START

TITLE: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

Reel No: 4 Patents: 5,199,111-5,206,954

VOLUME: 1149 ISSUES: 1-4

DATE: APRIL 6-27, 1993

PUBLICATION NO: 10426.00

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Vol. 1149 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 6, 1993

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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U.S.
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OF COMMERCE

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Trademark
Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
April 6, 1993 Volume 1149 Number 1

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April 6, 1993 Volume 1149 Number 1

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VOL

The current amounts of the maintenance fees due at 3 years 4,494,259 06/325,048 1/22/85

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 3, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,912,777 through 4,914,751
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 1, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,578,821 through 4,580,295
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 24, 1993 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,523	06/894,578	10/20/87
(4,494,527)	(06/448,923)	(1/22/85)
4,494,245	06/419,979	1/22/85
4,494,250	06/501,604	1/22/85
4,494,254	06/373,860	1/22/85
4,494,255	06/555,936	1/22/85
4,494,257	06/482,749	1/22/85
4,494,259	06/325,048	1/22/85
4,494,260	06/477,322	1/22/85
4,494,261	06/218,719	1/22/85
4,494,262	06/488,026	1/22/85
4,494,266	06/358,919	1/22/85
4,494,268	06/466,121	1/22/85
4,494,272	06/397,831	1/22/85
4,494,273	06/423,817	1/22/85
4,494,277	06/431,284	1/22/85
4,494,279	06/498,459	1/22/85
4,494,280	06/400,110	1/22/85
4,494,281	06/571,338	1/22/85
4,494,288	06/289,108	1/22/85
4,494,290	06/328,679	1/22/85
4,494,291	06/273,764	1/22/85
4,494,294	06/512,537	1/22/85
4,494,310	06/417,344	1/22/85
4,494,315	06/376,832	1/22/85
4,494,325	06/539,911	1/22/85
4,494,326	06/402,764	1/22/85
4,494,327	06/406,206	1/22/85
4,494,329	06/535,391	1/22/85
4,494,331	06/459,740	1/22/85
4,494,332	06/480,728	1/22/85
4,494,334	06/429,235	1/22/85
4,494,337	06/566,425	1/22/85
4,494,343	06/345,899	1/22/85
4,494,347	06/426,638	1/22/85
4,494,353	06/380,275	1/22/85
4,494,355	06/359,813	1/22/85
4,494,357	06/526,293	1/22/85
4,494,361	06/290,003	1/22/85
4,494,362	06/247,109	1/22/85
4,494,367	06/439,323	1/22/85
4,494,369	06/426,729	1/22/85
4,494,372	06/502,902	1/22/85
4,494,374	06/461,475	1/22/85
4,494,377	06/522,708	1/22/85
4,494,381	06/494,758	1/22/85
4,494,387	06/525,221	1/22/85
4,494,393	06/473,955	1/22/85
4,494,394	06/280,372	1/22/85
4,494,395	06/468,084	1/22/85
4,494,399	06/440,773	1/22/85
4,494,401	06/540,296	1/22/85
4,494,403	06/398,405	1/22/85
4,494,404	06/441,058	1/22/85
4,494,405	06/405,321	1/22/85
4,494,409	06/382,305	1/22/85
4,494,411	06/495,360	1/22/85
4,494,418	06/379,409	1/22/85
4,494,423	06/421,770	1/22/85
4,494,424	06/507,341	1/22/85
4,494,427	06/453,120	1/22/85
4,494,429	06/450,654	1/22/85
4,494,439	06/488,266	1/22/85
4,494,441	06/521,470	1/22/85
4,494,444	06/487,612	1/22/85
4,494,447	06/438,428	1/22/85
4,494,448	06/351,346	1/22/85
4,494,449	06/360,804	1/22/85
4,494,450	06/332,104	1/22/85
4,494,452	06/490,507	1/22/85
4,494,457	06/424,080	1/22/85
4,494,458	06/517,619	1/22/85
4,494,462	06/385,028	1/22/85
4,494,464	06/311,020	1/22/85
4,494,465	06/548,146	1/22/85
4,494,470	06/485,591	1/22/85
4,494,475	06/438,031	1/22/85
4,494,478	06/465,503	1/22/85
4,494,493	06/609,168	1/22/85
4,494,495	06/434,711	1/22/85
4,494,497	06/387,819	1/22/85
4,494,498	06/455,804	1/22/85
4,494,499	06/492,940	1/22/85
4,494,505	06/440,534	1/22/85
4,494,507	06/495,662	1/22/85
4,494,514	06/468,999	1/22/85

Patent Number	Serial Number	Issue Date
4,495,335	06/241,120	1/22/85
4,495,336	06/385,351	1/22/85
4,495,339	06/561,434	1/22/85
4,495,344	06/500,745	1/22/85

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Patent Number	Serial Number	Issue Date
4,494,515	06/515,935	1/22/85
4,494,518	06/433,913	1/22/85
4,494,520	06/459,054	1/22/85
4,494,526	06/470,042	1/22/85
4,494,528	06/510,550	1/22/85
4,494,529	06/335,805	1/22/85
4,494,530	06/475,507	1/22/85
4,494,541	06/317,555	1/22/85
4,494,543	06/354,144	1/22/85
4,494,546	06/505,444	1/22/85
4,494,548	06/370,014	1/22/85
4,494,557	06/419,836	1/22/85
4,494,560	06/448,258	1/22/85
4,494,567	06/483,147	1/22/85
4,494,575	06/462,975	1/22/85
4,494,577	06/464,992	1/22/85
4,494,578	06/479,946	1/22/85
4,494,585	06/463,915	1/22/85
4,494,587	06/456,743	1/22/85
4,494,588	06/487,584	1/22/85
4,494,595	06/556,480	1/22/85
4,494,596	06/434,077	1/22/85
4,494,597	06/317,408	1/22/85
4,494,598	06/456,171	1/22/85
4,494,602	06/456,995	1/22/85
4,494,604	06/508,640	1/22/85
4,494,607	06/493,029	1/22/85
4,494,608	06/447,023	1/22/85
4,494,610	06/483,789	1/22/85
4,494,611	06/347,873	1/22/85
4,494,612	06/468,297	1/22/85
4,494,616	06/514,935	1/22/85
4,494,617	06/461,675	1/22/85
4,494,620	06/530,258	1/22/85
4,494,622	06/416,370	1/22/85
4,494,630	06/517,992	1/22/85
4,494,635	06/403,300	1/22/85
4,494,637	06/468,292	1/22/85
4,494,638	06/365,644	1/22/85
4,494,640	06/457,643	1/22/85
4,494,641	06/322,816	1/22/85
4,494,644	06/455,374	1/22/85
4,494,645	06/399,984	1/22/85
4,494,647	06/411,611	1/22/85
4,494,649	06/384,482	1/22/85
4,494,650	06/524,388	1/22/85
4,494,654	06/438,932	1/22/85
4,494,659	06/491,088	1/22/85
4,494,660	06/532,202	1/22/85
4,494,662	06/472,011	1/22/85
4,494,665	06/459,594	1/22/85
4,494,668	06/575,201	1/22/85
4,494,671	06/570,184	1/22/85
4,494,675	06/384,144	1/22/85
4,494,679	06/402,159	1/22/85
4,494,691	06/442,507	1/22/85
4,494,693	06/404,956	1/22/85
4,494,695	06/302,518	1/22/85
4,494,697	06/457,195	1/22/85
4,494,699	06/479,204	1/22/85
4,494,703	06/370,645	1/22/85
4,494,706	06/498,131	1/22/85
4,494,707	06/466,887	1/22/85
4,494,708	06/601,783	1/22/85
4,494,712	06/444,398	1/22/85
4,494,716	06/459,101	1/22/85
4,494,727	06/311,678	1/22/85
4,494,728	06/385,579	1/22/85
4,494,729	06/458,162	1/22/85
4,494,735	06/552,340	1/22/85
4,494,739	06/472,401	1/22/85
4,494,743	06/297,611	1/22/85
4,494,750	06/373,557	1/22/85
4,494,756	06/554,999	1/22/85
4,494,759	06/546,915	1/22/85
4,494,760	06/518,710	1/22/85
4,494,763	06/472,949	1/22/85
4,494,765	06/377,690	1/22/85
4,494,768	06/463,008	1/22/85
4,494,769	06/386,662	1/22/85
4,494,773	06/413,530	1/22/85
4,494,778	06/360,561	1/22/85
4,494,779	06/398,096	1/22/85
4,494,782	06/478,441	1/22/85
4,494,783	06/356,379	1/22/85
4,494,786	06/516,791	1/22/85
4,494,788	06/427,842	1/22/85
4,494,791	06/287,048	1/22/85
4,494,792	06/287,053	1/22/85
4,494,796	06/359,812	1/22/85
4,494,797	06/521,691	1/22/85
4,494,799	06/466,033	1/22/85
4,494,802	06/488,031	1/22/85
4,494,805	06/445,357	1/22/85
4,494,806	06/494,414	1/22/85
4,494,817	06/522,578	1/22/85
4,494,820	06/462,058	1/22/85
4,494,832	06/368,038	1/22/85
4,494,833	06/368,039	1/22/85
4,494,838	06/398,132	1/22/85
4,494,839	06/469,312	1/22/85
4,494,840	06/529,787	1/22/85
4,494,845	06/500,596	1/22/85
4,494,849	06/472,883	1/22/85
4,494,854	06/525,805	1/22/85
4,494,855	06/587,110	1/22/85
4,494,865	06/449,365	1/22/85
4,494,871	06/322,544	1/22/85
4,494,874	06/281,068	1/22/85
4,494,877	06/516,375	1/22/85
4,494,879	06/572,360	1/22/85
4,494,880	06/590,022	1/22/85
4,494,884	06/439,274	1/22/85
4,494,887	06/569,578	1/22/85
4,494,889	06/513,623	1/22/85
4,494,895	06/464,200	1/22/85
4,494,898	06/371,138	1/22/85
4,494,904	06/354,906	1/22/85
4,494,911	06/489,772	1/22/85
4,494,913	06/396,408	1/22/85
4,494,914	06/481,151	1/22/85
4,494,919	06/420,084	1/22/85
4,494,920	06/549,071	1/22/85
4,494,923	06/523,621	1/22/85
4,494,924	06/534,285	1/22/85
4,494,925	06/408,224	1/22/85
4,494,928	06/515,167	1/22/85
4,494,930	06/403,647	1/22/85
4,494,933	06/473,241	1/22/85
4,494,943	06/414,579	1/22/85
4,494,944	06/393,070	1/22/85
4,494,954	06/450,040	1/22/85
4,494,955	06/549,076	1/22/85
4,494,959	06/509,713	1/22/85
4,494,961	06/504,115	1/22/85
4,494,962	06/444,356	1/22/85
4,494,963	06/507,266	1/22/85
4,494,967	06/502,018	1/22/85
4,494,970	06/346,786	1/22/85
4,494,972	06/461,371	1/22/85
4,494,976	06/471,452	1/22/85
4,494,980	06/437,325	1/22/85
4,494,983	06/383,977	1/22/85
4,494,987	06/370,438	1/22/85
4,494,990	06/510,636	1/22/85
4,494,995	06/471,083	1/22/85
4,494,997	06/504,568	1/22/85
4,495,002	06/487,485	1/22/85
4,495,005	06/547,184	1/22/85
4,495,006	06/547,302	1/22/85
4,495,019	06/380,756	1/22/85
4,495,026	06/523,574	1/22/85
4,495,028	06/427,247	1/22/85
4,495,029	06/409,361	1/22/85
4,495,031	06/494,348	1/22/85
4,495,032	06/542,834	1/22/85

Patent Number	Serial Number	Issue Date
4,495,035	06/241,120	1/22/85
4,495,040	06/493,779	1/22/85
4,495,041	06/368,550	1/22/85
4,495,046	06/524,394	1/22/85
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4,799,648	06/939,528	1/24/89

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4,800,499	06/854,818	1/24/89
4,800,503	06/909,222	1/24/89
4,800,507	06/941,764	1/24/89
4,800,514	07/055,137	1/24/89
4,800,528	07/129,930	1/24/89
4,800,532	07/125,628	1/24/89
4,800,536	07/057,782	1/24/89
4,800,537	06/893,055	1/24/89
4,800,538	06,846,583	1/24/89
4,800,545	07/033,933	1/24/89
4,800,547	06/939,205	1/24/89
4,800,558	07/021,235	1/24/89
4,800,566	07/079,961	1/24/89
4,800,584	07/092,551	1/24/89
4,800,585	07/069,686	1/24/89
4,800,590	06/691,225	1/24/89

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,396,148	06/314,238	8/02/83	10/23/81	1/29/93
4,443,401	06/331,738	4/17/84	12/17/81	1/29/93
4,445,184	06/283,117	4/24/84	7/13/81	1/28/93
4,454,105	06/432,630	6/12/84	10/05/82	2/11/93
4,662,429	06/896,155	5/05/87	8/13/86	2/11/93
4,462,822	06/549,845	7/13/84	11/08/83	2/11/93
4,625,071	06/668,131	11/25/86	11/05/84	1/13/93
4,641,514	06/553,168	2/03/87	11/18/83	2/11/93
4,641,910	06/641,674	2/03/87	8/17/84	2/11/93
4,703,766	06/871,888	11/03/87	6/06/86	2/10/93
4,711,058	06/864,999	12/08/87	2/06/86	2/11/93

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,799,892	07/107,204	1/24/89	4,800,273	07/141,588	1/24/89
4,799,894	07/093,990	1/24/89	4,800,274	07/009,682	1/24/89
4,799,896	07/112,527	1/24/89	4,800,279	06/776,133	1/24/89
4,799,906	07/126,401	1/24/89	4,800,286	07/083,647	1/24/89
4,799,907	07/010,455	1/24/89	4,800,289	07/004,707	1/24/89
4,799,910	07/058,409	1/24/89	4,800,290	07/123,321	1/24/89
4,799,912	07/006,210	1/24/89	4,800,312	07/053,147	1/24/89
4,799,917	07/135,671	1/24/89	4,800,323	07/074,697	1/24/89
4,799,919	07/082,863	1/24/89	4,800,337	06/879,477	1/24/89
4,799,927	07/123,829	1/24/89	4,800,346	07/049,142	1/24/89
4,799,932	07/064,894	1/24/89	4,800,361	07/073,064	1/24/89
4,799,939	07/027,784	1/24/89	4,800,363	07/000,134	1/24/89
4,799,951	07/113,298	1/24/89	4,800,366	07/082,029	1/24/89
4,799,965	07/094,866	1/24/89	4,800,367	07/079,771	1/24/89
4,799,966	07/063,358	1/24/89	4,800,371	06/900,319	1/24/89
4,799,969	07/176,572	1/24/89	4,800,372	06/930,883	1/24/89
4,799,976	07/165,008	1/24/89	4,800,373	07/089,157	1/24/89
4,799,977	07/098,081	1/24/89	4,800,377	07/052,534	1/24/89
4,799,982	07/129,466	1/24/89	4,800,383	06/781,121	1/24/89
4,800,009	07/086,313	1/24/89	4,800,384	06/866,647	1/24/89
4,800,011	07/076,463	1/24/89	4,800,393	07/080,955	1/24/89
4,800,015	07/063,124	1/24/89	4,800,394	06/930,535	1/24/89
4,800,020	07/052,780	1/24/89	4,800,406	06/927,170	1/24/89
4,800,027	07/007,089	1/24/89	4,800,425	07/134,872	1/24/89
4,800,040	07/053,591	1/24/89	4,800,431	06/892,727	1/24/89
4,800,041	06/913,391	1/24/89	4,800,436	07/020,923	1/24/89
4,800,052	06/943,232	1/24/89	4,800,443	07/085,425	1/24/89
4,800,054	07/058,436	1/24/89	4,800,456	07/126,374	1/24/89
4,800,060	06/404,851	1/24/89	4,800,460	07/095,346	1/24/89
4,800,066	06/887,751	1/24/89	4,800,464	07/152,611	1/24/89
4,800,069	07/099,677	1/24/89	4,800,465	07/080,446	1/24/89
4,800,080	06/896,580	1/24/89	4,800,470	07/093,965	1/24/89
4,800,091	06/934,752	1/24/89	4,800,471	07/230,364	1/24/89
4,800,108	07/172,435	1/24/89	4,800,473	07/069,976	1/24/89
4,800,113	07/036,622	1/24/89	4,800,475	07/113,715	1/24/89
4,800,117	06/864,350	1/24/89	4,800,484	06/623,214	1/24/89
4,800,118	07/117,175	1/24/89	4,800,491	06/931,314	1/24/89
4,800,140	07/103,856	1/24/89	4,800,498	06/877,729	1/24/89
4,800,164	06/751,248	1/24/89	4,800,499	06/854,818	1/24/89
4,800,168	06/788,280	1/24/89	4,800,503	06/909,222	1/24/89
4,800,181	07/091,698	1/24/89	4,800,507	06/941,764	1/24/89
4,800,186	07/114,323	1/24/89	4,800,514	07/055,137	1/24/89
4,800,188	07/028,353	1/24/89	4,800,528	07/129,930	1/24/89
4,800,202	07/147,416	1/24/89	4,800,532	07/125,628	1/24/89
4,800,204	07/190,428	1/24/89	4,800,536	07/057,782	1/24/89
4,800,205	07/114,811	1/24/89	4,800,537	06/893,055	1/24/89
4,800,227	06/642,011	1/24/89	4,800,538	06,846,583	1/24/89
4,800,240	07/057,059	1/24/89	4,800,545	07/033,933	1/24/89
4,800,241	07/121,333	1/24/89	4,800,547	06/939,205	1/24/89
4,800,252	06/629,784	1/24/89	4,800,558	07/021,235	1/24/89
4,800,257	07/013,555	1/24/89	4,800,566	07/079,961	1/24/89
4,800,260	07/136,376	1/24/89	4,800,584	07/092,551	1/24/89
4,800,264	07/129,899	1/24/89	4,800,585	07/069,686	1/24/89
			4,800,590	06/691,225	1/24/89

Reg. Number	Serial Number	Reg. Date
933,786	72/398,797	5/16/1972

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Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,713,086	06/585,661	12/15/87	3/02/84	2/11/93
4,713,111	06/894,548	12/15/87	8/08/86	2/11/93
4,738,836	06/923,249	4/19/88	10/27/86	12/23/92
4,745,033	07/029,691	5/17/88	3/24/87	2/11/93
4,753,690	06/896,037	6/28/88	8/13/87	2/11/93
4,758,406	07/125,504	7/19/88	11/25/87	2/11/93
4,762,700	07/048,352	8/09/88	5/11/87	2/11/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

Re. 33,928, Re. S.N. 08/002,946, Filed Jan. 11, 1993, Cl. 92/94, FIRE-SAFE VALVE ACTUATOR, Billy R. Bruton, et. al., Owner of Record: *Axelson, Inc., Longview, Tex.*, Attorney or Agent: Michael L. Smith, Ex. Gp.: 3401

4,971,872, Re. S.N. 07/978,969, Filed Nov. 20, 1992, Cl. 430/57, ELECTROSTATIC MACHINE, Shunpei Yamazaki, Owner of Record: *Semiconductor Energy Laboratory Co., Ltd., Kanagawa-Ken, Japan*, Attorney or Agent: Donald R. Studebaker, Ex. Gp.: 1507

4,990,094, Re. S.N. 08/014,469, Filed Feb. 5, 1993, Cl. 439/108, DATA DISTRIBUTION PANEL, Curtis S. Chandler, et. al., Owner of Record: *Amp Inc., Harrisburg, Pa.*, Attorney or Agent: Michael L. Lynch, Ex. Gp.: 3202

4,991,214, Re. S.N. 08/012,947, Filed Feb. 3, 1993, Cl. 381/038, SPEECH CODING USING SPARSE VECTOR CODEBOOK AND CYCLIC TECHNIQUES, Daniel K. Freeman, et. al., Owner of Record: *British Telecommunications, London, England*, Attorney or Agent: Paul J. Henon, Ex. Gp.: 2301

4,993,893, Re. S.N. 08/019,738, Filed Feb. 19, 1993, Cl. 407/116, CUTTING INSERT WITH CHIP CONTROL Kenneth L. Niebauer, Owner of Record: *Kennametal Inc., Latrobe, Pa.*, Attorney or Agent: James G. Porcelli, Ex. Gp.: 3203

5,057,669, Re. S.N. 08/016,794, Filed Feb. 11, 1993, Cl. 219/501, TEMPERATURE CONTROL CIRCUIT HAVING SERIES CONNECTED FAIL-SAFE CONTROL, Richard L. Dennison, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Walter C. Linder, Ex. Gp.: 2106

5,091,435, Re. S.N. 08/013,821, Filed Feb. 4, 1993, Cl. 521/134, CROSS-LINKABLE, FOAMABLE POLYOLEFIN RESIN COMPOSITION, Toshiaki Suzuki, et. al., Owner of Record: *Tonen Chemical Corp., Tokyo, Japan*, Attorney or Agent: Stephen G. Adrian, Ex. Gp.: 1503

5,093,936, Re. S.N. 08/012,645, Filed Feb. 3, 1993, Cl. 2/419, PROTECTIVE HEAD GEAR AND DETACHABLE FACE PROTECTOR, Steve Copeland, et. al., Owner of Record: *Itech Sports Products Inc., Ville St.-Laurent, Canada*, Attorney or Agent: Eckhard H. Kuesters, Ex. Gp.: 2407

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,784,904, Reexam. No. 90/002,965, Requested Feb. 1, 1993, Cl. 428/317.900, REINFORCED SHAPED ARTICLE, Richard Wood, et. al., Owner of Record: *Imperial Chemical Industries, Plc., London, England*, Attorney or Agent: Cushman, Darby & Cushman, Washington, D.C., Ex. Gp.: 1504, Requester: David L. Mossman, Rosenblatt & Associates, Houston, Tex.

5,039,428, Reexam. No. 90/002,964, Requested Feb. 19, 1993, Cl. 210/711, WASTE WATER TREATMENT PROCESS USING IMPROVED RECYCLE OF HIGH DENSITY SLUDGE, Thomas H. Wentzler, et. al., Owner of Record: *Tetra Technologies, Inc., The Woodlands, Tex.*, Attorney or Agent: Douglas H. Elliott, Arnold, White & Durkee, Houston, Tex., Ex. Gp.: 1308, Requester: Owner

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an addittional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATION WHICH EXPIRED FEBRUARY 22, 1993
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
86,566	71/055,957	5/21/1912
86,576	71/056,864	5/21/1912
86,587	71/061,262	5/21/1912
86,594	71/039,487	5/21/1912
294,037	71/321,886	5/17/1932
294,046	71/322,171	5/17/1932
294,061	71/315,235	5/17/1932
294,100	71/322,444	5/17/1932
294,103	71/322,864	5/17/1932
294,106	71/322,998	5/17/1932
294,110	71/323,213	5/17/1932
294,115	71/287,210	5/17/1932
294,133	71/321,903	5/17/1932
294,136	71/322,715	5/17/1932
294,157	71/322,938	5/17/1932
558,910	71/521,878	5/20/1952
558,912	71/527,577	5/20/1952
558,914	71/530,803	5/20/1952
558,917	71/538,364	5/20/1952
558,918	71/539,558	5/20/1952
558,919	71/540,542	5/20/1952
558,920	71/540,883	5/20/1952
558,925	71/548,146	5/20/1952
558,930	71/558,972	5/20/1952
558,934	71/595,808	5/20/1952
558,935	71/568,103	5/20/1952
558,944	71/573,116	5/20/1952

Reg. Number	Serial Number	Reg. Date
558,948	71/575,210	5/20/1952
558,952	71/578,930	5/20/1952
558,956	71/581,820	5/20/1952
558,957	71/582,595	5/20/1952
558,958	71/582,704	5/20/1952
558,965	71/587,887	5/20/1952
558,966	71/587,924	5/20/1952
558,967	71/588,353	5/20/1952
558,972	71/590,518	5/20/1952
558,991	71/596,685	5/20/1952
558,995	71/597,569	5/20/1952
558,996	71/597,786	5/20/1952
559,004	71/599,596	5/20/1952
559,009	71/600,949	5/20/1952
559,014	71/601,924	5/20/1952
559,015	71/602,053	5/20/1952
559,016	71/602,070	5/20/1952
559,029	71/603,856	5/20/1952
559,031	71/603,976	5/20/1952
559,034	71/604,591	5/20/1952
559,036	71/604,744	5/20/1952
559,041	71/605,055	5/20/1952
559,042	71/605,281	5/20/1952
559,044	71/606,024	5/20/1952
559,045	71/606,025	5/20/1952
559,057	71/607,637	5/20/1952
559,069	71/609,635	5/20/1952
559,073	71/610,084	5/20/1952
559,074	71/610,421	5/20/1952
559,076	71/610,667	5/20/1952
559,097	71/612,671	5/20/1952
559,104	71/613,125	5/20/1952
559,110	71/613,952	5/20/1952
559,116	71/614,529	5/20/1952
559,118	71/614,581	5/20/1952
559,125	71/615,222	5/20/1952
559,131	71/615,801	5/20/1952
559,147	71/618,538	5/20/1952
559,150	71/619,615	5/20/1952
559,154	71/585,198	5/20/1952
559,155	71/612,868	5/20/1952
559,160	71/569,530	5/20/1952
559,161	71/571,801	5/20/1952
559,164	71/582,804	5/20/1952
559,173	71/601,628	5/20/1952
559,174	71/602,588	5/20/1952
559,176	71/603,574	5/20/1952
559,177	71/604,093	5/20/1952
562,048	71/581,520	7/22/1952
914,481	71/338,665	6/08/1971
921,072	72/372,897	9/28/1971
924,857	72/386,286	11/30/1971
933,712	72/358,127	5/16/1972
933,717	72/376,448	5/16/1972
933,723	72/391,581	5/16/1972
933,724	72/375,306	5/16/1972
933,725	72/346,619	5/16/1972
933,726	72/357,022	5/16/1972
933,730	72/342,785	5/16/1972
933,732	72/359,493	5/16/1972
933,733	72/359,727	5/16/1972
933,736	72/369,527	5/16/1972
933,742	72/377,963	5/16/1972
933,748	72/380,224	5/16/1972
933,751	72/385,915	5/16/1972
933,752	72/391,237	5/16/1972
933,755	72/379,630	5/16/1972
933,758	72/382,250	5/16/1972
933,761	72/346,653	5/16/1972
933,762	72/368,067	5/16/1972
933,764	72/355,492	5/16/1972
933,771	72/384,201	5/16/1972
933,777	72/397,388	5/16/1972
933,778	72/397,389	5/16/1972
933,780	72/380,348	5/16/1972
933,782	72/389,945	5/16/1972
933,783	72/393,557	5/16/1972
933,786	72/398,797	5/16/1972
933,787	72/336,615	5/16/1972
933,794	72/375,138	5/16/1972
933,796	72/360,924	5/16/1972
933,801	72/376,625	5/16/1972
933,802	72/377,122	5/16/1972
933,803	72/377,558	5/16/1972
933,809	72/396,965	5/16/1972
933,810	72/396,967	5/16/1972
933,811	72/396,971	5/16/1972
933,812	72/396,973	5/16/1972
933,816	72/357,814	5/16/1972
933,817	72/358,034	5/16/1972
933,818	72/359,238	5/16/1972
933,829	72/383,301	5/16/1972
933,831	72/385,398	5/16/1972
933,832	72/401,563	5/16/1972
933,833	72/403,314	5/16/1972
933,837	72/397,056	5/16/1972
933,838	72/190,817	5/16/1972
933,848	72/380,140	5/16/1972
933,849	72/380,191	5/16/1972
933,855	72/384,158	5/16/1972
933,862	72/358,759	5/16/1972
933,867	72/361,149	5/16/1972
933,870	72/372,121	5/16/1972
933,871	72/372,134	5/16/1972
933,875	72/374,030	5/16/1972
933,879	72/376,508	5/16/1972
933,884	72/377,534	5/16/1972
933,888	72/380,900	5/16/1972
933,891	72/385,084	5/16/1972
933,893	72/325,754	5/16/1972
933,894	72/337,521	5/16/1972
933,896	72/346,085	5/16/1972
933,897	72/346,086	5/16/1972
933,898	72/346,716	5/16/1972
933,899	72/348,302	5/16/1972
933,904	72/361,189	5/16/1972
933,905	72/361,380	5/16/1972
933,909	72/373,707	5/16/1972
933,910	72/375,332	5/16/1972
933,915	72/381,425	5/16/1972
933,916	72/381,887	5/16/1972
933,918	72/382,144	5/16/1972
933,922	72/385,369	5/16/1972
933,929	72/355,234	5/16/1972
933,938	72/371,280	5/16/1972
933,942	72/385,927	5/16/1972
933,946	72/390,345	5/16/1972
933,960	72/383,474	5/16/1972
933,961	72/384,772	5/16/1972
933,965	72/370,968	5/16/1972
933,969	72/380,479	5/16/1972
933,977	72/372,734	5/16/1972
933,978	72/372,805	5/16/1972
933,982	72/376,380	5/16/1972
933,983	72/386,241	5/16/1972
933,984	72/386,242	5/16/1972
933,989	72/363,781	5/16/1972
933,991	72/368,737	5/16/1972
934,000	72/382,765	5/16/1972
934,004	72/385,997	5/16/1972
934,005	72/386,068	5/16/1972
934,018	72/365,315	5/16/1972
934,019	72/367,060	5/16/1972
934,022	72/383,699	5/16/1972
934,023	72/385,947	5/16/1972
934,024	72/386,859	5/16/1972
934,026	72/388,312	5/16/1972
934,027	72/388,473	5/16/1972
934,029	72/386,553	5/16/1972
934,032	72/373,103	5/16/1972
934,034	72/380,199	5/16/1972
934,037	72/385,023	5/16/1972
934,044	72/342,792	5/16/1972
934,048	72/380,280	5/16/1972
934,049	72/380,619	5/16/1972
934,051	72/383,741	5/16/1972

Reg. Number	Serial Number	Reg. Date
934,243	72/368,264	5/16/1972
934,244	72/377,606	5/16/1972
934,246	72/332,263	5/16/1972

Service by Publication

Cincinnati Development and Manufacturing Co., Cincinnati,

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Reg. Number	Serial Number	Reg. Date
934,052	72/383,742	5/16/1972
934,055	72/384,512	5/16/1972
934,056	72/384,699	5/16/1972
934,057	72/384,759	5/16/1972
934,062	72/385,636	5/16/1972
934,063	72/368,021	5/16/1972
934,065	72/386,050	5/16/1972
934,066	72/387,094	5/16/1972
934,069	72/387,645	5/16/1972
934,070	72/387,797	5/16/1972
934,071	72/387,881	5/16/1972
934,074	72/388,319	5/16/1972
934,075	72/388,720	5/16/1972
934,077	72/392,452	5/16/1972
934,078	72/396,077	5/16/1972
934,083	72/370,854	5/16/1972
934,085	72/377,900	5/16/1972
934,086	72/316,363	5/16/1972
934,087	72/340,512	5/16/1972
934,091	72/360,687	5/16/1972
934,093	72/373,617	5/16/1972
934,096	72/376,743	5/16/1972
934,097	72/380,323	5/16/1972
934,098	72/380,353	5/16/1972
934,100	72/384,002	5/16/1972
934,102	72/296,667	5/16/1972
934,108	72/373,118	5/16/1972
934,109	72/375,313	5/16/1972
934,114	72/382,497	5/16/1972
934,116	72/296,574	5/16/1972
934,122	72/349,988	5/16/1972
934,124	72/350,987	5/16/1972
934,125	72/351,229	5/16/1972
934,131	72/356,400	5/16/1972
934,132	72/359,066	5/16/1972
934,133	72/359,637	5/16/1972
934,137	72/370,829	5/16/1972
934,140	72/373,856	5/16/1972
934,141	72/373,857	5/16/1972
934,142	72/374,309	5/16/1972
934,149	72/376,509	5/16/1972
934,152	72/377,478	5/16/1972
934,153	72/378,915	5/16/1972
934,157	72/385,001	5/16/1972
934,162	72/345,432	5/16/1972
934,163	72/349,945	5/16/1972
934,164	72/350,090	5/16/1972
934,167	72/355,880	5/16/1972
934,169	72/362,856	5/16/1972
934,172	72/372,236	5/16/1972
934,173	72/372,297	5/16/1972
934,174	72/372,299	5/16/1972
934,179	72/380,314	5/16/1972
934,180	72/383,002	5/16/1972
934,181	72/383,009	5/16/1972
934,183	72/383,976	5/16/1972
934,184	72/384,364	5/16/1972
934,185	72/384,443	5/16/1972
934,190	72/356,489	5/16/1972
934,194	72/384,823	5/16/1972
934,196	72/337,397	5/16/1972
934,201	72/368,144	5/16/1972
934,203	72/378,135	5/16/1972
934,204	72/378,136	5/16/1972
934,208	72/370,650	5/16/1972
934,209	72/370,651	5/16/1972
934,214	72/376,453	5/16/1972
934,215	72/390,177	5/16/1972
934,219	72/355,904	5/16/1972
934,220	72/357,476	5/16/1972
934,224	72/371,828	5/16/1972
934,225	72/372,715	5/16/1972
934,226	72/374,111	5/16/1972
934,228	72/383,315	5/16/1972
934,236	72/385,537	5/16/1972
934,238	72/362,919	5/16/1972
934,242	72/374,646	5/16/1972
934,243	72/368,264	5/16/1972
934,244	72/377,606	5/16/1972
934,246	72/332,263	5/16/1972
934,249	72/369,583	5/16/1972
934,250	72/387,591	5/16/1972
934,256	72/377,685	5/16/1972
934,261	72/385,110	5/16/1972
934,262	72/390,292	5/16/1972
934,270	72/333,620	5/16/1972
934,271	72/342,320	5/16/1972
934,273	72/364,824	5/16/1972
934,277	72/354,595	5/16/1972
934,279	72/361,699	5/16/1972
934,280	72/369,813	5/16/1972
934,636	72/364,615	5/23/1972
936,983	72/356,992	7/04/1972
937,006	72/370,665	7/04/1972

Errata

The following registration number was inadvertently listed as cancelled in the "Trademark Registration Cancelled, Section 8" and "Index of Registrants" sections of the *Official Gazette* of Nov. 24, 1993:

TM 369, TMI 4 1,421,798

Consequently, the above-identified registration is still active.

Mar. 9, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers listed in the "Trademark Registrations Issued" and "Index of Registrants" sections of the *Official Gazette* was listed inadvertently:

TM 314, TMI 28	1,752,470	2/16/93
TM 477, TMI 13	1,700,579	7/14/92
TM 166, TMI 34	1,755,415	3/02/93
TM 172, TMI 17	1,755,644	3/02/93

Consequently, the certificates of registration bearing the above identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

Mar. 9, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers listed in the "Trademark Registrations Issued" and "Index of Registrants" sections of the *Official Gazette* were listed inadvertantly on Mar. 9, 1993:

TM 199, TMI 23	1,757,371
TM 194, TMI 37	1,757,166
TM 196, 199, TMI 37	1,757,220
TM 181, TMI 25	1,756,590
TM 188, TMI 9	1,756,906
TM 183, TMI 38	1,756,665
TM 183, TMI 1	1,756,667

Consequently, the certificates of registration bearing the above identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

Mar. 9, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

National Health Advisors, Inc., Nashville, Tenn., Reg. No. 1,568,745, for the mark "NATIONAL HEALTH ADVISORS, INC. NHA" and design, Canc. No. 21,053.

National Health Advisors, Inc., Nashville, Tenn., Reg. No. 1,572,554, for the mark "NATIONAL HEALTH ADVISORS, INC. NHA" and design, Canc. No. 21,052.

Laser Services Inc., Jamaica, N.Y., Reg. No. 1,451,378, for the mark "LASER" and design, Canc. No. 20,947.

Chr. Bjelland & Co., Inc., New York, N.Y., Reg. No. 103,084, for the mark "ALICE", Canc. No. 21,209.

Carolina Enterprises, Inc., New York, N.Y., Reg. No. 999,060, for the mark "LEGENDS OF THE WEST" and design, Canc. No. 21,108.

Rickshaw Express, Inc., New York, N.Y., Reg. No. 1,126,477, for the mark "RICKSHAW EXPRESS", and design, Canc. No. 21,089.

Cincinnati Development and Manufacturing Co., Cincinnati, Ohio, Reg. No. 644,366, for the mark "INSULSTRUC", Canc. No. 21,085.

New Directions, Massillion, Ohio, Reg. No. 1,117,475, for the mark "NEW DIRECTIONS" and design, Canc. No. 20,852.

Uni-Hoist International, Inc., Phoenix, Ariz., Reg. No. 1,642,010 for the mark "UNI-HOIST", Canc. No. 20,460.

Marine Culture Enterprises, Laie, Hi., Reg. No. 1,457,622, for the mark "BLUE PACIFIC", Canc. No. 20,885.

John F. Milanese, Fort Lauderdale, Fla., Reg. No. 656,604, for the mark "THE INTERLUDES", Canc. No. 20,787.

Aspen Manufacturing Co., Dayton, Ohio, Reg. No. 745,730, for the mark "SHOPCRAFT", Canc. No. 20,957.

Flexi Media Game Systems, Inc., Manhattan Beach, Calif., Reg. No. 1,612,297, for the mark "LOTTA CASH", Canc. No. 21,064.

Paris Trina Clutchette and Doris Louise Brown, dba American Billboad International Top 40 Fashions, Beverly Hills, Calif. Reg. No. 1,583,753, for the mark "AMERICAN BILLBOARD INTERNATIONAL TOP 40 FASHIONS", and design, Canc. No. 20,870.

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

PATENT NOTICES

SPECIAL BOXES FOR MAIL

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PATENT NOTICES

Certificates of Correction For Week of April 6, 1993

Des.319,095	4,999,282	5,037,448	5,055,665
Des. 319,967	4,999,460	5,037,587	5,056,347
Des. 320,505	5,000,360	5,037,981	5,056,491
Des. 320,709	5,003,524	5,038,208	5,056,522
Des. 322,539	5,004,165	5,038,223	5,056,535
Re. 33,566	5,004,693	5,038,303	5,056,968
PP. 7,765	5,006,012	5,038,488	5,057,160
4,612,340	5,006,156	5,038,491	5,057,225
4,662,222	5,006,527	5,038,712	5,057,304
4,793,365	5,006,955	5,038,713	5,057,467
4,795,155	5,007,942	5,038,911	5,057,565
4,829,555	5,009,296	5,039,318	5,057,613
4,840,129	5,010,882	5,039,565	5,057,946
4,863,739	5,011,463	5,039,606	5,058,047
4,864,140	5,011,512	5,039,893	5,058,128
4,866,885	5,011,559	5,040,077	5,058,203
4,877,401	5,012,323	5,040,139	5,058,345
4,877,778	5,012,800	5,040,192	5,058,740
4,882,306	5,013,667	5,040,232	5,058,854
4,891,439	5,013,857	5,040,269	5,059,079
4,896,347	5,013,913	5,040,898	5,059,246
4,901,338	5,015,561	5,041,002	5,059,496
4,908,471	5,017,635	5,041,065	5,059,645
4,909,181	5,017,707	5,041,160	5,059,709
4,910,696	5,017,909	5,041,239	5,059,783
4,914,146	5,018,259	5,041,386	5,059,801
4,914,318	5,018,791	5,041,520	5,059,938
4,917,303	5,020,623	5,042,082	5,059,983
4,921,484	5,021,081	5,043,183	5,060,016
4,922,449	5,021,082	5,043,329	5,060,271
4,923,077	5,021,503	5,043,363	5,060,310
4,924,021	5,021,505	5,043,419	5,060,362
4,933,347	5,022,305	5,043,463	5,060,519
4,934,412	5,022,824	5,043,748	5,060,533
4,934,635	5,023,286	5,043,763	5,061,177
4,936,121	5,023,384	5,043,895	5,061,294
4,937,748	5,023,532	5,043,939	5,061,403
4,941,175	5,023,831	5,044,634	5,061,449
4,941,669	5,023,982	5,044,744	5,061,521
4,942,280	5,024,508	5,044,772	5,061,540
4,943,401	5,024,512	5,044,888	5,061,682
4,944,485	5,026,239	5,045,280	5,061,691
4,946,150	5,026,611	5,045,327	5,062,007
4,946,686	5,027,123	5,045,637	5,062,064
4,947,089	5,027,288	5,045,727	5,062,166
4,950,638	5,027,784	5,045,797	5,062,357
4,951,670	5,027,823	5,046,062	5,062,489
4,952,528	5,027,836	5,046,181	5,062,520
4,953,921	5,027,940	5,046,328	5,062,756
4,956,425	5,028,058	5,046,599	5,062,784
4,960,606	5,028,505	5,046,904	5,062,869
4,965,397	5,028,686	5,047,406	5,062,879
4,970,131	5,028,720	5,047,883	5,062,941
4,971,556	5,028,901	5,048,814	5,063,234
4,972,287	5,029,091	5,048,878	5,063,415
4,972,399	5,029,183	5,048,997	5,063,519
4,972,624	5,031,002	5,049,683	5,063,624
4,974,071	5,031,035	5,050,002	5,063,810
4,975,795	5,031,242	5,050,573	5,063,846
4,976,679	5,031,331	5,051,142	5,063,956
4,977,306	5,032,011	5,051,321	5,064,164
4,977,391	5,032,139	5,051,581	5,064,195
4,977,910	5,032,525	5,051,593	5,064,422
4,979,127	5,032,672	5,051,759	5,064,487
4,984,425	5,033,086	5,052,060	5,064,678
4,985,271	5,033,651	5,052,413	5,064,728
4,985,374	5,033,867	5,053,091	5,064,746
4,987,209	5,033,848	5,053,128	5,065,676
4,991,190	5,034,185	5,053,198	5,065,689
4,991,365	5,034,360	5,054,149	5,065,737
4,992,806	5,034,501	5,054,218	5,065,979
4,994,322	5,034,652	5,054,587	5,066,128
4,994,463	5,035,642	5,054,601	5,066,444
4,994,893	5,035,813	5,054,634	5,066,621
4,996,432	5,036,159	5,055,224	5,066,651
4,996,586	5,036,405	5,055,347	5,066,751
4,997,148	5,036,646	5,055,354	5,066,794
5,066,822	5,070,654	5,075,022	5,079,012
5,066,898	5,071,096	5,075,127	5,079,042
5,067,074	5,071,536	5,075,131	5,079,297
5,067,456	5,071,649	5,075,335	5,079,540
5,067,550	5,071,887	5,075,405	5,079,927
5,067,639	5,072,171	5,075,426	5,080,269
5,067,658	5,072,185	5,075,509	5,080,672
5,068,388	5,072,367	5,075,615	5,080,836
5,068,487	5,072,623	5,075,652	5,081,041
5,068,535	5,072,624	5,075,708	5,081,546
5,068,758	5,072,862	5,076,111	5,081,587
5,068,965	5,072,929	5,076,559	5,081,681
5,069,080	5,073,095	5,076,847	5,081,802
5,069,158	5,073,156	5,076,849	5,082,026
5,069,201	5,073,194	5,076,859	5,084,163
5,069,403	5,073,252	5,077,219	5,085,385
5,069,438	5,073,546	5,077,329	5,086,679
5,069,471	5,073,926	5,077,461	5,087,154
5,069,649	5,074,228	5,077,553	5,091,607
5,069,874	5,074,310	5,077,815	5,094,429
5,070,082	5,074,313	5,078,568	5,130,200
5,070,145	5,074,420	5,078,638	5,136,117
5,070,318	5,074,576	5,078,657	5,164,430
5,070,326	5,074,755	5,078,910	5,178,220

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Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

VOL 1149 ISS 1 AP 7 1993 UMI

PATENT EXAMINING CORPS

REEXAMINATIONS

APRIL 6, 1993

VOL 1149 ISS 1 AP 6 1993 UMI

PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	4/11/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	7/09/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/29/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/29/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	9/05/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	9/17/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/31/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	12/05/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	3/20/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	8/24/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	11/18/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/15/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	6/09/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/12/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	6/12/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/25/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during March 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,940,801 to 3,947,895 inclusive
Plant Patents ..... 3,831 to 3,855

REEXAMINATIONS

APRIL 6, 1993

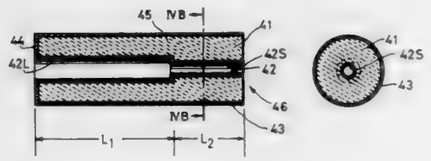
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,506,241 (1967th)

COAXIAL DIELECTRIC RESONATOR HAVING DIFFERENT IMPEDANCE PORTIONS AND METHOD OF MANUFACTURING THE SAME

Mitsuo Makimoto, Yokohama; Yukichi Aihara, Kawasaki, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma, Japan

Reexamination Request No. 90/002,434, Sep. 9, 1991.
Reexamination Certificate for Patent No. 4,506,241, issued Mar. 19, 1985, Ser. No. 445,837, Nov. 30, 1982.
Claims priority, application Japan, Dec. 1, 1981, 56-193895
Int. Cl.[5] H01P *7/04*
U.S. Cl. 333—222



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4**, **6** and **8–13** are cancelled.

Claims **5** and **7** are determined to be patentable as amended.

New claim **14** is added and determined to be patentable.

5. A coaxial dielectric resonator [as claimed in claim **1**] *comprising:*

(*a*) *a generally hollow cylindrical dielectric material having first and second ends, said cylindrical dielectric material having eliminating means for eliminating harmonics corresponding to integral multiples of a fundamental resonance frequency, said eliminating means having a thick portion of dielectric material, a thin portion of dielectric material, and a stepped portion of dielectric material interposed between said thick and thin portions of dielectric material, said thick portion of dielectric material having an impedance different from that of said thin portion of dielectric material so that an impedance ratio K of said impedance of said thin portion of dielectric material to said impedance of said thick portion of dielectric material is less than one to prevent resonance of said resonator at said harmonics;*

(*b*) *an outer conductor attached to the outer surface of said dielectric material;*

(*c*) *an inner conductor attached to the inner surface of said dielectric material; and*

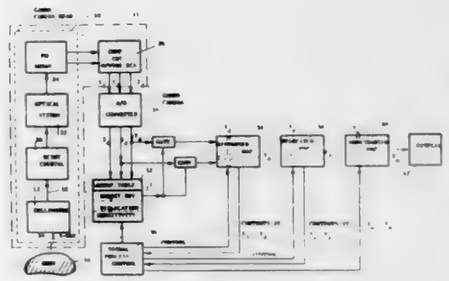
(*d*) *a short-circuit plate attached only to one of said first and second ends of said cylindrical dielectric material thereby closing said one end and making a short circuit between said outer and inner conductors, the other end of said cylindrical dielectric material being open,* wherein said short-circuit plate is attached *only* to the end of said thin portion of [said] dielectric *material.*

B1 4,588,897 (1968th)

GAMMA CAMERA CORRECTION SYSTEM AND METHOD FOR USING THE SAME

Dan Inbar; Giora Gafni, both of Haifa; Ernest Grimberg, Kiryat Bialick, and Jacob Koren, Haifa, all of Israel, assignors to Elscint, Ltd., Haifa, Israel

Reexamination Request No. 90/002,734, May 26, 1992.
Reexamination Certificate for Patent No. 4,588,897, issued May 13, 1986, Ser. No. 483,741, Apr. 11, 1983.
Continuation of Ser. No. 161,050, Jun. 19, 1980, Pat. No. 4,424,446
Int. Cl.[5] G01T *1/208*
U.S. Cl. 250—363.07



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **5**, **6**, **9** and **11** is confirmed.

Claims **1**, **3**, **4**, **7** and **10** are cancelled.

Claim **8** is determined to be patentable as amended.

New claims **12–21** and **22** are added and determined to be patentable.

6. A nuclear imaging device comprising:

(a) a head that includes a plurality of photodetectors for producing output signals in response to radiation stimuli which are emitted by a radiation field and interact with the device;

(b) coordinate computation circuitry for operating on said signals and producing, for an interaction, a pair of calculated coordinate signals that define distorted coordinates of the interaction;

(c) means for storing spatially dependent energy window correction factors;

(d) means for storing spatially dependent sensitivity correction factors based on a relocated coordinate system;

(e) means responsive to the occurrence of an interaction for producing a validating signal validating the interaction if the total energy thereof satisfies the energy window correction factor evaluated at the calculated coordinates of the interaction; and

(f) means for converting the calculated coordinates of a validated interaction into undistorted coordinates by applying to the calculated coordinates the sensitivity correction factor evaluated at the relocated coordinates of the validated interaction.

B1 4,727,416 (1969th)

ELECTRONIC VIDEO DENTAL CAMERA

The patentability of claims **5–8** is confirmed.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

the other portion of said hook and loop fastening material to the mating surface of the other of said parts, and means to

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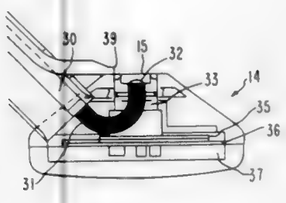
B1 4,727,416 (1969th)
ELECTRONIC VIDEO DENTAL CAMERA
David H. Cooper, Saratoga, and Charles S. Bush, Los Gatos, both of Calif., assignors to Fuji Optical System Inc., Los Gatos, Calif.
Reexamination Request No. 90/002,036, Jun. 1, 1990.
Reexamination Certificate for Patent No. 4,727,416, issued Feb. 23, 1988, Ser. No. 22,171, Mar. 5, 1987.
Int. Cl.[5] **H04N** *7/18;* **A61B** *1/04, 1/06*
U.S. Cl. 358—98



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **15**, **19**, **21–24** and **27** are cancelled.

Claims **1**, **6**, **14**, **20** and **25** are determined to be patentable as amended.

Claims **2–5**, **7–13**, **16–18**, **26** and **28**, dependent on an amended claim, are determined to be patentable.

New claims **29–76** are added and determined to be patentable.

1. A dental camera for use in displaying an image from inside the mouth onto a monitor comprising an electronic video endoscope having a shape like a dental mirror, said endoscope comprising:
a handle *having a longitudinal axis, a proximal end, and a distal end;*
a camera head *for placement within the mouth* including a camera lens, *said camera head* located at **[**the**]** *said* distal end of said handle, said camera head being formed such that said camera lens is placed at an angle from the axis of said handle, *wherein said camera lens is located in said camera head such that said image is directed to said camera lens without reflection by a planar mirrored surface, and wherein one or both of said camera head and said camera lens is reflexed toward said handle for retroflexed viewing;*
[and**]**
means for providing a flow of fluid over the surface of said camera lens;
means for connecting one or more cables to said handle at or near said proximal end; and
means interior to said handle for providing communication between said one or more cables and said camera head.

B1 4,814,688 (1970th)
REFERENCE GENERATOR
Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.
Reexamination Request No. 90/002,418, Aug. 26, 1991.
Reexamination Certificate for Patent No. 4,814,688, issued Mar. 21, 1989, Ser. No. 163,646, Mar. 3, 1988.
Int. Cl.[5] **G05F** *3/16*
U.S. Cl. 323—317

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

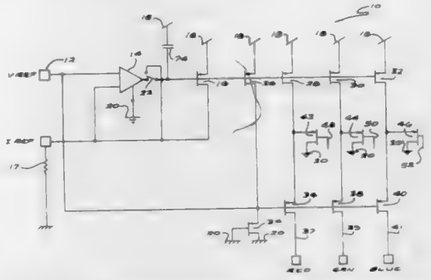
The patentability of claims **5–8** is confirmed.

claims **1**, **3**, **4**, **9–14** and **16–18** are determined to be patentable as amended.

Claims **2** and **15**, dependent on an amended claim, are determined to be patentable.

New claims **19–39** are added and determined to be patentable.

5. A reference generator for use in a digital-to-analog converter to provide for a replication of colors in accordance with binary information introduced to the converter, including,
a plurality of transistors,
means for providing a plurality of input signals each having a first logic level representing a binary "1" and having a second logic level representing a binary "0" and each representing an individual one of the primary colors in accordance with such logic level,



means for introducing individual ones of the input signals in the plurality to individual ones of the transistors to control the state of operation of such transistors in accordance with the logic levels of such input signals,
means for providing for the introduction of an energizing voltage to the transistors in the plurality to obtain a flow of current through such transistors in accordance with the logic levels of the input signals and the magnitude of the energizing voltage,
means for providing a substantially constant current at first particular times,
means for providing a reference voltage at second particular times different from the first particular times,
first control means responsive to the substantially constant current for maintaining the energizing voltage at a substantially constant value,
second control means responsive to the reference voltage for maintaining the energizing voltage at the substantially constant value, and
means responsive to the reference voltage for overriding the first control means.

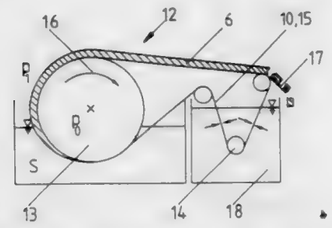
B1 4,837,944 (1971st)
PROCESS FOR THE FORMATION AND DRYING OF FILTER CAKE
Reinhard Bott, Karlsruhe, Fed. Rep. of Germany, assignor to Bokela Ingenieurgesellschaft fur Mechanische, Karlsruhe, Fed. Rep. of Germany
Reexamination Request No. 90/002,517, Nov. 22, 1991.
Reexamination Certificate for Patent No. 4,837,944, issued Jun. 13, 1989, Ser. No. 58,198, Jun. 4, 1987.
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629805
Int. Cl.[5] **F26B** *3/00*
U.S. Cl. 34—22

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–21** is confirmed.

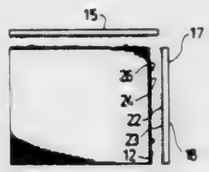
Claim **1** is determined to be patentable as amended.

1. A process for forming and drying porous filter cake comprising the steps of:
[providing**]** *forming said filter cake by causing* individual solid particles *to emerge from a suspension and depositing*



said individual solid particles on a filter medium by means of a fluid acting on the filter cake,
providing a pressure difference at opposite sides of the filter medium,
using a filter medium with a higher capillary intake pressure for the fluid than a capillary intake pressure of the filter cake, and
applying a filtration pressure to the fluid which is at least slightly larger than the capillary intake pressure of the filter cake and is equal to or smaller than the capillary intake pressure of the filter medium.

B1 4,883,331 (1972nd)
METHOD OF AND STRUCTURE FOR THE JOINING OF SUBSTANTIALLY RIGID PARTS TOGETHER
Craig Mengel, 2114 Robinson Street, Regina, Saskatchewan, Canada S4T 2P7
Reexamination Request No. 90/002,607, Jan. 15, 1992.
Reexamination Certificate for Patent No. 4,883,331, issued Nov. 28, 1989, Ser. No. 221,120, Jul. 19, 1988.
Claims priority, application Canada, Jul. 24, 1987, 542982
Int. Cl.[5] **A47B** *17/00*
U.S. Cl. 312—195



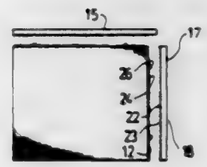
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claim **2**, dependent on an amended claim, is determined to be patentable.

1. A knock-down kit of substantially rigid parts for the construction of furniture and the like comprising a plurality of parts and means to detachably fasten said parts together in the desired relationship to form the assembled furniture, said means including one portion of a hook and loop fastening material secured to the mating surface of one of said parts and the other portion of said hook and loop fastening material to the mating surface of the other of said parts, and means to mechanically align said parts in the desired relationship one with the other just prior to engaging said hook and loop portion together in detachable fastening relationship, said kit including a pair of floor engaging desk pedestals, a rear panel and a desk top panel, *each pedestal having a substantially rectangular upper and rear sides with corresponding mating surfaces,* said hook and loop portions being secured in matching relationship, firstly on the mating surface of the upper side of said pedestals and on the mating surface of the underside of said desk top **[**portion**]** *panel* and secondly, upon the mating surfaces of the rear side of said pedestals and the mating surface of the inner side of said rear panel, said means to mechanically align said parts also engaging between the upper **[**side**]** *sides* of said **[**pedestal**]** *pedestals* and the under side of said *desk* top **[**desk**]** panel and between the rear sides of said pedestal and said rear panel, said means to mechanically align said parts comprises at least one dowel extending perpendicular from said mating surface of one of said parts and a matching *blind* aperture extending perpendicular from the mating surface of the other of said parts engageable with said dowel prior to the engagement of said portions of said hook and loop fastening material to one another in a detachable fastening relationship, and hook and loop portions being situated spaced from said dowels and said matching apertures.

B1 4,966,421 (1973rd)
METHOD OF AND STRUCTURE FOR THE JOINING OF SUBSTANTIALLY RIGID PARTS TOGETHER
Craig Mengel, 2114 Robinson Street, Regina, Saskatchewan, S4T 2P7, Canada
Reexamination Request No. 90/002,609, Jan. 15, 1992.
Reexamination Certificate for Patent No. 4,966,421, issued Oct. 30, 1990, Ser. No. 420,152, Oct. 10, 1989.
Claims priority, application Canada, Jul. 24, 1987, 542982
Int. Cl.[5] **A47B** *17/00*
U.S. Cl. 312—195



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **5** is confirmed.

Claims **1** and **2** are determined to be patentable as amended.

Claims **3** and **4** dependent on an amended claim, are determined to be patentable.

New claims **6–12** are added and determined to be patentable.

1. In an article of knock down furniture comprising a plurality of panels joined face to face by hook and loop fastener material with two detachably engageable portions secured to opposed faces of adjacent panels, mechanical alignment means for aligning the panels in a predetermined alignment, said mechanical alignment means comprising:
dowel means secured to and projecting from one of the opposed faces of adjacent panels and engageable with the other of the opposed faces for preventing engagement of the fastener material portions, and aperture means in the

other of the opposed faces for receiving the dowel means

type series connected between said first and second refer-

STATUTORY INVENTION REGISTRATIONS

PUBLISHED APRIL 6, 1993

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other of the opposed faces for receiving the dowel means *in sliding and non-threaded engagement* when the panels are in the predetermined alignment, whereby the portions of the fastener material are allowed to come into engagement only [in] *in the* predetermined alignment.

B1 5,029,283 (1974th)

LOW CURRENT DRIVER FOR GATE ARRAY

Daniel L. Ellsworth, and Maurice M. Moll, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Reexamination Request No. 90/002,559, Feb. 12, 1992.
Reexamination Certificate for Patent No. 5,029,283, issued Jul. 2, 1991, Ser. No. 500,621, Mar. 28, 1990.
Int. Cl.[5] **H03K** *5/02, 17/284, 19/094, 19/092*
U.S. Cl. 307—475

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **15–19** is confirmed.

Claims **2**, **21**, **22**, and **23** are cancelled.

Claims **1**, **3**, **4**, **5**, **20**, and **25** are determined to be patentable as amended.

Claims **6–14**, **24**, **26–29** dependent on an amended claim, are determined to be patentable:

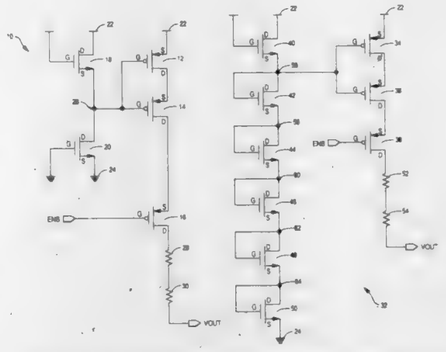
1. A circuit in a gate array for providing a low current to an output comprising:

first and second reference voltage sources;

a first transistor of a first conductivity type;

a plurality of second transistors of a second conductivity type series connected between said first and second reference voltage sources *wherein each of said second transistors is diode connected*; and

a third transistor series connected with said first transistor



between said first reference voltage source and said output;

wherein the control electrode of said first transistor is connected to a common point between two of said second transistors.

STATUTORY INVENTION REGISTRATIONS

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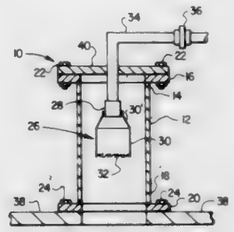
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1158

METHOD AND APPARATUS FOR SUPPLYING FOAM TO TANKS

Thomas K. Perkins, 6816 Stichter, Dallas, Tex. 75230; Sophany Thach, 5335 Bent Tree Forest Dr., Dallas, Tex. 75248, and Kenneth C. Miller, 2902 Tam O'Shanter La., Richardson, Tex. 75080

Filed Dec. 16, 1991, Ser. No. 807,486
Int. Cl.[5] **B65B** *1/04*
U.S. Cl. 141—11 **9 Claims**



1. An apparatus for supplying foam to a tank, said apparatus comprising:

(a) a cylindrical body positioned to sealingly engage said tank above an opening in the top of said tank;

(b) a plate positioned to sealingly engage a first end of said cylindrical body to form an enclosed zone within said cylindrical body and above said opening in said tank; and

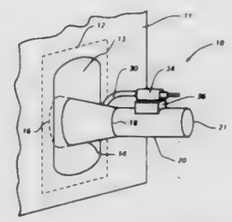
(c) a foam generator positioned in said enclosed zone for supplying foam to said tank.

H1159

PORTABLE PNEUMATIC AIRCRAFT FUEL TANK AIR EDUCTOR

Charles C. Roach, Midlothian, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 534,988, Jun. 8, 1990, abandoned. This application Jun. 3, 1991, Ser. No. 710,196
Int. Cl.[5] **F04F** *5/00*
U.S. Cl. 417—151 **3 Claims**



1. A spark-free portable air eductor for purging fumes from aircraft fuel tanks that have contained a low vapor pressure fuel comprising:

a conical tube having a larger diameter opening and a smaller diameter opening, said larger diameter opening residing within the fuel tank to be purged and said smaller diameter opening residing outside the fuel tank whereby said conical tube passes through an access opening in the aircraft fuel tank;

a mounting plate connected to said conical tube forward of said larger diameter opening wherein said mounting plate is further attached at the access opening whereby an airtight seal is formed between said mounting plate and the aircraft fuel tank to be purged;

a jet located at the point of said smaller diameter opening for introducing air under pressure in the range of 100–200 PSI thereat, said jet having its opening residing along a longitudinal axis of said conical tube with said opening pointing in a direction substantially 180° away from the fuel tank;

a means for transporting said air under pressure inserted through said conical tube and connected to said jet;

a quick disconnect valve for connecting an air line supplying said air under pressure to said means for transporting; and

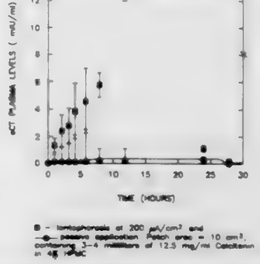
a cylindrical tube sharing said longitudinal axis of said conical tube and connected to said conical tube operatively sized with an inside diameter two inches or less and a length approximately three times said inside diameter.

H1160

IONTOPHORETIC DELIVERY OF PEPTIDES

Hawkins V. Maulding, Corey La., Mendham, N.J. 07945, and James R. Siverly, 9 Henry St., Morristown, N.J. 07960

Filed Nov. 26, 1990, Ser. No. 617,824
Int. Cl.[5] **A61M** *1/30*
U.S. Cl. 604—20 **8 Claims**



7. A method for transporting salmon calcitonin into the blood stream of a patient which comprises using an iontophoretic patch containing in a donor electrode a solution of salmon calcitonin and water.

H1161

AQUEOUS COAL SLURRY

Mark H. Berggren, Golden; Francis J. Smit, Arvada, and Wilbur W. Swanson, Golden, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 30, 1989, Ser. No. 428,682
Int. Cl.[5] **C10L** *1/32*
U.S. Cl. 44—280 **7 Claims**

1. An aqueous slurry containing coal particles having a partial top size of about 30 microns and dextrin as a dispersant at a concentration between about 0.01% and about 2.00% by

consisting essentially of cake flour and said sweetener component consisting essentially of crystalline sucrose, said method

layer-units comprises two or three silver halide emulsion layers being substantially the same in spectral sensitivity and different

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weight, and an additional dispersant selected from the group consisting of ammonium naphthalene sulfonate at a concentration of about 1.00% by weight, ammonium lignosulfonate at a concentration of about 0.20% by weight, or an ammonium salt of a synthetic resin at a concentration of about 0.20% by weight.

H1162
MOLDED COMPOSITE ARTICLE AND PROCESS FOR PRODUCING THE SAME

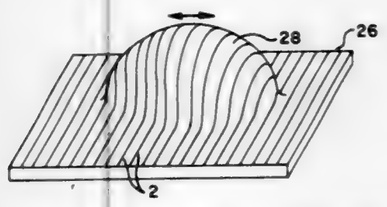
Michio Yamamoto, 3-1-40, Yamate-cho, Iwakuni-shi, Yamaguchi-ken, Japan 740 , and Haruo Negishi, 481-11, Shiromeguri, Kamakura-shi, Kanagawa-ken, Japan 247

Continuation of Ser. No. 376,151, Jul. 7, 1989, abandoned, which is a continuation of Ser. No. 98,971, Sep. 10, 1987, abandoned. This application Apr. 15, 1991, Ser. No. 684,510

Claims priority, application Japan, Sep. 11, 1986, 61-212777; Sep. 16, 1986, 61-216004; Sep. 29, 1986, 61-228404; Mar. 2, 1987, 62-45121

Int. Cl.[5] **B32B** *31/08*

U.S. Cl. 156—179 **3 Claims**



1. A process for producing a molded composite article having at least one substantially hemispherical surface, which comprises:

unidirectionally paralleling continuous filaments in such a manner that said filaments substantially define a layer and are spaced apart from each other;

bonding said paralleled spaced continuous filaments on an extensible thermoplastic film to provide a laminate;

stacking at least two of said laminates to form a sheet wherein said paralleled filaments in each laminate are laid at an angle to said filaments in an adjacent laminate and wherein the film of one of said at least two laminates is in facing relation to said continuous filaments of the other of said at least two laminates; and thereafter,

molding said sheet so as to form an article having at least one substantially hemispherical portion which is reinforced with said paralleled filaments and wherein the spaces between said continuous filaments are increased and the film is extended.

H1163
PIPELINE REPAIR METHOD

Lee Bone, 3413 Sage Brush Trail, Plano, Tex. 75023

Filed Dec. 3, 1990, Ser. No. 620,794

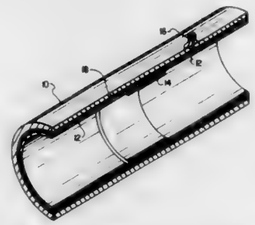
Int. Cl.[5] **B32B** *31/00*

U.S. Cl. 156—294 **3 Claims**

1. A method for repairing a pipeline comprising:

joining sections of pipe comprising fiberglass with internal collars by bonding each collar to an interior surface of one section of fiberglass pipe and to an interior surface of another section of fiberglass pipe,

inserting the joined sections into a pipeline, and



pumping a hardening polymer into the annular space between the joined sections of fiberglass pipe and the pipeline.

H1164
METHOD OF TREATING THE SURFACE OF COMMERCIALLY AVAILABLE POLYMER FILMS

William L. Wade, Jr., Neptune; Robert J. Mammone, So. Plainfield, both of N.J., and Michael Binder, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1991, Ser. No. 714,469

Int. Cl.[5] **B29C** *35/04;* **H05B** *11/00*

U.S. Cl. 264—22 **5 Claims**

1. Method of treating the surface of commercially available polymer films wherein the polymer is selected from the group consisting of polyethylene, polypropylene, polyester, polysulfone, polycarbonate, and polyvinylidene fluoride, said method comprising treating the surface of the polymer film with a low temperature gas plasma so as to improve the subsequent bonding of aluminum to the polymer surface without the need for adhesives.

H1165
LAYER CAKES PREPARED WITH CRYSTALLINE SWEETENER BLENDS

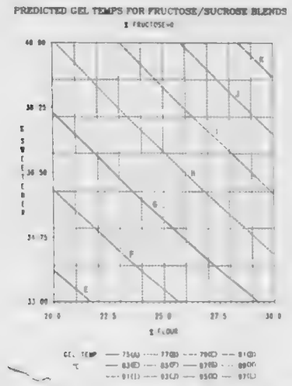
Susan D. Horton, Decatur; Dorothy C. White, Argenta, and Charles W. Kraut, Mt. Zion, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 368,734, Jun. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 304,545, Jan. 31, 1989, abandoned. This application Sep. 19, 1990, Ser. No. 586,316

Int. Cl.[5] **A23L** *1/09*

U.S. Cl. 426—555 **2 Claims**

1. A method of reformulating a cake mix comprising a crystalline sweetener component and a flour component in a weight ratio of crystalline sweetener component to flour component of from about 1.2 to about 1.4, said flour component consisting essentially of cake flour and said sweetener component consisting essentially of crystalline sucrose, said method comprising replacing from about 20% to about 30% by weight of said crystalline sucrose with crystalline fructose.



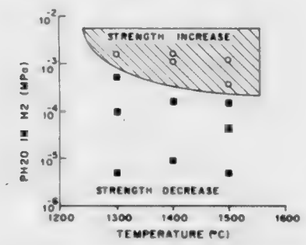
H1166
PROCESS FOR STRENGTHENING SILICON BASED CERAMICS

Hyoun-Ee Kim, Oak Ridge, and A. J. Moorhead, Knoxville, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 7, 1991, Ser. No. 665,854

Int. Cl.[5] **C23C** *16/00*

U.S. Cl. 427—255.3 **3 Claims**



1. A process for strengthening a composition of matter comprising silicon based ceramics, said process comprising:

exposing said composition of matter to a gaseous atmosphere consisting essentially of hydrogen and a sufficient amount of water vapor for a sufficient time and sufficient temperature to produce an oxide film at the surface of said ceramic that increases the strength of said composition of matter.

H1167
PROCESS FOR MANUFACTURING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Kuniaki Uezawa; Masaru Iwagaki; Kiichi Sato; Hideo Akamatsu, and Minoru Ishikawa, all of Hino, Japan, assignors to Konica Corp., Japan

Filed Sep. 24, 1990, Ser. No. 586,682

Claims priority, application Japan, Sep. 27, 1989, 1-253078

Int. Cl.[5] **G03C** *1/46*

U.S. Cl. 430—506 **1 Claim**

1. A process for manufacturing a silver halide color photographic light-sensitive material having a blue light-sensitive layer-unit, a green light-sensitive layer-unit and a red light-sensitive layer-unit in which at least one of said light-sensitive layer-units comprises two or three silver halide emulsion layers being substantially the same in spectral sensitivity and different in speed from each other, comprising steps of

producing a high-speed silver halide emulsion having a largest average grain size among the silver halide emulsions to be used in said at least one light sensitive layer-unit,

chemically sensitizing said high-speed silver halide emulsion,

producing a low-speed silver halide emulsion having a smaller average grain size than that of said high-speed emulsion,

chemically sensitizing said low-speed emulsion,

mixing said chemically sensitized high-speed and said chemically sensitized low-speed emulsion in a ratio of from 5:95 to 50:50 by weight in terms of silver, and

coating said chemically sensitized high-speed emulsion and said mixture of said chemically sensitized high-speed emulsion and said chemically sensitized low-speed emulsion to form said at least on light-sensitive layer-unit.

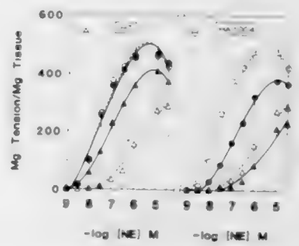
H1168
INHIBITORS OF PROTEIN KINASE C ACTIVITY AS PROTECTORS AGAINST SEPTIC SHOCK AND REDUCERS OF ARDS

Thomas M. McKenna, Rockville, and Taffy J. Williams, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1991, Ser. No. 748,307

Int. Cl.[5] **A01N** *43/04, 33/18, 31/00*

U.S. Cl. 514—28 **8 Claims**



1. A therapy for septic shock which reduces inflammation and improves tissue and organ perfusion comprising infusing between about 0.1 to 50 mg/kg body weight of a PKC inhibitor selected from the group consisting of lipid analoges in a pharmaceutically acceptable carrier into a entity at risk of septic shock.

H1169
POLYMER WITH IMPROVED BARRIER PROPERTIES

Joseph M. Machado, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1991, Ser. No. 748,403

Int. Cl.[5] **C08F** *283/00*

U.S. Cl. 525—185 **10 Claims**

1. A method for improving barrier properties of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by incorporating therein an amount of a poly(vinylidene fluoride) polymer sufficient to reduce the barrier property water vapor transmission rate of the linear alternating polymer to less than about 5 wt. % loss per year.

H1170

response to the function detect signal received from the address decoder; and

means for alternatingly presenting at least a selected two of received signals to demultiplexing means for demultiplex-

H1175
DYNAMIC CHANNEL SELECTION SYSTEM

Paul J. Giorgio, Providence, R.I., assignor to The United States

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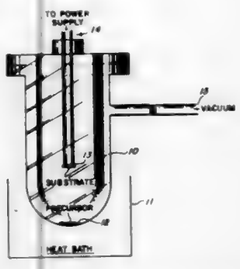
H1170
VOLATILE DIVALENT DOUBLE METAL ALKOXIDES

Andrew Purdy, Alexandria, Va., assignor to United States of America, Washington, D.C.

Filed Jul. 31, 1989, Ser. No. 387,047
Int. Cl.[5] C07F *1/08*
U.S. Cl. 556—113 **11 Claims**



1. A copper-containing double metal alkoxide compound suitable for use as a precursor in a chemical vapor deposition process wherein a coating of metal oxide is deposited on a substrate having the formula:

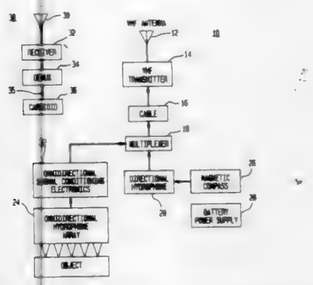
$$M_yCu_2(OR)_{2(y+z)}$$

wherein M is selected from the group consisting of Ba, Sr and Ca, y is a whole integer from 1 to 4, z is a whole integer from 1 to 6, and R is selected from the group consisting of CMe_3, CMe_2Et, $CMeEt_2$, CMe_2Pr, $CMeEtPr$, CEt_3 and combinations of the above.

H1171
CARDIOID BEAMFORMER WITH NOISE REDUCTION

Ricky M. Fillhart, Doylestown, and Donato M. Russo, Warrington, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1990, Ser. No. 631,584
Int. Cl.[5] G01S *3/80*
U.S. Cl. 181—125 **18 Claims**

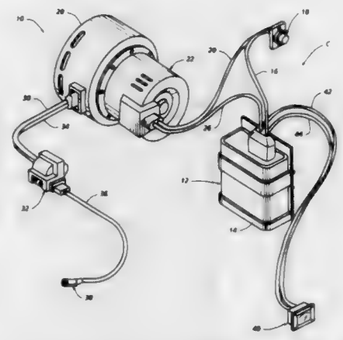


1. A method for detecting and localizing acoustic sources, comprising the steps of:
(a) providing a plurality of first electrical signals representative of sonar signals;
(b) receiving a plurality of second electrical signals representative of sonar return signals corresponding to said first electrical signals;
(c) multiplexing said second electrical return signals;
(d) transmitting said multiplexed electrical return signals;
(e) receiving said transmitted multiplexed signals by multiplexed signal receiving means separate from said transmitting means;
(f) applying, by said multiplexed signal receiving means, said received signals to demultiplexing means for demultiplexing of said signal to provide a demultiplexed signal;
(g) applying a demultiplexed signal by signal line means, coupled to said demultiplexing means to cardioid means separated from said demultiplexing means; and,
(h) processing said applied demultiplexed signal by said cardioid means to provide electrical signals representative of said sonar return signals.

H1172
VEHICLE BATTERY JUMPER SYSTEM

Allen Gorniak, 4640 Clayton St., Denver, Colo. 80216

Continuation of Ser. No. 461,307, Jan. 5, 1990, abandoned. This application May 7, 1991, Ser. No. 700,036
Int. Cl.[5] H02J *7/34*
U.S. Cl. 307—48 **1 Claim**



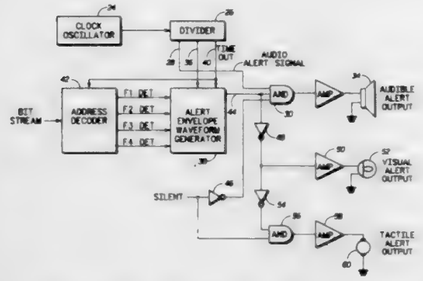
1. A vehicle battery jumper system comprising:
A) a re-chargeable back-up battery mounted in an engine compartment of a vehicle;
B) a starter system for the vehicle which includes a starter and a vehicle battery connected to said starter to start an engine associated with the vehicle;
C) a connection circuit means for connecting said back-up battery to the starter and which comprises
(1) a manual switch connected to said back-up battery and located in a passenger compartment of the vehicle on a dashboard in that passenger compartment, and
(2) a motor connected to said manual switch to be connected to said back-up battery when said manual switch is closed.

H1173
PAGING DEVICE WITH ALTERNATING ALERT OUTPUTS

Walter L. Davis, Coral Springs; George Drapac, and Stephen H. Woltz, both of Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 306,171, Feb. 6, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 772,640
Int. Cl.[5] G08B *5/22*
U.S. Cl. 340—825.44 **14 Claims**

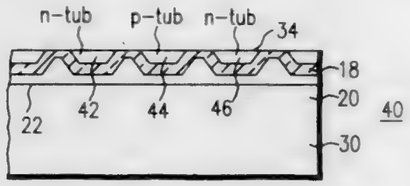
8. An alert generating apparatus for use in conjunction with a selective call receiver having an address decoder that matches a received address recovered from an input signal to an address assigned to the selective call receiver and generates at least one function detect signal corresponding to an alert sequence, said apparatus comprising:
first means for generating a first alert signal selected in response to the function detect signal received from the address decoder;
second means for generating a second alert signal selected in response to the function detect signal received from the address decoder; and
means for alternatingly presenting at least a selected two of an audible alert signal, a visual alert signal, and a tactile alert signal as determined at least in part by the received address and controlled by the first and second alert signals, a first of the at least a selected two alert signals being activated during at least a first portion of each of a plurality of successive time intervals and a second of the at least a selected two alert signals being activated during at least a second portion of each of a plurality of successive time intervals, the second portion being subsequent to the first portion, thereby producing the alert sequence and reducing the load on the energy source.



H1174
WAFER BONDED DIELECTRICALLY ISOLATED STRUCTURES

William G. Easter, Reading, and Richard H. Shanaman, III, Myerstown, both of Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.

Division of Ser. No. 608,955, Nov. 5, 1990. This application Aug. 7, 1991, Ser. No. 741,700
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—49 **6 Claims**

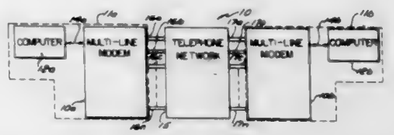


1. A dielectrically isolated wafer structure comprising
a plurality of tub regions comprising monocrystalline silicon, said tub regions including sidewalls and a top and a bottom major surface;
a layer of electrically insulative material disposed to cover the sidewalls and bottom major surface of the plurality of tub regions;
conformal material disposed over the layer of electrically insulative material such that said layer of electrically insulative material is disposed between said conformal material and said plurality of tub regions, said conformal material disposed so as to form an essentially flat major surface; and
a silicon substrate bonded to the first major surface of the conformal material.

H1175
DYNAMIC CHANNEL SELECTION SYSTEM

Paul J. Giorgio, Providence, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 195,991, May 4, 1988, Pat. No. 4,862,456, and a continuation-in-part of Ser. No. 195,992, May 4, 1988, Pat. No. 4,864,567. This application Jul. 3, 1989, Ser. No. 375,078
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—118 **11 Claims**

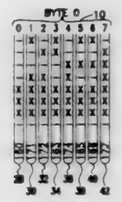


1. A selecting system for selecting particular first telephone lines in an arrangement having a plurality of first and second telephone lines wherein said first telephone lines are serially connected to a respective member of said second plurality of telephone lines comprising:
interface means connected to said first plurality of telephone lines for generating a signal representative of the on/off hook status of said first plurality of telephone lines;
digitizing means connected to said interface means for generating a first word representative of the on/off hook status of said first plurality of telephone lines;
communications means connected to said interface means for transmitting said first word over the first of said available first plurality of telephone lines, said communications means further comprising reception means for receiving a second word over the first of said available first plurality of telephone lines representative of the number of available second plurality of telephone lines;
comparison means for comparing said first and second words;
modifying means for modifying said first word to produce a new first word representative of the maximum number of telephone lines available at both said first and second plurality of telephone lines; and
selection means for selecting said particular first telephone lines having a quantity equal to said maximum number of telephone lines available at both said first and second plurality of telephone lines.

H1176
BIT DISPERSEMENT METHOD FOR ENHANCED SEC-DED ERROR DETECTION AND CORRECTION IN MULTI-BIT MEMORY DEVICES

Gerald A. Schwoerer, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Filed Aug. 30, 1989, Ser. No. 400,071
Int. Cl.[5] G11C *29/00*
U.S. Cl. 371—2.2 **1 Claim**



1. A method of detecting multi-bit errors in a computer, comprising:
(a) constructing a SEC-DED codeword such that said SEC-DED codeword can correct one bit in error and detect two bits in error; and

for projecting electromagnetic energy output along said optical axis;

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DED codeword can correct one bit in error and detect two bits in error; and

(b) dispersing a plurality of bits from a plurality of multi-bit memory devices throughout said SEC-DED codeword such that a syndrome calculated from said SEC-DED codeword can detect when one of said multi-bit memory devices has failed.

H1177

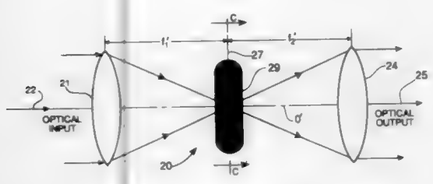
RADIOACTIVELY BIASED OPTICAL LIMITER

David J. Kosah, Palm Bay, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 16, 1989, Ser. No. 422,163

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—11 5 Claims



1. An optical power limiter device, comprising:

(a) first and second lenses having respective first and second focal lengths disposed along an optical axis and with spacing therebetween equal to the sum of said first and second focal lengths whereby a focal plane common to both said first and second lenses is defined along said axis between said first and second lenses;

(b) said first lens disposed for receiving electromagnetic energy input directed along said optical axis and focusing the input at said focal plane and said second lens disposed for projecting electromagnetic energy output along said optical axis;

(c) a cell comprising optically nonlinear material disposed along said optical axis at said focal plane common to said first and second lenses; and

(d) a radioactive source of ionizing radiation disposed near said nonlinear material for selectively irradiating said optically nonlinear material with said ionizing radiation and thereby controlling the electromagnetic field level necessary to cause optical nonlinear effects within said optically nonlinear material.

H1157

FILTER

Manabu Yanou; Osami Kato, both c/o Mitsubishi Rayon Co., Ltd., 1-60 Sunadabashi 4-chome, Higashi-ku, Nagoya-shi, Aichi 461, and Kazuo Kuwahara, c/o Mitsubishi Rayon Co., Ltd., 3-19, Kyobashi 2-chome, Chuo-hu, Tokyo 104, all of, Japan

Filed Dec. 21, 1989, Ser. No. 454,131

U.S. Cl. D23—209

REISSUES

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,210

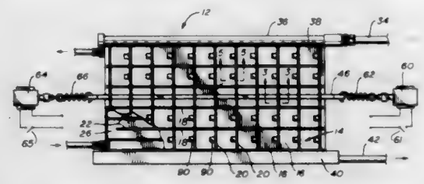
LINEAR RELEASE ICE MACHINE AND METHOD

Robert C. Lane, and Joseph M. Lee, both of 2030 Richmond, Houston, Tex. 77098

Original No. 4,688,386, dated Aug. 25, 1987, Ser. No. 827,094, Feb. 7, 1986. Application for reissue May 3, 1989, Ser. No. 347,430

Int. Cl.[5] F25C *5/06*

U.S. Cl. 62—72 24 Claims



22. A method for making discrete ice blocks comprising:

(a) flowing chilled water over a plurality of surfaces for receiving such chilled water, wherein such surfaces incorporate an evaporator and fins joined as a rigid unit to said evaporator and plates mounted in movable relationship transverse to said fins;

(b) freezing the water for building up ice;

(c) applying a force to urge said plate surfaces from a first to second position wherein said ice is removed from said surfaces for use; and,

(o) allowing said ice to begin to melt to trigger movement of said plates from a first to a second position whereby said blocks are ejected for use as ice.

Re. 34,211

AIR-FUEL RATIO DETECTING SENSOR

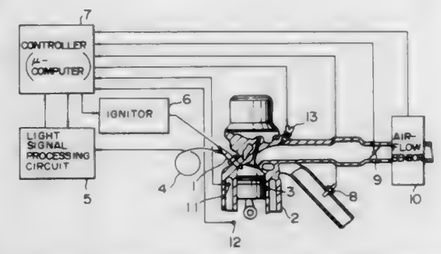
Hiroshi Kuroiwa, Hitachi, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,779,455, dated Oct. 25, 1988, Ser. No. 81,847, Aug. 5, 1987. Application for reissue Oct. 25, 1990, Ser. No. 603,008

Claims priority, application Japan, Aug. 13, 1986, 61-188506

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—116 23 Claims



1. A sensor system for detecting air-fuel ratio in an internal combustion engine, comprising:

(a) transparent combustion light extracting means for extracting combustion light produced in a combustion chamber of said engine;

(b) photoelectric conversion means for photoelectrically converting two given waveforms of the combustion light extracted through said combustion light extracting means into electrical wavelength signals; and

(c) air-fuel ratio determining means for determining the air-fuel ratio on the basis of said two wave-length signals supplied from said photoelectric conversion means, wherein said air-fuel ratio determining means includes peak detection means for detecting peaks of the two wave-length signals produced by said photoelectric conversion means, respectively, angular difference detecting means for detecting angular difference between the peaks detected by said peak detecting means, and air-fuel ratio determining means for determining the corresponding air-fuel ratio on the basis of said angular difference.

Re. 34,212

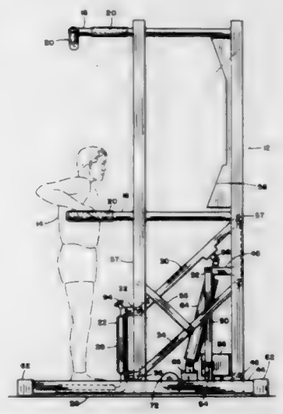
UPPER BODY EXERCISE APPARATUS

Lanny L. Potts, Tulsa, Okla., assignor to Tri-Tech, Inc., Tulsa, Okla.

Original No. 4,846,458, dated Jul. 11, 1989, Ser. No. 82,347, Aug. 6, 1987. Application for reissue Apr. 23, 1991, Ser. No. 689,670

Int. Cl.[5] A63B *21/00*

U.S. Cl. 482—26 18 Claims



11. An upper body exercise apparatus to assist an exerciser, which comprises:

(a) a frame having a base;

(b) a first exerciser support platform, having an upper surface, said upper surface being parallel to said base, for said exerciser to stand on;

(c) at least a first handle extending from said frame;

(d) means for oscillating said first exerciser support platform vertically between a lower position and an upper position while maintaining said first exercising support platform parallel to said base and while avoiding any horizontal displacement, and in the absence of a second exercise support platform which moves vertically in a direction opposite the direction of movement of said first exerciser support platform, all of said upper surface occupying a region, when said first exerciser support platform is in said lower position, which is below the region occupied by said upper surface when said first exerciser support platform is in the upper position;

(e) means mounted at one end to said base and at the other end to said oscillating means for providing a substantially constant force to said oscillating means having a component opposite the force of gravity on the exerciser during said oscillating from said lower position to said upper position.

Re. 34,213

ELECTROCHEMICAL CONVERTERS AND COMBINED

(10) and the focal plane (11) and, subsequent to each such change, again fitting or matching the luminous cursor to a

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Re. 34,213

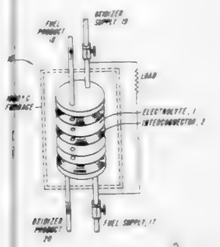
ELECTROCHEMICAL CONVERTERS AND COMBINED CYCLE SYSTEMS

Michael S. Hsu, Roundhill Rd., Lincoln, Mass. 01773

Original No. 4,721,556, dated Jan. 26, 1988, Ser. No. 861,433, May 9, 1986. Continuation-in-part of Ser. No. 735,441, May 17, 1985, Pat. No. 4,629,537. Application for reissue Jan. 24, 1990, Ser. No. 469,199

Int. Cl.[5] C25B *9/00, 9/04;* H01M *2/08;* B05D *5/06*

U.S. Cl. 204—258 24 Claims



24. An electrochemical converter comprising:

(a) a set of solid-oxide electrolyte plates having a fuel electrode material applied to one surface of each plate and an oxidizer material applied to a second surface of each plate; and

(b) a set of interconnector plates having corrugated structures, comprising at least one electrically conductive material, the corrugated structure defining groove networks for the passage of gases and ridges for gas seals and electrical contact with the electrode coatings of the electrolyte plates;

wherein the converter is assembled by stacking alternating layers of the electrolyte and interconnector plates together at an elevated assembly temperature to fuse the adjacent plates to each other such that upon cooling the electrolyte plates experience in-plane compression.

Re. 34,214

METHOD AND APPARATUS FOR MICROPHOTOMETERING MICROSCOPE SPECIMENS

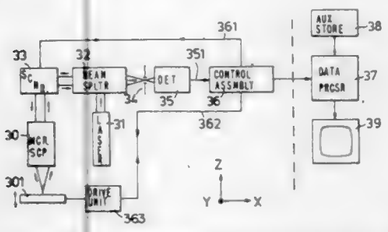
Kjell S. Carlsson, Vallentuna, and Nils R. D. Aslund, Stockholm, both of Sweden, assignors to Molecular Dynamics, Inc., Sunnyvale, Calif.

Original No. 4,631,581, dated Dec. 23, 1986, Ser. No. 703,842, Feb. 21, 1985. Application for reissue Dec. 21, 1988, Ser. No. 288,287

Claims priority, application Sweden, Mar. 15, 1984, 8401458

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—93 21 Claims



1. A method for microphotometering and subsequent image combination by generating with the aid of a convergent light beam a luminous dot or cursor in the focal plane (**11**) of a microscope (**30**), fitting the cursor to a plurality of part elements in the specimen (**10**), and collecting light created by the luminous cursor and the specimen (**10**), detecting the collected light and producing corresponding electric signals, characterized by changing the mutual position between the specimen (**10**) and the focal plane (**11**) and re-fitting the luminous cursor to a plurality of part elements in the specimen (**10**); repeating stepwise changes in the mutual position between the specimen (**10**) and the focal plane (**11**) and, subsequent to each such change, again fitting or matching the luminous cursor to a plurality of part elements in the specimen; collecting the light created by the luminous cursor and part elements in the specimen (**10**) and screening-off any disturbing light created synchronously from adjacent (above, beneath, beside) part elements in the specimen (**10**); detecting the thus collected light and storing measurement values obtained through said detection, said storage optionally being effected synchronously with the matching of the luminous cursor with part elements in the specimen (**10**) and with the changes in the mutual position between the specimen (**10**) and the focal plane (**11**), said measurement values being representative of locations in various layers through the specimen; and combining the measurement values from locations in a plurality of layers, representative of a given volume of the specimen, in dependence upon a planned/desired analysis of the specimen[.] *in a manner yielding a projected representation from a desired angle of at least a portion of the specimen.*

Re. 34,215

METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF VIBRATIONAL DISTURBANCES ON THE FREQUENCY STABILITY OF A LASER

David Fink, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Original No. 4,744,634, dated May 17, 1988, Ser. No. 856,559, Apr. 28, 1986. Continuation of Ser. No. 534,624, May 15, 1990, abandoned. Application for reissue Oct. 31, 1991, Ser. No. 785,191

Int. Cl.[5] H01S *3/08*

U.S. Cl. 359—578 13 Claims

2. In an interferometer structure including a resonant cavity and cavity reflectors whose relative positions determine the resonant cavity frequency of said interferometer cavity, said interferometer having a mounting connected to said structure at at least two positions, said positions being selected from a plurality of possible mounting positions, a method for reducing the variations in said resonant cavity frequency caused by accelerating forces comprising the steps of:

supporting the structure with at least one pair of support means connected to the structure, the structure including a resonant cavity disposed between cavity end reflectors;

the step of supporting being accomplished by connecting individual ones of the pair of support means such that each is connected to the structure at a distinct location relative to one of the cavity end reflectors, [each individual one of the pair of support means being connected to the structure at a distinct location which is independent of the location of the other individual one of the pair of support means] *said locations being asymmetrically disposed with respect to ends of the cavity;*

the step of connecting including a step of selecting, from a plurality of possible support locations, the location of each individual one of the pair of support means to reduce variations in the resonant cavity frequency when the structure is subjected to accelerating forces;

the method further including a step of;

trimming the mass distribution of the structure by selecting the distribution of mass within the structure so as to further reduce variations in resonant frequency caused by accelerating forces.

PLANT PATENTS

GRANTED APRIL 6, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,193

MINIATURE ROSE PLANT NAMED 'MORALERT'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Dec. 6, 1991, Ser. No. 803,227

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially medium red in color, with reverse of petals being a slightly lighter shade of red, and further characterized by the being plant of compact well rounded shape, vigorous, with the main stems and shoots being moderately thorny, said plant being easy to propagate from cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

8,194

CHERRY ROOTSTOCK: BROOKS-2 CULTIVAR

Lyle A. Brooks, deceased, late of Forest Grove, Oreg., and by Wallace E. Heuser, legal representative, P.O. Box 578, Hartford, Mich. 49057

Continuation of Ser. No. 371,654, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 165,221, Mar. 7, 1988, abandoned. This application Jan. 23, 1992, Ser. No. 825,751

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—37 1 Claim

1. A cherry tree rootstock plant substantially as herein described and illustrated.

8,195

PEACH TREE "SNOWBRITE"

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95351

Filed Dec. 23, 1991, Ser. No. 811,721

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—42.1 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described, which is of large size, vigorous, upright in growth and a regular and productive bearer of large, very firm, white flesh, freestone fruit with excellent flavor and eating quality; the fruit is further characterized by coloring 6 to 7 days before maturity and in comparison to Giant Babcock Peach (U.S. Plant Pat. No. 1,353) has firmer white flesh, a higher degree of attractive red skin color and matures approximately 34 days earlier.

8,196

NECTARINE TREE (WESTERN RED)

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Feb. 10, 1992, Ser. No. 833,068

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—41.1 1 Claim

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is most similar to its seed parent, August Red Nectarine (U.S. Plant Pat. No. 6,363), by producing clingstone fruit that is very firm in texture and late season in maturing, but is distinguished therefrom and an improvement thereon by producing fruit that is larger in size, has a higher percentage of red color, and that ripens 7 to 10 days earlier.

8,197

NECTARINE TREE (BIG JUAN)

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Feb. 10, 1992, Ser. No. 833,055

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—41.3 1 Claim

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is most similar to May Diamond Nectarine (U.S. Plant Pat. No. 5,454) by producing early maturing, full red, freestone fruit but is distinguished therefrom and an improvement thereon by producing fruit that is larger in size, that is purely yellow to the stone in flesh color, and that ripens 7 days earlier.

8,198

DWARF, VARIEGATED SCHEFFLERA NAMED COVEEN

Ernest A. Gorvel, Stuart, Fla., assignor to Florida Cuttings, Inc., Stuart, Fla.

Filed Nov. 9, 1990, Ser. No. 611,402

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—88.1 1 Claim

1. A new and distinct cultivar of *Schefflera arboricola* named Coveen, as herein shown and described.

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PATENTS

GRANTED Apr. 6, 1993

ERRATA

For CLASS	See PATENT NO.
110-241	5,199,354
110-261	5,199,355
110-346	5,199,356
110-347	5,199,357
173-075	5,199,501
212-156	5,199,583
223-085	5,199,608
241-073	5,199,666
242-295	5,199,682
292-288	5,199,759
405-101	5,199,812
414-718	5,199,861
504-209	5,199,968
504-272	5,199,969
504-225	5,199,970
208-233	5,199,978
423-308	5,200,187
424-094	5,200,340
570-178	5,200,431
514-399	5,200,453
428-064	5,200,492
526-262	5,200,497
524-081	5,200,503
257-390	5,200,802
257-560	5,200,803
257-538	5,200,804
257-077	5,200,805
257-676	5,200,806
257-758	5,200,807
257-750	5,200,808
257-707	5,200,809
361-398	5,200,810

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GENERAL AND MECHANICAL

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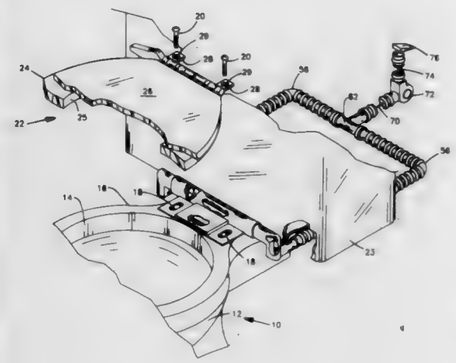
PATENTS

GRANTED APRIL 6, 1993

GENERAL AND MECHANICAL

5,199,111
TOILET ODOR REMOVING APPARATUS
Daniel J. Antepenko, Rte. 1, Box 119, Spruce Pine, Ala. 35855
Filed Sep. 3, 1991, Ser. No. 754,078
Int. Cl.[5] E03D 9/05
U.S. Cl. 4—213 3 Claims



1. A toilet odor removing apparatus for a toilet bowl having a generally oval opening therein having a major axis and a minor axis, said generally oval opening being surrounded by a generally flat upper surface having a pair of spaced parallel bores formed therethrough on a back side of the toilet bowl for accommodating bolts for anchoring a toilet seat, said toilet odor removing apparatus comprising:

an exhaust fixture, dimensioned to fit upon said back side of said toilet bowl, including a front edge having a plurality of openings therein which are in substantial alignment with said oval opening of said toilet bowl, a rear edge, a hollow chamber in communication with said one or more openings in said front edge and extending to said rear edge, a flat plate secured along a portion of each side of said hollow chamber, each of said plates having an apertures therethrough spaced the same distance apart as said bolts for anchoring said toilet seat, said apertures being oblong in shape to allow for possible adjustment of said exhaust fixture in a direction parallel to said major axis of said oval opening of said toilet bowl toward and way from said minor axis of said generally oval opening of said toilet bowl, and a pair of spaced openings in said hollow chamber adjacent said rear edge of said exhaust fixture;

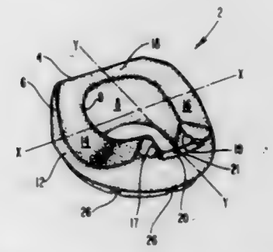
a pair of generally L-shaped pipes, each having a first end and a second end, said first end being of the same cross-sectional configuration as said spaced openings in said hollow chamber and being adapted to be telescopically received within said spaced openings;

a pair of hoses, each having a first end and a second end, said first end of each hose being secured to said second end of a respective one of said generally L-shaped pipes;

an exhaust outlet in communication with the outside atmosphere; and

blower means mounted in an area remote from said toilet bowl and being in communication with each said second end of said hoses and with said exhaust outlet.

5,199,112
RAISED SUPERIMPOSED TOILET SEAT FOR TOTAL HIP ARTHROPLASTY PATIENTS
Michael M. Locarno, Boonton, N.J., assignor to Bel-Art Products, Inc., Pequannock, N.J.
Filed Sep. 30, 1991, Ser. No. 767,804
Int. Cl.[5] A47K 13/24
U.S. Cl. 4—239 5 Claims



1. A raised toilet seat of the type which is superimposed upon a conventional toilet bowl, comprising:

a back section, a front section and a circumferentially extending wall;

a contoured top surface for supporting a user in a seated position;

a through opening disposed substantially central to the seat and defined by an inner a circumferential edge of the contoured top surface, said opening having a longitudinal axis and a transverse axis;

the wall being interrupted on either side of the longitudinal axis by corresponding contoured portions, said corresponding contoured portions providing the contoured top surface;

the corresponding contoured portions sloping downwardly circumferentially from a substantially planar surface near the seat back section and radially downward, outwardly from the inner edge of the contoured top surface to hear the transverse axis, and forward of the transverse axis the corresponding contoured seat portions sloping radially downward, outwardly from said edge and curving upwardly circumferentially to terminate in ends near the seat front section;

the back and front sections, the contoured top surface and the circumferential wall forming a seat top, said seat top having an underside, and the underside having a rim extending downwardly therefrom, said rim extending into the toilet bowl while the seat rests on top of said bowl;

the underside having a notched surface near the back of the seat and extending across said underside, a pair of holes provided in said notched surface, each of which holes of the pair of holes is disposed at a corner of the notched surface, and said holes accommodating a securing clamp for securing the raised superimposed toilet seat to the toilet;

the contour of the corresponding contoured portions being effective for keeping a user's legs in an abducted position, preventing internal rotation as well as adduction at the user's hips; and

said corresponding contoured portions on either side of the longitudinal axis providing a bilateral contour on the top surface whereby the user's feet are closer to the user's center of gravity to enhance seating comfort and to facilitate standing of the user from a seated position on the seat.

347-147 O.G.-93-2

5,199,113
hole, said first cylindrical body being formed from clear,

5,199,115
ler for driving the same, improved means for heating the water

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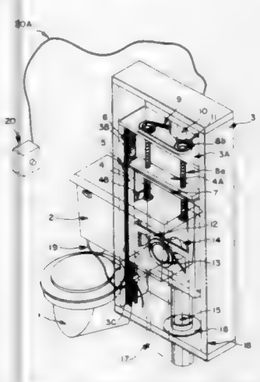
5,199,113

AUTOMATICALLY ADJUSTED WATER CLOSET FOR HANDICAPPED AND OTHER FAMILY MEMBERS

George L. Glasow, and Pilar Vilar-Glasow, both of 31 Scottsville Rd., Rochester, N.Y. 14611

Filed Dec. 6, 1991, Ser. No. 803,037
Int. Cl.[5] E03D 11/00
U.S. Cl. 4—252.2 6 Claims



1. Elevation adjusting apparatus for connection to a vertical wall for allowing elevation adjustment of a toilet, said apparatus comprising:

an outer box-shaped frame adapted to be mounted to the wall such that two opposing sides thereof are oriented substantially vertically, said sides having opposing channels mounted thereto interiorly of said outer frame;

an inner box-shaped frame having guide wheels mounted to two opposing sides thereof exteriorly of said inner frame, said wheels being engaged with said channels to allow substantially vertical displacement of said inner frame with respect to said outer frame;

a toilet carrier fixedly mounted to said inner frame, said carrier having a passage therethrough and being adapted to support the toilet with a discharge pipe thereof extending through said passage; and,

a drive mechanism for effecting said vertical displacement of said inner frame, said mechanism including: a pair of spaced apart, substantially vertically oriented drive screws rotatably mounted above said inner frame to said outer frame and freely extending through apertures formed in a top side of said inner frame; a safety lifting block having a pair of threaded apertures engaged by lower end portions of said screws; a reversible motor mounted to said outer frame; and drive linkage operably connecting said motor and said screws,

whereby said drive mechanism is normally operable to raise and lower the toilet with said inner frame supported on said safety lifting block, but upon interference with the toilet during lowering movement thereof, said safety lifting block will separate from said inner frame thereby preventing exertion of force on the toilet from said motor.

5,199,114

DRAIN CLEARING DEVICE

Robert Christopher, 2146 W. Wellington Rd., Newtown, Pa. 18940

Filed Jun. 28, 1991, Ser. No. 722,846
Int. Cl.[5] E03D 9/00
U.S. Cl. 4—255.02 4 Claims

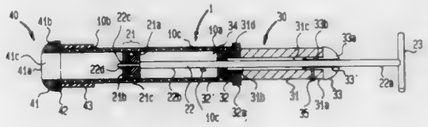
4. A drain clearing device comprising:

a transparent and hollow first cylindrical body having an open end and an open lower end and at least one vent hole, said first cylindrical body being formed from clear, spun acrylic resin;

a piston plunger assembly including a piston slidably and sealingly disposed within the first cylindrical body, a piston rod fixedly attached at one end to said piston and having a piston rod handle fixedly attached to the opposite end of said piston rod, said piston comprising a three-part piston assembly including a main piston portion, an end piston portion and a piston ring sandwiched between the main piston portion and the end piston portion, said main piston portion being formed having first and second reduced sections which respectively receive the piston ring and the end piston portion, said main piston portion, piston ring and end piston portion being retained attached to the piston rod by means of a retaining ring, said piston assembly being formed from dense rubber material;

support means for supporting said piston plunger assembly fixedly attached to the upper end of the first cylindrical body, said piston rod being receivable in slidable engagement in said support means, said piston plunger assembly support means comprising a second cylindrical body, a cylinder reducer and an end bell, said second cylindrical body having a longitudinal bore extending therethrough and a reduced section formed at a lower end thereof, said cylindrical reducer having a receiving means for receiving the reduced section of the second cylindrical body,

said cylinder reducer being formed having an annular reducer flange which fits atop the upper end of the first



cylindrical body, said cylinder reduced being fixedly attached to said first cylindrical body by reducer screw fastener means which engage the upper end of the first cylindrical body, said reduced section of said second cylindrical body being receivable in said cylinder reducer in frictional engagement.

said end bell being formed having a lower portion which engages the longitudinal bore of said second cylindrical body and a bell head portion which first atop an upper end of the second cylindrical body, said end bell being fixedly attached to said second cylindrical body by bell screw fastener means which engage the second cylindrical body and the end bell,

vertically-aligned reducer and end bell apertures being respectively formed in the cylinder reducer and the end bell for receipt of the piston rod in sliding engagement, said cylinder reducer and said end bell are formed from polyvinyl chloride material; and

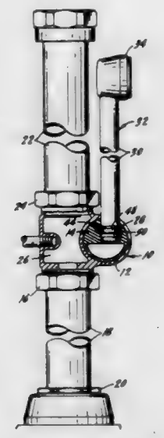
a drain seal attached to the lower end of the first cylindrical body in sealing engagement, said drain seal including a drain seal opening communicating with the first cylindrical body, said drain seal comprising a bulbous member formed from medium density, closed cell sponge rubber and having an integrally-formed half-doughnut head portion, said half-doughnut head portion substantially comprising a flat central end portion which extends to arcuate side walls, said bulbous member being attachable to said first cylindrical body opposite to said flat central portion.

5,199,115

BEDPAN RINSING APPARATUS ARM ASSEMBLY SEAL

John F. Whiteside, Franklin Park, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Oct. 21, 1991, Ser. No. 779,623
Int. Cl.[5] A61G 9/00
U.S. Cl. 4—300.2 1 Claim



1. A diverter mechanism for a bedpan rinsing apparatus including a diverter valve body, a nozzle pivot rotatably mounted within said diverter valve body, an opening in said diverter valve body, a passage in said nozzle pivot, a bedpan rinsing arm assembly including a tube positioned in said nozzle pivot passage and extending through said diverter valve body opening,

the improvement comprising means for sealingly attaching said tube to said nozzle pivot within said passage including a stop in said passage, said stop comprising a shoulder formed within said passage and a washer seated upon said shoulder, said washer having a portion extending radially inward of said shoulder and into said passage, an annular seal positioned in said passage against said stop, said tube having a tapered end thereof in contact with said seal, and means for locking said tube in said passage in contact with said seal, said locking means including a bore in said nozzle pivot opening into said passage and forming an acute angle therewith, a peripheral groove on the exterior of said tube, said groove having an axial surface and an adjoining radial surface, with said radial surface forming an angle slightly greater than 90 degrees therewith, a threadedly mounted locking member axially movable in said bore toward said passage and tube, said locking member having a tapered nose thereon which is in flush contact with said groove axial surface with the point of said tapered nose contacting said groove at the junction of said radial and axial surfaces, whereby inward movement of said locking member drives said tube toward said seal with said nose biting into said tube at the junction of said surface to prevent rotation of said arm assembly.

5,199,116

HIGH-EFFICIENCY PORTABLE SPA

Earl L. Fischer, 3708 Lehman Ct., Rogers, Ark. 72756

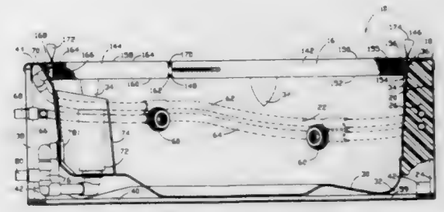
Filed May 10, 1991, Ser. No. 698,290
Int. Cl.[5] E03C 1/044
U.S. Cl. 4—541.2 6 Claims

1. In a spa having a tub, a recirculation line for taking water out of the tub at one location and returning it to the tub at another location, an impeller coupled in flow communication with the line for effecting recirculation of water through the tub and the line, and a motor operably coupled with the impeller for driving the same, improved means for heating the water as it flows through the recirculation line comprising:

a venturi located within said recirculation line downstream from the impeller for creating separate regions of relatively high and low pressure within the line as water flows past the venturi;

a tubular heat exchange coil wrapped around said motor for drawing heat from the motor and transferring it to water in the recirculation line during operation of the motor,

said coil having an inlet coupled in flow communication with the recirculation line at said high pressure region and an outlet coupled in flow communication with the line at said low pressure region whereby to induce circulation of a heat exchanging flow of water through the coil during concurrent recirculating flow of water through the recirculation line; and



temperature sensing and control means operably connected with said motor for energizing and deenergizing the motor in response to the sensed temperature of water in the spa,

said venturi including a member supported centrally within a tubular section of said recirculation line in radially inwardly spaced relationship therewith to define a restricted, annular flow path around the member,

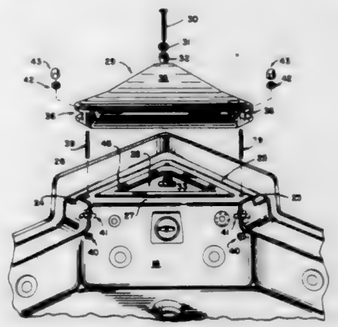
said member having a flat, squared-off shoulder facing in the upstream direction and extending radially inwardly from said restricted flow path at the upstream end of the flow path for causing turbulent flow in the line between the impeller and the member for increasing heat gain in the water moving through the recirculation line.

5,199,117

SEAT ATTACHMENT SYSTEM

Jonathan M. Hintz, Sheboygan Falls, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 22, 1992, Ser. No. 823,796
Int. Cl.[5] A47K 3/12
U.S. Cl. 4—590 9 Claims



1. A removable seating system which comprises:

(a) a plate having an upper seating surface, a lower surface

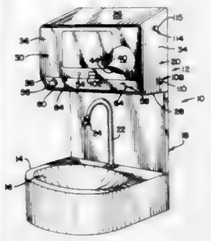
and operable therewith to hold said foot plate when piv-

open form and from said mat back surface when said mat wraps around said pillow form for said transportation and

glider or caster means, the improvement comprising longer extension devices provided between the legs and glider or

(a) a plate having an upper seating surface, a lower surface and a side peripheral edge generally perpendicular to the upper and lower surfaces; and
(b) the plate having at least one indentation in its side peripheral edge, which indentation is open to the side peripheral edge and has a ceiling and a floor, the floor having a passageway extending from the indentation to the lower surface, the passageway being disposed to accommodate a fastener and the indentation being such as to permit a fastener retainer to be inserted in the indentation in alignment with the passageway.

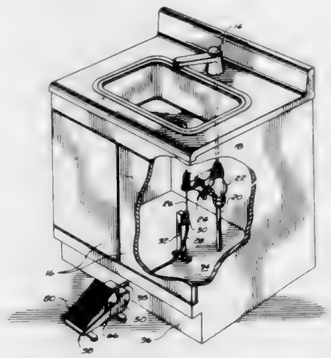
5,199,118
HAND WASH STATION
Charles K. Cole, Glenview, and Joseph A. Mitre, Bellwood, both of Ill., assignors to World Dryer, Division of Specialty Equipment Companies, Inc., Chicago, Ill.
Filed Feb. 11, 1991, Ser. No. 653,273
Int. Cl.[5] A47K *1/04;* **E03C** *1/05*
U.S. Cl. 4—619 **14 Claims**



1. A sanitizing device comprising a housing including means for dispensing soap;
means for dispensing water;
first sensor means for detecting the proximity of a user, said first sensor means being operatively connected to said soap dispensing means and to said water dispensing means such that upon sensing the proximity of a user said first sensor means activates said soap dispensing means and activates said water dispensing means;
dryer means for dispensing heated air; and
second sensor means for detecting the proximity of a user, said second sensor means being operatively connected to said dryer means such that upon sensing the proximity of a user said second sensor means activates said dryer means and wherein said second sensor means is additionally operatively connected to said water dispensing means such that upon sensing the proximity of a user said second sensor means deactivates said water dispensing means.

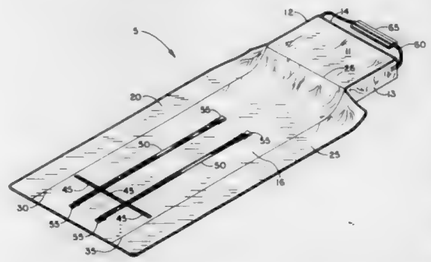
5,199,119
FOOT OPERATED WATER CONTROL
Ronald D. Weber, 1 Regulus Ct., Alameda, Calif. 94501
Filed Jul. 1, 1991, Ser. No. 723,584
Int. Cl.[5] A47K *1/04;* **B66D** *1/14*
U.S. Cl. 4—619 **8 Claims**

1. A foot operated mechanism for use in combination with a valve means having a plunger for controlling flow through said valve means, said plunger being biased into a normally closed position, and for actuating said plunger into an open position for flow through said valve means, said foot operated mechanism comprising:
a base plate;
a crank pivotally connected to said base plate;
a foot plate pivotally connected to said base plate;
crank actuating means connected to said foot plate for pivoting said crank;
a latch pivotally mounted to said crank actuating means;
hook means formed in said base plate for catching said latch and operable therewith to hold said foot plate when pivoted;
release means engagable with said latch and actuable apart from said foot plate; and
a cable communicating between said crank and said plunger;



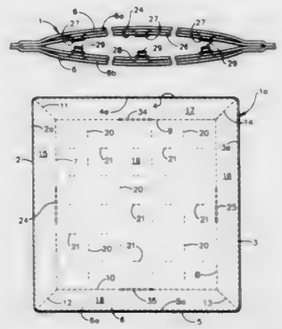
whereby pivoting said foot plate pivots said crank and therefore pulls said cable to actuate said plunger and also engages said latch with said hook means;
said release means, when actuated, rotating said latch out of engagement with said hook means.

5,199,120
PORTABLE COMBINED LOUGING MAT AND PILLOW HAVING A POCKET
Terrance F. Holmes, 2733 Adriatic Way, Sacramento, Calif. 95826
Filed May 28, 1992, Ser. No. 890,649
Int. Cl.[5] A47G *9/06*
U.S. Cl. 5—419 **6 Claims**



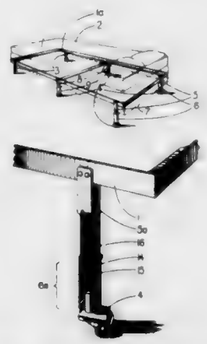
1. A portable combined lounging mat and pillow, comprising
a) a pillow having distal, proximal, and opposing side borders and front and back surfaces, wherein said pillow is adapted to have a thickness between said front and back surfaces that provides both a cushioned support for a user and a form around which said mat wraps for transportation and storage;
b) a mat secured to said pillow, wherein said mat has first and second ends and front and back surfaces, wherein said mat first end is secured to said pillow and said mat wraps around said pillow form for said transportation and storage;
c) a storage compartment associated with said mat proximate said mat second end; and
d) means associated with said mat proximate said mat second end for accessing said storage compartment from both said mat front and back surfaces when said mat is in an open form and from said mat back surface when said mat wraps around said pillow form for said transportation and storage.

5,199,121
ADJUSTABLE FILL COMFORTER
Andrew H. Payne, Cincinnati, Ohio, assignor to Down Lite Products, Inc., Loveland, Ohio
Filed Oct. 9, 1992, Ser. No. 958,932
Int. Cl.[5] A47G *9/04, 9/02, 9/08*
U.S. Cl. 5—502 **21 Claims**



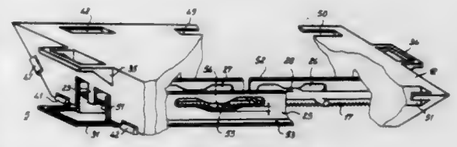
1. A comforter adapted to cover a substantial body portion of a human user, comprising an outer fabric shell containing a fill material, said shell comprising a top fabric panel and a bottom fabric panel joined together about their peripheral edges, said fill material being captively located between said top and bottom shell panels, said top and bottom shell panels being additionally joined together along at least one seam dividing said comforter into at least two areas, along a portion at least of said at least one seam said joinder of said top and bottom shell panels being releasable and restorable comprising an openable and closable passage in said seam through which said fill material can be shifted between said at least two areas of said comforter to adjust the amount of said fill in said areas.

5,199,122
BED ANGLE-ELEVATORS
Norbert Styblo, 33 Tremont St., Carver, Mass. 02330
Filed Apr. 8, 1992, Ser. No. 865,223
Int. Cl.[5] A47C *21/00, 31/00*
U.S. Cl. 5—509.1 **1 Claim**



1. In a bed having legs supporting the head area of the bed, legs supporting generally the midsection area of the bed, the lower portions of said legs having removably attached thereto glider or caster means, the improvement comprising longer extension devices provided between the legs and glider or caster means at the head area of the bed, and shorter extension devices provided between the legs and glider or caster means at the midsection area of the bed, said extension devices comprising an upper surface area that includes a projection adapted to removably attach the extension device to its respective leg, and a lower surface that includes a cavity that is adapted to removably attach the extension device to its respective glider or caster means whereby the extension devices positioned between the glider or caster means and the legs at the head and midsection area of the bed elevate the head area of the bed relative to the foot area of the bed.

5,199,123
EXAMINATION BED FOR NMR OR TOMODENSITOMETRY APPARATUS
Sireul Jacques, Wissous, and Gauthier Rene, Antony, both of France, assignors to General Electric CGR SA, France
PCT No. PCT/FR87/00279, § 371 Date Mar. 9, 1989, § 102(e) Date Mar. 9, 1989, PCT Pub. No. WO88/00452, PCT Pub. Date Jan. 28, 1988
Continuation of Ser. No. 744,685, Aug. 9, 1991, abandoned, which is a continuation of Ser. No. 314,061, Mar. 9, 1989, abandoned. This PCT application Jul. 10, 1987, Ser. No. 860,223
Claims priority, application France, Jul. 18, 1986, 86 10476
The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.
Int. Cl.[5] A47B *13/00*
U.S. Cl. 5—601 **32 Claims**



1. A medical examination unit comprising:
an examination means for examining a patient; and
a medical examination bed;
said medical examination bed including
a chassis,
a movable plateau which is movable with respect to said chassis,
drive means or moving said plateau in a predetermined direction with respect to said chassis and with respect to said examination means for permitting the insertion of said plateau into said examination means and the withdrawal of said plateau from said examination means,
first rack means, extending along a length of said plateau, for enabling said plateau to move in said predetermined direction, and
means for disengaging said plateau drive means, said disengaging means comprising retracting means in said plateau for supporting said first rack means and for moving said first rack means in a direction away from said drive means without raising said plateau,
wherein said examination means is aligned with said bed, and said chassis and examination means include support means for receiving and guiding said plateau,
wherein said plateau drive means include a mobile assembly having first and second ends, the moving of said mobile assembly being translational with respect to said plateau and said chassis, said mobile assembly having an elongated shape, wherein the first end of said mobile assembly is mechanically connected to said chassis and is movable by translation with respect to said chassis, and the second end of said mobile assembly is mechanically connected to the plateau and is movable by translation with respect to said plateau.

5,199,124

5,199,126

(1) adding water to said wash chamber while rotating said

5,199,129

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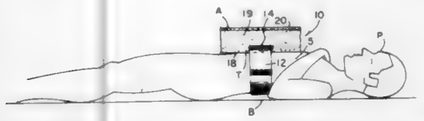
5,199,124

CUSHION TO PREVENT SLEEPING ON THE ABDOMEN

Daniel E. Klemis, 25 Hale St., Beverly, Mass. 01915

Filed Jun. 9, 1992, Ser. No. 895,948
Int. Cl.[5] A47C 20/00; A47G 9/00; A61G 7/06
U.S. Cl. 5—630 8 Claims



1. A device to prevent a user from sleeping on or rolling onto the abdomen during sleeping, said device comprising:

a resilient cushion having a generally wedge-shaped cross-section, said cushion being characterized as having a generally rectangular resilient base and a length and a width sufficient to engage major portions of the user's abdomen and sternum, the length of said cushion being greater then its width, said cushion further being characterized as having two sides extending from said base and converging into an apex, said apex being disposed parallel to said length, the elevation of said sides being between about 0.5 and 1.5 times the width of said base;

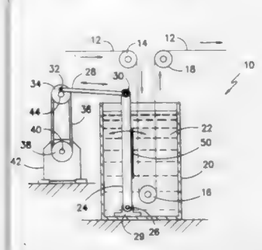
fastening means to secure said cushion and maintain said resilient base in position on the user's abdomen and sternum during sleeping with said apex being parallel to the long axis of the user, said fastening means extending transversely of said apex of said cushion and engaging and wrapping around the torso of the user.

5,199,125

METHOD FOR TEXTILE TREATMENT

Wolfgang K. F. Otto, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 739,188, Aug. 1, 1991. This application Apr. 2, 1992, Ser. No. 862,089
Int. Cl.[5] D06B 3/20
U.S. Cl. 8—151 25 Claims



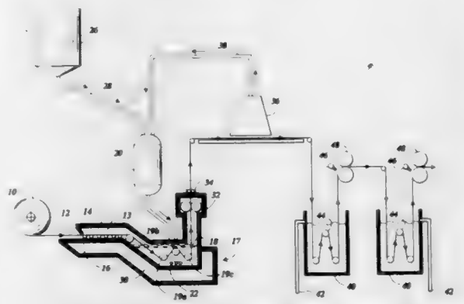
1. A method for delivering liquid against a textile fabric having a face and interstices comprising the step of transporting said textile fabric through a tank or liquid while oscillating a member within said tank of liquid at a product of a frequency and amplitude of 75 to 1500 inches×cycles per minute, thereby creating a plane of liquid substantially perpendicular to said face of said textile fabric for achieving rapid and repeated penetration of liquid into said interstices and interchange between liquid in said tank and liquid trapped in said interstices directed at the surface of said textile fabric.

5,199,126

METHOD AND APPARATUS FOR DYEING CARPET

B. Frank Fuller, 9729 Mountainair Dr., Ooltewah, Tenn. 37363

Continuation of Ser. No. 561,161, Aug. 1, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 837,680
Int. Cl.[5] D06B 3/10, 23/14
U.S. Cl. 8—151 10 Claims



1. A method for continuously dyeing fabric materials, which method is carried out under atmospheric conditions, comprising the steps of:

a. providing a dye solution having a boiling point above about 212° F. at standard temperature and pressure;

b. providing a fabric material;

c. heating said dye solution to a temperature above about 212° F. at standard temperature and pressure;

d. applying said heated dye solution to said fabric material; and

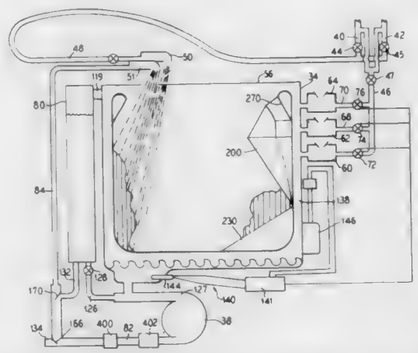
e. fixing said dye to said fabric material without the need for steam fixation.

5,199,127

METHOD FOR RINSING FABRIC ARTICLES IN A VERTICAL AXIS WASHER

Jeanne C. Van Newenhizen, Benton Township, Berrien County; Mark B. Kovich, St. Joseph Township, Berrien County; Jim J. Pastryk, Weesaw Township, Berrien County, and Anthony H. Hardaway, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 2, 1992, Ser. No. 816,168
Int. Cl.[5] D06F 21/08
U.S. Cl. 8—158 18 Claims



10. A method of rinsing fabric in a washer having a wash chamber including a side wall, a floor, a floor ramp, and a baffle, wherein said wash chamber is rotatable about a vertical axis, comprising the steps:

(1) adding water to said wash chamber while rotating said wash chamber about a vertical axis a number of revolutions sufficient to cause said fabric, rinse water and wash chamber to rotate at approximately the same speed;

(2) tumbling said fabric within said wash chamber by periodically decelerating said wash chamber, causing said fabric to impinge said floor ramp and travel up said side wall of said wash chamber to impinge said baffle, thereby causing said fabric to tumble within said wash chamber as said wash chamber decelerates;

(3) repeating steps 1–2 for a first time period;

(4) directing a spray of rinse water onto said fabric during said first time period as said fabric is rotating with and tumbling in said wash chamber;

(5) selectively spinning and selectively draining said wash chamber to remove of said rinse water from said fabric; and

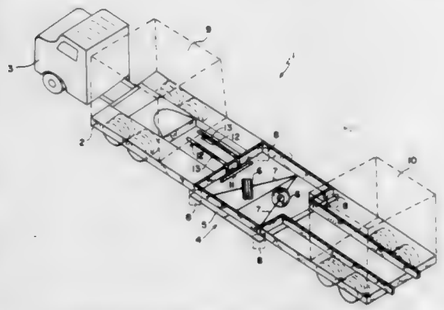
(6) repeating steps 1–5 a predetermined number of times.

5,199,128

METHOD AND APPARATUS FOR CLEANING RUBBER DEPOSITS FROM AIRPORT RUNWAYS AND ROADWAYS

Sandy M. Stubbs, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 3, 1991, Ser. No. 682,153
Int. Cl.[5] A47L 11/282
U.S. Cl. 15—52 5 Claims



1. An apparatus for removing rubber deposits from a surface comprising:

a large vehicle having a cab, a trailer following the cab, and a cleaning assembly attached to the under side of said trailer, including:

a frame directly attached to said trailer, at least one axle attached to said frame, and at least one tire mounted on said axle so that said axle and said tire are aligned at a yaw angle to the direction of travel of the vehicle;

a means for raising and lowering said cleaning assembly for contact of said tire with said surface;

at least one water tank attached to the top side of said trailer, said water tank being equipped with a means for delivering a desired amount of water to said surface in front of said tire with respect to the direction of travel of the vehicle; and

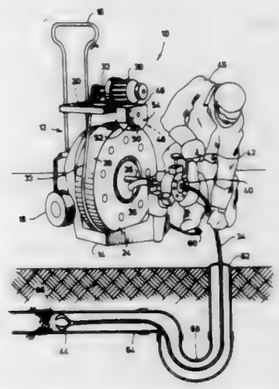
a means for placing a vertical load on said tire.

5,199,129

TORQUE MONITORING SYSTEM FOR ROTARY DRAIN AND SEWER CLEANING APPARATUS

Roy Salecker, and Rockwell T. Sloter, both of Mendota, Ill., assignors to Spartan Tool, A Div. of Heico, Inc., Mendota, Ill.

Filed Mar. 24, 1992, Ser. No. 856,524
Int. Cl.[5] B08B 9/02
U.S. Cl. 15—104.33 11 Claims



1. In a rotary drain and sewer cleaning apparatus including a flexible elongate cable insertable into a line,

a drum having an end of the elongate cable attached therein and a portion of the elongate cable wound therein,

a motor drive means for rotating said drum, and

a means for selectively providing power to the drive means causing the drive means to rotate, the improvement comprising:

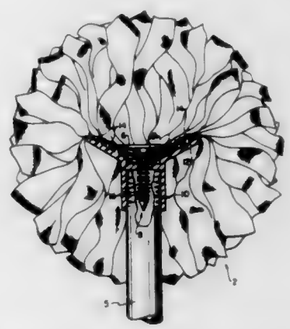
a circuit including sensing means for measuring a motor drive torque as said drum rotates and generating a torque signal representing motor drive torque level, and means controlled by said torque signal for indicating said torque level.

5,199,130

HYDROPHOBIC MOP WHICH RETAINS ITS SHAPE

Johanna D. Lazar, 117 E. 57th St., New York, N.Y. 10022

Continuation-in-part of Ser. No. 656,018, Feb. 15, 1991, abandoned, which is a continuation of Ser. No. 208,734, Jun. 17, 1988, abandoned. This application Jan. 23, 1992, Ser. No. 824,507
Int. Cl.[5] A47L 13/20
U.S. Cl. 15—229.2 8 Claims



1. A mop for cleaning external surfaces; comprising:

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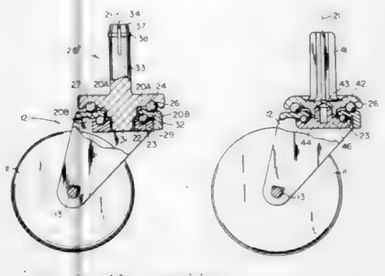
a handle;
a mop head which includes a plurality of elongated cleaning elements each having a center area with a locating aperture in alignment with each other, the cleaning elements each being comprised of net mesh material composed of hydrophobic yarns which define interstices, each of the cleaning elements having two sides facing away from each other and having edges;
a fastener extending through each of the locating apertures;
means for securing the handle and the fastener together;
means for compressing the center area of each of the cleaning elements together; and
means for retaining the shape of the mop head, the retaining means including a plurality of protruding ends of the hydrophobic yarns which comprise the edges of the cleaning elements and which engage within interstices of the net mesh material of neighboring ones of the cleaning elements, the cleaning elements cooperating with each other in response to the compressing means and the retaining means to cause the mop head to have and resiliently retain a fluffy, full-bodied shape of generally spherical dimension, the cleaning elements having free ends whose edges are comprised of a plurality of the protruding ends, the edges of the free ends of the cleaning elements and the two sides of the cleaning elements constituting abrasive surfaces which are suited for cleaning the external surfaces of particulate matter when moved back and forth against the external surfaces.

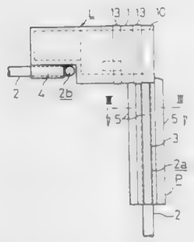
5,199,131
THERMOPLASTIC CASTER ASSEMBLY
Charles A. Harris, Evansville, Ind., assignor to Babcock Industries, Inc., Fairfield, Conn.
Filed Jun. 26, 1991, Ser. No. 721,318
Int. Cl.[5] B60B *33/00*
U.S. Cl. 16—21 **9 Claims**



1. A caster assembly comprising:
a stem and upper ball bearing retainer combination unit made of a single homogeneous piece of plastic and having a central longitudinal swivel axis;
a horn;
a bottom bearing retainer made of a single piece of reinforced plastic;
an upper set of ball bearings spaced in a first circle about the axis and located between the horn and the upper retainer; and
a lower set of ball bearings spaced in a second circle about the axis and located between the horn and the bottom retainer, with the bottom retainer being fused to the stem and retainer combination unit.

8. A method of making a caster assembly having a mounting stem unit, a horn with two side legs and a top bridge portion, a bottom bearing retainer, and a first set of bearings between the bridge portion of the horn and the mounting stem unit, and a second set of bearings between the bridge portion and the retainer, the method comprising the steps of:
placing ball bearings between the bridge portion of the horn and the stem unit on top of the bridge portion to comprise the first set, and placing ball bearings between the bottom bearing retainer and the bottom of the bridge portion to comprise the second set; and
fusing the bottom bearing retainer on the bottom of the stem unit while holding the bearings in place in a bearing race groove in the stem unit and in a bearing race groove in the bottom bearing retainer.

5,199,132
HINGE FOR A SUN VISOR IN A MOTOR VEHICLE
Carlos Gabas, Barcelona, Spain, assignor to Industrias Techno-Matic, S.A., Calle Espronceda, Spain
PCT No. PCT/ES90/00022, § 371 Date Feb. 27, 1991, § 102(e) Date Feb. 27, 1991, PCT Pub. No. WO91/00190, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 27, 1990, Ser. No. 656,131
Claims priority, application Spain, Jul. 3, 1989, 8902176
Int. Cl.[5] E05C *17/64;* **E05D** *11/08;* **B60J** *3/00*
U.S. Cl. 16—342 **4 Claims**

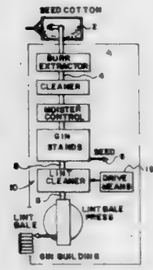


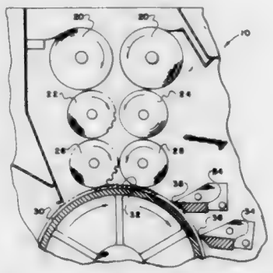
1. A hinge for a motor vehicle sun visor having a sun visor body and a frame with an open perimeter and two free ends, the hinge comprising an essentially L-shaped, one-piece body member; a longitudinal frame holder located on a side of said body extending perpendicularly to an axis of pivoting of the sun visor body and formed so that one of the free ends of the frame fits snugly and slidingly therein; at least two longitudinal tabs for holding and retaining another of free ends of the frame and located on a side of the body member extending longitudinally to the axis of pivoting of the sun visor; a connector formed by a portion of said body member for pivotally supporting the sun visor in the motor vehicle and designed to receive additional means for holding and retaining a motor vehicle support shaft on which said body member is mounted; reinforcement means on said body member for making a firm connection between said body member and the sun visor body, said reinforcement means including a plurality of fins provided on said frame holder, said fins being coextensive with said frame holder and extending in two directions which are perpendicular to one another as seen in a cross section which is perpendicular to an elongation of said frame holder.

5,199,133
LINT CLEANER FEEDING ROLLERS
Jimmy L. Burton, Rt. 3 Box 396, Bells, Tenn. 38006
Filed Sep. 19, 1991, Ser. No. 762,621
Int. Cl.[5] D01B *1/06*
U.S. Cl. 19—39 **7 Claims**

1. In a lint cleaner in a cotton gin having
a) a cotton gin building,
b) receiver means for receiving seed cotton into the gin building which encloses
c) transport means for transporting the seed cotton from the receiver means to
d) gin stand means for separating seeds and lint from the seed cotton, and
e) lint conveyor means for conveying the lint cotton from the gin stand means to the lint cleaner and for conveying the lint cotton from the lint cleaner to

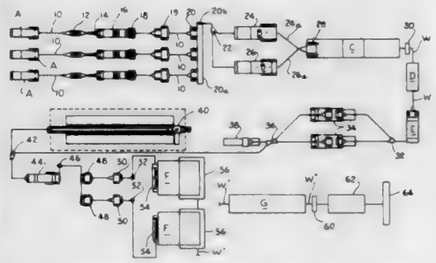
f) press means for pressing the cotton lint into dense cotton bales,
g) the lint cleaner having
h) a saw cylinder mounted for rotation about a cylinder axis extending along a cylinder length,
i) a plurality of saw teeth attached to the circumferential surface of the cylinder,
j) drive means for rotating the saw cylinder, so that the surface thereof has a saw cylinder circumferential surface speed,
k) the saw teeth inclined in a direction of tooth movement during cylinder rotation, and
l) a feed means for feeding a substantially continuous layer of lint cotton to the saw teeth, and





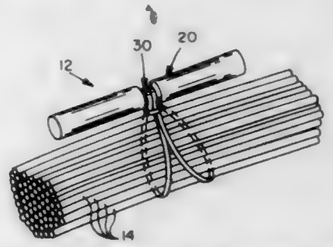
m) a plurality of grid bars extending the length of saw cylinder with
n) an edge of each grid bar in close proximity to the saw teeth;
wherein an improvement in the feed means for feeding the layer of lint cotton to the saw teeth comprises in combination with the above;
o) feed rollers adjacent to the saw teeth, one of said rollers which is smooth having about 2 mm clearance to the saw teeth for pressing the layer of lint cotton onto the saw teeth, and
p) feed drive means for rotating the feed rollers so that the surface of the smooth feed roller moves in the same direction and has a feed surface speed of at least about 1/37th of the saw surface speed.

5,199,134
SYSTEM AND METHOD FOR PRODUCING A BLEACHED COTTON, NONWOVEN WEB
William G. Ripley, P.O. Box 3373, Lubbock, Tex. 79452
Filed Nov. 13, 1990, Ser. No. 612,558
Int. Cl.[5] D01G *21/00*
U.S. Cl. 19—66 CC **27 Claims**



1. A continuous fiber processing system for producing a bleached and blended cotton fibers comprising:
bale opening means for opening bales of cotton fibers;
a plurality of fiber feed lines receiving fibers from said bale opening means;
each of said fiber feed lines including a first fiber opening means for individualizing and cleaning said fibers to produce cleaned opened fibers; and
first blender means comprising a common conveyor for collecting said opened and cleaned fibers from said plurality of fiber delivery lines and conveying said opened and cleaned fibers to a common point so that said opened fibers may be fed to second fiber blending means;
said second fiber blending means for further mixing said cleaned and opened fibers to produce cleaned and twice blended fibers;
web forming means receiving said cleaned and twice blended fibers;
continuous flow bleaching means for receiving said web of cleaned and blended fibers and producing a web of bleached cotton fibers;
a dryer for drying said web of bleached fibers;
second fiber opening means receiving said web of bleached fibers for opening said fibers and producing opened bleached fibers;
third blending means including a high capacity condenser means receiving opened bleached fibers from said second fiber opening means;
said high capacity condenser means includes a plurality of high capacity condensers; and a switch box receiving said opened bleached fibers from said second fiber opening means and blending said fibers by selectively distributing said fibers between said high capacity condensers;
a junction box connected to said plurality of high capacity condenser means;
a fiber baling means connected to said junction box for receiving and pressing said fibers into a bale of bleached cotton fibers; and
said junction box being also connected to fiber cleaning, storing and feeding means so that fibers from said high capacity condenser means may be selectively fed to said fiber baling means for being pressed into bleached cotton fiber bales or to said fiber cleaning, storing and feeding means for delivery to fiber carding means.

5,199,135
BINDING DEVICE
Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550
Filed Jun. 25, 1992, Ser. No. 904,256
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 R **1 Claim**



1. In a binding device of a type in which a closed loop elongated elastic band having opposed first and second ends is disposed in encircling relation about a bundle with said first end projected through the second end and held against withdrawal therefrom by a dowel pin inserted in a directional path through said projected first end, the improvement comprising a circular notch V-shaped in cross section at a medial location on said dowel pin, said band being wrapped about said notch of said dowel with the first end of said band being passed through said band loop whereby the second end of said band is cinched tightly about said dowel within said notch, said projected first

end of said loop being subsequently seated in said notch upon

shaped slot; the improvement comprising a rope guard com-

sion and a minor axis dimension, said major axis dimension

5,199,140

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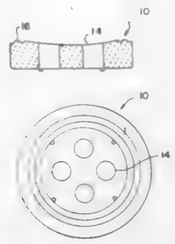
end of said loop being subsequently seated in said notch upon bundle encirclement under the urging of said elastic whereby further movement of said dowel pin along said directional path is inhibited to correspondingly obviate inadvertent disengagement of said binding device from about said bundle.

5,199,136

BUTTON FOR ARTICLES OF CLOTHING

James P. McNerney, Arvada, and Lynn D. Geving, Denver, both of Colo., assignors to Coors Ceramicon Designs, Ltd., Golden, Colo.

Filed May 16, 1991, Ser. No. 701,504
Int. Cl.[5] A44B *1/00*
U.S. Cl. 24—90 TA 5 Claims



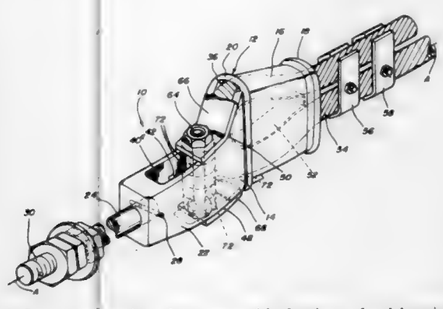
1. A button for an article of clothing, said button comprising a ceramic material selected from the group consisting of zirconia, alumina, alumina-zirconia composites, and SiC whisker-reinforced comosies, said ceramic material having a strength of at least about 250 MPa and a critical stress-intensity factor of at lest about 6 MPam$^{\frac{1}{2}}$, for the purpose of reducing breakage of the button, wherein said ceramic is resistant to deterioration from dry cleaning solvents and detergents.

5,199,137

ROPE GUARD ASSEMBLY FOR WEDGE CLAMP

Franklin R. Edwards, Bloomfield Hills, Mich., assignor to Nylube Products, Co., Rochester Hills, Mich.

Filed Mar. 25, 1991, Ser. No. 674,696
Int. Cl.[5] F16G *11/00*
U.S. Cl. 24—136 K 22 Claims



1. In a rope wedge clamp assembly having a load bearing body portion with a load bearing axis therethrough, said body portion including a rope securement portion having a first end and a second end and a rod connection portion at said second end, said rope securement portion including surfaces forming a wedge shaped slot extending through the body for receiving a rope and wedge assembly in secured engagement under load, a surface forming a second slot extending from side through the rod connection portion and communicating with said wedge shaped slot; the improvement comprising a rope guard comprising:

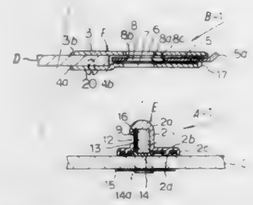
abutment means secured within said second slot for abutting a rope secured in the wedge shaped slot thereby preventing axial movement of said rope and wedge assembly which could loosen said securement of said rope and wedge assembly in said wedge shaped slot.

5,199,138

MAGNETIC FASTENER

Tamao Morita, Tokyo, Japan, assignor to Tarmo Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1992, Ser. No. 899,979
Claims priority, application Japan, Jun. 17, 1991, 3-170396
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—303 14 Claims



1. A fastener means comprising

a male member which is provided with either a projection made of a permanent magnet or a projection having a permanent magnet, and

a female member which includes a female frame comprising a first and a second plate members, and a slide plate which is made of a ferromagnetic material, slidably inserted between said first and the second plate members and manipulated from the outside of the female frame, said first and the second plate members and the slide plate having communicating openings through which said projection of the male member is inserted, said projection to be inserted in the female member being provided with either a dent or a strip for engagement on the side where said slide plate is attracted by the permanent magnet of the projection, and the peripheral edge of the opening of the slide plate being attracted to one face of the projection within said dent or to a face of said projection located below said engagement strip,

which is characterized in that said first plate of the female frame includes two opposing sides that are bent inward along the edges, and dented portions and/or catches on the upper ends of said sides, and said second plate has on its side edges catches which fit into said indented portions or indented portions which receive said catches, and

said first plate and the second plate which are assembled by inserting said catches into said indented portions are firmly engaged by welding.

5,199,139

FASTENING DEVICE

T. Gordon Hutchinson, P.O. Box 250, Dublin, N.H. 03444

Continuation-in-part of Ser. No. 734,214, Jul. 22, 1991, Pat. No. 5,129,926, which is a continuation-in-part of Ser. No. 584,196, Sep. 18, 1990, Pat. No. 5,075,938, which is a continuation-in-part of Ser. No. D. 535,872, Jun. 11, 1990. This application Feb. 19, 1992, Ser. No. 837,739
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—464 20 Claims

1. A fastening device comprising:

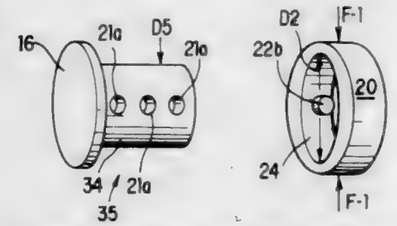
a stud component;

a deformable component having a dimensionally deformable substantially elliptical shaped aperture therein said deformable component aperture having a major axis dimension and a minor axis dimension, said major axis dimension being greater than said minor axis dimension, said aperture adapted to receive into interengaging position said stud component when said stud component is inserted into said aperture of said deformable component and when said deformable component is placed onto said stud component;

means for deforming said aperture thereby creating a deforming force along a direction parallel to said major axis and perpendicular to said minor axis of said elliptical shaped aperture, said aperture axes dimensions deformable so that said minor axis dimension increases as said major axis dimension decreases upon inserting and extracting of said stud component into and from said aperture of said deformable component and upon application of said deforming force to said deformable component;

said stud component comprising a substantially cylindrical shaped stud member, said aperture to receive said stud component when said stud member is inserted into said aperture of said deformable component and when said deformable component is placed onto said stud component thereby putting said deformable component and said stud component into interengaging relationship;

at least one means for interengaging said deformable and said stud components, said at least one means for interengaging matingly positioned and located on an interior wall of said aperture which surface defines said aperture of said deformable component said means for engaging lie parallel to and in line with a minor axis of said elliptically shaped aperture of said deformable component said interengaging means also being integral with said stud member and adapted to matingly cooperate with said deformable component to interengage said stud and said deformable components;



interengagement forces created by said deformation of said aperture and said interengagement of said deformable component with said stud component being only at both ends of said minor axis when said stud component is in interengagement with said deformable component;

wherein said at least one pair of interengaging means comprises:

at least one pair of mating holes disposed on opposite ends of radii of said stud member, integral with and distributed along said stud member between said body portion and protruding end of said stud member and spacing between adjacent pairs or holes being not less than a dimension which is adequate to permit said interengaging of said stud and said deformable component;

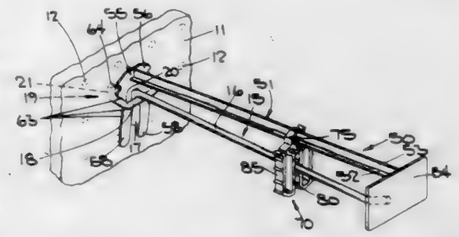
said deformable component adapted to have at least one pair of pegs for engagement which matingly cooperates with at least one pair of said at least one pair of mating holes of said stud component when said stud component and said deformable component are attached as a consequence of application of said deforming force, said stud component and deformable component interengagement results from said interengagement forces created by said deformation of said aperture.

5,199,140

INVENTORY CONTROL CLIP FOR DISPLAY HANGERS

Stanley C. Valiulis, Rockford, and Randy D. Long, Durand, both of Ill., assignors to Southern Imperial, Inc., Rockford, Ill.

Filed Oct. 30, 1991, Ser. No. 785,315
Int. Cl.[5] A41F *1/00*; A44B *17/00*
U.S. Cl. 24—545 9 Claims



1. The combination of, generally horizontally extending hanger arm means, a label holder having a generally horizontally extending arm spaced above the hanger arm means, and a merchandise control clip, said combination being characterized in that said clip is made from a single piece of plastic and includes a body portion with a pair of laterally spaced and upwardly projecting fingers which straddle and engage said label holder arm to retain said clip on said label holder arm, and a pair of laterally spaced and upright legs integral with said body portion and positioned below said fingers in engagement with said hanger arm means to retain said clip on said hanger arm means, said fingers and said legs being adjustable along the length of said label holder arm and said hanger arm means, respectively, and retention means on said legs permitting said legs to be adjusted to and retained in various vertical positions relative to said hanger arm means.

5,199,141

METHOD OF PRODUCING A NONWOVEN FIBROUS TEXTURED PANEL AND PANEL PRODUCED THEREBY

Elwood G. Trask, and Robert R. Walters, both of Auburn, Me., assignors to Gates Formed-Fibre Products, Inc., Auburn, Me.

Continuation of Ser. No. 457,998, Jan. 10, 1990, Pat. No. 5,077,874. This application Sep. 6, 1991, Ser. No. 755,912
The portion of the term of this patent subsequent to Jan. 7, 2008, has been disclaimed.
Int. Cl.[5] D04H *5/06*
U.S. Cl. 28—115 12 Claims

1. A nonwoven fibrous, flexible material comprising a needled web having a front outer surface and a non-glazed back surface disposed opposite thereof and including interengaged first fibers and second thermoplastic fibers, said outer surface being substantially free of said second thermoplastic fibers and said web having a plurality of weld joints between said second thermoplastic fibers and at least a portion of said first fibers proximate said back surface.

5,199,142

for temporarily preventing the disc from moving in a down-

member, and that each of said guide belts is equipped with a tension providing means, to thereby cause the

collar having a top, generally planar surface for receiving the clamp nut, a bottom surface, and a central opening

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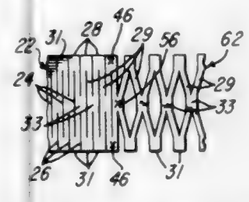
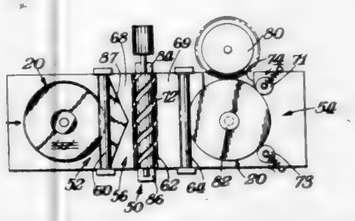
5,199,142
PRODUCTION OF EXPANDED METAL STRIP FOR REINFORCING A RESILIENT PRODUCT
Robert W. Davis, Xenia, Ohio, assignor to The Gem City Engineering Co., Dayton, Ohio
Filed Sep. 4, 1991, Ser. No. 754,942
Int. Cl.[5] B21D *31/04*
U.S. Cl. 29—6.1 13 Claims



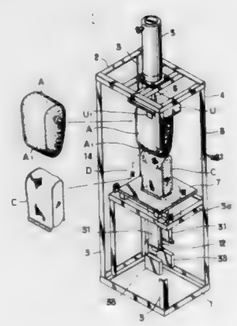
1. A method of producing an expanded metal strip adapted to be used for reinforcing a resilient weatherstrip product, comprising the steps of progressively shearing a continuous thin strip of metal with longitudinally spaced and laterally extending slits to define longitudinally connected opposing U-shaped tabs each having a pair of generally parallel leg portions and with the leg portions of each tab integrally connected by a separate corresponding edge portion of the strip and the adjacent leg portions of adjacent tabs integrally connected by a separate corresponding center portion of the strip, feeding the strip between a first set of continuously moving opposing gripping members positioned for progressively gripping the edge portions of the strip and a second set of continuously moving opposing gripping members positioned between the first set of gripping members for progressively gripping the center portions of the strip, positioning the second set of gripping members downstream of the first set of gripping members by a predetermined distance corresponding generally to the width of the tabs, and driving the first and second sets of gripping members at differential surface speeds with the second set moving at a speed substantially greater than the speed of the first set to effect continuous and uniform expansion of the strip to separate corresponding edge portions and center portions in longitudinally spaced relation by progressively deforming the opposing U-shaped tabs into opposing V-shaped tabs.

5,199,143
SHAVING MACHINE
August DeFazio, 33 Forman La., Englishtown, N.J. 07726
Division of Ser. No. 704,210, May 22, 1991. This application Apr. 29, 1992, Ser. No. 875,394
Int. Cl.[5] B21C *43/00*
U.S. Cl. 29—81.11 2 Claims



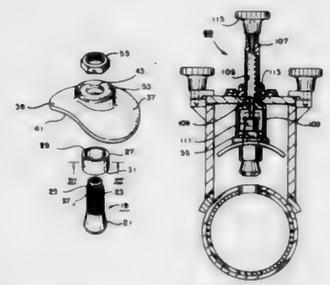
1. A shaving machine for shaving down the face of a plastic compact disc, said machine having an entrance into which a disc would be inserted, a first rotating rubbery roller across said entrance for engaging a face of the disc and feeding the disc in a downstream direction away from said entrance, a shaving mill downstream from said first roller for engaging and shaving a face of the disc fed to said shaving mill by said first roller, a centering pin downstream from said shaving mill for temporarily preventing the disc from moving in a downstream direction, means mounted near said centering pin for brushing the edge of the disc and rotating the disc about said centering pin until the disc is again moved in a downstream direction by a further disc fed through said machine, and a second rotating rubbery roller downstream from said centering pin for ejecting the downstream most disc from said machine.

5,199,144
APPARATUS FOR AFFIXING COVERING MEMBER TO ARMREST BODY USED FOR AUTOMOTIVE SEAT
Yasuo Abe, and Ayaru Sasaki, both of Tokyo, Japan, assignors to Tachi-S Co. Ltd., Tokyo, Japan
Filed May 30, 1991, Ser. No. 708,045
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—235 4 Claims



1. An apparatus for affixing a covering member to a padding in order to produce an armrest body for an automotive seat, in which said covering member is formed in a shaped of one-side opened container and said padding is formed in a given configuration of said armrest body, said apparatus comprising:
a lower die means upon which is placed said covering member; and
an upper die means upon which is secured said padding, said upper die means being disposed above said lower die means and including an upper die body and a drive means for causing said upper die body to be moved vertically towards and away from said lower die means:
said lower die means including:
a movable base member;
a drive means for causing vertical movement of said movable base member in a synchronous relation with said vertical movement of said upper die body, so that both said upper and lower die bodies are moved together at the same speed and in the same direction;
a pair of support members, each being disposed on respective first opposite sides of said drive means;
a pair of guide belts, each being disposed on respective second opposite sides of said drive means, said second opposite sides being situated at points excepting said first opposite sides;
wherein said support members and guide belts surround said drive means of said lower die means and movable base member, said support members and guide belts cooperating with one another at their respective upper portions to define a means for receiving said covering member which is turned over to expose its reverse surfaces;
a rod means provided above and extended between said pair of support members;
the arrangement of said pair of guide belts being such that each of them is at its upper portion folded about said rod means, extending downwardly, and further connected with said lower die drive means via said movable base member, and that each of said guide belts is equipped with a tension providing means, to thereby cause the guide belt to be stretched evenly;
whereby operation of said upper die means drive means causes said padding secured at said upper die means to be moved downwardly, thereby inserting said padding into a hollow defined within said pair of support members and guide belts, and with such padding insertion, said movable base member is lowered simultaneously by said lower die means drive means, which in turn causes said guide belts to be hauled downwardly, thereby turning over said covering member neatly to bring its reverse surfaces in contact with the outer surfaces of said padding, so as to affix said covering member over said padding, with top surfaces of said covering member appearing on said padding.

5,199,145
CORPORATE STOP ASSEMBLY
Jim S. McMillan, Benbrook, and Simon Tarsha, Forth Worth, both of Tex., assignors to Pipe Rehab International, Inc., Memphis, Tenn.
Filed Mar. 21, 1991, Ser. No. 672,877
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—237 4 Claims

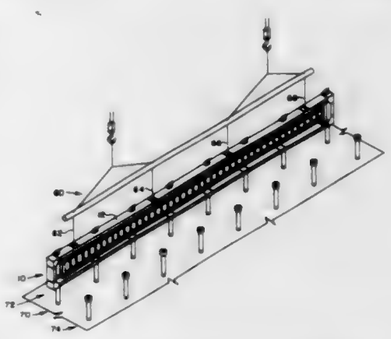


1. A corporate stop for blind side sealing of an opening provided in an external sidewall of a longitudinally extending conduit of the type lined with a synthetic liner also having a concentric opening, the corporate stop comprising:
a threaded stem having an enlarged, conical head portion and a neck portion of reduced size, the neck portion terminating in an extension portion;
a resilient sleeve member coaxially surrounding the neck portion of the stem, the sleeve member having an upper end and having a lower end adapted to accommodate the enlarged, conical head portion of the threaded stem;
a compression washer having an upper side and a lower side which is contoured to fit the sidewall of the conduit, the compression washer having an opening which is alignable with the opening provided in the external sidewall of the conduit and in the liner, the lower side of the compression washer having a sleeve receiving recess provided for receiving the upper end of the sleeve member when the stop is installed on the conduit for forming an external seal between the compression washer and the external sidewall of the conduit;
a clamp nut engageable with the neck portion of the threaded stem for forcibly moving the lower end of the sleeve member over the enlarged, conical head portion of the threaded stem to expand the lower end of the sleeve member and form an internal seal with the opening in the lined conduit;
wherein the resilient sleeve member is formed of an elastomeric material, the material being linearly and radially reinforced; and
wherein the upper side of the compression washer has a central raised portion which forms a protruding collar, the collar having a top, generally planar surface for receiving the clamp nut, a bottom surface, and a central opening alignable with the opening in the conduit, and wherein the internal sleeve receiving recess is formed in the bottom surface of the protruding collar, the sleeve receiving recess having a greater diameter than the diameter of the central opening, the diameter of the sleeve receiving recess being selectively sized to receive the upper end of the resilient sleeve to form an external seal between the compression washer and the external sidewall of the conduit as the clamp nut is engaged with the neck portion of the threaded stem.

5,199,146
TENSIONING AND CRIMPING TOOL
Donald D. Grover, Kenosha, Wis.; Theodore H. Kunkel, Jr., Cincinnati, and Jeffery A. Stafford, Dayton, both of Ohio, assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Jul. 25, 1990, Ser. No. 555,540
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—268 75 Claims

1. A tensioning and crimping tool comprising means for tensioning a wire, holding and crimping means for holding a ferrule and for crimping the ferrule onto the wire after the wire has been tensioned, means for operating said tensioning means and said crimping means, said holding and crimping means including a movable member positionable to hold the ferrule and then to crimp the ferrule in response to said operating means, and hand-operated means for actuating said operating means.

5,199,147
MOVABLE JIG ASSEMBLY FOR THE MANUFACTURE OF AIRCRAFT COMPONENTS
Trevor D. Whiteside, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Division of Ser. No. 621,696, Nov. 28, 1990, Pat. No. 5,142,764. This application Oct. 31, 1991, Ser. No. 785,652
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—281.1 5 Claims



1. A structure assembly jig for tack-free positioning of com-

a pointed end about which said tapered end portion of said

arm means and ramp floor assembly in a position to exert

material of said workpiece, said wing means define an

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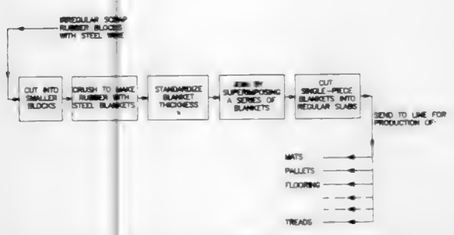
ponents for subsequent fastening comprising, a frame for positioning said components in a desired assembly, movable clamps mounted to said frame, means to move said clamps into pressure contact with said components to hold them in place in said frame, and means to move said frame and the clamp components to a second location so that said components can be subsequently fastened without tacking.

5,199,148

METHOD OF PROCESSING RUBBER BLOCKS WITH STEEL

Umberto Colognori, Av. Parana, No. 2128, Sorocaba, S. Paulo, Brazil

Filed Nov. 29, 1991, Ser. No. 800,245
Claims priority, application Brazil, Feb. 25, 1991, PI9100739
Int. Cl.[5] B07B *13/00;* **B23P** *17/04*
U.S. Cl. 29—403.1 **1 Claim**



1. A method for processing rubber blocks with steel wire of irregular shapes and coming from scrap material provided by tire production lines, comprising the steps of:

cutting irregular blocks of rubber and steel wire from the tire production line into smaller blocks of rubber and steel wire;

crushing said smaller blocks of rubber and steel wire such that blankets of rubber and steel wire are formed;

regulating the thickness of said blankets such that said blankets have a uniform thickness;

joining said blankets together by superimposing a plurality of said blankets having a uniform thickness to thus make up a single piece of rubber and steel wire having a uniform thickness; and

cutting said single piece of rubber and steel wire so as to form processed slabs, ready to be used as raw material for other processing lines where rubber articles are manufactured.

5,199,149

METHOD OF JOINING TWO SUPERIMPOSED FLAT THIN OBJECTS TOGETHER USING A FRANGIBLE JOINING PIN

Hideo Matsuura, Komaki, Japan, assignor to Kunimori Kagaku Co., Ltd., Aichi, Japan

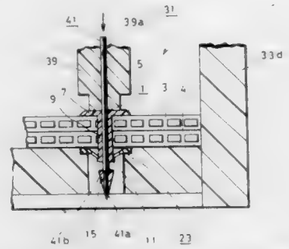
Filed May 15, 1992, Ser. No. 883,472
Claims priority, application Japan, Nov. 26, 1991, 3-336119
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—432.2 **8 Claims**

1. A method of joining together at least two flat thin objects made of a given material, said method comprising:

positioning and supporting a washer, also made of said given material, beneath a superimposed assembly of said flat, thin objects;

fitting a hollow joining pin, also made of said given material, about a metal pin supported substantially perpendicularly to and coaxially with said washer and positioned above said superimposed assembly of said objects, said joining pin having a head, a shank and a tapered end portion which is severable from said shank, said metal pin having a pointed end about which said tapered end portion of said joining pin is positioned;

moving together said metal pin and said joining pin toward said washer to drive said pointed end of said metal pin and said tapered end portion of said joining pin into said assembly of said flat thin objects to make a hole therein and to force said shank of said joining pin through said hole in said flat thin objects until said shank is fittingly engaged with said washer, whereby said assembly of said flat thin objects are secured together between said head and said washer;



severing said tapered end portion of said joining pin from said shank of said joining pin by moving said metal pin relative to said joining pin such that an engaging portion of said metal pin engages an engageable portion of said severable tapered end portion of said joining pin to cause severing of said tapered end portion from said shank; and

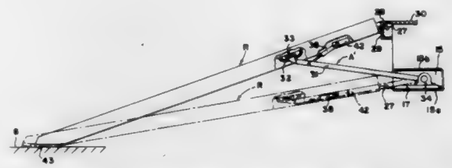
removing said metal pin from said joining pin after said shank of said joining pin is fittingly engaged with said washer and after severing of said tapered end portion from said shank.

5,199,150

METHOD OF CONSTRUCTING A RETRACTABLE UNDERBODY TRUCK RAMP

Carl N. Mortenson, Midland, Mich., assignor to Magline, Inc., Pinconning, Mich.

Filed Apr. 8, 1991, Ser. No. 681,977
Int. Cl.[5] B23P *11/00;* **E01D** *1/00;* **B65G** *11/12*
U.S. Cl. 29—436 **5 Claims**



1. A method of constructing a retractable ramp for a cargo carrying vehicle having a rearwardly opening, longitudinally extending storage chamber below a vehicle floor provided for holding cargo, the ramp including an elongate ramp floor assembly having: a rear end adapted to engage the ground storage and a front end adapted to be releasably connected to the vehicle adjacent the rear end of the said vehicle floor, arm means pivotally connected to the ramp assembly near the front end of said ramp assembly and extending forwardly therefrom into the storage chamber; a transport device provided on the front end of the arm means to support the front end of the ramp floor assembly when the latter is withdrawn from the chamber and movable along the chamber when the floor ramp assembly and arm means are to be stored in the chamber, said transport device being connected to said storage chamber to initially support the front end of the ramp floor assembly via the arm means comprising the steps of:

a. pivotally connecting force asserting means between the

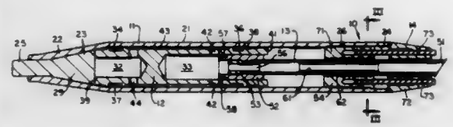
arm means and ramp floor assembly in a position to exert power to counterbalance the weight of the front end of the ramp floor assembly and assist its manual movement from an initial position of extended inoperative deployment in which the front end of the ramp floor assembly is removed from the storage chamber and the transport device remains in the storage chamber to support the ramp floor assembly in a position in which the arm means and force asserting means are more nearly coextensive with the ramp floor assembly, to an operative second position of tilted deployment in which the front end of the ramp floor assembly is raised relative to the arm means and can be connected to the rear end of the vehicle to serve as a platform leading to and from the vehicle floor.

5,199,151

METHOD FOR MAKING A PNEUMATIC GROUND PIERCING TOOL

Steven W. Wentworth, Greenfield; Robert F. Crane, Mequon, and Jon A. Haas, Oconomowoc, all of Wis., assignors to Earth Tool Corporation, Oconomowoc, Wis.

Continuation-in-part of Ser. No. 435,953, Nov. 13, 1989, Pat. No. 5,025,868. This application Oct. 1, 1990, Ser. No. 591,099
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—437 **13 Claims**



1. A method of making an pneumatic ground piercing tool, which tool comprises a tubular body having a tapered nose at a front end thereof, a striker disposed for reciprocation within said body to impart impacts thereto for driving the body through the ground, an air distributing mechanism for effecting reciprocation of said striker, and a tail assembly mounted in a rear end opening of said body for securing the striker and air distributing mechanism in the body, which method comprises:

forcing a front end portion of a tubular metal body between spaced, frustoconical surfaces of an anvil and a die to form said end portion into a frustoconically tapered shape on both the inner and outer surfaces thereof, the anvil having a frustoconical rear portion which seats against the inner surface of said end portion and a cylindrical shank which extends out of the front end of said tubular metal body;

inserting the striker into the body through the rear end opening of the body;

installing the air distributing mechanism in the body behind the striker; and

securing the tail assembly in the rear end opening of the body.

5,199,152

CAPTIVATING A FASTENER TO A WORKPIECE

David P. Wagner, Geneva, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

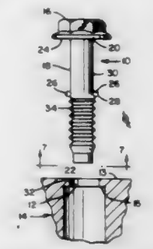
Division of Ser. No. 735,873, Jul. 25, 1991, Pat. No. 5,154,559. This application Jan. 27, 1992, Ser. No. 826,573
Int. Cl.[5] B23P *11/00, 11/02*
U.S. Cl. 29—444 **14 Claims**

1. A method of captivating a shank portion of a fastener within a workpiece, wherein said workpiece has an aperture having a predetermined diameter and is made from a deformable material having a predetermined degree of resiliency and a predetermined degree of elastic memory, comprising the steps of:

providing wing means upon said shank portion of said fastener, said wing means being composed of a relatively hard, non-deformable material as compared with said material of said workpiece, said wing means define an outer diameter which is greater than said predetermined diameter of said aperture of said workpiece, and said wing means have a rounded cross-sectional configuration;

inserting said shank portion of said fastener into said aperture of said workpiece until said wing means of said shank portion of said fastener engages a marginal portion of said workpiece which defines said aperture; and

applying a force to said fastener so as to cause said wing means of said shank portion of said fastener to be forced through said aperture of said workpiece and thereby swage said marginal portion of said workpiece defining



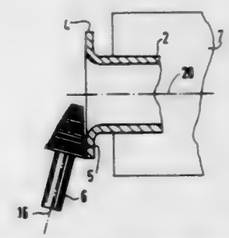
said aperture, thereby increasing said diameter of said aperture of said workpiece to a predetermined degree which is sufficient to permit passage of said wing means of said shank portion of said fastener therethrough while permitting said swaged marginal portion of said workpiece to return towards its original position and condition in accordance with said predetermined resiliency and elastic memory properties thereof so that said aperture of said workpiece substantially achieves its original diametrical dimension so as to retain said fastener at a pre-assembled position within said workpiece after passage of said wing means of said shank portion of said fastener through said aperture of said workpiece.

5,199,153

METHOD FOR MAKING A FLANGED PIPE LENGTH HAVING A LINING OF PLASTIC MATERIAL

Bernd Schulte-Ladbeck, Houston, Tex., assignor to Compagnie Plastic Omnium, Lyons, France

Filed Dec. 2, 1991, Ser. No. 801,682
Claims priority, application France, Dec. 3, 1990, 90 15095
Int. Cl.[5] B29C *57/04, 63/34*
U.S. Cl. 29—447 **4 Claims**



1. A method for making a flanged length of pipe provided with a lining of plastic material, comprising the steps of:

(a) supplying a length of metal tubing (2) having a longitudinal axis (20);

(b) clamping one end of the metal tubing in a clamping device (7) and rotating said tubing about said longitudinal axis (20);

(c) rotating a grooved tool (6) about an axis of revolution

(16) and applying it to the inside face of the other end of

said predetermined location on he rim thereby securing

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CONTINUOUS MANUFACTURE OF FORMED PLATES

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(16) and applying it to the inside face of the other end of the metal tubing;

(d) forming a grooved flange on said tubing by moving the tool (6) on the inside surface of the tubing (2) and simultaneously pivoting the tool about an axis perpendicular to the axis of revolution to generate an annular flange having projections (5) in the form of substantially circular ridges concentric with the axis (20) of the tubing;

(e) introducing a cylindrical tubular sleeve (3) of plastic material into the metal tubing (2) and projecting an end portion outwardly beyond the flanged end of the tubing;

(f) heating said sleeve to a temperature sufficient to make the plastic material deformable;

(g) reforming the projecting end of the plastic sleeve (3) and forcing it intimately against the flange (4) of the metal tubing in a manner whereby said plastic material assumes a shape complementing the projections (5) formed on the flange (4) and said plastic sleeve forms a tight bond to said flange (4).

5,199,154

METHOD FOR PUTTING A U-SECTION PROFILE IN PLACE ON A RIM OF A FRAME OF A MOTOR VEHICLE BODY

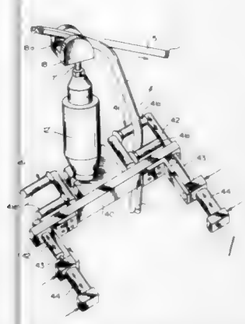
Gérard Mesnel, and François Mesnel, both of Carrieres-Sur-Seine, France, assignors to Establissements Mesnel, Carrieres-Sur-Seine, France

Continuation of Ser. No. 609,438, Nov. 5, 1990, abandoned. This application May 4, 1992, Ser. No. 880,287

Claims priority, application France, Apr. 5, 1990, 90 04357; Jul. 5, 1990, 90 08547

Int. Cl.[5] B23P *17/00, 21/00*

U.S. Cl. 29—451 **17 Claims**



1. A method for placing and securing a provile having a U-shaped cross section onto a projecting rim of a frame of a vehicle body, comprising:

a) providing a length of the profile that is substantially equal to the length of the projecting rim, said profile comprising a substantially non-extendable reinforcement sheet with a resilient covering material;

b) fastening a predetermined section of the profile onto a predetermined location on the projecting rim; and

c) vibrating a flexible headed mallet against the profile over substantially the complete length thereof thereby securing the profile onto the rim, including the steps of

i) postponing the mallet adjacent said predetermined location on the projecting rim,

ii) vibrating the mallet against the profile while moving the mallet in a first direction extending away from said predetermined location on the rim thereby securing a first portion of the profile thereonto,

iii) repositioning the mallet adjacent said predetermined location on the projecting rim, and

iv) vibrating the mallet against the profile while moving the mallet in a second direction extending away from said predetermined location on he rim thereby securing a second portion of the profile onto the rim.

5,199,155

METHOD FOR MANUFACTURE OF A COLD-GAS PYROTECHNIC GENERATOR

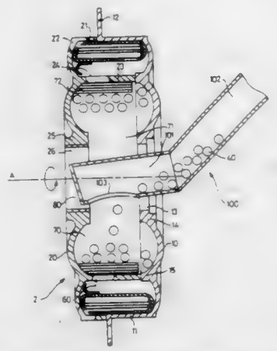
Paul-Philippe Cord, Paris, France; Bengt Morner, Hovas, Sweden; Kyriakos Vavalidis, Ferrieres En Bray, and Christian Perotto, Ballancourt, both of France, assignors to S.N.C. Livbag, Vert Le Petit, France

Division of Ser. No. 544,511, Jun. 27, 1990, Pat. No. 5,139,280. This application Apr. 30, 1992, Ser. No. 876,468

Claims priority, application France, Jul. 5, 1989, 89 08989

Int. Cl.[5] F42B *3/04;* **B21D** *39/02*

U.S. Cl. 29—463 **6 Claims**



1. A method of manufacturing a cold-gas pyrotechnic generator of the type having a casing of revolution having a central axis, said casing being provided with outer orifices and including a base and a cover fastened together transversely, said base and said cover together forming:

an inner ignition channel for receiving an ignition device;

an annular intermediate chamber employed as a combustion chamber or containing elements of a gas-generating pyrotechnic composition;

an annular peripheral chamber employed as a cooling and filtering chamber, said peripheral chamber containing filtering means;

wherein said intermediate chamber and said peripheral chamber are in communication through intermediate orifices therebetween, and said peripheral chamber is in communication with the outside through said outer orifices, and wherein said casing defines, between said inner central ignition channel and said intermediate chamber, a lateral opening whose height is greater than the largest dimension of said elements of gas-generating pyrotechnic composition, wherein said lateral opening is continuous about said central axis, the method comprising the steps of

a) placing the filtering means in the chamber and assembling the cover with the base,

b) rotating the casing about the central axis thereof,

c) pouring the pyrotechnic composition into the lateral opening of the chamber while rotating the casing, and

d) introducing an ignition device into the inner central channel.

5,199,156

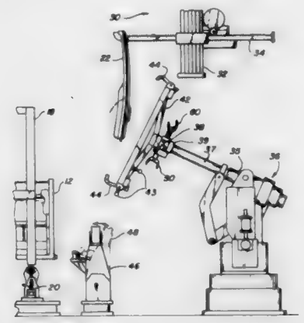
METHOD FOR ASSEMBLING A VEHICLE USING AN AUTOMATIC TOY TAB SYSTEM

Christiano G. Rossi, 6980 Sandalwood, Birmingham, Mich. 48010

Division of Ser. No. 599,764, Oct. 9, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 764,284

Int. Cl.[5] B21D *39/00;* **B23D** *11/00*

U.S. Cl. 29—509 **6 Claims**



1. In a work station for assembling together the main body framework components of a vehicle, including an underbody, roof headers, roof bows, and two side aperture panels, each component having plurality of tab members; an automated method of assembling and holding the vehicle body framework components together using a toy tab system, comprising the steps of:

transporting an underbody into a work station by a first carrier means for carrying said underbody into said work station for assembly and out of said work station when assembled;

holding said first carrier means in a proper X, Y, and Z coordinate location by a lower locating means fixed within the work station that accurately positions said first carrier means;

delivering a plurality of side aperture panels over said work station by a second carrier means for carrying said panels into said work station;

unloading said panels from said second carrier means onto an elevator means capable of extracting said panels from said second carrier means and moving vertically and horizontally;

lowering said panels into said workstation by said elevator means;

positioning alongside said workstation, a plurality of programmable robotic means capable of performing multiple functions;

unloading said panels from said elevator means by clamping onto said panels with said gripping means of said robotic means;

positioning said panels alongside said underbody using said robotic means;

clamping onto said gripping means of said robotic means by a lower clamping means;

disengaging said robotic means from said panels;

supplying a plurality of roof headers and roof bows into said work station by a delivery means;

positioning said roof headers and roof bows on said panels using said robotic means;

bending the plurality of tab members of said underbody, panels, roof headers and roof bows around an adjoining edge using said robotic means forming an intact vehicle body;

releasing said lower clamping means from said body; and

transporting said body out of said workstation by said first carrier means.

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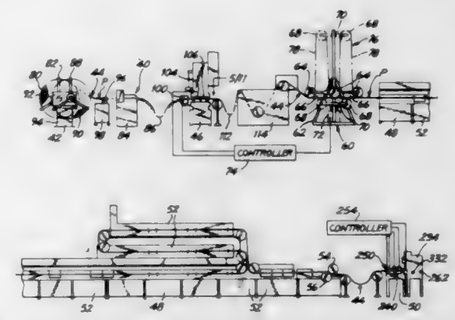
CONTINUOUS MANUFACTURE OF FORMED, PLATED COMPONENT PARTS HAVING SELECTED ALTERNATE CONFIGURATIONS

Arthur A. Kurz, New Vernon, and Jeffrey McFadden, Cranford, both of N.J., assignors to Adaptive Technology, Inc., New Vernon, N.J.

Filed Jan. 21, 1992, Ser. No. 822,967

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—527.4 **9 Claims**



1. The method of manufacturing formed, plated component parts in a continuous production run which includes component parts of alternate configurations, the method comprising:

advancing a continuous strip of material along a predetermined path of travel from a supply of strip material through forming means placed at a forming station located along the path of travel downstream from the supply;

forming component parts of a first configuration in the continuous strip of material at the forming station such that the component parts are carried by the continuous strip along the predetermined path of travel;

advancing the strip of material, with the formed component parts therein, from the forming station downstream through plating means placed at a plating station located along the predetermined path of travel downstream of the forming station;

selectively accumulating a length of the continuous strip, with the component parts therein, between the forming station and the plating station such that advancement of the strip through the plating station is continued from the accumulated length;

modifying the forming means at the forming station while the strip is advanced from the accumulated length through the plating station such that advancement of the strip through the plating station is continued while the forming means is modified for forming component parts of a second configuration; and

subsequently forming component parts of the second configuration in the continuous strip of material at the forming station such that the component parts are carried by the continuous strip along the predetermined path of travel through the plating station

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5,199,158

MULTIPLE STATION FLEXIBLE BORING MACHINE

Richard Wioskowski, Fraser; Howard H. Schafer, Ann Arbor; George P. Bader, Clinton Twp., Macomb County, and Edward J. Irvine, St. Clair Shores, all of Mich., assignors to Litton Industrial Automation Systems, Inc., Florence, Ky.

Filed Jul. 28, 1992, Ser. No. 920,764

Int. Cl.[5] B23Q *7/02*

U.S. Cl. 29—563 **25 Claims**

1. A multiple station boring machine for locating and transferring a pallet carrying a workpiece having at least one loca-

tor thereon for performing a series of machining operations on bonding material, said components having different rates of

d) closing the tang about the post with sufficient heat to destroy the insulation, if any, on the electrical conductor

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METHOD FOR THE MANUFACTURE OF A

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tor thereon for performing a series of machining operations on the workpiece, said machine comprising:

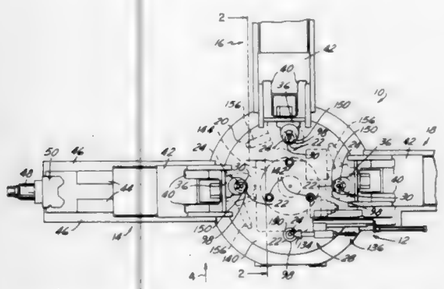
a base;

a table carried by said base for receiving and transporting a pallet thereon;

a drive operably associated with said table for indexing said table relative to the base;

at least one pallet for receiving and clamping a workpiece, a locator ring on said pallet having a plurality of circumferentially spaced and generally radially extending teeth for accurately axially, radially, and circumferentially locating said pallet;

a part loading station adjacent said table having a base, a locator ring on said base having a plurality of circumferentially spaced and generally radially extending teeth for complementary mating engagement with said locator teeth of said locator ring on said pallet for accurately axially, radially and circumferentially locating said pallet on said base and a workpiece locator carried by said base of said part loading station for engaging with the locator of a workpiece for circumferentially locating the work-



piece with respect to said locator ring on said pallet and said locator ring on said base in mating engagement therewith; and

at least two machine tool stations adjacent said table, each machine tool station having a separate base, a locator ring carried by said base of said machine tool station and having a plurality of circumferentially spaced and generally radially extending teeth for complementary mating engagement with said locator teeth of said locator ring on said pallet for accurately axially, radially, and circumferentially locating the workpiece on said pallet with respect to said base of said machine tool, and a clamp carried by said base of said machine tool station for clamping said pallet to said base while said locator ring on said pallet is in mating engagement with said locator ring on said base of said machine tool station for maintaining the accurate location of the workpiece with respect to said base of said machine tool station during the machining of the workpiece by a machine tool in said machine tool station, whereby said drive moves said table to transfer a pallet seriatim from one station to another station.

5,199,159

METHODS FOR CRYOGENIC REMOVAL OF EPOXY/WIRE FIELD WINDINGS AND FOR SEPARATING MULTI-LAYER PRINTED CIRCUIT WIRING BOARDS

Gary R. Waldsmith, Pilot Hill, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 648,071, Jan. 31, 1991, Pat. No. 5,070,603. This application Nov. 20, 1991, Ser. No. 796,115

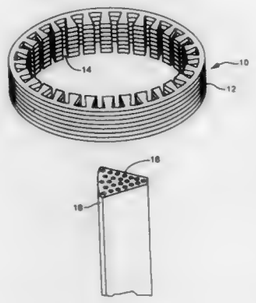
Int. Cl.[5] H02K *15/02;* **B23P** *19/04*

U.S. Cl. 29—596 **6 Claims**

1. A method of separating structure comprising first and second components which are bonded together by means of bonding material, said components having different rates of thermal expansion and contraction comprising:

1. filling a container with a cryogenic cooling substance, said liquid being at a temperature of approximately −170° F. centigrade;
2. immersing said structure in said cryogenic cooling substance, to break the bond of the bonding material between the first and second components through said different rates of thermal expansion and contraction of said components;
3. removing said structure from said cooling substance when said bond is broken; and
4. applying a separating force to said first and second components until the components are separated.

5. A method of separating the windings from the cylindrical core of an elctromagnetic machine, said windings being wound conventionally around said magnetic core and being embedded



in an epoxy wedge and bonded within slots in the core, said wiring said core having different rates of expansion and contraction in response to changes in temperature, said method comprising the steps of:

1. cutting the top and bottom of the wiring as close to the surface of the core as possible to make the winding flush with the top and bottom of the cylindrical core;
2. filling an insulated container with a cryogenic cooling substance;
3. immersing the core with embedded wiring into the cooling substance for a period of approximately 5 minutes;
4. removing the core and wiring from the cooling substance;
5. placing the core and wiring into a warm (approximately 100° F.) drying oven for approximately 2 hours;
6. removing the core and wiring from the drying oven and placing the core on a stand; and
7. driving out the wedge shaped bundles with a punch.

5,199,160

METHOD OF TERMINATING ELECTRICAL WINDINGS

Thomas W. Degenhart, Geneva; Russell C. Harley, Elburn, and Allen Wade, Prophetstown, all of Ill., assignors to Furnas Electric Company, Batavia, Ill.

Filed Jan. 9, 1991, Ser. No. 639,143

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—605 **14 Claims**

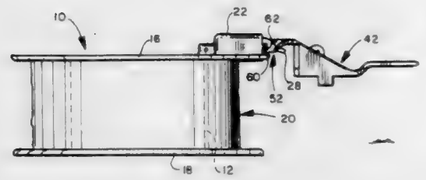
1. A method of terminating a winding with a terminal comprising the steps of:

a) providing a post of thermoplastic in adjacency to a terminal mounting structure;

b) wrapping an electrical conductor forming part of said winding around said post;

c) mounting a metal terminal having a tang on said mounting structure so that the tang extends at least partially about said post; and

d) closing the tang about the post with sufficient heat to destroy the insulation, if any, on the electrical conductor



and establish a fused electrical connection between the tang and/or terminal and the conductor.

5,199,161

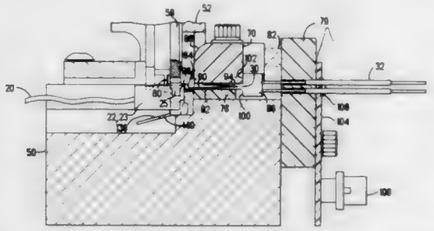
CABLE TESTING APPARATUS

Joseph F. Stachura, Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 7, 1991, Ser. No. 742,676

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—705 **10 Claims**



1. In a cable making machine for making and electrically testing a cable assembly including a cable having conductors terminated to contacts of a first connector at one end and contacts of a second connector at an other end, said machine including a base having a pair of spaced openings for receiving and guiding said first and second connectors, a reciprocating ram arranged to move toward and away from said base, terminating tooling carried by said ram, and an electrical test module for testing continuity between the contacts of said first connector through the conductors of said cable to the contacts of said second connector,

electrical probe means for electrically connecting said contacts of said first and second connectors with said test module comprising:

(a) a plurality of probe members each having an elongated portion, a contacting surface at one end of said elongated portion, and a shank at the other end thereof;

(b) a guide having means for spacing and guiding said plurality of probe members so that the contacting surface of each probe member is movable between a position of engagement with a respective one of the contacts of said first and second connectors and a position spaced therefrom; and

(c) means for moving said contacting surfaces of the probe members out of said position of engagement to said position spaced therefrom during termination of said first and second connectors to said cable,

wherein said elongated portion of each probe member includes resilient means for preventing binding of said probe member with said guide during said moving of said contacting surface.

5,199,162

METHOD FOR THE MANUFACTURE OF A WIRE-ELECTRODE FOR SPARK-EROSIVE CUTTING

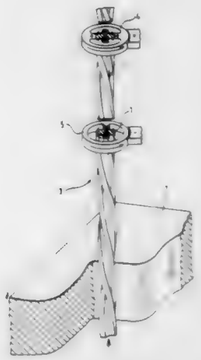
Heinrich Groos, Herborn, Fed. Rep. of Germany, assignor to Berkenhoff GmbH, Heuchelheim, Fed. Rep. of Germany

Division of Ser. No. 629,236, Dec. 18, 1990, Pat. No. 5,140,125. This application Jul. 31, 1991, Ser. No. 738,528

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942604

Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—825 **7 Claims**



1. A method for the manufacture of a wire electrode, comprising the steps of:

twisting a first wire forming a first electrode;

introducing, during said twisting step, a second wire forming a second electrode into a helix formed in said first electrode during said twisting step, at least one of said first and second electrode wires having an insulation thereon electrically isolating said first and second electrode wires from one another; and thence

removing a selected radially outermost part of the insulation from said one of said first and second electrode wires to expose the wire of said one of said first and second electrodes.

5,199,163

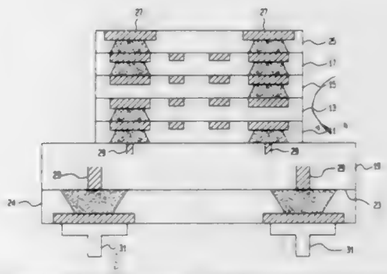
METAL TRANSFER LAYERS FOR PARALLEL PROCESSING

Scott G. Ehrenberg, Fishkill, and Janet L. Poetzinger, Pleasant Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1992, Ser. No. 891,627

Int. Cl.[5] H05K *3/36*

U.S. Cl. 29—830 **10 Claims**



1. A method for fabricating a multilayer interconnect structure, comprising the steps of:

forming a plurality of subunits comprised of metal carriers

and metal transfer layers, each of said metal carriers hav- and for providing electrical interconnection between two or

5,199,166

member in radial sealing engagement with the container

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and metal transfer layers, each of said metal carriers having a thermal coefficient of expansion matched to a substrate which will be joined to said metal transfer layers, each of said metal transfer layers made by the steps of forming wiring patterns on each of said metal carriers, applying a layer of thermoplastic material over said wiring patterns, forming vias in said thermoplastic material which terminate at said wiring patterns, and depositing a joining material in said vias;

joining a first of said subunits to a substrate with said joining material in said first of said subunits electrically connecting said wiring patterns in said first of said subunits to said substrate;

removing said metal carrier from said first of said subunits;

joining at least a second of said subunits to said first of said subunits, said joining material in said second of said subunits electrically connecting said wiring patterns in said second of said subunits to said first of said subunits; and

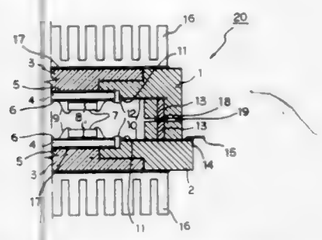
removing said metal carrier from said second of said subunits.

5,199,164

METHOD OF MANUFACTURING SEMICONDUCTOR PACKAGE

Gu S. Kim, and Young S. Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Division of Ser. No. 706,898, May 29, 1991, Pat. No. 5,157,588.
This application Mar. 30, 1992, Ser. No. 859,663
Claims priority, application Rep. of Korea, Mar. 30, 1991, 91-5087
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 **4 Claims**



1. A method of manufacturing a semiconductor package comprising the steps of:

forming upper and lower members which are respectively coupled with a pad of Cu-W or Cu-Mo by brazing method.

attaching upper and lower substrates loaded with a plurality of chips on said members,

interconnecting said chips on said substrates in the members,

connecting of said upper member to said lower member,

sealing said upper and lower members together, and

forming heat sinks at the outside of said upper and lower members.

5,199,165

HEAT PIPE-ELECTRICAL INTERCONNECT INTEGRATION METHOD FOR CHIP MODULES

Robert K. Crawford, Palo Alto; Jacques Leibovitz, San Jose; Daniel J. Miller, San Francisco, and Kim H. Chen, Fremont, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 806,997, Dec. 13, 1991, Pat. No. 5,161,090.
This application Aug. 5, 1992, Ser. No. 925,541
Int. Cl.[5] H05K *7/20*
U.S. Cl. 29—846 **5 Claims**

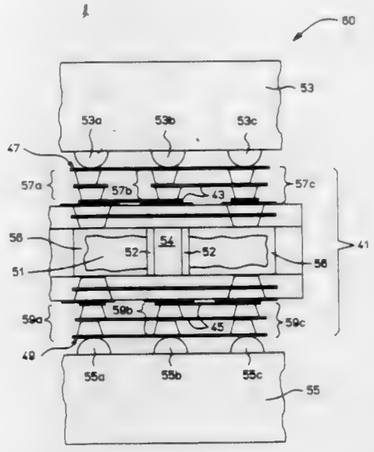
1. A method for limiting, to a selected temperature range, the temperature of one or more electronic component chips and for providing electrical interconnection between two or more such chips, the method comprising the steps of:

providing a substrate having at least one channel completely contained therein, each channel defining a hollow that extends from a first end to a second end of the channel, the substrate having one or more substrate faces with at least one chip positioned on at least one face of the substrate;

providing a heat pipe wick, having a working fluid contained therein, which is completely situated within the hollow of the channel and extends from the first end of the channel to the second end of the channel;

providing a heat pipe evaporator chamber adjacent to and in fluid communication with the wick at the first end of the channel, to receive working fluid from the wick and to add thermal energy to the working fluid and to direct the working fluid toward the second end of the channel;

providing a heat pipe condenser chamber adjacent to and in fluid communication with the wick at the second end of the channel, to receive working fluid as a gas from the wick at a high temperature, to withdraw thermal energy from the working fluid and to return the working fluid as a liquid within the wick to the first end of the channel;



providing heat dissipation means adjacent to and in thermal contact with the condensor chamber, for withdrawing thermal energy from the condenser chamber, for dispersing or dissipating this thermal energy, and for maintaining the temperature of the condenser chamber within a predetermined temperature range;

providing a plurality of columns of material of high electrical and thermal conductivity, each conducting column providing direct thermal contact between at least one chip and the working fluid in the evaporator chamber;

providing a plurality of sheaths, each sheath surrounding one of said plurality of columns for insulating the column from direct contact with said wick an said working fluid;

providing a plurality of electrical interconnect traces of material on the substrate that electrically connect electronic components on two or more chips, with each trace electrically contacting at least two distinct electronic components through at least two conducting columns; and

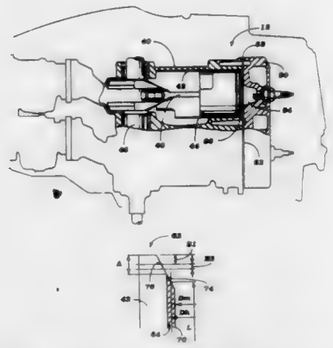
causing a substantial portion of the heat generated in electronic component chips to be removed from the chips by conduction of this heat through the conducting columns to the working fluid in the heat pipe.

5,199,166

CYLINDER BLOCK OF AN ENGINE

Katsumi Torigai, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 9, 1991, Ser. No. 756,538
Claims priority, application Japan, Sep. 20, 1990, 2-248893
Int. Cl.[5] H01R *43/00;* **F01B** *11/02*
U.S. Cl. 29—888.061 **8 Claims**



1. A method of making a cylinder for a cylinder block of a reciprocating machine comprising the steps of forming a cylinder having an inner surface which comprises an inner bore; coating the inner bore with a wear resistant plating; chamfering off an inner ring of an upper end of said cylinder in a manner to prevent removal of said plating upon machining of said upper end; wherein said chamfering step is carried out upon a region of said inner ridge of said upper end of said cylinder which extends from a location beneath said upper end of said cylinder to a location all of the way up to, and including, an absolute end surface of said cylinder.

5,199,167

METHOD OF MANUFACTURE OF MINIATURE DISPENSER

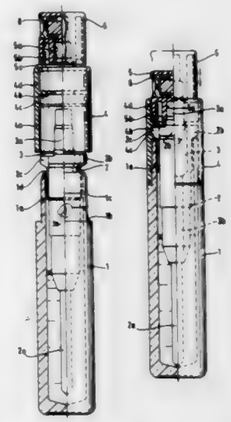
William Desazars de Montgailharo, Paris, and Jean-Louis Bougamont, Eu, both of France, assignors to Societe Francaise d'Aerosols et de Bouchage, Escarbotin, France

Division of Ser. No. 547,724, Jul. 2, 1990, Pat. No. 5,102,018.
This application Dec. 17, 1991, Ser. No. 809,634
Claims priority, application France, Jul. 4, 1989, 89 08941
Int. Cl.[5] B21D *53/00*
U.S. Cl. 29—888.02 **6 Claims**

2. The method of assembling a liquid dispenser comprised of an open-ended container for holding a liquid to be dispensed, a pump having an axially moveable piston, a venting mechanism operable between opened and closed positions for controlling air communication between the interior of the container and the atmosphere, an outer bush member disposed in sealing engagement over the open end of the container, and an axially moveable nozzle disposed above the container and extending axially through the bush member and into communication with the atmosphere for dispensing the liquid upon axial movement of the nozzle against the piston to move the piston axially and pump fluid through the nozzle while the venting mechanism is open to connect the interior of the container to the atmosphere and permit air to enter the container as liquid is dispensed therefrom, the method of assembly comprising the steps of:

a) connecting the pump to the bush member to form a sub-unit, and

b) assembling the sub-unit onto the container with the bush member in radial sealing engagement with the container during such assembly while maintaining the venting mechanism open to connect the interior of the container with the atmoshere.

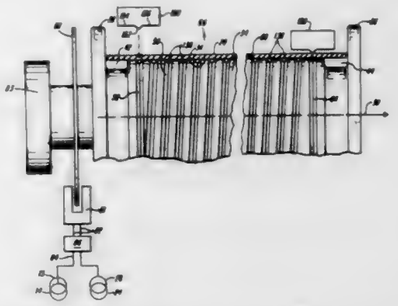


5,199,168

NON-SLIP TACHOMETER ROLLER

Keith L. Daly, Clinton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 620,465, Nov. 29, 1990, Pat. No. 5,088,172.
This application Oct. 3, 1991, Ser. No. 770,603
Int. Cl.[5] B21H *1/14;* **B21K** *1/02*
U.S. Cl. 29—895.3 **3 Claims**



1. A method for forming a tachometer roller for a tape drive assembly for detecting the speed of a tape streaming along a reference axis across the roller, the roller periphery having an axially extending center circumferential portion over which a data portion of the tape passes, the center circumferential portion being bounded by respective adjacent edge portions, the method comprising the step of forming an air vent groove on the roller center circumferential portion, the groove extending generally obliquely to the reference axis, and further comprising the steps of forming a first terminus of the groove on the roller center circumferential portion as a 360 degree circumferential groove at one of the respective edge portions and forming a second terminus of the groove on the roller center circumferential portion as a 360 degree circumferential groove at the other of the respective edge portions.

inserting a bearing, the bearing rotatably supporting a core shaft of a rotor core such that an axis of the bearing is

thereof facing in a second direction opposite to the first direction and a thumb wheel at one and thereof;

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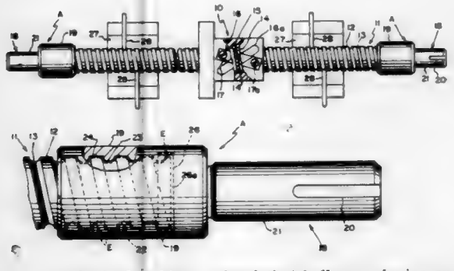
5,199,169

METHODS OF MAKING RECIRCULATING BALL NUT AND SPLINED SHAFT AND SCREW ASSEMBLIES

Michael J. Bonzak, Bay City, Mich., assignor to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed Dec. 23, 1991, Ser. No. 812,747
Int. Cl.[5] F16C *43/00*
U.S. Cl. 29—898.07 6 Claims



1. A method of making recirculating ball race device and ball screw shaft assemblies of the character wherein the ball race device has internal ball receiving groove portions and land portions and incorporates a recirculating ball circuit having load-bearing balls therein, and the screw shaft has complemental ball groove and land portions for cooperatively receiving the balls, comprising the steps of:

(a) cutting the screw shaft to a desired length which leaves at least one end with an externally grooved and landed portion extending to a terminal end of the screw shaft;

(b) relatively moving the screw shaft and the recirculating ball race device with balls incorporated in its groove portions to cause the race device to move over said end of the screw shaft and axially along it to a location removed from said end of the screw shaft, with the race balls received in the grooved portions of the screw shaft as the race device moves along the screw shaft and radially separating the race device and screw shaft.

(c) selecting a pre-machined shaft end component comprising a sleeve with an open end and an opposite end with an internal end wall surface, the sleeve opposite end having a projecting section with an external pre-machined cylindrical bearing surface thereon of a size required for rotatably supporting the said end of the screw snaft for the diameter and length of screw shaft which has been cut, the sleeve further having internal groove and land portions, which complement the ball-accommodating external groove and land portions of the screw shaft, but leave a clearance therebetween, and coating at least one of said grooved portions of the pre-machined shaft end component and said one end of the screw shaft with a hardenable adhesive;

(d) relatively axially moving the pre-machined shaft end component and screw shaft to cause the pre-machined shaft end component sleeve to move interactively over said terminal end of the screw shaft and axially along the screw shaft to dispose the internal wall surface of said end of the sleeve of the pre-machined end component on the screw shaft, with said internal wall surface radially opposite the terminal end of the screw shaft, to dispose the adhesive radially between the sleeve and screw shaft; and

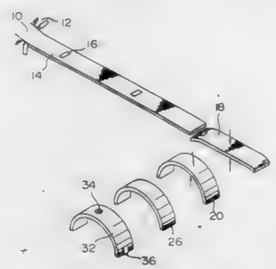
(e) hardening the adhesive between the sleeve of the pre-machined shaft end component and said screw shaft to form an integrated axially extending adhesive key between the pre-machined shaft end component and screw shaft.

5,199,170

MANUFACTURING METHOD OF HALF-SPLIT BEARINGS

Sanae Mori, Nagoya; Takayosi Sasaki, Tajimi, and Noriyoshi Ito, Aichi, all of Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Continuation of Ser. No. 641,311, Dec. 12, 1990, abandoned, which is a continuation of Ser. No. 483,021, Feb. 20, 1990, abandoned, which is a continuation of Ser. No. 328,269, Mar. 24, 1989, abandoned. This application May 4, 1992, Ser. No. 888,391
Claims priority, application Japan, Apr. 7, 1988, 63-85983
Int. Cl.[5] B21D *53/10*
U.S. Cl. 29—898 5 Claims



1. A method of manufacturing a half-split bearing, comprising the steps of:

providing a blank having a width corresponding to a width of a final said half split bearing;

first bending opposite ends of said blank by a first punch and die set while restraining a central portion of said blank in a wall-thickness wise direction, said restraining produced by clamping said blank between a restrainer located centrally on the punch of said first punch and die set and the die of said set, thereby forming a partially processed bent blank having first bendings;

further, bending in a second stage said partially processed bent blank by a second punch and die set beginning at points between said first bendings and a central portion while restraining said central portion of said partially processed bent blank in the wall-thickness wise direction, said restraining produced by clamping said partially processed bent blank between a restrainer located centrally on the punch of said second punch and die set and the die of said set, said bending in a second stage forming a substantially half-circular blank;

reducing a circumferential length of said substantially half-circular blank while restraining said substantially half-circular blank in the wall-thickness wise, widthwise and circumferential directions between a third punch and die set, thereby forming a half-split bearing of a predetermined size.

5,199,171

METHOD OF MANUFACTURING A MOTOR CASING MADE OF RESIN

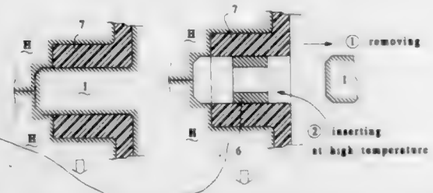
Takao Umezawa, Seta, and Takao Ochiai, Ashikaga, both of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gumna, Japan

Continuation of Ser. No. 708,706, May 31, 1991, abandoned. This application Aug. 4, 1992, Ser. No. 921,965
Claims priority, application Japan, May 31, 1990, 2-142679; Jun. 15, 1990, 2-157283; Jun. 15, 1990, 2-157284
Int. Cl.[5] B21D *53/00*
U.S. Cl. 29—898.07 6 Claims

1. A method for manufacturing a motor casing having a circular bear seat portion for supporting a bearing, comprising the steps of:

injecting a heated thermoplastic resin material into a mold thereby forming a motor casing by molding;

inserting a bearing, the bearing rotatably supporting a core shaft of a rotor core such that an axis of the bearing is substantially parallel to an axis of the core shaft, into the bearing seat portion while a temperature of the thermoplastic resin material is below a recrystallization tempera-



ture of the thermoplastic resin material and above a glass transition temperature of the thermoplastic resin material; and

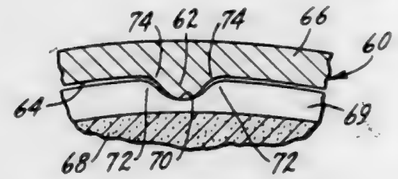
cooling the thermoplastic resin material to room temperature to obtain a bearing seat portion that is substantially completely round.

5,199,172

METHOD OF MANUFACTURING A PINLESS RETAINER FOR A PRIMARY RING

Alexandre Runowski, Chicago, Ill., assignor to John Crane Inc., Morton Grove, Ill.

Filed Apr. 2, 1992, Ser. No. 862,349
Int. Cl.[5] B21D *53/10*; F16J *15/34*
U.S. Cl. 29—898.11 8 Claims



1. A method of manufacture of a positive drive retainer for a sealing ring in a mechanical seal, the mechanical seal sealing a housing and a relatively rotating shaft and including a pair of oppositely facing sealing rings, one of said sealing rings being attached to the housing and the other of said sealing rings being attached to the shaft, the retainer providing a means for sealingly engaging and retaining one of said sealing rings, the improvement comprising a machining step whereby an engagement surface of said retainer is machined to form a substantially annular recess around an inner circumferential wall of the retainer, the circumferential recess wall including a plurality of evenly spaced, diametrically opposed, inwardly projecting ridges for engaging corresponding axial grooves in the sealing ring to be held by the retainer.

5,199,173

CONCAVE, CONVEX SAFETY RAZOR

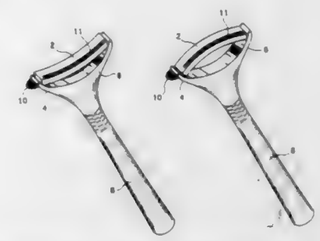
Kenneth J. Hegemann, and Rebecca M. Inzunza, both of Carlsbad, Calif., assignors to Hegemann Research Corporation, Carlsbad, Calif.

Filed Oct. 17, 1991, Ser. No. 779,065
Int. Cl.[5] B26B *21/00, 21/08, 21/14, 21/16*
U.S. Cl. 30—49 26 Claims

1. A shaving system comprising:

a razor blade cartridge curved in a fixed arcuate shape having a concave cutting edge on one side thereof facing in a first direction and a convex cutting edge on the other side thereof facing in a second direction opposite to the first direction and a thumb wheel at one and thereof;

a handle; and



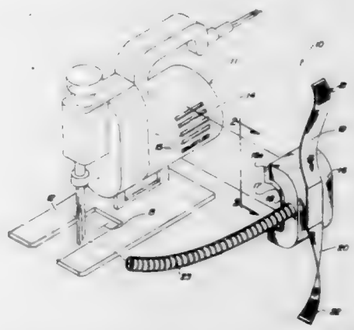
means mounted to said handle for rotatably receiving each end of said cartridge and for selectively positioning the concave cutting edge in a first fixed shaving position and the convex cutting edge in a second fixed shaving position.

5,199,174

SAWDUST REMOVAL APPARATUS

Jeffrey C. Wild, 46 Green Garden Ct., East Haven, Conn. 06512

Filed Apr. 13, 1992, Ser. No. 867,499
Int. Cl.[5] B27B *19/09*
U.S. Cl. 30—123.3 5 Claims



1. A sawdust removal apparatus for use in combination with a saw member, wherein the saw member includes a saw member blade, and the saw member blade is directed along a cutting line, wherein the saw member includes a saw member housing, and the apparatus comprises,

a manifold housing, the manifold housing including a concave arcuate inner wall, and

the inner wall defining an inner wall cavity arranged for receiving the saw member housing therewithin, and

the manifold housing having an upper end and a lower end and the manifold housing including a first strap member extending from the upper end of the manifold housing, and a second strap member extending from the lower end of the manifold housing, the first strap member including a first fastener and the second strap member including a second fastener arranged for securement of the manifold housing about the saw member housing, and

the manifold housing including a manifold housing chamber contained therewithin, with a directional conduit mounted to the manifold housing into and in pneumatic communication with the manifold housing chamber, the directional conduit formed of a flexible goose neck rib construction to permit flexure of the directional conduit for orientation of the flexible conduit to the cutting line, and

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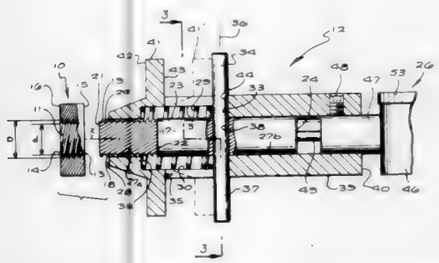
the manifold housing inner wall includes a plurality of inner wall apertures arranged for confrontation with the saw member housing, wherein the saw member housing is formed with motor vent slots to permit positioning of the motor vent slots adjacent the inner wall apertures, and each inner wall aperture includes a valve plate, the valve plate mounted interiorly of the manifold housing chamber to the inner wall of the manifold housing ,with each valve plate including a spring hinge to bias the valve plate against an interior surface of the inner wall within the manifold housing chamber.

5,199,175

GAUGE FOR MEASURING THREADS OF VARYING PITCH

William P. Green, 3570 E. Lombardy Rd., Pasadena, Calif. 91107

Filed May 11, 1990, Ser. No. 522,188
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] G01B *3/36*
U.S. Cl. 33—199 R **21 Claims**



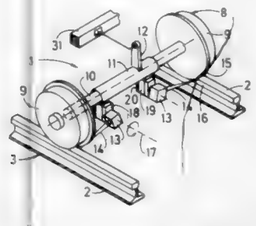
1. A gauge for measuring a thread of varying pitch formed on a work part, said gauge comprising:
an element having a thread adapted to be screwed along an axis into engagement with said thread of varying pitch and to a position at which binding of the threads offers resistance to further advancement of the threads together; and
a dial indicator operable to indicate the position at which said binding of the threads occurs as a measurement of said thread of varying pitch.

5,199,176

APPARATUS FOR THE NON-CONTACT MEASUREMENT OF A TRACK GAGE

Josef Theurer, Vienna, and Franz Eglseer, Ohlsdorf, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 23, 1991, Ser. No. 781,774
Claims priority, application Austria, Nov. 12, 1990, 2277/90
Int. Cl.[5] G01C *3/00;* **E01B** *35/04, 29/04;* **B61K** *9/00*
U.S. Cl. 33—338 **10 Claims**



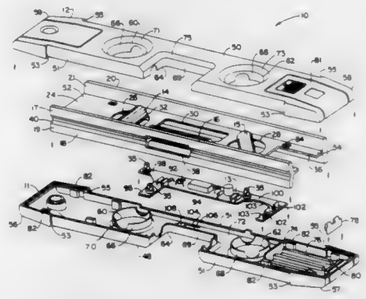
1. Apparatus for the non-contact measurement of the gage of a track comprising two rails having rail heads, which comprises
(a) a machine frame extending in a longitudinal direction and equipped with undercarriages supporting the machine frame for mobility on the track and a wheel axle having wheels running on the track rails,
(b) an optical sensor associated with each track rail and affixed to the wheel axle, each sensor being mounted on the wheel axle and pivotal about an axis extending in the longitudinal direction of the machine frame, and each sensor emitting a light beam capable of sensing the distance of the sensor from the associated rail without contact therewith, and
(c) a stepping motor connected to each sensor for pivoting the sensor about said axis, the stepping motor and connected sensor constituting a closed control circuit for calculating an angular position required for focussing the light beam on a location of the associated track rail having a constant vertical position and correspondingly pivoting the sensor with respect to the associated track rail into the calculated angular position.

5,199,177

LEVEL

Walter J. Hutchins, West Hartford, Conn.; John H. Wilcox, Shaftsbury, Vt.; James M. Jackson, Dearborn Heights, and John M. Clark, Ann Arbor, both of Mich., assignors to Stanley Tools, a Division of The Stanley Works, New Britain, Conn.

Filed May 14, 1992, Ser. No. 882,936
Int. Cl.[5] G01C *9/32*
U.S. Cl. 33—348.2 **20 Claims**



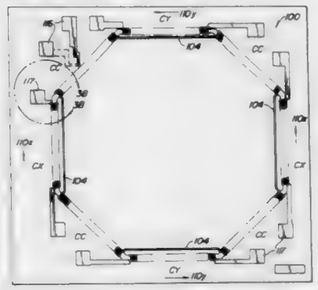
1. A level, comprising,
a frame provided with parallel working surfaces and an interconnecting web, the web having an aperture providing a pair of oppositely directed notches,
an elongated vial positioned with its ends precision fitted in the pair of notches at a preselected relationship relative to the working surfaces with the longitudinal axis of the vial generally parallel to the plane of the web,
a cover including first and second cover plates mounted on opposite sides of the web, at least one of the first and second cover plates having an aperture for viewing the vial, the cover having means defining a circuit board retaining portion and a battery retaining portion,
a printed circuit board adapted to be automatically inserted in a stationary position in the circuit board receiving portion, the circuit board having a light emitting diode for illuminating the vial, and
connecting means for forming an electrical connection between the circuit board and one or more batteries when the one or more batteries are mounted in the battery retaining portion, the connecting means being adapted to be automatically inserted during assembly of the level.

5,199,178

THIN FILM COMPASS AND METHOD FOR MANUFACTURING THE SAME

Hing S. Tong, Saratoga, and Fai-Loy P. Lam, San Mateo, both of Calif., assignors to APAC, Inc., Saratoga, Calif.

Filed Oct. 23, 1991, Ser. No. 781,743
Int. Cl.[5] G01C *17/28*
U.S. Cl. 33—361 **10 Claims**



1. A thin film magnetic compass comprising:
a substrate;
a plurality of layers on said substrate forming a first group of at least two sensing coils, at least a first excitation coil, and a first magnetic core in said sensing and excitation coils, wherein said at least two sensing coils have axes that are transverse to one another, so that when said compass is placed in a geomagnetic field and when said core is driven into magnetic saturation by means of said excitation coil, said sensing coils will provide signals for determining the direction of said geomagnetic field;
wherein said core is in the shape of a polygon having an even number of sides or a circle, said compass comprising a first and a second pair of sensing coils surrounding said core, wherein the two sensing coils in each of the two pairs have axes that are substantially parallel to each other but transverse to those of the axes of the other pair; said compass further comprising:
a least a substantially flat additional second magnetic core substantially coplanar with and surrounding said first magnetic core; and
at least two additional pairs of sensing coils surrounding said second core.

5,199,179

APPARATUS AND METHOD FOR MEASURING ANGLES BETWEEN ANGULARLY RELATED FLAT SURFACES

Stuart K. Baker, 3546 Seaway Dr., New Port Richey, Fla. 34652

Filed Apr. 16, 1992, Ser. No. 869,502
Int. Cl.[5] B43L *7/00*
U.S. Cl. 33—415 **18 Claims**

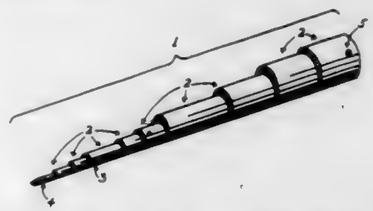
1. A tool for measuring angles between surfaces, comprising:
first and second measuring sections;
each section including a measuring plate having a surface extending in a predetermined plane, a hinge element for pivotally securing said sections one to the other and defining a hinge axis for said sections, means pivotally mounting each plate and said hinge element relative to one another enabling each plate for pivotal movement about an axis generally normal to said hinge axis and generally parallel to the measuring surface plane of said plate, and first means for locking said plate relative to said hinge element in selected angular positions about said normal axis; and
second means cooperable with said hinge element for locking said sections in selected angular positions about said hinge axis whereby said measuring plates are angularly adjustable about said hinge axis and about axes generally normal to said hinge axis and parallel to the respective planes of said plate.

5,199,180

MACHINE GUARD SAFETY GAUGE/GUARDCHEK ™

Jack E. Yablonsky, 252 Bentrup Ct., Lenox, Mass. 01240

Filed May 1, 1992, Ser. No. 877,146
Int. Cl.[5] G01B *3/20*
U.S. Cl. 33—501.45 **10 Claims**



1. An apparatus for setting and checking machine safety guards consisting essentially of a series of connected cylinders with parallel, stepped centerlines, said centerlines being common to a single vertical plane and said cylinders sharing a common bottom edge formed as a straight line parallel to and co-planar with said centerlines;
wherein said series of connected cylinders have a tip at one end thereof, and said cylinders have diameters and lengths selected such that at any point on said gauge the cylinder diameter corresponds to a maximum safe opening size to a hazard zone of a machine at the corresponding combined cylinder length, as measured from the tip and said point.

5,199,181

ELECTRIC MOTOR BRUSH ALIGNMENT TOOL

Patrick D. Gordin, Oskaloosa, Iowa, assignor to S & K Racing Products, Inc., Oskaloosa, Iowa

Filed Feb. 20, 1992, Ser. No. 839,312
Int. Cl.[5] G01D *21/00*
U.S. Cl. 33—645 **5 Claims**

1. In combination with an electric motor having brush holding brackets positioned generally along an axis on opposite sides of a rotor of the electric motor, and an electric motor brush alignment tool, comprising:
first and second pin means for insertion into the brush holding brackets, the brush holding brackets having an inner cross-sectional dimension and the first and second pin means having an outer cross-sectional dimension which closely conforms to the inner cross-sectional dimension of the brush holding brackets; and
alignment means to which are connected the first and second

pin means for adjustably bringing the first and second pin

5,199,183

wall means forming a fluidizing chamber, said wall means including an annular gas permeable bottom wall having an

electrically conductive coal fine constituents, the electrical charge being discharged to a lesser degree from the

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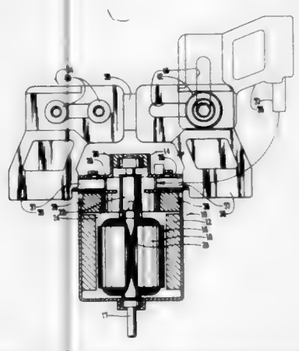
pin means for adjustably bringing the first and second pin means into the brush holding brackets while maintaining



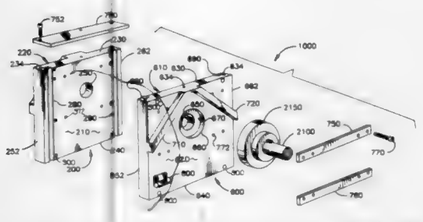
the first and second pin means along the axis so that the brush holding brackets will be aligned along the axis.

5,199,182

SHAFT ALIGNMENT DEVICE

James L. Fowler, 14704 W. 149th Ct., Olathe, Kans. 66062

Filed Jun. 9, 1992, Ser. No. 895,783
Int. Cl.[5] G01B *5/25*
U.S. Cl. 33—645 **21 Claims**



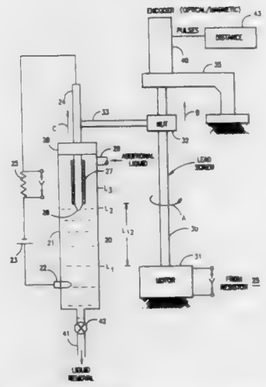
1. An alignment device for aligning a driver shaft with a driven shaft of adjacent machinery units comprising:
a first plate;
an aperture in said plate;
means on said first plate for positioning an imaginary, central, longitudinal axis of said driver shaft in a normal position relative to a center of said first plate aperture;
bracket means for connecting said driven shaft to said first plate in said normal position;
at least one key element extending along a surface of said first plate;
a second plate having a configuration congruent to said first plate;
an aperture in said second plate at a position identical to said first plate aperture;
means on said second plate for positioning an imaginary, central, longitudinal axis of said driven shaft in a normal position relative to a center of said second plate aperture;
bracket means for connecting said driven shaft to said second plate in said normal position;
a keyway on a surface of said second plate for registering said at least one key element therein, at least one of said shafts being user manipulated in a manner to register said at least one key in said keyway and position said plates in congruency, whereupon to place said attached driver and driven shafts in a desired relative position therebetween.

5,199,183

METHOD AND APPARATUS FOR MEASURING RISE IN HEIGHT OF A LIQUID COLUMN

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 703,449, May 21, 1991, Pat. No. 5,115,574. This application Mar. 10, 1992, Ser. No. 848,910
Int. Cl.[5] B65B *1/30*; **G01F** *23/24*
U.S. Cl. 33—714 **14 Claims**



1. A method for measuring the rise in height of a liquid column, comprising the steps of:
a) forming an electrically conductive, cylindrical liquid column,
b) effecting electrical contact between said liquid column and an electrode to establish current flow between said liquid column and said electrode by lowering said electrode to a reference position in juxtaposition with the surface of said liquid column,
c) raising said electrode to a second position above the surface of said liquid column at which contact between said electrode and said liquid column is broken, thereby causing current flow between said liquid column and said electrode to cease,
d) adding an additional quantity of an electrically conductive liquid to said liquid column to cause the surface of said liquid column to rise to a height above said reference position and below said second position of said electrode,
e) lowering said electrode to a third position in juxtaposition with the surface of said liquid column to effect electrical contact between said liquid column and said electrode, thereby establishing current flow between said liquid column and said electrode, and
f) determining the distance of travel of said electrode between said reference and third positions as a measure of the rise in height of said liquid column from the adding of said additional quantity of electrically conductive liquid to said liquid column.

5,199,184

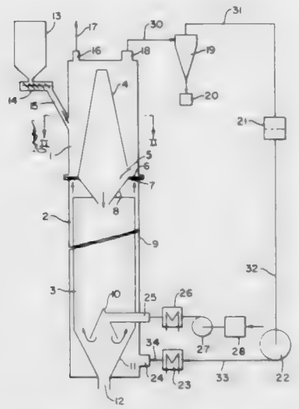
FLUIDIZED-BED OR EFFERVESCENT BED CHAMBER, TREATMENT TOWER AND PROCESS IN TWO STAGES

Roger Rosse, Emmenbrücke, Switzerland, assignor to Bühler AG, Uzwil, Switzerland

PCT No. PCT/CH88/00086, § 371 Date Jan. 9, 1990, § 102(e) Date Jan. 9, 1990, PCT Pub. No. WO89/11073, PCT Pub. Date Nov. 16, 1989
PCT Filed May 9, 1988, Ser. No. 455,457
Int. Cl.[5] F26B *3/08*
U.S. Cl. 34—10 **23 Claims**

1. In an apparatus for fluidizing particulate material over a predetermined operation height within a gas stream,

wall means forming a fluidizing chamber, said wall means including an annular gas permeable bottom wall having an outer circumference and an inner circumference;
inlet means within said wall means for introducing said particulate material into said chamber;
outlet means for discharging said material from said chamber;
a hat-shaped superseding body connected to said inner circumference and rising above said bottom wall in the middle of said chamber concentrically to it, said body extend-



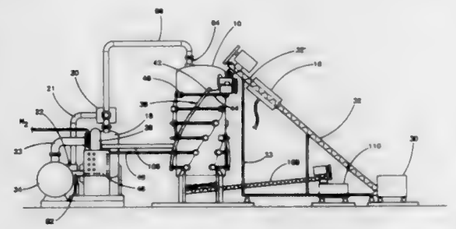
ing substantially in total over said operation height and having a cross-section which diminishes from below to above at least in a lower portion of its height;
partition means extending between said wall means and said superseding body, said inlet means being located on one side of said partition means, while said outlet means are situated on the other side of said partition means;
pneumatic conveying means on said bottom wall for assisting in movement of said particulate material from said inlet means toward said outlet means.

5,199,185

PROCESS AND EQUIPMENT FOR GASEOUS DESICCATION OF ORGANIC PARTICLES

James G. Davidson, Paris, Tenn., assignor to Western Dry, Inc., Marion, Ill.

Filed Jun. 20, 1991, Ser. No. 719,121
Int. Cl.[5] F26B *7/00*
U.S. Cl. 34—12 **39 Claims**



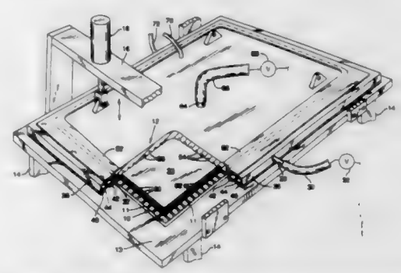
1. A process for removing moisture from coal, wherein the coal includes relatively conductive constituents and relatively non-conductive water, the process comprising:
transforming the coal to coal fines for further treatment;
polarizing the coal fines with an electrical charge;
discharging the electrical charge from the coal fines until the electrical charge is substantially reduced in the relatively electrically conductive coal fine constituents, the electrical charge being discharged to a lesser degree from the relatively less conductive water particles, thus producing a charge or polarization differential between the water and the more conductive coal fine constituents;
removing water from the coal fines in a coal drying chamber by admixing the coal fines with a relatively dry gaseous media having a different state of electrical charge from the polarized water particles in the coal fines;
separating the moisture laden gaseous media from the coal fines; and
collecting the dried coal fines.

5,199,186

VACUUM-OPERATED VENEER DRYER

Thomas E. Rice, 413 Emerald Cir., Medford, Oreg. 97501, and David W. Osborne, 24025 Springbrook Rd., Medford, Oreg. 97504

Filed May 14, 1991, Ser. No. 699,503
Int. Cl.[5] F26B *13/30*
U.S. Cl. 34—92 **10 Claims**



1. A dryer comprising a substantially flat first platen and an opposed substantially flat second platen and the platens being relatively movable toward and away from each other,
elongate continuous sealing means interposed between the platens and circumscribing a void region located between the platens, said void region being adapted to receive a load of material with the load being bounded on opposite sides by the platens,
means for introducing heat to said void region,
means for evacuating said void region with the withdrawal of gas therefrom,
means for evacuating said void region with the withdrawal of gas therefrom,
said sealing means comprising an elongate manifold, means forming an elongate vacuum mouth extending along the length of the manifold, a fluid communication established between the manifold and said vacuum mouth and a vacuum source connecting with said manifold, and
flexible air-impervious means extending from the manifold and joining the manifold to one of said platens whereby the manifold is sealed to said one platen, but permitting relative movement of the manifold with respect to said one platen.

5,199,187

FREEZE DRYER APPARATUS HAVING AN INTERIM CONDENSING SYSTEM AND USE THEREOF

David T. Sutherland, Kingston, N.Y., assignor to SP Industries, Miami, Fla.

Filed Jul. 31, 1991, Ser. No. 738,785
Int. Cl.[5] F26B *5/06*
U.S. Cl. 34—92 **5 Claims**

1. A freeze dryer apparatus comprising:
a refrigeratable product chamber having a single cavity therein;
a refrigeratable condenser chamber exterior to said refriger-

atable product chamber connected through a valve to a

each said arm receiving an article of outerwear thereon

other part loaded at said first position to be sprayed, dried and

said inner sole being freely movable within said compart-

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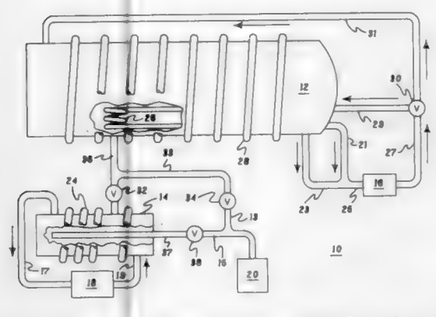
atable product chamber connected through a valve to a vacuum source and communicating through a channel with the product chamber, said channel having a valve therein, said condenser chamber being operable in a condensing mode for condensing thereon into ice relatively large amounts of water vapor migrating thereto from the product chamber and operable in a defrost mode for defrosting said condenser chamber;

valve means for directly connecting the product chamber to a vacuum source; and

an interim condensing system for use during defrost mode operation of the condenser chamber, said system having a refrigeratable condensing surface positioned within said single central cavity of said refrigeratable product chamber for condensing water vapor migrating from the product chamber toward the vacuum source when the valve means is positioned so as to directly connect the product chamber and the vacuum source and also positioned to be defrosted during condensing mode operation of the condenser chamber, said interim condensing system being operable in a condensing mode for condensing water vapor into ice on its condensing surface and operable in a defrost mode for allowing ice to be defrosted therefrom;

wherein when said refrigeratable condenser chamber is operating in a condensing mode and said interim condensing system is operating in a defrost mode, water vapor generated by said defrost mode of said interim condensing system condenses into ice onto said refrigeratable condenser chamber.



5,199,188

METHOD AND APPARATUS FOR DRYING FOOTWEAR AND HANDWEAR

Daniel Franz, P.O. Box 2241, Conway, N.H. 03818

Filed Jul. 8, 1991, Ser. No. 725,322

Int. Cl.[5] F26B *25/00*

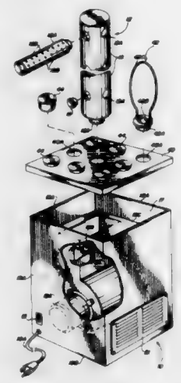
U.S. Cl. 34—105 **6 Claims**

1. An apparatus for drying multiple articles of outerwear comprising:

a) a base member having a top surface provided with at least one aperture;

b) air circulation means in said base member to force air through said at least one aperture;

c) outerwear support means having a hollow central member one end of which is profiled to be received in an aperture of said base member and a plurality of hollow arms, said arms in fluid communication with and extending from said central member in a patterned spaced array, each said arm receiving an article of outerwear thereon and directing air therein; and



d) a plurality of plug means to close off unoccupied open arm apertures and base member apertures.

5,199,189

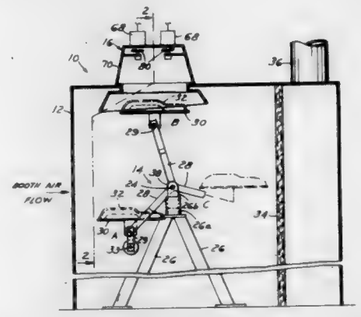
WATERBASED CLEARCOAT DRYING APPARATUS

Clifford L. Bourgoine, New Durham, N.H.; Kristan M. Pierce, Howell, Mich., and Frederick J. Viles, Jr., Mashpee, Mass., assignors to Davidson Textron Inc., Dover, N.H.

Filed Jul. 2, 1992, Ser. No. 908,165

Int. Cl.[5] P26B *11/00*

U.S. Cl. 34—186 **13 Claims**



1. A drying apparatus comprising a booth, a ferris wheel rotatably mounted in the booth and including a plurality of equally spaced, radially extending pair of arms, support means operatively connected to the distal ends of each pair of arms for securing a part to be dried thereon, counterweight means operatively connected to each support means for maintaining said support means in a horizontal plane, indexing means operatively connected to said ferris wheel for indexing same through a plurality of indexed positions, and heater means mounted on the top of the booth adapted to heat and direct air downwardly onto each part indexed to a position directly below the heater means for a predetermined length of time to dry the part, wherein said part is loaded on said support means of a first pair of arms at a first position and sprayed with a waterbased clearcoat, indexed to said position below the heater means for receiving the heated air, then indexed to a third position for continuing the drying, and next indexed to a further position to be unloaded from the support mans, and another part loaded at said first position to be sprayed, dried and unloaded.

5,199,190

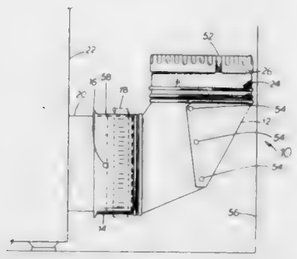
UNIVERSAL APPLIANCE VENTING ASSEMBLY

James J. Mayer, Naperville, and James L. Ratton, Washington, both of Ill., assignors to Champion Furnace Pipe Company, Peoria, Ill.

Filed Nov. 19, 1990, Ser. No. 615,089

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—235 **21 Claims**



1. A fitting for connecting a pair of passages intermediate the passages, comprising:

means for interconnecting a first passage and a second passage intermediate the passage, the first passage defined by a vent member, the second passage defined by another vent member, an end of one of the vent members connected to an end of the other vent member by the connecting means;

swivel means for providing rotation between the connected ends of the vent members joined by the connecting means, the swivel means incorporated into the connecting means; and

locking means for providing a positive connection between the connected ends of the vent members joined by the connecting means and the outlet and the length of tubing.

5,199,191

ATHLETIC SHOE WITH INFLATABLE MOBILE INNER SOLE

Armenak Moumdjian, Nor Marash Street, Bourj-Hammud, Beirut, Lebanon

Continuation-in-part of Ser. No. 608,570, Nov. 2, 1990, Pat. No. 5,112,560, which is a division of Ser. No. 295,438, Jan. 10, 1989, abandoned, which is a division of Ser. No. 74,765, Jul. 17, 1987, Pat. No. 4,845,861. This application Jun. 4, 1991, Ser. No. 710,769

Int. Cl.[5] A43B *13/18, 13/20, 13/00*

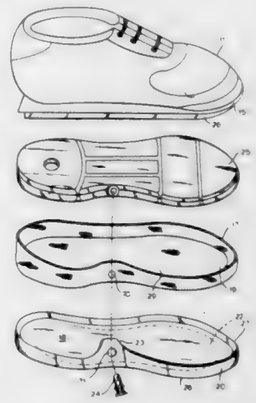
U.S. Cl. 36—28 **20 Claims**

1. An athletic shoe comprising:

an athletic shoe sole having a plate embedded therein over substantially an entire length of said sole, and a raised rim extending all around a periphery of said sole and molded unitarily therewith, said rim having an upwardly extending formation on one side of said sole;

an athletic shoe upper affixed to said rim of sole around said periphery thereof, said upper and said sole defining a compartment between them extending substantially a full length and width of said sole, said compartment having a peripheral wall bounded by said rim, said formation overlying said wall;

a hollow flexible inner sole received in said compartment and having a heel portion, a shank portion, a foot-ball portion and a toe portion, said inner sole further having a flexible valve element extending laterally thereof through said wall and said formation and forming the only location at which said inner sole is anchored in said compartment, said inner sole being freely movable within said compartment except at said element; and



at least one checkvalve in said valve formation permitting fluid pressurization of an interior of said inner sole.

5,199,192

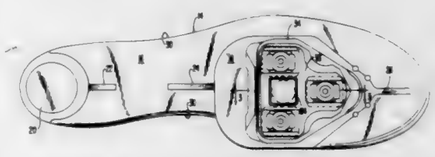
CYCLING SHOE AND OUTSOLE WITH ROTATABLE CLEAT

Bruce J. Kilgore, Lake Oswego; Thomas P. Allen, Beaverton, and Perry W. Auger, Tigard, all of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Jun. 14, 1990, Ser. No. 539,891

Int. Cl.[5] A43B *05/14*

U.S. Cl. 36—131 **26 Claims**



1. A cycling shoe outsole comprising a rigid outsole plate and a rigid cleat support plate, said outsole plate having a curved contour approximating the bottom curvature of a foot in at least the ball area and an outer perimeter border to which a cycling shoe upper is to be attached, said cleat support plate being located in the ball area of the outsole and having a flat surface to which a cycling cleat is to be attached, and at least a portion of said cleat support plate extending laterally beyond said perimeter border of said outsole plate on the medial side of said outsole.

5,199,193

WORKING MACHINE

Masahiro Akiba, and Shigeo Matsuyama, both of Tokyo, Japan, assignors to International Remote Corporation, Tokyo, Japan

Filed Apr. 15, 1992, Ser. No. 868,678

Claims priority, application Japan, Dec. 26, 1991, 3-356813; Jan. 30, 1992, 4-38317; Jan. 30, 1992, 4-38318

Int. Cl.[5] E02F *3/32*

U.S. Cl. 37—341 **14 Claims**

1. A working machine for traveling on land and on a bottom of a body of water to excavate a material from the water bottom comprising:

a traveling lower structure capable of self-traveling and

including a base, provided with predetermined traveling

downwardly open seabed penetrating position upwardly

a pump having an inlet from the interior of the tank and said pump having an outlet;

advancing said charge of snow in a vertical disposal direction in said chamber;

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including a base, provided with predetermined traveling means, and a swivel base disposed on said base;

an upper structure including an operator's chamber for controlling and traveling means, wherein a lower surface of said operator's chamber is in contact with an upper surface side of said swivel base in a retracted position and adapted to extend upwardly of the water body surface in an extended position; and

means for raising and lowering the upper structure relative to the lower structure, wherein said raising and lowering

means includes an extending and retracting body formed from a plurality of tubes having different cross-sectional sizes and fitted one within another, said tubes being disposed to move relative to each other in an axial direction to allow said extending and retracting body to extend or retract telescopically, wherein friction-absorbing means is interposed between adjacent ones of fitted portions of said tubes, and wherein said friction-absorbing means includes bases each secured to upper and lower portions of said tubes and sliding pieces each supported by said bases and formed of a material having a smooth surface.

5,199,194

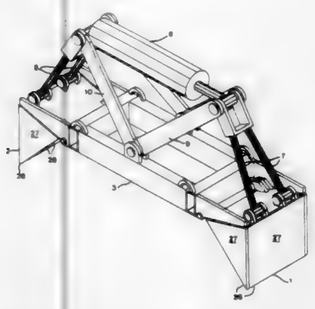
SEA BOTTOM SAMPLER

William J. Scott, St. John's, Canada, assignor to C-CORE-Centre for Cold Ocean Resources Eng., St. John's, Canada

Filed Sep. 30, 1991, Ser. No. 767,619

Int. Cl.[5] E02F *3/34, 3/47*

U.S. Cl. 37—340 **21 Claims**



1. An apparatus for collecting samples of seabed materials comprising:

a generally horizontal frame;

cover means comprising at least one cover element pivotally connected to said frame for movement between a generally vertical open position when the apparatus is descending to a generally horizontal closed position when the apparatus is ascending;

a plurality of buckets, said buckets each being below said cover and pivotally connected to said frame; and

actuation meant for pivoting each of said buckets from a downwardly open seabed penetrating position upwardly toward said cover means to a closed sample retaining position, said buckets each having a separate sample retaining position whereby each bucket is capable of independently retaining a sample when in said closed position.

5,199,195

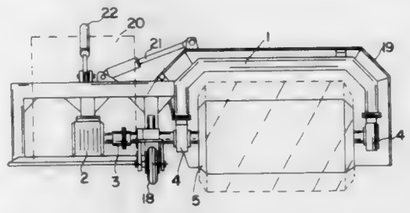
ARTICULATED TOOTHED EXCAVATING APPARATUS

Frank P. Scordilis, 4355 Conrad Dr., Spartanburg, S.C. 29301, and Andreas Scordilis, 73 Pinetree Ct., Inman, S.C. 29349

Continuation-in-part of Ser. No. 607,868, Nov. 2, 1990, abandoned. which is a continuation of Ser. No. 418,487, Oct. 10, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 722,967

Int. Cl.[5] E02F *5/04, 3/24*

U.S. Cl. 37—350 **16 Claims**



8. An excavating apparatus, said apparatus comprising:

a frame for supporting a cutting means, said frame including a wheel support portion and a cutting means support portion, said cutting means support portion being pivotal about a vertical axis from a position locating said cutting means substantially perpendicular to the direction of movement of the apparatus on one side of the apparatus to a position substantially perpendicular to the direction of movement of the apparatus on the opposite side of the apparatus; and

cutting means supported by said cutting means support portion and adapted to cut earthen material, said cutting means comprising a rotatable drum including a plurality of helical rows of cutting members.

5,199,196

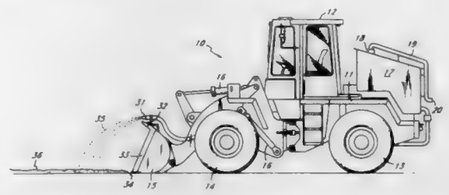
EARTH GRADING AND SOIL COMPACTION TRACTOR WITH WATER SPRAY CAPABILITY

Paul M. Straley, 1635 Fire Hollow, Diamond Bar, Calif. 91765

Filed Jun. 16, 1992, Ser. No. 899,280

Int. Cl.[5] E02F *3/00*

U.S. Cl. 37—442 **11 Claims**



1. An improved tractor for earth grading and soil compaction of the type having a tractor frame and body with a hydraulically operated bucket mounted on the front for moving soil and a centrally located cab and at least two front wheels and at least two rear wheels, wherein the improvement comprises:

a water tank supported by said tractor frame and positioned behind said cab, said water tank having a water tight interior volume;

a pump having an inlet from the interior of the tank and said pump having an outlet;

a water outlet hose connected at one end to the outlet of said pump and said outlet hose directing water forward of said tractor, said outlet hose having at least an end portion thereof fabricated from a flexible material, said end portion being positioned near the bucket of said tractor; and

a nozzle affixed to said bucket and said nozzle being fed by said water outlet hose whereby when said water tank supplies water to said pump which, in turn, supplies water through said water outlet hose to said nozzle, the resulting water spray from said nozzle can be directed by an operator of said tractor to the soil which is being moved by said bucket to result in a mixed combination of soil and water of a predetermined and desired moisture content for compaction and wherein the water in said tank increases the weight on said wheels to further increase the soil compaction by said tractor.

5,199,197

WEAR RESISTANT OFFSET SIDEBAR CHAIN

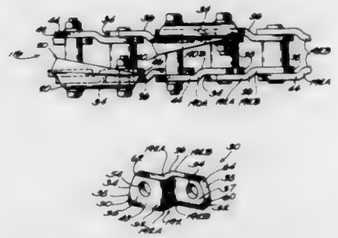
John H. Thuerman, Waukesha, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 310,240, Feb. 13, 1989, Pat. No. 4,941,315. This application Jun. 11, 1990, Ser. No. 535,846

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.[5] E02F *5/06;* **F16G** *13/06*

U.S. Cl. 37—465 **36 Claims**



1. An offset sidebar chain comprising a plurality of chain links joined together by chain pins, at least one of the chain links including a sidebar having a first edge adapted to be supported in sliding contact with a supporting surface, said first edge being generally linear and extending in the direction of movement of the chain with respect to the support surface, and the sidebar including an opposite edge spaced from and generally parallel to said first edge, a trailing end having a first pitch hole therethrough and a leading end having a second pitch hole therethrough, the pitch holes housing said chain pins, at least one of the leading end and the trailing end of the sidebar including an induction hardened portion adjacent the first edge, each sidebar of each link that includes at least one induction hardened sidebar further including a continuous offset bend extending in the direction normal to the supporting surface.

5,199,198

APPARATUS AND METHOD FOR SNOW DISPOSAL

Pierre Godbout, c/o 211, boul. Saint Joseph Ouest, Montreal, Quebec, Canada

Filed Jan. 29, 1992, Ser. No. 827,644

Claims priority, application Canada, Jan. 30, 1991, 2035322

Int. Cl.[5] E01H *5/00*

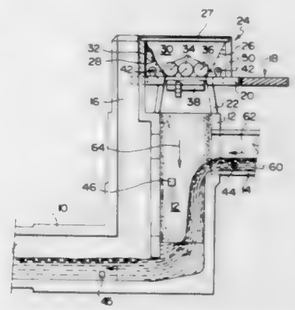
U.S. Cl. 37—196 **19 Claims**

7. A method of snow disposal and flow control comprising:

removably mounting a mobile chamber adapted to receive a charge of snow to be disposed of;

advancing said charge of snow in a vertical disposal direction in said chamber;

projecting snow discharged from said chamber to freely ball in a vertical downwardly extending path spaced from said advancing step;



disposing of said snow in a disposal means for receiving projected snow downstream in a direction from which said snow is projected, said now being disposed of in disposal means including a conduit beneath said downwardly extending path having a liquid flow adapted to receive and transport particulate snow away from the disposal site.

5,199,199

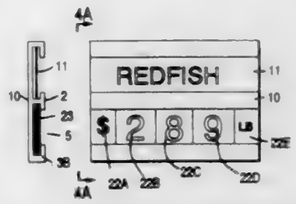
SIGN SYSTEM

Benjamin L. Garfinkle, 1120 Portal Ave., Piedmont, Calif. 94610

Continuation-in-part of Ser. No. 554,146, Jul. 16, 1990. This application Jan. 25, 1991, Ser. No. 647,430

Int. Cl.[5] G09F *9/00, 3/20*

U.S. Cl. 40—5 **10 Claims**



1. A sign system for conveying merchandise identifying and pricing information comprising a frame having viewing regions for supporting and displaying said information for contained within at least one of said viewing regions are alphameric panels or numeric panels having thereon, said panels comprise a longitudinally extending strip of polymeric material whereby said panels in a parallel which are not to be viewed are hidden in a parallel relationship behind those which are to be viewed by folding said longitudinally extending strip along score means created between at least two of said panels wherein each score means comprises at least two substantially parallel adjacent horizontally extending cuts which pass through a substantial but not total thickness of said strip on one face thereof.

5,199,200

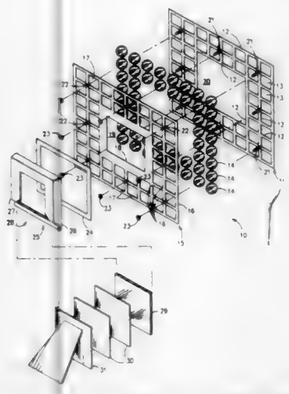
assembly, said outer leg portion having a hook formation at the

marginal edges of the second mirror being received in

said first and second wing portions being formed of a

VOL 1149 ISS 1 AP 6 1993 UMI

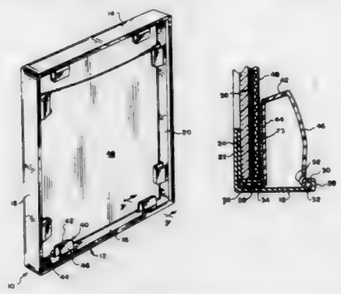
5,199,200
MARBLE PICTURE FRAME
David Howell, 333 Hook Rd., Katonah, N.Y. 10536
Filed Jul. 24, 1992, Ser. No. 919,206
Int. Cl.[5] G09F *1/12*
U.S. Cl. 40—152 15 Claims



1. A picture frame comprising a front grid member having a plurality of intersecting strips formed thereon to define a plurality of grid openings in a margin surrounding a picture opening, said grid openings having a predetermined grid spacing between adjacent ones of said openings and a predetermined opening size thereacross; a back grid member having a similar plurality of intersecting strips to define a similar plurality of grid openings in a margin surrounding a back grid member picture opening; a plurality of spheroids of a predetermined diameter between said grid opening size and said grid spacing, and retained in an array between said front and back grid members in the margins thereof; fastener means holding said front and back grid members in registry with one another with said spheroids disposed therebetween in respective ones of said grid openings; and a picture holder member secured to one said grid member at the picture opening thereof.

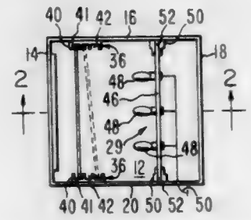
5,199,201
PICTURE/POSTER FRAME ASSEMBLY AND RETAINER FOR HOLDING COMPONENTS IN THE FRAME OF THE ASSEMBLY
Daniel E. Vilims, Downers Grove, Ill., assignor to Chuen J. Rhee, Barrington, Ill.
PCT No. PCT/US90/03291, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/15560, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 8, 1990, Ser. No. 691,042
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] A47G *1/06*
U.S. Cl. 40—156 11 Claims

8. For use in a picture frame assembly including a picture frame, a retainer clip comprising a retainer body having a planar bight portion, an inner planar leg portion having a locator flange extending laterally outwardly therefrom connected to said planar bight portion and an outer leg portion, said planar bight portion extending at an angle from said planar inner leg portion, said planar inner leg portion having an outer areal surface adapted to abut and be adjacent to a portion of a back surface of a backing panel forming part of a picture frame assembly, said outer leg portion having a hook formation at the outer end thereof, and engaging means for grippingly engaging



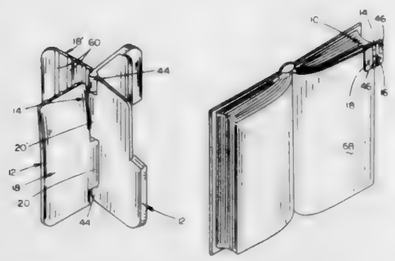
said outer areal surface of said inner leg portion of said retainer clip to the back surface of the backing panel.

5,199,202
LIGHT BOX WITH MULTIPLE IMAGE-FORMING MEANS THEREIN
Gary S. Musgrave, 267 27th St., San Francisco, Calif. 94131
Continuation of Ser. No. 571,807, Aug. 22, 1990, abandoned.
This application Feb. 3, 1992, Ser. No. 830,519
Int. Cl.[5] G09F *13/12*
U.S. Cl. 40—219 7 Claims



1. Apparatus for forming multiple light images comprising:
a light box having a first wall and a pair of spaced, parallel second walls adjacent to the first wall, said first wall being provided with an inner surface and a central opening therethrough;
A first, transparent mirror secured to the inner surface of the first wall and extending across said central opening thereof;
a second, opaque mirror having a thickness and a reflecting surface provided with a design formed therein, said second mirror having a pair of opposed marginal edges;
a plurality of spaced fixed ribs on each of the second walls respectively, the ribs on one of the second walls being aligned with the ribs on the other second wall, each pair of adjacent ribs of each said second wall defining an open end groove for removably receiving an adjacent marginal edge of the second mirror to thereby mount the second mirror in the light box in spaced relationship to the first mirror, there being at least two of the grooves on each of the second walls respectively, adjacent ribs on each of the second walls having a spacing therebetween and the spacing between said adjacent ribs of each of the second walls being greater than the thickness of the second mirror to permit the second mirror to be mounted in a location at an acute angle with respect to the first mirror; and
a light source in the light box for directing light rays through the design and through the mirrors so that an image of the design will be reflected a number of times by the mirrors and such images will be observable through the central opening from a position exteriorly of the light box, the marginal edges of the second mirror being received in grooves which are aligned when the second mirror is parallel to the first mirror, the marginal edges of the second mirror being received in grooves which are out of alignment when the second mirror is at an acute angle relative to the first mirror.

5,199,203
REUSABLE INDEXING TAB
Douglas W. Jones, 2807 Century Rd., Omaha, Nebr. 68123
Filed Feb. 7, 1992, Ser. No. 832,389
Int. Cl.[5] G09F *23/10*
U.S. Cl. 40—641 8 Claims



1. A reusable indexing tab, comprising:
first and second wing portions operably pivotally connected for movement between a clamped position and an unclamped position;
said first wing portion including:
a first generally planar panel having longitudinal inner and outer side edges, upper and lower edges and forward and rearward surfaces;
a first hinge portion mounted on a portion of said inner edge; and
a second generally planar panel having longitudinal inner and outer edges, upper and lower edges and forward and rearward surfaces, mounted along a portion of its inner edge to said first hinge portion, to thereby connect said first and second panels;
a second wing portion including:
a first generally planar panel having longitudinal inner and outer side edges, upper and lower edges and forward and rearward surfaces;
a first hinge portion mounted on a portion of said inner edge; and
a second generally planar panel having longitudinal inner and outer edges, upper and lower edges and forward and rearward surfaces, mounted along a portion of its inner edge to see first hinge portion, to thereby connect said first and second panels;
said first and second wing portions operably connected at said hinge portions for pivotal movement between said clamped position, with the rearward surface of the first wing first panel in abutting flush contact with the rearward surface of the second wing first panel and the forward surface of the first wing second panel in abutting flush contact with the forward surface of the second wing second panel, and the upper edge of the first wing first panel in contact with the lower edge of the second wing first panel and the lower edge of the first wing first panel in contact with the upper edge of the second wing first panel, and said unclamped position wherein said first panels are pivoted apart and said second panels are pivoted apart;
bias means producing a clamping force between said rearward surfaces of said first and second wing first panels when in the clamped position;
said bias means including:
said first and second wing portions being formed of a resilient flexible material; and
said first panels of said first and second wing portions each having a bend therein such that said first panels are bent rearwardly towards one another when connected together, said bends located such that the bent portions of said first panels are forced into flat coplanar positions biased against said bends when said wing portions are moved to the clamped position, to produce the clamping force between the first panels; and
means for selectively locking said wing portions in the clamped position.

5,199,204
TURKEY DECOY KIT APPARATUS
Lester L. Lowery, Rte. 1, Box 13, Virgilina, Va. 24598
Filed Mar. 5, 1992, Ser. No. 846,038
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—2 5 Claims

1. A turkey decoy kit apparatus, comprising,
an elongate central body torso, the body torso including a torso rear end portion and a torso forward end portion, the rear end portion and the forward end portion are longitudinally aligned relative to one another, and the rear end portion including a tail portion projecting exteriorly of the central body torso, and a neck portion mounted to the forward end portion, extending exteriorly of the central body torso, the neck portion including a head portion mounted to the neck portion spaced from the central body torso, and
a plurality of wing members mounted to the central body torso, and
a deformable spine rod mounted coextensively through the tail portion, the central body torso, the neck portion, and the head portion, and
the central body torso including a torso bottom surface and a torso top surface, the torso bottom surface including a rigid support block mounted within the torso through the torso bottom surface, with the support block including a threaded bore directed therewithin, and
mounting means secured to the threaded bore for securement of the torso to a support surface.

5,199,205
ILLUMINATED BOBBER
Mark S. Klammer, Mankato, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.
Filed Jun. 23, 1992, Ser. No. 902,877
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—17 5 Claims

1. An illuminated bobber comprising a hollow sealed body member, a hollow transparent guide mounted on the top of said body member, means for illuminating said guide to provide a signal and a hollow transparent float mounted on said

5,199,207

annular opening, with the housing slot coextensive with

shank by a hook elbow, said hook barb defining one end of said

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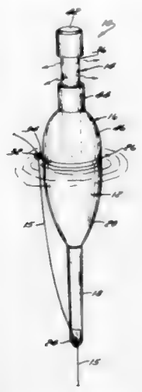
guide for movement between the body member and the upper end of the guide whereby said transparent float is free to move



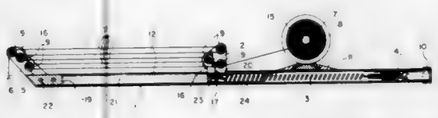
on said guide when said body member is pulled down in the water in response to a strike by a fish to illuminate the float and change the color of the signal.

5,199,206

FISHING ROD WITH LINE DRAG AND RECOVERY DEVICE

Francis J. Richardson, 1921 Hunt Meadow Dr., Annapolis, Md. 21403-1636, assignor to Francis Joseph Richardson, Annapolis, Md.

Filed Feb. 7, 1992, Ser. No. 832,307
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—18.1 **6 Claims**



1. A fishing rod having means for line drag and line recovery, which interacts with a conventional reel's line drag and line recovery, comprising:

a one-piece rod fabricated of rigid hollow material, having a longitudinal groove at one end and a drag adjustment screw at the other end; said groove having a sliding multi vertical roller assembly movable longitudinally thereof;

said sliding multi vertical roller assembly having three pinned rollers, two guide plates welded to a sliding cylinder and an anti line tangle means; a swivel attaching to said sliding cylinder;

a stationary multi vertical roller assembly having three pinned rollers and two guide plates welded to a stationary cylinder and an anti line tangle means, fixedly mounted at one end of said groove;

an internal rod spring device having two ends, one end of the spring being connected to the swivel of the sliding cylinder and the other end of the spring being connected to the drag adjustment screw, whereby

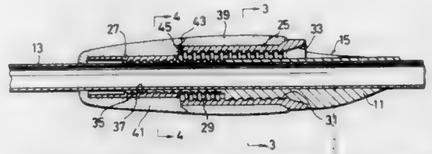
a fishing line from a conventional fishing reel is sequenced by said sliding vertical multi roller assembly, said stationary vertical multi roller assembly and said anti line tangle means, thereby preventing the fishing line from tangling.

5,199,207

REEL LEG FIXING APPARATUS FOR FISHING ROD

Masayuki Nakagawa, Urawa, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Nov. 1, 1991, Ser. No. 786,285
Claims priority, application Japan, Nov. 14, 1990, 2-119242[U]
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 **7 Claims**



1. A reel leg fixing apparatus for mounting on a fishing rod and penetration thereby entirely along the central longitudinal axis of said apparatus, comprising:

a reel leg mounting section having a reel leg mounting plane formed directly or indirectly on the fishing rod proper,

a front-side reel leg fixing section placed at the front side of said reel leg mounting plane,

a back-side reel leg fixing section placed at the back side of said reel leg mounting plane,

a first grasping section adapted at a rear end thereof for accepting and fixing a reel leg and composing said front-side reel leg fixing section placed at said reel leg mounting plane side, a first female screw section formed entirely around the interior annular side wall of said first grasping section being threadably engaged outwardly of and coaxially to a first male screw section formed entirely around the exterior annular side wall of said front side reel leg fixing section,

a second grasping section composing said front-side reel leg fixing section placed at the front side of said first grasping section, a second female screw section formed entirely around the interior annular side wall of said second grasping section, said second female screw section being threadably engaged outwardly of and coaxially to a second male screw section formed coaxially outwardly entirely around the exterior annular side wall of the fishing rod proper forwardly in relation to said first male screw section,

and a flexible member substantially covering the exterior annular side walls of said second grasping section and rotating therewith, to thereby provide more comfortable holding of the fishing rod and more reliable stable fixing of the reel leg to the fishing rod proper.

5,199,208

FISHING LURE GUARD

Patrick A. Matchette, 650 Sanford St. SW., Palm Bay, Fla. 32908

Filed Feb. 27, 1992, Ser. No. 842,542
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—25.2 **1 Claim**

1. A fishing lure guard, comprising,

an elongate cylindrical housing, the cylindrical housing defined about a housing axis, the housing including a first end spaced from a second end, the first end including a wall plate fixedly mounted within the first end orthogonally oriented relative to the housing, with the second end defining an entrance opening, and

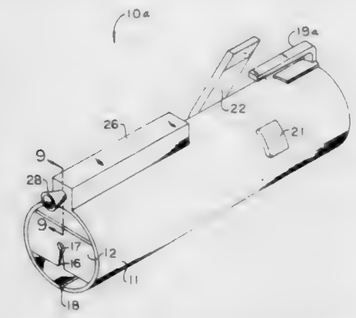
the wall plate including a wall plate lower edge, and

a plate slot directed into the wall plate extending from the lower edge, with the slot terminating in an annular opening, and

a housing slot directed through the cylindrical housing, with the housing slot radially aligned with the plate slot and the annular opening, with the housing slot coextensive with the cylindrical housing, the cylindrical housing defining a cavity therewithin coextensive with the housing extending from the first end to the second end, and

an L-shaped mounting flange fixedly secured to the cylindrical housing adjacent the second end, with the mounting flange including a horizontal leg, the horizontal leg positioned above the cylindrical housing and parallel to the housing axis, and

a hook and loop fastener patch mounted to an exterior surface of the cylindrical housing positioned between the first end and the second end, and a flexible fastener strap including a second hook and loop fastener patch secured to



the strap spaced from the hook and loop fastener patch permitting securement of the strap about an associated fishing rod, and

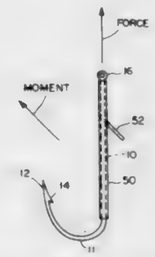
a manifold fixedly mounted to an exterior surface of the cylindrical housing, the manifold including a manifold conduit directed through the manifold, and the manifold conduit including a conical entrance guide coaxially aligned with the manifold conduit, with the entrance guide projecting beyond the first end to direct a fish attractant fluid into the manifold conduit, and a plurality of exit ports in fluid communication with the manifold conduit, with the exit ports directed into the cylindrical housing from the manifold conduit.

5,199,209

FISH HOOK ATTACHMENT FOR FISH HOOK CONSTRUCTION

Russell Cook, Wellesley, Mass., assignor to Wellesley Research Associates, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 525,644, May 21, 1990, Pat. No. 5,056,257, which is a continuation-in-part of Ser. No. 441,638, Nov. 27, 1989, Pat. No. 4,987,696. This application Mar. 25, 1991, Ser. No. 674,113
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—43.16 **14 Claims**



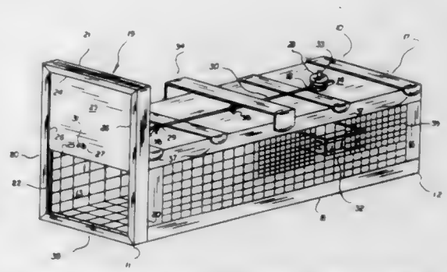
1. An attachment adapted to fit about a shank of a fish hook, said hook having a hook shank, a hook barb attached to said shank by a hook elbow, said hook barb defining one end of said construction, said attachment comprising a hollow sleeve having a slot extending the entire length of said sleeve, said sleeve having a size to permit said sleeve to fit tightly about said hook shank, a hydrofoil having a first surface rigidly secured to said sleeve, said hydrofoil extending in a direction between 5° and 85° from the sleeve shank in a direction away from said hook elbow, said first surface being positioned perpendicular to a plane defined by the shank and hook elbow, said hydrofoil having a free unsecured end and means for attaching a line to said hook.

5,199,210

LIVE ANIMAL TRAP

Anthony Nastas, 1840 W. Lawrence Ave., Ellwood City, Pa. 16117

Filed Oct. 9, 1992, Ser. No. 958,706
Int. Cl.[5] A01M *23/16*
U.S. Cl. 43—61 **6 Claims**



1. An animal trap adapted to capture a single animal, said trap comprised of:

a) an elongated cage having forward and rear extremities and an interior region bounded in part by spaced apart roof and floor panels, paired parallel side panels orthogonally disposed to said roof and floor panels, and a rear panel, said roof panel having an elongated aperture centered between said side panels and extending in a direction between said forward and rear extremities,

b) a framework associated with said forward extremity and comprised of spaced apart paired side channel members and a lower channel member orthogonally joining said side channel members, said channel members having continuous grooves directed toward said interior region and centered upon a plane perpendicularly disposed to said roof panel,

c) a substantially rectangular door panel having upper, lower and side extremities, and adapted to travel vertically within said framework, said side extremities slidably engaging the grooves of said side channel members, said lower extremity configured to engage the groove of said lower channel member upon extreme downward travel of said door panel, thereby closing said forward extremity, said door panel having a lockup aperture adjacent said lower extremity,

d) retainer means associated with said elongated aperture and adapted to slidably engage said roof panel,

e) an elongated trip rod adapted to reciprocally travel above said roof panel, said trip rod having a proximal extremity fixedly associated with said retainer means and a distal extremity adapted to penetratively engage said lockup aperture, thereby maintaining said trap door panel in an upward, open disposition against the urging of gravitational force, and

f) bait holding means residing within said interior region and suspended by said retainer means,

whereby,

said trap is set by raising said door panel to its upper limit

contaminants in the soil without combusting the contami-

5,199,214

third web matrix receives application of water thereto,

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and sliding said trip rod forward to engage said lockup aperture, and

said trap is tripped when an animal enters the open forward extremity of said cage in search of said bait and pushes on said bait holding means, thereby rearwardly displacing said retainer means and trip rod, causing release of said door panel and the falling thereof with consequent sealing of the cage.

5,199,211

FISHING APPARATUS

Alan N. McKenzie, Kelso, Australia, assignor to McKenzie's Fishing Company Pty Ltd, Tasmania, Australia

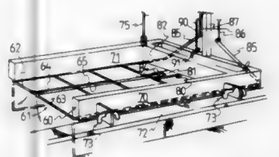
PCT No. PCT/AU90/00101, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/10384, PCT Pub. Date Sep. 20, 1990

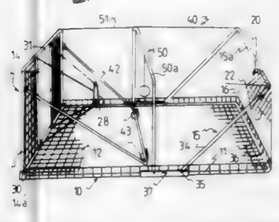
PCT Filed Mar. 8, 1990, Ser. No. 777,227

Claims priority, application Australia, Mar. 8, 1989, PJ3104

Int. Cl.[5] A01K *69/10*

U.S. Cl. 43—105 **17 Claims**





1. A shooting mechanism for depositing a fish trap into a body of water, the fish trap having a collapsed condition and an erected operable condition; the trap having a base wall, a front wall and a rear wall which, in the collapsed condition, lie generally flat on the base wall and which, in the erected operable condition, occupy upright positions to define front and rear walls of the erected fish trap; the shooting mechanism including a main support frame for mounting to a fishing vessel so as to extend outwardly from the vessel over the water, a trap support gate mounted to the main support frame the trap support gate having a supporting position extending generally horizontally and in which it supports the fishing trap in its erected operable condition over the water, the trap support gate being selectively movable from the supporting position to a retracted position so that the trap is allowed to fall freely past the trap support gate into the water.

5,199,212

SOIL DECONTAMINATION SYSTEM

Bobby G. Newcomb, Oklahoma City, Okla., assignor to ARC Management, Co., Oklahoma City, Okla.

Filed Apr. 8, 1991, Ser. No. 682,789

Int. Cl.[5] A01B *77/00;* **A01G** *11/00*

U.S. Cl. 47—1.82 **24 Claims**

1. A soil decontamination apparatus comprising:

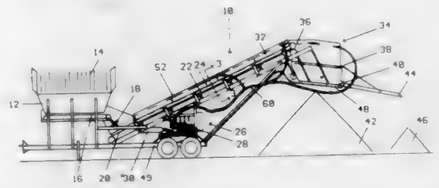
means for breaking down clumps of contaminated soil;

a heat chamber;

conveyor means for transporting the contaminated soil from the means for breaking down clumps of soil through the heat chamber;

a plurality of heaters secured within the heat chamber for heating the soil to a temperature sufficient to volatilize contaminants in the soil without combusting the contaminants; and

a vapor extraction system communicating with the heat



chamber for drawing volatilized contaminants from the heat chamber and burning the contaminants, wherein the vapor extraction system includes an internal combustion engine for burning the volatilized contaminants.

5,199,213

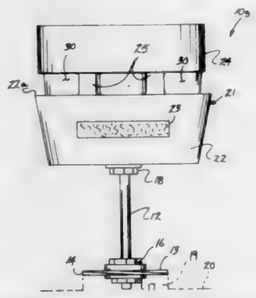
CEMETERY PLANT POT

Sharon E. Krebs, 5919 Shope Pl., and Robert E. Fleck, 5920 Locust La., both of Harrisburg, Pa. 17109

Filed Mar. 12, 1991, Ser. No. 668,233

Int. Cl.[5] A47G *7/00*

U.S. Cl. 47—39 **2 Claims**



1. A cemetery plant pot apparatus comprising, in combination.

a truncated conical lower base container, the lower base container including a planar floor, and

a support rod mounted coaxially and orthogonally relative to the planar floor, and the support rod including a support rod head positioned within the lower base, and

a container fastener mounted about the support rod capturing the planar floor between the container fastener and the support rod head, and

the support rod including a lower terminal end, and

a cylindrical mounting disk secured to the support rod adjacent the lower terminal end, and

the mounting disk including an externally threaded cylindrical side wall for mounting of the disk within an internally threaded pedestal bore, and

the conical lower base includes an upper annular rim defined by a predetermined first diameter, and a cylindrical upper base coaxially aligned with the conical lower base, with the cylindrical upper base spaced above the lower base and defined by a predetermined second diameter less than the predetermined first diameter, and a plurality of protecting webs securing the cylindrical upper base to the upper annular rim defining a plurality of windows between the upper base, the lower base, and the connecting webs to permit directing of irrigation fluid through the windows.

5,199,214

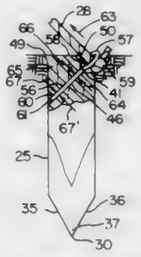
TREE STAKING SYSTEM, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Dalen Products, Inc., Knoxville, Tenn.

Filed Aug. 3, 1992, Ser. No. 924,143

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—42 **18 Claims**



1. In a stake for a tree comprising a piece of material having an upper end means adapted to be operatively associated with an end of a support rope that is to be interconnected to said tree that is planted in the ground, said piece of material having a lower end means adapted to be driven into said ground in spaced relation to said tree by hammering on said upper end means thereof, said stake having a pair of opposed side means and a centerline extending between said upper end means and said lower end means, the improvement wherein said stake has a substantially straight hole therein and leading from said upper end means at an angle to said centerline, said hole having an upper end that interrupts said upper end means adjacent one of said opposed side means whereby said hole is adapted to receive a substantially straight shank portion of an anchor pin through said upper end thereof until an attaching end of said pin for said end of said rope abuts said upper end means of said stake adjacent said upper end of said hole.

5,199,215

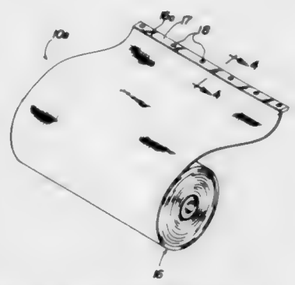
VEGETATION MAT APPARATUS

Martin J. Lopez, 13749 Toby Trail, Grass Valley, Calif. 95945

Filed Jan. 8, 1992, Ser. No. 818,153

Int. Cl.[5] A01G *1/06, 9/14*

U.S. Cl. 47—56 **6 Claims**



1. A vegetation mat apparatus, comprising,

a web assembly, including a flexible fluid impermeable polymeric first web and a fabric mesh second web mounted coextensively to a top surface of the first web, and

a compacted peat moss third web matrix, including a matrix of vegetation seeds directed therethrough mounted coextensively to a top surface of the second web, and

a fabric fourth web mounted coextensively to a top surface of the third web, wherein the second web and the fourth web receive expansion of the third web matrix when the third web matrix receives application of water thereto, and

the web assembly includes a first end surface, wherein the first end surface includes a mounting flange mounted coextensively thereto, the mounting flange includes a plurality of mounting flange apertures directed through the mounting flange spaced apart a predetermined spacing, and a water receiving slot directed medially of the mounting flange aligned with the third web matrix.

5,199,216

FRENCH CASEMENT WINDOW OPERATOR

Gregory J. Vetter, Owatonna, and Daniel G. Tucker, Waseca, both of Minn., assignors to Truth Div. of SPX Corporation, Owantonna, Minn.

Filed Jun. 17, 1992, Ser. No. 899,717

Int. Cl.[5] E05F *17/00*

U.S. Cl. 49—109 **18 Claims**

1. An operator for a French casement window having a first window sash supported in a frame by a first hinge and a second window sash supported in said frame by a second hinge, each of said sashes having a first vertical side adjacent the first vertical side of the other sash when said sashes are closed and a second vertical side adjacent the frame when said sash is closed, each of said hinges supporting the associated sash for pivotable movement about a vertical axis on a horizontally slidable hinge shoe, said axis being generally associated with the second vertical side of the sash, said operator comprising:

an operating arm with a roller mounted at an end of said operating arm and movable in an arc between extended and retracted positions as said operating arm moves between window open and closed positions, respectively;

a channel member mountable on said first sash to extend horizontally on said first sash to confine and be engaged by said roller as said operating arm is moved between extended and retracted positions;

a bracket mountable on said second sash adjacent the second vertical side;

a drag link pivotally connected on one end to the bracket and on the other end to said operating arm; and

drive means for pivoting said operating arm about a pivot axis;

whereby pivoting of said operating arm moves said roller through said arc to move said first sash between window open and closed positions and further moves said drag link to synchronously move said second sash between window open and closed positions.

5,199,217

MOVABLE WINDOW, PARTICULARLY FOR AN AUTOMOBILE

Jean-Pierre Roze, Compiegne, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 688,708, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 191,437, May 9, 1988, abandoned. This application Nov. 12, 1991, Ser. No. 789,816

Claims priority, application France, May 7, 1987, 87 06471

Int. Cl.[5] E05F *11/38*

U.S. Cl. 49—375 **4 Claims**

1. A vertically movable window, comprising a monolithic or laminated window of glass or a plastic material or both, equipped along at least one part of a periphery thereof with a

pin passage means in said upper and lower lips of said

5,199,220

able carriage and cutting means cooperable to cut said

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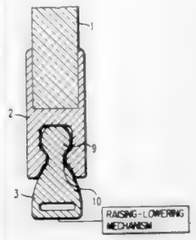
molded thermoplastic profile having a fitting space and an opening defined by ribs and a connecting piece having a rounded head and a neck bisected by an axis in the plane of the window which secures a window moving mechanism to the

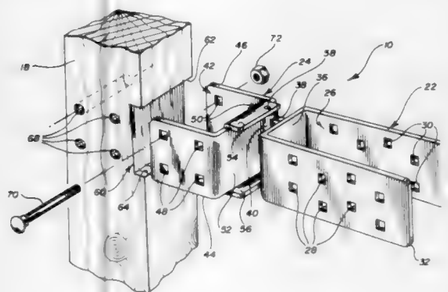


window, wherein the molded profile is obtained by molding said profile onto at least a portion of the window periphery, the profile ribs locking comprising ribs to ensure locking of the rounded head of the connecting piece in the fitting space the molded profile.

5,199,218
GATE HINGE

Donald E. McQuade, 56 Jefferson St., Redbank, N.J. 07701

Filed Jan. 4, 1991, Ser. No. 641,873
Int. Cl.[5] E05D *15/00*
U.S. Cl. 49—381 **11 Claims**

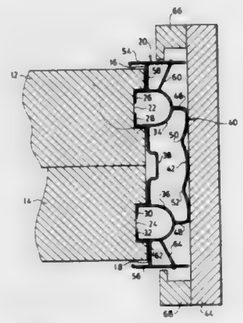


1. A gate hinge assembly comprising:
A) a stationary post comprising:
1] a flat mid face and two adjacent flat side faces;
2] at least one notch formed in the flat mid face, said notch having upper and lower shoulders; and
3] a plurality of passages formed parallel to said flat mid face and substantially perpendicular to said adjacent side faces;
B) a non-moveable stirrup member fixed to said stationary post comprising:
1] a flat web and two adjacent flat stirrup legs, the flat web having a top and bottom surface;
2] upper and lower lips extending from the top and bottom of the flat web; said lower lip abutting and in registration with said lower shoulder of said notch in said stationary post; and
3] passage means in said upper and lower lips aligned for the mounting of a pivot pin;
C) a movable stirrup member adapted to be fixed to a gate comprising;
1] a flat web and two adjacent stirrup legs;
2] an extension member extending perpendicularly from said flat web and parallel to said stirrup legs;
3] said extension member in registration with said pivot pin passage means in said upper and lower lips of said non-moveable stirrup member; and
4] retaining means fixed to said extension member and adapted to receive the pivot pin to enable said movable stirrup member to pivot about said pivot pin with respect to said non-moveable stirrup member;
D) at least one of said passage means in said upper and lower lips aligned for the mounting of a pivot pin, and said extension member extending perpendicularly from said flat web being positioned closer to one of said stirrup legs; and
E) said extension member extending an amount sufficient to enable clearance of said web of said movable stirrup member with relation to said web of said non-moveable stirrup member when pivoted in one direction only.

5,199,219
WINDOW JAMB LINER

James A. Martini; Norman R. Westfall, and Richard S. deNormand, all of Rochester, N.Y., assignors to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Jul. 22, 1991, Ser. No. 734,202
Int. Cl.[5] E05D *15/16*
U.S. Cl. 49—428 **14 Claims**

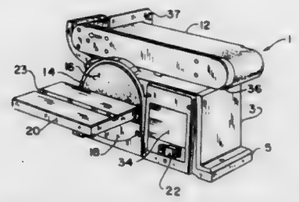


1. A window jamb liner for mounting tilt-takeout window sashes between jambs to form a standard window assembly comprising:
an extruded body having a predetermined length extending between two ends and pairs of tracks extending along said length of the extruded body for engaging respective plows of upper and lower window sashes;
a pair of channels formed within said extruded body respectively joining the tracks of each of said pairs of tracks;
first and second webs formed within said extruded body separately joining said channels throughout said length of the extruded body;
said first web being formed within said extruded body by separate portions of respective window sash runs;
said second web being formed within said extruded body, in part, by a single spring for urging both of said channels apart from one of the said jambs; and
said single spring having a first end joined to one of said channels, a second end joined to the other of said channels, and a bow-shaped portion interconnecting said first and second ends of the single spring to increase torsional stiffness between said channels.

5,199,220
COMBINATION BELT AND DISC SANDER

Robert E. Steiner; Daniel A. Terpstra, both of St. Louis County, Mo., and Steven H. Plume, Madison County, Tenn., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 19, 1992, Ser. No. 901,181
Int. Cl.[5] B24B *21/00*
U.S. Cl. 51—3 **13 Claims**

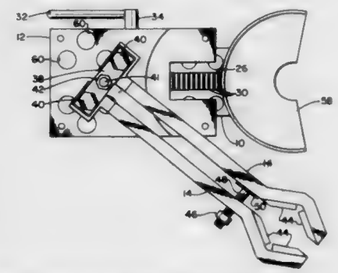


1. A combined belt and disc sander comprising:
a housing;
a belt sander attached to and extending across an upper surface of the housing;
a disc sander attached to a side surface of said housing, said disc sander in its entirety being positioned below a top horizontal surface of said belt sander; and
motor means within said housing and operatively connected to both said belt sander and said disc sander for joint operation thereof.

5,199,221
TUBE CUTTING APPARATUS

Tollief O. Hillestad, 108 9th Ave., W. Summerland Key, Fla. 33042

Filed Feb. 13, 1992, Ser. No. 835,280
Int. Cl.[5] B26D *1/18*
U.S. Cl. 51—34 G **18 Claims**

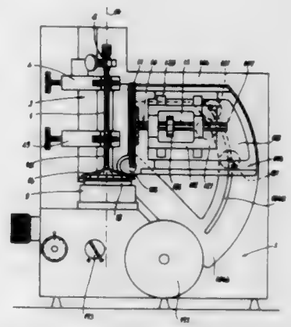


1. A tube cutting apparatus, comprising:
a frame,
a movable carriage supported on said frame and adapted to move along a linear path passing through a tube which is to be cut,
means for guiding said carriage along said linear path to substantially eliminate movement of the carriage except along said linear path,
means for supporting said frame from a stationary object, said support means comprising a pair of congruous support arms and means for forcing said arms toward each other to grip an intervening object,
means for reversibly securing and pivotally connecting said frame to said support means to allow for rotational adjustment of said frame relative to said support means about an axis parallel with the longitudinal axis of said tube which is to be cut, and
cutting means secured to said movable carriage, said movable carriage and cutting means cooperable to cut said tube along a plane perpendicular to the axis of said tube.

5,199,222
DEVICE FOR GRINDING THE HEAD OF A VALVE, ESPECIALLY OF AN INTERNAL-COMBUSTION ENGINE

Jacques Leroux, Annecy le Vieux, and Patrick Vivier, Faverges, both of France, assignors to Serdi-Societe d'Etudes de Realisation et de Diffusion Industrielles, Annecy, France

Filed May 6, 1991, Ser. No. 696,137
Claims priority, application France, May 7, 1990, 90 06192; Sep. 10, 1990, 90 11354
Int. Cl.[5] B24B *5/36*
U.S. Cl. 51—105 VG **17 Claims**



1. A device for grinding the head of a valve having a stem, a stem end, and a head opposite the stem end, the device comprising:
a rigid stand;
a first support for rotatably supporting the stem between the stem end and the stem head, said first support being mounted on the stand and comprising at least two second supports extending parallel to one another, the two second supports being separated from one another and each comprising a cradle for receiving the valve stem with an aperture in the cradle increasing in width outward on either side of a reference plane of symmetry passing through and including an axis of rotation of the valve stem, and a movable fence mounted opposite the cradle and forming with the cradle a rotary stay for the valve stem;
a stop for rotational bearing against the valve end;
a drive mechanism that drives the valve in rotation, the drive mechanism comprising a rotary driving member for rotationally coupling with the valve head on a front face of the valve head opposite a rear face to be machined;
a compensation member compensating for misalignment between a driving axis of rotation of the rotary driving member and the axis of rotation of the valve stem;
a machining station mounted on the stand apart from the first support for supporting the valve stem, the machining station comprising a tool for machining the rear face of the valve head and a second drive mechanism that drives the machining tool in rotation about a machining axis wherein the first support for supporting the valve stem in terms of rotation is vertically fixed to the rigid stand to maintain the axis of rotation of the valve stem in the reference plane of symmetry which is a vertical reference plane, and the machining station is mounted on the stand so that the machining tool is adjustable about an axis perpendicular to the vertical reference plane in order to adjust the machining axis in relation to the position of the rear face of the valve to be machined.

5,199,223

displacement in a positively connected manner on said

opening and translatable back-and-forth lengthwise there-

C) a second broad face of said wedge arranged at said fixed

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5,199,223

DEVICE FOR CLAMPING A DISC-SHAPED TOOL

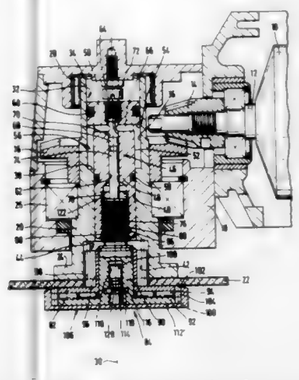
Boris Rudolf, Stuttgart, and Josef Gentischer, Weinstadt, both of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 293,299, Jan. 4, 1989, abandoned. This application Jan. 22, 1990, Ser. No. 465,639

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1988, 3800437

Int. Cl.[5] B24B *23/02*

U.S. Cl. 51—168 31 Claims



1. Device for clamping a disc-shaped tool on a motor-driven tool spindle of a portable machine, tool comprising:

a grinding disc on an angle grinder;

a clamping anchor arranged in said tool spindle which has an axial recess, said clamping anchor being axially displaceable relative to said tool spindle and rotationally fixedly connected to said tool spindle;

a clamping flange releasably attachable to the free end of said clamping anchor;

an abutment arranged at the tool end of the tool spindle;

means actuatable by a manual actuating mechanism operable tool-free for releasably pressing said clamping flange against said abutment, thereby clamping said tool between these said means for releasably for releasably pressing comprising:

a first pressure cylinder including a first cavity (**56**) between said clamping anchor (**46**) and said tool spindle (**20**);

a second pressure cylinder including a second cavity (**70**) arranged in said clamping anchor (**46**) or said tool spindle (**20**); and

a connecting channel (**66**) between said two cavities (**56**, **70**);

said second pressure cylinder including a piston (**68**) delimiting said second cavity (**70**), and in order to releasably clamp said tool (**22**), said piston (**68**) being adjustable and fixable in its position in which it clamps said tool (**22**) by said manual actuating mechanism from a tool end of said tool spindle (**20**);

said first cavity (**56**) defined by delimiting surfaces (**38**, **54**) of said tool spindle (**20**) and said clamping anchor (**46**), with said delimiting surfaces facing one another and being arranged in axially spaced relation to one another;

said manual actuating mechanism being operable via a retaining device (**84**) for securing said clamping flange (**82**) on said clamping anchor (**46**);

said retaining device being releasably attachable to said clamping anchor (**46**);

said manual actuating mechanism comprising an adjustable clamping member (**86**, **144**) acting upon said piston (**68**) in order to effect clamping;

said clamping member (**86**, **144**) being arranged on said retaining device (**84**); and said retaining device including:

a clamping member (**86**) which is securable against axial displacement in a positively connected manner on said clamping anchor (**46**); and

said clamping member (**86**) being securable by a securing element (**106**) which is displaceable in the axial direction.

5,199,224

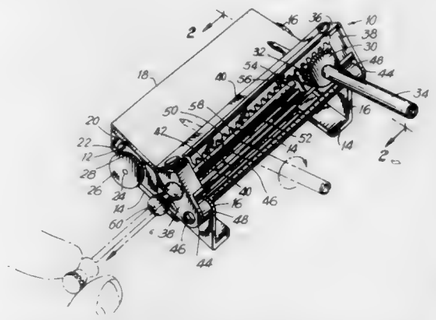
DART SHARPENER

Peter A. Aluotto, 1668 Hendrickson St., Brooklyn, N.Y. 11234

Filed Jul. 24, 1992, Ser. No. 919,719

Int. Cl.[5] B24B *19/16*

U.S. Cl. 51—157 11 Claims



1. A dart sharpening apparatus comprising:

a substantially U-shaped frame having a bottom portion and two opposed upright portions;

a sharpening stone, said sharpening stone being disposed between said opposed upright portions of said substantially U-shaped frame;

means for disposing said sharpening stone between said opposed upright portions of said substantially U-shaped frame;

means for simultaneously translating and rotating a dart to be sharpened across said sharpening stone between said opposed upright portions of said substantially U-shaped frame, said means including a dart holder wherein the dart to be sharpened may be fixedly secured, said means being disposed between said opposed upright portions of said substantially U-shaped frame and being rotatable about an axis adjacent and substantially parallel to said sharpening stone, so that the dart may first be secured within said dart holder, and, subsequently, by rotating said means for simultaneously translating and rotating the dart about said axis, the dart may be brought into contact with said sharpening stone for sharpening;

wherein said means for simultaneously translating and rotating a dart to be sharpened across said sharpening stone comprises:

a substantially rectangular frame having a length substantially equal to that of said sharpening stone, said rectangular frame including two widthwise members and two lengthwise members defining a rectangular opening, said two widthwise members having extensions in a common direction, said extensions being used to connect said rectangular frame to said substantially U-shaped frame by directing a bolt through one of said extensions, through one of said opposed upright portions of said substantially U-shaped frame, through the other of said opposed upright portions, and through the other of said extensions, and by placing a nut upon said bolt, said rectangular frame thereby being rotatable about said bolt and affixed to said substantially U-shaped frame, said lengthwise members of said rectangular frame each having a guide rail within said rectangular opening and one of said lengthwise members having a rack gear attached thereto;

a carrier, said carrier being disposed within said rectangular opening and translatable back-and-forth lengthwise therewithin, said carrier having guide grooves on two opposed surfaces, said guide grooves cooperating with said guide rails on said lengthwise members to maintain said carrier within said rectangular opening, said carrier having a cylindrical hole directed therethrough, said cylindrical hole having a diameter greater than the distance separating said guide rails, so that said guide rails, cooperating with said guide grooves, may extend into said cylindrical hole through said carrier;

a rod, said rod having a first end, said first end having an enlarged knob, said rod being directed and extending through one of two widthwise members of said rectangular frame, said rod further having a second end, said second end threadingly engaging within a hole in said carrier, so that said rod may be used to translate said carrier back-and-forth within said rectangular opening; and

a dart holder, said dart holder including a cylindrical shaft having an axial bore, said cylindrical shaft having a diameter substantially equal to that of said cylindrical hole in said carrier, said cylindrical shaft having a groove on an outer surface, so that said guide rails of said lengthwise members of said rectangular frame may hold said cylindrical shaft within said cylindrical hole in said carrier, said cylindrical shaft further having a threaded internal opening for said axial bore and a toothed external flange, so that said rack gear on one of two said lengthwise members of said rectangular frame may rotate said cylindrical shaft when said carrier is translated within said rectangular opening, said dart holder further including a resilient, compressible member within said axial bore of said cylindrical shaft and a threaded end cap, said threaded end cap being screwed into said threaded internal opening of said axial bore to compress said resilient, compressible member therewithin to narrow said axial bore, said end cap having a central hole, so that a dart may be inserted therethrough, and through said axial bore in said cylindrical shaft to be firmly held by said resilient, compressible member for sharpening against said sharpening stone.

5,199,225

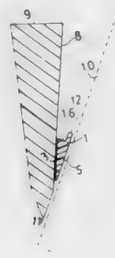
BLADE SHARPENING GUIDE

Renato Esposito, 18700 SW. 84th Crt., Miami, Fla. 33157

Filed Jul. 29, 1992, Ser. No. 921,227

Int. Cl.[5] B24B *3/54*

U.S. Cl. 51—214 12 Claims



1. A sharpening guide for grinding a blade having two broad surfaces against an abrading surface at a fixed angle, said guide comprising:

A) an elongate strip having a uniform cross section in the shape of a wedge;

B) a first broad face of said wedge having an adhesive means thereon for removably affixing to one of said broad surfaces of said blade;

C) a second broad face of said wedge arranged at said fixed angle relative to said first broad face, said second broad face arranged to be held flat against an abrading surface while said guide is removably affixed to said blade to thereby grind said blade at said fixed angle relative to said broad surface;

D) a narrow face of said wedge joining said first and second broad faces; and

E) release means extending from said narrow face for facilitating removal of said guide from said blade after grinding.

5,199,226

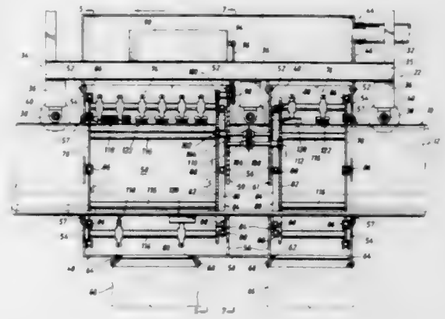
METHOD AND APPARATUS FOR REMOVING OUTER COATINGS FROM PIPE

James L. Rose, Houston, Tex., assignor to E. B. Thomas, Houston, Tex.

Continuation-in-part of Ser. No. 646,499, Jan. 28, 1991, Pat. No. 5,107,633, which is a continuation-in-part of Ser. No. 470,819, Jan. 26, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 743,989

Int. Cl.[5] B08B *9/02*; E08B *9/38*; B24C *3/06*

U.S. Cl. 51—317 39 Claims



1. Apparatus for removing a coated material from the outer surface of a pipe supported above the ground adjacent a ditch receiving the pipe; said apparatus comprising:

a side boom tractor for supporting the pipe above the ground;

a skid pulled by said side boom tractor adjacent a side of the pipe;

a carriage adjacent said side boom tractor including a support frame having rollers contacting the outer surface of said pipe supporting the carriage for movement along the pipe to remove the coated material from the outer surface of the pipe; said carriage comprising:

an enclosed housing supported from said support frame extending about said pipe and having a discharge opening, said enclosed housing including a pair of side sections mounted on said support frame for pivotal movement between an inoperable open position for removal from said pipe and an operable closed position about said pipe;

means for selectively opening and closing said discharge opening;

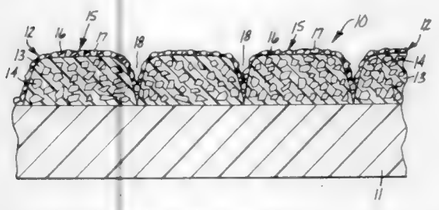
means within the enclosed housing movable in a generally transverse direction relative to the longitudinal axis of the pipe for contacting and removing the coated material from the pipe in small particles; and

collecting means connected to said housing at said discharge opening for receiving and collecting the waste coated material removed from the pipe for disposal at a remote disposal site.

and having an edge portion adapted to form an enclosure

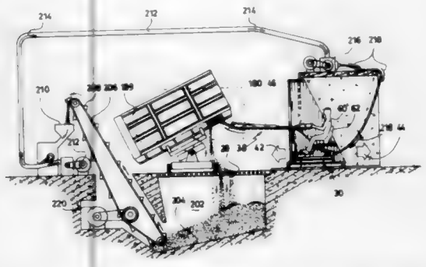
said rear flat surface and a front surface adjacent said front

5,199,227
SURFACE FINISHING TAPE
Michihiro Ohishi, Sagamihara, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 624,569, Dec. 10, 1990, Pat. No. 5,147,416.
This application Mar. 12, 1992, Ser. No. 849,933
Claims priority, application Japan, Dec. 20, 1989, 1-330470
Int. Cl.[5] B24B *11/00*
U.S. Cl. 51—395 14 Claims



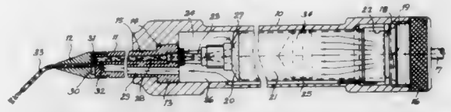
1. A surface finishing tape comprising:
(a) a base portion having a sheet-like backing one surface of which is covered with an assemblage composed of a plurality of closely spaced protuberances, adjacent protuberances being separated by narrow spaces, wherein said protuberances are comprised of a mixture of binder and solid particles which are selected from the group consisting of silica, talc, aluminum hydroxide, clay, barium hydroxide, aluminum oxide, silicon carbide, boron nitride, chromium oxide, iron oxides, calcium carbonate and mixtures thereof; and
(b) an abrasive layer which contains premium abrasives particles in a binder covering the surface of each of said protuberances without completely filling said narrow spaces whereby to provide grinding debris-collecting grooves between abrasive-covered protuberances.

5,199,228
SANDBLASTING SYSTEM AND PROCESS
Normand R. Beausoleil, 717, Rang St-Amable, St-Gabriel-de-Brandon, Quebec, Canada J0K 2N0
Filed Apr. 15, 1992, Ser. No. 868,527
Claims priority, application United Kingdom, Apr. 19, 1991, 9108518
Int. Cl.[5] B24C *3/10, 9/00*
U.S. Cl. 51—417 9 Claims



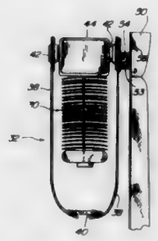
1. A surface treatment system adapted to project a material, said system comprising,
a vertical flat protecting wall provided with a narrow slit horizontally extending across said wall, said wall has a transparent window extending above the slit,
a control center mounted on a platform longitudinally displaceable parallel to said wall, along one side thereof,
an operator's seat mounted on said platform, and means for vertically displacing said seat relative to said slit,
a stand for supporting an article having a large surface to be treated, said stand mounted in a blasting housing located on a side of the wall opposite the seat, means for pivoting said stand about a vertical and a horizontal axis,
an elongated tubular gun extending through said slit of said wall into said housing for projecting said material in said housing, said gun being pivotally mounted on a post fixed on said platform adjacent said wall, said gun being pivoted on said post for projecting around vertical and horizontal axis of an angle of about 180 degrees, said gun extending between said housing and said seat through said slit, said gun having a pair of handles for manually directing said gun in a plurality of angular directions across and along said slit,
a movable shelter for said control center, said shelter having a substantially horizontal floor fixed to said protecting wall, means for moving said shelter in a direction perpendicular to said wall, actuating means mounted on said platform for moving said platform on said floor parallel to said wall,
said control center comprising first and second pedals located between said seat and said wall, said pedals adapted to be actuated by an operator sitting on said seat, a first electric switching device and a first lever adapted to be actuated by said first pedal for operating said first switching device for actuating said shelter moving means, a second electric switching device and a second lever adapted to be actuated by said second pedal for operating said second switching device for moving said platform,
whereby said gun is adapted to laterally project said material on said article when the platform is laterally displaced from side to side along said slit, and when the gun and the stand are pivoted about their vertical axes and whereby the gun is adapted to upwardly and downwardly project said material on said article when the gun and the stand are pivoted about a horizontal axis.

5,199,229
SAND BLASTING DEVICE
Wolf-Dietrich Herold, Seefeld; Peter Koran, Weilheim, and Rudolf Haas, Unterbrunn, all of Fed. Rep. of Germany, assignors to THERA Patent GmbH & Co., KG Gesellschaft Fur Industrielle Schutzrechte, Seefeld, Fed. Rep. of Germany
Filed Feb. 26, 1991, Ser. No. 660,608
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 9002268[U]
Int. Cl.[5] B24C *5/04;* A61C *3/025*
U.S. Cl. 51—439 7 Claims



1. A hand-held device for treating small surface areas with a jet of pressurized air containing sand particles, comprising
a compartment for holding a supply of said sand,
a piston rearwardly confining said compartment and adapted to be advanced by pressurized air,
a feed channel communicating with the front end of said compartment,
an inlet opening provided in a wall of said compartment in a region where it communicates with said feed channel, for admitting pressurized air into the compartment for fluidizing the sand,
a head portion including a mixing chamber for mixing the sand supplied through said feed channel with pressurized air,
a nozzle for blasting the mixture onto the surface area to be treated, and
a sealing cup of air-permeable foamed plastics filter material and having an edge portion adapted to form an enclosure around an area to be treated, a window pane opposite said edge portion, and a peripheral wall with a passage for passing a front portion of said nozzle into said enclosure.
4. A hand-held device for treating small surface areas with a jet of pressurized air containing sand particles, comprising a nozzle for blasting said jet onto the surface area to be treated, and a sealing cup of air permeable, foamed plastics filter material, said cup including an edge portion adapted to form an enclosure around the area to be treated, a window pane opposite said edge portion, and a peripheral wall with a passage for passing a front portion of said nozzle into said enclosure.

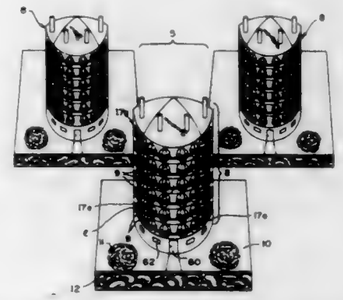
5,199,230
VENETIAN BLIND STORAGE ASSEMBLY
Dana K. Gehman, Somerset, Pa., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.
Filed May 26, 1992, Ser. No. 888,891
Int. Cl.[5] E04B *7/16*
U.S. Cl. 52—66 12 Claims



1. A venetian blind assembly for use in a collapsible tent trailer, comprising:
a venetian blind;
means for mounting the venetian blind to an interior of the collapsible tent trailer;
a pouch enclosing slats of the venetian blind, the pouch being sized to enclose the slats while the venetian blind is retracted and having a bottom opening sized to allow the slats of the venetian blind to extend downwardly from the pouch while the venetian blind is expanded, and
closure means for closing the bottom opening of the pouch while the venetian blind is retracted.

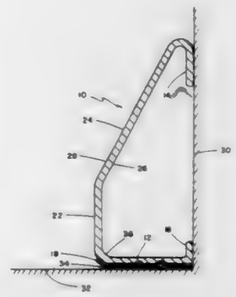
5,199,231
VILLAGES OF MOLDED HOUSES
DeLora B. Dever, 601 NE. S. Shore Rd., Portland, Oreg. 97211
Filed Jan. 15, 1992, Ser. No. 820,759
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—79.1 14 Claims

1. A multipurpose structure comprising:
a) a plurality of housing units;
b) a core support building or elliptical shape comprising a front curved surface and a rear flat surface whereby said housing units are disposed thereon said front curved surface; and
c) a support slab for mounting said core support building thereon whereby said slab includes a rear portion adjacent said rear flat surface and a front surface adjacent said front curved surface, said rear portion comprising means for



providing a balancing weight relative to said front portion to balance said plurality of housing units.

5,199,232
CHANNEL FORMING DEWATERING DEVICE
Darrell A. Chandler, 335 Beechwood Dr., and Gary E. Money, 116 Autumn Dr., both of Campbellsville, Ky. 42718
Filed Nov. 8, 1990, Ser. No. 610,507
Int. Cl.[5] E02D *27/00*
U.S. Cl. 52—169.5 6 Claims



1. A channel forming dewatering device for placement against a wall and attachment to a floor with an adhesive comprising:
a. a baseboard member for attachment to said floor with said adhesive;
b. a flexible liner placed between said baseboard and said floor, said flexible liner being attached to said baseboard member and adhering to said floor with said adhesive, said flexible liner allowing movement of said baseboard member with respect to said floor;
c. a lower flange that contacts with said wall proximate to said floor;
d. a web attached to said lower flange, said web attached to said floor proximate to said wall;
e. a bend attached to said web away from said lower flange;
f. a vertical section rising vertically from attachment to said bend;
g. an angular section attached to said vertical section;
h. an upper flange attached to said angular section such that said lower flange and said upper flange are in substantially alignment, and said upper flange contacts said wall; and
i. wherein said web and said liner are integrally constructed.

5,199,233
(a) a glass unit;

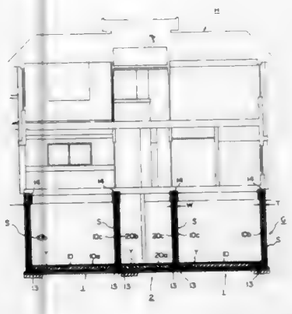
tially planar surface for the clean room panel wall system
(a) an inboard glass lite;

5,199,233

PREFABRICATED CONCRETE BASEMENT AND PROCESS FOR CONSTRUCTING THE SAME

Hideo Fukutomi; Hideaki Sagawa, and Takashi Minakuchi, all of Tokyo, Japan, assignors to Misawa Homes Co. Ltd., Tokyo, Japan

Filed May 17, 1991, Ser. No. 702,070
Claims priority, application Japan, May 23, 1990, 2-133165; Jun. 8, 1990, 2-150304
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—169.14 24 Claims



1. A concrete prefabricated basement having a plurality of underground units, each of said underground units forming a rectangular box-shaped structure with an open top, each of said underground units comprises a plurality of precast concrete blocks abutted one to another at parallel planes perpendicular to the direction along the longitudinal direction of the underground units, the blocks being integrated with each other by a first connection means and

wherein said precast concrete blocks comprising at least one main body block having a first bottom plate section and two opposing first side plate sections integrally formed with said first bottom plate section so as to sandwich said first bottom plate section therebetween, said first bottom plate section and said two first side plate sections defining a U-shaped perpendicular cross-section, and at least two gable blocks having a second bottom plate section and three second side plate sections integrally formed with said second bottom plate section, with two of said second side plate sections opposing one another, and the remaining second side plate section being in contact a three end faces thereof with said two opposing second side plate section and said second bottom plate section of the main body block and said three second side plate sections of the gable block defining the rectangular box-shaped structure with an open top face;

each of said blocks having a previously formed waterproof layer and protective layer, said protective layer lying on said waterproof layer, over the entire outer surface of the bottom plate portion and the side plate portions of the blocks; and

said underground units being arranged side by side in the lateral direction of the underground units, with any adjacent two of said plurality of underground units being connected to each other.

5,199,234

SKYLIGHT ASSEMBLY

James C. Guhl, Hudson, Wis., assignor to Andersen Corporation, Minn.

Filed Jan. 8, 1991, Ser. No. 638,831
Int. Cl.[5] E04B *7/18*
U.S. Cl. 52—200 18 Claims

1. A skylight assembly adapted to be mounted to cover an opening in a roof structure of a building, comprising:

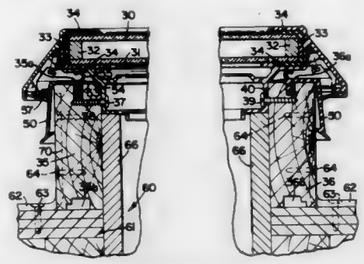
(a) a glass unit;

(b) a fiberglass sash member, said window unit positioned in said sash member;

(c) a frame operatively connected to said sash member, said frame comprising:

(i) said frame having an inside surface and an outside surface;

(ii) said sash member having an attachment flange positioned proximate said inside surface; and



(iii) means for securing said attachment flange to only said inside surface, wherein said glass unit may be replaced from inside of the building by removal of said securing means, whereby said sash member and glass unit may be removed and replaced;

(d) means for operatively connecting said frame to the roof structure; and

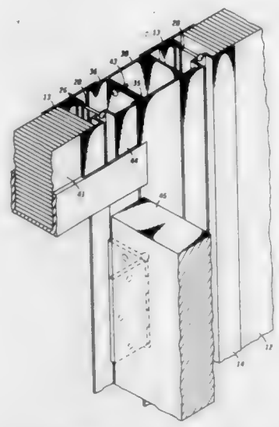
(e) a gasket operatively connected to said frame and positioned between said frame and said sash member forming a weatherstrip.

5,199,235

CLEAN ROOM WALL SYSTEM

Michael H. Holkenbrink, and David G. Madden, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 20, 1990, Ser. No. 569,301
Int. Cl.[5] E04B *2/74;* E06B *1/04*
U.S. Cl. 52—211 4 Claims



1. A panel wall system for a clean room environment having at least one substantially planar surface which deters the accumulation of particulates, comprising:

a plurality of flat wall panels, having a first side and a second side, being interconnected by battens, providing a substantially planar surface for the clean room panel wall system on at least the first side;

at least one opening through one of the plurality of wall panels for mounting an accessory in the panel wall system;

means for joining the accessory to the wall panel, which means maintains the substantially planar surface of the first side;

at least one door panel, allowing passage through the panel wall system, the door panel having a first edge and a second edge;

means for hinging the door panel to the panel wall system, which means maintains the substantially planar surface of the first side;

at least one transom, having a first side and a second side, the first side facing the same direction as the substantially planar surface; and

means for mounting the transom above the door panel, which means maintains the substantially planar surface of the first side,

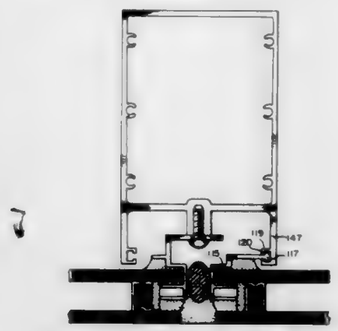
wherein the means for hinging the door panel to the panel wall system comprises a door jamb element, having a front side, a back side, an outer edge, and an inner edge, the outer edge being formed such that the outer edge can be coupled to a wall panel using battens, the front side and back side being formed such that when the outer edge is coupled to the wall panel, the front side aligns with the first side of the wall panel in a substantially planar fashion, and the back side aligns with the second side of the wall panel in a substantially planar fashion, the front side further being formed such that the inner edge of the front side extends laterally in such a fashion as to form a wide lip against which the door panel rests when in a closed position, the back side further being formed such that the inner edge of the back side extends laterally in such a fashion as to form a narrow lip, a space existing between the wide lip and the narrow lip corresponding to the width of the door jamb element, at least one notch being machined in the narrow lip to accept a butt hinge, the butt hinge being coupled to the first edge of the door panel, the butt hinge further being coupled to the door jamb element in such a fashion that the narrow lip bears the weight of the butt hinge and of the door panel.

5,199,236

INSULATED GLASS/FLUSH OUTER SURFACE ARRANGEMENT

Glenn R. Allen, Burnaby, Canada, assignor to Aluglass Trading Company Limited, Canada

Filed Apr. 29, 1991, Ser. No. 693,336
Int. Cl.[5] E04C *2/46;* E04B *1/60*
U.S. Cl. 52—235 21 Claims



1. A pre-fabricated insulated window assembly for flush mounting to the grid frame or mullion of a building, said assembly comprising:

(a) an inboard glass lite;

(b) an outboard glass lite;

(c) separator means disposed around the inner periphery of said lites for maintaining parallel separation of said lites;

(d) sealing means disposed around said inner periphery for maintaining an airtight seal around said periphery;

(e) a peripheral gap formed between said lites by insetting said separator means and said sealing means from the edges of at least two opposed sides of said lites;

(f) first and second retaining means provided in said gap on at least said two opposed sides respectively for assisting in retaining said lites in spaced relation to one another and for attaching said assembly to said grid frame, each of said retaining means further comprising:

(i) a channel for mating with and tightly gripping one edge of said inboard lite;

(ii) a first bonding surface protruding into said gap, generally parallel to and spaced from the inner plane surface of said outboard lite to define a first recess for receiving bonding material; and,

(iii) engagement means projecting inwardly relative to the inner surface of said inboard lite for engaging said grid frame;

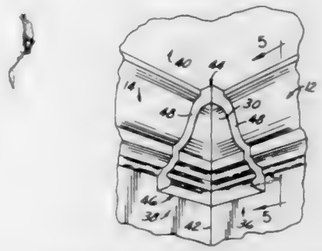
said engagement means for said first retaining means further comprising a quick-fit positioning and retaining element mating with a complementary element on or fixed to said grid frame for quick, initial, positive positioning of one side of said assembly relative to said grid frame and, said engagement means for said second retaining means further comprising means for retaining in place a series of fasteners mating with complementary fastening means in or cooperating with said grid frame for subsequently fixing said second retaining means in place on said grid frame.

5,199,237

MITERLESS MOLDING SYSTEM

William H. Juntunen, Middlebury, Ind., assignor to Abitibi-Price Corporation, Troy, Mich.

Filed Dec. 30, 1991, Ser. No. 816,347
Int. Cl.[5] E04B *5/00*
U.S. Cl. 52—288 12 Claims



1. A receptacle providing the exterior appearance of a finished joint of two adjacent lineal moldings received on at least one wall of a room which comprises: a body having an opaque front face overlying adjacent ends of adjacent lineal moldings, at least two opaque side faces of which extends generally transverse to an adjacent portion of said front face and extends across the entire face width of an underlying lineal molding, each of said two side faces having an edge contoured for complimentarily mating engagement with the outer surface of an underlying lineal molding, said front face being generally planar, said two side faces each having a contoured edge being generally parallel to each other, and each said contoured edge in cooperation with said body and an underlying portion of a wall providing a recess telescopically receiving a portion of a lineal molding with its adjacent end underlying said body.

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second wall's abutting surface a tongue having a base, sides

station for forming fish in said filled pockets thereat into desired shapes during said remainder of said cycle of operation, a

flower pot; wherein the sheet of material comprises an

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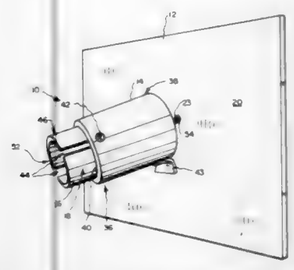
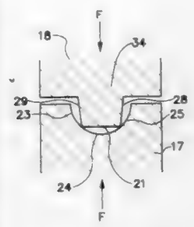
5,199,238
WALL REPAIR DEVICE
Luis L. Maestas, 785 N. 50 West, Midway, Utah 84049
Filed May 31, 1991, Ser. No. 708,190
Int. Cl.[5] E02D *37/00*
U.S. Cl. 52—514 **16 Claims**



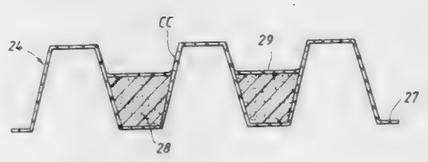
1. A device to aid in the repair of a hole in a wall in which two outer sheets are connected to opposing side faces of each of a series of studs, said device comprising:
a rigid mounting plate having top and bottom faces,
a first hollow cylinder having top and bottom portions and forming a cavity,
a second hollow cylinder disposed within the cavity of the first cylinder so as to be in telescoping relationship to the first cylinder, the second cylinder having top and bottom portions,
advancing means for selectively drawing the second cylinder outwardly through the top portion of the first cylinder to an extended position, and
means hingedly connecting the bottom portion of the first hollow cylinder to the top face of the mounting plate such that the first cylinder is brought into a position normal to the mounting plate while the second cylinder is drawn outwardly by the advancing means,
such that the top portion of the second cylinder contacts one of the two outer sheets and the bottom portion of the first cylinder contacts the top face of the mounting plate, the bottom face of the mounting plate contacting the other of the two outer sheets to substantially cover a hole therein.

5,199,239
HOUSING SEAL INTERFACE
Edgar W. Younger, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 30, 1991, Ser. No. 767,581
Int. Cl.[5] B65D *43/04*
U.S. Cl. 52—595 **12 Claims**



1. An interface assembly for sealing, abutting surfaces of first and second walls, against penetration by fluids at least one wall is comprised of nearly rigid material which deforms under load, comprising in the first wall and extending along at least a portion of the abutting surface a groove having an opening of predetermined width and an interior surface having opposing walls converging toward the bottom thereof, and along the second wall's abutting surface a tongue having a base, sides projecting from the base, and an end surface spaced from the base and intersecting both sides, the intersection of said end surface and said sides defining corners spaced from each other by a predetermined amount less than the predetermined width of the groove's mouth, said tongue and groove having relative dimensions and shapes allowing the tongue to enter the groove and mate with non-surface contact therewith, with each corner of the tongue forming a line of contact with one of the groove's walls, and clamping means in mechanical connection with the walls for forcing the tongue's corners against the groove's sides and for causing deformation of at least one of the tongue and the groove along the lines of contact between the tongue's corners and the groove's walls.

5,199,240
BUILDING PANEL AND METHOD OF MAKING SAME
Herbert J. Ewald, Jr., 615 Avenue A., Karnes, Tex. 78118
Filed Oct. 21, 1991, Ser. No. 780,259
Int. Cl.[5] E04C *2/32*
U.S. Cl. 52—814 **3 Claims**

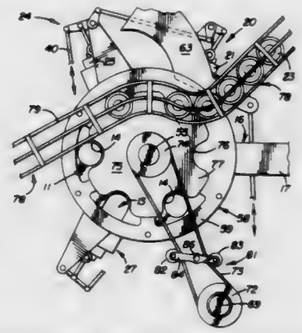


1. A panel, comprising
a sheet of relatively rigid plastic material having longitudinally extending, laterally spaced first walls and longitudinally extending, laterally spaced second walls extending between and connecting adjacent first walls to form elongate, oppositely facing channels,
elongates rod of foamed plastic material filling the channels to a depth at which they longitudinally overlap with rods in adjacent channels, and
layers of relatively rigid, plastic material disposed over and onto the outer faces of the rods and joined to the first and second walls of the channel in which the rods are disposed.

5,199,241
CAN STAR DRIVE FOR SOLID PACK TUNA CANNING MACHINES
Jack Gorby, Los Angeles, and Edward J. Rowley, Azusa, both of Calif., assignors to Sea-Pac, Inc., Gardena, Calif.
Filed Dec. 30, 1991, Ser. No. 814,150
Int. Cl.[5] B65B *63/02*
U.S. Cl. 53—122 **7 Claims**

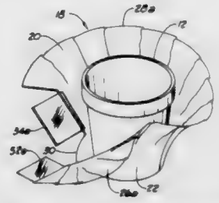
1. In a cyclically-operating fish-canning machine having first and second turrets rotatable about a common axis, each turret having a plurality of fish-receiving and forming pockets therewithin which extend through the turret from side-to-side thereof and a pocket entrance through the periphery of the turret, the first turret having N pockets spaced equidistantly around its periphery, N being an integer, and the second turret having 2N pockets spaced equidistantly around its periphery, said machine having first, second and third spaced-apart operational stations adjacent the peripheries of said turrets, said turrets being positionable at said first station with one pocket of both of said turrets being in alignment with each other, means at said first station for filling both of the aligned pockets with fish, means for rotating said first turret through 360°/N and said second turret through 180°/N during a part of each cycle of operation to move the filled pockets thereof from said first station to said third and second stations, respectively, and to hold said turrets against rotation for a remainder of said cycle of operation, forming means at said second and third

station for forming fish in said filled pockets thereat into desired shapes during said remainder of said cycle of operation, a can star rotatable coaxially with said turrets, said can star having 2N can holders spaced equidistantly around its periphery, can guide means for feeding cans to and taking cans away from said can star, and plunger means at said second and third stations for ejecting fish from said turret pockets into cans held by said can star can holders during a portion of said remainder of said cycle of operation, the improvement comprising:



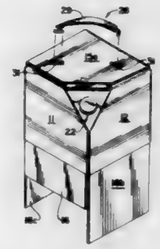
can star drive means separate from said means for rotating said first and second turrets for (a) holding said can star against rotation with two of its can holders at said second and third stations respectively during the portion of a cycle that said plunger means operate to eject fish from said turret pockets, and for (b) rotating said can star through 360°/N during a length of time in the rest of said cycle of operation, which is substantially longer than the length of time that said first turret rotates through 360°/N during a cycle of operation.

5,199,242
METHOD FOR WRAPPING FLOWER POTS USING A SELF ADHERING WRAPPING MATERIAL
Donald E. Weder, Highland; William F. Straeter, Breese; Joseph G. Straeter, Highland, all of Ill.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill., and Jack W. Redditt, Nashville, Tenn., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 368,597, Jun. 20, 1989, Pat. No. 5,007,229, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Mar. 29, 1991, Ser. No. 677,225
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] B65B *11/56, 11/48*
U.S. Cl. 53—397 **25 Claims**



1. A method of wrapping at least a portion of a flower pot, comprising:
providing a wrapping material comprising a sheet of material sufficiently sized to wrap at least a portion of the flower pot; wherein the sheet of material comprises an upper surface and a lower surface; and a cling material secured to a portion of the sheet material,
wherein the cling material is capable of connecting to the sheet of material and itself upon contacting engagement and wherein the sheet of material with the cling material connected thereto is wrappable about the flower pot whereby portions of the cling material contactingly engage and connect to portions of the wrapping material for generally securing the sheet of material wrapped about at least a portion of the flower pot,
wrapping the flower pot by disposing the sheet of material about the flower pot so that portions of the cling material contactingly engage and connect to portions of the wrapping material for generally securing the sheet of material about at least a portion of the flower pot.

5,199,243
CONTAINER
Frank Vlasaty, Huntley, Ill., and Robert J. Smith, Rapid City, S. Dak., assignors to American Colloid Company, Arlington Heights, Ill.
Division of Ser. No. 729,932, Jul. 15, 1991, Pat. No. 5,106,015. This application Jan. 27, 1992, Ser. No. 826,092
Int. Cl.[5] B65B *7/20, 61/14, 61/18*
U.S. Cl. 53—410 **3 Claims**



1. A method of assembling and filling a container for a granular material, comprising the steps of:
(a) cutting a blank from a flat sheet of foldable material, said blank having four vertical sides, top side sections, bottom side sections, and a glue tab;
(b) folding said connected four vertical sides and sealing said glue tab;
(c) folding and sealing said top side sections;
(d) mounting a pouring spout at a corner formed by said top side sections and two of said vertical sides, and fastening a cap to said spout;
(e) positioning said container with said top side sections facing downwardly;
(f) filling said container by pouring the granular material through an opening formed between said bottom side sections and into direct contact with said vertical sides and said top side sections; and
(g) folding and sealing said bottom side sections.

5,199,244
PILLOW FILLING APPARATUS
Scott B. Beier, and Gary L. Pospisal, both of Omaha, Nebr., assignors to Products Unlimited, Inc., Omaha, Nebr.
Filed Mar. 12, 1990, Ser. No. 491,951
Int. Cl.[5] B65B *1/04, 63/00*
U.S. Cl. 53—428 **10 Claims**

8. A method for filling a pillow tick with filling material, comprising the steps of:
providing a source of filling material and an apparatus for loosening and fluffing the filling material;

operating said loosening and fluffing apparatus so as to pro-

discharge means at a discharge position adjacent an un-

between a starting position on opposite sides of the webs and a welding position, in which the webs are held together with the

5,199,249
FARM MACHINE ADAPTABLE TO THE CONTOUR OF

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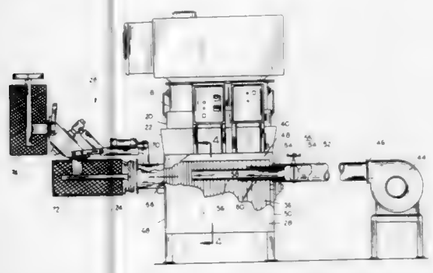
operating said loosening and fluffing apparatus so as to produce fluffed material;

providing means for creating an air current which flows from said fluffing apparatus into an open pillow tick; and



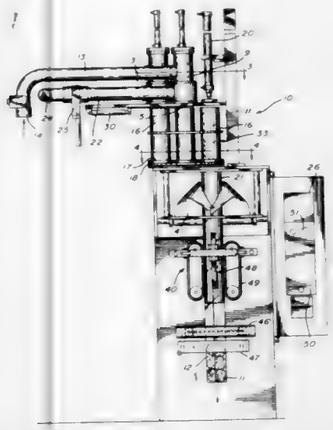
throwing said fluffed material from said fluffing apparatus into said air current downstream of the means for creating the air current, to be carried unobstructed to said pillow tick.

5,199,245

METHOD AND APPARATUS FOR PACKAGING CLOTH ARTICLES

Leo Daddario, and Antonio Peixeiro, both c/o Europak Packaging Machinery Inc., 1155 Autoroute 13, Laval, Quebec, Canada H7W 5J8

Filed Oct. 1, 1991, Ser. No. 769,456
Int. Cl.[5] B65B *35/50*
U.S. Cl. 53—447 **13 Claims**



11. A method of packaging two or more light-weight cloth articles in a containment means, said method comprising the steps of:

(i) conveying a cloth article in each of two or more loading conduits by controlled air flow means;

(ii) retaining said cloth articles in retention means associated with each of said loading conduits;

(iii) simultaneously transferring said cloth articles from said retention means of said loading conduits into associated ones of three or more discharge means;

(iv) accumulating a predetermined number of said articles in each of said discharge means,

(v) displaying each of said discharge means in a serial path and in alignment with said retention means of said loading conduits to facilitate the transfer and accumulation of said articles in each of said discharge means,

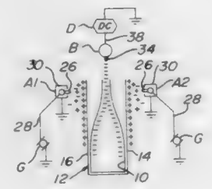
(vi) discharging the articles contained within one of said discharge means at a discharge position adjacent an unloading means after it has accumulated said predetermined number of said articles.

5,199,246

ELECTROSTATIC METHOD AND APPARATUS FOR OPENING LINERS WITHIN CONTAINERS

Richard D. Rodrigo, Line Lexington, Pa., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 8, 1992, Ser. No. 941,796
Int. Cl.[5] B31B *7/00*; **B65B** *43/26, 61/00*
U.S. Cl. 53—449 **8 Claims**



1. A method for opening liners of containers in order to maintain the liners in spread apart open disposition prior to filling, comprising,

(a) placing a partially open liner in an open container with the upper end of each facing upwardly,

(b) directing a stream of A.C. air ions toward opposing outside walls of the container,

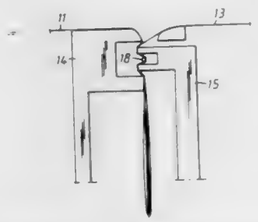
(c) directing a stream of D.C. air ions toward the partially open liner so that the interior surfaces of the liner will become charged opposite to the charge on the walls of the container and effect electrostatic adhesion of the walls of the liner to the walls of the container and in spread apart disposition against the walls of the container.

5,199,247

ARRANGEMENT FOR ENVELOPING OBJECTS IN ENVELOPING MATERIAL TAKEN FROM TWO STORAGE REELS

Claes Björkman, Essingeringen; Leif Lundblad, Djurgardsslätten, and Tord Pettersson, Skolvägen, all of Sweden, assignors to Nybo Seal System AB, Stockholm, Sweden

Filed May 20, 1992, Ser. No. 886,528
Int. Cl.[5] B65B *51/30, 51/14, 61/10, 9/02*
U.S. Cl. 53—554 **14 Claims**



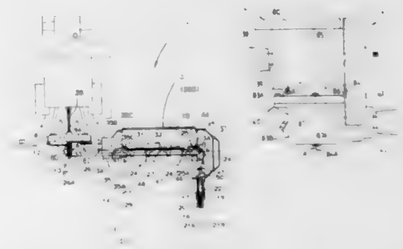
1. An arrangement for enveloping an object which is located between two heat-weldable webs of enveloping material which are taken from respective storage reels and joined together downstream of said object in a transverse direction of the webs, said arrangement including two mutually coacting welding jaws for joining the webs together at a point upstream of the object, which jaws extend in the transverse direction of the webs across the width thereof and of which one is a wire-carrying jaw which carries a heating wire and the other jaw is a forked jaw having two fork legs having ends separated by a fork gap said jaws being moveable relative to one another between a starting position on opposite sides of the webs and a welding position, in which the webs are held together with the free ends of the fork legs in abutment with one side of the webs and with the heating wire located in the mouth region of the fork gap and between said leg ends and abuts the other side of the webs, and in which, when hot, the wire functions to weld said material webs together and to burn off or melt off the webs within the weld region so as to separate the enveloped object from rearwardly located parts of enveloping material, wherein a major part of the heating wire is free from a remainder of the wire-carrying jaw, and wherein, in the welding position, at least one of the jaws is biased by a spring device towards a further position in which the wire is located within the forked jaw, between the legs thereof at a distance from the mouth of the fork gap and out of contact with the webs of enveloping material.

5,199,249

FARM MACHINE ADAPTABLE TO THE CONTOUR OF THE LAND AND HAVING A PIVOTING HOUSING

Bernard Wattron, Haegen, and Rino Ermacora, St Jean Saverne, both of France, assignors to Kuhn, S.A., Saverne Cedex, France

Filed Nov. 12, 1991, Ser. No. 790,486
Claims priority, application France, Nov. 12, 1990, 90 14186
Int. Cl.[5] A01D *34/66*
U.S. Cl. 56—15.2 **20 Claims**



1. A farm machine comprising:

a connecting means for connection to a three-point hitch of a motor vehicle;

a body connected to said connecting means through a first joint, said first joint having an upwardly directed axis, said body comprising at least one work element which is driven by a transmission means comprising gear means;

a maneuvering means and a gear device for pivoting said body around said axis of said first joint;

a first housing rigidly connected to said connecting means, said first housing comprising an input shaft; and

a second housing rotatably connected to said body, said second housing comprising an output shaft which extends in a direction of said body;

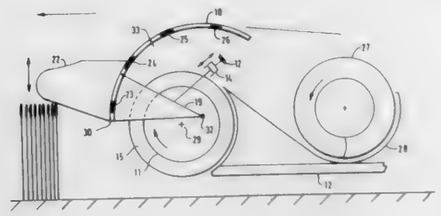
wherein, in a vicinity of said first joint, said body is connected to said connecting means through a second joint, said second joint having an axis which is at least approximately perpendicular to the axis of the first joint and to a longitudinal axis of said body, and a universal joint telescopic shaft transmits a rotational movement of said output shaft of said second housing to an input shaft of an intake housing connected to said body.

5,199,248

GRAIN LOSS MONITOR

Oliver D. Hale, Haynes; Robert N. Hobson, Cople, and Vien N. Nguyen, Hockley, all of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB90/01458, § 371 Date Jun. 26, 1991, § 102(e) Date Jun. 26, 1991, PCT Pub. No. WO91/03928, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 21, 1990, Ser. No. 689,759
Claims priority, application United Kingdom, Sep. 21, 1989, 8921404
Int. Cl.[5] A01D *41/06*
U.S. Cl. 56—102 **33 Claims**



1. Apparatus for harvesting required crop parts from standing crop comprising:

crop stripping means for stripping from a standing crop required parts of the crop;

guide means cooperating with the crop stripping means to form a crop flow passage for detached crop parts;

detector means positioned in the region of the crop flow passage for monitoring a characteristic of the trajectory of detached crop parts along the passage;

operating means for varying an operating parameter for the apparatus which influences the trajectory of detached crop parts along the passage in operation; and

signal processing means for processing signals from the detector means, the signal processing means having an output connected to the operating means for adjusting the operating means in response to the output of the detector means.

5,199,250

HARVESTING MACHINE HAVING AN ORIENTATION ELEMENT

Rino Ermacora, St Jean Saverne, and Bernard Wattron, Haegen, both of France, assignors to Kuhn, S.A., Saverne Cedex, France

Filed Nov. 12, 1991, Ser. No. 790,767
Claims priority, application France, Nov. 12, 1990, 90 14185
Int. Cl.[5] A01D *34/66*
U.S. Cl. 56—15.2 **41 Claims**

1. A harvesting machine comprising:

a body which rests on the ground both in a work position and in a transport position through at least one wheel, said at least one wheel being connected directly or indirectly to said body through a first joint, said first joint having an upwardly directed axis;

a first locking means for stopping a pivoting of said at least one wheel around the axis of said first joint;

connecting means which is to be rigidly connected, at least during work, to a motor vehicle, said body being connected to said connecting means through a connecting

device, said connecting device comprising a second joint

said positioning means comprising adjustable stop means receiving position and for movement of the tube to a transfer

below said trailing edge, said leading cutting member

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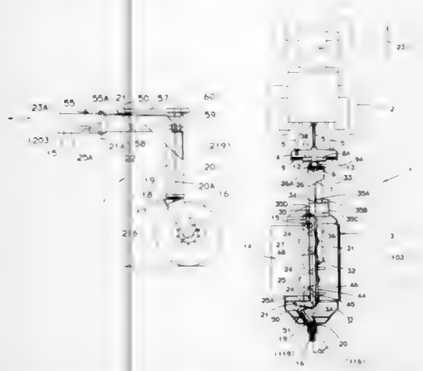
device, said connecting device comprising a second joint having an upwardly directed axis; and

a second locking means for stopping a pivoting of said body around the axis of said second joint;

wherein:

said body is movable from a work position, in which a longitudinal axis of said body extends crosswise to a direction of work, to a transport position in which said longitudinal axis extends at least approximately parallel to a direction of transport, such that:



at work, said second locking means stops the pivoting of the body around the axis of said second joint, while said at least one wheel is capable of pivoting around the axis of said first joint; and

during transport, said first locking means, stops the pivoting of said at least one wheel around the axis of said first joint, while said body is capable of pivoting around the axis of said second joint;

wherein said harvesting machine further comprises orientation means for orienting, for the transport of said harvesting machine, said at least one wheel in the direction of transport.

5,199,251

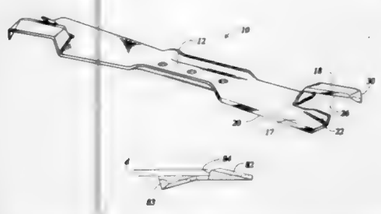
MULCHING BLADE INCLUDING MULTIPLE CUTTING EDGES

Russell V. Rouse; James R. Powers, both of Conyers, and Frank H. Hancock, Jr., McDonough, all of Ga., assignors to Snapper Power Equipment Division of Fuqua Industries, Inc., McDonough, Ga.

Filed Dec. 19, 1991, Ser. No. 810,816

Int. Cl.[5] A01D *34/72, 34/73*

U.S. Cl. 56—255 **7 Claims**



1. A grass cutting blade for cutting grass or other vegetation, comprising:

a mounting portion for mounting relative to a rotatable shaft; a first end; and

a second end opposing said first end and including leading and trailing cutting members, said leading and trailing cutting members each defining corresponding leading and trailing cutting edges, said leading cutting edge being below said trailing edge, said leading cutting member including an upturned foil portion for causing upward air and grass clippings flow upon rotation of said blade in its cutting direction, said foil portion having an upper edge portion which upon rotation of said blade travels in a path substantially parallel to the cutting path of said trailing cutting edge,

such that as said blade rotates, grass is first clipped by said leading cutting edge, a portion of said grass clippings are directed upwardly by said foil into the cutting path of said cutting edge, and then clipped a second time in midair by said trailing cutting edge.

4. A grass cutting blade for cutting grass or other vegetation, comprising:

an elongate body for mounting relative to a rotatable shaft; a first end; and

a second end opposing said first end and including leading and trailing cutting members and an upturned foil included in said leading cutting member, said leading and trailing cutting members each defining corresponding leading and trailing cutting edges, said leading cutting edge being below said trailing edge, said upturned foil including an upper edge which upon rotation of said blade travels in a path substantially parallel to the cutting path of said trailing cutting edge, and said trailing cutting member including a downturned and inwardly directed portion which directs air flow downwardly and inwardly toward the rotational axis of said blade,

such that as said blade rotates, grass is first clipped by said leading cutting edge and directed upwardly and airborne by said upturned foil into the cutting path of said trailing cutting edge.

5,199,252

WHEEL RAKE

Kenneth I. Peeters, Bear Creek, Wis., assignor to H & S Manufacturing Co., Inc., Marshfield, Wis.

Filed Apr. 3, 1991, Ser. No. 679,723

Int. Cl.[5] A01D *57/12, 67/00, 78/14*

U.S. Cl. 56—377 **10 Claims**

1. An agricultural implement comprising:

a primary frame having a front end, a rear end and opposed sides;

a secondary frame operably supporting a bank of ground driven wheel rakes;

joint means for operably, pivotally coupling said secondary frame to said primary frame;

extension means operably coupling said secondary frame to said primary frame for shifting said secondary frame between a folded, transport position and an extended, raking position wherein said secondary frame is oriented at a raking angle relative to said primary frame; and

positioning means operably carried by said extension means for selectively positioning said secondary frame at one of a plurality of raking angles,

said extension means comprising a telescoping member shiftable between a collapsed configuration and an extended configuration, said telescoping member operably extending between said primary frame and said secondary frame, said positioning means comprising adjustable stop means operably coupled to said telescoping member for determining the length of said telescoping member when in said extended configuration.

5,199,253

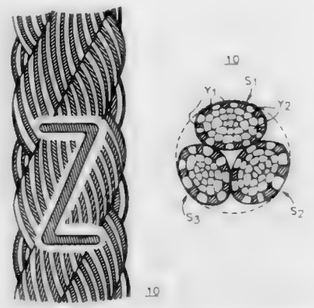
NYLON ROPE HAVING SUPERIOR FRICTION AND WEARING RESISTANCE

George A. Berger, Lafayette, La., assignor to American Manufacturing Company, Inc., Lafayette, La.

Continuation of Ser. No. 553,883, Jul. 16, 1990. This application Feb. 13, 1992, Ser. No. 833,611

Int. Cl.[5] D02G *3/02, 3/36*

U.S. Cl. 57—236 **20 Claims**



1. A rope formed of only synthetic fibers exhibiting excellent resistance to wet abrasion comprising:

a plurality of strands, each strand including a core portion and a cover portion;

said core portion being comprised of a plurality of yarns of a first type, each yarn being formed of a plurality of filaments formed of nylon;

said cover portion being comprised of a plurality of yarns of said first type and a plurality of yarns of a second type, each yarn of said second type being formed of a plurality of filaments formed of nylon, said first and second type yarns being arranged in alternating fashion about said core portion;

said filaments in said first type of yarn having a first cross-sectional, non-circular, shape for providing said first type of yarn with greater abrasion resistance than said second type of yarn and said filaments in said second type of yarn having a second cross sectional shape different from said first cross sectional shape for providing said second type of yarn with a greater flexibility than said second first type of yarn.

5,199,254

DEVICE FOR SEQUENTIALLY LOADING ORIENTATED TUBES ONTO THE DOFFING BELT OF A SPINNING MACHINE

Roberto Badiali, Pordenone; Amedeo Quaia, Porcia, and Luciano Bertoli, Pordenone, all of Italy, assignors to Savio S.p.A., Pordenone, Italy

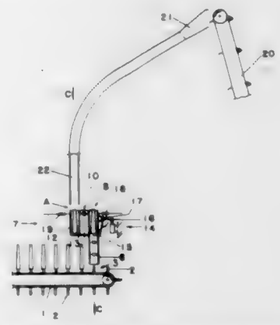
Filed Jun. 20, 1991, Ser. No. 717,934

Claims priority, application Italy, Jun. 27, 1990, 20808 A/90

Int. Cl.[5] D01H *9/12, 3/02*

U.S. Cl. 57—281 **11 Claims**

1. A device for loading empty spinning tubes onto pegs of a doffing belt of a spinning machine, comprising: a tube raising member extending above said belt, a tube orienting member operatively positioned over said doffing belt which positions and maintains positioned over said doffing belt which positions and maintains the tubes in a vertical position, and an intermediate storage device between said tube duct and said doffing belt containing movable compartments for receiving a tube in a vertical position in each compartment from the tube duct at a receiving position and for movement of the tube to a transfer position wherein the tube is dischargeable from the compartment in a vertical position onto a receiving peg on the doffing belt.



5,199,255

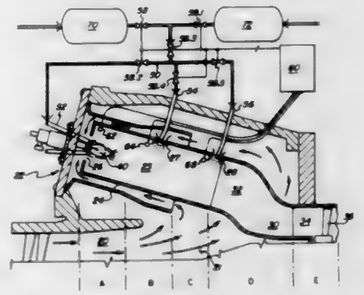
SELECTIVE GAS-PHASE NOX REDUCTION IN GAS TURBINES

William H. Sun, and William F. Michels, both of Aurora, Ill., assignors to Nalco Fuel Tech, Naperville, Ill.

Filed Apr. 3, 1991, Ser. No. 679,803

Int. Cl.[5] F02G *3/00*

U.S. Cl. 60—39.02 **18 Claims**



1. A method for reducing the NO_x level in the hot combustion gas stream of a gas turbine having a compressor stage for producing a high-speed, pressurized flow of combustion air, a combustion chamber where fuel is burned and to which compressed combustion air is admitted at selected axially-spaced positions, a transition stage following the combustion chamber and before a turbine section, and a turbine section where kinetic energy from a rapidly-moving stream of heated combustion gases is converted to rotary motion comprising the step of:

introducing droplets of an aqueous solution comprising from 1 to 20% of a nonvolatile NO_x-reducing agent selected from the group consisting of urea, cyanuric acid, carbamate, cyanamide, methyl amine, biuret, and mixtures of any of these, at an axial position selected to enable significant reduction of NO_x within a desired axial zone within the turbine, with the droplets being of a size within the range of 10 to 50 microns and NO_x-reducing agent concentration effective to evaporate within the desired axial zone and enable selective, gas-phase reaction to reduce NO_x dispersed throughout the stream of combustion gases, and with the droplet size further being selected so as to avoid impacting on turbine blades.

5,199,256

50% and more than 10% of the internal cross section of the

5,199,259

ASSEMBLY COMPOSED OF A PRESSURIZED FLUID

supply face of the cylinder-block and the communication

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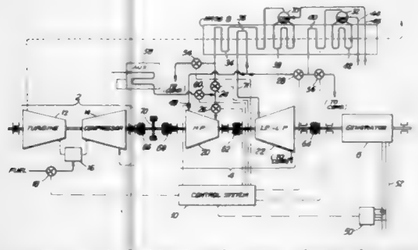
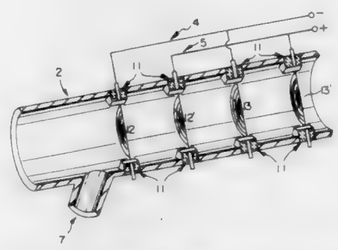
5,199,256
OVERSPEED PROTECTION FOR A GAS TURBINE/STEAM TURBINE COMBINED CYCLE
James H. Moore, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 766,282, Sep. 27, 1991, abandoned, which is a continuation of Ser. No. 593,389, Oct. 2, 1990, Pat. No. 5,099,643, which is a continuation of Ser. No. 302,169, Jan. 26, 1989, abandoned. This application Jul. 15, 1992, Ser. No. 914,012
Int. Cl.[5] F02C *6/18*
U.S. Cl. 60—39.182 **3 Claims**



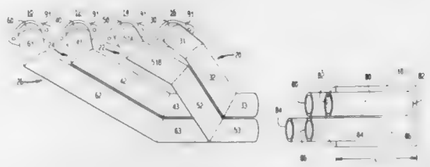
1. An improved combined cycle power plant and overspeed protection system of the type having a reheat stem turbine including a high pressure steam turbine section with at least one control valve, and a lower pressure steam turbine section; a gas turbine including a turbine section, a combustor, a fuel valve supplying said combustor, and an air compressor with a discharge end leading to said combustor; a load driven by said reheat steam turbine and said gas turbine; said reheat steam turbine, said gas turbine and said load all having rotating members; a heat recovery steam generator heated by said gas turbine, including a high pressure steam generating section supplying steam to said high pressure steam turbine section through said control valve, and a steam reheater section receiving steam exhausted from said high pressure steam turbine section; the improvement comprising:
a valveless steam conduit connected between the outlet of said steam reheater section and the inlet of said lower pressure steam turbine section,
a plurality of solid couplings serving to solidly couple said rotating members together as a single rotor, said rotor having a single thrust bearing, and
control means for sensing a potential overspeed condition operatively connected to said control valve and said fuel valve to prevent overspeed,
whereby the steam in said steam reheater and in said valveless steam conduit may freely expand through said lower pressure steam turbine and potential overspeed of said rotor is resisted by the combined inertia of said coupled rotating members and by the braking torque of said air compressor.

5,199,257
DEVICE FOR REMOVAL OF PARTICULATES FROM EXHAUST AND FLUE GASES
Angelo Colletta; Giampaolo Giromella, and Medardo Pinti, all of Rome, Italy, assignors to Centro Sviluppo Materiali S.p.A., Rome, Italy
Division of Ser. No. 468,148, Jan. 22, 1990, abandoned. This application May 20, 1992, Ser. No. 900,705
Claims priority, application Italy, Feb. 10, 1989, 47637 A89
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—275 **1 Claim**

1. In a device for reduction of exhaust gas particulates in an exhaust pipe, comprising in combination a two-pole high-voltage generator, a plurality of conductors alternately connected to one or the other of said poles, said conductors constituting substantially the only obstruction to flow of exhaust gas through said pipe and occupying a total area which is less than 50% and more than 10% of the internal cross section of the pipe, said connectors each consisting of a conductive metal grid arranged inside said pipe perpendicular to the general direction of flow of said exhaust gases, and means for introducing air into said pipe upstream of said conductors; the improvement wherein each said conductive metal grid is of spiderweb configuration consisting of a plurality of radially extending wires supporting and spacing apart a plurality of concentric circular wires.

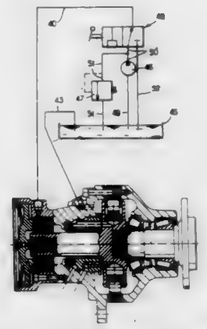


5,199,258
ADJUSTABLE TORQUE/HORSEPOWER EXHAUST CONTROL SYSTEM
Randolph S. Barth, 55 Moreau Ave., Freehold, N.J. 07728
Filed Feb. 20, 1992, Ser. No. 838,015
Int. Cl.[5] F02B *27/02*
U.S. Cl. 60—313 **8 Claims**



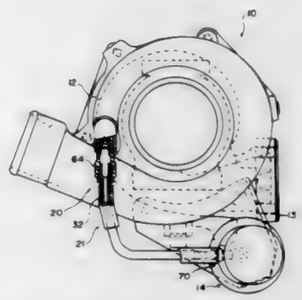
1. In a header system of an automotive vehicle, the combination comprising:
a collector pipe of inner diameter D_1, outside diameter D_2, and length L;
a plate, internally secured to said pipe substantially perpendicular to the length thereof, and having a plurality of equiangularly spaced apertures equidistant from one another;
a first plurality of pipes, individual ones of which being securably coupled with respective ones of said plurality of apertures; and
a second plurality of pipes, individual ones of which being coupled from a head of an internal combustion engine to a respective one of said first plurality of pipes;
with each of said first plurality of pipes having an inside diameter greater than the outside diameter of each of said second plurality of pipes;
whereby each of said second plurality of pipes slidably couples with each of said first plurality of pipes and is slidably removable therefrom; and
with each of said second plurality of pipes being composed of a plurality of pipe segments, individual ones of which being of pre-selected length, and cut at their respective ends at pre-selected angles, for joining together in orientation to traverse component parts of said automotive vehicle engine and exhaust system.

5,199,259
ASSEMBLY COMPOSED OF A PRESSURIZED FLUID MECHANISM AND A DISC BRAKE COUPLED THERETO
Marc L. Perot, Eve, and Alain W. Noel, Verberie, both of France, assignors to Poclain Hydraulics, Verberie, France
Filed Nov. 28, 1990, Ser. No. 619,137
Claims priority, application France, Nov. 29, 1989, 89 15733
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—435 **3 Claims**



1. In an assembly composed of a pressurized fluid mechanism, motor or pump, and of a disc brake coupled thereto, comprising:
a principal housing;
a reaction cam;
a cylinder-block mounted for relatively rotation with respect to said cam about a geometrical axis and provided with a supply face;
a plurality of cylinders arranged in the cylinder-block, substantially radially with respect to said geometrical axis;
a plurality of pistons, mounted to slide in said cylinders and capable of being in abutment on said cam, preferably via roller bearings;
an internal fluid distributor valve, substantially stationary, vis-á-vis rotation about said geometrical axis, with respect to said cam and provided with a communication face capable of being disposed in abutment on said supply face of the cylinder-block the substantially tight mutual abutment of said supply and communication faces defining within the principal housing two enclosures separated by said supply and communication faces, with neither of said two enclosures being connected to a supply fluid and said two enclosures being substantially free of said supply fluid;
a first disc brake element, fast with respect to rotation about said geometrical axis, with a first of the two parts—cylinder-block and cam—and bearing a first set of brake discs;
a second disc rake element, fast with respect to rotation about said geometrical axis, with the second of said two parts—cylinder-block and cam—, and bearing a second set of brake discs;
a thrust member capable of being in abutment on a brake disc disposed at the end of a stack constituted by the assembly of the brake discs of said first and second sets of brake discs;
a motive braking member, coupled to said thrust member and capable of provoking a braking thrust displacement on said stack of brake discs; and
a brake-release jack coupled between said thrust member and said second disc brake element and comprising a brake-release chamber capable of containing a brake-release fluid under pressure, whose effect is the elimination of the braking thrust on said stack;
the brake-release chamber is in permanent communication with a first of said two enclosures, therefore insulated from the second enclosure by the mutual abutment of the supply face of the cylinder-block and the communication face of the distributor valve, said permanent communication being entirely within the motor or pump and said permanent communication being independent of control means between the break-release chamber and the first of said two enclosures.

5,199,260
WASTEGATE ACTUATOR CONTROL VALVE FOR A TURBOCHARGER
Michael A. Iwick, Carol Stream, Ill., assignor to Navistar International Transporation Corp., Chicago, Ill.
Filed Dec. 16, 1991, Ser. No. 808,407
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—602 **11 Claims**



1. In a wastegate valve assembly for a turbocharger, said assembly including a wastegate actuator for controlling said valve in response to turbocharger compressor outlet pressure being transmitted thereto through a means establishing fluid communication between a compressor housing of the turbocharger and an inlet of said wastegate actuator, the improvement comprising a control valve assembly for said actuator disposed in said fluid communication means between said compressor and said wastegate actuator, said control valve assembly comprising:
a valve housing including an inlet thereto communicating with said compressor, an outlet therefrom communicating with said wastegate actuator, and an internal cavity,
a slidable piston disposed in said cavity, said piston being biassed to a first position closing said inlet and having a second position displaced from said inlet upon said compressor pressure being sufficiently large to overcome said bias, said piston having communication means permitting pressurized air entering said inlet, upon said piston being in said second position, to be communicated to said valve housing outlet, said piston communication means comprises a flat in a peripheral sidewall of said piston and a metering orifice through said sidewall into said flat, said valve housing further having a bleed orifice therein, said orifice being disposed to be blocked by said piston when said piston moves to said second position displaced from said inlet.

5,199,261
INTERNAL COMBUSTION ENGINE WITH TURBOCHARGER SYSTEM
Glenn L. Baker, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Continuation of Ser. No. 566,087, Aug. 10, 1990, abandoned. This application Aug. 4, 1992, Ser. No. 925,320
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—612 **3 Claims**

1. A turbocharger system for an internal combustion engine having an exhaust port and an intake port comprising:

a first turbocharger having an operational limit and a first

nected to an auxiliary crankshaft, means for reciprocating the

said reaction tank, said impeller producing a flow pat- tween said first and second fuel passages; and a plurality of gas

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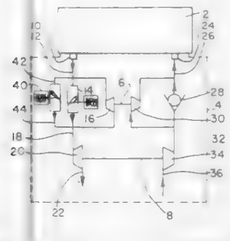
a first turbocharger having an operational limit and a first turbine connected to the exhaust port of the engine via a first exhaust line and a first compressor connected to the intake port of the engine via a first intake line;

a second turbocharger relatively larger than said first turbocharger and having a second turbine connected to said first turbine via a second exhaust line and a second compressor connected to said first compressor via a second intake line;

a first exhaust flow control means between said first exhaust line and said second exhaust line in parallel with said first turbine for bypassing at least a portion of the exhaust from the engine past said first turbine to said second turbine, said first exhaust flow control means being biased to be at



least partially closed but being openable solely in response to an exhaust pressure increase from the exhaust port sufficient to overcome said bias such that sufficient exhaust is diverted to said second turbine that said first turbine is prevented from exceeding said operational limit when the operating conditions of the engine increase; and

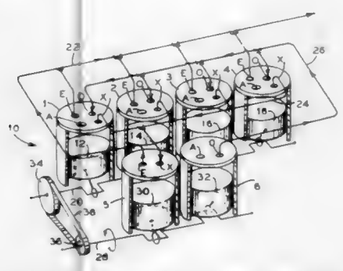
an intake air control means between said first compressor line and said second compressor line in parallel with said first compressor for bypassing at least a portion of the air from said second compressor past said first compressor to the engine, said intake air control means being biased closed but being openable in response to an intake air pressure increase from said second compressor above a predetermined pressure.

5,199,262

COMPOUND FOUR STROKE INTERNAL COMBUSTION ENGINE WITH CROSSOVER OVERCHARGING

James A. E. Bell, Oakville, Canada, assignor to Inco Limited, Toronto, Canada

Filed Nov. 5, 1991, Ser. No. 788,005
Int. Cl.[5] F02G *3/02*
U.S. Cl. 60—622 **10 Claims**



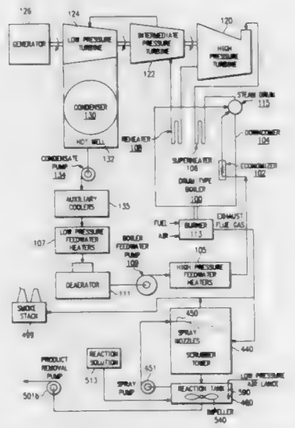
1. A reciprocating piston four stroke internal combustion engine, the engine comprising a plurality of associated combustion pistons and cylinders, the combustion pistons rotatably connected to a power crankshaft, means for introducing fuel into the combustion cylinders, at least one expansion piston and cylinder, at least one compression piston and cylinder, the expansion piston and the compression piston rotatably connected to an auxiliary crankshaft, means for reciprocating the expansion piston and the compression piston at least twice as fast as the combustion pistons, means for introducing air into the combustion cylinders and the compression cylinder, means for exhausting the combustion cylinders and the expansion cylinder, crossover means for flowably connecting the combustion cylinders to the expansion cylinder, and overcharging means for flowably connecting the compression cylinder to the combustion cylinders.

5,199,263

COMBUSTION SYSTEM WITH REDUCED SULFUR OXIDE EMISSIONS

Terence W. Green, Temple, and Melanie K. Lange, Milam County, both of Tex., assignors to Texas Utilities Electric Co., Dallas, Tex.

Filed Aug. 12, 1991, Ser. No. 744,061
Int. Cl.[5] F01K *21/00;* **C01B** *17/00*
U.S. Cl. 60—670 **18 Claims**



1. A coal-fired steam-electric power generating station, comprising:

(a) a burner;

(b) a boiler which converts feed water into steam by using heat generated by said burner;

(c) a steam turbine connected to receive steam from said boiler and to generate electricity accordingly;

(d) a smokestack connected to discharge exhaust gases from said burner into the atmosphere; and

(e) a scrubber interposed to receive at least part of the flow of exhaust gases from said burner to said smokestack, said scrubber including:

(i) a scrubber tower connected to an exhaust of said burner so that exhaust gases flow through the interior of said scrubber tower;

(ii) spray nozzles positioned and connected so that droplets of liquid emitter by said spray nozzles travel through the interior of said scrubber tower;

(iii) a reaction tank connected to receive the liquid flow from said scrubber tower;

(iv) a reaction solution makeup source connected to supply a slurry containing carbonates to said reaction tank wherever the pH in said reaction tank falls below a predetermined level;

(v) a product removal pump connected to remove dense particulates from the bottom of said reaction tank;

(v) a main spray pump connected to pump solution from said reaction tank to supply said nozzles;

(vi) at least one motor-driven impeller in the interior of said reaction tank, said impeller producing a flow pattern which sweeps fine particulates off the bottom of said reaction tank; and

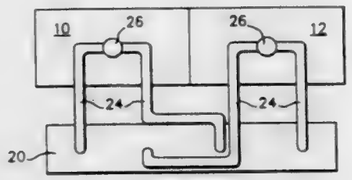
(vii) one or more lances which are connected to a low-pressure air supply and are positioned to introduce air bubbles into said reaction tank near the bottom thereof.

5,199,264

STEAM OPERATED TURBINE-GENERATOR INSTALLATIONS

Paul W. Viscovich, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1991, Ser. No. 653,569
Int. Cl.[5] F01K *7/22*
U.S. Cl. 60—679 **19 Claims**



1. In a power generating installation including a steam turbine-generator system, a source of steam under pressure, and steam conditioning means, wherein the steam turbine-generator steam includes a high pressure turbine and at least one low pressure turbine, each turbine having a team inlet and an exhaust outlet, and an output shaft coupled to all turbines, and the steam conditioning means are connected between the exhaust outlet of the high pressure turbine and the steam inlet of the low pressure turbine and comprise means for removing moisture from, and reheating, steam flowing between the exhaust outlet of the high pressure turbine and the steam inlet of the low pressure turbine, the improvement wherein said means for removing moisture and reheating comprise two structurally separate devices which include a reheating device which functions exclusively to add heat to the steam and a moisture separating device which acts to remove moisture from the steam, and said reheating device comprises: a housing; a plurality of tubes arranged in a bundle in said housing; and conduit means for conducting steam from said source of steam into said tubes and for directing steam from the exhaust outlet of said high pressure turbine, through said housing and around said tubes, and to the steam inlet of at least one low pressure turbine.

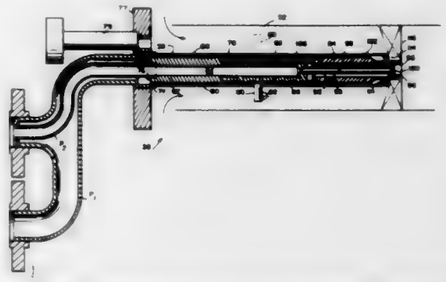
5,199,265

TWO STAGE (PREMIXED/DIFFUSION) GAS ONLY SECONDARY FUEL NOZZLE

Richard J. Borkowicz, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1991, Ser. No. 680,073
Int. Cl.[5] F23R *3/34*
U.S. Cl. 60—737 **13 Claims**

1. A secondary nozzle for a gas turbine which includes primary and secondary combustion zones, the secondary nozzle comprising: an elongated, tubular nozzle body having an inlet end and an outlet end; a tubular core assembly having an outer diameter less than an interior diameter of said tubular nozzle body to thereby define a first axial fuel passage between said core assembly and said tubular nozzle body extending to at least one discharge orifice at said outlet end, and a second axial fuel passage through said core assembly extending to a pilot orifice at said outlet end; an air passage located along at least a portion of said tubular nozzle body and located radially between said first and second fuel passages; and, a plurality of gas injectors extending radially out of said elongated tubular nozzle body from said second fuel passage, upstream of said outlet ends.

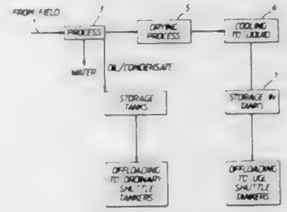


5,199,266

UNPROCESSED PETROLEUM GAS TRANSPORT

Arne Johansen, Grimstad, Norway, assignor to Ugland Engineering A/S, Grimstad, Norway

Filed Feb. 20, 1992, Ser. No. 837,963
Claims priority, application United Kingdom, Feb. 21, 1991, 9103622
Int. Cl.[5] F25J *1/00;* **F17C** *13/08*
U.S. Cl. 62—8 **7 Claims**



1. A method of dealing with unprocessed petroleum gas obtained under pressure from a well stream of an oil or gas production field, comprising separating liquids and solids from said unprocessed gas drying said unprocessed gas, cooling said unprocessed gas under sufficient pressure to produce liquefied unprocessed petroleum gas al a temperature of not lower than −120° C., and placing said liquefied unprocessed petroleum gas in storage tanks at a temperature between about −100° C. and −120° C. and a pressure of from 10 to 30 Bar for transportation to a remote processing and/or distribution station.

5,199,267

GAS CIRCULATION TYPE GAS LASER APPARATUS AND METHOD OF OPERATING THE SAME

Jin Mitsui, Chigasaki, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 15, 1992, Ser. No. 822,609
Claims priority, application Japan, Jun. 4, 1991, 3-132913
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.1 **13 Claims**

1. A method for performing laser oscillation in a gas laser apparatus while circulating a laser gas medium containing a rare gas,

preliminarily applying a solidifiable gas which is not a component of the laser gas medium and which solidifies at a trap temperature in a low temperature trap containing a

filler, to solidify said solidifiable gas and thereby forming

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partially defrosting the ice formed around said protruding parts so that said ice falls off after the predetermined

condensing said refrigerant from a gas to a liquid;

evaporating said refrigerant in the evaporator, while passing

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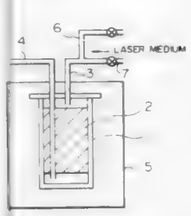
filler, to solidify said solidifiable gas and thereby forming an adsorption surface; and



then, contacting said laser gas medium with said low temperature trap.

5,199,268

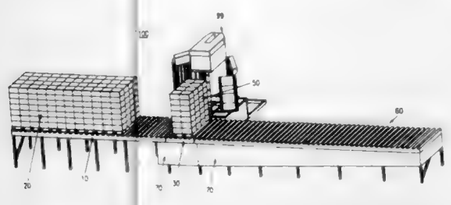
AUTOMATIC IN-FEED CONVEYOR SYSTEM FOR AN ICE INJECTOR SYSTEM

Richard V. Crabb, Jr., Pacific Grove; Rich Fischer, Aromas, and Kevin Nobusada, Salinas, all of Calif., assignors to Post-Harvest Technologies, Inc., Salinas, Calif.

Filed Feb. 6, 1992, Ser. No. 832,460

Int. Cl.[5] F25D *17/02*

U.S. Cl. 62—60 **15 Claims**



8. An improved apparatus for simultaneously injecting coolant into a plurality of produce containers stacked together and having sides with openings therein, said apparatus of the type having a holding tank for containing the coolant and having a top opening, a support for holding said container stack in a position above said holding tank and over said top opening, a frame to enclose one side of said container stack and including a frame side wall facing the container sides having inwardly facing ports therein aligning with said container openings, means to shift at least some of said frame side walls into contact with said container stack, means to pump coolant from said holding tank into said ports and through said container openings into said containers to cool the produce therein, and drain means for catching and guiding any overflow coolant back into said holding tank, wherein the improvement to said apparatus comprises:

a first conveyor means for receiving a supply of container stacks;

a shuttle means for receiving from said first conveyor a container stack, transporting said container stack into said coolant injection system and retrieving said stack therefrom, said shuttle means having a collection means for receiving said overflow coolant from said container stack and routing said coolant back to said coolant tank;

a second conveyor means for receiving from said shuttle means said container stack, said second conveyor means having a collection means for receiving said overflow coolant from said container stack and routing said coolant back to said coolant tank;

sensing means for detecting the presence and movement of said container stack and generating electrical signals; and

control means for receiving said electrical signals and converting said signals into new signals to control said apparatus.

5,199,269

PELLETISER AND METHOD FOR MAKING FROZEN PELLETS

Alvar Andersson, Viken, Sweden, assignor to Frigoscandia Food Process Systems Aktiebolag, Helsingborg, Sweden

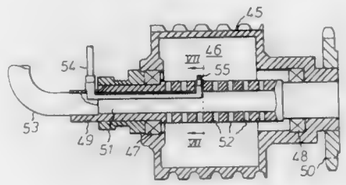
PCT No. PCT/SE89/00268, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO89/11228, PCT Pub. Date Nov. 30, 1989

PCT Filed May 17, 1989, Ser. No. 613,531

Claims priority, application Sweden, May 18, 1988, 8801850

Int. Cl.[5] F25D *13/06;* **A23G** *9/00;* **F25C** *1/00*

U.S. Cl. 62—63 **6 Claims**



1. A pelletizer for making pellets from a liquid or semi-liquid food product which has been refrigerated to a moldable consistency, said pelletizer comprising:

two facing, hollow molding rolls having slidingly intermeshing teeth of rounded complimentary shape;

said teeth of both rolls having axially spaced-apart recesses extending circumferentially throughout the entire width of each tooth, said recesses having an arcuate profile in a longitudinal section along an axis of said roll;

the center distance of spaced-apart recesses of each tooth being substantially equal to the axial width of said recesses, the recesses of one roll being axially located between the recesses of the other roll;

such that during rotation of said molding rolls, the recesses of each tooth define individual pellet-shaped and, once per revolution of each of said molding rolls, almost completely closed cavities; and

further comprising freezing means for freezing the outer surface of said moldable consistency food product and simultaneously molding said food product into pellets without substantial compression thereof in said individual pellet-shaped recesses when said food product is fed between said rolls, said freezing means comprising a refrigerator and means for feeding a refrigerant from said refrigerator to the hollow interior of each of said hollow molding rolls.

5,199,270

PROCESS AND DEVICE FOR MAKING ICE CUBES

Marcellus C. P. L. Simkens, Hoogweg 24, Wingene, Belgium 8050

PCT No. PCT/BE90/00040, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/01472, PCT Pub. Date Feb. 7, 1991

PCT Filed Jul. 6, 1990, Ser. No. 807,874

Claims priority, application United Kingdom, Jul. 21, 1989, 8916712

Int. Cl.[5] F25C *5/08*

U.S. Cl. 62—73 **14 Claims**

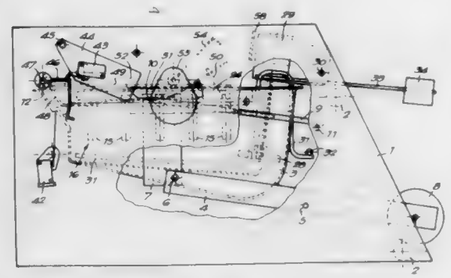
1. Process for making ice cubes, comprising:

moving a tank with water into an uppermost position around downwardly directed protruding parts,

refrigerating the protruding parts when the tank is in said uppermost position so that ice is formed around said protruding parts,

moving said tank from its uppermost position to a lowermost position by supplying water to said tank, after a predetermined amount of ice has been formed around said protruding parts and,

partially defrosting the ice formed around said protruding parts so that said ice falls off after the predetermined amount of ice has been formed around said protruding parts, wherein an upper grid hingedly mounted around a horizontal axis is pushed up, by the movement of the tank from said lowermost position to said uppermost position into an uppermost position in which position it is located



between the protruding parts so that, when ice is formed around said parts the grid is situated above the ice cubes and cannot go downward as long as all the ice cubes have not yet fallen off, and wherein the defrosting is only stopped and subsequently the refrigerating of the protruding parts restarted after said grid has hinged downwards from its uppermost position, and thus after all the ice cubes have fallen off.

5,199,271

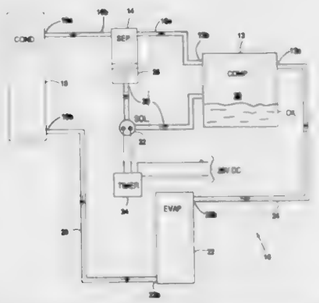
AIR CONDITIONING SYSTEM HAVING TIMED OIL DRAIN SEPARATOR

John W. Ewer, San Antonio, Tex., assignor to Zee Systems, Inc., San Antonio, Tex.

Filed Jan. 24, 1991, Ser. No. 645,223

Int. Cl.[5] F25B *43/02*

U.S. Cl. 62—84 **19 Claims**



17. An improved method for air conditioning space within a general aviation aircraft using an air conditioning system lubricated by an oil miscible with a refrigerant, and having a compressor, a condenser, and an evaporator, the system further having a separator between the compressor and the condenser, the separator containing a drain line to the compressor, the drain line having a timer actuated normal open solenoid valve, the method comprising:

compressing the gaseous refrigerant, said compressing step including the admixing of a portion of the lubricating oil with the refrigerant;

expelling the admixed composition from the compressor at the high end thereof;

separating the lubricating oil from the refrigerant;

storing the separated lubricating oil;

condensing said refrigerant from a gas to a liquid;

evaporating said refrigerant in the evaporator, while passing air from the air conditioned space through the evaporator;

returning said refrigerant to an inlet of the compressor; and

periodically returning the stored lubricating oil to the compressor through the drain line.

5,199,272

IDLING SPEED CONTROL SYSTEM

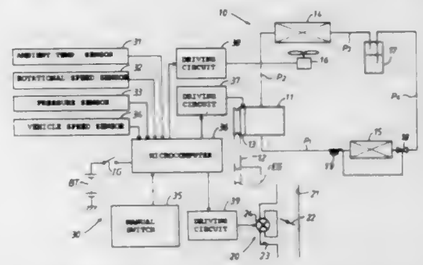
Yasushi Yamanaka, Nakashima; Shigeo Numazawa, Nagoya; Hideki Suzuki, Chita; Hiroshi Kishita, and Yasuyuki Nishi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 4, 1992, Ser. No. 893,848

Claims priority, application Japan, Oct. 9, 1991, 3-261953

Int. Cl.[5] B60H *1/32*

U.S. Cl. 62—133 **11 Claims**



1. An idling speed control system for an engine of an automotive vehicle which is equipped with a refrigeration circuit for circulating refrigerant through a compressor, which is variable in a capacity of the discharged refrigerant, driven by the engine, a condenser and an evaporator, the idling speed control system comprising:

control means for controlling a quantity of an air flow sucked into a combustion chamber of the engine,

detecting means for detecting numerical information required for measuring or calculating a first influence degree given to an output of the engine by the compressor during operation of the refrigeration circuit,

estimating means for estimating, in accordance with said numerical information, a second influence degree which will be given to the engine output by the compressor and will be required for maintaining cooling ability of the refrigeration circuit in a predetermined state under condition that the engine drives the compressor at a predetermined idling speed, and

output means for outputting a control signal dependent on said estimated second influence degree to said control means prior to idling operation of the engine and for rendering said control means controlling said quantity of the air flow in accordance with said estimated second influence degree.

5,199,273

REACH-IN COOLER WITH INTERCHANGEABLE REFRIGERATOR AND FREEZER SYSTEMS

Robert K. Silva, Two Rivers, and Kenneth L. Kaiser, Manitowoc, both of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Sep. 28, 1990, Ser. No. 589,929

Int. Cl.[5] F25D *19/00*

U.S. Cl. 62—298 **21 Claims**

21. A reach-in cooler comprising:

a) an insulated cabinet member having a door, a door opening and a roof member;

b) an interchangeable refrigeration system mounted on the roof member and having an electrical control box, the control box having a receptacle; and

c) heater wires positioned around the perimeter of the door

tected by the generator output saturation detection means

ing means and said supporting means collectively maintain said

provided with an open front end with a closed rear end; door

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c) heater wires positioned around the perimeter of the door opening and terminating in a plug, the plug mating with the receptacle in the control box such that the connection

between the heater wires and the control box on the interchangeable refrigeration system can be made by plugging the plug into the receptacle.

5,199,274

AUTOMOTIVE AIR CONDITIONING APPARATUS

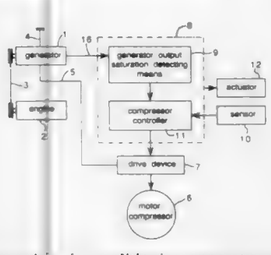
Makoto Yoshida, Kusatsu; Sugimatsu Hasegawa, Otsu, and Masafumi Nishimiya, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 17, 1992, Ser. No. 900,937

Claims priority, application Japan, Jun. 17, 1991, 3-144464; Apr. 1, 1992, 4-079448

Int. Cl.[5] F25B *27/00;* **B60H** *1/32*

U.S. Cl. 62—228.4 **1 Claim**



1. An automotive air conditioning apparatus comprising an automotive generator that is driven by the engine output and comprises

one or plural outputs,

a switching element controlling the field coil and the excitation current flowing through the field coil, and

a voltage regulator for maintaining a constant voltage in at least one generator output by controlling the ON/OFF state of the switching element,

an electrical compressor with a built-in motor driven by the electrical input,

a control means for controlling the speed of the electrical compressor according to the conditions inside and outside the vehicle, and

a drive device for driving the electrical compressor according to a control signal from the control means,

wherein the control means comprises a compressor control means for reducing the compressor speed when the generator output saturation detection means measures the ON time or switching period of the switching element and detects saturation of the generator output, and the ON time or switching period of the switching element detected by the generator output saturation detection means exceeds a predetermined threshold value.

5,199,275

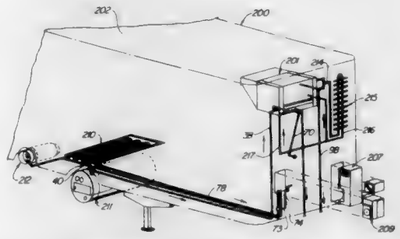
REFRIGERATION TRAILER

Patrick S. Martin, Dallas, Tex., assignor to General Cryogenics Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 651,206, Feb. 6, 1991, Pat. No. 5,090,209, which is a continuation-in-part of Ser. No. 591,386, Oct. 1, 1990, Pat. No. 5,069,039. This application Feb. 25, 1992, Ser. No. 841,590

Int. Cl.[5] F25D *21/06*

U.S. Cl. 62—275 **12 Claims**



1. A kit for installation in a cryogenic refrigeration system wherein liquid CO_2 in an evapoarator absorbs a quantity of heat exceeding the latent heat of vaporization of the CO_2 to cool air adjacent the evaporator, the kit comprising:

(a) heat exchanger means;

(b) means to connect said heat exchanger means to receive CO_2 from the evaporator; and

(c) means to connect said heat exchanger means to a secondary evaporator such that CO_2 vapor flowing from said heat exchanger means expands to provide cold CO_2 vapor for circulation through the secondary evaporator, said heat exchanger means delivering a quantity of heat to CO_2 received from the evaporator to prevent solidification of the CO_2 when depressurized to permit it to expand for circulation through the secondary vaporizer.

5,199,276

FAN COIL UNIT WITH NOVEL REMOVABLE CONDENSATE PAN

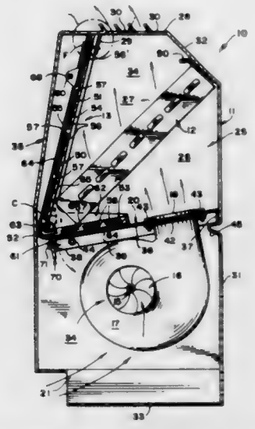
John T. Sullivan, 3910 Madison Ave., Hyattsville, Md. 20781

Filed Nov. 12, 1991, Ser. No. 790,876

Int. Cl.[5] F25D *21/14*

U.S. Cl. 62—291 **27 Claims**

20. A fan coil unit comprising a housing defining a chamber, said chamber being defined in part by first and second relatively spaced opposite walls, said second wall being relatively removable to gain access into said chamber, said chamber being further defined by third and fourth relatively spaced opposite walls disposed in generally transverse relationship to said first and second walls and a fifth wall disposed in generally transverse relationship to said first through fourth walls, a fan board in generally spanning relationship between said third and fourth walls, a condensation pan in generally spanning relationship between said third and fourth walls, first means for removably securing said condensation pan and fan board together to define a predetermined angle therebetween, means for supporting said fan board relative to said first wall, and second means for removably securing said condensation pan to said fifth wall whereby said first and second removably securing means and said supporting means collectively maintain said predetermined angle while permitting access to said chamber



and said condensation pan and fan board through an access opening defined by movement of said second wall.

5,199,277

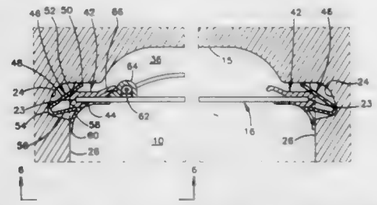
REFRIGERATOR WITH MEANS TO MOUNT AN EVAPORATOR

Lars T. Granström, and Leif J. E. Strindberg, both of Täby, Sweden, assignors to Aktiebolaget Electrolux Luxbacken, Stockholm, Sweden

Filed Mar. 16, 1992, Ser. No. 851,744

Int. Cl.[5] F25D *19/00*

U.S. Cl. 62—298 **2 Claims**



1. A refrigerator having a chamber which is kept refrigerated by a vertical, substantially planar and rectangular evaporator arranged in the chamber, wherein the evaporator at two vertical edges is snapped into indentations in opposite vertical walls of the chamber, the evaporator at its respective vertical edges rests in an indentation in the form of a vertical groove, resilient means are arranged between at least the bottom of one of the grooves and the corresponding edge of the evaporator, which resilient means press the evaporator against the other groove, and the evaporator at its respective vertical edge is surrounded by a strip having a U-formed cross section to which the resilient means are fastened.

5,199,278

COMBINED MACHINE FOR PROCESSING PRODUCTS FOR MAKING ICE-CREAM AND CONFECTIONARY

Gino Cocchi, Bologna, Italy, assignor to Carpigiani S.R.L., Italy

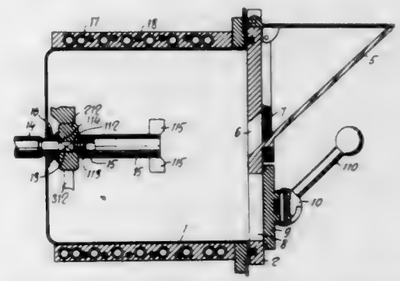
Filed Jan. 3, 1992, Ser. No. 820,288

Claims priority, application Italy, Jan. 16, 1991, 000018 A/91

Int. Cl.[5] A23G *9/12*

U.S. Cl. 62—343 **9 Claims**

1. A combined machine for processing products for making ice-cream and confectionery comprising: a processing cylinder provided with an open front end with a closed rear end; door means for closing in an easily openable manner the front end of said cylinder; refrigeration means and heating means in heat-exchange relation with said cylinder; electronic control means for alternately operating said refrigeration and said heating means according to the selected operational phases of processing; stirring means in said cylinder; a power operated shaft extending with one end into the rear end of said cylinder; and coupling means on said shaft end and on said stirring means for positively quickly locking said stirring means to said shaft end



in an easily releasable manner so as to permit the quick substitution of said stirring means so as to permit the processing for pasteurisation of various liquid mixtures and the processing for production of ice-creams, grated-ice drinks and confectioner's creams in general, said door mounting means having an opening structure for charging the liquid mixtures to be processed, which opening structure includes a closing means and a charging hopper which are supported by the door means, and further including a discharge opening for the finished product, which discharge opening is closable in a leakproof manner by a releasable means supported by the door means.

5,199,279

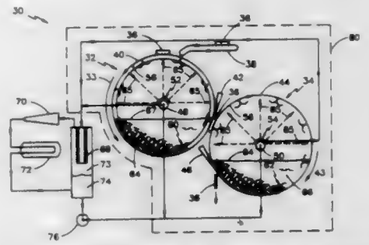
DRUM CONTACT FREEZER SYSTEM AND METHOD

Martin M. Reynolds, 16809 N. 59th St., Scottsdale, Ariz. 55254

Filed Aug. 13, 1991, Ser. No. 744,483

Int. Cl.[5] A23G *9/18*

U.S. Cl. 62—346 **24 Claims**



23. An apparatus for use in freezing a material, comprising:

a) a refrigerant having a boiling temperature in a range of approximately −100° F. and −40° F.;

b) a pair of counter-rotating contact drum freezers, each having:

i) an outer rotating surface for receiving and contacting a material to be frozen; and

ii) an inner rotating surface defining an interior of said drum freezer having an upper region and a lower region, wherein, during operation, said interior contains a predetermined volume of said refrigerant;

iii) means for spraying said refrigerant at approximately its

boiling temperature against said inner rotating surface

5,199,281

bushing and having a diameter equal to said circular seating hole

a second end of the tubular member, a hexagonal hole in axial alignment and communicating with the tubular hole

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boiling temperature against said inner rotating surface in said upper region of said interior;

iv) means for removing said refrigerant from said interior, wherein a predetermined volume of said refrigerant is maintained in said lower region and the pressure in said interior is maintained below about 100 psi, wherein, after said inner rotating surface rotates through said predetermined volume of said refrigerant in said lower region, said sprayed refrigerant scrubs said inner rotating surface in said upper region; and

v) at least one trough secured to said inner rotating surface for containing a portion of said refrigerant from said lower region to prolong contact between said refrigerant and said inner rotating surface; and

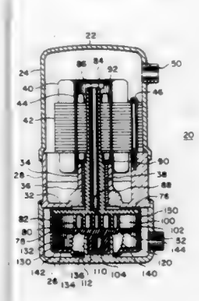
c) said drum freezers being positioned substantially adjacent to each other, wherein one side of the material to be frozen contacts said outer rotating surface of a first of said pair of drum freezers and an opposite side of the material subsequently contacts said outer rotating surface of a second of said pair of drum freezers.

5,199,280

CO-ROTATIONAL SCROLL COMPRESSOR SUPERCHARGER DEVICE

Delmar R. Riffe, Cullman, Ala.; Peter A. Kotlarek, Onalaska, Wis., and Robert E. Utter, Whitehouse, Tex., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 25, 1991, Ser. No. 796,746
Int. Cl.[5] **F01C** *1/04*
U.S. Cl. 62—498 **40 Claims**



1. Scroll gas compression apparatus having a suction pressure portion comprised of:

a first scroll member having a first scroll end plate from which a first scroll wrap extends;

a second scroll member having a second scroll end plate from which a second scroll wrap extends;

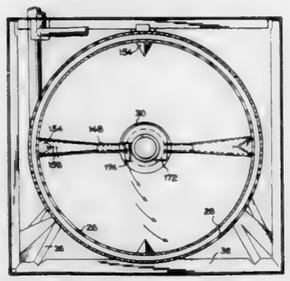
a precharging device secured to said first scroll member, said precharging device substantially enclosing said first scroll wrap, said second scroll wrap and said second scroll end plate so as to define a generally enclosed and substantially discrete intermediate space within said suction pressure portion of said compression apparatus, said precharging device (i) defining an aperture for permitting said gas to flow into said intermediate space and (ii) increasing the pressure of said gas with respect to the pressure at which said gas enters said suction pressure portion of said compression apparatus.

5,199,281

CENTRALLY MOUNTED SPRAY INLET FOR AUTOMATIC WASHER LAUNDRY BASKET

Devinder Singh; Sheryl L. Farrington, both of St. Joseph, and Kenneth B. Austin, Hartford, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 28, 1990, Ser. No. 635,482
Int. Cl.[5] **D06F** *39/08*
U.S. Cl. 68—207 **12 Claims**



1. An automatic fabric washer comprising:

a wash tub for receiving a supply of wash liquid;

a wash basket for receiving a load of fabric concentrically mounted within said wash tub for rotation relative to said wash tub;

said basket having a substantially solid bottom wall; a vertical axis rigid post mounted concentrically within said basket to rotate with said basket;

spray means carried on said post to rotate relative to said post; liquid conduit means extending between said spray means and said tub and extending through said post for carrying wash liquid from said tub to said spray means;

pump means in said liquid conduit means for moving said wash liquid from said tub to said spray means; and valve means in said liquid conduit means to selectively control the flow of liquid to said spray means.

5,199,282

PADLOCK WITH ROTARY ROD SHACKLE ENGAGEMENT

Ropin Wang, 5F No. 1 Lane 85 Kawang Fu North Rd., Taipei City, Taiwan

Filed Nov. 27, 1991, Ser. No. 799,258
Int. Cl.[5] **E05B** *67/22*
U.S. Cl. 70—38 A **3 Claims**

1. An improved padlock comprising

a lock body and a shackle,

said lock body having a hollow cylindrical bushing,

a first circular insertion hole located near a first end of said hollow cylindrical bushing,

a second circular insertion hole located near a second end of said hollow cylindrical bushing,

a first terminal body fixedly engaged at said first end of said hollow cylindrical bushing,

said first terminal body having a first radial connection hole corresponding to said first circular insertion hole and a circular seating hole communicating with said first radial connection hole facing inward from said first end, of said hollow cylindrical bushing,

said circular seating hole being coaxial with an axis of said hollow cylindrical bushing,

a second terminal body fixedly engaged inwardly from said second end of said hollow cylindrical bushing,

said second terminal body having a second radial connection hole corresponding to said second circular insertion hole and a circular through hole communicating with said second radial connection hole,

said circular through hole being coaxial with said axis of said

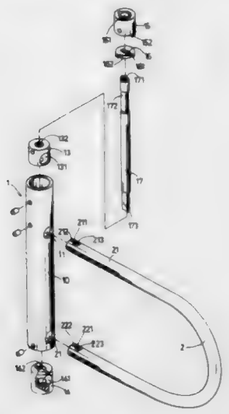
bushing and having a diameter equal to said circular seating hole,

a circular rod having a diameter equal to said diameters of said seating hole and said through hole and having two notched segments on sides of said circular rod,

each of said two notched segments having two walls parallel to each other and an axis of said circular rod,

said circular rod rotably engaged in said seating hole and said through hole so that said two notched segments are respectively located opposite said first circular insertion hole and said second circular insertion hole,

said shackle having a pair of insertion ends respectively corresponding to said first circular insertion hole and said second circular insertion hole,



each of said pair of insertion ends having a slot and a communicating circular locking hole at an inner end of said slot,

each slot having a width substantially equal to a distance between said two walls of said each of said two notched segments,

each said communicating locking hole having a diameter substantially equal to the diameter of said circular rod,

wherein, said insertion ends of said shackle are insertable through said first circular insertion hole and said second circular insertion hole and over said two notched segments when said circular rod is rotated to an open position of said padlock and a circumference of said circular rod engages walls of each said communicating locking hole when said circular rod is rotated to a closed position of said padlock.

5,199,283

AUTOMOBILE STEERING LOCK

Hsien-Paue Chen, No. 76, Lane 274, Jung-Jeng S. Road, Yung-Kang Shiang, Tainan Hsien, Taiwan

Filed May 13, 1992, Ser. No. 882,038
Int. Cl.[5] **B60R** *25/02*
U.S. Cl. 70—209 **3 Claims**

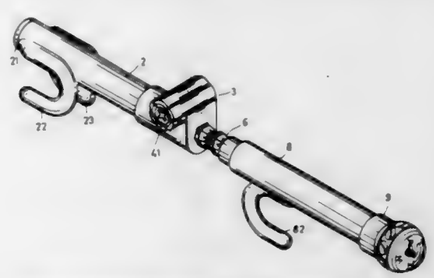
1. An anti-theft device for attachment to a steering wheel of an automobile comprising:

a) an elongate tubular member including a central longitudinal passageway therethrough and a pair of hooks secured adjacent a first end thereof, with the hooks opening in opposite directions and parallel to one another for engaging a first portion of the steering wheel;

b) a hexagonal rod member telescopically receivable within the passageway of the tubular member, the rod member including a plurality of longitudinally spaced annular grooves, with each groove being defined by a vertical sidewall and a slope sidewall;

c) a housing having a tubular hole for receiving and securing a second end of the tubular member, a hexagonal hole in axial alignment and communicating with the tubular hole for slidably receiving the hexagonal rod member therethrough, a horizontal cross-wise bore and an opening in an upper surface of the housing;

d) a locking means, an actuator, a locating means and a biasing spring disposed within the horizontal cross-wise bore of the housing, the locking means including a diametrical slot in a bottom thereof for receiving a portion of the



actuator to permit rotation of the actuator by the locking means, the locating means being urged by the biasing spring into engagement with a selected annular groove of the hexagonal rod member to render the rod member immovable with respect to the housing; and

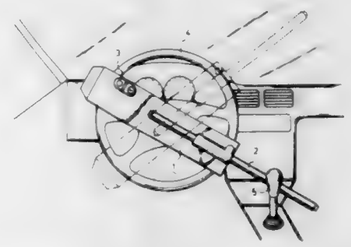
e) wherein rotation of the actuator by the locking means causes the locating means to be disengaged from the selected annular groove and permit the rod member to slide freely through the central passageway of the tubular member and the hexagonal hole of the housing.

5,199,284

LOCK DEVICE FOR A STEERING WHEEL IN AN AUTOMOBILE

Chuan-Chuan Lin, I-Hsiu No. 148, I-Hsiu Li, Hsueh-Chia Chen, Tainan Hsien, Taiwan

Filed Apr. 13, 1992, Ser. No. 867,462
Int. Cl.[5] **B60R** *25/02*
U.S. Cl. 70—209 **2 Claims**



1. A lock device for a steering wheel in an automobile, comprising:

a retaining plate unit including an elongated plate body adapted to cover upper surfaces of two diametrically opposed portions of a rim of the steering wheel, a fixed pawl member fixed on said plate body, and a movable pawl member mounted axially movably on said plate body, said plate body having a restricted slide slot formed therein and a retaining hole formed therethrough, said movable pawl member having a sliding body confined and slidable in aid restricting slide slot, and an L-shaped holding arm mounted pivotally on said sliding body, said

L-shaped holding arm extending through said retaining

tained in a sealed condition; and, when the locking bar is

the lock, and fitting and rotating in the base, the rotating

which the bolt is withdrawn substantially into the lock

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L-shaped holding arm extending through said retaining hole of said plate body;

a blocking rod mounted axially movably on said plate body said blocking rod having a row of notches;

a locking mechanism locking said blocking rod releasibly in one of several first selected positions on said retaining plate unit so as to extend a portion of said blocking rod from an end of said retaining plate unit including;

a guide tube mounted securely on said retaining plate unit and having a central bore through which said blocking rod extends; said guide tube having a blind hole, said blind hole in communication with said central bore of said guide tube and having an open end facing toward the rim of the steering wheel when said lock device is mounted on the steering wheel;

a retaining piece mounted removably within said blind hole of said guide tube and selectively engaged within one of said notches of said guide tube;

whereby, when said lock device is mounted on the steering wheel, said open end of said blind hole is closed by the rim of the steering wheel so that said retaining piece cannot be accessed; and

a key plug unit disposed on said retaining plate unit which engages the L-shaped holding arm of said movable pawl member so as to lock said L-shaped holding arm of said movable pawl member releasably in one of several second selected positions on said retaining plate unit, said key plug unit being disengaged from the L-shaped holding arm of said movable pawl member when a key is inserted into said key plug unit and turned thereby unlocking said key plug unit;

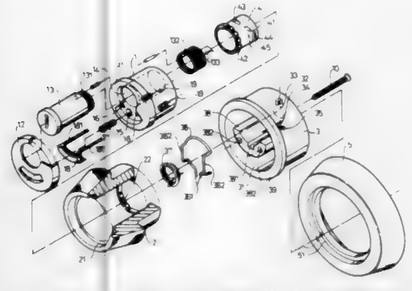
whereby, when unlocking said key plug unit said I-shaped holding arm of said movable pawl member is disengaged from said key plug unit such that said L-shaped holding arm of said movable pawl member can be turned so as to disengage said L-shaped holding arm from said retaining hole of said plate body.

5,199,285

LOCKING DEVICE FOR AN AUXILIARY LOCK

Jui C. Lin, Kaohsiung Hsien, Taiwan, assignor to Taiwan Fu Hsing Industry Co., Ltd., Kangshan Kaohsiung Hsien, Taiwan

Filed Oct. 17, 1991, Ser. No. 778,238
Int. Cl.[5] E05B *13/10*
U.S. Cl. 70—220 **4 Claims**



1. A locking device for an auxiliary lock comprising;

a lock having a central opening for a key block to fit in, a safety button with two legs, two long holes in the lock for the legs of the safety button to extend through, to contact with an actuating wheel, the actuating wheel having outer peripheral teeth and being combined with a nut having an acutating plate to extend through an actuating hole in the bottom of the actuating wheel, the lock being covered with a cap, the lock fitting in the interior of a rotating ring and being combined with a base by means of two bolts screwed in two threaded holes in a bottom of the base;

the rotating ring fitting around an outer spherical surface of the lock, and fitting and rotating in the base, the rotating ring having inner spherical teeth to engage or disengage from the teeth on the actuating wheel;

the base shaped cylindrically, having an interior round cavity for the rotating ring to fit and rotate therein, the base having a bottom wall with a hole for the actuating plate to pass through, a hook on the wall, a position hole in the wall and a position block adjacent the hole, the hook positioning an elastic clamp which has shoulders to pinch in a first slot or a second slot of the actuating wheel, the position hole and the position block locating one end of a spring, having the other end fitting in a hole in the actuating wheel so that the actuating wheel can be pushed straight or rotatingly back to an original position by means of the spring;

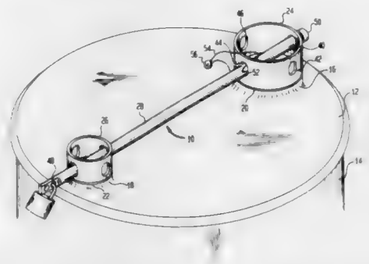
the actuating wheel being urged by the spring to have its teeth disengaged from the inner teeth of the rotating ring, the slots of the actuating wheel being movable for pinching by the elastic clamp by pressing in the safety button so that the teeth of the actuating wheel may engage the inner teeth of the rotating ring, the rotating ring being rotatable through 90° to rotate the actuating wheel, which then rotates the actuating plate 90° to extend a dead bolt for locking the lock.

5,199,286

DRUM LOCK DEVICE

Gary P. Jakubas, Rutherford, N.J., assignor to Taurus Precision, Inc., Totowa, N.J.

Filed Dec. 16, 1991, Ser. No. 808,230
Int. Cl.[5] B65D *55/14*
U.S. Cl. 70—230 **14 Claims**



1. A locking device for a drum having a head with two openings therethrough, each opening having a flanged portion with interior threads thereabout, said locking device comprising, in combination:

a pair of caps, each having at one end an exteriorly threaded portion for cooperative functional relationship with a corresponding one of said flanged portions and at the other end a wall, in turn, comprising:

shoulder means for receiving a closure gasket, said shoulder means being dimensioned to fit within a corresponding one of said drum openings;

an open ended cylindrical member with a plurality of pairs of apertures therethrough having 180-degree spacing between the apertures of each pair, said apertures extending, with the cap installed in the corresponding opening, beyond and external to the drum head;

a locking bar with an elongated body dimensioned to extend, with both caps installed in the corresponding openings therefor, through the apertures of both caps, said locking bar having means for retention at one end and means for locking at the other end;

a closure gasket on said shoulder means, said closure gasket structured of a resilient material so as to permit alignment of the apertures without unsealing the drum; and,

whereby, during installation of the locking bar, when the caps are rotated to align the apertures, the drum is maintained in a sealed condition; and, when the locking bar is locked, the rotation of the caps is precluded.

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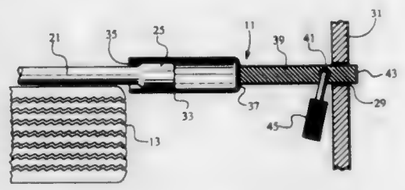
SECURITY DEVICE FOR SECURING A SPARE TIRE

Kirby L. McClary, Mesquite, Tex., assignor to Adell Corporation, Sunnyvale, Tex.

Filed Aug. 19, 1991, Ser. No. 746,993
Int. Cl.[5] B62D *43/04*; E05B *65/12*
U.S. Cl. 70—259 **16 Claims**



1. A security device for securing a spare tire mounted on a hoist having a hoist shaft accessible through an opening in a bumper, comprising:

a cover for blocking access to the end of the hoist shaft, wherein the cover can be removed from the end of the hoist shaft by moving the cover a sufficient distance toward the bumper, and wherein the cover is a cup that fits over the end of the hoist shaft;

a locking shaft extending from the cover through the opening in the bumper; and

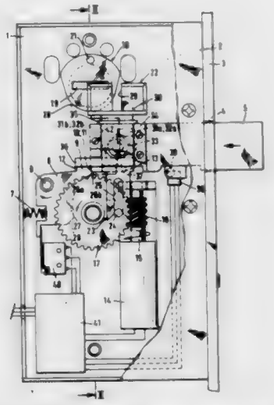
locking means for selectively preventing movement of the cover to a position in which the cover can be removed from the end of the hoist shaft.

5,199,288

ELECTROMECHANICAL DOOR LOCK

Jaakko Meriläinen; Jorma Issakainen, both of Joensuu, and Markku Jurvanen, Niittylahti, all of Finland, assignors to Abloy Security Ltd. Oy, Helsinki, Finland

Filed Oct. 16, 1991, Ser. No. 778,299
Claims priority, application Finland, Oct. 24, 1990, 905232
Int. Cl.[5] E05B *47/02*
U.S. Cl. 70—279 **25 Claims**



1. An electromechanical door lock comprising:

a lock body,

a bolt movable relative to the lock body in directions along a bolt axis between a locking position in which the bolt protrudes from the lock body and a releasing position in which the bolt is withdrawn substantially into the lock body relative to the locking position,

dead-locking means for releasably dead-locking the bolt in its locking position,

electromechanical force transmission means,

manual force transmission means, and

coupling means having a first condition in which they provide force transmission connection from both said manual force transmission means and said electromechanical force transmission means to the bolt and the dead-locking means for allowing operation of either force transmission means to effect movement of the bolt from its releasing position to its locking position, and a second condition in which the force transmission connection from said electromechanical force transmission means to the bolt is disconnected so that the bolt is movable from its releasing position to its locking position only through said manual force transmission means,

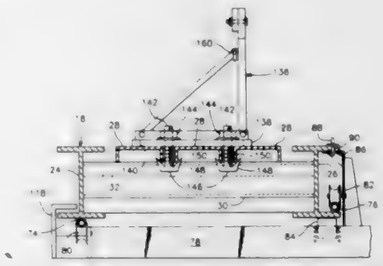
and wherein the coupling means are changed from the first condition to the second condition by said manual force transmission means.

5,199,289

COLLISION REPAIR RACK SYSTEM

Virgil H. Hinson, 206 Fairway Oaks Dr., Brunswick, Ga. 31523

Filed Sep. 13, 1991, Ser. No. 760,011
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—457 **13 Claims**



1. A vehicle repair support rack including an outer peripheral portion incorporating two generally straight opposite longitudinal side portions and at least one generally straight end portion joined to one pair of corresponding ends of said side portions by relatively small radius of curvature rounded corner portions, said outer peripheral portion defining track structure extending thereabout, at least one carriage guidingly engaged with said track structure for support therefrom and adjustment therealong, said carriage and track structure including coacting lock means operative to releasably lock said carriage in selected adjusted positions along said track structure, said side, end and corner portions each including inner and outer margins, said track means including inner and outer tracks extending along said inner and outer margins, said carriage being elongated in a direction transverse relative to said inner and outer margins and including inner and outer ends, said inner end including follower means guidingly engaged with said inner track, said outer end including a pull tower supported therefrom spaced outward of said outer margin and an intermediate length portion of said carriage including follower means guidingly engaged with said outer track, said inner track including a structural member extending along each of said end and longitudinal side portions and including a horizontal longitudinal flange having an inner marginal edge, said flanges intersecting at generally right angles at said corner portions, said inner track means also including elongated, straight track member sections extending along and supported from and beneath said flanges outward of said inner marginal edges, said track member sections being joined at said corner

portions by short radius of curvature curved track member

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into the same form, the plurality of rods being arranged in a

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BENDING TOOL FOR BENDING METAL SHEET

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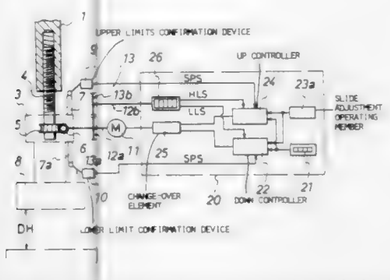
portions by short radius of curvature curved track member sections, said inner end of said carriage underlying the corresponding flange and inner marginal edge and having the corresponding follower means supported therefrom and guidingly engaged with the corresponding track member section, said inner end of said carriage also including an upwardly projecting bracket disposed closely inward of said inner marginal edge and including an upper inwardly directed safety portion closely overlying the corresponding flange, the inner marginal edge of each of said flanges, at the intersections of said end structural member and the adjacent ends of said side structural members being notched to provide clearance for said bracket as said inner end follower means moves about the corresponding short radius of curvature curved track member section.

5,199,290

METHOD OF AUTOMATIC ADJUSTMENT OF DIE HEIGHT OF A PRESS

Shigenori Kashiwagi, Sagamihara; Naomi Sato, Kamimikawa, and Yasuo Kitamura, Tokyo, all of Japan, assignors to Aida Engineering, Ltd., Sagamihara and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Division of Ser. No. 599,801, Oct. 19, 1990, Pat. No. 5,140,834. This application Jun. 3, 1992, Ser. No. 893,242
Claims priority, application Japan, Oct. 19, 1989, 1-272344
Int. Cl.[5] B21J *9/20*
U.S. Cl. 72—21 **1 Claim**



1. A method for automatically adjusting die height in a press having a slide which moves reciprocally between a top dead center and a bottom dead center, the slide carrying plural dies disposed in a work transfer direction, comprising the steps of:

determining and storing possible load patterns corresponding to possible numbers of the plural dies under load;

determining and storing, relative to a basic position of the bottom of the slide at the bottom dead center of a basic load pattern selected from among the possible load patterns, respective amounts of correction necessary to rectify the position of the bottom of the slide at the bottom dead center for each of the possible load patterns;

performing respective single cycles of the press in response to respective actuations of a press start means; and

after each single cycle,

identifying the load pattern of the press;

reading out the amount of correction for the identified load pattern,

actuating a slide adjustment start means to send a drive control signal corresponding to the read out amount of correction to a slide adjustment device, and

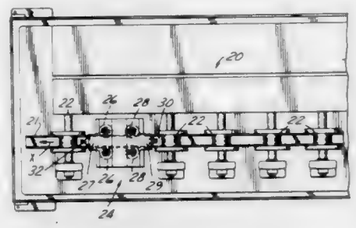
rectifying the position of the bottom of the slide so that at the bottom dead center of a next cycle of operation of the press in the identified load pattern the die height is adjusted so as to be at same constant level relative to the basic position.

5,199,291

ROLL FORMING MACHINE WITH FLARE CONTROL UNIT

Gordon H. Bahl, Jr., Northville; Roger Levy, Bloomfield Hills; Marvin J. Engelsman, Royal Oak, and Jerome Kubiak, Troy, all of Mich., assignors to Tishken Products Co., Oak Park, Mich.

Filed Mar. 26, 1992, Ser. No. 857,735
Int. Cl.[5] B21D *5/14*
U.S. Cl. 72—181 **16 Claims**



1. A roll forming machine comprising:

a plurality of form roll pairs being rotatable about first axes extending in first directions for deforming a thin metal into a desired open cross-sectional shape having inner and outer surfaces, said plurality of form roll pairs being spaced along a longitudinal work path;

at least one arbor positioned at a lateral position within said work path, and within a portion of the cross-sectional shape of the part to be formed, said arbor being shaped so as to engage only inner surfaces of said cross-sectional shape while leaving the outer surfaces of the cross-sectional shape unsupported about the entire arbor; and

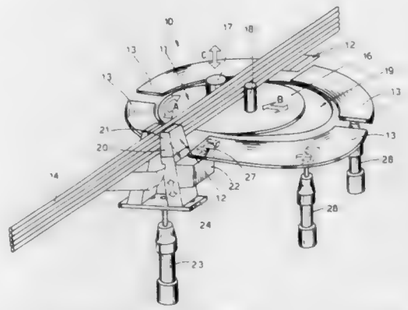
at least one pair of flare rollers spaced laterally outwardly of said path, and rotatable about axes which are generally perpendicular to said first directions longitudinally immediately adjacent but offset from said arbor, such that laterally innermost portions of said flare rollers are longitudinally offset from said arbor so that a line passing through axes of said pair of flare rollers does not extend through said arbor.

5,199,292

ASSEMBLY TO BEND BUNDLES OF RODS

Giorgio Del Fabro, Cassacco-Fraz.Monegnacco, and Marcello Del Fabro, Udine, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy

Filed Feb. 28, 1992, Ser. No. 843,279
Claims priority, application Italy, Feb. 28, 1991, UD91A000026
Int. Cl.[5] B21D *7/022*
U.S. Cl. 72—307 **6 Claims**



1. An assembly to bend a plurality of rods at the same time into the same form, the plurality of rods being arranged in a bundle having one rod stacked on another in a first direction normal to a longitudinal axis of said rods, comprising:

a supporting bench having a surface extending in a plane substantially normal to said first direction;

a bending assembly having an abutment roll and a bending pin able to rotate about said abutment roll to bend said rods;

a first retaining means including grippers movable in guides between a working position for fixedly clamping said bundle of rods and a retracted position below said surface of said supporting bench, said retracted position locating said first retaining means out of engagement with said rods, said first retaining means being positioned upstream of said bending assembly and substantially on said longitudinal axis of said rods; and

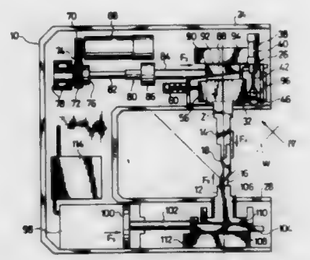
a second retaining means including grippers movable in guides between a working position for fixedly clamping said bundle of rods and a retracted position below said surface of said supporting bench, said retracted position locating said second retaining means out of engagement with said rods, said second retaining means being positioned downstream of said bending assembly and substantially on said longitudinal axis of said rods.

5,199,293

SHEET WORKPIECE BENDING MACHINE

Alberto A. Catti; Franco Sartorio, and Stefano Vergano, all of Turin, Italy, assignors to Amada Company, Limited, Japan

Continuation of Ser. No. 459,292, Dec. 29, 1989, Pat. No. 5,092,151. This application Nov. 20, 1991, Ser. No. 795,045
Claims priority, application Italy, Dec. 29, 1988, 68165 A/88; Dec. 29, 1988, 68166 A/88
Int. Cl.[5] B21J *7/32*
U.S. Cl. 72—443 **6 Claims**



1. A sheet workpiece bending machine comprising:

a frame;

a first slide member mounted on the frame for movement in a vertical direction;

a second slide member mounted on the first slide member for movement in the vertical direction and carrying one of an upper and a lower bending tool, the other of the upper and the lower tools mounted so as to cooperate with the other tool to effect bending in a sheet workpiece;

a first drive means kinematically interposed between the first slide member and the second slide member to make the second slide member travel a relatively long first distance with respect to the first slide member so that the upper and lower bending tools are caused to move toward each other in an approach phase;

an engage/disengage means associated with the first and the second slide members for causing the two slide members to engage with or disengage from each other; and

a second drive means kinematically interposed between the first slide member and the frame to make the first slide member travel a second distance, short relative to the first distance, in a bending phase.

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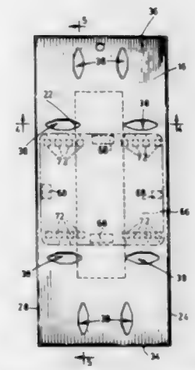
BENDING TOOL FOR BENDING METAL SHEET

Travis H. Murczek, 1229 S. 57th Ave., Cicero, Ill. 60650

Filed Dec. 20, 1991, Ser. No. 811,694
Int. Cl.[5] B21D *5/16*
U.S. Cl. 72—457 **2 Claims**



1. An improved tool for forming a flange at an edge of a sheet of metal comprising:

a base forming plate having a base bending edge and a second base bending edge;

a cover forming plate having a cover bending edge and a second cover bending edge, the cover forming plate and the base forming plate positioned in spaced apart relation with the base bending edge and the cover bending edge in parallel spaced apart relation and the second base bending edge and the second cover bending edge in parallel spaced apart relation;

the base forming plate and the cover forming plate defining a bending slot therebetween having an opening bounded by the bending edges;

a spacer positioned in the bending slot, constructed to abut an edge of the sheet of metal positioned in the bending slot at a slot depth from the bending edges and to position the bending edges in parallel relation to the edge of the metal sheet, and constructed to abut the edge of the sheet of metal positioned in the bending slot at a second slot depth from the second bending edges and to position the second bending edges in parallel relation to the edge of the metal sheet;

the cover forming plate having two width-gaging openings formed through the cover forming plate at spaced apart locations along the direction of the cover bending edge adjacent to the bending edge and communicating with the bending slot and further having two width-gaging openings formed through the cover forming plate at spaced apart locations along the direction of the second cover bending edge adjacent to the second bending edge and communicating with the bending slot; and

each width-engaging opening adjacent to one of the cover bending edges being defined by a boundary having two straight first sides, each extending away from the adjacent bending edge from a first vertex spaced from the bending edge to meet a straight second side at a second vertex, each second side extending away from the adjacent bending edge perpendicular to the bending edge to meet a straight third side at a third vertex, the third sides extending away from the adjacent bending edge toward each other to meet at a fourth vertex spaced apart from the first vertex in a direction generally perpendicularly away from the adjacent bending edge whereby the vertices of the width-gaging opening provide identifiable locations at distances from the adjacent bending edge that are less than the slot depth and the bending tool is thereby constructed

to form a flange at the edge of the sheet of metal of width

combined test volume along a predominant part of said

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WALL SHEAR STRESS SENSOR

tion means to provide one or more direct current voltages

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to form a flange at the edge of the sheet of metal of width equal to the slot depth, the second slot depth, or a distance from a bending edge to an identifiable location on the boundary of adjacent width-gaging openings.

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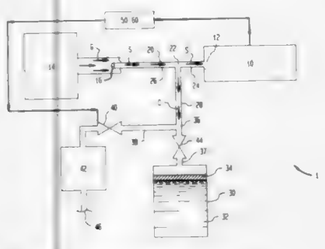
FEEDBACK CONTROLLED GAS MIXTURE GENERATOR ESPECIALLY FOR AN HYGROMETER REACTION CHECK

Jacob Mettes, Doylestown, Pa., assignor to Meeco, Inc., Warrington, Pa.

Filed Jan. 22, 1991, Ser. No. 644,081
Int. Cl.[5] G01C *17/38;* **B01F** *3/02*
U.S. Cl. 73—1 G **26 Claims**



1. A gas mixture generator comprising:
a gas stream;
a source of a component to be added to said gas stream;
a connection from said source to said gas stream permitting the addition of said component to said gas stream;
a leg positioned in said connection between said source and said gas stream through which gas from said gas stream can be removed;
a counterflow formed in part of said connection when said gas is removed from said connection, said counterflow regulating the amount of said component added to said gas stream;
means for controlling the amount of said gas from said gas stream which is removed through said leg;
an analyzer able to detect said component in said gas stream and give information on the amount of said component present in said gas stream after said addition; and
means for providing a feedback signal from said analyzer to said controlling means to control the amount of said gas from said gas stream which is removed through said leg.

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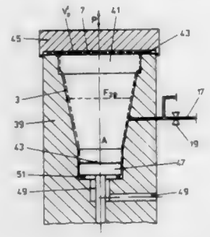
METHOD FOR REDUCING TEST CYCLE TIME AND FOR IMPROVING MEASURING ACCURACY AT A LEAK TESTING PROCESS

Martin Lehmann, Obere Farnbuhlstr. 1, CH-5610 Wohlen, Switzerland

Continuation-in-part of Ser. No. 469,398, Jan. 24, 1990, Pat. No. 5,042,291. This application May 8, 1991, Ser. No. 696,917
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902435
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.3 **19 Claims**

1. A method for leak testing a container, closed with a foil-like lid fixed to a projecting rim of said container, comprising the steps of
disposing said closed container into a test receptacle,
supporting said closed container within said receptacle at said projecting rim on a border area of said receptacle, so as to form a first test volume between an inner wall of said receptacle and the wall of said container,
sealingly closing said receptacle with a cover and providing a second test volume between said cover and said foil-like lid,
connecting said first and second test volumes to form a combined test volume along a predominant part of said container closed by said lid,
establishing a pressure difference between said combined



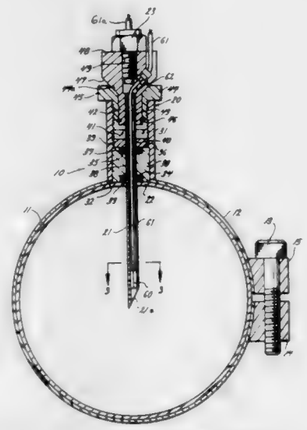
test volume and a pressure inside said container as an initial value, and
monitoring a pressure prevailing within said combined test volume as a leak indicative signal.

5,199,297

THIN WALLED CAN TEMPERATURE AND PRESSURE MONITORING DEVICE AND METHOD

Ellen Y. Lin, and Timothy T. Raw, both of St. Louis, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Oct. 4, 1991, Ser. No. 771,622
Int. Cl.[5] G01N *33/14*
U.S. Cl. 73—52 **17 Claims**



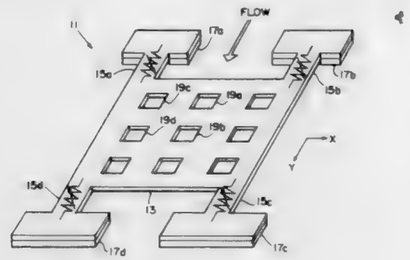
1. A removable portable can testing device for measuring process variables in a filled sealed thin wall metallic can containing carbonated beverages comprising
a) a body member,
b) clamp means attached to the body member for removably engaging a complete circular segment of the outer periphery of a can body sidewall to support said can body against lateral pressure,
c) a probe member longitudinally movable in the body member for engaging and piercing the can body to measure the variables within the sealed can body,
d) means for sealing the can contents from being lost when the probe has pierced the can body, said seal means including a first seal for sealing against the outer surface of the metallic can body where the probe enters the can and second seal means for sealing around the probe, and
e) means associated with the probe for measuring and reporting the numerical value of the variable being measured.

5,199,298

WALL SHEAR STRESS SENSOR

Kay Y. Ng, Kuala Kumpur, Malaysia, and Martin A. Schmidt, Reading, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 21, 1991, Ser. No. 718,786
Int. Cl.[5] G01N *11/00*
U.S. Cl. 73—54.01 **8 Claims**



1. A wall shear stress sensor comprising:
a plate having micron dimensions;
a plurality of piezoresistive supporting arms coupled to the plate and a substrate for suspending the plate from the substrate in a plane having a subject surface over which fluid flows, each arm having a longitudinal axis, the fluid having a flow component parallel to the longitudinal axis of each arm, the arm being strained in response to fluid flow over the subject surface displacing the plate and providing an indication of deflection of the plate along the longitudinal axes of the arms; and
readout means coupled to the plate and arms to receive the indication of deflection of the plate and to therefrom provide measurements of detected shear stress.

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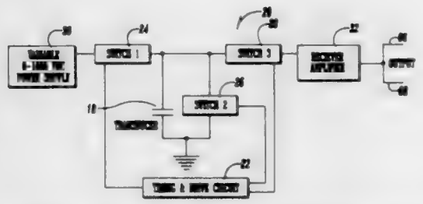
ULTRASONIC UNIPOLAR PULSE/ECHO INSTRUMENT

Michael S. Hughes; David K. Hsu; Donald O. Thompson, and Samuel J. Wormley, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Mar. 11, 1991, Ser. No. 667,437
Int. Cl.[5] H04B *1/02;* **G01N** *29/10, 29/24*
U.S. Cl. 73—610 **21 Claims**



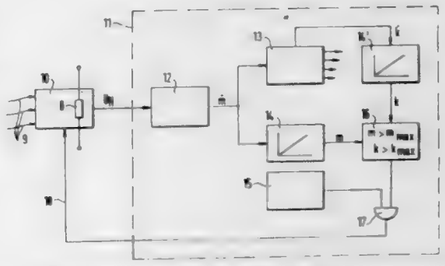
5. A drive for transmitting and receiving unipolar ultrasonic energy for sue in nondestructive evaluation comprising:
a housing to which components of the device can be installed;
first connection means on the housing to connect the device to an ultrasonic transducer means;
second connection means on the housing to connect the device to an electrical power source;
third connection means on the housing to connect the drive to a receiver amplifier means for providing an amplified received signal to an output;
power conversion means connected to the second connection means to provide one or more direct current voltages to the device;
control means for controlling timing and operation of the device according to parameters;
manually adjustable controls connected to the control means for adjusting the parameters related to the control means;
display means for displaying representations of one or more parameters;
first switch means for providing an electrical pathway for excitation voltage to the first connection means, the first switch means being controlled between non-conducting and conducting states by the control means and being conducting during a first time period to charge the transducer means;
second switch means for providing a low impedance electrical pathway to quickly discharge electrical charge from the transducer means, the second switch means being controlled by the control means to be conducting at a time after the first switch means is conducting and then non-conducting; and
third switch means for providing an electrical pathway to the third connection means from the transducer means, the third switch means being controlled by the control means and being in a conducting state when ultrasonic energy is received through the third connection means, at a time substantially after the second switch means is non-conducting after being conducting.

5,199,300

DEVICE FOR CONTROLLING RESISTOR TEMPERATURE

Wolfgang Kienzle, Hemmingen; Rudolf Sauer, Benningen, and Jürgen Gras, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00632, § 371 Date Mar. 20, 1991, § 102(e) Date Mar. 20, 1991, PCT Pub. No. WO90/04091, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 5, 1989, Ser. No. 671,906
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835235
Int. Cl.[5] F02M *65/00*
U.S. Cl. 73—118.2 **5 Claims**



1. A method for automatically controlling the temperature of a current-carrying resistor that is incorporated in an air-mass flowmeter for an internal-combustion engine, the automatic control having a plurality of phases with one being a free-burning operation of the resistor, comprising the steps of:
(a) determining a fuel throughput rate for the internal-combustion engine and generating a first signal representative of the fuel throughput rate;
(b) integrating the first signal representative of the fuel throughput rate and generating a second signal representative of a fuel quantity;
(c) comparing the second signal representative of the fuel quantity with a predetermined value and generating a third signal when the second signal exceeds the predetermined value; and

(d) initiating a free-burning operation for the resistor when

membrane on said opening of said housing, it is exactly mechanically adjusted to said piezoresistive measuring element,

cantilever with one end of the beam fixed and the other end thereof free and unsupported;

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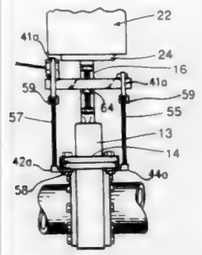
(d) initiating a free-burning operation for the resistor when the third signal is generated.

5,199,301

APPARATUS FOR APPLYING A KNOWN AXIAL FORCE TO A VALVE STEM

Donald L. Bauer, Atascadero, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1991, Ser. No. 753,785
Int. Cl.[5] F16K *31/05*; G01L *5/00*
U.S. Cl. 73—168 **10 Claims**



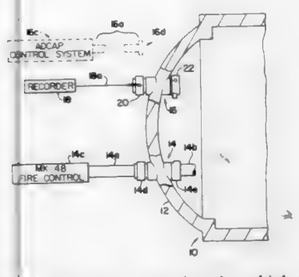
1. Apparatus for applying an axial force to a valve stem, mounted in a valve yoke or the like, the ends of which are not accessible, comprising in combination:
first and second loading beams juxtaposed on opposite sides of the valve stem and elongated in a direction perpendicular to the valve stem;
means connecting said first and second loading beams and holding them together;
a first leg pivotally connected to said first and second loading beams and extending approximately parallel to the valve stem;
a second leg pivotally connected to said first and second loading beams and extending approximately parallel to the valve stem;
first force means included in said first leg for exerting a force against said first and second loading beams.

5,199,302

TORPEDO TUBE DIFFERENTIAL PRESSURE TRANSDUCER

Frank P. Mello, Tiverton, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1991, Ser. No. 766,594
Int. Cl.[5] G01L *7/00*
U.S. Cl. 73—714 **2 Claims**



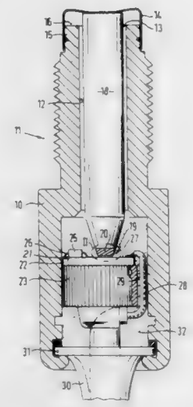
1. In a submarine having a torpedo tube which is isolated from the submarine interior, and which is capable of firing at least two different types of torpedoes, and which tube further includes a breech door for the torpedo tube with two differently configured electrical bulkhead fittings for selectively connecting either of said type of torpedoes in the tube to fire control equipment provided inside the submarine, the improvement comprising:
pressure transducer means inside the torpedo tube;
adapter connector means for said pressure transducer means, said adapter connector means configured to fit a pair of differently configured electrical connectors, said adapter connector means further including a "wet side" portion carrying said pressure transducer means and further adapted to be received on the "wet side" of either of said two bulkhead fittings inside said torpedo tube, said adapter connector means further including the "dry side" portion adapted to be received on the "dry side" of either of said bulkhead fittings inside the submarine interior.

5,199,303

PRESSURE SENSOR FOR DETERMINATION OF PRESSURE IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Walter Benedikt, Kornwestheim; Johann Konrad, Tamm; Matthias Küssel, Korntal-Münchingen; Wolfgang Schmidt, Vaihingen/Enz; Josef Tosch, Schweiberdingen; Manfred Vogel, Ditzingen Heimerdingen, and Werner Herden, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1991, Ser. No. 726,297
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4022781; Feb. 7, 1991, 4103706
Int. Cl.[5] G01L *7/08, 9/06*
U.S. Cl. 73—727 **4 Claims**



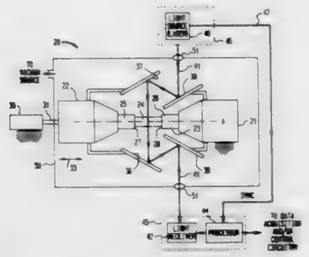
1. A pressure sensor for determination of pressure in a combustion chamber of an internal combustion engine, particularly for motor vehicles, comprising a housing; a membrane associated with the housing; a sensor element; a plunger extending between said membrane and said sensor element so as to supply a pressure to be determined from said membrane to said sensor element and located in said housing, said housing having at least one housing opening and a shaft and said membrane closing said opening of said housing and being connected with said shaft of said housing in the region of a side wall so that a bottom of said membrane is flexible and a pressure to be determined is transferable to said plunger from said bottom of said membrane and then transferable through said plunger to said sensor element; a counter bearing for said plunger; a support provided for a hybrid and composed of ceramic material and located o said counter bearing for said plunger, said sensor element being a piezoresistive measuring element and located on said hybrid so as to produce an electrical signal corresponding to the pressure, aid membrane being formed as a cup-shaped membrane, so that during mounting of said cup-shaped membrane on said opening of said housing, it is exactly mechanically adjusted to said piezoresistive measuring element.

5,199,304

APPARATUS FOR OPTICALLY MEASURING SPECIMEN DEFORMATION DURING MATERIAL TESTING

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Poestenkill, N.Y.

Filed Feb. 20, 1992, Ser. No. 839,339
Int. Cl.[5] G01L *1/024*
U.S. Cl. 73—800 **18 Claims**



1. Apparatus for a material testing system for imparting controlled deformation to a test specimen and for simultaneously measuring a physical dimension associated therewith, said apparatus comprising:
first and second opposing jaws for holding opposing ends of a test specimen, said specimen having a longitudinal axis, said first jaw being movable and said second jaw being fixed, wherein said first jaw is controllably positioned with respect to the second jaw so as to produce a predefined force in said specimen and oriented along said longitudinal axis thereby causing a controlled amount of compressive or tensile deformation to occur in said specimen;
means for producing a collimated planar beam of radiation with a pre-defined orientation, said producing means being fixed in position;
first light reflecting means, secured to said first jaw at a first side thereof and oriented at a first pre-defined angle with respect to said longitudinal axis, for reflecting said beam incident thereat in a planar orientation towards said specimen, as an entering beam, so as to traverse a pre-defined portion of said specimen to be measured;
second reflecting means, secured to said first jaw at a second side opposite to said first side and oriented at a second pre-defined angle with respect to said longitudinal axis, for reflecting portions of said beam not blocked by said specimen, as an exiting beam;
a beam detector, being fixed in position and responsive to said exiting beam, for producing a detected signal; and
means, responsive to said detected signal, for converting said detected signal into a pre-defined physical dimension for said specimen.

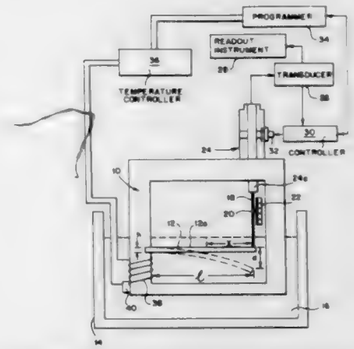
5,199,305

METHOD AND APPARATUS FOR MEASURING THE STRAIN DEVELOPED IN A COATED SURFACE

Sheldon M. Smith, Los Gatos, and Clement C. Hiel, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1991, Ser. No. 779,672
Int. Cl.[5] G01N *3/20*
U.S. Cl. 73—851 **7 Claims**

1. A method of determining the strain developed in a coated surface, said method comprising:
mounting a beam, with a coating on a surface thereof, as a cantilever with one end of the beam fixed and the other end thereof free and unsupported;
applying a force to the free end of the beam to cause deflection of the beam until the coating on the beam fails; and



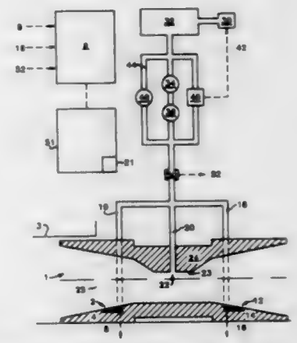
determining the strain in the beam, and hence in the coating at the point of failure, based on the dimensions of the beam, the point along the beam where failure of the coating occurs and the amount of deflection of the beam, independently of the temperature of the beam and the material from which the beam is made.

5,199,306

METHOD AND APPARATUS FOR METERING FLOW IN CLOSED CONDUITS THAT SURCHARGE

Robert M. Hunter, 320 S. Willson Ave., Bozeman, Mont. 59715

Filed Nov. 16, 1990, Ser. No. 614,292
Int. Cl.[5] G01F *1/44*
U.S. Cl. 73—861.63 **20 Claims**



1. An apparatus for metering liquid flow in a closed conduit that surcharges comprising:
a tubular Venturi metering device having a longitudinal axis, an entrance section, and a throat section having a top,
first pressure sensing means for sensing the pressure in said entrance section referenced to the pressure at said throat top, said first means attached to said device, for producing an electrical output that characterizes the pressure that said first means senses,
second pressure sensing means for sensing the pressure in said throat referenced to ambient air pressure, said second means attached to said apparatus for producing an electrical output that characterizes the pressure that said second means senses; and

means for computing the flow rate through the apparatus

stators is extended adjacent a locus of movement of the N-

sensing capacitance changes of liquid in said second flow

member so as to urge the rotatable member in a rotational

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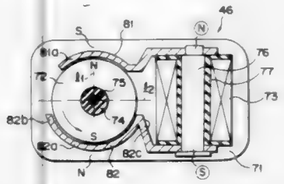
means for computing the flow rate through the apparatus using said electrical outputs.

5,199,307
AUTOMATIC POWER GENERATION TYPE FLOWMETER

Hajime Onoda, and Wataru Sato, both of Tokyo, Japan, assignors to Kimmon Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1991, Ser. No. 641,870
Claims priority, application Japan, Jan. 20, 1990, 2-11242; Apr. 13, 1990, 2-39031[U]
Int. Cl.[5] G01F *1/075*
U.S. Cl. 73—861.78 **15 Claims**

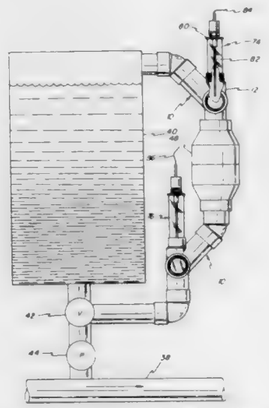


1. An automatic power generation type flowmeter that generates an electric power signal, as a measuring signal, said flowmeter measuring a flow rate of a fluid flowing through a passage and transmitting the measuring signal to a receiver positioned at a remote location, comprising:
(1) detecting means, having a detection mechanism for detecting an action and a flow rate of the fluid flowing through the passage, said detecting means further including a rotatable detection shaft driven by the detection mechanism, for converting the detected flow rate into a number of rotations of the detection shaft;
(2) transmission means for receiving a rotational force from the rotatable detection shaft of the detecting means and for converting said rotations of the detection shaft to an intermittent rotation;
(3) power generation means coupled to the transmission means for outputting an electric signal corresponding to the detected flow rate of the fluid that had flowed through a passage the power generation means including:
(a) a rotation shaft, having an axis and extending in an axial direction, said rotation shaft being connected to the transmission means, said rotation shaft having a permanent magnet with N- and S-poles located on first and second opposite sides of the rotation shaft;
(b) an electromagnetic coil and a core, said core having first and second end portions and an axis passing through both said first and second end portions of said core, said electromagnetic coil being wound around the core, the core being positioned adjacent to the magnet so that the axis of the core is oriented in a direction that is perpendicular to the axis of the rotation shaft;
(c) a first stator having first and second end portions, the first end portion of the first stator being magnetically coupled to the first end portion of the core and said second end portion of the first stator facing the N-pole of the magnet; and
(d) a second stator having first and second end portions, the first end portion of the second stator being magnetically coupled to the second end portion of the core and said second end portion of the second stator facing the S-pole of the magnet;
(4) a casing housing said detected mechanism, said transmission means and said detecting means; and
(5) a flow indicator means positioned within the casing at a position adjacent to a position of said power generation means, the flow indicator means being connected to receive a rotation force from said transmission means; and wherein
said second end portion of each of said first and second stators is extended adjacent a locus of movement of the N- and S-poles of said magnet, said locus of movement being defined when the rotation shaft rotates, one of said second end portions extending a different length in a direction away from said core than the other one of said second end portions.

5,199,308
MULTI-FUNCTIONAL LEVEL PROBE MOUNTING DEVICE

Davie B. Lawhon, Furlong; James C. Rodgers, Pipersville, and George H. Alexander, Jr., Hatfield, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 3, 1991, Ser. No. 637,099
Int. Cl.[5] G01D *21/00;* **G01N** *27/00*
U.S. Cl. 73—866.5 **5 Claims**

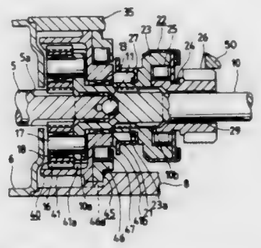


1. In a fluid measurement system for feeding fluid in controlled amounts from a tank to a treatment line, a fluid volume measurement structure comprising:
a container connected to said tank such that fluid may be transferred from said tank to said container;
said container comprising an upper end and a lower end;
a first mounting means connecting said tank to said upper end of said container and having an interior portion defining a first flow passage;
a second mounting means connecting said lower end of said container to said treatment line and having an interior portion defining a second flow passage;
a first sensor aperture in said first mounting means for mounting a first fluid sensor in fluid communication with said first flow passage;
a second sensor aperture in said second mounting means for mounting a second fluid sensor in fluid communication with said second flow passage;
a third sensor aperture in said first mounting means for mounting a first liquid capacitance sensor therein, said third sensor aperture comprising a first planar wall surface contiguous to said first flow passage and adapted to block fluids in said first flow passage from entering said third sensor aperture, said first planar wall surface adapted for contacting a first capacitance sensor for sensing capacitance changes of liquid in said first flow passage; and
a fourth sensor aperture in said second mounting means for mounting a second liquid capacitance sensor therein, said fourth sensor aperture comprising a second planar surface contiguous to said second flow passage and adapted to block fluids in said second flow passage from entering said fourth sensor aperture, said second planar wall surface adapted for contacting a second capacitance sensor for sensing capacitance changes of liquid in said second flow passage.

5,199,309
STARTER UNIT

Shuzou Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Dec. 17, 1991, Ser. No. 808,615
Claims priority, application Japan, Dec. 28, 1990, 2-417243
Int. Cl.[5] F02N *15/06;* **F16H** *1/32, 35/10*
U.S. Cl. 74—7 E **3 Claims**



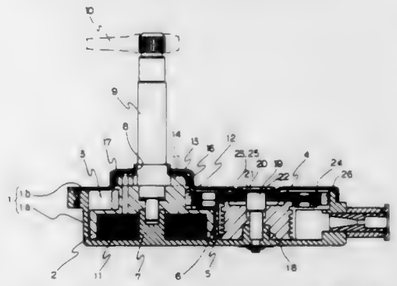
1. A starter unit comprising:
an epicyclic reduction gear for reducing the speed of rotation of the armature shaft of an electric motor through revolution of planet gears;
an output shaft supporting said planet gears to which the rotation thus speed-reduced is transmitted;
a first over-running clutch comprising a first clutch inner member which is the cylindrical front end portion of an internal gear frame in said epicyclic reduction gear, and a first clutch outer member which is coupled to said first clutch inner member through rollers and fixedly secured to a bracket of said electric motor, in which said internal gear frame is fixed relative to said first clutch outer member when said armature shaft is rotated in a first direction, so as to rotate said output shaft in said first direction with the aid of said planet gears;
a second over-running clutch mounted on said output shaft in such a manner so as to be slidable along said output shaft in an axial direction thereof, said second over-running clutch comprising a second clutch outer member helical-spline-mounted on said output shaft, and a second clutch inner member coupled through rollers to said second clutch outer member in such a manner as to be rotated in said first direction; and
a pinion formed on the front end portion of said second clutch inner member of said second over-running clutch, said pinion being engaged with the ring gear of an engine as said second over-running clutch is moved forwardly, to transmit the rotation of said armature shaft thereto.

5,199,310
DRIVING DEVICE FOR CABLE TYPE WINDOW REGULATOR

Tatuo Yoshimura, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Jun. 25, 1991, Ser. No. 720,334
Claims priority, application Japan, Jun. 26, 1990, 2-169083; Jun. 26, 1990, 2-169084; Jun. 26, 1990, 2-169085
Int. Cl.[5] E05F *11/48*
U.S. Cl. 74—89.2 **14 Claims**

1. A driving device for a cable type window regulator, comprising:
(a) a housing;
(b) a drum rotatably supported by the housing, for winding and unwinding cables for actuating a window glass;
(c) a rotatable member rotatably supported by the housing, which is separated from the drum;
(d) a spiral spring arranged concentrically with the rotatable member so as to urge the rotatable member in a rotational direction; and
(e) a torque transmitting means for transmitting a torque between the drum and the rotatable member,

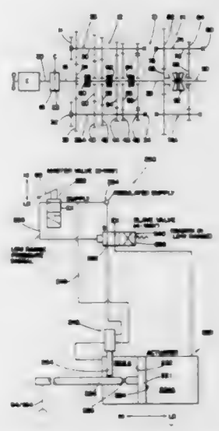


said housing comprising a first compartment for housing said spiral spring, a second compartment for housing said drum, and a partition provided between said first compartment and said second compartment.

5,199,311
VARIABLE PRESSURE RANGE SECTION ACTUATOR ASSEMBLY

Dale E. Muyskens, Vicksburg, and Ronald A. Hutchison, Portage, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 23, 1992, Ser. No. 824,672
The portion of the term of this patent subsequent to Mar. 16, 2010, has been disclaimed.
Int. Cl.[5] F16H *59/00*
U.S. Cl. 74—335 **32 Claims**



1. A control method for controlling a shift actuator (**96**) associated with a synchronized jaw clutch (**92**) for selectively engaging and disengaging a selectable ratio (high) in a first transmission section (**14**) of a compound transmission (**10**) comprising first and second (**12**) multiple speed sections connected in series, said synchronized jaw clutch having a not blocked and a blocked condition, said method comprising:
(a) sensing selection of engagement of said first transmission section selectable ratio;
(b) sensing if said synchronized jaw clutch is in either the not blocked or the blocked condition;
(c) responding to sensing (i) a selection of engagement of

said first transmission section selectable ratio and (ii) said

5,199,313

(10) comprising first and second (12) multiple speed sections

hollow cylindrical body engaged in said end bore and

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said first transmission section selectable ratio and (ii) said synchronized jaw clutch in the not blocked condition by causing said actuator to urge said synchronized jaw clutch into engagement with a first force ($p * a_{224}$); and

(d) responding to sensing (i) a selection of engagement of said first transmission section selectable ratio and (ii) said synchronized jaw clutch in the blocked condition by causing said actuator to urge said synchronized jaw clutch into engagement with a second force ($p * (a_{224} - a_{222})$, said second force being smaller than said first force.

5,199,312

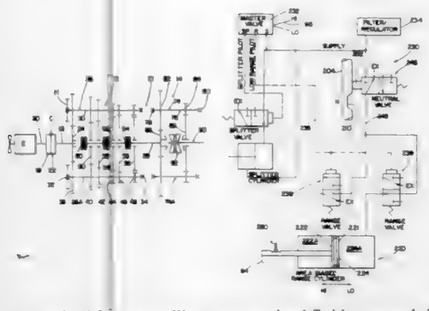
RANGE SECTION ACTUATOR CONTROL SYSTEM AND METHOD FOR PREVENTING DAMAGE TO RANGE SECTION SYNCHRONIZERS

Michael J. Huggins, Kalamazoo; Daniel A. Monette, Battle Creek, and Ronald A. Hutchison, Portage, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 23, 1992, Ser. No. 824,638

Int. Cl.[5] F16H *59/00*

U.S. Cl. 74—335 **34 Claims**



1. A method for controlling a pressurized fluid operated shift actuator (**220**) for an auxiliary transmission section (**14**) of a compound transmission (**10**) including a main transmission section (**12**) having engaged and not engaged positions connected in series with said auxiliary transmission section, said auxiliary transmission section including a selectable high speed ratio (direct) and a selectable low speed ratio (reduction), each engageable by a synchronized jaw clutch assembly (**92/128**), switch means (**98/98A**) for selecting a desired auxiliary section ratio, said actuator (**220**) comprising a piston (**221**) having a first piston surface (**224**) defining a first chamber (**224A**) and a second piston surface (**222**) defining a second chamber (**222A**), pressurization of said first chamber (**224A**) causing said actuator to urge said synchronized jaw clutch assembly to engage said high speed ratio and pressurization of said second chamber (**222A**) causing said actuator to urge said synchronized clutch assembly to engage said low speed ratio, each of said chambers selectively connectable to a common source (**234**) of pressurized fluid and to an exhaust (EX), said method comprising:

sensing the current engaged or not engaged position of said main transmission section, and

exhausting at least said first chamber whenever said main transmission section is in the engaged position thereof (**246/328** and **329**).

5,199,313

AUTOMATIC SELECTOR DEVICE OF A CHANGE-SPEED GEARBOX OF A MOTOR VEHICLE

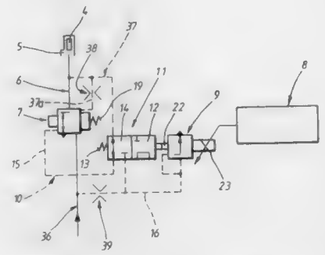
Alfons Müller, Rheinhausen, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Jul. 23, 1992, Ser. No. 917,171

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1991, 4124384

Int. Cl.[5] B60K *20/10*

U.S. Cl. 74—335 **4 Claims**



1. An automatic selector device of a change-speed gearbox of a motor vehicle, comprising an electronic control unit, a frictional connection, a selector setting element operatively arranged for selectively engaging the frictional connection, a selector valve having at least one gear position for subjecting the selector setting element to working pressure and one zero position for switching off the working pressure from the selector setting element, a spring device providing a spring force to move the selector valve into the zero position, a first pressure surface acting in opposition to the spring device and arranged to be subjected to a control pressure to move the selector valve into a gear position, the first pressure surface being dimensioned such that the pressure force which results from the control pressure generated by the minimum excitation is smaller than the spring force for moving the selector valve into the zero position, an electromagnetic control valve adapted to be excited by the electronic control unit and arranged to adjust the control pressure in proportion to excitation of the electromagnetic control valve to move the selector valve into a gear position, a control pressure conduit operatively arranged to selectively connect the selector valve to the control valve, a gear retention control valve located in the control pressure conduit and having a gear release position and a gear retention position, a spring device providing a spring force for moving the gear retention control valve into the gear retention position, an auxiliary control force, resulting from a magnetic force of the electromagnetic control valve caused by a permanent minimum excitation, which auxiliary control force is sized to move the gear retention control valve into the gear release position, and a conduit section of the control pressure conduit, for connecting the selector valve to the gear retention control valve, while in the gear release position, being connected to the control valve and shut off from the selector setting element, and in the gear retention position, is connected to the selector setting element and shut off from the control valve.

5,199,314

SYNCHRONIZED SPLITTER SECTION PROTECTION SYSTEM/METHOD

Ronald A. Hutchison, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 23, 1992, Ser. No. 824,956

Int. Cl.[5] F16H *59/00*

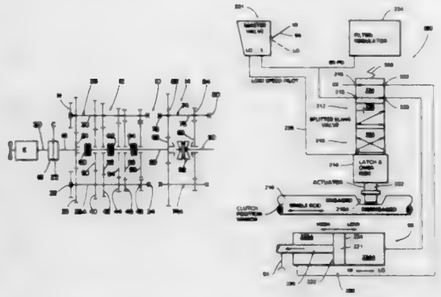
U.S. Cl. 74—335 **55 Claims**

1. A control method for controlling a shift actuator (**96**) associated with a synchronized jaw clutch (**92**) for selectively engaging and disengaging a selectable ratio (high) in a first transmission section (**14**) of a vehicular compound transmission

(**10**) comprising first and second (**12**) multiple speed sections connected in series, said transmission having an input shaft (**16**) for connection to a prime mover (E) through a selectively engageable and disengageable disconnect member (C) said method comprising:

(a) sensing selection of engagement of said first transmission section selectable ratio;

(b) sensing if the disconnect member is in either an engaged or a disengaged condition;



(c) responding to sensing (i) a selection of engagement of said first transmission section selectable ratio and (ii) said disconnect member being disengaged by causing said actuator to urge said synchronized jaw clutch into engagement with a first force ($p * a_{224}$); and

(d) responding to sensing (i) a selection of engagement of said first transmission section selectable ratio and (ii) said disconnect member being engaged by causing said actuator to urge said synchronized jaw into engagement with a second force ($p * (a_{224} - a_{222})$), said second force being considerably smaller than said first force.

5,199,315

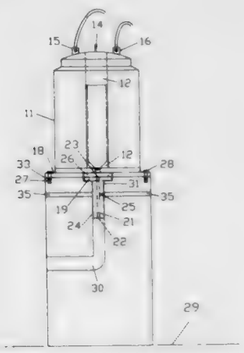
APPARATUS TO CONTROL THE MODULATION PRESSURE IN A FOURTH GEAR CLUTCH PACK

Daniel L. Hilden, 5025 Independence St., Maple Plain, Minn. 55359

Filed Feb. 3, 1992, Ser. No. 829,414

Int. Cl.[5] F16H *59/00*

U.S. Cl. 74—335 **1 Claim**



1. An apparatus to control the modulation pressure in a fourth gear clutch pack, which comprises:

a throttle member having a longitudinal bore extending therethrough from a front end to a back end, a hole extending through a wall thereof into said longitudinal bore, and a shoulder at said back end, said front end extending into an end bore of a fourth gear valve body with said hollow cylindrical body engaged in said end bore and with said shoulder engaging an end wall of said fourth gear valve body;

a modulation solenoid having a passage extending therethrough from an entrance end to an exit end, said modulation solenoid securably mounted to said end wall of said fourth gear valve body with said passage being substantially in alignment with said longitudinal bore, said modulation solenoid having a means for regulating discharge of fluid out of said fourth gear valve body through said end bore and through said passage so that (1) for fourth gear modulation pressure in said fourth gear clutch pack, said modulation solenoid is energized by a control unit and said regulating means closes said passage, preventing fluid from discharging out of said fourth gear valve body through said passage; and (2) for minimum modulation pressure in said fourth gear clutch pack, said modulation solenoid is not energized by said control unit and said regulating means opens said passage, permitting discharge of fluid out of said fourth gear valve body through said longitudinal bore and through said passage; and

a seal member having an opening therethrough, said seal member mountably engaged at said entrance end of said solenoid and at said back end of said throttle member to prevent fluid from leaking out between said modulation solenoid and said throttle member, said opening being substantially in alignment with said passage and longitudinal bore.

5,199,316

FULLY-SYNCHRONIZED MULTIPLE SPEED MANUAL TRANSMISSION FOR MOTOR VEHICLES

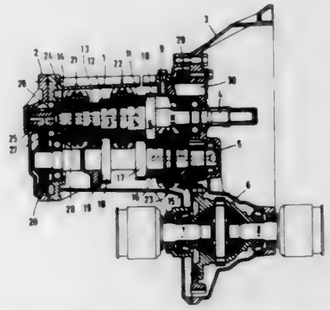
Harald Hofmann, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1992, Ser. No. 862,686

Claims priority, application Fed. Rep. of Germany, May 18, 1991, 4116418

Int. Cl.[5] F16H *3/08*

U.S. Cl. 74—360 **14 Claims**



1. A manual transmission for producing multiple ratios of the speeds at an input end and an output end of the transmission, comprising:

a driving shaft and a driven shaft, the shafts being parallel and supported for rotation about their respective axes;

multiple pairs of intermeshing pinions and gears, each pair associated with a speed ratio, one member of each pair supported on the driving shaft, the other member of each pair supported on the driven shaft; and

a first synchronizer means located at the end of the driving shaft remote from the input end, for selectively driveably connecting the pinions of first and second speed ratio pairs to the driving shaft.

5,199,317

wherein said second face of said connecting rod end abuts

5,199,320

REMOTE CONTROL ASSEMBLY WITH CONDUIT

way (**16**) extending through said terminal body (**14**) from

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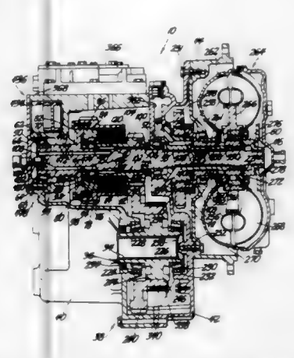
5,199,317
FORWARD AND REVERSE POWER SHIFT TRANSMISSION

Keith O. Moore, N. Dartmouth, Mass.; Robert Wessel, Greenwood, Ind., and Bruce M. Roberts, New Bedford, Mass., assignors to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed Jun. 22, 1992, Ser. No. 902,113
Int. Cl.[5] F16H *3/14*
U.S. Cl. 74—361 23 Claims



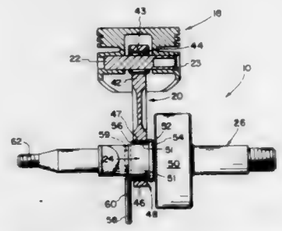
1. A forward and reverse power shift transmission including a gear case, an input shaft rotatably journalled in the grear case, for rotation about an input shaft axis, a gear fixed to the input shaft, a clutch gear rotatably journalled on the input shaft forward of the gear fixed to the input shaft and a clutch pack carried by the input shaft and operable to lock the clutch gear to the input shaft when engaged; a lay shaft rotatably journalled in the gear case for rotation about a lay shaft axis that is parallel to and spaced from the input shaft axis, a gear fixed to the lay shaft and in mesh with the gear fixed to the input shaft, a lay clutch gear rotatably journalled on the lay shaft forward of the gear fixed to the lay shaft and a clutch pack carried by the lay shaft and operable to lock the lay clutch gear to the lay shaft when engaged; an output shaft rotatably journalled in the gear case for rotation about an output shaft axis, an output gear secured to the output shaft and in mesh with the clutch gear on the input shaft and the lay clutch gear on the lay shaft; a pump drive gear rotatably journalled in the transmission for rotation about the input shaft axis, a pump drive shaft rotatably journalled in the gear case, and a driven pump gear secured to the pump drive shaft and in mesh with the pump drive gear; and a lubricant pump driven by the pump drive shaft and operable to supply lubricant to lubricate the transmission.

5,199,318
DEVICE FOR RESTRAINING CONNECTING ROD ON A CRANKSHAFT

Eric B. Hudson, Hilbert, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 22, 1991, Ser. No. 796,405
Int. Cl.[5] F16C *3/04*; G05G *1/00*
U.S. Cl. 74—595 16 Claims

1. An assembly comprising:
a crankshaft having a crankpin;
a connecting rod having an end with a first opening therein disposed around said crankpin, said connecting rod end having a first face and an opposite second face;
said crankshaft having a radially protruding portion integral with said crankpin, wherein said first face of said connecting rod end abuts said radially protruding portion; and
a retainer received in a second opening in said crankpin, wherein said second face of said connecting rod end abuts said retainer, wherein said radially protruding portion and



said retainer prevent excessive axial movement of said connecting rod along said crankshaft

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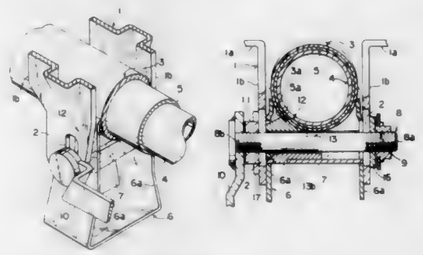
5,199,319
TILT TELESCOPIC STEERING DEVICE

Isao Fujiu, Kiryu, Japan, assignor to Kabushiki Kaisha Yamada Seisakusho, Gunma, Japan

Filed Feb. 13, 1992, Ser. No. 834,121
Claims priority, application Japan, Feb. 15, 1991, 3-42336
Int. Cl.[5] B62D *1/18*
U.S. Cl. 74—493 5 Claims

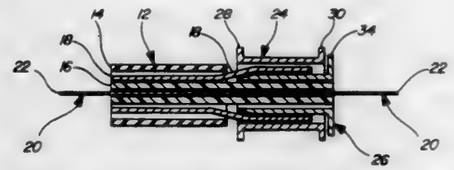


1. A tilt telescopic steering device, comprising:
a slidable inner cylinder connected to a steering shaft having a steering wheel at one end of the shaft;
a steering column supporting said slidable inner cylinder so that said slidable inner cylinder can move in an axial direction thereof, an opening being formed in a portion of said steering column;
plural fixed tilting brackets, including a pair of descending portions positioned on both sides of said steering column;
a U-shaped raising and lowering bracket disposed inside said descending portions with an open portion of the U-shape facing upward and towards the descending portions, said U-shaped raising and lowering bracket being connected to said steering column to move up and down relative to said fixed tilting brackets;
a guide member on said raising and lowering bracket, extending in a transverse direction to said inner cylinder;
a screw bar penetrating said fixed tilting brackets and said raising and lowering bracket, said raising and lowering bracket being fixed with respect to said fixed tilting brackets by tightening said screw bar; and
a pressing piece supported by said screw bar and being movable along said guide member, a portion of said pressing piece being formed as a surface which is capable of pushing an outer surface of said slidable inner cylinder through the opening in said steering column, said pressing piece being always spring-urged transversely on said screw bar.

5,199,320
REMOTE CONTROL ASSEMBLY WITH CONDUIT ANCHOR DEVICE

Arthur L. Spease, Bloomfield Hills, and Elio Evangelista, Washington, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Feb. 19, 1992, Ser. No. 838,563
Int. Cl.[5] F16C *1/10*
U.S. Cl. 74—502.4 10 Claims

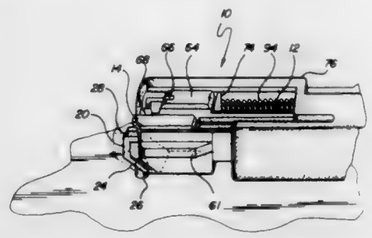


1. A motion transmitting remote control assembly (**10**) of the type for transmitting motion in a curved path by a flexible motion transmitting core element (**20**), said assembly comprising:
a conduit (**12**) comprising an outer jacket (**14**), an inner sheath (**16**), and support wires (**18**) of a predetermined diameter disposed between said outer jacket (**14**) and said inner sheath (**16**);
a flexible motion transmitting core element (**20**) disposed within said inner sheath (**16**);
a cylindrical outer ferrule (**24**) disposed over said support wires (**18**); and
characterized by a cylindrical inner ferrule (**26**) disposed over said inner sheath (**16**) and under said support wires (**18**) and axially moveable into overlapping engagement with said outer ferrule (**24**) to form a radial interstitial space therebetween smaller than the diameter of the support wires, whereby the support wires are radially compressed and deformed to tightly occupy said interstitial space as the inner and outer ferrules (**26**,**24**) are moved into overlapping engagement thereby securely clamping said support wires (**18**) between said inner and outer ferrules (**26**,**24**).

5,199,321
ADJUSTABLE TERMINAL HAVING A CAM SURFACE ACTUATOR

Joseph M. Nowak, Berkley, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jul. 7, 1992, Ser. No. 910,717
Int. Cl.[5] F16C *1/10*
U.S. Cl. 74—502.6 19 Claims

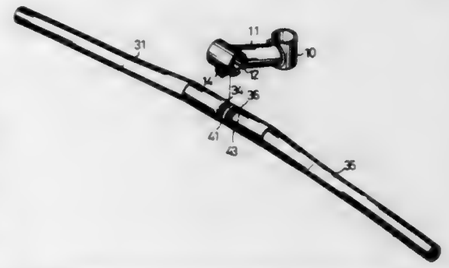


1. A motion transmitting remote control cable assembly (**10**) for transmitting motion in a curved path comprising:
a core element (**12**) having ends;
a terminal body (**14**) fixedly attached to and moveable with one of said ends of said core element (**12**), said terminal body including a front end and a rear end and a passageway (**16**) extending through said terminal body (**14**) from said front end to said rear end and a set of ratcheting teeth (**18**) disposed within said passageway (**16**);
an elongated sliding member (**20**) slideably disposed in said passageway (**16**) of said terminal body (**14**) and having a plurality of spaced apart ratcheting teeth (**22**) for engaging said ratcheting teeth (**18**) in said passageway (**16**) to provide incremental adjustment of said sliding member (**20**) with respect to said terminal body (**14**);
characterized by camming means (**24**) disposed at one end of said sliding member (**20**) for translating reciprocating linear motion of said sliding member into perpendicular reciprocating linear motion of a button (**26**) disposed in the reciprocating path of said sliding member (**20**).

5,199,322
HANDLEBAR ASSEMBLY FOR CYCLES

Meng-Liang Wu, No. 370, Sec. 4, Yuan Lu Rd., Hsi Fu Chen, Chang Hua Hsien, Taiwan

Filed Mar. 18, 1992, Ser. No. 853,497
Int. Cl.[5] B62K *21/12*, *21/16*; F16B *7/00*
U.S. Cl. 74—551.1 7 Claims



1. A handlebar assembly comprising a stem having a sleeve fixed thereon, a handlebar including a first half and a second half each including a free end engaged in said sleeve, a coupler including two end portions, said free end of said first half of said handlebar engaged on a first end portion of said coupler, a first engaging means including a pair of stubs oppositely formed on said second end portion of said coupler, a second engaging means including a pair of slots formed in said free end of said second half of said handlebar and engaged with said stubs of said first engaging means when said free end of said second half is engaged on said second end portion of said coupler, each of said slots being L-shaped, whereby, said second half of said handlebar is coupled to said coupler, and said handlebar is easily secured to said sleeve.

5,199,323
APPARATUS FOR CONNECTING A MEMBER TO A SHAFT AT ANY ANGULAR POSITION

Leslie C. Kaufman, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 24, 1989, Ser. No. 342,491
Int. Cl.[5] G05G *1/00*
U.S. Cl. 74—559 20 Claims

1. Apparatus for fixing a member at any position within a predetermined angular range to a non-circular cross section of a shaft, comprising
a) an insert formed of a relatively soft, rigid material and having a central bore whose cross section conforms to the shaft cross section, a circular periphery, and a slot extending radially between the periphery and the central bore; and
b) a clamping element fixed to the member and formed of relatively hard, rigid material, and having a bore whose periphery conforms to the periphery of the insert and has at least one tooth thereon projecting radially inward from

the clamping element bore's periphery, said clamping

mined based upon a detection of the speed stage shifting of the transmission by said speed stage shifting detection means only

trollably displacing said multiple blades toward said axis to sever the wire

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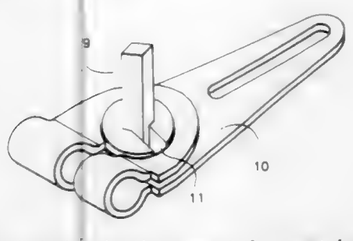
the clamping element bore's periphery, said clamping element bore adapted to receive the insert in surrounding relation to the clamping element bore's periphery thereof and permitting relative angular rotation of the clamping element with respect thereto, said clamping element further including clamping means to be operated with the insert positioned on the shaft cross section for distorting the clamping element adjacent its bore to reduce its bore diameter, for forcing the tooth into the insert's periphery, and for clamping the clamping element to the insert and the insert to the shaft.

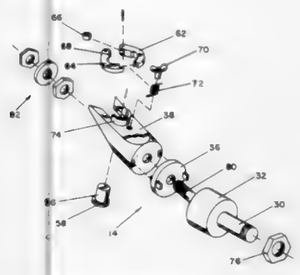


5,199,324

ADJUSTABLY VARIABLE PEDAL APPARATUS AND METHOD

Charles J. Sain, Albuquerque, N. Mex., assignor to Saisan Partners, Albuquerque, N. Mex.

Filed Sep. 19, 1991, Ser. No. 762,930
Int. Cl.[5] G05G *1/14*; B62M *3/08*
U.S. Cl. 74—594.6 **13 Claims**



1. A pedal assembly comprising:
pedal means;
crank arm means having an axis;
means for adjustably attaching said pedal means to said crank arm means at a predetermined angle of inclination to a perpendicular to said axis, wherein rotation of said crank arm varies said angle of inclination as a function of crank arm rotation angle;
means for inclining said pedal means at a first incremental angle of said predetermined angle of inclination; and
means for inclining said pedal means at a second incremental angle of said predetermined angle of inclination.

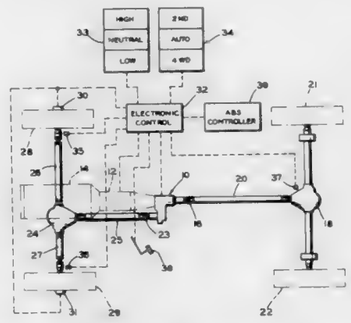
5,199,325

ELECTRONIC SHIFT OR CLUTCH ACTUATOR FOR A VEHICLE TRANSMISSION

David C. Reuter, Fort Wayne; John S. Sewell, Columbia, and Robert Leeper, Ft. Wayne, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 12, 1991, Ser. No. 760,528
Int. Cl.[5] F16D *13/52*
U.S. Cl. 74—861 **20 Claims**

1. An electronic shift actuator for a vehicle four wheel drive torque transfer case having a torque transfer shaft rotatably supported within a transfer case, said actuator comprising:
a rotary electric motor coaxially mounted relative to the transfer shaft and including a hollow motor shaft surrounding the transfer shaft;
a hollow sleeve means surrounding said transfer shaft and axially movable between a first axial position wherein the



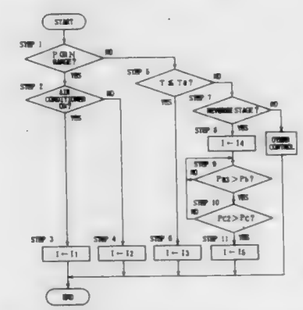
transfer case operates in a first mode and a second axial position wherein the transfer case operates in a second mode;
means for preventing rotation of said sleeve means relative to said transfer case; and
means for translating the rotational movement of said motor shaft to selective axial movement of said sleeve means between said first and second axial positions.

5,199,326

IDLE UP OF ENGINE OF AUTOMOBILE ACCORDING TO ELEVATION OF TRANSMISSION OIL TEMPERATURE

Kunihiro Iwatsuki, Toyota; Hidehiro Oba, Aichi, and Hiromichi Kimura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 795,841, Nov. 21, 1991, abandoned. This application Jul. 17, 1992, Ser. No. 913,760
Claims priority, application Japan, Nov. 28, 1990, 2-328274
Int. Cl.[5] F02D *41/08*
U.S. Cl. 74—873 **4 Claims**



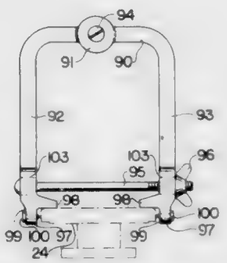
1. A control system for controlling idle operation of an engine of an automobile equipped with an automatic transmission including hydraulically actuated friction engaging means for shifting stages of the transmission and an oil pump driven by the engine to provide a pressurized oil for actuating said friction engaging means, comprising means for detecting temperature of the oil, means for detecting a speed stage shifting of the transmission, and means for determining an idle rotation speed of the engine for the idle operation thereof so as to temporarily increase said idle rotation speed for a period determined based upon a detection of the speed stage shifting of the transmission by said speed stage shifting detection means only when the oil temperature detected by said oil temperature detection means is higher than a threshold value above which the viscosity of the oil reaches such a value that oil leakage in the oil pump becomes substantial.

5,199,327

UNITARY TOOL FOR REMOVING AND INSTALLING RADIATOR CAPS

Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212

Continuation-in-part of Ser. No. 655,551, Feb. 12, 1991, Pat. No. 5,161,436. This application Nov. 15, 1991, Ser. No. 795,937
Int. Cl.[5] B67B *7/00*
U.S. Cl. 81—3.41 **8 Claims**



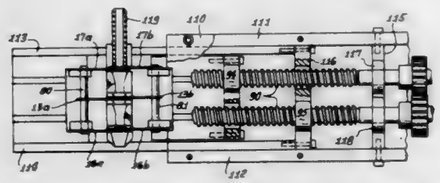
1. A tool for removing and installing a radiator cap from a radiator cap filler neck, comprising:
a. a handle having a pair of opposed legs, each said leg having a top portion including a connecting aperture and a lower end having at least one first aperture, with both said legs pivotally connected to each other at said top portion aperture;
b. said lower end of each said leg further comprising a second aperture adjacent to and above said first aperture;
c. a bolt inserted through each of said second apertures and secured with an adjustable fastening means; and
e. means through said at least one first aperture for gripping said depending skirt portion of said radiator cap.

5,199,328

MULTIPLE BLADE SET STRIP APPARATUS FOR CABLE AND WIRE

Jack L. Hoffa, Brea, Calif., assignor to Eubanks Engineering Company, Monrovia, Calif.

Division of Ser. No. 611,057, Nov. 9, 1990, Pat. No. 5,146,673. This application Oct. 28, 1991, Ser. No. 783,498
Int. Cl.[5] H02G *1/12*
U.S. Cl. 81—9.51 **23 Claims**



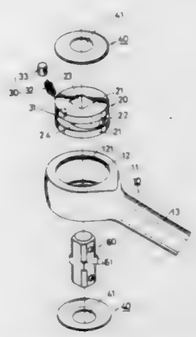
1. In apparatus for processing wire to cut the wire into sections and to strip sheathing from the sections to expose section wire ends, the combination comprising:
a) conveyor means for displacing the wire, including said sections, axially endwise,
b) first cutter means including multiple blades located for movement toward said axis, a first drive means for controllably displacing said multiple blades toward said axis to sever the wire,
c) second and third cutter means each including multiple blades located for movement toward said axis, and additional drive means for controllably displacing said multiple blades of said second and third cutter means toward said axis to cut into said sheathing and to selected depths, said second and third cutter means respectively located at axially opposite sides of said first cutter means and axially spaced therefrom,
d) and drive means to controllably drive said conveyor means to
i) position the wire to be severed by said first cutter means, thereby to produce forward and rearward wire sections,
ii) controllably relatively displace said sections axially, into positions to enable penetration of said second and third cutter means blades into said sheathing, for subsequent stripping of selected lengths of sheathing from a rearward portion of the forward section and from a forward portion of the rearward section, as during controlled endwise displacement of said sections by said conveyor means.

5,199,329

SOCKET WRENCH

Frank Hsu, No. 28, Chung-Hsing E. Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan

Filed Oct. 16, 1992, Ser. No. 961,802
Claims priority, application Taiwan, May 1, 1992, 79211345401
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—59.1 **1 Claim**



1. A wrench used with a socket member, said wrench comprising:
a handle having a box end with an internal wall that confines a central bore through said box end;
a pair of identical rollers having a diameter smaller than that of said internal wall and being disposed in said central bore of said box end, said pair of identical rollers having an eccentric shaft fixed therebetween, said eccentric shaft having a central rectangular opening passing therethrough and an annular space being formed around said eccentric shaft between said pair of identical rollers and being confined by said internal wall, said annular space having a widest portion with a first predetermined length formed on one side of said eccentric shaft and a narrowest portion with a second predetermined length formed on the other side of said eccentric shaft opposite to said widest portion thereof;
a pair of retaining plates mounted to said box end on both sides of said pair of identical rollers respectively so as to retain said pair of rollers in said box end, each of said retaining plates having a circular hole formed therethrough, said circular hole having a diameter smaller than said widest portion and greater than said narrowest portion, said circular hole being eccentrically disposed relative to said eccentric shaft, said circular hole being positioned relative to said eccentric shaft such that said widest portion of said annular space is positioned adjacent said box end and said narrowest portion of said annular space is positioned away from said box end;
a blind end;
a base;
a top;
sides; and
a ball joint mediate said base and said blind end; said sides being spaced apart and tapered from said base to said top to make

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HAND WRENCHING TOOL

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retaining plates having a circular hole formed therethrough and aligned with said central rectangular opening of said pair of identical rollers, said circular hole having a diameter which is smaller than diagonal length of said central rectangular opening of said pair of identical rollers;

a drive shaft disposed in said central rectangular openings of said pair of identical rollers and provided with two end portions which respectively protrude out of said circular holes of said retaining plates such that said end portions can be inserted in said socket member to rotate a nut, said drive shaft having a rectangular shoulder formed at an intermediate portion thereof and being fittingly held in said rectangular opening so as to permit rotation of said drive shaft with said rollers, said drive shaft being prevented by said retaining plates from falling out of said rectangular opening of said pair of identical rollers;

a plate member fixed between said narrowest and widest portion confined by said pair of identical rollers and said internal wall of said box end, said plate member being perpendicular to two opposed inner faces of said identical rollers;

a compression spring including a first end fixed to said plate member and a second end;

a cylindrical member disposed movably between said pair of identical rollers and having an axis parallel to said eccentric shaft, said cylindrical member further having a diameter which is smaller than said first predetermined length but is larger than said second predetermined length, said second end of said compression spring being connected to and biasing said cylindrical member so as to locate said cylindrical member at a position between said widest and narrowest portions, wherein said cylindrical member frictionally abuts against said internal wall of said box end and said eccentric shaft;

whereby when said handle is rotated in a first direction, said cylindrical member moves from said position towards said narrowest portion thereby correspondingly rotating said eccentric shaft in said first direction; and

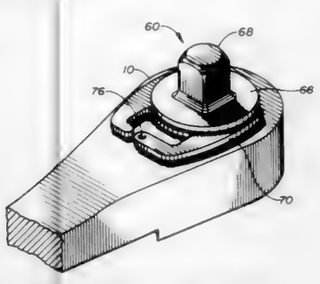
whereby when said handle is rotated in a second direction opposite to said first direction, said cylindrical member moves towards said widest portion against biasing action of said compression spring, wherein said cylindrical member disengages with said internal wall of said box end and said eccentric shaft so that said handle rotates idly relative to said identical rollers.

5,199,330

REVERSING RATCHET WRENCH

Robert L. Arnold, Leola; Richard P. Folkenroth, Windsor; James A. Van Lenten, Lancaster; Kenneth J. Taggart, Columbia, all of Pa., and James P. Gurzenski, Long Meadow, Mass. assignors to Easco Hand Tools, Inc., Lancaster, Pa.

Filed Oct. 1, 1991, Ser. No. 769,866
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63.2 **22 Claims**



1. A reversible ratchet wrench, comprising:

a gripping handle;

a wrench head formed with a first surface, an opposing second surface, a substantially cylindrical driver chamber extending inwardly from said first surface, and a substantially cylindrical pawl chamber adjacent to said driver chamber and extending inwardly from said first surface, said driver chamber communicating with said pawl chamber along a peripheral area of overlap;

a driver rotatably seated in said driver chamber, said driver further comprising,

a generally cylindrical pawl-engaging member defined by driver teeth arcuately spaced around the periphery,

a driver cap overlying one end of said pawl-engaging member and covering said driver teeth, the junction between said driver cap and said pawl-engaging member being defined by an annular groove therebetween, and

a drive tang at another end of said pawl-engaging member;

a retainer for retaining said driver within said driver chamber;

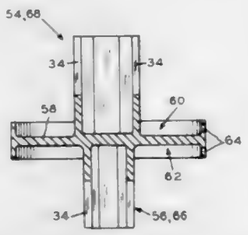
a pawl rotatably seated within said pawl chamber, said pawl having outwardly facing pawl teeth selectably engagable with said driver teeth to permit uni-directional rotation of said driver, said pawl also including a pawl cap covering said pawl teeth and projecting into said annular groove between said driver cap and said pawl-engaging member of said driver, said pawl cap and overlapping driver cap providing a protective cover for said pawl teeth and driver teeth over the respective chambers, and said pawl being retained within said pawl chamber by the driver cap overlying said pawl cap.

5,199,331

DRAIN PLUG REMOVER

Kazuichi Tsukamoto, 63-38, Kitashinden, Ogawa Shimomashiki, Kumamoto, Japan

Filed Jul. 23, 1992, Ser. No. 917,413
Claims priority, application Japan, Sep. 20, 1991, 3-84847
Int. Cl.[5] B25B *13/00*
U.S. Cl. 81—121.1 **5 Claims**



1. A tool for removing a drain plug from a vehicle engine oil pan, comprising:

a. a socket formed to engage the drain plug;

b. a shield member extending circumferentially outward from said socket so as to interpose between the drain plug and a user's hand; and

c. a handle, extending from the shield member and opposing said socket, which the user's hand grasps to hold and rotate the tool;

d. said handle being formed to a second socket of different size than said socket;

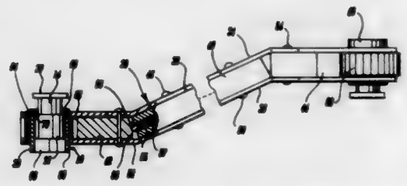
e. said shield member being formed with two, opposing, concave receptacles, providing a concave receptacle for each socket.

5,199,332

HAND WRENCHING TOOL

Ronald W. Batten, 5618 White Ct., Torrance, Calif. 90503

Continuation of Ser. No. 939,144, Dec. 8, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 191,619
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—124.1 **9 Claims**



1. The combination of a socket wrench adapted for application of torque limiting frangible fasteners having a flatted wrenching collar of narrow height, said wrench having at least one socket sleeve of substantially greater depth than the height of said wrenching collar distally carried on a wrench body with a through aperture having unbroken, smooth-walled indexing flats for mating with said flatted wrenching collar and with an internal lip at one end thereof, and;

a. a cylindrical member having a cylindrical body with an external diameter closely conforming to the internal diameter of said socket sleeve and a length sufficient to fill at least 50 percent of the depth of said socket sleeve and leave an unfilled depth substantially equal to the height of said narrow collar, said member being slidably received within said socket sleeve and having a reduced diameter neck at one end to form an annular shoulder with said cylindrical body, and said neck having a length at least equal to the width of said narrow wrenching collar; and

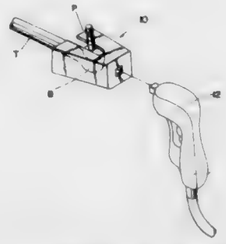
b. A ring permanently secured to the outer end of said reduced diameter neck whereby said internal lip of said socket sleeve is captured between said annular shoulder and said ring, thereby slidably retaining said cylindrical member in said socket sleeve.

5,199,333

WEDGE-GRIPPING TIE ROD END SOCKET WRENCH

Henry C. Snyder, Jr., Cleveland, Ohio, assignor to S.W.B.H. Efficient Systems, Inc., North Ridgeville, Ohio

Continuation-in-part of Ser. No. 485,247, Feb. 26, 1990, abandoned. This application Apr. 15, 1991, Ser. No. 685,430
Int. Cl.[5] B25B *13/00*
U.S. Cl. 81—124.3 **3 Claims**



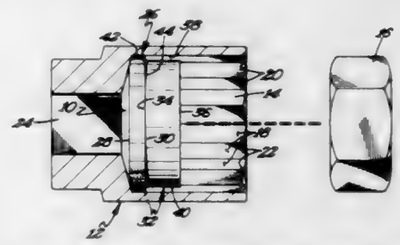
1. A vehicle steering system tie rod end hand socket wrench for rotatably tightening or loosening a tie rod end having a ball joint with or without an upstanding pintle, comprising: a portable, non-magnetic, one-piece, wedge-gripping, hollow, smooth multi- sided frusto-pyramidal socket with an open base and a closed top; an open-ended slot in one of said sides extending from said open base longitudinally in one of said sides, and terminating in a blind end beneath said top, said slot being tapered from said base toward said blind end and sized to make wedge-gripping engagement with the pintle of a tie rod end ball joint mediate said base and said blind end; said sides being spaced apart and tapered from said base to said top to make wedge-gripping engagement with a tie rod end ball joint mediate said base and said top; said sides having interior and exterior smooth parallel surfaces adapted to provide quick engagement with and quick release from a tie rod end ball joint; and means to fasten a powered high torque tool to said top, whereby high torque may be applied to said wrench to turn said tie rod end ball joint, and whereby said tie rod end socket wrench is adapted to wedge-grip a plurality of sizes of tie rod end ball joints without need for adjustment.

5,199,334

MAGNETIC KEEPER ACCESSORY FOR WRENCH SOCKETS

Richard A. Vasichek, HCR, Box 30, Brocket, N. Dak. 58321, and Robert J. Vasichek, R.R. #1, Michigan, both of N. Dak. 58259

Continuation-in-part of Ser. No. 709,588, Jun. 3, 1991, Pat. No. 5,146,814. This application May 28, 1992, Ser. No. 889,672
The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—125 **20 Claims**



1. Accessory for use in a wrench socket without need for modifying the wrench socket, with the wrench socket being of a conventional design including a well having an inner periphery formed by multiple sides intersecting at outer corners and including a handle mounting end, with the well slideably receiving a fastener, with the accessory preventing the fastener from sliding from the well to hold the fastener captive in the well while the socket is being moved to the fastening location, comprising, in combination: a nonmagnetic, compressible disk having planar, parallel, opposed, first and second faces, a periphery having at least portions of a size greater than the inner periphery of the well, and a recess extending at a depth from the second face of the disk towards but spaced from the first face of the disk and spaced from the periphery of the disk; and a generally cylindrical magnet having planar, parallel, opposed, first and second faces and a periphery smaller than the inner periphery of the well, with the depth of the recess being less than the height between the first and second faces of the magnet, with the recess having a size and shape for slideable receipt of the magnet for securing the magnet to the disk, with the magnet being secured to the disk with the second face of the magnet being spaced from the second face of the disk and the periphery of the magnet being spaced from the periphery of the disk with an annular portion of the second face of the disk extending beyond the periphery of the magnet, with the disk being deformable under force to pass into and snuggly fit within the inner periphery of the well with the magnet positioned on the opposite side of the disk than the handle mounting end of the socket with the disk magnetically insulating the magnet from the socket and with the magnet positioned generally concentrically within the inner periphery of the well creating an air space between the inner periphery of the well and the periphery of the magnet for magnetically insulating the magnet from the socket.

5,199,335

dated in said recess and angularly and axially movable

said press controls automatically moving said ram to position said tooling at a known height just above said workpiece during

f) means for maintaining said wheel means along a predeter-

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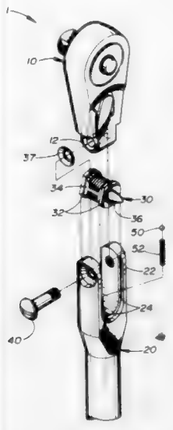
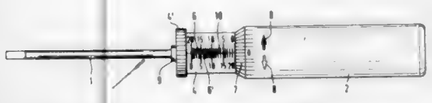
5,199,335
FLEX-HEAD TOOL WITH LOCKING FEATURE
Robert L. Arnold, Leola; Kenneth J. Taggart, Columbia, and James D. Diffenderfer, Lancaster, all of Pa., assignors to Easco Hand Tools, Inc., Lancaster, Pa.
Filed May 11, 1992, Ser. No. 881,204
Int. Cl.[5] B25G *1/06*
U.S. Cl. 81—177.8 **28 Claims**



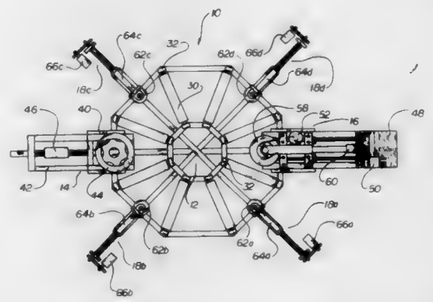
1. A locking flex-head tool, comprising:
a handle formed with an integral yoke at one end;
a tool head coupled to said yoke at a pivot, said tool head having a toothed hub facing rearwardly of said pivot into said yoke;
a locking spool rotatably carried in said yoke opposite the toothed hub such that its axis of rotation is orthogonal to the hub teeth, the locking spool further comprising,
a plurality of spool teeth geared to said hub teeth and extending around a portion of said spool, and
whereby said spool may be rotated into a first position in which said spool teeth engage said hub teeth to lock said tool head in a selected angular position with respect to said handle, and said spool may be rotated into a second position in which said planar section faces said hub to allow pivoting of said tool head.

5,199,336
TURN-COUNTING SETTING SCREWDRIVER
Albert Wuilmart, Outre-Cour 101, B-4651 Herve, Belgium
Filed Dec. 9, 1991, Ser. No. 803,594
Claims priority, application Belgium, Dec. 7, 1990, 09001169
Int. Cl.[5] B25B *15/00*
U.S. Cl. 81—436 **4 Claims**



1. A turn-counting screwdriver, comprising:
a handle;
a screwdriver shaft anchored in said handle and formed with a screwthread, said shaft being provided with a blade remote from said handle for engagement with a screw to be turned, said handle being formed with a recess opening in a direction of said blade;
a tubular part having a screwthread threadedly engaging said screwthread of said shaft, at least partly accommodated in said recess and angularly and axially movable relative to said handle;
graduations along a periphery of said handle at a mouth of said recess and cooperating with an index on said tubular part for signalling a fraction of a rotation of the screwdriver shaft;
double graduations along at least a portion of a length of said tubular part with each double graduation having graduation indicia extending in opposite directions relative to one another for signalling numbers of rotations of said shaft; and
an end-of-travel stop slidable on said shaft, adapted to be fixed thereto and engageable with said tubular part.

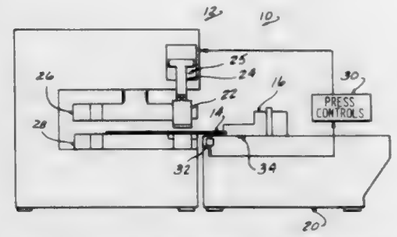
5,199,337
TIRE CUTTER APPARATUS
Jack Parker, HC 73, Box 21, Karval, Colo. 80823
Filed Sep. 6, 1991, Ser. No. 755,948
Int. Cl.[5] B23B *5/14*; **B26D** *1/143*
U.S. Cl. 82—83 **6 Claims**



1. A tire splitting apparatus for splitting tire casings circumferentially into segments, comprising:
a frame having a generally horizontal tire support table;
drive means mounted on said support table for engaging the outer crown of a tire casing and rotating a tire casing on said support table;
at least one pair of diametrically opposing support guides for engaging the outer crown of a tire casing such that a tire casing situated on said support table rotates substantially over the center of said support table;
cutting means diametrically opposite said drive means for slicing a tire casing circumferentially into segments;
adjustment means operatively connected to said support guides whereby tire casings of varying diameter may be sliced into circumferential segments and recycled;
wherein said drive means and said support guides and said cutting means are external to the tire to be split.

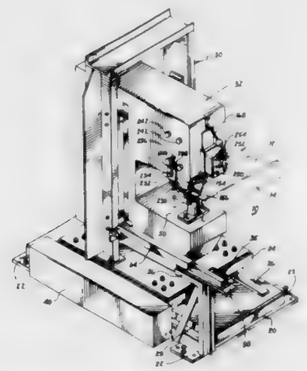
5,199,338
AUTOMATIC WORKHOLDER AVOIDANCE SYSTEM FOR A PRESS
Gerard J. Schorn, Southampton, and Maynard H. Unger, Norristown, both of Pa., assignors to Murata Machinery, Limited, Aichi, Japan
Filed Mar. 9, 1992, Ser. No. 848,130
Int. Cl.[5] B26D *5/20*
U.S. Cl. 83—13 **2 Claims**

2. A method of controlling programmed punch press operation of the type in which a hydraulically actuated ram drives punch tooling through a workpiece, said workpiece positioned by a movable carriage having grippers engaging one side of said workpiece and press controls including a programmed control automatically controlling carriage movement to locate predetermined portions of said workpiece beneath said tooling, said press controls automatically moving said ram to position said tooling at a hover height just above said workpiece during movement of said carriage between locations whereat punching operations are performed, said method comprising the steps of:



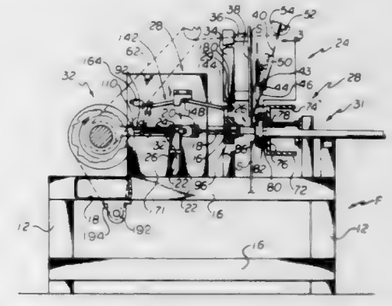
positioning an electrical switch at a location to be tripped by movement of said carriage towards said ram to a predetermined point whereat there is a possibility of a collision of said grippers with said tooling; and
overriding said press controls and raising said ram to a safe height higher than said grippers whenever said electrical switch is tripped.

5,199,339
H BEAM HOLE PUNCH
Clyde W. Creech, Phoenix, Ariz., assignor to C & M Enterprises, Inc., Phoenix, Ariz.
Continuation of Ser. No. 512,969, Apr. 23, 1990, abandoned.
This application Nov. 18, 1991, Ser. No. 793,463
Int. Cl.[5] B26D *5/02*
U.S. Cl. 83—50 **18 Claims**



1. Apparatus for transporting a punch and die assembly with respect to a beam to punch holes therein at predetermined locations, said apparatus comprising in combination;
a) a base;
b) a trolley, said trolley including super structure for supporting the punch and die assembly;
c) means for continually urging transport of said trolley across said base, said urging means including power means for conintuously urging transport of said trolley in a selected direction;
d) clutch means interconnecting said power means and said trolley for effecting movement of said trolley in response to actuation of said power means, said clutch means including means for accommodating continuing actuation of said power means upon halted transport of said trolley;
e) wheel means extending from said trolley to facilitate transport of said trolley across said base;
f) means for maintaining said wheel means along a predetermined path on said base;
g) means for halting transport of said trolley in the selected direction commensurate with the location of a hole to be punched in the beam and opposing movement of said trolley continuously urged by said power means, said halting means including a template fixedly positional relative to said base and having one hole corresponding with each hole to be punched in the beam and means attached to said trolley for engaging and disengaging the holes in said template to halt and resume, respectively, transport of said trolley in response to said urging power means;
h) motive means for raising and lowering the punch and die assembly relative to said trolley to position the punch and die of the punch and die assembly in operative position relative to the beam; and
i) means for actuating the punch and die assembly upon halted transport of said trolley to punch a hole in the beam.

5,199,340
MECHANICAL PARTS EJECTOR FOR TRIM PRESS
Wayne Lamson, Beaverton, Mich., assignor to John Brown Inc., West Warwick, R.I.
Filed May 24, 1991, Ser. No. 705,589
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—82 **32 Claims**



32. Apparatus for trimming and ejecting articles integrally thermoformed in a sheet of thermoplastic material from the sheet comprising:
a frame;
means for indexing a sheet of thermoplastic material having articles thermoformed therein to a trim station;
a pair of opposed trim dies mounted on said frame for relative movement toward and away from each other between a closed position engaging opposite sides of said sheet to trim an article in said sheet from said sheet at said trim station and a retracted spaced apart position allowing the sheet to be indexed therebetween; and
ejector mans received by one of said trim dies and movable relative thereto, between a retracted, rearward rest position and a forward ejecting position for ejecting a severed article from said trim station and moving the severed article relative to said trim dies;
ejector moving means for moving said ejector means between said retracted position and said forward ejecting position including
means responsive to said relative movement of said trim dies away from each other for initiating forward movement of said ejector means at a predetermined velocity;
means for accelerating the forward movement of said ejector means at a predetermined higher velocity; and
means for retracting said ejector means from said forward ejecting position to said rest position at a still higher predetermined velocity;

said ejector moving means comprises toggle linkage means

5,199,342

being movable relative to said work surface, the power saw being adapted to be operated by an operator normally posi-

piston assembly including a first piston fitted within the

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said ejector moving means comprises toggle linkage means coupled to said one trim die for movement therewith and for movement relative thereto.

5,199,341

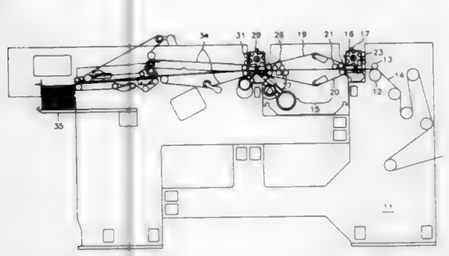
IN-LINE, ADJUSTABLE GAP CUTTING SHEETER FOR PRINTED WEBS

Donald A. Jones, Terre Haute, Ind., assignor to Numerical Concepts, Inc., Terre Haute, Ind.

Continuation-in-part of Ser. No. 521,570, May 10, 1990. This application Apr. 17, 1992, Ser. No. 870,394

Int. Cl.[5] B26D *7/18*

U.S. Cl. 83—100 **15 Claims**



1. An in-line, adjustable gap cutting system having a left end and a right end for gap cutting a moving web having a repetitious printed surface comprising:

a first rotary cutting head disposed to rotate towards the web as the web moves toward the cutting head;

a first rotary knife mounted on said first cutting head for cutting the web transversely into sheets or signatures of predetermined lengths in response to a signal determined by the printed surface of the web, said sheets or signatures having transverse leading edges and transverse following edges;

conveyor means having an upstream end receiving the moving web and a downstream end discharging cut sheets or signatures for moving successive sheets or signatures from the cutting head downstream at a controlled rate faster than the speed of the incoming web to generate a predetermined space between the transverse edges of each successive sheet or signature and the incoming web;

gripping means towards the downstream end of said conveyor means gripping successive sheets or signatures leaving the downstream end of said conveyor means;

a second cutting head disposed just downstream from said conveyor means and adjacent the successive incoming sheets or signatures to rotate towards said sheet or signature in a clockwise direction when viewed from the side of the web moving from right to left;

a second rotary knife mounted on said second cutting head for cutting a small chip from the leading edge of successive sheets or signatures, the width of said chip being predetermined in response to a signal determined by the printed surface thereof;

control adjustment means for changing the relative rates of said first and second cutting heads relative to each other, the linear rate of travel of the conveyor means and said gripping means relative to the rotation rates of the cutting heads to control the positions of the transverse cuts in said web and successive sheets or signatures;

a vacuum tube having a vacuum opening disposed below the second rotary knife for removing the small chips as they are being cut to define sheets or signatures; and

a positive air pressure means having an opening intersecting the vacuum opening to pulse air against the leading edge of the successive sheets or signatures just after the chip is removed to enable the successive sheets or signatures to move downstream across the vacuum opening without being diverted into the vacuum opening.

5,199,342

METHOD FOR CUTTING A WORKPIECE AND AN APPARATUS FOR PERFORMING THE METHOD

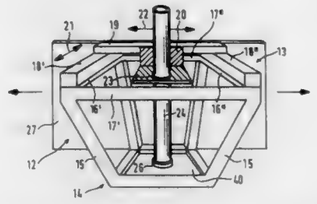
Peter Hediger, Fabrikweg 15, 5033 Buchs, Switzerland

Filed Jul. 31, 1991, Ser. No. 738,478

Claims priority, application European Pat. Off., Jul. 31, 1990, 90810576.0

Int. Cl.[5] B26F *3/00*

U.S. Cl. 83—177 **8 Claims**



1. An apparatus for cutting a plain, curved or arched workpiece by a beam-shaped fluid cutting medium ejected under high pressure, said apparatus comprising:

a tube-like member having an end portion and an inlet for receiving fluid;

nozzle means connected at said end portion of said tube-like member;

means for providing a high-pressure fluid jet escaping from said nozzle means;

guiding means including an upper guiding member adjustable in two directions extending perpendicular to each other for enabling said tube-like member to displace in axial direction; and

supporting means comprising a pyramid-shaped cage-like supporting member including a lower supporting plate for supporting for pivotal movement in all directions said end portion of said tube-like member at which said nozzle means is connected.

5,199,343

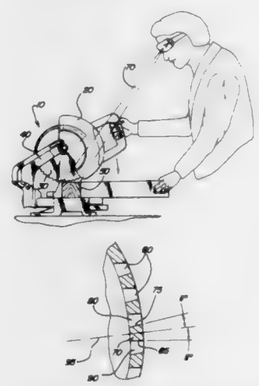
POWER SAW WITH LOUVERED BLADE GUARD

Michael L. O'Banion, Westminster, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 9, 1991, Ser. No. 774,774

Int. Cl.[5] B23D *47/00*

U.S. Cl. 83—397 **10 Claims**



1. A power saw having a circular disc-shaped cutting blade with cutting teeth disposed around its outer periphery, said power saw including a planar work surface for positioning a workpiece to be cut by the cutting blade, said cutting blade being movable relative to said work surface, the power saw being adapted to be operated by an operator normally positioned at an operating position relative to the power saw whereby the eyes of the operator are located above and displaced toward said operating position and away from the cutting blade so that the operator's line of sight forms an acute angle relative to the work surface; characterized in that said power saw further includes a unitary circumferential guard for protecting the operator from the cutting blade and for confining and directing cutting debris away from the operator, said guard being movably mounted to the power saw and comprising a pair of spaced substantially parallel side portions and an outer radial edge portion joining said side portions and extending circumferentially about the cutting blade to thereby define a channel that covers a radial portion of said cutting blade in a first position and is movable to expose the cutting teeth of said cutting blade in a second position, said guard having a plurality of louvers formed through said outer radial edge portion, said louvers being configured to prevent the direct ejection through said louvers of cutting debris emanating tangentially from the periphery of the cutting blade, while providing said normally positioned operator with an unobstructed line of sight through said louvers along the plane of the cutting blade to the interface between the cutting blade and the workpiece when said workpiece is positioned on said work surface, said outer radial edge portion of said guard having an inner edge surface and an outer edge surface defining a radial thickness therebetween, said louvers of said guard being tapered so as to provide a greater opening at said inner edge surface than at said outer edge surface.

5,199,344

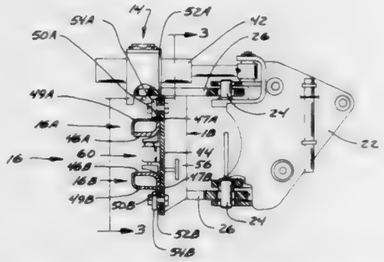
LOCK CYLINDER FOR BACKHOE SLIDE FRAME

Oryn B. Wagner, and Knute K. Brock, both of Bismarck, N. Dak., assignors to Clark Equipment Company, South Bend, Ind.

Filed Jun. 11, 1991, Ser. No. 713,714

Int. Cl.[5] F15B *15/26*; **B66C** *23/00*

U.S. Cl. 92—28 **15 Claims**



1. A machine having a slide frame slidably carried on at least one slide rail mounted on a support to define a plane of movement of the slide frame and a second rail spaced from the slide rail and generally parallel thereto, the slide frame having a fluid pressure locking cylinder assembly for exerting locking forces in two opposite directions along an axis, and comprising:

a cylinder housing carried by the slide frame to lock the slide frame into a desired position along the at least one slide rail wherein said at least one slide rail comprises a transversely extending lip, the lip on the rail having a narrow upper edge comprising an upper surface, and a second surface parallel to the plane of movement of the slide frame, support means on the slide frame slidably engaging the upper surface of the one slide rail for movement along the slide rail and for preventing separation of the slide frame from the slide rail in a direction perpendicular to the plane of sliding movement along the rail and wherein the slide rail comprises a channel like member having a stop wall on the opposite side of the lip from the slide frame;

a piston assembly within a bore in said cylinder housing, said piston assembly including a first piston fitted within the bore in the housing and mounted to extend outwardly through a first end of said housing, said first piston remaining partially within the housing, and a second piston slidably mounted in a bore in said first piston and extending outwardly from the housing in an opposite direction from the first piston, said second piston remaining partially within the housing, said second piston having an effective area that is less than the first piston, and means to provide fluid pressure to exert the same pressure on the first piston within the housing bore and the second piston within the bore in the first piston to provide a differential force in opposite directions from said housing, at least one of the first or second piston assemblies having wedge means to engage the slide rail and the other of the first and second pistons engaging the second rail, said wedge urging the stop wall against the lip when the wedge is under force from the lock cylinder; and

said locking cylinder assembly pistons exerting a force on the wedge means when the locking cylinder assembly is under fluid pressure to force the wedge means toward the slide rail and second rail and between the second surface of the slide rail and the slide frame to exert forces urging the support means against the upper surface of the slide rail and urging the slide frame away from the second surface and also urging the slide frame away from the second rail under forces exerted by the pistons.

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PISTON COMPRESSOR FOR THE OILFREE COMPRESSION OF A GAS

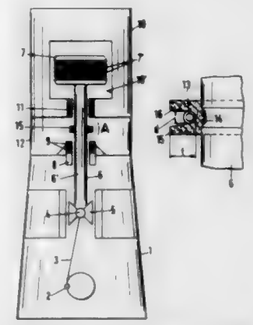
Hans Meier, Kollbrunn, Switzerland, assignor to Maschinenfabrik Sulzer-Burckhardt AG, Basel, Switzerland

Filed Jun. 22, 1992, Ser. No. 902,190

Claims priority, application Switzerland, Aug. 12, 1991, 2381/91

Int. Cl.[5] F04B *21/04*

U.S. Cl. 92—141 **1 Claim**



1. A piston compressor for the oilfree compression of a gas having at least one piston which is supported to be freefloating and is connected via a piston rod to a crosshead, the piston rod sliding in a guide bearing next to the crosshead and in a gland next to the cylinder, characterized in that a ring of porous material is arranged on the piston rod between the guide bearing and the gland and that the ring includes a circumferential groove which receives a tubular spring, the depth of the circumferential groove—measured from outside transversely to the longitudinal axis of the piston rod—being at least as great as the outer diameter of one turn of the tubular spring.

and a covered top end, said open bottom end passing

plate of said squeezing station, said kinematic unit being

wherein the diameter of the inner surface of the base

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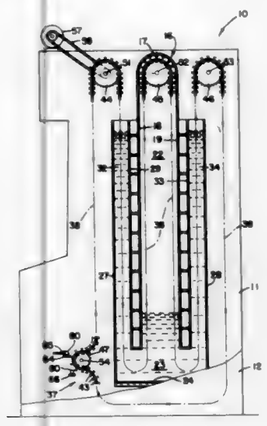
APPARATUS FOR HIGH SPEED STERILIZATION OF IRREGULARLY SHAPED CONTAINERS

Jeffery A. Hadley, Clovis, and William C. Kreamer, San Jose, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 29, 1991, Ser. No. 693,252
Int. Cl.[5] A23L *3/04, 3/06;* **A61L** *2/00, 2/04*
U.S. Cl. 99—362 **4 Claims**



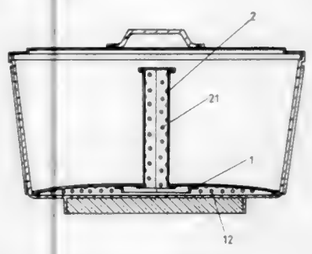
1. An improved hydrostatic sterilizer having a sterilizing chamber with a sterilizing medium therein, and a conveyor for moving a plurality of filled containers through the sterilizing chamber wherein an improvement comprises:
a carrier for holding a plurality of irregularly shaped containers wherein said carrier includes a plurality of annular members and a plurality of elongated rods, said elongated rods being interconnected by said annular members; and
means for mounting said carrier on a conveyor for moving said containers through a sterilization chamber.

5,199,347

PERFORATED STEAM PLATE

Kuang-Hsing Chen, 6-1 Fl., No. 22, Lane 106, Ren Jyh St., Taipei, Taiwan

Filed Aug. 18, 1992, Ser. No. 931,354
Int. Cl.[5] A47J *27/00, 27/04, 37/00*
U.S. Cl. 99—418 **3 Claims**



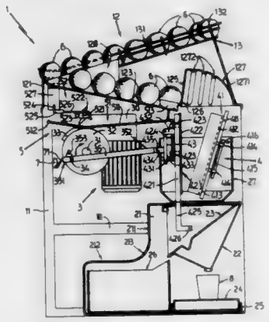
1. A perforated steam plate comprising:
a substantially convex retaining plate which allows an adequate space to be left between said retaining plate and a surface on which said retaining plate is positioned;
said retaining plate having a periphery which has an inward and upward bent end portion forming an reinforced seat of said retaining plate, and having a plurality of perforations evenly formed on entire surface thereof; and
a hollow and round upright tube having an open bottom end and a covered top end, said open bottom end passing down through said retaining plate via a central hole formed on said retaining plate and connecting to said retaining plate at its bottom surface with a flared periphery; and said upright tube having a plurality of perforations formed on its top end and its tube wall;
said retaining plate and said upright tube being so designed that their sizes correspond to the size of common boilers or cookers and therefore are suitable for being placed in a boiler or a cooker with said periphery and said bent end portion of said retaining plate contacting bottom surface of said boiler or said cooker.

5,199,348

MACHINE FOR EXTRACTING JUICE FROM CITRUS FRUIT

Antonio Cimenti, Via Baron, 15-30027 San Dona'di Piave (Venezia), Italy

Filed Nov. 8, 1991, Ser. No. 789,340
Claims priority, application Italy, Nov. 8, 1990, 45769 A/90
Int. Cl.[5] A23N *1/02;* **A47J** *19/02;* **B30B** *9/02*
U.S. Cl. 99—510 **11 Claims**



1. A machine for extracting juice from fruit, said machine comprising:
a framework,
a squeezing station including a first plate fixed relative to said framework, and a second movable plate pivotably mounted at a lower part thereof to said framework about a transverse axis, said second plate confronting said first plate and pivotable about said axis between a rest position and a squeezing position, said plates converging toward one another in a downward direction in the machine when said second plate is in the rest position thereof, and said plates lying close to one another when said second plate is in said squeezing position;
a loader including a central inclined chute having an uppermost end and a lowermost end which is disposed at a level above said squeezing station, lateral inclined chutes having lowermost ends adjacent the uppermost end of said central inclined chute, lifting components at the lowermost ends of said lateral inclined chutes, respectively, said lifting components each movable between a first position and a raised position, each said lifting component directing a piece of fruit having been situated at the lowermost end of a respective said lateral inclined chute into the central inclined chute when in the raised position thereof, and a spoon at the lowermost end of said central inclined chute, said spoon being movable between a first position and a raised position, said spoon directing a piece of fruit having been situated at the lowermost end of said central inclined chute toward a space between the plates of said squeezing station when in the raised position thereof;
a kinematic unit operatively connected to the lifting components and the spoon of said loader and to the movable plate of said squeezing station, said kinematic unit being drivable to move said lifting components and said spoon between said first and said raised positions thereof, respectively, and to pivot said movable plate about said transverse axis between said rest and said squeezing positions thereof;
drive means operatively connected to said kinematic unit for driving said kinematic unit; and
a collecting unit disposed below said squeezing station so as to receive and collect juice and residue of fruit squeezed at said squeezing station.

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SKIMMER/SEPARATOR LADLE

Hans Hansen, Vejle, Denmark, assignor to Scanintra ApS, Vejle, Denmark

Filed Jun. 26, 1992, Ser. No. 905,827
Claims priority, application Denmark, May 1, 1992, 0580/92
Int. Cl.[5] A47J *43/28*
U.S. Cl. 99—495 **19 Claims**

1. A skimmer/separator ladle comprising:
a handle of an elongated configuration, and
a bowl of a cup-shaped configuration defining an upper rim, said handle and said bowl being connected together, and said handle extending upwardly from said bowl at said upper rim thereof,
said bowl having an outwardly protruding tongue arranged at a first rim section of said bowl and being located below said upper rim of said bowl, and one or more throughgoing holes provided in said bowl and arranged at a second rim section of said bowl, said one or more throughgoing holes being located below said upper rim of said bowl and further being located above said tongue.

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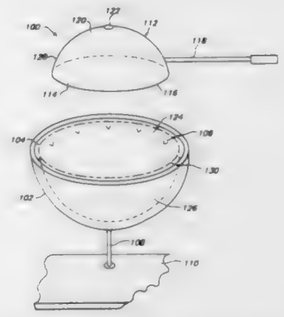
CUTTING DEVICE

Thomas Lin, P.O. Box 21216, Los Angeles, Calif. 90021

Division of Ser. No. 515,411, Apr. 27, 1990, Pat. No. 5,101,718.
This application Dec. 18, 1991, Ser. No. 809,760
Int. Cl.[5] A23N *3/00;* **A47J** *25/00;* **B26B** *3/00*
U.S. Cl. 99—543 **16 Claims**

1. A scooping device for use on a fruit having a generally spherical shape and having an outer peel and an inner edible portion, the fruit having been approximately bisected, the scooping device comprising a generally hemispherical-shaped scooping member having a dome or apex and a substantially circular edge, the edge forming a cutting blade;
a shaft member having a longitudinal axis extending outwardly from a point on an outer surface of the scooping member near the edge thereof to facilitate rotation of the scoop in a direction normal to the longitudinal axis;
a base member of hemi-spherical shape, the base member being adapted to accommodate and hold a piece of fruit the inside of which is removed by the scooping member, the base member having an inner surface and outer surface wherein the diameter of the inner surface of the base member exceeds the diameter of the scoop member by an amount which is slightly larger than the thickness of the outer peel of the fruit.

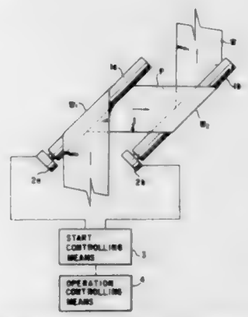


5,199,351

ANGLE-BAR DEVICE FOR USE IN ROTARY PRINTING PRESS

Yasuo Shibuya, and Tohru Higuchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 772,293
Claims priority, application Japan, Oct. 8, 1990, 2-268541
Int. Cl.[5] B41F *13/06*
U.S. Cl. 101—228 **6 Claims**



1. An angle-bar device for use in a rotary printing press which is put to use by allowing paper webs to run along their relevant paths, comprising:
at least two angle-bars disposed rotatively and spaced upstream and downstream from each other in the direction of running of a paper web, each of said angle-bars being inclined at an angle other than ninety degrees relative to said direction of running of the paper web so as to laterally displace the path of movement of the web from a first path of movement of the web as the web approaches the upstream angle-bar to a second path of movement of the web as the web leaves the downstream angle-bar;
driving means separate from the driving web for rotatively driving each of said angle-bars;
a start controlling means connected operatively with said driving means and adapted to control the starting of the driving means; and
means for controlling the drive means to each of said angle-bars so that each of said upstream and downstream angle-bars is rotated to increase the tension exerted on the paper web running around and between the angle-bars.

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GARMENT PLATE

Jeffrey Lee, 1 Lorraine Ct., Lawrenceville, N.J. 08648

Filed Jan. 27, 1992, Ser. No. 826,433
Int. Cl.[5] A47J *47/00*
U.S. Cl. 99—426 **4 Claims**

1. A garment plate comprising:
a substantially flat plate having a top surface and a bottom surface, said plate having a substantially circular shape with a diameter of between 8 and 12 inches;
a plurality of spaced apart ridges on said top surface of said plate, said ridges having a height of between 0.1 and 0.5 inches, said ridges being spaced apart between 0.5 and 1.5 inches, said ridges being substantially parallel to each other, said ridges being substantially perpendicular to a diameter of said plate, said ridges being substantially parallel to a chord of said plate, said ridges being positioned on said plate to facilitate/application of the garment around said plate and

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said first and second turbines having turbine exhaust ducts

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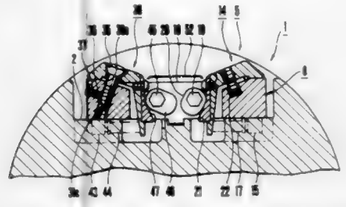
PLATE LOCK-UP DEVICE FOR PRINTING PRESS

Hiroyuki Sugiyama, Ibaraki, Japan, assignor to Komori Corporation, Japan

Continuation of Ser. No. 766,952, Sep. 24, 1991, abandoned, which is a continuation of Ser. No. 485,172, Feb. 26, 1990, abandoned. This application May 26, 1992, Ser. No. 888,321
Int. Cl.[5] B41F 27/06
U.S. Cl. 101—378 3 Claims



1. A plate lock-up device for a printing press including leading and trailing plate lock-up units which comprises:
- at least one of said plate lock-up units being located in a gap formed in a circumferential surface of a plate cylinder and mounted to said plate cylinder in said gap so as to be movable in the circumferential direction of said cylinder, said at least one plate lock-up unit having plate lock-up bases extending from said plate lock-up unit in an axial direction of said plate cylinder;
- a plurality of gripper plates pivotally supported by said plate lock-up bases and aligned in the axial direction of said plate cylinder;
- first spring members, each inserted between corresponding ones of said gripper plates and said plate lock-up bases, for pivoting said corresponding gripper plates with respect to said corresponding plate lock-up bases in a plate gripping direction; and
- a plurality of plate gripper cams, aligned on pivot shafts adjacent to said at least one plate lock-up unit, each plate gripper cam engaged with said corresponding gripper plate, for pivoting said gripper plates with respect to said corresponding plate lock-up bases in a plate release direction upon pivotal movement of said pivot shafts a plurality of plate stretching cams, aligned on at least one of said pivot shafts, said plate stretching cams having a different phase from said plate gripper cams on said at least one pivot shafts such that said gripper cams grip said plate before said plate stretching cams stretch the plate.

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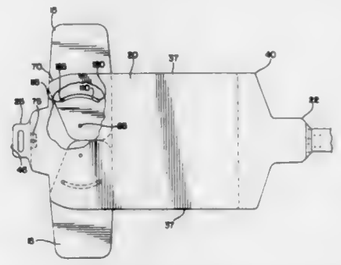
PRINTING MACHINE PALLET ASSEMBLY

Aleksander Szyszko, Carol Stream, Ill., assignor to M & R Printing Equipment, Inc., Glen Ellyn, Ill.

Filed Jun. 6, 1991, Ser. No. 711,086
Int. Cl.[5] B41F 1/28
U.S. Cl. 101—474 12 Claims

1. In combination:
printing means for applying inked indicia to a garment; and
a pallet assembly connected to said printing means for supporting said garment during the inking thereof, said pallet assembly including a first plate around which the body of a garment is to be disposed to receive on a side thereof ink for forming a pattern, said plate having a pair of outside surfaces, a free end, a fixed end and a periphery, and means for presenting a flat garment body surface to the ink applying means of said printing means comprising a pair of arm members around which the sleeves of said garment are to be disposed to stretch the body of said garment and thereby flatten the same, said pair of arm members being rotatably attached to said plate, and extending from opposite sides of the periphery of said plate said arms being rotatable toward each other to a position in which they extend from the free end of said plate to facilitate/application of the garment around said plate and arm members and away from each other so that the arm members project in opposite directions and extend outwardly from said periphery of said plate, wherein said arm members of said pallet assembly have a thin portion over one of said plate outside surfaces and a thicker portion opposite to said periphery.



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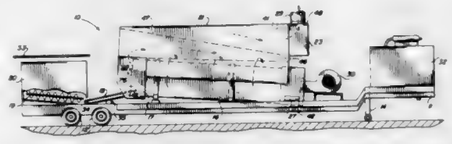
MOBILE SOIL REMEDIATION SYSTEM

Kenneth L. Wood, Apopka, Fla., assignor to TPS Technologies, Inc., Apopka, Fla.

Continuation of Ser. No. 545,685, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 273,378, Nov. 18, 1988, abandoned. This application Feb. 21, 1992, Ser. No. 840,640
Int. Cl.[5] F23G 7/00
U.S. Cl. 110—241 25 Claims



1. Readily transportable, compact soil remediation apparatus, comprising:
- a movable elongated platform;
- a feeder bin located on said platform for receiving a quantity of soil having volatile contaminants therein;
- a dryer, comprising a rotatable cylindrical drum coaxially mounted on said platform;
- a burner;
- means for delivering a quantity of said contaminated soil from said feeder bin to said dryer drum;
- means for rotating said drum, including flighting for elevating said quantity of soil and dropping the same in veils in the interior of said drum for heating by said burner and evaporating said contaminants from said soil;
- means for drafting air through said drum to carry said evaporated contaminants away from said drum;
- means positioned on said platform in straddling relationship over said dryer for receiving the air drafted through said drum and removing dust particles suspended therein; and
- means discharging said quantity of soil from said drum after removal of said contaminants therefrom.

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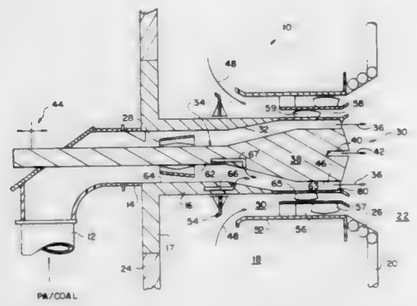
LOW NO_x SHORT FLAME BURNER

Albert D. Larue, Uniontown, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 23, 1991, Ser. No. 749,356
Int. Cl.[5] F23C 1/12
U.S. Cl. 110—261 12 Claims



1. A burner for the combustion of a pulverized coal fuel plus air mixture, comprising:
- an nozzle pipe (16) having an inlet (14) for receiving a pulverized coal fuel plus primary air mixture, an outlet (36) for discharging the pulverized coal fuel plus primary air mixture, and an inner surface which diverges along at least part of the length of said pipe between said inlet and said outlet and which includes cylindrical portions upstream and downstream of the diverging portion of said pipe;
- a plug extending axially in said nozzle pipe and defining an annular nozzle space in said pipe for the passage of the pulverized coal fuel plug primary air mixture, said plug having an outer surface which diverges along at least part of the length of said plug in said annular nozzle space and opposite the diverging portion of said pipe for diverting the pulverized coal fuel plus primary air mixture outwardly along said nozzle space and which includes cylindrical portions upstream and downstream of the diverging portion of said plug;
- drive means connected to said pipe and said plug for moving said pipe and plug axially with respect to each other to change the cross-sectional area of the nozzle space at the diverging portions of said pipe and plug so the pulverized coal fuel plus primary air mixture moves at a different velocity near the diverging portions of the pipe and plug;
- means for supplying ducted air from the outer surface of the plug at the diverging portions thereof into the annular nozzle space to reduce NO_x; and
- secondary air means extending around said pipe for supplying secondary air in an annular stream around the pulverized coal fuel plus primary air mixture discharged from said nozzle outlet.

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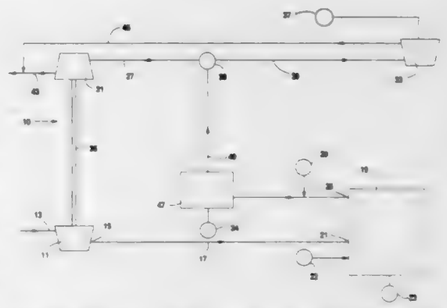
EFFICIENT INCINERATOR

Franklin D. Hoffert, Mountainside, N.J., assignor to Power Generating, Inc., Fort Worth, Tex.

Filed Dec. 17, 1991, Ser. No. 809,009
Int. Cl.[5] F23G 5/00
U.S. Cl. 110—346 2 Claims

1. A method of operating an incinerator with combustible solid waste products, said incinerator comprising, in combination, air compressor means for producing compressed air, air intake lines to provide air to said compressor, compressed air duct outlets, a fuel combustion chamber, a fuel combustion exhaust duct, a first turbine and a second turbine, said first turbine having compressor driving means coupled to it, said second turbine having an electrical generator coupled to it, said first and second turbines having turbine exhaust ducts respectively, said method comprising the steps of:
- pressurizing said fuel combustion chamber with compressed air from said air compressor through said compressor intake line,
- introducing solid combustible waste material into said pressurized fuel combustion chamber,
- burning said solid waste material in said pressurized fuel combustion chamber,
- removing hot compressed gases created by combustion of said solid combustible waste material from said combustion chamber by fluid gas flow through said combustion exhaust duct,
- splitting said hot compressed gases into first and second portions, respectively,



- allowing said first portion of said hot compressed gases to expand and cool through said first turbine,
- providing energy to said air compressor from said first turbine,
- allowing said second portion of said hot compressed gases to expand and cool through said second turbine,
- generating mechanical energy from said second turbine,
- generating electricity from said second turbine by use of said electrical generator,
- exhausting gases of said first and second portions of said hot compressed gases, which were expanded and cooled through said first and second turbines, respectively, through said turbine exhaust ducts.

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FURNACE FIRING APPARATUS AND METHOD FOR BURNING LOW VOLATILE FUEL

Juan A. Garcia-Mallol, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Mar. 25, 1991, Ser. No. 673,918
Int. Cl.[5] F23D 1/00
U.S. Cl. 110—347 31 Claims

1. An apparatus for burning particulate fuel comprising:
means defining a chamber for combusting fuel;
- a first discharge means extending into said combustion chamber for discharging a first stream of fuel into a primary combustion zone of said combustion chamber; and
- a second discharge means extending into said combustion chamber for discharging a second stream of fuel into a secondary combustion zone of said combustion chamber, said second discharge means being positioned such that said second stream of fuel entrains combustion products

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TABLE CONSTRUCTIONS

when said first table top is in said vertical position, the

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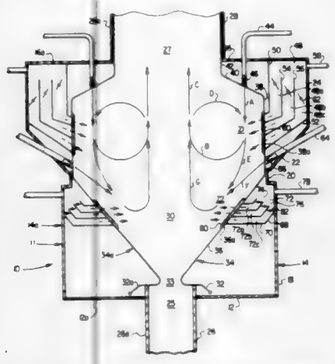
from said primary combustion zone and the position of said second discharge means being adjustable to vary the



amount of said combustion products entrained into said second stream of fuel.

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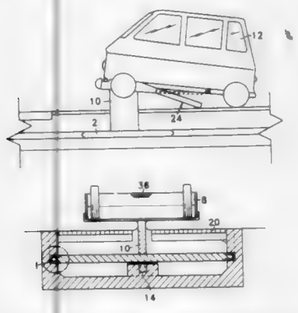
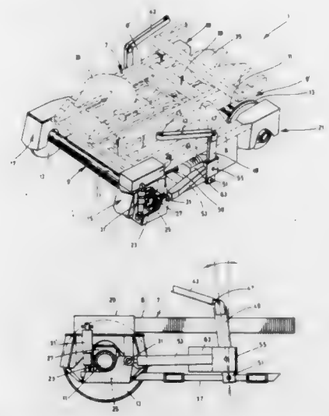
VEHICLE GUIDEWAY AND SYSTEM FOR MASS TRANSPORTATION
Peter J. M. Barratt, 2409 S. Miami Ave., Miami, Fla. 33129
Continuation-in-part of Ser. No. 636,266, Dec. 31, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 796,617
Int. Cl.[5] B61F *13/00*
U.S. Cl. 104—139 **4 Claims**



1. A transit system for transporting vehicles to and from nodal points comprising: track in connection with said nodal points, said track having a continuous duct, said duct having left and right walls, each of said walls having a groove on the interior side of each said wall, said grooves running parallel to one another and running the length of said track, said duct having a top wall with a central aperture running the length of said groove, wing of aerodynamic shape for movement within said duct, said wing having rotating means on the left and right sides of said wing, said rotating means for contacting said grooves strut means in connection with said so that said strut protrudes through said central aperture, sled means in connection with said strut and located above said top wall, said sled having means for attachment to vehicles for transport along said system.

5,199,359
STEERABLE RAIL-BOGIE
Jean Bedard, Charlesbourg, and Jacques Viens, Roxton Pond, both of Canada, assignors to Innotermodal Inc., Quebec, Canada
Filed May 20, 1992, Ser. No. 885,785
Int. Cl.[5] B61F *5/30*
U.S. Cl. 105—168 **7 Claims**



1. An improved twin-axle rail-bogie of the type comprising:
a chassis having a longitudinal axis;
a pair of railboard wheel assemblies each comprising an axle normally in a transverse position and on which a pair of rail-engaging wheels are mounted;
first mounting means comprising four axle end supporting assemblies for mounting said wheel assemblies under said chassis, each of said supporting assemblies comprising a journal box in which one end of one of said axles is mounted, and a box-supporting member onto which said journal box is connected through a resilient bushing; and
second mounting means for pivotably mounting at least one end of a vehicle on top of said chassis so that said at least one end of the vehicle is free to rotate about a vertical axis which intersects said longitudinal axis;
the improvement wherein said rail-bogie further comprises:
means for steering one of said wheel assemblies proportionally to a degree of rotation about said vertical axis of said at least end of the vehicle pivotably mounted on top of the chassis, said steering means including:
(a) slide means forming an integral part of said first mounting means, for slidably mounting one of said axle end supporting assemblies onto said chassis so that said one supporting assembly is longitudinally slidable and thus causes the one axle having one of its ends connected thereto to pivot forward or rearward out of its normal transverse position about the transversely opposite supporting assembly holding the opposite end of said one axle, said opposite supporting assembly acting as a pivot about the resilient bushing which gives some slack to the journal box in which said opposite end of the one axle is mounted; and
(b) an operating arm having one end attached to the vehicle close to the one supporting assembly slidably mounted onto the chassis, at a distance away from the vertical axis of said at least one end of said vehicle, and another end connected via a linking mechanism to the one supportingly assembly for moving said one supporting assembly in such a direction as to cause the one axle held by said one supporting assembly to pivot in the same direction but at a smaller angle than said one end of said vehicle with respect to said chassis.

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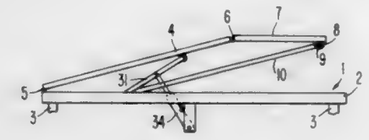
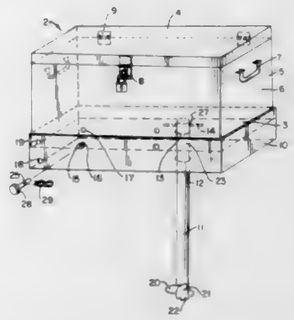
TABLE CONSTRUCTIONS
Sirkka Koistinen, Tuollavaaravägen 6B, 981 41 Kiruna Sverige, Sweden
PCT No. PCT/SE89/00518, § 371 Date Mar. 21, 1991, § 102(e) Date Mar. 21, 1991, PCT Pub. No. WO90/03133, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 26, 1988, Ser. No. 669,400
Claims priority, application Sweden, Sep. 27, 1988, 8803424; Dec. 14, 1988, 8804525
Int. Cl.[5] A47F *5/12*
U.S. Cl. 108—3 **9 Claims**



1. A table construction comprising:
a base frame (**1**);
a first table top (**4**) hingedly connected at one end thereof to the base frame and pivotable at a first pivot center (**5**) between various inclined positions at a plurality of angles relative to said base frame so as to enable a sitting person to perform work on said first table top;
a second table top (**7**);
said first table top further being hingedly connected at the opposite end thereof to the second table top, as part of a parallel arm system having a link (**10**) parallel to said first table top, such that said link is swingable from an initial substantially horizontal position to a substantially vertical position when said first table top is swung up substantially 90° from the base frame (**1**) while said second table top is in a substantially horizontal position irrespective of the angle of said first table top;
a catch arm (**13**) having a catch element (**15**);
a catch plate (**21***a*, **21***b*) having an upper surface, said catch plate connected to said base frame at a distance from a second pivot center (**11**) of said link and remote from the first pivot center (**5**) of said first table top; said catch plate having in said upper surface at least one recess (**22**) in which said catch element is enterable;
said link (**10**) having the catch arm pivotably attached thereto with said catch element provided to cooperate with the upper surface of the catch plate connected to said base surface of the catch plate so as to prevent the link from swinging down at least from said substantially vertical position towards said initial position;
wherein when said link is at an angle slightly exceeding 90°, said catch element passes one end of the catch plate, falls down below the catch plate, and passes under said one recess and beyond the opposite end thereof, such that said catch element is brought up to cooperate with the upper surface of said catch plate when said link is swung down toward said initial position;
a manually releasable locking device (**35–39**) connected to the base frame and located between the first pivot center of said first table top and the second pivot center of said link;
said link (**10**) further having pivoted thereto a support arm (**16**); said support arm preventing the link from being swung up more than 90° by means of said locking device when said locking device is in a locking position, but in an unlocking position thereof permits such movement;
a spring element (**28**) acting upon said link when the latter approaches and passes an angle of substantially 90° from said initial horizontal position to urge said link into a position in which said locking device is lockable in said link;
and an extension on said first table top; said extension being perpendicular to the first pivot center thereof, such that when said first table top is in said vertical position, the second table top is located at a height suitable for work upon said second table top by a standing person.

5,199,361
BEACH SAFETY ANCHOR SECURITY SYSTEM
Milton W. Robinson, 459 Woodcrest La., Media, Pa. 19063
Filed Aug. 19, 1991, Ser. No. 747,272
Int. Cl.[5] E05G *1/02*
U.S. Cl. 109—51 **13 Claims**



1. A ground anchor security system, which comprises:
(a) at least one auger-type ground anchor having an elongated shaft with a top end and a bottom end, said anchor having a helical auger plate extending from the shaft at its bottom end and having connecting means, including a hole, to connect a cross-member at its top end;
(b) a closable, lockable container having sides, a top and a bottom and having an opening located in said bottom of sufficient size to enable the top end of said anchor to pass through said opening and to enter into said container; and,
(c) a cross-member which is connectible to the top end of said anchor with said connecting means, by insertion into said hole, said cross-member having a length which is greater than the largest dimension of the opening in the bottom of said container, said cross-member being a rod or pipe, which fits into said hole, said rod being a handle of sufficient length to be grasped manually when connected to said connecting means for facilitating insertion of said anchor into ground and removal of said anchor from ground.

5,199,362
POLLUTION CONTROL METHOD AND APPARATUS
Lee R. Carter, 3920 SW. 30th St., Lot C-41, Ocala, Fla. 32674
Filed Nov. 27, 1991, Ser. No. 799,283
Int. Cl.[5] F23B *5/00*
U.S. Cl. 110—211 **3 Claims**

1. An apparatus for removing undesirable elements from an industrial smoke stream issuing from a furnace, boiler, incinerator, or other source, said apparatus comprising:
a plenum chamber coupled to receive smoke as it issues from the source;
a treatment station including a passageway sized to pass smoke from the source, and means within said passageway for removing undesirable elements from the smoke as it traverses the passageway;
pump means communicating with said plenum chamber and said passageway with said pump means being adapted to draw smoke from said plenum chamber and deliver the smoke to and through said passageway for treatment; and
a smoke stack coupled to receive treated smoke from which undesirable elements have been removed and expel the treated smoke into the atmosphere;

said pump means comprising an elongated cylinder having

effluent therein to cause particulate material to precipitate

a ribbon-like trimming that folds over lengthwise and

sense a thread disturbance, said monitoring means provid-

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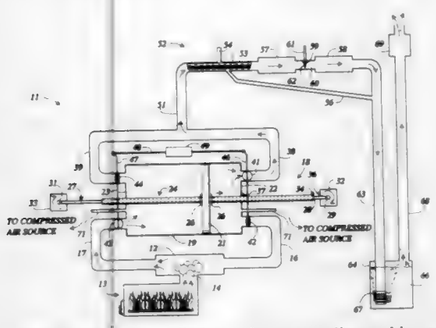
said pump means comprising an elongated cylinder having substantially closed first and second ends, a piston mounted for reciprocating movement within said cylinder, motive means for reciprocating said piston back and forth within said cylinder, a first intake duct communicating between said plenum chamber and said first end of said cylinder, a second intake duct communicating between said plenum chamber and said second end of said cylinder, a first exhaust duct communicating between said passageway and said first end of said cylinder, a second exhaust duct communicating between said passageway and said



second end of said cylinder, valve means disposed in each of said intake and exhaust ducts, and control means for actuating said valves to open said first intake duct and said first exhaust duct as said piston moves toward said second end of said cylinder and to open said second intake duct and said first exhaust duct and close said first intake duct and said second exhaust duct as said piston moves toward said first end of said cylinder, whereby smoke is drawn from the plenum chamber through the intake ducts and delivered to the passageway through the exhaust ducts as the piston reciprocates within the cylinder.

5,199,363

METHOD AND APPARATUS FOR MAKING SOLID WASTE MATERIAL ENVIRONMENTALLY SAFE USING HEAT

Eric Cheetham, Cogan Station, Pa., assignor to Phoenix Environmental, Ltd., Montgomery, Pa.

Division of Ser. No. 533,653, Jun. 4, 1990, Pat. No. 5,065,680, which is a continuation-in-part of Ser. No. 410,560, Sep. 21, 1989, Pat. No. 4,960,380. This application Nov. 13, 1991, Ser. No. 792,515

Int. Cl.[5] F23J *15/00*

U.S. Cl. 110—215 **5 Claims**

1. Apparatus for removing harmful constituents from non-combustible solid waste material, comprising:

means for continuously feeding a particulate mix of said solid waste material and a combustible excitation material as a source of heat energy into a reaction chamber, 'a reaction chamber,

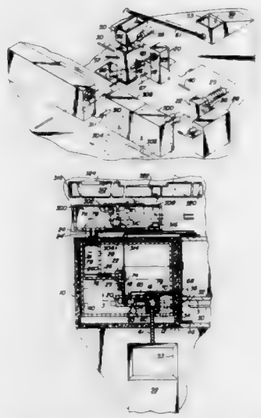
means for introducing oxygen into said reaction chamber,

said reaction chamber having means for reacting the mix in said chamber in the presence of oxygen until the solid waste becomes a molten slag and the temperature within the chamber above the bath of molten slag is high enough to destroy substantially all of the harmful constituents of the gaseous effluent generated by the formation of the molten slag,

means for conducting excess molten slag from the reaction chamber,

means for conducting the gas and particulate effluent generated by the formation of the molten slag from the reaction chamber into a second chamber,

said second chamber having means for rapidly cooling the effluent therein to cause particulate material to precipitate out of the effluent,



and means for treating the effluent to remove substantially all of the remaining particulate and harmful constituents to achieve acceptable environmental quality,

and means for releasing the effluent into the atmosphere.

5,199,364

SEWING MACHINE HAVING TWO BORDERING GUIDES MOVABLE VERTICALLY AND HORIZONTALLY RESPECTIVELY, FOR APPLYING RIBBON LIKE TRIMMINGS TO A WORK PIECE

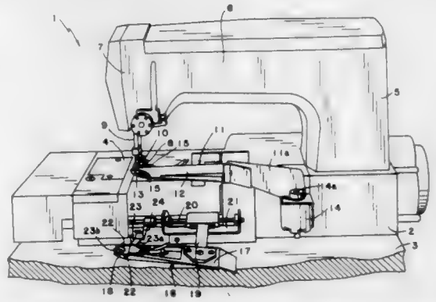
Robert F. I. Conte, Buccinasco, and Angiolicchio Raffaele, Cesano Boscone, both of Italy, assignors to Rimoldi, S.R.L., Milan, Italy

Filed Mar. 27, 1990, Ser. No. 499,807

Claims priority, application Italy, Oct. 20, 1989, 22095 A/89

Int. Cl.[5] D05B *35/06, 35/08, 35/10*

U.S. Cl. 112—152 **9 Claims**



1. A sewing machine having means to apply ribbon-like trimmings to a workpiece, comprising:

a work table defined along a top surface of a bed and the workpiece advanced along said work table;

a head held in cantilevered fashion above the work table;

a presser foot oscillatably connected to the head for pressing the workpiece against the work table;

sewing means operating through the work table in a region of the presser foot in order to sew the workpiece;

a first bordering guide rotatably connected to the bed and rotating about a substantially vertical axis, said first bordering guide having a first outlet end for slidably engage a ribbon-like trimming that folds over lengthwise and moves from a rest position where said first bordering guide is spaced apart sideways from the work table to a working position where the first outlet end is located on the work table and in front of the presser foot;

a second bordering guide oscillatably connected to the machine bed and oscillatable about a substantially horizontal axis at right angles to a feed direction of the workpiece on the work table, said second bordering guide having an outlet end to slidably engage a second ribbon-like trimming that folds over lengthwise, and movable from a rest position where the second bordering guide is in a lower position with respect to the work table to a working position where an outlet end of said second bordering guide is disposed on the work table in front of the presser foot and;

said first bordering guide is fastened to a support element operatively connected to a fluid-operated rotary actuator secured to the sewing machine bed and disposed relative to a substantially vertical axis.

5,199,365

SEWING MACHINE THREAD MONITORING SYSTEM

Kurt Arnold, Kaiserslautern, Fed. Rep. of Germany, assignor to PFAFF Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

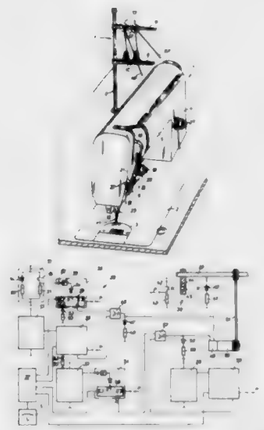
PCT No. PCT/EP89/00472, § 371 Date Jan. 9, 1991, § 102(e) Date Jan. 9, 1991, PCT Pub. No. WO89/12124, PCT Pub. Date Dec. 14, 1989

PCT Filed Apr. 28, 1989, Ser. No. 634,145

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818663

Int. Cl.[5] D05B *69/36*

U.S. Cl. 112—273 **15 Claims**



1. A thread monitoring arrangement for monitoring thread on a stitch-forming machine, the thread passing through a tensioning device to an associated stitch-forming element from an endless thread reserve, the thread monitoring arrangement comprising:

first sensor means for sensing a presence of the thread, said first sensor means positioned adjacent a point on the thread path between the thread reserve and a respective associated tensioning device; second sensor means for sensing presence of the same thread at a different location, said second sensor means positioned adjacent a point on the thread path between the tensioning device and a respective stitch-forming element associated therewith; shutoff means for stopping a drive motor of the stitch forming machine; and, monitoring means for receiving signals from said first and second sensor means which sense a thread disturbance, said monitoring means providing a switching signal to said shutoff means dependent upon the origin of the signal received from said first and second sensor means to stop the drive motor of the stitch forming machine.

5,199,366

HIGH-SPEED BOAT

Otto Ranchi, 6, rue de l'Est, Geneva, Switzerland

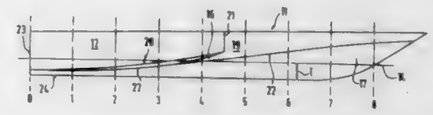
PCT No. PCT/EP88/00468, § 371 Date Jan. 24, 1990, § 102(e) Date Jan. 24, 1990, PCT Pub. No. WO88/09283, PCT Pub. Date Dec. 1, 1988

PCT Filed May 25, 1988, Ser. No. 445,731

Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717548

Int. Cl.[5] B63B *1/20*

U.S. Cl. 114—56 **27 Claims**



1. A watercraft having a fore part and a stern longitudinally spaced therefrom, the watercraft comprising a central body including chine-type frames having V-shaped bottom frame sections which become relatively flatter on the frames from the fore part toward the stern of the watercraft, first and second, mutually symmetrical lateral annexes on the central body forming a structural unit therewith, the annexes also including chine-type frames, the lateral annexes extending in the longitudinal direction along the central body starting in a middle region thereof and extending rearwardly therefrom at least to the stern of the watercraft, the frames of the lateral annexes including bottom frame members of an inclination relative to a horizontal plane no greater than an inclination of the bottom frame sections relative to the horizontal plane of the central body in any given vertical frame plane of the watercraft, the lateral annex including a bottom surface shaped to provide a rise angle for the watercraft which changes gradually in a longitudinal direction, said rise angle on the annexes substantially corresponding to a rise angle of the central body at a longitudinal mid-region thereof and further amounting to 0° at the stern of the watercraft.

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CATAMARAN

Kotaro Horiuchi; Keiji Nakagawa, and Fumitaka Yokoyama, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 472,316, Jan. 30, 1990, abandoned. This application Jun. 27, 1991, Ser. No. 722,122

Claims priority, application Japan, Jan. 31, 1989, 1-021979

Int. Cl.[5] B63B *1/00*

U.S. Cl. 114—61 **25 Claims**

1. A catamaran comprised of a main hull having a V bottom defined by a pair of downwardly converging sides and a pair of sponsons each supported at a respective side of said main hull merging into the respective side thereof from forwardly extending tops spaced transversely outwardly from said respective sides and having upper portions extending above the bottom of said main hull, the top sand inner sides of said sponsons each merging into the respective side of said main hull above the bottom of said hull, said sponsons having cross sectional areas in planes taken at transverse cross sections along the length and below the water line that begin generally at a knife edge and which increase in a stepless fashion in cross

sectional area from the front toward amidships to a maximum

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a. a number of generally rectangular, hollow deck sections

of said deck means relative thereto in the directions between

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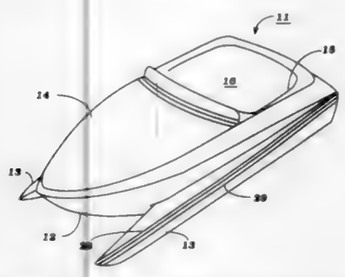
sectional area from the front toward amidships to a maximum and then reduce in a stepless fashion in cross sectional area



toward the rear of the sponsons and then increase in a stepless fashion in cross sectional area toward the end thereof.

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SMALL SHIP HAVING OUTER SHELL FORMED BY PLASTIC DEFORMATION AND METHOD OF PRODUCING SAME

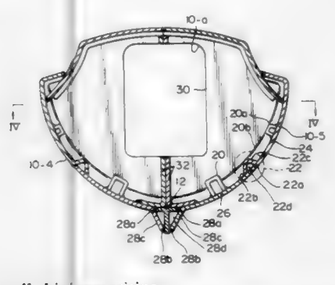
Takeshi Souda, Toyoake, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 634,041, Dec. 26, 1990, abandoned. This application Mar. 27, 1992, Ser. No. 860,219

Claims priority, application Japan, Dec. 27, 1989, 1-151177[U]; Dec. 27, 1989, 1-340497

Int. Cl.[5] B63B *3/06*

U.S. Cl. 114—65 R **6 Claims**



1. A small ship comprising:

a plurality of prefabricated sections having a size and shape suitable for overland transportation, the sections being connected to each other by welding to obtain a shell of the ship, each of the sections comprising at least one outer plate member of said shape obtained by a plastic deformation process;

skeletal strengthening structures being formed between adjacent outer plate members, each skeletal strengthening structure including an inwardly recessed flange portion of predetermined shape, having an end surface at one end thereof and a base surface spaced from the end surface, wherein the inwardly recessed flange portion is defined between the end surface and the base surface, the flange portion being integrally connected to one outer plate, and welded along the end surface and along the base surface to an adjacent plate, the flange being configured to define a closed space between the flange and the adjacent outer plate, the closed space extends along the length of the sections for obtaining the desired strength of the sections when connected to produce a shell of a small ship.

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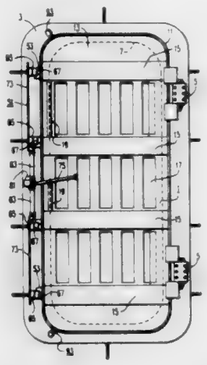
WATER TIGHT DOOR

Jeffry R. Meyer, Penn Hills Township, Allegheny County; Richard P. Kole, Murrysville, and Kevin V. Bridge, Unity Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 669,541, Mar. 14, 1991, abandoned. This application Mar. 26, 1992, Ser. No. 859,274

Int. Cl.[5] B63B *19/00*

U.S. Cl. 114—117 **10 Claims**



1. A water tight door for an opening in a frame portion comprising a peripheral band portion, a plate like portion connected to the peripheral band portion, a plurality of stiffening members extending across said plate like portion, said door overlapping all sides of said opening, a plurality of hinges disposed on one side of said door attaching said door to said frame portion, a peripheral gasket retainer and a peripheral L shaped portion which cooperate to form a partially enclosed seal area, the peripheral gasket retainer being affixed to one of the door and frame portions adjacent the opening and the L shaped portion being affixed to the other; a gasket having two extensive margins one of said margins having a thick portion adjacent thereto, which is configured to fit and remain within said retainer, said other margin being tapered to a radius and disposed to seat adjacent the corner of said L shaped portion and a strip like portion extending at an angle from said thick portion to said tapered portion and toward the corner of said L shaped portion, when the door is being closed; a dogging mechanism comprising a plurality of lugs having a ramp portion and a plateau portion, a plurality of links pivoted mounted to cooperate with the lugs, a connecting bar pivotally connected to said links to form a parallel bar linkage, a roller rotatably connected to each of the links and disposed to engage the ramp portion of the cooperatively associated lug and roll thereon and onto the plateau portion of the lug as the links are pivoted by the connecting bar, an operating handle mounted for rotation with a link rigidly connected to said handle and an operating bar connecting the operating handle link to the connecting bar to move the parallel bar linkage when the handle is turned and force the door into a water tight closed position irrespective of which side of the door is subjected to the higher pressure.

5,199,370

FLOAT AND DECK SYSTEM FOR FLOATING DOCKS

DeWayne D. Berquist, 13929 Terrace Rd. NE., Ham Lake, Minn. 55304

Filed Jul. 18, 1991, Ser. No. 732,138

Int. Cl.[5] B63B *35/38*

U.S. Cl. 114—263 **11 Claims**

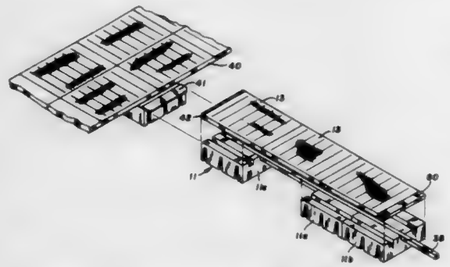
1. A floating dock structure including:

a. a number of generally rectangular, hollow deck sections having tops, bottoms, sides and ends;

b. each of said deck sections having a plurality of connective passages spaced along the respective sides thereof;

c. each of said deck sections providing stepped areas on opposite ends thereof for overlapping attachment of said sections in longitudinal relation;

d. a number of generally rectangular, hollow float sections having tops, bottoms, sides and ends;



e. each of said float sections having a plurality of connective passages extending from said tops to at least a selected portion of said sides whereby connective means may be arranged through said deck sections and said connective passages for direct attachment of deck sections to said float sections; and,

f. the spacing of said passages in said deck sections and said float sections being selected to permit selected placement and connection of said deck sections to said float sections.

5,199,371

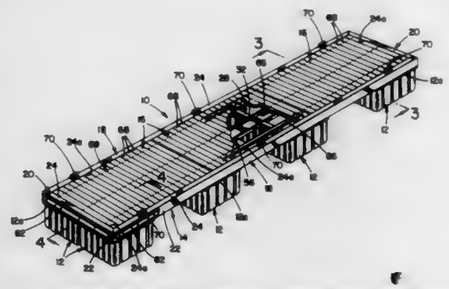
DECK STRUCTURE FOR FLOATING DOCK

Jon D. Meriwether, Follansbee, W. Va., assignor to The Louis Berkman Company, Steubenville, Ohio

Filed Dec. 23, 1991, Ser. No. 811,845

Int. Cl.[5] B63B *35/44*

U.S. Cl. 114—267 **37 Claims**



1. A deck structure for a floating dock comprising frame means and deck means, said frame means having opposite ends and opposite sides, support means, and upper surface means, said opposite ends extending between said opposite sides, each said opposite end and opposite side including a top surface, said support means comprising support members on each said opposite end and opposite side, each said support member having a horizontal leg spaced below said top surface of the corresponding one of said opposite ends and opposite sides, said deck means having opposite side edges and opposite end edges, said deck means resting on said upper surface means and on said horizontal legs of said support members, said legs of said support members directly underlying the corresponding ones of said opposite side edges and opposite end edges, said deck means being removable from said frame means as a unit, and said frame means including means for restraining displacement of said deck means relative thereto in the directions between said opposite ends and sides.

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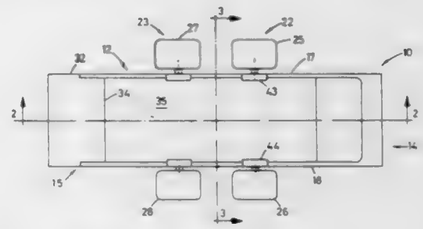
AMPHIBIOUS VEHICLE

Bruce H. J. W. Seligman, Surrey, and Raymond G. Wall, Vancouver, both of Canada, assignors to Watercraft Offshore Canada Ltd., Richmond, Canada

Filed Nov. 20, 1990, Ser. No. 616,234

Int. Cl.[5] B63B *35/00*

U.S. Cl. 114—270 **22 Claims**



1. An amphibious vehicle comprising:

(a) a body having front and rear portions, opposite sides and a bottom, the bottom curving smoothly upwardly at the front and rear portions of the body;

(b) at least one pair of wheels, each wheel being located adjacent a respective side;

(c) at least one pair of wheel mounting means for moving the respective wheel between raised and lowered positions thereof, so that when in the raised position thereof, lower portions of the wheels are raised above the said bottom, and when in the lowered position thereof, the lower portions of the wheels are below the said bottom, each wheel mounting means including:

each side of the body having a guide means for guiding the wheel, each guide means comprising a recess within the respective side of the body, each recess being defined in part by oppositely facing, generally U-sectioned guide walls, each guide wall having a transversely disposed central wall, and a pair of oppositely facing longitudinal side walls, clearance being provided between the side walls adjacent an outside of the body,

a support means for mounting the wheel for rotation relative thereto, the support means cooperating with the guide means for moving therealong between raised and lowered positions of the wheel, the support means comprising a carriage fitted within the recess, and a wheel journalling means cooperating with the carriage to permit rotation of the wheel relative to the carriage, each carriage comprising a pair of two bearing members having an outer shape generally complementary to the respective U-sectioned guide wall, the said wheel journalling means extending from the carriage through the clearance between the side walls,

actuating means for moving the carriage along the guide means between the raised and lowered positions, the actuating means cooperating with the body and the carriage; and

(d) the bottom of the vehicle has a low friction, wear-resisting plastic composition extending between the sides of the body and between upper portions of the bottom.

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opposite free ends received in respective said first ends of said stays;

optionally, a binder selected from the group consisting of Portland cement and lime.

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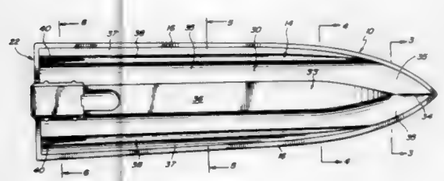
5,199,373
HULL CONFIGURATION FOR JET SKIS
Albert A. Mardikian, Corona del Mar, Calif., assignor to Mardikian Family Investors, Corona del Mar, Calif.
Filed Jan. 16, 1992, Ser. No. 821,223
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—288 **23 Claims**

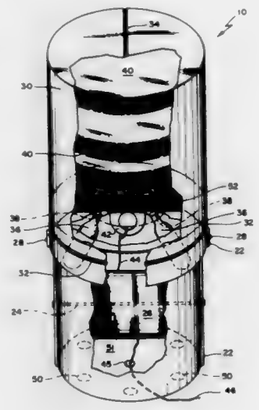
1. In a jet skill hull defined by an upper hull section and a lower hull section joined along a peripheral edge and having a bow and stern, wherein the lower hull section includes an improvement comprising:
a central longitudinal keel member formed in the lower hull section extending from the bow rearwardly to the stern of the lower hull section, whereby a bow portion and a trailing bottom portion are defined, wherein said bow portion of said keel is formed having a leading edge which extends downwardly from the peripheral edge, and wherein said trailing bottom portion is formed having a substantially flat surface terminating adjacent the stern of said lower hull section;
a pair of oppositely disposed symmetrical concave curvilinear fluted walls extending horizontally and substantially the length of said lower hull section so as to define said central keel, and wherein the forward portion of said concave curvilinear fluted walls form the bow portion of the lower hull section and said leading edge of said bow portion of said keel;



a pair of side walls joined along the lower portion of the peripheral edge extending substantially the length of the hull beginning rearwardly of the bow portion and terminating at the stern of the lower hull section, said side walls extending downwardly and inwardly from the peripheral edge for engagement with respective concave curvilinear fluted walls;
an elongated outer fluted groove formed within each of said concave curvilinear fluted walls so as to be positioned between said concave curvilinear fluted walls and adjacent the lower edge of each of said side walls substantially throughout the length thereof, whereby said hull is held down in contact with the water as the water impinges on the defined surfaces of said respective fluted walls and fluted grooves so as to cause the water to spin at a high velocity, thereby generating a suction action between the bottom surface of the lower hull section and the surface of the water; and
means to assist in controlling the skidding of said stern of said jet ski hull when said jet ski hull is subjected to a sharp turn, said skid control means being formed adjacent the terminating end of said stern, and wherein said skid-control means comprises a foreshortened double-fluted groove formed within the terminating end of each of said outer fluted grooves and positioned adjacent said respective side walls of the rearward portion of said stern.

5,199,374
AERIAL LOCATION SELF-ACTUATING EMERGENCY SEA SURFACE MARKER FOR CAPSIZED VESSELS
Paul Blanchette, Rte. 15A, Sunset, Me. 04683
Filed Jan. 23, 1992, Ser. No. 824,577
Int. Cl.[5] B63B *22/12*
U.S. Cl. 116—209 **15 Claims**

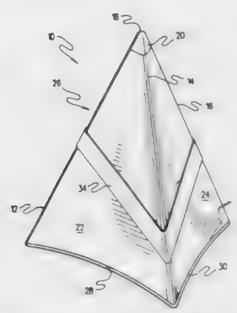
8. An emergency location marker system for vessels lost at sea below the water surface comprising:
an inflatable sea surface location marker constructed to form upon inflation a relatively large surface area flat configuration for blanketing a sufficient sea surface area for high visibility location by aerial search, said inflatable sea surface location marker being formed with at least one flexible joint for permitting said marker to flex in response to wave motion while adhering to the sea surface;



a location marker system container for storing the sea surface location marker in deflated folded form in a relatively small volume and bracket means for securing the container to an outside surface of a vessel;
a source of compressed gas and a sensor valve means for coupling the source of compressed gas to the inflatable sea surface location marker in the container, said sensor valve means being responsive to one of water and pressure in the container caused by a capsized condition of the vessel to inflate the location marker from the source of compressed gas;
said container comprising separable segments constructed with at least one break seam for breaking open in response to inflation of the location marker for releasing the inflated location marker;
and a line stored in the container secured at one end to the vessel and at the other end to the location marker.

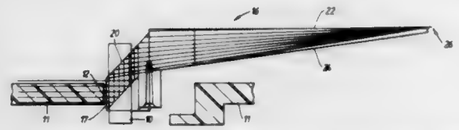
5,199,375
FOLDING WARNING MARKER
Mike V. Johson, 1602 SW. 2nd St., Bentonville, Ark. 72712
Filed Oct. 15, 1991, Ser. No. 775,501
Int. Cl.[5] E01F *9/01*
U.S. Cl. 116—209 **17 Claims**

1. A folding warning marker, comprising:
a plurality of elongated tubular stays;
means securing first ends of said stays and urging said stays apart comprising at least one torsional coil spring having opposite free ends received in respective said first ends of said stays;
a flexible cover over said stays; and



means retaining said stays within said cover such that said warning marker is movable between closed and open positions.

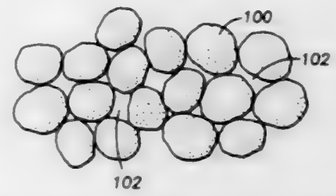
5,199,376
POINTERS
Ian K. Pasco, Warfield, England, assignor to Combined Optical Industries Limited, Slough, United Kingdom
Filed Jul. 23, 1990, Ser. No. 555,644
Claims priority, application United Kingdom, Jul. 29, 1989, 8917411
Int. Cl.[5] G01D *11/28, 13/22*
U.S. Cl. 116—332 **13 Claims**



1. An illuminable pointer comprising an at least translucent pointer staff and an at least translucent boss suitable for illumination by a light source, wherein the boss includes a staff hole adapted for mounting the pointer for rotation on a spindle and a cavity for holding a known mass to counterbalance the pointer staff, the boss having reflecting means comprising an aspheric totally internally reflecting surface arranged to reflect substantially parallel incoming light along the pointer staff towards a focus point outside the distal end of said pointer staff so that the pointer staff is evenly illuminated by light impinging on an internal surface of said pointer staff substantially along the length thereof as said light travels from said reflecting means to said focus point.

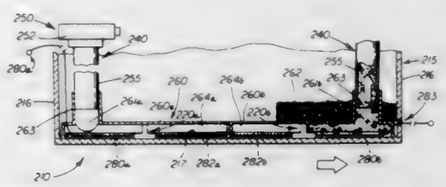
5,199,377
ARTIFICIAL REEFS MANUFACTURED FROM COAL COMBUSTION BY-PRODUCTS
William H. Gehrmann, III; Charles E. Anderson, both of Sugar Land; Sammy M. Ray, Galveston, and William B. Baker, Jr., Bacliff, all of Tex., assignors to JTM Industries, Inc., Stafford, Tex.
Continuation of Ser. No. 645,193, Jan. 24, 1991, abandoned. This application Apr. 23, 1992, Ser. No. 873,650
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—4 **9 Claims**

1. A cultch for mollusca said cultch being in the shape of a rounded pellet and formed of a composition comprising:
a coal or lignite combustion byproduct selected from the group consisting of fly ash and bottom ash; and
optionally, a binder selected from the group consisting of Portland cement and lime,
wherein the cultch is in the shape of pellets such that when a plurality of cultches are randomly stacked, as in an



article reef, then interstitial void spaces created by the random stacking are sufficiently large to allow the development of oyster spat to oysters in the spaces by allowing circulation of water and nutrients through the spaces.

5,199,378
AQUARIUM FILTERING SYSTEM AND METHOD
William E. Kissick, Jr., 911 Cramer Ave., Apt. 1, Lexington, Ky. 40502; Jay P. Frickman, 2365 Madison Rd., #209, Cincinnati, Ohio 45208, and Kevin R. McMahon, 41 Villa Pl., Fort Thomas, Ky. 41075
Continuation of Ser. No. 515,063, Apr. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 237,930, Aug. 29, 1988, Pat. No. 4,921,614. This application Dec. 23, 1991, Ser. No. 816,521
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 **31 Claims**



24. A system for cleaning an aquarium tank comprising:
an aquarium tank having sidewalls, a bottom wall with an inner bottom surface, and a perforated support structure positioned within the tank adjacent the bottom wall, said support structure defining a lower compartment between said support structure and the bottom wall of said tank and including at least one aperture formed therein and a side portion adjacent the sidewalls of the tank and an opposite portion opposite said side portion;
means for conducting water upwardly through the at least one aperture formed in the support structure from within the lower compartment;
movable barriers positioned within the lower compartment;
a biasing means engaging at one end one of the movable barriers and at the other end the opposite portion of the support structure; and
means for moving mechanically said one barrier within the lower compartment so that the barrier dislodges waste and debris deposited on the inner bottom surface of the tank and directs the dislodged waste and debris generally toward said at least one aperture formed in said support structure where the dislodged waste and debris is directed out of said lower compartment through said at least one aperture formed in said support structure and said conducting means.

5,199,379

placement, said at least one movable belt including rollers

fixed to said upper portion of said hollow cylindrical

5,199,384

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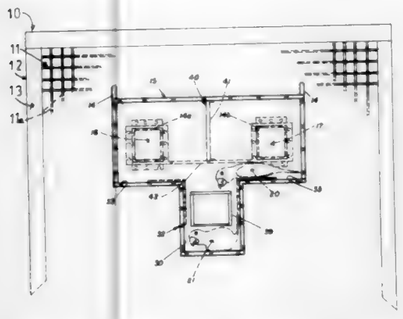
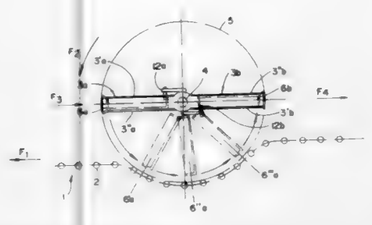
5,199,379
BREEDING BOX CONSTRUCTION AND METHOD FOR TEMPORIZING MALE AGGRESSION
James D. Brown, 1183 4th St., Napa, Calif. 94558
Continuation-in-part of Ser. No. 568,178, Aug. 16, 1990, Pat. No. 5,078,095. This application Sep. 12, 1991, Ser. No. 758,794
Int. Cl.[5] A01K *31/07*
U.S. Cl. 119—17 **17 Claims**



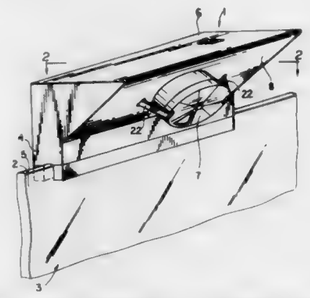
1. A breeding box for use with a bird cage to aid breeding of strong beaked birds wherein male bird aggression is temporized, comprising:
(i) a central section having a pair of arms each defining a non-parallel axis of symmetry with the other and a common junction point therebetween through which each said non-parallel axis of symmetry extends, a nesting arm attached to said pair of arms having an axis of symmetry also intersecting said common junction point, each of said pair of arms including a normally open external passageway to permit external entry and egress of birds relative to said central section,
(ii) a baffle positioned adjacent to said junction point of said pair of arms and said nesting arm, in attaching contact with said central section whereby direct passage between said pair of arms bypassing said nesting arm is prevented, and wherein a sitting female within said nesting arm is provided with an escape option whereby male aggression can be temporized without disruption of the breeding cycle.

5,199,380
SYSTEM FOR SEPARATING NEWLY HATCHED CHICKS FROM HATCHING DEBRIS
Bernard Keromnes, Plourin les Morlaix, and Jean-Pierre Breuil, Locquenole, both of France, assignors to Breuil Societe Anonyme, Landivisiau Cedex, France
Filed May 4, 1992, Ser. No. 878,227
Claims priority, application France, Dec. 2, 1991, 91 14894
Int. Cl.[5] A01K *43/00, 45/00*
U.S. Cl. 119—22 **20 Claims**



1. System for separating newly hatched chicks from hatching debris, comprising:
at least one movable belt displaceable in a direction of displacement, said at least one movable belt including rollers arranged parallel with respect to one another, and perpendicularly with respect to the direction of displacement; and
at least one support arm which is rotationally mounted above the belt about an axis substantially parallel to said rollers of said belt, said at least one support arm including means for maintaining at least one basket in which the chicks and the debris to be sorted are placed.

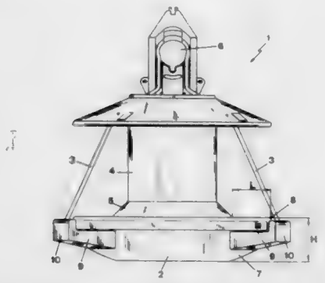
5,199,381
AUTOMATIC FISH FEEDER
Nathan Masopust, 246 Joy Rd., Woodstock, Conn. 06281
Filed Apr. 29, 1992, Ser. No. 875,381
Int. Cl.[5] A01K *61/02*
U.S. Cl. 119—51.04 **18 Claims**



1. A fish feeding apparatus for an aquarium comprising:
a housing having a surface angled relative to a surface of the aquarium;
drive means disposed within the housing and having engaging means extending outwardly from the housing angled surface, the drive means rotating the engaging means;
container means for food having a plurality of compartments mounted on the engaging means and rotatable therewith;
lid means disposed over the container means, the lid means fixed relative to the housing, the container means rotating relative to the lid, the lid means having an opening for discharging food therethrough;
means for mounting the apparatus on an aquarium and, means for removably mounting the lid means and container means as an assembly to the engaging means, means for removably mounting the lid means and container means as an assembly being a clip means which extend from the angled surface and have tab means for holding the assembly on the engaging means.

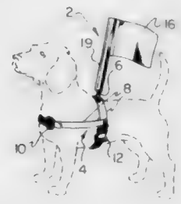
5,199,382
FEED TROUGH FOR YOUNG FARM BIRDS, IN PARTICULAR TURKEYS
Manfrin Adriano, Sandrigo, Italy, assignor to SKA S.p.A., Sandrigo, Italy
Filed Feb. 26, 1992, Ser. No. 840,978
Claims priority, application Italy, Mar. 4, 1991, 000010/91[U]
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—57.4 **5 Claims**

1. A kit comprising a feed trough for farm birds and a plurality of plates wherein said feed trough for farm birds comprises:
a hollow cylindrical organ (**4**) having a flared portion (**5**) at a lower end thereof;
an upper portion of said hollow cylindrical organ (**4**) engaged to an in communication with a horizontal tubular conduit (**6**) for feed transport;
a plurality of support struts (**3**); and
a first end of each of said plurality of support struts radially fixed to said upper portion of said hollow cylindrical organ (**4**);
wherein said plurality of plates comprises;
a plurality of circular container plates (**2**) each having a central pan bounded by a peripheral edge;
a bottom and a plurality of integral spokes (**9**) extending radially from said peripheral edge (**8**);
each outer diameter of said plurality of circular container plates being equal; and



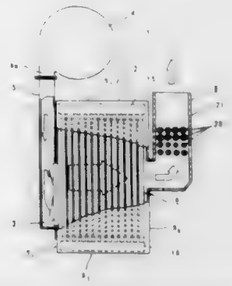
whereas, the diameter and a depth of each of said pans of said plurality of circular container plates are of a different size to accommodate different size farm birds;
wherein, a second end of each of said plurality of support struts are capable of being resiliently engaged to a free end of each of said plurality of integral spokes of one of said plurality of circular container plates'
wherein said each of said plurality of circular container plates can be separately and selectively engaged to said plurality of struts depending on the size farm bird to feed.

5,199,383
DOG SPOTTER SAFETY HARNESS
Dominic Lagana, R.R. #10, Peterborough, Ontario, Canada K9J 6Y2
Filed Feb. 5, 1991, Ser. No. 650,606
Claims priority, application Canada, Feb. 5, 1990, 2009354
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—96 **17 Claims**



1. A safety device for a quadruped animal comprising:
(a) a harness to be removably fitted to the animal;
(b) a resilient flexible elongated shaft formed from tightly wound coils extending along its length, the shaft being able to yield when encountering an obstacle and spring back to its initial position when the obstacle is removed;
(c) means to releasably secure an end of the shaft to the harness so that the shaft extends upwardly when the harness is positioned on the animal, said means comprising a base plate secured to the harness with a U-shaped slot in a central portion of the base plate, a head secured to the corresponding end of the shaft, the head being releasably lockable within said slot to anchor the shaft to the harness; and
(d) a flag secured to the shaft towards the other end.

5,199,384
QUADRANGULAR TYPE MULTI-TUBE ONCE-THROUGH BOILER
Toshihiro Kayahara; Seiji Tai, both of Matsuyama, and Sadayoshi Shibakawa, Iyo, all, Japan, assignors to Miura Co., Ltd., Japan
PCT No. PCT/JP89/01279, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO90/07084, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 20, 1989, Ser. No. 720,832
Claims priority, application Japan, Dec. 23, 1988, 63-167485[U]; Feb. 16, 1989, 1-17457[U]; Dec. 20, 1989, 63-166661[U]
Int. Cl.[5] F22B *5/02*
U.S. Cl. 122—18 **15 Claims**



1. A quadrangular type multi-tube once-through boiler unit comprising:
a boiler body which is constituted by a boiler casing of substantially rectangular form having a pair of opposing relatively wide end walls and a first pair and a second pair of opposing relatively narrow side walls and a water tube assembly in which a plurality of vertical water tubes are arranged parallel each other in said boiler casing, each said water tube including an upper end connected to an upper header and a lower end connected to a lower header,
a burner means provided on one end of said first pair of side walls in said boiler body,
an exhaust gas discharging means provided on an other end of said first pair of side walls in said boiler body,
a burner duct forming a premixed gas feed line to said burner means for supplying premixed gas to said burner means, and
a blower equipped to one end of said burner duct,
said burner means, said exhaust gas discharging means, said burner duct and said blower being positioned outside of the pairs of first and second side walls in said boiler body and inside of a region divided by the pair of extended surfaces of said opposing end walls,
said boiler body providing a path forming means for allowing substantially linear passage of the combustion gas from the side of said burner means to the side of said exhaust gas discharging means in said boiler body and forming combustion gas path by said path forming means,
said plurality of water tubes constituting a plurality of water tube rows from a first line to an n-th line from said burner means side to said exhaust gas discharging means side in said combustion gas path and the first row of water tube in said water tubes being centrally arranged adjacent to the combustion surface of said burner means;
said burner duct comprising a long path forming member extending along one side wall outside of said side wall of the first pair of side walls in said boiler body,
said burner duct extending outside of one said wall of the first pair of side walls in said boiler body along said side wall and being bent to extend outside of one side wall of

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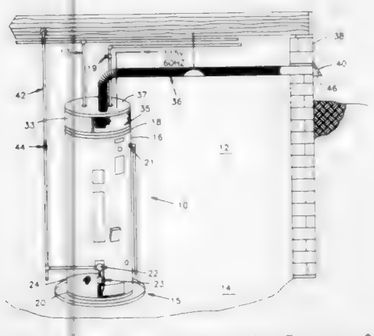
said second pair of side walls in said boiler body along said side wall.

5,199,385

THROUGH THE WALL VENTED WATER HEATER

Garrett L. Doss, Wyoming, Mich., assignor to Bradford-White Corp., Ambler, Pa.

Filed Mar. 24, 1992, Ser. No. 856,633
Int. Cl.[5] F22B 37/42
U.S. Cl. 122—504 15 Claims



1. A water heater capable of exhausting flue gases from an interior space of a building to an exterior space, said water heater having a tank with a water inlet and a water outlet, a flue pipe opening and a combustion chamber containing a fuel burner, said flue pipe opening at the top of the tank upon flue gas collection and exhaust means, said collection and exhaust means including a collector connected to the top of the water heater above and in alignment with the flue pipe, a blower and a low temperature flue gas exhaust line, said collector having at least one air inlet for mixing air from the interior space with flue gases exiting said flue pipe to inhibit condensation and reduce the temperature of flue gases flowing through the exhaust line, said water heater having control means for sensing the temperature of water in the tank and regulating the amount of fuel supplied to the burner, means for activating and deactivating the blower in response to controlling said fuel and including first means for sensing the temperature of a mixture of flue gases and air from the interior space and interrupting the fuel supplied to the burner in response thereto and second means for sensing the temperature of the mixture of flue gases and air from the interior space to continue blower operation until the mixture of flue gases and air reach a desired temperature after said fuel burner stops operating, and means for preventing flow of fuel to the fuel burner when the power supplied to said water heater has been interrupted.

5,199,386

VARIABLE AIR AND WATER INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Von J. Hubbard, 3536 Churchwood Dr., Salt Lake City, Utah 84118

Filed Apr. 20, 1992, Ser. No. 871,058
Int. Cl.[5] F02B 47/00
U.S. Cl. 123—25 E 6 Claims

1. A fluid injection system for injecting a mist of fluids essentially comprised of water, and water soluble alcohol mixtures, into the intake manifold of an internal combustion engine for mixing with the hydrocarbon fuels powering the engine for more complete combustion comprising:

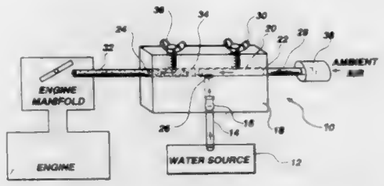
a. a fluid reservoir to hold a supply of fluid,

b a T junction mixer component having:

i. a water corrosive resistant housing defining a longitudinal tubular passage with an air inlet and a mixture outlet, and a right angle tubular passage forming a T junction with the longitudinal tubular passage, said right angle tubular passage having a water inlet leading into a pre-mixing chamber within the longitudinal tubular passage

ii. a rigid tube with a first end inserted within the air inlet of the longitudinal tubular passage extending to a point beyond the T junction to partially obstruct the water inlet and divert the fluid into the pre-mixing chamber, said rigid tube having a second end associated with an ambient air source to deliver a predetermined approximately constant air flow into the pre-mixing chamber,

iii. an adjustable set screw screwed in at right angles to the rigid tube to selectively restrict the air flow therethrough and deliver air to the pre-mixing chamber, while simultaneously restricting the water inlet to reduce the fluid flow into the pre-mixing chamber there through, where it turbulently mixes incoming fluid and air streams,



iv. a fluid intake tube inserted within the right angle tubular passage water inlet in communication with the fluid source to deliver a pre-set water flow to prevent the breaking of the siphoning action drawing fluid into the pre-mixing chamber for atomization into an atomized constant air to fluid mixture, and,

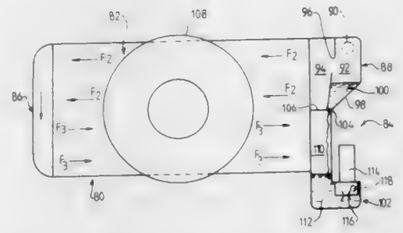
c. mixture conduit means associated with the mixture outlet to collect and transport the pre-mixing chamber's atomized fluid mixture for delivery into the intake manifold for admixture with the air drawn into the air intake of the engine in response to the vacuum created therein for blending with the fuel.

5,199,387

DUAL PHASE COOLING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Srun N. Ap, Villepinte, France, assignor to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Mar. 17, 1992, Ser. No. 852,643
Claims priority, application France, Mar. 20, 1991, 91 03410
Int. Cl.[5] F01P 9/02
U.S. Cl. 123—41.25 8 Claims



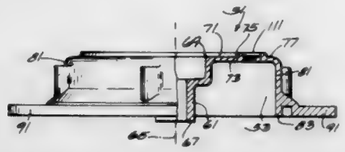
1. A cooling apparatus for an internal combustion engine, comprising means defining a coolant fluid inlet for a coolant fluid in the form of a mixture of its vapour and liquid phases, means defining a coolant fluid outlet for the coolant fluid in its liquid phase, a condenser interposed between said inlet and outlet, a phase separator interposed between said inlet and condenser, a liquid reservoir interposed between the condenser and said outlet wherein the condenser comprises a heat exchange tube bundle disposed for generally horizontal flow of fluid therein between the phase separator and said liquid reservoir and an integral water box carried by said tube bundle, said water box comprising an upper part which defines the phase separator and said fluid inlet, together with a lower part which defines said liquid reservoir and fluid outlet, the apparatus further including liquid flow passage means for directly communicating all of the coolant liquid from the upper part of said water box to the liquid reservoir in the lower part of said water box.

5,199,388

AXIAL FAN FLYWHEEL

Francis V. Bailey, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 2, 1992, Ser. No. 908,151
Int. Cl.[5] F01P 7/04
U.S. Cl. 123—41.65 3 Claims



3. A flywheel comprising a hub portion having an axis, an inner end, and an outer end spaced axially from said inner end, a central flange portion extending radially outwardly from said outer end of said hub portion in generally perpendicular relation to the axis of said hub portion and having an under surface, an outer surface spaced axially from said under surface, a radially outer periphery, a circular segment inwardly of said outer periphery, a plurality of openings extending axially through said circular segment and located in a circular array, and a like plurality of inclined surfaces located in said circular segment in respectively adjacent relation to said openings and extending, in inclined relation, from said outer surface to said under surface, whereby said openings have axial extent as well as horizontal extent, a generally cylindrical wall portion extending from said outer periphery of said central flange portion in generally spaced and parallel relation to said hub portion and in the direction toward said inner end of said hub portion from said outer end of said hub portion and including an end axially adjacent said inner end of said hub portion, and an outer flange portion extending radially outwardly from said end of said cylindrical wall portion in generally perpendicular relation to the axis of said hub portion.

5,199,389

WORK APPARATUS HAVING AN AIR-COOLED INTERNAL COMBUSTION ENGINE

Günter Wolf, Oppenweiler, and Reinhold Fink, Fellbach, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 19, 1992, Ser. No. 901,154
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1991, 4120877
Int. Cl.[5] F01P 1/02
U.S. Cl. 123—41.7 12 Claims

1. A work apparatus such as a motor-driven chain saw, the work apparatus comprising:

a housing defining a longitudinal axis;

said housing having first and second longitudinal sides defining a mounting space therebetween;

an air-cooled internal combustion engine having a cylinder extending into said mounting space;

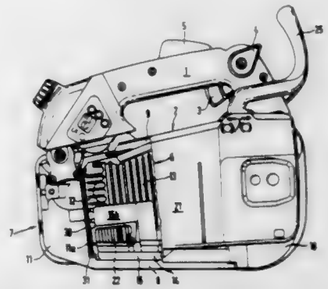
a fuel tank arranged in said housing in close proximity to said cylinder;

said first longitudinal side defining an air-inlet opening for receiving a flow of cooling air flowing in an air flow direction transversely to said axis for cooling said cylinder;

said second longitudinal side defining an air-outlet opening for passing the flow of cooling air to the ambient;

an exhaust gas muffler for receiving exhaust gas from said engine;

said exhaust gas muffler having a substantially L-shaped housing defining first and second housing legs;



said first and second housing legs conjointly defining a conducting wall for guiding the flow of cooling air;

having a first side facing toward said first housing leg and a second side facing toward said second housing leg;

said first housing leg extending approximately parallel to said air-flow direction; and,

said second housing leg being arranged transversely to said air-flow direction so as to cause air flowing along said conducting wall to partially back up thereby facilitating an increased transfer of heat from said cylinder to the air.

5,199,390

CYLINDER LINER

Fujio Hama, and Kenichi Harashina, both of Okaya, Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1992, Ser. No. 872,356
Claims priority, application Japan, May 9, 1991, 3-133614
Int. Cl.[5] F02F 1/10
U.S. Cl. 123—41.84 8 Claims

1. A cylinder liner comprising an outer circumferential surface provided with a plurality of groups of annular grooves, a longitudinal groove communicating the annular grooves with each other and forming an outlet for a cooling liquid in each of said groups of annular grooves, and a longitudinal groove communicating the annular grooves with each other and forming an inlet for the cooling liquid in each of said groups of annular grooves, wherein

the outlet communicates in series with the inlet in said adjoining groups of annular grooves, and

respective sectional areas of the annular grooves within at least one said group of annular grooves are decreased from an upstream side toward a downstream side.

substantially 180° out-of-phase to one another so that at every

ing disk having a unit-distance code that is checked

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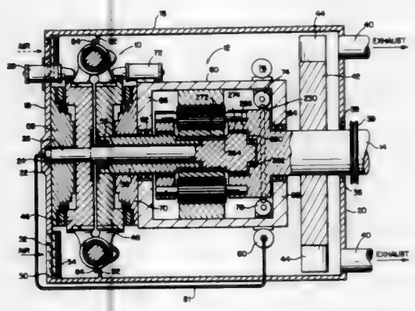
5,199,391

TOROIDAL INTERNAL COMBUSTION ENGINE

Gerald E. Kovalenko, 8009 Diving Cliff La., Springfield, Va. 22153

Filed Nov. 8, 1991, Ser. No. 789,357
Int. Cl.[5] F02B *53/00*
U.S. Cl. 123—43 B **28 Claims**



1. A toroidal internal combustion engine comprising:

a) a pair of coaxial, independently rotatable drive rotors, each rotor carrying a plurality of circumferentially spaced cylinder heads from one side of each of which extends a toroidal cylinder sector and from another side of each of which extends a toroidal piston sector, wherein the toroidal piston sectors are longitudinally slidably received within respective ones of the toroidal cylinder sections to define a plurality of circumferentially spaced, rotary acting power cylinders for imparting substantially circumferentially directed power strokes to the drive rotors;

b) a fuel inlet valve carried by each cylinder head for admitting at predetermined times in an operating cycle pressurized liquid fuel into each of the respective cylinders;

c) an igniter carried by each cylinder head for igniting at predetermined times in an operating cycle an air-fuel mixture within each cylinder; and

d) a drive clutch and gear assembly drivingly connected with each of the drive rotors and with an engine output drive shaft for transmitting successive intermittent rotary power strokes of the respective drive rotors to the engine output drive shaft to provide a substantially smooth, continuous output torque, the drive clutch and gear assembly including a plurality of overrunning clutches drivingly connected with a respective rotor and with a gear train coupled with the engine output drive shaft for imparting a unidirectional rotation to the engine output drive shaft.

5,199,392

ELECTROMAGNETICALLY OPERATED ADJUSTING DEVICE

Peter Kreuter, Aachen, and Klaus P. Schmitz, Lathen, both of Fed. Rep. of Germany, assignors to Audi Ag, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE89/00491, § 371 Date Apr. 23, 1991, § 102(e) Date Apr. 23, 1991, PCT Pub. No. WO90/01614, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 28, 1989, Ser. No. 654,645
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826978
Int. Cl.[5] F01L *9/04*
U.S. Cl. 123—90.11 **9 Claims**

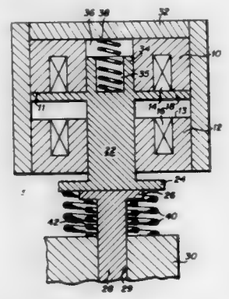
1. An electromagnetically operated, spring-biased actuator assembly for gas exchange valves in internal combustion engines, comprising in operative combination:

a) a first actuating solenoid and a second actuating solenoid disposed within a perimeter housing and spaced apart to define a gap therebetween, each of said solenoids having an iron core;

b) a ferromagnetic anchor plate disposed in said gap between said actuating solenoids to be selectively attracted to and guidingly reciprocated between engagement with each of said actuating solenoids, each engagement corresponding to either the closed or open operating condition of the gas exchange valve;

c) said anchor plate including:

i) an upper and lower stem portion, each of said stem portions disposed opposite one another and coaxial with the axial center of said anchor plate, said upper stem, portion being receivingly reciprocable in a central axial bore of said first actuating solenoid and said lower stem portion being receivingly reciprocable in a central axial bore of said second actuating solenoid;



ii) said lower stem portion having a terminal flange disposed to engage a coaxially aligned stamp member of a gas exchange valve stem, said terminal flange having a diameter sufficiently large to overlap the diameter of said stamp member;

d) a spring system for symmetrically stressing said anchor plate and assisting the reciprocating movement of said anchor plate and valve stem upon the appropriate excitation of each of said actuating solenoids; and

e) said spring system ensuring contact between said terminal flange portion of said anchor plate and said stamp member so that said reciprocating movement of said anchor plate is transferred to said gas exchange valve to open and close said gas exchange valve, and maintaining a constant neutral point of said spring system over the service life of the actuator assembly.

5,199,393

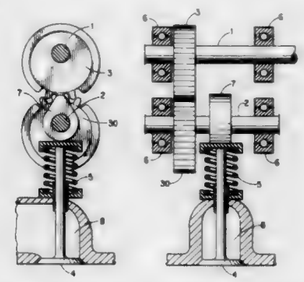
TIMING APPARATUS FOR A FOUR-STROKE ENGINE WITH CAMSHAFTS RUNNING AT DIFFERENTIATED ANGULAR ROTATION

Lando Baldassini, Via Della Fortezza 6, S. Piero A Sieve (Firenze), Italy

Filed Jun. 11, 1992, Ser. No. 897,321
Claims priority, application Italy, Jun. 11, 1991, 137 A/91
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 **5 Claims**

1. Timing apparatus in a four-stroke engine comprising a cam shaft located on a cylinder head and with a cam acting on a poppet valve, the apparatus further comprising a transmission shaft parallel to the camshaft driven by an engine crankshaft, which transmits the motion to the cam shaft through a pair of like toothed gears which are eccentrically keyed, one on the transmission shaft and the other on the cam shaft and

substantially 180° out-of-phase to one another so that at every turn of the transmission shaft running at constant speed, the



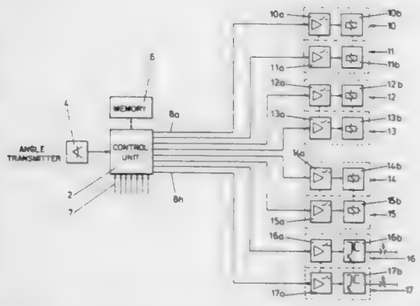
cam shaft performs half a turn at minimum speed and half a turn at maximum speed.

5,199,394

CIRCUIT ARRANGEMENT FOR ELECTRONIC CONTROL OF AN INTERNAL COMBUSTION ENGINE

Uwe Hartmann, and Udo Mai, both of Untergriesbach, Fed. Rep. of Germany, assignors to Vogt Electronic Ag, Erlau bei Passau, Fed. Rep. of Germany

Filed Nov. 15, 1991, Ser. No. 793,028
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039062
Int. Cl.[5] F02D *43/00*
U.S. Cl. 123—179.1 **11 Claims**



1. A circuit for electronic control of an internal combustion engines including injection valves that can be activated electrically as a function of regulated variables such as crankshaft position, engine speed, exhaust-gas composition and engine torque, the circuit comprising:

a) an electronic control unit, the electronic control unit including:

1) means to activate the intake valves, exhaust valves, injection valves and ignition device as a function of ignition duration and ignition timing; and

2) a start-up program with which ignition sequences of the engine cylinders, intake valves, injection valves and ignition device can be activated for any desired cylinder position of an engine-start-up process;

b) an electronic memory, connected with the control unit, the memory storing control programs for the control unit;

c) an engine-standstill detection circuit; and

d) an absolute-value angle transmitter to which the engine-standstill detection circuit is responsive, the absolute-value angle transmitter including:

1) a coding disk that is integrally connected with the crankshaft of the internal combustion engine, the coding disk having a unit-distance code that is checked automatically by the control unit;

2) means for generating signals corresponding to the crankshaft position during standstill and during rotational movement; and

3) means for generating electrical signals corresponding to engine temperature, engine load and engine knocking;

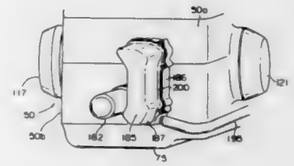
the signals being fed as regulated variables to the electronic control unit.

5,199,395

FOUR-CYCLE ENGINE

Sakae Mizumura, Tokyo; Tsunenori Fukumoto, Saitama; Susumu Mizuno, Saitama; Yasuo Shimura, Saitama; Takahiro Kudoh, and Jiro Shimizu, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 773,046
Claims priority, application Japan, Oct. 18, 1990, 2-280151; Nov. 20, 1990, 2-120810[U]
Int. Cl.[5] F01M *5/00*
U.S. Cl. 123—196 AB **7 Claims**



1. A water cooled oil cooling device for the engine of a vehicle comprising

a base fixed to the engine;

an oil filter;

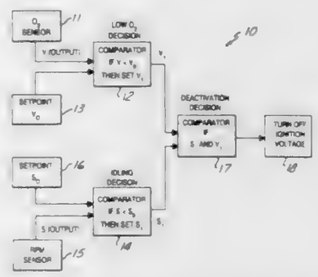
a water cooled oil cooling unit displaced from said filter, said oil filter and said water cooled oil cooling unit being mounted on said base, said base including an oil passage between said oil filter and said water cooled oil cooling unit.

5,199,396

ENGINE OPERATION INTERRUPT USING AMBIENT OXYGEN SENSING

Mordecai Shelef, Bloomfield Village, and Eleftherios M. Logothetis, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1992, Ser. No. 933,534
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D **12 Claims**



1. A system for the interruption of the operation of a motor vehicle equipped with an internal combustion engine, including the steps of:

means for sensing when the oxygen level in the surrounding

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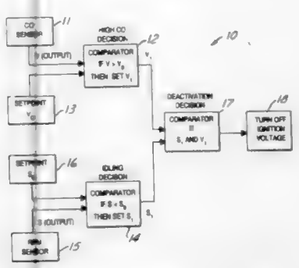
ambient goes below a predetermined value and providing a first output signal;
means for recognizing an idling condition of the engine and providing a second output signal; and
means for interrupting engine operation when the first output signal indicates an oxygen level below the predetermined value and the second output signal indicates an idling engine.

5,199,397

ENGINE OPERATION INTERRUPT USING AMBIENT MONOXIDE SENSING

Mordecai Shelef, Bloomfield Vilage; Eleftherios M. Logothetis, Birmingham, and Jacobus H. Visser, Belleville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1992, Ser. No. 933,535
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D **12 Claims**



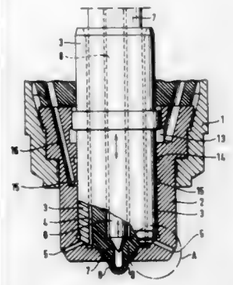
1. A system for the interruption of the operation of a motor vehicle equipped with an internal combustion engine, including the steps of:
means for sensing when the carbon monoxide level in the surrounding ambient rises above a predetermined value and providing a first output signal;
means for recognizing an idling condition of the engine and providing a second output signal; and
means for interrupting engine operation when the first output signal indicates a carbon monoxide level above the predetermined value and the second output signal indicates an idling engine.

5,199,398

FUEL INJECTION VALVE ARRANGEMENT

Ingemar Nylund, Korsholm, Finland, assignor to Wartsila Diesel International Ltd. Oy, Helsinki, Finland

Filed Jun. 8, 1992, Ser. No. 895,517
Claims priority, application Finland, Jun. 25, 1991, 913093
Int. Cl.[5] F02M *43/04*
U.S. Cl. 123—299 **4 Claims**



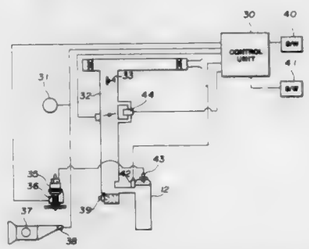
1. Improved fuel injection valve arrangement for so called dual fuel engines operated using two types of fuel, comprising a valve housing (**2**), which includes at least one nozzle orifice (**5**) opening into a combustion chamber of a cylinder in a combustion engine and which further includes first valve means for gaseous fuel and, independently controllable thereof, second valve means for pre-injection fuel used for ignition of the gaseous fuel, whereby the valve means for the gaseous fuel comprises an axially movable, cylindrical, substantially hollow valve member (**3**), the mantle surface of which is sealed to the valve housing (**2**), at least at the end located at the side of the combustion chamber of the cylinder, and inside of which there is a separate valve means (**7**;**8**) for the pre-injection fuel, the end part of the said valve member (**3**) located at the side of the combustion chamber being arranged to control the supply of the gaseous fuel from inside the valve member (**3**) into said at least one nozzle orifice (**5**), said end part being designed to comprise two sealing surfaces (**10***a*, **10***b*) placed on either side, in the moving direction of the valve member (**3**), of said at least one nozzle orifice (**5**) and arranged in co-operation with corresponding surfaces (**11***a*, **11***b*) in the valve housing (**2**).

5,199,399

SYSTEM AND METHOD FOR CONTROLLING IDLING SPEED FOR INTERNAL COMBUSTION ENGINE LINKED TO BELT TYPE ELECTRO-CONTINUOUSLY VARIABLE TRANSMISSION

Toru Shibuya, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 27, 1992, Ser. No. 888,757
Claims priority, application Japan, May 30, 1991, 3-126425
Int. Cl.[5] F02D *41/08*
U.S. Cl. 123—339 **10 Claims**



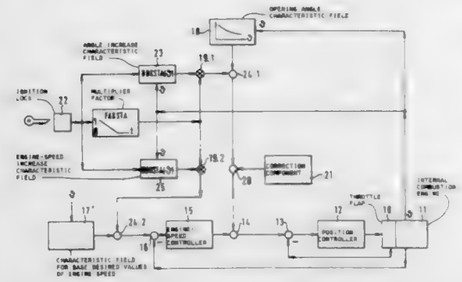
1. A system for controlling engine idling speed for an internal combustion engine associated with a belt type electro-continuously variable transmission, comprising:
a) first means for detecting an engine idling state of the engine and outputting an engine idling state indicative signal;
b) second means for detecting an engine revolution speed and outputting an engine revolution speed indicative signal according to the detected engine revolution speed;
c) third means for comparing the engine revolution speed with a predetermined engine revolution speed so as to derive a rate of engine revolution speed reduction and output the rate of the engine revolution speed reduction indicative signal according to the result of comparison;
d) fourth means for determining an abrupt deceleration of the engine when the engine falls in the engine idling state on the basis of the engine idling state indicative signal and the rate of engine revolution speed reduction indicative signal; and
e) fifth means for exceptionally supplying an amount of fuel into respective engine combustion chambers when the fourth means determines the abrupt deceleration of the engine.

5,199,400

METHOD AND ARRANGEMENT FOR THE IDLE CLOSED-LOOP CONTROL OF AN INTERNAL COMBUSTION ENGINE

Otto Sprenger, Kornwestheim; Klaus Heck, Hohenacker; Manfred Mezger, and Stefan Huwig, both of Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 22, 1991, Ser. No. 796,621
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1990, 4037772
Int. Cl.[5] F02D *41/16*
U.S. Cl. 123—339 **5 Claims**



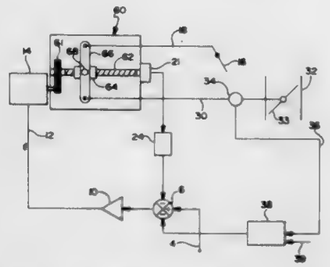
1. A method for precontrolling the opening angle of a throttle flap of an internal combustion engine during the idle engine-speed control thereof with the aid of a function block providing a time-reduced multiplier factor, the method comprising the steps of:
determining a temperature-dependent base desired value for said opening angle;
determining a temperature-dependent angle increase at the start of the engine;
multiplying said angle increase by said time-reduced multiplier factor to form a product; and,
adding said product to said base desired value within a start-time duration of the engine.

5,199,401

ENGINE THROTTLE SERVOACTUATOR CONTROL SYSTEM

Walter K. O'Neil, Birmingham; Donald R. Haefner, Oak Park; Wayne E. Klindt, Sterling Heights; Mark L. Leonard, Canton; Daniel R. Parks, Farmington, and Don K. St. John, Livonia, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 21, 1991, Ser. No. 780,178
Int. Cl.[5] F02D *11/10;* **B60K** *28/16*
U.S. Cl. 123—342 **19 Claims**



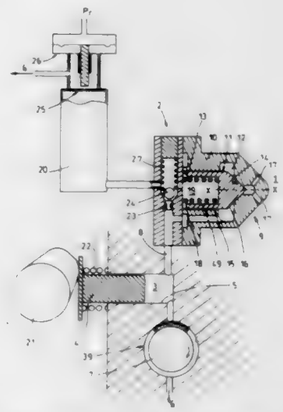
1. A method of controlling the position of a throttle control servoactuator comprising:
providing a servoactuator position command signal;
providing a throttle control servoactuator means having a DC motor drive mechanism;
providing a servoactuator position signal;
providing a servoactuator position feedback control means;
calculating a servoactuator momentum value based on the time derivative of said servoactuator position signal;
calculating a position error term by subtracting said servoactuator position signal from said position command signal; and
supplying a DC power signal to said motor with an amplitude proportional to said position error term reduced by said servoactuator momentum value.

5,199,402

DEVICE FOR INJECTING LIQUID SUCH AS FUEL INTO AT LEAST ONE PRESSURIZED CHAMBER OF A PERIODIC OPERATION MACHINE SUCH AS AN INTERNAL COMBUSTION ENGINE AND ENGINE OF THIS TYPE EQUIPPED WITH THIS DEVICE

Jean F. Melchior, 126 Bld Montparnasse, 75 014 Paris, France

Filed Feb. 18, 1992, Ser. No. 836,507
Claims priority, application France, Feb. 25, 1991, 91 02208
Int. Cl.[5] F02M *7/00*
U.S. Cl. 123—447 **28 Claims**



1. Device for injecting liquid into at least one chamber pressurized by a gas and forming part of a periodic operation machine such as an internal combustion engine, the device comprising a unit for pressurizing the liquid to be injected formed by a variable volume first cavity delimited by a piston reciprocating inside a cylinder,
which first cavity communicates with low-pressure liquid reserve means through the intermediary of a control unit establishing such communication cyclically in synchronism with the periodic operation of said machine and via a passage that is open at all times, except for the presence of a re-aspiration valve or like unit, with an injector formed by a nozzle and a mobile needle which is a body of revolution,
which nozzle comprises a second cavity connected to said passage and delimited laterally by a circular cylindrical wall and axially by a partially conical wall forming a seat and coaxial with said cylindrical wall and at least one injector orifice discharging into said pressurized chamber,
which needle has a cylindrical part forming a piston and adapted to slide with minimal operating clearance inside said cylindrical wall of said nozzle and a conical part cooperating with said seat,
which needle is adapted to be held when idle in bearing engagement with said seat by return means so as to interrupt communication between said second cavity and said

said valve means is re-adjusted such that the flow rate between

5,199,406

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injector orifice(s) and so that its cross-section bearing on said seat, when projected onto a plane perpendicular to the axis of said needle, is less than the transverse cross-section of the cylindrical part of said needle forming said piston, the free surface of said cylindrical part of said needle forming said piston delimiting a variable volume third cavity which communicates with a pressurized accumulator of said liquid and thereby constitutes said return means,

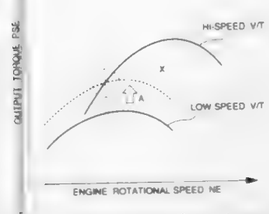
wherein said first cavity communicates with said third cavity through a calibrated orifice and a one-way valve connected in series and in that said accumulator communicates with said low-pressure liquid reserve mean through a variable cross-section leakage orifice provided with adjustment means adapted to maintain the pressure of the liquid in said accumulator at a substantially constant value for given operating conditions during periodic operation of said machine.

5,199,403

AIR FUEL RATIO CONTROL SYSTEM FOR VARIABLE VALVE TIMING TYPE INTERNAL COMBUSTION ENGINES

Shusuke Akazaki, and Hidehito Ikebe, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1992, Ser. No. 911,028
Claims priority, application Japan, Jul. 29, 1991, 3-211671
Int. Cl.[5] F02B *29/08*
U.S. Cl. 123—478 **7 Claims**



1. An air-fuel ratio control system for an internal combustion engine having at least one intake valve, and valve timing changing means for changing valve timing of said at least one intake valve at least between low-speed valve timing suitable for operation of said engine in a low engine rotational speed region, and high-speed valve timing suitable for operation of said engine in a high engine rotational speed region,

the system comprising:

operating condition detecting means for detecting operating conditions of said engine;

air fuel ratio calculating means for calculating a desired air-fuel ratio of a mixture supplied to said engine in response to the detected operating conditions of said engine;

changeover detecting means for detecting whether or not said engine has entered a predetermined changeover region in which said valve timing is to be changed; and

air-fuel ratio changing means for changing said desired air-fuel ratio when it is detected that said engine has entered said predetermined changeover region;

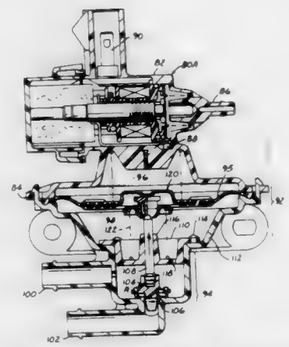
wherein when changeover is to be effected from said low-speed valve timing to said high-speed valve timing, said air-fuel ratio changing means changes said desired air-fuel ratio to be applied when said low-speed valve timing is selected, to one to be applied when said high-speed valve timing is selected, and said valve timing changing means changes said valve timing to said high-speed valve timing after said desired air-fuel ratio has been changed to said one to be applied when said high-speed valve timing is selected.

5,199,404

REGULATED FLOW CANISTER PURGE SYSTEM

John E. Cook, and William C. Gillier, both of Chatham, Canada, assignors to Siemens Automotive Limited, Ontario, Canada

Continuation-in-part of Ser. No. 591,219, Oct. 4, 1990, Pat. No. 5,050,568, which is a continuation-in-part of Ser. No. 490,791, Mar. 8, 1990, Pat. No. 5,054,455. This application Jun. 27, 1991, Ser. No. 722,765
Int. Cl.[5] F02M *25/08*; F01N *3/10*
U.S. Cl. 123—520 **8 Claims**



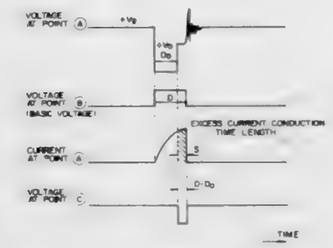
1. For controlling the purging of a fuel vapor-collection canister of an evaporative emission control system associated with the fuel system of an internal combustion engine, a regulated flow canister purge arrangement comprising an electronic vacuum regulator having a vacuum inlet at which engine intake manifold vacuum is received, an outlet at which is delivered a percentage of the engine intake manifold vacuum received at the vacuum inlet as determined by an electronic control signal supplied to a control input of the electronic vacuum regulator, a canister purge inlet to which a canister that is to be purged of gaseous fuel vapors is communicated, a canister purge outlet that is communicated to engine intake manifold vacuum, valve means for controlling flow between said canister purge inlet and said canister purge outlet, and a movable wall for operating said valve means, one side of said movable wall bounding one variable volume chamber and another side of said movable wall bounding another variable volume chamber, biasing means acting on said movable wall so as to cause said valve means to be biased toward blocking flow between said canister purge inlet and said canister purge outlet, and means communicating the outlet of said electronic vacuum regulator with said one variable volume chamber to cause the volumes of said chambers to vary in relation to the percentage of intake manifold vacuum applied to said one variable volume chamber, characterized in that: vacuum in said another variable volume chamber is caused to be correlated in a predetermined manner with engine intake manifold vacuum; in that in steady state operating conditions wherein the magnitude of intake manifold vacuum and the value of said control signal are held constant, said valve means operates to allow a corresponding, substantially constant flow rate from said canister purge inlet to said canister purge outlet that is correlated with the intake manifold vacuum and control signal values; in that for a certain steady state value of intake manifold vacuum and a certain steady state value of said control signal, said valve means operates to allow a certain corresponding flow rate from said canister purge inlet to said canister purge outlet; in that in response to a change in intake manifold vacuum from said certain steady state value thereof while said control signal remains unchanged at said certain steady state value thereof, said valve means is re-adjusted such that the flow rate between said canister purge inlet and said canister purge outlet is allowed to continue substantially unchanged at said certain flow rate; and in that in response to a change in said control signal from said steady state value thereof while the magnitude of intake manifold vacuum remains unchanged at said steady state value thereof, said valve means is re-adjusted such that the flow rate between said canister purge inlet and said canister purge outlet is changed from said certain flow rate in an amount correlated with the change in said control signal, and characterized further in that said valve means comprises a valve element that moves with said movable wall and a valve seat circumscribing a passage portion through which purge flow from said canister purge inlet to said canister purge outlet passes, said valve element comprising a tapered valve portion that coacts with said passage portion in setting restriction imposed on the purge flow.

5,199,405

IGNITION CURRENT CONDUCTION TIME CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Takashi Mukaihira, Katsuta; Noboru Sugiura, Mito; Ryoichi Kobayashi, Ibaraki, and Toshio Ishii, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,599
Claims priority, application Japan, May 18, 1990, 2-126990
Int. Cl.[5] F02P *3/045*
U.S. Cl. 123—609 **10 Claims**



1. An ignition current conduction time control apparatus for an internal combustion engine, comprising:

a crank reference position detector for detecting a crank rotating position of the engine;

means for obtaining ignition timing and ignition current conduction time from a detection signal rom said detector;

power transistors corresponding to cylinders;

means for applying ignition command signals, including signals specifying said ignition timing and said ignition current conduction time, to corresponding power transistors;

ignition coils corresponding to the cylinders, each provided on the output sides of said power transistors, for accumulating ignition energy during the ON period by said ignition command signals;

ignition plugs corresponding to the cylinders for receiving accumulated energy when a current applied to said ignition coils is cut off; and

control means for controlling ignition current conduction time as specified by said ignition command signals to be applied to said power transistors according to at least one of variations in values of the inductance of said ignition coil, the internal resistance of said ignition coils, coil temperature, source voltage and the ambient temperature to prevent excess current conduction of the power transistors

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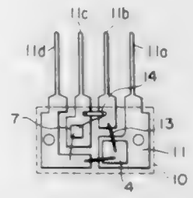
5,199,406

IGNITER FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Taruya, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1992, Ser. No. 878,667
Claims priority, application Japan, May 7, 1991, 3-101083
Int. Cl.[5] F02P *3/05*
U.S. Cl. 123—644 **3 Claims**



1. An igniter for an internal combustion engine, comprising:

a power transistor for interrupting an electric current flowing through a primary coil of an ignition coil;

a current detection resistor connected between said power transistor and the ground for detecting the current flowing through the primary coil, said current detection resistor having a resistance trimmed to provide a controlled resistance between said power transistor and the ground;

a current regulating circuit for regulating the current flowing through the primary coil in response to an output from said current detection resistor; and

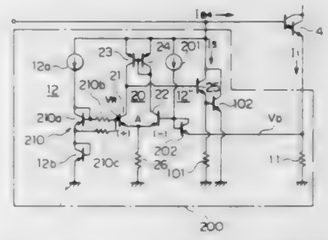
a mold resin package for hermetically sealing therein said power transistor and said current regulating circuit.

5,199,407

CURRENT LIMITER IN AN IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Nobuyuki Sawazaki; Masaaki Taruya, and Mitsuru Koiwa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1991, Ser. No. 769,320
Claims priority, application Japan, Oct. 4, 1990, 2-265124; Oct. 4, 1990, 2-265125
Int. Cl.[5] F02P *3/05*
U.S. Cl. 123—644 **6 Claims**



1. A current limiter in an ignition apparatus including a battery, an ignition coil connected to said battery, and a drive transistor connected to a junction between said battery and said ignition coil, said ignition coil having a primary winding connected to a power transistor and a secondary winding connected to a spark plug, said current limiter comprising:

a current sensing resistor for sensing a voltage corresponding to a current flowing from the primary winding of said ignition coil to said power transistor;

a differential amplifier having a first input terminal and a second input terminal and absorbing a part of a base cur-

cover having two opposite axles longitudinally aligned at

mounted in said annular groove in contact with said seat

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rent to be supplied from said battery to a base of said power transistor on the basis of a difference between a reference voltage imposed on the first input terminal thereof and a voltage imposed on the second input terminal thereof;

a first reference voltage source connected to the first input terminal of said differential amplifier for supplying thereto a first reference voltage;

a second reference voltage source for generating a second reference voltage, said second reference voltage source being connected between said current sensing resistor and the second input terminal of said differential amplifier for supplying thereto a total sum of the voltage sensed by said current sensing resistor and the second reference voltage; and

a plurality of output transistors coupled to form a Darlington circuit which is connected between said differential amplifier and the base of said power transistor.

5,199,408

AIR FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

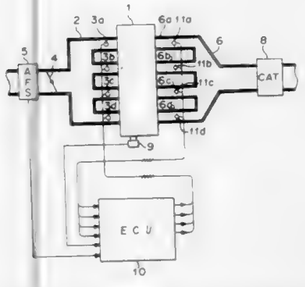
Seiji Wataya, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Continuation of Ser. No. 625,185, Dec. 10, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 825,315

Claims priority, application Japan, Dec. 22, 1989, 1-333938

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—672 **2 Claims**



1. An air fuel ratio control system for internal combustion engines, comprising:

an internal combustion engine having a plurality of cylinders, and an equal plurality of exhaust passages corresponding to the respective cylinders;

an equal plurality of oxygen sensors individually arranged in the respective exhaust passages to detect the composition of exhaust gas from the respective cylinders;

a control unit for independently controlling an air fuel ratio for each of the cylinders based on individual outputs from the respective oxygen sensors; and

reading means for individually reading the outputs of the oxygen sensors only during time periods when exhaust valves of the respective cylinders are open or have recently closed, such that remnant exhaust gases from other cylinders do not adversely affect the accuracy of readings from the oxygen sensors.

5,199,409

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

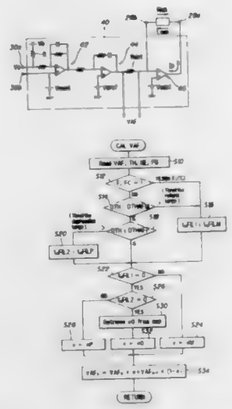
Yukio Miyashita; Hiroshi Ohno, and Shinichi Kubota, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1992, Ser. No. 878,586

Claims priority, application Japan, Jun. 14, 1991, 3-169457

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—694 **12 Claims**



1. A system for controlling an air/fuel ratio for an internal combustion engine using an oxygen concentration sensor;

said oxygen concentration sensor having an oxygen-pumping element and a cell element, each being composed of a member of a solid electrolytic material having oxygen ion-conductivity and a pair of electrodes having said member interposed therebetween, said oxygen-pumping element and said cell element defining a diffusion restriction region therebetween;

voltage applying means connected to said oxygen-pumping element for applying an output voltage, corresponding to a difference between voltage developed between said electrodes of said cell element and a predetermined reference voltage, to said oxygen-pumping element; and

current detecting means connected to said oxygen-pumping element for detecting a value of current flowing therein; comprising:

first means for detecting a plurality of operating conditions of the engine;

second means for smoothing the detected oxygen concentration at a rate determined in response to the detected engine operating conditions; and

control means for controlling an air/fuel ratio of the engine in response to the smoothed value.

5,199,410

TOY SAUCER LAUNCHING AND CATCHING DEVICE

Cheng-Tsuan Cheng, 3F No. 28, Lane 47, Sec. 2, Double Ten Rd., Pan Chiao, Taipei Hsien, Taiwan

Filed Dec. 12, 1991, Ser. No. 805,963

Int. Cl.[5] A63B *65/10*

U.S. Cl. 124—10 **1 Claim**

1. A toy saucer launching and catching device, comprising:

a handle formed of two opposed plastic shells;

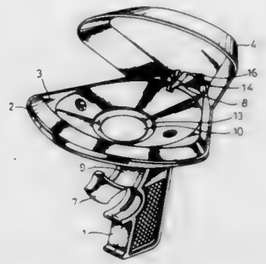
a base supported on said handle;

a saucer seat supported on said base for holding toy saucers, said saucer seat having a top surface curving inwards, said top surface having a round hole at the center for guiding toy saucers into a launching position;

an upper cover pivotably closed on said base, said upper cover having two opposite axles longitudinally aligned at a rear end thereof retained in two opposite axle holders, said axle holders being formed in said base and said saucer seat, the rear end of said upper cover having an inward projecting strip at a bottom thereof and a plurality of spring elements connected to said saucer seat, said spring elements being to provide a spring force constantly forcing said upper cover to close said saucer seat and said base;

a push plate movably retained between said base and said saucer seat, said push plate having a hooked portion on a bottom thereof and three circular posts on a top thereof, said three circular posts including a first circular post at the middle, a second circular post and a third circular post at two opposite sides behind said first circular post;

a spring rod mounted on said push plate, said spring rod having two opposite ends bent into two curved arm portions, said two curved arm portion including one disposed between said first circular post and said second circular post, and the other disposed between said first circular post and said third circular post;



a trigger pivoted to said handle, said trigger having a hooked portion stopped against the hooked portion on said push plate;

a lifting plate movably fastened in a hole on said base stopped at said projecting strip on said upper cover;

an auxiliary trigger pivoted to said handle, said auxiliary trigger having a raised portion stopped against said lifting plate;

at least one toy saucer placed in the round hole on said saucer seat with one above another, said at least one toy saucer each having a circular flange around the peripheral surface thereof and a recessed flat surface at the middle; and

wherein pulling said trigger with the finger causes said circular posts on said push plate to squeeze said spring rod so that the lowest one of said at least one toy saucer on said saucer seat is launched into the air; pulling said auxiliary trigger with the finger causes said cover to be lifted by said lifting plate for catching a toy saucer which was launched to fly into the air.

5,199,411

TOY MISSILE PROJECTOR

Yung-Chi Tsao, 2F, No. 27, Lane 419, Chung-Mei Street, Taichung, Taiwan

Filed Sep. 19, 1991, Ser. No. 762,494

Int. Cl.[5] F41B *11/02*

U.S. Cl. 124—67 **16 Claims**

1. A toy missile projector comprising:

a hollow tubular projector body having an annular stepped portion along its inner wall at an upper end thereof, an annular groove defined about the circumference of said annular stepped portion, a stop hole formed through a middle section of the projector body, and one or more axial guiding slots formed at a lower end of said inner wall;

a reset spring disposed in said annular groove;

a hollow outer tube having an inner wall with a stepped portion at an upper end thereof, and being slidably mounted in said annular groove in contact with said reset spring;

a hollow inner tube adapted to receive a projectile therein and having a stepped annular portion at its lower end, said inner tube being fixed at its upper end to an upper end of said outer tube and being slidably mounted in said projector body for movement between a retracted position substantially within said projector body and an extended position in which said stepped annular portion at said lower end of said inner tube engages with said stepped annular portion at said upper end of said projector body, said stepped annular portion at said lower end of said inner tube having a central hole formed therein adapted to have compressed air pass therethrough for launching of the projectile;

a piston rod having a stepped annular part with an airtight ring mounted thereabout, a keyway extending in a diametral direction of said piston rod, an axially extending hole formed through the center of a bottom end surface of said piston rod, and one or more blocks formed on an outer wall at a lower end of said piston rod, said piston rod being slidably mounted in said projector body with said one or more blocks being slidably received in said one or more axial guiding slots;

a movable pin mounted in said keyway with a small spring urging said movable pin outwardly of said piston rod;

a bottom cover fixed to said lower end of said projector body; and

a compression spring disposed in said axially extending hole of said piston rod and between said piston rod and said bottom cover for urging said piston rod upwardly.

5,199,412

PRODUCTION FACILITY FOR THE MECHANIZED FABRICATION OF MASONRY

Markus Anliker; Franz Anliker, and Jürgen Anliker, all of Riedlingen, Fed. Rep. of Germany, assignors to Hedwig Anliker, Riedlingen, Fed. Rep. of Germany

Filed May 1, 1991, Ser. No. 693,294

Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014615

Int. Cl.[5] B28D *1/02*

U.S. Cl. 125—12 **8 Claims**

1. A production facility for the mechanized fabrication of masonry, comprising:

first transfer means for moving a row of building stones in unison from a first position to another position that is spaced apart from the first position; and

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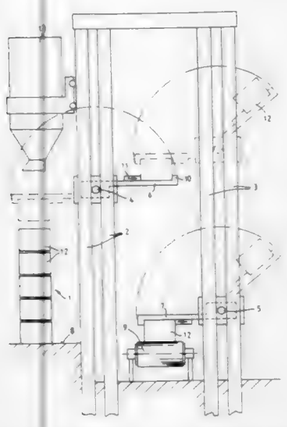
second transfer means for receiving the row of building stones from the first transfer means at the another position, pivoting the row of building stones about a horizontal axis which is parallel to a wall that is being fabricated and which is spaced apart from the wall that is being fabri-



cated, and for depositing the row of building stones upside down as a building stone course of the wall that is being fabricated,

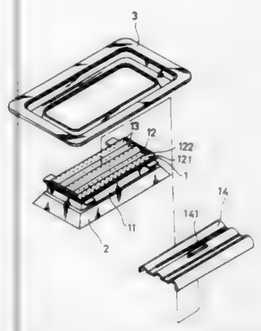
wherein the first transfer means comprises a pivotally mounted frame which comes down from above the building stone row at the first position.

5,199,413

MOBILE SPIRIT STOVE

Ming-Jing Chen, No. 3 Alley 55, Lane 352, Chye Dong Load, Ah Yi Li, Changhua, Taiwan

Filed Jul. 7, 1992, Ser. No. 909,737
Int. Cl.[5] F24C *5/00*
U.S. Cl. 126—43 **1 Claim**



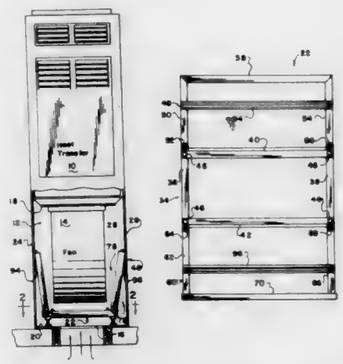
1. A mobile spirit stove comprising an alcohol fuel container supported on a base to hold glass fibers and alcohol fuel, a perforated plate mounted on said alcohol fuel container, said perforated plate having an undulating cross-section defining linearly directed parallel equally curved ridges and hollows having a first set of holes through said ridges wherein heated alcohol fuel gas flows from said alcohol fuel container for making fires, and a second set of holes through said hollows through which external aid is induced into said alcohol fuel container for circulation; and, a fire extinguishing cover, said fire extinguishing cover being contoured into straight parallel regular and equally curved ridges and hollows matingly engaging said ridges and hollows of said perforated plate for extinguishing fires after each use of the stove.

5,199,414

HAMMOCK FILTER FOR AIR CONDITIONER

Donald C. McMillon, P.O. Box 187, Snyder, Tex. 79549

Filed Oct. 14, 1992, Ser. No. 960,780
Int. Cl.[5] F24H *3/02*; **B01D** *46/10*
U.S. Cl. 126—99 R **19 Claims**



1. In a space heating and air-conditioning unit having
a. a heat transfer compartment above
b. a fan compartment, having
  i. a top structure,
  ii. a bottom structure,
  iii. two side structures,
  iv. a back structure, and
  v. a front structure,
c. a fan attached to the top structure,
d. a removable closure over an opening in the front structure, and
e. an air inlet in at least one of the bottom and side structures;
f. an improved filter structure comprising in combination with the above:
g. a rectangular bottom filter panel extending from the back structure to the closure over the front structure,
h. feet extending between the bottom filter panel and the bottom structure thus supporting the bottom filter panel above the bottom structure,
j. a rectangular closed filter panel extending from the back structure to the closure over the front structure,
k. the closed filter panel having a hinge side attached to a closed hinge side of the bottom panel,
l. the closed filter panel having a closed side contacting one of the side structures above said hinge side, and
m. a rectangular entry filter panel extending from the back structure to the closure over the front structure,
n. the entry filter panel having a hinge side attached to an entry hinge side of the bottom panel, and
o. the entry filter panel having an entry side contacting another of the side structure above said hinge side.

5,199,415

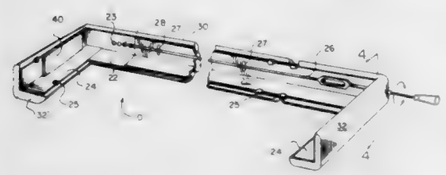
ADJUSTABLE FIREPLACE HEARTH SHIELD ASSEMBLY

Marvin B. Johnson, Jr., 25 Magnolia Dr., Newnan, Ga. 30263

Filed Jun. 25, 1992, Ser. No. 904,132
Int. Cl.[5] F24B *1/18*
U.S. Cl. 126—500 **3 Claims**

1. An adjustable fireplace hearth shield assembly having a substantially rigid and laterally adjustable frame member, comprising:

a) laterally extendible and retractable, interfitting righthand and lefthand frame tracks, said tracks defining angle extensions of L-shaped vertical cross-section, the righthand track overlapping in part the lefthand track adjacent the interior of the frame member, the lefthand track having plural anchor apertures in elongated gradient array,
b) the righthand track bearing on its interior an extendible-retractable tightening rod which overlaps the lefthand



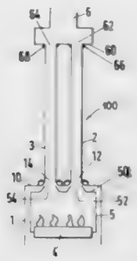
track for engagement with a preselected aperture of said lefthand track;
c) each of said frame tracks bearing rearwardly directed righthand and lefthand side tracks thereon at an angle of less than 90 degrees from said frame tracks;
d) replaceable exterior foam padding attached to the exterior of respective frame and side tracks, comprising a dense foam with adhesive means interiorly thereon, adhering to the exterior of all said tracks.

5,199,416

HOT AIR HEAT EXCHANGER

Gerd Gumienny, Landsberg a. Lech; Jaroslav Klouda, Fuerstenfeldbruck, and Franz Koch, Untermeitingen, all of Fed. Rep. of Germany, assignors to Rational Grosskuechentechnik Service GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1991, Ser. No. 808,743
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1991, 4120250
Int. Cl.[5] F24B *1/189*
U.S. Cl. 126—522 **13 Claims**



1. In a hot air heat exchanger comprising a heat exchanger housing having a floor which is essentially formed by an upper wall of an outer chamber containing a burner and having at least one heat exchanger pipe extending from the floor to an upper ceiling for conducting exhaust gases of the burner to heat ambient air flowing around the pipe, the improvements comprising the burner being disposed in an inner chamber, whose outer wall is arranged in the outer chamber with an all-around spacing therebetween, said inner chamber having an exhaust gas opening in an upper wall aligned with each heat exchanger pipe, said exhaust gas opening being provided with a perimeter wall that tapers in a direction toward the heat exchanger pipe and the outer chamber including an outer opening aligned with the exhaust gas opening of the inner chamber, each of said outer openings of said outer chamber being provided with a perimeter wall tapering in the direction toward the heat exchanger pipe with the heat exchanger pipe being secured in a gas-tight manner to the periphery wall of the outer opening, and said space between the inside wall surface of the outer chamber and the outside surface wall of the inner chamber being in communication with ambient air to allow flow of the air in an annular gap therebetween and between the perimeter walls of the exhaust gas opening and outer opening into the attached heat exchange pipe.

5,199,417

ENDOSCOPE HAVING A DEFLECTABLE DISTAL SECTION AND A SEMI-RIGID PROXIMAL SECTION

Richard P. Muller, Bronx, N.Y.; Raymond Ainger, III, Stamford, and Eugene P. Podbielski, Weston, both of Conn., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Dec. 21, 1990, Ser. No. 632,053
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—6 **45 Claims**

1. An endoscope comprising
an elongated shaft, including
a first elongated sheath tube having a selected length and including a deflectable distal section and a semi-rigid proximal section, said deflectable distal section having at its distal end a triangular shaped cross-sectional area of a selected geometrical dimension which terminates in a distal tip, said first elongated sheath tube including
means defining a first working channel and a second working channel, each of which extends axially from the proximal section of the first elongated sheath tube to the distal tip thereof;
means defining a fiber optic image bundle channel which is adapted to receive a fiber optic image bundle; and
a second semi-rigid elongated sheath tube having a predetermined length, which is greater than one-half of said first elongated sheath tube selected length and less than said selected length, positioned over and enclosing the proximal section of said first elongated sheath tube with the deflectable distal section extending beyond said second semi-rigid elongated sheath tube, said second semi-rigid elongated sheath tube having a cross-sectional shape sufficient to pass the proximal section of said first elongated sheath tube therethrough.

5,199,418

MOUTH SPECULUM

Robert G. Jamison, Jr., P.O. Box 57, Evans City, Pa. 16033, and Louis D. Jeffrey, 14805 Branched Oak Rd., Waverly, Nebr. 68462

Filed May 11, 1992, Ser. No. 881,057
Int. Cl.[5] A61B *1/06*; **A61D** *1/08*
U.S. Cl. 128—13 **7 Claims**

1. An illuminated mouth speculum, comprising:
a first tubular elongated member having first and second ends, a hollow interior cavity, a forward portion, and a rearward portion;
a second elongated member affixed at a forward end to the rearward portion of said first tubular member intermediate

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5,199,420

intersection of the forehead conduit and the right temple

said connector means including a connector tube being

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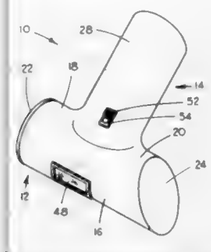
said first and second end and extending generally perpendicularly therefrom;

said second member having a rearward end with an opening therein communicating with an interior cavity extending longitudinally and forwardly within said second member from the rearward end thereof, said cavity formed of a length sufficient to receive at least a portion of a person's thumb to support said mouth speculum thereon;



a first cap removably mounted on the first end of said first member to enclose the cavity in said first member;

window means formed in the forward portion of said first member permitting the passage of light from said first member cavity; and

a light source selectively operably mounted within a portion of said first member.

5,199,419

SURGICAL RETRACTOR

Stanley H. Remiszewski, Greenwich; Paul A. Matula, Brookfield, and H. Jonathan Tovey, Milford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Aug. 5, 1991, Ser. No. 740,443

Int. Cl.[5] A61B *17/02*

U.S. Cl. 128—20 **58 Claims**

1. A surgical retractor comprising:

handle means including actuation structure;

housing means attached to said actuation structure of said handle means, said housing means having at least one center element disposed adjacent a guide element for relative reciprocal motion therewith, said center and guide elements having proximal and distal ends; and

a retractor assembly, including a reciprocal yoke assembly having a slide yoke means, a pivot yoke means, and a plurality of interleaved retractor blades connected together at a pivot pin, said slide yoke means and said pivot yoke means cooperating with said housing means such that relative reciprocal axial movement of said center element and said guide element serves to move said interleaved retractor blades between a closed position and an open position.

5,199,420

LITHOTRITOR ARRANGEMENT

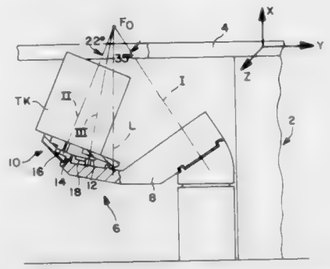
Theo Artmeier, Gröbenzell, Fed. Rep. of Germany, assignor to Dornier Medizintechnik GmbH, Fed. Rep. of Germany

Filed Jul. 15, 1991, Ser. No. 729,604

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1990, 4022496

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 EL **8 Claims**



1. An arrangement for treating a patient with focussed shock waves, comprising:

a housing;

a therapy head that includes means for generating, focussing and introducing shock waves into the body of a patient, the therapy head having a focal point isocenter and an axis of rotation that is movable on an enclosure of a cone, the cone having a tip which is in the focal point of the isocenter;

an arm rotatably mounted on the housing and having an axis of rotation; and

a gearing mechanism coupled between the arm and the therapy head to fasten the therapy head to the arm, wherein the gearing mechanism includes a toothed gearing which comprises a gearwheel fixedly connected with the arm, a rotatable differential gearwheel, a crank which fastens the rotatable differential gearwheel to the arm, and a gearwheel fastened to the therapy head.

5,199,421

SWIM MASK AND SNORKEL APPARATUS

Gerard G. Figgiani, and Angel Starling, both of 45-38 220 Place #2, Bayside, N.Y. 11361

Filed Nov. 14, 1991, Ser. No. 791,353

Int. Cl.[5] B63C *11/16, 11/02;* **A62B** *18/08*

U.S. Cl. 128—201.11 **3 Claims**

1. A swim mask apparatus, comprising,

a visor conduit frame, the conduit frame including a right temple conduit spaced from a left temple conduit,

and

a right lower conduit and a left lower conduit, an upper distal end of the right lower conduit mounted to a lower distal end of the right temple conduit,

and

an upper distal end of the left lower conduit mounted to a lower distal end of the left temple conduit, wherein the right lower conduit and the left lower conduit merge into an air manifold,

and

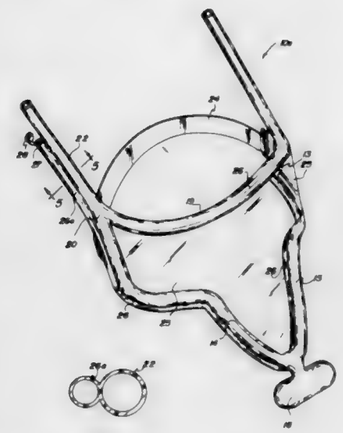
a forehead conduit joined to an upper distal end of the right temple conduit and an upper distal end of the left temple conduit at opposed right and left distal ends of the temple conduit, with the temple conduit, the right temple conduit, the left temple conduit, the right lower conduit, the left lower conduit, and the air manifold in pneumatic communication,

and

a right snorkel tube in pneumatic communication with a first intersection of the forehead conduit and the right temple conduit,

and

a left snorkel tube in pneumatic communication with a second junction defined by an intersection of the forehead conduit and the left temple conduit, wherein the right snorkel tube and the left snorkel tube extend upwardly above the forehead conduit,



and

an adjustable strap member secured to the right temple conduit and the left temple conduit for securement of the visor conduit frame to an individual,

and

a transparent visor contained coextensively within the visor conduit frame.

5,199,422

MODULAR SNORKEL

Stan Rasocha, Deerfield, Ill., assignor to Dacor Corporation, Northfield, Ill.

Filed Sep. 26, 1991, Ser. No. 766,053

Int. Cl.[5] B63C *11/16*

U.S. Cl. 128—201.11 **20 Claims**

18. A snorkel, comprising:

a breathing tube having an upper end and a lower end;

a snorkel body having an upper end and a lower end and provided with a passageway being in fluid communication with said breathing tube;

connector means for sealingly connecting said lower end of said breathing tube to said upper end of said snorkel body, said connector means including a connector tube being provided with means for rotatably orienting said connector means relative to said breathing tube in a plurality of secured, indexed, slip resistant positions; and

valve means disposed at an upper end of said breathing tube for defining a space for permitting the unrestricted flow of air into and out of said upper end of said tube and the exhaustion of water outward from said upper end of said tube, and including a valve housing having an outer wall configured for preventing the entry of water into said tube during surface swimming, and being secured in relation to said upper end of said tube to define said space for permitting the free flow of air into and out of said tube, and a one-way valve device disposed on said valve housing for facilitating the exhaustion of water outward from said upper end of said tube while preventing the entry of water into said tube through said one-way valve device.

5,199,423

OXYGEN-RICH GAS BREATHING SYSTEMS FOR PASSENGER CARRYING AIRCRAFT

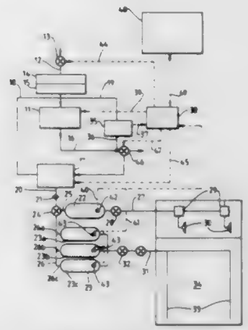
Michael W. Harral, Yeovil, and Robin H. J. Searle, Hardington Mandeville, both of England, assignors to Normalair-Garrett (Holdings) Ltd., England

Filed Feb. 6, 1991, Ser. No. 651,192

Claims priority, application United Kingdom, Feb. 10, 1990, 9003033

Int. Cl.[5] A62B *21/00, 7/00*

U.S. Cl. 128—202.26 **6 Claims**



1. Apparatus for supplying oxygen-rich gas for breathing by crew and passengers of a passenger carrying aircraft, comprising first gas storage means adapted for pre-charging with oxygen-rich gas and connected by first supply line means for delivering said oxygen-rich gas to an aircraft flight crew cabin for continuous breathing by a flight crew member flying the aircraft above a predetermined altitude and for breathing by all flight crew in the event of cabin decompression; second gas storage means adapted for pre-charging with oxygen-rich gas and connected by second supply line means for delivering said oxygen-rich gas for breathing by occupants of an aircraft passenger cabin in the event of cabin decompression; means for monitoring the content of oxygen-rich gas in the first and second gas storage means; molecular sieve oxygen concentrator means having a supply air inlet end and an oxygen-rich gas outlet end; supply air delivery means adapted for connection between a source of supply air and the inlet end of the concentrator means; oxygen-rich gas delivery means adapted for connection between the outlet end of the concentrator means and the first and second gas storage means; means for sensing the content of oxygen-rich gas in the first and second gas storage means; means for initiating operation of the concentrator means when the content of oxygen-rich gas in one or both of the first and second gas storage means is sensed to have fallen below a required content value; means for monitoring

tion pressure control means disposed in a common body with

said catheter body is inserted into the patient's trachea and

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the content of oxygen in oxygen-rich gas delivered by the concentrator means; spill valve means connected in the oxygen-rich gas delivery means; means connecting the spill valve means with the oxygen-rich gas sensing means whereby the spill valve means is signalled by the sensing means to open and vent to ambient oxygen-rich gas delivered by the concentrator means when the oxygen content of said gas is sensed as being below a required value; compressor means connected in the oxygen-rich gas delivery means; means connecting the compressor means with the oxygen-rich gas sensing means whereby the spill valve means is signalled to close and the compressor means is signalled to commence operating to increase the pressure of oxygen rich gas delivered by the concentrator means when the content of said gas is sensed to be above the required value for delivery to the first and second gas storage means.

5,199,424

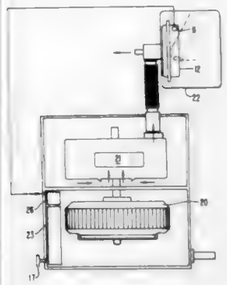
DEVICE FOR MONITORING BREATHING DURING SLEEP AND CONTROL OF CPAP TREATMENT THAT IS PATIENT CONTROLLED

Colin E. Sullivan, 27 Wharf Road, Birchgrove, Sydney, NSW 2041, and Christopher Lynch, 376 Lane Cove Road, North Ryde, Sydney, NSW 2113, both of Australia

Division of Ser. No. 548,108, Jul. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 457,757, Dec. 21, 1989, abandoned. This application Dec. 12, 1991, Ser. No. 806,157

Int. Cl.[5] A61M *16/00;* **A62B** *7/00;* **F16K** *31/02;* **A61B** *5/08*

U.S. Cl. 128—204.18 **8 Claims**



5. An air flow device, useful in CPAP therapy of a patient, comprising:

means for delivering variable pressure levels of pressurized air to a patient's respiratory system;

means, selectable by the patient, for controlling the time during which continuously delivered pressurized air rises from an initial low pressure level to a preset operating therapeutic level; and,

means for automatically maintaining the delivered pressurized air at the operating therapeutic level after the operating therapeutic level has been reached.

5,199,425

BREATHING APPARATUS WITH CHAMBER OF VARIABLE CAPACITY FOR SCUBA DIVING

Frédéric Perrier, Saint-Laurent-du-Var, France, assignor to La Spirotechnique Industrielle et Commerciale, Carros Cedex, France

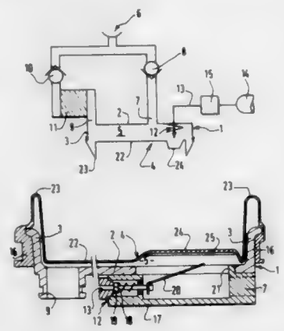
Filed May 22, 1991, Ser. No. 710,371

Claims priority, application France, Jun. 7, 1990, 90 07076

Int. Cl.[5] A61M *16/00;* **A62B** *7/04, 9/02;* **F16K** *31/26*

U.S. Cl. 128—204.26 **13 Claims**

1. A breathing apparatus comprising a housing, a demand valve in the housing, said housing having an actuating member and connectable to a source of breathing gas under pressure that discharges into a variable capacity chamber delimited by a surface and a peripheral wall portion of the housing and outwardly by a flexible wall member mounted by its periphery on the peripheral wall portion of the housing, said flexible wall consisting of means for reducing the breathing effort of a diver and for improving the diver's control during a dive, said means comprising a diaphragm made out of an elastomeric material which has been preshaped to have a central portion with a



main part and a control part of reduced area which is offset in an outward direction of the housing relative to the main part, said control part being located to cooperate with the actuating member when the diaphragm is fully depressed by the breathing effort of the diver.

5,199,426

AIRCRAFT AIRCREW G-RESPONSIVE VALVE SYSTEM FOR CONTROLLING BREATHING GAS AND SUIT-INFLATION

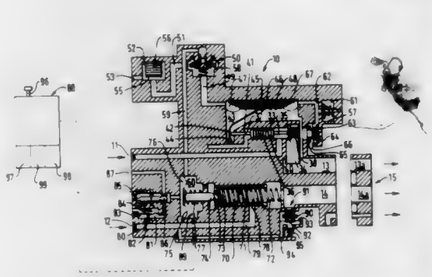
Alec J. Aldworth, Charmouth, and James C. Foote, Halstock, both of England, assignors to Normalair-Garrett Holdings, Ltd., England

Filed Sep. 18, 1990, Ser. No. 584,037

Claims priority, application United Kingdom, Sep. 21, 1989, 8921344

Int. Cl.[5] A62B *9/02, 17/00;* **A61M** *16/00;* **F16K** *17/36*

U.S. Cl. 128—205.24 **8 Claims**



1. An aircraft aircrew life support system comprising a breathing demand regulator means adapted to be connected with a breathing gas source for regulating delivery of breathing gas to a breathing mask in response to breathing demands of the aircrew member, and, if required, to a counter-pressure garment, the demand regulator including a breathing-pressure control chamber fed with gas to develop a control pressure therein determining the breathing gas pressure delivered by the regulator, aneroid means controlling outflow from the control chamber for increasing breathing gas delivery pressure appropriate to positive pressure breathing above a predetermined altitude, and valve means also controlling outflow from the control chamber for increasing breathing gas delivery pressure appropriate to positive pressure breathing in the presence of high or rapidly changing G-load; G-protection garment inflation pressure control means disposed in a common body with said demand regulator means for outputting inflation gas to a G-protection garment and to said valve means controlling outflow from the control chamber of said demand regulator means, said G-protection garment control means comprising a spring-biased pressure-balanced valve adapted to be displaced, against the spring bias, in an opening direction by a pneumatic actuator, the pneumatic actuator being subject to feedback control responding to G-protection garment inflation pressure, wherein the feedback control is by electrical signals derived by a pressure transducer sensing inflation pressure and wherein the pressure transducer senses pressure in a chamber subject to inflation pressure but isolated from the flow of inflation gas whereby turbulence effects tending to degrade pressure signals output by the transducer are avoided and duct means in said common body for ducting inflation gas output by said control means to be applied as in operating force to said valve means whereby breathing gas appropriate to positive pressure is delivered by said demand regulator to the breathing mask in the presence of increasing G-load.

5,199,427

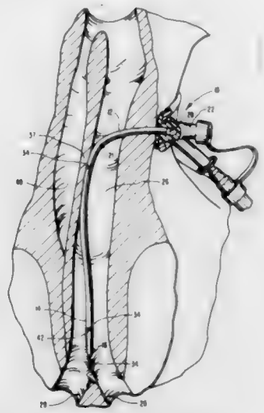
MULTI-LAYERED TRANSTRACHEAL CAATHETER

Richard D. Strickland, Sandy, Utah, assignor to Ballard Medical Products, Draper, Utah

Continuation-in-part of Ser. No. 600,435, Oct. 19, 1990. This application Oct. 18, 1991, Ser. No. 778,513

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **7 Claims**



1. A transtracheal catheter comprising:

an elongated catheter body comprising:

an inner layer and means to resist kinking of said inner layer and including constructing said inner layer of a material that is soft and flexible to the extent that it will bend rather than kink when placed within a patient's trachea for extended periods of time; and

an outer layer fused to the inner layer and comprising a material that is sufficiently hydrophobic and that has a sufficiently low coefficient of friction such that said outer layer is resistant to mucous buildup when placed in the trachea, said outer layer essentially completely covering said inner layer to prevent contact of mucous by the inner layer, and in combination with said inner layer provides said catheter body with enough softness and flexibility to bend rather than kink when placed within a patient's trachea for an extended period of time, and with enough rigidity to hold said catheter body firmly against a posterior wall of the trachea to minimize unwanted movement of the catheter body;

a proximal end and a distal end, said distal end being bent away from said catheter body at an angle such that when said catheter body is inserted into the patient's trachea and placed against the posterior wall of the trachea, said distal end is correspondingly deflected at said angle from the posterior wall; and

means for connecting said catheter body to an oxygen source said means for connecting being located at said proximal end of said catheter body.

5,199,428

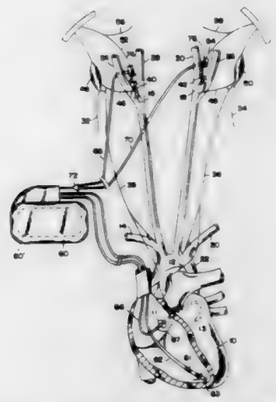
IMPLANTABLE ELECTRICAL NERVE STIMULATOR/PACEMAKER WITH ISCHEMIA FOR DECREASING CARDIAC WORKLOAD

Israel W. P. Obel, Johannesburg, South Africa, and Ivan Bourgeois, Verviers, Belgium, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 22, 1991, Ser. No. 673,883

Int. Cl.[5] A61N *1/08*

U.S. Cl. 128—419 C **32 Claims**



1. A system for influencing the natural biological blood pressure regulatory system in a patient, for reducing and controlling ischemia of myocardial tissue by electrical pulse by stimulation of the patient's nerve system, said system comprising:

ischemia sensor means adapted to be located within the venous return system of a patient's heart for sensing a constituent of the venous return blood draining from myocardial tissue and producing an electrical output signal substantially representing a chemical constituent of that blood;

signal transforming means for receiving the sensor means output signal and developing a stimulation trigger signal in response to an output signal indicative of a condition of ischemia; and

means responsive to said trigger signal for applying electric stimulation pulses to said nerve system.

5,199,429

IMPLANTABLE DEFIBRILLATOR SYSTEM EMPLOYING CAPACITOR SWITCHING NETWORKS

Mark W. Kroll, Minnetonka, and Theodore P. Adams, Edina, both of Minn., assignors to AngeMed, Inc., Plymouth, Minn.

Filed May 23, 1991, Ser. No. 704,619

Int. Cl.[5] A61N *1/39*

U.S. Cl. 128—419 **2 Claims**

1. A device for energy delivery to a heart of a human during defibrillation comprising:

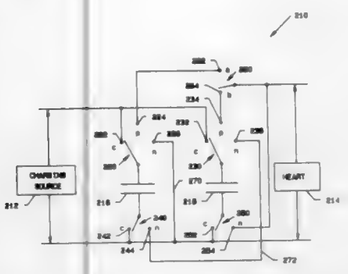
a. at least two capacitors;

ductive element, and to transmit the received light to a

5,199,433

b. electronic switching circuitry means for connecting said capacitors to the heart;

c. control means connected to the electronic switching circuitry to deliver the capacitor energy to the heart with at least one of said capacitors connected in parallel with another of said capacitors for a first phase of energy delivery; and,



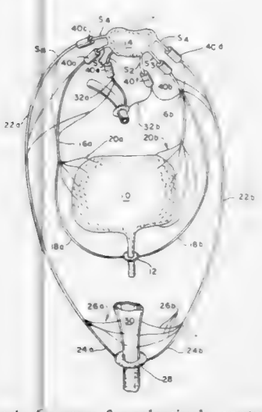
d. control means connected to the electronic switching circuitry to deliver the capacitor energy to the heart with at least one of said capacitors connected in series with another of said capacitors for a second phase of energy delivery whereby said second phase being either the same or opposite polarity of said first phase.

5,199,430

MICTURITIONAL ASSIST DEVICE

Zi-Ping Fang, University Hts.; J. Thomas Mortimer, and Graham H. Creasey, both of Cleveland Hts., all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Mar. 11, 1991, Ser. No. 667,523
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 F **13 Claims**



13. An electrical system for selectively controlling evacuation of a patient's bladder by concurrently generating action potentials on smaller diameter nerve fibers which cause contraction of the patient's bladder and suppressing action potentials in larger diameter nerve fibers connected with the patient's urethral sphincter to allow the urethral sphincter to relax, the larger and smaller diameter nerve fibers originating in part in left and right S_2 sacral roots, left and right S_3 sacral roots, and left and right S_4 sacral roots, the electrical system comprising:

a first cuff electrode at least partially encircling the left S_3 sacral root;

a second cuff electrode at least partially encircling the right S_3 sacral root;

a third cuff electrode at least partially encircling the left S_4 sacral root;

a fourth cuff electrode at least partially encircling the right S_4 sacral root;

each of the first, second, third, and fourth cuff electrodes including a central electrical contact, an antidromic end electrical contact, and an orthodromic end electrical contact, each of the cuff electrodes being implanted at least partially encircling the respective root with its antidromic end disposed closer to the patient's spinal column than its orthodromic end;

a current source means connected between the end electrical connectors and the central electrical connector of each cuff electrode for selectively applying quasi-trapezoidal shaped current pulses have a generally flat plateau and an exponentially decaying tail;

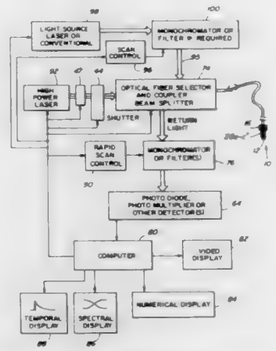
a means for adjusting an amplitude of the current pulses such that (i) a substantially −25 millivolt potential relative to a resting potential is created across membranes of nodes of the larger and smaller diameter nerve fibers to depolarize the nodes and initiate propagation of action potentials on the larger and smaller diameter nerve fibers and (ii) a hyperpolarizing potential of about 55 millivolts more negative than the resting potential is created across the nodes of the larger diameter nerve fibers blocking orthodromic propagation of action potentials on the larger diameter fibers without blocking orthodromic action potential propagation on the smaller diameter nerve fibers.

5,199,431

OPTICAL NEEDLE FOR SPECTROSCOPIC DIAGNOSIS

Carter Kittrell, Cambridge, Mass.; Robert M. Cothren, Jr., Beatrice, Nebr., and Michael S. Feld, Waban, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 58,675, May 26, 1987, Pat. No. 4,913,142, which is a continuation of Ser. No. 715,239, Mar. 22, 1985, abandoned. This application Oct. 4, 1989, Ser. No. 417,799
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—634 **20 Claims**



1. An optical needle device for the diagnosis of tissue comprising:

an optical needle having a sharp distal tip for the incision of tissue and an optically conductive element at the distal tip which directs light to a distal surface of the element and through which light is transmitted and received from tissue contacting the distal surface;

a plurality of optical fibers coupled to the optically conductive element to receive light returning from the tissue and directed through the distal surface of the optically conductive element, and to transmit the received light to a proximal end of the optical fibers;

a light source optically coupled to a proximal end of at least one of the optical fibers such that light from the source can be directed through the optically conductive element onto the tissue to be diagnosed; and

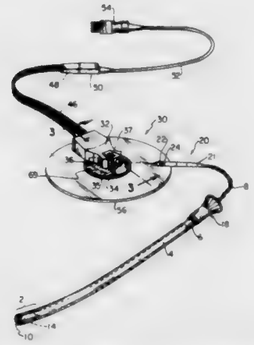
an analyzer coupled to the proximal end of at least one of the optical fibers to compare a characteristic of the light emitted by the tissue with a reference signal such that the condition of the tissue can be diagnosed.

5,199,432

FETAL ELECTRODE PRODUCT FOR USE IN MONITORING FETAL HEART RATE

Phillipp J. Quedens, Berlin; Donald R. Boucher, Wallingford; John T. Shipherd, Madison; Michael J. Malis, Trumbull, and Joseph A. Izzo, New Haven, all of Conn., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1990, Ser. No. 605,843
Int. Cl.[5] A61B *5/04, 5/0444*
U.S. Cl. 128—642 **10 Claims**



1. A fetal electrode product for use in monitoring fetal heart rate, said product being used in conjunction with a fetal monitor coupling device supported on the mother's body and having a housing with an opening, said product comprising:

a fetal electrode, a maternal electrode and a holder made of an insulating material, said electrodes secured to said holder;

a connector dimensioned and shaped to be received in the opening in the coupling device housing and having at least two contacts separated and electrically isolated from each other, said contacts positioned to make electrical contact with complementary contact members in said coupling device;

an insulated pair of elongated flexible wires, each of said wires electrically connecting a respective one of said contacts to a respective one of said fetal and maternal electrodes; and

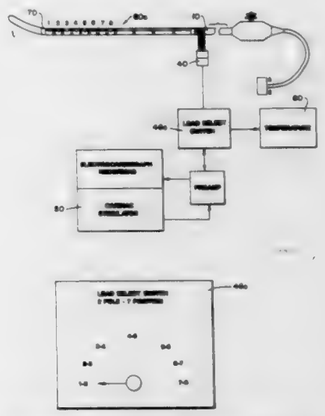
an elongated, flexible driving tube for rotating said holder, said driving tube defining a tubular channel in which the wires extend, the tube being displaceable relative to the wires in a direction away from the electrodes, the connector having an outer dimension which is less than the inner diameter of the driving tube so as to allow the connector to pass through the driving tube as the driving tube is pulled in the direction away from the electrodes to thereby cause the wires to leave the tubular channel.

5,199,433

ESOPHAGEAL RECORDING/PACING CATHETER WITH THERMISTOR AND CARDIAC IMAGING TRANSCEIVER

William T. Metzger, Libertyville; Rimas Buinevicius, Palos Park, and Richard M. Bilof, Wonder Lake, all of Ill., assignors to Arzco Medical Systems, Inc., Vernon Hills, Ill.

Continuation-in-part of Ser. No. 306,997, Feb. 6, 1989, Pat. No. 5,069,215. This application Nov. 2, 1990, Ser. No. 608,200
Int. Cl.[5] A61B *5/0402, 8/12;* **A61N** *1/05*
U.S. Cl. 128—642 **12 Claims**



1. A multi-function esophageal catheter usable to produce cardiac images of an individual from the individual's esophagus comprising:

an elongated body member having a proximal end and a distal end, said distal end insertable into the esophagus of the individual;

a cardiac imaging transceiver carried at said distal end;

a plurality of spaced apart electrodes carried on said body member, displaced from said transceiver toward said proximal end with each member of said plurality electrically coupled to said proximal end, said transceiver usable for carrying out a cardiac imaging function in combination with cardiac pacing using at least a selected one of said electrodes; and

a temperature sensor carried on said body member, a selected distance from said distal end for monitoring a temperature of the individual wherein said electrodes and said sensor are removably affixed to said body member.

5,199,434

Patent Not Issued For This Number

5,199,435

MAGNETIC RESONANCE IMAGING SYSTEM

Hiroshi Sugimoto, Nishinasunomachi, and Hirokazu Suzuki, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 11, 1990, Ser. No. 536,187
Claims priority, application Japan, Jun. 13, 1989, 1-150192
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **18 Claims**

1. A magnetic resonance imaging system for diagnosing right and left kidneys of a subject, comprising:

means for selectively exciting and saturating a first and a second sagittal slice, said first sagittal slice including said right kidney where blood flows in renal veins and said

second sagittal slice including said left kidney where

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ULTRASONIC IMAGER

noninvasively measure the left ventricular volume of the

a hollow hub;

a hollow needle having a proximal end and an open distal

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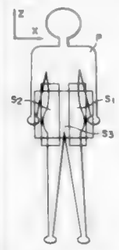
second sagittal slice including said left kidney where blood flows in renal veins; and

means for imaging including means for selectively exciting a coronal slice which includes the right and left kidneys where blood flows in renal veins said coronal slice intersecting said first and second sagittal slices to cause a magnetic resonance before said magnetic resonance caused by said selective exciting and saturating means is relaxed,



means for collecting a magnetic resonance signal, and means for acquiring a magnetic resonance image of said coronal slice based on said magnetic resonance signal.

5,199,436

RADIATION DETECTOR HAVING IMPROVED ACCURACY

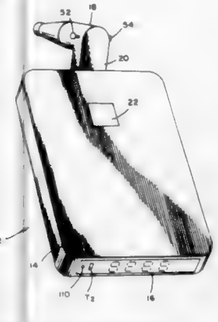
Francesco Pompei, Wellesley Hills, and Philip R. Gaudet, Jr., Concord, both of Mass., assignors to Exergen Corporation, Newton, Mass.

Division of Ser. No. 338,968, Apr. 14, 1989, Pat. No. 5,012,813, which is a continuation-in-part of Ser. No. 280,546, Dec. 6, 1988, Pat. No. 4,993,419. This application Jan. 28, 1991, Ser. No. 646,855

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] **A61B** *6/00*

U.S. Cl. 128—664 **5 Claims**



1. A temperature detector comprising:

a housing adapted to be held by hand;

an extension from the housing adapted to be inserted into an ear;

a radiation sensor supported within the detector and which receives radiation passing into the extension from a target area in the ear;

a temperature display on the housing for displaying temperature; and

a battery powered electronics in the housing for converting radiation sensed by the sensor to temperature displayed by the display, the electronics including a processor for providing an inner body temperature displayed on the housing as a function of the received radiation, indicating target temperature, compensated by an indication of ambient temperature to provide an inner body temperature approximation.

5,199,437

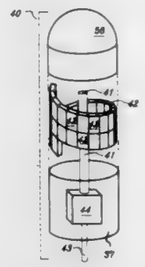
ULTRASONIC IMAGER

Edwin Langberg, Mt. Laurel, N.J., assignor to Sensor Electronics, Inc., Mt. Laurel, N.J.

Filed Sep. 9, 1991, Ser. No. 756,510

Int. Cl.[5] **A61B** *8/12*

U.S. Cl. 128—662.06 **4 Claims**



3. An improved intracavitary ultrasonic imaging system of a type in which a stationary probe supports a mechanically scanning movable ultrasonic transducer, the transducer is connected to a control and processing system, a position coding means is stationary with respect to the probe, and a readout head is moving with the transducer, said readout head reading the position coding means, said readout head connected to the control and processing system where the position signal is decoded, wherein the improvement comprises:

said position coding means is a sheath coded with a magnetic material, and said readout head is a magnetic head built into said transducer, said readout head transmitting position code through said probe to said control and processing system.

5,199,438

MEASUREMENT OF CARDIAC PERFORMANCE

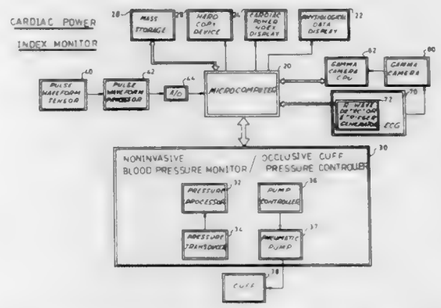
Andrew L. Pearlman, Misgav, Israel, assignor to ATP Advanced Technologies Limited, Vaduz, Liechtenstein

Filed Aug. 10, 1990, Ser. No. 565,642

Claims priority, application Israel, Sep. 27, 1989, 091803

Int. Cl.[5] **A61B** *5/02*

U.S. Cl. 128—670 **35 Claims**



1. A method for noninvasively measuring the value of cardiac power index as a descriptor of performance of a heart comprising the steps of:

noninvasively measuring the left ventricular pressure of the heart with reference to time; the step of measuring the left ventricular pressure comprising the steps of measuring the arrival times of cardiac pressure pulses at a given arterial site displaced form the heart at a plurality of pressure values;

noninvasively measure the left ventricular volume of the heart with reference to time;

determining the work performed by the left ventricle as the product of the left ventricular pressure and the left ventricular volume as a function of time;

determining the power of the left ventricle as the time derivative of said product; and

determining the slope fo the time derivative as it rises during the interval from the onset of systole to the moment of maximum power, thereby to provide a value of the cardiac power index.

5,199,439

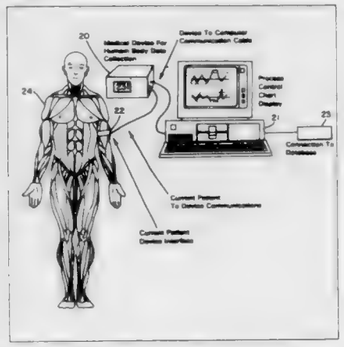
MEDICAL STATISTICAL ANALYZING METHOD

Stanley Zimmerman, 501 Cumberland Rd. E., Mobile, Ala. 36608; Lonnie Brown, 18 Rickarby Pl., Mobile, Ala. 36606, and Steven Zimmerman, 4151 Bay Front Rd., Mobile, Ala. 36605

Filed Jan. 16, 1990, Ser. No. 465,049

Int. Cl.[5] **A61B** *5/02*

U.S. Cl. 128—670 **38 Claims**



1. The process of monitoring patient vital signs from a monitoring device which is generating data using control charts with at least one control chart limit comprising the steps of:

(a) collectioning said data from said monitoring device;

(b) placing said data into statistically significant subgroups of at least one datum each;

(c) calculating for said statistically significant subgroups statistics to graph against said control charts;

(d) repeating the process steps (a) through (c) continuously;

(e) selecting for a statistically significant number of repetitions of steps (a) through (c) the data necessary to set at least one control chart limit;

(f) setting at least one control chart limit with said data;

(g) setting up at least one control chart with said at least one control chart limit;

(h) continuously graphing said statistics against said at least one control chart making a diagnosis or performing a treatment on said patient using said monitored vital signs graphing statistics.

5,199,440

Patent Not Issued For This Number

5,199,441

FINE NEEDLE ASPIRATION BIOPSY APPARATUS AND METHOD

Hugh H. Hogle, 1627 Wasatch Dr., Salt Lake City, Utah 84108

Filed Aug. 20, 1991, Ser. No. 747,741

Int. Cl.[5] **A61B** *10/00*

U.S. Cl. 128—753 **14 Claims**

1. A biopsy needle for collecting cells from inside a tissue comprising:

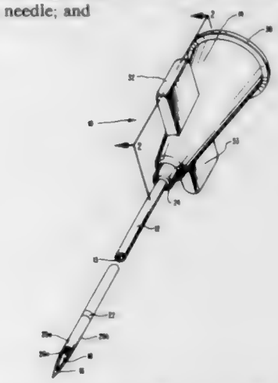
a hollow hub;

a hollow needle having a proximal end and an open distal end, the interior of said hollow needle having a first diameter, said hollow needle being mounted at said proximal end to said hollow hub and in fluid communication with said hollow hub;

suction means for imposing a negative pressure inside said hollow hub and said hollow needle;

a sharpened point on said hollow needle at said open distal end for penetrating said tissue;

a plurality of fenestrations in a sidewall of said hollow needle adjacent said distal end, each fenestration comprising a hole having a rim and a second diameter, said second diameter being smaller than said first diameter of said hollow needle; and



scraper means for scraping cells from said tissue, said scraper means comprising said suction means in combination with said plurality of fenestrations with said rim acting as a scraper for collecting cells from said tissue as said distal end of said hollow needle is inserted and retracted through said tissue with said negative pressure pulling said tissue inwardly into said holes with said rims scraping said cells from said tissue whereby said second diameter of said holes inhibits said tissue from being pulled by said negative pressure into said hollow needle to an extent that it plugs said hollow needle.

5,199,442

APPARATUS FOR REDUCTION OF SPASTICITY IN MALE AND FEMALE PATIENTS HAVING SPINAL CORD INJURY AS WELL AS OBTAINING SEMEN FROM MALES BY STIMULATION OF EJACULATORY NERVES

Stephen W. J. Seager, 10301 Norton Rd., Potomac, Md. 20854, and Lauro S. Halstead, 3522 Woodbine St., Chevy Chase, Md. 20815

Filed May 20, 1991, Ser. No. 701,815

Int. Cl.[5] **A61N** *1/05, 1/38*

U.S. Cl. 128—788 **2 Claims**

1. Apparatus for reducing spacticity of neurologically impaired patients comprising:

a) an elongated anal probe which is adapted to apply stimulus to a patient's pelvic floor, said probe defining a distal penetrating end and a proximal end, an axially aligned channel formed between ends therein with at least three conduits emanating radially therefrom, said probe further defining three longitudinally extending cavities therein, each said cavity being connected to one each of the conduits; three elongated bipolar electrodes, one each being secured in a corresponding cavity and extending above a ventral surface of the probe;

b) a temperature sensor disposed within one said conduit adjacent one said bipolar electrode, interiorly of the probe;

c) a stimulator circuit including the bipolar electrodes wherein current in the range of 0–35 volts and 0–700

dinal axis of said intermediate portion; said proximal por- the belts traveling in part parallel with and adjacent to a garni-

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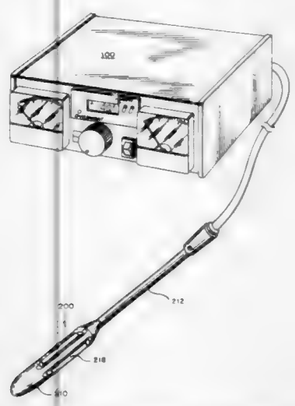
milliamps may be delivered to the electrodes through the axially aligned channel and conduits alternately by AC or



DC, to effect electrical stimulus to the patient whereby to reduce spasticity therein.

5,199,443

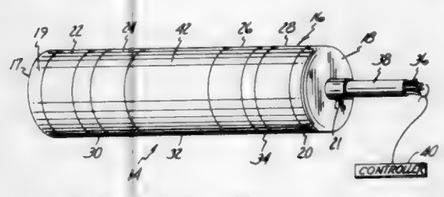
INCONTINENCE ELECTRODE APPARATUS

Donald D. Maurer, Anoka, and Alexander Kipnis, Minneapolis, both of Minn., assignors to Empi, Inc., St. Paul, Minn.

Filed Mar. 26, 1991, Ser. No. 675,568

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—788 **13 Claims**



1. A vaginal electrode, comprising:

a molded elongated tubular body, with an interior surface and an exterior surface and a longitudinal axis, having a plurality of conductive polymer bands separated by at least one non-conductive polymer band; each conductive polymer band having a width and an electrical receptacle at the interior surface wherein the electrical receptacle includes a domed region with a cylindrical cavity having an inner diameter; and

a plurality of leads configured for connection to an electrical power source, each lead having a terminal end with an electrical contact mated to one of the electrical receptacles to make mechanical and electrical connection between the conductive polymer band and the lead.

5,199,444

CONDOM HAVING ENHANCED GRIPPABILITY STRUCTURE AND ANNULAR SEALING ELEMENT

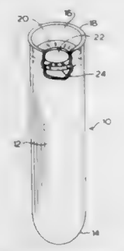
Robert G. Wheeler, Greenbank, Wash., assignor to Family Health International

Division of Ser. No. 568,426, Aug. 16, 1990, Pat. No. 5,036,863, which is a division of Ser. No. 271,884, Nov. 15, 1988, Pat. No. 4,964,416. This application Jul. 8, 1991, Ser. No. 726,913

Int. Cl.[5] A61F *6/04*

U.S. Cl. 128—844 **8 Claims**

1. A condom comprising an elongate main tubular sheath having a longitudinal axis and formed of a flexible elastic material, closed at a distal end and open at a proximal end thereof, with a circumscribing element joined to and extending radially outwardly from the proximal open end of the main tubular sheath to a substantially greater diametral extent than the diameter of the main tubular sheath, to provide a manually grippable extended area to aid in application of the condom to the penis of a wearer, with said main tubular sheath having secured thereto, at a proximal part thereof, at least one thin film annular-shaped sealing element formed of a flexible elastic material and having a thickness of from about 0.05 to about 0.25 millimeter, which (1) annularly circumscribes an interior opening of smaller size than the proximal end opening, with an



inner edge surface bounding the interior opening, and with top and bottom annular surfaces extending outwardly from said inner edge surface to an outer periphery of the sealing element, (2) is joined at the outer periphery to the main tubular sheath, (3) is oriented with the top and bottom annular surfaces of the sealing element generally perpendicular to the longitudinal axis of the main tubular sheath when the condom is positioned for donning, and (4) during insertion of a penis into the main tubular sheath and subsequent wearing of the condom, circumscribes the penis, with the inner edge surface of the sealing element bearing compressively against the penis to effect sealing of the condom thereagainst.

5,199,445

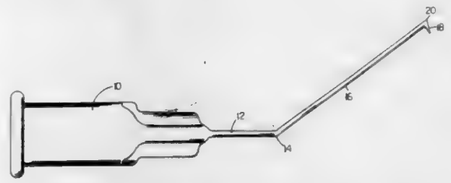
STROMAL PUNCTURE METHOD

Roy S. Rubinfeld, Bethesda, Md., assignor to Look, Inc., Norwell, Mass.

Division of Ser. No. 533,923, Jun. 6, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 787,799

Int. Cl.[5] A61B *17/34*

U.S. Cl. 128—898 **4 Claims**



1. A method of performing anterior stromal puncture on a portion of the anterior surface of the cornea of an eyeball comprising:

a) providing a stromal puncture needle having a proximal portion, an intermediate portion, and a distal portion, each of said portions having a proximal end and a distal end and a longitudinal axis extending therebetween; said intermediate portion extending from said proximal portion so that said longitudinal axis of said intermediate portion describes an angle of between 135° and 155° with said longitudinal axis of said proximal portion; said distal portion extending from said distal end of said intermediate portion so that said longitudinal axis of said distal portion describes an angle of between 75° and 105° with said longitudinal axis of said intermediate portion; said proximal portion, said intermediate portion and said distal portion being defined in a single plane; said proximal portion and said intermediate portion being 25 gauge and said intermediate portion having a length of about 18 mm; said distal portion defining a cutting tip which terminates distally in a piercing point; said distal portion having a length of between 0.1 mm and 0.25 mm;

b) holding said stromal puncture needle so that said intermediate portion is approximately tangential to a point of contact between said piercing point and the anterior surface of the cornea;

c) advancing said stromal puncture needle towards the anterior surface of the cornea thereby to insert distal portion into the stroma to a depth defined by said maximum length of said distal portion and at most until said intermediate portion contacts the anterior surface of the cornea thereby to limit said penetration of said distal portion;

d) withdrawing said stromal puncture needle from the stroma; and

e) repeating steps c) and d) a plurality of times thereby to form a plurality of punctures of limited depth in the anterior surface of the cornea.

5,199,446

CIGARETTE MAKING MACHINE

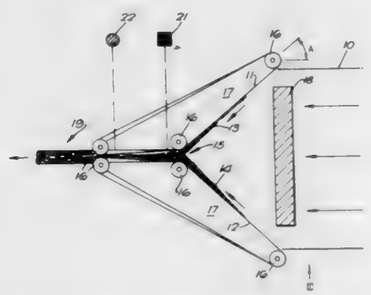
Michael J. Cahill, and John Dawson, both of Coventry, England, assignors to Molins PLC, Milton Keynes, United Kingdom

Continuation of Ser. No. 377,521, Jul. 10, 1989, abandoned. This application Jul. 11, 1991, Ser. No. 729,889

Claims priority, application United Kingdom, Jul. 12, 1988, 8816538; Sep. 30, 1988, 8823013

Int. Cl.[5] A24C *5/18*

U.S. Cl. 131—84.1 **15 Claims**



1. A cigarette making machine including a shower channel through which tobacco is arranged to be showered toward two converging suction bands so as to form two continuous tobacco sub-streams on the respective bands and to merge these sub-streams, in a region where the bands are closest, to form one stream.

5,199,447

APPARATUS FOR HIGH SPEED DELIVERY OF FREE FLOWING MATERIAL

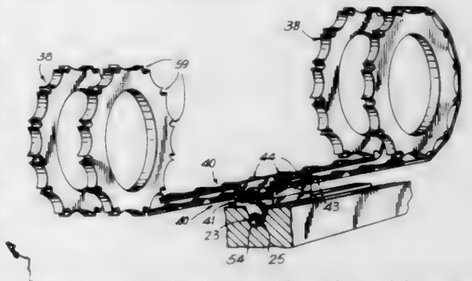
Joseph F. Budjinski, II, Quinton; Charles G. Atwell, Mechanicsville, and Martin T. Garthaffner, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 31, 1992, Ser. No. 828,423

Int. Cl.[5] A24C *5/47, 5/52*

U.S. Cl. 131—94 **8 Claims**

1. In an apparatus for inserting free flowing material into receiving spaces between filter plugs for use in construction cigarette filters, the improvement comprising, two continuous parallel belts composed of a continuous unlinked material traveling around and between a plurality of sprockets with individual pockets suspended between the belts, said pockets including funnels to receive and channel free flowing material, the belts traveling in part parallel with and adjacent to a garniture tape carrying the filter plugs, while the funnels in the



pockets channel free flowing material into the receiving spaces between filter plugs, said belt maintaining consistent spacing between said funnels.

5,199,448

METHOD AND APPARATUS FOR SEPARATION OF OBJECTIONABLE PARTICLES FROM TOBACCO MATERIAL

Michael P. Parker, Bedfordshire, United Kingdom, assignor to Rothmans International Tobacco (UK) Limited, United Kingdom

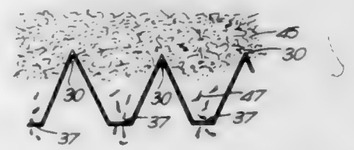
Continuation-in-part of Ser. No. 411,134, Sep. 22, 1989, Pat. No. 5,063,944. This application Dec. 20, 1990, Ser. No. 631,119

Claims priority, application United Kingdom, Sep. 28, 1988, 8822723

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[5] A24B *1/04, 3/18*

U.S. Cl. 131—110 **40 Claims**



1. Apparatus for the separation of objectionable particles from tobacco material which comprises a deck to receive the tobacco material, means for vibrating said deck, means for providing an air flow through the deck to fluidise the tobacco material, said deck having a convoluted and at least partly perforated surfaces which provides peaks and troughs, the air velocity of said fluidising air and said peaks and troughs providing stratified air velocities over the deck to cause the tobacco material to form a carpet at least a portion of which is below the peaks but spaced above the bottoms of the troughs and which together with the vibration of the deck agitates the carpet and causes the dust to be released and rise and the heavy particles to sink, said carpet moving lengthwise along said troughs during operation to a discharge location, means for removing the released dust, means for removing the heavy particles through the deck, the combination of the shape of the deck convolutions and the performations therein cause the velocity of the fluidising air to increase from the troughs to the peaks of the convolutions, and means for lifting the acceptable material from the carpet on a gentle removal air stream and transporting it from the discharge location.

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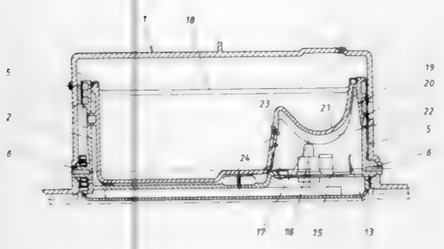
5,199,449

TILTABLE ASHTRAY OR STORAGE BIN FOR MOTOR VEHICLES, OR THE LIKE

Volker Dabringhaus; Gunter Dietz, both of Wuppertal; Udo Gutlein, Taufkirchen, and Hans-Joachim Haase, Altdorf, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Aug. 12, 1991, Ser. No. 743,909
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1990, 4025534
Int. Cl.[5] A24F *19/02*; B60N *3/12, 3/14*
U.S. Cl. 131—231 10 Claims

1. An ashtray and storage bin assembly comprising:
a frame fastenable to another object; a receiving housing supported in the frame;
an ashtray insert removably placeable in the receiving housing, the ashtray insert comprising an ash receptacle, clip fasteners on the ash receptacle for separably and removably securing the ash receptacle in the receiving housing;
a support housing in the receiving housing, support housing first fastening means in the receiving housing for enabling removable emplacement of the support housing in the receiving housing at a side of the ash receptacle;
a cigarette lighter removably disposed in the support housing, lighter support means in the support housing for receiving and supporting the lighter, whereby the lighter is installable in the support housing and the support housing is installable in the receiving housing;



a contact assembly in the receiving housing and connectable to an external electrical system, the contact assembly including a contact coupling which is positioned for electrically contacting the cigarette lighter when the cigarette lighter is installed in the support housing in the receiving housing;
electric illuminating means located in the receiving housing for illuminating the interior of the receiving housing,
the ash receptacle, the support housing and lighter being removable from the receiving housing to provide space for storage of objects in the receiving housing, while the electric contact assembly being permanently installed in the receiving housing and remaining in the receiving housing upon removal of the ash receptacle, the support housing and the lighter from the receiving housing, the space for storage of objects in the receiving housing being an upwardly open, cup-shaped, uninterrupted space extending from one side of the receiving housing to another side of the receiving housing.

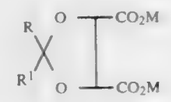
5,199,450

SMOKING COMPOSITIONS CONTAINING A TARTRATE SALT FLAVORANT-RELEASE ADDITIVE

Yoram Houminer, Richmond, and John D. Naworal, Midlothian, both of Va., assignors to Philip Morris Incorporated, New York, N.Y. and Philip Morris Products Inc., Richmond, Va.

Filed Feb. 26, 1991, Ser. No. 660,932
Int. Cl.[5] A24B *15/30*
U.S. Cl. 131—276 20 Claims

1. A smoking composition comprising an admixture of
(1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and
(2) between about 0.0001–5 weight percent, based on the total weight of filler, of a flavorant-release additive corresponding to the formula:



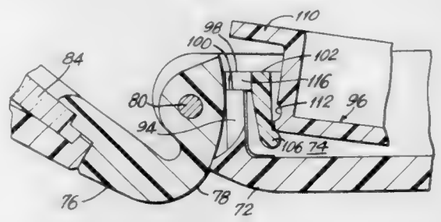
where R is hydrogen or a C_1–C_4 alkyl substituent; R^1 is a C_1–C_{12} hydrocarbyl substituent; and M is an alkali or alkaline earth metal

5,199,451

COMPACT WITH POP-UP TRAY OPERATED BY HINGED COVER

Antonio Montoli, Vedano Olona, Italy, assignor to Risdon Corporation, Naugatuck, Conn.

Filed Jun. 8, 1992, Ser. No. 895,012
Int. Cl.[5] A45D *27/22*
U.S. Cl. 132—315 8 Claims



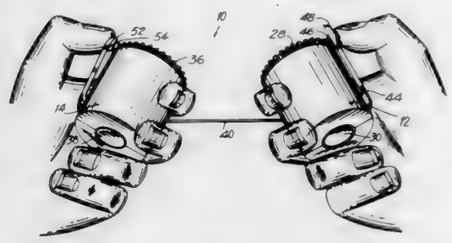
1. A compact comprising:
a) an open-box shaped base having a recess therein,
b) a frame secured to the base about the recess and having downward panels extending into the recess along the front and back respectively, the panels being formed with spaced vertical slots to define a plurality of downward stubby flexible wings, at least one of the wings being formed with inward retaining ribs, at least one of the wings being formed adjacent its lower end with an inwardly directly wedge having an upwardly and rearwardly sloping upper surface spaced down from the top of the frame, said wing being also formed with a rearward button on the back of the wing, the rear of the base being apertured to pass the button to the outside of the base
c) a shallow tray fitting into the recess, the tray having grooves along the inward surfaces of its front and back sides resiliently and releaseably receiving the retaining ribs to hold the tray in position in the frame, the tray superposing the wedge,
d) a cover hinged to the base by hinge means and the common axis of the hinge means being above the button
whereby if the cover is opened beyond a normal open position it engages the button to push the wedge under the tray to urge the tray up out of the frame and free of the retaining ribs.

5,199,452

DENTAL FLOSSING ARRANGEMENT AND METHOD

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Jun. 19, 1992, Ser. No. 901,180
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—325 12 Claims



1. A dental flossing arrangement, comprising:
(a) a pair of discrete housing configured to be held in opposite hands of a user;
(b) a supply reel mounted for turning movement on one of the housings;
(c) a take-up reel mounted for turning movement on the other of the housings;
(d) a supply of dental floss wound on the supply reel and extending from the supply reel between the housings to the take-up reel;
(e) first releasable locking means including a first resilient spring on said one housing for normally preventing movement of the supply reel in a locked state due to the inherent resilience of the first spring, and for selectively releasing the supply reel to dispense a length of floss from the supply reel;
(f) second releasable locking means including a second resilient spring on said other housing for normally preventing movement of the take-up reel in a locked state due to the inherent resilience of the second spring to thereby hold the dispensed length of floss taut between the housings in the locked states of the supply and take-up reels during flossing; and
(g) wind-up means on the take-up reel for releasing the take-up reel to wind the dispensed length of floss on the take-up reel after flossing.

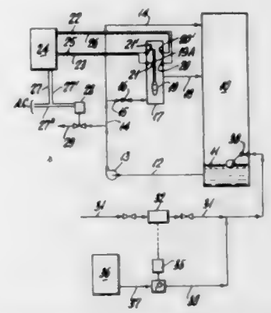
5,199,453

METHOD FOR CONTROL OF HARD WATER SCALE DEPOSITION IN EVAPORATIVE COOLING SYSTEMS

Khodabandeh Abadi, P.O. Box 2425, Tucson, Ariz. 85702, and Craig A. Hunt, Tucson, Ariz., assignors to Khodabandeh Abadi, Tucson, Ariz.

Division of Ser. No. 614,856, Nov. 16, 1990, Pat. No. 5,101,851, which is a division of Ser. No. 495,351, Mar. 19, 1990, Pat. No. 5,013,488. This application Dec. 5, 1991, Ser. No. 790,006
Int. Cl.[5] G05D *11/13*
U.S. Cl. 137—3 4 Claims

1. A method of control of the buildup of mineral solids in hard water in an evaporative cooling system which comprises:
a) detecting changes in density of water in the system containing dissolved and suspended hard water solids,
b) discharging water containing dissolved and suspended solids from the system when the density of the water in the system reaches a predetermined maximum value in the range of from about 1.02 to 1.04 grams per milliliter,
c) adding make up water to the system to replace the water discharged from the system,
d) continuing steps b) and c) until the density of the water in the system reaches a predetermined minimum value in the range of from about 1.004 to about 1.01 measured at ambient water temperature,



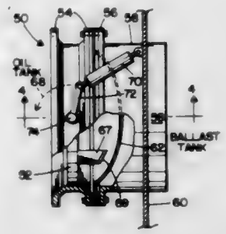
e) discontinuing steps b) and c) until the density of the water in the system again reaches the predetermined maximum value, and
f) repeating steps a) through e).

5,199,454

VALVE STRUCTURE

Edmund G. Tornay, New York, N.Y., assignor to Energy Transportation Group, Inc., New York, N.Y.

Filed Apr. 19, 1990, Ser. No. 510,932
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—68.1 5 Claims



1. A valve structure adapted to be mounted in an opening in a bulkhead separating a liquid cargo tank from a ballast tank, said valve structure comprising, in combination:
a section of cylindrical pipe adapted to be secured at a first end in an opening in a bulkhead and to extend into one of said tanks;
a normally closed butterfly valve having a cylindrical housing secured to a second end of said pipe section, said butterfly valve including a circular disk which is rotatable relative to said housing from a closed position to an open position;
a rupturable disk peripherally sealed to said pipe section at a location between the disk of said butterfly valve and said bulkhead; and
means secured to said butterfly valve disk for severing said rupturable disk in response to rotation of said valve disk from its closed position thereby to allow liquid flowing through the opened butterfly valve to flow through and collapse the severed disk.

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means extends in a first direction or in a second position

and through the filter member along an opposite direction of

along said second portion of the central bore between said second and fourth plugs;

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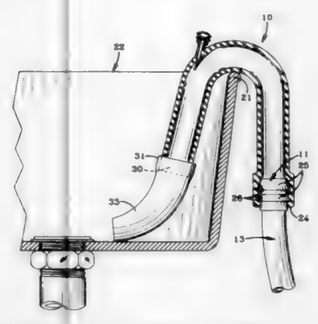
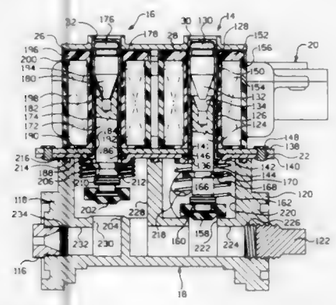
5,199,455
ANTI-SIPHON DEVICE FOR DRAIN CONDUITS
Anthony S. Dlouhy, Stevensville, Mich., assignor to Chardon Rubber Company, Chardon, Ohio
Filed Nov. 27, 1991, Ser. No. 799,405
Int. Cl.[5] F16K *15/00*
U.S. Cl. 137—217 10 Claims



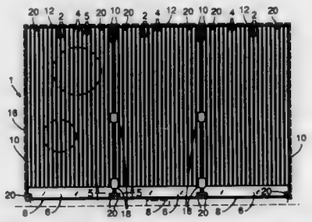
5. An anti-siphon drain conduit comprising:
first and second cylindrical tubular portions;
a U-shaped portion interposed between said first and second cylindrical tubular portions;
said first and second tubular portions as well as said U-shaped portion intersecting to define a drain passage extending through said conjoined portions;
a siphon break passage communicating with said drain passage at approximately the intersection of one said cylindrical tubular portion and said U-shaped portion.

5,199,456
SOLENOID GAS VALVE
John J. Love; Carl F. Fernstrom, both of St. Louis; Patrick S. Bauman, Ballwin, and Ralph E. Banes, St. Louis, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Sep. 3, 1992, Ser. No. 939,667
Int. Cl.[5] E03B *1/00*
U.S. Cl. 137—270 11 Claims



1. In a gas valve,
a valve body having an inlet and an outlet;
two solenoid valves connected fluidically in series in said valve body for controlling flow of gas from said inlet to said outlet; and
a housing assembly containing therein a circuit board on which electrical circuit components are mounted,
said circuit board further including first terminal means for enabling connection of said solenoid valves to said circuit board and second terminal means for enabling connection of external electrical circuitry to said circuit board,
said housing assembly being adapted for attachment to said valve body in a first position wherein said second terminal means extends in a first direction or in a second position wherein said second terminal means extends in a second direction,
said housing assembly being further adapted for enabling said connection of said solenoid valves to said circuit board when said housing assembly is in either said first or said second position,
said solenoid valves being adapted to be reversible in position in said valve body so as to provide said connection of said solenoid valves to said circuit board when said housing assembly is in either said first or said second position.

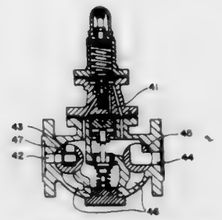
5,199,457
LEAK DETECTING SURFACE PROTECTOR
David R. Miller, 7373 SW. 25th, Portland, Oreg. 97219
Filed Feb. 25, 1992, Ser. No. 840,530
Int. Cl.[5] E03B *7/08*; F16L *55/07*
U.S. Cl. 137—312 10 Claims



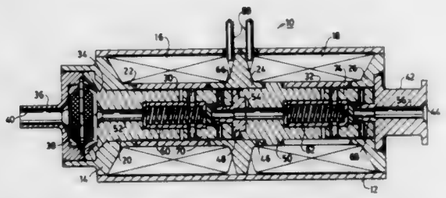
1. A tray device for collecting and detecting fluid leakage from plumbing fixtures and waste and supply lines comprising:
a tray structure having a sloping horizontal surface surrounded by side walls, a back wall and a front wall, said sloping horizontal surface extending downwardly from said back wall to said front wall;
an accummulation and detection trough at the bottom of said sloping horizontal surface to receive any fluid leakage collected on said sloping horizontal surface and running down said surface to said trough; and
a plurality of spaced parallel fins on said sloping horizontal surface, said fins extending from said back wall to said accummulation and detection trough where said fins have horizontal surfaces for receiving and supporting articles above said sloping horizontal surface, whereby any fluid leakage is collected between said fins on said sloping horizontal surface, thereby locating a leaking plumbing fixture above the point where a fluid leakage is isolated between certain fins and runs down said sloping horizontal surface to said trough.

5,199,458
MULTI-WAY VALVE
Bang Y. Wen, P.O. Box 5501, Ruian, Zhejiang, China
Filed Sep. 9, 1991, Ser. No. 756,448
Claims priority, application China, Sep. 15, 1990, 90107846
Int. Cl.[5] E03B *7/07*
U.S. Cl. 137—549 4 Claims

1. A multi-way valve comprising: a valve body defining an inlet passageway, a first outlet passageway, and a second outlet passageway; a rotatable core rotatably mounted to the valve body, said core defining a core passageway; a filter member disposed in the core passageway; said core being rotatable to a first position for establishing fluid communication between the inlet passageway and the first outlet passageway through the core passageway and through the filter member along one direction of the filter member, to a second position for establishing fluid communication between the inlet passageway and the second outlet passageway through the core passageway and through the filter member along an opposite direction of the filter member, and to a third position for closing fluid communication between the inlet passageway and the outlet passageways.

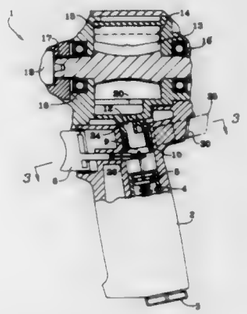


5,199,459
DUAL SERIES VALVE
Michael J. Mullally, Clifton Springs, N.Y., assignor to Valve Tech, Inc., Phelps, N.Y.
Division of Ser. No. 697,647, May 8, 1991, Pat. No. 5,150,879.
This application Apr. 8, 1992, Ser. No. 865,291
Int. Cl.[5] F16K *31/02*
U.S. Cl. 137—613 9 Claims



1. A dual series valve controlling fuel supply to thruster engines comprising:
a solenoid core having a central bore formed therein;
input and output ports of said valve formed at opposite ends of said central bore;
a first plug mounted at one of said ends of the central bore having a first conduit formed therein interconnecting said input port with said central bore;
a second plug mounted at the other of said ends of the central bore having a second conduit formed therein interconnecting said output port to said central bore;
a third plug mounted within said central bore dividing said central bore into first and second portions and having a third conduit formed therein interconnecting said first and second portions of the central bore;
a first passage within said first portion of the central bore interconnecting said first conduit with said third conduit;
a second passage within said second portion of the central bore interconnecting said second conduit with said third conduit;
a first guide member projecting from said first plug into said first portion of the central bore;
a second guide member projecting from said second plug into said second portion of the central bore;
third and fourth guide members respectively projecting from opposite ends of said third plug into said first and second portions of the central bore;
a first plunger having a first guide bore supported on said first and third guide members for movement along said first portion of the central bore between said first and third plugs;
a second plunger having a second guide bore supported on said second and fourth guide members for movement along said second portion of the central bore between said second and fourth plugs;
a first valve seal carried within said first guide bore between said first and third guide members for opening and closing said first passage interconnecting the first and third conduits;
a first valve seat forming one end of said third guide member within said first guide bore and encompassing at one end of said third conduit a first opening that is opened and closed by said first valve seal;
a second valve seal carried within said second guide bore between said second and third guide members for opening and closing said second passage interconnecting the second and third conduits; and
a second valve seat forming one end of said second guide member within said second guide bore and encompassing at one end of said second conduit a second opening that is opened and closed by said second valve seal.

5,199,460
PUSH BUTTON REVERSE VALVE FOR POWER TOOL
Robert E. Geiger, Sayre, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Apr. 13, 1992, Ser. No. 867,548
Int. Cl.[5] F16K *11/00*
U.S. Cl. 137—625.43 7 Claims



1. A push button reverse valve for a pneumatic pressure operated power tool comprising:
a rotatable spool disposed in a circular passageway;
a means for engaging and rotating said spool;
said spool being further provided with a means for receiving air at its one end and selectively distributing it to one of a plurality of passageways disposed adjacent to its other end;
said selected distribution being in response to selected rotation of said spool; and
said means for engaging and rotating said spool further comprises a plurality of side by side positioned push buttons.

5,199,461
FLUID DISTRIBUTION VALVE
Peter Carr, Cary, N.C., assignor to Instatherm Company, Cary, N.C.
Filed Jul. 2, 1992, Ser. No. 909,089
Int. Cl.[5] F16K *11/052*
U.S. Cl. 137—625.44 22 Claims

1. A fluid distribution valve comprising:
a housing having at least a first, a second and a third port each communicating between the interior and exterior of the housing;
a flap member adapted for selectively closing said ports;
means for mounting said flap member in said housing comprising a first mounting means mounting the flap for pivot-

ing about a first predetermined axis to a position closing

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the seal element being seated in the recess and filling it, so contact with a contour of an operating cam driven by a loom

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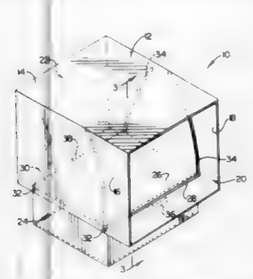
ing about a first predetermined axis to a position closing one of said ports and a second mounting means mounting the flap for pivoting about a second predetermined axis to a position closing another of said ports, at least one of said



first and second mounting means being selectively disengageable; and

means for selectively disengaging said disengageable mounting means.

5,199,462

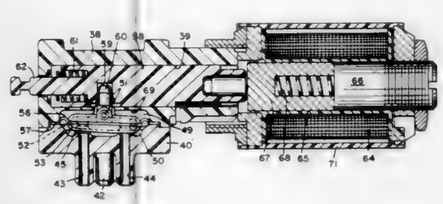
VALVE HAVING ROCKER VALVE MEMBER AND ISOLATION DIAPHRAGM

Joseph W. Baker, Sommerville, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Mar. 18, 1992, Ser. No. 854,880

Int. Cl.[5] F16K *7/16, 11/052*

U.S. Cl. 137—625.44 **6 Claims**



1. A valve comprising:

a valve body having a chamber,

a plurality of ports in the valve body communicating with the chamber, at least one of the ports being adapted for connection to a source of fluid under pressure,

a rocker valve member within the chamber, the rocker valve member being pivotable to close and open at least one of the ports,

a diaphragm within the chamber extending between the periphery of the rocker valve member and the valve body, the margin of the diaphragm being secured in the valve body, and all the ports facing one side of the diaphragm,

an axle pivotally mounting the rocker valve member, the axle being located on the side of the diaphragm opposite the side facing the ports,

operator means for pivoting the rocker valve member, the operator means engaging the rocker valve member on the side of the diaphragm opposite the side facing the ports, whereby the diaphragm serves to isolate the ports from the operator means, and

the valve body being devoid of means for supporting the portion of the diaphragm between the periphery of the rocker valve member and the valve body when that portion of the diaphragm swells in a direction away from the plurality of ports in response to the source of fluid pressure applied to at least one of the ports, at all operating pressures of the valve, to prevent leakage between the rocker valve member and the closed port.

5,199,463

METHOD FOR REMOTELY LINING CONDUITS

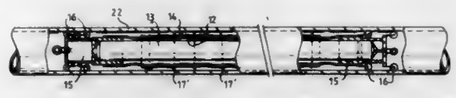
Raymond Lippiatt, Wimbourne, Great Britain, assignor to Subterra Limited, Wimbourne, United Kingdom

Filed Apr. 5, 1991, Ser. No. 680,674

Claims priority, application United Kingdom, Apr. 5, 1990, 9007719

Int. Cl.[5] F16L *1/00*

U.S. Cl. 138—98 **8 Claims**



1. A method of lining a conduit comprising locating a length of lining material on an inflator bag provided on a core to form an assembly, the core having a flexible state and a rigid state, inserting the assembly into the conduit while the core is in its flexible state, supporting the inflator bag and liner on the core by changing the state of the core from the flexible state to the rigid state to maintain an outer shape of the inflator bag, transporting the assembly down the conduit to the location to be lined, inflating the inflator bag to press the liner into contact with the conduit, making the lining self-supporting, deflating the inflatable bag and removing the inflator bag and core from the location.

5,199,464

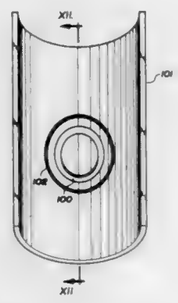
PIPELINE REPAIR SLEEVE ASSEMBLY HAVING HEAT SINK GROOVE

Donald D. Savard, Edmonton, Canada, assignor to Interprovincial Pipe Line, Inc., Edmonton, Canada

Continuation-in-part of Ser. No. 458,257, Dec. 28, 1989, Pat. No. 5,123,451. This application May 4, 1992, Ser. No. 877,622

Int. Cl.[5] F16L *55/16;* **B65D** *53/04;* **F16J** *15/06*

U.S. Cl. 138—99 **1 Claim**



1. In combination:

a steel pipeline containing pressurized fluid and having a defect in its wall and a repair sleeve assembly sealing the defect,

said repair sleeve assembly comprising a pair of substantially semi-circular non-flanged and non-apertured first and second steel shells with end edges and side edges and a flat, annular seal element retained by the first of the shells, said seal element having top and bottom and inner and outer side surfaces,

said first shell having an inner surface which is configured to form an inwardly opening, centrally positioned recess shaped to closely fit and receive the seal element, said inner surface further forming a groove fully encircling the recess in outwardly spaced relation whereby the groove is located between the outer edge of the recess and the side edges of the shell,

the seal element being seated in the recess and filling it, so that the seal member is rigidly confined along substantially the full extent of its top and outer side surfaces by the solid surfaces forming the recess and the seal element surrounds the defect and seals against the pipeline surface,

the seal element having a central opening that is in communication with the defect, said seal element being formed of flexible deformable resilient material,

said shells extending around substantially the entire periphery of the pipeline, said shells having been circumferentially clamped to the pipeline so that the non-recessed portions of their inside surfaces are in tight steel-on-steel contact with the pipeline and the shells are in a stressed state, but the side edges of the shells are not abutting,

said shells being welded longitudinally at the side edges and circumferentially to the pipe at the end edges in the stressed state to effectively form a pressure vessel with the pipeline.

5,199,465

TUBULAR PACKING CASINGS HAVING IMPROVED PEELABILITY

Michael Stiem, Eickeloh, Fed. Rep. of Germany, assignor to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 447,148

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842969

Int. Cl.[5] F16L *11/00*

U.S. Cl. 138—118.1 **10 Claims**

1. Tubular packing casing provided with a coating on its inner surface for improving the peelability comprising a homogeneous mixture of at least two components, characterized in that the coating contains as components a protein coagulant A and a polyvinyl alcohol B.

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CONTROL DEVICE FOR THE ROCKER ARM OF A TERRY LOOM REED OPERATING MECHANISM

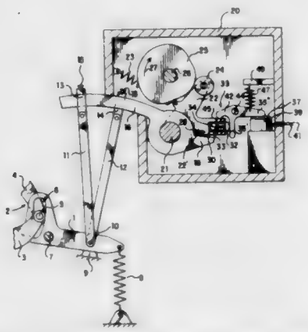
Luciano Corain, Vicenza, Italy, assignor to Nyuovopignone Industrie Meccaniche E Fonderia S.P.A., Florence, Italy

Filed Jan. 30, 1992, Ser. No. 828,235

Claims priority, application Italy, Feb. 13, 1991, M19-1A000373

Int. Cl.[5] D03D *39/22*

U.S. Cl. 139—27 **1 Claim**



1. A device for selecting the shift of a rocker arm of a reed operating mechanism in a terry loom, comprising a rocker arm, two push rods, each having respective ends, for shifting said rocker arm from a standard position defined by a return spring to an operating position in which a reed is brought into a retracted or open position to form the terry, said push rods being driven respectively by a control lever rotatable about an axis which by means of a spring is elastically maintained in contact with a contour of an operating cam driven by a loom drive shaft, and is made to cooperate with one of said push rods, said two push rods are respectively hinged to said rocker arm at one end and at another end to mutually different points on respective arms of two terry height adjustment levers, which are idly pivoted on said axis of rotation of said control lever and each terry adjustment lever has a shoulder tooth arranged for cooperation with a corresponding coupling pin slidable within a guide provided in said control lever, in which each said pin is retained by a spring in a passive or retracted position, each said pin also cooperates with one end of a selection lever, another end of said selection lever carries an armature of an electromagnet fixedly mounted in a casing, said selection lever also cooperates with a ledge on said control lever by the action of a spring which withdraws said armature from said electromagnet.

5,199,467

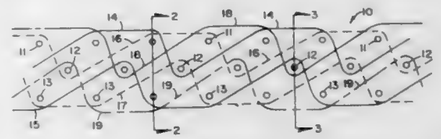
PAPERMAKERS FABRIC WITH STACKED MACHINE DIRECTION YARNS

Henry J. Lee, Summerville, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 534,164, Jun. 6, 1990, Pat. No. 5,103,874. This application Apr. 13, 1992, Ser. No. 855,904

Int. Cl.[5] D03D *13/00, 15/00*

U.S. Cl. 139—383 A **2 Claims**



1. A woven papermaking fabric for formation of a paper sheet in a papermaking machine about which the papermaking fabric travels, said papermaking fabric having machine direction yarns which correspond to the longitudinal direction of the papermaking fabric as it travels on the papermaking machine, the woven fabric has a paper forming side and a roller contact side and is comprised of:

a first system of longitudinal, monofilament machine direction yarns that predominate on the paper forming side of said fabric;

a second system of longitudinal, monofilament machine direction yarns that predominate on the roller contact side of said fabric;

the yarns of the first and second systems are arranged in vertically stacked pairs of first and second machine direction yarns positioned one above the other in a superimposed relationship; and

a system of cross machine direction yarns interwoven with the yarns of the machine direction systems in a repeat pattern that maintains the stacked relationship of the paired yarns such that the yarns of the first system do not pass to the roller contact side and the yarns of the second system do not pass to the paper forming side.

5,199,468

WEFT YARN CLEARING DEVICE

Hubertus H. Aarts, Deurne, and Antonius J. M. Hamer, Eindhoven, both of Netherlands, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 20, 1991, Ser. No. 702,847

Claims priority, application Switzerland, Jun. 21, 1990, 2075/90

Int. Cl.[5] D03D *45/50, 47/34*

U.S. Cl. 139—450 **11 Claims**

1. A weft yarn clearing device for a loom comprising

an extractor having an inlet for entry of a weft yarn into said

monitored by the imaging means with a target path and

storing liquid volatilizable hydrocarbon fuel in a storage

5,199,473

ASEPTIC FLUID TRANSFER APPARATUS AND

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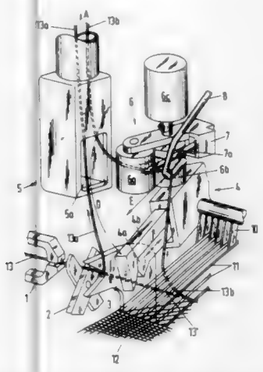
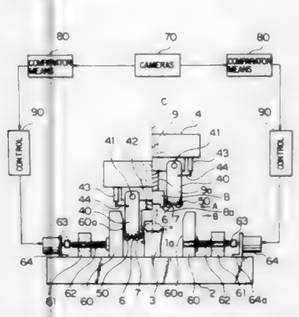
an extractor having an inlet for entry of a weft yarn into said extractor;
a pair of draw-off rollers; and
at least one gripper element movable from a first position to



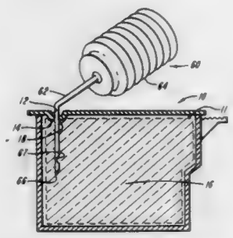
grip a weft yarn extending from a shed of warp yarns to a release position adjacent said extractor inlet to deliver a first portion of the gripped weft yarn to the extractor and to position a second portion of the weft yarn between said rollers for withdrawing of the weft yarn from the shed.

5,199,469
EXTERIOR LEAD FORMING DEVICE FOR SEMICONDUCTOR DEVICES
Kaoru Ishihara, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 29, 1991, Ser. No. 752,001
Claims priority, application Japan, Aug. 31, 1990, 2-228014
Int. Cl.[5] B21F *1/00*
U.S. Cl. 140—105 **2 Claims**



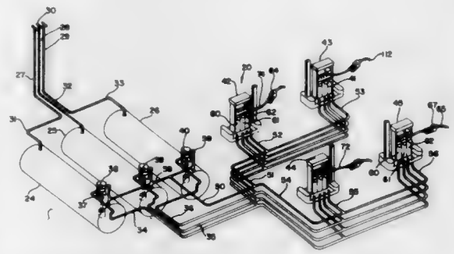
1. An exterior lead forming device for bending exterior leads of a semiconductor device into a predetermined form comprising:
a bending die having sides and for supporting a semiconductor device;
a pressing member for holding a semiconductor device on the bending die;
a forming member having a roller rotatably mounted thereon and movable along a side of the bending die to bend the exterior leads of the semiconductor device along the side of the bending die;
a guide member adjustable in position for guiding the forming member as the forming member moves along the side of the die such that the roller moves along a path in rolling contact with the exterior leads;
imaging means for monitoring the path of the roller;
comparison means for comparing the path of the roller monitored by the imaging means with a target path and for determining an error between the monitored path and the target path; and
adjustment means responding to the comparison means for adjusting the position of the guide member to reduce the error between the monitored path and the target path.

5,199,470
METHOD AND APPARATUS FOR REFILLING INK CARTRIDGES
Barry M. Goldman, Waltham, Mass., assignor to Graphic Utilities, Inc., Waltham, Mass.
Filed May 17, 1991, Ser. No. 702,081
Int. Cl.[5] B65B *3/30*
U.S. Cl. 141—1 **16 Claims**



1. A method for refilling an ink cartridge with ink, the method comprising the steps of
providing a device for clearing a hole in an ink cartridge, the device comprising
a handle having a longitudinal axis and defining a lateral surface disposed about said longitudinal axis for receiving torque, and
a bit rigidly affixed to said handle and extending coaxially along said longitudinal axis, so that torque applied to said surface about said axis is transmitted to the bit, the bit defining a tip, distal to the handle, for clearing the hole,
clearing a hole in the ink cartridge by pressing the tip of the bit against a sidewall of the cartridge and applying torque to the handle, and
dispensing ink through the hole and into the cartridge.

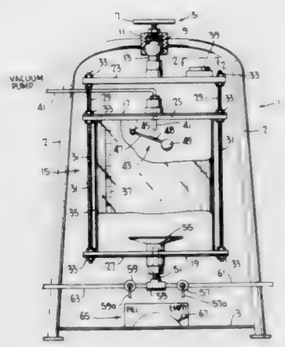
5,199,471
PROCESS TO PREVENT VAPOR BLOCKAGE FOR STAGE II VAPOR RECOVERY
Harry B. Hartman, Sugar Grove; Michael S. Butkovich, Aurora; Dennis J. Strock, Woodridge, and Wolfgang H. Koch, Batavia, all of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Mar. 4, 1991, Ser. No. 664,329
Int. Cl.[5] B67D *5/01*
U.S. Cl. 141—5 **6 Claims**



1. A vapor recovery process, comprising the steps of:

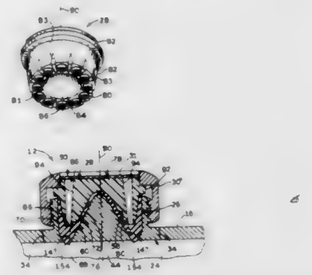
storing liquid volatilizable hydrocarbon fuel in a storage tank;
venting said storage tank;
pumping said fuel from said storage tank to a dispenser;
metering said fuel from said dispenser through a nozzle into a consumer's tank and controlling the flow of said fuel with said nozzle;
emitting volatilized hydrocarbon vapors from said consumer's tank during metering;
drawing a substantial amount of said vapors through said nozzle under vacuum assisted action of a vapor pump;
conveying a substantial amount of said vapors through a vapor return system comprising a vapor return hose and a vapor return line into said storage tank;
condensing some of said vapors in said vapor return hose to form condensate;
withdrawing said condensate from said vapor return hose into a condensate pickup tube extending into a nozzle by venturi action of said nozzle during said metering; and
feeding said condensate from said nozzle to said consumer's tank.

5,199,472
VOLUMETRIC CLOSED CHEMICAL TRANSFER SYSTEM
Gil Rollison, Memphis, Tenn., assignor to Gilco Sales, Inc., Memphis, Tenn.
Filed Feb. 6, 1991, Ser. No. 651,627
Int. Cl.[5] B65B *31/04*
U.S. Cl. 141—65 **8 Claims**



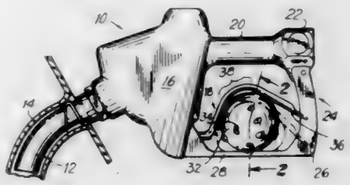
1. A self-contained, readily portable, closed, chemical transfer system comprising a support frame, a container assembly, a valved inlet line, a valved outlet line, an air line connected to said container assembly at a first end of said air line, a means connected to a second end of said air line which is capable of drawing air from said container assembly through said air line so as to create a vacuum in said container assembly, and a means for leveling said container assembly wherein said means for leveling is an integral part of said support frame, has a locking mechanism by which said container assembly is attached to said leveling means and serves to adjust position of said container assembly in relation to said support frame so that material present in said container assembly can be adjusted to be horizontally level when said transfer system is positioned on a non-level surface.

5,199,473
ASEPTIC FLUID TRANSFER APPARATUS AND METHODS
Edwin J. Galloway, Menasha, Wis., assignor to Galloway Trust, Neenah, Wis.
Division of Ser. No. 534,747, Jun. 7, 1990, Pat. No. 5,086,813, which is a division of Ser. No. 261,020, Oct. 20, 1988, Pat. No. 4,941,517. This application Nov. 4, 1991, Ser. No. 787,545
Int. Cl.[5] G01N *1/12*; **B65D** *41/20*
U.S. Cl. 141—312 **8 Claims**



1. An adapter for mounting in an outer wall of an enclosure to thereby become an integral part of the outer wall of the enclosure, said adapter having a top and a bottom, and comprising:
(a) an outer wall, comprising inner and outer surfaces thereof extending downwardly from said top of said adapter, said outer surface, of said outer wall, collectively with said top and said bottom of said adapter, defining an interior in said adapter,;
(b) a central core member;
(c) an annular channel disposed on said interior of said adapter, said annular channel having a top thereof at said top of said adapter, and a bottom on said interior of said adapter, between said bottom of said adapter and said top of said adapter;
(d) a plurality of holes extending from said bottom of said annular channel downwardly to said bottom of said adapter such that a needle can pass through said adapter by extending through (i) said annular channel and (ii) one of said plurality of holes; and
(e) means for mounting a fitting to said adapter.

5,199,474
GASOLINE PUMP ACTUATING HANDLE RETAINING MECHANISM
Anthony J. D'Angelo, Baiting Hollow, N.Y., assignor to Pump Ball USA, Inc., Baiting Hollow, N.Y.
Filed Dec. 4, 1991, Ser. No. 803,490
Int. Cl.[5] F16K *35/00*; **B65D** *51/24*
U.S. Cl. 141—392 **4 Claims**



1. Apparatus for controlling the dispensation of a fluid, comprising a fluid inlet pipe; manually-operable valve means connected to said inlet pipe and having an outlet nozzle for fluid dispensing, said valve means comprising a body, a pivot-

defined by said panels and said joint members when the

said sheaths which contains said bar, through one of said slots,

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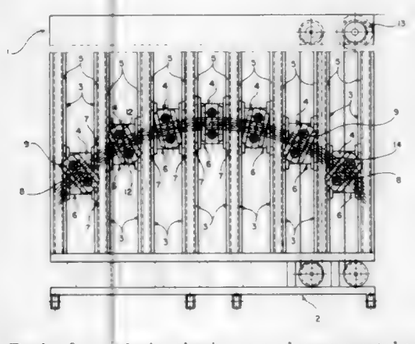
able actuating lever extending from said body, and a generally-rectangular guard assembly extending from said body and surrounding said lever, said lever having a first operating position corresponding to valve shut-off wherein said lever is proximate said frame and a second operative position corresponding to valve opening wherein said lever is displaced from said frame; and a spherical element having a diameter chosen to allow said spherical element to be inserted between said lever and said guard whereby said lever is in said second position whereby said handle is maintained in said second position without continued manual contact with said lever.

5,199,475

DEVICE FOR SHAPING CURVED COMPONENTS

Paul Koeder, Ellwangen, Fed. Rep. of Germany, assignor to Koeder Ingenieurbuero und Sondermaschinen, Ellwangen, Fed. Rep. of Germany

Filed Feb. 10, 1992, Ser. No. 833,043
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103893
Int. Cl.[5] B27H *1/00;* **B27D** *1/00*
U.S. Cl. 144—256.1 **20 Claims**



1. Device for producing shaping curved components having at least two adjustable clamping devices, wherein each clamping device comprises:

a) a slide that is movable along guides, said slide functioning as a base of the clamping device;

b) a rotary table which is rotatably mounted for rotation around a central axis of rotation;

c) at least two adjustable clamping elements arranged on the rotary table symmetrically with respect to the axis of rotation on opposite sides thereof; and

d) a centrically placed adjusting device connected to the clamping elements for changing the distance between the clamping elements for opening and closing the clamping device.

5,199,476

TREATMENT OF WOOD CHIPS

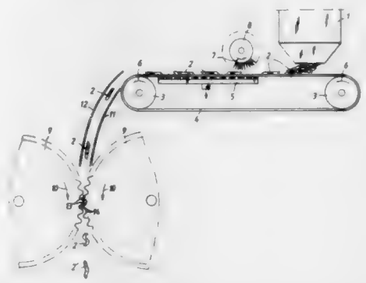
Ebbe Hoden, Mariefred, Sweden, assignor to Sunds Defibrator Industries Aktiebolag, Sweden

PCT No. PCT/SE90/00564, § 371 Date Jan. 17, 1992, § 102(e) Date Jan. 17, 1992, PCT Pub. No. WO91/03595, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 4, 1990, Ser. No. 820,583
Claims priority, application Sweden, Sep. 5, 1989, 8902920
Int. Cl.[5] B27M *1/02*
U.S. Cl. 144—362 **6 Claims**

1. A method of treating a plurality of wood chips, said wood chips having an average thickness ranging between a low average thickness and a high average thickness prior to impregnating said plurality of wood chips comprising the steps of:

providing said plurality of wood chips; and

compressing said plurality of wood chips to an average thickness which is less than said low average thickness without damaging fibers of said wood chips and while imparting to said plurality of wood chips an undulating configuration in at least one direction so as to produce a



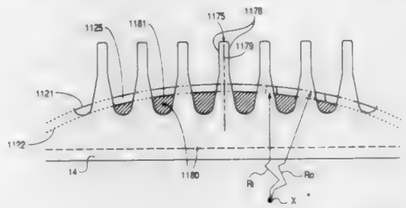
plurality of wave-shaped wood chips having at least one wave crest and at least one wave trough, said wood chips thereby having greater porosity and liquid absorption properties.

5,199,477

APPARATUS AND METHOD FOR FORMING DOVETAIL JOINTS

David A. Keller, 1327 I St., Petaluma, Calif. 94952

Filed Feb. 13, 1992, Ser. No. 834,920
Int. Cl.[5] B27M *3/00;* **B27C** *5/10*
U.S. Cl. 144—372 **12 Claims**



1. Using a dovetail template, the dovetail template defining a dovetail slot, and a router having a dovetail bit, a method for cutting dovetails on a curved side of a dovetail board which is to be joined to a pin board having a curved cross-section comprising:

disposing the dovetail board such that the dovetail template is tangential to the curved edge and the dovetail slot is centered over a point on the curved edge which is closest to the dovetail template; and

cutting the disposed dovetail board by passing the dovetail bit through the board within the dovetail slot.

5,199,478

AIR-TIGHTENING DEVICES IN FOLDING DOORS AND WINDOWS

Kenichi Kubota, Sabae, Japan, assignor to Nichimen Corporation, Japan

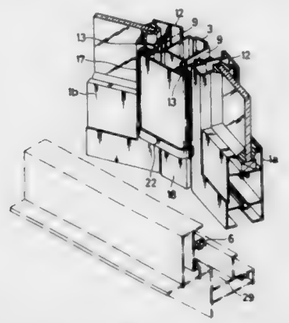
Filed Mar. 13, 1992, Ser. No. 850,631
Claims priority, application Japan, Oct. 12, 1991, 3-91458[U]
Int. Cl.[5] E06B *7/16*
U.S. Cl. 160—40 **2 Claims**

1. Air tightening devices for folding doors and windows comprising:

a) a plurality of panels selectively connected by joint members so as to be foldable about swivels supported by bearing flanges fitted to the joint members and which is characterized in that said swivels are located outside of a plane

defined by said panels and said joint members when the panels are in an unfolded position.

b) filler wedges are fitted to upper and lower ends of said bearing flanges to cover said ends and are provided with extensions coplanar with said plane so as to be able to abut at from sides at lateral sides against said panels; and,



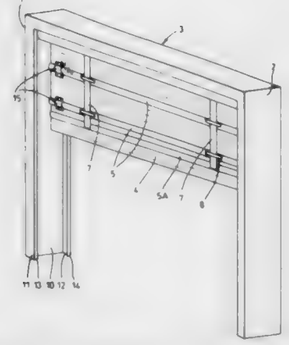
c) another sealing means fitted to at least one of lateral sides of said joint members and lateral sides of said frames so as to close said sides in an airtight manner when said door is closed.

5,199,479

SKID FOR A RAISABLE-CURTAIN GOODS-HANDLING DOOR

Bernard Kraeutler, Dunieres, France, assignor to Nergeco (société anonyme), Dunieres, France

Filed Mar. 4, 1992, Ser. No. 845,614
Claims priority, application France, Mar. 7, 1991, 91 02712
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **3 Claims**



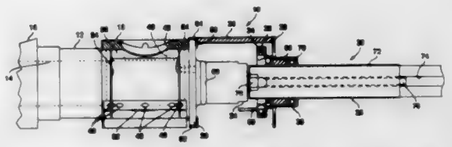
1. A raisable-curtain industrial door, comprising: two lateral slideways (**1**,**2**) disposed on opposite sides of a door opening, and a raisable curtain (**4**) which includes continuous lateral edges that slide in the slideways, said curtain being reinforced by horizontal reinforcing bars (**5**) having ends that slide in the slideways, the reinforcing bars being disposed in sheaths (**6**) formed by localized double thicknesses of the curtain, the sheaths having slots (**18**) close to the lateral edges of the curtain, wherein the door includes a plurality of skids (**15**) which each comprise a portion that is semi-cylindrical in shape with fixing means (**16**) for fixing it to the curtain, and which carry at an end a radial finger (**17**), wherein each skid has said semi-cylindrical portion fixed to said curtain by said fixing means at a location corresponding to a first end of one of said bars, said finger of said skid being engaged towards the inside of one of said sheaths which contains said bar, through one of said slots, said first end of said bar being abutted against said finger, said semi-cylindrical portion extending along said sheath and said bar towards a second end of said bar, wherein said skids slide in contact with the slideways, wherein each continuous lateral edge of the curtain is extended beyond the ends of the reinforcing bars, each of the slideways includes a web (**10**) substantially perpendicular to the curtain, and each continuous lateral edge of the curtain extends towards the inside of a slideway until it comes into contact with the web thereof to establish and maintain a continuous seal.

5,199,480

SEALED SHOT SLEEVE FOR VACUUM DIE CASTING

Thornton E. Schultz, Kenosha; LaVerne D. Smith, Pewaukee, and Russell J. VanRens, Milwaukee, all of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 27, 1992, Ser. No. 874,740
Int. Cl.[5] B22D *17/14, 17/20*
U.S. Cl. 164—65 **33 Claims**



1. Apparatus for injecting a shot of fluid casting material into a die cavity during a vacuum die casting operation, the apparatus being adapted to cooperate with a power source and being in communication with a runner that extends to the die cavity in which a die casting is formed, said apparatus comprising:

a sleeve means having an outlet at a first end thereof that is in communication with the runner and having an elongated cylindrical bore adapted to receive at least a portion of a plunger means which drives the material into the runner and the die cavity;

a reciprocating plunger means adapted to be moved between a retracted position and an extended position along a path, said plunger means having a plunger stem portion and a plunger tip portion, said plunger tip portion having an outer diameter approximately the same size as said cylindrical bore;

said sleeve means having a generally cylindrical sleeve member with said cylindrical bore, and a generally hollow cylindrical outer collar means that is rotatable about said sleeve member, said sleeve member and said collar means each having a pour aperture through which casting material may be poured, said collar means being rotatable to generally seal the sides of the bore when the respective pour apertures are not aligned;

said sleeve means having a collar retaining member located at the end opposite said first end, said collar retaining member having an axially oriented annular surface facing away from said collar means, said annular surface being of a diameter that is larger than said plunger tip portion;

said plunger means having a sealing means that is slidably carried thereby, said sealing means being adapted to engage said annular surface after initial movement of said plunger means from said retracted position to generally seal said end of said bore opposite said first end.

29. A method of sealing an apparatus for injecting a shot of fluid casting material into a die cavity during a vacuum die casting operation, the apparatus being of the type that is adapted to cooperate with a power source and is in communication with a runner that extends to the die cavity in which a die casting is formed, the apparatus having a sleeve member with an elongated cylindrical chamber adapted to receive at least a portion of a plunger means and having an outlet at a first end thereof that is in communication with the runner, a

plunger means that is moveable between a retracted position

which is below atmospheric pressure prior to pouring said

extending a plurality of pins through said surface to contact

5,199,485

AIR CONDITIONER FOR MOTOR VEHICLE HAVING

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plunger means that is moveable between a retracted position and an extended position along a path, the plunger means having a plunger stem portion and a plunger tip portion, the plunger tip portion having an outer diameter approximately the same size as said cylindrical chamber and larger than the diameter of the plunger stem portion, a sealing means that is slidably carried by the plunger means, the sealing means being adapted to engage the annular surface after initial movement of the plunger means from the retracted position to generally seal the end of the chamber opposite the first end, said method comprising the steps of:

pouring casting material into the chamber;

sealing the sides of the chamber;

moving the plunger means from the retracted position toward the extended position, the initial movement causing the plunger tip portion to enter the chamber and move the casting material into the runner and bring the sealing means into contact with the annular surface to seal the opposite end of the chamber, continued movement of the plunger means creating an enlarging volume in said chamber between the plunger tip portion and the sealing means resulting from the smaller diameter plunger stem portion, thereby creating a vacuum in the chamber which substantially eliminates any air flow between the plunger tip portion and the chamber, which air tends to prematurely draw the casting material into the die cavity.

5,199,481

METHOD OF PRODUCING REINFORCED COMPOSITE MATERIALS

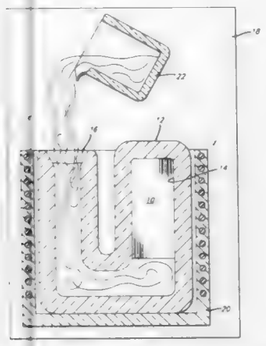
John M. Corwin; Stewart T. Harman, both of Royal Oak; Kenton F. Michaels, Detroit; Theodore T. Racchi, deceased, late of Addison Township, and Robert B. Andrusyszyn, legal representative, Rochester Hills, all of Mich.

Continuation-in-part of Ser. No. 498,296, Mar. 23, 1990, Pat. No. 5,172,746, which is a continuation of Ser. No. 258,362, Oct. 17, 1988, Pat. No. 4,932,099. This application Jun. 11, 1991, Ser. No. 715,155

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.[5] **B22D** *19/00*

U.S. Cl. 164—98 **19 Claims**



1. A method of producing a ceramic reinforced composite material, said method comprising the steps of:

(a) preconditioning a mass of ceramic reinforcing material with a preconditioning material;

(b) housing said mass of ceramic reinforcing material in a mold;

(c) heating said mold;

(d) melting an aluminum alloy;

(e) heating said molten aluminum alloy to a temperature in the range of about 1,800° F. to about 2,200° F.;

(f) pouring said molten aluminum alloy into said heated mold, said heated mold being evacuated to a first pressure which is below atmospheric pressure prior to pouring said molten aluminum alloy;

(g) almost immediately after pouring said molten aluminum alloy, applying a second pressure greater than said first pressure to rupture an oxide layer formed from said molten aluminum alloy to permit said molten aluminum alloy to wet said mass of ceramic reinforcing material, said second pressure being in the range of about 760 to about 1500 mm Hg; and

(h) solidifying said molten aluminum alloy.

5,199,482

PROCESS FOR MANUFACTURING A CASTING, OF ALUMINUM, PROVIDED WITH A POROUS INSERT

Martin Rühle, Stuttgart, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

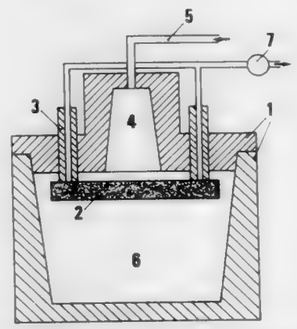
PCT No. PCT/DE90/00013, § 371 Date Aug. 2, 1991, § 102(e) Date Aug. 2, 1991, PCT Pub. No. WO90/08610, PCT Pub. Date Aug. 9, 1990

PCT Filed Jan. 12, 1990, Ser. No. 741,398

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903310

Int. Cl.[5] **B22D** *19/14*

U.S. Cl. 164—120 **2 Claims**



1. A method for the production of a molded casting comprising the steps of:

providing a mold with a porous insert part which can subsequently be dissolved out;

placing the porous insert part having pores into the mold;

subsequently surrounding the porous insert part by a melt;

putting the melt under pressure; and

maintaining a gas pressure on the insert part which is equal to or slightly less than the melt pressure.

5,199,483

METHOD AND APPARATUS FOR COOLING WAFERS

Kenneth J. Bahng, Sunnyvale, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 15, 1991, Ser. No. 701,437

Int. Cl.[5] **B25B** *11/00*; **F28F** *7/00*

U.S. Cl. 165—1 **24 Claims**

8. An anti-skating pedestal for wafers, comprising:

a body having a substantially planar wafer support surface; and

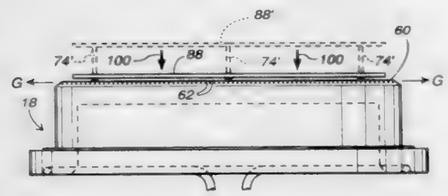
a fluid channel provided in said body which is so configured and located as to form an open channel when said wafer is supported on said surface to permit the escape of gas trapped between said wafer and said surface as the wafer is lowered onto the surface to prevent skating.

16. A method for lowering a wafer onto a pedestal in a gaseous environment, comprising:

positioning a wafer over a substantially planar, grooved surface of a pedestal;

extending a plurality of pins through said surface to contact a bottom surface of said wafer; and

retracting said plurality of pins into said pedestal to lower said wafer towards said surface, said grooved surface



being so configured and located as to form an open channel when said wafer is supported on said surface to permit the escape of gas trapped between said wafer and said surface as the wafer is lowered onto the surface to prevent skating.

5,199,484

HEAT STORAGE MEANS, MORE ESPECIALLY A LATENT HEAT STORAGE MEANS FOR MOTOR VEHICLE HEATING MEANS SUPPLIED WITH WASTE HEAT FROM THE ENGINE

Oskar Schatz, Waldpromenade 16, D8035 Gauting, Fed. Rep. of Germany

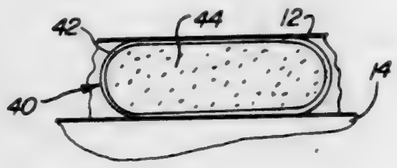
Continuation of Ser. No. 224,820, Jul. 27, 1988, Pat. No. 4,977,952. This application Mar. 13, 1991, Ser. No. 628,457

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725163

Int. Cl.[5] **F28D** *20/00*

U.S. Cl. 165—10 **3 Claims**

1. A latent heat storage means supplied with engine waste heat, comprising an inner housing surrounding a storage core, an outer housing surrounding the inner housing with a clear-



ance and a load bearing thermal insulation means between the inner housing and the outer housing characterized in that the load bearing thermal insulation means includes a plurality of insulating support members positioned between said inner and outer housing, said plurality of insulating support members formed from a cushioning deformable member, one or more spaces formed in said bearing insulation means, such that said plurality of insulating support members are mutually separate from one another so that flow paths are created to produce a vacuum and one or more radiation shields positioned in said one or more spaces.

5,199,485

AIR CONDITIONER FOR MOTOR VEHICLE HAVING RIGHT, LEFT AND CENTER TEMPERATURE CONTROLLED VENTS

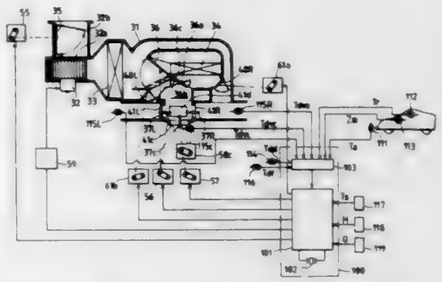
Toshikatsu Ito, Toukai; Tsuneo Kagohata, Oomiya, and Masashi Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1991, Ser. No. 738,589

Claims priority, application Japan, Aug. 3, 1990, 2-205007; Aug. 7, 1990, 2-208636; Sep. 3, 1990, 2-230686

Int. Cl.[5] **F25B** *29/00*

U.S. Cl. 165—22 **2 Claims**



1. An air conditioner for a motor vehicle comprising:

a blower for taking-in air;

an evaporator disposed downstream of said blower for cooling the air;

a reheater disposed downstream of said evaporator for reheating the cooled air;

a bypass passage arranged parallel to said reheater for bypassing the cooled air;

an air mix door regulating the mixing ratio of the reheated air and the bypassing cooled air for generating conditioned air;

a right side ventilation duct leading the conditioned air to a right side ventilation blow-out port, a left side ventilation duct leading the conditioned air to a left side ventilation blow-out port and a center ventilation duct leading the conditioned air to a center ventilation blow-out port which are arranged parallel each other and disposed downstream with respect to said reheater and said bypass passage,

a first cooled air passage leading the cooled air upstream of said air mix door to said right side ventilation duct;

a second cooled air passage leading the cooled air upstream of said air mix door to said left side ventilation duct;

a first reheated air passage leading the reheated air said reheater to said right side ventilation duct;

a second reheated air passage leading the reheated air downstream of said reheater to said left side ventilation duct;

a first temperature adjusting door disposed at the juncture of said first cooled air passage and said first reheated air passage for controlling the respective opening degrees thereof;

a second temperature adjusting door disposed at the juncture of said second cooled air passage and said second reheated air passage for controlling the respective opening degrees thereof;

a sensor means for detecting the external thermal conditions in and out the motor vehicle; and

a control unit for setting respective reference temperatures for the blow-out air at said right side ventilation blow-out port and said left side ventilation blow-out port with reference to a reference blow-out air temperature at said center ventilation blow-out port which is determined based upon a detected signal representing external thermal conditions from said sensor means, said control unit controlling the blow-out temperatures at said respective ven-

tilation blow-out ports by actuating said air mix door and

a baffle having a foot section extending from a wall of the

radiating electromagnetic energy into said volume by means

a portion of the low fluid loss cement slurry into the

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tilation blow-out ports by actuating said air mix door and said first and second temperature adjusting doors with reference to the set reference temperatures for the respective ventilation blow-out ports.

5,199,486

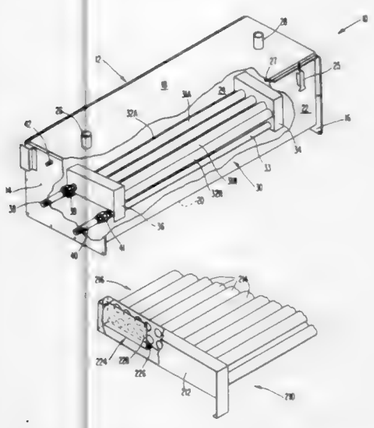
COATED HEAT EXCHANGER FOR HUMIDIFIER

Rick D. Balmer, Minnetonka; Peter J. Loniello, Richfield, and Kirk A. Nelson, Minneapolis, all of Minn., assignors to Dri-Steem Humidifier Company, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 604,347, Oct. 25, 1990, abandoned, which is a continuation of Ser. No. 195,275, May 18, 1988, abandoned. This application Jan. 27, 1992, Ser. No. 826,455

Int. Cl.[5] **F02M** *23/14, 31/00;* **F28F** *13/18, 19/02*

U.S. Cl. 165—47 **3 Claims**



1. A steam type humidifier for a heating, ventilating and air conditioning system comprising:

a rectangular box-shaped housing defining an evaporation chamber adapted to be filled with water and having a removable top cover with dispersion tube connections secured thereto to distribute steam to said heating, ventilating and air conditioning system;

a heat exchanger located within said evaporation chamber, said heat exchanger comprising upper and lower layers of parallel tubes longitudinally spaced substantially evenly in parallel horizontal planes, said tubes in each of said layers being in staggered relationship to the tubes of the other of said layers;

a supply manifold positioned at one end of said housing communicating with a steam source and connected in parallel to one end of all of said tubes so that steam introduced into said manifold from said source will flow into said tubes;

an outlet manifold positioned at an opposite end of said housing connected to the opposite end of said tubes for receiving said steam passing from said tubes and a drain tube for discharging steam secured to said outlet manifold and passing below said lower layer of tubes to said one end of said housing;

said supply manifold being box-shaped with a rectangular cross-section and having an inlet connection for said steam source arranged parallel to the axis of said tubes at one end of said supply manifold; and

a baffle having a foot section extending from a wall of the supply manifold to which said tubes are connected

and fixed along the bottom of said supply manifold and an unperforated leg section extending upwardly and attached to the top of said supply manifold and positioned relative to said inlet pipe to form means to deflect all of said steam substantially perpendicularly relative to the axis of said supply manifold inlet connection and in one direction along said supply manifold before entering said tubes, thereby breaking the momentum of said steam as it enters the supply manifold and evenly distributing said steam to prevent air from becoming trapped.

5,199,487

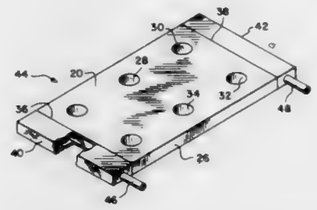
ELECTROFORMED HIGH EFFICIENCY HEAT EXCHANGER AND METHOD FOR MAKING

Lawrence DiFrancesco, Hayward, and Carlyle L. Helber, Jr., Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 31, 1991, Ser. No. 708,954

Int. Cl.[5] **F28F** *3/00*

U.S. Cl. 165—168 **21 Claims**



1. A structure which is convertible into a microchannel heat exchanger structure:

a unit, said unit having a plurality of layers and a connector between said layers, said layers each being of a metal plated on to a form of dissolvable material and said connector comprising electroplated structural metal, whereby said heat exchanger is formed by dissolving said form of dissolvable material.

5,199,488

ELECTROMAGNETIC METHOD AND APPARATUS FOR THE TREATMENT OF RADIOACTIVE MATERIAL-CONTAINING VOLUMES

Raymond S. Kasevich, Weston, and Raymond E. Holmes, Groton, both of Mass., assignors to KAI Technologies, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 491,005, Mar. 9, 1990, Pat. No. 5,065,819. This application Aug. 16, 1991, Ser. No. 745,950

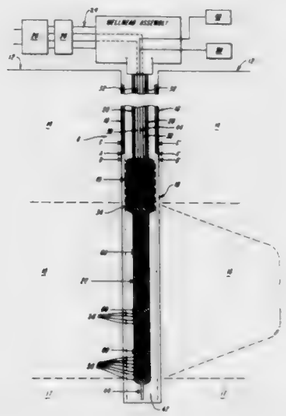
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] **E21B** *36/04, 43/24*

U.S. Cl. 166—248 **13 Claims**

1. A method for the treatment of a radioactive material-containing volume, comprising the steps of:

radiating electromagnetic energy into said volume by means of a radio frequency antenna apparatus;



volatilizing one of radioactive and non-radioactive materials in said volume; and

transporting said volatilized materials from said volume.

5,199,489

METHOD OF CEMENTING WELL CASING TO AVOID GAS CHANNELLING FROM SHALLOW GAS-BEARING FORMATIONS

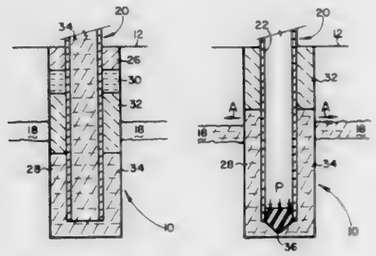
Les Johnson; Brian Sissons, and Kerry Crapo, all of Medicine Hat, Canada, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Nov. 30, 1990, Ser. No. 621,399

Claims priority, application Canada, Dec. 1, 1989, 2004393

Int. Cl.[5] **F21B** *33/138, 33/16*

U.S. Cl. 166—250 **5 Claims**



1. In wellbore penetrating the earth from a surface to subterranean formation including tubular surface casing having a central bore and an annulus between the surface casing and the wellbore, a process for cementing the casing and preventing gas migration from a shallow, over-pressured, gas-bearing zone penetrated by the wellbore comprising the steps of:

pumping a slug of right angle setting cement slurry into the casing;

pumping a slug of low fluid loss cement slurry into the casing above the right angle setting cement slurry to displace the slug of right angle setting cement slurry into the annulus;

inserting a bottom plug into the casing above the low fluid loss cement slurry;

pumping a pressurized fluid above said bottom plug to displace the right angle setting cement slurry to the surface and in the annulus above the gas-bearing zone and at least a portion of the low fluid loss cement slurry into the annulus;

stopping the pumping of the pressurized fluid for a period of time sufficient for the right angle setting cement slurry to set; and

pumping additional pressurized fluid above said bottom plug to displace a remainder of the low fluid loss cement slurry into the annulus.

5,199,490

FORMATION TREATING

Billy W. Surles, Houston; Philip D. Fader, Katy, and Carlos W. Pardo, Missouri City, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 18, 1991, Ser. No. 793,928

Int. Cl.[5] **E21B** *33/138, 43/24*

U.S. Cl. 166—270 **25 Claims**

1. A method for treating a subterranean petroleum-containing formation penetrated by at least one well in fluid communication with the formation, said formation comprising at least two layered intervals having differing permeabilities to fluid injection, including a first interval of relatively high permeability and a second interval of relatively lower permeability, in order to improve the injectivity profile of the formation to subsequently-injected oil recovery fluid, comprising:

(a) providing an aerosol treating fluid comprising steam, a polymerizable compound comprising a monomer or oligomer or furfuryl alcohol, a diluent for the compound, and an acid catalyst capable of causing polymerization of the polymerizable compound at formation temperatures, said acid being selected from the group consisting of sulfuric acid, toluene sulfonic acid, phosphoric acid, trichloroacetic acid, nitric acid and mixtures thereof;

(b) injecting said treating fluid into the formation to pass into the more permeable interval of the petroleum formation and to deposit on the mineral surfaces of the formations; and

(c) allowing the injected treating fluid to remain in the formation for a period of time sufficient to accomplish at least partial polymerization of the polymerizable compound, thereby reducing the permeability of the more permeable layer of the formation, so an increased portion of the subsequently injected oil recovery fluid enters the second interval.

5,199,491

METHOD OF USING NITRILE DERIVATIVE FOR SAND CONTROL

Helmuth Kutta, Richardson, Tex., and Robin Wiser-Halladay, Huntsville, Ala., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 4, 1991, Ser. No. 754,550

Int. Cl.[5] **E21B** *43/04, 43/267*

U.S. Cl. 166—276 **18 Claims**

1. In a method for consolidating a proppant injected into subterranean formations penetrated by a well from the surface, said well for producing to the surface a desired hydrocarbonaceous fluid from said subterranean formations, which method involves the steps of:

a. fracturing about the well penetrating into the subterranean formation to form fractures for increased production of the hydrocarbonaceous fluid; and

b. injecting a proppant in an oil based fracturing fluid in said fractures for holding said fractures open for increased production of said hydrocarbonaceous fluid;

the improvement consisting essentially of:

c. providing a mixture of a first ingredient consisting essentially of a diol and a second ingredient consisting essentially of a capped diisocyanate selected from the class consisting of adipodinitrile carbonate, adipodinitrile sulfite, and adipodinitrile oxalate;

rod means generally coaxially disposed in said offset pas-

being selectively removable from the outer wear bushing

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d. emplacing said mixture of said ingredients in said fractures so as to contact said proppant;
e. uncapping said capped diisocyante in said fractures; and
f. allowing said proppant, a diluent and said mixture with said uncapped diisocyanate to stand for a period of time in said fractures sufficient to consolidate said proppant.

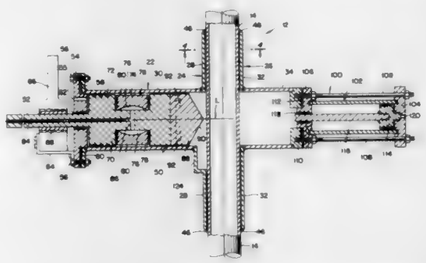
14. In a method for consolidating gravel in a well which includes:
a. emplacing gravel in the wellbore;
b. providing a consolidating additive formed by a diluent, a diol and a capped diisocyanate selected from the class consisting of adipodinitrile carbonate, adipodinitrile sulfite and adipodinitrile oxalate; and
c. emplacing said consolidating additive and a catalyst in said wellbore, and admixing said consolidating additive and said catalyst with said gravel and allowing to stand for a period of time sufficient to consolidate said gravel.

5,199,492
SAND CONSOLIDATION METHODS
Billy W. Surles, Houston; Philip D. Fader, Katy; Robert H. Friedman, Houston, and Carlos W. Pardo, Missouri City, all of Tex., assignors to Texaco Inc., White Plains, N.Y.
Filed Sep. 19, 1991, Ser. No. 762,150
Int. Cl.[5] E21B *33/138*
U.S. Cl. 166—295 **20 Claims**

1. A method for consolidating unconsolidated mineral particles including sand in a subterranean petroleum formation whose temperature is less than 300° F. penetrated by a well in fluid communication with at least a portion o the formation, comprising:
(a) introducing into the formation a predetermined volume of a preflush fluid comprising an organic diluent to remove residue from the sand grains;
(b) providing a sand consolidating liquid comprising a polymerizable oligomer of furfuryl alcohol, an ester diluent for the oligomer, and toluene sulfonic acid catalyst, the concentration of acid being selected to cause polymerization of the oligomer at formation temperatures in from 1 to 16 hours;
(c) mixing he sand consolidating liquid with a noncondensable gas to form a multi-phase treating fluid;
(d) injecting said multi-phase treating fluid into the formation to coat the sand grains and to occupy the void space of at least a portion of the formation adjacent to the well; and
(e) allowing the injected fluids to remain in the formations for a period of time sufficient to accomplish at least partial polymerization of the oligomer, forming a permeable consolidated mass around the wellbore.

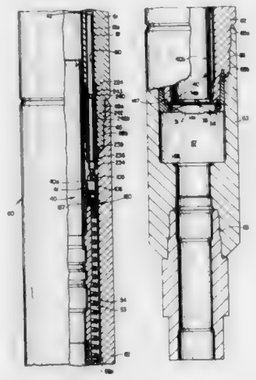
5,199,493
METHODS AND APPARATUS FOR SHUTTING A CONDUIT
George Sodder, Jr., 51 Maple St., Falls Views, W. Va. 25309
Continuation-in-part of Ser. No. 695,202, May 3, 1991. This application May 21, 1992, Ser. No. 886,153
Int. Cl.[5] E21B *29/08*
U.S. Cl. 166—297 **17 Claims**

1. Apparatus for shutting off a fluid pipe, comprising:
a fixture configured to be positioned around the exterior of the fluid pipe at a location intermediate the pipe ends, and
pipe shut-off means carried by said fixture and including:
pipe cutting means mounted in said fixture for movement in a direction extending transversely of a first axis defined by the pipe, and mounted for rotation about a second axis extending in said direction of movement,
drive means for rotating said pipe cutting means about said second axis and simultaneously driving said pipe cutting means forwardly in said direction of movement to cut out a section of the pipe and form a gap between remaining upstream and downstream sections of the pipe,
a body movable in a direction extending transversely of said first axis, said body being positioned and sized to fit within said gap, said body including at least one pocket formed in an outer periphery thereof,
a pipe sealing member mounted in said pocket for inward



and outward movement relative thereto between retracted and extended positions in a direction extending transversely of said direction of movement of said body; and
displacing means for displacing said pipe sealing member to said extended position and into contact with an end face of one of said remaining pipe sections to block the passage of fluid.

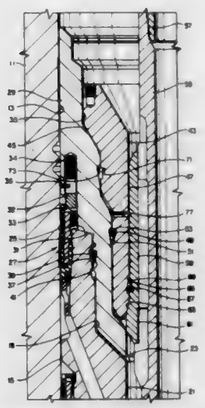
5,199,494
SAFETY VALVE, SEALING RING AND SEAL ASSEMBLY
Jimmie R. Williamson, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.
Filed Jul. 5, 1991, Ser. No. 726,312
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—319 **19 Claims**



13. A safety valve for downhole use in a well, comprising:
a housing having top and bottom ends spaced apart along an axis, an axial bore opening outwardly through said top and bottom ends, and an interior fluid passageway laterally offset from and generally parallel to said bore;
valve closure means mounted in said housing for movement relative thereto between first and second positions respectively permitting and blocking fluid flow through said bore;
an operator tube disposed in said housing and being axially movable relative thereto to shift said valve closure means from said second position to said first position;

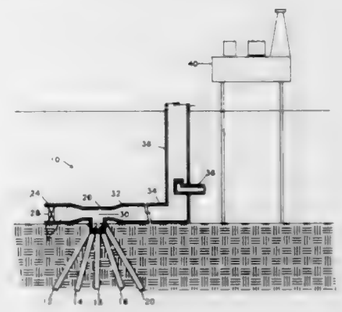
rod means generally coaxially disposed in said offset passageway for longitudinal movement therein relative to said housing for moving said operator tube from said second position to said first position in response to fluid control pressure exerted on the upper end of said rod means; and
sealing means for forming a fluid seal between upper and lower portions of said offset passageway, said sealing means including:
a hollow sleeve member coaxially anchored within said offset passageway and slidably receiving said rod means, said sleeve member having open top and bottom ends, said rod means having a lower end portion extending downwardly beyond said bottom end of said sleeve member and a longitudinal portion received within said sleeve member,
first cooperating means, formed on said longitudinal rod means portion and said open bottom end of said sleeve member, for engaging one another, and forming a first static seal therebetween that essentially precludes downward fluid flow through said sleeve member, in response to downward fluid-driven movement of said rod means relative to said sleeve member, and
second cooperating means, formed on said lower rod end portion and said open bottom end of said sleeve member, for engaging one another, and forming a second static seal therebetween that essentially precludes upward fluid flow through said sleeve member, in response to upwardly fluid driven movement of said rod means relative to said sleeve member.

5,199,495
SPLIT WEAR BUSHING FOR A DRILLING RIG
Norman Brammer, Fyvie Turiff, Scotland; Herman O. Henderson, Jr., and Richard W. Slyker, both of Houston, Tex., assignors to ABB Vetco Gray Inc., Houston, Tex.
Filed Dec. 30, 1991, Ser. No. 815,712
Int. Cl.[5] E21B *7/12, 17/10*
U.S. Cl. 166—339 **28 Claims**



1. In a subsea well assembly of the type having a wellhead housing, a casing hanger landed in the wellhead housing and supporting a string of casing extending into the well, an improved wear bushing assembly for reducing wear damage occurring when a string of drill pipe is rotated in the well, comprising in combination:
an outer wear bushing removably supported on the casing hanger;
an inner wear bushing removably supported on the outer wear bushing, the inner wear bushing having a bore and being selectively removable from the outer wear bushing by upward movement;
a wear bushing sub connected into the string of drill pipe for extension through the bore of the inner wear bushing, the wear bushing sub being movable downward relative to the inner and outer wear bushings in unison with the drill pipe for further drilling;
the inner diameter of the bore of the inner wear bushing being smaller than an inner diameter of the casing, providing a standoff to reduce contact of the drill pipe with the casing near the casing hanger to reduce wear on the casing; and
engaging means on the wear bushing sub for engaging the inner wear bushing to pull the inner wear bushing upward from the wellhead housing with the wear bushing sub and drill pipe when the drill pipe is being removed from the well.

5,199,496
SUBSEA PUMPING DEVICE INCORPORATING A WELLHEAD ASPIRATOR
Clifford L. Redus, Peterculter, Scotland, and Peter L. Sigwardt, Katy, Tex., assignors to Texaco, Inc., White Plains, N.Y.
Filed Oct. 18, 1991, Ser. No. 778,546
Int. Cl.[5] E21B *43/01*
U.S. Cl. 166—366 **6 Claims**



1. A method for achieving subsea transportation of hydrocarbons comprising:
providing at subsea wellhead terminus of at least one producing well, an aspirator having one end connected to a piping system extending to a remote production facility;
connecting said aspirator to said wellhead; and
opening said aspirator to hydrostatic sea pressure whereby a pressure differential is created enabling flow of oil and gas from said wellhead to said production facility.

3. A system for moving hydrocarbons significant subsea distances comprising:
a subsea wellhead connected to at least one producing well penetrating into an oil bearing formation;
aspirator means connected to said wellhead;
pipe means connecting said aspirator means to a remote production facility;
one way means connecting said aspirator means to hydrostatic sea pressure, whereby the Bernoulli effect of said aspiration or means will cause a pressure differential enabling movement of oil and gas from said wellhead to said production facility.

5,199,497

5,199,498

source of pressurized suppressant and a generally cylindrical has a drive shaft (**8**) releasably coupled with said blower wheel

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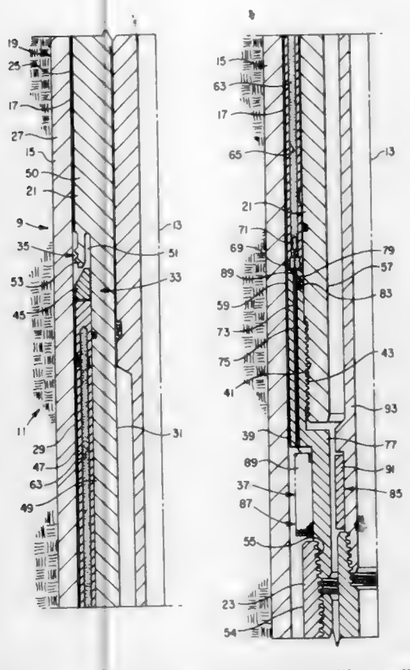
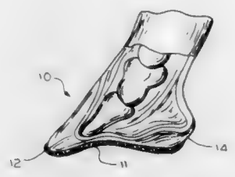
5,199,497
SHAPE-MEMORY ACTUATOR FOR USE IN SUBTERRANEAN WELLS
Richard J. Ross, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Feb. 14, 1992, Ser. No. 835,775
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—381 **24 Claims**



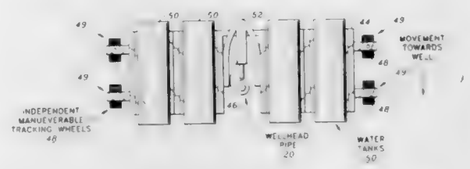
16. A method of operating in a wellbore, with a wellbore tool disposed therein and being of the type operable in a plurality of operating modes and being switchable between selected operating modes of said plurality of operating mode in response to application of force of a preselected force level to a force-sensitive member, comprising:
providing an actuator member formed of shape-memory material characterized by having a property of switching between a deformed shape and a pre-deformed shape upon receipt of thermal energy of a preselected amount, said pre-deformation shape defining an actuation dimension which is altered in said deformed shape by a preselected displacement distance;
providing a wellbore tubular conduit member;
coupling together said wellbore tool, said actuator member, and said tubular conduit member, with said force-sensitive member of said wellbore tool in alignment with said actuator dimension of said actuator member;
lowering said wellbore tubular conduit to a selected location within said wellbore; and
selectively applying thermal energy of said preselected amount to said actuator member, causing said actuator member to switch from said deformed shape to said pre-deformation shape which causes said actuator member to regain at least a portion of said actuation dimension and apply force of said preselected force level to said wellbore tool to switch said wellbore tool between selected operating modes of said plurality of operating modes.

5,199,498
CUSTOM HORSESHOE PAD AND HOOF REPAIR
Scott Knudsen, Grand Blanc, Mich., assignor to Michael Diesso, E. Wareham, Mass.
Filed Apr. 28, 1992, Ser. No. 874,826
Int. Cl.[5] A01L *7/02, 15/00*
U.S. Cl. 168—28 **20 Claims**



1. A hoof pad comprising a polymer composition containing at least about 50% by weight of high molecular weight polycaprolactone polymers wherein said composition has a melting point of from about 120° F. to about 200° F.

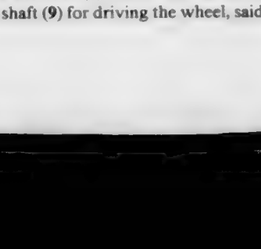
5,199,499
OIL WELL FIRE CAPPER/SNUFFER
Barry L. Butler, Solana Beach, Calif., assignor to Science Applications International Corporation, San Diego, Calif.
Filed Oct. 1, 1991, Ser. No. 769,903
Int. Cl.[5] A62C *3/06*
U.S. Cl. 169—46 **30 Claims**



1. A free standing oil well fire capper and snuffer apparatus for cutting off oil/gas flow from a wellhead in response to upward geologic and gas pressure forces without requiring attachment to a wellhead pipe from which a flame front is emanating and for extinguishing an oil wellhead fire, the apparatus comprising:
a capper/snuffer comprising
capper means capable of entering the wellhead pipe and for sealing the wellhead pipe,
fluid ballast and pressure exerting means for (i) fluid ballasting the capper means over the wellhead pipe to overcome the upward geologic and gas pressure forces and (ii) driving the capper means into the wellhead pipe, and
plugging means for stopping the oil/gas flow from the wellhead and for extinguishing said fire; and
mobile means for moving the capper means and the fluid ballast and the pressure exerting means above the wellhead.

5,199,500
SEVERABLE COVER FOR EXPLOSION AND FIRE SUPPRESSION NOZZLES
James M. Norman, Lenexa, Kans.; Bruce McLelland, Blue Springs, and William V. Henry, Lee's Summit, both of Mo., assignors to Fike Corporation, Blue Springs, Mo.
Filed Mar. 30, 1992, Ser. No. 860,801
Int. Cl.[5] A62C *3/00, 39/00*
U.S. Cl. 169—51 **10 Claims**

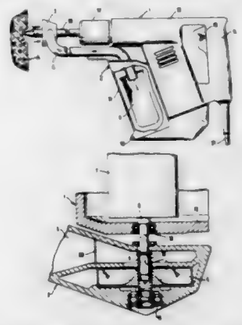
4. In a fire or explosion suppression system provided with a source of pressurized suppressant and a generally cylindrical suppressant release nozzle having a portion which extends into an area protected by the system and wherein the nozzle has orifice means which can become clogged or impeded by materials present in said area, a protective cover for the nozzle comprising:
a cover unit provided with a generally cylindrical portion having a longitudinal length, said cylindrical portion being capped by a semi-spherical end section integral therewith, the extremity of the semi-spherical section remote from said cylindrical portion of the cover unit presenting an apex,
said cover unit being configured and adapted to substantially envelop at least the portion of the nozzle which extends



into said area and that has said orifice means therein to prevent partial or total clogging of the nozzle orifice means by materials present in said protected area,
the cover unit generally cylindrical portion and semi-spherical end section having rupturable wall structure provided with lines of weakness that will sever under a pressure less than the pressure required to effect rupture of remaining portions of wall structure of the portion and section upon a release of pressurized suppressant for delivery through the nozzle,
said lines of weakness presenting a pattern that causes the wall structure on opposite sides of each line of weakness to deflect under the pressure of released suppressant flowing therepast without fragmenting of the wall structure into pieces that would be released into the protected area.

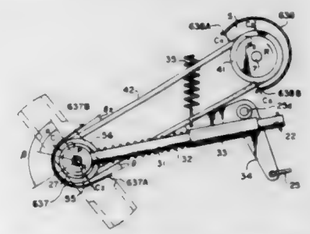
5,199,501
DRILLING OR CHISELING TOOL WITH SUCTION APPARATUS
Wilhelm Klüber, Königsbrunn, Fed. Rep. of Germany; Gebhard Gantner, Nenzing; Peter Brix, Penzberg, Fed. Rep. of Germany, and Max Dietrich, Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Liechtenstein
Filed Jul. 26, 1991, Ser. No. 736,708
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1990, 4024022
Int. Cl.[5] B25D *17/14*
U.S. Cl. 173—75 **5 Claims**

1. Manually operated drilling or chiseling tool (**1**) comprising a tool housing (**13**) having a leading or working end arranged to receive a working tool bit (**18**) and a trailing end, a suction device (**2**) for removing drillings or drilled material from the working end including a suction head (**3**) located adjacent the working tool bit (**18**), a suction line (**4**) connected to said suction head (**3**) for removing the drilled material therefrom, a suction blower wheel (**5**) for applying a suction to the suction head (**3**), and a separating device (**6**) connected to said suction line (**4**) at a position spaced from said suction head (**3**) and arranged to separate out the drilled material, wherein the improvement comprises that said suction device (**2**) is detachably connected to said tool housing **13**, said suction device (**2**) is formed as a detachable modular unit of said tool, said tool (**1**) has a drive motor (**7**), said suction blower wheel (**5**) of said suction drive (**2**) can be releasably coupled with the drive motor (**7**) of the tool (**1**), and said suction blower wheel (**5**) comprises a shaft (**9**) for driving the wheel, said drive motor (**7**) has a drive shaft (**8**) releasably coupled with said blower wheel shaft (**9**) for transmitting rotational movement directly from



said drive shaft to said blower wheel shaft. and a force biasing element biases the flower wheel shaft against the drive motor shaft.

5,199,502
EDGER WITH IMPROVED ROTARY BLADE DRIVING DEVICE
Makizo Hirata, Kakogawa; Shigeharu Ohama, and Michio Nishimura, both of Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 522,923, May 14, 1990. This application Sep. 27, 1991, Ser. No. 766,388
Claims priority, application Japan, May 15, 1989, 1-55970[U]; May 18, 1989, 1-58022; May 22, 1989, 1-128554; Jun. 28, 1989, 1-75824[U]; Jun. 28, 1989, 1-75825[U]; Jun. 28, 1989, 1-75826[U]; Jul. 4, 1989, 1-79244[U]
Int. Cl.[5] A01D *69/08*
U.S. Cl. 172—15 **4 Claims**



1. An edger having a main frame, at least one front wheel fastened in the front portion of said main frame, two rear wheels fastened in the rear portion of said main frame, a rotary blade disposed in the front portion on either side of said main frame and capable of conducting edging, an engine mounted on said main frame and a driving device for operating said rotary blade with said engine, said driving device comprising:
a driving pulley;
a pulley to be driven;
a driving belt arranged between said two pulleys;
a swing arm having the center of its swinging motion at a position different from the center of rotation of said driving pulley;
a rod slidably supported by said swing arm and supporting the shaft of said pulley to be driven;
a spring for urging said rod in a direction in which the distance between the shafts of said two pulleys is elongated; and
a clutch means comprising a driving-side pulley cover and a driven-side pulley cover, wherein said clutch means is engaged/released by changing the distance between the shafts of said two pulleys by swinging said swing arm, the distance between said driven-side pulley cover and said

atmosphere;

opposite positions, each guide channel having generally oppos-

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pulley to be driven having a small value so as to induce contact between said pulley to be driven and said driving belt at the time of clutch release, and belt inlet and outlet portions of said driving-side pulley cover being shaped and arranged to be closer to said driving belt when under tension than the intermediate portion of said driving-side pulley cover so as to release said driving pulley and said driving belt, the shape of said driven-side pulley cover being such that the distance from said back side of said belt becomes a minimum distance in a range of substantially 90° from a belt-holding starting point of said pulley to be driven toward the rotational direction in a range of 45°, the distance between the residual driven-side pulley cover portion and said back side of said belt being arranged to be larger than said minimum distance, and each of a belt inlet portion and a belt outlet portion of said driven-side pulley cover being arranged parallel to said driving belt or to flare away from said driving belt.

5,199,503

PLOW

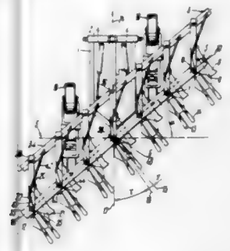
Vadim M. Matsepuro, ulitsa Verkhnava, 14-16, kv. 50; Fedor N. Volkov, both of Moscow; Natalia I. Ashakova, Moskovskaya; Leonid S. Kuzmich, Moscow; Vladimir A. Semenov, and Valery O. Mengo, both of Moskovskaya, all of U.S.S.R., assignors to Vadim Mikhailovich Matsepuro, Moscow, U.S.S.R.

PCT No. PCT/SU88/00233, § 371 Date Jul. 23, 1990, § 102(e) Date Jul. 23, 1990, PCT Pub. No. WO90/05446, PCT Pub. Date May 31, 1990

Continuation of Ser. No. 543,797, Jul. 23, 1990, abandoned. This PCT application Nov. 21, 1988, Ser. No. 798,832

Int. Cl.[5] A01B *3/28*

U.S. Cl. 172—221 **5 Claims**



1. A plow comprising:

a carrier frame (**1**);

a horizontal turnable frame (**3**) mounted on said carrier frame (**1**) and having working members including left-handed and right-handed plow bodies attached thereto, said turnable frame (**3**) being constructed as a parallelogram mechanism comprising pivotally interconnected front and rear beams (**34**, **35**), said plow bodies being secured on said rear beam in spaced relation therealong, and longitudinal links (**36**) interconnecting said beams (**34**, **35**), said front and rear beams (**34**, **35**) each being installed on the carrier frame (**1**) by means of a centrally arranged pivot (**37**, **38**), said front and rear beams being pivotable in two directions to an angle (α) relative to a vertical-transverse plane (**5**) passing through an axis (**39**, **40**) of one of the pivots (**37**, **38**), means for pivoting said turnable frame including a drive means disposed on the carrier frame (**1**) and connected with one of said front and rear beams (**34**, **35**);

each plow body comprising a front part including a post (**7**) rotatably connected with one of the beams (**34**, **35**), and to said post is attached a symmetrical part (**8**) of a moldboard with a share (**9**) having a plane (**10**) of symmetry passing through a vertical axis (**11**) of rotation of said post (**7**), and a rear part including a leg (**12**) to which are attached left-handed and right-handed moldboards (**13**, **14**) positioned in a mirror-like relation to each other, said leg (**12**) of said rear part being pivotally connected relative to the post (**7**) for swinging the left-handed and right-handed moldboards (**13**, **14**) together in opposite directions, on mounting the parallelogram mechanism in a working position, through a vertical plane (**15**), normal to the beams (**34**, **35**) to an angle $\phi=\alpha-\gamma$ from said vertical plane (**15**), wherein γ is the angle between a vertical-longitudinal plane (**17**) extending in the direction of travel (**24**) of the plow and a plane of symmetry (**18**) of the rear part of a plow body in said working position, the share (**9**) of the front part of each said plow body having sharpened side edges (**20**, **21**) which are truncated to be inclined at an angle β relative to the direction of plow movement to reduce the length of said share (**9**) from a value b/sin γ_0, wherein b is the width of the untruncated share with respect to the direction of travel (**24**) and γ_0 is the angle of said share relative to the direction of travel (**24**) of the plow whereby the spacing between adjacent plow bodies, as measured along the length of the rear beam, is minimized.

5,199,504

HIGH EFFICIENCY PNEUMATIC IMPACTING MECHANISM WITH A PLUNGER VALVE

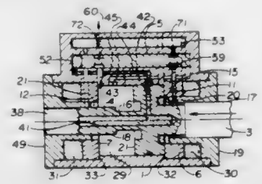
Zhi-Guo Dang, No. 74 A, Xiying Road, Xi'an, China

Filed Sep. 3, 1991, Ser. No. 753,731

Claims priority, application China, Sep. 15, 1990, 90 2 20630.3

Int. Cl.[5] B23Q *5/033;* **F01B** *25/02*

U.S. Cl. 173—17 **3 Claims**



1. A pneumatic impacting mechanism, comprising:

a first cylinder having a rear end and a front end;

a piston disposed in the cylinder, wherein a rear chamber is defined between the piston and the rear end of the first cylinder, and further wherein a front chamber is defined between the piston and the front end of the first cylinder, the piston being disposed in the cylinder for sliding movement therein between a forward position and a rearward position;

the piston including a rear air distributing bar and a front air distributing bar, the front air distributing bar defines thereon a working head;

the rear air distributing bar having an axially extending air inlet channel formed therein, said air inlet channel being in communication with a continuous supply of compressed air, such that compressured air is continuously supplied to the air inlet channel;

the piston having a radial air channel formed therein, said radial air channel being in communication with the air inlet channel, whereby compressed air in the air inlet channel passes into the radial air channel;

a second cylinder having a respective rear end and a respective front end;

a first air channel extending between and in communication with the rear chamber in the first cylinder and the front end of the second cylinder;

a second air channel extending between and in communication with the front chamber in the first cylinder and the rear end of the second cylinder;

a rear exhaust channel extending between and in communication with the rear chamber and the external ambient atmosphere;

a front exhaust channel extending between and in communication with the forward chamber and the external ambient

atmosphere;

whereby when the piston is in the forward position, the rear exhaust channel and the first air channel are open to the rear chamber, the front exhaust channel is blocked by the piston, and the radial air channel formed therein is substantially aligned with the second air channel for providing gaseous communication between the axial air inlet channel and the rear end of the second cylinder via the radial air channel and the second air channel;

further whereby when the piston is in the rearward position, the front exhaust channel and the second air channel are open to the forward chamber, the rear exhaust channel is blocked by the piston and the radial air channel formed therein is substantially aligned with the first air channel for providing gaseous communication between the axial air inlet channel and the front end of the second cylinder via the radial air channel and the first air channel;

a third air channel extending between and in communication with the rear chamber and the rear end of the second cylinder;

a fourth air channel extending between and in communication with the front chamber and the front end of the second cylinder;

a connecting air channel extending between and in communication with the rear end of the second cylinder and the front end of the second cylinder;

a plunger valve disposed in the second cylinder for sliding movement therein between a front position wherein the first air channel, the third air channel and the front exhaust channel are blocked thereby and the second air channel, fourth air channel and rear exhaust channel are open, and a rear position wherein the first air channel, the third air channel and the front exhaust channel are open and the second air channel, fourth air channel and the rear exhaust channel are blocked thereby;

means for selectively moving the plunger valve between the front and rear positions thereof;

the rear air distributing bar having a respective large portion and a small portion, such that with the piston in the forward position thereof, the third air channel is blocked by the said large portion, and further such that with the piston in the rearward position thereof, the third air channel is open; and

the front air distributing bar having a respective large portion and a small portion, such that with the piston in the forward position thereof, the fourth air channel is open, and further such that with the piston in the rearward position thereof, the fourth air channel is blocked by the said large portion;

such that air is continuously exhausted from the mechanism via, alternatively, the front and rear chambers thereof, permitting the compressed air to be fully exhausted therefrom after doing work, whereby when considered as a whole, the cylinder is always in an exhausting state, and further such that the back pressure of the piston is reduced to a level approximately equal to that pressure of the ambient atmosphere and the compressed air doing work within the cylinder can also expand to a pressure approximately equal to that pressure of the ambient atmosphere.

5,199,505

ROTARY IMPACT TOOL

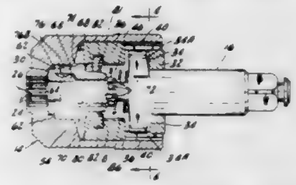
Osamu Izumisawa, Tokyo, Japan, assignor to Shinano Pneumatic Industries, Inc., Kamiminochi, Japan

Filed Apr. 24, 1991, Ser. No. 690,624

Int. Cl.[5] B25B *21/02*

U.S. Cl. 173—93.6 **14 Claims**

1. A rotary impact tool comprising a housing, a generally tubular cage supported for rotation in the housing, a motor mounted in the housing, the motor being connected to the cage for rotating the cage about a central longitudinal axis of the cage, the cage having an internal wall with two axially extending guide channels formed therein at generally diametrically opposite positions, each guide channel having generally opposing side walls and a transverse wall extending between said opposing side walls at the bottom of the channel, said side walls sloping inwardly toward one another from their intersection with the transverse wall, an output shaft mounted generally coaxially with the cage for rotation relative to the cage, the output shaft including anvil means projecting radially outwardly from the output shaft, said anvil means having generally flat impact surfaces, hammer means disposed in said guide channels for movement with the cage, said hammer means having a generally flat striking surface and being



adapted for a close sliding fit in the guide channels such that said hammer means is substantially restricted to sliding movement longitudinally of the guide channels, and clutch means for intermittently moving said hammer means axially in said guide channels between a retracted position in which the striking surface of said hammer means is clear of the impact surface of said anvil means for permitting rotation of the cage and said hammer means relative the output shaft, and an extended position in which the striking surface of said hammer means is in registration with the impact surface of said anvil means such that the striking surface of said hammer means is adapted to strike the impact surface of said anvil means upon further rotation of the cage.

5,199,506

FASTENER-DRIVING TOOL ASSEMBLY WITH IMPROVED FASTENER-LOADING FEATURES

George G. Dewey, Prospect Heights, and Ronald J. Allen, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 765,840, Sep. 26, 1991. This application Sep. 8, 1992, Ser. No. 941,608

Int. Cl.[5] B25C *1/14*

U.S. Cl. 173—104 **14 Claims**

1. A tool assembly for driving a fastener toward and into a workpiece, comprising:

a housing;

a nosepiece having an aperture defined therein for permitting a fastener to be axially driven through said nosepiece toward said workpiece;

means mounting said nosepiece for relative movement with respect to said housing;

a shuttle movable with respect to said nosepiece between a fastener-receiving position and a fastener-delivery position, and having a passageway defined therein for receiving said fastener with said fastener disposed axially within

said passageway and for permitting said fastener to be

the mast, the support base, and the mounting bracket may

lower than said outer recess, and which extends in the

head to align the longitudinal axes of the beam and the

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said passageway and for permitting said fastener to be axially driven through said shuttle and toward said workpiece;

means for guiding said fastener axially into said passageway of said shuttle when said shuttle is disposed at said fastener-receiving position;

means for causing resultant movement of said shuttle from said fastener-receiving position to said fastener-delivery position in response to said movement of said nosepiece with respect to said housing so as to transfer said fastener, disposed axially within said passageway of said shuttle, from said fastener-receiving position to said fastener-delivery position when said fastener is to be axially driven through said passageway of said shuttle and said aperture of said nosepiece toward said workpiece; and

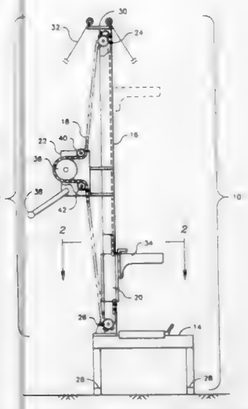
driving element means, comprising an axially and rotatably driven fastener driver and which si disposed so as to be axially driven through said passageway of said shuttle and into said aperture of said nose piece when said shuttle is disposed at said fastener-delivery position, for engaging said fastener disposed within said passageway of said shuttle so as to drive said fastener axially from said passageway of said shuttle and through said aperture of said nose piece into said workpiece.

5,199,507

PORTABLE DRILLING SYSTEM

Harry L. Westmoreland, 1306 Ravenscourt, Sugar Land, Tex. 77478

Filed Feb. 5, 1992, Ser. No. 831,773
Int. Cl.[5] E21C *5/06*
U.S. Cl. 173—147 **2 Claims**



1. A portable apparatus useful in drilling bore holes and which is specifically fabricated for manual disassembly, manual transport, and manual reassembly in various locations, said apparatus comprising:

a support base;

a mast connected to the support base;

a shuttle slidably mounted inside the mast;

a mounting bracket attached to the shuttle so that the mounting bracket is external to the mast and does not interfere with the slidability of the shuttle;

a winch assembly connected to the mast, such winch assembly comprising a reversible hand winch having at least one gear ratio; and

a chain connected to the shuttle and directed through the winch assembly such that the shuttle is capable of being manually directed upwardly and downwardly along the mast;

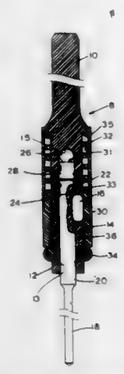
whereby the mast is removable from the support base and the mounting bracket is removable from the shuttle so that the mast, the support base, and the mounting bracket may each be removed and manually transported as separated units, wherein the mounting bracket is attached to the shuttle through a hinge arrangement having two pins extending through the hinge arrangement, whereby the mounting bracket can be rotated out and away from over the bore hole by removing one of the pins or removed from the shuttle by removing both of the pins from the hinge arrangement.

5,199,508

ROTARY HAMMER DRILL

Masaaki Miyanaga, Ashiya, Japan, assignor to Kabushiki Kaisha Miyanaga, Japan

Filed Aug. 1, 1991, Ser. No. 739,224
Int. Cl.[5] B23B *31/06*
U.S. Cl. 173—211 **2 Claims**



1. A rotary hammer drill comprising:

a tubular body adapted to be rotated and reciprocated, the body having a closed rear end, an open forward end, and a peripheral wall having a slot formed therethrough;

a bit having a shank at its rear end for telescopic engagement into said forward end of said tubular body, the shank having an outer recess formed in its peripheral wall spaced from its rear end;

elastically deformable means for engagement within the tubular body between the rear ends of said body and said shank;

a sleeve telescopically engaging around said tubular body and having an inner recess formed in its inner peripheral wall adjacent its forward end;

a spring interposed between the tubular body and sleeve to urge the sleeve forwardly relative to the body;

a stop on said tubular body for engagement with said sleeve to limit the forward movement of said sleeve, so that said inner recess of said sleeve is normally not aligned with said slot of said tubular body; and

connecting means engaging movably with said slot and normally with the inner wall of said sleeve and with the outer recess of said shank;

said connecting means being adapted, when said sleeve has been moved rearwardly to align said inner recess with said slot, and said shank is pulled forwardly, to shift radially out away from said outer recess to said inner recess,

said connecting means comprising a roller having a diameter large enough for a portion of said roller to project radially in from said slot even when said roller engages with the inner recess of the sleeve, so that said deformable means may engage with said roller so as not to fall out of said tubular body;

said slot being narrowed on its radially inner side to keep said roller from falling into said tubular body; and

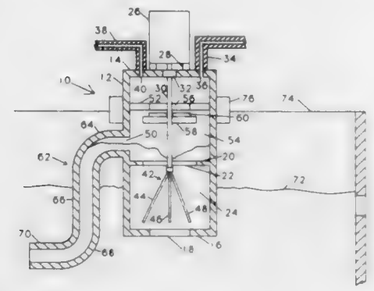
said shank of said bit having another recess which is shallower than said outer recess, and which extends in the peripheral wall of the shank between its rear end and the deeper outer recess, so that said shallower recess passes over said roller when said roller engages with said inner recess.

5,199,509

CONTROLLED GAS TRAP SYSTEM

Alan C. Wright, Bellaire; Scott A. Hanson; Patrick L. DeLaune, both of Houston; Howard L. McKinzie, and Hossein Aghazeynali, both of Sugar Land, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 14, 1992, Ser. No. 835,874
Int. Cl.[5] E21B *44/00, 49/00*
U.S. Cl. 175—50 **7 Claims**



1. In a mud logging system, an improved gas trap comprising:

a cylindrical housing having a restricted opening bottom end, a closed top end, and a first restricted opening intermediate member;

means to mount said housing in a mud receptacle with said housing in a substantially vertical condition and with the bottom of said housing extending below the surface of said mud;

motor means mounted on said top cover and connected to drive a shaft coaxially of said housing;

feed through means forming a seal between said shaft and said top cover;

agitator means attached to said shaft means and lying substantially between said bottom end and said intermediate member;

a mud exit port between said first intermediate member and said top cover;

mud exhaust line connected to said exit port and extending below the mud surface and both spaced from and directed away from said bottom end;

vent line means to admit substantially gas free air to said housing; and

means to draw off from said chamber gas evolved from said mud.

5,199,510

RAISE BORING HEAD AND STEM ASSEMBLY METHOD

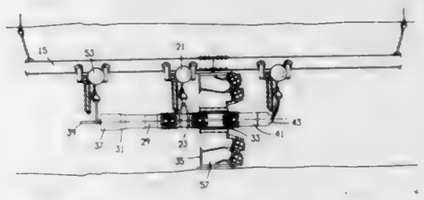
John M. Stanley, and Gregory L. Hern, both of Arlington, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed May 22, 1991, Ser. No. 704,027
Int. Cl.[5] E21D *3/00*
U.S. Cl. 175—53 **8 Claims**

1. A method for assembling an elongated stem having a forward end, a rearward end and a region to mate with a close fitting hole in the body of a raise boring head, comprising the steps of:

attaching an overhead beam to the body of the raise boring head to align the longitudinal axes of the beam and the close fitting hole;

supporting the stem by hoist means depending from the beam, with the longitudinal axis of the stem aligned with said axes of the beam and the close fitting hole;



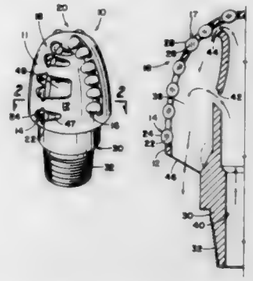
moving the stem along its longitudinal axis with the hoist means to assemble said region of the stem with the close fitting hole in the bit body of the raise boring head.

5,199,511

DRILL BIT AND METHOD FOR REDUCING FORMATION FLUID INVASION AND FOR IMPROVED DRILLING IN PLASTIC FORMATIONS

Gordon A. Tibbitts, and Craig H. Cooley, both of Salt Lake, Utah, assignors to Baker-Hughes, Incorporated, Salt Lake City, Utah

Filed Sep. 16, 1991, Ser. No. 760,584
Int. Cl.[5] E21B *21/00*
U.S. Cl. 175—65 **45 Claims**



1. A method of drilling a borehole comprising the steps of:

providing a drill bit having a plenum formed therein, a cutter formed thereon and a flow channel adjacent the cutter which connects the plenum with the exterior of said bit;

mounting the bit on the end of a drill string;

rotating the drill string;

pumping fluid down the string and into the plenum;

substantially isolating an earth formation ahead of the drill bit from the plenum;

cutting a chip from the formation; and

directing the cut chip into the plenum via the flow channel.

5,199,512

METHOD OF AN APPARATUS FOR JET CUTTING

Harry B. Curlett, Dallas, Tex., assignor to CCore Technology and Licensing, Ltd., Dallas, Tex.

Filed Sep. 4, 1990, Ser. No. 577,501
Int. Cl.[5] E21B *7/18, 10/60*
U.S. Cl. 175—67 **73 Claims**

1. An improved method of eroding a surface and inducing fracture therein with a high velocity liquid jet of the type wherein said high velocity liquid jet is formed for impingement against the surface, said improvement comprising the steps of:

injecting liquid into a substantially cylindrical chamber

5,199,514

said interior surface about said well hole axis comprising a disc mounted in said slide ring for rotation about an axis

sembly including a cutterhead and a variable number of weights disposed above the cutterhead, a rotatable drill string

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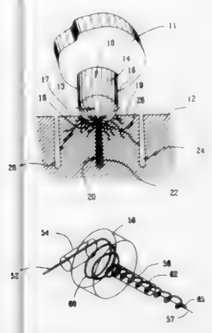
injecting liquid into a substantially cylindrical chamber centered about an axis;

inducing said liquid to swirl within said chamber about said axis;

discharging said swirling liquid outwardly through an outlet



passage coaxial with said chamber and having an open outer end to form a liquid jet originating at said open outer end and swirling about said axis; and

maintaining said open outer end of said outlet passage against said surface for the creation of enhanced fluid jet erosion therein.

5,199,513

SIDE-TRACKING MILLS

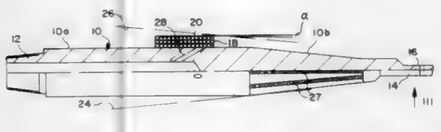
David Stewart, Stonehaven; Paul Hilliard, Aberdeen, both of United Kingdom, and Thomas Doig, Nijverhedesdraat, Netherlands, assignors to Tri-State Oil Tool (UK), Aberdeen, United Kingdom

Filed Feb. 11, 1991, Ser. No. 654,086

Claims priority, application United Kingdom, Feb. 10, 1990, 9003047

Int. Cl.[5] **E21B** *10/26*

U.S. Cl. 175—73 **15 Claims**



1. A starting mill for use in sidetracking a borehole, said starting mill comprising a generally tubular body, connecting means at one end of said tubular body for connecting said starting mill to an end of a drill string, and a plurality of cutting blades extending radially from and circumferentially spaced around said tubular body, each said cutting blade having a generally radially extending face which is a forward face in the direction of rotation of said starting mill, each said forward face being defined by an array of cutting elements, each said cutting element being in the form of a respective carbide disc secured to said cutting blade, each said cutting blade being angularly offset from and with respect to the longitudinal axis of said tubular body, said tubular body having another end opposite said one end and said other end being formed as a tapered nose, said cutting blades being positioned on said tubular body behind said tapered nose with front surfaces of said carbide discs lying in planes which are radial with respect to said tubular body and said cutting blades each having a respective radially outer edge inclined at an angle to said longitudinal axis of said tubular body such that the outside diameter of said starting mill across said cutting blades is less towards said one end than towards said tapered nose.

5,199,514

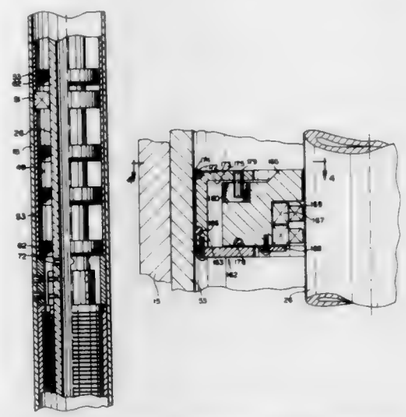
SEAL FOR WELL DRILLING ASSEMBLY

Charles H. Titus, 323 Echo Valley La., Newtown Square, Pa. 19073

Continuation-in-part of Ser. No. 516,151, Apr. 30, 1990, Pat. No. 5,069,298. This application Nov. 18, 1991, Ser. No. 793,608

Int. Cl.[5] **E21B** *4/02*

U.S. Cl. 175—107 **14 Claims**



1. In a drilling assembly comprising a drill bit operable to be rotated to produce a well hole of a given diameter, a hollow casing at a level spaced above the drill bit at the bottom of the hole, an upright rotary shaft mounted in said casing and projecting downwardly from said casing at its lower end to rotate the drill bit, rotary drive means drivingly connected to said rotary shaft for rotating said shaft about the axis of said well hole, flow passages for directing drilling mud to said drill bit, the lower end of the rotary shaft having an outer cylindrical surface with an outer diameter less than the interior dimension of said casing to provide an outer pressure passage therebetween, said flow and pressure passages having upper and lower interconnections at spaced upper and lower locations along the casing respectively, bearings in said pressure passage between said upper and lower interconnections, said bearings supporting said rotary shaft in said casing against radial and axial displacement relative to said casing, a body of lubricant in said pressure passage between said shaft and said casing engulfing said bearings, and upper and lower seals between said body and said upper and lower interconnections to respectively limit flow of drilling mud into said body of lubricant, and flow of lubricant from said body toward said interconnections, the improvement wherein

said casing has an interior circumferential surface surrounding the lower end of said rotary shaft,

each seal of said upper and lower seals comprising a slide ring mounted between said interior circumferential surface and said outer cylindrical surface and slidable longitudinally therealong, said slide ring of each seal having one transverse surface directed toward one of said interconnections and another transverse surface directed toward one of said bearings, said slide ring about its outer periphery being in sealing engagement with said interior surface,

mounting means for positioning packing elements around the inner periphery of each seal in sealing engagement with said outer surface, whereby said ring may slide longitudinally of said rotary shaft while maintaining a sealed transverse barrier across the pressure passage between said outer surface of said shaft and the interior surface of said casing, and

means to resist rotary movement of said slide ring within said interior surface about said well hole axis comprising a disc mounted in said slide ring for rotation about an axis generally parallel to the interior circumferential surface within a plane perpendicular to the rotary axis of said shaft, said disc engaging said interior circumferential surface of said casing and resisting rotation of said slide ring about the axis of the shaft but affording axial displacement of said slide ring therealong.

13. A floating seal for sealing an annular passage between a shaft and a casing surrounding said shaft, the shaft having an outer surface and the casing having an interior surface substantially parallel to the shaft outer surface, the shaft having a central longitudinal axis and being subject to distortion which effects radial displacement of its outer surface eccentric to said central axis,

said seal comprising a slide ring adapted to be mounted between said interior circumferential surface and said outer cylindrical surface and slidable longitudinally therealong, said slide ring about its outer periphery having sealing means affording sealing engagement with said interior surface, and a plurality of discs, each mounted for rotation on an axis substantially parallel to the interior circumferential surface of said casing in a plane substantially perpendicular to said central axis to afford rotation of said disc to permit axial displacement of said slide ring and resist circumferential displacement thereof relative to said interior surface,

a support ring for positioning packing elements around the inner periphery of said seal for sealing engagement with said outer surface, whereby said ring may slide longitudinally of said rotary shaft while maintaining a sealed transverse barrier across the pressure passage between said outer surface of said shaft and the interior surface of said casing, said support ring being separate from said slide ring and mounted for eccentric radial displacement within and mounted against axial displacement relative to said slide ring, and

means providing a seal between said rings throughout such radial displacement.

5,199,515

DRY PNEUMATIC SYSTEM FOR HARD ROCK SHAFT DRILLING

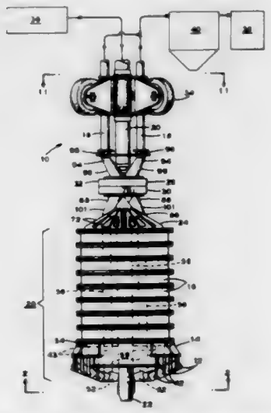
Kirk M. Sinclair, Lively, and John R. England, Sudbury, both of Canada, assignors to Inco Limited, Toronto, Canada

Filed Dec. 24, 1990, Ser. No. 633,454

Claims priority, application Canada, Jan. 3, 1990, 2007070

Int. Cl.[5] **E21B** *21/02, 21/12*

U.S. Cl. 175—213 **16 Claims**



1. A dry, vertical, shaft drilling system, the system comprising of a rotatable bottom hole assembly, the bottom hole assembly including a cutterhead and a variable number of weights disposed above the cutterhead, a rotatable drill string connected to the bottom hole assembly, air supply means extending downwardly to the cutterhead, the air supply means divided into an upper segment and a lower segment, a portion of the lower segment of the air supply means disposed within the cutterhead for agitating cuttings at the cutterhead, air extraction means extending upwardly away from the cutterhead, the air extraction means divided into an upper segment and a lower segment, a portion of the lower segment of the air extractions means disposed within the cutterhead for extracting the cuttings at the cutterhead, means for stabilizing the system within the shaft, swivel means disposed above the bottom hole assembly, the swivel means circumscribing the drill string and interposed between the upper and lower segments of the air extraction means so as to permit simultaneous rotation of the lower segment of the air extraction means and the bottom hole assembly while maintaining the upper segment of the air extraction means stationary.

5,199,516

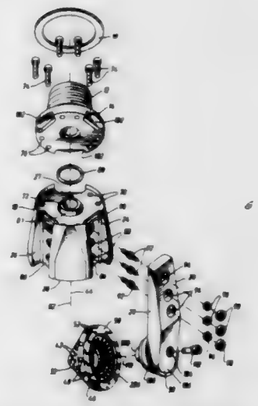
MODULAR DRILL BIT

Carlos Fernandez, San Clemente, Calif., assignor to Modular Engineering, San Clemente, Calif.

Division of Ser. No. 606,087, Oct. 30, 1990, Pat. No. 5,137,097. This application May 18, 1992, Ser. No. 885,135

Int. Cl.[5] **E21B** *10/20, 10/18, 10/22, 10/24*

U.S. Cl. 175—366 **4 Claims**



1. Apparatus for use in a drill bit comprising a body having a central axis and having a plurality of openings therein spaced about the central axis and each adapted to receive a cone-mounting leg, each of the openings having a generally planar back wall which is generally parallel to the central axis of the body, the plurality of openings comprising a plurality of keyways generally equally spaced about the central axis and each having a back wall having a centerline which is generally parallel with the central axis of the body, and a threaded pin coupled to the body, the threaded pin having a plurality of pockets therein, each aligning with a different one of the keyways in the body.

3. Apparatus for use in a drill bit comprising a drill bit body having a plurality of cone-mounting legs mounted thereon, a threaded pin mounted on and adapted to couple the drill bit body to a drill pipe, the threaded pin having a plurality of pockets generally equally spaced about an outer surface thereof for receiving end portions of the plurality of cone-mounting legs therein.

ing said driving means to said peripheral toothed circular

duced by said fan being drawn through said first and

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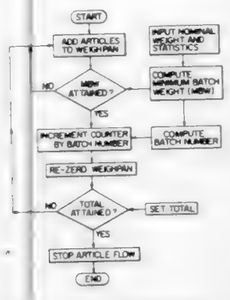
5,199,517
COUNTING ARTICLES

John Kirby, 364A Manchester Old Road, Middleton, Manchester, M24 4EB, England

Continuation-in-part of Ser. No. 386,293, Jul. 27, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 632,369
Claims priority, application United Kingdom, Aug. 4, 1988, 8818511
Int. Cl.[5] G01G *19/42*
U.S. Cl. 177—25.17 5 Claims



1. In a method for counting articles having a nominal weight and a statistical distribution of weights by weighting the articles and computing a dividend of the weight of the weighed articles by dividing the nominal weight into the weight of the weighed articles to give a number of articles as being equal to the dividend suitably rounded off to a nearest integer, the improvement comprising:

predetermining a minimum batch weight of a batch of the articles in relation to the said statistical distribution of weights such that a maximum rounding-off error of the dividend of the batch weight by the nominal weight is less than 0.5 so that on rounding-off the dividend is equal to the number of the articles in the batch (the batch number),

adding the articles successively on a continuous basis to a weighing apparatus,

noting the batch weight each time the minimum batch weight is added to the weighing apparatus,

maintaining an article count as articles are added to the weighing apparatus and incrementing the articles count by the batch number each time the minimum batch weight is added to the weighing apparatus, and

re-zeroing the weighing apparatus every time a batch weight is attained to eliminate a fractional weight giving rise to the rounding-off error.

5,199,518
LOAD CELL

Sheldon Woodle, 16870 NE. 24th Pl., Bellevue, Wash. 98008-2323

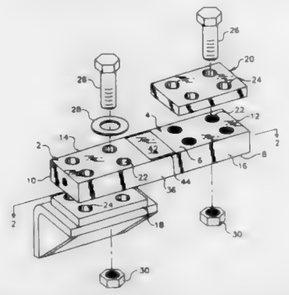
Filed Feb. 19, 1992, Ser. No. 838,480
Int. Cl.[5] G01G *3/14*; G01L *1/22*
U.S. Cl. 177—211 15 Claims

1. A load cell comprising:

a deformable member having a chamber therein extending parallel to the direction of force, said chamber having opposite interior sides parallel to the direction of force;

plate means on said deformable member extending transversely to the direction of force and to the axis of said chamber, said plate means covering said chamber;

means for securing said plate means to said deformable member whereby said plate means and said means for



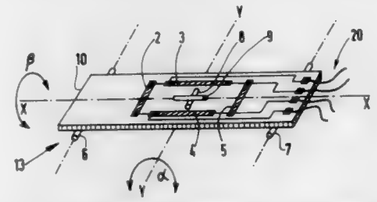
securing said plate means carry the structural loads of said deformable member; and

strain gauges on said opposite interior sides of said chamber.

5,199,519
STRAIN GAUGE ELEMENT

Rémy H. F. Polaert, Villecresnes, and Jean-Pierre Hazan, Sucy en Brie, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 5, 1991, Ser. No. 788,010
Claims priority, application France, Nov. 9, 1990, 90 13915
Int. Cl.[5] G01G *3/14, 21/12*; G01L *1/22*
U.S. Cl. 177—211 9 Claims



1. A strain gauge element comprising a strain gauge pressed between two pressure members which apply compression forces, characterized in that the compression forces applied by at least one of the pressure members are transmitted to a first surface of the strain gauge by a cross formed by two cylindrical rods, the contact between the strain gauge (or the said pressure member) and the cross being exerted on a generating line of one of the rods (or the other rod) of the cross, permitting the said pressure member to carry out a tilting movement about the said rod (or the other rod).

5,199,520
WHEELED CHAIR

Sen-Jung Chen, No. 236, Sec. 3, Ho-Ping W. Rd., Taipei City, Taiwan

Filed Dec. 11, 1991, Ser. No. 804,967
Int. Cl.[5] A61G *5/04*
U.S. Cl. 180—65.5 2 Claims

1. A wheelchair comprising:

a chair including a seat;

means for folding and unfolding said seat;

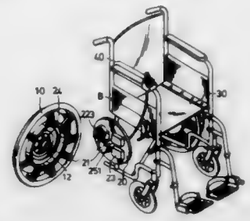
a pair of stationary plates each of which is fixedly provided on each side of said seat, said stationary plate having a shaft extending outwardly therefrom;

a pair of wheels, each of which is rotatably mounted on said shaft of said stationary plate, each wheel having a circular plate with a toothed periphery fixedly attached thereto;

a driving means mounted on said stationary plate;

a gear means mounted on said stationary plate and connecting said driving means to said peripheral toothed circular plate of said wheel for transmitting rotation of said driving means to said wheel;

a rechargeable battery means mounted on said stationary



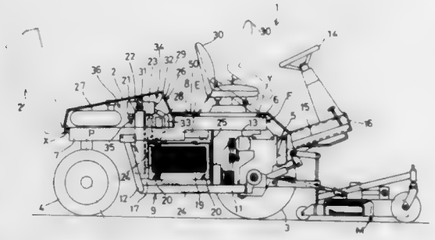
plate, the battery means supplying power to said driving means, whereby the seat may be folded or unfolded without obstruction from the battery means;

a control switch actuating said driving means to move said wheel.

5,199,521
LAWN MOWER HAVING PASSAGES FOR ENGINE COOLING AIR

Kazuo Samejima; Shigeru Morita; Yoshihiro Kawahara; Hideya Umemoto; Terutaka Takei; Yoshikazu Togoshi, and Akiyoshi Takemoto, all of Osaka, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Apr. 22, 1991, Ser. No. 689,197
Claims priority, application Japan, Jul. 18, 1990, 2-191551; Dec. 12, 1990, 2-400388[U]
Int. Cl.[5] B60K *11/04*
U.S. Cl. 180—68.1 10 Claims



1. A lawn mower having a driver's section and a grass cutting unit forwardly of a vehicle body, and an engine mounted between front and rear wheels, comprising:

a pair of main frames extending longitudinally of the vehicle body, each of said main frames including a front frame member, and a rear frame member connected to said front frame member and disposed at a lower level than said front frame member,

said engine being mounted below the front frames between said front and rear wheels,

a radiator disposed rearwardly of said engine and having an upper portion projecting upwardly of the rear frame members,

first cover means for covering said engine, said first cover means including side covers depending respectively from said main frames, lower covers connecting the respective side covers to lower positions of said engine, and a front cover for closing an area forwardly of said engine, said radiator defining a rear wall of said first cover means,

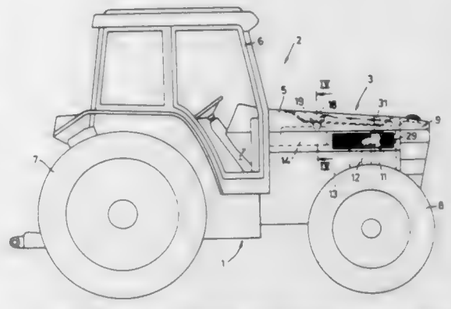
second cover means disposed rearwardly of said driver's section for covering said upper portion of said radiator, said second cover means defining a second ambient air intake opening in a forward portion thereof, and

a fan disposed adjacent said radiator, cooling air flows produced by said fan being drawn through said first and second ambient air intake openings, at least a large part of said cooling air flows being exhausted rearwardly through said radiator.

5,199,522
AIR INLET FOR VEHICLE ENGINE

Wayne B. Martenas, New Holland, Pa., and Philip Gaff, Prittlewell, England, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed May 27, 1992, Ser. No. 888,676
Int. Cl.[5] B60K *13/02*
U.S. Cl. 180—68.3 7 Claims



1. A vehicle having an engine compartment with an engine and an air cleaner mounted therein; and a cover for the engine compartment, said cover including air inlet means for the passage of ambient air through said cover, and air duct means extending from within the vicinity of said air inlet means in said cover to an inlet of the air cleaner to direct the flow of ambient air to said air cleaner, the improvement comprising:

said air duct means incorporates an air plenum chamber provided within said engine compartment cover, said plenum chamber having an air inlet adjacent the air inlet means in the engine compartment cover and an air outlet connectable to the air inlet of the air cleaner;

said engine compartment cover including two pivotally mounted hinge panels, at least one of said hinge panels having a pair of limbs arranged in a generally L-shaped configuration, said plenum chamber being provided along a corner between said two limbs and having a generally triangular cross-sectional configuration defined on two sides by the respective limbs of said at least one hinge panel and on the third side by a plenum plate.

5,199,523
FRONT AND REAR WHEEL STEERING SYSTEM FOR A VEHICLE

Masaru Abe; Yoshimichi Kawamoto; Norio Ukai, and Takashi Kohata, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 369,085
Claims priority, application Japan, Jun. 23, 1988, 63-155958
Int. Cl.[5] B62D *5/00, 5/02, 5/06*
U.S. Cl. 180—140 12 Claims

1. A front and rear wheel steering system for a vehicle, comprising: a front wheel steering gear box having an input end coupled with a steering wheel, a first output end coupled with a steering linkage for a front wheel, and a second output end coupled with an end of a coupling shaft extending longitudinally of a vehicle body for transmitting a steering input from said steering wheel as a rotary movement of said coupling shaft about its longitudinal line; and a rear wheel steering gear box having an input end coupled with another end of said coupling shaft, and an output end coupled with a steering linkage for a

5,199,526

lar support is an elongated tube having a first pair of

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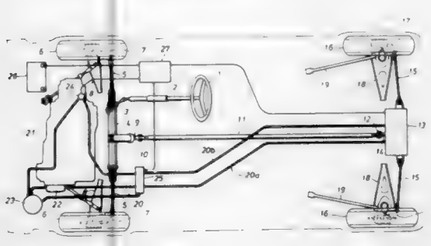
rear wheel; wherein said rear wheel steering gear box comprises:

a swing shaft pivotally coupled with said other end of said coupling shaft at its one end via a pivot shaft extending perpendicularly to said longitudinal line of said coupling shaft;

a steering rod, for steering said rear wheel by longitudinal movement of said steering rod, extending laterally of said vehicle body and provided with a crank portion radially extending from said steering rod;



guide means for guiding said steering rod for linear movement along its longitudinal line and rotary movement around its longitudinal line;

joint means coupling a part of said swing shaft with said crank portion of said steering rod for transmitting a gyrating movement of said swing shaft around said longitudinal line of said coupling shaft to said steering rod as a longitudinal movement thereof; and

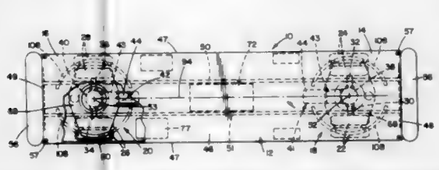
control means for rotating said steering rod about its longitudinal line according to an output from a vehicle speed sensor.

5,199,524

AUTOMATED GUIDED VEHICLE

Milan E. Ivancic, Willoughby, Ohio, assignor to Mentor AGVS, Inc., Mentor, Ohio

Filed Jul. 1, 1991, Ser. No. 723,902
Int. Cl.[5] B60K *17/358*
U.S. Cl. 180—237 **28 Claims**



1. An automated guided vehicle for carrying and moving loads comprising:

deck means for supporting loads to be transported by said vehicle and having longitudinally opposite first and second ends;

first and second wheel assembly means respectively at said first and second ends of said deck means for steering and driving said vehicle along a predetermined path;

said first and second wheel assembly means being supported by said deck means for rotation independent of each other about a corresponding vertical axis and each comprising at least two wheels aligned and laterally spaced from each other, each of said two wheels being connected to a corresponding axle;

first and second differential gear means respectively connecting the axles of said two wheels of said first and second wheel assembly means;

first and second differential drive means for respectively independently driving said first and second differential gear means to rotate the corresponding axles and wheels; and

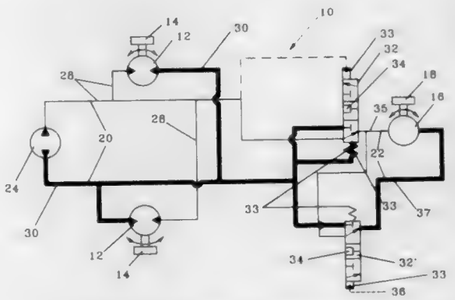
first and second steering means for respectively independently rotating said first and second wheel assembly means about said corresponding vertical axis.

5,199,525

CONTROL CIRCUIT FOR HYDROSTATIC ALL WHEEL DRIVE VEHICLE

Robert A. Schueler, Oconomowoc, Wis., assignor to Ransomes Inc., Johnson Creek, Wis.

Continuation of Ser. No. 421,616, Oct. 13, 1989, abandoned. This application Aug. 12, 1991, Ser. No. 746,049
Int. Cl.[5] B60K *17/356*
U.S. Cl. 180—242 **5 Claims**



1. A hydrostatic drive circuit for delivering power to the drive wheels of an all wheel drive vehicle, said drive circuit comprising:

a front drive wheel motor having fluid inlet and outlet ports;

a read drive wheel motor having fluid inlet and outlet ports;

a pump having an output for providing at said output pressurized hydrostatic fluid;

a plurality of hydrostatic lines coupled to said output and said front and rear drive wheel motors for communicating the pressurized hydrostatic fluid to said front and rear drive wheel motors; and

control valve means coupled to said hydrostatic lines and responsive to the traction delivered by said front and rear drive wheel motors for selectively decoupling said front and rear drive wheel motors from the pressurized hydrostatic fluid when the traction developed by said front or rear drive wheel motor falls below a predetermined minimum;

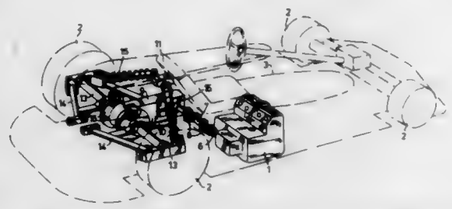
said control valve means further including common pressure means responsive to said decoupling of said front and rear drive wheel motors for communicating said fluid inlet port of said decoupled front or rear drive wheel motor with said fluid outlet port of said decoupled front or rear drive wheel motor so as to permit continued hydrostatic fluid flow through said decoupled front or rear drive wheel motor and so as to avoid abrupt torque transitions in said decoupled front or rear drive wheel motor as said decoupled front or rear drive wheel motor is decoupled from the pressurized hydrostatic fluid.

5,199,526

LIGHTWEIGHT HIGH PERFORMANCE ROAD RACING VEHICLE

Peter R. J. Derviller, #35, 185 Woodridge Drive, S.W., Calgary, Alberta, Canada T2W 3X7

Continuation-in-part of Ser. No. 410,468, Sep. 21, 1989, abandoned. This application May 29, 1991, Ser. No. 707,033
Int. Cl.[5] B60K *5/04*
U.S. Cl. 180—297 **11 Claims**



1. A lightweight, high performance road racing vehicle, comprising:

a chassis in which are mounted four wheels, said chassis having a central longitudinal axis and a power module;

a driver's cockpit having a longitudinal center line and including a protective roll cage integrally constructed within the power module of the chassis, said roll cage having an internal portion for mounting a driver's seat therein with the seat being laterally offset from the central longitudinal axis on one side thereof, the cockpit being configured to allow the driver to assume a reclining position and wherein the longitudinal center line of the driver's cockpit is angularly offset from the central longitudinal axis of the vehicle such that the lateral offset of the cockpit increases rearwardly;

an engine within the power module of the chassis, the engine having a power takeoff shaft and being capable of powering the vehicle at racing speeds, the engine being mounted laterally offset from the central longitudinal axis on an opposite side thereof and laterally adjacent the seat, the relative offset of the seat and the engine being selected so that the weight of the driver and the weight of the engine exert approximately equal and opposite moments about the central longitudinal axis, thereby maintaining vehicular balance;

power transmission means within the power module of the chassis, said means comprising: a transverse drive shaft from the power takeoff shaft of the engine to the central longitudinal axis of the vehicle; a primary drive sprocket fixed to an inner end of the drive shaft; a final drive sprocket located rearwardly of the primary drive sprocket; and a closed loop chain engaging the primary and final drive sprockets and being aligned in a vertical plane extending along the central longitudinal axis; and

a rear axle within the power module, the axle comprising: a central shaft journalled in the chassis and fixed to the final drive sprocket; two outer swing shafts articulately rotatably connected at their inner ends to respective outer ends of the central shaft and at their outer ends to respective rear wheels, each said swing shaft being rotatably supported adjacent its outer end by at least one independent suspension arm connected between each rear wheel and the chassis.

5,199,527

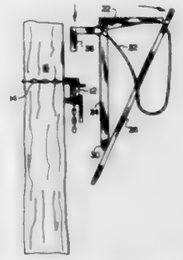
TREE STAND AND BRACKET

Dwight M. Jennings, R.F.D. 5, Trinity, N.C. 27370

Filed Feb. 11, 1992, Ser. No. 833,888
Int. Cl.[5] A45F *3/26*
U.S. Cl. 182—187 **10 Claims**

1. A tree stand or the like, said stand comprising:

(a) a bracket adapted to be attached to a tree or pole, said bracket including: (i) a tubular support wherein said tubular support is an elongated tube having a first pair of spaced apart cleats at one end for engagement with the surface of the tree and a handle extending downward from said tubular support at the other end; (ii) a flexible connector having one end attached to one side of said tubular support; and (iii) means attached to the opposite side of said tubular support for receiving the other end of said flexible connector;



(b) a stand for supporting at least one person, said stand including a frame, a seat connected to one end of said frame, and a platform connected to the other end of said frame; and

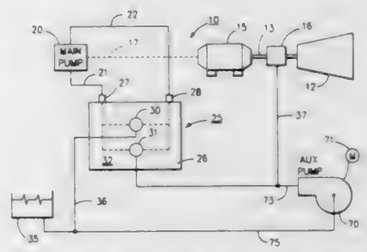
(c) means for selectively and releasability attaching said stand to said bracket.

5,199,528

FLOW CONTROLLER

John M. Rinaldo, E. Greenbush, N.Y., assignor to Atlas Copco Aktiebolag, Sweden

Filed Dec. 5, 1991, Ser. No. 804,239
Int. Cl.[5] F01M *1/18*
U.S. Cl. 184—6.4 **11 Claims**



5. A flow control apparatus for protecting a rotating machine coupled to a pump means from experiencing lubrication starvation in the event the machine and the pump go into reverse rotation, the apparatus including:

a housing having an inlet channel connected to the discharge side of the pump means and an outlet channel, being spaced apart from said inlet channel, connected to the suction side of the pump means;

said housing further including a first passage means connecting said spaced-apart inlet and outlet channels and a second passage means spaced apart from said first passage means also connecting said inlet and outlet channels;

a first flow means for connecting said first passage means to a fluid reservoir containing a quantity of lubricating oil;

a second flow means for connecting said second passage means to the rotating machine;

a first free-floating means mounted in said first passage means moving therein in response to pressure exerted on said first free-floating means by oil passing through said housing, said first flow means thereby being placed in

communication with either said inlet or outlet channel;

said aperture, thereby allowing said member to pass

said braking surfaces into engagement with said fixed

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SHOPPING CART BRAKE

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communication with either said inlet or outlet channel; and

a second free-floating means mounted in said second passage means moving therein in response to pressure exerted on said second free-floating means by oil passing through said housing, said second flow means thereby being placed in communication with either said inlet or outlet channel.

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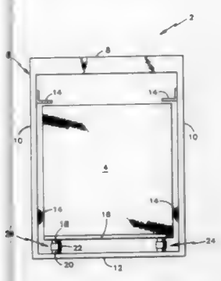
SELF ALIGNING SUPPORTS FOR ELEVATOR CAB

John K. Salmon, South Windsor, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Nov. 21, 1991, Ser. No. 795,567
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R **6 Claims**



1. A self aligning elevator cab mounting assembly for supporting an elevator cab in an elevator cab frame in a pendulum fashion, said assembly comprising:

a) opposed seat means for securement to the cab and the frame; and

b) a non-compressible rolling member for sandwiching between said seat means, said rolling member having opposed upper and lower, spheroidal end surfaces which engage said seat means to provide point contact with each of said seat means, and a substantially cylindrical side surface disposed radially outwardly of said spheroidal end surfaces.

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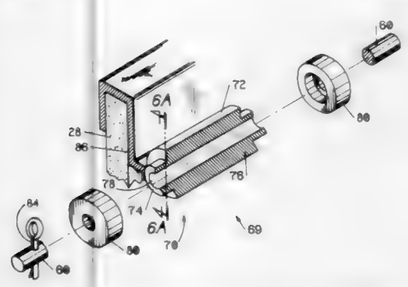
RETAINER ASSEMBLY

Louis Bialy, Simsbury, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 1, 1991, Ser. No. 771,025
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R **12 Claims**



1. A retainer assembly for an elevator cab, comprising:

a member;

a clasp section, having a main body disposed along an axis and a boss extending out from said body, parallel to said axis, said main body and said boss having an axially extending cutout and aperture, said aperture having a shape complimenting said member, wherein said cutout exposes said aperture, thereby allowing said member to pass through said cutout and be received by said complimentary aperture; and

a collar, having an aperture, wherein said collar slides over said boss of said clasp section, thereby fixing said member within said aperture of said clasp section.

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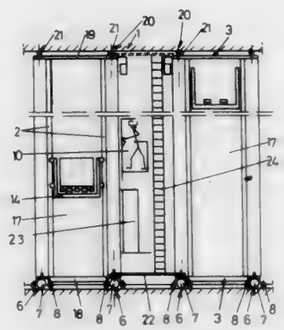
RAIL-MOUNTED, HIGH-LIFT STACKING VEHICLE

Peter Malin, Wolfurt, Austria, assignor to Lagertechnik Gesellschaft M.B.H., Wolfurt, Austria

PCT No. PCT/AT90/00063, § 371 Date Dec. 11, 1991, § 102(e) Date Dec. 11, 1991, PCT Pub. No. WO91/01265, PCT Pub. Date Feb. 7, 1991
PCT Filed Jun. 15, 1990, Ser. No. 776,328
Claims priority, application Austria, Jul. 19, 1989, 1740/89
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—9 R **10 Claims**



1. A rail-mounted, high-lift stacking vehicle for travelling between an upper guide rail and a lower guide rail, comprising:

a travelling mechanism (**13**) for movement along a lower guide rail, said travelling mechanism including at least two spaced apart travelling mechanism bodies (**6**), each body including at least one travelling roller (**7**) for rolling along the lower guide rail;

an upper guide mechanism (**3**) for movement along an upper guide rail;

at least two lift masts (**2**) connected between said travelling mechanism and said upper guide mechanism;

a lift carriage (**14**) mounted for vertical displacement to at least one of said masts; and

at least one articulation (**20**) in each of said travelling mechanism and said upper guide mechanism, for permitting a bending of each of said travelling and guide mechanisms in a horizontal plane for facilitating movement of the stacking vehicle along curves in the upper and lower guide rails.

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ELECTROMAGNETIC ELEVATOR BRAKE

Manabu Suganuma, Yamato; Toshihiko Uematsu, and Hisaki Kenmochi, both of Kofu, all of Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 30, 1991, Ser. No. 769,103
Int. Cl.[5] B66B *5/16*
U.S. Cl. 187—80 **3 Claims**

1. An elevator electromagnetic brake for engaging a fixed surface, said brake comprising:

a pair of brake arms, said brake arms pivoting about an axis,

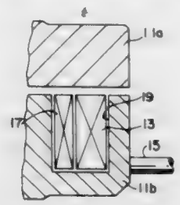
a braking surface attaching to one end portion of each arm,

a body portion attaching to a second end portion of each arm,

a means for urging said arms to pivot about said axis to urge said braking surfaces into engagement with said fixed surface,

a primary electromagnet disposed within one of said body portions for urging said arms to pivot about said axis to urge said braking surfaces out of engagement with said fixed surface against a force of said means, and

a secondary electromagnet disposed within one of said body portions for urging said arms to pivot about said axis to



urge said braking surfaces out of engagement with said fixed surface against a force of said means if said primary electromagnet does not urge said arms to pivot about said axis to urge said braking surfaces out of engagement with said fixed surface as desired, said secondary electromagnet being arranged in a same one of said body portions as said primary electromagnet, said secondary electromagnet being disposed concentrically within a diameter of said primary electromagnet.

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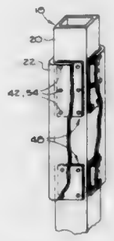
LIFT TRUCK

Rudeger H. Wilke, Darien, Ill., assignor to Savage Bros. Co., Elk Grove Village, Ill.

Filed Mar. 16, 1992, Ser. No. 852,014
Int. Cl.[5] B66B *7/02*
U.S. Cl. 187—95 **9 Claims**



1. A truck for grasping a load, moving it vertically, and holding it in selected positions in its vertical movement, and capable of being moved along a floor for transporting the load, comprising,

a base directly engaging the floor,

a column on the base and including a post mounted on the base and a sleeve slideably mounted on the post,

lifting arms on the sleeve capable of holding the load,

the sleeve and post being of complementary polygonal shape in cross section, and

slide pads separate from and independent of the post and sleeve, and of limited yieldability interposed between the post and sleeve and having elements positioned at least adjacent the ends of the sleeve, said slide pads constituting bearing means,

the slide pads being separate from each other and positioned flat against the sides of the post and sleeve, and adjacent ones of the slide pads, at each corner of the post and sleeve, being spaced apart circumferentially.

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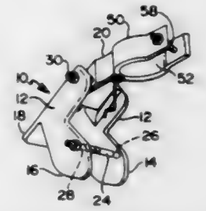
SHOPPING CART BRAKE

David Goff, 763 Menominee, Pontiac, Mich. 48341

Filed Dec. 16, 1991, Ser. No. 808,101
Int. Cl.[5] F16D *49/00*
U.S. Cl. 188—74 **2 Claims**



1. A shopping cart brake for attachment to a rear leg of a shopping cart to prevent a non-inflatable tire on the rear leg from rotating, the brake comprising:

(a) a connecting arm for removably and adjustably attaching the brake to the rear leg of the shopping cart;

(b) a split yoke, which is pivotally connected to the connecting arm and which includes two braking flanges for engaging and applying frictional force to the sides of the non-inflatable tire to prevent the tire from rotating;

(c) an actuator, integral with the split yoke, for applying force to the split yoke, thereby engaging the braking flanges with the sides of the non-inflatable tire; and

(d) an adjustable tension bar, located between the braking flanges, for increasing or decreasing the frictional force the braking flanges apply to the sides of the non-inflatable tire, wherein the tension bar may be adjusted so that the braking flanges may be disengaged from the sides of the non-inflatable tire by merely moving the cart rearwardly.

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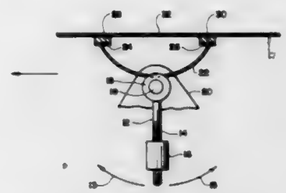
ACCELERATION-SENSITIVE FRICTION DEVICE

Arthur Kaye, Preston, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom

Continuation-in-part of Ser. No. 503,624, Apr. 3, 1990, abandoned. This application Aug. 8, 1991, Ser. No. 741,948
Claims priority, application United Kingdom, Apr. 10, 1989, 8908012
Int. Cl.[5] B60T *7/12*
U.S. Cl. 188—135 **14 Claims**



1. An acceleration-sensitive friction device for damping undesired acceleration-induced movements of a control member, comprising:

a bearing;

a pendulum mounted for oscillation in said bearing about an axis so as to be bi-directionally sensitive to longitudinal 'g' forces;

an element which is displaceable as a function of the amplitude of pendulum movement and which is one of: a part of said bearing, and a discrete part connected to said bearing;

at least two braking members disposed one on each side of said axis; each braking member being:

(i) connected to said element such that in use an increase in

said amplitude is effective to vary the displacement of said

a setting member mountable on a base machine,

located and axially movably with respect to said input shaft

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FRICTION FACING MATERIAL AND CARRIER

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said amplitude is effective to vary the displacement of said element; and

(ii) adapted frictionally to engage a surface of said control member with a frictional force, the magnitude of which is functionally related to the displacement of said element and thus to the increase, in either longitudinal direction, of said amplitude.

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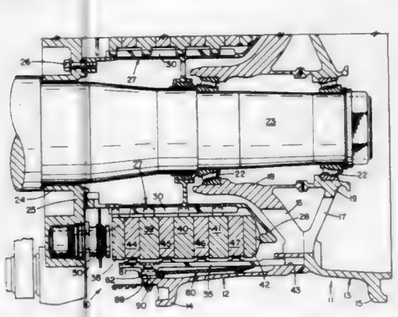
HEATSHIELD INSTALLATION FOR AIRCRAFT BRAKE

Gary L. Clark, Maplewood, Ohio, assignor to The BFGoodrich Company, Akron, Ohio

Filed Feb. 13, 1992, Ser. No. 835,164
Int. Cl.[5] F16D *65/84*
U.S. Cl. 188—264 G 13 Claims



1. In an aircraft wheel and brake assembly having an axle with a circular flange thereon, said axle having a central axis, bearing means mounted on said axle; a wheel support mounted on said bearing means for rotation relative to said axle about said central axis, said wheel support having a circumferentially extending rim member and a radially inwardly disposed web portion; a torque tube with an annular hub secured to said circular flange; said torque tube having a plurality of circumferentially spaced splines; a plurality of stator discs mounted on said splines for axial movement thereon; a plurality of circumferentially spaced wheel keys located radially inwardly of said rim member and providing a clearance space therebetween, a plurality of rotor discs splined to said wheel keys for rotation therewith and for axial movement thereon; said rotor discs interleaved with said stator discs to define a heat sink; power means mounted on said circular flange for moving said stator discs and said rotor discs toward each other to effect a braking action; a heat shield located in said clearance space between said rim member of said wheel support and said wheel keys for circumferentially encompassing said heat sink, a plurality of circumferentially spaced spacers secured to said heat shield, and fastener means extending through said spacers and interconnecting the one end of said keys to said rim member while said spacers captively secure said heat shield in a radial and axial location relative to said central axis to control the flow of heat energy from said heat sink towards said wheel support.

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ABUTMENT WITH A DAMPING DEVICE

Helmut Wörner, Justinus Kerner Str. 23, D-7306 Dendendorf, and Sebastian Unterhuber, Denkendorf, both of Fed. Rep. of Germany, assignors to Helmut Worner, Denkendorf, Fed. Rep. of Germany

Filed Nov. 7, 1991, Ser. No. 790,278
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1990, 4035286; Nov. 23, 1990, 9015950
Int. Cl.[5] B23Q *5/52;* B65G *47/88;* F15B *15/22;* F16F *9/49*
U.S. Cl. 188—266 34 Claims

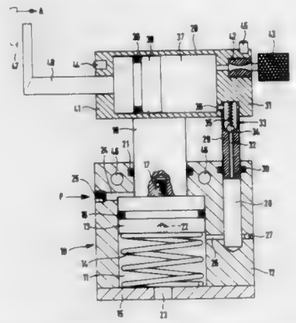
1. An abutment for damping movement of a workpiece having different masses and traveling at different speeds, said abutment comprising;

a setting member mountable on a base machine,

at least one damping device having a damping piston movable in a damping cylinder,

a choke device engaged to said at least one damping device providing resistance to flow of air leaving and entering said damping cylinder when said damping piston is moved,

an abutment member engaged to said damping piston and movable by said workpiece from a first abutment position to a second end abutment position,



said at least one damping device moveably engaged on said setting member,

actuating means associated with said setting member for moving said at least one damping device and abutment member in a direction perpendicular to a longitudinal axis of said at least one damping device out of a plane of abutment and back into said plane of abutment, and

return means for return of said abutment member from said end abutment position into said first abutment position.

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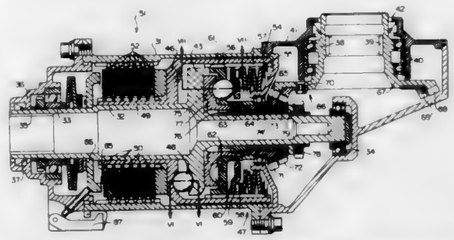
DRIVE DEVICE WITH VARIABLE TORQUE-LIMITING SYSTEM

Manfred Fischer, Markdorf, and Alfred Magg, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

PCT No. PCT/EP90/00273, § 371 Date Aug. 22, 1991, § 102(e) Date Aug. 22, 1991, PCT Pub. No. WO90/09921, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 20, 1990, Ser. No. 752,472
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1989, 3905576
Int. Cl.[5] B60K *41/26;* F16D *55/14*
U.S. Cl. 192—7 22 Claims



1. A drive device having a torque limiter (**15**) comprising an input shaft (**32**) and an output shaft (**38**); an input flange (**43**) being supported by said input shaft (**32**) and carrying input ramps (**44**) on a surface thereof; an output flange (**46**) drivingly connected with said output shaft (**38**) and being concentrically

located and axially movably with respect to said input shaft (**32**), said output flange (**46**) having output ramps (**45**) on a surface thereof adjacent said input ramps (**44**), roller members (**48**) being supported between said input ramps and said output ramps (**44**, **45**) via a pre-load force generated by a spring assembly (**47**), and a multi-disc brake (**51**) associated with said output flange for varying transmission of an output torque of said drive device,

wherein a comparator element (**74**) is drivingly connected with said output shaft (**38**) to detect the number of revolutions of said output shaft (**38**),

said spring assembly (**47**) interacts with said output flange (**46**) and said comparator element (**74**), and

the pre-load force of said spring assembly (**47**) is varied due to relative rotation between said comparator element (**74**) and said output flange (**46**) during operation of said drive device.

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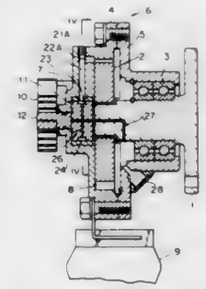
FLUID COUPLING HAVING A VANE PUMP SYSTEM

Yasuhei Kikuchi, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Apr. 24, 1991, Ser. No. 690,695
Claims priority, application Japan, Apr. 27, 1990, 2-110551
Int. Cl.[5] F16D *31/02*
U.S. Cl. 192—60 15 Claims



1. A temperature-controlled pneumatic coupling adapted for use in intermittently driving a cooling fan, comprising:

a drive input shaft;

a housing rotatably supported on said drive input shaft and being adapted to support the cooling fan, said housing having an actuating chamber defined therein which has a curved wall configuration;

a rotor mounted on and fixed for rotation with said drive input shaft and being accommodated in said actuating chamber, said rotor having a plurality of radially extending slots defined therein;

a plurality of radial vanes radially movably accommodated in said plurality of radially extending slots, respectively;

a plurality of pneumatic fluid passages communicating with said actuating chamber;

a rotatable substantially cylindrical valve member, having at least one valve passage formed therein, for changing fluid communication between said fluid passages; and

a temperature sensitive member mounted outside said housing for rotating said substantially cylindrical valve member in response to changes in ambient temperature.

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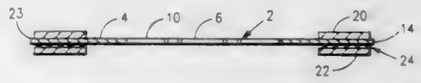
FRICTION FACING MATERIAL AND CARRIER ASSEMBLY

John F. Fitzpatrick-Ellis; Richard D. Cooke, both of Warwick, and Stuart J. Sleath, Leamington Spa, all of United Kingdom, assignors to Automotive Products plc, England

PCT No. PCT/GB90/00098, § 371 Date Jul. 24, 1991, § 102(e) Date Jul. 24, 1991, PCT Pub. No. WO90/08908, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 25, 1990, Ser. No. 730,787
Claims priority, application United Kingdom, Jan. 27, 1989, 8901880
Int. Cl.[5] F16D *13/64, 69/04*
U.S. Cl. 192—70.11 26 Claims



1. A friction material and carrier assembly for a clutch driven plate, the assembly being intended for rotation about an axis and said assembly comprising a carrier having first and second opposite sides, a first array of friction material disposed at said first side, a second array of friction material disposed at said second side, each array of friction material being arranged circumferentially about said axis, a first adhesive bond securing the first array of friction material to the carrier and a second adhesive bond securing the second array of friction material to the carrier, said second adhesive bond being of an elastomeric material providing resilient cushioning relative to the carrier for the second array of friction material, and said first adhesive bond being axially thinner than said second adhesive bond to provide e less axial cushioning movement than said second adhesive bond thereby to allow less axial movement relative to the carrier for the first array of friction material than is provided for the second array of friction material.

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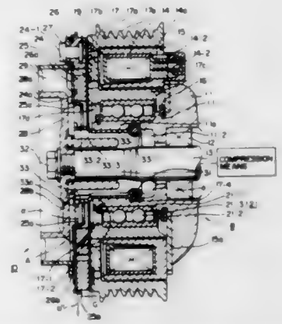
ELECTROMAGNETIC CLUTCH FOR A COMPRESSOR

Masashi Tobyama, Obu; Masahito Yamashita, Nagoya, and Kazushige Murao, Kariya, all of Japan, assignors to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of Kariya, Japan

Filed May 27, 1992, Ser. No. 888,359
Claims priority, application Japan, May 28, 1991, 3-038563[U]; Mar. 19, 1992, 4-014911[U]
Int. Cl.[5] F16D *27/10*
U.S. Cl. 192—84 C 12 Claims



1. In a connected construction between an electromagnetic clutch and a compressor, wherein the compressor has a housing having a boss portion defining an axial opening, and a drive shaft which is rotatably supported at the housing and passed

through the opening via a shaft seal member, and wherein the

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movement member, said measuring and movement members

representative of the envelope of the AC signal based on

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through the opening via a shaft seal member, and wherein the electromagnetic clutch has a rotor rotatably supported at the boss portion, a solenoid stationarily arranged in an annular space formed in the rotor, an armature arranged so as to axially face the rotor, a holder for holding the armature, a hub which is connected to the drive shaft of the compressor, and an annular cushion rubber arranged between the holder and the hub for an elastic connection of the armature with the drive shaft, the improvement comprising, in combination, an annular cover which is arranged on a surface of the armature opposite the surface thereof facing the rotor, the cover having a central opening, and an annular oil sleeve extending coaxially from said tubular boss portion which includes a free end extended through said opening of the cover, said oil sleeve defining, at its free end, an annular flange shaped oil cut portion extending radially outwardly in such a manner that said oil cut portion is located axially outwardly from said opening.

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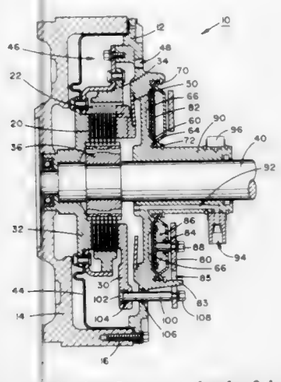
AIR RELEASING WET CLUTCH

Richard A. Flotow, 4859 County Rd. 36A, Butler, Ind. 46721

Filed Mar. 31, 1992, Ser. No. 861,303

Int. Cl.[5] F16D *25/04, 13/56*

U.S. Cl. 192—88 A **4 Claims**



1. A release mechanism for a wet clutch of the type including a clutch pack having interleaved driven and intermediates disks, the driven disks being attached to a rotatable shaft and the intermediate disks being attached to a driven hub, a pressure plate disposed so as to apply clamping pressure to said clutch pack so as to cause said interleaved disks to frictionally engage each other, a clutch cover having an inner surface disposed adjacent said pressure plate and having an outer surface, and spring means to apply said clamping pressure to said pressure plate, said release mechanism comprising:

(a) an air operated, annular diaphragm sealingly attached to said cover and operatively connected to said pressure plate to draw said pressure plate from said clutch pack and release said clamping pressure therefrom;

(b) a release plate disposed adjacent said outer surface of said clutch cover and attached to said pressure plate through said cover;

(c) said air operated diaphragm being disposed between said outer surface and said release plate so as to force said release plate away from said outer surface when air pressure is applied to said diaphragm;

(d) an annular air chamber defined between said diaphragm and said outer surface; and

(e) an annular ring disposed against said diaphragm and attached to said release plate by means of a plurality of bolts.

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APPARATUS FOR AND METHOD OF DISCRIMINATING BILL

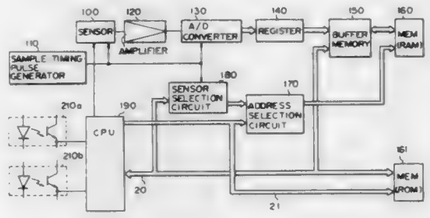
Shinya Kamagami; Takashi Yajima, and Ienobu Takizawa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,707

Claims priority, application Japan, Aug. 22, 1990, 2-219078; Nov. 16, 1990, 2-308654

Int. Cl.[5] G07D *7/00*

U.S. Cl. 194—207 **13 Claims**



13. A method of discriminating a bill in a bill discriminating apparatus comprising sensor means for reading all the printed patterns of a discriminated bill and producing discriminated data including bill scale data representing the tone of the printed patterns, and a data storage memory for storing the discriminated data including bill scale data produced by the sensor means, the method comprising the steps of:

selecting and fetching the bill scale data from the data storage memory with bill scale data selection means;

segmenting the thus fetched bill scale data into a plurality of block areas with data segmenting means;

subjecting the segmented bill scale data to an arithmetic averaging process each block area with data arithmetic means; and

comparing the segmented bill scale data which was subjected to an arithmetic averaging process in each block area with standard operation data for each of a plurality of bills previously determined, with bill decision means.

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COIN OPERATED LOCK FOR DELIVERING A LOCKING MEANS SECURED IN SAID LOCK

Aage Lenander, Horsholm, and Bertil Engstrom, Graested, both of Denmark, assignors to Catena Systems APS, Denmark

PCT No. PCT/DK89/00299, § 371 Date Aug. 15, 1991, § 102(e) Date Aug. 15, 1991, PCT Pub. No. WO90/07167, PCT Pub. Date Jun. 28, 1990

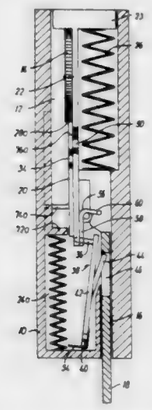
PCT Filed Dec. 20, 1989, Ser. No. 678,965

Claims priority, application Denmark, Dec. 20, 1988, 7103/88

Int. Cl.[5] G07F *17/00*

U.S. Cl. 194—212 **6 Claims**

1. A coin operated lock for delivering a locking means secured in said lock after the introduction of a means of payment, such as a coin, into said lock, said lock comprising, a first chamber for receiving the locking means, securing members for securing the locking means in the first chamber, a second chamber for receiving said means of payment, delivering members for delivering the locking means after the introduction of the means of payment, a scanning member associated with the second chamber, said scanning member adapted to scan, during a displacement movement, the sizes of the introduced means of payment in the direction of the displacement movement of the scanning member, and corresponding to at least one of such sizes, said scanning member being provided with at least one recess for receiving a releasing member attached to the first chamber, said scanning member adapted to move into engagement with said recess so as to cause release of the locking means to permit removal thereof from the first chamber, said scanning member including a measuring member and a movement member, said measuring and movement members being coupled together so as to move at the same time and in relation to each other, the measuring member being provided



with said at least one recess, said movement member including a passage for receipt of the releasing member in engagement connection in the passage and said at least one recess when they occupy a displacement position aligned with each other.

5,199,545

METAL BODY DISCRIMINATING APPARATUS

Kaihei Takamisawa, Saku, and Masakazu Tokumura, Minamisaku, both of Japan, assignors to Takamisawa Cybernetics Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1991, Ser. No. 757,468

Claims priority, application Japan, Feb. 28, 1991, 3-034620

Int. Cl.[5] G07D *5/08*

U.S. Cl. 194—319 **10 Claims**

1. Apparatus for discriminating a metal body, said apparatus comprising:

a hollow body;

a self-oscillator having a coil wound around said hollow body and a feedback capacitive element operatively coupled to said coil, wherein a feedback voltage of the self-oscillator is applied to the capacitive element to generate a first AC signal;

first detecting means operatively electrically connected to said self-oscillator for detecting the frequency of the AC signal and for outputting signals indicative of the frequency on the basis of such detection; and

second detecting means operatively electrically connected to said self-oscillator for detecting the amplitudes of the waveform of the AC signal and for outputting signals representative of the envelope of the AC signal based on such detection,

whereby when a metal body passes through said hollow body and the space within said coil wound therearound, the amplitude and frequency of the AC signal changes such that the outputs of said detecting means discriminates the metal body.

5,199,546

DISTRIBUTING DEVICE FOR FEEDING FLAT PRODUCTS TO A USER MACHINE

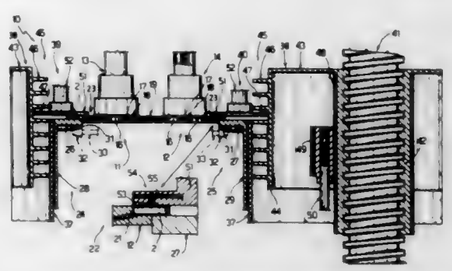
Mario Spatafora, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Jan. 29, 1992, Ser. No. 827,716

Claims priority, application Italy, Feb. 1, 1991, B091A 000028

Int. Cl.[5] B65G *1/00*

U.S. Cl. 198—347.3 **10 Claims**



1. A distributing device (**10**) for feeding flat products (**2**) to a user machine (**5**) having two input channels (**6**, **7**);

the distributing device (**10**) comprising a single feed channel (**4***a*) for a first stream (**3**) of products (**20** being designed to direct the products (**2**) in said first stream (**3**) alternately to said two input channels (**6**, **7**), for feeding each input channel (**6**, **7**) with a respective second stream (**8**, **9**) of products (**2**);

two first transfer devices (**11**, **12**), and two conveyors (**24**, **25**) with each conveyor being connected to a respective first transfer device between the feed channel (**4***a*) and a respective input channel (**6**, **7**) for feeding the input channel (**6**, **7**) with a respective second stream (**8**, **9**) of products (**2**);

pickup and release means (**22**) being provided on each first transfer device (**11**, **12**) for picking up a product (**2**) on a portion of the feed channel (**4***a*) at a pickup station (**4***b*), and transferring the product (**2**) onto the respective conveyor (**24**, **25**) at a release station (**23**);

two compensating stores (**38**) assigned respectively to said two first transfer devices; and

a second transfer device (**39**, **40**) located between each first transfer device (**11**, **12**) and the respective said store (**38**).

5,199,547

METHOD AND DEVICE FOR UNLOADING PRODUCTS OFF A CONTINUOUSLY-MOVING CONVEYOR

Fulvio Boldrini, Ferrara, and Antonio Gamberini, Bologna, both of Italy, assignors to G.D. Societa' Per Azioni, Bologna, Italy

Filed Jul. 27, 1992, Ser. No. 919,858

Claims priority, application Italy, Jul. 29, 1991, BO91 A 000285; Oct. 1, 1991, BO91 A 000348

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—463.2 **8 Claims**

3. A device for unloading products (7) off a continuously-moving conveyor (3) and through a passage (18) located in a fixed position at a given portion of the conveyor (3), which presents a number of seats (8) for receiving respective said products (7); characterized by the fact that it comprises an auxiliary seat (37) located between the conveyor (3) and the

said second plurality of rollers comprising at least a first, arranged in chambers closed at the top, formed for that pur-

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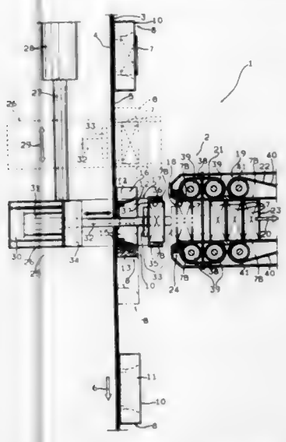
passage (18); a pusher (33) located on the opposite side of the conveyor (3) in relation to the auxiliary seat (37); first actuating means (28) for moving the auxiliary seat (37) and the pusher (33) along the path of said seats (8) at the same speed as the conveyor (3) and into selective alignment with each seat (8) on



the conveyor (3), and to and from an unloading position (17) wherein the auxiliary seat (37) and the pusher (33) are aligned with said passage (18); and second actuating means (31) for moving said pusher (33) to and from said passage (18) through said seats (8) and at a predetermined speed.

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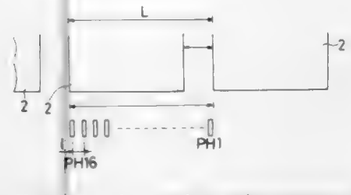
CONTROLS IN A GOODS ASSORTING DEVICE

Michihiro Tanaka; Junichi Teruta, and Shigeo Yamanishi, all of Amagasaki, Japan, assignors to Hitachi Kiden Kogyo K.K., Amagasaki, Japan

Filed Oct. 3, 1991, Ser. No. 770,428
Int. Cl.[5] B65G *43/00*
U.S. Cl. 198—502.4 **1 Claim**



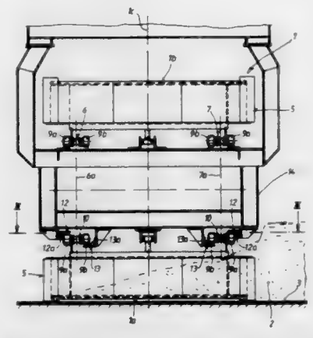
1. A control system in a goods assorting apparatus, wherein goods can be divided accurately into a specified assorting destination by detecting a moving state of an assorting carrier which is driven by a linear motor driving system, wherein the instantaneous speed of a reaction plate provided for the assorting carrier is repeatedly calculated on the basis of the times at which the states of a large plurality of photoelectric switches changes, said photoelectric switches being more than two in number and being arranged at regular intervals in one section of a reaction plate fitting pitch and detecting movement of the reaction plate and, on the basis of such varying data, generation of synchronizing signals is carried out by a predetermined pattern and an absolute position of the reaction plate in the reaction plate fitting pitch is detected.

5,199,549

SCRAPER CONVEYOR FOR LOOSE BULK MATERIAL

Hubertus Lütke, Beckum, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Jul. 14, 1992, Ser. No. 913,230
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1991, 4124405
Int. Cl.[5] B65G *65/06*
U.S. Cl. 198—520 **5 Claims**



1. Scraper conveyor for loose bulk material with a lower material conveying run (1*a*) and an upper return run (1*b*), particularly in the form of a reclaiming scraper conveyor which removes bulk material from bulk material pile (3), containing a plurality of paddle-shaped conveyor elements (5) which are arranged behind one another in the direction of conveying the material (4), are connected by at least one continuously circulating drawing means (6, 7) and are supported and guided in the region of at least two longitudinal central planes of reference (6*a*, 7*a*) running parallel to one another, in each case by means of supporting rollers (9*a*, 9*b*) of rail-like roller guiding arrangements (12, 13) with upper and lower bearing surfaces (12*a*, 13), characterised in that the supporting rollers (9*a*, 9*b*) are provided on both sides of the appertaining longitudinal central plane of reference (6*a*, 7*a*) and each roller guiding arrangement contains at least in the region of the lower material conveying run (1*a*) an upper guide rail (12) lying above the supporting rollers (9*a*) on one side of the longitudinal central plane of reference and forming the upper bearing surface (12*a*) as well as a lower guide rail (13) lying below the supporting rollers (9*b*) on the other side of the longitudinal central plane of reference and forming the lower bearing surface (13*a*).

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BELT TYPE TRANSFER APPARATUS AND SECTIONAL ROLLER USED THEREIN

Hitoshi Wachi, Fujioka, and Houji Yamato, Isesaki, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/01244, § 371 Date Aug. 9, 1991, § 102(e) Date Aug. 9, 1991, PCT Pub. No. WO91/08969, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 12, 1989, Ser. No. 752,626
Int. Cl.[5] B65G *15/14*
U.S. Cl. 198—626.1 **4 Claims**

1. In a belt-type transfer apparatus for conveying an object, means for changing the direction of said conveyance from a first direction to a second direction displaced from said first direction by an angle θ, said means comprising:

a first plurality of rollers;

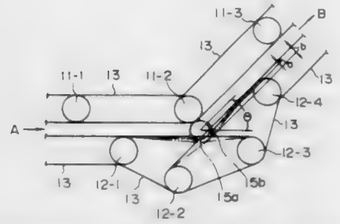
a first set of belts wound around successive rollers in said first plurality;

a second plurality of rollers spaced from said first plurality;

said second plurality of rollers comprising at least a first, second, third and fourth roller;

a second set of belts wound around said second plurality of rollers, said second set of belts comprising at least a first belt and a second belt, said first and second sets of belts defining a path of travel therebetween for said object, said object being held in said path of travel by said first and second sets of belts;

wherein at least one of said first plurality of rollers is arranged with respect to said other of said first plurality of rollers so as to cause said object to change direction, and wherein said second set of belts is wound such that said first belt is wound around at least said first, second and third roller and said second belt is wound around at least said second, third and fourth roller such that said object is held in said path of travel by said first belt during conveyance in said first direction, by said first and second belts during said change in direction, and by said second belt during conveyance in said second direction.

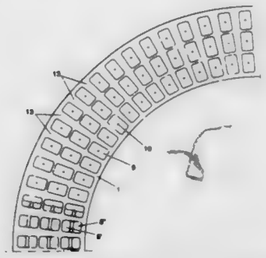


5,199,551

BEND SEGMENT FOR A CHAIN CONVEYOR

Jacobus J. Wallaart, Esdoornstraat 41, 2691 VG 's-Gravenzande, and Constantinus P. J. M. Vermeulen, 2e Middellandstraat 2, 3021 BM Rotterdam, both of Netherlands

Filed Apr. 16, 1992, Ser. No. 869,685
Claims priority, application Netherlands, Apr. 19, 1991, 9100690
Int. Cl.[5] B65G *15/60*
U.S. Cl. 198—805 **12 Claims**



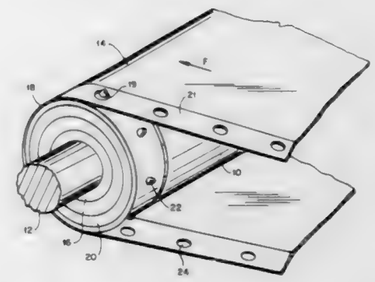
1. A bend segment for a chain conveyor comprising a conveyor chain movable over a track including at least one bend zone, said bend segment consisting of at least one substantially U-shaped plastics element and the legs (2,3) of the U-shaped element forming the rails over which the chain can move, while said chain comprises links (4) each comprising a substantially rectangular bearing surface and a connection system (5,6) located below the bearing surface, the successive links being pivotally coupled to each other through the connection systems thereof and consisting at least partly of a magnetizable material, and permanent magnets (8) are arranged at least in the connecting portion (12) between the legs of the U-shaped element, characterized in that the permanent magnets (8) are arranged in chambers closed at the top, formed for that purpose in the bottom surface (1) of the U-shaped plastics element, said chambers being separated from each other by radially extending ribs (11), and the chambers and the magnets (8) extend in the bottom surface on opposite sides of the connecting portion over a substantial part of the width of the legs (2,3) of the U-shaped element.

5,199,552

ENDLESS BELT CONVEYOR

Gilbert Dauchez, Blanc Mesnil, France, assignor to FCB, Montreuil, France

Filed Jun. 8, 1992, Ser. No. 895,330
Claims priority, application France, Jun. 10, 1991, 91 07040
Int. Cl.[5] B65G *23/06*
U.S. Cl. 198—834 **5 Claims**



1. An endless belt conveyor comprising

(a) two pulleys

(1) one of which is a drive pulley having opposite ends and having a drive shaft arranged to rotate the pulley in a direction of rotation,

(b) an endless belt trained over the pulleys, and

(c) belt guiding means at at least one of the drive pulley ends, the belt guiding means comprising

(1) a freewheel including an outer ring and an inner ring, the outer ring being mounted on the inner ring for unidirectional rotation in the direction of rotation of the drive pulley and the inner ring being fastened to the pulley shaft for rotation therewith, and

(2) a circular row of studs affixed to the outer ring of the freewheel,

(3) the belt having an edge aligned with the row of studs and defining a row of holes, the studs fitting into the holes.

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SLIDING CONTACTOR FOR ELECTRIC EQUIPMENT

Hisaji Shinohara; Naoshi Uchida; Kiyoshi Kandatsu, all of Kanagawa; Soujun Matsumura; Tadashi Chiba, both of Osaka, and Shigeharu Miyazaki, Tokyo, all of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 652,635, Feb. 8, 1991, abandoned. This application Oct. 8, 1991, Ser. No. 772,084
Claims priority, application Japan, Oct. 9, 1990, 2-271498
Int. Cl.[5] H01H *1/02*
U.S. Cl. 200—265 **2 Claims**

1. A movable electrical contactor having a surface thereof in slidable contact with a mating conductor, said surface being coated with a composite material in which particles of graphite (C) are dispersed in a matrix of silver (Ag), characterized in that the coating film is formed by electric plating using a plating liquid comprising:

metal silver in the range of 2–100 g/l in concentration, potas-

sium cyanide in the range of 2–250 g/l, potassium hydrox-

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cross rib to engage said lower and sloping surface portions of said sliding ways;

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ELECTRIC PUSH BUTTON SWITCH, ESPECIALLY

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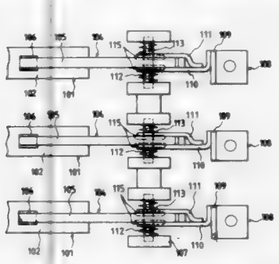
sium cyanide in the range of 2–250 g/l, potassium hydroxide in the range of 0.5–15 g/l, graphite powder in the



range of 1–55 g/l, and a dispersant for dispersing graphite powder into plating liquid in the range of 10–2000 ppm.

5,199,554

SPRING CONTACT

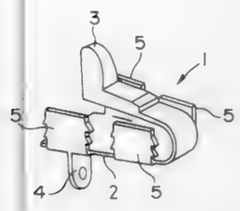
Toshiji Kano, and Kenji Katayose, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1991, Ser. No. 745,711

Claims priority, application Japan, Sep. 13, 1990, 2-95565[U]

Int. Cl.[5] H01H *1/26*

U.S. Cl. 200—283 **4 Claims**



1. A spring contact device comprising:

an insulative case having at least one pair of slots extending upwardly from a bottom thereof; and

a spring contact attached to said insulative case, said spring contact comprising:

a contact portion made by bending upwardly a thick portion of a profile spring sheet at one end such that said contact portion projects through an aperture in a top of said case;

a terminal portion made from a thinner portion of said profile spring sheet at another end so as to project downwardly from a bottom of said case;

a U-shaped leaf spring portion made from a middle portion of said profile spring sheet between said contact and terminal portions, thereby connecting said contact portion to said terminal portion such that said contact portion is resiliently movable with respect to said terminal portion; and

at least one pair of press-fit lugs extending upwardly from opposite sides of a lower section of said U-shaped leaf spring portion such that an upper section of said U-shaped leaf spring portion is disposed between said press-fit lugs, said press-fit lugs having engaging projections and being press fitted into said slots for securing said spring contact to said case.

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PUSH BUTTON SWITCH

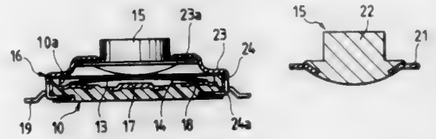
Kouichi Hirano, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1992, Ser. No. 839,638

Claims priority, application Japan, Feb. 22, 1991, 3-048789

Int. Cl.[5] H01H *13/14, 13/04*

U.S. Cl. 200—341 **7 Claims**



1. A push button switch comprising:

a housing having a main body defining an opening in an inner bottom surface therein;

a fixed contact exposed on the inner bottom surface;

a movable contact disposed to face said fixed contact;

a stem having a flange portion around the main body and being mounted on the housing movably in an up-and-down direction;

said movable contact contacting said fixed contact when said stem is lowered; and

said stem being a first metallic material constituting said flange portion and a second metallic material constituting said main body.

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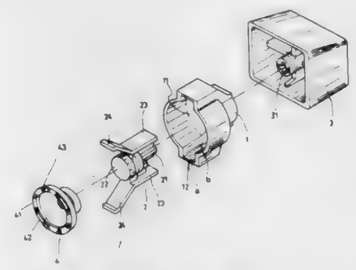
STRUCTURE OF KEY SWITCH

Michael Lee, Taipei, Taiwan, assignor to Silitek Corporation, Taiwan

Filed Oct. 8, 1991, Ser. No. 772,789

Int. Cl.[5] H01H *13/70*

U.S. Cl. 200—345 **1 Claim**



1. A key switch actuator comprising:

a locating member including a substantially ring-shaped body having a central opening therethrough, said body having two opposite sliding ways positioned within said central opening, said central opening having two opposing locations wherein one of said two opposite sliding ways is located at one of said opposing locations and the other of said two opposite sliding ways is located at the other of said opposing locations, each of said sliding ways having a lower surface portion, an upper surface portion and a sloping surface portion extending therebetween;

a switching member slidably positioned within said central opening of said locating member, said switching member having a cross rib circular flange connected thereto and two opposite side plates attached to said cross rib; said switching member side plates are slidably positioned within said two sliding ways, each of said side plates having an extension obliquely extending away from said cross rib to engage said lower and sloping surface portions of said sliding ways;

a key cap movably connected to said switch member for moving said switch member within said locating member, said key cap having a cross slot adapted to engage the cross rib of said switch member and

an elastic member adapted to support said switching member on a PC board in a keyboard, said elastic member having a ring-shaped bottom, said ring-shaped bottom having a plurality of notches defining therebetween a plurality of raised edges, each of said edges having a plurality of raised portions adapted to be positioned on said PC board.

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METHOD OF PRODUCING AN ELECTRIC OR ELECTRONIC COMPONENT, A METHOD OF PRODUCING A KEY AND A KEY

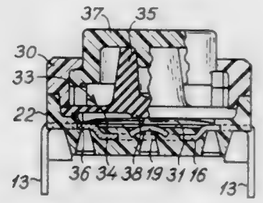
Gert Brandt, Rødovre, and Søren R. Hansen, Ballerup, both of Denmark, assignors to MEC A/S, Ballerup, Denmark

Continuation of Ser. No. 457,178, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 156,827, Feb. 17, 1988, abandoned. This application Nov. 19, 1990, Ser. No. 615,306

Claims priority, application Denmark, Jan. 28, 1988, 430/88

Int. Cl.[5] H01H *5/18, 13/14*

U.S. Cl. 200—406 **12 Claims**



1. A key comprising:

a housing of an electrically insulating material defining a recess therein,

at least two mutually spaced metallic terminal components each including an outer terminal and extending out from the housing and an inner contact means exposed in said recess,

a switching element arranged within the recess and being switchable between a first state, in which it is out of electrically conductive contact with at least one of the electric contact means, and a second state, in which the switching element is contacting both of said contact means so as to establish electrically conductive contact therebetween,

a membrane of an elastic material extending transversely to the recess so as to define therein a sealed chamber containing the switching element and the contact means, a first side surface of the membrane being in abutting engagement with the switching element,

a stem part made from an elastically compressible material extending from a second opposite side surface of the membrane, the stem part being formed integrally with the membrane, extending substantially at right angles to the membrane, from a central part thereof, and having an outer free end, the stem having a conical shape with a base of the conical shape in contact with the membrane, the stem further having an inner hollow portion, and

an actuating member connected to the outer free end of said stem part and being movable in relation to the housing, whereby the switching element may be switched between its first and second states by depressing the actuating member, the movement of the actuating member being transmitted to the switching element through the elastically compressible stem part.

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ELECTRIC PUSH BUTTON SWITCH, ESPECIALLY HAZARD-WARNING-SIGNAL SWITCH FOR MOTOR VEHICLES

Walter Neubauer, Lauffen, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Beitigheim-Bissingen, Fed. Rep. of Germany

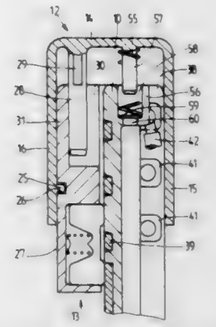
PCT No. PCT/EP90/01927, § 371 Date Jul. 19, 1991, § 102(e) Date Jul. 19, 1991, PCT Pub. No. WO91/06966, PCT Pub. Date May 16, 1991

PCT Filed Oct. 29, 1990, Ser. No. 720,472

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936380

Int. Cl.[5] H01H *13/12*

U.S. Cl. 200—531 **34 Claims**



17. An electric push button switch comprising:

a push button linearly actuable in a direction, said push button having first, second, third and fourth side walls and a top, each having an inside which together define an internal cavity;

a slide having a length extending in the direction of said linear actuation, most of the length of said slide being positioned in said internal cavity in said push button;

means for mounting said slide to said second side wall of said push button such that said slide is movable with said push button in the direction of actuation of said push button and is spaced from an opposed, first side wall of said push button;

a socket having a length extending in said direction of linear actuation and a series of stationary contacts mounted along said length thereon, said socket projecting into said interior cavity of said push button between said slide and said first side wall of said push button with most of the length received therein to be positioned side by side with said slide within said interior cavity;

said stationary contacts each extending through said socket and including a terminal section disposed on a side of said socket opposite from a side of said socket facing said slide;

said terminal section of each of said stationary contacts being arranged in a row and located within said hollow interior of said push button;

an electrical connection fixed to each terminal section of said stationary contacts and disposed between said socket and said first side wall of said push button;

a reset spring interposed between the inside of said top of said push button and an abutment on said socket for normally biasing said push button away from said socket;

a guide pin mounted on the inside of said top and extending from said push button toward said socket;

said reset spring disposed about said guide pin and seated on a seat formed on said abutment on said socket;

a pin receiver opening formed adjacent to said seat on said abutment for receiving said guide pin; and

bridging contacts on said slide for establishing electrical connection with said stationary contacts on said socket.

5,199,559

mounted to the inner side of said first sidemember and a

locking means in the outer cannula-retaining panel and the

of opposed generally convexly shaped end walls joined to

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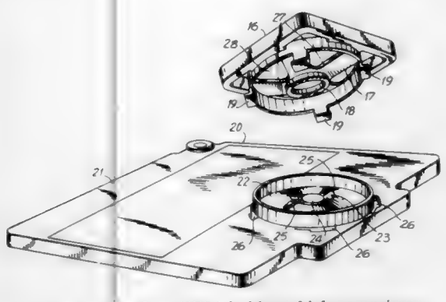
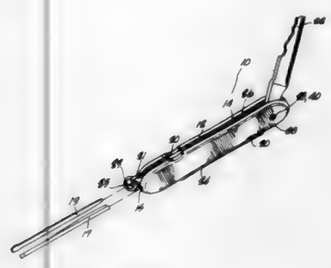
5,199,559
INTRAOCULAR LENS CASE
Stephen R. Dark, Riverside, Calif., assignor to Ioptex Research, Inc., Irwindale, Calif.
Filed Mar. 16, 1992, Ser. No. 851,916
Int. Cl.[5] B65D *81/24*
U.S. Cl. 206—5.1 **11 Claims**



1. An intraocular lens (IOL) holder which comprises:
(a) a base having a recessed portion which contains a concave portion sized to hold and support and IOL with or without loops affixed thereto or integral therewith;
(b) a cover for the base which has disposed therein a flexible insert wherein the flexible insert has an open, substantially circular central portion and spokes radially extending therefrom and substantially equidistantly spaced from each other; and
(c) means for locking said cover and said holder base in secure relationship to one another.

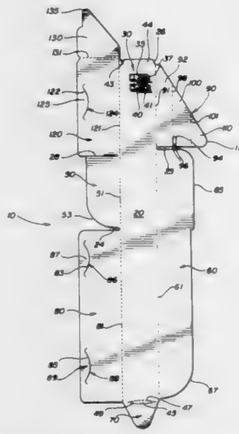
5. An intraocular lens (IOL) holder which comprises:
(a) a base having a recessed portion which contains a concave portion sized to hold and support an IOL with or without loops affixed thereto or integral therewith, and further, wherein said base is integral with a case body;
(b) a cover for the base which has disposed therein a flexible insert wherein the flexible insert has an open, substantially circular central portion and spokes radially extending therefrom and substantially equidistantly spaced from each other; and
(c) means for locking said cover and said holder base in secure relationship to one another.

5,199,560
KEY CASE WITH RETRACTABLE KEYS
Dong H. Lee, 5113 Ramsdell Ave., La Crescenta, Calif. 91214, and Jae W. Hyun, 39 Penny La., Scarsdale, N.Y. 10583
Filed Aug. 31, 1992, Ser. No. 937,141
Int. Cl.[5] A45C *11/32*
U.S. Cl. 206—37.3 **13 Claims**



1. A key case with retractable keys comprising:
a) a first sidemember,
b) a lower leaf spring having a first end that is pivotally mounted to the inner side of said first sidemember and a second end that is free standing,
c) an upper leaf spring that lays atop said lower leaf spring and having a free-standing first end and a second end that is pivotally mounted to the inner side of said first sidemember, where the free-standing end of each said spring produces a spring force when each of said springs is pressed against the pivoted end of the interfacing said spring,
d) a first key articulately mounted at one end of said first sidemember above the free-standing first end of said upper leaf spring,
e) a second key articulately mounted at the opposite end of said first sidemember below the free-standing second end of said lower leaf spring, where the respective said springs allow said first and second keys to be selectively extracted from their retracted positions to either a horizontal position or an angled position, and
f) a second sidemember that is attached to said first sidemember by means of rivets which also function as the pivot pins for said springs and keys, where said second sidemember maintains said key case in an assembled condition.

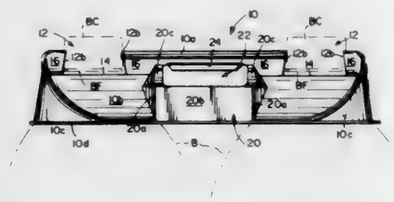
5,199,561
PACKAGE FOR ENDOSCOPIC NEEDLE AND SUTURE AND CANNULA ASSEMBLY
Constance E. Roshdy, New Egypt, N.J., and Robert J. Cerwin, Pipersville, Pa., assignors to Ethicon, Inc., Somerville, N.J.
Filed Feb. 18, 1992, Ser. No. 836,497
Int. Cl.[5] A61L *17/02*
U.S. Cl. 206—63.3 **15 Claims**



1. A package comprising:
a central panel with four sides said panel having a top and a bottom;
a first suture-retaining panel foldably attached to a first side of the central panel;
an outer cannula-retaining panel foldably attached to the first side of the central panel;
an upper, outer locking panel foldably connected to the first side of central panel above the first suture retaining panel;
a lower suture-retaining panel foldably connected to a second side of the central panel;
an upper cannula-retaining panel foldably connected to the second side of the central panel above the lower suture-retaining panel;
cannula locking means in the upper cannula-retaining panel for retaining a cannula;
locking means in the outer cannula-retaining panel and the upper, outer locking panel for fastening the package; and,
needle park means on the central panel for receiving and retaining a surgical needle.

13. A package, comprising
a central panel having a top and a bottom, said panel having a substantially rectangular shape with two major sides and an upper minor side and a lower minor side;
a first suture-retaining panel foldably attached, centrally, to a first major side of the central panel;
an outer cannula-retaining panel foldably attached to the first major side of the central panel below the first suture-retaining panel;
an upper, outer locking panel foldably connected to the central panel above the first suture-retaining panel;
an inner suture-retaining panel foldably connected to the second major side of the central panel;
a triangularly-shaped cannula-retaining panel foldably connected to the second major side of the central panel above the inner cannula-retaining panel;
an end tab panel foldably connected to the lower minor side of the central panel;
a tab extending from the upper minor side of the central panel for retaining a suture;
cannula locking means in the triangularly-shaped panel for retaining a cannula;
locking means in the outer cannula retaining panel and the upper, outer locking panel for fastening the package; and,
needle park means on the central panel for receiving and retaining a surgical needle.

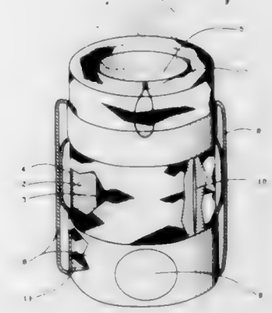
5,199,562
MULTIPLE BOTTLE CARRIER
Arthur E. Adami, Andover, Mass., and Christopher P. Amberg, Ownings Mills, Md., assignors to Sweetheart Cup Company Inc., Owings Mills, Md.
Filed Mar. 5, 1992, Ser. No. 845,925
Int. Cl.[5] B65D *71/00*
U.S. Cl. 206—151 **17 Claims**



1. A multiple bottle carrier comprising a one-piece carrier body which includes:
an upper wall, and opposed pairs of side and end walls;
lateral reinforcement projections formed in said opposed pair of side walls of said carrier body;
a plurality of bottleneck-receiving apertures formed in said carrier body and corresponding in number to the bottles to be carried;
an opposed pair of substantially horizontal support surfaces associated with each said aperture for supporting an annular bottleneck flange of a bottle received in said aperture and thereby supporting the bottle when carried by the carrier; and
a pair of opposed resilient fingers also associated with each said aperture, said fingers extending upwardly from said support surfaces to a location above the bottleneck flange when the bottle is received in the aperture, and converging towards one another so as to removably lock the bottle to the carrier.

11. A multiple bottle carrier comprising:
a one-piece carrier body having an upper wall, a pair of opposed side walls which are joined to said upper wall along and which divergingly extend therefrom, and a pair of opposed generally convexly shaped end walls joined to said side walls and said upper wall;
said side and end walls collectively establishing a continuous bottom edge of said carrier body which establishes an opened bottom cavity of said carrier body to receive an upper shoulder region of bottles to be carried thereby;
a number of bottleneck-receiving apertures formed in said carrier body and corresponding in number to the bottles to be carried;
an opposed pair of substantially horizontal support surfaces associated with each said aperture for supporting an annular bottleneck flange of a bottle received in said aperture and thereby supporting the bottle when carried by the carrier;
a pair of opposed resilient fingers also associated with each said aperture, said fingers extending upwardly from said support surfaces to a location above the bottleneck flange when the bottle is received in the aperture, and converging towards one another so as to removably lock the bottle to the carrier; and
a perimetrical bottom flange joined to and extending along said bottom edge of said carrier body, said bottom flange contacting said upper shoulder regions of the bottles carried thereby to compress the carrier body in the region between the support surfaces and the bottom flange which, in turn, causes the support surfaces to exert an upward bias force against the bottleneck flanges of bottles supported thereby.

5,199,563
CUSHIONED CAMERA CASE
H. Gene Goodman, 3564 Hill Dr., Duluth, Ga. 30136
Filed Dec. 23, 1991, Ser. No. 811,987
Int. Cl.[5] B65D *85/38, 85/30*
U.S. Cl. 206—316.2 **23 Claims**



1. A cushioned camera case comprising:
a tubular body made of thick resilient material without rigid framework,
expansion sections for camera component appendages; a fixed base end; wherein the expansion sections for camera component appendages are slits of select lengths positioned in walls of the tubular body; and
an easy-open entrance at an opposite end from the fixed base end.

5,199,564

therein for engagement with the advancement mecha-

with said at least one portal such that a battery is insertable or removable directly by an electronic device; and

a tray;

a plurality of wells formed within said tray, each of said

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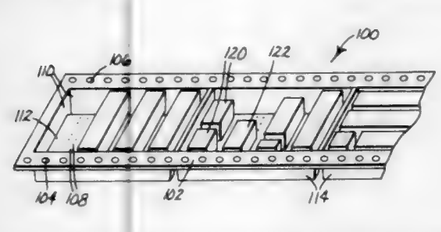
5,199,564
CARRIER TAPE FOR ELECTRONIC THROUGH-HOLE COMPONENTS
Thomas Skrtic, Eau Claire, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 13, 1992, Ser. No. 851,420
Int. Cl.[5] B65D 73/02
U.S. Cl. 206—330 30 Claims

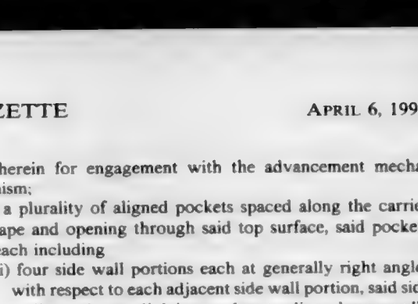


1. A unitary flexible carrier tape for storage and seriatim delivery of electronic through-hole components by an advancement mechanism, each component having a body having a plurality of pins projecting from the body and arranged in two parallel rows, the carrier tape comprising:
(a) strip portion defining a top surface, said strip portion including laterally spaced, parallel rows of aligned holes formed in said top surface for engagement with the advancement mechanism;
(b) a plurality of aligned pockets spaced along the carrier tape and opening through said top surface, said pockets each including
(i) four side wall portions each at generally right angles with respect to each adjacent wall portion, said side wall portions adjoining and extending downwardly from said top surface of said strip portion, and
(ii) a bottom wall portion adjoining said side wall portions to form the pocket, said bottom wall portion having
(A) two parallel rows of aligned apertures formed therein and adapted for receipt of and engagement with each of the pins one of the components, said rows having at least as many apertures as the component has pins, and
(B) two spaced rib portions formed in said bottom wall and projecting away from said strip portion for a distance greater than the length of the pins to protect the pins of the component.

9. A unitary flexible carrier tape for storage and seriatim delivery of electronic through-hole components by an advancement mechanism, each component having a body including a plurality of arranged pins projecting substantially downwardly from the body, the carrier tape comprising:
(a) a strip portion defining a top surface, said strip portion including opposed, parallel rows of aligned holes formed therein for engagement with the advancement mechanism;
(b) a plurality of aligned pockets spaced along the carrier tape and opening through said top surface, said pockets each including
(i) at least one wall portion adjoining and extending downwardly from said top surface of said strip portion, and
(ii) a bottom wall portion adjoining said side wall portion to form the pocket, said bottom wall portion having
(A) a plurality of arranged apertures formed therein and adapted for receipt of each of the pins of the components, said bottom wall portion having at least as many apertures as the component has pins, and
(B) at least one rib portion formed in said bottom wall and projecting away from said strip portion for a distance greater than the length of the pins to protect the pins of the component.

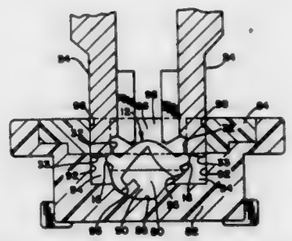
25. A unitary flexible carrier tape adapted for advancement by a mechanism, the carrier tape comprising:
(a) a strip portion defining a top surface, said strip portion including opposed, parallel rows of aligned holes formed therein for engagement with the advancement mechanism;
(b) a plurality of aligned pockets spaced along the carrier tape and opening through said top surface, said pockets each including
(i) four side wall portions each at generally right angles with respect to each adjacent side wall portion, said side wall portions adjoining and extending downwardly from said top surface of said strip portion, and
(ii) a bottom wall portion adjoining said side wall portions to form the pocket, said bottom wall portion having
(A) a plurality of arranged apertures formed therein and adapted for receipt of and engagement with each of the pins of the components, said bottom wall portion having at least as many apertures as the component has pins, and
(B) two spaced rib portions formed in said bottom wall and projecting away from said strip portion for a distance greater than the length of the pins to protect the pins of the component,
(c) a plurality of electronic through-hole components disposed within said pockets, each component having a body including a plurality of arranged pins projecting from the body, each of the pins having a downwardly extending terminal end, said components adapted for carriage within said pockets with said pins disposed within said apertures to form a loaded carrier tape and to enable delivery of said components by said loaded carrier tape as said loaded carrier tape is advanced by the mechanism; and
(d) a core around which said loaded carrier tape is wound to form a supply roll.

5,199,565
SMALL BATTERY DISPENSING AND REMOVAL APPARATUS
Barry Voroba, Minnetonka, Minn., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Nov. 4, 1991, Ser. No. 787,027
Int. Cl.[5] B65D 73/02
U.S. Cl. 206—333 15 Claims



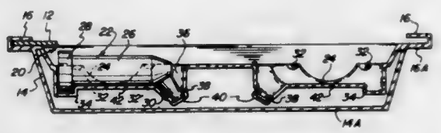
1. A battery dispenser comprising:
a core having a main body portion and a skirt portion, said main body portion defining a space interior of said main body portion;
at least one battery dispensing means formed along said skirt portion for holding a battery in a vertical position for direct insertion into an electronic device;
at least one battery removal means formed adjacent to said main body portion for directly removing a battery from an electronic device;
a housing having at least one portal formed therein and means for rotatably securing said core within said housing wherein rotating said core positions each of said dispensing means and said removal means into communication with said at least one portal such that a battery is insertable or removable directly by an electronic device; and
battery support means adjacent to said at least one battery dispensing means when said battery dispensing means is in communication with said at least one portal for maintaining a battery held in said dispensing means in said vertical position for insertion into an electronic device.

5,199,566
SURGICAL CLIP APPLIER
Mark S. Ortiz, Milford, Ohio; Michael S. Cropper, Edgewood, Ky.; William J. Zwaskis, Fanwood, N.J., and Richard F. Schwemberger, Cincinnati, Ohio, assignors to Ethicon, Inc., Cincinnati, Ohio
Division of Ser. No. 780,744, Oct. 18, 1991, Pat. No. 5,163,945.
This application Aug. 19, 1992, Ser. No. 932,235
Int. Cl.[5] B65D 85/24
U.S. Cl. 206—339 6 Claims



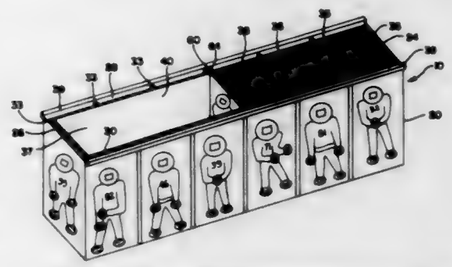
1. A cartridge for housing a plurality of surgical clips that have opposed, hinged leg portions that define side surfaces and which are movable between an open position and a closed position, at least one of the leg portions having a boss portion extending outwardly therefrom, said cartridge comprising:
a base member having at least one cavity formed therein for receipt of a surgical clip therein; said cavity having a floor portion, a pair of opposed, upstanding parallel side walls that are adjusted to be oriented adjacent the side surfaces of a surgical clip and a pair of opposed, upstanding end walls that are adapted to be oriented adjacent at least one boss portion of the clip; spacer portions extending inwardly into said cavity at the intersection of said side walls and said end walls so as to define a generally key-shaped cavity for locating a surgical clip in a spaced relationship from said end walls; and said floor portion and said spacer portions being configured so as to conform to and support the leg portions of a surgical clip as the surgical clip moves between an open position and a closed position.

5,199,567
SINGLE PATIENT DOSE DENTAL CARTRIDGE TRAY AND ORGANIZING SYSTEM
John Discko, Jr., Hamden, Conn., assignor to Centrix, Inc., Shelton, Conn.
Filed May 8, 1991, Ser. No. 697,253
Int. Cl.[5] B65D 83/10
U.S. Cl. 206—369 15 Claims



1. A dental cartridge package comprising:

5,199,568
CARD DISPLAY AND STORAGE CONTAINER
Kenneth F. Streit, 414 S. Seegwun Ave., Mt. Prospect, Ill. 60056, and Richard J. Petrus, 619 Sycamore La., Wheeling, Ill. 60090
Filed Jul. 8, 1992, Ser. No. 910,845
Int. Cl.[5] B65D 5/44
U.S. Cl. 206—443 20 Claims



1. A container for storing and displaying collector cards, comprising:
a base member comprising a floor, four walls, and a plurality of protrusions facing inward from the walls;
an inner liner disposed in an upright position at a substantially uniform distance from each of the four walls, the inner liner engaging the inward-facing protrusions in order to maintain the distance between the inner liner and the walls;
a plurality of outer display compartments for receiving and displaying individual collector cards, the display compartments being defined by at least one of the walls, the floor, the inner liner and the inward-facing protrusions, each display compartment having a width at least about equal to the width of the collector card being displayed; and
an inner storage compartment defined by the inner liner and the floor for receiving and storing collector cards which are not being displayed, the inner storage compartment having a width at least about equal to the width of the collector cards being stored;
the base member further comprising a stiff, transparent construction material to facilitate viewing of the cards in the outer display compartments.

5,199,569
PACKAGE FOR SHEETS OF X-RAY FILM
Matthew Di Pietro, Webster; Thomas J. Kausch, and Vincent B. Dethier, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 6, 1991, Ser. No. 802,967
Int. Cl.[5] B65D 85/00
U.S. Cl. 206—455 6 Claims

1. A package for enclosing a plurality of sheets of photosensitive material, the package comprising:
a pouch for enclosing a plurality of sheets of photosensitive

material, the pouch having a first face and a second face, as to cause liquid at the base wall to run down to and collect at

5,199,572

in book fashion; a tube formed by the cover by and between

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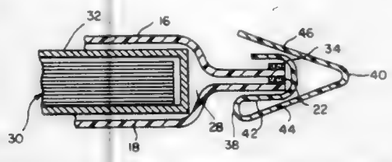
material, the pouch having a first face and a second face located in generally parallel planes, said first and second faces each having an outer surface and an inner surface, means sealing the faces about the periphery together so as to form a space for receiving and completely surrounding and sealing a plurality of sheets of photosensitive material, the pouch having a leading edge and first and second side edges extending from the leading edge, and

a leader secured to the leading edge of the pouch, the leader being engagable for removing the pouch from the plurality of sheets, the leader being folded about the leading edge so that a portion of the leader is adjacent to the outer surface of each of said first and second faces, the leader having side edge portions, means securing the side edge portions of the leader to the first and second side edges of the pouch, the portion of the leader between the side edge portions being free from the pouch, and means for allowing the separation of the leader from the side edges to as to allow the leader to be unfolded from about the leading edge and said first and second faces to its unfolded position.

4. A package containing a plurality of sheets of material, the package comprising;



a pouch for enclosing the plurality sheets, the pouch having a first face and a second face located in generally parallel planes, said first and second faces each having an inner surface and an outer surface, means sealing the faces together so as to fully surround and seal a plurality of sheets within the pouch, the pouch having a leading edge and first and second side edges extending from the leading edge, and

a leader secured to the leading edge of the pouch, the leader being engagable for removing the pouch from the plurality of sheets, the leader being folded about the leading edge so that a portion of the leader is adjacent to the outer surface of each of said first and second faces, the leader having side edge protons, means for securing the side edge portions of the leader to the first and second side edges of the pouch, the portion of the leader between the side edge portions being free from the pouch and means for allowing separation of the leader from the side edges so as to allow the leader to be unfolded from about the leading edge and said first and second faces to its unfolded position.

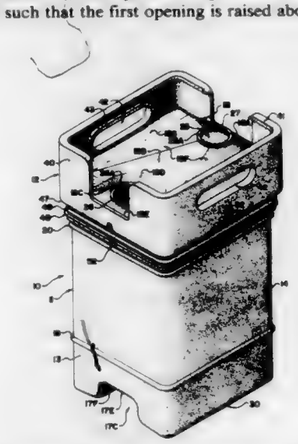
5,199,570

LIQUID TRANSPORTATION CONTAINER

Kenneth M. McKenzie, Winnipeg, Canada, assignor to Bonar Inc., Winnipeg, Canada

Filed Dec. 2, 1991, Ser. No. 801,363
Int. Cl.[5] **B65D** *5/00*
U.S. Cl. 206—503 12 Claims

1. A liquid transportation container comprising a moulded hollow substantially closed container body having a generally horizontal base wall, upstanding side wall means and a generally horizontal top wall, first opening means in the top wall for discharge of liquid contents from the container, the first opening means being arranged in the top wall at a position adjacent one portion of the side wall means and remote from an opposed portion of the side wall means, the base wall being inclined relative to the horizontal such that a first location on the base wall directly vertically below the opposed portion of the side wall means is raised above a second location on the base on the base wall directly vertically below the first opening means so as to cause liquid at the base wall to run down to and collect at the second location, the top wall being inclined relative to the horizontal such that the first opening is raised above a second



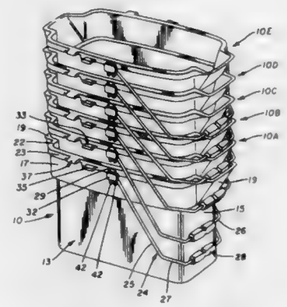
location on the top of wall adjacent said opposed portion of the side wall means, whereby a second similar container can be stacked underneath the container when rotated about a vertical central axis through 180 degrees.

5,199,571

NESTABLE BUCKETS HAVING LOCKABLE BAILS

Stacy L. Wolff, Akron, and Charles W. Craft, Jr., Apple Creek, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Mar. 22, 1991, Ser. No. 674,542
Int. Cl.[5] **B65D** *25/00*
U.S. Cl. 206—518 41 Claims



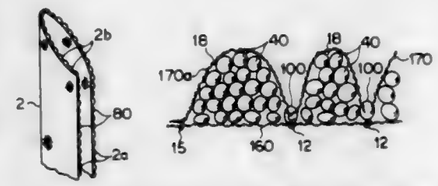
20. A bucket capable of being nested with a plurality of like buckets to form a stack of buckets comprising a bottom surface, opposed side walls and adjoining opposed end walls extending upwardly from said bottom surface forming an open top, a bail having one end pivotally attached to said opposed side walls, a handle carried by the other end of said bail, a spout member formed at the top of at least one of said end walls, said bail having a pivot length such that said handles of the lowest three of the plurality of buckets in a stack rest against the one said end wall of the lowermost bucket and underneath the spout of the lowermost bucket, and the handle of the fourth of the plurality of buckets rests in said spout of the lowermost bucket.

5,199,572

BALLOON STORAGE SYSTEM AND METHOD FOR ASSEMBLING THE SAME

Seietsu Abe, Nichimo Co., Ltd. 6-2, 2-chome, Ohtemachi, Chiyoda-ku, Tokyo, Japan

Continuation of Ser. No. 375,590, Jul. 5, 1989, abandoned. This application Jan. 23, 1991, Ser. No. 644,734
Int. Cl.[5] **B65D** *77/00, 85/00*
U.S. Cl. 206—526 18 Claims



1. A balloon storage system comprising a storage means for containing balloons, having balloons therewithin, comprising:

a. a net, for surrounding said balloons, having meshes smaller in size than said balloons when said balloons are inflated; and

b. a means for releasably locking edges of the net together comprising a locking element intertwined at most with longitudinally alternate ones of longitudinally adjacent net meshes which are transversely paired with corresponding meshes of said net at adjoining net edges, at least a portion of said locking element being in a chain stitch configuration,

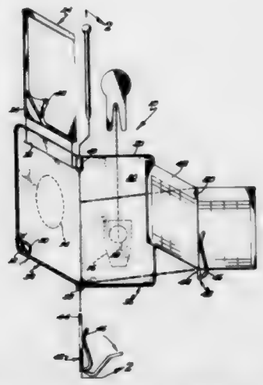
said storage system being capable of releasing said balloons by unlocking said locking element thereby permitting said adjoining net edges to separate for passage of said balloons therebetween.

5,199,573

GOLF ACCESSORY ORGANIZER

Vladimir Gribovsky, 6301 Bayridge Rd., Mound, Minn. 55364

Filed Apr. 25, 1991, Ser. No. 691,456
Int. Cl.[5] **B65D** *71/00*
U.S. Cl. 206—579 11 Claims



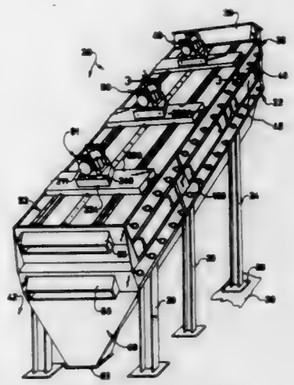
1. Organizer for golf accessories including a golf card comprising, in combination: a cover having a first half and a second half of a shape and size complementary to the first half, with the first and second halves being interconnected together along a fold line; means for securing the first half and the second half together along a spine support line extending generally parallel to and spaced from the fold line, with the securing means biasing the first half to overlie the second half in book fashion; a tube formed by the cover by and between the fold line and the securing means; means for holding the golf card in page fashion between the first and second halves comprising a first portion extending in the tube and a second portion interconnected to the first portion, with the golf card being sandwiched between the second portion and the securing means; and means for holding a pen or pencil between the first and second halves, wherein the pen or pencil holding means comprises a U-shaped member having free ends, with the free ends of the U-shaped member captured by the securing means between the first and second halves to define a tube for slideably receiving a portion of the pen or pencil.

5,199,574

VIBRATING SCREEN SEPARATOR

Clifford G. Hollyfield, Jr., Roswell, and Allen S. Jackson, Atlanta, both of Ga., assignors to J & H Equipment, Inc., Roswell, Ga.

Filed Oct. 31, 1991, Ser. No. 785,523
Int. Cl.[5] **B07B** *1/28*
U.S. Cl. 209—315 21 Claims



1. A vibrating screen separator comprising:

a material input end and at least one spaced apart material discharge end, wherein material travels from said input end towards said discharge end;

a rigid, elongated frame adapted to be disposed upon a supporting surface, said frame comprising a pair of spaced apart sides;

a generally planar, mesh screen comprising a pair of sides tensioned in spaced apart relationship substantially within said frame and transversely with respect to the direction of material travel;

elongated strip means for directly contacting and vibrating said screen, said strip means oriented in spaced apart, generally parallel relation with respect tot said frame sides in substantial alignment with the direction of material travel;

tuned suspension means for resiliently securing said strip means relative to said frame for uniformly distributing screen vibration, said tuned suspension means comprising buffers at each end of said strip means for resiliently securing opposite ends of said strip means to said frame; and,

dynamic vibrator drive means for vibrating said strip means and thus said screen, said vibrator drive means comprising a vibrator having an axis of rotation generally parallel with the direction of material travel and means for resiliently mounting said vibrator vertically spaced apart from said screen, said dynamic vibrator drive means comprising:

a first mounting plate to which said vibrator is firmly at-

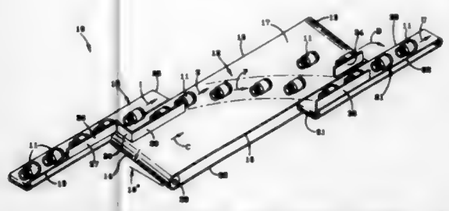
moving particles and generates a respective trigger signal

said legs has an upper end and a lower end, a transverse head portion extending between the upper ends of said

shelf side of the standard, said stabilizer means dimensioned for the free end thereof, with the shelf in the

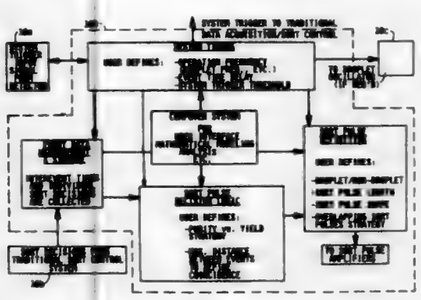
a first mounting plate to which said vibrator is firmly attached;
a second mounting plate secured relative to said frame; and,
an symmetric array of buffers for resiliently coupling said first mounting plate to said second mounting plate.

5,199,575
NON-DESTRUCTIVE DETECTION OF A SPOILED LIQUID NUTRITIONAL PRODUCT IN A SEALED CONTAINER
John R. McHugh, Worthington, Ohio, assignor to Abbott Laboratories, Abbott Park, Ill.
Filed May 21, 1992, Ser. No. 886,202
Int. Cl.[5] B07C 5/00
U.S. Cl. 209—522 **12 Claims**



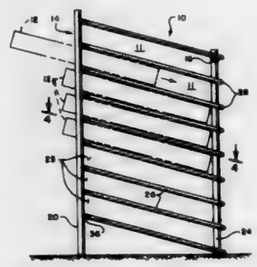
1. A non-destructive method for detecting spoilage of a liquid food product in sealed containers comprising the steps of:
(a) introducing a liquid food product sealed inside of substantially cylindrical containers having axes of rotation to a moving, conveyor, said conveyor having a top surface, an upper edge, a lower edge, a first end, and a second end, said conveyor top surface being inclined downwardly from the first edge to the second edge;
(b) having the conveyor move the containers towards the first end of the conveyor;
(c) allowing the containers which fall within the range of a normative path which is followed by a container containing an unspoiled liquid food product as they roll across the conveyor to exit the conveyor at a first location; and
(d) allowing containers which do not fall within the range of a normative path as they roll across the conveyor to exit the conveyor at a second location.

5,199,576
SYSTEM FOR FLEXIBLY SORTING PARTICLES
Mark A. Corio, and James F. Leary, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.
Filed Apr. 5, 1991, Ser. No. 681,559
Int. Cl.[5] B07C 5/00
U.S. Cl. 209—564 **7 Claims**



1. A system for sorting particles comprising:
a measurement unit which measures selected parameters of moving particles and generates a respective trigger signal in response to the passage of selected particles by a selected point and respective detector signals pertaining to selected parameters of the particles;
an overlap detection circuit responsive to successive trigger signals to generate respective overlap signals in response to time separation of trigger signals by less than selected intervals; and
a sorter responsive to the trigger, detector and overlap signals to generate respective sorting signals for sorting the particles at a selected yield/purity ratio which includes intermediate values between maximum yield and maximum purity.

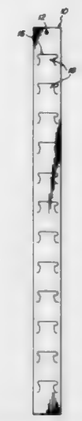
5,199,577
FILE RACK
Steven G. Curtis, Buena Park, Calif., assignor to Russ Bassett Company, Whittier, Calif.
Filed Aug. 27, 1991, Ser. No. 750,288
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—40 **4 Claims**



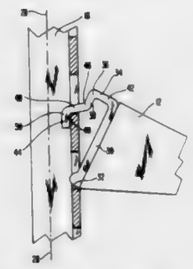
1. A file rack for storage of objects in vertical spaced apart relation with an edge portion of each object being accessible for finger gripping to remove the stored object, comprising:
first and second upstanding spaced apart posts defining an entrance side for the file rack;
third and fourth upstanding posts spaced apart an amount less than said first and second posts defining the back side for the file rack;
a plurality of identical bent wire dividers affixed to the upstanding posts in a parallel equally spaced relation, said dividers being substantially planar and sloping uniformly downwardly from the first and second posts to the third and fourth posts; and
each divider is generally U-shaped with a crossbar approximately the same length as the spacing of the third and fourth posts, two equal length side arms, and outer end portions of the side arms being flared opposite to one another, said first and second posts being secured to the flared end portions and said third and fourth posts being secured to the divider crossbars.

5,199,578
CLIP STRIP FOR SUPPORTING MULTIPLE PACKAGES AND DISPLAY ASSEMBLY USING SAME
Melvin A. Pendergraph, Manchester; Richard G. Grainger, Cheshire, and Edmund J. Czopor, Jr., Burlington, all of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Dec. 10, 1991, Ser. No. 805,379
Int. Cl.[5] A47G 29/00
U.S. Cl. 211—72 **9 Claims**

1. A display assembly comprising:
(a) a vertically disposed elongated planar strip of synthetic resin having upper and lower ends and having a multiplicity of incisions spaced therealong, said incisions defining upwardly extending tabs which includes a pair of horizontally spaced vertically extending legs whereby each of said legs has an upper end and a lower end, a transverse head portion extending between the upper ends of said legs, and a base extending between the lower ends of said legs, whereby said base is hinged to said planar strip, at least some of said tabs being deflected about their base outwardly of the plane of said strip to form upwardly extending hooks, said tabs having horizontally outwardly extending ears at the head portion thereof with one of said ears having greater horizontal dimension than the other ear; and
(b) apertured articles of merchandise supported on said hooks.



5,199,579
ATTACHING DEVICE FOR VARIABLY POSITIONABLE DISPLAY SHELF
Frederick H. Van Duyne, Ringwood, N.J., assignor to Melrose Displays, Inc., Passaic, N.J.
Filed Mar. 2, 1992, Ser. No. 844,752
Int. Cl.[5] A47F 5/08
U.S. Cl. 211—90 **20 Claims**



1. An attaching device adjustably mounting a display unit shelf in any one of at least two positions onto said support surface having a face plane with predetermined openings therethrough, said attaching device comprising, in combination:
a wire formative attached to said shelf, when viewed with the shelf installed on one side of and substantially normal to said face plane, having an anterior portion on the shelf side of the face plane and a posterior portion, on the other side, and extending through one of said predetermined openings, said anterior portion of said body, in turn, further comprising;
stabilizer means for exerting forces from the shelf onto the shelf side of the standard, said stabilizer means dimensioned for the free end thereof, with the shelf in the second position, to coact with another one of said predetermined openings and provide additional stability to the shelf;
said posterior portion of said body, in turn, further comprising;
two or more wire clip means serially connected to said stabilizer means, said wire clip means and said stabilizer means having the longitudinal axes thereof substantially coplanar, each wire clip means having a load-bearing portion and a descender portion connected at substantially right angles the one to the other and, when installed, the load-bearing portion of the selected wire clip means rests upon the lower edge of the opening and the descender abuts the rear thereof, said two or more clip means providing at the juncture thereof a predetermined selected angle for a corresponding angular difference between adjacent shelf positions;
whereby to change the mounting position of the shelf, no disassembly and subsequent reassembly is required.

5,199,580
BANANA CARRIER
Jack D. Bankier, Northbrook, Ill., assignor to Bankier Companies, Inc., Glenview, Ill.
Filed Aug. 13, 1991, Ser. No. 744,415
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—113 **21 Claims**

1. A banana carrier comprising:
at least one banana carrying tray; and
a vertically arranged shaft, said shaft mounted to a central portion of said tray to hold said tray generally horizontally, said shaft having a fixture at a top end thereof for supporting said shaft and said tray from overhead in hanging fashion, said tray providing a surface sloped from an outside of said tray toward said shaft for holding bananas thereon.

5,199,581
GOLF EQUIPMENT SUPPORT RACK
William D. Arnold, Florissant, Mo., assignor to Lee Rowan Company, St. Louis, Mo.
Filed Apr. 2, 1992, Ser. No. 862,350
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—106 **24 Claims**

1. A golf equipment support rack for attaching to the front of a mounting structure, comprising:
two horizontally spaced first means for removably and uprightly supporting two golf bags in a horizontally spaced relationship;

second means for restricting angular, outward revolution of

5,199,583
CRANE TRUCK

placed relative to the shelf post in an upwardly directed posi-

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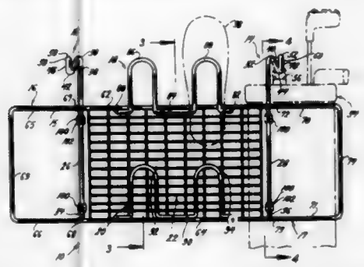
second means for restricting angular, outward revolution of golf bags about the first means; and



third means for attaching to the mounting structure and for securely supporting the first and second means.

5,199,582

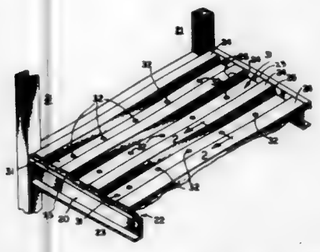
STORAGE RACK SHELVING WITH IMPROVED FIRE PROTECTION

Robert T. Halstrick, 1421 Wells Dr., Bensalem, Pa. 19020

Continuation-in-part of Ser. No. 522,645, May 14, 1990, abandoned. This application Jan. 30, 1991, Ser. No. 648,027

Int. Cl.[5] **A47F** *5/00*

U.S. Cl. 211—135 **3 Claims**



1. Storage rack shelving for storing goods at multiple levels in combination with at least one overhead run of sprinkler heads to provide a supply of sprinkler fluid, which is discharged upon demand onto the topmost level of goods, which fluid then flows over and down the sides of the goods underneath and out onto subsequent lower levels to provide improved fire protection, said storage rack comprises:

a plurality of vertical upright posts,

at least two horizontal rails connecting at least two of said posts together at least two vertical locations,

said rails each having a notched wall and a top plate, said top plate connected to a top edge of said notched wall,

decking to support said goods, connected to and extending along said rails at said vertical locations,

said decking having center panels carried by said notched wall,

angularly inclined panels connected to said center panels and extending upwardly therefrom so as to define a plurality of channels therewith to contain and guide sprinkler fluid that flows over said goods from said supply, and

top ribs each of which is connected to a pair of said inclined panels at a location between a pair of said channels to support the goods,

a plurality of sized drainage openings in said channel center panels at selected locations, to permit said fluid to flow thereout and down to said lower levels, and

said top plates of said rails are in the same plane as said decking top ribs to confine said fluid to said channels.

5,199,583

CRANE TRUCK

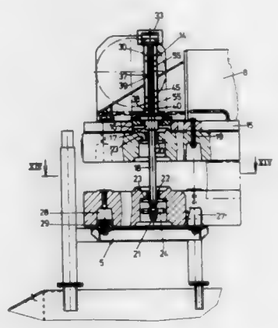
Wolfgang Weider, Neunkirchen, and Hermann Daum, Feucht, both of Fed. Rep. of Germany, assignors to Faun GmbH, Fed. Rep. of Germany

Filed Jul. 16, 1992, Ser. No. 915,427

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1991, 4124173

Int. Cl.[5] **B66C** *23/72*

U.S. Cl. 212—156 **13 Claims**



1. A crane truck comprising

a drivable undercarriage (**1**),

a superstructure (**9**) supported on said undercarriage (**1**) to be rotatable by a slewing rim (**10**),

a counterweight (**6**) attached to a counterboom (**8**) of said superstructure (**9**), which counterboom (**8**) projects in a direction opposite to the projecting direction of a boom (**12**) of said superstructure (**9**),

a lifting unit comprising of two vertically arranged and hydraulically actuatable piston-cylinder drives (**14**, **14'**) on said counterboom (**8**), by means of which lifting unit said counterweight (**6**) is displaceable between a lifted operation position connected with the counterboom (**8**) and a driving position, in which it rests lowered onto a support (**5**) on said undercarriage (**1**),

piston rods (**18**, **18'**) of said piston-cylinder drives (**14**, **14'**) being drivable to rotate about their longitudinal axis between a locking position non-positively connected with said counterweight (**6**) and an unlocking position of release from said counterweight (**6**),

a first sensor (**37**) responding to the longitudinal movement of said piston rods (**18**, **18'**) of each piston-cylinder drive (**14**, **14'**), by means of which first sensor (**37**) the piston rod position associated with the operation position of the counterweight (**6**) is detectable,

a first display for displaying the piston rod position,

a control unit coupled with at least one of said sensor and said display, by means of which control unit a crane control can be switched off, when said counterweight (**6**) comes out of its operation position,

a second sensor (**38**) equally responding to the longitudinal movement of said piston rods (**18**, **18'**) of each piston-cylinder drive (**14**, **14'**), by means of which second sensor (**38**) the piston-rod-release position to be taken for release of the locking engagement between said piston rods (**18**, **18'**) and said counterweight (**6**) in their drive position is detectable,

a second display for displaying said piston-rod-release position, and

a second control unit coupled with at least one of said second sensor and said second display, by means of which a rotary- actuator control (**34**, **34'**) of said piston rods (**18**, **18'**) can be switched off, when said piston rods (**18**, **18'**) are not in their position of release.

5,199,584

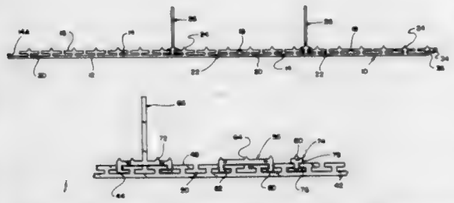
UNIVERSAL FLOOR/SHELF ORGANIZER FOR PRODUCT MERCHANDISING DISPLAY UNITS

Dewalt W. Fowler, Manchester, and Robert J. Swain, Creve Coeur, both of Mo., assignors to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed Jan. 23, 1992, Ser. No. 824,296

Int. Cl.[5] **A47F** *5/00*

U.S. Cl. 211—184 **19 Claims**



1. A shelf organizer for merchandising products therefrom comprising a substantially flat product supporting member having front, rear and opposed side portions, said product supporting member having joinder means associated therewith enabling said member to be cooperatively engaged with a similarly constructed product support member, a plurality of divider members for forming optional segregated channels on said product supporting member for arranging products therebetween, said product supporting member further including a plurality of spaced means each adaptable for cooperatively engaging any one of said divider members, said divider members being removably engageable with the spaced means on said product supporting member so as to selectively vary the distance between any two adjacent divider members.

5,199,585

SUPPORT ARRANGEMENT FOR COMPONENTS IN SHELF SYSTEMS

Gerhard Schäfer, Neunkirchen/Salchendor, Fed. Rep. of Germany, assignor to Fritz Schafer Gesellschaft mit beschrankter Haftung, Neunkirchen, Fed. Rep. of Germany

Filed May 1, 1991, Ser. No. 694,426

Claims priority, application Fed. Rep. of Germany, May 1, 1990, 4013989

Int. Cl.[5] **A47F** *5/00*

U.S. Cl. 211—187 **21 Claims**

1. In a support arrangement for components in shelf systems, particularly for continuous frames in continuous shelf systems, the arrangement including hanging brackets, each hanging bracket being provided on a rear side thereof with a group of locking hooks, the arrangement further including shelf posts with said at least one row of openings in said for releasably receiving the locking hooks of the hanging brackets, each hanging bracket having on the rear side thereof near opposite ends of the bracket a support edge each for support of the components, the locking hooks being approximately T-shaped double hooks, such that each of the support edges can be placed relative to the shelf post in an upwardly directed position, the improvement comprising a spacing between two successive openings in said at least one row of openings in said the shelf post corresponding to half a spacing between two double hooks of the groups of double hooks of the hanging brackets.

5,199,586

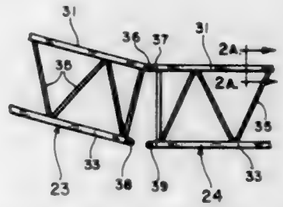
QUICK-CONNECT SECTIONAL BOOM MEMBERS FOR CRANES AND THE LIKE

David J. Pech; Wayne W. Beebe, both of Manitowoc; Terry Casavant, Two Rivers; John Lanning, Cato; Paul M. Pukita, Manitowoc, and Michael J. Wanek, Two Rivers, all of, assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Jul. 25, 1991, Ser. No. 736,029

Int. Cl.[5] **B66C** *23/26, 23/24, 23/70, 23, 42*

U.S. Cl. 212—175 **35 Claims**



1. A quick-connect sectional boom member for cranes and the like, the sectional boom member comprising:

a) at least three chords with intermediate lacing elements, each of the chords having an end configured to abut a corresponding end of a chord of a second sectional boom member to which said first sectional boom member is adapted to connect,

b) a connector attached to said end of each chord for connecting with a mating connector on each of the abutting ends of the chords of said second sectional boom member,

c) said connectors each comprising a load bearing surface for transmitting compressive loads between abutting chords, and

d) at least one of said connectors comprising a first connector comprising a lug having a vertically protruding pin extending therefrom.

5,199,587

BIAXIAL-ORIENTATION BLOW-MOLDED BOTTLE-SHAPED CONTAINER WITH AXIAL RIBS

Akiho Ota; Hiroaki Sugiura, and Hiroichi Ishii, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 821,909, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 693,012, Apr. 29, 1991, abandoned, which is a continuation of Ser. No. 169,168, Mar. 10, 1988, abandoned, which is a continuation of Ser. No. 836,109, Mar. 4, 1986, abandoned. This application Jun. 4, 1992, Ser. No. 892,669

Claims priority, application Japan, Apr. 17, 1985, 60-57180[U]; Oct. 4, 1985, 60-152099[U]; Oct. 4, 1985, 60-152100[U]

Int. Cl.[5] **B65D** *23/00*

U.S. Cl. 215—1 C **14 Claims**

1. A blow-molded bottle-shaped container of biaxially oriented synthetic resin integrally molded with a neck at the top of a cylindrical body thereof, comprising:

a pair of recesses depressed inwardly on the cylindrical wall thereof at opposing sides of the cylindrical body,

a grip comprising a first cylindrical body portion between said recesses, and

a second cylindrical body portion opposite to said grip,

wherein only two axial reinforcing ribs are formed in the

wall including means for absorbing a reduced pressure generated in the bottle-shaped container, and

midsection to place the side sections thereof in parallel,

5,199,591

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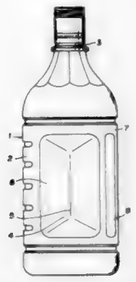
wherein only two axial reinforcing ribs are formed in the grip, each reinforcing rib being located adjacent a corresponding one of said recesses and depressed inwardly and concavely, and

wherein a plurality of lateral reinforcing grooves are aligned at a predetermined interval on the second cylindrical body portion opposite to said grip.

14. A blow-molded, bottle-shaped container formed of biaxially oriented synthetic resin and having a longitudinal axis, comprising:

a neck section;

a body section having a circumference defining a substantially circular perimeter of said container, said body section consisting of a first body portion and an adjacent



second body portion, said first body portion defining a grip;

a shoulder section tapering between said neck section and said body section; and

a bottom section,

said first body portion defining said grip having first and second opposed recesses indented from said circumference and being separated by a central grip portion, said central grip portion consisting of first and second longitudinally extending axial reinforcing ribs and an arcuate section therebetween, said reinforcing ribs being substantially adjacent to said first and second recesses, respectively, said first and second reinforcing ribs extending inward from said circumference, and said arcuate section extending entirely in said circumference.

5,199,588

BIAXIALLY BLOW-MOLDED BOTTLE-SHAPED CONTAINER HAVING PRESSURE RESPONSIVE WALLS

Yoshiaki Hayashi, Matsudo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00988, § 371 Date Feb. 14, 1990, § 102(e) Date Feb. 14, 1990, PCT Pub. No. WO91/04912, PCT Pub. Date Apr. 18, 1991

PCT Filed Sep. 29, 1989, Ser. No. 465,227

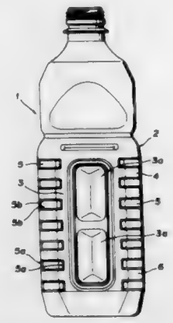
Claims priority, application Japan, Apr. 1, 1988, 63-44275[U]

Int. Cl.[5] B65D *1/02*

U.S. Cl. 215—1 C **2 Claims**

1. A biaxially blow-molded bottle-shaped container of synthetic resin, comprising a generally square cross-sectional body portion having four sides and ridge line portions between each pair of adjacent said sides,

each said side having a flat wall portion which as a panel wall including means for absorbing a reduced pressure generated in the bottle-shaped container, and



at least one of said ridge line portions having depressed cross grooves spaced apart in parallel.

5,199,589

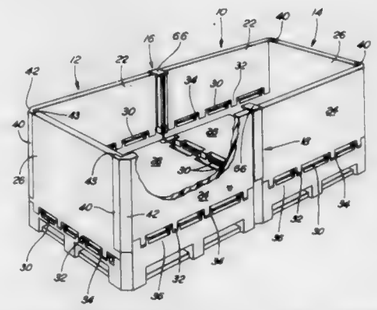
COLLAPSIBLE BIX BOX ASSEMBLY FORMED OF TWO SEPARATE COLLAPSIBLE BIN BOXES

William L. Noble, 2146 Newport, Walled Lake, Mich. 48390

Filed Jul. 27, 1992, Ser. No. 919,337

Int. Cl.[5] B65D *6/22*

U.S. Cl. 220—7 **5 Claims**



1. A collapsible bin box assembly comprising two separate, collapsible bin boxes,

each of said bin boxes having

(a) a horizontal, rectangular base,

(b) end walls hinged to opposite ends of said base for swinging movement from upright positions inwardly to positions overlying said base, and

(c) side walls hinged to opposite sides of said base for swinging movement from upright positions inwardly to positions overlying said base,

said bin boxes being disposed in end-to-end relationship

(a) with their adjacent ends substantially abutting,

(b) with said end walls at said adjacent ends of said bases turned inwardly to said positions overlying said bases,

(c) with said end walls at the remote ends of said bases upright, and

(d) with the side walls of said bin boxes at each side of said bin box assembly aligned with one another and upright and their adjacent side edge portions parallel,

and a splice for interconnecting the side walls at each side of said bin box assembly,

each splice comprising an elongated plate having a longitudinally extending midsection and longitudinally extending side sections,

each splice being folded along said longitudinally extending midsection to place the side sections thereof in parallel, confronting, substantially abutting relationship,

said side sections of each splice being disposed between said side walls and having generally U-shaped hooks engaging and interconnecting said adjacent, parallel side edge portions of said side walls, and

said side walls at each side of said bin box assembly and said splice interconnecting them being swingable as a unit from the upright positions of said side walls to said positions overlying said bases and vice versa.

5,199,590

COLLAPSIBLE DEVICE FOR SECURING A COVER OVER A SWIMMING POOL

Lance Grandahl, One Grandview Ter., E. Windsor, Conn. 06088, and Gary Jeanfaivre, 865 Clintonville Rd., Wallingford, Conn. 06492

Filed Sep. 27, 1991, Ser. No. 767,118

Int. Cl.[5] B65D *25/08*

U.S. Cl. 220—222 **20 Claims**

1. A collapsible, easily stowable fluid container for securing a cover over a swimming pool, said container comprising

A. an elongated, longitudinally extendible and easily collapsible central hollow portion construction for being easily moved between a first, compact, stowable position and a second, fully extended pool cover securing position;

B. first and second container stabilizing, end-forming portions formed from substantially rigid material, each of said end-forming portions comprising

a. a substantially closed, hollow shape,

b. an interior portal zone interconnected to and communicating with one end of the elongated, longitudinally extendible central hollow portion, whereby the hollow interior of the end-forming portions communicate with the hollow interior zone of the central portion, thereby forming a closed fluid holding container, and

c. support means

1. formed on the outer surface of the end-forming portion,

2. positioned for contacting the cover of the swimming pool, and

3. providing, secure, rotation preventing retention of the end-forming portion and the elongated central hollow portion on the swimming pool cover; and

C. filter means

a. formed in at least one of said end-forming portions in a surface thereof generally opposed from the surface on which the support means is formed, and

b. constructed for allowing the transfer of fluid into and out of the container;

whereby a collapsible, easily stowable fluid container is attained which is easily longitudinally extended and securely positioned on the cover of the swimming pool for being substantially filled with the desired fluid and retained in position for extended time periods, without any unwanted movement or dislodgement thereof.

5,199,591

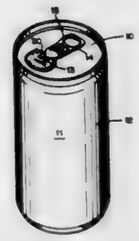
RESEALABLE FLIP-TOP CAN

Richard A. Thibeault, and Deborah M. Thibeault, both of Nashua, N.H., assignors to Preferred Cantop Corporation, Amherst, N.H.

Filed Nov. 21, 1991, Ser. No. 795,535

Int. Cl.[5] B65D *51/18*

U.S. Cl. 220—253 **10 Claims**



1. A resealable flip-top can for containing a beverage that is opened by a pull tab, said resealable beverage can comprising:

a can top having a first area that is ruptured by said pull tab to open a first opening in said can top through which said beverage is dispensed, said pull tab being fastened to said can top by a rivet in the middle of said can top, and said can top having a first raised ridge thereon forming a closed loop that passes completely around said first opening; and

a circular sealing top that is rotatably attached to said can top by said rivet, said sealing top covering substantially all of said can top, said sealing top having a second opening, and said sealing top being rotated into a first position where said second opening is in registration with said first opening in said can top in order to dispense the beverage in said can, said sealing top being rotated into a second position where said second opening is out of registration with said first opening in order to reseal said can, said sealing top having a second ridge forming a closed loop that passes completely around said second opening, and a third ridge forming a closed loop, said second ridge circumferentially contacting said first ridge when said sealing top is in said first position to prevent beverage from getting between said can top and said sealing top when beverage is being dispensed from said can, said third ridge circumferentially contacting said first ridge when said sealing top is in said second position to reseal said can.

5,199,592

CONTAINER WITH LATCHABLE HINGED SIDEWALL GATE

Cheryl M. Reiland, and Mark Hillis, both of Tacoma, Wash., assignors to Perstorp Extec, Inc., Tacoma, Wash.

Continuation of Ser. No. 554,047, Jul. 17, 1990, abandoned, which is a division of Ser. No. 323,684, Mar. 15, 1989, Pat. No. 4,967,927. This application Mar. 17, 1992, Ser. No. 852,760

Int. Cl.[5] B65D *7/00*

U.S. Cl. 220—335 **3 Claims**

1. A container, comprising:

a substantially planar base;

a sidewall having an exterior surface defining a plane, and, having an opening, the opening defined by a bottom edge and first and second side edges formed in said sidewall;

a gate attached by a hinge to said sidewall said gate having a bottom surface and first and second side edges;

said hinge rotatably attached to said sidewall defining a first axis of rotation;

said hinge rotatably attached to said gate to define a second axis of rotation;

said first axis being spaced from and substantially parallel to said second axis, wherein said gate is movable from a first

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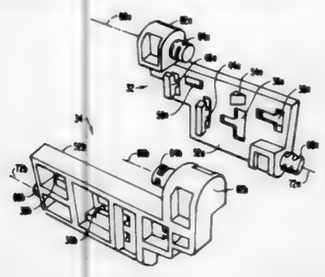
portion to a second position, said gate, when in said first position substantially covering at least a portion of said opening without projecting in a direction outward from said container, beyond said first plane, and said gate, when in said second position, different from said first position uncovering the entirety of said opening; and



first and second coupler, said first coupler, releasably attaching said first side edge of said gate to said first side edge formed in said sidewall and said second coupler releasably attaching said second side edge of said gate to said second side edge formed in said sidewall, when said gate is in said first position.

5,199,593

PLASTIC CASE HAVING IMPROVED ULTRASONIC WELDS BETWEEN HALVES THEREOF AND METHOD FOR PRODUCING SAME

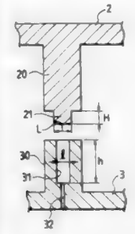
Akihisa Kita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 12, 1991, Ser. No. 743,617

Claims priority, application Japan, Aug. 14, 1990, 2-85442[U]; Sep. 11, 1990, 2-94736[U]; Oct. 8, 1990, 2-105196[U]

Int. Cl.[5] B65D *6/00*

U.S. Cl. 220—359 **7 Claims**



1. A plastic case comprising:

a first half case;

a projection formed on said first half case; and

a second half case having a recess formed thereon,

wherein said first half case and said second half case are joined by ultrasonically welding said projection formed on said first half case with said recess formed on second half case, said recess having a diameter slightly smaller than a diameter of said projection so that said projection must be forcibly inserted into said recess, a gap being formed between the bottom of said recess and a distal end face of said projection to provide an internal space for receiving excess material produced during said ultrasonic welding.

5,199,594

CONTAINER FOR RECOVERING A USED TREATING LIQUID

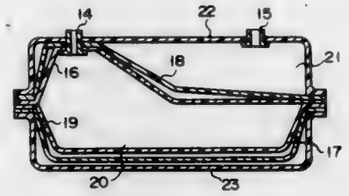
Kuniyasu Obara, Chiba; Yoshiaki Take, and Akihiro Taguchi, both of Tokyo, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 169,020, Mar. 16, 1988. This application Mar. 8, 1990, Ser. No. 492,405

Claims priority, application Japan, Sep. 26, 1985, 60-147043; Mar. 23, 1987, 62-42334[U]

Int. Cl.[5] B65D *87/16*

U.S. Cl. 220—403 **7 Claims**



1. A container for storing a treating liquid and for recovering a used treating liquid, which comprises: an outer box made of a substantially rigid material having a top wall portion and a fixing section at the top wall portion; and a flexible inner bag held within the outer box having a pair of access ports detachably connected to the fixing section of the outer box and a partition wall dividing the interior of the inner bag into a lower compartment defining a treating-liquid storage chamber and an upper compartment defining a used-liquid storage chamber, said storage chambers each having one of the pair of access ports for providing communication with an outer associated apparatus.

5,199,595

METHOD OF PRODUCING A CUP-SHAPED, STERILISABLE CONTAINER, AS WELL AS CONTAINER

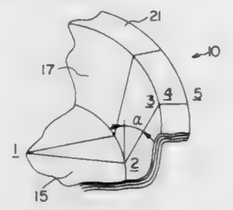
Olivier Y. Muggli, Neuhausen am Rheinfall, and Andreas Ziegler, Schaffhausen, both of Switzerland, assignors to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Division of Ser. No. 686,693, Apr. 17, 1991. This application Oct. 5, 1992, Ser. No. 956,335

Claims priority, application Switzerland, Apr. 26, 1990, 1437/90

Int. Cl.[5] B32B *1/08*; B65D *90/04*

U.S. Cl. 220—450 **14 Claims**



1. Cup-shaped, sterilizable container which comprises a stretch-drawable composite laminate with an aluminum foil of a thickness less than 40 microns, a sealable plastic inner layer of high extensibility and a plastic outer layer of high extensibility and load-bearing capacity, said container having a side wall and a container bottom with the side wall running at a side wall angle (a) with respect to the direction perpendicular to the container bottom, wherein the aluminum foil has a thickness between 8 and 40 microns, the plastic inner layer has a thickness between 30 and 80 microns, the plastic outer layer has a thickness between 1 and 40 microns and wherein the container walls are fold-free.

5,199,596

DRAWN CAN BODY METHODS, APPARATUS AND PRODUCTS

William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.

Division of Ser. No. 831,624, Feb. 21, 1986, which is a continuation-in-part of Ser. No. 712,238, Mar. 15, 1985, abandoned. This application Sep. 1, 1989, Ser. No. 402,496

Int. Cl.[5] B65D *8/00*

U.S. Cl. 220—604 **6 Claims**

1. A one-piece cup-shaped can body having a closed endwall and a side wall defining the longitudinally opposite open end of such can body formed solely by draw processing from flat-rolled sheet metal precoated with an organic coating,

such can body endwall having a thickness which is substantially equal to starting gage for such flat-rolled sheet metal,

such can body side wall as drawn having a uniform height with a thickness over such height which averages about 15% less than starting gage for such flat-rolled sheet metal, with

a side wall portion of greater thickness than starting gage for such precoated sheet metal,

such side wall portion of greater thickness being located solely contiguous to the open end of such cup-shaped can body and having a thickness which is less than about 3% greater than such starting gage, with

a seaming flange at such open end of the side wall as drawn,

such seaming flange being in a plane which is perpendicularly transverse to the central longitudinal axis of such can body.

5,199,597

SELF-CLOSING CONTAINER LID

William C. Gladish, 6501 Harding Rd. Apt. A24, Nashville, Tenn. 37205

Filed Aug. 30, 1991, Ser. No. 753,221

Int. Cl.[5] A47G *19/22*

U.S. Cl. 200—715 **6 Claims**

5. A removable self-closing lid for covering a top of a container, wherein said container has an outer wall surface and said container top has an opening for accessing into said container and a rim forming a perimeter of said top, wherein said self-closing lid comprises:

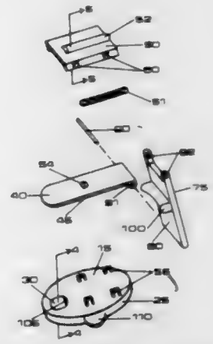
a) a cap member having upper and lower surfaces, a pressure sealing perimeter lip for securing said cap member over said top rim to produce a substantially liquid tight seal, and a pouring aperture penetrating through said cap upper and lower surfaces;

b) a sealing plate with upper and lower surfaces and having first and second ends, wherein said sealing plate is slidably positioned above said cap member upper surface and over said pouring aperture;

c) a housing fastened to said cap member upper surface in which said sealing plate slides;

d) leveraging means associated with said cap and said sealing plate for accessing said container through said pouring aperture by sliding said sealing plate within said housing and said accessing occurs when said leveraging means is activated by a user exerting pressure on said leveraging means, wherein said pressure is directed substantially towards said can, and automatically sealing said container when said leveraging means is deactivated by said user releasing said pressure, wherein said leveraging means comprises:

a trigger member with upper and lower surfaces and having first and second ends, wherein said user pressure is applied to said trigger member second end upper surface;



a sliding leverage ridge protruding from said trigger lower surface, wherein said sliding leverage ridge provides a fulcrum during sliding of said sealing plate, wherein said leverage ridge slides on said outer container wall surface during leverage means activation and deactivation to produce a sliding fulcrum; and

a hinge securing said trigger first end to said sealing plate second end; and

e) resilient means for automatically sealing said container, wherein said resilient means are within said housing and coupled to said sealing plate.

5,199,598

DISPENSING APPARATUS FOR TENNIS BALL CONTAINERS

Tyree Sampson, 3509 Camelot Rd., Trotwood, Ohio 45426

Filed Sep. 23, 1991, Ser. No. 763,628

Int. Cl.[5] G07F *11/00*

U.S. Cl. 221—194 **12 Claims**

1. An apparatus for dispensing tennis ball containers, said apparatus comprising a housing, said housing supporting therein:

hopper means for storing tennis ball containers;

track means for conveying tennis ball containers, said track means having a first end disposed below said hopper means and adapted to receive tennis ball containers from said hopper means, said track means having a second end disposed below said first end and towards which said tennis ball containers may move and exit by force by gravity, and said track means comprising opposing, generally parallel first and second walls extending from said first end to said second end, wherein said first wall has a first slot and said second wall has a second slot; and

dispensing means for releasing said tennis ball containers one at a time from said track means, said dispensing means disposed generally adjacent to said second end of said track means, and said dispensing means further comprising:

a first shaft mounted in said housing;

a generally U-shaped discharge lever, said discharge lever

ably abutting marginal edge portions of the articles

retaining flowable material, the body including a first wall and a second wall;

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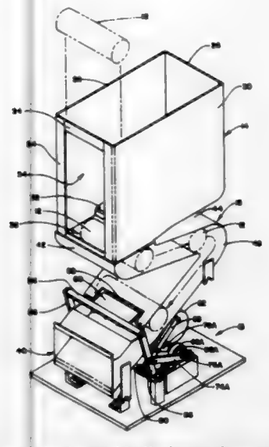
inverted and the opposite ends thereof rotatably connected to said first shaft, said discharge lever further including a discharge plate attached between said opposite ends and extending laterally from said discharge lever, said discharge lever rotatable between first and second positions to extend or retract said discharge plate through said first slot into and out of the path of said tennis ball containers, respectively;

a generally U-shaped stop lever, said stop lever inverted and the opposite ends thereof rotatably connected to said first shaft, said stop lever further including a stop plate attached between said opposite ends and extending laterally from said stop lever, said stop lever rotatable between first and second positions to retract or extend said stop plate through said second slot out of and into the path of said tennis ball containers, respectively;



means for swinging said discharge lever and said stop lever through a cycle in timed relation to alternately interrupt the movement of said tennis ball containers in said track means and dispense one or more tennis ball containers, such that during said cycle said stop lever moves from its first position allowing free movement of said tennis ball containers to its second position to interrupt the movement of one or more tennis ball containers to be retained in said track means, while said discharge lever retracts from its first position interrupting the movement of one or more tennis ball containers to be dispensed, to its second position allowing one or more tennis ball containers to be dispensed, after which said discharge lever returns to its first position to interrupt the movement of the next one or more tennis ball containers to be dispensed, and said stop lever returns to its first position allowing said tennis ball containers to freely move in said track means.

5,199,599

APPARATUS FOR DISPENSING ARTICLES

Michael W. Shade, P.O. Box 33, Depere, Wis. 54115

Filed Jun. 19, 1992, Ser. No. 901,767

Int. Cl.[5] B65H *1/08*

U.S. Cl. 221—226 **12 Claims**

1. A dispensing apparatus for vending articles comprising:

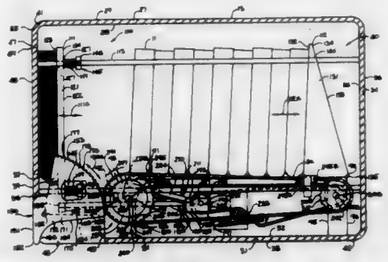
a platform having a forward portion and operable to support the articles to be vended;

a rearward support assembly slideably borne by the platform and operable to urge the articles toward the forward portion of the platform;

a carriage assembly moveably borne by the platform;

a metering assembly pivotally mounted on the carriage assembly and operable for movement from a first position, wherein the metering assembly substantially inhibits movement of the articles toward the forward portion of the platform, to a second position, wherein the metering assembly permits the articles to move toward the forward portion of the platform;

an actuator disposed in force transmitting relation relative to the platform; and



a drive assembly borne by the platform and disposed in force receiving relation relative to the actuator, and in driving relation relative to the rearward support assembly, and the metering assembly, respectively, the drive assembly simultaneously urging the rearward support assembly toward the forward portion of the platform, and driving the metering assembly from the first position to the second position, upon movement of the actuator, thereby vending a single article.

5,199,600

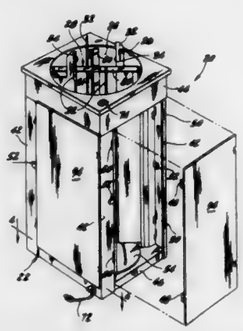
DISPENSER FOR STACKABLE ARTICLES

Kim C. Fletsam, New Athens, Ill., assignor to Duke Manufacturing Co., St. Louis, Mo.

Filed Sep. 11, 1990, Ser. No. 580,817

Int. Cl.[5] B65H *31/20*

U.S. Cl. 221—241 **13 Claims**



1. A dispenser for stackable articles such as dishes and the like, the dispenser comprising:

a housing having an opening in its top;

a carriage, within the housing and moveable along a generally vertical central axis of the housing, for supporting a generally vertical stack of the articles;

means for biasing the carriage vertically upwardly in the housing to dispense the articles from the opening in the top of the housing;

a plurality of elongate guide members in the housing and spaced about the periphery of the carriage for retaining the articles in a generally vertical stack, each guide member having a vertically extending guide surface for slideably abutting marginal edge portions of the articles stacked on the carriage; and

means for mounting the guide members for coordinated movement of their respective guide surfaces so that movement of one guide surface into position to accommodate articles of a particular size simultaneously moves the other guide surfaces into position to accommodate articles of that size.

5,199,601

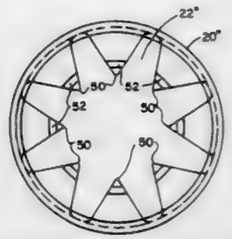
DISPENSER FOR CUPS AND CUP-LIKE ARTICLES

Henry G. Roethel, Ravenna, Ohio, assignor to The Meyer Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 755,093, Sep. 5, 1991. This application Feb. 11, 1992, Ser. No. 833,985

Int. Cl.[5] A47F *1/08*

U.S. Cl. 221—310 **6 Claims**



1. In an apparatus for storing a supply of containers having an open upper end and a generally conical side wall tapering to a smaller bottom end, the apparatus comprising a housing for maintaining the containers in a stacked telescopically interfitted relationship and including a diaphragm with an opening through which the lowermost container of the stack extends and which diaphragm acts to retain the stack in the housing while permitting the lowermost container to be withdrawn, the improvement wherein the diaphragm comprises a unitary body of resilient elastomeric material with the periphery of the opening defined by a plurality of integral fingers extending radially inwardly of the opening and having width and thickness which progressively decreases proceeding in a radial inward direction, and a surface of the fingers facing the stack of containers having narrow ribs extending from the said surface for engaging the containers as they are pulled through the opening.

5,199,602

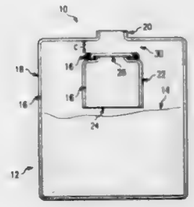
FLEXIBLE RETAINER CLOSURE DEVICE

Terrence M. Drew, Boulder, Colo., assignor to Alden Laboratories, Inc., Boulder, Colo.

Filed Mar. 27, 1991, Ser. No. 675,755

Int. Cl.[5] B67B *7/00*

U.S. Cl. 222—1 **23 Claims**



1. A closure device, comprising:

(a) flexible material in the form of at least one body for retaining flowable material, the body including a first wall and a second wall;

(b) an opening for selectively allowing passage of said flowable material therethrough;

(c) a slit extending through said body wherein portions of said first and second walls surrounding said slit are sealably interconnected to define said slit through the body; and

(d) a neck between said body and an end defining said opening, the neck being foldable so as to allow said opening to be inserted through said slit.

5,199,603

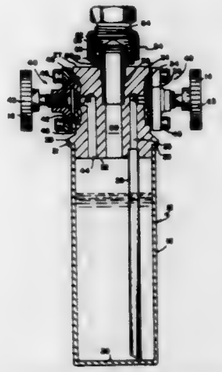
DELIVERY SYSTEM FOR ORGANOMETALLIC COMPOUNDS

Norman F. Prescott, Four Fairview Ave., Wenham, Mass. 01984

Filed Nov. 26, 1991, Ser. No. 797,910

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—3 **13 Claims**



1. A reusable cylinder and dip tube device for organometallic compounds comprising:

a container having an elongated cylindrical portion terminating in a bottom at one end and an open top at the other;

a closure member covering said open top, said closure member having sidewalls and an internal face covering said open top;

an inlet junction disposed in one of said sidewalls;

a first inlet means disposed in said closure member, said first inlet means extending from said inlet junction to an egress on said face;

an outlet junction disposed in one of said sidewalls;

a first outlet means disposed in said closure member, said first outlet means extending from said outlet junction to an ingress on said face;

a second inlet means disposed in said closure member, said second inlet means extending from said inlet junction to an ingress on a sidewall of said closure member;

a second outlet means disposed in said closure member, said second outlet means extending from said outlet junction to an egress on a sidewall of said closure member;

valve means for each of said inlet junction and said outlet junction, said valve means including a removable, resilient, metallic diaphragm disposed in each of said inlet junction and said outlet junction, one of said diaphragms being normally open and resiliently urgeable against the ingress of the first inlet means and the other of said diaphragms being normally open and resiliently urgeable against the ingress of the first outlet means, said valve means further including means to urge a portion of each of the diaphragms against the ingress of said first inlet and the egress of said first outlet means, whereby to control

the inflow and outflow of materials to and from said con-

5,199,605

5,199,606

DISPENSING AND MEASURING DEVICE HAVING AN

sured by the first pressure sensor reaches to a predetermined

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the inflow and outflow of materials to and from said container;

a dip tube disposed within said container and extending from the egress of said first inlet means to adjacent the bottom of said containers;

filling means disposed in said closure member to enable a user to fill said container.

5,199,604

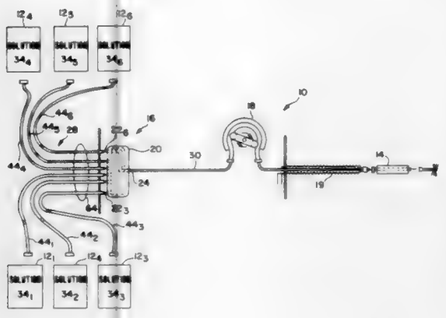
IRRIGATION SYSTEM AND METHOD FOR DELIVERING A SELECTED ONE OF MULTIPLE LIQUID SOLUTIONS TO A TREATMENT SITE

Lee Palmer, Austin, Tex., and James Marsall, Westford, Mass., assignors to Sultan Chemists, Inc., Englewood, N.J.

Continuation of Ser. No. 519,405, May 4, 1990, Pat. No. 5,060,825. This application Sep. 23, 1991, Ser. No. 763,540

Int. Cl.[5] B67D *5/22, 5/48*

U.S. Cl. 222—25 **8 Claims**



1. Periodontal irrigating system for delivering one of a plurality of liquid irrigating solutions to a treatment site in an oral cavity, comprising:

a plurality of solution reservoirs, each reservoir including a quantity of a respective liquid irrigating solution substantially sealed within a container;

handpiece means for gripping by an operator and delivering a selected one of said liquid solutions directly to a treatment site;

liquid solution coupling and selector means for fluidly coupling said handpiece means and a selected one of said liquid irrigating solutions of a respective solution reservoir, said liquid solution coupling and selector means including selector valve means having a plurality of inputs, an output, first tubing means for fluidly coupling each of said liquid irrigating solutions and a respective one of said inputs of said selector valve means, and second tubing means for fluidly coupling said output of said selector valve means and said handpiece means; and

pump means for causing a selected one of said liquid irrigating solutions to flow from said reservoir thereof to said handpiece means for delivery to the treatment site, said pump means operatively engaging only said second tubing means and being situated entirely out of the path of said flow of said selected liquid irrigating solution from said reservoir thereof to said handpiece means.

5,199,605

CREAMY OR PASTY PRODUCT DISPENSER WITH A ROTATIONALLY CONTROLLED APERTURE IN THE CAP AND WITH SAFETY MEANS AGAINST UNCONTROLLED OPENING

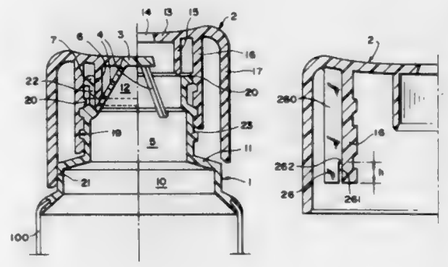
Bernard Schneider, Sainte Menehould, France, assignor to Cebal, Clichy, France

Continuation-in-part of Ser. No. 454,449, Dec. 21, 1989, abandoned. This application Jan. 10, 1992, Ser. No. 818,917

Claims priority, application France, Jan. 6, 1989, 89 00292

Int. Cl.[5] B67D *5/06*

U.S. Cl. 222—25 **13 Claims**



1. A creamy or pasty product dispenser including a rigid head fixed on a body and having an inside and an outside, and a cap engageable with said head, said cap comprising an outer skirt, a deformable internal crown and an intermediate ring which is between said outer skirt and said internal crown, said intermediate ring having an inside, said head and said cap including complementary screw threads for raising and lowering the cap comprising a screw thread on the outside of said head and a complementary screw thread on the inside of said intermediate ring, said cap including an aperture and said head including a stopper supported by several sloping legs fixed at their bottom ends to the inside of said head below an upper portion of said head, said stopper occluding said aperture when the cap is in a lowered position on said head, said deformable internal crown and said upper portion of said head cooperating sealingly once said cap is engaged on said head, said head including an annular shoulder below its screw thread, said shoulder having at least one stop lug thereon with a radial length and with a top end above the bottom of said cap when said cap is screwed downwards to a lowered position wherein said stopper occludes sealingly said aperture, said intermediate ring having an exterior rib that in the lowered position of the cap has a forcible engagement with said stop lug and snaps beyond it, hindering an uncontrolled unscrewing of said cap, said rib having the form of a blade 0.6 to 0.9 mm thick and being a lower portion of an essentially radial outer element on said intermediate ring, said rib having a lower end and being of a radial width sufficient to engage with said top end along at least half the radial length of said stop lug, said rib being defined by an essentially axial slit between said rib and said ring, said slit being open at its lower end and having a length of between 2 and 5 mm, said element being positioned whereby as said cap is screwed downward on said head, said rib lower end engages with said top end of said stop lug, said rib flexing and progressively bending on said top end, said rib then releasing beyond said top end and vibrating and emitting a sound and being arrested beyond said stop lug when the screwing is completed, said length of the slit defining the frequency of said sound signal, said sound being a signal of a safe closing of the dispenser.

5,199,606

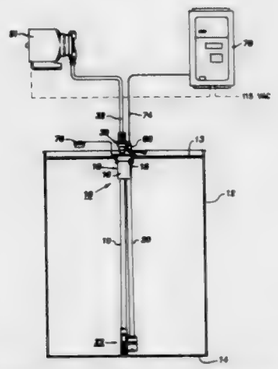
DISPENSING AND MEASURING DEVICE HAVING AN INTERNALLY EXTENDING OUTLET PIPE AND LEVEL SENSOR

Charles E. Nutting, Oakwood, Ohio, assignor to The Mogul Corporation, Chagrin Falls, Ohio

Filed Aug. 22, 1991, Ser. No. 748,528

Int. Cl.[5] B67D *5/24, 5/40*

U.S. Cl. 222—30 **12 Claims**



1. A device for dispensing and measuring fluid in a container having a top and a bottom comprising:

an adapter having an adapter body which is adapted to fit in the top of said container in a fluid tight fashion;

a foot structure with an intake;

tube means interconnecting said foot intake to pass fluid to said adapter and so that the foot structure will be located near the bottom of a container;

a fitting adapted to connect to the adapter and having an external conduit so that the fluid may be withdrawn from said container through the dispensing device;

said foot structure further including a level sensing device having electrical conductors extending between said level sensing device and said adapter;

an electrical circuit connected to said electrical conductors to process a signal from said level sensing device;

means to mount said electrical circuit in said adapter body; and

means to make an external electrical connection responsive to said level sensing device through said conductors for external connection to measuring means for determining one of the amount of fluid remaining in said container and the amount of fluid withdrawn from said container.

5,199,607

LIQUID DISPENSING APPARATUS

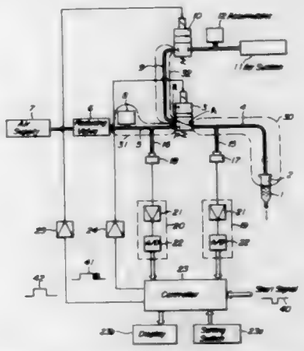
Ichiro Shimano, Tokyo, Japan, assignor to Musashi Engineering, Inc., Mitaka, Japan

Continuation of Ser. No. 621,514, Dec. 3, 1990, abandoned. This application Apr. 30, 1992, Ser. No. 879,146

Int. Cl.[5] B67D *5/08*

U.S. Cl. 222—55 **9 Claims**

1. A liquid dispensing apparatus comprising a syringe containing a liquid to be dispensed, an air supply for supplying compressed air to the syringe, a discharging solenoid valve connected to the syringe by means of a first pipe line and to the air supply by means of a second pipe line, a first pressure sensor for measuring pressure in the first pipe line, a second pressure sensor for measuring pressure in the second pipe line, and a controller connected to the discharging solenoid valve for outputting a signal to the discharging solenoid valve to communicate the first pipe line with the second pipe line and for controlling an output duration of the signal in accordance with a variation of time until the pressure in the first pipe line measured by the first pressure sensor reaches to a predetermined pressure after the first pipe line is communicated with the second pipe line, said apparatus further comprising an accumulator connected to the second pipe line, thereby preventing disturbance of the pressure in the syringe at the moment of communication between the first and second pipe lines.



5,199,608

GARMENT HANGER WITH IRREMOVABLE INFORMATION TABS

Andrew M. Zuckerman, Forest Hills, N.Y., assignor to Different Dimensions, Inc., Rego Park, N.Y.

Continuation of Ser. No. 591,621, Oct. 9, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 801,613

Int. Cl.[5] A47G *25/14*

U.S. Cl. 223—85 **14 Claims**

1. A garment hanger including a removal-resistant tab, comprising:

a hanger including a body and a hook member connected to said body;

a tab holder, formed integrally with said hanger, said tab holder having two opposite sides and a free edge, a first ridge disposed along said free edge and extending from said two opposing sides, and a second ridge extending from said two opposing sides and spaced from said first ridge; and

a tab including means for rendering said tab resistant to both accidental and intentional manual removal from said tab holder, said tab defining a face member and two opposing sides, each of said two opposing tab sides extending from said face member and terminating in a foremost edge opposite said face member, said opposing tab sides having a rib disposed on the inner surface of each for cooperatively engaging said first ridge to lock said tab to said tab holder, said opposing tab sides extending from said face member sufficiently such that said foremost edges of said

opposing tab sides border the near side of said second

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end of said first elongated member, said first engaging

ing outlet to regulate discharge of any contents in the

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opposing tab sides border the near side of said second ridge, without engaging said second ridge, when said ribs cooperatively engage said first ridge;

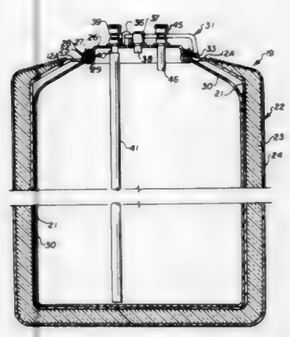
said second ridge being configured and dimensioned to obstruct access to said foremost edges of said opposing tab sides and thereby to essentially prevent both accidental and intentional manual removal of said tab from said tab holder.

5,199,609

PORTABLE DISPENSING SYSTEM

William O. Ash, Jr., 2537 S. Gessner, Ste. 216, Houston, Tex. 77063

Filed Sep. 11, 1991, Ser. No. 758,898
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **13 Claims**



13. In a liquid beverage dispensing container having a rigid wall and an access opening at one end thereof surrounded by a peripheral flange, a lid having a corresponding peripheral flange configured to be removably received within the beverage container opening, clamping means operatively connected between the container and lid to engage the container flange and lid flange in a releasably clamped condition, and fittings on the lid for connecting the interior of the container in fluid communication with gas filling means and liquid filling and dispensing means;

a gas and liquid impermeable flexible liner dimensioned to be inserted into and withdrawn from said beverage container in a collapsed condition to be filled with a liquid and substantially conform to the shape of the interior of said beverage container in an installed liquid filled condition,

said liner having an open end surrounded by a seal element releasably engaged on said lid flange to maintain said liner thereon during insertion and removal and to become engaged in fluid sealing relation between said container flange and said lid flange in the clamped condition to form a fluid pressure sealed envelope for containing a liquid beverage, whereby

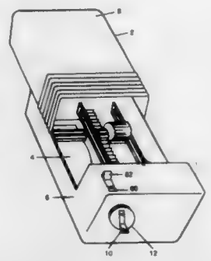
said lid and said liner assembly may be inserted and withdrawn from said container as a single unit and said liner in the installed condition filled with a liquid beverage of one type and after depletion of the liquid beverage, said liner may be refilled with a liquid beverage of the same type, or another said lid and said liner assembly may be installed in the same container from which the previous assembly was removed and filled with a liquid beverage of another type without requiring cleaning of said beverage dispensing container when switching from one beverage to another.

5,199,610

MOTORIZED TOOTH-PASTE DISPENSER

Mario Gagliardi, 256 Main Street North, Brampton, Ontario, Canada L6V 1P4

Filed May 11, 1989, Ser. No. 350,459
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—101 **15 Claims**



1. In a device for dispensing material from a collapsible container comprising:

(a) a housing having a dispensing aperture;

(b) means for retaining said container within said housing;

(c) spaced first and second racks disposed within said housing;

(d) a shaft having an axis extending from said first rack to said second rack, said shaft presenting one end extending beyond said second rack in the region remote, from said first rack;

(e) first and second pinions coaxially fixedly secured to said shaft and engageable with said first and second racks respectively;

(f) roller means coaxially secured to said shaft between said first and second pinion for squeezing said container and forcing said material from said container through said dispensing aperture;

(g) a electric motor coaxially joined to said one end of said shaft adjacent said second rack in the region remote from said first rack, for displacing said first and second pinions relative to said first and second racks respectively so as to displace said roller means and squeeze said container and force said material from said container through said dispensing aperture of said housing when said electric motor is activated;

(h) a plate secured to said electric motor, said plate being disposed substantially parallel to said axis of said shaft said plate, with said electric motor sliding relative to said housing, when said electric motor is activated,

(i) switch means for activating said electric motor.

5,199,611

APPARATUS FOR SQUEEZING MATERIAL FROM COLLAPSIBLE TUBES

Richard A. Santefort, Hamilton, and Ray H. Haerr, Batavia, both of Ohio, assignors to Valco Cincinnati, Inc., Cincinnati, Ohio

Filed Oct. 8, 1991, Ser. No. 772,840
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—103 **13 Claims**

11. An apparatus adapted for use with an elongated collapsible tube having a fluid material as its contents, said collapsible tube having upper and lower surfaces, a first rear end which is closed, and a second front end which has an opening for dispensing the fluid therefrom when said tube surfaces are squeezed together, the apparatus comprising:

(a) a first handle, said first handle comprising:

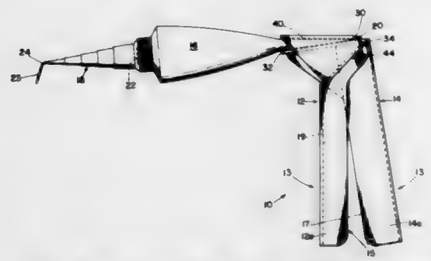
(i) a first elongated member dimensioned to be grasped by an adult hand, said first elongated member having upper and lower ends;

(ii) a first engaging plate fixedly connected to the upper end of said first elongated member, said first engaging plate being configured to abut and press against the lower surface of the collapsible tube, the rearmost portion of said first engaging plate defining a first pivot point;

(b) a second handle separate and distinct from said first handle, said second handle comprising:

(i) a second elongated member dimensioned to be grasped by an adult hand, said second elongated member having upper and lower ends;

(ii) a second engaging plate fixedly connected to the upper end of said second elongated member, said second engaging plate being configured to abut and press against the upper surface of the tube, the rearmost portion of



said second engaging plate defining a second pivot point; and

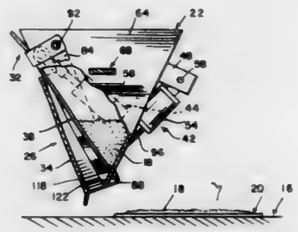
(c) said first and second pivot points lying in abutting pivotable relationship when said handles are brought together in their operable positions so that said handles are pivotable about said pivot points and so that said first and second engaging members are in spaced graspable relationship and a portion at least of the lower and upper surfaces of the collapsible tube is positioned between said first and second engaging plates, respectively, said first and second engaging plates operating to approach each other and thereby press the collapsible tube therebetween as said first and second elongated members are squeezed together.

5,199,612

TRAVELING BUCKET WITH DISPENSING OUTLET CLOSURE MECHANISM

Glen F. Raque, Louisville, Ky., assignor to Raque Food Systems, Inc., Louisville, Ky.

Filed May 23, 1991, Ser. No. 704,773
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—134 **41 Claims**



1. A bucket assembly for dispensing content onto an underlying carrier, the bucket assembly comprising

a hopper formed to include a dispensing outlet,

first means including an external closure flap for selectively rotating about an axis between a fully opened position and a fully closed position for opening and closing the dispensing outlet to regulate discharge of any contents in the hopper through the dispensing outlet, and

second means for selectively closing the dispensing outlet independently of the first means to block discharge of any contents in the hopper through the dispensing outlet so that a contents-receiving receptacle is established in the hopper to retain the contents in the hopper without actuation of the first means to close the dispensing outlet,

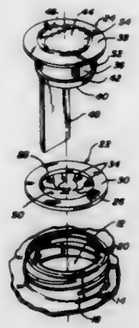
the second means pivoting about substantially the same axis as the first means for closing the dispensing outlet.

5,199,613

SMOOTH FLOW POUR SPOUT

Joseph M. Magrath, 1311 W. First St., McCook, Nebr. 69001, and Mike L. Claeys, Golden, Colo., assignors to Joseph M. Magrath, McCook, Nebr.

Filed Nov. 21, 1991, Ser. No. 795,512
Int. Cl.[5] B67D *5/32*
U.S. Cl. 222—153 **15 Claims**



10. A pour spout for use with liquid containers having an opening defined therein, through which said opening said pour spout extends, comprising in combination:

a spout member having at least one longitudinally-extending passage formed therein for receiving liquid flow from said container, a body portion of said liquid flow passage insertable through said opening defined in said container and including a first radially outward-directed peripheral protrusion from one end of said body portion and a second radially outward-directed peripheral portion from the opposite end of said body portion; and

means for locking said spout member to a continuous edge formed about said opening, including a ring adapted to overlay and engage said continuous edge and fingers projecting inwardly from said ring into the opening of said container, whereby said fingers are fixedly positioned between said body and the continuous edge of said container.

5,199,614

GREASE GUN AUTO-PULL FOLLOWER APPARATUS

David N. Husman, Manchester, Mo., assignor to Lincoln, St. Louis, Mo.

Filed Aug. 8, 1991, Ser. No. 742,367
Int. Cl.[5] G01F *11/00;* **F16N** *3/00*
U.S. Cl. 222—256 **20 Claims**

1. A fluid dispensing apparatus comprising:

a pump housing having a fluid supply inlet and a fluid dispensing outlet;

a fluid reservoir having a body with first and second ends, an opening at the first end of the body providing access to an interior of the body and an end wall at the second end of the body, the end wall having a hole therethrough, the first end of the body being attachable to the pump housing

to communicate the interior of the body with the fluid

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a curved vertical wall secured to and extending upwardly from the upper end of the first cylinder, the wall engaging

cup-shaped depression with a bottom wall sealed at least along a part of said tearing line of said bottom wall of said bottom

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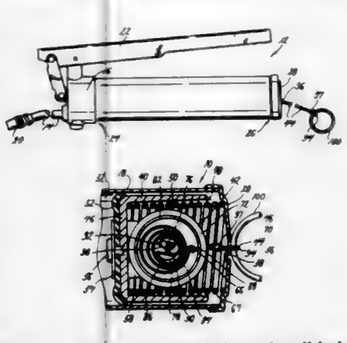
to communicate the interior of the body with the fluid supply inlet of the pump housing;

follower means mounted in the interior of the body for reciprocating movement through the body between the first and second ends;

pull means connected to the follower means and extending through the end wall hole out of the body interior for



pulling the pull means through the end wall hole and out of the body interior and thereby causing the follower means to move through the body interior toward the second end; and,

retracting means secured to the follower means and connected to the pull means for retracting the pull means pulled through the end wall hole out of the body interior back into the body interior.

5,199,615

DISPENSER WITH PRESSURE RELEASE MECHANISM

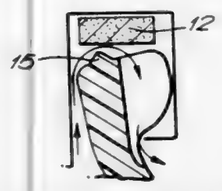
Trevor Downing, Romford, and Roderick M. Parker, Beccles, both of United Kingdom, assignors to Lawson Mardon Group UK Limited, London, United Kingdom

Continuation of Ser. No. 689,249, Jun. 12, 1991, abandoned. This application Aug. 28, 1992, Ser. No. 936,080

Claims priority, application United Kingdom, Jun. 11, 1987, 8713636

Int. Cl.[5] B65D *83/70*

U.S. Cl. 222—397 **9 Claims**



1. A dispenser comprising a plastics container and a closure which is secured in a fluid tight manner to a neck portion of the container, the neck portion of the plastics container and the closure forming between them a passageway means which is normally sealed by a seal means formed between an axial end of the neck portion and a seal portion of the closure which faces said axial end of the neck portion, said neck portion and closure further comprising an escape means which causes opening of the normally sealed passageway means upon deformation of the neck portion, by internal pressure at an elevated temperature, to permit release of the pressure within the dispenser by movement of the neck portion axially away from the said seal portion of the closure, while retaining the closure captive on the neck portion.

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COMBINATION DISCHARGE AND REFILL VALVE FOR UNIT DOSE DISPENSER

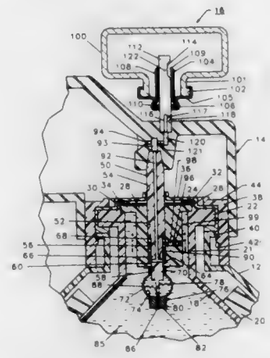
James H. Martin, 8322 County Line Rd., Burr Ridge, Ill. 60521

Division of Ser. No. 516,529, Apr. 30, 1990, Pat. No. 5,105,995. This application Apr. 13, 1992, Ser. No. 867,883

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[5] B65D *37/00*

U.S. Cl. 222—402.16 **3 Claims**



1. Dispensing apparatus, comprising in combination

a first elastomeric reservoir for containing a quantity of liquid under pressure, said reservoir having an opening therein,

manually operable means mounted in said reservoir across said opening for dispensing a predetermined volume of said liquid in response to each actuation thereof,

said manually operable means including a second elastomeric metering reservoir having an expanded, unstressed position defining a metering chamber therein, an elongate valve stem extending coaxially through said second reservoir and movable between a first position and a second position, said valve stem having a first axial passageway extending from one end located exteriorly of said first and second reservoirs to a location remote from the other end, said passageway being sealed from said second reservoir when said valve stem is in said first position and opening into said second reservoir when said valve stem is in said second position,

said valve stem having a second axial passageway extending from said other end, said other end being in communication with said first reservoir, said second passageway opening into said second reservoir when said valve stem is in said first position and being sealed from said second reservoir when said valve stem is in said second position, and

check valve means connected between said first passageway and said first reservoir.

5,199,617

CAP FOR CONTAINERS

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06612

Filed Apr. 23, 1992, Ser. No. 872,337

Int. Cl.[5] B65D *25/40*

U.S. Cl. 222—498 **5 Claims**

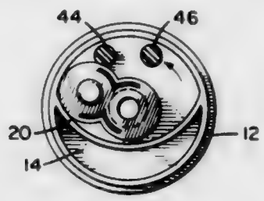
1. A cap adapted to be secured to an open end of a container, said cap comprising:

a first vertical hollow cylinder having an open lower end adapted to be secured to the open end of the container, the first cylinder having a closed upper end with a small centrally disposed first opening therein and has a raised peripheral first lip;

a curved vertical wall secured to and extending upwardly from the upper end of the first cylinder, the wall engaging the first lip at two spaced apart positions, said positions and the first opening being disposed essentially along a common horizontal line, the wall being spaced from the first opening and curving around one side of the first opening, the top of the wall being horizontally aligned with the top of the first lip;

a second vertical hollow cylinder open at both ends and secured to the upper end of the first cylinder with an upper end horizontally aligned with the top of the wall, the second cylinder having an axial bore vertically aligned with the first opening, the wall being spaced from and extending around one side of the second cylinder;

a horizontally elongated member which in the horizontal plane has the shape of a figure 8 with left hand and right hand half sections, the member having a top flat surface with first and second spaced holes therein, each hole having the same shape and size as the first opening and being disposed in a corresponding one of the half sections,



one of said holes being sealed, the other hole being open, the member having an open bottom end which is circumferentially surrounded by a downwardly extending peripheral second lip, the member resting slidably on top of the second cylinder, one side of said member slidably engaging said wall; and

a third vertical hollow cylinder having a flat top surface with a second central opening aligned with the bore of the second cylinder and having an open bottom end, the third cylinder rotatably engaging the first lip and the surface of the member, the third cylinder having first and second spaced vertical prongs extending downwardly from its top surface, the third cylinder when rotated in one direction with respect to the first cylinder causing the first prong to engage the member, the member moving into a first position at which the sealed hole seals off the top end of the second cylinder, the third cylinder when rotated in the opposite direction causing the second prong to engage the member, the member moving into a second position at which the open hole is aligned with the open bore.

5,199,618

POURING DEVICE FOR CONTAINER FOR FLOWABLE MATERIAL

Wilhelm Reil, Bensheim; Ulrich Deutschbein, Muhltal; Gerd Knobloch, Griesheim, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Alfa Holdings S.A., Pully, Switzerland

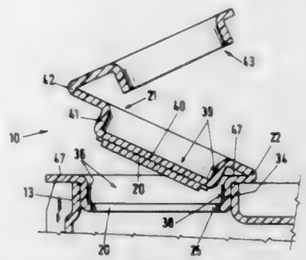
Filed Nov. 30, 1990, Ser. No. 621,615

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, 3939970; European Pat. Off., Apr. 11, 1990, 90106964.1

Int. Cl.[5] B65D *47/10*

U.S. Cl. 222—541 **8 Claims**

1. A pouring device of plastic material for fitting to an opening of a container for flowable material, which comprises a bottom portion having a cup-shaped depression with a bottom wall and an upstanding collar for engaging with an edge of an open container, said bottom wall having a tearing line for opening the pouring device, and a closure portion having a cup-shaped depression with a bottom wall sealed at least along a part of said tearing line of said bottom wall of said bottom



portion and an upstanding collar at the edge thereof pivotally connected to said bottom portion by hinge means.

5,199,619

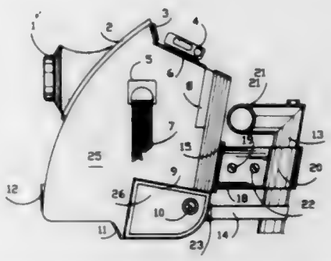
MULTI FUNCTIONAL CARRIER PACK FOR ATTACHMENT TO FRONT HANDLEBAR OF BICYCLE (BIKE PAL)

Seyed M. Mostashari, 3901 Tunlaw Rd., N.W. #103, Washington, D.C. 20007

Filed Oct. 2, 1990, Ser. No. 591,403

Int. Cl.[5] B62J *7/06, 9/00*

U.S. Cl. 224—36 **10 Claims**



1. A bicycle pack for releasably mounting to a bicycle handlebar comprising: a pack having a back, a front, a top, a bottom and two side panels and means for releasably attaching said pack to a front handle bar and stem of a bicycle, said panels defining an interior storage area, said interior storage area further comprising a plurality of panels, subdividing said interior storage area into a plurality of smaller compartments, each smaller compartment comprising means defining a separate access opening, said pack being constructed from a semi rigid material whereby articles may be stored within said pack without a noticeable deformation to said pack, wherein said attachment means comprises:

a mount having a circular portion capable of wrapping around a front handlebar stem, said circular portion including means for creating friction between the circular portion and the stem while protecting paint or any material applied over said stem, an arm portion serving to space said carrier pack a distance from said handle bar stem while serving to firmly mount said mount to the bicycle handlebar stem, and a mounting portion serving to adjustably mount said carrier pack to said mount, said mounting portion having a safety reflector mounted on a forward facing side end having means for protecting said surface of said reflector, said forward facing side having said safety reflector mounted thereto further including a mounting lip spread apart and depending from a bottom side and a right and left side of said forward facing side, said carrier pack further including a mounting plate se-

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cured to said pack, said mounting plate being capable of sliding engagement with said forward facing said and each of said mounting lips depending therefrom whereby said carrier pack may be detachably mounted to said mounting device.

5,199,620

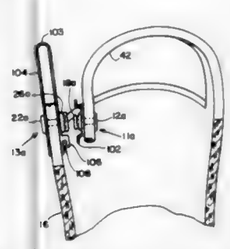
SECURITY HOLSTER THUMB-BREAK

Robert J. Beletsky, Rockport, Mass., assignor to Strong Holster Company, Gloucester, Mass.

Continuation of Ser. No. 464,367, Jan. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 420,144, Oct. 11, 1989, abandoned. This application Jul. 12, 1991, Ser. No. 730,030

Int. Cl.[5] **F41C** *33/02*

U.S. Cl. 224—243 **13 Claims**



1. An assembly for releasably securing at two spaced locations a holster safety strap to a holster, comprising:

a fastener assembly on the holster and safety strap operable in a first direction adapted to releasably engage to provisionally attach the strap to the holster;

at least one rigid tongue member protruding from one of the strap and holster, facing the other of the strap and holster when said fastener assembly is engaged; and

at least one tongue member receiving means attached to the other of the strap and holster and facing said rigid tongue member when said fastener assembly is engaged, said tongue member receiving means and said tongue member being relatively rotatable when engaged, in a second direction from a first, unlocking position wherein said tongue member is not engaged with said tongue member receiving means, to a second, securing position wherein said tongue member is engaged with said tongue member receiving means to prevent operation of said fastener assembly when engaged from disengaging for providing additional securing in a holster safety strap.

5,199,621

DRUMSTICK HOLDER HOLSTER

Stephen J. McLennan, 2236 Albury Ave., Long Beach, Calif. 90815

Filed Mar. 11, 1991, Ser. No. 667,277

Int. Cl.[5] **A45F** *5/00, 3/00*

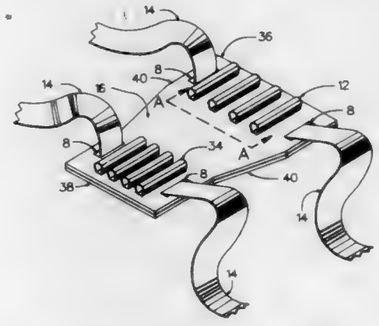
U.S. Cl. 224—253 **11 Claims**

1. A holster for storing and dispensing a plurality of drumsticks, each drumstick having a striking end and a holding end, for use by a percussion player and attached to the percussion player's body, the holster comprising:

an upper plate of flexible plate material substantially in the shape of a trapezoid having a short side and a long side which are parallel to each other, perforated by (a) a first row of a plurality of equally closely-spaced elongated slots located along the short side with a longitudinal axis of said slots perpendicular to the short side, (b) a second row of a plurality of equally widely-spaced elongated slots located along the long side and the number of said slots equal to the number of slots of said first row, (c) a first pair of elongated body strap openings located adjacent to said first row of slots with the longitudinal axis of said body strap openings parallel to the longitudinal axis of the slots in said first row, and (d) a second pair of elongated body strap openings located adjacent to said second row of slots with the longitudinal axis of said body strap openings parallel to the longitudinal axis of the slots in said second row;

a lower plate of flexible plate material of the same trapezoidal shape and dimensions as the upper plate, perforated by (e) a third pair of elongated body strap openings identical in dimensions and location to said first pair of parallel elongated body strap openings in the upper plate, and (f) a fourth pair of elongated body strap openings identical in dimensions and location to said second pair of elongated body strap openings in the upper plate, so that when the upper plate and the lower plate are placed coincident one on top of the other said first pair of body strap openings in the upper plate exactly overlays said third pair of body strap openings in the lower plate, and said second pair of body strap openings in the upper plate exactly overlays said fourth pair of body strap openings in the lower plate;

a first flat elastic ribbon threaded continuously through said first row of elongated slots in the upper plate to form a row of equally closely-spaced loops extending upward



from an upper side of the upper plate and designed to releasably grip the drumsticks near their striking ends;

a second flat elastic ribbon threaded continuously through said second row of elongated slots in the upper plate to form a row of equally widely-spaced loops extending upward from the upper side of the upper plate and designed to releasably grip the drumsticks near their holding ends, the holster assembly being constructed by glueing the upper side of the lower plate while exactly underlying the upper plate to a lower side of the upper plate and clamping portions of the threaded first flat elastic ribbon and second flat elastic ribbon between said upper and lower plates;

a first body strap of flat flexible strap material threaded through said overlaid first and third pair of body strap openings in the glued-together holster assembly with fastening means at the strap ends for strapping the holster to the percussion player; and

a second body strap of flat flexible strap material threaded through said overlaid second and fourth pair of body strap openings in the glued-together holster assembly with fastening means at the strap ends for strapping the holster to the percussion player.

5,199,622

FLOSS CUTTER AND HOLDER

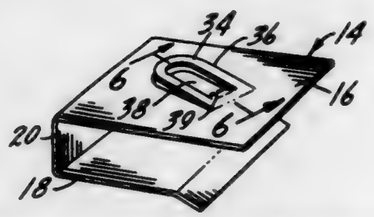
Robert A. Vieau, 233 Town Acres La., Roselle, Ill. 60101

Filed Feb. 1, 1990, Ser. No. 473,469

Int. Cl.[5] **B65H** *35/06*

U.S. Cl. 225—51 **4 Claims**

1. A device for cutting and clamping dental floss, including a body portion formed and adapted to be mounted on a housing which contains a supply of dental floss, a cantilever arm integral with and extending outwardly from said body portion and having spaced longitudinal extending edges thereof providing cutting surfaces which are formed and adapted to sever dental floss when it is pulled thereacross, a depression in said



cantilever arm located generally centrally between said longitudinal edges, said depression forming a clamping element integral with said cantilever arm and having a clamping surface facing away from said cantilever arm and being formed and adapted to cooperate with a portion of the housing to accessibly hold a dental floss cut end after severing.

5,199,623

DEVICE FOR SUPPORTING, TURNING AND SPREADING OF A WEB

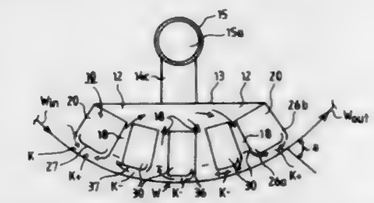
Raimo Rajala, Kaarina; Jukka Parvinen, Turku; Bertel Karlstedt, Parainen; Pertti Heikkilä, Raisio, and Ilkka Jokioinen, Lieto, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Continuation of Ser. No. 455,591, Dec. 22, 1989, abandoned. This application May 2, 1991, Ser. No. 694,799

Claims priority, application Finland, Jan. 6, 1989, 890077

Int. Cl.[5] **B65H** *20/14*

U.S. Cl. 226—97 **11 Claims**



1. A device for contact free air supporting, turning and spreading of a web, said device comprising:

a curved carrier face, said face shaped in dependence upon a turning angle of a web placed in close proximity thereto,

a plurality of interconnected nozzle boxes for blowing air to support said web, each nozzle box having a plurality of sides, one of said sides having at least one end separated by a gap from a side adjacent thereto, said one of said sides and said side adjacent thereto being shaped so as to define a nozzle oriented such that a gas in said nozzle box can flow therethrough, and one of said sides being substantially parallel to the run path of said web to form a boundary of said curved carrier face, and wherein some of said nozzle boxes are float-nozzle boxes, and said float-nozzle boxes are situated such that at least one foil-nozzle box is interposed between adjacent said float-nozzle boxes and pressure equalization pockets are created between adjacent nozzle boxes,

a single web floating pressure equalization chamber extending in a transverse direction substantially across the entire width of the web, said single web floating pressure equalization chamber being arranged downstream after said nozzles in the direction of air flow through said nozzles,

said pressure equalization pockets provided between said adjacent nozzle boxes directly communicating with said single web floating pressure equalization chamber, each said nozzle box having its interior separated from said single web floating pressure equalization chamber, said single web floating pressure equalization chamber and said pressure equalization pockets being structured and arranged to circulate the air to keep the pressure between said web and said turning device substantially invariable in spite of disturbances in the web due to uneven tension thereof, such that the distance between said web and said curved carrier face is kept substantially invariable.

5,199,624

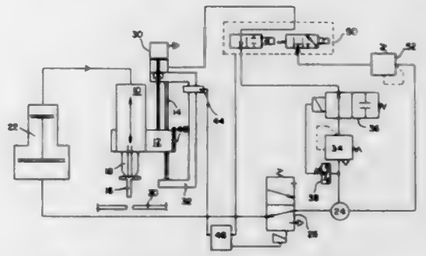
TABLE TOP RIVET SETTING ASSEMBLY

Charles F. Smart, Danbury; William E. O'Connor, Watertown, and Anthony D'Aquila, Trumbull, all of Conn., assignors to Emhart Inc., Newark, Del.

Filed Dec. 20, 1990, Ser. No. 630,904

Int. Cl.[5] **B21J** *15/28*

U.S. Cl. 227—2 **3 Claims**



1. A table top rivet setting assembly comprising

a pulling head for setting a rivet,

means for supporting said pulling head for vertical displacement from an up position to a down riveting position,

rivet delivery means for holding a rivet

said rivet delivery means being vertically displaceable from a retracted position relative to said pulling head to an advanced position beneath said pulling head whereat the rivet can be transferred to said pulling head and returning said rivet delivery means from said advanced position to said retracted position,

means for preventing the downward displacement of said supporting means,

means for operating said preventing means when said supporting means is at said up position including means for sensing that said supporting means is at said up position, and

means for disabling said operating means following the displacement of said rivet delivery means from said retracted position down to said advanced position and back up to said retracted position.

5,199,625

FASTENER-DRIVING TOOL ASSEMBLY WITH IMPROVED FASTENER-LOADING FEATURES

George G. Dewey, Prospect Heights, and Ronald J. Allen, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 765,840, Sep. 26, 1991. This application Sep. 8, 1992, Ser. No. 941,840

Int. Cl.[5] **B25C** *1/14*

U.S. Cl. 227—8 **16 Claims**

1. A tool assembly for driving a fastener toward and into a workpiece, comprising:

a nosepiece having an aperture defined therein for permitting a fastener to be axially driven through said nosepiece toward said workpiece;

5,199,626

tively connected to said head and to said manifold, a storage means for storing data on the spots determined to

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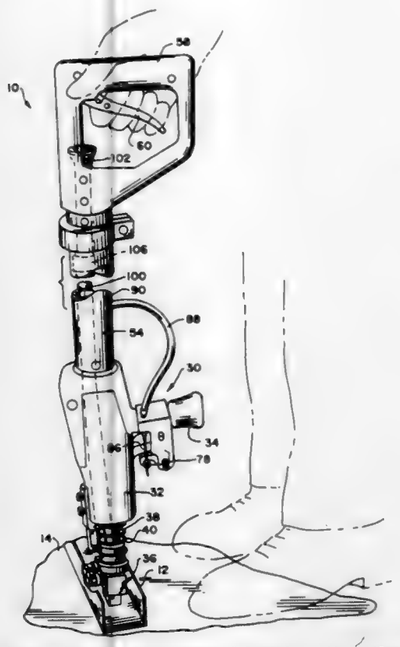
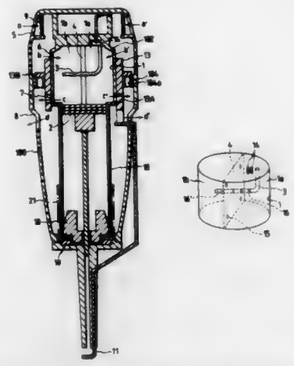
a housing;
means mounting said nosepiece for relative movement with respect to said housing;
a shuttle moveable with respect to said nosepiece between a fastener-receiving position and a fastener-delivery position, and having a passageway defined therein for receiving said fastener with said fastener disposed axially within said passageway and for permitting said fastener to be axially driven through said shuttle and toward said workpiece;
means for guiding said fastener axially into said passageway of said shuttle when said shuttle is disposed at said fastener-receiving position;
means for causing resultant movement of said shuttle form said fastener-receiving position to said fastener-delivery position in response to said movement of said nosepiece with respect to said housing so as to transfer said fastener, disposed axially within said passageway of said shuttle,



from said fastener-receiving position to said fastener-delivery position when said fastener is to be axially driven through said passageway of said shuttle and said aperture of said nosepiece toward said workpiece;
means comprising a driving element, which si disposed so as to be axially driven through said passageway of said shuttle and into said aperture of said nosepiece when said shuttle is disposed at said fastener-delivery position, for engaging said fastener disposed within said passageway of said shuttle so as to drive said fastener axially from said passageway of said shuttle and through said aperture of said nosepiece into said workpiece; and
means for retaining said fastener within said passageway of said shuttle when said shuttle is disposed at said fastener-delivery position so as to prevent said fastener from accidentally dropping out of said passageway of said shuttle but permitting said fastener to be axially driven from said passageway of said shuttle by said driving element.

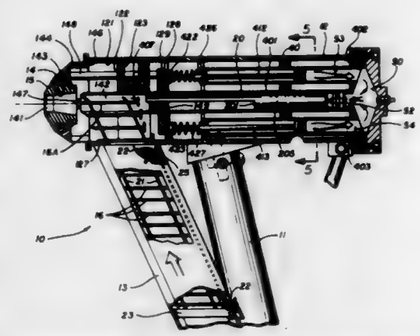
5,199,626
COMBUSTION GAS POWERED TOOL
Tsunehisa Terayama, Katsuta; Takuji Torii, Ushiku; Shinki Ohtsu, Ibaraki; Hiromu Utsumi, Katsuta; Teruo Suzuki, Hitachi; Toshifumi Kubota, Katsuta; Yo Kawakami, Mito; Yasuyuki Hirano, Katsuta, and Akira Uno, Hitachioota, all of Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan
Continuation of Ser. No. 769,257, Oct. 1, 1991, abandoned. This application May 27, 1992, Ser. No. 888,307
Claims priority, application Japan, Oct. 5, 1990, 2-269145
Int. Cl.[5] B25C *1/08*
U.S. Cl. 227—10 **5 Claims**



1. A combustion gas powered tool comprising:
a member defining a part of a cylindrical combustion chamber having an axis;
a piston movable in a direction along the axis of the combustion chamber, the piston defining the combustion chamber in conjunction with the member;
means for generating a mixture of air and fuel in the combustion chamber;
means for igniting the air-fuel mixture in the combustion chamber to drive the piston; and
an orifice grille extending in the combustion chamber and being parallel to the axis of the combustion chamber.

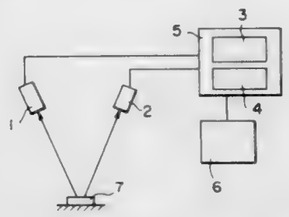
5,199,627
SELF POWERED MAGAZINE HAMMER
Jeffrey M. Christensen, 10359 Wilsey Ave., Tujunga, Calif. 91042
Filed Mar. 29, 1991, Ser. No. 678,534
Int. Cl.[5] B27F *7/09*
U.S. Cl. 227—130 **18 Claims**

1. A self powered hammer comprising a handle, a fixed body secured to said handle;
said fixed body including a cylindrical recess at one end thereof having a longitudinal axis;
a generally cylindrical movable striking head in reciprocal moving relationship along the axis of said body partially extending into the cylindrical recess in said body said head including a passageway along said axis;
means normally urging said movable head outward from said body;
a manifold within said body behind said movable head; and
hydraulic fluid filling said manifold;
said body including a first cylinder in said recess positioned along said axis, a nail holding chamber forming part of said cylinder, a first piston and a nail driving blade in said cylinder aligned with said passageway, an opening of said chamber exposed to the exterior of said body through said passageway; and
a second cylinder and a second piston in said body operatively connected to said head and to said manifold whereby striking the movable head member against a surface generates hydraulic pressure within said manifold



communicated to said first piston for driving said first piston toward said head and for driving a nail through said passageway into a work surface.

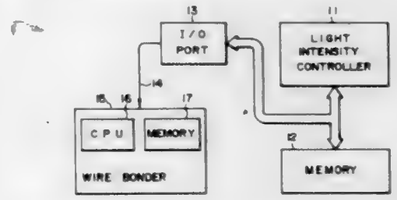
5,199,628
WIRE BONDING DEVICE
Yasuaki Honma, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jun. 2, 1992, Ser. No. 892,454
Claims priority, application Japan, Jun. 11, 1991, 3-166395
Int. Cl.[5] H01L *21/60;* **H05K** *3/32*
U.S. Cl. 228—4.5 **5 Claims**



1. A wire bonding device which comprises a height detector which detects the surface height of a semiconductor pellet without touching it; a position detector which detects the position of said semiconductor pellet; and a bonding head controller which controls a bonding tool based on the surface height data of said semiconductor pellet obtained from said height detector and the two-dimensional position coordinate data of said semiconductor pellet obtained from said position detector.

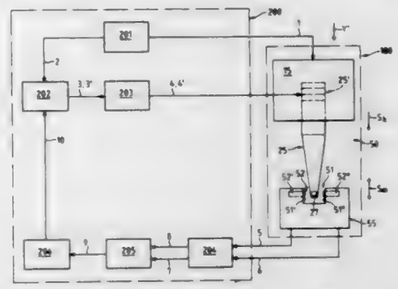
5,199,629
WIRE BONDING SYSTEM
Kensuke Sawase, and Hiromi Ogata, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan
Filed Dec. 19, 1991, Ser. No. 810,115
Claims priority, application Japan, Dec. 21, 1990, 2-413173
Int. Cl.[5] H01L *21/60*
U.S. Cl. 228—4.5 **22 Claims**

1. A wire bonding system comprising:
a decision means for determining the spots to be wired bonded on a substrate, said decision means determining the spots by performing a short-circuiting operation of the substrate;
a storage means for storing data on the spots determined to be wire bonded; and



a wire bonder for carrying out wire bonding in accordance with the data.

5,199,630
METHOD AND APPARATUS FOR MEASURING THE VIBRATION AMPLITUDE ON AN ENERGY TRANSDUCER
Armin Felber, Lucerne, and Walter Nehls, Udligenswil, both of Switzerland, assignors to ESEC SA, Cham, Switzerland
Filed Jan. 22, 1992, Ser. No. 824,133
Claims priority, application Switzerland, Feb. 15, 1991, 471/91
Int. Cl.[5] B23K *1/06, 20/10, 31/12*
U.S. Cl. 228—102 **10 Claims**



1. A method for measuring virbration amplitude of an energy transducer, which is fed to a process point together with a correspondingly constructed bonding head means for ultrasonic contacting wired connection of electrical circuits to metallic leadframe strips, comprising the steps of: supplying a energy transducer with a first ultrasonic value for generating a voltage for producing a mechanical longitudinal vibration; measuring an instantaneous amplitude of the longitudinal vibration of the energy transducer and a predetermined infeed of the bonding head means; determining a correction factor (K_f) from the thus established measured quantities; and using the correction factor (K_f) for calibrating the first ultrasonic value and consequently the vibration amplitude of the energy transducer.

5,199,631
DIFFERENTIAL PRESSURE METHOD AND APPARATUS FOR BONDING HIGH TEMPERATURE STRUCTURES
John J. Anderson, San Diego; Ken Schertzer, Imperial Beach; James F. Steckbeck, San Diego, and Donald O. Nelepovitz, San Diego, all of Calif., assignors to Rohr, Inc., Chula Vista, Calif.
Filed Jun. 1, 1992, Ser. No. 890,834
Int. Cl.[5] B23K *20/00*
U.S. Cl. 228—181 **27 Claims**

1. Apparatus for bonding high temperature resistant metal structures which comprises:
a chamber;

least one panel to the other of said panels to join the panels

including outwardly protruding rigid lip means having a

5,199,636
GIFT MAILING BOX

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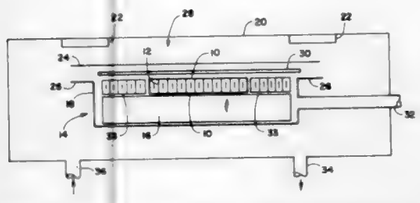
a high temperature resistant support means adapted to be placed in said chamber and adapted to support a multi-part high temperature resistant metal structural assembly to be bonded together;
a high temperature resistant foil sheet having a thickness of from about 0.0005 to 0.003 inch, adapted to cover said assembly on said support means and be bonded to said support to form a vacuum bag;



means for evacuating gases from within said bag and chamber;
means for heating said bag to a temperature for a predetermined time at which bonding of a structural assembly within said bag occurs; and
means for admitting gas into said chamber at a pressure higher than that within said bag.

5,199,632
RAILWAY CAR BODY STRUCTURES AND METHODS OF MAKING THEM

Michifumi Takeichi; Sumio Okuno; Masato Okazaki, and Morishige Hattori, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

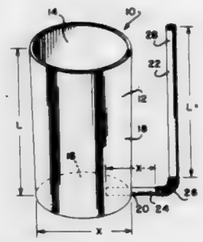
Division of Ser. No. 544,696, Jun. 27, 1990, Pat. No. 5,140,913. This application Jul. 21, 1992, Ser. No. 915,622
Claims priority, application Japan, Jun. 30, 1989, 1-166691; Dec. 27, 1989, 1-339253
Int. Cl.[5] B61D *17/00*
U.S. Cl. 228—181 **7 Claims**

1. A method of making a passenger car body structure having two opposite sides, a roof, two ends and a floorplate, including forming a structural panel assembly which is at least part of one of said sides, roof, ends and floorplate by steps comprising:
(i) aligning edge-to-edge at least two panels each comprising inner and outer metal sheets and, a cellular metal core brazed to said inner and outer metal sheets and maintaining said sheets spaced apart, wherein said core has a honeycomb structure having parallel cells whose axial direction is perpendicular to said inner and outer sheets, wherein at least one said panel has at an edge thereof a connecting member having a first portion substantially perpendicular to one of said inner and outer sheets and joined to said core, and having a second portion adjacent to and substantially parallel to said one of said inner and outer sheets, wherein said second portion extends away from said core to provide an end portion for welding said panel to an adjacent panel such that the weld is separated from the brazing of said core to said one of said inner and outer sheets,
(ii) welding said end portion of said second portion on said at least one panel to the other of said panels to join the panels together into said panel assembly.

5,199,633
DRINKING AID

L. Arthur Jantzen, 18 Spruce Ter., Wayne, N.J. 07470, and Raymond Maguire, 1668 SW. Buckskin Trail, Stuart, Fla. 34997

Filed Aug. 3, 1992, Ser. No. 923,567
Int. Cl.[5] B65D *3/28*
U.S. Cl. 229—103.1 **12 Claims**

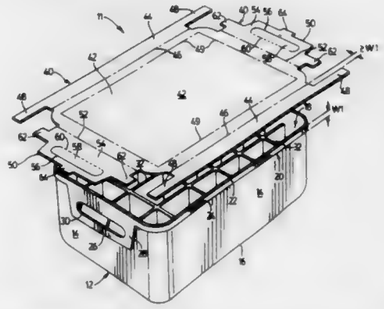


1. A drinking aid, comprising:
a cylindrical container having (a) an open top, (b) a closed bottom, and (c) an annular wall; wherein
said wall has an aperture formed therethrough in immediate adjacency to said closed bottom; and
an elongate tube, having an articulated portion intermediate the length of said tube; wherein
said tube is in penetration of said aperture, with a fluid-sealing, interference fit, and an end of said tube is confined within said wall.

5,199,634
STORAGE CONTAINER WITH DISPOSABLE LID

Barry R. Luce, 275 Ron Allen Drive, Dorchester, Ontario N0L 1G1; Danny P. St. Dennis, 550 Charlotte Street, Windsor, Ontario N8X 3A3, and Clifford E. J. Charbonneau, 300 Crownridge Blvd., Amherstburg, Ontario N9V 3W8, all of Canada

Filed Jun. 19, 1992, Ser. No. 901,074
Int. Cl.[5] B65D *43/02*
U.S. Cl. 229—125.29 **23 Claims**

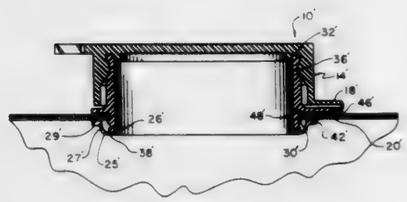


1. An interlocking container and lid, comprising;
a) a rigid container provided with a bottom and container side wall defining an interior, the side wall having an upper edge forming a container upper edge, said container upper edge defining a top opening for providing access into said interior of said rigid container, the rigid container including outwardly protruding rigid lip means having a lower edge, the lip means being located along at least a portion of the upper edge of the rigid container; and
b) a lid having a central portion dimensioned to cover said top opening, a plurality of spaced pairs of tab members attached to said central portion, the tab members of each of said plurality of spaced pairs being shaped and dimensioned so that when the lid is received onto the rigid container the two tab members of each of said plurality of spaced pairs are overlappable and attachable to each other beneath said rigid lip means to abut said lip lower edge to lock said lid to said rigid container.

5,199,635
CONTAINER HAVING RECLOSABLE POUR SPOUT MOUNTED THEREON

Robert S. Abrams, Albany, N.Y.; Joseph H. Miller, Framington, and Paul R. Bird, Naugatuck, both of Conn., assignors to Capital Spouts, Inc., Fultonville, N.Y.

Continuation-in-part of Ser. No. 634,439, Dec. 27, 1990, Pat. No. 5,108,029, which is a continuation-in-part of Ser. No. 465,848, Jan. 16, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 753,855
Int. Cl.[5] B65D *5/74*
U.S. Cl. 229—125.09 **20 Claims**

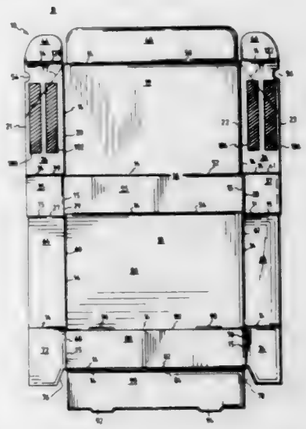


1. A container for holding pourable material, comprising:
a container body having an exterior surface, an interior surface, an interior for receiving pourable material, and an opening extending through a wall thereof for permitting emptying of the material from the container; and
a reclosable pour spout secured to the container body, said reclosable pour spout including:
a flange member having oppositely positioned first and second sides, and an aperture extending therethrough, the second side of the flange member being secured to the exterior surface of the wall of the container body,
an extension connected to and extending axially away from the first side of the flange member, said extension having an aperture extending therethrough that communicates with the aperture in the flange member, and
a stem connected to and extending axially away from the second side of the flange member, said stem having an aperture extending therethrough that communicates with the aperture in the flange member, said stem being comprised of a substantially axially extending portion that extends through the opening in the wall of the container body and an upwardly turned portion that extends toward the interior surface of the container body, a portion of said substantially axially extending portion extending beyond the interior surface of the container body toward the interior of the container body.

5,199,636
GIFT MAILING BOX

Lincoln L. C. Young, 4449 Candleberry Ave., Seal Beach, Calif. 90740

Filed Feb. 5, 1992, Ser. No. 831,798
Int. Cl.[5] B65D *5/22*
U.S. Cl. 229—151 **9 Claims**

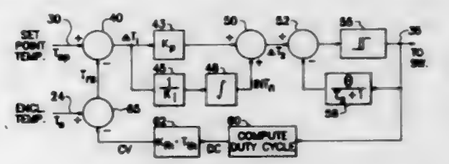


1. A foldable box formed from a single piece of folded corrugated cardboard comprising:
a main bottom segment, said main bottom segment having side walls and a front panel foldable over itself to form front walls, said folded front walls defining a space between said front walls;
a main top segment, connected to said main bottom segment, said main top segment having side walls, said side walls having projecting tab portions extending from the end of said side walls, said projecting tab portions capable of fitting within said space between said folded front panels of said main bottom segment, said side walls having a diagonal slit score whereby said projecting tab portions are capable of moving upwardly and away from said side walls for facilitating insertion of said projecting tab portions into said space.

5,199,637
ELECTRONIC THERMOSTAT HAVING CORRECTION FOR INTERNALLY GENERATED HEAT FROM LOAD SWITCHING

John T. Adams, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 5, 1992, Ser. No. 878,589
Int. Cl.[5] G05D *15/00*
U.S. Cl. 236—78 R **15 Claims**



1. In a thermostat for controlling flow of electrical power to a load and having an enclosure, a controller providing a switch control signal having first and second states, a switching element receiving the switch control signal for conducting power for the load responsive only to the switch control signal's first state and generating heat within the enclosure when conduct-

ing load power, an improvement for providing a correction

pressure admitted into said conduit is delivered through selected one of said spray heads.

and alternately into an open position, in which said nozzle needle frees the nozzle bore, and

fed to the outfeed means exceeds the expelling rate capac-

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ing load power, an improvement for providing a correction signal encoding a correction value substantially equal to the difference between the internal temperature within the enclosure and the ambient temperature external to the enclosure, comprising

a) duty cycle means receiving the switch control signal for providing a duty cycle function signal encoding a duty cycle function value following the average fraction of total time the switch control signal's first state exists; and

b) correction signal means receiving the duty cycle function signal for providing the correction signal encoding a correction value equal to the product of the duty cycle function value and a predetermined constant value encoded in a constant value signal.

5,199,638

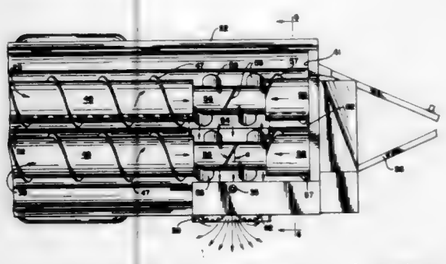
DUAL AUGER MANURE SPREADER HAVING CONTROLLED BEATER FEED

Thomas R. Fischer, Wapakoneta, Ohio, assignor to Allied Products Corporation, Chicago, Ill.

Filed Mar. 23, 1992, Ser. No. 854,717

Int. Cl.[5] A01C *3/06*

U.S. Cl. 239—7 **21 Claims**



1. A manure spreader for distributing any of a variety of manure materials having varying consistencies, comprising:

a bin mounted onto a frame having ground engaging wheels, said bin having a side wall and an opening therethrough;

at least two auger assemblies longitudinally mounted with the bin in side-by-side relationship, said auger assemblies partially define outfeed means generally adjacent to said opening of the sidewall, and said auger assemblies include means for feeding manure materials in a feed direction longitudinally generally along the auger assemblies;

a beater assembly positioned generally at said sidewall opening, said beater assembly having beater paddles for receiving manure materials from said outfeed means and for distributing such manure material onto a field, said beater assembly having a limited expelling rate capacity for distributing the manure material, said beater assembly having at least one generally vertical shaft onto which said beater paddles are mounted;

drive means for rotating said auger assemblies and for rotating said shaft of the beater assembly;

each auger assembly includes at least two different flight profiles, one such profile including members for moving the manure materials toward and into said outfeed means, and the other such profile including outfeed blade members partially defining the outfeed means, said outfeed blade members being positioned to receive the manure material from said one such profile and for delivering the thus received manure material to said beater assembly; and

said outfeed means is further defined by a lower wall of the bin, said outfeed blade members move the manure materials generally between said lower wall and said other such profiles of the auger assemblies, and said blade members are mounted to exhibit a slippage characteristic with respect to the manure material within the outfeed means whereby manure material moved into the beater assembly by the outfeed means is retarded when manure material fed to the outfeed means exceeds the expelling rate capacity of the beater assembly.

5,199,639

SHOWER WITH A MICROMOTOR OPERATED REVOLVING SHOWER HEAD

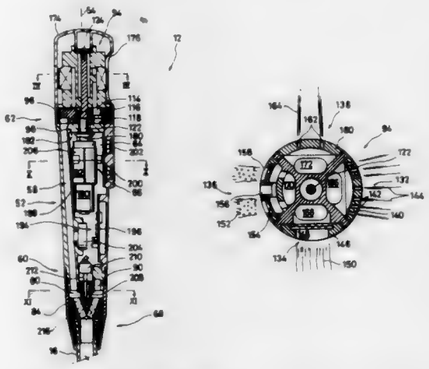
Hiroshi Kobayashi; Masahito Hitotsumatsu; Ryosuke Hayashi; Mikio Horimoto, and Yasuhide Kimura, all of Fukuoka, Japan, assignors to Toto, Ltd., Fukuoka, Japan

Filed Feb. 10, 1992, Ser. No. 833,427

Claims priority, application Japan, Feb. 12, 1991, 3-19082; Feb. 21, 1991, 3-27275; Mar. 6, 1991, 3-39877; Apr. 16, 1991, 3-84228

Int. Cl.[5] F16K *25/00;* **F16J** *15/40*

U.S. Cl. 239—11 **63 Claims**



1. A shower unit comprising:

a tubular casing having a proximal end and a distal end and having a water conduit extending therethrough, said proximal end of the casing being adapted to be connected to a water supply for admitting water under pressure into said conduit, said distal end of said casing defining a planar end face perpendicular to the longitudinal axis of said casing, said conduit being radially offset with respect to the longitudinal axis of the casing for at least a length thereof to provide in said casing a radially central cavity contiguous to said distal end, said conduit terminating in a water outlet port which opens onto said planar end face and is radially offset from the longitudinal axis of the casing;

a rotatable shower head supported with respect to said casing at a side of said distal end opposite said central cavity for rotation about said longitudinal axis of said casing, said shower head having a planar end face in flush with and rotatably engaging with said planar end face of said casing, said shower head having a plurality of different spray heads angularly equally spaced apart from each other and having different spray characteristics, each of said spray heads having a water inlet which opens onto said end face of said shower head and a radially outwardly directed spray outlet in fluid communication with said water inlet, said water inlet being radially offset from the longitudinal axis of said casing by a distance equal to the distance of offset of said water outlet port;

an electric drive housed in said central cavity of said casing and having an output drivingly coupled to said rotatable shower head to rotate it when activated;

means for supplying electric power to said electric drive; and,

control means for activating said electric drive to rotate said shower head so that one of said water inlets is selectively aligned with said water outlet port whereby water under pressure admitted into said conduit is delivered through selected one of said spray heads.

5,199,640

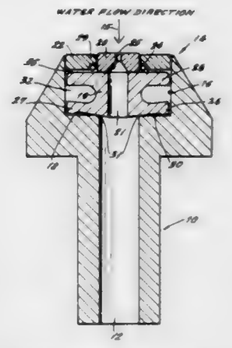
SHOCK MOUNTED HIGH PRESSURE FLUID JET ORIFICE ASSEMBLY AND METHOD OF MOUNTING FLUID JET ORIFICE MEMBER

Thomas A. Ursic, 12 Bedford Dr., West Trenton, N.J. 08628

Filed Sep. 16, 1991, Ser. No. 760,616

Int. Cl.[5] B05B *15/06*

U.S. Cl. 239—11 **32 Claims**



1. An orifice assembly for emitting a stream of fluid under high pressure comprising:

an orifice member having an aperture therein through which a high pressure fluid is emitted as said stream;

a support member disposed downstream of said orifice member, said support member providing support for said orifice member, said support member comprising means for permitting flexure of said support member such that a tensile stress is generated in said support member in response to the application of high pressure fluid to said orifice member and having a passageway therein in communication with the aperture in the orifice member, whereby the orifice member is allowed to move in response to the application of high pressure fluid;

a housing having an opening for receiving said orifice member and support member therein; and

means for retaining said orifice member and support member in said housing.

5,199,641

FUEL INJECTION NOZZLE WITH CONTROLLABLE FUEL JET CHARACTERISTIC

Dietmar Hohm, Neufahrn; Peter Kleinschmidt, Munich; Hans Meixner, Haar, and Dieter Stein, Holzkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

PCT No. PCT/DE89/00610, § 371 Date May 17, 1991, § 102(e) Date May 17, 1991, PCT Pub. No. WO90/03512, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 28, 1989, Ser. No. 671,881

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833093

Int. Cl.[5] B05B *3/14*

U.S. Cl. 239—102.2 **11 Claims**

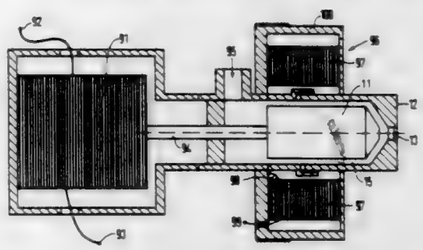
1. A fuel injection nozzle for combustion engines, comprising:

a nozzle bore arranged in a nozzle part,

a nozzle needle within the nozzle part,

a drive connected to the nozzle needle, said drive having an electrical input for receiving an electrical input variable to cause the nozzle needle to be moved into a closing position, in which said nozzle needle closes the nozzle bore, and alternately into an open position, in which said nozzle needle frees the nozzle bore, and

means for imparting, during the open position of the nozzle needle, an alternating stroke movement to at least one of said nozzle part and said nozzle needle which is situated in a region of formation of an injection jet, said means for imparting being excitable by a further electrical input variable and being designed structurally in such a way that



a period for the alternating stroke movement is many times smaller than a predetermined minimum opening time of the injection nozzle, said means for imparting imparts the alternating stroke movements with a period which corresponds to an excitation frequency of between 5 kHz and 20 kHz, and said means for imparting alters an opening angle of the injection jet of the injection nozzle under control of the further electrical input variable.

5,199,642

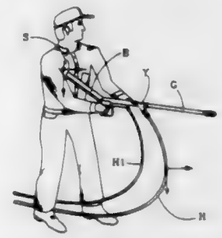
HIGH PRESSURE WATER SPRAY GUN

George J. Rankin, 3620 W. 11th St., Houston, Tex. 77088

Filed Aug. 22, 1991, Ser. No. 748,665

Int. Cl.[5] B05B *9/01*

U.S. Cl. 239—124 **9 Claims**



8. In a manually operated high pressure fluid spray gun comprising a housing having an inlet passage, a discharge passage and a dump passage therein with valve means for selectively opening and closing flow through said dump passage to cause the discharge of high pressure fluid through said dump passage or said discharge passage wherein said valve means comprises:

reversible seat means and double ended reversible piston means having sealing surfaces at the opposite ends thereof adapted to engage said seat means to close off fluid passage through said dump passage, and

a crushable alignment ring for engagement by said reversible seat means to facilitate alignment of said seat means with respect to said piston means.

5,199,643

unless said shutoff means in said inlet means is blocking

low air pressure, said air directing means including a first

opposed relation to said fuel reservoir chamber, and a

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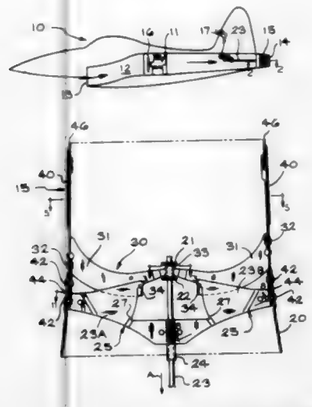
5,199,643

MODEL AIRCRAFT VARIABLE GEOMETRY NOZZLE

Walter J. Rozmus, 6113 Zion Cir., Port Orange, Fla. 32019

Filed Apr. 13, 1992, Ser. No. 867,471
Int. Cl.[5] F02K 1/30
U.S. Cl. 239—265.39 20 Claims



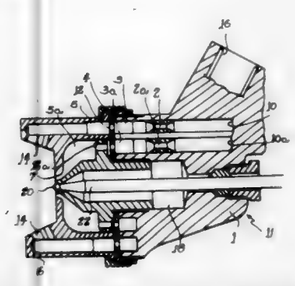
1. In a scale model jet propelled aircraft receiving its forward propelling thrust from the exit of high velocity gases from a rearwardly directed tail pipe, the improvement comprising a variable area exhaust nozzle affixed to the exit end of said tail pipe, said nozzle having a multiplicity of overlapping blades circumferentially spaced about the exit end of said tail pipe, each of said blades hingedly connected to the perimeter of said tail pipe opening, operable means positioned inside of said nozzle for convergingly rotating said blades inwardly toward and divergingly outward from the tail pipe counterline about said hinged connection thereby selectively varying the nozzle exit area.

5,199,644

HVLP PAINT SPRAY GUN

Wolfgang Haferkorn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Bersch & Fratscher GmbH, Karlstein am Main, Fed. Rep. of Germany

Filed Sep. 26, 1990, Ser. No. 588,176
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 8911932[U]
Int. Cl.[5] B05B 1/28, 1/34
U.S. Cl. 239—296 8 Claims



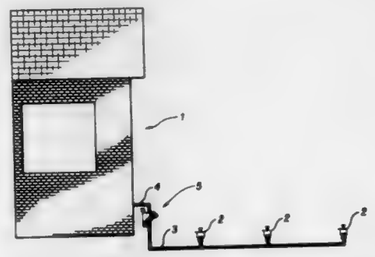
1. A paint spray gun comprising a gun body having means for receiving liquid and means for directing said liquid through a paint chamber and out of said gun body through a liquid outlet nozzle, and means for receiving air at an air pressure entrance level and means for directing said air through said gun body and out at least one air outlet nozzle at a relatively low air pressure, said air directing means including a first stream inlet channel having a predetermined cross-section for directing said air through said gun body and a second stream inlet channel having a predetermined cross-section for directing said air through said gun body, separate expansion chambers respectively associated with each of said inlet channels, separate orifices connecting said inlet channels and said expansion chambers, said orifices having a reduced cross-section for reducing the pressure of said air from said channels into said air expansion chambers, separate air distribution chambers respectively associated with each of said air expansion chambers a distribution disc having a plurality of apertures separately connecting said expansion chambers and said distribution chambers, said air distribution chambers directing said air out of said gun through separate air outlet nozzles, wherein said separate air outlet nozzles atomize and shape said liquid leaving said gun body through said liquid outlet nozzle.

5,199,645

SPRINKLER SYSTEM CONVERSION KIT

Keith A. Anderson, Rte. 2 Box 448, Jacksonville, Tex. 75766, and Christopher N. Green, 724 Lewelling Blvd., Apt. 309, San Leandro, Calif. 94579

Filed Feb. 14, 1992, Ser. No. 835,360
Int. Cl.[5] B05B 7/26
U.S. Cl. 239—310 11 Claims



1. A chemical treatment apparatus for the infusion of soluble solid chemicals into a pressurized liquid flow stream within an existing pipeline comprising:

a housing;

inlet means on said housing to receive liquid flow from the pipeline for treatment in said apparatus, said inlet means including shutoff means for selectively blocking said liquid flow;

mixing means within said housing for exposing the surface of said solid chemicals to at least a portion of said liquid flow stream to dissolve a portion of said solid chemicals into said liquid to form a treatment solution, said mixing means including;

canister means for holding said solid chemicals in position to be impinged upon by said liquid flow from said inlet means during operation, said canister means including walls perforated by a plurality of small openings permitting liquid flow therethrough but preventing the passage of said solid chemicals;

cap means for holding said canister means in place and sealing a canister opening in said housing during operation, said cap means being removable to allow easy replenishment of said solid chemicals in said canister means;

outlet means to discharge said treatment solution into the pipeline;

air vent valve means in an air vent in said housing for allowing downstream drainage during depressurization of the pipeline by allowing air to replace drained liquid and for sealing said air vent during normal pressurized operation;

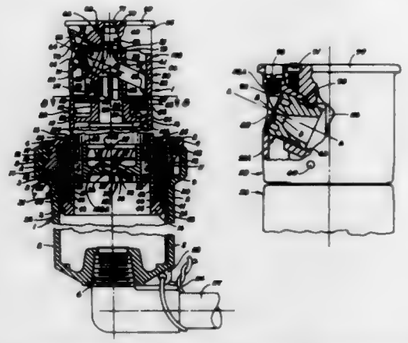
safety interlock means preventing removal of said cap means unless said shutoff means in said inlet means is blocking said liquid flow.

5,199,646

SPRINKLER DEVICE

Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408

Division of Ser. No. 403,758, Sep. 6, 1989, Pat. No. 5,086,977, which is a division of Ser. No. 37,704, Apr. 13, 1987, Pat. No. 4,867,378. This application Sep. 3, 1991, Ser. No. 753,937
Int. Cl.[5] B05B 1/26
U.S. Cl. 239—240 4 Claims



1. A sprinkler having a nozzle housing; a nozzle means in said housing for flow therethrough; a staggered nozzle flow passage extending through said nozzle means; said staggered nozzle flow passage comprising a forward flow inlet section extending into said nozzle means a short distance, means at the end of said forward flow inlet section blocking flow from said inlet section so that the flow turns to the side, and an outlet section having a surface on which turned flow will impact and then exit out of the nozzle means for short range coverage, said nozzle means including a center conventional nozzle flow passage for long range coverage.

5,199,647

FUEL INJECTION NOZZLE

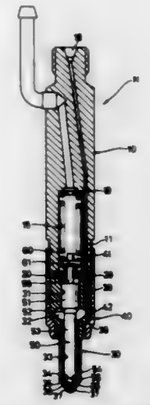
Fumitsugu Yoshizu, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Dec. 9, 1991, Ser. No. 803,587
Claims priority, application Japan, Dec. 21, 1990, 2-404075[U]
Int. Cl.[5] F02M 61/18; B05B 1/26
U.S. Cl. 239—533.12 7 Claims

1. A fuel injection nozzle comprising:

(a) a hollow elongated nozzle body having a closed distal end, said nozzle body having a fuel reservoir chamber intermediate the opposite ends thereof, a tapered valve seat formed on an inner surface of a distal end portion of said nozzle body, and a plurality of pairs of first and second injection ports formed in the distal end portion of said nozzle body spaced from one another in a direction from an axis of said nozzle body, the angle of said first injection port relative to the axis of said nozzle body being acute and smaller than the angle of said second injection port relative to the axis of said nozzle body, inner ends of said first injection ports being disposed at said valve seat, inner ends of said second injection ports being spaced from the inner ends of said first injection ports toward the distal end of said nozzle body in the direction of the axis of said nozzle body, and each pair of said first and second injection ports having a substantially common outer end;

(b) a needle valve received in said nozzle body, said needle valve having a pressure receiving portion disposed in opposed relation to said fuel reservoir chamber, and a tapered conical abutment portion formed forwardly of said pressure receiving portion, and the inner ends of said first injection ports facing an outer peripheral surface of said abutment portion when said abutment portion of said needle valve is seated on said valve seat; and



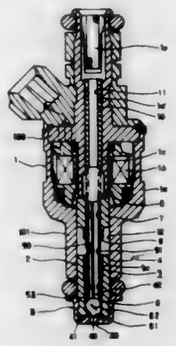
(c) spring means for urging said needle valve so as to cause said abutment portion to be seated on said valve seat, wherein pressure within said fuel reservoir chamber causes said pressure receiving portion to urge said needle valve against the bias of said spring means, thereby disengaging said abutment portion from said valve seat.

5,199,648

FUEL INJECTION VALVE

Takuya Fujikawa, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,187
Int. Cl.[5] B05B 1/30
U.S. Cl. 239—585.4 10 Claims



1. A fuel injection valve comprising:

i) a solenoid assembly **1** including a yoke **1***a* having a cup-shaped portion, an axial bore **12** and a cylindrical portion **101**, a core **1***d* having a fuel conduit **11**, and a coil **1***b* enclosing said core **1***d*;

ii) a nozzle body **4** fitted and fixed in the axial bore **12** of said yoke **1***a*, said nozzle body being cylindrical and having an injection hole **40** at its leading end and a seat face **41** at the back of said injection hole **40**; and

iii) a tubular control valve **5** fitted in said nozzle body **4**, said

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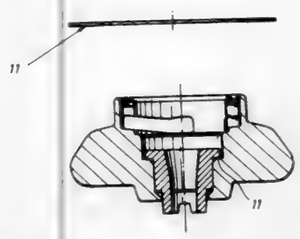
tubular control valve **5** having a ball **6** fixed at its leading end and enabled to come into output contact with said seat face **41**, said tubular control valve **5** having an armature **7** fitted in and affixed to the outer circumference of its rear portion, said armature **7** being lifted by energizing said coil **1***b*,

iv) wherein the ball **6** at the leading end of said tubular control valve **5** has a diameter larger than that of said tubular control valve **5** and equal to the internal diameter of said nozzle body **4**, an annular fuel passage **53** being formed between said tubular control valve and said nozzle body and a fuel reserve space **54** being formed between said ball, said seat face **41** and a conduit **42** of said nozzle body and wherein said ball **6** contacts with said conduit **42** of said nozzle body **4** at its largest-diameter portion corresponding to a tangent **60**, and wherein said ball **6** is formed in its region containing said tangent **60** with a plurality of grooves **62** which are angled to intersect the axis of said tubular control valve **5**.

5,199,649
SPRAY NOZZLE

Steen Tølbøll, Holte, Denmark; assignor to Hardi International A/S, Denmark

Filed Aug. 5, 1991, Ser. No. 740,065
Int. Cl.[5] **B05B** *1/00*
U.S. Cl. 239—600 **4 Claims**



1. A spray nozzle assembly adapted for dye coding and disconnect attachment to a pipe stud, said nozzle assembly comprising a unitary nozzle body, a union member mounting said body, said union member having a through opening with a surrounding wall and with one end for receiving the pipe stud and an opposite end receiving said nozzle body, said through opening having a radial shoulder between said ends facing the pipe receiving end, said nozzle body having a radial flange facing the nozzle receiving end of the opening, a circumferential metal sealing disc surrounding said nozzle body under said flange and projecting radially therefrom into cutting engagement with the surrounding wall of the through opening between the flange and shoulder to sealingly connect the union and nozzle body whereby the assembly provides a quick disconnect unit for said pipe stud.

5,199,650
STRUCTURE FOR PREVENTING CURRENT FROM LEAKING OUT OF DEVICES FOR ELECTROSTATIC SPRAY COATING

Ichirou Ishibashi; Nilchi Toyama; Toshio Kubota; Shoko Sasaki, and Nobunari Arai, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

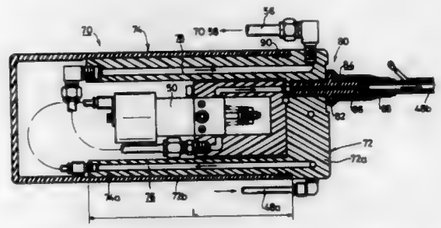
Filed Jan. 16, 1992, Ser. No. 821,048
Claims priority, application Japan, Jan. 22, 1991, 3-5709; Mar. 28, 1991, 3-64918
Int. Cl.[5] **B05B** *5/00*
U.S. Cl. 239—691 **6 Claims**

1. A structure for preventing current from leaking out of devices used for electrostatic spray coating, said structure comprising:

a manifold base made of an electrically-insulating material, said manifold base having a line connecting portion which enables a plurality of lines to be externally connected;

a storage tank formed integrally with said manifold base, for temporarily storing electrically conductive paint therein;

an insulation mechanism for electrically insulating said storage tank from a paint feed source; and



a pair of covers each made of an electrically-insulating material, said covers serving to cover devices including said insulation mechanism and being mounted on said manifold base.

5,199,651
GRINDING ORGANIC PIGMENTS

Fridolin Bäbler, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 352,710, May 11, 1989, abandoned, which is a continuation of Ser. No. 212,118, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 520,932, Aug. 8, 1983, abandoned. This application Sep. 27, 1989, Ser. No. 414,632
Claims priority, application Switzerland, Aug. 20, 1982, 4979/82
Int. Cl.[5] **B02C** *23/18*
U.S. Cl. 241—16 **8 Claims**

1. An improved process for conditioning organic pigments by grinding an organic pigment or mixture of organic pigments selected from the group consisting of the quinacridone series and of perylenetetracarboxylic acid dianhydride in water with a grinding aid wherein the improvement comprises using as a grinding aid an unsubstituted aliphatic 1,2-dihydroxy compound having 6 to 18 carbon atoms in amounts of 0.5 to 20% by weight, based on the pigment or pigment mixture to be ground.

5,199,652
METHOD FOR SEPARATING A MIXTURE OF TWO PLASTICS WITH SIMILAR SPECIFIC GRAVITIES

Bela K. Mikofalvy, Avon Lake, and H. Khim Boo, Strongsville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

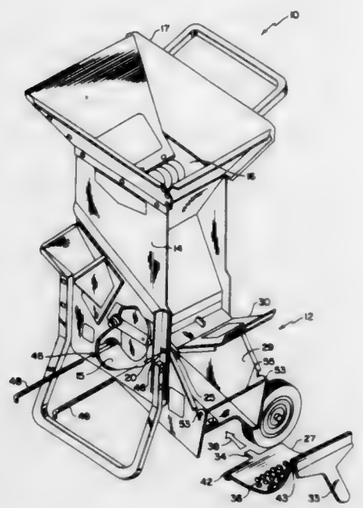
Filed Feb. 28, 1992, Ser. No. 843,710
Int. Cl.[5] **B02C** *23/08;* **B03B** *1/00*
U.S. Cl. 241—2 **20 Claims**

11. A method for the separation of a plastic material containing polyvinyl chloride and polyethylene terephthalate comprising: dividing the plastic material into smaller particles, soaking the divided particles in a plasticizer capable of plasticizing polyvinyl chloride for a predetermined amount of time, removing any excess plasticizer, and separating the polyvinyl chloride particles from the polyethylene terephthalate particles.

5,199,653
DISCHARGE ASSEMBLY FOR CHIPPER/SHREDDER

John T. Durrant, Schagticoke; Michael J. Cowett, Watervliet, and Kevin J. Connolly, Ballston Lake, all of N.Y., assignors to Gardea Way Incorporated, Troy, N.Y.

Continuation of Ser. No. 554,121, Jul. 17, 1990, abandoned. This application Nov. 7, 1991, Ser. No. 789,053
Int. Cl.[5] **B02C** *17/00*
U.S. Cl. 241—73 **2 Claims**



1. A discharge assembly for controlling the discharge of material from a discharge opening in a pulverizing cavity of a chipper/shredder device housing for garden waste and debris, the device having an entrance passageway for feeding garden waste and debris materials into the cavity and movable pulverizing elements in the cavity for chipping and/or shredding materials therein, comprising:

a discharge element covering the discharge opening having a generally rectangular shape and a plurality of fixed size apertures therein for discharging materials shredded by the pulverizing elements;

said discharge element having a mounting passageway at opposed ends thereof;

a removable fastening rod extending through each mounting passageway, said fastening rods cooperating between the passageway at opposite ends of said discharge element and said housing for rigidly supporting said element proximate the moveable pulverization elements during use while being removable from said discharge element and said housing to permit removal of said discharge element for clean-out and replacement purposes;

each said fastening rod being accessible from outside the cavity and the discharge assembly;

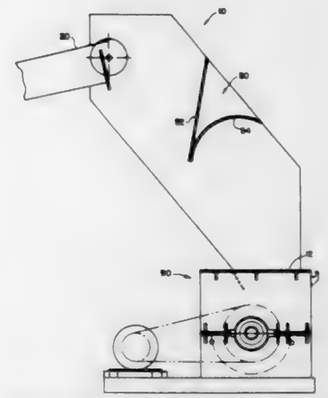
an operator engageable handle fixed to one end of said discharge element at the discharge opening end of the element for grasping said discharge element during installation and removal upon insertion and/or removal of each said fastening rod; and

a locator tab fixed to the end of said discharge element opposite to said handle, said housing having an aperture adjacent to said discharge opening for receiving said locator tab, thereby to facilitate alignment of said passageways in said discharge element with said housing for insertion of said removeable fastening rods.

5,199,654
MATERIAL AND AIR DEFLECTOR FOR FEED CHUTE

G. Heyward Fulghum, Sr., Wadley, Ga., assignor to Fulghum Industries, Inc., Wadley, Ga.

Filed Jun. 17, 1992, Ser. No. 899,887
Int. Cl.[5] **B02C** *9/04*
U.S. Cl. 241—74 **7 Claims**



1. A material feed chute for a cutting device having side walls, an inlet opening for receiving material and an outlet opening in flow connection with a feed inlet of the cutting device, said side walls defining a flow passage from said inlet to said outlet and a material and air deflector defined within the chute between the inlet and outlet openings, said material and air deflector comprising:

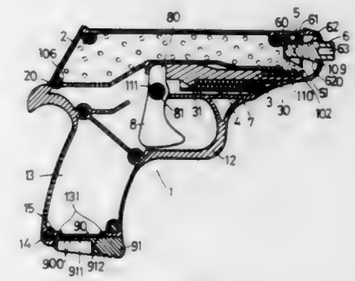
an upstream deflector portion to direct material flowing through the chute towards the cutting device; and

a downstream deflector portion having a curved surface for intercepting and recirculating material ejected from the cutting device back toward the cutting device.

5,199,655
PISTOL-SHAPED PEPPER GRINDER

Hang-Te Yang, No. 20-1, Hsin Ho Heng Rd., An Ping Ind. Park, Tainan, Taiwan

Filed Dec. 2, 1991, Ser. No. 801,032
Int. Cl.[5] **A47J** *42/34*
U.S. Cl. 241—169 **4 Claims**



1. A pepper grinder comprising:

a) a pistol shaped housing having a barrel portion and a grip portion, the housing defining an interior grain pepper storage chamber, an entry opening for placing grain pepper into the storage chamber and a first exit opening through which ground pepper may pass;

tween said first piston and said aperture of said cylinder

cable retrieval tool which faces the cable storage reel, the

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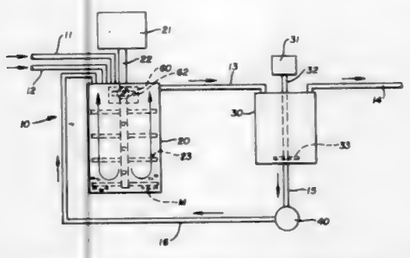
b) first closure means operatively associated with the pistol shaped housing for selectively opening and closing the entry opening;
c) a grinding plate having a grinding teeth portion slidably mounted within the pistol shaped housing such that at least the grinding teeth portion extends into the grain pepper storage area;
d) a grinding block operatively associated with the pistol shaped housing and the grinding plate such that sliding movement of the grinding plate grinds the grain pepper between the grinding plate and the grinding block;
e) a trigger pivotally attached to the pistol shaped housing and operatively associated with the grinding plate such that pivoting movement of the trigger causes the grinding plate to slide relative to the pistol shaped housing;
f) biasing means operatively associated with the grinding plate so as to bias the grinding plate to an extreme position;
g) a seasoning storage chamber defined within the grip portion of the pistol shaped housing;
h) a second exit opening defined by the pistol shaped housing in communication with the seasoning storage chamber; and
i) second closure means operatively associated with the pistol shaped opening so as to selectively open and close the second exit opening.

5,199,656

CONTINUOUS WET GRINDING SYSTEM

Arno Szegvari; Margaret Y. Szegvari, both of Akron, and Richard A. Wochele, Brunswick, all of Ohio, assignors to Union Process, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 597,540, Oct. 15, 1990, Pat. No. 5,080,293. This application Oct. 1, 1991, Ser. No. 769,957
The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.
Int. Cl.[5] B02C *17/16*
U.S. Cl. 241—171 **26 Claims**



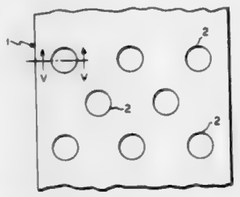
1. A continuous grinding system for comminuting material in a liquid, comprising:
a) a grinding vessel connected to a source of liquid and the material to be comminuted and having a depth dimension;
b) said grinding vessel including a rotating shaft extending into said vessel and at least one mixing arm attached to and projecting radially from said shaft;
c) a funnel-shaped housing disposed on the top of said vessel;
d) at least one impeller arm attached to and projecting radially from said shaft above said at least one mixing arm and below said generally funnel-shaped housing;
e) a cylindrical sleeve disposed in encircling relationship with said at least one impeller arm and extending into said grinding vessel a distance of from about 10% to about 75% of said depth dimension thereof; and
f) filtering means disposed adjacent the top of said vessel.

5,199,657

ROLLER MILL

Gerhard Kästingschäfer, Wadersloh, and Bernhard Peterwerth, Bad Lear, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed May 24, 1991, Ser. No. 705,323
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018785
Int. Cl.[5] B02C *4/02;* **B30B** *3/00, 11/16*
U.S. Cl. 241—235 **10 Claims**



1. Roller mill assembly for use in crushing brittle feed material having a characteristic average grain size, said assembly comprising:
a pair of adjacent crushing rollers having means for rotating said rollers in opposite directions, said rollers having respective outer surfaces which are spaced to form a gap therebetween into which the material is fed for crushing, each of said rollers having a plurality of recesses formed in its roller surface, said rollers having means for forcing them toward one another with a force sufficient to crush the material within the gap and cause at least a portion of said material to enter said recesses and solidify therein, each of said recesses having a width approximating the average grain size of the feed material and a depth which is greater than ½ said width thereby enabling the solidified feed material to be embedded in said recesses and fill said recesses so that the embedded feed material forms a common material crushing surface with said roller surfaces.

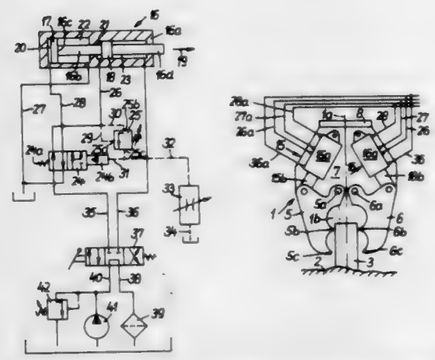
5,199,658

DUAL-FORCE HYDRAULIC DRIVE FOR A DEMOLITION TOOL

Robert-Jan Bartels; Helmar Näfe, and Hans-Dieter Piotrowski, all of Essen, Fed. Rep. of Germany, assignors to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 14, 1992, Ser. No. 835,310
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1991, 4104856
Int. Cl.[5] B02C *1/06*
U.S. Cl. 241—266 **10 Claims**

1. A demolition tool comprising
(a) a carrier body;
(b) two tool blades mounted on the carrier body; said tool blades together defining a too mouth for receiving material to be crushed; at least one of the tool blades being movable relative to the other tool blade for varying the size of the tool mouth;
(c) a hydraulic cylinder including
(1) a cylinder housing having an aperture;
(2) first and second chambers defined in said cylinder housing;
(d) a piston rod received in said cylinder housing; said piston rod having an inner end situated in said cylinder housing; said piston rod projecting from said cylinder housing through said aperture and being operatively connected to said at least one movable blade;
(e) first and second pistons spacedly affixed to said piston rod and bounding said first and second chambers, respectively; said first piston being situated at said inner end of said piston rod and said second piston being situated between said first piston and said aperture of said cylinder housing;
(f) means for introducing hydraulic fluid under pressure into said first and second chambers for exposing the first and second pistons to pressure to generate a force for moving the piston rod in a working direction in which said piston rod moves said at least one movable blade towards the other blade to reduce the size of the tool mouth; at equal pressures prevailing insaid first and second chambers, the



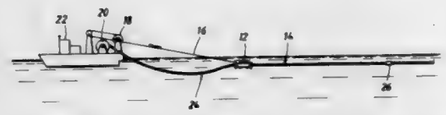
force derived from said first piston being greater than the force derived from said second piston; and
(g) a control unit operatively connected to said first and second chambers for controlling admission of hydraulic fluid under pressure thereto; said control unit having first and second positions; in said first position said control unit admitting hydraulic fluid under pressure solely to said second chamber and in said second position said control unit admitting hydraulic fluid under pressure to said first chamber.

5,199,659

SEISMIC CABLE RETRIEVAL APPARATUS AND METHOD

Anthony M. Zibilich, Jr., Mandeville, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Apr. 22, 1991, Ser. No. 688,411
Int. Cl.[5] B65H *75/00;* **F16L** *1/12*
U.S. Cl. 242—54 R **44 Claims**



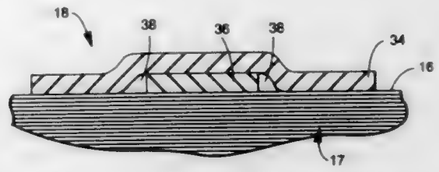
44. An apparatus for retrieving marine cable on board a ship which reduces a longitudinal tension force on the cable at a cable storage reel when the cable storage reel is winding up the cable, comprising:
(a) a collar attached to the cable at a location where the collar is functional to absorb the longitudinal tension force of the cable trailing behind the collar;
(b) a cable retrieval tool which encircles the cable;
(c) a biasing mechanism which is a part of the cable retrieval tool and is functional to allow movement of the cable retrieval tool along the cable in a direction away from the cable storage reel and over the collar and movement toward the storage reel until the biasing mechanism encounters the collar; and
(d) a line attached between the ship and a forward end of the cable retrieval tool, the forward end being the end of the cable retrieval tool which faces the cable storage reel, the line is operative to apply a tension force on the cable retrieval tool such that tension applied on the line pulls the cable retrieval tool toward the ship causing the biasing mechanism to engage the collar, and by applying a large enough additional tension force on the line, an opposing force is placed on the collar which is greater than the longitudinal tension force on the cable trailing behind the collar, the larger opposing force on the line pulls the collar toward the ship creating an isolated portion of cable between the cable retrieval tool and the cable storage reel whereby the longitudinal tension force on the cable at the cable storage reel is reduced so that the isolated portion of cable can be wound on the reel.

5,199,660

RIBBED-BELT FOR BELT-DRIVEN TAPE PACK

David P. Smith, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 2, 1992, Ser. No. 862,411
Int. Cl.[5] G03B *1/04*
U.S. Cl. 242—192 **14 Claims**



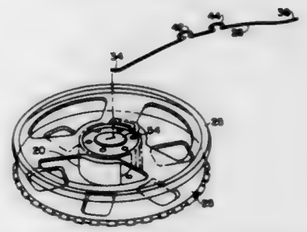
1. A thin, continuous, flexible drive belt adapted for use in a belt-driven data cartridge including tape pack, a roller, and a drive belt wound around the tape pack and the roller, wherein the belt has a single raised portion which extends longitudinally along the center of the face of the belt that contacts the tape pack.

5,199,661

WIRE REEL SPRING/CASSETTE COVER COMBINATIONS AND METHODS FOR ASSEMBLY

Anthony L. Gelardi, Cape Porpoise; Craig Lovecky, Old Orchard Beach, both of Me.; Alan Lowry, Canton, Mass.; Richard Rolfe, Biddeford, Me., and W. Tyler Fitzsimmons, Washington, D.C., assignors to Shape Inc., Biddeford, Me.

Filed Mar. 28, 1991, Ser. No. 676,380
Int. Cl.[5] G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—199 **10 Claims**



1. A tape cassette reel spring/cover combination, comprising:
(a) an area formed on a planar area of the cassette cover for receiving a reel spring;
(b) a pair of tape reels positioned on a planar area of a cassette base, each tape reel including a flat surface;

(c) an elongated metal reel spring, including a wire body

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a housing having first and second longitudinally spaced

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(c) an elongated metal reel spring, including a wire body with two legs, each leg including two ends and a portion between the two ends which curves in a direction from the planar area of the cassette cover toward the planar area of the base, and back toward the planar area of the cover, said curved portion tangentially contacting the flat surface of one of the tape reels, said curved end acting as a wear surface;

(d) means formed on the area of the cassette cover for receiving the spring; and

(e) means formed on the spring for removably mounting the spring on the means for receiving.

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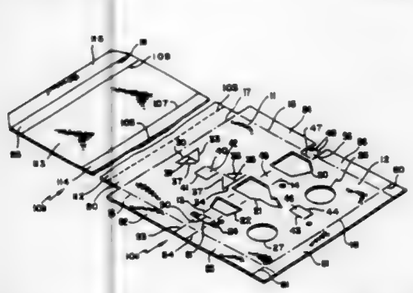
LIMITED USE COMBINED MAILER AND VIDEO CASSETTE AND METHOD OF FORMING SAME

Carle D. Klupt, 8218 Arrowhead Rd., Baltimore, Md. 21208

Continuation of Ser. No. 701,368, May 13, 1991, abandoned, which is a continuation of Ser. No. 440,218, Nov. 22, 1989, abandoned. This application Jul. 30, 1992, Ser. No. 921,382

Int. Cl.[5] **G11B** *23/087*

U.S. Cl. 242—199 **28 Claims**



18. A record cassette, comprising a substantially flat, one-piece blank of self-supporting manually bendable material, including a first portion adapted to be bent into the form of an enclosure for a record medium and the transport mechanism therefor; said first portion including means for mounting said transport mechanism in said housing to permit controlled movement of said record medium therein, said means for mounting said transport mechanism including a plurality of tabs formed on said first portion being bent inwardly of said enclosure for positional placement adjacent said transport mechanism, and a second portion connected to said first portion and adapted to be bent about said enclosure after the formation thereof as an integral mailer for the cassette.

28. A process for producing a video cassette with an integral mailer, comprising the steps of

constructing a substantially flat relatively thin one-piece blank of self-supporting manually bendable material with prearranged cutouts and tabs and a line of separation therein,

bending a portion of the blank to form a multi-sided enclosure with at least two of the sides substantially parallel to each other,

inserting at least two of said tabs internal said enclosure adjacent a peripheral edge of a pair of reels within said enclosure for positionally locating said reels within said enclosure,

sealing the enclosure to prevent return thereof toward the original shape of the blank, and

bending another portion of the blank, connected to the first-named portion along said line of separation, to at least partially encompass the enclosure and thereafter sealing the two portions together.

5,199,663

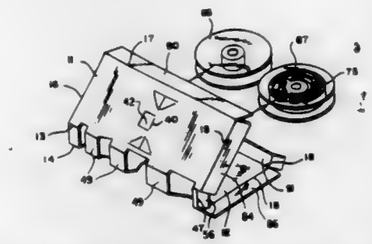
LIMITED USE VIDEO CASSETTE

Carle D. Klupt, 8218 Arrowhead Rd., Baltimore, Md. 21208

Continuation of Ser. No. 440,217, Nov. 22, 1989, abandoned. This application Oct. 22, 1991, Ser. No. 782,774

Int. Cl.[5] **G11B** *23/087*

U.S. Cl. 242—199 **38 Claims**



1. A video cassette for rotatably mounting a pair of reels for a recording tape in juxtaposition to allow transfer of the tape from one reel to the other as they are rotated in unison when the cassette is operating in a video cassette recorded (VCR), comprising

a single flat piece of development cardboard having plural cutouts and fold lines for formation into a self-contained housing for said reels accommodating said rotatable mounting thereof, for loading directly into the VCR, said single flat piece of said cardboard defining a pair of spaced apart side panels joined to an end panel by a first set of said fold lines, said end panel having a first set of said cutouts for passage of said tape adjacent thereto,

said cutouts being arranged and adapted to accommodate positioning of said housing in said VCR, and a second set of said cutouts defining a pair of said cutouts being positioned in spaced apart relationship to expose the respective rotational driving mechanisms of said pair of reels when rotatably mounted in juxtaposition in said housing, for mating with the driving mechanism of the VCR when the cassette is loaded therein.

5,199,664

FISHING REEL WITH SPOOL AND ADJUSTABLE BRAKE

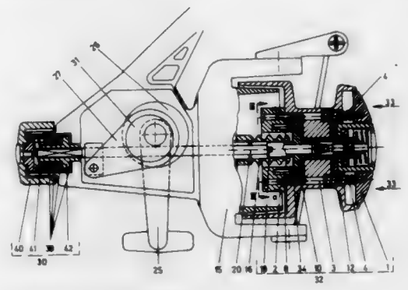
Rupert Kuntze, Grafensteinberg, and Gerhard Gruber, Meinheim, both of Fed. Rep. of Germany, assignors to D.A.M. Deutsch Angelgerate Manufaktur Hellmuth Kuntze GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 11, 1991, Ser. No. 653,162

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1990, 4004244

Int. Cl.[5] **A01K** *89/01, 89/027*

U.S. Cl. 242—228 **13 Claims**



1. A fishing reel comprising:

a housing having first and second longitudinally spaced ends;

a spindle extending longitudinally from the first end of said housing to the second end thereof;

a driving handle for rotating said spindle relative to said housing;

a spool rotatably mounted at the second end of said housing, said spool being adapted to receive a fishing line;

means for drivingly coupling said spindle to said spool;

an adjustable drag brake carried by the first end of said housing, said drag brake acting between said spindle and said housing to adjustable control the braking force acting on said spindle;

releasing means for selectively disengaging said means for drivingly coupling said spindle to said spool such that said spool is permitted to rotate with respect to said spindle; and

an over-run brake being located at the second end of said housing and acting between said spool and said spindle to brake said spool when said releasing means disengages said means for drivingly coupling said spindle to said spool, whereby when the drive coupling between said spindle and said spool is disengaged by said releasing means and said spool is permitted to rotate relative to said spindle under the braking action of said over-run brake, actuation of said driving handle cause said spindle to rotate and said means for drivingly coupling said spindle to said spool to become automatically re-engaged.

5,199,665

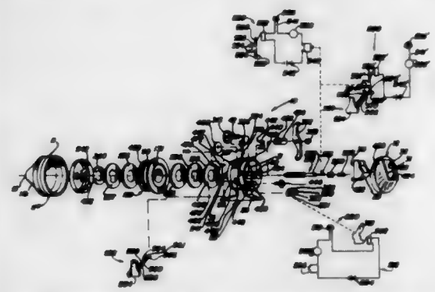
ELECTRONIC BAIT ALERT FOR A FISHING REEL

Steven M. Tipton, Tulsa, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Filed Apr. 22, 1991, Ser. No. 689,150

Int. Cl.[5] **A01K** *89/027*

U.S. Cl. 242—305 **16 Claims**



1. In a fishing reel of the type having a spool for storing a supply of line, a drive train rotatable in a line payout and a line collection direction and means rotatable by rotation of said drive train in a line collection direction for directing line onto the spool, an electronic bait alert comprising:

an actuator on the drive train, the actuator moving in a first direction in response to urging of said drive train in a line payout direction;

means for producing an electric signal only in response to said drive train being urged in a line payout direction and said actuator moving in said first direction and not in response to said drive train rotating in the line collection direction; and

means responsive to said electric signal for giving a user of the fishing reel a sensory indication of the line being tensioned with a predetermined force to thereby avoid undetected line payout.

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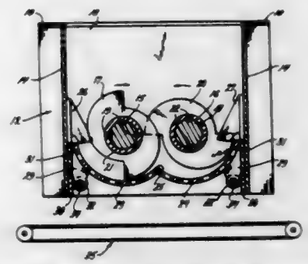
ROTARY SHREDDING APPARATUS WITH OSCILLATING GRATE

Robert M. Williams, 16 La Hacienda, St. Louis, Mo. 63124

Filed Jan. 3, 1992, Ser. No. 816,713

Int. Cl.[5] **B02C** *13/02*; **B07B** *1/32*

U.S. Cl. 241—73 **9 Claims**



1. In material reducing apparatus having a frame with a material inlet and a classified material outlet of a desired size, a pair of parallel rotatable shafts mounted in said frame, a plurality of material reducing cutter discs fixed on each shaft with the discs on each shaft overlapping those on the other shaft, a material classifier grate mounted in the material outlet and formed with perforations for sizing material reduced by the cutter discs, said overlapping cutter discs being axially spaced along said shafts thereby leaving deed spaces on said grate surface of the dead spaces on said grate to be swept by said cutter discs.

5,199,667

BALANCING DEVICE FOR AIR FLOATERS

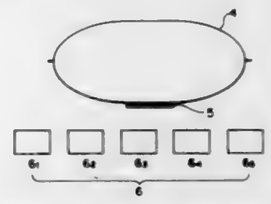
Yoshiro Fujii, Chiba, Japan, assignor to Adonis Inc. and Deutsu Prox Inc., both of Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 692,370

Claims priority, application Japan, Apr. 27, 1990, 2-44659[U]; Oct. 8, 1990, 2-268372

Int. Cl.[5] **B64B** *1/40*

U.S. Cl. 244—93 **12 Claims**



4. In an air floater comprising a balloon body which seals a gas therein, the gas having a specific gravity less than air, and balancing means detachably attached to the balloon body and having a weight conforming to the lift of the balloon body, the improvement wherein:

the balloon body comprises a film composed of a central layer made of ethylene-vinyl alcohol copolymer-resin, an aluminum evaporated layer provided outside the central layer, and a heated adhesive layer provided inside the central layer; and

the balancing means comprises a balancer cover including an adhesive surface portion having a rear surface to be adhered to the balloon body, a cover portion, and a folding portion for integrally connecting both the adhesive surface portion and the cover portion, the balancing means further comprising a balancer composed of one sheet and capable of separating into a reference balancer and a

a) structure, including a forwardly elongated fuselage, having a nose portion, including left and right elongated

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METHOD AND APPARATUS FOR DEPLOYING A

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regulating balancer, and a both-sided adhesive sheet for causing the reference balancer to adhere to a front surface of the adhesive surface portion.

5,199,668

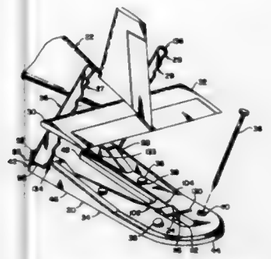
LAUNCHER FOR RADIO CONTROLLED FLIGHTS OF A MODEL AIRPLANE, RELEASING THE MODEL AIRPLANE FOR FLIGHT UPON DEPRESSING A FOOT PEDAL THEREOF

Matthey A. Swaney, Jr., P.O. Box 391, Morrilton, Ark. 72110

Filed Jan. 23, 1992, Ser. No. 824,576

Int. Cl.[5] B64C *25/68;* **A63H** *27/14;* **B64F** *1/16*

U.S. Cl. 244—110 R **22 Claims**



1. A launcher for radio controlled flights of a model airplane, which holds and then releases a model airplane, without the pilot, an assistant, or an observer, needing to bend down close to the model airplane into the engine exhaust stream to release the model airplane from the launcher, because any one of them by operation of a foot pedal located at the rear of the launcher can clear the model airplane for taxiing and/or takeoff, comprising:

a. a horseshoe-like shaped base for placement on the ground, an open heel end of this horseshoe base being pointed in the direction of intended first movements of the model airplane, and always remaining well clear of any portions of the released model airplane and only extending alongside the end of a fuselage of a model airplane which is in the launching position, a curved toe end of this horseshoe base serving to support the releasing foot pedal, located beyond the rear of the end of a fuselage of a model airplane, extending spaced heels of this horseshoe base providing a clear passageway between them for the exiting tail wheel of a model airplane, and providing at their heel ends, respective mounting locales for rotatable, adjustable, releasible, restraining, spaced arms, which, when raised in their upright restraining positions, obstruct any forward motion of a model airplane, as the respective stabilizer portions of this model airplane bear against these respective restraining spaced arms;

b. a releasing foot pedal pivotally secured to the horseshoe-like shaped base at the curved toe end thereof, and thereby located beyond the rear end of a fuselage of a model airplane;

c. rotatable, releasible, restraining, spaced arms pivotally secured respectively at the mounting locales at the heel ends of the extending spaced heels of the horseshoe-like shaped base, which are releasibly held in their upright restraining positions, when respective stabilizer portions of the model airplane bear against them, until the depression of the releasing foot pedal;

d. a linkage system interconnecting the releasing foot pedal and the rotatable, releasible, restraining arms, which, upon depression of the releasign foot pedal, clears the way for the rotation of the previously held rotatable, releasible, restraining, spaced arms, to permit them to clear themselves from the pathway of the departing respective stabilizer portions of the model airplane, when the pilot, by radio controls, is directing the model airplane away from this launcher, after he or she, an assistant, or an observer, has at the outset depressed the foot pedal, after the pilot had decided the model airplane was ready for taxiing, takeoff, and flight.

5,199,669

ROTARY PARACHUTE

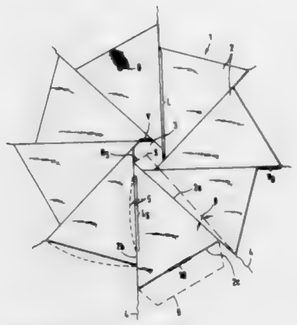
Karl-Heinz Vogt, Essen, and Heinz Olmscheid, Castrop-Rauxel, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 31, 1992, Ser. No. 922,230

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1991, 4127022

Int. Cl.[5] B64D *17/02*

U.S. Cl. 244—145 **5 Claims**



1. A rotary parachute, comprising

a canopy having an apex and comprised of triangular, sewn-together fabric segments each having a base edge along an outer circumference of the canopy, a tip opposite the base edge and longitudinal edges on either side of said tip with seams connecting together the adjacent longitudinal edges of adjacent segments and rotation slits existing in regions of the respective seams, the tip of each segment being offset laterally from the apex of the canopy to form an apex opening in said canopy having a shape of a regular polygon and the base edges being offset from one another so that each segment has a circumferentially projecting tip.

5,199,670

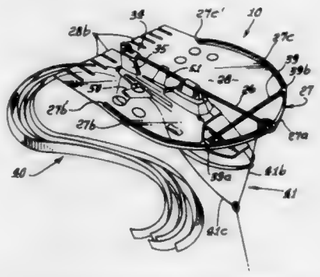
HELICOPTER STUNT KITE

Eugene Cheltenham, 1823 Hollyvista Ave., Los Angeles, Calif. 90027

Filed May 13, 1991, Ser. No. 699,330

Int. Cl.[5] A63H *27/08;* **B64C** *31/06*

U.S. Cl. 244—154 **12 Claims**



1. In a toy aircraft, the combination comprising

a) structure, including a forwardly elongated fuselage, having a nose portion, including left and right elongated sections, and means holding said sections in assembled relation,

b) said structure having a retainer portion projecting upwardly and above said sections,

c) and a forwardly and rearwardly elongated kite extending above said fuselage and attached to said retainer portion,

d) the kite including a forwardly extending first spar having a forwardly extending axis, there being a pivot on said retainer portion and supporting the spar to pivot about said axis, whereby the kite may pivot about said spar axis,

e) and wherein the fuselage has a nose portion and including a bridle line attached to said kite proximate forward extent of said spar and extending to a connection on said fuselage nose portion.

5,199,671

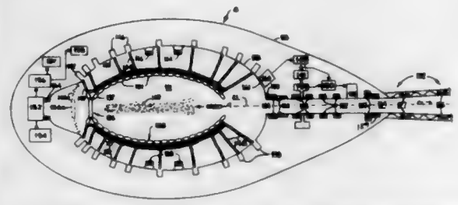
EXTRATERRESTRIAL TRANSPORTATION APPARATUS AND METHODS

Edward F. Marwick, 2516 Partridge La., Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 588,711, Mar. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 137,849, May 7, 1980, Pat. No. 4,436,695, which is a continuation-in-part of Ser. No. 40,849, May 21, 1979, Pat. No. 4,344,913, which is a continuation-in-part of Ser. No. 953,166, Oct. 20, 1978, Pat. No. 4,216,058, which is a continuation-in-part of Ser. No. 810,894, Jun. 28, 1977, Pat. No. 4,121,971. This application Aug. 20, 1984, Ser. No. 642,336

Int. Cl.[5] B64G *1/00*

U.S. Cl. 244—158 R **36 Claims**



1. The method of receiving cargo with a mass of excess of 10 kg in an impact chamber of an extraterrestrial receiving facility, said impact chamber has a volume in excess of five cubic meters and said cargo has traveled a path of more than 10 km through space which has an average mass density of less than 1 gram per cubic meter, said cargo travels with a relative velocity to said impact chamber of more than 500 meters per second through an opening of said impact chamber that is aligned with the path of said cargo, said method includes positioning loose materials within said impact chamber to interact with said cargo, and said method also includes the positioning of sturdy movable configuration means which are attached to the wall of said impact chamber and said means interact with said loose materials and said cargo, as a result of such interactions the relative velocity of said cargo to said impact chamber is reduced to zero and there is negligible damage to said configuration means and to the wall of said impact chamber, the mass of said loose materials is more than a hundred times the mass of said cargo and the mass of said configuration means is more than ten time the mass of said cargo.

5,199,672

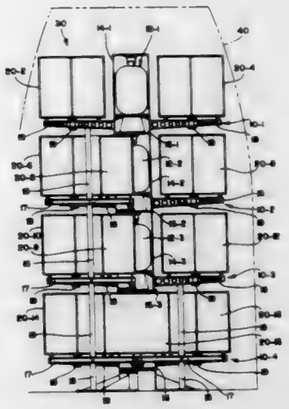
METHOD AND APPARATUS FOR DEPLOYING A SATELLITE NETWORK

Jan A. King, and Neal J. Beidleman, both of Boulder, Colo., assignors to Orbital Sciences Corporation, Fairfax, Va.

Filed May 25, 1990, Ser. No. 529,395

Int. Cl.[5] B64G *1/10*

U.S. Cl. 244—158 R **36 Claims**



1. A method of deploying a network of a plurality of satellites in a plurality of orbit planes comprising the steps of:

launching the plurality of satellites into an initial orbit having an initial orbit plane;

transferring a first satellite from the initial orbit into a first orbit having a first orbit plane, wherein the initial and first orbit planes process at a predetermined initial and first rates, respectively, said initial and first rates being different by a first difference rate;

transferring a next satellite from the initial orbit into a next orbit having a next orbit plane after waiting a first time period selected based on the first difference rate, wherein the initial and next orbit planes precess at the initial rate and a predetermined next rate, respectively, said initial and next rates being different by a next difference rate; and

repeating the foregoing step after waiting a next time period selected based on the next difference rate, whereby the satellites are sequentially deployed from the initial orbit plane into the plurality of orbit planes.

5,199,673

CROSS-TYPE CLAMP AND CONNECTION PRODUCED THEREBY BETWEEN TWO CROSSED WIRE CABLES, AND WIRE CABLE NET WITH CROSS-TYPE CLAMPS

Reinhold Bolliger, Windisch, Switzerland, assignor to Brugg Drahtseil AG, Birr, Switzerland

Filed Jul. 12, 1991, Ser. No. 729,364

Claims priority, application European Pat. Off., Sep. 14, 1990, 90117708.9

Int. Cl.[5] B21F *27/00*

U.S. Cl. 245—2 **8 Claims**

1. Cross-type clamp for clamping together two crossed wire cables or wire cable sections at the point of crossing by means of two clamp parts, the clamp parts comprising claws holding together the clamp parts, and the clamp parts exerting a pressing force on the wire cables at the point of crossing and each of which having a bearing surface for a respective one of the two crossed wire cables, and at least one of which being provided with at least one pair of mutually opposing claws, wherein for each claw belonging to one of the two clamp parts, there is provided on the other clamp part a slot for guiding the

claw through, the claw being guided through the slot and the

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flanges being connected to said associated one of said members at a second point in said second arrangement, and a plurality of

said arm of said chair such that an inner face of said retaining flange bears against said chair arm, and said binding strap is

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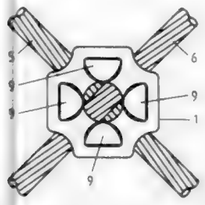
claw through, the claw being guided through the slot and the end piece of the claw projecting beyond the slot being bent back, and wherein the claws are formed from tabs of sheet metal having their end pieces bent around and being connected in one piece to the associated clamp part, the end pieces of the tabs projecting beyond the slots being rounded off, and wherein the slots being rounded off at their slot ends and



having an opening width w above the sheet thickness s of the sheet metal forming the tabs and a slot length l above the tab breadth, which slot length l is, for fixing the position of the tabs or claws, with $l \approx b+w-\sqrt{w^2-s^2}$ at least approximately equal to the sum of the tab breadth b and the slot opening width w less $\sqrt{w^2-s^2}$ and with $l \approx b+0.414s$ at least approximately equal to the sum of the tab breadth b and 0.414 times the sheet thickness s of the sheet metal forming the tabs.

5,199,674

MULTI-ARTICULATION SWITCH

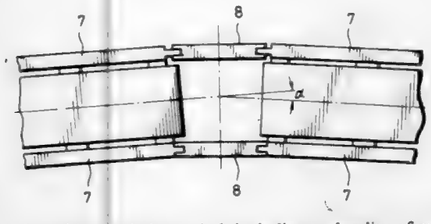
Kiyoshi Mihirogi, Odawara, Japan, assignor to HSST Corporation, Tokyo, Japan

Filed Sep. 20, 1991, Ser. No. 764,563

Claims priority, application Japan, Sep. 26, 1990, 2-256000

Int. Cl.[5] E01B *25/00;* **B61B** *13/08*

U.S. Cl. 246—434 **5 Claims**



1. A multi-articulation switch including a plurality of movable track girders, and means for selectively connecting adjacent movable track girders between one fixed main track girder and a plurality of other fixed track girders, comprising;

main rails fixedly secured onto said movable track girders for guiding a vehicle, respectively;

said main rails forming a curved path when said one fixed main track girder is connected to at least one of said another fixed main track girders; and

short intermedial rails continuously positioned between said main rails of one of said movable track girders and said fixed main track girder adjacent thereto and between said main rails of said adjacent movable track girders, for coupling them, both ends of said intermedial rails being continuously engaged with said main rails on said fixed main track girder or said movable track girders with a variable relative angle therebetween,

said intermedial rails comprising means for moderating horizontal and vertical deviations between said one main rail and said other main rails.

5,199,675

NUT, AND A DEVICE USING THE NUT FOR CLAMPING AND SUPPORTING ELONGATE OBJECTS

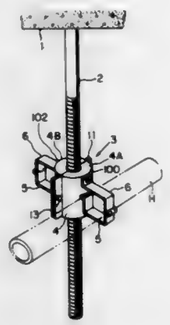
Takeshi DeGuchi, Osaka, Japan, assignor to Inaba Denki Sangyo Co., Ltd., Osaka, Japan

Filed Sep. 12, 1990, Ser. No. 581,583

Claims priority, application Japan, Dec. 28, 1989, 1-152762[U]; Mar. 12, 1990, 2-25448[U]

Int. Cl.[5] F16L *3/22*

U.S. Cl. 248—62 **19 Claims**



1. A supporting device of supporting elongate objects comprising:

a nut including a pair of nut parts formed by circumferentially dividing the nut, a pivotal connection for interconnecting circumferential ends of said nut parts to be pivotable between an open position and closed position, and retainer means for releasably holding said nut parts in the closed position;

holders each connected to said nut and formed into a recessed shape for receiving an elongated object; and

covers for closing said holders, respectively, to prevent the elongated objects from moving out of said holders, wherein said holders are supported in a cantilever fashion by said nut, and each of said covers is connected to a free end of one of said holders to be pivotable between an open position and closed position, said supporting device further comprising fixing elements for fixing free ends of said covers in the closed position to said nut.

5,199,676

ADJUSTABLE WATER HEATER STAND

Ronald A. Kowalewski, Brookfield, Wis., assignor to AOS Holding Company, Wilmington, Del.

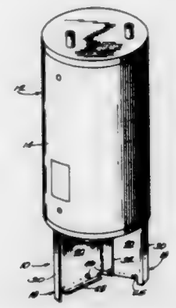
Filed Mar. 11, 1992, Ser. No. 849,929

Int. Cl.[5] A47G *23/02*

U.S. Cl. 248—149 **17 Claims**

1. A stand for supporting water heaters of various sizes, said stand comprising of three substantially identical members which, in a first arrangement, support a water heater having a first width, and which, in a second arrangement, support a water heater having a second width, each of said members including a substantially planar and generally rectangular main portion having first and second parallel edges, and third and fourth parallel edges, a first flange extending generally perpendicularly from said main portion along said first edge, and an attachment flange extending at an angle of less than 90° to said main portion from said edge, each of said attachment flanges being connected to an associated one of said members at a first point in said first arrangement, and each of said attachment

flanges being connected to said associated one of said members at a second point in said second arrangement, and a plurality of



fasteners for securing said attachment flanges to said members in either of said first and second arrangements.

5,199,677

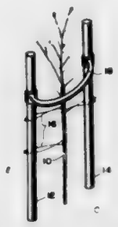
TREE STAKE STABILIZER

James R. Sessions, 127 Thayer Way, Vallejo, Calif. 94589

Filed Nov. 4, 1991, Ser. No. 787,410

Int. Cl.[5] A01G *17/14*

U.S. Cl. 248—218.4 **3 Claims**



1. A tree stake stabilizer for attachment to a pair of spaced tree stakes having round cross sections for providing rigidity to said pair and clearance to a tree planted between said pair, said stabilizer comprising:

a pair of tubular collars for loosely engaging each stake of said pair of round tree stakes, the axes of said tubular collars being substantially parallel to each other;

an adjustable length elongated bar having its ends connected to each of said tubular collars, said bar being arcuate to form a horizontal offset from the tree.

5,199,678

CUP HOLDER

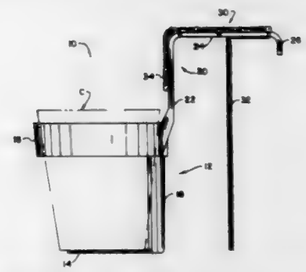
Aaron Luebke, P.O. Box 154, Okawville, Ill. 62271

Continuation-in-part of Ser. No. 682,541, Apr. 8, 1991, abandoned. This application Feb. 14, 1992, Ser. No. 836,096

Int. Cl.[5] A47C *7/62*

U.S. Cl. 248—311.2 **5 Claims**

1. A cup holder for removable attachment to an arm of a chair, said cup holder comprising a cup receptacle, support means, and securing means, said cup receptacle having means for supporting a cup therein, said support means being connected to said cup receptacle and being comprised of a single elongated, flat horizontal support arm having a downwardly depending retaining flange at a distal end thereof, said securing means being comprised of a binding strap connected to a bottom side of said horizontal support arm toward said distal end and spaced from said retaining flange, a top surface of said horizontal support arm having means for releasably securing said strap, whereby said horizontal support arm is placed on said arm of said chair such that an inner face of said retaining flange bears against said chair arm, and said binding strap is



wrapped around said chair arm and secured to said top surface of said support arm, whereby said cup holder is secured to said chair arm.

5,199,679

HEIGHT ADJUSTING DEVICE FOR A SEAT

Yoshihiko Nakamura, Okazaki, and Yukifumi Yamada, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jul. 5, 1991, Ser. No. 726,377

Claims priority, application Japan, Jul. 26, 1990, 2-198281

Int. Cl.[5] A45D *19/04*

U.S. Cl. 248—394 **6 Claims**

1. A height adjusting device for a seat comprising:

a lower arm;

a seat-cushion having a front end portion and a rear end portion;

a first operating mechanism including a rear bell-crank pivotally-connected to the lower arm and having one end portion connected to the rear end portion of the seat-cushion, a first sector-gear pivotally-connected to the lower arm and connected to the other end portion of the rear bell-crank, and a first handle for rotating the first sector-gear a and

a second operating mechanism including a second sector-gear pivotally-connected to the lower arm, a swing link pivoted at one end portion thereof to the second sector-gear, a front bell-crank having one end portion connected to the front end portion of the seat-cushion and the other end portion connected to the first sector gear, and a second handle for rotating the second-sector gear.

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lower slotted plate are orthogonally mounted adjacent a

(a) a clutch disk having near its periphery an annular array of

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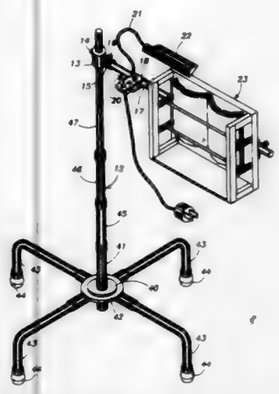
BOOK HOLDER APPARATUS

Luis A. Rivera, 17 Avenida 16-96, Zona 11, Anillo Periferico, Guatemala

Filed Oct. 28, 1991, Ser. No. 783,527
Int. Cl.[5] A47B 5/00
U.S. Cl. 248—441.1 2 Claims



1. A book holder apparatus, comprising,

a pedestal, the pedestal including a first support post orthogonally mounted relative to the pedestal, the first support post including a first support post collar complementarily and slidably receiving the first support post therewithin, wherein a first fastener radially directed through the first support post collar fixedly secures the first support post collar relative to the first support post, and

a collar sleeve integrally mounted in orthogonal orientation relative to the first support post collar, and

a second support post received within the collar sleeve, and a second fastener radially directed into the collar sleeve fixedly secures the second support post relative to the collar sleeve and orthogonally orients the second support post relative to the first support post, and

a housing member rotatably mounted relative to the second support post, and

a support bracket fixedly secured to the second support post includes a flexible goose neck member mounted to the support bracket, and

an illumination housing mounted to an upper distal end of the goose neck, with an illumination member mounted within the illumination housing, and a switch member mounted to the support bracket to effect selective actuation of the illumination member, and

the illumination housing positioned above the housing member, wherein the housing member is arranged for securement of a book member therewithin, and

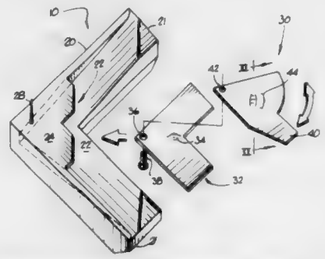
the housing member includes a housing floor, and the housing floor including a housing rear wall orthogonally and fixedly mounted to the floor extending upwardly relative thereto, the rear wall including a rear wall rear surface and a rear wall forward surface, the rear wall rear surface including a plurality of coaxially aligned loop members fixedly mounted to the rear surface, each loop member including a loop fastener directed through the loop member, and the loop members receiving the second support post therethrough, and the loop fasteners intersecting the second support post in selective engagement to effect selective rotation of the second support post relative to the loop members, and a right upper slotted plate and a right lower slotted plate orthogonally and integrally mounted adjacent a right side edge of the rear wall, wherein the right upper slotted plate and the right lower slotted plate are arranged in a coplanar relationship relative to one another, and a left upper slotted plate and a left lower slotted plate are orthogonally mounted adjacent a left edge of the rear wall arranged in a coplanar relationship relative to one another, wherein the right upper slotted plate includes a first slot, the left upper slotted plate includes a third slot, the first slot and a third slot define a first plane, and the right lower slotted plate includes a second slot, and the left lower slotted plate includes a fourth slot, wherein the second slot and the fourth slot are coplanar to define a second plane, wherein the first plane is parallel relative to the second plane and spaced above the second plane, and the first slot and the third slot include a first rod frictionally engaged therethrough, and the second slot and the fourth slot include a second rod frictionally directed therethrough to secure a book member between the first rod and the forward surface of the rear wall and the second rod and the forward surface of the rear wall.

5,199,681

BRACKET SYSTEM FOR MOUNTING POSTERS ON WALLS

Mark M. Reidy, 718 Grant St., No. 9, Denver, Colo. 80203

Filed Jan. 27, 1992, Ser. No. 826,004
Int. Cl.[5] A47F 1/14
U.S. Cl. 248—488 9 Claims



1. A mounting bracket for attaching a poster to a wall surface, the poster having a front side and a back side and at least one corner portion, the bracket comprising:

first means for engaging the front side of the poster comprising a corner component having a first leg, a second leg forming an angle to the first leg, and a slot in said corner component for receiving the corner portion of the poster,

second means for engaging the back side of the poster, said second means consisting of a locking means, said locking means having friction pad for contacting the back side of the poster, a lever pivotally mounted on the friction pad to bring the first means and said friction pad to grippingly engage the sides of the poster, and

fastening means for attaching the first and second means to the surface.

5,199,682

FISHING REEL WITH ANNUAL RATCHET CLUTCH EXTERNAL THE SPOOL

Scott James, 15 Kearny Ave., Apt. #3B, Edison, N.J. 08817

Filed Jun. 3, 1991, Ser. No. 709,357
Int. Cl.[5] A01K 89/033; F16D 63/00
U.S. Cl. 242—295 20 Claims

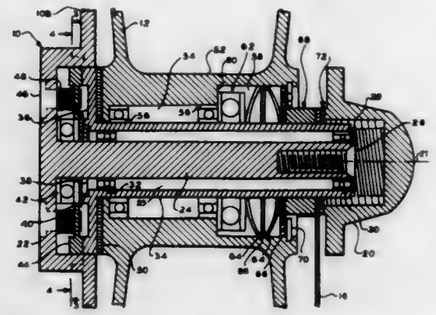
1. A fishing reel comprising:

a frame assembly defining an axis and including a frame teeth arrangement facing in an axial direction;

a spindle rotatably mounted on said frame assembly coaxially with said frame teeth arrangement: and

a spool having at least one flange and a cylindrical core rotatably mounted on said spindle, said spindle comprising:

(a) a clutch disk having near its periphery an annular array of axially projecting disk teeth arranged so that each disk tooth rotates relative to and against a plurality of teeth of said frame teeth arrangement, said annular array of disk teeth being external said spool core; and



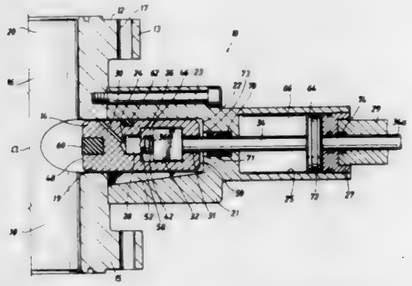
(b) a brake pad mounted between said clutch disk and said spool for frictionally engaging and resisting relative motion therebetween.

5,199,683

BLOWOUT PREVENTER OPENING MECHANISM

Tri C. Le, Fort Bend County, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Filed Jun. 9, 1992, Ser. No. 896,054
Int. Cl.[5] E21B 33/06
U.S. Cl. 251—1.3 19 Claims



1. A blowout preventer comprising:

a blowout preventer housing having a central bore therethrough and defining cavity means intersecting said central bore;

closure members disposed within said cavity means for movement toward and away from each other between an open position and a closed position closing said central bore and dividing said central bore into upper and lower zones respectively above and below said closure members;

at least one of said closure members having a bypass passageway therethrough, said bypass passageway having first and second ends disposed so as to allow communication between said upper and lower zones through said bypass passageway, and having a straight-sided, tubular sealing section intermediate said ends;

a sealing piston reciprocable in said bypass passageway into and out of said sealing section;

and a circumferential seal interengaging said sealing piston and said sealing section when said sealing piston is in said sealing section.

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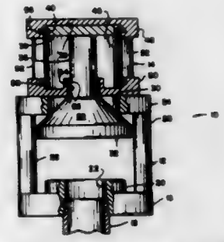
DISCHARGE VALVE FOR DISSOLVED AIR FLOTATION

William A. Maples, Appleton, Wis., assignor to Microlift Systems Inc., Sturgeon Bay, Wis.

Division of Ser. No. 669,667, Mar. 14, 1991, Pat. No. 5,139,663.
This application Apr. 20, 1992, Ser. No. 870,933
Int. Cl.[5] F16K 31/42, 1/36
U.S. Cl. 251—30.01 8 Claims



1. A self-cleaning valve for discharge of a pressurized dissolved air flotation aqueous treatment liquid from a high pressure reservoir to a low pressure body of liquid to be treated comprising:

a) a discharge head assembly adapted to be attached to a conduit supplied with pressurized treatment liquid and being provided with a central fluid discharge opening;

b) a reciprocable cap positioned to reciprocate from a position whereon it restricts flow of liquid through said central opening to a position wherein flow through said opening is unrestricted;

c) said cap being attached to one end of a reciprocable rod, and defining a frusto-conical upper portion arranged to extend within the central opening of said discharge head;

d) said reciprocable rod being attached at its opposite end to a piston;

e) a cylinder head assembly including an enclosed cylinder for operatively receiving said piston;

f) means for preselecting and maintaining axial spacing of said reciprocal cap relative to said central opening;

g) said enclosed cylinder assembly, said cap and said discharge head assembly being positioned in relative axial alignment;

h) said cylinder being provided with an opening on each side of said piston;

i) a source of pressurized control fluid connectable to each of said cylinder openings; and

j) means to selectively direct the flow of said pressurized control fluid to a cylinder opening located at a respective side of said piston.

5,199,685

FLUID FLOW CONTROL DEVICE COMPRISING A DEFORMABLE MASKING MEMBRANE TRANSVERSE TO THE FLUID FLOW

Patrick Larseneur, Versailles, France, assignor to Valeo Thermique Habitacle, Le Mesnil-Saint-Denis, France

Filed Feb. 13, 1992, Ser. No. 834,935
Claims priority, application France, Feb. 21, 1991, 91 02102
Int. Cl.[5] F16K 7/00
U.S. Cl. 251—212 6 Claims

1. A fluid flow control device comprising a fluid flow duct having a duct wall; a masking member arranged in and across said duct, said masking member being a deformable membrane having two lip members defining a transversely extending aperture through the thickness of the membrane, the membrane further having two groups of bellows-type folds extending in the same general direction as said aperture and on either side of the latter,; and an actuating member cooperable with the aperture defining lip members of the membrane, whereby the actuating member can engage the lip members of the mem-

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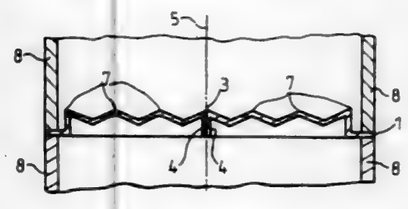
brane so as to move them apart to put the membrane in a first position in which the aperture is open and so as to bring said lip



members together to put the membrane in a second position in which the aperture is closed.

5,199,686

NON-CONTINUOUS BASE GROUND LEVEL AUTOMOTIVE LIFT SYSTEM

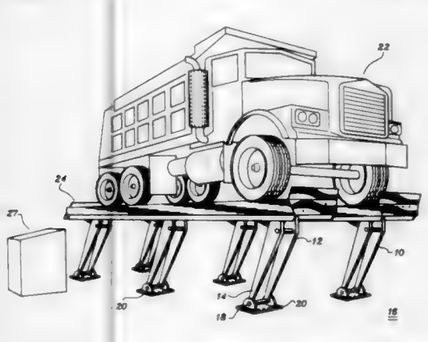
Robert H. Fletcher, Glenwood, N.J., assignor to Advantage Lift Systems Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 643,021, Jan. 18, 1991, Pat. No. 5,096,159. This application Jan. 2, 1992, Ser. No. 815,748

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] B66F *7/12*

U.S. Cl. 254—90 **11 Claims**



1. A non-continuous base ground level automotive lift system, comprising

(a) a longitudinal plurality of transverse pairs of left and right rigid lifting legs, neither any legs of said pairs of legs nor any longitudinally successive legs having any on-ground connection therebetween, each of said legs having a top and a bottom, each bottom of each leg having, pivotally secured therewith, a planer base which is anchored upon an on-ground floor;

(b) left and right longitudinal vehicle wheel support platforms, said left and right wheel platforms having a pivotal connection relative to the respective tops of each of said respective pairs of left and right rigid legs; and

(c) fluid piston and cylinder power means, within at least one pivotal connection within at least one each of said left and right pluralities of lifting legs, for selectively changing the length of the piston of said power means to correspondingly and synchronously modify the angulation between each piston, its corresponding lifting leg and its respective platform, to thereby synchronously control the height of the respective left and right platforms relative to each other.

5,199,687

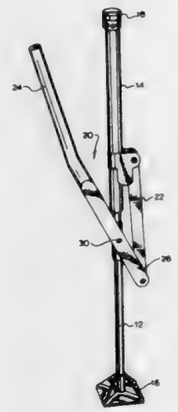
LIFTING JACK FOR RAILROAD CAR PLATFORM

David L. Maurer, 414 W. Howard St., Box 556, Durand, Ill. 61024

Filed Jun. 22, 1992, Ser. No. 901,867

Int. Cl.[5] B66F *3/00*

U.S. Cl. 254—114 **1 Claim**



1. A lifting jack for use within a railroad car for the lifting of separating platforms therein, said jack comprising:

upper and lower telescoping members;

a supporting foot member attached to the lower extremity of said lower telescoping member;

a platform contacting member attached to the upper extremity of said upper telescoping member;

a lever member having an upper and lower portion, said upper portion being angled upwardly from said lower portion, wherein said lever member is pivotally connected at its lower portion to said lower telescoping member at the upper extremity thereof, and wherein said lower portion of said lever member protrudes beyond said pivotal connection for directing lifting force upwardly; and

a link connected to the extension of said lower portion of said lever arm protruding beyond said pivotal connection and said upper telescoping member proximate the lower extremity thereof to cause said upper telescoping member to rise in response to downward pressure on the upper portion of said lever member.

5,199,688

FAILURE MODES FOR A JACK

Darryl L. Engel, LaOtto, Ind., assignor to Universal Tool & Stamping Company, Inc., Butler, Ind.

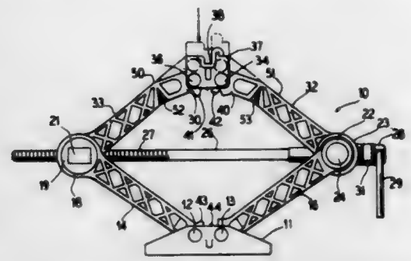
Filed Sep. 14, 1992, Ser. No. 944,356

Int. Cl.[5] B66F *3/12*

U.S. Cl. 254—126 **10 Claims**

1. A scissors jack having a base member, a support bracket, lower pivoted channel members with their lower ends pivotally connected to said base member, upper pivoted channel members with their upper ends pivotally connected to said support bracket, the upper ends of said lower channel members pivotally connected to the lower ends of said upper channel members and a lead screw coupled to said lower and upper channel members for raising and lowering the jack, comprising an overload indicating and protecting means comprising,

weakened portions formed in said upper channel members which upon overload of the jack allow the upper channel



members to bend a limited amount without fracturing so as to indicate the overload condition.

5,199,689

TRANSMISSION LINE INSTALLATION

Nicholas W. Proud, Needham Market, and Robert A. Freeman, Ipswich, both of England, assignors to British Telecommunications public limited company, London, England

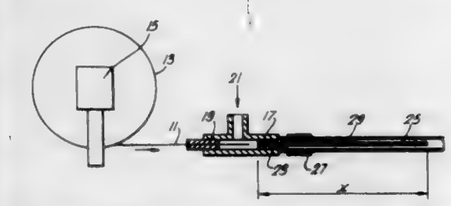
PCT No. PCT/GB89/00599, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO89/12245, PCT Pub. Date Dec. 14, 1989

PCT Filed May 31, 1989, Ser. No. 603,711

Claims priority, application United Kingdom, Jun. 2, 1988, 8813068

Int. Cl.[5] B66F *3/24*

U.S. Cl. 254—134.4 **10 Claims**



1. A method of advancing a transmission line along a duct with viscous drag of a fluid medium, comprising introducing the transmission line to a feed portion of duct, introducing said fluid medium into said feed portion at a super-atmospheric pressure so as to advance the line along the portion and into a main duct through the action of viscous drag forces acting on the line in the feed portion, which main duct has a larger diameter than the feed portion, and which main duct is stationary with respect to said feed portion, and continuing the supply of fluid during installation of the transmission line in the main duct.

5,199,690

ACTIVE VIBRATION ISOLATION SYSTEM

Philip Marshall, Lexington, Mass., assignor to M/RAD Corporation, Woburn, Mass.

Continuation of Ser. No. 558,642, Jul. 26, 1990, abandoned. This application Jul. 30, 1992, Ser. No. 922,650

Int. Cl.[5] F16F *9/22, 9/43*

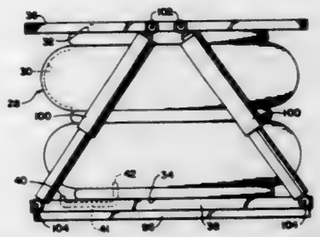
U.S. Cl. 267—64.25 **15 Claims**

1. An active vibration isolation system for damping movement of a load comprising, in combination:

a plurality of airbag springs for supporting a load, each of said airbag springs having a top end and a bottom end, and a flexible air chamber extending between said top and bottom ends, with a port for admitting air to and removing air from said chamber;

a top plate and a bottom plate attached to the top and bottom ends, respectively, of each of said airbag springs, said top and bottom plates being caused to move toward and away from one another with changes in the load and the pressure of the volume of air within the chambers of said airbag springs;

a servo system for admitting air to and exhausting air from the chambers of said airbag springs as a function of changes in the spacing between said top and bottom plates, whereby to cause said airbag springs to expand or contract in a direction to oppose movement of said top and bottom plates toward and away from one another;



a plurality of damping means extending between and coupled to said plates so as to dampen relative movement of said plates in parallel with the damping action of said airbag springs, each of said damping means comprising at least one pair of hydraulic shock absorbers extending between and coupled to said top and bottom plates, each pair of shock absorbers being disposed next adjacent to an airbag spring, with at least one pair of shock absorbers associated with one airbag spring extending at a right angle to the shock absorbers associated with another airbag spring.

5,199,691

HYDRAULIC ANTI-VIBRATION SLEEVES

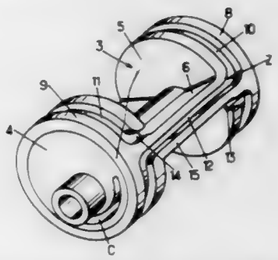
Bernard Bouhier, Vierzon, and Jean Thelamon, Bonneval, both of France, assignors to Hutchinson, Paris, France

Filed Nov. 12, 1991, Ser. No. 789,850

Claims priority, application France, Nov. 13, 1990, 90 14056

Int. Cl.[5] F16F *13/00*

U.S. Cl. 267—140.12 **6 Claims**



1. A hydraulic anti-vibration sleeve comprising:

an outer rigid tubular member having a longitudinal axis and opposite axial ends;

an inner rigid tubular member disposed inside of said outer tubular member;

an elastomer body interconnecting said outer tubular member and said inner tubular member, said elastomer body being shaped and cooperating with said tubular members to form at least two diametrically opposite watertight pockets, said elastomer body including

a) a first portion which delimits at least one of said pockets

and which is generally U-shaped in axial section and being supported on a shaft capable of rotation integrally

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PAPER SHEET FEEDER

restriction members of the second side being coupled to each other so as to be movable as a unitary structure in the direction

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and which is generally U-shaped in axial section and open radially outward, and

b) an axially central second portion in the form of two arms which extend radially between said tubular members and parallel to the longitudinal axis of said outer tubular member;

two rigid annular section members which are bonded to said first portion, said two rigid annular section members having an axis which is the same as the longitudinal axis of said outer tubular member and being respectively disposed inside and adjacent respective said opposite axial ends of said outer tubular member,

a connection member provided axially along an outside edge of one of said arms;

a narrow channel which provides communication between said pockets, said narrow channel being formed of an end length in each of said annular section members and a connection length interconnecting said end lengths which said connection length extends axially along said connection member of said outside edge of the one of said radial arms of said axially central second portion; and

a damping liquid which fills said pockets and said narrow channel.

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CLAMP DEVICE DRIVE APPARATUS

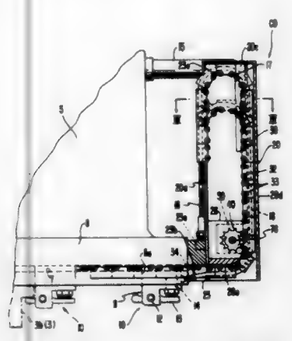
Seiji Kimura, Toyono, and Kouji Wada, Itami, both of Japan, assignors to Aloi Seiki, Inc., Hyogoken, Japan

Filed Mar. 22, 1991, Ser. No. 673,536

Claims priority, application Japan, Mar. 24, 1990, 2-30024[U]; Nov. 30, 1990, 2-130486[U]

Int. Cl.[5] B23G *1/20*

U.S. Cl. 269—55 **3 Claims**



1. A clamp device drive apparatus for driving a clamped device including a foot portion engaged with a horizontal T-shaped groove formed on a surface portion of a base member on which an object to be clamped is mounted and being disposed movably along the T-shaped groove, between a clamping position where the clamp device clamps the object and an unclamping position away from the object, comprising:

a push-pull chain introduced into the T-shaped groove from an open end thereof and connected to the foot portion of the clamp device at one end;

a vertical housing directed along a base structure supporting the base member, for containing the push-pull chain extending from the T-shaped groove, a base end portion thereof being fixed to the side surface of the base member so as to correspond to the T-shaped groove;

a guide means provided in the housing for guiding the push-pull chain extending into the housing form the open end of the T-shaped groove so as to convert a running course of the push-pull chain by an angle of about 90° in a vertical plane including the T-shaped grooves;

a sprocket provided in the housing and engaged with the push-pull chain near the guide means, and the sprocket being supported on a shaft capable of rotation integrally with the sprocket; and

a drive means, mounted on the housing, for driving the sprocket to rotate in both directions of rotation, the drive means comprising, a pressurized fluid cylinder including a piston member driven selectively forward and backward, a rotation restraining means for restraining rotation of the piston member, and a screw mechanism including a ball screw nut fixed inside the piston member in parallel with the axis thereof and a ball screw shaft engaged with the screw nut and fixed to the shaft at one end thereof,

wherein the piston member of the cylinder comprises a piston main body portion of smaller diameter than the inside diameter of a cylinder body of the cylinder, first and second piston portions formed at opposite ends of the piston main body portion, respectively, and the cylinder body comprises a partition wall contacting slidably with a surface of the piston main body portion between the first and second piston portions, and inside the cylinder body a first fluid chamber is formed between the first piston portion and a partition wall and second fluid member is formed between a second piston portion and the partition wall,

wherein the ball screw nut and the ball screw shaft are disposed coaxially with the cylinder means, and the rotation restraining means comprises a rod member extending slidably through the piston member and fixed at the opposite ends thereof.

5,199,693

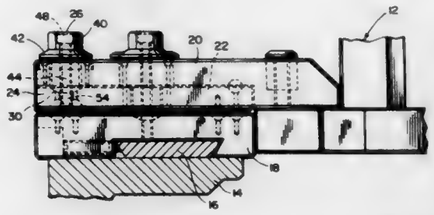
WORKPIECE HOLDING SYSTEM WITH LOCK SCREW

Lars Johanson, 72 Hillsdale Rd., Cedar Grove, N.J. 07009

Filed Apr. 7, 1992, Ser. No. 864,853

Int. Cl.[5] B23Q *3/02*

U.S. Cl. 269—93 **6 Claims**



1. A workpiece holding system comprising an adjustment block mounted on a support base, an adjustment screw threaded through the adjustment block and having a lower end engaged with the support base to adjust the adjustment block toward or away from the support base to accurately position a workpiece holding fixture and a lock screw extending axially through a bore in the adjustment screw and including a headed upper end engaged with the adjustment screw and a threaded lower end threaded into an internally threaded bore in the support base to lock the adjustment screw in relation to the support base and adjustment block without introducing any deflective force on the adjustment block, said lock screw including a head at the upper end thereof of cylindrical configuration, said adjustment screw receiving bore including a shoulder facing upwardly adjacent the upper end thereof for engagement by the head on the upper end of the lock screw for exerting a locking force on the adjustment screw to lock the adjustment screw to the support base to prevent rotation of the adjustment screw.

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PAPER SHEET FEEDER

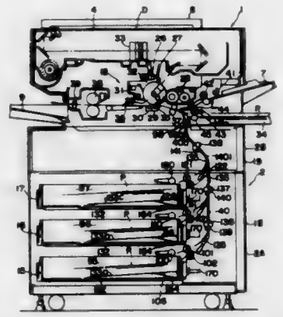
Ken Iseda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 22, 1991, Ser. No. 734,207

Claims priority, application Japan, Jul. 23, 1990, 2-194203

Int. Cl.[5] B65H *3/44*

U.S. Cl. 271—9 **16 Claims**



1. A paper sheet feeder comprising:

first storing means for storing a first group of paper sheets;

second storing means for storing a second group of paper sheets;

first taking-up means for taking up the first group of paper sheets one by one from said first storing means;

first transferring means for transferring the first paper sheets supplied from said first storing means;

second taking-up means for taking up the second group of paper sheets one by one for said second storing means;

second transferring means for transferring the second paper sheets to said first transferring means from said second storing means, said first transferring means transferring the second paper sheets transferred from said second transferring means;

selecting means for selecting one of said first or second taking-up means to energize the selected one of said first or second taking-up means; and

means for causing one of said first or second transferring means corresponding to the selected one of said first or second taking-up means to prevent the corresponding paper sheet from passing therethrough and to register the corresponding paper sheet in a predetermined orientation.

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CASSETTE FOR FEEDING SHEET MATERIALS

Akinobu Nakahata, Sakai; Hiroshi Kubota, Osaka; Kenji Oda, Toyonaka, and Yoshinori Makiura, Kawachinagano, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

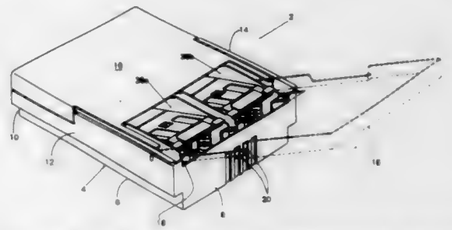
Filed Feb. 14, 1992, Ser. No. 835,498

Claims priority, application Japan, Feb. 15, 1991, 3-022287

Int. Cl.[5] B65H *1/00*

U.S. Cl. 271—9 **29 Claims**

1. A cassette for feeding sheet materials comprising a container body, having an upper surface that is at least partly opened, and at least two sheet material-holding means that are arranged in said container body in parallel in the direction of width, wherein each of said sheet material-holding means includes a pair of width restriction members, each pair of width restriction members constituted by a width restriction member of a first side and a width restriction member of a second side, said width restriction members being so disposed that their positions can be freely adjusted in the direction of width and the sheet materials are held between said pairs of width restriction members, the width restriction members of the first side being coupled to each other so as to be movable as a unitary structure in the direction of width, the width restriction members of the second side being coupled to each other so as to be movable as a unitary structure in the direction of width, and said width restriction members of the first side



and said width restriction members of the second side being coupled to each other so that they are movable in synchronism in a direction to approach each other or in a direction to separate away from each other.

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PAPER FEEDING UNIT

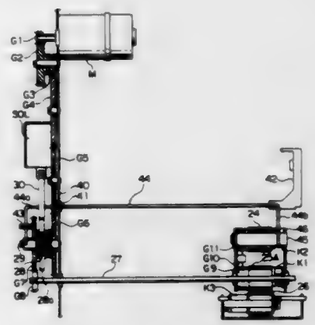
Shogo Kato, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 716,101, Jun. 17, 1991, abandoned. This application Jul. 31, 1992, Ser. No. 921,428

Claims priority, application Japan, Jun. 19, 1990, 2-162331; Jun. 20, 1990, 2-162451

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—10 **6 Claims**



1. A paper feeding unit for feeding paper in a feeding direction from a stack of papers stored in a paper feeding cassette, the paper feeding unit comprising:

a pick-up roller, having a housing, for pulling out a sheet of paper from the top surface of the stack by coming in contact therewith;

a swing lever, comprising a rod with a bend at each end, for intermittently contacting the housing of the pick-up roller at one bent end by a swing motion thereof for causing the pick-up roller to intermittently come in contact with and retract from the top surface;

cam means for intermittently contacting the other bent end of the swing lever and for swinging the swing lever; and

clutch means for intermittently driving the pick-up roller to rotate a predetermined rotation angle by each driver.

first and second positions, said drive means including a rotary

roller means, cupping means, and wave guide means

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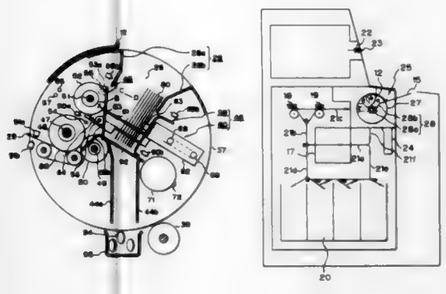
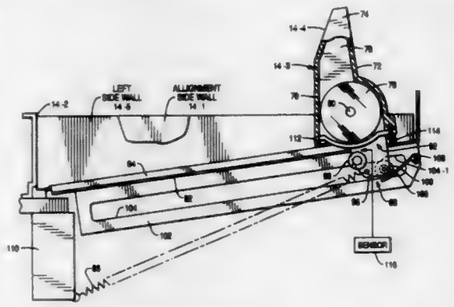
5,199,697
AUTOMATIC TELLER MACHINE
Naohiro Yamada, and Yutaka Nagahashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 23, 1991, Ser. No. 734,782
Claims priority, application Japan, Aug. 16, 1990, 2-85875[U]; Dec. 19, 1990, 2-403579
Int. Cl.[5] **G07F** *19/00;* **B65H** *3/06, 3/52*
U.S. Cl. 271—122 **4 Claims**

3. In an automatic teller machine with a receiving/dispensing unit in a customer panel of a main body of the machine, said receiving/dispenting unit having a rotary body, which is composed of two flanges supported for rotation in an opposing relationship and two platelike bill guides fixed in an opposing relationship and extending in a direction perpendicular to the flanges, and an openable shutter arranged to cover the rotary body at a position facing a customer, whereby the rotary body with bills received together therein is rotated and then stopped at a receiving/dispensing position to conduct a deposit/withdrawal procedure, the improvement wherein one ends of the bill guides serve as a receiving opening for receiving the bills from the customer panel, a gear is formed in an outer periphery of at least one of the flanges, the rotary body is provided with a means for separating and feeding the bills one by one and an opening for feeding the thus-separated bills into the main body, and a drive source is provided to rotate the gear.



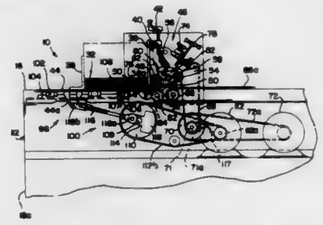
4. The machine of claim 3, wherein the separating and feeding means comprises:
a bill pusher provided on a side of one of the bill guides so that the bill pusher is movable toward and away relative to the other bill guide;
a bill pusher drive source for moving the bill pusher;
a picker roller arranged so that a part of an outer periphery of the picker roller can enter between the bill guides from a side of the other bill guide to hold bills, which have been inserted or fed between the bill guides and are to be pushed by the bill pusher, between the picker roller and the bill pusher and to feed the bills toward rear end portions of the bill guides;
a feed roller arranged at the rear end portions of the bill guides to feed bills, which have been fed from the picker roller, to a feed-in opening for a bill discriminator unit;
a reverse roller arranged in contact with the feed roller to separate one by one the bills to be fed into the feed-in opening; and
a roller drive source for rotating the picker roller, feed roller and reverse roller.

5,199,698
DOCUMENT FEEDER EMPLOYING A VARIABLE LOAD APPLICATOR AND AN ENDLESS BELT
Kenneth S. Seymour, Conestogo; Dennis T. Sonnenburg, Waterloo, and Joseph Guido, Elmira, all of Canada, assignors to NCR Corporation, Dayton, Ohio
Filed Mar. 5, 1992, Ser. No. 846,119
Int. Cl.[5] **B65H** *3/04*
U.S. Cl. 271—34 **10 Claims**



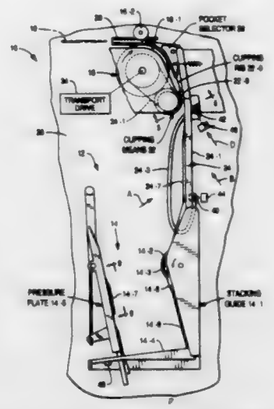
1. A hopper module comprising:
a hopper;
a pusher;
biasing means for biasing said pusher from a loading station to a picking station in said hopper;
a document picker located at said picking station;
a velocity sensor for generating a velocity signal corresponding to the velocity of the pusher as the pusher is moved by said biasing means from said loading station towards a stack of documents in said hopper; and
a controller for energizing said document picker, for receiving the velocity signal, and for delaying the energization of said document picker for a predetermined time whenever the velocity signal exceeds a predetermined level.

5,199,699
BASE HAVING ANTI-VIBRATION MEANS
George B. Murad, Buffalo Grove, and Neil A. Polit, Crystal Lake, both of Ill., assignors to Videojet Systems International, Inc., Wood Dale, Ill.
Filed Mar. 18, 1992, Ser. No. 853,103
Int. Cl.[5] **B65H** *3/24*
U.S. Cl. 271—131 **16 Claims**



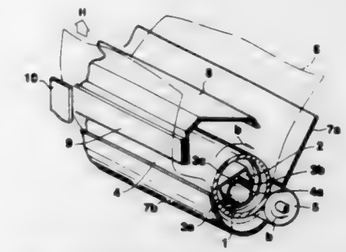
1. Apparatus comprising, in combination, a base, operating means cooperative with said base to define a work station, said operating means being of the type sensitive to horizontal vibration of the base, document feeder means operative to support a stack of documents on said base, said feeder means including a transfer member moveable between a first position to receive a document from the stack and a second position to move the received document along a predetermined path toward the work station, drive means for effecting substantially horizontal reciprocating movement of said transfer member between said first and second positions, said drive means including a rotary drive shaft, and linkage means interconnecting said drive shaft to said transfer member so as to effect said reciprocating movement of said transfer member during rotation of said drive shaft, said linkage means including a crank arm mounted on said drive shaft for rotation therewith, a connecting rod having a first end pivotally connected to said crank arm eccentric to the axis of rotation of said drive shaft, and having a second end pivotally connected to said transfer member so that each rotation of said drive shaft effects a full cycle movement of said transfer member between its first and second positions, and counterbalance means including a counterbalance weight carried by said crank arm so as to create horizontal force components acting on the base which are substantially equal and opposite to any horizontal force components imparted to the base by said transfer member during reciprocating movement thereof.

5,199,700
DOCUMENT STACKING APPARATUS
Richard A. Fairey, Kitchener, and Kenneth S. Seymour, Conestogo, both of Canada, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 23, 1991, Ser. No. 764,416
Int. Cl.[5] **B65H** *29/70, 31/26, 29/38*
U.S. Cl. 271—209 **10 Claims**



1. A document handling apparatus comprising:
a receptacle means for receiving documents to be stacked therein, with said receptacle means having an entrance area, an end wall, a pressure plate, and a pair of stacking drive rollers to move a document to be pocketed towards said end wall, and with said documents having trailing edges which at times block said entrance area;
an entry drive roller means for receiving a document to be pocketed in said receptacle means;
a cupping means having first, second, and third drive rollers and an idler roller for cupping said document, with said idler roller cooperating with said second drive roller to pull said document from said entry drive roller means and to drive said document in free flight towards said pair of stacking drive rollers;
a wave guide means for facilitating the entry of documents into said receiving means, said wave guide means including a flexible band positioned between said cupping means and said pair of drive rollers, with said flexible band forming a wave when the leading edge of said document to be pocketed impacts said flexible band such that said wave moves the trailing edges of documents already in said receiving means out of said receiving area; and
a planar member, with said receptacle means, entry drive roller means, cupping means, and wave guide means mounted on said planar member;
said wave guide means including a guide member mounted on said planar member, with said guide member having a cupping rib positioned thereon to start an initial cupping of said document prior to said document reaching said cupping means.

5,199,701
CARRIER APPARATUS USING ULTRASONIC ACTUATOR
Masaharu Shioya, Akikawa, and Takahiro Mizushina, Tachikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 436,902, Nov. 15, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 605,071
Claims priority, application Japan, Nov. 25, 1988, 63-297459; Nov. 25, 1988, 63-297460; Nov. 2, 1989, 1-286150; Nov. 2, 1989, 1-286151
Int. Cl.[5] **B65H** *5/06*
U.S. Cl. 271—272 **20 Claims**



1. A carrier apparatus comprising:
a cylindrical body having an outer peripheral surface;
changing means, capable of being extended and contracted, for elastically changing a circular cross section of said cylindrical body into an elliptical cross section;
control means for controlling the extension and contraction of said changing means so that the changing of the cross section of said cylindrical body to said elliptical shape is caused intermittently; and
rotation means, located in contact with a predetermined position being on a portion of the outer peripheral surface of said cylindrical body and being not overlapped with major and minor axes of said elliptical cross section, for rotating in response to a displacement of the outer peripheral surface of said cylindrical body, which is caused by changing of the cross section of said cylindrical body to said elliptical shape;
whereby an object to be carried by said carrier apparatus is carried by rotation of said rotation means.

5,199,702
SHEET TRANSPORT APPARATUS
Timothy M. Davis, Macedon, and John H. Looney, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 26, 1992, Ser. No. 858,264
Int. Cl.[5] **B65H** *5/06*
U.S. Cl. 271—274 **8 Claims**

1. Sheet transport apparatus comprising a pair of driven transport rolls and a pair of associated idler nip rolls forming sheet transport nips therebetween and defining a sheet transport path, one of said pair of transport rolls and pair of idler rolls being fixedly supported in a sheet feed table, the other of said pair of transport rolls and pair of idler rolls being mounted on a shaft which is pivotally mounted about an axis perpendicular to the shaft and parallel to the sheet feeding path, said

shaft being pivotally mounted at the midpoint between said

and 4, respectively) being shiftable on said common shaft

5,199,705

an elongated golf club shaft having a top end, a bottom end

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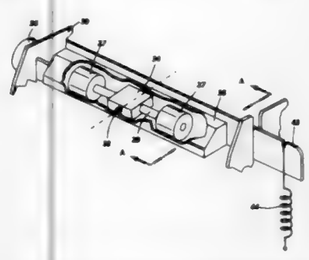
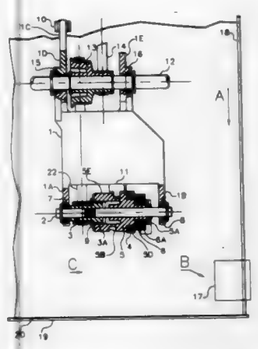
shaft being pivotally mounted at the midpoint between said pair of rolls in a pivot housing extending across the sheet feeding path, one end of said pivot housing having means to fixedly engage said sheet feed table and including means to bias



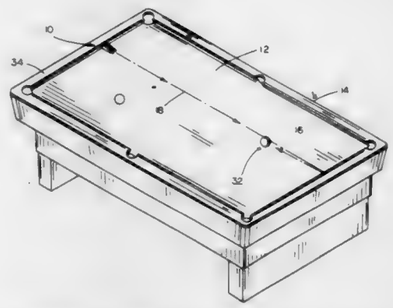
the other end of said pivot housing toward said sheet feed table to enable said shaft to pivot about said axis to provide the same nip force between each of said driven transport rolls and its associated idler nip roll.

5,199,703
DEVICE FOR STACKING AND ALIGNING INDIVIDUALLY SUPPLIED SHEETS
Werner Hess, Stuttgart, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 27, 1991, Ser. No. 799,226
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101381
Int. Cl.[5] **B65H** *29/20, 31/26, 9/16*
U.S. Cl. 271—314 **10 Claims**



1. Device for aligning sheets which are individually supplied to a collecting tray in which they are stacked one above the other, said collecting tray having a support surface and a lateral limiting wall arranged parallely with the direction of entrance of the sheets as well as an abutment associated with the front end side of the sheets, said sheet-aligning device for aligning said sheet both at said lateral limiting wall and at said front abutment comprising:
a pivotable arm (**1**);
first and second drivable wheels (**4**, **6**) of identical diameter arranged on a common shaft (**2**) at the free end of said pivotable arm (**1**), said first wheel (**6**) mounted for rotation on a first collar (**5***a*) of a rotatably mounted sleeve (**5**), said collar being disposed eccentrially with respect to said common shaft (**2**), and said second wheel (**4**) arranged on a second collar (**5***d*) of said rotary sleeve (**5**), said second collar being disposed concentrically with respect to said common shaft (**2**);
said sleeve (**5**) together with the first and second wheel (**6** and **4**, respectively) being shiftable on said common shaft (**2**);
said second wheel held in positive engagement with said sleeve (**5**), and said sleeve (**5**) permanently held in positive engagement with a rotatably mounted and drivable coupling portion (**3**); and
said first wheel (**6**), when resting on the incoming sheet, being shiftable toward the lateral limiting wall (**18**) and, when separated from said sheet, shiftable in the opposite direction.

5,199,704
POOL BALL POSITIONING APPARATUS
Raymond F. Badami, 4522 N. 40th St., Omaha, Nebr. 68111
Filed Nov. 7, 1991, Ser. No. 790,418
Int. Cl.[5] **A63D** *15/00*
U.S. Cl. 273—2 **2 Claims**

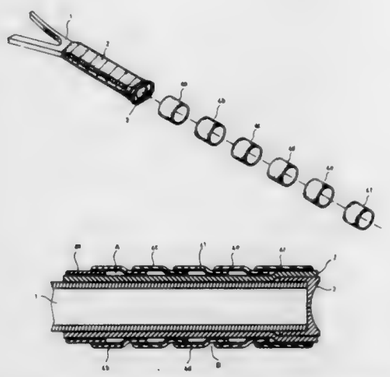


1. A method for repetitively positioning a pool ball at substantially the same location on a pool table, comprising the steps of:
providing a standard size pool table with a felt playing surface and standard pool balls;
providing a pool ball positioning apparatus having a wedge-shaped body with an inclined upper surface sloped downwardly and forwardly from a rearward surface to a forward end, a bottom surface and a straight channel formed in said upper surface extending from the rearward surface along the entire length of said upper surface, the channel having an arcuate shape in transverse cross-section matching the curvature of said pool balls, and the upper surface being inclined at an angle of approximately 21° from the horizontal;
locating the ball positioning apparatus on the felt playing surface of said pool table with the bottom surface resting on the playing surface of the pool table;
positioning one of said pool balls at a predetermined location in the channel on the upper surface;
releasing the ball to permit the ball to roll down the inclined surface to a first position on the playing surface of the pool table;
displacing said ball at said first position with another pool ball which has been moved by a pool cue;
positioning a second pool ball on the wedge-shaped body at said predetermined location; and,
releasing said second pool ball to locate said second pool ball at substantially said first position.

5,199,705
BASEBALL RADAR SPEED SENSOR AND CATCHER'S CHEST PROTECTOR
Nevin C. Jenkins, Homosassa, and Rande W. Newberry, Palm Harbor, both of Fla., assignors to Sports Radar, Inc., Homosassa, Fla.
Filed Dec. 11, 1991, Ser. No. 804,929
Int. Cl.[5] **A63B** *69/40*
U.S. Cl. 273—26 C **7 Claims**

1. The combination of a body garment and sensing means mounted on said body garment; said body garment being a chest protector worn by a catcher and said sensing means being means to measure the relative velocity of a ball thrown towards the catcher wearing said body garment; said sensing means includes display means for a readout of the velocity of the ball to be readable the catcher.

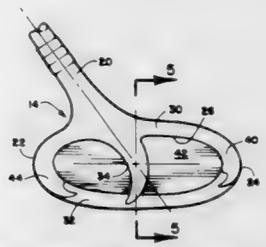
5,199,706
GRIP ASSEMBLY FOR A RACKET
Dennis Chen, Suite 1, 11F, 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan
Filed May 18, 1992, Ser. No. 884,417
Int. Cl.[5] **A63B** *49/08*
U.S. Cl. 273—75 **9 Claims**



1. In a games racket comprising a frame, a shaft adjoining therewith, and a handle portion on the free end of said shaft;
a plurality of generally annular elastic bands, each band having an inner cross section less than that of a corresponding section of said handle portion on which it is to be positioned, each said elastic band being tautly positioned around said corresponding section of said handle portion.

5,199,707
GOLF CLUB
James G. Knox, 324 Dewitt Ct., El Cajon, Calif. 92020
Filed Jun. 1, 1992, Ser. No. 891,713
Int. Cl.[5] **A63B** *53/00, 53/04*
U.S. Cl. 273—80 C **6 Claims**

1. An iron type golf club comprising:
an elongated golf club shaft having a top end, a bottom end and a longitudinally extending axis;
an iron type golf club head having an elongated neck portion having a tubular top end for receiving the bottom end of said golf club shaft, the top end of said neck portion having a longitudinally extending axis that aligns with the longitudinal axis of said golf club shaft;
said golf club head having a center of gravity that lies substantially on the longitudinal axis of said golf club shaft;
said golf club head having a toe, a heel, a front surface and a rear surface; and



a cavity being formed in the rear surface of said golf club head by a respective vertically spaced rearwardly extending top flange and a rearwardly extending bottom flange of said golf club head, a vertical bridge member extending from said neck portion and connecting said rearwardly extending top flange to said rearwardly extending bottom flange, said bridge member being rearwardly spaced from said rear surface so that the front surface of the club head can recoil and then spring forward as it strikes a golf ball.

5,199,708
LAWN ROLLER GAME
Raymond Lucas, 5960 Parkman Rd., NW., Warren, Ohio 44481
Filed Jun. 15, 1992, Ser. No. 898,526
Int. Cl.[5] **A63F** *3/00;* **A63B** *67/06*
U.S. Cl. 273—126 R **3 Claims**

1. A lawn roller game comprising a longitudinally extending playing surface defined between at least two pairs of spaced target posts, each of said pairs of target posts are positioned in spaced parallel relation to one another, said game including playing rings, having a central axis and a periphery, said rings being adapted to be projected linearly along the playing surface towards one of said pairs of said target posts, each of said playing rings of a known height equal to at least two times its known width, having an continuous inner wall surface, each pair of said target posts comprised of spaced parallel post elements, said post elements are spaced in relation to one another a distance equal to twice the transverse width of said playing ring, a finger opening defined in said continuous inner wall surface and extending outwardly therethrough of each of said playing rings, and means for gripping said rings through said finger openings.

5,199,709

printing means at the playing area, storing data of a series of

and second-shaped members to rotate relative to each other;

housing that when said headgear is worn by a golfer and

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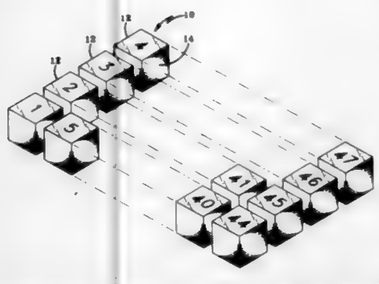
5,199,709

DICE AND METHOD FOR SELECTING LOTTERY NUMBERS

Raymond J. Lumpp, Jr., and Mary F. Lumpp, both of 1420 Grove St., NE., North Canton, Ohio 44721

Filed Feb. 3, 1992, Ser. No. 829,763
Int. Cl.[5] A63F 9/04
U.S. Cl. 273—146 13 Claims



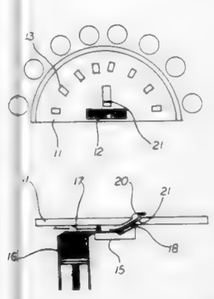
1. Apparatus for randomly selecting a predetermined set of numbers from a larger sequence of integers comprising:
- a multiplicity of dice equal in number to said predetermined sequence;
- each of said die having a plurality of exterior surfaces;
- each of said die being symmetrical from one exterior surface to the next permitting the die when rolled on a flat surface, to have an equal opportunity to rest on any of said exterior surfaces;
- one of said exterior surfaces of each of said die having an integer transcribed thereon; and
- at least some portion of each of said dice having one of a preselected multiplicity of colors thereon, each color in said multiplicity of colors being associated with a subset of integers such that each subset is generated by reviewing the number of times each integer was chosen in the previous years lottery, with the numbers appearing most often having a first color, numbers appearing next most often having a second color, until finally the number appearing least often is assigned a color.

5,199,710

METHOD AND APPARATUS FOR SUPPLYING PLAYING CARDS AT RANDOM TO THE CASINO TABLE

Stewart Lamle, 3 Fordham Hill Oval, Suite 15F, New York, N.Y. 10468

Filed Dec. 27, 1991, Ser. No. 816,300
Int. Cl.[5] A63F 1/14
U.S. Cl. 273—149 R 13 Claims



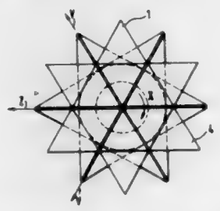
1. A method of supplying playing cards into play at a playing area while a card game is in progress for immediate use by players during said card game comprising the steps of providing a store of playing card stock and a playing card stock printing means at the playing area, storing data of a series of possible playing card values in a memory, successively generating signals representing indicia designating respective single, individual playing card values randomly drawn from the series of stored playing card values while the game is in progress; and feeding the signals successively to the printing means whenever playing cards are required for immediate use by players according to the rules of the game, operating the printing means to print stock forming successive single, individual leading playing cards with a respective indicia corresponding with the signals received and immediately delivering the single, individual printed leading playing cards successively, one-by-one into play at the playing area while the game is in progress.

5,199,711

THREE-DIMENSIONAL LOGICAL TOY

Zoltan Pataki, MSZMP Udulo, H-8171 Balatonaliga; Geza Csomos, Heimhuder Strasse 46, D-2000 Hamburg 13, and Janos Feher, Szentkiratyi u. 46, H-1088 Budapest, all of Hungary

PCT No. PCT/HU90/00034, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991, PCT Pub. No. WO90/14140, PCT Pub. Date Nov. 29, 1990
PCT Filed May 17, 1990, Ser. No. 646,751
Claims priority, application Hungary, May 17, 1989, 2441/89
Int. Cl.[5] A63F 9/08
U.S. Cl. 273—153 S 4 Claims



1. A three-dimensional logical toy comprising:
- three first-shaped members, each first-shaped member including a first portion having a pair of substantially equilateral-triangle shaped surfaces and a second portion having a pair of substantially swallowtail-like shaped surfaces, one swallowtail-like shaped surface extending from each equilateral-triangle shaped surface, each first-shaped member further including a pair of planar surfaces abutting the equilateral-triangle shaped surfaces and the swallowtail-like shaped surfaces, each of the planar surfaces and the equilateral-triangle shaped surfaces having an arcuate locking projection extending therefrom;
- three second-shaped members, each second-shaped member including a first portion having a pair of substantially equilateral-triangle shaped surfaces and a second portion having a pair of substantially swallowtail-like shaped surfaces, one swallowtail-like shaped surface extending from each equilateral-triangle shaped surface, each second-shaped member further including a pair of planar surfaces abutting the equilateral-triangle shaped surfaces and the swallowtail-like shaped surfaces, each of the planar surfaces having an arcuate locking groove extending thereinto, each of the equilateral-triangle shaped surfaces having an arcuate locking projection extending therefrom, the pair of planar surfaces of each second-shaped member abutting planar surfaces of a pair of first-shaped members with the arcuate projections on the planar surfaces of the first-shaped members within the arcuate locking grooves on the abutting planar surfaces of the abutting second-shaped members to interlock the first-shaped members and the second-shaped members into an intermediate layer of members while permitting the first-shaped members

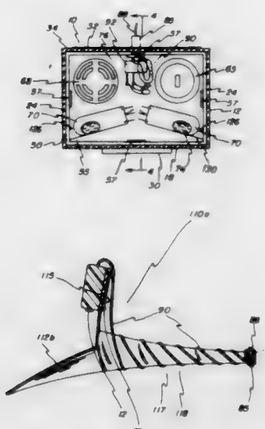
and second-shaped members to rotate relative to each other;
- a first set of six third-shaped members, each third-shaped member shaped like a prism with a base portion shaped like an equilateral triangle and a second portion shaped like an isosceles triangle, with the base portion having a locking projection extending therefrom, the base portion of each member of the first set of third-shaped members abutting an equilateral-triangle shaped surface of one of the first-shaped members and the second shaped members with the locking projection of each member of the first set of third-shaped members cooperating with the locking projection on the abutting equilateral-triangle shaped surface of the abutting first-shaped and second-shaped members to interlock the first set of third shaped members with the first-shaped and second-shaped members into a top layer while permitting the first set of third-shaped members to rotate relative to the abutting first-shaped and second-shaped members; and
- a second set of six third-shaped members, the base portion of each member of the second set of third-shaped members abutting an equilateral-triangle shaped surface of one of the first-shaped members and the second shaped members with the locking projection of each member of the second set of third-shaped members cooperating with the locking projection on the abutting equilateral-triangle shaped surface of the abutting first-shaped member to interlock the second set of third-shaped members with the first-shaped and second-shaped members into a bottom layer while permitting the second set of third-shaped members to rotate relative to the abutting first-shaped and second-shaped members, to form the three-dimensional toy.

5,199,712

GOLF SWING TRAINING APPARATUS

Fred L. Hoyle, Jr., 9836 Meadow Wood Dr., Pickerington, Ohio 43147; Richard W. Holstein, 1845 Progress Ave., Columbus, Ohio 43207, and Patrick S. Phillips, 495 S. Third St., Columbus, Ohio 43215

Filed Feb. 19, 1992, Ser. No. 839,477
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—187.2 7 Claims



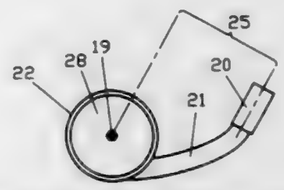
1. A golf swing training apparatus for use in practicing proper head movement comprising in combination,
- headgear having a visor, and
- a housing, said housing having a closed top and a bottom, said housing having a clip member extending therefrom, said clip secured to said headgear, a circuit board, a buzzer, a battery, an on-off switch, and a pair of mercury switches, said mercury switches being so oriented in said housing that when said headgear is worn by a golfer and undesirable head tilt occurs during a golf swing, the mercury slides within one or the other of said switches and makes contact with the switch electrodes thereby closing the circuit and activating said buzzer.

5,199,713

GOLF SWING TRAINING DEVICE

Frank Kinoshita, P.O. Box 3164, Rancho Santa Fe, Calif. 92067

Filed Feb. 20, 1992, Ser. No. 839,331
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—193 A 6 Claims



1. A golf swing training device comprising a standard grip, a straight shaft, and a training device head, having a weight limitation of not more than 19 ounces;
- said standard grip being adhesively attached to said straight shaft;
- said straight shaft being attached to said training device head;
- said training device head weight being in the range of 8.0 to 14.0 ounces, being shaped to define a mass section, a hosel, and an interconnect joining the mass section to the hosel;
- said mass section having a weight of at least 5.0 ounces;
- said mass section having a front surface area of at least 2.0 square inches;
- said mass section having center of gravity located at least 2.5 inches from the longitudinal axis of said straight shaft;
- said mass section center of gravity location affording a high axial moment of inertia training device defined by having a torque limitation of not less than 17.5 in-oz about said longitudinal axis when said mass section has a weight of 7.0 ounces;
- said torque limitation being adjusted by the dimensionless multiplying factor obtained by dividing the actual weight of said weighted mass section in ounces by 7.0 ounces;
- said hosel being that portion of said training device head that is designed to interfit with said straight shaft;
- said interconnect being a structural connection rigidly connecting said mass section to said hosel; and wherein
- said interconnect and said hosel have a combined weight limitation of not more than 3.0 ounces.

5,199,714

METHOD OF PLAYING A WORD SOLITAIRE CARD GAME

Dorothy D. Harper, 110 N. Holmes, Kirkwood, Mo. 63122

Filed Apr. 22, 1991, Ser. No. 637,333
Int. Cl.[5] A63F 1/00
U.S. Cl. 273—299 1 Claim

1. A method of playing a word forming solitaire-type card game comprising the step of:
- a) providing a deck of fifty-two cards, said deck having fifty cards each, having only one letter of the alphabet on its obverse side, wherein said fifty cards represent all the letters of the alphabet, and two blank cards each having no indicia on its obverse side, said blank cards representing any letter of the alphabet, the reverse side of all fifty-two cards being identical;
- b) arranging a row of seven separate stacks on a flat surface

by dealing the top card of the deck face up to form a first

cord and a second end connected to said body where said

5,199,717

radially inwardly therefrom into self-biased rotary sealing

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by dealing the top card of the deck face up to form a first stack, dealing one card face down and a second card face up on top of the face down card to form a second stack, dealing two cards face down and a third card face up on top of the two face down cards to form a third stack, continuing this process until seven stacks are formed comprising twenty-eight cards, each stack having a face up card at the top, setting aside the remaining cards in a face down pile;

c) attempting to form at least one word or the first portion of at least one word using said face up cards;

d) moving said face up cards and placing said face up cards in correct spelling order below the face up card or cards having the letter or letters starting said at least one word or said first portion of said at least one word, if no complete word is formed, continuing to step (f);

e) if said at least one word is completely formed, removing to one side said face up cards spelling said at least one word;

f) turning face up the top card of the stacks having no face up cards, and if a stack is vacant of cards, moving an extra

card from any stack and placing said card face up in said previously vacant stack wherein each of said seven stacks have a face up card; if there is no extra card in any of the other stacks to fill a vacant stack, taking a card from the face down pile to fill said vacant stack, if at least one word can be formed using said face up card, repeating steps (d) and (e);

g) when said stack can no longer form a word, taking three cards at one time from said face down pile to form a mini stack, if the top card of said mini stack can be used toward forming a word in one of said seven stacks, playing said card on said stack, if the second card of said mini stack can be used toward forming a word, playing said second card on said stack, continue playing the third card of said mini stack if it can be used toward forming a word, then continue taking three cards from said face down pile to form another mini stack, whenever a top card of a mini stack cannot be used to form a word, return return the mini stack to the face down pile and take another three cards;

h) continuing play until either all the cards are used in words or the top cards in the mini stacks cannot yield words.

5,199,715

GAME DEVICE FOR CATCHING A BALL ON A TARGET

Richard A. May, 1800 Sunrise Way, Palm Springs, Calif. 92264

Filed Mar. 23, 1992, Ser. No. 856,344

Int. Cl.[5] **A63B** *67/10*

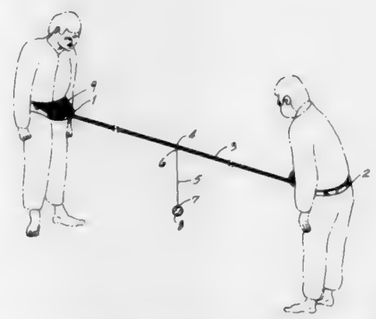
U.S. Cl. 273—331 **10 Claims**

1. A game apparatus played by a pair of players for catching a body on a target comprising:

(a) a pair of frames each having a target surface where said target surface carries and is covered at least in part by a hook and loop fabric;

(b) an elastic cord interconnecting frames;

(c) a flexible string having a first end carried by said elastic cord and a second end connected to said body where said body has a surface substantially covered by a hook and loop fabric such that said body is separably adherent to said hook and loop fabric carried by said target surface; and



(d) belt means carried by each said frame for attaching said frame to said player whereby each player by his movements influences the motion and location of said body for catching said body on the respective target surface carried by said player.

5,199,716

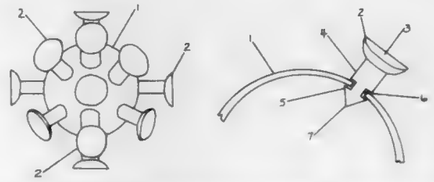
SUCTION BALL

David DeFluiter, and Darren Defluiter, both of 169 W. Alessandro, San Clemente, Calif. 92672

Filed Aug. 19, 1991, Ser. No. 746,948

Int. Cl.[5] **A63B** *43/00*

U.S. Cl. 273—344 **1 Claim**



1. A device for throwing and adhering to a surface comprising:

a. a sphere which is hollow and formed from two half spheres connected together which is approximately 1½ inches in diameter;

b. the sphere has 18 to 24 apertures defined therein with each aperture spaced equidistant from adjacent apertures spaced around the sphere surface;

c. wherein 18 to 24 round suction cups comprised of a cup, a pedestal and a connector are inserted and retained in the apertures; and

d. the suction cup is approximately ¾ inches long with the cup ¾ inches in diameter, the pedestal is approximately ¼ inch long and smaller in diameter than the cup, and the connector is approximately ¼ inch long having an end tapered to a point and a section smaller in diameter than the pedestal.

5,199,717

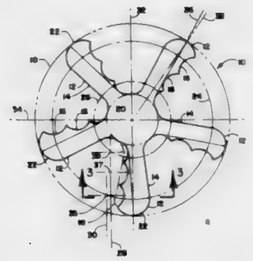
LIGHT WEIGHT BOOMERANG TOY HAVING IMPROVED FLIGHT AND RETURN CHARACTERISTICS

Harold C. Wimmer, Vista, Calif., assignor to John C. Jensen, Vista, Calif., a part interest

Filed Aug. 5, 1992, Ser. No. 926,160

Int. Cl.[5] **A63B** *65/08*

U.S. Cl. 273—426 **21 Claims**



1. A light weight and safe boomerang toy having improved flight and return characteristics which comprises:

a generally planar, circular, hub portion;

from 3 to 6 substantially uniformly spaced blades extending outwardly from said hub and substantially coplanar therewith;

each of said blades having a continuous, uniformly shaped, leading edge;

each of said blades having a trailing edge having three contiguous inwardly directed scallops extending over substantially the entire trailing edge;

each of said blades and said hub being substantially coplanar;

each of said blades and said hub having a substantially uniform thickness, except that the trailing portion of each blade decreases substantially in thickness from a reference line near the blade centerline to the trailing edge; and

said reference line angled from the center of the blade tip toward the blade trailing edge.

5,199,718

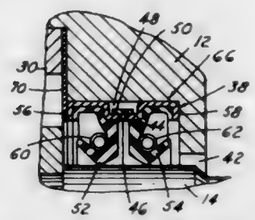
ROTARY MACHINE SHAFT SEAL

Albin J. Niemiec, Sterling Heights, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Apr. 13, 1992, Ser. No. 867,388

Int. Cl.[5] **F16J** *15/32*

U.S. Cl. 277—29 **17 Claims**



1. In a rotary machine that includes a housing, a shaft carried for rotation and extending from said housing and a shaft seal carried by said housing in sealing engagement with said shaft to prevent leakage of fluid along said shaft, the improvement wherein said shaft seal comprises:

an annular shell of rigid construction adapted for mounting on said housing surrounding said shaft and spaced radially therefrom,

annular sealing means carried within said shell and extending radially inwardly therefrom into self-biased rotary sealing engagement with said shaft, and

pressure relief valve means that includes at least one opening that extends radially through said shell adjacent to but spaced from said sealing means, and a resilient band surrounding said shell externally of said shell and overlying said opening such that fluid pressure within said shell through said opening urges said band away from said opening.

5,199,719

SEALING ARRANGEMENT

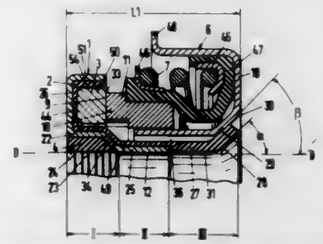
Richard W. Heinrich, Heilbronn; Klaus-Jürgen Uhrner, Leingarten, and Gunther Eggensperger, Heilbronn, all of Fed. Rep. of Germany, assignors to KACO GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 571,268

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927589

Int. Cl.[5] **F16J** *15/38*

U.S. Cl. 277—40 **23 Claims**



1. In a sealing arrangement, including a slide ring seal means, and a counter ring that is accommodated in a holder means that is provided with a presser sleeve via which in an installed state said sealing arrangement is seated with a press fit on a component that is to be sealed, the improvement wherein:

three zones are provided that are disposed one after the other in an axial direction and in an installed state are disposed about said component that is to be sealed such that said component that is to be sealed extends through all three zones of said sealing arrangement, said zones including, successively, a sealing zone made of elastic material, at tight fit zone formed by said presser sleeve, and a holding zone, with at least said sealing zone and said tight fit zone being made of different materials, with said sealing zone and said presser sleeve being seated on said component that is be sealed, with said sealing zone and said holding zone being made of material that has a higher elasticity than does said presser sleeve, and with said holding zone holding the individual components of said sealing arrangement together in an axial direction.

5,199,720

SPLIT MECHANICAL FACE SEAL

Jon J. Radosav, Des Plaines; Thomas A. Evans, Schaumburg; David M. Dudek, Palatine; Russell G. Wieser, Vernon Hills; Brian J. Atwater, Chicago, and Robert J. Eisbrenner, Glenview, all of Ill., assignors to John Crane, Inc., Morton Grove, Ill.

Continuation of Ser. No. 529,208, May 25, 1990, Pat. No. 5,114,163. This application Dec. 10, 1991, Ser. No. 805,470

The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.[5] **F16J** *15/38*

U.S. Cl. 277—81 S **30 Claims**

1. A split mechanical face seal for providing fluid-tight sealing between a housing and a shaft adapted to rotate relative thereto, said split seal comprising:

having at least one cylinder bore and at least one liquid hole

for securing including a clamp rail mounted on said

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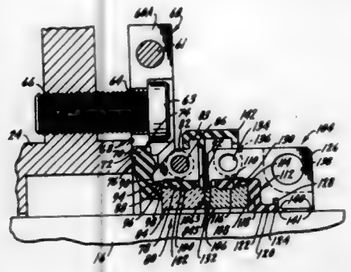
adjacent, rigid, annular, primary and mating rings formed of a plurality of arcuate ring segments, each defining generally radial, opposed sealing faces;

means for joining and retaining the ring segments of each of said rings in rigid connection with the other segments of each ring, whereby each said opposed sealing face defined by said rings has a smooth surface devoid of discontinuities around its complete circumference, said joining and retaining means further comprising:

a resilient split means for said primary ring and a resilient split means for said mating ring, each said resilient split means positioning and supporting its associated ring in a generally coaxial relationship with the shaft and with the other ring, so that the sealing face of each said ring is in opposite and facing relationship to the sealing face



of the other said ring, said resilient split means for said primary ring rigidly supporting said primary ring from axial and radial movement, said resilient split ring for said mating ring nonrigidly supporting said mating ring and biasing said mating ring in an axial direction against said primary ring; and

a split holder means for said mating ring and a split holder means for said primary ring each circumferentially connecting said respective resilient split means to its associated ring in a substantially concentric relationship, each said split holder means comprising a pair of semicircular holder members releasably attachable to each other and when in an attached condition, sealingly engaging and compressing to a limited degree at least a portion of said respective resilient split means upon its associated segmented ring.

5,199,721

CRANKSHAFT SEAL FOR AN INTERNAL COMBUSTION ENGINE

Wolfgang Schmitt, Viernheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Feb. 21, 1992, Ser. No. 839,794

Claims priority, application Fed. Rep. of Germany, May 16, 1991, 4115922

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—181 **7 Claims**

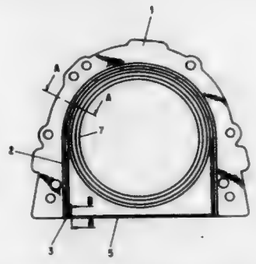
1. Crankshaft seal assembly for an internal combustion engine having a block and a crankshaft, said assembly comprising

a die cast carrier having an aperture for receiving said crankshaft axially therethrough and an axially open recess about said aperture,

a support piece formed of sheet metal and having an aperture for receiving said crankshaft therethrough and a flange extending radially outward from said aperture in said piece, said flange being received in said recess in said carrier,

a ring of polymeric material fixed to said support piece about said aperture in said piece, thereby providing sealing means for said crankshaft, and

a seal fixed to said flange of said support piece opposite said carrier and having at least one axially projecting sealing lip which provides sealing means for said engine block,



said seal being non-integral with said ring of polymeric material.

5,199,722

SEAL ASSEMBLY FOR STIRLING ENGINE

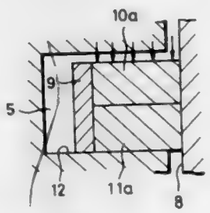
Yoshiaki Wada; Tunesaku Itaba; Koichiro Kasahara, all of Kashiwazaki; Yutaka Momose, Anjyo; Tetsumi Watanabe, Okazaki, and Hiroyuki Katsuda, Okazaki, all of Japan, assignors to Kabushiki Kaisha Riken, Tokyo and Aisin Seiki Kabushiki Kaisha, Kariya, both of Japan

Filed Jul. 3, 1991, Ser. No. 725,680

Claims priority, application Japan, Aug. 10, 1990, 2-210176

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—138 **4 Claims**



1. A sliding seal assembly for use with an annular sliding surface that frictionally contacts said surface and slides relative to it, said assembly comprising, in combination:

a seal ring body having an inner circumferential surface and an outer circumferential surface in sliding contact with said sliding surface, said body consisting of a matrix of polytetrafluoroethylene resin filled with from 10 to 20% by weight of carbon fibers having a length of from 100–700 μm and a diameter of from 10–20 μm and from 5 to 15% by weight of at least one powder having a particle diameter of from 1–30 μm selected from the group consisting of carbon powder, boron nitride powder and molybdenum disulfide powder; and

an expander ring in abutting contact with the inner circumferential surface of said seal ring body for urging said seal ring body against said sliding surface.

5,199,723

STEEL LAMINATE GASKET WITH SEAL PROTECTING MEMBER

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 611,703, Nov. 13, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 866,121

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—235 B **14 Claims**

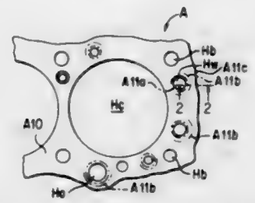
1. A steel laminate gasket for an internal combustion engine having at least one cylinder bore and at least one liquid hole arranged near the cylinder bore, comprising,

a plurality of metal plates for constituting the steel laminate gasket, each plate having a gasket edge portion, at least one first hole corresponding to the cylinder bore and at least one second hole corresponding to the liquid hole of the engine, said second hole being located between the first hole and the gasket edge portion,

first sealing means for sealing around the cylinder bore of the engine,

second sealing means for sealing around the liquid hole of the engine, said second sealing means being formed of a bead integrally formed on one of the plates for constituting the metal laminate gasket and entirely surrounding the liquid hole, and

means for partly supporting the second sealing means situ-



ated between the gasket edge portion and a part of the second sealing means facing the gasket edge portion without extending along the entire gasket edge portion, said supporting means being formed of a bead and integrally formed on one of the plates without substantially facing the first sealing means so that the second sealing means does not substantially directly face the gasket edge portion, said supporting means being located adjacent the second sealing means and spaced apart from both the second sealing means and the gasket edge portion so that when the gasket is tightened, the supporting means receives a part of tightening pressure applied to the second sealing means at a side of the gasket edge portion, said bead for the supporting means providing surface pressure at least equal to surface pressure of the second sealing means when the gasket is tightened to protect the second sealing means.

5,199,724

MATCHING SEAL ELEMENT FOR CLOSING AN OPENING IN A CABLE FITTING OR PIPE LINE

Hans-Juergen Meltsch, Schwerte, and Wolf Kluwe, Hagen, both of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Jan. 24, 1991, Ser. No. 645,495

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1990, 4004009

Int. Cl.[5] F16J *15/00;* **B65D** *59/06*

U.S. Cl. 277—237 R **24 Claims**

1. A matching seal element for closing an opening, comprising:

a cylindrical closed terminal wall formed of interconnected seal rings, said seal rings being interconnected at one side of said terminal wall;

a cylindrically shaped part firmly integrated to said terminal wall so that said terminal wall closes one side of said cylindrically shaped part, said cylindrically shaped part defining a radial slot along a generated line and along said terminal wall, said cylindrically shaped part having an open end including a seal forming element, and

clamp means for closing said radial slot, said clamp means comprising:

raised beads extending along both sides of said radial slot, and

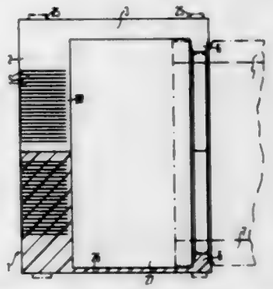
means for securing said raised beads together, said means for securing including a clamp rail mounted on said raised beads to hold said raised beads in abutment;

a receptacle means for fitting into an introduction opening, said receptacle being fastenable to said seal forming element, said receptacle means comprising:

a spreadable dowel-like element,

a seal arranged between said dowel-like element and a wall of said introduction opening, and

means for affixing to said seal forming element of said cylindrically shaped part on an end of said dowel-like



element that projects outwardly from said introduction opening;

a sealant between said receptacle means and said introduction opening for sealing;

a spreader wedge mounted in said dowel-like element to spread said dowel-like element in said introduction opening, said spreader wedge being of a wedge shape in a longitudinal direction,

means for forming a spreader channel of said dowel-like element in which said spreader wedge is inserted.

5,199,725

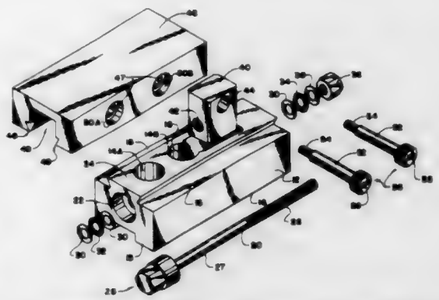
ADJUSTABLE TOP JAW

James R. Jaggers, 3532 SW. 14 St., Fort Lauderdale, Fla. 33311

Filed Jan. 7, 1991, Ser. No. 637,692

Int. Cl.[5] B23B *31/16*

U.S. Cl. 279—123 **16 Claims**



1. An adjustable top jaw, which top jaw is attachable to a master jaw which is in turn attached to a chuck of a lathe or similar machine along a radial extending from the center of said chuck, said top jaw comprising:

(a) a base segment having a base mountable on said master jaw, said base segment aligned with a radial directed outward from the center of said chuck, said base segment having:

(1) a lead screw aperture extending entirely through said base segment, said lead screw aperture aligned with said radial;

recesses formed in the top and bottom surface of said axle,

5,199,729

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(2) a drive block slot extending downward from the top of said base segment into said base segment, said drive block slot extending into said base segment a distance below said lead screw aperture;

(b) means for removably mounting said base segment to said master jaw;

(c) a drive block located within said drive block slot, said drive block having a first aperture extending therethrough colinearly with said lead screw aperture, said first aperture being threaded, said drive block extending upward from said drive block slot above said base segment, said drive block having a second aperture, said second aperture extending through said drive block above and perpendicular to said first aperture;

(d) a lead screw having a threaded end, said threaded end having threads corresponding to said threads of said first aperture of said drive block, said lead screw located within said lead screw aperture, said threaded end of said lead screw threadingly extending through said first aperture of said drive block, said lead screw having a head opposite said threaded end, said lead screw rotatable about its longitudinal axis within said lead screw aperture, said lead screw constrained within said lead screw aperture by means for constraining said lead screw within said lead screw aperture;

(e) a top segment attachable to said base segment, said top segment having a drive block channel for receiving the part of said drive block extending upward from said drive block slot, said drive block channel having a width slightly larger than said drive block and a length somewhat longer than said drive block whereby, when said top segment is mounted on said base segment, said part of said drive block extending upward from said drive block slot is contained within said drive block channel;

(f) means for slidably attaching said top segment to said base segment; and,

(g) means for attaching said top segment to said drive block;

whereby the rotation of said lead screw causes said drive block to move forward or backward in said drive block slot according to the direction of rotation of said lead screw thereby moving said top segment forward and backward in accordance with the movement of said drive block due to the interaction of said means for attaching said top segment to said drive block thereby moving said top segment into clamping arrangement with a work piece.

5,199,726

FOOT ATTACHED ROLLERSKATE OR SIMILAR ARTICLE AND ASSEMBLY METHOD THEREFOR

William Willett, Orange, Calif., assignor to Mattel, Inc., El Segundo, Calif.

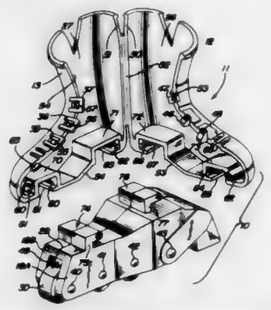
Filed Jan. 21, 1992, Ser. No. 823,398
Int. Cl.[5] A63C *1/04*
U.S. Cl. 280—11.27 **9 Claims**

1. A sports article to be received upon a wearer's foot comprising:

a shoe having upper and lower portions and formed by matable half portions joined by a vertically extending common hinge and movable between an open position and a closed mated position;

a weight bearing assembly attachable to said shoe and having a housing and surface contacting means attached to said housing weight support;

attachment means for releasably coupling said weight bearing assembly to said shoe including means located on the lower portion of each of said half portions for engaging means located on said housing when said half portions are in said closed position;



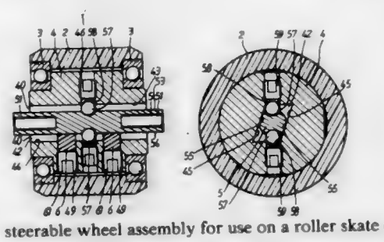
closure means on said half portions cooperating to secure said half portions in said closed mated position to captivate said weight bearing assembly and said wearer's foot.

5,199,727

STEERABLE WHEEL ASSEMBLY FOR A ROLLER SKATE

Kuo J. Lai, No. 30, Alley 9, Lane 25, Chin-Li St., Tou-Cheng Shiang, Taipei Shian, Taiwan

Filed Mar. 3, 1992, Ser. No. 845,154
Int. Cl.[5] A63C *1/24*
U.S. Cl. 280—11.28 **3 Claims**



1. A steerable wheel assembly for use on a roller skate comprising:

a) a hollow wheel, having first and second ends, including a bearing housing molded therein at both of said ends, with a reduced diameter compartment molded in between said bearing housings;

b) first and second roller bearings each of which is mounted in a respective one of said bearing housings;

c) a shaft received in said reduced diameter compartment of said hollow wheel, said shaft including a journal formed on each end thereof, each of said journals being inserted into a respective one of said roller bearings such that said hollow wheel may rotate relative to said shaft upon said first and second roller bearings, said shaft further including a passage, formed through the center line of the shaft, having an upper surface, a lower surface and two slanted surfaces, a first threaded hole tapped through a central portion of said shaft, substantially perpendicular to said passage which entirely penetrates the upper and lower surfaces of said passage and said shaft, and second and third threaded holes which extend through said shaft into said passage;

d) an axle received within said passage with each end of said axle protruding from said passage and including a threaded hole formed therein, said axle having four flat surfaces including top and bottom surfaces that are parallel to and positioned a predetermined distance from the upper and lower surfaces of said passage respectively, said axle further including centrally located, hemispherical

recesses formed in the top and bottom surface of said axle, the remaining two flat surfaces of said axle being flush with the two slanted surfaces of said passage with a predetermined clearance therebetween;

e) first and second ball bearings, each of bearings being positioned between one of said hemispherical recesses of said axle and said first threaded hole formed in said shaft with a set screw being installed into each end of said first threaded hole over a respective ball bearing in order to govern the pivoting movement of the axle;

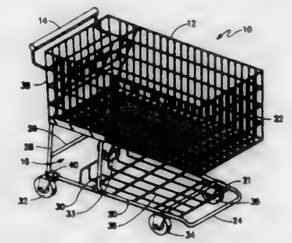
f) first and second cylindrical cushions, each of said cylindrical cushions being located in a respective one of said second and third threaded holes in said shaft between said axle and a respective set screw in order that the set screw may adjust the elasticity applied to the axle, wherein said axle may pivot on said first and second ball bearings upon an application of force to said axle during use of said steerable wheel assembly whereby the action of said axle causes said hollow wheel to cant so as to permit said wheel assembly to turn.

5,199,728

SPACER DEVICE FOR USE IN CONJUNCTION WITH SHOPPING CARTS

V. James Hutchison, 1949 S. Robb Way, Lakewood, Colo. 80228

Filed Apr. 3, 1991, Ser. No. 680,097
Int. Cl.[5] B62B *11/00*
U.S. Cl. 280—33.992 **18 Claims**



1. A spacer device adapted to be mounted on a shopping cart in order to prevent lateral binding when said shopping cart is nested with another said shopping cart wherein said shopping carts define a mated pair when in a nested state so that there is an inner cart and an outer cart, each of said shopping carts including a basket operative to receive goods for transport and a wheeled frame supporting said basket for movement along a support surface, said mated pair having frame portions that contact one another to position the inner and outer carts with respect to one another when in the nested state, said spacer device comprising:

a) a central body portion adapted to be secured alongside of said frame portion of a first one of said mated pair at a selected location so that said central body portion is interposed between said frame portion thereby preventing direct contact of said frame portions to one another, said central body portion having an exposed glide surface formed of a low friction material and oriented such that said frame portion of a second one of said mated pair slideably contacts the glide surface for lateral sliding movement therealong as said mated pair are moved into and out of the nested state; and

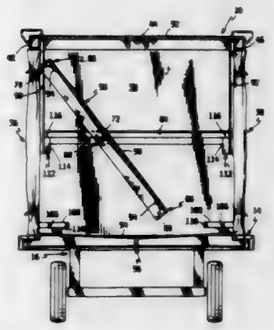
b) mounting means for securing and retaining said central body portion at the selected location whereby said glide surface of the central body portion prevents lateral binding when said mated pair are moved into and out of the nested state.

5,199,729

STOWABLE SHELF BAG CART

Sheldon H. Sievert, Alexandria; John H. Hoeper, and John V. Silver, both of Glenwood, all of Minn., assignors to Watkins Aircraft Support Products, Inc., Glenwood, Minn.

Filed Jul. 26, 1991, Ser. No. 736,524
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—47.35 **6 Claims**



1. An equipment transport cart comprising:

a wheeled chassis;

a frame having a base, a first end, a second end, a first side and a second side, said base mounted to and said frame extending upwardly from said wheeled chassis;

a shelf member having a first end, a second end, a first side and a second side, said first end of said shelf member mounted to said first end of said frame and said second end of said shelf member mounted to said second end of said frame, said shelf member being pivotably and slidably connected to said first and second ends of said frame along an axis approximately midway between its said first side and its said second side and extending from its said first end to its said second end, said shelf member being selectively pivotable between at least a first side wall position coincident with said first side of said frame and a shelf position;

latch means, whereby said shelf member may be releasably retained in said first side wall position, said shelf position or a second side wall position;

first, second, third and fourth upright corner members, said first end of said frame extending between said first and second upright corner members, said second end of said frame extending between said third and fourth upright corner members, said first side of said frame extending between said first and third upright corner members, and said second side of said frame extending between said second and fourth upright corner members;

first, second, third and fourth lateral brace members, said first lateral brace member extending between said first and second upright corner members, said second lateral brace member extending between said third and fourth upright corner members, said third lateral brace member extending between said first and third upright corner members, and said fourth lateral brace member extending between said second and fourth upright corner members;

first and second axial projections opposably extending from said axis of said shelf member, said first axial projection extending from said first end of said shelf member and said second axial projection extending from said second end of said shelf member;

first, second, third and fourth end projections, said first end projection extending from said first end of said shelf member adjacent said first side of said shelf member, said second end projection extending from said first end of said shelf member adjacent said second side of said shelf member, said third end projection extending from said second

end of said shelf member adjacent said first side of said

5,199,731

CHEF ASSEMBLY FOR VEHICLES

ing the relative positions between the trailer and bogie, said bogie having a pneumatic brake system, the improvement

lower cavity floor, the lower cavity floor positioned below the shaft cavity, and the shaft cavity including a

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end of said shelf member adjacent said first side of said shelf member, and said fourth end projection extending from said second end of said shelf member adjacent said second side of said shelf member;

first and second axial channel members, said first axial channel member extending between and fixedly attached to said first and second upright corner members of said frame and slidably engageable with said first axial projection of said shelf member, and said second axial channel member extending between and fixedly attached to said third and fourth upright corner members of said frame and slidably engageable with said second axial projection of said shelf member; and

first, second, third and fourth channel members, said first channel member integral with and extending along a portion of said first upright corner member of said frame and slidably engageable with said first end projection of said shelf member, said second channel member integral with and extending along a portion of said second upright corner member of said frame and slidably engageable with said second end projection of said shelf member, said third channel member integral with and extending along a portion of said third upright corner member of said frame and slidably engageable with said third end projection of said shelf member, and said fourth channel member integral with and extending along a portion of said fourth upright corner member of said frame and slidably engageable with said fourth end projection of said shelf member.

5,199,730

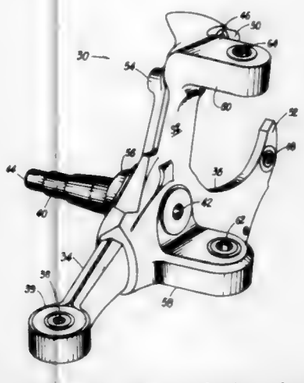
SPINDLE ASSEMBLY FOR EXTENDING THE TURNING ANGLE OF A MOTOR VEHICLE AND REDUCING TIRE WEAR

Rodney D. Westfall, 1920 Fairview Ave., Fruitland, Id. 83619, and Kevin C. Davis, 615 N. 6th St., Payette, Id. 83661

Filed Aug. 14, 1991, Ser. No. 744,926

Int. Cl.[5] **B62D** *7/18*

U.S. Cl. 280—96.1 **5 Claims**



5. In a steering knuckle of the type having a tie rod arm and a brake caliper mounting flange joined in the same plane to a main upstanding knuckle member and a spindle extending normal to one side of said plane, the improvement comprising in one-piece casting a pair of ball joint pivot arms extending from the opposite side of said plane and having vertically aligned bores therein each removed from said plane by an equal length R_E so that said spindle pivots about a pair of ball joints located on an axis at the centerline through said aligned bores.

5,199,731

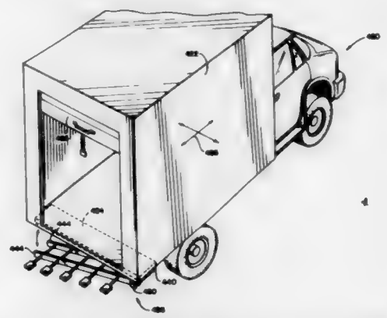
STEP ASSEMBLY FOR VEHICLES

Samuel K. Martin, United States Embassy, USAMRU P.O. Box 30137, Nairobi, Kenya

Continuation-in-part of Ser. No. 600,832, Oct. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 577,023, Sep. 4, 1990, Pat. No. 5,137,294. This application Nov. 26, 1991, Ser. No. 799,435

Int. Cl.[5] **B60R** *3/02*

U.S. Cl. 280—166 **8 Claims**



1. A step apparatus for a vehicle, the apparatus comprising:

mounting bracket means for attachment beneath the vehicle;

two step supporting members having proximal ends pivotally attached to the mounting bracket means and distal ends, the step supporting members having pivotal movement between a retracted position beneath the vehicle and an extended inclined position subjacent to the vehicle;

a plurality of rungs, each of the rungs having a rung axis and being supported by the two step supporting members, with a first end of each rung extending beyond a first of the step supporting members;

a step plate attached in cantilevered manner to the first end of each of the rungs whereby the first step supporting member is intermediate the step plate and the second step supporting member along the rung axis; and

transmission means for causing the distal ends of the step supporting members to contact a ground and thereby acquire the extended position.

5,199,732

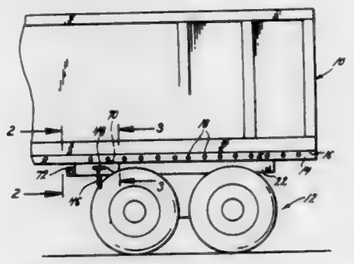
APPARATUS FOR UNLOCKING A BOGIE ON A TRACTOR-TRAILER RIG

Herbert D. Lands, Cahokia, and Phillip H. Clark, Smithton, both of Ill., assignors to Herbert Lands, Inc., Cahokia, Ill.

Filed Aug. 2, 1991, Ser. No. 739,691

Int. Cl.[5] **B62D** *53/06*

U.S. Cl. 280—407.1 **27 Claims**



1. In a mechanism for selectively connecting and disconnecting a truck trailer and a bogie supporting said trailer for adjusting the relative positions between the trailer and bogie, said bogie having a pneumatic brake system, the improvement comprising:

means for pneumatically connecting and disconnecting said trailer and said bogie; and

means for interfacing said pneumatic connecting and disconnecting means with said pneumatic brake system and for sensing the presence and absence of pneumatic pressure in said pneumatic brake system and for controlling said pneumatic connecting and disconnecting means in response to a sensed presence or absence of pneumatic brake pressure in said pneumatic brake system to thereby prevent said pneumatic connecting end disconnecting means from disconnecting said trailer from said bogie without said bogie pneumatic brake system being engaged.

5,199,733

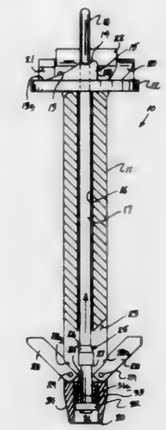
SAFETY HITCH PIN

Glen E. DeLorme, 4622 W. Crystal Ave., Bartonville, Ill. 61607

Filed Sep. 9, 1991, Ser. No. 756,518

Int. Cl.[5] **B60D** *1/02;* **F16B** *21/00*

U.S. Cl. 280—515 **6 Claims**



1. A safety hitch pin apparatus for reception within a trailer coupling, wherein the apparatus comprises,

a cylindrical shaft, the cylindrical shaft including a plate member fixedly and orthogonally mounted to an upper terminal end of the cylindrical shaft, and the cylindrical shaft including a central conduit channel directed through the cylindrical shaft, and

the cylindrical shaft including a lower terminal end, and

a lock rod slidably disposed within the cylindrical shaft and projecting through the cylindrical shaft lower terminal end, and

a shaft cavity formed within the cylindrical shaft spaced from the lower terminal end, and

lock means pivotally mounted within the shaft cavity for projection exteriorly and radially of the cylindrical shaft in a second position from a first position, with the lock means completely contained within the cylindrical shaft, and

actuator means mounted on the lock rod for effecting projecting of the lock means from the first position to the second position, and

the cylindrical shaft includes a cylindrical shaft lower cavity coaxially contained within the cylindrical shaft projecting interiorly from the lower terminal end, and the lock rod including a lock rod lower end plate, and the lower cavity including a lower cavity floor spaced from and parallel to the cylindrical shaft lower terminal end, and a spring captured between the lock rod lower end plate and the lower cavity floor, the lower cavity floor positioned below the shaft cavity, and the shaft cavity including a shaft cavity floor, and the actuator means including an actuator means bottom surface, with the bottom surface in abutment with the shaft cavity floor in the first position, and displaced from the shaft cavity floor in the second position.

5,199,734

SKI

Bernhard Mayr, Hard, Austria, assignor to Head Sportgeräte Gesellschaft m.b.H. & Co. OHG, Wuhrkopfweg, Austria

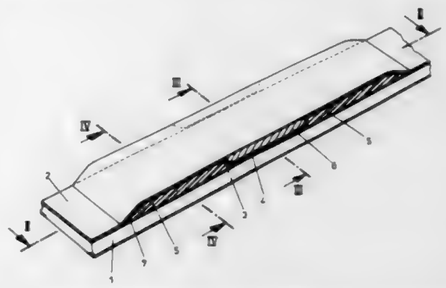
Filed Apr. 3, 1991, Ser. No. 680,145

Claims priority, application Austria, Apr. 5, 1990, 820/90; Sep. 17, 1990, 1888/90

The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.

Int. Cl.[5] **A63C** *5/07*

U.S. Cl. 280—602 **20 Claims**



1. A ski having front and rear ends, with a damping element to damp out shocks that act transversely to a longitudinal direction of the ski in an area adjacent that of a ski binding, comprising:

a carrier body;

at least one layer of damping material which is arranged between the carrier body and the ski, said damping material comprising an elastomer; and

said carrier body being bonded rigidly to an upper chord of the ski in a middle area which lies between front and rear ends of said carrier body in the longitudinal direction of the ski, said carrier body being connected in front of and behind said middle area to the surface of the ski through said damping material.

5,199,735

DEVICE FOR FASTENING FOOTGEAR TO A SPORTS IMPLEMENT

Valerio Tonel, Biadene, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Feb. 25, 1991, Ser. No. 660,089

Claims priority, application Italy, Mar. 6, 1990, 82533 A/90

Int. Cl.[5] **A63C** *9/18*

U.S. Cl. 280—615 **6 Claims**

1. A device for fastening an item of footgear to a sports implement which can slide with respect to the ground, comprising:

a tip element which is connectable to the sports implement

5,199,737

said gear means achieving a double gear reduction be-

attachment members by which a second end of said retainer

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a tip element which is connectable to the sports implement and which has at least one seat for accommodating at least a tip region of the item of footgear;

a band-like element having ends which are elastically connected to said tip element;

at least one transverse slot defined between said tip element and said band-like element, thereby said band-like element being elastically deformable with respect to said tip element for allowing an oscillation to the item of footgear with respect to the sports implement; and

at least one member for controlling the elastic deformation of said band-like element with respect to said tip element, said at least one member being positionally accommodated in said at least one slot.

5,199,736

SAFETY SKI BINDING HAVING A PIVOTABLE SOLE PLATE

Roland Jungkind, Bärenalpstrasse 3, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany

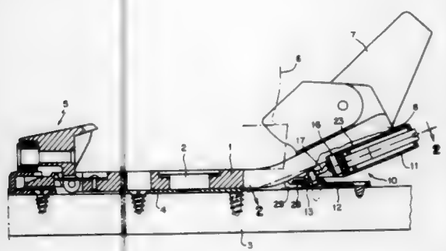
PCT No. PCT/DE91/00218, § 371 Date Dec. 4, 1991, § 102(e) Date Dec. 4, 1991, PCT Pub. No. WO91/15272, PCT Pub. Date Oct. 17, 1991

PCT Filed Mar. 12, 1991, Ser. No. 777,384

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 4010923

Int. Cl.[5] A63C *9/081*

U.S. Cl. 280—618 **4 Claims**



1. A safety ski binding comprising:

a sole plate having a front end and a rear end;

means for connecting the sole plate to a ski such that said sole plate is pivotable in a direction substantially parallel to the surface of the ski;

first and second pivot levers operatively associated with the rear end of said sole plate for holding said sole plate in a substantially central position, said pivot levers being pivotable between a holding position and a release position;

at least one abutment positioned proximate said pivot levers for supporting said pivot levers when said pivot levers are in said holding position;

a bridge member positioned adjacent said pivot levers; and

a spring positioned adjacent said bridge member such that said spring presses said bridge member against said pivot levers to urge said pivot levers to said holding position, and wherein said pivot levers are urged in opposite directions to bear against said abutment.

5,199,737

METHOD OF CONTROLLING A SEMI-ACTIVE CHASSIS

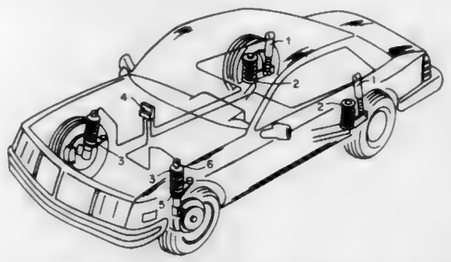
Zhen Huang, Wuppertal, Fed. Rep. of Germany, assignor to August Bilstein GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany

Filed Jan. 2, 1992, Ser. No. 816,183

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 4104398

Int. Cl.[5] B60G *17/08*

U.S. Cl. 280—707 **13 Claims**



1. Method of controlling a semi-active chassis of a vehicle with variable dashpots having controlled valves, a wheel mass and a body, comprising the steps of: measuring a difference between the speed of the wheel mass and that of the body; measuring acceleration of the body, and selectively speed of the body; forming input parameters from said measuring steps for controls generating a parameter for adjusting resilience of said dashpots; distinguishing between once-only roadway excitation and periodic roadway excitation when said controls detect a roadway excitation (X_E); generating an output parameter I_R by said controls in the event of a once-only excitation in accordance with either a skyhook principle or Huang's algorithm to construct a parameter for varying said resilience (D); detecting by said controls long-wave excitation in the event of periodic excitation such that a mathematical sign of body acceleration (a_a) does not change during a period (T_L) defining long-wave excitation, said controls detecting short-wave excitation wherein intervals (T) between signals hardening resilience are compared with half a period (T_K) defining short-wave excitation such that, when $T<T_K$, said controls will generate an output parameter that softens the resilience and, when long-wave excitation is detected, said controls will generate an output parameter that hardens the resilience; said controls generating an output parameter in accordance with an algorithm for once-only excitation in event of periodic excitation when neither short-wave nor long-wave excitation is detected.

5,199,738

LANDING GEAR FOR SEMITRAILERS

Ervin VanDenberg, North Canton, Ohio, assignor to Jost International of Grand Haven Michigan, Grand Haven, Mich.

Filed Apr. 16, 1991, Ser. No. 685,836

Int. Cl.[5] B60S *9/06*

U.S. Cl. 280—766.1 **20 Claims**

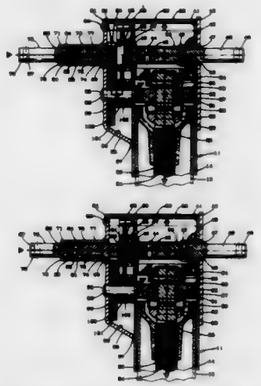
1. A two speed landing gear assembly for a semitrailer, comprising:

a) first and second upright telescopic legs mounted in a laterally spaced relationship generally adjacent to a front end of said semitrailer;

b) in-line laterally-oriented input and output shafts rotatably mounted on said first leg, said output shaft being operatively connected to an input shaft rotatably mounted on said second leg; and

c) gear means mounted on and generally adjacent to each of said shafts for operating said landing gear in a high gear and a low gear, said input shaft on said first leg being axially movable to allow for shifting between said gears,

said gear means achieving a double gear reduction between the input and output shafts when in low gear and providing for direct coupling of the input and output shafts when in high gear, so that upon shifting said gear



means of said first leg input and output shafts into low gear, a ratio of turns of said first leg input shaft to inches of vertical travel of said legs of from about 15 to about 50 is achieved, and upon shifting said first leg gear means into high gear, said ratio of from about 2 to about 5 is achieved.

5,199,739

AIR BAG COVER OPENING MECHANISM FOR USE IN VEHICLE

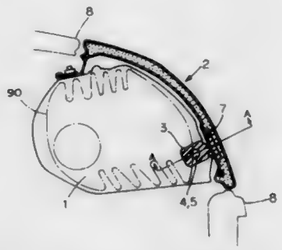
Kazuyuki Fujiwara, Okazaki; Shotaro Okamura, and Hiroaki Yamao, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 13, 1991, Ser. No. 744,447

Claims priority, application Japan, Sep. 5, 1990, 2-236510

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—732 **18 Claims**



1. An air bag cover opening mechanism for an air bag device for use in a vehicle, comprising:

an air bag secured to a vehicle body and adapted to accommodate an air bag in a folded state, said air bag case being provided with an opening;

an air bag cover for closing the opening of said air bag case;

a connecting member for pivotally connecting one end of said air bag cover to said air bag case about which said air bag cover pivots when opened; and

connecting means for connecting another end of said air bag cover to said air bag case in such a manner that only a tensile load acting in a direction of a path of opening of said air bag cover acts on said connecting means,

said connecting means comprises:

a retainer having an end secured to said air bag cover; and

attachment members by which a second end of said retainer is secured to said air bag case,

said attachment members comprise:

a spacer which is inserted into said retainer; and

a bolt for rotatably securing said retainer to said air bag case via said spacer such that said retainer can rotate about an axis of said spacer so that only a tensile load in the direction of opening of the air bag cover is applied to the retainer when the air bag cover opens.

5,199,740

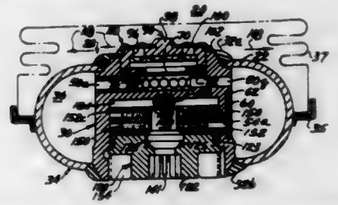
HYBRID INFLATOR FOR AIR BAG

Richard L. Frantom, Richmond; Klaus F. Ocker; Robert M. Kremer, both of Fraser; William E. Rogerson, Rochester Hills; William D. Gaw, Jr., Clawson, all of Mich.; Roy G. Brown, Hot Springs, Ark.; Teresa L. Bazel, Annadale, Va.; Donald W. Renfroe, Haymarket, Va.; Charles D. Woods, Gainesville, Va., and Robert J. Bishop, Washington, Mich., assignors to Bendix Atlantic Inflator Co., Sterling Heights, Mich.

Filed Jun. 10, 1991, Ser. No. 713,189

Int. Cl.[5] B60R *21/26*

U.S. Cl. 280—736 **8 Claims**



1. A device (**20**) for inflating an air bag (**37**) comprising:

a pressure vessel (**34**) formed by a vessel part (**22**) and a generator body assembly (**30**), the generator body assembly received within opposing openings (**24**, **26**) in the vessel part (**22**) and secured thereto to provide a gas tight seal (**28**),

the generator body assembly (**30**) includes:

a first bore (**38**) to receive a quantity of propellant (**150**) and initiator assembly means (**120**) to cause the propellant (**150**) to burn in response to a control signal indicative of a vehicle crash;

at least one radial passage (**54***a–c*, **54***d–f*) directed toward an internal wall of the pressure vessel (**34**) such that some of the products of combustion of the burning propellant will impinge thereon and plate thereto;

a first burst disk (**60**) sealing the at least one radial passage and pressure vessel, the first burst disk (**60**) opened by the products of combustion permitting same to flow into the pressure vessel (**34**) and heat gas stored therein;

a plurality of flow passages (**50**) communicating with the pressure vessel (**34**) to an outlet passage (**40**);

an outlet burst disk (**70**) disposed relative to exit ends of the flow passages and to the outlet passage (**40**) to provide a gas tight seal, the outlet burst disk ruptured as a result of at least increased gas pressure in the pressure vessel (**34**) resulting from heating due to the burning of the propellant.

5,199,741

METHOD OF ASSEMBLING AN INFLATOR

Timothy A. Swann; John P. O'Loughlin, both of Mesa, and Jerome W. Emery, Tempe, all of Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Dec. 18, 1990, Ser. No. 629,229

Int. Cl.[5] B60R *21/26*

U.S. Cl. 280—740 **29 Claims**

1. A method of assembling an inflator for inflating a vehicle occupant restraint, said method comprising the steps of:

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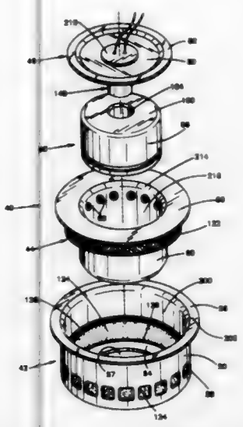
interconnecting (a) a diffuser having openings for conducting fluid flow away from the diffuser into the occupant restraint and (b) a combustion cup having openings for conducting fluid flow from a chamber in the combustion cup to a chamber in the diffuser;

thereafter, positioning a gas generating material for producing gas in a quantity sufficient to inflate fully the occupant restraint in the chamber in the combustion cup; and



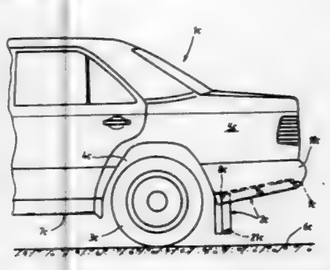
closing the chamber in the combustion cup by moving a closure member relative to the interconnected diffuser and combustion cup into a position at one end of the chamber in the combustion cup and welding the closure member to the interconnected combustion cup and diffuser with a single weld.

5,199,742

WHEEL COVER FOR CATCHING SPRAY WATER, DIRT OR THE LIKE

Hans Götz, Böblingen, and Klaus Müller, Nagold, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Mar. 19, 1992, Ser. No. 854,104
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1991, 4109129
Int. Cl.[5] B62B *9/16*
U.S. Cl. 280—851 **7 Claims**



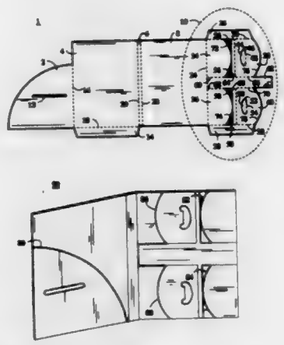
1. A wheel cover for catching spray water or dirt, which is pivotably suspended on a vehicle body and has an operating position located opposite to and at a distance from a tread periphery of an associated wheel and protrudes downwards relative to a level of a floor of said vehicle body, and which is pivotable up from the operating position into a non-operating position under the vehicle floor, wherein said wheel cover includes first and second preformed shells foldably connected together, said preformed shells forming a hollow body in said operating position when folded one upon the other, said first preformed shell facing towards the tread periphery and being penetrated by catchment pockets, said first preformed shell bounding, jointly with the second preformed shell, a drain channel, and wherein the preformed shells are movable upwardly into an unfolded non-operating position in which said preformed shells are located under the vehicle floor one behind the other in a longitudinal direction of the vehicle body.

5,199,743

DISK CARRIER

Alexander B. Rosinski, III, North Chelmsford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 10, 1992, Ser. No. 834,013
Int. Cl.[5] B42D *15/00*
U.S. Cl. 281—45 **18 Claims**



1. A folder for holding disks comprising:

a first panel,

a spine, hingedly joined to the first panel,

a second panel, hingedly joined to the spine, the hingedly joined spine being positioned between the first and second panels and allowing opening and closing of the folder,

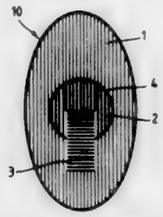
a disk panel positioned in overlaying relationship with the inner surface of the second panel, the perimeter region of the disk panel exclusive of the region facing the spine being bonded to the second panel, the perimeter region of the disk panel facing the spine being left unbonded, the disk panel further being bonded to the second panel along a first bonding strip extending from the unbonded perimeter region of the disk panel facing the spine in a direction away from the spine and along a second bonding strip extending across the disk panel in crossing relationship with the first bonding strip, the disk panel having a first cut line being immediately adjacent to the second bonding strip such that the second bonding strip is positioned between the first cut line and the spine, the first cut line extending between the first bonding strip and the bonded perimeter region of the disk panel, the disk panel having a second cut line being immediately adjacent to the second bonding strip, the second bonding strip being positioned between the second cut line and the spine, the second cut line extending between the first bonding strip and the bonded perimeter region of the disk panel, the first bonding strip being positioned between the first and the second cut lines, the cut lines, the unbonded perimeter regions of the disk panel, the bonded perimeter regions of the disk panel, and the bonded bonding strips being oriented to form four disk pockets between the second panel and the disk panel, the disk pockets being positioned in two rows of two for holding disks.

5,199,744

SECURITY DEVICE

Colin Shenton, Surrey, England, assignor to De La Rue plc, London, England

Continuation of Ser. No. 659,383, Mar. 18, 1991, abandoned. This application Jul. 24, 1992, Ser. No. 917,960
Claims priority, application United Kingdom, Sep. 9, 1988, 8821150
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—91 **25 Claims**



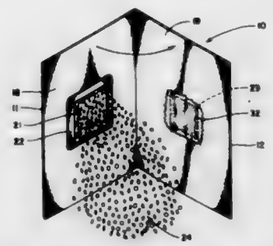
5. A substrate carrying a security device comprising in association at least one blind embossed transitory image, and a blind embossed non-transitory linear area which is visible when the device is examined from substantially all viewing angles.

5,199,745

CONFETTI SURPRISE GREETING CARD

Lawrence J. Balsamo, 539 Yosemite Ct., Roselle, Ill. 60172

Filed Apr. 6, 1992, Ser. No. 864,413
Int. Cl.[5] G09F *1/00*
U.S. Cl. 283—117 **9 Claims**



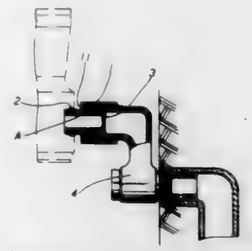
1. A greeting card, comprising: first and second interconnected leaves foldable into engagement with one another each having an outwardly facing side and an inwardly facing side, the inwardly facing side of one leaf of the leaves having a rupturable package of confetti mounted thereon, said package having a center and a giver activated adhesive on the inwardly facing side of the other leaf aligned with and engageable with the center of the confetti package on the other leaf, said adhesive being a water soluble adhesive so it may be activated by moistening and when the leaves are closed the moistened adhesive adheres to the confetti package so when opened by the receiver fractures the package and expels the confetti, whereby the need for protective layers on the adhesive is eliminated.

5,199,746

CONNECTOR STRUCTURE FOR MIXED TYPE OF FAUCET

Chin-Ding Pan, No. 7, Lane 155, Sec. 4 La Ho Road, La Kang Town, Changhua Hsien, Taiwan

Filed Nov. 27, 1991, Ser. No. 799,215
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—8 **3 Claims**



1. A connector structure for mixed type of faucet, comprising a hexagon nut, a spherical connector, an O-ring, a water sealing gasket and a Z-shaped connecting pipe, wherein said spherical connector has a spherical end and a pipe-shaped end and is formed with a central axial hole, said pipe-shaped end of said spherical connector being formed with outer threads, said axial hole of said spherical connector having a hexagonal cross-section, an annular groove being formed on a middle portion of said spherical connector whereby said O-ring can be fitted therein when assembled, wherein when said spherical connector is first extended through said hexagon nut, said spherical connector is screwed on a faucet seat and then said Z-shaped connecting pipe is screwed with a water pipe imbedded in a wall and then said hexagon nut is screwed with said Z-shaped connecting pipe, said hexagon nut having an inner flange at its one end, which forces said spherical connector toward said

Z-shaped connecting pipe, said water sealing gasket being disposed between said spherical connector and Z-shaped connecting pipe, a surface of said water sealing gasket, which contacts with said spherical connector, being spherically shaped correspondingly, whereby in case the water pipe is biased, said inner flange of said hexagon nut can closely move along the spherical surface of said spherical connector, permitting said spherical connector to be biased through an angle for suitably connecting with the water pipe.

5,199,747

CONNECTOR ASSEMBLY FOR DOUBLE WALLED TUBING

Willi E. Jahr, 22 Springdale St., Markham, Ontario, Canada L3P 2A9

Filed May 16, 1991, Ser. No. 701,040
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—47 **4 Claims**

1. A connector assembly for establishing connection between ends of lengths of double walled thermally insulated tubing having thin metallic inner and outer cylindrical walls and insulation therebetween, the assembly comprising:

first and second complementary interengageable coupling members, each coupling member comprising concentric spaced inner and outer cylindrical walls, and a connecting wall extending both radially and longitudinally between the inner and outer walls, the connecting wall of the first coupling member and the connecting wall of the second coupling member having complementary mating configurations for forming a lapped joint with the connecting walls abutting and the inner and outer walls of the coupling members respectively forming substantially continuous inner and outer surfaces;

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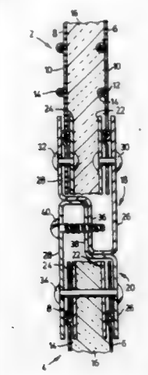
outer support rings associated with each coupling member and respectively of slightly different diameters from the diameters of the outer walls of the coupling members, the respective outer support rings and outer walls of the coupling members being dimensioned to receive between them the ends of the outer walls of a length of tubing to which the coupling member is applied;

plural outer fastening means passing through each of the outer wall of each coupling member, the outer wall of the associated length of tubing and the associated outer support ring to clamp the outer wall of the length of tubing to which the coupling member is applied between the outer wall of the coupling member and its associated outer support ring; and

inner fastening means securing the inner wall of at least one of the coupling members to the inner wall of the tubing;

the coupling members and support rings being of substantially thicker and more rigid metal than that of the inner and outer walls of the tubing to which the assembly is to be applied.



5,199,748

ROTARY COUPLING FOR TWO DIFFERENT FLUIDS

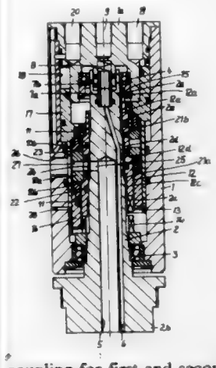
Liebhard Jung, Nesselwang, and Helmut Heel, Lengenwang, both of Fed. Rep. of Germany, assignors to Ott Maschinentechnik GmbH, Kempten, Fed. Rep. of Germany

Filed Jan. 14, 1992, Ser. No. 820,547

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1991, 4103376

Int. Cl.[5] F16L *39/04*

U.S. Cl. 285—136 **5 Claims**



1. In a rotary coupling for first and second different fluids comprising a fixed housing and a hollow shaft mounted rotatably but axially immovably therein, the shaft being provided with a central through-flow channel for the first fluid and at least one second through-flow channel parallel thereto for the second fluid, first and second separate supply channels provided in the housing for the first and second fluids, respectively, and first and second sliding ring sealing devices between the first and second supply channels, respectively, and the hollow shaft, arranged coaxially with an axis of rotation for the hollow shaft, through which first and second sealing devices the first and second fluids can be fed separately to the respective first and second through-flow channels, wherein the first sliding ring sealing device is arranged centrally between an inner end of the hollow shaft and a housing part with the first supply channel, while the second sliding ring sealing device surrounds the hollow shaft concentrically and comprises a sliding ring rotatable with the hollow shaft and provided with at least one radial through passage, as well as two sliding rings having spring means for causing the two sliding rings to bear constantly against to axially facing end faces of the sliding ring, said two sliding rings being stationary relative to the housing, and wherein the hollow shaft has at least one radial bore which connects one of the first and second through-flow channels with the rotary sliding ring, the improvement wherein the second sliding ring sealing device is axially movable relative to the housing and the hollow shaft, the rotatable sliding ring being fixed against relative rotation to an inner bush coaxially surrounding the hollow shaft, with coupling means being provided for effecting a coupling and an uncoupling of the inner bush and the rotatable shaft and a relative axial sliding movement of the inner bush with respect to the hollow shaft, the two sliding rings being arranged in an outer bush concentrically and axially slidably surrounding the inner bush, the outer bush having an annular piston sliding in a cylinder chamber in the housing, and wherein the hollow shaft has in the sliding region of the inner bush first, second and third sections reducing, respectively, in diameter stepwise towards the inner end, a radially inner wall of the inner bush having three sections correspondingly reducing stepwise in diameter, and wherein the inner bush has O-rings at one axial end of each of the second and third sections, which only bear in the coupled state of the inner bush on the second and third sections of the hollow shaft corresponding in diameter and seal between them an annular chamber which communicates with the radial bore through the hollow shaft, so that during dry machining, when no second fluid is to be supplied through the second sliding ring sealing device to the hollow shaft, the outer bush can be moved into a rest position uncoupled from the hollow shaft caused by an axial movement of the annular piston together with the second sliding ring sealing device and the inner bush, in which rest position the inner bush is uncoupled from the hollow shaft and the inner bush and the O-rings are free of contact with a radially outer surface of the hollow shaft.

5,199,749

METAL SADDLE CLAMP WITH LOOPED CABLE FASTENER

Daniel P. Corcoran, Grandville, Mich., assignor to Corcoran Industries Inc., Grandville, Mich.

Filed Sep. 8, 1992, Ser. No. 941,386

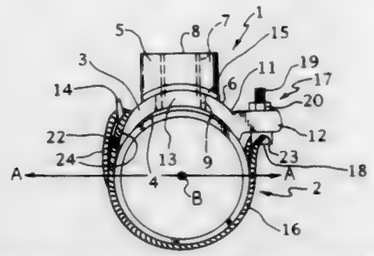
Int. Cl.[5] F16L *41/08*

U.S. Cl. 285—197 **6 Claims**

1. A pipe connector, said pipe connector in combination comprising a metal coupling and a fastening means, said metal coupling comprising

a circular unitary saddle-shaped member, said saddle-shaped member being dimensioned to at least partly surround a pipe to cover an aperture in the wall of said pipe wherein said saddle-shaped member has a long axis parallel to a line traversing across the pipe; said saddle-shaped member having an inner face which conforms substantially to the outside curvature of said pipe; an essentially rounded upper surface having surmounted thereon a circular housing, said housing having through its center, a central bore which extends through the saddle-shaped member and some distance below the line of curveture of the inner face; said bore being internally configured to accomodate a fastening means; said inner face, having an annular recessed area in its under side to house and retain a gasket, said recessed area being centrally disposed relative to the bore;

said saddle-shaped member having a lug integrally mounted on its upper outside surface, said lug being essentially horizontally aligned with the long axis of the saddle-shaped-member and having an aperture therethrough; said saddle-shaped member having integrally mounted on its upper outside surface opposite the lug, a vertical prong; said saddle-shaped member having mounted on the outside edge of it's upper surface two partial side rails, each



said rail being vertical with and parallel to the housing and being located between the lug and the prong thereof;

said fastening means comprising a cable and a bolt, said bolt having a head and a threaded shaft, the threaded shaft passing through the aperture of the lug and being surmounted by a threaded fastener; said cable being a cable without end and being attached to the head of said bolt such that there is formed two separate leads of the same cable which form a loop, wherein both of the leads pass under and around said pipe and loop over the prong such that when the threaded fastener is tightened down on the bolt, the cable is held in position by the prong, the bolt is pulled through the aperture of the lug whereupon the cable is pulled tightly against the outside surface of the pipe to couple the pipe coupling to the pipe.

5,199,750

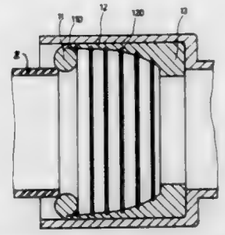
SNAKE TAIL RING SOCKET

Ming-Tung Yang, No. 4-3, Lane 97, Lung Chuan St., Taipei Hsien, Taiwan

Filed Apr. 21, 1992, Ser. No. 871,515

Int. Cl.[5] F16L *21/025*

U.S. Cl. 285—231 **3 Claims**



3. A seal ring socket sealingly positioned in said fitting connection and for accommodating an insertion pipe in said fitting connection, the insertion pipe having an inside diameter, a wall thickness and an outside diameter, the seal ring socket comprising: a front tip portion having a ball ring defining a pass hole having an inside diameter approximately equal to the inside diameter of the insertion pipe but smaller than the outside diameter of the insertion pipe such that insertion of the insertion pipe causes the ball ring to roll while the insertion pipe enters the seal ring socket, and; a socket neck portion defining a plurality of slots in an internal surface inside the ring socket so as to cause unbalanced stressing of internal and external surfaces of the ring socket such that the ball ring will curl inward to enlarge its volume to thereby sealingly engage the insertion pipe while being moved by the insertion pipe, wherein the plurality of slots in the internal surface of the socket neck have inclined side edges extending at an oblique angle of 22.5° outwardly from a center plane so as to form an included 45° angle, their depth being equal to approximately one half of the thinnest portion of socket neck so as to make the stress at the external surface of the ring socket larger than the stress at the internal surface as the ball ring is rolled inwardly.

5,199,751

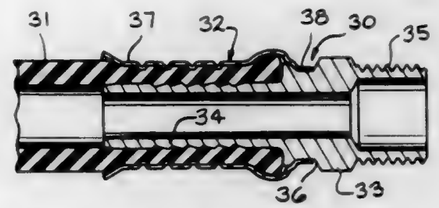
PRESSURE HOSE COUPLING COLLAR AND METHOD FOR PRODUCING SAME

Leo F. Beagle, Payne, and Richard I. Werner, Hicksville, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 13, 1990, Ser. No. 612,188

Int. Cl.[5] F16L *33/207*

U.S. Cl. 285—256 **8 Claims**



6. A hose coupling comprising:

a cylindrical sleeve, said sleeve having simultaneously a plurality of annular grooves formed in an outer surface thereof and a corresponding number of annular beads formed opposite said grooves on an inner surface thereof, each of said annular beads defining a generally annular flat surface portion, each of said annular flat surface portions defining a plurality of circumferentially spaced interruptions;

a nipple having a cylindrical portion;

means for securing said sleeve to said nipple such that said cylindrical portion of said nipple extends within said sleeve defining an annular space therebetween; and

a hollow cylindrical hose disposed in said annular space and secured to said sleeve and said nipple by crimping said sleeve about said hose and said cylindrical portion of said nipple so that said hose is at least clamped by said preformed annular beads and said cylindrical portion of said nipple.

5,199,752

HOSE CONSTRUCTION, COUPLING THEREFOR AND METHODS OF MAKING THE SAME

John D. Sanders, Springfield, Mo.; Homer N. Holden, Sylva, N.C., and Randy C. Foster, Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 693,109, Apr. 25, 1991, Pat. No. 5,129,686, which is a division of Ser. No. 408,161, Sep. 15, 1989, Pat. No. 5,037,143. This application Apr. 29, 1992, Ser. No. 875,865

The portion of the term of this patent subsequent to Jul. 14, 2008, has been disclaimed.

Int. Cl.[5] F16L *33/213*

U.S. Cl. 285—258 **20 Claims**

1. In a hose construction comprising a tubular hose having

an inner peripheral surface means and an outer peripheral

a key assembly for rotating said lever,

said collapsible element being formed of a resilient material

longitudinally extending slot, said longitudinally extend-

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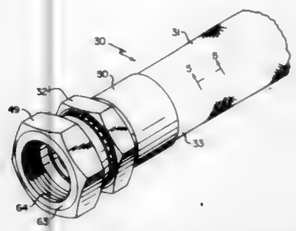
an inner peripheral surface means and an outer peripheral surface means, and a coupling secured to one end of said tubular hose, the improvement wherein said inner peripheral surface means of said tubular hose comprises an inner corrugated hose made of polymeric material and having inwardly convex projections with recesses therebetween and extending from said one end of said tubular hose to the other end thereof and wherein said coupling has an insert means disposed in said one end of said tubular hose and being radially outwardly expanded into sealing relation with said inner corrugated hose, said insert means having an outer peripheral surface means



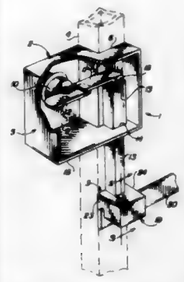
defined by a plurality of outwardly directed projections with recesses therebetween, said projections of said insert means being respectively received in said recesses of said inner hose and said projections of said inner hose being respectively received in said recesses of said insert means whereby the interior of said tubular hose is substantially sealed to the interior of said coupling, said projections of said insert means each having a transverse cross-sectional configuration of a certain length and said recesses of said insert means each having a transverse cross-sectional configuration of a predetermined length that is different than said certain length.

5,199,753

CHILD RESISTANT GATE LATCH

Arthur A. Presley, Jr., 5000 Interlachen, Baytown, Tex. 77521

Filed Jan. 22, 1992, Ser. No. 823,779
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—188 **12 Claims**



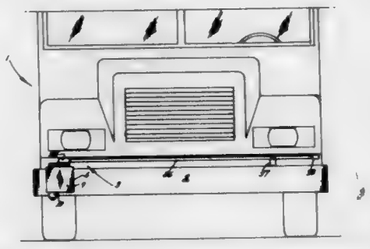
1. A child resistant latch for a gate and gate post comprising;
a latch operating assembly and a striker bar or keeper plate assembly, one of which is to be supported on said gate and the other of which is to be supported on said gate post,
a locking latch member supported for vertical movement into and out of latching engagement with said striker bar or keeper plate,
operating means interconnecting said latch operating assembly and said latch member for movement in a vertical direction,
said latch operating assembly including a lever operatively engageable with said operating means interconnecting said latch operating assembly and said latch member to open and close said latch member,
a key assembly for rotating said lever,
said latch operating assembly and said key assembly, in use, being supported a predetermined distance above said striker bar or keeper plate assembly to permit operation only by an adult or tall child, and
a guard enclosure surrounding said striker bar or keeper plate when said latch member is in latching position to prevent opening other than by said operating means.

5,199,754

SAFETY BARRIER FOR A SCHOOL BUS

Lowell J. D. Freeman, 26255 Highpass Rd., Junction City, Oreg. 97448

Filed Mar. 10, 1992, Ser. No. 848,745
Int. Cl.[5] B60R *21/14*
U.S. Cl. 293—117 **4 Claims**



1. A motor driven barrier assembly for attachment to a vehicle, said assembly comprising,
a base including a housing with means for attaching said base to said vehicle,
a reversible electric motor on said base,
switch means in circuit with said motor and an electrical source and operable to control motor operation,
an elongate barrier having a retracted position disposed transversely of the vehicle centerline and positionable to a deployed position projecting forwardly from the vehicle to prevent foot traffic crossing a street immediately forward of the vehicle, said barrier substantially coextensive with a vehicle bumper when in its retracted position,
pivot means swingable mounting said barrier on said base and
drive means coupling said motor to said pivot means to drive the barrier through an arc of approximately ninety degrees, spring means constituting a lost motion connection between said motor and said pivot means.

5,199,755

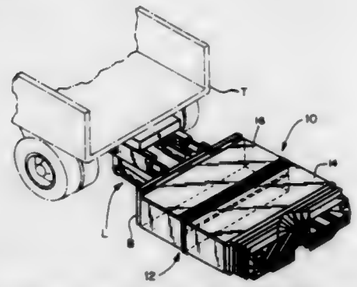
VEHICLE IMPACT ATTENUATING DEVICE

David C. Gertz, Citrus Heights, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 679,919, Apr. 3, 1991, abandoned. This application Jan. 24, 1992, Ser. No. 825,301
Int. Cl.[5] B60R *19/04*
U.S. Cl. 293—120 **18 Claims**

1. An impact attenuating device comprising:
a deformable energy absorbing element;
a mounting arrangement coupled to the energy absorbing element and configured to mount the energy absorbing element on a vehicle; and
a collapsible element mounted to an end of the energy absorbing element to extend away from the mounting arrangement;
said collapsible element having a foldable configuration which defines an end portion spaced from the energy absorbing element such that the end portion is movable toward the energy absorbing element by a selected amount in an impact without damaging the deformable energy absorbing element;

said collapsible element being formed of a resilient material adapted to deform and then recover after a low energy impact;



said collapsible element comprising a plurality of side surfaces which intersect at corners, wherein the side surfaces define generally parallel pleats, and wherein the corners define recesses that are deeper than the pleats.

5,199,756

LOCKING TONGS

Laurence Bartlett, Colchester, and Robert DeGuise, Milton, both of Vt., assignors to Edlund Company, Inc., Burlington, Vt.

Filed Feb. 27, 1992, Ser. No. 842,891
Int. Cl.[5] A47G *21/10*; A47J *43/28*
U.S. Cl. 294—16 **9 Claims**

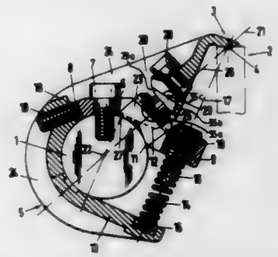
1. Locking tongs for grasping items, comprising:
two arms, each with a hinge end and a grasping end;
hinge means for pivotally connecting said two arms together at their hinge ends, so that said arms can pivot between an open position and a closed position; and
locking means slidably disposed at the hinge ends of said two arms, wherein in a first position said locking means engage said hinge ends of said two arms and prevent said arms from pivoting to an open position, and wherein in a second position said locking means disengage said hinge ends of said two arms and allow said arms to pivot freely, said locking means include a longitudinally extending plate mounted on said hinge means between the hinge ends of said two arms having a top end, a bottom end, and a longitudinally extending slot, the longitudinally extending slot being located adjacent to the bottom end of said plate, said longitudinally extending plate additionally includes a transverse slot located adjacent to the top end of said plate, said transverse slot is oriented perpendicular to said longitudinally extending slot, said longitudinally extending plate additionally includes a connecting slot which joins said transverse slot to said longitudinally extending slot and an end slot disposed at said bottom end of said plate and connected to said longitudinally extending slot.

5,199,757

GRIPPER FINGER FOR THE GRIPPER SPINDLE OF A SHEET-FED PRINTING PRESS

Claus Sisseth, Geisenheim-Johannisberg, Fed. Rep. of Germany, assignor to Man Miller Druckmaschinen GmbH, Geisenheim, Fed. Rep. of Germany

Filed Aug. 19, 1991, Ser. No. 746,969
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1990, 4026237
Int. Cl.[5] B65H *29/06*
U.S. Cl. 294—104 **3 Claims**



1. A gripper finger for a gripper spindle in a sheet-fed printing press, comprising:
first and second gripper finger components, said first gripper finger component having a first end and a gripper finger extension which contacts a gripper finger support at a transfer point, said second gripper finger component having a second end, one of said first and second gripper finger components presenting a supporting plane, said first and second gripper finger components cooperating to form an enclosure angle for enclosing a gripper spindle, said first gripper finger component contributing a maximum of 180 degrees to said enclosure angle, and said second gripper finger component supplementing said enclosure angle such that said enclosure angle is greater than 180 degrees;
means for fastening said second griper finger component to the gripper spindle;
a first compression spring, disposed between the first and second ends of the first and second gripper finger components, respectively, for exerting an adjustable, first spring force approximately in a direction of the transfer point;
an adjustment screw threadably engaged with the other of said first and second gripper finger components and having a tip which lies against the supporting plane of said one gripper finger component for exerting a screw force approximately in a direction of the transfer point so that the first spring force and the screw force combine to form a resultant force which is in a direction of a line connecting a center point of the gripper spindle and the transfer point;
a second compression spring disposed for being clamped between said first gripper finger component and the gripper spindle for urging said first gripper finger component against the gripper spindle, said second compression spring exerting a second spring force having a magnitude greater than the magnitude of the first spring force and being in a direction which essentially coincides with the direction of the resultant force and
means for adjusting the magnitude of the second spring force, said adjusting means includes a supporting element for said second compression spring which includes a

5,199,761

the entrance edges displaced at different elevations above

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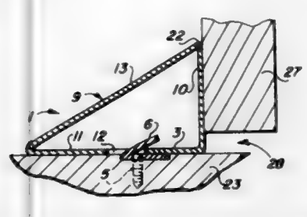
wedge-shaped head having a first wedge face, and a displaceable wedge having a second wedge face in sliding relationship with said first wedge face.

5,199,758
CARRIER APPARATUS FOR CARRYING OBJECTS
Nila G. Howell, 16 Honey Locust, Apt. 4, St. Charles, Mo. 63303
Filed Aug. 2, 1991, Ser. No. 739,880
Int. Cl.[5] A45C *13/26*
U.S. Cl. 294—171 **20 Claims**

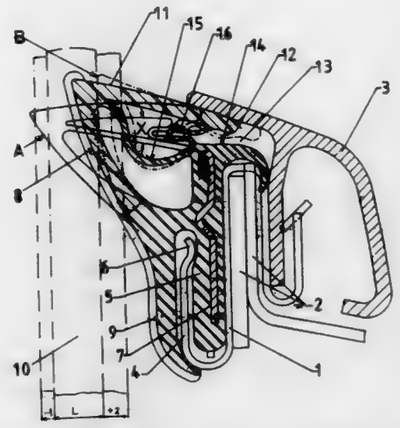
1. A carrier apparatus for carrying an object having a cord for suspending the object, the carrier apparatus comprising:
a carrier body having a given longitudinal length and opposite first and second ends, the body having an exterior surface and an interior surface, the interior surface forming an internal bore extending longitudinally through the body between the first and second ends; and
a slot formed in the body between the exterior and interior surfaces and extending longitudinally along the body between the first and second ends, the slot being formed as a continuous spiral that spirals at least one half a revolution around the body as it extends longitudinally between the first and second ends; wherein
the slot receives the object cord when the object is carried.

5,199,759
FLOOR-MOUNTED DOOR LOCK
Ronald D. Anderson, 212 Dawson St., Homer, La. 71040
Filed Aug. 6, 1992, Ser. No. 926,760
Int. Cl.[5] E05C *17/54*
U.S. Cl. 292—288 **14 Claims**



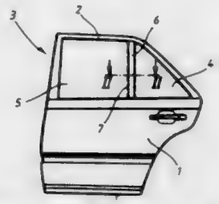
1. A floor-mounted door lock comprising anchor means disposed on a floor in fixed relationship in the path of swing of a door a door plate for engaging the door, a floor plate extending from said door plate and a floor plate slot provided in said floor plate for removably engaging said anchor means and blocking opening of the door.

5,199,760
PROFILED SEAL FOR LOWERABLE VEHICLE WINDOW
Heinz Vering, Schwelm, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany
Filed Apr. 1, 1992, Ser. No. 861,617
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1991, 4110824
Int. Cl.[5] B60R *13/06*
U.S. Cl. 296—146 J **8 Claims**



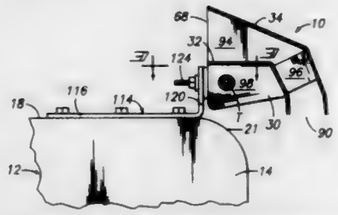
1. A profiled seal for attachment in a passage slot of a structural part of an automotive vehicle for sealing a raisable and lowerable window pane located in the vehicle near the structural part, the profiled seal comprising:
a stiff holding flank spaced a distance from the window, the holding flank having a top;
a fastening clamp on the holding flank and extending to the structural part for securing the profiled seal on the structural part;
an upwardly extending upper sealing lip attached to the holding flank and having an upper free end which self biases outwardly so that the upper lip can be applied against and can press against the window pane;
a downwardly extending, lower sealing lip also attached to the holding flank and extending downwardly along the holding flank;
a cover lip attached to the upper free end of the upper sealing lip, the cover lip extending from the upper sealing lip away from the window pane and generally above the holding flank;
a cover strip located generally inward from the holding flank and away from the window, the cover strip including a portion that extends toward the window and is above and spaced away from the top of the holding flank for defining a groove between the cover strip and the top of the holding flank; the cover lip having a free end away from the window pane which extends into the groove;
a pull band extending between the upper end of the upper sealing lip and the holding flank near the top thereof, the pull band being flexible and being of a length that the pull band is stretched when the window pane is lowered below the upper sealing lip and the upper sealing lip normally self biases outward beyond the position where it would first contact the window pane; and the pull band being flexible to flex and fold slightly when the window pane is raised to press the upper sealing lip inward toward the holding flank.

5,199,761
SIDE WINDOW FOR A MOTOR VEHICLE
Herbert Dannecker, Boblingen; Franz Waldhauser, Sindelfingen, and Günter Kling, Böblingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Mar. 2, 1992, Ser. No. 843,055
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1991, 4106715
Int. Cl.[5] B60J *5/00*
U.S. Cl. 296—146 J **7 Claims**



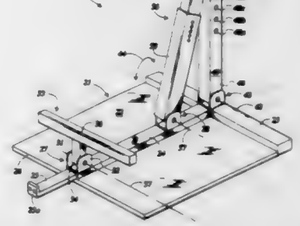
1. A side window for a motor vehicle, comprising a fixed window pane, a lowerable window pane, and a window web defining a recess and extending between the fixed and lowerable window panes said window web comprising a window guide profile for the lowerable window pane, a sealing and holding profile for the fixed window pane guided in the recess of the window web, and means for retaining the sealing and holding profile in an adjusted position relative to the window guide profile.

5,199,762
SQUARE-BACKED VEHICLE AIR FOIL SYSTEM
Rick L. Scheele, P.O. Box 381, and Dennis I. Nelson, P.O. Box 741, both of Darby, Mont. 59829
Filed Dec. 2, 1991, Ser. No. 801,711
Int. Cl.[5] B62D *35/00*; **B60J** *1/20*
U.S. Cl. 296—180.1 **36 Claims**



1. A square-backed vehicle air foil system for attachment to an upper rear edge of a square-backed vehicle to project into a horizontal airstream passing over a roof panel of the vehicle as the vehicle is propelled over a roadway to deflect and direct two layers of the airstream over the upper rear edge and downward along a rear panel of the vehicle to provide two moving air curtains over the rear panel to maintain the rear panel clean, comprising:
a) an elongated inner air foil element for extending along the upper rear edge in which the air foil element extends between an entrance edge and an exit edge;
b) an elongated outer air foil element complementary to and spaced from the inner air foil element for extending along the upper rear edge in which the outer foil element extends between an entrance edge and an exit edge with the entrance edge of the outer air foil element being displaced above the entrance edge of the inner air foil element and the exit edge of the outer air foil element being displaced rearward of the exit edge of the inner air foil element;
c) mounting means operatively connected to the inner and outer air foil elements for attaching the air foil elements to the square-backed vehicle along the upper rear edge with the entrance edges displaced at different elevations above the upper rear edge of the vehicle and projecting into the horizontal airstream passing over the roof panel of the vehicle and the exit edges of the air foils displaced at different distances rearward of the rear panel of the vehicle (1) for subdividing the airstream into layers and for deflecting and directing a first layer of the airstream along an inside surface of the inner air foil element over the upper rear edge of the vehicle and downward along and immediately adjacent the rear panel of the vehicle at a first velocity to provide a first moving air curtain over the rear panel to maintain the rear panel clean and (2) for deflecting and directing a second layer of the airstream between the inner air foil element and the outer air foil element over the upper rear edge of the vehicle and downward along the rear panel adjacent the first layer, at a second velocity greater than the first velocity, to provide a second moving air curtain to maintain the rear panel clean.

5,199,763
STANDING AID FOR USE WITH A CHECKOUT COUNTER
William D. Wilder, and Roger D. Brown, both of Sylacauga, Ala., assignors to Madix, Inc., Goodwater, Ala.
Filed May 3, 1991, Ser. No. 695,587
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—338 **31 Claims**



1. A standing aid for use with a checkout counter to assist an operator thereof while standing above a floor, comprising:
a base frame mounted above the floor adjacent the checkout counter;
mounting means for securing said base frame in close proximity to said floor and for opposing tilting forces exerted against said base frame by said operator;
a first stanchion pivotally mounted to said base frame and including a lower portion and an upper portion extendably mounted to said lower portion, said first stanchion capable of forward pivotal adjustment;
a second stanchion pivotally mounted at a lower portion thereof to said base frame and including an upper portion extendably mounted to said lower portion, said second stanchion pivotally mounted at one end thereof to said first stanchion;
a buttocks cushion pivotally mounted to said upper portion of said first stanchion; and
means for selectively securing said buttocks cushion in selected vertical and lateral positions.

5,199,764

shells connected by a film hinge and folded upon each

(c) flowing a gas down the wellbore and into said coal seam

forming an inclined working between the transport and

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5,199,764

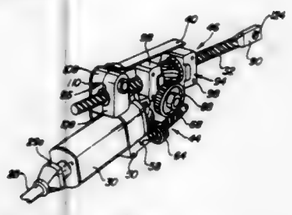
POWER LINEAR SEAT RECLINER

David L. Robinson, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Continuation of Ser. No. 511,628, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 384,161, Jul. 24, 1989, Pat. No. 4,962,963. This application Oct. 25, 1991, Ser. No. 782,782

Int. Cl.[5] B60N *2/22*

U.S. Cl. 297—361 **8 Claims**



1. A seat assembly comprising:

a seat member;

a seat back coupled to said seat member;

pivot means for permitting pivotal movement of said seat back;

a rod assembly including an elongated threaded rod having one end connectable to said pivot means, and a rotatable gear nut having an internally threaded surface such that said threaded elongated rod is intermeshed with said internally threaded surface of said gear nut for producing linear non-rotational motion of said elongated rod upon rotation of said gear nut; and

a recliner mechanism secured to said seat member and adapted to support said gear nut such that said elongated rod moves relative to said recliner mechanism and said gear nut, said recliner mechanism including an integrally mounted motor and a transmission assembly provided for coupling said gear nut to an output member of said motor, said transmission assembly including a housing having a first recess configured to securably confine a portion of said motor within said recliner mechanism, a second recess configured to receive first and second intermeshed gears such that said first gear is coupled for rotation to said motor output member, and a third recess configured to receive a worm gear coupled for rotation to said second gear, said housing further adapted to support a transversely extending non-rotatably shaft having a splined gear set mounted for free rotation thereon, said splined gear set being intermeshed with said worm gear so as to be rotatably driven thereby, said transmission assembly operable for controllably reducing the speed of said linear non-rotational motion of said elongated rod with respect to the rotational speed of said motor output member such that selective actuation of said motor acts to rotate said gear nut for generating said linear non-rotational movement of said elongated rod relative to said recliner mechanism for controllably adjusting the angular position of said seat back relative to said seat member.

5,199,765

HEADREST FOR CAR SEATS

J. Eugenio Garmendia, Zaragoza, Spain, and Dieter H. Quistorf, Nauheim, Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1990, Ser. No. 562,714

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926248

Int. Cl.[5] A47C *7/36*

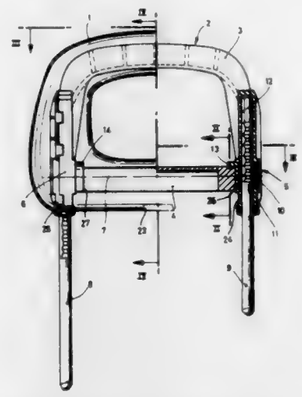
U.S. Cl. 297—391 **9 Claims**

1. A headrest for a car seat having a backrest, the headrest comprising:

a U-shaped support piece having a pair of arms and each arm having a mounting receptacle that opens downward towards the backrest;

a pair of bearings with each bearing having two bearing shells connected by a film hinge and folded upon each other and one of the bearings mounted in each of the arms of the U-shaped support piece;

a pair of swivels with on of the swivels rotatably received in each of the bearings;



a pair of stay bars with one of the stay bars mounted in each of the swivels connecting the arms of the support piece to the backrest of the car seat;

a foam-filled protective covering that encloses the U-shaped support piece; and

a crossbar having a pair of ends detachable connected to the mounting receptacles of the arms of the support piece.

5,199,766

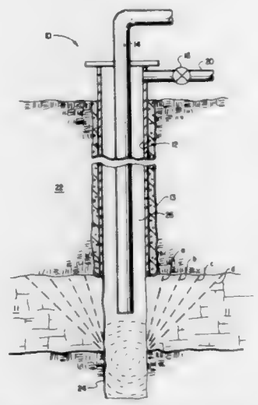
CAVITY INDUCED STIMULATION OF COAL DEGASIFICATION WELLS USING SOLVENTS

Carl T. Montgomery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 11, 1991, Ser. No. 805,162

Int. Cl.[5] E21B *43/26*

U.S. Cl. 299—5 **3 Claims**



1. A method for forming a cavity adjacent an open borehole within a coal seam to improve the production of fluids from the subterranean coal seam comprising:

(a) completing a wellbore into said coal seam;

(b) flowing a coal comminuting solvent down the wellbore to said coal seam and into said coal seam;

(c) flowing a gas down the wellbore and into said coal seam at high pressure; and

(d) releasing the pressure in said wellbore.

5,199,767

METHOD OF LIFTING DEEPSEA MINERAL RESOURCES WITH HEAVY MEDIA

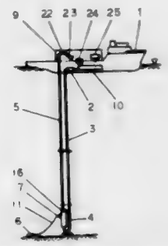
Kenjiro Jimbo, 34-11-301, Satsukigaoka 2-chome, Chiba-shi, Chiba 281, Japan

PCT No. PCT/JP90/00050, § 371 Date Mar. 12, 1991, § 102(e) Date Mar. 12, 1991, PCT Pub. No. WO91/10808, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 17, 1990, Ser. No. 651,251

Int. Cl.[5] E21C *45/00*

U.S. Cl. 299—8 **3 Claims**



1. A method of lifting raw deepsea mineral resources mined at a deepsea floor with a heavy medium through a lifting pipe from the sea floor to the sea surface, by buoyant force exerted by said heavy medium, which has a density heavier than a bulk density of said mineral resources, which method comprises

(1) blending heavy medium materials, additives and sea water in a regulative cell to produce said heavy medium,

(2) pumping said heavy medium from the sea surface sequentially through a downstream pipe, a sea floor U-tube and a lifting pipe by operating a piston pump,

(3) feeding nodules of said mineral resources into said tube by operating a first feeding device,

(4) operating a second feeding device which is situated in parallel with said first feeding device for continuously feeding said nodules into said U-tube,

(5) alternately operating said first and second feeding devices to continuously lift said nodules up the inside of said lifting pipe with said heavy medium by said buoyant force exerted by said heavy medium, and

(6) discharging said nodules with said heavy medium from said lifting pipe onto a marine ship on the sea surface.

5,199,768

METHOD FOR DEVELOPING THICK BEDS OF MINERALS

Alexandr S. Tripolko, ulitsa Jubileinaya, 86, kv. 90; Vasily L. Klishev, prospekt Lenina, 8, kv. 40.; Vladimir Y. Kovtun, ulitsa Bljukhera, 3, kv. 6., and Lev M. Papulov, ulitsa Kalinina, 26, kv. 7., all of Berezniki, Permskaya oblast, U.S.S.R.

Filed Jul. 19, 1991, Ser. No. 733,626

Int. Cl.[5] F21C *41/00*

U.S. Cl. 299—18 **6 Claims**

1. A method for developing a thick bed of minerals, comprising the following operations:

preparing a room with a contour for winning which includes;

incorporating a working conveyor below soil of the room which working conveyor extends lengthwise a long a length of the room,

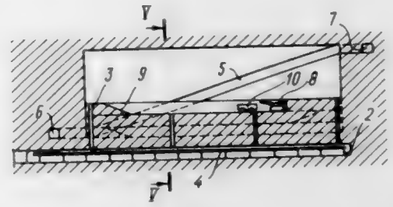
forming transport and fan drifts in the thick bed,

forming raises extending from the working conveyor to a roof portion of the room,

forming an inclined working between the transport and fan drifts so as to fit the contour of the room;

winning of a mineral, said winning being carried out in the room in horizontal layers downward by forward and reverse movements of a cutter-loader;

developing each of said horizontal layers through stopes extending along the length of the room through the forward and reverse movement of the cutter-loader, a first stope in each horizontal layer being developed in range of said raises, and subsequent stopes in each layer being developed in a direction from the first stope outward to an edge of the room;



extracting each subsequent horizontal layer beginning with soil of the preceding horizontal layer by a deepening of the cutter-loader to a layer underneath, the extracting including forming an inclined descent at an end part of the room and suppressing said inclined descent when developing the horizontal layer opened by said inclined descent, the extracting further including opening said inclined working to the horizontal layers by developing an extreme movement of said cutter-loader in each horizontal layer, supplying mineral to said raises and the passing of mineral through the raises to said working conveyor.

5,199,769

VALVE, IN PARTICULAR FOR SLIP-CONTROLLED HYDRAULIC BRAKE SYSTEMS

Erhard Beck, Weilburg; Bernd Schweighofer, Schmitten, and Horst Kornemann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

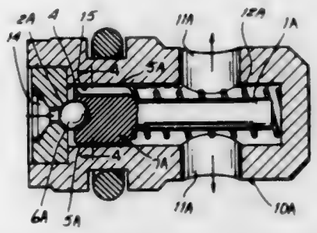
PCT No. PCT/EP90/01520, § 371 Date May 14, 1991, § 102(e) Date May 14, 1991, PCT Pub. No. WO91/04181, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 8, 1990, Ser. No. 688,949

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930757

Int. Cl.[5] F16K *17/06*

U.S. Cl. 303—114.1 **4 Claims**



1. A valve for controlling flow comprising a housing, an inlet passage and an outlet passage, a valve tappet, mounted in said valve housing for axial opening and closing movement, a tappet head formed on said valve tappet, a valve seat defining in part a flow path from said inlet passage to said outlet passage, a bore in said housing slidably receiving said valve tappet

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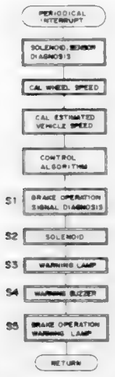
head, to axially movably guide said valve tappet head, a valve closure member moved by said valve tappet head onto said valve seat by closing movement of said valve tappet, said valve tappet head interposed between said valve seat and said outlet passage, at least one groove recessed into the circumferential outer surface of one side of said valve tappet head and extending longitudinally along the length thereof to accommodate fluid flow from said valve seat to said outlet passage when said valve closure member is moved off said valve seat by opening movement of said valve tappet, said groove creating a substantially greater circumferential area on said one side of said valve tappet head to generate a transverse force by the pressure of fluid flowing past said valve tappet head and acting on said circumferential area thereof, said groove comprising a asymmetric flow passage past said valve tappet head.

5,199,770

BRAKE SWITCH ABNORMALITY DETECTION DEVICE

Masato Yoshino, and Yoshio Katayama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd, Osaka, Japan

Filed Sep. 12, 1991, Ser. No. 757,998
Claims priority, application Japan, Sep. 17, 1990, 2-248294
Int. Cl.[5] F16D *66/00;* **B60T** *17/18*
U.S. Cl. 303—92 **19 Claims**



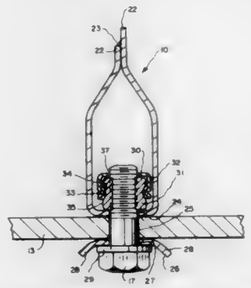
1. A brake switch abnormality detection device for a vehicle having front and rear wheels, comprising:
- brake means operatively provided for applying a braking force to said front and rear wheels;
- brake switch means for producing a brake signal while said brake means is operated;
- calculation means for calculating an estimated vehicle speed;
- detection means for detecting the presence of said brake signal;
- comparison means for comparing said estimated vehicle speed with a first predetermined speed and a second predetermined speed, said first speed being greater than said second predetermined speed; and
- abnormality detection means for producing an abnormality signal when said detection means fails to detect the presence of said brake signal during at least one detection period which is from a time when said estimated vehicle falls below said first predetermined speed to a time when said estimate vehicle speed reaches said second predetermined speed.

5,199,771

NOT RETAINING CLEAT FOR VEHICLE ENDLESS TRACK

M. Elmer James, Mendon, and Dennis Craghead, Logan, both of Utah, assignors to Logan Manufacturing Company, Logan, Utah

Filed Mar. 2, 1992, Ser. No. 844,770
Int. Cl.[5] B62D *55/26*
U.S. Cl. 305—54 **3 Claims**



1. A cleat to be assembled attached to the flexible belting of a vehicle endless track, the track comprising at least one endless flexible belt carrying longitudinally spaced sets of holes for mounting the cleat transversely to the belt, said cleat comprising:
- an elongate grouser plate having a generally planar belt contacting portion, having mounting holes therethrough matching the holes of one of the sets carried by the belt;
- an elongate backing plate having holes matching the mounting holes of the grouser;
- a mounting bolt operable through each of the matching holes to secure the backing plate, the belt, and the grouser together;
- a multifaced torque nut sized to be engaged by each mounting bolt; and
- an elongate member grasping a pair of opposed sides of each of the torque nuts, preventing rotation thereof with respect to said member, and holding said nuts spaced apart in matching relationship to the grouser mounting holes, the elongated member being installed along the belt contacting portion of the grouser.

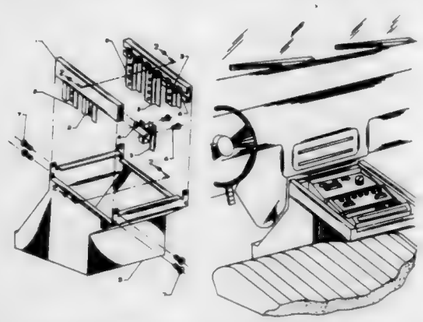
5,199,772

UNIVERSAL VEHICLE COMMUNICATION CONSOLE

Glenn A. Jordan, Harvard, Mass., assignor to Glenn A. Jordan, Harvard, Mass.

Filed Jan. 22, 1992, Ser. No. 823,897
Int. Cl.[5] B60R *7/00*
U.S. Cl. 312—7.1 **2 Claims**

1. A mounting system for mounting communication equipment of various sizes within an automobile console comprising:
- a first and second rail in confronting, spaced, face to face, substantially parallel relationship, each of the said rails comprising at least one continuous slot, said slot providing means whereby at least one nut plate may be captured in each said rail, and said slot further deterring rotation of the said nut plate, said slot being open on the opposing faces of the first and second said rails allowing for installation of fasteners into the captured said nut plate, said slot being open on either end to allow for said nut plate to be inserted or removed from the said first or second rails, a rectangular nut plate with at least one tapped hole into which said fasteners are inserted to join a hat section shaped communication mounting bracket with the said nut plate, said hat section shaped brackets secured to said nut plates and configured to mount said communication equipment of various sizes whereby the said nut plate is inserted into said slot in the end of said rail, said communication equipment being infinitely positionable along the length of said rails, said hat section brackets formed to create two planer flanges with at least one hole in each said flange through which said fasteners are inserted into said nut plate, a third surface of said hat section shaped



brackets having a series of holes allowing for vertical positioning of said communication equipment,
- a housing comprising a base upon which said first and second rails are supported and fastened, said housing enclosing said communication equipment.

screen of said CRT monitor is visible to an operator, wherein said mounting means include:
- at least two spaced apart supports mounted at fixed locations;
- first guide means having a first linear portion extending generally in a horizontal plane and a second linear portion extending upwardly therefrom and inclined relative thereto mounted on each of said spaced apart supports;
- second guide means extending in a linear direction that is inclined to the horizontal and at an angle that differs from that of said second linear portion mounted on each of said spaced apart supports; and
- at least four guide followers mounted at spaced apart locations on said CRT support means for cooperating with said first and second guide means to guide said movement of said CRT support means.

5,199,773

DESK TYPE WORK STATION

Macy J. Price, Jr., Louisville, and Daniel C. Starkey, Englewood, both of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.

Filed Dec. 20, 1990, Ser. No. 630,521
Int. Cl.[5] A47B *81/06*
U.S. Cl. 312—7.2 **17 Claims**

1. A desk type work station for holding and permitting operation of at least a CRT monitor comprising:
- a top panel portion having a generally flat top work surface and an opposite bottom surface;
- a pair of laterally spaced apart pedestal means for supporting said top panel portion;
- an open space located beneath said top panel portion and between said laterally spaced apart pedestal means;
- said top panel portion having an opening formed therein;
- a movable cover portion for covering said opening and forming a portion of said generally flat top work surface;
- shelf means for supporting a keyboard;
- shelf support means for supporting said shelf means and permitting movement of said shelf means between closed and opened positions;
- CRT monitor support means for supporting a CRT monitor; and
- mounting means for mounting said CRT monitor support means for movement between a first position at which said CRT monitor is located beneath said bottom surface and a second position at which at least a portion of said CRT monitor extends through said opening so that at least the

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5,199,774

COMBINATION LOCK AND INTERLOCK FOR A FILE CABINET

Paul R. Hedinger, Jasper; Steven F. Trinkel, Rockport, and David L. Hostetter, Jasper, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 27, 1990, Ser. No. 618,468
Int. Cl.[5] F05B *65/46, 7/06*
U.S. Cl. 312—219 **26 Claims**

1. A cabinet comprising:
- at least two drawers, each having a closed position and an open position;
- cable means extending adjacent each said drawer for preventing outward movement of said drawer, said cable means being movable between a slack position to allow outward movement of any one of said drawers and a taut position to prevent outward movement of any of said drawers;
- engaging means associated with each of said drawers for engaging and moving said cable means from said slack position to said taut position upon outward movement of one of said drawers, whereby only one drawer may be in said open position at any one time; and
- remote locking means attached to said cable means for selectively moving said cable means between said slack position and said taut position while each said drawer is in said closed position.

5,199,775

restriction means disposed inside said housing for restricting

said slide surfaces in said slide groove, so that said shelf is

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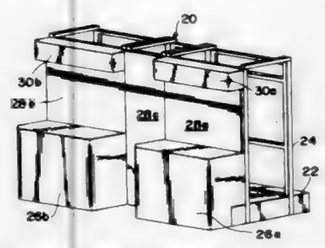
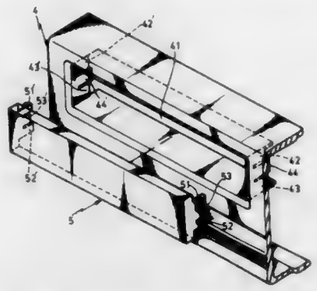
5,199,775
MODULAR EXHIBITRY UNIT
Micky T. Morgan, Princeton, and Bernard J. Ernst, Florham Park, both of N.J., assignors to The Corporate Communications Group, Inc., Princeton, N.J.
Filed Nov. 23, 1990, Ser. No. 617,137
Int. Cl.[5] A47B 47/03
U.S. Cl. 312—257.1 **17 Claims**



1. An exhibition stand comprising:
a three dimensional base for resting on a support surface, the base including a central section flanked by two opposed outside sections;
a pair of upright frames, each frame comprising:
two opposed, spaced upright tubular members forming respective sides of the frame;
a lower member extending between the opposed upright members; and
an upper member extending between the opposed upright members;
means on the base for receiving a lower portion of each frame to detachably mount the frames in spaced, opposed upright positions, with each of the frames being disposed between the central section and one of the outside sections;
means for joining the frames together, the joining means being located at a position spaced from the base, said joining means comprising a pair of U-shaped joining members, each joining member having an elongate central portion and a leg extending angularly at each end of the central portion, each leg including means for interfitting with one of said tubular upright members;
a first furniture element;
means for detachably fixing the furniture element on one of the frames;
a second furniture element;
means for detachably fixing the second furniture element on said one frame at a location above the first furniture element;
a panel of a size to extend from the first element to the second element; and
means for detachably mounting said panel on said one frame between the first and second furniture elements.

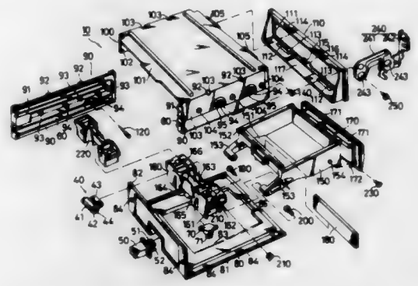
5,199,776
SURFACE PANEL WITH DISK DRIVER HOLDER OPENING AND CORRESPONDING COVER PLATE
Chung H. Lin, 5F-23, 70, Fu-Shing Road, Taoyuan, Taiwan
Filed Dec. 31, 1991, Ser. No. 815,148
Int. Cl.[5] A47B 96/20
U.S. Cl. 312—293.3 **1 Claim**

1. A surface panel with a disk driver holder opening and a corresponding cover plate comprising:
a) a surface panel having a disk drive holder opening formed therein, the opening including two inner lateral edges, each inner lateral edge being provided with an upper positioning element, a lower positioning element and an inwardly extending hook element positioned between the upper and lower positioning elements;
b) a removable cover plate including two inner lateral edges, each inner lateral edge being provided with an upper outwardly extending hook element, a lower outwardly extending hook element and a positioning element disposed between the upper and lower outwardly extending hook elements;
c) whereby the cover plate may be fitted within the disk driver holder opening and secured in place through engagement of the upper outwardly extending hook ele-



ments, lower outwardly extending hook elements and positioning elements of the cover plate with, respectively, the upper positioning elements, lower positioning elements and inwardly extending hook elements of the holder opening; and
d) the disk driver holder opening being sized for fitting a disk driver therein and disposing the disk driver flush with the holder opening after installation.

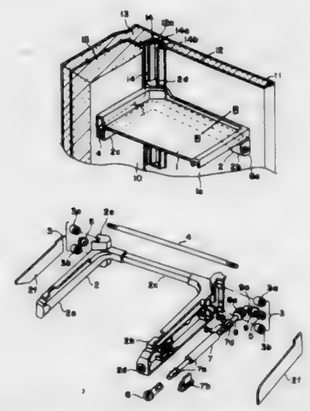
5,199,777
DRAWER APPARATUS
Hajime Taima, and Shinsuke Oki, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan
Filed Jun. 17, 1991, Ser. No. 716,288
Claims priority, application Japan, Jun. 19, 1990, 2-161073
Int. Cl.[5] A47B 88/00
U.S. Cl. 312—319.1 **9 Claims**



1. A drawer apparatus comprising:
a hollow housing having a front frame with at least one open front surface, an upper wall and a bottom wall with an open edge portion;
a tray slidably retained in said hollow housing and having a tray body with a rear portion and a recessed portion for storage, said tray being entered or drawn out from said housing through the open front surface thereof;
urging means for urging said tray in a direction in which said tray protrudes from the open front surface of said housing;
locking means disposed inside said housing for locking said tray to a position where said tray is accommodated in said hollow housing against urging force of said urging means; and

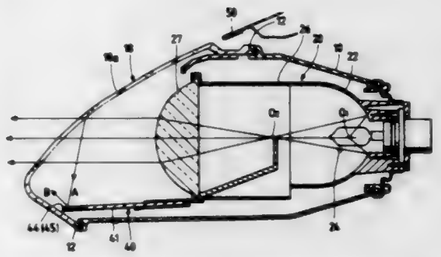
restriction means disposed inside said housing for restricting maximum protruding position of said tray,
wherein said urging means includes a constant-pressure spring for providing a contracting force and for urging said tray to move in the direction in which said tray protrudes from the open front surface of said housing due to the contracting force of said urging means, a spool to which one end portion of said constant-pressure spring is fixed and around which said constant-pressure spring is wound, said spool being pivotally fixed to said tray, and a hook foxed to the other end portion of said constant-pressure spring, said hook being hooked to the open front edge portion of the bottom wall of said housing, said front frame having an opening through which said tray is entered or drawn out from said housing, said front frame having a retaining portion which faces the open front edge portion of said bottom wall of said housing with the hook provided on the other end portion of said constant-pressure spring.

5,199,778
SHELF APPARATUS FOR A REFRIGERATOR
Takashi Aoki; Minoru Yonemura, both of Kusatsu; Hiroji Ito, Omihachiman; Akihiro Shigeta, Fujisawa; Yasuji Imai, Tsuzuki; Tatsuo Miyachi, Koga; Tomoyuki Nishimura, and Naoya Ishikawa, both of Kusatsu, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan
Filed Jan. 17, 1991, Ser. No. 642,386
Claims priority, application Japan, Jan. 19, 1990, 2-11441; Jan. 19, 1990, 2-11443; Jan. 19, 1990, 2-11445
Int. Cl.[5] F25D 11/00
U.S. Cl. 312—408 **11 Claims**



1. A shelf apparatus in a refrigerator having a rear wall and opposing side walls, comprising:
a pair of vertically extending rails, each of said rails situated generally at the intersection of a side wall and the rear wall and having a vertically extending slide groove with opposed slide surfaces;
a pair of racks, each of said racks formed on one of said slide grooves and having a vertically extending row of teeth;
at least one horizontally-oriented shelf having a rear edge and opposed side edges abutting said rear wall and said side walls respectively, each said shelf having a support assembly at the intersection of each side edge and rear edge including an engaging gear, an upper sliding member and a lower sliding member, each of said engaging gears engaging a portion of said row of teeth in one of said racks, each of said upper sliding members disposed above said engaging gear and sliding on one of said slide surfaces in said slide groove, each of said lower sliding members disposed below said engaging gear and sliding on one of said slide surfaces in said slide groove, so that said shelf is vertically moved when said support assembly moves upwardly and downwardly along said rails; and
a drive means mounted to said shelf for rotating said engaging gears to move said shelf.

5,199,779
PROJECTION-TYPE VEHICULAR HEADLAMP
Masakazu Sato, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1992, Ser. No. 826,963
Claims priority, application Japan, Feb. 8, 1991, 3-17647
Int. Cl.[5] B60Q 1/04
U.S. Cl. 362—61 **13 Claims**



1. A projection-type vehicular headlamp, comprising:
a lamp body;
a front lens covering a front opening of said lamp body, said front lens being an inclined lens the lens surface of which is inclined strongly rearward;
a light projecting unit comprising a substantially ellipsoidal mirror and a light source mounted within said mirror, and a projecting lens arranged in front of said light source for converting an output light beam of said light source reflected from said mirror into a substantially parallel light beam advancing forwardly of said headlamp, said light projecting unit being lens; and
a cover coated with a reflecting film arranged around a front end portion of said light projecting unit, said cover having a lower edge portion extending forward into a front extension, a light diffusing region being formed at least in a front end portion of said front extension of said cover, said light diffusing region being positioned in a band-shaped region along said front end portion of said front extension so as to receive light reflected downward from said front lens, and said light diffusing region reflecting said light reflected downward from sad reflector through said lens and laterally of said headlamp.

5,199,780
FLASHLIGHT HAT CLIP
John M. Ekman, 11520 SW. Champlin La., Beaverton, Oreg. 97007
Filed Feb. 14, 1992, Ser. No. 836,203
Int. Cl.[5] F21L 15/14
U.S. Cl. 362—106 **8 Claims**

1. A device for attaching a flashlight to a hat, said device comprising
a hat having a headband attachment means engagable with a vertical edge of said hat to attach said device to said hat and having a first support member engagable with the user's head to firmly position said device and a flashlight support member projecting outwardly from said first support member and carrying a plurality of flashlight gripping fingers curved to releasably retain a flashlight

face of said male fitting, said inner lamp socket of said

5,199,785

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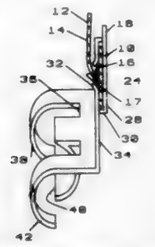
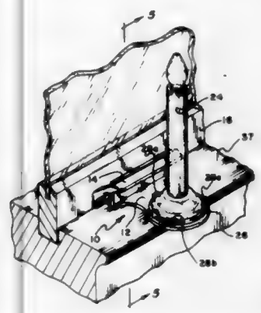
between said fingers to support said flashlight in a desired position, a flap projecting outwardly and downwardly



from said first support member to releasably engage said headband.

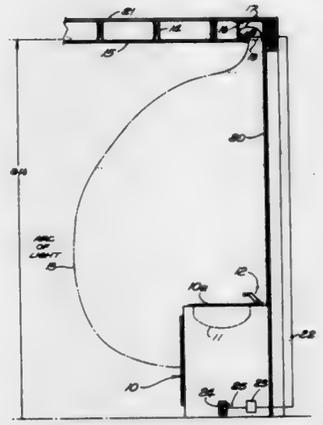
5,199,781
ELECTRIC CANDLE HOLDER
John E. Sweeny, 301 Williamsburg Ct., Marlton, N.J. 08053
Filed Oct. 6, 1992, Ser. No. 957,830
Int. Cl.[5] F21P *1/02*; F21Y *35/00*
U.S. Cl. 362—145 **15 Claims**



1. A device used for supporting an electric candle, comprising:
(a) a window sash;
(b) a handle attached to said window sash and extending substantially outward from said sash; and
(c) a base member for supporting an electric candle having a contact end and a candle end, said base member having means for retaining said candle to said base member at said candle end, said contact end abutting against said window sash;
(d) a stabilizing means being attached to said base member and extending upwardly therefrom, said stabilizer being forced against said handle for engaging said handle simultaneous with said contact end abutting said sash for facilitating the securing of said base member and said candle to said window sash.

5,199,782
ILLUMINATION SYSTEM FOR VANITY OR THE LIKE
Glenn M. Johnson, Westlake Village, and David C. Breda, Hermosa Beach, both of Calif., assignors to Glen Co. Breda & Associates, Inc., Westlake Village, Calif.
Continuation-in-part of Ser. No. 704,878, May 23, 1991, abandoned. This application Jan. 21, 1992, Ser. No. 822,993
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—147 **13 Claims**

1. An illumination system for a vanity or the like, comprising:
a counter and a mirror associated with said vanity, said mirror being mounted in a substantially vertical plane between said counter and a ceiling of a room in which said vanity is located;
a flush lighting fixture comprising an enclosure mounted into said ceiling, said enclosure having an elongated aperture adjacent to the top of said mirror and extending over at least a portion of the width of said mirror;
an elongated and substantially rectangular aperture in a plane of said ceiling, said elongated and substantially rectangular aperture opening into said enclosure and extending adjacent to the top edge of said mirror along at least a portion of the width of said mirror;
a linear light source extending substantially parallel to said aperture within said enclosure; and



a concave reflector responsive to light emission from said linear light source within said enclosure, said reflector having first, second and third surfaces, said first surface being oriented to reflect said light emission laterally toward said second and third surfaces, said second surface, being oriented to reflect light generally downward through said elongated and substantially rectangular aperture and toward said mirror, said third surface being oriented to reflect light downward through said elongated and substantially rectangular aperture and into said room adjacent said counter, said second and third reflector surfaces being illuminated directly from said linear light source and by reflection form said first surface

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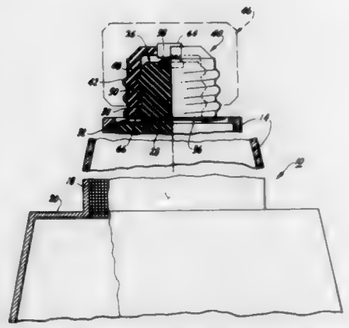
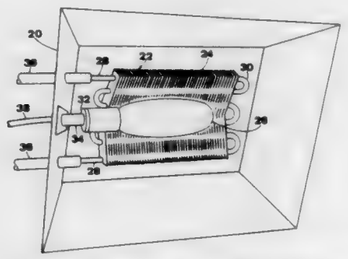
5,199,783
FLUORESCENT LIGHTING SYSTEM
Bruce A. Pelton, Emeryville, Calif., assignor to Lumatech Inc., Emeryville, Calif.
Filed Jul. 29, 1992, Ser. No. 921,897
Int. Cl.[5] F21K *7/00*
U.S. Cl. 362—260 **8 Claims**

1. A lighting system having a fluorescent lamp capable of screwing into a standard electrical lamp socket comprising;
a. a base member including a mechanism for mechanically and electrically connected to the fluorescent lamp,
b. a male fitting including an outer surface;
c. connecting means for mechanically fixing said male fitting to said base member;
d. an adaptor capable of mechanically and electrically connecting to the standard electrical lamp socket said adaptor including an external threaded outer surface for threadingly engaging the standard electrical lamp socket to effect mechanical and electrical contact therewith, said adaptor further including an inner lamp socket capable of mechanically and electrically contacting said outer surface of said male fitting, said inner lamp socket of said adaptor being of a non-standard size; and



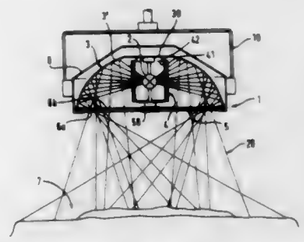
e. locking means for preventing said adaptor from screwing out of the standard electrical lamp socket;

5,199,784
MOISTURE SHEDDING LIQUID COOLED FLOODLIGHT FIXTURE
Charles R. Hempleman, 511 W. Glenoaks Blvd. #633, Glendale, Calif. 91202
Filed Oct. 12, 1990, Ser. No. 596,719
Int. Cl.[5] F21V *29/00*
U.S. Cl. 362—294 **8 Claims**



1. In combination, a high intensity lamp and luminaire assembly comprising,
(a) a lamp heat removal means comprising a heat exchanger with multiple metal fins and at least one metal tube running through said fins, and a heat transfer medium circulating in said at least one tube,
(b) wherein the heat exchanger is mounted at a point of highest heat concentration between said high intensity lamp and a reflective surface of said luminaire,
(c) a light ray dispersion means wherein the heat exchanger fins are arranged so as to minimize light ray convergence back onto a light source within said high intensity lamp,
(d) a condensate removal means wherein the heat exchanger is positioned to create a gravity fed drip path which directs condensate forming on the heat exchanger to a location separate from that of water vulnerable lamp components.

5,199,785
OPERATING THEATRE LAMP
Manfred Scholz, Seitingen, Fed. Rep. of Germany, assignor to Delma elektro-und medizinische Geraetebau Gesellschaft mbH, Tuttlingen, Fed. Rep. of Germany
Filed Dec. 17, 1991, Ser. No. 808,488
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1990, 9017143[U]
Int. Cl.[5] F21V *13/00*
U.S. Cl. 362—296 **6 Claims**



1. Operating theatre lamp, for lighting a site of an operation from above, comprising:
at least one light source providing a plurality of light beams directed in a predetermined solid angle outwardly towards a reflector arrangement which concentrates the plurality of light beams issuing from the at least one light source downwardly towards the site of the operation;
at least one infrared filter located between the light source and the reflector arrangement which absorbs a predominant portion of an infrared radiation component of the plurality of light beams;
at least one closure plate which covers the reflector arrangement from below receiving light beams reflected by the reflector arrangement downwardly towards the site of the operation, said at least one closure plate being made of a structured glass which irregularly refracts the plurality of light beams; and
a transparent foil adhered to an upper surface of the at least closure plate extending substantially over the entire upper surface of the at least one closure plate and reflecting an ultraviolet radiation component of the plurality of light beams;
whereby the adhesion of the transparent foil to the at least one closure plate prevents glass particles from falling onto the site of the operation when the at least one closure plate breaks.

5,199,786
MODULAR ELEMENT FOR A LIGHTING DEVICE
Mardick Baliozian, 175 E. Delaware Pl., Chicago, Ill. 60611
Filed Apr. 10, 1992, Ser. No. 867,053
Claims priority, application France, Jun. 12, 1991, 91 07124
Int. Cl.[5] F21V *7/00*
U.S. Cl. 362—297 **16 Claims**

1. A modular reflector element for a lighting device, said reflector element having a front face, a rear face, and being intended to house an elongated light source such as a cylindrical tubular lamp having a U-shape, said reflector element being provided with a reflecting surface on the front face which is

crank member, the paddle member fixed for corotation

plumbing fitting through which water passes, the indicator

$_2O_3.SiO_2$, $SiO_2.B_2O_3$ glass + Al_2O_3, and $BaO.SiO_2.Al$-

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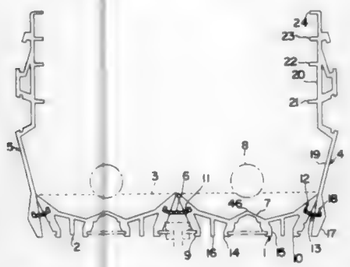
directed towards the light source, with a series of ribs on the rear face and with lateral edge members, wherein the lateral



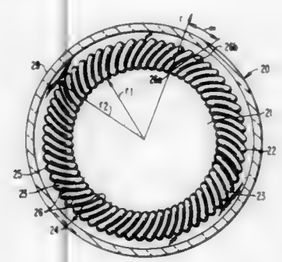
edge members are formed by end ribs and are rearwardly inclined towards each other and with respect to a front plane.

5,199,787

REFLECTOR LAMP HAVING IMPROVED LENS

Gary L. King, Sterling Heights, Mich., and Jerry W. Smith, Irvine, Ky., assignors to North American Philips Corporation, New York, N.Y.

Filed Jan. 8, 1992, Ser. No. 818,006
Int. Cl.[5] F21V *7/00*
U.S. Cl. 362—310 **16 Claims**



1. In a reflector lamp having a reflector defining an optical axis, a light source disposed within said reflector and substantially surrounded thereby, and a lens adjacent said reflector having an annular portion which includes a pattern of elongate beam forming elements, the improvement comprising:

a plurality of said elongate beam forming elements having oblique portions defined by a respective pair of side edges each extending from an inner end to an outer end of said oblique portions at an acute angle to a respective radius extending from said optical axis through said inner end of said side edges.

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APPARATUS FOR SEALING A LIQUID CONTAINER

Dorothy Stallings, Rte. 1, Box 165C, Pattonville, Tex. 75468

Continuation-in-part of Ser. No. 621,212, Dec. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 478,771, Feb. 12, 1990, Pat. No. Des. 320,398. This application Nov. 15, 1991, Ser. No. 791,945
Int. Cl.[5] B01F *7/20*
U.S. Cl. 366—247 **13 Claims**

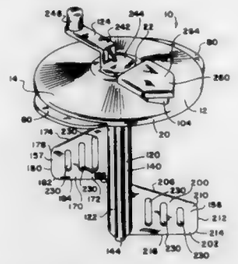
1. Apparatus for sealing a liquid container, comprising:

a sealing member with integral spout;

a stirring member rotatably connected to the sealing member;

a spout top constructed and arranged to seal the spout;

with the stirring member including a paddle member and a crank member, the paddle member fixed for corotation about a central axis at a top end to the crank member; and with the paddle member having a shaft depending from a



bearing element to a lower end, the bearing element being in close proximity to the sealing member, the shaft having a cross-section defined by four U-shaped lobes spaced equally about the central axis.

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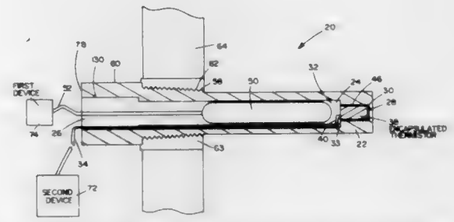
IMMERSION WELL ASSEMBLY

Stanley J. Mauric, 1210 Roundhill Rd., Baltimore, Md. 21218

Filed Nov. 19, 1990, Ser. No. 615,623
Int. Cl.[5] G01K *1/14, 5/32*
U.S. Cl. 374—143 **45 Claims**



1. A fluid vessel temperature sensing method, said method comprising the steps of:

providing an immersion well assembly including an elongate member having a longitudinal cavity and first and second temperature sensors longitudinally arranged in the cavity and on a longitudinal axis of the cavity, wherein one of the first and second sensors is disposed in a distal pocket of the cavity;

threading the elongate member into a preexisting threaded opening in a wall of a fluid vessel and thereby into a threaded-in position; and

when in the threaded-in position, the first sensor transmitting a temperature thereby sensed of fluid in the vessel to a first device and the second sensor transmitting a temperature thereby sensed of fluid in the vessel to a second device.

5,199,790

BATTERY-POWERED TEMPERATURE INDICATOR FOR FAUCET

Manfred Pawelzik, Soest, and Heinz Brandebusemeyer, Menden, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany

Filed Jun. 4, 1992, Ser. No. 894,726
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1991, 4120348
Int. Cl.[5] G01K *1/14, 13/02*
U.S. Cl. 374—147 **10 Claims**

1. A temperature indicator for use in combination with a plumbing fitting through which water passes, the indicator including:

a core assembly including

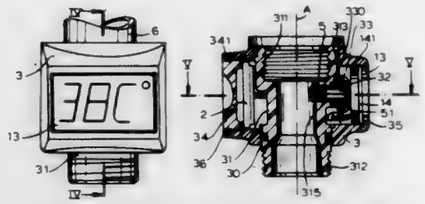
a display,

a circuit module fixed to and driving the display,

a temperature sensor connected to the circuit module,

a pair of long battery contacts connected to the module,

a finger extending from the module and carrying the long contacts, and



a pair of short battery contacts connected to the module in parallel with the long contacts;

an inner housing part interfitting with the fitting, traversed by the water, and formed with a recess in which the sensor is engageable;

a battery connected to one of the pairs of contacts, the other pair being unused; and

an outer housing part mounted on the inner housing part and carrying the core assembly.

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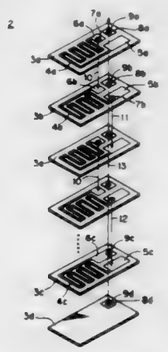
TEMPERATURE SENSOR

Tohru Kasanami; Hiroji Tani, and Shigeki Fujiwara, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 11, 1991, Ser. No. 713,163
Claims priority, application Japan, Jun. 11, 1990, 2-153620
Int. Cl.[5] G01K *7/18;* **H01C** *3/04*
U.S. Cl. 374—185 **5 Claims**



1. A temperature sensor comprising:

a ceramic layered body having a multilayer structure formed of a plurality of ceramic sheets having respective major surfaces;

a plurality of resistive patterns containing copper formed respectively on first major surfaces of said plurality of ceramic sheets;

conductive means series-connecting said plurality of resistive patterns with each other;

a pair of terminals connected respectively to both ends of said series-connected plurality of resistive patterns; and

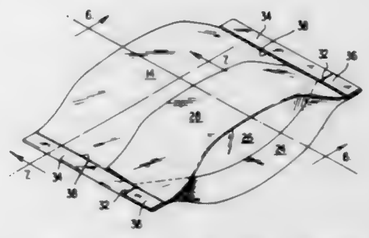
said plurality of ceramic sheets containing an unreducible ceramic material selected from the group consisting of $Al_2O_3.CaO.SiO_2.MgO.B_2O_3$, cordierite, $ZnO.MgO.Al_2O_3.SiO_2$, $SiO_2.B_2O_3$ glass + Al_2O_3, and $BaO.SiO_2.Al_2O_3.CaO.B_2O_3$.

5,199,792

SANDWICH POUCH

Paul D. Roosa, Saugerties, N.Y., assignor to International Paper Company, Purchase, N.Y.

Filed Oct. 18, 1991, Ser. No. 779,468
Int. Cl.[5] B65D *30/20, 33/24, 27/34*
U.S. Cl. 383—4 **1 Claim**



1. A sandwich pouch formed of a unitary, generally rectangular blank of paper, said pouch being generally rectangular and having upper and lower edges and having ends, said pouch having rear and front walls, internal upper and lower gussets along respective opposite, upper and lower longitudinal edges of the pouch, said gussets extending into the interior of the pouch, each end of the pouch being closed by end seal flaps, the pouch front wall including a top closure flap extending down from the upper longitudinal gusset and terminating in a free edge, said top closure flap free edge being free of adhesive or any latch, the pouch front wall including a lower flap extending up from the lower longitudinal gusset and terminating in a free edge, the rear pouch wall having a longitudinal fold line, said longitudinal fold lien separating the rear wall into two sections whereby that portion of the pouch rear wall above said rear wall longitudinal fold line can be bent rearwardly to permit insertion of a food product in the pouch, a pair of tear lines, each tear line being spaced from a respective end of the pouch, each said tear line being spaced from its respective pouch end by a distance at least equal to the width of its respective end seal flap, whereby when said end seal flaps are removed by tearing said tear lines the pouch can be opened and will lie flat without cutting or peeling or unlatching the free edge of the top closure flap, and whereby the gussets stand substantially upwardly from the flattened pouch to thereby border an object, such as a sandwich, carried within the pouch prior to tearing.

5,199,793

COLLAPSIBLE STORAGE BAG

Chad S. Jackson, 15821 Shamrock La., Ft. Myers, Fla. 33912

Filed May 7, 1992, Ser. No. 879,413
Int. Cl.[5] B65D *33/01*
U.S. Cl. 383—41 **8 Claims**

1. A flexible collapsible storage bag for holding large volumes of liquid designed for rapid filling and for rapid and complete emptying of its liquid contents when the bag rests on an uneven surface fabricated in its empty and collapsed condition in a rectangular shape comprising

an upper sheet of imperious flexible sheeting in a generally rectangular shape,

a lower sheet of impervious flexible sheeting sized similar to the upper sheet in a generally rectangular shape whose outer edges are securely joined to the outer edges of the upper sheet of sheeting to form the storage bag,

an open vent located at the center of the upper sheet of sheeting.

plurality of sealable filling and emptying ports located along

interior and exterior walls defining a central volume for

5,199,796

GAS PRESSURE BEARING

a bearing supporting the shaft and formed with an oil-ring

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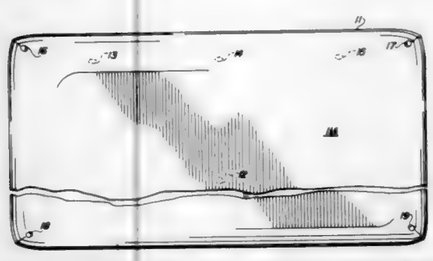
plurality of sealable filling and emptying ports located along one side of the upper sheet of sheeting, and



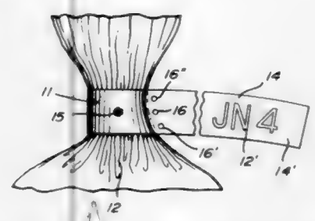
four sealable dragon holes each one located closely adjacent to on of the four corners of the lower sheet of sheeting to insure rapid and complete emptying of the bag's liquid contents when the bag rests on an uneven surface.

5,199,794

PLASTIC BAG WITH REUSABLE NECK CLOSURE BAND

Arnold Lipes, Montreal, Canada, assignor to Pamco, Inc., Lachine, Canada

Filed Jan. 31, 1992, Ser. No. 828,506
Int. Cl.[5] B65D *33/28*
U.S. Cl. 383—71 **7 Claims**



1. The combination of a plastic bag and a reusable neck closure band for said plastic bag, said band being formed of a plastic material and comprising a neck retention portion for retaining a bunched neck portion of said bag and opposed free band portions; said neck retention portion being attached to said bag by a heat fused attachment, and detachable sealing means interconnecting said free band portions together adjacent said bunched neck portion to restrain said bunched neck portion, said detachable sealing means being disconnected by pulling said free band portions away from one another and from said seal means to cause said sealing means to detach to free said bunched neck portion of said bag, said bag being reclosable by tieing said free band portions together about a reformed bunched neck portion.

5,199,795

PACKAGING FOR SHIPMENT AND CONTAINMENT OF HAZARDOUS WASTES

Joseph D. Russo, Palo Alto, and Laurence M. Russo, Oakland, both of Calif., assignors to Rousseau Research, Inc., Palo Alto, Calif.

Continuation of Ser. No. 534,725, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 278,585, Dec. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 257,725, Oct. 14, 1988, Pat. No. 4,969,750. This application Jan. 10, 1992, Ser. No. 821,267
Int. Cl.[5] B65D *30/08*
U.S. Cl. 383—113 **13 Claims**

1. A shipping package for safe containment during shipping of a container of hazardous material containing at least one etiologic agent comprising in operative combination:

a) a multi-layer pouch having generally parallel spaced interior and exterior walls defining a central volume for receiving therein a hazardous material secondary container assembly;

b) said multi-layer pouch including as said interior wall a first, interior layer contactable by said container;

c) said interior layer is easily and rapidly permeable throughout its entire interior extent by liquid escaping from said hazardous material container;

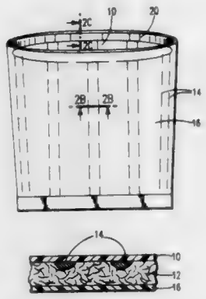
d) said multi-layer pouch including as said exterior wall a second, exterior plastic layer having an external surface in contact with the external ambient environment;

e) said exterior layer is impermeable by said liquid and by hazardous vapors from said hazardous material;

f) a seal flap formed from an extension of one exterior wall layer beyond a terminal edge of said interior layer which is sealable to an opposed exterior wall layer to define an opening to said central volume, said pouch upon sealing closure in the area of said flap completely surrounding and isolating said container;

g) seal means for completely adhesively sealing said package opening in said area of said flap so that said seal is impermeable by said hazardous liquid, or the vapors or an etiologic agent from said hazardous material;

h) a third layer of absorbent cellulosic wadding material disposed secured in a place between said first interior layer and said second exterior plastic layer;



i) said interior permeable layer comprises a fibrous, woven or non-woven material which retains said absorbent wadding layer in place and permits rapid passage of liquid therethrough for absorption by said wadding;

j) said absorbent material extending throughout the entire area of said interior layer which defines said central volume, so that upon closure of said flap, said absorbent material substantially completely encloses said hazardous material container, and upon any accidental release of hazardous liquid from said container during shipping there is absorbent material disposed immediately adjacent to any point of leakage through said permeable interior layer;

k) the density of said absorbent wadding material layer being sufficient to contain broken shards from said hazardous material container;

l) at least a portion of said wadding layer includes wicking channels which aid in the distribution of liquid to portions of said wadding remote from the area of said container from which said liquid is escaping;

m) the volume of said absorbent wadding material layer being sufficient to contain and completely absorb all liquid from said hazardous material upon release from said container while said exterior layer prevents leakage of liquid and vapors to the external ambient environment; and

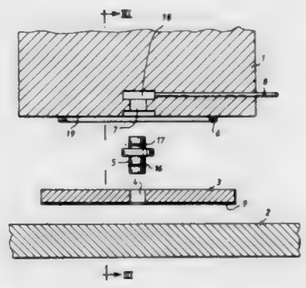
n) said adhesive seal providing direct sealing of said opposed exterior wall layers to each other without contacting said first interior layer and said absorbent wadding material.

5,199,796

GAS PRESSURE BEARING

Eckhard Enderle, Aalen-Dewangen, and Peter Ahnelt, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Jul. 27, 1992, Ser. No. 920,039
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1991, 4125802
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—100 **12 Claims**



1. A gas pressure bearing, formed as a chamber having its bearing side configured as a concave membrane which is deformable by bearing pressure, comprising:

a base element connected to a machine component and supported by said bearing;

said deformable concave membrane being a disk having a through bore positioned at its center;

a circular support mounted to said base element for supporting said disk without being fixed to said disk;

a bore formed in said base element inside said circular support, said bore communicating with a gas inlet; and

a cylindrical insert having a bore,

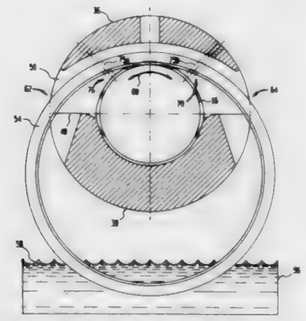
said cylindrical insert being configured to be received and fitted within said bores of both said base element and said disk in a form-locking manner.

5,199,797

OIL RING AND OIL-RING GUIDE SYSTEM FOR SLEEVE BEARINGS

Robert R. Burke, Cincinnati, Ohio, assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Feb. 12, 1992, Ser. No. 834,444
Int. Cl.[5] F16C *17/12*
U.S. Cl. 384—406 **9 Claims**



1. An oil-ring guide system comprising:

a shaft elongate along a shaft axis and mounted for rotation about the shaft axis in at least one direction;

a bearing supporting the shaft and formed with an oil-ring slot;

an oil reservoir mounted below the bearing; and

an oil ring received within the slot, supported by and encircling the shaft, and dipping into the reservoir, whereby rotation of the shaft in said direction causes rotation of the oil ring in the same direction so that the oil ring carries oil from the reservoir into the bearing for lubrication thereof;

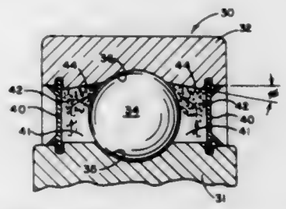
the slot being shaped with a protrusion extending towards the oil ring on at least one side of the oil ring to assist in guiding the oil ring, and the protrusion having a dimension that is small compared to the dimension of the slot in the direction of rotation of the oil ring, thereby reducing the drag on the oil ring and increasing the rotational speed of the oil ring in relation to the rotational speed of the shaft and increasing the amount of oil delivered to the bearing at a given rotational speed of the shaft.

5,199,798

BEARING WITH TAPERED LANDS

James S. Porter, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Jan. 27, 1992, Ser. No. 825,950
Int. Cl.[5] F16C *33/66*
U.S. Cl. 384—462 **15 Claims**



1. A bearing assembly comprising

inner and outer bearing races disposed in coaxial relation to each other for relative rotational movement,

a plurality of rolling elements interposed between said inner and outer races,

said bearing races each being formed with lands extending outwardly from opposite axial sides of said rolling elements,

annular sealing means between said inner and outer races on opposite axial sides thereof,

said lands and annular sealing means defining annular chambers on opposite axial sides of said rolling elements,

a quantity of lubricant within said chambers for lubricating said rolling elements and inner and outer bearings for facilitating relative movement, and

said lands of at least one of said bearing races extending axially outwardly from said rolling elements in similarly tapered relation to the axis of said inner and outer races for facilitating circulation of said lubricant during relative movement of said inner and outer races.

5,199,799

BALL BEARING AND HEAD POSITIONING APPARATUS

Yoshimi Masuda, Yokohama; Masakazu Sasaki, Sagamihara, and Kiyoshi Satoh, Fujisawa, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1991, Ser. No. 792,995
Claims priority, application Japan, Nov. 15, 1990, 2-307333
Int. Cl.[5] F16C *33/66, 33/38*
U.S. Cl. 384—470 **18 Claims**

1. A ball bearing assembly, comprising:

an first inner race;

an first outer race positioned coaxially with and facing said first inner race;

5,199,801

is fitted at the other end thereof in the corresponding other

storing a dot pattern of a row and a number of repetitions of

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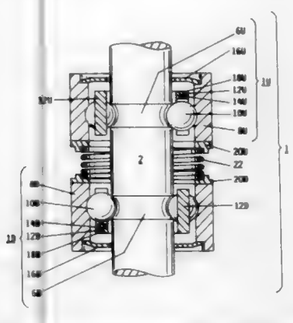
a first plurality of balls positioned between said first inner race and said first outer race; and

a first ball retainer, wherein said retainer contains a plurality



of holes extending through said retainer, through which a controlled quantity of grease is fed to said balls, said retainer preventing said grease from contacting said balls except by passage though said plurality of holes.

5,199,800

BEARING BUSHING FOR UNIVERSAL JOINTS

Bernard Bauer, Hassfurt; Werner Jacob, Frankfurt, and Martin Schepp, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 777,602

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, 9014393[U]

Int. Cl.[5] F16C *33/58*

U.S. Cl. 384—473 **6 Claims**

1. Bearing busing for universal joints, made of thin plate and consisting of a cylindrical sleeve and a bottom wall formed integrally with the sleeve, characterized in that the bottom (**8**, **30**) of the bearing bushing (**2**, **29**, **35**) is flat near its outer edge and is provided with several stamped areas (**16**) distributed around the periphery to form crimps, the lateral surfaces of said crimps (**17**) forming an acute angle alpha, the diameter of the circle surrounding the outer surfaces (**18**) being approximately equal to the diameter of the lateral surface of the cylindrical sleeve (**19**), and the juncture between the base surfaces (**18***a*) of the crimps (**15**) and the cylindrical sleeve (**19**) having a predetermined radius R whereby stress fractures are minimized at the base surfaces (**18***a*) of the crimps (**15**) and the cylindrical sleeve (**19**).

5,199,801

TWO ROW ANGULAR-CONTACT ROLLER BEARING

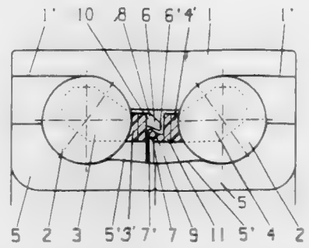
Martin Grehn, Dittelbrunn, and Norbert Kretzer, Donnersdorf, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Nov. 1, 1991, Ser. No. 786,270

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1990, 4037270

Int. Cl.[5] F16C *33/38*

U.S. Cl. 384—506 **17 Claims**



1. A two row angular contact rolling element bearing, having an outer ring, an inner ring radially inward of and spaced from the outer ring, two axially separated rows of bearing rolling elements between the outer and inner rings and a respective rolling element separator for the rolling elements of each row;

at least one of the rings of the bearing is axially divided into two axial sections, a respective one of the rows of rolling elements rolls over each section of the divided ring;

each of the separators for a respective row of rolling elements includes a respective resilient material collar which projects axially in the direction toward the other separator, the collars on the separators interlocking to each other as the separators are moved together to position the respective rows of rolling elements in the rings, the separator collars interlocking loosely to permit each separator and the respective rolling element row to rotate independently of the other separator and its respective rolling element row;

each divided ring section having means thereon located axially inward of the respective row of rolling elements for being engaged by and for positioning the row of rolling elements in the separator and the ring section.

5,199,802

NONSEPARABLE THRUST BALL BEARING

Tsutomu Shinohara, Osaka; Susumu Takei, and Shuichi Yoshino, both of Tokyo, all of Japan, assignors to Fujikin Inc., Osaka, Japan

Filed Nov. 27, 1991, Ser. No. 798,717

Claims priority, application Japan, Nov. 30, 1990, 2-129996[U]; Jul. 16, 1991, 3-055117[U]

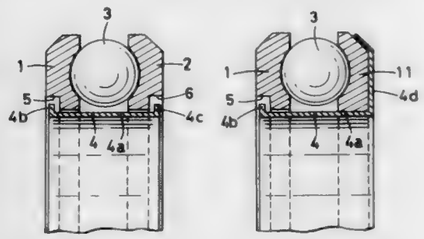
Int. Cl.[5] F16C *33/64, 33/58*

U.S. Cl. 384—617 **2 Claims**

1. A nonseparable ball bearing comprising a pair of races spaced apart in the direction of axis of rotation of the bearing, a plurality of balls rollable between the pair of races, and a connecting ring rotatably interconnecting the inner peripheries of the pair of races, the connecting ring comprising a hollow cylinder portion, and outer flanges formed at the respective ends of the cylinder portion approximately at a right angle therewith and in engagement with the respective races, the cylinder portion of the connecting ring being fitted at one end thereof in the corresponding one of the races with a clearance formed therebetween, the flange of the connecting ring at said one end thereof being fitted in a cutout formed in the corresponding race, with a clearance provided in the cutout around the flange, wherein the cylinder portion of the connecting ring

is fitted at the other end thereof in the corresponding other race with a clearance formed therebetween, and the flange of the connecting ring at the other end thereof is fitted in a cutout portion formed in the corresponding other race, with a clearance provided in the cutout portion around the flange.

2. A nonseparable ball bearing comprising a pair of races spaced apart in the direction of axis of rotation of the bearing, a plurality of balls rollable between the pair of races, and a connecting ring rotatably interconnecting the inner peripheries of the pair of races, the connecting ring comprising a hollow cylinder portion, and first and second outer flanges formed at the respective ends of the cylinder portion approximately at a right angle therewith and in engagement with the respective races, the cylinder portion of the connecting ring being fitted at one end thereof in the corresponding one of the races with



a clearance formed therebetween, the first flange of the connecting ring at said one end thereof being fitted in a cutout formed in the corresponding race, with a clearance provided in the cutout around the flange, wherein the cylinder portion of the connecting ring is fitted at the other end thereof in the corresponding other race in intimate contact therewith, and the second flange of the connecting ring at the other end thereof has a first portion extending a first length from said cylinder portion, a bent portion, and a second portion, wherein said first portion is connected by said bent portion to said second portion so that said second portion is inclined at an acute angle toward said first flange and is held in contact with the outer side surface of the corresponding other race along the length of the first portion and the second portion, whereby the connecting ring is fixed at the other end thereof to the other race.

5,199,803

METHOD OF COMPRESSING AND EXPANDING DOT-MATRIX CHARACTER

Tadao Shimizu, and Toshikazu Itoh, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00965, § 371 Date Mar. 21, 1991, § 102(e) Date Mar. 21, 1991, PCT Pub. No. WO90/03272, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 22, 1989, Ser. No. 667,381

Claims priority, application Japan, Sep. 26, 1988, 63-238780

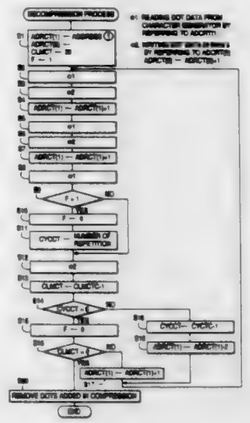
Int. Cl.[5] B41J *2/485*

U.S. Cl. 400—121 **3 Claims**

1. A method of compressing a dot matrix character which is arranged such that dots are not present in two successive adjacent columns of one and the same row, comprising the steps of:

adding a dot in such a column that the column just before thereof has a dot in the same row so as to obtain a dot matrix character in which dots are successive in two columns and in the same row, in order to generate a dot matrix character in which the same dot pattern is present in plural successive columns;

storing a dot pattern of a row and a number of repetitions of the dot pattern in a character generator when the same dot



pattern continues in successive columns in order to compress and store the dot matrix character.

5,199,804

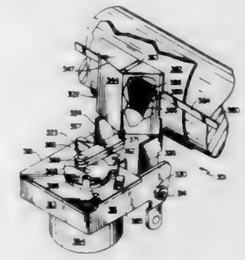
QUIET IMPACT PRINTER MECHANISM

Roger J. Rimbey, Spencer, and Stephen M. Pawlak, Cortland, both of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Continuation-in-part of Ser. No. 708,554, May 31, 1991. This application Oct. 24, 1991, Ser. No. 782,045

Int. Cl.[5] B41J *1/34, 7/34*

U.S. Cl. 400—160 **23 Claims**



1. An impact printer mechanism for driving a selected character pad of a print element to print a character on a sheet medium supported by a platen, the mechanism comprising:

a print hammer including a mass weight which supports a mounted anvil thereon, said mass weight includes a plate having a surface projecting a plurality of letter spaces in a plane parallel to said platen and includes having a maximum dimension in a direction perpendicular to said platen substantially behind said anvil; and

a rotary drive means including a rotary member having an axis of rotation, and means coupled to said rotary member at a point of connection and to said print hammer for actuating said print hammer to cause printing, said point of connection of said means coupled to said rotary member moving concentrically about said axis of rotation of said rotary member.

a cylindrical pushrod housing pipe **6** inserted in the con-

b) bearing means on the second end and the stem of said

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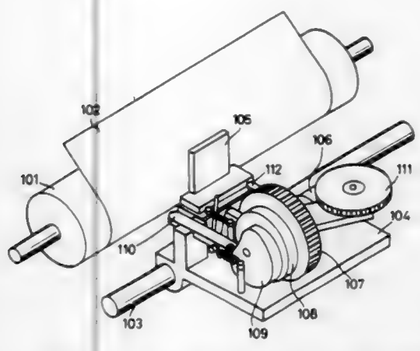
5,199,805

IMAGE RECORDING APPARATUS AND INK SHEET CASSETTE APPLICABLE THEREIN

Kenji Kawazoe, Kawasaki, and Yoshio Uchikata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 501,437, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 15,141, Feb. 17, 1987, abandoned. This application Aug. 22, 1991, Ser. No. 751,562
Claims priority, application Japan, Feb. 18, 1986, 61-31808; Feb. 18, 1986, 61-31809; Aug. 6, 1986, 61-184551
Int. Cl.[5] B41J *35/04, 2/325*
U.S. Cl. 400—248 47 Claims



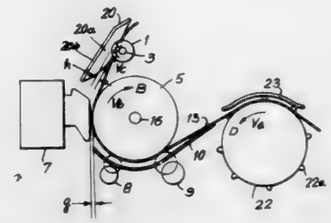
1. An image recording apparatus for recording an image on a record medium, said apparatus comprising:
a mounting section for detachably mounting an ink sheet containing ink thereon comprising a main body and a movable element movable with respect to said main body;
ink sheet conveying means for conveying the ink sheet mounted on said mounting section;
recording means for affecting the ink sheet mounted on said mounting section to record an image on the record medium, said recording means shiftable between an affecting position for affecting the ink sheet and a retracting position retracted from said affecting position, said recording means comprising a portion contacting said movable element for moving said movable element during shifting between the affecting position and the retracting position.
driving means for shifting said recording means between said affecting position and said reacting position;
displacing means provided downstream of said recording means with respect to a conveying direction of the ink sheet and shiftable so as to select a conveyance route of the ink sheet for recording or a conveyance route of the ink sheet for correcting an image on the record medium in response to receiving recording information or correction information, wherein said displacing means comprises:
means for engaging the ink sheet when a conveyance route of the ink sheet for correcting an image is selected and for disengaging the ink sheet when a conveyance route of the ink sheet for recording is selected; and
means for engaging and disengaging said movable element, wherein when said movable element engaging and disengaging means engages said movable element, said movable element and ink sheet engaging and disengaging means are shifted, in response to movement of said movable element during shifting of said recording means, so that said ink sheet engaging and disengaging means moves from engagement to disengagement from the ink sheet or from disengagement to engagement with the ink sheet; and
a motor for imparting a driving force to said driving means.

5,199,806

APPARATUS FOR FEEDING INDIVIDUAL SHEETS OF PAPER AS WELL AS CONTINUOUS FAN FOLD PAPER UTILIZING A PLATEN

Satoshi Fujioka; Tatsuya Seshimo, and Koichiro Yokoyama, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 494,998, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 210,440, Jun. 23, 1988, abandoned. This application Dec. 12, 1990, Ser. No. 626,378
Claims priority, application Japan, Jun. 30, 1987, 62-163495; Jun. 30, 1987, 62-163496; Jul. 15, 1987, 62-176404; Jul. 15, 1987, 62-176405
Int. Cl.[5] B41J *11/28*
U.S. Cl. 400—616 11 Claims



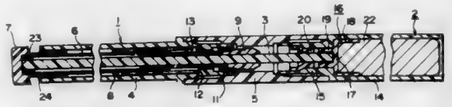
1. A paper feeding apparatus for a printer utilizing fanfold paper having holes along the edges thereof comprising a frame, a cylindrical platen having an upstream side and a downstream side rotatably supported on said frame, paper feeding means for feeding paper towards said platen, said paper feeding means being supported at the upstream side of the platen, driving means for driving the platen, roller means located at the downstream side of the platen, said roller means being coupled to the driving means to rotate with a circumferential speed greater than or equal to the circumferential speed of the platen, and pressing means for pressing the fanfold paper fed out from the upstream side of the platen to the roller means after printing, the roller means including at least one paper feed-out roller and a guide cover plate having a plurality of ribs extending therefrom, the ribs being adjacent the paper feed-out roller with each rib being separated at its side from the paper feed-out roller by a predetermined distance and each rib overlapping the paper feed-out roller by a predetermined distance whereby friction applied by the roller means draws out the paper from the printer.

5,199,807

KNOCKING TYPE SOLID COSMETIC CONTAINER

Masaki Uchida, Gunma, Japan, assignor to Mitsubishi Pencil Co., Ltd., Japan

Filed Jul. 15, 1991, Ser. No. 729,656
Claims priority, application Japan, Jul. 13, 1990, 2-74433[U]; Jul. 13, 1990, 2-74434[U]; Jul. 13, 1990, 2-74435[U]; Jan. 28, 1991, 3-7749[U]
Int. Cl.[5] A45D *40/02, 40/20*
U.S. Cl. 401—65 1 Claim



1. A knocking type solid cosmetics container which comprises:
a container main body 1 comprising a first tubular shaft 4 and a second tubular shaft 5;

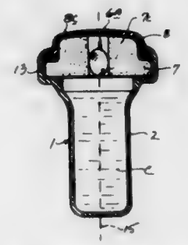
a cylindrical pushrod housing pipe 6 inserted in the container main body 1, a rear end thereof being projected out with a given length from the container main body 1;
a delivery chuck 9 fixedly provided on a front end of the pushrod housing pipe 6, a frontward outer periphery portion of said chuck 9 being flared and said delivery chuck being formed with wedge-shaped slits widening frontward;
a pushrod 3 inserted passing through into the pushrod housing pipe 6 and the delivery chuck 9;
a tubular cartridge 2 having a pushrod holding member 20 therein;
a piston 16 contained axially movably in the cartridge 2 and having a pushrod receiving portion; and
wherein said pushrod 3 is of such length that, when the container main body 1 and the cartridge 2 are first connected, the pushrod 3 is capable of pushing out the piston 16 by a given distance.

5,199,808

DEVICE FOR APPLICATION OF A LIQUID OR PASTY PRODUCT TO A SURFACE

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 607,668, Nov. 1, 1990, Pat. No. 5,064,306. This application Aug. 28, 1991, Ser. No. 755,516
Claims priority, application France, Nov. 30, 1989, 89 15781
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] A46B *11/02;* A46D *40/00*
U.S. Cl. 401—133 11 Claims



1. A device for the application of a liquid or pasty product, comprising a receptacle having a dispensing opening, a deformable applicator attached about said opening and separated from said receptacle by a tearable cover, said receptacle including means for perforating said cover disposed between said cover and said applicator, said means for perforating comprising a mobile, ellipsoidal shaped body, said device including a retaining element for said body to retain said body in a selected position relative to said cover and to allow a user to apply pressure to said deformable applicator to move said body to perforate said cover at said selected position whereupon said body will fall into said receptacle.

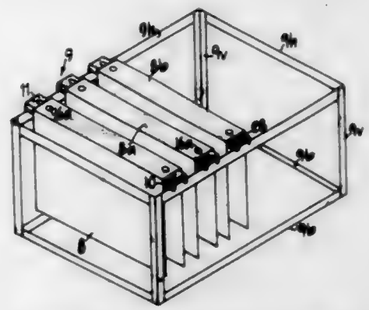
5,199,809

SUSPENDING CLIP FOR HANGING BINDER

Joseph K. Semerjian, 1890 S. Locust St., Des Plaines, Ill. 60018

Filed Apr. 30, 1992, Ser. No. 876,648
Int. Cl.[5] B42F *3/00*
U.S. Cl. 402—4 3 Claims

1. In a ring binder for hanging on a rack including an arched casing, a fastener eyelet housing having two ends and a stem with the first end secured to said casing and having a cover with an outside surface and an inside surface, the improvement comprising
a) the fastener eyelet housing having its second end abutting the surface of the cover;
b) bearing means on the second end and the stem of said fastener housing;
c) a slidable clip suitably mounted on the bearing means of said fastener housing which clip in turn comprises
i) a planar housing portion having two halves separated by a slot with two ends, one slot end having an opening therein, its slot configured to receive said fastening



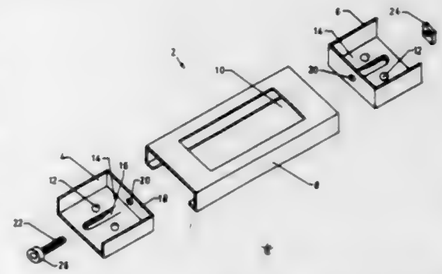
housing stem, said halves resiliently separable a sufficient distance to increase the opening at one end of the slot to allow the fastener housing stem to pass through the opening; and
ii) lips adjacent the housing portion for engaging the rack whereby the clip can be placed on the binder for hanging on a rack and the clip can thereafter be removed from the binder.

5,199,810

CLAMP FOR JOINING TWO SECTIONS OF COUNTERTOP

Luke B Williams, 2525 Concession #2 West, Lyndon, Ontario, Canada L0R 1T0

Filed Aug. 22, 1991, Ser. No. 748,514
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—13 8 Claims



1. A butt clamp for use in joining two sections of countertop for use in kitchens and the like, each section of countertop having an upper surface and a substrate with a lower surface, said clamp comprising two shoes, longitudinal alignment means for said shoes, means for attaching one shoe to the substrate of one section of the countertop and means for attaching the other shoe to the substrate of the other section of the countertop at a location for appropriately joining the two sections while the two shoes are aligned with one another, said shoes being slidable relative to said alignment means, means for forcing the shoes longitudinally closer to one another while maintaining said alignment, thereby joining the two sections of countertop.

5,199,811

second inclined guide notch to push said second stud into

to-face relationship, means fastening the tire side walls in said

said upper load cell element in either of said first and

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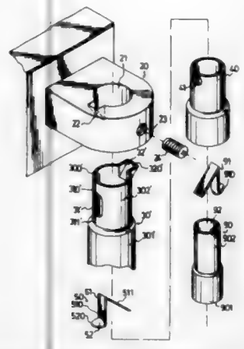
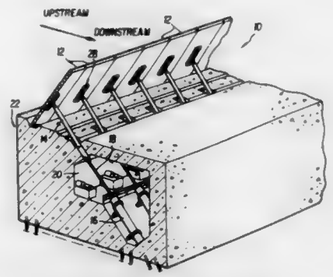
5,199,811
TELESCOPIC CONSTRUCTION
En-Liung Huang, 7th Fl., No. 97, Le-Li Rd., Taipei City, Taiwan
Filed Mar. 11, 1991, Ser. No. 667,037
Int. Cl.[5] F16B 7/12
U.S. Cl. 403—108 2 Claims



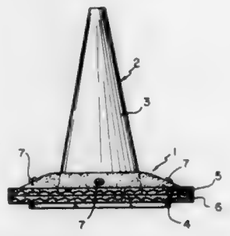
1. A telescopic construction, comprising:
a first tubular section having a first base portion and a first restricted tube portion extending upwardly from said first base portion, aid first restricted tube portion being provided with an axially extending slot;
a guide seat having a central through hole and a first inclined guide notch extending downward from a top side of said guide seat and communicated with said through hole, said first restricted tube portion extending into said through hole such that an upper portion of said axially extending slot directly faces said first inclined guide notch;
said guide seat having a radial threaded bore communicated with said through hole, said telescopic construction further comprising a threaded stud received in said threaded bore to lock said guide seat on said first restricted tube portion;
a second tubular section having a second base portion and a second restricted tube portion extending upwardly from said second base portion, said second tubular section being slidably disposed inside said first tubular section, said second restricted tube portion having a first radial hole aligned with said axially extending slot;
a first positioning member disposed inside said second restricted tube portion and having a first stud biased to project through said first radial hole and said axially extending slot;
said first stud engaging said first inclined guide notch and an upper end of said axially extending slot when said second tubular section is expanded from said first tubular section, the downward movement of said second tubular section relative to said first tubular section causing said first inclined guide notch to push said first stud into said first radial hole to disengage said first inclined guide notch, thereby retracting said second tubular section into said first tubular section;
said first restricted tube portion having a second inclined guide notch extending downward from a top end of said first restricted tube portion;
a third tubular section having a third base portion and a third restricted tube portion extending upwardly from said third base portion, said third tubular section being slidably disposed inside said second tubular section, said third restricted tube portion having a second radial hole axially aligned with said second inclined guide notch; and
a second positioning member disposed inside said third restricted tube portion and having a second stud biased to project through said second radial hole;
whereby, the downward movement of said third tubular section relative to said second tubular section causes said second inclined guide notch to push said second stud into said second radial hole to retract said third tubular section into said second tubular section.

5,199,812
HYDRAULIC FIXED STRUT GAME
Byron K. McClellan, Salem, Ind., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 10, 1991, Ser. No. 757,372
Int. Cl.[5] E02B 7/42
U.S. Cl. 405—101 20 Claims



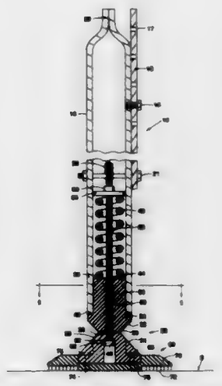
1. A movable dam gate system, comprising:
a sill disposed in a moving body of water, the sill having a dry internal gallery chamber formed therein;
a wicket gate means mounted to an upper surface of the sill for maintaining or regulating a pool of water within the body of water;
hinge means attaching the wicket gate means to the sill for providing a pivotal connection therebetween, the hinge means being attached to the gate means and sill at upstream portions thereof;
a movable strut mounted to the sill at a fixed angle thereto and having a distal end movably connected to the wicket gate means, said strut forming a watertight seal with said sill; and
hydraulic means disposed within the gallery chamber and comprising an hydraulic cylinder and piston rod for lifting the wicket gate means, the piston rod being connected to an anterior end of the fixed strut, force for lifting the wicket gate means being transmitted from the hydraulic means through the strut to the gate means.

5,199,813
WEIGHTS FOR ROAD MARKERS
Yaacov Nagler, 7300 Pyle Rd., Bethesda, Md. 20817
Filed Apr. 30, 1992, Ser. No. 876,451
Int. Cl.[5] E01F 9/00
U.S. Cl. 404—9 4 Claims



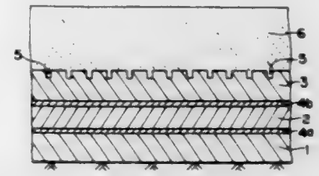
1. A weight for a road marker comprising, a plurality of discarded tire side walls, said side walls being stacked in face-to-face relationship, means fastening the tire side walls in said stacked relationship to provide a laminate structure, said road marker having a base portion for supporting the road marker on the ground, said laminate structure being mounted on said base, to thereby stabilize the road marker against being displaced on its side.

5,199,814
IMPACT RECOVERY DELINEATION SYSTEM
Richard O. Clark, Austin, and Richard M. Milton, San Antonio, both of Tex., assignors to Flexco, Austin, Tex.
Continuation-in-part of Ser. No. 664,000, Jan. 18, 1991, abandoned. This application Mar. 8, 1991, Ser. No. 667,185
Int. Cl.[5] E01F 9/00
U.S. Cl. 404—10 29 Claims



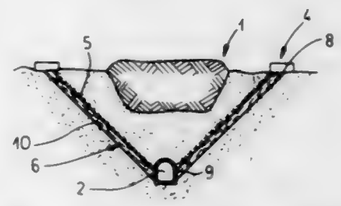
1. A self-uprighting delineation system comprising:
(a) a base means adapted to be supported by any suitable structure;
(b) a tubular delineator post of polymer composition;
(c) a pivotal load cell having supported connection with said base member and having supporting connection with said delineator post and further comprising:
(1) upper and lower load cell elements, each having a flat abutment face disposed in abutting relation and forming an abutment joint, said load cell elements each forming a cable passage, cross-section dimensioned in a first direction slightly greater than a single cable diameter and in a second perpendicular direction slightly greater than two cable diameters, said cable passage having radiused edges intersecting said flat abutment faces in said second perpendicular direction and having straight edges along said flat abutment faces in said first direction, said radiused edges and said straight edges cooperating such that said upper load cell element is capable of preferably pivoting in alignment with said first direction at said abutment joint relative to said lower load cell element;
(2) a pair of wire rope cables disposed in close fitting side-by-side relation and extending through said vertically aligned passages of said upper and lower load cell elements, said wire rope cables being capable of bending as said upper load cell is pivoted at said abutment joint and resisting tensile elongation and cooperating with said radiused edges and said straight edges to prevent relative rotation of said load cell elements while minimizing the bending and uprighting force required to pivot said upper load cell element in said first direction at said abutment joint relative to said lower load cell element; and
(3) at least one compression spring placing said wire rope cables under predetermined tensile load, said compression spring being further compressed upon pivoting of said upper load cell element in either of said first and second directions and developing an uprighting force urging said upper and lower load cell elements and said delineator post to the vertically aligned and properly oriented positions thereof.

5,199,815
FLOOR STRUCTURE FOR INDOOR ARTIFICIAL SKIING GROUND
Masanori Inoue, and Susumu Kishi, both of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Jul. 2, 1991, Ser. No. 722,330
Int. Cl.[5] E01C 5/22
U.S. Cl. 404—18 11 Claims



1. A floor structure for indoor artificial skiing ground, comprising;
a concrete base plate constructed on foundations;
a first waterproof covering disposed on said base plate;
a heat insulation layer located on said first waterproof covering;
a second waterproof covering disposed on said heat insulation layer;
a concrete pressing plate located on said second waterproof covering; and
a plurality of drainage ditches formed on top of said pressing plate.

5,199,816
SYSTEM FOR ISOLATING A DUMP
Friedrich W. Paurat, Kasselweg 29, D-4230 Wesel 1, and Roland Paurat, Blumenstrasse 11, D-4230 Wesel 13, both of Fed. Rep. of Germany
Filed Jun. 5, 1991, Ser. No. 710,429
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018822; Jun. 12, 1990, 4018824; Aug. 17, 1990, 4026048; Nov. 13, 1990, 4036103
Int. Cl.[5] B09B 1/00
U.S. Cl. 405—129 3 Claims



1. A method of isolating a dump sitting on the ground, the method comprising the steps of:
driving a tunnel driven longitudinally through the ground underneath the dump;
installing an array of perforated drainage pipes through the ground and each having a lower end opening into the tunnel and an upper end at the surface;
installing a perforated service tube inside each drainage pipe;

5,199,818

lower face enabling said side element simply to be placed on ground;

with its longitudinal axis generally parallel to the longitudinal axis of the torso of the diver, and

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providing a water barrier in the ground around the drainage pipes by injecting waterproofing material into the ground around the drainage pipes from the perforations of the service pipes and drainage pipes;

cutting underneath the barrier a slit having a lower end at the tunnel and an upper end at the surface; and

backfilling the slit with a water-impervious mass.

5,199,817

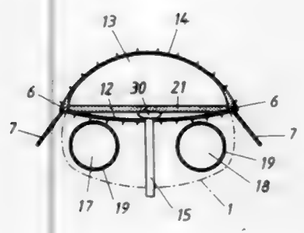
PROCESS OF PROVIDING AN ELONGATE UNDERGROUND CAVITY

Harald Wagner, Mauthausen, and Alfred Schulter, Linz, both of Austria, assignors to Mayreder Consult of the United States, Inc., Bowie, Md.

Filed Apr. 28, 1992, Ser. No. 875,247
Claims priority, application Austria, Sep. 4, 1991, 1744/91
Int. Cl.[5] E21D *9/00*
U.S. Cl. 405—139 **9 Claims**

1. A multi-stage process of excavating a large-volume, elongate underground cavity extending in a longitudinal direction and having a predetermined final cross-section comprised of a top segment extending over the largest width of the cavity cross-section and a bottom segment, which comprises the sequential steps of

(a) first excavating two laterally spaced galleries in the top segment in the longitudinal direction, only one of the galleries being excavated at any given time in any given cross-section of the top segment and each one of the galleries having side faces including an outer side face corresponding to a side face of the final top segment cross-section,



(b) lining the side faces of the galleries, the outer side faces being lined with permanent linings having a bottom edge,

(c) excavating the ground between the two galleries in the top segment to complete the excavation of the top segment,

(d) connecting the permanent linings of the outer side faces by a central permanent lining to form a load-bearing vault over the top segment, and

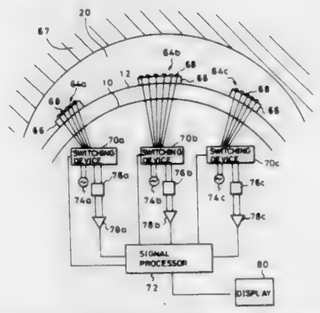
(e) finally, protected by the load-bearing vault, excavating the bottom segment and permanently lining the side faces and bottom of the excavated bottom segment.

5,199,818

METHOD AND APPARATUS FOR DETECTING COLLAPSE OF NATURAL GROUND IN SHIELD DRIVING METHOD

Masahiko Yamamoto; Kanji Shibatani, both of Hiratsuka; Hiroaki Yamaguchi, Isehara; Yasuo Kanemitsu; Tetsuya Shinbo, both of Hiratsuka; Tomoyuki Abe, Fujisawa; Yasuhiko Ichimura, and Shoichi Sakanishi, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP91/00317, § 371 Date Nov. 6, 1991, § 102(e) Date Nov. 6, 1991, PCT Pub. No. WO91/14078, PCT Pub. Date Sep. 19, 1991
PCT Filed Mar. 8, 1991, Ser. No. 773,560
Claims priority, application Japan, Mar. 9, 1990, 2-58373
Int. Cl.[5] E02D *5/00;* **E21D** *9/00*
U.S. Cl. 405—142 **10 Claims**



1. A method for detecting a collapse of natural ground in a shield driving method comprising:

using a measurement electrode row of dipole electrodes and a reference electrode row of Wenner electrodes, which rows are provided on an outer surface of a shield machine;

obtaining a measurement resistivity map from combinations of electrodes in said measurement electrode row and also obtaining a reference resistivity map corresponding to said measurement resistivity map by calculating, from said reference electrode row, certain resistivities of the natural ground and the thickness of a strate boundary; and

obtaining a variation ratio map by calculating the ratios of measured values of said measurement resistivity map with respect to calculated values of said reference resistivity map, thereby detecting a collapsed condition of the natural ground.

5,199,819

SEMI-BURIED STRUCTURE FORMED ON A MOUNTAINSIDE

Marcel Matiere, 17, avenue Aristide Briand, 15000 Aurillac, France

Filed Jun. 21, 1991, Ser. No. 719,008
Claims priority, application France, Jun. 22, 1990, 90 07877
Int. Cl.[5] E21D *9/00*
U.S. Cl. 405—149 **4 Claims**

1. A semi-buried covered structure for protecting a subgrade extending on a mountainside along a longitudinal axis, said structure being constructed entirely from precast concrete elements and being constituted by a succession of adjacent sections positioned sequentially along said longitudinal axis, each of said sections consisting of three precast elements, namely,

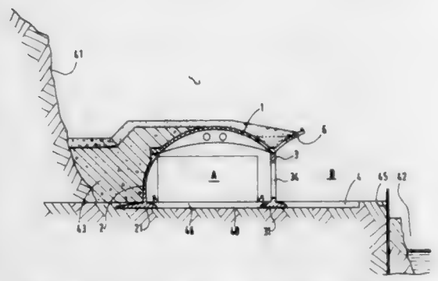
(a) two side elements, respectively placed on both sides of said subgrade, including an uphill side element and a downhill side element, each of said side elements comprising

(i) a base in the form of a widened footing with a plane lower face enabling said side element simply to be placed on ground;

(ii) a substantially vertical wall; and

(iii) an upper portion in the form of a longitudinal stringer; and

(b) an upper covering element consisting of a shell in the shape of a cylindrical sector associated with at least one transverse stiffening rib formed on an inner side of said shell and extending in a plane perpendicular to said longi-



tudinal axis and forming a substantially undeformable rigid unitary piece with said upper covering element;

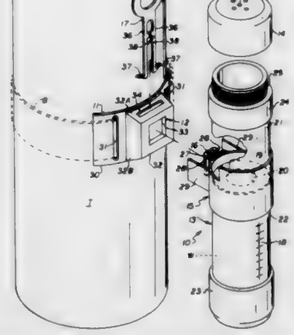
(c) said substantially vertical wall of said uphill side element being solid and inwardly curved, an outer side of said upper portion comprising a widened portion of triangular cross section forming said longitudinal stringer and comprising a horizontal face on which is formed a corresponding portion of one of said articulated bearings of said covering element.

5,199,820

ATTITUDE ADJUSTING APPARATUS FOR SCUBA DIVERS

Joseph J. Nicklo, 11110 Vanderford, Houston, Tex. 77099

Filed Apr. 22, 1991, Ser. No. 688,307
Int. Cl.[5] B63C *11/02*
U.S. Cl. 405—186 **21 Claims**



1. An attitude adjusting apparatus for use by scuba divers to automatically vary the position of ballast relative to the diver's center of buoyancy as the attitude of their body underwater changes comprising;

an elongate weight receptacle having a longitudinal axis,

said weight receptacle adapted to be releasably carried in close proximity to the center of buoyancy of the diver with its longitudinal axis generally parallel to the longitudinal axis of the torso of the diver, and

a mass of small independently free-moving weights movably carried by said weight receptacle which are distributed over varying areas along the length thereof relative to the diver's center of buoyancy as the longitudinal axis of the diver's body changes relative to a horizontal axis,

said weights comprising means for distributing said weight mass evenly over an area along the length of said weight receptacle at the approximate center of buoyancy when the diver is in a horizontal position, at the forward lowermost portion of said weight receptacle forward of the center of buoyancy as the diver assumes a descending head-down position, and at the rearward lowermost portion of said weight receptacle rearward of the center of buoyancy as the diver assumes an ascending head-up position, and

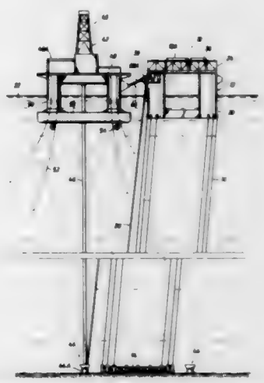
said free-moving weights become stabilized at various areas along the length of said weight receptacle upon the diver maintaining a desired angular swimming position.

5,199,821

METHOD FOR CONDUCTING OFFSHORE WELL OPERATIONS

David A. Huete, Spring, and Lee K. Brasted, Kingwood, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 624,866, Dec. 10, 1990, abandoned.
This application Jul. 24, 1992, Ser. No. 919,630
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—202 **28 Claims**



1. A method for conducting offshore well operations, comprising:

installing a compliant platform in substantially vertical alignment with a selected well site;

restraining an offshore drilling vessel with respect to the compliant platform;

positioning the offshore drilling vessel over the selected well site, comprising:

driving the compliant platform out of substantially vertical alignment with the selected well site; and

substantially vertically aligning a drilling derrick of the offshore drilling vessel over the selected well site and securing this position for well operations while continuing to restrain the position of the offshore drilling vessel with respect to the compliant platform; and

conducting well operations from the offshore drilling vessel through a riser.

5,199,822

of the longwall mining equipment during longwall shield recovery and the geotextile being positioned facing an

by the intersection of said chip face with respective side sur-

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5,199,822

METHOD FOR FILLING LAND AREAS WITH A MATERIAL COMPRISING SOIL AND SPENT LIME

Robert V. Rogers, 8177 Crawford, Washington, Mich. 48094

Filed Jan. 22, 1992, Ser. No. 823,988
Int. Cl.[5] C09K 17/00
U.S. Cl. 405—263 8 Claims

1. A method for filling land areas including the steps of:
generating a substance consisting essentially of spent lime (**14**) which is substantially non-reactive and will not absorb an appreciable amount of water;
intermixing said substance consisting essentially of substantially non-reactive spent lime (**14**) with soil (**18**) to form a substantially non-reactive composite fill material (**22**); and
filling a land area (**24**) with the composite fill material (**22**) to create a solid soil base.

5,199,823

AQUEOUS RESIN PREPARATIONS AND A PROCESS FOR STABILIZING ROCK AND PLUGGING CAVITIES

Heinz Mueller, Monheim; Claus-Peter Herold, Mettmann; Stephan von Tapavicza, Erkrath, and Edmund Edel, Filderstadt, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf and E. Epple & Co. GmbH, Stuttgart, both of Fed. Rep. of Germany

PCT No. PCT/EP90/00353, § 371 Date Nov. 6, 1991, § 102(e) Date Nov. 6, 1991, PCT Pub. No. WO90/10780, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 3, 1990, Ser. No. 761,902
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3907989
Int. Cl.[5] E02D 3/12; E21B 33/138
U.S. Cl. 405—264 17 Claims

1. An aqueous composition for stabilizing rock or plugging of cavities in tunnel construction and mining, said composition comprising an acid catalyzable resin selected from the group consisting of melamine, urea-formaldehyde, and mixtures thereof, and a viscosity stabilizer for said resin selected from the group consisting of zeolite NaA, hydroxysodalite, and mixtures thereof, said viscosity stabilizer serving to extend the storage life and usefulness of said composition.

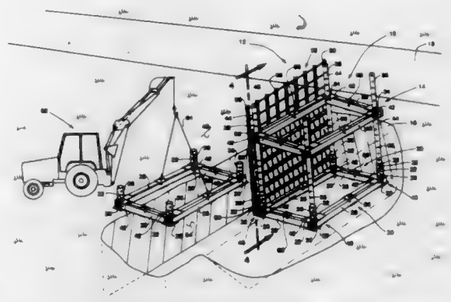
8. The process of stabilizing rock or plugging of cavities in tunnel construction and mining, comprising injecting into said rock or cavities an aqueous composition comprising a resin selected from the group consisting of melamine, urea-formaldehyde, and mixtures thereof, an acid catalyst for said resin, and a viscosity stabilizer for said resin selected from the group consisting of zeolite NaA, hydroxysodalite, and mixtures thereof, said viscosity stabilizer serving to extend the storage life and usefulness of said composition.

5,199,824

EXCAVATION SHORING SYSTEM

Jeffrey F. M. Smith, 82 Reynolds Mill Rd., York, Pa. 17403, and Vincent T. Rice, 3361 W. Canal Rd., Dover, Pa. 17315

Filed Aug. 3, 1992, Ser. No. 923,519
Int. Cl.[5] E21D 5/12; E02D 17/00
U.S. Cl. 405—282 7 Claims



1. An excavation shoring system comprising in combination a modular support frame assembly having a plurality of interconnected longitudinal and lateral beam members said longitudinal beam members respectively provided with a cable connecting eye bolt centrally intermediate the ends thereof for ease of lifting for installation within an excavation depression at a use installation site wherein vertically displaced assembly of a second plurality of interconnected longitudinal and lateral beam members upon a plurality of vertical frame posts in turn respectively having a regularly spaced plurality of vertically aligned pin openings respectively adapted to insertably receive a connecting pin cooperatively installed within corresponding pin openings within said vertical frame posts to retain said vertically displaced assembly of said second plurality of interconnected longitudinal and lateral beam members at a uniform vertically disposed position upon said vertical frame posts and thereby provide a vertical support profile for said modular support frame assembly whereby a plurality of shoring grids are supportable leaned against the sides thereof when erectably installed within said excavation depression, said shoring grids comprising the plurality thereof in turn being provided with a successive plurality of shoring grid elongated pockets respectively adapted to slidably receive and support a shoring plank to provide additional excavation depression shoring support and thereby further in turn provide worker and equipment safety from excavation depression wall cave in hazard.

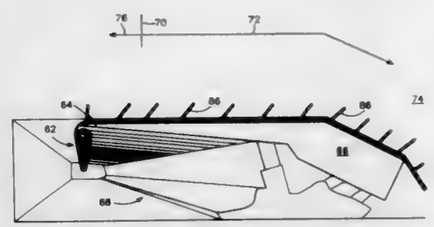
5,199,825

GRID COMPOSITE FOR LONGWALL SHIELD RECOVERY IN UNDERGROUND COAL AND TRONA MINES

Brian E. Travis, Hampton, Ga., assignor to The Tensar Corporation, Morrow, Ga.

Filed Dec. 6, 1991, Ser. No. 803,444
Int. Cl.[5] E21D 23/03
U.S. Cl. 405—296 8 Claims

1. A system for longwall shield recovery, said system comprising:
longwall mining equipment for cutting sections of a longwall face of a mine and said longwall mining equipment being advanced for subsequent cuts,
a longwall screening package for supporting a roof above the longwall mining equipment during advancement of the longwall mining equipment,
said longwall screening package including a grid composite formed of a polymer geogrid secured to a geotextile at interstitial nodes of the polymer geogrid, said polymer geogrid being positioned above and facing caving shields of the longwall mining equipment during longwall shield recovery and the geotextile being positioned facing an overhead gob whereby the geotextile aids in preventing cutting through by the overhead gob of the geogrid located below the geotextile.

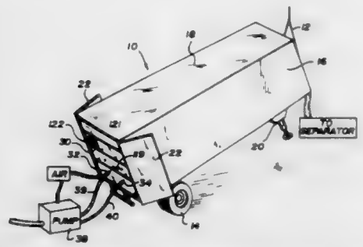


5,199,826

PUMP UNLOADING TRAILER CONTAINER FOR POWDERED BULK MATERIAL

James C. Lawrence, 851 Harrison, Valparaiso, Ind. 46383

Filed Feb. 14, 1992, Ser. No. 836,785
Int. Cl.[5] B60P 1/60
U.S. Cl. 406—41 3 Claims



1. A converted trailer for transportation of powder bulk material of the type which may be subject to clodding or clumping during transport, said converted trailer comprising a conventional box trailer of the type that has a front, rear and rear wheel carriage and a floor, comprising means enclosing the interior of said trailer to make it substantially leak-proof to such powder bulk material, a vent from the top front of the interior of the trailer, exit means at the rear bottom of the interior of said trailer, and gas injection means for injecting gas at the floor of said trailer to fluidize such material therein during unloading, said means for injecting including a larger number of gas injection points at the floor area adjacent the rear bottom and a smaller number of gas injection points at the floor area near the front of the trailer, said trailer also having means whereby the trailer may be pivoted during unloading about said rear wheel carriage, said means including said rear wheel carriage, so that its floor slants downward toward said exit means during unloading.

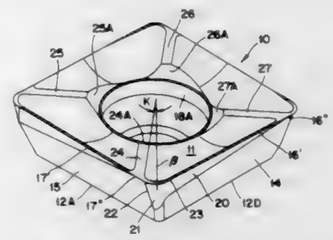
5,199,827

CUTTING INSERT AND CUTTING TOOL FOR CHIP REMOVING MACHINING

Göran Pantzar, Årsunda, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Dec. 3, 1991, Ser. No. 801,873
Claims priority, application Sweden, Dec. 3, 1990, 9003827-4
Int. Cl.[5] B23C 5/20
U.S. Cl. 407—42 23 Claims

1. A cutting insert for chip removing machining of metal workpieces, comprising a body having a polygonal upper chip face, a substantially planar bottom face, and side surfaces intersecting said chip face and corners of said insert and intersecting said chip face and said bottom face, cutting edges being formed by the intersection of said chip face with respective side surfaces, a lower portion of each side surface extending upwardly and outwardly from said bottom face, an upper portion of each side surface being beveled to form a planar clearance face which intersects a respective cutting edge, each clearance face being disposed between two adjacent corners and having a width extending in a direction transversely of said cutting edge, said width being largest adjacent one of said two corners and decreasing toward the other of said two corners, said insert including a strengthening land extending inwardly from said cutting edge, at least a portion of each clearance face located adjacent said one corner forming a substantially ninety degree angle with said plane.

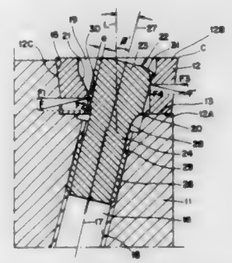


5,199,828

CUTTING TOOL WITH INSERT AND REMOVABLE LOCKING PIN

Karl-Erik Forsberg, Fagersta, and Mikael Jansson, Avesta, both of Sweden, assignors to Seco Tools AB, Fagersta, Sweden

Filed Nov. 19, 1991, Ser. No. 794,513
Claims priority, application Sweden, Nov. 21, 1990, 9003705
Int. Cl.[5] B23B 27/16
U.S. Cl. 407—104 16 Claims



1. A cutting tool for chip removing machining, comprising:
a holder body having an insert-receiving site including a base surface, side supporting surface means extending upwardly from said base surface, and an aperture extending downwardly through said base surface and being inclined toward said side supporting surface means,
a cutting insert seated on said site and including a bottom face engaging said base surface, side face means supported by said side supporting surface means, and a top face having at least one cutting edge, a through-hole extending through said insert from said top face to said bottom face, said through-hole including a cylindrical section and a tapered section disposed above said cylindrical section, said tapered section of progressively reduced cross-section in a downward direction, and
a locking pin insertable through said through-hole and securable in said aperture for releasably securing said insert to said holder and permitting said insert to be removed from, and seated upon, said site without completely detaching

said pin from said holder, said pin including a shank re-

5,199,832

suspendedly supported on a saddle of the drilling machine by

holder having a base body, said gripping sleeve being arranged

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said pin from said holder, said pin including a shank receivable in said aperture, and a head receivable in said through-hole, said head including a first cylindrical portion and a transition surface disposed therebelow, said transition surface being of upwardly expanding cross section, an intersection of said transition surface and said first cylindrical portion pressing against said tapered section of said through-hole at a first contact location disposed proximate said side supporting surface means, said head including a second cylindrical portion pressing against said tapered section at a second contact location situated above and diametrically opposite said first contact location, said second contact location being disposed remotely from said side supporting means, said second cylindrical lower ends by said tapered section of said through-hole, said second contact location being disposed below said top surface, said head applying a force to said insert at each of said contact locations, each of said forces including a downward component.

5,199,829

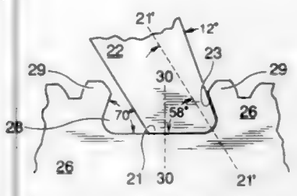
DOVETAIL SHAPER METAL-CUTTING TOOL

Darrell J. Bramwell, 1530 E. 650 N., New Castle, Ind. 47362

Filed Apr. 1, 1992, Ser. No. 861,650

Int. Cl.[5] **B23D** *13/00, 1/26*

U.S. Cl. 407—120 **2 Claims**



1. In a dovetail shaper metal-cutting tool that is utilized in a chip-type machining process to cut into a metal workpiece a specified dovetail-shaped slot having a specified right hand and left hand dovetail angle and a specified bottom dimension, the improvement comprising:

a plurality of cutting teeth at least one of which has both a right hand dovetail cutting edge to cut into the workpiece the specified right hand dovetail angle and a right hand bottom cutting edge that measures at least one-half of the specified bottom dimension of the dovetail slot to cut into the workpiece at least one-half of the specified bottom dimension, and at least one other of which has both a left hand dovetail cutting edge to cut into the workpiece the specified left hand dovetail angle and a left hand bottom cutting edge that measures at least one-half of the specified bottom dimension of the dovetail slot to cut into the workpiece at least one-half of the specified bottom dimension.

5,199,830

PRINTED CIRCUIT BOARD PRESSER DEVICE IN DRILLING MACHINE

Tamio Otani, Hadano; Kazuhiro Kogure, Kawasaki; Kunio Arai, Atsugi; Yasuhiko Kanaya, Machida, and Kazunori Hamada, Inagi, all of Japan, assignors to Hitachi Seiko Ltd., Ebina, Japan

PCT No. PCT/JP90/01559, § 371 Date Aug. 1, 1991, § 102(e) Date Aug. 1, 1991, PCT Pub. No. WO91/08073, PCT Pub. Date Jun. 13, 1991

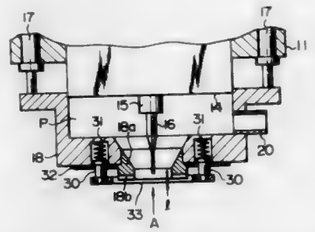
PCT Filed Nov. 30, 1990, Ser. No. 741,427

Claims priority, application Japan, Dec. 1, 1989, 1-310654

Int. Cl.[5] **B23B** *47/34*

U.S. Cl. 408—67 **7 Claims**

1. A printed circuit board presser device for use with a drilling machine, said printed circuit presser device being suspendedly supported on a saddle of the drilling machine by cylinders such that said saddle is slidably fitted on a spindle unit and adapted to communicate with a chip collector, to thereby hold a printed circuit board against a table during a drilling operation, said printed circuit board presser device comprising:



an axially movable upper-plate presser means provided on an outer side of a contact surface of the printed circuit board presser device with the printed circuit board so that a top end surface of the upper-plate presser means extends beyond said contact surface to a side of a table; and

urging means for pressing said upper-plate presser means against the table by a force larger than an attraction force generated by the printed circuit board presser device.

5,199,831

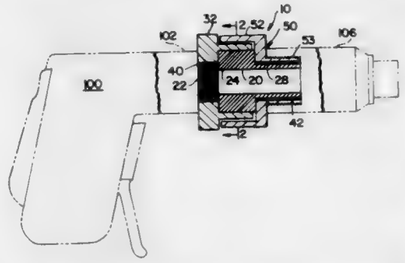
INFINITELY POSITIONABLE NOSE COUPLING

Robert Brouckson, Columbia, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 3, 1992, Ser. No. 829,198

Int. Cl.[5] **B23B** *49/02*

U.S. Cl. 408—72 R **10 Claims**



1. A coupling for use between a drill housing and a nose piece, said coupling comprising:

means for attachment to the drill housing, said means for attachment consisting of a hollow inner race;

means for attachment to the nose piece, said means for attachment consisting of a hollow outer race; and

means for providing infinitely rotatable positioning of the nose piece with respect to the drill housing, said means for provision consisting of a plurality of rollers positioned between said hollow inner race and said hollow outer race.

5,199,832

MULTI-COMPONENT CUTTING ELEMENT USING POLYCRYSTALLINE DIAMOND DISKS

Alexander K. Meskin, 2985 Morningside Dr., Salt Lake City, Utah 84117, and Clifford R. Pay, 2056 S. 775 West, Woods Cross, Utah 84087

Continuation of Ser. No. 148,495, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 794,569, Nov. 4, 1985, abandoned, which is a continuation of Ser. No. 593,123, Mar. 26, 1984, abandoned. This application Aug. 17, 1989, Ser. No. 395,177

Int. Cl.[5] **E21B** *10/58;* **B23B** *27/20*

U.S. Cl. 408—145 **14 Claims**

1. A cutting structure for a rotary drag bit for earth boring, comprising:

a cutting slug fixedly mounted on said bit and including a substantially planar cutting surface, said slug comprising:

a plurality of laterally juxtaposed thermally stable polycrystalline diamond cutting elements in the shape of cylindrical discs having mutually parallel axes; and

a metal matrix binder laterally interposed between said cylindrical discs and defining with the ends thereof said substantially planar cutting surface predominantly comprising said ends.

5,199,833

HAND HELD POWER TOOL WITH REMOVABLE TOOL HOLDER

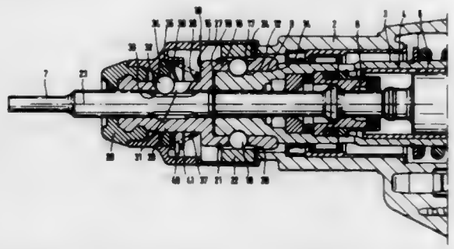
Siegfried Fehrle; Wilfried Kabatnik, both of Leinfelden-Echterdingen; Manfred Back, Nuertingen, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 3, 1992, Ser. No. 816,817

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1991, 4100186

Int. Cl.[5] **B23B** *31/107, 45/16*

U.S. Cl. 408—239 R **7 Claims**



1. A hand held power tool, comprising a rotatable spindle; a tool holder arranged on said spindle; a tool inserted in said tool holder; locking means fixing said tool holder with said spindle and engaging both in said tool holder and said spindle; a rotatable ring holding said locking means in its locking position and provided with depressions for receiving said locking means in it snot locking position; and a gripping sleeve connected with said ring and operating simultaneously as an actuating member for unlocking said tool inserted in said tool holder, said tool holder having a base body, said gripping sleeve being arranged rotatably and axially displaceably on said base body of said tool holder.

5,199,834

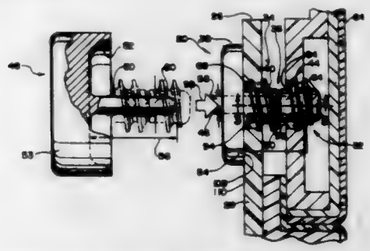
AIR BAG STUD

Richard Seidl, and Michael D. Marvell, both of Rockford, Ill., assignors to Textron Inc., Providence, R.I.

Filed Jan. 14, 1992, Ser. No. 820,514

Int. Cl.[5] **F16B** *19/00, 31/00, 35/00;* **B21D** *39/00*

U.S. Cl. 411—5 **23 Claims**



1. A fastener for releasably retaining a first member in relation to a second member, said fastener being frangible for fracturing upon the application of a predetermined tensioning force thereto permitting first and second members to which said fastener is engaged to be displaced, said fastener segments being retained in the first and second member after fracture; said fastener comprising a shank, a first and a second segment of said shank, frangible means spaced along said shank between said first and second segments for providing a predetermined fracture point between said first and second segments, helical engaging means on an outside surface of said first and second segments for engaging first and second members, respectively; said first and second segments being individually captively retained in a first and a second member to which said fastener is engaged, respectively, after being fractured at said frangible means upon the application of a predetermined tensioning force thereto.

5,199,835

BOLT TENSION INDICATOR

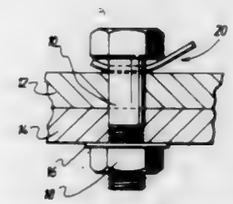
Arthur M. Turner, Beeley Hill Top, Matlock, Derbyshire DE4 2NW, England

Filed May 27, 1992, Ser. No. 888,844

Claims priority, application United Kingdom, Jun. 13, 1991, 9112785

Int. Cl.[5] **F16B** *31/02;* **G01L** *5/00*

U.S. Cl. 411—11 **4 Claims**



1. A bolt tension indicator made of spring steel and comprising an annular washer part having at its periphery at least one tab element projecting radially outwards, the annular washer part in its free condition having a concave cross section so that said at least one tab element, continuous with the radially outermost part of the washer, projects at an angle to the general plane of the washer, such that, when a proper tension is applied thereto in a bolted connection, the one tab element lies

longitudinal axis of the screw in the direction of the thread lead

age compartment in either of said first and second col-

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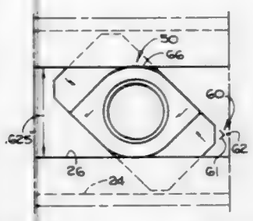
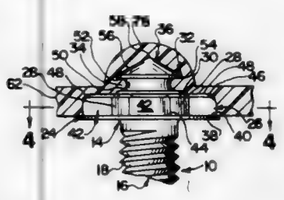
flat against a clamping face to indicate a proper tension in the fastening and the at least one tab element moves away from said clamping face upon a reduced tension in the fastening to so indicate said reduced tension.

5,199,836
T-NUT
Brian J. Gogarty, 385 S. Liberty, Elgin, Ill. 60120
Filed Apr. 13, 1992, Ser. No. 867,344
Int. Cl.[5] F16B *27/00, 37/00*
U.S. Cl. 411—84 **10 Claims**



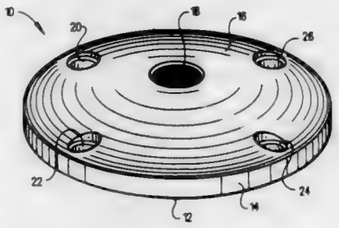
1. A T-nut for use in a machine tool having an integral mass table with a T-slot therein having a lower wide portion and an upper narrow portion, and further having upper flat surfaces extending from the upper narrow portion to the sides of the lower wide portion, the T-nut comprising,
a one-piece, integral, solid member including a lower relatively large head and an upper relatively small shank,
the head having a length substantially greater than its width, its length being nearly but less than the width of the lower wide portion of the T-slot, thereby enabling a free sliding fit therein and its width being substantially equal to the width of the upper narrow portion of the T-slot,
the T-nut thereby being capable of being inserted into active position in the T-slot by aligning its length with the length of the T-slot and moving it downwardly thereinto in direction perpendicular thereto and turning it substantially a quarter-turn about a vertical axis,
when the T-nut is in said active position, the head being positioned in the lower wide portion of the T-slot and the shank being positioned in the upper narrow portion thereof, and
the shank being shaped to operably engage the side surfaces of the upper narrow portion of the T-slot to prevent turning the T-nut beyond said quarter-turn,
the head having flat top surfaces extending throughout their extent from the shank to their outer ends.

5,199,837
ULTRASONIC INSERT STUD AND METHOD OF ASSEMBLY
David Goss, Rockford, Ill., assignor to Textron Inc., Providence, R.I.
Filed Oct. 16, 1991, Ser. No. 777,741
Int. Cl.[5] F16B *39/00*
U.S. Cl. 411—107 **22 Claims**



1. A stud for ultrasonic insertion into a strip of plastic material, the stud comprising a body portion defining a head portion adapted for ultrasonic insertion into the strip, and a threaded portion for use in attaining clamping engagement with a workpiece; the head portion comprising: a multilobular portion for providing torsional resistance when inserted in the strip; a leading end portion extending from the multilobular portion and in a direction away from the threaded portion; and the leading end portion including: a retaining groove into which strip material will flow upon insertion of the head portion into the strip to resist axial pull out of the head portion.

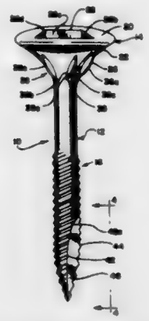
5,199,838
NUT FOR USE ON ROADWAYS, RUNWAYS, IN REINFORCED CONCRETE CONSTRUCTION, AND THE LIKE
David E. Luke, 1009 Delaware Ave., Ft. Pierce, Fla. 34950, and Richard MacAllaster, Box 1121, Marathon, Fla. 33050
Filed Dec. 19, 1991, Ser. No. 810,306
Int. Cl.[5] F16B *37/00, 39/28*
U.S. Cl. 411—140 **20 Claims**



1. A nut, comprising:
a body possessing an upper convex substantially spherically curved surface and a lower concave substantially spherically curved surface;
said upper surface having a radius of curvature substantially less than a radius of curvature of said lower surface;
said upper and lower surfaces connected by a substantially cylindrical side wall;
said body being substantially circular in plan view; and
a substantially cylindrical threaded bore extending substantially centrally through said body.

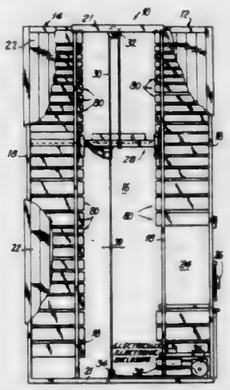
5,199,839
FASTENER SCREW HAVING IMPROVED INSTALLATION AND SELF-LOCKING CHARACTERISTICS
Lon DeHaitre, Arlington Heights, Ill., assignor to Abbott-Interfast Corporation, Wheeling, Ill.
Filed Oct. 9, 1991, Ser. No. 773,516
Int. Cl.[5] F16B *23/00, 25/00*
U.S. Cl. 411—387 **13 Claims**

1. A fastener screw comprising a unitary body having a head portion and an elongated shank coaxial with said head portion, said head portion having a generally planar end surface disposed substantially transverse to the longitudinal axis of said shank and having a drive recess therein, said head portion having an underside defined by a generally concave annular surface interposed between said end surface and said shank, said shank having an external thread thereon terminating in a pointed end to facilitate entry of the screw into a workpiece, said external thread having a generally longitudinal chip relief slot formed therein adjacent said pointed end so as to define a longitudinal cutting edge, and a plurality of outwardly projecting serrations formed about the periphery of said concave surface, each of said serrations extending substantially from said end surface to said shank and being inclined relative to the longitudinal axis of the screw in the direction of the thread lead angle so that said serrations burr into the workpiece and effect



a self-locking action therewith as the screw is threaded into the workpiece.

5,199,840
AUTOMATED STORAGE AND RETRIEVAL SYSTEM
John Castaldi, 785 Carroll St., Brooklyn, N.Y. 11215, and Fred Greenzang, 14 High Pasture Cir., Dix Hills, N.Y. 11746
Filed Aug. 1, 1990, Ser. No. 561,112
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—280 **16 Claims**



1. A storage and retrieval system comprising:
a first plurality of storage compartments successively vertically stacked along a height direction to define a first column;
a second plurality of storage compartments successively vertically stacked along said height direction to define a second column;
said first and second columns being spaced apart in opposed relation to define an access region therebetween;
at least one tray for storage in a storage compartment in either of said first or second columns, said tray having a first and second end spaced apart lengthwise along a longitudinal direction, and having opposite sides spaced apart widthwise along a width direction normal to said height and longitudinal directions;
extraction means disposed in said access region for withdrawing a selected tray from its respective storage compartment in the longitudinal direction, and for inserting the selected tray in the longitudinal direction into a storage compartment in either of said first and second columns;
means for vertically displacing said extraction means along said height direction;
said tray having first engagement means at said first end thereof and second engagement means at said second end, said first and second engagement means for engagement with said extraction means; and
said extraction means comprising:
(i) platform means for supporting said selected tray after withdrawal from its respective storage compartment, said platform means having opposite ends spaced apart lengthwise along a longitudinal direction;
(ii) first extractor rod means for engaging said engagement means at one of the ends of the selected tray;
(iii) second extractor rod means for engaging said engagement means at an other end of the selected tray;
(iv) first and second chain means spaced apart in the width direction for carrying said first and second extractor rod means, said first and second extractor rod means disposed longitudinally between said first and second chain means, each of said first and second chain means being trained about a respective pair of spaced apart rotatable gear means disposed proximate opposite ends of said platform means; and
(v) drive means for simultaneously rotating said first and second chain means and for effecting movement of said first and second extractor rod means towards and away from said selected storage compartment, said rotation of said first and second chain means enabling said first extractor rod means to move vertically along the height direction into said first engagement means for force-transmitting engagement therewith, wherein further rotation of said first and second chain means effects movement of said selected tray longitudinally in a first direction away from its respective storage compartment and onto said platform means, said further rotation effecting concurrent movement of said second extractor rod means longitudinally in a second direction towards said respective storage compartment until said tray is substantially withdrawn from said storage compartment, whereupon continued rotation of said first and second chain means enables said second extractor rod means to move vertically along the height direction into said second engagement means, said second extractor rod means thereby positioned for engagement with said second engagement means, said drive means effecting further rotation of said first and second chain means for moving said selected tray in said first direction fully onto said platform means; and further wherein when said selected tray is disposed on said platform means, additional rotation of said first and second chain means enables further movement of said selected tray into registered insertion in any one of the storage compartment selectively located in either of said columns.

5,199,841
APPARATUS FOR CUTTING OPEN A FIBER BALE STRAP
Walter Von Gehlen, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany
Filed Dec. 11, 1990, Ser. No. 625,454
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1989, 3941856
Int. Cl.[5] B65B *69/00*
U.S. Cl. 414—412 **17 Claims**

1. Apparatus for severing a strap surrounding a fiber bale, comprising
(a) a non-driven, idling cutting disk rotatable at least 360 degrees and having a periphery and a cutting edge on said periphery;

does contacts the ground to form a ramp by means of which a

hydraulic working cylinder having at least one hydraulic line

said lifting means having a pair of plate members to clamp

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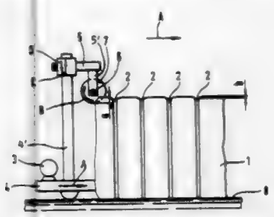
(b) support means for rotatably supporting the cutting disk; and

(c) displacing means for effecting relative movement under mutual pressure between the fiber bale and the cutting



disk for moving and rotating said cutting disk in said fiber bale toward said strap and for severing said strap in a direction generally perpendicular to a length dimension of said strap.

5,199,842

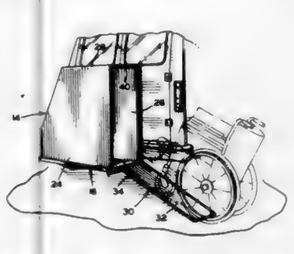
WHEELCHAIR CARRIER

Jerry L. Watt, R.R. #2, Wapakoneta, Ohio 45895, and Dennis J. Watt, Box 7172, Lafayette, Ohio 45854

Filed May 8, 1991, Ser. No. 696,879

Int. Cl.[5] B60P *3/06*

U.S. Cl. 414—537 **12 Claims**



1. A wheelchair carrier comprising connector means for connecting the carrier to a trailer hitch bar, said connector means having a connector body, a bolt for extending downwardly from said body, and first flange means extending downwardly on each side of said body to extend along sides of the trailer hitch bar, a generally rectangular supporting frame having tube means at one portion and slot means at another portion, means pivotally connecting a central edge portion of said frame and said connector means for pivotal movement of said frame between a generally horizontal position and an upright position, means on said connector means and said frame for holding said frame in the upright position, said connector means having an extension affixed to said connector body and extending under a central portion of said supporting frame when said frame is in the horizontal position, and said supporting frame having a central transverse frame member engagable with said extension when said supporting frame is in the horizontal position to aid in rigidly supporting said supporting frame by said connector means, a wheelchair housing supportable on said frame, said housing having tube means at one portion to cooperate with said tube means on said frame, rod means extendible through both of said tube means to connect and disconnect said one portion of said housing relative to said frame, said housing having second flange means at another portion, said second flange means being extendible into said slot means to connect and disconnect the other portion of said housing to said frame, said housing further comprising wall means forming an enclosure to receive a wheel-chair and forming an elongate opening at one end thereof, an elongate, rigid door, hinge means connecting a lower edge of said door and said housing at a bottom edge of said elongate opening, said door having a closed position closing off said elongate opening and an open position in which an upper edge of said door contacts the ground to form a ramp by means of which a wheelchair can be loaded into said enclosure and unloaded therefrom.

5,199,843

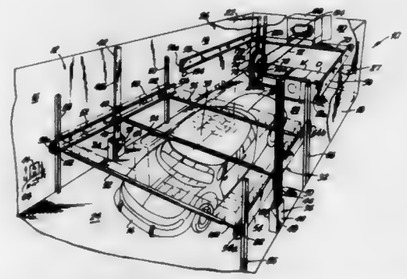
OVERHEAD STORAGE SYSTEM

Carl Sferra, 172 Pritchard Ave., Thornwood, N.Y. 10594

Filed Oct. 4, 1991, Ser. No. 771,775

Int. Cl.[5] B65G *1/06*

U.S. Cl. 414—592 **20 Claims**



1. A storage system comprising:

garage structure means including a garage floor and a ceiling a certain height above said floor, for housing a vehicle which occupies a certain parking space inside the garage structure means when the vehicle is parked on the garage floor;

lift means inside said garage structure means in a region of said parking space for receiving and delivering stored articles other than said vehicle, said lift means comprising storage shelf means for supporting the stored articles, and elevating means arranged to engage left and right sides of said storage shelf means for elevating said storage shelf means between a lower position at which the stored articles can be placed on or removed from the storage shelf means by an individual, and an upper position at which the storage shelf means is supported in a storage area;

wherein the upper position of said storage shelf means is a sufficient height above the lower position of the storage shelf means so that said vehicle can occupy said parking space inside the garage structure means and remain clear of said storage shelf means after said elevating means elevates the storage shelf means to the storage area at said upper position, and

said storage shelf means includes means for enabling the storage shelf means to separate from said elevating means for extending overhead clearance above said parking space to the ceiling of said garage structure means.

5,199,844

QUICK-DISCONNECT COUPLING FOR A MACHINE HAVING A BOOM AND A STICK

Charles P. Gilmore, Jr., Mondamin, Iowa, and James J. Maynard, Marcellus, N.Y., assignors to Gilmore Transporation Services, Inc., Missouri Valley, Iowa

Continuation of Ser. No. 547,943, Jul. 2, 1990, Pat. No. 5,108,252, which is a continuation-in-part of Ser. No. 177,360, Apr. 4, 1988, Pat. No. 4,938,651. This application Apr. 27, 1992, Ser. No. 874,539

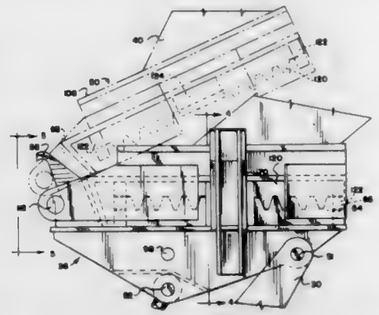
The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] B66C *23/56*

U.S. Cl. 414—694 **21 Claims**

1. In a machine adapted for heavy work including a boom, a stick having a tool for performing heavy work and including a

hydraulic working cylinder having at least one hydraulic line extending therefrom, at least one hydraulic power line on the boom for connection to the hydraulic line on the stick, means for driving the boom and stick, and a quick disconnect coupling between the boom and stick to permit a quick interchanging of sticks, the improvement in the coupling which comprises a male member attached to one of the boom or stick and a female member attached to the other of the boom or stick, said female member comprising a base, grab hook means on one end, aligning means intermediate the ends of the base for guiding alignment of the female member, intermeshing elements on said female member adapted to tightly interfit with elements of like shape on said male member, said intermeshing elements extending generally vertically from the base and toward the elements of like shape as the members come together and being arranged to inhibit both longitudinal and transverse movement between the male and female members, said intermeshing elements and elements of like shape further



including a plurality of slanting flat surfaces, the slanting surfaces of the elements on one member mating with slanting surfaces of the elements on the other member, some of said slanting surfaces slanting in one direction from the vertical and other of said slanting surfaces slanting in another direction relative to the vertical, at least some of the slanting surfaces on each member being angularly turned relative to other of said slanting surfaces on said member, remotely operable locking means on said members for positively locking the members together to maintain said intermeshing elements locked tightly together, and a quick-disconnect hydraulic coupling including a male coupling element and a female coupling element, one of said coupling elements fixedly mounted on one of said members and the other fixedly mounted on the other of said members such that when the members are together in engaging relation the coupling elements will couple, the coupling element on the stick being connected to the hydraulic line for the cylinder and the coupling element on the boom being connected to the boom hydraulic line.

5,199,845

ARTICLE HANDLING MACHINE

Takeshi Hirashima, and Atsuhiko Tazawa, both of Kosai, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 685,679

Claims priority, application Japan, Apr. 19, 1990, 2-41800[U]

Int. Cl.[5] B25J *15/08*

U.S. Cl. 414—744.1 **12 Claims**

1. An article handling machine comprising:

a base having a vertical axis;

a support having a lower end portion mounted on said base for rotation about said vertical axis of said base;

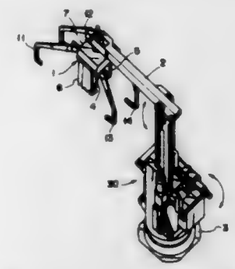
an arm having a proximal end portion pivoted to said support and a distal end portion;

lifting means provide don said distal end portion of said arm for lifting an article and a pallet;

said lifting means having a pair of plate members to clamp the article and pallet holding means to support the pallet;

at least one of said pair of plate members being movable such that said plate members open and close in a first direction, said pallet holding means comprising movable means which open and close in a second direction perpendicular to said first direction;

said lifting means further comprising a frame having an undersurface and drive means for moving said one plate member toward and away from said other plate member in said first direction, said other plate member being fixed to said undersurface;



a hook plate disposed so that said hook plate and said other plate member sandwich said one plate member and the article therebetween;

said hook plate including a lower edge portion and a pawl portion extending from said lower portion toward said other plate member, for holding an article at an undersurface thereof; and

said lifting means further comprising a first cylinder fixed to said frame for moving said one plate member and said hook plate in said first direction, and a second cylinder fixed to said one plate member for moving said hook plate in said first direction with respect to said one plate member.

5,199,846

CENTRIFUGAL FAN WITH NOISE SUPPRESSING ARRANGEMENT

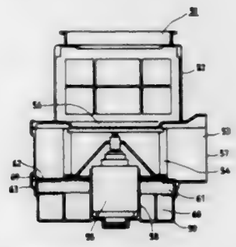
Yoshinori Fukasaku, Hitachi; Mitsuaki Mirumachi, Mito; Katsuhiko Hashimoto, and Susumu Yamazaki, both of Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of Japan

Filed Oct. 22, 1991, Ser. No. 780,240

Claims priority, application Japan, Oct. 22, 1990, 2-282006; Nov. 30, 1990, 2-329155

Int. Cl.[5] F01D *25/04*

U.S. Cl. 415—119 **5 Claims**



1. A centrifugal fan comprising:

a fan rotor,

an electric motor for rotating said fan rotor,

a scroll casing having an inner wall, for accommodating said fan rotor,

of blades of a rotorcraft rotor having a shaft driven in rotation, rotating the ballscrew relative to the propulsor disc, said pitch

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a partition member made of a porous sound absorbing material and facing at least a portion of the inner wall of said scroll casing, and

an air layer disposed behind said partition member and formed between said partition member and the inner wall of said scroll casing, whereby said partition member and said air layer suppress noise caused by rotation of said fan rotor and

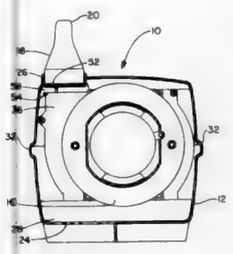
wherein said partition member faces a bottom inner wall of said scroll casing, and wherein said scroll casing includes a first scroll casing member covering said fan rotor and a second scroll casing member located in a bottom portion of said scroll casing, said second scroll casing member including a cylindrical housing located at a center of said second scroll casing member for holding said electric motor and said partition member being located and secured between said first scroll casing member and said second scroll casing member.

5,199,847

BALLOON INFLATOR WITH INVOLUTE CHAMBER AND BYPASS NOZZLE

David C. Nelson, Akron; William E. Bartasevich, Kent; Robert L. Waldo, Southington, and Wesley A. Schroeder, Uniontown, all of Ohio, assignors to Premium Balloon Accessories, Akron, Ohio

Filed Feb. 3, 1992, Ser. No. 829,310
Int. Cl.[5] F04B *35/04*; F03B *1/04*
U.S. Cl. 415—148 **7 Claims**



5. A balloon inflator, comprising:

a bypass motor;

an involute fan chamber adjacent said motor; and

a nozzle movable between engagement with an outlet of said fan chamber to direct air from said fan chamber out of said nozzle and disengagement with said outlet to allow air from said fan chamber to bypass said nozzle, said nozzle having an end slidingly received within a collar of a housing receiving said motor and fan chamber, said end of said nozzle having a flange about a periphery thereof, said flange positioned for selectable sealing engagement with a lip about a periphery of said outlet of said fan chamber.

5,199,848

PORTABLE WATER DRIVEN PUMP

Davorin Kapich, 3111 Serrano Dr., Carlsbad, Calif. 92009

Continuation of Ser. No. 606,868, Oct. 31, 1990, abandoned.
This application May 26, 1992, Ser. No. 890,375
Int. Cl.[5] F01D *9/02*
U.S. Cl. 415—202 **7 Claims**

1. A portable water turbine driven pump for pumping a liquid comprising:

(a) a pump housing;

(b) at least one bearing;

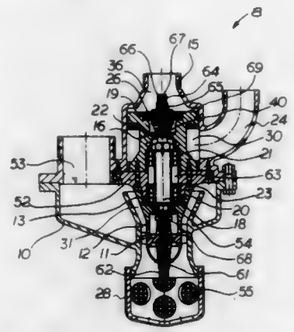
(c) a shaft bearing support means contained in said housing and for supporting said at least one bearing;

(d) a shaft supported by said at least one bearing and defining a shaft axis;

(e) a turbine nozzle body defining a turbine nozzle outlet surface and positioned inside said housing and firmly attached to said housing and comprising a turbine inlet cavity and a plurality of nozzles each of said nozzles providing a passageway for water to pass from said turbine inlet cavity to said turbine outlet surface and defining a nozzle centerline, where each of said nozzle centerlines:

(1) intersect said turbine nozzle outlet surface at points of intersection on a circle defining a nozzle exit circle which circle is concentric about said shaft axis and defines a nozzle exit plane which is perpendicular to said axis and

(2) forms an angle of about 10 to 30 degrees whit said nozzle exit plane;



(f) a driving water inlet means for providing driving water under pressure to said cavity;

(g) a liquid pump solidly attached at one end of said shaft, said pump having an inlet port and an outlet port for the passage of said liquid, said outlet port being non-coaxial with said axis;

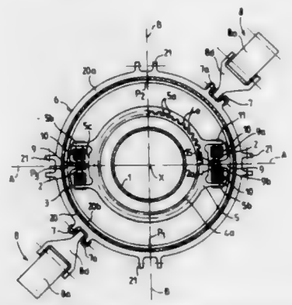
(h) an axial flow water turbine wheel solidly attached at the other end of said shaft and fully submerged in water having a plurality of turbine blades, said wheel and blades being positioned adjacent to said turbine body outlet surface such that water discharged from said nozzles impinge on said blades.

5,199,849

HELICOPTER SWASHPLATE MOUNTED ON ARTICULATIONS UNCOULED IN PITCHING AND ROLLING

Jean-Luc Leman, Aix-en-Provence, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed May 9, 1991, Ser. No. 697,383
Claims priority, application France, May 14, 1990, 90 06009
Int. Cl.[5] B64C *27/605*
U.S. Cl. 416—114 **19 Claims**



1. A device for controlling collective pitch and cyclic pitch

of blades of a rotorcraft rotor having a shaft driven in rotation about an axis, said device comprising:

at least one casing rigidly linked to a structure of the rotorcraft rotor;

at least one lower linking member fixed to said at least one casing, said lower linking member including

a) a tubular disk guide mounted coaxially about said shaft of said rotorcraft rotor, and

b) a disk support mounted about said tubular disk guide to slide along said tubular disk guide;

an upper linking member fixed to said shaft;

at least one ball bearing;

two annular disk assembled by said at least one ball bearing, said two annular disk mounted concentrically about said shaft, one of said two annular disks being a non-rotating disk and another of said two annular disks being a rotating disk, said non-rotating disk immobilized in rotation by said at least one lower linking member, said non-rotating disk mounted to be displaceable in an axial translational motion along said tubular disk guide and mounted to oscillate with respect to said shaft via an articulation mechanism about a longitudinal tilting axis and a lateral tilting axis of said two annular disks, said longitudinal and lateral tilting axis being perpendicular to each other, said rotating disk driven in rotation by said shaft by said at least one upper linkage member, said rotating disk connected to a pitch-control lever of each blade of the rotorcraft rotor by at least one pitch connecting rod;

control members controlling displacement in translational motion of the non-rotating disk along said tubular disk guide and controlling oscillation of said non-rotating disk with respect to said shaft; and

said articulation mechanism includes

two swivel joints arranged in diametrically opposite positions in either side of said axis of rotation of said shaft and arranged on either side of said lateral tilting axis and centered on said longitudinal tilting axis, each swivel joint retained between said disk support and said non-rotating disk so that said non-rotating disk oscillates about said longitudinal tilting axis, and

two linking assemblies rigid against torque stresses about said axis of said shaft and deformable in a direction substantially parallel to said axis of said shaft, each linking assembly mounted between respectively one of said swivel joints and said disk support so that said non-rotating disk oscillates about said lateral tilting axis by differential deformations of said two linking assemblies, wherein said rotating disk follows movements of said non-rotating disk and transmits said movements to said pitch-control levers by said pitch connecting rods.

5,199,850

PITCH STOP ASSEMBLY FOR VARIABLE PITCH PROPULSOR

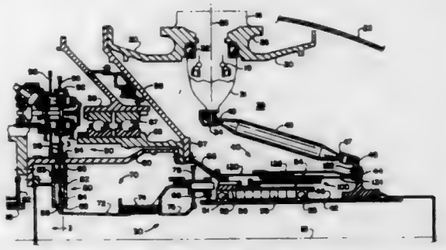
Paul A. Carvalho, Westfield, and Edward H. Kusiak, Longmeadow, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 31, 1991, Ser. No. 738,377
Int. Cl.[5] B63H *1/06*
U.S. Cl. 416—153 **4 Claims**

1. A pitch change system for changing blade pitch on a variable pitch propulsor having a rotatable disc and a plurality of blades mounted to the disc for rotation therewith, each blade further being selectively rotatable about its longitudinal axis for pitch change, said pitch change system comprising a pitch change actuation assembly including a ballscrew being relatively rotatable with respect to the propulsor disc, a ballscrew nut operatively connected to the blades of the propulsor disc and threadably mounted on the ballscrew so as to rotate with the propulsor disc and axially translate along the ballscrew in response to a relative rotation between the ballscrew and the propulsor disc; and a pitch stop assembly; and a pitch change drive assembly operatively associated with the ballscrew of the pitch change actuation assembly for selectively rotating the ballscrew relative to the propulsor disc, said pitch change system characterized in that the pitch stop assembly of the pitch change actuation assembly comprises:

a first stop means having ballscrew nut stop means associated therewith, said first stop means rotating and translating with the ballscrew nut;

second stop means mounted for rotation with the propeller disc, said second stop means having a reverse pitch stop means, a feather pitch stop means, an overspeed pitch stop means and a minimum low pitch stop means associated



therewith, said second stop means disposed in operative relationship with said first stop means whereby translation of the ballscrew nut relative to the ballscrew is precluded upon engagement of said ballscrew nut stop means with any one of said pitch stop means of said second stop means; and

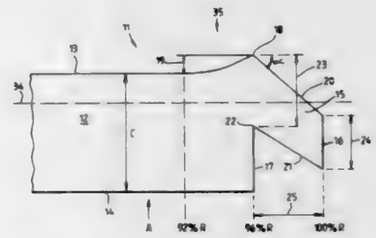
means for selectively rotating said second stop means relative to said first stop means whereby said ballscrew nut stop means may selectively bypass at least one of said feather pitch stop means and said overspeed pitch stop means.

5,199,851

HELICOPTER ROTOR BLADES

Frederick J. Perry, Yeovil, and Alan Brocklehurst, Sherborne, both of England, assignors to Westland Helicopters Ltd., England

Filed Oct. 23, 1991, Ser. No. 781,412
Claims priority, application United Kingdom, Oct. 24, 1990, 9023141
Int. Cl.[5] B64C *11/16, 27/46*
U.S. Cl. 416—223 R **17 Claims**



1. A helicopter rotor blade including a central portion of aerofoil section having a leading edge and a trailing edge defining a chord length and extending between an inner end for attachment to a helicopter rotor hub and an outer end having a chordwise blade edge extending forwardly from said trailing edge through part of a said chord length, and a tip vane of aerofoil section extending outwardly from said outer end, said tip vane having a leading edge swept rearwardly from the central portion leading edge and a trailing edge swept rearwardly from an intersection with said chordwise blade edge, outer ends of said tip vane leading and trailing edges defining

an outer chordwise tip edge defining during operation a one

cut-off, and a second state wherein said first passage is

stream from the flow control orifice and (2) a reference

5,199,856

PASSIVE STRUCTURAL AND AERODYNAMIC

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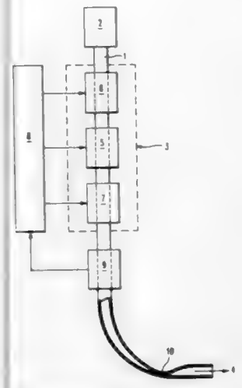
an outer chordwise tip edge defining during operation a one hundred percent operating radius, said tip vane having a mean chord length greater than fifty percent of the chord length of the central portion and a spanwise length greater than fifty percent of the chord length of the central portion whereby in operation approximately equal strength tip vortices are generated at the chordwise blade edge and the outer chordwise tip edge to reduce an acoustic impulse noise normally associated with a vortex trailed from the tip region of helicopter rotor blades.

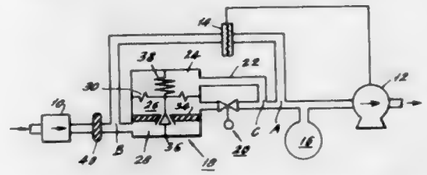
5,199,852
PUMPING ARRANGEMENT FOR INTRAVENOUS SUPPLY OF FLUIDS
Hal C. Danby, Sudbury, England, assignor to Danby Medical Limited, Earls Colne, England
Filed Feb. 12, 1992, Ser. No. 834,384
Claims priority, application United Kingdom, Feb. 14, 1991, 9103165
Int. Cl.[5] F04B *49/06*
U.S. Cl. 417—26 **20 Claims**



1. A pumping arrangement comprising:
means for subjecting fluid to pressure;
input and output controllable valve means for restricting fluid flow provided on a respective input and output side of said subjecting means;
means responsive to fluid pressure in delivery tubing connected in operation between the output controllable valve means and the point of application of the required fluid for detecting an increase in fluid pressure; and
means responsive to increases in pressure detected by said fluid pressure responsive means for controlling both said input and output controllable valve means to open,
whereby fluid under excess pressure in said delivery tubing is released back towards a source of fluid connected in operation to said input controllable valve means.

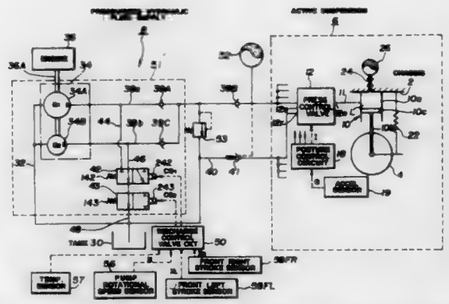
5,199,853
PNEUMATIC FLOW CONTROL SYSTEM
Harvey F. Padden, 5 Iron Forge South, Pompton Lakes, N.J. 07442
Filed Feb. 26, 1991, Ser. No. 660,888
Int. Cl.[5] F04B *45/06*
U.S. Cl. 417—43 **35 Claims**

1. A method of operating a fluid flow control system, comprising the steps of:
intermittently operating a pump at an efficient relatively high flow rate, and thereby causing fluid to flow through a flow control orifice, wherein the pump is operated intermittently as a function of the difference in pressure between (1) the pressure at a first location which is downstream from the flow control orifice and (2) a reference pressure;
maintaining a constant pressure differential across the flow control orifice, and thereby causing the fluid to flow



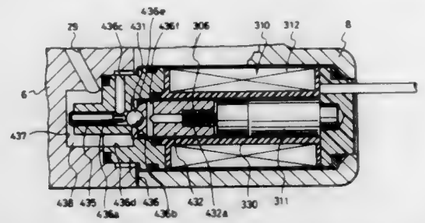
through the flow control orifice at a constant, relatively low flow rate; and
moderating flow through the system between the pump and the first location.

5,199,854
HYDRAULIC SUPPLY ARRANGEMENT FOR USE WITH ACTIVE AUTOMOTIVE SUSPENSION OR THE LIKE
Yutaka Aoyama, Odawara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 5, 1991, Ser. No. 740,384
Claims priority, application Japan, Aug. 8, 1990, 2-211394; Aug. 17, 1990, 2-217948; Aug. 17, 1990, 2-217949
Int. Cl.[5] F04B *49/06*
U.S. Cl. 417—282 **7 Claims**



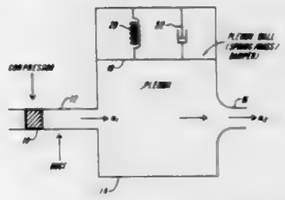
1. A source of hydraulic fluid under pressure comprising:
a first pump;
a first supply passage which is associated with said first pump and which receives the discharge thereof;
a first check valve disposed said first supply passage;
a second pump which has a smaller capacity than said first pump;
a second supply passage which is associated with said second pump and which receives the discharge thereof;
a second check valve disposed in said second supply passage;
a first drain passage which leads from said first supply passage at a location between said first pump and said first check valve;
a second drain passage which leads from said second supply passage at a location between said second pump and said second check valve;
drain passage control means for controlling the communication between said first and second drain passages and a reservoir;
said drain passage control means including:
first and second valves, said first valve being connected with said first and second drain passages and said second valve being fluidly interposed between said first valve and a reservoir, said first valve having a first state wherein said first drain passage is open and said second drain passage is cut-off, and a second state wherein said first passage is cut-off and said second drain passage is open,
said second valve having a first state wherein communication between the first valve and the reservoir is permitted and a second position wherein communication between said first valve and the reservoir is cut-off;
valve control means operatively connected with said first and second valves, said valve control means conditioning said first valve to assume its second state before said second valve is switched from its second state to its first state.

5,199,855
VARIABLE CAPACITY COMPRESSOR HAVING A CAPACITY CONTROL SYSTEM USING AN ELECTROMAGNETIC VALVE
Nobuyuki Nakajima, and Toshio Yamaguchi, both of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan
Filed Jun. 27, 1991, Ser. No. 723,470
Claims priority, application Japan, Sep. 27, 1990, 2-258667; Sep. 29, 1990, 2-102989[U]
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—295 **2 Claims**



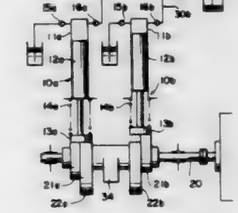
1. In a variable capacity compressor including a suction chamber, a discharging space within which discharge pressure prevails, a control element for determining timing of start of compression of a refrigerant gas, said control element having a pressure-receiving portion, a low-pressure chamber within which prevails suction pressure acting on said pressure-receiving portion of said control element, urging means cooperating with said suction pressure for urging said control element toward a minimum capacity position thereof, a high-pressure chamber within which prevails control pressure acting on said pressure-receiving portion of said control element for urging said control element toward a maximum capacity position thereof, high pressure-introducing passage means for introducing said refrigerant gas from said discharging space into said high-pressure chamber to create said control pressure therein, said high pressure-introducing passage means having a restriction hole for restricting flow of said refrigerant gas, a passage for communicating said high-pressure chamber with said suction chamber, a valve body for opening and closing said passage, a plunger, a coiled spring urging said valve body in a valve-closing direction through said plunger, and an electromagnetic actuator for magnetically attracting said plunger in a valve-opening direction against the urging force of said coiled spring,
the improvement wherein:
said valve body comprises a ball valve; and
passageway means is provided for applying said control pressure to one end of said ball valve of said valve body in said valve-opening direction, and at the same time for applying said control pressure to another end of said ball valve of said valve body in said valve-closing direction.

5,199,856
PASSIVE STRUCTURAL AND AERODYNAMIC CONTROL OF COMPRESSOR SURGE
Alan H. Epstein, Lexington; Edward M. Greitzer, Wayland; Daniel L. Gysling, West Newton; John Dugundji, Belmont, and Gerald R. Guenette, Salem, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Mar. 1, 1989, Ser. No. 317,441
Int. Cl.[5] F04B *11/00*
U.S. Cl. 417—312 **2 Claims**



1. Compressor surge control apparatus for a compressible fluid comprising:
a compressor connected to a plenum including a moveable wall whose motion varies the volume of the plenum, the wall connected to passive elements forming a spring-mass-damper system selected to damp pressure fluctuations in the plenum wherein the moveable wall is a rigid piston sealed with a convoluted diaphragm.

5,199,857
DUAL PLUNGER PUMP SYSTEM
Sannosuke Sanuki, Tokyo, Japan, assignor to Sanuki Kogyo Co., Ltd., Tokyo, Japan
Filed Mar. 3, 1992, Ser. No. 845,318
Claims priority, application Japan, Mar. 15, 1991, 3-75828
Int. Cl.[5] F04B *9/00, 39/00, 49/00, 45/00*
U.S. Cl. 417—319 **2 Claims**



1. A dual plunger pump system comprising a pair of plunger pumps each consisting of a cylinder and a plunger disposed within said cylinder, an intake side passage with a check valve connected to each of said cylinders, a discharge side passage with a check valve connected to each of said cylinders, a pair or short-stroke cams for alternately operating said plungers, a rotary drive shaft for rotating said short-stroke cams, a pair of ling-stroke cams opposite to said respective plungers, and a one-way clutch disposed between said long-stroke cams and said rotary drive shaft and freely rotatable relative to said rotary drive shaft in a first direction of rotation of said drive shaft and is engaged for rotation with said drive shaft in a reverse direction of rotation of said drive shaft for simultaneously transmitting rotary motion of said drive shaft to said

long-stroke cams only when said rotary drive shaft is rotated in

with at least one flow-through opening (45) on a side towards

thane or 1,1-difluoroethane is used as the refrigerant, compris-

ence, both the slide hole and drive pin having generally straight line portions which mate with one another, and a

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long-stroke cams only when said rotary drive shaft is rotated in said reverse direction of rotation.

5,199,858

OIL INJECTION TYPE SCREW COMPRESSOR

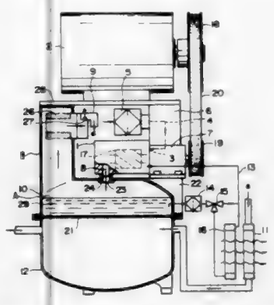
Noboru Tsuboi, Kakogawa; Masaki Matsukuma, Kobe; Kazuo Kubo, Kobe; Terumasa Kume, Kobe; Tsuyoshi Niimura, Kakogawa, and Atsushi Ikeda, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 24, 1991, Ser. No. 735,281

Claims priority, application Japan, Aug. 31, 1990, 2-232187; Nov. 5, 1990, 2-300418

Int. Cl.[5] **F04B** *39/02*

U.S. Cl. 417—362 **4 Claims**



1. An oil injection type screw compressor comprising:

a compressor body;

an oil tank connected to an outlet port of said compressor body for separating lubricating oil from gas discharged from the compressor body and collecting the thus separated lubricating oil, wherein said oil tank has a substantially L-shaped vertical section and is composed of a base portion defining an oil storage portion, and a column portion provided uprightly on said base portion,

a gas exit having an oil separating element and provided in said oil tank at an upper portion of said column portion, wherein said compressor body is disposed on said base portion, and

a reservoir tank formed unitarily with and below the oil tank, including a partition plate separating said reservoir tank from said oil tank.

5,199,859

REFRIGERANT COMPRESSOR

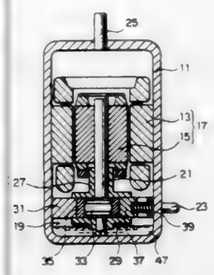
Shoichiro Kitaichi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 17, 1991, Ser. No. 701,890

Claims priority, application Japan, May 17, 1990, 2-127600

Int. Cl.[5] **F04B** *39/12*; **F04C** *29/02*

U.S. Cl. 417—410 R **7 Claims**



1. A refrigerant compressor in which 1,1,1,2-tetrafluoroethane or 1,1-difluoroethane is used as the refrigerant, comprising:

a closed casing in which said refrigerant and a refrigerator oil having compatibility with said refrigerant are received,

a compressing mechanism including a slidable section constructed by combining a first slidable member made of a cast iron having a Vickers hardness within the range of 200 to 300 with a second slidable member made of a carbon steel having a Vickers hardness within the range of 200 to 300 and an average number of crystalline grains per 1 mm^2 within the range of 2000 to 3200, said compressing mechanism being accommodated in said closed casing, and

a motor mechanism for driving said compressing mechanism.

5,199,860

HYDRAULIC RECIPROCATING PISTON PUMP FOR BRAKE INSTALLATIONS OF MOTOR VEHICLES WITH AN ABS SYSTEM

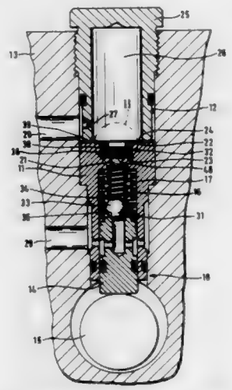
Alwin Stegmaier, Charleston, S.C., assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 13, 1992, Ser. No. 819,738

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1991, 4102803

Int. Cl.[5] **F04B** *21/04*

U.S. Cl. 417—566 **2 Claims**



1. A hydraulic reciprocating piston pump (**10**) for brake installations of motor vehicles with ABS systems, comprising a pump cylinder, a pump piston (**14**) operative within said pump cylinder (**11**), a displacement chamber (**16**) confined by said piston and said pump cylinder, an axially aligned cylindrical recess (**22**) in said pump cylinder, an axially aligned connecting bore (**21**) extending from said pump cylinder to said recess (**22**), a valve (**31**) operative in said displacement chamber (**16**) for admission of a pressure medium from a supply line (**20**) into said displacement chamber (**16**), a valve (**32**) in said recess (**22**), said valve (**32**) includes an inflow side and an outflow side, said valve (**32**) is embodied as a cup sleeve (**36**) with an axially extending sealing lip (**38**) of elastomeric material on the outflow side, which cooperates with a cylindrical sealing face (**39**) formed by an interior periphery of said cylindrical recess, a flat disc (**40**) having perforations (**41**) in an outer edge is associated with a bottom (**23**) of the cylindrical recess (**22**) which has nearly the same diameter as the cylindrical recess, the cup sleeve (**36**) has a disk-shaped body (**37**) which includes a peripheral area which forms the axially extending sealing lip (**38**), a support body (**24**), adapted to an interior contour of the cup sleeve (**36**) maintains axial play for the disk-shaped body (**37**) and radial play for the sealing lip (**38**) engages the cylindrical recess (**22**) on the outflow side of the valve (**32**) and is provided

with at least one flow-through opening (**45**) on a side towards the sealing lip (**38**).

5,199,861

LIFTING TRUCK WITH A TELESCOPIC LIFTING ARM

Amilcare Merlo, Cuneo, and Renato Galfre', San Dalmazzo, both of Italy, assignors to Merlo S.P.A. Industria Metalmeccanica, Cuneo, Italy

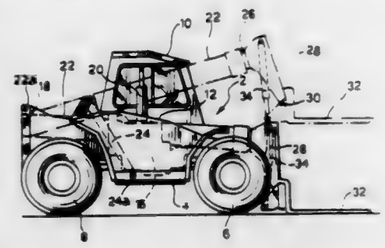
PCT No. PCT/EP88/00647, § 371 Date Jan. 26, 1990, § 102(e) Date Jan. 26, 1990, PCT Pub. No. WO89/00972, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 19, 1988, Ser. No. 458,686

Claims priority, application Italy, Jul. 27, 1987, 53559/87[U]

Int. Cl.[5] **E02F** *3/28*

U.S. Cl. 414—718 **1 Claim**



1. A lifting truck comprising a wheeled structure carrying a lifting arm (**22**) articulated to the rear of the structure about a horizontal axis perpendicular to the longitudinal axis (A—A) of the truck, an internal combustion engine (**16**) supported by the structure for propulsion of the truck and for the operation of the arm (**22**), and an operating and a driving cab (**10**) situated on one side of the structure to one side of the longitudinal axis (A—A), said driving cab including two side windows, the internal combustion engine (**16**) being longitudinally placed, that is with its shaft parallel to the longitudinal axis (A—A) to the cab (**10**) substantially below the line of sight of the operator and is spaced from the cab so as to define with the cab a space (**14**) having a width at least equal to the width of the telescopic lifting arm (**22**), the telescopic lifting arm being articulated to the extreme rear structure of the truck at a height which substantially corresponds to the height of the lower edge of said side windows so that, in its completely lowered position, the arm is partly accommodated in said space (**14**) in a substantially horizontal plane substantially below a horizontal plane tangent to the top of the engine (**16**) so as not to interfere with the view of the operator working in the driving cab.

5,199,862

SCROLL TYPE FLUID MACHINERY WITH COUNTER WEIGHT ON DRIVE BUSHING

Hiroaki Kondo, Aichi, and Takahisa Hirano, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

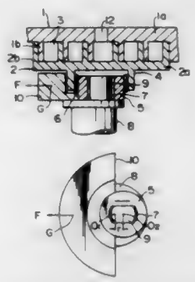
Continuation of Ser. No. 704,196, May 22, 1991, abandoned. This application Sep. 4, 1992, Ser. No. 939,438

Claims priority, application Japan, Jul. 24, 1990, 2-195701; Aug. 28, 1990, 2-89969[U]

Int. Cl.[5] **F01C** *1/04, 17/06, 21/00*

U.S. Cl. 418—55.1 **2 Claims**

1. A scroll type fluid machinery comprising a stationary scroll and a revolving scroll having spiral warps set up at end plates, respectively, the spiral wraps being engaged with each other, a drive bushing being fitted rotatably into a boss projected at a central part of an outer surface of the end plate of said revolving scroll, a drive pin projecting from a rotary shaft being fitted slidably into a slide hole bored in the drive bushing, a cross section of the slide hole having a notched circular shape and the drive pin having a notched circular shape corresponding to the shape of the slide hole but with a smaller circumference, both the slide hole and drive pin having generally straight line portions which mate with one another, and a balance weight being directly attached to the drive bushing, the balance weight balancing dynamic unbalance caused by revolving motion in a solar motion of said revolving scroll, and an axial position of the center of gravity of said balance weight



being made to substantially accord with the axial center of said drive bushing to thereby reduce a moment of inclined rotation of the drive bushing resulting from centrifugal force during rotation thereof, the generally straight line portions of the drive pin slide along the generally straight line portions of the slide hole during rotation of the revolving scroll.

5,199,863

SEALING OF AN ECCENTRIC BEARING OF A ROTARY PISTON INTERNAL COMBUSTION ENGINE

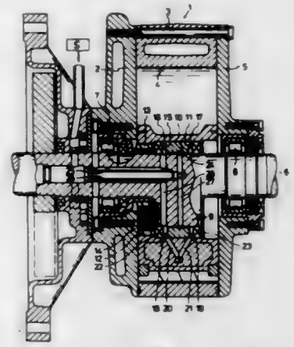
Dankwart Eiermann, Weissensberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin

Filed May 18, 1990, Ser. No. 525,476

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1990, 4003663

Int. Cl.[5] **F01C** *19/06, 19/12*

U.S. Cl. 418—61.2 **6 Claims**



1. A rotary piston internal combustion engine having an oil-cooled piston journalled by slide bearings and a housing, which consists of two side parts and a casing mantle part with dual-arc trochoidal-shaped casing mantle runway inner surfacing and having an eccentric shaft journalled in the side parts passing axially through the housing, a triangular piston journalled upon an eccentric of the eccentric shaft and rotating controlled by a synchronous transmission gear drive unit which is provided in the piston between the eccentric and one of the side parts, said synchronous transmission gear drive unit being formed by a hollow gear secured stationary on the piston and a pinion secured stationary on the housing located around the eccentric shaft, the improvement comprising:

bearing body means provided adjoining sealing rings ar-

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5,199,866

5,199,867

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bearing body means provided adjoining sealing rings arranged in location axially for sealing of an eccentric bearing on both sides thereof having turned-out recesses along axially inner edges thereof, said recesses being delimited radially by a bearing surface of the eccentric and being delimited axially laterally by sealing rings of elastomeric oil-resistant sliding material provided beside the turned-out recesses in the bearing body means, which engage securely against a bearing bore of the piston and sliding on the eccentric, and

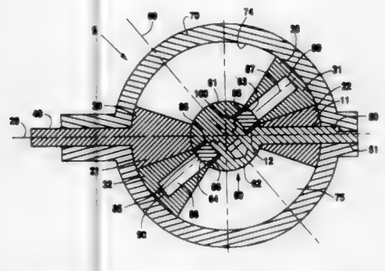
axial bore means in the bearing body means opening into said recesses and which are aligned with additional bores in the piston.

5,199,864

SPHERICAL FLUID PUMP OR MOTOR WITH SPHERICAL BALL COMPRISING TWO PARTS

Gary L. Stecklein, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Sep. 28, 1990, Ser. No. 590,464
Int. Cl.[5] F01C *3/06*
U.S. Cl. 418—68 **1 Claim**



1. A fluidic machine comprising:

a housing defining a chamber having a spherical shaped internal wall and at least one inlet port and one outlet port entering said internal wall in spaced relationship; a first vane assembly having a positions with opposed side surfaces of said first vane; chamber space into four parts that vary in volume as said second vane pivotally reciprocates about said second axis; a circular channel formed on said ball element having an axis oblique to said first and second axes; and means operatively connecting said second vane segments to said channel to reciprocate said second vane assembly about said second axis in response to rotation of said first vane assembly about said first axis;

said first vane assembly comprises a pair of segments secured together by two axially spaced sleeves defining said second axis, and a pair of axially spaced pins secured between said segments of said second vane and inserted in said sleeves on said first vane assembly; and

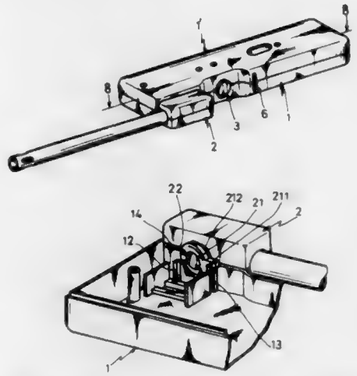
said ball element comprises a first generally hemispherical unit concentrically formed about an offset axis defining an acute angle with said axis of said stationary shaft; a second generally hemispherical unit secured to said first unit by threads concentric with said offset axis; said circular channel being defined between said hemispherical units; a ring mounted between said first and second ball units for rotation about said offset axis, and a pair of diametrically opposed radial projections on said ring respectively engagable with radial holes in said second vane segments to permit a free rotation of said second vane segments about said offset axis.

5,199,865

STRUCTURRE OF FOLDABLE SAFETY LIGHTER

Chung-Ho Liang, 5F-23, 70, Fu-Shing Road, Taoyuan, Taiwan

Filed Aug. 5, 1991, Ser. No. 740,083
Int. Cl.[5] F23Q *7/12*
U.S. Cl. 431—255 **3 Claims**



1. A safety lighter of the type having an igniting means disposed in an elongated nozzle tube for igniting fuel flowing therethrough, the improvement comprising:

a. a longitudinally extended housing formed by a pair of outer shell members coupled on to the other;

b. a fuel tank disposed within said housing;

c. valve means fluidly coupled to said fuel tank for dispensing fuel therefrom, said valve means including an outlet tube for transporting said dispensed fuel to said nozzle tube;

d. control means operatively coupled to said valve means for dispensing said fuel responsive to displacement of a control knob member extending through an opening formed in said housing, said control knob member displacement being in a direction substantially transverse said longitudinal direction, said control means including (1) a spring biased control bar member coupled to said control knob member for displacement in said transverse direction therewith, (2) a link member having a pair of lever arm portions, each of said lever arm portion being respectively coupled to said valve means and said control bar member for displacing said valve means to control said fuel dispensing responsive to said displacement of said control bar member, and (3) an electrical contact member coupled to a trigger portion of said control bar member for closing an electrical circuit to energize said igniting means substantially simultaneous with said dispensing of said fuel, said control know member having a tab portion extending therefrom, whereby unintentional operation is averted by rotation of said knob member from a predetermined position or displacing said tab into engagement with a slotted opening formed in said housing to thereby prevent said transverse displacement of said control bar member; and,

e. means for a rotatively supporting said nozzle tube having a first end coupled to said nozzle tube and a second end pivotedly coupled to said housing through an opening formed therein, said outlet tube extending through said rotatable support means into said nozzle tube, said rotatable support means including a triangularly shaped guide member disposed adjacent said pivotal coupling for rotative displacement within an arcuately contoured groove formed in said housing, said arcuately contoured groove terminating on one end in a triangularly shaped recess for engagement with said guide member.

5,199,866

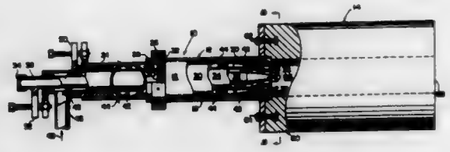
ADJUSTABLE MOMENTUM SELF-COOLED OXY/FUEL BURNER FOR HEATING IN HIGH TEMPERATURE ENVIRONMENTS

Mahendra L. Joshi, Altamonte Springs; James K. Nabors, Apopka, both of Fla., and Aleksandar G. Slavejkov, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa. and Combustion TEC, Inc., Orlando, Fla.

Filed Mar. 30, 1992, Ser. No. 860,651
Int. Cl.[5] F23C *7/00*
U.S. Cl. 431—353 **5 Claims**

1. An oxy-fuel combustion system comprising in combination:

an oxy-fuel burner having a generally cylindrical housing with a fuel conduit disposed in spaced relation to and concentrically within said housing; said fuel conduit being co-extensive along a major portion of said housing and having a flame end having a converging-diverging nozzle terminating in a same plane as the flame end of said housing; a fuel cap having a generally cylindrical cross-section terminating in a forward section in the shape of a truncated cone disposed concentrically within said fuel conduit, said fuel cap and said fuel conduit cooperating to produce an annular fuel flow at said flame end of said housing; an oxidizer conduit having a converging-diverging front section disposed concentrically within said housing between said fuel conduit and said housing, said oxidizer conduit extending coexistively in said housing; said fuel conduit adapted for variable positioning relative to said oxidizer conduit by sliding said fuel conduit relative to said oxidizer conduit along the longitudinal axis including a position where they terminate in the plane defined by the flame end of said housing to define an annular oxidizer passage orifice surrounding said fuel conduit; said fuel conduit and said fuel cap adapted for variable positioning relative to each other by sliding said fuel conduit relative to said oxidizer conduit along the longitudinal axis including a position where they terminate in the plane defined by the flame end of said housing to define an annular fuel passage means to introduce fuel to said fuel passage and oxidizer to said oxidizing passage; and



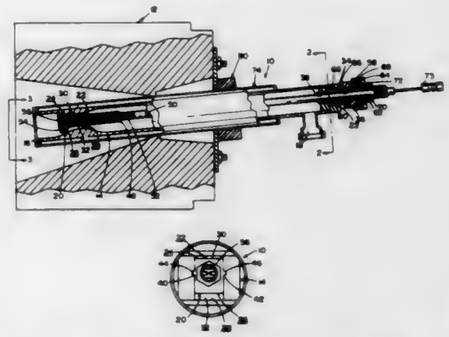
a precombustor mounted on said burner, said precombustor having a generally cylindrical central passage one end of which is in fluid tight relation to the flame end of said burner and a second end adapted to direct said flame for heating in industrial environments, the longitudinal axis of the cylinder being an extension of the longitudinal axis of said housing of said burner; said combustor so constructed and arrange that said passage has a length to diameter (L/d) ratio of between 2.0 and 6.0 where said burner is used to propagate a flame at firing rates of between 0.25 and 40.0 million Btu/hr.

5,199,867

FUEL-BURNER APPARATUS AND METHOD FOR USE IN A FURNACE

Loo T. Yap, Princeton, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Sep. 30, 1991, Ser. No. 768,800
Int. Cl.[5] F27B *14/00*; F23M *3/04*; F23C *5/00*
U.S. Cl. 432—13 **32 Claims**



1. A burner for burning fuel in an oxidant comprising:

fuel nozzle means for producing a fuel jet of the fuel adapted to burn within the oxidant with an outwardly extending flame and such that particles of the fuel become increasingly more buoyant along the length of the flame;

lower oxidant nozzle means located below the fuel nozzles means for creating a lower oxidant jet of the oxidant that produces a low-pressure field below the fuel jet for downwardly aspirating the fuel into the oxidant; and

upper oxidant nozzle means located above the fuel and lower oxidant nozzle means for creating an upper oxidant jet of the oxidant burning the increasingly more buoyant particles of the fuel;

the upper and lower oxidant nozzle means being independent and distinct from one another.

5,199,868

CONTINUOUS FURNACE

Hans Autenrieth; Manfred Hampl, both of Blaubeuren; Werner Kling, Senden; Dieter Link, Ehingen, and Rolf Hartung, Blaubeuren, all of Fed. Rep. of Germany, assignors to Centrotherm Elektrische Anlagen GmbH & Co., Blaubeuren, Fed. Rep. of Germany

PCT No. PCT/DE90/00376, § 371 Date Jan. 10, 1991, § 102(e) Date Jan. 10, 1991, PCT Pub. No. WO90/14184, PCT Pub. Date Nov. 29, 1990
PCT Filed May 22, 1990, Ser. No. 646,764
Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916922
Int. Cl.[5] F27B *9/28*
U.S. Cl. 432—59 **7 Claims**

1. A continuous furnace for the simultaneous two-sided sintering of sintered sheets upon substrates, comprising:

an elongated furnace muffle; and

drivable conveyor belt means for supporting the substrates and longitudinally traversing the muffle and endlessly led back to the muffle outside the muffle, said drivable conveyor belt means comprising:

a pair of individual belts guided in parallel next to one another and running synchronously,

means in said muffle including mutually inclined muffle bottoms extending the length of said muffle and on which said belt respectively lie for inclining belt surfaces of said individual belts in the muffle at a

an O-ring sealingly fitted around said shaft for reciprocation

5,199,873

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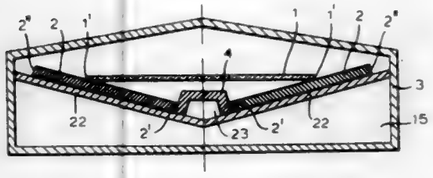
small angle to the horizontal, so that mutually facing inner edges of the individual belts run at a lower level than outer edges of the individual belts facing away from each other, the substrates being self-supporting between two parallel lateral edges of said substrate resting with one lateral edge on the belt surface of one of said individual belts and with a second lateral edge on the belt surface of the other individual belt, the belts being guided in said muffle on said muffle bottoms and means against which mutually facing



inner edges of said belt surfaces directly rest for laterally supporting said belts against movement toward one another over substantially entire lengths thereof in said muffle, the two individual belts being supported at their mutually facing inner edges of their inclined belt surfaces by a supporting member provide between the individual belts, each of said individual belts being independently guided on said support member, the support member seen in cross section having a channel for a process gas, gas passage openings being provided in a wall of the channel.

5,199,869

ORTHODONTIC SPRING

Don McGann, 15 No. Vista de Catalina, South Laguna, Calif. 92677

Filed Apr. 9, 1990, Ser. No. 506,711
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—21 **2 Claims**

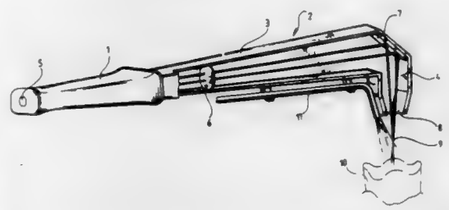
1. A wire spring appliance for mounting between a pair of adjacent teeth for separating the same, comprising a first leg segment in a vertical lingual plane, a second leg segment in a vertical buccal plane and a mainly straight bridge segment in an occlusal plane, the bridge segment joining the first and the second leg segments such that the bridge segment is placed under a torsional load when the first and the second leg segments are drawn near to a common reference plane such that the first leg segment is seated against the proximal wall of one of the adjacent teeth and the second leg segment is seated against the proximal wall of the other of the adjacent teeth, whereby the torsional load causes the legs to apply a separating force to each of the adjacent teeth, the legs being curved in mutually divergent arcs away from the reference plane such that the separating force applied to each of the proximal walls causes the spring to move in the gingival direction, whereby the spring is self-seating and self-tightening between the adjacent teeth.

5,199,870

PROCESS FOR DESTROYING AND REMOVING MATERIAL FROM TEETH

Rudolf Steiner, Ulm; Ulrich Keller, Dellmensingen, and Raimund Hibst, Erbach, all of Fed. Rep. of Germany, assignors to Aesculap AG, Tuttlingen, Fed. Rep. of Germany

PCT No. PCT/EP90/00554, § 371 Date Oct. 10, 1991, § 102(e) Date Oct. 10, 1991, PCT Pub. No. WO90/11728, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 7, 1990, Ser. No. 768,655
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911871
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—29 **14 Claims**



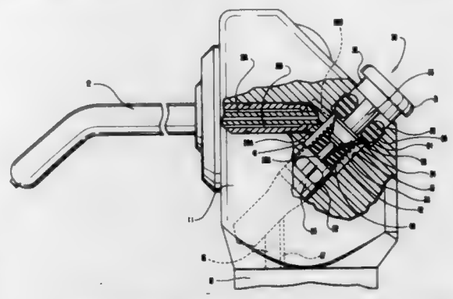
1. A process for destroying and removing tooth material by means of pulsed infrared laser beams, comprising the step of covering the tooth material, prior to or during the irradiation with the laser beams, with a layer of liquid of between 10 and 200 micrometers thickness which absorbs the laser radiation.

5,199,871

ACTUATOR FOR A CONTROL VALVE OF A DENTAL SYRINGE

Barry S. Young, Tualatin, Oreg., assignor to DCI International, Inc., Newberg, Oreg.

Filed Apr. 3, 1992, Ser. No. 862,740
Int. Cl.[5] A61G *17/02*
U.S. Cl. 433—80 **6 Claims**



1. In a dental syringe having a syringe head with a passageway therein and a normally closed valve in said passageway, said valve having a valve stem projecting therefrom for operating said valve, a valve actuator system comprising: a wall member defining said passageway; a groove in said wall member encircling said passageway;

a body, including a button having a diameter larger than the diameter of said passageway, a shoulder projecting from said button and having a diameter just less than the diameter of said passageway, a shaft having first and second ends, projecting at said first end from said shoulder towards said valve and having a diameter smaller than that of said shoulder, and a collar at said second end of said shaft, a portion of said collar having a diameter larger than the diameter of the shaft; and

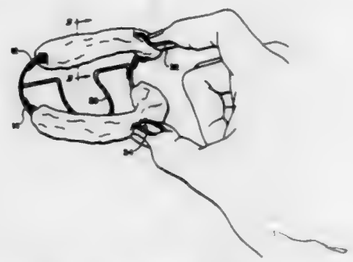
an O-ring sealingly fitted around said shaft for reciprocation of said shaft therethrough and sized to extend beyond the diameter of said shoulder, whereby said O-ring extends sealingly and is fixedly held within said groove and is held in said groove against undesired movement with said shaft when said body is inserted into said passageway.

5,199,872

DENTAL APPLIANCE

Francisco G. B. Leal, Rua Vicente Leite 1011 Apt. 200, Fortaleza/Ce, Brazil 60.170

Filed Dec. 10, 1991, Ser. No. 804,450
Int. Cl.[5] A61C *5/14, 5/00*
U.S. Cl. 433—136 **14 Claims**



1. A dental appliance for isolating an operating area of the mouth of a human patient and maintaining the mouth in an open position comprising:

a frame including upper and lower generally U-shaped sections in spaced relation one to the other and generally conformal in shape to the spaces between the upper gum and lip and lower gum and lip, respectively, of the mouth of a human patient, each section having a front portion and a pair of transversely spaced leg portions extending rearwardly from the front portion and along opposite sides of the patient's mouth;

the leg portions of said sections being connected to one another adjacent rear end portions thereof and transverse opposite sides of the appliance;

said connected rear and leg portions forming a resilient connection between said upper and lower sections, enabling movement of said upper and lower sections toward and away from one another about an axis extending generally transversely of said appliance;

said resilient connection maintaining said upper and lower sections spaced in a operative orientation a predetermined distance one from the other such that, upon placement of the appliance in a patient's mouth, the appliance maintains the patient's mouth in an open position;

said upper U-shaped section including the front portion and the pair of transversely spaced leg portions of said upper U-shaped section lying in a first plane, said lower U-shaped section including the front portion and the pair of transversely spaced leg portions of said lower U-shaped section lying in a second plane, said first and second planes in said operative orientation of said appliance intersecting one another along a line generally parallel to the axis and rearwardly of the axis; and

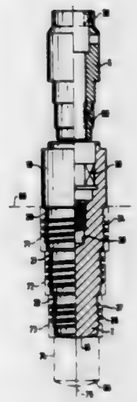
means carried by said frame for securing a flexible, absorbent material along the front portions of each of the upper and lower sections thereof enabling the material to cushion the appliance frame between the gums and lips of the patient.

5,199,873

DENTAL IMPLANT

Willi Schulte, Tübingen; Freimut Vinetham, Schwetzingen, and Walter Hund, Oberkirch-Stadelhofen, all of Fed. Rep. of Germany, assignors to Friedrichsfeld AG Keramik- und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

Filed Jan. 15, 1991, Ser. No. 642,344
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1990, 4000914
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—174 **20 Claims**



1. A dental implant comprising a post anchorable in a jawbone of a dental patient and a replacement tooth head fastenable to said post, said post having a crown end provided with means for attaching said replacement tooth head and said post having an outer surface configured to form an apical root end opposite said crown end, said outer surface having at least two steps having substantially the same axial length with each step having a substantially constant base diameter along the length of the step, and with each step toward said apical root end having a respective base diameter which is smaller than the base diameter of the adjacent step toward said crown end, at least one of said steps carrying a screw thread; wherein each step which carries a thread has a thread crest diameter which is at most equal to the base diameter of the adjacent step situated toward said crown end, and wherein upon implantation said post can be freely inserted into a stepped bore in the jawbone down to all but one last step length and then can be screwed this last step length further into the jawbone.

5,199,874

APPARATUS AND METHOD FOR INTERFACING INDIRECT-FIRE DEVICES WITH MILES

Carl J. Campagnuolo, Potomac; Jerome D. Gerber, Beltsville, both of Md., and Wesley K. Clark, Fort Irwin, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1991, Ser. No. 691,603
Int. Cl.[5] F41A *33/00*
U.S. Cl. 434—11 **8 Claims**

4. An acoustic receiver for use with a MILES-type tactical engagement simulation system supplied with a tampering circuit, said acoustic receiver comprising:

means for detecting an acoustic signal;

means responsive to said detecting means for identifying the presence of a device when the device generates a predetermined acoustic signal, said identifying means comprising means for filtering the predetermined acoustic signal, means for amplifying the predetermined acoustic signal after the predetermined acoustic signal has been filtered,

and a phase lock loop tuned to lock onto the predeter-

controller for generating supplemental actuator drive

an analog of the respiratory muscles with means for inducing

pair, said plurality of pairs including an IN pair and an

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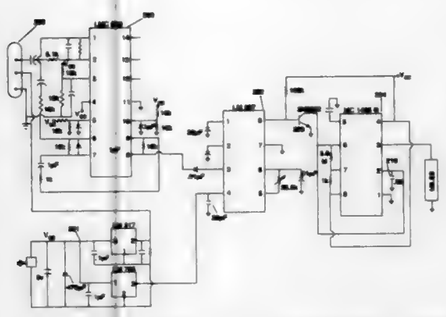
and a phase lock loop tuned to lock onto the predetermined acoustic signal; and

means responsive to said identifying means for momentarily removing a power supply source from a MILES-type



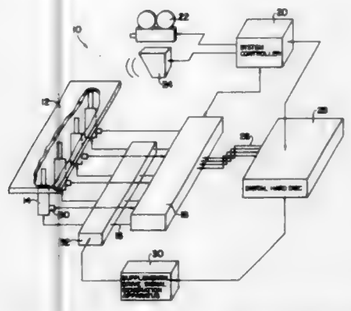
system, wherein said means for momentarily removing comprises means for activating a tampering circuit upon identification of the predetermined acoustic signal, and an electronic timer responsive to said phase lock loop.

5,199,875

METHOD AND APPARATUS FOR GENERATING SUPPLEMENTAL MOTION IN A SIMULATOR

Douglas Trumbull, Southfield, Mass., assignor to Ridefilm Corporation, Housatonic, Mass.

Filed Dec. 13, 1990, Ser. No. 626,828
Int. Cl.[5] G09B *9/00*
U.S. Cl. 434—61 **23 Claims**



1. A simulator system for use in providing an event simulation to occupants thereof, said simulator system comprising:

a motion base moveable along a plurality of displacement axes and having

displaceable actuators for moving said motion base along said axes in accordance with received drive signals;

feedback sensors configured with each of said actuators for providing signals indicative of the measured displacement of said corresponding actuator;

an audio-visual display means for providing a sequence of audio and visual images to the simulator system occupants;

a motion base controller receiving said feedback sensor signals for generating primary actuator drive signals below a cutoff frequency in response to received command signals;

a system controller for providing said command signals to said motion base controller in synchronization with the presentation of said audio-visual images and for providing auxiliary command signals;

a signal generator means independent of said motion base controller for generating supplemental actuator drive signals having a frequency above said cutoff frequency in response to said auxiliary command signals;

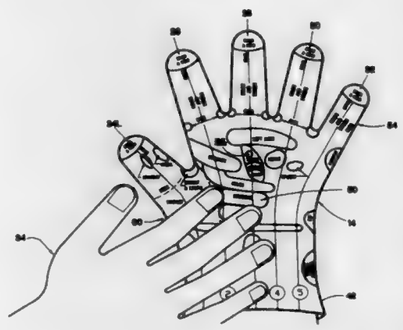
a drive signal summing apparatus serially configured with said motion base controller and said actuators for generating said actuator drive signals from a combination of said primary and said supplemental actuator drive signals.

5,199,876

HAND REFLEXOLOGY GLOVE

Martin S. Waldman, P.O. Box 5473, Vandenberg, Calif. 93437

Continuation-in-part of Ser. No. 756,072, Sep. 6, 1991. This application Aug. 31, 1992, Ser. No. 938,280
Int. Cl.[5] G09B *23/28*
U.S. Cl. 434—262 **12 Claims**



1. A hand reflexology zone morphological map in the form of a therapeutic glove comprised of:

a pliant plastic material for selectively covering a hand, resulting in an encompassing skin surface and texture of said hand to be overlaid with an artificial skin surface and texture means arranged of said pliant plastic material, forming an interface cushion over said hand for purposes of selectively conveying an associated hand reflexology input stimulation into said hand, whereby said artificial skin surface and texture means facilitates variations in focal depth of said reflexology input stimulation into said hand by altering sensitivity of said skin surface;

said pliant plastic material forming an interior volume, an interior surface area, a glove interior volume and interior surface area access means for removably receiving said hand into said interior volume allowing said interior surface area to directly interface with said hand;

an exterior surface area illustrated with a hand pattern reflexology receptor zone identification means consisting of a reflexology zone morphological map designed to directly overlay an array of reflex receptor zones in said hand for accurately targeting said reflexology input stimulation into said hand whereby an individual can instantly access any reflex receptor zone of interest to apply the benefits of hand reflexology as required.

5,199,877

PHYSIOLOGICAL DEMONSTRATION UNIT

W. Randolph Page, 1215 Pine St., New Orleans, La. 70115

Filed Jun. 14, 1991, Ser. No. 715,499
Int. Cl.[5] G09B *23/00*
U.S. Cl. 434—262 **17 Claims**

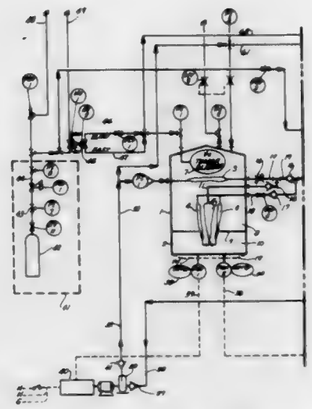
1. A "heart" unit serving as a partial analog system of the human body for demonstrating physiological events which occur during the growth of a brain tumor, including cardiac and respiratory failure during rapid tumor growth, comprising:

an analog of the heart with fluid pumping means for inducing a pulsing flow;

an analog of the respiratory muscles with means for inducing a secondary pressure pulse;

an analog of the circulatory system including circulating fluid upon which said analog heart induces a pulsing flow and said respiratory muscles induce a pressure oscillation;

an analog of the cranial cavity;



an analog of a brain tumor with supplemental means for displacing a portion of the intracranial cavity; and

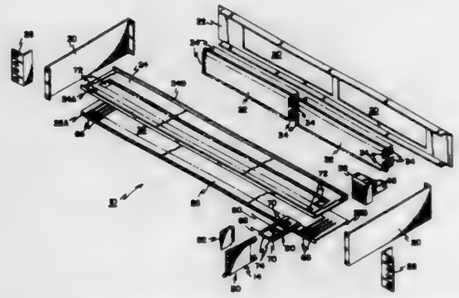
an analog of the cerebral fluid within analog ventricles with means to flow in and out of the cranial cavity via analog subarachnoid paths to equalize cerebral pressure with the circulatory system pressure outside of the cranial cavity.

5,199,878

PLUG-IN JACK CARD FOR NORMALLY CLOSED CONTACTS

James D. Dewey, Plymouth; Dennis M. Burroughs, Savage; Kevin A. Rademacher, Lakeville, and Daniel Rivera, Sr., Eden Prairie, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Nov. 15, 1990, Ser. No. 614,143
Int. Cl.[5] H01R *29/00, 9/09;* **H02B** *1/056;* **H05K** *7/14*
U.S. Cl. 439—49 **9 Claims**



1. An apparatus for providing access to a plurality of telecommunications lines, said apparatus comprising:

a frame;

a plurality of normally closed contacts carried on said frame, each of said contacts having electrical connection means for terminating said lines on said contacts, said plurality of contacts including a plurality of pairs of first and second contacts biased into electrical connection for a signal flow on lines terminated at said first and second contacts of a pair to pass through said first and second contacts of said pair, said plurality of pairs including an IN pair and an OUT pair;

a plurality of modules, each having means for releasably securing itself to said frame and each having circuit interruption means on a first side thereof for opening said normally closed contacts against said bias upon securing itself to said frame;

each of said modules including circuit means having at least an IN pair of first and second IN springs and an OUT pair of first and second OUT springs with springs of a pair biased into normally closed electrical contact,

a plurality of electrically conductive contact locations disposed on said module, said plurality electrically conductive contact locations including at least a pair of first and second IN contact locations and a pair of first and second OUT contact locations, said locations disposed for said first IN contact location to electrically engage said first IN contact, said second IN contact location to electrically engage said second IN contact, said first OUT contact location to electrically engage said first OUT contact and said second OUT contact location to electrically engage said second OUT contact upon said securing of said module to said frame;

said circuit means further including means for electrically connecting said first IN spring to said first IN contact location, said second IN spring to said second IN contact location, said first OUT spring to said first OUT contact location and said second OUT spring to said second OUT contact location; and

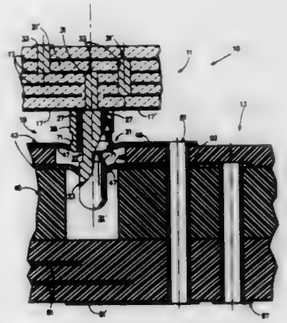
access means on said module for receiving a plug at either an IN or an OUT location on a second side of said module with a plug received at said IN location separating and electrically engaging said first and second IN springs and with a plug insert at said OUT location separating and electrically engaging said first and second OUT springs.

5,199,879

ELECTRICAL ASSEMBLY WITH FLEXIBLE CIRCUIT

Harold Kohn, Endwell; Kishor V. Desai, Vestal; Ronald J. Romanosky, Endwell; George J. Saxemeyer, Jr., Apalachin; Reinhold E. Tomek, Endwell, and James R. Webb, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1992, Ser. No. 840,212
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—63 **20 Claims**



1. A electrical assembly comprising:

a first circuit member including a circuitized substrate having first and second layers of circuitry as part thereof and at least one conductive pin projecting from said substrate and including first and second conductive portions electrically coupled to said first and second layers of circuitry, respectively, said second conductive portion being coaxially positioned about said first conductive portion to sub-

stantially reduce electrical interference between said pin

group, the boards of at least one subgroup of said first

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adapted to bite into the housing to hold the contact relative to

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stantially reduce electrical interference between said pin and adjacent pins during operation of said assembly; and

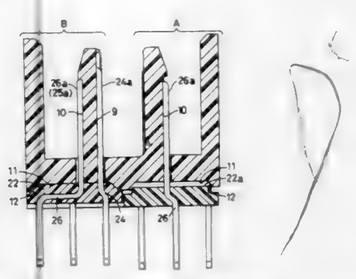
a second circuit member for being electrically coupled to said first circuit member and including a dielectric substrate having an opening therein and circuit means located on or within said dielectric substrate and including first and second flexible portions extending at least partly across said opening at spaced-apart locations therein, said first and second flexible portions of said circuit means adapted for frictionally and electrically engaging said first and second conductive portions of said conductive pin, respectively when said pin is positioned within said opening of said second circuit member to provide said electrical coupling between said first and second circuit members.

5,199,880

MULTIPOLE ELECTRICAL CONNECTOR

Tatsuya Arai, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,379
Claims priority, application Japan, Sep. 17, 1990, 2-96511[U]
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—65 **5 Claims**



1. A multipole electrical connector comprising:

a housing having a fitting cavity opening on a front side thereof;

at least one insulation plate extending forwardly into said fitting cavity from a rear wall of said housing;

a plurality of terminal receiving channels formed on opposite sides of said insulation plate at a predetermined pitch;

at least one terminal plate receiving recess formed on a rear side of said housing and separated from said fitting cavity by said rear wall;

a plurality of terminal apertures formed through said rear wall so as to communicate with said respective terminal receiving channels on said insulation plate;

a terminal plate;

a plurality of terminals planted on said terminal plate at a predetermined pitch to form a terminal unit;

said terminal unit being fitted in said receiving recess and secured to said housing by inserting said terminals into said receiving channels through said terminal apertures.

5,199,881

HERMAPHRODITIC INTERCONNECTION OF CIRCUIT BOARDS

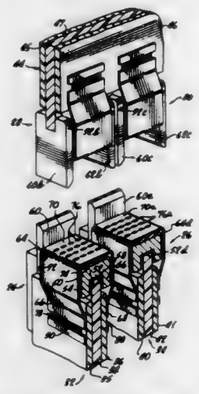
Felix M. Oshita, Santa Ana; Ronald L. Campbell, and Theodore R. Conroy-Wass, both of Tustin, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 3, 1991, Ser. No. 801,977
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—65 **32 Claims**

1. A package of interconnected circuit boards comprising:

first and second groups of circuit boards,

each of said groups comprising a plurality of substantially parallel boards, boards of said first group lying in planes transverse to planes in which lie boards of the second group, the boards of at least one subgroup of said first group of circuit boards having edges thereof electrically connected to an edge of a first board of the second group.

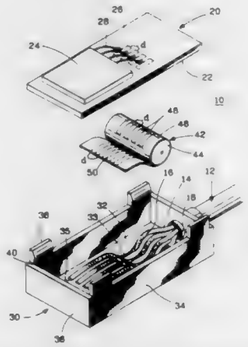


5,199,882

ELASTOMERIC WIRE TO PAD CONNECTOR

Warren A. Bates, Winston-Salem; Frederick R. Deak, Kernersville; David C. Johnson, Winston-Salem, and Keith L. Volz, Jamestown, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 19, 1992, Ser. No. 854,111
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—67 **15 Claims**



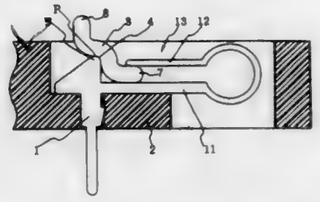
1. An electrical connector for interconnecting the conductive pads of a component to the conductive wires of a cable, including a planar substrate forming the lid of a housing with an electrical and conductive pads mounted thereon, the pads extending in an array on first centers, a housing including a cavity having a floor, including means to receive and position wires of a cable in an array on second centers, an elastomeric connector fitted in said cavity including a resilient core carrying a thin, flexible dielectric film thereon having conductive traces in an array extending on said first centers proximate said pads and on second centers proximate said floor and wires with means affixing said lid on said housing to compress said elastomeric connector within said cavity and interconnect the said pads to the traces and the traces to the said wires to effect said interconnection.

5,199,883

MOUNT-TO-CONTACT TYPE CONTACT

Kazumi Uratsuji, Tokyo, Japan, assignor to Yamaichi Electric Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1992, Ser. No. 849,663
Claims priority, application Japan, Mar. 15, 1991, 3-75863
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—72 **5 Claims**



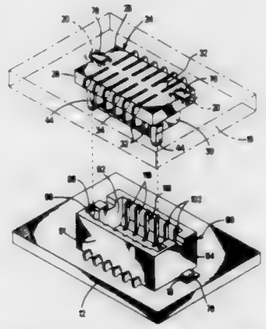
1. A mount-to-contact type contact comprising a stationary terminal, a swinging contact element swingably supported by said stationary terminal, and a spring adapted to resiliently hold on swinging end of said swinging contact element in a swinging direction, the other swinging end serving as a contact end on which a terminal of an electric part is to be mounted to realize a contact relation, said contact end formed by said other swinging end being swung in a swinging direction to swing said one swinging end against said spring so that contact pressure with said terminal of said electric part mounted on said contact end can be obtained by reaction of said spring portion.

5,199,884

BLIND MATING MINIATURE CONNECTOR

John W. Kaufman, Hershey; Donald J. Summers, Shiremanstown, and Gregory R. Pratt, Etters, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 2, 1991, Ser. No. 801,561
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—74 **8 Claims**



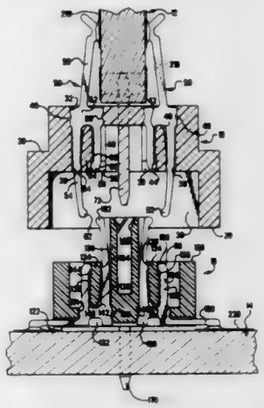
1. A miniature electrical connector for interconnecting circuits on close centers on the surfaces of circuit boards including plug and receptacle housings each having arrays of contacts of thin sheet metal set on edge in such housings on centers complementary to the centers of the circuits and including contact feet projecting from said housings in a common plane for soldering to said circuits with the receptacle housing including an interior cavity configured to receive the plug housing inserted therein along a given axis and with the plug housing having a bevel to ease entry into said cavity and having interior recesses containing said plug contacts therewithin positioned to receive said receptacle contacts entering said recesses to engage said plug contacts in a sliding engagement, where said contact feet include a U-shaped configuration with a locking point interiorly of the U-shaped configuration adapted to bite into the housing to hold the contact relative to the housing, and said plug and receptacle contacts each have ends opposite said feet positioned to be deflected transversely to said axis during such engagement to develop low resistance, stable electrical interfaces, said plug housing including a plurality of posts projecting from a front face thereof and the receptacle housing including interior recesses positioned to receive said posts to polarize and align said housings to assure entry of the receptacle contacts into the recesses of the plug housing and facilitate blind mating of said housings.

5,199,885

ELECTRICAL CONNECTOR HAVING TERMINALS WHICH COOPERATE WITH AN EDGE OF A CIRCUIT BOARD

Iosif Korsunsky, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 692,084, Apr. 26, 1991, abandoned.
This application Apr. 21, 1992, Ser. No. 873,526
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—79 **10 Claims**



1. A connector assembly having a housing with first and second terminals extending therefrom, the first and second terminals have respectively first and second mating legs which cooperate with a printed circuit board provided proximate the housing, the printed circuit board having conductive areas provided on surfaces thereof and conductive openings which extend between the surfaces, the connector assembly comprising:

the first terminals are secured in the housing, first mounting portions of the first terminals are located in first terminal receiving cavities of the housing, the first mating legs are integral with the first mounting portions and extend outside the housing, the first mating legs cooperate with the conductive areas provided on the printed circuit board for surface mounting thereto; and

the second terminals are secured in the housing, the second mating legs extend outside the housing, the second mating legs extend through an edge surface of printed circuit board to cooperate with the conductive openings provided on the printed circuit board.

tor to provide electrical connection to the notebook com- around said IC platform, so that leads of said IC carried on said

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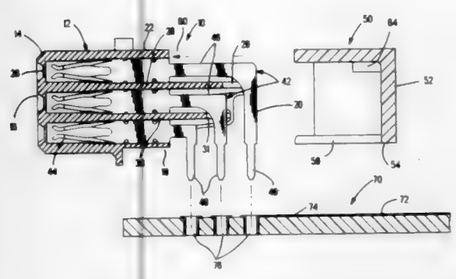
5,199,886

SHROUDED CONNECTOR ASSEMBLY

Robert A. Patterson, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 19, 1991, Ser. No. 795,172
Int. Cl.[5] H05K 1/00
U.S. Cl. 439—79 2 Claims



1. A shroud for an electrical connector of the type including a housing extending rearwardly from a mating face to an opposed exit face and from a top face to an opposed mounting face with a plurality of terminal-receiving apertures arrayed in at lest two rows and extending from the mating face to the exit face, the exit face including at least one organizer plate extending rearwardly therefrom parallel to the mounting face to an edge between adjacent ones of said at least two rows, the connector including a like plurality of terminal members secured in respective ones of the apertures from first contact sections along said mating face to elongate tails extending from the exit face, the terminal tails having intermediate sections extending to right angle bends held within corresponding recesses in an adjacent organizer plate edge and extending to second contact sections beyond the plane of the mounting face, the second contact sections being arrayed in at least two rows of exposed parallel pins for insertion and soldering into respective plated through-holes of a printed circuit card upon connector mounting to the card, the shroud comprising:

a member of dielectric material having a top wall and opposed end walls extending from housing-proximate edges adapted to be fitted against said exit face thereof and extending rearwardly a distance at least equal to the rearwardmost extent of said connector, to a sidewall extending form said top wall to a lower edge in said plane of said mounting face,

said member including a bottom wall extending from said lower edge forwardly to a leading edge adapted to abut an adjacent portion of said exit face;

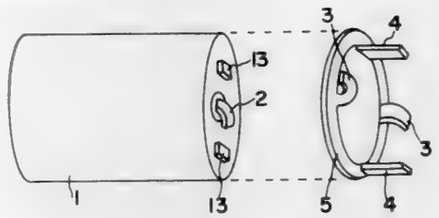
said bottom wall including an array of channels extending rearwardly from said leading edge spaced and dimensioned to receive thereinto said second contact sections upon said shroud being inserted onto said exit face from rearwardly thereof, thereby enclosing exposed portions of said terminal members above said plane of said mounting face and minimizing entry of solder, flux and conformal coating material into said exit face of said connector, where said shroud further includes grooves extending along an inside surface of said top wall form said sidewall and opposed from selected ones of intermediate sections of said terminal members disposed above an uppermost one of said organizer plate and adapted to receive thereinto said selected ones in an interference fit for self securing said shroud onto said connector.

5,199,887

SURFACE MOUNTING CONNECTOR

Fred D. Iacono, Crestwood, N.Y., assignor to Kings Electronics Co., Inc., Tuckahoe, N.Y.

Filed Sep. 30, 1991, Ser. No. 767,979
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—83 9 Claims



1. A connector for surface mounting a cable to a single surface of a printed circuit board, said connector comprising;

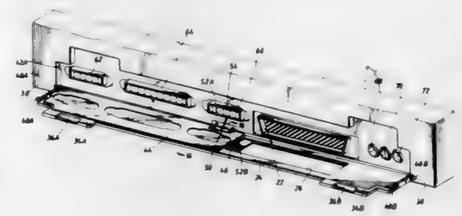
a connector body comprising a first end adapted to receive a cable and a second end, opposite said first end, having a center contact for establishing an electrical connection with said printed circuit board, at least one grounding contact adapted to contact corresponding printed circuit board grounding pads, and hold down tabs for attaching said connector to said printed circuit board, said grounding contacts and hold down tabs being formed on a separate support ring, attached to said second end of said connector body.

5,199,888

APPARATUS FOR COVERING THE ELECTRICAL CONNECTORS OF A NOTEBOOK COMPUTER

Neil L. Condra, The Woodlands; James R. Utz, and Thomas Mitchell, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jan. 24, 1992, Ser. No. 825,018
Int. Cl.[5] H01R 13/447
U.S. Cl. 439—142 20 Claims



1. Apparatus adapted for covering a plurality of electrical connectors of a housing of a notebook computer having an expansion base connector to provide electrical connection of the notebook computer to an expansion base, the apparatus comprising,

a first plate having an opening, said opening sized to allow access to the expansion base connector,

hinge means for pivotably mounting said first plate with the housing, said plate pivotable relative to the housing between an uncovered position to provide access to the plurality of electrical connectors and a retained position for covering the electrical connectors while allowing access to the expansion base connector,

a door adapted to cover said plate opening when said plate is in the retained position, said door slidable relative to said plate opening between a closed position and an open position for allowing access to the expansion base connector to provide electrical connection to the notebook computer, and

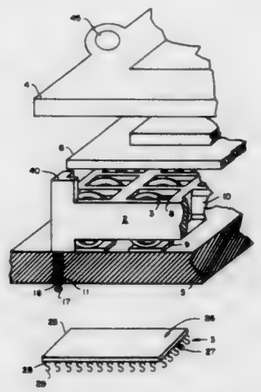
retaining means interengaged with the housing and said plate for positioning said plate in a prearranged relationship to the housing.

5,199,889

LEADLESS GRID ARRAY SOCKET

John E. McDevitt, Jr., Cumberland, R.I., assignor to Jem Tech, Cumberland, R.I.

Filed Nov. 12, 1991, Ser. No. 790,464
Int. Cl.[5] H01R 23/72
U.S. Cl. 439—66 20 Claims



1. A leadless grid array interconnection device for connecting an integrated circuit and a printed circuit board, wherein said integrated circuit comprises an integrated circuit leadless grid array, wherein said integrated circuit leadless grid array comprises a plurality of integrated circuit contact pads and said printed circuit board comprises a plurality of printed circuit board contact pads, and wherein the pattern of said printed circuit board contact pads corresponds to the pattern of said integrated circuit leadless grid array, said leadless grid array interconnection device comprising:

a. conductive element array comprising a plurality of conductive elements connectable to said integrated circuit contact pads and said printed circuit board contact pads; and

b. a removable insulative component comprising a plurality of socket cavities, each of said socket cavities formed for fully surrounding one of said conductive elements, wherein said insulative component is designed to be removably affixed to said printed circuit board, and wherein the pattern of said socket cavities corresponds to the pattern of said plurality of printed circuit board contact pads, said insulative component being removable from said printed circuit board while leaving said conductive element array connected to said printed circuit board contact pads to enable inspection of said conductive elements.

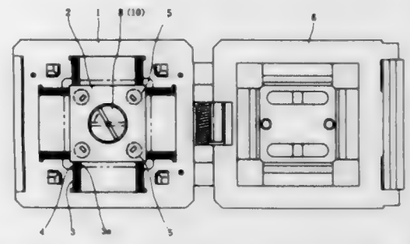
5,199,890

IC SOCKET

Masaaki Kubo, Tokyo, Japan, assignor to Yamaichi Electric Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1992, Ser. No. 897,449
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—72 4 Claims

1. An IC socket comprising a socket board, an IC platform disposed on said socket board for movement upward and downward and adapted to carry an IC thereon, and a plurality of contacts arranged in array on said socket board portion around said IC platform, so that leads of said IC carried on said IC platform contact said plurality of contacts, wherein said IC socket further comprises a pivot shaft member allowed to penetrate a central portion of said IC platform, a pivotal operation portion for allowing a tip of a tool to engage therewith, being formed on a head portion of said pivot shaft member such that said pivotal operation portion is exposed on an upper



surface side of said IC platform, a lower end portion of said shaft member being pivotably supported on said socket board portion right under said IC platform, said pivot shaft member being brought into connection with said IC platform through cam means adapted to guide said IC platform between a higher position and a lower position in accordance with a pivotal operation of said pivot shaft member, thereby adjusting an IC supporting height of said IC platform.

5,199,891

CABLE STRAIN RELIEF FOR SHIELDED ELECTRICAL CONNECTOR

Carl G. Reed, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1992, Ser. No. 882,322
Int. Cl.[5] H01R 13/698
U.S. Cl. 439—98 17 Claims

1. In an electrical connector terminating signal wires of a shielded electrical cable having a drain wire, the connector comprising an insulating housing containing electrical terminals having contacts electrically connected to the signal wires of the shielded electrical cable and metal shielding covering at least part of the insulating housing; a grounding clip connected to the metal shielding and receiving an end portion of the shielded electrical cable from which portion the signal wires extend to the said contacts of the connector, the drain wire of said cable being wound in a circuitous path about the grounding clip thereby providing strain relief for the electrical connections between said contacts and the signal wires of the shielded electrical cable.

an elongate insulative housing having;

second side of a daughter board inserted into said

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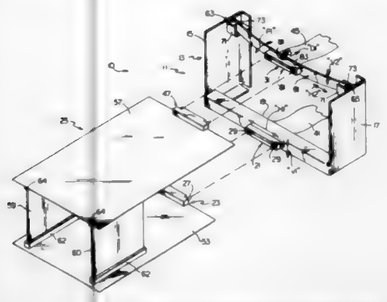
5,199,892

CONNECTOR ASSEMBLY AND INFORMATION HANDLING SYSTEM COMPONENT UTILIZING SAME

Jeffrey S. Campbell, Endicott; Frederick W. Doolittle; David B. Howe, both of Binghamton, and Christopher S. Pendleton, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1991, Ser. No. 776,940
Int. Cl.[5] H01R 13/64
U.S. Cl. 439—246 16 Claims



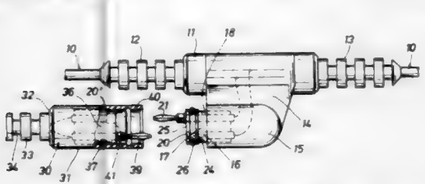
1. In an electrical connector assembly for electrically connecting first and second connectors spacedly positioned on a first structure including a chassis member for use in an information handling system to first and second partner connectors spacely positioned on a second structure in a substantially fixed relationship relative to each other when said first and second partner connectors engage said first and second connectors, respectively, said second structure including a pair of circuit boards, said first and second partner connectors being electrically coupled to a respective one of said circuit boards, the improvement wherein said first structure includes a spring member as part thereof, said first connector being positioned on said first structure at a first location, said second connector being pivotally positioned on said spring member of said first structure at a second location and movable in at least four different manners of direction when engaged by said second partner connector to thereby compensate for possible misalignment of said connectors.

5,199,893

SEISMIC CONNECTOR WITH REPLACEABLE SEAL

Don L. Fussell, 16818 Bobcat Trail, Cypress, Tex. 77429

Filed Jul. 22, 1991, Ser. No. 733,609
Int. Cl.[5] H01R 13/52
U.S. Cl. 439—271 9 Claims



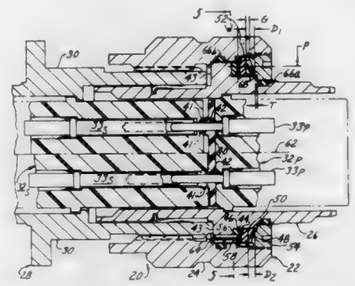
1. A seismic connector assembly comprising: a first connector means including a male insert member bonded within a first tubular body having an outer end, said male insert member having an outer portion extending beyond said outer end of said body; a second connector means including a female insert member having an outer face and being bonded within a second tubular body, an outer portion of said second tubular body extending beyond said outer face of said female insert member, said outer portion of said male insert member being arranged to be received within said outer portion of said second tubular body when said connector assembly is made up; internal annular recess means on said outer portion of said second tubular body; and replaceable seal ring means on said outer portion of said male insert member arranged to engage said recess means when said connector assembly is made up to prevent the entry of moisture and to releasably hold said first and second connector means together.

5,199,894

SELF-LOCKING CONNECTOR

Lou E. Kalny, 917 Sequoia Ct., San Dimas, Calif. 91773, and Frederick B. B. Baumann, 3454 N. Mills, Claremont, Calif. 91711

Filed Dec. 14, 1990, Ser. No. 627,647
Int. Cl.[5] H01R 13/623
U.S. Cl. 439—321 12 Claims



1. A self-locking electrical connector comprising:
(a) a first shell body for receiving a first set of contacts;
(b) a threaded clamping ring rotatably coaxially supported on the first shell body for holding the first set of contacts in axial engagement with a second set of contacts;
(c) a multiplicity of first detent members supportively coaxially located in a fixed angular relation to the clamping ring;
(d) a multiplicity of second detent members supportively coaxially located in a fixed angular relation to the first shell body, the first and second detent members being simultaneously engagable on a detent pitch circle having an average detent pitch diameter P and having a detent engagement width W; and
(e) biasing means for axially holding the first and second detent members in facing engagement, whereby a total surface contacting area of engagement between the detent members is at least 0.1 times the product of P and W, the biasing means providing a biasing force, the biasing force being distributed substantially uniformly among the first detent members, the first and second detent members being engagable in a multiplicity M of equally spaced positions having an angular spacing Φ and an equivalent tangential spacing S, wherein the total surface contact area of engagement is maintained at not less than approximately 0.05 times the product of P and W during rotational movement of the second detent members relative to the first detent members through an angle not less than half of the angular spacing Φ.

5,199,895

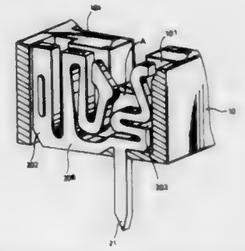
LOW INSERTION FORCE, SELF-LOCKING CONNECTING APPARATUS FOR ELECTRICALLY CONNECTING MEMORY MODULES TO A PRINTED CIRCUIT BOARD

Lien-Ker Chang, No. 20, Lane 17, Sec. 1, Yung An N., Taipei Hsien, Taiwan

Filed Feb. 4, 1992, Ser. No. 830,907
Int. Cl.[5] H01R 23/70
U.S. Cl. 439—326 3 Claims

1. An edge connector socket for printed circuit boards comprising:

an elongate insulative housing having;
a) a first and second end portions, and an elongate insertion face extending therebetween, said insertion face having;
i) an elongate, recessed channel extending therealong for receiving an edge portion of a daughter board provided with conductive terminals;
ii) a plurality of parallel slots formed therealong in perpendicular alignment over the channel;
b) a vertical securing post on each end portion disposed to a first side of a substantially vertical plane passing through the channel that is assumed by a printed circuit board when mounted in a functional position in said socket, each said post having a protruding pin extending towards a second side of the plane for engagement with a corresponding cooperating aperture on a daughter board when in said functional position;
c) a guide ramp on each end portion disposed to the second side of the plane and inclined at a predetermined insertion angle therewith for guiding the insertion of a daughter board into the channel;
a plurality of conductive contact members, each said contact members being disposed in a corresponding slot in said housing and having,
a) a base disposed in a lower portion of an associated slot having a terminal pin depending therefrom for establishing an electrical communication with a motherboard below said housing;
b) a generally linear vertical member extending upward from said base at a first transverse end thereon;



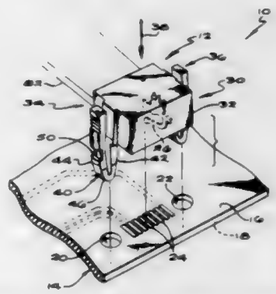
c) a crenelated fulcrum member on a second transverse end of said base having;
i) a lower generally S-shaped section defining substantially parallel upper and medial transverse portions adjoined by an inner bight;
ii) an upper oblique section adjoined to an outer end of the upper transverse portion, inclined towards said vertical member;
iii) a level section adjoined to the upper end of the oblique section to define a rounded first apex, wherein said first apex of said contact members abut a first side of a daughter board inserted into the channel of said housing to define a fulcrum about which the daughter board is rotated into said functional position;
d) a crenelated spring member on a medial position on said base spaced from said fulcrum member to define a receiving space in communication with the opening of the channel, said spring member having;
i) an ascending section spaced from said vertical member extending upward from said base;
ii) a descending section adjoined to an upper end of the ascending section;
iii) an upwardly directed inflected section adjoined to a lower end of the descending section by a bight, said inflected section defining;
a rounded second apex at a medial position thereon, directed towards said fulcrum member and of a lower position relative to said first apex, for abutting a second side of a daughter board inserted into said receiving space;
an inclinate cam surface on a terminal edge portion thereon leading to said second apex, for engaging a terminal edge of a daughter board inserted into said receiving space;
whereby, insertion of a daughter board into said receiving space of said contact members effects a flexure of said spring member thereof, reaction forces from said spring member of said contact members applied via said second apex thereof generate a torque on the daughter board to rotate the daughter board into engagement with said pin on each said securing post, mounting the daughter board in a functional position in said socket.

5,199,896

LATCHABLE P.C. BOARD CONNECTOR

Rene A. Mosquera, Laguna Niguel, Calif., assignor to ITT Corporation, Secaucus, N.J.

Filed Jul. 29, 1991, Ser. No. 736,994
Int. Cl.[5] H01R 13/74
U.S. Cl. 439—329 14 Claims



1. A connector and board combination, comprising:
a circuit board that has upper and lower opposite surfaces and at least one hole extending between said surfaces;
a connector which includes a housing with a main housing portion and with at least one latch, said latch comprises a largely U-shaped arm with a pair of largely parallel arm parts and a lower part joining said arm parts;
said arm parts are resiliently deflectable toward each other, and a first of said arm parts forms a largely upwardly-facing shoulder and forms an upper handle portion extending above said shoulder by more than twice the thickness of said circuit board when said arm parts are undeflected toward each other, with said upper handle portion being freely accessible to be pressed by a person's finger without blocking by said any other portion of said connector.

5,199,897

ELECTRICAL CONNECTORS

Osamu Hashiguchi, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Ltd., Tokyo, Japan

Continuation of Ser. No. 656,579, Feb. 15, 1991, abandoned.
This application Sep. 18, 1992, Ser. No. 947,780
Claims priority, application Japan, Mar. 15, 1990, 2-25027
Int. Cl.[5] H01R 13/627
U.S. Cl. 439—357 1 Claim

1. An electrical connector comprising a plug part, a receptacle part having a pair of ear portions each of which projects outwardly from the side thereof, said plug part including a body having a plurality of contact elements for connecting with conductors in a cable, a front hood for receiving said body, a pair of resilient lock members to secure to said front hood so as to extend along each side of said body within said front hood, a slider having a pair of legs which can be inserted

faces of the connector, the resilient projections have a

perimeter of the wall of the sealing chamber (10) offset 90°

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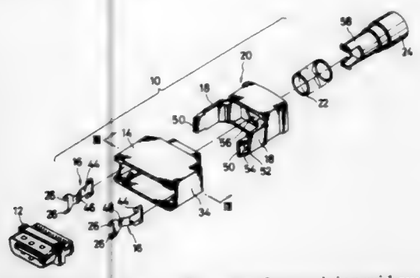
into said hood in connection with said resilient lock members, one end each of which is formed as a hook for engaging with a respective said ear portion, a rear hood to be inserted in said slider, said resilient lock members each being provided with a curved portion at an intermediate portion thereof, and said



each leg being provided with a recess for receiving said curved portion of said resilient lock member and a curve surface for cooperating with said curved portion of said resilient lock member whereby said plug portion can be easily removed from said receptacle part.

5,199,898

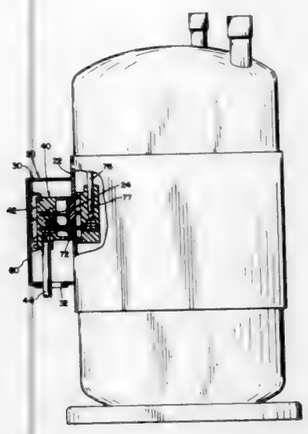
EXTERNAL TERMINAL SHIELD

Ronald R. Wisner, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 23, 1991, Ser. No. 763,918

Int. Cl.[5] **H01R** *13/62*

U.S. Cl. 439—367 **8 Claims**



1. A compressor with a hermetic housing and a hermetic terminal assembly thereon, said compressor having an external terminal shield assembly comprising:

a cluster block having electrical connectors removably attached to said hermetic terminal assembly, said cluster block including electrical power supply wires attached to said electrical connectors;

an enclosure covering both said cluster block and said hermetic terminal assembly, said electrical power supply wires leading from said cluster block through said enclosure to connect with an electric power source, said enclosure attached to said compressor and having means to open said enclosure to expose said cluster block and terminal assembly; and

means for interlocking said cluster block with said enclosure, so that when said enclosure is opened said cluster block is automatically electrically disconnected from said hermetic terminal assembly.

5,199,899

BRANCH CONNECTOR FOR ELECTRICALLY CONNECTING TWO ELECTRICAL CONDUCTORS

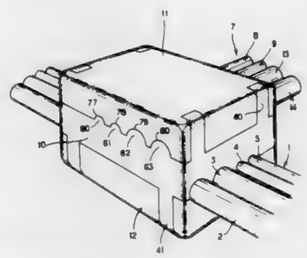
Jean Ittah, Villeneuve la Garenne, France, assignor to Societe Labinal, Montigny Le Bretonneux, France

Filed Sep. 17, 1991, Ser. No. 760,949

Claims priority, application France, Sep. 19, 1990, 90 11551

Int. Cl.[5] **H01R** *4/24*

U.S. Cl. 439—403 **5 Claims**



1. Branch connector comprising:

two half-shells;

an intermediate element designed to be inserted between said two half-shells;

means for assembling said two half-shells with the intermediate element;

said intermediate element having an upper face and a lower face, and comprising a series of channels with each channel constructed and arranged to receive a connecting device, each channel in said series of channels having an upper end opening onto said upper face and a lower end opening onto said lower face;

stops positioned to immobilize a connecting device in each channel so that free ends of sides of a first component of the connecting device protrude from one of said upper end or lower end of one of the channels, and free ends of sides of a second component of the connecting device protrude from the other end of the channel;

each of said half-shells has a bottom at a depth, when in position on said intermediate element, wherein corresponding free ends of the first component and the second component are capable of bearing against a corresponding bottom; and

each channel has a stop, on a side of one face of said upper face and said lower face of the intermediate element, capable of cooperating with an outer surface of a base part of the first component, and, on a side of another face of said upper face and said lower face of the intermediate element, a partition designed to be inserted between sides of the second component and to cooperate with an inner surface of a base part of the second component.

5,199,900

PANEL MOUNT ELECTRICAL CONNECTOR

Earl J. Hayes, Sr., Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 21, 1992, Ser. No. 839,855

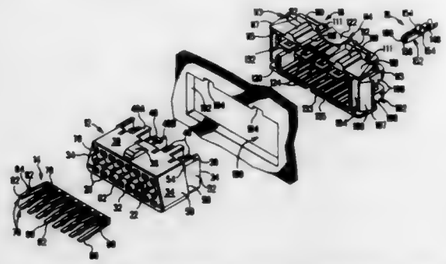
Int. Cl.[5] **H01R** *13/74*

U.S. Cl. 439—557 **8 Claims**

6. An electrical connector for insertion into an opening of a panel comprising:

resilient projections extending from the connector, the resilient projections have first ends which are essentially coplanar with respective surfaces of the connector, and second ends which are spaced from the respective surfaces of the connector, the resilient projections have a compound inclined configuration;

whereby as the electrical connector is inserted into the



opening of the panel, the resilient projections will be elastically deformed by sidewalls of the opening, thereby causing the resilient projections to exert a force on the sidewalls of the opening.

5,199,901

ELECTRICAL PLUG HOUSING WITH A KEYING DEVICE FOR AN ELECTRICAL CONTACT ELEMENT TO BE INSERTED INTO A CONTACT CHAMBER OF THE PLUG HOUSING

Michael Balser, Radevormwald-Dahlerau, and Rudolf Reinertz, Wuppertal, both of Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 28, 1992, Ser. No. 875,128

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1991, 9105277[U]

Int. Cl.[5] **H01R** *13/40*

U.S. Cl. 439—587 **5 Claims**

1. An electrical plug housing with a keying device for a crimped, electrical contact element with a sealing plug and operative for insertion into a contact chamber with an advanced sealing chamber in the plug housing, whereby the sealing chamber has a round cross section and the contact chamber has a rectangular cross section, and the front end of the contact element has two edges aligned parallel to each other, characterized in that the keying device (**14**) comprises:

(a) a prekeying device operative for engagement by the contact element, the prekeying device located in advance in the axial direction of the plug and in the form of two paired cross-sectional constrictions (**17**) located radially opposite each other in the sealing chamber (**10**) and of circular segmented cross section, that are each provided with an inlet slant (**16**); and

(b) two paired, opposing cross-sectional constrictions (**18**) in the sealing chamber (**10**) likewise of circular, segmented cross section, and featuring two insertion slants (**19**) behind and in the sealing chamber (**10**) in the axial direction of the prekeying device, which are positioned around the perimeter of the wall of the sealing chamber (**10**) offset 90° to the cross-sectional constrictions (**17**),

whereby the contact element first contacts the prekeying device for predetermined axial alignment and then passes between the constrictions to enter the contact chamber.

5,199,902

CONNECTOR DEVICE

Lane D. Kahle, Bradford, and Phillip C. Poux, Russell, both of Pa., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 23, 1991, Ser. No. 812,304

Int. Cl.[5] **H01R** *13/40*

U.S. Cl. 439—595 **14 Claims**

1. In a connector device which includes a first connector having a plurality of first contacts for mating with a second connector having a plurality of corresponding second contacts, said first contacts being electrically connected to said second contacts when said first connector is coupled to said second connector, wherein the improvement comprises a first connector which comprises:

(a) a receptacle housing for containing one or more rows of said first contacts, each of said first contacts having a long axis and an intermediate length and adjacent lengths in either end thereof, said intermediate length having a given width which is less than the widths of said adjacent lengths, and

(b) first locking means insertable through at least one aperture in said receptacle housing and slidable to first and second positions relative to said intermediate lengths, said contacts being unlocked in said first position and locked in said second position of said first locking means, relative to said receptacle housing, said first locking means including a first locking member having one or more legs which extend freely into one or more apertures of said receptacle housing, each leg being scalloped to provide continuous alternating raised and lowered lengths of said leg, each lowered length being adjacent to but spaced from a respective first contact when said first locking means is in said first position whereby each first contact can be inserted into or withdrawn from said receptacle housing without interference of said locking member, and each raised length being adjacent o a first side of said intermediate length of a respective first contact when said first locking means is in said second position whereby each first contact is locked into said receptacle housing.

5,199,903

device having a first connector to a second device having a

and a third section defining an offset elbow joining the adapter

56) toward said housing mounting face (**14**), the distal ends

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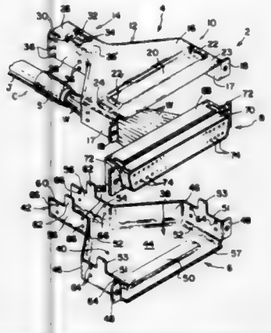
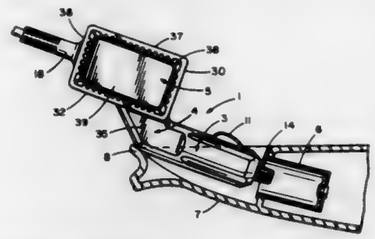
5,199,903
FERRULELESS BACK SHELL
John C. Asick; Karen E. Benjamin, both of Harrisburg, and Earl W. McCleerey, Mechanicsburg, all of Pa., assignors to AMP General Patent Counsel, Harrisburg, Pa.
Filed Feb. 28, 1991, Ser. No. 662,587
Int. Cl.[5] H01R 9/05
U.S. Cl. 439—610 27 Claims



1. A shielding back shell for an electrical connector, the electrical connector adapted to be terminated to conductors of a shielded electrical cable, the back shell comprising:
first and second back shell members configured to be secured together about said connector, in superposed relationship;
cable strain relief shell means for securing about external shielding on a length of said cable, said cable strain relief shell means comprising a first cable strain relief shell member connected to said first back shell member and a second cable strain relief shell member connected to the second back shell member, said strain relief shell members being interengageable with each other in nested relationship to enclose said externally shielded length of the cable and being provided thereon with flange means and recess means, said flange means being crimpable into said recess means for securing said strain relief shell members in firm engagement with said external shielding on said cable;
wherein each cable strain relief shell member comprises a base wall and opposed side walls upstanding from said base wall, said flange means comprising at least one flange upstanding from a side wall of at least the first strain relief shell member, said recess means comprising at least external, one recess formed in the base wall of at least the second strain relief shell member.

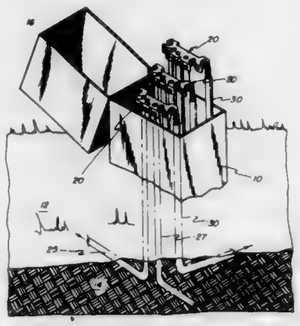
5,199,904
ELECTRICAL OFFSET ADAPTER PLUG
Richard F. Wharton, Glenview, Ill., assignor to Safco Corporation, Chicago, Ill.
Filed Aug. 6, 1992, Ser. No. 925,188
Int. Cl.[5] H01R 13/00
U.S. Cl. 439—668 16 Claims

1. An electrical offset adapter plug for accessing an electrically powered receptacle housed within a compartment having a restricted path by which the adapter plug is inserted into the receptacle, comprising a composite structure including a first adapter-plug section having a generally tubular body which is relatively longer than its tubular diameter and which is adapted for insertion into the receptacle, a second enclosure section defining an internal chamber for housing optional electrical components and serving also as a gripping handle for manual insertion of the offset adapter plug into the receptacle, and a third section defining an offset elbow joining the adapter plug section to the enclosure section with the enclosure section



being disposed substantially offset relative to both the length and tubular diameter of the adapter-plug section.

5,199,905
LAY-IN PEDESTAL CONNECTOR BAR AND METHOD
David R. Fillinger, Cincinnati, Ohio, assignor to Connector Manufacturing Co., Hamilton, Ohio
Filed Mar. 9, 1992, Ser. No. 848,673
Int. Cl.[5] H01R 11/09
U.S. Cl. 439—723 4 Claims

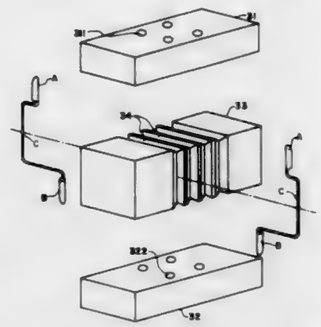


1. A lay-in pedestal connector bar comprising
a body member formed from a generally rectangular volume of metal, said body member including a front surface, a top surface and right and left sides,
means forming a pair of generally centrally located, completely enclosed wire openings in said top surface, said openings extending completely through said body member for receiving power supply cables,
means forming at least two lay-in openings in said top surface, one set of lay-in openings on each of the left and right sides of said body member, each of said openings extending completely through said body member and including entry slots for receiving distribution cables, and
set screws extending through said body member into said enclosed openings and said lay-in openings for securing electrical cables placed in said openings.

5,199,906
ELECTRICAL CONNECTOR
Chuen-Guey Wang, Taipei, Taiwan, assignor to Trusty Industrial Co., Ltd., Taipei, Taiwan
Continuation of Ser. No. 653,309, Feb. 11, 1991, abandoned.
This application May 27, 1992, Ser. No. 888,311
Int. Cl.[5] H01R 9/24
U.S. Cl. 439—723 4 Claims

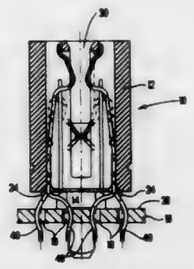
1. An electrical connector for electrically connecting a first

device having a first connector to a second device having a second connector, said electrical connector comprising:
a first connecting element having a conducting portion, a first free end of said first connecting element being connected to a first end of the conducting portion and compatible with the first connector, and a second free end connected to a second end of said conducting portion and compatible with the second connector; and



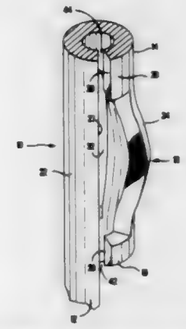
an accommodating member substantially in the shape of a cube, said accommodating member having at least one notched groove formed around the periphery thereof;
wherein said conducting portion is accommodated within the notched groove so that said first free end and said second free end are arranged respectively at opposite faces of said accommodating member and the notched groove has a depth substantially equal to a diameter of said conducting portion of said first connecting element.

5,199,907
ELECTRICAL CONNECTOR HAVING CONTACTS WITH BOARD RETENTION FEATURE
Ronald P. Jansen, Mechanicsburg, and Mark R. Thumma, Oberlin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 18, 1992, Ser. No. 900,644
Int. Cl.[5] H01R 13/41
U.S. Cl. 439—751 10 Claims



1. An electrical connector (**10**) for mounting to a printed circuit board (**16**), wherein the printed circuit board is formed with an array of plated through-holes (**18**), the connector comprising:
a housing (**12**) having a mounting face (**14**) and a plurality of contact-receiving passageways therethrough transverse to said mounting face; and
a plurality of contacts (**32, 34**) each disposed in a respective one of said plurality of passageways, each of said contacts including a tail portion (**40, 46**) extending out of said housing beyond said mounting face, each of said tail portions being smoothly curved over a predetermined length without any sharp bends or kinks from its distal end (**48, 56**) toward said housing mounting face (**16**), the distal ends of said tail portions being spaced relative each other so that the distal ends can each be substantially centered over a respective one of said circuit board holes (**18**) prior to said connector being mounted to said board and while said tail portions are relaxed, said predetermined length being sufficient so that when said connector is mounted to said board with said tail portions extending into said circuit board holes the smooth curve extends from said distal end at least through said circuit board, the curve of each of said tail portions being configured with a high region (**52, 62**) displaced from a respective axis (**54, 58**) which passes through the distal end parallel to the direction of insertion of the tail portions into the respective circuit board holes, the high region of each tail portion being so located along said predetermined length of said each tail portion that it is within the respective circuit board hole when the connector is mounted to the board, the curve of each of said tail portions being further configured so that when the tail portions are relaxed and the distal ends of the tail portions are substantially centered over the respective circuit board holes the projection of the high region of each tail portion onto the surface of the circuit board is outside the respective circuit board hole, insertion of each tail portion into its respective circuit board hole causing its high region to be displaced toward its respective axis so that a force normal to the respective axis is applied against the interior wall of the respective circuit board hole.

5,199,908
ELECTRICAL CONTACT
Matthew M. Sucheski, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 16, 1992, Ser. No. 914,912
Int. Cl.[5] H01R 13/41
U.S. Cl. 439—751 9 Claims



1. An electrical contact (**10**) for insertion and retention in a circular hole (**38**) which extends through a printed circuit board (**40**), said contact including a retention portion (**16**) comprising:
first and second collar sections (**18, 20**); and
first and second beam members (**22, 24**) each joining said first and second collar sections;
wherein said first and second collar sections are formed substantially as segments of respective cylinders of larger diameter than the diameter of said circuit board hole, said first and second collar sections being resiliently compressible to pass through said hole, said first and second beam members each having a length at least as great as the thickness of said circuit board;
whereby said first collar section can be passed through said circuit board hole when said collar sections are resiliently compressed so that said collar sections are on opposite sides of said circuit board and outside said circuit board

a ship service power system;
the inside of said boat with respect to the direction of the

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hole, and the subsequent relaxation and expansion of said collar sections causes said first and second beam members to engage the wall of said hole to retain said contact therein.

5,199,909

CONTACT SOCKET FOR CONNECTING FLAT CONTACT TONGUES

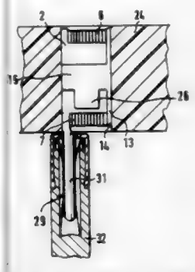
Paul Rainer Molitor, Mühldorf, and Meinrad Jankowski, Töging, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate, Muhldorf/Inn, Fed. Rep. of Germany

Filed Apr. 9, 1992, Ser. No. 865,477

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1991, 4112035

Int. Cl.[5] H01R *13/187*

U.S. Cl. 439—843 **4 Claims**



1. A contact socket for receiving a contact tongue, comprising a contact spring support with two bearing walls substantially parallel to one another, and a row of curved contact springs arranged on an inner surface of at least one of said walls to define an opening for a contact tongue between the springs and the other of said walls characterized in that opposite ends of each contact spring are bent back toward one another around opposite edges of said one bearing wall at bending points of the spring and that a distance between the bending points of each contact spring in a stretched-out state of the spring is greater than a distance between said edges by an amount determining the curvature of the contact spring.

5,199,910

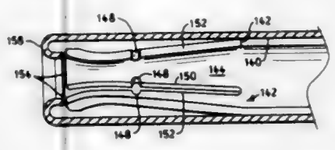
CONNECTOR DEVICE

Lane D. Kahle, Bradford, and Phillip C. Poux, Russell, both of Pa., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 23, 1991, Ser. No. 812,306

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—843 **9 Claims**



1. In a connector device which includes a first connector having a plurality of female contacts for mating with a second connector having a plurality of corresponding male contacts, said female contacts being electrically connected to said male contacts when said first connector is coupled to said second connector, wherein the improvement comprises (a) said female contacts each comprising means disposed at a first end of each female for attaching an electrical conductor to said female contact, and an opposite second end comprising three identical resilient beams which are equally spaced about a longitudinal axis of said female contact and include opposing female contact surfaces configured to engage a male contact of said plurality of corresponding male contacts, when said first connector is coupled to said second connector, at corresponding male contact surfaces which are equally spaced about a longitudinal axis of said male contact, each beam of said three identical beams including grooves cut out of opposing edges of said beams, said grooves being spaced from a distal end of a beam, and (b) a plurality of open ended cylindrical hoods each of which is concentric relative to an opposite second end of a female contact and includes an inner surface which engages an outer surface of said opposite second end of said female contact.

5,199,911

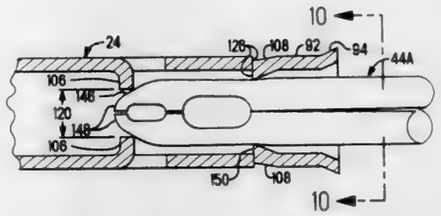
PRESS FIT SOLDER CUP

Charles E. Dorwart, Jr., Columbia; William T. Parker, Boiling Springs, and Jeffrey L. Showers, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 677,012, Mar. 28, 1991, abandoned. This application Mar. 16, 1992, Ser. No. 852,850

Int. Cl.[5] H01R *4/02*

U.S. Cl. 439—874 **13 Claims**



1. A solder cup adapted to be secured to the shank of a contact, said contact adapted to be received in a connector housing, the solder cup comprising:

a generally hollow body defining a bore sized to receive the shank of a contact therein from a first end, said body having at least one inwardly directed resilient retention feature proximate said first end, said at least one inwardly directed retention feature extending into said bore to define an effective diameter within said bore that is less than a cross section measurement of a contact adapted to be received in the bore, said solder cup adapted to receive and be soldered to a conductor proximate a second end and at least one inwardly directed stop member extending into said bore, said stop member positioned along said body to define the insertion depth of the shank within the bore, whereby upon insertion of the shank of a contact into the bore of the solder cup the shank is retained therein by engagement between said at least one resilient retention feature and said shank.

5,199,912

ELECTRIC POWER SYSTEM FOR MARINE VEHICLES

Thomas B. Dade, Poquoson; Kenneth W. Leiding, Norfolk, both of Va., and Peter P. Mongeau, Hopkinton, Mass., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Aug. 15, 1991, Ser. No. 745,350

Int. Cl.[5] B63H *21/12*

U.S. Cl. 440—6 **13 Claims**

1. An electric power system for marine vehicles comprising:

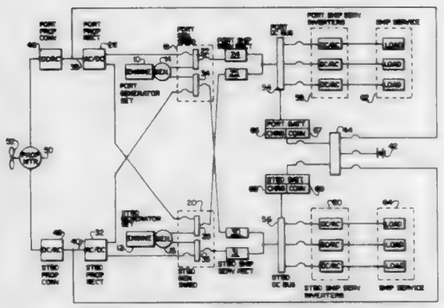
a first generator for generating an AC voltage having a first magnitude;

a propulsion power system including a propulsion motor for driving a propeller of said vehicle;

means for coupling said generated AC voltage to said propulsion power system;

a ship service power system;

means for coupling said generated AC voltage to said ship service power system including means for rectifying said AC voltage to a controlled reduced magnitude DC voltage, said reduced magnitude DC voltage being less than said first magnitude AC voltage by a given value, whereby voltage transients in said propulsion power system less than said given value are automatically compensated for by said means for rectifying such that they do not affect said ship service power system; and



wherein said means for coupling said generated AC voltage to said ship service power system includes inverters for converting said reduced magnitude DC voltage into three-phase AC voltage for use by ship service loads and said inverters include insulated gate bipolar transistors (IGBTs).

5,199,913

SMALL, JET-PROPELLED BOAT

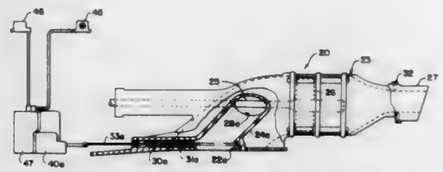
Makoto Toyohara, and Hiroshi Tasaki, Hamamatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed May 18, 1992, Ser. No. 884,763

Claims priority, application Japan, May 16, 1991, 3-141137

Int. Cl.[5] B63H *11/103*

U.S. Cl. 440—47 **15 Claims**



1. A jet-propelled boat including a hull, a bottom side of which is under water when operating the boat, a main duct positioned in the hull, impeller means within the main duct for creating a jet stream within the main duct, and first and second water-intake openings on the bottom of the hull positioned a predetermined distance apart on opposite sides of the hull and connected by respective duct branches to the main duct;

means including valves positioned to selectively open and close each of the first and second water-intake openings; and

means for controlling said valves to close one of said first and second openings when a turn is made in said boat such that said one of said openings which is positioned on the outside of said boat with respect to a direction of the turn is always closed to thereby prevent air from entering said one of said openings when it is exposed to the air during the turn so that only the opening which is positioned on the inside of said boat with respect to the direction of the turn will be open.

5,199,914

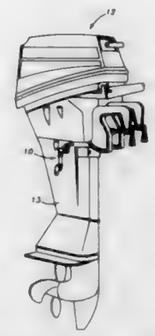
FOUR STROKE OUTBOARD MOTOR CRANKCASE OIL DRAIN PLUG OPENING ATTACHMENT

Wallace M. Marsh, S. 8900 Mullen Hill Rd., #641, Spokane, Wash. 99204

Filed Jul. 26, 1991, Ser. No. 736,228

Int. Cl.[5] B63H *21/38*

U.S. Cl. 440—88 **7 Claims**



1. A four stroke outboard motor crankcase oil drain plug opening attachment, comprising:

a manually operable valve having a spigot and a valve operator;

a fitting adapting the manually operable valve to a drain plug opening in an outboard motor having a crankcase and spacing the manually operable valve outward of the crankcase;

a downspout mounted to the manually operable valve and extending downwardly therefrom;

an oil drainage collector container having an upper end configured to receive the downspout therethrough;

wherein the oil drainage collector container includes a bale means adjacent the upper end for releasably suspending the oil drainage collector container from the manually operable valve with the downspout extending through the upper container end and into the container

wherein the upper end of the container includes an opening with a dimension across the opening less than the prescribed length dimension of the downspout; and

wherein the bale is arranged to suspend the container from the manually operable valve with a portion of the downspout length extending into the container through the container opening, the length of the portion extending into the container being greater than the dimension across the opening such that the container is not permitted to unintentionally swing free of the downspout.

5,199,915

FOOTPIECE FOR A SKI

Jeffery P. Bindon, 11 Edinburgh Crescent, Westville, Natal Province, and Hilton R. Thorpe, 366 Bartle Road, Umbilo, Natal Province, both of South Africa

Filed Mar. 1, 1991, Ser. No. 664,257

Claims priority, application South Africa, Mar. 2, 1990, 90/1620

Int. Cl.[5] B63B *35/81*

U.S. Cl. 441—70 **22 Claims**

1. A footpiece for locating a skier's foot on a water ski, wherein said footpiece comprises:

(a) a foot locating member including a first foot locating

portion formed to receive the heel part of a skier's foot

5,199,917

5,199,918

METHOD OF FORMING FIELD EMITTER DEVICE

symmetrically arranged with respect to said socket axis and defining said socket axis

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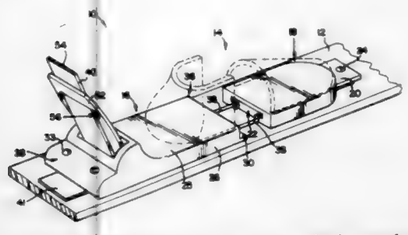
portion formed to receive the heel part of a skier's foot therein and a second foot locating portion formed to receive the ball and toe part of a skier's foot therein, one foot locating portion having attachment means for fixedly securing it to the ski, while the other foot locating portion is slidingly located relative to the ski, so that by sliding displacement of the slidingly located foot locating portion different sized skier's feet can be accommodated by the foot locating member;

(b) guide means for guiding sliding displacement of the slidingly located foot locating portion relative to the ski; ;and



(c) a flexible elongated strap element operatively coupled to the slidingly located foot locating portion and a locking means, said flexible elongated strap element extending away from said slidingly located foot locating portion and said locking means, and defining a free end so that a tensile force can be manually applied to said flexible elongate strap element by acting upon its free end, which force can be transmitted to said slidingly located foot locating portion for slidingly displacing said slidingly located foot locating portion relative to the ski and which force manipulates said locking means.

5,199,916

RELEASABLE ANCHOR PLUG

Timothy B. Prickett, 95-2051 Waikalani Pl., #604-E, Mililani, Hi. 96789

Filed Oct. 17, 1991, Ser. No. 779,064
Int. Cl.[5] B63B *35/79, 1/00, 35/00*
U.S. Cl. 441—75 **19 Claims**

1. A releasable anchor plug, comprising:

a housing having a leash cavity; and

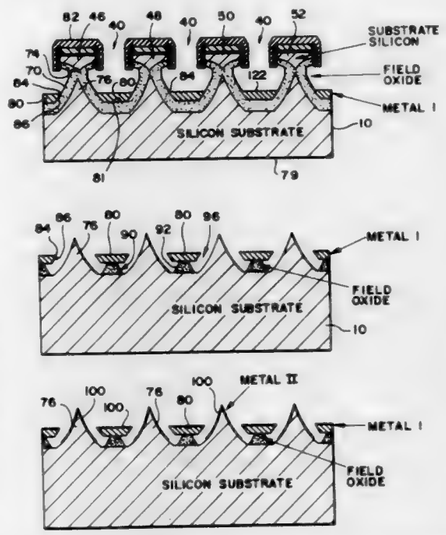
a leash pin slidably mounted in said housing and spanning said leash cavity, whereby retracting said leash pin prevents said leash pin from spanning said leash cavity.

5,199,917

SILICON TIP FIELD EMISSION CATHODE ARRAYS AND FABRICATION THEREOF

Noel C. MacDonald, and James P. Spallas, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 9, 1991, Ser. No. 803,986
Int. Cl.[5] H01J *9/04*
U.S. Cl. 445—24 **17 Claims**



1. A process for fabricating a densely packed microcathode field emitter array for producing high current density emissions at low voltages, comprising:

forming from a silicon substrate a multiplicity of closely-spaced generally cylindrical islands, each island being individually supported by a corresponding tapered generally conical silicon pedestal integral with said substrate;

laterally oxidizing the under surfaces of said silicon islands and the sides of said corresponding pedestals to form in each said silicon island and pedestal upper and lower opposed conical tips, respectively, said tips having nanometer-scale tip dimensions and wherein the lower tips are of substantially uniform height;

controlling the oxidation of said islands and pedestals to provide a uniform layer of oxide on said lower tips and on the surface of said substrate adjacent said lower tips to produce silicon tips having diameters in the range of 20 nm;

depositing a layer of gate electrode metal on selected portions of said oxide layer, below the level of said lower tip, deposition of said metal being limited by said island to define apertures in said metal which are axially aligned with said lower tips, said metal layer being spaced from said tips by the thickness of said oxide layer thereby providing self-aligned metal encapsulation for said oxidized lower tips; and

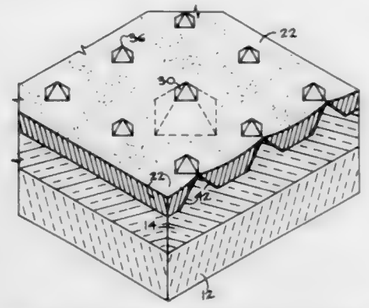
etching said oxide layer to lift off said islands and their included upper tips and to remove at least a part of said layer of oxide on each said pedestal to expose at least an upper conical portion of each of said lower tips above the top surface of said metal layer, while leaving oxide support means for said gate electrode metal, whereby said gate electrode metal surrounds, is below and closely spaced to, and is accurately aligned with, said tip.

5,199,918

METHOD OF FORMING FIELD EMITTER DEVICE WITH DIAMOND EMISSION TIPS

Nalin Kumar, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 7, 1991, Ser. No. 789,237
Int. Cl.[5] H01J *9/02*
U.S. Cl. 445—50 **18 Claims**



1. A method of fabricating a field emitter device, comprising the following steps in the sequence set forth:

providing a substrate;

coating said substrate with a diamond film having negative electron affinity and a top surface with spikes and valleys;

depositing a conductive metal on said diamond film; and

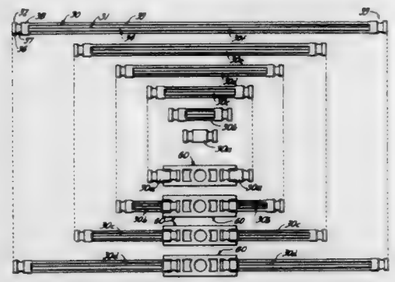
etching the conductive metal to expose the portions of said spikes without exposing said valleys, thereby forming diamond emission tips which protrude above said conductive metal.

5,199,919

CONSTRUCTION TOY SYSTEM

Joel I. Glickman, Huntingdon Valley, Pa., assignor to Connector Set Limited Partnership, Hatfield, Pa.

Continuation-in-part of Ser. No. 687,306, Apr. 18, 1991, Pat. No. 5,137,486, and a continuation-in-part of Ser. No. 625,809, Dec. 11, 1990, Pat. No. 5,061,219. This application Jun. 19, 1991, Ser. No. 717,639
Int. Cl.[5] A63H *33/04*
U.S. Cl. 446—126 **29 Claims**



1. A construction toy system of the type comprising a plurality of connector elements and rod-like strut elements formed of molded plastic material and removably joinable with other elements to form a coherent structure, wherein at least certain of the connector elements comprise

(a) a socket-forming section disposed on a predetermined defined socket axis and having open sides,

(b) said socket-forming section comprising a pair of spaced-apart, generally parallel cantilever mounted gripping arms symmetrically arranged with respect to said socket axis and defining said socket axis,

(c) said gripping arms being formed with first interlock means co-axial with said socket axis to interlock with a strut element for releasably but firmly holding a strut element aligned with said socket axis,

(d) second interlock means formed in said socket-forming section to interlock with a strut element for releasably but firmly holding a strut element in a predetermined axial position along said socket axis,

and wherein at least certain of said strut elements comprise

(e) elongated rod-like members formed with opposite end portions and intermediate portions integrally joining said end portions,

(f) said opposite end portions being provided with first and second interlocking means for cooperative engagement with the first and second interlocking means of said connector element, whereby the respective first interlocking means hold a strut element in coaxial alignment with said defined socket axis and the respective second interlocking means hold a strut element in predetermined axial position on said socket axis,

(g) each pair of gripping arms defining between them an open-sided, socket co-axial with said defined socket axis, and

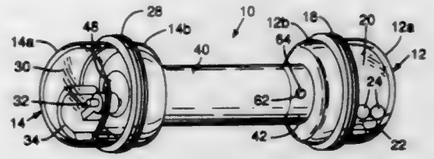
(h) said arms being resiliently separable to accommodate lateral snap-in reception of an end portion of a strut element from an open side of said socket forming section, in a direction transverse to said socket axis, whereby said strut element is firmly placed and positioned in fixed relation to said socket-forming section.

5,199,920

AMUSEMENT DEVICE WITH VIBRATED HANDLE

Richard P. Christen, Sandy, Oreg., assignor to Hart Enterprises, Inc., Vancouver, Wash.

Filed Jun. 22, 1992, Ser. No. 901,772
Int. Cl.[5] A63H *5/00*
U.S. Cl. 446—419 **6 Claims**



1. An amusement device comprising:

a handle adapted to be gripped in the hand of the user,

chamber structure joined to the handle and having walls defining an enclosed chamber,

a motorized vibration producer mounted on the handle producing on actuation vibrations which are transmitted to the handle and thence to said chamber structure, and

loose material composed of a series of members free to move with respect to each other confined in said chamber, the members of said material being set in random motion with actuation of the vibration producer.

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defining an interface and all of the front of each web not defining an interface is uncovered by the other web;

elements are turned from their operative positions about

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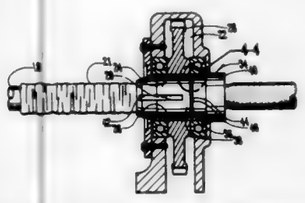
5,199,921

CHUCK FOR MEAT ENCASING MACHINES

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Jun. 22, 1992, Ser. No. 901,823
Int. Cl.[5] A22C *7/00*
U.S. Cl. 452—47 2 Claims



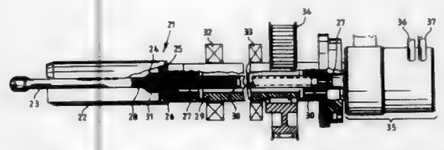
1. A chuck for a meat encasing machine, comprising,
an elongated body having an inlet end and a discharge end, a hollow bore extending therethrough, and exterior cylindrical surface,
a plurality of radially extending flutes in said bore,
an annular groove extending around said exterior cylindrical surface,
a resilient O-ring in said annular groove and slightly projecting outwardly from said groove to frictionally engage a socket 26 into which said chuck is inserted to prevent oscillation of said chuck with respect to said socket.

5,199,922

CUTTING DEVICE

Hendrik J. Korenberg; Hendrik J. Pardijs, both of Winterswijk, and Fransiscus E. Pruijs, Azewijn, all of Netherlands, assignors to Stork Nijhuis B.V., Lichtenvoorde, Netherlands

Filed Dec. 20, 1991, Ser. No. 811,245
Claims priority, application Netherlands, Dec. 21, 1990, 9002861
Int. Cl.[5] A22C *21/06*
U.S. Cl. 452—122 36 Claims



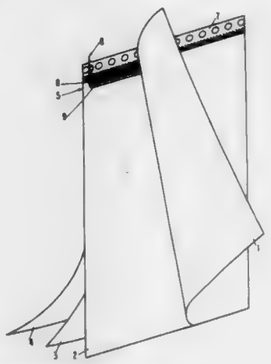
1. A cutting device for arranging a cut around an anus of an animal comprising:
a positioning rod for insertion into the anus of the animal;
a rotatably drivable cylindrical knife positioned coaxially around the positioning rod, the knife having a free end, the free end having a cutting edge;
pressure means comprising a pressure conduit extending through the positioning rod and opening on a peripheral surface of the positioning rod at a distance from the cutting edge and connectable to a pressure source to generate a pressure at the opening;
suction means comprising a suction conduit extending through the positioning rod and opening on a space bounded by the cylindrical knife and connectable to a suction source to generate a suction at the opening wherein the pressure conduit and the suction conduit extend in an axial direction through the positioning rod and the pressure conduit comprises a tube positioned within an axial bore in the positioning rod and the suction conduit is bounded by the positioning rod and the tube.

5,199,923

CARBON COPY SET CONSISTING OF UNINSCRIBED AND/OR INSCRIBED SHEETS AND/OR FORMS

Thomas Müller, Bendstrasse 17, 5100 Aachen, Fed. Rep. of Germany

PCT No. PCT/DE89/00723, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO90/05639, PCT Pub. Date May 31, 1990
PCT Filed Nov. 18, 1989, Ser. No. 700,135
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1988, 3839240; Mar. 18, 1989, 3908925
Int. Cl.[5] B42D *1/06, 1/10;* B41L *1/22*
U.S. Cl. 462—18 7 Claims



1. A carbon copy set comprising:
a first sheet having an elongated edge;
a first elongated strip of material having an adhesive coating thereon extending longitudinally of the strip on one side thereof, said elongated strip being attached to said first sheet at its elongated edge by a first portion of the adhesive coating, said strip being disposed such that an elongated edge of the strip and a second portion of the adhesive coating are positioned beyond the elongated edge of said first sheet, said first sheet and said first elongated strip together presenting a first combined sheet having said second portion of the adhesive coating exposed on one side thereof between the elongated edge of the first sheet and the elongated edge of the strip; and
a second sheet having an elongated edge, said combined sheet overlying said second sheet and being attached thereto by said second portion of the adhesive coating such that the elongated edge of the second sheet and the elongated edge of the strip of the first combined sheet coincide.

5,199,924

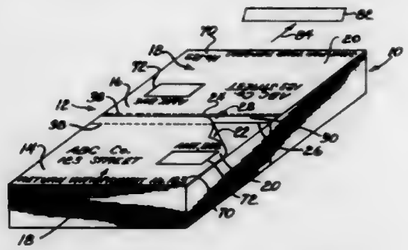
STRUCTURE FOR AND METHOD OF MAKING OVERLAPPING MULTIPART BUSINESS FORM UNIT SETS

Gary W. Fitzgibbons, Barrington, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Jun. 20, 1991, Ser. No. 720,215
Int. Cl.[5] B42D *15/00*
U.S. Cl. 462—26 31 Claims

1. A method of making repositionably adhered sheet segment units for manufacturing overlapping multipart business form unit sets comprising:
(a) providing at least two webs each having a front and a back and corresponding longitudinal edges;
(b) providing an image transfer medium coating on at least one of the front and back of at least one of said webs;
(c) locating said webs in side by side relation relative to each other and such that adjacent longitudinal edges overlap

defining an interface and all of the front of each web not defining an interface is uncovered by the other webs;
(d) assembling said overlapping edges together such that they are releasable with a longitudinal strip of reposition-



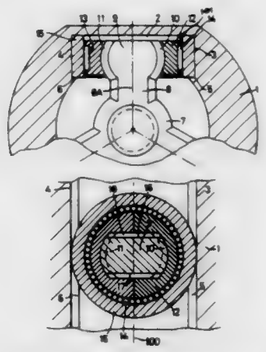
able adhesive located on one of the overlapping edges of the adjacent webs defining an interface; and
transversely severing the assembled webs into repositionably adhered sheet segment units.

5,199,925

TRIPOD UNIVERSAL JOINT WITH INTERMEDIATE ROLLER ELEMENTS

Hans-Heinrich Welschof, Rodenbach, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 5, 1990, Ser. No. 609,240
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3936600
Int. Cl.[5] F16D *3/20*
U.S. Cl. 464—111 5 Claims



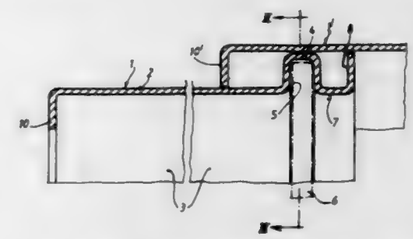
1. A tripod universal joint, comprising:
an outer joint member in the form of a sleeve having a rotational axis and three internal axis-parallel recesses;
each recess comprising a pair of tracks opposing one another on the direction circumferentially of the joint member;
an inner joint member disposed with other outer joint member and having three arms extending into the recesses of the outer joint member;
the arms of the inner joint member having part-spherical surfaces at their sides facing the tracks in the outer joint member and flatten head portions between said part-spherical surfaces;
intermediate elements having part-spherical internal surfaces engaging said part-spherical surfaces of the arms when the intermediate elements are in their operative position so as to be able to pivot freely relative to the arms about axes parallel and transverse to the joint member axes, and having recesses which enable the intermediate elements to be placed on the head portions when said intermediate elements are turned from their operative positions about the respective axes of the arms;
matching formations on the intermediate elements and the outer joint member which inter-engage in the assembled joint to prevent the intermediate elements from rotating completely about said arms;
rolling elements mounted on an external circumferential surface of said intermediate elements;
rollers provided so as to engage said rolling elements and so that said rolling elements are between said intermediate elements and said rollers, and being slidable radially on the rolling elements relative to the intermediate elements; and
means for guiding said rollers to roll on said pairs of tracks while preventing tilting of the rollers relative to the outer joint member.

5,199,926

TELESCOPIC COVER

Kurt Hennig, and Albert Stöhr, both of Bundesrepublik Deutschland, Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Ismaning, Fed. Rep. of Germany

Continuation of Ser. No. 439,043, Oct. 27, 1989, abandoned.
This application Nov. 12, 1991, Ser. No. 789,625
Int. Cl.[5] F16D *3/84*
U.S. Cl. 464—170 5 Claims



1. For use on a machine tool which, when in operation, generates waste materials, a telescopic cover assembly comprising a plurality of cover elements each including opposed side walls and a top wall spanning between said opposed side walls an having inner surfaces to define an interior space for enclosing the machine tool, consecutive ones of the cover elements being sized and shaped to nest within an immediately preceding cover element whereby said cover elements can be moved telescopically with respect to one another to expose the machine tool, each one of said cover elements being formed from a single sheet material blank, at least one of said cover elements having at least one transversely extending material deformation having an open U-shaped cross-section in its opposed side walls and top wall which opens toward the interior space defined by the cover element and formed by multiple bends in said cover element to form a concave recess for receiving and supporting a partition wall, whereby the opposed sidewalls and top wall can receive and support the edges of the partition wall, and wherein at least one of said cover elements has a partition wall forming a rear partition wall and wherein said material deformation projects toward the exterior surface of the cover element and said concave recess receives and holds said rear partition wall.

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gaged therewith for relative pivotal displacement in opposite

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rotatable inertial resistance means coupled to said frame; and

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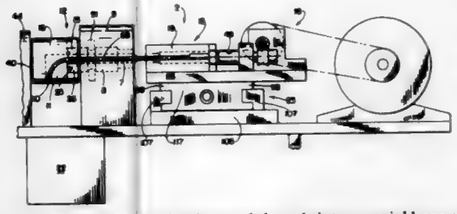
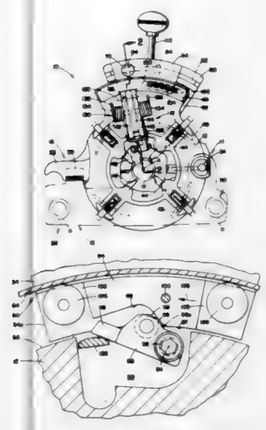
5,199,927
BENT SHANK NUT TAPPING METHOD AND APPARATUS
Shlomo Z. Rubin, 1845 Warrensville Center Rd., South Euclid, Ohio 44121
Filed Jan. 15, 1992, Ser. No. 821,156
Int. Cl.[5] B21D *53/24*
U.S. Cl. 470—98 **34 Claims**



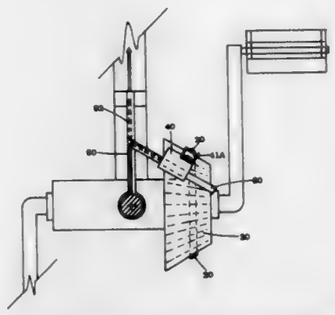
1. A machine for cutting internal threads into an axial bore of a continuous series of workpieces without interruption between workpieces comprising, in combination, a tap axially aligned with and attached to an end of a shank, an opposite end of said shank bent and removably engaged with a tap driver, continuous advancement means parallel and laterally aligned with said tap and incorporated into and journalled to rotate within symmetrical laterally opposed workpiece gripping means, said advancement and gripping means positioned to overlap said tap continuously to advance said workpieces onto said tap and shank, means to rotate said tap drive, and means to rotate said advancement means within said gripping means.

5,199,928
THREADING MACHINE DIE HEAD
Paul W. Gress, Bay Village, and Michael R. Sanner, Amherst, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.
Filed May 6, 1992, Ser. No. 878,297
Int. Cl.[5] B21H *3/02*
U.S. Cl. 470—75 **35 Claims**



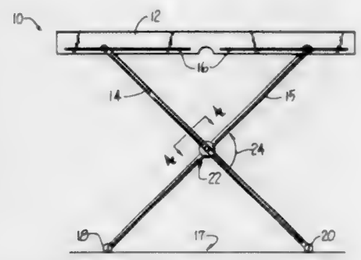
1. An annular thread cutting die head for a power driven threading machine, said die head having a die head axis and an entrance end and an exit end and comprising, a plurality of thread cutting dies, support plate means coaxial with said die head axis and supporting said cutting dies for displacement radially inwardly and outwardly of said die head axis, cam plate means coaxial with said support plate means and interengaged therewith for relative pivotal displacement in opposite directions about said die head axis, said cam plate means including means to displace said cutting ides radially inwardly and outwardly relative to said die head axis in response to said pivotal displacement in opposite directions thereabout, cam plate biasing means biasing said cam plate means to pivot about said die head axis in the direction to displace said cutting ides radially outwardly thereof, cam plate keeper means mounted on said support plate means for pivotal displacement between latched and released positions about a keeper axis parallel to said die head axis, said keeper means in said latched position thereof engaging means on said cam plate means to position said cam plate means in a first angular position relative to said support plate means against the bias of said cam plate biasing means, said keeper means in said released position thereof disengaging said means on said am plate means, whereby said cam plate biasing means displaces said cam plate means to a second angular position relative to said support plate means, and actuator means on said support plate means for controlling pivotal displacement of said keeper means from said latched to said released position thereof, said actuator means being positioned for engagement by a work piece moving relative to said die head in the direction from said entrance toward said exit end.

5,199,929
AUTOMATIC BICYCLE TRANSMISSION
William J. Stites, 47-18 Skillman Ave., Sunnyside, N.Y. 11104
Filed Apr. 16, 1990, Ser. No. 509,974
Int. Cl.[5] F16H *9/10*
U.S. Cl. 474—54 **20 Claims**



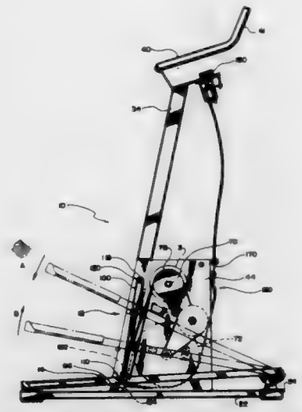
1. A propulsion system for human powered vehicles comprising:
a) a pedal mechanism,
b) an elongated, endless and looped material for coupling rotational energy from said pedal mechanism to a rear wheel of said human powered vehicle,
c) a smooth cone shaped surface affixed to said rear wheel for contacting and gripping said looped material,
d) a guide mechanism including a rolling apparatus for selectively placing said looped material upon locations of varying diameter on said smooth cone shaped surface,
e) an elongated guide rider bar located proximal to the undersurface of said smooth cone shaped surface and providing tracking means for said guide mechanism to move perpendicularly to said looped material, and
f) a placement means for moving said guide mechanism along the long axis of said guide rider bar.

5,199,930
ADJUSTABLE TRAINING HURDLE
Dennis W. Weber, Rte. 1, Box 42, Baldwin City, Kans. 66006
Filed Jul. 8, 1991, Ser. No. 726,857
Int. Cl.[5] A63B *5/02*
U.S. Cl. 482—17 **18 Claims**



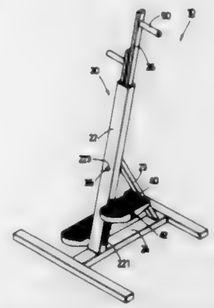
11. A track hurdle, comprising:
a hurdle board having a longitudinal slot therein;
a plurality of legs each leg having a first end and a second end;
a fastener providing slidable attachment of said first leg ends with said longitudinal slot such that said first leg ends may be displaced along said slot; and
a slip gear interconnecting said plurality of legs for pivotal movement such that pivotal leg movement results in slidable displacement of said first leg ends in said longitudinal slot and variation of the distance between said hurdle board and said second leg end.

5,199,931
EXERCISE MACHINE FOR SIMULATING STAIR CLIMBING
James B. Easley, Minneapolis; A. Hans Friedebach; Mark R. Nestande, both of Chaska; Paul M. Theisen, Shakopee, and John E. Titus, Savage, all of Minn., assignors to Fitness Master, Inc., Waconia, Minn.
Filed Nov. 27, 1991, Ser. No. 800,554
Int. Cl.[5] A63B *22/04*
U.S. Cl. 482—52 **18 Claims**



1. An exercise machine for simulating stair climbing, said machine comprising:
a frame;
movable, foot-receiving right and left pedals coupled to said frame;
rotatable inertial resistance means coupled to said frame; and
a drive system operatively coupling said pedals to said inertial resistance means, wherein said drive system comprises a first drive portion including a single rotatable drive shaft and two independent linkages, a right drive linkage and a left drive linkage, operatively linking each the respective pedal to said drive shaft and including at least two runs extending in generally opposite directions, each said linkage including lengthening means for lengthening said linkage whereby the movement of said pedals is transferred smoothly to said drive shaft, and a second drive portion that transmits the rotation of said drive shaft to said resistance means, said second drive portion comprising a first primary drive sheave mounted on said drive shaft, an intermediate transfer sheave, an endless power belt transmission means for connecting said primary and intermediate sheaves, a final sheave co-axially mounted with said resistance means, and a second endless power belt transmission means for connecting said intermediate and final sheaves.

5,199,932
GYMNASTIC APPARATUS PROVIDING ANIMATION OF CLIFF CLIMBING
Nien-Yuan Liao, No. 264, Sec. 2, Shi-Tung Rd., Taichung, Taiwan
Filed Oct. 1, 1992, Ser. No. 955,137
Int. Cl.[5] A63B *22/04*
U.S. Cl. 482—53 **2 Claims**



1. A gymnastic apparatus providing animation of cliff climbing comprising:
(a) a frame of an inverted Y-shaped construction comprising a bottom brace upon which a hollow main brace and a support brace are mounted;
(b) two hollow sliding rods arranged slidably along the direction of an axis of said main brace;
(c) two oil pressure cylinders arranged in said main brace, with each of said cylinders provided with a piston rod capable of moving synchronously with one of said sliding rods;
(d) a connecting tube communicating said two cylinders so as to facilitate an alternating movement of said two sliding rods in opposite directions;
(e) an adjustment button fastened to a mid-section of said connecting tube;
(f) two pedals fastened respectively to said two sliding rods; and
(g) two hand grips fastened respectively to said two sliding rods;
wherein said gymnastic apparatus is characterized in that said main brace is provided with two elongate slots of a length located respectively in two bottom side surfaces of said main brace, and that said main brace of said gymnastic apparatus contains therein said sliding rods, said oil pressure cylinders and said connecting tube, and further that

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PLYOMETRIC TRAINING DEVICE

freely through unobstructed space to the limit of free

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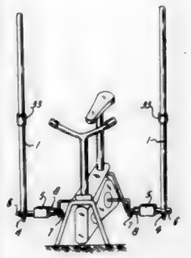
said two sliding rods are parallel to each other and are provided respectively with a top end of a length extending out of said main brace, and still further that said two oil pressure cylinders are fastened to a bottom of said main brace in a parallel manner so that said piston rod of said each of said cylinders is coupled with a bottom of one of said sliding rods so as to permit said each of said cylinders to be received in said one of said sliding rods at such time when said sliding rod moves upwards or downwards, and still further that said adjustment button extends out of said main brace, and finally further that said two pedals are fastened respectively to bottoms of said sliding rods via said two elongate slots of said main brace.

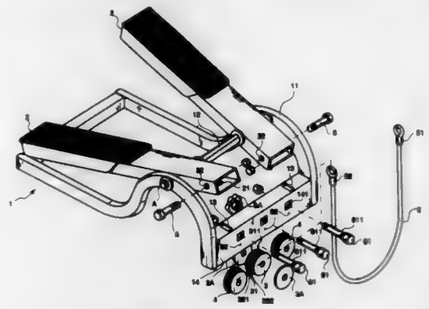
5,199,933
EXERCISE APPARATUS
Joseph F. Illuzzi, 2 Primrose La., Apt. 1A, Fords, N.J. 08863
Filed Jun. 9, 1992, Ser. No. 895,903
Int. Cl.[5] A63B *22/12, 69/16*
U.S. Cl. 482—62 **6 Claims**



1. An apparatus for enhancing an exercise bicycle comprising two essentially vertical elongated rigid poles tapered on one end and two pedals with a receiving connector with holes to receive said poles attached to each pedal wherein, the connectors are axially aligned with and rotatably attached to said pedals at the outside edge thereof so the pedals and connectors rotate independently about the longitudinal axis of the pedal to which the connector is attached, said pedals being adapted for screwing into pedal arms of an exercise bicycle or a regular bicycle adapted for use as an exercise bicycle; the essentially vertical poles are inserted at their tapered end into the receiving opening of the connector that is sufficiently larger than the diameter of the tapered end of the pole to enable the pole to be moved in a circular arc while remaining in the connector opening.

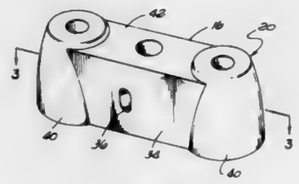
5,199,934
SIMPLE TYPE PEDALING EXERCISER
Pin F. Lin, Shui Road, No. 285, Sec. 1, Chang Hsiu Shui Hsiang, Changhua, Taiwan
Filed Aug. 12, 1992, Ser. No. 928,820
Int. Cl.[5] A63B *23/10, 22/04*
U.S. Cl. 482—79 **1 Claim**

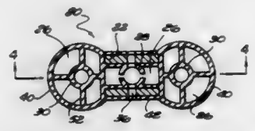
1. A pedaling exerciser comprising two arched, symmetrical side supports connected by a pivot, onto which two foot pedals are pivoted, and a transverse channel bar, a driving wheel and two driven wheels revolvably fastened inside said transverse channel bar and arranged in a line to hold a steel cable, said foot pedals each having a bottom hole into which either end of said steel cable is inserted and retained in place by a respective bolt, said transverse channel bar having two top holes through which either end of said steel cable passes, said driving wheel comprising two parallel grooves separated by a division wall, said division wall having an opening communicated between said two parallel grooves, said steel cable having a mid-portion inserted through the opening on said division wall and fixed in place with two opposite ends thereof respectively wound around said two parallel grooves in reverse directions and extended through said driven wheels and inserted through the



top holes on said transverse channel bar into the respective bottom hole on said foot pedals.

5,199,935
MOLDED TOP WEIGHT
Ronald S. Gibson, Valencia, and Theodore G. Habing, Long Beach, both of Calif., assignors to Pacific Fitness Corporation, Cypress, Calif.
Filed Apr. 2, 1992, Ser. No. 862,295
Int. Cl.[5] A63B *21/062*
U.S. Cl. 482—98 **8 Claims**





1. A top weight disposed at a top of a weight stack in a suspended weight exercise machine having guide rods on which the weight stack slides, and a central pick-up rod which engages the weight stack for suspension thereof, the top weight comprising:

a body having

opposed side walls wherein each side wall includes a vertically elongated opening therethrough,

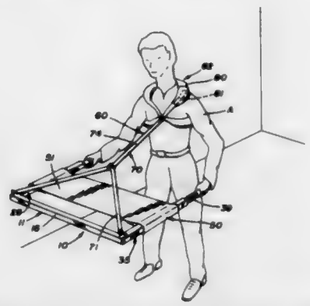
a plurality of open cavities,

a centrally located sleeve for receiving the pick-up rod, extending vertically through the center of the body, and

two bearing tubes disposed in the open cavities on opposite sides of the centrally located sleeve and extending vertically therethrough in a substantially parallel orientation, adapted to slidably engage the guide rods; and

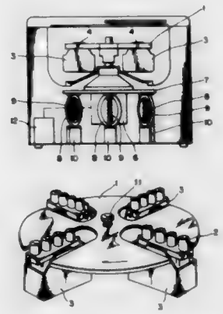
insert weight plates disposed in the open cavities on opposite sides of the centrally located sleeve, each insert weight plate having a slot therethrough, wherein the slots in the insert weight plates and the slots in the side walls are substantially aligned and in communication with a hole in the pick-up rod.

5,199,936
PLYOMETRIC TRAINING DEVICE
Charles W. Moye, Akron, Ohio, assignor to All Ohio Youth Athletic Club, Akron, Ohio
Filed Aug. 15, 1990, Ser. No. 567,928
Int. Cl.[5] A63B *21/02*
U.S. Cl. 482—148 **19 Claims**



1. Athletic training apparatus for conducting conditioning drills or exercises comprising, generally U-shaped frame means having cross beam means and a pair of extending arm means spaced and joined by said cross beam means, impact means of elastomeric material suspended between said arm means, and means for selectively adjustably tensioning said impact means, said means for selectively adjustably tensioning said impact means includes sleeve means selectively rotatably mounted on one of said arm means for engaging said impact means.

5,199,937
CENTRIFUGAL SEPARATOR
Atsuki Wada, Uji, and Akira Kasuya, Kyoto, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan
Continuation of Ser. No. 573,059, Aug. 24, 1990, abandoned. This application Jun. 2, 1992, Ser. No. 892,475
Claims priority, application Japan, Aug. 24, 1989, 1-219168
Int. Cl.[5] B04B *9/10*
U.S. Cl. 494—7 **4 Claims**



1. A centrifugal separator able to function as an agitator, comprising:

a rotor rotatable in one direction;

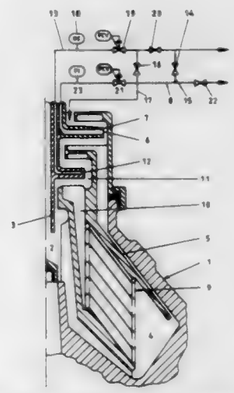
holder means for holding a sample container;

support means supporting said holder means on said rotor, said support means having an axis of rotation about which said holder is freely radially swingable on said holder means along a path like a pendulum between an outer top position established by centrifugal force on said holder and an inner top position to which said holder swings freely through unobstructed space to the limit of free pendulum motion due to gravity, said axis of rotation extending in a direction substantially tangential to the direction of rotation of said rotor, said support means having said path free of obstructions throughout the swinging motion of said holder;

drive means driving said rotor in said direction; and

control means connected to said drive means for controlling the rotation speed of said drive means for driving said rotor at a rotational speed sufficient for radially outwardly swinging said holder means holding a sample container in which a predetermined amount of a sample and reagents are contained sufficiently for causing the lower end of said holder means to be raised up by centrifugal force to said outer top position, and controlling a timing of the operation of said drive means for intermittently starting and stopping the driving of said rotor in said one direction for causing successive rocking movements of said holder between said outer top position and said inner top position to give a swirling motion to the sample in the sample container.

5,199,938
CENTRIFUGE DRUM FOR CONCENTRATING SUSPENDED SOLIDS
Werner Kohlstette; Aloys Bökamp, and Friedhelm Siegmann, all of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany
Filed Oct. 31, 1991, Ser. No. 786,152
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1990, 4036793
Int. Cl.[5] B04B *15/00, 11/08*
U.S. Cl. 494—10 **3 Claims**



1. A centrifuge drum for concentrating suspended solids, comprising: means forming a radially outer solids space and a radially inner peeling chamber, means defining channels through which solids are conveyed from the outer solids space and into the radially inner peeling chamber, a first peeler in the peeling chamber for diverting solids from the peeling chamber, a concentrate line associated with the first peeler for receiving the diverted solids, a second peeler for continuously extracting a separated clear phase from the interior of the drum, a clear-phase line associated with the second peeler for receiving the extracted clear-phase, means forming an openable and closable communicating line between the concentrate line and the clear phase line for providing a fluid path therebetween when the communicating line is open, means forming an openable and closable recirculation line extending into the first peeling chamber from the clear-phase line for providing a fluid path therebetween when the recirculation line is open and means for controlling the opening and closing of the communicating line

and the recirculation line to divert the solids when the commu-

abdomen, yet allowing forward, backward and lateral

5,199,942
METHOD FOR IMPROVING AUTOLOGOUS

vide a flow of gas through said conduit in said laser surgi-

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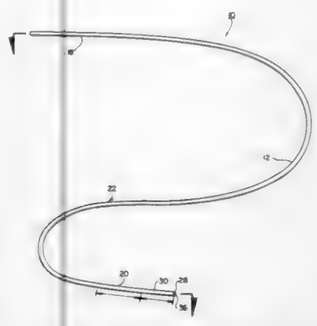
and the recirculation line to divert the solids when the communicating line and the recirculation line are closed whereby concentrate and clear phase are discharged separately and feed clear phase from the clear phase line to the first peeling chamber and then back to the clear phase line when the communicating line and the recirculation line are open, whereby only pure clear phase is discharged.

5,199,939

RADIOACTIVE CATHETER

Michael D. Dake, 1915 Mandeville Canyon Rd., Los Angeles, Calif. 90049; Bruce Hedger, 16220 Gundry Ave., Paramount, Calif. 90723, and Stephen Oesterle, 101 Burlingame Ave., Los Angeles, Calif. 90049

Filed Feb. 23, 1990, Ser. No. 484,117
Int. Cl.[5] A61N *5/00*
U.S. Cl. 600—3 **41 Claims**



1. A device suitable for endoluminal radiation treatment of a portion of a coronary artery in humans, the device comprising:
(a) an elongated, flexible carrier having a proximal section and a distal section; and
(b) radioactive means positioned in a radioactive segment of the distal section of the carrier, the radioactive means providing radiation in an amount from 0.01 to 100,000 millicuries per centimeter length of the radioactive portion,
wherein the carrier is sized and has sufficient stiffness and flexibility to navigate a human coronary artery so that the radioactive segment can be placed in a selected portion of a human coronary artery, the radioactive means when so placed providing sufficient radiation in less than 30 minutes to prevent restenosis in the selected portion after angioplasty.

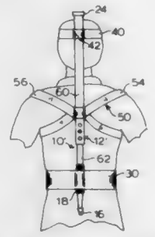
5,199,940

POSTURE TRAINING AND CORRECTING DEVICE

James B. Morris, 1709 Vista St., Durham, N.C. 27701, and Anita M. Dale, 12758 Mulholland Dr., Beverly Hills, Calif. 90210

Filed Sep. 12, 1991, Ser. No. 757,972
Int. Cl.[5] A61F *5/00;* **A61G** *15/00*
U.S. Cl. 602—19 **4 Claims**

1. A postural training and corrective device which provides a simple method of analyzing and training a person to recognize and correct faulty posture, comprising the elements of:
(a) a straight rigid rod tapered at the end, beginning at the lower back over the sacrum, extending vertically up over the lumbar and thoracic spine, ending at the top of the person's head;
(b) a strong elastic band attached on the rod for adjustable axial positioning over the lumbo-sacral area, reaching around the abdomen and fastening as a means of holding said rod firmly against the spine, exerting pressure on the abdomen, yet allowing forward, backward and lateral movement of the spine;
(c) a head band of weaker elastic attached for adjustable axial positioning on said rod by elastic attachment means, extending forward and encircling the forehead area providing a means for pulling the head gently toward said rod while allowing natural movement of the head;



(d) a band of elastic attached for adjustable axial positioning on said rod at the upper thoracic spine, extending laterally to form two shoulder loops, one fitting around the right shoulder and one fitting around the left shoulder, providing a means for holding said rod centered over the thoracic spine and as a means of reminding the wearer to square up drooping shoulders;
wherein when all of said elements are worn in position, wearer's body is urged into correct posture.

5,199,941

CONTOURED ANKLE BRACE AND STABILIZER

Robbie W. Makinen, 15601 E. 43rd Ter., Independence, Mo. 64055

Filed Mar. 13, 1992, Ser. No. 850,501
Int. Cl.[5] A61F *5/04*
U.S. Cl. 602—27 **8 Claims**

1. An anatomically contoured apparatus for use in connection with a human lower extremity to obtain calcaneus stability and protection of the sub-talor joint for total ankle stability comprising: medial and lateral molded plastic shells sized and configured for placement on the medial and lateral sides of the ankle, respectively, said shells adapted to cover the distal tibia and distal fibula, and extending down over the malleoli then widening posteriorly into a rearward heel extension to thereby encompass the entire calcaneus, sub-talor joint, the talus, distal tibia and distal fibula and all ligaments therein, and means for holding said shells in ankle stabilizing conformation, wherein said shells are used in conjunction with each other to prevent anterior and posterior excursion, joint line shifts, and calcaneus valgus and varus stresses.

5,199,942

METHOD FOR IMPROVING AUTOLOGOUS TRANSPLANTATION

Steven Gillis, Mercer Island, Wash., assignor to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 712,315, Jun. 17, 1991, abandoned. This application Sep. 26, 1991, Ser. No. 765,844
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—4 **17 Claims**

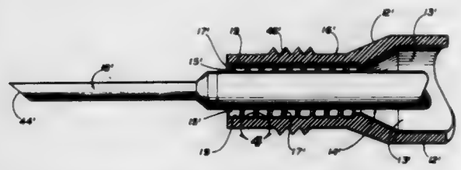
1. A method for autologous hematopoietic cell transplantation in a patient receiving cytoreductive therapy, comprising:
a. removing hematopoietic progenitor cells from the patient prior to cytoreductive therapy;
b. expanding the hematopoietic progenitor cells ex vivo with
(1) a growth factor comprising granulocyte macrophage-colony stimulating factor (GM-CSF) combined with interleukin-3 (IL-3), or a GM-CSF/IL-3 fusion protein, and
(2) one or more growth factors selected from the group consisting of steel factor (SF), interleukin-1 (IL-1) and granulocyte-colony stimulating factor (G-CSF) and combinations thereof,
to provide a cellular preparation comprising an expanded population of hematopoietic progenitor cells; and
c. administering the cellular preparation to the patient following cytoreductive therapy.

5,199,943

ULTRASONIC SURGICAL HANDPIECE

Peter Wypych, Irvine, Calif., assignor to Alcon Surgical, Inc., Fort Worth, Tex.

Filed Dec. 12, 1991, Ser. No. 806,566
Int. Cl.[5] A61B *17/00*
U.S. Cl. 604—22 **4 Claims**



1. An ultrasonic surgical handpiece, comprising:
a) a generally rigid, hollow body having a reduced diameter portion at a free end and an interior surface;
b) an ultrasonic piezo-electric horn coaxially mounted inside the body, terminating at the free end and defining a fluid flow passage between the horn and the interior surface of the body at the reduced diameter portion; and
c) a spiral thread formed in the interior surface at the reduced diameter portion for reducing shearing created by ultrasonic vibration of the horn of a fluid flowing through the fluid flow passage.

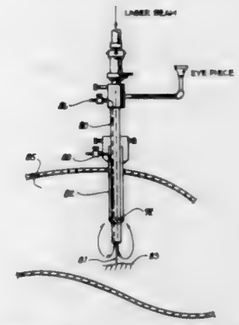
5,199,944

AUTOMATIC SMOKE EVACUATOR SYSTEM FOR A SURGICAL LASER APPARATUS AND METHOD THEREFOR

Ioan Cosmescu, 14449 N. 22nd St., Phoenix, Ariz. 85022

Continuation-in-part of Ser. No. 527,589, May 23, 1990, Pat. No. 5,108,389. This application Sep. 24, 1991, Ser. No. 764,842
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] A61B *17/36*
U.S. Cl. 604—26 **47 Claims**

1. An automatic smoke evacuator system and an external laser surgical apparatus comprising, in combination:
a laser surgical apparatus with a conduit for carrying gas;
flow means coupled to said laser surgical apparatus to provide a flow of gas through said conduit in said laser surgical apparatus;
exhaust means for carrying gas coupled to said laser surgical apparatus to withdraw gas from the area of the laser surgical apparatus;
vacuum means for providing a gas flow force for said exhaust means;



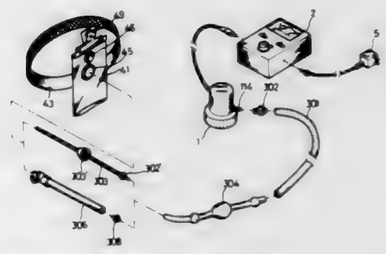
gas carrying conduit assembly means for connecting said exhaust means to said vacuum means;
electrically actuated valve means for controlling flow in said gas carrying conduit assembly means;
control means for activating said valve means in response to the activation of said laser surgical apparatus.

5,199,945

ELECTRO-MOTIVE ENEMA

Ven-Chung Chu, 3 Fl. 3, Lane 42, Yu Hsi Street, Yung Ho City, Taipei Hsien, Taiwan

Filed Jul. 23, 1990, Ser. No. 555,850
Int. Cl.[5] A61M *3/02*
U.S. Cl. 604—35 **1 Claim**



1. An electro-motive enema comprising:
an electro-motive pump, which can be used in any container to pump water;
a power supply unit including a box body, a lid, a bottom plate, a pilot lamp, a switch and a circuit board; and said bottom plate being loaded with a plurality of batteries; and said power supply unit able to be re-charged with a rectifier and the power supply of a car;
a tube assembly including a rubber tube, of which one end is mounted with a connector and connected with a water tube of said pump, while the other end thereof is mounted with another connector and connected with a rectal pipe; and said rectal pipe being mounted with a sleeve plug for completely sealing an anus to prevent from leaking water;
a washing nozzle, which can be inserted directly into anus in use;
a stool-exhausting assembly including a stool bag of which one end is closed with a clamp;
a fixed pad with a rubber washer;

5,199,947

lar ends and a cylindrical side face extending between

5,199,950

MEDICAL INSTRUMENT

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a belt being fastened in buckles on both sides of said fixed pad; and

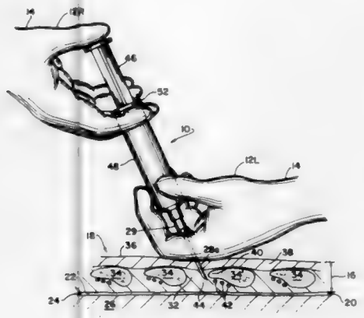
a connecting adapter being mounted in a small hole of said stool bag; and the center round hole thereof being used for inserting said rectal pipe or a washing nozzle; and said sleeve plug being used for sealing the anus during enema operation.

5,199,946

DEVICE AND METHOD FOR ADMINISTERING INTERPLEURAL ANESTHESIA

Joseph Abramowitz, 18 Covert St., Port Washington, N.Y. 11050

Filed Jun. 21, 1991, Ser. No. 719,150
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—51 2 Claims



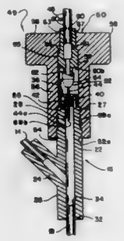
1. A method for a doctor to administer interpleural anesthesia to a patient using a hypodermic syringe of a type having opposite proximal and distal ends and an operational mode of forcing fluid under pressure from a needle forwardly extending therefrom in response to a power stroke of a plunger of said syringe, said method comprising the steps of selecting a site of entry for said needle in the patient's skin that is in a clearance location from a selected site of deposit of interpleural anesthesia, attaching in said forwardly extending position from said hypodermic syringe a blunt-nosed needle having fluid communication with said syringe, filling said springe with an anesthetizing fluid, inserting said blunt-nosed needle in said entry site to a preliminary depth in close proximity to said deposit site, holding said distal and proximal ends of said hypodermic syringe, guiding at the distal end of said hypodermic syringe the forwardly extending needle thereof along a path of movement from said entry site towards said deposit site, and forcing under pressure said anesthetizing fluid by activating at said proximal end said syringe plunger to cause exiting flow of said anesthetizing fluid from said blunt-nosed needle during the advancement of said blunt-nosed needle along said path of movement, whereby said exiting pressure of said anesthetizing fluid clears a path for said needle advancement although said needle is blunt-nosed to thereby obviate any inadvertent tissue punctures that otherwise might result at said deposit site using a sharp-nosed needle.

5,199,947

METHOD OF LOCKING AN INFLUENT LINE TO A PIGGYBACK CONNECTOR

George A. Lopez, Huntington Beach, and Virgil R. Laul, Dana Point, both of Calif., assignors to ICU Medical, Inc., Irvine, Calif.

Continuation of Ser. No. 346,193, Jan. 9, 1987, which is a division of Ser. No. 606,679, May 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 543,248, Oct. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 460,585, Jan. 24, 1983, abandoned. This application Sep. 10, 1991, Ser. No. 757,673
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—56 17 Claims



1. A method of securing a second influent fluid line to the branch port on a generally Y-shaped piggyback connector having a first influent fluid line on one influent side of the Y-shaped piggyback connector and a pierceable septum on the other influent side of the Y-shaped piggyback connector, said method comprising the steps of:

providing a safety connector of the type having a generally tubular body with a needle therein adapted to engage the pierceable septum on the branch port;

advancing said tubular connector in the direction of said branch port so that the needle within said tubular connector pierces the septum on said branch port and said branch port is received within said tubular connector;

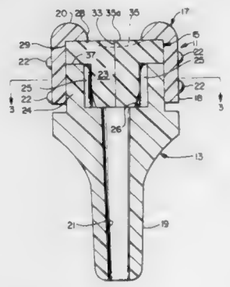
locking the branch port within the tubular connector by engaging complementary locking structures on the tubular connector and on the branch port.

5,199,948

NEEDLELESS VALVE

Charles J. McPhee, Huntington Beach, Calif., assignor to McGaw, Inc., Irvine, Calif.

Filed May 2, 1991, Ser. No. 694,637
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—86 27 Claims



1. An injection site comprising:

a housing having an inlet;

a septum having:

a cylindrical body having first and second opposite circular ends and a cylindrical side face extending between them;

a concave surface in the first end of the body; and

a slit extending axially from the concave surface at least substantially into the septum; and

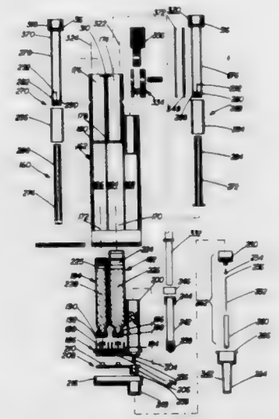
means for securing the septum to the housing at the inlet, with a peripheral portion of the septum body compressed so as to cause the concave surface to bulge, thereby becoming flat.

5,199,949

MULTIPLE PHARMACEUTICAL SYRINGE

Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corp., Laguna Hills, Calif.

Continuation-in-part of Ser. No. 667,319, Mar. 8, 1991, and a continuation-in-part of Ser. No. 668,278, Mar. 8, 1991. This application Jun. 21, 1991, Ser. No. 718,398
Int. Cl.[5] A61M *37/00, 5/24*
U.S. Cl. 604—88 8 Claims



1. A syringe, for use with liquid-filled pharmaceutical cartridges of the type having a barrel, the barrel having an open end and an accessible end, a piston within the interior of the barrel and a liquid within the barrel between the piston and the accessible end, comprising:

a body configured to house first and second of the cartridges therein;

a replaceable fluid path assembly mountable to the body, comprising;

an elongate accumulator chamber;

a movable accumulator piston housed within the accumulator chamber;

first means, engageable with the accessible ends of the first and second cartridges, for fluidly coupling the interiors of the barrels of the first and second cartridges to the accumulator chamber; and

means for preventing fluid flow into the interiors of the barrels of the first and second cartridges;

a hollow needle;

means for selectively fluidly coupling the hollow needle with the accumulator chamber; and

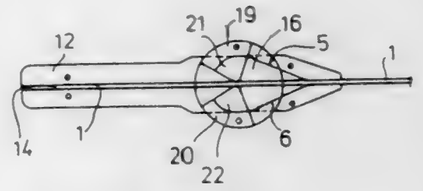
stem means engageable with the cartridge pistons and the accumulator piston by which selected amounts of liquid from the first and second cartridges are forcible by the stem into the accumulator chamber to mix within the accumulator chamber, the mixed liquid in the accumulator chamber being forcible by the stem through the selectively fluidly coupling means and through the hollow needle.

5,199,950

MEDICAL INSTRUMENT

Klaus Schmitt, Remshalden-Grunbach, and Helmut Entenmann, Schorndorf-Schornbach, both of Fed. Rep. of Germany, assignors to Willy Rusch AG, Fed. Rep. of Germany

Filed Aug. 22, 1991, Ser. No. 748,667
Claims priority, application European Pat. Off., Dec. 7, 1990, 90123498
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—95 16 Claims



1. A medical instrument comprising:

a relatively rigid shaft having a flexible tip attached to a distal end of the shaft, said shaft and tip each having a central lumen in fluid communication with one another;

tension cables fastened to said flexible tip, said tension cables being guided essentially parallel to the tip and the shaft; and

a handle fastened to the proximal end of the shaft with an adjusting wheel therein rotatably mounted about a rotation axis perpendicular to a longitudinal axis of the shaft, said tension cables being fastened to the adjusting wheel, the adjusting wheel having a central opening with the proximal end of said shaft inserted therein, said handle including means for rotating said adjusting wheel.

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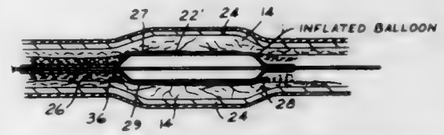
METHOD OF DRUG APPLICATION IN A TRANSPORTING MEDIUM TO AN ARTERIAL WALL INJURED DURING ANGIOPLASTY

James R. Spears, Bloomfield Hills, Mich., assignor to Wayne State University, Detroit, Mich.

Continuation-in-part of Ser. No. 525,104, May 17, 1990, Pat. No. 5,092,841. This application Sep. 13, 1991, Ser. No. 759,223
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 63 Claims



1. A method for treating a lesion in an arterial wall having plaque thereon and a luminal surface, the arterial wall having been injured during an angioplasty procedure, the arterial wall and the plaque defining therewithin fissures resulting therefrom, the method comprising the steps of:

providing a layer of a transporting medium disposed about an angioplasty catheter balloon, said transporting medium having a bioprotective material distributed therewithin, the layer of bioprotective material being surrounded by a removable sheath to prevent premature dissolution of the bioprotective material;

positioning the angioplasty catheter adjacent to the lesion being treated so that the transporting medium and the bioprotective material are entrapped therebetween;

removing the sheath so that the lesion is exposed to the

said portion of the structure, and having a second exterior surface on a substantially opposite side of said portion of the

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PROCESS FOR REDUCING DISCOLORATION OF

5,199,955

M-PHENYLENEDIAMINE COUPLER AND OXIDATIVE

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removing the sheath so that the lesion is exposed to the bioprotective material;

applying thermal energy, thereby liquefying the transporting medium under pressure and promoting contact of the bioprotective material with the fissures and the luminal surface, whereby the thermal energy bonds the bioprotective material to the arterial wall and within the fissures and vessels of the arterial wall; and

removing the angioplasty catheter, the bioprotective material remaining adherent to the fissures and vessels within the arterial wall, thereby treating the injured luminal surface with the bioprotective material, whereby at least semi-permanent protection to the arterial wall is provided, despite contact with blood flowing adjacent thereto, the blood dissolving and removing the transporting medium.

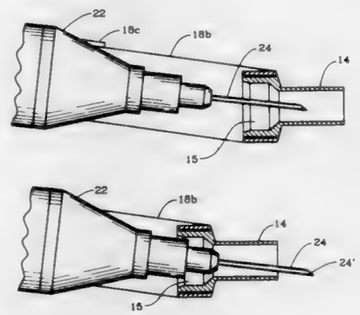
5,199,952

BIRD INJECTION SYSTEM

William M. Marshall, Sr., Salem; Gordon J. Lancaster, Jr., Bent Mountain, and Richard L. Booker, Salem, all of Va., assignors to Morf, Inc., Salem, Va.

Filed Apr. 9, 1991, Ser. No. 682,606
Int. Cl.[5] A61M *5/20*
U.S. Cl. 604—156 **2 Claims**

1. Apparatus for injecting a fluid dose through loose skin around a bird's neck, comprising a needle having a sharp end, a passage extending lengthwise through the needle, an outlet from the passage adjacent said sharp end and an inlet into the passage adjacent the other end of the needle, means to supply a fluid dose to said inlet, a structure supporting the needle, said structure having a portion extending around the needle and elongated toward one end of said portion, said elongated portion of the structure having a first exterior surface engageable with a bird's neck extending in the direction of elongation of said portion of the structure, and having a second exterior surface on a substantially opposite side of said portion of the structure, said exterior surfaces being spaced apart sufficiently for a fold of loose skin on a neck so engaged by the first exterior surface to be drawn across said end of said portion and over said second exterior surface, and means mounting the needle for lengthwise movement from a retracted position in



which its sharp end is covered by said portion of the structure to an extended position in which said sharp end projects beyond said end of the said portion, said lengthwise movement of the needle being in a path which passes between said exterior surfaces closer to the first surface than to the second surface, and also extends in a lien which converges toward said first exterior surface as it progresses toward the extended position of the needle.

5,199,953

PROCESS FOR REDUCING DISCOLORATION OF CELLULOSIC FIBERS, TREATED AT A HIGH TEMPERATURE WITH A SOLUTION OF A POLYCARBOXYLIC ACID AND BORIC ACID OR BORATE

Kwok-Wing Fung; Kam H. Wong, and David L. Brotherton, all of Easley, S.C., assignors to Ortec, Inc., Easley, S.C.

Continuation of Ser. No. 582,342, Sep. 14, 1990, abandoned. This application Jan. 10, 1992, Ser. No. 819,453
Int. Cl.[5] D06M *11/00, 13/00, 13/24*
U.S. Cl. 8—120 **27 Claims**

1. A process for reducing the formation of discoloration in fibrous cellulosic material treated at temperatures above about 175° C. with an aqueous durable-press treating solution of a polycarboxylic acid selected from aliphatic, alicyclic and aromatic acids, containing at least two carboxylic acid groups; a phosphate salt curing catalyst selected from alkali metal hypophosphites, alkali metal phosphites, alkali metal salts of polyphosphoric acids and alkali metal salts of orthophosphoric acid and hydrates thereof; comprising adding to the aqueous durable-press treating solution an inorganic boron-oxygen compound selected from alkali metal metaborates, alkali metal tetraborates, alkali metal pentaborates and boric acid and heating the fibrous cellulosic material in the resulting treating bath at a temperature above about 175° to block the formation of said discoloration while imparting durable-press properties to the thus-treated cellulosic fibrous material.

5,199,954

HAIR COLORING DYES INCORPORATING ARYL AMINES AND ARYL ALDEHYDES

Thomas M. Schultz, Ridgefield, Conn.; Catherine Grillo, Nyack, N.Y., and Sanae Kubo, Darien, Conn., assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1992, Ser. No. 840,522
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—408 **9 Claims**

1. A hair dye composition for imparting a stable, effective and longlasting coloring to the hair said composition comprising

A. between about 0.1% and 20% by weight of methylcellulose;

B. between about 0.05% and 5% by weight of sorbitol;

C. between about 0.1% and 3% by weight of an aryl amine selected from the group consisting of p-phenylenediamine, N-phenyl-p-phenylenediamine, p-aminophenol, and N,N-bishydroxyethyl-p-phenylenediamine;

D. between about 0.1% and 3% by weight of an aryl aldehyde selected from the group consisting of N,N-dimethyl-4-aminobenzaldehyde, N,N-dimethyl-4-aminocinnamaldehyde, 3,4-dihydroxybenzaldehyde, 4-hydroxybenzaldehyde, 2,4-dihydroxybenzaldehyde, 4-aminosalicylic aldehyde, and 5-aminosalicylic aldehyde;

E. between about 0.1% and 5% by weight of an inorganic metal salt having a valence between +1 and +3 selected from the group consisting of aluminum chloride, ferric chloride, lithium bromide, manganese chloride, copper chloride and manganese nitrate;

F. between about 0.01% and 1.0% by weight of citric acid;

G. between about 0.01% and 0.50% by weight of panthenol; and

H. water forming the balance.

5,199,955

M-PHENYLENEDIAMINE COUPLER AND OXIDATIVE DYE COMPOSITIONS CONTAINING SAME

Yuh-Guo Pan, Stamford; Mu-Ill Lim, Trumbell, both of Conn., and Alexander C. Chan, Mineola, N.Y., assignors to Clairol Inc., New York, N.Y.

Filed Jun. 15, 1992, Ser. No. 898,652
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—411 **2 Claims**

1. 1,5-Diamino-2,4-bis(2,2,2-trifluoroethoxy) benzene.

5,199,956

PROCESS FOR DYEING HYDROPHOBIC TEXTILE MATERIAL WITH DISPERSE DYES FROM SUPER-CRITICAL CARBON DIOXIDE

Wolfgang Schlenker; Dieter Werthemann, both of Basel; Peter Liechti, Arisdorf, and Angelo D. Casa, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 28, 1991, Ser. No. 751,047
Claims priority, application Switzerland, Sep. 3, 1990, 2836/90; Sep. 3, 1990, 2837/90; Sep. 3, 1990, 2838/90
Int. Cl.[5] D06P *1/00, 3/54, 5/20;* **C09B** *1/28*
U.S. Cl. 8—473 **31 Claims**

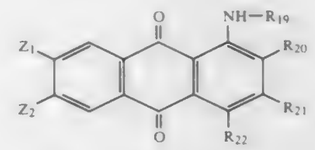
1. A process for dyeing hydrophobic textile material with disperse dyes, which comprises treating said textile material in supercritical carbon dioxide with an azo dye of formula

D—N=N—K (1)

wherein

D is the radical of an aromatic diazo component and

K is the radical of a coupling component, or with an anthraquinone dye of formula



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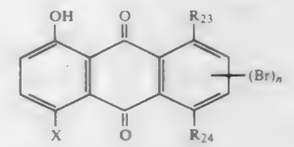

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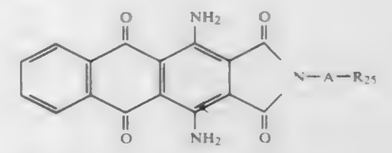

(4)

wherein

Z_1 and Z_2 are each independently of the other hydrogen or halogen,

R_{19} is hydrogen or unsubstituted or substituted alkyl or phenyl,

R_{20} is hydrogen, chloro, C_1–C_8alkoxy, unsubstituted or substituted phenoxy, C_1–C_4alkoxycarbonyl, C_1–C_8alkyltetrazolyl, phenoxysulfonyl or a radical of formula

—O—A—O—Y

wherein A is an alkylene radical of 2 to 6 carbon atoms and Y is unsubstituted or substituted phenyl, phenoxycar-

oxycarbonyl-C_2–C_4alkoxy or C_1–C_4alkoxy-C_1–C_4alkox-

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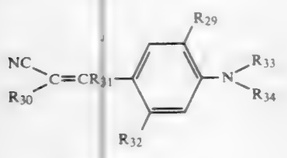
bonyl, phenylcarbonyl, C_1–C_4alkylcarbonyl or C_1–C_4alkoxycarbonyl,
R_{21} is hydrogen, chloro, unsubstituted or substituted phenoxy or cyano,
R_{22} is hydroxy, amino or a —NHR_{26} radical, wherein R_{26} is unsubstituted or substituted alkyl or phenylsulfonyl,
X is amino or nitro,
R_{23} is hydroxy, amino or unsubstituted or substituted alkylamino,
n is 0, 1 or 2,
R_{24} is hydroxy, amino or unsubstituted or substituted alkylamino or phenylamino,
A is an alkylene radicalmof 2 bto Ccarbon aomesuad
R_{25} is C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6alkoxy-C_2–C_4alkoxy, phenoxy, phenoxy-C_2–C_4alkoxy or C_1–C_6alkoxycarbonyl-C_2–C_4alkoxy, or with a dye of formula



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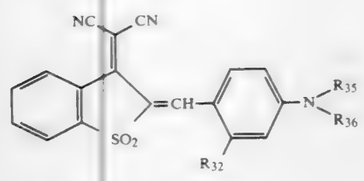

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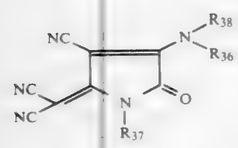

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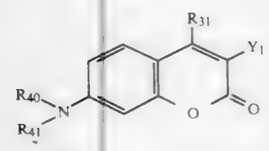

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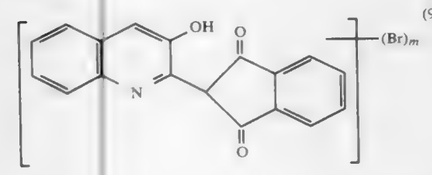

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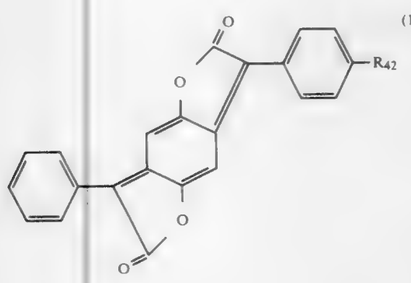

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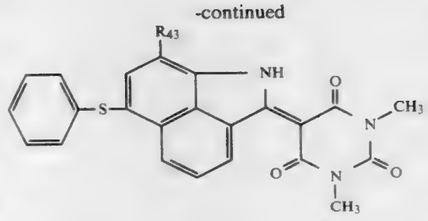

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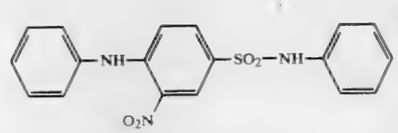

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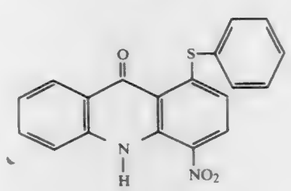

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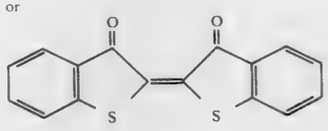
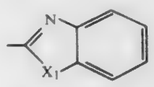
or



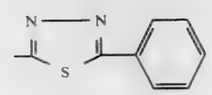
(14)

wherein
R_{29} is hydrogen or R_{29} and R_{33}, together with the N atom and the two linking carbon atoms, are a 5- or 6-membered ring,
R_{30} is cyano or a radical of formula



(15)

wherein X_1 is —NH, —N—C_1–C_4alkyl, O or S,
R_{31} is hydrogen or cyano,
R_{32} is hydrogen or C_1–C_4alkyl,
R_{33} and R_{34} are each independently of the other unsubstituted or substituted C_1–C_6alkyl, or R_{33} and R_{34}, together with the linking nitrogen atom, are a 5- or 6-membered ring,
R_{35} and R_{36} are each independently of the other C_1–C_{12}alkyl,
R_{37} is hydrogen, C_1–C_4alkyl or C_2–C_4alkenyl,
R_{38} is C_1–C_6alkyl,
R_{39} is C_1–C_6alkyl or phenyl-C_1–C_6alkyl,
R_{40} and R_{41} are each independently of the other C_1–C_4alkyl,
Y_1 is a radical of formula (15) or of formula



(16)

m is 0 or 1,
R_{42} is C_1–C_6alkoxy, C_1–C_6alkoxy-C_2–C_4alkoxy, C_1–C_4alkoxycarbonyl-C_2–C_4alkoxy or C_1–C_4alkoxy-C_1–C_4alkoxycarbonyl-C_2–C_4alkoxy, and
R_{43} is hydrogen, phenoxy or phenylthio.

5,199,957
COLORED TEXTILE FABRIC HAVING PARTIALLY REMOVABLE PIGMENT COATING
William M. Pascoe, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Oct. 24, 1991, Ser. No. 781,853
Int. Cl.[5] D06P *5/00*
U.S. Cl. 8—478 **9 Claims**

1. A process for treating a textile fabric, comprising the steps of:
providing a textile fabric which has been dyed, or is constructed of pre-dyed fiber, to give said fabric a first color;
applying a pigment and binder composition to a side of said fabric, said composition having from 2 to 4 g/l of pigment and 0.5 to 4 g/l of binder on a solid basis, wherein said pigment has a second color which is different from said first color, said binder is a film forming polymer selected from acrylic and acrylate resins, alkyl resins, alkyd resins, amino resins, phenolic resins, polyvinyl condensates, polyurethanes, polyureas, alkylene oxide addition products, and polyolefins and co-polymers thereof containing functional groups which may be cross-linked, and said composition is applied to said fabric at the rate of 50 to 100 wt. % wet pickup based on the weight of said fabric;
heating said fabric to a temperature of 225° to 300° F. for 1 to 4 minutes to cure said binder and fix between 30 to 70 wt. % of said pigment to said fabric; and
washing said cured fabric to remove a balance of said pigment not permanently fixed to said fabric, thereby exposing said first color.

5,199,958
STAIN RESISTANT MULTICOLOR TEXTURED CUT PILE CARPET: CATIONIC-DYEABLE NYLON YARN DYED WITH ANIONIC DYES AND ANIONIC-DYEABLE NYLON YARN
William G. Jenkins, Lexington, and Roy E. Guess, Roanoke, both of Va., assignors to Burlington Industries Inc., Greensboro, N.C.
Continuation-in-part of Ser. No. 552,178, Jul. 12, 1990, Pat. No. 5,085,667, which is a continuation of Ser. No. 519,237, May 4, 1990, abandoned. This application Jul. 19, 1991, Ser. No. 732,201
Int. Cl.[5] D06P *3/06, 3/82*
U.S. Cl. 8—539 **5 Claims**

1. A process of preparing a stain resistant multicolored carpet comprising the successive steps of:
(a) space dyeing a cationic-dyeable nylon yarn with an acid dye or a premetalized acid dye at a pH of from about 4.0 to 6.5 and fixing the dye to the fibers, the cationic dyeable nylon yarn dyed into predetermined colors, a predetermined pattern, or both, to intermittently dye the yarn different colors along the length thereof;
(b) tufting the space dyed yarns of step (a) and an acid dyeable nylon yarn having an affinity to acid dyes into a carpet; and
(c) dyeing the carpet prepared in step (b) with an amount of acid dye sufficient to selectively dye only the acid dyeable nylon fibers and not the previously space dyed cationic dyeable nylon fibers, to produce a multicolored stain resistant carpet.

5,199,959
COMPOSITION OF MATTER FOR FULL AND PARTIAL CALIX[8]ARENE ENCAPSULATION OF S-TRIAZINES FOR THERMAL STABILITY ENHANCEMENT AND DISSOLUTION IN DIESEL FUEL
Rodney L. Sung, Fishkill, N.Y.; Thomas F. Deross, Passaic, N.J., and Benjamin J. Kaufman, Hopewell Jct., N.Y., assignors to Texaco Inc., White Plains, N.Y.
Filed Mar. 9, 1992, Ser. No. 848,474
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—336 **2 Claims**

1. A composition of matter comprising a mixture of:
a) p-nonyl calix[8]arene-tri-hydroxyl-s-triazine;
b) p-nonyl calix[8]arene)ether-di-hydroxyl-s-triazine;
c) p-nonyl-calix[8]arene)diether-hydroxyl-s-triazine;
d) p-nonyl-calix[8]arene)triether-s-triazine;
e) p-phenyl-co-p-nonyl-calix[8]arene-tri-hydroxyl-s-triazine;
f) p-phenyl-co-p-nonyl-calix[8]arene)-di-hydroxyl-s-triazine;
g) (p-phenyl-c-p-nonyl-calix[8]arene)diether-s-triazine;
h) (phenyl-co-p-nonyl-calix[8]-arene)triether-s-triazine;
i) di(p-nonyl-calix[8]arene)diether-hydroxyl-s-triazine;
j) (p-nonyl-calix[8]arene)ether-d-(p-nonyl-calix[8]arene)'-diether-s-triazine;
k) di(p-phenyl-c-p-nonyl-calix[8]arene)diether-hydroxyl-s-triazine;
l) (p-phenyl-co-p-nonyl-calix[8]arene)ether-di(p-phenyl-co-p-nonyl-calix[8]arene)'diether-s-triazine;
m) tri-(p-nonyl-calix[8]arene)triether-s-triazine;
n) tri(p-phenyl-co-p-nonyl-calix[8]arene)triether-s-triazine;
o) [(p-nonyl-calix[8]arene)-(hydroxyl-s-triazine)]-copolyether;
p) [(p-phenyl-co-p-nonyl-calix[8]arene)-(hydroxyl-s-triazine)]copolyether;
q) [(p-nonyl-calix[8]arene)-(s-triazine)]star-polyether; and
r) [(p-phenyl-co-p-nonyl-calix[8]arene)-(s-triazine)star-polyether.

5,199,960
SULFUR COUPLED HYDROCARBYL DERIVED MERCAPTOBENZOTHIAZOLE ADDUCTS AS MULTIFUNCTIONAL ANTIWEAR ADDITIVES AND COMPOSITIONS CONTAINING SAME
Liehpao O. Farng, Lawrenceville; Andrew G. Horodysky, Cherry Hill, both of N.J., and James G. Murray, Whiting, Vt., assignors to Mobil Oil Corporation, Fairfax, Va.
Division of Ser. No. 413,150, Sep. 27, 1989, Pat. No. 5,073,279. This application Oct. 3, 1991, Ser. No. 770,277
Int. Cl.[5] C10L *1/24*
U.S. Cl. 44—341 **17 Claims**

1. A composition comprising a major amount of a liquid hydrocarbyl fuel and a minor multifunctional additive amount of from about 0.001 to about 10 wt. % based on the total weight of the composition of an additive reaction product comprising a sulfur coupled hydrocarbyl mercaptobenzothiazole made by reacting
(a) a C_6–C_{60} long-chain olefin with (b) a sulfur reactant and thereafter reacting the sulfur coupled intermediate product of (a) and (b) with (c) a mercaptobenzothiazole and wherein the molar quantities of the sulfurized olefin products of (a) and (b) to mercaptobenzothiazole vary from about 1:10 to about 10:1 and the temperature varies from ambient to about 250° C. with ambient or autogenous pressure and wherein the sulfur coupled hydrocarbyl mercaptobenzothiazole product has the following generalized structure:

surface of an opening in the roof (3) through which the reactor

5,199,963
DUAL FILTERING VACUUM SYSTEM

in a process of adsorbing moisture from a gas, particularly air,

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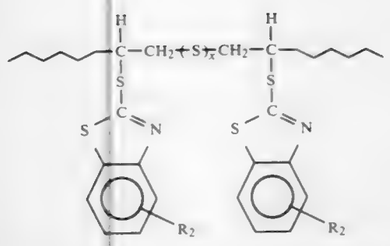
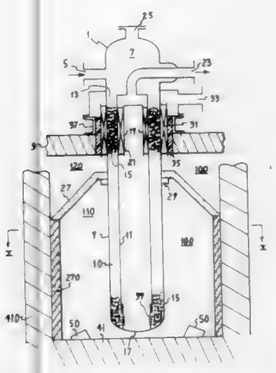


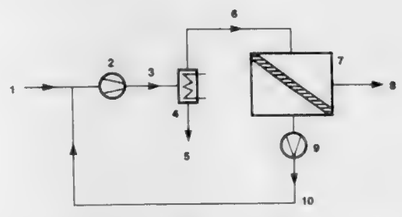
wherein R_2 is hydrogen or C_1–C_{40} hydrocarbyl and optionally contains sulfur, nitrogen and/or oxygen and x is an integer of from 1 to about 8.

5,199,961
APPARATUS FOR CATALYTIC REACTION
Kozo Ohsaki; Akio Naito, and Kazumi Shima, all of Chiba, Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan
Filed Aug. 23, 1991, Ser. No. 748,940
Claims priority, application Japan, Aug. 28, 1990, 2-225871
Int. Cl.[5] B01J *8/06*
U.S. Cl. 48—94 **8 Claims**



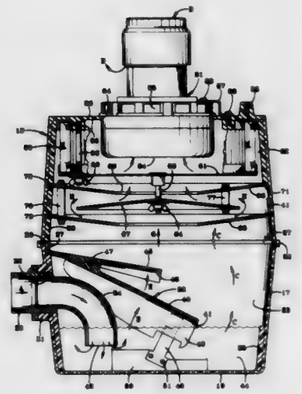
1. An apparatus for catalytic reaction comprising a heating chamber having a hearth (**41**), side wall(s) and a roof (**3**), and inlet and an outlet for a heat source gas; a substantially vertically mounted concentric double cylindrical tubular reactor (**1**) mounted in said roof (**3**) and protruding into the space (**100**) within said heating chamber; a gas-permeable dividing means (**27**) which divides the space (**100**) within the heating chamber into an upper convection heat transfer space (**120**) and a lower radiant heat transfer space (**110**) and disposed such that a lower portion of the protruding tubular reactor is within the radiant heat transfer space (**110**) and an upper portion of the protruding tubular reactor is within the convection heat transfer space (**120**); said tubular reactor (**1**) having an outer cylindrical tube (**9**) and a concentric inner tube (**11**), a lower end of said outer tube (**9**) being closed and having an inlet (**5**) at an upper end of said outer tube for raw material gas communicating with an annular space (**10**) defined by said outer and inner tubes, said annular space packed with catalyst and communicating with a lower and open end of said inner tube (**11**), an upper end of said inner tube being closed from said outer tube and communicating with an outlet means (**23**) for said reactor (**1**); characterised in that a heat recovery means (**19**) is disposed in the upper end of said inner tube, which heat recovery means protrudes inwardly from the internal surface of said inner tube, in that said outlet from said heating chamber comprises an annular opening defined by the outer surface of the outer tube (**9**) and the surface of an opening in the roof (**3**) through which the reactor protrudes, in that a heat recovery means (**31**) is disposed in said annular opening, in that the gas-permeable dividing means (**27**) extends outwardly from the outer surface of said outer tube (**9**) and obliquely downwardly to meet the side wall(s) of said heating chamber and in that a heat equalizing layer (**270**) extends from the outer periphery of the gas-permeable dividing means (**27**) substantially vertically downwardly to the hearth (**41**) and the inlet (**50**) for said heat source gas are disposed in the hearth (**41**) such as to direct said heat source gas onto an inner surface of said heat equalizing layer.

5,199,962
PROCESS FOR REMOVING CONDENSABLE COMPONENTS FROM GAS STREAMS
Johannes G. Wijmans, Menlo Park, Calif., assignor to Membrane Technology and Research, Inc., Menlo Park, Calif.
Continuation of Ser. No. 649,305, Jan. 30, 1991, Pat. No. 5,089,033, which is a continuation of Ser. No. 432,592, Nov. 7, 1989, abandoned. This application Feb. 14, 1992, Ser. No. 837,244
Int. Cl.[5] B01D *53/22, 71/24*
U.S. Cl. 55—16 **35 Claims**



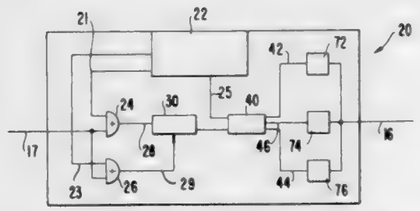
1. A process for recovering a condensable component from a gas stream, comprising the steps of:
(a) providing an incoming gas stream containing a condensable component, characterized by a boiling point higher than −100° C.;
(b) performing a condensation step, comprising:
bringing said incoming gas stream to a condition characterized in that the concentration of said condensable component is greater than its saturation concentration at said condition, so that condensation of a portion of said condensable component occurs;
withdrawing a condensed stream comprising said condensable component in liquid form;
withdrawing a non-condensed stream depleted in said condensable component compared with said incoming gas stream;
(c) performing a membrane separation step, comprising:
providing a membrane having a feed side and a permeate side;
providing a pressure difference between the permeate and feed sides of the membrane;
contacting said feed side with said non-condensed stream from said condensation step;
withdrawing from said permeate side a permeate stream enriched in said condensable component compared with said non-condensed stream;
(d) recycling said permeate stream to said condensation step (b).

5,199,963
DUAL FILTERING VACUUM SYSTEM
Arcoline J. Scarp, 6205 E. State Rt. 40, Tipp City, Ohio 45371
Filed Jul. 30, 1992, Ser. No. 922,508
Int. Cl.[5] B01D *47/02*
U.S. Cl. 55—186 **15 Claims**



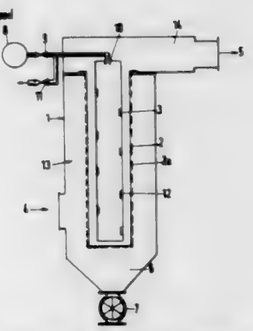
1. A vacuum cleaner comprising:
(a) a pan member adapted to contain a fluid bath;
(b) a cleaning air inlet formed in the pan member;
(c) an upper casing removably mounted on said pan member;
(d) motor means mounted on the upper casing for drawing air into the pan through the air inlet, said motor means having a cooling air inlet and outlet, and a cleaning air inlet and outlet;
(e) a main baffle mounted within the pan member and shrouding said cleaning air inlet;
(f) at least two fluid collector rings mounted within the upper casing to provide a circuitous path for cleaning air to follow when moving from the cleaning air inlet to the cleaning air outlet; and
(g) a replaceable annular air filter surrounding the cleaning air outlet through which cleaning air must pass before exiting into the environment.

5,199,964
METHOD AND APPARATUS FOR ADSORBING MOISTURE FROM GASES ESPECIALLY AIR
Roderich Gräff, 607 Church St., Ann Arbor, Mich. 48104
Continuation-in-part of Ser. No. 678,885, Mar. 27, 1991, abandoned, which is a continuation of Ser. No. 468,228, Jan. 22, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 864,600
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901779; European Pat. Off., Jan. 18, 1990, 90101002.5; Brazil, Jan. 22, 1990, PI9000240; Japan, Jan. 22, 1990, 2-013455; India, Feb. 5, 1990, 108/CAL/90
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—20 **18 Claims**



1. A method of controlling a duration of an absorption cycle in a process of adsorbing moisture from a gas, particularly air, using an adsorbing material including the steps of passing a moisture-carrying gas and a heated regenerating medium alternatingly through the adsorbing material in a series of alternating adsorption cycles and regeneration cycles, said method consisting of monitoring, during a regeneration cycle, a parameter of the adsorbing material depending on a total amount of moisture adsorbed by the adsorbing material during an adsorption cycle immediately preceding the regeneration cycle; comparing the value of the parameter monitored to a predetermined value of the parameter related to an optimum quantity of moisture to be adsorbed by the adsorbing material during adsorption; and controlling the duration of an adsorption cycle immediately succeeding the regeneration cycle according to said comparing.

5,199,965
BAG FILTER
Paul van Ackeren, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Apr. 30, 1992, Ser. No. 876,789
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1991, 4114626
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—293 **7 Claims**



1. A bag filter assembly including a housing; a supporting grid inside the housing; a bag filter having an outer circumference and being arranged on the supporting grid and being sufficiently permeable for permitting a gas to be cleaned to pass therethrough from a crude-gas side outside the supporting grid to a clean-gas side inside the supporting grid; a gas injector for directing a stream of gas under pressure from a pressurized gas generating source into the clean-gas side of the support grid, the assembly comprising:
an expandable bag having an expanded circumference and being disposed at a distance from the filter bag within the clean-gas side of the supporting grid and connected to the gas injector in pressure-tight manner; the distance of the expandable bag from the bag filter being selected as a function of the pressure produced by the injector and the source of the gas and the expandability of the expandable bag so that the expanded circumference of the expandable bag is greater than the outer circumference of the bag filter.

5,199,966

5,199,968

5,199,970
HERBICIDAL, OPTICALLY ACTIVE OR RACEMIC

5,199,972
METHOD OF PREPARING ACTIVE

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5,199,966

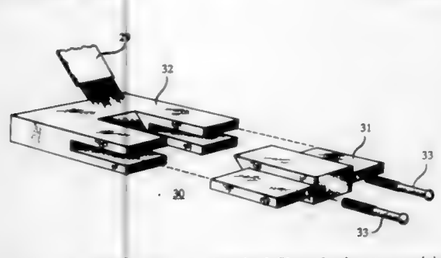
OPTICAL COUPLER METHOD

George T. Harvey, Princeton, N.J., and Peter H. Read, Morrisville, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 481,731, Feb. 14, 1990, abandoned, which is a continuation of Ser. No. 188,587, Apr. 29, 1988, abandoned. This application Aug. 12, 1991, Ser. No. 746,060

Int. Cl.[5] C03B *37/075*

U.S. Cl. 65—4.21 18 Claims



1. A method for making an optical fiber device comprising the steps of:

making at least one first groove of a first size in a glass preform, the preform having first thickness and width dimensions;

heating a portion of the glass preform containing part of the first groove to a sufficiently high temperature for reflow thereof;

drawing the reflowed portion of the preform such that the drawn portion has smaller width and thickness dimensions than the first width and thickness dimensions, whereby the drawn portion contains at least one second groove having a smaller size than the first groove;

allowing the drawn portion to harden and cutting off part of the drawn portion from the preform, the cut part of the drawn portion constituting a substrate having at least one second groove and having a first index of refraction;

mounting at least one optical fiber in said one second groove of the substrate, the optical fiber having an index of refraction substantially equal to the first index of refraction;

and bonding the optical fiber to the substrate.

5,199,968

PLANT GROWTH REGULATORS CONTAINING OXALIC ACID DERIVATIVES

Costin Rentzea, Heidelberg; Wilhelm Rademacher, Limburgerhof; Michael Keil, Freinsheim, and Albrecht Harreus, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 737,740, Jul. 30, 1991, Pat. No. 5,163,992. This application Mar. 9, 1992, Ser. No. 848,503

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1990, 4024118

Int. Cl.[5] A01N *43/44*

U.S. Cl. 504—209 13 Claims

1. A method for regulating plant growth, wherein the soil, the plants or their seeds is or are treated with a growth regulating amount of an azetidine derivative of the general formula I

A—CO—COO—Y—X—D I

where A is an azetidine ring which is bonded via its nitrogen atom and may be optionally substituted by one or two C_1–C_3-alkyl groups, Y is C_2–C_{10}-alkylene which may be optionally substituted by from one to three C_1–C_3-alkyl groups, X is oxygen or sulfur and D is C_1–C_{20}-alkyl or C_3–C_{10}-alkenyl, where these groups may be optionally substituted by from one to five halogen atoms, or is monocyclic or polycyclic C_3–C_{10}-cycloalkyl, C_3–C_{10}-cycloalkylmethyl, C_5–C_{10}-cycloalkenyl or C_5–C_{10}-cycloalkenylmethyl, where these rings may be optionally substituted by from one to three C_1–C_4-alkyl groups or a phenyl ring, or is phenyl, phenyl-C_1–C_6-alkyl or phenyl-C_3–C_6-alkenyl, where the aromatic radicals may be optionally substituted by from one to five halogen atoms and/or from one to three of the following groups: nitro, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio or C_1–C_4-haloalkylthio.

5,199,967

FOLIAR FERTILIZATION METHODS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 458,277, Jan. 17, 1983, abandoned. This application Feb. 26, 1988, Ser. No. 160,812

Int. Cl.[5] C05B *7/00*; C05D *5/00*

U.S. Cl. 71—34 10 Claims

1. A method for foliary fertilizing field and row crops with nitrogen source which comprises applying an aqueous ammonium ion-containing solution to the foliage of said crops, said solution comprising ammonium ion at a concentration phytotoxic to said field and row crops corresponding to at least about 1 weight percent nitrogen as a water-soluble ammonium compound, and contracting the foliage of said crops with magnesium ion in an amount corresponding to at least about 0.01 pound of magnesium ion per pound of ammonium ion sufficient to substantially eliminate the phytotoxic effect of said ammonium ion on said field and row crops.

5,199,969

AZOLYLETHANE DERIVATIVES AND FUNGICIDES AND GROWTH REGULATORS CONTAINING THEM

Rainer Seele, Fussgoenheim; Walter Himmele, Walldorf; Reiner Kober, Fussgoenheim; Eberhard Ammermann, Ludwigshafen; Gisela Lorenz, Neustadt; Wilhelm Rademacher, and Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

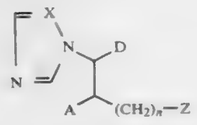
Continuation of Ser. No. 503,923, Apr. 4, 1990, abandoned. This application Feb. 25, 1991, Ser. No. 660,724

Claims priority, application Fed. Rep. of Germany, May 6, 1989, 3914944

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 504—272 16 Claims

1. A compound of the formula



wherein A is 2,4-dichlorophenyl, Z is methyl, D is methoxy or ethoxy, n is 0, 1, 2 or 3, and X is N.

5,199,970

HERBICIDAL, OPTICALLY ACTIVE OR RACEMIC SUBSTITUTED PROPIONIC ACID DERIVATIVES, HERBICIDE COMPOSITIONS CONTAINING THEM AND A PROCESS FOR PREPARING SAME

József Tompa; Ferenc Bartha; Tibor Timár; Ágota Répási née Veres; Vilmos Galamb, all of Tiszavasvári; Éva Füzi née Porkoláb, Tiszalök, and Dezsó Miklós, Veszprém, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar, Tiszavasvari, Hungary

Filed Oct. 30, 1990, Ser. No. 605,829

Claims priority, application Hungary, Nov. 2, 1989, 5645/89

Int. Cl.[5] A01N *43/84*; C07D *413/12*

U.S. Cl. 504—225 4 Claims

1. An optically active compound selected from the group which consists of:

N-allyl-2-{4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy}-propionic acid amide;

2'-(4-morpholino)ethyl 2-{4-(5-trifluoromethyl-2-pyridyloxy)phenoxy}propionate; and

2-{4-(5-trifluoromethyl-2-pyridyloxy)phenoxy}-propionic acid (2-dimethyloxime) ethyl ester.

5,199,971

PARTS FOR USE IN ROTARY GEAR PUMP

Kiyoaki Akechi, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

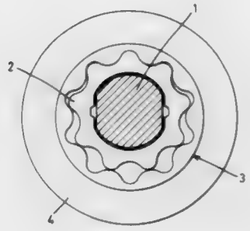
Filed Dec. 19, 1989, Ser. No. 452,384

Claims priority, application Japan, Dec. 19, 1988, 63-321332

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] C22C *21/04*

U.S. Cl. 75—249 15 Claims



1. A part for use in a rotary gear pump, having good sliding characteristics against a pump case made of light metals, said part being formed of aluminum alloy material obtained by subjecting aluminum alloy powders, which have been rapidly solidified at a cooling rate of 1000° C./sec or more and have particle sizes of 150 μm or less, to powder compacting and then to hot extrusion, wherein the aluminum alloy material contains a substantial amount of covalent-bonding Si crystal and an intermetallic compound containing aluminum to reduce the quantity of Al atoms on the sliding surface of the part which are cohesive with each other, and wherein a surface of the part is plated or coated with a fluorine resin.

5,199,972

METHOD OF PREPARING ACTIVE MAGNESIUM-HYDRIDE OR MAGNESIUM HYDROGEN-STORER SYSTEMS

Borislav Bogdanovic, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle G.m.b.H., Mulheim/-Ruhr, Fed. Rep. of Germany

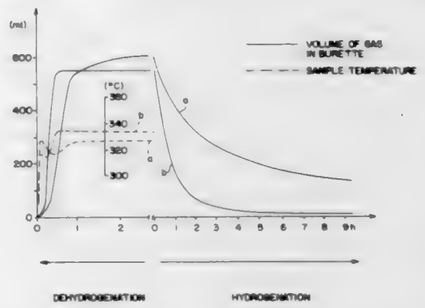
Division of Ser. No. 423,292, Oct. 18, 1989, abandoned, which is a continuation of Ser. No. 782,605, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 548,055, Nov. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 500,070, Jun. 1, 1983, Pat. No. 4,554,152. This application Apr. 30, 1990, Ser. No. 517,001

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247360

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[5] B22F *1/00*; C01B *6/24*

U.S. Cl. 75—255 4 Claims



1. A finely divided magnesium powder composition consisting essentially of 96–99% by weight of finely divided magnesium powder and 1–4% of one transition metal of groups IV–VIII of the Periodic Table, said composition being capable of reversibly sorbing hydrogen in an amount of 6.5–7.65% by weight at about 250°–400° C.

5,199,973

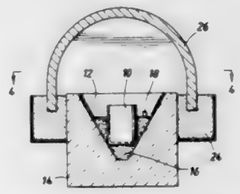
METHOD OF DISPOSING OF MEDICAL SHARPS

Charles F. Funk, Sr., P.O. Box 6513, Gulfport, Miss. 39501

Continuation-in-part of Ser. No. 562,886, Aug. 6, 1990, abandoned. This application Jun. 1, 1992, Ser. No. 891,933

Int. Cl.[5] B65D *83/10*

U.S. Cl. 75—392 8 Claims



1. A method of disposing of waste metals comprising placing the waste metals in a crucible of refractory material, placing a mixture of aluminum powder and iron oxide in the crucible, and igniting the mixture to produce an exothermic reaction that will raise the temperature of the waste metals above their melting point, reduce the iron oxide, and oxidize the aluminum.

5,199,974

5,199,976

an inorganic caustic material, (b) an alcohol and (c) an organo mercaptan, sulfide or mixtures thereof in amounts effective to

(d) from and including 0 to about 10 weight percent organic cosolvent, and

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5,199,974

METHOD FOR RECOVERING METAL CONTENTS OF METALLURGIC WASTE PRECIPITATES OR WASTE DUSTS BY SUSPENSION SMELTING

Sigmund P. Fugleberg, Turku, Finland, assignor to Outokumpu Research Oy, Pori, Finland

Filed Jan. 27, 1992, Ser. No. 826,118
Claims priority, application Finland, Feb. 13, 1991, 910692
Int. Cl.[5] C22B *7/00*
U.S. Cl. 75—659 **20 Claims**

1. A method for recovering the valuable metal contents of non-combustible metallurgic waste precipitates, dusts and intermediate products, as well as for producing soluble slag, comprising the steps of:

feeding combustion gas and fuel through one set of burners into an upper part of a reaction shaft of a flash smelting furnace, radially from the arch of the furnace for creating a flame;

feeding non-combustible divided metallurgic waste or intermediate product into the flame in order to create a suspension;

feeding fuel and oxygen into the shaft through another set of burners arranged on the shaft walls for maintaining a smooth temperature profile in the reaction shaft;

carrying out the smelting in reducing conditions so that the valuable metals volatilized in the reaction shaft are removed, along with gases, through the uptake shaft; and

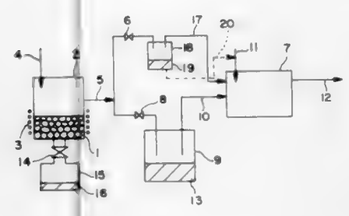
tapping created iron-containing slag from the settler.

5,199,975

METHOD FOR PROCESSING USED BATTERY

Hisashi Gunjishima, Ushiku; Junichiro Tanaka, and Masaharu Onoue, both of Shimonoseki, all of Japan, assignors to Mitsui Mining & Smelting Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 760,759, Sep. 16, 1991, abandoned. This application Mar. 6, 1992, Ser. No. 847,198
Claims priority, application Japan, Sep. 19, 1990, 2-247355; Jul. 1, 1991, 3-159373
Int. Cl.[5] C22B *7/00*
U.S. Cl. 75—669 **13 Claims**



1. A method for recovering cadmium from a used nickel-cadmium battery comprising heating at least one member of the group consisting of a nickel-cadmium naked battery a plurality of nickel-cadmium naked battery bodies encased in a resin case in a non-oxidizing atmosphere at 400° to 600° C. in a first stage to remove volatile constituents and then heating the battery bodies a non-oxidizing atmosphere at 800° to 1000° C. in a second stage to vaporize the cadmium and recovering the cadmium.

5,199,976

OZONE-FRIENDLY CORRECTION FLUID

Chiou C. Yau, Wrentham; Norman G. Sanborn, South Weymouth, and Kim H. Ng, Franklin, all of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 802,208, Dec. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 714,489, Jun. 13, 1991, abandoned. This application Mar. 13, 1992, Ser. No. 850,598
Int. Cl.[5] C09D *10/00*; **B32B** *35/00*
U.S. Cl. 106—19 A **22 Claims**

1. An ozone-friendly correction fluid comprising:

a non-halogenated solvent;

a film-forming polymeric material comprising a vinyl toluene-butadiene copolymer;

a dispersing agent; and

an opacifying agent.

5,199,977

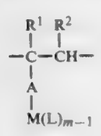
ANTIFOULING PAINT COMPOSITIONS

Naoki Yamamori, Minou; Junji Yokoi; Kiyoaki Higo, both of Ikoma, and Masayuki Matsuda, Osaka, all of Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan

Filed Jul. 19, 1991, Ser. No. 732,882
Claims priority, application Japan, Jul. 19, 1990, 2-192213; Jul. 19, 1990, 2-192214; Jul. 19, 1990, 2-192215
Int. Cl.[5] C09D *5/14*
U.S. Cl. 106—15.05 **12 Claims**

1. An antifouling paint composition comprising:

(a) a copolymer consisting essentially of 5 to 80% by weight of a first recurring unit of the formula:



wherein R^1 is hydrogen atom, methyl or an alkoxycarbonyl, R^2 is hydrogen atom or an alkoxycarbonyl, A is an acid ion-terminated pendant group, M is a transitional metal ion, L is a monobasic organic acid ion, and m is the valency of the transitional metal M; and the balance of the copolymer of a second recurring unit free from an acid function, said copolymer having a number average molecular weight from 2,000 to 100,000: and

(b) an amount of an organic ligand at least equal to a ligand-to-metal coordination ratio of 1:1,

said organic ligand being selected from the group consisting of aromatic nitro compounds, nitriles, urea compounds, alcohols, phenols, aldehydes, ketones, carboxylic acids and organic sulfur compounds.

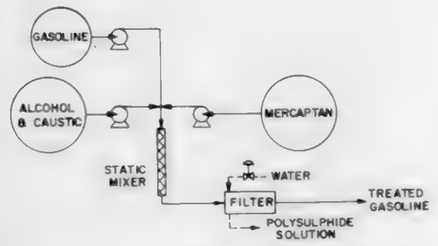
5,199,978

PROCESS FOR REMOVING ELEMENTAL SULFUR FROM FLUIDS

Marc A. Poirier, Sarnia; Robert J. Falkiner, Mississauga; Daniel W. Kraemer, Clearwater; John B. Gilbert, and Ian D. Campbell, both of Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 17, 1991, Ser. No. 715,959
Int. Cl.[5] C10G *19/00*
U.S. Cl. 208—233 **10 Claims**

1. A process for reducing the elemental sulfur content of a fluid containing same, comprising contacting said fluid with (a) an inorganic caustic material, (b) an alcohol and (c) an organo mercaptan, sulfide or mixtures thereof in amounts effective to



form a fluid insoluble polysulfide salt and separating the fluid insoluble components from the fluid.

5,199,979

UV RESISTANT, ABRASION RESISTANT COATINGS

Shaow B. Lin, Allison Park; Chia-Cheng Lin, Gibsonia; Robert M. Hunia, Kittanning, and Gary J. Marietti, Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1988, Ser. No. 276,276
Int. Cl.[5] C09K *210/10*
U.S. Cl. 106—287.14 **14 Claims**

1. An optically transparent coating composition for protecting a substrate from ultraviolet radiation consisting essentially of:

a. a partially hydrolyzed alkoxide of the general formula $R_xM(OR')_{z-x}$ wherein R is an organic radical, M is selected from the group consisting of silicon, aluminum, titanium, zirconium, cerium and mixtures thereof, R' is a low molecular weight alkyl radical, z is the valence of M and x is less than z and may be zero; and

b. a hydroxy-containing organic compound which absorbs ultraviolet radiation and which comprises hydrophilic moieties capable of reacting with said partially hydrolyzed alkoxide.

5,199,980

POLYURETHANE-BASED WATER-IN-WATER MULTICOLOR PAINT AND METHOD FOR MAKING

James F. Lynch, Schaumburg, and John Predkelis, Glen Ellyn, both of Ill., assignors to Multicolor Specialties, Inc., Cicero, Ill.

Continuation-in-part of Ser. No. 694,311, May 1, 1991, Pat. No. 5,114,485, which is a continuation-in-part of Ser. No. 586,762, Sep. 21, 1990, Pat. No. 5,114,484. This application Mar. 16, 1992, Ser. No. 851,525
Int. Cl.[5] C09D *5/29*
U.S. Cl. 106—311 **27 Claims**

1. A method for making a water-in-water multicolor paint comprising the steps of:

(A) providing a first composition comprising on a 100 weight percent basis:

(a) about 10 to about 40 weight percent of a water dispersed, film-forming, crosslinkable, polyurethane polymer system, said system comprising on a 100 weight percent total crosslinkable solids basis about 75 to and including 100 weight percent of polyurethane polymer and correspondingly from and including 0 to about 25 weight percent of reactive curative,

(b) about 0.5 to about 2 weight percent dissolved cellulose material selected from the class consisting of hydroxy (lower alkyl) cellulose and alkali metal carboxylated (lower alkyl) cellulose,

(c) from and including 0 to about 30 weight percent dispersed pigment,

(d) from and including 0 to about 10 weight percent organic cosolvent, and

(e) about 20 to about 80 weight percent water;

(B) providing a second composition comprising on a 100 weight percent basis:

(a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and

(b) about 95 to about 99.5 weight percent water;

(C) providing a third composition comprising on a 100 weight percent basis:

(a) about 0.5 to about 2 weight percent dissolved peptizing agent,

(b) about 5 to about 10 weight percent dispersed water swellable clay, and

(c) about 88 to about 95 weight percent water;

(D) providing a fourth composition comprising on a 100 weight percent basis:

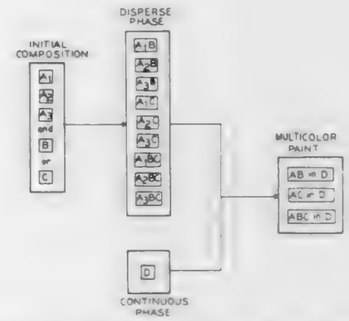
(a) about 2 to about 5 weight percent dispersed water swellable clay,

(b) about 0.1 to about 0.75 weight percent dissolved peptizing agent,

(c) about 2 to about 30 weight percent of said dispersed, film-forming, crosslinkable, polyurethane polymer system,

(d) from and including 0 to about 0.2 weight percent anti-foaming agent,

(e) from and including 0 to about 0.2 weight percent wetting agent,



(f) from and including 0 to 5 weight percent silica,

(g) from and including 0 to about 0.25 weight percent organofunctional silane,

(h) from and including 0 to about 3 weight percent organic cosolvent, and

(i) about 35 to about 65 weight percent water,

the relationship between components of said fourth composition being such that said fourth composition has a viscosity in the range of about 1,000 to about 1,500 centipoises;

(E) blending said first composition with a composition selected from the group consisting of:

(a) said second composition in the weight ratio range of about 85:15 through about 80:20 of said first composition to said second composition,

(b) said third composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said third composition, and

(c) a combination of said second composition and said third composition in the weight ratio range of about 70:15:15 to about 80:10:10 of said first composition to said second composition to said third composition so as to produce a first disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises; and

(F) mixing said first disperse phase gel composition with said fourth composition so that the ratio of the viscosity of said fourth composition to the viscosity of said first disperse

phase composition is in the range of about 1:5 to about

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BLACK MATRIX COMPOSITION FOR USE IN COLOR

5,199,987

METHOD OF PRODUCING CEMENT CLINKER

said gas flow suppressing means having a planar portion arranged so as to substantially confront said planar surface

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phase composition is in the range of about 1:5 to about 1:10, the mixing shear force used in said mixing being sufficient to break up said first disperse phase gel composition into discrete gel bodies dispersed in said fourth composition said mixing shear force being inversely proportional to the average size of said so formed disperse phase bodies, thereby to produce said multicolor paint.

5,199,981

PIGMENT COMPOSITIONS INCLUDING INTAGLIO PRINTING INK WASTE

Maurice A. Amon, New York, N.Y., and Ovart NitidandhaPrabhas, Bangkok, Thailand, assignors to Sicpa Holding SA, Switzerland

Filed Jan. 18, 1991, Ser. No. 643,556
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—407 **22 Claims**

1. A dry pigment composition for the coloration of synthetic plastic materials, comprising dried, pulverized and sieved ink wastes from intaglio printing processes, said ink wastes comprising pigment and residual ink resins.

5,199,982

PROCESS TO MANUFACTURE COLORED PIGMENTS BASED ON ZIRCON

Rodney D. Stramel, Edmond, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Apr. 24, 1992, Ser. No. 874,132
Int. Cl.[5] C01B *33/20*; C08K *3/00*
U.S. Cl. 106—451 **12 Claims**

1. A process for producing metal zircon pigment particles comprising the steps of:

mixing a zirconium halide, a silicon halide and metal halide chromophore with oxygen, where the metal halide chromophore is selected from the group consisting of praseodymium halide, vanadium halide and mixtures thereof;

oxidizing the halides at a temperature in the range of from about 600° to about 1400° C. to convert the halides to oxides and elemental halogen; and

recovering metal oxide pigment particles.

5,199,983

BLACK PIGMENT PARTICLES

Tsutomu Katamoto, Hiroshima, Japan, assignor to Toda Kogyo Corp., Hiroshima, Japan

Continuation of Ser. No. 526,820, May 22, 1990, abandoned. This application Mar. 26, 1992, Ser. No. 859,243
Claims priority, application Japan, May 30, 1989, 1-137751
Int. Cl.[5] C09C *1/24, 1/36*
U.S. Cl. 106—459 **6 Claims**

1. Black pigment particles having an apparent density of 0.5 to 1.2 g/cm^3 and consisting essentially of polycrystalline particles having an average particle size of 0.05 to 2.0 μm and composed of a mixed composition of 1 to 40% by weight of Fe_2TiO_5 and $Fe_2O_3.FeTiO_3$ solid solution, the amount of Ti in said polycrystalline particles being 15 to 20 atom % based on the total amount of Fe(II) and Fe(III).

5,199,984

BLACK MATRIX COMPOSITION FOR USE IN COLOR CATHODE RAY TUBE

Sumin Jeong, Kyunggi, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Oct. 25, 1991, Ser. No. 782,404
Claims priority, application Rep. of Korea, Oct. 31, 1990, 90-17608
Int. Cl.[5] C09C *1/44*
U.S. Cl. 106—474 **7 Claims**

1. A black matrix composition for use in a color cathode ray tube comprising a colloidal graphite as a major component, which comprises 0.8–5 weight percentage of graphite, 0.1–1 weight percentage of iron, 1.7–4.2 weight percentage of pigment, 0.1–0.5 weight percentage of surfactant and remaining water.

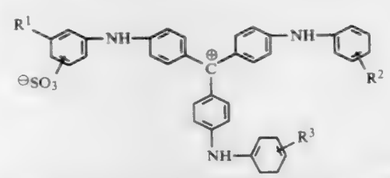
5,199,985

PIGMENT PREPARATION, A PROCESS FOR ITS PREPARATION AND ITS USE

Manfred Schneider, Eppstein/Taunus, and Rainer Schunck, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1991, Ser. No. 790,997
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1990, 4036266
Int. Cl.[5] C08K *5/16*; C09D *11/02*
U.S. Cl. 106—493 **10 Claims**

1. A pigment preparation based on an arylpararosanilinesulfonic acid pigment of the formula (I)



(I)

in which R^1, R^2 and R^3 independently of one another are hydrogen, chlorine or bromine or an alkyl or alkoxy group, each having 1 to 3 carbon atoms, and at least one alcohol having a chain length of C_8 to C_{20}, which has been modified with 2 to 8 mol of propylene oxide and with 1 to 14 mol of ethylene oxide.

5,199,986

PROCESS FOR COLORING BUILDING MATERIALS

Bernd Kröckert, Wesel; Günter Linde, Krefeld; Manfred Eitel, Krefeld; Kurt Schäfer, Krefeld, and Klaus Rohbock, Kempen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1992, Ser. No. 826,432
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1991, 4103531
Int. Cl.[5] C04B *14/02*
U.S. Cl. 106—712 **10 Claims**

1. A process for coloring building materials with inorganic pigments which comprises incorporating into said materials pigments in the form of granulates which are free-flowing and no dust forming wherein the pigment granulates are produced from spray dried granules by after-granulating.

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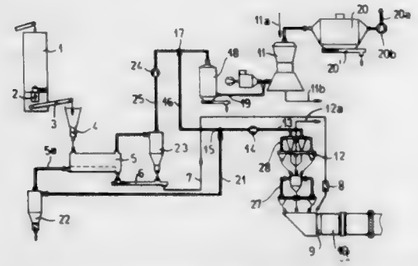
METHOD OF PRODUCING CEMENT CLINKER

Ludwig Ernstbrunner, Bad Fischau Brunn, Austria, assignor to Wopfinger Stein- und Kalkwerke Schmid & Co., Waldegg-/Wopfing and PWA Ortmann Aktiengesellschaft, Vienna, both of Austria

Filed Dec. 2, 1991, Ser. No. 800,528
Claims priority, application Austria, Nov. 30, 1990, 2428/90
Int. Cl.[5] C04B *7/43*
U.S. Cl. 106—761 **9 Claims**



1. A process for producing cement clinker which comprises the steps of:

(a) feeding into an inlet end of a rotary cement kiln inorganic cement clinker precursors;

(b) subjecting said inorganic cement clinker precursors in said kiln to a primary firing to form a cement clinker and produce a hot flue gas, said hot flue gas being discharged from said inlet end of said kiln;

(c) drying a paper sludge having a water content of about 50% with said hot flue gas to a predried paper sludge with a water content of about 30% by weight; and

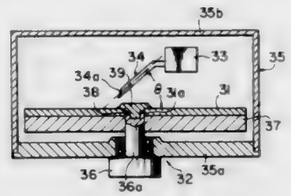
(d) introducing said predried paper sludge into said inlet end of said rotary kiln and sustaining therewith a secondary combustion at said inlet end, whereby ash from said secondary combustion is incorporated in said cement clinker.

5,199,988

MANUFACTURING APPARATUS AND METHOD FOR RECORDING MEDIUM

Hisamitsu Kamezaki, Ibaraki; Osamu Saito, Takatsuki, and Yoshitane Tsuburaya, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 18, 1989, Ser. No. 395,578
Claims priority, application Japan, Aug. 19, 1988, 63-204788; Sep. 20, 1988, 63-233620; Nov. 10, 1988, 63-282478; Mar. 24, 1989, 1-070398
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—52 **8 Claims**



1. An apparatus for producing a data recording medium including a substrate and a coated recording layer, comprising:

a turn table for supporting a substrate for the purpose of forming a coating film on a planar surface thereof by spin coating whereby a liquid coating is applied to said planar surface of said substrate by a rotational force of said turn table;

means for suppressing gas flow to stabilize said spin coating, said gas flow suppressing means having a planar portion arranged so as to substantially confront said planar surface of said substrate to be coated, said gas flow suppressing means being larger in diameter or width than a diameter or width of said substrate so as to cover an entire planar surface thereof, said gas flow suppressing means being positioned apart from said planar surface of said substrate at a distance less than one and one half times said diameter or width of said substrate;

an air space formed above said planar surface of said substrate on said turn table and closed by said planar portion of said gas flow suppressing means, said air space being suppressible of gas flow along said planar surface of said substrate; and

a nozzle for dropping said liquid coating onto said planar surface of said substrate, said nozzle having at least an open end portion arranged between said gas flow suppressing means and said substrate at a position above an inner circumferential portion of said substrate, said end portion of said nozzle being inclined so as to form an angle less than 90 degrees relative to said substrate as viewed from a side of said nozzle.

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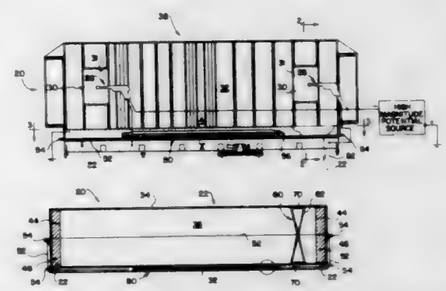
POWDER BOOTH FLOOR WIPING MECHANISM

Michael J. Thies; Jeffrey W. Hale, both of Indianapolis, and Christopher R. Merritt, Noblesville, all of Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Jul. 31, 1991, Ser. No. 738,802
Int. Cl.[5] B05B *15/12*; B05C *15/00*
U.S. Cl. 118—309 **9 Claims**



1. A pulverulent coating material application and reclaiming system comprising a booth including a floor, a pair of opposed side walls and a pair of opposed ends, means for conveying articles to be coated through the booth between the walls and above the floor for coating by said pulverulent material, a dispenser for dispensing said pulverulent material onto said articles as they are conveyed through the booth, a receptacle under said floor to which pulverulent material dispensed by said dispenser but not adhering to said articles can be returned for reclaiming, said floor terminating short of both of said ends to define adjacent each of said ends an entry to said receptacle for said reclaimed pulverulent material, and a floor wiping mechanism, the mechanism including a wiper member, low friction means for mounting on the wiper member to permit low friction movement of the wiper member on the floor, scraping means, means for mounting the scraping means on the wiper member in contact with the floor, and means for coupling the wiper member to a prime mover for reciprocating the wiper member at intervals lengthwise of the floor alternately toward one or the other of said ends to return pulverulent material accumulated on the floor therefrom alternately into one or the other of said entries.

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the web and which extends along the web in a cross-

engagement with the workpiece for depositing viscous

fiber to provide a reaction product that coats the optical

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APPARATUS FOR SOLDER-PLATING A LEAD-FRAME CARRYING ELECTRONIC COMPONENTS

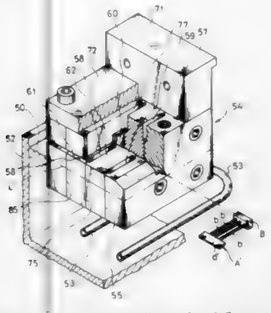
Akira Zeniya, Kyoto, Japan, assignor to Zeniya Industry Co., Ltd., Kyoto, Japan

Filed May 7, 1991, Ser. No. 696,833

Claims priority, application Japan, May 8, 1990, 2-118468; May 8, 1990, 2-118469

Int. Cl.[5] **B05C** *3/20, 5/02*

U.S. Cl. 118—401 **7 Claims**



1. An apparatus for solder-plating a lead-frame which carries a multiplicity of electronic components, which comprises:

i) a soldering bath containing molten solder,

ii) a heater provided in said soldering bath for heating said solder and maintaining said solder in its molten state, and

iii) a block, having a lower part including a bottom surface, made of a heat-resistant and solder-wettable metal, supported on said soldering bath in a manner that the lower part including at least the bottom surface of said block is immersed in said molten solder, and provided with:

a) at least one horizontal path extending across said block at a plane sufficiently above a level of said molten solder, having a cross-section capable of permitting unobstructed passage of said lead-frame therethrough, and having

at least one longitudinal plateau on a lower inside surface of said path, and

at least one longitudinal inverted plateau, whose planer configuration corresponds to that of the first mentioned plateau, on an upper inside surface of said path,

both of said longitudinal plateau and said longitudinal inverted plateau being capable of contacting with a lead-region of said lead-frame during said passage, and

b) at least a first vertical conduit with substantially flat cross-section, having an opening at the first mentioned plateau to communicate with said horizontal path and another opening at the bottom surface of said block and being capable of supplying a space formed between said plateau and said inverted plateau, with molten solder by capillary action.

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SHORT DWELL COATER APPARATUS

James L. Chance, Rockton, Ill., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Apr. 19, 1991, Ser. No. 688,002

Int. Cl.[5] **B05C** *3/18, 11/04*

U.S. Cl. 118—410 **7 Claims**

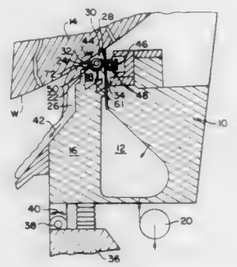
1. A short dwell coater apparatus for applying coating material onto a web guided by a backing roll, said apparatus comprising:

a coater housing disposed in close proximity to the backing roll such that the web guided by the backing roll moves between the backing roll and said housing, said housing defining an application chamber which is open towards the web and which extends along the web in a cross-machine direction, said application chamber being connected to a pressurized source of the coating material such that the coating material is applied to the web during movement of the web past said chamber;

said coater housing having an upstream lip disposed upstream relative to said chamber and adjacent to the web, said lip defining an upstream coating overflow for permitting excess coating material to flow therethrough;

a flexible coater metering blade disposed downstream relative to said chamber, said blade extending from said housing towards the web for metering the coating material applied to the web;

a perforate conduit disposed within said chamber and extending in a cross-machine direction, said conduit permitting the flow therethrough of a vortex of entrained air generated within said chamber such that in use of the



apparatus, when said vortex of entrained air is generated within said chamber, said air flows through said perforate conduit away from said chamber so that streaking of the coating material due to the intermittent escape of said entrained air past said metering blade is inhibited;

said perforate conduit including:

a tube extending through said chamber in a cross-machine direction, said tube defining a plurality of holes for permitting the flow therethrough of said entrained air;

each hole of said plurality of holes being aligned such that each of said holes is disposed on a line extending in a cross-machine direction; and

a plurality of branch channels, each branch channel being connected to said tube diametrically opposite to a corresponding hole of said plurality of holes such that said entrained air flows through said holes, through said tube and then through said channels away from said chamber.

5,199,992

APPARATUS FOR THE SINGLE STATION BALANCING AND CORRECTION OF ROTATING WORKPIECES

Gordon E. Hines, Ann Arbor, Mich., and Myles Jakubowski, Baxter, Tenn., assignors to Hines Industries, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 487,069, Mar. 1, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 793,134

Int. Cl.[5] **B05C** *11/00, 5/00*

U.S. Cl. 118—669 **13 Claims**

1. An improved balancing and correction apparatus for use in achieving the dynamic balance of rotational workpieces comprising, in combination:

support means for retaining a workpiece in a specified axial orientation during the dynamic rotation of the workpiece;

drive means positioned proximate said support means for dynamically rotating the workpiece;

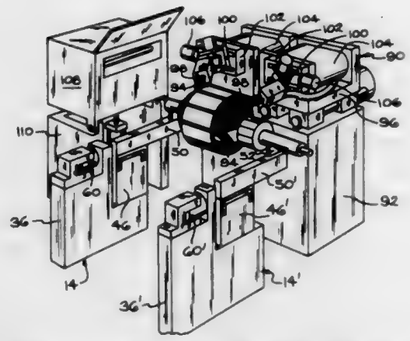
detection means for providing signals relating to the amount and location of any rotational unbalance in the rotating workpiece;

material application means movable between a position proximate said support means and a position of proximate

engagement with the workpiece for depositing viscous material onto the workpiece at a fixed designated location and in a variable amount calculated in response to the signals provided by the detection means;

sensor means for positioning said material application means into the position of proximate engagement with the workpiece to deposit the viscous material;

means for curing the viscous material into a solid deposit integrally fixed to the workpiece; and



controller means for receiving the signals from said detection means and said sensor means, and for calculating the fixed location and the amount of the point of unbalance, and for providing signals to said material application means to position said material application means and apply the viscous material to the workpiece in a variable amount dependent upon the calculations of the amount and location of unbalance and the signals received from said sensor means.

5,199,993

METHODS OF AND APPARATUS FOR COATING OPTICAL FIBERS

Don R. Edmonston, Atlanta, Ga., and Richard G. Huff, Basking Ridge, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 729,785, Jul. 10, 1991, which is a continuation of Ser. No. 424,774, Oct. 19, 1989, abandoned. This application May 1, 1992, Ser. No. 877,673

Int. Cl.[5] **C23C** *16/00*

U.S. Cl. 118—718 **5 Claims**

1. An apparatus for applying at least one coating to an optical fiber, said apparatus comprising:

(a) a coating deposition chamber having a longitudinally extending bore and a longitudinal axis and being adapted to have an optical fiber be moved therethrough;

(b) an entry plenum being connected to one end of said coating deposition chamber and having an entry orifice and an exit orifice spaced from said entry orifice, said entry plenum adapted to have an optical fiber which has been drawn from a preform extend through said entry orifice and said exit orifice into said coating deposition chamber;

(c) means for introducing a purge gas into said entry plenum;

(d) an exit plenum connected to an opposite end of said coating deposition chamber, said exit plenum having an entry orifice and an exit orifice spaced from said entry orifice and being adapted to have an optical fiber extend therethrough;

(e) means for introducing a purge gas into said exit plenum;

(f) means for introducing a reactive gas into said coating deposition chamber adjacent to said exit plenum, the reactive gas reacting upon contacting the drawn optical fiber to provide a reaction product that coats the optical fiber and a suspended soot;

(g) means for providing a cross-flow gas into said coating deposition chamber adjacent to an exit orifice of said entry plenum and to a fiber entry end of said coating deposition chamber in a direction substantially perpendicular to a longitudinal axis of said coating deposition chamber, the entry and exit plenums, said means for providing a cross-flow gas and said coating deposition chamber being con-

nected together such that the fiber is not exposed to external air, and the cross-flow gas being effective to prevent the accumulation of soot comprising reaction products of said reactive gas adjacent to said exit orifice of said entry plenum; and

(h) means for exhausting the purge gases, the reactive gas and the cross-flow gas wherein the reaction gas and suspended soot are exhausted with the cross-flow gas perpendicularly to the longitudinal axis of the coating deposition chamber.

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IMPURITY DOPING APPARATUS

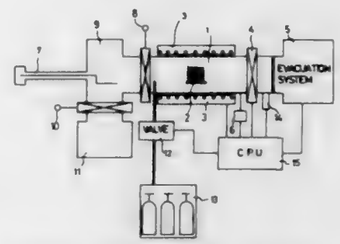
Kenji Aoki, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Dec. 6, 1990, Ser. No. 623,164

Claims priority, application Japan, Dec. 6, 1989, 1-318555

Int. Cl.[5] **H01L** *21/00*

U.S. Cl. 118—724 **9 Claims**



1. An impurity doping apparatus comprising: a vacuum chamber for receiving a semiconductor substrate:

evacuation means for evacuating said vacuum chamber;

heating means for heating the semiconductor substrate placed in said vacuum chamber;

a gas supply source for supplying at least one gas species to said vacuum chamber;

regulating valve means disposed between said vacuum chamber and said gas supply source for selecting a gas

species to be supplied and for regulating the amount of the

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late material by elevating them above the surface of said

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PHOSPHATE TREATMENT SOLUTION FOR

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species to be supplied and for regulating the amount of the selected gas species supplied to said chamber;

analyzing means communicating with said vacuum chamber and having an output connected to said controlling means for analyzing an exhaust component evacuated from said vacuum chamber; and

controlling means operative according to a given sequence of first, second, third and fourth procedures to control said evacuation means, said heating means and said regulating means, said controlling means being operative according to the first procedure to evacuate said vacuum chamber, said controlling means being operative according to the second procedure to effect heating of the semiconductor substrate to a given temperature for a given time interval to activate a surface of the semiconductor substrate, said controlling means being operative according to the third procedure to effect delivery of a given amount of a gas species containing an impurity component into said vacuum chamber while heating the substrate to deposit an impurity adsorption film on the activated surface, wherein said controlling means includes means operative according to the second procedure to detect an end point of activation of the substrate surface based on analyzed results fed from said analyzing means, and said controlling means being operative according to the fourth procedure to effect annealing of the semiconductor substrate at a given temperature for a given time interval to diffuse the impurity component from the impurity adsorption film into the semiconductor substrate.

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COMPOUNDS FOR REMOVING IRON RUST SCALES FROM WATER PIPES AND METHOD THEREFOR

Masami Shoji, Sendai, and Kishio Shoji, Tokyo, both of Japan, assignors to Seisui Co., Ltd., Japan

Continuation-in-part of Ser. No. 682,315, Apr. 9, 1991, abandoned. This application Apr. 13, 1992, Ser. No. 867,645

Int. Cl.[5] **C02F** *5/08;* **C23G** *1/08*

U.S. Cl. 134—2 **3 Claims**

1. A method of removing iron rust scales generated in water pipes containing chlorine treated water comprising the steps of:

a) preparing a compound comprising,

i. a metal oxide component consisting of Co, Ba, Ti and Y comprising about 4.0% by weight based on the total compound,

ii. a binding component selected from the group consisting of silica oxides, silicate salts, aluminum oxides, aluminum salts and mixtures thereof comprising about 10.0%–70.0% by weight based on the total compound, and

iii. a primary component comprising the balance of the component and consisting of iron oxide and manganese oxide where the iron oxide comprises about 55.0%–90.0% by weight of the balance and the manganese oxide comprises about 4.0%–30.0% by weight of the balance;

b) shaping the compound into a desired configuration;

c) contacting the chlorine treated water with the shaped compound for a period of time sufficient to generate increased amounts of HCl and HClO in the water; and

d) applying the contacted, chlorine treated water to the rust scales in the water pipes thereby making the iron rust scales water soluble and permitting removal of the iron rust scales therefrom.

5,199,996

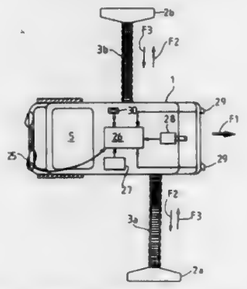
APPARATUS AND METHOD FOR CLEANING FLOORS

André Jonas, and Bernard Jonas, both of Le Rouret, France, assignors to Azurtec, France

Filed Aug. 16, 1991, Ser. No. 745,834

Int. Cl.[5] **A47L** *9/28, 5/36;* **B08B** *5/04*

U.S. Cl. 134—21 **12 Claims**



1. A cleaning apparatus for cleaning floor comprising:

a body provided with supporting wheels for moving said body in a first direction;

a first cleaning device provided with a cleaning nozzle and a hose capable of extending from said body in a direction perpendicular to said first direction; and

a means for winding and unwinding said hose from within said body, said winding and unwinding means comprising a winder provided within said body onto which said hose is wound, said winder mounted on a movable arm, and a motorized roller provided in proximity to said winder, for driving by friction, said hose such that the contact is maintained between said roller and said hose, regardless of the amount of hose wound onto said winder.

5,199,997

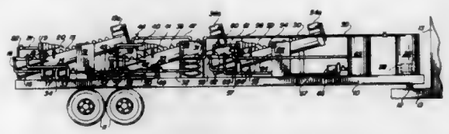
TREATMENT OF HYDROCARBON-CONTAMINATED PARTICULATE MATERIALS

Gene B. Stowe, Phoenix, Ariz., assignor to clnZall Corporation, Scottsdale, Ariz.

Filed Jun. 13, 1991, Ser. No. 714,651

Int. Cl.[5] **B08B** *3/00, 3/04, 3/10*

U.S. Cl. 134—25.1 **25 Claims**



1. A method for cleansing particulate material coated with oil comprising the steps of:

a. continuously introducing said particulate material into a first tank containing a body of hot stripper solution for said oil

b. agitating said particulate material in said body of solution to dissolve said oil in said stripper solution and remove it from said particulate material;

c. introducing stripper solution by injection into the bottom of said first tank to assist in the said agitating of said particulate material by creating a turbulence and causing a rising current of stripper solution within said tank;

d. removing overflow stripper solution containing dissolved oil from said tank, treating said solution to remove dissolved oil, heating said stripper solution and reintroducing it into said first tank to replace withdrawn solution for cleansing said particulate material;

e. continuously removing portions of said cleansed particulate material by elevating them above the surface of said body of solution on an inclined conveyor;

f. continuously introducing said removed portions of cleansed particulate material into a second tank containing a body of hot rinse water;

g. agitating said particulate material in said body of hot rinse water to remove residual oil and solution from said particulate material;

h. removing overflow rinse water containing residual oil and stripper solution from said second tank and treating said water to separate oil and stripper solution therefrom;

i. passing said treated rinse water through a filter, and thereafter reintroducing said rinse water into said second tank to assist further in removing residual oil and solution from said particulate material; and

j. continuously removing portions of said particulate material, free of oil and solution, from said second tank by elevating them above the surface of said body of rinse water on an inclined conveyor.

5,199,998

STABILIZATION OF ACICULAR, FERROMAGNETIC METAL POWDERS ESSENTIALLY CONSISTING OF IRON

Paul Klingelhoefer, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 6, 1992, Ser. No. 879,002

Claims priority, application Fed. Rep. of Germany, May 10, 1991, 4115426

Int. Cl.[5] **H01F** *1/02*

U.S. Cl. 148—105 **1 Claim**

1. A process for stabilizing acicular, ferromagnetic metal powders consisting essentially of iron against oxidation and corrosion by a two-stage reaction of the metal powder with an oxygen-containing inert gas, with the proviso that the oxygen content of the inert gas is not more than 2% by volume in the first stage, wherein an oxygen/inert gas mixture having a water vapor content of from 70 to 95% relative humidity and an oxygen content of from 10 to 20% by volume is used in the second stage.

5,199,999

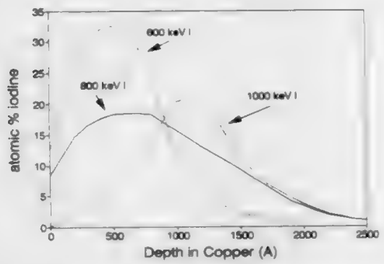
ION IMPLANTATION IN METAL ALLOYS

Lynann Clapham, and James L. Whitton, both of Stella, Canada, assignors to Queen's University, Kingston, Canada

Filed Dec. 18, 1991, Ser. No. 809,370

Int. Cl.[5] **C23C** *8/36*

U.S. Cl. 148—239 **7 Claims**



1. A method for implanting into a target selected from at least one metal having an atomic number greater than **24**, ions of at least one alloying element selected from elements having an atomic number greater than **24**, comprising precoating said target with a solid element having an atomic number up to **14** so as to provide a sacrificial layer on said target which is ablated during said implantation.

5,200,000

PHOSPHATE TREATMENT SOLUTION FOR COMPOSITE STRUCTURES AND METHOD FOR TREATMENT

Katsuya Yamamoto, Yokohama; Kenichi Fukuya, Fujisawa, and Tsuneo Saito, Yokohama, all of Japan, assignors to Nihon Parkerizing Co., Ltd. and Nissan Motor Co., both of Japan

Filed Jan. 30, 1990, Ser. No. 472,029

Claims priority, application Japan, Jan. 31, 1989, 1-21975

Int. Cl.[5] **C23C** *22/36*

U.S. Cl. 148—262 **12 Claims**

1. A phosphate treatment solution for composite structures having a combination of steels, zinc-plated steels and aluminum materials consisting essentially of an aqueous solution containing 0.3–2.0 g/l of zinc ions, 0.3–4.0 g/l of nickel ions, 0.3–2.0 g/l of manganese ions, 3–10 g/l of sodium ions, 0.1–10 g/l of potassium ions, 5.0-25.0 g/l of phosphate ions, 0.1–20 g/l of total fluorine ions, 4.0 g/l or more of nitrate ions and 0.01–1.0 g/l of nitrite ions.

said treatment solution having a pH of 2.0–3.5, and

said total fluorine ions being composed of 0.1–5 g/l as fluorine of complex fluorine ions and 0.01–2 g/l of free fluoride ions in which said free fluoride ions (g/l)=said total fluorine ions (g/l)—fluorine (g/l) in said complex fluorine ions—fluorine ions (g/l) in FlF_3.

5,200,001

PERMANENT MAGNET

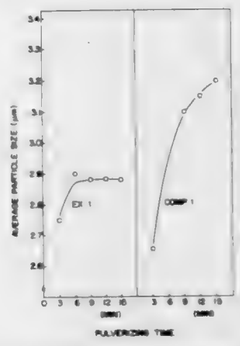
Satoshi Hirosawa, Nagaokakyo; Atsushi Hanaki, Kobe; Hiroyuki Tomizawa, and Shuji Mino, both of Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Nov. 29, 1990, Ser. No. 619,642

Claims priority, application Japan, Dec. 1, 1989, 1-313945

Int. Cl.[5] **H01F** *1/053*

U.S. Cl. 148—302 **26 Claims**



1. A permanent magnet having an intrinsic coercivity of at least 15 kOe and a maximum energy product of at least 20 MGOe, consisting essentially of:

12 to 18 atomic percent of R, wherein R is selected from the group consisting of one or more of Pr, Nd, Dy and Tb, and other rare earth elements contained as inevitable impurities, provided that $0.8 \leqq (Pr+Nd+Dy+Tb)/\text{total } R \leqq 1.0$,

5 to 9.5 atomic percent of B,

2 to 5 atomic percent of Mo,

0.01 to 0.5 atomic percent of Cu, and

0.1 to 3 atomic percent of Al,

with the balance being essentially Fe.

5,200,002

a composite consisting of graphite evenly dispersed in a

5,200,006

tions and being located between the axially inner edge of

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5,200,002

AMORPHOUS LOW-RETENTIVITY ALLOY

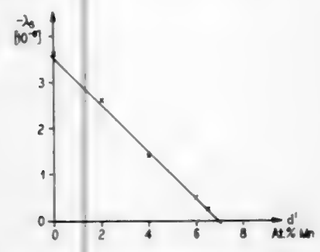
Hans-Reiner Hilzinger, Maintal, Fed. Rep. of Germany, assignor to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,632

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924280

Int. Cl.[5] **C22C** *19/07*; **H01F** *1/047*

U.S. Cl. 148—304 **6 Claims**



1. An amorphous, low-retentivity alloy, which contains cobalt, manganese, silicon and boron, having a composition

$$(Co_aNi_bT_cMn_dFe_e)_{100-f}(Si_xB_yM_z)_f,$$

wherein T is at least one o the elements Cr, Mo, W, V, Nb, Ta, Ti, Zr, and Hf; and M is at least one of the elements P, C, al, Ga, In, Ge, Sn, Pb, As, Sb, Bi and Be and the following relationships apply:

$0.39 \leqq a \leqq 0.99$,

$0 \leqq b \leqq 0.40$,

$0 \leqq c \leqq 0.08$,

$0.01 \leqq d \leqq 0.13$,

$0 \leqq e \leqq 0.02$,

$0.01 \leqq d+e \leqq 0.13$,

$a+b+c+d+e+ = 1$,

$18 \leqq t \leqq 35$,

$8 \leqq xt \leqq 24$,

$4 \leqq yt \leqq 24$,

$0 \leqq zt \leqq 8$, and

$x+y+z=1$.

5,200,003

COPPER GRAPHITE COMPOSITE

Pradeep K. Rohatgi, Milwaukee, Wis., assignor to Board of Regents of the University of Wisconsin System on behalf of the University of Wisconsin-Milwaukee, Milwaukee, Wis.

Filed Dec. 28, 1990, Ser. No. 635,711

Int. Cl.[5] **B22F** *1/00*

U.S. Cl. 148—514 **2 Claims**

1. A process for producing a cast copper alloy composite containing evenly dispersed graphite particles comprising

(1) Locating uncoated graphite particles in compact form at the bottom of a preheated steel die;

(2) Pouring molten copper alloy over the compacted graphite particles at pressures from 500 to 5000 psi;

(3) Infiltrating the compacted graphite particles resulting in a composite consisting of graphite evenly dispersed in a copper alloy matrix.

5,200,004

HIGH STRENGTH, LIGHT WEIGHT TI-Y COMPOSITES AND METHOD OF MAKING SAME

John D. Verhoeven; Timothy W. Ellis; Alan M. Russell, and Lawrence L. Jones, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 16, 1991, Ser. No. 808,363

Int. Cl.[5] **B22F** *7/00*

U.S. Cl. 148—527 **9 Claims**

1. A method of forming a composite of titanium and yttrium, comprising the steps of:

a) forming a body comprising Ti phase components and Y phase components, and

b) mechanically deforming the body to form a composite comprising elongated, ribbon-shaped Ti phase components and Y phase components aligned along an axis of the body.

5,200,005

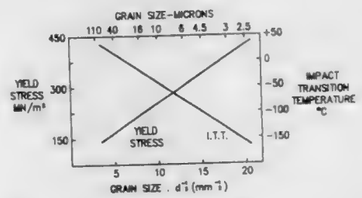
INTERSTITIAL FREE STEELS AND METHOD THEREOF

Abbas Najah-Zadeh, Montreal; John J. Jonas, Westmount, and Stephen Yue, Montreal, all of Canada, assignors to McGill University, Montreal

Filed Feb. 8, 1991, Ser. No. 652,872

Int. Cl.[5] **C21D** *7/13*

U.S. Cl. 148—648 **21 Claims**



1. A method of processing an interstitial free steel to increase strength and toughness of the steel comprising:

warm finish rolling an interstitial free steel in the single phase ferrite region below A_{r3} to effect ferrite dynamic recrystallization of the steel microstructure to a ferrite structure of an average grain size of at most 5 μm.

5,200,006

PNEUMATIC TIRE WITH UNIFORM GROUND PRESSURE AT THE TREAD FACE

Kenji Takehara, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

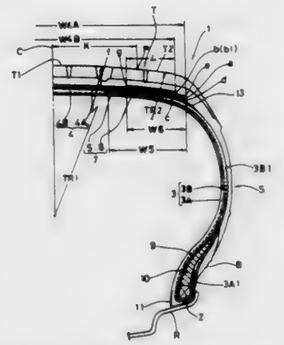
Filed Jun. 6, 1989, Ser. No. 362,019

Claims priority, application Japan, Jun. 7, 1988, 63-140704

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] **B60C** *3/04, 9/18, 9/20*

U.S. Cl. 152—454 **1 Claim**



1. A pneumatic tire comprising

a tread portion, the tread portion having a pair of tread edges,

a pair of sidewall portions extending radially inwardly, one sidewall portion from each tread edge,

a bead portion located at the radially inner end of each said sidewall portion and having a bead core extending therethrough,

a toroidal carcass, the carcass having a pair of carcass edges, each said carcass edge being turned up around each said bead core to secure both said carcass edges to said bead cores,

a belt composed of plural plies of steel cords disposed radially outside the carcass, one of said plural plies being a widest ply with a pair of outer edges, and

an inner band, said inner band being disposed between said carcass and said belt and being divided into a pair of axially spaced apart parts, each of said parts having an axially inner edge and an axially outer edge, said inner band being composed of extensible organic fiber cords arranged substantially parallel to the tire equator and disposed between the carcass and the belt so as to substantially align the axially outer edge of each said part of said inner band and one of the outer edges of the widest ply,

an outer band, said outer band being disposed radially outwardly of the belt, composed of extensible organic fiber cords arranged substantially parallel to the tire equator, and being divided into a pair of axially spaced apart parts, each of said parts of said outer band having an axially inner end and an axially outer end, each of said parts of said outer band having a width not larger than the width of each said part of the inner band,

the tread portion provided with a tread face comprising an internal arc portion with a radius of curvature TR1 defining a tread crown and a pair of external arc portions, each of said pair of external arc portions having a radius of curvature TR2 defining a tread shoulder axially outward from the tread crown,

the ratio TR2/TR1 of the radius of curvature TR2 to the radius of curvature TR1 being in a range from 0/15 to 0.45 when the tire is mounted on a regular rim and inflated to 5% of the standard internal pressure,

one of a pair of boundary points P being disposed between the internal arc portion and each of the external arc portions and being located between the axially inner edge of one said part of said inner band and the axially outward start point of an overlap area where the widest two said plies overlap in the axial direction of the tire.

5,200,007

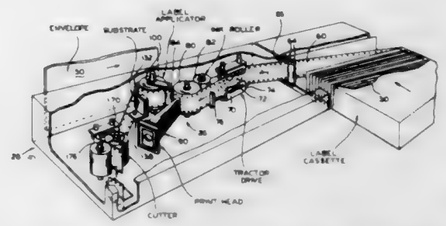
DOCUMENT FORWARDING SYSTEM

Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Company, Skokie, Ill.

Division of Ser. No. 635,938, Dec. 28, 1990, Pat. No. 5,076,876, which is a continuation of Ser. No. 109,467, Oct. 16, 1987, abandoned. This application Nov. 12, 1991, Ser. No. 791,040

Int. Cl.[5] **B32B** *31/00*

U.S. Cl. 156—64 **6 Claims**



2. A method for correcting mailing indicia on generally flat documents and the like, comprising the steps of:

a) conveying documents in sequential fashion along a predetermined path having a reading station enabling existing addressee indicia on the documents to be read by an operator,

b) guiding an elongated substrate carrying releasable labels in spaced aligned relation thereon along a predetermined path,

c) printing corrective indicia on successive labels carried on said substrate,

d) causing said substrate and labels having corrective indicia thereon to undergo an abrupt change in direction while guided along said predetermined path under longitudinal tension so as to effect selective release of successive labels from said substrate and application of said labels to predetermined ones of said documents, and

e) selectively reducing said longitudinal tension in said substrate so as to prevent release of selected ones of said labels from said substrate whereby to prevent application to a document.

5,200,008

RADIAL TIRE TREAD AND METHOD OF MOUNTING A TIRE WITH SAID TREAD

Gary D. Enterline, Greer, and Michel A. de Reynal, Greenville, both of S.C., assignors to Michelin Recherche et Technique, Frib, Switzerland

Filed Feb. 7, 1991, Ser. No. 652,412

Int. Cl.[5] **B60C** *11/11*

U.S. Cl. 156—110.1 **8 Claims**

6. A method of using a pneumatic tire having a pair of axially spaced apart beads, at least one radial carcass ply extending between and secured to said beads, a belt reinforcing package located radially outward of said carcass ply and a tread portion located radially outward of said belt reinforcing package for engagement with a ground surface, said tread portion comprising:

a tread width having a plurality of circumferential ribs separated and bounded by straight, zigzag or curvilinear circumferential grooves;

a plurality of lateral straight, zigzag or curvilinear grooves having a first incline with respect to an outer normal to a

tread surface defining inclined tread blocks for the cir-

members of a substantially equal diameter in which the

mosetting adhesive, to an inside of a conduit, the method

central hub, said central hub supporting said inner rim,

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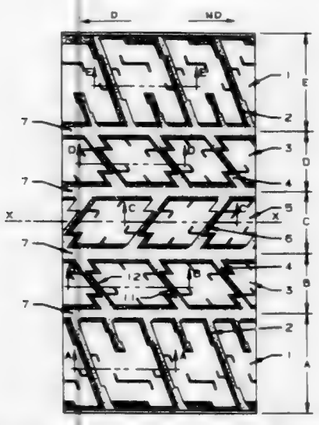
tread surface defining inclined tread blocks for the circumferential ribs within two lateral zones of said tread width; and

a plurality of lateral straight, zigzag or curvilinear grooves having a second incline with respect to an outer normal to the tread surface, being opposite to said first incline, defining reverse inclined tread blocks for the circumferential ribs within a central zone of the tread width;

a plurality of lateral straight, zigzag or curvilinear grooves having substantially zero inclines with respect to an outer normal to the tread surface for the circumferential ribs within two intermediate zones of the tread width, wherein said method of using said tire comprises the steps of:



a) installing one said tire on each rim of a vehicle;

b) mounting a plurality of said rims on each drive axle of said vehicle such that said inclined tread blocks have a first inclination with respect to a forward driving motion of said vehicle; and

c) mounting a plurality of said rims on each non-drive axle of said vehicle such that said inclined tread blocks have a second inclination with respect to the forward driving motion of said vehicle, said second inclination being opposite of said first inclination, resulting in improved wear rates and uniformity of the wear that increases the life of said tread portion.

5,200,009

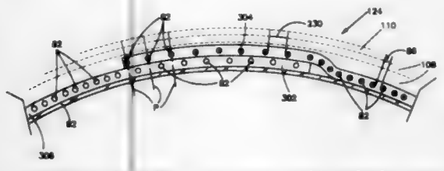
JOINING REINFORCED ELASTOMERIC SHEET MATERIAL

Noboru Tokita, Woodbridge, Conn., assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Division of Ser. No. 376,480, Jul. 7, 1989, Pat. No. 5,021,115. This application Aug. 10, 1990, Ser. No. 565,592

Int. Cl.[5] B29D *30/44*

U.S. Cl. 156—134 **6 Claims**



1. A method of building a tire carcass, said method comprising the steps of:

providing a predetermined length of elastomeric sheet material having a plurality of parallel extending reinforcing members of a substantially equal diameter in which the elastomeric sheet material has a first density of reinforcing members defined as the number of reinforcing members per unit length of the elastomeric sheet material in a direction parallel to a line containing the centers of adjacent reinforcing members;

elastically deforming opposite end portions of the elastomeric sheet material to change the density of the reinforcing members in each of the end portions to a second density less than the first density;

overlapping the end portions to align the reinforcing members in the end portions in a direction substantially parallel to each other; and

bonding together the end portions under heat and pressure to form a joint having density of reinforcing members substantially equal to the first density.

5,200,010

METHOD FOR MANUFACTURING LENS ARRAY OPTICAL SYSTEM

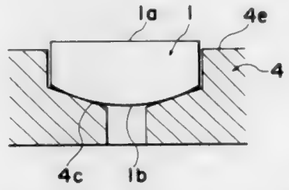
Koji Funami, Hirakata; Yuji Uesugi, Osaka, and Yukio Nishikawa, Ikeda, all of Japan, assignors to Matsushita Electric Industrial co., Ltd., Osaka, Japan

Filed Nov. 19, 1991, Ser. No. 794,054

Claims priority, application Japan, Nov. 20, 1990, 2-317246

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—154 **3 Claims**



1. A method for manufacturing a lens array optical system comprising a flat glass plate and a plurality of lenses, each of which has a flat surface and a curved surface, comprising the steps of:

removably fixing the lenses with a first adhesive agent in recessed lens holding portions of a lens holder, said recessed lens holding portions being formed to open through a flat surface of said lens holder and corresponding to the curved surfaces of said lenses, respectively;

polishing the flat surfaces of said lenses and said lens holder to make the flat surfaces of said lenses flush with said flat surface of said lens holder;

fixing said lenses to said flat glass plate with a second adhesive agent by pressing said lenses against said flat glass plate and hardening said second adhesive agent; and

removing said lens holder from said lenses.

5,200,011

NON-DIGGING TUBE REVERSE LINING ENGINEERING METHOD OF CONDUIT

Minoru Imamura, Yokohama; Hiroaki Kobayashi, Tokyo; Shigeru Toyoda, Urawa, and Seiichi Ikeda, Kawasaki, all of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01123, § 371 Date Apr. 25, 1991, § 102(e) Date Apr. 25, 1991, PCT Pub. No. WO91/03369, PCT Pub. Date Mar. 21, 1991

PCT Filed Sep. 4, 1990, Ser. No. 674,347

Claims priority, application Japan, Sep. 5, 1989, 1-230879

Int. Cl.[5] B29C *63/28, 63/36*

U.S. Cl. 156—156 **3 Claims**

1. A method for applying a lining tube, coated with a thermosetting adhesive, to an inside of a conduit, the method comprising the steps of:

measuring a distance from an exposed portion of the conduit to a service tee of the conduit;

providing a length of the lining, said length being longer than said measured distance;

connecting a rewinding tape to an end of said length of lining tube;

inserting said length of lining tube into the conduit;

turning said length of lining tube inside out during said inserting until said length of lining tube reaches said service tee, said turning inside out leaving a portion of said length of lining tube unturned at an end of the conduit adjacent said service tee;

providing a heating tube;

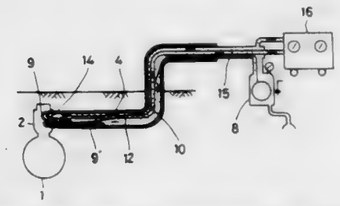
connecting a pull-out tape to an end of said heating tube;

inserting said heating tube inside said turned out lining tube;

turning said heating tube inside out during said inserting of said heating tube;

inserting a hot water hose inside said turned out heating tube;

circulating hot water through said heating tube and said hot water hose, said hot water being of a temperature to



harden and bond the thermosetting adhesive on said turned out lining tube, said lining tube being bonded with the inside of the conduit by said hardening;

removing said hot water hose from inside said turned out heating tube;

removing said heating tube from inside said turned out lining tube with said pull-out tape;

providing a first rod having a ring shaped heat cutter at one end;

passing said ring shaped heat cutter around said rewinding tape;

inserting said first rod into said turned out lining tube until said ring shaped heat cutter is adjacent said end of said portion of unturned lining tube;

heating said ring shaped heat cutter and cutting said rewinding tape from said unturned portion of lining tube;

removing said first rod and rewind tape from said turned out lining tube;

inserting a second rod with a heat fusion head into said turned out lining tube;

fusion cutting an opening in said turned out lining tube at said service tee; and

removing said second rod from said turned out lining tube.

5,200,012

METHOD FOR EMBODYING BY FILAMENTARY WINDING AN ANNULAR CAISSON EQUIPPED WITH INTERNAL STIFFENERS

Guy Blavignac, La Teste; Jean Dessaut, Bordeaux; Patrick Godin, Arsac, and Jean-Luc Pavec, Margaux, all of France, assignors to Aerospatiale Societe National Industrielle, Paris, France

Filed Dec. 11, 1990, Ser. No. 625,402

Claims priority, application France, Dec. 19, 1989, 89 16777

Int. Cl.[5] B31C *13/00*

U.S. Cl. 156—169 **8 Claims**

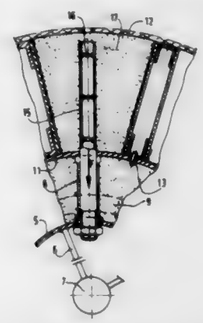
1. Method for forming a filament wound annular caisson equipped with internal stiffeners, said method comprising:

providing a primary mandrel having an inner rim and a central hub, said central hub supporting said inner rim, with agglomerated sand supported by said inner rim;

separately forming an internal wall (**11**) of the annular caisson (**1**) on a primary mandrel (**9**) by filament winding with resin impregnated filaments,

securing separately prefabricated stiffening elements (**3, 4**) to said internal wall,

placing agglomerated sand between said stiffening elements, (**17**), said agglomerated sand forming interpolated mandrels between the stiffening elements,



forming lateral (**10**) and external (**12**) walls of the caisson by filament winding with resin impregnated filaments over said interpolated mandrels, said filament winding forming flanges about a central portion of said caisson,

polymerizing said resin, removing said flanges by cutting,

separating the agglomerated sand forming the interpolated mandrels from the caisson, said caisson comprising lateral, external and internal walls formed by said filament winding, with said internal stiffening elements disposed between said internal wall and said external walls.

5,200,013

METHOD AND DEVICE FOR CORRUGATED DEFORMATION OF A FLAT MATERIAL SHEET

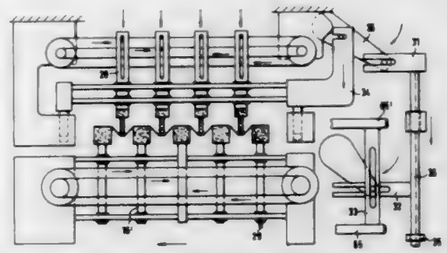
Roman Traber, Buchs, Switzerland, assignor to Dividella AG, Grabs, Switzerland

Filed Dec. 5, 1991, Ser. No. 802,624

Claims priority, application Switzerland, Dec. 18, 1990, 4016/90

Int. Cl.[5] B31F *1/20*

U.S. Cl. 156—210 **18 Claims**



1. A method for corrugated deformation of a flat material sheet (**1**) comprising steps of:

providing a first row (**2**) of approximately prismatic, parallel shaping tools, and a second row (**3**) of approximately prismatic, parallel shaping tools adapted to intermesh with the tools of said first row, said second row of tools being

5,200,015

5,200,016

residual corrosive compounds formed in the plasma etch-

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parallel to said first row, and at least one of said rows being movable in a direction toward the other row to an intermeshed positions,

loading said sheet between said rows while said rows are in a non-intermeshed loading position,

moving said second row of tools toward the first row to deform the sheet, while simultaneously, within each of said rows, closing the spacing between adjacent tools so that no relative movement takes place between the facing surfaces (6) of the shaping tools and the material sheet (1) during the deformation, and then

moving one of said rows of tools and the deformed sheet therewith along a path to a depositing position, in which the material sheet is discharged.

5,200,014

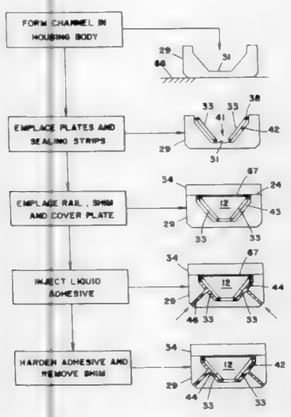
METHOD OF MANUFACTURING A LINEAR SLIDE

Roger Peters, 2260 American Ave., #1, Hayward, Calif. 94545

Division of Ser. No. 627,771, Dec. 14, 1990, Pat. No. 5,118,204. This application Dec. 9, 1991, Ser. No. 803,537

Int. Cl.[5] B29C *45/14*

U.S. Cl. 156—245 **7 Claims**



1. In a method for manufacturing a linear slide of the type used for precise, controlled translation of objects supported thereby which linear slide includes a housing with a guideway therein and a rail which extends along said guideway, the steps comprising:

initially providing said housing with a channel that is broader than said guideway

loosely disposing a plate in said channel in position to form a sidewall of said guideway,

emplacing said rail in said channel with a side of said rail being abutted against said plate in parallel relationship therewith,

sealing a region of said channel that is at the opposite side of said plate from said rail,

injecting liquid adhesive into said sealed region of said channel, and

hardening said liquid adhesive whereby said plate becomes a unitized part of said housing and forms said sidewall of said guideway.

5,200,015

JOINING PROCESS FOR VACUUM HEAT INSULATING ELEMENTS

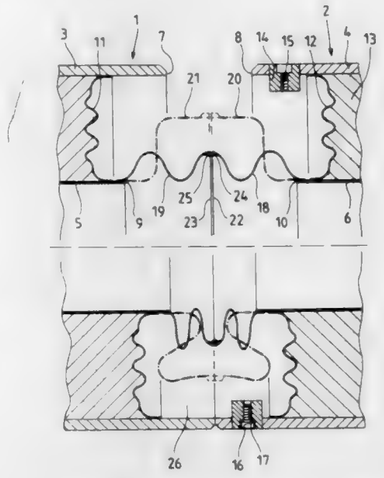
Lothar Schilf, Kirchlinteln, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Apr. 29, 1991, Ser. No. 692,903

Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016048

Int. Cl.[5] B32B *31/06*

U.S. Cl. 156—304.2 **11 Claims**



1. A process for joining edges of variously shaped vacuum heat insulating elements in which a vacuum is maintained between two walls, said vacuum heat insulating elements having edges which are adapted to be connected to each other to form a joint for the manufacture of heat insulated cylinders and containers having an axis which defines an axial direction, each of said vacuum heat insulating elements being disposed along said axis, with their respective edges being joined to form said cylinder or container, said process comprising the steps of:

connecting axially flexible bellows members between said walls at the edges of each of said vacuum heat insulating members in a vacuum tight manner, whereby the area between said walls of said vacuum heat insulating elements is sealed, said bellows members having axial compressible portions extending axially from a first of said walls beyond the edges of the respective vacuum heat insulating elements, and having edge areas adapted to be connected to each other;

positioning said vacuum heat insulating elements so that the edge areas of the respective bellows members are positioned for connection to each other;

connecting the edge areas of said bellows members to each other in a vacuum-tight manner;

moving said vacuum heat insulating elements toward each other until their respective edges are positioned for connection to each other, whereby a torus shaped gap is formed between said joined bellows members and a second of said walls, adjacent the edges of said vacuum heat insulating elements;

connecting said second walls with one another in a vacuum tight manner;

evacuating said torus shaped gap to a predetermined pressure through at least one opening in said vacuum heat insulating elements; and

sealing said opening.

5,200,016

SEMICONDUCTOR DEVICE MANUFACTURING APPARATUS

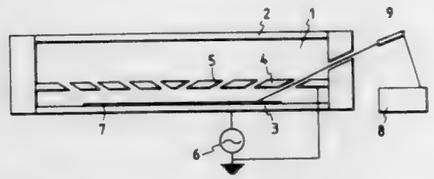
Isamu Namose, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 774,850

Claims priority, application Japan, Oct. 12, 1990, 2-273623; Sep. 26, 1991, 3-247302

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—345 **3 Claims**



1. In a semiconductor device manufacturing apparatus including a three-electrode type dry etching apparatus in which plasma is formed with a reaction gas introduced into a reaction chamber, upper, intermediate and lower electrodes are arranged parallel to one another, and the intermediate electrode is in the form of a grid having a plurality of through-holes, the improvement wherein at least one of said through-holes in said intermediate electrode has a central axis neither vertical nor horizontal with respect to a central axis of said intermediate electrode, and said at least one of said through-holes in said intermediate electrode is an optical end point detection hole,

and wherein said etching apparatus comprises an optical end point detecting unit having a detecting section, and said central axis of said at least one through-hole extends along a straight line connecting a material to be etched and said detecting section of said optical end point detecting unit.

5,200,017

SAMPLE PROCESSING METHOD AND APPARATUS

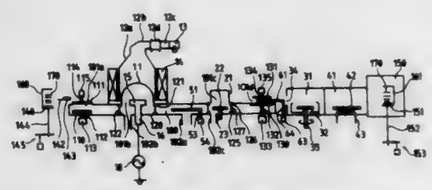
Yoshinao Kawasaki, Yamaguchi; Hironobu Kawahara, Kudamatsu; Yoshiaki Sato, Kudamatsu; Ryooji Fukuyama, Kudamatsu; Kazuo Nojiri, Higashimurayama, and Yoshimi Torii, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 477,474, Feb. 9, 1990. This application Jan. 7, 1991, Ser. No. 638,378

Claims priority, application Japan, Feb. 27, 1989, 1-42976

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—345 **13 Claims**



1. Apparatus for processing a sample, comprising

(i) means for effecting plasma etching of the sample, including supply means adapted to supply a first plasma-forming gas for the plasma etching,

(ii) means for effecting plasma treatment of the sample after the plasma etching, including supply means for supplying a second plasma-forming gas of the plasma treatment, said second gas being different from said first gas,

(iii) means for contacting the surface of the sample exposed by the plasma etching and the plasma treatment with a liquid adapted to effect at least one of (a) removal of residual corrosive compounds formed in the plasma etching and (b) passivation of said surface, and

(iv) means for drying said sample following contact with said liquid,

said apparatus further including means for transferring the sample from said means for contacting with a liquid to said drying means.

5,200,018

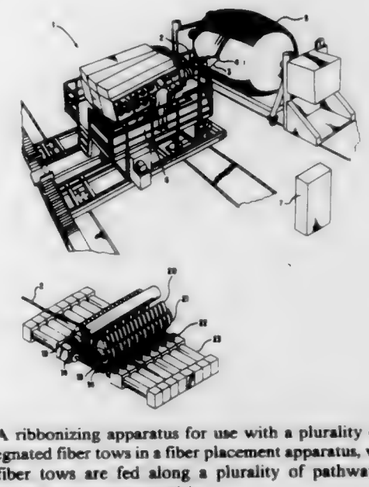
RIBBONIZING APPARATUS FOR INDIVIDUALLY HEATING A PLURALITY OF LATERALLY ADJACENT TOWS IN A FIBER PLACEMENT DEVICE

Dee R. Gill, St. Louis, Mo.; James P. Neilsen, West Valley City; Noel I. Shepherd, Grantsville; William J. Weis; John A. Johnson, both of Magna, and Kazutoshi Fujimoto, Layton, all of Utah, assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 19, 1990, Ser. No. 630,217

Int. Cl.[5] B65H *81/00*; B32B *31/12, 31/26*

U.S. Cl. 156—359 **29 Claims**



1. A ribbonizing apparatus for use with a plurality of resin impregnated fiber tows in a fiber placement apparatus, wherein said fiber tows are fed along a plurality of pathways, said ribbonizing apparatus comprising:

(a) means defining a plurality of laterally adjacent pathways for said plurality of fiber tows;

(b) means for selectively heating individual ones of said plurality of laterally adjacent fiber tows as said fiber tows extend along respective ones of said laterally adjacent pathways.

5,200,019

APPARATUS FOR DEPOSITING SLIVERS ON DOUBLE-CURVED BODIES OR SURFACES

Hendrik Brandis, Moltkestrasse 9, 8000 Munchen, and Jurgen Klenner, Stauffenstrasse 77, 8933 Untermeitingen, both of Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 727,884

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—523 **4 Claims**

1. An apparatus for depositing uni-directional pre-impregnated slivers on double-curved bodies or surfaces, with a dispensing reel for paying out the sliver and a pressing roller for applying the sliver to the receiving surface, characterised in that after passing through two jockey rollers (13, 14) and before running onto the pressing roller (22) the sliver (12) passes over a warping roller (30) which by virtue of the contours of its working surface achieves a variable running length of the fibres in the sliver (12) and so compensates for differing

lengths of the paths on which the individual fibres are deposspaced-apart adhesive locations corresponding to said spaced-apart patch locations;

wherein said substrate on said susceptor is cyclically irradiated by the light beam;

lattice positions so that chemical vapor deposition conditions that are otherwise favorable for epitaxial growth of

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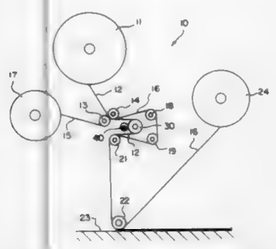
lengths of the paths on which the individual fibres are deposited, the contours of the working surface of the warping roller



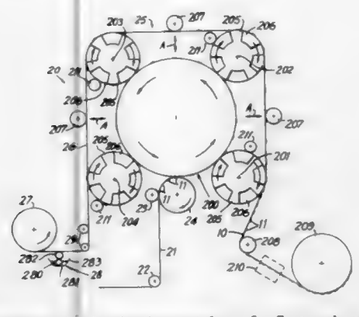
(30) being achieved by a shaping roller (40) which is pressed against the warping roller (30) and alters its shape according to the varying lengths of the deposition paths.

5,200,020

APPARATUS AND METHOD FOR LAMINATING PATCHES OF A FIRST WEB MATERIAL ONTO A SECOND WEB MATERIAL

Alfred L. Collins, Powhatan; Billy J. Keen, Jr., Chesterfield; George B. Reid; Renzer R. Ritt, Sr., both of Richmond; William H. Stevens, Midlothian, and Howard W. Vogt, Jr., Providence Forge, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 18, 1992, Ser. No. 837,722
Int. Cl.[5] B32B *31/00;* **A24C** *5/00*
U.S. Cl. 156—520 **9 Claims**



1. Apparatus for laminating patches of a first web material, each of said patches having a patch length and a patch width, onto spaced-apart patch locations on a strip of a second web material, said strip having a strip width substantially equal to said patch length, said spaced-apart patch locations being located at regular integral multiples of said patch width, said apparatus comprising:

(a) advancing means for advancing said second web material at a first linear velocity along a first travel direction to a lamination position;

(b) feeding means adjacent said second web material at said lamination position for feeding a band of said first web material at a second linear velocity, said band having a band width substantially equal to said patch length;

(c) patch cutting means for cutting patches from said band of said first web material, said patch cutting means operating at a surface velocity substantially equal to said second linear velocity, said first linear velocity being a multiple of said second linear velocity;

(d) applicator means for applying to a surface of said first web material facing said second web material, or a surface of said second web material facing a surface of said first web material, or both, a pattern of activatable adhesive at spaced-apart adhesive locations corresponding to said spaced-apart patch locations;

(e) acceleration means for spacing apart said continually cut patches and for transferring each of said spaced-apart patches to said spaced-apart patch locations on said second web wherein

(1) a first transfer drum, in contact with said patch cutting means and rotating with a surface velocity substantially equal to said first linear velocity, receives said patches from said patch cutting means whereby when said first transfer drum receives said patches, said patches are accelerated from said second linear velocity to said first linear velocity and are thereby spaced apart by said regular integral multiples, and

(2) a plurality of second transfer drums in contact with, and spaced equiangularly about, said first transfer drum and in contact with said strip of said second web material, each said second transfer drum rotating at a surface velocity substantially equal to said first linear velocity wherein each of said second transfer drums has a plurality of lands and depressions, said lands being for picking up said patches from said first transfer drum and depositing said patches on said spaced-apart adhesive locations on said strip of said second web material, each of said second transfer drums transferring its pro rata share of said patches, said depressions causing each of said second transfer drums to skip over those of said spaced-apart adhesive locations to which others of said second transfer drums apply their pro rata share of said patches;

(f) placement means for placing said first web material to said second web material at said spaced-apart locations; and

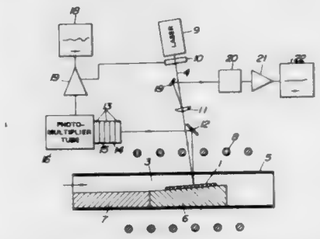
(g) activation means for activating an activatable adhesive said activatable adhesive located on a surface of said first web material facing said second web material.

5,200,021

METHOD AND APPARATUS FOR VAPOR DEPOSITION

Hiroji Kawai; Syunji Imanaga, both of Kanagawa; Ichiro Hase, Tokyo; Kunio Kaneko, Kanagawa, and Naozo Watanabe, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 158,062, Feb. 12, 1988, abandoned, which is a continuation of Ser. No. 12,448, Feb. 9, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 267,635
Claims priority, application Japan, Feb. 15, 1986, 61-31100; Feb. 15, 1986, 61-31101
Int. Cl.[5] C30B *25/16*
U.S. Cl. 156—601 **13 Claims**



1. A method for controlling growth and composition of a thin layer grown by means of vapor deposition, comprising the steps of:

irradiating a light beam onto the surface of the thin layer which is formed on a substrate mounted on a susceptor which has a slightly inclined mounting surface wherein said susceptor is rotated about a center axis thereof at a given constant speed, with an incident angle substantially at a right angle with respect to the thin layer surface,

wherein said substrate on said susceptor is cyclically irradiated by the light beam;

receiving a light beam reflecting from the thin layer for monitoring growth parameters and producing a growth parameter indicative signal based on said reflected beam compared to a reference beam; and

feedback controlling growing conditions of the thin layer based on said grown parameter indicative signal.

10. An apparatus for controlled deposition of a thin film of material on a substrate comprising:

a chamber capable of enclosing a substrate having a deposition surface upon which a thin film of material is to be deposited, said chamber being capable of confining an atmosphere which is a source of the material to be deposited, and having a wall in which at least one light-transmissive window is disposed,

rotatable mounting means disposed within said chamber and having a mounting surface upon which said substrate is mounted,

a light source for emitting light at a wavelength capable of being reflected by said substrate and by said material to be deposited;

means for forming an incident beam of said light and directing said beam through said window and onto said deposition surface, said beam being directed substantially normal to said deposition surface whereby light from said incident beam is reflected from said deposition surface and returns through said window as a reflected beam;

means for measuring the intensity of said reflected beam;

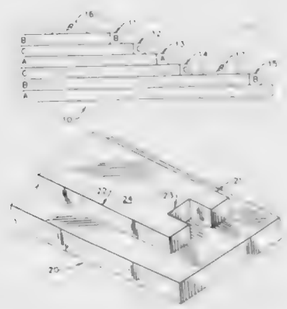
means for rotating said rotatable mounting means whereby said incident beam impinges alternately on said deposition surface of said substrate and said mounting surface of said mounting means, said mounting surface being essentially non-reflective of said incident beam at said wavelength.

5,200,022

METHOD OF IMPROVING MECHANICALLY PREPARED SUBSTRATE SURFACES OF ALPHA SILICON CARBIDE FOR DEPOSITION OF BETA SILICON CARBIDE THEREON AND RESULTING PRODUCT

Hua-Shuang Kong, Raleigh, and Calvin H. Carter, Jr., Cary, both of N.C., assignors to Cree Research, Inc., Durham, N.C.

Filed Oct. 3, 1990, Ser. No. 592,548
Int. Cl.[5] C30B *25/02, 29/36*
U.S. Cl. 156—612 **4 Claims**



1. A method of improving a surface of alpha silicon carbide for the growth thereon of a beta silicon carbide epitaxial layer, the method comprising:

mechanically preparing the surface of a {0001} plane of an alpha silicon carbide substrate; and thereafter

introducing atoms selected from the group consisting of aluminum, gallium and phosphorous into vacant lattice positions along the mechanically prepared surface to thereby prevent the vacant lattice positions from encouraging the repetitive growth of 6H silicon carbide at those lattice positions so that chemical vapor deposition conditions that are otherwise favorable for epitaxial growth of beta silicon carbide upon the basal plane will result in such growth of beta silicon carbide upon the mechanically prepared alpha silicon carbide substrate.

2. A method of growing epitaxial layers of beta silicon carbide on non-natural surfaces of alpha silicon carbide, the method comprising:

separating a bulk single crystal of 6H silicon carbide into a substrate crystal with at least one of the {0001} surfaces thereof exposed;

introducing atoms other than silicon or carbon lattice positions along the {0001} surface of the 6H silicon carbide substrate to thereby prevent the vacant lattice positions from encouraging the repetitive growth of 6H silicon carbide at those lattice positions; and

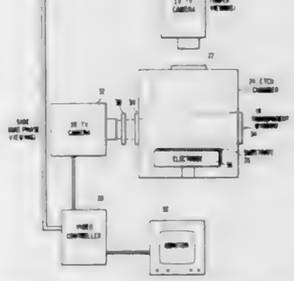
exposing the {0001}6H surface to carbon containing and silicon containing species under conditions for which the growth of beta silicon carbide is thermodynamically favored for a time sufficient for a desired epitaxial layer of beta silicon carbide to form upon the {0001} surface of the silicon carbide substrate.

5,200,023

INFRARED THERMOGRAPHIC METHOD AND APPARATUS FOR ETCH PROCESS MONITORING AND CONTROL

George G. Gifford, Bethel, Conn., and James A. O'Neill, New City, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 30, 1991, Ser. No. 753,189
Int. Cl.[5] B01J *19/12;* **H05H** *1/46;* **C23C** *14/52*
U.S. Cl. 156—626 **33 Claims**



1. A method for detecting the presence and location of suspended plasma particulates in a plasma etch reactor, comprising the steps of:

positioning a substrate in said plasma etch reactor;

creating a plasma in said plasma etch reactor for etching said substrate;

monitoring infrared emissions emanating from said gaseous plasma during etching of said substrate; and

detecting localized regions within said gaseous plasma which have infrared emission properties which differ from said gaseous plasma.

5,200,024

ant film by spraying a fluid substance onto said protruding

5,200,027

OIL MICROSENSOR HAVING INTERDIGITATED

5,200,029

METHOD OF MAKING A PLANAR OPTICAL

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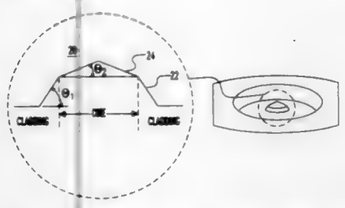
5,200,024

WET CHEMICAL ETCHING TECHNIQUE FOR OPTICAL FIBERS

Greg E. Blonder, Summit, and Bertrand H. Johnson, Murray Hill, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 486,630, Feb. 28, 1990, Pat. No. 5,101,457.
This application Dec. 23, 1991, Ser. No. 814,980
Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—628 **20 Claims**



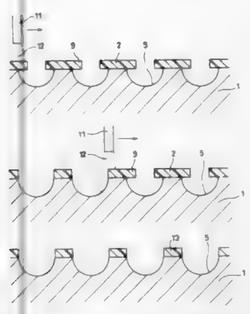
1. A method of manufacturing an optical fiber comprising the steps of:
a) providing an optical fiber which has first and second portions which etch at first and second rates, respectively, when exposed to an etchant, characterized by
b) exposing said portions to a treating agent, simultaneously with said etchant, which modifies at least one of said etch rates relative to the other.

5,200,025

METHOD OF FORMING SMALL THROUGH-HOLES IN THIN METAL PLATE

Keiji Toei; Yasuyoshi Miyaji; Masanobu Sato, all of Kyoto; Akihiro Inagaki, Shiga; Seiji Tonogai, Shiga, and Koichi Omoto, Shiga, all of Japan, assignors to Dainippon Screen Manufacturing Co. Ltd., Japan

Filed Sep. 19, 1991, Ser. No. 762,587
Claims priority, application Japan, Sep. 20, 1990, 2-252763
Int. Cl.[5] B44C *1/22;* **C23F** *1/00*
U.S. Cl. 156—640 **32 Claims**



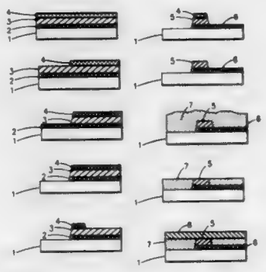
1. A method of forming small through-holes in a thin metal plate having first and second opposed surfaces, said method comprising the steps of:
forming a corrosion-resistant film on said first surface, said corrosion-resistant film having a plurality of openings formed therein;
etching said first surface of said thin metal plate through said openings of said corrosion-resistant film to form recesses in said metal plate which do not reach said second surface; the size of said recesses being larger than the size of said openings formed in said corrosion-resistant film so that portions of said corrosion-resistant film protrude over edges of said first surface which surround said recesses;
removing said protruding portions of said corrosion-resistant film by spraying a fluid substance onto said protruding portions;
covering said recesses with an etch-resisting layer;
etching said second surface to expose said recesses formed in said first surface so that a plurality of openings are formed in said plate; and
stripping said etch-resisting layer and said corrosion-resisting film formed on said first surface.

5,200,026

MANUFACTURING METHOD FOR MULTI-LAYER CIRCUIT BOARDS

Shuichi Okabe, Shiga, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1991, Ser. No. 700,287
Claims priority, application Japan, May 18, 1990, 2-127051
Int. Cl.[5] B44C *1/22;* **C23F** *1/00;* **B29C** *37/00*
U.S. Cl. 156—651 **10 Claims**



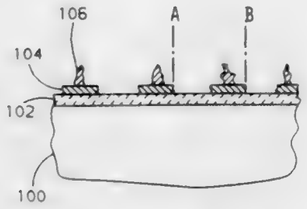
1. A method of manufacturing a multilayer circuit board with interlayer electrical connection between lower-layer and upper-layer electric circuits, both of which are formed on a substrate, said method comprising steps of:
(a) sequentially coating at least two metal layers on said substrate,
(b) applying positive photoresist on the upper metal layer of said metal layers,
(c) exposing and developing said photoresist to define a predetermined pattern,
(d) etching said upper metal layer,
(e) further, etching the metal layer(s) under said upper metal layer,
(f) exposing and developing the residual photoresist after the above exposure and development to define a predetermined pattern,
(g) etching the upper metal layer not covered by the remaining photoresist to form a via bump and the lower-layer electric circuit,
(h) removing the remaining photoresist on the upper metal layer,
(i) depositing an organic dielectric layer on said etched metal layers,
(j) flattening the surface of the organic dielectric layer to expose the surface of said via bump, and
(k) depositing another metal layer constituting the upper-layer electric circuit on said organic dielectric layer and the exposed surfaces of said via bump.

5,200,027

OIL MICROSENSOR HAVING INTERDIGITATED ELECTRODES WITH ROUGH SURFACES AND METHODS OF MAKING AND USING THE SAME

Han-Sheng Lee, Bloomfield Hills; Su-Chee S. Wang, Sterling Heights, and Otto J. Klingenmaier, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1991, Ser. No. 790,401
Int. Cl.[5] B44C *1/22;* **C23F** *1/00*
U.S. Cl. 156—651 **16 Claims**



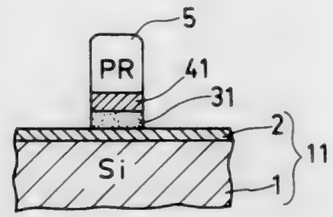
1. A method of making an oil sensor comprising the steps of:
growing silicon dioxide on a silicon wafer;
depositing silicon nitride on the silicon dioxide;
depositing polysilicon on the silicon nitride;
evaporating a material comprising at least one selected from the group consisting of aluminum, copper, silver, nickel and gold, on the polysilicon to form a thin layer;
forming an interdigitated pattern in said layer by photolithography to form electrodes;
exposing the electrodes to a zincate solution comprising ZnO and NaOH; and
thereafter exposing the electrode to an a HNO_3 solution.

5,200,028

ETCHING PROCESS OF SILICON MATERIAL

Tetsuya Tatsumi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1991, Ser. No. 741,735
Claims priority, application Japan, Aug. 8, 1990, 2-211388
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—656 **3 Claims**



1. A process for subjecting a silicon-based structure to etching, said structure having a silicon layer and a high-melting silicide layer superposed one on the other over a substrate, which process comprises etching said silicon layer with a first gaseous medium, and etching said silicide layer with a second gaseous medium, each of said first and second gaseous media having a hydrogen bromide gas and a fluorine radical-donating gas contained in a selected ratio, said first and second gaseous media differing in each selected ratios from each other.

5,200,029

METHOD OF MAKING A PLANAR OPTICAL AMPLIFIER

Allan J. Bruce, Westfield; Joseph Shmulovich, Murray Hill, both of N.J.; Amy Wong, Whitestone, N.Y., and Yiu-Huen Wong, Summit, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 691,262, Apr. 25, 1991, Pat. No. 5,119,460.
This application Dec. 4, 1991, Ser. No. 803,290
Int. Cl.[5] C03C *15/00*
U.S. Cl. 156—657 **9 Claims**

1. A method for forming an optical device on a substrate having a substantially planar principal surface, comprising:
a) forming a first layer of vitreous silicon dioxide on the principal surface;
b) depositing a second layer of silica-based glass over the first layer by sputtering a target of silica-based glass such that the second layer has a higher refractive index than the first layer;
c) annealing the second layer such that it is stabilized;
d) removing a portion of the second layer by etching, such that an elongate core, extending along the longitudinal axis, is formed, the core being adapted, after completion of the device, to guide electromagnetic radiation of at least a signal wavelength and a pump wavelength; and
e) depositing a third layer of phosphosilicate glass over the core such that the third layer has a smaller refractive index than the core;
characterized in that
f) the target further comprises sodium and erbium; and
g) the target composition is selected such that the core has an erbium-to-silicon atomic ratio of at least about 0.01, a sodium-to-silicon atomic ratio in the approximate range 0.2–0.6, and an absolute erbium concentration of at least about 1.4×10^{20} atoms per cubic centimeter, and the target composition is further selected such that a lasing level is associated with the erbium in the core, the lasing level having a radiative lifetime of at least about 7 ms.

5,200,030

METHOD FOR MANUFACTURING A PLANARIZED METAL LAYER FOR SEMICONDUCTOR DEVICE

Gyung S. Cho; Chul G. Ko, and Heon D. Kim, all of Seoul, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Oct. 23, 1991, Ser. No. 780,891
Claims priority, application Rep. of Korea, Oct. 25, 1990, 90-17093
Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—657 **21 Claims**

1. A method for manufacturing a planarized metal layer on a structure having a step difference in semiconductor device comprises:
providing a wafer **10**;

sequentially depositing a conducting layer **1** and an insulat- steps which process also removes or sufficiently inactivates

agitating said materials within said chamber;

semi-moist pulp leaving the dewatering device being be-

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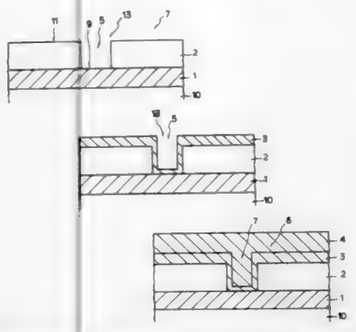
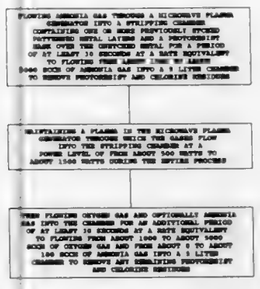
sequentially depositing a conducting layer **1** and an insulating layer **2** on the wafer **10**;
forming a contact hole **5** by removing a portion of the insulating layer **2** to expose a portion of the underlying conducting layer **1**, thereby producing structure **7** having a step difference;
introducing the resulting wafer **10** into a first chamber for degassing the insulating layer **2** at a predetermined temperature for a predetermined period;
depositing a first metal layer **3** on the entire surface of the resulting structure including the insulating layer **2** and the contact hole **5** to a 30% thickness relative to a predetermined thickness, which is to be finally deposited, at a



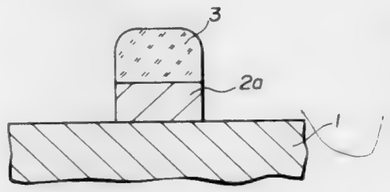
predetermined temperature in the first chamber, thereby connecting the first metal layer **3** to the exposed portion of the conducting layer **1** through the contact hole **5**;
introducing the resulting structure including the first metal layer **3** deposited on the wafer **10** into a second chamber; and,
depositing a second metal layer **4** on the first metal layer **3** to the remaining 70% thickness of the predetermined thickness to be finally deposited at a predetermined temperature in the second chamber, thereby forming a planarized metal layer **6** including the first and the second metal layer **3** and **4** on the structure **7** having the step difference of the wafer **10**.

5,200,031
METHOD FOR REMOVAL OF PHOTORESIST OVER METAL WHICH ALSO REMOVES OR INACTIVATES CORROSION-FORMING MATERIALS REMAINING FROM ONE OR MORE PREVIOUS METAL ETCH STEPS
Ian S. Latchford, Cupertino, Calif., and James Dillard, Dallas, Tex., assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed Aug. 26, 1991, Ser. No. 749,764
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—659.1 **11 Claims**



1. A dry process for removing, from an integrated circuit structure, photoresist remaining after one or more metal etch steps which process also removes or sufficiently inactivates chlorine-containing etch residues remaining from said previous one or more metal etch steps to provide at least 24 hours resistance to corrosion prior to removal of said inactivated chlorine-containing etch residues by wet processing, which dry process comprises:
a) flowing, into a vacuum stripping chamber maintained at a pressure of from about 0.5 Torr to about 3 Torr and containing said integrated circuit structure, NH_3 gas for a period of at least about 30 seconds at a rate equivalent to flowing from about 1000 sccm to about 5000 sccm of said NH_3 gas into a 5 liter chamber;
b) maintaining a plasma associated with said vacuum stripping chamber while said NH_3 gas is flowing into said stripping chamber;
c) then flowing NH_3 and O_2 gases into said vacuum chamber at a rate equivalent to a flow of from about 0 sccm to about 100 sccm of NH_3 and from about 1000 sccm to about 5000 sccm of O_2 into a 5 liter chamber for an additional period of at least about 30 seconds;
to thereby remove sad photoresist and also remove or sufficiently inactivate said chlorine-containing residues to provide said 24 hors of corrosion protection prior to wet processing to remove any remaining chlorine-containing residues.

5,200,032
DRY ETCHING METHOD
Keiji Shinohara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 24, 1991, Ser. No. 813,342
Claims priority, application Japan, Dec. 27, 1990, 2-415023
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—664 **3 Claims**

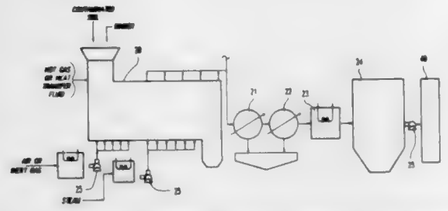


1. A dry etching method comprising reactive ion etching a layer of substantially pure copper material using an etching gas including a compound containing Cl and O as component elements or an etching gas including a compound containing Cl as a component element and a compound containing O as a component element, said etching processing producing volatile $CuCl_xO_y$ as a reaction product.

5,200,033
METHOD FOR REMOVING ORGANIC CONTAMINANTS FROM SOILS
Leo Weitzman, West Lafayette, Ind., assignor to LWV Associates, Inc., W. Lafayette, Ind.
Filed Sep. 9, 1991, Ser. No. 757,057
Int. Cl.[5] B01D *1/14*
U.S. Cl. 159—47.1 **5 Claims**

1. A method of removing organic chemical contaminants from materials including soils, solids or sludges comprising the steps of:
directing said materials into a housing having walls forming a sealed chamber with a front portion with an inlet and a rear portion with an outlet and a longitudinal axis extending therebetween;
adding binders to said materials concurrently or prior to said directing step;

agitating said materials within said chamber;
moving said materials from said inlet to said outlet;
heating said walls to indirectly heat said materials within

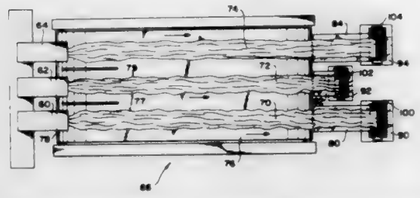


said chamber to vaporize organic chemical contaminants contained in said materials;
directing superheated steam into said chamber; and,
disposing of contaminants from said chamber.

5,200,034
USE OF SURFACTANTS HAVING AN HLB LESS THAN 10 IN THE DEINKING OF DRY TONER ELECTROSTATIC PRINTED WASTEPAPER
Sandra K. Richmann, Jacksonville Beach, and Mary B. Letscher, Jacksonville, both of Fla., assignors to Betz PaperChem, Inc., Jacksonville, Fla.
Filed Apr. 25, 1991, Ser. No. 691,201
Int. Cl.[5] D21C *5/02*
U.S. Cl. 162—5 **9 Claims**

1. A method for deinking electrostatic printed wastepaper consisting essentially of adding to an aqueous slurry of the electrostatic printed wastepaper an amount, sufficient for the intended purpose, of a surfactant chosen from the group consisting of an ethoxylated surfactant, propoxylated surfactant, esterified surfactant and alkanolamide surfactant, said surfactant having a hydrophile/lipophile balance of from about 0.5 to 10.0, said method enhancing the agglomeration of electrostatic toner particles and allowing for the separation of the particles from pulp fibers.

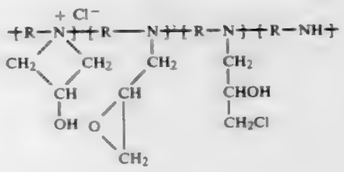
5,200,035
HIGH UNIFORMITY FOAM FORMING
Dinesh M. Bhat, Neenah; Robert J. Marinack, Oshkosh, and Bruce W. Janda, Neenah, all of Wis., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Jan. 24, 1992, Ser. No. 825,121
Int. Cl.[5] D21H *23/02*
U.S. Cl. 162—101 **28 Claims**



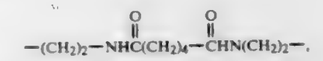
1. A method of foam forming of paper, comprising the steps of:
(a) metering a controlled feed of fiber dispersed in an aqueous liquid into a dewatering device, the consistency of the fiber dispersed in said aqueous liquid input to the dewatering device being between about 0.5 and about 7% by weight;
(b) obtaining, from said dewatering device, a uniform continuous strand of semi-moist pulp, the consistency of the semi-moist pulp leaving the dewatering device being between about 8 and 30% by weight;
(c) obtaining a stream of a foamed aqueous admixture;
(d) introducing said foamed aqueous stream and said semi-moist pulp into a dispersing mixer having shearing action extending substantially throughout a zone substantially athwart the flow path of said uniform continuous strand and said foamed aqueous stream and forming a stream of dispersed fiber bearing aqueous foam;
(e) conducting said dispersed fiber bearing aqueous stream to the inlet of a positive displacement pump; and
(f) thereafter conducting said dispersed fiber bearing stream through a headbox and depositing the fibers dispersed in said stream on a moving foraminous support.

5,200,036
PAPER WITH POLYCATIONIC LATEX STRENGTH AGENT
Isao Noda, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 516,410, Apr. 30, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 802,022
Int. Cl.[5] D21H *17/46*
U.S. Cl. 162—164.3 **3 Claims**

1. A paper sheet comprising multiple cellulosic fibers and a water-insoluble polycationic latex wet strength agent which is the reaction product of i) a cationic polyamide/polyamine/epichlorohydrin wet strength resin containing repeat units of the general structural type



wherein R is



and ii) an unsaturated carboxylate reactant selected from the group consisting of acrylic acid, methacrylic acid, glycidyl methacrylate, and mixtures thereof, said reaction product being co-polymerized via its point of unsaturation from said carboxylate reactant with latex-forming polymerizable monomers or oligomers selected from the group consisting of styrene, 1,3-butadiene, and mixtures thereof.

5,200,037
ABSORBENT STRUCTURES FROM MIXED FURNISHES
Isao Noda, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 794,313, Jan. 14, 1991, abandoned, which is a continuation of Ser. No. 666,474, Mar. 6, 1991, abandoned, which is a continuation of Ser. No. 499,197, Mar. 23, 1990, abandoned, which is a continuation of Ser. No. 197,180, May 23, 1988, abandoned. This application Jan. 19, 1992, Ser. No. 902,419
Int. Cl.[5] D21H *17/45*
U.S. Cl. 162—168.2 **1 Claim**

1. An absorbent structure, comprising an intimate wet-laid mixture of separately-prepared pulps A and B, wherein:
(i) from about 10% to about 50% by weight of said structure comprises fibrous cellulosic pulp (A) which is treated with latex particles, said latex particles being in the 0.1–2.5 micrometer size range and comprising a core which is a

polymer selected from the group consisting of butadiene,

5,200,039

umn being divided into at least said first and second bot-

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polymer selected from the group consisting of butadiene, isoprene, styrene and mixtures thereof, said core having an outer shell comprising moieties LQ, wherein L comprises a hydrophobic hydrocarbyl group containing one or more unsaturated bonds and Q is of the formula

$$-(EO)_n-\overset{\overset{\large R^1}{|}}{\underset{\underset{\large R^3}{|}}{N^+}}-R^2$$

wherein R^1 and R^2 are each C_1 to C_4 alkyl or hydroxyalkyl, or together form a cyclic or heterocyclic ring, and R^3 is H or C_1–C_4 alkyl or hydroxyalkyl, and wherein n is an integer of from 5 to about 50, EO is ethylene oxide and n is an integer from about 5 to about 50; and

(ii) from about 50% to about 90% by weight of untreated cellulose pulp (B).

5,200,038

PULP REFINER WITH FLUIDIZING INLET

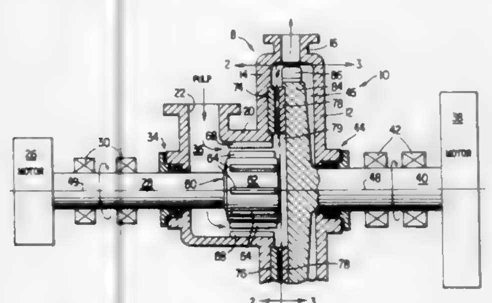
Kenton J. Brown, Mobile, Ala., assignor to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 112,326, Oct. 26, 1987, Pat. No. 4,820,381, which is a division of Ser. No. 20,150, Feb. 25, 1987, abandoned, which is a continuation of Ser. No. 770,169, Aug. 38, 1985. This application Nov. 15, 1988, Ser. No. 271,549

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] **B02C** *7/02, 7/06, 13/20;* **D21D** *1/30*

U.S. Cl. 162—261 **8 Claims**



1. A pulp refiner and pulp fluidizing apparatus for the treatment of paper pulp stock, the apparatus including a rotary pulp refiner and a rotary pulp fluidizer housed within a casing, at least a portion of the fluidizer being connected to and rotatable by a first shaft, at least a portion of the refiner being connected to and rotatable by a second shaft, said first and second shafts being coaxial to define a common axis and are rotatable independently of each other, whereby the fluidizer can be operated at a greater rotary speed than the rotary speed of the refiner, the output of the fluidizer being positioned contiguously to the input of the refiner, whereby the fluidizer deflocculates the paper pulp stock and the deflocculated stock substantially immediately passes to the input of the refiner while it is still deflocculated, whereby clogging of the refiner is inhibited and therefore higher paper pulp stock consistency can be refined by the disc refiner without clogging.

5,200,039

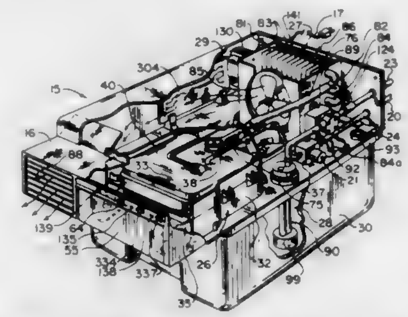
STEAM CHAMBER FOR A WATER DISTILLER WITH CONTAMINATION PREVENTION BAFFLE AND CHECK VALVE

Thomas J. Weber, Oak Creek, Wis.; Dale L. Garrison, Antioch, Ill., and Richard E. Forrest, Racine, Wis., assignors to Emerson Electric Co., Racine, Wis.

Filed Jan. 18, 1991, Ser. No. 642,883

Int. Cl.[5] **B01D** *3/02;* **C02F** *1/04*

U.S. Cl. 202—197 **5 Claims**



1. A distiller comprising a steam chamber, a condenser, and a conduit for conducting steam from said chamber to said condenser

said steam chamber including

a bottom portion defining a removable tray for holding water to be distilled,

a top portion for collecting steam created in the chamber by heating the water in the tray,

means for heating water in the tray to create steam,

an outlet for conducting steam from the top portion of the steam chamber to the conduit,

check valve means in the conduit for opening communication between the steam chamber and the condenser in response to steam pressure above atmospheric pressure in the steam chamber and for closing communication between the steam chamber and the condenser in the absence of the steam pressure in the steam chamber

baffle means extending between the tray and the top portion of the steam chamber for allowing steam to enter the top portion of the steam chamber while preventing water globules carried in the steam from entering the top portion of the steam chamber

said baffle means including a surface portion that faces the tray, depending sidewalls that extend from the surface portion in the direction of the tray, and an elongated slot formed in at least one of the sidewalls near its junction with the facing surface portion.

5,200,040

METHOD FOR RECTIFICATION AND APPARATUS THEREFOR

Yuji Naka, Yokohama; Tatsuo Sato, and Akihiro Kawashima, both of Tokyo, all of Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 344,296, Apr. 27, 1989, abandoned. This application Mar. 13, 1991, Ser. No. 668,742

Claims priority, application Japan, Oct. 21, 1988, 63-265376

Int. Cl.[5] **B01D** *3/00*

U.S. Cl. 203—25 **6 Claims**

1. A method for rectification comprising steps of:

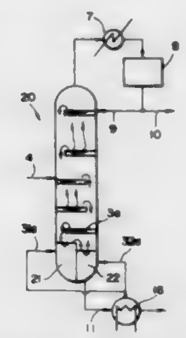
supplying raw materials to a rectifying column from a raw material feed pipe arranged at a middle level of said column;

returning a refluent fluid from a refluxing pipe arranged at an upper portion of said column to said column;

continuously overflowing a hold-up liquid from a first bottom tank having a higher surface of a liquid to a second bottom tank having a lower surface of a liquid in a bottom portion of said column, said bottom portion of said column being divided into at least said first and second bottom tanks having successively lower surface levels of the hold-up;

heating independently said hold-up in each of said bottom tanks, depending on the composition of the hold-up;

exchanging heat by bringing a vapor produced by heating the bottom into counter-current contact with the refluent liquid returned to the rectifying column, the contact being performed on plates arranged in said rectifying column and the refluent liquid from a lowest plate of the plates



flowing toward the bottom tank having the highest surface level of the liquid;

taking out a vapor from the top of said rectifying column and cooling said taken out vapor into condensed components;

taking a part of said condensed components out as a product and using the rest of the condensed components as the refluent liquid; and

taking out liqu from said bottom portt n of said column only from the bottom portion of the bottom tank having the lowest surface level of the liquid.

5,200,041

COMPOSITE ELEMENT INCORPORATING A POLYETHER OR COPOLYETHER, ITS PREPARATION PROCESS AND ITS USE FOR EXTRACTING AND SEPARATING METAL CATIONS

Jacques Simonet, Betton; Angely Lysiane, Cesson Sevigne; Noëlle Simonet, Betton; Viviane Questaigne, Rennes; Veronique Le Berre, Languijie; Henri Bouas-Laurent, Talence, and Jean-Pierre Desvergne, Leognan, all of France, assignors to Centre National De La Recherche Scientifique and Commissariat A L'Energie Atomique, Paris, France

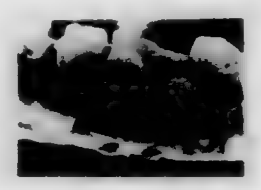
PCT No. PCT/FR90/00174, § 371 Date Jan. 9, 1991, § 102(e) Date Jan. 9, 1991, PCT Pub. No. WO90/11390, PCT Pub. Date Oct. 4, 1990

PCT Filed Mar. 15, 1990, Ser. No. 613,532

Claims priority, application France, Mar. 17, 1989, 89 03529

Int. Cl.[5] **B32B** *7/00*

U.S. Cl. 204—78 **15 Claims**



1. A composite element, comprising a support of an electrically-conducting, polyaromatic structure product covered with a polymer or copolymer of a crown dibenzoether of the formula:

(I)

in which m and n, which are the same or different, each have a value of 0 and 1 to 10, provided that m+n is ≦10.

5,200,042

PROCESS TO RECOVER PURE COPPER DURING PURIFICATION OF ZINC SULFATE SOLUTION

George Houlachi, Kirkland; Carole Allen, Pierrefonds, and Francis Bélanger, Montreal, all of Canada, assignors to Noranda Inc., Toronto, Canada

Filed Jun. 10, 1991, Ser. No. 712,537

Claims priority, application Canada, Jun. 8, 1990, 2018635

Int. Cl.[5] **C25C** *1/12*

U.S. Cl. 204—106 **7 Claims**

1. Process for recovery of copper from a copper residue obtained during purification of a zinc sulfate solution and containing about 50% copper and minor amounts of cadmium and zinc, said process comprising:

a) atmospheric leaching the copper residue in a concentrated sulfuric acid solution in the presence of an oxidant at a temperature of between 60° and 80° C. to produce a leach solution and separating the solids from the leach solution;

b) electrowinning copper from the leach solution to produce an electrowon solution;

c) returning the electrowon solution to the initial leaching stage (a) to initiate dissolution of the copper residue; and

d) bleeding a portion of the electrowon solution to reduce the concentration of impurities in the solution.

5,200,043

divalent negative oxygen ions at a cathode with the con-

moving the pressure plate toward the fixed base to exert pressure on the electrophoresis gel; and

a make-up tank containing a replenisher therein,

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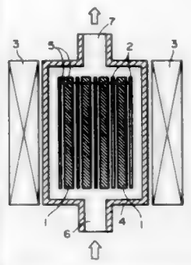
5,200,043

METHOD FOR TREATING WASTE GAS

Takashi Ooe; Hiroyasu Minoshima; Akiko Miura, all of Yokohama; Toshinori Matsuda, Kamakura, and Ryohei Itatani, Kyoto, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 610,149, Nov. 6, 1990, Pat. No. 5,130,007. This application Dec. 31, 1991, Ser. No. 814,800
Claims priority, application Japan, Nov. 8, 1989, 1-288694
Int. Cl.[5] C01B *33/027, 33/029, 35/00*
U.S. Cl. 204—130 5 Claims



1. A method for treating a waste gas, comprising the steps of:
providing a waste gas treating apparatus that includes a discharge tube comprising a tubular container having a gas introduction opening and a gas leading opening, at least one pair of anodes and cathodes placed within the container, a dc or ac power supply connected to electrodes, and a gas flow passage formed in the discharge tube, and wherein
at least a pair of anodes is provided opposite to each other in the flow passage,
at least a pair of cathodes is provided opposite to the anodes in a direction nearly at right angles to the anodes without contacting the anodes in a space including the pair of anodes,
a set of electrodes is comprised of said pair of anodes and said pair of cathodes,
a part or the whole of said anodes and said cathodes are comprised of a plurality of plates or pillars and are electroconductively connected integrally; and
a device for forming a magnetic field application device forming a dc or ac magnetic field in the opposing direction of the cathodes is fixed to the discharge tube;
supplying a discharge current of not more than 20 mA/cm^2 from the dc or ac power supply;
forming a dc or ac magnetic field of at least 50 guasses flux density;
introducing from the gas introduction opening a waste gas selected from the group consisting of silane gases, alkylsilane gases, germanium gases, chlorosilane gases, fluorosilane gases, a mixed gas containing phosphine and diborane as a doping gas, and tetraethoxysilane gas; and
treating the gas in the apparatus to reduce the toxicity of the waste gas.

5,200,044

METHOD FOR MEASURING OXYGEN CONTENT

Joseph B. Milstein, Brighton, Mass., and Ephraim S. Greenberg, 1 Strathmore Rd., Brookline, Mass. 02146, assignors to Ephraim S. Greenberg, Brookline, Mass.

Division of Ser. No. 342,116, Apr. 24, 1989, Pat. No. 5,106,482. This application Jul. 11, 1991, Ser. No. 728,297
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—153.16 9 Claims

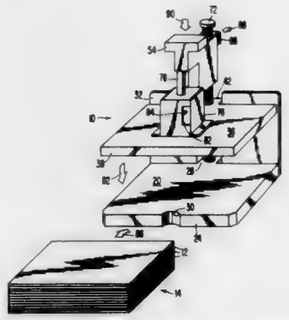
1. A method of analyzing the oxygen content of a specimen comprising the steps of:
(a) introducing a carrier gas containing oxygen from a specimen to be measured into an oxygen sensor;
(b) catalyzing the reduction of molecular oxygen gas to divalent negative oxygen ions at a cathode with the consumption of electrons provided through an electrically conductive chemically inert contact;
(c) raising the oxygen ion potential of an aqueous electrolytic solution containing potassium hydroxide electrolyte and a metal hydroxide, wherein said metal hydroxide is a material selected from a group consisting of aluminum hydroxide, an alkaline earth metal hydroxide, and a rare earth metal hydroxide;
(d) oxidizing an anode material to form an oxide and generate electrons which flow through an anode connector that is in contact with said anode material; and
(e) measuring electrical current flow between said anode and cathode, the measured current flow being directly proportional to the oxygen content of the specimen.

5,200,045

AGAROSE PLATE PRESS

Barbara M. Warren, Beaumont; James R. M. Sanford, Vidor; Edgar F. Neely, Kountze, and Robert J. Sarrine, Beaumont, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 523,709, May 1, 1990. This application Jun. 22, 1992, Ser. No. 902,000
Int. Cl.[5] G01N *27/26, 27/447, 33/561, 33/537*
U.S. Cl. 204—180.1 1 Claim



1. In a method of immunoelectrophoresis wherein protein separation is performed in an electrophoresis gel and thereafter at least one antiserum is applied to the separated proteins for immunoprecipitation, the method further including removing unreacted protein and unreacted antisera from the electrophoresis plate, the improvement comprising:
positioning at least one electrophoresis plate in a press of a type having a fixed base and a moveable pressure plate, the electrophoresis gel plate being positioned between the fixed base and the moveable pressure plate;

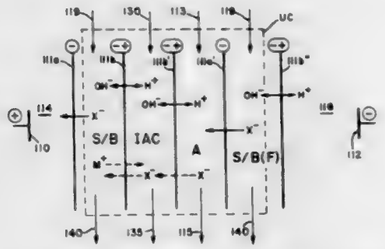
moving the pressure plate toward the fixed base to exert pressure on the electrophoresis gel; and
limiting the degree of movement of the pressure plate toward the fixed base to control the amount of pressure on the electrophoresis gel plate.

5,200,046

APPARATUS AND METHOD FOR ELECTRODIALYTIC TREATMENT OF SALTS TO PRODUCE ACID AND/OR BASE OF IMPROVED PURITY

Frederick P. Chlanda, Rockaway; Krishnamurthy N. Mani, Basking Ridge, and Yu-Chin Chiao, Bridgewater, all of N.J., assignors to Allied-Signal Inc., Morristownship, Morris County, N.J.

Filed Dec. 12, 1990, Ser. No. 626,643
Int. Cl.[5] B01D *61/00*
U.S. Cl. 204—182.4 24 Claims



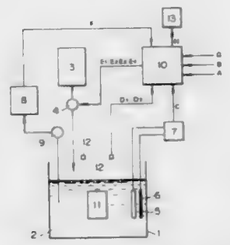
1. An electrodialysis apparatus comprising at least one unit cell comprising:
at least two adjacent, serially aligned electrodialytic means for splitting water, separated by an intermediate compartment disposed between said adjacent means for splitting water;
at least one ion selective membrane serially aligned with and adjacent to at least one of the means for splitting water, there being a product compartment between the ion selective membrane and the means for splitting water; and
an aqueous salt solution feed compartment serially aligned with and adjacent to the product compartment with the ion selective membrane therebetween.

5,200,047

PLATING SOLUTION AUTOMATIC CONTROL

Shigeo Hashimoto, Ikoma, and Yutaka Sugiura, Kobe, both of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Division of Ser. No. 406,863, Sep. 13, 1989, which is a continuation of Ser. No. 213,488, Jun. 30, 1988, abandoned, which is a continuation of Ser. No. 895,912, Aug. 13, 1986, abandoned. This application Feb. 27, 1992, Ser. No. 842,507
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—194 1 Claim



1. An apparatus for automatically and continuously controlling a concentration of an electroplating solution comprising:
a plating tank containing an electroplating solution therein,
a make-up tank containing a replenisher therein,
a supply means for supplying the replenisher in the make-up tank into the plating solution in the plating tank,
an analyzer for measuring a concentration of a consumable ingredient in the plating solution,
a detector for detecting whether or not a workpiece to be plated in introduced in the plating solution, and
a control unit having a computer incorporated therein and operatively interconnected to a pump, thermoregulator, and analyzer,
said control unit having stored therein a set of information bits A relating to a plating solution composition and the deposition amounts per unit time from the plating solution at varying temperatures and surface areas of a workpiece to be plated, or the amount of a replenisher to be supplied, and receiving a set of information bits B relating to the surface area of a workpiece to belated and a set of information bits C relating to the current density from an electric source for electroplating in order that upon receipt of surface area information B and current density information C, the control unit computes the amount of plating film to be deposited on the workpiece per unit time, or the amount of a consumable ingredient to be consumed, or the amount of replenisher to be supplied,
wherein when the workpiece of dipped in the plating tank, the detector delivers a signal D1 indicative of the presence of the workpiece in the tank to the control unit and the control unit then supplies a signal E1 based on the result of the preceding computation to the supply means to actuate the supply means so as to provide a predetermined flow rate for a predetermined time, thereby making up the plating solution with a predetermined amount of the replenishment over a predetermined time, and when the workpiece is thereafter taken out of the plating tank, the detector gives another signal D2 indicative of the absence of the workpiece in the tank to the control unit and the control unit then supplies another signal E2 to the supplying means to interrupt the operation thereof,
said control unit being connected to the analyzer whereby a set of information bits F relating to the concentration of consumable ingredient is delivered from the analyzer to the control unit in order that comparing information F with a previously stored set of information bits G relating to the permissible concentration range of the consumable ingredient in the plating solution, the control unit delivers a signal E3 to the supplying means to interrupt its operation for a predetermined time to thereby interrupt the supply of the replenisher for the predetermined time when the concentration of consumable ingredient in the plating solution exceeds the permissible concentration range, or the control unit delivers another signal E4 to the supplying means when the concentration of consumable ingredient in the plating solution is below the permissible concentration range so that signal E4 commands the supplying means to increase the flow rate therethrough by a predetermined quantity and/or extend the operating duration thereof by a predetermined time to thereby increase the supply of the replenisher by a predetermined amount,
whereby a workpiece is electroplated at a permissible concentration range of a consumable ingredient in the plating solution which is maintained by supplying the replenisher in an amount corresponding to the amount of the consumable ingredient determined from the surface area of the workpiece and by insuring whether or not the concentration is maintained within the permissible range by analyzing the consumable ingredient in the plating solution.

5,200,048

ELECTROPLATING APPARATUS FOR PLATING HALF

sealing said drive shaft to said bearing housing so that an

5,200,051

WHOLLY MICROFABRICATED BIOSENSORS AND

having an ion selecting electrode, and a syringe for introducing sample liquid into the flow cell, said syringe having a metal

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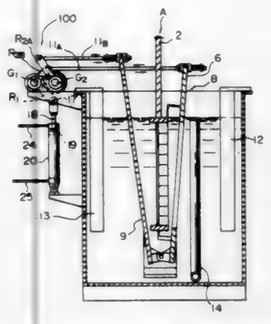
5,200,048
ELECTROPLATING APPARATUS FOR PLATING HALF BEARINGS

Tadashi Tanaka, Konan; Masaaki Sakamoto, Nagoya; Motomu Wada, Owariasahi, and Hideo Ishikawa, Komaki, all of Japan, assignors to Daido Metal Company Ltd., Tokyo, Japan

Division of Ser. No. 618,796, Nov. 28, 1990. This application May 27, 1992, Ser. No. 888,699
Claims priority, application Japan, Nov. 30, 1989, 1-309197
Int. Cl.[5] C25D *17/06*
U.S. Cl. 204—297 W **1 Claim**



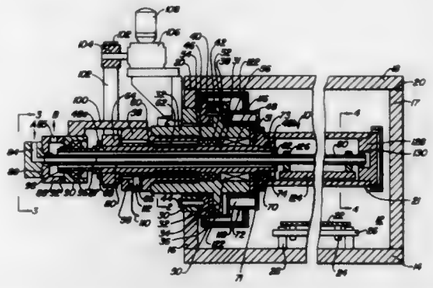
1. An electroplating apparatus for plating sliding bearings, comprising:
a plurality of plating tanks;
a plurality of plating cases each mounted within each of said plurality of plating tanks, respectively, each of said plating cases including a front abutment plate for facing inner surfaces of the half sliding bearings, and a rear abutment plate for facing rear surfaces of the half sliding bearings, said front abutment plate having a slit and a shield plate, said front and rear abutment plates being connected together at their one ends by a hinge;
an opening and closing device operatively connected to the other ends of said front and rear abutment plates so as to move said front and rear abutment plates toward and away from each other about said hinge to close and open said plating case; and
a support member for supporting the half sliding bearings in such a manner that the half sliding bearings are arranged end-to-end into a semi-cylindrical configuration; said support member supporting the half sliding bearings being inserted into said plating case when said plating case is in its open condition.

5,200,049
CANTILEVER MOUNT FOR ROTATING CYLINDRICAL MAGNETRONS

David E. Stevenson; Erik J. Bjornard, both of Northfield, Minn., and Geoffrey H. Humberstone, Holland, Mich., assignors to Viratec Thin Films, Inc., Faribault, Minn.

Continuation-in-part of Ser. No. 566,214, Aug. 10, 1990, abandoned. This application Jul. 29, 1991, Ser. No. 737,372
Int. Cl.[5] C23C *14/35*
U.S. Cl. 204—298.22 **24 Claims**

1. An apparatus for rotatably mounting a cylindrical magnetron in a vacuum chamber, comprising:
a bearing housing having one end thereof extending into said vacuum chamber and the other end located outside of said vacuum chamber;
a drive shaft rotatably mounted in said bearing housing with each end of said shaft extending beyond said bearing housing, said drive shaft having a means for attaching said cylindrical magnetron to the end of said drive shaft inside said vacuum chamber;
a vacuum seal means located in said bearing housing for sealing said drive shaft to said bearing housing so that an interior portion thereof is isolated from said vacuum chamber; and

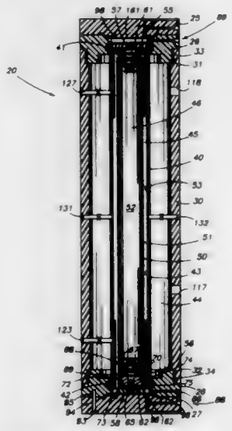


means for rotatably mounting said drive shaft in said bearing housing so that the load of said cylindrical magnetron is not transferred to said vacuum seal.

5,200,050
ELECTROPHORETIC PROCESSOR AND METHODS

Cornelius F. Ivory, and William A. Gobie, both of Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.

Filed Oct. 25, 1991, Ser. No. 782,692
Int. Cl.[5] G01N *27/26, 27/447*
U.S. Cl. 204—299 R **51 Claims**

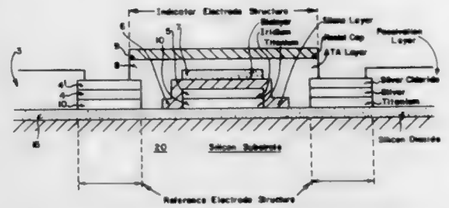


1. An electrophoretic processor comprising:
a stator;
a rotor mounted for rotation about an axis of rotation;
a rotor drive for rotating said rotor;
a processing chamber at least partially defined between the stator and rotor;
a first electrode positioned adjacent a first end of the processing chamber;
a second electrode positioned adjacent a second end of the processing chamber;
at least one ion exchange electrode membrane for separating at least one of said first or second electrodes from the processing chamber;
at least one fluid access port allowing fluid communication to or from said processing chamber.

5,200,051
WHOLLY MICROFABRICATED BIOSENSORS AND PROCESS FOR THE MANUFACTURE AND USE THEREOF

Stephen N. Cozzette, Nepean, Canada; Graham Davis, Plainsboro; Jeanne A. Itak, North Brunswick, both of N.J.; Imants R. Lauks, Yardley; Randall M. Mier, Morrisville, both of Pa.; Sylvia Piznik, Jackson, N.J.; Nicolaas Smit, Hightstown, N.J.; Susan J. Steiner, Trenton, N.J.; Paul Van Der Werf, Princeton Junction, N.J., and Henry J. Wieck, Plainsboro, N.J., assignors to I-Stat Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 432,714
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—403 **51 Claims**

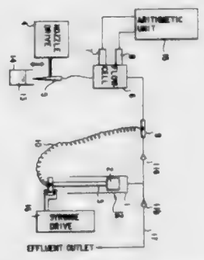


1. A wafer level microfabricated biosensor comprising:
(a) a base sensor;
(b) a permselective layer, superimposed over at least a portion of said base sensor, having a thickness sufficient to exclude substantially molecules with a molecular weight of about 120 or more while allowing the free permeation of molecules with a molecular weight of about 50 or less; an
(c) a biolayer superimposed over at least a portion of said permselective layer, comprising (i) a sufficient amount of a bioactive molecule capable of selectively interacting with a particular analyte species, and (ii) a support matrix in which said bioactive molecule is incorporated, which matrix is derived from the group consisting of a photoformable proteinaceous mixture, a film-forming latex, and combinations thereof and through which matrix said analyte species may freely permeate and interact with said bioactive molecule.

5,200,052
ION CONCENTRATION ANALYZER

Kiyochika Ishibashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1991, Ser. No. 802,872
Claims priority, application Japan, Dec. 25, 1990, 2-405998
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—409 **4 Claims**

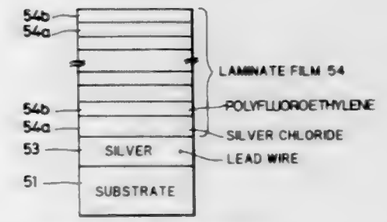


1. An ion concentration analyzer comprising a flow cell having an ion selecting electrode, and a syringe for introducing sample liquid into the flow cell, said syringe having a metal piston rod and a sliding block secured to the distal end of the piston rod and made of elastic insulating material so as to introduce sample liquid into the flow cell, said analyzer further comprising:
a metal member located in a pipe connecting the flow cell to the syringe, placed in contact with the sample liquid flowing through the pipe, and electrically connected to the piston rod directly or by a conductive member.

5,200,053
REFERENCE ELECTRODE

Takeshi Shimomura; Shuichiro Yamaguchi; Naoto Uchida; Takehisa Mori, all of Kanagawa, and Teruaki Katsube, Tama, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/01188, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO89/04959, PCT Pub. Date Jun. 6, 1989
PCT Filed Nov. 24, 1988, Ser. No. 490,636
Claims priority, application Japan, Nov. 24, 1987, 62-293957; Oct. 27, 1988, 63-271784
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—435 **7 Claims**



1. A reference electrode comprising:
a conductive substrate; and
a laminate film including a laminate layer of several alternate layers of silver halide and an insulating and hydrophobic material selected from fluorine organic compound (fluororesin), polyetrafluoroethylene, aromatic polyparaxylene and polystyrene, said laminate layer covering the surface of said conductive substrate and having said layer of insulating and hydrophobic material at an outer most surface.

5,200,054
ICE ELECTRODE ELECTROLYTIC CELL

David F. Glenn; Dan F. Suciu; Taryl L. Harris, and Jani C. Ingram, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 22, 1992, Ser. No. 917,243
Int. Cl.[5] C25C *5/02, 5/00;* **B22F** *9/00*
U.S. Cl. 205—74 **12 Claims**

1. An apparatus for the recovery of a heavy metal from waste water, soil, and process streams comprising:
a. an electrolytic cell containing an electrolyte;
b. an anode within the electrolyte;
c. a cathode within the electrolyte having an internal refrigerant conduit; and
d. a refrigeration means providing a controllable cold refrigerant by conduit to the cathode internal refrigerant con-

duit, wherein refrigerant flow through the cathode forms

5,200,056

stream with an alcohol in an etherification zone at etherifi-

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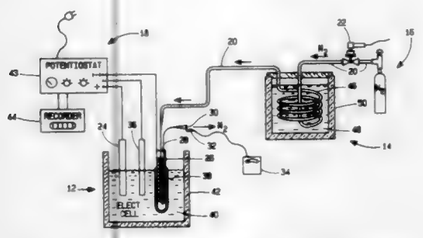
duit, wherein refrigerant flow through the cathode forms a layer of ice surrounding the cathode and a layer of heavy



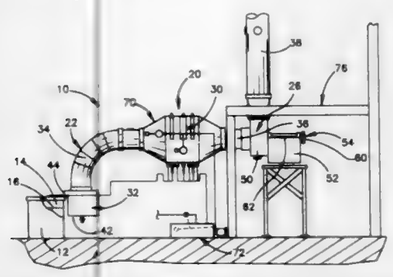
metal is deposited over the layer of ice on application of an electric current to the cathode and anode.

5,200,055

SYSTEM AND METHOD FOR CHROME RECOVERY

Larry J. Zitko, 6980 Rt. 534, Windsor, Ohio 44099

Filed Aug. 29, 1991, Ser. No. 752,038
Int. Cl.[5] C25D *21/04, 21/06;* **B01D** *45/00*
U.S. Cl. 205—94 **10 Claims**



8. A method of recovering chrome from a chrome plating process comprising:

a. inducing a flow of chrome bearing mist-like fluid from adjacent the surface of a chrome plating solution along a flow path through first and second chrome removal stations;

b. stationing said first chrome removal station in the flow path with chrome collecting surfaces oriented for contact with the chrome bearing fluid and depositing chrome thereon;

c. stationing said second chrome removal station in the flow path with second chrome collecting surfaces oriented for collecting chrome from said chrome bearing fluid flowing therethrough and depositing chrome thereon; and,

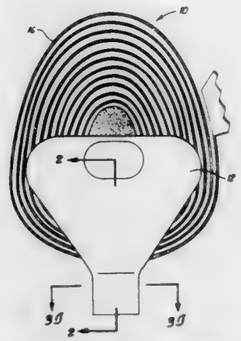
d. reclaiming chrome from the first and second chrome removal stations by directing solvent onto said second station surfaces to remove chrome deposited thereon, thereafter directing the solvent and second station chrome onto said first station surfaces to remove chrome deposited thereon, and collecting the solvent and first and second station chrome.

5,200,056

METHOD FOR ALIGNING POLE TIPS IN A THIN FILM HEAD

Uri Cohen, Palo Alto, Calif., and Nurul Amin, Burnsville, Minn., assignors to Seagate Technology Inc., Scotts Valley, Calif.

Continuation of Ser. No. 480,558, Feb. 15, 1990, Pat. No. 5,141,623. This application Feb. 7, 1992, Ser. No. 832,431
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] C25D *5/02*
U.S. Cl. 205—122 **1 Claim**



1. A method of manufacturing a thin film magnetic head upon a substrate comprising the steps of:

depositing a magnetic bottom pole layer upon the substrate;

depositing a gap material layer upon the magnetic bottom pole layer;

depositing a magnetic upper pole layer upon the gap material layer through a photoresist plating mask;

electroplating through the same photoresist plating mask a selectively etchable platable first metal sacrificial mask layer upon the magnetic upper pole layer;

removing the photoresist plating mask;

removing non-aligned portions of the gap layer and the magnetic bottom pole layer whereby the first metal sacrificial mask layer protects the magnetic top pole layer and the aligned portions of the gap layer and the magnetic bottom pole layer; and

selectively chemically etching remaining portions of the first metal sacrificial mask layer with a selective chemical each.

5,200,057

ADDITIVE COMPOSITION, ACID ZINC AND ZINC-ALLOY PLATING BATHS AND METHODS FOR ELECTRODEDEPOSITING ZINC AND ZINC ALLOYS

Valerie M. Canaris, Parma, Ohio, assignor to McGean-Rohco, Inc., Cleveland, Ohio

Filed Nov. 5, 1991, Ser. No. 787,932
Int. Cl.[5] C25D *3/22, 3/56*
U.S. Cl. 205—313 **28 Claims**

8. An aqueous acidic plating bath for electrodepositing zinc or a zinc alloy on a substrate comprising water and

(a) zinc ions or a mixture of zinc ions and at least one additional metal selected from nickel and cobalt,

(b) chloride ions, or a mixture of chloride and sulfate ions,

(c) a poly(N-vinyl-2-pyrrolidone), and

(d) at least one sulfur-containing compound of the formulae

$$RS(R'O)_nH \quad (I)$$

or

$$S—[(R'O)_nH]_2 \quad (II)$$

wherein R is hydrogen or an alkyl group containing up to about 24 carbon atoms, each R' is independently an alkylene group containing 2 or 3 carbon atoms, and each n is independently an integer of from 1 to about 100.

5,200,058

CATALYTIC CONVERSION OVER MODIFIED SYNTHETIC MESOPOROUS CRYSTALLINE MATERIAL

Jeffrey S. Beck, Lawrenceville; David C. Calabro, Somerset, both of N.J.; Sharon B. McCullen, Newtown, Pa.; Bruce P. Pelrine, Trenton; Kirk D. Schmitt, Pennington, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 718,056, Jun. 20, 1991, Pat. No. 5,145,816, which is a continuation-in-part of Ser. No. 625,245, Dec. 10, 1990, Pat. No. 5,098,684, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990, Pat. No. 5,102,643, said Ser. No. 718,056, is a continuation-in-part of Ser. No. 625,171, Dec. 10, 1990, Pat. No. 5,057,296. This application Jun. 8, 1992, Ser. No. 895,283
Int. Cl.[5] C10G *11/00*
U.S. Cl. 208—46 **20 Claims**

1. A process for catalytic conversion of an organic compound-containing feedstock to conversion product which comprises contacting said feedstock under catalytic conversion conditions with a catalyst comprising a modified inorganic, porous, non-layered crystalline phase material exhibiting, after calcination and/or functionalization, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18 Angstrom Units with a relative intensity of 100 and having a benzene adsorption capacity of greater than 15 grams per 100 grams anhydrous crystal at 50 torr and 25° C., said crystalline material having been modified by the method comprising

contacting with a treatment composition comprising $M'X'Y'_n$ wherein

M' is selected from a group consisting of Periodic Table Groups IIA, IIIA, IVA, VA, VIA, VIIIA, IB, IIB, IIIB, IVB, VB and VIB;

X' is selected from a group consisting of halides, hydrides, alkoxides of 1 to about 6 carbon atoms, alkyl of C_{1-18}, alkenyl of C_{1-18}, aryl of C_{1-18}, aryloxide of C_{1-18}, sulfonates, nitrates, and acetates;

Y' is selected from a group consisting of X', amines, phosphines, sulfides, carbonyls and cyanos; and

n=1–5; said treatment composition contacting occurring under sufficient conditions so that the crystalline phase material is functionalized.

5,200,059

REFORMULATED-GASOLINE PRODUCTION

Paula L. Bogdan, Des Plaines; R. Joe Lawson, Palatine, and J. W. Adriaan Sachtler, Des Plaines, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 21, 1991, Ser. No. 796,519
Int. Cl.[5] C10G *59/00, 59/06*
U.S. Cl. 208—79 **20 Claims**

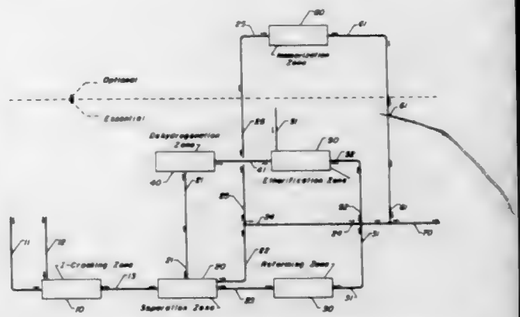
1. A process combination for producing a gasoline component from a naphtha feedstock comprising the steps of:

(a) contacting the naphtha feedstock with a selective isoparaffin-synthesis catalyst at selective-isoparaffin-synthesis conditions in the presence of hydrogen to form a synthesis effluent with a higher isoparaffin/n-paraffin ratio than that of the naphtha feedstock;

(b) separating the synthesis effluent in a separation zone to obtain an isobutane-rich stream, a light naphtha and a reforming feed;

(c) dehydrogenating at least a portion of the isobutane-rich stream in a dehydrogenation zone at dehydrogenation conditions using a dehydrogenation catalyst and recovering an isobutene-containing stream;

(d) contacting at least a portion of the isobutene-containing stream with an alcohol in an etherification zone at etherification conditions to obtain an ether and a hydrocarbon raffinate;



(e) contacting the reforming feed in a reforming zone at reforming conditions using a reforming catalyst to obtain a reformate; and

(f) blending the gasoline component comprising at least a portion of each of the light naphtha, ether and reformate.

5,200,060

HYDROTREATING PROCESS USING CARBIDES AND NITRIDES OF GROUP VIB METALS

Daniel J. Sajkowski, Winfield, Ill., and Shigeo T. Oyama, Potsdam, N.Y., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 26, 1991, Ser. No. 692,284
Int. Cl.[5] C10G *47/02*
U.S. Cl. 208—108 **27 Claims**

1. A hydrotreating process comprising contacting a hydrocarbon feedstock having a boiling point of at least about 460° F. with a catalyst having at least one member selected from the group consisting of a carbide of a Group VIB metal and a nitride of a Group VIB metal at a temperature of at least about 600° F. and total pressure of at least about 500 psig.

5,200,061

DELAYED COKING

Salvatore T. M. Viscontini, Northampton, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 20, 1991, Ser. No. 763,008
Int. Cl.[5] C10G *9/14*
U.S. Cl. 208—131 **5 Claims**

1. A method for cooling a coking drum containing a bed of hot coke comprising the steps of:

a. heating a coker feedstock to an elevated coking temperature;

b. injecting the coker feedstock into the coking drum;

c. commencing delayed coking of the feedstock;

d. creating a channel through an impervious zone of the

5,200,063

photosensing means responsive to light from said light

backflush the means for filtering waste material at inter-

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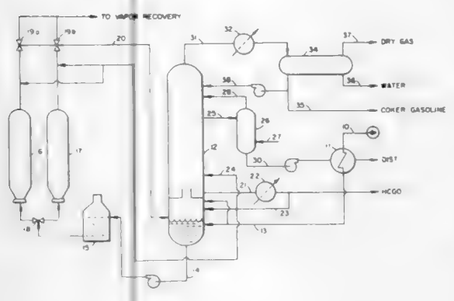
coke bed by discharging a fluid through a distributor disposed about the coking drum and in communication with the inside of the coking drum said fluid creating a channel through the impervious zone as the fluid flows through the coking drum; and



e. quenching the coking drum with a quench liquid whereby the quency liquid flows through the channel formed in the bed.

5,200,062

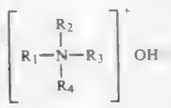
PROCESS FOR REMOVING ELEMENTAL SULFUR FROM FLUIDS

Marc-André Poirier, and John B. Gilbert, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 17, 1991, Ser. No. 715,957
Int. Cl.[5] C10G *29/20*
U.S. Cl. 208—236 11 Claims

8. A process for reducing the corrosivity of a hydrocarbon fuel by removing elemental sulfur resulting from the transportation of said fuel through a pipeline used to transport sour hydrocarbon fluids, which process comprises contacting said fuel with effective amounts of

(a) a quaternary ammonium hydroxide soluble in said fuel and having the general formula:



wherein R_1, R_2, R_3 and R_4 are each independently alkyl, hydroxyalkyl, alkoxyalkyl, aryl or hydroxyaryl containing 1 to 16 carbon atoms to convert the elemental sulfur to a soluble polysulfide product;

(b) an alcohol; and

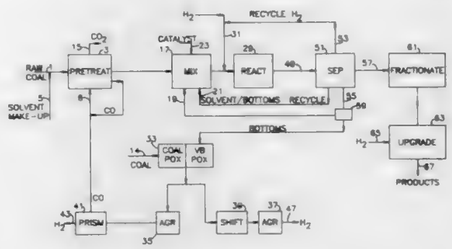
(c) an organo mercaptan soluble in said fuel to form a substantially non-corrosive, fuel soluble polysulfide product.

5,200,063

COAL HYDROCONVERSION PROCESS COMPRISING SOLVENT ENHANCED PRETREATMENT WITH CARBON MONOXIDE

Dan R. Neskora; Stephen N. Vaughn; W. Neal Mitchell; Calude C. Culross; Steve D. Reynolds, all of Baton Rouge, La., and Edward Effron, Springfield, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 541,851, Jun. 21, 1990, abandoned.
This application Oct. 9, 1991, Ser. No. 774,446
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] C10G *1/00, 1/06, 1/08*
U.S. Cl. 208—400 22 Claims



2. A process for hydroconverting coal to produce a hydrocarbonaceous liquid which comprises the steps of:

(a) forming a mixture comprising a water-containing coal, carbon monoxide and an organic solvent in a pretreatment zone, wherein the ratio of water-to-dry coal at pretreatment conditions is not more than 0.5:1, and subjecting the mixture to a temperature within the range of 550° to 700° F. and pressure of at least 1800 psi to cause depolymerization and hydrogenation of the coal to a significant extent;

(b) removing gases from the coal organic solvent mixture;

(c) forming a subsequent mixture of pretreated coal, organic solvent, and a catalyst, wherein the catalyst is comprised of dispersed particles of a metal sulfide-containing compound, said metal being selected from the group consisting of Groups VA, VIA, VIII and VIIIA of the Periodic Table of the Elements and mixtures thereof;

(d) reacting the resulting mixture containing said catalyst under coal hydroconversion conditions in the presence of hydrogen, in a hydroconversion zone;

(e) separating the contents of said hydroconversion zone into at least three fractions: (1) an effluent product comprising a hydrocarbonaceous liquid, essentially free of coal residue solids; (2) a bottoms comprising coal residue solids; and (3) a gaseous top; and

(f) upgrading the hydrocarbonaceous liquid from step (e) by treatment with hydrogen.

5,200,064

FUEL CONTAMINATION DETECTOR

Daniel G. Russ, deceased, late of Fort Wayne by Ruth S. Russ, executrix ; Vilmer L. Nichols, Fort Wayne; Steven E. Modezjewski, Fort Wayne, and Michael R. Miller, Churubusco, all of Ind., assignors to Telectro-Mek, Inc., Fort Wayne, Ind.

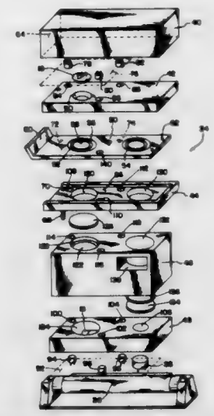
Filed Feb. 22, 1991, Ser. No. 659,822
Int. Cl.[5] G01N *33/28, 1/34, 21/88, 21/01*
U.S. Cl. 210—94 18 Claims

1. In a fluid contamination detection system configured and arranged such that a fluid sample containing particulates is passed successively through a first filter element that both traps the particulates and acquires the coloration of the fluid sample and a second filter element that only acquires the coloration of the fluid sample, a particulate detection apparatus, comprising:

a light source;

photosensing means responsive to light from said light source for providing an indication of light intensity;

a filter support slide including a first aperture and a second aperture, said slide being movable between a first position whereat said first aperture is intermediate said light source and said photosensing means and a second position whereat said second aperture is intermediate said light source and said photosensing means, said slide being adapted to support the first filter element over said first aperture and the second filter element over said second aperture, thereby causing the first and second filter elements to be intermediate said light source and said photosensing means when said slide is in said first and second positions, respectively;



opacity measuring means responsive to said photosensing means for measuring the respective opacities of the first and second filter elements when said slide is in said first and second positions, respectively; and

indicating means for providing an indication dependent upon said measured opacities of the first and second filter elements, whereby detection of particulate levels in the fluid sample is performed without further handling of said first and second filter elements once they are placed in supporting relationship on said filter support slide, thereby minimizing filter contamination and resulting measurement error.

5,200,065

TERTIARY WASTE TREATMENT AND DISPOSAL SYSTEM

John A. Sinclair, and Thomas A. Sinclair, both of Lilburn, Ga., assignors to Waste Water Systems, Inc., Lilburn, Ga.

Filed Feb. 25, 1991, Ser. No. 660,530
Int. Cl.[5] C02F *9/00;* E02B *11/00;* B01D *29/62*
U.S. Cl. 210—104 2 Claims

2. A waste water treatment system for further treating waste water effluent from a primary treatment system, comprising:

a system controller means to control the operation of the treatment system,

a dosing tank means for accepting the effluent and providing a downstream flow of effluent,

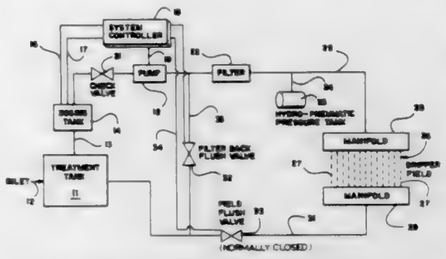
pump means for pressurizing fluid flow downstream from the dosing tank means and throughout the treatment system,

means for filtering waste material from the downstream flow of effluent,

backflush pressure means for accepting filtered effluent from the means for filtering waste material to subsequently backflush the means for filtering waste material at intervals of time,

means to effect the discharge of the filtered effluent into a ground environment,

wherein the means to effect the discharge of the filtered effluent comprises a manifold to distribute the filtered effluent to a plurality of fluid flow tubes, the tubes having emitted means to discharge the filtered effluent to the ground environment at controlled rates,



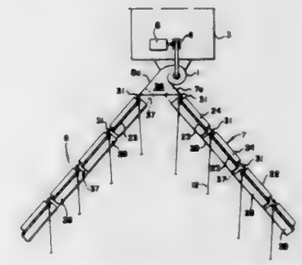
wherein field flush valve means are provided downstream from the means to discharge the filtered effluent, the system controller means providing a signal at selected intervals to operate the pump means and to open the field flush valve means thereby creating a forceful turbulent fluid flow through the fluid flow tubes effecting a cleaning of the emitting means and subsequently causing the filtered effluent to flow into the primary treatment system for reprocessing.

5,200,066

OIL SPILL COLLECTING DEVICE WITH VORTEX GENERATOR

Adam A. Jorgensen, 1911 NW. 36th St., Oakland Park, Fla. 33309

Filed Nov. 18, 1991, Ser. No. 793,172
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—109 13 Claims



1. An oil spill collecting device for collecting an oil layer spilled on a water surface, comprising at least a first floating oil collecting arm having a leading side facing the water surface, a vortex generator disposed at one end of the collecting arm, at least one elongate water inlet with two facing side edges in said vortex generator in fluid communication with the leading side of the collecting arm facing the oil layer, moving means for creating relative movement between said water surface and said collecting arm for forming a vortex in said vortex generator, oil drawing means for drawing oil collecting in an oil pocket forming in said vortex, wherein said vortex generator has a substantially cylindrical surface tangentially engaging said leading side of said first collecting arm at one side edge of said water inlet; a draw pipe having an oil intake disposed in said oil pocket in said oil drawing means, and an oil pump

connected to said draw pipe for pumping oil from said oil

5,200,068

tadiene coating comprises a substantially homogeneous film having a uniform polymer crosslinking layer to form particles

the filter member includes a filter central cavity positioned above the upper floor and between the inner wall to direct

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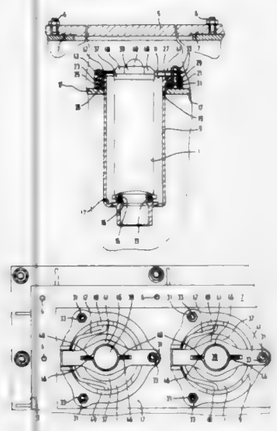
connected to said draw pipe for pumping oil from said oil intake; draw pipe leveling means coupled to said draw pipe for maintaining said oil intake in a position in said oil pocket substantially level with the center of said pocket; and a servo drive in said leveling means coupled to said draw pipe, and oil/water sensing means coupled to said servo drive for maintaining said oil intake at said position substantially level with the center of said pocket.

5,200,067

DEVICE FOR MOUNTING A FILTER ELEMENT

Norbert Sann, Saarbrucken, Fed. Rep. of Germany, assignor to Hydac Filtertechnik GMBH, Sulzbach/Saar, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 799,439
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1990, 403919202
Int. Cl.[5] B01D *35/027*
U.S. Cl. 210—172 5 Claims



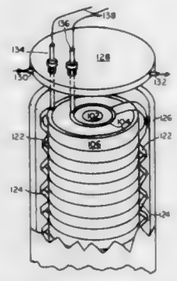
1. A filter device, comprising:
a mounting member;
a tubular housing coupled to said mounting member by holding elements, said housing having opposed ends, an entry opening at one of said ends and a discharge opening at the other of said ends;
a tubular filter element mounted in said housing, said filter element having first and second opposed ends, said first end defining a contact surface, said contact surface including an outwardly projecting tongue thereon;
a seat in said housing receiving the second end of said filter element;
a holder attached to said mounting member, said holder including first means for engaging said contact surfaces of said filter element to press said second and against said seat, said first means including second means for preventing rotation of said filter element relative to said housing, said second means including at least one slot-shaped opening, defined by abutment-edges, receiving said outwardly projecting tongue on said contact surfaces of said filter element;
a first seal mounted on said seat to seal said second end of the filter element to said seat;
a second seal mounted between said mounting member and said housing; and
a third seal mounted on said mounting member.

5,200,068

CONTROLLED CHARGE CHROMATOGRAPHY SYSTEM

Marc D. Andelman, 6 Nadine Rd., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 792,902, Nov. 15, 1991, which is a continuation of Ser. No. 512,970, Apr. 23, 1990, abandoned.
This application Jan. 13, 1992, Ser. No. 819,828
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 14 Claims



1. A flow-through capacitor for use in a chromatographic system for the purification of liquids containing materials which capacitor comprises:
a) a central, longitudinal, electrically non-conductive support means to provide support for a plurality of washer elements thereon and to permit the longitudinal flow of a liquid toward the one or other end of the support means;
b) a plurality of stacked washer elements arranged as a unit about the support means, the washer elements in each unit arranged in a close, contacting, sequential arrangement to include in each washer unit:
i) a non-electrically conductive spacer washer element;
ii) a high surface area, porous, electrically conductive washer element to act as a stationary phase of a chromatographic column, said washers being sized, dimensioned, and positioned to allow for placement into a chromatographic column; and
iii) an electrically conductive backing washer element;
c) means to electrically connect the alternating backing washer elements along the support means to form anode and cathode leads of the connected backing washer elements
whereby anode and cathode washer elements are adapted to be connected to a power source to form the anode and cathode of the flow-through capacitor.

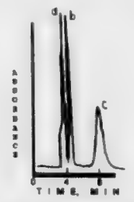
5,200,069

SEPARATIONS MATERIAL

GwoChung Lin, 3521 Salisbury Ct., Wexford, Pa. 15090

Continuation of Ser. No. 294,344, Dec. 28, 1988, abandoned.
This application Aug. 13, 1991, Ser. No. 745,469
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 18 Claims

17. A chromatographic packing material consisting essentially of stable polybutadiene coated and crosslinked on a surface of generally spherical alumina consisting of crystals of alumina and aluminum hydroxide extending radially outward from a central core region and having a shape selected from principally acicular to principally lamellar wherein the polybutadiene coating comprises a substantially homogeneous film having a uniform polymer crosslinking layer to form particles



having average sizes in the range of about 8–10 micrometers with a surface area in the range of about 20–50 micrometers.

5,200,070

BOTTLE WATER FILTER ARRANGEMENT

Kevin P. McMenamin, 554 Cedar St., Ramona, Calif. 92065

Filed Jul. 20, 1992, Ser. No. 916,484
Int. Cl.[5] B01D *35/027, 24/12*
U.S. Cl. 210—206 3 Claims

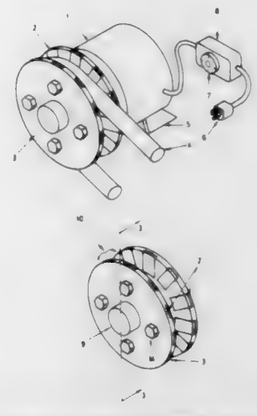
1. A bottle water filter arrangement, comprising,
a water cooler, the water cooler having a water cooler top wall and a top wall opening, and a top wall annular flange mounted to the top wall surrounding the top wall opening, and
a torroidal collar, the torroidal collar having an annular channel receiving the top wall annular flange, and
the torroidal collar including a central collar opening sealingly receiving a water bottle therethrough in an inverted orientation, wherein the torroidal collar further includes a collar annular flange directed into the central collar opening, and
a filter member, the filter member having a cylindrical outer wall and a lower floor, and the filter member including an outer wall flange mounted to an upper end of the outer wall mounted upon the collar annular flange,
and wherein the filter member includes a cylindrical inner wall spaced from the cylindrical outer wall, and an upper floor spaced from the lower floor, and a wall cavity oriented within the filter member between the outer wall and the inner wall and the upper floor and the lower floor, and a filtration medium contained within the wall cavity, and the inner wall including an annular array of inner wall openings directed through the inner wall in communication with the wall cavity, wherein the inner wall openings are positioned adjacent to an upper end of the inner wall, and the lower floor includes a plurality of lower floor openings in communication with the wall cavity, wherein the filter member includes a filter central cavity positioned above the upper floor and between the inner wall to direct fluid from the filter central cavity through the inner wall openings, through the filtration medium, and through the lower floor openings.

5,200,071

TRANSLATING MAGNETIC FIELD TREATMENT DEVICE

Michael S. Spiegel, Miami Beach, Fla., assignor to Quantum Systems International, Inc., Miami Beach, Fla.

Filed Jan. 9, 1992, Ser. No. 818,516
Int. Cl.[5] C02F *1/48*
U.S. Cl. 210—222 3 Claims



1. A fluid treatmemt system for changing the rates of growth of certain crystals and other solids formed within a fluid comprising:
a. and electrical power source;
b. a speed control unit connected to said power source, said unit having an adjustable knob;
c. a motor connected to said speed control unit, and having a rotatable shaft;
d. a wheel assembly mounted on said shaft consisting of two circular ferro-magnetic disks separated from each other on said shaft a pre-determined distance to form a gap, said disks being oriented perpendicular to and being concentrically mounted about said shaft, each said disk having an inner surface facing said gap;
e. a ferro-magnetic spacer member concentrically arranged about said shaft and located in said gap between said disks, said spacer member having a pair of spaced apart ends, a respective said end of said spacer member contacting a respective said inner surface of said disks;
f. an array of magnets concentrically arranged in a circular pattern about said shaft on a said inner surface of each of said disks, each said magnet having an inner pole face facing the gap, each magnet having a polarity parallel to a longitudinal direction of said shaft, the number of said magnets on each said disk being equal, each respective said magnet on one of said disks being located directly opposite to a respective said magnet on said other disk;
g. the polarity of the inner pole faces of said magnets on one of said disks being the same as each other and the polarity of the inner pole faces of said magnets on the other of said disks being the same as each other but opposite to the polarity of the inner pole faces of said magnets on said one disk;
h. an elongated fluid conduit having a U-shaped non-magnetic portion located in the gap formed by said disks

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between said inner pole faces of said magnets, wherein fluid flows in said conduit through said gap in a continuous flow into and out of said gap;

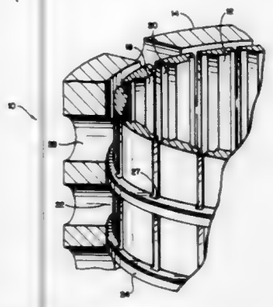
i. said U-shaped non-magnetic portion of said conduit being hollow so as to have no obstruction for continuous fluid flow therethrough, wherein sufficient magnetic force is provided by the combination of the strength of the magnets, velocity of the fluid, and rotation of the magnets to accomplish beneficial effects on impurities in the fluid.

5,200,072

SCREEN PLATES AND METHODS OF MANUFACTURE

Frey Å. Frejborg, and Lassi J. Halonen, both of Queensbury, N.Y., assignors to Ahlstrom Screen Plates Inc., Glens Falls, N.Y.

Filed Aug. 16, 1990, Ser. No. 573,839
Int. Cl.[5] B01D *29/13*
U.S. Cl. 210—232 23 Claims



1. A screen cylinder comprising:

a generally cylindrical screening medium having a plurality of openings therethrough;

a generally cylindrical structural backing plate for structurally supporting said screening medium and having a plurality of openings therethrough; and

said screening medium and said structural backing plate lying concentrically one within the other and having respective opposed surfaces in engagement with one another at an interface therebetween whereby said backing plate structurally supports said screening medium;

one of said screening medium and said backing plate having a plurality of circumferentially extending recesses formed in its opposing surface and opening at the opposing surface of the other of said screening medium and said backing plate at the interface thereof establishing communication between the respective openings of said screening medium and said backing plate;

a plurality of axially spaced projections spaced one from the other in the axial direction defining said recesses and projecting radially from one of said screening medium and said backing plate at said interface;

the openings in said screening medium being elongated and extending in a generally axial direction substantially normal to the circumferential extent of said recesses.

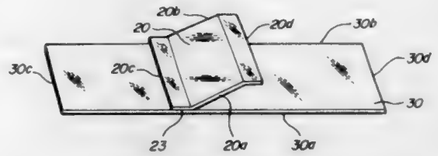
5,200,073

POLYMERIC FILM FILTER ASSEMBLY

William C. Steere, Grass Lake, and Jeff Lucas, Ypsilanti, both of Mich., assignors to Gelman Sciences Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 659,581, Feb. 22, 1991, Pat. No. 5,104,536. This application Aug. 1, 1991, Ser. No. 739,279
Int. Cl.[5] B01D *61/18*
U.S. Cl. 210—232 21 Claims

1. A plural chamber film filter assembly including 1) a flexible tubular filter device comprising a fluid porous dead end filter panel between first and second polymer film fluid-barrier panels forming together an open-ended fluid-inflatable hollow unitary sleeve or pouch, the filter panel having spaced apart transverse first and second end edges with the first transverse end sealed to the first polymer film panel and with the other transverse end sealed to the second polymer film panel such that the porous panel crosses over from one panel to the other panel whereby the device interior is fluid sealingly partitioned by the filter panel into a first chamber for receiving axial flow of a fluid to be brought into contact with the upstream surface of the filter panel and to pass therethrough and be filtered



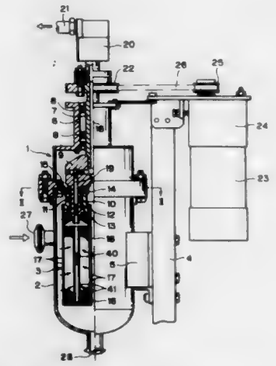
thereby and a second chamber for receiving the permeate fluid through the downstream surface of the filter panel, the filter having sealed side edges and an end edge defining an open ingress means, and 2) a hollow vessel support member defining a third chamber having rim means forming an opening adapted to receive the filter device therethrough within the third chamber and being adapted to support the thus received filter device upright with said open fluid ingress means uppermost in fluid-sealing relation with said rim means for introducing filterable liquid into the thus supported filter device for filtering the liquid.

5,200,074

ION-EXCHANGE APPARATUS HAVING ROTATABLE CARTRIDGES

Akira Suzuki; Shoichi Matsuda; Masafumi Ogata, all of Tokyo; Takanobu Inoue, and Kimiaki Yasuda, both of Fukui, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1991, Ser. No. 771,990
Claims priority, application Japan, Oct. 9, 1990, 2-271599
Int. Cl.[5] B01D *24/32*
U.S. Cl. 210—267 5 Claims



1. An apparatus for separating a component from a liquid, the apparatus comprising:

A tank having an enclosed structure and an inlet for said liquid;

a cartridge supporting member provided in said tank, said cartridge supporting member being rotatable around a first axis positioned at a substantially central position of said tank;

first driving means for rotating said cartridge supporting member;

coupling means for coupling said driving means to said cartridge supporting member;

a plurality of cartridges supported by said cartridge supporting member, each said cartridge containing therein a supply of a granular ion exchange material capable of separating a component from said liquid, and each said cartridge having a number of holes at an outer periphery thereof for introducing said liquid into a respective said cartridge to contact said ion exchange material contained therein;

passage means for causing treated solution to flow from said cartridges to the outside of said tank;

wherein each said cartridge is supported by said cartridges supporting member so that said cartridge is rotatable around a second axis spaced away from said first axis and parallel to said first axis; and

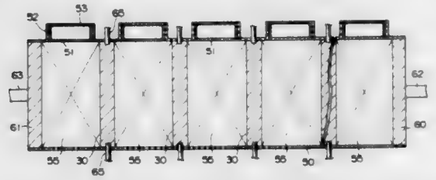
second driving means for rotating each said cartridge around said second axis, wherein each said cartridge is rotated around said second axis when said cartridge supporting member is rotated around said first axis.

5,200,075

SEPARATOR

Seiya Otani, Tokyo; Hiroaki Taniguchi, Kuki; Kei Yokoyama, Fukuyama; Yoshimi Shiroto, Yokohama; Mitsunori Shimura, Yokohama; Osamu Akimoto, Yokohama, and Masayoshi Notoya, Kawasaki, all of Japan, assignors to NKK Corporation and Chiyoda Corporation, both of Japan

Filed Mar. 5, 1992, Ser. No. 846,198
Claims priority, application Japan, Mar. 8, 1991, 3-069069; Mar. 8, 1991, 3-069070
Int. Cl.[5] B01D *24/04, 24/12, 24/42*
U.S. Cl. 210—283 10 Claims



6. A separator having a structure in which a plurality of cylindrical body units each of which is open-ended at both ends and is packed with an adsorbent and are connected to each other through partition plates, each of said cylindrical body units having an opening formed at the upper wall thereof and tightly closed with a detachable plug cover, each of said partition plates having openings formed on both sides and on the periphery wall thereof, a first fluid passage provided in each of said partition plates communicating said openings formed on both sides thereof each other and a second fluid passage provided in each of said partition plates which is in fluid communication with said first fluid passage and with said opening formed on the periphery wall thereof.

5,200,076

EASILY DISASSEMBLED ROTOR SYSTEM

David N. Salyer, Garden Grove, Calif., assignor to Aquatechnology Resource Management, Long Beach, Calif.

Filed Apr. 9, 1992, Ser. No. 866,147
Int. Cl.[5] B01D *63/16*
U.S. Cl. 210—321.68 6 Claims

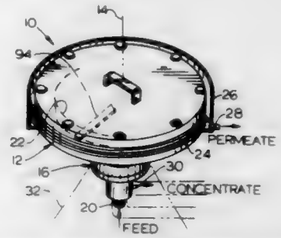
1. A rotary separator, comprising:

a stationary frame having upper and lower portions;

a rotary frame having an axis of rotation and having upper and lower parts spaced along said axis and forming a pressure chamber between them, said rotary frame having a stack of at least one membrane pack lying in said chamber;

upper and lower bearings which are spaced along said axis and which support said rotary frame in rotation on said stationary frame;

means for providing easy access to the region of said membrane pack, including means for enabling both said upper and lower bearings to directly support only said lower rotary frame part on said stationary frame, means for enabling both said upper and lower bearings to lie below said upper rotary part, and means for enabling said upper rotary part to be free of direct rotary support on said stationary frame and to be readily detachable from said lower part.

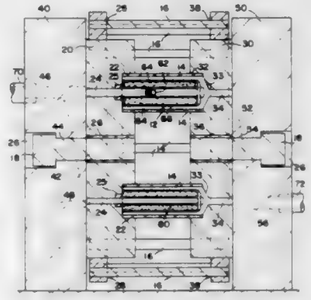


5,200,077

BACKFLUSHABLE ROTARY MELT POLYMER FILTER APPARATUS

Raymond R. McNeice, De Bary, and Royal R. Swanson, DeLand, both of Fla., assignors to Memtec America Corporation, Timonium, Md.

Filed Apr. 8, 1991, Ser. No. 681,736
Int. Cl.[5] B01D *33/00*
U.S. Cl. 210—323.2 18 Claims



1. A continuous, self-cleaning, filter apparatus for filtering a liquid material comprising: a filter housing constructed and arranged for rotational motion about an axis of said filter housing, having an inlet manifold and an outlet manifold, a plurality of filter elements disposed in a circular pattern around said axis, secured within said filter housing each of said plurality having an inlet means adjacent to said inlet member and an outlet means adjacent to said outlet member, said inlet member having an inlet manifold sufficient to communicate with each said inlet means when said filter housing is rotationally positioned at a full filtering position, said inlet manifold defines a partial toroidal cavity, a circular side of which is registered and in communication with each of said inlet means when said filter housing is rotationally positioned at a full filtering position said outlet manifold sufficient to communicate with each said outlet

means, means for introducing a liquid to be filtered into said, a base that cooperate to define a liquid retaining volume, an

(e) passing the gas/liquid dispersion under said high turbu-

5,200,082

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means, means for introducing a liquid to be filtered into said inlet manifold so that said liquid will pass through said inlet means and said filter elements to filter contaminants therefrom and thereafter pass through said outlet means into said outlet manifold, means to permit said liquid to exit from said outlet manifold, and means for partially rotating said filter housing with respect to said inlet manifold to rotate one of said filter elements to a backflush position wherein the inlet means of said one filter element will be aligned with a backflush port within said inlet member independent of said inlet manifold, thereby causing a portion of said liquid within said outlet manifold to flow through said filter element in a direction opposite to the direction of flow during filtration at said backflush position to flush contaminants from said one filter element and purge said contaminants from the apparatus via said backflush port, and thereafter to further rotate the backflushed filter element into communication with said inlet manifold and full filtering position.

5,200,078

MICROPOROUS MEMBRANES FROM POLY(ETHERETHERKETONE)-TYPE POLYMERS

Henry N. Beck, Walnut Creek; Richard A. Lundgard, Antioch, and Robert D. Mahoney, Danville, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 380,058, Jul. 14, 1989, Pat. No. 5,064,580, which is a continuation-in-part of Ser. No. 175,716, Mar. 31, 1988, Pat. No. 4,904,426. This application Nov. 9, 1990, Ser. No. 612,775

Int. Cl.[5] **B01D** *39/16*

U.S. Cl. 210—500.23 **13 Claims**

1. A microporous semi-permeable membrane comprised of a drawn unsulfonated poly(etheretherketone)-type polymer, said membrane possessing a nitrogen flux of at least about

$$1 \times 10^{-6} \frac{\text{cm}^3\ (\text{STP})}{\text{cm}^2\ \text{sec cmHg}}$$

5,200,079

CIRCULAR CLARIFIER INCLUDING IMPROVED SKIMMER CLARIFIER

Robert E. Schwartz, Montgomery, and Donald C. Vock, Batavia, both of Ill., assignors to McNish Corporation, West Chicago, Ill.

Filed Jun. 20, 1990, Ser. No. 540,835

Int. Cl.[5] **B01B** *21/18*

U.S. Cl. 210—525 **2 Claims**

1. In a clarifier of the type comprising a peripheral wall and a base that cooperate to define a liquid retaining volume, an influent conduit for introducing influent into the volume, an effluent conduit for removing clarified effluent from the volume, means including at least one rotatable arm for removing sludge from a lower portion of the volume, means including at least one scum removal conduit for removing scum from the volume, and means for rotating the rotatable arm to sweep the rotatable arm across the base and under the sum removal conduit, the improvement comprising:

at least one skimmer assembly mounted on the rotatable arm to extend upwardly therefrom, said skimmer assembly comprising:

a parallelogram linkage having a pair of end links pivotably connected between upper and lower intermediate links;

a skimmer blade mounted to one of the end links to skim the liquid containing volume as the rotatable arm rotates;

a support assembly mounted to extend above the rotatable arm;

an upper pivot connection between the support assembly and the upper intermediate link;

a lower pivot connection between the support assembly and the lower intermediate link;

said upper and lower pivot connections each positioned at a central portion of the respective intermediate link such that both of the intermediate links extend outwardly on both sides from the respective pivot connection; and

a counterweight mounted to the other of the end links of the parallelogram linkage, opposed to the one of the end links to which the skimmer blade is mounted, for biasing the parallelogram linkage for rotation about the pivot connections to bias the skimmer blade upwardly.

5,200,080

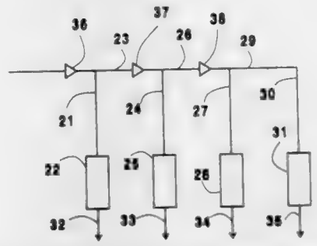
WASTE TREATMENT OXIDATION OPERATIONS

Thomas J. Bergman, Jr., North Tarrytown, and Lawrence M. Litz, Pleasantville, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Oct. 2, 1991, Ser. No. 769,645

Int. Cl.[5] **C02F** *3/00*

U.S. Cl. 210—607 **34 Claims**



1. An improved process for the oxidation of liquid waste comprising:

(a) passing liquid waste from its holding source through a flow line;

(b) dispersing an oxygen-containing gas into the liquid waste in said flow line, thereby forming a gas/liquid dispersion;

(c) pumping the gas/liquid dispersion through a pipeline contactor zone at an elevated pressure under non- or low turbulent flow conditions for the dissolution of oxygen into said liquid waste;

(d) passing said gas/liquid dispersion through pipeline means to the vicinity of said holding source, such pipeline means providing at least two separate branch lines for re-injecting the gas/liquid dispersion into said holding source, said dispersion passing through turbulence promoter means capable of increasing the flow velocity thereof with a change from non- or low turbulent to high turbulent flow conditions prior to the branch point in the pipeline means for each such branch line;

(e) passing the gas/liquid dispersion under said high turbulent flow conditions to at least two eductor means, positioned on each said branch line and being capable of dissipating the pumping energy of the dispersion into said dispersion, thereby forming an enhanced fine bubble dispersion of oxygen in the liquid waste; and

(f) re-injecting the enhanced dispersion from said eductor means into said holding source for the liquid waste, whereby enhanced oxygen/water dispersions are conveniently obtained in a convenient, flexible manner.

5,200,081

SECONDARY SEWAGE TREATMENT SYSTEM

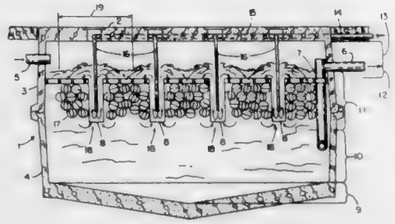
William L. Stuth, 28620 Maple Valley Hwy. SE., Maple Valley, Wash. 98038

Continuation of Ser. No. 559,425, Jul. 23, 1990, Pat. No. 5,030,353, which is a continuation of Ser. No. 297,294, Jan. 13, 1989. This application Jul. 3, 1991, Ser. No. 725,559

The portion of the term of this patent subsequent to Jul. 9, 2003, has been disclaimed.

Int. Cl.[5] **C02F** *3/06*

U.S. Cl. 210—615 **20 Claims**



8. A process for secondarily treating waste water liquor comprising the steps of providing a vertical waste water treatment region having an upper turbulent zone, an intermediate mixing zone, a lower settling zone, and a bottom sludge-collecting zone below said settling zone, each extending across the region; providing a plurality of vertical aerating zones extending through said mixing zone and being in fluid communication with the bottom of said mixing zone and with said turbulent zone; providing a barrier between said turbulent and mixing zones to retain a bouyant media within said mixing zone and prevent such bouyant media from escaping into said turbulent zone; providing a bouyant media in sufficient volume to substantially fill said mixing zone; introducing waste water liquor into said treatment region in said turbulent zone to fill said treatment region up to and including said turbulent zone, and to float said bouyant media into occupancy of said mixing zone, beneath said barrier; introducing air into said aerating zones in sufficient quantity to create a pumping effect of a magnitude that will continuously draw waste liquor from the bottom of said mixing zone, aerate the withdrawn waste liquor portion and expel the aerated portion into said turbulent zone with sufficient force to create turbulence within said turbulent zone, and that will cause waste liquor to pass through said barrier and into and gently downwardly through said mixing zone whereby aerobic microbial growth on said bouyant media will be established; regulating air introduction into said aerating zones to establish a non-turbulent flow rate of waste liquor through said mixing zone sufficient to enable said bouyant media to be self-cleaning but insuffient to wash said microbial growth off said bouyant media; permitting treated waste liquor to settle from said mixing zone into said settling zone in the absence of aeration below said mixing zone; permitting waste liquor portions to settle out from said settling zone into said sludge-collecting zone in the absence of aeration; and drawing off treated waste liquor from within said settling zone.

5,200,082

METHOD FOR REMOVING TOXIC SUBSTANCES FROM INDUSTRIAL AND AGRICULTURAL WASTE WATER

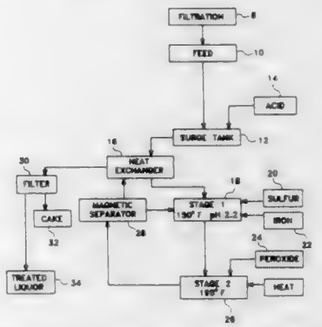
Orrie C. Olsen, and Peter F. Santina, both of Walnut Creek, Calif., assignors to Santina Water Company, Concord, Calif.

Filed Jul. 2, 1991, Ser. No. 724,993

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[5] **C02F** *1/48, 1/70*

U.S. Cl. 210—667 **25 Claims**



1. A method for removing soluble selenium from a liquor of industrial waste water containing selenium, comprising,

adjusting the pH of the liquor to an acid range,

adding a reducing agent to the liquor, with agitation, to form a slurry with the liquor and reducing agent,

adding wettable elemental sulfur to the liquor,

the amounts of the reducing agent and of the sulfur being selected in combination to permit recovery of the selenium with additional steps of:

continuing to agitate the slurry,

after a period of time within which the pH of the slurry rises and then stabilizes, oxidizing the slurry sufficiently to effect selenium recovery as a precipitate, and continuing to agitate the slurry substantially continuously, and

separating the recovered, precipitated selenium to produce a treated liquor low in selenium.

5,200,083

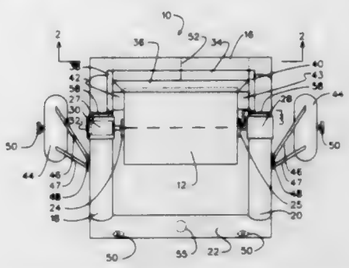
SKIMMER AND METHOD FOR ITS USE

Joseph B. Kaylor, Manassas, Va., assignor to Jannette Gomez Kaylor, Manassas, Va.

Filed Oct. 16, 1991, Ser. No. 778,295

Int. Cl.[5] **E02B** *15/04*

U.S. Cl. 210—671 **19 Claims**



14. A method for operating a drum skimmer to recover oil floating on water comprising:

covering the oil contacting surface of said skimmer drum with an oil-avid material, said material comprising a non-woven mat of oleophilic fibers, substantially the entire

surface of said fibers coated with a film of a hydrocarbon

5,200,085

tive coacervating amount of a finely divided water insoluble

5,200,088

REMOVAL OF HEXAVALENT CHROMIUM FROM

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surface of said fibers coated with a film of a hydrocarbon soluble non-crosslinked rubber;

continuously rotating said drum with its lower surface in contact with said floating oil to remove therefrom an adhering layer of oil with accompanying water;

adjusting the rotation rate of said drum so that its rim velocity is sufficiently fast to cause a separation of said accompanying water from said adhering oil layer; and

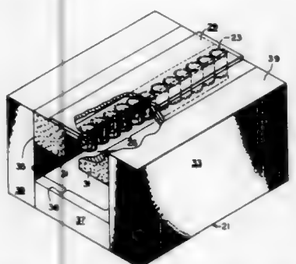
removing said adhering oil layer from said drum surface.

5,200,084

APPARATUS AND METHODS FOR MAGNETIC SEPARATION

Paul A. Liberti, Churchville; Brian P. Feeley, Easton, and Dhanesh I. Gohel, Philadelphia, all of Pa., assignors to Immunicon Corporation, Huntingdon Valley, Pa.

Filed Sep. 26, 1990, Ser. No. 588,662
Int. Cl.[5] B01D *1/48*
U.S. Cl. 210—695 **42 Claims**



21. A method for magnetically separating a target substance from a non-magnetic test medium in a magnetic separator comprising a container with an open top, magnetic wire means positioned within the container providing an exposed surface area and magnetic means for magnetizing the magnetic wire means, the method comprising the steps of:

a) contacting a quantity of magnetic particles comprising a receptor capable of binding specifically to said target substance within said test medium under conditions causing binding of said receptor to said target substance, resulting in target substance-bearing magnetic particles;

b) introducing said test medium in which said magnetic particles are suspended into said container holding said magnetic wire means; and

c) positioning said container holding magnetic wire means and said test medium having the suspension of magnetic particles therein adjacent to said magnetic means in order to generate in said test medium a magnetic field gradient operative upon the magnetic particles within the test medium to attract said magnetic particles to the exposed surface area of the magnetized wire and cause such particles to be adhered to said exposed surface, and

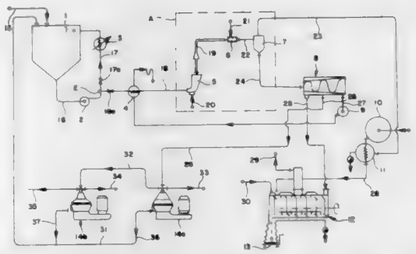
d) controlling the quantity of magnetic particles introduced into the container relative to the exposed surface area of said wire means, and controlling the orientation of said exposed surface area causing said particles to adhere to the surface area in a substantially single layer corresponding in thickness to about the size of said target-substance bearing magnetic particles.

5,200,085

PROCESS AND APPARATUS FOR EXTRACTION OF SOLID MATTER CONTAINING FAT AND/OR PROTEIN FROM SLUDGE

Péter Rudolf; Béla Szabó, both of Budapest; Ferenc Jankó, Győr; Erzsébet Neszmélyi, Budapest; János Illés, Budapest; István Takács, Budapest; Ferenc Havas, Kapuvár, and György Bende, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Hungary

PCT No. PCT/HU90/00063, § 371 Date May 3, 1991, § 102(e) Date May 3, 1991, PCT Pub. No. WO91/03305, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 3, 1990, Ser. No. 679,059
Claims priority, application Hungary, Sep. 5, 1989, 4567/89
Int. Cl.[5] C02F *11/12*
U.S. Cl. 210—703 **14 Claims**



1. A process for the extraction of one or both of fat and protein containing material from waste water sludge, the process comprising the steps of:

circulating the waste water sludge in a circulating tank;

heating the waste water sludge to a temperature of 30°–60° C.;

pressurizing the waste water sludge to a pressure of 2–4 bar;

supplying the waste water sludge to a heating unit;

heating the waste water sludge to an increased temperature of approximately 130°–150° C. in 1–2 seconds in the heating unit to bring about granulation in the waste water sludge;

holding the waste water sludge in a heat holding pipe connected to the heating unit for approximately 60–300 seconds while the pressure of 2–4 bar and the increased temperature of 130°–150° C. are maintained;

expanding the waste water sludge adiabatically in 1–2 seconds by reducing the pressure to approximately 0.01–0.02 bar using an adiabatic expansion valve connected to the heat holding pipe;

supplying the waste water sludge to a separating tank; and

separating the waste water sludge into water, water containing fat and solid impurity and a solid phase containing protein in a three-phase screw centrifuge connected to the separating tank.

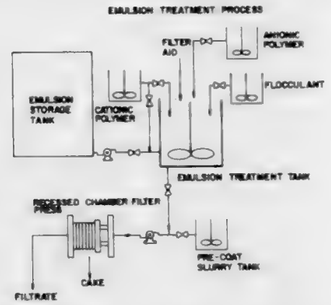
5,200,086

EMULSION DESTABILIZATION AND TREATMENT

Jitendra T. Shah, Naperville; Thomas M. Miller, Aurora, and John H. Collins, Bloomingdale, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 20, 1991, Ser. No. 747,776
Int. Cl.[5] C02F *1/56*
U.S. Cl. 210—708 **18 Claims**

1. A treatment process for treating phosphorous containing oily waste emulsions containing fatty acid esters obtained from polyester fiber of phosphonic acids finishing operations, which treating process comprises treating said phosphorous containing oily waste emulsion containing the fatty acid esters with an effective emulsion destabilizing amount of a cationic emulsion destabilizing polymer having a weight average molecular weight ranging from about 1000 to about 500,000 and an effective coacervating amount of a finely divided water insoluble filter aid, mixing and forming a coacervated slurry containing said esters in water and then removing the slurry phase containing fatty acid esters of phosphoric acids from the water phase, discarding the slurry phase, and either discharging or recycling the water phase.

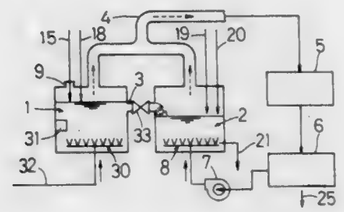


5,200,087

METHOD OF AND APPARATUS FOR RECOVERING MERCURY FROM DRAINAGE

Mitsuyuki Nishihara, Kyoto, Japan, assignor to Kubota Corporation, Osaka, Japan

Filed Dec. 9, 1991, Ser. No. 803,591
Claims priority, application Japan, Dec. 12, 1990, 2-401734
Int. Cl.[5] C02F *1/62, 1/70*
U.S. Cl. 210—718 **11 Claims**



1. A method of recovering mercury from drainage comprising the steps of:

feeding mercury-containing waste water into a first treating tank;

heating the waste water in said first treating tank together with a metal having a stronger ionizing tendency than mercury, to reduce mercury ions in the waste water and free the mercury ions as metallic mercury;

transferring the solution under treatment from said first treating tank to a second treating tank;

adjusting the solution to be alkaline in said second treating tank, and reducing the mercury ions remaining in the solution under treatment by means of a water soluble metallic salt having a stronger ionizing tendency than mercury, to free the mercury ions as metallic mercury;

collecting and cooling mercury vapor containing gases generated from said first treating tank and said second treating tank:

collecting, in a gas-liquid separator, mercury having been condensed and liquefied as a result of the cooling step; and

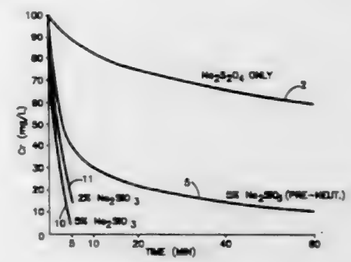
feeding exhaust gas generated from said gas-liquid separator into the solution under treatment in said second treating tank.

5,200,088

REMOVAL OF HEXAVALENT CHROMIUM FROM WASTE MATERIAL

John F. Pilznienski, Dearborn Hts., Mich., assignor to Kolene Corporation, Detroit, Mich.

Filed Jul. 15, 1991, Ser. No. 730,106
Int. Cl.[5] C02F *1/62*
U.S. Cl. 210—720 **20 Claims**



1. A method of removing Cr^{+6} ions from an alkaline solution having a pH of at least about 10 or higher comprising the steps of:

adding to the alkaline solution an effective amount of an alkali metal dithionite to reduce the Cr^{+6} toe Cr^{+3}, said Cr^{+3} being formed at least in part in colloidal or soluble form;

providing in said solution a soluble coprecipitant selected from the group consisting of silicates and aluminates which will form a precipitate at reduced pH from that of the alkaline solution, and which precipitate will tie up said colloidal or soluble Cr^{+3} as a coprecipitated material;

lowering the pH of the solution to between about 7.0 and about 9.5; and,

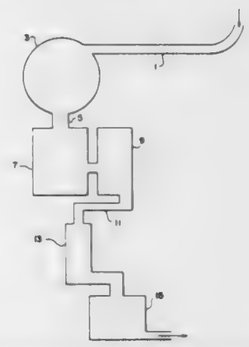
thereafter removing said coprecipitated material from the solution.

5,200,089

PULP AND PAPER MILL WASTEWATER COLOR REMOVAL

Kristine S. Siefert, Crete; Manian Ramesh, Naperville; Martha R. Finck, Countryside, and Chandrashekar S. Shetty, Lisle, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 12, 1991, Ser. No. 744,172
Int. Cl.[5] C02F *1/56*
U.S. Cl. 210—725 **4 Claims**



1. A method for decolorizing an effluent stream from a pulp mill plant, said effluent stream having a pH of from about 9 to about 10 and including color bodies, the method comprising the steps of adding an effective amount of a decolorizing com-

ture zone in a lower region thereof wherein a liquid phase is contains sludge dispersed therein; said processing comprising

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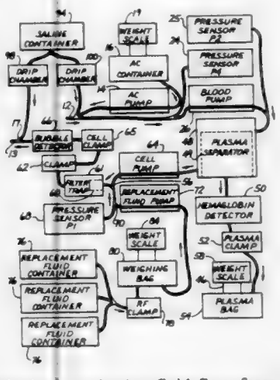
position including ferrous sulfate and a water-soluble cationic amine polymer formed by the reaction of epichlorohydrin with dimethylamine, the ferrous sulfate and polymer in a molar ratio of from 30 to 1 to 1 to 1, said decolorizing composition reacting with the color bodies to form a sludge; and removing the sludge from the effluent stream.

5,200,090

MULTIPLE FLUID SOURCE ISOLATION, METERING AND ALARM SYSTEM AND METHOD

Michael G. Ford, Orange, and Paul R. Prince, San Juan Capistrano, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 502,395, Mar. 30, 1990, abandoned. This application Oct. 1, 1991, Ser. No. 769,335
Int. Cl.[5] B01D *35/157, 21/30, 61/32*
U.S. Cl. 210—739 53 Claims



32. A method of monitoring fluid flow from one or more containers having a limited fluid source into a fluid flow system so as to prevent air from an empty container entering the flow system, said method comprising:

(1) flowing a first isolated amount of fluid from at least one of said fluid sources into a weighing bag;

(2) weighing the fluid in the weighing bag;

(3) controlling the flow of fluid from the fluid source such that fluid is flowed into the weighing bag when the weight of fluid in the bag has dropped below a preselected lower working limit and fluid flow into the weighing bag is stopped when the weight of fluid in the weighing bag rises above a preselected upper working limit; and

(4) initiating flow from the weighing bag into the flow system until the weight of fluid falls below the lower working limit.

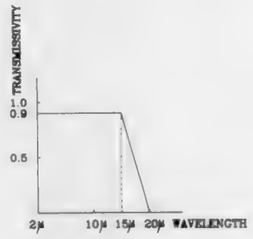
5,200,091

PROCESS TO RECOVER SALT FROM BRINE WASTE WATER

Chang S. Chang, 2F, No. 3, Alley 10, Lane 304, An leh Road, Yung Ho City, Taipei Hsien, Taiwan

Filed Nov. 7, 1991, Ser. No. 788,850
Int. Cl.[5] B01D *17/06*
U.S. Cl. 210—748 1 Claim

1. The process to recover salt from Brine waste water, using infrared light to vaporize or decompose the organic compounds coated on the surfaces of sodium chloride or potassium



chloride crystals whereby to purify above salt crystals, regardless of the type of infrared equipment.

5,200,092

COMPOSITION AND METHOD FOR SULFIDE CONTROL

Bruce E. Richards, Streator; Tyrone G. Goodart, Peru; Philip A. Vella, and John R. Walton, both of Ottawa, all of Ill., assignors to Carus Corporation, Peru, Ill.

Filed Jun. 23, 1992, Ser. No. 903,006
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—758 6 Claims

6. A method for controlling the sulfides in water, the method comprising:

adding to the sulfide containing water an aqueous composition comprising

from about 0.5 to about 10 weight percent potassium permanganate;

from about 0.5 to about 42 weight percent sodium nitrate; and

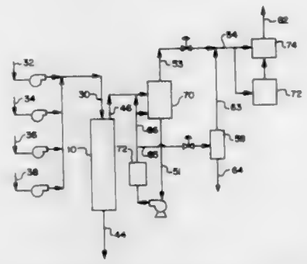
from about 48 to about 99 weight percent water at a rate to maintain a permanganate salt to S^{2-} sulfide ion concentration in the range of from about 1:1 to about 6:1.

5,200,093

SUPERCRITICAL WATER OXIDATION WITH OVERHEAD EFFLUENT QUENCHING

Herbert E. Barner, Kinnelon; Chiung-Yuan Huang, Glen Ridge, both of N.J.; William R. Killilea, West Chelmsford, and Glenn T. Hong, Tewksbury, both of Mass., assignors to ABB Lummus Crest Inc., Bloomfield, N.J.

Filed Jun. 3, 1991, Ser. No. 709,264
Int. Cl.[5] C02F *1/74, 11/08*
U.S. Cl. 210—761 5 Claims



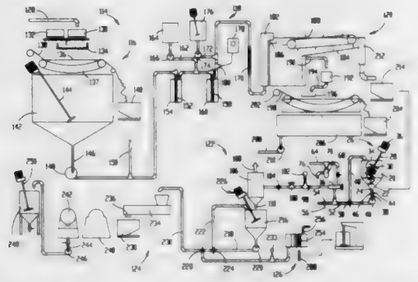
1. In a supercritical water oxidation process of the type wherein a pressurized feed material including water, organics, inorganics, and oxidant are introduced into an upper region of a vertically elongated, generally cylindrical walled, closed pressure vessel defining within its interior a supercritical temperature zone in the upper region thereof and a lower temperature zone in a lower region thereof wherein a liquid phase is provided, and allowed to oxidize under supercritical temperature conditions in the supercritical temperature zone to form an oxidized super fluid phase which is discharged from the upper region of the vessel and precipitates, said precipitates and other solids passing from the supercritical temperature zone and collecting in the lower temperature zone in an aqueous brine solution which is discharged from the lower region of the vessel, the improvement comprising contacting the discharged oxidized super fluid phase with a cold quench liquid so as to produce a resultant vapor stream and a resultant liquid stream containing the bulk of any of said precipitates and other solids carried over in the oxidized supercritical fluid phase.

5,200,094

METHOD OF RECOVERY OF PRINTING INK WASTES USING ELEVATED TEMPERATURE, PRESSURE AND SHEAR

Alan M. Hill, Topeka; Michael D. Cain, and Donald D. Cain, both of Lawrence, all of Kans., assignors to Lawrence Paper Company, Lawrence, Kans.

Continuation-in-part of Ser. No. 811,183, Dec. 20, 1991, abandoned. This application Jun. 15, 1992, Ser. No. 899,090
Int. Cl.[5] B01D *1/14;* B41F *31/20*
U.S. Cl. 210—768 16 Claims



1. A method of recovering printing ink wastes, comprising the steps of:

providing a flowable stream of material including printing ink wastes;

directing said flowable stream into a confined zone while simultaneously passing a stream of steam into said zone;

subjecting said flowable stream to conditions of elevated temperature and pressure and intense shear by contacting said flowable stream with said steam in said zone, to thereby create processed ink wastes; and

passing said processed ink wastes out of said zone.

2. The method of claim 1, said material stream-providing step comprising the steps of:

obtaining a quantity of printing ink washup waste;

separating a substantial fraction of a solids fraction of said washup waste to form a sludge; and

agitating said sludge to form said flowable stream.

5,200,095

ECOLOGICAL PROCEDURE FOR THE TREATMENT AND COMPLETE RECOVERY OF SLUDGE FROM SUGARED FRUIT CONCENTRATES

Carlos A. P. Franco, Villanueva De La Canada, and Carlos M. Sanchez, Tarancon, both of Spain, assignors to Energia e Industrias Aragonesas, S.A., Spain

Filed Oct. 21, 1991, Ser. No. 779,863
Claims priority, application Spain, May 16, 1991, 9101186
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—781 9 Claims

1. An ecological procedure for the treatment and complete recovery of sludge from sugared fruit juice concentrate which contains sludge dispersed therein; said processing comprising the steps of:

(a) subjecting said fruit juice concentrate to a first phase separation step to separate sludge from said fruit juice concentrate; said first phase separation being conducted under temperature conditions and residence time to cause the precipitation of sludge from the juice concurrently with the phase separation and to form a stream of fruit juice concentrate having a suspended solids content of 2 to 5%; said first phase separation being conducted at a temperature of 2° to 50° C. and a residence time of 0.05 to 15 minutes;

(b) subjecting said stream of fruit juice containing 2 to 5% suspended solids to a second phase separation wherein sludge is precipitated and removed from the juice to produce a stream of concentrated fruit juice substantially free of sludge;

(c) recovering said sludge from said first and second phase separation steps.

5,200,096

METHOD OF INHIBITING CORROSION IN ACIDIZING WELLS

Dennis A. Williams; Phyllis K. Holifield; James R. Looney, and Lee A. McDougall, all of Houston, Tex., assignors to Exxon Chemicals Patents, Inc., Linden, N.J.

Filed Sep. 27, 1991, Ser. No. 768,060
Int. Cl.[5] E21B *43/07;* C11D *7/48;* C23F *11/16*
U.S. Cl. 252—8.553 9 Claims

1. In a method of acidizing a subterranean formation penetrated by a borehole which has metal pipe positioned therein comprising:

(a) selecting an aqueous acid solution selected from the group consisting of 7.5% to 20% HCl and mud acid containing from 9 to 21% HCl;

(b) adding separately to the acid solution the following additives to form a corrosion inhibitor in said acid solution;

(i) from 0.10 to 4.0 wt % of a bismuth compound;

(ii) from 0.2 to 10 wt % of a quaternary ammonium compound capable of forming a complex with bismuth; and

(c) adding to the acid solution from 0.1 to 25 wt % of a surfactant having an HLB of 1–16 for solutions containing from 15 to 24 wt % acid, and 1 to 5.5 for solutions containing less than 15% acid and not less than 10% acid, and greater than 1 and less than 3 for solutions containing less than 10 wt % acid; said acid solution being free of toxic acetylenic and antimony compounds; and

(d) pumping the solution with the corrosion inhibitor down the pipe and into the formation.

5,200,097

PROCESS FOR MAKING A PARTICULATE WATER DISPERSIBLE FREE FLOWING FABRIC SOFTENER COMPOSITION

Leonard Hughes; James G. Fuller, both of Dublin, Ohio, and William J. Zeman, Janesville, Wis., assignors to Sherex Chemical Company, Inc., Dublin, Ohio

Continuation-in-part of Ser. No. 354,476, May 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 233,340, May 31, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 512,887
Int. Cl.[5] C11D *3/42*
U.S. Cl. 252—8.75 13 Claims

1. A method for making bis(alkylamidoalkyl)amine-derived quaternary compound fabric softener in particulate form which comprises:

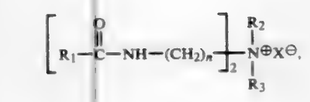
1) forming a liquified blend of:

(a) said bis(alkylamidoalkyl)amine-derived quaternary compound of the formula:

5,200,101

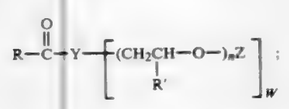
5,200,103

VOL 1149 ISS 1 AP 6 1993 UMI

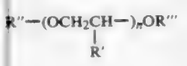


where:
R_1 is a C_6–C_{22} alkyl group
R_2 is a C_1–C_3 alkyl group
R_3 is a C_1–C_3 alkyl group, a phenyl group or a benzyl group
n is 1–6
X^- is a monovalent anionic residue of an alkylating agent and,

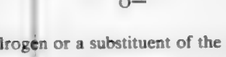
(b) a polyoxyalkylene derivative processing aid of a compound having the structural formula:



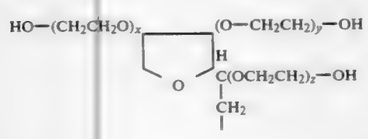
a compound having the structural formula:



where:
n is 0–30
R is a C_6–C_{22} alkyl group,
R′ is hydrogen or a C_1–C_3 alkyl group,
R″ is hydrogen, C_5–C_{22} alkyl or isostearyl;
R‴ is hydrogen, C_5–C_{22} alkyl or isostearyl;
W = 1 or 2
Y is oxygen or a substituent of the formula:



Z is hydrogen or a substituent of the formula:



wherein x, y, and z may be from 1 to 10 and mixtures thereof; said processing aid present in an amount effective for quaternary compound to be pumpable

(2) atomizing said liquified blend to form particulates thereof.

5,200,098

CERIUM-CONTAINING LUBRICATING COMPOSITIONS

Josefina M. Dumdum, Chino Hills, and Paula J. Bosserman, Riverside, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 12, 1988, Ser. No. 257,107
Int. Cl.[5] C10M *125/18*

U.S. Cl. 252—18 **20 Claims**

5. A method for providing an anti-wear lubrication composition comprising the steps of:

a) digesting a cerium/fluorine-containing composition contaminated with high silicon and iron contents with an aqueous solution of hydrofluoric acid for a time sufficient to reduce the combined silicon and iron contents to below about 1.0 weight percent and to raise the fluorine-to-cerium molar ratio to about 3.0 or above, with said upgraded composition having a combined iron and silicon content of at least about 0.1 weight percent; and

b) forming said anti-wear lubricating composition by blending a homogeneous mixture of:

1) at least about 80 weight percent of a lubricant; and

2) from about 0.1 to about 20 weight percent of the digested cerium/fluorine-containing composition of step a).

5,200,099

REACTION PRODUCTS OF DIALKYL AND TRIALKYL PROSPHITES WITH ELEMENTAL SULFUR AND THEIR USE IN LUBRICANT COMPOSITIONS

Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 108,599, Oct. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 883,665, Jul. 9, 1986, Pat. No. 4,717,491. This application Jan. 5, 1990, Ser. No. 461,201
Int. Cl.[5] C10M *137/04*

U.S. Cl. 252—32.7 E **2 Claims**

1. A process for making a lubricating oil comprising:

(a) reacting a dialkyl or trialkyl phosphite having the structural formula $(R'O)_2POR^2$ where R′ is an alkyl hydrocarbon radical of 4 to 18 carbon atoms and R^2 is hydrogen or an alkyl hydrocarbon radical of 4 to 18 carbon atoms with a reactant consisting essentially of elemental sulfur in a mole ratio of sulfur to phosphite of about 0.8 to about 1.2, at a temperature between 75° C. and about 110° C. in the absence of any catalytic material added to promote reaction of the two reactants;

(b) separating the reaction product thereby obtained; and

(c) blending the reaction product with a lubricating oil.

5,200,100

MULTIFUNCTIONAL VISCOSITY INDEX IMPROVER CONTAINING PHENOTHIAZINE

Maria M. Kapuscinski, Carmel; Theodore E. Nalesnik, Wappingers Falls; Robert T. Biggs, Walden, and Benjamin J. Kaufman, Hopewell Junction, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 24, 1991, Ser. No. 690,241
Int. Cl.[5] C10M *151/02, 149/04*

U.S. Cl. 252—47.5 **7 Claims**

1. A substantially linear graft polymer soluble inoic containing a carbon-carbon backbone which comprises a substantially linear carbon backbone polymer with pendant groups containing phenothiazine which groups are attached to the polymer by grafting reaction onto said polymer backbone of a graft functional monomer containing phenothiazine, said monomer being present in the amount of 0.01 to 3.0 moles per 1000 carbon atoms of the backbone polymer and graft polymerized thereon, under graft polymerization at a temperature of 150° to 160° C. in the presence of dicumyl peroxide derived from unsaturated compound containing groups which are capable for reacting with amino alkyl phenothiazine which has an amine containing group attached to the aromatic ring.

5,200,101

ARYLAMINE/HINDERED PHENOL, ACID ANHYDRIDE AND THIOESTER-DERIVED MULTIFUNCTIONAL ANTIOXIDANT, ANTIWEAR AND RUST INHIBITING ADDITIVES

Shin-Ying Hsu, Morrisville, Pa.; Andrew G. Horodysky, Cherry Hill, N.J.; Douglas E. Johnson, Pennington, N.J., and David A. Blain, Mount Laurel, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 24, 1991, Ser. No. 719,407
Int. Cl.[5] C10M *135/12*

U.S. Cl. 252—47.5 **20 Claims**

1. An improved lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor multifunctional antiwear, antioxidant, rust inhibiting additive product of reaction prepared by reacting an arylamine with a hydrocarbyl acid anhydride and a thioester in equimolar, less than molar or more than molar amounts at temperatures varying from ambient to about 250° C. under pressures varying from ambient to slightly higher or autogenous for a time sufficient to obtain the desired additive product of reaction.

5,200,102

MULTIFUNCTIONAL OLEFIN COPOLYMER AND LUBRICATING OIL COMPOSITION

Munmaya K. Mishra, and Isaac D. Rubin, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

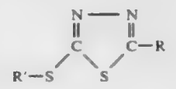
Filed Dec. 2, 1991, Ser. No. 801,220
Int. Cl.[5] C10M *149/12;* **C08F** *255/06*

U.S. Cl. 252—475 **12 Claims**

9. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor amount effective to impart viscosity index improvement, dispersancy, antiwear and antioxidant properties to said oil of an additive reaction product prepared by the steps comprising:

(A) reacting a polymer prepared from ethylene and at least one C_3–C_{10} alpha-monoolefin and, optionally, a polyene selected from non-conjugated dienes and trienes comprising from about 15 to 80 mole percent of ethylene, from about 20 to 85 mole percent of said C_3–C_{20} alpha-monoolefin, and from about 0 to 15 mole percent of said polyene and having an average molecular weight ranging from about 5,000 to 500,000 with at least one olefinic carboxylic acid acylating agent to form one or more acylating reaction intermediates characterized by having a carboxylic acid acylating function within their structure, and

(B) reacting said reaction intermediate in (A) with an amino alkylthio thiadiazole represented by the formula:



in which
R is $—NH_2$, $—CH_2—(CH_2)_n—NH_2$,
$—CH_2—$aryl$—NH_2$ in which n has a value from 1 to 10, and
R′ is hydrogen, a hydrocarbyl radical having from 1 to 10 carbon atoms, or a hydroxyalkyl or alkoxyl radical having from 2 to 10 carbon atoms.

5,200,103

ETHYLENE ALPHA-OLEFIN COPOLYMER SUBSTITUTED MANNICH BASE LUBRICANT DISPSERSANT ADDITIVES

Won R. Song, Short Hills; Robert D. Lunberg, Bridgewater; Antonio Gutierrez, Mercerville, and Robert A. Kleist, Bayonne, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 226,604, Aug. 1, 1988, Pat. No. 5,017,299. This application Feb. 1, 1990, Ser. No. 473,625
The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.
Int. Cl.[5] C10M *159.16*

U.S. Cl. 252—51.5 R **25 Claims**

1. A lubricating oil dispersant additive useful in oleaginous compositions which comprises a condensation product obtained by the reaction of:

(a) at least one alkyl-substituted hydroxyaromatic compound formed by the alkylation of at least one hydroxy aromatic compound with at least one terminally unsaturated ethylene alpha-olefin polymer of 300 to 20,000 number average molecular weight, at least 30% of said polymer's chains contain terminal ethenylidene unsaturation;

(b) at least one aldehyde reactant; and

(c) at least one nucleophilic reactant.

5,200,104

COMPOSITION FOR THE TREATMENT OF OVERSPRAY IN PAINT SPRAY BOOTHS

Edwin C. Zuerner, Troy; Robert R. Patzelt, and Norman Foster, both of Bloomfield Hills, all of Mich., assignors to Nortru, Inc., Detroit, Mich.

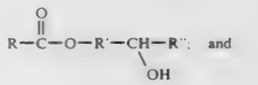
Filed Nov. 8, 1991, Ser. No. 790,650
Int. Cl.[5] C11D *7/50*

U.S. Cl. 252—170 **15 Claims**

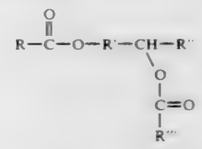
1. A composition for treating oversprayed paints consisting essentially of:

between about 5 and about 50 percent by volume of a carbonyl compound selected from the group consisting of

1. alcohol esters having the general formula:



2. condensation products of alcohol esters and carboxylic acid having the general formula:



and mixtures thereof, wherein R′ and R″ are chosen from the group consisting of substituted alkyl groups, unsubstituted alkyl groups and mixtures thereof, said substituted and unsubstituted alkyl groups having from 1 to 8 carbon atoms, wherein R and R‴ are chosen from the group consisting of linear alkyl groups having from 1 to 10 carbon atoms, branched alkyl groups having from 1 to 10 carbon atoms, R and R‴ being either identical or different alkyl functionalities, said carbonyl compound being capable of dissolving paint while remaining essentially insoluble and non-reactive with an aqueous media;

from about 0.1 to about 20% by volume of an emulsifier; and

water.

5,200,105

continued

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5,200,105

SCALE CONTROL IN AQUEOUS SYSTEMS

Dionisio G. Cuisia, Buffalo Grove, Ill., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 512,282, Apr. 20, 1990, abandoned. This application Nov. 7, 1991, Ser. No. 790,105

Int. Cl.[5] C02F *5/14*

U.S. Cl. 252—180 **6 Claims**

1. A composition for inhibiting the deposition of scale and sludge in aqueous systems comprising the combination of three or more additives selected from the group consisting of

(a) polyacrylic acid (PAA) having a molecular weight of from 1000 to 90,000, copolymer of allyl sulfonate and maleic anhydride (ASMA) having a molecular weight of from 1,000 to 10,000 and a weight ratio of 1:1, and mixtures thereof,

(b) hydroxyethylidene diphosphonic acid (HEDPA), amino (trimethylene)phosphonic acid (AMP), diethylenetriamine pentaacetic acid (DTPA) and mixtures thereof, and

(c) copolymer of acrylic acid and acrylamide (AAA) having a molecular weight of from 1000 to 10,000 and a weight ratio of 1:10 to 10:1, and wherein the combination contains at least one additive selected from each of (a), (b), and (c) supra in a ratio of a:b:c of (6-2):(6-2):(3-1) respectively on an active basis.

5,200,106

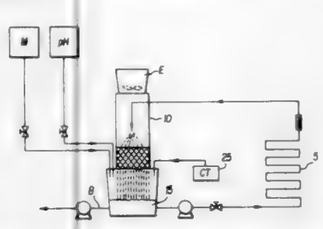
COMPOSITIONS COMPRISING TRANSITION METALS FOR TREATING AND MONITORING LIQUID SYSTEMS

John E. Hoots, St. Charles; Rodney H. Banks, Naperville, and Donald A. Johnson, Batavia, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 315,713, Feb. 27, 1989, Pat. No. 4,966,711. This application Sep. 20, 1990, Ser. No. 585,899

Int. Cl.[5] C02F *5/00, 1/00*

U.S. Cl. 252—181 **28 Claims**



1. A product for monitoring a liquid system comprising at least one metal tracer which is a transition metal in the form of an ion, cation, oxyanion or other charged radical which is soluble in the liquid system, wherein said tracer is present in the product in an amount such that, within the liquid system to which the product is to be added, a concentration of said tracer of from 10 parts per billion to 2 parts per million is realized.

5,200,107

POLYMETHYLMETHACRYLATE SYRUP AS MEDIUM FOR LIQUID CRYSTALS

Virginia Piermattie, Pittsburgh, and Sharon J. Elliot, Hempfield Township, Westmoreland County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1991, Ser. No. 749,788

Int. Cl.[5] C09K *19/52, 19/00*; G02F *1/13*

U.S. Cl. 252—299.01 **12 Claims**

1. A composition for making liquid crystal films comprising liquid crystal dispersed in a polymethylmethacrylate syrup comprising about 1% to about 25% by weight polymethylmethacrylate dissolved in methyl methacrylate monomer, in a weight ratio of liquid crystal to syrup of about 1:3 to about 1.3:1.

5,200,108

FERROELECTRIC LIQUID CRYSTAL COMPOSITION, LIQUID CRYSTAL OPTICAL DEVICE PRODUCED BY USING THE FERROELECTRIC LIQUID CRYSTAL COMPOSITION, AND METHOD OF PRODUCING THE LIQUID CRYSTAL OPTICAL DEVICE

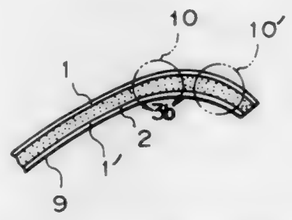
Kimihiro Yuasa; Satoshi Hachiya; Kazuharu Morita, and Kenji Hashimoto, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 384,785

Claims priority, application Japan, Jul. 26, 1988, 63-184673; Sep. 9, 1988, 63-224715; Feb. 22, 1989, 1-40287

Int. Cl.[5] C09K *19/52*; G02F *1/13*

U.S. Cl. 752—299.01 **6 Claims**



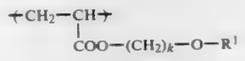
1. A liquid crystal optical device comprising two flexible substrates that

are parallel to each other,

have surfaces facing each other on which are disposed respective electrode layers, at least one of the electrode layers being a transparent electrode layer, and

support a layer of a ferroelectric liquid crystal composition therebetween and in contact with the electrode layers;

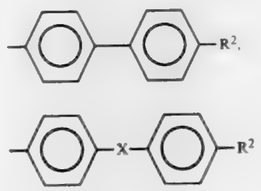
the layer of the ferroelectric liquid crystal composition which is disposed between the two substrates and in contact with the electrode layers of the substrates comprising from 40 to 97% by weight of (A) a ferroelectric liquid crystal material and from 3 to 60% by weight of (B) a non-liquid-crystalline polymeric material selected from the group consisting of a thermoplastic resin, a crosslinkable resin and a mixture thereof; the (A) ferroelectric liquid crystal material being uniaxially oriented by a bending treatment and comprising at least 3 mol % of at least one ferroelectric polymeric liquid crystal having a number average molecular weight of at least 1,000 and being selected from the group consisting of a polyacrylate-type ferroelectric polymeric liquid crystal having the repeating units represented by the following general formula:



wherein

k is an integer having a value of 1 to 30,

R^1 is



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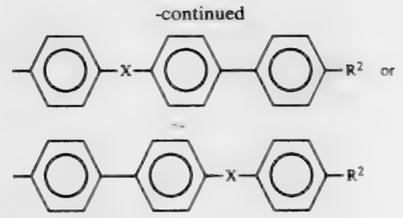
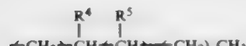


• X is —COO— or —OCO—,

R^2 is —$COOR^3$, —$OCOR^3$, —OR^3 or —R^3, wherein R^3 is



wherein

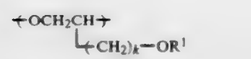
each of m and n is independently an integer having a value of 0 to 9,

q is an integer having a value of 0 or 1,

each of R^4 and R^5 is independently —CH_3, a halogen atom or —CN, with the proviso that when R^5 is —CH_3, n is not an integer having a value of 0, and that when q is 0 and R^4 is —CH_3, n is not an integer having a value of 0, and

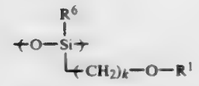
C* represents an asymmetric carbon atom;

a polyether-type ferroelectric polymeric liquid crystal having the repeating units represented by the following general formula:



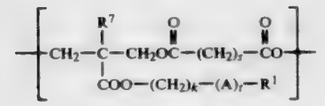
wherein k and R^1 are as defined above;

a polysiloxane-type ferroelectric polymeric liquid crystal having the repeating units represented by the following general formula:



wherein R^6 is a lower alkyl radical and k and R^1 are as defined above; and

polyester-type ferroelectric polymeric liquid crystals having the repeating units represented by the following general formula:



wherein

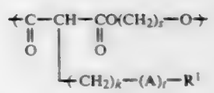
R^7 is —H, —CH_3 or —C_2H_5,

s is an integer having a value of 1 to 20,

A is —O— or —COO—,

t is an integer having a value of 0 or 1, and

R^1 and k are as defined above or



wherein s, A, t, R^1 and k are as defined above.

5,200,109

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE USING SAME

Takashi Iwaki, Isehara; Takao Takiguchi, Tokyo; Shinichi Nakamura; Yoko Yamada, both of Atsugi; Takeshi Togano, Yokohama, and Shosei Mori, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

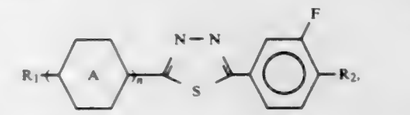
Continuation of Ser. No. 585,530, Sep. 20, 1990, abandoned. This application Jan. 15, 1992, Ser. No. 820,811

Claims priority, application Japan, Sep. 22, 1989, 1-245012; May 15, 1990, 2-123149

Int. Cl.[5] C09K *19/34, 19/30*; C07D *285/12*

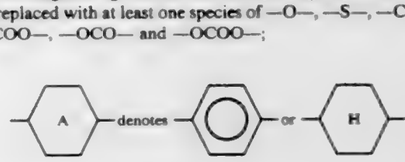
U.S. Cl. 252—299.61 **201 Claims**

1. A mesomorphic compound represented by the following formula (I):



(I)

wherein R_1 and R_2 respectively denote a linear or branched alkyl group having 1–18 carbon atoms capable of including one or non-neighboring two or more methylene groups which can be replaced with at least one species of —O—, —S—, —CO—, —COO—, —OCO— and —OCOO—;



and n is 0 or 1.

5,200,110

PYRIMIDINE DERIVATIVES AND LIQUID CRYSTAL COMPOSITIONS INCLUDING SAME

Tsuyoshi Obikawa; Shuhei Yamada, and Shuji Ikukawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 501,203, Mar. 29, 1990, abandoned. This application Apr. 15, 1992, Ser. No. 870,727

Claims priority, application Japan, Apr. 6, 1989, 1-87428; Apr. 6, 1989, 1-87429; Sep. 11, 1989, 1-234096; Oct. 12, 1989, 1-265665; Nov. 20, 1989, 1-301481

Int. Cl.[5] C09K *19/34*; C07C *277/00, 255/00*

U.S. Cl. 252—299.61 **20 Claims**

10. A liquid crystal composition comprising an effective amount of at least one 2-phenyl-5-(4'-trans-cyclohexyl) phenyl pyrimidine derivative for widening the nematic temperature range and decreasing the threshold voltage, the pyrimidine derivative having the general formula:

exposed to said source of energy substantially not being

the time which 1 gram of paste-form product takes to dissolve

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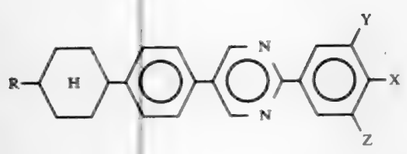


(I)

wherein R is a straight chain alkyl group having 1 to 10 carbon atoms; X is CN or F; Y is F or H; Z is F or H; when X is F, one of Y and Z is H and the other is F; when X is CN, at least one of Y and Z is F; and the cyclohexane ring is a trans isomer.

5,200,111

OPTICALLY ACTIVE COMPOUND

Seiichi Takano, Izumi; Kunio Ogasawara, Sendai; Toshihiro Shibata, Omiya; Masaki Kimura, Tokorozawa, and Norio Kurosawa, Urawa, all of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 326,540

Claims priority, application Japan, Mar. 25, 1988, 63-71067

Int. Cl.[5] C09K *19/52, 19/12;* **C07C** *41/00, 43/00*

U.S. Cl. 252—299.66 **2 Claims**

1. A nematic liquid crystal composition comprising an optically active compound and a nematic liquid crystal compound, wherein said optically active compound is (S,S)-4-[4'-(3''-chloro-1''-methylbutoxyl)phenyl]benzonitrile.

5,200,112

ELECTRICALLY CONDUCTIVE POLYMERIC MATERIALS AND USES THEREOF

Marie Angelopoulos, Briarcliff Manor; Wu-Song Huang, Poughkeepsie; Richard D. Kaplan, Wappingers Falls, all of N.Y.; Marie-Annick Le Corre, St Fargeau Ponthierry, France; Stanley E. Perreault, Wappingers Falls, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Michel R. Tissier, Noisy Sur Ecole, France, and George F. Walker, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 357,565, May 26, 1989. This application Jun. 20, 1991, Ser. No. 718,079

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—500 **19 Claims**

1. A method comprising:

forming a solid solution containing a doping precursor and a polymer selected from the group consisting of substituted or unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophene, polyacetylenes formed from soluble precursors and combinations thereof; and

selectively exposing regions of said solid solution to a source of energy for a sufficient time to cause said dopant precursor to transform to a dopant capable of inducing electrical conductivity within said polymer within said selectively exposed regions;

the concentrations of said polymer and said dopant precursor being sufficient for said selectively exposed regions to be electrically conductive; and

exposing said solid solution to a solvent to dissolve those regions not exposed to said source of energy, said regions exposed to said source of energy substantially not being dissolved.

5,200,113

ANTISTATIC AND ELECTRICALLY CONDUCTING COMPOSITION

Jürgen Finter, Freiburg, Fed. Rep. of Germany; Bruno Hilti, Basle, Switzerland; Carl W. Mayer, Riehen, Switzerland, and Ernst Minder, Sissach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1989, Ser. No. 411,950

Claims priority, application Switzerland, Sep. 30, 1988, 3639/88

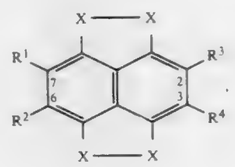
Int. Cl.[5] H01B *1/00*

U.S. Cl. 252—518 **25 Claims**

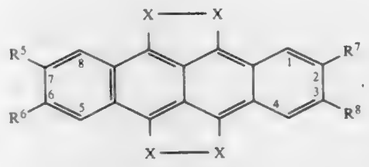
1. A composition of high electrical conductivity comprising

a) a thermoplastic polymer soluble in an inert organic solvent selected from the group consisting of polyesters, polyester-amides, polyurethanes, polyamides, polycarbonates and polyimides derived from monomers containing hydroxyl groups, saponified and unsubstituted or hydroxyalkylated polymers of vinyl esters and ethers, hydroxylated polybutadiene and polyisoprene, polyacrylates and polymethacrylates containing hydroxyalkyl radicals in the ester group, polyacrylic and polymethacrylic acids, reduced polyketones and copolymers thereof, copolymers of unsubstituted and hydroxyalkylated vinyl alcohol, acrylates and methacrylates, acrylic acids and methacrylic acids and diolefins with comonomers selected from acrylonitrile, olefins, diolefins, vinyl chloride, vinylidene chloride, vinyl fluoride, vinylidene fluoride, styrene, α-methylstyrene, maleic anhydride, maleimide, vinyl ethers and vinyl esters, and polyadducts of unsubstituted and hydroxyalkylated epoxy compounds containing an average of more than one epoxy group per molecule with diols, primary monoamines, disecondary diamines, disecondary linear or cyclic dicarboxylic acid diamides or dicarboxylic acids, each of which thermoplastic polymers contains aliphatic or cycloaliphatic side groups bonded to the polymer backbone via a group —O—, —O—$OR^{2\text{-}2}$—OCO— or —CO—O—, said side groups containing at least one Cl, Br or I atom in the α-, β-, γ- or ω-position, R^{22} being C_2–C_{12}alkylene, C_4–C_{12}cycloalkylene, C_4–$C_{1\text{-}2}$cycloalkylene-CH_2—, C_4–C_{12}cycloalkylene-(CH_2)—$_2$, benzylene or xylylene which is unsubstituted or substituted by OH, Cl, Br or phenyl, and, suspended therein, in the form of a needle network of crystal needles

b) 0.01 to 20% by weight, based on polymer a), of a charge transfer complex of chlorine, bromine or iodine and a compound of formula I or Ia

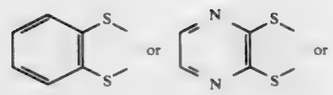


(I)



(Ia)

or mixtures thereof, wherein X is S, Se or Te, R^1, R^2, R^3 and R^4 are independently of each other a hydrogen atom or Cl, or R^1 and R^2, and R^3 and R^4, together are each



or

or

R^1, R^2, R^3 and R^4 are each phenylthio, 4-methylphenylthio, 4-methoxy-phenylthio or pyrid-4-ylthio, and R^5, R^6, R^7 and R^8 are independently of the others H or F, or R^5 is CH_3 and R^6, R^7 and R^8 are H, or R^5, R^6, R^7 and R^8 are CH_3, or R^5 and R^6 are CH_3 or Cl and R^7 and R^8 are H, or R^5 and R^6 are H, R^7 is —COR^9 and R^8 is H or —COR^9, R^5 and R^6 are H and R^7 and R^8 together are —CO—O—CO— or —CO—NR^{10}—CO—, wherein R^9 is halogen, —OH, —NH_2, the radical of an alcohol or of a primary or secondary amine, or —OM, M being a cation, and R^{10} is H or the radical of a primary amine from which the NH_2 group has been removed.

5,200,114

ALKALINE CLEANER FOR REDUCING STAIN ON ALUMINUM SURFACES

Leslie M. Beck, Perkasie, Pa., assignor to Man-Gill Chemical Company, Cleveland, Ohio

Division of Ser. No. 573,650, Aug. 24, 1990, Pat. No. 5,110,494. This application Nov. 12, 1991, Ser. No. 791,488

Int. Cl.[5] C11D *7/06, 7/32, 17/00, 10/02*

U.S. Cl. 252—542 **7 Claims**

1. An aqueous alkaline composition having a pH in the range of from about 11.5 to about 12.5 useful for cleaning aluminum surfaces comprising from about 20 to about 75% by weight of at least one inorganic base; from about 1 to about 15% by weight of at least one metal complexing agent; from about 1 to about 20% by weight of at least one heterocyclic compound selected from the group consisting of a pyrrole, imidazole or pyrazole compound; and from about 10 to about 70% by weight of water.

5,200,115

PASTE-FORM DETERGENT CONTAINING ALKYL GLYCOSIDE AND α-SULFOFFATY ACID DI-SALT AS SURFACTANTS

Brigitte Giesen, Duesseldorf-Grafenberg; Alfred Meffert, Monheim; Andreas Syldatk, and Ingo Wegener, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP89/00933, § 371 Date Feb. 15, 1991, § 102(e) Date Feb. 15, 1991, PCT Pub. No. WO90/02163, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 7, 1989, Ser. No. 656,050

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827778

Int. Cl.[5] C11D *1/83*

U.S. Cl. 252—557 **12 Claims**

1. A paste-form laundry and cleaning detergent, containing nonionic and anionic surfactants and water, having a viscosity Hoeppler at 20° C. or according to Brookfield Helipath at 20° C. and four rpm) in the range from about 1000 to 200,000 mPa.sec, consisting essentially of an alkyl glycoside containing 8 to 22 carbon atoms in the alkyl chain as the nonionic surfactant and an α-sulfo-fatty acid di-salt as the anionic surfactant, with a weight ratio of the alkyl glycoside to the α-sulfo-fatty acid di-salt of 10:1 to 1:3, and having a dissolving time not greater than 10 min per 1 g of the detergent in 100 ml water the dissolving time determined by adding 1 gram of the paste form product, in the form of a single portion, to a 250 milliliter glass beaker about 5.5 centimeter in diameter, adding 100 milliliters of water at 20±2° C. to the beaker, stirring the contents of the beaker with a 3 centimeter long magnetic stirring rod at 500 RPM and measuring the time which the paste takes to dissolve, the time which 1 gram of paste-form product takes to dissolve under the test conditions is the dissolving time.

5,200,116

PHOTOCHROMIC CHROMENE COMPOUNDS

Harry G. Heller, Cardiff, Wales, assignor to PPG Industries, Inc., Pittsburgh, Pa.

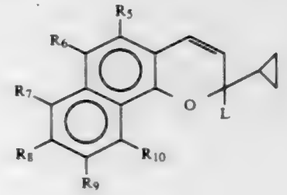
Filed Jul. 23, 1990, Ser. No. 557,432

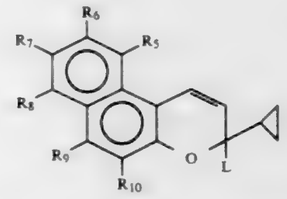
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] G02B *5/23;* **C07D** *311/80, 311/04, 251/00*

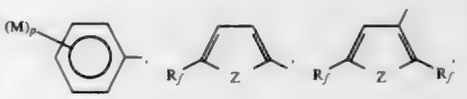
U.S. Cl. 252—586 **25 Claims**

16. A photochromic article comprising a solid transparent organic host material containing a photochromic amount of each of (a) photochromic substance selected from the group consisting of spiro(indolino) naphthoxazines, spiro(indolino) pyrido benzoxazines, and spiro(indolino) benzoxazines that, when activated, color to shades of purple and/or blue, and (b) photochromic substance represented by one of the following graphic formulae:

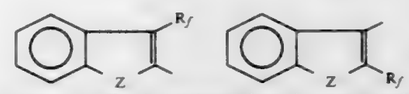




wherein L is selected from the groups represented by



L-1 L-2 L-3



Z is oxygen or sulfur, R_f is selected from the group consisting of hydrogen, C_1–C_4 alkyl, phenyl (C_1–C_4) alkyl, and chloro. M is selected from the group consisting of C_1–C_5 alkyl, C_1–C_5 alkoxy, halogen, C_1–C_4 dialkylamino, and a heterocyclic nitrogen-containing substituent having 5 or 6 atoms in the heterocyclic ring; p is an integer of from 0 to 3; and R_5–R_{10} are each selected from the group consisting of C_1–C_{10} alkyl, C_5–C_7 cycloalkyl, phenyl, mono- or disubstituted phenyl, C_1–C_4 alkoxy, halogen, and five-membered heteroaromatic groups, said phenyl substituent(s) being selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro and bromo.

5,200,117

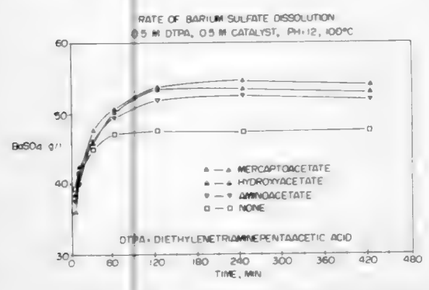
starter means (**10**) and is arranged to be actuated by a third

having uneven pits with predetermined memorized infor-

5,200,122

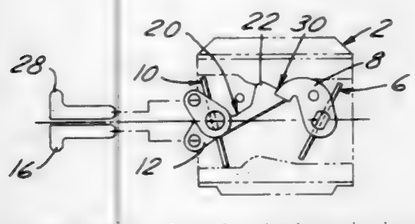
VOL 1149 ISS 1 AP 6 1993 UMI

5,200,117
SULFATE SCALE DISSOLUTION
Richard L. Morris, Duncanville, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.
Division of Ser. No. 431,114, Nov. 3, 1989, Pat. No. 5,084,105, which is a continuation-in-part of Ser. No. 332,147, Apr. 3, 1989, Pat. No. 5,093,020. This application Jan. 16, 1992, Ser. No. 821,373
Int. Cl.[5] G21F 9/00
U.S. Cl. 252—626 16 Claims



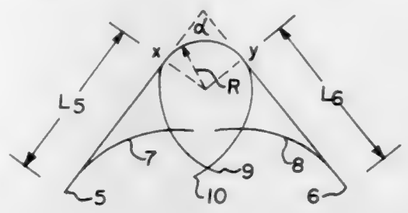
1. A composition for dissolving an alkaline earth metal sulfate scale comprising:
a) an aqueous solution having a pH of from about 10 to about 14;
b) a chelating agent comprising a polyaminopolycarboxylic acid or a salt of such an acid; and
c) a synergistic scale-dissolving quantity of anions of at least one monocarboxylic acid selected from a substituted acetic acid or an aromatic carboxylic acid having the carboxyl group attached directly to the aromatic nucleus.

5,200,118
CARBURETOR FOR CHAIN SAWS
Elmar Hermle, Hülben, Fed. Rep. of Germany, assignor to Walbro Corporation, Cass City, Mich.
Filed May 28, 1992, Ser. No. 890,574
Claims priority, application Fed. Rep. of Germany, May 29, 1991, 4117554
Int. Cl.[5] F02M 1/02
U.S. Cl. 261—64.6 7 Claims



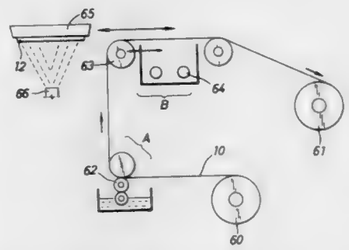
1. A carburetor for an internal combustion engine, in particular of a chain saw, including throttle means biased towards an idle position and adapted to be displaced by a first actuating member, starter means adapted to be displaced between start and rest positions by a second actuating member, and holding means which when actuated moves said throttle means to a start position and holds said throttle means in the start position via detent means, said detent means being released by said first actuating member when the throttle means continues to be displaced such that said holding means returns into its rest position under the action of return spring means, characterized in that said holding means (20) is operatively separate from the starter means (10) and is arranged to be actuated by a third actuating member (28).

5,200,119
TOWER PACKING ELEMENT
Max Leva, 1 Hodgson Ave., Pittsburgh, Pa. 15205
Continuation-in-part of Ser. No. 530,195, May 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,196, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 722,841, Apr. 11, 1985, abandoned. This application May 9, 1991, Ser. No. 697,806
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—94 34 Claims



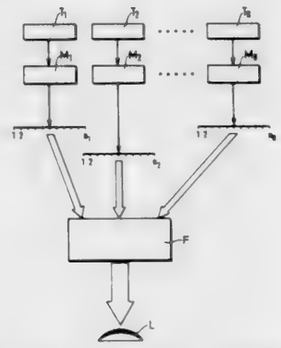
1. A tower packing element for use in randomly packed beds comprising a strip base shaped to define two straight elongated legs and an arcuately shaped bend, each of said straight legs consisting of one single straight segment only without being arcuately or angularly bent, said straight legs being smoothly and tangentially joined to the ends of said arcuately shaped bend and being open-ended on their other ends, both of said legs defining a critical angle α ranging from 20 degrees to 135 degrees when said legs are projected along respective imaginary lines beyond their tangential meeting points with said arcuately shaped bend, and at least one slot in the plane of at least one of said legs and at least one tongue depending from at least one of said straight legs and displaced from the plane of said straight legs and pointing away from the plane of said straight leg, said arcuately shaped bend being substantial in length and having a substantially smooth surface with no slots or depending tongues.

5,200,120
METHOD OF FORMING OPTICAL DISCS
Naomi Sakai, Chiba, Japan, assignor to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 20, 1990, Ser. No. 554,849
Claims priority, application Japan, Jul. 21, 1989, 1-190396
Int. Cl.[5] B29D 11/00
U.S. Cl. 264—1.3 1 Claim



1. A process for forming uneven pits which comprises:
coating a radiation curable resin composition on one of a transparent substrate and a support sheet,
coating a radiation curable resin composition on a stamper having uneven pits with predetermined memorized information,
pressure contacting said one of said transparent substrate and said support sheet with the stamper at a positional relationship so that said radiation curable resins may be contacted face to face to each other to form a laminated product,
irradiating the laminated product with radiation from the side of said one of said transparent substrate and said support sheet to effect curing of said radiation curable resin composition, thereby transferring the uneven pits from the stamper to the resin thus cured, and
subsequently peeling off the stamper, followed by forming a metallic reflective film on the uneven pit surface of the cured resin.

5,200,121
METHOD FOR THE MANUFACTURE OF CONTACT LENSES
Peter Hagmann, Hösbach-Bahnhof, and Peter Höfer, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Apr. 22, 1991, Ser. No. 689,400
Claims priority, application Switzerland, Apr. 24, 1990, 1376/90
Int. Cl.[5] B29D 11/00
U.S. Cl. 264—1.8 20 Claims



1. In a method for the manufacture of contact lenses,
(a) shaping tools are manufactured,
(b) said shaping tools are fitted in mould plates,
(c) said mould plates are inserted into an injection moulding tool,
(d) using said shaping tools. a plurality of disposable moulds are manufactured by injection moulding each of said moulds comprising a male mould-half having a shaping face for a rear face of a contact lens and a female mould-half having a shaping face for a front face of said contact lens, and
(e) said contact lenses are manufactured by direct polymerization of a polymerization batch in said disposable moulds, the improvement wherein only a limited number of shaping tools are provided for said injection moulding of said plurality of said moulds, a thus obtained limited number of standardized disposable moulds being shaped for the production of only a limited variety of contact lenses having different standardized diameters, standardized radii of curvature of the rear faces and standardized focal powers;
and wherein said standardized moulds are further finished subsequently, thus increasing the variety of said injection moulded disposable molds for said manufacture of contact lenses having desired diameters, desired radii of curvature of the rear faces and required focal powers.

5,200,122
SURFACE ACTIVATING METHOD FOR THERMOPLASTIC RESIN MOLDED ARTICLES
Koichiroh Katoh, Abiko; Motomi Nogiwa, Zushi, and Yoshiharu Iwasaki, Yokohama, all of Japan, assignors to Japan as represented by Director Science and Technology, and Nippon Petrochemicals Company, Limited, Tokyo, Japan
PCT No. PCT/JP91/00069, § 371 Date Nov. 25, 1991, § 102(e) Date Nov. 25, 1991, PCT Pub. No. WO91/11484, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 23, 1991, Ser. No. 768,511
Claims priority, application Japan, Jan. 23, 1990, 2-11811
Int. Cl.[5] B29C 71/04
U.S. Cl. 264—22 5 Claims

1. A method for activating the surface of a thermoplastic resin molded article comprising radiating the surface of a thermoplastic resin molded article with ultraviolet light no longer than 300 nm in wavelength, said molded article formed of a resin composition including (A) 1% to 99% by weight of a polypropylene resin; (B) 1% to 99% by weight of an engineering plastic, said engineering plastic selected from the group consisting of polystyrene resins, polymethacrylate resin, polyacetal resin, polyamide resins, polycarbonate resins, polyphenylene ether resins, polyester resins, polysulfone resins, polyether sulfone resins, polyphenylene sulfide resins, polyether ether ketone resins, polyacrylate resins, polyamide-imide resins, polyimide resins, fluorine resins and mixtures thereof; and (C) 3 to 100 parts by weight, based on 100 parts by weight of said components (A) and (B), of a polyolefin resin functionalized by at least one member selected from the group consisting of carboxylic acid group-containing monomers, carboxylic ester group-containing monomers, acid anhydride group-containing monomers, epoxy group-containing monomers, hydroxyl group-containing monomers, amino group-containing monomers, alkenyl cyclic iminoether derivatives and polyfunctional monomers.

5,200,123
PROCESS FOR PRODUCING ULTRA THIN THERMOPLASTIC FILMS
Guenther Crass, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Sep. 16, 1991, Ser. No. 761,194
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, 4032907
Int. Cl.[5] B29C 55/14, 65/04
U.S. Cl. 264—22 5 Claims

1. A process for the production of ultra thin thermoplastic films comprising the steps of:
providing a base layer of thermoplastic film;
providing an ultra thin coating layer of thermoplastic film;
electric corona discharge treating one surface of either the base layer or coating layer;
superimposing the base layer on the coating layer, so that the electric corona discharge treated surface is between the base layer and the coating layer, and thereby forming a composite film;
biaxially stretching the composite film; and
delaminating the composite film into the base layer and ultra thin coating layer, which ultra thin coating layer represents the ultra thin thermoplastic film.

5,200,127
METHOD AND APPARATUS FOR GAS ASSISTED

5,200,128
PROCESS FOR PRODUCING BINDER CONTAINING

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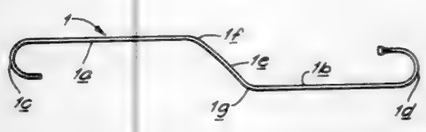
5,200,124
METHOD AND APPARATUS FOR SHAPING THERMOPLASTIC TUBES
Trevor G. Bowkett, Shawbury, England, assignor to McKechnie Plastics Limited, Glasgow, Scotland
Filed Nov. 7, 1991, Ser. No. 788,767
Claims priority, application United Kingdom, Nov. 13, 1990, 9024619
Int. Cl.[5] B29C *53/08*
U.S. Cl. 264—25 **20 Claims**

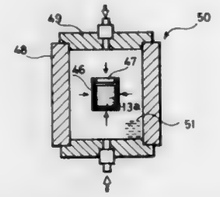


1. A method of forming a bend in a tube of thermoplastic material comprising the steps of:
providing a former and an associated infra-red radiation source spaced from said former;
externally supporting the tube on said former prior to heating the tube to pre-form a bend corresponding to a required bend configuration;
holding the tube stationary relative to said former and controlling the emission of infra-red radiation from said radiation source to heat the bend and soften the thermoplastic material for conformation to the required bend configuration;
cooling the tube to set the thermoplastic material for retaining the required bend configuration while holding the tube stationary relative to said former; and
removing the tube from said former with the bend formed therein.

6. Apparatus for forming a bend in a tube of thermoplastic material comprising:
external former means for supporting the tube to preform a required bend configuration prior to heating the tube;
means for holding the tube stationary relative to said former means;
a source of infra-red radiation associated with said former means for heating the tube to soften the thermoplastic material for conformation to the required bend configuration, said infra-red radiation source being spaced from said former means and from an outer surface of the tube supported thereon; and
a source of cooling fluid for cooling the tube to set the thermoplastic material to retain the required bend configuration.

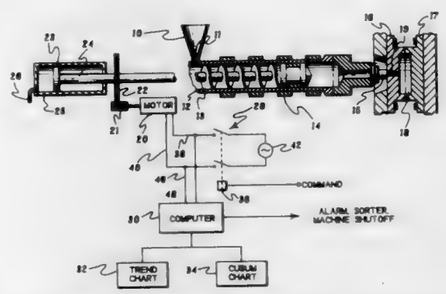
5,200,125
METHOD FOR SEAL MOLDING ELECTRONIC COMPONENTS WITH RESIN
Michio Osada, Kyoto, Japan, assignor to T&K International Laboratory, Ltd., Uji, Japan
Filed Dec. 13, 1989, Ser. No. 450,847
Claims priority, application Japan, Dec. 24, 1988, 63-326559; Dec. 24, 1988, 63-326560
Int. Cl.[5] B28B *3/04;* **B29C** *33/72*
U.S. Cl. 264—39 **11 Claims**

1. A method for resin-seal molding an electronic component into a resin body, comprising the steps of:
(a) placing a premolded resin tablet into an elastic mold and sealing said elastic mold,
(b) exposing said elastic mold with said premolded resin tablet in said elastic mold to a high pressure of a liquid pressure medium for applying a high density compression force to said resin tablet through said elastic mold thereby removing substantially all air from said premolded resin tablet and for further densifying said premolded resin tablet,
(c) discontinuing said step (b) and removing any liquid pressure medium still adhering to an outer surface of said elastic mold,
(d) transferring said further densified resin tablet still in said elastic mold from which any liquid previously adhering to said outer surface of said elastic mold has been removed, to a resin-seal molding device having a pot,
(e) feeding said densified resin tablet out of said elastic mold into said pot,



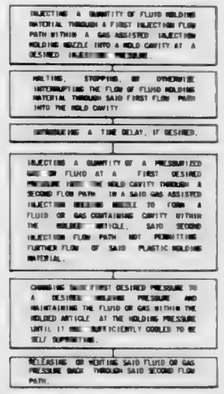
(f) placing a lead frame on which said electronic component is mounted in a predetermined position on a parting face between an upper mold section and a lower mold section of said resin-seal molding device, and
(g) seal molding said electronic component on said lead frame with resin by clamping closed said upper and lower mold sections of said resin-seal molding device.

5,200,126
METHOD AND APPARATUS FOR MONITORING THE STABILITY OF THE INJECTION MOLDING PROCESS BY MEASUREMENT OF SCREW RETURN TIME
James J. Wenskus, Jr., Rochester, and Alan B. Miller, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 29, 1990, Ser. No. 619,783
Int. Cl.[5] B29C *45/76*
U.S. Cl. 264—40.1 **36 Claims**



1. A method for monitoring the stability of the operation of a continuously operating injection molding machine, said machine having a reciprocably translatable plasticating screw disposed therein which is rotated in each molding cycle during a recovery period following each injection operation until a desired amount of molding material has been plasticated and positioned for the next injection operation, said method comprising the steps of:
generating a signal when the screw is rotating;
separately measuring and storing a time duration value for said signal during selected molding cycles;
computing upper and lower time duration limits from a plurality of said stored time duration values;
comparing each subsequently measured time duration value with said upper and lower time duration limits; and
initiating an alarm when the measured time duration value falls outside the upper and lower limits.

5,200,127
METHOD AND APPARATUS FOR GAS ASSISTED INJECTION MOLDING
William A. Nelson, New Baltimore, Mich., assignor to Automotive Plastic Technologies, Inc., Sterling Heights, Mich.
Filed Dec. 17, 1990, Ser. No. 628,746
Int. Cl.[5] B29C *45/00;* **B29D** *22/00*
U.S. Cl. 264—85 **46 Claims**

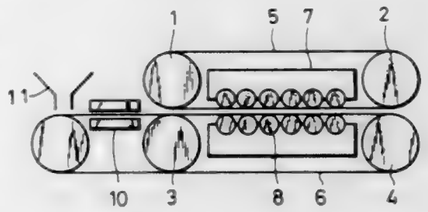


1. A method of fluid assisted injection molding for producing a molded article, said method including the steps of:
a) employing an injection nozzle for injection of fluid molding material from a supply of fluid molding material and a pressurized fluid from a supply of pressurized fluid into a mold cavity, wherein said injection nozzle contains a rotatable valve containing a cylindrical barrel axially mounted within said injection nozzle, said cylindrical barrel having a separate first fluid molding material passageway and a separate second pressurized fluid passageway such that when said cylindrical barrel is in a first position said first passageway forms a portion of a first injection flow path and when said cylindrical barrel is in a second position said second passageway forms a portion of a second injection flow path, wherein said first and second injection flow paths form a common flow path from the end of the cylindrical barrel adjacent to the mold cavity to the end of the injection nozzle adjacent to the mold cavity, and wherein said first and second passageways at the end of said cylindrical barrel adjacent to the mold cavity are axially displaced from each other and from the center of the circle formed by said end of the cylindrical barrel;
b) activating said rotatable valve to inject a quantity of fluid molding material from said supply of fluid molding material through said first injection flow path in said injection nozzle into said mold cavity, wherein said cylindrical barrel is rotated to said first position;
c) activating the rotatable valve to stop said injection of fluid molding material through said first injection flow path by rotating said cylindrical barrel from said first position;
d) activating the rotatable valve to inject a charge of pressurized fluid into said mold cavity through said second flow path in said injection nozzle to form a fluid containing cavity in said fluid molding material, wherein said cylindrical barrel is rotated to said second position and wherein said second flow path is isolated from said supply of fluid molding material; and
e) containing said pressurized fluid within said mold cavity until said molded article has set in the mold cavity; and
f) venting said pressurized fluid to ambient through said second flow path.

5,200,128
PROCESS FOR PRODUCING BINDER-CONTAINING FIBROUS MATS
Günter H. Kiss, Lesa, Italy, assignor to Lignotock GmbH, Sontra, Fed. Rep. of Germany
Continuation of Ser. No. 530,109, May 29, 1990, abandoned.
This application Feb. 11, 1992, Ser. No. 834,481
Claims priority, application Fed. Rep. of Germany, May 29, 1989, 3917787
Int. Cl.[5] B32B *21/08;* **B29C** *67/00*
U.S. Cl. 264—113 **4 Claims**

1. A method of forming a laminated fibrous mat, comprising the steps of:
(a) unrolling a prefabricated tangled fiber synthetic mat onto a conveyor to define a first layer; the synthetic mat being formed from a material which tends to shrink and to become sticky upon heating;
(b) distributing wood fibers onto the synthetic mat as it travels along the conveyor to form a second layer;
(c) distributing synthetic fiber material in loose filament form onto the second layer to define a third layer;
(d) distributing wood fibers onto the third layer to form a fourth layer; and
(e) distributing synthetic fiber material in loose filament form onto the fourth layer to define a fifth layer;
wherein the accumulation densities of the synthetic and wood fibers are deposited in accordance with a statistical distribution substantially corresponding to an edge-blurred, periodic comb profile, and wherein the thickness of each of the synthetic fiber layers is substantially less than the thickness of the wood fiber layers.

5,200,129
PROCESS FOR CONTINUOUS PRODUCTION OF POLYOLEFIN MATERIAL
Seizo Kobayashi; Takashi Mizoe, and Yoshimu Iwanami, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan
Filed Apr. 19, 1991, Ser. No. 687,501
Claims priority, application Japan, Apr. 20, 1990, 2-102928
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.
Int. Cl.[5] B29C *43/26*
U.S. Cl. 264—119 **15 Claims**



1. A process for continuously producing a high-strength and high-modulus polyolefin material, which comprises:
feeding a polyolefin powder between a pair of upper and lower endless belts having inner and outer surfaces opposed to each other,

conveying the polyolefin powder between the endless belts

trichlorobenzene solution, a peak intensity of methyl groups

b) retracting the movable platen of said mold thereby extracting the sprue from said sprue bushing;

the stamp when said relative position is such that the desired thickness of the object is obtained;

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conveying the polyolefin powder between the endless belts under compression to compression-mold the polyolefin powder at a temperature lower than the melting point of the polyolefin powder, the compression being effected, via the endless belts, by a pressing means comprising two opposing sets of a plurality of rollers, each set arranged at the outer surface of each endless belt so that each roller of one set faces a roller of the opposing set and each of which rollers is rotatably supported at the shaft ends by a frame, and then

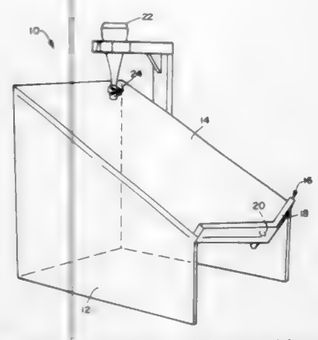
rolling and stretching the resultant compression-molded polyolefin.

5,200,130

METHOD OF MAKING POLYOLEFIN ARTICLES

Randy E. Meirowitz, Neenah, and Robert J. Phelan, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 17, 1990, Ser. No. 628,232
Int. Cl.[5] B29C *47/06*
U.S. Cl. 264—232 **11 Claims**



1. A method for providing an article comprising a generally hydrophobic polyolefin with a modified surface, the steps of the method comprising:

contacting the surface of said generally hydrophobic polyolefin with a copolymeric material while said hydrophobic polyolefin is at a temperature above its glass transition temperature whereby the copolymeric material is heat fused to said hydrophobic polyolefin, said copolymeric material comprising a generally hydrophobic moiety soluble in said polyolefin and a modifying moiety generally insoluble in said polyolefin.

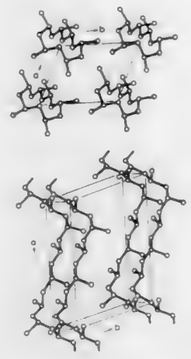
5,200,131

METHOD FOR MOLDING SYNDIOTACTIC POLYPROPYLENE

Tadashi Asanuma; Tateyo Sasaki; Mitsuru Ito; Shigeru Kimura, all of Takaishi, and Takeo Inoue, Kawachinagano, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 2, 1991, Ser. No. 679,522
Claims priority, application Japan, Apr. 9, 1990, 2-92304; Apr. 9, 1990, 2-92305; Jul. 23, 1990, 2-192929; Aug. 13, 1990, 2-211584; Nov. 14, 1990, 2-306136
Int. Cl.[5] D01F *6/06*; B29D *7/01*; B29C *71/00, 55/02*
U.S. Cl. 264—232 **10 Claims**

1. A method for molding a polypropylene or a propylene copolymer substantially having a syndiotactic structure which comprises melting and molding a propylene polymer into a molded article, quenching the molded article at a cooling rate of 50° C. or more per minute and then stretching the quenched article, said propylene polymer being selected from the group consisting of: a propylene homopolymer having a substantially syndiotactic structure wherein in the absorption spectrum of ^{13}C-NMR of the propylene homopolymer measured in a 1,2,4-trichlorobenzene solution, a peak intensity of methyl groups attributed to the syndiotactic structure observed at about 20.2 ppm on the basis of tetramethylsilane is 0.7 or more of the total peak intensity of all the methyl groups; a copolymer of propylene and ethylene or another α-olefin having 4 to 20 carbon atoms wherein in the absorption spectrum of ^{13}C-NMR of said



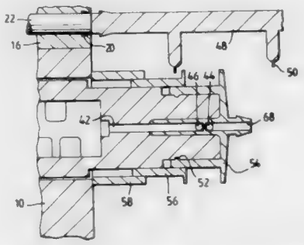
copolymer measured in a 1,2,4-trichlorobenzene solution, a peak intensity oserved at about 20.2 ppm on the basis of tetramethylsilane is 0.5 or more of the total peak intensity attributed to the methyl groups of all the propylene units; and a mixture of said homopolymer or said copolymer with a small amount of polypropylene having a substantially isotactic structure.

5,200,132

METHOD AND AN APPARATUS FOR PRODUCING A DRIP-IRRIGATION EMITTER

Adiel Shfaram, Hof Ashkelon, and Avraham Zakay, Rishon LeZion, both of Israel, assignors to Plastro Gvat, Kibbutz Gvat, Israel

Continuation of Ser. No. 423,584, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 172,257, Mar. 23, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 742,484
Claims priority, application Israel, Mar. 31, 1987, 82072
Int. Cl.[5] B29C *45/16, 65/56*
U.S. Cl. 264—238 **3 Claims**



1. A method for manufacturing a drip irrigation emitter using an injection mold including a stationary and a movable platen, a sprue bushing, a plurality of sprue gates, and a stripper plate, said method comprising the steps of:

a) molding onto a main injection-mold core having three different active diameters, three different, axially spaced apart members of said emitter, at least two of said members being substantially annular, the inside diameter of at least one of said annular members being a tight fit on the outside diameter of the next smaller of said members;

b) retracting the movable platen of said mold thereby extracting the sprue from said sprue bushing;

c) removing a first, axial, needle-shaped, core from the smallest of said emitter members and opening a split cavity that determines the outside configuration of said emitter members thereby also withdrawing second and third, lateral, needle-shaped cores;

d) advancing the stripper plate of said mold thereby stripping the largest of said emitter members from that portion of said main injection-mold core that has the largest of said active diameters, and subsequently initiating a process of mutually telescoping said emitter members while temporarily retaining said smallest member against movement in response to the advance of the stripper plate whereby, in the course of said process, said sprue gates are severed from said members in an axial direction and at the end of said process, said members have been assembled into an emitter wherein said members are tightly nested one inside the other and frictionally held in a predetermined axial and angular relationship that establishes an uninterrupted flow path for proper functioning of said emitter; and

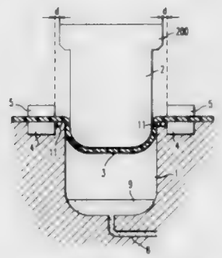
e) ejecting said emitter from said mold.

5,200,133

METHOD FOR MAKING COMPOSITE MATERIAL PARTS BY STAMPING

Jean H. Dieul, Voisins-le-Bretonneux, and Jean-Claude Bonneau, Chaville, both of France, assignors to Bronzavia-Air Equipment, Asnieres, France

Continuation-in-part of Ser. No. 207,053, May 13, 1988, abandoned. This application Jul. 23, 1990, Ser. No. 556,379
Claims priority, application France, Apr. 10, 1987, 87 05107; PCT Int'l Appl., Sep. 15, 1987, PCT/FR87/00357
Int. Cl.[5] B29C *67/14*
U.S. Cl. 264—257 **11 Claims**



1. A method for making molded objects out of composite materials based on a fabric consisting of at least two superimposed fiber layers held together by means of a stitched connecting thread wherein the fibers in each layer are continuous and are oriented in a single direction, the layers being positioned relative to each other so that the direction of fibers in any given layer is different from the direction of fibers in the remaining layer(s), comprising the steps of:

stamping the fabric in a rimmed die having a hollow contour by means of a stamp which conforms in shape to the hollow of the die, while applying at the same time to the fabric which overlays the rim and hollow of the die, a monitored tension on the fabric at the rim which is modulated by interposing relaxation stages which apply a minimum tension slightly greater than zero;

impregnating a portion of the fabric with the quantity of resin or binder needed for the cohesion of the finished object thereby forming a set, while maintaining the monitored tension on the fabric;

compressing the set formed by the resin or binder and the fabric between the die and stamp in order to degas the resin, while, at the same time, checking the relative position of the stamp and the die in order to stop the motion of the stamp when said relative position is such that the desired thickness of the object is obtained;

polymerizing the resin by heating the die, stamp, or both, to a temperature which enables the polymerization of the resin; and

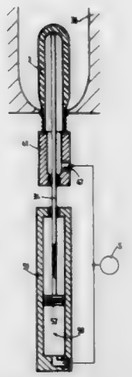
removing the finished object from the die after allowing the die, stamp, or both to cool.

5,200,134

METHOD AND APPARATUS FOR STRETCHING AND BLOWING UP A HEATED PREFORM

Andre-Marcel Collombin, and Ennio G. Curetti, both of Grand-Lancy, Switzerland, assignors to Dynaplast SA, Grand-Lancy, France

Filed May 31, 1991, Ser. No. 709,017
Claims priority, application Switzerland, May 31, 1990, 1844/90
Int. Cl.[5] B29C *49/12*
U.S. Cl. 264—532 **4 Claims**



3. Method for stretching and blowing up a preheated preform comprising the steps of:

providing a single pressurized air supply which feeds pressurized air to both a pneumatic piston and a regulating valve;

feeding pressurized air furnished by said pressurized air supply to the piston thereby displacing a stretching rod into the preform until the stretching rod has contacted a closed end of the preform;

after the rod has contacted the closed end, further feeding pressurized air to the piston to mechanically stretch the preform longitudinally and simultaneously feeding pressurized air from said pressurized air supply through the regulating valve to the inside of the preform to blow up the preform thereby transversely deforming the preform during the mechanical stretching using said single pressurized air supply.

5,200,135

METHOD TO IMPROVE THE SERVICE LIFE OF GAS INJECTION DEVICES USED TO INTRODUCE A GAS INTO MOLTEN METAL

Gregorio Vargas-Gutierrez, and Carlos Maroto-Cabrera, both of Ave. Junco de la Vega #208, Col. Roma 64700 Monterrey, Nuevo Leon, Mexico

Continuation of Ser. No. 733,220, Jul. 22, 1991, abandoned. This application Aug. 10, 1992, Ser. No. 926,379
Int. Cl.[5] C21B *7/16*
U.S. Cl. 266—47 **3 Claims**

1. A method for producing a long life, wear resistant gas

injection device to be used for blowing gases into metals con-

guide for movement in the direction of the lance axis, the

5,200,139

said method comprising the steps of

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injection device to be used for blowing gases into metals contained in metallurgical reactors, comprising the steps of

isostatic pressing powders to form a base section of the device about a tuyere for insertion into a furnace for injecting gas,

forming previously to element installation in the furnace of a tip of controlled shape on the base section for insertion into the furnace by thermal spraying and bonding progressively molten or semi-molten material while a gas is flowing through said tuyere allowing the formation of at least one channel for gas flow through the tip, and

controlling permeability of the tip that is being formed by means of gas pressure and flow rate through the tuyere during the tip formation step to form said channels with porosity small enough to avoid molten metal infiltration into the tip when gas flow is cut-off in use of the injection device in a furnace.

5,200,136

ARRANGEMENT FOR INSTALLING AND REMOVING A LANCE INTO AND FROM A METALLURGICAL VESSEL

Norbert Ramaseder, Linz, and Hubert Öllinger, St. Veit, both of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H, Linz, Austria

Filed Jan. 31, 1991, Ser. No. 648,651

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003068

Int. Cl.[5] C21C *5/46*

U.S. Cl. 266—79 **16 Claims**

1. In an arrangement for introducing and withdrawing a lance along its axis into and out of a tiltable metallurgical vessel, and having drive means stationarily arranged to operate in the direction of the lance axis, including means pivotally mounting said drive means, said lance being designed as a guide for movement in the direction of the lance axis, the improvement:

wherein said drive means is displaceable and is mounted so as to be pivotable about two axes which cross each other,

said arrangement comprising a stationary supporting structure and including,

a horizontally extending guide rails disposed on said supporting structure,

a carrying plate displaceably guided along said guide rails,

a base plate mounted on said carrying plate so as to be pivotable about an axis perpendicular to said carrying plate,

housing means provided on said base plate accommodating said drive means for said lance,

said housing means being mounted so as to be pivotable about an axis directed parallel to said guide rails,

a displacement means for moving said carrying plate relative to said stationary supporting structure,

a first pivoting means for pivoting said base plate relative to said carrying plate, and

a second pivoting means for pivoting said housing means relative to said base plate.

5,200,137

Patent Not Issued For This Number

5,200,138

SPECTRAL SHIFT-PRODUCING SUBASSEMBLY FOR USE IN A NUCLEAR FUEL ASSEMBLY

Harry M. Ferrari, Fox Chapel, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1991, Ser. No. 740,342

Int. Cl.[5] G21C *7/26*

U.S. Cl. 376—209 **16 Claims**

1. A spectral shift-producing subassembly for use with a nuclear fuel assembly in a nuclear reactor, said subassembly comprising:

(a) at least one elongated hollow empty tubular rodlet being hermetically sealed at its opposite ends and having an axially-extending annular wall section of reduced thickness compared to the thickness of the remainder of said rodlet thereby adapting said reduced thickness wall section of said rodlet to creep collapse- and rupture after a desired extended period of use in a nuclear reactor permitting moderator liquid in the reactor to enter and fill the empty rodlet and produce a spectral shift; and

(b) means for mounting said rodlet in the nuclear fuel assembly.

5,200,139

METHOD AND APPARATUS FOR PROTECTING A NUCLEAR REACTOR

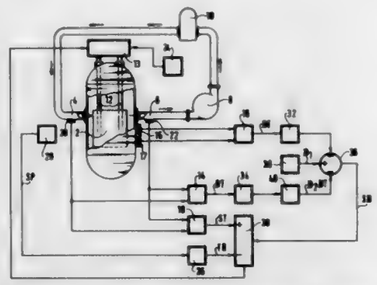
Jean-Lucien Mourlevat, Noisy le Roi; Gérard Montanari, Houilles, both of France, and Pierre Kockerols, Wilrijk, Belgium, assignors to Framatome, Courbevoie, France

Filed Jul. 17, 1991, Ser. No. 731,331

Claims priority, application France, Jul. 17, 1990, 90 09095

Int. Cl.[5] G21C *7/00*

U.S. Cl. 376—216 **7 Claims**



1. A method of protecting a nuclear reactor wherein a temperature regulation system of said reactor is inhibited whenever a combination of nuclear power and an axial power difference between a top and a bottom of a core of said reactor exceeds a predetermined inhibit threshold, said reactor comprising:

a core containing fuel rods in which nuclear reaction takes place, giving off nuclear power which is distributed between top and bottom of the core and which is transformed into heat;

a heat exchange circuit for causing heat exchange fluid to penetrate into the core via an inlet duct, for causing the fluid to circulate through the core, and for removing it therefrom via an outlet duct, thereby removing said heat, said circuit providing heat to an external heat receiver having varying requirements;

control clusters penetrating in controlled manner into the core from the top thereof in order to control said nuclear reaction therein;

at least one power measuring system for providing a total power signal representative of said nuclear power;

a power difference measuring system for providing a power difference signal representative of an axial difference in nuclear power between the top and the bottom of the core;

a temperature measurement system for providing an operating temperature signal representative of an operating temperature which is a temperature of said heat exchange fluid;

a power control system acting on some of said control clusters as a function of varying needs of said heat receiver so that said receiver receives heat power which corresponds, at least approximately, to the needs of said receiver;

a reference temperature defining circuit receiving a power signal representative of said nuclear power, and generating a temperature reference signal representative of a reference temperature which depends on said nuclear power and which is such that said reactor operates under optimum conditions when said operating temperature is equal to said reference temperature at each value of said nuclear power; and

a temperature regulation system receiving said operating temperature and said temperature reference signal and acting on control clusters in a manner which is different from said power control system for the purpose of at least limiting a difference between said operating temperature and said reference temperature;

said method comprising the steps of

(a) combining said total power signal and said power difference signal to define a composite power, and

(b) inhibiting said temperature regulation system when said composite power exceeds a predetermined inhibit threshold.

5,200,140

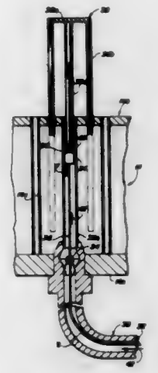
CABLE CONTROL ROD DRIVE ASSEMBLY

Irvin R. Kobes, San Jose, and Charles W. Dillmann, Morgan Hill, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 12, 1992, Ser. No. 834,744

Int. Cl.[5] G21C *7/12*

U.S. Cl. 376—227 **14 Claims**



1. An assembly for selectively positioning a control rod along a vertical axis in a nuclear reactor core disposed inside a reactor pressure vessel comprising:

a flexible cable slidably disposed through a cable conduit;

a coupling releasably joining said cable to said control rod;

a drive joined to said cable for selectively advancing and retracting said cable in opposite directions through said cable conduit for selectively positioning said control rod in said reactor core;

said coupling being slidingly disposed inside said cable conduit with said cable extending from said coupling and through said cable conduit to said drive; and

pressurizing means for providing a selectively pressurized driving fluid inside said cable conduit to apply a pressure force against said coupling for translating said coupling and said control rod joined thereto.

5,200,141

THERMIONIC FUEL ELEMENT

Gary O. Fitzpatrick, Poway, Calif., assignor to Advanced Energy Technology, Inc., City of Poway, Calif.

Filed Aug. 6, 1991, Ser. No. 741,790

Int. Cl.[5] G21D *7/00*

U.S. Cl. 376—321 **16 Claims**

1. In a thermionic fuel element including a collector base having a bore supporting a collector surrounding and closely spaced but not in contact with a generally concentric emitter which is supported by a generally concentric emitter base, the emitter base defining a central lumen containing a fissioning nuclear fuel, an improvement which comprises:

a thermal shield structure between a portion of said emitter

including a plurality of concentric heater tubes having

5,200,146

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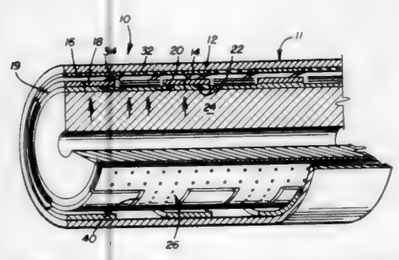
and said collector, said shield structure being adapted to thermally insulate that portion of said collector opposite



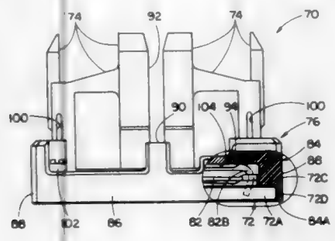
the shield structure from receiving at least a portion of the heat developed by said fuel.

5,200,142

NUCLEAR FUEL ASSEMBLY TOP NOZZLE WITH IMPROVED PERIPHERAL HOLD-DOWN ASSEMBLY

Edmund E. DeMario, Columbia, and Robert W. Cantrell, Hopkins, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 18, 1991, Ser. No. 686,954
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—446 **14 Claims**



1. In a top nozzle for use in a fuel assembly having a plurality of guide thimbles for mounting said top nozzle, the combination comprising:

(a) a lower adapter plate mountable to the guide thimbles and having a peripheral edge;

(b) a plurality of guide structures attached to and extending upwardly from said lower adapter plate at locations spaced inwardly from said peripheral edge of said lower adapter plate so as to separate said lower adapter plate into an interior portion extending between interior sides of said guide structures and mountable to said guide thimbles and a peripheral portion extending about exterior sides of said guide structures, said guide structures defining a plurality of vertically-extending first guide elements; and

(c) a peripheral hold-down assembly disposed along said peripheral portion of said lower adapter plate about said exterior sides of said guide structures and having a plurality of second guide elements movably coupled to said first guide elements of said guide structures for permitting vertical movement of said hold-down assembly relative to said lower adapter plate and guide structures in providing a downward biasing force against said peripheral portion of said lower adapter plate of said top nozzle;

(d) said peripheral hold-down assembly including

(i) a peripheral arrangement of leaf springs overlying and extending along said peripheral portion of said lower adapter plate, and

(ii) an upper annular retainer member solely overlying and extending along said peripheral portion of said lower adapter plate and overlying and engaging said peripheral arrangement of leaf springs, said upper annular retainer member being separate from said lower adapter plate and capable of undergoing vertical movement relative to said lower adapter plate and said guide structures so as to provide a downward biasing force via said leaf springs against said peripheral portion of said lower adapter plate.

5,200,143

FUEL ASSEMBLY FOR NUCLEAR REACTOR

Lennart Johansson, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed Apr. 6, 1992, Ser. No. 864,329
Claims priority, application Sweden, Apr. 11, 1991, 9101084
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—449 **2 Claims**

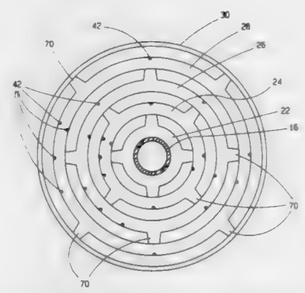
1. A fuel assembly (**1**) for a nuclear reactor, comprising a number of parallel fuel rods (**2**) which are held together by means of spacers (**4**, **5**) arranged along the fuel rods (**2**) as well as guide tubes (**3**) arranged between the fuel rods (**2**) in parallel therewith, said guide tubes (**3**) extending through the spacers (**4**, **5**), a top nozzle (**6**) and a bottom nozzle (**7**) between which the guide tubes (**3**) are fixed, characterized in that bottom sleeves (**8**) for the guide tubes (**3**) are arranged in the spacer **5**) nearest the bottom nozzle (**7**), said bottom sleeves (**8**) being rigidly fixed to the spacer (**5**) and resting against the bottom nozzle (**7**) and being provided with a first locking member for receiving a second locking member, arranged at the end of a guide tube, in order to lock the guide tube (**3**) so as to be rigid in the direction of rotation.

5,200,144

SIMULATED NUCLEAR REACTOR FUEL ASSEMBLY

Victor T. Berta, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 22, 1992, Ser. No. 864,717
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—463 **4 Claims**



1. A simulated nuclear reactor fuel assembly comprising: a heater assembly having a top end and a bottom end and including a plurality of concentric heater tubes having electrical circuitry connected to a power source, the heater tubes being radially spaced from each other;

an outer target tube and an inner target tube concentric with the heater tubes and with each other, the outer target tube surrounding and radially spaced from the heater tubes, and the inner target tube surrounded by and radially spaced from the heater tubes and outer target tube;

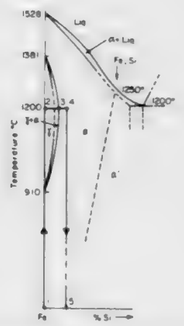
and further wherein the top of the assembly is generally open to allow for the electrical power connection to the heater tubes and the bottom end of the assembly includes means for completing the electrical circuitry in the heater tubes to provide electrical resistance heating to simulate the power profile in a nuclear reactor.

5,200,145

ELECTRICAL STEELS AND METHOD FOR PRODUCING SAME

Richard C. Krutenat, Belmont, Mass.; Robert S. Barnard, Highland Heights, Ohio; John P. Dismukes, Annandale, N.J.; Bernard H. Kear, White House Station, N.J., and Horst Witzke, Flemington, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 485,350, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 255,895, Nov. 11, 1988, Pat. No. 4,904,500, which is a continuation of Ser. No. 59,423, Jun. 8, 1987, abandoned. This application Jul. 12, 1991, Ser. No. 729,246
Int. Cl.[5] C22C *33/00*
U.S. Cl. 420—129 **25 Claims**



1. A pack diffusion method for making iron alloy products in the form of thin gauge sheets having diffused silicon or silicon and aluminum comprising:

adding to a retort (a) an iron feedstock; (b) a silicon oxide source, aluminum source or a combination thereof; (c) a reducing agent; (d) an activator; and (e) an essentially inert filler wherein said filler contains aluminum nitride to form a mixture of ingredients;

providing a non-oxidizing atmosphere within the retort;

heating the mixture for a time sufficient to reduce said silicon oxide source and create a silicon diffusant to diffuse silicon into the iron feedstock and to create an aluminum diffusant for diffusing aluminum into the iron feedstock;

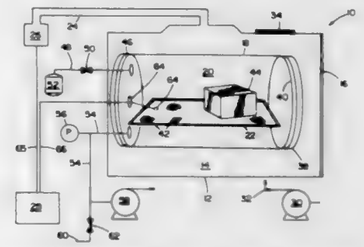
recovering an iron alloy product containing about 0.25 wt. % to about 7.0 wt. % silicon, and 0 wt. % to about 4 wt. % aluminum, wherein the orientation of the magnetic properties within a plane of the iron alloy product is substantially non-oriented, textured, or grain oriented.

5,200,146

APPARATUS FOR EFFECTING PLASMA STERILIZATION

Claude A. Goodman, Gaithersburg, Md., assignor to Air Techniques, Inc., Hicksville, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,553
Int. Cl.[5] A61L *2/14*
U.S. Cl. 422—23 **8 Claims**



1. A plasma sterilization assembly, which comprises:

a microwave means defining a microwave chamber;

means for generating RF energy within said microwave chamber;

a sterilization vessel defining a sterilization chamber disposed inside said microwave chamber;

perforated tray means disposed in said sterilization chamber for receiving an article to be sterilized;

a storage vessel containing a low molecular weight aliphatic alcohol;

vacuum pump for evacuating said sterilization chamber;

conduit means providing fluid flow communication between said sterilization chamber and said vacuum pump;

conduit means for introducing vaporous low molecular weight aliphatic alcohol into said sterilization chamber from said storage vessel; and

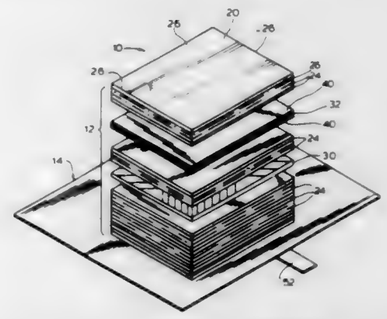
means for energizing said means for generating said RF energy to a level to form a plasma of said low molecular weight aliphatic alcohol and thereby generate micromolecular concentrations of microbicidal agents.

5,200,147

COMPACT PREVACUUM STEAM STERILIZER TEST PACK

Thomas A. Augurt, New Canaan, Conn., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Continuation of Ser. No. 489,204, Mar. 5, 1990, abandoned. This application Jan. 15, 1992, Ser. No. 823,089
Int. Cl.[5] G01N *31/22*
U.S. Cl. 422—56 **12 Claims**



1. A compact prevacuum steam sterilization test pack for

testing the efficiency of a vacuum system of a steam sterilizer

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5,200,149

TEST PACK FOR USE IN DETECTING

to said tube in response to the as-monitored progress of

distal port of said pipette stem tip to communicate with

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testing the efficiency of a vacuum system of a steam sterilizer apparatus to create a vacuum, comprising

(a) a bundle having a pair of end surfaces including a top surface and a bottom surface, a plurality of layers therebetween in flow communication generally parallel to each other and to said top and bottom surfaces, and an edge formed by said plurality of layers and extending between aid top surface and said bottom surface generally transverse to said layers, said bundle including:

(i) a porous test sheet with a steam sensitive indicator ink printed thereon positioned between layers of said bundle to indicate the efficiency of the vacuum system of a sterilizer;

(ii) a plurality of selectively porous layers within said bundle above and below said test sheet; and

(iii) at least one pair of non-porous gas-impermeable layers disposed intermediate said test sheet and one of said end surfaces and spaced from both said test sheet and said one end surface by at least one of said porous layers, said non-porous layers of said pair of non-porous layers being laminated to opposed surfaces of a single one of said porous layers; the number, the position and spacing apart of said non-porous layers depending upon the level of efficiency desired in order to pass the test; and

(B) a porous overwrap folded about said bundle to maintain the integrity thereof.

5,200,148

CHEMICAL ASSAY TAPE

Yoshio Saito, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 288,883, Dec. 23, 1988, abandoned. This application Apr. 29, 1991, Ser. No. 692,969
Claims priority, application Japan, Jan. 11, 1988, 63-3448
Int. Cl.[5] G01N *31/22*
U.S. Cl. 422—56 **7 Claims**

1. In a chemical assay tape for determining the amount of a substance contained in a liquid sample, said tape comprising a water-impermeable support, at least one water permeable porous spreading layer and at least one water permeable porous reagent layer which is disposed between said support and said at least one porous spreading layer, one of said at least one reagent layer having reagent material therein and one of said at least one spreading layer being positioned farthest from said support so as to form a radially outermost layer of said tape upon winding of said tape,

the improvement comprising means for preventing the formation of minute stress cracks in said radially outermost layer of said tape attendant to the winding and storage thereof on a reel, said preventing means comprising a plurality of stress relieving grooves which are spaced at substantially constant intervals, said grooves extending perpendicular to a length of said chemical assay tape,

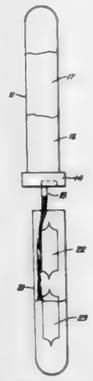
wherein said plurality of grooves are spaced from each other by a distance sufficient to prevent cracking of said radially outermost layer, said grooves extending at least through said radially outermost layer but through fewer than all of said reagent and spreading layers.

5,200,149

CHEMICAL TEST KIT FOR USE IN DETECTING IMPURITIES IN OIL SAMPLES

David J. Fisher, North Adams, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 370,231, Jun. 22, 1989, Pat. No. 4,957,871, which is a division of Ser. No. 50,924, May 15, 1987, Pat. No. 4,873,056, which is a continuation of Ser. No. 529,154, Sep. 2, 1983, Pat. No. 4,686,192. This application Jul. 18, 1990, Ser. No. 554,782
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[5] G01N *21/78, 31/16*
U.S. Cl. 422—61 **20 Claims**



1. A kit for detecting the presence of certain substances in oil, comprising:

(a) a first flexible container, having at least one breakable capsule mounted within said first container and containing a reagent selected to react with a specific impurity contained in a sample of oil that is placed into said first container to produce a product that can be extracted from the oil into an aqueous layer and means for separating the aqueous layer from an oil layer; and

(b) a second flexible container, having at least one breakable capsule mounted within said second container and containing a chemical reagent selected to react with said product in said aqueous layer thereby indicating the presence of a threshold concentration of the impurity to be detected.

5,200,150

PREPARATION OF GEL-FILLED SEPARATION COLUMNS

Donald J. Rose, Jr., Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 538,348, Jun. 14, 1990, Pat. No. 5,061,355. This application Jun. 28, 1991, Ser. No. 722,642
Int. Cl.[5] G01N *21/00, 31/00, 33/00*
U.S. Cl. 422—62 **9 Claims**

1. A system for polymerization of a material in a tube comprising:

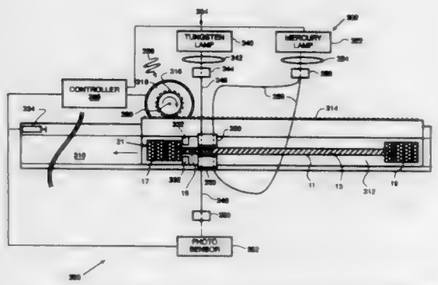
holding means for holding a longitudinally extending tube assembly including said tube;

an energy source capable of directing energy into an initiation section of said tube to the exclusion of other sections of said tube;

redirection means for progressively changing the section of said tube into which said source directs radiation;

monitor means for monitoring the progress of polymerization in said tube; and

control means for controlling the rate of redirection relative to said tube in response to the as-monitored progress of polymerization in said tube, said control means being



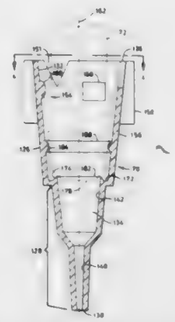
coupled to said first monitor means and said redirection means.

5,200,151

FLUID DISPENSING SYSTEM HAVING A PIPETTE ASSEMBLY WITH PRESET TIP LOCATOR

Ernest W. Long, Concord, Mass., assignor to P B Diagnostic Systems, Inc., Westwood, Mass.

Filed May 21, 1990, Ser. No. 526,310
Int. Cl.[5] G01N *21/00;* **B01L** *3/02*
U.S. Cl. 422—100 **12 Claims**



4. A pipette system operative with a pipette for transferring fluid between a container and a compartment of an assay module in an assay system, the pipette system comprising

a pipette including a pipette tip holder crown and a pipette tip holder stem extending from said pipette tip holder crown;

a tray carrying a plurality of pipette tips, each said pipette tip including a pipette tip crown and a pipette tip stem extending from said pipette tip crown, there being a pipette tip chamber in said pipette tip crown and said pipette tip crown including a cylindrical sidewall with a circular cross section which surrounds said pipette tip chamber, said plurality of pipette tips being oriented with their respective pipette tip chambers directed for receiving said pipette tip holder stem;

transport means for transporting said pipette between a container holding a fluid and a compartment of an assay module, said transport means serving to transport said pipette to said tray for replacement of a pipette tip and including a vertical drive for raising and lowering said pipette to enable transfer of fluid between a container holding fluid and a compartment of an assay module,

wherein said pipette tip stem has a pipette tip stem passage extending along a central axis of said pipette tip from a distal port of said pipette stem tip to communicate with said pipette tip chamber at a distal end of said pipette tip chamber, there being a ledge at said distal end of said pipette tip chamber located at a predetermined distance from the distal port of said pipette tip stem, said ledge encircling a proximal end of said pipette tip stem passage, said ledge including an edge which contacts a surface of said pipette tip holder stem to form a seal upon insertion of said pipette tip holder stem into said pipette tip chamber; and

said pipette tip holder stem has a passage extending along a central axis of said pipette tip holder stem to a distal port of said pipette tip holder stem to communicate with said pipette tip stem passage upon insertion of said pipette tip holder stem into said pipette tip chamber, said surface of said pipette tip stem which contacts said edge of said ledge being configured to mate with said ledge to position said holder distal port of said pipette tip holder stem at said predetermined distance from said distal port of said pipette tip stem; and

means for retaining said pipette tip holder stem in said pipette tip chamber, said retaining means comprising

a ridge element extending partway along an interior surface of said pipette tip chamber, wherein an edge of said ridge element is a chord of said cross sectional circle of said cylindrical sidewall of said pipette tip crown; and

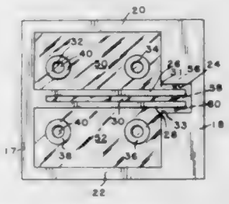
a ridge receiving member disposed on a sidewall of said pipette tip holder stem for receiving said ridge element said ridge receiving member having the form of a protruberance encircling said pipette tip holder stem, the protruberance having a surface inclined relative to a central axis of said pipette tip holder stem for contacting said ridge element to produce a snap action force upon travel of said ridge element past a peak of said protuberance during insertion of said pipette tip holder stem into said pipette tip chamber.

5,200,152

MINIATURIZED BIOLOGICAL ASSEMBLY

James F. Brown, Clifton, Va., assignor to Cytonix Corporation, Silver Spring, Md.

Continuation-in-part of Ser. No. 375,700, Jul. 5, 1989, abandoned, which is a division of Ser. No. 174,163, Mar. 28, 1988, abandoned. This application Dec. 27, 1990, Ser. No. 632,655
Int. Cl.[5] G01N *1/28*
U.S. Cl. 422—102 **17 Claims**



1. A miniaturized biological assembly for containing a sample of microscopic-sized particulate biological material in a fluid medium to enable quantitative microscopic examination thereof, said assembly comprising

first and second plates which are disposed in registry with one another and adhered to one another.

at least one patterned layer located between said first and second plates to define at least one chamber between said first and second plates for a sample of particulate biological material in a fluid medium and to define a boundary which minimizes contamination and drying of liquid sample and protects liquid sample against deterioration at temperatures at which liquid sample is maintained for study, said at least one chamber having a depth dimension

between said first and second plates which enables all

having electrodes formed at predetermined positions

perforations, said inlet cylinder being connected to said exhaust gas inlet pipe section and extending through said second

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SUSCEPTOR FOR VAPOR-GROWTH DEPOSITION

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between said first and second plates which enables all particulate biological material therein to be viewed within a particular depth of field characteristic of a microscope,

attachment means to fixedly position said first and second plates together with said at least one patterned layer therebetween, and

a plurality of annular pads located within said at least one chamber and extending between said first and second plates, and wherein said attachment means comprises adhesive within said annular pads to adhere said first and second plates together.

5,200,153

CONTAINER WITH CAP ATTACHED BY A DOUBLE HINGE

Anthony H. Carr, Bedfordshire; Paul R. Darnell, Northamptonshire, and Ian W. Davidson, Bedfordshire, all of England, assignors to Unilever Patent Holdings, B.V., Great Britain

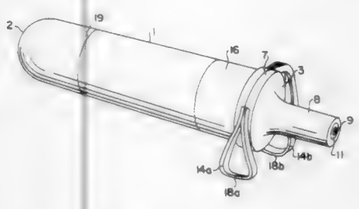
PCT No. PCT/GB90/00569, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO90/12648, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 12, 1990, Ser. No. 623,972

Claims priority, application United Kingdom, Apr. 14, 1989, 8908547

Int. Cl.[5] B01L *3/00*

U.S. Cl. 422—102 **6 Claims**



1. A container comprising:

a tubular main body having an opening defined therein;

a cap for closing said opening; and

hinge means for attaching said cap to said tubular main body, said hinge means consisting essentially of first and second strips of material, each of said strips of material being attached to both said tubular main body and to said cap, said first strip of material being attached to said cap and to said tubular main body at positions diametrically opposed to positions at which said second strip of material is attached to said tubular main body and to said cap, respectively, said hinge means together defining support means when said cap closes said opening, said support means supporting a portion of said tubular main body so that said closed opening is at an elevation above a surface on which said tubular main body is horizontally disposed.

5,200,154

HONEYCOMB HEATER HAVING INTEGRALLY FORMED ELECTRODES AND/OR INTEGRALLY SINTERED ELECTRODES AND METHOD OF MANUFACTURING SUCH HONEYCOMB HEATER

Takashi Harada, Nagoya; Fumio Abe, Handa, and Hiroshige Mizuno, Tajimi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 14, 1990, Ser. No. 581,985

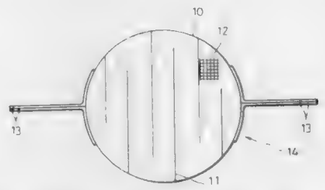
Claims priority, application Japan, Jul. 6, 1990, 2-178529

Int. Cl.[5] F01N *3/10;* **B01D** *53/36;* **H05B** *3/10*

U.S. Cl. 422—174 **1 Claim**

1. A method of manufacturing a honeycomb heater having integrally formed and sintered electrodes by powder metallurgy, comprising the steps of:

preparing a formed honeycomb body as one body by forming raw material powders into a honeycomb configuration having electrodes formed at predetermined positions thereon, said electrodes being made of the same material



as said honeycomb configuration, said honeycomb body having a large number of passages; and

sintering the formed body.

5,200,155

APPARATUS FOR BURNING OXIDIZABLE COMPONENTS IN AN EXHAUST FLOW

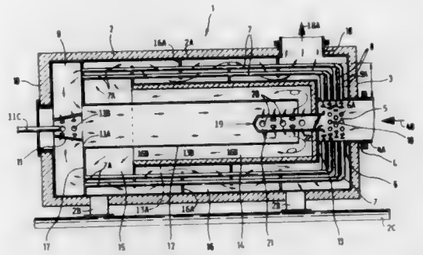
Herbert Obermueller, Linsengericht, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,514

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1990, 4007625

Int. Cl.[5] B01D *53/00*

U.S. Cl. 422—182 **17 Claims**



1. An apparatus for burning oxidizable components in an exhaust gas flow, comprising an axially extending cylindrical housing means for enclosing a combustion chamber, a first end wall for closing one end of said housing means, an exhaust gas inlet pipe section passing through said first end wall for leading exhaust gas flow into said housing means, a second end wall for closing an opposite end of said housing means, a cylindrical first pipe section extending axially in said housing means and forming a flue gas mixing space inside said first pipe section, burner means mounted in a first ring chamber which is defined inside said housing means between a radially outwardly extending flange and said second end wall for at least partly burning components in exhaust gas, said first pipe section having a first open end facing said burner means and a second open end, said radially outwardly extending flange surrounding said first open end for mounting said first pipe section in said housing means, said burner means facing said first open end of said first pipe section, a second pipe section in said housing means surrounding said first pipe section to define a combustion chamber between said first and second pipe sections and to enclose a flow ring space between said second pipe section and said housing means, a separation wall closing one end of said second pie section, said separation wall being spaced from said second open end of said first pipe section to form a flow path between said separation wall and said first pipe section, said separation wall being axially spaced from said first end wall to form a second ring chamber between said separation wall and said first end wall, an inlet cylinder with perforations, said inlet cylinder being connected to said exhaust gas inlet pipe section and extending through said second ring chamber for forming an exhaust gas distribution chamber between said separation wall and said exhaust gas inlet pipe section, a plurality of heat exchange pipes each having an L-configuration with an axial leg extending substantially axially of said housing means in said flow ring space and a radial leg extending substantially radially inwardly of said housing means in said second ring chamber, each of said radially inwardly extending legs of said heat exchange pipes ending in connection with a respective one of said perforations of said inlet cylinder so that incoming exhaust gas is distributed into said radially inwardly extending legs of said heat exchange pipes, and a flow outlet means leading through said housing means from said flow ring space for discharging cleaned exhaust gases.

5,200,156

DEVICE FOR IRRADIATING FLOWING LIQUIDS AND/OR GASES WITH UV LIGHT

Horst Wedekamp, Herford, Fed. Rep. of Germany, assignor to Wedeco Gesellschaft fur Entkeimungsanlagen mbH, Herford, Fed. Rep. of Germany

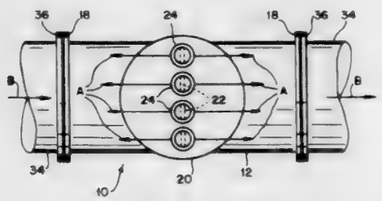
PCT No. PCT/DE89/00691, § 371 Date Jul. 16, 1990, § 102(e) Date Jul. 16, 1990, PCT Pub. No. WO90/04454, PCT Pub. Date May 3, 1990

PCT Filed Oct. 25, 1989, Ser. No. 477,934

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836494

Int. Cl.[5] B01J *19/12*

U.S. Cl. 422—186.3 **15 Claims**



1. A device for irradiating a flowing liquid or gas medium with UV light, comprising

a housing with an upstream entry opening for inflowing medium and with a downstream exit opening for out-flowing medium; and

one or several UV light sources arranged in protective pipes which are permeable for UV light, said UV light sources located within said medium and arranged in such a way that the UV light radiation is directed and its maximum extends in the flow direction of the inflowing medium and the outflowing medium;

wherein the UV light sources have a flat oval cross-section;

said flat oval cross-section comprising two parallel flat walls with oval walls connecting together the ends of said flat walls;

and wherein said UV light sources emit greater than 50% of their emitted light via said flat walls, and lesser than 50% via said oval walls; and

said flat walls oriented perpendicular to the direction of flow of said liquid or gas medium.

5,200,157

SUSCEPTOR FOR VAPOR-GROWTH DEPOSITION

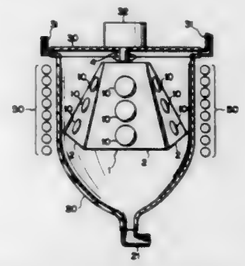
Eiichi Toya; Masayuki Ohkawa; Kazuo Itoh, and Yasumi Sasaki, all of Yamagata, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 551,646, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 232,553, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 13,432, Feb. 11, 1987, abandoned. This application Mar. 14, 1991, Ser. No. 668,329

Claims priority, application Japan, Feb. 17, 1986, 61-32223

Int. Cl.[5] C30B *25/12*

U.S. Cl. 422—246 **3 Claims**



1. A susceptor in the form of a plate having a thickness of 200 to 300 μm and formed from silicon carbide having a bulk density of 3.00 g/cm^2 or more for supporting a substrate on which material is epitaxially grown by vapor growth deposition comprising:

a body formed of a first layer, the crystal particles of which have an average diameter of 120 μm or less, and a second layer which has a recess portion for supporting said substrate and having a thickness of 120 μm or less, the surface region of the second layer constituted of at least 70 percent crystals having a diameter of 5 μm or less, and the average crystal grain size of the second layer being 60 μm or less and 50 percent or less of that of the first layer.

5,200,158

PROCESS AND APPARATUS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

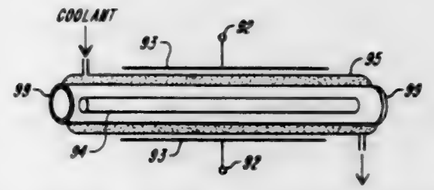
Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Division of Ser. No. 562,392, Aug. 3, 1990, which is a continuation-in-part of Ser. No. 72,899, Jul. 14, 1987, Pat. No. 4,818,488, which is a continuation-in-part of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427. This application Sep. 19, 1991, Ser. No. 762,573

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] A61L *2/14*

U.S. Cl. 422—292 **6 Claims**



1. Apparatus for sterilization and treatment of narrow bore, elongated and generally tubular devices in a gas plasma comprising,

an elongated gas-confining chamber containing an elongated

2) cooling at least a portion of the effluent gas stream to

at least one long chain alkenyl group having 50–100 car-

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device to be sterilized and treated, formed with a generally cylindrical wall,

at least two gas permeable and microorganism-impervious membranes generally of round cross section for sealing each free end of said chamber containing said elongated device to be sterilized and treated,

means for connecting said chamber to a gas delivery system at a first end of said chamber,

means for connecting said chamber to a gas exhaust system at a second end of said chamber,

means for evacuating said chamber through one of said membranes and for flowing gas through said chamber through one of said membranes, and

means for applying a suitable high frequency electromagnetic field in close proximity to said chamber.

5,200,159

PURIFIED SOLUTION CONTAINING IRON AND MANGANESE, AND METHOD PRODUCING THEREOF

Naoe Hirai, Yokohama; Toboru Murase, Ichikawa; Teruo Mori, Sakura, and Katsunobu Okutani, Ichikawa, all of Japan, assignors to Chemirite, Ltd. and TDK Corporation, both of Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,798

Claims priority, application Japan, Oct. 17, 1988, 63-259448

Int. Cl.[5] C01G *3/04*

U.S. Cl. 423—140 **3 Claims**

1. A purified solution containing iron chloride and manganese chloride, having a P-content not higher than about 0.007 wt. % with respect to the total content of iron and manganese, and a Mn-content higher than about 0.45 wt. % with respect to the total content of iron and manganese.

5,200,160

PROCESS FOR REMOVING SULFUR DIOXIDE AND NITROGEN OXIDES FROM FLUE GASES

Lewis B. Benson, Coraopolis; Yungli J. Lee, Lancaster, and John W. College, Pittsburgh, all of Pa., assignors to Dravo Lime Company, Pittsburgh, Pa.

Filed Aug. 29, 1991, Ser. No. 751,754

Int. Cl.[5] B01D *53/34*

U.S. Cl. 423—235 **18 Claims**

1. In a process for the removal of sulfur dioxide and nitrogen oxides from flue gases by contact in the scrubbing section of a liquid scrubbing unit, having a scrubbing section and a hold tank, of the flue gases with an aqueous scrubbing slurry of calcium components to remove sulfur dioxide and which aqueous scrubbing slurry contains ferrous-EDTA as a promoter to remove nitrogen oxides, with a portion of the ferrous-EDTA oxidized to ferric-EDTA in the liquid scrubbing unit, and wherein a portion of the aqueous slurry discharged from the liquid scrubbing unit is recycled to the scrubbing section of said liquid scrubbing unit, while the remainder of the aqueous scrubbing slurry is discharged from the liquid scrubbing unit and passed to a thickener and clarified, with clarified liquid from said thickener returned to the liquid scrubbing unit, the improvement comprising:

adding a sulfur-containing compound selected from the group consisting of sulfur, a sulfide and a polysulfide, as an initial reducing agent, in an amount sufficient to convert a portion of ferric-EDTA to ferrous EDTA, but less than that which will cause precipitation of iron as ferrous sulfide and ferrous disulfide, to an aqueous slurry of calcium components, prior to introduction thereof into said liquid scrubbing unit for admixture with said aqueous scrubbing slurry;

adding a further reducing agent, selected from the group consisting of metallic iron and a sulfite salt of sodium, to said aqueous scrubbing slurry in an amount sufficient to convert at least a major portion of ferric-EDTA contained therein to ferrous-EDTA;

adding an antioxidant, selected from the group consisting of hydrazine and glyoxal, in an amount sufficient to react with a major portion of dissolved oxygen in the scrubbing liquor, to said aqueous scrubbing slurry, to minimize the oxidation of ferrous-EDTA therein to ferric-EDTA in the scrubbing section of said scrubbing liquid unit;

passing the remainder of said aqueous scrubbing slurry to said thickener to produce a thickener underflow and said clarified liquor;

removing said thickener underflow from said thickener; and returning said clarified liquor to said liquid scrubbing unit.

5,200,161

PROCESS FOR THE SEPARATION OF HYDROGEN CYANIDE FROM GASES AND WASTE GASES

Joachim Fischer, Rodenbach; Hubert Wolf, Hammersbach, and Manfred Diehl, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 6, 1992, Ser. No. 878,916

Claims priority, application Fed. Rep. of Germany, May 23, 1991, 4116840

Int. Cl.[5] C01C *3/00;* **G01N** *25/08*

U.S. Cl. 423—236 **7 Claims**

1. A process for the separation of hydrogen cyanide from gases containing in addition to hydrogen cyanide, also hydrogen sulfide comprising scrubbing said gases in a gas scrubber with an aqueous scrubbing liquid to which formaldehyde in the form of an aqueous solution is added at a controlled rate for conversion of the hydrogen cyanide in said gases into glycol nitrile, branching off a measuring stream from the scrubbing liquid leaving the gas scrubber, controlling said rate by the deviation of a measured value determined at a constant pH in said measuring stream which is branched off from the scrubbing liquid leaving the gas scrubber, adding an aqueous hydrogen peroxide solution to said measuring stream in such a quantity that free hydrogen peroxide can still be detected after a contact time in the range of from 1 to 100 seconds, and the hydrogen cyanide tension across the measuring stream which has been treated thereby and adjusted to a constant pH of from 5 to 9 is determined as the measured value.

5,200,162

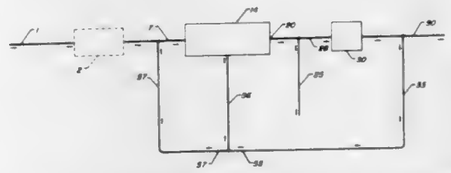
PROCESS FOR N_2O DECOMPOSITION

Brian W. Riley, High Barnet, and John R. Richmond, High Beach, both of United Kingdom, assignors to UOP, Des Plaines, Ill.

Filed Apr. 1, 1992, Ser. No. 862,016

Int. Cl.[5] B01J *8/00;* **C01B** *21/00*

U.S. Cl. 423—239 **14 Claims**



1. A process for the decomposition of N_2O in a gas stream comprising:

1) passing an N_2O-containing gas stream into a N_2O-decomposition zone, having a permissible maximum temperature, T_{max}, corresponding to the lower of the onset of catalyst sintering or NO_x formation, where said N_2O-containing gas stream is brought into contact under N_2O-decomposition conditions with a catalyst effecting decomposition of N_2O into nitrogen and oxygen to afford an effluent gas stream depleted in N_2O and enriched in nitrogen and oxygen;

2) cooling at least a portion of the effluent gas stream to afford a cooled effluent gas stream; and

3) recycling at least a portion of the cooled effluent gas stream to the N_2O-decomposition zone so as to maintain all temperatures in the N_2O-decomposition zone below T_{max}.

5,200,163

REMOVAL OF PHOSGENE FROM OFF-GASES

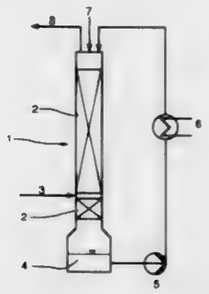
Jochem Henkelmann, Ludwigshafen; Thomas M. Kahl, Roemerberg; Irene Troetsch-Schaller, Frankenthal; Leopold Hupfer, Friedelsheim; Wolfgang Franzischka, Frankenthal, and Wolfgang Schwarz, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 30, 1991, Ser. No. 785,288

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1990, 4039750

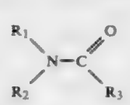
Int. Cl.[5] C01B *7/07;* **B01D** *47/00*

U.S. Cl. 423—240 R **7 Claims**



1. In a process for removing phosgene from off-gases by washing with a liquid, the improvement which comprises:

reacting the phosgene contained by the off-gas in a washing zone with a wash liquid which consists essentially of at least one compound of the formula



where R_1 and R_2 are identical or different and are selected from the group consisting of alkyl of 1 to 8 carbons and cycloalkyl of 5 to 8 carbon atoms, or R_1 and R_2 when taken together may also represent $-(CH_2)_n-$ where n is 4 or 5, and R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and cycloalkyl of 5 to 6 carbon atoms, or R_1 or R_2 when taken individually together with R_3 may also represent $-(CH_2)_m-$ where m is 3, 4 or 5, to form a Vilsmeier salt; and

further reacting said salt with water to form an off gas containing HCl with the phosgene removed.

5,200,164

EASILY DISPERSIBLE CARBON BLACKS

Avrom I. Medalia, Newton; Eva M. Breckner, Cambridge, and James A. Belmont, Maynard, all of Mass., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 504,215, Apr. 4, 1990, abandoned. This application Dec. 12, 1990, Ser. No. 626,434

Int. Cl.[5] C09C *1/56*

U.S. Cl. 423—265 **13 Claims**

1. A treated carbon black comprising:

a carbon black and a treating agent comprising at least one compound of which at least one compound contains both at least one long chain alkenyl group having 50–100 carbon atoms and at least one amine group, wherein the fraction, by weight, of carbon black in the treated carbon black is greater than 100/(100+DBPA of the carbon black) and wherein the carbon black is treated with an amount of treating agent sufficient to improve the dispersing characteristics of the carbon black while still allowing the carbon black to be substantially dry and free flowing or subsequently pelletized.

5,200,165

CONTROLLED PRECIPITATION OF AMORPHOUS, SILICA FROM GEOTHERMAL FLUID OR AQUEOUS MEDIA HAVING A SILICIC ACID CONCENTRATION

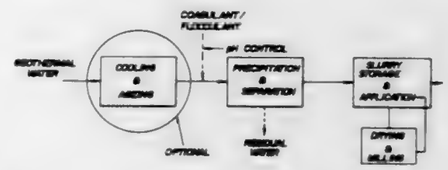
Ross T. Harper; James H. Johnston, both of Wellington, and Nicholas Wiseman, Rotorua, all of New Zealand, assignors to Tasman Pulp & Paper Co. Limited, Auckland and Geochemistry Research Limited, Wellington, both of New Zealand

Filed Mar. 20, 1990, Ser. No. 495,976

Claims priority, application New Zealand, Mar. 23, 1989, 228472; Jan. 19, 1990, 232170

Int. Cl.[5] C01B *33/18*

U.S. Cl. 423—339 **69 Claims**



1. A method of obtaining precipitated amorphous silica comprising siliceous material having a tertiary aggregate structure which is selected from the group consisting of Type-I, Type-II and Type-III amorphous silica, which method comprises:

providing a source fluid containing siliceous materials and an amount of a precipitation agent for said siliceous materials, selected from the group consisting of at least one cation, at least one cationic polymer, at least one cationic flocculent, and at least one non-ionic flocculent, which is insufficient to cause substantial quantities of said siliceous materials to come out of solution in said source fluid;

maintaining the pH of said fluid at up to about 9.5 during the following steps;

forming a silica sol, by causing said source fluid to become supersaturated with respect to amorphous silica and initiating polymerization of said siliceous materials therein into polymeric material comprising primary particles of polymeric amorphous silica, without causing substantial quantities of said siliceous materials to be precipitated;

aging said silica sol by holding such for a time sufficient to continue the polymerization of said siliceous materials in said sol into said polymeric material, without causing substantial quantities of said polymeric material to be precipitated;

adding to said silica sol a sufficient quantity of at least one of said precipitation agents to provide a sufficient proportion thereof, in relation to said polymeric material, to convert said polymeric material into a silica particle having a tertiary aggregate structure of said Type-I, Type-II or Type-III, and to cause rapid precipitation thereof from said silica sol; and

harvesting precipitated amorphous silica.

5,200,168

step of permitting said skin lesion to completely thaw after said drocarbons comprising the step of ionically fluorinating the

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5,200,166
PURIFICATION OF HYDROGEN PEROXIDE SOLUTION

Shujiro Shiga, Ohta; Yasuyoshi Suwaguri, Chiba; Koji Kabasawa, Chiba, and Tatsuya Momobayashi, Chiba, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Dec. 31, 1991, Ser. No. 815,182
Claims priority, application Japan, Jan. 14, 1991, 3-2580
Int. Cl.[5] C01B *15/01*
U.S. Cl. 423—584 **5 Claims**

1. A process for purifying a hydrogen peroxide solution which comprises treating a 10 to 60% by weight hydrogen peroxide solution having a pH between 1.5 and 5.0 and containing anionic impurities with a hydrogencarbonate form or carbonate form anion exchange resin to remove the anionic impurities while adding an acid or a salt thereof having an acid dissociation constant pKa in water of not more than 5 to the hydrogen peroxide solution to be treated continuously or semi-continuously in an amount of from 0.1 to 5.0 milliequivalents per liter of hydrogen peroxide solution; wherein said acid or salt thereof is at least one compound selected from the group consisting of hydrochloric acid, chlorous acid, hydrofluoric acid, nitric acid, sulfuric acid, phosphinic acid, phosphonic acid, phosphoric acid, diphosphoric acid, tripolyphosphoric acid, formic acid, acetic acid, chloroacetic acid, cyanoacetic acid, dichloroacetic acid, trichloroacetic acid, fluoroacetic acid, bromoacetic acid, iodoacetic acid, lactic acid, 2-chloropropionic acid, citric acid, tartaric acid, aminobenzoic acid, clorobenzoic acid, dichlorobenzoic acid, nitrobenzoic acid, dinitrobenzoic acid, salicylic acid, p-hydroxybenzoic acid, o-fluorobenzoic acid, difluorobenzoic acid, o-bromobenzoic acid, o-iodobenzoic acid, phenoxyacetic acid, benzenedicarboxylic acid, aminotris(methylenephosphonic acid), nitrilotri(methylenephosphonic acid), hydroxyethylidenediphosphonic acid, ethylenediaminetetra(methylenephosphonic acid), diethylenetriaminepenta(methylenephosphonic acid), cyclohexanediaminetetraacetic acid, diethylenetriaminepentaacetic acid, ethylenediaminetetraacetic acid, glycol ether diaminetetraacetic acid, hydroxyethylethylenediaminetriacetic acid, and nitrilotriacetic acid, and salts thereof.

5,200,167
METHOD FOR THE PREPARATION OF SPHERICAL, FINE PARTICLE TITANIUM OXIDE

Umio Maeda; Tutomu Imagawa, and Masatugu Noziri, all of Takaoka, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/01295, § 371 Date Oct. 1, 1990, § 102(e) Date Oct. 1, 1990, PCT Pub. No. WO90/09963, PCT Pub. Date Sep. 7, 1990
PCT Filed Dec. 25, 1989, Ser. No. 582,193
Claims priority, application Japan, Feb. 28, 1989, 1-47533
Int. Cl.[5] C01G *23/047*
U.S. Cl. 423—610 **8 Claims**

1. Method for preparing titanium oxide which comprises
(a) vaporizing a liquid consisting essentially of titanium alkoxide to form a first vapor;
(b) vaporizing methanol to form a second vapor;
(c) contacting the first vapor and second vapor under gas phase conditions sufficient to cause the reaction of the first vapor with the second vapor thereby forming a first solid particle reaction product therefrom;
(d) hydrolyzing the first solid particle reaction product thereby forming a second solid particle reaction product comprising titanium oxide;
(e) drying the second solid particle titanium oxide reaction product and recovering essentially spherical, fine particles of titanium oxide.

5,200,168
PROCESS FOR THE DEALUMINATION OF ZEOLITE BETA

Minas R. Apelian, Vincetown; Thomas F. Degnan, Moorestown, both of N.J.; Anthony S. Fung, Chadds Ford, Pa., and Gordon J. Kennedy, Turnersville, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Jan. 31, 1992, Ser. No. 828,624
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—714 **18 Claims**

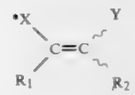
1. A process for the dealumination of a zeolite having the structure of zeolite Beta, which comprises contacting said zeolite having the structure of zeolite Beta with dicarboxylic acid for a sufficient time to effect greater than about 50% dealumination.

5,200,169
VINYL SUBSTITUTED RADIOHALOGEN CONJUGATES FOR PROTEIN LABELING

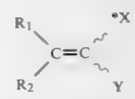
Daniel S. Wilbur, Edmonds, and Stephen W. Hadley, Seattle, both of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Division of Ser. No. 171,731, Apr. 5, 1988, Pat. No. 4,876,081, which is a continuation-in-part of Ser. No. 39,155, Apr. 16, 1987, Pat. No. 4,870,188. This application Jul. 5, 1989, Ser. No. 350,104
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] C07D *207/46;* **C07C** *69/76, 69/62;* **A61K** *69/02*
U.S. Cl. 424—1.1 **3 Claims**

1. A compound according to formula (I) or (II):



I



II

wherein
*X is a radiohalogen,
C═C is a double bonded set of sp^2 hybridized carbon atoms,
R_1 and R_2 are substituents independently selected from among hydrogen, alkyl of 1 to about 12 carbon atoms, and aryl of 5 to 7 carbon atoms, and
Y is benzoic acid bonded to an activated functional group to facilitate bonding of the compound to polypeptides, proteins, and protein fragments under conditions that preserve the biological activity of the polypeptides, proteins, and protein fragments, the functional group being selected from the group consisting of imide esters, alkyl imide esters, amido alkyl imide esters, succinimide esters, acylsuccinimides, imidate esters, alkyl imidate esters, amido alkyl imidate esters, phenolic esters, substituted phenolic esters, tetrafluorophenyl esters, wherein alkyl is of from 1 to about 12 carbon atoms.

5,200,170
MEDICAL PROCESS—USE OF DICHLORODIFLUOROMETHANE (CCL_2F2) AND CHLORODIFLUOROMETHANE ($CHCLF_2$) AS CRYOGENS FOR TREATING SKIN LESIONS

Ronald A. McDow, 1717 Nottingham Pl., Nashville, Tenn. 37221

Filed Jul. 18, 1989, Ser. No. 381,296
Int. Cl.[5] A61M *35/00;* **A01N** *25/02;* **A61K** *9/08;* **A61L** *9/04*
U.S. Cl. 424—45 **4 Claims**

2. The method according to claim 1 further comprising the step of permitting said skin lesion to completely thaw after said step of removing said fluid retaining device, and sequentially repeating said steps of placing said hollow fluid retaining device in said upright position, introducing said cryogenic agent

into said top open end of said fluid retaining device, terminating said introducing step and retaining said hollow fluid retaining device in said upright position while said cryogenic agent is evaporating, and subsequently removing said fluid retaining device from said upright position.

5,200,171
ORAL HEALTH PREPARATION AND METHOD

Perry Ratcliff, Scottsdale, Ariz., assignor to Micropure, Inc., Scottsdale, Ariz.

Filed Nov. 20, 1990, Ser. No. 615,989
The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.
Int. Cl.[5] A61K *7/16, 7/18, 7/20, 33/16*
U.S. Cl. 424—52 **24 Claims**

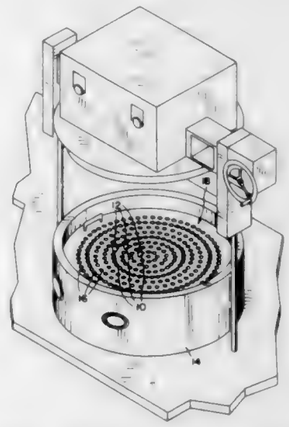
1. A composition for preventing and treating dental disease by reducing the number of micro-organisms in the mouth, said composition comprising an oral health preparation selected from the group consisting of a mouthwash and a dentifrice, wherein the oral health preparation contains stabilized chlorine dioxide in a concentration in the range of between about 0.005%–0.5% and a monofluorophosphate compound in a concentration in the range of between about 0.02%–3.0% to retard escape of chlorine dioxide from the composition at a pH in the range of 6.0 to 7.4, thereby increasing the shelf life and efficacy of the composition.

5,200,172
COSMETIC PRODUCTS AND METHODS OF PRODUCING SAME

Melvin Kamen, Highlands, N.J., and Philip Bernstein, Yardley, Pa., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 296,230, Jan. 12, 1989, Pat. No. 4,978,524. This application Dec. 17, 1990, Ser. No. 628,612
Int. Cl.[5] A61K *7/021*
U.S. Cl. 424—64 **6 Claims**

1. A method of providing a cosmetic product comprising 60–75% oil, 20–25% wax, 5–10% fatty material, 5–10% polyhydroxy alcohol, and 5–10% color additives, with a 100–300 angstrom thick uniform, satin-matte finish of fluorinated hydrocarbons comprising the step of ionically fluorinating the surface of said cosmetic product using a plasma treatment

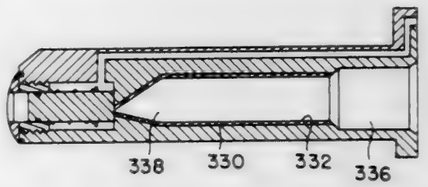


process wherein the gas plasma reacts with the surface of the cosmetic product to provide a uniform satin-matte finish.

5,200,173
MOLDED COSMETIC PRODUCTS CONTAINING UNIFORM ULTRA GLOSSY WET LOOK SURFACE FINISH

Melvin E. Kamen, Highlands, and Philip Bernstein, Glen Ridge, both of N.J., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Division of Ser. No. 400,834, Aug. 30, 1989, Pat. No. 5,108,667. This application Aug. 5, 1991, Ser. No. 740,170
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.
Int. Cl.[5] A61K *7/027*
U.S. Cl. 424—64 **1 Claim**



1. An improved lipstick product having a uniform, ultra glossy wet look surface finish which is obtained solely by the following molding process:
(a) mounting a polymeric lipstick mold or polymeric lipstick mold insert having a threaded bore and made of an ingredient selected from the group consisting of polyalkylenes, having 2–8 carbon atoms, polyamides, styrenics, polyacetals, polycarbonates, polyacrylates, polysulfones, polyesters, and cellulosics, to a mold holding fixture containing a plurality of threaded mounts, by screwing the threaded bore into the threaded mounts,
(b) placing the molds and mold holding apparatus into a vacuum chamber,
(c) closing and evacuating the vacuum chamber,
(d) introducing into the vacuum chamber and into each individual mold through a separate gas feed line, a treatment gas selected from the group consisting of ethylene tetrafluoride, fluoroethane, silicone fluoride, fluorine, and methyl fluoride,

5,200,176

5,200,179

5,200,183

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(e) forming an anti-adhesive surface layer of 10–1000 angstroms on the inner surface wall of each mold or mold insert with a cold glow discharge of said treatment gas plasma, and molding a lipstick material in said mold or mold insert whereby said anti-adhesive surface layer reduces the surface adhesivity between said polymer and the surface of the material being molded.

5,200,174

GEL STICK ANTIPERSPIRANT COMPOSITION CONTAINING 2-OXAZOLIDINONE DERIVATIVE AND PROCESS FOR MAKING THEM

John M. Gardlik, and Brian D. Hofrichter, both of Cincinnati, Ohio, assignors to Procter & Gamble, Cincinnati, Ohio

Filed May 6, 1991, Ser. No. 696,375
Int. Cl.[5] A61K *7/32, 7/34, 7/38*
U.S. Cl. 424—66 22 Claims

1. A solid antiperspirant composition in gel stick form, having an acidic pH, comprising:
(a) from about 0.5% to about 35% of an antiperspirant active;
(b) from about 0.5% to about 10% of a gelling agent selected from the group consisting of substituted and unsubstituted dibenzylidene alditols, and mixtures thereof;
(c) from about 5% to about 98% of a hydroxy solvent for said gelling agent selected from the group consisting of monohydric and polyhydric alcohols; and
(d) from about 0.5% to about 40% of a 2-oxazolidinone having a C_1–C_4 alkyl radical substituted at the 3 position of the heterocyclic ring, or a mixture thereof, wherein said gelling agent is more soluble in said 2-oxazolidinone than in said hydroxy solvent.

5,200,175

HAIR TREATMENT COMPOSITION

Yoshiko Tabata, Chiba, and Naohisa Kure, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,648
Claims priority, application Japan, Nov. 28, 1990, 2-328288
Int. Cl.[5] A61K *7/09, 7/13*
U.S. Cl. 424—70 6 Claims

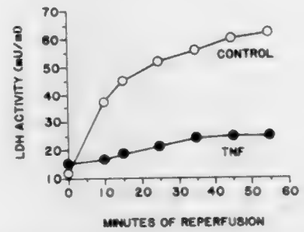
1. A hair treatment composition, which comprises:
(A) 3 to 10% by weight, calculated as a cysteine, of cysteine or a salt thereof, and
(B) a monosaccharide having 4 to 10 carbon atoms and having no aldehyde or ketone group, C_4–C_{10} straight chain or cyclic polyhydric alcohols, condensation products of two or three of said monosaccharides or polyhydric alcohols, saccharides which are produced by condensation of two or three monosaccharides having 4 to 10 carbon atoms and also having an aldehyde group or a ketone group, with the aldehyde or ketone group being eliminated during the course of the condensation process, the proportion by weight of (B)/(A) being less than 3.

5,200,176

METHOD FOR PROTECTION OF ISCHEMIC TISSUES USING TUMOR NEROSIS FACTOR

Grace H. W. Wong, South San Francisco, and David V. Goeddel, Hillsburough, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Oct. 6, 1989, Ser. No. 418,010
Int. Cl.[5] A61K *37/02*
U.S. Cl. 424—85.1 21 Claims



1. A method for the protection of ischemic tissues, comprising the administration to said tissue prior to reperfusion of an effective amount of a tumor necrosis factor.

5,200,177

TREATMENT OF ATOPIC DISORDERS WITH GAMMA-INTERFERON

Donald Y. M. Leung, Englewood, Colo., and Raif S. Geha, Belmont, Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 444,763, Dec. 1, 1989, abandoned. This application Jul. 13, 1992, Ser. No. 912,564
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.5 9 Claims

1. A method of treating an individual having Type 1 atopic dermatitis comprising administering to the individual an amount of gamma interferon sufficient to reduce, ameliorate or eliminate clinical symptoms of the Type 1 atopic dermatitis.

5,200,178

METHOD FOR TUMOR DETECTION

H. William Strauss, Newton Center; Robert H. Rubin, Brookline; Ban An Khaw, Milton, and Faina Shtern, Boston, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 161,040, Feb. 26, 1988, abandoned. This application Jul. 16, 1991, Ser. No. 731,384
Int. Cl.[5] A61K *49/02, 49/00*
U.S. Cl. 424—1.1 13 Claims

1. A method of detecting an Fc receptor-expressing tumor site in vivo in an individual which comprises:
administering to said individual a diagnostically effective amount of a non-specific detectably-labeled immunoglobulin or an Fc or Fc' fragment thereof;
contacting said immunoglobulin or Fc or Fc' fragment thereof with Fc receptors at said tumor site; and
detecting said detectably-labeled immunoglobulin or Fc or Fc' fragment thereof.

5,200,179

VACCINE

Dale Bordt, and Hans Draayer, both of Jacksonville, Ill., assignors to Beecham Group p.l.c., Middlesex, England

Continuation of Ser. No. 243,251, Sep. 14, 1988, abandoned, which is a continuation of Ser. No. 101,822, Sep. 28, 1987, abandoned. This application Feb. 13, 1991, Ser. No. 655,254
Int. Cl.[5] A61K *39/12, 39/02*
U.S. Cl. 424—89 14 Claims

1. A vaccine which is substantially free from live viruses or bacteria and contains an inactivated virus or bacterium together with a pharmaceutically acceptable carrier, wherein the inactivated virus or bacterium was prepared by inactivating a live virus or bacterium with ascorbic acid and/or a salt thereof in the presence of oxygen and a source of heavy metal ions.

5,200,180

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF THE HUMAN EYE

Christian Bannert, Miltenbergstrasse 17, D-8900 Augsburg 22, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 449,882, Dec. 15, 1989, abandoned. This application Feb. 5, 1991, Ser. No. 650,847
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721163
Int. Cl.[5] A61F *2/00*
U.S. Cl. 424—427 3 Claims

1. The method of treating diseases of the human eye, which comprises simultaneously or successively applying to the eye at least two compounds capable of gel formation with each other, wherein the compounds capable of gel formation are a solution of a calcium salt with a concentration of 0.01 to 2.5 mmols per 100 ml and a solution of a polysaccharide with a concentration of 0.01 to 1% by weight.

5,200,181

ORAL BILIRUBIN THERAPY

Paul J. Soltys, Somerville; Claudy J. P. Mullon, Burlington, and Robert S. Langer, Somerville, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 142,129, Jan. 11, 1988, abandoned. This application Oct. 1, 1990, Ser. No. 593,345
Int. Cl.[5] A61K *37/50, 37/52, 9/14;* C12N *11/00*
U.S. Cl. 424—94.3 4 Claims

1. A method of controlling serum bilirubin levels in a mammal by administering a bilirubin conversion enzyme via the stomach to the mammal's intestinal tract, said enzyme being conjugated to an inert polymeric particulate carrier resistant to intestinal degradation.

5,200,182

ANTIVIRAL OR ANTIBACTERIAL COMPOSITION AND METHOD OF USE

Witold Kiczka, Princeton, N.J., assignor to Nika Health Products, Ltd., Vaduz, Liechtenstein

PCT No. PCT/US88/01785, § 371 Date Jan. 26, 1990, § 102(e) Date Jan. 26, 1990
PCT Filed May 26, 1988, Ser. No. 459,738
Int. Cl.[5] A61K *37/52, 37/56, 37/58, 37/60*
U.S. Cl. 424—94.5 7 Claims

1. A method of treating herpes in a human patient comprising administering a therapeutically effective amount of a ribonuclease dimer.

5,200,183

RECOMBINANT BILE SALT ACTIVATED LIPASES

Jordan J. N. Tang, and Chi-Sun Wang, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 504,635, Apr. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 122,410, Nov. 19, 1987, Pat. No. 4,941,944. This application Jun. 12, 1990, Ser. No. 537,426
The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.
Int. Cl.[5] A61K *37/54;* C12N *15/55, 9/20*
U.S. Cl. 424—94.6 10 Claims

1. An isolated nucleotide molecule encoding bile salt-activated milk lipase or a polypeptide portion thereof, the lipase or portion thereof including a heparin binding sequence BXBXXBBB, wherein B is a basic amino acid residue and X is an uncharged amino acid residue, binding bile salts, and having lipase activity in the presence of the bile salts.

5,200,184

LIPOPOLYSACCHARIDES OF REDUCED TOXICITY AND THE PRODUCTION THEREOF

Robert S. Munford, and Catherine L. Hall, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 515,657, Apr. 24, 1990, abandoned, which is a continuation of Ser. No. 53,044, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,428, May 28, 1986, Pat. No. 4,929,604. This application Jul. 8, 1991, Ser. No. 728,763
Int. Cl.[5] A61K *37/54, 31/715;* C12N *9/18*
U.S. Cl. 424—94.61 6 Claims

1. A method of treating a mammal with Gram-negative bacterial septic shock or prophylactically treating said mammal susceptible to Gram-negative bacterial septic shock, the method comprising administering intravascularly to said mammal an amount of immunogenically tolerated acyloxyacyl hydrolase effective to prevent LPS tissue toxicity.

5,200,185

METHOD FOR BREEDING POULTRY AND LIVESTOCK WITH SUPERIOR MEAT AND SKIN QUALITY, OR FOR MAINTAINING HEALTHY PETS

Shiyushichi Takahashi, 23-2, Sakigaoka 3-chome, Funabashi-shi, Chibaken, 274, Japan

PCT No. PCT/JP90/01658, § 371 Date Oct. 22, 1991, § 102(e) Date Oct. 22, 1991, PCT Pub. No. WO91/09353, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 20, 1990, Ser. No. 752,666
Claims priority, application Japan, Dec. 25, 1989, 1-332974; May 8, 1990, 2-116872; May 9, 1990, 2-119218
Int. Cl.[5] A61K *35/78;* A23K *1/00*
U.S. Cl. 424—195.1 12 Claims

1. A method of raising and maintaining the health of an animal selected from the group consisting of mammals and poultry, comprising feeding said animal a composition comprising animal feed and about 0.1 to 30% *Eucommia ulmoides* Oliver leaves based on volume of said feed.

5,200,186

PROCESS FOR THE PREPARATION OF EXTRACTS HAVING HIGH CONTENT IN ANTHOCYANOSIDES

Bruno Gabetta, and Gianfranco Zini, both of Milan, Italy, assignors to Inverni Della Beffa S.P.A., Milan, Italy

Filed Aug. 3, 1990, Ser. No. 562,216
Claims priority, application Italy, Aug. 11, 1989, 21515 A/89
Int. Cl.[5] A61K *35/78, 31/35;* C09B *61/00*
U.S. Cl. 424—195.1 8 Claims

1. A process for the preparation of an extract having high content of anthocyanosides which consists of:
(a) reacting for 2–4 hours at room temperature an extract of

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fruits of *Vaccinium muyrtillus, Ribes nigrum, Vitis vinifera* or *Sambucus nigra*, containing 2–40% of anthocyanosides in addition to organic acids, salts, carbohydrates, flavonic glycosides, polyphenolic compounds and catechic tannins with 20–30 volumes of an aqueous solution containing at least 5 moles of bisulfite ion per mole of anthocyanosides to form a solution of an anthocyanoside-bisulfite adduct of pH 1–3.5;

(b) adjusting the pH of said solution from step a) to 5–6 by addition of 10% aqueous alkali and passing said solution through a column containing a resin obtained by polymerization of styrene, the amount of said resin being about 1 liter of resin per 10 grams of said flavonic glycosides and said catechic tannins to be absorbed, whereby said bisulfite adduct is eluted in the aqueous solution together with said salts, said organic acids and said carbohydrates while said polyphenolic compounds and said catechic tannins remain absorbed on said column;

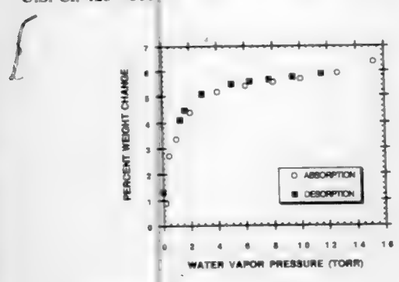
(c) acidifying to pH 1–2 said aqueous solution from step b) by addition of hydrochloric acid whereby the anthocyanoside-bisulfite adduct is cleaved, completing the cleavage by passing a stream of an inert gas in said aqueous solution, and extracting said aqueous solution with butanol or amyl alcohol whereby said anthocyanosides are obtained in a butanol or amyl alcohol solution, concentrating said butanol or amyl alcohol solution and recovering said extract of anthocyanosides therefrom.

5,200,187

MOLYBDENUM PHOSPHATE COMPOSITIONS

Robert C. Haushalter, Little York, and Linda A. Mundi, Lake Hopatcong, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 18, 1991, Ser. No. 761,536
Int. Cl.[5] C01B 25/37; C07F 11/00
U.S. Cl. 423—308 **4 Claims**



1. A compound having the formula:

$$[R_4X]_aA_bM_e(MoO)_d(H_2PO_4)_f(HPO_4)_gH_2)]$$

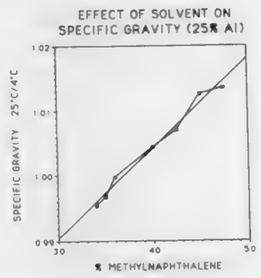
wherein a, b, e, and i are greater than or equal to zero and c, d, and at least one of f and g is greater than zero and not necessarily integers; R=H, phenyl, C_nH_{2n+1}, or combinations thereof, n is an integer greater than or equal to 0 and less than or equal to 3; where X=N, P or As; A=Li, Na, K, Rb, Cs, Tl, Mg, Ca, Sr, Ba, NH_4, H_3O or combinations thereof; M is a transition element or cation from main group elements, or combinations thereof, and P is tetrahedrally coordinated and Mo is octahedrally coordinated and is in an oxidation state of less than or equal to 5+.

5,200,188

WATER-DILUTABLE ISOTHIAZOLONE COMPOSITIONS

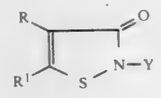
John R. Mattox, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 21, 1990, Ser. No. 586,063
Int. Cl.[5] A01N 25/00
U.S. Cl. 424—405 **19 Claims**



1. A water-dilutable preservative concentrate composition comprising:

(a) an isothiazolone having a water solubility of less than 1% by weight of the formula:



wherein

Y is an unsubstituted alkyl group of 2 to 18 carbon atoms; a substituted alkyl group of 2 to 18 carbon atoms having at least one hydrogen atom replaced by hydroxy, halo, cyano, alkylamino, dialkylamino, phenylamino, halophenylamino, carboxy, carbalkoxy, alkoxy, aryloxy, morpholino, piperidino, pyrrolidonyl, carbamoxy, or isothiazolonyl, wherein the total number of carbon atoms in the substituted alkyl group does not exceed 18; an unsubstituted or halo-substituted alkenyl group of 4 to 18 carbon atoms; unsubstituted or halo-substituted alkynyl group of to 18 carbon atoms; an unsubstituted or alkyl-substituted cycloalkyl group having a four to six carbon atom ring and up to 12 carbon atoms; an unsubstituted or a halo-, lower alkyl-, or lower alkoxy-substituted aralkyl group wherein the total number of carbon atoms in the aralkyl group does not exceed 10; or an unsubstituted or a halo-, nitro-, lower alkyl-, or lower carbalkoxy-, substituted aryl group wherein the total number of carbon atoms in the aryl group does not exceed 10; and

R and R^1 are the same or different substituent selected from hydrogen, halogen, or a (C_1–C_4) alkyl group;

(b) a first organic solvent selected from the group consisting of aromatic hydrocarbons having: a kauri-butanol value >70, a boiling range at one atmosphere within the limits 230°–680° F., and a specific gravity of <0.95;

(c) a second organic solvent capable of dissolving at least about 20% by weight of said isothiazolone and selected from the group consisting of lower-alkyl substituted naphthalene, tetralin, lower-alkyl substituted tetralins, indane, and lower-alkyl substituted indanes, said second organic solvent having a specific gravity of >0.95; and

(d) an emulsifier

provided that said composition is in the form of a non-aqueous emulsive concentrate which forms a stable macroemulsion upon dilution with water.

5,200,189

PEROXYACID ANTIMICROBIAL COMPOSITION

Thomas R. Oakes, Lake Elmo; Patricia M. Stanley, Minneapolis, and Jerome D. Keller, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Jul. 23, 1991, Ser. No. 734,580
Int. Cl.[5] A01N 37/02, 39/02
U.S. Cl. 424—405 **12 Claims**

1. A peroxyacid antimicrobial concentrate composition comprising:

(a) about 0.01 to 25 wt. % of a C_1–C_4 peroxycarboxylic acid;

(b) about 0.01 to 10 wt. % of a peroxyacid of the structure R_1—CO_3H, wherein R_1 comprises a linear, saturated hydrocarbon chain having about 5 to 17 carbon atoms;

(c) about 0.1 to 30 wt. % of a hydrotrope coupling agent capable of solubilizing said peroxyacid of (b) in the concentrate and when the concentrate is diluted with water; and

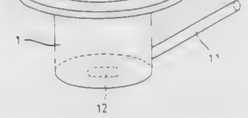
(d) about 1 to 50 wt. % of hydrogen peroxide; wherein the concentrate composition is capable of being diluted with a major proportion of water to form an antimicrobial sanitizing use solution having a pH in the range of about 3 to 7.

5,200,190

PERCUTANEOUS PHARMACEUTICAL PREPARATION

Masato Azuma, Osaka; Hiroko Tsukahara, Takatsuki; Hiroshi Kuroda, Ibaraki, and Mutsumi Fukuda, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1989, Ser. No. 419,356
Claims priority, application Japan, Oct. 11, 1988, 63-256379; Jan. 26, 1989, 1-16622; Mar. 7, 1989, 1-54779; Jun. 14, 1989, 1-150986; Jul. 10, 1989, 1-178537; Jul. 10, 1989, 1-178538
Int. Cl.[5] A61F 13/02
U.S. Cl. 424—443 **10 Claims**



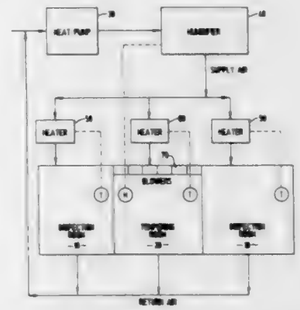
1. A percutaneous pharmaceutical preparation comprising a flexible backing, which is not permeable to an active ingredient, and an adhesive layer formed on said flexible backing; said adhesive layer comprising an adhesive base material and an active ingredient compatible with said adhesive base material; wherein said adhesive base material consists essentially of a copolymer containing 2-ethylhexyl acrylate in a concentration of 55 to 60 mol % and N-vinyl-2-pyrrolidone in a concentration of 30 to 45 mol %, and said active ingredient is estradiol and/or the esters thereof which are contained in a concentration of 6 to 25% by weight of the total amount of said adhesive base material and said active ingredient wherein the estradiol and/or the esters thereof are completely dissolved in said copolymer.

5,200,191

SOFTGEL MANUFACTURING PROCESS

Don Steele, Westlake, and Gregory Dietel, Moorpark, both of Calif., assignors to Banner Gelatin Products Corp., Chatsworth, Calif.

Filed Sep. 11, 1991, Ser. No. 757,553
Int. Cl.[5] A61K 9/48
U.S. Cl. 424—453 **24 Claims**



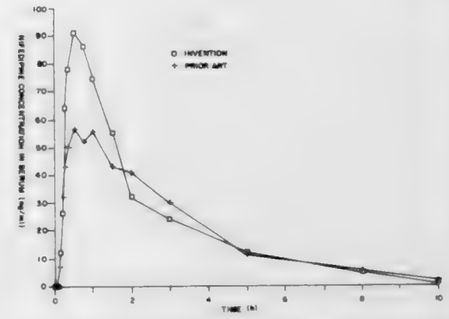
1. In a process for producing a plurality of gelatin shells encapsulating a fill, wherein the fill is first encapsulated in a shell and then the shells containing the fill are dried at a given temperature so that the water content of each shell ranges from 6–10%, the improvement comprising subsequently heating the filled shells to a temperature above the given temperature and in a range of 32°–43° C. and at 35–60% relative humidity whereby dimples and bubbles are removed from the filled shells.

5,200,192

INSTANT ORAL-RELEASE CAPSULE CONTAINING NIFEDIPINE

Walter Wimmer, Blumenroder Strasse 68, 6250 Limburg/Lahn, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,957
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738236
Int. Cl.[5] A61K 9/65
U.S. Cl. 424—455 **23 Claims**



1. An instant oral-release capsule comprising a capsule body formed of a soft gelatine containing a light protective pigment, said capsule containing an aqueous or aqueous alcoholic solution of nifedipine, a polyalkylene glycol and a polyoxyethylene ester component, the amount of the polyoxyethylene ester component in the solution being sufficient to prevent precipitation of nifedipine in the mouth of a patient after release of the

5,200,193

lose fibers, cellulose ester fibers, cross-linked sodium carboxy-

5,200,196

(a) a wall comprising at least in part a composition permea-

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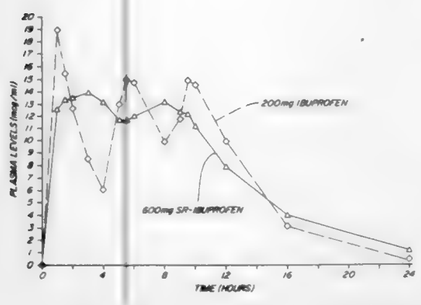
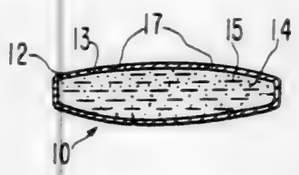
5,200,193
PHARMACEUTICAL SUSTAINED RELEASE MATRIX AND PROCESS
Galen W. Radebaugh, Maple Glen; Thomas N. Julian, Horsham, and Robert Glinecke, Glenside, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.
Continuation of Ser. No. 184,532, Apr. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 41,164, Apr. 22, 1987, Pat. No. 4,245,286. This application Oct. 22, 1990, Ser. No. 600,279
Int. Cl.[5] A61R 9/72
U.S. Cl. 424—468 17 Claims



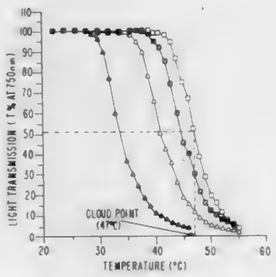
1. A shaped and compressed sustained release therapeutic composition comprising an effective amount of an analgesic and a granulating agent and excipients combined into a matrix, characterized by a long-lasting slow and relatively regular incremental release of the analgesic upon administration, wherein the granulating agent and excipients includes a combination of two polymers, ethylcellulose and povidone, wherein the total amount of granulating agent and excipients is an amount effective to form a solid matrix of active and binder materials and is less than 20 percent of the weight of said shaped and compressed composition wherein the total amount of granulating agent, and granulating agent and excipients is in the range of 5 to less than 20 percent of the weight of pair shaped and compressed composition.

5,200,194
ORAL OSMOTIC DEVICE
David E. Edgren, El Granada, and Gurdish K. Bhatti, Fremont, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Dec. 18, 1991, Ser. No. 809,741
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—473 19 Claims



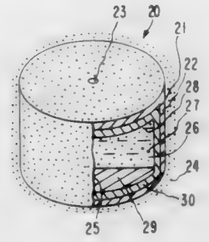
1. An osmotic device for the controlled delivery of a beneficial agent to an oral cavity of an animal over an extended delivery period, the device having a size and shape suitable for comfortably retaining the device in the oral cavity for the extended delivery period, the device including a wall surrounding a solid dose of the beneficial agent, the beneficial agent exhibiting at least some degree of solubility in an aqueous fluid present in the oral cavity, and a fibrous support material comprised of hydrophilic water-insoluble fibers selected from the group consisting of cellulose fibers, microcrystalline cellulose fibers, cellulose ester fibers, cross-linked sodium carboxymethyl cellulose fiber, low-substituted hydroxypropyl cellulose fibers, seaweed fibers, chitin fibers, chitsan fibers, and blends thereof, the wall having a passageway communicating the solid dose with the exterior of the device, the wall being formed of a semipermeable material which is (i) permeable to the passage of the aqueous fluid and (ii) substantially impermeable to the passage of the fibrous support material.

5,200,195
PROCESS FOR IMPROVING DOSAGE FORM DELIVERY KINETICS
Liang C. Dong, Mountain View; Michael H. Dealey, San Francisco; Terry L. Burkoth; Patrick S. L. Wong, both of Palo Alto; Jerry D. Childers, and Brian L. Barclay, both of Sunnyvale, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Dec. 6, 1991, Ser. No. 804,137
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—473 3 Claims



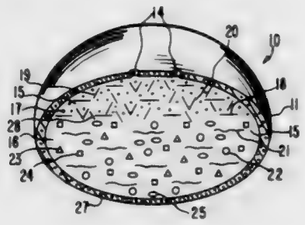
1. A process for reducing the stickiness of a dosage form to biological tissue in a fluid environment of use, wherein the process comprises:
(a) admitting a dosage form into the environment of use, the dosage form comprising:
(1) a wall comprising a composition permeable to the passage of fluid, which wall surrounds;
(2) a compartment;
(3) a first composition in the compartment comprising 15 to 60 weight percent of a hydrophilic polymer possessing a critical solution temperature which is a means for providing in situ flocculation of the polymer, 10 to 45 weight percent of a dehydrating agent exhibiting an ability to depress the critical solution temperature of the polymer, and a drug;
(4) a second composition in the compartment comprising 20 to 85 weight percent of a polymer that imbibes fluid. expands and thereby pushes the first composition from the dosage form;
(5) an exit passageway in the wall that connects the compartment with the environment of use;
(b) imbibing fluid into the first composition causing the hydrophilic polymer to form a floc comprising the drug above the critical solution temperature and in the presence of the dehydrating agent, which floc, when delivered from the dosage form, reduces the stickiness of the hydrophilic polymer; and,
(c) imbibing fluid into the second composition causing it to expand and push the first composition from the dosage form, whereby the floc is delivered to the environment of use.

5,200,196
IMPROVEMENT IN PULSED DRUG THERAPY
Atul D. Ayer, Palo Alto; Felix Theeuwes, Los Altos, and Patrick S. L. Wong, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Continuation of Ser. No. 312,845, Feb. 21, 1989, Pat. No. 4,986,987, which is a division of Ser. No. 861,188, May 9, 1986, Pat. No. 4,842,867. This application Jan. 11, 1991, Ser. No. 640,469
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—473 1 Claim



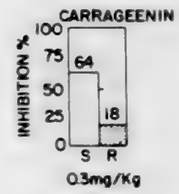
1. An improvement in a chronological dosage form for delivering a beneficial drug to a drug recipient, wherein the dosage form comprises:
(a) a wall comprising at least in part a composition permeable to the passage of fluid, which wall surrounds and forms;
(b) a compartment;
(c) a drug formulation in the compartment;
(d) at least one exit means in the wall for delivering the drug from the dosage form, and wherein the improvement comprises:
(e) means in the compartment for delaying the delivery of drug from the dosage form, which means comprises a drug-free 0.1 mm to 10 mm thick lamina that delays the delivery of drug for up to 12 hours and surrounds the drug formulation for providing drug at a delayed time for therapy int he recipient.

5,200,197
CONTRACEPTIVE PILL
Jeri D. Wright, Dublin; Jerry D. Childers, Fremont; Brian L. Barclay, Sunnyvale; Patrick S.-L. Wong, Palo Alto, and Linda E. Atkinson, Portola Valley, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 437,480, Nov. 16, 1989, Pat. No. 5,098,714. This application Dec. 9, 1991, Ser. No. 805,241
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—473 10 Claims



1. An osmotic device for delivering contraceptive steroids, the osmotic device comprising:
(a) a wall comprising at least in part a composition permeable to the passage of fluid, which wall surrounds;
(b) a compartment;
(c) at least one exit passageway that connects the exterior of the device with the compartment;
(d) a first composition in the compartment, said composition comprising a pharmaceutically acceptable carrier comprising a member selected from the group consisting of polyethylene oxide comprising a 50,000 to 350,000 molecular weight and a polyvinylpyrrolidone comprising a 8,000 to 65,000 molecular weight and a contraceptively effective amount of an estrogenic steroid that is delivered in 0.2 micrograms to 30 micrograms per hour for up to 24 hours over time for providing contraceptive control;
(e) a second composition in the compartment, said second composition comprising an osmopolymer, which composition when the device is in operation in the presence of fluid that enters the device, increases in dimensions and displaces the first composition through the passageway from the device; and,
(f) a coat on the exterior of the wall, the coat comprising a pharmaceutically acceptable carrier comprising a contraceptively effective amount of an estrogenic steroid and a contraceptively effective amount of a progestogenic pair, which are coadministered from the coat to provide immediate contraceptive control prior to the delivery of the estrogenic steroid from the compartment.

5,200,198
MEDICAMENT AND ITS PRODUCTION AND USE IN THE TREATMENT OF PAIN, INFLAMMATION AND FEVER IN MAN AND ANIMALS
Gerd Geisslinger, Nuremberg, and Kay Brune, Marioffstein, both of Fed. Rep. of Germany, assignors to Paz Arzneimittel-Entwicklungsgesellschaft mbH, Frankfurt, Fed. Rep. of Germany
Filed May 16, 1991, Ser. No. 700,797
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 4028906
Int. Cl.[5] A61K 9/14, 9/48, 31/19
U.S. Cl. 424—489 20 Claims



1. A medicament effective for the treatment of a disease characterized by pain or inflammation, which comprises
(a) substantially pure R(−)-flurbiprofen or R(−)-flurbiprofen in combination with up to about 40% S(+)- flurbiprofen and
(b) a pharmaceutically acceptable carrier wherein said medicament comprises 2–10% of a release agent.

5,200,199
of a container closure body that has a circular top panel wall,

side locking pieces at said acting position and at said

said first shaft 222, 222', respectively, in order to adjust

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5,200,199

Patent Not Issued For This Number

5,200,200

PREPARATION OF ELECTROLYTE SOLUTIONS AND CONTAINERS CONTAINING SAME

Richard L. Veech, c/o Laboratory of Metabolism, NIAAA, Room 55A, 12501 Washington Ave., Rockville, Md. 20852

Division of Ser. No. 940,331, Dec. 17, 1986, Pat. No. 4,929,449, which is a continuation-in-part of Ser. No. 810,915, Dec. 18, 1985, abandoned. This application Apr. 16, 1990, Ser. No. 509,182

Int. Cl.[5] A61K *33/14*

U.S. Cl. 424—663 13 Claims

1. A method for administration of a redox active parenteral therapeutic solution comprising the steps of

(A) dissolving in sterile and substantially pyrogen free water inorganic salts and carbon dioxide which are also both sterile and substantially pyrogen free thereby producing an aqueous solution having the following compositions:

Component	Quantity (in mMoles/Liter)
Na^+	130–165
K^+	0–5
Ca^{++}	0–2.5
Mg^{++}	0–1.5
Cl^-	90–120
HCO_3^-	.5–60
CO_2	.1–25

(B) filling a sterile bag having a substantially inert plastic inner wall and having an internal volume ranging from about 0.5 to 3 liters with said solution, said bag being further characterized by being substantially impermeable to carbon dioxide,

(C) sealing said bag,

(D) storing and moving such resulting sealed bag to a location adjacent a patient to whom said solution is to be administered parenterally,

(E) penetrating said bag with a tubular delivery system associated therewith under sterile conditions, and

(F) interconnecting the interior of said bag with said patient under sterile conditions through said delivery system.

5,200,201

APPARATUS FOR FORMING PLASTIC GRIP MEMBER OF CONTAINER CLOSURE

Kashiwa Murayama, Fujisawa; Masakazu Tatsuta, Hiratsuka; Yoshiharu Shibata, Hiratsuka; Hideki Yajima, Hiratsuka; Yuji Kano, Chigasaki; Tateo Kubo, Hiratsuka; Kinji fuchie, Tokorozawa, and Hiroshi Sato, Hiratsuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,705

Claims priority, application Japan, Sep. 7, 1990, 2-235592; Jan. 24, 1991, 3-22645

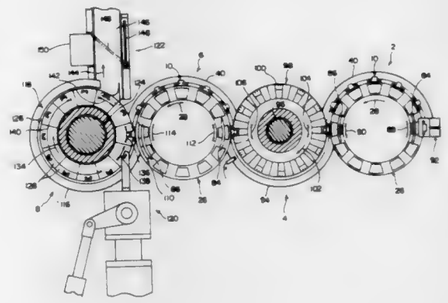
Int. Cl.[5] B29C *45/06, 45/14*

U.S. Cl. 425—117 13 Claims

1. A molding apparatus for forming a plastic grip member and, at the same time, linking it integrally to a protruding piece of a container closure body that has a circular top panel wall, a cylindrical skirt wall extending downwardly from a peripheral edge of said top panel wall and said protruding piece protruding from a lower edge of said skirt wall, said molding system comprising:

a rotary container closure body conveyor apparatus for carrying said container closures; wherein

said rotary container closure body conveyor apparatus is comprised of a rotary disc that rotates on a central axis extending substantially vertically and has a plurality of container closure body-receiving portions formed on an outer peripheral surface thereof at intervals in the circumferential direction, and a rotation preventing mechanism which prevents the container closure bodies held in the



receiving portions from rotating therein;

each of said receiving portions formed in said rotary disc being capable of at least partly holding the top panel wall and the skirt wall of the container closure body which is so placed that the protruding piece thereof is directed upwards;

said rotation preventing mechanism includes a pair of locking pieces disposed on said rotary disc in relation to each of said receiving portions, and each of said pair of locking pieces is constituted by an upstream-side locking piece having a tip that can be positioned being faced to one side edge of the protruding piece of the container closure body on the upstream side of said rotary disc in the direction of rotation thereof and a downstream-side locking piece having a tip that can be positioned being faced to the other side edge of the protruding piece of the container closure body on the downstream side of said rotary disc in the direction of rotation thereof; and

at least said downstream-side locking pieces of said pair of locking pieces are mounted on said rotary disc in a manner to freely move between an acting position at which the tips thereof are positioned being faced to the one side edge of the protruding piece of said container closure body and a retreated position at which the tips thereof are separated away from the protruding piece of said container closure body, and said rotation preventing mechanism further includes a downstream-side locking piece positioning mechanism that selectively positions said downstream-side locking pieces at said acting position and at said retreated position.

5,200,202

HEAD UNIT FOR A SEMICONDUCTOR LEAD FRAME LOADER

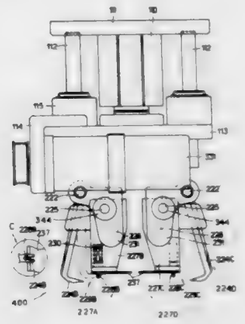
Dong H. Ahn, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki, Rep. of Korea

Filed Oct. 18, 1991, Ser. No. 778,529

Claims priority, application Rep. of Korea, Oct. 20, 1990, 90-16802

Int. Cl.[5] B29C *39/10, 45/14, 39/22*

U.S. Cl. 425—126.1 11 Claims



1. A head unit for a semiconductor lead frame loader comprising:

a vertical operating portion comprising a first cylinder **110** and a plurality of guide rods **112** combining a first upper plate **111** and an intermediate plate **113**;

a clamping portion comprising a fixing piece **223** fixed to first shafts **222**, **222'** and operating in close relationship to a cylinder rod **221** of a second cylinder **220**, jaws **224A**, **224B**, **224C**, **224D** rotatable as being interlocked with the fixing piece **223**, side plates **231**, **231'** supporting a second upper plate **232** at its both sides which fixes the second cylinder **220**, and pin portions **229A**, **229B**, **229C**, **229D**, fixed to a second and third shafts **225**, **225'**, **226**, **226'** inserted between the side plates, the clamping portion interlocked with the vertical operating portion;

an adjusting portion comprising a fourth shaft **335** which is provided with the power of a motor **331** through a pulley **332**, **333** and a belt **334** and which is combined with a ball screw nut **337** at its middle, and adjusting portion upper plate **339** combined with a housing **338** which fixes the ball screw nut **337** and guide by two cross roller guides **342** fixed to the intermediate plate **113**, and pin portions **229A**, **229B** which interlock with the adjusting portion upper plate **339**;

a fixing portion comprising a fixing portion upper plate **340** fixed to a housing opposite to a pulley **333** of the fourth shaft **335**, and pin portions **229C**, **229D** fixed to the fixing portion upper plate **340**; and

second shafts **225**, **225'**, for adjusting the distance separating a pair of jaws **224A**, **224B** and **224C**, **224D** installed on said first shaft **222**, **222'**, respectively, in order to adjust distance between said pair of jaws **224A**, **224B** and **224C**, **224D**, respectively, and each said second shafts **225**, **225'** further including a right hand threaded portion, a left hand threaded portion and a knob **344**, **344'** at an end thereof respectively such that in use the distance separating said pair of jaws **224A**, **224B** and **224C**, **224D** installed on first shaft **222**, **222'**, respectively, can be adjusted by rotation of the second shafts **225**, **225'** in order to adjust distance between said pair of jaws **224A**, **224B** and **224C**, **224D** whereby the head unit can be adjusted to accommodate different sized lead frames.

5,200,203

APPARATUS FOR QUANTITATIVELY DIVIDING BREAD DOUGH

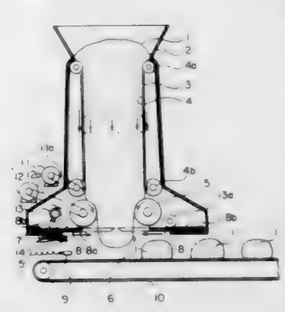
Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 571,467, Aug. 22, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,778

Claims priority, application Japan, Aug. 28, 1989, 1-220992

Int. Cl.[5] A21C *5/00*

U.S. Cl. 425—142 8 Claims



1. An apparatus for quantitatively dividing bread dough comprising:

a. a dough hopper having a pair of vertical side walls,

b. a dough outlet formed adjacent a downstream end of said dough hopper,

c. a pair of substantially parallel vertical conveyors located opposite from each other and extending along the pair of side walls of the hopper,

d. a dividing device located adjacent the dough outlet, and

e. means for controlling a conveying speed of the vertical conveyors to make uniform the speed of substantially all parts of the dough between the conveyors based on a flow rate of the dough flowing downward from the dough outlet.

5,200,204

ROTARY EXTRUDER WITH INTEGRAL AUGER FEED ASSEMBLY

Douglas J. Horton, and Richard L. Abner, Jr., both of Big Spring, Tex., assignors to Permian Research Corporation, Big Spring, Tex.

Filed Mar. 11, 1991, Ser. No. 667,532

Int. Cl.[5] B29C *47/00*

U.S. Cl. 425—188 4 Claims

1. An extrusion device comprising:

a rotary extruder having a barrel with an eccentric bore, a rotor with a continuous cylindrical surface rotatably mounted within the bore, defining an annulus between the rotor and the eccentric bore; and

an integral auger feed assembly having a barrel member with a longitudinal bore communicating in perpendicular rela-

tion with the annulus, an auger rotatably mounted within

the fins, a plurality of divider panels spaced from each

a nozzle means having a reservoir for containing a charge of

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APPARATUS FOR PRODUCING PLASTIC PARTS WITH

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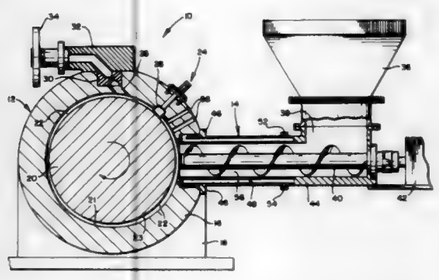
tion with the annulus, an auger rotatably mounted within the longitudinal bore, and means for limiting heat transfer



between the barrel of the rotary extruder and the barrel member.

5,200,206

Patent Not Issued For This Number

5,200,205

EXTRUDER BARREL TEMPERATURE REGULATION APPARATUS

Siegfried R. Wissmann, and Christopher P. Surface, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 24, 1991, Ser. No. 690,277
Int. Cl.[5] B29C *47/00*
U.S. Cl. 425—200 8 Claims

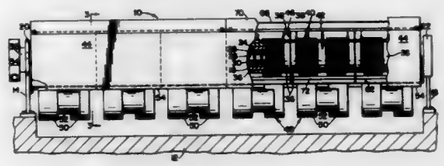
1. Apparatus for externally heating and cooling the wall of a mixing chamber, said apparatus comprising:

a. a plurality of tubular shells each having an inner surface adapted to contact an exterior surface of the mixing chamber, the shells each positioned in end-to-end relationship to form an outer sleeve defining a series of contiguous, independent temperature control zones positioned along the exterior surface of the mixing chamber, each shell including independent, interiorly disposed heat sources for heating a respective shell to a desired temperature to transfer heat to an inner wall surface of the mixing chamber;

b. each shell having a pair of groups of cooling fins extending substantially radially outwardly from an outer surface of the shell, each group of fins spaced axially from the other group of fins to define an annular area without fins, wherein the ratio of the radial height of the cooling fins to the thickness of the shell is about 1.6;

c. a continuous external shroud positioned around and in closely spaced surrounding relationship with the shells and radially adjacent outermost ends of the fins for confining cooling air movement to spaces around and between the fins, a plurality of divider panels spaced from each other along the mixing chamber, each divider panel extending radially between the shroud and the shell for dividing the interior space between the shroud and the respective shells into a plurality of discrete temperature control sections to permit independent control of the temperature at a temperature control section to a desired temperature level by confining respective cooling air flows within a temperature control section; and

d. at least one forced air circulating blower positioned exteriorly of each shell each blower spaced axially along the shell from an adjacent blower and having an air flow outlet oriented to discharge air radially toward a respective shell and over the cooling fins of the shell.

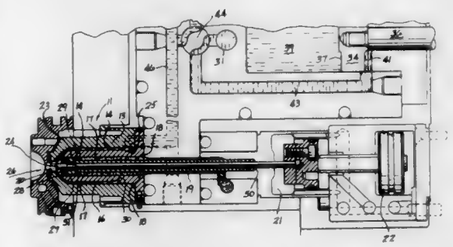


5,200,207

HOT RUNNER SYSTEM FOR COINJECTION

Vitaly Akselrud, Richmond Hill, and Stefan von Buren, Toronto, both of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Jun. 10, 1991, Ser. No. 712,567
Int. Cl.[5] B29C *45/16, 45/20, 45/38*
U.S. Cl. 425—557 6 Claims



1. A nozzle assembly for an injection molding machine comprising, in combination,

a nozzle means having a reservoir for containing a charge of resin,

said reservoir leading to a mold cavity via a nozzle gate,

channel means including a port in said nozzle means leading from a source of resin under pressure to said reservoir,

a floating piston defining a sleeve disposed in said nozzle means,

said piston having opposed working surfaces,

a first working surface having an area larger than the area of a second working surface whereby resin under pressure acting upon both working surfaces operates to drive said piston in a predetermined direction,

a valve stem received in said sleeve;

means for reciprocating said valve stem,

said valve stem being movable from a first position in which said port is closed to a second position in which said port is open so that resin under pressure operates on both working surfaces and flows into said reservoir;

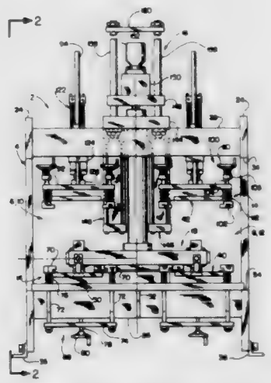
said resin under pressure while filling said reservoir operates, by virtue of said differential areas, to drive said sleeve in said predetermined direction effective to close said port.

5,200,208

MULTI-STATION RUBBER INJECTION MOLDING MACHINE

Zachariha Cohen, Cleveland Heights, and Robert L. Luck, Mentor, both of Ohio, assignors to US Molding Machine Company, Mentor, Ohio

Filed Aug. 11, 1988, Ser. No. 232,425
Int. Cl.[5] B29C *45/18*
U.S. Cl. 425—566 18 Claims



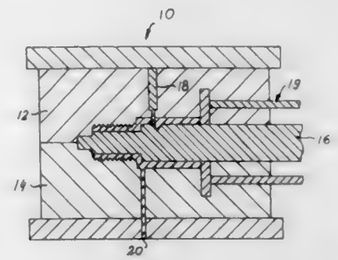
1. A multi-station rubber injection molding machine comprising first and second molding stations for respective molds, a rubber injection unit, means for maintaining said injection unit at a position fixed in relation to said molding stations, and manifold means for selectively transferring uncured rubber molding material from said rubber injection unit when in said fixed position to a mold in either one of said first and second molding stations, said manifold means including inlet means for receiving molding material from said injection unit, first and second nozzle members including respective transfer passages, said first and second nozzle members each being movable from a first position to a second position for operatively connecting the transfer passage in the nozzle member to a respective mold, and said first and second nozzle members each operating to connect the transfer passage therein to said inlet means when in said second position and to disconnect the transfer passage therein from said inlet means when in said first position.

5,200,209

APPARATUS FOR PRODUCING PLASTIC PARTS WITH A RESILIENT PROJECTION

William Nattel, Montreal, and Alain Michaud, St. Luc, both of Canada, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1990, Ser. No. 489,140
Claims priority, application Canada, Sep. 29, 1989, 615011
Int. Cl.[5] B29C *45/36, 39/26, 39/34*
U.S. Cl. 425—577 5 Claims



1. A shaping mould for producing a part of plastic material having a resilient projection, said mould comprising:

an outer shell;

an inner core mounted within said shell to define therewith a cavity having a shape corresponding to the shape of said part of plastic material;

a recess defined by surfaces in said inner core for receiving plastic material in fluid state which solidifies to form said resilient projection;

a camming surface in said recess to raise said projection out of said recess as a result of a sliding contact between said projection and said inner core;

said outer shell comprising two mating parts movable between an opened and a closed position, an outer core mounted to one of said mating parts for movement therewith with respect to said inner core;

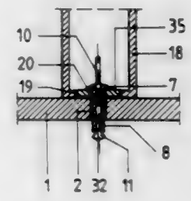
said inner core comprising a barrier element received within said recess when said mating parts are in a closed position, said barrier element abutting said camming surface to prevent the plastic material to contact said camming surface.

5,200,210

ASSEMBLY FOR FASTENING COMPONENTS FOR PRODUCING CONCRETE BODIES

Frithiof Schimpff, Wiesbaden, Fed. Rep. of Germany, assignor to Wayss & Freytag Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 397,483, Aug. 14, 1989, Pat. No. 5,127,160.
This application Mar. 10, 1992, Ser. No. 848,734
Int. Cl.[5] B28B *21/86*
U.S. Cl. 425—577 11 Claims



1. An assembly for casting a concrete body, comprising:

a casing having a wall provided with a bore;

VOL 1149 ISS 1 AP 6 1993 UMI

a tubular component projecting inwardly into an interior of said casing and detachably secured thereto; and

shearable attaching means detachably securing said tubular component to said wall, said shearable attaching means including:

a transverse element within said tubular component and located at an end thereof adjacent said wall, said element having a hole aligned with said bore,

a blind rivet having a head wholly received within said tubular component and braced against said element, a tubular shank extending through said bore and said hole, and a spread end lying along an exterior side of said wall and braced thereagainst around said bore, and

a drawing mandrel in said shank, said shank being shearable with a defined shear force between said element and said wall.

5,200,211

FOOD COMPOSITION COMPRISING UREA

Philip C. Anderson, and Kent L. Anderson, both of Crete, Nebr., assignors to Foodsmith Corporation, Crete, Nebr.

Continuation of Ser. No. 567,235, Aug. 14, 1990, Pat. No. 5,098,719. This application Mar. 23, 1992, Ser. No. 855,232

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—2 **8 Claims**

1. A method for alleviating protein malnutrition in a human comprising administering to said human an effective amount of a food composition comprising substantially biuret-free urea, sorbitol and a quantity of an edible anti-urease component effective to prevent substantial exocellular degradation of said urea wherein said sorbitol and said urea are present in a molar ratio of from about 0.5:1 to about 2.0:1.

5,200,212

DOG CHEW WITH MODIFIABLE TEXTURE

Herbert R. Axelrod, 6 Marine Pl., Deal, N.J. 07753

Continuation of Ser. No. 521,521, May 10, 1990, abandoned. This application Feb. 20, 1992, Ser. No. 839,748

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—2 **9 Claims**

1. A method of feeding a dog with a highly nutritious completely digestible dog chew that is quickly and easily individually by a dog owner to the texture preference or hardness modifiable need of a particular dog, said method consisting essentially in the steps of:

intermixing a combination of 60%–95% casein and 5%–40% gelatin;

adjusting the moisture content of said intermixed combination to total 10%–30%;

molding said moisture adjusted combination into a preselected shape of said dog chew;

placing said dog chew in a moisture proof packaging before substantially any moisture is lost from said molded shape;

said dog owner removing said dog chew from said packaging;

just prior to heating said dog chew consumption sufficiently to effect expansion thereof to the degree of hardness preferred by said particular dog; and

feeding the heated dog chew to said dog.

5,200,213

GUM BASE CONTAINING TOCOPHEROL

Charles P. Orfan, Howell; Daniel A. Vento, Edison; Archie L. Hightower, Plainfield, and Walter C. Romanofsky, Piscataway, all of N.J., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation of Ser. No. 743,824, Aug. 12, 1991, Pat. No. 5,132,121. This application Apr. 27, 1992, Ser. No. 874,711

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—3 **22 Claims**

1. A chewing gum base, comprising:

5–95% by weight of an elastomer selected from the group consisting of polyisobutylene, isobutylene-isoprene copolymer, styrene butadiene copolymer, polyvinyl acetate, vinyl acetate-vinyl laurate copolymer, natural rubber, natural gum, and mixtures thereof;

0–75% by weight of an elastomer plasticizer selected from the group consisting of natural rosin esters and synthetic terpene resins;

1–65% by weight of a filler material; and

0.01–1.00% by weight of a tocopherol mixture comprising 7–20% by weight alpha tocopherol, 45–75% by weight gamma tocopherol and 18–32% by weight delta tocopherol;

the gum base being substantially free of synthetic antioxidants.

5,200,214

TOCOPHEROL MIXTURE FOR USE AS A MINT OIL ANTIOXIDANT IN CHEWING GUM

David G. Barkalow, Woodridge; Michael J. Greenberg, Northbrook, and Gordon N. McGrew, Evanston, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation of Ser. No. 722,692, Jun. 28, 1991, Pat. No. 5,139,796. This application Apr. 14, 1992, Ser. No. 868,545

The portion of the term of this patent subsequent to Aug. 18, 2009, has been disclaimed.

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—3 **15 Claims**

1. A stabilized mint oil composition, comprising:

a mint oil selected from the group consisting of peppermint oil, spearmint oil, corn mint oil, Scotch spearmint oil and mixtures thereof; and

a stabilizer system which is substantially free of synthetic antioxidants, the stabilizer system including 0.05–3.0% of a tocopherol mixture by weight of the mint oil, blended into the mint oil, the tocopherol mixture comprising 7–15% by weight alpha tocopherol, 45–70% by weight gamma tocopherol and 20–35% by weight delta tocopherol.

5,200,215

ENZYME TREATED LOW MOISTURE CONTENT COMESTIBLE PRODUCTS

Louise Slade; Harry Levine, both of Morris Plains; Stuart Craig, Morristown; Henry Arciszewski, Franklin Lakes, and Susan Saunders, Randolph, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation of Ser. No. 183,927, Apr. 20, 1988, abandoned. This application Oct. 25, 1991, Ser. No. 781,646

Int. Cl.[5] A21D *8/04*

U.S. Cl. 426—18 **13 Claims**

1. A method for reducing color fading in cookies which fade during storage comprising forming a machinable cookie dough by admixing cookie ingredients comprising a flour which contains water-soluble hemicelluloses, sugar, shortening or fat, and water with an enzyme composition comprising a pentosanase which hydrolyzes said water-soluble hemicelluloses to obtain hydrolysis products with reduced water holding capacity, and baking the dough to obtain cookies having a moisture content of less than about 5% by weight, exclusive of inclusions, the water soluble hemicellulose content of said flour being reduced by at least about 30% by weight in the production of said hydrolysis products, and at least about 30% by weight of said hydrolysis products having a linear degree of polymerization of 3 to less than about 100, said enzymatic treatment and said cookie moisture content being such so that the color of the cookies after baking remains essentially unchanged during shelf storage for at least about six months.

5,200,216

PROCESS OF MAKING ACCEPTABLE MOZZARELLA CHEESE WITHOUT AGING

Richard L. Barz, Castle Rock, and Carolyn P. Cremer, Denver, both of Colo., assignors to Leprino Foods Company, Denver, Colo.

Filed Oct. 4, 1990, Ser. No. 592,519

Int. Cl.[5] A23C *19/14*

U.S. Cl. 426—36 **74 Claims**

1. In a process of manufacturing a mozzarella variety of cheese comprising the following steps:

a) pasteurizing cow's milk having a fat content in the range of about 1.5 to 3.5 weight percent;

b) fermenting the milk with one or more lactic acid-producing bacteria to obtain a cheese milk;

c) coagulating the cheese milk to obtain a coagulum comprised of curd and whey;

d) cutting the coagulum and draining the whey therefrom, thereby leaving a cheese curd;

e) heating, kneading, and stretching the cheese curd until it is a homogeneous, fibrous mass of heated, unripened mozzarella variety cheese having a moisture content in the range of about 45 to 60 weight percent and a milkfat content of at least about 30 weight percent (dried solids basis);

f) cooling the heated cheese in cold brine; and

g) removing the cooled cheese from the brine; the improvement wherein (i) said steps (a) through (g) are controlled so that the cooled cheese removed from the brine has a combined moisture and wet milkfat content of at least about 70 weight percent, and (ii) said cheese is frozen within about 48 hours after being removed from the brine, thereby obtaining a mozzarella variety cheese that can be satisfactorily baked on a pizza without having to first be held in an unfrozen state at about 35° to 45° F. for approximately 7 to 21 days.

5,200,217

ENZYME INFUSION PROCESS FOR PREPARING WHOLE PEELED CITRUS FRUIT

Robert S. Elliott, Wildomar, and Julia C. Tinibel, Pomona, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Oct. 25, 1991, Ser. No. 783,013

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] A23L *1/05*

U.S. Cl. 426—50 **14 Claims**

1. A process for preparing whole peeled citrus fruit, comprising the steps of:

maintaining the core and surface temperatures of fresh citrus fruit at a temperature of less than about 20 degrees C.;

breaking the peel surface of the fruit so as to penetrate the albedo layer, but not penetrate the juice sections;

infusing an aqueous solution of pectinase into the fruit;

holding the infusion-treated fruit for a time period which is sufficient to allow the pectinase to break down the pectin present in the albedo layer but is insufficient to raise the temperature of the core of the fruit to above about 25 degrees C.; and

removing the peel from the fruit.

5,200,218

COMPOSITION FOR DOG FOOD

Priscilla D. Lasater, and Donald C. Mooers, both of P.O. Box 1305, Pahrump, Nev. 89041

Continuation-in-part of Ser. No. 433,163, Nov. 8, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 622,734

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—72 **13 Claims**

1. A dog food supplement composition consisting essentially of: ingredients combined in proportion according to the following ranges:

Ingredient	Parts
brewer's yeast	2–4
bran	3–5
biscuit mix	2–6
water	3–4.2
desiccated liver	0.5–1.5
safflower oil	1–2
ascorbic acid	0.75–1.5 grams/pound
chelated zinc	2–4 grams/pound,

said supplement composition improves and maintains the dog's overall health and is in the form of a moist cookie.

5,200,219

METHOD OF PREPARING GREEN BEANS AND THE RESULTING PRODUCT

Jeffrey R. Twyman, 893 W. Wooster St., Bowling Green, Ohio 43402

Continuation of Ser. No. 143,841, Jan. 14, 1988, Pat. No. 5,151,284, which is a continuation-in-part of Ser. No. 38,501, Apr. 15, 1987, Pat. No. 4,867,996. This application Dec. 20, 1991, Ser. No. 811,351

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] A23B *7/00, 7/04, 7/05*

U.S. Cl. 426—106 **21 Claims**

1. A method of preparing fresh green beans for fresh produce sales by slowing down normal deterioration of the beans to extend the shelf life, the method comprising immersing fresh beans in water at a temperature and time effective to clean the beans, and partially stabilize the beans to prevent normal rapid deterioration and extend the shelf life.

5,200,220

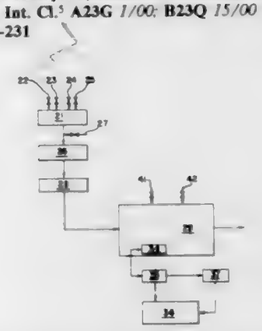
CHOCOLATE CONCHING

Roberto A. Capodieci, Glen Ellyn, Ill., assignor to Mars, Incorporated, McLean, Va.

Filed Apr. 3, 1992, Ser. No. 862,972

Int. Cl.[5] A23G *1/00;* **B23Q** *15/00*

U.S. Cl. 426—231 **41 Claims**



1. A process for producing chocolate by a procedure including a conching operation, the process comprising the steps of:

passing ingredients for making chocolate, including choco-

late refinings, into a conching apparatus having agitators

5,200,224

METHOD OF TREATING FRYER COOKING OIL

heated water in said heated water reservoir and refill the

maintaining a baking temperature in the range from about 650° F. to 690° F. in said baking compartment

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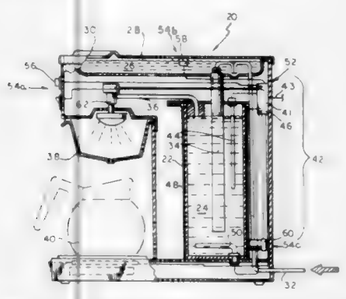
late refinings, into a conching apparatus having agitators and a motor controlled by a variable speed drive;
moving the conching agitators into and through the ingredients, said moving step including moving the conching agitators at a conching agitator speed;
conching said ingredients by continuing said moving step for a length of time until the ingredients produce a chocolate product;
monitoring resistance imparted to the conching agitators by the ingredients generally throughout the moving step in order to continuously detect an ingredients resistance to movement of the conching agitators;
modulating said conching agitator speed to provide a variable conching agitator speed which continuously substantially maintains a predetermined power input to the ingredients substantially throughout said conching step, said modulating step being substantially ongoing, the conching agitator speed being a function of the ingredients resistance monitored during said monitoring step such that the conching agitator speed increases as said ingredients resistance decreases and such that said conching agitator speed decreases as said ingredients resistance increases, whereby said predetermined power input is maintained substantially constant substantially throughout the conching step;
controlling the length of time of the conching step in response to the monitoring step whereby a finished chocolate product is provided having a preselected maximum viscosity characteristic; and
removing the finished chocolate product from the conching apparatus.

5,200,221
METHOD FOR CONTROLLING A BEVERAGE BREWING APPARATUS
John T. Knepler, Chatham, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Division of Ser. No. 555,046, Jul. 19, 1990. This application Jan. 3, 1992, Ser. No. 816,969
Int. Cl.[5] A23F *5/00*
U.S. Cl. 426—231 3 Claims

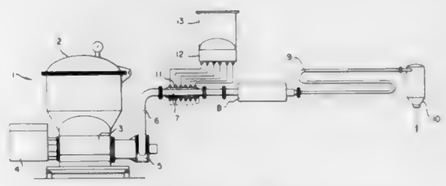


1. A method for controlling water temperature of a fill water displacement beverage brewing apparatus, said beverage brewing apparatus having a brew cycle during which a selected volume of heated water is dispensed from the beverage brewing apparatus to infuse a beverage brewing substance, said method including the following steps: providing a heated water reservoir, thermostatic controls operatively associated with said heated water reservoir for maintaining a generally consistent temperature of water retained in said heated water reservoir, and a heating device operatively associated with said thermostatic controls and said heated water reservoir for controllably heating the water retained in the heated water reservoir; maintaining a predetermined volume of water in the heated water reservoir within a predetermined temperature range; thermostatically controlling the temperature of said volume of water; activating a brew cycle; introducing fill water to the heated water reservoir to displace a portion of the heated water in said heated water reservoir and refill the heated water reservoir in proportion to the portion displaced thereby, the displaced portion of heated water providing water for the brew cycle; overriding said thermostatic controls and activating said heating device simultaneously with the initiation of the brew cycle to heat the water retained in the heated water reservoir and fill water introduced into the heated water reservoir; and continuing to override the thermostatic controls and activation of said heating device until a predetermined period of time is lapsed after the termination of the delivery of water to said heated water reservoir.

5,200,222
MICROWAVE TOASTING OF PUFFED R-T-E CEREALS
Edward C. Schwab, New Brighton, and George E. Brown, Edina, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Continuation of Ser. No. 750,786, Aug. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 726,591, Jul. 8, 1991, abandoned. This application Jun. 18, 1992, Ser. No. 899,576
Int. Cl.[5] A23L *1/00*; A21D *15/00*
U.S. Cl. 426—241 79 Claims

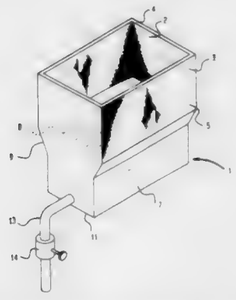
1. A method for interiorly toasting a puffed R-T-E cereal base to improve its flavor and texture, comprising the step of:
subjecting a puffed R-T-E cereal base to a high intensity microwave field for a sufficient period of time long enough to toast the interior of the cereal base and shorter than to cause exterior scorching to provide an interiorly toasted R-T-E cereal base,
wherein the microwave field has a field strength of about 125–350 V/cm.

5,200,223
METHOD AND AN APPARATUS FOR INJECTING A LIQUID INTO MEAT
Knud Simonsen, Slagelse, Denmark, assignor to Simo Industries A/S, Slagelse, Denmark
Filed Jun. 20, 1991, Ser. No. 719,116
Claims priority, application Denmark, Jun. 20, 1990, 1507/90
Int. Cl.[5] A23L *1/31*
U.S. Cl. 426—281 14 Claims



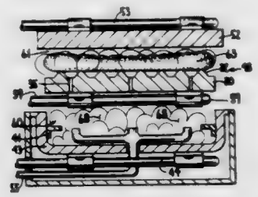
1. A method of treating meat, comprising the steps of:
conveying meat substantially continuously through a conduit which is substantially closed to the environment outside of the conduit; and
injecting a liquid in the form of thin jets into the meat as the meat is conveyed through said conduit to penetrate the meat to a given depth, said jets of liquid being applied intermittently or periodically in short bursts separated by comparatively longer intervals.

5,200,224
METHOD OF TREATING FRYER COOKING OIL
Bernard Friedman, Allentown, Pa., assignor to Oil Process Systems, Inc., Allentown, Pa.
Continuation of Ser. No. 518,312, May 7, 1990, abandoned, which is a continuation of Ser. No. 99,134, Sep. 21, 1987, abandoned. This application Nov. 19, 1991, Ser. No. 794,794
Int. Cl.[5] A23L *1/01*; C11B *3/04*
U.S. Cl. 426—417 10 Claims



1. A method of frying food comprising providing a supply of cooking oil for use in a food frying process in a fryer apparatus, frying said food in said supply of cooking oil whereby said cooking oil including degradation products comprising surfactants are produced therein and food residue accumulates in said fryer apparatus, adding a treatment compound directly in said cooking oil, said treatment compound thereby reducing the amount of said surfactants to said cooking oil, permitting said treatment compound to remain within said fryer apparatus and settle upon said food residue while continuing said food frying process, removing said cooking oil, said food residue, and said treatment compound from said fryer apparatus, separating said removed cooking oil from said food residue and said removed treatment compound, returning said separated removed cooking oil to said fryer apparatus for continuing said food frying process thereafter, and intermittently adding additional amounts of said treatment compound to said cooking coil while further continuing said food frying process, such that the need for constant or immediate filtering is eliminated.

5,200,225
PIZZA BAKING PROCESS
Okan Apaydin, 213 Orchard Way, Wayne, Pa. 19087
Filed May 9, 1991, Ser. No. 697,860
Int. Cl.[5] A21D *8/00*; F24D *1/00*
U.S. Cl. 426—510 4 Claims



1. A process for fully baking a pre-baked pizza product just prior to consumption, which comprises:
spraying water against a heated plate and flashing said water into dry super-heated steam at a temperature of about 600° F.,
passing said steam into a baking compartment containing a pre-baked pizza, and
maintaining a baking temperature in the range from about 650° F. to 690° F. in said baking compartment,
whereby said pizza product is fully baked for consumption.

5,200,226
DAIRY PREPARATION AND PROCESS
José Sanchez Rodriguez, Las Palmas de Gran Canaria, Spain, assignor to Jose Sanchez Penate, S.A., Las Palmas de Gran Canaria, Spain
Filed Oct. 29, 1990, Ser. No. 604,886
Claims priority, application Spain, Jun. 13, 1990, 9001640; Jun. 13, 1990, 9001641
Int. Cl.[5] A23C *9/15*
U.S. Cl. 426—585 5 Claims

1. Process of obtaining a dairy preparation comprising a homogeneous mixture of liquid skim milk and vegetable oil wherein a content of the oil does not exceed 4 g. per 100 ml. of the preparation and wherein the preparation is heated at a temperature of about 150° C. for no longer than four seconds before being packaged, the process comprising the steps of:
obtaining liquid skim milk by reconstitution of powdered skim milk with hot water at a temperature of about 72° to 76° C.;
heating up the liquid skim milk to a temperature of about 72° to 76° C.;
obtaining a vegetable oil emulsion in hot water at a temperature of between 72° an 76° C.;
dispensing said emulsion into the skim milk;
homogeneously mixing the skim milk and vegetable oil emulsion in a static mixer and then in a dynamic mixer;
standardizing the dairy preparation;
storing the dairy preparation in storage tanks;
dispensing vitamins into the dairy preparation;
subjecting the dairy preparation to a sudden heating a temperature up to 150° C. for no longer than four seconds;
and packaging the dairy preparation.

5,200,227
STABLE AQUEOUS SOLUTIONS OF TETRAHYDRO AND HEXAHYDRO ISO-ALPHA ACIDS
James A. Guzinski, and Larry J. Stegink, both of Kalamazoo, Mich., assignors to Kalamazoo Holdings, Inc., Kalamazoo, Mich.
Filed May 11, 1992, Ser. No. 881,458
Int. Cl.[5] C12C *3/00*
U.S. Cl. 426—600 20 Claims

1. A single-phase aqueous alkaline solution containing tetrahydro iso-alpha acids or hexahydro iso-alpha acids in solution at a concentration which cannot be attained with that particular iso-alpha acid alone, together with another type of iso-alpha acid which serves to solubilize the tetrahydro iso-alpha acid or hexahydro iso-alpha acid and stabilize the solution.

5,200,228
SHAPED SUGAR CANE PRODUCT
Kevin B. Andrews, 41-745 Mooiki St., Waimanalo, Hi. 96795
Filed Nov. 4, 1991, Ser. No. 787,637
Int. Cl.[5] A23L *1/212*
U.S. Cl. 426—615 4 Claims

1. A shaped sugar cane product made by the method of:
a. billeting sugar cane stalks into lengths of from about 1½ inches to about 20 inches;
b. loading a tube with an opening on its one side and end with an individual billet; and

a. cutting the individual billet into sticks by pressing the

5,200,230

said data, and utilization thereof to modify process param-

cal vapor deposition apparatus and contacting a surface of

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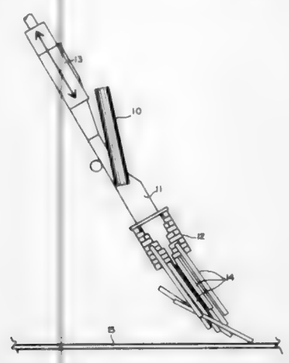
c. cutting the individual billet into sticks by pressing the billet lengthwise in the tube against a cutter comprising a



grid of intersecting cutting blades with a reciprocating action for each individual billet.

5,200,229

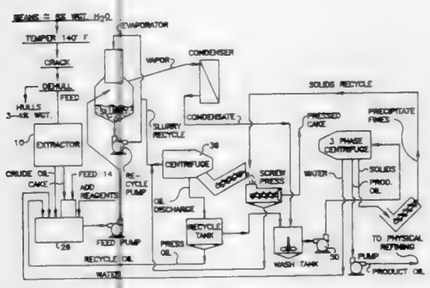
OIL EXTRUSION PROCESS

Hans R. Strop, Strongsville, Ohio, assignor to EPE, Incorporated, Strongsville, Ohio

Division of Ser. No. 403,737, Sep. 6, 1989, Pat. No. 5,077,071. This application Dec. 30, 1991, Ser. No. 815,933

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—623 **11 Claims**



1. A process for producing a substantially toxic-free feed from vegetable oil bearing materials, the process comprising the steps of:

adding moisture to comminuted or whole oil bearing materials which contain glucosinolates and their cyanate breakdown products prior to separating oil from said oil bearing materials;

adding an acid to adjust the pH to about 2 to 3;

maintaining the oil bearing materials in the acid for a minimum of about 5 minutes to hydrolyze the glucosinolates and their cyanate breakdown products to carbon dioxide and ammonia;

stripping the ammonia and carbon dioxide from the slurry to be left with a dry slurry including solids and oil; and

subsequently separating oil from said dry slurry to produce a substantially toxic-free feed.

5,200,230

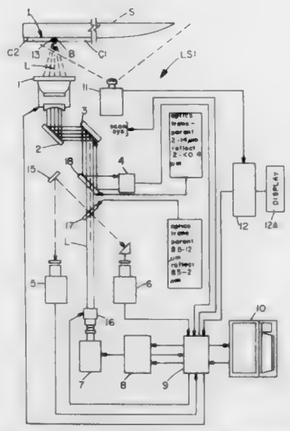
LASER COATING PROCESS

Mark P. Poullos, and Edmund M. Williams, both of Dallas, Tex., assignors to Dunfries Investments Limited, St. Helier, United Kingdom

Continuation-in-part of Ser. No. 419,652, Oct. 11, 1989, which is a continuation-in-part of Ser. No. 68,024, Jun. 29, 1987, abandoned. This application Mar. 28, 1990, Ser. No. 500,687

Int. Cl.[5] B05D *3/06, 3/02, 1/02*

U.S. Cl. 427—8 **3 Claims**



1. A method for providing a permanent pinhole-free fluorocarbon polymer material coating to a curvaceous metal substrate, comprising, in combination, the following steps:

a. elecrostatically charge said substrate to one polarity;

b. spray a layer of fluorocarbon powder of an opposite polarity onto the substrate;

c. repeat said spray step until desired thickness of said coating is obtained;

d. align output beam of an IR laser through an optical path including an optical corrector to project onto and be reflected from the substrate back through said corrector and be deflected into a telemetry measuring sensor to create a feedback signal to an analog/digital conversion interface unit, to correctly focus said beam in said optical corrector for a consistent optical focus onto the substrate;

e. pass said beam through a first optical deflector, deflect a part of said beam back to an IR sensor, to measure current real time laser power, and signal through said analog/digital unit to lock in the value specified for the instant condition;

f. initiate raster scanning of said laser beam through X and Y scanning mirrors, and measure distance to the, substrate and send signals to said analog/digital unit to correctly focus said corrector to provide said consistent optical focus of said beam onto said substrate;

g. set the correct emissivity value of the surface being treated into an IR camera and an IR thermal image processor;

h. set the correct emissivity value into an IR feedback sensor in an optical path relating to said substrate;

i. place said telemetry measuring sensor in said optical path of said laser beam, and direct its output through said corrector, which allows distance measurements to be made in real time, as said beam sweeps across the surface of the interface of the substrate and the coating being fused;

j. direct video data picked up by said IR camera to said image processor, and pass same to said analog/digital unit and a central processing unit terminal, for interpretation of

said data, and utilization thereof to modify process parameters requiring such modification.

5,200,231

METHOD OF MANUFACTURING POLYCRYSTALLINE DIAMOND LAYERS

Peter K. Bachmann, Aachen; Hans Lydtin, Stolberg, and Arnd Ritz, Huckelhoven, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 570,237, Aug. 17, 1990, abandoned. This application Jan. 10, 1992, Ser. No. 820,029

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1989, 3927136

Int. Cl.[5] B05D *3/06;* **C23C** *16/26*

U.S. Cl. 427—573 **10 Claims**

1. A method of manufacturing a layer of polycrystalline diamond on a substrate by a plasma induced chemical vapor deposition process comprising positioning a substrate in a reactor, heating said substrate to a temperature between 450° C.–1200° C., introducing a gas phase comprising hydrogen and ≦30% by volume of a carbon containing gas into said reactor at a pressure of between 10^{-5}–1 bar so as to contact said heated substrate, coupling microwave energy at a frequency of 2.45 GHz into the reactor as the energy required for the deposition process, generating a pulsating plasma at the start of the deposition process by varying the power of the microwave energy coupled into the reactor between a low and a high power level of about 400 W and 1300 W respectively during a first period so as to cause diamond crystal nuclei to form from the gas phase and deposit on said substrate and, after said first period, adjusting the power of the microwave energy coupled into the reactor to a constant power level between said low and high power levels for a second period to thereby cause a layer of diamond crystallites to form on said diamond crystal nuclei.

5,200,232

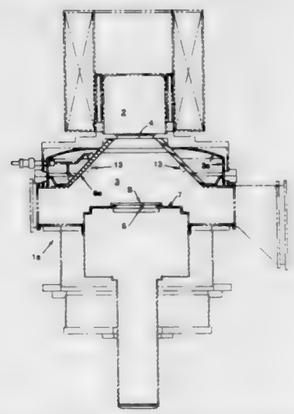
REACTION CHAMBER DESIGN AND METHOD TO MINIMIZE PARTICLE GENERATION IN CHEMICAL VAPOR DEPOSITION REACTORS

James E. Tappan, Milpitas; Arthur K. Yasuda, San Francisco; Dean R. Denison, San Jose, and Randall S. Mundt, Pleasanton, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Dec. 11, 1990, Ser. No. 623,090

Int. Cl.[5] B05D *3/06;* **C23C** *16/00*

U.S. Cl. 427—569 **12 Claims**



1. A method of improving the quality of a film deposited on a specimen in a chemical vapor deposition apparatus through minimization of particle generation in a reaction chamber of the apparatus, comprising:

a step of generating plasma in a plasma chamber of a chemical vapor deposition apparatus and contacting a surface of a specimen in a reaction chamber of the apparatus with a plasma stream so as to deposit a film thereon; and

a step of controlling deposition quality of a line-of-sight surface which faces the surface of the specimen to improve adhesion and integrity of a film formed thereon during the depositing step so as to minimize particle generation in the reaction chamber, the line-of-sight surface completely surrounding the plasma stream and diverging from a center of the plasma stream so as to become wider in a direction towards the surface of the specimen, the controlling step comprising maintaining the line-of-sight surface at a substantially constant temperature.

5,200,233

METHOD OF APPLYING PHOSPHOR PARTICLES TO SURFACES

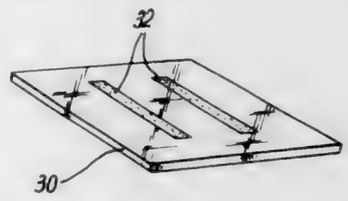
Ference Mohacsi, Chatham, United Kingdom, assignor to Masonlite Limited, United Kingdom

Filed Oct. 3, 1990, Ser. No. 592,189

Claims priority, application United Kingdom, Oct. 7, 1989, 8922809

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—67 **5 Claims**



1. A method of applying phosphor particles to a surface, said method utilizing an inorganic binder material between said phosphor particles and said surface, said method comprising:

(a) suspending said inorganic binder material in a volatile solvent to produce a suspension;

(b) adding phosphor particles and an organic volatile carrier to the suspension;

(c) removing the volatile solvent from the suspension to produce a printing medium containing phosphor particles;

(d) coating said printing medium onto a surface by printing; and

(e) removing the organic volatile carrier from the printing medium at a temperature no greater than 175° C.

5,200,234

METHOD FOR RESTORING UNDERGROUND ELECTRICAL CABLE

Glen J. Bertini, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 16, 1991, Ser. No. 809,633

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—118 **21 Claims**

1. A method for restoring the dielectric properties of an in-service underground electrical cable having a central conductor encased in a polymeric insulation jacket, said cable being positioned within a surrounding conduit, comprising:

filling the space between said cable and said conduit with a restorative fluid comprising a homogeneous mixture of a silane antitreeing agent and a dielectric oil, said dielectric oil being completely miscible with said antitreeing agent and having a solubility in said polymeric insulation of less than 5 weight percent.

5,200,235

Patent Not Issued For This Number

5,200,236

a metal alkoxide and a chlorine containing acid in an

5,200,239

DECORATION ARTICLE WITH AN AUTOMATIC

longitudinal channel with an open bottom and parallel sides, the sides having bottom edges extending downwardly to the

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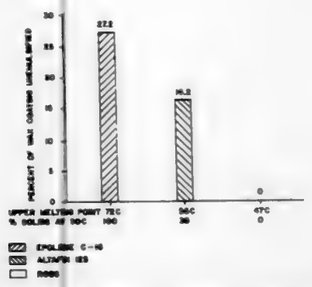
5,200,236

METHOD FOR WAX ENCAPSULATING PARTICLES

David J. Lang, Ossining; Ahmed A. Kamel, Valley Cottage; Paul A. Hanna, Queens Village, all of N.Y.; Robert Gabriel, Ellicott City, Md., and Richard Theiler, Harrington Park, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 563,732, Aug. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 436,996, Nov. 15, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 688,692
Int. Cl.[5] B05D 7/00
U.S. Cl. 427—213 27 Claims



1. A method for forming a coherent, continuous coating around a core material in the form of a core particle or an aggregate of particles to form encapsulated particles which are suitable for use in liquid cleaning compositions, the method comprising:
(a) providing a core material in the form of core particles or an aggregate of core particles which is a nonfriable, water soluble or water dispersible solid material which dissolves, disperses or melts in a temperature range of from about 40° to about 50° C.;
(b) suspending the particles or the aggregate of the particles in a fluidized bed to form suspended particles;
(c) providing one or more paraffin waxes to the coating around the suspended particles to form a batch of encapsulated particles which is stable in an aqueous alkaline environment, the one or more paraffin waxes having a melting point between about 40° C. and about 50° C., and a solids content of 100 to about 35% at 40° C. and a solids content of 0 to about 15% at 50° C.;
(d) heating the one or more paraffin waxes to a temperature above its melting temperature sufficiently to melt all the wax to form a molten wax;
(d) fluidizing the bed by passing air through the particles, so as to maintain a bed temperature no higher than melting point of the wax; and
(f) spraying the molten paraffin wax onto the fluidized bed at a rate and for time sufficient to apply a continuous coherent paraffin wax coating of from about 100 to about 1,500 microns thick around each of the particles.

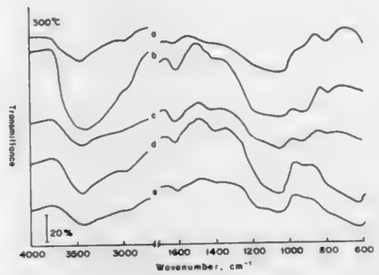
5,200,237

SOLID-GEL PRECURSOR SOLUTIONS AND METHODS FOR THE FABRICATION OF POLYMETALLICSILOXANE COATING FILMS

Toshifumi Sugama, Mastic Beach, N.Y., assignor to Associated Universities, Inc., Washington, D.C.

Division of Ser. No. 590,770, Oct. 1, 1990, Pat. No. 5,110,863. This application Oct. 28, 1991, Ser. No. 783,169
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—380 15 Claims

1. A method of preparing a polymetallicsiloxane coating on a substrate comprising:
(a) coating the substrate with a solution comprising a monomeric organoalkoxysilane, containing an imidazole group, a metal alkoxide and a chlorine containing acid in an alcohol/water medium;
(b) heating the coated substrate for a time sufficient and at a temperature sufficient to yield a solid coating; and



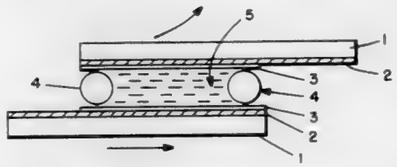
(c) further heating said substrate for a time sufficient and at a temperature sufficient to produce a polymetallisiloxane coating upon said substrate.

5,200,238

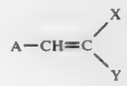
LIQUID CRYSTAL DISPLAY DEVICES AND METHOD OF MANUFACTURE

Ciaran B. McArdle, Dublin, Ireland; John G. Woods, Farmington, and Anthony F. Jacobine, Meriden, both of Conn., assignors to Loctite (Ireland) Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 542,466, Jun. 22, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 766,492
Int. Cl.[5] C09K 19/00
U.S. Cl. 428—1 20 Claims



1. A method of forming a liquid crystal alignment layer having a tilt angle of at least about 5 degrees, said method comprising
(i) coating a liquid crystal electrode with a polymer of a monomer of the formula IV:



IV

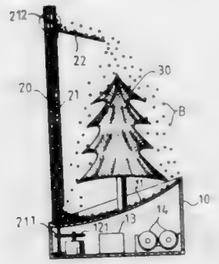
wherein A is —H or —CH=CH$_2$ or, provided that X and Y are both —CN, A may be —R^2 or —CH=CHR wherein R^2 is hydrocarbyl, aryl or alkaryl, and X and Y are strong electron withdrawing groups;
(ii) exposing the polymer to UV irradiation of sufficient intensity and for a time period of from about 0.1 seconds to about 5 minutes to photochemically modify the polymer; and
(iii) heating the modified polymer for at least about 5 seconds at from about 100° C. to about 400° C.

5,200,239

DECORATION ARTICLE WITH AN AUTOMATIC FLAKING DEVICE

Pao-Jung Chen, No. 112, Lane 465, Lien Ts'un Road, Fung Yuan City, Taichung Hsien, Taiwan

Filed May 22, 1992, Ser. No. 886,896
Int. Cl.[5] A63J 5/02
U.S. Cl. 428—13 2 Claims



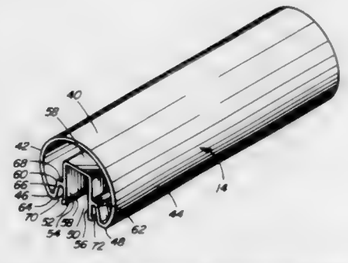
1. A decoration article with an automatic flaking device, comprising:
a bottom basin having a battery power source, an inner circuit in association with a sound actuating device, and a motor means disposed therein;
a transparent cover disposed on top of said bottom basin;
an inclined surface disposed on top of said bottom basin with a decoration means positioned thereon;
a plurality of flake particles which can be naturally piled up at the lowermost point of said inclined surface being made of light material;
a flake circulating tube having an inlet at the bottom end thereof and an outlet at the top end thereof being located with the bottom inlet thereof in conact with said lowermost point of said inclined surface;
a screw conveyor disposed inside said flake circulating tube with the bottom end thereof going through said inclined surface and engaged with the drive gear of said motor by means of a gear;
an oblique guide plate disposed below said top outlet of said flake circulating tube;
whereby said flake particles are delivered from said inlet to said outlet of said flake circulating tube by said screw conveyor continually and are led via said oblique guide plate and flake down as a result of gravity.

5,200,240

ALUMINUM RAILING APPARATUS

Neill E. Baker, 13900 - 60th Avenue, Surrey, British Columbia, Canada V5W 1S7

Filed May 2, 1991, Ser. No. 694,300
Int. Cl.[5] E04H 17/14
U.S. Cl. 428—34.1 11 Claims



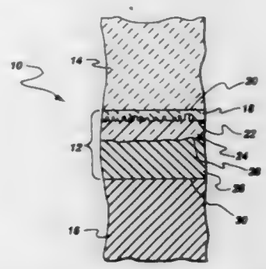
1. An aluminum railing member comprising a hollow extrusion with a top, sides, a bottom having a picket-receiving, longitudinal channel with an open bottom and parallel sides, the sides having bottom edges extending downwardly to the bottom of the channel, and connecting portions adjacent the bottom which extend between the channel and the sides of the extrusion, the connecting portions having parts parallel to the sides of the picket receiving channel and spaced apart therefrom, forming lateral channels on each side of the picket-receiving channel.

5,200,241

METAL-CERAMIC STRUCTURE WITH INTERMEDIATE HIGH TEMPERATURE REACTION BARRIER LAYER

Herman F. Nied, Clifton Park, and Richard L. Mehan, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 18, 1989, Ser. No. 353,580
Int. Cl.[5] B32B 17/06, 15/04
U.S. Cl. 428—34.6 11 Claims



1. A high-temperature metal-ceramic structure comprising:
a silicon based ceramic member from which silicon on one surface is substantially removed to create a porous surface;
a layer of glass secured to said ceramic member, said layer of glass including a portion thereof in said porous surface;
a layer of refractory metal bonded to said layer of glass; and
a metal member bonded to said layer of refractory metal, said layer of glass providing a reaction barrier between said silicon based ceramic member and said metal member.

5,200,242

INK JET TRANSPARENCY WITH EXTENDED PAPER BACKING

Christopher J. Hohmann, West Warwick, R.I., assignor to Arkwright, Inc., Fiskeville, R.I.

Filed Jan. 9, 1990, Ser. No. 461,837
Int. Cl.[5] B41M 5/00; B32B 3/00
U.S. Cl. 428—40 3 Claims

1. A receptor sheet composite for use in a sheet fed ink jet printer comprising:
a paper backing, said paper backing including a leading edge zone;
a transparency film overlaying said backing for receiving an image when used in said imaging apparatus, said transparency film including a leading edge zone of about one inch in length and an image-receiving area of eight and one-half by eleven inches or 210 by 297 mm in overall dimension;
slits or perforations formed across a widthwise end portion of said transparency film at a boundary of the leading edge zone and separating the leading edge zone of said transparency film from said image-receiving area, whereby said image-receiving area of said transparency film is removable from the leading edge zone thereof at the delineation;
means for securing said transparency film to said paper backing, said means for securing being comprised of adhe-

sive applied to at least a portion of the leading edge zone

5,200,244

COMPOSITE FABRICS COMPRISING CONTINUOUS

wherein x is an integer having a value of about 2 to 7 and mixtures thereof, and

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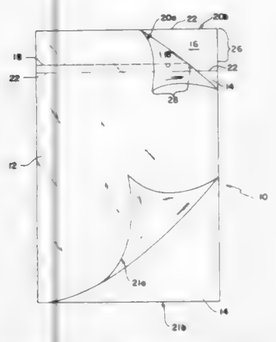
sive applied to at least a portion of the leading edge zone of said paper backing and to an area of said paper backing extending below the leading edge zone thereof and below said slits or perforations said adhesive being a removable adhesive which permits removal of said transparency film from said paper backing without leaving a residue remaining on said transparent film;

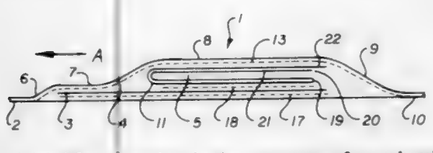


said leading edge zone being defined as a predetermined widthwise end portion area of said transparency film and said paper backing which is not intended for imaging in a printing operation, whereby said transparency is able to receive an image over the entire length of said image-receiving area.

5,200,243
LABEL

Hendrik J. Van Veen, AT Amsterdam, Netherlands, assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Mar. 25, 1992, Ser. No. 857,381
Claims priority, application Netherlands, Mar. 28, 1991, 9100560
Int. Cl.[5] B42D *15/00*; B32B *3/00*
U.S. Cl. 428—40 **20 Claims**



1. A label for a container having an outer surface, wherein the label extends between a front edge and a rear edge, spaced from one another along a main axis of the label, wherein the label comprises:

at least one information panel with a front edge and a rear edge spaced from one another along the main axis;

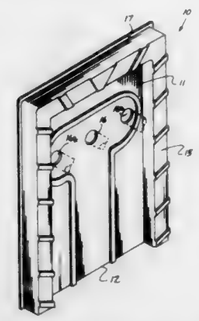
a base sheet for supporting the information panel, wherein at least a part of the bottom surface of the base sheet is provided with an adhesive for adhesion to a relatively flexible label bearing sheet and the outer surface of the container, respectively, and has a front edge and a rear edge spaced from one another along the main axis; and

a protective sheet for covering the information panel, wherein a first section of the lower surface of said protective sheet is adhered in the upper surface of the base sheet and a second section of it extends beyond the rear edges of the information panel, the base sheet extending to the rear edge of the label, wherein at least a portion of the lower surface of the second section is provided with an adhesive, which enables it to be adhered to and released from the outer surface of the container on repeated occasions.

5,200,244
SHOWER WALL PATCH

Michael A. Keller, P.O. Box 423 216 E. Dawes, Cannon Beach, Oreg. 97110

Filed Jun. 24, 1991, Ser. No. 719,613
Int. Cl.[5] B32B *3/08*
U.S. Cl. 428—81 **2 Claims**



1. A shower wall patch arranged for securement to a vertical wall, with a bathtub member mounted against a lower portion of the vertical wall, wherein the shower wall patch comprises,

a central flange plate, the central flange plate including a bottom edge, and

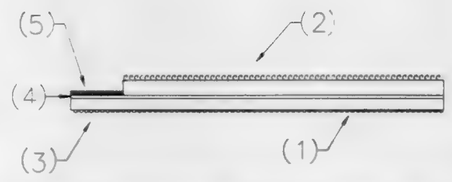
a "U" shaped perimeter flange fixedly and orthogonally mounted to a perimeter of the flange plate, with the perimeter flange defining an opening, with the bottom edge positioned in alignment with the opening, and

a planar lip flange coplanar with the flange plate positioned exteriorly of and coextensive with the "U" shaped perimeter flange to accommodate caulking and sealing thereof, the central flange, the perimeter flange, and the lip flange formed of a polymeric material.

5,200,245
FASTENER

Louis T. Brodrick, Jr., 110 Brodrick La., Hot Springs, Ark. 71901

Filed Oct. 25, 1991, Ser. No. 782,607
Int. Cl.[5] A44B *11/25*; B32B *3/06, 23/02, 7/12*
U.S. Cl. 428—100 **1 Claim**

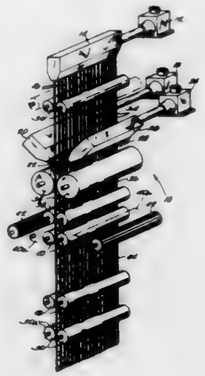


1. Fastener consisting essentially of two elongated layers of hook and loop materials of different lengths, one layer of the hook type and one of the loop type, permanently joined together back-to-back to provide at least one protruding end, and with the at least one protruding end having a pressure-sensitive adhesive layer on the back side thereof serving to permanently affix the fastener to the object to be secured to another part of itself or to another object, by winding the fastener around the other parts of itself or other object so that the hook and loop surfaces are pressed together and adhere releasably.

5,200,246
COMPOSITE FABRICS COMPRISING CONTINUOUS FILAMENTS LOCKED IN PLACE BY INTERMINGLED MELT BLOWN FIBERS AND METHODS AND APPARATUS FOR MAKING

Reinhardt N. Sabee, Appleton, Wis., assignor to Tuff Spun Fabrics, Inc., Appleton, Wis.

Filed Mar. 20, 1991, Ser. No. 672,529
Int. Cl.[5] B32B *5/26, 7/10*; D04G *5/06, 5/08*
U.S. Cl. 428—109 **16 Claims**



1. A non-woven fabric comprising:

a substantially longitudinal array of continuous filaments of a thermoplastic polymer in a nonrandom laydown orientation; and

two or more opposing depositions of melt blown fibers;

wherein at least some of the melt blown fibers are intermingled, under turbulent conditions, with each other and with the continuous filaments to form an integrated, coalesced matrix of continuous filaments and melt blown fibers.

5,200,247
BIODEGRADABLE FILM CONTAINING AN ALKANOYL POLYMER/PVA BLEND AND METHOD OF MAKING SAME

Pai-Chuan Wu, Cincinnati; Frank Moore, Jr., Hamilton, both of Ohio, and Thomas R. Ryle, Burlington, Ky., assignors to Clopay Corporation, Cincinnati, Ohio

Filed Jun. 5, 1992, Ser. No. 893,672
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—131 **19 Claims**

1. A biodegradable thermoplastic film comprising a blend of

(a) an alkanoyl thermoplastic polymer selected from the group consisting of

(i) a thermoplastic dialkanoyl polymer characterized in that at least about 10 percent of said polymer is attributable to recurring dialkanoyl units of the formula

wherein R represents a divalent aliphatic hydrocarbon radical; and wherein R' is of the group consisting of divalent aliphatic hydrocarbon radicals and divalent aliphatic oxahydrocarbon radicals, and

(ii) a thermoplastic oxyalkanoyl polymer of the formula

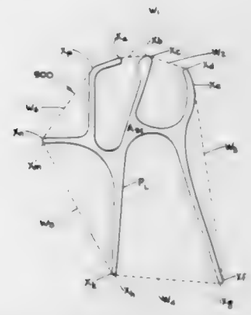
wherein x is an integer having a value of about 2 to 7 and mixtures thereof, and

(b) polyvinyl alcohol.

5,200,248
OPEN CAPILLARY CHANNEL STRUCTURES, IMPROVED PROCESS FOR MAKING CAPILLARY CHANNEL STRUCTURES, AND EXTRUSION DIE FOR USE THEREIN

Hugh A. Thompson, Fairfield, and Edward H. Krautter, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 482,446, Feb. 20, 1990, abandoned. This application Oct. 8, 1991, Ser. No. 773,164
Int. Cl.[5] D01D *5/00*; B32B *3/30*
U.S. Cl. 428—131 **48 Claims**



1. Capillary channel polymeric structures having collapse resistance having one or more intrastructure capillary channels formed by a capillary channel base, and at least two capillary channel polymeric walls, each wall having a base end and a distal end and each wall extending from said base along the length of said base in the axial direction parallel to said base for at least about 0.2 cm, said structures further having a Specific Capillary Volume of at least about 2.0 cc/g, a Specific Capillary Surface Area of at least about 2000 cm^2/g, and a Compressive Strength (Dry) of at least about 13,800 $dynes/cm^2$.

5,200,249
VIA METALLIZATION FOR ALN CERAMIC ELECTRONIC PACKAGE

Leonard E. Dolbert, Clarksville; Jack H. Enloe, Columbia; Ellice Y. Luh, Bethesda, and John W. Lau, Gaithersburg, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 567,518, Aug. 15, 1990. This application Aug. 22, 1991, Ser. No. 748,487
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—137 **9 Claims**

1. A dielectric aluminum nitride base for use in an electronic package, said base comprising dense aluminum nitride ceramic and at least one electrically conductive, hermetic via, said via consisting of metallization, said metallization consisting essentially of:

a) aluminum nitride, and

b) metal selected from the group consisting of tungsten, molybdenum and mixtures thereof.

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reinforcement for the joints and cut-outs that are fre-

ene resin with a Rockwell hardness of at least 70 that has been

of a principal inorganic filler dispersed in the back face-side

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5,200,250

PHOSPHORS, METHOD FOR TREATING THE SURFACE THEREOF AND PROCESS FOR PRODUCING A PHOSPHOR SCREEN

Hideo Tono, and Kazuhito Iwasaki, both of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Oct. 19, 1990, Ser. No. 600,208
Claims priority, application Japan, Oct. 20, 1989, 1-271825
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—144 14 Claims

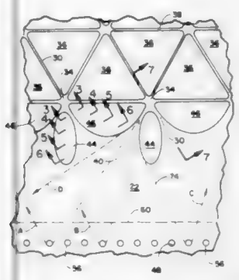
1. A phosphor comprising phosphor particles and a surface treating material attached or coated on the phosphor particles, wherein said surface treating material comprises a water-soluble zinc compound and a polycarboxylate.

5,200,251

FILAMENT WOUND COMPOSITE STRUCTURE, ITS TOOLING AND METHOD OF MANUFACTURE

Christopher B. Brand, Alexandria, Va., assignor to General Dynamics Corporation, Space Systems Division, San Diego, Calif.

Filed Jun. 20, 1991, Ser. No. 718,121
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—156 7 Claims



1. An isogrid filament wound composite structure having at least one or more pseudo-isotropic laminate zones in its joint regions comprising;

a primary skin sheet configured as a section of a conical surface, said primary skin sheet having a top surface and a bottom surface;

a plurality of ribs each having a top surface and a bottom surface, the bottom surface of said ribs being integrally connected to the top surface of said primary skin sheet and said ribs intersecting each other at predetermined angles to form a plurality of joint sections; and

some of said joint sections having a psuedo-isotropic zone formed by some of its ribs being discontinued by tapering their height in the direction away from said joint section, at the same time that the height of said ribs are being shortened, the width of the ribs are tapered outwardly to be wider, the pseudo-isotropic laminate zone has a top surface formed integrally with the bottom surface of said ribs and the pseudo-isotropic laminate zone has a bottom surface integrally formed with the top surface of said primary skin sheet, the resulting structure provides local reinforcement for the joints and cut-outs that are frequently present in aerospace structures.

3. Tooling for an isogrid filament wound composite structure having at least one or more pseudo-isotropic laminate zones in its joint regions comprising:

a cylindrical mandrel having an outer surface having a plurality of primary and secondary grooves intersecting each other at predetermined angles to form a plurality of groove junctions, said primary and secondary grooves form primary raised boss members between themselves having a predetermined configuration; and

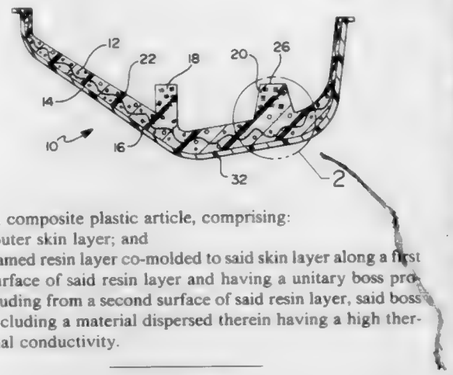
at least one of said grove junctions having substantially constant width and height primary grooves coming into said groove junction from one of its lateral sides, secondary grooves coming into said grove junction and said secondary grooves have a width that tapers to become narrower as they get closer to said groove junction while simultaneously increasing the depth of said secondary grooves as they approach said groove function, secondary raised boss members are formed between said secondary groves.

5,200,252

REINFORCED FASTENING BOSS AND METHOD FOR MAKING THE SAME

Josh Kelman, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Jul. 20, 1992, Ser. No. 915,317
Int. Cl.[5] B32B 1/00, 3/02, 5/14
U.S. Cl. 428—159 12 Claims



1. A composite plastic article, comprising:

an outer skin layer; and

a foamed resin layer co-molded to said skin layer along a first surface of said resin layer and having a unitary boss protruding from a second surface of said resin layer, said boss including a material dispersed therein having a high thermal conductivity.

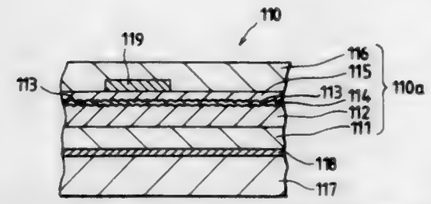
5,200,253

HOLOGRAM FORMING SHEET AND PROCESS FOR PRODUCING THE SAME

Masahisa Yamaguchi; Hitoshi Fujii; Shuichi Kobayashi, and Takahiro Kawai, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Aug. 3, 1990, Ser. No. 562,316
Claims priority, application Japan, Aug. 9, 1989, 1-204691; Aug. 9, 1989, 1-204692; Aug. 9, 1989, 1-204693; Aug. 9, 1989, 1-204697; Aug. 9, 1989, 1-204698; Aug. 9, 1989, 1-204699; Aug. 9, 1989, 1-204700; Dec. 20, 1989, 1-329949; May 29, 1990, 2-56081[U]
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—195 20 Claims

1. A hologram forming sheet comprising a polypropylene resing sheet with a Rockwell hardness of at least 70 and a hologram pattern forming surface provided on one side of said polypropylene resin sheet, said hologram pattern forming surface being provided simultaneously with the molding of said polypropylene resin sheet in such a way that a polypropylene resin with a Rockwell hardness of at least 70 that has been extruded as a molten thin film from a T die is pressed and cooled with a chill roll equipped with a hologram relief master plate on its peripheral surface.



5,200,254

RECEPTOR SHEET MANIFOLDS FOR THERMAL MASS TRANSFER IMAGING

Robert M. Henry, Round Rock; David N. Anderson, Austin; Feng M. Lin, Austin; Manisha Sarkar, Austin, and Donald J. Williams, Austin, all of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1992, Ser. No. 850,348
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—195 13 Claims

1. A receptor sheet manifold comprising:

a) a polymeric image receptor sheet comprising: a transparent film substrate having an image receptive layer coated on at least one surface thereof, said image receptive layer comprising at least about 90% imaging polymer, from about 1% to about 5% perfluoroalkylsulfonamidopolyether antistatic agent, and from about 0.2% to about 5% silica particles, and attached thereto

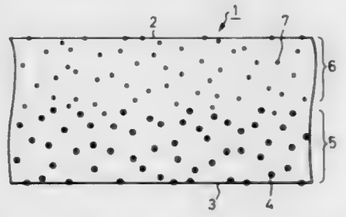
b) a nontransparent backing sheet having a contact surface touching said attached receptor sheet, and an opposing surface, said opposing surface having a coating comprising from about 75% to about 94% of a binder resin capable of adhering thereto, from about 1% to about 10% antistatic agent and from about 5% to about 15% of a particulate, such that said opposing surface has a Bekk smoothness of about 450 to about 550 Bekk seconds.

5,200,255

MAGNETIC RECORDING MEDIUM SUBSTRATE COMPRISING AN AROMATIC IMIDE POLYMER FILM AND INORGANIC FILLER PARTICLES

Kenji Matsubara; Akinori Ohtani; Toshiyuki Nishino, and Kazuhiko Yoshioka, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jul. 26, 1989, Ser. No. 385,063
Claims priority, application Japan, Jul. 29, 1988, 63-188124
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—212 17 Claims



1. An aromatic imide polymer film for a magnetic recording material, composing a film, hiving front and back face-side surfaces and corresponding front and back face-side half strata, consisting essentially of an aromatic imbibe polymer, particles of a principal inorganic filler dispersed in the back face-side half stratum of the film, in an amount of 0.5 to 5% based on the weight of the back face-side half stratum and having an average size of 40 to 200 m μm, and particles of an additional inorganic filler dispersed in a front face-side half stratum of the film, in a concentration of 1/10 to 8/10 of that of the principals filler particles and having an average size of 1/20 to 7/10 of that of the principal filler particles, wherein the back face-side surface has a centerline average surface roughness of 2 to 10 m μm and is provided with convexities formed thereon due to the principal filler particles and having an average height of 10 to 50 μm, and the front face-side surface has a centerline average surface roughness of 1/10 to 8/10 of that of the back face-side surface and is provided with convexities formed thereon due to the additional filler particles and having an average height of 2/10 to 8/10 of that of those of the back face-side surface.

5,200,256

COMPOSITE LIGHTWEIGHT BULLET PROOF PANEL FOR USE ON VESSELS, AIRCRAFT AND THE LIKE

C. R. Dunbar, 5325 Chambord Dr., Greenwell Springs, La. 70739

Filed Jan. 23, 1989, Ser. No. 300,815
Int. Cl.[5] B63G 9/00; E06B 9/00; B32B 7/02, 3/26
U.S. Cl. 428—212 16 Claims

1. A lightweight, composite armor lining for use in protecting objects such as vessels and like craft from powered high speed projectiles comprising:

a) a plurality of layers of fabric compression molded with a binder resin to form a composite layer;

b) an elastomeric foam material layer; and

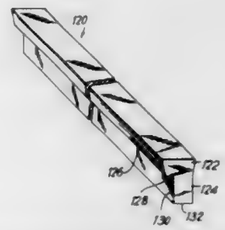
c) an intermediate wire mesh layer.

5,200,257

ELASTOMERIC MOLD SEALS

Gregory M. Gatarz, East Brunswick, N.J., and Ronald M. Marsilio, Mogadore, Ohio, assignors to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 467,771, Jan. 19, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 806,396
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—217 7 Claims



1. An elastomeric mold seal in combination with a molding apparatus having first and second molding members, said first molding member having a seal groove therein, said molding

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5,200,264

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apparatus receiving an article for molding one side thereof having an upstanding rim including a lip, an essentially vertical wall and an essentially horizontal wall, comprising a seal formed from an elastomeric material having an essentially L-shaped cross-section including an enlarged head essentially trapezoidal in cross-section sized to be retained in said seal groove and an elongated leg essentially rectangular in shape and formed integrally with said head having an end depending therefrom, said seal having a recessed portion formed intermediate said leg and said head including an essentially horizontal ledge and an essentially vertical surface, said ledge engaging said lip of said rim, said essentially vertical surface engaging said vertical wall of said rim, and said end of said leg engaging said horizontal wall when said article is being molded in said molding apparatus.

5,200,258

PHOTOGRAPHIC PRINTING PAPER SUPPORT

Shigehisa Tamagawa, and Masafumi Kashiwagi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1990, Ser. No. 504,363
Claims priority, application Japan, Apr. 6, 1989, 1-87277
Int. Cl.[5] B32B *23/08, 15/10;* **D21F** *11/00*
U.S. Cl. 428—218 **6 Claims**

1. A support for use in photographic printing paper comprising a base paper which is covered on both sides with a polyolefin coating, said base paper being one which has undergone calender treatment between a metallic roll and a synthetic resin roll and then between a metallic roll and another metallic roll,

wherein said calender treatment between the metallic roll and the synthetic resin roll is performed in such a manner that the density of the paper is increased to a range from 0.70 to 1.00 g/cm^3 and said calender treatment between the metallic rolls is performed in such a manner that the density of the paper is increased to a range from 1.00 to 1.20 g/cm^3, and

wherein said calender treatment is performed at the final finishing process.

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FIBER-FILLED CONCRETE OVERLAY IN CATHODIC PROTECTION

John J. Bartholomew, Mentor, and Thomas J. Gilligan, III, Painesville, both of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 456,697, Dec. 26, 1989, abandoned. This application Aug. 22, 1991, Ser. No. 748,618
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—224 **21 Claims**

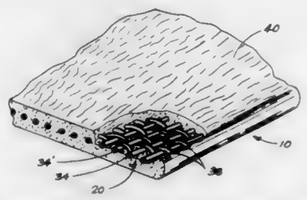
1. In a cathodically-protected steel-reinforced concrete structure having an impressed-current anode embedded in said concrete structure and spaced apart from steel reinforcing members also embedded in said concrete structure, and said anode comprises an electrocatalytically-coated valve metal anode, the improvement comprising a fiber-filled concrete overlay for said structure, which overlay contains from above about 3.2 pounds to about 20 pounds, per cubic yard of said overlay, of non-smooth, non-conductive, fibrillated polymeric fiber comprising polymeric fiber bundles, said fibrillated and bundled polymeric fiber having average fiber length at least as long as the thickness of a coating layer of said overlay, said fiber being resistant to degradation at elevated pH, and with said fiber-filled overlay embedding said valve metal anode.

5,200,260

NEEDLED PAPERMAKING FELT

Chien-Yeh Hsu, Greer, S.C., assignor to Wangner Systems Corporation, Greenville, S.C.

Filed Feb. 14, 1992, Ser. No. 835,549
Int. Cl.[5] B32B *5/06, 27/02;* **D21F** *3/02, 7/08*
U.S. Cl. 428—234 **20 Claims**



1. A papermaker wet end felt for use with impulse drying equipment comprising

a base fabric having a top surface and a bottom surface, said fabric including a plurality of nylon monofilament warp yarns interwoven with a plurality of nylon monofilament yarns each having a diameter of between 0.012 and 0.030 inches;

a fiber batt secured to said base fabric in a manner as to cover said top and bottom surfaces, said fiber batt consisting of fibers of multi extruded filaments selected from the group consisting of polyetheretherketone having repeating units of two ether groups and one ketone group; whereby,

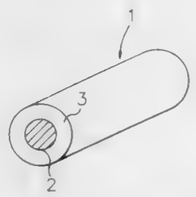
when said felt is subjected to heated rolls said batt acts to insulate said nylon base fabric so that it may function in temperatures of up to 700° F. without excessive degradation.

5,200,261

FOAM MATERIAL REINFORCED WITH COMPOSITE FIBERS

Setsuo Taguchi, Shiga, and Miyoshi Okamoto, Osaka, both of Japan, assignors to Toray Industries, Inc., Japan

Filed Dec. 7, 1990, Ser. No. 624,240
Claims priority, application Japan, Dec. 11, 1989, 1-322164
Int. Cl.[5] D02G *3/00;* **B32B** *5/22, 3/26, 7/00*
U.S. Cl. 428—245 **21 Claims**



1. A fiber-reinforced foamed material comprising (1) a foamed body of a resin polymer, which resin polymer has a flexural elasticity modulus not smaller than 150 kg/mm^2, and (2) composite reinforcement fibers, said composite reinforcement fibers having a bonding component having a melting point temperature at least 10 C. lower than a foam treatment temperature and a reinforcement component having a melting point temperature 20 C. or higher than the foam treatment temperature and wherein said composite reinforcement fibers are integrated with said foamed body so as to reinforce said foamed body.

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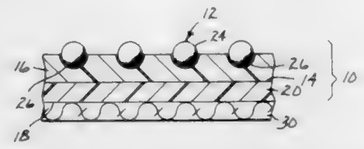
LAUNDERABLE RETROREFLECTIVE APPLIQUE WITH IMPROVED RETENTION OF RETROREFLECTIVE ELEMENTS

Wu-Shyong Li, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 1, 1992, Ser. No. 862,345
Int. Cl.[5] G02B *5/128;* **B32B** *3/00*
U.S. Cl. 428—266 **21 Claims**



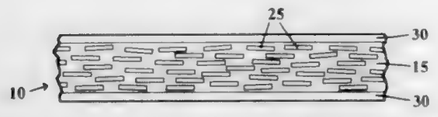
1. A retroreflective applique comprising a monolayer of retroreflective elements partially embedded in and protruding from the front surface of a binder layer wherein said binder layer comprises a flexible polymer having active hydrogen functionalities and one or more isocyanate-functional silane coupling agents.

5,200,263

PUNCTURE AND CUT RESISTANT MATERIAL AND ARTICLE

Arnold S. Gould, 46 Wildwood Dr., Bedford, Mass. 01730, and Larry D. Nichols, 134 Gray St., Arlington, Mass. 02174

Filed Aug. 13, 1991, Ser. No. 744,284
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—323 **15 Claims**



1. A puncture and cut resistant composite material comprising:

at least one layer of flexible elastomeric material;

a plurality of hard, but not brittle, flat platelets devoid of sharp corners or edges contained within each said layer of elastomeric material, said platelets being substantially impervious to puncturing or cutting by a sharp, impacting object having a pointed tip driven by forces normally produced by hand; and

a coating covering each of said platelets, said coating being (1) such that there is substantially no adherence between said elastomeric material and said coating, (2) such that the platelets are contained within encapsulating pockets in said elastomeric material to thereby allow the surrounding material to flex and stretch about the platelets, (3) such that when said tip of said impacting object engages said coating on one of said platelets is inhibited;

said platelets being oriented within said at least one layer of elastomeric material so that said platelets lie substantially parallel to the plane of said at least one layer of elastomeric material and substantially cover any surface to which the composite material may be applied, and being sized and disposed in said at least one layer of elastomeric material so as to allow said composite material to flex, and so as to render said composite material puncture and cut resistant.

5,200,264

THERMOSET POLYMER THICK FILM COMPOSITIONS AND THEIR USE AS ELECTRICAL CIRCUITRY

Richard L. Frentzel, Chino Hills, Calif., assignor to Advanced Products, Inc., Cheshire, Conn.

Division of Ser. No. 403,235, Sep. 5, 1989, Pat. No. 5,049,313. This application Jun. 17, 1991, Ser. No. 716,187
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—323 **6 Claims**

1. A method of curing a polymer thick film on a substrate comprising the steps of:

(1) providing a polymer thick film composition comprising:

(a) a resin system comprising an admixture of:

(i) about 4.50 parts to about 12 parts by weight of at least one phenoxy resin; and

(ii) about 6 parts to about 15.5 parts by weight of at least one blocked isocyanate resin; and

(b) a conductive material selected from the group consisting of:

(i) about 50 parts to about 70 parts by weight silver flake; and

(ii) an admixture of about 15 to about 25 parts by weight graphite and about 3 parts to about 6 parts by weight of carbon black.

(2) applying said composition to a substrate; and

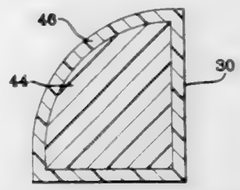
(3) thermally curing said composition onto said substrate.

5,200,265

CRYSTALLINE PLASTIC BODY WITH OUTER AMORPHOUS PLASTIC SURFACE LAYER

Keith L. Seifert, Torrington, and Robert E. Furst, Griswold, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 681,283, Apr. 8, 1991, Pat. No. 5,104,241. This application Jan. 2, 1992, Ser. No. 816,686
Int. Cl.[5] B32B *18/00, 7/04;* **F16C** *33/56*
U.S. Cl. 428—325 **7 Claims**



1. A plastic part composed of a thermoplastic resin, said plastic part comprising:

a crystalline portion composed of said thermoplastic resin in a crystalline state; and

an amorphous outer layer composed of said thermoplastic resin in an amorphous state overlying at least a part of said crystalline portion for improving the ability of said plastic part to withstand friction without failure.

5,200,266

METHOD FOR PRODUCING CONSTRUCTION PANELS USING AIR HARDENING

Günter Exner, Dettelbach, Fed. Rep. of Germany, assignor to Fulgurit Baustoffe GmbH, Wunstorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 5,542, Jan. 21, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 188,078
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601734
Int. Cl.[5] B32B *13/02*
U.S. Cl. 428—326 **8 Claims**

6. In a construction panel comprising cellulose fibers as the reinforcing means and at least one inorganic binder, wherein

the panel is subjected to air hardening by storage in stacking,

sticking resin capable of functioning as a sticking agent for

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a) a thermoplastic resin bead having an average diameter of

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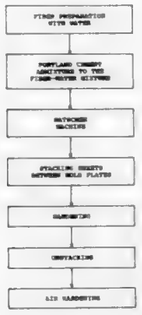
the panel is subjected to air hardening by storage in stacking structures, the improvement comprising:



said inorganic binder comprising Portland cement having a sulfur trioxide proportion between about 0.1% and 1% by weight of binder.

5,200,267

FIRE-RETARDANT SYNTHRETIC BOARD PRODUCT

Ted J. Bauer, Medford; David M. Harmon, Phoenix, both of Oreg.; Rory G. Kirwan, Dungavvan, and Roberta Treliving, Woodlands, both of United Kingdom, assignors to Medite Corporation, Medford, Oreg.

Division of Ser. No. 668,068, Mar. 12, 1991, which is a continuation-in-part of Ser. No. 326,226, Mar. 20, 1989, Pat. No. 5,093,058. This application Nov. 13, 1991, Ser. No. 792,033

Claims priority, application Ireland, Mar. 14, 1990, 910/90

Int. Cl.[5] B32B *23/14, 21.04*

U.S. Cl. 428—326 **13 Claims**

1. A synthetic fire-retardant board product made from a cellulosic material by:

extracting hot and wet fibers from a cellulosic material;

transporting the hot and wet fibers in a first stream;

transporting separate second and third streams comprising a binder and a diluent, respectively, generally toward the first stream;

merging the second and third streams to form a fourth stream;

emulsifying the binder and the diluent in the fourth stream;

immediately after emulsifying, applying the binder/diluent emulsion in the fourth stream to the hot and wet fibers in the first stream;

partially dewatering the hot and wet fibers;

introducing fire-retardant liquid onto the cellulosic material;

forming the partially dewatered fibers into a mat; and

compressing the mat in a heated press to cure the binder to form a consolidated board product.

5,200,268

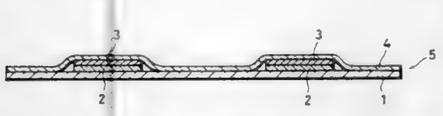
STICK-ADHESIVE COMPOSITION, A STICK-ADHESIVE COMPOSITION LAYER, AND A TRANSFER SHEET WITH THE LAYER

Hideo Hamada, 15-401, Kawanaka-Shinmachi, Daito-shi, Osaka 574, Japan

Filed Apr. 1, 1991, Ser. No. 678,461

Int. Cl.[5] B32B *7/12*

U.S. Cl. 428—354 **2 Claims**



1. A transfer sheet comprising a release sheet, a stick-adhesive layer disposed on the releasable side of said release sheet and formed form a stick-adhesive composition comprising a sticking resin capable of functioning as a sticking agent for sustained contact to a substrate and a moisture-curing resin curable upon exposure to atmospheric moisture to provide an adhesive to a substrate, the resins of the stick-adhesive being in a weight ratio of sticking resin to moisture-curing resin in the range of 90:10 through 20:80 based on nonvolatile matter thereof, a main transfer layer disposed on said stick-adhesive layer opposed form said release sheet, and a moisture-proofing means disposed on said main transfer layer and adapted to maintain said stick-adhesive layer in moisture-free condition, said release sheet is a moisture-proof sheet, said stick-adhesive layer is a pattern-printed layer formed on the releasable side of said release sheet, said main transfer layer is at least one pattern-printed layer having a pattern in registry with that of said stick-adhesive layer, and said moisture-proofing means for maintaining said stick adhesive layer in moisture-free condition comprises said release sheet in combination with a peelable protective sheet disposed on said main transfer layer in such a manner that it covers an area larger than and extending the pattern of said main transfer layer.

5,200,269

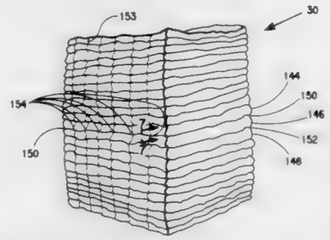
APPARATUS AND METHOD FOR BALING CUT FIBERS AND PRODUCT

Craig R. Lukhard, Newark; Elwood A. Roth, Seaford, both of Del., and Maurice C. Todd, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 1, 1990, Ser. No. 531,661

Int. Cl.[5] D02G *3/00;* **B65D** *91/00*

U.S. Cl. 428—362 **2 Claims**



1. A bale of crimped nylon staple fiber comprising: a strapped bale density in the range of from about 18 to about 26 lbs/ft^3, a seven day unstrapped density of from about 9 to about 12 lbs/ft^3, said fiber being crimped in the range of from 6–20 crimps per inch and having a cut length of about 4 to about 8 inches, a crimp elongation of from about 25 to 45 percent and a moisture content of 4 to 8 percent, said bale being formed of a plurality of separable compacted layers of said yarns stacked one next to the other, each of said layers having substantially the same unstrapped bale density.

5,200,270

CARRIER FOR A BIOLOGICALLY ACTIVE COMPONENT FOR IMMUNOASSAY OR ENZYMATIC REACTION

Hiroshi Ishida, Machida; Yuji Higo, Nagoya, and Masuo Inoue, Komae, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation-in-part of Ser. No. 400,872, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 881,692, Jul. 3, 1986, abandoned. This application Sep. 19, 1991, Ser. No. 762,085

Claims priority, application Japan, Feb. 25, 1986, 61-38279

Int. Cl.[5] B32B *5/16;* **C12N** *11/08;* **G01N** *33/545*

U.S. Cl. 428—403 **21 Claims**

1. A carrier for a biologically active component for immunoassay or enzymatic reaction, which comprises:

a) a thermoplastic resin bead having an average diameter of from 0.05 to 20 mm,

b) from 1 to 25% by weight, based on the bead, of a magnetically responsive powder having an average particle size of from 0.01 to 10 μm bound on the bead, and

c) a polymer coated thereon in a thickness of from 2 to 30 μm, said polymer having a number average degree of polymerization of from 20 to 5000 and having or capable of having functional groups capable of binding the biologically active component.

5,200,271

POLYARYLENE SULFIDE RESIN COMPOSITIONS AND MOLDED ARTICLES

Wataru Kosaka, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 22, 1992, Ser. No. 887,033

Claims priority, application Japan, Feb. 22, 1989, 1-42629

Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—457 **10 Claims**

1. A composite molded article comprising:

a molded article comprising a polyarylene sulfide resin comprising:

a polyarylene sulfide resin (A);

at least one type of a fiber reinforcement (B) containing silicic acid as a major component and having an average fiber diameter of 15 μm or shorter and an average fiber length of 300 μm or longer; and

at least one type of a milled ceramic fiber reinforcement (C) containing Al_2O_3 and SiO_2 as major components in a ratio in weight of Al_2O_3 to SiO_2 ranging from 0.8 to 1 to 1.3 to 1, having an average fiber diameter of 2 to 4 μm, an average fiber length of 10 to 30 μm;

wherein the polyarylene sulfide resin (A) is contained in an amount ranging from 30% to 75% by weight, the fiber reinforcement (B) is contained in an amount ranging from 15% to 70% by weight, and the fiber reinforcement (C) is contained in an amount ranging from 1% to 25% by weight; and

a metal plate on at least one surface of said molding.

5,200,272

PROCESS FOR METALLIZING SUBSTRATE SURFACES

Kirkor Sirinyan, Bergisch Gladbach; Reinhold Dederichs, Leverkusen; Rudolf Merten, Leverkusen; Ulrich von Gizycki, Leverkusen; Gerhard-Dieter Wolf, Dormagen, all of Fed. Rep. of Germany, and John L. Williams, McMurray, Pa., assignors to Miles Inc., Pittsburgh, Pa. and Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 342,763, Apr. 24, 1989, abandoned. This application Jul. 30, 1992, Ser. No. 922,592

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814506

Int. Cl.[5] C23C *26/00*

U.S. Cl. 428—458 **12 Claims**

7. A substrate having a strongly adhering metallic coating which is prepared by a process which comprises

a) applying to the surface of said substrate a primer composition comprising a film-forming organic polymer and a polymeric organic additive having a surface tension of 45 to 70 mN/m, wherein said additive comprises a member selected from the group consisting of polyesters, polyamides and polyoxazolines,

b) wetting the primed surface prepared in a) with a solution of an organometallic compound based on an element from Group 1 or 8 of the periodic table,

c) reducing the organometallic compound to the pure metal either during or prior to step d) and

d) non-electrically metallizing the activated primed surface prepared in

b) either in conjunction with or following step c) by the wet chemical method.

5,200,273

METAL COMPOSITE OF RUBBER, BENOTHIAZOLE SULFENAMIDE AND COPPER ALLOY

Kiyoshige Muraoka; Mamoru Uchida, and Takafumi Taguchi, all of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation of Ser. No. 550,207, Jul. 10, 1990, abandoned, which is a continuation of Ser. No. 266,580, Nov. 3, 1988, abandoned. This application Feb. 28, 1992, Ser. No. 842,802

Claims priority, application Japan, Nov. 7, 1987, 62-281777; Dec. 4, 1987, 62-308093

Int. Cl.[5] B32B *15/06*

U.S. Cl. 428—465 **2 Claims**

1. A composite material comprising a rubber composition and a metal material, wherein said rubber composition contains, per 100 parts by weight of rubber, 3 to 6 parts of weight of sulfur, and N-oxydiethylene-2-benzothiazolylsulfenamide or N-tert-butyl-2-benzothiazolylsulfenamide as a vulcanization accelerator, wherein said metal material is provided with a plating of a ternary alloy consisting of 60 to 75 weight % copper, 4 to 10 weight % nickel, and the balance being zinc; with the proviso that no adhesion accelerator or cobalt salt of an organic acid is contained in the rubber composition.

5,200,274

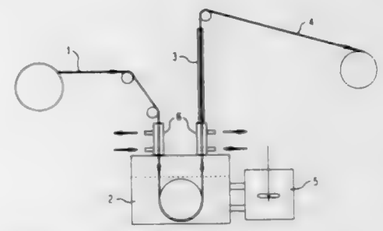
PROCESS FOR SURFACE-MODIFYING POLYPROPYLENE OR POLYETHYLENE

Tai-Shung Chung, Randolph; Edward R. Kafchinski, Winfield, and Frank Haimbach, IV, Upper Montclair, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation-in-part of Ser. No. 870,526, Apr. 17, 1992. This application Jun. 11, 1992, Ser. No. 896,944

Int. Cl.[5] B32B *27/08;* **B05D** *3/12;* **B21F** *9/00;* **D06C** *3/00*

U.S. Cl. 428—515 **20 Claims**



1. A process for modifying an article surface having an area, said article comprising polypropylene or polyethylene, said process comprising:

coating said surface with a dope, said dope comprising a copolymer and a solvent, at a coating temperature sufficient to keep said copolymer dissolved in said solvent, wherein said copolymer comprises a maleic acid-grafted polypropylene or polyethylene copolymer;

drying said coated surface at a drying temperature sufficient to vaporize said solvent which drying temperature is at least as high as said coating temperature; and,

stretching said surface to at least about 50% more than said surface area without causing a residual strain of more than about 11% of said area,

wherein the temperature of said dope is not allowed to fall below that needed to keep said copolymer dissolved in said solvent prior to drying.

5,200,275

FUEL CELL METAL CURRENT COLLECTOR CORROSION

5,200,277

ELECTROLUMINESCENT DEVICE

said electrochemically active section comprising at least one fuel cell comprising:

first and second spaced apart tubesheets disposed in the housing;

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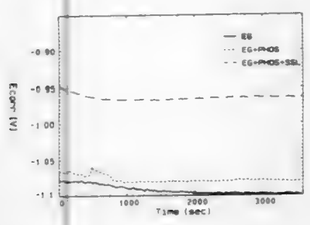
5,200,275

STEEL SHEET WITH ENHANCED CORROSION RESISTANCE HAVING A SILANE TREATED SILICATE COATING

Wim J. van Ooij, Fairfield, and Ashok Sabata, Cincinnati, both of Ohio, assignors to Armco Steel Company, L.P., Middletown, Ohio

Division of Ser. No. 632,858, Dec. 24, 1990, Pat. No. 5,108,793. This application Jul. 12, 1991, Ser. No. 729,551
Int. Cl.[5] B32B *15/18*
U.S. Cl. 428—623 2 Claims



1. A steel sheet including a composite coating, the composite coating consisting of a metallic inner layer and an outer silicate layer,

said metallic layer being an alloy of lead and tin,

said silicate layer including a metal salt and a surface film of silane,

said metal salt being from the group consisting of barium nitrate, calcium nitrate and strontium nitrate, and

said silicate layer having a thickness of at least about 2 nm thereby minimizing rusting of the sheet.

5,200,276

COLOR-COATED ARTICLE AND METHOD FOR PRODUCING THE SAME

Hiroshi Tasaki; Eiji Nishimura, both of Saitama, and Yasunori Yamamoto, Kanagawa, all of Japan, assignors to Nippon Mining & Metals Co., Limited, Tokyo, Japan

Continuation of Ser. No. 595,515, Oct. 11, 1990, abandoned. This application Jul. 15, 1992, Ser. No. 914,013
Claims priority, application Japan, Oct. 18, 1989, 1-269047; May 17, 1990, 2-125486; May 23, 1990, 2-131207
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—629 4 Claims

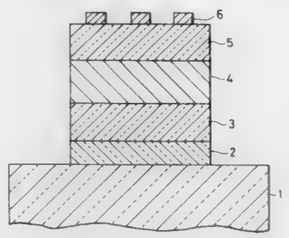
1. A brown coated article which consists of an iron substrate, a zinc hot-dip galvanizing layer on said substrate consisting essentially of from 1 to 15% by weight of Fe and from 0.05 to 1% by weight of Mn, and balance of Zn, and a brown Zn-Mn-Fe oxide layer which is present as an exposed top surface on the zinc hot-dip galvanizing layer said brown color designated as one of 5Y/DK, 5YR/DK or 5GY/DK of Hue and Tone graph of the Color Image Dictionary published by Kodansha on May 20, 1989, page 186.

5,200,277

ELECTROLUMINESCENT DEVICE

Takahiro Nakayama; Kenichi Onisawa; Katsumi Tamura, all of Ibaraki; Kazuo Taguchi, Tokyo; Akira Sato, Ibaraki; Kenichi Hashimoto, Ibaraki; Yoshio Abe, Ibaraki, and Masanobu Hanazono, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 309,860, Feb. 14, 1989, abandoned. This application Dec. 22, 1989, Ser. No. 454,961
Claims priority, application Japan, Feb. 29, 1988, 63-47140
Int. Cl.[5] B32B *5/14*; C23C *14/00*; B05D *1/02*
U.S. Cl. 428—690 11 Claims



1. An electroluminescent device comprising: a substrate: first electrodes formed on said substrate; a first dielectric film formed on said first electrodes; an active layer formed on said first dielectric film; a second dielectric film formed on said active layer; and second electrodes formed on said second dielectric film; said first and second dielectric films including first regions made of a material with a strong self-healing type dielectric breakdown characteristic, second regions made of a material with a strong propagating type dielectric breakdown characteristic, and mixed region consisting of a mixture of these two materials, said first and second regions being arranged alternately in the film thickness direction with said mixed regions therebetween, the mixing ratio of these two materials in said mixed regions changing in such a manner that the ratio of one material gradually decreases from a region of this material toward the adjacent region of the other material, the changes in the mixing ratio of these two materials of the dielectric films in the film thickness direction being thus continuous and periodic.

5,200,278

INTEGRATED FUEL CELL POWER GENERATION SYSTEM

David S. Watkins, Coquitlam; Kenneth W. Dircks, North Vancouver; Danny G. Epps, Tsawwaggen; Brian N. Gorbell, Robert D. Merritt, both of Vancouver, all of Canada, assignors to Ballard Power Systems, Inc., North Vancouver, Canada

Filed Mar. 15, 1991, Ser. No. 670,245
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—24 20 Claims

1. An electrical power generation system comprising:

a fuel cell stack comprising a humidification section and an electrochemically active section, said humidification section comprising at least one fuel humidification assembly comprising a fuel humidification water stream, an inlet hydrogen containing fuel stream and a water vapor transport membrane interposed therebetween for transporting water vapor from said fuel humidification water stream to said inlet fuel stream to produce a humidified fuel stream, said humidification section further comprising at least one oxidant humidification assembly comprising an oxidant humidification water stream, an inlet oxygen containing oxidant stream and a water vapor transport membrane interposed therebetween for transporting water vapor from said oxidant humidification water stream to said inlet oxidant stream to produce a humidified oxidant stream,

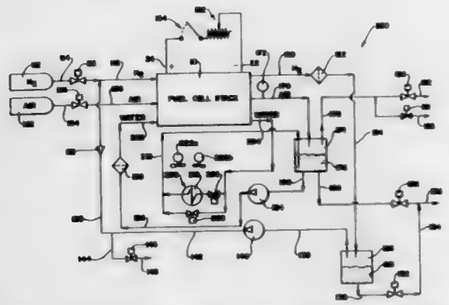
said electrochemically active section comprising at least one fuel cell comprising:

an anode having a catalyst associated therewith for producing cations from said humidified fuel stream,

a cathode having a catalyst associated therewith for producing anions from said humidified oxidant stream, said anions reacting with said cations to form water at said cathode,

an ion exchange membrane interposed between said anode and said cathode, said membrane facilitating the migration of cations from said anode to said cathode and isolating said humidified fuel stream from said humidified oxidant stream, and

an electrical path for conducting the electrons formed at said anode to said cathode,



said electrochemically active section further comprising at least one inlet coolant water stream for absorbing heat generated within said electrochemically active section to produce an outlet coolant water stream;

a heat exchanger for removing heat from said outlet coolant water stream to produce a chilled coolant water stream;

a water separator for removing water from said humidified oxidant stream to produce a dehumidified oxidant stream and a removed water stream;

a coolant reservoir for receiving said removed water stream from said water separator and for receiving said chilled coolant water stream from said heat exchanger;

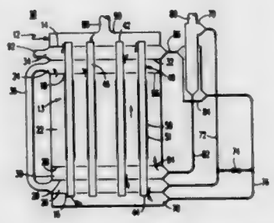
wherein said inlet coolant water stream is drawn from said coolant reservoir.

5,200,279

SOLID OXIDE FUEL CELL GENERATOR

Robert Draper, Churchill Boro; Raymond A. George, Pittsburgh, and Larry A. Shockling, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 11, 1991, Ser. No. 774,932
Int. Cl.[5] H01M *8/12*
U.S. Cl. 429—30 16 Claims



1. A solid oxide fuel cell generator for electrochemically reacting a fuel gas with an oxidizing gas, comprising:

a housing;

first and second spaced apart tubesheets disposed in the housing;

at least two spaced apart, intermediate barrier walls between and spaced from the tubesheets, the at least two intermediate barrier walls and housing defining a generator chamber spaced from the tubesheets; and

an array of spaced apart fuel cells;

each fuel cell comprising:

a hollow tube having a peripheral surface and an axial length extending through the generator chamber between two open tube ends, the one tube end engaging the first tubesheet and the second tube end engaging the second tubesheet; and

an electrochemical cell superposed on the peripheral surface of the tube in the generator chamber, the electrochemical cell comprising a solid oxide electrolyte and a contiguous electrical interconnector, the solid oxide electrolyte concentrically disposed between a fuel electrode and an oxidant electrode.

5,200,280

TERMINAL COVER FOR A BATTERY PACK

Alvydas P. Karasa, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 755,245, Sep. 5, 1991, abandoned. This application Apr. 14, 1992, Ser. No. 869,054
Int. Cl.[5] H01M *2/10*
U.S. Cl. 429—65 24 Claims

1. An enclosure for a battery pack, the pack having opposite first and second ends and including at least one cell and a raised and exposed terminal carried at the first end for providing electrical contact with the at least one cell comprising:

a first end cap for capping the first end of the battery pack and including a raised terminal cover having a plurality of walls for enclosing the terminal so as to render it contactable by an outside element only by penetration of that element within the walls of the terminal cover; and

means for surrounding the battery pack and overlappingly engaging the end cap so as to retain the end cap on the first end of the battery pack.

5,200,281

SINTERED BIPOLAR BATTERY PLATES

George D. Leap, Plum Boro, and Hilary Moyes, Penn Hills Twp., Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 18, 1991, Ser. No. 794,090
Int. Cl.[5] H01M *2/14, 4/52, 4/54, 10/26*
U.S. Cl. 429—129 8 Claims

1. A sintered bipolar battery plate comprising a porous positive electrode and a porous negative electrode, with a central, non-porous current collector having planar dimensions greater than the electrodes, where the central current collector is between the positive electrode and the negative electrode, wherein the positive electrode contains sintered particles of elemental silver sintered into an expanded metal sheet selected from the group consisting of nickel and silver,

the negative electrode contains sintered particles of elemental

forming an image pattern of toner particles on a receiver

layer for generating carriers corresponding to a distribu-

their halogen-substituted derivatives, nitro group-substituted

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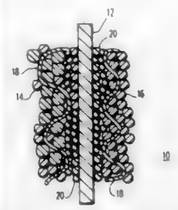
the negative electrode contains sintered particles of elemental iron sintered into an expanded nickel sheet, the current collector is solid nickel sheet, and the positive and negative electrodes are each sintered to thin, porous, metallic connection



layers selected from the group consisting of nickel fiber, nickel powder and mixtures thereof, which layers are sintered to the current collector on opposite sides, providing an all sintered construction.

5,200,282

NICKEL ELECTRODE AND ALKALINE BATTERY USING THE SAME

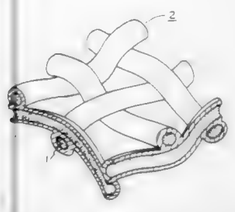
Masuhiro Ohnishi; Masaharu Watada, and Masahiko Oshitani, all of Takatsuki, Japan, assignors to Yuasa Battery Co. Ltd., Takatsuki City, Japan

Continuation of Ser. No. 500,511, Mar. 28, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 769,526

Claims priority, application Japan, Jun. 15, 1989, 1-152786; Aug. 17, 1989, 1-212767

Int. Cl.[5] H07M 4/74

U.S. Cl. 429—223 8 Claims



1. A nickel electrode for an alkaline battery which comprises a plurality of metal wires connected together to provide a network-like, alkaline-proof metal mesh core; a highly conductive and electrochemically irreversible material covering said metal wires of said metal mesh core to a thickness of 2 to 5 μm, said highly conductive and electrochemically irreversible material comprising cobalt oxyhydroxide; and a layer of active material in which said metal mesh core with covering material extends, said highly conductive and electrochemically irreversible material providing a boundary between said metal wires and said layer of active material.

5,200,283

INFORMATION RECORDING MEDIUM

Atsushi Nakano, Yokohama; Dai Imanishi; Tadayuki Shimada, both of Yokosuka, and Shigeo Shimizu, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 6, 1992, Ser. No. 828,663

Claims priority, application Japan, Feb. 8, 1991, 3-39588

Int. Cl.[5] G11B 7/24

U.S. Cl. 430—20 3 Claims

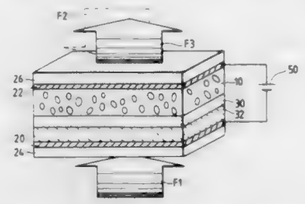
1. An information recording medium comprising:

a first transparent electrode;

a carrier transport layer formed on the first transparent electrode for generating an electric current on the basis of fed carriers;

a carrier generation layer formed on the carrier transport layer for generating carriers corresponding to a distribution of an intensity of incident information-writing light containing information, and for feeling the generated carriers to the carrier transport layer, the carrier generation layer being made of inorganic material;

an electric power supply electrically connected to the first transparent electrode for generating an electric field corresponding to the distribution of the intensity of the incident information-writing light in cooperation with the carrier transport layer and the carrier generation layer;



a photo-modulation layer formed on the carrier generation layer for recording the information in the incident information-writing light in response to an application of the electric field generated by the electric power supply, and for modulating applied information-reading light in accordance with the recorded information, the photo-modulation layer being made of a complex member of polymer dispensed liquid crystal; and

a second transparent electrode formed on the photo-modulation layer and being electrically connected to the electric power supply.

5,200,284

MELAMINE-CURED POLYESTER-AMIDE COATED ARTICLES USEFUL AS TONER FUSING MEMBERS

Jiann H. Chen, Fairport; Tsang J. Chen, and Lawrence P. DeMejo, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1992, Ser. No. 890,494

Int. Cl.[5] G03G 17/04; B32B 25/20

U.S. Cl. 430—33 10 Claims

1. A coated article comprising:

a substrate, and coated thereon a composition comprising a crosslinked product of:

a polyester-amide, and

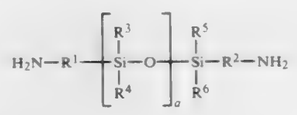
a melamine resin;

wherein, said polyester-amide comprises the polycondensation product of:

one or more C_{2-20} dicarboxylic acids or an activated derivative thereof,

2,2-bis(4-hydroxyphenyl)hexafluoropropane, and

an aminoalkyl-terminated organopolysiloxane of the formula,



wherein,

R^1 and R^2 are independently C_{1-16} alkylene;

R^3–R^6 are independently C_{1-6} alkyl, vinyl or phenyl; and

a is 3 to 300.

8. A coated article according to claim 1, wherein said substrate is a belt comprising a continuous flexible substrate.

10. A method of fusing heat-softenable toner to a substrate comprising:

forming an image pattern of toner particles on a receiver sheet by electrostatic attraction; and

contacting the receiver sheet with the belt of claim 8 at a temperature and pressure sufficient to fuse the toner particles to the receiver.

5,200,285

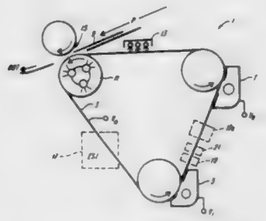
SYSTEM AND METHOD FOR FORMING MULTIPLY TONED IMAGES

Jeffrey J. Carrish, Milford, Mass., assignor to Delphax Systems, Inc., Canton, Mass.

Filed Mar. 20, 1990, Ser. No. 496,442

Int. Cl.[5] G03G 13/22, 15/22; G01D 15/06

U.S. Cl. 430—45 31 Claims



1. A method of producing a multiply-toned print on a recording member, such method comprising the steps of

(i) forming on a latent image bearing member having surface release characteristics a first electrostatic latent image of regions to be toned by a first toner

(ii) toning said first electrostatic latent image with said first toner to produce a first toned image on said latent image bearing member

(iii) melting and then cooling said first toned image to consolidate it on the latent image bearing member

(iv) forming a successive latent image of regions to be toned by a successive toner on the latent image bearing member and toning said successive latent image with the successive toner to produce a composite image including consolidated regions toned with said first toner and regions which are toned with the successive toner, and

(v) melting said composite image and transferring the composite image to a recording member.

6. The method of claim 1, wherein the steps of forming a first electrostatic latent image and of forming a successive latent image are performed by forming a single latent image having differing levels of charge in regions to be toned by toners of different colors.

5,200,286

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Yuichi Yashiki; Kazuya Hongo, and Seiji Ashiya, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

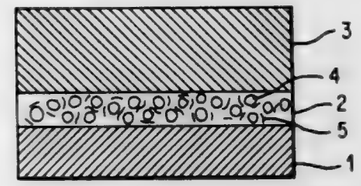
Continuation of Ser. No. 201,172, Jun. 2, 1988, abandoned. This application Feb. 6, 1991, Ser. No. 652,254

Claims priority, application Japan, Jun. 4, 1987, 62-138922

Int. Cl.[5] G03G 15/02, 15/04, 15/08

U.S. Cl. 430—58 8 Claims

1. A function separated electrophotographic photoreceptor comprising a substrate having thereon at least an electric charge generating layer and an electric charge transporting layer, wherein the electric charge generating layer is formed from a coating solution prepared by dispersing an electric charge generating material in powder form in an acid and then adding the resulting dispersion to an electrically inert binder resin solution, said acid being selected from the group consisting of: inorganic acids including hydrochloric acid, sulfuric acid, nitric acid, hydrobromic acid and phosphoric acid; and organic acids including formic acid, acetic acid, propionic acid, butyric acid, lactic acid, benzoic acid, sulfonic acid, and their halogen-substituted derivatives, nitro group-substituted derivatives, and alkyl-substituted derivatives; said acid being present in an amount of about 0.1 to 2 mol percent of said electric charge generating material, wherein said electric charge generating layer has a thickness of from about 0.05 to 5 μm and said electric charge transporting layer has a thickness



of from about 5 to 50 μm, wherein the acid within the electric charge generating layer contacts the electric charge transporting layer at an interface between the electric charge generating layer and the electric charge transporting layer to form an electric charge migration resulting in a contact sensitization at the interface.

5,200,287

CARRIER FOR DEVELOPING ELECTROSTATIC IMAGE

Ken Ohmura, Hachioji; Kenji Tsujita, Kanagawa, and Shigenori Kouno, Tokyo, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 731,866

Claims priority, application Japan, Jul. 27, 1990, 2-197892

Int. Cl.[5] G03G 9/113

U.S. Cl. 430—108 7 Claims

1. A carrier for developing an electrostatic image comprising a core particle and a resin layer coated on the core particle, wherein the resin layer comprises a silicone resin and a carbon fluoride having a BET specific surface area of not less than 100 m^2/g.

5,200,288

ELECTROSTATIC DEVELOPING TONER WITH HYDROXYAROMATIC CARBOXYLIC ACID ADDITIVE

Osamu Ando, Kawasaki; Masako Takeuchi; Hitoshi Ono, both of Yokohama; Toshiyuki Sueyoshi, Chigasaki, and Shigenori Hayakawa, Hiratsuka, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Dec. 11, 1991, Ser. No. 804,981

Claims priority, application Japan, Dec. 12, 1990, 2-401712; May 9, 1991, 3-104383; May 24, 1991, 3-120365; Jul. 30, 1991, 3-190060

Int. Cl.[5] G03G 9/097

U.S. Cl. 430—110 13 Claims

1. An electrostatic image-developing toner comprising at least a resin and a colorant, which contains at least one compound selected from the group consisting of a hydroxyanthracenecarboxylic acid compound, a bishydroxynaphthalenecarboxylic acid compound, a bishydroxyanthracenecarboxylic acid compound, and a metal compound of a compound having hydroxynaphthalenecarboxylic acids dimerized by means of a methylene chain.

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5,200,289

CHARGE CONTROL AGENT COMBINATION FOR A LIQUID TONER

Roy J. Harrington, Waynesville; George A. Gibson, Vandalia, and Margate T. Thomas, Medway, all of Ohio, assignors to AM International Incorporated, Chicago, Ill.

Filed Dec. 4, 1991, Ser. No. 803,478
Int. Cl.[5] G03G *9/135*
U.S. Cl. 430—115 **15 Claims**

1. A liquid toner composition for electrophotography in the form of a dispersion comprising:

(a) a carrier liquid;

(b) pigmented or dyed particles;

(c) a binder material insoluble in said carrier liquid;

(d) a charge control agent in a charge directing amount;

(e) said charge control agent comprising, lecithin, an alkylated N-vinyl pyrrolidone polymer which is soluble in the carrier liquid, and 0.5% to 10% by weight, based on the total weight of active components of the charge control agent, of an oil soluble or dispersible anionic surfactant.

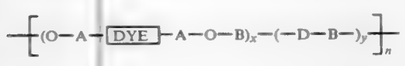
5,200,290

LIQUID DEVELOPERS CONTAINING COLORED POLYMERS WITH A COLOR CHROMOPHORE COVALENTLY BOUND THERETO

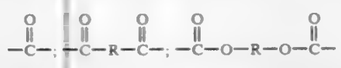
Beng S. Ong, Mississauga; Melvin D. Croucher, Oakville, and Raymond W. Wong, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1990, Ser. No. 590,855
Int. Cl.[5] G03G *9/08, 9/10*
U.S. Cl. 430—115 **25 Claims**

1. A liquid developer comprising a hydrocarbon liquid medium, a charge control agent, a polymeric surfactant, and a colored core polymer comprising a polymeric backbone having a color chromophore covalently bound thereto, wherein the colored polymer is of the formula:



wherein A is selected from the group consisting of alkylene and arylene, B is selected from the group consisting of



wherein R is selected from the group consisting of alkylene groups, arylene groups, and polyether groups, D is selected from the group consisting of dioxyalkane and dioxyarene, x is a fraction number of from about 0.01 to 1.0, and y is a fraction number of from 0 to about 0.99, with x + y being equal to 1, and n representing the number of the monomer units.

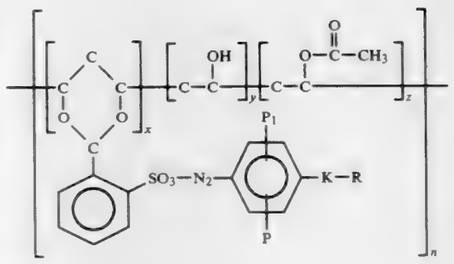
5,200,291

PHOTOSENSITIVE DIAZONIUM RESIN, ELEMENT MADE THEREFROM, METHOD OF PREPARING THE RESIN AND METHOD FOR PRODUCING NEGATIVE LITHOGRAPHIC IMAGE UTILIZING THE RESIN

Stanley F. Wanat, Scotch Plains, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 434,374, Nov. 13, 1989, abandoned. This application Apr. 11, 1991, Ser. No. 684,547
Int. Cl.[5] G03F *7/021, 7/32*
U.S. Cl. 430—163 **20 Claims**

1. A polymeric compound having the formula



wherein

x ranges from about 0.05 to about 0.5

y ranges from about 0.80 to about 0.35

z ranges from about 0.10 to about 0.25

n ranges from about 50 to about 1500

R is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl;

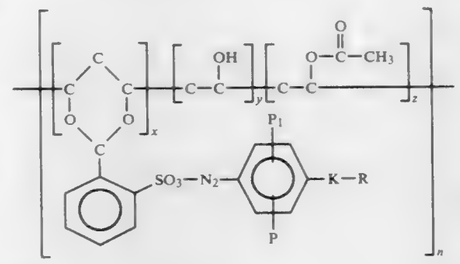
K is selected from the group consisting of

—S—, —O—, and —CH_2—, or is absent;

P and P_1 are selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, and H; and

P_1 may be the same as P or different.

10. A method for preparing a polymeric compound having the formula



wherein

x ranges from about 0.05 to about 0.5

y ranges from about 0.80 to about 0.35

z ranges from about 0.10 to about 0.25

n ranges from about 50 to about 1500

R is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl;

K is selected from the group consisting of

—S—, —O—, and —CH_2—, or is absent;

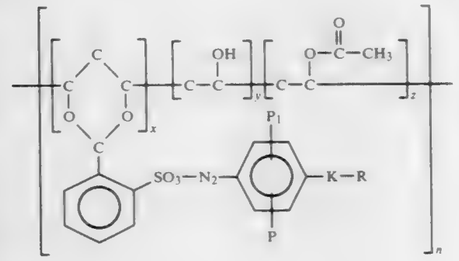
P and P_1 are selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, and H; and

P_1 may be the same as P or different;

which method comprises providing a poly(vinyl alcohol/vinyl acetate) copolymer having a molecular weight of from about 5,000 to about 100,000 and from about 75% to about 90% hydrolysis by weight, and reacting said copolymer with a sufficient amount of an aromatic aldehyde salt in the presence

of an acid to produce an aromatic ketal acid condensate of the reactants; then treating said ketal condensate with a sufficient amount of a base to produce a ketal condensate salt; and then reacting said ketal condensate salt with a sufficient amount of light-sensitive diazonium salt monomer to effect an ion exchange between said salts whereby a diazonium compound radical is substituted onto the aromatic ring of said ketal condensate.

16. A method for producing a negative lithographic image which comprises providing a polymeric compound layer on a substrate, imagewise exposing said compound to actinic radiation, and then removing the non-exposed portions of the layer with a developer, wherein the polymeric compound has the formula



wherein

x ranges from about 0.05 to about 0.5

y ranges from about 0.80 to about 0.35

z ranges from about 0.10 to about 0.25

n ranges from about 50 to about 1500

R is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl;

K is selected from the group consisting of

—S—, —O—, and —CH_2—, or is absent;

P and P_1 are selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, and H; and

P_1 may be the same as P or different.

5,200,292

LIGHT-SENSITIVE COMPOSITION CONSISTING ESSENTIALLY OF, IN ADMIXTURE A NONIONIC AROMATIC DIAZO COMPOUND AND A CATIONIC DYE/BORATE ANION COMPLEX

Fumiaki Shinozaki, and Junichi Fujimori, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 17, 1990, Ser. No. 466,548
Claims priority, application Japan, Jan. 17, 1989, 1-8156
Int. Cl.[5] G03C *1/54;* **G03F** *7/023, 7/031*
U.S. Cl. 430—178 **4 Claims**

1. A light-sensitive composition, consisting essentially of in admixture at least (a) a nonionic aromatic diazo compound and (b) a cationic dye/borate anion complex, wherein the light-sensitive composition upon imagewise exposure gives latent images which impart differential solubility between exposed and unexposed areas of the light sensitive composition in a developer.

2. A light-sensitive composition consisting essentially of, in admixture, at least:

(1) (a) a nonionic aromatic diazo compound and (b) a cationic dye/borate anion complex, and

(2) a radical-polymerizable unsaturated compound, wherein the light-sensitive composition upon imagewise exposure gives latent images which impart differential solubility between exposed and unexposed areas of the light sensitive composition in a developer.

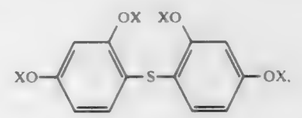
5,200,293

PHOTORESIST COMPOSITION CONTAINING SPECIFIC AMOUNTS OF A NAPHTHOQUINONE DIAZIDE SULFONYL ESTER OF TETRAHYDROXY DIPHENYL SULFIDE AND A POLYHYDROXY COMPOUND

Reinhard Schulz, Reinheim; Horst Münzel, Reutlingen, and Ekkehard Bartmann, Erzhausen, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

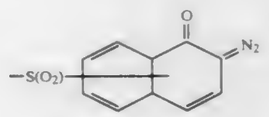
Continuation of Ser. No. 481,525, Feb. 16, 1990, abandoned. This application Nov. 14, 1991, Ser. No. 793,494
Claims priority, application Switzerland, Feb. 23, 1989, 00655/89
Int. Cl.[5] G03F *7/23, 7/32*
U.S. Cl. 430—191 **12 Claims**

1. A positive-working photoresist composition containing 23–27%, based on said composition, of at least one compound of formula (I)



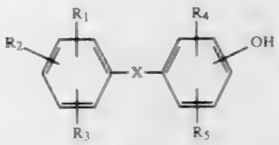
(I)

wherein one of the substituents X is hydrogen or a group of formula II



(II)

and the other substituents X are a group of formula II; and 6–11%, based on said composition, of at least one polyhydroxy compound of formula III



(III)

wherein X is a direct bond, —O—, —S—, —SO_2—, —CO— or $C(R_6(R_7)$—, and R_1, R_2, R_3, R_4 and R_5 are each independently of the other hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy or hydroxy, and R_6 and R_7 are each independently of the other hydrogen, —CH_3 or —CF_3.

5,200,294

METHOD FOR MAKING A LITHOGRAPHIC PRINTING PLATE ACCORDING TO THE SILVER SALT DIFFUSION TRANSFER PROCESS

René M. De Keyzer, Sint-Niklaas; Jean-Marie O. Dewanckele, Drongen; Ludo L. Van Rompuy, Destelbergen, and Jos A. Vaes, Betekom, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 19, 1991, Ser. No. 810,150
Int. Cl.[5] G03C *8/32*
U.S. Cl. 430—204 **6 Claims**

1. A method for making a lithographic printing plate according to the DTR-process comprising the steps of:

stress being effective to reduce the tendency of said lami- an alkali metal, an alkaline earth metal, a quaternary ammo-

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information-wise exposing an imaging element comprising on a support a silver halide emulsion layer and an image-receiving layer containing physical development nuclei and

developing said information-wise exposed imaging element with an alkaline processing liquid in the presence of developing agent(s), silver halide solvent(s) and hydrophobizing agent(s) characterized in that said hydrophobizing agent(s) are present in said alkaline processing liquid in a total amount of at least 0.1 g/l and wherein at least one of said silver halide solvents is a compound corresponding to the following formula:

$$Z-(R^1-S)_t-R^2-S-R^3-Y \quad (I)$$

wherein Z and Y each independently represents hydrogen, an alkyl group, an amino group, an ammonium group, a hydroxyl, a sulfo group, a carboxyl, an aminocarbonyl or an aminosulfonyl, R^1, R^2 and R^3 each independently represents an alkylene that may be substituted and optionally contain a oxygen bridge and t represents an integer from 0 to 10.

5,200,295

METHOD FOR THE PRODUCTION OF A SILVER IMAGE

Leon L. Vermeulen, Herenthout; Robert S. Pauwels, Brasschaat, and Jean-Marie O. Dewanckele, Drongen, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Dec. 10, 1991, Ser. No. 804,610

Claims priority, application European Pat. Off., Dec. 18, 1990, 90203374.5

Int. Cl.[5] **G03C** *5/54, 1/48*

U.S. Cl. 430—206 **20 Claims**

1. A method for the production of a silver image by the silver complex diffusion transfer reversal process, said method comprising the following steps:

(I) image-wise photo-exposing a silver halide emulsion layer of a photographic silver halide emulsion material having in waterpermeable relationship with the silver halide at least one developing agent.

(II) wetting with a practically neutral aqueous liquid the said photo-exposed silver halide emulsion layer and/or wetting with said liquid a development nuclei containing layer of an image-receiving material as defined hereinafter and contacting said materials thereby bringing said layers into waterpermeable relationship with each other, and

(III) separating the contacted materials after formation in the image-receiving material of a silver image,

wherein said image-receiving material contains in co-operable relationship: (i) physical development nuclei, (ii) a silver halide solvent being a silver complexing agent or precursor thereof, (iii) a watersoluble sulfite or sulfite precursor, and (iv) a mixture of sodium and/or potassium tetraborate and a sodium and/or potassium salt of an organic mono- or polycarboxylic acid, wherein the acid is characterized by at least one dissociation step corresponding at 25° C. with a dissociation constant smaller than $10^{-2.5}$, in other words a pKa value higher than 2.5.

5,200,296

IMAGE RECEIVING MATERIAL FOR SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Hiroaki Nagamatsu; Susumu Baba, and Tatsuhito Taniguchi, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Apr. 8, 1992, Ser. No. 865,190

Claims priority, application Japan, May 14, 1987, 3-138224; Apr. 10, 1991, 3-104637; May 14, 1991, 3-138225

Int. Cl.[5] **G03C** *5/54*

U.S. Cl. 430—232 **6 Claims**

1. An image receiving material for silver complex diffusion transfer process which comprises a support, an image receiving layer provided on the support and an upper layer provided on the image receiving layer wherein physical development nuclei are distributed densely in the vicinity of the surface of the support and gradually diminishing towards the upper layer and a color toning agent is contained densely in the upper layer and gradually diminishing towards the surface of the support and the physical development nuclei and the color toning agent are thus mutually distributed.

5,200,297

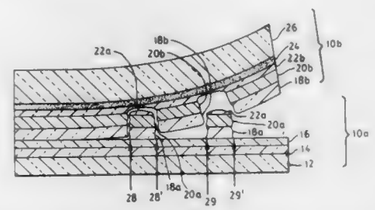
LAMINAR THERMAL IMAGING MEDIUMS, CONTAINING POLYMERIC STRESS-ABSORBING LAYER, ACTUATABLE IN RESPONSE TO INTENSE IMAGE-FORMING RADIATION

Neal F. Kelly, Woburn, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 21, 1990, Ser. No. 616,854

Int. Cl.[5] **G03F** *7/34, 7/11*

U.S. Cl. 430—253 **20 Claims**



1. A laminar thermal imaging medium, actuatable in response to intense image-forming radiation for production of an image, said laminar medium comprising in order:

a first sheet transparent to said image-forming radiation;

a polymeric stress-absorbing layer absorptive of physical stress applied to the thermal imaging laminar medium;

a layer of polymeric material heat-activatable upon subjection of said thermal imaging laminar medium to said image-forming radiation;

a porous or particulate image-forming layer on said polymeric heat-activatable layer and forming an interface therewith, said image-forming layer comprising an image-forming colorant material in a binder therefor, said image-forming layer having cohesivity in excess of its adhesivity for said polymeric heat-activatable layer; and

a second sheet covering said porous or particulate image-forming layer and being laminated directly or indirectly to said image-forming layer;

said thermal imaging laminar medium being capable of absorbing radiation at or near said interface of said polymeric heat-activatable layer and said porous or particulate image-forming layer, at the wavelength of the exposing source, and being capable of converting absorbed energy into thermal energy of sufficient intensity to heat activate said polymeric heat-activatable layer rapidly; said heat-activated polymeric layer, upon rapid cooling, attaching said porous or particulate image-forming layer firmly to said heat-activated polymeric layer, and through said polymeric stress-absorbing layer, to said first sheet;

said thermal imaging laminar medium being adapted to image formation by exposure of portions of said medium to radiation of sufficient intensity to attach exposed portions of said porous or particulate image-forming layer firmly to said heat-activated polymeric layer, and through said polymeric stress-absorbing layer, to said first sheet, and by removal to said second sheet, upon separation of said first and second sheets after imagewise exposure, of unexposed portions of said porous or particulate image-forming layer, thereby to provide first and second images, respectively, on said first and second sheets;

said polymeric stress-absorbing layer absorptive of physical stress being effective to reduce the tendency of said laminar medium, before imaging, to delaminate at said interface of said polymeric heat-activatable layer and said porous or particulate image-forming layer.

5,200,298

METHOD OF FORMING IMAGES

Yoshihiro Takagi; Mitsunori Hirano, and Senzo Sasaoka, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

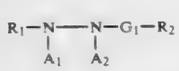
Continuation of Ser. No. 521,637, May 10, 1990, abandoned. This application Aug. 8, 1991, Ser. No. 742,559

Claims priority, application Japan, May 10, 1989, 1-116832; May 10, 1989, 1-116833

Int. Cl.[5] **G03C** *1/06*

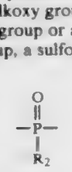
U.S. Cl. 430—264 **6 Claims**

1. A method of forming a black-and-white image of very high contrast having a gamma value of 8 or above using a negative imagewise exposed photosensitive material comprising a support having thereon at least one hydrophilic colloid layer, at least one layer of which is a silver halide emulsion layer comprising silver halide grains having a bromide content of at least 70% and an iodide content of up to 5 mol %, at least one of said hydrophilic colloid layer containing a hydrazine derivative represented by formula (I), at least one of said hydrophilic colloid layer containing at least one nucleation accelerator selected from the compounds represented by formulae (II) and (III), said photosensitive material containing at least one dye having an absorption maximum in the wavelength region of from 300 nm to 420 nm, comprising processing the photosensitive material with a developer having a pH of from 11.0 to 9.5, said developer being substantially free from benzotriazoles:



(I)

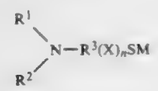
wherein R_1 represents an aliphatic group or an aromatic group; R_2 represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an amino group, a carbamoyl group or an oxycarbonyl group; G_1 represents a carbonyl group, a sulfonyl group, a sulfoxy group,



or an iminomethylene group; and each of A_1 and A_2 represents a hydrogen atom, or one of A_1 and A_2 represents a hydrogen atom and the other is an alkylsulfonyl group, an arylsulfonyl group, or an acyl group:

$$Y-[(X)_n-A-B]_m \quad (II)$$

wherein Y represents a group which adsorbs to a silver halide; X represents a hydrogen atom or a divalent linking group; A represents a divalent linking group; B represents an amino group, an ammonium group, or a nitrogen-containing heterocyclic group; m represents 1, 2 or 3; and n represents 0 or 1:



(III)

wherein R^1 and R^2 each represents a hydrogen atom or an aliphatic residue, or R^1 and R^2 combine together to form a ring; R^3 represents a divalent aliphatic group; X represents a divalent, nitrogen-, oxygen- or sulfur-containing heterocyclic group; n represents 0 or 1; and M represents a hydrogen atom, an alkali metal, an alkaline earth metal, a quaternary ammonium salt, a quaternary phosphonium salt, or an amidino group.

5,200,299

QUINOLINE AND ACRIDINE COMPOUNDS EFFECTIVE AS PHOTOINITIATORS AND CONTAINING POLYMERIZABLE (METH)ACRYLOYL SUBSTITUENTS

Hartmut Steppan, and Hans-Dieter Frommeld, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1989, Ser. No. 454,199

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843205

Int. Cl.[5] **G03F** *7/031;* **C07D** *215/18, 219/02, 215/12*

U.S. Cl. 430—281 **13 Claims**

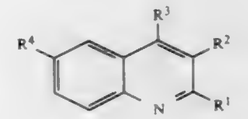
1. A photopolymerizable mixture which comprises:

a) a polymeric binder,

b) a polymerizable compound having at least one terminal olefinic double bond and a boiling point above 100° C. at normal pressure, and

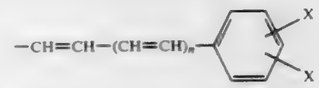
c) a N-heterocyclic compound as photoinitiator,

wherein the N-heterocyclic compound is a compound of the general formula I



in which

R^1 is a group of the formula



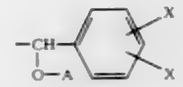
and

R^2 is a hydrogen atom or a methly group, or

R^1 and R^2 jointly form an unsubstituted or substituted 5- or 6-membered carbocyclic ring,

R^3 is a hydrogen atom, a methyl group or an unsubstituted or substituted phenyl group,

R^4 is a hydrogen or halogen atom, a methyl group, an unsubstituted or substituted benzoyl group or a group of the formula



n is zero or 1,

X is a hydrogen or chlorine atom, an alkyl group containing 1 to 4 carbon atoms or one of the groups OA, CH_2OA, CH_2NHA or C_2H_4OA, where a plurality of Xs may be identical or different form one another, and

A is an acryloyl or methacryloyl group, the compound containing at least one group A.

9. A compound of the general formula I

g) removing selected portions of the photosensitive dielec-

trode, when an unreactive electrode is immersed in said

-continued

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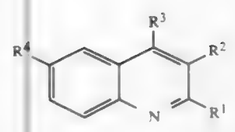
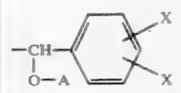


in which

R^1 and R^2 jointly form an aromatic or partially hydrogenated ring.

R^3 is a hydrogen atom, a methyl group or an unsubstituted or substituted phenyl group,

R^4 is a hydrogen or halogen atom, a methyl group, an unsubstituted or substituted benzoyl group or a group of the formula



n is zero or 1,

X is a hydrogen or chlorine atom, an alkyl group containing 1 to 4 carbon atoms or one of the groups OA, CH_2OA, CH_2NHA or C_2H_4OA, where a plurality of Xs may be identical or different form one another, and

is an acryloyl or methacryloyl group, the compound containing at least one group A.

5,200,300

METHODS FOR FORMING HIGH DENSITY MULTI-CHIP CARRIERS

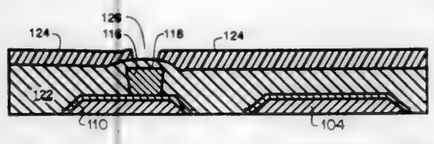
Jacques Leibovitz, San Jose; Maria L. Cobarruviaz, Cupertino; Kenneth D. Scholz, Palo Alto, and Clinton C. Chao, Redwood City, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 360,828, Jun. 1, 1989, Pat. No. 5,055,425, and a continuation-in-part of Ser. No. 439,713, Nov. 20, 1989, abandoned. This application Mar. 1, 1991, Ser. No. 662,860

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] H01L *21/283, 21/312*

U.S. Cl. 430—312 **15 Claims**



1. A method of forming an integrated circuit structure, comprising the steps of:

a) forming a circuit pattern on a substrate;

b) depositing a composite metal layer and a photoresist layer over the circuit pattern, and forming apertures in the photoresist layer;

c) forming solid metal vias in the apertures and, then, removing the photoresist layer;

d) depositing another photoresist layer over the solid vias and the circuit pattern while leaving preselected areas of the composite material unprotected;

e) with the second photoresist layer in place, etching away unprotected portions of the composite layer and, then, stripping away the second photoresist layer;

f) forming a layer of photosensitive dielectric material over the resulting structure; and

g) removing selected portions of the photosensitive dielectric material to expose top surfaces of the solid vias.

5,200,301

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Kaspar Wingender, Leverkusen, and Wolfgang Schmidt, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 20, 1991, Ser. No. 795,118

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039022

Int. Cl.[5] G03C *1/46, 5/42*

U.S. Cl. 430—373 **5 Claims**

5. A method for processing a color photographic recording material comprising at least one blue-sensitive silver halide emulsion layer containing at least one yellow coupler, at least one green-sensitive silver halide emulsion layer containing at least one magenta coupler, at least one red-sensitive silver halide emulsion layer containing at least one cyan coupler and, a silver halide emulsion layer with no color coupler, in which the silver halide coatings together, expressed as $AgNO_3$, amount to no more than 0.8 g/m^2 and in which the silver halides have a silver chloride component of at least 95 mol-% and in which silver halide coating for one color sensitivity containing at least one color coupler together with the silver halide coating of the silver halide emulsion layer with no color coupler, expressed as $AgNO_3$, is from 0.2 to 0.6 g/m^2 and the silver halide coating of all the other silver halide emulsion layers together, expressed as $AgNO_3$, amounts to no more than 0.2 g/m^2 by the steps comprising (a) development, (b) intensification, (c) fixing or stabilization, (d) optionally rinsing and (e) drying; wherein development is carried out with a color developer of the p-phenylenediamine series; intensification is carried out with H_2O_2; development and intensification may be combined into a single step and no bleaching is carried out.

5,200,302

PROCESS FOR COATING DEVELOPMENT OF SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL

Haruhiko Iwano, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 456,923, Dec. 26, 1989, abandoned. This application Feb. 10, 1992, Ser. No. 831,737

Claims priority, application Japan, Dec. 26, 1988, 63-328753

Int. Cl.[5] G03C *7/30*

U.S. Cl. 430—376 **11 Claims**

1. A process for coating development of a silver halide color photosensitive material by coating said silver halide color photosensitive material with color developer to form a thin film, said process comprising:

imagewise exposing said silver halide color photosensitive material,

applying a color developer comprising a developing agent consisting essentially of a p-phenylenediamine developing agent having a group capable of imparting hydrophilic properties selected from the group consisting of 3-methyl-4-amino-N-ethyl-N-β-hydroxyethylaniline, 3-methyl-4-amino-N-ethyl-N-β-methanesulfonamidoethylaniline, 3-methyl-4-amino-N-N-di-β-hydroxyethylaniline, 3-β-methanesulfonamidoethyl-4-amino,N,N-diethylaniline, 3-sulfoethyl-4-amino-N,N-diethylaniline, 3-carboxyethyl-4-amino-N,N-diethylaniline, 3-methyl-4-amino-N-ethyl-N-sulfoethylaniline, sulfates thereof, hydrochlorides thereof, p-toluenesulfonates thereof and phosphates thereof, to said imagewise exposed photosensitive material, wherein said color developer has an ionic strength of 0.8 or below, to form a coating film which has a thickness of at most 20 times the thickness of the dry photosensitive layer of the photosensitive material and an electric potential of −280 mV to −400 mV, based on a standard electrode, when an unreactive electrode is immersed in said color developer.

5,200,303

METHOD OF FORMING A COLOR IMAGE FROM SILVER HALIDE PHOTOSENSITIVE MATERIALS CONTAINING CYAN COUPLER WITH HIGH VISCOSITY ORGANIC SOLVENT AND POLYMER

Osamu Takahashi; Yoshio Seoka; Hidetoshi Kobayashi, and Tsumoru Ishii, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 389,157, Aug. 3, 1989, abandoned. This application Feb. 1, 1991, Ser. No. 668,791

Claims priority, application Japan, Aug. 4, 1988, 63-194860

Int. Cl.[5] G03C *5/30*

U.S. Cl. 430—377 **1 Claim**

1. A method of forming a color image comprising developing an exposed light-sensitive silver halide photographic material composed of a support having thereon at least one light-sensitive silver halide emulsion layer, containing silver halide grains having a halogen composition from 0 to 1 mol % of silver iodide, 95 mol % or more silver chloride and the remainder silver bromide, said at least one light-sensitive silver halide emulsion layer or an adjacent layer thereto containing an oil droplet dispersion in a hydrophilic binder, the oil droplets containing the combination of (a) a polymer insoluble in water and soluble in an organic solvent; (b) a high boiling point organic solvent having the formula (III):

$$W_1—COOW_2 \quad \text{(III)}$$

wherein W_1 and W_2, which may be the same or different, each represents a substituted or unsubstituted alkyl, cycloalkyl, alkenyl, aryl or heterocyclic group; and having a viscosity at 25° C. of at least 500 cp and a boiling point of at least 120° C.; and (c) at least one coupler capable of forming a nondiffusible cyan dye by a coupling reaction with an oxidized form of a primary aromatic amine developing agent with a color developing solution which is essentially benzyl alcohol free.

5,200,304

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroyuki Yoneyama, and Nobutaka Ohki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

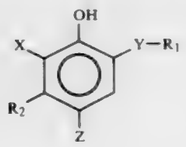
Filed Dec. 14, 1990, Ser. No. 627,759

Claims priority, application Japan, Dec. 22, 1989, 1-331222

Int. Cl.[5] G03C *7/34, 1/34*

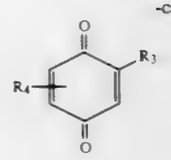
U.S. Cl. 430—505 **37 Claims**

1. A multilayer silver halide color photographic material comprising a support having thereon a yellow color forming silver halide emulsion layer, a magenta color forming silver halide emulsion layer and a cyan color forming silver halide emulsion layer, wherein the cyan color forming silver halide emulsion layer contains at least one oil-soluble cyan coupler which is capable of coupling with an oxidation product of an aromatic primary amine developing agent to form a substantially diffusion-resistant dye, and which is represented by formula (I), at least one member selected from the compounds represented by formulae (II) and (III), and at least one compound represented by formula (IV):

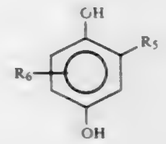


(I)

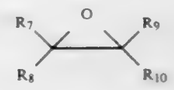
-continued



(II)



(III)



(IV)

wherein:

Y represents —NHCO— or —CONH—;

R_1 represents an alkyl group, an aryl group, a heterocyclic group or an amino group;

X represents a hydrogen atom, a halogen atom, an alkoxy group or an acylamino group;

R_2 represents an alkyl group or an acylamino group or, when bonded to X, a non-metallic atom which forms a 5-membered to 7-membered ring;

Z represents a hydrogen atom or a group capable of being released upon coupling with an oxidation product of a developing agent;

R_3 and R_5 each represents a halogen atom;

R_4 and R_6 each represents an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an amido group, an alkylthio group, an acyl group, a sulfonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group or a sulfoxide group, with the proviso that each of these groups has 6 or more carbon atoms; and

R_7, R_8, R_9 and R_{10} each represents a hydrogen atom, an aliphatic group, an aromatic group, an aliphatic oxycarbonyl group, an aromatic oxycarbonyl group or a carbamoyl group, or R_7 and R_8 or R_9 and R_{10} may combine with each other to form a 5-membered to 7-membered ring, with the provisos that R_7, R_8, R_9 and R_{10} do not simultaneously represent hydrogen atoms, and the total number of carbon atoms included therein is from 8 to 60.

5,200,305

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING COLOR COUPLERS WHICH YIELD HEAT-STABLE DYES

Hans-Joachim Schumann, Cologne, and Erich Wolff, Solingen, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,168

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1989, 3933899

Int. Cl.[5] G03C *7/34*

U.S. Cl. 430—505 **2 Claims**

1. A color photographic recording material which contains on a transparent layer support at least one red-sensitive halide emulsion layer and a cyan coupler of the phenol type associated therewith, at least one green-sensitive silver halide emulsion layer and a magenta coupler of the 5-pyrazolone or pyrazoloazole type associated therewith and at least one blue-sensitive silver halide emulsion layer and a yellow coupler of the acylacetanilide type associated therewith, characterized in that the following condition applies to the cyan dye formed

silver halide developer under the photographic develop-

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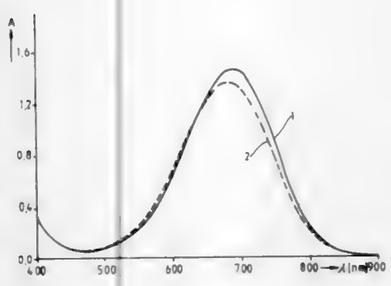
from the cyan coupler in the layer during chromogenic development:

$$a\cdot(1+b)\leqq 1.5$$



where
a is the temperature coefficient of the absorption

$$A_{(T=23^\circ C)} = \lg \frac{I_o}{I}$$

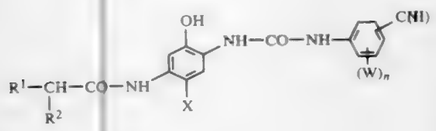
(I_o and I representing the spectral radiant flux respectively in front of and behind the sample)

$$a = -\left[\frac{1}{A}\right]\left[\frac{\Delta A}{\Delta T}\right]\cdot 1{,}000$$

wherein ($\Delta A/\Delta T$) is the change of absorption per °C., i.e. the measured absorption difference ΔA caused by the temperature difference ΔT, standardized to the absorption A at T=23° C., and
b is the temperature coefficient of the absorption wavelength λ(T=23° C.)

$$b = -\left[\frac{1}{\lambda}\right]\left[\frac{\Delta\lambda}{\Delta T}\right]\cdot 1{,}000$$

wherein ($\Delta\lambda/\Delta T$) is the change in wavelength per °C., i.e. the measured wavelength difference $\Delta\lambda$ caused by the temperature difference ΔT, standardized to the wavelength λ max at T=23° C. and λ is the wavelength of maximum absorption of the formed dye and the cyan coupler corresponds to formula II



in which
W represents H or another substituent;
n has a value of 1 to 4;
R^1 represents a phenoxy group which has at least one unsubstituted o-position on the phenyl ring and, in addition may be substituted by 1 to 3 substituents from the group consisting of $C^{1\text{-}3}$ alkyl, alkoxy or cycloalkyl;
R^2 represents alkyl containing at least 8 C atoms,
X represents hydrogen, halogen or a group releasable during the color coupling reaction.

5,200,306

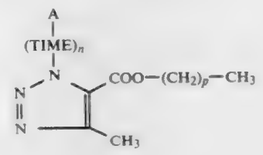
COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A COUPLER WHICH RELEASES A PHOTOGRAPHICALLY ACTIVE COMPOUND

Heinrich Odenwälder, Leverkusen; Hans Vetter, Cologne; Peter Bergthaller, Bergisch Gladbach, and Dirk Hübner, Cologne, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

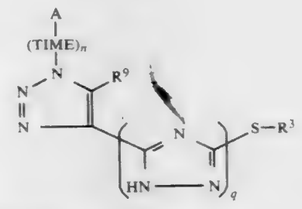
Continuation of Ser. No. 447,899, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 133,637, Dec. 14, 1987, abandoned. This application Mar. 22, 1991, Ser. No. 674,419
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644405; Dec. 24, 1986, 3644416
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] G03C *7/388*
U.S. Cl. 430—505 **8 Claims**

1. A color photographic recording material comprising at least one silver halide emulsion layer, and associated therewith, a coupler which contains a releasable 1,2,3-triazolyl radical attached to its coupling position, wherein the coupler corresponds to one of the formula III and IV:

(III)

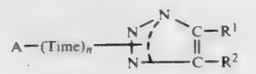


(IV)

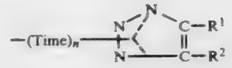


A represents the residue of a yellow-forming coupler which coupler is capable of producing a yellow dye upon color development with the oxidation product of a silver halide developer under photographic development conditions;
TIME represents a linking member which, on reaction of a coupler with the oxidation product of a silver halide developer, is released together with the triazole ring attached thereto and, in turn, releases the triazole ring with delay under the development conditions;
R^3 is C_1–C_7 alkyl;
R^9 is H, CH_3—COO—$(CH_2)_p$—CH_3;
n=0 or 1;
p=an integer of from 1 to 8;
q=0 to 1;
said coupler being contained in a predominantly red-sensitive silver halide emulsion layer or a predominantly green-sensitive silver halide emulsion layer.

3. A color photographic recording material comprising at least one photosensitive silver halide emulsion layer and, associated therewith, a coupler which contains a releasable 1,2,3-triazolyl radical attached to its coupling position, wherein the coupler corresponds to the following formula



wherein
A represents the residue of yellow coupler which, as a consequence of a reaction with the oxidation product of a silver halide developer under the photographic development conditions, releases a radical corresponding to the following formula



TIME represents a linking group which, on reaction of the coupler with the oxidation product of a silver halide developer, is released together with the triazole ring attached thereto and, in turn, releases the triazole ring with delay under the development conditions;
n=0, 1 or 2;
R^1 represents H, alkyl, aryl, —S—R^3, —O—R^3, —CO—R^3, a carboxylic acid ester group, an amino group, —CONR-^{4}—R^5 or a heterocyclic group;
R^2 represents halogen, —OH, alkyl, a phenyl group which is substituted with at least one substituent selected from the group consisting of halogen, alkyl, aryl, an amino group alkocy, aryloxy, alkylthio, arylthio, nitro, cyano, —CF_3 and acyl;
naphthyl, —S—R^3, —O—R^3, —CO—R^3, a carboxylic acid ester group having at least 3 carbon atoms, an amino group, —CO—NR^4—R^5, cyano or a heterocyclic group;
provided that at least one of the substituents R^1 and R^2 is —S—R^3, $COOR^8$ or a heterocyclic group, where R^8 is C_2–C_{10} alkyl or aryl;
R^3 represents alkyl, cycloalkyl, aralkyl, aryl, alkenyl or alkynyl;
R^4 represents alkyl, aralkyl, aryl, acyl, —NH_2 or acylamino;
R^5 represents hydrogen or has the same meaning as R^4 or R^4 and R^5 together represents the residue required to complete a cyclic amino group;
said 1,2,3,-triazolyl radical being attached through a nitrogen atom other than a middle nitrogen, and said coupler being contained in a predominantly red-sensitive silver halide emulsion layer.

5,200,307

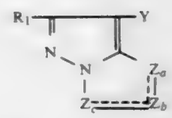
SLIVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Osamu Takahashi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1991, Ser. No. 767,680
Claims priority, application Japan, Oct. 2, 1990, 2-264446
Int. Cl.[5] G03C *1/815, 7/388*
U.S. Cl. 430—507 **15 Claims**

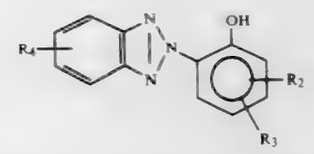
1. A silver halide color photographic material containing a support having thereon photographic constitutional layers comprising a silver halide emulsion layer containing a yellow coupler, a silver halide emulsion layer containing a magenta coupler, and a silver halide emulsion layer containing a cyan coupler as well as non-photosensitive layers, which comprises (a) in said magenta coupler containing layer, at least one magenta coupler represented by formula (I) given below, the ratio of the weight (A) of the high-boiling organic solvent contained in said magenta coupler containing silver halide emulsion layer to the weight (B) of said magenta coupler (A/B) being between 4.5 and 6.0, and (b) in a non-photosensitive layer located at a position farther than the cyan coupler containing emulsion layer from the support, at least one ultraviolet absorbing agent represented by formula (II) given below and a hydrophobic polymer insoluble in water but soluble in an organic solvent and being present together in lipophilic particles prepared by a method wherein a hydrophobic liquid in which the ultraviolet-absorbing agent and the hydrophobic polymer are dissolved together is emulsified and dispersed:

Formula (I)



wherein R_1 represents a hydrogen atom or a substituent, Z_a, Z_b and Z_c each represent a methine, substituted methine, =N—, or —NH—, Y represents a hydrogen atom or a group capable of being released upon a coupling reaction with the oxidized product of a developing agent, and the compound may form a dimer or higher polymer through R_1, Y, or Z_a, Z_b, or Z_c when it is a substituted methine,

Formula (II)



wherein R_2R_3, and R_4 each represent a hydrogen atom, a halogen atom, a nitro group, a hydroxyl group, an alkyl group, an alkoxy group, an aryl group, an aryloxy group, an alkenyl group, or an acylamino group.

5,200,308

COLOR PHOTOGRAPHIC MATERIAL

Hirofumi Ohtani; Hiroshi Shimazaki, and Yoshitaka Yamada, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 31, 1990, Ser. No. 636,419
Claims priority, application Japan, Jan. 19, 1990, 2-10972
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—508 **5 Claims**

1. In a color photographic material having on a support at least one blue-sensitive silver halide emulsion layer containing a yellow forming color coupler, at least one green-sensitive silver halide emulsion layer containing a magenta forming color coupler, and at least one red-sensitive silver halide emulsion layer containing a cyano forming color coupler, the improvement wherein the spectral response of said blue-sensitive silver halide emulsion layer, $S_B(\lambda)$, satisfies the following conditions:
(A) 410 nm$\leqq\lambda_B^{max}\leqq$480 nm where λ_B^{max} is the wavelength at which $S_B(\lambda)$ is maximum; and
(B) 470 nm$\leqq\lambda_B^{80}\leqq$490 nm where λ_B^{80} is the wavelength at which $S_B(\lambda)$ is 80% of $S_B(\lambda_B^{max})$;
the spectral response of said green-sensitive silver halide emulsion layer, $S_G(\lambda)$, satisfies the following conditions;
(A) 530 nm$\leqq\lambda_G^{max}\leqq$590 nm where λ_G^{max} is the wavelength at which $S_G(\lambda)$ is maximum; and
(B) 520 nm$\leqq\lambda_G^{80}\leqq$550 nm and 550 nm$\leqq\lambda_G^{80}\leqq$600 nm where λ_G^{80} is the wavelength at which $S_G(\lambda)$ is 80% of $S_G(\lambda_G^{max})$;
the spectral response of said red-sensitive silver halide emulsion layer, $S_R(\lambda)$, satisfies the following conditions:
(A) 600 nm$\leqq\lambda_R^{max}\leqq$640 nm where λ_R^{max} is the wavelength at which $S_R(\lambda)$ is maximum; and
(B) 580 nm$\leqq\lambda_R^{50}\leqq$600 nm and 645 nm$\leqq\lambda_R^{50}\leqq$659 nm where λ_R^{50} is the wavelength at which $S_R(\lambda)$ is 50% of $S_R(\lambda_R^{max})$, with $S_R(\lambda_R^{610})$, or the sensitivity at 610 nm, being at least 85% of $S_R(\lambda_R^{max})$, or the sensitivity at the wavelength of maximum sensitivity,
wherein the red-sensitive silver halide emulsion layer contains the combination of at least one spectral sensitizer represented by the following general formula (I), at least one spectral sensitizer represented by the following general formula (II)

and at least one spectral sensitizer represented by the following

comprising the interacted test sample, tissue material and

is substantially composed of DNA or RNA when the

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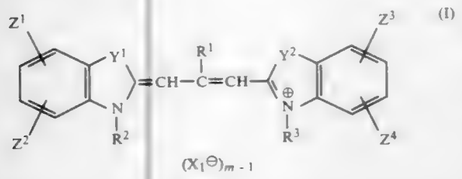
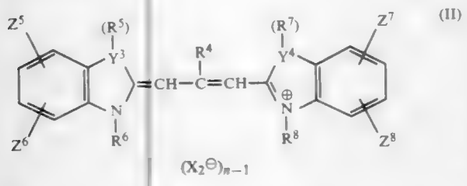
and at least one spectral sensitizer represented by the following general formula (III):



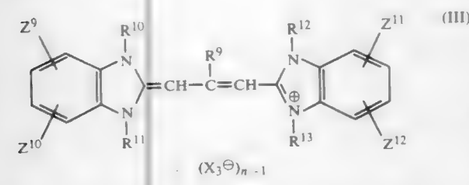
(I)

where R^1 is a hydrogen atom, an alkyl group or an aryl group; R^2 and R^3 are each an alkyl group; Y^1 and Y^2 are each a sulfur atom or a selenium atom; Z^1, Z^2, Z^3 and Z^4 are each a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, an amino group, an acyl group, an acylamino group, an acyloxy group, an aryloxy group, an alkoxycarbonyl group, an aryloxycarbonylgroup, an alkoxycarbonylamino group, a sulfonyl group, a carbamoyl group, an aryl group, an alkyl group or a cyano group; Z^1 and Z^2 and/or Z^3 and Z^4 may combine together to form a ring; $X_1\ominus$ is an anion; m is an integer of 1 or 2, provided that m is 1 when the spectral sensitizer of (I) forms an intramolecular salt;



(II)

where R^1 is a hydrogen atom, an alkyl group or an aryl group; R^5, R^6, R^7 and R^8 are each an alkyl group; Y^3 and Y^4 are each a nitrogen atom, an oxygen atom, a sulfur atom or a selenium atom, provided that when Y^3 is a sulfur atom, an oxygen atom or a selenium atom, R^5 is absent and also provided that Y^3 and Y^4 are not a nitrogen atom at the same time; Z^5, Z^6, Z^7 and Z^8 are each a hydrogen atom, a halogen atom, a hydroxyl atom, an alkoxy group, an amino group, an acyl group, an acylamino group, an acyloxy group, an aryloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkoxycarbonylamino group, a carbamoyl group, an aryl group, an alkyl group, a cyano group or a sulfonyl group, provided that Z^5 and Z^6 and/or Z^7 and Z^8 may combine together to form a ring; $X_2\ominus$ is an anion; and n is an integer of 1 or 2, provided that n is 1 when the spectral sensitizer of (II) forms an intramolecular salt;



(III)

where R^9 is a hydrogen atom, an alkyl group or an aryl group; R^{10}, R^{11}, R^{12} and R^{13} are each an alkyl group; Z^9, Z^{10}, Z^{11} and Z^{12} are each a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, an amino group, an acyl group, an acylamino group, an acyloxy group, an aryloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkoxycarbonylamino group, a carbamoyl group, an aryl group, an alkyl group, a cyano group or a sulfonyl group, provided that Z^9 and Z^{10} and/or Z^{11} may combine to form a ring; $X_3\ominus$ is an anion; and n is an integer of 1 or 2 provided that n is 1 when the spectral sensitizer of (III) forms an intramolecular salt.

5,200,309

COLOR PHOTOGRAPHIC MATERIALS INCLUDING MAGENTA COUPLER, CARBONAMIDE COMPOUND AND ANILINE OR AMINE COMPOUND, AND METHODS

Paul B. Merkel, Rochester, and Stephen P. Singer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1991, Ser. No. 751,469
Int. Cl.[5] G03C *1/08, 7/26, 7/32*
U.S. Cl. 430—546 **29 Claims**

1. A color photographic material, comprising a support bearing a silver halide emulsion and a coupler composition comprising (a) a two-equivalent pyrazolone magenta dye-forming coupler, (b) a carbonamide compound, and (c) at least one compound selected from the group consisting of an aniline compound and an amine compound.

5,200,310

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Naoto Ohshima, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 17, 1990, Ser. No. 628,330
Claims priority, application Japan, Dec. 18, 1989, 1-327712
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—567 **11 Claims**

1. A silver halide photographic material having at least one photosensitive emulsion layer on a base, which comprises, in the emulsion layer, a silver halide emulsion of silver chlorobromide, 95 mol % or more of which is made up of silver chloride, and which is substantially free from silver iodide, wherein

the silver chlorobromide emulsion is obtained by mixing silver halide host grains with silver halide fine grains whose average grain diameter is smaller than said silver halide host grains and whose silver bromide content is higher than said silver halide host grains, followed by ripening, to form, on or near the surfaces of silver halide grains, localized phases having a silver bromide content of at least 10 mol %, and then by chemically sensitizing the formed surfaces, and

the formation of said localized phases or the chemical sensitization of the surfaces is carried out at a temperature of 55° C. or below.

5,200,311

METHOD OF DETERMINATION OF PESTICIDES BY RADIOBIOCHEMISTRY

Stanley E. Charm, Boston; Shlomo Capua, Winchester, and Eliezer Zomer, Quincy, all of Mass., assignors to Charm Sciences Inc., Malden, Mass.

Filed Jul. 19, 1990, Ser. No. 556,952
Int. Cl.[5] C12Q *1/00, 1/18*; G01N *1/00, 33/564*
U.S. Cl. 435—4 **10 Claims**

1. A method for a radioactive assay for the determination of the concentration of an organophosphorus or carbamate pesticide in a test sample from a food product at concentration levels of below about 50 ppb, which method comprises:

a) adding to a food test sample a selected amount of an insect brain tissue material homogenate, which tissue material contains binding receptors or enzymes that interact with the pesticide to be tested in the test sample;

b) incubating the test sample and the tissue material;

c) adding a C^{14} radiolabeled pesticide the same as the pesticide to be tested and which interacts with the binding receptors and enzymes of the tissue material; d) incubating the test sample with the tissue material and the C^{14} radiolabeled pesticide to provide an interacted mixture;

e) separating the interacted mixture into a liquid fraction

comprising the interacted test sample, tissue material and C^{14} radioactive pesticide;

f) adding a scintillation material to the liquid fraction;

g) determining the counts per minute of the liquid fraction; and

h) comparing the counts per minute of the separated fraction with the counts per minute from a standard control chart to determine the concentration of the pesticide in the test sample, the concentration of the pesticide in the test sample being about 50 ppb or less.

5,200,312

MEMBRANE BASED DOT IMMUNOASSAY AND METHOD OF USE

John J. Oprandy, Rockville, Md., assignor to The United States of America as represented by The Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 303,191, Jan. 30, 1989, abandoned. This application Dec. 30, 1991, Ser. No. 814,160
Int. Cl.[5] C12Q *1/70*; G01N *33/545*
U.S. Cl. 435—5 **11 Claims**

9. An aqueous immunobinding assay method for detecting an antigen or antibody target in a test solution comprising:

filtering an aqueous solution containing a ligand which specifically binds to said target wherein said ligand is selected from the group consisting of an antigen, antibody, and antigen-antibody complex, under positive pressure through a hydrophobic PVDF membrane to form a clearly defined spot;

immobilizing said ligand by drying said membrane to form a test strip;

incubating said test strip in a blocking/wetting solution comprising a blocking agent in a wetting solution, wherein the amount of said blocking agent is sufficient to block all non-specific binding sites and said wetting solution comprises a surfactant in a buffer, wherein the amount of said surfactant is sufficient to reduce the hydrophobicity of said clearly defined spot;

diluting said test solution in said wetting solution and incubating said test strip therein for a time sufficient for any target present to bind to said ligand and form a reacted test strip;

incubating said reacted test strip with a label conjugated to an antigen or antibody which specifically binds to said target; and

measuring said label to determine if said target is present.

5,200,313

NUCLEIC ACID HYBRIDIZATION ASSAY EMPLOYING DETECTABLE ANTI-HYBRID ANTIBODIES

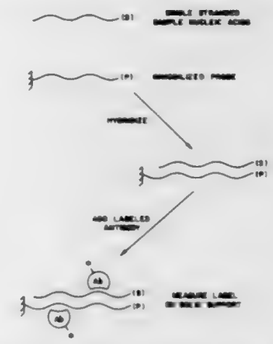
Robert J. Carrico, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 707,420, Mar. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 616,132, Jun. 1, 1984, abandoned, and a continuation-in-part of Ser. No. 626,927, Jul. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 520,524, Aug. 5, 1983, abandoned. This application Apr. 25, 1988, Ser. No. 188,114
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **9 Claims**

1. A nucleic acid hybridization method for determining a polynucleotide having a particular base sequence in a test medium containing single stranded nucleic acids, comprising the steps of:

(a) combining the test medium with an immobilized polynucleotide probe under hybridization conditions, said immobilized probe comprising at least one single stranded base sequence which is substantially complementary to the sequence in the polynucleotide to be determined and which is (i) substantially composed of RNA when the polynucleotide to be determined is RNA or DNA, or (ii) is substantially composed of DNA or RNA when the polynucleotide to be determined is RNA,

whereby hybridization of the polynucleotide to be determined with said probe results in the formation of hybrid duplexes that are either DNA.RNA or RAN.RNA, and



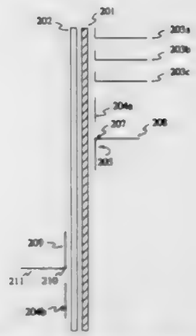
(b) detecting immobilized hybridized probe resulting from step (a) by adding an antibody reagent that binds to either of said DNA.RNA or RNA.RNA duplexes but not both duplex types when formed between the polynculeotide to be determined and the complementary probe and determining the antibody reagent that becomes bound to such duplexes.

5,200,314

POLYNUCLEOTIDE CAPTURE ASSAY EMPLOYING IN VITRO AMPLIFICATION

Michael Urdea, Alamo, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Filed Mar. 23, 1990, Ser. No. 497,938
Int. Cl.[5] C12Q *1/68*; C07H *15/12*
U.S. Cl. 435—6 **24 Claims**



1. A method for detecting an analyte polynucleotide strand having an analyte sequence within a sample containing polynucleotides, which method comprises:

a) contacting said analyte polynucleotide with a capture probe under hybridization conditions to form an analyte-capture probe complex, said capture probe comprising an analyte-binding region and a first specific binding partner, said analyte-binding region hybridizable with a region of said analyte polynucleotide, and said first specific binding partner having specificity for a second binding partner;

b) contacting said first specific binding partner with said second binding partner, wherein said second binding

partner is immobilized on a first support, whereby said

having 2 to 4 carbon atoms, X is hydrogen or acyl

receiving the test sample with sample transport ending

5,200,320

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partner is immobilized on a first support, whereby said analyte-capture probe complex is immobilized at said first support to provide an immobilized analyte-capture probe complex;

c) separating nonbound polynucleotides from said immobilized analyte-capture probe complex;

d) contacting said analyte polynucleotide with a first primer complementary to a first primer-binding region of said analyte polynucleotide under hybridizing conditions, said first primer comprising an analyte-hybridizing region and a third specific binding partner separated from one another by means for halting transcription therebetween;

e) initiating nucleotide polymerization with polymerization means at said first primer to form an analyte-complementary strand duplex said complementary strand complementary to said analyte but not to said third specific binding partner;

f) denaturing said analyte-complementary strand duplex to yield said complementary strand separated from said analyte polynucleotide;

g) contacting said complementary strand with a second primer capable of hybridizing to a second primer-binding region of said complementary strand, and contacting said analyte polynucleotide with said first primer;

h) initiating nucleotide polymerization with polymerization means to form an analyte-copy duplex having a strand complementary to a region of said complementary strand containing said first primer-binding region, and an analyte-complementary strand duplex;

i) repeating steps f-h using the product of step h in place of the analyte-complementary strand duplex of step e to provide an amplified product comprising said first and second primers, amplified amounts of said analyte polynucleotide and a polynucleotide sequence complementary to said analyte sequence; and

j) detecting said amplified product.

5,200,315

PARTICULATE BIOLOGICALLY ACTIVE REAGENT CONTAINING POLYOXYALKYLENE SIDE CHAINS, ANALYTICAL ELEMENT AND METHODS FOR USE OF THE REAGENT

Richard C. Sutton, and Marsha B. Oenick, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1990, Ser. No. 558,272

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] **C12Q** *1/68;* **G01N** *21/00;* **C08L** *33/00;* **C08F** *12/16*

U.S. Cl. 435—6 **28 Claims**

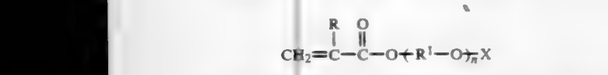
12. A method for the determination of a specific binding ligand in a specimen comprising:

A. forming a water-insoluble specific binding complex of said specific binding ligand of interest in said specimen, or a specific binding receptor therefor, with a water-insoluble, particulate reagent comprising:

(I) a water-insoluble, nonporous particle whose outer surface comprises a copolymer having recurring units derived by polymerization from:

(a) at least about 0.5 mole % of one or more ethylenically unsaturated polymerizable monomers having reactive groups which are, directly or indirectly, capable of reaction with a biologically active substances having an amino or sulfhydryl group,

(b) from about 0.1 to about 20 mole % of one or more ethylenically unsaturated polymerizable monomers which are represented by the structure:



wherein R is hydrogen or methyl, R^1 is alkylene having 2 to 4 carbon atoms, X is hydrogen or acyl and n is 2 to 30, and

(c) from about 60 to about 99.4 mole % of one or more ethylenically unsaturated oleophilic monomers which provide hydrophobicity to said copolymer, said monomers being selected from the group consisting of vinyl aromatics, acrylic and methacrylic acid esters and amides, butadiene, acrylonitrile, vinyl acetate, vinylbenzyl acetate, vinyl bromide, vinylidene chloride and crosslinkable monomers, and

(II) a biologically active substance covalently attached to said particle through said reactive groups, said substance being specifically reactive with either said ligand or with said receptor therefor, and

B. detecting the presence of said complex as an indication of the presence or amount of said ligand in said specimen.

5,200,316

IMMUNOASSAY METHODS USING NONCROSS REACTIVE CEA GENE FAMILY MEMBERS ANTIBODIES

James Elting, Madison; Thomas Barnett, Prospect; Michael Kamarck, Bethany, and John Hart, Wallingford, all of Conn., assignors to Miles Inc., Elkhart, Ind.

Filed Feb. 15, 1990, Ser. No. 480,428

Int. Cl.[5] **G01N** *33/574;* **C12Q** *1/68*

U.S. Cl. 435—6 **13 Claims**

1. In an immunoassay method for differentiating between family members of the CEA gene family, wherein a serum or plasma sample is contacted with an antibody that specifically recognizes one or more of said family members, under conditions sufficient to allow said antibody to bind to said family member or members to form antibody-antigen products, and such antibody-antigen products are detected,

the improvement which comprises employing as said antibody, a monoclonal antibody (a) which binds specifically with TM-CEA but does not crossreact with CEA or NCA, (b) which binds specifically with TM-CEA and CEA but does not crossreact with NCA, or (c) which binds specifically with TM-CEA and NCA but does not crossreact with CEA.

5,200,317

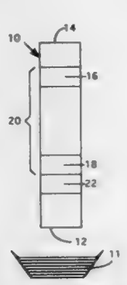
METHOD AND DEVICE FOR QUANTITATIVE CHROMATOGRAPHY

Gradimir G. Georgevich, Mundelein, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 305,886, Feb. 2, 1989. This application Jan. 10, 1992, Ser. No. 821,280

Int. Cl.[5] **G01N** *33/543, 31/78;* **C12Q** *1/42*

U.S. Cl. 435—7.4 **15 Claims**



1. A method of quantitating an enzyme in a test sample, comprising the steps of:

(a) contacting the test sample to a bibulous test strip through which the test sample migrates, said test strip comprising,

(i) a proximal end and a distal end, said proximal end for receiving the test sample with sample transport ending at or before said distal end;

(ii) a substrate zone disposed between the proximal and distal ends and containing a depletable quantity of a transformable enzyme substrate, with the proviso that said substrate is soluble in and transported by said aqueous mobile phase along said strip until substantially all of said substrate is transformed to an insoluble, nondiffusive reaction product thereby ending the enzyme/substrate reaction; and

(iii) a quantitation zone disposed between said proximal end and the distal end wherein said quantitation zone is free of immobilization reagents and wherein said reaction product ceases transport through the test strip thereby producing a column of signal in said quantitation zone; and

(b) detecting the length and intensity of the column of signal produced in the quantitation zone as a measure of the enzyme activity.

5,200,318

DIAGNOSIS OF IDDM WITH A PANEL OF IMMUNOREAGENTS

Daniel U. Rabin, Branford, and William J. Knowles, Madison, both of Conn., assignors to Miles Inc., Elkhart, Ind.

Filed May 13, 1992, Ser. No. 882,300

Int. Cl.[5] **C12Q** *1/00*

U.S. Cl. 435—7.21 **21 Claims**

1. A method for the diagnosis of insulin dependent diabetes mellitus in a patient, comprising the steps of contacting a blood sample obtained from such patient with an immunoreagent comprising epitopes of two or more of GAD, ICA512, and ICA12, and determining binding of antibody present in the patient's blood sample to one or more of said epitopes.

5,200,319

DIAGNOSIS OF GLOMERULONEPHRITIS

M. Amin Arnaout, Chestnut Hill; Robert T. McCluskey, Brookline, and John L. Niles, Cambridge, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 428,286, Oct. 27, 1989, Pat. No. 5,091,303. This application Oct. 25, 1990, Ser. No. 603,782

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.[5] **G01N** *33/564, 33/573, 33/577*

U.S. Cl. 435—7.24 **9 Claims**

1. A method of diagnosing pauci-immune necrotizing and/or crescentic glomerulonephritis in a patient, said method comprising:

(a) contacting a sample of biological fluid from said patient with a substantially pure protein having the following characteristics:

(i) it can be isolated from neutrophils;

(ii) it has a mass of approximately 29 kD as determined by SDS-PAGE;

(iii) it is capable of binding diisopropylfluorophosphate;

(iv) it has a pI of approximately 9.2–9.4;

(v) it is capable of binding to auto-antibodies present in the sera of individuals afflicted with Wegener's granulomatosis; and

(vi) it has the N terminal amino acid sequence Ile-Val-Gly-Gly-His-Glu-Ala-Gln-Pro-His-Ser-Arg-Pro-Tyr-Met-Ala-Ser-Leu-Gln-Met-Arg-Gly-Asn-Pro-Gly-Ser-His (SEQ. ID NO.: 1); and

(b) detecting immune complexes formed in step (a), formation of said immune complexes being diagnostic of pauci-immune necrotizing and/or crescentic glomerulonephritis.

5,200,320

METHOD FOR IDENTIFYING USEFUL POLYPEPTIDE VACCINES

Alessandro Sette, San Diego, Calif.; Soren Buus, Copenhagen, Denmark, and Howard M. Grey, San Diego, Calif., assignors to National Jewish Center for Immunology and Respiratory Medicine, Denver, Colo.

Filed Dec. 7, 1987, Ser. No. 130,036

Int. Cl.[5] **G01N** *33/566, 33/567*

U.S. Cl. 435—7.24 **2 Claims**

1. Method for determining a polypeptide which potentially generates an immunogenic response, comprising:

(i) contacting a first polypeptide which binds to an MHC molecule;

(ii) determining binding strength between said first polypeptide and said MHC molecule;

(III) contacting said MHC molecule with a second polypeptide which differs from said first polypeptide by having one amino acid less at one end as compared to said first polypeptide;

(iv) determining binding strength between said second polypeptide and said MHC molecule;

(v) continuing to contact said MHC molecule with a series of polypeptides, each member of said series of polypeptides differing from the polypeptide which preceded it by having one amino acid less at one end as compared to the polypeptide which preceded it and determining binding strength between the MHC molecule and each member of said series of polypeptides until a member of the series of polypeptides has a binding strength reduced by one half or more relative to the polypeptide which preceded it in the series, wherein said reduction in binding strength by one half or more indicates that the preceding polypeptide contains a critical binding segment;

(vi) contacting the polypeptide determined to contain said critical binding segment to a sample of T-cells; and

(vii) measuring T-cell proliferation following the contacting in (vi), wherein a positive T-cell proliferation response is indicative of potential immunogenicity of said polypeptide.

5,200,321

MICROASSAY ON A CARD

David A. Kidwell, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1990, Ser. No. 578,390

Int. Cl.[5] **G01N** *33/533*

U.S. Cl. 435—7.9 **18 Claims**

1. A card for assaying of a suspected substance in a liquid sample, comprising:

a first layer comprising a hydrophobic portion having formed therein at least one well for receiving the liquid sample;

a second layer defining a bottom surface of said well, comprising a supporting surface of cellulose which directly and covalently binds and supports thereon a reactive species, and a control membrane, beneath said supporting surface, for controlling the velocity of liquid flow therethrough so that, if said substance is present in said sample, said substance in said sample detectably reacts with said reactive species;

a third layer underneath said well and said control membrane, comprising a polymeric superabsorbent material selected from the group consisting of salts of polyacrylic acid or acrylic acid grafted on a starch backbone and impregnated with a reagent which produces a signal directly proportional to the concentration of any suspected substance in the liquid sample received in said well, said superabsorbent material having an absorptive capacity of at least about 200 mL distilled water/100 cm^2; said third layer also including a backing beneath said superabsorbent material for supporting said superabsorbent material, said

backing and said superabsorbent layer being sufficiently

based on the detection of complement activation wherein an increase in complement activation being indicative of in-

aeration and dispersal of air such that the L-lactate concentra-

R^1 is H or lower alkyl; with (b) a glycoside of formula III

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backing and said superabsorbent layer being sufficiently transparent to said signal when wet so that said signal may be detected by reading said signal through said wet backing;

a conjugated molecule selected from the group consisting of (i) an antibody-enzyme conjugate capable of specifically binding said substance and (ii) a conjugate of said substance and an enzyme, said conjugated molecule being within said first or second layer and said reagent comprising a substrate for said enzyme;

said reactive species being a binding partner for said conjugated molecule, said binding partner being selected from the group consisting of:

(1) an antibody capable of specifically binding said conjugate of said substance and said enzyme; and

(2) said substance.

5,200,322

METHOD FOR ASSAYING PROTEIN C AND MEASURING KIT FOR THE SAME

Kenji Matsumoto, Hyogo, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Japan

Continuation of Ser. No. 97,732, Sep. 17, 1987, abandoned. This application Feb. 28, 1991, Ser. No. 662,497

Claims priority, application Japan, Sep. 19, 1986, 61-222294; Feb. 18, 1987, 62-36739

Int. Cl.[5] C12Q *1/56; G01N 33/86*

U.S. Cl. 435—13 **11 Claims**

1. A method for assaying protein C (PC) comprising the steps of:

making activated protein C (PCa) by adding PC activator to diluted plasma;

adding antithrombin III, heparin and low-molecular-weight thrombin inhibitor;

adding synthetic peptide substrate for activated protein C; and

measuring colorimetrically or fluorometrically the amount of decomposition product formed by hydrolyses of the substrate with PCa.

5,200,323

IN VITRO METHOD TO DETERMINE THE SAFETY OF MODIFIED HEMOGLOBIN BLOOD SUBSTITUTES FOR HUMAN PRIOR TO CLINICAL USE

Thomas M. S. Chang, St-Lambert, and Colin Lister, Brossard, both of Canada, assignors to McGill University, Montreal, Canada

Filed Jan. 31, 1992, Ser. No. 828,680

Int. Cl.[5] C12Q *1/34*

U.S. Cl. 435—18 **19 Claims**

1. An in vitro method to determine the safety of modified hemoglobin blood substitutes for human subjects prior to their clinical usage, wherein said method is based on complement activation reaction from adding said modified hemoglobin blood substitutes to a human plasma sample and comprises the steps of:

a) obtaining at least one plasma sample from at least one human subject by:

i) taking a blood sample and immediately centrifuging; and

ii) separating said centrifuged blood sample of step i) and retaining the supernatant plasma;

b) mixing said plasma of step ii) with said modified hemoglobin blood substitutes or control-ringer in a weight/volume ratio of about 4:1;

c) incubating for a time sufficient to allow for a complement activation reaction to occur;

d) adding the product of step c) to an appropriate volume of saline in an EDTA tube; and

e) analyzing the degree of complement activation by analysis of the product of step d);

thereby determining the safety of said modified hemoglobin blood substitutes relative to said human subject plasma sample based on the detection of complement activation wherein an increase in complement activation being indicative of increased toxicity.

5,200,324

METHOD OF DIAGNOSING SENILE DEMENTIA OF THE ALZHEIMER TYPE

Dasakumar S. Navaratnam; John D. Priddle; Brendon I. McDonald; A. David Smith, and Kim A. Jobst, all of Oxford, England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 576,886, Sep. 4, 1990, abandoned. This application Aug. 1, 1991, Ser. No. 739,040

Int. Cl.[5] C12Q *1/46;* **C12N** *9/18;* **G01N** *15/18*

U.S. Cl. 435—20 **6 Claims**

1. A method of screening for Alzheimer's disease, which comprises determining by means of iso-electric focussing, if a patient has an anomalous molecular form of acetylcholinesterase (AChE) in his cerebrospinal fluid, which anomalous molecular form is not found in cerebrospinal fluid in a normal age-matched control, the presence of said anomalous molecular form of AChE in the patient indicative of the presence of Alzheimer's disease.

5,200,325

SELF-INDICATING ANALYSIS EMPLOYING STOICHIOMETRIC CHEMICAL SUBTRACTION

Joel M. Blatt, Granger; Steven C. Charlton, Elkhart; Bert Walter, South Bend, and Mary E. Warchal, Osceola, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 154,225, Feb. 10, 1988, abandoned. This application Aug. 21, 1992, Ser. No. 933,008

Int. Cl.[5] C12Q *1/32;* **C12N** *11/18*

U.S. Cl. 435—14 **9 Claims**

1. An analytical method for the spectrophotometric determination of glucose at a predetermined concentration in a liquid test sample which comprises the steps of:

a) combining the glucose containing sample with NAD and glucose dehydrogenase under conditions which will result in the transformation of the NAD to NADH;

b) simultaneously providing pyruvate and lactate dehydrogenase to convert the NADH formed in step (a) to NAD and the pyruvate to lactate, with the amount of pyruvate present upon initiation of the reaction being equal to the amount of glucose that would be present in the test sample at said predetermined concentration to be determined, multiplied by the stoichiometric ratio of moles of NADH per mole of glucose consumed in step (a); and

c) determining whether any NADH remains in the reaction mixture from step (a) by measuring light absorbance of NADH or a product of an indicator reaction involving NADH.

5,200,326

METHOD FOR THE FERMENTATIVE PRODUCTION OF L-AMINO ACIDS FROM α-KETO ACIDS

Christian Wandrey; Rolf Wichmann, both of Jülich; Ulrich Groeger; Manfred Kircher, both of Bielefeld; Wolfgang Leuchtenberger, Bruchkobel, and Eberhard Breuker, Detmold, all of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 44,678

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614586

Int. Cl.[5] C12P *13/04, 13/06*

U.S. Cl. 435—106 **14 Claims**

1. A method of producing an L-amino acid from an α-ketocarboxylic acid comprising continuous fermentation with the aid of glutamate-producing bacteria in the presence of ammonium ions and of an energy supplier, with biomass retention, wherein there is employed a cell concentration in the fermenter of >260 g TS/l, dwell times of 1–20 hours, and with

aeration and dispersal of air such that the L-lactate concentration of the product solution remains under 40 mmoles/l.

5,200,327

EXPRESSION SYSTEM FOR THE SECRETION OF BIOACTIVE HUMAN GRANULOCYTE MACROPHAGE COLONY STIMULATING FACTOR (GM-CSF) AND OTHER HETEROLOGOUS PROTEINS FROM STREPTOMYCES

Robert T. Garvin, Toronto, and Lawrence T. Malek, Brampton, both of Canada, assignors to Cangene Corporation, Mississauga, Canada

Continuation-in-part of Ser. No. 795,331, Nov. 6, 1985, abandoned, and a continuation-in-part of Ser. No. 221,346, Jul. 18, 1988, abandoned. This application Jul. 26, 1988, Ser. No. 224,568

Claims priority, application Canada, Jul. 25, 1988, 572956

Int. Cl.[5] C12P *21/02;* **C12N** *15/76, 15/00, 1/21*

U.S. Cl. 435—69.5 **21 Claims**

1. A gene expression system comprising a regulatory nucleotide sequence operably linked to a nucleotide sequence encoding a heterologous protein, wherein

said regulator nucleotide sequence comprises a promoter sequence operably linked to a nucleotide sequence encoding a signal peptide;

said signal peptide is capable of directing the secretion of said heterologous protein in bioactive form from a host selected from the genus Streptomyces; and

said signal peptide is a hybrid of signal peptides of the genus Streptomyces.

7. A vector capable of transformation and replication in Streptomyces wherein said vector comprises a gene expression system of claim 1 or claim 5.

14. A process of producing a heterologous protein in a bioactive form that is secreted from a host selected from the genus Streptomyces comprising the steps of:

(A) transforming a host selected from the genus Streptomyces with a vector according to claim 7;

(B) growing a culture of the host produced by transformation with said vector under conditions such that said heterologous protein is expressed and secreted in said bioactive form; and

(C) recovering said heterologous protein from said culture.

5,200,328

PROCESS FOR PRODUCING METHYL GLYCOSIDE ESTERS

Ole Kirk, Copenhagen; Sven Erik Godtfredsen, Vaerlose, both of Denmark, and Fredrik Björkling, Helsingborg, Sweden, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Mar. 16, 1990, Ser. No. 494,702

Claims priority, application Denmark, Feb. 17, 1989, 0768/89

The portion of the term of this patent subsequent to Mar. 2, 2010, has been disclaimed.

Int. Cl.[5] C12P *19/04*

U.S. Cl. 435—101 **11 Claims**

1. A process for preparing a compound of formula I

$$R—COO—X—OCH_3 \quad (I)$$

wherein

R is alkyl with 7–24 carbon atoms optionally substituted by hydroxy or halogen; and

X is a monosaccharide containing one hexose or pentose unit which carries (a) the $—OCH_3$ group at the anomeric carbon atom and (b) the R—COO—group at a primary hydroxy group; comprising reacting (a) an acid or ester of formula II

$$R—COOR^1 \quad (II)$$

wherein

R is as defined above; and

R^1 is H or lower alkyl; with (b) a glycoside of formula III

$$X—OCH_3 \quad (III)$$

wherein

X is as defined above; in a substantially non-aqueous medium, in the substantial absence of a solvent other than the acid or ester of formula II acting as a solvent for the glycoside of formula III, and in the presence of an immobilized lipase.

5,200,329

METHOD OF HYDROXYLATING 3-[(4,7-DICHLOROBENZOXAZOL-2-YL)METHYL-]AMINO-5-ETHYL-6-METHYL-2-(1H)-PYRIDINONE BY INCUBATION WITH LIVER SLICES

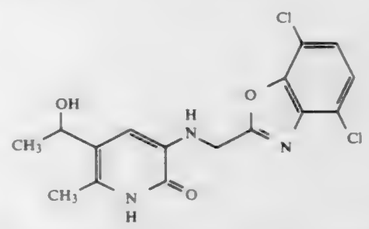
Suresh K. Balani, Hatfield; Anthony D. Theoharides, Lansdale, and Laura R. Kauffman, Jeffersonville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 771,963, Oct. 4, 1991, abandoned. This application Mar. 10, 1992, Ser. No. 850,008

Int. Cl.[5] C12P *17/16*

U.S. Cl. 435—118 **2 Claims**

1. A method of preparing the compound



or a pharmaceutically acceptable ester thereof, comprising the steps of

(1) providing a quantity of 3-[(4,7-dichlorobenzoxazol-2-yl)methyl]amino-5-ethyl-6-methyl-2-(1H)pyridinone,

(2) incubating the compound of step 1 with rat liver slices, and

(3) isolating the compound.

5,200,330

METHOD FOR THE PREPARATION OF METHYL ANTHRANILATE

Gregory V. Page, Maplewood; Bonita Scire, East Brunswick, and Mohamed I. Farbood, Holmdel, all of N.J., assignors to BASF K&F Corporation, Parsippany, N.J.

Division of Ser. No. 70,062, Jul. 6, 1987, abandoned. This application Sep. 14, 1990, Ser. No. 582,829

Int. Cl.[5] C12P *13/00, 13/02, 7/62*

U.S. Cl. 435—128 **8 Claims**

1. A method for the production of methyl anthranilate comprising:

providing a microorganism selected from the group consisting of *Trametes versicolor* ATCC 42394 and Polyporus sp. ATCC 10089;

incubating said microorganism under aerobic conditions with substrate methyl N-methyl anthranilate in a nutrient broth for a period of time at a pH and at a temperature effective to allow said microorganism to convert said substrate to methyl anthranilate, wherein said pH is in a range of from about 3 to about 9, said temperature is in a range of from about 18° C. to about 33° C. and said incubation period is from 1 to 14 days; and

recovering the methyl anthranilate.

tially pure R(+)-phenylethanol in the presence of NADPH,

5,200,338

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5,200,331
METHOD OF PRODUCING AN AMIDE UTILIZING A MICROORGANISM
Kiyoshi Kawakami; Toyozi Tanabe, and Osamu Nagano, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 870,531, Jun. 4, 1986, abandoned. This application Jan. 2, 1990, Ser. No. 462,345
Claims priority, application Japan, Jun. 4, 1985, 60-119761
Int. Cl.[5] C12P *13/02;* **C12N** *1/20*
U.S. Cl. 435—129 **1 Claim**

1. A method for the production of an amide from a nitrile which comprises:

(1) culturing a microorganism selected from the group consisting of Rhodococcus sp. A-32, FERM BP-1046, and Rhodococcus sp. A-33, FERM BP-1047, in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen, inorganic substances and 0.25 to 0.5 percent by weight of an inducer nitrile selected from the group consisting of propionitrile, isobutyronitrile and methacrylonitrile;

(2) contacting in an aqueous medium said cultured microorganism with a second nitrile to thereby convert said second nitrile to the corresponding amide;

(3) isolating said amide from the aqueous medium;

with the proviso that when said microorganism is Rhodococcus sp. A-32, FERM BP-1046, said second nitrile is selected from the group consisting of acetonitrile, propionitrile, acrylonitrile, isobutyronitrile, methacrylonitrile, succinonitrile, adiponitrile, benzonitrile and terephthalonitrile and when said microorgnaism is Rhodococcus sp. A-33, FERM BP-1047 said second nitrile is acrylonitrile or methacrylonitrile.

5,200,332
PROCESS FOR PREPARATION OF COPOLYMER
Tsuneo Yamane, Nagoya; Shunsaku Ueda, Toyoake; Shigeki Imagawa, Niigata; Torakazu Tahara, Niigata; Yoshiharu Tokunaga, Niigata; Hiroyuki Iesaka, Niigata, and Teizi Urakami, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Filed Sep. 13, 1991, Ser. No. 759,919
Claims priority, application Japan, Sep. 14, 1990, 2-242605
Int. Cl.[5] C12P *7/62;* **C12R** *1/05;* **C08G** *63/06*
U.S. Cl. 435—135 **1 Claim**

1. A process for the preparation of a copolymer comprising D-3-hydroxybutyrate and D-3-hydroxyvalerate which comprises

cultivating viable bacteria under a bacterium-propagating condition, and subsequently cultivating the bacteria by contacting with n-amyl alcohol or with a mixture of n-amyl alcohol and a carbon source utilizable by the bacterium under a bacterium propagation-restricting condition; and

recovering the copolymer from the bacterial cells

wherein said bacterium has a capacity of producing poly-3-hydroxybutyrate and belongs to Genus *Pseudomonas, Athiorhodium, Azotobacter, Spirillum, Methylobacterium, Hyphomicrobium, Ancylocater, Xanthobacter, Paracoccus, Rhizobium, Bradyhizobium, Bacillus, Nocardia, Corynebacterium* or *Rhodococcus.*

5,200,333
CLONING RESTRICTION AND MODIFICATION GENES
Geoffrey G. Wilson, Beverly, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.
Continuation of Ser. No. 707,079, Mar. 1, 1985, abandoned. This application Mar. 19, 1991, Ser. No. 672,158
Int. Cl.[5] C12N *15/55*
U.S. Cl. 435—172.3 **11 Claims**

1. A method of isolating DNA coding for a restriction endonuclease comprising the steps of:

(a) forming a DNA library from a source containing DNA coding for the restriction endonuclease;

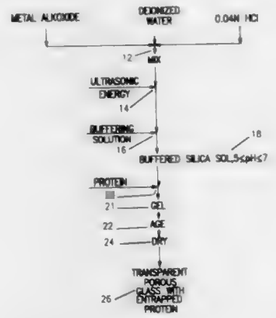
(b) digesting the DNA library of step (a) with an appropriate restriction enzyme to obtain DNA coding for the corresponding methylase;

(c) transforming a host cell with the DNA of step (b);

(d) analyzing varying amounts of extract from the transformed host cell of step (c) for restriction endonuclease activity; and

(e) isolating recombinant DNA from the host cell of step (d) which exhibits restriction endonuclease activity.

5,200,334
SOL-GEL ENCAPSULATED ENZYME
Bruce S. Dunn, Los Angeles; Joan S. Valentine, Encino; Jeffrey I. Zink, Sherman Oaks; Lisa Ellerby, Los Angeles; Fumito Nishida, Los Angeles; Clinton Nishida, Los Angeles, and Stacey A. Yamanaka, Los Angeles, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Filed Aug. 13, 1991, Ser. No. 744,524
Int. Cl.[5] C12N *11/04, 11/14, 11/08;* **C03C** *3/00*
U.S. Cl. 435—182 **40 Claims**



1. A process for the production of a porous, transparent sol-gel glass containing an alcohol sensitive active biological material entrapped therein comprising:

(a) forming a single phase sol by mixing a metal alkoxide in a non-alcoholic medium comprising water and an acid catalyst in a container exposed to ultrasonic energy, the mixture having a pH not greater than about 2;

(b) removing the ultrasonic energy and raising the pH of the sol to about 5 to 7 by the addition of a buffering agent;

(c) adding said active biological material to the buffered sol;

(d) forming a gel and allowing the gel to age; and

(e) allowing at least a portion of the water in the gel to evaporate so that the volume of the product produced in step (d) is decreased and the active biological material is trapped in a monolith of the gel having a reduced volume.

5,200,335
PHENYLETHANOL DEHYDROGENASE CAPABLE OF REDUCING ACETOPHENONE TO R(+)-PHENYLETHANOL
Werner Hummel, Titz, and Maria-Regina Kula, Niederzier-Hambach, both of Fed. Rep. of Germany, assignors to Forschungszentrum Juelich GmbH, Juelich, Fed. Rep. of Germany
Filed May 6, 1991, Ser. No. 694,988
Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014573
Int. Cl.[5] C12N *9/04, 1/00*
U.S. Cl. 435—190 **4 Claims**

1. An isolated phenylethanol dehydrogenase that selectively catalyzes the reduction of acetophenone in solution to essentially pure R(+)-phenylethanol in the presence of NADPH, and wherein said dehydrogenase, in substantially pure form,

(A) has an optimum pH of 7 for reduction of acetophenone and an optimum Ph of 8 for oxidation of phenylethanol;

(B) has an optimum temperature of 25°–30° C.;

(C) has a K_M value of 6×10^{-4} M for acetophenone;

(D) has a K_M value of 1.4×10^{-4} M for NADPH; and

(E) is rapidly inactivated by EDTA but is only weakly inhibited by inhibitors and chelators selected from the group consisting of 2,2'-dipyridine, 1,10-phenanthroline, iodoacetamide, p-hydroxymercurybenzoate, N-ethylmaleimide, phenylmethanesulfonyl fluoride and Triton X-100 and SH-protecting reagents selected from the group consisting of dithiothreitol and glutathione.

5,200,336
RESTRICTION ENDONUCLEASE OBTAINABLE FOAM BACILLUS COAGULANS AND A PROCESS FOR PRODUCING THE SAME
Huimin Kong, Beverly, and Ira Schildkraut, Hamilton, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.
Filed Jul. 2, 1990, Ser. No. 547,787
Int. Cl.[5] C12N *9/22, 1/00*
U.S. Cl. 435—199 **6 Claims**

1. A restriction endonuclease obtainable from *Bacillus coagulans,* ATCC No. 55055, where said endonuclease recognizes the following base sequence in double-stranded deoxyribonucleic acid molecules:

5' . . . ↓ (N)10CGA(N)6TGC(N)12 ↓ . . . 3'
3' . . . ↑ (N)12GCT(N)6ACG(N)10 ↑ . . . 5'

and cleaves said deoxyribonucleic acid molecules at both ends of the recognition sequence as indicated by the arrows.

5,200,337
NOVEL TYPE II RESTRICTION ENDONUCLEASE, APO I, OBTAINABLE FROM ARTHROBACTER PROTOPHORMIAE AND A PROCESS FOR PRODUCING THE SAME
Carol Polisson, Arlington; Derek Robinson, Boxford, and Keith Lunnen, Newbury, all of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.
Filed Oct. 25, 1991, Ser. No. 782,515
Int. Cl.[5] C12N *9/22*
U.S. Cl. 435—199 **12 Claims**

1. A substantially pure Type II restriction endonuclease ApO I obtainable from *Arthrobacter protophormiae* (ATCC#55228) which recognizes and cleaves all permutations of the following base sequence in double-standard deoxyribonucleic acid molecules:

and having a cleavage defined by the arrows.

5,200,338
BACTERIAL EXTRACELLULAR LIGNIN PEROXIDASE
Donald L. Crawford, and Muralidhara Ramachandra, both of Moscow, Id., assignors to Idaho Research Foundation, Incorporation, Moscow, Id.
Filed Nov. 30, 1988, Ser. No. 277,802
Int. Cl.[5] C12N *9/24*
U.S. Cl. 435—200 **16 Claims**

1. A lignin peroxidase enzyme having a molecular weight of about 18 kD, enzyme activity that produces Cα–oxidation and Cα–Cβ cleavage of lignin and lignin degradation products, and a specific lignin peroxidase activity of greater than 0.30 enzyme U/mg.

5,200,339
PROTEASES CAUSING ABNORMAL DEGRADATION OF AMYLOID β-PROTEIN PRECURSOR
Carmela R. Abraham, 5 Blodgett Rd., Lexington, Mass. 02173
Continuation-in-part of Ser. No. 568,806, Aug. 17, 1990, abandoned. This application Apr. 5, 1991, Ser. No. 681,093
Int. Cl.[5] C12N *9/48;* **C12Q** *1/37;* **A61K** *37/547*
U.S. Cl. 435—212 **2 Claims**

1. A brain-derived, calcium activated proteolytic factor comprising a serine protease that cleaves β-protein precursor at a site outside the β-protein domain and near the β-protein N-terminus, said serine protease migrating as a band having a molecular weight of about 30 kDa and a band having a molecular weight of about 68 kDa, as estimated by 12% SDS-PAGE using as molecular weight standards phosphorylase B, bovine serum albumin, ovalbumin and carbonic anhydrase.

5,200,340
THROMBIN-ACTIVATED TISSUE PLASMINOGEN ACTIVATORS
Donald C. Foster; Eileen R. Mulvihill; Patrick J. O'Hara, all of Seattle, Wash.; Kurt Pingel, Farum, Denmark, and Shinji Yoshitake, Ibaraki, Japan, assignors to ZymoGenetics, Inc., Seattle, Wash.
Filed May 22, 1987, Ser. No. 53,412
Int. Cl.[5] C12N *9/61, 15/00, 15/58, 15/35*
U.S. Cl. 424—94.64 **11 Claims**

1. A single chain form of a human t-PA, wherein said single chain form is cleavable by thrombin, said cleavage resulting in stimulation of amidolytic activity.

measuring average sodium ion concentration in the entire, a first volume has been formed, a method for improving the

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5,200,341

ALTERED GENE AND *E. COLI* STRAINS AND METHODS USEFUL IN ENHANCED ACCUMULATION OF PROTEINS

Mark G. Obukowicz, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 7, 1991, Ser. No. 772,760
Int. Cl.[5] C12N *15/31, 1/21, 15/67;* C12P *21/00*
U.S. Cl. 435—252.33 9 Claims

1. An isolated rpoH gene that encodes a σ^{32} protein in which cysteine instead of arginine is at amino acid residue 268.

5,200,342

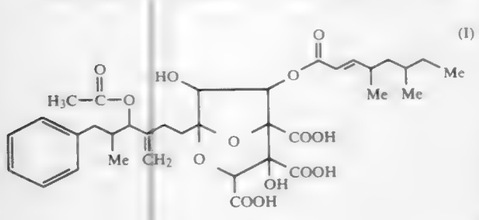
SQUALENE SYNTHETASE INHIBITORS AND PROCESSES THEREFROM

Gerald F. Bills, Roselle, N.J.; Maria T. Diez, Madrid, Spain; Mary N. Omstead, Westfield, N.J., and Fernando Pelaez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 14, 1991, Ser. No. 715,535
Int. Cl.[5] C12P *17/18;* C12N *1/14;* C12R *1/645*
U.S. Cl. 435—254 3 Claims

1. A biologically pure culture of *Curvularia lunata* selected from the group consisting of:
(a) *Curvularia lunata* var. lunata MF5573 (ATCC 74067);
(b) mutants of *Curvularia lunata* var. lunata MF5573 (ATCC 74067) having essentially the characteristics of *Curvularia lunata* var. lunata MF5573 (ATCC 74067);
(c) Curvularia lunata var. aeria MF5572 (ATCC 74066); and
(d) mutants of *Curvularia lunata* var. aeria MF5572 (ATCC 74066) having essentially the characteristics of *Curvularia lunata* var. aeria MF5572 (ATCC 74066); said culture being capable of producing a compound of structure:

(I)



in recoverable amounts.

5,200,343

METHOD FOR MICROBIAL DEHALOGENATION OF HALOALIPHATIC COMPOUNDS USING A SULFATE REDUCING BACTERIA, DESULFOMONILE TIEDJEI

James R. Cole, East Lansing; Babu Z. Fathepure, and James M. Tiedje, both of Lansing, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed May 3, 1991, Ser. No. 695,295
Int. Cl.[5] C12N *9/00, 1/00*
U.S. Cl. 435—262.5 10 Claims

1. A method for dehalogenation of a haloaliphatic compound wherein the halogen is selected from the group consisting of chlorine, bromine and iodine which comprises:
(a) growing cells of a sulfate reducing bacterium having the sulfate reducing and dehalogenation characteristics of *Desulfomonile tiedjei* ATCC 55165 in the presence of a 1,3-substituted phenyl compound which induces the dehalogenation by the bacterium without being metabolized wherein the cells are grown under anaerobic conditions in a synthetic chemically defined medium for the cells consisting essentially of, a pyruvic compound as an electron donor selected from the group consisting of pyruvic acid, pyruvic esters, acid salts of pyruvic acids and mixtures thereof, 1,4-naphthoquinone, thiamine and nicotinamide, essential vitamins and minerals to provide induced cells with an ability to dehalogenate the haloaliphatic compound; and
(b) anaerobically transferring the induced cells into a second chemically defined medium containing the haloaliphatic compound so as to dehalogenate the haloaliphatic compound.

5,200,344

DIAGNOSTIC TESTING FOR *CAMPYLOBACTER JEJUNI* OR *CAMPYLOBACTER COLI* INFECTIONS USING NOVEL ANTIGENS

Martin J. Blaser, 733 Darden Place, Nashville, Tenn. 37205; Richard T. Ellison, III, 2391 Eudora St., Denver, Colo. 80207, and Zhi H. Pei, 2139-K Acklen Ave., Nashville, Tenn. 37212

Filed Nov. 13, 1990, Ser. No. 612,330
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—7.32 13 Claims

1. A method for detecting the presence of antibodies to *Campylobacter jejuni* or *Campylobacter coli* comprising contacting a test sample suspected of containing said antibodies with an amount of an antigenic composition effective to form with said antibodies, detectable amounts of an antigen/antibody complex, said method further comprising the step of determining whether the quantity of said antigen/antibody complex exceeds a predetermined positive threshold amount;
said antigenic composition comprising a PEB1 antigen which, when obtained from *Campylobacter jejuni* without alteration of its natural composition, has an apparent molecular weight of about 28 kDa (as measured on sodium dodecyl sulfate polyacrylamide gel under reducing conditions), a molecular weight of 28.9±1.0 kDa (as measured by gel filtration chromatography under native conditions) and an isoelectric point of 8.5, said PEB1 antigen being present in said antigenic composition at a concentration, relative to other acid-extractable surface structures of *Campylobacter jejuni*, higher than that resulting from acid extraction of surface structures from whole cell *Campylobacter jejuni*.

8. A method for detecting the presence of antibodies to *Campylobacter jejuni* or *Campylobacter coli* comprising contacting a test sample suspected of containing said antibodies with an amount of an antigenic composition effective to form, with said antibodies, detectable amounts of an antigen/antibody complex, said method further comprising the step of determining whether the quantity of said antigen/antibody complex exceeds a predetermined positive threshold amount;
said antigenic composition comprising a PEB3 antigen which, when obtained from *Campylobacter jejuni* without alteration of its natural composition, has an apparent molecular weight of 30 kDa (as measured on sodium dodecyl sulfate polyacrylamide gel under reducing conditions), and an isoelectric point greater than 9.3, said PEB3 antigen being present in said antigenic composition at a concentration, relative to other acid-extractable surface structures of *Campylobacter jejuni*, higher than that resulting from acid extraction of surface structures from whole cell *Campylobacter jejuni*.

5,200,345

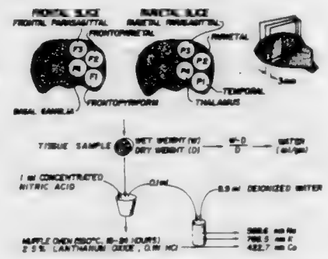
METHODS AND APPARATUS FOR QUANTIFYING TISSUE DAMAGE, DETERMINING TISSUE TYPE, MONITORING NEURAL ACTIVITY, AND DETERMINING HEMATOCRIT

Wise Young, New York, N.Y., assignor to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 394453, Aug. 16, 1989, abandoned. This application Aug. 2, 1990, Ser. No. 561,986
Int. Cl.[5] G01N *33/48, 33/86, 21/00;* A61B *5/05*
U.S. Cl. 436—63 36 Claims

1. A method for quantifying cellular damage in a tissue sample, comprising:

measuring average sodium ion concentration in the entire tissue sample ($[Na]_t$);
measuring average potassium ion concentration in the entire tissue sample ($[K]_t$);
obtaining a value equal to $[Na]_t - [K]_t$; and



comparing said value to the value of $[Na]_t - [K]_t$ in normal tissue,
whereby the degree of deviation from normal values is a quantitative indication of cellular damage.

5,200,346

ALDICARB IMMUNOASSAY BY SULFONE EQUIVALENTS

Stephen B. Friedman, Chapel Hill, and Thomas N. Stewart, Durham, both of N.C., assignors to Ensys, Inc., Durham, N.C.

Filed Jul. 16, 1991, Ser. No. 731,752
Int. Cl.[5] G01N *33/545*
U.S. Cl. 436—518 17 Claims

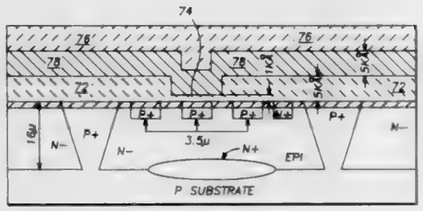
1. An immunoassay for detecting total aldicarb in an aqueous sample suspected of containing the same, comprising:
adding an oxidant selected from the group consisting of potassium peroxymonosulfate and peroxyacids to the aqueous sample, the oxidant provided in an amount sufficient to oxidize all aldicarb contained in said solution to aldicarb sulfone; then
combining the aqueous sample with a thioether solution capable of neutralizing excess oxidant in said aqueous sample to thereby provide a neutralized test solution; then
contacting the neutralized test solution to an antibody capable of binding aldicarb sulfone; and then
detecting the aldicarb sulfone bound to the antibody.

5,200,347

METHOD FOR IMPROVING THE RADIATION HARDNESS OF AN INTEGRATED CIRCUIT BIPOLAR TRANSISTOR

Jin-Tarng Wang, Cupertino; Robert T. Haraga, San Jose, and Wadie N. Khadder, Sunnyvale, all of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Feb. 14, 1991, Ser. No. 655,314
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 21 Claims



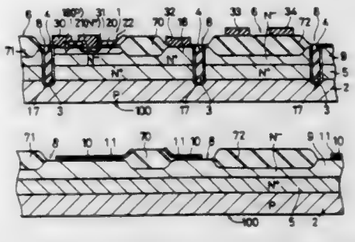
1. For use with an integrated circuit which includes an npn bipolar transistor on which a variable thickness oxide layer of a first volume has been formed, a method for improving the radiation hardness of the transistor comprising the steps of:
removing the variable thickness oxide layer; and
forming a new oxide layer of predefined volume on the transistor, said predefined volume being selected to be less than said first volume so as to reduce the probability of radiation damage to said npn bipolar transistor.

5,200,348

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH CONSTANT WIDTH DEEP GROOVE ISOLATION

Akihisa Uchida; Daisuke Okada; Toshihiko Takakura, all of Koganei; Katsumi Ogiue, Nishitama; Yoichi Tamaki, Kokubunji, and Masao Kawamura, Fuchu, all of Japan, assignors to Hatachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 353,060, May 17, 1989, Pat. No. 5,084,402, which is a division of Ser. No. 169,748, Mar. 18, 1988, Pat. No. 4,853,343, which is a division of Ser. No. 946,778, Dec. 26, 1986, Pat. No. 4,746,963, which is a continuation of Ser. No. 529,132, Sep. 2, 1983, abandoned. This application Dec. 3, 1991, Ser. No. 801,865
Claims priority, application Japan, Sep. 6, 1982, 57-153910
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] H01L *21/306, 21/76*
U.S. Cl. 437—33 16 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:
(a) selectively forming an oxidation impermeable mask on a main surface of a semiconductor body, said semiconductor body including a semiconductor substrate of a first conductivity type, a buried semiconductor layer of a second conductivity type opposite to said first conductivity type on said substrate, and an epitaxial semiconductor layer, said main surface corresponding to an upper surface of said epitaxial semiconductor layer, said mask covering a first region of said main surface in which a semiconductor element having a PN junction is to be formed;
(b) oxidizing a second region of said main surface exposed from said oxidation impermeable mask by employing said oxidation impermeable mask, thereby to selectively form a thick oxide film in said second region;
(c) after the step (b), forming a groove in said main surface of said semiconductor body so as to surround said first region, wherein said groove reaches said semiconductor substrate of said first conductivity type through said buried semiconductor layer;
(d) forming a thin oxide film within said groove so as to cover a whole exposed surface of said groove, said thin oxide film being thinner than that of said thick oxide film;
(e) filling said groove with a material so as to form an isolation structure; and
(f) introducing impurities of said first conductivity type into said fist region, to form a first semiconductor layer of said first conductivity type in said first region, wherein said first semiconductor layer and said epitaxial semiconductor layer in said first region form said PN junction of said semiconductor element.

5,200,349

DRAM CELL AND METHOD OF MANUFACTURING THE SAME

including bitlines and wordlines in a face of a semiconductor

(d) implanting lightly doped regions in the active region

type and having a trench formed for forming capacitance

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5,200,349

SEMICONDUCTOR DEVICE INCLUDING SCHOTKY GATE OF SILICIDE AND METHOD FOR THE MANUFACTURE OF THE SAME

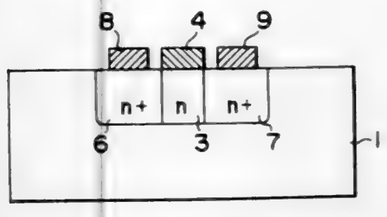
Naoki Yokoyama, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 755,452, Aug. 16, 1985, abandoned, which is a continuation of Ser. No. 721,144, Apr. 10, 1985, Pat. No. 4,566,021, which is a continuation of Ser. No. 334,923, Dec. 28, 1981, abandoned. This application Jul. 25, 1988, Ser. No. 223,699

Claims priority, application Japan, Dec. 30, 1980, 55-189544

Int. Cl.[5] H01L *21/338*

U.S. Cl. 437—41 **21 Claims**



1. A method for the manufacture of a semiconductor device, comprising the steps of:

forming a Schottky gate electrode of a refractory metal silicide including silicide of at least one of Mo and W on a compound semiconductor substrate, the Schottky gate electrode having a barrier height and an ideality factor which are stable with respect to heat treatment at temperatures up to substantially 850° C.;

forming regions by introducing an impurity into the compound semiconductor substrate using the Schottky gate electrode as a mask; and

subsequently heat treating the semiconductor substrate and the Schottky gate electrode by heating the semiconductor substrate and the Schottky gate electrode to a temperature in the range from substantially 650° C. to substantially 850° C.

5,200,350

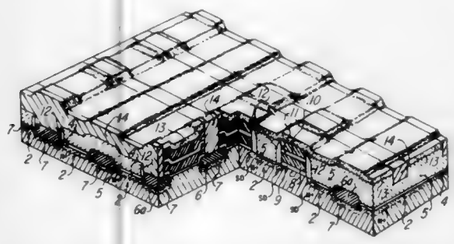
FLOATING-GATE MEMORY ARRAY WITH SILICIDED BURIED BITLINES

Manzur Gill, Rosharon, and Howard L. Tigelaar, Allan, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 576,086, Aug. 30, 1990, Pat. No. 5,095,345, which is a continuation of Ser. No. 269,849, Nov. 10, 1988, abandoned. This application Jul. 26, 1991, Ser. No. 736,337

Int. Cl.[5] H01L *21/265, 21/70*

U.S. Cl. 437—43 **20 Claims**



1. A method for making a non-volatile memory cell array including bitlines and wordlines in a face of a semiconductor substrate of first conductivity type, comprising the steps of:

forming thick field oxide regions and thick field oxide strips, both with underlying channel stop regions in said face;

growing a gate oxide layer of said face;

applying a first conductive layer of said face;

applying a second conductive layer of said face overlying and insulated from said first conductive layer by an inter-level dielectric layer;

forming a protective layer over said second conductive layer;

patterning said protective layer and etching said protective layer, said second conductive layer, said inter-level dielectric layer, said first conductive layer, and said gate oxide layer to form control- and floating-gate strips such that said strips are substantially centered on said field oxide regions and such that said strips extend over said field oxide regions and said field oxide strips;

implanting an impurity material of second conductivity type to form conductors parallel to and adjacent to said control- and floating-gate strips, with three of said conductors between said thick field oxide strips;

siliciding said conductors;

forming a first insulating oxide in the space between said control- and floating-gate strips and over said conductors;

removing a part of said first insulating oxide and substantially all of said protective layer to form a surface substantially planar including the upper surface of said second conductive layer;

applying a third conductive layer to said substantially planar surface; and

patterning said third conductive layer and etching through said third conductive layer and said control- and floating-gate strips to form wordlines from said third conductive layer, control gates from said control-gate strips and floating gates from floating-gate strips while leaving said conductors protected by said first insulating oxide, wherein said wordlines, control gates and floating gates are substantially centered between said thick field oxide regions and extend over a part of adjacent said thick field oxide regions.

5,200,351

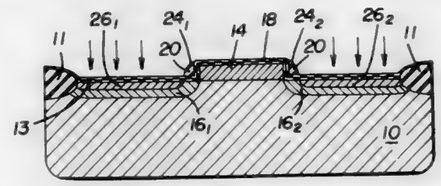
METHOD OF FABRICATING FIELD EFFECT TRANSISTORS HAVING LIGHTLY DOPED DRAIN REGIONS

Zahra Hadjizadeh-Amini, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 569,773, Aug. 17, 1990, abandoned, which is a continuation of Ser. No. 425,244, Oct. 23, 1989, abandoned. This application Feb. 14, 1992, Ser. No. 837,536

Int. Cl.[5] H01L *21/336*

U.S. Cl. 437—44 **2 Claims**



1. A method of fabricating a field effect transistor (FET) having lightly doped drain regions, comprising the sequential steps of:

(a) providing a substrate having an active region defined by field oxide regions;

(b) providing a gate overlying a first portion of the active region;

(c) oxidizing the exposed portions of the gate;

(d) implanting lightly doped regions in the active region using the gate as a mask;

(e) providing a silicon nitride layer overlying the active region, the gate, and overlying the field oxide regions;

(f) providing a silicon oxide layer overlying the silicon nitride layer;

(g) etching the silicon oxide layer to form LDD spacers at the edges of the gate using an etchant which has a selectivity of at least 20:1 for silicon oxide with respect to silicon nitride; and

(h) implanting source and drain regions in respective ones of the lightly doped drain regions using the LDD spacers as masks.

5,200,352

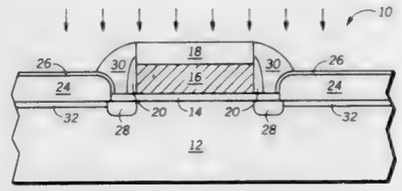
TRANSISTOR HAVING A LIGHTLY DOPED REGION AND METHOD OF FORMATION

James R. Pfiester, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 25, 1991, Ser. No. 797,580

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—44 **20 Claims**



1. A process for fabricating a transistor comprising:

providing a substrate material;

providing an insulated conductive control region overlying the substrate material, and providing a dielectric region overlying the insulated conductive control region;

forming a first spacer adjacent a perimeter of the insulated conductive control region;

forming exposed portions of the substrate material;

forming an epitaxial region from the exposed portions of the substrate material, the epitaxial region being adjacent to the first spacer;

removing the first spacer, the first spacer removal forming doping-accessible portions of the substrate material;

doping the doping-accessible portions of the substrate material after removing the first spacer to form both a first doped region and a second doped region within the substrate material;

forming a second spacer adjacent to the insulated conductive control region, the second spacer partially overlying the epitaxial region; and

doping the epitaxial region to form a third doped region and a fourth doped region.

5,200,353

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING TRENCH CAPACITOR

Masahide Inuishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 461,589, Jan. 5, 1990, abandoned, which is a continuation of Ser. No. 211,931, Jun. 27, 1988, Pat. No. 4,918,500. This application Sep. 4, 1991, Ser. No. 754,296

Claims priority, application Japan, Jun. 29, 1987, 62-161663

Int. Cl.[5] H01L *21/70*

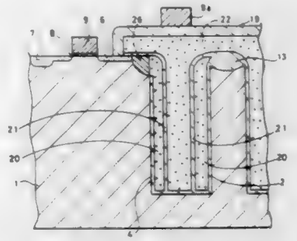
U.S. Cl. 437—52 **10 Claims**

1. A method for manufacturing a semiconductor memory device, comprising the steps of:

preparing a semiconductor substrate having a major surface, having an impurity concentration of a first conductivity type and having a trench formed for forming capacitance for storing information charges,

forming a first insulating layer in an inner portion of said trench such that on at least one sidewall said first insulating layer begins a distance below the upper end of said trench,

forming an impurity contact region in said substrate by implanting ions in the region of the at least one sidewall above said first insulating layer and a portion of the major surface of said substrate by an oblique ion implantation,



forming a first conducting layer along and in contact with said at least one sidewall of said first insulating layer and said impurity contact region,

forming a second insulating layer along and in contact with sidewall portions of said first conductive layer, and

forming a second conductive layer in an inner portion of a trench formed by said second insulating layer and said first insulating layer.

5,200,354

METHOD FOR MANUFACTURING DYNAMIC RANDOM ACCESS MEMORY CELL

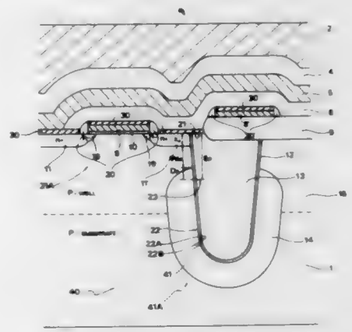
Jae C. Om, Taegu, and In S. Chung, Kyungki, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co. Ltd., Seoul, Rep. of Korea

Division of Ser. No. 381,289, Jul. 18, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 621,872

Claims priority, application Rep. of Korea, Jul. 22, 1988, 88-9189; Sep. 22, 1988, 88-12240

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—52 **3 Claims**



1. A method for manufacturing a DRAM of SDT cell structure comprising:

forming a P well region on a t type silicon substrate;

forming a trench from the top of the P well region into a portion of the P type substrate with the trench having an inner surface;

forming a selectively doped P+diffusion region into a portion of the P well region and in a portion of the P type silicon substrate by;

(a) depositing an impurity dopant source of the inner surface

said second insulation layer positioned on said mask pat-

5,200,357

METHOD FOR THE SELF-ALIGNMENT OF METAL

electric has been deposited, said second dielectric etching more rapidly than said first dielectric;

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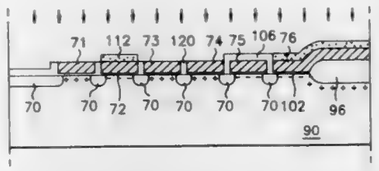
(a) depositing an impurity dopant source of the inner surface of the trench;
(b) filling the trench with a photoresist, and selectively etching back the photoresist;
(c) removing the portion of the impurity dopant exposed by the selective etching of the photoresist;
(d) removing all the remaining photoresist; and,
(e) forming the selective P+diffusion region in the said portions of the P well region and said P type substrate by heat treatment of the remaining impurity dopant source;
removing the remaining impurity dopant source from the trench;
forming a capacitive dielectric film layer on the inner surface of the trench;
filling the trench with material for a charge storing electrode, and planarizing the resulting top surface of the trench;
forming a field oxide layer by LOCOS technology on a portion of the top surface of the trench and on the P well region proximate the trench;
forming a gate electrode by a mask pattern process on a portion of the P well region opposite the field oxide layer and forming a gate electrode line by the mask pattern process on a portion of the field oxide layer;
forming LDD regions by an ion implantation process in the P well region near both sides of the gate electrode;
forming an oxide film spacer at each side of the gate electrode and at each side of the gate electrode line;
forming a source electrode and a drain electrode in the P well region by the ion implantation process such that a portion of the source and a portion of the drain electrode is located under the gate electrode;
forming a conducting layer on the entire surface except for a portion of the field oxide layer and the oxide film spacers formed at each side of the gate electrode and the gate electrode line, thereby connecting the drain electrode and the charge storing electrode;
forming a first insulating layer on the entire surface after the drain electrode and the source electrode are connected;
re- ving a portion of the first insulating layer, by the mask atterning process, from the conducting layer which is formed over a portion of the source electrode;
forming a polycide layer for a bit line on the first insulating layer and the conducting layer, where a portion of the first ulating layer has been removed, thereby connecting the irce electrode to the polycide layer; and;
s entially forming a second insulating layer and a protece layer on the polycide layer for the bit line.

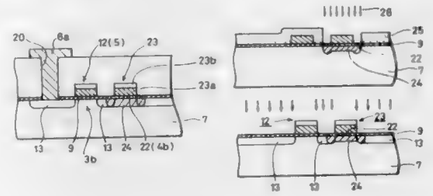
5,200,355
METHOD FOR MANUFACTURING A MASK READ ONLY MEMORY DEVICE
Jeong-Hyeok Choi, and Chul-Ho Shin, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea
Filed Nov. 15, 1991, Ser. No. 792,590
Claims priority, application Rep. of Korea, Dec. 10, 1990, 1990-20260; Dec. 10, 1990, 1990-20261
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **52 Claims**

1. A method for manufacturing a mask read only memory device, comprising the step of:
consecutively forming a first conductive layer and a first insulation layer over a top surface of a semiconductor substrate of a given conductivity type, said semiconductor substrate having a gate oxide layer formed thereon;
forming a mask pattern of a word line in the order of odd numbers or even numbers;
forming a second insulation layer positioned on a top surface and on a sidewall of said mask pattern and on a partial top surface of said first conductive layer;
forming a third insulation layer over a top surface of said substrate and etching out said third insulation layer until said second insulation layer positioned on said mask pattern is sufficiently exposed; and
consecutively etching out a partial top surface of said second insulation layer and said first conductive layer by using a



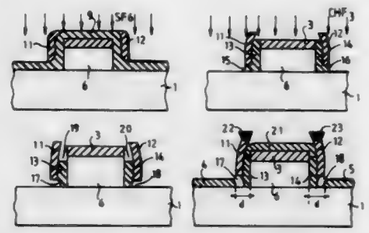
remaining third insulation layer as a mask, so as to form a first conductive layer pattern separated from each other with spacing corresponding to a thickness of said second insulation layer.

5,200,356
METHOD OF FORMING A STATIC RANDOM ACCESS MEMORY DEVICE
Kenichi Tanaka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 385,074, Jul. 26, 1989, abandoned. This application Apr. 9, 1991, Ser. No. 682,652
Claims priority, application Japan, Jul. 29, 1988, 63-190808
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—60 **5 Claims**



1. A claim method of forming an oxide film resistor for a static RAM device comprising the steps of:
(a) forming an oxide film on a main surface of a semiconductor substrate having a first conductivity;
(b) disposing a polycrystalline silicon layer on said oxide film after forming said oxide film in said step (a);
(c) patterning said polycrystalline silicon layer in a first specified configuration after disposing said polycrystalline silicon layer in said step (b);
(d) disposing a resist layer over said main surface of said semiconductor substrate and said polycrystalline silicon layer after patterning said polycrystalline silicon layer in said step (c);
(e) patterning said resist layer in a second specified configuration which includes an opening in a specified region to a portion of said polycrystalline silicon layer after disposing said resist layer in said step (d);
(f) ion-implanting silicon or impurities in said semiconductor substrate and said oxide film in the regions which fail to have said resist layer disposed thereon after patterning said resist layer in said step (e).

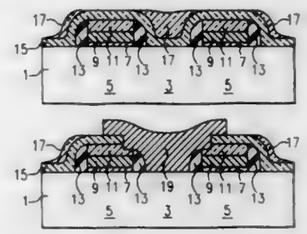
5,200,357
METHOD FOR THE SELF-ALIGNMENT OF METAL CONTACTS ON A SEMICONDUCTOR DEVICE, AND SELF-ALIGNED SEMICONDUCTORS
Philippe Collot, Orsay, and Paul Schmidt, Bourg la Reine, both of France, assignors to Thomson-CSF, Puteaux, France
Filed Jun. 6, 1991, Ser. No. 711,070
Claims priority, application France, Jun. 12, 1990, 90 07282
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—180 **4 Claims**



1. A method for self-alignment of metal electron contacts on a semiconductor device comprising at least one raised pattern on a semiconductor body, said method comprising the following operations:
depositing by an isotropic method, on free surfaces of the body and of the pattern, including a lateral surface and flanks of said pattern, of a first insulating layer of silica SiO_2 and then a second insulating layer of silicon nitride Si_3N_4 with well-controlled thicknesses,
anisotropic, reactive ion etching, by SF_6, of the second layer in its parts deposited on the free surfaces of the body and on top of the pattern, portions of said second layer deposited on the flanks of the pattern remaining unetched,
anisotropic, reactive ion etching, by CHF_3, of the first layer, with the exception of its portions deposited on the flanks of the pattern, which are masked by the corresponding portions of the second layer;
selective and isotropic chemical etching, by a buffered solution of $HF/NH_4F/H_2O$, of the first layer, this etching operation creating a sub-etching in the portions of the first layer that are partially masked by the corresponding portions of the second layer not etched by said selective solution,
self-aligned metallization, by a directional method, of the metal electrode contacts of the semiconductor device, the juxtaposed portions of the first and second insulating layers on the flanks of the pattern constituting sidewalls between regions of the semiconductor device controlled by two neighboring metallizations.

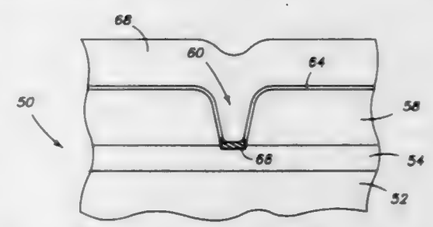
5,200,358
INTEGRATED CIRCUIT WITH PLANAR DIELECTRIC LAYER
Cheryl A. Bollinger, Kutztown; Min-Liang Chen, Allentown; David P. Favreau, Coopersburg; Kurt G. Steiner, Bethlehem, and Daniel J. Vitkavage, Zionsville, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 15, 1991, Ser. No. 793,070
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—180 **5 Claims**

1. A method of semiconductor integrated circuit fabrication comprising the steps of fabricating spaced apart features on a substrate, said features comprising a dielectric top layer and conducting bottom layer;
and making an electrical contact to at least a portion of the substrate between the features
Characterized in that said making comprises depositing first and second dielectrics over said features, etching said dielectrics with a blanket etchback after said second dielectric has been deposited, said second dielectric etching more rapidly than said first dielectric;
opening a contact window in said first and said second dielectric layers to said at least a portion of the substrate, said opening step comprises depositing and patterning a resist to form a window larger than the spacing between



said features and which exposes at least a portion of said dielectrics, and etching said exposed dielectrics to reveal at least a portion of the substrate area; and
electrically contacting said portion of the substrate, whereby said etching rate difference between said first and second dielectrics prevents formation of contacts to said bottom layer.

5,200,359
METHOD OF DECREASING CONTACT RESISTANCE BETWEEN A LOWER ELEVATION ALUMINUM LAYER AND A HIGHER ELEVATION ELECTRICALLY CONDUCTIVE LAYER
Leslie A. Pearey; Timothy P. O'Brien; John E. Knudson; Thomas N. Melody, and Russell C. Zaborik, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Oct. 3, 1991, Ser. No. 771,399
Int. Cl.[5] H01L *21/441*
U.S. Cl. 437—192 **21 Claims**



1. A semiconductor processing method for decreasing electrical contact resistance between different elevation electrically conductive layers, the method comprising the following steps:
applying an aluminum layer atop a partially processed semiconductor wafer, the aluminum layer having an upper surface;
exposing the semiconductor wafer with applied aluminum layer to an oxidizing atmosphere and forming an electrically resistive aluminum oxide at the upper surface of the aluminum layer;
applying an interlayer insulating dielectric material atop the aluminum layer;
selectively patterning and etching the interlayer dielectric to define a contact opening to the aluminum layer;
applying a layer of titanium metal atop the patterned and etched interlayer dielectric, the titanium metal contacting the upper aluminum oxide surface of the aluminum layer within the contact opening;
reacting the titanium metal with the aluminum oxide in the

contact to transform aluminum oxide into a less electri- lower wiring with an interlayer dielectric film, forming via-

a conductive paste (21) is inserted into the through-bores, and

attaching the heatsink to the surface by said adhesive so that a bondlength of the adhesive between the heatsink and the

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contact to transform aluminum oxide into a less electrically resistive titanium oxide; and

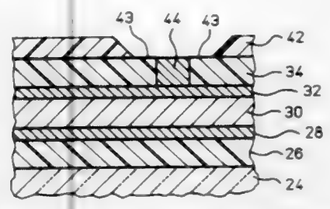
after application of the titanium metal and reaction to form a titanium oxide, applying a layer of conductive material atop the wafer over the titanium oxide, and thereafter selectively patterning and etching the conductive layer.

5,200,360

METHOD FOR REDUCING SELECTIVITY LOSS IN SELECTIVE TUNGSTEN DEPOSITION

Donald R. Bradbury, Palo Alto, and Gary W. Ray, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 12, 1991, Ser. No. 792,520
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—192 **4 Claims**



1. A method of providing a plug for electrical connection to a metallic layer on an integrated circuit substrate comprising:

forming an insulator layer on a metallic layer;

forming an antinucleation resist layer on said insulator layer;

forming a contact hole through said antinucleation resist layer and said insulator layer;

baking said antinucleation resist layer, effective for thermosetting said antinucleation resist layer;

removing an upper portion of said antinucleation resist layer, said removing including,

exposing a region of said insulator layer about said contact hole,

retaining a lower portion of said antinucleation resist layer to cover the remainder of said insulator layer, and

argon sputter etching and oxygen plasma descumming said metallic layer to the extent exposed by said forming of said contact hole;

selectively depositing tungsten into said contact hole; and

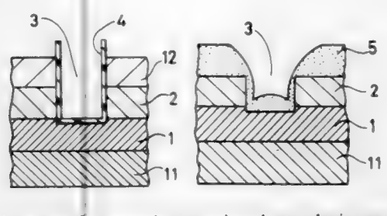
removing said antinucleation resist layer.

5,200,361

PROCESS FOR PREPARING A SEMICONDUCTOR DEVICE USING HYDROGEN FLUORIDE AND NITROGEN TO REMOVE DEPOSITS

Shigeo Onishi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1991, Ser. No. 772,869
Claims priority, application Japan, Nov. 15, 1990, 2-310395
Int. Cl.[5] H01L *21/44, 21/465*
U.S. Cl. 437—194 **3 Claims**



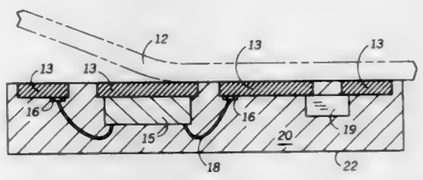
1. A process for preparing a semiconductor device comprising the steps of forming a lower wiring of aluminum or an aluminum alloy on a semiconductor substrate, coating said lower wiring with an interlayer dielectric film, forming via-holes in said interlayer dielectric film through a patterned resist by a reactive ion etching method to expose said lower wiring, removing deposits produced by said method in said via-holes and a portion of said interlayer dielectric film around said deposits by means of a mixed gas of hydrogen fluoride gas and nitrogen gas at a ratio of hydrogen fluoride to nitrogen of 0.1–20 wt.% in the absence of water vapor, and then forming upper wiring on said interlayer dielectric film.

5,200,362

METHOD OF ATTACHING CONDUCTIVE TRACES TO AN ENCAPSULATED SEMICONDUCTOR DIE USING A REMOVABLE TRANSFER FILM

Paul T. Lin; Michael B. McShane, both of Austin, Tex.; Sugio Uchida, and Takehi Sato, both of Nagano, Japan, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 576,255, Aug. 31, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 756,952
Claims priority, application Japan, Sep. 6, 1989, 1-231323
Int. Cl.[5] H01L *21/56, 21/58, 21/60*
U.S. Cl. 437—207 **8 Claims**



1. A process for fabricating a semiconductor device comprising the steps of:

providing a transfer film;

providing a pattern of conductive traces on said transfer film;

providing a semiconductor device die;

forming electrical interconnections between said pattern of conductive traces and said semiconductor device die;

providing a resin material on one side of said transfer film to encapsulate said semiconductor device die, said electrical interconnections, and a portion of said pattern of conductive traces; and

removing said transfer film to expose one side of said pattern of conductive traces.

5,200,363

METHOD FOR MANUFACTURING A SEMICONDUCTOR PACKAGE INCLUDING A GLASS SUPPORT

Steffen Schmidt, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 20, 1991, Ser. No. 830,205
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1990, 4040821
Int. Cl.[5] H01L *21/52, 21/58, 21/60*
U.S. Cl. 437—208 **2 Claims**

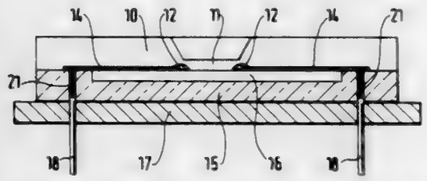
1. A method for constructing an electronic component with at least one silicon chip which is provided on at least one main surface with electronic switching elements, characterized in that

a housing (**17**) having a pattern of connector pins (**18**) is provided,

through-bores are provided in a glass support (**15**) in the same pattern as the connector pins (**18**) of the housing (**17**),

the silicon chip (**10**) is bonded to the glass support (**15**) with its main surface equipped with electronic switching elements (**12, 14**),

a conductive paste (**21**) is inserted into the through-bores, and



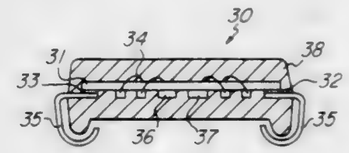
the glass support (**15**), together with the silicon chip (**10**) is applied to the housing (**17**) in such a way that the connector pins (**18**) extend into the through-bores.

5,200,364

PACKAGED INTEGRATED CIRCUIT WITH ENCAPSULATED ELECTRONIC DEVICES

Wah K. Loh, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 470,673, Jan. 26, 1990, Pat. No. 5,115,298. This application Jan. 21, 1992, Ser. No. 822,774
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—209 **2 Claims**



1. A method of making an integrated circuit package, the method comprising the steps of:

attaching a first electronic device to the top of and between two adjacent power supply busses of a leadframe;

attaching a second electronic device to the top of and between the two adjacent power supply busses of the leadframe;

attaching a semiconductor device to the bottom of the leadframe; and

encapsulating with an encapsulant the leadframe, the first and second electronic devices, and the semiconductor device to thereby form an integrated circuit package with leadfingers extending from the encapsulant.

5,200,365

SYSTEM FOR ACHIEVING DESIRED BONDLENGTH OF ADHESIVE BETWEEN A SEMICONDUCTOR CHIP PACKAGE AND A HEATSINK

Robbyn M. Culver, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

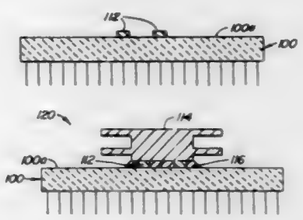
Division of Ser. No. 523,443, May 14, 1990, Pat. No. 5,055,909. This application Sep. 26, 1991, Ser. No. 765,597
Int. Cl.[5] H01L *21/56, 21/58*
U.S. Cl. 437—209 **6 Claims**

1. A method for attaching a heatsink to a semiconductor package, said package comprising a housing for holding a semiconductor chip, said housing having a surface suitable for connection to a heatsink to dissipate heat generated by the chip, said method comprising:

forming a plurality of spacers on said surface of the housing;

applying an adhesive to the surface or the heatsink;

attaching the heatsink to the surface by said adhesive so that a bondlength of the adhesive between the heatsink and the



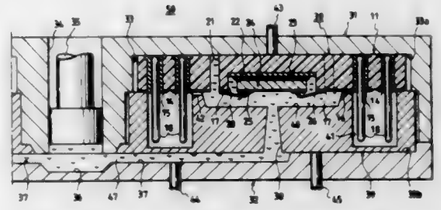
surface is substantially defined by the thickness of the spacers.

5,200,366

SEMICONDUCTOR DEVICE, ITS FABRICATION METHOD AND MOLDING APPARATUS USED THEREFOR

Tomio Yamada, Tamamura; Hiroi Oka, Takasaki; Atsusi Nakamura; Kunihiko Nishi, Kokubunji; Kazuo Yamazaki, Kodaira; Kouzi Koizumi, Hinode, and Junichi Saeki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 691,850
Claims priority, application Japan, Apr. 27, 1990, 2-114866; Feb. 25, 1991, 3-53300
Int. Cl.[5] H01L *21/56, 21/60*
U.S. Cl. 437—211 **16 Claims**



1. A method of fabricating a semiconductor device, comprising the steps of:

preparing a substantially square base substrate made of an insulating material;

forming radially a plurality of lead patterns around the periphery of a main plane of said base substrate;

adhering a substantially square pellet having electronic circuits and external terminals on a first main plane thereof to a pellet fixed portion substantially at the center of said main plane of said base substrate encompassed by the tips of said lead patterns;

connecting electrically the tips of said lead patterns to said external terminals by means of wires; and

molding said pellet, part of each of said leads and said wire by injecting under pressure a resin into a cavity;

wherein said resin is injected toward the substrate from a side of the substrate that includes the main plane, the resin being injected under pressure into said cavity from a gate extending toward the radial center of said lead patterns, and the resin is diffused radially along each of said wires and toward each air vent opened at a remotest position of said cavity from said gate.

5,200,367

bath and an upper portion of said member is disposed

5,200,370

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5,200,367

METHOD FOR ASSEMBLING PACKAGES OF SEMI-CONDUCTOR ELEMENTS

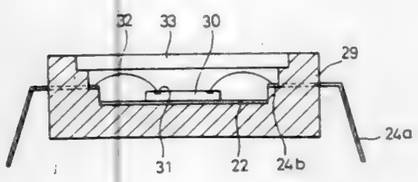
Jun S. Ko, Seoul, Rep. of Korea, assignor to Gold Star Electron Co., Ltd., Rep. of Korea

Filed Nov. 6, 1991, Ser. No. 787,484

Claims priority, application Rep. of Korea, Nov. 13, 1990, 18359/1990

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—216 **4 Claims**



1. A method for assembling a package of semi-conductor elements, comprising the steps of:

primarily molding inner leads of a lead frame previously prepared for manufacturing each of said packages, except for a part of said inner leads to be wire bonded, so as to maintain the inner leads at a certain state;

secondarily molding the inner leads by using a die mold, so as to form a package of a step shape in which a portion of each remaining inner lead is exposed at a surface of the package and an upper portion of the package is open;

bonding a die on a paddle of said lead frame and then bonding wires between respective exposed inner leads and a bonding pad of the die;

forming a covering lid on the open upper portion of the package; and

performing a trimming process to remove lead fixing dambers of a lead frame and performing a forming process to shape outer leads of the package to a desired shape.

5,200,368

CONTINUOUS SOLDER COATING APPARATUS AND ITS METHOD

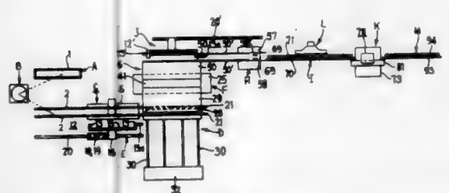
Naokatsu Kojima, Sunto, and Shinichi Makino, Mishima, both of Japan, assignors to Kabushiki-Kaisha Fuji Seiki Seizo Sho (Fuji Seiki Machine Works, Co. Ltd.), Shizuoka, Japan

Filed Sep. 24, 1991, Ser. No. 764,730

Claims priority, application Japan, Sep. 25, 1990, 2-251989

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—220 **17 Claims**



1. A continuous solder coating apparatus for an elongated lead frame having a plurality of semiconductor devices mounted at spaced intervals therealong with each semiconductor device having leads projecting outwardly from at least one pair of opposite sides, comprising:

a solder coating unit including means defining a liquid solder bath, and a coating member positioned over said bath so that a lower portion of said member is immersed in said bath and an upper portion of said member is disposed above said bath;

said upper portion having a tunnel-like solder coating passage extending horizontally therethrough and defined between generally opposed top and bottom walls, said passage having a cross section which substantially corresponds to the cross section of the lead frame and includes a channel-like groove of enlarged cross section for accommodating a plastic package which encloses the semiconductor device and a pair of narrow slit-like passages which project horizontally outwardly from opposite sides of said groove for accommodating leads which project from opposite sides of the package;

said coating member including a plurality of slit-like slots of narrow width projecting vertically thereof, each of said slots having a lower end which opens through the lower portion of the coating member for direct communication with the solder bath, and each of said slots having an upper end which opens upwardly in direct communication with one of the slit-like passages, each slit-like passage having at least one of said slit-like slots communicating therewith for feeding solder upwardly to the slit-like passage by capillary action;

a flux coating device for applying a flux solution to opposite surfaces of the lead frame;

transfer means for supporting the lead frame in a horizontal orientation and for moving it from the flux coating device to the solder coating unit and for effecting horizontal movement of the horizontally-oriented lead frame into and through the coating passage to effect solder coating of upper and lower surfaces of the leads.

5,200,369

GLAZE COMPOSITIONS

John F. Clifford, Sydenham, and Ivan Wozniak, Longton, both of United Kingdom, assignors to Cookson Group PLC, London, United Kingdom

Filed Apr. 9, 1991, Ser. No. 682,381

Claims priority, application United Kingdom, Apr. 12, 1990, 9008386

Int. Cl.[5] C03C *3/091*

U.S. Cl. 501—66 **5 Claims**

1. A transparent glaze composition for use on china and fine china which is essentially free from lead and cadmium and which consists essentially of the following components:

SiO_2	35 to 60%
Bi_2O_3	5 to 45%
Al_2O_3	7 to 45%
B_2O_3	4 to 10%
at least one of CaO, MgO, SrO or BaO	2 to 20%
at least one of Li_2O, Na_2O, K_2O	1 to 10%
TiO_2	0 to 10%
ZrO_2	0 to about 2.5%
SnO	0 to 10%
Nb_2O_5	0 to 5%
Ta_2O_5	0 to 5%
Sb_2O_3	0 to 5%
a rare earth oxide	0 to 10%
ZnO	0 to 10%
P_2O_5	0 to 10%
MoO_3 and/or WO_3	0 to 5%
fluoride ions	0 to 5%

all percentages being percentages by weight based on the total weight of the composition, with the proviso that BaO is not contained in an amount of more than 2% by weight, the glaze composition having a firing temperature of 1100° C.±40° C., and having a coefficient of thermal expansion of 50 to 90×10^{-7}° C.$^{-1}$.

5,200,370

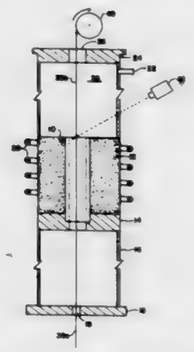
MONOCRYSTALLINE CERAMIC FIBERS AND METHOD OF PREPARING SAME

James R. Lennox; Roger T. Pepper, both of Saco, and Paul V. Chayka, Gorham, all of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Nov. 16, 1990, Ser. No. 615,025

Int. Cl.[5] C04B *35/02;* **H01B** *12/00;* **C30B** *13/00*

U.S. Cl. 501—95 **25 Claims**



1. Process for preparing a substantially monocrystalline ceramic fiber, said process comprising the steps of:

forming a continuous coating on a fiber of polycrystalline ceramic, said coating being substantially chemically nonreactive with said fiber and comprising a refractory material having a melting point higher than that of said polycrystalline fiber;

heating the coated fiber in a zone to a temperature above the melting point of said ceramic, but below the melting point of said coating, so as to melt said ceramic; and,

cooling said melted ceramic at a rate sufficient to crystallize said ceramic in said substantially monocrystalline form.

5,200,371

METHOD FOR PREPARING ORGANIC SILAZANE POLYMERS AND METHOD FOR PREPARING CERAMICS FROM THE POLYMERS

Yoshihumi Takeda, Jouetsu, and Akira Hayashida, Higashimurayama, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 631,272

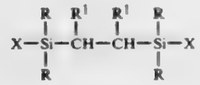
Claims priority, application Japan, Dec. 20, 1989, 1-330109

Int. Cl.[5] C04B *35/02*

U.S. Cl. 501—95 **1 Claim**

1. A method for manufacturing a ceramic material comprising the steps of:

reacting an organic silicon compound of formula (I):

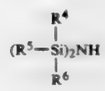


(I)

wherein R is selected from the class consisting of hydrogen, chloro, bromo, methyl, ethyl, phenyl, and vinyl, R^1 is hydrogen or methyl, and X is chloro or bromo, or a mixture of an organic silicon compound of formula (I) and an organic silicon compound of formula (II):

(II)

wherein R^2 and R^3 are independently selected from the class consisting of hydrogen, chloro, bromo, methyl, ethyl, phenyl, and vinyl, and X is chloro or bromo, with a disilazane of formula (III):



(III)

wherein R^4, R^5 and R^6 are independently selected from the class consisting of hydrogen, methyl, ethyl, phenyl, and vinyl, at a temperature of 25° to 350° C. in an anhydrous atmosphere; and reacting the resulting organic silazane polymer having residual halogen in an amount of 0.05 to 3% by weight with ammonia added to the polymer in an amount of 2 to 10 times on molar basis relative to the content of residual halogen in the polymer, thereby reducing the residual halogen in the polymer to 0.01% by weight or lower;

melting the resulting organic silazane polymer having a reduced content of the residual halogen to form a desired shape;

infusibilizing the formed article; and

firing the article into inorganic form.

5,200,372

METHOD FOR PRODUCTION OF HIGH-PRESSURE PHASE SINTERED ARTICLE OF BORON NITRIDE FOR USE IN CUTTING TOOL AND SINTERED ARTICLE PRODUCED BY THE METHOD

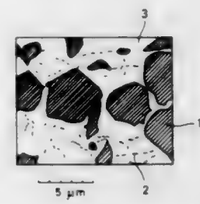
Yutaka Kuroyama, Aichi, and Nasumi Maeno, Handa, both of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1990, Ser. No. 635,985

Claims priority, application Japan, Jan. 12, 1990, 2-3336

Int. Cl.[5] C04B *35/56, 35/58*

U.S. Cl. 501—96 **5 Claims**



1. A sintered article of high-pressure phase boron nitride for use in cutting tool, which is produced by mixing wurtzite type boron nitride particles of a maximum diameter of 1 μm with an intermetallic compound formed between at least one inorganic compound selected from the group consisting of a) at least one compound of carbides, nitrides, and borides severally of the elements of Group 4a (Ti, Zr, and Hf), Group 5a (V, Nb, and Ta), and Group 6a (Cr, Mo, and W) in the Periodic Table of Elements and b) a mutual solid solution of said compounds and at least one metal selected from the group consisting of Al, Ni, Si, Co, Zr, and W, further mixing cubic boron nitride particles of a maximum diameter of 1 μm with the resultant mixture and sintering the produced mixture under a pressure of at least 20 Kb at a temperature of at least 1,000° C. and which comprises (1) 10 to 80% by volume of high-pressure phase boron nitride

composed of 95 to 99.9% by volume of said cubic boron nitride

5,200,375

methyl chloride by reacting methane with hydrogen chloride

alumina polymer, zirconium polymer, chromium polymer and

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composed of 95 to 99.9% by volume of said cubic boron nitride and 0.1 to 5% by volume of wurtzite type boron nitride and (2) 20 to 90% by volume of intermetallic binding phase compound having said high-pressure phase boron nitride dispersed uniformly therein.

5,200,373

HIGH STRENGTH COMPOSITE CERAMIC STRUCTURE AND PROCESS FOR PRODUCING THE SAME

Yoshiyuki Yasutomi; Seiji Watahiki, both of Katsuta; Junji Sakai, Ibaraki; Akio Chiba; Tadahiko Miyoshi, both of Hitachi, and Masahisa Sobue, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1991, Ser. No. 670,734
Int. Cl.[5] C04B *35/58, 41/87, 38/00;* C23C *16/34*
U.S. Cl. 501—97 11 Claims

1. A composite ceramic structure of sintered ceramics having a porosity of 5 to 40% by volume comprising a shape composed of particles selected from the group consisting of grains and whiskers of at least one inorganic compound selected from the group consisting of TiO_2, ZrO_2, Cr_2O_3, Al_2O_3, BeO, Ta_2O_5, HfO_2, Nb_2O_5 WO_3, V_2O_5 and MgO, said particles having layers coated thereon of at least one inorganic compound selected from the group consisting of SiC, Si_3N_4, SiO_2, TiC, TiN, AlN, ArN, ZrC, Cr_3C_2, Cr_2N, BeN, WC, WN, VN, VC, Fe_3C, Mo_2N, Mo_2C, ThC, HfN, HfC, TaN, TaC and NbN, and being bonded to one another with epitaxially grown silicon nitride particles having an average particle size of not more than 0.2 μm.

5,200,374

SIALON-BASED SINTERED BODY AND PROCESS FOR PRODUCING SAME

Tetsuo Yamada; Tetsuo Nakayasu, both of Ube; Atsuhiko Tanaka, Yamaguchi; Takuji Takahashi, and Yasuhiko Kohtoku, both of Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 5, 1991, Ser. No. 680,944
Claims priority, application Japan, Apr. 6, 1990, 2-90140; Apr. 17, 1990, 2-99253; Jun. 5, 1990, 2-145301
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—98 10 Claims

1. A SiAlON-based sintered body, comprising:

5 to 50% by weight of a first crystal phase of REα-SiAlON represented by $RE_x(Si, Al)_{12}(O, N)_{16}$ where RE stands for at least one modifying rare earth element, wherein said element is Ho, Er, Tm, Yb, or Lu and x has a value of $0<x\leqq 2$;

30 to 90% by weight of a second crystal phase of β-SiAlON represented by $Si_{6-z}Al_zO_zN_{8-z}$ where z has a value of $0<z\leqq 4.2$; and

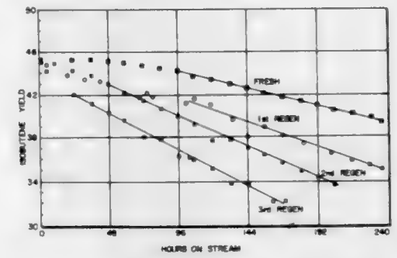
2 to 10% by weight of a third crystal phase containing at least one rare earth element RE, wherein said element is Ho, Er, Tm, Yb, or Lu, and wherein said third crystal phase is a melilite crystal phase of $RE_2Si_3N_4O_3$.

5,200,375

HYDROGEN REGENERATION OF MONOFUNCTIONAL DEHYDROGENATION AND AROMATIZATION CATALYSTS

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 597,218, Oct. 15, 1990, abandoned.
This application Jan. 6, 1992, Ser. No. 819,563
Int. Cl.[5] B01J *29/38, 38/10;* C07C *5/333;* C10G *35/095*
U.S. Cl. 502—53 14 Claims



1. A process for regenerating a coked monofunctional catalyst composition resulting from catalysis in dehydrogenation and/or dehydrocyclization, wherein the coked monofunctional catalyst composition comprises

a dehydrogenation/hydrogenation metal and a non-acidic microporous crystalline material wherein the dehydrogenation/hydrogenation metal is present in an amount which ranges from 0.1 to 20 weight percent;

wherein said material contains 0.1 to 20 weight percent of tin, indium, thallium or lead;

which coked monofunctional catalyst composition suffers dehydrogenation/hydrogenation metal migration and agglomeration, on exposure to oxygen regeneration conditions; wherein the microporous crystalline material has an X-ray diffraction pattern of a zeolite which is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-35, ZSM-48 and ZSM-50;

wherein the process consists essentially of:

regenerating the catalyst, in the absence of oxygen, by contacting said catalyst with hydrogen, at an elevated pressure of at least about 400 to about 600 psig and subjecting the catalyst to an elevated temperature of from 100° up to about 600° C.

5,200,376

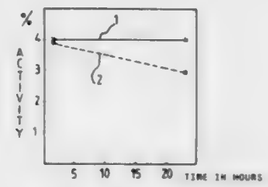
CATALYSTS FOR OXYHYDROCHLORINATION OF METHANE

Jacques Saint Just, Le Pecq; Yaounès B. Taarit, Tassin La Demi Lune; Meyer C. Naccache, Ecully, and Michel Dufaux, Saint Germain Mont D'or, all of France, assignors to Gaz De France, France

Filed Apr. 24, 1991, Ser. No. 690,497
Claims priority, application France, Apr. 27, 1990, 90 05454
Int. Cl.[5] B01J *29/04*
U.S. Cl. 502—60 4 Claims

1. A catalyst for the oxyhydrochlorination of methane into

methyl chloride by reacting methane with hydrogen chloride and oxygen, the catalyst comprising a zeolite partially exchanged with divalent metallic Mn^{++} cations and between 0.5% and 10% by weight Cu^{++} cations.



5,200,377

ZEOLITE SSZ-28

Stacey I. Zones, San Francisco; Dennis L. Holtermann, Crockett, and Robert A. Innes, San Rafael, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation of Ser. No. 198,414, May 25, 1988, abandoned.
This application Mar. 2, 1992, Ser. No. 844,192
Int. Cl.[5] B01J *29/28;* C01B *35/10, 33/34*
U.S. Cl. 502—62 13 Claims

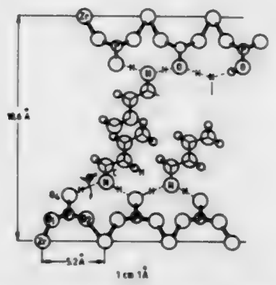
2. A zeolite having a composition, as synthesized and in the anhydrous state, in terms of mole ratios of oxides as follows: (0.1 to 2.0)Q_2O:(0.1 to 2.0)M_2O:W_2O_3:(20:1 to about 45:1) YO_2 wherein M is an alkali metal cation, W is selected from aluminum, gallium, iron, boron and mixtures thereof, Y is selected from silicon, germanium and mixtures thereof, Q is an N,N-dimethyltropinium or N,N-dimethyl-3-azonium bicyclo[3.2.2]nonane cation and having the X-ray diffraction lines of Table 1.

5,200,378

PILLARING OF LAYERED COMPOUNDS

Abraham Clearfield, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.

Continuation of Ser. No. 382,059, Jul. 14, 1989, Pat. No. 5,017,537, which is a continuation of Ser. No. 142,731, Jan. 11, 1988, abandoned. This application May 20, 1991, Ser. No. 702,804
The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.
Int. Cl.[5] B01J *29/04*
U.S. Cl. 502—62 30 Claims



1. A pillared composition comprising a layered material which does not swell appreciably in water, the layers of which are selected from the group consisting of layers of a group IV A or IVB phosphate, alkali titanate, titanium niobate, alkaline niobate, antimonate, manganate, silicate, or metal oxide and said layers are separated by a pillaring substance, wherein said pillaring substance is selected from the group consisting of alumina polymer, zirconium polymer, chromium polymer and bismuth polymer.

5,200,379

OLEFIN POLYMERIZATION USING SUPPORTED PENTADIENYL DERIVATIVE-TRANSITION METAL COMPLEXES

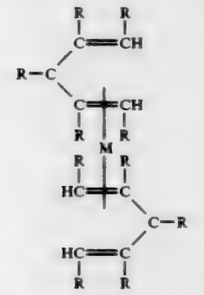
Max P. McDaniel, Bartlesville, Okla., and Paul D. Smith, Seabrook, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 534,658, Jun. 7, 1990, Pat. No. 5,075,394.
This application Nov. 1, 1991, Ser. No. 786,713
Int. Cl.[5] C08F *4/64, 4/642*
U.S. Cl. 502—154 10 Claims

1. A process of preparing an olefin polymerization catalyst comprising:

(a) activating an inorganic refractory compound by calcining in air; and

(b) contacting said activated inorganic refractory compound with a pentadienyl derivative-transition metal complex, said pentadienyl derivative-transition metal complex being selected from the group represented by the structural formula:



wherein each R is hydrogen, an alkyl radical having 1 to 4 carbon atoms or a silyl radical of the formula-SiR^1_3 wherein R^1 is an alkyl radical having 1 to 4 carbon atoms, and M is a transition metal selected from titanium, vanadium and zirconium under conditions whereby said complex is adsorbed on said refractory compound.

5,200,380

PROCESS FOR PRODUCING ALDEHYDES

Wolfgang Herrmann, Freising; Christian Kohlpaintner, Stephanskirchen, and Helmut Bahrmann, Hanauinkeln, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 6, 1991, Ser. No. 804,832
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040315
Int. Cl.[5] B01J *31/00;* C07F *15/00;* C07C *45/00*
U.S. Cl. 502—166 2 Claims

1. A catalyst for hydroformylation of a monomer selected from the group consisting of monoolefins, unconjugated polyolefins, cycloolefins, and derivatives thereof, said catalyst containing rhodium and a diphosphine, said diphosphine resulting from sulfonation of biaryl compounds of Formula I

5,200,388

METALORGANIC CHEMICAL VAPOR DEPOSITION OF

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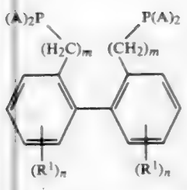


(I)

wherein the A radicals are independently alkyl, cycloalkyl, phenyl, tolyl, or naphthyl; the R^1 radicals are independently hydrogen, alkyl having 1 to 14 carbon atoms, alkoxy having 1 to 14 carbon atoms, aryloxy having 1 to 14 carbon atoms, cycloalkyl having 6 to 14 carbon atoms, aryl having 6 to 14 carbon atoms, aryloxy having 6 to 14 carbon atoms, or a fused benzene ring; the m's are independently integers from 0 to 5, and the n's are independently integers from 0 to 4.

5,200,381

METHOD OF PREPARING CATALYST FOR HYDROGENATION OF HYDROCARBON OIL

Tetsuro Kamo, Ichikawa, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Oct. 10, 1991, Ser. No. 774,339
Claims priority, application Japan, Oct. 17, 1990, 2-278057
Int. Cl.[5] B01J *31/04*
U.S. Cl. 502—170 **16 Claims**

1. A method of preparing a catalyst for the hydrogenation of a hydrocarbon oil without calcination which consists of the steps of (a) providing a carrier substance consisting essentially of at least one of an inorganic oxide and an inorganic oxide hydrate, (b) contacting said carrier substance with an aqueous solution containing ions of a metal from Group VI of the Periodic Table, ions of a metal from Group VIII of the Periodic Table and hydrocarboxylic acid to form a blend, (c) kneading and shaping said blend, and (d) heating said blend to a temperature not higher than 200° C.

5,200,382

CATALYST COMPRISING THIN SHELL OF CATALYTICALLY ACTIVE MATERIAL BONDED ONTO AN INERT CORE

Ian A. Cody, Clearwater; Mahmoud M. Hafez, Bright's Grove, and David N. Zinkie, Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 15, 1991, Ser. No. 792,544
Int. Cl.[5] B01J *27/13*
U.S. Cl. 502—204 **19 Claims**

1. A catalyst comprising a thin annular shell of catalytically active material in gamma alumina deposited on and bonded to an inert, non-catalytically active core.

5,200,383

METHOD FOR THE PRODUCTION OF CATALYTICALLY ACTIVE MIXED PHASES

Michael Kotter, Bruchsal, and Friedrich Weyland, Leimen-St. Ilgen, both of Fed. Rep. of Germany, assignors to Kraftanlagen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP88/00902, § 371 Date May 10, 1990, § 102(e) Date May 10, 1990, PCT Pub. No. WO89/03244, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 8, 1988, Ser. No. 382,785
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734429
Int. Cl.[5] B01J *35/02*
U.S. Cl. 502—300 **10 Claims**

1. Method for the production of catalytically active mixed phases in powder form from precursors which contain the elements of the mixed phases, with thermal and mechanical treatment, in which method the precursor contained in a solution containing a solvent is applied to heated surfaces of moving heat carrying bodies, precipitated on said bodies with evaporation of the solvent, and decomposed, and calcined, the mixed phase formed on the heat carrying bodies is removed from the heat carrying bodies, and the mixed phase is subsequently crushed.

5,200,384

EXHAUST GAS-PURIFYING CATALYST EXCELLENT IN HEAT RESISTANCE AND PROCESS FOR PREPARATION THEREOF

Masaki Funabiki, Mishima; Kunihide Kayano, and Teiji Yamada, both of Numazu, all of Japan, assignors to N.E Chemcat Corporation, Tokyo, Japan

PCT No. PCT/JP90/00753, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/14888, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 8, 1990, Ser. No. 635,519
Claims priority, application Japan, Jun. 9, 1989, 1-145491
The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.
Int. Cl.[5] B01J *21/04, 23/10, 23/56, 37/03*
U.S. Cl. 502—304 **16 Claims**

1. An exhaust gas-purifying catalyst containing on a support having a monolithic structure as catalytic components at least one element of the platinum group, activated alumina, cerium oxide and a coprecipitated ceria-stabilized zirconia.

5,200,385

THERMOSENSITIVE RECORDING MATERIAL

Hiroaki Inoue, Fuji; Norihiko Inaba; Hiroaki Okuda, both of Numazu, and Koji Yamamoto, Fuji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 12, 1989, Ser. No. 449,004
Claims priority, application Japan, Dec. 20, 1988, 63-322378; Nov. 2, 1989, 1-286886
Int. Cl.[5] B41M *5/26*
U.S. Cl. 503—209 **8 Claims**

1. A thermosensitive recording material comprising a substrate, and a thermosensitive recording layer formed thereon, which comprises:
a leuco dye;
a color developer capable of inducing color formation in said leuco dye upon application of heat thereto, and
a water-soluble lubricant, wherein said water-soluble lubricant is an alkylphosphate anionic surface active agent.

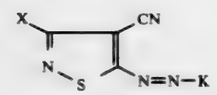
5,200,386

AZO DYES FOR THERMOTRANSFER PRINTING

Ruediger Sens, Mannheim; Helmut Reichelt, Neustadt; Sabine Gruettner, Mutterstadt; Karl-Heinz Etzbach, Frankenthal, and Gunther Lamm, Hassloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

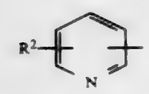
Filed May 31, 1991, Ser. No. 708,371
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1990, 4018067
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 **6 Claims**

1. A process for transferring an azo dye by diffusion from a transfer to a plastic-coated substrate with the aid of a heat source, which comprises using for this purpose a transfer on which there is or are situated one or more azo dyes of the formula I



I

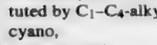
in which the substituents have the following meanings:
X is a radical of the formula IIa or IIb



IIa

IIb

where
R^1 is hydrogen, C_1–C_6-alkyl, or phenyl which may be substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy, chlorine, bromine or cyano,
n is 1 or 2, and
R^2 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine or bromine, and
K is the radical of a coupling component III



III

of an aniline, aminoaphthaline, pyrazole, hydroxypyridone or tetrahydroquinoline.

5,200,387

SUPERCONDUCTING MATERIALS OF HIGH DENSITY AND CRYSTALLINE STRUCTURE PRODUCED FROM A MIXTURE OF $YBA_2CU_3O_{7-x}$ AND CUO

Martin Schwarz, Königstein/Taunus, and Iris Küllmer, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 17, 1990, Ser. No. 553,746
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3923845
Int. Cl.[5] H01B *12/00;* **C01G** *3/02*
U.S. Cl. 505—1 **6 Claims**

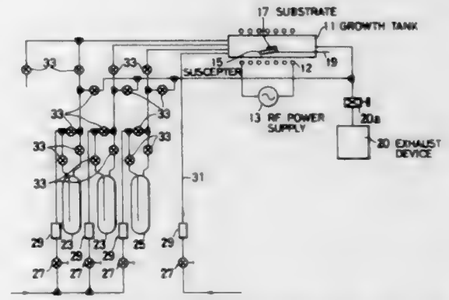
1. A process for the preparation of a superconductor of the empirical composition $YBa_2Cu_3O_{7-x} \times zCuO$, in which z is a number from 0.08 to 0.84, which consists of elongated crystals grown together irregularly and has a density of at least 5.9 g/cm^3 and a critical temperature of about 88° to about 90° K., wherein a fine-grained superconductor powder of the composition $YBa_2Cu_3O_{7-x}$ is mixed with 1 to 10% by weight of fined-grained CuO, wherein the CuO has an average particle size of no more than 100 μm, the mixture is compacted under a pressure-released 1 MPa, and the resulting compact is heated at 940°–985° C. for at least 5 hours.

5,200,388

METALORGANIC CHEMICAL VAPOR DEPOSITION OF SUPERCONDUCTING FILMS

Hitoshi Abe, and Tomohiro Nakamori, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 348,676, May 5, 1989, abandoned. This application Jun. 22, 1990, Ser. No. 542,151
Claims priority, application Japan, May 13, 1988, 63-114710
Int. Cl.[5] B05D *3/06, 5/12;* **C23C** *16/00*
U.S. Cl. 505—1 **5 Claims**



1. A process for forming a superconducting film on a substrate using chemical vapor deposition wherein the superconducting film exhibits a zero resistance at a temperature of at least 80° K., said process comprising the steps of:
(a) heating said substrate upon which said superconducting film is to be formed;
(b) providing the following source materials:
(1) one of the compounds $Ba(DPM)_2$-$(THF)_\eta$ or $Ba(DPM)_2$-$(DMF)_\eta$,
(2) one of the compounds $Cu(DPM)_2$-$(THF)_\eta$ or $Cu(DPM)_2$-$(DMF)_\eta$, and
(3) one of the compounds $M(DPM)_3$-$(THF)_\eta$ or $M(DPM)_3$-$(DMF)_\eta$,
where DPM is 2, 2, 6, 6-tetramethyl-3,5-heptanedianate represented by the chemical formula

$$CH_3C(CH_3)_2COCHCOC(CH_3)_2CH_3$$

where THF is tetrahydrofuran represented by the chemical formula:

where DMF is dimethylformamide represented by the chemical formula $CHON(CH_3)_2$
where M is an element chosen from the list:
Y, La, Nd, Pm, Sm, Eu, Er, Gd, Tb, Dy, Ho, Tm, Yb or Lu, and
where n is any integer;
(c) gasifying said source materials to form first gases;
(d) introducing said first gases into a growth tank; and
(e) simultaneously introducing at least one of the following second gases O_2, O_3, or N_2O to said tank whereby an oxide superconducting film is formed on said substrate located in said growth tank.

5,200,389

aqueous solution containing dissolved copper and barium

5,200,392

COMPOSITE FOR MAKING SUPERCONDUCTING

prising mono-oleoyl phosphatidylethanolamine vesicles, a salt solution, and a water soluble protein or peptide wherein the

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5,200,389
METHOD FOR MANUFACTURING AN OXIDE SUPERCONDUCTING ARTICLE

Kyoji Tachikawa, Hiratsuka; Yukio Shinbo, Tokyo; Moriaki Ono, Tokyo; Shigeyoshi Kosuge, Tokyo, and Makoto Kabasawa, Tokyo, all of Japan, assignors to The Tokai University Juridicial Foundation and NKK Corporation, both of Tokyo, Japan

Continuation of Ser. No. 482,203, Feb. 20, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 782,795
Claims priority, application Japan, Mar. 13, 1989, 1-60460
Int. Cl.[5] B05D *3/02*
U.S. Cl. 505—1 **11 Claims**

1. A method for manufacturing a superconducting article, comprising the steps of:

forming a first layer comprising a mixture of a superconductor $LnBa_2Cu_3O_x$ and a Ln_2BaCu oxide on a surface of a substrate selected from the group consisting of ceramics, nickel and a nickel alloy, said Ln is a rare earth element, said mixture of the superconductor $LnBa_2Cu_3O_x$ and the Ln_2BaCu oxide being prepared by subjecting a mixture of CuO, $BaCO_3$ and Ln_2O_3 to a plurality of treatments, each comprising a firing, a cooling and a pulverizing, and the content ratio of the Ln_2BaCu oxide in said first layer being within the range of from 5 to 80 wt. % relative to the total amount of the superconductor $LnBa_2Cu_3O_x$ and the Ln_2BaCu oxide; then

forming a second layer comprising a mixture of at least CuO and $BaCuO_2$ on a surface of said first layer, the molar ratio of copper to barium in said second layer being within the range of copper: barium = 1:0.10 to 0.95, and said second layer having a melting point of from 800° to 1,000° C.; then

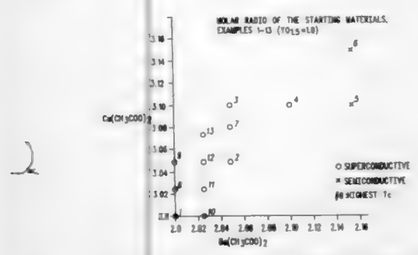
melting said mixture in said second layer, and keeping the molten state of said second layer for a period of time of from 1 minute to 4 hours in an oxygen-containing atmosphere to cause the resultant melt of said mixture in said second layer to diffusion-react with the Ln_2BaCu oxide in said first layer, thereby converting said first layer and said second layer into a film of an oxide superconductor comprising the superconductor $LnBa_2Cu_3O_x$; and

cooling said film of said oxide superconductor thus produced to room temperature, thereby manufacturing said superconducting article comprising said substrate and said film of said oxide superconductor formed on the surface of said substrate.

5,200,390
CO-PRECIPITATION PROCESS FOR PREPARING SUPERCONDUCTOR POWDER

Wei-Yean Howng, Albuquerque, N. Mex., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 21, 1990, Ser. No. 526,273
Int. Cl.[5] H01B *12/06;* **C01G** *3/00;* **C04B** *41/89;* **H01L** *39/12*
U.S. Cl. 505—1 **16 Claims**



1. A co-precipitation process for preparing a superconductor powder comprising:

suspending an insoluble yttrium compound powder in an aqueous solution containing dissolved copper and barium salts to form a slurry,

adding an aqueous ammonium carbonate solution to the slurry, whereupon a precipitate forms that comprises copper and barium carbonate compounds deposited onto the yttrium compound powder,

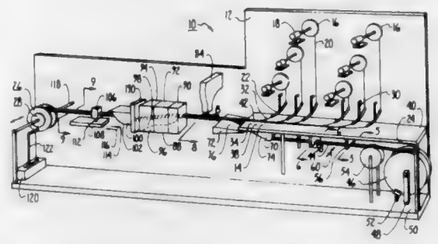
drying the precipitate, and

calcining the dried precipitate to form the superconductor powder.

5,200,391
METHOD AND APPARATUS FOR FABRICATING A MULTIFILAMENTARY WIRE

Michael V. Fisher, San Diego; Kurt M. Schaubel, Cardiff; Lawrence D. Woolf, Carlsbad; Robert A. Olstad, San Diego, and William A. Raggio, Del Mar, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Sep. 24, 1990, Ser. No. 587,230
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 **11 Claims**



1. An apparatus for manufacturing a bend-tolerant superconductor wire having an electrically conductive support substrate and a plurality of superconductor filaments, which comprises:

means for aligning said filaments into a layer of superconductor material comprising a backboard;

a plurality of supply spools rotatably mounted on said backboard, each of said supply spools holding one of said superconductor filaments;

a plurality of movable wire transfer controllers, each of said controllers being mounted on said backboard to individually engage with one of said superconductor filaments from said respectively associated supply spool to establish a preselected orientation for said controllers;

means for generating a signal representative of the deviation of said controller from said preselected orientation;

a plurality of drive means each electrically connected with a respective signal generating means and operatively connected with a respective said supply spool for rotating said respective supply spool in response to said signal;

a combiner board having a surface formed with a guide channel and a plurality of curved grooves integrally extending therefrom, each of said grooves sequentially aligned on said surface for individually receiving one of said superconductor filaments and feeding said superconductor filament into said guide channel

means for positioning said layer on said substrate;

means for uniformly moving said layer together with said substrate at a preselected speed;

means for dispensing a flowable solder paste having a flux constituent and a solder metal constituent onto said moving substrate to cover said layer with said solder paste;

means for heating said solder paste to activate said flux and melt said solder metal to surround said layer with said solder; and

means for freezing said solder to encase said superconductor layer in said solder and attach said solder to said substrate.

5,200,392
COMPOSITE FOR MAKING SUPERCONDUCTING WIRES OR TAPES

A. Srinivasa Rao, Arnold, and Om P. Arora, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1990, Ser. No. 599,604
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 **6 Claims**

1. An improved metal plus ceramic superconducting wire or tape comprising:

a metal plus ceramic superconductor composite having a superconducting transition temperature of about 85° K. to about 88° K., and further wherein the resistance of said superconductor composite at room temperature is about $1.6\times10^{-6}\Omega$-cm;

said superconductor composite composed of a combination of about 60 weight percent of substantially pure aluminum and about 40 weight percent of a superconducting ceramic compound;

said superconducting ceramic compound composed of a mixture of about 100 grams of Y_2O_3, about 200 grams of $BaCO_3$ and about 300 grams of CuO, said superconductor ceramic compound further having the formula $YBa_2Cu_3O_{6+x}$;

said metal plus ceramic superconducting wire or tape produced by the process comprising the steps of:

mixing yttrium oxide, barium carbonate and copper oxide to produce a mixture of about 100 grams of Y_2O_3, about 200 grams of $BaCO_3$ and about 300 grams of CuO;

ball milling said mixture for at least one hour;

calcining said mixture at a temperature of 940° C. + or −2° C. with a heating sequence of about 3° C. to about 5° C. per minute, said temperature being maintained for about 300 to about 600 minutes;

cooling said mixture to room temperature at the rate of about 3° C. to about 5° C. per minute;

grinding said mixture into a fine powder;

heating said mixture to a temperature of about 700° C. at the rate of about 5° C. per minute;

cooling said mixture, for about 300 minutes in a flowing oxygen environment, to a temperature of about 500° C. to 600° C.;

annealing said mixture at a temperature of about 550° C. to 600° C. for about 300 minutes in a flowing oxygen environment;

cooling said mixture to room temperature at a rate of 1° C. per minute, wherein the above steps produce said superconducting ceramic compound;

combining said superconducting ceramic compound with said substantially pure aluminum by mixing about 60 weight percent of substantially pure aluminum powder and about 40 weight percent of said superconducting ceramic compound;

ball milling said combination for at least one hour to produce said superconductor composite; and

processing said superconductor composite into said metal plus ceramic superconducting wire or tape.

5,200,393
LIPID EXCIPIENT FOR NASAL DELIVERY AND TOPICAL APPLICATION

Alan L. Weiner, Lawrenceville, N.J., assignor to The Liposome Company, Inc., Princeton, N.J.

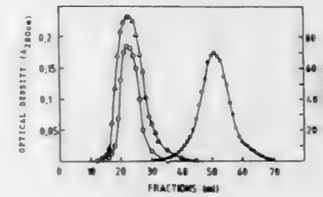
Continuation of Ser. No. 07/312,512, Feb. 17, 1989, abandoned. This application Aug. 27, 1991, Ser. No. 758,276
Int. Cl.[5] A61K *37/02, 47/44*
U.S. Cl. 514—3 **23 Claims**

1. A non-irritating lipid vesicle excipient composition comprising mono-oleoyl phosphatidylethanolamine vesicles, a salt solution, and a water soluble protein or peptide wherein the composition has a pH from about 8.5 to about 10.0 and a concentration of mono-oleoyl phosphatidylethanolamine of about 0.1 to 0.4 weight %, wherein the excipient is adapted for mucosal delivery.

5,200,394
DERIVATIVES OF TYPE A AND B SYNERGIMYCINS

Mario Di Giambattista, 38, Av. de Mai, 1200, Brussel; André Pecher, Ave. Télémaque 8 bte 10, 1190 Brussels, and Carlo Cocito, Rue de l'Elevage 26, 1340 Bruyeres/Ottignies, all of Belgium

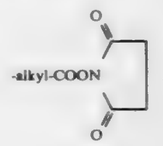
PCT No. PCT/BE88/00029, § 371 Date Jun. 22, 1990, § 102(e) Date Jun. 22, 1990, PCT Pub. No. WO89/03843, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 474,806
Claims priority, application Belgium, Oct. 22, 1987, 8701199
Int. Cl.[5] A61K *37/00, 37/02;* **C07K** *7/02, 5/00*
U.S. Cl. 514—9 **21 Claims**

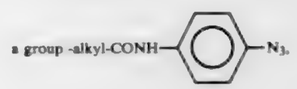


1. Derivatives of synergimycin according to the formula

Z—X—R

where Z is a synergimycin radical of type A or B which is linked through its reactive carbonyl, by means of an arm X of the type =N— or =N—O—, to a substituent R representing a hydrogene atom, an alkyl group, an alkyl-COOH group, a group -alkyl-(α-NH_2)COOH, a group





a group -(Alk-CONH)$_n$ Prot, or a group -(Alk-CONH)$_n$-Rib, where n is a function of the $-NH_2$ content of the coupling protein as well as pharmaceutically acceptable salts, esters and optionally, acid addition compounds with pharmaceutically acceptable acids.

5,200,395

5,200,400

5,200,402

5,200,395

PHARMACEUTICAL COMPOSITION OF BUF-5 FOR TREATING ANEMIA

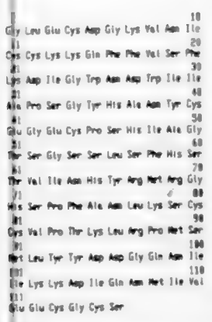
Yuzuru Eto; Naoto Koyama; Daisuke Ejima; Masayo Washitake, and Hiroshiro Shibai, all of Kawasaki, Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Continuation of Ser. No. 617,259, Nov. 23, 1990, abandoned, which is a continuation of Ser. No. 423,875, Oct. 18, 1989, abandoned. This application Oct. 29, 1991, Ser. No. 784,685

Claims priority, application Japan, Oct. 18, 1988, 63-262321; Oct. 18, 1988, 63-262322; Oct. 18, 1988, 63-262323

Int. Cl.[5] **A61K** *37/02*

U.S. Cl. 514—12 **1 Claim**



1. A method of treating anemia, comprising administering an antianemia effective amount of BUF-5 to a patient in need thereof.

5,200,396

METHOD OF TREATING NEURODEGENERATIVE DISORDERS USING EPIDERMAL GROWTH FACTOR

Angelo Carenzi, Busto Arsizio; Gianni Pezzoli, Milan, and Sante Ricciardi, Bresso, all of Italy, assignors to Zambon Group S.P.A., Vicenza, Italy

Filed Apr. 24, 1991, Ser. No. 690,670

Claims priority, application Italy, Apr. 26, 1990, 20144 A/90

Int. Cl.[5] **A61K** *37/02, 37/36*

U.S. Cl. 514—12 **3 Claims**

1. A method for the treatment of neurodegenerative disorders in a patient comprising administering to said patient in need of the treatment a neurotrophically effective amount of Epidermal Growth Factor.

5,200,397

USE OF PEPTIDE ANALOGS OF THROMBOSPONDIN FOR THE INHIBITION OF ANGIOGENIC ACTIVITY

Alan H. Deutch, Columbia, Md., and George P. Tuszynski, Williamstown, N.J., assignors to W. R. Grace & Co.-Conn., New York, N.Y. and The Medical College of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 483,527, Feb. 22, 1990. This application Jan. 31, 1991, Ser. No. 646,531

Int. Cl.[5] **A61K** *37/00, 37/02;* **C07K** *5/00, 7/00*

U.S. Cl. 514—15 **4 Claims**

1. A method for inhibiting angiogenic activity comprising administering an effective amount of a polypeptide compound comprising the formula:

Z_1-AA_1-AA_2-AA_3-AA_4-AA_5-AA_6-AA_7-AA_8-AA_9-Z_2 (SEQ ID NO. 20)

wherein:

Z_1	is hydrogen, amino, or acetyl;
AA_1	is tryptophan or n-formyl-tryptophan;
AA_2	is serine, threonine or aspartic acid;
AA_3	is proline, glutamic acid, serine or isoleucine;
AA_4	is cysteine;
AA_5	is serine or asparagine;
AA_6	is valine or threonine;
AA_7	is threonine or serine;
AA_8	is cysteine;
AA_9	is glycine or serine; and
Z_2	is hydroxyl, or carboxyl, including carboxyamide or alkylamide forms thereof.

5,200,398

COMPOSITION FOR THE PRESERVATION OF ORGANS COMPRISING GLUCURONIC ACID OR A PHYSIOLOGICALLY TOLERATED SALT OR ESTER THEREOF

Steven M. Strasberg, Toronto, and Robert P. C. Harvey, Oakville, both of Canada, assignors to Mount Sinai Hospital Corporation, Toronto, Canada

Filed Sep. 12, 1991, Ser. No. 759,567

Int. Cl.[5] **A61K** *9/08, 31/715;* **A01N** *1/02*

U.S. Cl. 514—23 **15 Claims**

1. A composition for the preservation and storage of organs intended for transplantation comprising an effective amount of glucuronic acid or a physiologically tolerated salt or ester thereof in a pharmaceutically acceptable organ preservation solution.

5,200,399

METHOD OF PROTECTING BIOLOGICAL MATERIALS FROM DESTRUCTIVE REACTIONS IN THE DRY STATE

Scott H. Wettlaufer, Newfield, and Aldo C. Leopold, Ithaca, both of N.Y., assignors to Boyce Thompson Institute for Plant Research, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 583,858, Sep. 14, 1990, abandoned. This application Apr. 1, 1991, Ser. No. 678,065

Int. Cl.[5] **A61K** *31/70, 31/715, 35/78*

U.S. Cl. 514—23 **42 Claims**

1. A method of protecting biological materials selected from the group consisting of tissues, cells, organelles, and biologically active compounds from drying and from destructive reactions which take place during storage, comprising the steps of:

(a) selecting a mixture comprising materials from the group consisting of tissues, cells, organelles, and biologically active compounds;

(b) combining said mixture with sufficient quantity of one or more vitrifying solutes to protect said mixture during drying and to inhibit said destructive reactions,

(c) drying said combination, by exposing said combination to a desiccant, at a temperature above that at which said combination will freeze and below that at which said vitrifying solutes achieve the vitrified state, at approximately normal atmospheric pressure, until said combination is substantially dry, and

(d) storing said combination in a dry state.

5,200,400

METHOD FOR INHIBITING ALLOGRAFT REJECTION USING PHOTOACTIVATABLE NUCLEOTIDES OR NUCLEOSIDES

Kenichi Teramoto, and Melvin E. Clouse, both of Brookline, Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Filed Jul. 12, 1991, Ser. No. 731,191

Int. Cl.[5] **A01N** *43/04, 43/54*

U.S. Cl. 514—45 **9 Claims**

1. A method for inhibiting rejection of a transplanted organ or tissue by a recipient mammal, said method comprising

(a) after transplantation, introducing into the bloods stream of said mammal an effective amount of a pharmaceutical composition containing a photoactivatable nucleotide or nucleoside analog which causes selective sensitization of dividing alloreactive lymphocytes of said mammal; and

(b) exposing said mammal to one effective dose of irradiation to destroy said sensitized dividing alloreactive lymphocytes to a greater extent than non-sensitized cells of said mammal.

5,200,401

WATER-DISPERSIBLE GRANULES OF NEOPHANS AND AZANEOPHANS FOR USE IN PLANT PROTECTION

Hans Röchling, Bad Soden am Taunus, and Joachim Baumgärtner, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

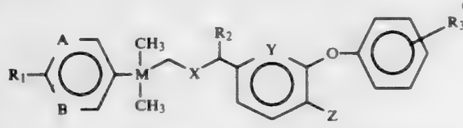
Filed Feb. 15, 1991, Ser. No. 656,291

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005154

Int. Cl.[5] **A01N** *55/00;* **A61K** *31/695*

U.S. Cl. 514—63 **7 Claims**

1. Water-dispersible granules which contain 0.5 to 60% by weight of a compound of the formula I



in which

A and B independently of one another are CH, CR_4 and N,

X is CH_2, O, or S,

Y is CH or N,

Z is H or F,

R_1 and R_4 independently of one another are H, halogen, $(C_1–C_3)$-alkyl, $(C_1–C_3)$-halogenoalkyl, $(C_1–C_3)$alkoxy, $(C_1–C_3)$-halogenoalkoxy, $(C_1–C_4)$-alkylthio, or $(C_1–C_4)$-halogenoalkylthio, or R_1 and R_4 together are $—CH_2—O—CH_2—$;

R_2 is H, $(C_1–C_3)$-alkyl, ethinyl, vinyl, halogen, cyano,

R_3 is H, halogen, $(C_1–C_4)$-alkyl, $(C_1–C_3)$-alkoxy and

M is Si,

which contain, in addition to finely divided highly absorptive silica in the amount of 30 to 110% by weight relative to compound I, and suitable wetting and dispersing agents, an aluminum silicate or magnesium aluminum silicate and a mono-, di- or trisaccharide, wherein the ratio by weight of silica to mono-, di- or trisaccharide is 1:1.8 to 1:3.

5,200,402

ANTI MICROBIAL MAFENIDE-PHOSPHANILATE COMPOUND, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE THEREFOR

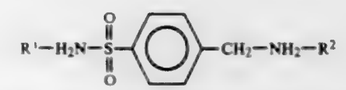
Albert McManus, San Antonio, Tex., assignor to U.S. Army Medical Research & Development Command, Fort Detrick, Frederick, Md.

Filed Oct. 24, 1991, Ser. No. 782,179

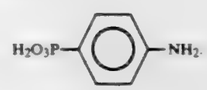
Int. Cl.[5] **A61K** *31/685;* **C07F** *9/38*

U.S. Cl. 514—76 **16 Claims**

1. A compound of the formula I



wherein R^1 and R^2 independently are absent or a phosphanilate group of formula II



5,200,403

INHIBITION OF β LACTAMASE WITH 6 β-(SUBSTITUTED METHYL)-PENICILLANIC ACID DERIVATIVES

Marco Alpegiani, Milan, Italy; Stephen Hanessian, Beaconsfield, Canada; Giuseppe Meinardi, and Ettore Perrone, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Division of Ser. No. 217,713, Jul. 11, 1988, abandoned. This application Jul. 23, 1991, Ser. No. 734,559

Int. Cl.[5] **A61K** *31/43*

U.S. Cl. 514—195 **3 Claims**

1. A method of inhibiting the action of β-lactamase enzymes in an individual in need of such inhibition treatment, which comprises treating said individual with an effective amount of 6β-allyl penicillanic acid 1,1-dioxide or its pharmaceutically or veterinarily acceptable salts.

5,200,404

3-TETRAZOLYLTHIOMETHYL CEPHALOSPORIN ANTIBIOTICS

Frederick H. Jung, Taissy, France, assignor to ICI Pharma, Cergy Cedex, France

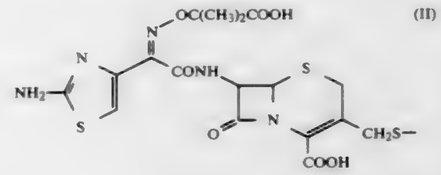
Filed Mar. 18, 1991, Ser. No. 670,863

Claims priority, application European Pat. Off., Mar. 16, 1990, 90400724.2

Int. Cl.[5] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 514—206 **8 Claims**

1. A compound of the formula (II):



nyl, 4-(1-methyl) piperidinyl, 2,6-dimethyl-1-piperidinyl

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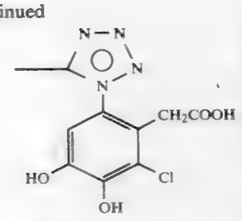


or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof.

5,200,405

USE OF N-(1-HEXAHYDROAZEPINYLALKYL) ACETAMIDES FOR THE TREATMENT OF CHOLINERGIC TRANSMISSION DISORDERS

Maurice Israel, Bures sur Yvette; Yvette Morot-Gaudry, Gif sur Yvette; Max Robba, Paris; Gérard Adam, Le Mesnil le Roi, and Pierre Renard, Versailles, all of France, assignors to Adir et Compagnie, Courbevoie, France

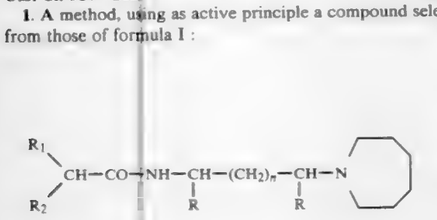
Filed Sep. 11, 1991, Ser. No. 758,905

Claims priority, application France, Sep. 12, 1990, 90 11266

Int. Cl.[5] A61K *31/55*

U.S. Cl. 514—212 **7 Claims**

1. A method, using as active principle a compound selected from those of formula I :



in which:

R represents a radical selected from : hydrogen and alkyl containing 1 to 4 carbon atoms inclusive,

n represents 0, 1, 2, 3 or 4,

R_1 and R_2, which may be the same or different, represent a radical selected from :

straight-chain or branched alkyl or alkenyl containing 1 to 6 carbon atoms inclusive,

cycloalkyl containing 3 to 7 carbon atoms inclusive, or cycloalkenyl containing 5 to 7 carbon atoms inclusive,

aryl, aralkyl, heteroaryl or heteroaralkyl optionally substituted by one or more groups selected from halogen, alkoxy, nitro, trifluoromethyl, and hydroxyalkyl, aryl designating phenyl or naphthyl, and heteroaryl designating furyl, thienyl, pyrrolyl, o imidazolyl, benzofuryl, benzothienyl, benzimidazolyl or indolyl,

an isomer thereof, or an addition salt thereof with a pharmaceutically-acceptable acid, of stimulating acetyl choline release in a living animal afflicted with Alzheimer's Disease of a myasthenia, comprising the step of administering to the said living animal an amount of a compound of formula I which is effective for alleviation of the said condition.

5,200,406

PHARMACEUTICALLY USEFUL 2,5-DIOXO-1H-OCTAHYDROIMIDAZO[1,2-A]AZEPINES

Mario Pinza, Milan; Alberto Cerri, Vigevano Pavia; Carlo Farina, Valsolda Como, and Maria T. Riccaboni, Milan, all of Italy, assignors to I.S.F. Societa per Azioni, Italy

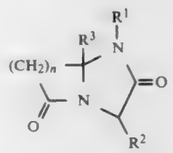
Division of Ser. No. 669,806, Mar. 15, 1991, Pat. No. 5,130,319, which is a division of Ser. No. 307,012, Feb. 6, 1989, Pat. No. 5,053,422. This application Apr. 3, 1992, Ser. No. 862,855

Claims priority, application Italy, Feb. 8, 1988, 19336 A/88

Int. Cl.[5] A61K *31/415;* **C07D** *487/04*

U.S. Cl. 514—214 **8 Claims**

1. A compound of structure (1)



(I)

wherein

R^1 is hydrogen, C_{1-4} alkyl, CHR^6CONHR^7 *1 or CHR*^{6}$COOR^7$ in which R^6 and R^7 are each hydrogen or C_{1-4} alkyl;

R^2 is hydrogen, C_{1-5} alkyl, $C_6H_5CH_2$, CH_2OH, $CH_2CH_2CONH_2$ or CH_2COOH;

R^3 is hydrogen, C_{1-4} alkyl, $CONH_2$ or CO_2R^8 in which R^8 is hydrogen, or C_{1-4} alkyl, and

n is 4;

or a pharmaceutically acceptable salt thereof.

5,200,407

AZOLE DERIVATIVES AND ANTI-ULCERATIVE COMPOSITION CONTAINING SAME

Kiyoaki Katano; Tamako Tomomoto; Hiroko Ogino; Naoki Yamazaki; Fumiya Hirano; Yasukatsu Yuda; Fukio Konno; Motohiro Nishio; Tomoya Machinami; Seiji Shibahara; Takashi Tsuruoka, and Shigeharu Inouye, all of Yokohama, Japan, assignors to Meiji Seika Kaburhiki Kaisha, Yokohama, Japan

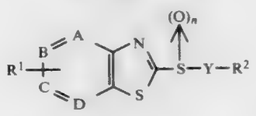
Division of Ser. No. 544,671, Jun. 27, 1990, Pat. No. 5,079,255. This application Jun. 14, 1991, Ser. No. 716,621

Claims priority, application Japan, Jun. 29, 1989, 1-165244; Nov. 24, 1989, 1-303366

Int. Cl.[5] A61K *31/435;* **C07D** *513/04*

U.S. Cl. 514—234.2 **5 Claims**

1. A compound of the formula



wherein

one of A, B, C and D represents —N= and the others represent —CH=;

Y represents $-(CH_2)_p-$ wherein p is an integer of 1-4;

R^1 represents (1) a hydrogen atom, (2) a C_{1-4} alkyl group which is unsubstituted or substituted by fluorine (3) a halogen atom, (4) a C_{1-4} alkoxy group, (5) methoxymethyl, (6)) ethoxymethyl, or (7) 2,2,2-trifluoroethoxy

R^2 represents a five or six membered heterocyclic group containing at least one nitrogen atom which may be either saturated or unsaturated, may be substituted by a substituent and may be condensed with another ring and selected from the group consisting of 1-pyrrolidinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 2-(1-methyl)pyrrolidinyl, 3-(1-methyl)pyrrolidinyl, 2-(1-ethyl)pyrrolidinyl, 3-(1-ethyl) pyrrolidinyl, 1-piperazinyl, 1-(4-methyl)piperazinyl, 1-piperidinyl, 2-(1-methyl)piperidinyl, 3-(1-methyl)piperidinyl, 4-(1-methyl) piperidinyl, 2,6-dimethyl-1-piperidinyl, 2,2,6,6-tetramethyl-1-piperidinyl, 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 2-oxazolidinon-5-yl, morpholinyl, 1-methyltetrazol-5-yl, 1-cyclohexyltetrazol-5-yl, 1,3-dioxisoindol-2-yl, and 4-methylimidazol-5-yl, and

n is an integer from 0 and 2,

or a pharmaceutically acceptable salt thereof.

5,200,408

ANALGESIC α-AMINO-N-PYRIDYLBENZENEPROPANAMIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Nicole Bru-Magniez; Eric Sartori, both of Paris, and Jean-Marie Teulon, La Celle Saint Cloud, all of France, assignors to Laboratoires UPSA, Agen, France

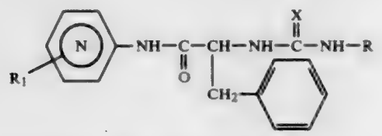
Filed Mar. 11, 1992, Ser. No. 849,709

Claims priority, application France, Feb. 11, 1992, 92 01521

Int. Cl.[5] C07D *213/36;* **A61K** *31/44*

U.S. Cl. 514—237.2 **12 Claims**

1. An α-amino-N-pyridylbenzenepropanamide compound of the formula:



and having the (S) configuration, wherein:

the amide substituent on the pyridine ring is ortho, meta or para to the nitrogen in the pyridine ring;

R is hydrogen or $-(CH-R_4)_n-A$ wherein R_4 is selected from the group consisting of hydrogen; phenyl; and phenyl substituted by lower alkyl, one or two halogens, trifluoromethyl, nitro, amino, hydroxy, lower alkoxy, thiol or lower alkyl thio;

n is an integer from 0 to 5;

A is selected from the group consisting of lower alkyl; C_3–C_7 cycloalkyl; phenyl, furanyl, thienyl or pyridyl, substituted by lower alkyl, one or two halogens, trifluoromethyl, nitro, amino, hydroxy, lower alkoxy, thiol or lower alkyl thio; or

$-(CH_2)_n-N(R_2R_3)$ in which n is as defined above and R_2 and R_3 are identical or different and are lower alkyl, C_3–C_7 cycloalkyl or form, together with the nitrogen atom to which they are attached, a ring selected from the group consisting of morpholine and piperazine N-substituted by lower alkyl, C_3-C_7 cycloalkyl, phenyl and phenyl substituted by lower alkyl, one or two halogens, trifluoromethyl, nitro, amino, hydroxy, lower alkoxy, thiol or thio lower alkyl;

R_1 is selected from the group consisting of hydrogen, halogen, lower alkyl and COOR′ wherein R′ is hydrogen or lower alkyl; and

x is oxygen or sulfur;

or a pharmacologically acceptable salt thereof.

5,200,409

COMPOSITION AND USE OF SUBSTITUTED 1,3-DITHIOLO-AND 1,4-DITHIINOQUINOXALINES AS AN ANTIMICROBIAL

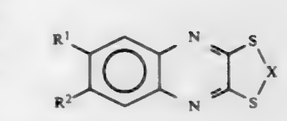
Duane R. Romer; Ravi B. Shankar, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 814,527, Dec. 30, 1991, abandoned. This application May 22, 1992, Ser. No. 887,036

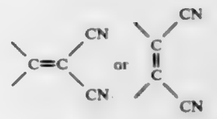
Int. Cl.[5] C07D *495/04;* **A61K** *31/459*

U.S. Cl. 514—250 **24 Claims**

1. A compound corresponding to the formula

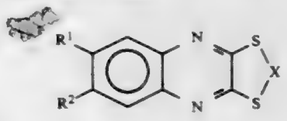


wherein X represents:

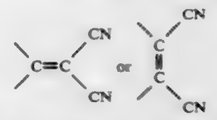


and R^1 and R^2 independently represent hydrogen, halogen, nitro, cyano, alkyl, alkoxy, arylcarbonyl, or an alkoxy carbonyl group, wherein the alkyl, alkoxy, arylcarbonyl, or alkoxy carbonyl may be with or without halogen substituents, provided that at least one of R^1 and R^2 is a nitro, cyano, alkoxy, alkylcarbonyl, or an alkoxy carbonyl group.

10. A method for inhibiting microorganisms in a microbial habitat comprising contacting said microbial habitat with an antimicrobially-effective amount of a compound corresponding to the formula:



wherein X represents:



and R^1 and R^2 independently represent hydrogen, halogen, nitro, cyano, alkyl, alkoxy, arylcarbonyl, or an alkoxy carbonyl group, wherein the alkyl, alkoxy, arylcarbonyl, or alkoxy carbonyl may be with or without halogen substituents, provided that at least one of R^1 and R^2 is a nitro, cyano, alkoxy, alkylcarbonyl, or an alkoxy carbonyl group.

5,200,410

MEDICAMENTS FOR THE TREATMENT OF CEREBRAL APOPLEXY

Jörg Traber, Lohmar, and Gerhard-Wilhelm Bickenberg, Ameneberg, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., Cologne, Fed. Rep. of Germany

Division of Ser. No. 714,470, Jun. 13, 1991, which is a division of Ser. No. 579,414, Sep. 10, 1990, Pat. No. 5,070,102, which is a division of Ser. No. 407,161, Sep. 14, 1989, Pat. No. 4,988,700. This application May 15, 1992, Ser. No. 884,488

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831882

Int. Cl.[5] A61K *31/35, 31/38, 31/435, 31/445*

U.S. Cl. 514—277 **8 Claims**

1. A method of treating cerebral apoplexy in a patient in need thereof which comprises administering to said patient an amount effective therefor of a serotonin agonist which has a binding strength of less than 10,000 nmol/l on binding to $5HT_{1A}$ receptors and is selected from the group consisting of an amino-chroman, amino-thiopyran, indolyl-alkyl-piperidine and tetrahydropyridine.

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5,200,411

HETEROATOMS-CONTAINING TRICYCLIC COMPOUNDS

Andrew J. F. Edmunds, and Maximilian Grassberger, both of Vienna, Austria, assignors to Sandoz, Ltd., Basel, Switzerland

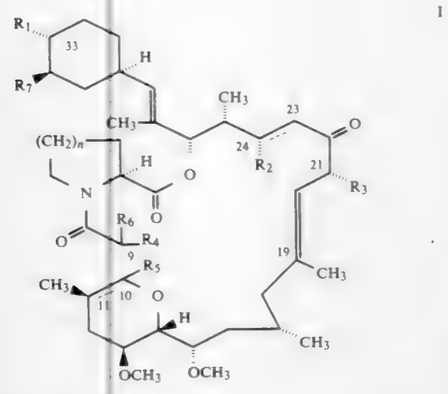
Continuation-in-part of Ser. No. 656,046, Feb. 14, 1991, abandoned. This application Jun. 13, 1991, Ser. No. 710,348

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1989, 3919466; Oct. 20, 1989, 3934991

Int. Cl.[5] **C07D** *491/16;* **A61K** *31/395*

U.S. Cl. 514—291 **7 Claims**

1. A compound of formula I



I

wherein

R_1 is acyloxy or hydroxy or tert-butyldimethylsilyloxy;

R_2 is hydroxy or tert-butyldimethylsilyloxy or is absent, whereby when R_3 is cyclopropylmethyl or methylcyclopropylmethyl, R_2 additionally can be hydrogen;

R_3 is methyl, ethyl, n-propyl, allyl, cyclopropylmethyl or methylcyclopropylmethyl;

either

R_4 is hydrogen, hydroxy or tert-butyldimethylsilyloxy, acyloxy or is absent; and

R_5 is unprotected hydroxy, halogen of atomic number of from 9 to 53 or is absent; or

R_4 and R_5 together form a group —OC(=O)O— or —OC(=S)O—; and

R_6 is hydrogen or, when R_4 and R_5 together form a group —OC(=O)O—, is hydrogen or methoxy;

or

R_4 and R_6 together from a group oxo; and

R_5 is unprotected hydroxy or halogen of atomic number of from 9 to 53 or is absent;

R_7 is unprotected hydroxy or methoxy; and

n is 1 or 2,

where acyloxy is alkylcarbonyloxy of 2 to 8 carbon or benzoyloxy substituted by halogen of atomic number of from 9 to 53 and protected hydroxy is tert-butyldimethylsilyloxy; with the proviso that

a) at least one of R_1, R_2, R_4 and R_5 is other than unprotected hydroxy;

b) when R_4 and R_6 together form a group oxo, then either R_3 is cyclopropylmethyl or methylcyclopropylmethy; or R_5 is halogen of atomic number of from 9 to 53 or is absent; and

c) when R_1 is acyloxy, then either R_4 and R_6 are other than together a group oxo; or R_4 and R_6 together form a group oxo and R_5 is halogen of atomic number of from 9 to 53 or is absent.

7. A method of inducing immunosupression or treating inflammation in a subject in need of said treatment, which comprises administering to the subject a therapeutically effective amount of a compound according to claim 1.

5,200,412

HETEROBICYCLIC CONTAINING BENZENE SULFONAMIDES WHICH ARE PLATELET ACTIVATING FACTOR ANTAGONISTS

Mark Whittaker, and Andrew Miller, both of Oxfordshire, England, assignors to British Bio-Technology Limited, Oxford, England

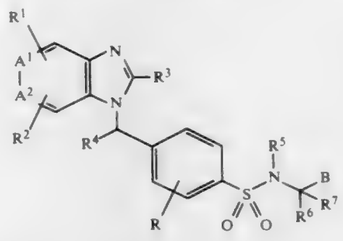
Filed Aug. 15, 1991, Ser. No. 745,471

Claims priority, application United Kingdom, Aug. 15, 1990, 9017878; Aug. 16, 1990, 9018040; Jun. 14, 1991, 9112857

Int. Cl.[5] **C07D** *235/06, 235/07, 471/04;* **A61K** *31/435, 31/415*

U.S. Cl. 514—293 **20 Claims**

1. A compound of general formula I;



I

wherein

A^1 is =N—, =CH— or =CR^1—;

A^2 is —N=, —CH= or —CR^2=;

provided that, when one of A^1 and A^2 is a nitrogen atom, the other of A^1 and A^2 is other than a nitrogen atom;

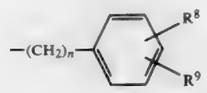
R represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, halogen or —OC_1–C_6 alkyl;

each of R^1 and R^2 independently represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, halogen, —CN, —CO_2H, CO_2C_1–C_6 alkyl, —$CONH_2$, —CHO, —CH_2OH, CF_3, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —SC_1–C_6 alkyl, —SO_2C_1–C_6 alkyl, —NH_2, —NHCOMe or NO_2 or R^1 and R^2 together with the carbon atoms to which they are attached form a fused phenyl ring;

R^3 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, CF_3, -(C_1–C_6 alkyl)phenyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)C_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)C_4–C_8 cycloalkenyl or thiophenyl;

R^4 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, CO_2C_1–C_6 alkyl, —SC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)phenyl or thiophenyl;

R^5 represents hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —COC_1–C_6 alkyl, CO_2C_1–C_6 alkyl, —(COC_1–C_6 alkyl)phenyl, —(CO_2C_1–C_6 alkyl)phenyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)CO_2C_1–C_6 alkyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl or a group —D wherein D represents a group:



wherein n is an integer from 0 to 3, and each of R^8 and R^9 is independently hydrogen, —C_1–C_6 alkyl, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, halogen, —CN, —CO_2H, CO_2C_1–C_6 alkyl, —$CONH_2$, —$CONHC_1$–C_6 alkyl, —$CONH(C_1$–C_6 alkyl)2, —CHO, —CH_2OH, CF_3, —OC_1–C_6 alkyl, —SC_1–C_6 alkyl, —SCC_1–C_6 alkyl, —SO_2C_1–C_6 alkyl, —NH_2 or —NHCOMe;

each of R^6 and R^7 independently represents hydrogen, halogen, —C_1–C_6 alkyl optionally substituted by one or more halogen atoms, —C_2–C_6 alkenyl, —C_2–C_6 alkynyl, —(C_1–C_6 alkyl)CO_2C_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)$N(C_1$–C_6 alkyl)$_2$, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)C_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)C_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)OC_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)OC_4–C_8 cycloalkenyl, —(C_1–C_6 alkyl)SC_3–C_8 cycloalkyl, —(C_1–C_6 alkyl)SC_4–C_8 cycloalkenyl, a side chain of a naturally occurring amino acid, a group —D as defined above or a —(C_1–C_6 alkyl)OD group wherein D is as defined above;

or R^6 together with R^5 and the atoms to which they are attached form a 5 to 8 membered nitrogen-containing heterocyclic ring;

or R^6 and R^7 together with the carbon atom to which they are attached form a C_3–C_8 cycloalkyl ring;

B represents a) a —ZR^{10} group wherein Z is —C(O)—, —C(=O)O—, —C(=S)— or —C(=S)O— and R^{10} is —C_1–C_{18} alkyl optionally substituted by one or more halogen atoms, —C_2–C_{18} alkenyl, —C_2–C_{18} alkynyl, —(C_1–C_6 alkyl)OC_1–C_6 alkyl, —(C_1–C_6 alkyl)SC_1–C_6 alkyl, —(C_1–C_6 alkyl)O(C_1–C_6 alkyl)OC_1–C_6 alkyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, pyridyl, a group —D as defined above or a —(C_1–C_6 alkyl)OD group wherein D is as defined above;

b) a —$CONR^{11}R^{12}$ group wherein each of R^{11} and R^{12} is independently hydrogen, —C_1–C_{18} alkyl optionally substituted by one or more halogen atoms, —C_2–C_{18} alkenyl, —C_2–C_{18} alkynyl, —C_3–C_8 cycloalkyl, —C_4–C_8 cycloalkenyl, pyridyl, a group —D as defined above or R^{11} and R^{12} together with the nitrogen atom to which they are attached form a 5 to 8 membered nitrogen-containing heterocyclic ring;

or a pharmaceutically or veterinarily acceptable acid addition salt or hydrate thereof.

5,200,413

INDOLYL CARBOXAMIDES USEFUL TREATING MIGRAINE, CLUSTER HEADACHE, TRIGEMINAL NEURALGIA OR EMESIS

Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group p.l.c., Middlesex, United Kingdom

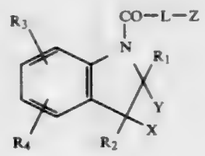
Division of Ser. No. 389,286, Aug. 2, 1989, Pat. No. 5,049,556, which is a division of Ser. No. 202,224, Jun. 3, 1988, Pat. No. 4,871,744, which is a continuation-in-part of Ser. No. 550, Jan. 5, 1987, abandoned. This application Aug. 5, 1991, Ser. No. 740,397

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] **C07D** *451/04, 451/14;* **A61K** *31/46, 31/445*

U.S. Cl. 514—299 **12 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



(I)

wherein

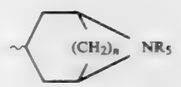
L is NH;

X and Y are together are a bond;

R_1 and R_2 are independently selected from hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl-C_{1-4} alkyl, or together are C_{2-4} polymethylene;

R_3 and R_4 are independently selected from hydrogen, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-7} acyl, C_{1-7} acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6} alkylsulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphinyl, hydroxy, nitro, amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C_{1-4} alkylamino optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl, or phenyl C_{1-4} alkyl groups or optionally N-disubstituted by C_{4-5} polymethylene;

Z is a group of formula (a)



(a)

wherein

n is 2 or 3;

p is 1 or 2;

q is 1 to 3;

r is 1 to 3; and

R_5 or R_6 is C_{1-7} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl or C_{2-7} alkenyl-C_{1-4} alkyl.

5,200,414

METHODS FOR THE TREATMENT OF COGNITIVE DISORDERS

Michael B. Tyers, Ware, England, assignor to Glaxo Group Limited, London, England

Division of Ser. No. 424,736, Oct. 20, 1989, which is a division of Ser. No. 133,885, Dec. 16, 1987, Pat. No. 4,985,437. This application Jul. 27, 1992, Ser. No. 919,255

Claims priority, application United Kingdom, Dec. 17, 1986, 8630074; Dec. 17, 1986, 8630076; Dec. 17, 1986, 8630077; Mar. 25, 1987, 8707175

Int. Cl.[5] **A61K** *31/44*

U.S. Cl. 514—299 **1 Claim**

1. A method of improving cognition in a patient suffering from dementia or other cognitive disorder which comprises administering to the patient an effective amount of endo-N-(8-methyl-8-azabicyclooct-3-yl)-2,3-dihydro-3,3-dimethylindole-1-carboxamide, or a physiologically acceptable salt or solvate thereof, which compound acts as a 5-HT antagonist at 5-HT_3 receptors.

5,200,415

PYRAZOLO[1,5-A]PYRIDINE-3-CARBOXYLIC ACID DERIVATIVES AND THEIR PHARMACEUTICAL USE

Takeo Higashino; Yukio Suzuki, both of Shizuoka; Takehiko Sasahara, Numazu; Tetsu Saito, Mishima, and Daisuke Mochizuki, Shizuoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

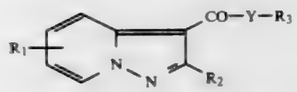
Filed Oct. 29, 1991, Ser. No. 783,869

Claims priority, application Japan, Nov. 1, 1990, 2-297818; Nov. 27, 1990, 2-323807

Int. Cl.[5] **A61K** *31/44;* **C07D** *471/02*

U.S. Cl. 514—300 **8 Claims**

1. A serotonin 3 receptor antagonist comprising as an active ingredient a pyrazolo[1,5-a]pyridine-3-carboxylic acid derivative represented by the following formula (I):

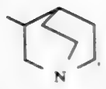


(I)

wherein R_1 and R_2 individually mean a hydrogen atom or a lower alkyl group, R_3 denotes a group represented by the following formula:

5,200,420

VOL 1149 ISS 1 AP 6 1993 UMI



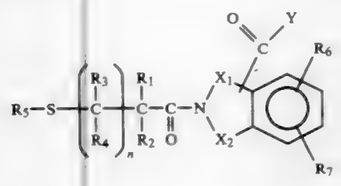
and Y stands for —O— or —NH—, or a salt thereof, and a pharmaceutically acceptable diluent.

5,200,416
CYCLIC AMIDES

John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y., and Bruce E. Williams, Cottage Grove, Minn., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed May 12, 1980, Ser. No. 148,083
Int. Cl.[5] A61K *31/47*; C07D *217/16*
U.S. Cl. 514—307 **42 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3, R_4, R_6 and R_7 are independently hydrogen or lower alkyl having 1–6 carbon atoms;

R_5 is hydrogen, lower alkyl having 1 to 6 carbon atoms, or alkanoyl having 1 to 6 carbon atoms;

Y is OH or OM wherein M is a pharmaceutically acceptable cation;

n is an integer from 0 to 1, and

one of X_1 and X_2 is (CR_8R_9) and the other is $(CR_8R_9)_2$ wherein R_8 and R_9 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms.

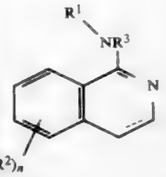
22. A method of reducing the blood pressure in mammals having hypertension which comprises administering an effective amount of a compound according to claim 1.

5,200,417
SUBSTITUTED 4-AMINO-ISOQUINOLINE COMPOUNDS, PHARMACEUTICAL COMPOSITION AND METHOD OF USE

Thomas H. Brown; Robert J. Ife, and Colin A. Leach, all of Welwyn, England, assignors to Smithkline Beecham Intercredit B.V., Welwyn Garden, England

Filed Apr. 4, 1990, Ser. No. 504,781
Claims priority, application United Kingdom, Apr. 12, 1989, 8908229
Int. Cl.[5] A61K *31/47*; C07D *217/22*
U.S. Cl. 514—310 **9 Claims**

1. A compound of structure (I)



in which:

R^1 is C_{3-6}cycloalkyl, C_{3-6}cycloalkylC_{1-6}alkyl, phenyl $(CH_2)_m$ the phenyl group being optionally substituted by 1–3 radicals selected from C_{1-6}alkyl, C_{1-6}alkoxy, amino-C_{1-6}alkylthio, halogen, cyano, hydroxy, carbamoyl, carboxy, C_{1-6}alkanoyl and trifluoromethyl or Het $(CH_2)_m$ in which Het is furyl or thienyl and m is 0 to 6;

R^2 is C_{1-6}alkyl, phenyl, C_{1-6}alkoxy, C_{1-6}alkylthio, hydroxy, C_{1-6}alkanoyl, amino, C_{1-6}alkylamino, di-C_{1-6}alkyl-amino, halogen, trifluoromethyl or cyano;

R^3 is hydrogen or C_{1-4}alkyl;

n is 0 or 1 and the dotted line indicates the optional presence of a double bond; provided that i) when n is 0, and there is no optional double bond; R^1 is not phenyl, cyclopropyl, cyclopentyl, 2-fluorophenyl phenylethyl or benzyl; (ii) when R^2 is chloro and there is no optional double bond, R^1 is not cyclopropyl; iii when R^2 is alkyl, hydroxy or alkoxy, n is 1 and the optional double bond is present, then R^1 is not phenyl $(CH_2)_m$ in which m is 0 to 3 and the phenyl is optionally substituted by halogen, alkoxy or alkyl; or a pharmaceutically acceptable salt thereof.

5,200,418
CRYPTOSPORIDIOSIS AMELIORATION

Donald R. Redman, Wooster, Ohio, and James E. Fox, Norcross, Ga., assignors to The Ohio State University, Columbus, Ohio and Rhone-Poulenc Inc., Monmouth Junction, N.J.

Filed Jul. 12, 1991, Ser. No. 728,875
Int. Cl.[5] A61K *31/47*
U.S. Cl. 514—311 **5 Claims**

1. A method of amelioration of cryptosporidiosis symptoms in a neonatal bovine host exposed to and susceptible to infection by *cryptosporidium oocysts*, which method comprises:

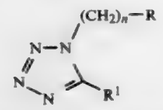
administering daily and orally decoquinate to said host with an initial daily administration of the decoquinate within 3 days of birth and followed by subsequent daily administrations of the decoquinate for 3 to 6 weeks and in a daily total dosage of an amount which is nontoxic and effective to shorten duration of diarrhea of said host arising from said infection in comparison to a like infected but untreated host.

5,200,419
SUBSTITUTED TETRAZOLES AND DERIVATIVES THEREOF ACTING AT MUSCARINIC RECEPTORS

Sheila H. Hobbs, Dexter, and Haile Tecle, Ypsilanti, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

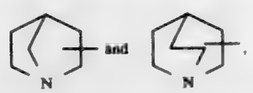
Filed May 21, 1990, Ser. No. 526,423
Int. Cl.[5] C07D *211/36, 401/06*
U.S. Cl. 514—323 **3 Claims**

1. A compound of Formula I



I

wherein R is selected from the group consisting of



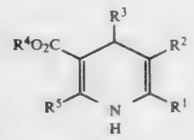
R^1 is hydrogen, alkyl of from one to ten carbon atoms, alkynyl of from two to ten carbon atoms or aryl; n is zero or an integer of one or two; or a pharmaceutically acceptable acid addition salt thereof.

5,200,420
2,6-DIALKYL-4-(BENZOTHIAZOL- OR BENZOXAZOL-4-YL-1,4-DIHYDROPYRIDINES

Siegfried Goldmann, Wuppertal; Horst Böshagen; Jürgen Stoltefuss, both of Haan; Alexander Straub; Rainer Gross, both of Wuppertal; Joachim Hütter, Leverkusen; Siegbert Hebisch, and Martin Bechem, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,731
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011106
Int. Cl.[5] C07D *413/04*; A61K *31/44*
U.S. Cl. 514—338 **11 Claims**

1. A 4-hetero-substituted-1,4-dihydropyridine of the formula



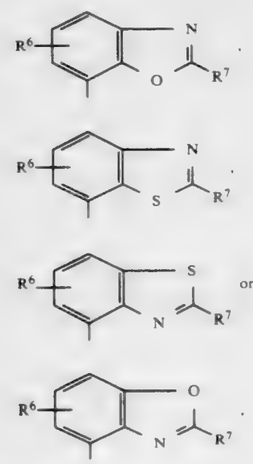
(I)

in which

R^1 and R^5 are identical or different and represent straight-chain or branched alkyl having up to 8 carbon atoms,

R^2 represents nitro or cyano,

R^3 represents a radical of the formula



in which

R^6 denotes hydrogen, halogen or straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms,

R^7 denotes aryl having 6 to 10 carbon atoms, which is optionally monosubstituted or disubstituted by identical or different substituents from the group consisting of halogen, nitro, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, and carboxyl, or

denotes thienyl or pyridyl,

R^4 represents hydrogen, or

represents straight-chain or branched alkyl, alkenyl, alkadienyl or alkynyl in each case having up to 10 carbon atoms which are optionally monosubstituted or disubstituted by identical or different substituents from the group consisting of halogen, hydroxyl, carboxyl, cyano, nitro, phenoxy and straight-chain or branched alkylthio, alkoxy, alkoxycarbonyl, acyl or acyloxy in each case having up to 8 carbon atoms, and phenoxy or phenyl optionally monosubstituted or disubstituted by identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl or alkoxy in each case having up to 6 carbon atoms,

or a physiologically acceptable salt thereof.

5,200,421
MICROBICIDAL ACTIVE COMPOUND COMBINATIONS

Georg-Wilhelm Ludwig, Krefeld; Otto Exner, Ratingen; Wilfried Paulus, Krefeld; Karl-Heinz Büchel, Burscheid, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 13, 1992, Ser. No. 867,955
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1991, 4113158
Int. Cl.[5] A01N *43/64, 47/10*
U.S. Cl. 514—383 **7 Claims**

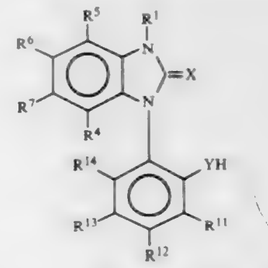
1. A fungicidally microbicidally active composition comprising a synergistic mixture of tebuconazole or a salt thereof and 3-iodo-2-propargyl n-butylcarbamate wherein the synergistic weight ratio of tebuconazole to 3-iodo-2-propargyl n-butycarbamate is from 1:9 to 9:1.

5,200,422
BENZIMIDAZOLE DERIVATIVES, THEIR PREPARATION AND USE

Soren-Peter Olesen, Bronshoj, and Frank Wätjen, Herlev, both of Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark

Continuation-in-part of Ser. No. 586,900, Sep. 24, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,412
Int. Cl.[5] A61K *31/415*; C07D *487/00, 235/04*
U.S. Cl. 514—387 **8 Claims**

1. A compound selected from those having the formula



wherein R^1 is hydrogen, NH_2 or C_{1-6}-alkyl which may be branched;

X is O, S, NCN;

Y is O, S;

R^4, R^5, R^6 and R^7 independently of each other are hydrogen, halogen, CF_3, NO_2, NH_2, OH, C_{1-6}-alkoxy, $C(=O)$-phenyl or $SO_2NR^IR^{II}$ wherein R^I and R^{II} independently are hydrogen or C_{1-6}-alkyl;

R^{11} is hydrogen, halogen, NO_2 or $SO_2NR'R''$ wherein R' and R'' independently are hydrogen or C_{1-6}-alkyl;

R^{13} is hydrogen, halogen, phenyl, CF_3, NO_2;

^{12}R is hydrogen or together with R^{13} forms a C_{4-7}-carbocyclic ring which may be aromatic or partially saturated;

R^{14} is hydrogen or together with R^{13} forms a C_{4-7}-carbocyclic ring which may be aromatic or partially saturated.

5,200,427
PORPHYRIC INSECTICIDES

5,200,431
PROCESS FOR THE SEPARATION OF HALOGENATED

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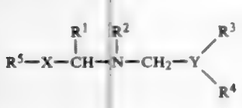
5,200,423

AMINE DERIVATIVES, PROCESSES FOR PREPARING THE SAME AND FUNGICIDES CONTAINING THE SAME

Tetsuya Maeda, Tokorozawa; Toshiyuki Yamamoto, Tokyo; Mitso Takase, Hino; Kazuya Sasaki, Higashikurume; Tadashi Arika, Kasukabe; Mamoru Yokoo, Kawagoe; Rieko Hashimoto, Asaka; Kouji Amemiya, Kodaira, and Sakae Koshikawa, Kawaguchi, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

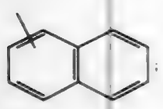
Filed Jan. 25, 1991, Ser. No. 720,327
Claims priority, application Japan, Jun. 9, 1984, 59-118636
Int. Cl.[5] A61K *31/38*; C07D *333/20*
U.S. Cl. 514—438 2 Claims

1. An amine derivative represented by formula (I):



(I)

wherein
X is



Y is

R^1 is hydrogen atom;
R^2 is hydrogen atom or an alkyl group of 1 to 6 carbon atoms;
R^3 is hydrogen atom;
R^4 is hydrogen atom, an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group of 3 to 7 carbon atoms or a halogenated alkyl group;
R^5 is hydrogen atom, an alkyl group of 1 to 6 carbon atoms, a halogen atom or a nitro group,
wherein R^5 is attached to an arbitrary position of X, and R^3 or R^4 is attached to an arbitrary position of Y.

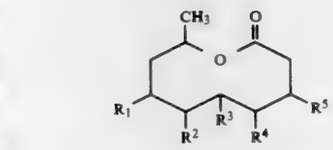
5,200,424

USE OF 10-MEMBERED RING LACTONES AS LIPID REGULATORS

Ernold Granzer, Kelkheim/Taunus; Peter Hammann, Babenhausen; Joachim Wink, Rödermark, and Susanne Grabley, Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 26, 1991, Ser. No. 749,869
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1990, 4027100
Int. Cl.[5] A61K *31/335*
U.S. Cl. 514—450 3 Claims

1. A method for lowering serum cholesterol comprising administering to a mammal, in need of treatment for lowering serum cholesterol, a serum cholesterol lowering amount of a compound of the formula



I

in which, independently of one another,
R^1 and R^4 are hydrogen or hydroxyl,
R^2 and R^3 are hydroxyl,
R^5 is hydrogen, hydroxyl or an oxo group, and
R^2 and R^3, and R^3 and R^4, can each together form a double bond.

5,200,425

DRUGS CONTAINING A PSORALENE DERIVATIVE

Jean-Jacques Goupil, 30, Avenue du Prèsident Wilson, 94230 Cachan, France

Continuation of Ser. No. 395,283, Aug. 19, 1989, Pat. No. 4,970,230, which is a continuation of Ser. No. 161,360, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 822,952, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 498,275, May 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 195,414, Oct. 9, 1980, Pat. No. 4,429,138, which is a continuation-in-part of Ser. No. 953,118, Oct. 20, 1978, abandoned, said Ser. No. 161,360, is a continuation-in-part of Ser. No. 21,604, Mar. 2, 1987, Pat. No. 4,699,787, which is a continuation of Ser. No. 858,863, Apr. 30, 1986, abandoned, which is a continuation of Ser. No. 374,189, May 3, 1982, abandoned, which is a continuation of Ser. No. 101,506, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 821,092, Aug. 2, 1977, abandoned. This application Nov. 1, 1990, Ser. No. 595,027
Claims priority, application France, Aug. 4, 1976, 76 23799; Oct. 21, 1977, 77 31719; Dec. 12, 1977, 77 37144
Int. Cl.[5] A61K *31/35*; C07D *493/04*
U.S. Cl. 514—455 5 Claims

1. A topical dosage form for the use in the treatment of conditions selected from the group consisting of carcinomas of the epidermic cells, Hutchinson freckles, actinic hyperkeratoses and combinations thereof, said dosage form comprising as an active ingredient an amount of 5-methoxypsoralene greater than 1,000 ppm up to 10,000 ppm and a therapeutically acceptable carrier, said active ingredient being activated by a dose of UV radiation in the range of about 5–10 joules/cm^2 per treatment.

5. An oral dosage form for use in the oral treatment of conditions selected from the group consisting of carcinomas of the epidermic cells, Hutchinson freckles, actinic hyperkeratoses and combinations thereof, said dosage form comprising as an active ingredient 5-methoxypsoralene in the form of tablets containing 400–800 mg of said active ingredient per tablet and a therapeutically acceptable carrier, said active ingredient being activated by a dose of ultraviolet A radiation on the affected area ranging from between about 5 and 10 joules/cm^2 per treatment.

5,200,426

INHIBITORS OF NEUTRAL ENDOPEPTIDASE/CALLA AS CHEMOTHERAPEUTIC AGENTS

Louis B. Hersh, Dallas, Tex., and R. C. Bateman, Jr., Hattiesburg, Miss., assignors to Board of Regents, The University of Texas, Austin, Tex.

Filed Aug. 14, 1990, Ser. No. 567,499
Int. Cl.[5] A61K *31/335*; C07C *255/19, 229/24*
U.S. Cl. 514—475 35 Claims

1. A method of inhibiting the growth or differentiation of CALLA+ human leukemia cells comprising subjecting such cells to an effective amount of an NEP inhibitor.

5,200,427

PORPHYRIC INSECTICIDES

Constantin A. Rebeiz, Urbana; John A. Juvik, Champaign, and Carole C. Rebeiz, Urbana, all of Ill., assignors to The Board of Trustees of the Univ. of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 144,883, Jan. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 895,529, Aug. 11, 1986, which is a continuation of Ser. No. 754,092, Jul. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 634,932, Jul. 27, 1984, abandoned. This application Jan. 9, 1989, Ser. No. 294,132
Int. Cl.[5] A01N *37/44*
U.S. Cl. 514—561 16 Claims

1. An insecticidal composition comprising an insecticidally effective amount of δ-aminolevulinic acid; and an insecticidally acceptable inert carrier therefor.

5,200,428

AGENT FOR THE TSH SUPPRESSION AND TREATMENT OF STRUMA

Claus Horst, Berlin, Fed. Rep. of Germany, assignor to Henning Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 23, 1991, Ser. No. 748,882
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 4026600
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—561 4 Claims

1. A method for suppression of TSH which comprises oral administration to a goiter patient in need thereof of a therapeutically effective dose 3,5-diido-L-thyronine.

5,200,429

ACNE VULGARIS TREATING

Toshiya Sato, Tokyo; Satoko Tsukada, Kanagawa; Hanako Hata, and Kenya Ishida, both of Tokyo, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Sep. 26, 1991, Ser. No. 765,739
Claims priority, application Japan, Sep. 28, 1990, 2-257226
Int. Cl.[5] A61K *31/015*
U.S. Cl. 514—766 3 Claims

1. A method of treating or preventing acne vulgaris which comprises topically applying to a patient in an amount effective to inhibit proliferation of *Propionibacterium acnes*, a composition containing, as an active ingredient, at least one compound selected from the group consisting of caryophyllene, cedrene, longifolene and thujopsene, and at least one carrier or diluent acceptable for topical application.

5,200,430

DEBRIDEMENT OF BODILY CAVITIES USING DEBRIDEMENT FLUIDS

Jay L. Federman, Philadelphia, Pa., assignor to Escalon Ophthalmics, Inc., Skillman, N.J.

Filed Mar. 21, 1991, Ser. No. 672,972
Int. Cl.[5] A61K *47/00*
U.S. Cl. 514—772 19 Claims

1. A method for removing foreign substances from a mammalian body cavity containing an aqueous phase comprising injecting into the cavity at a location near the lower portion of the cavity a water-immiscible, optically clear, biocompatible debridement fluid having a specific gravity greater than water in an amount sufficient to at least partially displace the aqueous phase, removing the aqueous phase and the foreign substances from the cavity at a location near the upper portion of the cavity and removing the debridement fluid.

5,200,431

PROCESS FOR THE SEPARATION OF HALOGENATED HYDROCARBONS BY EXTRACTIVE DISTILLATION

Pravin K. Dattani, Hockessin, Del.; John D. Scott, Cheshire, England; Barry W. Farrant, Lancashire, England, and Charles J. Shields, Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 21, 1991, Ser. No. 747,755
Claims priority, application United Kingdom, Aug. 21, 1990, 9018372
Int. Cl.[5] C07C *17/38*
U.S. Cl. 570—178 10 Claims

1. A method for separating 1,1,1,2-tetrafluoroethane from a mixture containing 1,1,1,2-tetrafluoroethane and chlorine-containing halogenated hydrocarbons which comprises adding an extraction agent to said mixture, extractively distilling the mixture in an extractive distillation zone and recovering 1,1,1,2-tetrafluoroethane from the extractive distillation zone, the extraction agent being selected from trichloroethylene, perchloroethylene, carbon tetrachloride and aliphatic hydrocarbons containing from 4 to 10 carbon atoms.

5,200,432

POLYPHENYLENE OXIDE-RECYCLED POLYSTYRENE COMPOSITION AND METHOD

Richard C. Bopp, West Coxsackie, and Daniel L. Roberts, Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 478,099, Feb. 12, 1990, Pat. No. 5,147,894. This application Aug. 13, 1992, Ser. No. 929,250
Int. Cl.[5] C08J *11/04*
U.S. Cl. 521—40.5 17 Claims

1. A polymer composition which comprises a melt-compounded product of (a) a polyphenylene oxide polymer; and (b) a recycled polystyrene material, wherein the recycled polystyrene material is derived from bromine-modified polystyrene which exhibits a melt flow index greater than about 25 hen devolatized by heating above its glass transition temperature.

5,200,433

PROCESS FOR PREPARING LOW DENSITY POROUS CROSSLINKED POLYMERIC MATERIALS

Sharon M. Beshouri, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 20, 1992, Ser. No. 870,858
Int. Cl.[5] C08J *9/28*
U.S. Cl. 521—64 23 Claims

1. A process for the preparation of a porous crosslinked polymeric material comprising the steps of:
(a) providing a water-in-oil high internal phase emulsion comprising (i) a mixture of polymerizable monomers comprising at least one vinyl monomer and from about 2 to about 50 weight percent, based on the mixture, of a difunctional unsaturated crosslinking monomer, (ii) at least 90 weight percent, based on the emulsion, of water as the internal phase (iii) from about 2 to about 40 weight percent, based on the polymerizable monomers, of a surfactant comprising (A) a sorbitan monoester having a fatty acid moiety of at least 6 carbon atoms and (B) at least one other sorbitan ester having at least one different fatty acid moiety than component (A), and (iv) an effective amount of a polymerization catalyst to cure the polymerizable monomers; and
(b) heating the water-in-oil high internal phase emulsion under conditions effective to cure the polymerizable monomers.

5,200,434

AMIDE DERIVATIVES OF ALKYLENE OXIDE

5,200,436

SILOXANE INIFERTER COMPOUNDS, BLOCK

wherein —X— is a divalent species having the general formula

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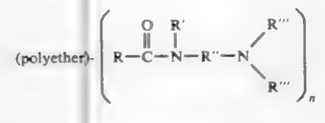
5,200,434

AMIDE DERIVATIVES OF ALKYLENE OXIDE POLYETHERS AND THEIR USES IN POLYURETHANE FOAM MANUFACTURE

Frederick E. Bailey, Jr., deceased, late of Charleston by Mary C. L. Bailey, executrix ; Harry R. Hinney, Cross Lanes, both of W. Va.; Paul L. Matlock, Ossining, N.Y., and Reinhart Schiffauer, Cross Lanes, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 30, 1991, Ser. No. 815,827
Int. Cl.[5] C08G *18/00*; C08J *9/00*
U.S. Cl. 521—129 **8 Claims**

1. In a process for making polyurethane foam by reacting and foaming a reaction mixture comprising a polyol, an organic polyisocyanate, a catalyst, and a blowing agent, the improvement which comprises using as the catalyst a composition of matter comprising at least one aminoamide derivative of at least one carboxyl group containing polyether, said polyether derivative being represented by the general formula:



wherein

R is CH_2 when the aminoamide-containing moiety is located on an end of polyether chain, and is C_2H_4 or $CH_2CH(CH_3)$ when the aminoamide-containing moiety is located along a polyether chain;

R′ is H, an alkyl group of 2–4 carbon atoms, or R″—N(R‴)$_2$;

R″ is alkylene of 2–6 carbon atoms, phenylene or $C_2H_4N(CH_3)C_2H_4$;

R‴ groups individually are alkyl groups of 1–18 carbon atoms or phenyl, or the R‴ groups on a given nitrogen atom are 2-carbon alkylene moieties joined together by a divalent linking atom X to form a six-membered ring wherein X is —O— or >N—R*, and R* is H or an alkyl group of 1–18 carbon atoms; and

n is 1–6.

5,200,435

COMPOSITION OF FLEXIBLE POLYURETHANE FOAMS BLOWN USING REDUCED AMOUNS OF CHLOROFLUOROCARBON BLOWING AGENTS AND METHOD FOR PREPARATION

Ricardo DeGenova, Lake Jackson, and Jerram B. Nichols, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 11, 1991, Ser. No. 757,862
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—159 **7 Claims**

1. A method for preparing a flexible polyurethane foam comprising mixing as foam formulation components:

(1) an "A" component consisting of a blend of a polymethylene polydiphenyldiisocyanate and a methylene diphenyldiisocyanate prepolymer wherein the methylene diphenyldiisocyanate prepolymer is prepared from a prepolymer formulation having a first active hydrogen containing compound which has an average equivalent weight of about 30 grams per equivalent to about 600 grams per equivalent;

(2) a "B" component containing a second active hydrogen containing compound; and

(3) a carbon dioxide generating blowing agent; under reaction conditions sufficient to prepare a flexible polyurethane foam.

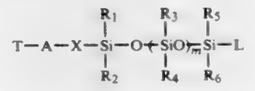
5,200,436

SILOXANE INIFERTER COMPOUNDS, BLOCK COPOLYMERS MADE THEREWITH AND A METHOD OF MAKING THE BLOCK COPOLYMERS

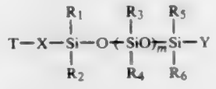
Ramesh C. Kumar, Maplewood; Milton H. Andrus, Jr., White Bear Lake, and Miecyzslaw H. Mazurek, Roseville, all of Minn., assignors to Minnesota Mining and Manufacture Company, St. Paul, Minn.

Division of Ser. No. 660,979, Feb. 26, 1991, Pat. No. 5,025,266, which is a continuation of Ser. No. 393,550, Aug. 14, 1989, abandoned. This application Jul. 25, 1991, Ser. No. 735,652
Int. Cl.[5] C08G *77/04, 77/22*; C08F *293/00, 2/48*
U.S. Cl. 522—57 **11 Claims**

1. A block copolymer represented by the formula



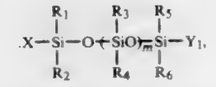
which is made by the utilization of an iniferter represented by the formula



wherein:

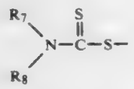
A comprises at least one polymer block consisting essentially of polymerized free radically polymerizable monomer;

T and X are organic groups selected so that the T-X bond is capable of dissociating upon being subjected to a radiant energy source to form a terminator free radical of the formula T. and an initiator free radical of the formula



said initiator free radical being sufficiently reactive to initiate free radical polymerization of free radically polymerizable monomer and said terminator free radical being insufficiently capable of initiating free radical polymerization of free radically polymerizable monomer by capable of rejoining with said initiator free radical or a free radical polymer segment free radically polymerized with said initiator free radical;

wherein T is



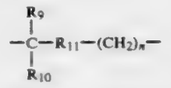
wherein R_7 and R_8 are monovalent moieties selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} fluoroalkyl including at least one fluorine atom, aryl and substituted aryl, R_7 and R_8 being the same or different and being selected so that they will not prevent said initiator free radical from initiating free radical polymerization or the combining of said terminator free radical with said initiator free radical or a polymer free radical segment including said initiator free radical; or

wherein T is $R_{12}OC—S—$

wherein R_{12} is a monovalent moiety selected from the group consisting of hydrogen, C_{1-4} alkyl, aryl and substituted aryl;

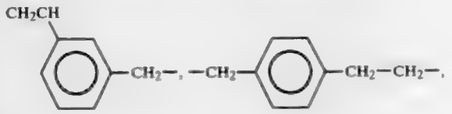
wherein —X— is a divalent species selected from the group consisting of alkylene, arylalkene, and arylene; or

wherein —X— is a divalent species having the general formula



wherein R_9 and R_{10} can be the same or different and are selected from the group consisting of hydrogen and C_{1-6} alkyl, R_{11} is a divalent species selected from the group consisting of C_{1-7} alkylene and phenylene, and n is an integer of at least 1; or

wherein X is selected from the group consisting of



and mixtures thereof;

R_1, R_2, R_5 and R_6 are monovalent moieties selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy and aryl which can be the same or different;

R_3 and R_4 are monovalent moieties which can be the same or different selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} fluoroalkyl including at least one fluorine atom and aryl;

R_1, R_2, R_3, R_4, R_5 and R_6 are selected so that they do not prevent said initiator free radical from initiating free radical polymerization or the combining of said terminator free radical with said initiator free radical or a polymer free radical segment including said initiator free radical;

Y is selected from the group consisting of —X—T and —Z wherein X and T are defined above and Z is an organic moiety that will not dissociate to form free radicals when subjected to said energy source;

L is selected from the group consisting of —X—A—T and —Z wherein X and T are defined above and Z is an organic moiety that will not dissociate to form free radicals when subject to said energy source;

Y_1 is selected from the group consisting of —X. and —Z; and

m is an integer of at least 10.

5,200,437

COATING COMPOSITIONS CONTAINING ALK-1-ENYL ETHERS

James A. Dougherty, Pequannock; Fulvio J. Vara, Chester, both of N.J.; Jeffrey S. Plotkin, Monsey, N.Y.; Paul D. Taylor, West Milford, and Kolazi S. Narayanan, Palissdes Park, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

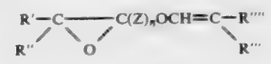
Filed Jan. 6, 1992, Ser. No. 817,218
Int. Cl.[5] C08F *2/46*
U.S. Cl. 522—89 **13 Claims**

1. A coating composition comprising:

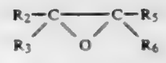
(a) the reaction product of (i) a hydroxylated compound having the formula

$$HO—[R(OH)_m]_l$$

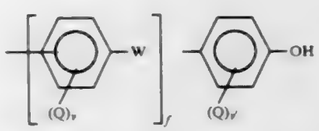
(ii) an alk-1-enyloxy oxirane having the formula



and (iii) from 0 to 95% of an alkyl epoxide having the formula



wherein m has a value or from 0 to 8; t has a value of from 1 to 50; when m is a positive integer, R is C_2 to C_{20} alkylene, alkenylene, alkynylene, arylene, aralkylene, alkarylene, aralkenylene or alkenylarylene which radicals are optionally substituted with a carbonyl, vinyl ether, carboxylate, carbonate, alkyloxyalkyl, alkenyloxyalkyl, halo, hydroxy, alkyloxy or a mixture thereof and when m is zero, R can be C_1 to C_{20} alkyl, phenyl, benzyl, a polyhydroxylated starch, cellulose or sugar and alkoxylated derivatives thereof or the radical



where

W is lower alkyl, sulfur, sulfonyl or oxygen; Q and Q′ are each independently lower alkyl or halogen; v and v′ each have a value of from 0 to 4 and f has a value of from 1 to 50;

Z is C_1 to C_8 alkylene, alkenylene, alkynylene or (alkyleneoxy)g-lower alkylene where g has a value of from 1 to 8;

R′, R″, R‴ and R⁗ are each independently hydrogen or alkyl having from 1 to 6 carbon atoms;

n has a value of from 1 to 8;

R_2, R_3, R_5 and R_6 are each independently hydrogen, C_1 to C_6 alkyl or alkenyl or halogenated alkyl or alkenyl;

(b) optionally, a curable diluent, and

(c) a cationic photoinitiator.

5,200,438

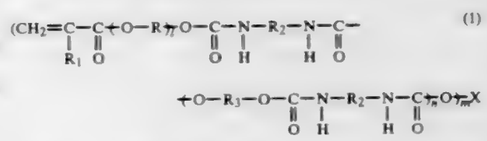
ULTRAVIOLET RAY-CURABLE INK

Toshihiro Fujii; Hiroki Nii; Makoto Ikeda, all of Fukuyama; Masao Etori, Nishikasugai, and Ban Tanaka, Toyota, all of Japan, assignors to Hayakawa Rubber Co., Ltd., Japan

Continuation of Ser. No. 652,483, Feb. 8, 1991, abandoned, which is a continuation of Ser. No. 247,372, Sep. 21, 1988, abandoned. This application Dec. 30, 1991, Ser. No. 815,579
Claims priority, application Japan, Mar. 9, 1988, 63-53680
Int. Cl.[5] C08F *2/48*; C08G *18/32, 18/69*
U.S. Cl. 522—96 **1 Claim**

1. An ultraviolet ray-curable ink comprising by weight:

100 parts by weight of an ultraviolet ray-curable rubbery copolymer having the general formula (1):



(1)

wherein R represents an alkylene group having 2–8 carbon atoms, R_1 is selected from the group consisting of H and CH_3, R_2 is a residue of diisocyanate, R_3 is a residue of dihydric alcohol, X is a residue of dienic liquid rubber having at least one hydroxyl group, l is a number of 1–4, m is a number ranging from $1.0<m<3.0$ and n is a number of 1–12;

50–500 parts of at least one mono or polyfunctional monomer selected from the group consisting of acrylic or meth-

acrylic esters of C_1–C_{12} alcohol having a side chain, alkyl-

5,200,441

PROCESS FOR PREPARING THERMOPLASTIC RESINS

5,200,445

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acrylic esters of C_1–C_{12} alcohol having a side chain, alkyl-substituted aminoalcohols, alkylsubstituted aminoalcohol-methacrylates, acrylamides, acrylimides and N-vinyl-2-pyrrolidone;

at least one kind of urethaneacrylate polyfunctional photopolymerizable oligomer having at least 2 acrylate groups present in an amount of up to 300 parts; and

1–30 parts of a photopolymerization initiator.

5,200,439

METHOD FOR INCREASING INTRINSIC VISCOSITY OF SYNDIOTACTIC POLYPROPYLENE

Tadashi Asanuma, Takaishi, Japan, assignor to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 2, 1991, Ser. No. 679,533

Claims priority, application Japan, Apr. 13, 1990, 2-96546; May 30, 1990, 2-138252; Nov. 29, 1990, 2-325514

Int. Cl.[5] C08F *2/48, 110/06;* **C08J** *3/28*

U.S. Cl. 522—157 **18 Claims**

1. A method for increasing the intrinsic viscosity of polypropylene having a substantially syndiotactic structure which comprises irradiating syndiotactic propylene having an intrinsic viscosity of from 0.1 to 5 with radiation in the absence of oxygen, and then heating the irradiated syndiotactic polypropylene until radicals formed by the irradiation disappear.

5,200,440

ORGANOSILICONE-TREATED SILICA AND A COMPOSITION CONTAINING IT

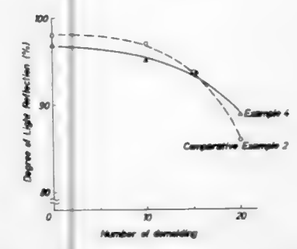
Toshio Takago, Annaka; Hiroshi Inomata, Takasaki; Shinichi Sato, and Hitoshi Kinami, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 606,870

Claims priority, application Japan, Nov. 2, 1989, 1-286388

Int. Cl.[5] C08K *9/06*

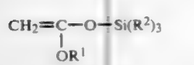
U.S. Cl. 523—213 **11 Claims**



1. An organosilicone-treated silica obtained by treating

(A) a silica powder having a specific surface area 5 of at least 50 m^2/g with

(B) a triorgano(1-alkoxyvinyloxy)silane having the formula (I):



(I)

wherein R^1 is a monovalent hydrocarbon group of from 1 to 8 carbon atoms or an ether linkage-containing organic group having from 1 to 8 carbon atoms, and three R^2's may be the same or different and are each a substituted or unsubstituted monovalent hydrocarbon group of from 1 to 18 carbon atoms or an ether linkage-containing organic group having from 1 to 18 carbon atoms.

5,200,441

PROCESS FOR PREPARING THERMOPLASTIC RESINS

Young M. Kim, and Chan H. Lee, both of Daejeon-si, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea

Filed Aug. 26, 1991, Ser. No. 749,870

Claims priority, application Rep. of Korea, Aug. 28, 1990, 90-13332

Int. Cl.[5] C08L *0/00*

U.S. Cl. 523—221 **3 Claims**

1. A process for preparing thermoplastic resins having a high surface gloss and excellent impact resistance which comprises blending the graft polymer (D) having a grafting degree of 60~120% which is prepared by graft polymerizing an aromatic vinyl compound and a vinyl cyanide compound to 10~40% by weight of rubber latex (B) having 0.20~0.35μ of an average particle diameter, agglomerated by the shearing force, and the graft polymer (C) having a grafting degree of 25~45% which is prepared by graft polymerizing an aromatic vinyl compound and a vinyl cyanide compound to 40~80% by weight of rubber latex (A) having 0.25~0.40μ of an average particle diameter, agglomerated by the acidulation or made by the emulsion polymerization, with the proviso that in the thermoplastic resins, the weight ratio of the latex (A) to the latex (B) is from 90/10 to 50/50.

5,200,442

PROCESS FOR THE PREPARATION OF A CROSSLINKABLE BINDER FOR PAINTS FROM FLUOROPOLYMER SOLUTIONS

Michael Schlipf, Burgkirchen, and Eduard Weiss, Burghausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1991, Ser. No. 806,582

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1990, 4040129

Int. Cl.[5] C08K *0/00*

U.S. Cl. 523—340 **6 Claims**

1. A process for the preparation of a crosslinkable paint binder, which comprises

a) distilling under atmospheric pressure a solution of a fluorine-containing copolymer comprising copolymerized units from

1) a perfluoroolefin,

2) a saponifiable vinyl ester of a short-chain

3) a vinyl ester of a highly branched carboxylic acid which resists saponification,

b) subjecting the distillation residue from step a) to vacuum distillation coupled with a forced transfer of the so-obtained highly viscous copolymer,

c) dissolving the so-obtained highly viscous copolymer in a mixture of an alkanol having 1 to 4 carbon atoms and a second solvent, this mixture also being capable of dissolving the saponified product from step d), below, to form a homogeneous solution,

d) saponifying the saponifiable groups of said copolymerized units 2), by the addition of an alkaline agent, and

e) filtering the resulting solution of the copolymer.

5,200,443

RADIATION STABILIZED FABRIC HAVING IMPROVED ODOR CHARACTERISTICS CONTAINING AN HINDERED AMINE COMPOUND

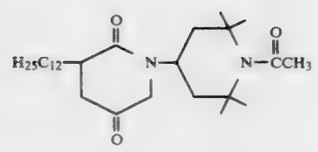
Robert L. Hudson, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 29, 1991, Ser. No. 677,226

Int. Cl.[5] C08K *5/3435*

U.S. Cl. 524—99 **14 Claims**

1. An ionizing radiation stabilized fabric comprising a nonwoven web formed of a propylene polymer containing an acetylated hindered amine light stabilizer having a formula of:



9. An ionizing radiation stabilized fabric having improved odor characteristics comprising a nonwoven web formed of a propylene polymer containing polymethyl propyl 3-oxy siloxane.

5,200,444

POLYMER MATRICES HEAT AND LIGHT STABILIZED WITH NOVEL BENZOPHENONE/1,4-DIHYDROPYRIDINE COMPOUNDS

Michel Gay, Villeurbanne, and Sylvie Lavault, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

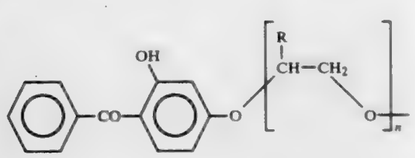
Division of Ser. No. 531,296, May 31, 1990, Pat. No. 5,034,533. This application Dec. 13, 1990, Ser. No. 626,767

Claims priority, application France, May 31, 1989, 89 07415

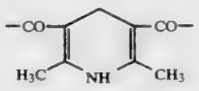
Int. Cl.[5] C08K *5/34*

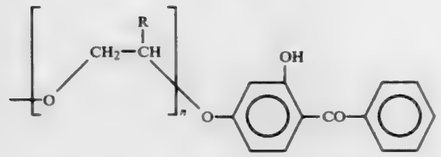
U.S. Cl. 524—99 **15 Claims**

1. A heat and light stabilized composition of matter, comprising an organic polymeric matrix, said polymeric matrix having incorporated therein an effective heat/light stabilizing amount of a benzophenone/1,4-dihydropyridine compound having the following formula (I):



(I)





in which n is a number ranging from 1 to 3, and R is a methyl radical or a hydrogen atom.

5,200,445

SELF-EXTINGUISHING ELASTOMERIC POLYMERIC COMPOSITIONS COMPRISING TRIAMINO TRIAZINE OLIGOMERS AND PHOSPHATES AND/OR PHOSPHONATES

Roberto Cipolli, Novara; Enrico Masarati, Piacenza; Gilberto Nucida, Milan; Mario Pirozzi, Milan, and Roberto Oriani, Milan, all of Italy, assignors to Ministero Dell'Universita' e Della Ricerca Scientifica e Tecnologica, Rome, Italy

Filed Sep. 11, 1991, Ser. No. 757,591

Claims priority, application Italy, Sep. 13, 1990, 21456 A/90

Int. Cl.[5] C08J *5/10;* **C08K** *5/34;* **C08L** *23/00*

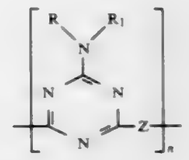
U.S. Cl. 524—100 **45 Claims**

1. Self-extinguishing polymeric compositions comprising:

a) from 89 to 40 parts by weight of a thermoplastic polymer or of a polymer having elastomeric properties;

b) from 8 to 33 parts by weight of one or more phosphates and/or phosphonates of ammonium or of an amine; and

c) 3 to 27 parts by weight of one or more oligomeric compounds derived from 2,4,6-triamino-1,3,5-triazine, having the general formula (I):



(I)

wherein

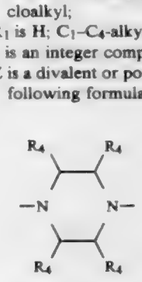
R is $-(C_mH_{2m})-OR_2$, wherein m is an integer comprised between 2 and 8,

R_2 is H; C_1–C_8-alkyl; C_2–C_8-alkenyl; $-(C_pH_{2p})-OR_3$ wherein p is an integer comprised between 1 and 4 and R_3 is H, C_1–C_4-alkyl, C_6–C_{12}-cycloalkyl or C_6–C_{12}-alkylcycloalkyl;

R_1 is H; C_1–C_4-alkyl or R;

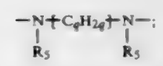
n is an integer comprised between 2 and 50;

Z is a divalent or polyvalent radical comprised of one of the following formulae:

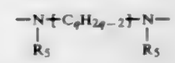


(II)

wherein radicals R_4, equal or different among them, are hydrogen or C_1–C_4-alkyl;

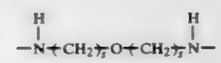


(III)



(IV)

wherein q is an integer comprised between 2 and 14; R_5 is hydrogen; C_1–C_4-alkyl; C_2–C_6-alkenyl; C_1–C_4-hydroxyalkyl;



(V)

5,200,448

5,200,450

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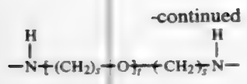
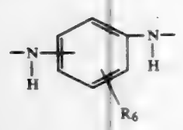
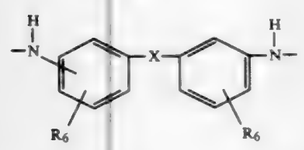


(VI)

wherein s is an integer comprised between 2 and 5 and t is an integer comprised between 1 and 3;

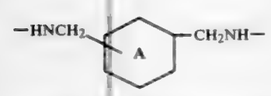


(VII)



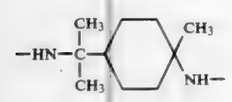
(VIII)

wherein:
X is a direct bond C—C; O; S; S—S; SO; SO_2; NH; $NHSO_2$; NHCO; N=N; CH_2;
R_6 is hydrogen; hydroxyl; C_1–C_4-alkyl; (C_1–C_4)-alkoxy;

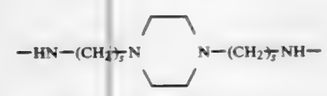


(IX)

wherein A is a saturated or an unsaturated cycle;

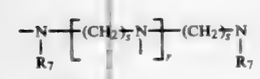


(X)



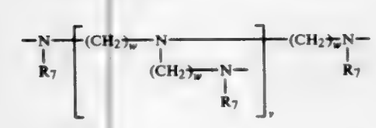
(XI)

wherein s has the previously defined meaning;



(XII)

where:
R_7 is hydrogen or C_1–C_4-alkyl;
r is an integer comprised between 1 and 5; indexes s, equal or different among them, have the previously defined meaning;



(XIII)

wherein:
R_7 has the previously defined meaning;
w is an integer comprised between 2 and 4;
v is 1 or 2.

5,200,446

PLASTIC MOLDING COMPOUND TREATED WITH AN ANTISTATIC AGENT

Klaus-Dieter Bergner, Biberbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 9, 1991, Ser. No. 697,766

Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015184

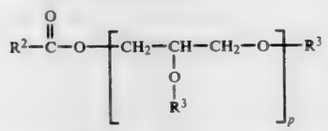
Int. Cl.[5] **C08K** *5/42;* **C08L** *27/00*

U.S. Cl. 524—173 **14 Claims**

1. A polyvinyl chloride composition containing an antistatic agent, which composition consists essentially of 94 to 99.95% by weight, based on the composition, of polyvinyl chloride and 0.05 to 6% by weight, based on the composition, of the antistatic agent, said antistatic agent consisting essentially of 5 to 40% by weight, based on the antistatic agent, of a compound of formula I:

(I)

wherein R^1 is a linear or branched aliphatic hydrocarbon radical having 4 to 30 carbon atoms or a cycloaliphatic hydrocarbon radical having 6 to 30 carbon atoms, M is an alkali metal or alkaline earth metal atom, m is 1 or 2 and n is 1, 2, 3 or 4, each sulfonate group occupying a terminal or intermediate position, and 60 to 95% by weight, based on the antistatic agent, of a compound of formula II:



(II)

wherein R^2 is an aliphatic hydrocarbon radical having 3 to 23 carbon atoms, which is optionally substituted by one or two hydroxyl groups, or a cycloaliphatic or aromatic hydrocarbon radical having 6 to 22 carbon atoms, R^3 is a hydrogen atom or the radical

wherein R^2 is as defined above, and p is 1, 2, 3 or 4.

5,200,447

METHOD OF DECREASING FORMALDEHYDE CONTENT IN ORGANIC PAINT COATING SYSTEMS

Jerry A. Dieter, Rochester, and Chester P. Jarema, Sterling Heights, both of Mich., assignors to Grow Group, Inc., New York, N.Y.

Division of Ser. No. 813,898, Dec. 23, 1991, Pat. No. 5,140,058, which is a continuation of Ser. No. 542,302, Jun. 22, 1990, abandoned. This application Jun. 10, 1992, Ser. No. 896,759

Int. Cl.[5] **C08K** *5/32;* **C08G** *12/04;* **B01D** *3/34*

U.S. Cl. 524—259 **7 Claims**

1. A method of increasing the yield in the distillation of an organic paint in a solvent therefor comprising the steps of:
   a. providing a composition comprised of organic paint from paint application equipment that has been purged with a solvent for the paint;
   b. adding to the composition of step a, an effective amount of an organic nitrogen containing formaldehyde fixating agent, thereby decreasing the formaldehyde content of the composition;
   c. distilling the composition of step b; and
   d. recovering the distillate.

5,200,448

FREEZE-THAW STABLE POLYACRYLAMIDE EMULSIONS

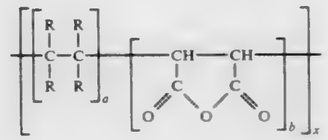
Peter M. Robinson, High Point, N.C., and Martin R. Jenkins, Columbus, Ga., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 327,388, Mar. 21, 1989, abandoned, which is a division of Ser. No. 122,494, Feb. 5, 1988, which is a continuation of Ser. No. 816,171, Jan. 3, 1986. This application Mar. 27, 1992, Ser. No. 860,310

Int. Cl.[5] **C08K** *5/10*

U.S. Cl. 524—317 **12 Claims**

1. A method of freeze-thaw stabilizing a water-in-oil emulsion of a water soluble polymer having 20 to 35 percent by weight polymeric solids comprising adding thereto a freeze-thaw stabilizing amount of a polymeric surfactant of the formula:



wherein x is a whole number greater than about 5, the mole ration of a:b is from about 3:1 to about 1:3, the HLB number is less than about 14, the R groups are independently selected from the group consisting of hydrogen, alkyl (C_{1-48}), alkoxy (C_{1-48}), alkenyl (C_{2-48}), aryl (C_{6-12}), and alkaryl (C_{7-12}) provided that at least one R group is alkyl (C_{12-48}), said amount being sufficient to make the emulsion more stable when subjected to freeze-thaw cycles than if no polymeric surfactant was employed.

5,200,449

POLYIMIDE RESIN AND PREPARATION THEREOF

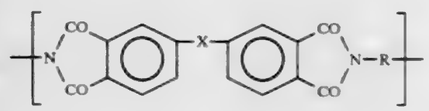
Hiroshi Itatani, Chiba, Japan, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 8, 1991, Ser. No. 697,122

Int. Cl.[5] **C08J** *3/09;* **C08K** *5/13;* **C08L** *77/06*

U.S. Cl. 524—323 **5 Claims**

1. A polyimide resin composition, where a polyimide resin containing more than 60 weight % of the repeating unit represented by the general formula (I)



(I)

is dissolved in a solvent mixture selected from the group consisting of phenol/4-methoxy phenol at a mixing weight ratio of 4:6–7:3 and phenol/2,6-dimethyl phenol at a mixing weight ration of 4:6–6:4.

5,200,450

THERMOPLASTIC MOLDING COMPOSITIONS BASED ON POLYAMIDE

Gerd Blinne, Bobenheim; Walter Goetz, Ludwigshafen; James Hurley, Mannheim; Herbert Gutsche, Beindersheim, and Klaus Muehlbach, Heppenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

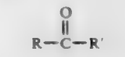
Filed Oct. 1, 1991, Ser. No. 769,431

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1990, 4031724

Int. Cl.[5] **C08J** *5/10;* **C08K** *5/07;* **C08L** *51/00;* **C08G** *69/00*

U.S. Cl. 524—356 **8 Claims**

1. A thermoplastic molding composition consisting essentially of
   A) from 96 to 99.9% by weight of at least one polyamide with a melting point of more than 250° C.,
   B) from 0.1 to 4% by weight of one or more dialkyl ketones of the general formula I



I

where R and R' are each alkyl of from 10 to 30 carbon atoms,
and also, based on the sum total of A) and B),
   C) from 0 to 40% by weight of an impact modifying rubber,
   D) from 0 to 60% by weight of fibrous or particulate fillers or a mixture thereof, and
   E) from 0 to 120% by weight of a modified polyphenylene ether.

5,200,451

1,3-DIPHENOXY-2-PROPANOL AS HEAT STABILIZER AND COMPOSITIONS STABILIZED THEREWITH

William G. Wright, Anna Maria, Fla., assignor to Wrightline Chemical Corporation, Anna Maria, Fla.

Filed Mar. 5, 1992, Ser. No. 846,591

Int. Cl.[5] **C08L** *5/06*

U.S. Cl. 524—372 **8 Claims**

1. A polymeric composition, which is exposed to heat, consisting essentially of 100 parts of a polymer, containing blended therein as a heat stabilizer and antioxidant from 0.1–5 parts, based on the weight of said polymer, the compound 1,3-diphenoxy-2-propanol;
   said polymeric composition optionally also containing from 0 to 55 parts, based on the weight of said polymer, of at least one of filter, dye, pigments plasticizer flow control or caring agent.

5,200,452

FIRE RETARDANT CURABLE 1-OXA-3-AZA TETRALINE (ALSO TERMED "3,4-DIHYDRO-1,3-BENZOXAZINE") DERIVED RESIN COMPOSITION

Herbert Schreiber, Wollerau, Switzerland, assignor to Gurit-Essex AG, Freienbach, Switzerland

Filed Nov. 18, 1991, Ser. No. 793,817

Claims priority, application Switzerland, Dec. 21, 1990, 4106/90

Int. Cl.[5] **C08J** *3/20*

U.S. Cl. 524—398 **65 Claims**

1. A resin mixture which may be cured to form a polymeric resin which is difficultly inflammable, said resin mixture comprising:
   (a) a resin component comprising at least one thermically curable 1-oxa-3-aza tetraline groups containing compound; and
   (b) a compound selected from the group consisting of:
   organic compounds of an element of the 6th auxiliary group of the periodic system;

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AQUEOUS ADHESIVE COMPOSITIONS CONTAINING

5,200,458

ADHESIVE COMPOSITION

carbon monoxide complex compounds of an element of the 6th auxiliary group of the periodic system;
organic compounds of an element of the 7th auxiliary group of the periodic system;
carbon monoxide complex compounds of an element of the 7th auxiliary group of the periodic system;
organic compounds of an element of the 8th auxiliary group of the periodic system;
the carbon monoxide complex compounds of an element of the 8th auxiliary group of the periodic system;
organic compounds of copper;
carbon monoxide complex compounds of copper;
organic compounds of antimony;
carbon monoxide complex compounds of antimony;
organic compounds of bismuth; and
carbon monoxide complex compounds of bismuth.

5,200,453

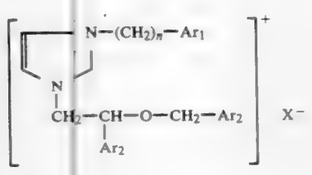
PRESERVATIVE FOR OPHTHALMIC SOLUTIONS

Herwig J. Janssen, Beersebaan, Belgium, assignor to Iolab Corporation, Claremont, Calif.

Filed Sep. 17, 1990, Ser. No. 583,523
Claims priority, application United Kingdom, Sep. 18, 1989, 8921072
Int. Cl.[5] A61K *31/415*
U.S. Cl. 514—399 **7 Claims**

1. A method for preserving Ophthalmic solutions which comprises adding to the solution an effective amount of a quaternary imidazolium salt of the formula:

(I)



Wherein
n is an integer from 1 to 6;
Ar_1 is phenyl or phenyl substituted with 1, 2, or 3 halo, C_1–C_6 alkoxy groups;
X is a pharmaceutically acceptable anion; and each
Ar_2 is independently a phenyl group substituted with two halo groups.

5,200,454

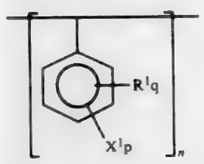
FLAME-RETARDANT RESIN COMPOSITION

Akikazu Nakano, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 288,032, Dec. 21, 1988, abandoned. This application Apr. 10, 1990, Ser. No. 507,144
Claims priority, application Japan, Jan. 14, 1988, 63-4920
Int. Cl.[5] C08K *3/10, 3/34, 3/40*
U.S. Cl. 524—409 **38 Claims**

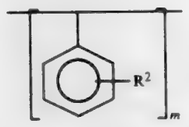
1. A flame-retardant resin composition having a halogen content of 2 to 40% by weight based on the amount of said composition, which comprises
(a) 100 parts by weight of a styrene-based polymer having mainly syndiotactic configuration, or a mixture of 99 to 50% by weight of said styrene-based polymer and 1 to 50% by weight of a thermoplastic resin, exclusive of tetrafluoroethylene-based polymer, and/or rubber;
(b) 3 to 40 parts by weight of a flame retardant selected from the group consisting of
(i) halogenated polystyrenes comprising a polymer consisting of one or more types of a structural unit expressed in formula (I):

(I)



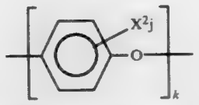
where X^1 denotes a halogen atom, and R^1 denotes a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, hydroxyl group or amino group, and also $1 \leqq p \leqq 5$, $0 \leqq q \leqq 4$, and n is an integer of 3 to 10,000; or a copolymer of a structural unit expressed in said formula (I) with a structural unit expressed in formula (II)

(II)



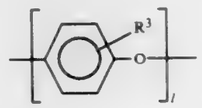
where R^2 denotes a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, hydroxyl group or amino group, and the total of m and n is 3 to 10000, and the ratio of n and m is such that the former is 0.01 to 99.99 mol % of the total of the two; and
(ii) halogenated polyphenylene oxides comprising a polymer consisting of one or more types of a structural unit expressed in a formula (III):

(III)



where X^2 denotes a halogen atom, $1 \leqq j \leqq 4$, k is an integer of 3 to 1000; or a copolymer of the structural unit expressed in said formula (III) and a structural unit expressed in formula (IV):

(IV)



where R^3 denotes a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, and the total of k and l is 3 to 1,000, and the ratio of k and l is such that the former is 0.01 to 99.99 mol % of the total of the two; and
(c) 1 to 15 parts by weight of an auxiliary flame retardant.

5,200,455

AQUEOUS ADHESIVE COMPOSITIONS CONTAINING STABILIZED PHENOLIC RESINS

Patrick A. Warren, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jan. 30, 1992, Ser. No. 828,337
Int. Cl.[5] C08K *3/10*
U.S. Cl. 524—413 **15 Claims**

1. An aqueous primer composition comprising a polyvinyl alcohol-stabilized aqueous phenolic resin dispersion, a latex of chlorosulfonated polyethylene, and a metal oxide.

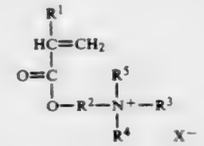
5,200,456

STABILIZATION OF DISPERSIONS OF METAL OXIDES AND/OR CARBON BLACK IN WATER

Philippe J. Teyssié, Neuville en Condroz; Luc E. Leemans, Diepenbeek; Walter A. Verdyck, Schoten, and Nikolaas C. de Jaeger, Hove, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jul. 9, 1991, Ser. No. 727,446
Claims priority, application European Pat. Off., Jul. 10, 1990, 90201849.8
Int. Cl.[5] C08K *3/22*
U.S. Cl. 524—430 **5 Claims**

1. A water dispersion comprising water, at least one of a metal oxide or carbon black, a hydrophilic binder and a block-copolymer which comprises at least one block of a methacrylate or acrylate monomer corresponding to the general formula:



wherein R^1 represents a methyl group or hydrogen, each of R^3, R^4 and R^5 which may be the same or different represent a hydrogen, an alkyl, aryl or alkylaryl group, R^2 represents a divalent organic group and X^- represents an anion.

5,200,457

WATER REPELLANT FOR WOOD

Ramesh C. Vasishth, and Darrel D. Nicholas, both of Starkville, Miss., assignors to Forest Products Laboratory, Mississippi State University, Mississippi State, Miss.

Filed Jun. 9, 1989, Ser. No. 363,769
Int. Cl.[5] C08K *3/10*
U.S. Cl. 524—437 **8 Claims**

1. A composition for making wood water repellant; said composition consisting essentially an acidic aqueous solution or an acidic aqueous emulsion of a glyoxal-urea adduct and an aluminum halohydrate dissolved in said solution or emulsion; said glyoxal-urea adduct being capable of reacting with cellulose contained in said wood under acidic conditions upon drying.

5,200,458

ADHESIVE COMPOSITION

Masaharu Iwasaki, Toda; Takashi Yonehara; Hiroyasu Morinaga, both of Kawaguchi; Satoshi Okajima, and Katsuhiro Koda, both of Tokyo, all of Japan, assignors to Oshika Shinko Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/01226, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO90/06348, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 7, 1989, Ser. No. 689,944
Claims priority, application Japan, Dec. 9, 1988, 63-310135; Dec. 9, 1988, 63-310136
Int. Cl.[5] C08K *3/34*
U.S. Cl. 524—456 **7 Claims**

1. An adhesive composition comprising a vinyl acetate polymer emulsion which contains acetoacetylated polyvinyl alcohol as a protective colloid and which further contains a calcium silicate.

5,200,459

STABLE BUTADIENE HETEROPOLYMER LATICES

Mark A. Weih, Cambridge Springs, and Helmut W. Kucera, West Springfield, both of Pa., assignors to Lord Corporation, Erie, Pa.

Filed May 31, 1991, Ser. No. 708,973
Int. Cl.[5] C08F *2/16;* **C08K** *3/20;* **C08L** *9/04*
U.S. Cl. 524—459 **22 Claims**

1. A butadiene heteropolymer latex prepared by an emulsion polymerization of a butadiene monomer and at least one copolymerizable monomer in the presence of polyvinyl alcohol and a stabilizing organic solvent wherein the stabilizing organic solvent is utilized in an amount ranging from about 10 to 100 parts by weight per 100 parts by weight of total monomers.

5,200,460

POLYACETAL POLYMER BLENDS

Joseph M. Machado, Richmond, and Randall P. Gingrich, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 30, 1991, Ser. No. 693,191
Int. Cl.[5] C08L *61/02*
U.S. Cl. 524—494 **13 Claims**

1. A composition comprising a blend of a polyacetal polymer, glass fibers, and from about 1.0 wt % to about 20 wt % of unsubstituted polyvinyl phenol polymer.

5,200,461

ANIONIC MICROGEL PARTICLE DISPERSION AND A COATING COMPOSITION THEREFROM

Yasuyuki Tsuchiya, Hirakata, and Kenshiro Tobinaga, Kawanishi, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 171,916, Jan. 5, 1988, abandoned. This application Jul. 5, 1990, Ser. No. 548,187
Claims priority, application Japan, Jan. 7, 1987, 62-1332; Jan. 7, 1987, 62-1333; Jan. 7, 1987, 62-1334; Jan. 7, 1987, 62-1336; Jan. 7, 1987, 62-1337; Jan. 7, 1987, 62-1338; Jan. 7, 1987, 62-1339
Int. Cl.[5] C08K *3/20*
U.S. Cl. 524—510 **8 Claims**

1. A process for preparing an anionic micro gel particle dispersion comprising:
(i) emulsifying in an aqueous medium a resin composition comprising
(A) 100 parts by weight of an anionic film-forming aqueous resin, and
(B) 10 to 250 parts by weight of a thermosetting crosslinking agent which is self-crosslinked or crosslinked with said aqueous resin (A) in terms of a condensation or addition reaction wherein the parts by weight are based on the solid content of the resin composition,
provided that, when the aqueous resin (A) is selected from

the group consisting of maleic natural or synthetic

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5,200,469

CROSSLINKED ELASTOMERIC POLYMERS AND

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the group consisting of maleic natural or synthetic drying oil and maleic polybutadiene and a half-ester or half-amide thereof, the thermosetting crosslinking agent (B) is selected from the group consisting of methylolphenols, etherified methylolphenols and melamine resins, and when the aqueous resin (A) is an anionic acrylic resin, the thermosetting crosslinking agent (B) is selected from the group consisting of methylolphenols and etherified methylolphenols,

(ii) and then heating the resultant emulsion to a temperature above the crosslinkable temperature of said crosslinking agent (B).

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SUCCINIMIDE CONTAINING POLYMERS AND LATTICES PREPARED FROM SAME

Richard C. Sutton, Rochester; Ignazio S. Ponticello, Pittsford; Susan J. Danielson, and Marsha D. B. Oenick, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 25, 1991, Ser. No. 646,132
Int. Cl.[5] C08L *39/00;* **C08F** *122/40, 212/06*
U.S. Cl. 524—548 **11 Claims**

1. A water-insoluble, noncrosslinked, nonporous copolymer having recurring units derived from:

(a) from 80 to about 99.9 mole percent of one or more ethylenically unsaturated polymerizable oleophilic monomers which provide hydrophobicity to said copolymer, provided that none of said monomers are crosslinking monomers,

(b) from about 0.1 to 20 mole percent of one or more ethylenically unsaturated polymerizable monomers having a succinimidoxycarbonyl group, and

(c) from 0 to about 10 mole percent of one or more other ethylenically unsaturated polymerizable monomers.

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AQUEOUS, RADIATION-CURABLE URETHANE ACRYLATE EMULSIONS AND PROCESS FOR PRODUCING THE SAME

Werner Flakus, Recklinghausen, Fed. Rep. of Germany, assignor to Huels, AG, Marl, Fed. Rep. of Germany

Filed Feb. 20, 1992, Ser. No. 837,960
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1991, 4110821
Int. Cl.[5] C08L *75/00*
U.S. Cl. 524—591 **11 Claims**

1. A method of producing an aqueous radiation-curable urethane urea acrylate emulsion, comprising:

mixing a cyclic polyisocyanate with water at a ratio of NCO equivalents to H_2O moles of about 10-20:>0-1, to form an NCO-containing urea polyisocyanate;

reacting said NCO-containing urea polyisocyanate with hydroxyethyl acrylate at an equivalent ratio of NCO to OH of about 15-20:10-15, to form an NCO-containing urethane urea acrylate;

reacting said NCO-containing urethane urea acrylate with a polyol in the absence of a solvent, at a temperature in the range of 50°-100° C., to form an essentially NCO-free resin; and

emulsifying said essentially NCO-free resin in water containing a hexose alkoxylate ester of an unsaturated fatty acid as a nonionic surfactant.

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WATER-SOLUBLE RADICAL-CURING POLYVINYL ALCOHOL DERIVATIVE

Akihisa Furuno, and Susumu Harashima, both of Kanagawa, Japan, assignors to Nitto Chemical Industry Co. Ltd., Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,846
Claims priority, application Japan, Dec. 22, 1989, 1-331169
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—59 **18 Claims**

1. A water-soluble radical-curing polyvinyl alcohol derivative which is obtained by reacting an anion-modified polyvinyl alcohol prepared by saponification of a copolymer comprising vinyl acetate and at least one of an unsaturated carboxylic acid and a derivative thereof with a glycidyl-containing vinyl compound in water or in a mixed solvent of water and a lower alcohol having from 1 to 4 carbon atoms under acidic conditions.

5,200,465

IMPACT MODIFICATION OF POLYIMIDES

AnnMarie Hellstern, Clifton Park; Robert J. Halley, Schenectady; Linda L. Mitchell, Delmar, all of N.Y., and I-Chung W. Wang, Vienna, W. Va., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 271,250, Nov. 14, 1988, Pat. No. 5,045,595. This application Dec. 11, 1990, Ser. No. 627,515
The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.
Int. Cl.[5] C08L *51/08*
U.S. Cl. 525—66 **15 Claims**

1. A composition comprising a polyimide in combination with a sufficient amount to improve the impact resistance of the polyimide of an impact modifier comprising a graft polymer having:

(a) as a first stage, an elastomeric polydiorganosiloxane and the polymerization product of silicon-free vinyl monomer, both formed by simultaneous polymerization, and

(b) at least one subsequent stage graft polymerized in the presence of any previous stages, said subsequent graft polymerized stage comprising polymers selected from the group consisting of copolymers of acrylonitrile with vinyl aromatic monomers, copolymers of methacrylonitrile with vinyl aromatic monomers, homopolymers of vinyl aromatic monomers, homopolymers and copolymers of lower alkyl acrylates or methacrylates, homopolymers and copolymers of acrylamide or methacrylamide and homopolymers and copolymers of acrylic acid or methacrylic acid.

5,200,466

RESIN COMPOSITION FOR POWDER COATINGS

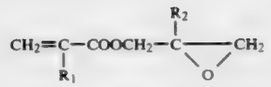
Taisaku Kano, Yokohama; Takayoshi Sekido, Hiratsuka; Eiichiro Miyazaki, Fujisawa, and Makoto Nishimori, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 25, 1991, Ser. No. 674,467
Claims priority, application Japan, Oct. 12, 1990, 2-272434
Int. Cl.[5] C08L *67/02, 37/00, 33/14*
U.S. Cl. 525—133 **16 Claims**

1. A resin composition for powder coatings, which comprises,

(A) a resin comprising

(a) 10 to 90 wt. % of an acrylic resin (A-1) having a viscosity of 100 to 800 poises at 140° C. that is a copolymer obtained by polymerizing 10 to 50 wt. % of a monomer component (a-1) represented by the formula (I):



Formula (I)

wherein R_1 and R_2 each represent a hydrogen atom or a lower alkyl group,

with 90 to 50 wt. % of another monomer component (a-2) comprising one or more monomers copolymerizable with said monomer component (a-1) and

(b) 90 to 10 wt. % of an acrylic resin (A-2) having a viscosity of 1,000 to 5,000 poises at 140° C. that is a copolymer obtained by polymerizing 10 to 50 wt. % of a monomer component (a-1) represented by the formula (I) given above and 90 to 50 wt. % of monomer component (a-2) comprising one or more monomers copolymerizable with said monomer component (a-1) and

(B) a polybasic acid compound obtained by reacting a polybasic acid and a polyhydric alcohol and having a viscosity of 100 to 2,000 poises at 140° C. wherein the resin and polybasic acid compound are blended so that the equivalent ratio of the glycidyl groups in the acrylic resin (A-1 and A-2) to the acid groups in the polybasic compound (B) is from 1.5 to 0.5.

5,200,467

MOLDABLE POLYBLENDS CONTAINING A POLYVINYL CHLORIDE RESIN

Frank E. Lordi, West Chester, Pa., and Peter J. Vanderpool, Cherry Hill, N.J., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Division of Ser. No. 82,260, Aug. 6, 1987, Pat. No. 4,798,868. This application Jan. 12, 1989, Ser. No. 296,453
Int. Cl.[5] C08L *35/06, 39/04*
U.S. Cl. 525—205 **24 Claims**

1. A moldable polyblend comprising: (a) from about 60 to 70 wt. % based on total polyblend of a polyvinyl chloride resin, (b) from about 20 to 30 wt. % based on total polyblend of a non-equimolar copolymer comprised of less than 50 mole percent of an unsaturated dicarboxylic acid or anhydride moiety and at least 50 mole-percent of at least one monomer copolymerizable therewith selected from the group consisting of vinyl aryl monomers, unsaturated nitriles, acrylic monomers, and mixtures thereof, wherein said non-equimolar copolymer is modified with a rubber; and (c) from about 10 to 20 wt. % based on total polyblend of an interfacial modifier selected from the group consisting of copolymers of methyl methacrylate and glutarimide, copolymers of methyl methacrylate and an N-aryl maleimide, and copolymers of alpha-methylstyrene, acrylonitrile, and, optionally, styrene.

5,200,468

BLENDS OF NYLON M5T AND AN IONOMER

Joseph Pickton, New Providence, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Oct. 23, 1990, Ser. No. 601,842
Int. Cl.[5] C08L *77/00*
U.S. Cl. 525—183 **19 Claims**

1. A polymer composition capable of being formed into shaped articles comprising a poly(2-methylpentamethylene terephthalamide), also known as nylon M5T, and about 0.5 to 5 weight % of ionomer based on the total of nylon M5T and ionomer, wherein said ionomer has a weight average molecular weight of about 500 to one million.

5,200,469

CROSSLINKED ELASTOMERIC POLYMERS AND PROCESS FOR PRODUCING THE SAME

Pierre Hous, Steenokkerzeel, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 18, 1990, Ser. No. 510,737
Int. Cl.[5] C08F *255/08, 279/02;* **C08G** *67/00*
U.S. Cl. 525—245 **38 Claims**

1. A process for preparing a crosslinked unsaturated copolymer of a C_4 to C_7 isomonoolefin and a C_4 to C_{14} conjugated multiolefin which comprises the steps of: contacting at a temperature of between about 100° and 260° C. for a period of up to 15 minutes, an uncrosslinked, unsaturated halogen-containing copolymer of a C_4 to C_7 isomonoolefin and a C_4 to C_{14} conjugated multiolefin comprising an unsaturated non-halogen containing moiety and an unsaturated chemically bound allylic halogen-containing moiety, said halogen being selected from the group consisting of from about 0.05 to 0.4 weight percent chlorine, from about 0.05 to 0.5 weight percent bromine and mixtures thereof, in the presence of a curing mixture comprising (a) at least one curing agent which reacts essentially only with said allylic halogen, and (b) at least one bifunctional dienophile selected from the group consisting of a bismaleimide, a polyacrylate, a methacrylic ester, a para-benzoquinone, and mixtures thereof.

5,200,470

NORBORNENE DICARBOXY PHENYLIMIDE POLYMERS

Jawed Asrar, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 629,910, Dec. 19, 1990, Pat. No. 5,115,037. This application Dec. 18, 1991, Ser. No. 809,987
Int. Cl.[5] C08F *8/04*
U.S. Cl. 525—326.8 **6 Claims**

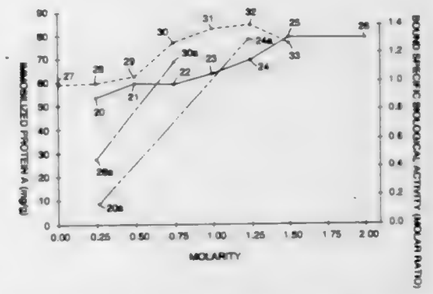
1. A polymer prepared by metathesis ring-opening polymerization of a eutectic-forming mixture of orthosubstituted and meta-substituted N-aryl norbornene dicarboximide monomers, wherein said N-aryl group is substituted with a halo, cyano, alkyl or halogenated alkyl substituting group.

5,200,471

BIOMOLECULES COVALENTLY IMMOBILIZED WITH A HIGH BOUND SPECIFIC BIOLOGICAL ACTIVITY AND METHOD OF PREPARING SAME

Patrick L. Coleman; Dean S. Milbrath, and Margaret M. Walker, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 5, 1990, Ser. No. 609,436
Int. Cl.[5] C08F *26/10;* **A61K** *31/395*
U.S. Cl. 525—326.9 **16 Claims**



12. The biologically active adduct support according to claim 9, wherein R^1 in the azlactone-functional polymeric support is hydrogen.

5,200,472

tion product of polyamic acid and bismaleimide modified by

removing said vaporized volatiles from said reactor vessel;

partially condensing said volatiles to separate the lower

5,200,478

METHOD FOR ACTIVATING SUPPORTED CHROMIUM

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5,200,472

VULCANIZABLE ACRYLIC ELASTOMER COMPOSITION

Akihiro Naraki, Kitaibaraki, Japan, assignor to Nippon Mektron, Limited, Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,141
Claims priority, application Japan, Jun. 5, 1990, 2-146538
Int. Cl.[5] C08C *19/22, 19/24;* C08L *37/00*
U.S. Cl. 525—381 8 Claims

1. A vulcanizable acrylic elastomer composition having improved compression set properties which comprises copolymers of

(a) an alkyl acrylate having an alkyl group having 1 to 8 carbon atoms, and

(b) an alkoxyalkyl acrylate having an alkoxyalkyl group having 2 to 8 carbon atoms, and

(c) an epoxy group-containing vinyl monomer, and

(d) alpha, beta-unsaturated carboxylic acid aryl ester,

and a combination of cross-linking agents that includes:

(1) a diphenyl phthalate, and

(1) a quaternary ammonium salt or a phosphonium salt, and

(3) at least one of a urea compound and a guanidine compound.

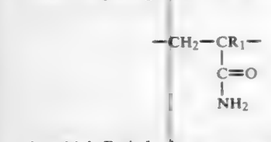
5,200,473

CHELATING RESINS AND METHOD FOR THEIR USE IN THE EXTRACTION OF METAL IONS

Gilbert Jeanneret-Gris, Chemin des Joncheres 4, 2022 Bevaix, Switzerland

Continuation of Ser. No. 445,832, Nov. 22, 1989, abandoned.
This application Dec. 23, 1991, Ser. No. 812,760
Claims priority, application Switzerland, Mar. 25, 1988, 1135/88
Int. Cl.[5] C08F *8/32*
U.S. Cl. 525—381 8 Claims

1. A method for the preparation of hydrophilic polymer resin, beads, having functional groups forming chelating ligands for metal ions, which comprises: reacting a cross-linked resin comprising units of the formula (I)



Formula (I)

in which R_1 is hydrogen or an aliphatic or aryl moiety, in an aqueous suspension with chelating ligands selected from the group consisting of amino acids, polyamines aminoalcohols, aminothiols, aminoaldoximes, azamacrocyclic compounds, aza-crown-ethers, amino phosphonic and sulfonic acids in an aqueous solution;

said reaction occurring in the presence of a coupling agent selected from the group aliphatic, aromatic, and heterocyclic aldehydes, and in the presence of a competitive agent selected from the group of soluble amides and organic compounds having active hydrogen atoms for association with metal ions, in an aqueous acidic medium;

whereby said competitive agent reacts with the coupling agent at approximately the same rate as the amido groups of the formula (I) resin.

5,200,474

POLYIMIDE ADHESIVE COMPOSITION INCLUDING BARBITURIC ACID MODIFIER

Ker M. Chen; Jing P. Pan; Gwo Y. Shiau, all of Hsinchu; Tsung H. Wang, and Wei C. Chang, both of Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Aug. 22, 1990, Ser. No. 571,139
Int. Cl.[5] C08L *79/00*
U.S. Cl. 525—426 7 Claims

1. A polyimide adhesive composition comprising the reaction product of polyamic acid and bismaleimide modified by barbituric acid or a derivative thereof.

5,200,475

EPOXY RESIN COMPOSITIONS CONTAINING DISECONDARY AROMATIC AMINES

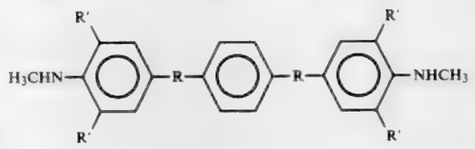
Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 3, 1991, Ser. No. 709,903
Int. Cl.[5] C08G *59/50*
U.S. Cl. 525—486 5 Claims

1. A composition comprising:

(a) an epoxy resin having an average of about 2 vicinyl epoxide groups per molecule;

(b) from about 30 to about 50 mole percent based on the epoxy resin, of an aromatic amine which can be represented by the structure formula



in which each R is a divalent linking moiety selected from the group consisting of C_{1-6} alkylene, —S— and —O—, and each R′ is ethyl;

(c) from about 20 to about 40 mole percent based on the epoxy resin, of 2,6-dialkyl aniline; and

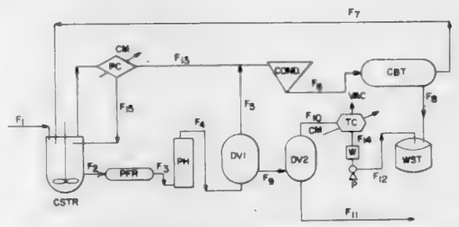
(d) from about 25 to about 50 mole percent based on the epoxy resin, of a multifunctional amine or phenolic cross-linking agent selected from the group consisting of a,a′-bis(3,5-dialkyl-4-aminophenyl)-1,4-diisopropylbenzene, 4,4′-methylenedianiline, p-phenylenediamine, m-phenylenediamine, alkylated m-phenylenediamines, phenol-formaldehyde novolacs, p-aminophenol and the tetraphenol of ethane.

5,200,476

REDUCTION OF UNDESIRABLE VOLATILES IN RECYCLE STREAMS USING PARTIAL CONDENSATION IN THE REACTOR VAPORIZATION LINE

José M. Sosa, Deer Park, and Stan Beisert, Houston, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Feb. 8, 1991, Ser. No. 652,688
Int. Cl.[5] C08F *112/08*
U.S. Cl. 526—67 10 Claims



1. A continuous process for polymerizing monovinyl aromatic compounds, said process comprising the steps of:

producing a product stream from a monovinyl aromatic monomer stream by polymerization in a reactor vessel system;

controlling reaction temperatures in said reactor vessel by allowing the products in said vessel to boil off the volatiles therein at temperatures and pressures sufficient to primarily vaporize only the volatile constituents;

removing said vaporized volatiles from said reactor vessel;

partially condensing said volatiles to separate the lower boiling point volatiles from the higher boiling point volatiles;

returning the condensed higher boiling point volatiles to said reactor vessel;

transferring said lower boiling point volatiles to separate condensing and filtering systems; separating at least one cut of volatile compounds out of the solids and non-volatile liquid compounds in said product stream to form a partially-purified stream;

condensing said at least one cut of volatiles in said condensing system and thereafter removing non-desirable compounds therefrom in said filtering system to form a purified recycle condensate;

recycling said purified condensate back into said reactor vessel system;

passing said partially-purified stream through an additional devolatilization at a higher vacuum than the previous devolatilization, thereby separating an additional cut of volatile compounds from said stream and forming a purified stream;

removing said additional cut of volatile compounds from said process; and,

flowing said purified stream of polymer into a finishing system.

5,200,477

PROCESS FOR PRODUCING STICKY POLYMERS

Edgar C. Baker, Bridgewater; George N. Foster, Bloomsbury, and Aaron S. Rhee, Belle Mead, all of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Feb. 22, 1991, Ser. No. 659,565
The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.
Int. Cl.[5] C08F *2/34*
U.S. Cl. 526—74 23 Claims

1. A process for preventing agglomeration of sticky polymers in a polymerization system which comprises adding to said polymerization system about 0.3 to about 80 weight percent based on the weight of the final product of an inert particulate material having a surface coating thereon of an organo modified polydimethylsiloxane (OM-PDMS) of the formula:

wherein:

R, may be the same or different, and represents phenyl or an alkyl group having from 1 to 4 carbon atoms;

R′, represents hydrogen, or a straight or branched or cyclic alkyl chain having 5 to 50 carbon atoms;

R″, may be the same or different and represents R or R′

R‴ is alkylene, cycloalkyl, or alkoxy which can be substituted with hydroxy, amino, alkyl substituted amino, hydroxyl amino, phenol, alkyl substituted phenol, alkyl substituted piperidinoxy and epoxy;

X=is an integer of 0 to <2000

Y=is an integer of 0 to <2000,

Z is an integer of 1 to 2000, with the proviso that the sum of (x+y+z) is greater than or equal to 4 and less than or equal to 2000, with the further proviso that the repeat units if they are present can be in any sequence, either random or non-random.

5,200,478

METHOD FOR ACTIVATING SUPPORTED CHROMIUM OXIDE CATALYSTS AND OLEFIN POLYMERIZATION PROCESS CARRIED OUT THEREWITH

Claude Vogels, Lasne, and Lac Lerot, Brussels, both of Belgium, assignors to Solvay S.A., Brussels, Belgium

Division of Ser. No. 203,647, Jun. 3, 1988, Pat. No. 5,093,300, which is a continuation of Ser. No. 652,147, Sep. 18, 1984, abandoned, which is a continuation of Ser. No. 481,877, Apr. 4, 1983, abandoned. This application Oct. 23, 1991, Ser. No. 780,787
Int. Cl.[5] C08F *4/24, 10/02*
U.S. Cl. 526—106 7 Claims

1. A polymerization process comprising contacting at least one alpha-monoolefin having 2 to 8 carbon atoms with an activated chromium-containing catalyst supported on a silica-containing base and recovering a polymer, wherein the catalyst is first activated by the process comprising:

(a) a first activation step of heating catalyst in an oxidizing atmosphere at an oxidizing activation temperature within the range of 600°–850° C. until at least a part of the chromium present in the catalyst is converted to the hexavalent state;

(b) a second activation step, immediately following step (a), of cooling the catalyst in an oxidizing atmosphere until it reaches a temperature, below the oxidizing activation temperature, comprised between 550° and 750° C.;

(c) replacing the said oxidizing atmosphere by a non-oxidizing atmosphere at the temperature reached at the end of step (b) and maintaining the catalyst at the said temperature for a period of time between 15 minutes and 20 hours sufficient to achieve at least partial self-reduction of at least a portion of the chromium present in the catalyst to a lower valence state; and

(d) cooling the catalyst in the said non-oxidizing atmosphere from the temperature of step (c) to ambient temperature.

5,200,479

HARDENABLE FLUORINATED COPOLYMER, THE PROCESS FOR MAKING THE SAME, AND ITS APPLICATION IN PAINTS AND VARNISHES

Patrick Kappler, Ecully, and Jean-Luc Perillon, Bernay, both of France, assignors to Atochem, France

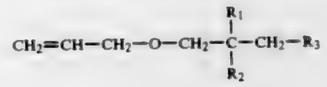
Division of Ser. No. 779,017, Oct. 18, 1991, Pat. No. 5,136,001. This application Jul. 15, 1992, Ser. No. 914,424
Claims priority, application France, Oct. 19, 1990, 90 12970
Int. Cl.[5] C08F *18/20*
U.S. Cl. 526—212 6 Claims

1. The processing of making a hardenable copolymer based on a fluorinated monomer and allylic monomer, comprising polymerizing

(a) tetrafluoroethylene,

(b) chlorotrifluoroethylene, vinylidene fluoride, or a mixture of the two,

(c) an allylic polyol of formula:



in which

R_1 is H or CH_2OH,

R_2 is OH or CH_2OH, and

R_3 is CH_3 or OH,

with the proviso that R_1 and R_3 cannot be simultaneously H and CH_3, and

(d) an allylic or acrylic monomer with a fluorocarbon chain of formula:

rently to said melts at a separation pressure of about 5 to about

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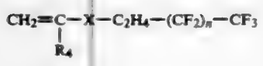


in which
n has a value of 3 to 12,
R_4 is H or CH_3, and
X is CH_2—O or

in a solvent medium in the presence of an organosoluble polymerization initiator at a temperature of between about 30° to 120° C. at a pressure of about 10 to 80 bars for a time sufficient to form said copolymer.

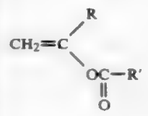
5,200,480

CHLOROTRIFLUOROETHYLENE BASED COPOLYMER SUITABLE AS PAINT VEHICLE

Yutaka Maruyama; Hidenari Okinaka, and Kengo Kadotani, all of Kamifukuoka, Japan, assignors to Central Glass Company Limited, Ube City, Japan

Filed Jun. 20, 1991, Ser. No. 718,562
Claims priority, application Japan, Jun. 20, 1990, 2-161551
Int. Cl.[5] C08F *214/18*
U.S. Cl. 526—249 **10 Claims**

1. A copolymer comprising:
25 to 75 mol % of first repeating units which originate from chlorotrifluoroethylene;
10 to 70 mol % of second repeating units which originate from a fatty acid ester represented by the formula (1),



(1)

wherein R is hydrogen atom or methyl group, and R′ is an alkyl group having 1 to 12 carbon atoms; and
3 to 75 mol % of third repeating units which originate from a hydroxyl-containing allyl ether represented by the formula (2),

$$CH_2{=}CH{-}CH_2{-}O{-}(CH_2)_n{-}OH \quad (2)$$

wherein n is an integer from 3 to 8.

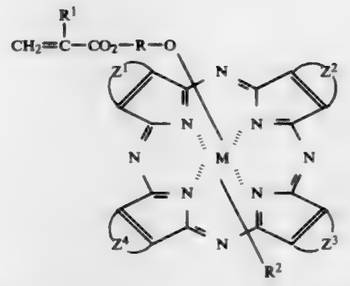
5,200,481

TETRAAZAPORPHYRIN MONOMERS AND POLYMERS

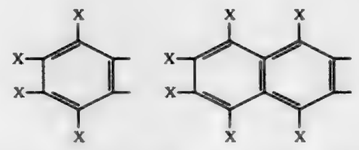
James R. Sounik, Somerset; Jacquelyn Popolo, Old Tappan, both of N.J., and Thomas M. Leslie, Huntsville, Ala., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Jul. 15, 1991, Ser. No. 729,752
Int. Cl.[5] C08F *126/06*; C09B *69/10*
U.S. Cl. 526—259 **13 Claims**

1. A tetraazaporphyrin dye of the formula I, the residue of which is contained as recurring polymerized monomeric units in a polymer, and the polymer has a T_g in the range of about 60°–250° C.



where M is a coordinated silicon, germanium or tin atom; Z^1, Z^2, Z^3 and Z^4 individually are one of the following structures:



where X is hydrogen, halogen or an aliphatic, alicyclic or aromatic substituent containing 1–12 carbon atoms; R is a divalent aliphatic, alicyclic or aromatic substituent containing between about 2–20 carbon atoms; R^1 is hydrogen or a C_1–C_4 alkyl substituent; and R^2 is an aliphatic, alicyclic or aromatic substituent containing between about 1–20 carbon atoms.

5,200,482

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT COPOLYMERS OF DIALLYL AMMONIUM MONOMERS AND ACRYLAMIDE MONOMERS IN SOLUTION

Herbert A. Gartner, Baden-Baden, Fed. Rep. of Germany, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 667,707, Mar. 11, 1991, Pat. No. 5,110,883.
This application Dec. 30, 1991, Ser. No. 814,175
Int. Cl.[5] C08F *236/20*
U.S. Cl. 526—295 **16 Claims**

1. A water-soluble, linear copolymer of diallyl ammonium monomer and an acrylamide monomer having a uniform diallyl ammonium monomer to acrylamide monomer ratio and an intrinsic viscosity of from about 10 to about 25 dl/g as determined in a 4% sodium chloride solution.

5,200,483

POLYOL(ALLYL CARBONATE) COMPOSIITONS AND ARTICLES PREPARED THERE FROM

Christopher D. Selvig, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 7, 1991, Ser. No. 788,978
Int. Cl.[5] C08F *18/24, 283/02*
U.S. Cl. 526—301 **30 Claims**

1. A polymerizable organic composition comprising a copolymerizable blend of:
(a) polyol(allyl carbonate), and
(b) from about 10 to about 70 weight percent of a mixture of aliphatic urethanes, the terminal portions of which contain a functional group selected from the group consisting of allyl and acrylyl groups, said mixture of aliphatic urethanes being representable by at least two of the expressions,

(1) D—B—A—B—D,
(2) D—B—A—B—D′ and
(3) D′—B—A—B—D′

wherein D represents the terminal portion containing the allyl group, D′ represents the terminal portion containing the acrylyl group, B represents an aliphatic bis carbamic moiety representable by the formula, —OC(O)—NH(E)NH—C(O)—O—, wherein E is the aliphatic residue of an aliphatic diisocyanate, and A in each aliphatic urethane present in the mixture of aliphatic urethanes represents the residue of a saturated aliphatic diol selected from the group consisting of C_2–C_6 alkane diols, diethylene glycol, polyester diol, polyether diol or polycarbonate diol, the mole ratio of said allyl groups to acrylyl groups in the aliphatic urethanes present in the mixture being from about 15:1 to about 1:1.

5,200,484

TERPOLYMERS OF ETHYLENE, THEIR PREPARATION AND THEIR USE AS ADDITIVES FOR MINERAL OIL DISTILLATES

Werner Reimann, Duisburg, Fed. Rep. of Germany, assignor to Hoechst Atkiengesellschaft, Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 716,949
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020640
Int. Cl.[5] C08F *218/08*
U.S. Cl. 526—331 **3 Claims**

1. A terpolymer from a mixture of monomers comprising ethylene, 5 to 20 mol % of vinyl acetate, and 0.2 to 5 mol % of isobutyl vinyl ether, said terpolymer having a mean molecular weight (M_n) of 500 to 5000 g/mol.

5,200,485

PROCESS FOR OBTAINING COPOLYMERS WITH A VERY LOW CONTENT RESIDUAL BUTADIENE USING AND INERT GAS PURGE

William J. Dale, Scarborough; George Liebermann, Mississauga, both of Canada, and Richard L. McQueen, Oklahoma City, Okla., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 14, 1990, Ser. No. 612,668
Int. Cl.[5] C08F *236/6*
U.S. Cl. 526—340 **7 Claims**

1. A process for removing residual butadiene from a copolymer composition formed by the reaction of butadiene and at least one second monomer in a reaction vessel, said process comprising purging said reaction vessel with an inert gas after the desired degree of polymerization has occurred, wherein said purge occurs while the reaction vessel is heated to the final polymerization temperature.

5,200,486

PROCESS FOR SEPARATING VOLATILE COMPONENTS FROM REACTION MIXTURES OBTAINED THROUGH HIGH-PRESSURE POLYMERIZATION

Heinz Beckemeier; Heinz-Dieter Bühnes, both of Oberhausen; Herbert Mercamp, Dinslaken, and Wilhelm Zoller, Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 484,397, Feb. 23, 1990, abandoned.
This application Nov. 6, 1991, Ser. No. 790,126
Int. Cl.[5] C08F *6/28*
U.S. Cl. 526—352 **15 Claims**

1. The process for the separation of volatile components from polymer melts formed during the homopolymerization of ethylene or the copolymerization of ethylene with other copolymerizable compounds at elevated pressures and elevated temperatures, wherein a ratio of ethylene is passed countercurrently to said melts at a separation pressure of about 5 to about 70 MPa and a melt temperature of at least about 120° C.

5,200,487

PROCESS FOR THE SYNTHESIS OF POLYSILSESQUIOXANES AND APPLICATION OF THE COMPOUNDS OBTAINED

Marc Lagarde, Strasbourg; Dominique Brousseoux, Marcoussis, and Jean-Claude Dubois, St Remy les Chevreuses, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 20, 1990, Ser. No. 630,507
Claims priority, application France, Dec. 28, 1989, 89 17315
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—21 **4 Claims**

1. A process for synthesizing polysilsesquioxane comprising the steps of:
(i) hydrolyzing a mixture of ether and a trichlorosilane wherein said trichlorosilane has the general formula $RSiCl_3$ where R represents an organic radical consisting of an alkyl, aryl, vinyl or allyl, thereby obtaining first solid products;
(ii) collecting first solid products resulting from step (i),
(iii) dissolving said solid product in an anhydrous ketonic solvent in the presence of an amine base while heating
(iv) evaporating and drying the solution of step (ici) until a second solid product is obtained,
(v) dissolving said second solid products in an anhydrous ketonic solvent with a chain terminating agent while heating until a second solution is obtained, and
(vi) filtering, evaporating and drying said second solution to obtain said polysilsesquioxane.

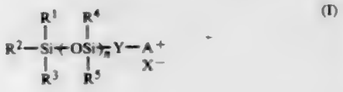
5,200,488

POLYORGANOSILOXANE HAVING A QUATERNARY SALT AT ITS ONE TERMINAL AND PERCUTANEOUS ABSORPTION-PROMOTING AGENT

Yu Nagase; Takao Aoyagi, both of Sagamihara, and Tomoko Nakamura, Ayase, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

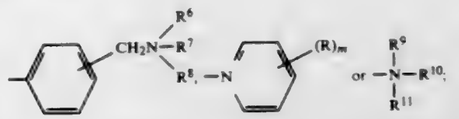
Filed Nov. 4, 1991, Ser. No. 787,103
Claims priority, application Japan, Nov. 6, 1990, 2-298938; May 8, 1991, 3-131597
Int. Cl.[5] C08G *77/04*
U.S. Cl. 528—28 **4 Claims**

1. A polyorganosiloxane having a quaternary salt at its one terminal, of the following formula (I):



(I)

wherein A is



X^- is a counter anion in the quaternary salt; each of R^1 to R^5 which may be the same or different, is an alkyl group, a substituted alkyl group or a phenyl group; Y is a C_{1-6} linear or branched bivalent alkylene or oxyalkylene group; and n is an integer of at least 1, provided that when n is 2 or more, each of R^4 and R^5 may be the same or different, wherein each of R^6 to R^8 which may be the same or different, is an alkyl group, a substituted alkyl group or a phenyl group, or R^6 to R^8 together form a ring and/or an unsaturated bond; R is a C_{1-6} alkyl group or a phenyl group; m is an integer of from 0 to 3, provided that

when is 2 or 3, each R may be the same or different; and each

before or during preparation of the thermoplastic polyure-

-continued

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when is 2 or 3, each R may be the same or different; and each of R^9 to R^{11} which may be the same or different, is a phenyl group, a benzyl group or a C_{1-6} alkyl group.

5,200,489

WATER DISPERSIBLE POLYISOCYANATES

Patricia B. Jacobs, Pittsburgh, and Terry A. Potter, Beaver, both of Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Feb. 27, 1992, Ser. No. 842,866

Int. Cl.[5] C08G *18/30*

U.S. Cl. 528—49 **8 Claims**

1. A polyisocyanate composition which is dispersible in water, has an average NCO functionality of 2 to 6 and comprises

a) a polyisocyanate adduct prepared from 1,6-hexamethylene diisocyanate or a mixture of hexamethylene diisocyanate with up to 70% by weight, based on the weight of the diisocyanates, of another diisocyanate and

b) an emulsifier which comprises the reaction product of

i) a monohydroxy functional polyether wherein the ethylene oxide portion of the polyether has a molecular weight of 200 to 1000 and the polyether has a total molecular weight of 200 to 1500 with

ii) either a polyisocyanate adduct which corresponds to component a) or another polyisocyanate,

wherein said emulsifier is present in an amount sufficient to provide an ethylene oxide content of at least 10% by weight, based on the weight of the polyisocyanate composition.

5,200,490

POLYURETHANE VINYL ETHERS

Ulrich Jaeger; Erich Beck, both of Harthausen, and Michael Karcher, Schwetzingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 21, 1992, Ser. No. 838,846

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1991, 4109649

Int. Cl.[5] C08G *18/38*

U.S. Cl. 528—49 **8 Claims**

1. A polyurethane vinyl ether, obtainable by reacting

A) 1 NCO equivalent of one or more isocyanurate-containing polyisocyanates with

B) 0.01–1.0 OH equivalent of one or more monohydroxyvinyl ethers and

C) 0–0.99 equivalent of functional groups of further compounds, which groups are reactive with OCN.

5,200,491

PROCESS FOR THE PREPARATION OF THERMOPLASTIC POLYURETHANE ELASTOMERS

Wolfgang Brüser, Leverkusen; Friedemann Müller, Neuss, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 24, 1992, Ser. No. 903,416

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1991, 4121785

Int. Cl.[5] C08G *18/08*

U.S. Cl. 528—51 **9 Claims**

1. A process for the preparation of thermoplastic polyurethane elastomers comprising reacting at an NCO:OH ratio of between 0.85 and 1.2:1

(a) at least one substantially linear hydroxyl-terminated polyol;

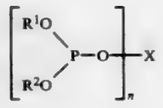
(b) at least one diisocyanate corresponding to the formula OCN-Z-NCO, wherein Z is a difunctional organic group;

(c) optionally, at least one diol chain extender; and

(d) optionally, catalysts or other auxiliaries and/or additives, in the presence of

(e) 0.000001 to 0.3% by weight, based on the total weight of the other components, of one or more phosphorus compounds that is added to one or more of the other components before or during preparation of the thermoplastic polyurethane elastomer to deactivate metal traces, wherein said phosphorus compound is selected from the group consisting of

(i) a phosphite corresponding to the formula



in which

X is hydrogen or an optionally substituted n-covalent C_{1-18} aliphatic, C_{4-18} cycloaliphatic, C_{6-18} aromatic, C_{7-24} alkaryl, or C_{7-24} aralkyl group optionally containing olefinic double bonds and/or heteroatoms selected from O, S, and non-basic N;

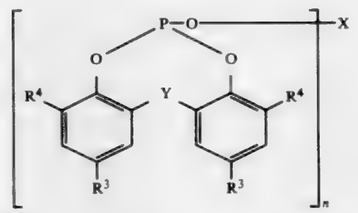
n is an integer of 1 to 4 according to the covalence n of X; and

R^1 and R^2 are independently C_{1-18} alkyl, C_{5-18} cycloalkyl, C_{7-24} aralkyl or alkaryl, or C_{6-24} aryl, or

R^2 represents C_{1-18} alkyl, C_{5-15} cycloalkyl, C_{7-24} aralkyl or alkaryl, or C_{6-24} aryl, and R^1 and X together represent an optionally substituted C_{2-4} alkylene chain, or

R^1, R^2, and X together represent a linear or branched C_{1-9} alkyl or C_{5-7} cycloalkyl group optionally substituted by 3- to 6-membered rings containing O and S as heteroatoms;

(ii) a phosphite corresponding to the formula



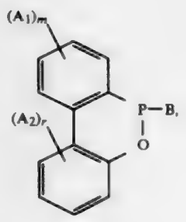
in which

X and n are as defined above;

R^3 and R^4 are the same or different and independently represent C_{1-9} aliphatic, C_{5-6} cycloaliphatic, C_{7-9} aralkyl, or C_{6-10} aryl groups; and

Y is a direct single bond, S, or HCR^5 wherein R^5 is hydrogen, C_{1-6} alkyl, cyclohexenyl, or cyclohexyl;

(iii) a compound having the formula



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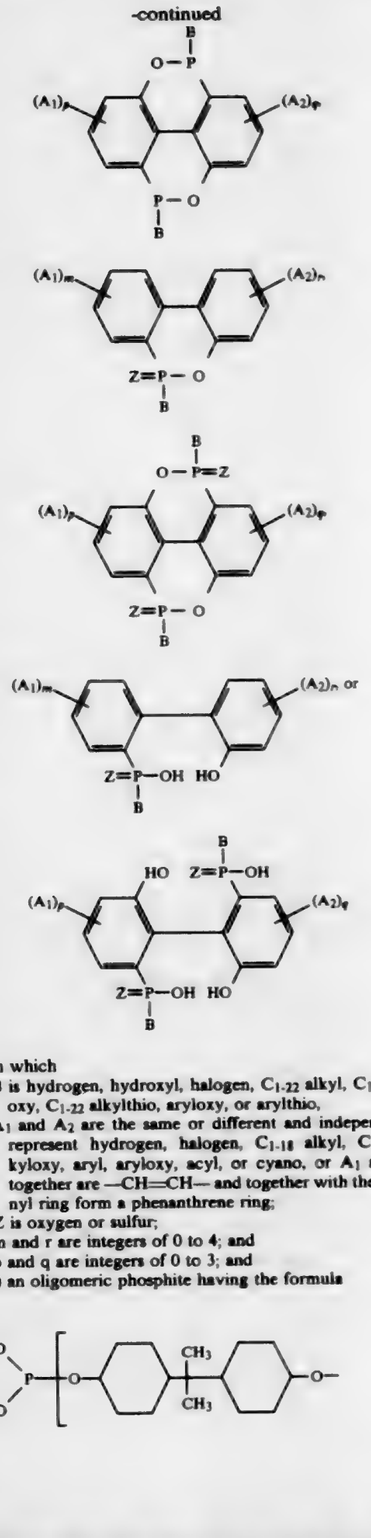


in which

B is hydrogen, hydroxyl, halogen, C_{1-22} alkyl, C_{1-22} alkoxy, C_{1-22} alkylthio, aryloxy, or arylthio,

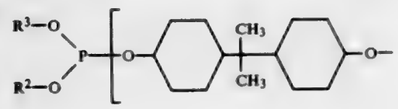
A_1 and A_2 are the same or different and independently represent hydrogen, halogen, C_{1-18} alkyl, C_{1-18} alkyloxy, aryl, aryloxy, acyl, or cyano, or A_1 and A_2 together are —CH=CH— and together with the biphenyl ring form a phenanthrene ring;

Z is oxygen or sulfur;

m and r are integers of 0 to 4; and

p and q are integers of 0 to 3; and

(iv) an oligomeric phosphite having the formula



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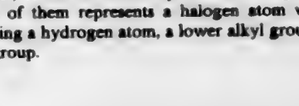
in which

R^1, R^2, and R^3 are the same or different and independently represent C_{1-18} alkyl, aryl, or a group of the structure



R^2 and R^3 are as defined above and R^1 is a group of the following structure

R^1 is as defined above and R^2 and R^3 are a group of the following structure

m is an integer of 1 to 20.

5,200,492

POLYMER BLENDS

Takashi Ohnaga; Toshiaki Sato; Shiro Nagata, all of Kurashiki; Mitsuo Ohtani, Niigata; Koji Arakawa, Shibata, and Teruo Hasegawa, Nakajo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

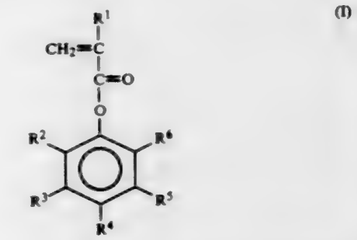
Filed Oct. 24, 1991, Ser. No. 782,055

Claims priority, application Japan, Oct. 29, 1990, 2-292533

Int. Cl.[5] C08L *69/00, 33/16*; G02B *1/04*

U.S. Cl. 428—64 **8 Claims**

1. A polymer blend comprising a copolymer (A) which comprises (i) 50 to 98% by weight of units from methyl methacrylate and ii) 2 to 50% by weight of units from a monomer represented by the general formula (I), and an aromatic polycarbonate (B)



(I)

wherein R^1 represents a hydrogen atom or a methyl group, and R^2, R^3, R^4, R^5 and R^6 each represents a halogen atom or at least one of them represents a halogen atom with the rest representing a hydrogen atom, a lower alkyl group or a lower alkoxyl group.

5,200,493

one nitrogen with active hydrogen of (B)(a) and (B)(b) of 1

5,200,497

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VOL 1149 ISS 1 AP 6 1993 UMI

5,200,493

HETEROATOM CONTAINING PERFLUORALKYL TERMINATED NEOPENTYL MERCAPTO-ALCOHOLS AND COMPOSITIONS THEREFROM

Michael Jacobson, Haworth, N.J., and Kirtland P. Clark, Bethel, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 660,603, Feb. 25, 1991, Pat. No. 5,145,996, which is a continuation-in-part of Ser. No. 620,232, Nov. 29, 1990, Pat. No. 5,097,067, which is a continuation-in-part of Ser. No. 444,073, Nov. 30, 1989, Pat. No. 5,097,048. This application Jun. 19, 1992, Ser. No. 901,488
Int. Cl.[5] C08G 18/38
U.S. Cl. 528—70 7 Claims

1. A linear polythiourethane having recurring structural units of formula VIII or IX

$$—S—CH_2—C(CH_2—X—E—R_f)_2—CH_2—O—CO—NH—G—NHCO— \quad (VIII)$$

$$—S—CH_2—C(CH_2—X_1—R_f)_2—CH_2—O—CO—NH—G—NHCO— \quad (IX)$$

where

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

E is branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, SO_2—, —COO—, —OOC—, —CONR—, —NRCO—, —SO_2NR—, and —NRSO_2—, or terminated at the R_f end with —CONR— or —SO_2NR—, where R_f is attached to the carbon or sulfur atom,

X is —S—, —O—, —SO_2—, or —NR—,

X_1 is —CONR— or —SO_2NR—, where R_f is attached to the carbon or sulfur atom,

R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms, and

G is the radical of an aliphatic, cycloaliphatic or aromatic diisocyanate after removal of the two NCO groups.

5,200,494

ONE-PACK TYPE EPOXIDE COMPOSITION

Masao Kubota; Ritaro Nagabuchi, and Yasuo Chiba, all of Miyoshi, Japan, assignors to Fuji Kasei Kogyo Co., Ltd., Tokyo, Japan

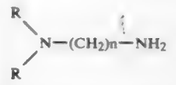
Filed Apr. 10, 1991, Ser. No. 683,047
Claims priority, application Japan, Apr. 16, 1990, 2-97781
Int. Cl.[5] C08L 63/00; C08G 59/50, 51/04
U.S. Cl. 528—111 10 Claims

1. A one-pack epoxide composition which can be heat cured at 80° C. or higher and which comprises

(A) at least one epoxide having more than one epoxy group in the molecule, and

(B) a curing agent which is the reaction product of

(a) at least one N,N-dialkylaminoalkylamine represented by the general formula



wherein R is an alkyl group of 1 to 4 carbon atoms, and n is 2 to 3,

(b) at least one amine having one or two nitrogen atoms with active hydrogen and having a ring structure in its molecule, and

(c) at least one diisocyanate,

and which is prepared by heating said reactants (B)(a), (B)(b) and (B)(c) at a temperature of from room temperature to 160° C. in a molar ratio of (B)(b) to (B)(a) of 0.02 mole≦(B)(b)≦3.0 mole and in a chemical equivalent of diisocyanate in (B)(c) per one nitrogen with active hydrogen of (B)(a) and (B)(b) of 1 chemical equivalent≦diisocyanate≦1.2 chemical equivalents.

5,200,495

RIGID-ROD BENZOBISAZOLE POLYMER CONTAINING CYCLIC PHOSPHATE ESTER

Fred E. Arnold, Centerville, and Jom P. Chen, Hilliard, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 22, 1992, Ser. No. 887,000
Int. Cl.[5] C08G 79/04
U.S. Cl. 528—168 8 Claims

1. A rigid-rod aromatic heterocyclic polymer having repeating units of the formula:

wherein Ba is a benzobisazole moiety of the formula:

wherein X is —O—, —S— or —NH.

5,200,496

PROCESS FOR PREPARING POLYCARBONATE HAVING REDUCED CARBONATE BYPRODUCT CONTENT

Sarat Munjal; Thomas M. Wardlow, and Andrew F. Hall, all of Lake Jackson, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1991, Ser. No. 724,642
Int. Cl.[5] C08G 64/20
U.S. Cl. 528—198 10 Claims

1. A process for preparing polycarbonate comprising

(a) forming a carbonate oligomer by contacting a carbonyl halide with a dihydroxy compound dianion in a reaction mixture containing water, a solvent capable of dissolving a carbonyl halide, and a base in an amount per mole of dihydroxy compound given by $2+4Y(Z-1)$ moles where Y=about 0 to about 0.5 and Z=about 1.15 to about 1.5,

(b) admixing a chain terminator with said reaction mixture after said carbonyl halide has been substantially completely reacted with said dianion of said dihydroxy compound in said reaction mixture,

(c) forming a polycarbonate by admixing a carbonate oligomer condensation catalyst with said reaction mixture after said chain terminator has been substantially completely reacted with said reaction mixture,

(d) recovering a polycarbonate produce from said reaction mixture.

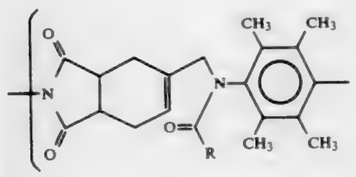
5,200,497

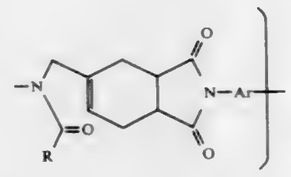
POLYIMIDE FROM BISN-ISOPRENYLS OF ARYL DIAMIDES

Joseph G. Smith, Jr., Hampton, and Raphael M. Ottenbrite, Midlothian, both of Va., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

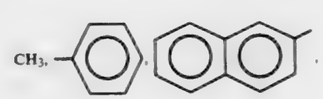
Filed Aug. 16, 1990, Ser. No. 568,128
Int. Cl.[5] C08F 222/40
U.S. Cl. 526—262 3 Claims

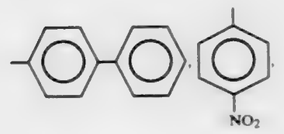
1. A polyimide formed of recurring units of

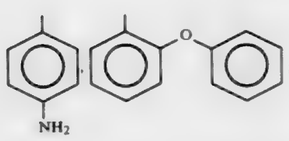




R is selected from the group of radicals consisting of

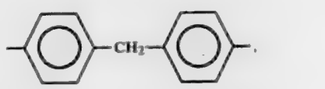


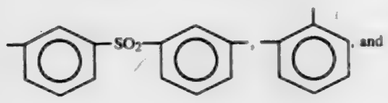




and

Ar is selected from the group of radicals consisting of





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5,200,498

LACTAM-LACTONE COPOLYMER

Kishore Udipi, Longmeadow, and Lionel R. Stebbins, Belchertown, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 29, 1992, Ser. No. 827,438
Int. Cl.[5] C08G 69/14
U.S. Cl. 528—323 18 Claims

1. A polymerizable composition comprising:

a. a lactam monomer;

b. a lactone monomer;

c. a catalytically effective amount of a C_3 to c_{12} lactam magnesium halide; and

d. an effective amount of an initiator capable of initiating lactam-lactone copolymerization in the presence of the C_3 to C_{12} lactam magnesium halide catalyst.

5,200,499

REMOVAL OF WATER BY VENTING DURING THE POLYMERIZATION OF PHENYLENE SULFIDE POLYMERS WITH SULFUR SOURCE/POLAR ORGANIC COMPOUND MOLAR RATIO BEING AT LEAST 0.36/1

Joe F. Geibel, Bartlesville, and John E. Inda, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1990, Ser. No. 619,559
Int. Cl.[5] C08G 75/16
U.S. Cl. 528—388 10 Claims

1. A process for producing phenylene sulfide polymers comprising the sequential steps of:

(a) dehydrating an aqueous admixture comprising at least one sulfur source and at least one polar organic compound to form a dehydrated admixture;

(b) admixing at least one polyhalo-substituted aromatic compound with the dehydrated admixture from step (a) to produce a polymerization mixture, wherein said sulfur source is present in a concentration of at least about 0.36 moles of sulfur source per mole of polar organic compound;

(c) subjecting said polymerization mixture to polymerization conditions effective to produce a polymerization reaction wherein said polyhalo-substituted aromatic compound is consumed and by-product water is produced; and

(d) venting said polymerization mixture during said polymerization reaction after a portion of said polyhalo-substituted aromatic compound is consumed in said polymerization reaction, wherein said venting releases substantially by-product water produced during said polymerization reaction.

5,200,500

PROCESS FOR THE PREPARATION OF CROSS-LINKED POLYARYLENE SULFIDE

Yo Iizuka; Toshio Hosokawa; Yoshinobu Itoh; Shinji Yamamoto; Kazuo Kusida, and Takayuki Katto, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 352,879, May 17, 1989, abandoned. This application Aug. 22, 1990, Ser. No. 569,766
Claims priority, application Japan, May 26, 1988, 63-129390
Int. Cl.[5] C08G 75/14, 79/04
U.S. Cl. 528—388 4 Claims

1. A process to produce a cross-linked granular polyarylene sulfide by reacting an alkali metal sulfide, a dihaloaromatic

compound and a polyhaloaromatic compound in an organic amide solvent, comprising:

which comprises contacting said catalyst with a compound represented by the formula:

5,200,504

METALLOPEPTIDES HAVING STABILIZED SECONDARY STRUCTURES

5,200,506

PROCESS FOR PREPARING NEW THYMOPENTIN RETRO-INVERSO ANALOGS AND FRAGMENTS

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compound and a polyhaloaromatic compound in an organic amide solvent, comprising:

(A) an initial-stage polymerization step for obtaining a polyarylene sulfide by reacting an alkali metal sulfide, a mixture of dihaloaromatic and polyhaloaromatic compounds in an amount of 0.98 to 1.3 mol containing 0.003 to 0.1 mol polyhaloaromatic compound having three or more halogen substituents in a molecule, per mol of the alkali metal sulfide, in the presence of water in an amount of 0.5 to 2.9 moles per mol of said alkali metal sulfide at a temperature not lower than 180° C. to lower than 235° C. until a total conversion ratio of said dihalo- and polyhaloaromatic compounds reaches 50 to 98% and a melt viscosity of a polyarylene sulfide obtained at the end of the step becomes 5 to 5,000 poise, measured at 310° C. and a shear rate of 1,200/second;

(B) a temperature raising step in which with the amount of water adjusted to 2.5 to 7 moles per mole of fed alkali metal sulfide, the temperature raising condition from the temperature of step (A) to 240° C. is controlled so that the melt viscosity of a polymer obtained at 240° C. reaches in the range of 300 to 10,000 poise, measured at 310° C. and a shear rate of 1,200/second and the temperature raising rate between 240° C. and a temperature of the following step (C) is further controlled to be within the range of 10° to 100° C./hour; and

(C) a second-stage polymerization step for further continuing the reaction at a temperature of 245° to 290° C. until a melt viscosity of the final product reaches not lower than 1×10^5 poise, measured at 330° C. and a shear rate of 2/second and wherein the average particle diameter of the granular cross-linked polyarylene sulfide obtained is 100 to 2,000 μm.

5,200,501

EASILY-SLIDABLE POLYARYLENE THIOETHER FILM AND PROCESS FOR PRODUCING THE SAME

Yukichika Kawakami, and Zenya Shiiki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

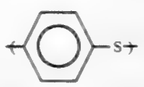
Division of Ser. No. 382,033, Jul. 19, 1989, which is a continuation of Ser. No. 120,834, Nov. 16, 1987, abandoned. This application Feb. 26, 1991, Ser. No. 660,842

Claims priority, application Japan, Nov. 20, 1986, 61-276999

Int. Cl.[5] C08G *75/00*

U.S. Cl. 528—388 **3 Claims**

1. An easily-slidable polyarylene thioether film comprising a film containing, as the basic resin, a polyarylene thioether mainly composed of repeating unit of



and not containing substantial amount of powdery lubricant, which has the surface properties including the arithmetic average surface roughness Ra within a range of 2 to 200 nm and the dynamic friction coefficient μk within a range of 0.1 to 0.6 at least on one side of the film.

5,200,502

DEACTIVATOR REAGENT FOR OLEFIN POLYMERIZATION CATALYSTS

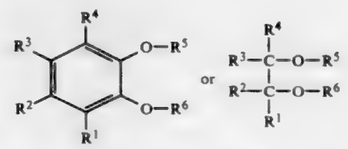
Sun-Chueh Kao, and Frederick J. Karol, both of Belle Mead, N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Aug. 26, 1992, Ser. No. 935,197

Int. Cl.[5] C08F *6/02*

U.S. Cl. 528—494 **22 Claims**

1. A method for deactivating a Ziegler-Natta transition element catalyst employed in olefin polymerization reactions, which comprises contacting said catalyst with a compound represented by the formula:



wherein R^1, R^2, R^3, and R^4 are the same or different and are H, linear or branched alkyl radicals having from 1–20 carbon atoms, cycloalkyl, aryl, arylalkyl, which with the exception of H, can combine to form rings of cyclic alkyl or benzene; R^5 and R^6 has the same meaning as R^1, R^2, R^3, and R^4 except for hydrogen, R^5 or R^6 can combine with R^1, R^2, R^3, and R^4 to form a cyclic alkyl containing an oxygen atom, R^5 and R^6 can also combine to form a divalent hydrocarbon radical containing from 1–20 carbon atoms, said compound being present in an amount sufficient to controllably deactivate said olefin polymerization catalyst.

5,200,503

STABILIZERS FOR HALOPOLYMER COMPOSITIONS

Chii-Shu Chen, Parsippany, N.J., assignor to Ausimont, U.S.A., Inc., Morristown, N.J.

Filed Apr. 15, 1992, Ser. No. 868,636

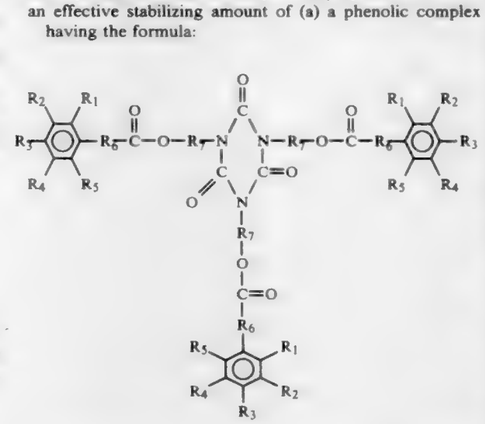
Int. Cl.[5] C08K *3/3492, 5/36, 5/524*

U.S. Cl. 524—81 **59 Claims**

1. A composition, comprising:

an ethylene/chlorotrifluoroethylene copolymer; and

an effective stabilizing amount of (a) a phenolic complex having the formula:



wherein at least one of R_1, R_2, R_3, R_4 and R_5 is —OH, and wherein the remaining R_1 through R_5 is hydrogen or an aliphatic hydrocarbon, and wherein each of R_1 through R_5 may be the same or different provided that at least one of R_1 through R_5 is —OH, and each of R_6 and R_7 is an alkylene group having from 1 to about 10 carbon atoms, and each of R_6 and R_7 may be the same or different; and

(b) a phosphite of the formula $P-(OR)_3$, wherein R is hydrogen, or an alkyl, cycloalkyl, aralkyl, aryl, or a hydroxy-substituted alkyl group having from 1 to 18 carbon atoms.

5,200,504

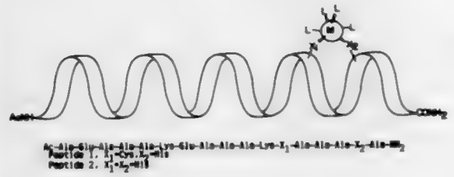
METALLOPEPTIDES HAVING STABILIZED SECONDARY STRUCTURES

Reza M. Ghadiri, Del Mar, Calif., assignor to The Scripps Research Institute, La Jolla, Calif.

Filed Oct. 2, 1990, Ser. No. 591,968

Int. Cl.[5] A61K *37/02, 37/26;* **C07K** *5/00, 7/00*

U.S. Cl. 530—304 **15 Claims**



1. A metallopeptide comprising a polypeptide bonded to a metal cation at two coordinating amino acid residues that are aqueous solvent-accessible, said metallopeptide having a secondary structure stabilized by said bonded metal cation.

5,200,505

R106 COMPOUNDS

Kazutoh Takesako, Kusatsu; Katsushige Ikai, Shiga; Kazuo Shimanaka, Tokyo; Junko Yamamoto, Moriyama; Fumiyo Haruna, Himeji; Teruya Nakamura, Kusatsu; Hideyo Yamaguchi, Kawasaki, and Katsuhisa Uchida, Tokyo, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Jan. 22, 1991, Ser. No. 643,948

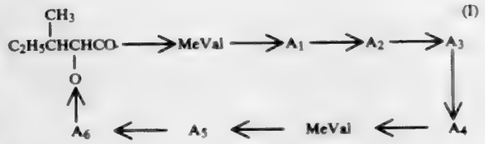
Claims priority, application Japan, Jan. 23, 1990, 2-14384

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[5] C07K *11/02*

U.S. Cl. 530—323 **1 Claim**

1. An R106 compound represented by the following formula (I):



wherein:

A_1 is Phe, o-FPhe, m-FPhe, or Tyr;

A_2 is MePhe, o-FMePhe, m-FMePhe, MeTyr, Sar, MeSer, or β-oxoMePhe;

A_3 is Pro, 4Hyp, or SPro;

A_4 is allo-Ile or Nle;

A_5 is Leu or Nva;

A_6 is β-HOMeVal or Sar;

excluding those wherein A_1 is Phe and A_2 is MePhe and A_3 is Pro and A_4 is allo-Ile and A_5 is Leu and A_6 is β-HOMeVal (SEQ ID No. 4).

5,200,506

PROCESS FOR PREPARING NEW THYMOPENTIN RETRO-INVERSO ANALOGS AND FRAGMENTS THEREOF AND THE INTERMEDIATES OBTAINED THEREIN

Alessandro Sisto, Rome, and Antonio S. Verdini, Monterotondo, both of Italy, assignors to Enitricerche S.p.A., Milan and Sclavo S.p.A., Siena, both of Italy

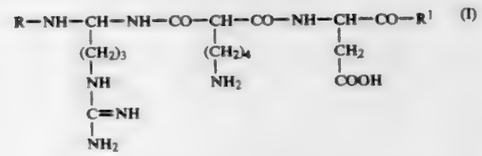
Division of Ser. No. 168,237, Mar. 15, 1988, Pat. No. 5,013,723. This application Jan. 31, 1991, Ser. No. 648,977

Claims priority, application Italy, Mar. 19, 1987, 19763 A/87

Int. Cl.[5] A61K *37/02;* **C07K** *5/08, 5/10*

U.S. Cl. 530—339 **4 Claims**

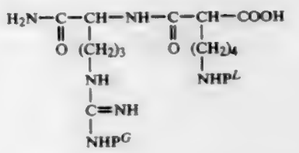
1. A process for preparing a compound of formula (I):



wherein R is hydrogen or an acyl radical, and R^1 is an $-OR^2$ group,

wherein R^2 is hydrogen or a straight or branched alkyl radical of from 1 to 6 carbon atoms, a straight or branched alkenyl or alkynyl radical of from 3 to 6 carbon atoms, or an aryl-alkyl or alkyl-aryl radical of from 7 to 12 carbon atoms, which comprises:

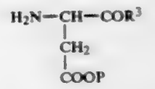
(a) condensing a peptide fragment of formula (II)



wherein

P^L represents a protective group of the side-chain amino function, and

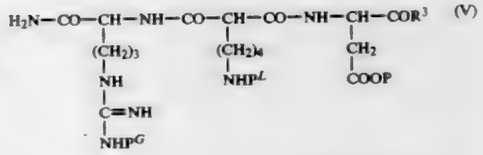
P^G is a protecting group for the guanidino function, with a compound of formula (III)



wherein

R^3 represents the group $-OR^2$ or the group —OP wherein P is a carboxyl protecting group;

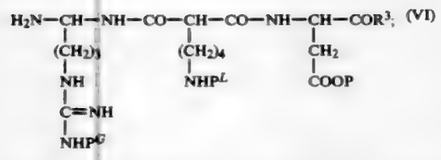
(b) converting the terminal amide group of the thus obtained intermediate of formula (V)



into a primary amino group by treatment with I,I-bis-trifluoroacetoxy-iodobenzene to yield an intermediate of formula (VI):

5,200,511

VOL 1149 ISS 1 AP 6 1993 UMI



(c) optionally actuating the terminal primary amino function group; and
(d) removing the protecting groups from the peptide.

5,200,507

METHOD OF SEPARATING A PEPTIDE FROM A RESIN

Paul C. Chieng, St. Louis, Mo., assignor to Mallinckrodt Specialty Chemicals Company, St. Louis, Mo.

Filed Apr. 12, 1991, Ser. No. 684,286
Int. Cl.[5] A61K *37/02;* **C08F** *283/00*
U.S. Cl. 530—344 **12 Claims**

1. A method of separating a peptide from a resin to which the peptide is bound, comprising the steps of
a) treating the resin-bound peptide with hydrogen fluoride so as to cleave the peptide from the resin and form a first mixture of peptide, hydrogen fluoride and resin;
b) removing the resin from said first mixture so as to provide a resin-free second mixture including said peptide and said hydrogen fluoride; and
c) separating the peptide of said second mixture from the hydrogen fluoride of said second mixture.

5,200,508

CELL SURFACE ANTIGEN THAT BINDS WITH L6 MONOCLONAL ANTIBODY

Gajanan Nilaver; Lawrence Rosenbaum, and Edward A. Neuwelt, all of Portland, Oreg., assignors to The State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon Health Sciences University, Eugene, Oreg.

Continuation of Ser. No. 483,512, Feb. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 348,048, May 4, 1989, abandoned. This application Dec. 12, 1991, Ser. No. 807,787
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 **11 Claims**

1. A tumor antigen having characteristics comprising:
(a) being a glycoprotein normally present on cell membranes of LX-1 human lung carcinoma cells; and
(b) a purity sufficient to yield, when the tumor antigen is electrophoresed on an SDS/polyacrylamide gel, a single band migrating to a position in the gel corresponding to a molecular weight of about 45 kilodaltons, the band immunoreactive with YL-3 polyclonal antibodies and with L6 monoclonal antibodies.

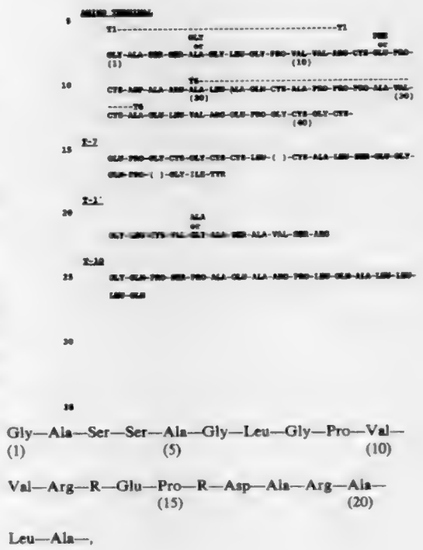
5,200,509

HUMAN SOMATOMEDIN CARRIER PROTEIN SUBUNITS AND PROCESS FOR PRODUCING THEM; RECOMBINANT DNA MOLECULES, HOSTS, PROCESSES AND HUMAN SOMATOMEDIN CARRIER PROTEIN-LIKE POLYPEPTIDES

Emerald M. Spencer, San Francisco, and Carol Talkington-Verser, San Rafael, both of Calif., assignors to Celtrix Pharmaceuticals, Inc., Santa Clara, Calif.

Continuation of Ser. No. 290,250, Dec. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 34,885, Apr. 6, 1987, abandoned, and a continuation-in-part of Ser. No. 170,022, Mar. 31, 1988, abandoned. This application Sep. 20, 1991, Ser. No. 763,481
Int. Cl.[5] C07K *15/06, 15/14*
U.S. Cl. 530—350 **1 Claim**

1. An essentially purified and isolated carrier protein-like polypeptide which:
(a) has a naturally occurring amino acid sequence with the following N-terminal sequence:



Gly—Ala—Ser—Ser—Ala—Gly—Leu—Gly—Pro—Val—
(1) (5) (10)

Val—Arg—R—Glu—Pro—R—Asp—Ala—Arg—Ala—
(15) (20)

Leu—Ala—,

wherein R is a cysteine or half-cysteine,
(b) binds insulin-like growth factor 1 (IGF-1); and
(c) has a molecular weight of about 15,000 to about 30,000 daltos as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis under reducing conditions.

5,200,510

METHOD FOR PURIFYING FACTOR VIII:C, VON WILLEBRAND FACTOR AND COMPLEXES THEREOF

Anur A. Kumar; Frederick S. Hagen, and Andrzej Z. Sledziewski, all of Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 62,896, Jun. 16, 1987, abandoned. This application Mar. 2, 1988, Ser. No. 162,877
Int. Cl.[5] C07K *3/18, 3/20*
U.S. Cl. 530—383 **21 Claims**

1. A method for purifying von Willebrand factor from a heterogeneous biological fluid, comprising:
exposing the biological fluid to a peptide that specifically binds to von Willebrand factor, said peptide consisting essentially of between four and ninety-six amino acids and containing a sequence of at least four consecutive amino acids corresponding to amino acids 165–260 of glycoprotein Ib, said peptide bound to an insoluble matrix such that the von Willebrand factor specifically binds to said peptide;
eluting the bound von Willebrand factor from the peptide; and
collecting the von Willebrand factor-containing eluate.

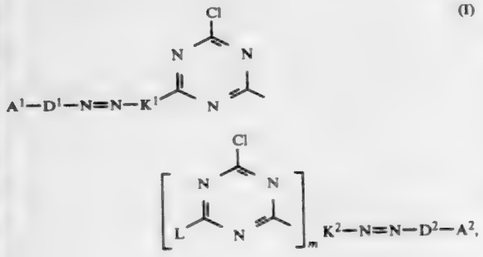
5,200,511

CHOLOROTRIAZINE DYES WITH TWO AZO CHROMOPHORES EXHIBITING FURTHER REACTIVE GROUPS

Hermann Loeffler, Speyer, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1992, Ser. No. 860,139
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1991, 4113838
Int. Cl.[5] C09B *62/09, 62/533;* **D06P** *1/38*
U.S. Cl. 534—634 **7 Claims**

1. A reactive dye of the formula I



(I)

where
m is 0 or 1,
A^1 and A^2 are different from each other and each is an additively fiber-reactive radical or a substitutively fiber-reactive radical or else, in the case of A^2, hydrogen, with the proviso that no more than one of A^1 and A^2 is a substitutively fiber-reactive radical and no more than one of A^1 and A^2 is an additively fiber-reactive radical,
D^1 and D^2 are identical or different and each is independently of the other substituted or unsubstituted phenylene, substituted or unsubstituted phenylenemethyl, substituted or unsubstituted naphthylene or substituted or unsubstituted naphthylenemethyl,
K^1 and K^2 are identical or different and each is independently of the other the radical of a coupling component of the aminonaphthalenesulfonic acid series, and L is a bridge member.

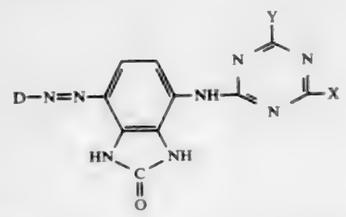
5,200,512

WATER-SOLUBLE AZO COMPOUNDS, HAVING A FIBRE-REACTIVE TRIAZENYLAMINO GROUP

Uwe Reiher, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 27, 1991, Ser. No. 816,299
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1990, 4042290
Int. Cl.[5] C09B *29/50, 62/085, 62/51, 1/38*
U.S. Cl. 534—635 **18 Claims**

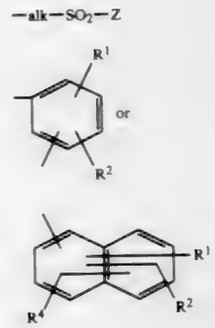
1. A water-soluble azo compound of the formula



where
D is phenyl substituted by one, two or three substituents selected from the group consisting of chlorine, bromine, fluorine, sulfo, carboxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, notri, styryl unsubstituted or substituted by nitro or nitro and sulfo, benzothiazol-2-yl unsubstituted or substituted by methyl, methoxy, sulfo or methyl and sulfo, sulfamoyl, carbamoyl and alkylsulfonyl of 1 to 4 carbon atoms, at least one of these substituents being a water-solubilizing group selected from sulfo and carboxy, or at least one of these substituents being substituted by a water-solubilizing group selected from sulfo and carboxy, or
D is naphthyl substituted by one, two or three sulfo groups;
Y is fluorine, chlorine or a group of the formula

—A—R

where
A is oxygen or the group NH, and
R is hydrogen, alkyl of from 1 to 10 carbon atoms, or cycloalkyl of from 5 to 8 carbon atoms, or alkyl of from 2 to 8 carbon atoms which is interrupted by one or two hetero groups selected from group consisting of —O—, —NH—, —N(CH_3)—, —SO_2— and —CO—, or is benzyl, sulfomethyl, β-sulfoethyl or cyano;
X is fluorine, chlorine or an amino group conforming to the formula —NH—B, where
B is a group of the formula



where
alk is branched or straight-chain alkylene of from 1 to 4 carbon atoms, or alkylene of from 2 to 8 carbon atoms which is interrupted by one or two hetero groups selected from the consisting of —O—, —NH—, —N(CH_3)— and —SO_2—,
Z is vinyl or an ethyl substituted in the β-position by a substituent which is eliminable by means of alkali to form the vinyl group, in which said substituent is selected from the group consisting of halogen, alkanoyloxy of 2 to 5 carbon atoms, sulfobenzoyloxy, benzoyloxy, phenylsulfonyloxy, toluylsulfonyloxy, phosphato, sulfato, thiosulfato and dialkylamino with alkyls each of 1 to 4 carbon atoms,
R^1 is hydrogen, carboxy, sulfo or a group of the formula —SO_2—Z, where Z is as defined above,
R^2 is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, chlorine, bromine, carboxy, sulfo or nitro,
R^3 is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, chlorine or bromine and
R^4 is hydrogen, sulfo or carboxy.

5,200,513

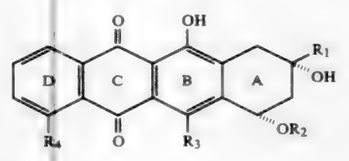
5,200,515

5,200,517

-continued

5,200,513
PROCESSES FOR PRODUCING DOXORUBICIN, DAUNOMYCINONE, AND DERIVATIVES OF DOXORUBICIN
Desmond M. S. Wheeler, Lincoln, Nebr., assignor to Board of Regents, University of Nebraska-Lincoln, Lincoln, Nebr.
Filed Jan. 22, 1990, Ser. No. 542,902
Int. Cl.[5] C07H *15/24*
U.S. Cl. 536—6.4 **37 Claims**

1. A process for the production of a compound of the general formula:



2

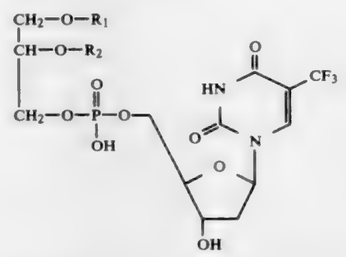
wherein R_1 is one of: $O{=}CCH_3$ or $O{=}C{-}CH_2OH$;
R_2 is one of daunosamine, or H;
R_3 is NO_2; and
R_4 is OCH_3, OH or H;
comprising the steps of:
preparing a mono ketal of a 1,4-naphthoquinone as the precursor of the CD rings;
preparing a precursor for Ring A with C_6 and C_{11} attached and the stereochemistry at C_7 and C_9 established and coupling it to CD and then completing ring B;
said step of preparing a precursor for Ring A comprising the substeps of methylation of 5-oxocyclohex-2-enecarboxylic acid to methyl 5-oxocyclohex-2-enecarboxylate at a reaction temperature of between −20 to 20 degrees centigrade, trimethylsilylethynylation of said cyclohexenecarboxylate at a temperature of between −50 to −78 degrees centigrade after removal of water and ethanol to produce methyl cis-5-hydroxy-5-(trimethylsilylethynyl)cyclohex-2-enecarboxylate, epoxidation to methyl cis-(2,3-epoxy-5-hydroxy)-5-(trimethylsilyl ethynyl)cyclohexane-1-carboxylate and opening of the resulting epoxide ring to give methyl cis-3,5-dihydroxy-5-(trimethylsilylethynyl) cyclohex-1-ene carboxylate.

5,200,514
SYNTHESIS OF 2-DEOXYPYRIMIDINE NUCLEOSIDES
Chung K. Chu, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.
Filed Jan. 19, 1990, Ser. No. 467,152
Int. Cl.[5] C07H *1/00*
U.S. Cl. 536—28.53 **13 Claims**

1. A process for the preparation of a 2′-deoxy pyrimidine nucleoside, comprising the steps of:
combining a nucleoside that has 2′ and 3′ hydroxyl groups with a mixture of acyl bromide or chloride selected from the group consisting of a C_1 to C_{20} alkanoic bromide or chloride, acetoxyisobutyryl bromide, or acetoxyisobutyryl chloride, and HX, wherein X is Br or Cl, to form a 2′-halo-3′-acyl pyrimidine nucleoside, and then
reacting the 2′-halo-3′-acyl pyrimidine nucleoside with a reducing agent to form a 2′-deoxy pyrimidine nucleoside.

5,200,515
5′-TRIFLUOROMETHYL-2′-DEOXY-URIDINE PHOSPHOLIPID COMPOUNDS
Satoshi Shuto; Hiromichi Itoh; Takumi Obara, and Tatsuro Fujiwara, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 16, 1991, Ser. No. 701,125
Claims priority, application Japan, May 16, 1990, 2-126278
Int. Cl.[5] C07H *19/20*
U.S. Cl. 536—26.8 **9 Claims**

1. Compounds of the formula



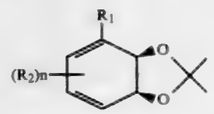
[I]

wherein R_1 and R_2 are each $C_{16\text{-}18}$ long-chain aliphatic acyl and are the same or different; and pharmacologically acceptable salts thereof.

5,200,516
SYNTHESIS OF SUGARS FROM SUBSTITUTED AND UNSUBSTITUTED ARENE DIOLS
Tomas Hudlicky, Blacksburg, Va., assignor to Virginia Tech Intellectual Properties, Blacksburg, Va.
Continuation-in-part of Ser. No. 480,891, Feb. 16, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 802,943
Int. Cl.[5] C07G *3/00, 11/00*; C07H *15/00, 17/00*
U.S. Cl. 536—41 **29 Claims**

1. A method for producing a diene useful as an intermediate agent, said method comprising:
a. providing a substituted arene diol of the formula:

wherein:
R_1 is halogen, lower alkyl, lower alkenyl, lower alkynyl, CN, OR, or CO_2R;
R_2 is H, halogen, lower alkyl or a bridging group between two arene moieties;
R is H or lower alkyl; and n is 0 to 5;
b. protecting such diol as a chiral diol to allow for face selectivity in subsequent hydroxylation or oxygenation methods, said protected diol having the formula:



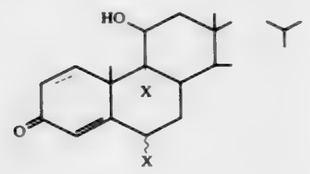
wherein R_1 and R_2 are as defined above.

5,200,517
INCLUSION-COMPLEXING AGENT FOR USE IN ISOLATION OF XYLENE ISOMER(S) AND/OR ETHYLBENZENE
Isamu Uemasu, Tsukuba; Yosuke Takagi, Yokohama, and Makoto Chiwa, Yachiyo, all of Japan, assignors to Agency of Industrial Science and Technology; Ensuiko Sugar Refining Co. Ltd. and Japan Organo Co. Ltd., Japan
Continuation-in-part of Ser. No. 583,427, Sep. 17, 1990, Pat. No. 5,095,173. This application Apr. 10, 1991, Ser. No. 683,409
Claims priority, application Japan, Sep. 19, 1989, 1-240807; May 14, 1990, 2-121212
Int. Cl.[5] C08B *37/16*; C13K *5/00*
U.S. Cl. 536—103 **4 Claims**

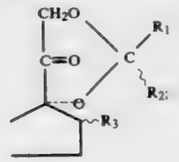
1. An inclusion complex of at least one of a xylene isomer and ethylbenzene, and of a substituted α-cyclodextrin having the hydrogen atom of at least one hydroxyl group thereof substituted with at least one member selected from the group consisting of a glucosyl group, a maltosyl group, a maltooligosaccharide residue, a hydroxyethyl group, a hydroxylpropyl group, a methyl group, a sulfonic group, an alkylenesulfonic group, and a carboxyalkyl group.

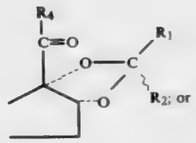
5,200,518
ANTI-INFLAMMATORY CARBOXYCYCLIC ACETAL PREGNANE DERIVATIVES
Hyun P. Kim; Kwan S. Sin; Chang M. Kim; Moon Y. Heo, all of Chuncheon, Rep. of Korea, and Henry J. Lee, Tallahassee, Fla., assignors to Kangweon National University, Chuncheon, Rep. of Korea
Filed Feb. 21, 1991, Ser. No. 658,542
Int. Cl.[5] C07J *71/00*
U.S. Cl. 540—63 **4 Claims**

1. Carboxycyclic acetal pregnane derivative of the formula:



wherein
X is H, F, Cl, or CH_3;
and Y is





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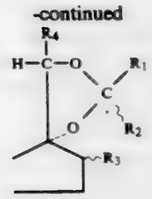
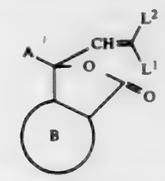


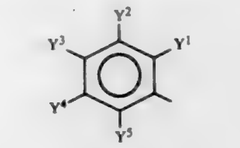
wherein
R_1 is H, alkyl of 1-5 carbon atoms, phenyl, or benzyl;
R_2 is $COOR_6$, or R_5CONHR_6;
R_3 is H, F, OH, or CH_3;
R_4 is CH_2OH, CH_2OCOR_6, $COOR_6$, or $CONHR_6$;
R_5 is alkyl of 1-3 carbon atoms;
R_6 is alkyl of 1-5 carbon atoms or benzyl;
represents a single or double bond;
~ represents α-stereoconfiguration, β-stereoconfiguration or a mixture of both α- and β-stereoconfigurations; and
— represents α-stereoconfiguration.

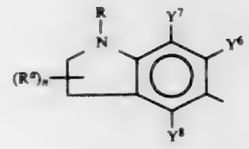
5,200,519
MONO(INDOLYLETHYLENYL)PHTHALIDES
Ponnampalam Mathiaparanam, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.
Filed Jan. 3, 1992, Ser. No. 817,263
Int. Cl.[5] C07D *405/06, 405/14, 413/14*
U.S. Cl. 544—146 **11 Claims**

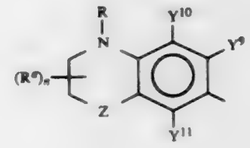
1. A mono(indolylethylenyl)phthalide of the formula:



wherein A is independently selected from







5,200,520

VOL 1149 ISS 1 AP 6 1993 UMI

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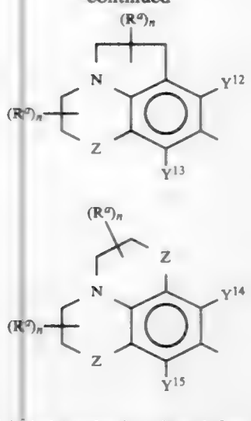
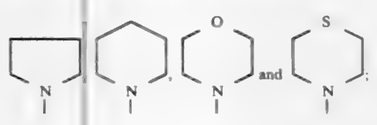


wherein Y^3 is independently selected from dialkylamino consisting of symmetrical and unsymmetrical alkyl (C_1–C_8), alkylcycloalkylamino, dicycloalkylamino, alkylarylamino, diarylamino, dialkoxyalkylamino,



wherein each of Y^1, Y^2, Y^4–Y^{15} is the same as Y^3 or independently selected from hydrogen, alkyl (C_1–C_8), alkoxy (C_1–C_8) and halogen;

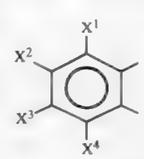
wherein R is independently selected from alkyl (C_1–C_8), alkoxyalkyl, and aryl (substituted or unsubstituted);

wherein Z is independently selected from CH_2, O, S, SO_2 or NR;

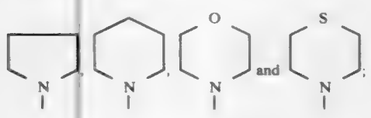
wherein each R^a is independently selected from alkyl (C_1–C_8) and hydrogen;

wherein each n is an integer selected from 0 to four;

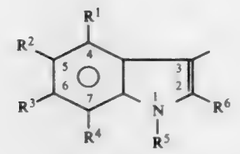
wherein B is independently selected from



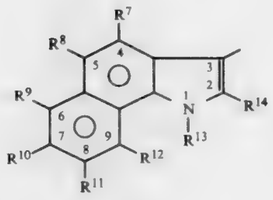
wherein each of X^1–X^4 is independently selected from hydrogen, halogen, alkyl (C_1–C_8), alkoxy (C_1–C_8), dialkylamino consisting of symmetrical and unsymmetrical alkyl (C_1–C_8), alkylcycloalkylamino, dicycloalkylamino, alkylarylamino, diarylamino,



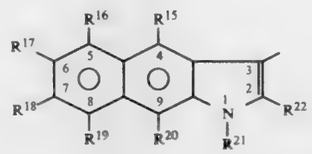
wherein each L^1 and L^2 is the same or different and is each independently selected from indole moieties (J1) through (J4)



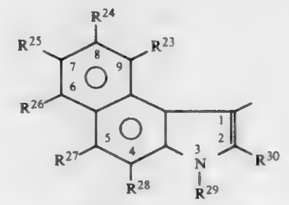
(J1)



(J2)



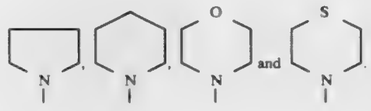
(J3)



(J4)

wherein in (J1) through (J4) above each of R^5, R^6, R^{13}, R^{14}, R^{21}, R^{22}, R^{29} and R^{30} need not be the same and is each independently selected from hydrogen, alkyl (C_1–C_8), cycloalkyl, alkoxyalkyl, aroxyalkyl, substituted or unsubstituted aryl

each of R^1, R^2, R^3, R^4, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{23}, R^{24}, R^{25}, R^{26}, R^{27} and R^{28} need not be the same and is each independently selected from hydrogen, alkyl (C_1–C_8), cycloalkyl, substituted or unsubstituted aryl, halogen, alkoxy (C_1–C_8), aroxy, cycloalkoxy, dialkylamino consisting of symmetrical and unsymmetrical alkyl (C_1–C_8), alkylcycloalkylamino, dicycloalkylamino, alkylarylamino, diarylamino,



5,200,520

PROCESS FOR THE PRODUCTION OF PIPERAZINYLPYRIMIDINE DERIVATIVES

David L. Kuo, Brig, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Dec. 10, 1991, Ser. No. 804,372

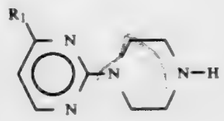
Claims priority, application Switzerland, Dec. 18, 1990, 4014/90

Int. Cl.[5] **C07D** *403/04*

U.S. Cl. 544—295 **19 Claims**

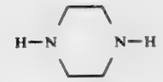
1. Process for the production of a piperazinylpyrimidine compound of the formula:

I



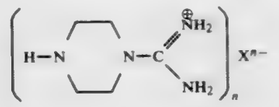
wherein R_1 is a hydrogen atom or a C_1–C_4 alkyl group, branched or unbranched, characterized in that, in a first stage, piperazine of the formula:

II



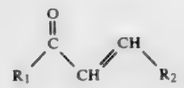
or its hydrate is acid-related with cyanamide to an amidine salt of the formula:

III



wherein X is an anion which forms said amidine salt and n corresponds to the valence of said anion which forms said amidine salt of formula III is optionally isolated, and then, in a second stage, the amidine salt of formula III is reacted with a carbonyl compound of the formula:

IV



wherein R_1 has the above meaning and R_2 is a C_1–C_4 alkoxy group or $—NH_2$, which is substituted or unsubstituted, in the presence of a base to said piperazinylpyrimidine of formula I.

5,200,521

CYCLOHEXYLPHENYLPYRIMIDINES, PROCESS FOR THEIR PREPARATION, AND THEIR USE IN LIQUID-CRYSTALLINE MIXTURES

Gerd Illian, Frankfurt am Main; Rainer Wingen, Hettersheim am Main, and Ingrid Müller, Niedernhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

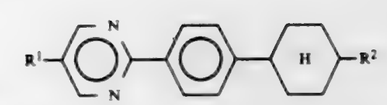
Filed Sep. 25, 1991, Ser. No. 765,551

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1990, 4030579

Int. Cl.[5] **C07D** *239/26;* **C09K** *19/34;* **G02F** *1/13*

U.S. Cl. 544—298 **3 Claims**

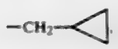
1. A cyclohexylphenylpyrimidine of the formula (I)



(I)

in which

R^1 is straight-chain or branched, chiral or achiral alkyl or alkenyl having 2 to 16 carbon atoms, in which one or two nonadjacent $—CH_2—$ groups may be replaced by —O—, —S—, —CO—, —COO—, —OCO—, $—Si(CH_3)_2—$ or $—C(CH_3)_2—$, and in which one or more hydrogen atoms of the alkyl or alkenyl radical may also be replaced by fluorine atoms, and in which the terminal CH_3 group of the alkyl is replaced by



is straight-chain or branched, chiral or achiral alkyl having 1 to 10 carbon atoms.

5,200,522

METHOD FOR PREPARING 3-AMINO-2-CHLORO-4-ALKYLPYRIDINES

Karl G. Grozinger, Ridgefield; Karl D. Hargrave, Brookfield, and Julian Adams, Ridgefield, all of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

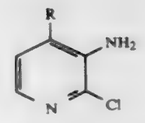
Filed Jun. 11, 1991, Ser. No. 714,129

Int. Cl.[5] **C07D** *213/73*

U.S. Cl. 546—250 **7 Claims**

1. A process for the preparation of a 3-amino-2-chloro-4-alkylpyridine of the formula:

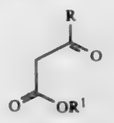
(I)



wherein R is alkyl of from one to three carbon atoms, which comprises the steps of:

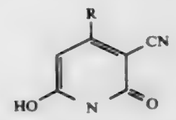
a) reacting a compound of the formula:

(II)



wherein R is as defined above and R^1 is alkyl from one to three carbon atoms, with cyanoacetamide and a hydroxide of an alkali metal, in the presence of an organic solvent, at a temperature of from 60° C. to 80° C., for 1 to 4 hours, to produce a compound of the formula:

(IV)



b) reacting the compound produced in a) with phosphorous oxychloride or phenylphosphonic dichloride, at a temperature of 110° C. to 180° C., for 6 to 24 hours, to produce a compound of the formula:

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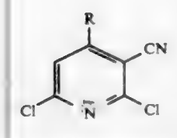
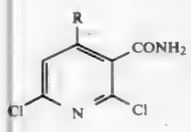


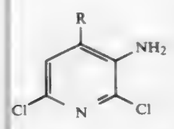
(V)

c) heating the compound produced in b) in the presence of an inorganic acid, at a temperature of from 80° C. to 110° C., for 1 to 10 hours, to produce a compound of the formula:



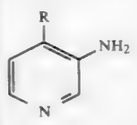
(VI)

d) reacting the compound produced in c) with a hydroxide of an alkali metal and a halide at a temperature of 0° C. to 100° C., for 1 to 10 hours, to produce a compound of the formula:



(VII)

e) hydrogenating the compound produced in d) in the presence of hydrogen and an organic solvent and a base, with palladium dichloride or palladium metal, at 50 to 150 psi, at a temperature of from 20° C. to 100° C., for 6 to 24 hours, to produce a compound of the formula:



(VIII)

f) contacting the compound produced in e) with hydrochloric acid and chlorine gas, at a pH of 0.01 to 2, at a temperature of 5° C. to 30° C. for 0.5 to 2 hours, to produce the 3-amino-2-chloro-4-alkylpyridine of formula I.

5,200,523

SYNTHESIS OF NOJIRIMYCIN DERIVATIVES

George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 596,648, Oct. 10, 1990, abandoned. This application Jun. 17, 1991, Ser. No. 716,490

Int. Cl.[5] C07D *211/40*

U.S. Cl. 546—220 **1 Claim**

1. 5-Amino-5-deoxy-3,6-di-O-benzyl-D-glucono-δ-lactam.

5,200,524

CAMPTOTHECIN INTERMEDIATES AND METHOD OF MAKING SAME

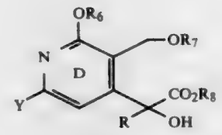
Daniel L. Comins, and Matthew F. Baevsky, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 632,970, Dec. 20, 1990, Pat. No. 5,162,532. This application Aug. 10, 1992, Ser. No. 927,220

Int. Cl.[5] C07D *213/64*

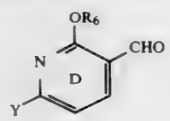
U.S. Cl. 546—301 **7 Claims**

1. A method of making a compound of Formula XII:



(XII)

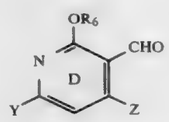
wherein Y is H or Cl, and R, R_6, R_7, and R_8 are loweralkyl, from a carboxyaldehyde of Formula VIII:



(VIII)

comprising

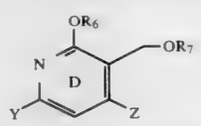
halogenating the carboxyaldehyde of Formula VIII to produce a 4-halo-yridinecarboxaldehyde of Formula IX:



(IX)

wherein Z is selected from the group consisting of bromo and iodo; and then

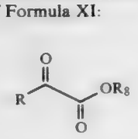
reducing the 4-halo-pyridinecarboxaldehyde of Formula IX to give an alkoxymethylpyridine of Formula X:



(X)

wherein R_7 is loweralkyl; and then

alkylating the alkoxymethylpyrdine of Formula X with a compound of Formula XI:



(XI)

to yield the compound of Formula XII.

5,200,525

ANTI-SEIZURE COMPOUNDS

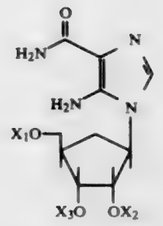
Harry E. Gruber, San Diego, and Paul J. Marangos, Encinnitas, both of Calif., assignors to Gensia Pharmaceuticals, San Diego, Calif.

Filed Jan. 24, 1989, Ser. No. 301,453

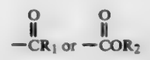
Int. Cl.[5] C07D *233/46*

U.S. Cl. 548—311.7 **2 Claims**

1. A prodrug of the formula:



wherein X_1, X_2, and X_3 are independently hydrogen,



wherein R_1 and R_2 are independently hydrocarbyl of 1 to about 24 carbon atoms or two of X_2 and X_3 taken together form a cyclic carbonate group, provided that not all of X_1, X_2 and X_3 are hydrogen.

5,200,526

SYNTHESES OF OPTICALLY PURE α-AMINO ACIDS FROM 3-AMINO-2-OXETANONE SALTS

Lee D. Arnold, Streetsville, and John C. Vederas, Edmonton, both of Canada, assignors to The Governors of the University of Alberta, Edmonton, Canada

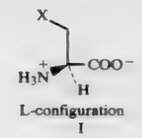
Continuation of Ser. No. 189,405, Apr. 27, 1988, abandoned. This application Oct. 23, 1990, Ser. No. 601,371

Claims priority, application United Kingdom, Apr. 27, 1987, 8709888

Int. Cl.[5] C07D *231/10, 305/04*

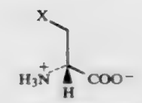
U.S. Cl. 548—375.1 **40 Claims**

1. A process for the preparation of optically pure, free alpha-amino acids of the formulas I and Ia, respectively:



L-configuration
I

or

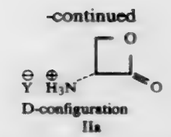


D-configuration
Ia

wherein X is the amino acid side-group determinant, said process consisting essentially of the nucleophilic ring-opening of 3-amino-2-oxetanone salts of the formulas II and IIa, respectively:

L-configuration
II

or



D-configuration
IIa

wherein Y is a suitable salt anion, said nucleophilic ring-opening occurring by reacting said 3-amino-2-oxetanone with a nucleophilic reagent bearing said amino acid side-group determinant X, said nucleophilic reagent being an anion selected from the group consisting of cyanide, malonate, hydrogen sulphide, thiosulfate, trifluoroacetate, hydrogen phosphate, phosphate, chloride and azide, or another nucleophile selected from the group consisting of cysteine, 2-amino-ethanethiol, dimethyl sulfide and pyrazole.

5,200,527

PROCESS FOR THE PRODUCTION OF 2-AZABICYCLO [2.2.1] HEPT-5-EN-3-ONE

Gareth Griffiths, Visp, and Felix Previdoli, Brig, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Apr. 1, 1992, Ser. No. 863,683

Claims priority, application Switzerland, Apr. 8, 1991, 1034/91

Int. Cl.[5] C07D *209/52*

U.S. Cl. 548—452 **12 Claims**

1. A process for the production of 2-azabicyclo[2.2.1]hept-5-en-3-one comprising: reacting 1,3-cyclopentadiene with methanesulfonyl cyanide in a Diels-Alder reaction in an inert solvent at a temperature of −50° to +100° C. to 3-methanesulfonyl-2-azabicyclo[2.2.1]hepta-2,5-diene; and then hydrolyzing the latter compound to 2-azabicyclo[2.2.1]hept-5-en-3-one.

12. (±)-3-Methanesulfonyl-2-azabicyclo[2.2.1]hepta-2,5-diene.

5,200,528

DIKETOPYRROLOPYRROLES

Gary Wooden, Oberschrot; Guy de Weck, Basel, and Olof Wallquist, Marly, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

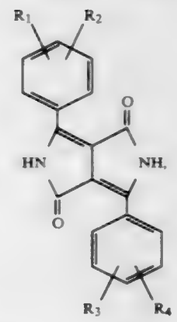
Filed Apr. 20, 1992, Ser. No. 870,986

Claims priority, application Switzerland, Apr. 26, 1991, 1250/91

Int. Cl.[5] C07D *487/00, 487/02*

U.S. Cl. 548—453 **5 Claims**

1. A 1,4-diketopyrrolo[3,4-c]pyrrole of formula



(I)

wherein R_1, R_2, R_3 and R_4 are each independently of one another hydrogen, Cl, Br, CH_3, OCH_3, CN or phenyl, and at least one of the substituents R_1, R_2, R_3 and R_4 is a group

$$—O(CH_2)_nX \text{ or } —O(CH_2CH_2O)_pCH_2CH_2X$$

5,200,533

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wherein
n is an integer from 2 to 12, and
p is an integer from 1 to 3,
X is a heterocyclic radical selected from the group consisiting of piperazinyl, pyridinyl, morpholinyl, piperidinyl and pyrrolidinyl, which radical is unsubstituted or substituted by one or two methyl groups, or is a group

$$-NR_5R_6$$

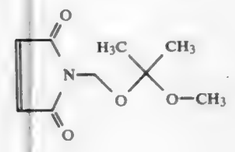
or

$$-N[(CH_2)_n-NR_5R_6]_2, \text{ wherein}$$

R_5 and R_6 are each independently of the other hydrogen, C_1–C_6alkyl or C_5–C_6cycloalkyl.

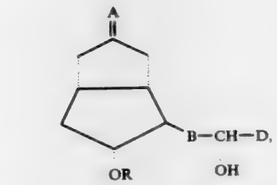
5,200,529
BLOCKED MONOMER AND POLYMERS THEREFROM FOR USE AS PHOTORESISTS
Christopher E. Osuch, Mine Hill, and Michael J. McFarland, Bound Brook, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Division of Ser. No. 543,321, Jun. 25, 1990, Pat. No. 5,081,001, which is a division of Ser. No. 289,592, Dec. 22, 1988, Pat. No. 4,962,171, which is a division of Ser. No. 52,950, May 22, 1987, Pat. No. 4,810,613. This application Oct. 25, 1991, Ser. No. 782,699
Int. Cl.[5] **C07D** *405/00, 207/452;* **C08F** *20/58, 212/08, 216/14, 222/40*
U.S. Cl. 548—517 **7 Claims**

1. As a composition of matter a substituted maleimide having the structure:



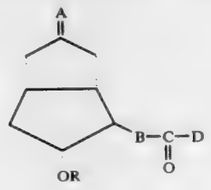
5,200,530
KETO REDUCTION OF CARBACYCLIN INTERMEDIATES
Helmut Dahl; Gabriela Buttner, and Dieter Peschel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany
PCT No. PCT/DE87/00519, § 371 Date Nov. 13, 1986, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO88/03527, PCT Pub. Date May 19, 1988
Continuation of Ser. No. 237,112, Jul. 13, 1988, abandoned. This PCT application Nov. 12, 1987, Ser. No. 772,762
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 368761
Int. Cl.[5] **C07F** *7/04*
U.S. Cl. 549—214 **9 Claims**

1. A process for the production of a 15α-hydroxybicyclo[3.3.0]octane of formula I



(I)

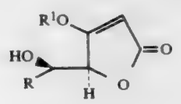
in which
A is —O—X—O—, =CH—$(CH_2)_3$—COOR′, =CH—CH-2—O—CH_2—COOR′ or =CH—$(CH_2)_3$—O—CH-2—CH_2—COOR′
X is straight-chain or branched alkylene of 1–7 C atoms
R′ is C_1–C_7alkyl,
R is $-SiR_1R_2R_3$,
R_1, R_2 and R_3 can be the same or different and each is alkyl of 1–7 C atoms or phenyl,
B is trans-CH=C(X′) wherein the trans-configuration relates to the C chain, and
X′ is hydrogen or bromine,
D is alkyl of 1–10 C atoms, alkenyl of 2–10 C atoms or alkynyl of 2–10 C atoms,
comprising reducing, in the presence of a cerium (III) salt, a corresponding keto-bicyclo[3.3.0]octane of formula II



(II)

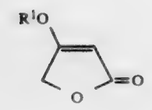
5,200,531
PROCESS FOR THE PRODUCTION OF THREO-4-ALKOXY-5-(ARYLHYDROXYMETHYL)-2(5H)-FURANONES
David Laffan, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland
Filed Dec. 17, 1991, Ser. No. 808,761
Claims priority, application Switzerland, Dec. 20, 1990, 4056/90
Int. Cl.[5] **C07D** *307/32*
U.S. Cl. 549—313 **12 Claims**

1. Process for the production of a threo-4-methoxy-5-(phenylhydroxymethyl)-2(5H)-furanone of the general formula and relative configuration:



I

wherein R is a phenyl group optionally substituted by at least one member selected from the group consisting of a halogen atom, a lower alkyl group and a nitro group, and R^1 is an alkyl group with 1 to 4 carbon atoms, comprising: condensing a 4-alkoxy-2(5H)-furanone of the general formula:



II

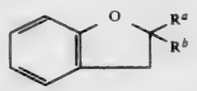
wherein R^1 has the above-mentioned meaning, with an optionally substituted benzaldehyde of the general formula:

R—CHO III

wherein R has the above-mentioned meaning, the condensation being performed under catalysis by lithium hydroxide at a temperature of 0° to 60° C. in a mixture of a dipolar aprotic solvent with a protic solvent in the volume ratio of 20:1 to 1:20; and precipitating the product by the addition of water without previous neutralization and removing the dipolar aprotic solvent without previous neutralization, or (2) removing the dipolar solvent without previous neutralization and precipitating the product by the addition of water without previous neutralization.

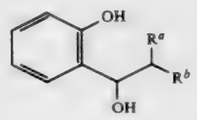
5,200,532
PREPARATION OF 2,2-DISUBSTITUTED-2,3-DIHYDROBENZOFURANS
Albrecht Harreus, Ludwigshafen; Bernd Wolf, Fussgoenheim, and Jochen Wild, Ruppertsberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 27, 1991, Ser. No. 750,347
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027573
Int. Cl.[5] **C07D** *307/79*
U.S. Cl. 549—462 **8 Claims**

1. A process for the preparation of a 2,2-disubstituted 2,3-dihydrobenzofuran I



I

or a derivative thereof, where R^a and R^b, independently of one another, are C-organic radicals, by reacting a 2-hydroxybenzyl alcohol II

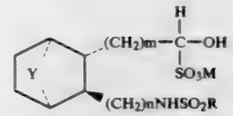


II

or a derivative thereof in an inert organic solvent in the presence of an acidic ion exchange resin, the improvement which comprises carrying out the reaction in the presence of an inert inorganic desiccant.

5,200,533
INTERMEDIATES FOR PREPARATION OF 2,3-TRANS-1,4-BRIDGED CYCLOHEXANE SULFONAMIDE DERIVATIVES
Masayuki Narisada, Ibaraki; Mitsuaki Ohtani, Nara; Fumihiko Watanabe, Kitakatsuragi, and Kyozo Kawata, Hirakata, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
Division of Ser. No. 711,562, May 30, 1991, Pat. No. 5,120,865, which is a continuation of Ser. No. 447,520, Dec. 7, 1989, abandoned. This application Mar. 12, 1992, Ser. No. 851,291
Claims priority, application Japan, Dec. 14, 1988, 315969
Int. Cl.[5] **C07D** *493/08;* **C07C** *311/17*
U.S. Cl. 549—463 **2 Claims**

1. Alkali metal hydrogen sulfite salt of 2,3-trans-1,4-bridged cyclohexane sulfonamide derivative of Formula (III):

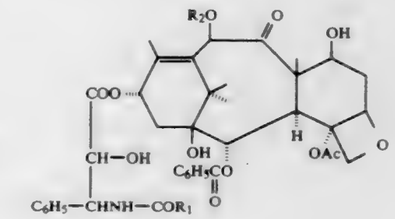


(III)

where R is phenyl or phenyl substituted with hydroxy, lower alkoxy, halogen or lower alkyl; Y is unsubstituted or substituted methylene, ethylene, vinylene or oxygen; m is 0 or 1; n is 0, 1 or 2 with the proviso that when m is 0, n is not 0, and when m is 1, n is not 2; and M is an alkali metal.

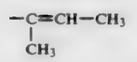
5,200,534
PROCESS FOR THE PREPARATION OF TAXOL AND 10-DEACETYLTAXOL
Koppaka V. Rao, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.
Filed Mar. 13, 1992, Ser. No. 851,469
Int. Cl.[5] **C07D** *305/14*
U.S. Cl. 549—510 **18 Claims**

1. A process for the preparation of a taxane of the formula



(I)

wherein R_1 is C_6H_5 or



and R_2 is hydrogen or acetyl, which comprises the steps of:
(a) reacting a periodate with a taxane-7-xyloside of the formula:

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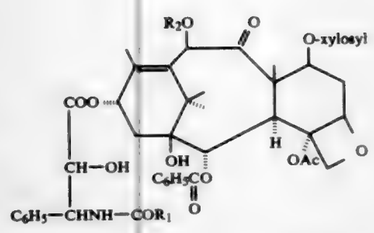


(II)

wherein R_1 and R_2 are as defined in a reaction-inert solvent at a temperature of from about 0° to about 60° C.; and

(b) reacting the products obtained in step (a) with phenylhydrazine and acetic acid in a reaction-inert solvent at a temperature of from about 20° to about 60° C.

5,200,535

CYCLOHEXANONE DERIVATIVES

Paul H. Briner, Canterbury, England, assignor to Shell Research Limited, United Kingdom

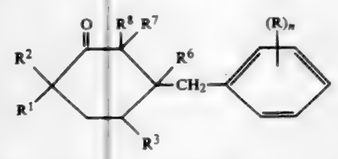
Filed Aug. 19, 1991, Ser. No. 746,977

Claims priority, application United Kingdom, Sep. 3, 1990, 9019192; Sep. 3, 1990, 9019193; Sep. 3, 1990, 9019194

Int. Cl.[5] **C07D** *303/12, 301/12;* **C07C** *49/543, 49/603*

U.S. Cl. 549—546 **5 Claims**

1. A compound of the formula



(I)

in which n represents an integer from 0 to 5;

each R represents a halogen atom, nitro, cyano, hydroxyl, alkyl, haloalkyl, alkoxy, haloalkoxy, amino, alkylamino, dialkylamino, alkoxycarbonyl, carboxyl, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, carbamoyl, alkylamido, cycloalkyl or phenyl group;

R^1, R^2 and R^3 independently represent a hydrogen atom or an alkyl group;

R^6 and R^7 together represent a single carbon-carbon bond and R^8 represents a hydroxyl group, or,

R^6 and R^7 together represent an epoxy group and R^8 represents a hydrogen atom.

5,200,536

FLUORINE-CONTAINING VITAMIN D3 ANALOGUES

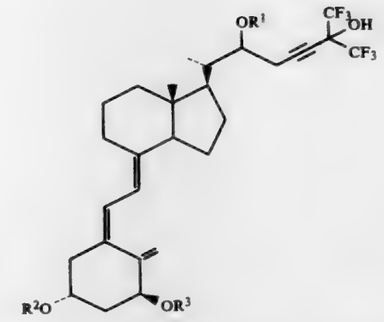
Nobuo Ikekawa; Takeo Taguchi, both of Tokyo, Japan; Yoko Tanaka, Delmar, N.Y.; Yoshiro Kobayashi, Tokyo, and Yutaka Ohira, Tsukuba, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Feb. 10, 1992, Ser. No. 832,888

Int. Cl.[5] **C07J** *172/00*

U.S. Cl. 552—653 **4 Claims**

1. A fluorine-containing vitamin D_3 analogue of the formula [I]:



[I]

wherein R^1, R^2 and R^3 are independently a hydrogen atom or a hydroxy-protecting group.

5,200,537

PROCESS FOR PREPARING METALLOCENES

John Y. Lee, and Steven P. Diefenbach, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Aug. 3, 1992, Ser. No. 923,646

Int. Cl.[5] **C07F** *7/28, 11/00*

U.S. Cl. 556—11 **12 Claims**

1. A process for preparing a transition metal compound of the formula: $(RC_5H_4)_2MX_2$, where R is hydrocarbyl or silahydrocarbyl of 1 to 20 carbon atoms, M is titanium or zirconium and X is halogen, said process comprising the steps of:

(a) reacting $Na(C_5H_5)$ with RX, where R and X are as defined above, in an organic solvent so as to form a reaction product mixture which includes RC_5H_4 and C_5H_5;

(b) vacuum stripping said product mixture at ambient temperatures so as to remove substantially all of said C_5H_5 from said product mixture;

(c) deprotonating said RC_5H_4 and

(d) adding MX_4, where M and X are as defined above, to said product mixture so as to react said deprotonated RC_5H_4 and said MX_4 and form said transition metal compound, said compound being substantially free of C_5H_5 containing impurities.

5,200,538

OPTICALLY ACTIVE 2-METHYLENECYCLOPENTANONE DERIVATIVE AND PROCESS FOR PREPARING SAME

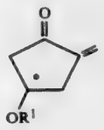
Takashi Takahashi, Kanagawa, and Yoshikazu Takehira, Hyogo, both of Japan, assignors to Daiso Co., Ltd., Osaka, Japan

Division of Ser. No. 727,219, Jul. 9, 1991. This application May 27, 1992, Ser. No. 888,703

Int. Cl.[5] **C07C** *45/41, 45/42*

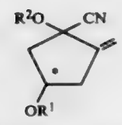
U.S. Cl. 556—12 **2 Claims**

1. A process for preparing an optically active 2-methylenecyclopentanone derivative (IX) represented by the general formula



(IX)

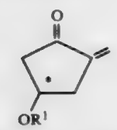
(wherein R^1 is a protective group for hydroxyl, and the symbol * represents an asymmetric carbon atom), the process comprising treating an optically active 2-methylenecyclopentane derivative represented by the general formula



(VIII)

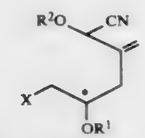
(wherein R^2 is a protective group for hydroxyl, and R^1 and the symbol * are as defined above) in the presence of an acid to hydrolyze the derivative (VIII), and then treating the hydrolyzed compound in the presence of a base for decyanohydrogenation.

2. A process for preparing an optically active 2-methylenecyclopentanone derivative (IX) represented by the general formula



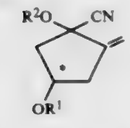
(IX)

(wherein R^1 is a protective group for hydroxyl, and the symbol * represents an asymmetric carbon atom), the process comprising treating an optically active compound represented by the general formula



(VII)

in the presence of a base for ring closure to obtain 2-methylenecyclopentane derivative represented by the general formula



(VIII)

and subsequently treating the compound (VIII) in the presence of an acid to hydrolyze the compound (VIII), and then treating the hydrolyzed compound in the presence of a base for decyanohydrogenation (in the above formulae (VII) and (VIII), R^2 is a protective group for hydroxyl, X is a halogen atom or R^4SO_3 group (wherein R^4 is an alkyl or an aryl), and R^1 and the symbol * are as defined above).

5,200,539

HOMOGENEOUS BIMETALLIC HYDROFORMYLATION CATALYSTS, AND PROCESSES UTILIZING THESE CATALYSTS FOR CONDUCTING HYDROFORMYLATION REACTIONS

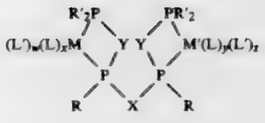
George G. Stanley, and Scott A. Laneman, both of Baton Rouge, La., assignors to Louisiana State University Board of Supervisors, a governing body of Louisiana State University Agricultural and Mechanical College, Baton Rouge, La.

Filed Aug. 27, 1990, Ser. No. 573,355

Int. Cl.[5] **C07F** *15/00*

U.S. Cl. 556—21 **4 Claims**

1. A composition of matter comprising



wherein

M is a Group VIII metal or Group IB metal;

M′ is a Group VIII metal or Group IB metal;

X is selected from the group consisting of methylene; substituted methylene CSS′ where S and S′ can be the same or different, and each of S and S′ is a hydrocarbon moiety which can be saturated or unsaturated and which contains up to 20 carbon atoms; oxygen; and NO where O is a hydrocarbon moiety which can be saturated or unsaturated and which contains up to 20 carbon atoms;

each Y is selected from the group consisting of ethyl; propyl; and meta-substituted aryl having hydrogen, F, or methyl substituents; where the Ys may be the same or different;

each R is a hydrocarbon moiety which can be saturated or unsaturated and which contains up to 20 carbon atoms; where the Rs may be the same or different;

each R′ is selected from the group consisting of methyl, ethyl, n-propyl, n-butyl, methoxy, ethoxy, propoxy, and butoxy; where the R's may be the same or different;

each L and L′ is a substituent ligand selected from the group consisting of H, CO, alkenyl, alkyl, substituted alkenyl, and substituted alkyl; where the Ls may be the same or different; and where the L's may be the same or different; and

and the values of the numbers w, x, y, and z for the ligands L and L′ depend on the metal centers M and M′ and are selected such that each metal center M and M′ has 14, 16, or 18 valence electrons.

5,200,540

REFINING PROCESS OF ORGANIC TIN (IV) POLYHALIDES

Yasuyuki Suzaki; Yuji Watanabe; Toshinao Fujita, and Naruo Den, all of Tokyo, Japan, assignors to Koriyama Kasei Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01687, § 371 Date Aug. 2, 1991, § 102(e) Date Aug. 2, 1991, PCT Pub. No. WO91/09862, PCT Pub. Date Jul. 11, 1991

PCT Filed Dec. 25, 1990, Ser. No. 721,560

Claims priority, application Japan, Dec. 28, 1989, 1-341188

Int. Cl.[5] **C07F** *7/22*

U.S. Cl. 556—87 **9 Claims**

1. Method for producing an organic tetravalent tin polyhalide which comprises contacting an admixture of organic tetravalent tin polyhalide and organic tetravalent tin monohalide with hydrochloric acid, hydrogen chloride or chlorine in an amount and under conditions sufficient to convert the organic tetravalent tin monohalide to organic tetravalent tin polyhalide.

5,200,541

NON-CENTROSYMMETRIC ORGANOMETALLIC MOLECULES, PROCESS OF PREPARATION AND APPLICATION IN NONLINEAR OPTICS AND INTERMEDIATES

Thierry Thami, Paris, France, assignor to Societe Francaise Hoechst, Puteaux, France

Filed Jan. 10, 1992, Ser. No. 819,540

Claims priority, application France, Jan. 10, 1991, 91 00238

The portion of the term of this patent subsequent to Dec. 17, 1992, has been disclaimed.

Int. Cl.[5] **C07F** *1/08, 15/04, 15/06;* **C07G** *281/00*

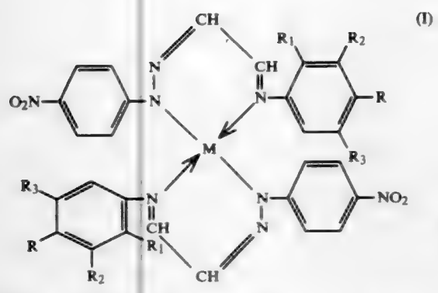
U.S. Cl. 556—110 **15 Claims**

1. The products having general formula (I)

5,200,545

THIURAM DISULPHIDES CONTAINING PHOSPHATE

VOL 1149 ISS 1 AP 6 1993 UMI



(I)

in which R represents a C_1–C_{18} alkoxyl, C_1–C_{18} alkylthio, C_1–C_{18} monoalkylamino or C_2–C_{36} dialkylamino group, R_1 represents a hydrogen atom or a C_1–C_{18} alkyl group, R_2 and R_3, identical or different, represent a hydrogen atom or a C_1–C_{18} alkoxyl group and M represents a cobalt, nickel or copper atom.

12. The products having general formula (II)

(II)

in which R represents a C_1–C_{18} alkoxyl, C_1 –C_{18} alkylthio, C_1–C_{18} monoalkylamino or C_2–C_{36} dialkylamino group, R_1 represents a hydrogen atom or a C_1–C_{36} alkyl group, R_2 and R_3, identical or different, represent a hydrogen atom or a C_1–C_{18} alkoxyl group, with the exclusion of paranitrophenyl-hydrazono-1 paramethoxyphenylimino-2 ethane.

5,200,542

DIALLYL SILYL AMINES

Andrew J. Sivak, Edgewood Boro; Leonard A. Cullo, Hempfield Township, Westmoreland County, and William L. Krayer, Mt. Lebanon Township, Allegheny County all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 422,275, Oct. 16, 1989, which is a continuation-in-part of Ser. No. 257,895, Oct. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,960, May 8, 1987, abandoned. This application Aug. 6, 1992, Ser. No. 925,133

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—410 **4 Claims**

1. Trimethyl silyl diallyl amine.

5,200,543

SILOXANE COMPOUNDS

Hiroshi Inomata; Hiromasa Yamaguchi, and Kenichi Fukuda, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

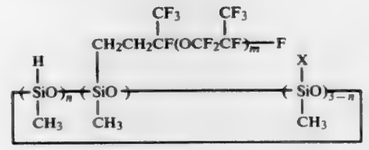
Filed Jul. 2, 1992, Ser. No. 906,835

Claims priority, application Japan, Jul. 4, 1991, 3-190767

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—434 **4 Claims**

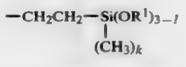
1. A siloxane compound of the formulae (1):



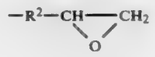
(1)

wherein

X is a group of the following formula (2) or (3):



(2)



(3)

wherein

R^1 is a monovalent hydrocarbon group, R^2 is a divalent organic group, and k is an integer of 0 to 2,

m is an integer of 1 to 4, and n is equal to 1 or 2.

5,200,544

RESIST MATERIALS

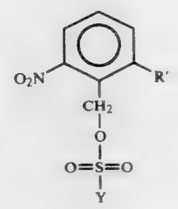
Francis M. Houlihan, Millington; Thomas X. Neenan, New Providence, and Elsa Reichmanis, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 565,074, Aug. 9, 1990, Pat. No. 5,135,838, and a continuation-in-part of Ser. No. 316,051, Feb. 24, 1989, Pat. No. 4,996,136, which is a continuation-in-part of Ser. No. 160,368, Feb. 25, 1988, abandoned. This application Jan. 24, 1992, Ser. No. 825,341

Int. Cl.[5] C07C *309/19, 309/06, 255/50*

U.S. Cl. 558—44 **1 Claim**

1. A material represented by the formula



where R′ is a perfluorinated alkyl, lower alkyl, alkoxide, or cyano, and Y is an alkyl, substituted alkyl, aryl, or substituted aryl.

5,200,545

THIURAM DISULPHIDES CONTAINING PHOSPHATE OR PHOSPHONATE FUNCTIONAL GROUPS, THEIR PREPARATION AND THEIR USE IN THE MANUFACTURE OF FIREPROOFING VINYL POLYMERS

Gilbert Clouet, La Wantzenau, France, and C. P. Reghunadhan Nair, Trivandrum, India, assignors to Elf Atochem S.A., Paris-La Defense, France

PCT No. PCT/FR89/00172, § 371 Date Dec. 3, 1990, § 102(e) Date Dec. 3, 1990, PCT Pub. No. WO89/10371, PCT Pub. Date Nov. 2, 1989

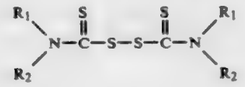
PCT Filed Apr. 17, 1989, Ser. No. 582,897

Claims priority, application France, Apr. 19, 1988, 88 05178

Int. Cl.[5] C07F *9/09*

U.S. Cl. 558—159 **3 Claims**

1. Chemical compound denoted by the formula (I):



(I)

in which:

R_1 and R_2, independently of each other, denote:

a linear or branched C_1-C_{12} alkyl group, optionally interrupted by —O— or

a C_3-C_{12} cycloalkyl group;

an aryl group;

a —Y—R_4 group, in which:

Y denotes a single bond, —O— or

and

R_4 denotes a phosphate or phosphonate functional group;

R_3 and R_5 being chosen independently from the groups forming part of the definition of R_1, and R_2;

it being possible for each of the groups R_1, R_2 and R_3 to carry at least one functional group chosen from the phosphate or phosphonate functional groups, on the condition that at least one of the radicals either consists of or carries at least one phosphate or phosphonate functional group, it being possible for this functional group to be carried by the radical R_3 or R_5.

5,200,546

PHOSPHONOALKYL PHENYLALANINE COMPOUNDS SUITABLY PROTECTED FOR USE IN PEPTIDE SYNTHESIS

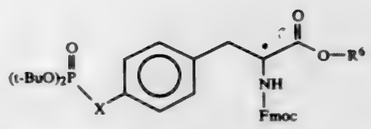
Terrence R. Burke, Jr., Bethesda, and Benjamin B. Lim, Baltimore, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 30, 1991, Ser. No. 767,621

Int. Cl.[5] C07F *9/40, 9/6518, 9/572*

U.S. Cl. 558—190 **5 Claims**

1. A compound of the formula:



(I)

wherein x is —CH_2—, —CHF—, —CF_2—, —CHOH— or —C(O)—, t-BuO is tertiary butoxy, Fmoc is 9-fluorenylmethyloxycarbonyl; R^6 is hydrogen, pentafluorophenyl, nitrophenyl, benzotriazolyl or succinimidolyl, and * indicates a chiral carbon atom; and the optical isomers thereof.

5,200,547

PREPARATION OF URETHANE AND CARBONATE PRODUCTS

Dennis P. Riley, Ballwin, and William D. McGhee, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 4, 1990, Ser. No. 576,883

Int. Cl.[5] C07C *68/04*

U.S. Cl. 558—265 **19 Claims**

1. A process for preparing urethanes and carbonates comprising:

a) bringing CO_2 and a primary or secondary amine, an alcohol, an aminoalcohol, or a mixture thereof into reactive contact in the presence of a tertiary amine base, and in a solvent to form the corresponding ammonium carbamate salt or carbonate salt, and

b) reacting said salt with an allyl halide in the presence of a palladium tertiary phosphine catalyst system.

5,200,548

2,4,5-TRIHALOGENO- AND 2,3,4,5-TETRAHALOGENOBENZENE DERIVATIVES

Erich Klauke, Odenthal; Uwe Petersen, Leverkusen, and Klaus Grohe, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

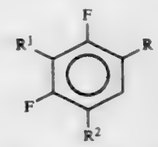
Division of Ser. No. 459,876, Jan. 2, 1990, Pat. No. 5,072,038. This application Sep. 20, 1991, Ser. No. 763,027

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420796

Int. Cl.[5] C07C *255/00*

U.S. Cl. 558—425 **1 Claim**

1. A process for the preparation of 2,3,4,5-tetrahalogenobenzonitrile derivatives of the formula



in which R is —CN and R^1 is Cl and R^2 is Cl or F, said process comprising reacting 2,3,4,5-tetrachlorobenzonitrile with potassium fluoride in a solvent at an elevated temperature of between about 160° C. and about 260° C., in a molar ratio of potassium fluoride:2,3,4,5-tetrachlorobenzonitrile of 2:1–4:1 if R^2 is Cl and 3:1–6:1 if R^2 is F.

5,200,549

R_3, R_4 and R_5 represent hydrogen, fluorine, OH, —CH_3,

are each selected from the group consisting of sub-groups (a) and (b), wherein (a) is unsubstituted phenyl, naphthyl, furyl or

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5,200,549

ANTIPSORIATIC AGENTS

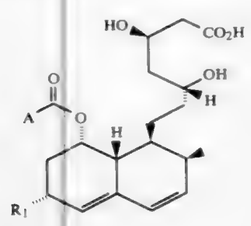
Peter M. Wovkulich, Nutley; Milan R. Uskokovic; Ann Goldstein, both of Upper Montclair, all of N.J., and John A. McLane, West Haven, Conn., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 270,980, Nov. 14, 1988, Pat. No. 5,073,568. This application Sep. 24, 1991, Ser. No. 764,641

Int. Cl.[5] C07C *69/76, 69/63*

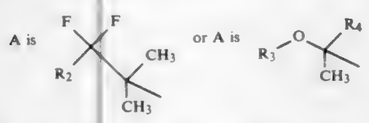
U.S. Cl. 560—61 **15 Claims**

1. A compound of the formula



II

wherein R_1 is hydrogen or methyl;



and R_2 is lower alkyl; R_3 is phenyl, or phenyl substituted by 1 to 3 substituents selected from the group consisting of halo, lower alkyl, and lower alkoxy; and R_4 is hydrogen or methyl; or a pharmaceutically acceptable salt of said acid, a C_{1-4} alkyl ester of said acid, an acetylamino-substituted-C_{1-4} alkyl ester of said acid, a phenyl-dimethylamino ester of said acid or a α-monoglyceride of said acid.

5,200,550

BI-AROMATIC ESTERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN OR VETERINARY MEDICINE AND IN COSMETIC COMPOSITIONS

Braham Shroot, Antibes, and Jean-Michel Bernardon, Nice, both of France, assignors to Centre International de Recherces Dermatologiques Galderma (Cird Galderma), Valbonne, France

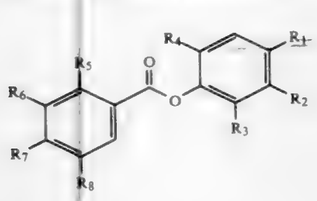
Filed Jul. 17, 1990, Ser. No. 553,087

Claims priority, application France, Jul. 18, 1989, 89 09652

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—64 **17 Claims**

1. A bi-aromatic ester having the formula



(I)

wherein

R_1 represents —$COOR_9$,

R_9 represents hydrogen, alkyl having 1–6 carbon atoms, monohydroxyalkyl or polyhydroxyalkyl,

R_2 represents hydrogen, alkyl having 1–6 carbon atoms, OR_9, fluorine or —CF_3,

R_3, R_4 and R_5 represent hydrogen, fluorine, OH, —CH_3, —OCH_3, —CF_3, —COOH or —CH_2OH,

R_6 and R_8, each independently, represent hydrogen, substituted alkyl having 3–15 carbon atoms and 1-adamantyl,

R_7 represents hydrogen, alkyl having 1–6 carbon atoms, alkenyl and OR_{12} wherein R_{12} represents hydrogen, alkyl having 1–6 carbon atoms and alkenyl,

with the proviso that when R_2 represents hydrogen, then:

(i) either R_3 and R_4 are other than hydrogen or —CH_3,

(ii) or R_7 is other than OR_{12} and R_6 or R_8 is 1-adamantyl,

(iii) or R_7 represents OR_{12}, but R_6 and R_8 are other than hydrogen, and

(iv) or R_7 represents OR_{12} but R_5 is other than hydrogen.

5,200,551

METHOD OF PREPARING AN INTERMEDIATE FOR THE MANUFACTURE OF BAMBUTEROL

Peter Jaksch, Järna, Sweden, assignor to Aktiebolaget Astra, Sodertalje, Sweden

PCT No. PCT/SE90/00792, § 371 Date Jul. 31, 1991, § 102(e) Date Jul. 31, 1991, PCT Pub. No. WO91/08197, PCT Pub. Date Jun. 13, 1991

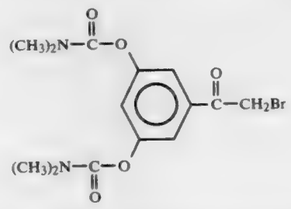
PCT Filed Nov. 20, 1990, Ser. No. 741,424

Claims priority, application Sweden, Dec. 1, 1989, 8904064

Int. Cl.[5] C07C *269/00*

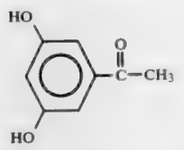
U.S. Cl. 560—132 **2 Claims**

1. A method for the preparation of 2'-bromo-3,5-di-[N,N-dimethylcarbamoyloxy]acetophenone, having the formula



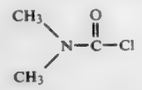
(1)

comprising: reacting 3,5-dihydroxyacetophenone



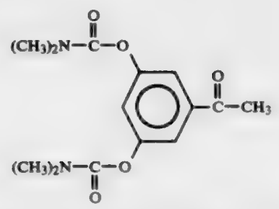
(2)

with N,N-dimethylcarbamoylchloride,



(3)

in a solvent, quenching with water, removing the solvent and dissolving of the resulting 3,5-di-[N,N-dimethylcarbamoyloxy]acetophenone



(4)

in ethyl acetate, to which dissolved hydrogen bromide is added and then bromine, whereupon the resulting intermediate (1) is collected in the form of crystals, wherein the reaction between said 3,5-dihydroxyacetophenone (2) and N,N -dimethylcarbamoylchloride (3) is carried out in ethylacetate, isopropylacetate, butylacetate, ethylmethylketone or isobutylmethylketone as the solvent with a small amount of pyridine as a catalyst using a base comprising crystallized potassium carbonate.

5,200,552

POLYMERIZABLE SUBSTITUTED AMIDE COMPOUND, POLYMER OBTAINED THEREFROM AND NONLINEAR OPTICAL MATERIAL USING THE SAME

Satoshi Urano, Tsuzuki; Noriyuki Tsuboniwa, Higashiosaka; Tetsuji Kawakami, Katano, and Katsuya Wakita, Nara, all of Japan, assignors to Nippon Paint Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

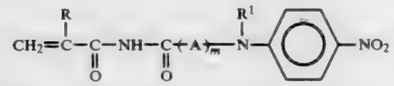
Filed Sep. 25, 1991, Ser. No. 765,513

Claims priority, application Japan, Sep. 25, 1990, 2-256040

Int. Cl.[5] C07C *271/18, 275/30*

U.S. Cl. 560—163 **5 Claims**

1. A polymerizable substituted amide compound represented by the formula;



[I]

wherein R and R^1 respectively represent a hydrogen atom or a lower alkyl group, A represents —X—$(CH_2)_n$— in which X represents an oxygen atom or —NH— and n is an integer of 1 to 6, and m is 0 or 1.

5,200,553

BIOLOGICALLY ACTIVE CARBOXYLIC ACID ESTERS

Abraham Nudelman, Rehovot; Matitiahu Shaklai, and Ada Rephaeli, both of Tel Aviv, all of Israel, assignors to Kupat Holim Health Insurance Institution of the General Federation of Labor, Tel Aviv, Israel

Filed Jul. 25, 1988, Ser. No. 223,595

Claims priority, application Israel, Jul. 30, 1987, 83389; Jul. 11, 1988, 87072

Int. Cl.[5] C07C *67/02*

U.S. Cl. 560—263 **12 Claims**

1. Compounds selected from the group consisting of compounds having formulas (I), (II) and (III):

$XCH_2—CHX—CHX—C(=O)—O—Z$ (I),

$CH_3—CO—CH_2—C(=O)—O—Z$ (II) and

$CH_3—CH_2—CO—C(=O)—O—Z$ (III)

wherein X is H, or one X only may be OH; Z is —CHR—O—(O=)C—R^1, R represents a member selected from the group consisting of hydrogen and alkyl, and R^1 represents a member selected from the group consisting of alkyl, aminoalkyl, aralkyl, aryl, alkoxy, aralkoxy and aryloxy, in which aryl by itself, and aryl in aralkyl, aralkoxy and aryloxy, are each selected from the group consisting of sub-groups (a) and (b), wherein (a) is unsubstituted phenyl, naphthyl, furyl or thienyl, and (b) is phenyl, naphthyl, furyl or thienyl, each of which is substituted by at least one substituent selected from the group consisting of alkyl, alkoxy or halogen, provided that in (I) when X is H and R' is propyl, then R is alkyl which contains at least three carbon atoms.

5,200,554

BISPHOSPHONIC ACID DERIVATIVES AND THEIR USE

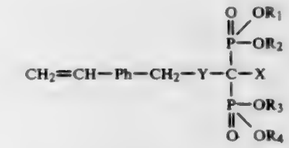
Jan-Anders H. Nasman, Rakunnatie 58a C48, SF-20720 Turku; Osmo Hormi, Kairduäylä 32 A 14, SF-90570 Oulu; Esko O. Pajunen, Yo-Kylä 78 A 4, 20540 Turku, and Mats J. Sundell, Kuppiagarua 8968, 20510 Turku, all of Finland

Filed Jan. 21, 1992, Ser. No. 823,326

Int. Cl.[5] C07C *61/00*; C08F *2/00*

U.S. Cl. 562—21 **4 Claims**

1. A compound comprising a bisphosphonic acid derivative having the general formula (I)



(I)

wherein

each one of the groups R_1, R_2, R_3 and R_4 is independently selected from the group consisting of hydrogen, lower alkyl, —CH_2CH_2OH, or R_1 and R_2 are together —CH_2CH_2—, and R_3 and R_4 are together —CH_2CH_2—;

X is selected from the group consisting of hydrogen, methyl, ethyl and COOH;

Y is selected from the group consisting of an optionally unsaturated alkylene group —$(CH_2)_n$— where n has the value 0 to 12 —OCH_2CH_2O—, —$OCH_2C^*H(OH)CH_2$—, where the carbon atom marked with * is chiral and is in a form selected from the group consisting of the R-form, S-form, and a racemate; and

Ph is a phenyl group which carries the vinyl group in meta- or para position to the methylene group.

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PROCESS FOR THE PREPARATION OF S(+)-6-METHOXY-α-METHYL-2-NAPHTHALENE-ACETIC ACID

Gerard Kessels, Garrucha, Spain, assignor to Westpur Investment Limited, Douglas, United Kingdom

Filed Jul. 23, 1991, Ser. No. 734,598

Claims priority, application Netherlands, Jul. 27, 1990, 9001703

Int. Cl.[5] C07B *57/00*

U.S. Cl. 562—401 **4 Claims**

1. A process for the preparation of S(+)-6-methoxy-α-methyl-2-naphthalene-acetic acid by resolution of R,S-6-methoxy-α-methyl-2-naphthalene-acetic acid comprising

a) dissolving R,S-6-methoxy-α-methyl-2-naphthalene-acetic acid, R(−)-2-amino-1-butanol and water at 40°–60° C. to obtain a solution,

b) cooling the solution of (a) to 25°–35° C.,

c) grafting the cooled solution by adding a salt of S(+)-6-methoxy-α-methyl-2-naphthalene-acetic acid and R(−)-2-amino-1-butanol,

d) cooling the solution of (c) to 5°–15° C. forming crystals, e) separating by filtration the formed crystals from the solution of (d),

f) washing the formed crystals of (e) with water,

g) hydrolyzing said formed crystals by adding strong acid to

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obtain hydrolyzed crystals of S(+)-6-methoxy-α-methyl-2-naphthalene-acetic acid and residual mother liquor,

h) separating by filtration the hydrolyzed crystals from the mother liquor,

i) racemizing the residual components present in the liquor by heating the mother liquor of (h),

j) repeating the process beginning with step (a) by using the recycled residual components of (i).

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PROCESS FOR THE PREPARATION OF 3,4,6-TRIFLUOROPHTHALIC ACID AND THE ANHYDRIDE THEREOF

Theodor Papenfuhs, Frankfurt am Main, and Ralf Pfirmann, Griesheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

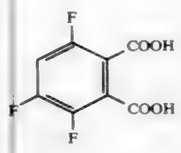
Filed May 21, 1992, Ser. No. 887,182

Claims priority, application Fed. Rep. of Germany, May 22, 1991, 4116625

Int. Cl.[5] **C07D** *307/89;* **C07C** *51/06*

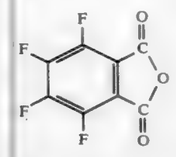
U.S. Cl. 562—480 **8 Claims**

1. A process for the preparation of 3,4,6-trifluorophthalic acid of the formula (1)



(1)

or of the anhydride thereof, which comprises dehalogenating tetrafluorophthalic anhydride of the formula (2)



(2)

or tetrafluorophthalic acid using zinc in aqueous-alkaline medium at temperatures of approximately 20° C. to approximately 160° C. and, optionally, converting the resulting 3,4,6-trifluorophthalic acid into the anhydride by dehydrating it.

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PROCESS FOR PREPARATION OF CRUDE TEREPHTHALIC ACID SUITABLE FOR REDUCTION TO PREPARE PURIFIED TEREPHTHALIC ACID

John C. Gee, Aurora; Jeffrey I. Rosenfeld, Schaumburg, and Thomas M. Bartos, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 685,221, Apr. 12, 1991, abandoned. This application Jan. 15, 1992, Ser. No. 821,490

Int. Cl.[5] **C07C** *51/43*

U.S. Cl. 562—486 **8 Claims**

1. A process for the preparation of a crude aromatic polycarboxylic acid obtained by oxidizing an alkyl aromatic hydrocarbon to a polycarboxylic acid in the presence of an aliphatic carboxylic acid of 1 to 5 carbon atoms to prepare the crude polycarboxylic acid wherein the concentration of the aliphatic carboxylic acid in mother liquor retained by the crude polycarboxylic acid is equal to or less than about 5000 ppmw, based upon the weight of the crude polycarboxylic acid present, the aliphatic carboxylic acid being replaced by water, which process comprises:

(a) introducing a stream of a slurry of a crude aromatic polycarboxylic acid in a mother liquor comprising an aliphatic carboxylic acid having from 1 to 5 carbon atoms into a filter cell or a series of filter cells maintained in a suitable position whereby each filter cell develops a filter cake in the filter cells upon introduction of the slurry into each filter cell;

(b) interrupting the stream of the slurry into each filter cell upon development of the filter cake;

(c) introducing a water stream into each filter cell so as to form a reservoir of water in the filter cells sufficient in depth over the filter cake to cover the filter cake and water pressure is in a range above system pressure sufficient to displace the aliphatic carboxylic acid by positive pressure displacement from the filter cake;

(d) displacing the aliphatic carboxylic acid by positive pressure displacement from the filter cake;

(e) repeating steps (c) and (d) to successively wash filter cake into filter cells having successively increasing content of the aliphatic acid in a counter-current method to wash filter cake in each filter cell in reverse order to degree of contamination by the aliphatic carboxylic acid; and

(f) discharging the crude aromatic polycarboxylic acid containing 5000 ppmw, or less, in retained mother liquor of the aliphatic acid from the series of the filter cells.

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S(+)-IBUPROFEN-L-AMINO ACID AND S(+)-IBUPROFEN-D-AMINO ACID AS ONSET-HASTENED ENHANCED ANALGESICS

King C. Kwan, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 422,466, Oct. 17, 1989, abandoned. This application Aug. 9, 1991, Ser. No. 743,545

Int. Cl.[5] **C07C** *53/134*

U.S. Cl. 562—496 **23 Claims**

1. A compound which is S(+)-ibuprofen-L-amino acid or S(+)-ibuprofen-D-amino acid, substantially free of any other ibuprofen-amino acid stereoisomer.

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PROCESS FOR PRODUCING SORBIC ACID

Masahiro Nakajima, Minamatashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Sep. 16, 1991, Ser. No. 760,196

Claims priority, application Japan, Oct. 15, 1990, 2-275756

Int. Cl.[5] **C07B** *35/04;* **C07C** *57/10*

U.S. Cl. 562—599 **2 Claims**

1. In the process for producing sorbic acid by decomposing a polyester obtained by reacting crotonaldehyde with ketene in the presence of an organic acid zinc salt, the improvement which comprises dissolving said polyester in an aromatic hydrocarbon solvent having an azeotropic temperature thereof with water of 92° to 100° C., followed by washing the resulting polyester solution with water or a mineral acid water to remove the zinc matter contained therein, and continuously contacting the resulting solution with a strongly acidic porous type ion exchange resin, said strongly acidic porous type ion exchange resin being treated with a lower alkyl alcohol in advance, followed by continuously contacting aid polyester solution with the treated resin at 60° to 95° C.

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PREPARATION OF CARBOXYLIC CHLORIDES

Thomas M. Kahl, Roemerberg; Jochem Henkelmann, Ludwigshafen; Leopold Hupfer, Friedelsheim; Wolfgang Franzischka, Frankenthal, and Wolfgang Schwarz, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 686,817, Apr. 17, 1991, abandoned. This application Jun. 30, 1992, Ser. No. 908,439

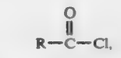
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1990, 4012781

The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.

Int. Cl.[5] **C07L** *51/58*

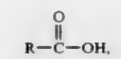
U.S. Cl. 562—857 **13 Claims**

1. In a process for the preparation of a carboxylic chloride of the formula



(I)

in which R denotes C_1–C_{30}-alkyl, C_2–C_{30}-alkenyl or C_2–C_{30}-alkynyl, by reacting a carboxylic acid of the formula

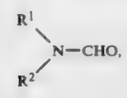


(II)

in which R has the meanings stated with liquid or gaseous phosgene

(III)

in the presence of a catalyst adduct of phosgene and N,N-disubstituted formamide of the formula



(IV)

in which R^1 and R^2 are independently C_1–C_3-alkyl or R^1 and R^2 together form a C_4- or C_5-alkylene chain which may or may not be interrupted by an oxygen atom or by a nitrogen atom carrying a C_1–C_3-alkyl group or CHO, the product (I) being isolated from the catalyst adduct by phase separation, the improvement which comprises:

carrying out the reaction in the presence of said catalyst adduct of phosgene and N,N-disubstituted formamide (IV) in which the amount of phosgene in the adduct is kept between about 20 to 70% molar, based on the formamide.

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PROCESS FOR PRODUCING OPTICALLY ACTIVE AMINES

Naoto Konya, Takatsuki; Yukio Yoneyoshi, Misawa; Yoji Sakito, Takarazuka; Shinji Nishii, Ibaraki; Gohfu Suzukamo, Suita, and Hiroko Sakane, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

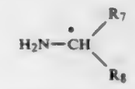
Filed Oct. 7, 1991, Ser. No. 771,569

Claims priority, application Japan, Oct. 8, 1990, 2-271014

Int. Cl.[5] **C07C** *209/88, 209/40*

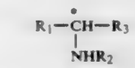
U.S. Cl. 564—373 **22 Claims**

1. A process for producing an optically active amine represented by the formula (IV)



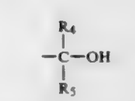
(IV)

wherein R_7 and R_8 each denote an alkyl group, aryl group or aralkyl group, providing that they do not denote the same group at the same time, and * indicates an asymmetric carbon atom, which comprises reacting an asymmetric reducing agent obtained from (1) an optically active amine derivative represented by the formula (I)



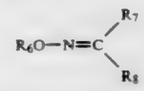
(I)

wherein R_1 denotes an alkyl group, aryl group, or aralkyl group; R_2 denotes a hydrogen atom, alkyl group or aralkyl group; R_3 denotes an aryl group or a substituent represented by the formula (II)



(II)

wherein R_4 and R_5 each denote a hydrogen atom, aryl group or aralkyl group, and * is as defined above, (2) a metal borohydride and (3) sulfuric acid, with either the syn-isomer or the anti-isomer of an oxime derivative represented by the formula (III) or with a mixture rich in either one of the two isomers



(III)

wherein R_6 denotes an alkyl group, aralkyl group or alkyl-substituted silyl group, and R_7 and R_8 are as defined above.

ELECTRICAL

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KEY POSITION COMPUTING APPARATUS AND

senting multi-channel tone generating processes;
a common read-only memory means shared by said plurality

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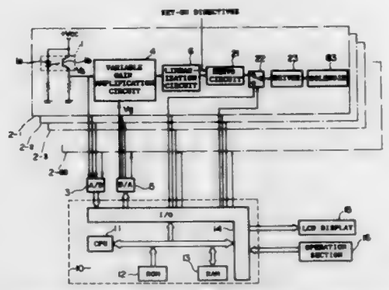
KEY POSITION COMPUTING APPARATUS AND COMPUTING METHOD THEREFOR

Makoto Kaneko, and Ichirou Ohe, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation-in-part of Ser. No. 647,440, Jan. 29, 1991, abandoned. This application Oct. 23, 1991, Ser. No. 781,727
Claims priority, application Japan, Jan. 30, 1990, 2-20030
Int. Cl.[5] G10F *1/02*
U.S. Cl. 84—21 20 Claims



1. A key position computing apparatus for a player piano comprising:

(a) sensing means provided on each key for measuring a characteristic operating signal representing a distance between a reference plane and a key surface for each key, and for outputting a value of the characteristic operating signal;

(b) gain adjusting means for adjusting a gain of the value of the characteristic operating signal output from the sensing means to a constant value;

(c) linearizing means for approximating the value of the characteristic operating signal output from the sensing means with a linearized output signal;

(d) memory means for storing computer programs to compute a relationship between the linearized output signal output from the linearizing means and the distance between the reference plane and the key surface;

(e) programmable memory means for storing the value of the characteristic operating signal of the sensing means for each key; and

(f) computing means for computing the relationship between the linearized output signal from the linearizing means and the distance from the reference plane to the key surface of each key, thereby permitting a continual monitoring and a real time dynamic reproduction of a musical performance.

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Patent Not Issued For This Number

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DIGITAL INFORMATION PROCESSING APPARATUS WITH MULTIPLE CPUS

Ryuji Usami, Akigawa; Kosuke Shiba, Fussa; Koichiro Daigo, Fussa; Kazuo Ogura, Fussa; Jun Hosoda, Hanno; Teruo Jinbo, Fussa; Takashi Akutsu, Akishima; Yoshiki Negoro, Fussa; Yoshito Yamaguchi, Oome, and Hajime Manabe, Higashiyamato, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 29, 1991, Ser. No. 709,101
Claims priority, application Japan, Jun. 29, 1990, 2-170161; Jun. 29, 1990, 2-170169; Jul. 2, 1990, 2-175133
Int. Cl.[5] G10H *1/057, 7/00*
U.S. Cl. 84—602 10 Claims

1. A digital microcomputer comprising:

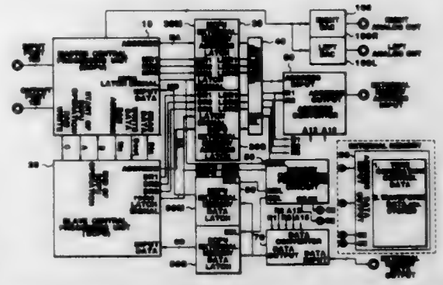
a plurality of CPUS operable by respective programs representing multi-channel tone generating processes;

a common read-only memory means shared by said plurality of CPUs for storing waveform data;

a plurality of address latch means for respectively latching addresses for said common read-only memory means output from said plurality of CPUS in response to respective control signals from said plurality of CPUs;

address select means, provided between said plurality of address latch means and said common read-only memory means, for selecting an address output form any of said plurality of address latch means;

a plurality of output-data latch means, provided between said common read-only memory means and said plurality of CPUs, for selectively latching waveform data output from said common read-only memory means to distribute said data to a desirable one of said plurality of CPUs; and



control means for, in response to access request signals output from two or more of said plurality of cpus when simultaneously requesting access to said common read-only memory means, controlling said address select means, said common read-only memory means and said plurality of output-data latch means in a sequence so as to execute an actual access operation to said common read-only memory means for each of said two or more CPUs requesting said access without causing any overlapping, thereby generating a plurality of tone signals by accessing the waveform data stored in said common head-only memory means by said plurality of CPUs.

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MUSICAL TONE SYNTHESIZING APPARATUS HAVING IMPROVED PROCESSING OPERATION

Miyata Satoshi; Okamoto Eisaku, and Abe Yasuaso, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 28, 1990, Ser. No. 636,067
Claims priority, application Japan, Jan. 5, 1990, 2-70
Int. Cl.[5] G10H *1/08*
U.S. Cl. 84—602 4 Claims

1. A musical tone synthesizing apparatus comprising:

memory means for storing musical tone control parameters for determining characteristics of musical tones;

information processing means, capable of being operatively connected to said memory means, for outputting musical tone control data and a control signal;

control means for causing said memory means to connect to said information processing means based on said control signal;

address setting means for setting an address value for sending to said memory means responsive to said control signal, said address value being used as an initial address when said memory means is connected to said information processing means;

increment means for incrementing the address value by a

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correcting said operation data into values falling within a particular one of plural tone generation regions deter-

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KEY-TOUCH STATE DETECTION DEVICE FOR AN

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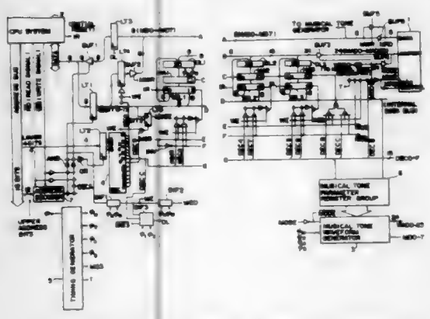
increment means for incrementing the address value by a predetermined number in response to connection of said information processing means to said memory means; and



tone generating means, capable of being connected to said memory means, for controlling the reading out of musical tone parameters from the memory means and for generating a musical tone signal based on said read out musical tone control parameters.

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ELECTRONIC MUSICAL INSTRUMENT WITH AD-LIB MELODY PLAYING DEVICE

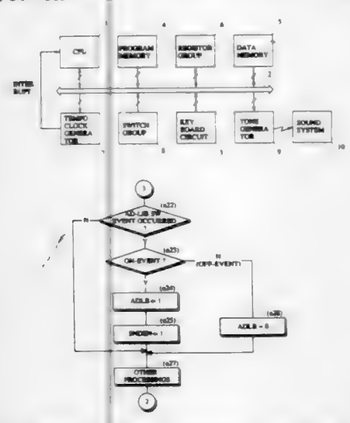
Hideaki Shimaya, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 26, 1990, Ser. No. 634,029

Claims priority, application Japan, Dec. 26, 1989, 1-339272

Int. Cl.[5] G10H *7/00;* **G04B** *13/00;* **A63H** *5/00*

U.S. Cl. 84—609 **14 Claims**



1. An electronic musical instrument with ad-lib playing function comprising:

ad-lib melody data storage means for storing ad-lib melody data;

ad-lib switch means being operable for initiating and terminating ad-lib melody playing;

clock means for generating clock pulses;

counter means for counting the generated clock pulses independent of an operation of the ad-lib switch means;

reading means, responsive to the ad-lib switch means, for reading the ad-lib melody data according to the counted number of clock pulses; and

tone-generating means for generating tones corresponding to the ad-lib melody data read by the reading means.

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ENVELOPE GENERATING APPARATUS

Junichi Minamitaka, Fussa; Kunio Sato, Sagamihara, and Mayumi Ohya, Hamamatsu, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 521,736, May 10, 1990, which is a division of Ser. No. 408,412, Sep. 14, 1989, Pat. No. 4,958,552, which is a continuation of Ser. No. 117,082, Nov. 3, 1987, abandoned. This application Sep. 6, 1991, Ser. No. 758,529

Claims priority, application Japan, Nov. 6, 1986, 61-170531[U]; Nov. 6, 1986, 61-170532[U]; Nov. 6, 1986, 61-170533[U]; Nov. 6, 1986, 61-170534[U]; Nov. 6, 1986, 61-170535[U]; Nov. 6, 1986, 61-170536[U]; Nov. 6, 1986, 61-170537[U]; Nov. 6, 1986, 61-170538[U]; Nov. 6, 1986, 61-170539[U]; Nov. 6, 1986, 61-264205; Nov. 6, 1986, 61-264206; Nov. 6, 1986, 61-264207

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] G10H *1/057*

U.S. Cl. 84—627 **6 Claims**

4. An envelope waveform approximating apparatus for approximating an envelope waveform, int he form of a limited number of function waveforms whose characteristic changes at switching points, said apparatus comprising:

display means for displaying the envelope waveform to be approximated;

point designating means for designating at least one point of said displayed envelope waveform with respect to the time axis;

segmenting means for segmenting said displayed envelope waveform at the point designated by said point designating means to obtain a plurality of segmented envelope waveforms;

function waveform determining means for determining a function waveform for each of the plurality of said segmented envelope waveforms to optimally approximate the envelope waveform;

switching point determining means for determining cross point of the function waveforms in the adjacent intervals defined by the point designated by said point designating means, as the switching point; and

memory means coupled to said function waveform determining means and to said switching point determining means for memorizing the function waveforms and the switching points as an approximated envelope waveform.

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METHOD OF CONTROLLING SOUND SOURCE FOR ELECTRONIC MUSICAL INSTRUMENT, AND ELECTRONIC MUSICAL INSTRUMENT ADOPTING THE METHOD

Yoshiko Fukushima; Satoshi Usa, and Tetsuo Okamoto, all of 10-1, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Jan. 30, 1991, Ser. No. 648,156

Claims priority, application Japan, Jan. 31, 1990, 2-18896; Jan. 31, 1990, 2-18897

Int. Cl.[5] G10H *7/00;* **H03G** *3/00*

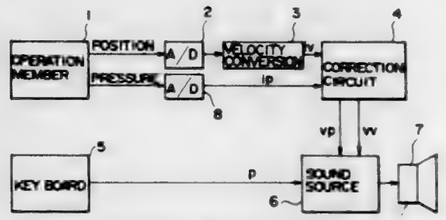
U.S. Cl. 84—658 **10 Claims**

1. A method of controlling a sound source for an electronic musical instrument which comprises the steps of:

outputting operation data of a performance operation member corresponding to musical tone control parameters of a musical instrument;

correcting said operation data into values falling within a particular one of plural tone generation regions determined in accordance with at least one musical tone control parameter of said musical instrument; and

inputting said corrected operation data to said sound source.



5,200,569

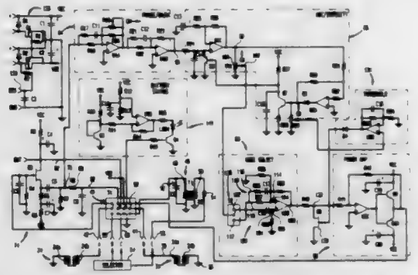
MUSICAL INSTRUMENT PICKUP SYSTEMS AND SUSTAINER SYSTEMS

Steven M. Moore, 514 142nd Ave. SE., 98, Bellevue, Wash. 98007

Continuation-in-part of Ser. No. 407,857, Sep. 15, 1989, abandoned, which is a division of Ser. No. 199,851, May 27, 1988, Pat. No. 4,907,483. This application Jun. 14, 1990, Ser. No. 538,240

Int. Cl.[5] G10H *3/18*

U.S. Cl. 84—723 **9 Claims**



5. A sustainer for a musical instrument having at least one vibratory element comprising:

(a) drive means for accepting a signal and applying a driving force to a vibratory element of the instrument responsive to said drive signal; and

(b) a sustain feedback circuit for accepting a feedback signal representing motion of said vibratory element and conducting said feedback signal to said drive means, whereby said drive means will apply said drive force to said vibratory element responsive to said feedback signal, said sustain feedback circuit including an inverting signal path and a noninverting signal path, said noninverting signal path and said inverting signal path having different frequency response characteristics, and mode switch means for selectively directing said feedback signal through either one of said signal paths to said drive means while disabling the other one of said signal paths.

5,200,570

KEY-TOUCH STATE DETECTION DEVICE FOR AN AUTOMATIC PERFORMANCE PIANO

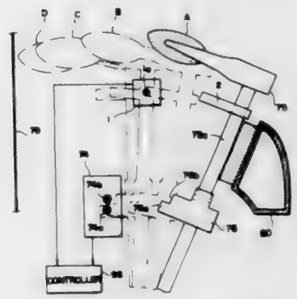
Kiyoshi Kawamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jul. 27, 1990, Ser. No. 558,569

Claims priority, application Japan, Aug. 8, 1989, 1-205487

Int. Cl.[5] G10H *1/02*

U.S. Cl. 84—737 **3 Claims**



1. A key-touch state detection device for an automatic performance musical instrument including a keyboard having a plurality of keys, at least one string, and at least one hammer which is operative to strike the at least one string in response to an operation of a corresponding key of the plurality of keys, the device comprising:

hammer position sensing means for sensing the hammer at at least two positions as the hammer travels a predetermined path in response to the operation of the corresponding key, a first position corresponding to a hammer stop position and a second position corresponding to a position in the vicinity of the string; and

release time determining means, responsive to the hammer position sensing means, for determining a release time of the corresponding key based on the position of the hammer sensed by the hammer position sensing means.

5,200,571

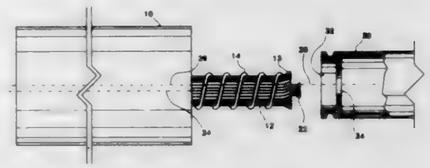
PRIMER POCKET CLEANER

Doyle D. Gracey, P.O. Box 155, Tehachapi, Calif. 93561

Filed Apr. 6, 1992, Ser. No. 863,967

Int. Cl.[5] F42B *33/00, 35/02*

U.S. Cl. 86—24 **6 Claims**



1. A primer pocket cleaner comprising:

a base with an axis;

a bundle of bristles with one end of said bundle mounted off center into said base and with a cleaning surface of an outer bundle of bristles and a central bundle of bristles extending above the surface of the outer bundle of bristles on the opposite end of said bundle;

a retracting coil spring surrounding said outer bundle of bristles outside said base to prevent flaring; and

a turning device with a mount to hold said base, sch that said

5,200,573

squib are received, said universal squib connector provid-

molding together with said second portion thereof facili-

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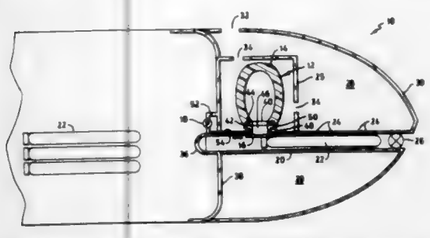
base and bristle bundle are rotated by said turning device about the axis of said base.

5,200,572

ELLIPITCAL ELASTOMERIC IMPULSE ENERGY STORAGE AND TRANSFER SYSTEM

Laurent C. Bissonnette, Narragansett; Scott D. Boyd, Portsmouth, and Jeffrey R. Millburn, Providence, all of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 8, 1992, Ser. No. 910,044
Int. Cl.[5] B63G *8/28*; F41F *3/10*
U.S. Cl. 89—1.81 **6 Claims**



3. An elastomeric impulse energy storage and transfer system for launch of projectiles into a liquid medium, said system comprising:

a launch tube having a muzzle end and a breech end, said launch tube being adapted to house a projectile and slidably guide said projectile during a launch;

a breech valve attached to said launch tube at said breech end, said breech valve being adapted to provide access to the interior of said launch tube from said breech end for loading said projectile;

a muzzle valve attached to said launch tube at said muzzle end, said muzzle valve being adapted to permit egress of said projectile from said launch tube into said liquid medium;

a cylindrical collar fixed to said launch tube between said muzzle end and said breech end, nearer to said breech end, so as to be disposed behind said projectile, said collar means having a longitudinal axis generally normal to a longitudinal axis of said launch tube, said cylindrical collar being adapted to provide access by a working fluid to said launch tube at a point behind said projectile;

a control valve mounted on said collar for selectively placing the interior of said collar in communication with said interior of said launch tube;

an elastomeric accumulator fixed to said collar at a planar base of said accumulator, said accumulator having in elevation a frusto-ellipsoidal configuration, and said accumulator having an ellipsoidal configuration along a sectional plane parallel with said accumulator base plane;

said accumulator being adapted to store energy by elastic expansion of walls thereof, an exterior surface of said accumulator being exposed to the pressure of said liquid medium; and

a pump having a suction side thereof in communication with said liquid medium and a discharge side thereof in communication with said accumulator via said collar, for selectively pumping said liquid into said accumulator to inflate and distend said accumulator;

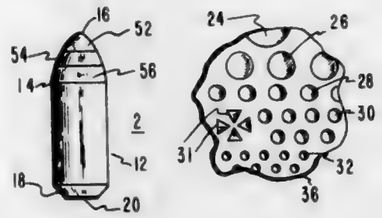
whereby upon opening of said muzzle valve to flood said launch tube and opening said control valve to place said accumulator in communication with said launch tube via said collar, said accumulator contracts, thereby forcing the liquid medium stored in said accumulator through said collar and out said muzzle end of said launch tube along with said projectile.

5,200,573

PROJECTILE HAVING A MATRIX OF CAVITIES ON ITS SURFACE

Charles L. Blood, No. 1 Farview Ave., Atlantic Highlands, N.J. 07716

Filed May 28, 1991, Ser. No. 706,387
Int. Cl.[5] F42B *6/00*
U.S. Cl. 102—501 **5 Claims**



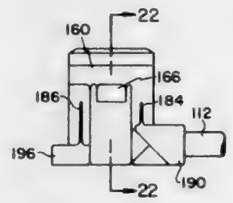
1. A projectile intended to be fired from a gun, said projectile comprising a substantially cylindrical body portion having a diameter, said body portion having an axis and a first surface; a tapered nose portion having a second surface and a tip, the nose portion being positioned adjacent to and coaxially aligned with respect to the body portion, and the tip being positioned on the axis of and furthest from the body portion; and further including a matrix of cavities applied to the surface of the nose portion, said cavities having a shape and a size, the size of said cavities decreasing from the largest adjacent the body portion to the smallest adjacent the tip.

5,200,574

UNIVERSAL SQUIB CONNECTOR

Donald J. Cunningham; John E. Allard, both of North Ogden; Virginia E. Chandler; Bradley W. Smith, both of Ogden, and David B. Monk, Kaysville, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 680,979, Apr. 5, 1991. This application Feb. 24, 1992, Ser. No. 837,080
Int. Cl.[5] C06D *5/00*; H01R *13/648*
U.S. Cl. 102—530 **4 Claims**



1. A gas generator comprising:

a housing having a wall provided with outer orifices, in which wall a socket is formed, and including,

a pin type squib having electrically conducting pins protruding from a protion thereof,

an inner central chamber in which is placed said squib for ignition, said squib being positioned such that said pins thereof extend into said socket,

an intermediate chamber containing a gas generant pyrotechnic composition,

an outer chamber containing means for filtering and for communicating externally of the housing by way of said outer orifices, with at least said intermediate and outer chambers communicating through intermediate orifices,

a universal squib connector for connecting said squid to a source of electrical current for initiating ignition, said universal squib connector being positioned in said socket and including holes therein into which said pins from said squib are received, said universal squib connector providing a permanent pig tail connection to said squib and comprising,

connecting terminals,

a ferrite bead having said holes therethrough in a spaced relationship, each of said holes having a first end and a second end, with one of said terminals positioned in one of said holes and another of said terminals positioned in another of said holes, the spacing of said holes being such as to allow each of the protruding pins of said squib to enter the first end of an individually associated one of said holes to make electrical contact with an individually associated one of said terminals, said ferrite bead providing EMI/RFI protection in a region surrounding said terminals,

a plurality of elecrical input conductors providing a pig tail connection for connecting an electrical circuit to said squib with each of said input conductors having an end positioned in the second end of an associated one of said holes in said ferrite bead and connected to the terminal positioned therein, and

further including means to permanently retain said universal squib connector in said socket and thereby to permanently retain each of said terminals in electric contact with an individually associated one of the protruding pins of said squib,

wherein said ferrite bead and said terminals are encapsulated in a plastic molding with the holes in said ferrite bead extending through the plastic molding to allow entry of each of the protruding pins of said squib to enter the associated first end thereof and an end of each of said pair of electrical input conductors to enter the associated second end thereof,

wherein said means to permanently retain said universal squib connector in said socket comprises flexible latch means attached to said plastic molding and extending outwardly and downwardly from a side wall portion thereof, said latch means being compressed inwardly against said side wall portion of said plastic molding of said universal squib connector in said socket, said socket having a groove in the side wall thereof into which said latch means moves and is captured,

wherein said plastic molding includes first and second portions that extend at substantially a right angle to each other with said first portion extending in the direction of said electrical input conductors and contacting said wall of said housing of said generator in which said socket is formed, said first portion guiding and allowing said electrical input conductors to run parallel to said wall of said housing,

further including anti-rotation means provided in cooperative relation with said universal squib connector and said gas generator to predetermine the angular orientation of said universal squib connector with respect to that of said gas generator and to prevent relative angular movement between said universal squib connector and said squib,

wherein two sets of ribs of different length provided on said second portion of said universal squib connector provides a tight fit with an inner wall of said socket, with the ribs having the shorter length being positioned adjacent said first portion of said plastic molding and the axial positions of all of said ribs being such that all of the ribs engage the wall of said socket at the same time,

wherein said anti-rotation means comprises a cavity adjoining said holes in said universal squib connector and a projection on said squib with said projection on said squib matching the configuration of said cavity,

wherein said cavity is "T" shaped whereby there is only one angular position at which said cavity is arranged to receive said projection on said squib, and

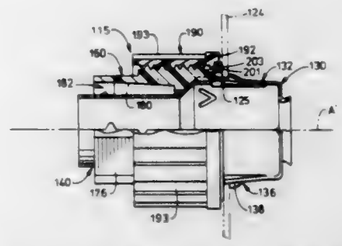
wherein said first portion of said plastic molding includes opposed triangular surfaces that extend parallel to said first portion and parallel to said electrical input conductors and are spaced from said wall of said housing, said triangular surfaces of said first portion of said plastic molding together with said second portion thereof facilitating gripping of said universal squib connector.

5,200,575

CONNECTOR ASSEMBLY FOR CONDUIT

Robert K. Sheehan, 571 Rolling Rock La., Cincinnati, Ohio 45255

Continuation-in-part of Ser. No. 646,352, Jan. 25, 1991, abandoned. This application Feb. 25, 1992, Ser. No. 841,583
Int. Cl.[5] H02G *3/06*
U.S. Cl. 174—65 R **28 Claims**



23. A connector assembly for providing a substantially fluid tight connection of conduit to a bulkhead, said assembly comprising:

a substantially tubular hollow connector body having a longitudinal axis and front and rear sections therealong, said front section comprising means for lockingly mounting said connector body in an aperture of a bulkhead, and said rear section comprising means for receiving the end of a conduit to be connected;

a substantially hollow sealing member having proximal and distal ends and telescopingly connected over said connector body in substantially non-rotatable condition, said sealing member comprising a sealing bore for sealingly receiving the end of a conduit;

means for retaining the end of said conduit within said sealing bore;

a substantially hollow sealing sleeve connected to said sealing member and being selectively axially reciprocable therealong, said sleeve comprising a sealing surface and means for interacting with said sealing member to retain said sleeve in a selected axial position; and

a deformable sealing member mounted adjacent said sealing surface to provide a substantially fluid tight seal between said bulkhead and said assembly.

5,200,576

MULTI-POINT CONTACT COMPRESSION CONNECTOR

Gary E. Schrader, Manchester, and Robert K. Annan, Merrimack, both of N.H., assignors to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 655,987, Feb. 15, 1991, abandoned. This application Mar. 2, 1992, Ser. No. 842,767
Int. Cl.[5] H01R *4/18*
U.S. Cl. 174—94 R **11 Claims**

1. An electrical compression connector for connecting a plurality of conductors or cables, comprising:

a connector body of compressible material adapted to be inserted into a crimping tool having two opposed curved die surfaces for the compression of the connector, said connector body provided with a pair of parallel side faces and a pair of parallel side walls, each of said side walls provided between said side faces, said side faces forming a central web portion, said central web portion provided with at least three recesses extending through the connector body from one of said side faces to the second of said

side faces to allow for the inclusion of conductors within

5,200,578

said conductive patterns being made of conductive mate-

hole wall, said spring means being adapted to acoustically

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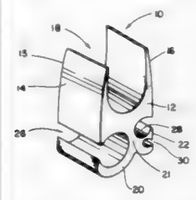
side faces to allow for the inclusion of conductors within each of the recesses, the periphery of said connector body provided with at least four distinct, non-continuous points of contact with said curved die surfaces of a crimping tool when said connector body is inserted within the crimping tool, prior to crimping; and



wherein when force is applied to the crimping tool, said connector body will compress, thereby compressing said connector body around the electrical conductors to be provided in said recesses and securing the conductors therein.

5,200,577

SUPERCONDUCTING WIRE

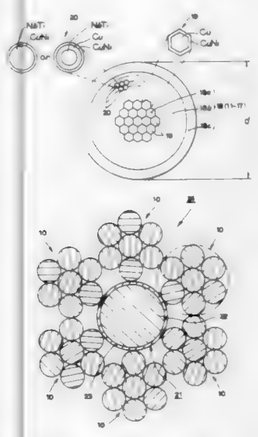
Mamoru Shimada, Sayama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1991, Ser. No. 714,616

Claims priority, application Japan, Jun. 13, 1990, 2-152594; May 24, 1991, 3-120376

Int. Cl.[5] H01B *12/00*

U.S. Cl. 174—125.1 **2 Claims**



1. A superconducting wire comprising:

a bundle including a plurality of twisted superconducting material filaments, each of said superconducting material filaments being essentially composed of a three-layer structure having a central core, an intermediate filament layer and a sheath portion arranged outside the filament layer, the central core having a structure of honeycomb matrix in which a plurality of stabilized copper materials each formed by covering a copper material with CuNi material are arranged, the intermediate filament layer having a structure in which NbTi material filaments are tightly arranged outside the matrix, and the sheath portion being composed of a CuNi material layer.

5,200,578

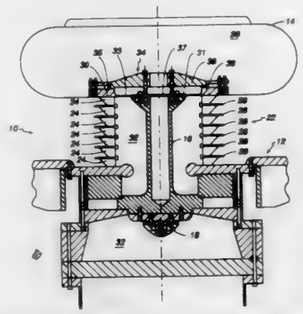
HIGH VOLTAGE FEEDTHROUGH BUSHING

John P. Brucker, Espanola, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 27, 1991, Ser. No. 799,467

Int. Cl.[5] H01B *17/26*

U.S. Cl. 174—152 R **3 Claims**



1. A feedthrough bushing for a high voltage diode, comprising:

a central conductor extending axially through said bushing;

a grading ring assembly circumferentially surrounding and coaxial with said central conductor;

a flexible conductive plate having an outer ring for compressively sealing against said grading ring assembly, an inner ring for compressively sealing against said central conductor, and a center ring therebetween having a thickness effective for relative translation of said outer ring and said inner ring, for said compression sealing against said grading ring assembly and said central conductor, respectively; and

compression beam means bolted to said central conductor for urging said flexible conductive plate toward said grading ring assembly to obtain said compression sealing therebetween.

5,200,579

CIRCUIT BOARD WITH CONDUCTIVE PATTERNS FORMED OF THERMOPLASTIC AND THERMOSETTING RESINS

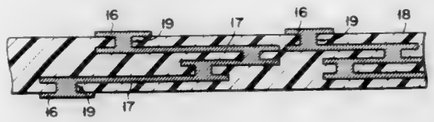
Megumu Takeuchi, Yokohama, Japan, assignor to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,301

Claims priority, application Japan, Mar. 30, 1990, 2-83855

Int. Cl.[5] H05K *1/00*

U.S. Cl. 174—256 **6 Claims**



1. A circuit board with conductive patterns formed of conductive material and thermoplastic and thermosetting resins comprising:

a plurality of resin film substrates in which films having heat deformation properties are laminated one upon the other;

conductive patterns formed on at least one surface of each of said resin films; and

connecting portions for electrically connecting said conductive patterns, said connecting portions being made of conductive material including thermoplastic resin, and

said conductive patterns being made of conductive material including thermosetting resin.

5,200,580

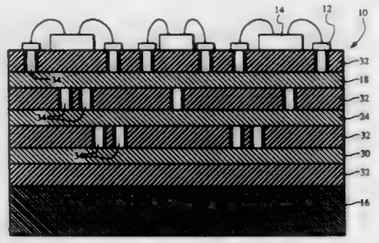
CONFIGURABLE MULTI-CHIP MODULE INTERCONNECT

Kenneth T. Sienski, Plano, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Aug. 26, 1991, Ser. No. 749,932

Int. Cl.[5] H05K *1/00*

U.S. Cl. 174—264 **12 Claims**



1. A configurable multi-chip module comprising:

a power/ground layer having a standardized pattern or metal strips;

a first signal interconnect layer, above said power/ground layer, having a standardized pattern of metal strips extending above said power/ground layer;

a second signal interconnect layer, above said first signal interconnect layer, configurable to a custom application by placement of metal strips for connection with the standard pattern of metal strips of said first signal interconnect layer;

a bond pad layer, above said second signal interconnect layer, for receiving chips and connecting input and output leads of the chips to said second signal interconnect layer and dielectric material separating each layer of said module; and

dielectric material separating each layer of said module.

5,200,581

METHOD OF COUPLING A SEIMIC DETECTOR MODULE TO THE WALL OF A BOREHOLE, AND A SONDE FOR IMPLEMENTING THE METHOD

Bruce W. Boyle, Noisy le Roi; Claude Stanisiere, Bures sur Yvette, and Alain Delpuech, Robinson, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 483,347, Feb. 20, 1990, Pat. No. 4,987,969, which is a continuation of Ser. No. 231,093, Aug. 11, 1988, abandoned. This application Dec. 21, 1990, Ser. No. 632,289

Claims priority, application France, Aug. 13, 1987, 87 11525

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] G01V *1/00, 1/40*

U.S. Cl. 181—102 **29 Claims**

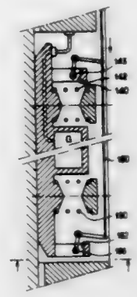
1. A sonde for acquiring seismic signals in a borehole traversing an earth formation, said sonde comprising:

a detector module including at least one seismic sensor;

an elongated body having a cavity disposed on one side thereof suitable for receiving said detector module while said detector module is in a retracted position and for operatively securing said detector module to said body while said detector module is in an extended position;

anchor means disposed on another side of said body, for securing said body against the borehole wall;

spring means connecting said module to said body, said spring means for exerting a force to displace said module from its retracted position in said cavity to its extended position, whereby said detector module contacts the borehole wall, said spring means being adapted to acoustically isolate said detector module from said body; and



means for retracting said module into said cavity against the force exerted by said spring means, said means for retracting being acoustically decoupled from said detector module when said detector module is in its extended position.

5,200,582

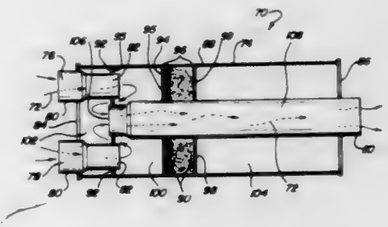
PASSIVE MUFFLER FOR LOW PASS FREQUENCIES

Leon A. Kraai, Jr., Jackson, and Robert L. Sager, Jr., Grass Lake, both of Mich., assignors to Tennessee Gas Pipeline Company, Lincolnshire, Ill.

Filed Aug. 29, 1991, Ser. No. 752,009

Int. Cl.[5] F01N *1/24*

U.S. Cl. 181—256 **17 Claims**



1. A sound attenuating muffler for exhaust gas comprising a housing, at least one exhaust inlet tube and at least one exhaust outlet tube extending through an outer surface of the housing, first and second transverse perforated partitions within the housing extending across an interior dimension of the housing transverse to a flow of sound waves propagating therein and arranged such that a gap is provided between the partitions having a length in a direction of sound wave propagation on the order of 1/10 wave length of a preselected cutoff frequency, above which sound waves are to be attenuated; an exhaust receiving chamber defined between a first housing outer surface portion and the first partition; and a sound chamber defined between the second partition and a second housing outer surface portion having a length in the direction of sound wave propagation on the order of ¼ wavelength of the preselected cutoff frequency.

trip means of the operating mechanism to trip the circuit

providing heat for a fusing of a plastic lid to a plastic

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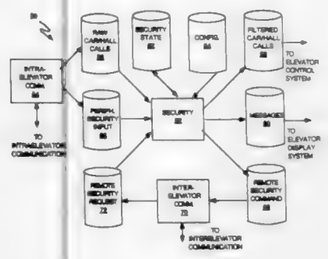
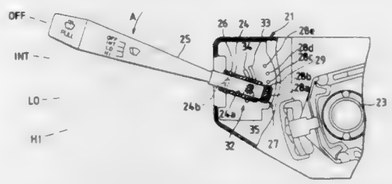
5,200,583
ADAPTIVE ELEVATOR SECURITY SYSTEM
Bertram F. Kupersmith, Avon; Jannah Stanley, Cromwell; Jeremy B. Kezer, and David M. Hughes, both of New Britain, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.
Filed Oct. 31, 1991, Ser. No. 785,738
Int. Cl.[5] B66B *1/00*
U.S. Cl. 187—126 5 Claims



1. A method of providing secure service to an elevator system in a building, comprising:
providing a plurality of configuration signals indicative of a table of entries, each entry including a field identifying a particular security peripheral device which may be actuated to affect access to use of the elevator system, a field identifying a floor of the building, the access to which is to be affected by actuation of the related peripheral device, a field identifying an electro car involved in the affected access of said entry and a field indicating whether said entry is effective or not to deny access in response to car calls, up hall calls or down hall calls, receptively;
providing, in response to actuation of a security peripheral device, a security input signal indicative of such security peripheral device having been actuated;
providing, in response to said configuration signals and said security input signal, a plurality of security state signals separately indicative of any floors to which access is to be denied from any specific elevator car, any floors from which access si to be denied to any specific elevator car traveling in the up direction, and any floors from which access is to be denied to any specific elevator car reveling in the down direction;
providing, in response to actuation of hall call buttons and car calls buttons, corresponding raw hall call signals and raw car call signals; 'and providing to said elevator system, filtered hall call signals and filtered car call signal each corresponding to a related one of said raw hall call signals and said raw car call signals relating to service not involving access which is indicated by said security state signals as access to be denied.

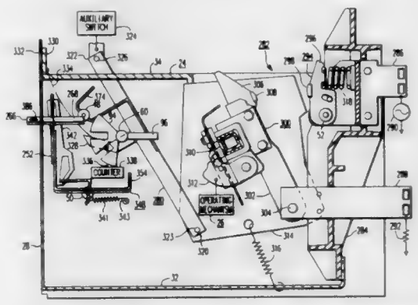
5,200,584
LEVER SWITCH
Masami Nagaya, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
Filed Jul. 10, 1991, Ser. No. 727,685
Claims priority, application Japan, Jul. 18, 1990, 2-76182
Int. Cl.[5] H01H *9/00*
U.S. Cl. 200—4 8 Claims

1. A lever switch comprising:
first and second fixed contact portions mounted on an insulator disposed in a casing;
a lever rotatively mounted on said casing; and
first switching means for connecting said first contact portion and second contact portion by rotary operation of said lever, wherein said switching means includes a coil body supported by said lever said coil having two end



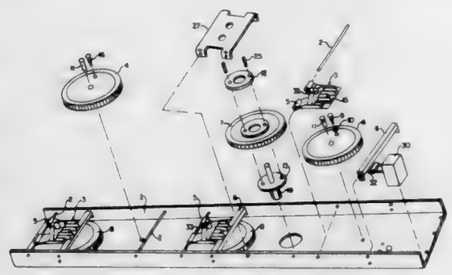
portions, and two contacts which are formed by extending both end portions.

5,200,585
DRAWOUT SWITCHGEAR WITH IMPROVED LEVERING-IN MECHANISM AND INTERLOCK
Norman Davies, Penn Township, Westmoreland County; Stanislaw A. Milianowicz, Monroeville; Nagar J. Patel, Plum Boro, and Edward J. Klimek, Jeannette, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 6, 1991, Ser. No. 788,705
Int. Cl.[5] H01H *9/20*
U.S. Cl. 200—50 AA 23 Claims



14. A circuit breaker having electrical contacts operable between open and closed positions, a circuit breaker chassis, a levering-in mechanism supported by the chassis which includes first and second shafts having orthogonal axes, with the first shaft having an actuating end for rotating the first shaft, translating means for translating rotation of the first shaft to rotation of the second shaft, with rotation of the second shaft rotating crank arms which function to move the circuit breaker between predetermined positions relative to a circuit breaker compartment and associated electrical contacts, an operating mechanism having closing means and tripping means for respectively closing and tripping the circuit breaker, and a shutter having first and second positions which respectively block and enable access to the actuating end of the first shaft, characterized by:
the shutter having a flat elongated body portion having first and second sides, first and second longitudinal ends, an actuating tab adjacent to the second end which extends outwardly from the first side, and a pivot point intermediate the ends,
means pivotally mounting the pivot point of said shutter to the circuit breaker chassis, whereby the shutter is pivotable between the first and second positions,
and means linking the first end of the shutter with the trip means of the operating mechanism, whereby movement of the actuating tab and shutter from the first to the second position moves the first end of the shutter and actuates the trip means of the operating mechanism to trip the circuit breaker.

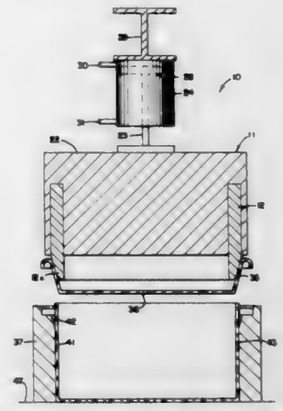
5,200,586
FIVE GEAR ISOLATING MECHANISM FOR BYPASS ISOLATION SWITCHES
George A. Smith, N. Huntingdon, and Thomas K. Fogle, Shaler, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 31, 1991, Ser. No. 738,713
Int. Cl.[5] H01H *9/26*; H02J *9/00*
U.S. Cl. 200—50 C 11 Claims



1. A mechanism for bypass isolation switches of the type having at least three adjacent circuit interruption devices each circuit interruption device having a handle which can be in one of an ON position, an OFF position and a RESET position comprising:
a) a housing;
b) at least three switch gears mounted on the housing such that there is one switch gear for each circuit interruption device;
c) at least one spacer gear mounted on the housing and engaging two of the at least three switch gears;
d) a drive gear mounted on the housing and being sized and positioned to drive the switch gears;
e) at least three cams each cam eccentrically connected to a switch gear such that there is one cam adjacent to each switch gear, each cam having a mouth sized and positioned to receive a handle of a circuit interruption device;
f) drive means connected to the drive gear; and
g) lock means attached to the housing and having a stop member positioned to extend to a position adjacent one cam and when so positioned prevent the cam from moving from one of an OFF position to an ON position and an ON position to an OFF position.

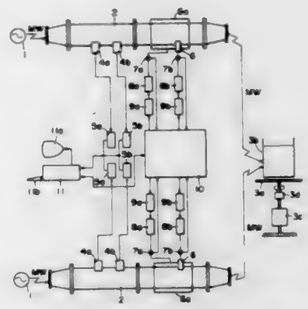
5,200,587
INDUCTION HEATING COIL WITH CONICAL BASE
Jin-Liou Fang, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed Oct. 22, 1990, Ser. No. 600,900
Int. Cl.[5] H05B *6/40*
U.S. Cl. 219—10.53 9 Claims

1. An induction heating apparatus for providing uniform fusing of a plastic lid with a layer of electrically conductive material to a generally cylindrical plastic container, said apparatus comprising:
a coil having a generally conical lower portion, said coil having first and second input leads;
a source of electrical power for selectively supplying an electrical current to said first and said second input leads of said coil;
means for inducing an electrical current in the layer of electrically conductive material of said plastic lid in response to said electrical current in said coil, said induced current providing heat for a fusing of a plastic lid to a plastic container;
a generally cylindrical hollow nest for receiving a generally cylindrical container, said nest having a generally conical upper wall portion; and



means for pressing said coil against said plastic lid to press a portion of said container and a portion of said lid between said conical portion of said coil and said conical wall portion of said nest to confogm a portion of said container to a portion of said lid during a fusing operation.

5,200,588
MICROWAVE HEATING APPARATUS HAVING IMPEDANCE MATCHING ADJUSTABLE WAVEGUIDE
Isao Kondoh, and Yoshiyuki Kato, both of Naka, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Filed Nov. 14, 1991, Ser. No. 791,535
Claims priority, application Japan, Nov. 19, 1990, 2-313129
Int. Cl.[5] H05B *6/70*
U.S. Cl. 219—10.55 A 3 Claims



1. A microwave heating apparatus comprising:
a microwave oscillator,
a waveguide for transmitting a microwave outputted from the microwave oscillator to an object to be heated,
means for detecting power provided in the waveguide so as to detect the power of the microwave inputted from the microwave oscillator to the object to be heated and the reflected power of the microwave reflected from the object to be heated,
a matching stub provided in the waveguide, and

means for driving the matching stub, said driving means

5,200,590

tion and a plurality of rod-shaped portions, each of said

beam is directed on the workpiece to etch a first path into

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means for driving the matching stub, said driving means being provided with

means for calculating a VSWR value from the inputted power and the reflected power,

a motor for driving the matching stub, and

means for controlling the operation of the motor so that the VSWR value is maintained within a predetermined range.

5,200,589

MICROWAVE OVEN HAVING A FAN MOTOR ROTATION CONTROL FUNCTION

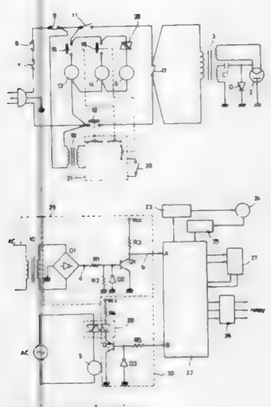
Jung R. Kim, Kangwon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 1, 1991, Ser. No. 723,593

Claims priority, application Rep. of Korea, Jun. 30, 1990, 9539/1990

Int. Cl.[5] **H05B** *6/68*

U.S. Cl. 219—10.55 B **2 Claims**



1. A microwave oven having

a humidity sensor,

a keyboard,

a fan motor, and

a microprocessor, the improvement comprising:

a) switching means connected between said fan motor and said supplying line of AC power source, for controlling AC power supplied to said fan motor;

b) driving means for driving said switching means in accordance with a control signal from said microprocessor;

c) zero crossing signal generating means for detecting a zero point from AC power voltage during a constant cycle to generate a predetermined width of pulse signal at said zero point and for applying the predetermined width of pulse signal to said microprocessor, said zero crossing signal generating means including

a low voltage transformer for stepping down AC power voltage applied to its primary winding up to a set value,

full wave rectifying means for full-wave rectifying the stepped down AC power voltage, and

pulse generating means for generating the pulse signal of a predetermined width at said zero point of the full-wave rectified AC power voltage;

d) said microprocessor adapted for inputting said pulse signal from said zero crossing signal generating means and for outputting the control signal to said driving means in response to said pulse signal to control said switching means in accordance with the command signals from said keyboard and the output signal from said absolute humidity sensor.

5,200,590

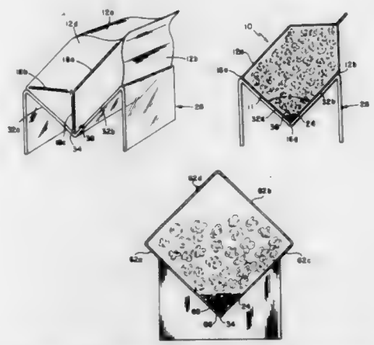
APPARATUS AND METHOD FOR MAKING MICROWAVE POPCORN

Robert F. Bowen, Burlington; Robert J. Castoldi, Newton, and John S. Sklenak, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 5, 1991, Ser. No. 803,257

Int. Cl.[5] **H05B** *6/80;* **B65D** *77/02*

U.S. Cl. 219—10.55 E **19 Claims**



1. Apparatus for popping popcorn in a microwave oven, comprising:

a microwave transparent foldable package holding popcorn kernels, said package having a bottom panel and four side panels each joined to said bottom panel and adjacent ones of said side panels along edges wherein, in an unfolded state of said package, regions of restricted volume are formed along and adjacent said edges between respective joining ones of said side and bottom panels; and

means for supporting said package on one of said edges to position the corresponding one of said regions of restricted volume as the lower most region of said package with the respective joining panels of said one edge being inclined wherein said kernels clump in said lower-most region and, as said kernels begin to pop by microwave heating, unpopped kernels disturbed from said clump by popping kernels are directed back to said lower-most region by said inclined panels.

5,200,591

ELECTRIC DISCHARGE CONTOUR MACHINING METHOD

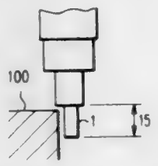
Nobuaki Ohba, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 792,934

Claims priority, application Japan, Nov. 29, 1990, 2-333279

Int. Cl.[5] **B23H** *1/00, 7/32*

U.S. Cl. 219—69.17 **7 Claims**



6. An electric discharge contour machining method for machining a workpiece to a desired shape having a plurality of contours, said method comprising the steps of:

continuously rotating a spindle having coaxially extended therefrom a rod-shaped electrode having an axis of rotation and a plurality of rod-shaped portions, each of said plurality of rod-shaped portions having a circular cross-section and a different outer diameter;

creating an electrical discharge between said rod-shaped electrode and the workpiece;

machining the workpiece by moving said electrode along the desired shape of said workpiece; and

selectively altering the relative position of said rod-shaped electrode to the workpiece by changing the position of said rod-shaped electrode so that selected ones of the plurality of rod-shaped portions machine the workpiece, wherein a constant predetermined gap is maintained between the selected ones of said plurality of rod-shaped portions and said workpiece as said workpiece is being machined.

5,200,592

AUTOMATIC CUTTING APPARATUS FOR CLOTH

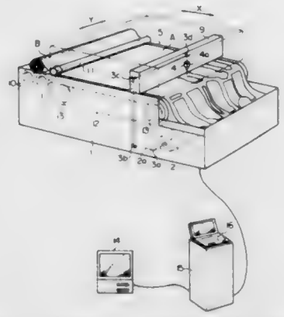
Masaaki Yabu, Tokyo, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Oct. 3, 1991, Ser. No. 770,538

Claims priority, application Japan, Oct. 4, 1990, 2-267134

Int. Cl.[5] **B23K** *26/00*

U.S. Cl. 219—121.67 **9 Claims**



1. A cutting apparatus for cloth having plate means for setting said cloth flat, cutting head means having a generator for outputting a laser beam of which intensity corresponds to a value of supply current, said generator being so arranged upwardly of said plate means as to have said laser beam irradiated over said cloth for cutting said cloth on said plate means with said laser beam, and transfer means for moving said cutting head means relative to said plate means for cutting said cloth in a predetermined shape, comprising:

means actuable based on cutting condition of said cloth with said laser beam;

memory means in which are stored said cutting conditions corresponding to the features of the respective cloths;

designating means for selectively generating one of signals indicating respectively said features of said cloths; and

means for reading out the cutting condition corresponding to the selected signal from said memory means and setting said cutting condition as read out to feed the latter to said actuating means.

5,200,593

METHOD OF CONTROLLING THE LENGTH OF METAL CHIPS

Edward D. Rutkowski, 18045 St. Louis, Detroit, Mich. 48234

Filed Feb. 4, 1991, Ser. No. 650,466

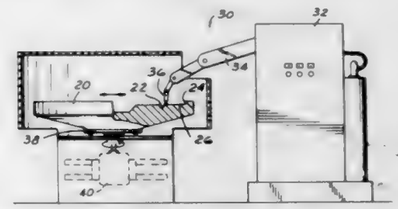
Int. Cl.[5] **B23K** *26/00*

U.S. Cl. 219—121.69 **4 Claims**

1. A method of machining a workpiece comprising the steps of:

(i) mounting a laser beam generating member to a robot arm, directing a laser beam onto a workpiece and continuously moving the member along a workpiece surface as the laser beam is directed on the workpiece to etch a first path into the workpiece surface; and

(ii) cutting material away from the workpiece along a second path, with the second path intersecting the first path to define break point for chips of removed material;



(iii) wherein the first path defines a continuing pattern on the workpiece, and the second path sequentially intersects several points on the first path, the distance between subsequent intersection points defining the length of a chip that is removed from the workpiece, the pattern being selected such that the maximum chip length is less than a desired maximum.

5,200,594

ELECTRODE FOR USE IN PLASMA ARC WORKING TORCH

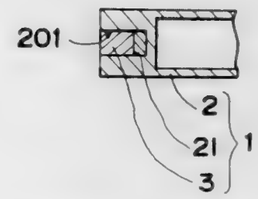
Toshihiko Okada, Takatsuki; Masanobu Uchida, Suita, and Hiroshi Fujiwara, Higashiosaka, all of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Jun. 26, 1991, Ser. No. 721,175

Claims priority, application Japan, Jun. 26, 1990, 2-167978; Jun. 26, 1990, 2-167979

Int. Cl.[5] **B23K** *9/00*

U.S. Cl. 219—121.52 **4 Claims**



1. An electrode for use in a plasma arc working torch, said electrode having an insert of refractory metal inserted in the hollow formed in a base electrode which is composed of copper or copper alloy and is cooled by a cooling agent, wherein said insert of refractory metal has a nickel film electroplated and a noble metal film plated thereon in a sequential way and is inserted in said hollow having a diameter slightly larger than that of said insert of refractory metal, and said base electrode having said insert of refractory metal inserted in the hollow is pressed through pressing tools in a direction from the periphery to the center thereof and is ground at the projected part produced with the pressing work by any available mechanical work so that both heading faces of the resultant base electrode and said insert of refractory metal are positioned at the same horizontal plane.

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means including a computer for generating a plurality of digi-

buffer means for storing said image of said row of dibits

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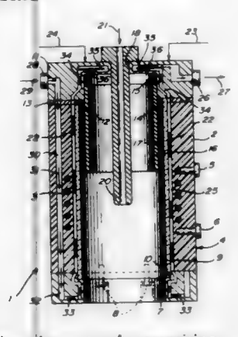
5,200,595

HIGH PERFORMANCE INDUCTION PLASMA TORCH WITH A WATER-COOLED CERAMIC CONFINEMENT TUBE

Maher I. Boulos, and Jerzy Jurewicz, both of Sherbrooke, Canada, assignors to Universite de Sherbrooke, Quebec, Canada

Filed Apr. 12, 1991, Ser. No. 684,179
Int. Cl.[5] B23K 9/00
U.S. Cl. 219—121.52 12 Claims



1. An induction plasma torch comprising:
a tubular torch body including a machined cylindrical inner surface having a first diameter;
a plasma confinement tube (a) made of ceramic material having a high thermal conductivity, and (b) including a first end, a second end, and a machined cylindrical outer surface having a second diameter slightly smaller than said first diameter;
the plasma confinement tube being mounted within said tubular torch body, and the cylindrical inner and outer surfaces being coaxial to define between said inner and outer surfaces a thin annular chamber of uniform thickness;
a gas distributor head mounted on the torch body at the first end of the plasma confinement tube for supplying at least one gaseous substance into said confinement tube, said at least one gaseous substance flowing through the plasma confinement tube from its first end toward its second end;
an induction coil coaxial with said cylindrical inner and outer surfaces, embedded in the torch body, and supplied with an electric current for inductively applying energy to said at least one gaseous substance flowing through the plasma confinement tube in order to produce and sustain a high temperature plasma in said confinement tube; and
means for establishing a high velocity flow of cooling fluid in the thin annular chamber, the high thermal conductivity of the ceramic material forming the confinement tube and the high velocity flow of cooling fluid both contributing in efficiently transferring heat from the plasma confinement tube, heated by said high temperature plasma, into the cooling fluid to thereby efficiently cool said confinement tube.

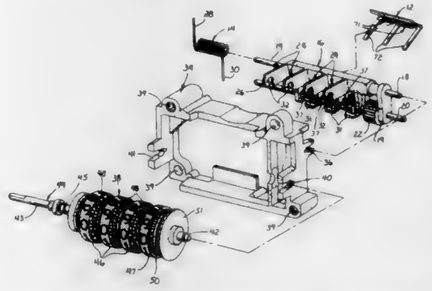
5,200,596

TRIP ODOMETER ASSEMBLY

Gregg S. Coffey, Linden, Mich., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed May 27, 1992, Ser. No. 889,536
Int. Cl.[5] G06C 25/00, 15/42
U.S. Cl. 235—131 FD 3 Claims

1. In a trip odometer comprising a mounting bracket, a trip odometer wheel assembly rotatably mounted within the mounting bracket, a pinion carrier including transfer gears, pivotably mounted in the mounting bracket and a pinion spring mounted to the pinion carrier, the improvement wherein:
the pinion carrier comprises a mating surface having a thickness and two protruding locators and comprising an underside surface, wherein each locator has a retention ramp operatively associated with the pinion spring to retain the pinion spring in a secured position; and
the pinion spring comprises
(a) a mounting surface,
(b) a leader ramp formed at a first end of the mounting surface for guiding the mounting surface over the mating surface of the pinion carrier and for guiding the mounting surface over the locators enabling engagement of the locators and the pinion spring,
(c) a second end of the mounting surface, opposite from the first end, forming acute bends and finger bends,
(d) a series of leaf springs extending out of the acute bends operatively associated with the transfer gears,
(e) the finger bends being interposed between the leaf springs



(f) arcuate extensions protruding from the finger bends and arching towards the mounting surface,
(g) retention springs formed from the arcuate extensions for operatively engaging with the underside surface, the retention springs having a free state extension from the mounting surface less than the thickness of the mating surface,
(h) bends located at the end of the retention springs, bending away from the mounting surface to form spring ramps for guiding the springs to the underside surface, and
(i) two locating holes defined by the mounting surface, the locators protruding through the locating holes, whereby the improvements allow self-guided one step assembly of the pinion spring to the pinion carrier.

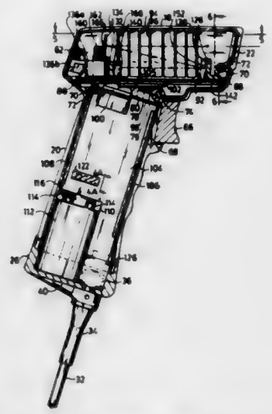
5,200,597

DIGITALLY CONTROLLED SYSTEM FOR SCANNING AND READING BAR CODES

Jay M. Eastman, Pittsford; Anna M. Quinn, Rochester; Scott R. Grodevant, Hilton, and John A. Boles, Fishers, all of N.Y., assignors to PSC, Inc., Webster, N.Y.

Filed Feb. 7, 1991, Ser. No. 652,158
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—455 30 Claims

1. A portable scanner unit for scanning an optical beam across a symbol when pointed toward the symbol for reading data represented by the symbol in response to light returned to said unit which comprises optical assembly means including a light source for producing the optical beam and means for scanning the beam across the symbol, means including a photodetector illuminated by said return light and circuitry for translating the returned light into electrical signals with variable sensitivity of translation, means for varying the sensitivity of said translating means which corresponds to the relationship of the amplitude of said electrical signal to the intensity of said return light illuminating said photodetector, manually actuable means for providing an output upon actuation which is manually variable in magnitude and for operating said light source when said unit is pointed towards said symbol, and control means including a computer for generating a plurality of digital control signals corresponding respectively to a predetermined optical intensity of said beam, the intensity of said returned light, and the magnitude of variable output of said manually actuable means and applying said digital control



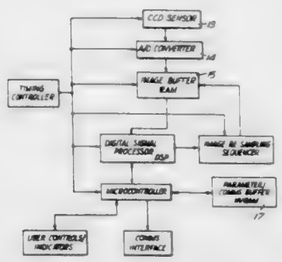
signals to said optical assembly means and said means for varying the sensitivity of translation of said translating means for controlling with said digital control signals the intensity of the light produced by said lights source, the sensitivity of said translating means to said returned light and the distance over which said scanning means scans the beam across said symbol.

5,200,598

OPTICAL READER

Stephen C. Rencontre, 30A Moreland Avenue, Croydon, England CR0 6EA

PCT No. PCT/GB89/00727, § 371 Date Dec. 11, 1990, § 102(e) Date Dec. 11, 1990, PCT Pub. No. WO90/00292, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 29, 1989, Ser. No. 613,914
Claims priority, application United Kingdom, Jun. 29, 1988, 8815490
Int. Cl.[5] G06K 9/03
U.S. Cl. 235—472 12 Claims



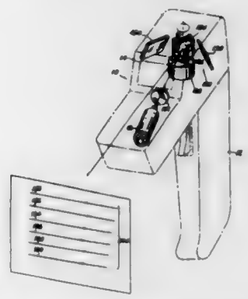
1. An optical reader for reading high density dibit encoded data from a data strip, said optical reader comprising:
an optical detector; and
means, connected to said optical detector, for decoding an output from said optical detector, said optical detector including photo-sensitive means arranged to extend transversely across a row of dibits thereby to form an image of said row of dibits, and said means connected to said optical detector including:
buffer means for storing said image of said row of dibits and
image transform means, operatively connected to said buffer means, for detecting a skew angle of said reader relative to said data strip and for applying a shear transformation to said image of said row of dibits stored in said buffer means thereby compensating for distortion of said image in accordance with said skew angle.

5,200,599

SYMBOL READERS WITH CHANGEABLE SCAN DIRECTION

Mark Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Inc, Bohemia, N.Y.

Continuation of Ser. No. 721,951, Jun. 27, 1991, abandoned, which is a division of Ser. No. 510,674, Apr. 13, 1990, Pat. No. 5,059,779, which is a continuation-in-part of Ser. No. 367,335, Jun. 16, 1989, Pat. No. 5,124,539. This application Jul. 14, 1992, Ser. No. 912,666
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 9 Claims



1. An arrangement in a light scanning system for reading coded indicia, comprising:
(a) a housing having an exit port;
(b) scanner means in the housing for directing a light beam along an optical path through the exit port exteriorly of the housing to a coded indicium to be read, including
(i) a main mirror mounted in the optical path for turning movement about a turning axis,
(ii) a plurality of folding mirrors surrounding and facing the main mirror, and
(iii) a reversible drive operatively connected to the main mirror;
(c) control means for controlling the reversible drive, including an actuator actuatable from an off state to a first operational state in which the reversible drive only turns the main mirror in one circumferential direction about the turning axis to direct the light beam impinging on the main mirror to the folding mirrors for sequential reflection therefrom, and to sweep the light beams sequentially reflected off the folding mirrors in a corresponding plurality of first scans, one following directly after another, across the coded indicium; and
(d) said actuator being further actuatable from the first operational state to a second operational state in which the reversible drive only turns the main mirror in a circumferential direction opposite to said one circumferential direction about the turning axis to direct the light beam impinging on the main mirror to the folding mirrors for sequential reflection therefrom, and to sweep the light beams sequentially reflected off the folding mirrors in a corresponding plurality of second scans, one following directly after another, across the coded indicium.

nal light by using an intensity of the external light mea-

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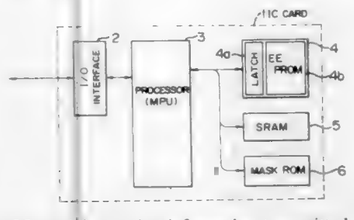
IC CARD AND METHOD FOR WRITING INFORMATION THEREIN

Toru Shinagawa, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 398,474, Aug. 25, 1989, abandoned.
This application Aug. 10, 1992, Ser. No. 925,416
Claims priority, application Japan, Aug. 29, 1988, 63-214522
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 12 Claims



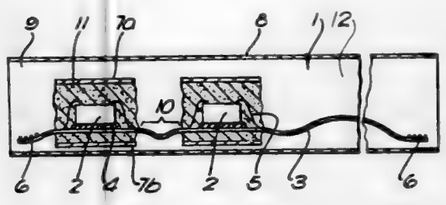
1. An IC card for storing information transmitted from an external terminal unit, comprising:
a processor for dividing data of a plurality of bytes, transmitted from the external terminal unit, into a predetermined number of bytes;
a first memory means for storing a system program;
a second memory means for storing an application program; and
a third memory means for storing the processed predetermined number of bytes to be written in said second memory means;
said second memory means including a latch circuit for temporarily latching data of the predetermined number of bytes written from said third memory means, prior to another byte being stored in said third memory means, and an electrically erasable and programmable memory for receiving and storing data of the predetermined number of bytes written from said latch circuit, prior to another predetermined number of bytes being transmitted from said third memory means to the latch circuit, to thereby allow continuous receiving and storing of data in said IC card.

5,200,601

FLEXIBLE IDENTIFICATION CARD OR TOKEN

Charles R. Jarvis, Bewdley, Great Britain, assignor to W. & T. Avery Limited, West Midlands, United Kingdom

PCT No. PCT/GB90/00081, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO90/08365, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 18, 1990, Ser. No. 603,710
Claims priority, application United Kingdom, Jan. 19, 1989, 8901189
Int. Cl.[5] G06K *19/077, 19/07*
U.S. Cl. 235—492 8 Claims



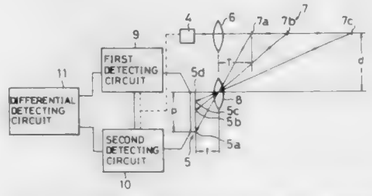
1. A portable electronic token having an overall predetermined minimum flexibility and formed of a flexible plastics material, said token including:
an electronic component mounted on a flexible substrate providing electrical connections to said component, said electronic component and said electrical connections defining a region of said token;
a first high tensile member overlying and encompassing said region; and
a second high tensile member underlying and encompassing said region,
said first and second high tensile members, said electronic component and said flexible substrate being encapsulated by said flexible plastics material,
wherein said first and second high tensile members serve to restrain said token from flexing over said region of token, portions of said token including said plastics material and said substrate which are peripheral to said region, providing increased flexibility to thereby maintain the overall predetermined minimum flexibility of said token.

5,200,602

DISTANCE MEASURING DEVICE OF CAMERA

Keiichi Ikebe, Yokohama; Takashi Hongoh, and Motokuni Demura, both of Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 22, 1992, Ser. No. 886,841
Claims priority, application Japan, Jul. 13, 1991, 3-198836
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.6 6 Claims



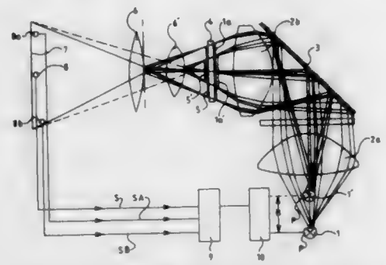
1. A distance measuring device of a camera comprising:
a light source for emitting pulse light to a measured object;
a semiconductor optical position detector disposed in a position in which a spot of the pulse light reflected on said measured object is focused and formed as an image;
the semiconductor optical position detector continuously detecting the position of an incident light spot according to a distance of said measured object based on a parallax between said light source and the semiconductor optical position detector in a displacing direction of the spot position provided by a change in said distance;
the semiconductor optical position detector providing first and second electric current outputs having a mutual electric current ratio according to the detected position of the incident light spot;
a first detecting circuit for receiving said first electric current output of the semiconductor optical position detector, and logarithmically transforming and outputting a changing amount of said first electric current output provided by said pulse light;
a second detecting circuit for receiving said second electric current output of the semiconductor optical position detector, and logarithmically transforming and outputting a changing amount of said second electric current output provided by said pulse light;
a differential detecting circuit for providing a distance measuring signal by calculating a difference between said changing amounts of the first and second electric current outputs logarithmically transformed and outputted from the first and second detecting circuits;
external light measuring means for measuring the luminance of a photographed object; and
means for correcting an error in said distance measuring signal of the differential detecting circuit caused by external light by using an intensity of the external light measured in advance by the external light measuring means.

5,200,603

SOURCE DISTANCE ADJUSTMENT ARRANGEMENT FOR UNIFORM ILLUMINATION OF PROJECTION SURFACE

Hubert Hackenberg, Holzkirchen; Traugott Liermann, Unterhaching, and Hans-Joachim Schrecke, Grasbrunn, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1992, Ser. No. 872,635
Claims priority, application Fed. Rep. of Germany, May 23, 1991, 4116803
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.9 10 Claims



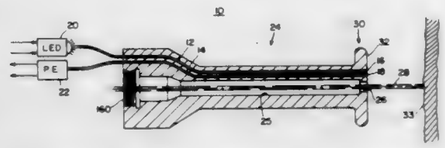
1. A method of uniform illumination of a projection surface with a light source and an optical element located between the light source and the projection surface, comprising the steps of measuring a light intensity on a projection surface; and adjusting a distance between a light source and the optical element in dependence on the measured light intensity on the projection surface so as to optimize at least one of brightness and distribution.

5,200,604

HANDPIECE OPTICAL PROXIMITY DETECTOR FOR DISABLING SURGICAL LASER BEAM

Robert I. Rudko, Holliston, and Stephen J. Linhares, Taunton, both of Mass., assignors to Laser Engineering, Inc., Milford, Mass.

Filed Aug. 7, 1991, Ser. No. 741,642
Int. Cl.[5] G01J *1/32*
U.S. Cl. 250—205 12 Claims



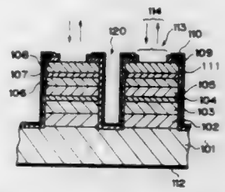
1. A proximity detector for the probe of the beam delivery apparatus of a laser system comprising:
a probe having a face for contacting a target surface to be struck by the laser beam;
means for directing a gauging light to said target surface;
means for sensing any gauging light returning from said target surface to said probe; and
means, responsive to said means for sensing, for generating a control signal inhibiting the firing of the laser system if gauging light returning from said target is sensed by said means for sensing.

5,200,605

OPTICALLY FUNCTIONAL DEVICE WITH INTEGRAL RESISTANCE LAYER

Shiro Satoh, Ogawara, and Yasuhiro Osawa, Sendai, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of Japan

Filed Feb. 12, 1992, Ser. No. 834,210
Claims priority, application Japan, Feb. 13, 1991, 3-41213
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—214 LS 8 Claims



1. An optically functional device comprising:
a semiconductor substrate;
a light receiving portion disposed on said semiconductor substrate for receiving input light;
a light emitting portion disposed on said light receiving portion for emitting output light;
a window disposed above said light emitting portion, through which input light and output light pass; and
a resistance layer made of a semiconductor for functioning as load resistance, said resistance layer being disposed at least in either place between said semiconductor substrate and said light receiving portion, or between said light receiving portion and said light emitting portion, or on said light emitting portion,
said light emitting portion comprising a light emitting layer made of semiconductor material having energy of a forbidden band width more than energy of a main peak of input light;
said light receiving portion comprising a base and a collector each of which is made of a semiconductor material having energy of a forbidden band width equal to or less than energy of a main peak of input light, and
said light emitting portion being adapted to feed back a part of said output light to said light receiving portion, thereby a nonlinear output response to input light being performed based on the feedback effect of said output light absorbed by said light receiving portion.

5,200,606

LASER RADAR SCANNING SYSTEM

Nicholas J. Krasutsky, Farmer Branch; Lewis G. Minor, Arlington, and Edward M. Flowers, Grand Prairie, all of Tex., assignors to LTV Missiles and Electronics Group, Dallas, Tex.

Filed Jul. 2, 1991, Ser. No. 724,794
Int. Cl.[5] H01J *3/14*; G01C *3/08*
U.S. Cl. 250—216 14 Claims

1. Apparatus for splitting reflected light from transmitted light, comprising:
an optical system operable to transmit a first, diverging beam of light along a first axis and to receive a second, reflected beam coaxial with the first beam, the second beam having greater cross-sectional area than the first beam, said optical system including
a splitter mirror lying in a plane at an angle to the first axial

a multi-faceted diamond as an internal reflection element;

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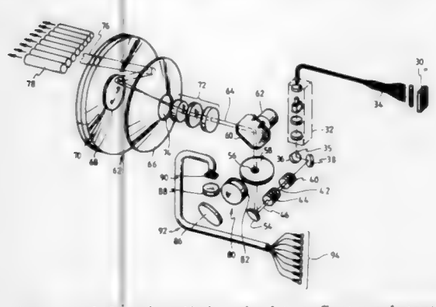
and having an off-center aperture coaxial with the first beam, the aperture being smaller in area than the second



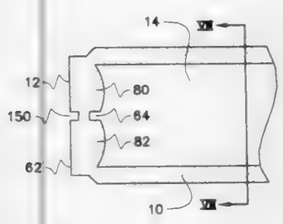
beam, and the mirror being sized to reflect a substantial portion of the second beam.

5,200,607

PHOTOELECTRIC SENSOR WITH DROPLET RESISTANT FACE

Catherine I. Klima, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 27, 1992, Ser. No. 842,691
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—216 28 Claims



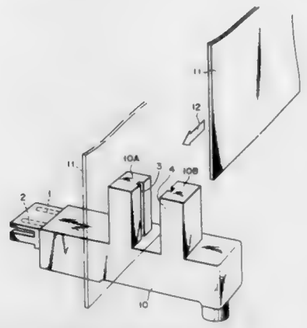
1. A sensor, comprising:
a housing;
a light transmissive portion of said housing, said light transmissive portion having a first segment and a second segment, said light transmissive portion having an inner surface and a generally flat outer surface;
a discontinuity formed in said outer surface of said light transmissive portion, said discontinuity being disposed between said first and second segments;
a light source disposed within said housing and associated with said first segment to permit light from said light source to pass through said first segment in a direction from inside of said housing to outside of said housing;
a light sensitive component disposed within said housing and associated with said second segment to permit light to pass through said second segment in a direction from outside of said housing to said light sensitive component; and
means for preventing light from passing directly from said light source to said light sensitive component without passing through said light transmissive portion.

5,200,608

PHOTO-INTERRUPTER OPERATING ON WIDE-RANGED POWER VOLTAGE WITH A CONSTANT CURRENT MEANS

Tomokazu Kitajima, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1991, Ser. No. 753,377
Claims priority, application Japan, Sep. 4, 1990, 2-232357
Int. Cl.[5] G01V 9/04
U.S. Cl. 250—221 14 Claims



1. An object detector comprising:
a first terminal to which a power supply voltage is applied;
a second terminal for outputting an output signal;
light emitting means, connected to said first terminal, for emitting light;
photodetector means, optically coupled with said light emitting means, for converting a light signal into an electrical signal, said photodetector means being connected to said second terminal;
switching means connected between said light emitting means and said second terminal so as to operate in response to said electrical signal detected by said photodetector means; and
constant current means connected between said light emitting means and said second terminal for allowing a current having a constant level to flow into said light emitting means, said constant current means including a first polarity type first transistor having an emitter connected to said first terminal, a first polarity type second transistor having an emitter connected to said first terminal and a base connected to a base and a collector of said first transistor, a resistor having an end connected to the collector of said first transistor and an other end connected to a connecting point of said light emitting means and said switching means, a second polarity type third transistor having an emitter connected to said second terminal and a collector connected to a collector of said second transistor, and a second polarity type fourth transistor having an emitter connected to said second terminal and a base connected to a base and the collector of said third transistor, so as to generate a constant current using a forward direction voltage of said light emitting means as a reference voltage.

5,200,609

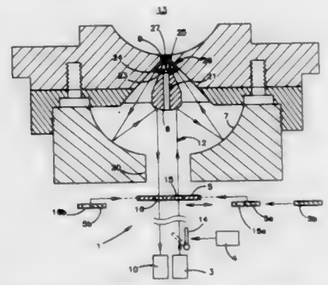
RADIANT ENERGY SPECTROSCOPY SYSTEM WITH DIAMOND INTERNAL REFLECTION ELEMENT

Donald W. Sting, 358 Turtleback Rd., New Canaan, Conn. 06840, and John A. Reffner, 97 Ocean Dr. East, Stamford, Conn. 06902

Filed Aug. 27, 1991, Ser. No. 750,201
Int. Cl.[5] G01J 31/50
U.S. Cl. 250—226 19 Claims

1. A radiant energy spectroscopy system comprising:
a source of radiant energy;

a multi-faceted diamond as an internal reflection element;
a sample in contact with one sample contacting surface of the diamond; and



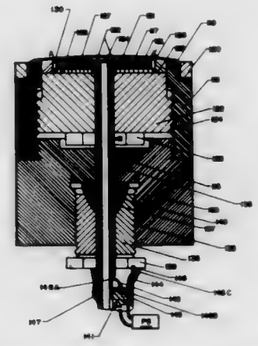
an optical system to direct the radiant energy to and from the diamond for a single internal reflection off the sample contacting surface of the diamond.

5,200,610

FIBER OPTIC MICROPHONE HAVING A PRESSURE SENSING REFLECTIVE MEMBRANE AND A VOLTAGE SOURCE FOR CALIBRATION PURPOSE

Allan J. Zuckerwar, Newport News, Va.; Frank W. Cuomo, East Providence, R.I., and William E. Robbins, Achilles, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 586,369, Sep. 21, 1990, Pat. No. 5,146,083.
This application Jun. 3, 1992, Ser. No. 894,504
Int. Cl.[5] H01J 40/14
U.S. Cl. 250—227.21 10 Claims



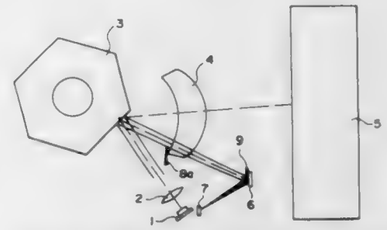
1. An apparatus for measuring pressure fluctuations, comprising:
a pressure-sensing membrane which undergoes deflections in relation to pressure fluctuations to be measured;
a membrane deflection sensor;
a backplate within said apparatus and adjacent said membrane; and
a voltage source for creating a predetermined voltage potential between said backplate and said membrane.

5,200,611

OPTICAL SCANNING APPARATUS HAVING LIGHT SHIELDING MEMBER

Yutaka Hattori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 7, 1991, Ser. No. 772,289
Claims priority, application Japan, Oct. 8, 1990, 2-269994
Int. Cl.[5] H01J 3/14
U.S. Cl. 250—235 10 Claims



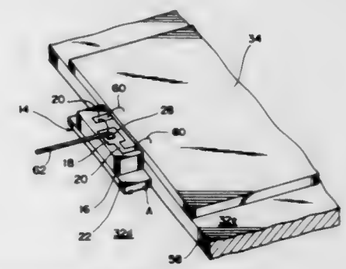
1. An optical scanning apparatus for converting a laser beam into a scanning beam by an optical deflection means and for raster-scanning a photosensitive material with the scanning beam through a converging lens to form an image on the photosensitive material, said optical scanning apparatus comprising a lightshielding member disposed between said optical defection means and said converging lens for shielding the scanning beam incident on an edge portion of said converging lens, said edge portion being located on a scanning starting position side.

5,200,612

PHOTODETECTOR CARRIER FOR IMPROVING THE HIGH SPEED OF A PHOTODETECTOR AND METHOD FOR PRODUCING SAME

Kaoru Moriya, Kawasaki, and Akira Okamoto, Higashikurume, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 3, 1990, Ser. No. 620,830
Claims priority, application Japan, Dec. 8, 1989, 1-317583
Int. Cl.[5] H01J 5/02
U.S. Cl. 250—239 12 Claims



1. A photodetector carrier, comprising:
a ceramic substrate having a conductive photodetector mounting portion and a wiring pattern formed thereon, said ceramic substrate being partially metallized at a rear face thereof; and
a metal plate brazed to the metallized portion of the rear face of said ceramic substrate, said metal plate being cut away at a portion thereof which corresponds to said photodetector mounting portion and said wiring pattern.

5,200,613

trons in the ionization chamber by irradiating a major

5,200,616

nected to a first end of the first electromechanical trans-

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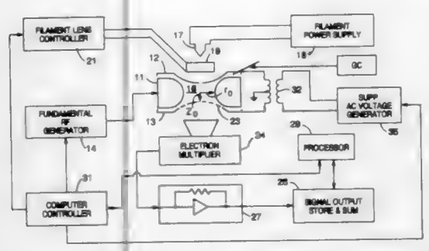
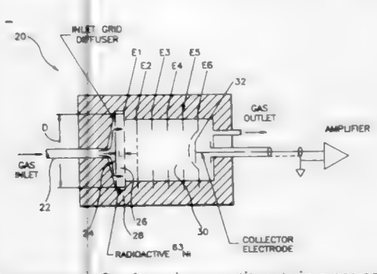
5,200,613
MASS SPECTROMETRY METHOD USING SUPPLEMENTAL AC VOLTAGE SIGNALS
Paul E. Kelley, San Jose, Calif., assignor to Teledyne MEC, Mountain View, Calif.
Continuation-in-part of Ser. No. 622,191, Feb. 28, 1991. This application Aug. 30, 1991, Ser. No. 753,325
Int. Cl.[5] H01J *49/42*
U.S. Cl. 250—282 **48 Claims**



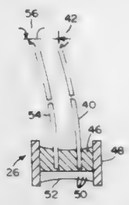
1. A mass spectrometry method, including the steps of:
(a) establishing a trapping field capable of trapping a parent ion, a product ion, and an undesired ion within a trap region bounded by a set of electrodes; and
(b) applying a supplemental AC voltage signal to at least one of the electrodes, wherein the supplemental AC voltage signal has a high power frequency component and a low power frequency component, wherein the low power frequency component has an amplitude selected to induce a first reaction of the parent ion, wherein the first reaction produces the product ion, wherein the low power frequency component has a frequency matching a resonant frequency of the parent ion, wherein the high power frequency component has a frequency matching a resonant frequency of the undesired ion, wherein the high power frequency component has an amplitude sufficient to eject the undesired ion from the trap region, and wherein the low power frequency component is applied simultaneously with the high power frequency component.

5,200,614
ION MOBILITY SPECTROMETERS
Anthony Jenkins, North Reading, Mass., assignor to Ion Track Instruments, Inc., Mass.
Filed Jan. 16, 1992, Ser. No. 821,681
Int. Cl.[5] B01D *59/44;* **H01J** *49/00*
U.S. Cl. 250—286 **14 Claims**



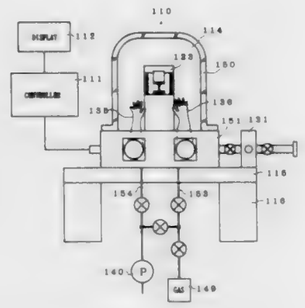
1. An apparatus for detecting constituents in a gas comprising:
a ionization chamber;
a gas inlet for delivering into the ionization chamber a sample gas stream to be tested for constituents;
means for spreading the sample gas stream substantially evenly across the ionization chamber;
a radioactive source for producing positive ions and electrons in the ionization chamber by irradiating a major portion of the sample gas stream and for producing other ions by combination or ion exchange with primary electrons and positive ions in the sample gas stream;
a switchable open grid electrode in communication with the ionization chamber for defining an electric field within the ionization chamber;
an elongate drift chamber in communication with the open grid electrode;
switching means for periodically providing an electric field-free space within the ionization chamber to allow ion population to build up within the ionization chamber and for subsequently providing a high electric field across the ionization chamber, for a period of less than one millisecond, which periodically causes most ions of one polarity in the ionization chamber to be swept out of the ionization chamber through the open grid electrode and into the drift chamber, and which causes ions of opposite polarity to be discharged on walls of the ionization chamber;
a collector electrode at an end of the drift chamber opposite the open grid electrode;
means for providing an electric field in said drift chamber between the said open grid electrode and said collector electrode at the opposite end of the drift chamber for causing ions to travel through the drift chamber at drift velocities dependent on their respective charge and mass;
means for sequentially collecting ions of differing mass and means for transmitting collected ion current to a signal processing means for measuring intensity and arrival time of the collected ions;
whereby the intensity and arrival time are indicative of the amount and identity of constituents of the sample gas stream.

5,200,615
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF FLUIDS
Joram Hopenfeld, 1724 Yale Pl., Rockville, Md. 20850
Filed Jun. 25, 1991, Ser. No. 720,229
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—302 **28 Claims**



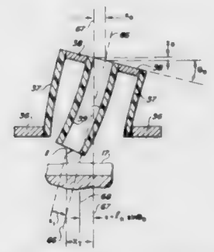
1. A sensor, adapted to be disposed in a particular position for detecting the presence of a particular fluid, said sensor comprising a body and a fluid-sensitive member fixed to said body so as to be exposed to fluid in such position, said sensor exhibiting a remotely-monitorable physical characteristic capable of assuming one of two defined states, wherein the state of said characteristic is determined by a positional relationship between two or more components of said sensor, said positional relationship being maintained in a first condition by said member prior to exposure of said member to said particular fluid and being altered to a second condition upon exposure of said member to said particular fluid, whereupon said positional relationship between said two or more components is permanently altered, said sensor being arranged such that the state assumed by said physical characteristic can be detected remotely from said position.

5,200,616
ENVIRONMENT CONTROLLABLE SCANNING PROBE MICROSCOPE
Ryohei Kokawa, Hadano; Osamu Nishikawa, Tokyo, and Masahiko Tomitori, Yokohama, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan
Filed Dec. 19, 1991, Ser. No. 810,159
Claims priority, application Japan, Dec. 20, 1990, 2-404211
Int. Cl.[5] H01J *37/18*
U.S. Cl. 250—306 **11 Claims**



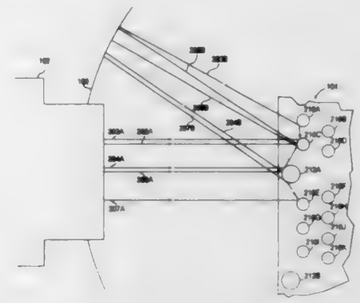
1. A scanning probe microscope comprising:
a gas-tight main chamber;
a base for mounting a sample in the main chamber;
a probe provided in the main chamber for tracing the surface of sample;
discharging means for discharging a first gas from the main chamber; and
charging means for charging a second gas or gases into the main chamber.

5,200,617
PMN TRANSLATOR AND LINEARIZATION SYSTEM IN SCANNING PROBE MICROSCOPE
John B. Hayes; Jamshid Jahanmir, and Eric M. Frey, all of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.
Continuation-in-part of Ser. No. 848,106, Mar. 9, 1992, which is a continuation-in-part of Ser. No. 694,827, May 2, 1991, Pat. No. 5,103,094. This application Aug. 13, 1992, Ser. No. 930,096
Int. Cl.[5] G01N *23/00*
U.S. Cl. 250—306 **5 Claims**



1. A scanning mechanical translation device comprising in combination:
(a) a base;
(b) a first electromechanical transducer element and a second electromechanical transducer element, the second electromechanical transducer element having a first end portion connected to said base, the second electromechanical transducer having negligable hysteresis;
(c) means connected to a second end of the second electromechanical transducer element and extending to and connected to a first end of the first electromechanical transducer element for supporting the first end of the first electromechanical transducer element in fixed relationship to the second end of the second electromechanical transducer element, the second electromechanical transducer element extending alongside of the first electromechanical transducer element so that the second end of the second electromechanical transducer element is located generally adjacent to the first end of the first electromechanical transducer element;
(d) a utilization device connected to a second end of the first electromechanical transducer element;
(e) means for producing a position signal representing a position of the utilization device relative to an object;
(f) first means for applying a first control voltage between first and second control conductors of the second electromechanical transducer element to cause movement of the utilization device in a first scan direction;
(g) second means for applying a second control voltage between third and fourth control conductors of the first electromechanical transducer element to cause movement of the utilization device in a second scan direction; and
(h) a servo feedback circuit receiving the position signal and producing in response thereto the first control voltage.

5,200,618
METHOD AND APPARATUS FOR ATOMIC IMAGING
Dilano K. Saldin, Milwaukee, Wis., and Pedro L. de Andres Rodriquez, Madrid, Spain, assignors to University of Wisconsin - Milwaukee, Milwaukee, Wis.
Filed Mar. 9, 1990, Ser. No. 490,847
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—307 **20 Claims**



1. A method for imaging of the atomic environment of the surface of a sample, including the steps of:
(a) directing a beam of electrons against said surface to form an interference pattern resulting from the interference of waves emanating from said surface when the beam of electrons is directed against said surface;
(b) detecting the intensity distribution of said pattern;
(c) calculating numerical image intensity data corresponding to said intensity distribution; and
(d) reconstructing the data to form an image indicating the location of a scatterer atom on said surface relative to an associated emitter atom on said surface

5,200,619
a support sheet;

a hood;
theretoward within a predetermined field of view having a central portion and a laterally displaced peripheral portion, the

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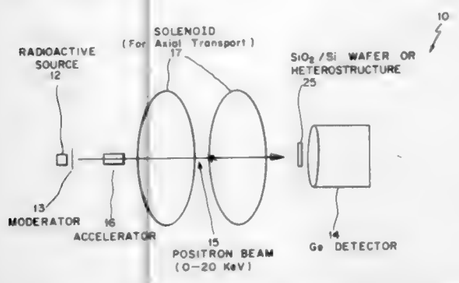
5,200,619

DETERMINATION OF INTERFACIAL STATES IN SOLID HETEROSTRUCTURES USING A VARIABLE-ENERGY POSITRON BEAM

Palakkal P. V. Asoka kumar, Coram, and Kelvin G. Lynn, Center Moriches, both of N.Y., assignors to Associated Universities, Inc., Washington, D.C.

Filed Oct. 4, 1991, Ser. No. 770,891
Int. Cl.[5] H01J 37/00
U.S. Cl. 250—307 12 Claims



1. A method for characterizing an interfacial electron state in a solid heterostructure using a positron beam to probe the solid heterostructure, which comprises:

(a) directing a positron beam having a known energy level at a point of a solid heterostructure, wherein said energy level is sufficient for said positron beam to penetrate said solid heterostructure and contact electrons at trap sites at an interface of the solid heterostructure;

(b) detecting the number and energy of gamma rays emitted from said solid heterostructure as a result of positrons from said positron beam annihilating with said electrons at the trap sites of the solid heterostructure;

(c) quantifying the data obtained in step (b) as a function of Doppler broadening of a photopeak about 511 keV created by the annihilation of said positrons and said electrons at the trap sites at the interface of said solid heterostructure; and

(d) comparing the function of the data quantified in step (c) with a known corresponding function of the Doppler broadening of the annihilation photopeak about 511 keV for a positron beam directed at the same material of known interface state density,

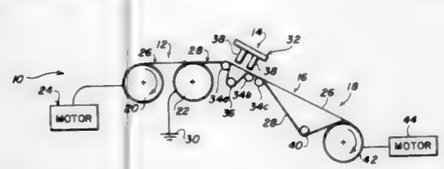
whereby said comparison facilitates characterization of the interface sate density of the solid heterostructure at points corresponding to the penetration of positrons having said energy level into the interface of the solid heterostructure.

5,200,620

ELECTROSTATIC FIBER SPREADER INCLUDING A CORONA DISCHARGE DEVICE

Jonathan M. Peritt; Richard Everett, and Alan Edelstein, all of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 5, 1991, Ser. No. 788,018
Int. Cl.[5] H01T 19/00
U.S. Cl. 250—324 20 Claims



1. An apparatus for uniformly spreading fibers, said apparatus comprising:

a support sheet;

a fiber tow including a layer of fibers;

at least one corona discharge means positioned adjacent to a region of said support sheet for providing substantially uniform spreading of said layer of fibers; and

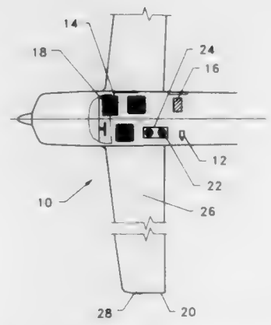
means for providing movement of said sheet and said fiber tow past said corona discharge means, said tow being supported upon regions of said support sheet upstream and downstream of said corona discharge means and separated from said region of said support sheet adjacent to said at least one corona discharge means.

5,200,621

OFF-SURFACE INFRARED FLOW VISUALIZATION

Gregory S. Manuel, Norfolk; Kamran Daryabeigi, Virginia Beach; Clifford J. Obara, Yorktown, and David W. Alderfer, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 16, 1991, Ser. No. 808,302
Int. Cl.[5] G01M 19/00, 9/06
U.S. Cl. 250—330 5 Claims



1. A method for visualizing off-surface fluid flow on an aircraft in flight comprising

releasing an infrared absorbing/emitting gas from within the aircraft into an area to be visualized; and

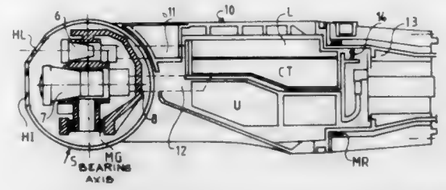
imaging the area with an infrared imaging system.

5,200,622

SELF-CHECKED OPTRONIC SYSTEM OF INFRA-RED OBSERVATION AND LASER DESIGNATION POD INCLUDING SUCH A SYSTEM

Jean-Marc Rouchon, Orsay, and Jean-Louis Ricci, Paris, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 3, 1991, Ser. No. 801,900
Claims priority, application France, Dec. 4, 1990, 90 15158
Int. Cl.[5] H04N 5/33
U.S. Cl. 250—334 7 Claims



1. A self-checked optronic system for infra-red observation, comprising:

a hood;

a first port transparent to radiation in an infra-red band and borne by the hood,

an optical system for the deflection and formation of infra-red images having a first sighting line perpendicular to the first port when the hood is in a first position and a detector sensitive in the infra-red band,

a second port which is mounted on the hood, is reflective to radiation of said infra-red band, and is positioned along a second sighting line which is not coaxial with the first sighting line when the hood is in the first position, and

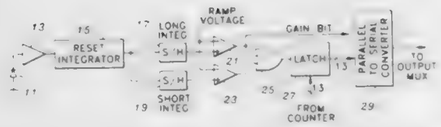
means for rotating the hood so as to position the second port perpendicularly to the first sighting line in order to carry out a self-checking operation by sending back an image of the detector to the detector.

5,200,623

DUAL INTEGRATION CIRCUIT

Robert Cannata, Santa Barbara, Calif., assignor to Grumman Aerospace Corp., Bethpage, N.Y.

Filed Dec. 4, 1991, Ser. No. 804,221
Int. Cl.[5] H04N 5/33
U.S. Cl. 250—338.1 4 Claims



1. A method for integrating the output signal of space based infrared detectors, said method comprising the steps of:

a) receiving the output signal of an infrared detector at an input port;

b) simultaneously communicating the detector output signal to first and second integration circuits;

c) integrating the detector output signal over a first time interval with the first integration circuit;

d) simultaneously integrating the detector output signal over a second time interval with the second integration circuit, the second time interval being longer that the first time interval;

e) latching a first counter at a first counter value when a first reference ramp signal achieves a preset value relative to the integrated value of the detector output in the first integration circuit;

f) outputting the latched first counter value as a digital signal representative of the detector output signal in response to saturation of the second integration circuit;

g) latching a second counter at a second counter value when a second reference ramp signal achieves a preset value relative to the integrated value of the detector output in the second integration circuit in response to non-saturation of the second integration circuit;

h) overwriting the first counter value with the second counter value in further response to non-saturation of the second integration circuit; and

i) outputting the latched second counter value as a digital signal representative of the detector output signal in further response to non-saturation of the second integration circuit.

5,200,624

WIDE-ANGLE RADIANT ENERGY DETECTOR

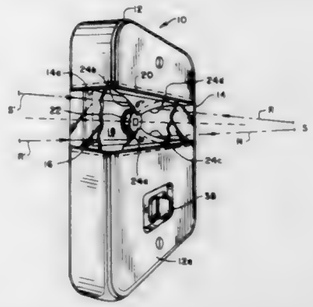
John T. Pederson, Jr., Bourbonnais, and Curtis R. Davidson, Oswego, both of Ill., assignors to Pittway Corporation, Chicago, Ill.

Filed Sep. 9, 1991, Ser. No. 756,996
Int. Cl.[5] G01J 5/08
U.S. Cl. 250—353 27 Claims

1. A wide-angle device for detecting radiant energy emitted theretoward within a predetermined field of view having a central portion and a laterally displaced peripheral portion, the device comprising:

a supporting frame having a first supporting region and a second supporting region displaced laterally from said first region;

a radiant energy detector carried on said first region for directly receiving radiant energy from the central portion



of the field of view with said second region, at least in part, located laterally of said detector; and

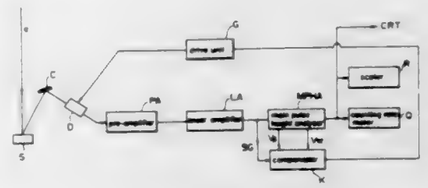
at least one reflector supported on said second region and shaped to conform to a portion of a parabola with said detector substantially located at a focal point of said parabola, said reflector being offset from said central portion and located between the peripheral portion and said detector to direct incident radiant energy from the peripheral region onto said detector.

5,200,625

X-RAY SPECTROMETER

Masao Kawai, Shiga, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 29, 1991, Ser. No. 783,964
Claims priority, application Japan, Oct. 30, 1990, 2-293031
Int. Cl.[5] G01T 1/17, 1/36
U.S. Cl. 250—374 13 Claims



1. An X-ray spectrometer, which comprises:

(a) a main pulse-height selector for selecting the pulse height of output pulses from a proportional counter tube;

(b) means for counting the output pulses and converting them into a signal indicative of X-ray intensity; and

(c) a compensator for compensating for the effects of an energy shift in said proportional counter tube in real-time when a specimen is measured;

said compensator including:

(i) a subordinate pulse-height selector having a window set within the range of the width of a window of said main pulse-height selector; and

(ii) an operation unit for generating a signal which controls a driving power supply of said proportional counter tube to an arbitrary level by said subordinate pulse-height selector.

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5,200,628

rial, and transmitting at least one second radiation with a

5,200,630

SEMICONDUCTOR DEVICE

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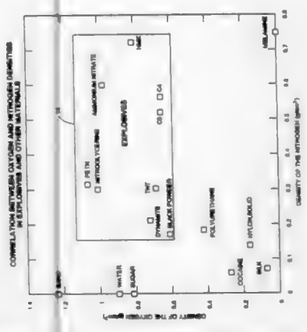
5,200,626

HIDDEN EXPLOSIVES DETECTOR EMPLOYING PULSED NEUTRON AND X-RAY INTERROGATION

Frederick J. Schultz, Oak Ridge, Tenn., and John T. Caldwell, Los Alamos, N. Mex., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 28, 1990, Ser. No. 500,165
Int. Cl.[5] G01N *23/222*
U.S. Cl. 250—390.04 29 Claims



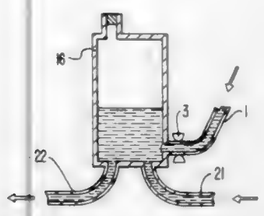
1. A method for detecting explosive material hidden in a package, comprising:
the initial steps, in any order, of:
employing pulsed thermal neutron interrogation and 10.8 MeV gamma ray detection to form a nitrogen density image of the package; and
employing fast neutron interrogation and 6 and 7 MeV gamma ray detection to form an oxygen density image of the package; and
then considering the images together to determine whether the package likely contains explosive material.

5,200,627

APPARATUS AND METHOD FOR MONITORING FLOW OF INFUSION LIQUID

Jacques Chevallet, Serezin du Rhone, France, assignor to Hospal Industrie, France

Filed Feb. 13, 1991, Ser. No. 654,581
Claims priority, application France, Feb. 23, 1990, 90 02548
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—573 13 Claims



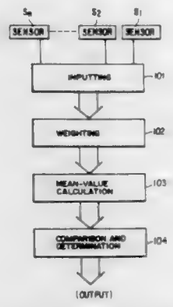
1. A flow detecting apparatus for detecting movement of an infusion fluid into the flow of a receiving fluid, the apparatus comprising:
receiving duct means for conveying the receiving fluid;
infusion duct means connected to the receiving duct means for conveying the infusion fluid in an infusion direction into the receiving duct means; and
means for sensing whether the receiving fluid moves from the receiving duct means into the infusion duct means in a direction opposite to the infusion direction.

5,200,628

METHOD FOR DISTINGUISHING PARTICLES IN FLUID AND APPARATUS FOR THE SAME INCLUDING PLURAL SENSORS AND WEIGHTING

Teruo Ikeda, and Masao Watanabe, both of Yokohama, Japan, assignors to Nikuni Machinery Industrial Co., Ltd., Kawasaki, Japan

Division of Ser. No. 610,948, Nov. 9, 1990. This application Jan. 29, 1992, Ser. No. 827,983
Claims priority, application Japan, Nov. 10, 1989, 1-292568; Sep. 18, 1990, 2-247865; Sep. 18, 1990, 2-247866
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—574 16 Claims



1. A method of determining the individual existence of a first group of particles contained in a fluid and a second group of particles in the same fluid but with characteristics different from the first particles that is capable of distinguishing particles in a fluid, the method comprising:
determining the position of a boundary that is indicated by a change in characteristic value by using a plurality of sensors, the step of determining the position including the steps of
for each of a sequence of groupings of mutually adjacent sensors among all the sensors, effecting a predetermined weighting of each of the measurement values output from the sensors of the respective grouping,
obtaining weighted means for each of the groupings of mutually adjacent sensors from the weighted measurement values, and
comparing the weighted means with one another to detect the first and second groups of particles.

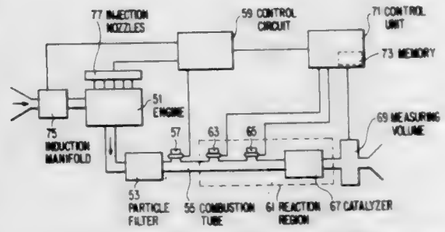
5,200,629

METHOD AND SYSTEM FOR CHANGING THE CONCENTRATION OF ONE MATERIAL IN A FLUID MEDIUM OF MIXED MATERIALS

Heinz J. Kaiblinger, Munich, Fed. Rep. of Germany, assignor to Chlean Plants & Engineering Establishment, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 596,376, Oct. 12, 1990, Pat. No. 5,149,983. This application Mar. 4, 1992, Ser. No. 845,709
Claims priority, application Switzerland, Mar. 5, 1991, 663/91
Int. Cl.[5] G01N *15/06, 21/00*
U.S. Cl. 250—575 9 Claims

1. A method for changing the concentration of at least another material within a fluid of mixed materials in a measuring medium (**69**) by determining the concentration of at least one material within the fluid in the measuring medium (**69**), wherein the at least one material is capable of at least partly chemically converting the at least another material, and the at least one material has a radiation frequency absorption range from an absorption maximum region to a low absorption region, comprising
transmitting a first radiation having a frequency (f_1) in the range of the radiation absorption maximum of said material, and transmitting at least one second radiation with a frequency (f_2) lying in the low radiation absorption region of said material, along the same path through said measuring medium (**69**);
detecting the transmitted first and second radiations after passing through said measuring medium (**69**) by means of a detector (**13**) and converting the detected radiations into proportional electrical signals;
transmitting said first and second radiations f_1, f_2) in the transmitting step as pulses with the same constant repetition frequency ($1/T_N$) in alternating fashion;
maintaining the pulse intervals between the pulses of said first and said second radiations f_1, f_2) constant with respect to each other, and the time dependent intensity course of the pulses of said first and second radiations so as not to overlap each other;
dividing out a portion of the first and second radiations before entering said measuring medium;
placing a reference fluid containing a known concentration of said at least one material, the concentration of which is to be measured in said fluid in the measuring medium (**69**), in a reference volume (**5***a* . . . **5***z*);
passing the divided out portion of the first and second radiations through the reference volume (**5***a* . . . **5***z*) containing the reference fluid;
detecting the divided out portion of the first and second



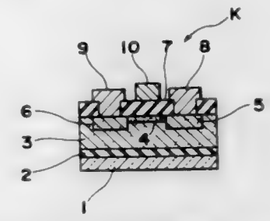
radiations after passing through said reference volume (**5***a* . . . **5***z*) and converting the detected radiations into proportional electrical signals;
demodulating said electrical signals from the detected first and second radiations passed through said measuring medium (**69**), and demodulating said electrical signals from the detected divided out portion of the first and second radiations passed through said reference volume (**5***a* . . . **5***z*;
integrating over a time span said electrical signals corresponding to the pulses of the first and second radiations f^1, f_2) passed through said measuring medium (**69**) and said electrical signals corresponding to the divided out portion of the first and second radiations passed through said reference volume (**5***a* . . . **5***z*);
comparing the integrated values of said electrical signals of said pulses of said first and said second radiations f_1, f_2) with one another in an evaluating circuit and determining the concentration of the said at least one material in the fluid in the measuring medium (**69**);
determining in the evaluating circuit the quantity of said one material required to at least partly chemically convert the another material within the fluid in the measuring medium (**69**); and
chronologically injecting a quantity of said one material into said fluid thereby at least partly chemically converting the another material.

5,200,630

SEMICONDUCTOR DEVICE

Noboru Nakamura, Hirakati; Hiroyuki Kuriyama, Minoo; Shinya Tsuda, Yahata, and Shoichi Nakano, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 504,638, Apr. 3, 1990, abandoned. This application Aug. 7, 1991, Ser. No. 742,578
Claims priority, application Japan, Apr. 13, 1989, 1-93759; May 18, 1989, 1-124903
Int. Cl.[5] H01L *45/00, 27/01, 27/13*
U.S. Cl. 257—570 4 Claims



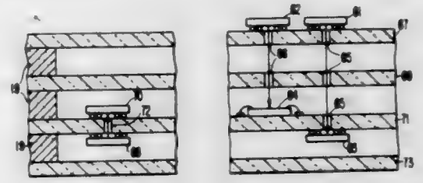
1. A semiconductor device comprising:
a semiconducting layer of polycrystalline silicon having a grain boundary,
an insulating film provided on an upper face of said semiconducting layer,
an electrode provided on an upper face of said insulating film,
channels formed on the upper face of said semiconducting layer, and
a further semiconducting layer of amorphous silicon located immediately between said insulating film and said upper face of said semiconducting layer, said further semiconducting layer having one face that faces the electrode, said face being in contact with said insulating film and beneath said electrode, said further semiconducting layer having an opposite face in contact with said upper face of said semiconducting layer of polycrystalline silicon and having a thickness of at most 2000 Å which prevents the insulating film from penetrating into the grain boundary of the polycrystalline silicon and which enables mobility of carriers in the channels.

5,200,631

HIGH SPEED OPTICAL INTERCONNECT

Francis D. Austin, Haymarket; Richard Kachmarik, Bealeton, and Leonard T. Olson, Centreville, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1991, Ser. No. 740,742
Int. Cl.[5] H01L *31/12, 31/16*
U.S. Cl. 257—81 16 Claims



1. An optoelectronic package providing free space optical communication between a plurality of substrates arranged in a stacked, spaced relationship each substrate in the package having devices mounted thereon, the package comprising:
a first substrate having substantially parallel first and second surfaces;
a first light emitting transmitter mounted on the first surface of the first substrate;

a second substrate having substantially parallel first and

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drain electrode perpendicularly onto a plane which is parallel

5,200,636

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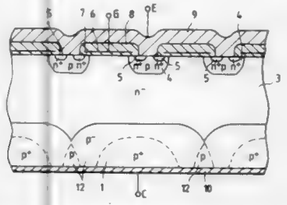
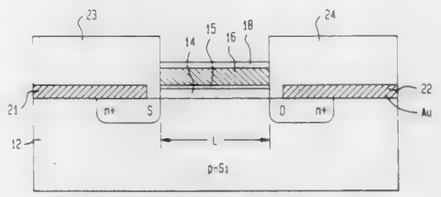
a second substrate having substantially parallel first and second surfaces, the surfaces of the first and second substrates oriented in substantially parallel directions;
a first optical receiver mounted on the second surface of the second substrate, the first transmitter and first receiver oriented along an optical path so that light emitted by the first transmitter can be received by the first receiver, the optical path allowing free space optical communication between the first transmitter and first receiver;
a third substrate having substantially parallel first and second surfaces oriented in a substantially parallel direction to the surfaces of the first and second substrates, the third substrate located between the first and second substrates along the optical path having an optical means to allow light to pass through; and,
means to hold the first and second substrates so that the first transmitter and the first receiver are located along the optical path.

5,200,632
CONDUCTIVITY MODULATION MOSFET
Kenya Sakurai, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Apr. 18, 1991, Ser. No. 686,937
Claims priority, application Japan, Apr. 20, 1990, 2-104838
Int. Cl.[5] H01L *29/74, 27/02, 29/10*
U.S. Cl. 257—212 **5 Claims**



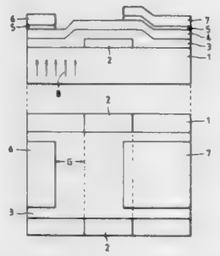
1. A conductivity modulation type MOSFET comprising:
a first region of a first conductivity type having a low impurity concentration;
a plurality of second regions of a second conductivity type selectively formed in a surface region of one side of the first region;
a plurality of third regions of the first conductivity type selectively formed in a surface region of the second regions;
a plurality of gate electrodes each formed above a surface region of the second region located between the first region and the third region;
a gate insulating film between the gate electrode and the surface region of the second region;
an emitter electrode in contact with both the second region and the third region;
a fourth region of the second conductivity type having a high impurity concentration, formed adjoining an other side of the first region;
a plurality of fifth regions of the second conductivity type, selectively formed surrounding the fourth region to have a lower impurity concentration than the inpurity concentration of the fourth region; and
a collector electrode in contact with both the fourth region and the fifth regions.

5,200,633
SENSOR MATERIAL FOR MEASURING THE PARTIAL PRESSURE OF GASES OR VAPORS; AND GAS SENSORS
Franz Dickert, Nuremberg; Doris Zeltner, Erlangen; Gert Mages, Hemhofen, and Heinz Kimmel, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 14, 1989, Ser. No. 323,345
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808467; Mar. 14, 1988, 3808468
The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.
Int. Cl.[5] H01L *29/66, 29/96*
U.S. Cl. 257—253 **32 Claims**



1. Sensor material having electrical or optical properties that change in response to a change in partial pressure of a gas or vapor comprising:
at least one hydrophobic metal complex having an ion mobility or ionic concentration which changes in response to the change in partial pressure of the gas or vapor.

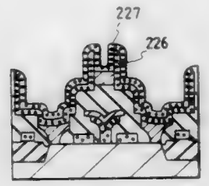
5,200,634
THIN FILM PHOTOTRANSISTOR AND PHOTOSENSOR ARRAY USING THE SAME
Toshihisa Tsukada, Musashino; Yoshiyuki Kaneko, Hachioji; Hideaki Yamamoto, Tokorozawa; Norio Koike, Suginami; Ken Tsutsui, Nishitama; Haruo Matsumaru, Nishitama, and Yasuo Tanaka, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 414,322, Sep. 29, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 803,798
Claims priority, application Japan, Sep. 30, 1988, 63-244167; Feb. 10, 1989, 1-29793; Feb. 16, 1989, 1-35068; Mar. 17, 1989, 1-63583; Mar. 20, 1989, 1-66126
Int. Cl.[5] H01L *27/01, 27/14, 31/00*
U.S. Cl. 257—291 **52 Claims**



1. A thin film phototransistor including an arrangement to reduce dark current and comprising a field effect transistor including a source electrode, a drain electrode, a gate electrode, a gate insulating film, and a semiconductor layer, wherein there is a gap between one projection of said gate electrode and another projection of at least one of said source electrode and said drain electrode, said one projection and said another projection being obtained by projecting said gate electrode and said at least one of said source electrode and said drain electrode perpendicularly onto a plane which is parallel with said semiconductor layer to reduce dark current to thereby increase a ratio between photocurrent that flows when light is applied and a predetermined voltage is applied to the gate electrode and dark current that flows when the same predetermined voltage is applied to the gate electrode but no light is applied.

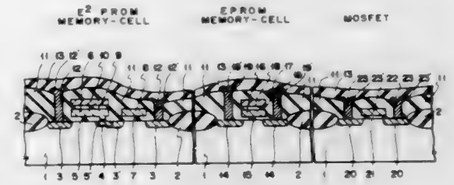
5,200,635
SEMICONDUCTOR DEVICE HAVING A LOW-RESISTIVITY PLANAR WIRING STRUCTURE
Toru Kaga, Urawa; Shinichiro Kimura, Kunitachi; Katsutaka Kimura, Akishima; Yoshinobu Nakagome, Hachiouji; Digh Hisamoto, Kokubunji; Yoshifumi Kawamoto, Tsukui; Eiji Takeda, Koganei; Shimpei Iijima, Akishima; Tokuo Kure, Nishitama, and Takashi Nishida, Taitou, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 475,148, Feb. 5, 1990, Pat. No. 5,140,389, which is a continuation-in-part of Ser. No. 287,881, Dec. 21, 1988, Pat. No. 4,970,564. This application Apr. 17, 1991, Ser. No. 686,757
Claims priority, application Japan, Apr. 17, 1990, 2-099439; May 9, 1990, 2-117573; May 14, 1990, 2-121117
Int. Cl.[5] H01L *29/68, 23/48, 29/04*
U.S. Cl. 257—306 **5 Claims**

1. In a dynamic random access memory (DRAM), formed at a main surface of a substrate, including word and data lines and plural memory cells each of which includes a transistor having an active region and storage capacitance, the combination wherein:



each data line has a substantially orthogonally overlapping arrangement with said word lines, with respect to a plan view thereof;
each said active region is disposed, with respect to said plan view, at an angle direction which is substantially different from that of the corresponding ones of said word and data lines;
the data lines are disposed as lower level conductive layers than that for forming charge storage electrodes of said memory cells, said storage capacitance is characterized as including a storage capacitance portion thereof that is provided by a side wall which is directioned substantially perpendicular to that of the main surface of said substrate; and
the data lines are higher level conductive layers than said word lines with respect to the main surface of said substrate, said data lines are formed insulatedly above said word lines and over further coductive layers disposed in spacings between respective word lines.

5,200,636
SEMICONDUCTOR DEVICE HAVING E²PROM AND EPROM IN ONE CHIP
Teruo Uemura, Kawasaki; Takahide Mizutani; Naoki Hanada, both of Yokohama; Tatsuo Mori, Katsuta, and Kazuyoshi Shinada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 10, 1990, Ser. No. 594,173
Claims priority, application Japan, Oct. 11, 1989, 1-264453
Int. Cl.[5] H01L *29/68;* **G11C** *11/34*
U.S. Cl. 257—315 **27 Claims**



1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type having a major surface;
first, second, third, and fourth semiconductor regions of a second conductivity type which are separately formed in the major surface of said substrate;
first carrier storage means, formed above said substrate between said first and second semiconductor regions, for storing carriers;
first insulating means, formed between said first carrier storage means and said substrate, for electrically insulating said first carrier storage means from said substrate;
a first conductive layer formed above said first carrier storage means and having a sheet resistance of ρsA;
second insulating means, formed between said first conductive layer and said first carrier storage means, for insulating said first conductive layer from said first carrier storage means;
second carrier storage means, formed above said substrate between said third and fourth semiconductor regions and formed above said fourth semiconductor region so as to partly overlap said fourth semiconductor region, for storing carriers;
third insulating means, formed between said second carrier storage means, said substrate, and said fourth semiconductor region, for electrically insulating said second carrier storage means from said substrate and from said fourth semiconductor region;
a second conductive layer formed above said second carrier storage means and having a sheet resistance of ρsB;
fourth insulating means, formed between said second conductive layer and said second carrier storage means, for insulating said second conductive layer from said second carrier storage means; and
tunneling means, formed between said fourth semiconductor region and said second carrier storage means, for causing carriers to tunnel between said second carrier storage means and said fourth semiconductor region,
wherein said first carrier storage means consists of a third conductive layer having a sheet resistance of ρsC, and said second carrier storage means consists of a fourth conductive layer having a sheet resistance of ρsD, wherein a relationship between the sheet resistance ρsC and the sheet resistance ρsD is presented by

$$\rho sC \neq \rho sD.$$

5,200,637

region disposed at side surfaces of said groove and said

the covers and base providing at least three electrical connections to said semiconductor device.

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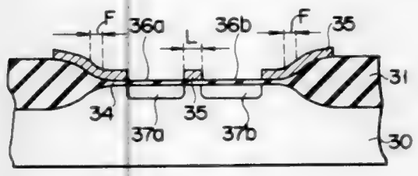
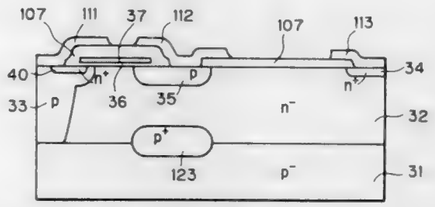
5,200,637
MOS TRANSISTOR AND DIFFERENTIAL AMPLIFIER CIRCUIT WITH LOW OFFSET
Kenji Matsuo; Yasukazu Noine, and Kazuhiko Kasai, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 449,765, Dec. 13, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 658,461
Claims priority, application Japan, Dec. 15, 1988, 63-317104
Int. Cl.[5] H01L *27/01*
U.S. Cl. 257—368 **14 Claims**



1. A MOS transistor comprising:
a semiconductor substrate of a first conductivity type;
a LOCOS type field insulation layer and a gate insulation layer, formed on said semiconductor substrate, said gate insulation layer having a first region defining an element forming region and said LOCOS type field insulation layer having a second region surrounding the element forming region;
a gate electrode layer formed on said LOCOS type field insulation layer, and covering said element forming region and a portion of the second region surrounding the element forming region, and including at least first and second openings formed above the element forming region, all of said first and second openings being formed inside and apart from a boundary between the element forming region and the second region by a first predetermined distance; and
first and second impurity diffusion regions of a second conductivity type, respectively acting as drain and source regions, and formed in said semiconductor substrate in contact with the gate insulation layer and under said first and second openings in said gate electrode layer;
wherein the channel length of the MOS transistor is defined by a second predetermined distance between the first and second openings in the gate electrode layer, and the channel width of the MOS transistor is defined by the dimensions of the first and second openings in the gate electrode layer.

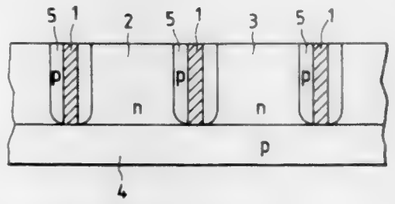
5,200,638
A SEMICONDUCTOR DEVICE FOR EXTRACTING A SIGNAL USED TO MONITOR POTENTIAL OF A HIGH VOLTAGE ISLAND AT A LOW VOLTAGE ISLAND AND METHOD OF MANUFACTURING THE SAME
Takeshi Kida; Kazumasa Satsuma, both of Itami; Gourab Majumdar, Fukuoka; Tomohide Terashima, Fukuoka; Hiroshi Yamaguchi, Fukuoka; Masanori Fukunaga, Fukuoka, and Masao Yoshizawa, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,243
Claims priority, application Japan, Dec. 28, 1989, 1-340202
Int. Cl.[5] H01L *27/02*
U.S. Cl. 257—368 **14 Claims**

1. A semiconductor device, comprising:
a first conductivity type semiconductor substrate;
a second conductivity type first semiconductor region formed on said semiconductor substrate in an island manner;
a first conductivity type second semiconductor region formed on said semiconductor substrate to surround said first semiconductor region;
a first conductivity type third semiconductor region selectively formed in a surface of said first semiconductor region in a vicinity of said second semiconductor region;
a voltage applying region formed in the surface of said first semiconductor region near a center thereof;
an insulating film formed on the surface of said first semiconductor region between said second and third semiconductor regions to overlap with surfaces of said second and third semiconductor regions;



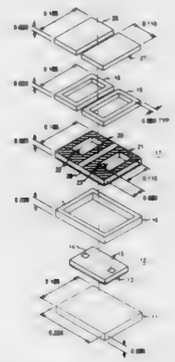
a conductive film formed on said insulating film;
a sense electrode formed on said third semiconductor region for use in detecting a voltage applied to said voltage applying region in a current blocking state; and
a first conductivity type buried region of an impurity concentration larger than that of said semiconductor substrate, formed in a boundary between said semiconductor substrate and said first semiconductor region, opposite to said third semiconductor region.

5,200,639
SEMICONDUCTOR DEVICE WITH ISOLATING GROOVE CONTAINING SINGLE CRYSTALLINE ALUMINUM WIRING
Keiji Ishizuka, Kawasaki; Yuzo Kataoka, Hiratsuka; Toshihiko Ichise, Kawasaki; Hidekazu Takahashi, Atsugi, and Hayao Ohzu, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1991, Ser. No. 707,022
Claims priority, application Japan, May 31, 1990, 2-139623; May 31, 1990, 2-139624; Jun. 29, 1990, 2-169947
Int. Cl.[5] H01L *29/06, 27/04, 27/10*
U.S. Cl. 257—508 **10 Claims**



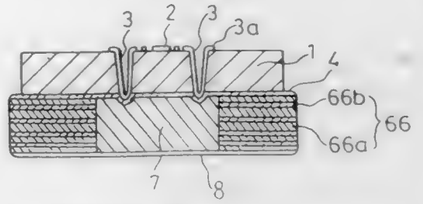
1. A semiconductor device comprising:
a semiconductor body;
a plurality of element regions formed within said semiconductor body;
an isolating region for making each of said element regions electrically independent;
wherein said isolation region comprises (i) a conductive region formed of single crystalline aluminum filling a groove at one surface side of said body, (ii) a doped region provided on a bottom of said groove and formed of a semiconductor material doped with an impurity to form a pn junction with said element region, and (iii) an insulating region disposed at side surfaces of said groove and said doped region.

5,200,640
HERMETIC PACKAGE HAVING COVERS AND A BASE PROVIDING FOR DIRECT ELECTRICAL CONNECTION
David J. Scheftic, South Waverly, Pa.; William A. Peterson, Vestal, N.Y.; John E. Escallier, Selden, N.Y., and Hanna E. Rykowska, Deer Park, N.Y., assignors to Electron Power Inc., Deer Park and General Electric Company, Johnson City, both of N.Y.
Filed Aug. 12, 1991, Ser. No. 743,986
Int. Cl.[5] H01L *23/02, 23/12*
U.S. Cl. 257—693 **16 Claims**



1. In combination:
A) at least one die of a semiconductor material having one contact on the under surface and at least two contacts on the upper surface and constituting at least one semiconductor device;
B) a compact hermetic surface mount package for said at least one semiconductor device comprising:
1) a base of a metal having good thermal and electrical conductivity and Coefficient of Thermal Expansion compatible with that of said semiconductor material, said at least one die being attached to said base;
2) a first apertured frame having a Coefficient of Thermal Expansion compatible with that of said base, sealed along the walls of the first aperture to said base, said aperture accommodating said at least one die;
3) a second frame composed of an electrically insulating material and having a Coefficient of Thermal Expansion compatible with that of said first frame, said second frame having a second and a third aperture for upward passage of bond wires from said die with overhangs adjacent each aperture for bond wire attachment, and a first metallization coating the under surface sealed to the first frame along the walls of the first aperture and separate second and third metallizations coating the upper surface along the walls of s id second and third apertures for sealing and including said overhangs;
4) at least two wire bonds, each connecting a device upper surface contact to one of said second and third metallizations on said overhangs;
5) at least two apertured subframes, each having a Coefficient of Thermal Expansion compatible with that of said second frame and each being sealed along the walls of one of said second and third apertures to said second frame, each aperture accommodating a bond to an overhang; and
6) at least two covers, each sealed to a subframe to close the package about said at least one semiconductor device, the covers and base providing at least three electrical connections to said semiconductor device.

5,200,641
SEMICONDUCTOR DEVICE STRUCTURE INCLUDING BENDING-RESISTANT RADIATING LAYER
Katsuya Kosaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1991, Ser. No. 724,788
Claims priority, application Japan, Oct. 4, 1990, 2-268882
Int. Cl.[5] H01L *23/02, 39/02*
U.S. Cl. 257—720 **17 Claims**



1. A semiconductor device structure comprising:
a semiconductor substrate having opposed front and rear surfaces, a linear thermal expansion coefficient, and an active semiconductor device disposed in said semiconductor substrate at a part of the front surface; and
a radiating layer disposed on the rear surface of said semiconductor substrate for radiating heat generated by said active semiconductor device, said radiating layer including a metal portion disposed on a part of the rear surface of said semiconductor substrate that is directly opposite the part of the front surface of said semiconductor substrate on which said active semiconductor device is disposed and a composite portion disposed on the rear surface of said semiconductor substrate surrounding and contacting said metal portion, said composite portion including a metal dispersed in a dispersion medium in a concentration so that said composite portion has a linear thermal expansion coefficient substantially equal to that of said semiconductor substrate, said dispersion medium having a composition different from said metal

5,200,642
INTERNAL CAPACITOR ARRANGEMENT FOR SEMICONDUCTOR DEVICE ASSEMBLY
Jon Long, Livermore, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.
Filed Dec. 19, 1989, Ser. No. 454,751
Int. Cl.[5] H01L *23/12, 29/95*
U.S. Cl. 257—724 **9 Claims**

1. A semiconductor device assembly comprising
a semiconductor device mounted to a die attach pad, wherein the die attach pad is generally coplanar with a plurality of leads extending generally radially in a plane from the semiconductor device, wherein a pair of the leads are power leads;
a plastic film layer having two opposing surfaces formed atop the leads, wherein the semiconductor device extends above one surface of the plastic film layer and the leads are disposed on the opposite surface of the plastic film layer;
a portion of the plastic film layer forming a pad disposed atop the pair of power leads;
cutouts extending through the pad in alignment with the pair of power leads; and

a capacitor disposed aton the pad on a surface of the plastic

current delivered to said common bus increases for each

fourth means connected to said first, second and third means, for combining the pair of pulse voltages $+V_3$, $-V_3$, at

5,200,647
HIGH-SPEED SIGNAL MULTIPLEXING CIRCUIT FOR

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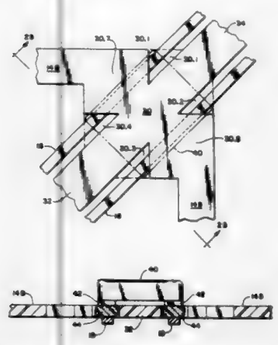
a capacitor disposed atop the pad on a surface of the plastic film layer opposite the leads, having two conductive legs,



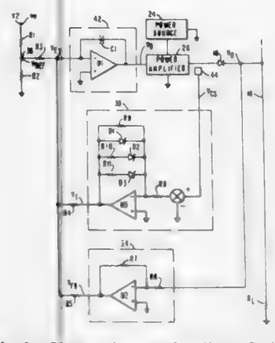
both of which are connected through the cutouts to the pair of power leads.

5,200,643

PARALLEL ELECTRIC POWER SUPPLIES WITH CURRENT SHARING AND REDUNDANCY

Stuart C. Brown, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1989, Ser. No. 313,264
Int. Cl.[5] H02J *1/10*
U.S. Cl. 307—53 **10 Claims**



1. A method of operating a plurality of electric power supplies, each having an output connected to a common bus, said method comprising:

producing a plurality of voltage feedback signals, each of said voltage feedback signals being representative of voltage delivered by a corresponding one of a plurality of independent DC power supplies connected to a common bus;

producing a plurality of output current feedback signals, each of said output current feedback signals being representative of current delivered by a corresponding one of said power supplies to said common bus;

combining each of said voltage feedback signals with a corresponding voltage reference signals and a corresponding one of said output current feedback signals to produce a plurality of error signals, said error signals corresponding to each of said power supplies;

independently controlling the output voltage of each of said power supplies in response to a corresponding one of said error signals such that said output voltage decreases as the current delivered to said common bus increases for each of said power supplies; and

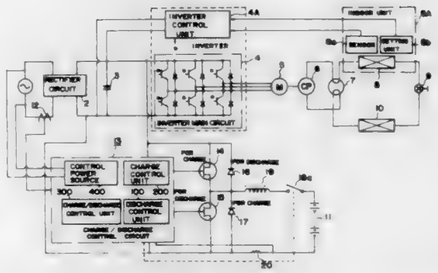
applying a preselected gain to each of said current feedback signals before combining said current feedback signals with said voltage feedback signals and said voltage reference signal, wherein said gain decreases as the output current of each of said power supplies increases.

5,200,644

AIR CONDITIONING SYSTEM HAVING BATTERY FOR INCREASING EFFICIENCY

Takehiro Kobayashi, and Kazuhiko Akiyama, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 30, 1989, Ser. No. 357,780
Claims priority, application Japan, May 31, 1988, 63-133758; May 31, 1988, 63-133759
Int. Cl.[5] F24F *11/00*
U.S. Cl. 307—66 **20 Claims**



1. An air conditioning system comprising:

a converter for converting a first alternating current from a commercial alternating current power source into a first direct current,

an inverter for re-converting said first direct current into a second alternating current having a predetermined frequency corresponding to an air conditioner load,

a compressor driven with said second alternating current output by said invertor,

a battery for supplying a second direct current to said invertor through a switching element, and

a discharge control unit for controlling said switching element so that said battery supplies a magnitude of said second direct current corresponding to a difference between said first alternating current supplied from said power source to said converter and a preset current value when said first alternating current exceeds said preset current value.

5,200,645

DEVICE FOR OBTAINING AND SWITCHING HIGH VOLTAGES APPLIED TO X-RAY TUBE ELECTRODES

Jacques Laeuffer, Paris, France, assignor to General Electric CGR S.A., Les Moulineaux, France

Filed Oct. 8, 1991, Ser. No. 772,888
Claims priority, application France, Oct. 9, 1990, 90 12441
Int. Cl.[5] H05G *1/32*
U.S. Cl. 307—82 **8 Claims**

1. A device used for providing switched X-ray tube electrode biasing voltages VS_1, VS_2 or VS'_1, VS'_2, comprising:

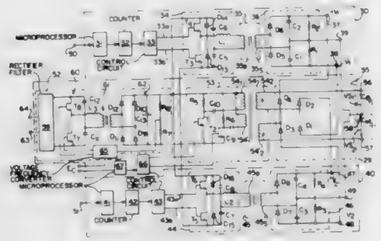
first means for generating a first pair of adjustable DC voltages $+V_1$, $-V_1$ with equal and opposite amplitudes,

second means for generating a second pair of adjustable DC voltages $+V_2$, $-V_2$ with equal and opposite amplitudes,

third means for generating a pair of pulse voltages $+V_3$, $-V_3$ with equal and opposite amplitudes, and

fourth means connected to said first, second and third means, for combining the pair of pulse voltages $+V_3$, $-V_3$, at determined instants, with one of the voltages of the first and second pairs of DC voltages so as to charge capacitors and obtain DC voltages

$VS_1 = V_3 - V_1$ *and* $VS_2 = -V_3 + V_2$



during a certain period of time, and to provide DC voltages

$VS'_1 = -V_3 + V_2$ *and* $VS'_2 = +V_3 - V_1$

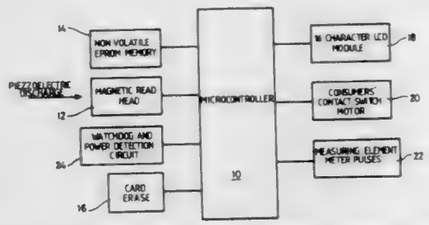
during another period of time.

5,200,646

PROTECTION OF SUPPLY METERING

Richard Wand, Spalding, and Kenneth Payne, Peterborough, both of England, assignors to Ampy Automation-Digilog Limited, Peterborough, England

Filed May 15, 1991, Ser. No. 700,594
Claims priority, application United Kingdom, May 23, 1990, 9011531
Int. Cl.[5] H01H *83/00*
U.S. Cl. 307—116 **10 Claims**



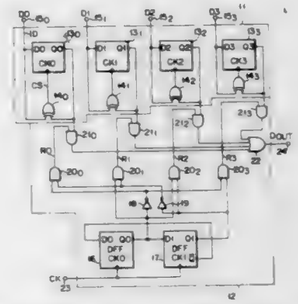
1. In combination with electronic circuitry which controls the operation of a controller to in turn control the supply of a commodity and which can be interfered with by high voltage discharges, protection apparatus comprising power failure detection means and signal generating means for generating a particular pattern of signals whenever an orderly shutdown is required due to failure of a supply (deliberate or otherwise) or due to power-down when a prepaid credit expires, non volatile memory means having a signal memory in which the said particular pattern of signals is stored, means for reading the memory on subsequent power-up and further signal generating means for generating a control signal if the pattern of signals is not found in the memory, thereby to indicate that the previous interruption was not an orderly shutdown but a crash power-down due to interference.

5,200,647

HIGH-SPEED SIGNAL MULTIPLEXING CIRCUIT FOR MULTIPLEXING HIGH-SPEED SIGNALS

Koichi Motoike, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 19, 1991, Ser. No. 746,723
Claims priority, application Japan, Aug. 20, 1990, 2-217161
Int. Cl.[5] H03L *07/06*
U.S. Cl. 307—241 **11 Claims**



1. A high-speed signal multiplexing circuit for multiplexing a signal at a high speed, comprising:

a plurality of latch means for latching 1-bit data;

latch control means, provided for each latch means, for causing the latch means to latch 1-bit data supplied thereto, when the 1-bit data supplied to the latch means differs from 1-bit data which has been latched in the latch means;

generating means for generating a read signal for successively reading data latched in said latch means in synchronism with a clock signal; and

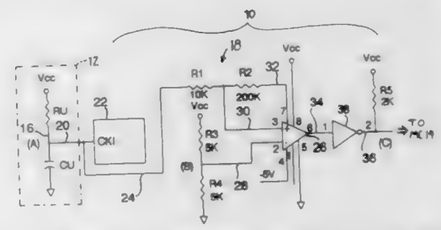
reading means for successively reading data latched in said plurality of latch means in response to the read signal.

5,200,648

EMULATOR CIRCUIT AND METHOD FOR GENERATING CMOS LEVEL CLOCK INPUT

Hari J. Vyas, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clar, Calif.

Filed Aug. 13, 1991, Ser. No. 744,371
Int. Cl.[5] H03K *5/00, 5/08*
U.S. Cl. 307—269 **19 Claims**



1. An emulator for generating a CMOS level clock signal from a provided set of RC components comprising:

a) microcontroller means for generating a sawtooth wave form clock input signal from a provided RC network; and

b) an emulation circuit responsive to said sawtooth wave form signal for forming a square wave output signal having a frequency equal to a frequency of said sawtooth wave form signal.

5,200,649

tors; a second means connecting the emitter electrodes of said

mined plural number, an output terminal of one of said

power supplies, one serial connection between said sour-

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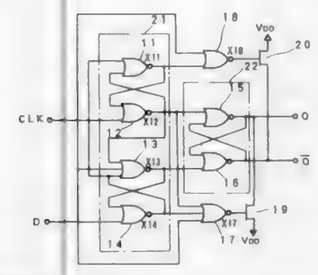
5,200,649

FLIP-FLOP CIRCUIT WITH DECREASED TIME REQUIRED FROM TAKE IN OF DATA INPUT TO SETTING OF DATA OUTPUT

Jiro Fukui, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1991, Ser. No. 796,640
Claims priority, application Japan, Nov. 28, 1990, 328326
Int. Cl.[5] H03K *3/284, 3/286, 3/29*
U.S. Cl. 307—272.1 **9 Claims**



1. A flip-flop circuit, comprising:
a data take-in circuit (DTIC) means, having a data input and a clock input, for successively taking in a series of data inputs at said data input at successive data input times synchronized with a clock signal that is input at said clock input, said clock signal comprising a series of clock pulses, and for providing a first logical output, having successive states determined by said series of data inputs and said clock signal, and a second logical output;
a data hold circuit (DHC) means, having an input terminal and an output terminal, for successively receiving at said input terminal said successive states of said first logical output and providing a DHC output at said output terminal having successive states determined by said successive states of said first logical output, each one of said successive states of said DHC output being held for a period of time starting at a time slightly after occurrence of one of said data input times until occurrence of an immediately succeeding one of said data input times; and
a data output forced update circuit (DOFUC) means, responsive to said first logical output and said second logical output from said DTIC means, for temporarily setting said output terminal of said DHC means to a logical state which is substantially the same as that of an immediately succeeding one of said successive states of said DHC output to be provided at said output terminal by said DHC means and for maintaining said output terminal at said logical state until said immediately succeeding one of said successive states of said DHC output is provided at said output terminal by said DHC means.

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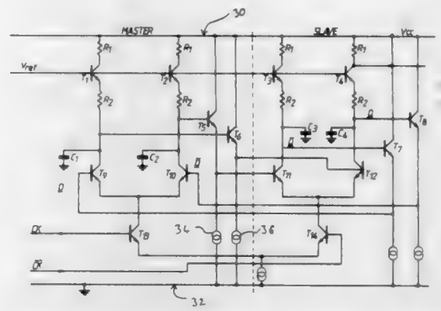
HIGH FREQUENCY MASTER/SLAVE FLIP-FLOPS

Nicholas P. Cowley, Wroughton; Rod Lawton, Swindon, both of United Kingdom, and Thomas D. S. McClelland, Lisburn, Northern Ireland, assignors to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 391,536, Jul. 28, 1989. This application Nov. 21, 1990, Ser. No. 616,843
Claims priority, application United Kingdom, Nov. 11, 1987, 8727953
Int. Cl.[5] H03K *3/289, 19/086, 5/13*
U.S. Cl. 307—272.2 **2 Claims**

1. A flip-flop comprising a current source; first, second and third pairs of transistors, each transistor of said first, second and third pairs of transistors having an emitter electrode, a base electrode and a collector electrode, a first means connecting the emitter electrodes of said first pair of transistors together and to the collector electrode of one of the third pair of transistors; a second means connecting the emitter electrodes of said second pair of transistors together and to the collector electrode of the other of said third pair of transistors; a third means connecting the emitter electrodes of said third pair of transistors together and to said current source; a fourth means connecting the collector electrodes of said first pair of transistors to respective base electrodes of the second pair of transistors; a fifth means connecting the collector electrodes of said second pair of transistors to respective base electrodes of said first pair



of transistors; and means for applying clock signals in antiphase to the base electrodes of said third pair of transistors, whereby, in operation, in each half-cycle of said clock signals a respective one of said first and second pairs of transistors is caused to conduct, and potentials are caused to develop on the collector electrodes of the transistors of said one of said first and second pairs of transistors, in accordance with potentials developed during immediate preceding half-cycle of said clock signals, on the collector electrodes of the transistors of the other of said first and second pairs of transistors.

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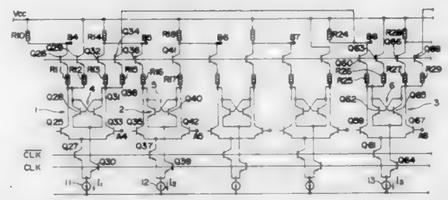
COLLECTOR DOT AND CIRCUIT

Yoshihiro Komatsu, and Masato Kawata, both of Kanagawa, Japan, assignors to Sony Cororation, Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 792,616
Claims priority, application Japan, Nov. 20, 1990, 2-316415
Int. Cl.[5] H03K *19/086*
U.S. Cl. 307—455 **3 Claims**



1. A collector dot AND circuit, comprising:
a first differential circuit including first and second transistors differentially connected to each other:
a first output transistor connected to an output electrode of said first transistor;
a second output transistor connected to an output electrode of said second transistor:
a second differential circuit including third and fourth transistors differentially connected to each other:
a predetermined plural number of third output transistors cascade connected to an output electrode of said third transistor for dividing an electric current outputted from said third transistor into electric currents of the predetermined plural number, an output terminal of one of said third output transistors being connected to an output terminal of said second output transistor so as to provide an AND output signal:
a same predetermined plural number of dummy transistors connected between an output electrode of said fourth transistor and a power source for causing an electric current having an equal magnitude to that of an electric current flowing through said third transistor to flow through said fourth transistor:
a first constant-current source for supplying a constant electric current to said first differential circuit: and
a second constant-current source for supplying a constant electric current to said second differential circuit so that an electric current outputted from each of said third output transistors is equal in magnitude to an electric current outputted from said first output transistor.

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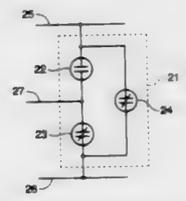
PROGRAMMABLE/REPROGRAMMABLE STRUCTURE COMBINING BOTH ANTIFUSE AND FUSE ELEMENTS

Roger R. Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 13, 1991, Ser. No. 791,797
Int. Cl.[5] H03K *19/173*
U.S. Cl. 307—465 **20 Claims**



1. A programmable/reprogrammable structure in an integrated circuit comprising:
first and second conductors; and
a combination of one-time programmable elements coupled therebetween;
wherein said one-time programmable elements comprise an antifuse element coupled in series to a first fuse element via a third conductor thereby forming an antifuse/fuse series combination and a second fuse element coupled in parallel to said series combination, thereby providing a programming sequence having an initial state and first, second and third programmable states.

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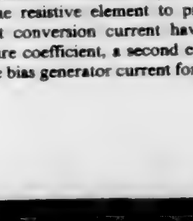
TRISTATE OUTPUT GATE STRUCTURE PARTICULARLY FOR CMOS INTEGRATED CIRCUITS

David Moloney, Cornaredo; Gianfranco Vai, Pavia; Maurizio Zuffada, and Giorgio Betti, both of Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Italy

Filed Jun. 21, 1991, Ser. No. 718,669
Claims priority, application Italy, Jun. 22, 1990, 20728 A/90
Int. Cl.[5] H03K *19/017, 19/094*
U.S. Cl. 307—473 **23 Claims**

1. A CMOS output logic gate circuit connected between first and second power supplies for generating a output signal on a first terminal responsive to an input signal on a second terminal when said gate circuit is operational responsive to an enable signal on a third terminal, said output logic gate circuit comprising
logic means connected to said second terminal and said third terminal for generating logic signals responsive to input and enable signals; and
at least three serially connected MOS transistors, each having first and second source/drains and a gate, said source/drains serially connected between said first and second power supplies, one serial connection between said source/drains connected to said output terminal; said serially connected MOS transistors having
a first serially connected MOS transistor connected between said first terminal and said second power supply, said first MOS transistor having a gate terminal connected to said third terminal so that said first MOS transistor is turned on and off responsive to a disable signal on said third terminal; and
remaining serially connected MOS transistors, each having a gate connected to said logic means such that said



remaining serially connected MOS transistors operate to generate on said first terminal a predetermined logic function of an input signal on said second terminal when said circuit is operational, said remaining serially connected MOS transistors including a second MOS transistor connected between said first terminal and said first power supply, said second serially connected MOS transistor responsive to said logic means so that said second MOS transistor is turned on and off responsive to an enable signal on said third terminal;
whereby said first terminal may be electrically isolated responsive to an enable signal on said third terminal.

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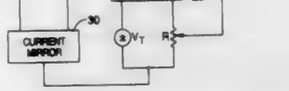
TRIM CORRECTION CIRCUIT WITH TEMPERATURE COEFFICIENT COMPENSATION

Donald Archer, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 20, 1991, Ser. No. 794,960
Int. Cl.[5] G06G *7/10;* **H03F** *3/45*
U.S. Cl. 307—491 **7 Claims**



1. An operational amplifier bias system that provides input offset voltage trim current to an operational amplifier with minimum offset thermal drift, the bias system comprising:
a bias generator that provides bias generator current to the operational amplifier; and
correction means responsive to the bias generator current for providing an input offset trim current to the operational amplifier that compensates for offset drift error of the input offset voltage of the operational amplifier with change in temperature, the correction means including a resistive element, an input current mirror responsive to the bias generator current for providing a reference current to the resistive element to provide a temperature coefficient conversion current having a predetermined temperature coefficient, a second current mirror responsive to the bias generator current for providing a tempera-

ture coefficient correction current, current summing

trigger handle, the power semiconductor controlling the flow

nection to an ac source, and being relatively angularly

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ture coefficient correction current, current summing means for summing the temperature coefficient conversion current and the temperature coefficient conversion current to provide an output current having a predetermined temperature coefficient, and a trim bit network responsive to the output current for providing the input offset voltage trim current.

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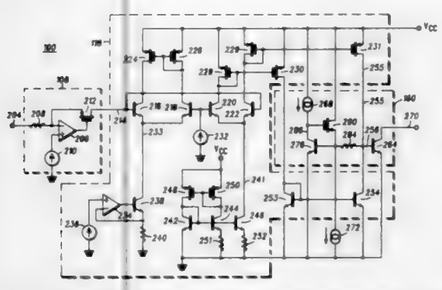
TEMPERATURE-INDEPENDENT EXPONENTIAL CONVERTER

Daniel C. Feldt, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1991, Ser. No. 709,739

Int. Cl.[5] G06G *7/24;* **H01L** *31/00*

U.S. Cl. 307—492 **8 Claims**



1. A circuit for generating a temperature-independent signal which is exponentially related to an input signal, said circuit comprising:

a temperature-compensation amplifier having at least one band-gap current generator operative to generate a current of a value proportional to temperature, said temperature-compensation amplifier coupled to receive the input signal and operative to amplify the input signal and to generate thereby an amplified signal of a value proportional to temperature; and

an exponential amplifier including at least one bipolar junction transistor having a base electrode, a collector electrode, and an emitter electrode, wherein the base electrode of the at least one bipolar junction transistor is coupled to receive the amplified signal of the value proportional to temperature generated by the temperature-compensation amplifier, and wherein the amplified signal is operative to bias the at least one bipolar junction transistor at a bias voltage of a value which is proportional to temperature whereby a current generated at the collector electrode of the at least one bipolar junction transistor is exponentially related to the bias voltage of the base electrode of the at least one bipolar junction transistor, and whereby the current generated at the collector electrode of the at least one bipolar junction transistor comprises the temperature-independent signal which is exponentially related to the input signal.

5,200,656

CIRCUIT FOR MEASURING THE DIFFERENCE BETWEEN TWO SUCCESSIVE PERIODS IN A WAVEFORM

Richard D. Gunther, San Diego, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 23, 1992, Ser. No. 856,420

Int. Cl.[5] G01R *19/12, 29/02;* **H03K** *5/22*

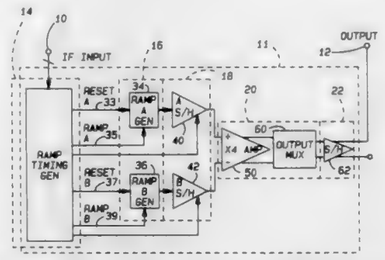
U.S. Cl. 307—517 **11 Claims**

1. A single chip system for measuring the time difference between successive periods in a waveform, comprising:

sensing means, coupled to an input signal, for sensing periods of said input signal;

ramp generator means, coupled to said sensing means, for producing ramping waveforms on successive periods of said input signal;

storage means, connected to said ramp generator means, for



sampling and holding outputs of said ramp generator means;

logic means, coupled to said storage means, for comparing outputs from said storage means and creating output voltage levels; and

output means, connected to said logic means, for selecting and outputting an appropriate voltage signal.

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APPARATUS FOR CONTROLLING OR REGULATING EQUIPMENT POWERED BY BATTERIES

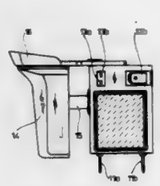
Fritz Prestel, Hausen A. Tann, Fed. Rep. of Germany, assignor to BSG-Schalttechnik GmbH & Co. KG, Ballingen, Fed. Rep. of Germany

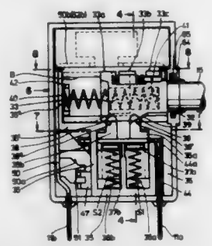
Filed Nov. 22, 1991, Ser. No. 797,441

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1990, 4038786

Int. Cl.[5] H02K *7/14*

U.S. Cl. 310—50 **22 Claims**





1. An apparatus for controlling operation of battery operated equipment, the apparatus comprising: a closed housing (**21**) having an opening; an external, displaceable, trigger handle (**14**) on the housing; and an electrical circuit means for controlling an amount of power to be supplied to an equipment motor, the electrical circuit means including a plurality of circuit components which include a potentiometer with at least one power semiconductor responsive to adjustment of the potentiometer which adjusts in response to displacement of the

trigger handle, the power semiconductor controlling the flow of current to the equipment motor and being part of an integrated circuit (IC) which in turn is disposed within the housing on a circuit board, the circuit board being in contact with a heat sink (**29**) which protrudes to the outside through the opening in the housing (**30**).

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ELECTRIC MOTOR WITH THROUGH-BOLT GUIDES FOR MOUNTING

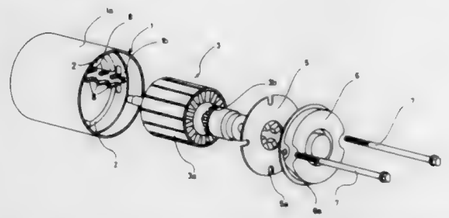
Teruhisa Kohno, and Seiji Nokubo, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 27, 1991, Ser. No. 800,166

Claims priority, application Japan, Nov. 28, 1990, 2-127123[U]

Int. Cl.[5] H02K *5/00*

U.S. Cl. 310—89 **6 Claims**



1. In an electric motor having a hollow cylindrical outer yoke with a closed end and an open end; an inner yoke provided on an inner periphery of said outer yoke for enlarging a magnetic path area; a plurality of permanent magnets fixed to said inner periphery of said inner yoke at regular intervals along a circumference of said inner periphery; a rotor arranged coaxially with said outer yoke, said rotor including armatures and commutators; brushes rotating and sliding with said commutators; an end surface cover for closing said open end of said outer yoke; and at least one through-bolt inserted from said end surface cover toward said closed end of said yoke radially outwardly of an outer periphery of said rotor through a clearance between neighboring permanent magnets; the improvement comprising through-bolt guide means for guiding said at least one through-bolt and for preventing said through-bolt from being attracted by said permanent magnets, said through-bolt guide means including guide protrusions formed integrally with said inner yoke.

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AXIAL AND RADIAL FIELD ELECTRIC ROTATING MACHINES HAVING RELATIVELY ROTATABLE FIRST AND SECOND STATORS

Patrick W. Clarke, 244 Sagamore Dr., Murray Hill, N.J. 07974

Continuation-in-part of Ser. No. 462,059, Jan. 8, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 763,955

Int. Cl.[5] H02K *21/04, 23/02, 1/12*

U.S. Cl. 310—112 **18 Claims**

1. An adjustable speed drive system comprising:

a first pair of field plates freely rotatable about a shaft and providing an axial magnetic field substantially in the direction of the shaft and between the first pair of field plates;

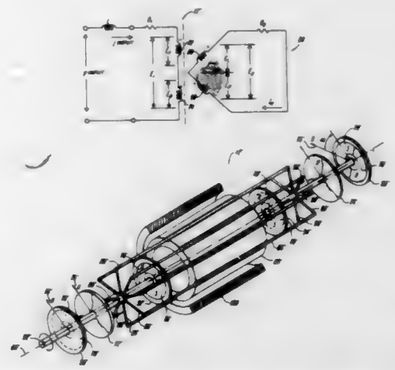
an input winding disposed between the first pair of field plates;

a second pair of field plates freely rotatable about the shaft and providing an axial magnetic field substantially in the direction of the shaft and between the second pair of field plates;

a second input winding disposed between the second pair of field plates; and

a rotor attached for rotation with the shaft and having windings disposed between each pair of field plates;

the first and second input windings being adapted for connection to an ac source, and being relatively angularly adjustable with respect to each other about the axis of the shaft to provide a predetermined angular orientation of one input winding with respect to the other input winding,



the speed of the shaft being a function of the angular orientation between the first and second input windings.

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ELECTRIC MACHINE

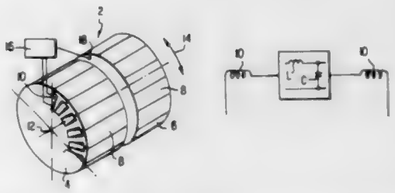
Götz Heidelberg, Am Hügel 16, D-8136 Starnberg-Percha; Andreas Gründl, Haseneystrasse 20, and Peter Ehrhart, Saalburgstrasse 24a, both of D-8000 München, all of Fed. Rep. of Germany

Continuation of Ser. No. 623,381, Nov. 16, 1990. This application Jul. 20, 1992, Ser. No. 915,409

Claims priority, application Fed. Rep. of Germany, May 16, 1988, 3816651

Int. Cl.[5] H02K *11/00, 16/00, 1/00, 21/14*

U.S. Cl. 310—114 **21 Claims**



1. An electric machine comprising:

an armature including a permanent-magnetic excitation part of the machine;

a stator including an induction part of the machine, the induction part having a first and a second region, each region equipped with current conductors, the armature and the stator being movable relative to each other

commutating means for commutating the machine, the commutating means including electronic components;

adjustment means for purposefully changing a voltage induced in the induction part during operation of the machine, by adjustment of the relative phase of the voltages induced in the two regions of the induction part;

wherein the first region of the induction part is physically adjustable relative to the second region of the induction part in the direction of relative movement of the armature and the stator; and

wherein a sensor is provided in the second region for detecting the instantaneous relative position of the armature and the stator.

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surfaces of the vibration member and located at one of the vibrational nodes of the longitudinal vibrations and one of

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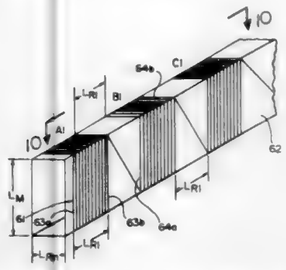
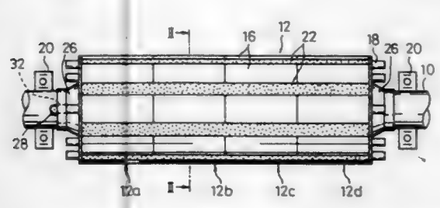
5,200,661
SLOTLESS, BRUSHLESS, LARGE AIR GAP ELECTRIC MOTOR
Daniel J. Shramo, and Susan M. Benford, both of 20791 Avalon Dr., Rocky River, Ohio 44116
Continuation of Ser. No. 451,810, Dec. 15, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 776,724
Int. Cl.[5] H02K *3/00*
U.S. Cl. 310—184 15 Claims



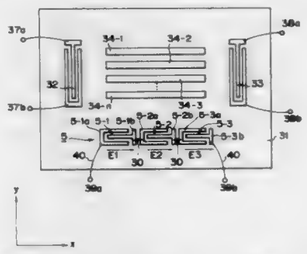
1. A slotless, brushless, large air gap electric motor, comprising:
a stator having a field winding and field backiron; said field winding having a plurality of coil segments, each of said coil segment including a plurality of electrically conductive turns of a polygonal shape, said turns in each coil segment having circumferentially opposite sides, and said circumferentially opposite sides of relatively adjacent turns being circumferentially offset with respect to one another in the same circumferential direction; and
a rotor disposed within said stator, said rotor including a shaft with a permanent magnet mounted thereon.

5,200,662
JOINT STRUCTURE OF RADIAL TYPE ROTOR AND OUTPUT SHAFT IN SYNCHRONOUS MOTOR
Kiyoshi Tagami, Hachioji, and Hiroyuki Uchida, Minamitsuru, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP89/00715, § 371 Date Mar. 30, 1990, § 102(e) Date Mar. 30, 1990, PCT Pub. No. WO90/01825, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 17, 1989, Ser. No. 469,466
Claims priority, application Japan, Aug. 2, 1988, 63-192027
Int. Cl.[5] H02K *1/22*
U.S. Cl. 310—261 6 Claims



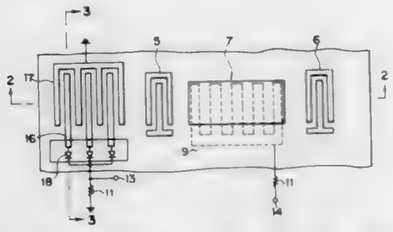
1. A joint structure of a radial-type rotor and an output shaft in a synchronous motor, the radial-type rotor including at least one rotor unit having an axis thereof, a plurality of rotor cores and magnets alternately circumferentially arranged around the axis, and non-magnetic annular-shaped end plates arranged at axially both ends of said rotor unit for fastening said rotor unit onto the output shaft, wherein:
said rotor unit is provided with an axially extending inner circumference thereof defining an axially extending gap between said axially extending inner circumference and an outer circumference of said output shaft;
means are provided for defining a small injection opening at an axially outer end of at least one of said non-magnetic annular shaped end plates to be communicated with said axially extending gap between said axially extending inner circumference for said at least one of said non-magnetic annular shaped end plates and the outer circumference of said output shaft; and
a molding resin is filled through said injection opening in said axially extending gap, and hardened therein to tightly join said plurality of rotor cores and magnets of said rotor unit with said output shaft via said hardened molding resin.

5,200,663
SURFACE ACOUSTIC WAVE DEVICE PROVIDED WITH OUTPUT TRANSDUCER SPLIT INTO A PLURALITY OF PORTIONS, AND COMMUNICATION SYSTEM USING THE SAME
Norihiro Mochizuki, Atsugi; Koichi Egara, Tokyo, and Kenji Nakamura, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 27, 1991, Ser. No. 750,392
Claims priority, application Japan, Aug. 29, 1990, 2-225086; Aug. 29, 1990, 2-225087; Aug. 29, 1990, 2-225088; Aug. 29, 1990, 2-225089; Aug. 29, 1990, 2-225090
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 D 42 Claims



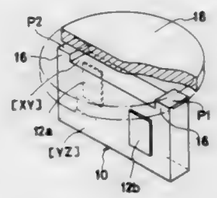
1. A surface acoustic wave device comprising:
a piezoelectric substrate;
a plurality of input transducers, formed on said substrate, for generating surface acoustic waves corresponding to input signals;
a plurality of waveguides which are juxtaposed on a region of said substrate where the surface acoustic waves generated by said input transducers overlap each other, and in which signals are generated due to an interaction of the surface acoustic waves, said waveguides generating surface acoustic waves corresponding to the signals due to the interaction; and
an output transducer for receiving the surface acoustic waves generated from said waveguides, converting the surface acoustic wave into electrical signals, and extracting the electrical signals, said output transducer being constituted by a plurality of portions, juxtaposed in a widthwise direction of the surface acoustic waves generated from said waveguides, for receiving some components of the surface acoustic waves generated from said waveguides, and outputting signals, said portions being connected to each other, so that electric fields of electrical signals output from said portions are synthesized in the same direction.

5,200,664
SURFACE ACOUSTIC WAVE DEVICE
Kazuyoshi Sugai, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan
Filed Jul. 9, 1991, Ser. No. 727,557
Claims priority, application Japan, Jul. 10, 1990, 2-183631
Int. Cl.[5] H01H *9/25*
U.S. Cl. 310—313 R 12 Claims



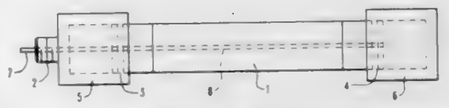
5. A surface acoustic wave device comprising: a substrate having a surface, an epitaxial layer provided on said surface of said substrate and having a surface on a side thereof remote from said substrate; an insulating layer provided on said surface of said epitaxial layer and having a surface on a side thereof remote from said epitaxial layer; a piezo-electric layer provided on said surface of said insulating layer and having a surface on a side thereof remote from said insulating layer; an input transducer and an output transducer provided on said surface of said piezo-electric layer at spaced locations; a gate electrode provided on said surface of said piezo-electric layer between said input transducer and said output transducer; an array of first diodes provided on said surface of said epitaxial layer substantially in alignment with said gate electrode; an array of conductive strips provided on said surface of said piezo-electric layer on a side of said input transducer remote from said output transducer; and a plurality of second diodes each having an anode connected to a respective one of said conductive strips, said second diodes having cathodes which are connected to each other.

5,200,665
ULTRASONIC ACTUATOR
Tamotsu Iijima, Yamanashi, Japan, assignor to Nisca Corporation, Yamanashi, Japan
Filed Oct. 8, 1991, Ser. No. 772,889
Claims priority, application Japan, Nov. 21, 1990, 2-316659
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 12 Claims



1. An ultrasonic actuator comprising:
an elastic vibration member of a rectangular plate having a shape capable of concurrently inducing longitudinal and bending vibrations each forming vibrational loops and nodes with an alternating current of resonant frequency, said vibration member having two opposite excitation surfaces being broadest in area, and two opposite most slender planes perpendicular to said opposite excitation surfaces, said most slender planes having oppesite end portions,
at least one vibrator attached to at least one of said excitation surfaces of the vibration member and located at one of the vibrational nodes of the longitudinal vibrations and one of the vibrational loops of the bending vibrations induced in said vibration member,
at least one exciting current source for applying the alternating current to said vibrator to induce the longitudinal and bending vibrations in said vibration member,
one of said most slender planes of said vibration member having two motion extracting means defined at the opposite end portions of said most slender plane at which two of the vibrational loops opposite in phase of the bending vibrations are induced, and
a disk-shaped moving object being in press contact with both said motion extracting means.

5,200,666
ULTRASONIC TRANSDUCER
Martin Walter, and Dieter Weber, both of Karlsbad, Fed. Rep. of Germany, assignors to Martin Walter Ultraschalltechnik G.m.b.H., Straubenhardt, Fed. Rep. of Germany
Filed Mar. 7, 1991, Ser. No. 665,995
Claims priority, application European Pat. Off., Mar. 9, 1990, EP90104490
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 8 Claims



1. An ultrasonic transducer for the transmission of ultrasonic energy of a predetermined wavelength to a liquid, comprising: a rod-like resonator of a length between opposite end faces thereof which is ½ or a multiple thereof of said predetermined wavelength and an ultrasonic generator with an ultrasonic energy emitting end structure coupled to each of the opposite end faces of said rod-like resonator, said ultrasonic generators being adapted to operate synchronized at the same frequency for providing longitudinal ultrasonic vibration waves of the same wavelength to said resonator from its opposite ends for simultaneous synchronized energization of said rod-like resonator from its opposite ends so as to provide for efficient ultrasonic signal emission radially from said rod-like resonator.

5,200,667
COLOR CATHODE-RAY-TUBE WITH ELECTRICAL AND OPTICAL COATING FILM
Yasuo Iwasaki, and Hiroshi Okuda, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 3, 1991, Ser. No. 695,322
Claims priority, application Japan, May 10, 1990, 2-122364; May 29, 1990, 2-138768
Int. Cl.[5] H01J *29/89*
U.S. Cl. 313—478 7 Claims

1. A color cathode ray tube, comprising:
a face plate; and
a coating film including a polymer of silicon alkoxide, translucent and conductive particles, and a plurality of types of dyes or pigments and formed over an outer surface of said face plate;
said coating film having a main absorption band with an absorption peak in a range between a wavelength of 570 nm and a wavelength of 610 nm which is between a main

spectrum of green luminescence and a main spectrum of

one ionizable gas or gas mixture and, optionally, at least

a capacitative divider circuit for maintaining the first electri-

5,200,672
CIRCUIT CONTAINING SYMMETRICALLY DRIVEN COIL

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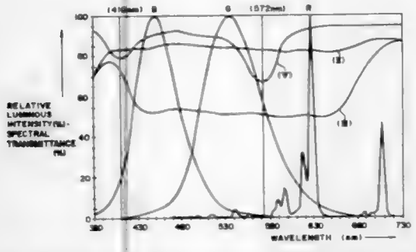
spectrum of green luminescence and a main spectrum of red luminescence;



said coating film further having a sub-absorption band with a maximum sub-absorption peak in a range between a wavelength of 380 nm and a wavelength of 420 nm.

5,200,668

LUMINESCENCE ELEMENT

Yutaka Ohashi, Fujisawa; Atsuhiko Nitta; Nobuhiro Fukuda, both of Yokohama, and Hiroshi Waki, Mitaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

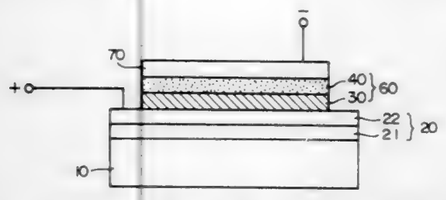
PCT No. PCT/JP89/01181, § 371 Date Jul. 18, 1990, § 102(e) Date Jul. 18, 1990, PCT Pub. No. WO90/05998, PCT Pub. Date May 31, 1990

PCT Filed Nov. 21, 1989, Ser. No. 536,567

Claims priority, application Japan, Nov. 21, 1988, 1-292467; Jan. 25, 1989, 1-13983; Feb. 7, 1989, 1-26578

Int. Cl.[5] H05B *33/12, 33/14, 33/26*

U.S. Cl. 313—498 **7 Claims**



1. A luminescence element which comprises two electrode layers at least one of which is transparent or translucent and a luminescence function-manifesting layer provided between these two electrode layers, the luminescence function-manifesting layer comprising an inorganic semiconductor thin film layer and an organic semiconductor thin film layer.

5,200,669

ELEVATED POWER HIGH-PRESSURE DISCHARGE LAMP

Angus Dixon; Hans-Werner Goelling, both of Berlin; Jörn Dierks, Penzing, and Jürgen Begemann, München, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen m.b.H, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1991, Ser. No. 766,451

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1990, 9013735[U]

Int. Cl.[5] H01J *61/36*

U.S. Cl. 313—623 **22 Claims**

1. An elevated power high-pressure discharge lamp having an essentially rotation-symmetrical quartz glass discharge vessel (**1**, **9**, **19**) including

a discharge bulb portion (**2**, **10**) defining a discharge space, and

two oppositely extending neck portions (**3**, **11**, **20**);

a fill within the discharge space, said fill including at least one ionizable gas or gas mixture and, optionally, at least one of: mercury; a metal halide;

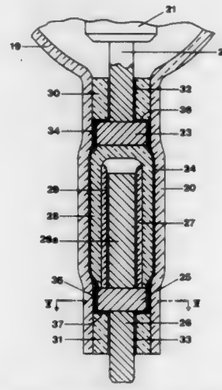
two tungsten electrode systems melt-sealed to the discharge vessel, each of said two systems having:

an electrode head (**21**);

an electrode shaft element (**4**, **12**, **22**) supporting the respective electrode head which extends from the discharge space into a respective neck portion (**3**, **11**, **20**);

a current supply lead element (**15**, **26**) extending outwardly from the respective neck portion;

at least one molybdenum sealing foil (**5**, **14**, **24**) in the respective neck portion (**3**, **11**, **20**) electrically connecting the electrode shaft element (**4**, **12**, **22**) to the respective current supply lead element (**15**, **26**);



said at least one sealing foil (**5**, **14**, **24**) being gas-tightly melt-sealed into the respective neck portion; and

wherein each of said systems comprises

a metal foil (**6**, **16**, **17**, **18**, **29**, **32**, **33**, **34**, **35**, **36**, **37**) surrounding, at least in part, at least one of:

the electrode shaft element (**4**, **12**, **22**);

the current supply lead element (**15**, **26**); in a region where the at least one electrode shaft element and the current supply lead element is located in the neck portion (**3**, **11**, **20**), the metal foil being positioned between the at least one electrode shaft element and the current supply lead element and the material of the neck portion, and

wherein said metal foil comprises a high temperature resistant material defining a metal foil surface, and where the metal foil surface of the metal foil is embossed.

5,200,670

SURFACE DISCHARGE PLASMA CATHODE ELECTRON BEAM GENERATING ASSEMBLY

Simon J. Scott, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Oct. 4, 1990, Ser. No. 592,048

Claims priority, application United Kingdom, Oct. 6, 1989, 8922602

Int. Cl.[5] H05H *1/24*

U.S. Cl. 315—111.91 **16 Claims**

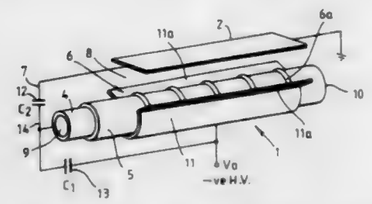
1. A surface discharge plasma cathode electron beam generating assembly, including:

an anode maintainable at a substantially constant first potential;

a cathode device, said cathode device having a first electrically conductive member, a dielectric member at least partially surrounding the first member, and electrically conductive means disposed on the surface of the dielectric member most remote from the first member and insulated from said first member;

only a single high voltage source; and

a capacitative divider circuit for maintaining the first electrically conductive member at a second potential different from said first potential and for maintaining the electrically conductive means at a high negative third potential relative to said first and second potentials, so that only a



small fraction of the total voltage supplied by the source to the anode and cathode device is applied across the dielectric member to ionize gas and create a plasma in a gap between the anode and the electrically conductive means and the full potential across the gap is used to form and accelerate an electron beam in the gap.

5,200,671

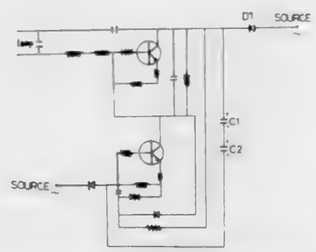
FILAMENT-FREE LAMP TUBE STRUCTURE

Chang-Tai Wang, No. 28, Lane 61, Su-Chung St., Ho-Ping Lee, Su-Lin Cheng, Taipei Hsien, Taiwan

Filed Feb. 24, 1992, Ser. No. 840,491

Int. Cl.[5] H05B *41/29*

U.S. Cl. 315—209 R **5 Claims**



1. A filament-free lamp tube structure comprising

a filament-free lamp tube having two pins without a filament between them, one on each end of said tube;

an AC source;

an electronic circuit including

rectifying and filtering means connected to said AC source to rectify and filter said AC source,

charging-discharging means to generate a pulse, connected to said rectifying and filtering means,

oscillating and amplifying circuit means to produce a high frequency signal connected to receive said pulse,

said pins of said filament-free lamp tube connected to receive said high frequency signal from said oscillating and amplifying circuit

whereby said high frequency signal excites the electrons in said filament-free lamp tube to collide with the walls of said tube to generate light from said lamp tube.

5,200,672

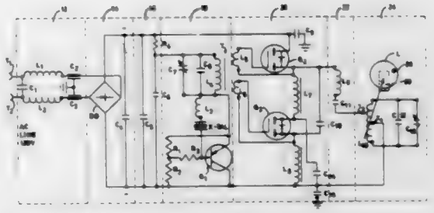
CIRCUIT CONTAINING SYMETRICALLY-DRIVEN COIL FOR ENERGIZING ELECTRODELESS LAMP

Iosif Sheynberg, Lynn, and Fred Whitney, Salem, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Nov. 14, 1991, Ser. No. 792,120

Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—248 **3 Claims**



1. An arrangement comprising:

an electrodeless discharge lamp including a sealed envelope enclosing an ionizable medium capable of emitting radiant energy when subjected to a radio frequency field; and

circuit means for operating said electrodeless discharge lamp, said circuit means comprising:

a pair of AC terminals adapted to receive an AC signal from an AC power supply;

DC power supply means coupled to said AC input terminals for generating a DC voltage;

oscillator means coupled to said DC power supply means for generating an output signal at a given radio frequency;

RF amplifier means responsive to said oscillator output signal, said RF amplifier means being a Class E amplifier including first and second semiconductor switches connected in series with said DC power supply; and

an output tank circuit including an induction coil and capacitor means connected in parallel and responsive to the output of said RF amplifier, said induction coil being positioned in close physical proximity to said envelope for coupling to said ionizable medium an electric field having a magnitude sufficient to initiate ionization of said ionizable medium and a magnetic field for maintaining said ionization, said induction coil having a pair of ends and having an input tap and a return tap coupled to the output of said RF amplifier and adapted to by symmetrically driven by said RF amplifier whereby the instantaneous voltage between one end of said induction coil and said return tap is the same as the instantaneous voltage between the other end of said induction coil and said return tap.

5,200,673

METHOD AND DEVICE FOR SUPPRESSION OF LEAKAGE OF MAGNETIC FLUX IN DISPLAY APPARATUS

Hideo Hishiki, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 663,059, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 430,620, Oct. 31, 1989, abandoned. This application Jan. 10, 1992, Ser. No. 819,630

Claims priority, application Japan, Oct. 31, 1988, 63-274672

Int. Cl.[5] H01J *29/56*

U.S. Cl. 315—370 **9 Claims**

1. A device for suppression of leakage of magnetic flux in a cathode ray tube display apparatus which comprises at least a cathode ray tube having a face plate with top and bottom rims and a side rim and a horizontal plane which horizontally crosses the face plate at a vertical center thereof and is approximately perpendicular to the face plate, and horizontal beam deflection means generating the leakage of magnetic flux, said

deflection means comprising a pair of upper and lower coils, includes a slave manipulator arm for working on a workpiece,

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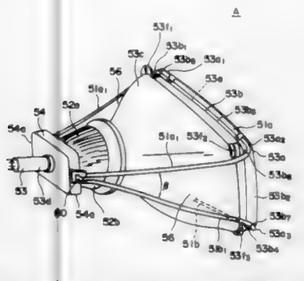
deflection means comprising a pair of upper and lower coils each of which has a bent-up section producing a first magnetic field which deflects an electron beam of the cathode ray tube, and a second magnetic field produced as the leakage of magnetic flux, said first and second magnetic field forming a boundary plane therebetween so that two boundary planes are formed of said upper and lower deflection coils, respectively, said device comprising:

a pair of conductor means each of which has a main portion and two lead portions connected to the main portion, said main portion of the pair of conductor means being disposed substantially within said boundary plane and substantially along the top and bottom rims of the face plate, respectively, each of said lead portions of the pair of



conductor means being rigidly mounted along a side wall of a funnel of the cathode ray tube so that one end of the lead portion is bent along the side rim of the face plate to couple with said main portion and another end of the lead portion extends directly and linearly toward a rear portion of said horizontal beam deflection means, each of said lead portions being arranged so as to establish an additional magnetic flux which contributes to the suppression of leakage of magnetic flux, and each of said lead portions progressively approaching said horizontal plane as the lead portion extends toward the rear of the horizontal beam deflection means, said pair of conductor means being driven with a current proportional to a horizontal deflection current flowing through said horizontal beam deflection means.

5,200,674

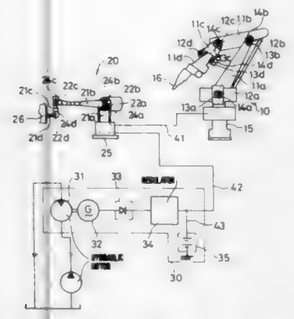
ELECTRIC POWER SUPPLY DEVICE FOR MOBILE VEHICULAR APPARATUS WITH AERIAL CABIN HAVING FORCE-FEEDBACK MANIPULATOR

Mineyuki Fujimoto, and Kouichi Tsurumaki, both of Okegawa, Japan, assignors to Aichi Sharyo Co., Ltd., Nagoya, Japan

Filed Nov. 8, 1990, Ser. No. 610,771

Int. Cl.[5] H02P *7/00*

U.S. Cl. 318—34 **6 Claims**



1. An electric power supply device on a mobile vehicular apparatus having a force-feedback manipulator device which includes a slave manipulator arm for working on a workpiece, a master control arm for controlling the slave manipulator arm to work on the workpiece, and a DC electric actuator mounted on the master control arm, for applying an amount of mechanical energy corresponding to a load on the slave manipulator arm, to the master control arm, said electric power supply device supplying electric energy to the DC electric actuator, said electric power supply device comprising:

an AC generator;

a rectifier connected to said AC generator, for rectifying an electric current generated by said AC generator;

a regulator connected to said rectifier, for maintaining the voltage with respect to the rectified electric current at a constant level, said regulator being connected to a power line for transmitting the electric current at the constant-level voltage to the DC electric actuator; and

a battery connected to said power line, wherein said battery is adapted to assist said AC generator when said AC generator is incapable of supplying sufficient power at times when said manipulator device is under large loads.

5,200,675

COMMUTATION CIRCUIT FOR A BRUSHLESS D.C. MOTOR

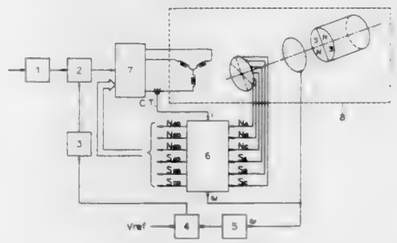
Kwangjoon Woo, Seoul, Rep. of Korea, assignor to Zen Zen Electric Company Ltd., Seoul, Rep. of Korea

Filed Nov. 5, 1991, Ser. No. 788,332

Claims priority, application Rep. of Korea, Nov. 6, 1990, 90-17914

Int. Cl.[5] H02P *5/00*

U.S. Cl. 318—254 **9 Claims**



1. A commutation circuit for a trapezoidal drive brushless D.C. motor, said motor having a commutation angle, an angular motor velocity and a load current, said circuit generating reference commutation pulses and a control commutation pattern and comprising:

a) an αROM for storage of a commutation advance pulse represented by a commutation advance angle α as a sequence of address signals, said commutation advance angle being calculated as an inverse tangent function of said motor velocity and said load current;

b) an αROM address area supplying said address signals into address terminals of said αROM;

c) a pattern ROM outputting a control commutation pattern, said control commutation pattern being either a starting commutation pattern or a driving commutation pattern;

d) a pattern ROM address area comprising:

i) a presettable up-counter using the output of a binary counter as a clock signal to generate a driving pattern, said binary counter having been preset at every reference commutation pulse by said commutation advance angle (α); and

ii) a data selector to select between said starting commutation pattern and said driving commutation pattern;

e) a control signal selecting area outputting a pattern selection signal into said data selector to select said starting or driving pattern for output; and

f) a direction-of-rotation selector outputting a clockwise or counterclockwise rotation signal to said pattern ROM;

whereby in said running state said motor commutation is advanced by said advance angle α.

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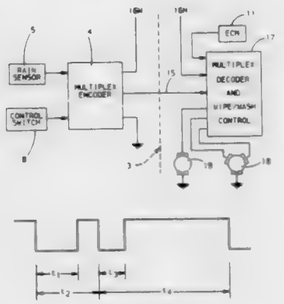
MULTIPLEXED VEHICLE WINDOW WIPER CONTROL

Donald L. Mueller, Dayton; Michael B. Monahan, Miamisburg, and Amanda R. Wright, Fairborn, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 734,025, Jul. 22, 1991, abandoned, which is a continuation of Ser. No. 633,627, Dec. 20, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 865,620

Int. Cl.[5] B60S *1/08*

U.S. Cl. 318—444 **14 Claims**



1. In a window wiper system for an automotive vehicle including a control switch, another wiper control device and a wiper mechanism including a motor, a two-channel time division multiplex controller, said controller comprising:

a multiplex encoder and a multiplex decoder interconnected by a conductor extending through the firewall over which a multiplex control signal is applied from the encoder to the decoder;

the multiplex encoder including means for generating the multiplex control signal as a cyclical waveform containing alternating cycles of different first and second periods wherein the duty cycle of the first period cycles is determined by the other wiper control device and the duty cycle of the second period cycles is determined by the control switch; and

the multiplex decoder including means for controlling the wiper mechanism in response to the respective duty cycles of the first period cycles and the second period cycles.

13. In a window wiper system for an automotive vehicle including a control switch, a resistive rain sensor mounted on an external surface of a vehicle window and a wiper mechanism including a motor controlled at least in part in response to a rain sensor signal and in part in response to another wiper signal, apparatus for generating a wiper control signal comprising, in combination:

means for determining periods of substantially equal time duration during which the rain sensor is alternately monitored and not monitored;

means effective to provide a DC voltage across the rain sensor in a first direction during those periods in which the rain sensor is monitored and in an opposite direction during those periods in which the rain sensor is not monitored, whereby electrical polarization of water on the vehicle window is minimized; and

means for generating the rain sensor signal in response to the resistance of the rain sensor during those periods in which the rain sensor is monitored and generating another wiper signal during those periods in which the rain sensor is not monitored.

5,200,677

METHOD AND APPARATUS FOR CONTROLLING POSITIONING MEANS

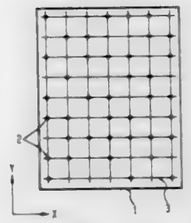
Gunter Dueck, Neckargemuend, and Ulrich Schauer, Sinsheim, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1992, Ser. No. 877,309

Claims priority, application European Pat. Off., Jul. 18, 1991, 91112012.9

Int. Cl.[5] G05B *19/405*

U.S. Cl. 318—567 **13 Claims**



1. A method of controlling a tool for processing predetermined workpiece surface target locations on a workpiece surface, comprising the steps of:

dividing a workpiece surface having a plurality of predetermined workpiece surface target locations thereon into sections so as to form a geometrical coarse structure, wherein the workpiece surface target locations within each section forms a geometrical fine structure;

forming an individual route within each section, wherein each workpiece surface target location within each section is accessible by the individual route corresponding to the section in which the workpiece surface target location is located;

forming a final accessing route, wherein each individual route is accessible from an adjacent individual route, and wherein each workpiece surface target location is accessible by the final accessing route; and

successively processing each workpiece surface target location in accordance with the final accessing route with the tool.

5,200,678

MOTOR DRIVING CONTROL APPARATUS

Mutuo Tokashiki, Narashino; Kazumasa Sugiyama, Funabashi; Sumio Kobayashi, Chiba; Hiroshi Sugai, Sakura, and Kazuyuki Nakagawa, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Chiba, both of Japan

Filed Nov. 6, 1990, Ser. No. 609,660

Claims priority, application Japan, Nov. 24, 1989, 1-303171

Int. Cl.[5] G05B *19/42*

U.S. Cl. 318—568.13 **21 Claims**

1. A motor driving control apparatus for driving a motor according to a control command from an external apparatus, in which said motor driving control apparatus comprises:

test operation control command generation means for generating a control command having a predetermined pattern for driving said motor in a test operation;

control command selection means for selecting one of the control command from said external apparatus and the control command from said test operation control command generation means as a control command for said motor; and

operation analysis means for analyzing an operation of said

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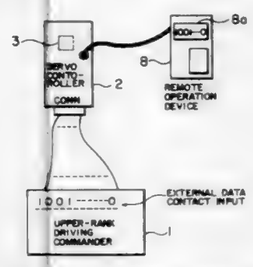
motor in accordance with the control command from said test operation control command generation means, thereby providing said motor driving control apparatus with a self-diagnosis function.

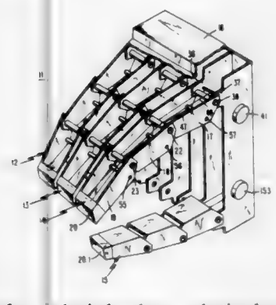


5,200,679

ARTIFICIAL HAND AND DIGIT THEREFOR

Douglas F. Graham, 2427 Fort Scott Dr., Arlington, Va. 22202

Filed Feb. 22, 1990, Ser. No. 483,180
Int. Cl.[5] B25J *15/08*
U.S. Cl. 318—568.16 32 Claims



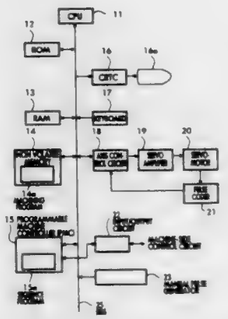
1. A digit for a robotic hand or a robotic claw manipulator or a prosthetic device comprising guide means and phalanx means between a tip and root of the digit, a tactile sensor, a reversible motor having a shaft, first and second reels on the shaft; first and second cables, said first and second cables having a first end fixedly connected to displaced first and second points on the tip of the digit, respectively, and a second end connected to be driven by said reversible motor shaft; the first ends of the first and second cables being wound in opposite directions on the first and second reels so that in response to said shaft being turned in the first direction by the motor being activated in the first direction the first cable is wound on the first reel and the second cable is paid from the second reel and in response to said shaft being turned in the second direction by the motor being activated in the second direction the second cable is wound on the second reel and the first cable is paid from the first reel, said cables being positioned and connected to (a) said reversible drive means, (b) said first and second points and (c) said guide means, and (a) said phalanx means, (b) said first and second points, (c) said drive means and (d) said guide means being positioned and arranged so that in response to said drive means being activated in a first direction the first cable exerts a tensile force on said first point and a compressive force on the guide means to cause the phalanx means to be urged from a bent position toward a straight position and in response to said drive means being activated in a second direction the second cable exert a tensile force on said second point and a compressive force on the guide means to cause the phalanx means to be urged away from a straight position toward an object being grasped until the compressive force exerted on said object reaches a predetermined level subject to which said tactile sensor is responsive.

5,200,680

FEED SPEED CONTROL METHOD FOR A NUMERICAL CONTROL DEVICE

Takao Sasaki, Hachioji; Kentaro Fujibayashi, Musashino; Toshiaki Otsuki, Hino, and Yasuhiro Saito, Minamitsuru, all of Japan, assignors to Fanuc Ltd., Japan

PCT No. PCT/JP90/01028, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO91/03778, PCT Pub. Date Mar. 21, 1991
PCT Filed Aug. 10, 1990, Ser. No. 651,267
Claims priority, application Japan, Aug. 29, 1989, 1-221963
Int. Cl.[5] G05B *19/407, 13/00*
U.S. Cl. 318—571 5 Claims



1. A feed speed control method for a numerical control device controlling a servomotor driving a tool at a feed speed and traveling along an instructed machining path in accordance with a machining program, the feed speed control method comprising the steps of:

(a) computing an approximated acceleration of each axis of each plane on which the tool travels on the instructed machining path based on a difference in speed between adjacent blocks and distribution distances and speeds of the adjacent blocks according to: $\alpha=\Delta V/\text{minimum}(1m/Vm, 1n/Vn)$ where α is the approximated acceleration, ΔV is the difference in speed between the adjacent blocks and minimum(1m/Vm, 1n/Vn) is the minimum value of each of the distribution distances divided by each of the respective speeds of the adjacent blocks;

(b) computing first ratios of a permissible acceleration to the approximated acceleration for each axis when one of the approximated acceleration of each axis is larger than a permissible acceleration according to: $K2=(\alpha max/\alpha)$ where K2 is the first ratios and αmax is the permissible acceleration;

(c) selecting a smallest first ratio of the first ratios of each axis; and

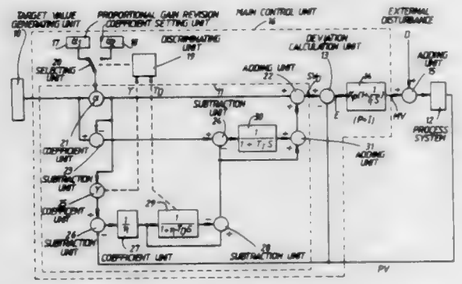
(d) computing an actual feed speed by multiplying the smallest first ratio with a command speed according to: $F=Fc$ minimum(K2) where F is the actual feed speed and Fc is the command feed speed and controlling the device responsive to the actual feed speed.

5,200,681

PROCESS CONTROL SYSTEM

Kazuo Hiroi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 660,003, Feb. 25, 1991, abandoned.
This application Jul. 6, 1992, Ser. No. 908,754
Claims priority, application Japan, Mar. 9, 1990, 2-58438
Int. Cl.[5] G05B *11/42*
U.S. Cl. 318—610 6 Claims



1. A control system for controlling a process system subject to an external disturbance by adjusting the value of a control amount signal output from the process system to a target signal value, the control system comprising:

target signal generating means for generating a target signal having the target signal value; and

main control means, operatively coupled to the target value signal generating means to receive the target signal and the control amount signal for suppressing fluctuation of the control amount signal value produced by the external disturbance and for adjusting the control amount signal value to the target signal value, the main control means including

suppressing means for performing at least proportional and integral control operations on the control amount signal from a choice of proportional, integral and derivative control operations based on control constants including at least one of proportional gain and integral time from a choice of proportional gain, integral time and derivative time values, at least one of the control constants being adjusted to suppress fluctuation of the control amount signal value produced by the external disturbance,

adjusting means for performing at least proportional and integral control operations on the target signal and the control amount signal from a choice of proportional, integral and derivative control operations according to at least a proportional gain revision coefficient to adjust the proportional gain applied by the suppressing means from a choice of the proportional gain revision coefficient and a derivative time revision coefficient to adjust a the derivative time applied by the suppressing means, and to adjust the control amount signal value to the target signal value,

proportional gain revision coefficient means for setting a plurality of proportional gain revision coefficients, and

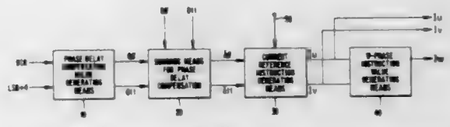
coefficient selecting means for discriminating whether the suppressing means performs a derivative control operation and whether the adjusting means performs a derivative control operation, and for selecting one of the proportional gain revision coefficients from among the plurality of proportional gain revision coefficients according to the discrimination result.

5,200,682

MOTOR CURRENT PHASE DELAY COMPENSATING METHOD AND APPARATUS THEREOF

Dong-Il Kim, Seoul; Hyo-Kyu Kim, and Sang-Kwon Im, both of Suwon-shi, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 14, 1991, Ser. No. 744,900
Claims priority, application Rep. of Korea, Aug. 14, 1990, 90-12550
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—632 8 Claims



1. A motor current phase delay compensating apparatus comprising:

a speed detecting means for detecting the speed of a rotor;

an A/D converter for converting an analog signal of a resolver outputted from said speed detecting means into a digital signal;

a rotational direction discriminating means for discriminating a rotational direction of a servo motor;

a phase delay compensation value generating means which receives an output signal of said A/D converter and an output signal of said rotational direction discriminating means and outputs a phase delay value with respect to the speed of the rotor;

a summing means for phase delay compensation which sums the output signal of said phase delay compensation value generating means and the output signal of the A/D converter and outputs a phase delay compensation amount;

a current reference instruction value generating means which receives the output from said summing means for phase delay compensation and an output from a speed PI controller and outputs U-phase and V-phase analog reference instruction values; and

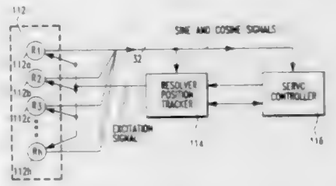
a W-phase current reference instruction value generating means which sums said U-phase and V-phase analog current reference instruction values and outputs a W-phase analog reference instruction value so as to control the current phase delay slowing to a stator coil winding of motor.

5,200,683

METHOD FOR OPTIMIZING SAMPLING RATES FOR POSITION TRACKING FOR MOTION CONTROL SYSTEMS

Donald K. Taylor, Piney Flats; Richard J. Maczka, and Carl H. Russell, III, both of Johnson City, all of Tenn., assignors to Siemens Industrial Automation, Inc., Johnson City, Tenn.

Filed Jan. 30, 1992, Ser. No. 828,322
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—661 5 Claims



1. A jitter condition detecting system for a resolver position

tracking system (RPT), said RPT having a plurality of sam-

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a battery pack having first, second, and third contacts dis-

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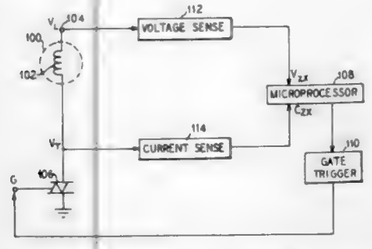
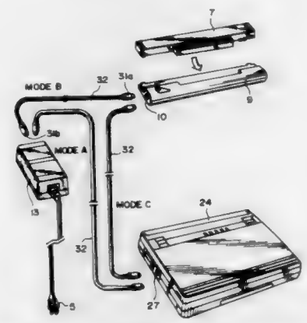
tracking system (RPT), said RPT having a plurality of sampling rates for sampling resolver positions throughout at least three sequential quadrants over time, comprising:
detection means for determining a first, a second and a third position of said resolver;
storage register means for storing said first, second and third positions of said resolver;
switching means for changing said sampling rates; and
control means for comparing said first, second and third positions stored in said storage register and activating said switching means when said first, second and third positions are in the same sequence as said quadrants.

5,200,684
ELECTRICAL MOTOR MONITORING SYSTEM FOR A DOMESTIC APPLIANCE
Clarence H. Fisher, Royalton Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Continuation of Ser. No. 503,139, Mar. 30, 1990, Pat. No. 5,075,613, which is a continuation of Ser. No. 182,509, Apr. 18, 1988, abandoned. This application May 28, 1991, Ser. No. 706,259
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—809 **14 Claims**



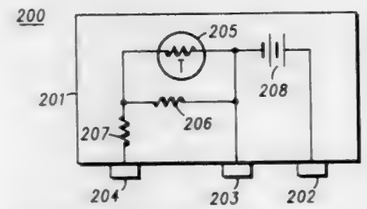
1. A drive system for an automatic appliance having a drum rotatable about a horizontal axis, comprising:
an induction motor mounted within the appliance;
an alternating voltage/current source operatively coupled to said motor;
means for linking said motor to said drum;
means for connecting sad motor to said voltage/current source at a point in time T1 and for disconnecting said motor at a next zero crossing of said alternating current;
means for sensing said alternating current flowing in said motor and providing a current signal indicative of a zero crossing of said alternating current;
means for sensing said alternating voltage and providing a voltage signal indicative of a zero crossing of said alternating voltage;
means for digitizing a voltage across said means for connecting and disconnecting said motor to said alternating voltage which simplicity measures said motor's back emf, and providing a digital output;
a microprocessor receiving said voltage signal, said current signal, and said digital voltage providing a trigger signal at an output thereof connected to a control input of said means for connecting and disconnecting, said microprocessor providing said trigger signal at said point in time T1 to said means for connecting and disconnecting after receiving said current signal indicative of a zero crossing of said alternating current, said microprocessor having an nut coupled to said means for digitizing and including means for storing a plurality of digital outputs for a time interval between said point in time T1 and a last previous zero crossing of said alternating current, said microprocessor determining said motor emf from said digitized voltages to monitor at least one appliance operating condition so that said appliance operating condition is controlled directly.

5,200,685
ADAPTER FOR EXTERNAL BATTERY AND BATTERY SYSTEM
Kenji Sakamoto, Ora, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Jul. 24, 1991, Ser. No. 734,937
Claims priority, application Japan, Jul. 31, 1990, 2-203255
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—2 **13 Claims**



1. A system comprising an adapter for a chargeable external battery in combination with a charger, said adapter being provided for selectively connecting the chargeable external battery to a computer or the charger, the charger comprising a constant current source, and the adapter comprising:
A) a battery connector having a common terminal for connecting the adapter to the chargeable external battery;
B) an external device connector including a through terminal which is connected to the common terminal of the battery connector, a power output terminal for outputting power from the external battery, and a power input terminal which is independent of the power output terminal for receiving a current from the constant current source for charging the external battery;
C) a first diode provided in a current path between the power output terminal and the battery connector so as to selectively conduct current from the external battery only to the power output terminal; and
D) a second diode provided between the power input terminal and the battery connector so as to selectively conduct current from the power input terminal only to the external battery.

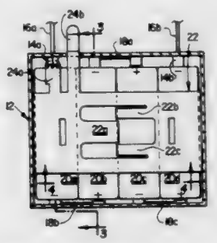
5,200,686
METHOD AND APPARATUS FOR DETERMINING BATTERY TYPE
Steven S. Lee, Northbrook, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 10, 1991, Ser. No. 774,435
Int. Cl.[5] H02J *7/00*; **H01M** *10/44*
U.S. Cl. 320—2 **6 Claims**



1. A battery charger apparatus comprising:

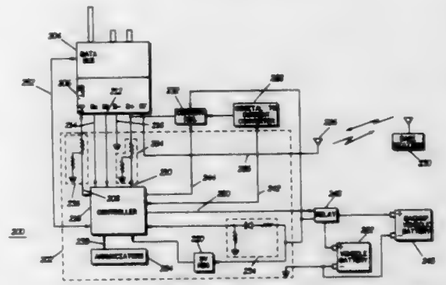
a battery pack having first, second, and third contacts disposed upon an exterior surface, the battery pack including:
one or more rechargeable cells arranged between the first and second contacts;
a thermistor and a first resistor in parallel combination, with one end of the combination connected to the second contact;
a second resistor connected between the other end of the combination and the third contact;
a battery charger including:
a pocket having first, second, and third contacts, the pocket constructed and arranged so that the first, second, and third contacts of the pocket operably engage the first, second, and third contacts, respectively, of the battery pack;
a plurality of current sources that may be enabled individually or in combination, the current sources coupled to the first contact of the pocket;
means for measuring voltage coupled to the third contact of the pocket;
controller means, coupled to the plurality of current sources and to the means for measuring voltage, for selectively enabling one or more of the current sources in response to the measured voltage.

5,200,687
ENERGY STORAGE SYSTEM FOR BOTH CHARGING AND DISCHARGING
Jonas Lindblom, and Erik Johnsson, both of Upplands Vasby, Sweden, assignors to Victor Technologies AB, Sweden
Filed Apr. 30, 1991, Ser. No. 693,659
Int. Cl.[5] H01M *10/04*
U.S. Cl. 320—2 **10 Claims**



1. An energy storage system comprising:
a plurality of chargeable batteries, each having a positive terminal and a negative terminal disposed at its respective ends;
means for connecting said batteries in a side-by-side relationship;
a receptacle for receiving said batteries, said receptacle having terminals which are engaged by the respective terminals of said batteries in a manner to establish current flow through said batteries; and
two conductors extending from corresponding terminals of said receptacle for supplying electrical energy from said batteries to an external circuit;
said connecting means electrically connecting one of said batteries to a power source for conducting current from said power source to said batteries to charge said batteries.

5,200,688
VEHICULAR CHARGER
Joseph Patino, Plantation, and Henry A. Bogut, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 31, 1991, Ser. No. 708,572
Int. Cl.[5] H02J *7/00*; **H01M** *10/48*
U.S. Cl. 320—13 **10 Claims**



9. A method of charging a battery operated radio having a battery from a vehicular battery operated charger, comprising the steps of:
charging the radio battery with the vehicular battery operated charger;
monitoring the voltage level of the vehicular battery;
comparing the vehicular battery voltage level to first and second threshold voltage levels;
generating a first control signal when the vehicular battery voltage drops below the first threshold voltage level;
discontinuing the charging of the radio battery when the first control signal is generated;
automatically annunciating a low battery condition when the vehicular battery voltage level is lower than the first threshold voltage level;
monitoring the voltage level of the radio battery;
comparing the radio battery voltage level to a radio battery voltage threshold level; and
generating a second control signal when the radio battery voltage level is below the radio battery voltage threshold level;
transmitting a low voltage alert signal when the vehicular battery voltage level falls below the second threshold voltage level;
receiving the low voltage alert at a base station; and
transmitting a message from the base station to the battery operated radio which causes a task to be performed by the vehicular battery operated charger.

5,200,689
BATTERY CHARGE MONITOR TO DETERMINE FAST CHARGE TERMINATION
Armando Interiano, Houston; Randall L. Hess, Cypress; Patrick R. Cooper, Houston, and Joseph F. Freiman, Cypress, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Jan. 24, 1992, Ser. No. 824,935
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—20 **5 Claims**

1. An apparatus for charging a battery comprising:
a battery;
means for charging said battery at a high rate;
means for charging said battery at a low rate;
means for determining the temperature of said battery;
means for determining the voltage of said battery;
means for indicating a predetermined time interval; and
means coupled to said high rate battery charging means, said low rate battery charging means, said battery temperature monitoring means, said battery voltage determining means and said predetermined time interval means for disabling

said high rate battery charging means and enabling said low rate battery charging means when said battery volt-

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CONTROL SYSTEM FOR EXCITATION OF

indicative of a desired level of current through the load;

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HEAD ASSEMBLY FOR PRINTED CIRCUIT BOARD

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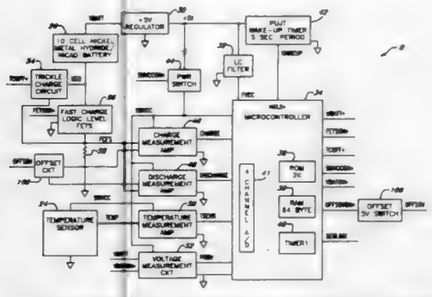
said high rate battery charging means and enabling said low rate battery charging means when said battery voltage has remained constant for said predetermined interval



and said battery temperature has increased by a predetermined amount during said predetermined interval and for indicating that said battery is fully charged upon said disabling of said high rate battery charging means.

5,200,690

QUICK CHARGE CONTROL APPARATUS AND CONTROL METHOD THEREOF

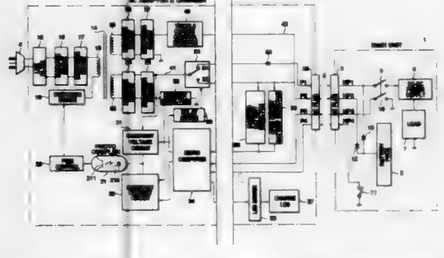
Zenjiro Uchida, Ashikaga, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 30, 1991, Ser. No. 769,114

Claims priority, application Japan, Oct. 1, 1990, 2-264710; Nov. 14, 1990, 2-309422

Int. Cl.[5] H02J *7/04*

U.S. Cl. 320—20 **15 Claims**



1. A quick charge control apparatus for effecting quick charging of a secondary battery during a charging period which includes an initial stage at the beginning of the charging period, comprising:

(a) a charging circuit for supplying a charging current for quick charge use to the secondary battery;

(b) constant current means for effecting control so as to maintain the charging current from the charging circuit to the secondary battery at a selected value;

(c) switching means for effecting step switching of a current value of the charging current from the constant current means; and

(d) controller means for controlling the switching means in such a manner as to cause a step increase of the value of the charging current supplied to the secondary battery during successive predetermined periods in the initial stage of the charging period.

5,200,691

CONTROL SYSTEM FOR EXCITATION OF SYNCHRONOUS MACHINE

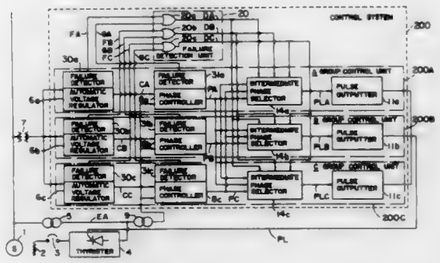
Hitoshi Murakami, Sayama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1991, Ser. No. 670,869

Claims priority, application Japan, Mar. 16, 1990, 2-64123

Int. Cl.[5] H02P *9/00*

U.S. Cl. 320—25 **8 Claims**



1. An excitation control system for a synchronous machine, the control system comprising:

a plural number of group control units that perform control of output pulses of a plural number of phase components, each of the group control units including an automatic voltage regulator portion that outputs a control signal to regulate the terminal voltage of a synchronous machine, a phase control portion that outputs a phase signal to control the phase of a trigger pulse of a thyristor rectifier apparatus that supplies a field current to a field winding of the synchronous machine, an intermediate phase selector portion that selects a phase signal of an intermediate phase from phase signals outputted by the phase control portions of the group control units, and a pulse output portion that outputs the trigger pulse on the basis of the intermediate phase signal selected by the intermediate phase selector portion; and

a logical calculation circuit that supplies to the thyristor rectifier apparatus the logical sum of the trigger pulses from the group control units.

5,200,692

APPARATUS FOR LIMITING CURRENT THROUGH A PLURALITY OF PARALLEL TRANSISTORS

Jeffrey A. Krinsky, Renton, and Tim R. Majoch, Puyallup, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 23, 1991, Ser. No. 764,000

Int. Cl.[5] G05F *1/59, 1/573*

U.S. Cl. 323—269 **13 Claims**

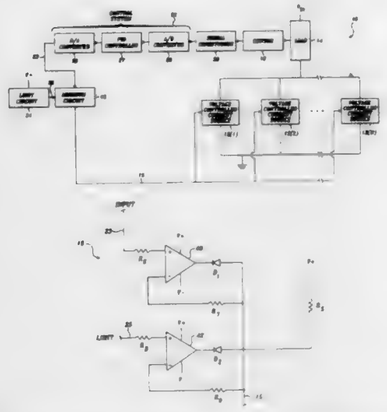
1. Apparatus for controlling current through a load, comprising:

a plurality of current control stages, each current control stage including first, second and third terminals, and means for conducting current between the first and second terminals in response to a control signal present at the third terminal;

minimum circuit means, responsive to first and second input signals, for generating the minimum of the first and second input signals to thereby establish the control signal;

sensing means for determining a value that is a function of the current flow through the load;

feedback means, responsive to said sensing means, for generating the first input signal such that the first input signal is indicative of a desired level of current through the load; and



limit circuit means for generating the second input signal, to thereby establish a maximum current flow through the current control stages.

5,200,693

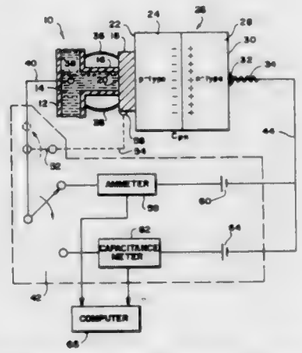
METHOD FOR DETERMINING CHARACTERISTICS OF PN SEMICONDUCTOR STRUCTURES

James Singletery, Jr., Lakeview Terrace, Calif., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,019

Int. Cl.[5] G01R *27/26, 31/22*

U.S. Cl. 324—158 D **8 Claims**



1. A method of determining the carrier concentration and profile depth in a pn semiconductor structure comprising the steps of:

measuring the pn junction intercept voltage of said semiconductor structure to be tested;

determining the pn junction capacitance, C_{pn}, of said semiconductor structure to be tested from said measured intercept voltage;

measuring the carrier concentration and profiling depth of said structure; and,

determining the actual carrier concentration and profile depth from said determined pn junction capacitance and said measured carrier concentration and profiling depth.

5,200,694

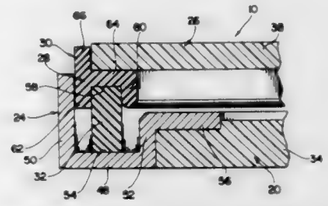
HEAD ASSEMBLY FOR PRINTED CIRCUIT BOARD TEST FIXTURE

Robert J. Nesbitt, and Bruce A. Seavey, both of North Attleboro, Mass., assignors to TTI TesTron, Inc., Woonsocket, R.I.

Filed May 18, 1992, Ser. No. 884,909

Int. Cl.[5] G01R *1/02, 1/04*

U.S. Cl. 324—158 F **11 Claims**



1. In a head assembly for a vacuum actuated test fixture for a printed circuit board including a top plate having top and bottom sides and a perimeter, said top plate being adapted for receiving said printed circuit board in sealed relation thereon, a probe plate having a perimeter and having a plurality of test probes thereon, and support means for supporting said top plate in upwardly spaced relation to said probe plate and for sealing between said top plate and said probe plate so that said top plate is nevertheless downwardly movable toward said probe plate for effecting electrical contact between said test probes and said printed circuit board, the improvement comprising said support means comprising a rigid peripheral support member including a substantially horizontally extending support wall extending adjacent the perimeter of said top plate in downwardly spaced relation thereto, said support wall having a top side and being received in sealed relation on said probe plate, and resilient seal means between said top plate and said support wall extending along the perimeter of said top plate, said resilient seal means including a primary seal member received in sealed engagement with one of either the bottom side of said top plate or the top side of said support wall, and a resilient secondary seal member received in sealed engagement with the other of the bottom side of said top plate or the top side of said support wall, said primary and secondary seal members being positioned one atop the other and cooperating for supporting said top plate on said support wall, said primary seal member normally being maintained in spaced relation to said other of the bottom side of said top plate or the top side of said support wall by said secondary seal member, said secondary seal member being resiliently compressible to draw said primary seal member into sealed engagement with both the bottom side of said top plate and the top side of said support wall.

5,200,695

CONTACT PROBE

Toshio Kazama, Kanagawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 30, 1991, Ser. No. 739,051

Claims priority, application Japan, Jul. 30, 1990, 2-201999

Int. Cl.[5] G01R *1/073*

U.S. Cl. 324—158 P **13 Claims**

1. A contact probe, comprising:

a tubular receptacle having an inner surface defining an inner diameter, a front end, and a rear end, said tubular receptacle including a first shoulder surface at one end thereof;

a needle member slideably received in said tubular receptacle, said needle member including a second shoulder surface at one end thereof;

a compression coil spring coiled around said needle member, the ends of said coil spring respectively abutting said first and second shoulder surfaces, whereby said needle mem-

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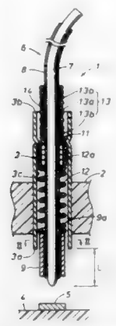
ber is urged out of said front end of said tubular receptacle; and

means for limiting an extent of movement of said needle member out of said front end of said tubular receptacle;



said compression coil spring including a large diameter portion adjacent said first shoulder surface, said large diameter portion adapted to frictionally engage said inner surface of said receptacle, the remainder of said compression coil spring having an outer diameter generally smaller than said inner diameter of said receptacle.

5,200,696

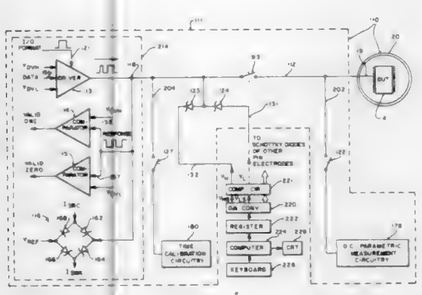
TEST SYSTEM APPARATUS WITH SCHOTTKY DIODES WITH PROGRAMMABLE VOLTAGES

David Menis, Cohasset, Mass.; Harold S. Vitale, Los Gatos, Calif.; Phillip D. Burlison, Morgan Hill, Calif., and William R. DeHaven, Los Altos, Calif., assignors to LTX Corporation, Westwood, Mass.

Continuation-in-part of Ser. No. 581,514, Sep. 10, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 756,325

Int. Cl.[5] G01R *31/22*

U.S. Cl. 324—158 R **6 Claims**



5. An apparatus for a test system for testing an electronic circuit, comprising:

(A) an interconnect path having a first end and a second end, wherein the first end of the interconnect path is coupled to the electronic circuit under test, and wherein the interconnect path transmits a signal from the electronic circuit under test to the second end of the interconnect path;

(B) a comparator coupled to the second end of the interconnect path for receiving and comparing the signal from the electronic circuit under test with a reference voltage, wherein the comparator has a high input impedance, and wherein the comparator provides an output signal to the test system;

(C) a first Schottky diode having an anode and a cathode for reducing ringing of the signal from the electronic circuit under test, wherein the anode of the first Schottky diode is coupled to the interconnect path at a point near the comparator, and wherein the cathode of the first Schottky diode is coupled to a selectable high voltage;

(D) a second Schottky diode having an anode and a cathode for reducing ringing of the signal from the electronic circuit under test, wherein the anode of the second Schottky diode is coupled to a selectable low voltage, and wherein the cathode of the second Schottky diode is coupled to the interconnect path at the point near the comparator; and

(E) programmable means for providing the selectable high voltage and the selectable low voltage, wherein the programmable means comprises:

(1) a computer for receiving a user input to set a first value corresponding to the selectable high voltage and a second value corresponding to the selectable low voltage; and

(2) a digital to analog converter coupled to the computer for receiving the first value and the second value from the computer and for converting the first value into the selectable high voltage and the second value into the selectable low voltage.

5,200,697

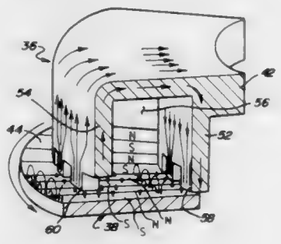
HUB AND BEARING ASSEMBLY WITH INTEGRATED ROTATION SENSOR INCLUDING A TONE RING AND ANNULAR TRANSDUCER

Jonathan M. Adler, and Kevin J. Fontenot, both of Ypsilanti, Mich., assignors to NTN Corporation, Osaka, Japan

Filed Nov. 27, 1991, Ser. No. 800,056

Int. Cl.[5] G01P *3/487, 3/488;* **F16C** *32/00, 19/00*

U.S. Cl. 324—174 **20 Claims**



1. A bearing assembly comprising:

an inner bearing race located radially within an outer bearing race having an axis of rotation,

a plurality of rolling bearing elements located radially between said inner and outer bearing races permitting relative rotation between said races,

a tone ring defining a face having regions of magnetic poles which alternate in polarity along said face, said tone ring being fixed relative to one of said bearing races,

an annular transducer fixed to the other of said bearing races, said transducer having a case made of a ferromagnetic material defining a first set of teeth facing said tone ring face, and a second set of teeth facing said tone ring face, said transducer teeth being arranged relative to said tone ring magnetic pole regions such that said first set of teeth are magnetically coupled to regions of said tone ring defining one magnetic pole while said second set of teeth are magnetically coupled to regions of said tone ring defining the opposite magnetic pole, and said transducer teeth coupled to said tone ring such that said poles exposed to said first and second set of teeth alternate upon relative rotation between said tone ring and said transducer, and

a conductor winding within said transducer whereby an alternating magnetic flux passing through said transducer in response to said relative rotation induces an alternating voltage in said winding.

5,200,698

SYSTEM FOR SENSING THE POSITION OF A ROTATING STEEL SHAFT INCLUDING A TRACK FORMED BY A STRIP HAVING DISCONTINUOUS ELECTRICAL PROPERTIES, AND A METHOD OF MANUFACTURING SUCH A TRACK

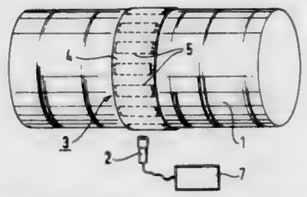
Marc Thibaud, Soisy sous Montmorency, France, assignor to Gec Alsthom SA, Paris, France

Filed Jan. 16, 1990, Ser. No. 465,862

Claims priority, application France, Jan. 17, 1989, 89 00492

Int. Cl.[5] G01B *7/30;* **G01P** *3/49*

U.S. Cl. 324—207.22 **3 Claims**



3. A method of manufacturing a track having areas of non-ferromagnetic metal material on a steel shaft, said track being adapted for use in determining the rotational position of said shaft by sensing the metal areas, said method comprising the steps of: forming a strip of electrical insulating material having regularly distributed areas of non-ferromagnetic metal on one face thereof, and gluing said strip to the periphery of said shaft with the areas of non-ferromagnetic metal facing the shaft and isolated therefrom by said glue.

5,200,699

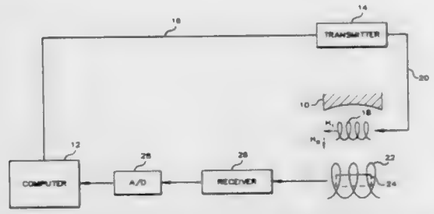
EVALUATION OF LIQUID-CONTAINING SAMPLES USING NUCLEAR MAGNETIC RESONANCE

Bernard A. Baldwin, and Stephen M. Wharry, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 25, 1991, Ser. No. 765,631

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—303 **17 Claims**



1. A method of evaluating the potential production characteristics of a zone of a subterranean formation which extends between a first depth and a second depth comprising:

(a) obtaining at least one sample of the formation from the zone;

(b) substantially saturating the sample with a saturating liquid comprising water;

(c) subjecting the thus saturated sample to a static magnetic field, oriented in a first direction and along a reference frame axis, so as to substantially align the nuclear magnetization of the saturating liquid with the static magnetic field;

(d) subjecting the sample during step (c) to at least one radio frequency pulse, at a resonant frequency with respect to preselected nuclei in the saturating liquid, so as to substantially invert the magnetization of such preselected nuclei to an orientation in a second direction substantially opposite to the first direction;

(e) detecting, at a predetermined delay time following the radio frequency pulse of step (d), a component of the magnetization of the preselected nuclei which is parallel to the reference frame axis;

(f) repeating steps (d) and (e) for at least one other delay time;

(g) determining, from the magnetization component values and corresponding delay times obtained in (e) and (f), the delay time at which the magnetization component is about 0, hereinafter referred to as the NMR zero time; and

(h) determining if the zone is potentially productive of hydrocarbons which are substantially free of water based on the NMR zero time obtained in step (g).

5,200,700

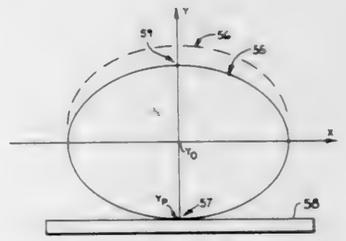
REDUCTION OF NMR ARTIFACTS CAUSED BY TIME VARYING LINEAR GEOMETRIC DISTORTION

Gary H. Glover, Menlo Park, Calif.; Stephen W. Flax, Wauwatosa, Wis., and Ann Shimakawa, San Francisco, Calif., assignors to General Electric, Milwaukee, Wis.

Filed Nov. 30, 1990, Ser. No. 620,177

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **6 Claims**



1. A method for correcting a set of NMR image data comprised of a plurality of digitized NMR signals that are acquired over a period of time during which the subject moves due to respiration, the steps comprising:

(a) measuring the position of the subject as each digitized NMR signal is acquired;

(b) calculating a motion value (ΔY) for each digitized NMR signal which indicates the position of the subject with respect to a reference position;

(c) calculating a magnification factor m(V) for each motion value (ΔY) which is proportional to the motion value (ΔY) and a distance from a stationary point in the subject;

(d) correcting each digitized NMR signal in the NMR image data set using an associated magnification factor m(V); and,

(e) reconstructing an image using the corrected NMR image data set.

5,200,701

MAGNETIC RESONANCE IMAGING APPARATUS WITH REGULATOR FOR REDUCING EDDY CURRENT EFFECTS

Horst Siebold, Erlangen; Ralph Oppelt, Weiher, and Guenter Ries, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 18, 1991, Ser. No. 761,650

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 4029816; European Pat. Off., Aug. 19, 1991, 91113857.6

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **15 Claims**

1. A magnetic resonance imaging apparatus comprising:

a main field magnet which generates a main magnetic field in

tus having an operating frequency, the improvement compris-

5,200,705

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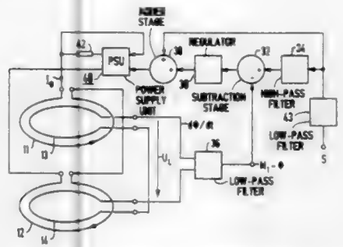
the direction of the z-axis of a rectangular coordinate system, said magnet having planar pole pieces containing ferromagnetic material and having a gap between said pole pieces of a size for accommodating a body region to be examined of a human body having a body axis extending in the direction of the x-axis of said coordinate system;

two gradient coils having respective oppositely flowing gradient currents, said gradient coils each generating a gradient field with magnetic flux associated therewith, said magnetic flux being subject to changes due to the presence of said ferromagnetic material;

voltage-controlled power supply means connected to said gradient coils for supplying said gradient coils with said gradient currents;



two sensor coils respectively associated with said gradient coils for measuring said changes in the magnetic flux of each gradient coil, and each sensor coil generating a no-load voltage corresponding to said changes;

low-pass filter means, functioning as an integrator above a lower limit frequency, for generating a measured value signal from said no-load voltage, said measured value signal being proportional to said magnetic flux; and

regulator means, to which said measured value signal is supplied, connected to said voltage-controlled power supply means for controlling said power supply means for altering said gradient currents dependent on said magnetic flux.

5,200,702

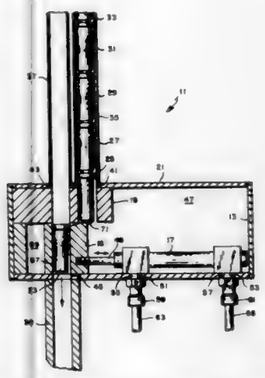
FEED MECHANISM AND METHOD THEREFOR

Kevin D. Lilly, Framingham, and David G. Cory, Boston, both of Mass., assignors to Bruker Instruments, Inc., Billerica, Mass.

Filed Mar. 4, 1991, Ser. No. 663,709

Int. Cl.[5] **B65G** *49/00*; **G01R** *33/46*

U.S. Cl. 324—321 **17 Claims**



1. Apparatus for sequential provision of a plurality of similarly configured objects to a predetermined location in a test chamber wherein the contents of one of said objects is tested, said apparatus comprising:

a container;

a member slidably disposed in that container and provided with a plurality substantially parallel passageways therethrough, wherein each of said passageways is configured to fully contain only one of the objects;

moving means for moving said member repeatedly between first and second positions in said container;

feed means connected to and opening into said container for sequentially providing the objects to said container and to a first one of said passageways when said member in said first position;

provision means connected to said container for delivering the object in said first passageway from the container when said member is in said second position; and

escape means, connected to said container and aligned with said provision means, for providing an escape path from said container for the objects through a second of said passageways when the objects are returned from said provision means;

wherein in said first position said first passageway of said plurality of passageways is aligned with said feed means such that an object can be fed from said feed means to said first passageway and such that when the object is returned from said provision means, a substantially unrestricted path is provided for the returned object through the alignment of said second passageway and said escape means, whereby returned objects can pass through said second passageway and said escape means and do not block proper operation of said apparatus; and wherein said first passageway in said second position is aligned with said provision means such that the object in said first passageway can be provided to said provision means.

5. Apparatus for supplying test samples to an automatic NMR spectrometer, each sample being contained in one of a plurality of similarly configured rotors, comprising:

a rotor magazine for holding the plurality of rotors,

a chute for delivering the rotors to the spectrometer,

a rotor ejection apparatus for ejecting rotors from the spectrometer after an NMR spectrum has been obtained, and means for sequentially feeding the rotors one at a time from the rotor magazine to the chute including;

a sliding transfer member provided with at least one rotor space sized to hold only one rotor at a time, and

means connected to the transfer member for repetitively oscillating the transfer member between the rotor magazine and the chute so that a single rotor is removed from the rotor magazine and dropped into the chute during each oscillation.

5,200,703

ANTI-INTERFERENCE FILTER FOR A GRADIENT COIL IN A NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Walter Popp, Emskirchen; Karl-Ulrich Erlenkamp; Peter Feld, both of Nuremberg; Norbert Rietsch, Dormitz, and Markus Vester, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Atkiengesellschaft, Munich, Fed. Rep. of Germany

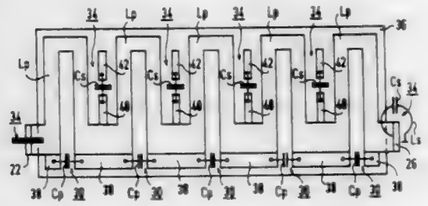
Filed Sep. 23, 1991, Ser. No. 764,349

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1990, 4032707

Int. Cl.[5] **G01V** *3/00*

U.S. Cl. 324—322 **12 Claims**

1. In a nuclear magnetic resonance imaging apparatus having a gradient coil with a feeder for said gradient coil, said apparatus having an operating frequency, the improvement comprising:



an anti-interference filter for radio-shielding said feeder formed by a band elimination filter which rejects signals at said operating frequency of said apparatus.

5,200,704

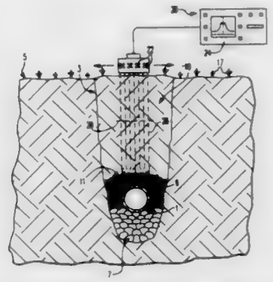
SYSTEM AND METHOD INCLUDING A BURIED FLEXIBLE SHEET TARGET IMPREGNATED WITH FERROMAGNETIC PARTICLES AND EDDY CURRENT PROBE FOR DETERMINING PROXIMITY OF A NON-CONDUCTIVE UNDERGROUND STRUCTURE

William G. Clark, Jr., Murrysville Boro; Francis X. Gradich; Lee W. Burtner, both of Elizabeth Twp., and Michael J. Metala, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1991, Ser. No. 662,664

Int. Cl.[5] **G01V** *3/165*; **G01B** *7/14, 7/10*; **F16L** *55/00*

U.S. Cl. 324—326 **6 Claims**



1. A system for determining the proximity of a non-conductive, underground conduit, comprising:

(1) a portable target medium in the form of a non-conductive, flexible sheet material impregnated with between about 0.5 and 10% of non-permanently magnetizable ferromagnetic particles by weight which couple with a fluctuating magnetic field, said sheet material being buried in the ground and spaced a known distance with respect to conduit, and

(2) an eddy current probe means movable above the ground for emanating said fluctuating magnetic field and for generating a signal indicative of the distance between said sheet material and said probe means so that the location of said conduit relative to said probe means can be determined.

5,200,705

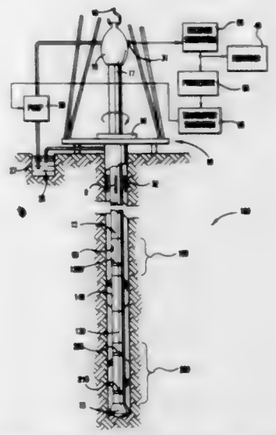
DIPMETER APPARATUS AND METHOD USING TRANSDUCER ARRAY HAVING LONGITUDINALLY SPACED TRANSDUCERS

Brian Clark, Missouri City; Stephen D. Bonner, Sugar Land; Jacques Jundt, Missouri City, all of Tex.; Martin Luling, Danbury, Conn., and Richard A. Rosthal, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 31, 1991, Ser. No. 786,138

Int. Cl.[5] **G01V** *3/18, 3/38*; **E21B** *47/12, 49/00*

U.S. Cl. 324—338 **86 Claims**



53. Apparatus for determining a dip characteristic of formations surrounding a borehole, comprising:

an elongated device moveable through the borehole;

an array of several transducers mounted in said device, said transducers having respectively different locations along the longitudinal direction of the borehole;

means for producing indications of the relative rotational orientation of said device with respect to the longitudinal direction of the borehole;

means coupled to with said transducers for generating signals from measurements taken at respective ones of said transducers; and

means for determining a dip characteristic of said formations from said signals and said orientation indications.

5,200,706

APPARATUS FOR MEASURING IONIC CONCENTRATION IN TWO MEASUREMENT CONFIGURATIONS

Takaaki Yada, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Apr. 8, 1991, Ser. No. 681,729

Claims priority, application Japan, Apr. 9, 1990, 2-38370

Int. Cl.[5] **G01N** *27/06*

U.S. Cl. 324—446 **15 Claims**

1. An apparatus for measuring ionic concentration in a sample liquid comprising:

a body; and

measuring means attached to the body for measuring the ionic concentration of the sample liquid and producing a signal representative of the measured concentration, the measuring means including a sensor means having a substantially flat surface sensor including a plurality of laminated substrates and a printed circuit interposed between a center and a lowermost substrate, the measuring means

operative in a first position by placing the sample on the

5,200,708

on the input sides of said respective amplifying circuits so

a linear push-pull connected power amplifier, having a signal

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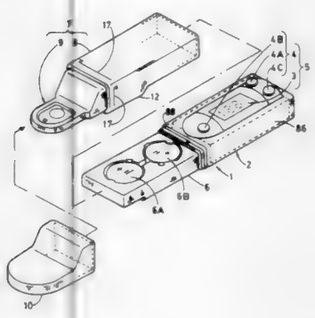
operative in a first position by placing the sample on the measuring means when the body is on a substantially flat



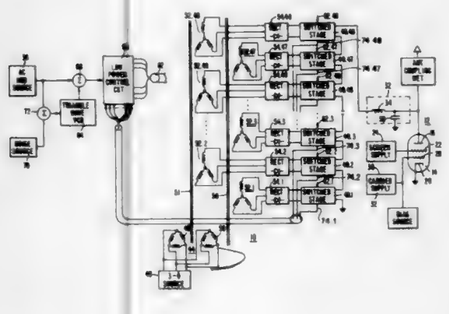
surface and operative in a second position by immersing the measuring means within the sample.

5,200,707

AMPLIFIER WITH MULTIPLE SWITCHED STAGES AND NOISE SUPPRESSION

Bryan A. Weaver, Dallas, Tex., assignor to Continental Electronics Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 533,646, Jun. 5, 1990, Pat. No. 5,099,203. This application Nov. 20, 1991, Ser. No. 795,142
Int. Cl.[5] H03F *3/38*
U.S. Cl. 330—10 50 Claims



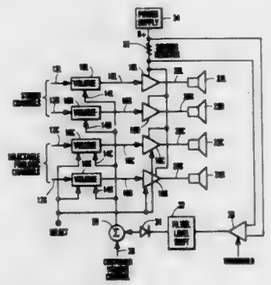
1. An amplifier responsive to a signal source comprising at least several power output stages activated only to one of two bi-level states controlled in response to the value of the source, bi-level outputs associated with the bi-level states of the plural stages being summed together, power supply means including an AC to DC converter for said stages, said converter including plural primary windings and several secondary windings, one for each of the stages, each of said secondary windings being coupled to only one of the primary windings, said windings being coupled together so that at all times loading of the primary windings by the secondary windings as a result of activation of the output stages is approximately equal.

5,200,708

APPARATUS FOR THE VIRTUAL EXPANSION OF POWER SUPPLY CAPACITY

Robert E. Morris, Jr., and Mark R. Anderson, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Sep. 11, 1991, Ser. No. 755,581
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—124 R 8 Claims



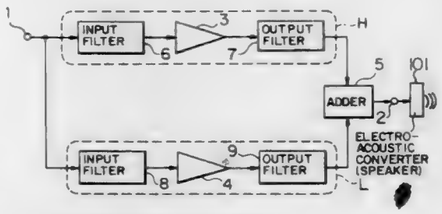
1. Apparatus comprising:
a first number of circuits,
a second number of circuits,
power supply means for providing power to the first number of circuits, the first number of circuits drawing a predetermined amount of power from the power supply means,
means for selectively enabling said power supply means to power the second number of circuits,
means for sensing the amount of the power drawn from the power supply means by the first and second number of circuits, and
means for reducing the total power drawn from the power supply means in response to the sensed power drawn when the amount of power drawn by the first and second number of circuits exceeds the predetermined amount of power.

5,200,709

AUDIO AMPLIFYING CIRCUIT

Masataka Saito, Hirakata, and I. Fusanori, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 6, 1991, Ser. No. 755,801
Claims priority, application Japan, Sep. 19, 1990, 2-250644
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—126 12 Claims



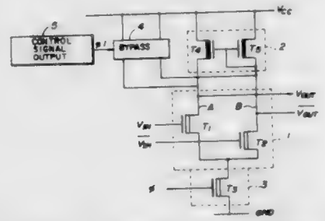
1. An amplifying circuit comprising:
a high frequency amplifying circuit for amplifying a high frequency component of a reproduction signal having frequency components in a range from a low frequency to a high frequency;
a low frequency amplifying circuit for amplifying a low frequency component of the reproduction signal;
first and second input filters which are respectively provided on the input sides of said respective amplifying circuits so as to pass the respective high and low frequency components of the amplifying circuits;
first and second output filters which are respectively provided on the output sides of the respective amplifying circuits and which have the same characteristics as those of the respective first and second input filters; and
an adding circuit for adding outputs of the output filters,
wherein said adding circuit outputs an amplified reproduction signal including the frequency components in a range from the low frequency to the high frequency which have been added by the adding circuit.

5,200,710

CURRENT MIRROR AMPLIFIER CIRCUIT AND METHOD OF DRIVING THE SAME

Yoshiharu Kato, Kasugai, Japan, assignor to Fujitsu Limited, Kanagawa and Fujitsu Vlsi Limited, Aichi, both of Japan

Filed Aug. 26, 1991, Ser. No. 749,833
Claims priority, application Japan, Aug. 31, 1990, 2-231524
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—257 12 Claims



1. A current mirror amplifier circuit comprising:
differential amplifier circuit means, having first and second nodes, for differentially amplifying a pair of complementary input signals in an activation mode;
current mirror circuit means coupled between a first power source and the first and second nodes of said differential amplifier circuit means;
switching circuit means, coupled between said differential amplifier circuit means and a second power source which supplies a second voltage lower than a first voltage supplied by the first power source, for switching a mode of said differential amplifier circuit means from a standby mode to the activation mode in response to an activation signal; and
bypass circuit means, coupled between the first power source and the first and second nodes of said differential amplifier circuit means, for pulling up potentials of the first and second nodes during the standby mode,
said bypass circuit means being deactivated after the differential amplifier circuit means is switched from the standby mode to the activation mode.

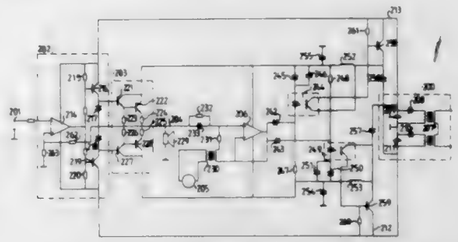
5,200,711

PULSE-WIDTH MODULATED, LINEAR AUDIO-POWER AMPLIFIER

Kenneth Andersson, Kungsbacka, and Dan Bavholm, Kullavik, both of Sweden, assignors to AB Lab. Gruppen Andersson & Bavholm, Kungsbacka, Sweden

Filed Oct. 28, 1991, Ser. No. 784,658
Claims priority, application Sweden, Oct. 26, 1990, 9003426
Int. Cl.[5] H03F *3/30*
U.S. Cl. 330—267 1 Claim

1. An audio power amplifier with pulse-width modulation, comprising
a DC supply unit having two poles,
a signal input,
a linear push-pull connected power amplifier, having a signal output adapted to be connected to a loudspeaker means,
a pulse generator having a pulse frequency of 200 kHz–2 MHz,
pulse modulating means for modulating signals delivered by said pulse generator with input signals derived from said signal input into pulse modulated signals,
discriminator means including a DC voltage source for obtaining discriminated pulse signals from said pulse modulated signals,
class D amplifying means for amplifying said discriminated



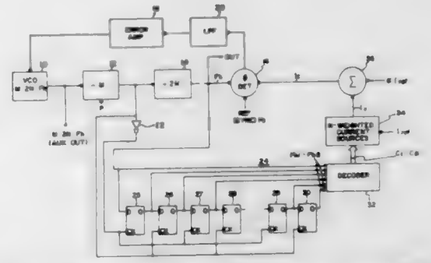
pulse signals and comprising two pulse amplifiers each supplied from a respective one of said two poles of said DC supply unit and connected to the respective other of said two poles via a respective recovery diode, and
two lowpass filter circuits each connected to a respective said amplifier for delivering respective filtered supply voltages for powering said push-pull connected power amplifier, which filtered supply voltages are dependent on said input signals,
said linear push-pull connected amplifier having an input that receives an input signal derived from a signal that is input to said signal input.

5,200,712

VARIABLE SPEED PHASE LOCKED LOOP

Gopal K. Srivastava, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 26, 1991, Ser. No. 813,461
Int. Cl.[5] H03L *7/093, 7/18*
U.S. Cl. 331—1 A 9 Claims



1. The method of operating a phase detector comprising:
establishing a variable gain characteristic that varies from a minimum to a maximum for said phase detector;
operating said phase detector in a phase locked loop with a gain determined by said variable gain characteristic such that when in a locked condition, the gain of said phase detector is at said minimum and when in an unlocked condition, the gain of said phase detector is at said maximum, said gain of said phase detector increasing with increasing displacement from said locked condition to said unlocked condition.

pares the input signal and an output signal of said refer-

5,200,718

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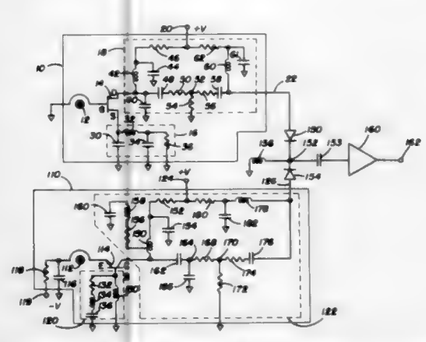
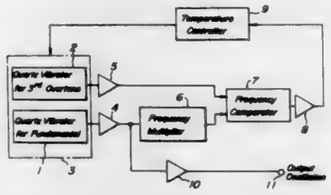
5,200,713
MULTIPLE MAGNETICALLY TUNED OSCILLATOR
Martin I. Grace, and Richard E. Simmons, both of San Jose, Calif., assignors to Wiltron Company, Morgan Hill, Calif.
Continuation-in-part of Ser. No. 725,388, Jun. 28, 1991, Pat. No. 5,115,209, which is a continuation of Ser. No. 592,859, Oct. 4, 1990, abandoned. This application May 18, 1992, Ser. No. 884,830
Int. Cl.[5] H03B *5/18*
U.S. Cl. 331—49 **51 Claims**



1. Magnetically tuned apparatus having an apparatus output, comprising:
- a first circuit including as a component a first magnetically tunable resonator, said first circuit outputting a first signal having a first analog characteristic which varies as a first function of the strength of the magnetic field containing said first resonator;
- a second circuit including as a component a second magnetically tunable resonator, said second circuit outputting a second signal having a second analog characteristic which varies as a second function of the strength of the magnetic field containing said second resonator;
- magnetic field generating means for generating a single magnetic field, said first and second resonators both being disposed in said single magnetic field; and
- switch means for providing to said apparatus output an output signal responsive to selectably said first signal or said second signal.

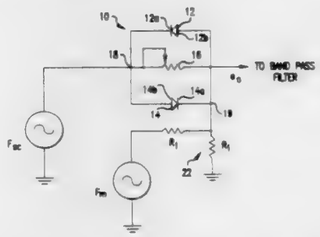
5,200,714
CRYSTAL OSCILLATOR WITH QUARTZ VIBRATOR HAVING TEMPERATURE DETECTING FACULTY, QUARTZ VIBRATOR FOR USE THEREIN, AND METHOD OF MEASURING TEMPERATURE USING QUARTZ VIBRATOR
Hitoaki Hayashi, Tokyo, Japan, assignor to Asahi Dempa Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1991, Ser. No. 725,486
Claims priority, application Japan, Jul. 7, 1990, 2-178501
Int. Cl.[5] H03B *1/00, 5/32;* **H03L** *1/02;* **H01L** *41/107*
U.S. Cl. 331—66 **18 Claims**

1. A crystal oscillator with a temperature detecting faculty comprising:
- an oscillating means including at least a first quartz vibrator for generating a fundamental oscillation and a second quartz vibrator for generating an n-th overtone oscillation relative to said fundamental oscillation, a temperature-frequency characteristic of the first quartz vibrator being different from that for the second quartz vibrator;
- a temperature detecting means for receiving the fundamental oscillation and n-th overtone oscillation generated by said oscillating means and processing frequencies of these oscillations to detect a temperature of the first quartz vibrator and the second quartz vibrator; and



- an output means for outputting at least one oscillation generated by said oscillating means as an output oscillation.

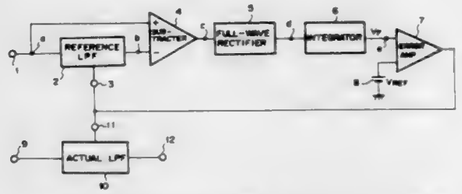
5,200,715
WAVEFORM MODULATION AND DEMODULATION METHODS AND APPARATUS
Richard C. Gerdes, and Mary K. Gerdes, both of Scotsdale, Ariz., assignors to WavePhore, Inc., Tempe, Ariz.
Filed Sep. 6, 1991, Ser. No. 756,180
Int. Cl.[5] H03C *1/00*
U.S. Cl. 332—185 **13 Claims**



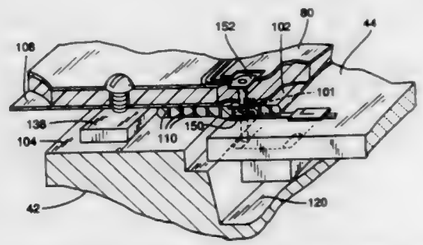
1. A modulator cell for modulating a subcarrier signal with a modulation signal comprising:
- a subcarrier signal source;
- a pair of diodes connected in parallel, each diode having an anode and a cathode and wherein the anode of a first diode is coupled to the subcarrier signal source, wherein the anode of the first diode is coupled to the cathode of the second diode so that current flow through the diodes is antiparallel and a resistor coupled in parallel to the diodes; and
- a modulation signal source coupled to the anode of the second diode wherein both the subcarrier and the modulation signal have a peak to peak amplitude and the modulation signal source includes a means for limiting the peak to peak amplitude of the modulation signal to be less than one half of the peak to peak amplitude of the subcarrier signal.

5,200,716
CUT-OFF FREQUENCY AUTOMATIC ADJUSTING FILTER
Nobutaka Amano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 17, 1991, Ser. No. 731,516
Claims priority, application Japan, Jul. 17, 1990, 2-188551
Int. Cl.[5] H03H *11/04*
U.S. Cl. 333—17.1 **5 Claims**

1. A cut-off frequency automatic adjusting filter comprising:
- a plurality of filters whose cut-off frequency is electrically controllable, one of said plurality of filters being a reference filter to which is inputted a square wave signal of a certain frequency as a reference input signal; and
- a feedback circuit responsive to square waves which compares the input signal and an output signal of said reference filter and generates an electrical signal for causing the cut-off frequency of said reference filter to be constant, said electrical signal being supplied to said reference filter and another filter of said plurality of filters for the constancy of said cut-off frequeney.

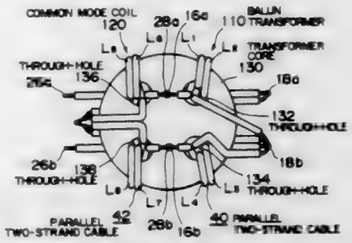


5,200,717
ACTIVE ELECTRICAL CIRCUITRY INTERCONNECTED AND SHIELDED BY ELASTOMER MEANS
Michael L. Kyle, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.
Filed Apr. 11, 1991, Ser. No. 683,643
Int. Cl.[5] H01P *5/00*
U.S. Cl. 333—24 R **10 Claims**



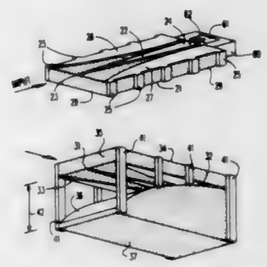
1. An apparatus for interconnecting and shielding active electrical circuitry, comprising:
- a housing including an electrically conductive surface having an opening that defines at least one cavity positioned within the housing, the cavity having floor and wall with top margins adapted to support a first substrate, the first substrate carrying active electrical circuitry on a major surface thereof, the major surface facing the floor of the cavity;
- spacer means positioned on the electrically conductive surface of the housing for separating an interconnect circuit from the electrically conductive surface; and
- an electrically conductive elastomer material positioned under compression between the first substrate and the interconnect circuit around a periphery of the opening, the interconnect circuit including a second substrate having a plurality of signal conductors and a shield conductor, the elastomer providing electrically conductive paths between the active electrical circuitry on the first substrate and the signal conductors on the interconnect circuit and the elastomer further functioning as a shield that substantially surrounds the signal conductors and the active electrical circuitry.

5,200,718
BALUN TRANSFORMER WITH COMMON MODE COIL
Tatsuo Kato, Tokyo, Japan, assignor to SMK Co., Ltd., Tokyo, Japan
Filed Oct. 22, 1991, Ser. No. 780,498
Claims priority, application Japan, Oct. 23, 1990, 2-110647; Oct. 23, 1990, 2-110648
Int. Cl.[5] H03H *7/42*
U.S. Cl. 333—25 **2 Claims**



1. A balun transformer with a common mode coil characterized in that parallel two-strand cable wound around a core having through-holes through which said cable passes composes both a balun transformer for converting impedance and a common mode coil for removal of noise, wherein the common mode coil is configured to be connected to one of an input side and an output side of said balun transformer, and wherein four of said through-holes are formed in the core, two of which allow a first parallel two-strand cable to pass therethrough constituting said balun transformer for impedance conversion and a winding of another parallel two-strand cable passing through the remaining two holes constituting a common coil for noise removal.

5,200,719
IMPEDANCE-MATCHING COUPLER
Walter Margulis, and Maria C. R. Carvalho, both of Rio de Janeiro, Brazil, assignors to Telecommunicacoes Brasileiras S/A, Campinas, Brazil
Filed Oct. 7, 1991, Ser. No. 772,329
Claims priority, application Brazil, Dec. 7, 1989, 8906400
Int. Cl.[5] H01P *5/08*
U.S. Cl. 333—34 **9 Claims**



1. A coupling device for matching different impedance values, said device comprising:
- an elongated dielectric substrate;
- a signal carrying conductor extending along said substrate;
- first ground plant conducting means extending along said substrate and spaced from said signal carrying conductor to form a first transmission line therewith;
- at least second ground plane conducting means extending along said substrate generally coextensively with said first ground plane conducting means and spaced from said

signal carrying conductor to form a second transmission

5,200,722

- a main-circuit opening-and-closing assembly driven by said

projected position when said electrical contacts of said circuit breaker are closed and for assuming a retracted

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signal carrying conductor to form a second transmission line therewith;

the conductor cross-section and the conductor spacing cross-section for each of the transmission lines being varied along the length thereof to change the respective impedances thereof along the line length and to change the characteristic impedance of the coupling device along the line length.

5,200,720

EMI BEAD CORE FILTER, PROCESS AND APPARATUS THEREOF

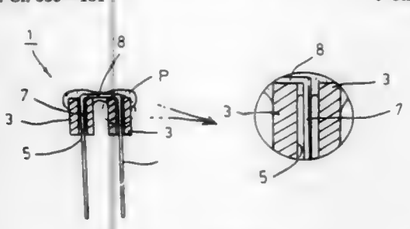
Hyung J. Yi, Anyang, Rep. of Korea, assignor to Sam HWA Capacitor Co., Ltd., Kyunggi, Rep. of Korea

Filed Aug. 28, 1991, Ser. No. 750,933

Claims priority, application Rep. of Korea, Nov. 27, 1990, 19258

Int. Cl.[5] H03H 7/01

U.S. Cl. 333—181 3 Claims



1. An EMI bead core filter comprising a ferrite core having a hole, a lead wire received in said hole and having a bending portion on an upper surface of the core and a coating layer including an epoxy powder deposited on the upper surface of said core to adhere said core and said wire.

5,200,721

DUAL-MODE FILTERS USING DIELECTRIC RESONATORS WITH APERTURES

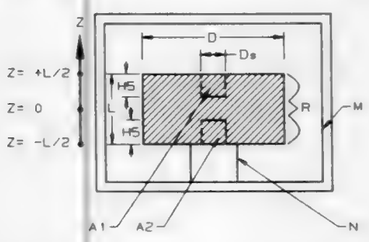
Raafat R. Mansour, Waterloo, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed Nov. 19, 1991, Ser. No. 794,044

Claims priority, application Canada, Aug. 2, 1991, 2048404

Int. Cl.[5] H01P 1/20, 7/10

U.S. Cl. 333—202 16 Claims



1. A dual-mode filter comprising at least one cavity resonating in a dual-mode, said at least one cavity containing a dielectric resonator, said resonator containing at least one aperture, said at least one aperture extending partially through said resonator and being sized and located to shift a resonance frequency of a spurious mode to a higher frequency range distance from a principal mode.

5,200,722

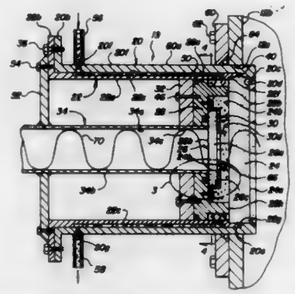
MICROWAVE WINDOW ASSEMBLY

David Wolf, Clawsen, Mich., assignor to United Solar Systems Corporation, Troy, Mich.

Filed Nov. 27, 1991, Ser. No. 800,160

Int. Cl.[5] H01P 1/08

U.S. Cl. 333—252 21 Claims



1. A microwave window assembly for transmitting high power microwave energy from microwave propagating means into the interior of a chamber and including first and second windows formed of a dielectric material substantially transparent to microwave energy with the first window adapted to be sealed in a wall of the chamber and the second window spaced rearwardly from the first window to define a space therebetween, means for circulating a cooling fluid in the space between the windows, and means defining an axially extending waveguide surface for transmitting the microwave energy from the propagating means to the window assembly, characterized in that the waveguide surface includes a first waveguide portion comprising a closed surface of substantially uniform cross section extending from a location rearwardly of the second window to a location proximate the rearward surface of the second window and a second waveguide portion corresponding in size and cross-sectional configuration to said first portion extending from the forward surface of the second window and into said space toward the rearward surface of said first window, said second waveguide portion terminating at a location spaced rearwardly from the rearward surface of said first window so as not to interfere with the circulation of cooling fluid between the windows.

5,200,723

REMOTELY-CONTROLLED RELAY

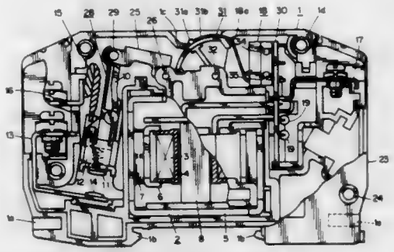
Hiroaki Fujihisa, and Manabu Sogabe, both of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,037

Claims priority, application Japan, May 23, 1990, 2-133027

Int. Cl.[5] H01H 75/00

U.S. Cl. 335—14 3 Claims



1. A remotely-controlled relay comprising
a bistable polar electromagnet device

a main-circuit opening-and-closing assembly driven by said bistable polar electromagnet device;

a housing for housing said bistable polar electromagnet device and said main-circuit opening-and-closing assembly; wherein said bistable polar electromagnet device includes;

a coil energized selectively in a first direction and in a second direction by a current supplied from an external circuit;

a switch circuit connected with said coil and selectively forming a first current path in which said coil is energized in said first direction and a second current path in which said coil is energized in said second direction;

a plunger magnetized by said coil such that said plunger moves through a stroke between a first position and a second position, said plunger moving to said first position when said coil is energized in said first direction and moving to said second position when said coil is energized in said second direction;

a lever pivotally supported by said housing and driven by said plunger to pivot, said lever driving said switch circuit to form said first current path when said plunger arrives at a center of said stroke during the time when said plunger moves from said second position to said first position, said lever driving said switch circuit to form said second current path when said plunger arrives at said center of said stroke during the time when said plunger moves from said first position to said second position,

a link having a first end driven by said plunger and a second end connected to said main-circuit opening-and-closing assembly, and pivotally supported by said housing at an intermediate position between said first end and said second end, said link causing said main-circuit opening-and-closing assembly to close when said plunger moves to said first position and to open when said plunger moves to said second position.

5,200,724

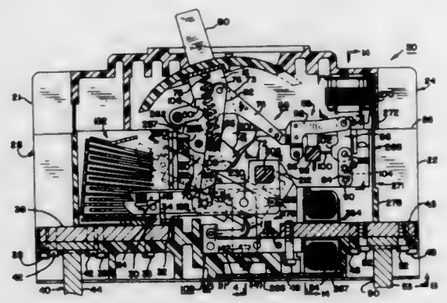
ELECTRICAL CIRCUIT BREAKER OPERATING HANDLE BLOCK

Lance Gula, Aliquippa, and Perry R. Gibson, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 330,549, Mar. 30, 1989, Pat. No. 4,951,019. This application Jun. 18, 1990, Ser. No. 539,938

Int. Cl.[5] H01H 9/20, 23/00

U.S. Cl. 335—166 3 Claims



1. A circuit breaker, comprising:
an electrically insulated housing;
a pair of electrical contacts disposed within said housing of which one is moveable between an open and a closed position;
an operating lever having a handle arm, said operating lever moveable between an on and an off position;
crossbar means mechanically connected to said moveable electrical contact and moveable therewith for assuming a projected position when said electrical contacts of said circuit breaker are closed and for assuming a retracted position when said electrical contacts of said circuit breaker are open;
linkage means including an upper and lower toggle link joined together and mechanically connected to said handle arm for causing said closed electrical contacts to attempt to open when said operating lever is moved from the on position towards the off position;
first lever restrictor means which projects from said lower toggle link for restricting the movement from said operating lever to a predetermined limit between the on position and the off position when said operating lever is moved from the on position towards the off position and said electrical contacts of said electric circuit breaker remain in the closed position; and
second lever restrictor means comprising said upper toggle link having a projection member integral therewith and said handle arm having a projection member disposed thereon, whereby movement of the operating lever is hindered from exceeding said predetermined limit between the on position and the off position by said handle arm projection member engaging said upper toggle link projection member when said electrical contacts of said electric circuit breaker remain in the closed position.

5,200,725

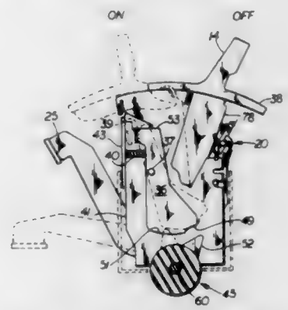
MOLDED CASE CIRCUIT BREAKER MULTI-POLE CROSSBAR ASSEMBLY

David Arnold, Chester, and Roger N. Castonguay, Terryville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 22, 1991, Ser. No. 644,185

Int. Cl.[5] H01H 9/00

U.S. Cl. 335—172 6 Claims



1. A molded case circuit breaker comprising:
an insulated circuit breaker case and cover;
a stationary and a movable contact within said case said movable contact being arranged at one end of a movable contact arm;
an operating mechanism within said case and arranged for separating said stationary and movable contacts upon overcurrent conditions within a protected circuit;
a handle operator extending outside said cover and arranged for opening and closing said stationary and movable contacts upon quiescent current conditions within said protected circuit;
a pair of extending operating springs connected with said operating mechanism and arranged for rapidly driving said movable contact toward and away from said stationary contact; and
an operating spring accelerator interacting with said operating mechanism to provide delayed motion to said movable contact and thereby further extend said operating springs

to more rapidly drive said movable contact toward said

a first pair of permanent magnets attached to free ends of

a first magnetic flux generation means provided on one

sleeve passage extending through the projection, the se-

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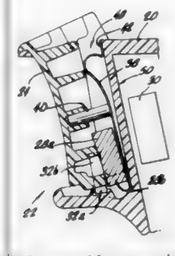
to more rapidly drive said movable contact toward said stationary contact.

5,200,726

ELECTRIC SWITCH ASSEMBLY AND RELATED METHOD OF USE

Lee E. Leppo, Tallmadge, and James A. Campo, Brunswick, both of Ohio, assignors to Telxon Corporation, Akron, Ohio

Filed Aug. 26, 1991, Ser. No. 749,867
Int. Cl.[5] H01H 9/00
U.S. Cl. 335—207 17 Claims



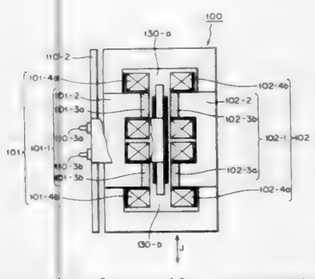
1. An electric switch assembly comprising:
a housing;
a trigger attached to the housing such that it is movable between an open position and a closed position;
a first magnet attached to the trigger;
a second magnet fixed relative to the housing and located adjacent to the first magnet when the trigger is in its open position; and
a magnetic reed switch located within the interior of the housing, the magnetic reed switch having a first position that it assumes when the trigger is in its closed position and having a second position that it assumes when the trigger is in its open position.

5,200,727

FORCE GENERATING APPARATUS

Mitsuru Katoh; Shinichi Kawada; Michio Fukano, and Takeshi Hojo, all of Tokyo, Japan, assignors to Tokimec Inc., Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 767,142
Claims priority, application Japan, Oct. 11, 1990, 2-272891
Int. Cl.[5] H01F 7/08, 5/00
U.S. Cl. 335—222 3 Claims



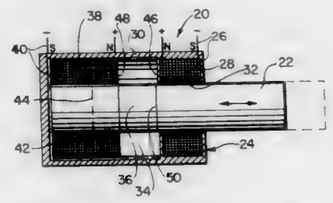
1. A pickup torquer for use with a gyro apparatus comprising:
a rectangular frame formed by laminating a number of plates made of magnetic material and having first and second pairs of leg portions which project inwardly from the inner surfaces of longer opposing sides of said rectangular frame at same positions with spacings between facing ends of said first and second pairs of leg portions;
a first pair of permanent magnets attached to free ends of said first pair of leg portions;
a second pair of permanent magnets attached to free ends of said second pair of leg portions;
a first pair of primary coils wound around said first pair of leg portions;
a second pair of primary coils wound around said second pair of leg portions; and
a secondary coil located in said spacings in noncontact fashion with said first and second pairs of permanent magnets, wherein magnetic fluxes generated by said permanent magnets travels through a magnetic circuit formed by said permanent magnets, said leg portions and said spacings so that said secondary coil intersects said magnetic fluxes, said first and second pairs of primary sails being excited by an AC current.

5,200,728

SOLENOID DEVICE

David Patterson, R.R. 190 6, Smith Falls, Ontario K7A 4S7, and Albert Patterson, R.R. 190 5, London, Ontario, N6A 4B9 both of Canada

Filed Jun. 1, 1992, Ser. No. 890,820
Int. Cl.[5] H01F 7/08
U.S. Cl. 335—223 7 Claims



1. In a solenoid having an electrically energizable first coil consisting of one or more layers of windings about a non-magnetic form from which a magnetic armature extends and within which said armature moves between retracted position and extended position the distance between those positions being the distance of the throw of the solenoid, the improvement characterized by the end of the armature within the first coil having a section of rigid non-magnetizable material of predetermined length secured to it so as to move therewith, and a second, electrically energizable second coil consisting of one or more layers of windings about a non-magnetic form, which windings are energizable in a manner independent from that of the first coil, said second coil being secured to the other end of the length of non-magnetizable material so as to move therewith from a position adjacent the first coil when the armature is in extended position to a position spaced therefrom when the arm is in retracted position, whereby, when the first coil is energized to move the armature along its throw, the second coil is simultaneously energized so as to produce a cooperative magnetic force with respect to the first coil.

5,200,729

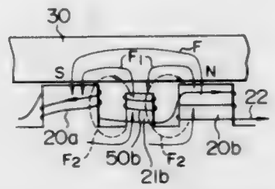
PERMANENT MAGNET AND MAGNETIZATION APPARATUS FOR PRODUCING THE PERMANENT MAGNET

Katsuji Soeda; Shuzo Otsuki, and Masaru Wada, all of Sukagawa, Japan, assignors to Yamamoto Electric Corporation, Sukagawa, Japan

Filed Feb. 7, 1990, Ser. No. 479,301
Claims priority, application Japan, Aug. 29, 1989, 1-222730; Nov. 1, 1989, 1-285546
Int. Cl.[5] H01F 7/20, 13/00
U.S. Cl. 335—284 8 Claims

7. A magnetization apparatus for magnetizing a permanent magnet comprising:

a first magnetic flux generation means provided on one surface of a single piece of magnet material for generating N-pole magnetic flux;
a second magnetic flux generation means provided adjacently to said first magnetic flux generation means on said one surface for generating S-pole magnetic flux; and
a third magnetic flux generation means provided between said first and second magnetic flux generation means on said one surface for passing therethrough part of magnetic flux generated by said first and second magnetic flux generation means and for generating magnetic flux for



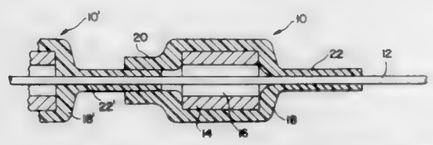
canceling said magnetic flux passing through said third magnetic flux generation means,
wherein each of said first and second magnetic flux generation means includes coil means connected to a DC power source through a switch, and continuously and serially wound around all of said first and second magnetic flux generation means, said coil means wound around said first magnetic flux generation means being wound in an opposite direction from a direction of winding of said first magnetic flux generation means, and
said third magnetic flux generation means includes a shorting coil wound therearound.

5,200,730

PREMOLDED SUPPRESSOR SLEEVE

Kiyoshi Masuda, New York, N.Y.; James May, Scranton, Pa.; Takao Otsuka, Kawasaki, and Michio Inamura, Ayase, both of Japan, assignors to FerriShield, Inc., New York, N.Y.

Filed Oct. 18, 1991, Ser. No. 778,514
Int. Cl.[5] H01F 27/02, 17/06
U.S. Cl. 336—90 3 Claims



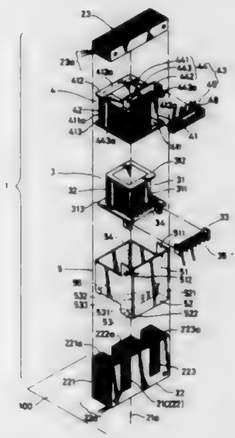
1. A preformed noise suppressor for engagement over a cable, comprising:
a cylindrical ring shaped core having a core passage extending from one end of the core, to an opposite end thereof, the core passage being adapted to receive a cable extending through the core, the core being made of electrical noise absorbing material;
a one piece cylindrical preformed sleeve of resilient insulating material covering the core, the sleeve extending beyond both ends of the core and having a sleeve passage to accommodating a cable extending through the core passage; and
securing means formed as one piece with the sleeve and engageable with a cable extending through the core for securing the sleeve at a selected position along the cable;
the sleeve comprising a main cylindrical portion extending around the core and having an inside diameter defining part of the sleeve passage, a cylindrical projection having a smaller inside and outside diameter than the main portion, extending outwardly from the main portion, the sleeve passage extending through the projection, the securing means comprising the projection for frictionally engaging a cable extending through the core, and a circular thick wall portion of the sleeve extending on an opposite side of the main portion from the projection, the thick wall portion having a thicker wall thickness than the projection and a smaller inside and outside diameter than the main portion, the projection being longer than the thick wall portion.

5,200,731

DOUBLE INSULATED TRANSFORMER OF THE COAXIAL TYPE AND METHOD OF ASSEMBLING THE SAME

Yoshiro Tochio, Tokyo; Yoshihiro Mishimura, and Hideo Koaishi, both of Nagano, all of Japan, assignors to Musashino Tuko Co., Ltd., Nagano, Japan

Filed Aug. 30, 1990, Ser. No. 575,016
Claims priority, application Japan, Jan. 26, 1990, 2-16471
Int. Cl.[5] H01F 27/02, 27/30
U.S. Cl. 336—198 16 Claims



1. A double-insulated transformer of the coaxial type, comprising a core assembly having a center core; a primary winding assembly assembled to surround coaxially the center core of said core assembly which has a primary bobbin case, a primary coil winding wound around the bobbin case and a primary terminal portion provided at an axial end of said bobbin case for connecting the primary coil and input lead lines; a secondary winding assembly assembled to surround coaxially said primary winding assembly which has a primary bobbin case, a secondary coil winding wound around said secondary bobbin case and a secondary terminal portion provided at an axial end of said secondary bobbin case opposite to said primary terminal portion for connecting said secondary coil winding with external lead lines; and an insulating case assembled to surround coaxially said secondary winding assembly, wherein said insulating case comprises a body portion of tube-like shape for covering said secondary coil winding and at least one covering portion formed integrally on an axial end of said body portion and extending along the axial direction for covering one of said primary and secondary terminal portions.

5,200,732

an insulator over said shield layer.

be produced across the choke 14 and the AC signal is rectified by the diode 142 connected between the first

predetermined threshold of a thermal condition within a helmet of a user, comprising:

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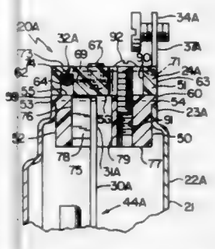
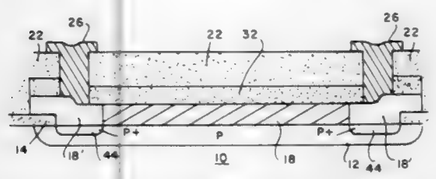
5,200,732
TEMPERATURE OPERATED SWITCH CONSTRUCTION, TERMINAL BLOCK THEREFOR AND METHODS OF MAKING THE SAME
Thomas M. Buckshaw, Indiana, and Joseph J. Erdelsky, Jeannette, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 688,157, Apr. 19, 1991, Pat. No. 5,148,142.
This application May 5, 1992, Ser. No. 878,672
The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.
Int. Cl.[5] H01H *37/36, 87/00*
U.S. Cl. 337—329 **18 Claims**



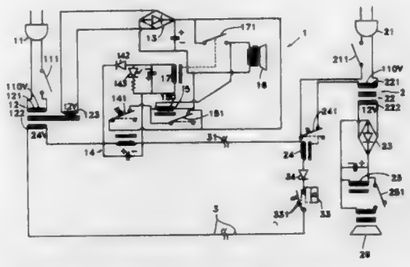
1. In a temperature operated switch construction comprising a housing means, a movable switch arm carried in said housing means, temperature actuated means disposed in said housing means and being operatively interconnected to said switch arm to cause movement of said arm between operating positions thereof in relation to the temperature being sensed by said temperature actuated means, said housing means comprising a main part and a removable terminal block carried by said main part, said terminal block carrying a switch means that is operatively associated with said switch arm so that said switch means is in a first condition thereof when said switch arm is in a first operating position thereof and said switch means is in a second condition thereof when said switch arm is in a second operating position thereof, the improvement wherein said switch means comprises a reed switch means and wherein said switch arm carries a magnet means for operating said reed switch means to said conditions thereof as said switch arm is moved to said positions thereof, said terminal block having spaced apart stop means that are respectively engaged by said switch arm and thereby determine said positions thereof.

5,200,733
RESISTOR STRUCTURE AND METHOD OF FABRICATION
Christopher K. Davis, Merritt Island, and Thomas L. Carndell, Palm Bay, both of Fla., assignors to Harris Semiconductor Corporation, Melbourne, Fla.
Filed Oct. 1, 1991, Ser. No. 769,209
Int. Cl.[5] H01C *1/06*
U.S. Cl. 338—64 **14 Claims**



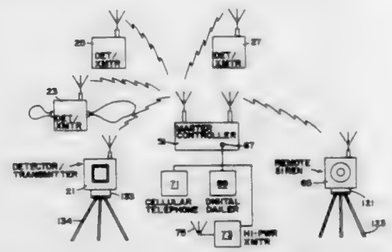
1. An integrated circuit including a resistor comprising:
a semiconductor resistor region over an integrated circuit;
a conductive shield layer in contact with and over a substantial portion of said resistor region; and
an insulator over said shield layer.

5,200,734
DETECTING AND ALARMING SYSTEM FOR DETECTING SHORTCIRCUITED OR BROKEN CIRCUIT
Tieng-Fu Lin, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan
Filed Jan. 6, 1992, Ser. No. 817,321
Int. Cl.[5] G08B *29/00*
U.S. Cl. 340—508 **5 Claims**



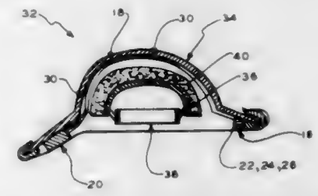
1. A detecting and alarming system comprising:
a main alarm circuit provided in a headquarter control center including a main alarm powered by a main power source;
at least a terminal alarm circuit having a terminal alarm powered by a terminal power source; and
at least a connecting loop connected between said main alarm circuit and each said terminal alarm circuit and powered by said main alarm circuit having means for actuating either said main alarm circuit and said terminal alarm circuit upon a breaking or a shortcircuiting in the connecting loop, whereby upon a breaking of each said connecting loop, said main alarm and one said terminal alarm will be actuated for giving a warning in response to the breaking of the loop; and upon a shortcircuited of the loop, said main alarm will be actuated for giving a warning in response to the shortcircuiting of said loop;
said main alarm circuit **1** including: the main power source of alternative current **11** having a main power switch **111** for an on-off control of the main power source, a first transformer **12** respectively converting a high input voltage to a first lower output voltage (**122**) for powering the connecting loop **3** and converting the high input voltage to a second lower voltage (**123**) for powering the main alarm **16**, a first rectifier **13** converting an input alternative current to be a direct current for powering the main alarm **16**, a choke **14**, which is connected between a positive pole and a negative pole of the connecting loop **3** and powered for normally electromagnetically attracting a first contactor switch **141**, which normally closes the main alarm circuit as connected across two poles of the first rectifier **13**, and for disconnecting the main alarm circuit **1**, an automatic holding circuit **15** including an electromagnetic coil **150** and a second contactor switch **151** connected in series across two output poles of the first rectifier **13** with the electromagnetic coil **150** further connected in series with the first contactor switch **141**, and a first relay **17** connected in parallel with the choke **14** through a diode **142** and operatively closing a relay switch **171** connected between a rectified power source through the first rectifier **13** and the main alarm **16** for actuating the main alarm **16** electrically connected across the two poles of the first rectifier **13**, whereby upon a breaking of the connecting loop **3**, the choke **14** will not be powered by the connecting loop **3** and the first contactor switch **141** will be restored to close the main alarm circuit **1** for sounding the main alarm **16**; and whereby upon a shortcircuiting of the connecting loop **3**, an alternative-current (AC) signal will be produced across the choke **14** and the AC signal is rectified by the diode **142** connected between the first relay **17** and the choke **14** to actuate the relay **17** to close the relay switch **171** for sounding the alarm **16**.

5,200,735
WEATHER PROTECTED PORTABLE SECURITY SYSTEM FOR IN-FIELD USE
Thomas N. Hines, 1025 Bayside Dr., Palatine, Ill. 60067
Continuation of Ser. No. 378,020, Jul. 11, 1989, abandoned. This application Mar. 20, 1991, Ser. No. 673,259
Int. Cl.[5] G08B *13/00, 15/00, 25/00*
U.S. Cl. 340—539 **15 Claims**



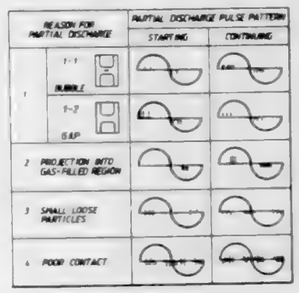
1. A weather-protected portable security system comprising:
an alarm condition sensor including at least one of an intruder detector (including at least one of a microwave emitter/detector and an infrared sensor) for sensing the presence of a moving object, thing or being; a motion/vibration sensor; a contact sensor to sense a gap opened between two objects and a fire/smoke sensor; and a loop sensor having a weatherproof housing and a pair of electrified wire loops adapted to be connected between a fixed object and an item to be protected and to generate an alarm condition signal if either loop is cut, broken or pulled from said housing;
said alarm condition sensor also including a first radio transmitter in a first weather-protected housing, said transmitter for sending a signal representative of an alarm condition to a remote receiver;
a second weather-protected housing containing;
a radio receiver for receiving the signal from said first transmitter;
a controller for responding to the received signal;
a second ratio transmitter activated by said signal from said controller for sending a signal to a remote alarm device; and
a remote alarm device in a third weather-protected housing including a radio receiver for receiving said activating signal from said second transmitter and for sounding an audible alarm is response to said signal, said remote alarm device being located at the same site as said alarm condition sensor.

5,200,736
ASSEMBLY FOR MONITORING HELMET THERMAL CONDITIONS
Christopher E. Coombs, Boonton, N.J.; Gene Keohane, Philadelphia, Pa.; Robert M. Armstrong, Clifton Heights, Pa., and Robert E. Gray, Glen Mills, Pa., assignors to Cairns & Brother Inc., Clifton, N.J.
Continuation-in-part of Ser. No. 691,682, Apr. 25, 1991, abandoned, which is a continuation of Ser. No. 436,257, Nov. 13, 1989, abandoned. This application Sep. 20, 1991, Ser. No. 763,190
Int. Cl.[5] G08B *17/00;* **A42B** *3/00*
U.S. Cl. 340—586 **35 Claims**
1. A battery operated assembly for monitoring at least one predetermined threshold of a thermal condition within a helmet of a user, comprising:
means disposed in said helmet for sensing said thermal condition;



means disposed in said helmet for detecting when said thermal condition reaches said predetermined threshold; and
means disposed in said helmet in the field of view of said user for visually indicating to said user when said predetermined threshold is reached.

5,200,737
SYSTEM AND METHOD FOR DETECTING PARTIAL DISCHARGE OF GAS-INSULATED SWITCHGEAR
Katsumi Konishi, Chiba, and Takaaki Sakakibara, Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 29, 1991, Ser. No. 799,945
Claims priority, application Japan, Nov. 30, 1990, 2-336733
Int. Cl.[5] G01R *31/06*
U.S. Cl. 340—644 **16 Claims**



1. A method for detecting partial discharge generated in an interior of a gas-insulated switchgear used in a transformer installation, comprising the following steps:
detecting a high-frequency component of a voltage applied to a conductor of said gas-insulated switchgear;
detecting a fundamental wave component of the voltage applied to the conductor of said gas-insulated switchgear;
determining whether said partial discharge gas has occurred, and a reason for said partial discharge, based upon a relationship between said high-frequency component and said fundamental wave component of the voltage applied to the conductor of said gas-insulated switchgear;
frequency modulating said detected high frequency component and said fundamental wave component;
converting said frequency-modulated high-frequency component and said frequency-modulated fundamental wave component into respective first and second optical signals;
outputting said first and second optical signals into a fiberoptic network;
receiving said first and second optical signals from said fiberoptic network and converting said first and second optical signals into first and second frequency-modulated signals;

before displaying said character, identifying pixels that par-

5,200,742
ELECTRONIC DEVICE WITH EXCLUSIVE CONTROL

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converting said first and second frequency-modulated signals into first and second pulse signals;
outputting said second pulse signal to a computing element;
converting said first pulse signal into a digital signal and inputting said digital signal to said computing element in response to said computing element receiving said second pulse signal; and
comparing said digital signal with digital signals representing known patterns of said partial discharge, and determining said partial discharge has occurred and said reason for said occurrence of said partial discharge if said digital signal corresponds with at least one of said digital signals representing said known patterns of said partial discharge.

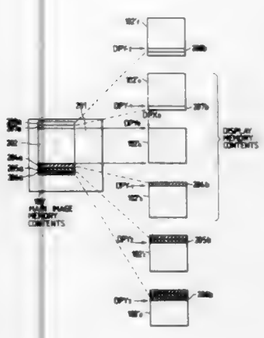
5,200,738

METHOD OF IMAGE DISPLAY WITH SCROLLING CAPABILITY

Teruo Fumoto, Kawasaki; Yoshimitsu Kanno, Sagamihara; Shin Yamada, and Hiroaki Kotera, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 9, 1990, Ser. No. 611,713
Claims priority, application Japan, Nov. 9, 1989, 1-291844
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—726 **2 Claims**

1. A method of data display for a system including a main image memory having stored therein data representing a main image, a display memory coupled to temporarily hold data transferred thereto from the main image memory, display means for displaying at least a selected portion of the data held in the display memory, and means for controlling selection of the data portion to execute display scrolling, the method comprising:



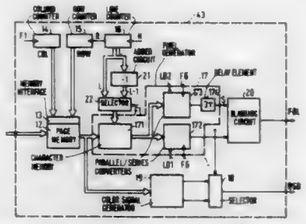
(a) transferring from the main image memory to the display memory at least sufficient data to produce a display picture by the display means;
(b) executing scrolling by selecting successively different portions of the data contents of the display memory to be displayed by the display means; and
(c) detecting whether there is insufficient data held in the display memory to execute a current scrolling operation, and if such insufficiency is detected, transferring from the main image memory to the display memory only the data to be newly displayed for the scrolling operation.

5,200,739

CHARACTER GENERATOR FOR DISPLAYING CHARACTERS WITH A SHADOW ON A DISPLAY SCREEN

Rudolf Eland, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 839,013, Feb. 18, 1992, abandoned, which is a continuation of Ser. No. 505,207, Apr. 4, 1990, abandoned. This application Jul. 24, 1992, Ser. No. 919,508
Claims priority, application Netherlands, Apr. 20, 1989, 8900988
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—730 **11 Claims**



1. A character generator for generating characters comprising n*m pixels, where n and m are integers, on a display screen which is also adapted to display a picture signal, said character generator comprising:
a) means for generating a character code corresponding to a character to be displayed;
b) pixel generating means for generating color selection bits in response to said character code and a pixel address;
c) pixel addressing means for alternately generating and providing to said pixel generating means a first pixel address so as to obtain a first color selection bit for a first pixel to be displayed and a second pixel address so as to obtain a second color selection bit for a predetermined pixel adjacent to said first pixel;
d) color generating means for generating a foreground color for said first pixel in response to a first value of said first color selection bit and a background color for said first pixel in response to a second value of said first color selection bit, and for generating a foreground color for said predetermined pixel in response to a first value of said second color selection bit and a background color for said predetermined pixel in response to a second value of said second color selection bit; and
e) a blanking circuit for providing a blanking signal for blanking said picture signal which is:
i. active when said first pixel has said foreground color;
ii. active when said first pixel has said background color and said predetermined pixel has said foreground color; and
iii. inactive when said first pixel has said background color and said predetermined pixel has said background color.

5,200,740

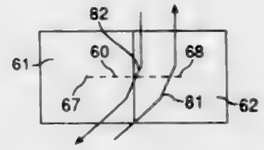
DROPOUT-FREE CENTER POINT FILL METHOD FOR DISPLAYING CHARACTERS

William H. Paxton, Los Altos Hills, and Stephen N. Schiller, Menlo Park, both of Calif., assignors to Adobe Systems Incorporated, Mountain View, Calif.

Filed Aug. 1, 1989, Ser. No. 388,336
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—735 **7 Claims**

1. In a method of displaying a character consisting of one or more contiguous black sections on a raster device using the center point fill method of selecting and displaying pixels by turning on those pixels having centers within said black sections, and selecting and displaying additional pixels to make the character connected, comprising the steps of:

before displaying said character, identifying pixels that partially fall within a black portion of the character but where the center of such pixels do not fall within said black portion, and where such pixels are located between discontinuous portions of the character represented by said pixels turned on by said center point fill method that should be connected but are not, and



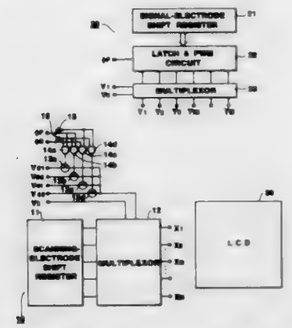
displaying identified pixels which form a closed path between said discontinuous portions of said character, selecting those pixels containing the greatest amount of black to provide a continuous path through the character at least one pixel wide, thus removing said discontinuous portions of the displayed character.

5,200,741

LIQUID-CRYSTAL DISPLAY APPARATUS

Minoru Usui, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,879
Claims priority, application Japan, Nov. 30, 1988, 63-154799[U]
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **35 Claims**



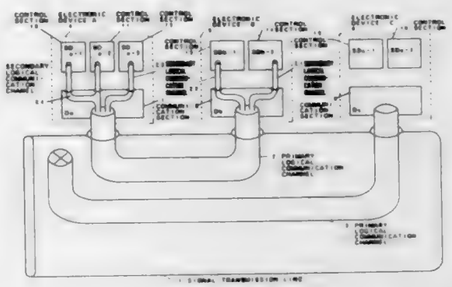
1. A liquid-crystal display apparatus having liquid crystals operable with a predetermined driving voltage applied during respective display periods, comprising:
liquid-crystal display panel means including scanning electrodes and signal electrodes, both of which are disposed in a matrix arrangement;
display control means for dividing a selection period during which said scanning electrodes are to be drive into m divided periods wherein m is a positive integer, and for repeatedly displaying a picture based on common video data for m times; and
scanning-electrode driving means for driving said scanning electrodes with a plurality of voltage values each corresponding to each of m divided periods divided by said display control means so that a different voltage difference is applied between said scanning electrodes and said signal electrodes in each respective divided period, and an effective driving voltage applied to said scanning electrodes during the display period is equivalent to said predetermined driving voltage.

5,200,742

ELECTRONIC DEVICE WITH EXCLUSIVE CONTROL TYPE COMMUNICATION FUNCTION AND ITS COMMUNICATION SYSTEM

Masao Ikezaki, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 501,120
Claims priority, application Japan, Mar. 31, 1989, 1-083418
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.03 **18 Claims**



1. An electronic communication device for connection to a transmission line in a communication system, said communication system comprising at least two said electronic communication devices connected to said transmission line, said electronic communication device comprising:
a plurality of first sub-devices each including a first control section;
a first communication section for (a) assembling a message including at least one of a first part containing data relating to establishment of a primary logical communication channel on said transmission line, a second part containing data relating to release of a primary logical communication channel on said transmission line and a third part containing data relating to message content of said message and (b) receiving a said message from another one of said at least two communication devices, said primary channel for transferring said message between said first communication section and a second communication section of said another one of said at least two communication devices connected to said transmission line;
said first control section for processing said message transferred via said primary channel and for sending to said first communication section a first connection request addressed to a particular second control section of a second sub-device of said another one of said communication devices and including first information relating to establishment of, and second information relating to release of, on said primary channel, a secondary logical communication channel between (a) one or more of said first sub-devices of said first communication device and (b) said particular second control section of said second sub-device of said another one of said communication devices; and
said first communication section, in response to said first connection request, transmitting to said second communication section of said another one of said communication devices a second connection request, including address information identifying said particular second control section of said another one of said communication devices, for establishing said secondary communication channel;
whereby said second communication section, in response to said second connection request, sends to said particular second control section of said another one of said communication devices, on the basis of said address information contained in the second connection request from the first communication device, a third connection request for

establishing said secondary channel, such that said second-

host station over the second pair of lines when the trans-

interactive function order determining means for picking up

predetermined control operation when the counted time exceeds a predetermined interval of time during which no

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establishing said secondary channel, such that said secondary channel may be established; and

said first communication section transferring at least a part of said message to any said first control section of any one of said first sub-devices.

5,200,743

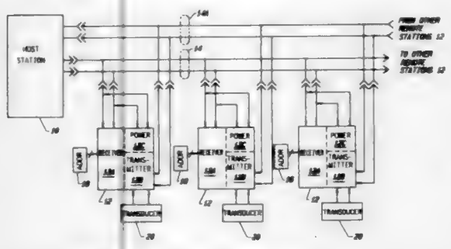
MULTIPLE REMOTE SENSOR SYSTEM FOR REAL TIME ANALOG SENSING AND DIFFERENTIAL CUMMUNICATION

Michael J. St. Martin, South lake Tahoe, Calif., and Roger A. Hala, Gardnerville, Nev., assignors to Bently Nevada, Minden, Nev.

Continuation of Ser. No. 403,123, Sep. 1, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 721,697

Int. Cl.[5] H04Q *9/14*; **G08C** *15/06*

U.S. Cl. 340—825.07 **18 Claims**



1. A communication system comprising

a host station;

a plurality of remote stations each associated with a sensor;

a first wire and a second wire forming a first pair of lines to which the plurality of remote stations are coupled in shunt, and which the host station can use to address any one of the plurality of remote stations with which it desires to communicate and can use to substantially continuously supply power to the remote stations;

a source of power having a positive terminal and a negative terminal;

first switch means controlled by the host, and connected to the positive terminal of the source of power and to the first pair of lines for connecting the positive terminal to the first wire when a first signal state is issued by the host, and for connecting the positive terminal to the second wire when a second signal state is issued by the host;

second switch means controlled by the host and connected to the negative terminal of the source of power and to the first pair of lines for connecting the negative terminal to the second wire when the first signal state is issued by the host and for connecting the negative terminal to the first wire when the second signal state is issued by the host, so that the host can place differential address and control signals upon the first pair of lines while power is being supplied to the remote stations on the first pair of lines:

a second pair of lines, separate from the first pair of lines, which the host station can use to receive differential signals communicated to it by an addressed remote station; and

wherein each of the remote stations operates with voltages and currents compatible with hazardous area requirements and includes

receiving means coupled to the first pair of lines and responsive to the differential address and control signals from the host station for determining when the host station is addressing the remote station and thereupon issuing a transmitter enable signal, and for extracting control information from the differential address and control signals;

means for receiving a sensor signal;

transmitting means which are normally in a quiescent state and responsive to the extracted control information for transmitting a real time differential voltage signal to the host station over the second pair of lines when the transmitter enable signal is issued by the receiving means, wherein the real time differential voltage signal is selected by the extracted control information from among the sensor signal, a first analog signal having a magnitude which is the full scale value of the sensor signal, and a second analog signal having a magnitude which is the zero level for the sensor signal, and wherein the transmitting means maintains the sensor in a quiescent state until the transmitter enable signal is issued, and further wherein the transmitting means are configured so that, when the sensor signal is selected for transmission, the real time differential voltage signal which is transmitted changes in real time in proportion to real time changes in the sensor signal, and the rate of change of the real time differential voltage signal is in real time and in proportion to the rate of change of the sensor signal, so that the differential voltage signal retains substantially all of the dynamic character of the sensor signal, and the information content of the sensor signal is substantially preserved in the differential voltage signal, and further wherein the sensor signal can have frequencies on the order of several thousand hertz.

5,200,744

INTERACTIVE PLANT MONITORING SYSTEM

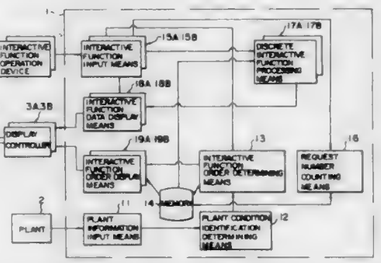
Hiroshi Hiromoto, Kokubunji, and Hideo Ohashi, both of Fuchu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 31, 1990, Ser. No. 472,961

Claims priority, application Japan, Jan. 31, 1989, 1-19727

Int. Cl.[5] H04Q *9/00*

U.S. Cl. 340—825.15 **3 Claims**



1. An interactive plant monitoring system wherein a plurality of interactive functions for monitoring a plant are displayed on a monitoring screen of a CRT display, and an input to each of the plurality of interactive functions is discriminated on the basis of an input signal from an interactive input device connected to the CRT display for realizing an interactive operation together with the monitoring screen, the interactive plant monitoring system comprising:

plant condition discriminating means for discriminating the plant operation condition on the basis of the process data outputted from the plant;

memory means for storing information regarding the display order of the interactive functions which are previously determined for each plant condition;

interactive function order controlling means for picking up information regarding display order of the interactive functions from said memory means in accordance with the discrimination result by said plant condition discriminating means and for displaying the information regarding display order on said monitoring screen;

operation request number counting means for accumulating the operation number of an interactive function displayed on the monitoring screen for each plant condition and storing said accumulated operation number; and

interactive function order determining means for picking up from said memory means information regarding the display order of the interactive functions in accordance with the discrimination result by said plant condition discriminating means, setting an interactive function display priority order in accordance with the interactive function operation number picked up from said operation request number counting means in accordance with the discrimination result by said plant condition discriminating means, and updating said interactive function display order information in accordance with said display priority order;

whereby said interactive function order controlling means displays the interactive functions in accordance with the information determined by said interactive function order determining means.

5,200,745

SYSTEM AND METHOD FOR COMMUNICATING DATA BETWEEN CONTROL UNIT AND MASTER STATION APPLICABLE TO AUTOMOTIVE VEHICLE

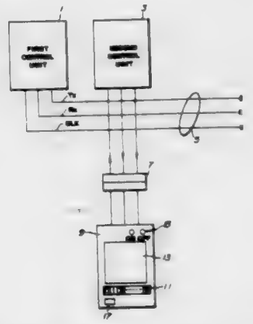
Hideo Takai, Kanagawa; Hidetoshi Inagaki, Tokyo, and Toru Futami, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 2, 1990, Ser. No. 591,515

Claims priority, application Japan, Oct. 9, 1989, 1-262168; Oct. 24, 1989, 1-274799

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.65 **30 Claims**



1. A system for communicating data between a master station and any one of a plurality of control units,

wherein said master station includes:

a) first means for selecting a control unit from among a plurality of control units and for transmitting a selection command to the selected control unit to establish a communication state between the master station and the selected control unit;

b) second means for transmitting a control command to the selected control unit instructing the selected control unit to perform a predetermined control operation;

c) third means for transmitting a diagnostic execution command to the selected control unit instructing the selected control unit to send monitor data relating to the predetermined control operation to the master station; and

d) fourth means for repeatedly transmitting a continuation command to the selected control unit for enabling the continuation of the predetermined control operation by the selected control unit, said fourth means repeatedly transmitting said continuation command at least once within a predetermined interval of time for every repetition of said predetermined interval of time; and

wherein said selected control unit includes: fifth means for counting an elapsed time upon receipt of either of the continuation command or the diagnostic execution command from the master station and for terminating the predetermined control operation when the counted time exceeds a predetermined interval of time during which no continuation command is received thereat.

5,200,746

SWITCHING MODULE FOR DIGITAL CROSS-CONNECT SYSTEMS

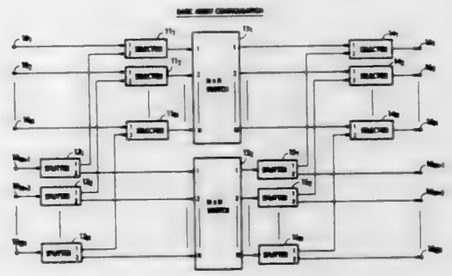
Yuuki Yoshifuji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 739,801

Claims priority, application Japan, Aug. 6, 1990, 2-206875

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.8 **8 Claims**



1. A switching module comprising:

first and second groups of N input terminals, and first and second groups of N output terminals;

first and second N×N space switches;

a first group of N selectors each having a first input coupled to an associated one of the input terminals of the first group and an output coupled to an associated one of N inputs of the first N×N space switch;

a first group of N splitters connected respectively to the input terminals of the second group, each of the splitters having a first output coupled to a second input of an associated one of the selectors of the first group and a second output coupled to an associated one of N inputs of the second N×N space switch;

a second group of N selectors each having a first input coupled to an associated one of N outputs of the first N×N space switch and an output coupled to an associated one of the output terminals of the second group;

a second group of N splitters connected respectively to N outputs of the second N×N space switch, each of the splitters having a first output coupled to a second input of an associated one of the selectors of the second group and a second output coupled to an associated one of the output terminals of the first group; and

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5,200,747

TURN COUNTING POSITION SENSOR

James W. Betz, Ogden, and William I. Buchanan, North Ogden, both of Utah, assignors to Bourns, Inc., Riverside, Calif.

Filed Dec. 13, 1990, Ser. No. 627,077

Int. Cl.[5] G08C *19/16*; **H01C** *10/32, 10/00*

U.S. Cl. 340—870.21 **31 Claims**

1. An angular position sensor, comprising:

means, having at least two respectively rotationally positionable elements, for sensing an angular position of a shaft between 0° and 360° relative to a fixed starting position, said means for sensing including a means for determining the direction of rotation of said shaft;

means for counting a number of revolutions of said shaft, said means for counting being advanced incrementally upon a predetermined degree of rotation of said means for sensing, said means for counting including a means for

for stopping the injection of the fractional reset signal so as to

5,200,752

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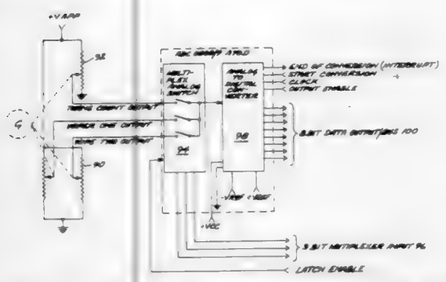
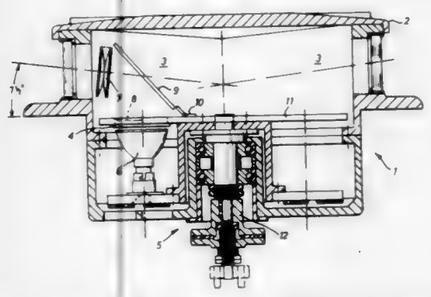
determining the direction of rotation of one of said respectively rotationally positionable elements; and



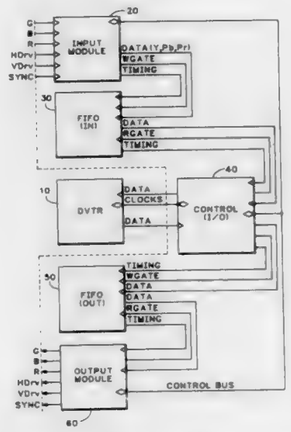
means for computing an angle of rotation for said shaft relative to said fixed position from sensed output of said means for counting and said means for sensing.

5,200,748
PATH GUIDANCE INDICATION APPARATUS FOR VEHICLES OR CRAFT
Ronald E. Attfield, The Belde, Church Lane, Bearstead, Nr. Maidstone, Kent, ME14 EF, England
Continuation of Ser. No. 624,526, Dec. 7, 1990, abandoned, which is a continuation of Ser. No. 297,367, Jan. 17, 1989, abandoned. This application Mar. 31, 1992, Ser. No. 863,131
Claims priority, application United Kingdom, Jan. 14, 1988, 8800759
Int. Cl.[5] B64F *1/18*
U.S. Cl. 340—953 **6 Claims**



1. Apparatus for indicating to a vehicle or craft a desired path of travel, comprising:
(a) a body;
(b) a plurality of optical systems housed in the body and adapted to emit a visual signal over a desired path, each said optical system defining an optical aperture and comprising a colored filter to cover only a portion of said optical aperture of the system;
(c) means for partially masking electromagnetic radiation emitted by some of the optical systems; and
(d) means for rotating the optical systems and mask means;
wherein said optical systems, mask means and rotation means cooperate to produce a series of omni-directional visual signals over 360° of azimuth for indicating to a viewer of said signals a desired path of travel, said series comprising, from top to bottom as viewed, a flashing visual signal of a first color over a first viewing angle range and a steady non-flashing series of visual signals of said first color over a second viewing angle range, a steady non-flashing series of visual signals of a second color over a third viewing angle range, and a flashing visual signal of said second color over a fourth viewing angle range, each said viewing angle range delimiting a discrete corridor within or without a predetermined azimuth angle, and wherein the steady non-flashing first color over the second viewing angle range defines a desired flight path.

5,200,749
FORMAT CONVERTER ARCHITECTURE
Philip S. Crosby, Portland, and Ajay K. Luthra, Beaverton, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed May 28, 1991, Ser. No. 706,462
Int. Cl.[5] H04N *7/01*
U.S. Cl. 341—87 **16 Claims**

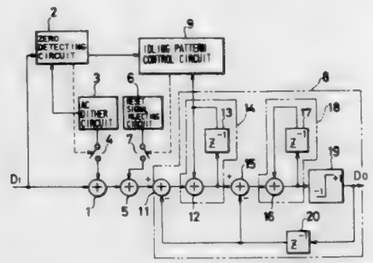


1. An apparatus for converting an input signal having a specified format into a digital signal having a pre-existing digital format, both the specified and pre-existing digital formats being orthogonal in structure and having lines and fields, comprising:
means for extracting from the input signal an active data portion according to the specified format to generate a digital data stream of active samples; and
means for inserting into the digital data stream dummy samples to generate the digital signal, the number of the dummy samples being a function of the relationship of the specified format and the pre-existing digital format.

5,200,750
DIGITAL-TO-ANALOG CONVERTER WITH NOISE-FREE SIGMA-DELTA MODULATION
Tatsuo Fushiki, and Sadayuki Narusawa, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan
Filed Nov. 21, 1991, Ser. No. 795,757
Claims priority, application Japan, Nov. 22, 1990, 2-319433
Int. Cl.[5] H03M *3/02, 1/20*
U.S. Cl. 341—143 **4 Claims**

1. A digital-to-analog conversion apparatus comprising: modulating means for effecting sigma-delta modulation of multi-bit input data to form a pattern of quantized output data so as to produce a pulse signal corresponding to the input data; detecting means for detecting a silent condition when the input data is continuously held at a zero level; injecting means operative when the silent condition is detected for effecting continuous injection of a fractional reset signal into the modulating means to gradually change an internal state of the modulating means; and control means operative to detect when the modulating means reaches an optimum internal state effective to stabilize a varying idling pattern of the quantized output data

for stopping the injection of the fractional reset signal so as to effect convergence of the varying idling pattern into a fixed

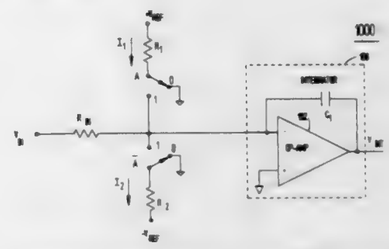


idling pattern which is substantially free of an audible frequency component under the silent condition.

5,200,751
DIGITAL TO ANALOG CONVERTER USING A PROGRAMMABLE LOGIC ARRAY
Michael D. Smith, Lewisville, Tex., assignor to Dallas Semiconductor Corp., Dallas, Tex.
Filed Jun. 26, 1989, Ser. No. 371,464
Int. Cl.[5] H03M *1/76*
U.S. Cl. 341—147 **3 Claims**

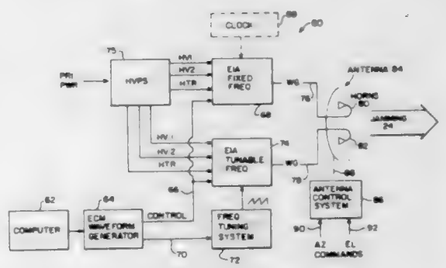
1. An integrated circuit digital to analog converter, comprising:
a voltage source, which provides multiple scaled voltages;
a plurality of row lines, connected to receive respective ones of said scaled voltages from said voltage source;
each of said row lines including multiple selection transistor locations in series,
respective ones of said selection transistors having gates which are connected to control inputs,
programmable connections being located to short out selected respective ones of said selection transistors;
a plurality of column busses;
a plurality of programmable jumpers, each selectably connecting a respective one of said row lines to a respective one of said column busses;
said selection transistors being configured so that, multiple ones of said column busses may be driven simultaneously.

5,200,752
INTEGRATING ANALOG TO DIGITAL CONVERTER RUN-UP METHOD AND SYSTEM
Wayne C. Goeke, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 18, 1991, Ser. No. 732,382
Int. Cl.[5] H03M *1/50*
U.S. Cl. 341—168 **12 Claims**



1. A method for controlling the run-up (RU) interval of an integrated A/D converter, comprising the steps of:
(a) applying an analog signal to an integrator;
(b) applying a positive reference charge to said integrator regardless of the integrated charge within said integrator;
(c) maintaining the application of said positive reference charge to said integrator when the integrated charge within said integrator is negative, or alternatively, applying a negative reference charge to said integrator when the integrated charge within said integrator is positive;
(d) maintaining said negative reference charge, or alternatively, applying said negative reference charge to said integrator regardless of the integrated charge within said integrator; and
(e) maintaining the application of said negative reference charge to said integrator when the integrated charge within said integrator is positive, or alternatively, applying a positive reference charge to said integrator when the integrated charge within said integrator is negative.

5,200,753
MONOPULSE RADAR JAMMER USING MILLIMETER WAVE TECHNIQUES
Saul Janusas, Seacliff, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Feb. 20, 1992, Ser. No. 837,882
Int. Cl.[5] G01S *7/38*; H04K *3/00*
U.S. Cl. 342—14 **9 Claims**



1. A radar jamming system comprising:
a fixed frequency means outputting a millimeter wave fixed signal;
a tunable frequency means outputting a millimeter wave variable signal;

means connected to an input of the tunable means for pro-

surface portion and down over the side surface portions;

5,200,755

a) a framework for supporting said antenna elements;
b) means attached to designated portions of said framework

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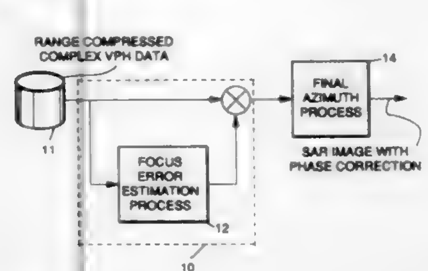
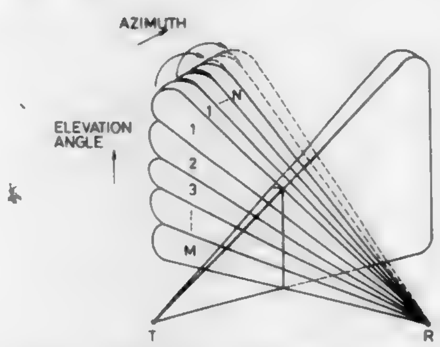
means connected to an input of the tunable means for producing a scanning tuning signal;
first and second antenna horns for respectively transmitting the output signals from the fixed and tunable frequency means, simultaneously; and
first and second waveguides connected between the fixed and tunable means and their corresponding antenna horns;
wherein a range of transmitted scanned frequencies relative to the fixed frequency include an intermediate frequency of a distant radar receiver to be jammed, the receiver having a local oscillator operating at a frequency substantially lower than the fixed frequency.

5,200,754
FOURTH-ORDER-PRODUCT PHASE DIFFERENCE AUTOFOCUS
Yoji G. Niho, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 27, 1991, Ser. No. 799,505
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 **7 Claims**



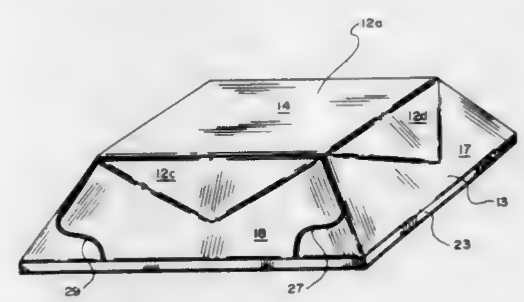
1. A phase difference autofocus computational method for use in processing range compressed video phase history (VPH) data of a SAR data to correct for phase errors contained therein, said method comprising the steps of:
dividing an array of range compressed VPH data into first and second subarrays;
forming a third subarray of range compressed VPH data comprising a portion of the array;
complex-conjugate multiplying the first subarray with the third subarray to produce a first second-order-product subarray;
complex-conjugate multiplying the third subarray with the second subarray to produce a second second-order-product subarray;
complex-conjugate multiplying the first second-order-product subarray with the second second-order-product subarray to produce a first fourth-order-product subarray;
time reversing and complex-conjugate multiplying the second second-order-product subarray with the first second-order-product subarray to produce a second fourth-order-product subarray;
separately performing Fourier transforms on the first and second fourth-order-product subarrays to produce respective FFT filter banks;
separately performing magnitude-detections on respective FFT filter banks to produce respective autofocus functionals;
summing the respective autofocus functionals over all range bins;
respectively determining the locations of the peak response values of the autofocus functionals;
computing quadratic and cubic phase error values from the respective peak response locations;
combining the quadratic and cubic phase error values in accordance with a predefined relationship to produce a phase error correction signal; and
multiplying the range compressed VPH data with the phase error correction signal to produce phase-corrected VPH data.

5,200,755
BISTATIC RADAR SYSTEM
Shoji Matsuda, and Masaya Takase, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 622,019, Dec. 4, 1990, abandoned. This application Jul. 16, 1992, Ser. No. 912,209
Claims priority, application Japan, Dec. 6, 1989, 1-318120
Int. Cl.[5] G01S *13/48;* **H01Q** *3/24*
U.S. Cl. 342—158 **9 Claims**



1. A bistatic radar system comprising:
a transmit station having an antenna for transmitting a transmit beam; and
a receive station separate from the transmit station for forming a cluster of receive beams, intersecting the transmit beam;
said receive station performing step-wise shifting, wherein each of said receive beams is step-wise shifted in a direction of propagation of the transmit beam such that a last beam of said receive beams in the direction of propagation of the transmit beam becomes a first beam of said receive beams in the direction of propagation of the transmit beam upon termination of a predetermined time period for each of said receive beams.

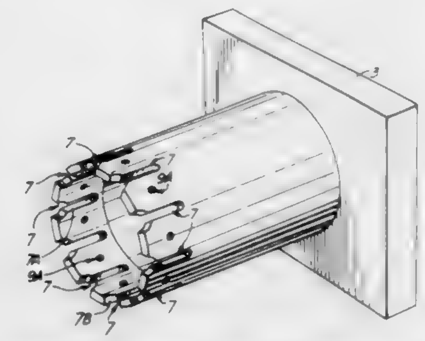
5,200,756
THREE DIMENSIONAL MICROSTRIP PATCH ANTENNA
Walter Feller, Airdrie, Canada, assignor to NovAtel Communications Ltd., Calgary, Canada
Filed May 3, 1991, Ser. No. 695,279
Int. Cl.[5] H01Q *1/38*
U.S. Cl. 343—700 MS **11 Claims**



1. An antenna assembly comprising:
A. a dome-like substrate having a surface with a top portion and side portions extending from said top portion, said side surface portions defining an opening opposite said top surface portion;
B. a ground plane layer on the interior surface of said substrate;
C. a radiative layer on the exterior surface of said substrate, said radiative layer having a central portion on said top surface portion and apex portions extending from said top

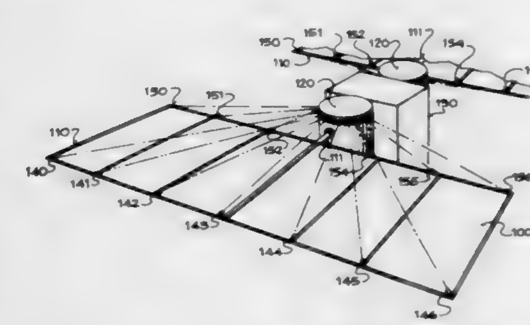
surface portion and down over the side surface portions; and
D. a base contacting said substrate and closing said opening, said base having a first surface facing the interior of said substrate and a second surface opposite said first surface.

5,200,757
MICROWAVE ANTENNAS HAVING BOTH WIDE ELEVATION BEAMWIDTH AND A WIDE AZIMUTH BEAMWIDTH OVER A WIDE FREQUENCY BANDWIDTH
Hari L. Jairam, Harrow, England, assignor to GEC-Marconi Limited, England
Filed May 22, 1991, Ser. No. 703,886
Claims priority, application United Kingdom, May 23, 1990, 9011576
Int. Cl.[5] H01Q *13/00*
U.S. Cl. 343—786 **16 Claims**



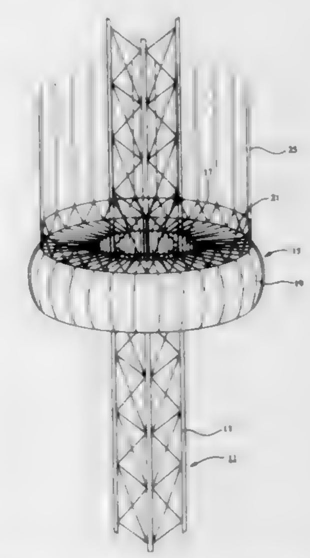
1. A microwave antenna having a beamwidth and a bandwidth over a range of operating frequencies, comprising: a horn radiator including a tubular radiating end portion having a longitudinal axis, and means for maximizing the beamwidth, including at least four open-ended cut-outs formed in said tubular radiating end portion, said cut-outs extending along the axis no more than about one-half wavelength at the highest operating frequency in said range.

5,200,758
SYSTEM FOR CONTROLLING THE RADIATION PATTERN OF AN ANTENNA
Calvin W. Gillard, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Division of Ser. No. 417,604, Oct. 5, 1989, Pat. No. 5,047,788. This application Mar. 9, 1990, Ser. No. 490,883
Int. Cl.[5] H01Q *1/120, 1/220, 3/300*
U.S. Cl. 343—880 **10 Claims**



1. An apparatus for controlling the radiation pattern of an antenna, said antenna comprising an array of elements that are in precisely predetermined phase relationship with each other so as to produce a specified radiation pattern, said apparatus comprising:
a) a framework for supporting said antenna elements;
b) means attached to designated portions of said framework for generating a plurality of optical signals, each of said optical signals being associated with a corresponding portion of said framework;
c) means for analyzing said plurality of optical signals to determine precise locations of said designated portions of said framework, and concomitantly for determining an actual figure during a specified time interval for said antenna; and
d) means for generating electrical signals for electronically producing changes of phase of individual antenna elements of said array as said designated portions of said framework undergo mechanical displacement relative to each other, said changes of phase of said individual antenna elements thereby maintaining substantially diffraction-limited performance of said antenna so as to control said radiation pattern.

5,200,759
TELECOMMUNICATIONS TOWER EQUIPMENT HOUSING
Henry J. McGinnis, 132 Los Robles Dr., Arlington, Tex. 76006
Filed Jun. 3, 1991, Ser. No. 709,633
Int. Cl.[5] H01Q *1/12*
U.S. Cl. 343—890 **11 Claims**



1. A housing for a tower for housing telecommunication equipment, comprising in combination:
an annular outer wall having an axis adapted to coincide with a longitudinal axis of the tower, the outer wall being of a material selected to allow the passage of telecommunication signals through the wall from the telecommunication equipment;
an annular inner wall spaced radially inward from the outer wall, the inner wall defining a central opening for receiving the tower;
a floor extending between the inner and outer walls for supporting the telecommunication equipment;
a top extending between the inner and outer walls above the floor;
means at the inner wall for securing the housing to the tower; and wherein
the outer wall comprises a plurality of separate wall sections, each wall section having a vertical inward extending flange on each side, the flanges being fastened together.

5,200,763 **5,200,764**

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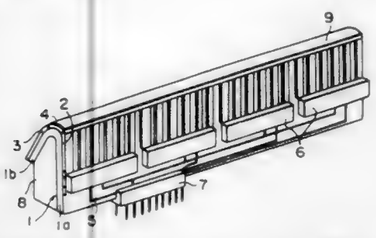
5,200,760

THERMAL HEAD FOR A THERMAL PRINTER

Takashi Ujihara, Yamagata, and Tsunehiro Tsukagoshi, Saitama, both of Japan, assignors to Tohoku Pioneer Electronic Corporation, Yamagata, Japan

Filed Jun. 28, 1991, Ser. No. 723,012
Claims priority, application Japan, Sep. 28, 1990, 2-259892; Jan. 21, 1991, 3-20558
Int. Cl.[5] B41J 2/335
U.S. Cl. 346—76 PH 5 Claims



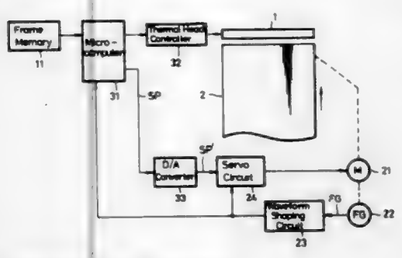
1. A thermal head for a thermal printer comprising:
an insulator substrate made of heat resistant resin and having an end face;
a supporting member supporting said substrate in an upright position;
a plurality of heating members attached to the end face of said substrate; and
a plurality of individual conductive patterns and a common electrode attached to respective sides of said substrate, and connected to said heating members so as to supply a current to each of said heating members,
said supporting member having a rounded top portion, wherein said heating members, said individual conductive patterns and said common electrode are provided on one side of said substrate, said supporting member is attached to another side of said substrate, and said substrate is bent at a location of said heating members over the rounded top portion of said supporting member, and
said substrate being separated from said supporting member at the top portion thereof, thereby forming a space between said substrate and the top portion.

5,200,761

THERMAL PRINTING APPARATUS

Kozo Kawakita, and Koichi Kokusho, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1990, Ser. No. 596,082
Claims priority, application Japan, Oct. 12, 1989, 1-265758; May 25, 1990, 2-136432
Int. Cl.[5] B41J 2/32; G01D 15/24
U.S. Cl. 346—76 PH 2 Claims



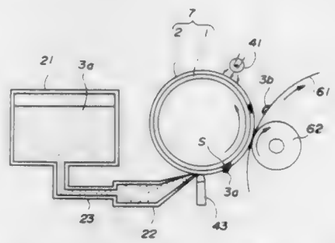
1. A thermal printer comprising:
(1) a thermal head having a plurality of heating elements arranged along a line in a horizontal direction;
(b) printing data processing means for energizing said heating elements of said thermal head in accordance with a gray level of an input video signal;
(c) driving means for continuously moving a print paper relative to said thermal head in a vertical direction;
(d) pitch setting means for setting a vertical print pitch according to a number of effective horizontal print lines, an effective width of said thermal head in the horizontal direction and an aspect ratio of a printed image; and
(e) speed control means coupled to said driving means for changing a moving speed of said print paper according to said vertical print pitch, wherein an energizing time to said heating elements is fixed independent of the vertical print pitch, and wherein said moving speed of said print paper and a printing cycle are controlled in order to make a density of said printing image constant independent of the vertical print pitch.

5,200,762

IMAGE FORMING APPARATUS

Yasuo Katano; Yasuyuki Okada, both of Yokohama; Takeshi Takemoto, Yamato; Akira Oyamaguchi, Yokohama, and Yoshio Watanabe, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 24, 1991, Ser. No. 690,584
Claims priority, application Japan, Apr. 25, 1990, 2-111398; May 2, 1990, 2-116172
Int. Cl.[5] B41M 5/26
U.S. Cl. 346—76 R 13 Claims



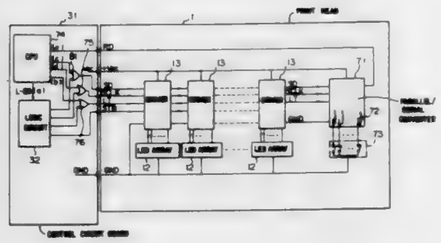
1. An image forming apparatus comprising:
a recording medium having a recording layer which has a characteristic in which a receding contact angle decreases when said recording layer is heated in a condition where said recording layer is in contact with a liquid, said recording medium being moved by an external driving mechanism in a predetermined direction;
supplying means, coupled to said recording medium, for supplying a liquid to a predetermined area on a surface of said recording layer of said recording medium, said supplying means comprising a narrow path for leading the liquid to the surface of said recording layer due to a capillary attraction; and
heating means, coupled to said recording medium, for selectively heating the surface of said recording layer of said recording medium in accordance with image information,
wherein an area on the surface of said recording layer is heated and brought in contact with the liquid supplied by said supplying means so that the area changes to a liquid adhesive area to which the liquid can be easily adhered due to the decreasing of the receding contact angle, and wherein a visible image corresponding to the image information is formed on the surface of said recording layer when a recording agent is adhered to the liquid adhesive area.

5,200,763

PRINTER WITH AN LED PRINT HEAD HAVING MEANS FOR SETTING DATA ABOUT THE PRINT HEAD

Jiro Tazuma, and Naoji Akutsu, both of Tokyo, Japan, assignors to Oki Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00940, § 371 Date Mar. 20, 1991, § 102(e) Date Mar. 20, 1991, PCT Pub. No. WO90/03273, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 14, 1989, Ser. No. 668,492
Claims priority, application Japan, Sep. 21, 1988, 63-236799
Int. Cl.[5] G01D 9/42, 15/14
U.S. Cl. 346—107 R 5 Claims



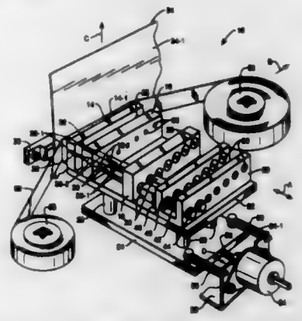
1. An LED printer for use with a print controller which supplies printing data to the printer, comprising:
an LED print head having a serial clock signal input port and a latch signal input port, the LED print head including
a plurality of LED array chips, and
a plurality of driver chips which are connected to the serial clock signal input port and the latch signal input port, each of said driver chips additionally being connected to a respective one of the LED array chips;
a control circuit board which is separated from the LED print head, the control circuit board including
a CPU having a serial clock signal output port and a latch signal output port,
a logic circuit which receives the printing data from the print controller and which controls timing for supplying the printing data to the driver chips of the print head, the logic circuit being connected to the CPU and having a serial clock signal output port and a latch signal output port,
a gate having an input port that is connected to the serial clock signal output port of the CPU, an input port that is connected to the serial clock signal output port of the logic circuit, and an output port that is connected to the serial clock signal input port of the print head, and
another gate having an input port that is connected to the latch signal output port of the CPU, an input port that is connected to the latch signal output port of the logic circuit, and an output port that is connected to the latch signal input port of the print head; and
data setting means for providing setting data in serial form to the CPU in accordance with characteristics and specifications of the LED print head, the data setting means being disposed on the LED print head and including
means for establishing a setting data word in parallel form, and
means for converting the setting data word from parallel form to serial form, the means for converting being connected to the serial clock signal input port and the latch signal input port of the print head.

5,200,764

PRINT HEAD ASSEMBLY FOR USE IN AN ULTRASONIC PRINTER

Hideo Nagasawa, Oiso, Japan, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 633,905, Dec. 26, 1990, abandoned. This application Jun. 18, 1992, Ser. No. 902,431
Claims priority, application Japan, Dec. 27, 1989, 1-336792; May 22, 1990, 2-130293
Int. Cl.[5] G01D 15/10; B41J 2/25
U.S. Cl. 346—105 25 Claims



1. A print head assembly for use in an ultrasonic printer, said ultrasonic printer having a platen, and an ink ribbon and a print medium operably associated with said platen, said print head assembly comprising:
plate support means for supporting said print head assembly;
a wire guide block and a print head guide block secured to said plate support means;
at least one print head slidably mounted in said print head guide block, said at least one print head having a print head wire secured thereto which is slidably mounted in said wire guide block, said at least one print head comprising:
an ultrasonic vibrator;
a horn coupled to said ultrasonic vibrator for amplifying energy generated by said ultrasonic vibrator;
said print head wire being coupled to said horn and having a tip which forces the ink ribbon into engagement with the print medium and against the platen in order to print a pixel on the print medium upon generation of energy by said ultrasonic vibrator; and
a pressurizing mechanism located in said ultrasonic printer, said pressurizing mechanism engaging said plate support means to cause said tip of said print head wire to force the ink ribbon against the print medium and the platen with a predetermined force so that a pixel may be printed on the print medium when said ultrasonic vibrator is energized.

5,200,765

APPARATUS AND METHOD FOR CALIBRATING A GREY LEVEL PRINTHEAD

Hwai-Tzuu Tai, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1990, Ser. No. 498,512
Int. Cl.[5] G01D 9/00, 9/42
U.S. Cl. 346—107 R 22 Claims

1. A method for calibrating a printhead having a plurality of light-emitting recording elements, the method comprising the steps of:
(a) measuring a light intensity of each recording element of said plurality of recording elements;
(b) generating a first set of exposure times for which recording elements may be energized;

(c) weighing for one recording element of said plurality of

receiving a light beam spot, a plurality of optical wave-

5,200,768

a shifting means for moving the toner feed means toward or

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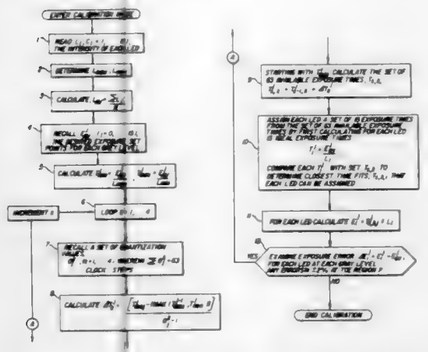
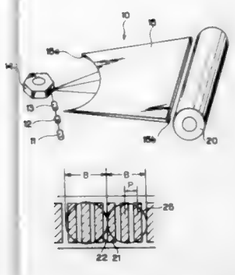
(c) assigning for one recording element of said plurality of recording elements a first subset of said exposure times having a number of said exposure times less than in said first set and equal to a plural number of grey levels for recording by the one recording element;
(d) for the one recording element, calculating an exposure error resulting from assigning for the one recording element the first subset of said exposure times from said first set;
(e) comparing the exposure error with a criterion establishing acceptable error;



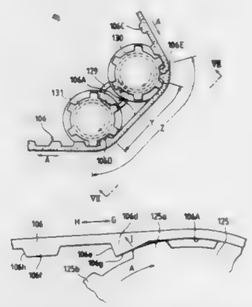
(f) if the criterion is not met, generating a new set of said exposure times and then repeating steps (c)–(e) so that the criterion is met with a new subset of said exposure times from the new set of said exposure times;
(g) when the criterion is met, storing the new subset of said exposure times in memory; and
(h) in response to a signal calling for recording of a grey level pixel by said one recording element, the signal is transformed into a second signal for controlling a duration of a recording period for recording the pixel, the duration being related to one of the stored exposure times in said new subset.

5,200,766
OPTICAL SCANNING DEVICE USED FOR IMAGE FORMING APPARATUS
Takeo Iwasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Mar. 1, 1991, Ser. No. 662,822
Claims priority, application Japan, Mar. 13, 1990, 2-61995
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **27 Claims**



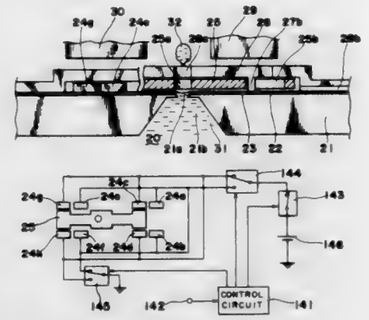
20. An optical scanning device for optically scanning a light beam in a first direction on a photosensitive medium on the basis of image information to form a desired image corresponding to the image information on the photosensitive medium, the optical scanning device comprising:
an optical waveguide array including a light incident end for receiving a light beam spot, a plurality of optical waveguides for guiding therealong the light beam spot received at the light incident end, and a light emitting end for emitting the light beam spot guided along the plurality of waveguides onto the photosensitive medium, the plurality of optical waveguides being arranged at the light incident end along a second direction and being arranged at the light emitting end along the first direction;
a light beam irradiating means for receiving the image information and for selectively irradiating the light incident end of said optical waveguide array with light beam spots on the basis of the image information, each of the light beam spots irradiated on the light incident end having a spot diameter; and
wherein an interval between centers of each two adjacent optical waveguides arranged at the light incident end along the second direction is smaller than the spot diameter of the light beam spot.

5,200,767
RECORDING APPARATUS HAVING TIMING BELT DRIVING MECHANISM FOR DRIVING RECORDING HEAD
Isao Tsukada; Hayato Shinohara, both of Yokohama, and Yasuhide Saito, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 480,000, Feb. 14, 1990, Pat. No. 5,140,344. This application Jan. 23, 1992, Ser. No. 824,291
Claims priority, application Japan, Feb. 14, 1989, 1-34573; Apr. 4, 1989, 1-85598; May 22, 1989, 1-126588; May 30, 1989, 1-134655
Int. Cl.[5] G01D *15/16;* **B41J** *19/20;* **F16H** *7/02*
U.S. Cl. 346—139 R **9 Claims**



1. A timing belt driving mechanism used for scanning a recording head to record on a recording medium, said mechanism comprising:
a driving pulley having teeth; and
a timing belt having a toothed portion with teeth of a predetermined shape at a predetermined pitch, said belt is moved by the rotative driving of said driving pulley meshing with said belt to thereby move a driven member coupled to said belt, wherein said timing belt is provided with an untoothed portion for idly rotating said driving pulley relative to said belt, and the shape of at least one of the teeth of the toothed portion of said belt which are located in face-to-face relationship at opposite ends of said untoothed portion differs from the shape of the other tooth and is formed into such a shape that it is difficult for a tooth of said driving pulley to run thereon.

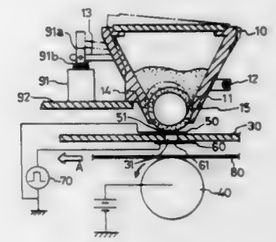
5,200,768
INK RECORDING APPARATUS
Narito Shibaike, Hirakata; Soichiro Mima, Nishinomiya, and Seiko Minamide, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 9, 1990, Ser. No. 610,967
Claims priority, application Japan, Nov. 9, 1989, 1-292899
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] B41J *2/16, 2/165*
U.S. Cl. 346—140 R **12 Claims**



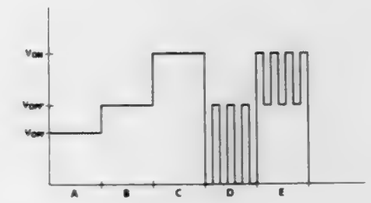
1. An ink recording apparatus, comprising:
an ink chamber for holding ink therein;
an ink jet port provided in said ink chamber;
pressure means for applying pressure to ink in said ink chamber;
a shutter having an outer surface disposed at said ink jet port, said shutter comprising a thin film disposed so as to be moveable between a shut-off position for preventing ink from being jetted out after passing through said ink jet port and a passing position for allowing ink to be jetted out after passing through said ink jet port; and
shutter driving means for driving said shutter between said shut-off and passing positions in response to recording signals, said shutter driving means comprising electrodes having surfaces provided in correspondence with said shut-off position and said passing position of said shutter, a power supply for applying a voltage to said electrodes and a control circuit for controlling the voltage applied to said electrodes by said power supply, whereby said shutter is driven by electrostatic attraction forces between the surfaces of said electrodes and the surface of said shutter.

5,200,769
IMAGE FORMING APPARATUS PROVIDED WITH SHIFTING MEANS FOR THE TONER FEED MEANS
Osamu Takemura, Nishinomiya, and Yoshihiro Koyama, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Nov. 25, 1991, Ser. No. 796,755
Claims priority, application Japan, Nov. 26, 1990, 2-324389
Int. Cl.[5] B41J *2/415*
U.S. Cl. 346—140 R **6 Claims**

1. An image forming apparatus comprising:
a substrate having a plurality of toner passages extending therethrough,
a pair of electrodes, each having holes extending therethrough and communicating with corresponding toner passages of the substrate, he electrodes sandwiching the substrate as an insulating and being disposed so that each hole of each electrode is aligned with a corresponding toner passage,
a toner feed means disposed above one electrode for feeding charged toner,
a shifting means for moving the toner feed means toward or away from the toner passages in the substrate, and
an image information generating means for giving a prescribed potential between the pair of electrodes so that an electric field which causes the charged toner to pass through the toner passages is formed inside the toner passages.



5,200,770
BACKGROUND FROM AN ELECTROGRAPHIC PRINTER THROUGH MODULATED OFF STATES
Richard J. Gable, Mt. View, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 12, 1991, Ser. No. 790,791
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 **5 Claims**



1. An electrographic recording device which writes image data on a recording medium, said device configured to reduce unwanted background writing comprising:
recording means including a series of electrodes arranged in a longitudinally extending array;
a first voltage supply means for supplying a modulated voltage to said electrodes, said modulated voltage having a maximum value below a threshold for writing;
a second voltage supply means for supplying a constant voltage to said electrodes; and
a switching means for connecting said electrodes to said first voltage supply means during a non-writing state, supplying said modulated voltage to said electrodes to reduce unwanted background writing during said non-writing state, and for connecting said electrodes to said first voltage supply means and said second voltage supply means during a writing state, resulting in a voltage above said threshold, for writing directly onto said recording medium.

5,200,771

tion for directing a beam of light along a light path and reflect-

5,200,774
CAMERA WITH AUTO PROGRAM ZOOM CONTROL

hole, wherein said jig guiding device comprises a guide rib, said guide rib protruding from said camera body,

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5,200,771

EYEGLASSES HAVING A DETACHABLE NOSE REST

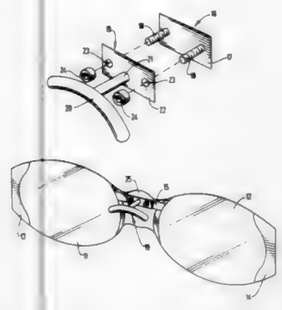
Ingeborg Schmolz, Munich, and Rolf Winkler, Eisingen, both of Fed. Rep. of Germany, assignors to Frey & Winkler GmbH & Co. KG, Koenigsbach, Fed. Rep. of Germany

Filed Apr. 19, 1991, Ser. No. 687,485

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1990, 9004468[U]

Int. Cl.[5] G02C *5/02*

U.S. Cl. 351—132 12 Claims



1. In a pair of eyeglasses, having lenses, a bridge connected between edges of the lenses and a nose rest that can be mounted on the side of the bridges facing toward the wearer, the improvement wherein: said nose rest comprises a one-piece bow; a creating plate having two bores, and a spacer element securing said bow to said retaining plate, said bow, said retaining plate and said spacer element constituting respective portions of a one-piece shaped structure; said bow has substantially the shape of a circular arc and is positioned and configured to rest essentially only on the bride of the nose of a wearer; and said eyeglasses further comprises two externally threaded screw elements secured to said bridge and passing through said bores of said retaining plate and two threaded nuts fastened to said screw elements for securing said retaining plate to said bridges.

5,200,772

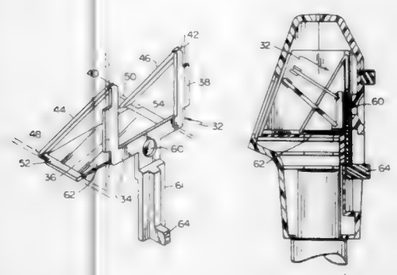
FILTER APPARATUS FOR RETINOSCOPE

David G. Perkins, Syracuse, and Richard A. Monroe, Liverpool, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Sep. 11, 1991, Ser. No. 757,899

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—213 11 Claims



1. An improved retinoscope of the type having a housing with a viewing path passing therethrough, a source of illumination for directing a beam of light along a light path and reflecting means redirecting the light path along the viewing path the improvement comprising:

a first filter means slidably mounted within the housing so that said first filter means may be towed into and out of the viewing path, said first filter means being positioned behind the reflecting means so that said first filter means is not in the light path of the source;

a second filter means slidably mounted within the housing so that said second filter means may be moved into and out of the light path between the light source and the reflecting means;

a hinged frame means for slidably and dependently containing said first and second filter means within the housing; and

actuating means connected to said hinged frame means for selectively moving said first filter means into and out of the viewing path while dependently moving said second filter means into and out of the light path so as to modify the light observed along the viewing path.

5,200,773

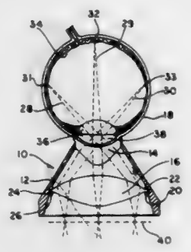
DIAGNOSTIC INDIRECT OPHTHALMOSCOPY CONTACT LENS SYSTEM

Donald A. Volk, 9378 Jackson Ave., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 428,504, Oct. 27, 1989, Pat. No. 5,046,836. This application Oct. 29, 1990, Ser. No. 604,531

Int. Cl.[5] A61B *3/00*

U.S. Cl. 351—219 20 Claims



1. An indirect ophthalmoscopy lens device used to observe the fundus of the eye comprising,

a holding means to support and position a plurality of lenses relative to one another,

said plurality of lenses including a contact lens element having a concave posterior surface and convex anterior surface,

at least one anterior lens element having first and second surfaces,

said contact lens element and said at least one anterior, lens element being positioned relative to one another to refract light rays from an illumination system to form an image of the light source on the fundus of an examined eye and to collect light rays emerging from the fundus of the eye and refracting said emerging light rays to form an inverted aerial image of the fundus, and means supported within said holding means to erect said inverted image of the fundus produced by said contact lens element and said at least one anterior lens element to form a real erect image of the fundus anterior to said at least one anterior lens element.

5,200,774

CAMERA WITH AUTO PROGRAM ZOOM CONTROL AND EYE SENSING CONTROL

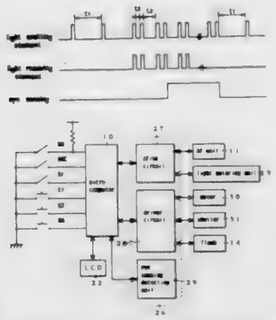
Hidekazu Nakajima, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1991, Ser. No. 721,246

Claims priority, application Japan, Jun. 26, 1990, 2-169302; Jun. 26, 1990, 2-169303; Jun. 26, 1990, 2-169304; Jun. 26, 1990, 2-169305; Jun. 27, 1990, 2-169430

Int. Cl.[5] G03B *29/00, 13/02*

U.S. Cl. 354—62 3 Claims



1. A camera with an eye sensing control comprising;

a detecting means for examining whether any object is presently adjacent to a viewfinder or not;

a first controlling means for controlling the detecting means so that the object near the viewfinder is repeatedly detected at first intervals, and after the presence is detected, at least another detecting action is executed at second intervals shorter than the first intervals; and

a second controlling means for controlling the camera action according to a result of the repeated detection of the detecting means.

5,200,775

WATERPROOF CAMERA

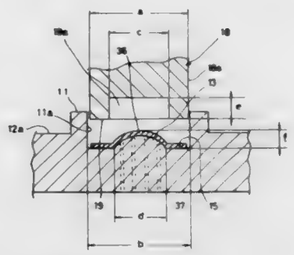
Hidetaka Yokota, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1991, Ser. No. 777,787

Claims priority, application Japan, Oct. 29, 1990, 2-112113[U]

Int. Cl.[5] G03B *17/08*

U.S. Cl. 354—64 15 Claims



1. A waterproof camera comprising:

a watertight camera body;

at least one air bleeding hole formed in said camera body to connect the inside and outside of said camera body;

an air permeable and water impermeable filter attached to said air bleeding hole; and

a jig guiding device provided on said camera body which guides a filter adhering jig adapted to attach said air permeable and water impermeable filter to said air bleeding hole, wherein said jig guiding device comprises a guide rib, said guide rib protruding from said camera body.

5,200,776

LENS BARREL FOR CAMERA

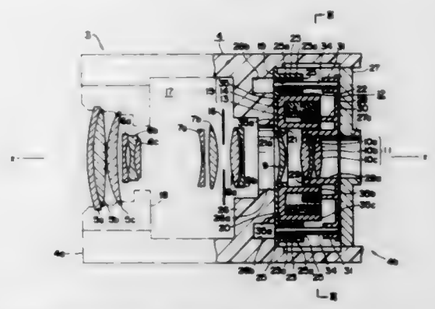
Satoshi Sakamoto, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed May 13, 1991, Ser. No. 698,842

Claims priority, application Japan, May 21, 1990, 1-130580

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—195.12 16 Claims



1. A lens barrel for a camera, comprising:

an outer shell having a pair of guide portions provided at an inside thereof;

a lens holding member holding a movable lens thereon, said lens holding member having a pair of guide portions provided substantially at opposite locations thereof with respect to an optical axis of said movable lens, said lens holding member being supported at said guide portions thereof for sliding movement on said guide portions of said outer shell;

an actuator, for moving said lens holding member, including a coil securely mounted on said lens holding member and a magnet securely mounted on said outer shell, said coil and magnet being disposed coaxially with each other about the optical axis of said movable lens;

a position detecting means spaced by substantially equal distances from said two guide portions of said lens holding member for detecting a position of said lens holding member with respect to said outer shell; and

a moving speed detecting means for detecting a speed of movement of said lens holding member, said moving speed detecting means being provided at a location spaced at substantially equal distances from said guide portions remote from said position detecting means.

5,200,777

FILM CASSETTE WITH INTEGRATED CASSETTE ELEMENT LOCK AND LIGHT BLOCKING DEVICE

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,356

Int. Cl.[5] G03B *7/18*

U.S. Cl. 354—275 6 Claims

1. An improved film cassette wherein light blocking means is supported for movement to a light blocking position for preventing ambient light from entering a cassette shell and to a non-blocking position, and a separate cassette element is supported for movement to use said film cassette, and wherein the improvement comprises:

locking means for normally engaging said cassette element to prevent movement of the cassette element is coupled with said light blocking means for movement, when the light blocking means is moved to its non-blocking posi-

tion, to a non-locking position disengaged from the cas-

called conditions for said desired items and under said

element included in an image forming apparatus, said method

said tray for accommodating said processed sheets moved

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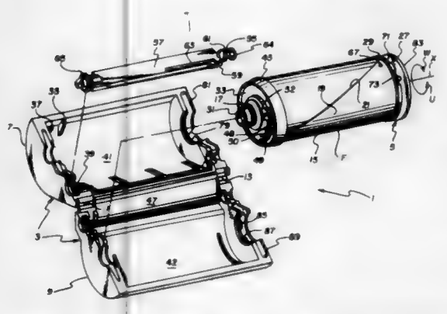
tion, to a non-locking position disengaged from the cassette element to allow movement of the cassette element,



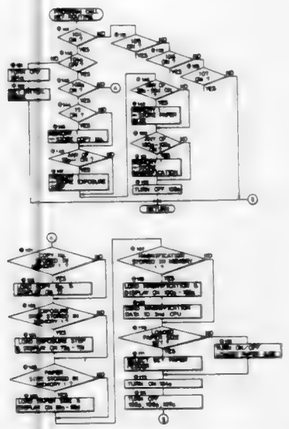
whereby said film cassette cannot be used unless said light blocking means is in its non-blocking position.

5,200,778

COPYING APPARATUS HAVING A MEMORY FOR STORING SELECTED COPYING CONDITIONS

Masazumi Ito, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 291,212, Dec. 28, 1988, abandoned.
This application Dec. 19, 1991, Ser. No. 810,538
Claims priority, application Japan, Dec. 29, 1987, 62-335580
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—204 5 Claims



1. A copying apparatus including a plurality of independent elements cooperating with each other to form an image, comprising:

input means for inputting copying conditions of a plurality of prescribed items necessary for determining an image forming node;

first control next for controlling said plurality of elements such that image formation is carried out under said inputted copying conditions;

memory means;

memory control means for storing in said memory means those of said plurality of copying conditions for any combination of the prescribed items which are desired items;

calling means for calling said copying conditions of the desired items stored in said memory means; and

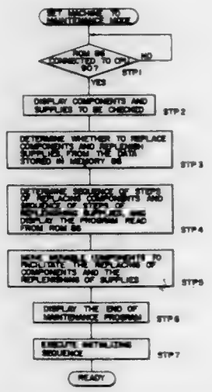
second control means for controlling said plurality of elements such that image formation is carried out under said called conditions for said desired items and under said inputted conditions for the prescribed items other than said desired items, whereby image formation is carried out under said inputted copying conditions for each carrying out of image formation under said called condition.

5,200,779

IMAGE FORMING APPARATUS WITH MAINTENANCE PROCEDURE

Yoshiaki Nawata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1991, Ser. No. 711,074
Claims priority, application Japan, Jun. 8, 1990, 2-148480
Int. Cl.[5] C03G *15/00*
U.S. Cl. 355—206 7 Claims



1. An image forming apparatus, comprising:

(a) means for forming an image on an image bearing member, said forming means including a plurality of movable components;

(b) a means for storing data including (1) a condition required for operating the forming means so as to perform an image formation, (2) a parameter used to check a time for maintenance of the forming means, (3) a first data item indicating a part of the forming means which should be subjected to maintenance in the case where the time for maintenance is checked, and (4) a procedure for maintenance of the image forming means;

(c) means for controlling the forming means in accordance with at least one of the data of the storing means to move the movable components in the vicinity of the part of the forming means which should be subjected to maintenance; and

(d) means for setting the forming means in a maintenance mode in which the forming means is checked in accordance with the parameter stored in the storing means.

5,200,780

ADJUSTMENT OF SURFACE POTENTIAL SENSOR RESPONSIVE TO PHOTOCONDUCTIVE ELEMENT OF IMAGE FORMING APPARATUS

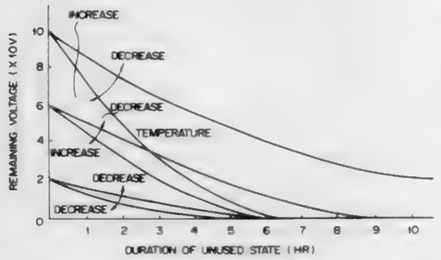
Tasushi Koichi, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 31, 1992, Ser. No. 831,196
Claims priority, application Japan, Jan. 31, 1991, 3-32160; Dec. 16, 1991, 3-332246
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—208 11 Claims

1. A method of adjusting a surface potential sensor for measuring a surface potential of a surface of a photoconductive element included in an image forming apparatus, said method comprising the steps of:

(a) leaving said photoconductive element unused for a period of time necessary for said photoconductive element to recover from fatigue;

(b) applying a reference voltage to a substrate included in said photoconductive element; and



(c) adjusting said surface potential sensor by using, as a reference value, a resulting potential generated on the surface of said photoconductive element as a result of the application of said reference voltage to said substrate included in said photoconductive element.

5,200,781

SHEET DISCHARGING TRAY FOR USE IN IMAGE FORMING APPARATUS

Masayuki Hata, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jun. 29, 1992, Ser. No. 905,319
Claims priority, application Japan, Aug. 5, 1991, 3-61507[U]
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—210 6 Claims

1. An image forming apparatus having a lower body in which means for feeding recording sheets is disposed, and an upper body in which an image carrying member, developing means and a developer container are disposed, the uppermost part of said upper body being provided with a sheet discharge tray for accommodating processed recording sheets, said apparatus comprising:

(a) a cover provided above said container and on the leading end of said tray in a discharging direction of said processed recording sheets, having a closed position and an open position at which replenishment developer is supplied to said container, said cover forming an extension of said tray for accommodating said processed sheets moved from said tray; and

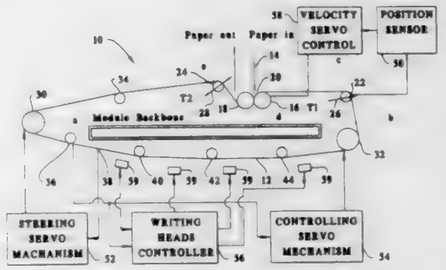
(b) a member provided to one end of said cover, for preventing said processed recording sheets on said cover from falling down.

5,200,782

DISTURBANCE ISOLATION IN A BELT RECEPTOR OF A COLOR PRINTER

Vittorio R. Castelli, Yorktown Heights, N.Y., and Stephen T. Chai, Rancho Palos Verdes, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1991, Ser. No. 786,685
Int. Cl.[5] G03G *5/00*
U.S. Cl. 355—212 17 Claims



1. An apparatus for isolating disturbances in a belt receptor module of a color printer, said belt receptor module having a transfer station at which an image is transferred from a belt receptor in said belt receptor module to a recording medium, said apparatus comprising:

a pair of spaced tension rollers by which said belt receptor passes, one of said tension rollers being located at a position adjacent one side of said transfer station and the other of said tension rollers being located at a position adjacent an opposite side of said transfer station such that said tension rollers and said transfer station define an isolation span of said belt receptor module, said one tension roller being movable along a first line to create a first tension level in said belt receptor, said other tension roller being movable along a second line different from the first line to create a second tension level in said belt receptor, said first and second tension levels being different,

wherein said transfer station comprises a transfer backup roller and a transfer pinch roller, said belt receptor passing over said transfer backup roller, between said transfer backup and pinch rollers, and under said transfer pinch roller, said apparatus further comprising sensor means for sensing the position of said one tension roller, said sensor means providing an output signal indicating the position of said roller.

5,200,783

BLACK IMAGE DENSITY CORRECTING DEVICE

Yasutaka Maeda, Ikoma, and Katsuhiro Nagayama, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

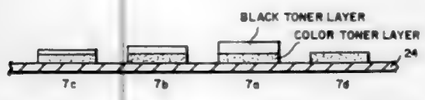
Filed Aug. 28, 1991, Ser. No. 750,575
Claims priority, application Japan, Aug. 30, 1990, 2-231669
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 9 Claims

1. An image density correcting device for a color copying machine capable of producing monochrome copies and full color copies, the device comprising:

a toner density detecting means for detecting the toner density of a toner image transferred on a transfer medium;

a toner density storing means for storing a predetermined reference value for the toner density;

a toner density comparing/judging means for judging the toner density of the image by comparing the toner density detected by the toner density detecting means with said predetermined reference value stored in the toner density storing means; and



a toner density correcting means for correcting the toner density of the image based on the result of the comparison and judgment by the comparing/judging means,

wherein the toner density is corrected after a black toner layer is formed in any non-black color detectable by the toner density detecting means, when monochrome copies using black toner are produced.

5,200,784

TRANSFERRING DEVICE CONTROLLED FOR PREVENTING THE LEADING EDGE OF A SHEET FROM BEING EXCESSIVELY CHARGED

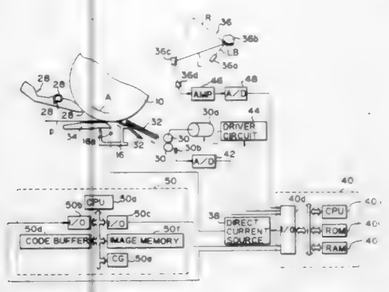
Masatoshi Kimura, Ebina; Sachio Sasaki, Yokohama; Hideaki Iwasaki, Kawasaki; Kunihiko Sato, Zama; Masao Konishi, Hachioji; Akiyoshi Iwamasa, Ebina; Toshio Tooda, Kawasaki; Hiroshi Nou, Yokohama; Shigenobu Utaka, Kawasaki, and Ryo Kitao, Yokohama, all of Japan, assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 483,691, Feb. 23, 1990. This application Oct. 10, 1991, Ser. No. 774,377

Claims priority, application Japan, Feb. 25, 1989, 1-44367; Feb. 25, 1989, 1-44368; Feb. 25, 1989, 1-44369

Int. Cl.[5] G03G *15/16*

U.S. Cl. 355—274 **6 Claims**



1. A toner image transferring device for electrostatically transferring a charged toner image electrostatically held by a toner image carrying body to a sheet or paper, said toner image transfer device comprising:

transfer charger means disposed in the vicinity of said toner image carrying body to form a clearance therebetween for feeding an electric charge to the sheet or paper while said sheet or paper is passed therethrough;

electric source means for supplying an electric energy to said transfer charger means to thereby give the sheet or paper an electric charge having a polarity opposite to that of the charge of the toner image; and

means for controlling an electric energy output from said electric source means to said transfer charger means in such a manner that said transfer charger means gives the sheet or paper a first amount of electric charge necessary for the transfer of the toner image when the sheet or paper is completely intervened between said toner image carrying body and said transfer charger means during the passage of the sheet or paper through the clearance therebetween, and that said transfer charger means gives the sheet or paper a second amount of electric charge when the leading edge of the sheet or paper is intervened between said toner image carrying body and said transfer charger means during the passage of the sheet or paper through said clearance therebetween, so that a leading edge zone of the sheet or paper has a charge value, resulting from said second amount of electric charge, which is substantially equal to that of the sheet or paper resulting from said first amount of electric charge.

5,200,785

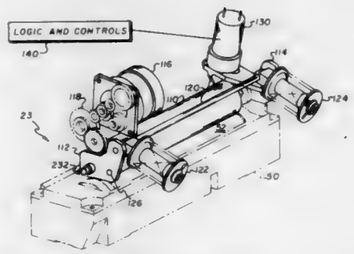
IMAGE-FORMING APPARATUS FUSER AND CUSTOMER REPLACEABLE FUSING ROLLER CARTRIDGE THEREFOR

Linn C. Hoover, and Ralph E. Williams, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1992, Ser. No. 830,037

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—282 **11 Claims**



1. Image-forming apparatus comprising:

means for forming a toner image on a receiving sheet, a fuser,

means for feeding a toner image-bearing receiving sheet to said fuser for fixing the toner image to the receiving sheet, said fuser including:

a pressure roller,

means for rotating said pressure roller, and

a cartridge received in said image-forming apparatus and including

a housing having an access opening, and

a fusing roller mounted for rotation in said housing about an axis of rotation and drivable by frictional engagement with said pressure roller through said access opening said housing substantially surrounding and protecting said fusing roller, said roller being rotatable only by such frictional engagement with said pressure roller through said access opening.

5,200,786

DONOR BRUSH RAM SYSTEM

Paul M. Fromm, Rochester; Rabin Moser, Fairport, and Alvin D. Kromm, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1991, Ser. No. 798,379

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—284 **24 Claims**

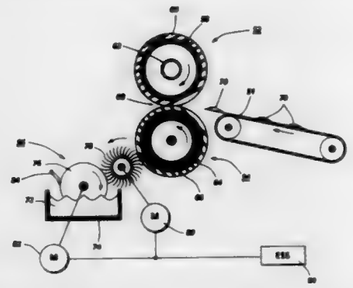
1. Apparatus for applying offset preventing liquid to one member of a contact fuser for fixing powder images to a substrate, said apparatus comprising:

a supply of release agent material;

a release agent metering member supported for contact with said supply of release agent material;

means for effecting movement of said metering member in an endless path at different surface velocities; and

donor means supported in contact with said metering member and a fuser member of said contact fuser for conveying



release agent material from the former to the latter at various rates depending on the surface velocity of said metering member;

said means for effecting movement of said metering member being operative independently of said fuser member.

5,200,787

METHOD AND APPARATUS FOR SUPPLYING AND COLLECTING TONER IN AN IMAGE FORMING DEVICE

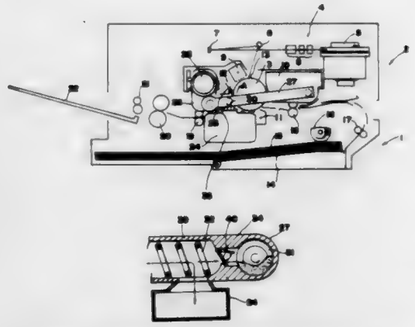
Keizo Nishiguchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 497,800, Mar. 21, 1990, abandoned, which is a continuation of Ser. No. 314,168, Feb. 22, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,458

Claims priority, application Japan, Feb. 23, 1988, 63-41587

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—298 **14 Claims**



1. An image forming apparatus which comprises:

image forming means for forming an electrostatic latent image on a photosensitive member;

developing means accommodating a toner for developing said electrostatic latent image;

cleaning means for removing the toner remaining on the photosensitive member;

collecting means for collecting the toner removed by said cleaning means; and

transporting means for transporting the toner removed from the photosensitive member to the collecting means until the collecting means is substantially filled with the removed toner, and for thereafter transporting the toner removed from the photosensitive member to the developing means.

5,200,788

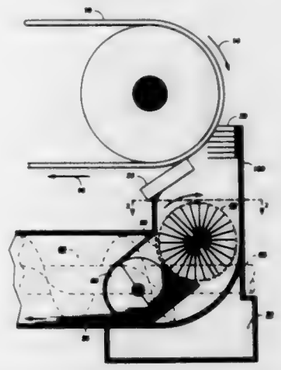
BRUSH AUGER RECLAIM FILTRATION IN A PHOTORECEPTOR CLEANER HOUSING

Bruce E. Thayer, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 4, 1991, Ser. No. 787,201

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—298 **18 Claims**



1. A apparatus for reclaiming toner removed from an imaging surface by a cleaning device, comprising:

a housing defining a chamber having a top opening therein;

a brush auger, having fibers extending outwardly therefrom, mounted rotatably in the chamber of said housing and being positioned to receive, through the top opening, toner and waste particles removed from the imaging surface;

a separating member substantially impervious to the waste particles and pervious to the toner, with the fibers of said brush auger being adapted to push the toner through said member; and

means for transporting toner pushed through said member by the fibers of said brush auger to a location remote from said housing.

5,200,789

METHOD AND APPARATUS FOR CLEANERLESS IMAGE FORMING

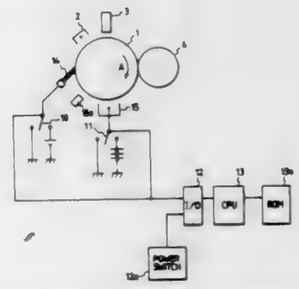
Koichiro Oshiumi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 12, 1991, Ser. No. 791,047

Claims priority, application Japan, Nov. 13, 1990, 2-308081; Feb. 20, 1991, 3-45707

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—296 **9 Claims**



1. A cleanerless image forming method for scattering toner

such that said optical beam generating means generates

light source means for modulating light received from said

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remained on an image carrier after transfer by a memory removing member to recover the same at a developing section, comprising the steps of:

discrimination step of discriminating a moment at which a power switch is turned on, and

execution step of applying a predetermined voltage to a transfer unit when the power switch is turned on, setting a potential of the memory removing member to a zero potential, and re-developing the toner remained on the memory removing member to said iamge carrier.

5,200,790

AUTOMATIC DOCUMENT CONVEYING DEVICE

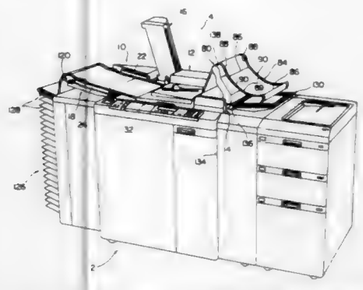
Yoichiro Irie, Suita; Yoshiyuki Takeda; Tsuyoshi Nagao, both of Osaka, and Yasuhiko Kida, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Chuo-Osaka, Japan

Filed Nov. 29, 1991, Ser. No. 800,016

Claims priority, application Japan, Nov. 30, 1990, 2-329545

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—308 31 Claims



1. An automatic document conveying device applied to an image processor having a transparent plate disposed on the upper surface of a housing thereof, a document to be processed being placed on the transparent plate, comprising:

a continuous document placing means on which will be placed a continuous document that has folding lines extending in the direction of width at stated intervals in the conveying direction and feed holes formed along both side edges thereof at stated intervals in the conveying direction, said continuous document being placed in a condition in which it is folded along said folding lines;

a continuous document receiving means for receiving the continuous document that is conveyed passing on said transparent plate; and

a conveying means which conveys the continuous document passing on said transparent plate from said continuous document placing means while unfolding it along the folding lines and hands it over to said continuous document receiving means while again folding it along the folding lines, wherein

said conveying means includes a conveyer belt mechanism having an endless belt that comes in contact with one surface of the continuous document, a pin tractor mechanism having an endless belt that has a plurality of feed pins arranged in the conveying direction at stated intervals to come into engagement with the feed holes of the continuous document, and a conveyance control means that controls the operation of said conveyer belt mechanism and said pin tractor mechanism; and

said conveyance control means controls the operations of said conveyer belt mechanism and said pin tractor mechanism in a manner that, except when the conveyance of the continuous document is finished. The continuous document is slackened between said conveyer belt mechanism and said pin tractor mechanism, most of the conveying force required for conveying the continuous document is transmitted from said conveyer belt mechanism to the continuous document, and the slackness is removed from the continuous document when the conveyance of the continuous document is finished.

5,200,791

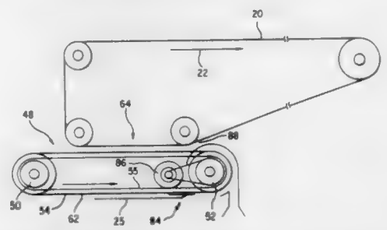
MULTIPLE PITCH COLOR REGISTRATION SYSTEM

Richard M. Dastin, Fairport, and Kenneth J. Mihalyov, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1991, Ser. No. 749,760

Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—326 21 Claims



2. An image registration control system in a color printer for synchronizing the placement of at least two latent images on a photoreceptor surface with the movement of a paper transfer loop, the registration control system comprising:

means for electronically partitioning the photoreceptor surface into at least two pitches corresponding to said at least two latent images;

means for scanning an original document;

means for applying said at least two latent images onto the photoreceptor surface corresponding to scanned color images of the original document;

means for electronically signaling when said means for scanning arrives at a lead edge of the original document for each scan; and

means for electronically synchronizing the movement of a paper transfer loop in response to each electronic signal.

5,200,792

DEVICE FOR OBTAINING DISTANCE INFORMATION FROM AN OBJECT BY INSTANTANEOUSLY ILLUMINATING THE OBJECT BY A LIGHT BEAM

Johji Tajima, and Shizuo Sakamoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 574,678, Aug. 30, 1990, abandoned.

This application Mar. 19, 1992, Ser. No. 853,845

Claims priority, application Japan, Aug. 31, 1989, 1-222994

Int. Cl.[5] G01C *3/00, 3/08;* H04N *7/00, 7/18*

U.S. Cl. 356—1 6 Claims

1. A distance information obtaining device for obtaining distance information related to a distance between a predetermined position and an object, said distance information obtaining device comprising:

optical beam generating means for generating an optical beam having a plurality of wavelength components,

illuminating means for illuminating said object with a monochromatic beam having a selected one of said wavelength components,

image pickup means located at said predetermined position for picking up an optical image of said object to produce a picture signal.

processing means, connected to said image pickup means, for processing said picture signal into a processed signal representative of said distance information, and

activating means, connected to said optical beam generating means and to said image pickup means, for simultaneously activating said optical beam generating means and said image pickup means for a predetermined time duration

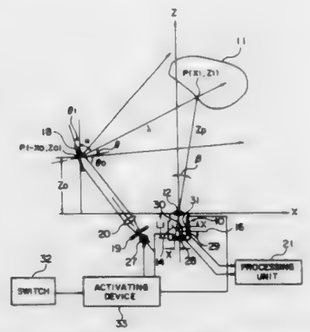
such that said optical beam generating means generates said optical beam while activated and such that said image pickup means picks up the optical image of said object while activated,

said optical beam generating means generating said optical beam at an intensity that is higher than that of environmental light in the vicinity of said object,

said predetermined time duration being selected so that said environmental light appears in said optical image as a component which is not greater than k percent of said optical image, k being less than 100, where k represents a predetermined percentage allowed for an error in said distance information,

said illuminating means being located at a predetermined distance from said predetermined position,

said image pickup means comprising first and second transducing means each comprising a plurality of unit cells, the unit cells of said first transducing means corresponding to the respective unit cells of said second transducing means, each of the unit cells of said first transducing means having a first spectral sensitivity, each of the unit cells of said



second transducing means having a second spectral sensitivity which is different from said first spectral sensitivity, a particular one of the unit cells of said first transducing means and a corresponding one of the unit cells of said second transducing means transducing said optical image into first and second object picture signals with a level rate to produce said first and said second object picture signals collectively as said picture signal,

said processing means processing said first and said second object picture signals into said processing signal using said level rate and said predetermined distance,

wherein said activating means is connected to said optical beam generating means and said first and said second transducing means for simultaneously activating said optical beam generating means and said first and said second transducing means for said predetermined duration so that said optical beam generating means generates said optical beam while activated and so that said first and said second transducing means transduce the optical image of said object into said first and said second object picture signals while activated.

5,200,793

RANGE FINDING ARRAY CAMERA

Bobby L. Ulich, and Kent Pflibsen, both of Tucson, Ariz., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Continuation of Ser. No. 602,635, Oct. 24, 1990, abandoned.

This application Feb. 20, 1992, Ser. No. 839,746

Int. Cl.[5] G01C *3/08;* H04N *7/00*

U.S. Cl. 356—5 26 Claims

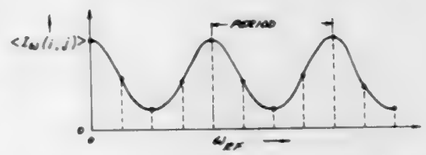
1. An electro-optical camera system comprising:

light source means;

light beam modulating means in communication with said light source means for modulating light received from said light source means;

optical focusing means for directing said modulated light through a medium and at a target and for receiving light backscattered from said target and directing said backscattered light through said light beam modulating means wherein said light beam modulating means modulates said backscattered light;

photodetector means having a plurality of pixels, said photodetector means for receiving said backscattered light from



said light beam modulating means and detecting at least three intensity levels associated with a period of modulation back through said light beam modulating means for each of said pixels;

frequency modulating means for varying the frequency of modulation of said light beam modulating means; and

computer means for determining the frequency modulation period at each of said pixels as the frequency of modulation of said light beam modulating means is varied wherein range data of the target is determined.

5,200,794

OPTICAL HEAD FOR AN OPTICAL AUTHENTICITY IDENTIFING SYSTEM

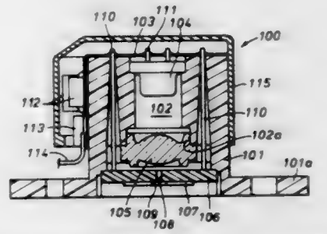
Hiroaki Nishiguma; Hidekazu Hosino, and Yoshiaki Seki, all of Kanagawa, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 547,936, Jul. 3, 1990, abandoned. This application Oct. 24, 1991, Ser. No. 782,976

Claims priority, application Japan, Aug. 11, 1989, 1-209065; Aug. 11, 1989, 1-209066; Aug. 11, 1989, 1-209067; Aug. 11, 1989, 1-209068; Nov. 30, 1989, 1-311422

Int. Cl.[5] G06K *7/10*

U.S. Cl. 356—71 10 Claims



1. An optical head for optically determining the authenticity of an article by impinging a light beam upon an identification region provided on said article and having a selected reflective directivity, and receiving light reflected by said identification region, comprising:

an annular casing defining a central bore therein;

a light emitting element received at one end of said central bore and having a light emitting surface thereof facing interior of said central bore, said light emitting surface providing a coherent beam of light;

a lens provided in an intermediate part of said central bore;

a generally planar mounting means provided at an other end of said central bore remote from said one end, said mounting means including a generally planar array of photodi-

odes mounted on a surface thereof facing away from said

5,200,796

shaft and said second shaft being synchronous with that of the rotating object;

said deviation always indicate the true positions of those points on said sample top surface which correspond to

odes mounted on a surface thereof facing away from said light emitting element whereby said photodiodes do not receive direct light from said light emitting element, and an opening for allowing said coherent light beam emitted from said light emitting element to pass therethrough; and

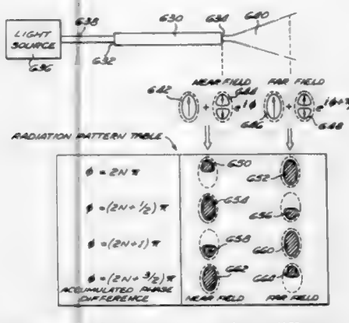
said array of photodiodes arranged around said opening with each of said photodiodes being capable of individually detecting a magnitude of light reflected from a said identification region of a said article and impinged thereon.

5,200,795

PASSIVE QUADRATURE PHASE DETECTION SYSTEM FOR COHERENT FIBER OPTIC SYSTEMS

Byoung Y. Kim, Menlo Park, Calif.; Hee G. Park, Junggu, Rep. of Korea, and Shangyuan Huang, Shanghai, China, assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 31, 1989, Ser. No. 401,175
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—345 **20 Claims**



1. An apparatus for detecting a phase difference between first and second optical signals, comprising:

a multi-mode optical fiber;

means for coupling one of said first and second optical signals to a first mode of said multi-mode optical fiber and the other of said first and second optical signals to a second mode of said multi-mode optical fiber, said first and second modes of said multi-mode optical fiber interfering within said multi-mode optical fiber in response to said phase difference between said first and second signals, said multi-mode optical fiber providing an output optical signal having an intensity pattern responsive to said phase difference between said first and second optical signals, said intensity pattern further representing a phase difference between said first and second modes of said output optical signal;

means for detecting a near-field intensity pattern that represents said intensity pattern of said output optical signal; and

means for detecting a far-field intensity pattern that is in quadrature with said near-field intensity pattern, said far-field intensity pattern representing a phase difference between said first and second modes that differs by 90° ($\pi/2$ radians) from said phase difference between said first and second modes of said output optical signal represented by said near-field intensity pattern.

5,200,796

METHOD AND APPARATUS FOR DETECTING AND MEASURING A PHYSICAL MAGNITUDE

Michel R. Lequime, Eguilles, France, assignor to Bertin & Cie, Plaisir, France

PCT No. PCT/FR90/00105, § 371 Date Oct. 9, 1990, § 102(e) Date Oct. 9, 1990, PCT Pub. No. WO90/09564, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 14, 1990, Ser. No. 582,893
Claims priority, application France, Feb. 14, 1989, 89 01900
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] G01J *3/45*
U.S. Cl. 356—346 **13 Claims**

1. A method of detecting and measuring a physical magnitude, the method comprising using a source of incoherent light to illuminate a sensor of the interferometric type and sensitive to the magnitude to be measured, modulating in a periodic manner the spectrum of the light flux passing through the sensor at a frequency which is a function of the magnitude to be measured, then statically demodulating the light flux leaving the sensor by means of a demodulator interferometer, analyzing the demodulated light flux spectrum to deduce the value of the physical magnitude therefrom, said analyzing step comprising using demodulated flux spectrum analysis apparatus having optical resolution such as to be insensitive to modulation frequencies generated by the sensor and by the demodulator, and analyzing solely that modulation in the demodulated signal which is characteristic of a beat frequency between the spectrum modulation due to the sensor and that due to the demodulator.

5,200,797

DEVICE FOR MEASURING THE ANGLE OF ROTATION OR OF THE ANGULAR POSITION OF A ROTATING OBJECT

Volker Tank, Eching; Helmut Dietl, Munich, and Franz Lanzl, Wessling, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e.v., Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 386,918, Jul. 31, 1989, abandoned. This application Jul. 29, 1991, Ser. No. 736,843
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1988, 3826149
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—363 **16 Claims**

1. In at least one optical interferometer comprising a rotatable retro-reflector having a rotational axis laterally displaced with respect to the plane of symmetry thereof in relation to the center of symmetry thereof, the rotational axis and the axis of symmetry enclosing the same angle as the rotational axis of the retro-reflector and the optical axis of the interferometer, a first beam splitter, a first set of two fixed plane mirrors disposed vertically with each other, and a first detector, wherein a path deflection is caused by means of rotation of the retro-reflector;

an improvement for measuring the rotational angle or the angular position of a rotating object comprising:

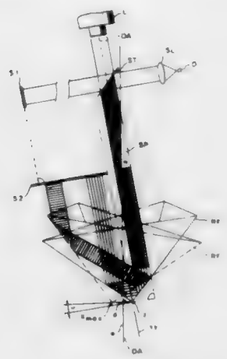
a first shaft engaged to said retro-reflector;

an axis of said first shaft being concentric to said rotational axis of said retro-reflector;

said first shaft connected with a second shaft of said rotating object to be measured;

the rotational movement of the retro-reflector and said first shaft and said second shaft being synchronous with that of the rotating object;

wherein at least one laser source for generating a beam with a defined wave length used as signal source and introduced into the interferometer in such a way that by means of said laser beam routed via said first beam splitter, said first set of fixed mirrors and the retro-reflector, laser interferences are generated and registered by said first single detector which have a cosine relationship to path differences generated by the rotation of the retro-reflector and thus a cosine relationship to the rotational angle of the retro-reflector and said rotating object.

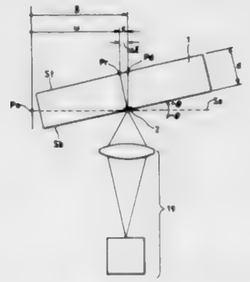


5,200,798

METHOD OF POSITION DETECTION AND THE METHOD AND APPARATUS OF PRINTING PATTERNS BY USE OF THE POSITION DETECTION METHOD

Soichi Katagiri, Hachiohji; Shigeo Moriyama, Tama; Tsuneo Terasawa, Ohme, and Masaaki Itou, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1991, Ser. No. 734,159
Claims priority, application Japan, Jul. 23, 1990, 2-192946
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—363 **25 Claims**



1. A position detection method comprising the steps of:

detecting the positions of specific points on the bottom surface of a sample so as to indirectly measure the positions of those points on the sample top surface which correspond to said specific points, the measurements of said specific points being prearranged to contain a deviation that varies with a tilt angle of said sample; and

having said deviation cancel a difference caused by said sample tilt angle between the positions on said sample bottom surface and the positions on said smaple top surface;

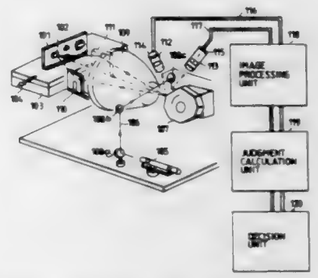
wherein the measurement of said specific points containing said deviation always indicate the true positions of those points on said sample top surface which correspond to said specific points.

5,200,799

SYSTEM FOR OPTICALLY INSPECTING CONDITIONS OF PARTS PACKAGED ON SUBSTRATE

Yuji Maruyama, Tokyo; Yukifumi Tsuda, Kawasaki; Kazutoshi Ikegaya, Sagamihara; Kunio Sannomiya, Atsugi; Hiroto Toba, and Takumi Seto, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 11, 1990, Ser. No. 580,547
Claims priority, application Japan, Sep. 12, 1989, 1-236158; Jun. 29, 1990, 2-173449
Int. Cl.[5] G01B *11/00*; **H01J** *3/14*; **G01N** *21/86*
U.S. Cl. 356—394 **1 Claim**



1. A system for inspecting the packaging condition of parts packaged on a printed-circuit board, comprising:

transferring means for moving said printed-circuit board in a predetermined direction;

light source means for emitting a light beam;

scanning means for optically scanning a surface of said printed-circuit board with the light beam emitted from said light source means;

a pair of optical means for reflecting, at symmetrical positions with respect to the scanning plane, scattered light due to the scanning of said printed circuit board performed by said scanning means and condensing the reflected light;

a pair of position detection means each disposed to be responsive to the condensed reflected light for respectively generating photoelectric signals I1 and I2 corresponding to an incident position thereon;

first calculation means for calculating luminance data L1 and L2 and height data P1 and P2 on the basis of said photoelectric signals I1 and I2;

second calculation means coupled to said first calculation means for determining a final height data, said second calculation means outputting as said final height data an average value $(P1+P2)/2$ of said height data P1 and P2 when $|P1-P2| \leqq \Delta P$, outputting as said final height data said height data P1 when $|P1-P2| > \Delta P$, $L_{MAX} > L1 > L_{MIN}$, $L_{MAX} > L2 > L_{MIN}$, and $L1 > L2$, outputting as said final height data said height data P2 when $|P1-P2| > \Delta P$, $L_{MAX} > L1 > L_{MIN}$, $L_{MAX} > L2 > L_{MIN}$ and $L2 > L1$, outputting as said final height data said height data P1 when $L_{MAX} > L1 > L_{MIN}$ and $L2 \geqq L_{MAX}$ or $L_{MIN} \geqq L2$, outputting as said final height data said height data P2 when $L_{MAX} > L2 > L_{MIN}$ and $L1 \geqq L_{MAX}$ or L_{MIN}24 L1, and outputting zero as said final height data when $L1 \geqq L_{MAX}$ or $L_{MIN} \geqq L1$ and $L2 \geqq L_{MAX}$ or $L_{MIN} \geqq L2$, where ΔP represents a predetermined height difference threshold, L_{MAX} designates a predetermined higher luminance threshold, L_{MIN} denotes a predetermined lower luminance threshold; and

decision means coupled to said second calculation means for

comparing the final height data outputted from said sec-

an implant region of opposite conductivity type disposed in

structure and having the formula Si_x(metal 1)$_y$(metal 2)$_z$(metal

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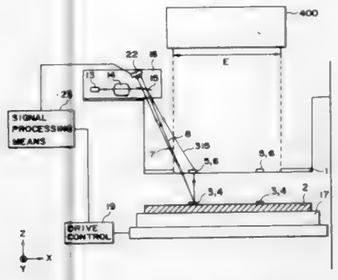
comparing the final height data outputted from said second calculation means with predetermined reference data to decide the package condition of said parts on said printed-circuit board.

5,200,800

POSITION DETECTING METHOD AND APPARATUS

Shigeyuki Suda; Kenji Saitoh, both of Yokohama; Minoru Yoshii, Tokyo, and Noriyuki Nose, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 692,932, Apr. 29, 1991, abandoned.
This application May 29, 1992, Ser. No. 892,732
Claims priority, application Japan, May 1, 1990, 2-115447; Jun. 1, 1990, 2-143869
Int. Cl.[5] G01B 11/00
U.S. Cl. 356—401 21 Claims



1. In a method of detecting a position of a substrate having a alignment mark with an optical power, wherein a radiation beam is projected from an optical head to the alignment mark such that the alignment mark produces a signal beam on the basis of which the position of the substrate is detected, the improvements residing in:

forming a reference mark on the substrate at a position different form that of the alignment mark;

projecting a radiation beam from the optical head to the reference mark, such that the reference mark produces a reference beam;

detecting the relative positional deviation of the optical head relative to the reference mark on the basis of the produced reference beam; and

adjusting the relative position of the optical head and the alignment mark on the basis of the detected relative positional deviation and, after the adjustment, detecting the position of the substrate on the basis of the produced signal beam.

5,200,801

INSPECTION OF CONTAINER FINISH

John W. Juvinall, Ottawa Lake; Robert D. Kohler, Temperance, both of Mich., and James A. Ringlien, Maumee, Ohio, assignors to Owens-Illinois Glass Container Inc., Toledo, Ohio

Continuation of Ser. No. 522,767, May 14, 1990, abandoned.
This application Mar. 2, 1992, Ser. No. 845,740
Int. Cl.[5] G01N 21/90
U.S. Cl. 356—428 4 Claims

1. Apparatus for detecting vertical checks in the finish of a translucent container having a central axis and an open mouth comprising:

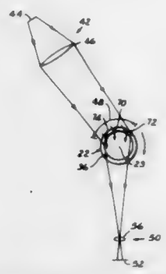
means for rotating the container about its central axis,

a source for directing light energy onto the finish of the container as it rotates from externally of the container laterally of the container axis over an angular portion of substantially 90° of the container finish,

a camera that includes an area array sensor containing a matrix of image sensing elements arranged in a row-and-column array positioned externally of the container at an angle to the container axis and means for directing onto said array an image of the illuminated portion of the container finish as the container rotates,

said camera being oriented with respect to said light source such that a vertical check in the container finish reflects light energy from the source to the camera as the check passes through that portion of the container finish that is illuminated to create a bright image of the check against a normally dark background, and

means responsive to said camera for detecting vertical checks in the container finish as a function of such reflected light energy,



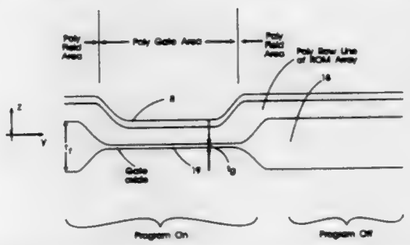
said camera-responsive means including information processing means coupled to said camera for scanning said element array at increments of container rotation and obtaining a two-dimensional image of vertical checks at the container finish at each said increment of container rotation, said information processing means including electronic memory and means for storing in said memory each said two-dimensional image of vertical checks detected at the container finish at successive increments of container rotation.

5,200,802

SEMICONDUCTOR ROM CELL PROGRAMMED USING SOURCE MASK

William E. Miller, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 705,678, May 24, 1991, abandoned.
This application Jun. 22, 1992, Ser. No. 902,516
Int. Cl.[5] H01L 29/78, 27/10, 29/06
U.S. Cl. 257—390 22 Claims



1. In a ROM device formed on a substrate and having a plurality of individual storage cells programmed to an active state and a plurality of storage cells programmed to an inactive state, a cell structure for the cells programmed to the inactive state comprising:

an insulating layer disposed on the substrate;

an electrically-conductive gate electrode disposed on the insulating layer;

a drain region of first conductivity type disposed in the substrate adjacent to the region of substrate directly below the gate electrode;

an implant region of opposite conductivity type disposed in the substrate adjacent to the region of substrate directly below the gate electrode but spaced apart from the drain region; and

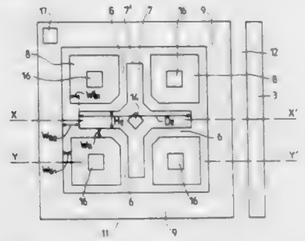
a source region of first conductivity type formed in the substrate adjacent the implant region and separated from the gate electrode by the implant region.

5,200,803

INTEGRATED CIRCUIT HAVING A LATERAL MULTICOLLECTOR TRANSISTOR

Pierre Leduc, Colleville-Montgomery, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 23, 1991, Ser. No. 690,442
Claims priority, application France, Apr. 27, 1990, 90 05413
Int. Cl.[5] H01L 29/72, 29/06, 23/48
U.S. Cl. 257—560 6 Claims



1. An integrated circuit comprising a lateral transistor having laterally spaced emitter and collection regions of a first conductivity type, which regions are provided at a surface in a base region of a second conductivity type opposite to the first, the emitter region having an elongate shape in at least one longitudinal direction and the contour of the lateral transistor being surrounded by a deep insulating layer, wherein the collector region comprises at least two separate zones between which an elongate portion of the emitter region is disposed, an additional region of the first conductivity type is provided bordering the contour of the transistor and disposed between the contour of the transistor and the deep insulating layer and adjacent at least the extremities of said elongate portion of the emitter region, and a distance W_{B2} between the ends of said elongate portion and said additional region is greater than a distance W_B between said elongate portion and said collector zones.

5,200,804

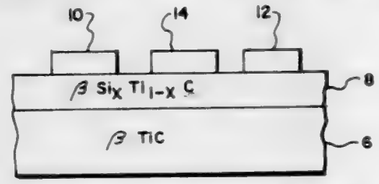
Patent Not Issued For This Number

5,200,805

SILICON CARBIDE:METAL CARBIDE ALLOY SEMICONDUCTOR AND METHOD OF MAKING THE SAME

James D. Parsons, Newbury Park, and Oscar Stafsudd, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 28, 1987, Ser. No. 138,411
Int. Cl.[5] H01L 29/161, 29/20, 29/22, 29/24
U.S. Cl. 257—77 18 Claims



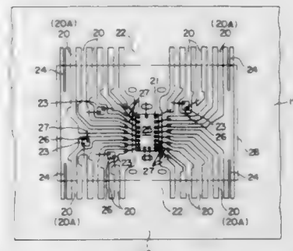
1. A semiconductor material comprising a metal carbide: β-SiC alloy with a homogeneous single phase cubic crystal structure and having the formula $Si_w(metal\ 1)_x(metal\ 2)_y(metal\ 3)_zC$, where $w+x+y+z=1$, $1>w>0$ and said metals have lattice parameters within about 5% of that of β-SiC.

5,200,806

LEAD FRAME HAVING A PLURALITY OF ISLAND REGIONS AND A SUSPENSION PIN

Hiromiti Sawaya, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

PCT No. PCT/JP90/01167, § 371 Date May 10, 1991, § 102(e) Date May 10, 1991
PCT Filed Sep. 12, 1990, Ser. No. 678,336
Claims priority, application Japan, Sep. 12, 1989, 1-236406
Int. Cl.[5] H01L 23/12, 23/48
U.S. Cl. 257—676 10 Claims



1. A lead frame made of a die-cut conductive plate and used for manufacturing a semiconductor device, comprising:

a frame portion at the peripheral area of said lead frame;

a main bed portion supported by support members extending from said frame portion for mounting a semiconductor main chip;

a plurality of leads extending from opposite sides of said frame portion toward the inner area of said lead frame, with the tip portion thereof being positioned near said main bed portion, some of said plurality of leads having a sub-bed portion formed at a predetermined area for mounting a semiconductor sub-chip; and

a suspension pin formed outside of a predetermined lead which is positioned at the outmost position of said plurality of leads, said suspension pin extending along said predetermined lead and being resin sealed with said plurality of leads at a resin molding process of semiconductor device manufacturing processes.

5,200,807

WIRING CONNECTION STRUCTURE FOR A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Koji Eguchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1990, Ser. No. 520,482
Claims priority, application Japan, Oct. 30, 1989, 1-283338
Int. Cl.[5] H01L 23/48, 29/44, 29/52, 29/60
U.S. Cl. 257—758 18 Claims

1. A wiring connection structure for a semiconductor integrated circuit device for interconnecting a plurality of wiring layers isolated by an insulating layer, via a through hole defined in the insulating layer, comprising:

a semiconductor substrate having a main surface,

a first insulating layer formed on the main surface of said semiconductor substrate;

a first wiring layer formed on said first insulating layer;

a second insulating layer formed on said first wiring layer and including a through hole defined so as to extend to a surface of said first wiring layer; and

a second wiring layer formed on said second insulating layer

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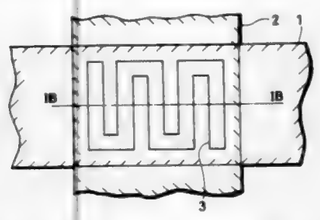
and connected to said first wiring layer via said through hole,



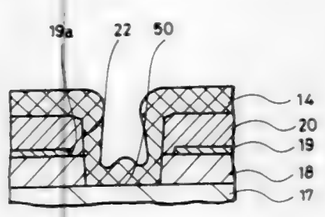
wherein said through hole comprises a single through hole in a region where said second wiring layer overlaps with said first wiring layer, said through hole forming a winding groove having a continuous perimeter.

5,200,808

SEMICONDUCTOR DEVICE HAVING SMOOTH CONTACT HOLES FORMED THROUGH MULTI-LAYER INSULATORS OF DIFFERENT ETCHING SPEEDS

Toru Koyama; Katuhiko Tamura, and Takako Nagamine, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 578,923, Sep. 7, 1990, abandoned. This application Jul. 16, 1992, Ser. No. 914,219
Claims priority, application Japan, Nov. 29, 1989, 1-311269
Int. Cl.[5] H01L 23/48, 29/34
U.S. Cl. 250—750 4 Claims



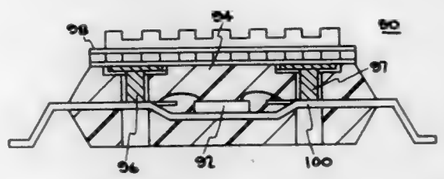
1. A semiconductor device of a multi-layer film structure in which a lower conductor layer and an upper conductor layer separated by a multilayered insulator film are connected to each other through a contact hole provided in the multilayered insulator film, comprising:
- a substrate;
- a lower conductor layer provided on said substrate and having a connection portion;
- a first insulator film provided on said lower conductor layer;
- a second insulator film provided on said first insulator film and having etching speed different from etching speed of said first insulator film;
- a third insulator film provided on said second insulator film;
- said second insulator film including a first opening portion having a larger diameter than a diameter of said connection portion and completely lined by said third insulator film so as not to expose the second insulator film;
- said first and third insulator film including a second opening portion penetrating said first and third insulator films to reach said connection portion; and
- an upper conductor layer provided on said substrate and electrically connected to said lower conductor layer so as to line said second opening portion.

5,200,809

EXPOSED DIE-ATTACH HEATSINK PACKAGE

Young I. Kwon, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 27, 1991, Ser. No. 767,171
Int. Cl.[5] H05K 7/20
U.S. Cl. 257—707 10 Claims



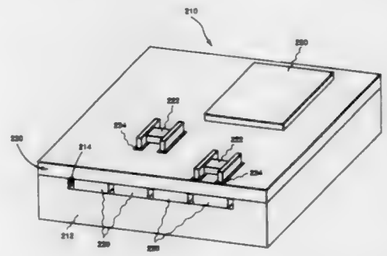
1. Apparatus for cooling an integrated circuit die contained in a molded plastic package, comprising:
- a lead-frame having a die-attached paddle to which an integrate-circuit die is attached;
- a molded package, which is formed of plastic material and which is molded around said lead-frame to which said integrated-circuit die is attached, said molded package having one or more passages formed therein for respectively exposing one or more predetermined portions of the lead-frame;
- one or more thermally conductive column members, each respectively attached at one end to a respective one of said selected exposed portions of said lead-frame, each of said one or more thermally conductive column members extending through a passage formed in said molded package to an exterior surface of said molded package and, together with the lead-frame, providing a path for conduction of heat from the integrated-circuit die to the other end of each of said one or more thermally conductive column members at the exterior of the molded package.

5,200,810

HIGH DENSITY INTERCONNECT STRUCTURE WITH TOP MOUNTED COMPONENTS

Robert J. Wojnarowski, Ballston Lake, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1990, Ser. No. 504,749
Int. Cl.[5] H01L 23/02, 23/16; H05K 1/00, 7/02
U.S. Cl. 361—398 36 Claims



1. An electronic system comprising:
- a substrate having a component-supporting surface with at least one cavity therein;
- a first plurality of electric components having contact pads on major surfaces thereof, said first plurality of electronic components being disposed in said at least one cavity such that said major surfaces are substantially coplanar with

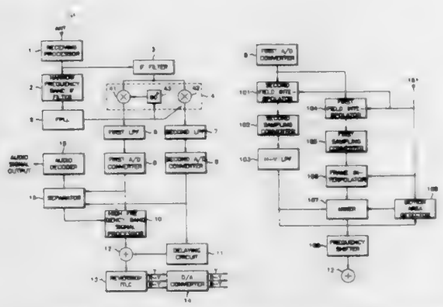
portions of said component-supporting surface surrounding said at least one cavity;
- a removable high density interconnect structure, said high density interconnect structure being removable from said electronic components without damaging said electronic components and without removing said components from said at least one cavity, and comprising:
- a layer of polymer dielectric film overlying and bonded by means of a thermoplastic adhesive to said major surfaces of said first plurality of electronic components and to portions of said component-supporting surface surrounding said at least one cavity,
- said layer of polymer dielectric film having via holes therein in alignment with said contact pads, and
- a pattern of interconnection conductors disposed on said layer of polymer dielectric film so as to extend into and between at least some of said via holes to provide electrical connection between at least some of said contact pads; and
- at least one additional electronic component disposed on said high density interconnect structure on the opposite side of said high density interconnect structure from said first plurality of electronic components, and electrically connected to conductors of said high density interconnect structure.

5,200,811

HIGH DEFINITION TELEVISION VIDEO SIGNAL RECEIVER AND PROCESSING METHOD THEREFOR

Hyun-Deok Cho, Suwon City, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 16, 1991, Ser. No. 685,822
Claims priority, application Rep. of Korea, May 11, 1990, 1990-6721
Int. Cl.[5] H04N 9/78, 9/64
U.S. Cl. 358—12 36 Claims



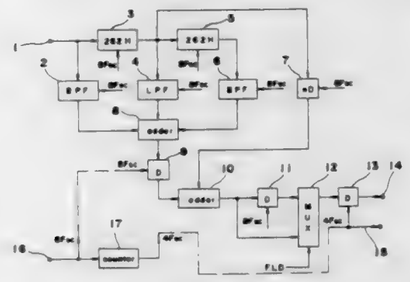
1. A circuit for processing a high definition television signal, said circuit comprising:
- receiving processor means for converting a radio frequency signal supplied through a receiving terminal into a first intermediate frequency signal;
- first filter means connected to said receiving processor means, for generating a narrow band intermediate frequency signal from the first intermediate frequency signal;
- second filter means connected to said receiving processor means, for splitting a second intermediate frequency signal from the first intermediate frequency signal;
- frequency phase locked loop means connected to said first filter means, for demodulating the second intermediate frequency signal in a quadrature phase-shift demodulation technique with a quadrature phase shift demodulator with the narrow band intermediate frequency signal to generate a slow band frequency signal and a high band frequency signal;
- first low-pass filter means and second low-pass filter means connected to the frequency phase locked loop means, for low-pass filtering with a pass band of (¼)Xo' said low band frequency signal and the high band frequency signal, said first low-pass filter means receiving said high band frequency signal, said second low-pass filter means receiving said low band frequency signal;
- a first analog-to-digital converter and a second analog-to-digital converter connected to said first low-pass filter means and said second low-pass filter means, respectively, for converting the low band frequency signal and the high band frequency signal from said first low-pass filter means and said second low-pass filter means, respectively, into a first digital signal and a second digital signal;
- separator means connected to said first analog-to-digital converter and said second analog-to-digital converter, for separating the low band frequency signal and the high band frequency signal from said first analog-to-digital converter and said second analog-to-digital converter into a synchronizing signal, an audio signal, a motion vector and a control signal;
- audio decoder means connected to said separator means, for decoding said audio signal;
- high frequency band signal processor means connected to said first analog-to-digital converter, for interpolating said first digital signal in response to said motion vector;
- delay means connected to said second analog-to-digital converter, for delaying said second digital signal;
- adding means connected to said high frequency band signal processor means and said delay means for adding the signal output from said high frequency band processor means to the signal output from said delay means;
- an inversion integration of time compressed luminance and chrominance means connected to said adding means, for converting a signal output from said adding means into a luminance signal and chrominance signal; and
- a digital-to-analog converter connected to said inversion integration of time compressed luminance and chrominance means, for converting said luminance signal and said chrominance signal into respective analog signals.

5,200,812

SAMPLING FREQUENCY DOWN-CONVERTING APPARATUS

Kunio Suesada, Ikoma; Toshiaki Koya, Kadoma, and Kunio Sekimoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 8, 1990, Ser. No. 476,731
Claims priority, application Japan, Feb. 9, 1989, 1-30533
Int. Cl.[5] H04N 7/12, 11/02
U.S. Cl. 358—13 10 Claims



1. A sampling frequency down-converting apparatus comprising a means for sampling original digital picture signals at a sampling frequency of 8 Fsc (Fsc: color sub-carrier frequency) so as to thin out said sampled picture signals and a means for low-pass converting said sampled picture signals into intermediate digital picture signals having a sampling

5,200,816

METHOD AND APPARATUS FOR COLOR PROCESSING

RGB signals by passing each RGB signal separately through a lookup table;

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frequency of 4 Fsc ±Fh/2 (Fh: horizontal scanning frequency) or 4 Fsc ±Fv/2 (Fv: field frequency).

5,200,813

CONTROL METHOD FOR WHITE BALANCE OF VIDEO CAMERA

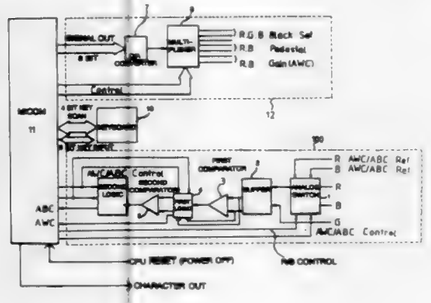
Byeong G. Jeon, Suweon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 26, 1991, Ser. No. 661,015

Claims priority, application Rep. of Korea, Feb. 28, 1990, 90-2655

Int. Cl.[5] H04N *9/73, 9/07*

U.S. Cl. 358—29 **3 Claims**



1. In a circuit including means for providing an automatic white control signal and an automatic balance control signal in dependence upon reception of a video signal representative by a plurality of color signals, a keymatrix for selecting control modes, a microcomputer for controlling automatic white balance of the video signal in dependence upon said automatic white control signal, said automatic balance control signal and said control modes, the white balance control method, comprising:

a storing process for storing automatic white balance values into addresses indicated according to values representative of illuminating conditions of an illuminated object and an optical filter;

a producing process for producing said automatic white balance values stored by said storing process to white balance said video signal according to values representative of said illuminating conditions of said illuminated object and said optical filter.

5,200,814

VIDEO PROJECTOR WITH OPTICAL COLOR BALANCE

Koji Hirata, Kamakura; Hiroki Yoshikawa, Hiratsuka; Takahiko Yoshida, Miura; Tooru Numata, Chigasaki; Masayuki Muranaka, Yokohama; Kiyoshi Wada, Yokohama; Isao Yoshizaki, Yokohama, and Shigeru Inaoka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,790

Claims priority, application Japan, Apr. 28, 1989, 1-107605; Sep. 8, 1989, 1-231599; Feb. 28, 1990, 2-45384

Int. Cl.[5] H04N *9/31*

U.S. Cl. 358—60 **36 Claims**

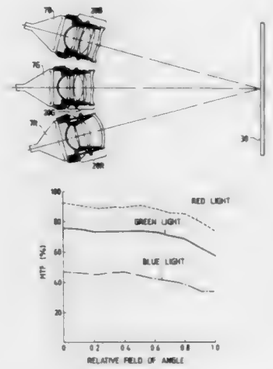
1. A color image display device comprising:

red, green and blue image producing means for producing red, green and blue color images, respectively;

a screen; and

individual projection means for respectively projecting red, green and blue, said projection means projecting images produced by said red, green and blue image producing means respectively onto said screen,

said projection means for green having a focus characteristic higher than the focus characteristic of said projection means for blue and for red when green light is projected therethrough.



5,200,815

CONVERGENCE CORRECTION APPARATUS FOR A VIDEO PROJECTION SYSTEM

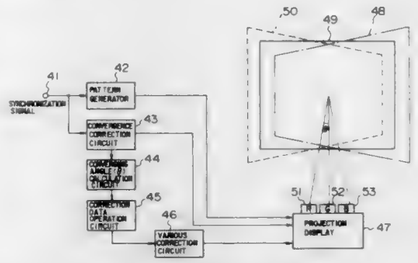
Susumu Tsujihara, Neyagawa, and Yasuaki Sakanishi, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 3, 1991, Ser. No. 709,301

Claims priority, application Japan, Jun. 7, 1990, 2-148989

Int. Cl.[5] H04N *9/31*

U.S. Cl. 358—60 **10 Claims**



1. An image correction apparatus comprising:

means for widening projecting and displaying images on a screen by using a plurality of projector tubes;

means for setting specifications of the projecting optical system of said display means;

means for determining correction amounts for convergence, deflection linearity, luminance reduction and focus error through computation in accordance with data for converging angles produced from said setting means; and

means for controlling various correction circuits in a projector unit in accordance with the correction data of various kinds.

5,200,816

METHOD AND APPARATUS FOR COLOR PROCESSING WITH NEURAL NETWORKS

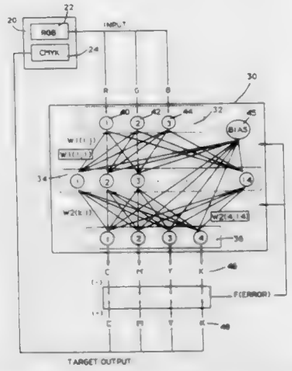
Oded M. Rose, Herzliya, Israel, assignor to Scitex Corporation Ltd., Herzliya, Israel

Filed Jul. 19, 1991, Ser. No. 734,310

Claims priority, application Israel, Jun. 25, 1991, 98622

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—80 **40 Claims**



1. A method for providing a neural network including the steps of:

providing a neural network structure including a plurality of neurons for receiving a first color value from among a first set of color values which first color value is to be transformed into a corresponding second color value from among a second set of color values and for providing an output indication of the corresponding second color value; and

training the neural network structure on a plurality of ordered pairs, each ordered pair comprising a first color value from among the first set of color values and a corresponding second color value from among the second set of color values.

5,200,817

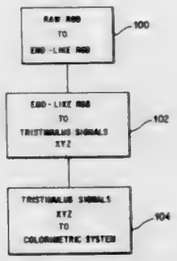
CONVERSION OF AN RGB COLOR SCANNER INTO A COLORIMETRIC SCANNER

David Birnbaum, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1991, Ser. No. 752,118

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—80 **12 Claims**



1. A method of converting RGB scanner signals comprising the steps of:

scanning an image with a scanning means and detecting raw RGB signals from said scanned image;

transforming said raw RGB signals to equivalent END-like RGB signals by passing each RGB signal separately through a lookup table;

transforming said END-like RGB signals into a set of tristimulus values XYZ;

transforming said tristimulus values XYZ into colorimetric coordinates; and

providing each of plurality of images on a recording medium in superimposed registration with one another using the colorimetric coordinates to form a multi-color copy of said scanned image.

5,200,818

VIDEO IMAGING SYSTEM WITH INTERACTIVE WINDOWING CAPABILITY

Inbal Neta; Michal Neta, both of 21 Havazelet Street, Kiron, Israel 55454 , and Yves Villaret, Hasigalit 16, Hadera, Israel 38417

Filed Mar. 22, 1991, Ser. No. 673,328

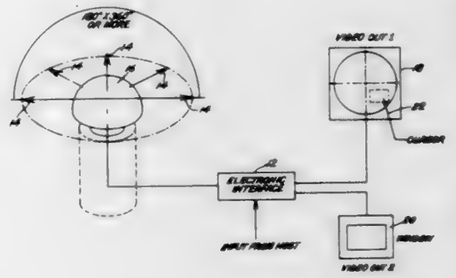
Int. Cl.[5] H04N *5/00*

U.S. Cl. 358—87 **11 Claims**

1. In a system for providing high resolution images of a scene, apparatus for simultaneously obtaining a wide angle image of the scene and a window image of a selected particular region of the scene, comprising:

an optical module having a plurality of light sensitive arrays disposed therearound, each light sensitive array comprising a sensor element and a lens element for providing electrical output signals representative of the scene;

means for connecting the output of each light sensitive array to an electronic interface, said electronic interface comprising means for processing the signals from said light sensitive arrays;



monitor view display means;

window view display means; and

means for connecting the output signal from said electronic interface to said monitor view display and said window view display to provide on the monitor view display a high resolution image of the entire scene obtained by the combination of a plurality of images acquired simultaneously on a plurality of sensor elements and on the window view display a high resolution image of a selected particular region of the scene obtained by the integration of data received from the sensor elements.

5,200,819

(c) counting the number of matching pels or the number of

parison associated with one or the other mode, respectively,

(b) generating a data signal indicative of the data to be pro-

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5,200,819

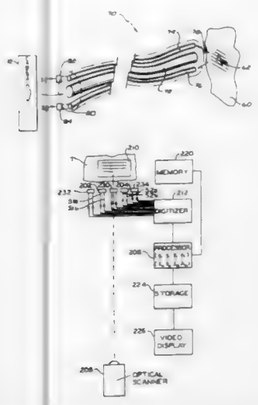
MULTI-DIMENSIONAL IMAGING SYSTEM FOR ENDOSCOPE

Sol Nudelman, Avon, and Donald R. Ouimette, Plantsville, both of Conn., assignors to The University of Connecticut, Farmington, Conn.

Division of Ser. No. 472,646, Jan. 30, 1990, Pat. No. 5,109,276, which is a continuation-in-part of Ser. No. 199,997, May 27, 1988, Pat. No. 4,938,205. This application Feb. 13, 1992, Ser. No. 835,761

Int. Cl.[5] A61B *1/04*; H04N *13/00*

U.S. Cl. 358—98 5 Claims



1. An endoscope adapted for operation in association with optical scanner means which generates radiation tracing out a raster comprising;

probe means for forming a flexible tubular member having a proximal end and a distal end;

first optical cable means disposed in said probe means comprising a bundle of coherent flexible optical fibers forming a first optical cable extending between a proximal end surface and a distal end surface;

photodetector means comprising a photodetector for generating an electrical signal having an instantaneous value proportional to the quantity of light impinging said photodetector;

processor means communicating with said photodetector means for generating a signal indicative of a multi-dimensional image of said object,

so that a raster from said scanner applied at said proximal end of said probe means is projected through said distal end surface of said optical channel for illumination of the object to be examined and radiation reflected from the object impinges said photodetector means wherein said processor generates signals indicative of a depth image of said object.

5,200,820

BLOCK-MATCHING MOTION ESTIMATOR FOR VIDEO CODER

Hamid Gharavi, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 26, 1991, Ser. No. 692,279

Int. Cl.[5] H04N *7/18*, *7/12*

U.S. Cl. 358—105 14 Claims

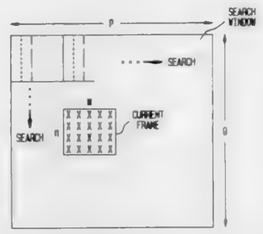
1. A method of estimating the frame-to-frame motion of a block of pels in a video frame comprising the steps of:

(a) comparing the pels in the block in a current frame with pels in a corresponding block in a previous frame;

(b) determining from each comparison whether each pel is a matching pel or a mismatching pel;

(c) counting the number of matching pels or the number of mismatching pels;

(d) repeating steps (a) through (c) for a predetermined number of blocks that surround the corresponding block in the previous frame; and



(e) estimating the relative motion of the block between its position in the current frame and its position in the previous frame in response to the position of the block in the previous frame at which the number of matching pels is highest or the number of mismatching pels is lowest.

5,200,821

ARRANGEMENT FOR PROCESSING SIGNALS BEFORE AND AFTER TRANSMISSION AND/OR STORAGE WITH FLOW RATE REDUCTION, AND SIGNAL TRANSMISSION AND/OR STORAGE SYSTEMS INCLUDING SUCH ARRANGEMENTS

Mohammad R. Haghiri, Sceaux; Pascal Denoyelle, Creteil, and Thierry Fautier, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

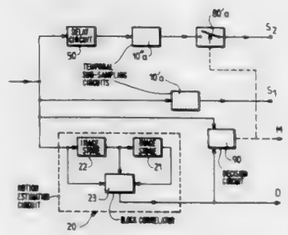
PCT No. PCT/NL90/00085, § 371 Date Feb. 8, 1990, § 102(e) Date Feb. 8, 1990, PCT Pub. No. WO90/16128, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 19, 1990, Ser. No. 613,830

Claims priority, application France, Jun. 20, 1989, 89 08186; Jun. 20, 1989, 89 08187

Int. Cl.[5] H04N *7/00*, *7/13*

U.S. Cl. 358—133 19 Claims



17. An arrangement for processing previously transmitted and/or stored signals after reduction of the quantity of information components to be transmitted and/or stored, effected either in accordance with a first mode denoted the compensated transmission and/or storage mode and with the aid of a temporal sub-sampling sub-assembly in a predetermined ratio provided to supply a first signal sequence, or in accordance with a second mode, denoted the fall-back transmission and/or storage mode and with the aid of a fall-back processing sub-assembly provided to add a second signal to the said first sequence with spatial sub-sampling of the said sequences, and to effect the alternate selection of one or the other of these spatially sub-sampling sequences, the choice of the said mode being effected with the aid of a decision-taking sub-assembly and on the basis of likewise transmitted and/or stored motion information components, and an information component comparison associated with one or the other mode, respectively, with a view to selecting either the output of the said motion-compensated sub-assembly or the output of the said fall-back processing sub-assembly, characterized in that it comprises:

(a) a first sub-sampling and interpolation sub-assembly of the received signals corresponding to the previously transmitted and/or stored signals and constituting the input signals of the arrangement;

(b) a motion-compensation sub-assembly whose input is connected in accordance with the said selection of the first or the second operating mode, respectively, either directly to the input of the said arrangement or to this same input but via the said first sub-sampling and interpolation sub-assembly;

(c) a second sub-sampling and interpolation sub-assembly whose input is connected, in accordance with the said selection of the first or the second mode of operation, respectively, either to the output of the said motion-compensation sub-assembly, or directly to the input of the said arrangement;

(d) a change-over switch which from its output or in accordance with the said mode information corresponding to the selection of the first or second mode of operation, respectively, supplies from its output either the output of the said motion-compensation sub-assembly or the output of the said second sub-sampling and interpolation sub-assembly;

(e) a change-over switch for alternately selecting at a frequency twice as high as the frequency of the input signals, either the said output of this change-over switch or the input of the said motion-compensation sub-assembly but delayed by a half-period of the rate of the said input signals of the arrangement.

5,200,822

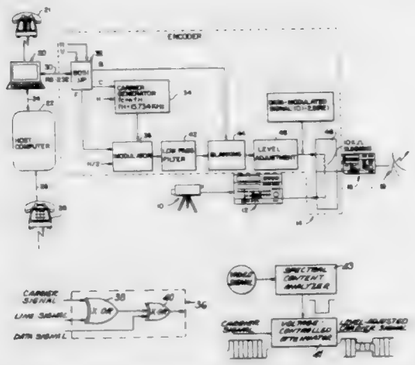
ARRANGEMENT FOR AND METHOD OF PROCESSING DATA, ESPECIALLY FOR IDENTIFYING AND VERIFYING AIRING OF TELEVISION BROADCAST PROGRAMS

Kenneth A. Bronfin, New York, N.Y.; Stephen M. Mahrer, Mt. Holly, N.J.; W. Robin Wilson, New York, N.Y., and Francis A. Davenport, Haddonfield, N.J., assignors to National Broadcasting Company, Inc., New York, N.Y.

Filed Apr. 23, 1991, Ser. No. 690,111

Int. Cl.[5] H04N *7/08*

U.S. Cl. 358—142 35 Claims



1. A method of processing data with a television signal having an active video component and a timing component for lines of a picture to be displayed on a viewing area of a television receiver, comprising the steps of:

(a) generating a carrier signal in timed relation to the timing component of the television signal;

(b) generating a data signal indicative of the data to be processed;

(c) modulating the carrier signal and the data signal in timed relation to the timing component of the television signal to form a data-modulated signal having a low amplitude in a range from 0.1 to 2.5 IRE;

(d) adding the data-modulated signal to the active video component of the television signal to form an encoded composite signal on a plurality of lines of the picture; and

(e) transmitting the encoded composite signal to the receiver for displaying the picture on the viewing area, said data-modulated signal on said plurality of lines of the picture being substantially invisible to a viewer of the picture due to said low amplitude.

5,200,823

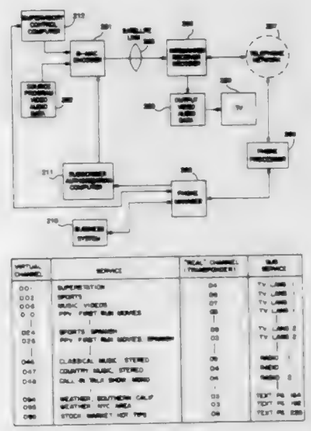
VIRTUAL CHANNELS FOR A MULTIPLEXED ANALOG COMPONENT (MAC) TELEVISION SYSTEM

Robert Yoneda; Keith Gammie, and Wayne Sheldrick, all of Ontario, Canada, assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Mar. 29, 1991, Ser. No. 677,555

Int. Cl.[5] H04N *7/08*, *7/04*

U.S. Cl. 358—146 9 Claims



1. A decoder for use in a television system, said decoder comprising:

a receiver for receiving a television signal including a linked sequence of text pages wherein each text page is accompanied by information identifying the next text page in the linked sequence of text pages;

a memory for storing a channel map for mapping the linked sequence of text pages to a plurality of virtual channels, each virtual channel having text pages of the linked sequence of text pages mapped thereto in accordance with root text pages defining a first text page on each of said virtual channels and root page spacings defining a number of text pages mapped to each of said virtual channels, a final text page of a first virtual channel linked to the root text page of a second virtual channel; and

a selector for selecting ones of said virtual channels to display the linked sequence of text pages in accordance with the channel map stored in said memory.

fied frequency signal in accordance with said automatic

means removably attachable to a person's head, including

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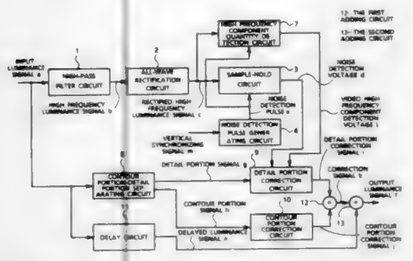
5,200,824

LUMINANCE SIGNAL NOISE SUPPRESSOR

Atsuhisa Kageyama, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1991, Ser. No. 731,152
Claims priority, application Japan, Jul. 20, 1990, 2-190757
Int. Cl.[5] H04N *5/21, 5/208*
U.S. Cl. 358—167 5 Claims



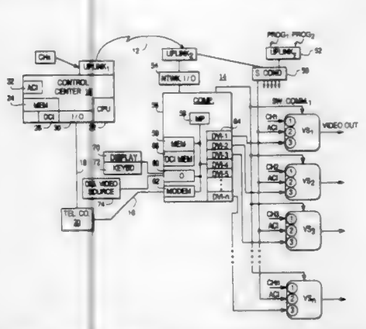
1. A luminance signal noise suppressor, comprising:
a high-pass filter circuit for extracting high frequency components from a luminance signal of an input video signal;
a rectification circuit for rectifying the extracted high frequency components;
a sample-hold circuit for sampling to produce a mean voltage of the rectified components during a period of a vertical synchronizing signal of the input video signal and holding the sampled mean voltage during a period until a next vertical synchronizing signal;
a noise detection pulse generating circuit for detecting a noise level in said vertical synchronizing signal of the input video signal, and in accordance with said noise level, enabling said sample-hold circuit; and
a circuit means for receiving the luminance signal and suppressing noise therein in accordance with a correction quantity that varies in accordance with an output voltage of said sample-hold circuit;
whereby a noise level of said luminance signal is automatically reduce in a weak electric field.

5,200,825

COMMERCIAL INSERTION SYSTEM REMOTELY CONTROLLING MULTIPLE VIDEO SWITCHES

Michael C. Perine, Key Biscayne, Fla., assignor to Beam Laser Systems, Inc., Miami, Fla.

Filed Jul. 1, 1992, Ser. No. 907,175
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] H04N *5/268, 7/10, 7/08*
U.S. Cl. 358—181 11 Claims



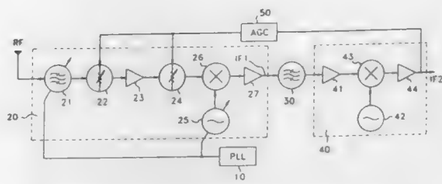
1. A video switch system for receiving a plurality of programmed channel video composite signals, each programmed channel video signal correpsonding to a respective channel of a plurality of channels, and for selecting, on a per channel basis, said programmed channel video signal as a first video signal, a commercial insert video signal as a second video signal and a locally generated video signal, said plurality of programmed channel video signals being sent independently of said commercial insert signals over a first telecommunications network, the commercial insert signal being sent over a second telecommunications network, the switch system being remotely controlled on a per channel basis, by respective first, second and third switch commands, corresponding to a respective programmed channel video signal, the commercial insert signal and said local video signal, said first, second and third switch command signals being sent with insert locator data via said second telecommunications network, the switching system comprising:
means for storing a plurality of digitally formatted video signals at various predetermined locations;
means for obtaining from said means for storing, and outputting a third video signal as said local video signal, said third video signal corresponding to one of said plurality of digitally formatted videosignals that is obtained from said means for storing using said insert locator data, said insert locator data corresponding to select ones of said predetermined storage locations; and
a plurality of video switches, a respective video switch corresponding to each one of said plurality of channels, each video switch receiving at three respective video inputs, the corresponding programmed channel video signal, said commercial insert video signal, and said third video signal, each video switch having means for respectively applying the same at a video output thereof based upon receipt of said respective first, second and third switch commands at a control input of the respective video switches.

5,200,826

TV SIGNAL RECEIVING DOUBLE CONVERSION TELEVISION TUNER SYSTEM HAVING AUTOMATIC GAIN CONTROL PROVISIONS

Chang-yeol Seong, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 17, 1991, Ser. No. 701,760
Claims priority, application Rep. of Korea, Jun. 21, 1990, 90-9152
Int. Cl.[5] H04N *5/44;* H04B *1/26*
U.S. Cl. 358—191.1 5 Claims



1. A television signal receiving tuner, comprising:
first filter means coupled to receive incoming radio frequency signals and responsive to a phase-lock loop circuit, for filtering said incoming radio frequency signals at a first predetermined bandwidth to provide a first filtered frequency signal;
first variable attenuator means for attenuating said first filtered signal in accordance with an automatic gain controlled voltage signal generated by an automatic gain controller to provide a first attenuated frequency signal;
first amplifier means for amplifying said first attenuated signal to provide an amplified frequency signal;
second variable attenuator means for attenuating said amplified frequency signal in accordance with said automatic gain controlled voltage signal generated by said automatic gain controller to provide a second attenuated frequency signal;
voltage-controlled oscillator means responsive to said phase-lock loop circuit, for providing a first local oscillator frequency signal;
first mixer means for converting said second attenuated frequency signal into a first intermediate frequency signal having a frequency approximately of 2 GHz by subtracting said amplified frequency signal from said first local oscillator frequency signal;
second amplifier means for amplifying said first intermediate frequency signal to provide a first amplified intermediate frequency signal;
second filter means for bandpass filtering said first amplified intermediate frequency signal at a second predetermined bandwidth to provide a second filtered frequency signal;
third amplifier means for amplifying said second filtered frequency signal to provide a second amplified intermediate frequency signal;
second mixer means responsive to a local oscillator generating a second local oscillator frequency signal, for converting said second amplified intermediate frequency signal into a second intermediate frequency signal by subtracting said second amplified intermediate frequency signal from said second local oscillator frequency signal;
fourth amplifier means for amplifying said second intermediate frequency signal at a selected level to provide a final tuned signal, wherein said final tuned signal feeds back to control said automatic gain controlled voltage signal by said automatic gain controller.

5,200,827

HEAD MOUNTED VIDEO DISPLAY AND REMOTE CAMERA SYSTEM

Charles M. Hanson, Richardson; Vaughn J. Koester, Dallas, and Robert D. Fallstrom, Richardson, all of Tex., assignors to Varo, Inc., Garland, Tex.

Continuation of Ser. No. 507,978, Apr. 11, 1990, Pat. No. 5,005,213, which is a division of Ser. No. 372,243, Jul. 19, 1989, Pat. No. 4,970,589, which is a division of Ser. No. 168,137, Mar. 14, 1988, Pat. No. 4,884,137, which is a division of Ser. No. 883,994, Jul. 10, 1986, Pat. No. 4,786,966. This application Dec. 18, 1990, Ser. No. 630,367
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—211 6 Claims

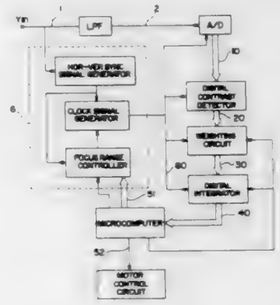
1. A video system, comprising:
an imaging system for generating video signals representative of an object comprising night vision equipment for generating said video signals representative of an image in low light ambient conditions;
receiver means remotely located from said imaging system for receiving video signals;
a video signal transmission link operating between said imaging system and said receiver means;
a vacuum fluorescent video display coupled to said receiver means for displaying a visual representation of the object; and
means removably attachable to a person's head, including means for mounting thereto said video display in a position such that the person can view the display without the use of the person's hands and such that the person can move about in a substantially unrestricted manner.

5,200,828

AUTOFOCUSING DEVICE FOR USE IN A VIDEO CAMERA AND AN AUTOFOCUSING METHOD THEREOF

Seong I. Jang; Jae K. Chong, both of Seoul; Sung H. Lee; Min H. Song, both of Kyunggi; Ook Kim, Seoul, and Dong S. Kim, Kyunggi, all of Rep. of Korea, assignors to Sam Jung Co., Ltd., Kyunggi, Rep. of Korea

Filed Mar. 14, 1991, Ser. No. 669,534
Claims priority, application Rep. of Korea, Mar. 19, 1990, 90-3663; Feb. 21, 1991, 91-2807
Int. Cl.[5] H04N *5/232;* G03B *3/00, 13/18*
U.S. Cl. 358—227 7 Claims



1. A method for autofocusing a video camera, which extracts a video signal obtained within a predetermined focus range in an image pick-up element of the video camera, converts said video signal into a digital signal, integrates said digital signal to produce a focusing value, and moves a focusing lens in a direction of increasing contrast so that an optimal focus may be obtained by use of said focusing value, said method comprising the steps of:
(a) defining a focus range for which said video signal is to be extracted,
(b) generating a control clock pulse having higher frequencies than that of said video signal during the periods of arrivals of the horizontal and vertical synchronizing signals corresponding to said focus range,
(c) sampling said video signals obtained in said image pick-up element according to said control clock pulses and converting the sampled signal into a digital signal,
(d) generating a digital differential signal which represents the difference between the current value of said digital signal and that of one control clock pulse earlier one,
(e) generating a digital weighted signal by transforming said digital differential signal by means of a nonlinear weight value curve,
(f) integrating said digital weighted signals for at least one field or frame, thereby obtaining said focusing value,
(g) determining a speed and direction of rotation of a focusing lens motor based on said focusing value to move the focusing lens toward the location where the approximately maximum focusing value is obtained,
(h) adjusting said focus range defined in step (a), and
(i) adjusting said nonlinear weight value curve of step (e), by transforming the nonlinear weight value curve if said focusing value does not belong to current grade of the focusing value, and
maintaining the nonlinear weight value curve if said focusing value pertains to current grade of the focusing value.

5,200,833

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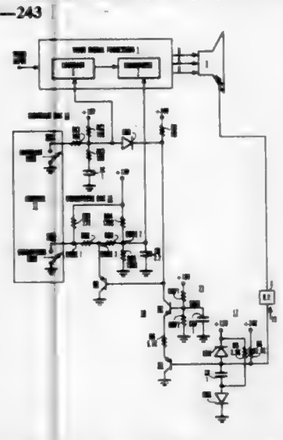
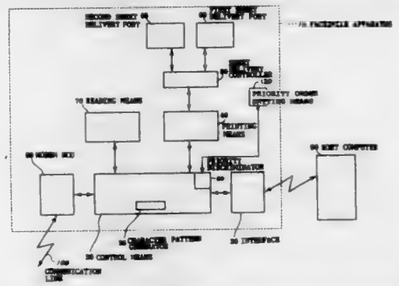
5,200,829
CONTRAST BEAM CURRENT LIMITING ARRANGEMENT WITH SECONDARY BRIGHTNESS BEAM CURRENT LIMITING PROVISIONS
William A. Lagoni, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Dec. 16, 1991, Ser. No. 807,468
Int. Cl.[5] H04N *5/68, 9/16, 5/57*
U.S. Cl. 358—243 **11 Claims**



1. In a television system including a picture tube and a video signal processing channel, having image contrast and brightness sections, for supplying a processed video signal to said picture tube, and user responsive contrast and brightness control units for generating respective user contrast and brightness control signals, a beam current limiting arrangement comprising:
means for sensing the beam current drawn by said picture tube;
means for generating a contrast beam current control signal for reducing the image contrast when the sensed beam current exceeds a first threshold value;
means coupled to said user responsive brightness control unit for comparing the level of said user contrast control signal to a nominal brightness control level corresponding to a nominal image brightness level; and
means coupled to said comparing means for generating a brightness beam current control signal for reducing the image brightness when (1) the sensed beam current exceeds a second threshold, and (2) if the user brightness control level exceeds the nominal user brightness control level.

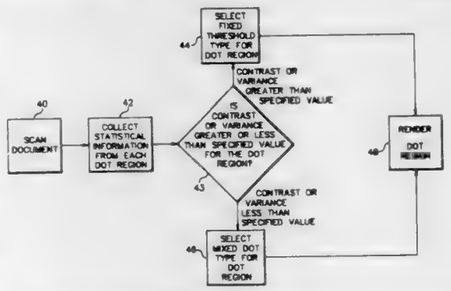
5,200,830
FACSIMILE APPARATUS CAPABLE OF RECEIVING AND PRINTING MULTIPLE KINDS OF DATA IN ACCORDANCE WITH A PREDETERMINED PRIORITY ORDER
Mamoru Imaizumi, Nagoya, and Toshinori Taniguchi, Inabe, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Dec. 19, 1990, Ser. No. 630,256
Claims priority, application Japan, Jan. 25, 1990, 2-15408
Int. Cl.[5] H04N *1/23, 1/32*
U.S. Cl. 358—296 **26 Claims**

8. A facsimile apparatus comprising:
data reception means for receiving multiple kinds of data;
mode setting means for setting a priority order in which one specific kind of data among said multiple kinds of data is received in precedence over other kinds of data through said data reception means;
mode discrimination means for determining the priority order which is set by said mode setting means; and
reception control means for controlling said data reception



means in accordance with a priority order determination made by said mode discrimination means.

5,200,831
METHOD AND ARRANGEMENT FOR LOCALLY SWITCHING GRAY DOT TYPES TO REPRODUCE AN IMAGE WITH GRAY LEVEL PRINTING
Hwai-Tzuu Tai, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 5, 1992, Ser. No. 895,555
Int. Cl.[5] H04N *1/23*
U.S. Cl. 358—298 **8 Claims**

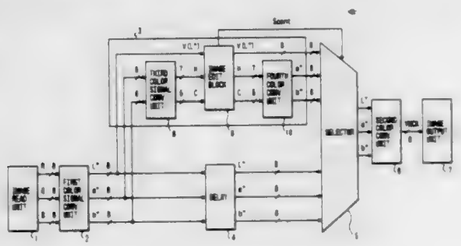


4. An arrangement for reproducing an original image, comprising:
a scanner which scans and digitizes the original image into pixels;
a controller coupled to the scanner to receive the digitized original image, and which produces a first signal corresponding to said digitized original image; and
a printer coupled to the controller to receive said first signal and which produces on a recording medium a reproduction of the original image;
wherein said controller includes:
means for collecting statistical information of dot regions from the first signal;
means for selecting for each dot region of the first signal a dot type to render that dot region in accordance with the statistical information, the dot type being either a mixed dot type or a fixed threshold type; and
means for controlling a printer to print the reproduction of the original image by rendering the dot regions of the first signal in accordance with the selected dot type for each dot region.

8. An arrangement for reproducing an original image, comprising:
a scanner which scans and digitizes the original image into pixels;
a controller coupled to the scanner to receive the digitized

original image, and which produces a first signal corresponding to said digitized original image; and
a printer coupled to the controller to receive said first signal and which produces on a recording medium a reproduction of the original image;
wherein said controller includes:
means for collecting statistical information of dot regions from the first signal;
means for selecting for each dot region of the first signal a dot type to render that dot region in accordance with the statistical information, the dot type being either a mixed dot type or a partial dot type; and
means for controlling a printer to print the reproduction of the original image by rendering the dot regions of the first signal in accordance with the selected dot type for each dot region.

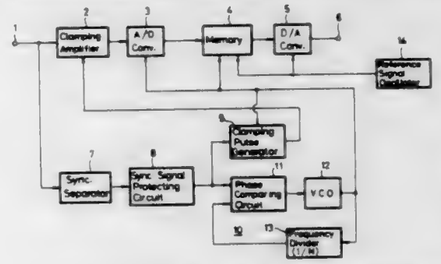
5,200,832
COLOR IMAGE RECORDING DEVICE WITH COLOR EDIT AND CONVERSION PROCESSING
Kazuman Taniuchi; Katuyuki Kouno; Hiroshi Sekine, and Yoshihiro Terada, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 13, 1992, Ser. No. 882,006
Claims priority, application Japan, May 14, 1991, 3-109242
Int. Cl.[5] H04N *1/29, 1/387, 1/46*
U.S. Cl. 358—300 **10 Claims**



1. A color image recording device comprising:
image read means for separating an original document image by colors to output the same image in the form of signals of primary colors including red, green and blue;
first color signal conversion means for converting the three primary color signals output from said image read means to generate a brightness signal and first and second color difference signals;
image edit means for performing a specified color edit processing on output signals of said first color signal conversion means;
second color signal conversion means for converting an output signal of said image edit means into a developing color; and
image output means for recording an image in accordance with an output signal of said second color signal conversion means,
said image edit unit including third color signal conversion means for converting the first and second color difference signals of output signals of said first color signal conversion unit into a hue signal and a chroma signal, image edit block for performing a specified color edit processing on the brightness signal output from said first color signal conversion unit as well as on the hue signal and chroma signal respectively output from said third color signal conversion means, and a fourth color signal conversion unit for converting the hue signal and chroma signal output from said third color signal conversion means into first and second color difference signals.

5,200,833
SIGNAL LEVEL CLAMPING APPARATUS FOR A CTDM VIDEO SIGNAL
Yoshisori Suzuki; Yoshiyuki Suzuki, and Kazuo Ido, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jan. 27, 1992, Ser. No. 826,396
Claims priority, application Japan, Jan. 31, 1991, 3-011310
Int. Cl.[5] H04N *5/78, 9/89*
U.S. Cl. 358—320 **4 Claims**

1. In a time-base correction apparatus of a video tape recorder/reproducer, said apparatus having a time-base correcting unit for correcting time-base errors in a reproduced color difference signal which includes adjacent horizontal synchronizing signals and first and second time-compressed color difference line signals sequentially arranged between said adjacent synchronizing signals with a predetermined interval between said color difference line signals; a signal level clamping apparatus comprising:
a clamping circuit for receiving said reproduced color difference signal and providing a clamped output signal to said time-base correction unit;
a synchronizing signal separator circuit for receiving said reproduced color difference signal and separating said horizontal synchronizing signals from said reproduced color difference signal;
a write clock signal generating circuit for receiving separated horizontal synchronizing signals from said synchronizing signal separating circuit, generating a write clock signal synchronized with said separated horizontal synchronizing signals, and applying said write clock signal to



said time-base correction unit to control writing of said clamped output signal into said time-base correction unit; and
a clamping pulse generating circuit for receiving said separated horizontal synchronizing signals from said synchronizing signal separating circuit and applying a clamping pulse to said clamping circuit in timed relationship to said separated horizontal synchronizing signals so that said clamping circuit clamps said reproduced color difference signal during said predetermined intervals between said first and second color difference line signals.

5,200,834
MAGNETIC RECORDING AND REPRODUCING APPARATUS OBTAINING SEPARATE CLOCK SIGNALS FROM BRIGHTNESS AND COLOR COMPONENTS OF A VIDEO SIGNAL
Kunio Iwaibana, Osaka, and Takeshi Kuwajima, Tokyo, both of Japan, assignors to NEC Home Electronics Ltd., Osaka and NEC Corporation, Tokyo, both of Japan
Filed Mar. 30, 1989, Ser. No. 330,406
Claims priority, application Japan, Mar. 30, 1988, 63-77288; Apr. 30, 1988, 63-108264
Int. Cl.[5] H04N *9/89*
U.S. Cl. 358—324 **2 Claims**

1. A magnetic record reproducing apparatus comprising:
two A/D converters for respectively digitizing luminance and chrominance signals as components of an analog composite video signal;

image forming means for reading the digital image data out

5,200,839
IMAGE PROCESSING APPARATUS

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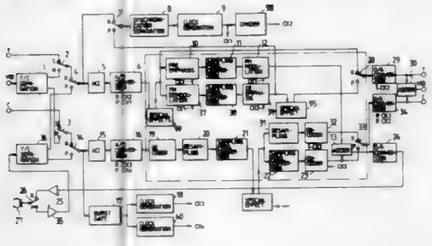
a digital signal processing circuit, receiving the digitized luminance and chrominance signals from said two A/D converters, for modulating a frequency of the luminance signal and converting a frequency of the chrominance signal into a low frequency band, comprising:

a) clock means for producing a clock signal synchronized with a burst signal within said chrominance signal, and

b) means for resampling said chrominance signal using said clock signal;

a first D/A converter, receiving the frequency modulated luminance signal and the low frequency converted chro-



minance signal, for converting said frequency modulated luminance signal and said low frequency converted chrominance signal to a first analog signal and using said first analog signal to perform a magnetic recording operation;

second and third D/A converters, receiving the digitized luminance and chrominance signals for converting the digitized luminance and chrominance signals to analog form; and

means for mixing the luminance and chrominance signals outputted from the second and third D/A converters to produce a composite analog video signal.

5,200,835

DEMODULATOR FOR FM MODULATED VIDEO SIGNALS WITH PRE-DEMODULATION SIDEBAND SUPPRESSION AND POST-DEMODULATION SIDEBAND RESTORATION

Etsurou Sakamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

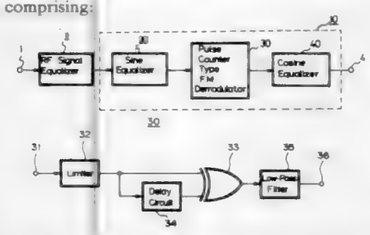
Filed Feb. 11, 1991, Ser. No. 653,614

Claims priority, application Japan, Feb. 15, 1990, 2-34729

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—330 **10 Claims**

1. An FM demodulating apparatus receiving an FM modulated video signal having upper and lower sideband components, comprising:



(a) a first equalizer means for suppressing the upper and lower sideband components of the FM modulated video signal;

(b) an FM demodulator circuit connected to the first equalizer, wherein the FM demodulator circuit is a pulse counter type FM demodulator; and

(c) a second equalizer means for receiving the demodulated video signal from the FM demodulator circuit, for recovering the upper and lower sideband components suppressed by the fist equalizer means and for deriving an output video signal.

5,200,836

IMAGE COMMUNICATION APPARATUS WITH SUBSTITUTED RECEPTION WITH REDUCED MEMORY REQUIREMENT

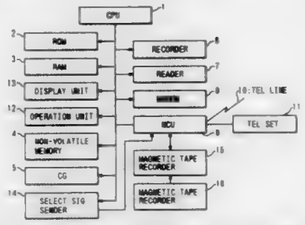
Shigeru Koizumi, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,479

Claims priority, application Japan, Dec. 6, 1988, 63-308141

Int. Cl.[5] H04N *5/782*

U.S. Cl. 358—335 **10 Claims**



1. An image communication apparatus comprising: magnetic recording means for recording on a magnetic tape;

reception means for receiving image data from outside said apparatus; and

control means for causing said magnetic recording means to record the image data received by said reception means on the magnetic tape,

wherein said control means adds to the image data extra information for identifying the image data as image data, and then causes recording of the image data and the extra information on the magnetic tape.

5,200,837

DIGITAL COPIER INCLUDING MEANS FOR ERASING DIGITAL IMAGE DATA OVER A GIVEN AREA, ESPECIALLY SUITABLE FOR PREVENTING JAMMING OF PAPER

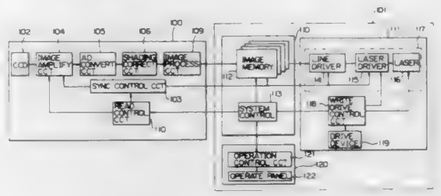
Tetsuo Sakurai, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Apr. 27, 1990, Ser. No. 515,708

Claims priority, application Japan, Apr. 30, 1989, 1-110763; May 24, 1989, 1-130663; May 24, 1989, 1-130665; Nov. 10, 1989, 1-292999; Feb. 16, 1990, 2-35475

Int. Cl.[5] H04N *1/00, 1/387;* **G03G** *21/00*

U.S. Cl. 358—401 **10 Claims**



1. A digital copier for transferring an image formed on a photoconductive element by digitally processing a document image and fixing the image on a paper sheet, the digital copier comprising:

image reading means for converting the document image into a multi-level density signal by a photoelectric conversion device;

converting means for converting the multi-level density signal from said image reading means into digital image data;

storing means for storing the digital image data from said converting means;

image forming means for reading the digital image data out of said storing means to form an image based on the image data on the photoconductive element;

transferring means for transferring the image formed by said image forming means to the paper sheet being transported;

erasing means for erasing the digital image data over a predetermined area in a subscanning direction; and

a counter providing a numerical value indicating a number of black pixels in a predetermined range included in the digital image data along a leading edge of the document, the digital image data being erased by the erasing means when the number of black pixels counted is greater than a predetermined value.

5,200,838

LATERAL EFFECT IMAGING SYSTEM

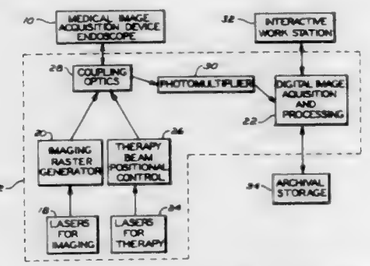
Sol Nudelman, Avon, and Donald R. Ouimette, Plantsville, both of Conn., assignors to The University of Connecticut, Farmington, Conn.

PCT No. PCT/US89/02322, § 371 Date Nov. 23, 1990, § 102(e) Date Nov. 23, 1990

Continuation-in-part of Ser. No. 199,997, May 27, 1988, Pat. No. 4,938,205. This PCT application May 26, 1989, Ser. No. 613,636

Int. Cl.[5] A61B *1/04, 1/06;* **H04N** *13/00*

U.S. Cl. 358—443 **19 Claims**



16. An endoscope adapted for operation in association with optical scanner means which generates radiation tracing out a raster comprising;

probe means for forming a flexible tubular member having a proximal end and a distal end;

first optical cable means received in said member comprising a bundle of coherent flexible optical fibers forming a first optical cable extending between a proximal end surface and a distal end surface;

photodetector means comprising at least tow lateral effect photodetectors for generating an electrical signal having an instantaneous value proportional to the quantity of light impinging said photodetectors;

processor means communicating with said photodetector means for generating a signal indicative of a multi-dimensional image of said object,

so that a raster from said scanner applied at said proximal end of said probe means is projected through said distal end surface of said optical channel for illumination of the object to be examined and radiation reflected from the object impinges said photodetector means wherein said processor generates signals indicative of a stereo image of said object.

5,200,839

IMAGE PROCESSING APPARATUS

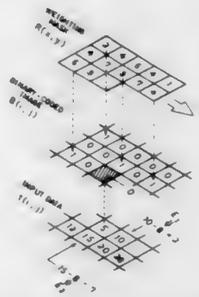
Takeharu Uchizono, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 749,952, Aug. 26, 1991, abandoned. This application Jun. 19, 1992, Ser. No. 900,762

Claims priority, application Japan, Aug. 31, 1990, 2-230263; Aug. 31, 1990, 2-230264

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—448 **24 Claims**



1. An image processing apparatus comprising:

input means for inputting multivalue data;

calculation means for obtaining an average density value representing average in a predetermined set of picture elements neighboring a target picture element, using data which have been subjected to quantization processing;

quantization means for quantizing the input multivalue data according to the average density value obtained by said calculation means; and

processing means for performing removal processing on multivalue data of a predetermined picture element from among input multivalue data of a plurality of picture elements,

wherein said quantization means quantizes multivalue data which are obtained from multivalue data of the removed picture element and from multivalue data of picture elements which are not removed.

5,200,840

IMAGE PROCESSING APPARATUS

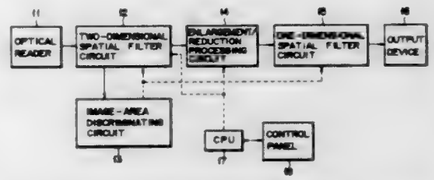
Yuzo Koike; Hidekazu Sekizawa, both of Yokohama, and Naofumi Yamamoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 6, 1990, Ser. No. 549,435

Claims priority, application Japan, Jul. 7, 1989, 1-176081; Nov. 15, 1989, 1-294879

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—451 **11 Claims**



1. An image processing apparatus comprising:

image-area discriminating means for discriminating an attribute of an image on the basis of an image signal and outputting a discrimination result as an image-attribution signal;

enlargement/reduction processing means for subjecting said

image to enlargement/reduction processing with a predetermined enlargement/reduction ratio; and

rized data in addresses which are generated based not only

the transfer zone includes:

charge divider means receiving, at input, said charge trans-

5,200,844

COLOR HEAD-UP DISPLAY SYSTEM

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image to enlargement/reduction processing with a predetermined enlargement/reduction ratio; and

filtering means, connected to said image-area discriminating means and said enlargement/reduction processing means, which controls a spatial frequency component of said image signal, in accordance with said image-attribution signal and said enlargement/reduction ratio, wherein said filtering means comprises a one-dimensional spatial filter for performing one-dimensional filtering on an output signal of said enlargement/reduction processing means in accordance with said discrimination signal and wherein said spatial filter includes averaging means for obtaining a moving average of said output signal of said enlargement/reduction processing means and a γ circuit for controlling a γ characteristic of an output signal of said averaging means.

5,200,841

APPARATUS FOR BINARIZING IMAGES

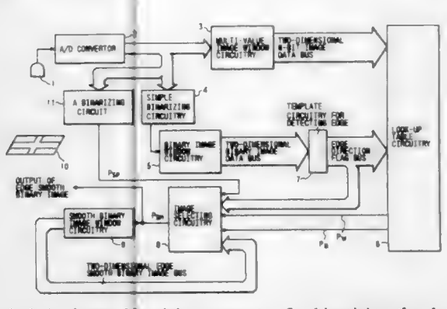
Kenichi Kotaki, Tokyo; Hideo Kimura, and Shigeru Takemoto, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,223

Claims priority, application Japan, May 25, 1990, 2-135995; May 30, 1990, 2-140486

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—455 **7 Claims**



1. An image binarizing apparatus for binarizing the data item of a desired pixel among the multi-value image data items of pixels composed of plural bits, the multi-value image data items being output from an image taking device in a time series manner, said image binarizing apparatus comprising:

multi-value image window circuitry for obtaining said multi-value image data items in the form of two dimensions, whereby said multi-value image window circuitry cuts a two-dimensional image in a small field of vision from an image plane to be taken;

a first binarizing circuit for binarizing said multi-value image data items in accordance with a variable threshold which is determined based on said multi-value image data items of the pixels around said desired pixel;

a second binarizing circuit for binarizing said multi-value image data items in accordance with a predetermined threshold;

binary image window circuitry for obtaining image data which has been binarized by said second binarizing circuit, whereby said binary image window circuitry cuts a binary two-dimensional image in a small field of vision from an image plane to be taken;

edge detecting circuitry for comparing and collating the binary two-dimensional image data obtained by said binary image window circuitry with edge templates each having a predetermined angle, whereby said edge detecting circuitry detects whether or not the position of said desired pixel is on an edge, and outputs an edge direction in the form of edge detection data when the position of said desired pixel is on the edge;

memory circuitry for storing two types of smoothly binarized data in addresses which are generated based not only on the multi-value image data items obtained by said multi-value image window circuitry, but also on the edge detection data which is output from said edge detecting circuitry, the two types of smoothly binarized data stored in said memory circuitry being dependent on the smooth binary image data of a pixel adjacent to said desired pixel in said edge direction, said memory circuitry outputting two types of smooth binary image data in the addresses which correspond to said multi-value image data items and said edge detection data; and

selecting circuitry for selecting either one of the two types of smooth binary image data which are output either from said first binarizing circuit or from said memory circuitry, whereby when said edge detecting circuitry detects that an edge is not present, said selecting circuitry selects an output from said first binarizing circuit, while on the contrary, when said edge detecting circuitry detects that an edge is present, said selecting circuitry selects either one of the two types of smooth binary image data which are output from said memory circuitry, this selection being based on the smooth binary image data of the pixel adjacent to said desired pixel in the edge direction.

5,200,842

CHARGE-COUPLED DEVICE WITH WIDE DYNAMIC RANGE

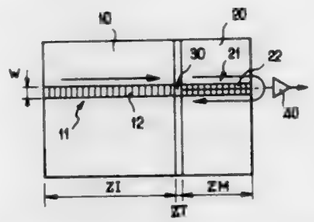
Alain Becker, Montrouge, France, assignor to Thomson-CSF, Puteaux, France

Filed Jan. 11, 1991, Ser. No. 639,894

Claims priority, application France, Jan. 16, 1990, 90 00429

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—483 **6 Claims**



1. A charge-coupled device having, on one and the same component:

an image zone having a first array of at least one line of cells, each formed by a photo-active pixel receiving a light energy and carrying out a first integration of this light energy by the accumulation of a corresponding electrical charge, means for transferring this charge from point to point in the array, along the line, up to an end of this line;

a memory zone having a second array of cells that are not photo-active, the number of lines of this memory zone being homologous with that of the first array,

a transfer zone interposed between the image zone and the memory zone, to receive the charges that have accumulated in the cells of the first array and to transfer them towards the second array to store them therein, and

reading means to detect the charges stored in the second array and to convert them into an electrical voltage or current signal;

wherein, for each line or for each of said lines:

the line of the second array is looped line sequenced at the same time as the corresponding line of the first array, and at the same rate,

said line of the second array including an input and an output so that it can receive, at said output, the charges introduced at input and transferred from point to point up to the output, and

the transfer zone includes:

charge divider means receiving, at input, said charge transferred from point to point in the first array along the line and dividing said charge into two sub-charges with a predetermined relative ratio;

means to neutralize the first of these sub-charges, and

means to add the second of these sub-charges to the charge received at output of the looped line and to re-inject the resultant total charge into the input of the looped line so as to make it recirculate therein;

the concomitant sequencing of the lines of the first array and of the second array being repeated in a plurality of cycles so as to bring about an increase, by the accumulation of the, second successive sub-charges in the looped line, of the corresponding charge of the memory array and thus, by the second integration that results therefrom, to increase the dynamic range of the charge-coupled device by a proportion corresponding to said predetermined ratio of the two sub-charges.

5,200,843

POLARIZED SYNTHESIZATION IN PROJECTION TYPE LIQUID CRYSTAL DISPLAYS

Johji Karasawa, and Junichirou Shinozaki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

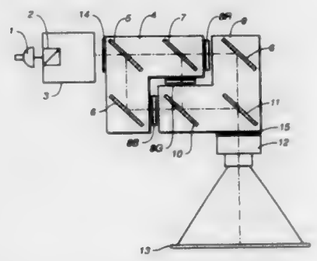
Filed Oct. 5, 1990, Ser. No. 593,107

Claims priority, application Japan, Oct. 5, 1989, 1-260882

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—40 **14 Claims**

1. In a projection type liquid crystal display system having a light source, light separation means for separating light from said light source into dichroic light components, at least one liquid crystal light valve having a planar surface for receiving and modulating light from said light separation means, light synthesizing means for reflecting modulated light from said liquid crystal light valve, a projection lens for projecting light from said light synthesizing means, a polarizing beam splitter arranged between said light source and said light separation means to separate said light into two polarized light components having perpendicular polarization directions relative to each other and polarizing conversion means optically aligned between said light source and said light separation means for converting said polarized light components to have the same polarization direction means to project said polarized light components in side-by-side, parallel relationship onto said light valve planar surface with said polarized light components incident therewith, said polarized light components having substantially the same optical path length between said light source and said light valve.



5,200,844

COLOR HEAD-UP DISPLAY SYSTEM

Thomas C. Suvada, Palos Verdes Estates, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Foster City, Calif.

Filed May 22, 1992, Ser. No. 887,474

Int. Cl.[5] G02F *1/13*; G09G *3/02*; H04N *9/31*

U.S. Cl. 359—40 **20 Claims**

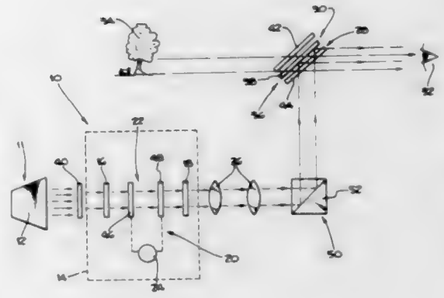
1. A field sequential color head-up display system, comprising:

image generating means having a source of light of at least two different wavelengths;

light polarizing means in optical communication with said source, including a color selective polarizing filter having first and second substantially orthogonally oriented absorption axes, the first absorption axis passing linearly polarized light of a first color and the second absorption axis passing linearly polarized light of a second color;

circular polarizing means in optical communication with said light polarizing means for selectively transmitting light of a color determined by the amount by which the light emitted by said source is optically retarded;

variable optical retarding means disposed between said color selective polarizing filter and said circular polarizing means for retarding light applied to said circular polarizing means;



control means coupled to said variable optical retarding means for controlling the amount of optical retardation imposed by said retarding means upon light transmitted therethrough, whereby said retarding means are capable of at least first and second retardations resulting in the emission of light of at least first and second colors;

image collimating means in optical communication with said circular polarizing means for applying an image generated by said image generating means to an image combining means positioned in the line of sight between an observer and a scene to provide a superposition of a generated image over the scene visible to the observer; and

optical wavelength enhancement means in optical communication with said image collimating means and said image combining means for enhancement of the reflectivity on said image combining means of the wavelengths of light generated by said light source

whereby generated images appear to the observer as if they were located at infinity so that scenes visible to the observer through the image combining means appear to include the generate images.

5,200,845

signal levels of a reference voltage level and an intermedi-

predetermined gap therebetween, sad second substrate

5,200,849

LIGHT BEAM SCANNING SYSTEM

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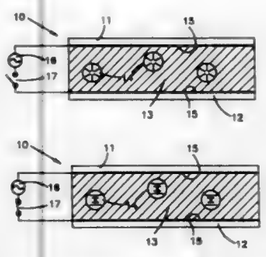
5,200,845

COLOR LIQUID CRYSTAL DISPLAY CONSISTING OF POLYMER-DISPERSED CHIRAL LIQUID CRYSTAL HAVING NEGATIVE DIELECTRIC ANISOTROPY

Peter P. Crooker, Honolulu, Hi., and Dengke Yang, Kent, Ohio, assignors to University of Hawaii at Manoa, Honolulu, Hi.

Continuation of Ser. No. 430,673, Oct. 31, 1989, abandoned.
This application Mar. 25, 1992, Ser. No. 857,678
Int. Cl.[5] G02F 1/1347
U.S. Cl. 359—51 7 Claims



1. A liquid crystal color display comprising at least one sheet of liquid crystal material formed by microdroplets of liquid crystal having a generally spherical shape and a diameter of about 1–20 μm dispersed in a polymeric matrix by phase separation, said liquid crystal being in the cholesteric phase and having negative dielectric anisotropy of at least −3, said material being further characterized in that:

the liquid crystal in said microdroplets has a liquid crystal director configuration or a random orientation in the absence of an electric field so that incident light is scattered, and

the application of an electric field is effective to cause the cholesteric liquid crystal in said microdroplets to align perpendicular to the direction of the field to form a planar helical texture having a helical pitch so as to selectively reflect light of a wavelength determined by the helical pitch of the chiral liquid crystal.

5,200,846

ELECTRO-OPTICAL DEVICE HAVING A RATIO CONTROLLING MEANS FOR PROVIDING GRADATED DISPLAY LEVELS

Masaaki Hiroki, Kanagawa, and Akira Mase, Aichi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Feb. 18, 1992, Ser. No. 837,394
Claims priority, application Japan, Feb. 16, 1991, 3-77317; Feb. 16, 1991, 3-77320; Feb. 16, 1991, 3-77321; Mar. 27, 1991, 3-87776; Mar. 27, 1991, 3-89540
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—57 20 Claims

1. An electro-optical device comprising:

a pair of substrates;

an electro-optical modulating layer provided between said substrates;

matrix lines comprising column control lines and row control lines provided on one of said substrates;

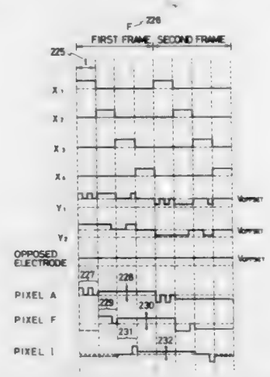
a plurality of pixel electrodes provided on said one of said substrates;

a plurality of transistors provided on said one of said substrates, each of the transistors being connected to corresponding one of said pixel electrodes at one of source and drain terminals thereof, to corresponding one of said row control lines at the other one of the source and drain terminals, and to corresponding one of said column control lines at a gate terminal thereof;

means for supplying a signal to each of said transistors at two signal levels of a reference voltage level and an intermediate level;

means for addressing said transistors once per an addressing period;

means for controlling a ratio (a total period of the reference voltage level during the addressing period)/(a total period



of the intermediate level during the addressing period); and

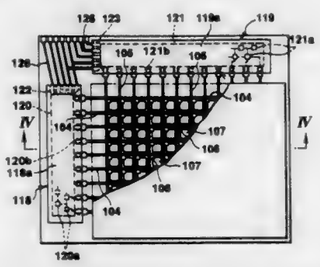
means for supplying said reference voltage level at high and low two levels with said intermediate level between said high and low two levels, and with said high and low two levels alternated.

5,200,847

LIQUID CRYSTAL DISPLAY DEVICE HAVING DRIVING CIRCUIT FORMING ON A HEAT-RESISTANT SUB-SUBSTRATE

Atsushi Mawatari, Hamura, and Ichiro Ono, Hachioji, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,215
Claims priority, application Japan, May 1, 1990, 2-111811; May 1, 1990, 2-111812
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—59 20 Claims



1. A liquid-crystal display device having a driving circuit, comprising:

a first substrate on which a plurality of first electrodes are arrayed, sad first substrate having substantially no heat resistance property;

a plurality of signal supplying lines electrically connected with said plurality of first electrodes on said first substrate and extending to a periphery of said first substrate, said signal supplying lines having terminal portions installed on at least one end thereof in order to supply driving signals to said first electrodes;

a second substrate having substantially no heat resistance property and separated from said first substrate with a predetermined gap therebetween, said second substrate having at least one second electrode arranged to oppose said first electrodes;

sealing means for enclosing a region containing said plurality of first electrodes inside the terminal portions on said first substrate, and for bonding said first substrate with said second substrate;

a liquid crystal material sealed in the region enclosed by said first substrate, second substrate, and sealing-means;

heat-resistant sub-substrate having a smaller area than that of said first substrate and connected to the periphery of said first substrate;

a driving circuit block having

input terminals for receiving a display control signal supplied from the outside,

driving circuit means for generating the driving signals to be supplied to at least said first electrodes according to the inputted display control signal, said driving circuit means including formed on said sub-substrate and including a plurality of thin-film transistors connected together, said transistors comprised of a semiconductor having a crystal structure, and

output terminals for outputting the driving signal from said driving circuit means,

said input terminals, said driving circuit, and said output terminals being mounted on said sub-substrate; and

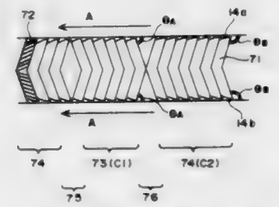
connecting means for electrically connecting each output terminal of said driving circuit block with each terminal portion of said signal supplying lines formed on said first substrate.

5,200,848

FERROELECTRIC SMECTIC LIQUID CRYSTAL DEVICE

Yukio Hanyu; Junichiro Kanbe; Hideyuki Kawagishi, and Yutaka Inaba, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 245,644, Sep. 16, 1988, Pat. No. 4,932,758.
This application Mar. 19, 1990, Ser. No. 495,607
Claims priority, application Japan, Sep. 17, 1987, 62-234357; Sep. 18, 1987, 62-232502; Sep. 7, 1988, 63-225049
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—100 25 Claims



1. A process for preparing a chiral smectic liquid crystal device, comprising the steps of:

(a) providing a pair of substrates, each having a uniaxial alignment axis, said uniaxial alignment axes being parallel and identical in direction with each other;

(b) disposing between the pair of substrates a chiral smectic liquid crystal capable of forming a higher-temperature alignment state and a lower-temperature alignment state in its chiral smectic phase; and

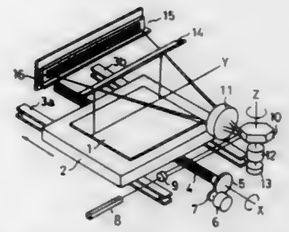
(c) cooling the chiral smectic liquid crystal from a phase having a temperature higher than the chiral smectic phase to place the chiral smectic liquid crystal first in the higher-temperature alignment state and then further cooling the chiral smectic liquid crystal to place the liquid crystal in the lower-temperature alignment state in the chiral smectic phase in a bistable alignment state providing two stable orientation states.

5,200,849

LIGHT BEAM SCANNING SYSTEM

Yukihiko Inagaki, and Yoshihiro Kishida, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 9, 1992, Ser. No. 818,512
Claims priority, application Japan, Jan. 9, 1991, 3-12903; Jan. 24, 1991, 3-25380
Int. Cl.[5] G02B 26/08
U.S. Cl. 359—196 8 Claims



1. A light beam scanning system for scanning an object with a light beam emitted from a light source, said light beam scanning system comprising:

scanning means for scanning the light beam emitted from the light source;

a lattice plate disposed in a position equivalent to a scanning plane of the light beam and extending in a primary scanning direction to receive the light beam from the scanning means, said lattice plate including a plurality of light transmitting sections each having a width substantially corresponding to a diameter of the light beam in an in-focus position;

light quantity detecting means for detecting a light quantity of the light beam having passed through said light transmitting sections; and

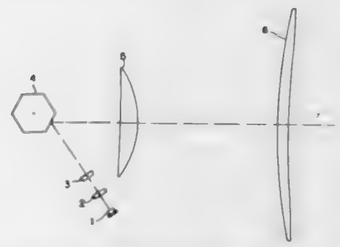
focus displacement determining means for determining amounts of focus displacement of the light beam at different points in the primary scanning direction from levels of a detection signal provided by said light quantity detecting means.

5,200,850

ANAMORPHIC OPTICAL SYSTEM

Takashi Iizuka, and Akira Morimoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1992, Ser. No. 846,803
Claims priority, application Japan, Mar. 5, 1991, 3-123234
Int. Cl.[5] G02B 26/08
U.S. Cl. 359—206 6 Claims



5. An anamorphic optical system comprising:

a collimator lens which renders parallel light beams emitted by a light source;

a cylindrical lens which converges said parallel light beams

tive to the vertical direction, said first sheet is tensioned at least the helmet increases with the angular displacements (a, b) of

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in an auxiliary scanning direction so as to form a line spread function image;

a scanning deflector which deflects the light beam that has passed through said cylindrical lens in a principal scanning direction;

a scanning lens group comprising an imaging lens group of one or more plastic lenses and a single plastic correcting lens disposed on the image plane side of said imaging lens group; wherein

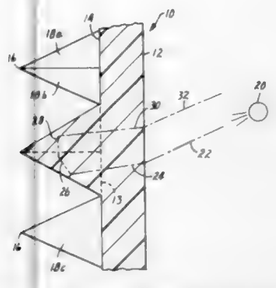
the focal displacement due to temperature changes lies within a focal depth of the system.

5,200,851

INFRARED REFLECTING CUBE-CORNERED SHEETING

James C. Coderre, Lake Elmo, and David M. Burns, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1992, Ser. No. 835,619
Int. Cl.[5] G02B *5/124, 5/22*
U.S. Cl. 359—351 15 Claims



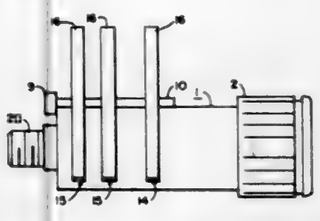
1. A retroreflective article having first and second major sides, said first side being substantially flat and said second side having an array of cube-corner retroreflective elements thereon, wherein said elements comprise a polymeric matrix which is transmissive to infrared light but which is substantially opaque to visible light.

5,200,852

DIOPTRIC SIGHT

Walter Gehmann, Karlstrasse 40, 7500 Karlsruhe, Fed. Rep. of Germany

Filed Aug. 15, 1991, Ser. No. 745,179
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1990, 4027854
Int. Cl.[5] G02B *23/00, 7/02;* F41G *1/02*
U.S. Cl. 359—399 16 Claims



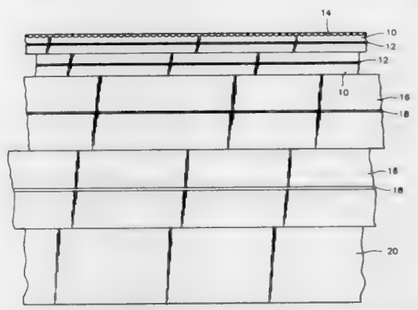
1. A dioptric sight comprising a tubular body portion, an eyepiece mounted on one end of said body portion, an elastic material sleeve for mounting on said eyepiece, said tubular body portion and said sleeve each having at least one transverse slot formed therein with each slot receiving at least one filter disc of a diameter corresponding to the diameter of said tubular body portion and consisting of a filter disposed in an annular frame, said annular frame being internally threaded and having an internal collar formed at one side and a retaining ring threaded into the frame from the other side with the filter disposed between the collar and the retaining ring, and means for locking said filter discs in position in said slots.

5,200,853

BOARD FOR SCREENING AND WRITING AND A METHOD FOR THE PRODUCTION THEREOF

Opher Berkman, 13 Shmuel Hanagid Street, Herzaliyah, Israel 46498

Filed Feb. 24, 1992, Ser. No. 840,151
Claims priority, application Israel, Oct. 31, 1991, 99916
Int. Cl.[5] G03B *21/56*
U.S. Cl. 359—443 19 Claims



1. A durable multipurpose screenboard especially adapted for both the screening of projected images and for writing thereon, wherein said screenboard comprises an upper section, a core section and a base section, said upper section comprising at least two superposed layers of transparent overlay sheets, each of said sheets weighing between 20 and 120 grams per square meter and having been soaked in a solution or melt of a polymeric resin material to subsequently form an intermediate solid plastic layer, the upper surface of the upper sheet being roughened by a plurality of closely-spaced complementary depressions of depth between 0.01 mm and 0.2 mm, said core section comprising at least one paper sheet weighing between 60 and 140 grams per square meter and having been soaked in a solution or melt of a polymeric resin material to subsequently form an intermediate solid plastic layer, and said base section comprising a plastic sheet, said screenboard having a surface being adapted to both reduce glare of projected images and to erasably retain particles from writing implements pressed therealong.

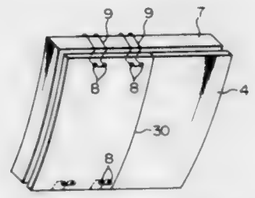
5,200,854

LARGE-SCREEN PROJECTION-TYPE DISPLAY

Masanori Ogino, Yokohama; Yoshiaki Iwahara, Yokosuka; Shuichi Sakamoto, and Yukihiro Kobayashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video & Information System, Inc., Kanagawa, both of Japan

Filed Feb. 20, 1992, Ser. No. 838,320
Claims priority, application Japan, Mar. 27, 1991, 3-085852
Int. Cl.[5] G03B *21/56*
U.S. Cl. 359—451 10 Claims

1. A large-screen projection-type display using a transmission-type screen, wherein s id transmission-type screen is formed of, at least, two sheets, or a first sheet provided on the viewer's side, and a second sheet provided on the projection source side far from said first sheet, both of said sheets are tilted toward the viewers by about 0.04 radian or above relative to the vertical direction, said first sheet is tensioned at least in the vertical direction, said second sheet has a warp of more



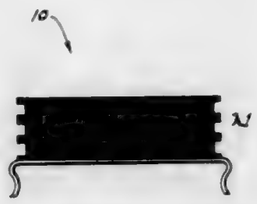
than about 2.4 times as large as its thickness, and said first sheet and said second sheet are kept spaced about 7 mm or below.

5,200,855

ABSORBING DICHROIC FILTERS

William A. Meredith, Jr., and Paul M. LeFebvre, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jul. 12, 1991, Ser. No. 728,882
Int. Cl.[5] G02B *5/28*
U.S. Cl. 359—588 12 Claims



1. A dichroic filter, comprising a periodic stack of relatively low index of refraction material (L) and relatively high index of refraction material (H), one of the materials having metal-like properties in a relatively short wavelength region of the visible spectrum and one of the materials having dielectric properties in a relatively longer wavelength region of the visible spectrum, the materials providing a cut-on transition from metal-like absorption to dielectric transmission at the relatively longer wavelength region, for selectively transmitting light in a selected region of the longer wavelength region of the visible spectrum.

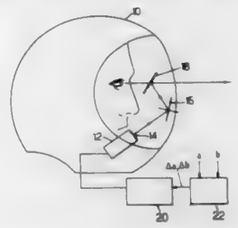
5,200,856

HELMET SIGHT INCLUDING A GRATICULE IMAGE WITH INCREASING DEVIATION WITH HELMET DISPLACEMENT

Raymond Beaussant, Bretigny, France, assignor to Intertechnique, Plaisir, France

Filed Feb. 11, 1992, Ser. No. 834,057
Claims priority, application France, Feb. 12, 1991, 91 01611
Int. Cl.[5] G02B *27/10*
U.S. Cl. 359—630 5 Claims

1. Helmet sight comprising collimator means for projecting an image of a monocular aiming graticule into the field of vision of the wearer of the helmet and means of measurement of the angular position of the helmet with respect to a reference structure, wherein the collimator means of projection are designed to give the graticule an angular position whose deviation (Δa, Δb) with respect to a reference orientation linked to the helmet increases with the angular displacements (a, b) of the helmet from a predetermined middle position with respect



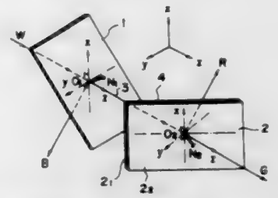
to the reference structure, the deviation being in the direction of the displacement of the helmet.

5,200,857

COLOR SEPARATION/SYNTHETIC OPTICAL SYSTEM INCLUDING TWO DICHROIC MIRRORS ANGLED FOR CORRECTION OF ASTIGMATISM

Hajime Matsushita, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 14, 1992, Ser. No. 820,548
Claims priority, application Japan, Jan. 17, 1991, 3-3764
Int. Cl.[5] G02B *27/10, 5/28*
U.S. Cl. 359—634 7 Claims



1. A color separation/synthetic optical system in which a plurality of dichroic mirrors for allowing an incident light to be transmitted therethrough or to be reflected thereon every different ray of color light are provided in succession on a center axis of the transmitted bundle of light to separate a white light into respective rays of color light of red, green and blue by the plurality of dichroic mirrors, and to synthesize respective rays of color light of red, green and blue into a predetermined color light,

wherein the system has at least two first and second dichroic mirrors which are disposed adjacent to each other,

said first dichroic mirror comprising a substrate and a mirror layer disposed on a light incident side of said substrate and being arranged within a plane including a first axis vertical to the optical center axis and inclined by a predetermined angle with respect to the optical center axis,

said second dichroic mirror comprising a pair of substrates and a mirror layer interposed between said pair of substrates, the thickness and refraction index of one of said pair of substrates at the light incident side being prescribed to give a light, which is reflected by said second dichroic mirror, an astigmatism to compensate an astigmatism given by said first dichroic mirror, the thicknesses and refraction indexes of said pair of substrates being prescribed to give a light, which is transmitted through said second dichroic mirror, an astigmatism to compensate the astigmatism given by said first dichroic mirror, said second dichroic mirror being arranged within a plane including a second axis vertical to both of the optical center axis and the first axis and inclined by a predetermined angle with respect to the optical center axis.

5,200,858

ing surface to provide for magnification of an image on the

(a) a first lens unit which comprises two meniscus element

producing electronic image data representative of said still

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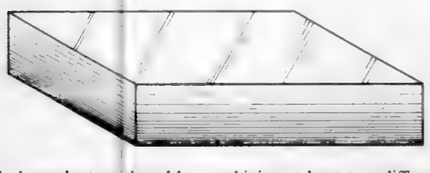
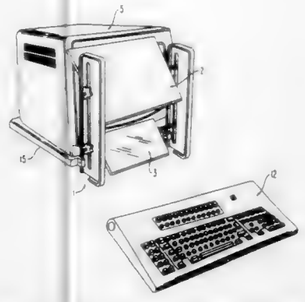
5,200,858
UNI-DIRECTIONAL GRADIENT INDEX OF REFRACTION GLASSES
James J. Hagerty, Taos, N. Mex.; David N. Pulsifer, San Jose, Calif., and Guy E. Rindone, State College, Pa., assignors to LightPath Technologies, Inc., Tucson, Ariz.
Continuation of Ser. No. 518,530, May 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 266,670, Nov. 3, 1988, Pat. No. 4,929,065. This application May 11, 1992, Ser. No. 881,142
Int. Cl.[5] G02B *1/00*
U.S. Cl. 359—652 8 Claims



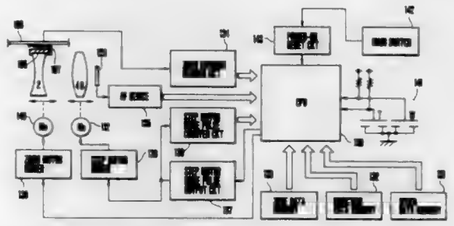
1. A product produced by combining at least two different glass compositions of substantially different refractive indices to form an optical body substantially free of discontinuities and interfaces and having two substantially parallel surfaces, a first surface having a first composition substantially uniform thereacross and a second surface having a second composition substantially uniform thereacross, with a variation in composition from said first surface to said second surface and a concomitant change in index of refraction from said first surface to said second surface along an axis therebetween.

5,200,859
VISION SAVER FOR COMPUTER MONITOR
Leonard E. Payner, and Jimmy L. Keener, both of Elyria, Ohio, assignors to Ergonomic Eyecare Products, Inc., Elyria, Ohio
Continuation-in-part of Ser. No. 435,047, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 191,079, May 6, 1988, Pat. No. 4,880,300. This application Mar. 7, 1991, Ser. No. 665,754
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—857 22 Claims



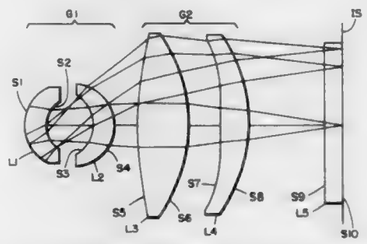
1. A vision saver for use with a computer monitor comprising first and second reflecting surfaces and support means for supporting said first and second reflecting surfaces in spaced relation in front of a computer monitor such that said first reflecting surface is relatively higher than said second reflecting surface and faces the screen of said monitor and the second reflecting surface, and said second reflecting surface faces said first reflecting surface and outwardly from the screen of said monitor whereby a person can visually observe the screen of the computer monitor by viewing the second reflecting surface, wherein said first reflecting surface is a concave reflecting surface to provide for magnification of an image on the screen of the computer monitor when viewing the second reflecting surface, and wherein the radius of curvature of the concave first reflecting surface is between 25 and 200 inches.

5,200,860
LENS POSITION CONTROL DEVICE
Masahide Hirasawa; Hirofumi Suda; Naoya Kaneda, and Hiroyuki Wada, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 707,942, May 28, 1991, abandoned, which is a continuation of Ser. No. 362,265, Jun. 6, 1989, abandoned. This application Jul. 16, 1992, Ser. No. 913,983
Claims priority, application Japan, Jun. 9, 1988, 63-142079
Int. Cl.[5] G02B *7/11;* G03B *3/00*
U.S. Cl. 359—696 26 Claims



8. A lens position control device comprising:
(a) a first lens group movable along an optical axis, for performing a function of varying an image magnification;
(b) a second lens group movable along the optical axis, for performing a function of compensation at the time of variation of the image magnification and a function of focusing;
(c) detecting means for detecting positions of said first lens group and said second lens group; and
(d) control means for controlling a moving speed and a moving direction of said second lens group on the basis of (1) position information of said first and said second lens groups obtained by said detecting means, and (2) predetermined positional information of said first and second lens group, said control means, when reversing the moving direction of said second lens group, stopping said second lens group for a predetermined time.

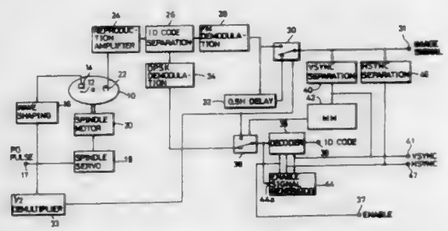
5,200,861
LENS SYSTEMS
Jacob Moskovich, Cincinnati, Ohio, assignor to U.S. Precision Lens Incorporated, Cincinnati, Ohio
Filed Sep. 27, 1991, Ser. No. 766,763
Int. Cl.[5] G02B *13/22, 13/18*
U.S. Cl. 359—662 47 Claims



1. A lens system which includes an aperture stop and which comprises:

(a) a first lens unit which comprises two meniscus element whose concave surfaces face each other and whose combined optical power is negative, the system's aperture stop being located between the two meniscus elements; and
(b) a second lens unit which has a positive power, said lens system including at least one aspheric lens surface.

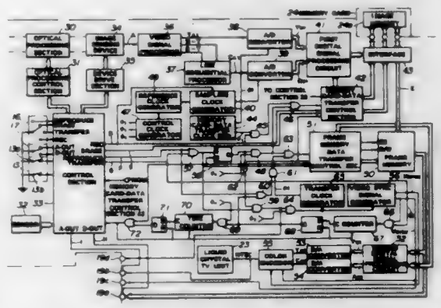
5,200,862
ELIMINATING SIGNAL QUALITY DETERIORATIONS IN A REPRODUCED STILL IMAGE
Kouichi Sato, Fujimi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 637,922, Jan. 7, 1991, abandoned, which is a continuation of Ser. No. 238,314, Aug. 31, 1988, abandoned. This application Sep. 16, 1991, Ser. No. 759,616
Claims priority, application Japan, Aug. 31, 1987, 62-217532
Int. Cl.[5] H04N *5/78*
U.S. Cl. 360—10.1 19 Claims



1. A still image reproducing device, comprising:
first means for reproducing recording information that is taken from a recording medium, in which a field image signal and said recording information regarding a still image are recorded in a multiplexed recording form;
second means for reproducing said field image signal that is taken from said recording medium;
means for producing an interpolation image signal by delaying said field image signal that is reproduced by said second reproducing means;
means for alternately switching between an output of said second reproducing means and an output of said interpolation image signal producing means; and
means for decoding said recording information that is reproduced by said first reproducing means so as to decode said recording information with a synchronous signal that is contained in said field image signal that is outputted by said second reproducing means, only when said second reproducing means is switched to output said field image signal.

5,200,863
IMAGE DATA RECORDING SYSTEM INCLUDING MEMORY CARD
Masaharu Orii, Oome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 503,113, Mar. 28, 1990, abandoned, which is a continuation of Ser. No. 185,491, Apr. 25, 1988, abandoned. This application Feb. 12, 1992, Ser. No. 835,105
Claims priority, application Japan, Apr. 30, 1987, 62-107651
Int. Cl.[5] H04N *5/78*
U.S. Cl. 360—35.1 47 Claims

1. A video data recording system, comprising:
housing means;
optical means arranged at least partly in said housing means for forming an optical image on a predetermined plane in said housing means;
image data processing means arranged in said housing means for receiving said optical image as a still image and for producing electronic image data representative of said still image;
buffer memory means coupled to said image data processing means for storing the electronic image data derived from said image data processing means;
detachable memory means detachably mounted to said housing means and electrically coupled to said buffer memory means when mounted to said housing means, for storing a limited number of independent electronic image data which are supplied from said buffer memory means;
output terminal means arranged on said housing means and coupled for outputting said electronic image data derived from said detachable memory means via said buffer memory means when said detachable memory means is mounted to said housing means;
write control means arranged in said housing means for controlling a writing operation of said electronic image data supplied from said buffer memory means into said detachable memory means when said detachable memory means is mounted to said housing means;
read-out control means arranged in said housing means for controlling a reading out operation of said electronic image data to said output terminal means via said buffer memory means when said detachable memory means is mounted to said housing means; said read-out control means including:
transfer means for repeatedly transferring to said output terminal means, said electronic image data representa-



tive of one of the still images stored in said detachable memory means via said buffer memory means, such that said electronic image data representative of said one still image is repeatedly transferred to said output terminal means a plurality of times over a given time period;
transfer time sensing means for sensing whether or not said given time period during which said electronic image data of said one still image is repeatedly transferred by said transfer means, corresponds to a predetermined time period; and
transfer control means for stopping the electronic image data transfer of said electronic image data of said one still image by said transfer means responsive to said given time period during which said transfer means repeatedly transfers said electronic image data of a same still image exceeding said predetermined time period; and
peripheral memory means outside of said housing means and detachably coupled to said output terminal means and capable of storing a large number of independent image data, for storing said repeatedly transferred electronic image data, corresponding to a plurality of a same still image, output from said output terminal means, said large number being substantially greater than said limited number;
said peripheral memory means including reproducing means for continuously and sequentially reproducing said same electronic image data of said same still image stored in said

a hub supported by a bearing assembly for rotation about a

a slider body having a surface with a leading edge, a trailing

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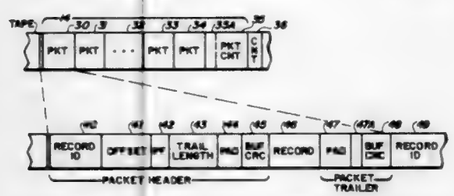
peripheral memory means, whereby each said same still image stored in said peripheral memory means is sequentially reproduced for such predetermined time period.

5,200,864

COMBINING SMALL RECORDS INTO A SINGLE RECORD BLOCK FOR RECORDING ON A RECORD MEDIA

Edwin C. Dunn; Scott M. Fry; Scott A. Jackson; Neil H. MacLean, Jr.; Richard P. Reynolds, and Richard A. Ripberger, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1989, Ser. No. 372,744
Int. Cl.[5] G06F *12/00*
U.S. Cl. 360—48 **19 Claims**



1. In a machine-effected method of operating a data recorder that records data as a plurality of separately identifiable data records in respective ones of a predetermined number of data blocks on a storage medium, said data recorder having control means for effecting control over the data recorder, data means coupled to the control means and a storage medium for reading and recording data from and to the storage medium and wherein said storage medium has a plurality of data block formats, each data block format for storing data in a series of data blocks on the storage medium, said data records being recordable in any of said plurality of data block formats:

including the machine-executed steps of:

said control means establishing a mode of operating in the recorder for each of the plurality of said data block formats including retaining each of said data records in respective ones of said data blocks as separately identified data records;

said control means establishing a mode of operation in the recorder indicating which one of the plurality of said data formats is to be next read from the storage medium is unknown;

said control means actuating said data means to record a plurality of said data blocks on said storage medium and to record one of said demarcation marks between two predetermined ones of said data blocks;

after said recording of said data blocks and said one demarcation mark, said control means actuating said data means to read data from one said storage medium having recorded data blocks separated by one said demarcation marks and including reading one of said demarcation marks and to supply said read one demarcation mark to said control means for setting the mode of operation to the format indicated by said supplied demarcation mark and then said control means actuating said data means to read data from said storage member in said indicated data format;

said control means establishing recordable format-indicating demarcation marks to be recorded on the storage medium for indicating demarcation between diverse ones of said plurality of data formats; and

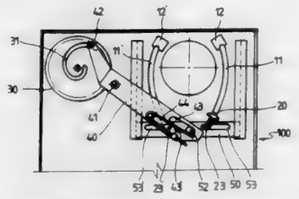
said control means before actuating said data means to record certain data records in a first one of said data block formats onto the storage medium, actuating said data means to record one of said demarcation marks to signify a first one of said data block formats, and actuating said data means to record said certain data records in a second one of said data block formats but not record any demarcation mark.

5,200,865

TAPE LOADING APPARATUS FOR A VIDEO TAPE RECORDER

Ki-chay Yoon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Dec. 31, 1990, Ser. No. 636,507
Claims priority, application Rep. of Korea, Dec. 29, 1989, 89-20528
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 **4 Claims**



1. A tape loading apparatus for a video recorder comprising:

a rotating head drum;

two movable pole bases respectively having tape guides for abutting a tape to an outer surface of said head drum, and being movable along respective sides of said head drum;

(a) means for transmitting power to load and unload the tape;

a lever for swiveling within a certain arcuate path by said power transmitting means;

a movable plate connected to a free end of said lever and for rectilinearly sliding along guiders from a tape inserting position to a side position of said head drum; and

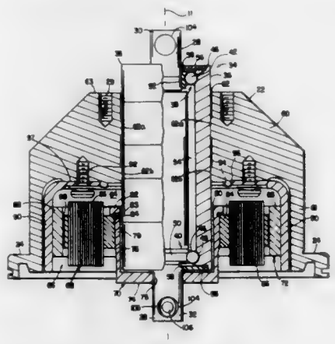
means for connecting said two pole bases, said lever and said movable plate to displace said two pole bases along corresponding paths and elastically maintaining same at displaced positions, said two pole bases, being driven by said lever and movable plate.

5,200,866

MOTORIZED SPINDLE FOR DISK DRIVE

Tave J. Frugé, Colorado Springs, and James C. Mao, Monument, both of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 9, 1991, Ser. No. 682,726
Int. Cl.[5] G11B *17/02*
U.S. Cl. 360—99.08 **31 Claims**



1. A disk drive spindle comprising

a hub supported by a bearing assembly for rotation about a stationary shaft, said bearing assembly including a pair of bearings axially spaced along said shaft,

a motor for rotating said hub about an axis of said shaft, and

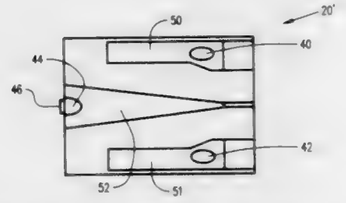
a mount attached to a portion of said shaft that is disposed axially outwardly of said pair of bearings, said mount having a region that is disposed radially outwardly of said bearing assembly and extends a substantial axial distance between said pair of bearings, at least a portion of said motor being secured to said region of said mount so that said motor is disposed substantially axially between said pair of bearings.

5,200,867

TRANSDUCER CARRIER FOR DISK FILE WITH LIQUID FILM HEAD-DISK INTERFACE

Thomas R. Albrecht, San Jose; John S. Foster, and Andrew M. Homola, both of Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1991, Ser. No. 724,696
Int. Cl.[5] G11B *5/60, 17/02*
U.S. Cl. 360—103 **9 Claims**



1. A transducer assembly for a data recording disk file of the type wherein a disk has a liquid film on its surface, the assembly comprising:

a carrier having an air-bearing surface near its front end for supporting the front end of the carrier above the liquid film when the disk is rotating at its operational speed and a ski foot near its rear end for skiing on the liquid film when the disk is rotating at its operational speed; and

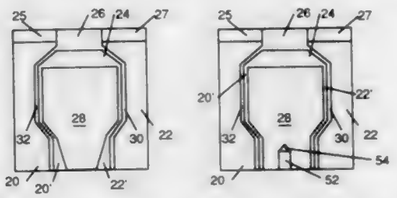
a transducer attached to the carrier for reading data from or writing data to the disk.

5,200,868

NEGATIVE PRESSURE AIR BEARING SLIDER HAVING AN AIR BEARING SURFACE TRAILING A NEGATIVE PRESSURE CAVITY

Robert E. Chapin, Burnsville, and Richard A. Strom, Eagan, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 528,925, May 25, 1990, Pat. No. 5,128,822. This application Apr. 8, 1992, Ser. No. 865,362
Int. Cl.[5] G11B *21/21*
U.S. Cl. 360—103 **15 Claims**



1. A negative pressure air-bearing slider for supporting a transducer proximate a rotating disk, the slider comprising:

a slider body having a surface with a leading edge, a trailing edge, and first and second side edges;

first and second raised side rails positioned along the first and second side edges, respectively;

a raised cross rail positioned near the leading edge and extending between the side rails;

a negative pressure cavity trailing the cross rail and positioned between the side rails, the negative pressure cavity developing negative pressure during flight which vents through the trailing edge; and

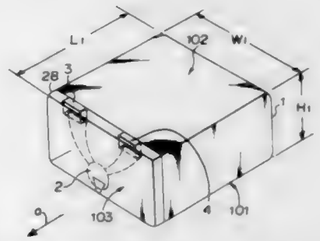
means positioned at the trailing edge and between and spaced from the side rails for providing an air-bearing surface which develops positive pressure to increase lift at the trailing edge at low disk speeds and which has a diminished effect at high disk speeds relative to an increased negative pressure effect of the negative pressure cavity.

5,200,869

FLYING TYPE THIN FILM MAGNETIC HEAD HAVING A TRANSDUCING ELEMENT

Mikio Matsuzaki, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 658,872
Claims priority, application Japan, Feb. 22, 1990, 2-43572
Int. Cl.[5] G11B *5/60*
U.S. Cl. 360—103 **4 Claims**



1. A thin film magnetic head comprising:

a slider having a first surface which faces a magnetic recording medium, a second surface opposite to said first surface and an end surface; and

a thin film magnetic transducing element attached to the end surface of the slider, said thin film magnetic transducing element being provided with a bonding pad electrically connected to a conductor coil, said bonding pad having a first surface which is adjacent to the end surface of the slider and a connecting surface which is co-planar with the second surface of the slider and extends from the second surface of the slider.

5,200,870

THIN-FILM MAGNETIC HEAD CONNECTION STRUCTURE

Eeltje A. Draaisma; Arie H. Van Heeren, and Franciscus A. Prouk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 686,330, Apr. 16, 1991, abandoned. This application Apr. 15, 1992, Ser. No. 870,726
Claims priority, application Netherlands, May 17, 1990, 9001146
Int. Cl.[5] G11B *5/147*
U.S. Cl. 360—126 **3 Claims**

1. A thin-film magnetic head, having a substrate and at least a multilayer magnetic head structure present on the substrate, said structure including a shielding layer and at least one connecting tab for connecting said magnetic head structure to a connecting track external to said magnetic head, the edges of said connecting tab being covered by covering portions of said

shielding layer, characterized in that the height from the sub-

5,200,872

means on detection of said loss of neutral fault, said tripping circuit means including;

front panel of said grille when said knob is connected to said slide shaft by said coupling means.

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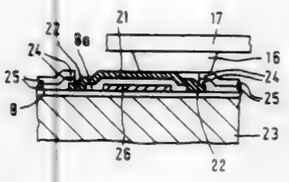
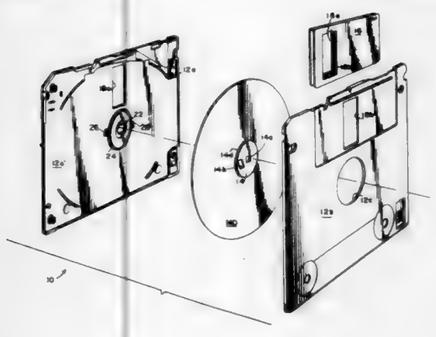
shielding layer, characterized in that the height from the substrate of a central portion of said connecting tab, uncovered by



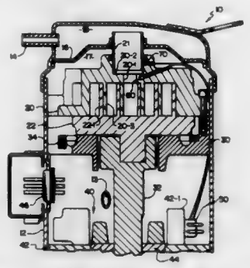
said covering portions, is at least as large as the height from the substrate of said covering portions.

5,200,871
FLEXIBLE MAGNETIC DISC CASSETTES WITH INTEGRALLY MOLDED DRAG FINGERS
Patrick M. Hughes, Clinton, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.
Filed Feb. 5, 1991, Ser. No. 650,595
Int. Cl.[5] G11B *23/033*
U.S. Cl. 360—133 **16 Claims**



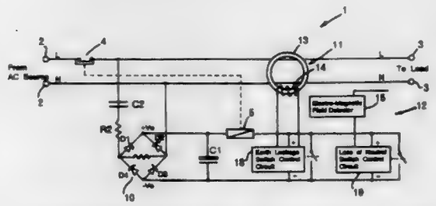
1. A flexible magnetic disc cassette comprising:
a cassette case having upper and lower cassette case halves joined to one another to define an interior space; and
a flexible planar magnetic disc having a central hub, said magnetic disc being positioned for rotational movement within said interior space between and parallel to said upper and lower cassette case halves, wherein
said upper cassette case half includes a centering ring which prevents lateral slippage of said magnetic disc within said cassette case, and wherein
at least one of said upper and lower cassette case halves include at least one integrally molded and outwardly extending drag finger positioned exteriorly of said centering ring, said at least one drag finger having a base end unitary with said one of said upper and lower cassette case halves, and a free terminal end, opposite to said base end, which imparts a frictional drag force against said central hub during said rotational movement of said magnetic disc.

5,200,872
INTERNAL PROTECTION CIRCUIT FOR ELECTRICALLY DRIVEN DEVICE
John R. D'Entremont, Foxboro, Mass.; Howard H. Fraser, Jr., Lafayette, and James C. Wilson, Cazenovia, both of N.Y., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 449,689, Dec. 8, 1989, abandoned. This application Feb. 7, 1992, Ser. No. 832,642
Int. Cl.[5] H02H *7/08;* **H02K** *11/00*
U.S. Cl. 361—25 **32 Claims**



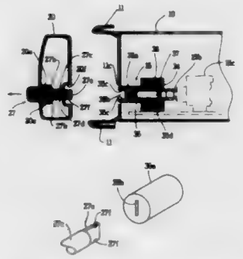
1. A protection circuit for providing additional internal protection to a device contained within a shell of said device, said device being driven by an electric motor having an internal line break to interrupt electric motor power to said motor responsive to a specific operating condition of said motor, said circuit comprising:
a sensor for detecting a predetermined condition of said device;
power means disposed within said shell for providing power to said circuit including an auxiliary winding within said motor and electromagnetically coupled thereto for supplying power relatively lower than said power to said motor; means for assisting in actuating said line break including a heater thermally coupled to said break for thermal actuation thereof to interrupt power to said motor; and power connection means for connecting said power means to the heater in response to said sensor detecting a certain predetermined condition.

5,200,873
CIRCUIT INTERRUPTER
Oliver Glennon, Ballinasloe, Ireland, assignor to Square D Company, Palatine, Ill.
Filed Dec. 5, 1990, Ser. No. 624,797
Int. Cl.[5] H02H *3/26, 3/28*
U.S. Cl. 361—45 **6 Claims**



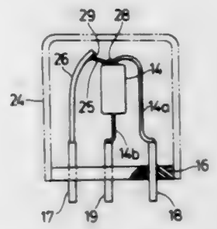
1. A circuit interrupter for use in an electrical power system having line and neutral leads connected between an energy source and a load, said circuit interrupter comprising:
circuit breaker means for opening said line lead on activation thereof;
fault detection circuit means for detection of a loss of neutral fault condition;
tripping circuit means for activation of said circuit breaker means on detection of said loss of neutral fault, said tripping circuit means including:
a D.C. power supply having an input connected to said line and neutral leads;
a closed loop circuit including a charge storage device, a solenoid coupled to said circuit breaker means, and a switch, said charge storage device being connected across the output of said D.C. power supply;
a switch control circuit, responsive to said fault detection circuit means, for driving said switch from a normally-open position to a closed position to allow discharge of said charge storage device through said solenoid for activation of said circuit breaker means; and
a ground fault detection circuit having associated therewith a second control circuit and a second switch, said second switch being connected in parallel with said closed loop circuit switch.

5,200,874
OPERATING DEVICE OF AN ELECTRONIC EQUIPMENT MOUNTED ON A MOTOR VEHICLE
Akio Ito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 26, 1991, Ser. No. 797,843
Claims priority, application Japan, May 7, 1991, 3-41245[U]
Int. Cl.[5] H02B *1/01*
U.S. Cl. 361—346 **3 Claims**



1. An operating device of an electronic equipment which is mounted on a motor vehicle, the electronic equipment having a) an equipment body secured to a vehicle body of the motor vehicle, and b) a grille detachably mounted on a front panel of the equipment body, said operating device comprising:
a knob having a shaft rotatably and axially slidably mounted on said grille;
a first spring mounted on said shaft for outwardly urging said knob;
an electronic device having an operating shaft having a front end and said electronic device provided inside said equipment body;
connecting means for connecting a rear end of said knob with said front end of said operating shaft, said connecting means including
a first cylindrical member connected to said operating shaft of said electronic device,
a second cylindrical member axially slidably engaged with said first cylindrical member,
a slide shaft slidably engaged with said first cylindrical member, and
a second spring for inwardly urging said slide shaft, a front end of said slide shaft being located slightly inside of an opening formed on said front panel of said equipment body by said second spring; and
coupling means for coupling a rear end of said shaft of said knob with said front end of the slide shaft when said knob is depressed,
wherein said first spring having a larger elastic force than said second spring so that said knob is projected from a front panel of said grille when said knob is connected to said slide shaft by said coupling means.

5,200,875
PROTECTION STRUCTURE FOR A SURGE ABSORBER
Naruo Yoshioka; Fujio Ikeda, and Takaaki Itoh, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Nov. 26, 1991, Ser. No. 798,531
Claims priority, application Japan, Nov. 27, 1990, 2-320899
Int. Cl.[5] H02H *9/04;* **H01H** *61/00*
U.S. Cl. 361—56 **18 Claims**



1. A protective structure for a surge absorber comprising:
means for connecting the surge absorber to an electronic device to protect the electronic device from transient surge voltages; and
means for protecting the surge absorber and an electronic device connected thereto from a continuous overvoltage comprising:
a first electroconductive spring member, the spring properties of which do not deteriorate from heat generated by repeated transient surge voltages therethrough, having means for connection to a communication line and being movable between a first spring-loaded position and a second non-spring loaded position;
a second electroconductive member connecting the first spring member to the surge absorber for maintaining the first member in the first position;
the spring member connecting the electronic device and the surge absorber to the communication line when in the first position and disconnecting when in the second position;
release means activated by heat generated from a continuous overvoltage connecting the second member to the surge absorber for releasing the second member and the first member from its first position.

5,200,876
ELECTROSTATIC BREAKDOWN PROTECTION CIRCUIT
Etsuya Takeda, Suita, and Yutaka Nanno, Amagasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 10, 1990, Ser. No. 507,118
Claims priority, application Japan, Apr. 10, 1989, 1-901115
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—91 **10 Claims**

1. An electrostatic breakdown protection circuit for preventing an internal circuit from positive and negative high voltages, comprising:
a hot line connected to said internal circuit for supplying a data signal;
a bypass line;
a first diode connected in a first direction between said hot line and said bypass line; and
a second diode connected in a second direction between said hot line and said bypass line and connected in parallel to said first diode;

a serial circuit which includes a resistor and a Zener diode,

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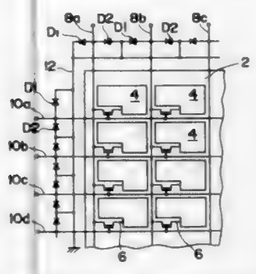
wherein each of said first and second diodes is formed by a first electrode and a second electrode which are separated from each other by an insulation layer provided between



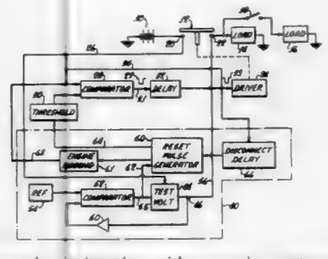
said first and second electrodes, said first and second electrodes being offset in a lateral direction by a predetermined distance.

5,200,877

BATTERY PROTECTION SYSTEM

Arnold L. Betton, Kings Beach, and Edgar A. Hirzel, Granada Hills, both of Calif., assignors to Baton Labs, Inc., Granada Hills, Calif.

Continuation-in-part of Ser. No. 504,238, Apr. 4, 1990, abandoned. This application Apr. 2, 1991, Ser. No. 679,535
Int. Cl.[5] H02H *3/24*
U.S. Cl. 361—92 **39 Claims**



1. For use in conjunction with an engine system having a battery, an ignition system, and a first at least one electrically powered load connected to the battery, a device adapted to electrically disconnect the battery from the first at least one load whenever the battery energy falls below a predetermined value and to automatically connect the battery to the first at least one load, said device comprising:

a normally closed main switch for connection between a battery and the first at least one electrically powered load;

means for sensing an electrical battery characteristic indicative of battery drain and for generating an output signal whenever the energy capacity of said battery falls below a predetermined value;

timing means responsive to said sensing means output signal for generating a timing output signal a delay interval after said sensing means output signal;

means responsive to said timing means output signal for opening said main switch;

circuit means including said first at least one electrically powered load for connection to a second at least one electrically powered load such that when said second load is connected to said first at least one electrically powered load the voltage across said circuit means decreases; and

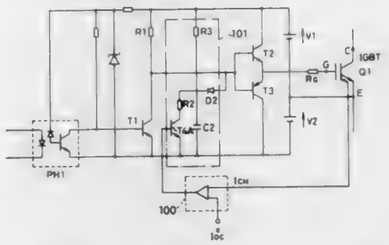
automatic reset means connected to said circuit means for closing said main switch when the voltage across said circuit means changes.

5,200,878

DRIVE CIRCUIT FOR CURRENT SENSE IGBT

Kiyoaki Sasagawa, and Hiroshi Miki, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 12, 1991, Ser. No. 729,436
Claims priority, application Japan, Jul. 19, 1990, 2-191057
Int. Cl.[5] H03K *17/08*
U.S. Cl. 361—93 **21 Claims**



1. A drive circuit for a current sense IGBT which has a main circuit through which a main current flows, a gate for controlling the main current flowing the main circuit, and a sense circuit which detects the main current and outputs a signal corresponding to the main current as a detected current, said drive circuit comprising:

means for discriminating an overcurrent of said main current on the basis of said detected current; and

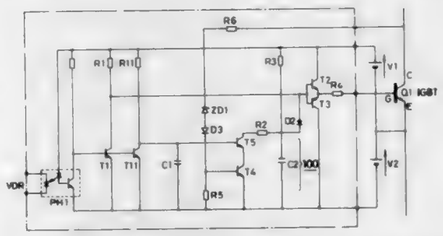
a variable voltage source means, connected between said means for discriminating and said gate of said IGBT, for gradually reducing a voltage applied to said gate of the IGBT while said means for discriminating detects the overcurrent.

5,200,879

DRIVE CIRCUIT FOR VOLTAGE DRIVEN TYPE SEMICONDUCTOR DEVICE

Kiyoaki Sasagawa, and Hiroshi Miki, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 12, 1991, Ser. No. 729,480
Claims priority, application Japan, Jul. 19, 1990, 2-191058
Int. Cl.[5] H03K *17/56*
U.S. Cl. 361—93 **21 Claims**



1. A drive circuit for a voltage driven type semiconductor device which has a control terminal, a first main terminal, and a second main terminal, comprising:

a photocoupler which is turned on and off by a drive signal fed from an external control circuit;

a pair of output transistors whose bases are connected to each other, and are operatively connected to an output of said photocoupler, said control terminal and said first main terminal of said semiconductor device being supplied with control signals from outputs of said output transistors, and said first main terminal and said second main terminal of said semiconductor device being made conductive or nonconductive by said control signals;

a serial circuit which includes a resistor and a Zener diode, a first terminal of said serial circuit being connected to said second main terminal of said semiconductor device so that said serial circuit conducts when a voltage across said first and second main terminals of said semiconductor device exceeds a predetermined voltage;

first detecting means for detecting, after a predetermined time has elapsed since an output of said photocoupler is produced to turn on said semiconductor device, the presence of the output of said photocoupler;

second detecting means, serially connected with said first detecting means, for detecting a current flowing through said serial circuit so as to detect an overcurrent through said semiconductor device;

a diode; and

a variable voltage source, having a terminal which is connected to the bases of said output transistors via said diode, for gradually reducing a voltage of said variable voltage source itself while said first and second detecting means simultaneously detect the presence of the output of said photocoupler and the overcurrent through said semiconductor device, and for inducing said semiconductor device to an off state with the decline of said voltage,

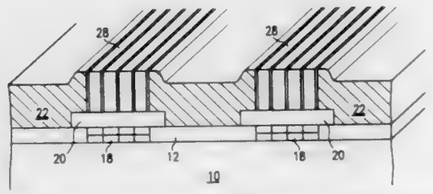
wherein a detecting level of said second detecting means can be set independently of the predetermined time associated with said first detecting means.

5,200,880

METHOD FOR FORMING INTERCONNECT FOR INTEGRATED CIRCUITS

Kuei-Wu Huang, Irving, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 17, 1991, Ser. No. 808,600
Int. Cl.[5] H01G *4/06;* **H01L** *21/285*
U.S. Cl. 361—311 **39 Claims**



30. An interconnect structure in an integrated circuit, comprising:

a first conductive layer overlying a first insulating layer, wherein said first conductive layer defines a pattern for interconnect;

a second insulating layer overlying the integrated circuit;

an interconnect mold in the second insulating layer according to the pattern for interconnect, wherein said interconnect mold is coincident with the first conductive layer and exposes a portion of the first conductive layer; and

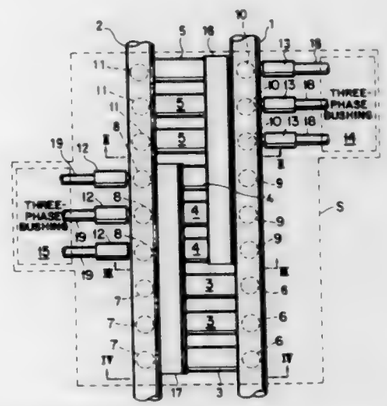
a second conductive layer filling in said interconnect mold such that the second conductive layer is aligned with and lies on top of the first conductive layer, wherein the first and second conductive layers form a single interconnect layer.

5,200,881

GAS INSULATED SWITCHGEAR

Kousaku Itai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1991, Ser. No. 736,715
Claims priority, application Japan, Jul. 27, 1990, 2-198035; Aug. 29, 1990, 2-225199
Int. Cl.[5] H02B *5/00, 13/035;* **H01H** *33/00*
U.S. Cl. 361—333 **13 Claims**



1. Gas insulated switchgear comprising:

a pair of main buses aligned substantially parallel to one another in a first direction to define a first plane and defining a space therebetween;

a plurality of sets of circuit breakers, each set made up of a plurality of parallel circuit breakers, said sets being aligned substantially parallel to one another in a second direction substantially orthogonal to said first direction in a second plane under said first plane, said positioned to be beneath said space;

a plurality of sets of first disconnecting switches, each of said disconnecting switches being mounted at a respective end of an associated one of said circuit breakers, for switchably connecting said plural sets of circuit breakers to one another in series, the series connection of said circuit breakers being connected across said main buses, at least one of said plurality of sets of first disconnecting switches being arranged to physically support one of said main buses and at least one other of said plurality of sets of first disconnecting switches being arranged to physically support the other of said main buses;

a plurality of connection buses for connecting adjacent pairs of said plurality of sets of circuit breakers through adjacent pairs of said plurality of sets of first disconnecting switches, each of said connection buses being disposed substantially parallel to said main buses above said circuit breakers, and each of said connection buses being supported by the adjacent pairs of said plurality of sets of first disconnecting switches;

a plurality of sets of second disconnecting switches, each of said sets of second disconnecting switches being supported by an adjacent one of said plurality of sets of first disconnecting switches and each of said second disconnecting switches being electrically connected to an electrical junction of adjacent pairs of said first disconnecting switches; and

a plurality of sets of branch buses, each of said branch buses being respectively connected to an associated one of said second disconnecting switches, and each of said branch buses being connected to an outside-connection bushing.

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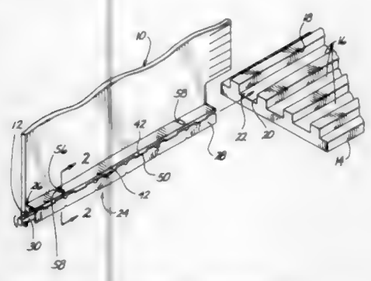
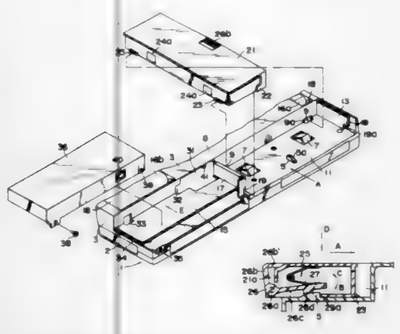
5,200,882
CIRCUIT BOARD RETAINER
Michael L. Blomquist, Newbury Park, Calif., assignor to International Electronic Research Corporation, Burbank, Calif.
Filed Jan. 17, 1992, Ser. No. 822,417
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—386 7 Claims



1. A board retainer assembly comprising:
a cold plate, a groove in said plate, said groove defined by generally parallel opposed first and second walls receive an edge of a board and a board retainer, said retainer expanding and releasably clamping said edge in said groove, said retainer including an elongated body received in said groove, said elongated body including an elongated face extending generally parallel to and spaced a predetermined distance from said first wall, a camming surface on said elongated body, a rotatable camming element in camming relationship with said camming surface, a resilient element mounted to said elongated body in operative association with said rotatable camming element for engaging said second wall and biasing said elongated face toward said first wall when actuated by said camming element.

5,200,883
PORTABLE COMPUTER HAVING AN EXTERNAL BATTERY MOUNTING PORTION AND OPTIONAL DEVICE MOUNTING PORTION
Takaichi Kobayashi, Itsukaichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 542,041, Jun. 22, 1990, abandoned. This application Jun. 16, 1992, Ser. No. 899,135
Claims priority, application Japan, Jun. 23, 1989, 1-162216; Jun. 23, 1989, 1-162219; Jun. 23, 1989, 1-162221
Int. Cl.[5] H05K 7/12; E05C 3/14; G06F 1/16
U.S. Cl. 361—395 15 Claims

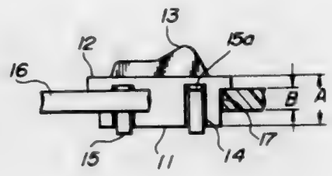


1. A portable computer comprising:
a housing substantially in the form of a rectangular prism, having a top face, a peripheral surface continuous with the top face, and a receiving recess opening to the top face and the peripheral surface;
an optional component having substantially the same shape as the receiving recess and removably fitted in the receiving recess, the optional component having an outer surface constituting par of the top face of the housing and part of the peripheral surface of the housing when the optional component is fitted in the receiving recess; and
means for retaining the optional component in the receiving recess, said retaining means including first engaging means provided in the receiving recess of the housing, second engaging means, provided in the optional component, for engaging the first engaging means when the optional component is fitted in the receiving recess and for disengaging from the first engaging means when the optional component is moved in a direction substantially parallel to the top face of the housing, and lock means for locking the optional component in the receiving recess so that the first engaging means and the second engaging means are in engagement with each other, the lock means having a detent projection projecting vertically in the receiving recess from a bottom of the receiving recess, and the optional component comprising a retaining member, provided at a bottom of the optional component, for engaging the detent projection when the optional component is fitted in the receiving recess;
the optional component including an opening for receiving the detent projection when the optional component is fitted in the receiving recess, and a stopper portion, defining part of the opening, for abutting against the detent projection to substantially stop movement of the optional component when the second engaging means is disengaged from the first engaging means while the optional component is moved in the direction substantially parallel to the top face of the housing.
6. A portable computer comprising:
a housing substantially in the form of a rectangular prism including a front portion having a keyboard, a rear portion having a rear top surface and a rear side surface continuous with the rear top surface, and a display connecting portion located between the front portion and the rear portion, the rear portion having a first receiving recess for receiving an optional device other than a second battery pack, the first receiving recess and the second receiving recess being open to the rear top surface and the rear side surface, the battery pack having a first upper surface and a first rear surface which are substantially flush with the rear top surface and the rear side surface of the housing, respectively, when the battery pack is fitted in the first receiving recess;
a display unit connected to the display connecting portion and rotatable between a closed position for covering the keyboard and an open position for operating the keyboard; and
a cover removably attached to the rear portion for covering the second receiving recess, the cover having a second upper surface and a second rear surface which are substantially flush with the rear top surface and the rear side surface of the housing, respectively.

5,200,884
ELECTRICAL CONTROL DEVICE
Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 22, 1989, Ser. No. 440,366
Claims priority, application Japan, Feb. 15, 1989, 1-35811
Int. Cl.[5] H05K 1/18
U.S. Cl. 361—401 7 Claims

1. An electrical apparatus comprising:
a body member having flanges which extend from opposing sides and adjacent a first end thereof;
a plurality of recesses formed on opposing lateral sides of said body member;

a plurality of resilient terminals provided at a second end surface of said body member and extending along said lateral sides in a one to one correspondence guided within said plurality of recesses;
a printed wiring board including a through-hole and a plurality of electrical conducting means formed on the surface of said printed wiring board and extending to an inner wall of said through-hole;

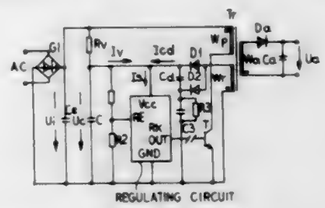


said body member being suspended by said flanges contacting the surface of said printed circuit board so that said body member is disposed within said through-hole, whereby distal ends of each of said plurality of resilient terminals resiliently engage only the electrical conducting means formed on the inner wall of said through-hole and terminate below the surface of said printed circuit board.

5,200,885
DOUBLE BURN-IN BOARD ASSEMBLY
Harold E. Hamilton, Minneapolis, and Charles M. Hicks, Circle Pines, both of Minn., assignors to Micro Control Company, Minneapolis, Minn.
Filed Apr. 26, 1990, Ser. No. 513,997
Int. Cl.[5] H01R 23/72, 9/09
U.S. Cl. 361—413 8 Claims

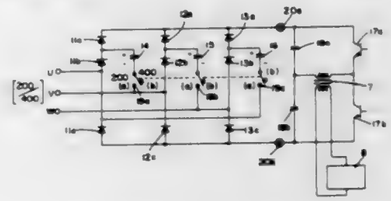
1. A burn-in board assembly comprising a pair of mother boards placed back to back, each of said mother boards having a plurality of burn-in sockets for mounting components to be burned in, separate conductors and connectors on each mother board for providing connection from the burn-in sockets to external driver/receiver components, and means for connecting individual conductors on each of the mother boards to the corresponding conductors on the other mother board in parallel such that one set of driver/receiver components provides signals to both mother boards, and spacer means along top and bottom edges of said mother boards for holding said mother boards in a spaced relationship at such edges, said connectors being along one edge of such boards extending between the top and bottom edges, and electrically conductive spacer means connecting selected conductors on each of the mother boards to the other mother board for carrying electrical signals between the mother boards.

5,200,886
START-UP FOR A SWITCHED-MODE POWER SUPPLY
Karl Schwarz, Krumbach/Attenhausen; Horst Bartussek, Augsburg, and Helmut Rettenmaier, Grossaitingen, all of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Fed. Rep. of Germany
PCT No. PCT/DE90/00697, § 371 Date Mar. 10, 1992, § 102(e) Date Mar. 10, 1992, PCT Pub. No. WO91/04605, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 11, 1990, Ser. No. 838,452
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1989, 3930432
Int. Cl.[5] H02M 7/517
U.S. Cl. 363—49 2 Claims



1. A switched-mode power supply comprising: a serial RC section as running-up circuit and an auxiliary winding supplying a supply and regulating voltage for a regulating circuit, one connecting side of the auxiliary winding connected via at least one first forward-polarized diode circuit to a supply input of the regulating circuit and via a voltage divider circuit to a regulating input of the regulating circuit and the one connecting side of the auxiliary winding connected via at least one second forward-polarized diode circuit and a subsequent parallel RC section having a low-resistance resistor component to a primary-side collective connection; and a differentiating capacitor, one terminal side of the differentiating capacitor connected to a cathode terminal of the at least one first diode circuit which is connected to the supply input of the regulating circuit and the other terminal side of the differentiating capacitor connected to a cathode terminal of the at least one second diode circuit, the cathode terminal of the at least one second diode circuit being connected to the parallel RC section.

5,200,887
POWER SUPPLY UNIT FOR ARC PROCESSING
Hirokazu Ioroi, Settu; Narumi Fukumoto, Osaka; Yoshihiro Fukuju; Masahi Horii, both of Takatsuki, and Kikuo Terayama, Kawabe, all of Japan, assignors to Daiben Corporation, Japan
Filed Oct. 29, 1991, Ser. No. 784,564
Claims priority, application Japan, Jun. 28, 1991, 3-185628
Int. Cl.[5] H02M 7/04
U.S. Cl. 363—143 5 Claims



5. A power supply unit for arc processing for a commercial AC power supply, in which either of high or low voltages inputs of approximately 1:2 ratio is selectively supplied as an input, the AC input is, after being rectified into DC power, inversely converted into a high frequency AC power by an

5,200,890
meric keyboard and a playing card reader, the method com-

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inverter circuit employing switching elements, and then converted into a power suitable for arc processing comprising:

three rectifying circuits connected in parallel, and each rectifying circuit comprising three diodes connected in series by connection points between the three series connected diodes;

the AC power supply having input terminals and each input terminal of the commercial power supply being connected to a first one of the series connection points of the three diodes forming a corresponding rectifying circuit;

two capacitors connected by a connecting point and arranged in series between two output terminals of the three rectifying circuits;

three input voltage change-over circuits, each of which comprises a capacitor and a voltage change-over switch connected in series between a second one of the series connection points of the three diodes forming the corresponding rectifying circuit and the first series connection point of one of other rectifying circuits, each voltage change-over switch being closed at the low voltage input and opened at the high voltage input;

a single phase input voltage change-over circuit arranged to connect a connection point of the two series capacitors to one of the input terminals and to cut off one of the remaining input terminals at a single phase low voltage input, and to cut off the connection with said capacitors at a single phase high voltage input; and

an inverter circuit for said inverse conversion connected in parallel to the two series capacitors.

5,200,888

METHOD FOR AUTOMATICALLY DESIGNING A PROGRAM STRUCTURE

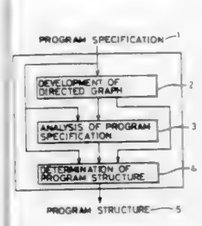
Masaaki Hashimoto, Kyoto, Japan, assignor to ATR Communication Systems Research Laboratories, Kyoto, Japan

Filed Jun. 12, 1990, Ser. No. 536,919

Claims priority, application Japan, Jun. 14, 1989, 1-151949; May 28, 1990, 2-138712

Int. Cl.[5] G06F *15/20*; G06G *7/48*

U.S. Cl. 364—400 **4 Claims**



1. A method for automatically designing a structure of a program represented by a procedural programming language from a program specification described by a nonprocedural program specification description language, having: descriptive elements having characteristics of sets, and descriptive elements having characteristics of mappings for mapping set elements in said sets; and

descriptive elements for defining a necessary calculation method for obtaining values of the set elements mapped by said mappings;

said method comprising:

a first step of detecting a portion where flows of execution timing of said calculation with respect to the respective set elements synchronize and a portion where flows of execution timing of said calculation do not synchronize, by analyzing said program specification; and

a second step of defining a data structure and a procedure structure as the program structure by handling said portion where the flows of execution timing synchronize and said portion where the flows of execution timing do not synchronize by different methods.

5,200,889

SYSTEM FOR MAINTAINING CONTINUOUS TOTAL OF REFUND AMOUNTS DUE A CUSTOMER AND FOR ALLOWING CUSTOMER DESIGNATION OF THE AMOUNT OF REFUND TO BE APPLIED TO A PURCHASE

Kunio Mori, Tokyo, Japan, assignor to Terasoka Seiko Co., Ltd., Tokyo, Japan

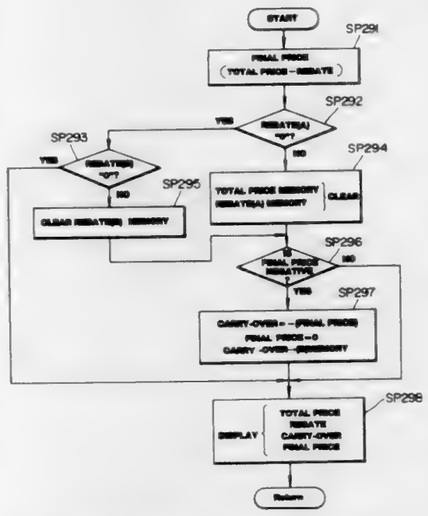
Continuation of Ser. No. 426,273, Oct. 25, 1989, abandoned. This application Aug. 26, 1991, Ser. No. 751,627

Claims priority, application Japan, Oct. 31, 1988, 63-275724

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—401 **11 Claims**



1. A sales-data-processing apparatus comprising:

computing means for computing a potential discount for each customer on the basis of the total price of articles which are purchased by the customer and are eligible for discount;

storing means for storing said potential discount or said total price from which said potential discount is calculated for each customer;

input means including primary input means for entering customer-identification data for identifying each customer, and secondary input means for entering the discount desired by the customer at the time of calculation;

subtraction means for subtracting said desired discount from the total price of the current purchase so as to obtain the final price of the current purchase;

display means including primary display means for displaying said potential customer discount according to said customer-identification data entered from said primary input means, and secondary display means for displaying said final price; and

updating means for updating said storing means on the basis of said desired discount and said total price of the articles eligible for discount of the current purchase, wherein a remaining discount is obtained by subtracting said desired discount from said potential customer discount in order to obtain a new potential customer discount which is stored in said storing means for use by said customer at the time of a next purchase.

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COMPUTERIZED BRIDGE GAME INCLUDING STORAGE OF DEALS USED FOR CONSTRUCTING PLAYERS

Philippe Pionchon, Paris, France, assignor to Syllogy S.A., Paris, France

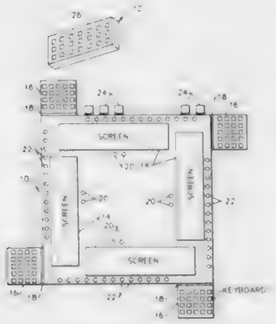
PCT No. PCT/FR88/00553, § 371 Date Jul. 6, 1989, § 102(e) Date Jul. 6, 1989, PCT Pub. No. WO89/04523, PCT Pub. Date May 18, 1989

PCT Filed Nov. 9, 1988, Ser. No. 381,736

Claims priority, application France, Nov. 10, 1987, 87 15589

Int. Cl.[5] A63F *1/00*

U.S. Cl. 364—410 **19 Claims**



1. Bridge game apparatus having a first computer system comprising a microprocessor, memories, and input and output units including at least one alphanumeric keyboard, a display screen, and a playing card reader, wherein the microprocessor of said first computer system comprises:

means for controlling said input and output units in response to being connected to at least one of the following two elements:

a prerecorded pre-dealt deal module comprising a memory in which the deals are recorded, means for connecting to the microprocessor of said first computer system, means for selecting one of the deals recorded in the memory, means for reconstructing the deal by attributing cards to player positions, means for inputting bids made by the players, means for comparing bids entered by said inputting means with bids recorded in the memory, and means for displaying the optimum final contract together with prerecorded comments; and

an intelligent play module removably connected to the microprocessor of said first computer system for analyzing the essential stages of the game including bidding, opening, and card play on an arbitrary deal when taking the place of at least one player, said analysis being performed by means of a second computer system comprising microprocessors and memories containing knowledge bases with the rules of the game for bidding, for opening, and for card play, data bases containing all of the information accessible to the replaced player, and inference engines for applying the rules of the knowledge bases to the information in the data bases, for recording significant results, and for updating the data bases, in order to determine each action of the player replaced by the second computer system; and

means for causing said first computer system to operate as an instructional apparatus when connected to the prerecorded pre-dealt deal module and for causing said first computer system to operate as a high level play apparatus when said first computer system is connected to the intelligent play module of said second computer system.

8. A method of playing bridge by means of a computer system comprising a microprocessor, memories, and input and output units having at least one display screen, an alphanumeric keyboard and a playing card reader, the method comprising the steps of:

controlling said input and output units by means of the microprocessor; and

analyzing the essential stages of the game including bidding, opening, and card play on an arbitrary deal when taking the place of at least one player, said analysis being performed by means of a second computer system comprising microprocessors and memories containing knowledge bases with the rules of the game for bidding, for opening, and for card play, data bases containing all of the information accessible to the replaced player, and inference engines for applying the rules of the knowledge basis to the information in the data bases, for recording significant results, and for updating the data bases, in order to determine each action of the player replaced by the second computer system.

9. The method of playing bridge according to claim 8, said method further comprising the steps of using the microprocessor to control the various input and output units in order to:

record the number of players present and their places;

select a deal in a memory containing a determined number of recorded deals;

reconstruct the selected deal by reading the playing cards and displaying the place of the player to receive each card as read; and

input each bid from each player present, compare that bid with a corresponding bid prerecorded in the memory, correct it if necessary, display the final contract, together with the prerecorded comments, and keep a score.

5,200,891

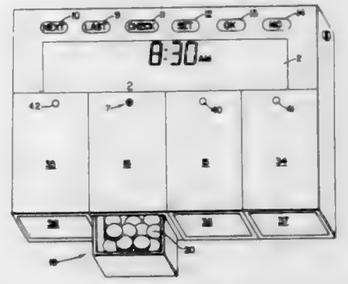
ELECTRONIC MEDICATION DISPENSING METHOD

Bruce A. Kehr, 9429 Holbrook La., Potomac, Md. 20854; David Lerner, New York, N.Y.; Richard D. Demenus, New York, N.Y., and Michael J. Edl, New York, N.Y., assignors to Bruce A. Kehr

Filed Jan. 17, 1990, Ser. No. 464,877

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.01 **19 Claims**



1. A device for monitoring the medication of an individual patient, comprising:

a casing,

a display means for displaying messages,

a plurality of accessible medication compartments in said casing,

control means for storing a schedule of medication alert signals, for providing timing signals and for controlling said display means,

means responsive to said control means for producing medication alert signals, and

a plurality of user actuatable input means carried by said casing and connected to said control means for programming said control means,

said display means having a substantially continuous display area extending closely adjacent to each of said compartments,

wherein said control means includes means for displaying representing nuance of the text, a computer aided text genera-

wherein each cycle of said periodic signal corresponds to

5,200,896

METHOD FOR ESTIMATING LONGITUDINAL

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wherein said control means includes means for displaying information on said display means at a location adjacent to one or more compartments.

5,200,892

INTELLIGENT ELECTRONIC WORD PROCESSOR WITH PLURAL PRINT WHEELS AND TABLES USED TO IDENTIFY DISPLAYED CHARACTERS SUPPORTED BY DESIGNATED PRINT WHEELS

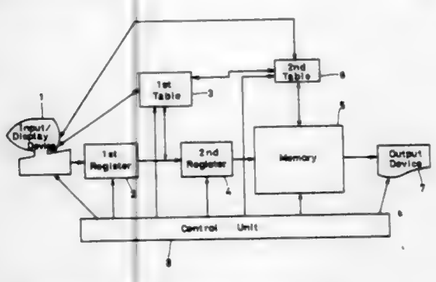
Keizo Saito, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 171,175, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 691,775, Jan. 16, 1985, abandoned. This application Apr. 22, 1991, Ser. No. 688,700

Claims priority, application Japan, Jan. 17, 1984, 59-6921; Jan. 30, 1984, 59-12976[U]; Mar. 8, 1984, 59-46318; Mar. 28, 1984, 59-64141

Int. Cl.[5] G06F *15/403*

U.S. Cl. 364—419 **2 Claims**



1. A word processor system comprising:

memory means for storing print data;

a plurality of different types of print wheel wheel means for printing out the print data;

designation means for designating one type of print wheel means among the plurality of types of print wheel means for printing out the print data;

table means for storing a plurality of character information tables each of which includes information regarding characters supported by a different one of the plurality of types of the print wheel means;

control means coupling to said table means for identifying characters supported by the type of print wheel means designated by said designation means by referring to the character information table corresponding to the type of print wheel means designated; and

display means coupling to said table means and said control means for displaying all characters supported by the system and for indicating the characters supported by the type of print wheel means designated.

5,200,893

COMPUTER AIDED TEXT GENERATION METHOD AND SYSTEM

Kuniaki Ozawa, Kawasaki; Hiroshi Kinukawa, Machida, and Kazuaki Maeda, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Microcomputer Engineering Ltd., Kodaira, both of Japan

Filed Feb. 26, 1990, Ser. No. 484,888

Claims priority, application Japan, Feb. 27, 1989, 1-043016

Int. Cl.[5] G06F *15/38, 15/00*

U.S. Cl. 364—419 **53 Claims**

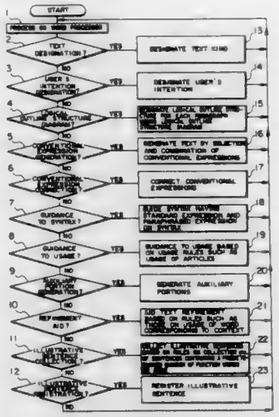
1. A computer system which includes a central processing unit, a memory, an input device and an output device, said memory storing a file of commonly used expressions and a rule for use in determining a logical outline structure of a text from first data representing classification of the text and second data representing nuance of the text, a computer aided text generation method comprising:

(a) a first step of inputting the first data of the text by said input device;

(b) a second step of inputting the second data of the text by said input device;

(c) a third step of obtaining a logical outline structure of the text corresponding to said input first and second data by referring to said rule stored in said memory;

(d) a fourth step of graphically outputting said logical outline structure obtained by said third step to said output device;



(e) a fifth step of inputting third data designating at least a scene and a topic contained in said output logical outline structure from said input device in correspondence to the output logical outline structure; and

(f) a sixth step of selecting a commonly used expression corresponding to said second data representing nuance of the text from said file of commonly used expressions in response to said inputted third data designating at least a scene and a topic contained in said output logical outline structure.

5,200,894

METHOD FOR PROCESSING ECHO SOUNDING DATA COLLECTED FROM BOREHOLES IN THE EARTH

James N. McCoy, Wichita Falls; Augusto L. Podio, Austin, and Kenneth L. Huddleston, Wichita Falls, all of Tex., assignors to James N. McCoy, Wichita Falls, Tex.

Filed Jul. 16, 1990, Ser. No. 552,529

Int. Cl.[5] G01V *1/00*

U.S. Cl. 364—422 **61 Claims**

1. A method for processing data for use in counting tubing joints in a tubing string positioned in a borehole in the earth, each of the tubing joints having a collar, the method comprising the steps of:

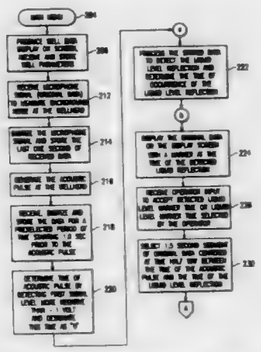
generating sonic energy which is transmitted down said borehole wherein reflections of said sonic energy are produced when said sonic energy strikes the collars of said tubing joints,

receiving said reflections as a return signal,

digitizing said return signal to produce a set of digital samples,

storing said digital samples,

filtering said digital samples to produce a periodic signal wherein each cycle of said periodic signal corresponds to one of said collar reflections in said return signal, and



counting said cycles of said periodic signal for measuring depth in said borehole.

5,200,895

AUTOMOTIVE SUSPENSION SYSTEM WITH ENHANCED RESPONSE CHARACTERISTICS

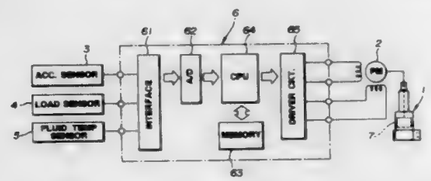
Junichi Emura; Fumiyuki Yamaoka; Shinobu Kakizaki; Mitsuo Sasaki, and Hiroyuki Shimizu, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Japan

Filed Dec. 12, 1990, Ser. No. 626,062

Claims priority, application Japan, Dec. 13, 1989, 1-324826; Dec. 16, 1989, 1-326525; Dec. 16, 1989, 1-326526

Int. Cl.[5] B60G *17/015*

U.S. Cl. 364—424.05 **12 Claims**



1. A system for controlling damping characteristics for a vehicle comprising:

a multi-stage variable damping force shock absorber which is variable of damping characteristics in a plurality of damping modes different from each other;

sensor means for monitoring a vehicular driving parameter representing a damping force control parameter;

a plurality of data maps stored in a memory unit which are assigned to the damping modes respectively, each data map representing preselected different relations of the damping mode relative to a value of the damping force control parameter; and

control means responsive to the damping force control parameter monitored by said sensor means for selecting one of the damping modes based on a value of the damping force control parameter according to a preselected one of the data maps stored in a first memory location of the memory unit for modifying the damping characteristics of said multi-stage variable damping shock absorber, said control means arranging the data map in the first memory location which is assigned to the damping mode selected every damping mode selecting operation of said control means.

5,200,896

METHOD FOR ESTIMATING LONGITUDINAL ACCELERATION OR DECELERATION OF A VEHICLE BODY

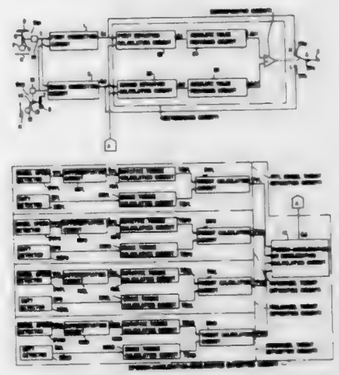
Makoto Sato, and Hiromi Izagaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,112

Claims priority, application Japan, Sep. 7, 1989, 1-232325

Int. Cl.[5] G01P *15/00*

U.S. Cl. 364—426.01 **5 Claims**



1. A method for estimating a longitudinal acceleration or deceleration of a vehicle body, comprising the steps of:

providing a longitudinal acceleration-deceleration detector which is mounted on the vehicle body to detect an acceleration or deceleration of the vehicle body in a longitudinal direction;

detecting a longitudinal detected value using said longitudinal acceleration-deceleration detector;

providing a vertical acceleration-deceleration detector which is mounted on the vehicle body to detect an acceleration or deceleration of the vehicle body in a vertical direction;

detecting a vertical detected value using said vertical acceleration-deceleration detector;

providing first and second correcting circuit means each receiving said longitudinal detected value and said vertical detected value, for respectively producing signals representing first and second corrected acceleration values, wherein said first corrected acceleration value represents a corrected longitudinal detected value when the vehicle body is on an upward sloped gradient, and wherein said second corrected acceleration value represents a corrected longitudinal detected value when the vehicle body is on a downward sloped gradient;

using said first and second correcting circuits for respectively determining said first and second corrected acceleration values based on said longitudinal and vertical detected values for both an upward sloped gradient and a downward sloped gradient; and

providing at least one wheel speed sensor for sensing a speed of a wheel;

using said at least one wheel speed sensor to produce an output signal representing wheel speed of said sensed wheel;

providing at least one signal representing brake duty;

providing a pseudo-acceleration determining means for determining a pseudo-acceleration of the vehicle body from said at least one wheel sensor and from said at least one signal representing brake duty;

using said pseudo-acceleration determining means to determine said pseudo-acceleration of the vehicle body from

components, at least one cylinder and a crankshaft, the method

col according to the arbitrary driver decision from among

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the output of said at least one wheel sensor and from said at least one signal representing brake duty;

providing a switch for selectively causing an output terminal to receive only one of said first and second corrected acceleration values;

providing comparator means comparing said pseuo-acceleration with each of said first and second corrected acceleration values, for producing an output signal actuating said switch;

using said switch for selectively causing the output terminal to receive one of said first and second corrected acceleration values based on the output of said comparator means, such that whichever of said first and second corrected acceleration values is closest to said pseudo-acceleration is connected to said output terminal.

5,200,897

VEHICLE CONTROL SYSTEM

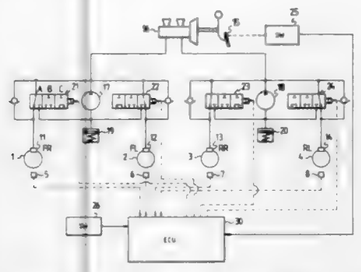
Nobuhiko Makino, Anjo; Teruyoshi Wakao, Nagoya; Shinichi Yamada, Kariya, and Susumu Masutomi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 25, 1990, Ser. No. 528,890

Claims priority, application Japan, May 26, 1989, 1-134128

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 **7 Claims**



4. A vehicle control system comprising:

a rotational speed sensing means for sensing rotational speeds of at least three vehicle wheels including a right-hand vehicle wheel and a left-hand vehicle wheel;

a speed calculating means for calculating speeds of the vehicle wheels one the basis of the rotational speeds from the rotational speed sensing means;

a judging means for judging whether a tire used in the right-hand vehicle wheel and a tire used in the left-hand vehicle wheel are different in size on the basis of the calculated speeds of the vehicle wheels;

a selecting means for, in cases where the judging means judges that said tires having different sizes are being used, selecting one of said right-hand vehicle wheel and left-hand vehicle wheel which uses a smaller tire;

a corrective coefficient calculating means for calculating a corrective coefficient on the bais of the calculating speeds of the vehicle wheel except for the calculated speed of the selected vehicle wheel which uses said smaller tire, wherein one of a front vehicle wheel and rear vehicle wheel is defined as a reference and the corrective coefficient corrects a deviation of the speed of the other front vehicle wheel and the other rear vehicle wheel with respect to said reference vehicle wheel;

speed correcting means for correcting the speed of the other of the front vehicle wheel and the rear vehicle wheel by use of the corrective coefficient calculated by the corrective-coefficient-calculating means to remove a difference between the speeds of the front vehicle wheel and the rear vehicle wheel;

an excluding means for excluding the speed of the vehicle wheel selected by the selecting means, and for calculating an estimated speed of a vehicle on the basis of the speed of said reference vehicle wheel and speeds of said corrected vehicle wheels.

5,200,898

METHOD OF CONTROLLING MOTOR VEHICLE

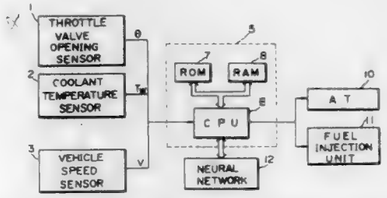
Hiromitsu Yuhara, and Ryujin Watanabe, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 614,194

Claims priority, application Japan, Nov. 15, 1989, 1-296591

Int. Cl.[5] F02D *41/04*

U.S. Cl. 364—431.05 **10 Claims**



1. A method of controlling a motor vehicle having an engine, with a neural network which has a learning capability, comprising the steps of:

periodically supplying a present value of the throttle valve opening of the engine and a rate of change of the present value of the throttle valve opening to the neural network;

controlling the neural network to learn the present value of the throttle valve opening when the rate of change of the present value of the throttle valve opening becomes zero so that a predicted value of the throttle valve opening approaches the actual value of the throttle valve opening at the time the rate of change thereof becomes zero; and

controlling an operating condition of the motor vehicle based on the predicted value of the throttle valve opening, which is represented by a periodically produced output signal from said neural network.

5,200,899

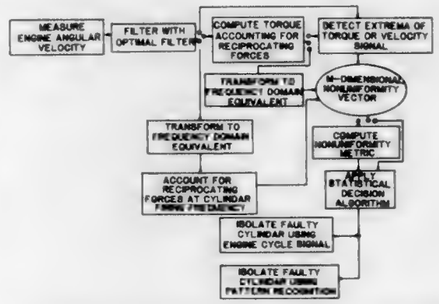
METHOD AND SYSTEM FOR DETECTING THE MISFIRE OF AN INTERNAL COMBUSTION ENGINE UTILIZING ANGULAR VELOCITY FLUCTUATIONS

William B. Ribbens, and Giorgio Rizzoni, both of Ann Arbor, Mich., assignors to Regents of the University of Michigan, Ann Arbor, Mich.

Filed Apr. 20, 1990, Ser. No. 512,779

Int. Cl.[5] F02P *17/00*; G01M *15/00*; G01L *3/24*

U.S. Cl. 364—431.08 **42 Claims**



1. A method for detecting the misfire of a reciprocating internal combustion engine having a plurality of reciprocating components, at least one cylinder and a crankshaft, the method comprising the steps of:

measuring the angular velocity of the crankshaft to obtain an electrical signal representation thereof;

filtering the electrical signal to minimize the effects of random error and disturbances in the electrical signal to obtain a filtered angular velocity signal;

calculating an M-dimensional torque nonuniformity vector derived from the filtered angular velocity signal, where M is proportional to the number of cylinders of the engine; and

applying a statistical decision algorithm to the torque nonuniformity vector, which algorithm statistically distinguishes between a true misfire and normal cyclic variability which characterizes the combustion process in each cylinder of the engine, to thereby obtain a misfire signal.

5,200,900

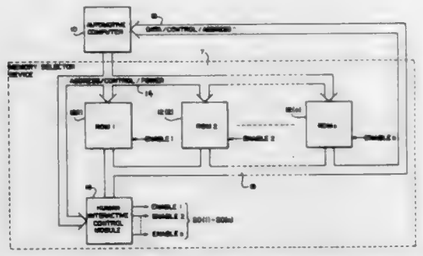
AUTOMOTIVE MULTIPLE MEMORY SELECTOR APPARATUS WITH HUMAN INTERACTIVE CONTROL

John B. Adrain, 723 Ocean View Dr., Port Hueneme, Calif. 93041, and John V. Colin, Port Hueneme, Calif., assignors to John B. Adrain, Port Hueneme, Calif.

Continuation of Ser. No. 579,072, Sep. 6, 1990, abandoned. This application Jan. 30, 1992, Ser. No. 830,552

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—431.12 **14 Claims**



1. An improvement in a vehicle having a predetermined combination of operational elements for controlling vehicular operation according to at least one originally provided program, said predetermined combination of operational elements being defined in a fixed system having a bus, said elements of said system design controlled by an electronic control unit according to said originally provided program said improvement comprising:

a universal module coupled to said bus for arbitrarily reconfiguring programmed control of said electronic control unit regardless of the type of design of said system in which said electronic control unit is employed, said universal module for permitting arbitrary selection among a plurality of additional operational protocols not originally included within said fixed system design, said universal module comprising:

a plurality of preprogrammed memories, each of said memories for storing at least one additional program for use in controlling operation of said vehicle in a distinguishable protocol in addition to those provided by said originally provided program and in lieu of control provided by said originally provided program; and

an interactive control, said interactive control being coupled to said plurality of preprogrammed memories only for selectively communicating one of said plurality of preprogrammed memories to said electronic control unit, operation of said vehicle being changed by said interactive control while said vehicle is in transit and being controlled according to said additional program in said selected preprogrammed memory in lieu of said originally provided program,

whereby said vehicle is caused to operate in a selected protocol according to the arbitrary driver decision from among a plurality of alternatives available in said plurality of preprogrammed memories.

5,200,901

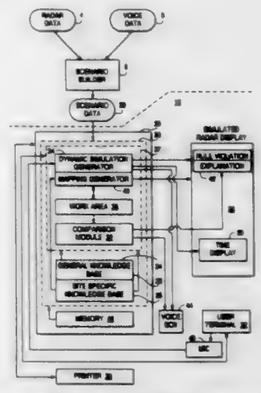
DIRECT ENTRY AIR TRAFFIC CONTROL SYSTEM FOR ACCIDENT ANALYSIS AND TRAINING

Arthur Gerstenfeld, Newton; Charles Millet, Amesbury; Thomas D. Moody, Norwood, and Erich Ma, Watertown, all of Mass., assignors to UFA, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 176,639, Apr. 1, 1988, Pat. No. 4,979,137, which is a continuation-in-part of Ser. No. 931,867, Nov. 18, 1986, Pat. No. 4,827,418. This application Dec. 17, 1990, Ser. No. 628,436

Int. Cl.[5] G06F *15/48*

U.S. Cl. 364—439 **15 Claims**



1. An air traffic control simulator in a data processing system, wherein said data processing system includes a radar memory means for storing previously generated radar information corresponding to an actual aircraft flight pattern including at least one position and heading of said actual aircraft, a verbal communications memory means for storing data corresponding to previously generated verbal communications between a pilot of the actual aircraft and an actual controller during the flight pattern, an input device for receiving input commands from at least one user, and a display apparatus having a display screen, and wherein said simulator may interact with the user to simulate an air traffic scenario, said simulator comprising:

radar input means for receiving radar data corresponding to the stored radar information;

voice input means for receiving voice data corresponding to the stored data for the verbal communications;

coordinating means for automatically coordinating the input radar data and the input voice data to generate coordinated data for producing one of said air traffic scenarios; and

generating means for generating on said display screen at least one display image of said produced air traffic scenario including a representation of said actual aircraft indicating the position and heading.

5,200,902

AIRPORT CONTROL/MANAGEMENT SYSTEM

Harold R. Pilley, R.F.D. #1, Box 204, Deering, N.H. 03244

Filed Oct. 9, 1990, Ser. No. 593,214

Int. Cl.[5] G06F *15/48*

U.S. Cl. 364—439 **12 Claims**

1. Airport control/management system, comprising:

(a) means establishing a precise 3-dimensional digital map of

a selected airport space envelope, the map containing

circuit; memory means connected to said electronic cir-

and fabric take-off means, said computer being connected to said apparatus so as directly to control each individual yarn

upper wire guide and said upper surface and a distance between said lower wire guide and said lower surface on

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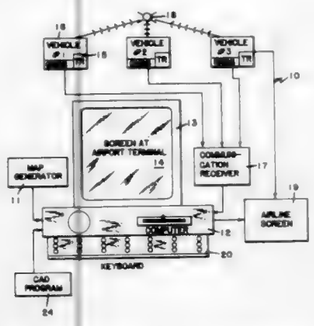
a selected airport space envelope, the map containing GNSS positioning system reference points,

(b) a computer with a monitor screen for receiving and displaying the 3-dimensional map,

(c) means located on at least one vehicle in the airport space envelope to generate and transmit condinuous GNSS-based location reports,



(d) a receiver associated with the computer to receive the said reports from the vehicle,

(e) means associated with the computer and using the said reports to superimpose 3-dimensional image corresponding to the vehicle path onto the 3-dimensional map, and

(f) means associated with the 3-dimensional map for generating airport control and management signals as a function of the vehicle path to control the traffic in an airport.

5,200,903

FRANKING MACHINE

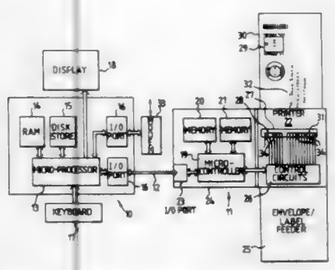
Dennis T. Gilham, Ongar, United Kingdom, assignor to Alcatel Business Systems Ltd., Romford, United Kingdom

Continuation of Ser. No. 818,352, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 733,175, Jul. 19, 1991, abandoned, which is a continuation of Ser. No. 216,013, Jul. 7, 1988, abandoned. This application Aug. 19, 1992, Ser. No. 932,380

Claims priority, application United Kingdom, Jul. 9, 1987, 8716183

Int. Cl.[5] **G06F** *15/20*

U.S. Cl. 364—464.02 **9 Claims**



1. A franking machine system comprising:

computing means including

data processing means;

data entry means connected to said data processing means into input address data and postage charge data relating to a mail item to said data processing means; and

a first input/output port connected to said data processing means; a peripheral device comprising a franking machine including electronic circuit means to effect accounting and control operations;

a second input/output port connected to said electronic circuit; memory means connected to said electronic circuit means for registering a value of credit available for use in franking mail items and for registering a value of postage used in franking mail items;

printing means connected solely to and operable solely by print control signals output by said electronic circuit means to print on a mail item;

and a secure housing containing said electronic circuit means, said second input/output port and said memory means;

communication means interconnecting said first and second input/output ports;

said data processing means in response to input from said data entry means of destination data and postage charge data relating to a mail item sending corresponding destination data signals and postage charge signals via said first input/output port, said communication means and said second input/output port to said electronic circuit means of said peripheral device;

said electronic circuit means in response to said postage charge signals received from said data processing means checking a postage charge represented by said postage charge signals with the value of credit registered in said memory means to determine if said value of credit is sufficient relative to said postage charge and in response to said value of credit being sufficient outputting the print control signals directly to said printing means to effect at the same time printing on the mail item of a destination address corresponding to said address data and of a franking impression denoting payment of the postage charge corresponding to said postage charge data in respect of said mail item.

5,200,904

COMPUTER AIDED DESIGN SYSTEM

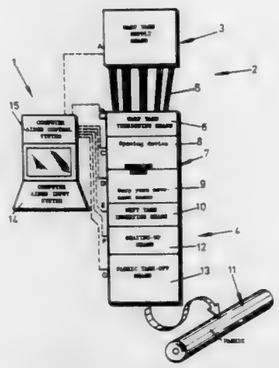
Marie Tottman, Burbeck Court, 62A Gallowgate Square, Largs, KA30 8HZ, United Kingdom

PCT No. PCT/GB87/00602, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO89/02001, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 26, 1987, Ser. No. 465,133

Int. Cl.[5] **G06F** *15/46*

U.S. Cl. 364—470 **11 Claims**



1. A computer aided design system suitable for use in designing and producing fabric weaving patterns in woven fabric portions, which system has a computer programmed to display weaving patterns and input weaving variables defined by different user-defined selections of each of a plurality of weaving pattern variables, wherein said computer is connected to a weaving apparatus comprising a warp yarn supply means, shedding means, weft yarn picking means, beating-up means

and fabric take-off means, said computer being connected to said apparatus so as directly to control each individual yarn shedding control means of said shedding means and individual warp yarn lifting means in accordance with said user-defined weaving pattern variables selections thereby to produce, in use of the system with a warp yarn arrangement in said warp yarn supply means corresponding to the user-defined selections of warp yarn arrangement variables of said weaving pattern variables, a woven fabric sample corresponding to the weaving pattern defined by the user-defined selection of weaving pattern variables.

5,200,905

ELECTRIC DISCHARGE MACHINING CONTROL APPARATUS

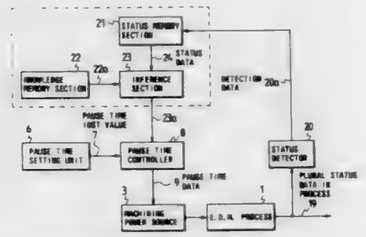
Kazuhiko Uemoto; Koji Akamatsu, and Nobuaki Ohba, all of Aichi, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 7, 1990, Ser. No. 563,650

Claims priority, application Japan, Aug. 9, 1989, 1-206058

Int. Cl.[5] **G06F** *15/46;* **B23H** *1/00*

U.S. Cl. 364—474.04 **5 Claims**



1. An electric discharge machining control apparatus comprising:

control means for controlling at least one machining condition in an electric discharge machining operation;

knowledge memory means for storing methods effective in allowing said control means to control said machining condition;

status detecting means for detecting machining status data from an electric discharge machining process

status memory means for storing at least one of the present and past machining status data detected by said status detecting means; and

inference means for combining a plurality of results which are obtained from machining status data read out of said status memory means and methods read out of said knowledge memory means in association with said machining status data thus read, to provide an instruction value for the control of said machining condition by said control means.

5,200,906

WIRE-CUT ELECTRIC DISCHARGE MACHINING METHOD

Takahiko Yamashita, Ebina; Akira Busujima, Hadano, and Toshiyuki Makino, Kawasaki, all of Japan, assignors to Hitachi Seiko Ltd., Ebina, Japan

Filed Nov. 21, 1990, Ser. No. 616,846

Int. Cl.[5] **G06F** *15/46;* **B23H** *7/08*

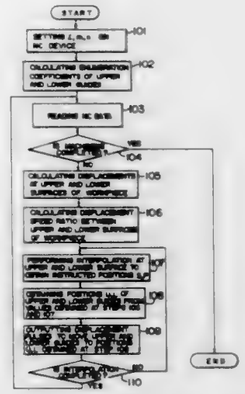
U.S. Cl. 364—474.04 **1 Claim**

1. A wire-cut electric discharge machining method in which a wire electrode supported by upper and lower wire guides between which a workpiece having an upper surface and a lower surface is held, is moved relative to said workpiece while electric discharge is effected between said wire electrode and said workpiece; comprising the steps of:

previously setting data concerning shapes to be machined at said upper and lower surfaces, a distance between said upper and lower surfaces, and a distance between said upper wire guide and said upper surface and a distance between said lower wire guide and said lower surface on an NC machine;

calculating ratios between said distances;

computing displacement positions of said wire electrode at said upper and lower surfaces, that is, inlet and outlet positions of said wire electrode from data giving said shapes to be machined;



interpolating said wire inlet and outlet positions at said upper and lower surfaces;

calculating displacement positions of said upper and lower wire guides from the thus interpolated inlet and outlet positions of said wire electrode and said ratios; and

moving said upper and lower guides successively along said displacement positions of said upper and lower wire guides so as to machine said workpiece.

5,200,907

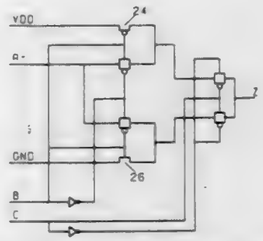
TRANSMISSION GATE LOGIC DESIGN METHOD

Dzung J. Tran, 7353 SE. Hacienda, Hillsboro, Oreg. 97123

Filed Apr. 16, 1990, Ser. No. 510,114

Int. Cl.[5] **G06F** *7/48;* **H03K** *17/687*

U.S. Cl. 364—490 **16 Claims**



1. A method of constructing a transmission gate logic circuit for providing a predetermined boolean function of N input variables, comprising:

providing an N-stage transmission gate multiplexer (TGM) binary tree structure formed of TGM circuits and including a first stage and an Nth final stage, each TGM circuit having first and second input terminals, first and second control terminals and an output terminal;

coupling each input variable and its complement, respectively, to the first and second control terminals of a respective stage of the tree structure, seriatim, the most significant input variable (msb) being coupled to the Nth

stage of the tree structure, and the least significant input

5,200,909

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stage of the tree structure, and the least significant input variable (lsb) being coupled to the first stage;

identifying a series of 2^N paths through the three structure, from the final stage input terminals to the first stage output terminal, each path having a corresponding input terminal in the final stage, so that each path corresponds to a unique binary state of the input variables;

designating as a TRUE path each one of the series of paths for which the predetermined boolean function is true;

designating as a FALSE path each one of the series of paths for which the predetermined boolean function is false;

for each TRUE path, coupling a logical true signal to the corresponding input terminal; and

for each FALSE path, coupling a logical false signal to the corresponding input terminal;

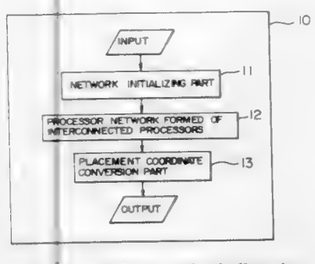
whereby, in operation of the logic circuit, the logic states of the input variables control the TGM circuits to route a logic signal to the output terminal in accordance with the predetermined boolean function.

5,200,908

PLACEMENT OPTIMIZING METHOD/APPARATUS AND APPARATUS FOR DESIGNING SEMICONDUCTOR DEVICES

Hiroshi Date, and Terumine Hayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 533,540
Claims priority, application Japan, Jun. 8, 1989, 1-144123
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—491 **25 Claims**



1. A method of determining optimal allocation of a multiplicity of circuit elements having a predetermined correlation with one another, comprising the steps of:

setting at least information for connecting the circuit elements and coordinates for arranging the circuit elements;

generating output values for allocating the circuit elements by executing operation in n^2 processors, each of which receives its own output and outputs of the other processors to substantially arrange the circuit elements on locations on the basis of a weight representing a degree of connection between the circuit elements and on the basis of a threshold representing an allocation possibility of the circuit elements on the locations, both the weight and the threshold being obtained from the information and the coordinates;

calculating a constraint variable in a processor of the coordinates value (i, k) such that an i-th circuit element (where i=1 to n) is arranged on a k-th location (where k=1 to n), so that a circuit evaluation function becomes an optimal value and converges up to a constraint condition; and

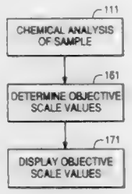
arranging a circuit element on the coordinates of one of the processor which generates an output value which converges the constraint variable to the constraint condition, by deciding whether the constraint variable is converged or not.

5,200,909

METHOD FOR EVALUATION OF A LIQUID, PARTICULARLY WINE

John P. Juergens, 3011 Hillmont Dr., Oxford, Miss. 38655

Continuation-in-part of Ser. No. 316,667, Feb. 28, 1989, abandoned. This application Dec. 7, 1990, Ser. No. 629,644
Int. Cl.[5] G01N *33/14*
U.S. Cl. 364—497 **19 Claims**



13. A method of developing a consumer substance evaluation system to aid an user in selecting a substance, comprising the steps of:

(a) determining substance characteristics which influence consumer choice;

(b) determining what substance characteristics can be quantitatively determined; and

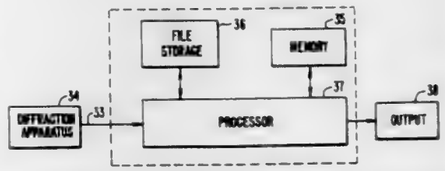
(c) converting the quantitative determinations into objective product rating scales so that the user can make an objective evaluation of the substance based on the objective product rating scales.

5,200,910

METHOD FOR MODELLING THE ELECTRON DENSITY OF A CRYSTAL

Subramanian Subbiah, Woodside, Calif., assignor to The Board of Trustees of the Leland Stanford University, Palo Alto, Calif.

Filed Jan. 30, 1991, Ser. No. 648,788
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—499 **24 Claims**
MICROFICHE APPENDIX INCLUDED
(3 Microfiche, 255 Pages)



1. A diffractometer system for generating an image of the electron density distribution of a macromolecule crystal, the system comprising:

(a) a source of radiation that diffracts when directed onto the macromolecule crystal;

(b) a detector for collecting an intensity versus position diffraction pattern of the macromolecule crystal;

(c) a processor for converting the diffraction pattern of the crystal into the electron density distribution of the macromolecule crystal, the processor including:

(i) means for determining the asymmetric unit of the crystal;

(ii) means for distributing a number of scattering bodies within the asymmetric unit;

(iii) means for repeatedly generating a scattering amplitude pattern of the scattering bodies, correlating that pattern against the diffraction pattern of the crystal, and moving the scattering bodies a fixed distance to increase

the correlation between the patterns of the crystal and the scatterers;

(iv) means for reducing the size of the fixed distance in iii; and

(v) means for ending step iii after the size of the fixed distance reaches a predetermined value, and

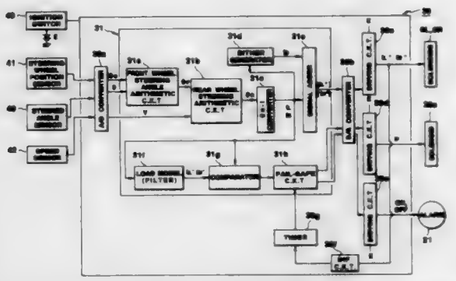
(d) a graphical display device for generating an image of the three-dimensional electron density distribution of the crystal, wherein the arrangement of scattering bodies in the ending distribution represents the electron density distribution of the macromolecule crystal.

5,200,911

APPARATUS FOR DETECTING FAILURE OCCURRING IN CONTROL SYSTEM FOR DRIVING LOAD

Yasuki Ishikawa, and Yasuhiro Shiraishi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 21, 1990, Ser. No. 525,771
Claims priority, application Japan, May 19, 1989, 1-126129; May 19, 1989, 1-126131; May 19, 1989, 1-126132
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—578 **30 Claims**



1. A failure detection system comprising:

first means for applying a driving signal on which a dither signal is superimposed, said driving signal driving a control load;

second means for monitoring said dither signal included in said driving signal provided by said first means to detect failure in said first means by an absence of the dither signal in said driving signal; and

third means for monitoring variation in the level of said driving signal from said first means to deactivate a failure detecting operation of said second means in response to variation out of a preselected range.

5,200,912

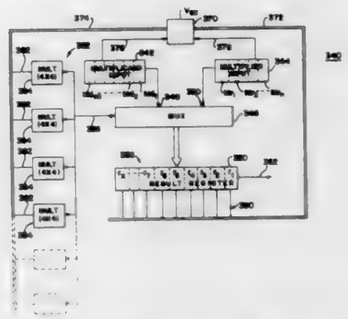
APPARATUS FOR PROVIDING POWER TO SELECTED PORTIONS OF A MULTIPLYING DEVICE

Safdar M. Asghar, Austin, Tex., and Donald D. Mondul, Naperville, Ill., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 794,995, Nov. 19, 1991, Pat. No. 5,136,537. This application Aug. 3, 1992, Ser. No. 924,346
Int. Cl.[5] G06F *1/00, 7/52*
U.S. Cl. 364—707 **8 Claims**

1. An apparatus for providing power to selected portions of a multiplying device, said multiplying device determining the product of a first number having a first plurality of digits and a second number having a second plurality of digits, said multiplying device comprising a plurality of components including a plurality of multiplier units for determining a plurality of partial products, said plurality of partial products comprising a respective partial product for each pair-combination of said first plurality of digits and said second plurality of digits, and including a register means for storing information, said register means including plurality of register cells for accumulatingly storing said plurality of partial products according to a predetermined arrangement; the apparatus comprising:

a comparing means operatively connected for receiving said first number and said second number and comparing said first plurality of digits with said second plurality of digits, said comparing means determining the highest number of digits contained in said first plurality of digits or said



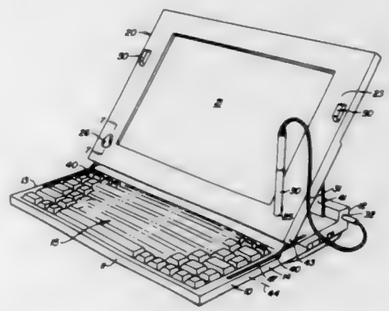
second plurality of digits; said comparing means being operatively connected with specified multiplier units of said plurality of multiplier units, with specified register cells of said plurality of register cells, and with a source of said power; said comparing means employing said highest number of digits in a predetermined algorithmic relation to selectively provide said power specified components of said plurality of components.

5,200,913

COMBINATION LAPTOP AND PAD COMPUTER

Jeff C. Hawkins, Redwood City, and John J. Daly, San Carlos, both of Calif., assignors to Grid Systems, Inc., Fremont, Calif.

Continuation of Ser. No. 519,031, May 4, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 839,004
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—708 **20 Claims**



1. A portable computer comprising:

a computer housing;

a keyboard carried by said computer housing;

a display device having an obverse viewing surface and a reverse surface; and

a four bar hinge mechanism for mounting said display device to said computer housing,

said display device being slidable between a closed position in which the display device covers the keyboard with said reverse surface and an open position in which the keyboard is uncovered and the display device is

first and said second product vectors, said iterative calcu-

postshift should be executed by 1 bit in the low order

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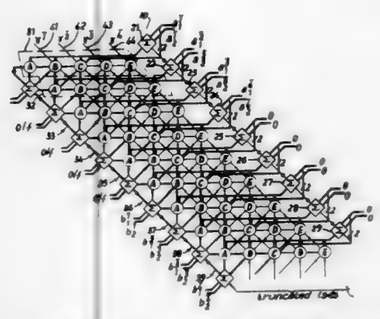
positioned rearwardly of the keyboard at a viewing angle.

5,200,914
WAVE DIGITAL FILTER WITH FINE GRAINED PIPELINING

John V. McCanny, Newtownards, United Kingdom; Rajinder Jit Singh, Ipoh, Malaysia, and Roger F. Woods, Belfast, United Kingdom, assignors to Queens University of Belfast, Northern Ireland

Filed Apr. 2, 1991, Ser. No. 679,324
Claims priority, application United Kingdom, Apr. 3, 1990, 9007521
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.14 10 Claims

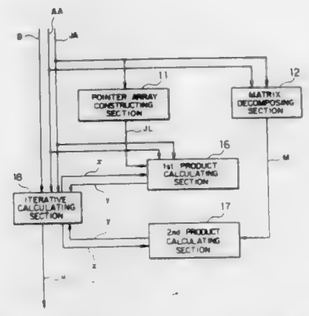


1. A wave digital filter for filtering input data comprising:
a plurality of input cells which are operative for receiving a first input data signal and a second input data signal and outputting a difference data signal representing the difference between said second input data signal and said first input data signal;
a sub-processor associated with each input cell, each sub-processor comprising a plurality of sub-cells which are arranged in groups to receive said first input data signal, said second input data signal and said difference data signal simultaneously and in parallel from the input cell associated therewith,
said sub-cells comprising a plurality of sub-sub-cells wherein selected sub-cells have multiplier sub-sub-cells which are operative for multiplying said difference data signal by a filter coefficient signal and providing a product data signal representative of said multiplication, said sub-cells further including an additional sub-sub-cell which receives said product data signal and is operative for performing at least one predetermined arithmetic function to said product data signal in accordance with a predetermined number system, and providing a first emergent data signal representative of said arithmetic function, said first emergent data signal being one of least two different data signal types, said additional sub-sub-cells transmitting said first emergent data signal according to said type to at least one different sub-cell of a different sub-processor during a subsequent clock pulse, said at least one different sub-cell into which said first emergent data signal is transmitted being determined by the type of emergent data signal generated during a previous clock cycle, said at least one different sub-cell having further sub-sub-cells which are operative for performing aa further predetermined arithmetic function on said first emergent data signal and providing a second emergent data signal; and
an output cell associated with each sub-processor, each output cell receiving said second emergent data signal from predetermined arithmetic sub-sub-cells in accordance with a predetermined sequence of arithmetic functions performed and the filter coefficient input to each sub-cell, each output cell having first and second output ports for outputting first and second output data signals representative of said first and second input data signals as filtered by said sub-processors.

5,200,915
DEVICE FOR RAPIDLY SOLVING A SYMMETRIC LINEAR SYSTEM ON A SUPERCOMPUTER

Ken Hayami, and Hiroshi Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 712,890
Claims priority, application Japan, Jun. 12, 1990, 2-151664
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—736 4 Claims

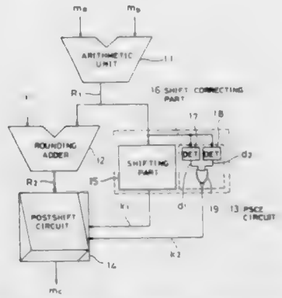


1. A supercomputer for solving a symmetric linear system given by Au=b, where A represents a symmetric coefficient matrix, b represents a right-hand side vector, and u represents a solution vector, said symmetric coefficient matrix being equal to a three-term sum of a diagonal matrix plus an upper triangular matrix plus a lower triangular matrix which is equal to a transpose matrix of said upper triangular matrix, said supercomputer being supplied with said right-hand side vector, said diagonal matrix, and said upper triangular matrix, said supercomputer calculating said solution vector using said right-hand side vector, said diagonal matrix, and said upper triangular matrix, said supercomputer comprising:
a pointer array constructing section supplied with said upper triangular matrix to construct a pointer array which points to said lower triangular matrix to thereby speed up vector processing on said supercomputer;
a matrix decomposing section supplied with said diagonal matrix and said upper triangular matrix to decompose said diagonal matrix and said upper triangular matrix into an approximate matrix which approximates said symmetric coefficient matrix;
a first product calculating section, supplied with said diagonal matrix, said upper triangular matrix, and a first vector and connected to said pointer array constructing section, to calculate a first product vector using said diagonal matrix, said upper triangular matrix, said first vector, and said pointer array, said first product vector being equal to a product of said symmetric coefficient matrix and said first vector;
a second product calculating section, supplied with a second vector and connected to said matrix decomposing section, to calculate a second product vector using said approximate matrix and said second vector, said second product vector being equal to a product of an inverse matrix of said approximate matrix and said second vector; and
an iterative calculating section, supplied with said diagonal matrix, said upper triangular matrix, said right-hand side vector and connected to said first and said second product calculating sections, to carry out iterative calculation using said supercomputer on said diagonal matrix, said upper triangular matrix, said right-hand side vector, said first and said second product vectors, said iterative calculating section iteratively providing said first and said second product calculating sections with said first and said second vectors to make said first and said second product calculating sections iteratively calculate said first and said second product vectors, respectively, said iterative calculating section producing said solution vector.

5,200,916
MANTISSA PROCESSING CIRCUIT OF FLOATING POINT ARITHMETIC APPARATUS FOR ADDITION AND SUBTRACTION

Tadahiro Yoshida, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1991, Ser. No. 813,664
Claims priority, application Japan, Dec. 28, 1990, 2-408822
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 4 Claims

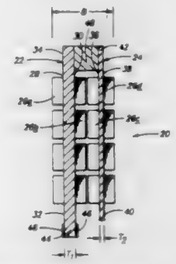


1. A mantissa processing circuit for executing the addition and subtraction of mantissa parts of two operands and for performing rounding and normalization for the result of addition and subtraction of the mantissa parts in a floating point arithmetic apparatus for addition and subtraction which receives two floating point numbers as the operands, each floating point number having a sign bit, an exponent part and the mantissa part of n bits and being normalized, comprising:
an arithmetic unit for receiving the mantissa parts of the operands as input data wherein the mantissa part of the one of the operands which has the smaller exponent part than that of the other is preshifted in the low order direction by a bit number equal to the difference between the values of the exponent parts of the operands when the values of the exponent parts do not correspond to each other, receiving the mantissa parts of the operands as input data which are not preshifted when the values of the exponent parts of the operands correspond to each other, executing binary addition and subtraction on two input data thus received, and outputting the results of binary addition and subtraction as a first intermediate result,
a rounding adder for executing rounding addition of adding 1 to a bit of the first intermediate result as demanded from said arithmetic unit and outputting the result of rounding addition as a second intermediate result,
a postshift-count-encode circuit coupled to the first intermediate result from said arithmetic unit for generating data on the direction and quantity of postshift to be applied to the second intermediate result from said rounding adder for normalization, including a shifting part for sequentially searching for a first non-zero value bit in the low order direction from the highest order bit of the first intermediate result from said arithmetic unit, generating data on the direction and quantity of postshift according to the position of the first non-zero value bit thus obtained, and giving to said postshift circuit the generated data as a first postshift data and a shift correcting part for giving to said postshift circuit a second postshift data that additional postshift should be executed by 1 bit in the low order direction when it is expected that the position of the first non-zero value bit of the first intermediate result from said arithmetic unit is moved by 1 bit in the high order direction for rounding addition executed by said rounding adder and outputting the data thus generated as a postshift data, and
a postshift circuit for shifting the second intermediate result from said rounding adder in the high or low order direction in accordance with the postshift data from said postshift-count-encode circuit, and outputting the result of shift as the mantissa part of a calculation result.

5,200,917
STACKED PRINTED CIRCUIT BOARD DEVICE

James M. Shaffer; Karl H. Mauritz, and Glen Atkins, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Nov. 27, 1991, Ser. No. 800,582
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—51 15 Claims



1. A memory device for connection to a connector provided on a control board, the memory device comprising:
a first printed circuit board having first and second surfaces;
connecting means for mating with a connector on a control board, the connecting means being provided at an end of the first printed circuit board;
a first memory circuit mounted on the first surface of the first printed circuit board;
a second memory circuit mounted on the second surface of the first printed circuit board;
the first printed circuit board having conductive paths formed on at least one of the first and second surfaces, the conductive paths electrically coupling the first and second memory circuits to the connecting means;
a second printed circuit board having first and second surfaces;
a third memory circuit mounted on the first surface of the second printed circuit board;
a fourth memory circuit mounted on the second surface of the second printed circuit board;
the second printed circuit board having conductive paths formed on at least one of the first and second surfaces, the conductive paths being electrically coupled to the third and fourth memory circuits;
a board alignment support connected between the first and second printed circuit boards, the board alignment support supporting the first and second printed circuit boards in a spaced and substantially parallel relation;
interfacing means for electrically coupling the conductive paths on the first printed circuit board to the conductive paths on the second printed circuit board; and
the third and fourth memory circuit being addressable through the connecting means, the conductive paths on the first printed circuit board, the interfacing means, and the conductive paths on the second printed circuit board when the device is mounted to a connector on a control board.

5,200,918

5,200,919

5,200,920
METHOD FOR PROGRAMMING PROGRAMMABLE

having a source receiving the first power supply potential and a drain output the output signal;

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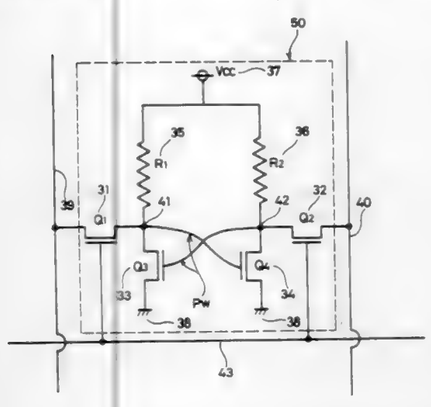
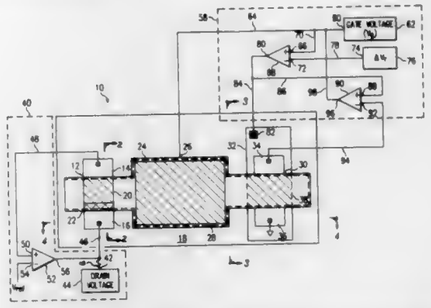
5,200,918
STATIC SEMICONDUCTOR MEMORY WITH POLYSILICON SOURCE DRAIN TRANSISTORS
Tomohisa Wada, and Masahide Inuishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 693,023, Apr. 30, 1991, which is a continuation of Ser. No. 381,084, Jul. 18, 1989, Pat. No. 5,166,763. This application Apr. 24, 1992, Ser. No. 873,148
Claims priority, application Japan, Jul. 20, 1988, 63-181109
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—182 **6 Claims**



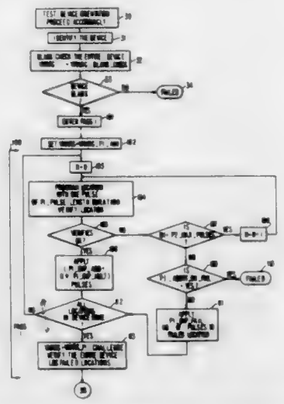
1. A memory cell of a static type semiconductor memory device comprising:
a first driver transistor constituted by a first MOS transistor, connected between a first memory cell node and a first potential node, and said first MOS transistor including a gate electrode connected to a second memory cell node;
a second driver transistor constituted by a second MOS transistor, connected between said second memory cell node and said first potential node, and said second MOS transistor including a gate electrode connected to said first memory cell node;
a first load element connected between said first memory cell node and a second potential node; and
a second load element connected between said first memory cell node and a second potential node; and
a second load element connected between said second memory cell node and said second potential node;
wherein the MOS transistors each comprise
(i) polycrystal silicon layers formed on a main surface of a semiconductor substrate with a spacing from one another for defining a channel region on said main surface, said polycrystal silicon layers containing impurities,
(ii) source and drain regions below said polycrystal silicon layers, said source and drain regions comprising impurities diffused from said polycrystal silicon layers into said substrate such that edges of the source and drain regions are aligned with edges of the corresponding polycrystal silicon layer, and
(ii) source and drain regions below said polycrystal silicon layers, said source and drain regions comprising impurities diffused from said polycrystal silicon layers into said substrate such that edges of the source and drain regions are aligned with edges of the corresponding polycrystal silicon layer, and
(iii) a gate electrode formed on said channel region with a gate insulating film interposed therebetween.

5,200,919
ELECTRICALLY-ERASABLE, ELECTRICALLY-PROGRAMMABLE READ-ONLY MEMORY CELL WITH A SELECTABLE THRESHOLD VOLTAGE AND METHODS FOR ITS USE
Cetin Kaya, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 546,066, Jun. 29, 1990, abandoned. This application Jul. 15, 1991, Ser. No. 730,566
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **15 Claims**



1. An electrically-erasable, electrically-programmable read only memory cell, with a write controllable threshold voltage, formed in a semiconductor layer of a first conductivity type, comprising:
a first transistor, source and drain regions of said first transistor formed in said semiconductor layer to be of a second conductivity type opposite said first conductivity type, a channel area of said first transistor in said semiconductor layer spacing said source region from said drain region;
a tank region formed in said semiconductor layer spaced from said first transistor and formed to be of said second conductivity type;
a second transistor, a source and a drain region of said second transistor formed in said tank region to be of said first conductivity type, a channel area of said second transistor in said tank region spacing said source region in said second transistor from said drain region of said second transistor;
a floating gate having a first portion insulatively adjacent said channel area of said first transistor, and a second portion insulatively adjacent said channel area of aid second transistor, and operable to control the threshold voltages of said channel areas upon the application of a predetermined voltage to the floating gate;
a control gate insulatively disposed adjacent said floating gate, said control gate operable to control the charging of said floating gate upon the application of preselected voltages to said drain of said first transistor and said control gate;
a voltage source for providing a voltage level to said control gate sufficient to increase the charge stored in said floating gate;
a threshold control circuit coupled to vary the potential of said tank in relation to said control gate; and
a monitoring circuit coupled to control the application of said voltage level to said control gate in response to a change in potential on said source of said second transistor and such that the charge on said floating gate stops increasing when a selected threshold voltage of said channel area of said second transistor is obtained, said selected voltage within a range defined by the threshold voltage when said floating gate is not charged, and a voltage proportionate to the maximum charge which can be accumulated on said floating gate.

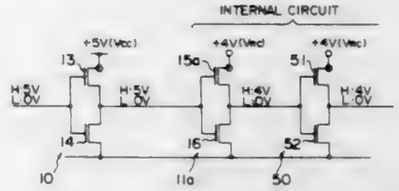
5,200,920
METHOD FOR PROGRAMMING PROGRAMMABLE ELEMENTS IN PROGRAMMABLE DEVICES
Kevin A. Norman, Belmont; James D. Sansbury, Portola Valley; Alan L. Herrmann, Sunnyvale; Matthew C. Hendricks, Los Gatos, and Behzad Nouban, Mountain View, all of Calif., assignors to Altera Corporation, San Jose, Calif.
Continuation of Ser. No. 476,715, Feb. 8, 1990, abandoned. This application Sep. 17, 1991, Ser. No. 759,944
Int. Cl.[5] G11C *11/34, 7/00, 29/00*
U.S. Cl. 365—185 **30 Claims**



1. A method for programming a programmable logic device, said device having an array of erasable programmable read-only memory cells, each of which has a threshold voltage, and to each of which at least one high-voltage programming pulse must ordinarily be applied for a predetermined duration to program said programmable logic device, said method comprising the steps of:
selecting a first duration shorter than said predetermined duration;
applying a first number of high-voltage programming pulses to each of said erasable programmable read-only memory cells, each of said high-voltage programming pulses having a first magnitude and having said first duration, said number being at least one;
selecting a second duration shorter than said first duration; and
applying a second number of high-voltage programming pulses to each of said erasable programmable read-only memory cells, each of said high-voltage programming pulses having a second magnitude and having said second duration, said second number being at least one.

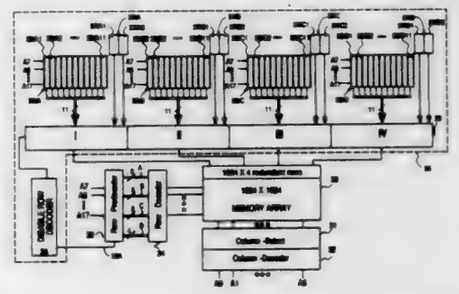
5,200,921
SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING P-CHANNEL MOS TRANSISTORS HAVING DIFFERENT THRESHOLD VOLTAGES
Yoshinori Okajima, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Continuation of Ser. No. 762,116, Sep. 19, 1991, abandoned. This application Jul. 30, 1992, Ser. No. 921,380
Claims priority, application Japan, Sep. 20, 1990, 2-252525
Int. Cl.[5] G11C *7/06*
U.S. Cl. 365—189.11 **8 Claims**

1. A semiconductor integrated circuit comprising:
a first circuit outputting an output signals having a high logic numeral approximately equal to a first power supply potential; and
a second circuit receiving the output signal, wherein:
said first circuit comprises a first P-channel MOS transistor having a source receiving the first power supply potential and a drain output the output signal;
said second circuit comprises a second P-channel MOS transistor having a gate receiving the output signal, a source receiving a second power supply potential lower than the first power supply potential, and a drain connected to an output terminal;
said first and second P-channel MOS transistors respectively



have threshold voltages at which predetermined identical drain currents defining a boundary between ON and OFF states of said first and second P-channel MOS transistors are obtained, each of the first and second threshold voltages being a gate-source voltage corresponding to a potential of the gate with respect to the source; and
the second threshold voltage of said second P-channel MOS transistor is greater than the first threshold voltage of said first P-channel MOS transistor.

5,200,922
REDUNDANCY CIRCUIT FOR HIGH SPEED EPROM AND FLASH MEMORY DEVICES
Kameswara K. Rao, 1172 Arlington La., San Jose, Calif. 95129
Filed Oct. 24, 1990, Ser. No. 602,999
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—200 **4 Claims**



1. A control circuit for enabling a reading operation of a plurality of redundant cells in a memory circuit, the memory circuit having an array of memory cells and a memory array decoding circuit coupled to said memory array and connectable to a plurality of addressing lines, said control circuit comprising:
a redundant cell decoding circuit coupled to said plurality of redundant cells for providing a select signal to said redundant cells;
an address select circuit coupled to said redundant cell decoding circuit and connectable to said plurality of addressing lines, said address select circuit including a first means for programming said address select circuit to provide an address select signal to said redundant cell decoding circuit in response to an address signal at said addressing lines;
an enable-disable circuit coupled to said redundant cell decoding circuit having a second means for programming

said enable-disable circuit to provide an enable signal to

5,200,924

said bit lines not selected for reading, wherein a non-selected cell is isolated from said second and fourth cur-

means for providing an external clock signal and a write/-read enabling signal; and

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said enable-disable circuit to provide an enable signal to said redundant cell decoding circuit;

wherein said first means for programming said address select circuit is a first programmable fuse circuit and wherein said means for programming said enable-disable circuit is a second programmable fuse circuit and wherein each of said first and second programmable fuse circuits include:

a first programmable element;

an enable input line coupled to said first programmable element for receiving a chip select pulse; and

an output line coupled to said first programmable element;

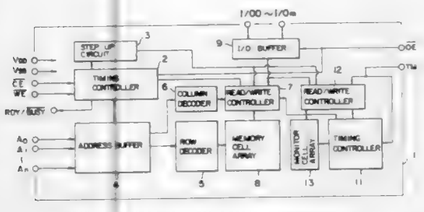
wherein a first voltage level is latched at said output line when said first programmable element is programmed in a first state, and wherein a second voltage level is latched at said output lien when said first programmable element is programmed in a second state.

5,200,923

NON-VOLATILE MEMORY DEVICE

Kouji Sekiguchi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 22, 1990, Ser. No. 601,919
Claims priority, application Japan, Oct. 20, 1989, 1-273479
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—201 **4 Claims**



1. A non-volatile memory device comprising:

(a) memory cell array having a plurality of transistor memory cells arranged in an array, each memory cell comprising a transistor, data being written in and erasable from each memory cell by applying predetermined voltages to a control gate and a drain thereof, respectively, and by further injecting and extracting electrons to and from a floating gate thereof;

(b) a monitor cell array having first and second monitor cells provided with the same characteristics as those of the memory cells;

(c) first means for writing a data "0" and then a data "1" in the first monitor cell and a data "1" and them a data "0" in the second monitor cell of said monitor cell array, whenever a data is written in one of the memory cells of said memory cell array;

(d) second means for applying a voltage V_{th1} higher than a threshold sense level voltage V_{th3} applied to the control gates of the memory cells to a control gate of the first monitor cell of said monitor cell array and a voltage V_{th2} lower than the threshold sense level voltage V_{th3} to a control gate of the second monitor cell of said monitor cell array, in response to a test mode signal externally input whenever a data is read from said memory cells; and

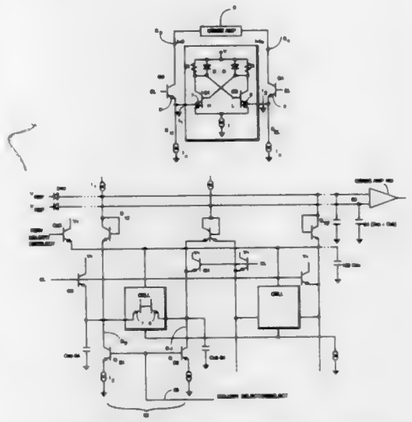
(e) third means for discriminating whether there exists a margin in the number of data writable operations of the memory cells by detecting deterioration in either of said monitor cells by observing an on state and off state of the first and second monitor cells, when the voltages V_{th1} and V_{th2} are respectively applied to the control gates of the first and second monitor cells of the said monitor cell array by said second means.

5,200,924

BIT LINE DISCHARGE AND SENSE CIRCUIT

Thomas S. W. Wong, Santa Clara County, Calif., assignor to Synergy Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 331,684, Mar. 30, 1989, abandoned.
This application May 21, 1991, Ser. No. 704,675
Int. Cl.[5] G11C *7/00, 11/414, 11/416*
U.S. Cl. 365—208 **14 Claims**



1. An arrangement for sensing the state of a selected cell of an array of static memory cells arranged in rows and columns, each said memory cell comprising first and second bipolar transistors whose different states define the value stored in said selected cell, said arrangement comprising:

a single word line connected to every memory cell in a row of said array;

first and second bit lines, said first bit line coupled to an emitter of said first transistor of every memory cell in a column of said array, said second bit line coupled to an emitter of said second transistor of every memory cell in a column of said array;

means for selecting the selected cell in said array by selective activation of said word and said first and second bit lines;

a first current source coupled to said emitter of said first transistor of said selected cell by said first bit line for providing a first current value, said first current value consisting of a first bit line capacitance discharge current component and a first transistor read current component;

a second current source providing a second current value lower than said first current value supplied by said first current source, said second current source coupled by said first bit line to said emitter of said first transistor of said selected cell;

first diode means series-coupled in said first bit line between said second current source and said emitter of said first transistor of said selected cell;

a third current source coupled to said emitter of said second transistor by said second bit line for providing a third current value, said third current value consisting of a second bit line capacitance discharge current component and a second transistor read current component;

a fourth current source providing a fourth current value lower than said third current value supplied by said third current source, said fourth current source coupled by said second bit line to said emitter of said second transistor of said selected cell;

second diode means series-coupled in said second bit line between said fourth current source and said emitter of said second transistor of said selected cell;

means coupled to said first and second bit lines for selectively reverse biasing said first and second diode means in said bit lines not selected for reading, wherein a non-selected cell is isolated from said second and fourth current sources;

said first current source having said first current value preselected to provide first bit line capacitance discharge within a desired time period, and said second current source having said second current value preselected so that a difference current between said first current value and said second current value, which flows in said first transistor of said selected cell for reading a state of said first transistor, is within a desirable operating range for said first transistor;

said third current source having said third current value preselected to provide second bit line capacitance discharge within a desired time period, and said fourth current source having said fourth current value preselected so that a difference current between said third current value and said fourth current value, which flows in said second transistor of said selected cell for reading a state of said second transistor, is within a desirable operating range for said second transistor; and

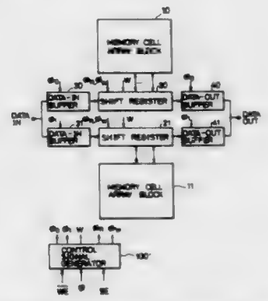
sense means coupled to said first and second bipolar transistors in said selected cell for sensing the state of said selected cell.

5,200,925

SERIAL ACCESS SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREFOR

Yoshikazu Morooka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 337,703, Apr. 13, 1989, abandoned.
This application Jul. 8, 1991, Ser. No. 728,323
Claims priority, application Japan, Jul. 29, 1988, 63-191380
Int. Cl.[5] G11C *7/00, 8/04*
U.S. Cl. 365—219 **28 Claims**



1. A serial access semiconductor memory device, comprising:

a memory cell array divided into a plurality of blocks,

a plurality of register means each provided corresponding to each said plurality of blocks for receiving and sending data from and to memory cells on a selected row in the corresponding block, each of said plurality of register means including means for data latching and shifting data,

a plurality of input buffer means each provided separately corresponding to each said plurality of register means for serially transmitting externally applied data to the corresponding register, said plurality of input buffer means receiving different data from each other in a sequential data stream,

a plurality of output buffer means each provided corresponding to each of said plurality of register means for serially outputting the data received from the corresponding register means, wherein timing of the activation of the input buffer means and the output buffer means for each of the memory cell array blocks is different,

means for providing an external clock signal and a write/-read enabling signal; and

logic means responsive to said external clock signal and said write/read enabling signal for generating an internal clock signal;

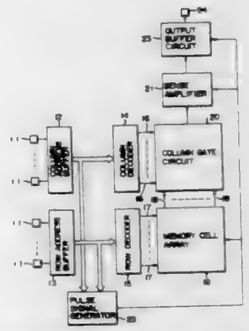
wherein said internal clock signal is applied in common to said plurality of register means, so that a shifting operation in each of said plurality of register means is performed in response to the same internal clock signal, and the relationship of operation timing between said plurality of register means and said plurality of input buffer means during a data writing operation differs from the relationship of operation timing between said plurality of register means and said plurality of output buffer means during a data reading operation.

5,200,926

SEMICONDUCTOR INTEGRATED CIRCUIT

Hiroshi Iwahashi, Yokohama; Hideo Kato, Kawasaki, and Yuuichi Tatsumi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 568,734, Aug. 17, 1990, Pat. No. 5,056,064, which is a division of Ser. No. 290,721, Dec. 27, 1988, Pat. No. 4,959,816. This application Jun. 27, 1991, Ser. No. 722,530
Claims priority, application Japan, Dec. 28, 1987, 62-330056; Oct. 7, 1988, 63-252971; Nov. 18, 1988, 63-291969
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—233.5 **10 Claims**



1. A semiconductor integrated circuit comprising:

an address change detection circuit for detecting a change in address input signal and generating a pulse signal;

a memory cell for storing data;

a data detection circuit for detecting the data stored in said memory cell;

a transfer control circuit connected to said data detection circuit and having a delay time controlled by the pulse signal from said address change detection circuit;

an output buffer circuit connected to said transfer control circuit; and

an output buffer control circuit which is controlled by the pulse signal from said address change detection circuit so as to cause said output buffer circuit not to output data output from said data detection circuit for a predetermined period of time;

wherein the pulse signal from said address change detection circuit is generated with a predetermined delay time with respect to a timing when the address input signal is changed, and the pulse signal is output at least until the data stored in said memory cell is detected by said data detection circuit in accordance with the address input signal and reaches said output buffer circuit.

5,200,927

(c) calculating said orientations of each of said axes, with

fied location in a subterranean formation, said location being in

transmission means for insonifying the volumetric area with

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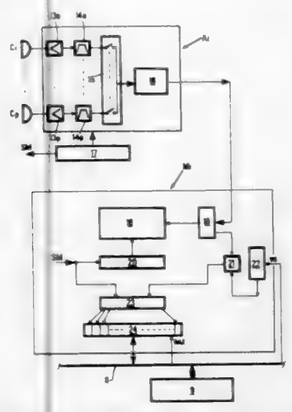
5,200,927
METHOD AND APPARATUS FOR CONTROLLING AN IMMERSED MULTISOURCE ARRAY EMITTING ACOUSTIC IMPULSES
Jacques Cretin, Le Chesnay; Jean-Francois Therond, Neuilly S/Seine, and Alain Regnault, Antony, all of France, assignors to Institut Francais Du Petrole, Rueil Malmaison and Compagnie Generale De Geophysique, Massy, both of France
Filed Jun. 28, 1991, Ser. No. 723,385
Claims priority, application France, Jun. 29, 1990, 90 08268
Int. Cl.[5] H04B *17/00*
U.S. Cl. 367—13 5 Claims

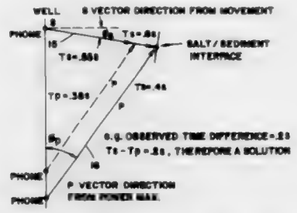


1. A method for checking the triggering of an immersed emission array including a plurality of acoustic impulse sources, a plurality of acoustic wave detectors arranged close to said sources, and a device for monitoring the triggering sequences of the sources including a programmable computer, wherein the acquisition of signals by said acoustic wave detectors is effected during a first time interval containing the expected triggering times of the acoustic impulse sources, said method comprising:
acquiring the signals by said acoustic wave detectors during a second time interval subsequent to the first time interval;
detecting the ones of the signals acquired during the second time interval whose levels exceed a set threshold value as possible overruns;
storing the possible overruns in an overrun indicator;
reading systematically the overrun indicator; and
checking the signals which have caused the overruns.

5,200,928
METHOD FOR USING MODE CONVERTED P- TO S-WAVE DATA TO DELINEATE AN ANOMALOUS GEOLOGIC STRUCTURE
Mark K. MaCleod, Houston, Tex., assignor to Chevron Research and Technology Company, San Francisco, Calif.
Filed Nov. 7, 1991, Ser. No. 789,229
Int. Cl.[5] G01V *1/00*
U.S. Cl. 367—27 3 Claims

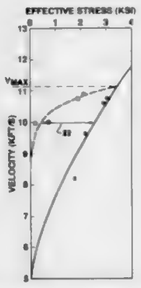
1. A method of using mode converted pressure, P- to S-shear wave data to delineate the surface of a geologic unit having an anomalous velocity, comprising the steps of:
(a) fixedly attaching at least two seismic sensors to the outside of a tubing means, said tubing means having a top end and a bottom end, each said sensor having three orthogonal axes of sensitivity;
(b) lowering said bottom end of said tubing means into a wellbore which penetrates said geologic unit and determining the depth of each of said sensors;
(c) calculating said orientations of each of said axes, with respect to an Earth based reference;
(d) causing at least one seismic wavefields to emanate from at least one seismic source points wherein said seismic wavefields are propagated through said geologic unit and the surrounding earth, so that a wavefield encounters said geologic unit at a non-normal incidence angle to generate a converted S- wave, and is observed at said orthogonal axes of sensitivity at said sensors;
(e) separately recording said observed wavefields along each of said orthogonal axes at each of said sensors;
(f) determining said incidence angle ϕ_p of said direct arrival wave;
(g) determining said incidence angle ϕ_s of said converted S-wave, where

$$\phi_s = \sin^{-1}(dt/dz) * Vs;$$



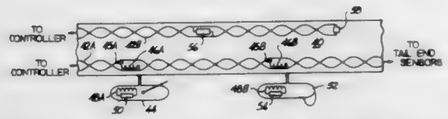
wherein dt is the difference in arrival time of the mode converted shear wave, and wherein dz is equal to the difference in depth between the sensors, and wherein Vs is equal to the shear wave salt velocity;
(h) determining the intersection point of each converted S-wave raypath with the raypath of each direct arrival;
(i) determining the length of said raypaths;
(j) determining the travel times along said converted S-wave raypaths and along said direct arrival raypaths by dividing said length of each raypath by the respective velocity of such raypath; and
(k) determining a point on the interface of said geologic unit with said surrounding earth by comparing the difference between said raypath travel times with the difference between the recorded arrival times of said converted S-wave and said direct arrival wave.

5,200,929
METHOD FOR ESTIMATING PORE FLUID PRESSURE
Glenn L. Bowers, Cypress, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Mar. 31, 1992, Ser. No. 860,930
Int. Cl.[5] G01V *1/30*
U.S. Cl. 367—38 7 Claims



1. A method for estimating the pore fluid pressure at a specified location in a subterranean formation, said location being in a velocity reversal zone resulting from unloading, said method comprising the steps of:
(a) estimating the approximate sonic velocity at said location in said subterranean formation;
(b) estimating the overburden stress at said location in said subterranean formation;
(c) estimating the approximate relationship between effective stress and sonic velocity within said velocity reversal zone taking into account any hysteresis effects resulting from said unloading of said subterranean formation;
(d) computing the effective stress at said location in said subterranean formation from said approximate sonic velocity and said approximate relationship between effective stress and sonic velocity; and
(e) subtracting said effective stress from said overburden stress to obtain said pore fluid pressure.

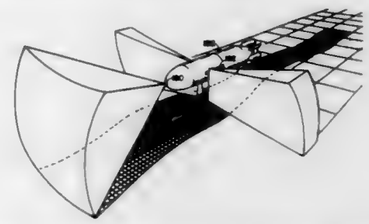
5,200,930
TWO-WIRE MULTI-CHANNEL STREAMER COMMUNICATION SYSTEM
Robert E. Ronquette, Kenner, La., assignor to The Laitram Corporation, Harahan, La.
Filed Jan. 24, 1992, Ser. No. 825,007
Int. Cl.[5] G01V *1/22*
U.S. Cl. 367—76 25 Claims



1. For use in a seismic streamer system including a streamer cable with a plurality of sensors disposed therealong at individual sensor locations and a signal line for conveying signals to and from the sensors, a multi-channel communication system, comprising:
a central controller having means for transmitting first message signals on at least one outboard signal channel over the signal line,
message coupling means connected across the signal line at each sensor location for coupling message signals between the signal line and each sensor, and
communication means in each of the sensors and coupled to the signal line through said message coupling means for receiving the first message signals and for transmitting second message signals on at least one inbound signal channel over the signal line, said outbound signal channel being different from said inbound signal channel,
said channel controller further having means for receiving the second message signals,
said message coupling means further having electrical properties producing a signal line characteristic characterized by a peaked minimum loss and maximum group delay region centered about a resonant frequency and a relatively constant loss and group delay region substantially above the resonant frequency,
said outbound and inbound signal channels being within said relatively constant loss and group delay region.

5,200,931
VOLUMETRIC AND TERRAIN IMAGING SONAR
James G. Kosalos, Kirkland; Stephen J. Szender; James L. Roberts, both of Seattle, and John D. Schlatter, Edmonds, all of Wash., assignors to Alliant Techsystems Inc., Edina, Minn.
Filed Jun. 18, 1991, Ser. No. 717,353
Int. Cl.[5] G01S *15/89*
U.S. Cl. 367—88 34 Claims

1. A sonar system for imaging a volumetric area, comprising:
transmission means for insonifying the volumetric area with acoustic signals;
a receiver array including at least three elements for receiving a plurality of backscatter acoustic signals reflected from structures within the volumetric area and for generating electrical signals corresponding to the reflected backscatter signals, the elements being distributed within a receiver plane parallel to the face of the receiver array such that at least two elements are separated in a horizontal direction and at least two elements are separated in a vertical direction;
means for generating timing data indicative of the time delay between transmission of an acoustic signal from the transmission means and reception of reflected backscatter signals associated with the acoustic signal at the receiver means;
means for generating magnitude data as a function of the amplitude of the reflected backscatter signals; and
processor means for refining the reflected backscatter signals, the processor means including:



means for generating vertical angle data as a function of vertical differential phase measurements of the electrical signals corresponding to the reflected backscatter signals received by the vertically displaced elements, the vertical angle data being indicative of the vertical angle between the backscatter signals and a vertical reference plane oriented normal to the receiver plane;
means for generating horizontal angle data as a function of horizontal differential phase measurements of the electrical signals corresponding to the reflected backscatter signals received by the horizontally displaced elements, the horizontal angle data being indicative of the horizontal angle between the backscatter signals and a horizontal reference plane oriented normal to the receiver plane; and
means for steering the magnitude data for each of the plurality of backscatter signals to a particular pixel within the insonified volumetric area as a function of the timing data, the vertical angle data, and the horizontal angle data associated with each backscatter signal so that a three-dimensional histogram of backscatter magnitudes as a function of location is formed.

5,200,932
UNDERWATER AUDIBLE SIGNALLING DEVICE
Bo H. G. Ljung, 32 Hemlock Ter., Wayne, N.J. 07470
Filed Jan. 17, 1992, Ser. No. 822,095
Int. Cl.[5] H04R *15/00*
U.S. Cl. 367—174 7 Claims

1. A device for projecting audible sound waves into a surrounding body of water comprising:
a housing forming a liquid-filled chamber therein; and
a diaphragm enclosing said chamber; and
means for vibrating said diaphragm; and
said vibrations projecting sound waves into said surrounding body of water and into said chamber; and
means for containing said sound waves inside said chamber; and
means for rendering said liquid in said chamber effectively compressible; and

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below the storage medium so as to couple the light beam

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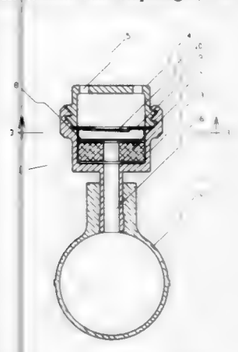
said means for containing sound waves in said chamber and said means for rendering said liquid compressible in said chamber comprise a compressible absorber incorporated in said chamber;

said means for vibrating said diaphragm comprise a valve in communication with said diaphragm; and



means to introduce liquid under pressure, into said chamber causing said valve to vibrate; and

said valve comprises a reed partially closing an opening in said diaphragm; and means to affix one end of said reed to said diaphragm.

5,200,933

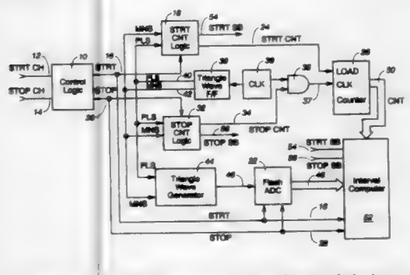
HIGH RESOLUTION DATA ACQUISITION

Glenn W. Thornton, and Kenneth R. Fuller, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 28, 1992, Ser. No. 889,565

Int. Cl.[5] **G04F** *8/00, 10/00*

U.S. Cl. 368—113 **13 Claims**



1. Apparatus for high resolution event interval timing, comprising:

clock means for generating a clock pulse train;

triangle wave means for generating an analog triangle wave having an amplitude and slope functionally related to time elapsed during each clock pulse in said train;

converter means for forming a first digital value of said amplitude and slope of said triangle wave at the start of said event interval and a second digital value of said amplitude and slope of said triangle wave at the end of said event interval;

counter means for counting said clock pulse train during said event interval to form a gross event interval time; and

a computer for combining said gross event interval time and said first and second digital values to output a high resolution value for said event interval.

5,200,934

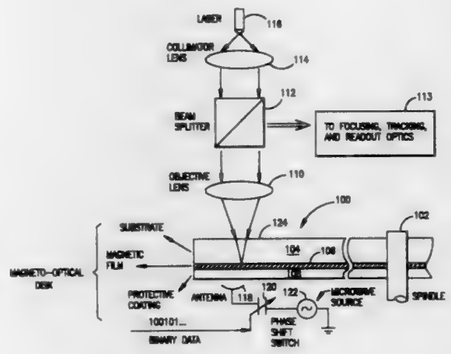
METHOD AND APPARATUS FOR DIRECT OVERWRITE ON MAGNETO-OPTICAL RECORDING MEDIA USING CIRCULARLY POLARIZED MICROWAVES

Masud Mansuripur, Tucson, Ariz., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Feb. 6, 1991, Ser. No. 651,565

Int. Cl.[5] **G11B** *11/12, 13/00, 13/04*

U.S. Cl. 369—13 **26 Claims**



1. A method for direct overwriting of data on a rotating magneto-optical disk, comprising the steps of: providing said rotating magnetooptical disk;

operating a laser beam to impinge on a desired area of the magneto-optical disk on which data is to be directly overwritten;

activating a source of polarized microwave radiation at a predetermined time such that said source of polarized microwave radiation irradiates the desired area at the same time as said laser beam impinges on said desired area of said magneto-optical disk on which data is to be directly overwritten; and

using the data to be written to control the polarization of said microwave radiation irradiated by said microwave source such that the data is directly overwritten existing data on the magneto-optical disk.

8. The method of claim **1**, wherein said laser beam is operated in a pulsed mode.

18. A magneto-optical disk drive system comprising a rotating magneto-optical disk and a laser beam system for heating predetermined selected areas on said magneto-optical disk for recording data on said magneto-optical disk and an apparatus for accomplishing direct overwriting of data on said magneto-optical disk, said apparatus comprising:

a source of polarized microwave radiation located in such proximity to said magneto-optical disk that the microwave radiation irradiated by said source of polarized microwave radiation impinges on said area of said magneto-optical disk wherein said area contains existing data and is desired to be overwritten with new data to be recorded; and

a phase shift switch connected to said source of polarized microwave radiation such that the state of said polarized microwave radiation can be changed by said data to be recorded.

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RECORDING APPARATUS USING MAGNETO-OPTICAL EFFECT INCLUDING CONTROL MEANS FOR INHIBITING ENERGIZING OF THE LIGHT BEAM GENERATING MEANS IN RESPONSIVE TO CODED DATA

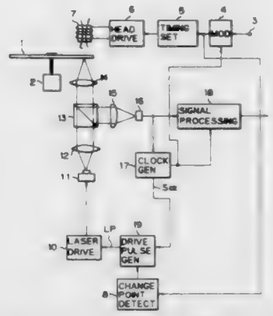
Tetsu Watanabe, Tokyo, and Tamotsu Yamagami, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 608,744

Claims priority, application Japan, Nov. 21, 1989, 1-302369

Int. Cl.[5] **G11B** *13/04, 11/12*

U.S. Cl. 369—13 **7 Claims**



1. A magneto-optical recording apparatus, comprising:

means for generating a light beam for irradiating a region of a magneto-optical disc;

means for producing a magnetic field acting on said region of the magneto-optical disc;

means for providing input data to be recorded;

modulating means for modulating said input data in accordance with a predetermined modulation system so as to provide coded data having a minimum length (Tmin) between transitions thereof and a window margin (Tw) determined by said modulation system;

means for transmitting and supplying said coded data to said magnetic field producing means so that said magnetic field is modulated in accordance with said coded data;

means for generating reference clocks;

light beam driving means operative in response to said reference clocks to provide drive pulses for energizing said means for generating said light beam to intermittently irradiate said region of the disc; and

control means responsive to said coded data for inhibiting said energizing of said means for generating the light beam at times corresponding to all of said transitions in said coded data when the ratio Tmin/Tw is greater than 1.

5,200,936

MAGNETO-OPTIC METHOD AND APPARATUS FOR RECORDING AND RETRIEVING HIGH-DENSITY DIGITAL DATA

Rolf Allenspach, Adliswil, and Andreas Bischof, Zurich, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1990, Ser. No. 571,796

Claims priority, application European Pat. Off., Jan. 9, 1990, 90810017.5

Int. Cl.[5] **G11B** *7/135, 13/04*

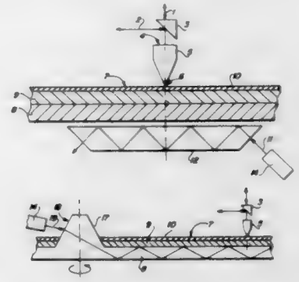
U.S. Cl. 369—13 **5 Claims**

1. A method for optically retrieving data from a storage medium, the storage medium including a recording layer, the method comprising the steps of:

generating a light beam;

directing the light beam such that the light beam is initially incident upon an inclined face of a prism to transmit a light wave therein, the prism arranged at such a short distance below the storage medium so as to couple the light beam into the recording layer;

transmitting the light beam through the recording layer and then through an opening at the apex of a sharply pointed tip, wherein the sharply pointed tip provides high lateral resolution probing of the light beam; and



passing the light beam through a polarization beam splitter to separate the p- and s-components thereof and detect the rotation of polarization resulting from the light beam transmitting through the recording layer.

5,200,937

APPARATUS FOR AND METHOD OF RECORDING AND/OR REPRODUCING INFORMATION BY MEANS OF TWO ACTUATORS

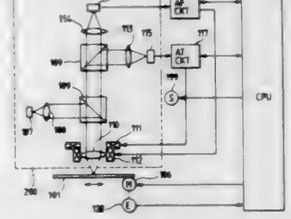
Hideki Hosoya, Kawasaki, and Satoshi Shikichi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 835,063, Feb. 18, 1992, abandoned, which is a continuation of Ser. No. 473,598, Feb. 1, 1990, abandoned. This application Jul. 23, 1992, Ser. No. 917,737

Claims priority, application Japan, Sep. 29, 1988, 63-242425; Sep. 29, 1988, 63-242426; Feb. 3, 1989, 1-024003

Int. Cl.[5] **G11B** *7/00*

U.S. Cl. 369—32 **48 Claims**



1. An apparatus for effecting recording and/or reproduction of information by illuminating with a light beam a recording medium having a plurality of tracks each of which is divided along its length into a recording area and an area excluding said recording area, said apparatus comprising:

a motor for moving said medium and said light beam relative to each other along the length of said tracks;

a first actuator for moving said light beam in a direction transverse to said tracks;

an optical head provided with said first actuator;

a second actuator for moving said optical head in a direction transverse to said tracks;

a first control circuit for moving said light beam to a particular track from a track on which said light beam is positioned by means of said first actuator; and

a second control circuit for moving said optical head in the same direction as that of movement of said light beam at a

predetermined timing when said light beam is positioned

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magnet being held on said fixed unit in confronting relation to said one of said coil and said magnet so as to form a part of said magnetic circuit; and

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FOCUS ADJUSTING APPARATUS FOR AN OPTICAL PICKUP APPARATUS

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predetermined timing when said light beam is positioned in said area excluding said recording area of said track.

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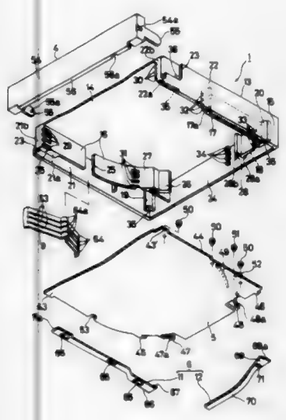
DISK MAGAZINE AND DISK LOADING DEVICE

Yoshiyuki Akiyama, and Nobuyuki Hara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP89/00229, § 371 Date Oct. 27, 1989, § 102(e) Date Oct. 27, 1989, PCT Pub. No. WO89/08918, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 3, 1989, Ser. No. 444,142
Claims priority, application Japan, Mar. 7, 1988, 63-53178; Aug. 16, 1988, 63-203562
Int. Cl.[5] G11B *17/22*
U.S. Cl. 369—36 10 Claims



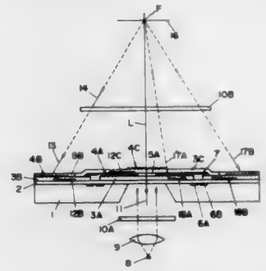
1. A disk magazine capable of accommodating a plurality of disks used for recording and reproducing information, in a vertical direction and in such a way as to be in layers and spaced away from one another; having an opening for taking out the disks in one side thereof; and capable of detachably mounting on an apparatus for recording and/or reproducing information, the disk magazine comprising:
a pivoted lid for closing said opening; and
a plurality of disk pushing means for pushing out said respective disks accommodated in said disk magazine by a predetermined projection amount through said opening by means of pressing a pressed portion thereof, which is arranged near said opening on said one side, said lid also covering said pressed portion when said lid is in a closed condition.

5,200,939

OPTICAL HEAD APPARATUS INCLUDING A WAVEGUIDE LAYER WITH CONCENTRIC OR SPIRAL PERIODIC STRUCTURE

Seiji Nishiwaki, Katano; Yoshinao Taketomi, Moriguchi; Shinji Uchida, Osaka; Takaaki Tomita, Moriguchi, and Junichi Asada, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/00796, § 371 Date Apr. 4, 1991, § 102(e) Date Apr. 4, 1991, PCT Pub. No. WO90/01768, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 2, 1989, Ser. No. 474,757
Claims priority, application Japan, Aug. 5, 1988, 63-196583; Jun. 30, 1989, 1-170123
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] G11B *7/00*; G02B *6/34, 27/42*
U.S. Cl. 369—44.12 18 Claims



1. An optical head apparatus including a converging means, said converging means comprising:
a first waveguide layer having a central region;
a first concentric or spiral periodical structure formed on said first waveguide layer around said central region;
a laser beam source for generating a laser beam;
coupling means, having a center axis, for guiding said laser beam emitted from said laser beam source to a cross point between said center axis and said first wave-guide layer within said central region of said first waveguide layer,
said first waveguide layer converting said laser beam into waveguide light and leading said waveguide light from said central region to said periodical structure which causes said waveguide light to be radiated outside of said first waveguide layer so as to be converged to at least one converging point outside of said first waveguide layer.

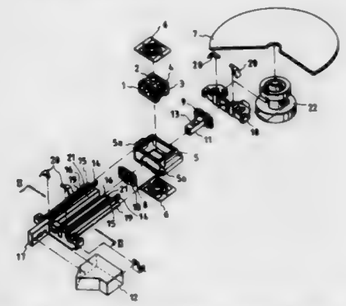
5,200,940

OPTICAL UNIT ACTUATOR FOR INFORMATION RECORDING/REPRODUCING APPARATUS

Shoji Goto; Ichiro Kawamura, and Hiroshi Yamamoto, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 13, 1991, Ser. No. 654,461
Claims priority, application Japan, Feb. 13, 1990, 2-32048
Int. Cl.[5] G11B *7/12*
U.S. Cl. 369—44.15 6 Claims

1. An optical unit actuator for an information recording/reproducing apparatus, comprising:
an optical unit including an objective lens and displaceable in a predetermined direction relative to a recording medium;
a fixed unit immovable as against the displacement of said optical unit, said fixed unit including a magnetic circuit;
an electromagnetic drive mechanism including at least one coil and a magnet cooperative with said coil to drive said optical unit in said predetermined direction relative to said recording medium, one of said coil and said magnet being fixed to said optical unit, the other of said coil and said magnet being held on said fixed unit in confronting relation to said one of said coil and said magnet so as to form a part of said magnetic circuit; and
an elastic support means disposed between said other of said coil and said magnet and said fixed unit for substantially



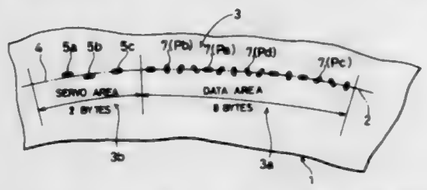
taking up vibration caused by a reaction force produced between said coil and said magnet as a result of acceleration produced when said optical unit including an objective lens moves in said predetermined direction relative to said recording medium.

5,200,941

OPTICAL RETRIEVAL SYSTEM FOR ENCODING PIT ANGULAR DATA AND OPTICAL RECORDING ELEMENT THEREOF

Hirotsugu Matoba, Sakurai; Toshihisa Deguchi, Nara; Shigeo Terashima, Tenri, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Abeno, Japan

Filed Dec. 19, 1989, Ser. No. 453,927
Claims priority, application Japan, Dec. 27, 1988, 63-330952
Int. Cl.[5] G11B *7/00, 7/24*
U.S. Cl. 369—44.26 3 Claims



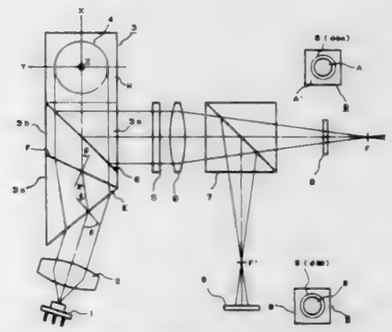
1. An optical recording element for storing information comprising:
a substrate with a recording surface on one side thereof having a plurality of track elements extending end to end in a track direction; and,
a plurality of elongated bits disposed within each of said track elements and coplanar with the recording surface wherein information is recorded according to an angle of each of said pits within a full range of 360 degrees with respect to the track direction;
wherein each track element includes a servo sector and a data storage sector;
wherein each data storage sector has a storage capacity of 8 bytes and each servo sector has a storage capacity of 2 bytes; and
wherein information is stored in each data storage sector using four types of elongated pits at angles of 0°, 90°, substantially 45° in a clockwise direction and substantially 45° in a counterclockwise direction with respect to the track direction.

5,200,942

FOCUS ADJUSTING APPARATUS FOR AN OPTICAL PICKUP APPARATUS

Nobuhiko Hosobata; Yukio Yoshikawa, and Masaaki Takagi, all of Tokyo, Japan, assignors to Copal Company Ltd., Tokyo and Fujitsu Ltd., Kanagawa, both of Japan

PCT No. PCT/JP90/01325, § 371 Date Jul. 30, 1991, § 102(e) Date Jul. 30, 1991, PCT Pub. No. WO91/06097, PCT Pub. Date May 2, 1991
PCT Filed Oct. 15, 1990, Ser. No. 689,282
Claims priority, application Japan, Oct. 14, 1989, 1-267519; Oct. 19, 1989, 1-272066
Int. Cl.[5] G11B *7/09*
U.S. Cl. 369—44.41 8 Claims



1. A focus adjusting apparatus of an optical pickup apparatus in which light focused on a recording medium by a focusable objective lens and reflected on the recording medium is concentrated to first and second focuses through said objective lens, a focusing lens and an optical divider, and including
a first optical detector disposed before the first focus and
a second optical detector disposed after the second focus,
whereby said objective lens is servo-controlled by outputs of said first and second optical detectors, wherein
said first optical detector includes a central light receiving plane having an optical axis of said first optical detector centered therein and having a smaller area than that of a light spot irradiated by said focusing lens and a peripheral light receiving plane disposed at the periphery of said central light receiving plane and having a larger area including said central light receiving plane than that of the light spot,
said second optical detector includes a central light receiving plane having an optical axis of said second optical detector centered therein and having a smaller area than that of a light spot irradiated by said focusing lens and a peripheral light receiving plane disposed at the periphery of said central light receiving plane and having a larger area including said central light receiving plane than that of the light spot,
said focus adjusting apparatus comprising
means for calculating a ratio of a quantity of received light of said central light receiving plane to the whole quantity of received light of said central light receiving plane and said peripheral light receiving plane of said first optical detector,
means for calculating a ratio of a quantity of received light of said central light receiving plane to the whole quantity of received light of said central light receiving plane and said peripheral light receiving plane of said second optical detector, and
servo driving means for controlling said objective lens so that a difference between the ratio of the quantity of received light of said central light receiving plane to the whole quantity of received light of said central light receiving plane and said peripheral light receiving plane of

said first optical detector and the ratio of the quantity of received light of said central light receiving plane to the

ing at least image data or computer data as a main data, which comprises:

an optical means for accessing data from the optical data storage disk; and

containing a minority of the radiation being reflected from the first surface toward data signal receiving means and

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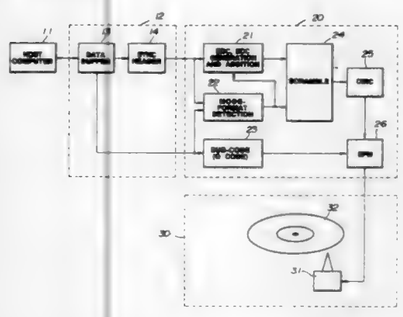
said first optical detector and the ratio of the quantity of received light of said central light receiving plane to the whole quantity of received light of said central light receiving plane and said peripheral light receiving plane of said second optical detector is reduced to 0.

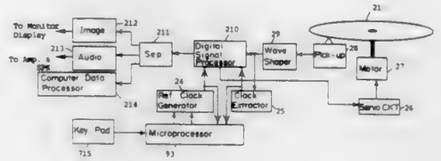
5,200,943
METHOD AND APPARATUS FOR CONTROLLING ENCODING AND RECORDING OF MAIN INFORMATION DATA IN ACCORDANCE WITH DIFFERENT DETECTED DATA FORMATS OF THE MAIN INFORMATION DATA
Tatsushi Sano, Kanagawa, and Tatsuya Inokuchi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sep. 28, 1990, Ser. No. 590,227
Claims priority, application Japan, Oct. 2, 1989, 1-257564
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—48 **11 Claims**



6. An optical disc recording system for recording on an optical disk record information composed of a data block of a predetermined number of bytes of data which include main information having a plurality of formats and a subsidiary information associated with the main information, the subsidiary information having a synchronizing part located at a leading end of each data block, wherein the system comprises:
an input section for annexing to the main information and a subsidiary information associated with the main information, a header part and a synchronizing part, which includes a discriminative information for discriminating various formats of the main information, to thereby produce corresponding output signals;
an encoding circuit section for encoding output signals supplied from the input section on the basis of the discriminative information to thereby generate the record information; and
a recording device supplied with the record information from the encoding circuit section to effect recording of the record information on a recordable optical disc.

5,200,944
DISC PLAYBACK APPARATUS FOR REPRODUCING SEQUENTIALLY RECORDED DIGITAL DATA
Yasuhito Souma, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 17, 1991, Ser. No. 686,389
Claims priority, application Japan, Apr. 18, 1990, 2-101924
Int. Cl.[5] G11B *20/10*
U.S. Cl. 369—48 **6 Claims**

1. A disc playback apparatus for reproducing data from a disc having recorded sequentially thereon digital data including at least image data or computer data as a main data, which comprises:
a single motor operable to rotate the disc;
a pick-up assembly operable to read the data from the disc and to output an electrical signal corresponding thereto;
a wave shaping means for shaping the electrical signal output from the pick-up assembly into a pulse signal and for outputting the pulse signal;
a clock extracting means for receiving the pulse signal from the wave shaping means and for extracting a playback clock signal from the pulse signal;
a reference clock generating means for outputting a reference clock signal and a reference clock signal control means for continuously varying a frequency of the reference clock signal;
a switching means adapted to be externally switched on and off;
wherein said reference clock control means controls the reference clock generating means so that the frequency of the reference clock signal is increased when the switching means is switched on, but is decreased when the switching means is switched off;
a rotation servo means for controlling the spindle motor so

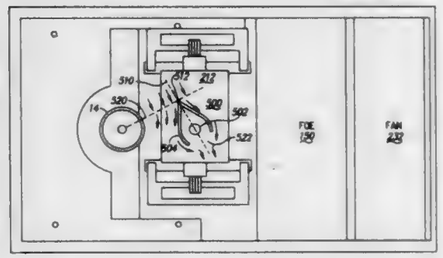


that the frequency of the playback clock signal outputted from the clock extracting means is consistent with the frequency of the reference clock signal outputted from the reference clock generating means;
a digital signal processing means for receiving the pulse signal outputted from the wave shaping means, the playback clock signal outputted from the clock extracting means and the reference clock signal outputted from the reference clock generating means and for latching data from the pulse signal on the basis of the playback clock signal, and for subjecting the latched data to a first process and to output the data after being processed by the first process, according to the reference clock signal; and
a processing and outputting means for receiving data outputted from the digital signal processing means and for subjecting the data attributes to a second process and then to output the data after being processed by the second process.

5,200,945
OPTICAL DATA STORAGE SYSTEM WITH AIRFLOW DEFECTING MEMBER
Edward M. Engler, San Jose; Stephen L. Heesacker, Sunnyvale; David A. Holmstrom, and Byron S. Lee, both of San Jose, all of, Calif. assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 7, 1992, Ser. No. 817,720
Int. Cl.[5] G11B *33/02*
U.S. Cl. 369—99 **30 Claims**

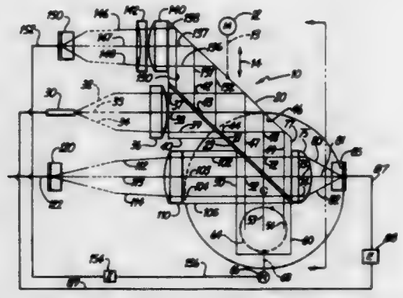
1. An optical data storage system comprising:
a means for receiving an optical data storage disk;
a means for rotating the optical data storage disk;

an optical means for accessing data from the optical data storage disk; and



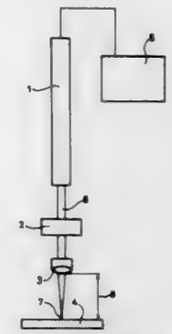
an airflow means located between the optical means and the rotating disk for diverting an airflow generated by the rotating disk away from the optical means.

5,200,946
SIMPLE MAGNETO-OPTIC REWRITABLE HEAD FOR ROUGHEDIZED ENVIRONMENTS
Bernard S. Fritz, Egan, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 2, 1991, Ser. No. 771,042
Int. Cl.[5] G11B *7/135*
U.S. Cl. 369—112 **15 Claims**



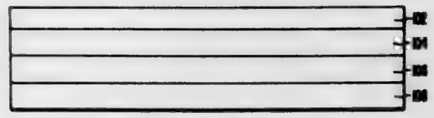
1. Optical apparatus for use in reading and writing data onto a recording medium comprising:
prism means having first, second, third and fourth surfaces, the first surface having polarizing beam splitting material thereon which material is highly reflective to radiation polarized in a first sense while transmissive to a majority of radiation polarized in a second sense, the second surface being highly reflective to radiation, the third and fourth surfaces being radiation transmissive;
first means for transmitting a beam of polarized radiation as an input and arranged so that a majority of the input passes to a first portion of the first surface and through the beam splitting material into the prism as radiation polarized in the second sense and thence to the second surface where it is reflected back to a second portion of the first surface where it is split into first and second beams, the first beam containing the majority of the radiation is transmitted out of the prism as a first output and the second beam containing a minority of the radiation is reflected to the third surface where it is transmitted out of the prism to power monitoring means;
second means for transmitting the first output beam to the recording medium for use in recording data thereon and for receiving radiation reflected therefrom containing information recorded on the medium, the second means transmitting the reflected radiation to the first surface where it is split into third and fourth beams, the third beam containing a minority of the radiation being reflected from the first surface toward data signal receiving means and the fourth beam containing the majority of the radiation being transmitted through the beam splitting material and through the prism to the second surface for reflection to the fourth surface where it is transmitted out of the prism toward focus detecting means.

5,200,947
OPTICAL RECORDING MEDIUM, OPTICAL RECORDING METHOD, AND OPTICAL RECORDING DEVICE USED IN METHOD
Toshimi Satake; Tomoaki Nagai; Hiroshi Fukui; Akio Sekine, and Miyuki Yokoyama, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan
Division of Ser. No. 474,932, Feb. 5, 1990, Pat. No. 5,100,711.
This application Dec. 20, 1991, Ser. No. 811,114
Claims priority, application Japan, Feb. 3, 1989, 1-25462; Feb. 9, 1989, 1-30677; Aug. 30, 1989, 1-223850
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—275.1 **2 Claims**



1. A method for optical recording by a laser beam which comprises the step irradiating an optical recording medium with a laser beam condensed by a condenser having a focal length of 0.5 mm or more and a numerical aperture (N.A.) of 0.1 to 0.5, said optical recording medium being composed of a hydrophilic substrate, a light-absorbing layer containing a near infrared absorbent, and a heat-sensitive color-developing layer containing a basic dye and an organic developer, said layers being superposed on said substrate.

5,200,948
RECORDING METHOD AND APPARATUS
Paul R. Goldberg, Palo Alto; Bryan K. Clark, Sunnyvale; Joel D. Finegan, Campbell, and Robert Guerra, Santa Clara, all of Calif., assignors to Tandy Corporation, Ft. Worth, Tex.
Continuation-in-part of Ser. No. 153,288, Feb. 5, 1988, abandoned. This application Jan. 10, 1989, Ser. No. 294,723
Int. Cl.[5] G11B *7/24*
U.S. Cl. 369—284 **72 Claims**



1. A recording medium comprising:
a first layer, said first layer forming a detectable deformation when heated;
a second, reflective layer adjacent to said first layer; and

a third layer adjacent said second layer, opposite said first layer, said third layer remaining substantially deformed

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5,200,950
METHOD AND CIRCUIT ARRANGEMENT FOR

5,200,951

scribers at others of said endpoint nodes during respective

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a third layer adjacent said second layer, opposite said first layer, said third layer remaining substantially deformed when said first layer is cooled;

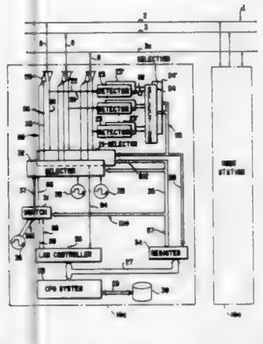
wherein said second layer optically isolates said first layer from said third layer.

5,200,949

LINK CHANGEOVER CONTROL SYSTEM FOR LOCAL AREA NETWORK OF BROADCASTING ARRANGEMENT

Seiichi Kobayashi, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 8, 1991, Ser. No. 697,163
Claims priority, application Japan, May 14, 1990, 2-121377
Int. Cl.[5] H04J 3/14
U.S. Cl. 370—16 10 Claims



1. A link changeover control system for a LAN of a broadcasting arrangement having a plurality of node stations connected by an active LAN link path through which communication is normally held and a plurality of spare LAN link paths, wherein each of said node stations comprises:

transmission means for transmitting a communication signal;

reception means for receiving the communication signal;

pilot signal insertion means for inserting a pilot signal into the communication signal, said pilot signal indicating an effective LAN link path;

means for detecting the pilot signal inserted in the communication signal; and

link path changeover means for changing said active LAN link path to one of said spare LAN link paths when said pilot signal has become undetectable from said active LAN link path; wherein

the pilot signal is inserted into the communication signal transmitted over said active LAN link path by said pilot signal insertion means of one of said plurality of node stations having control as a master supervisor, and the inserted pilot signal is detected by pilot signal detection means of other node stations having no control as the master supervisor, wherein said active LAN link path is maintained to be used for communication by detection of said pilot signal; and

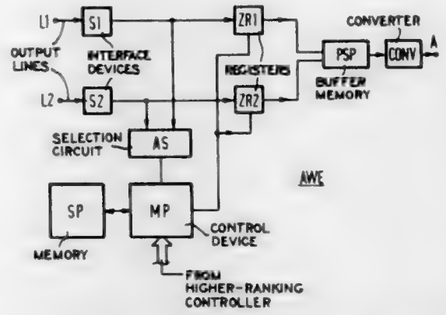
when the pilot signal becomes undetectable in said active LAN link path at least by one of said other node stations, said link path changeover means of said master supervisor node station changes the link path used for communication from said active LAN link path to one of said spare LAN link paths by inserting said pilot signal into said communication signal transmitted on said one of said spare LAN link paths and, at the same time, said link path changeover means of said other node stations change the link path used for communication from said active LAN link path to said one of said spare LAN link paths wherefrom the pilot signal has become detectable.

5,200,950

METHOD AND CIRCUIT ARRANGEMENT FOR REDUCING THE LOSS OF MESSAGE PACKETS THAT ARE TRANSMITTED VIA A PACKET SWITCHING EQUIPMENT

Andreas Foglar, and Peter Rau, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,360
Claims priority, application European Pat. Off., Apr. 27, 1990, 90108055.6
Int. Cl.[5] H04L 1/22
U.S. Cl. 370—16 7 Claims



1. In a method for forwarding message packets transmitted from offering trunks onto serving lines via virtual connections during asynchronous transmission of said message packets, each message packet having a packet header which identifies a respective virtual connection through packet switching equipment comprising a plurality of redundant switching matrices, in which a message packet group having a plurality of identical message packets corresponding in number to the number of redundant switching matrices is formed by duplication of each of the message packets transmitted on one of the offering trunks in the course of a virtual connection, in which an identical auxiliary identifier, which is changed for each of the successive message packet groups, is attached to each message packet of a message packet group, in which the message packets of a message packet group are separately transmitted across the redundant switching matrices in the direction of the serving lines defined by respective virtual connections, and in which only one of the message packets of a message packet group is forwarded to the serving line defined by the virtual connection after such a transmission across the redundant switching matrices on the basis of the auxiliary identifier respectively attached to the message packets, the improvement wherein:

after the separate transmission of the message packets of one of said message packet groups respectively across the redundant switching matrices towards the defined serving line and checking for transmission faults, forwarding a first-arriving faultlessly-transmitted message packet of said one message packet group whose message packets have the auxiliary identifier that is the next following the auxiliary identifier of the most recently-transmitted message packet;

identifying one of said plurality switching matrices via which the transmission of the message packets occurs the slowest; and

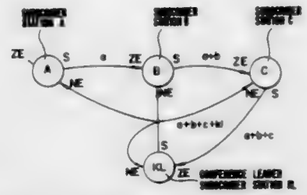
forwarding to the defined serving line the message packets that ar faultlessly transmitted as the first of their respective message packet group via said slowest switching matrix.

5,200,951

APPARATUS AND METHOD FOR TRANSMITTING MESSAGES BETWEEN A PLURALITY OF SUBSCRIBER STATIONS

Alfred Grau, Zurich; Max Loder, Bonstetten, and Hanspeter Küpfer, Birmensdorf, all of Switzerland, assignors to Siemens-Albis AG, Zurich, Switzerland

Continuation of Ser. No. 573,815, Aug. 28, 1990, abandoned.
This application Jun. 30, 1992, Ser. No. 908,547
Claims priority, application Switzerland, Sep. 12, 1989, 03326/89
Int. Cl.[5] H04M 3/56; H04Q 11/02
U.S. Cl. 370—62 33 Claims



1. A method for transmitting information between a plurality of subscriber stations using selected modulated carrier frequencies, comprising the steps of:

forming a transmission chain of all participating subscriber stations;

establishing a connection for a simultaneous communication between at least three of the subscriber stations;

supplying all of the subscriber stations, except for a first subscriber station, with a user signal of a preceding subscriber station in the transmission chain;

adding in each subscriber station the user signal of the proceeding subscriber station to produce a compound signal;

forwarding the compound signal to a subscriber station that is next on the transmission chain, wherein the compound signal that is generated in a last subscriber station of the transmission chain is supplied to all subscriber stations participating in the simultaneous communication connection; and

transmitting compound user signals, between the subscriber stations, and the compound signal, generated in the last subscriber station and supplied to all the subscriber stations, on an available selected carrier frequency that is different for each compound signal.

5,200,952

ADAPTIVE VCP CONTROL IN INTEGRATED SERVICES NETWORKS

Simon Bernstein, Reston, Va., and Mark Jurkevich, Burtonsville, Md., assignors to Sprint International Communications Corp., Reston, Va.

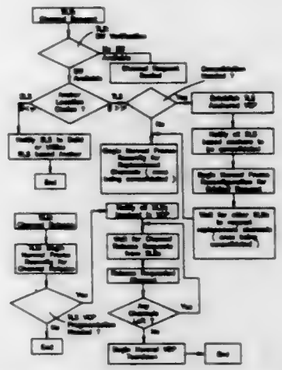
Filed Mar. 28, 1991, Ser. No. 676,540
Int. Cl.[5] H04J 3/16
U.S. Cl. 370—79 29 Claims

1. A method of establishing call connections for information transmission between a multiplicity of subscribers as components of traffic in an integrated services network (ISN), in which subscribers are located at endpoint nodes of the ISN, the ISN includes transit nodes interconnecting separate links of the ISN, and the information traffic consists of a multiplicity of media types according to the different subscribers including voice, video and data traffic component types, said method comprising the steps of

establishing call connections as virtual circuits (VCs) between subscribers among the various endpoint nodes of said ISN as necessary to accommodate desired information transmissions,

assembling a plurality of traffic component types, in the form of portions of information streams to be transmitted from subscribers at an endpoint node of said ISN to subscribers at others of said endpoint nodes during respective call connections between subscribers, into each of a sequence of composite frames of variable size for transmission through the ISN,

limiting the traffic component types assembled into any given one of said composite frames at one endpoint node to those destined for subscribers at the same one of other endpoint nodes of the ISN, so that each composite frame is transmitted between a fixed pair of the endpoint nodes,



anchoring a logical connection at each endpoint node of said pair as a virtual circuit path (VCP) between said pair of endpoint nodes to accommodate a multiplicity of VCs therebetween, and

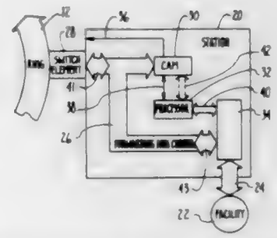
shifting the location of the anchor of a VCP at an endpoint node to adapt to changes in the flow of information traffic for subscribers thereat.

5,200,953

METHOD FOR PROGRAMMING A CONTENT ADDRESSABLE MEMORY (CAM)

Charles J. Spatafore, Poway, and Dana P. McCreary, Escondido, both of Calif., assignors to Integrated Networks Corporation, San Diego, Calif.

Filed Oct. 15, 1991, Ser. No. 776,574
Int. Cl.[5] H04J 3/24
U.S. Cl. 370—85.12 21 Claims



1. A system for receiving data from a network destined for addressed facilities at a station on the network which comprises:

a forwarding data channel;

a switch connected to said forwarding data channel interconnecting said station with said network, said switch having an accept configuration for copying data destined for at least one said facility at said station, and a reject configuration for not copying data not destined for at least one said facility at said station back;

a content addressable memory connected to said forwarding

second direction, opposite to the first direction, time slots x, where x is an integer between 1 and n, and (x+n) in each frame

electronic reprographic system for scanning and processing and printing a plurality of jobs, comprising:

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data channel for identifying data properly destined for at least one said facility at said station, said content addressable memory being connected to said switch to appropriately control said switch between said accept configuration and said reject configuration; and

a processor for generating address data indicative of said facilities at said station, and for transmitting said address data to said content addressable memory over said forwarding data channel to update said content addressable memory.

5,200,954

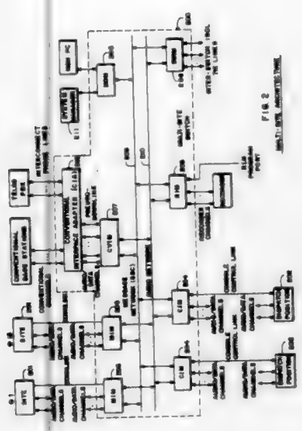
COMMUNICATION LINK BETWEEN MULTISITE RF TRUNKED NETWORK AND AN INTELLIGENT DISPATCHER CONSOLE

James L. Teel, Jr., Goode; Charles P. Brame, Forest; Timothy F. Cree, Forest; Stephen R. Downs, Forest, and Satish Kappagantula, Lynchburg, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Feb. 22, 1991, Ser. No. 658,637

Int. Cl.[5] H04J *3/00*; **H04Q** *7/00*

U.S. Cl. 370—94.1 **3 Claims**



1. A method for communicating data message packets over a communication channel between a multisite switch and a dispatcher console, the multisite switch routing audio communications between a dispatcher console and a mobile RF unit, the multisite switch having a distributed architecture with intelligent interconnected nodes, at least one of said nodes being operatively connected to a dispatcher console, said method comprising the following steps performed by said at least one of said nodes:

a. selecting a sync byte;

b. appending to the sync byte a second byte designating the message type and the number of bytes that follow in the data message;

c. appending to the second byte a data field containing a data message identifier, an identifier of a callee that is a dispatcher console or a mobile RF unit;

d. appending to the data field a sequence byte indicating the sequence of the current packet and last correctly received data packet;

e. appending to the sequence byte a checksum or CRC field to complete a data message packet;

f. transmitting the data message packet from the multisite switch to the dispatcher console.

5,200,955

REPEATER FOR TDMA MOBILE RADIO

David A. McFarlane, Saxmundham, and John R. Ball, Woodbridge, both of England, assignors to British Telecommunications public limited company, Great Britain

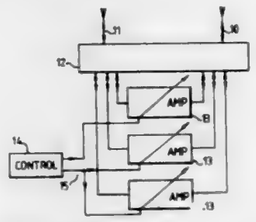
PCT No. PCT/GB89/00413, § 371 Date Oct. 3, 1990, § 102(e) Date Oct. 3, 1990, PCT Pub. No. WO89/10660, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 19, 1989, Ser. No. 601,702

Claims priority, application United Kingdom, Apr. 22, 1988, 8809602

Int. Cl.[5] H04B *3/36*

U.S. Cl. 370—97 **14 Claims**



1. A radio repeater for a frequency b. i having a plurality of RF channels for carrying a plurali of digital TDMA channels each having a sequence of time slots, comprising:

a plurality of single RF-channel amplifier units;

control means for scanning the RF channels to identify an active RF channel and for assigning one of the amplifier units to an identified active channel;

wherein each of the amplifier units has means for identifying an active time-slot of a TDMA channel, within an active RF channel, and for amplifying digital signals in that time slot.

5,200,956

COMMUNICATIONS SYSTEM FOR DATA TRANSMISSION OVER A TIME DIVISION DUPLEX FREQUENCY CHANNEL

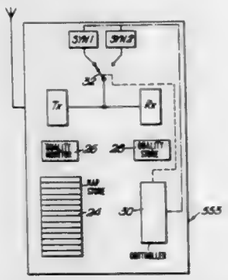
Christopher D. Pudney, Smallfield, and Frank C. G. Owen, Petts Wood, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1990, Ser. No. 528,016

Claims priority, application United Kingdom, May 26, 1989, 8912175

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.1 **14 Claims**



1. A communication system comprising: at least one primary station having a transmitter and receiver and at least one secondary station having a transmitter and receiver, a radio frequency channel providing communication between a primary station and a secondary station with said radio frequency channel divided in the time domain into a succession of frames, each frame comprising 2n time slots, where n is an integer, wherein a sequence comprising the first n of said 2n time slots is allocated for transmission in a first direction between a primary station and a secondary station and another sequence comprising the remaining n time slots is allocated for transmission in a second direction, opposite to the first direction, time slots x, where x is an integer between 1 and n, and (x+n) in each frame of 2n time slots forming a duplex voice channel, wherein each said station includes means for determining the usage of the duplex voice channels and a station wishing to transmit a signal determines which of any available duplex voice channels is acceptable and transmits in its respective time slot, wherein at least one secondary station comprises a map store for storing indicia relating to the usage of the duplex voice channels and control means for determining that the station has a data message for transmission and that the data rate of the message exceeds that of a duplex voice channel, said control means, upon determining that the data rate of the message exceeds that of a duplex voice channel, selects at least one additional duplex voice channel from those which are stored in its map store as being available for use, causing non-identical packets of the data message to be transmitted substantially in parallel in at least two of said duplex voice channels and relinquishing said at least one additional duplex voice channel following transmission of the data message.

5,200,957

MOBILE ASSISTED HANDOFF

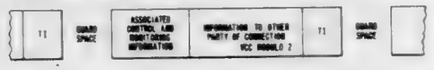
Jan E. A. S. Dahlin, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 498,751, Mar. 26, 1990, abandoned, which is a division of Ser. No. 371,126, Jun. 26, 1989, Pat. No. 5,042,082. This application Jul. 22, 1991, Ser. No. 733,376

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—100.1 **26 Claims**



1. In a cellular mobile radio system of the type in which digital information is communicated bidirectionally between a base station and a plurality of mobile stations over respective digital communication channels, wherein at least two digital communication channels share a common radio channel in a time division multiplex fashion, a method for synchronizing a mobile station and a base station during time slots in which digital information is transmitted bidirectionally between the mobile station and the base station, comprising the steps of:

assigning a first time slot of a radio channel to communications which are to take place from a base station to a mobile station;

assigning a second time slot of a radio channel to communications which are to take place from said mobile station to said base station;

transmitting a multi-bit time slot identifier code during said first time slot to enable said mobile station to identify said assigned first time slot in which a communication from said base station is to take place and to enable said mobile station to become phase synchronized to said base station; and

transmitting a multi-bit time slot identifier code during said second time slot to enable said base station to identify said assigned second time slot in which a communication from said mobile station is to take place and to enable said base station to become phase synchronized to said mobile station.

5,200,958

METHOD AND APPARATUS FOR RECORDING AND DIAGNOSING FAULTS IN AN ELECTRONIC REPROGRAPHIC PRINTING SYSTEM

Robert S. Hamilton; Daniel C. Chen; Sharon Mathiason; Ronald S. Tomory, and Anthony M. Federico, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1990, Ser. No. 589,644

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—16.4 **12 Claims**

7. An apparatus for recording and diagnosing faults in an electronic reprographic system for scanning and processing and printing a plurality of jobs, comprising:

means for monitoring the system for occurrence of faults in a job;

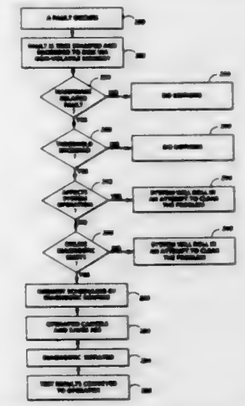
a fault logging means;

means for recording each fault of said faults in said fault logging means;

means for determining whether the number of recordings of a particular fault in the fault logging means exceeds a previously determined threshold number set for the particular fault;

providing means for providing at least one online diagnostic routine;

means for determining whether an online diagnostic routine is available from the providing means for the particular fault when a determination is made that the number of recordings of said particular fault in the fault logging means has exceeded said threshold number set for said particular fault; and



means for providing information to an operator regarding said particular fault recorded in said fault logging means and means for providing information from the providing means regarding an available online diagnostic routine related to said particular fault.

5,200,959

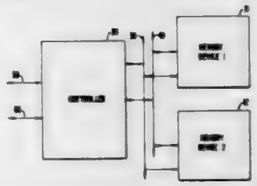
DEVICE AND METHOD FOR DEFECT HANDLING IN SEMI-CONDUCTOR MEMORY

Stephen Gross, Mountain View, and Robert D. Norman, San Jose, both of Calif., assignors to SunDisk Corporation, Santa Clara, Calif.

Filed Oct. 17, 1989, Ser. No. 422,949

Int. Cl.[5] G11C *29/00*

U.S. Cl. 371—21.6 **27 Claims**



4. A solid-state memory system for storing sequential data, comprising:

a memory array formed by a plurality of memory cells;

a data portion of the memory array usable for storing data files, said data portion having memory cells that are accessible in a prescribed order;

a first information list in the memory array, said first information list including an ordered directory of previously detected defects of the data portion, each defect being a

cluster of one or more defective memory cells classifiable by defect type, and said ordered directory listing each

(a) input means for inputting a code train from a transmission line, the code train including a code word constituting an

bits stored in said FIFO drops below a predetermined threshold.

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from interfering with an information signal carried on said broadened optical signal;

external modulator means coupled to receive the broadened

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cluster of one or more defective memory cells classifiable by defect type, and said ordered directory listing each defect's location and type according to the prescribed order of the memory cells in the data portion;

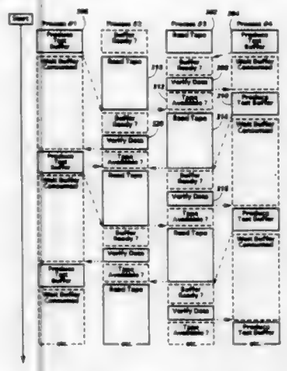
a controller connected to the memory array for controlling access operations thereof, said controller accessing the memory cells in the data portion in the prescribed order while responsive sequentially to the first information list for skipping over a number of defective memory cells appropriate for its defect type at each defect's location.

5,200,960

STREAMING TAPE DIAGNOSTIC

Robert S. Hamilton, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1990, Ser. No. 586,353
Int. Cl.[5] G01R 31/28; G06F 11/00
U.S. Cl. 371—24 2 Claims



1. In an electronic image processing apparatus having image processing means, a controller electrically interconnected to the image processing means for directing the operation of the image processing means, the controller including a plurality of first buffers and a plurality of second buffers, a system memory, a disk memory connected to the first buffers and the second buffers and to the system memory, an external storage device port for communicating with a tape for serially storing data, the tape and the disk memory being electrically connected to the external storage device port, the method of diagnosing the serial to parallel transfer of data between the tape and the disk memory comprising the steps of:

creating a plurality of blocks of data within the controller for transfer to the tape via the external storage device port,

transferring said plurality of blocks of data via the external storage device port to the tape,

recreating said plurality of blocks of data in the plurality of first buffers,

reading the plurality of blocks of data from the tape via the external storage device port to the plurality of second buffers, and

comparing the plurality of blocks of data from the tape in the second buffers with the data in the plurality of first buffers in a parallel manner.

5,200,961

ERROR DETECTION AND/OR CORRECTION DEVICE

Katsumi Karasawa, Tokyo, and Motokazu Kashida, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

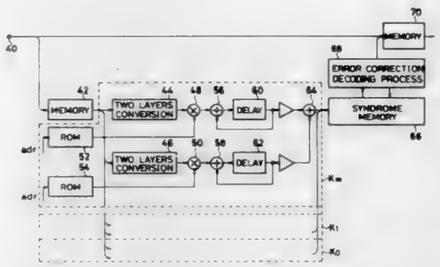
Filed Jul. 10, 1990, Ser. No. 550,439
Claims priority, application Japan, Jul. 13, 1989, 1-181160
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—37.1 12 Claims

1. An error detection and/or correction device, comprising:

(a) input means for inputting a code train from a transmission line, the code train including a code word constituting an error detection and/or correction code;

(b) division means for dividing n symbols which belong to each code word input from said input means into i symbol groups, each of the i symbol groups consisting of (n/i) symbols, each of the symbols consisting of j bits, where i, j and (n/i) are integers equal to or larger than 2;

(c) generation means for generating i coefficient groups by dividing n coefficients of a check matrix into i coefficient groups, each of the i coefficient groups consisting of (n/i) coefficients;



(d) i calculation means for performing a calculation between the i symbol groups and the i coefficient groups, each of said i calculation means producing an output value corresponding to a sum of values resulting from multiplication of (n/i) symbols by (n/i) coefficients;

(e) addition means for adding the output values from said i calculation means and generating one syndrome; and

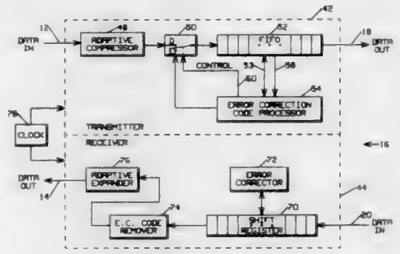
(f) error detection and/or correction means for detecting and/or correcting an error of the code word by using the syndrome output from said addition means.

5,200,962

DATA COMPRESSION WITH ERROR CORRECTION

Ming-Luh Kao, and Jong-Keung Cheng, both of Miami, Fla., assignors to Racal-Datacom, Inc., Sunrise, Fla.

Filed Nov. 3, 1988, Ser. No. 269,814
Int. Cl.[5] H03M 13/00, 7/30
U.S. Cl. 371—41 12 Claims



12. A method of converting a variable rate stream of data bits to a fixed rate stream of data bits, comprising the steps of:

receiving said variable rate stream of data bits;

generating a fixed number of error correction bits from a fixed number of said data bits at varying intervals to produce said fixed rate stream of data bits;

placing said variable rate stream of data bits into a First In First Out (FIFO) memory;

monitoring the number of bits stored in said FIFO memory; and

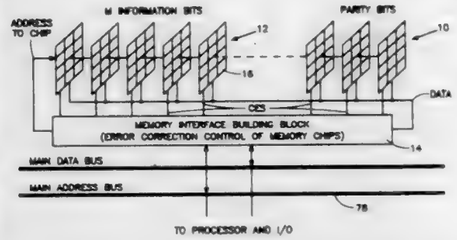
generating said error correction bits when said number of bits stored in said FIFO drops below a predetermined threshold.

5,200,963

SELF-CHECKING ON-LINE TESTABLE STATIC RAM

Savio N. Chau, Hacienda Heights, and David A. Rennels, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 26, 1990, Ser. No. 543,915
Int. Cl.[5] G06F 15/40
U.S. Cl. 371—68.1 19 Claims



1. A digital memory chip for use in a random access memory for fault-tolerant computers, said digital memory chip comprising:

a) a plurality of on-line testable and correctable memory cells, each memory cell comprising a memory sub-cell pair, for holding individually addressable binary bits as pairs of initially duplicate bits in respective memory sub-cell pairs; and,

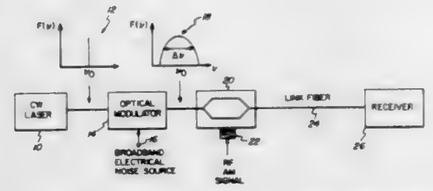
b) error detection means incorporated within each memory cell and connected to each memory sub-cell pair thereof and comprising means for continuously sensing the contents of each sub-cell of each memory sub-cell pair and for outputting an error signal whenever a transient error indicated by a difference between the bits of a memory sub-cell pair occurs in the corresponding memory cell.

5,200,964

BROAD LINEWIDTH LASERS FOR OPTICAL FIBER COMMUNICATION SYSTEMS

David R. Huber, Warrington, Pa., assignor to General Instrument Corporation, Hatboro, Pa.

Continuation-in-part of Ser. No. 668,027, Mar. 12, 1991. This application Jan. 15, 1992, Ser. No. 821,004
Int. Cl.[5] H01S 3/10
U.S. Cl. 372—26 24 Claims



1. Apparatus for use in communicating information over an optical fiber comprising:

a laser for providing an output signal with a mode at a frequency ν_0;

means for optically modulating said laser output signal by a periodic function to increase the linewidth of said mode and thereby provide a broadened optical signal generally centered around ν_0, said periodic function having a frequency that is high enough to avoid sidebands thereof from interfering with an information signal carried on said broadened optical signal;

external modulator means coupled to receive the broadened optical signal, for modulating said broadened optical signal with an information signal; and

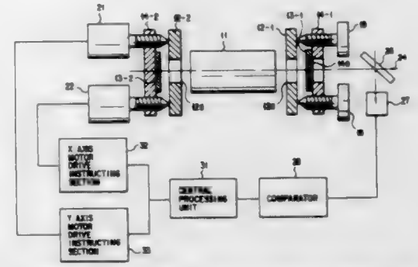
means for coupling the broadened optical signal modulated with said information signal from said external modulator means to an optical transmission path.

5,200,965

SYSTEM FOR ADJUSTING LASER OSCILLATOR

Kazuhiro Okuyama, and Kohji Inamoto, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 2, 1992, Ser. No. 815,751
Claims priority, application Japan, Jan. 8, 1991, 3-494; Dec. 19, 1991, 3-336476
Int. Cl.[5] H01S 3/13
U.S. Cl. 372—29 9 Claims



1. A system for adjusting a laser oscillator comprising:

a laser oscillator for generating a laser beam, including,

a laser medium for generating a laser wave;

a pair of resonant mirrors arranged to face each other with said laser medium in between, and perpendicular to said laser wave, and

tilting means for slightly tilting one of said resonant mirrors in first and second directions approximately perpendicular to each other;

means for detecting a laser beam whose power varies in an output distribution having a peak according to slight tilting of said one of said resonant mirrors in one of said first and second directions, and generating a power signal corresponding to said power; and

arithmetic operation means for consecutively sampling said power signal by a predetermined number of times, averaging values of sampled power signals to acquire first and second laser power average values close to each other on said output distribution, and determining to which positions on said output distribution said first and second laser power average values correspond, in accordance with amounts of change in said acquired laser power average values, thereby generating a control signal to urge said tilting means.

5,200,966

RESONANTLY PUMPED, ERBIUM-DOPED, GSGG, 2.8 MICRON, SOLID STATE LASER WITH ENERGY RECYCLING AND HIGH SLOPE EFFICIENCY

Leon Esterowitz, Springfield, and Robert C. Stoneman, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1992, Ser. No. 883,336
Int. Cl.[5] H01S 3/091, 3/092
U.S. Cl. 372—71 19 Claims

1. A laser system comprising:

a crystal having a GSGG host material doped with a preselected percent concentration of erbium such that the com-

bination of said GSGG host material and said preselected

under the stabilization control of an operating point of said

smaller optical confinement in the active layer at said output end;

5,200,970

METHODS AND COMPOSITIONS FOR PROTECTING

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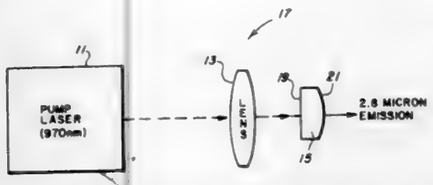
bination of said GSGG host material and said preselected percent concentration of erbium will produce a recycling process that provides an internal quantum efficiency of at least unity when said crystal is resonantly pumped;

a laser cavity defined by first and second reflective elements at opposing ends of said crystal to form a reflective path therebetween; and



resonant pumping means for directly pumping the $^4I_{11/2}$ upper laser state of said erbium with a pump beam to cause said crystal to produce a laser emission corresponding to the $^4I_{11/2} \rightarrow {}^4I_{13/2}$ laser transition having a wavelength of substantially 2.8 microns, said crystal producing the laser emission at a slope efficiency of at least 20%, one of said first and second reflective elements outputting a portion of said laser emission at substantially 2.8 microns.

5,200,967

OPTICAL FREQUENCY DEVIATION MEASURE AND CONTROL DEVICE FOR LASER LIGHT

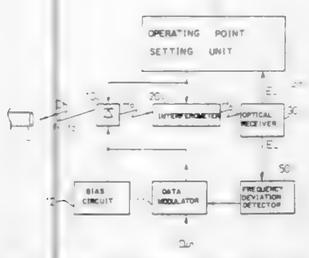
Hideyuki Miyata, and Hiroshi Onaka, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1991, Ser. No. 763,513

Claims priority, application Japan, Sep. 20, 1990, 2-248955; Mar. 14, 1991, 3-049712; Mar. 14, 1991, 3-049930

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—32 41 Claims



1. An optical frequency deviation measure and control device for a laser light for measuring and controlling the deviations of the optical frequency of a laser light source emitting light subjected to frequency or phase modulation according to an inputted modulation signal, said device comprising:

a light interference means responsive to laser light subjected to frequency or phase modulation according to inputted data, for outputting interference light dependent on optical frequency discriminating characteristics;

an optical receiving means responsive to said interference light for converting light intensity to an electrical signal;

an operating point stabilizing means responsive to said electrical signal for causing an operating point of said laser light to correspond to the optical frequency corresponding to the maximum or minimum value of said optical frequency discriminating characteristics; and

an optical frequency deviation measuring means for detecting the deviation of an optical frequency from an average value of light intensity of said interference light obtained from an electrical signal from said optical receiving means under the stabilization control of an operating point of said laser light by said operating point stabilizing means, or an optical frequency deviation stabilizing means for calculating an error value between said average value and a predetermined value and feeding back said error value to the modulation factor of said laser light.

5,200,968

LASER AMPLIFIER FOR AMPLIFYING OPTICAL WAVES WITHOUT SATURATION

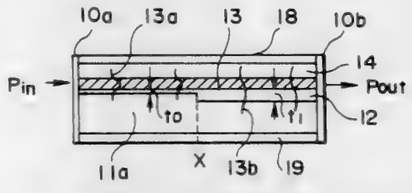
Hirohide Kurakake, and Haruhiko Tabuchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1991, Ser. No. 809,114

Claims priority, application Japan, Dec. 18, 1990, 2-403384

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 12 Claims



1. A laser amplifier having an input end and an output end for amplifying an incident optical beam supplied to said input end and outputting an output optical beam from said output end after optical amplification, comprising:

an active layer having a first refractive index, said active layer extending in a first direction from said input end to said output end from which an output optical beam is exited, said active layer having a substantially flat upper major surface and a substantially flat lower major surface both extending in said first direction, said active layer having a uniform thickness such that said upper and lower major surfaces extend generally parallel with each other, said active layer further having a first side wall and a second, opposing side wall both extending in said first direction, said active layer having a uniform width such that said first and second side walls extend with a uniform separation from each other, said active layer forming said output optical beam by amplifying the incident optical beam that is caused by a stimulated emission of photons upon passage of the incident optical beam through the active layer in said first direction from said input end to said output end;

an optical wave guide layer of a semiconductor material doped to a first conductivity type and having a second refractive index, said optical waveguide layer having upper and lower major surfaces and extending in said first direction from said input end to said output end, said optical waveguide layer being provided such that said upper and lower major surfaces of said optical waveguide layer extend generally in parallel with said upper and lower major surfaces of the active layer and in contact with said active layer at either one of said upper major surface and said lower major surface of the active layer so that the optical beam amplified in the active layer is transferred to the optical waveguide layer and guided in the first direction therealong, said optical waveguide layer having a thickness, measured across said upper major surface and said lower major surface of the optical waveguide layer, such that said thickness is set at a first value at said input end and at a second, different value at said output end, said first and second values of said thickness being determined such that there is a large optical confinement in the active layer at said input end and there is a smaller optical confinement in the active layer at said output end;

a first clad layer of a semiconductor material doped to said first conductivity type and having a third refractive index that is smaller than said second refractive index, said first clad layer having upper and lower major surfaces and provided below said lower major surface of said waveguide layer;

a second clad layer of a semiconductor material having a fourth refractive index that is smaller than said first refractive index and doped to said second conductivity type that is opposite to said first conductivity type, said second clad layer having upper and lower major surfaces and provided above said upper major surface of said active layer;

first electrode means provided on said upper major surface of the second clad layer in ohmic contact therewith for injecting first carriers having a first polarity to said active layer through said second clad layer;

second electrode means provided on said lower major surface of the first clad layer in ohmic contact therewith for collecting second carriers having a second, opposite polarity to said active layer through said first clad layer;

first anti-reflection means provided on said input end for minimizing reflections at said input end; and

second anti-reflection means provided on said output end for minimizing reflections at said output end.

5,200,969

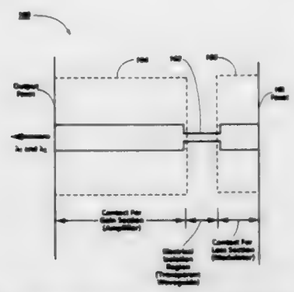
SWITCHABLE MULTIPLE WAVELENGTH SEMICONDUCTOR LASER

Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1991, Ser. No. 779,211

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—50 6 Claims



1. A solid state semiconductor laser switchable between at least two different output wavelengths, comprising:

a laser body of the type including a plurality of contiguous layers of semiconductor material, located in an optical path, at least first and second portions of said layers of the type providing carrier quantization in at least one dimension, wherein said first and second portions are formed such that one quantum level of said first portion is at the same energy level as a different quantum level of said second portion;

means for providing gain in said optical path when an electrical bias is applied thereto;

means for providing loss in said optical path when an electrical bias is applied thereto to thereby limit the output of said laser to a first wavelength which corrsponds to an energy level of said first portion which is not found in said second portion when a first electrical bias is applied thereto, and to thereby limit the output of said laser to a second wavelength different than said first wavelength which corresponds to an energy level found in both said first and second portions when a second electrical bias, different than said first electrical bias, is applied thereto.

5,200,970

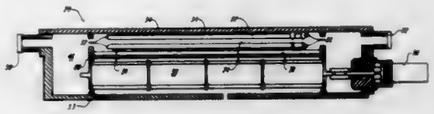
METHODS AND COMPOSITIONS FOR PROTECTING LASER EXCITATION GASES FROM CONTAMINATION

Peter J. Klopotek, Framingham, Mass., assignor to Summit Technology, Inc., Waltham, Mass.

Filed Dec. 3, 1990, Ser. No. 621,285

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—55 7 Claims



1. In a gas laser apparatus having a gaseous laser medium and excitation elements enclosed and supported with a chamber by structural elements, the improvement comprising:

at least one structural element fabricated of a polymeric material and having a thin dielectric film covering all exposed surfaces of said polymeric element within said chamber, said film serving as a protective coating to retard outgassing of volatile organic molecules into said chamber from said polymeric material.

5,200,971

GAS LASER WITH LONGITUDINAL FLOW

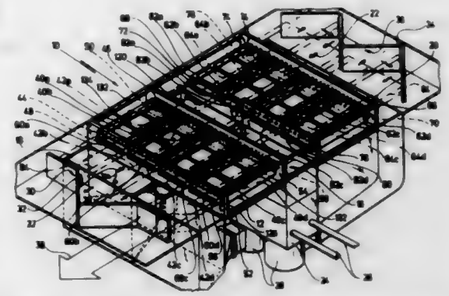
Eberhard Wildermuth, Fellbach; Hartwig Von Buelow, Tuebingen; Wolfram Schock, Boeblingen; Joerg Porath, Hamburg, and Klaus Schanz, Reinbek, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Boan and Rofin-Sinar Laser GmbH, Hamburg, both of Fed. Rep. of Germany

Filed Jan. 23, 1992, Ser. No. 824,117

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1991, 4102123

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—58 29 Claims



1. High-frequency excited gas laser with longitudinal flow, comprising a discharge channel having laser gas flowing therethrough in a direction of flow and high-frequency electrodes arranged on both sides of the discharge channel for generating a high-frequency discharge transversely to the direction of flow, said discharge channel comprising a plurality of channel elements, their channel axes being aligned parallel to one another in the direction of flow, said channel elements being arranged beside or next to one another in a direction of installation transverse to the direction of flow and said channel elements having a cross section with a greater extension in a first cross direction at right angles to the direction of flow than in a second cross direction extending at right angles to the first cross direction and to the direction of flow.

5,200,972

ND LASER WITH CO-DOPED ION(S) PUMPED BY

5,200,974

ELECTRODE CARRIER ARM FOR AN ELECTRIC ARC

enclosing said outer cylinder, said furnace body cover

5,200,977

TERMINAL UNIT APPARATUS FOR TIME DIVISION

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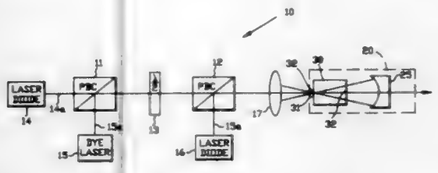
5,200,972

ND LASER WITH CO-DOPED ION(S) PUMPED BY VISIBLE LASER DIODES

Richard Scheps, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1991, Ser. No. 718,316
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—69 4 Claims



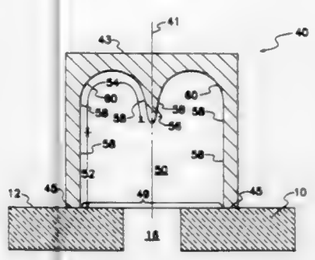
1. A laser apparatus for producing a 1.06 μ Nd transition therein comprising:
- a co-doped Cr,Nd:GSGG laser material and an output coupler forming a resonator; and
- at least one laser diode pumping Cr^{3+} of said co-doped Cr,Nd:GSGG laser material between 610 and 680 nm to effect said 1.06 μ Nd transition in said Cr,Nd:GSGG, in which said pumping is at levels up to 300 mW cw with lowest threshold power measured at least 938 μW and highest output power of 43 mW cw.

5,200,973

TOROIDAL CATHODE

Carol M. Ford, Columbia Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 7, 1991, Ser. No. 712,174
Int. Cl.[5] H01S 3/097
U.S. Cl. 372—87 21 Claims



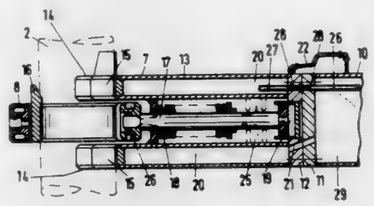
1. A cathode for a laser, wherein the laser includes at least one cathode and one anode, and said laser includes a gas filled chamber with a bore extending from the outer surface of the laser to the gas filled chamber, said cathode comprising:
- a body providing a cavity for containing an active gas, said body including an opening to said cavity within said body, interior wall surfaces defining said cavity and in which said interior wall surfaces are electrically conductive, and a mounting surface surrounding said opening for permitting attachment to said laser such that said cathode body opening is aligned with said bore of said laser block such that gas contained in said laser block is in communication with the cavity of said cathode; and
- a protrusion within said cavity positioned on a selected portion of the interior wall surfaces of said cavity extending towards said opening in a direction substantially parallel to the longitudinal axis of the bore whereby the protrusion is substantially parallel to the path of incoming ions emitted from the gas filled chamber during the operation of the laser.

5,200,974

ELECTRODE CARRIER ARM FOR AN ELECTRIC ARC FURNACE

Uwe Kark, Hamburg, and Karl-Heinz Klein, Kehl, both of Fed. Rep. of Germany, assignors to Badische Stahl Engineering GmbH, Kehl, Fed. Rep. of Germany

PCT No. PCT/EP89/00480, § 371 Date Sep. 7, 1990, § 102(e) Date Sep. 7, 1990, PCT Pub. No. WO89/11203, PCT Pub. Date Nov. 16, 1989
PCT Filed May 2, 1989, Ser. No. 536,558
Claims priority, application Fed. Rep. of Germany, May 2, 1988, 8805807
Int. Cl.[5] H05B 7/10
U.S. Cl. 373—94 9 Claims



1. An electrode carrier arm for an electric are furnace, comprising:
- a current-carrying arm part made from a light metal material of high conductivity and having an internal cavity for circulation of cooling liquid;
- a current-carrying electrode clamping device made from a material of high conductivity and having an interior cavity for the circulation of cooling liquid;
- a current carrying, flanged connection between the interior cavity of the arm part and the interior cavity of the clamping device, the flanged connection including a first flange plate forming a boundary of the interior cavity of the arm part, a second flange plate abutting and removably secured to the first flange plate and forming a boundary of the interior cavity of the clamping device, whereby said first and second flange plates provide a current transmission path from the arm part to the clamping device, said current carrying, flanged connection further including orifices in registry through said first and second flange plates for the passage of cooling liquid between the interior cavity of the arm part and the interior cavity of the clamping device.

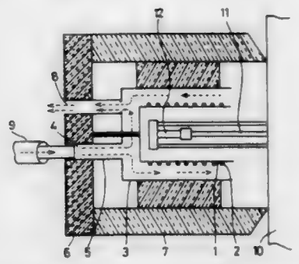
5,200,975

FURNACE FOR VISCOELASTICITY MEASURING DEVICE WITH CONCENTRIC GAS COOLING SHIELD

Hidetaka Kato, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,357
Claims priority, application Japan, Nov. 29, 1990, 2-130372[U]
Int. Cl.[5] B01L 7/00
U.S. Cl. 373—109 8 Claims

1. In a viscoelasticity measuring apparatus having a furnace for heating a sample whose viscoelasticity is to be measured, the improvement wherein said furnace comprises:
- an internal cylinder having an outer circumference;
- a heater wire wound around the outer circumference of said internal cylinder;
- sample holding means located within said internal cylinder for holding a sample in said internal cylinder to enable the sample to be heated by heat generated by said heater wire;
- an outer cylinder surrounding said internal cylinder to form an annular space with said internal cylinder; and
- a furnace body cover made of a heat insulating material enclosing said outer cylinder, said furnace body cover having a cool gas introduction opening for introducing a



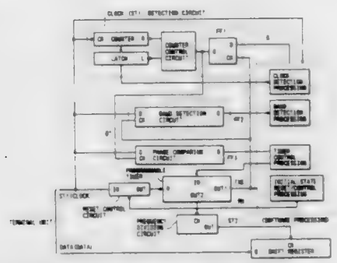
cool gas into said space and a cool gas exhaust opening for removing the cool gas from said space.

5,200,976

SYNCHRONIZING SYSTEM

Yukihito Ishihara, Ohme; Yasuyuki Kozima, Hitachi, and Atsushi Mizuno, Kodaira , all of Japan, assignors to Hitachi Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,875
Claims priority, application Japan, Nov. 25, 1989, 1-305297
Int. Cl.[5] H04L 7/033
U.S. Cl. 375—8 10 Claims



1. A synchronizing circuit comprising:
- a programmable timer for receiving an external clock signal and forming an internal clock signal;
- means for comparing respective phases of said external clock signal and a baud timing signal formed using said internal clock signal for each baud timing;
- means for controlling said programmable timer in accordance with a result of a phase comparison of said comparing means;
- reset control means for synchronizing a transitional edge of said internal clock signal with a corresponding transitional edge of said external clock signal by resetting said internal clock signal formed in the programmable timer when said external clock signal is initially received in the programmable timer;
- baud detection means for forming a bit pattern in accordance with said external clock signal and said internal clock signal; and,
- means for forming the baud timing signal supplied to said comparing means in accordance with said bit pattern.

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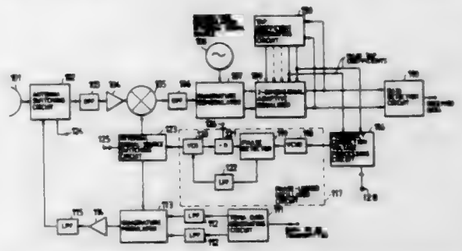
TERMINAL UNIT APPARATUS FOR TIME DIVISION MULTIPLEXING ACCESS COMMUNICATIONS SYSTEM

Hiroshi Ohnishi, Tokyo; Yuuri Yamamoto, Yokohama, and Kouei Misaizu, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 25, 1991, Ser. No. 660,054
Claims priority, application Japan, Feb. 23, 1990, 2-43016
Int. Cl.[5] H03H 7/30, 7/40; H04B 7/10
U.S. Cl. 375—15 4 Claims



1. In a terminal unit apparatus of a time division multiplexing radio communications system, including carrier demodulation means for demodulating a received quadrature digital modulation signal, transmitted from a base station, to an intermediate frequency band modulated signal, an internal signal source for supplying to said carrier demodulating means a local oscillator signal for executing said demodulation, quadrature demodulation means for demodulating said intermediate frequency band modulated signal to obtain two baseband signals in a quadrature relationship, 2-dimensional adaptive equalizer circuit means for executing waveform equalization of said baseband signals, tap coefficient generating circuit means for repetitively supplying to said 2-dimensional adaptive equalizer circuit means successively updated values of tap coefficients which include a pair of main tap coefficients, and data detection means for recovering transmitted data from equalized output signals produced from said 2-dimensional adaptive equalizer circuit means, the improvement comprising means for deriving a frequency correction signal having a value which is based upon the value of said main tap coefficients and for applying said frequency correction signal to correct a frequency error of said internal signal source.

5,200,978

PROCESS FOR ACTUATION OF MULTI-LEVEL DIGITAL MODULATION BY A DIGITAL SIGNAL PROCESSOR

Michelangelo Lo Carto, Seregno, and Marcello Salerno, Gorgonzola, both of Italy, assignors to Siemens Telecomunicazioni S.p.A, Italy

Filed Apr. 8, 1991, Ser. No. 681,965
Claims priority, application Italy, May 18, 1990, 20380 A/90
Int. Cl.[5] H04C 25/34, 25/49; H03H 7/30
U.S. Cl. 375—17 7 Claims

4. A multi-level digital modulation system, comprising:
- means for providing a serial flow having a bit frequency fb which is parallelized to form first words of N bits called symbols having a symbol frequency fs;
- means for generating from said first words second and third words synchronous with the first words and respectively belonging to a channel termed "in phase" and a channel termed "in quadrature" representing components along two orthogonal axes of a vector which digitally modulates a sinusoidal carrier both in phase and in amplitude;
- means for digitally filtering said second and third words having a symbol frequency fs, obtaining corresponding therewith fourth and firth filtered words, said digital filtering being carried out at a sampling frequency fc synchronous with said symbol frequency fs and corresponding to said symbol frequency fs multiplied by an

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said digital frame induced jitter filtering means also having

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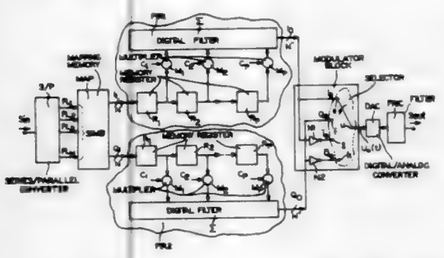
sponding to said symbol frequency fs multiplied by an appropriate number K greater than 2;

means for negating a value of said fourth an fifth filtered words and obtaining in correspondence therewith sixth and seventh negated filtered words; and



means for cyclically selecting in order, at each period of said sampling frequency fc, one of said fourth, fifth, sixth, and seventh words which provide a sequence of discrete samples of said digitally modulated sinusoidal carrier.

5,200,979

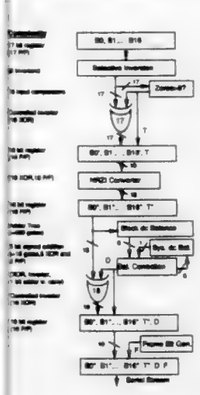
HIGH SPEED TELECOMMUNICATION SYSTEM USING A NOVEL LINE CODE

Gwendolyn K. Harris, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 6, 1991, Ser. No. 710,995

Int. Cl.[5] H04L *25/34, 25/45*

U.S. Cl. 375—19 **18 Claims**



9. A method of serially transmitting digital data signals in blocks of coded bits, comprising steps of:

encoding each block of bits which include data bits B (B0, B1, . . . , Bn-2, Bn-1) of a preselected length of n, n being a positive integer, a transition bit T and a dc balance bit D, said data bits B representing data words,

said transition bit T indicating a bit inversion operation performed in response to the number of bits in said data bits and said transition bit of said block that are one of the binary states, and

said dc balance bit D indicating a bit inversion operation performed in response to the dc balance of all the bits in said block with respect to a previously accumulated system balance;

then updating an accumulated system balance by algebraically summing said dc balance of said block and said previously accumulated system balance;

repeating the above steps for each of successive blocks; and serially transmitting each block successively.

5,200,980

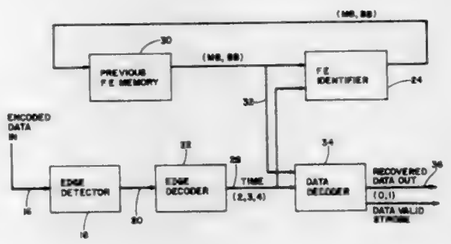
DIGITAL BI PHASE DATA RECOVERY SYSTEM

Dennis M. Briddell, Raleigh, N.C., assignor to Memorex Telex N.V., Amsterdam, Netherlands

Filed Aug. 9, 1991, Ser. No. 743,259

Int. Cl.[5] H04L *27/22*

U.S. Cl. 375—83 **1 Claim**



1. A data recovery system for deriving digital data from a bi phase encoded data stream wherein signal transition occurs at mid-bit or bit boundaries, the derived digital data being represented as a 1 or 0, comprising:

edge detector means for detecting the occurrence of each falling edge of the data stream;

edge decoder means connected to said edge detector means for determining the time between successive falling edges;

falling edge identifier means connected to said edge decoder for determining whether a detected falling edge occurred on a bit boundary (BB) or at mid-bit (MB) according to the table

		MB	BB
Bit Cells Between Falling Edges	2	MB	BB
	3	BB	MB
	4	MB	X

falling edge memory means connected to said falling edge identifier for remembering whether the previous falling edge occurred at BB or MB;

a data decoder connected to receive input from said falling edge memory means and said edge decoder, the data decoder having means for determining the recovered data for passage out as decoded data according to the table

		Previous Falling Edge	
		MB	BB
Bit Cells Between Falling Edges	2	0	1
	3	1	10
	4	10	Invalid

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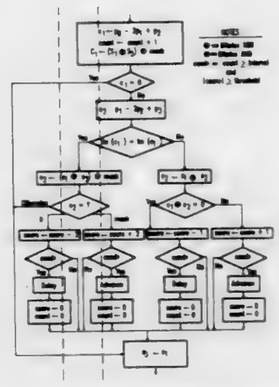
FINE TIMING RECOVERY FOR QAM MODEM RECEIVER

Iddo Carmon, Kfar-Sava, Israel, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 563,434, Aug. 7, 1990, abandoned. This application Jun. 22, 1992, Ser. No. 902,511

Int. Cl.[5] H03D *3/24*

U.S. Cl. 375—106 **4 Claims**



1. A method for generating a correction command for advancing or delaying the sample timing of a modem analog front end used to recover data from an incoming QAM baseband signal said baseband signal having a second derivative and maxima/minima, the method comprising the steps of:

(a) sampling baseband signal at two complex points per symbol;

(b) utilizing the two complex points derived in step (a) to estimate the algebraic signs of the second derivative of the baseband signal, the signs being estimated separately for the real and imaginary axis;

(c) utilizing the algebraic signs generated in step (b) to make a local decision regarding the convexity/concavity of said baseband signal;

(d) accumulating said local decisions made in step (c) over a predetermined time period; and

(e) utilizing the accumulated local decisions to make a global decision regarding the sampling point position relative to said baseband signal maxima/minima.

5,200,982

IN-LINE PIECE-WISE LINEAR DESYNCHRONIZER

William B. Weeber, Apex, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Oct. 2, 1991, Ser. No. 771,037

Int. Cl.[5] H04L *7/00*

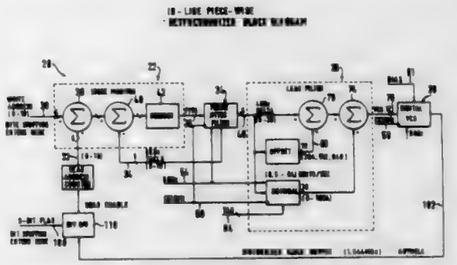
U.S. Cl. 375—118 **7 Claims**

1. A digital desynchronizer for smoothing phase jumps caused by pointer changes of a first signal operating in a first format mapped into a signal operating in a second format comprising:

A) digital elastic store means for generating a digital elastic store position detection output signal (FJTR), said means having means for receiving the write address and read address associated with the signal operating in the first format, as well as an input for receipt of a threshold signal which in turn is a function in part of the digital elastic store position detection output signal;

B) digital frame jitter filter means for generating a digital frame induced jitter filter output signal (DELTA) having an input connected to the elastic store position output signal (FJTR), said DELTA output signal being linear and proportional to the elastic store position output signal, said digital frame induced jitter filtering means also having means for generating said threshold signal, wherein said threshold signal is a function of the elastic store output signal (FJTR);

C) digital leak filter means connected to the DELTA output, for generating a digital leak rate filter output signal (VCO), said VCO signal being proportional to the desired transmission frequency of the signal in said first format;



D) digital VCO means connected to the VCO signal, for generating a clock signal operating at a frequency of the second format; and

E) means, connected to the clock signal, for generating said read address associated with the signal operating in the first format.

5,200,983

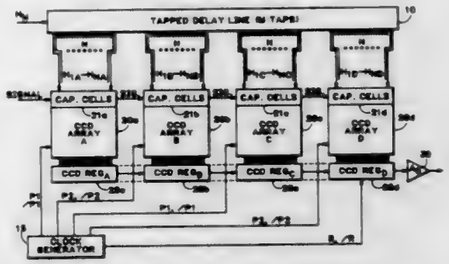
FISO ANALOG SIGNAL ACQUISITION SYSTEM EMPLOYING CCD ARRAY STORAGE

Grigory Kogan, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 17, 1992, Ser. No. 836,436

Int. Cl.[5] G11C *27/04*

U.S. Cl. 377—57 **6 Claims**



1. An analog signal acquisition system comprising:

a plurality of CCD arrays (**20***a*–**20***d*), each array containing a plurality of serial registers (**22**) of charge coupled devices, each serial register (**22**) having a first cell (**23**) and a plurality of additional cells (**24**) coupled in series with the first cell (**23**), with acquired samples being transferred along the plurality of additional cells (**24**) according to a clock signal having a plurality of phases, each array (**20***a*–**20***d*) operating in response to a clock signal of a different phase (P1,P2,/P1,/P2);

means (**10**) for producing a plurality of sequential hold signals in response to a master hold signal; and

a plurality of sampling means (Q*x*), each responsive to one of the plurality of sequential hold signals, for temporarily connecting an associated first cell (**23**) to a signal to be sampled so that the associated first cell acquires a sample

at a time determined by a respective one of the sequential

coupling means for coupling and uncoupling the holding

nals or signals which modify the operating parameters

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at a time determined by a respective one of the sequential hold signals.

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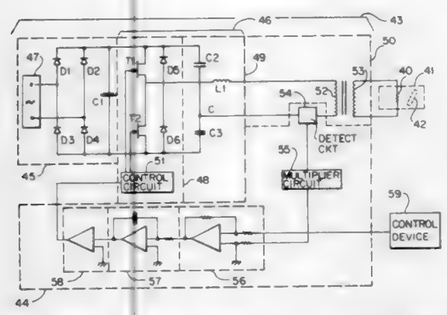
FILAMENT CURRENT REGULATOR FOR AN X-RAY TUBE CATHODE

Jacques Laeuffer, Paris, France, assignor to General Electric CGR S.A., Les Moulineaux, France

Filed Aug. 13, 1991, Ser. No. 744,416
Claims priority, application France, Aug. 14, 1990, 90 10349
Int. Cl.[5] H05G *1/34*
U.S. Cl. 378—110 **2 Claims**



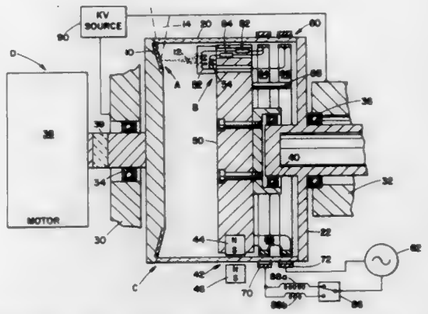
1. A filament current regulator for an X-ray tube cathode comprising a circuit for the supply of current to a filament and a circuit for the regulating of said current, said supply circuit comprising:
a DC voltage source;
a DC/AC converter for providing current pulses from said DC voltage source; and
an isolating transformer the primary winding of which is connected to the output terminal of said DC/AC converter;
wherein said DC/AC converter is of the hyporesonant type and generates current pulses to said isolating transformer;
wherein said DC/AC converter is controlled by high-frequency pulses provided by a regulation circuit; and
wherein said isolating transformer is of a pulse type having its secondary winding directly connected to said filament;
wherein said regulation circuit comprises:
a circuit for detecting the current I(t) in said filament;
a circuit for computing the square $I^2(t)$ of the current I(t);
a differentiator circuit for obtaining the difference ϵ between $I^2(t)$ and a signal I^2ref representing the square of the current I_{ref} to be obtained in said filament;
an integrator circuit for integrating the difference ϵ;
a comparator circuit for comparing the integrated signal with a threshold and for obtaining an output signal as soon as the integrated signal goes beyond said threshold;
a control circuit for controlling said DC/AC converter, said control circuit being controlled by the output signal of said second comparator circuit and generating control signals for said DC/AC converter so as to generate current pulses in the primary winding of the transformer.

5,200,985
X-RAY TUBE WITH CAPACITIVELY COUPLED FILAMENT DRIVE

Lester Miller, Forest Park, Ill., assignor to Picker International, Inc., Highland Hts., Ohio

Filed Jan. 6, 1992, Ser. No. 817,295
Int. Cl.[5] H01J *35/06*
U.S. Cl. 378—135 **21 Claims**

1. In an x-ray tube which includes an evacuated envelope, a cathode assembly and an anode surface disposed within the evacuated envelope, and a means for permitting relative rotational movement between the cathode assembly and the envelope, the cathode including an electron emitting cathode filament means, THE IMPROVEMENT COMPRISING:
at least first and second annular capacitor members mounted to the cathode assembly inside of the envelope, the cathode filament means being connected between the first and second annular capacitor members to receive electrical power therefrom;

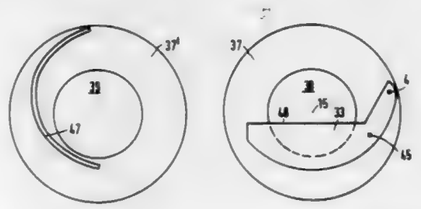


third and fourth annular capacitor members disposed exterior to the envelope, the third annular capacitor member being capacitively coupled to the first annular capacitor member and the fourth annular capacitor member being capacitively coupled to the second annular capacitor member, such that the annular capacitor members transfer AC electrical power from an external AC power source to the cathode filament means.

5,200,986
X-RAY EXAMINATION APPARATUS AND FILTER MEANS FOR USE IN SUCH X-RAY

Harald Schlie, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 6, 1992, Ser. No. 864,109
Claims priority, application European Pat. Off., Apr. 12, 1991, 91200860.4
Int. Cl.[5] G21K *3/00*
U.S. Cl. 378—156 **18 Claims**



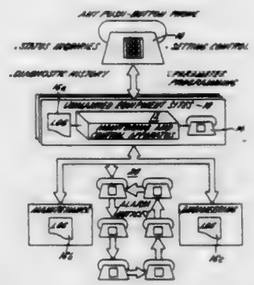
15. A filter construction for use with an X-ray examination apparatus comprising:
an X-ray absorbing filter body; and
drive means for positioning the filter body in the X-ray beam;
said drive means comprising:
a pair of holding members including guide means and having a central opening positioned about a central ray emitted from an X-ray source to an X-ray detector, said filter body being between the holding members and moveably connected thereto via said guide means;
a motor coupled to at lest one holding member for rotation of the at least one holding member around the central ray; and

coupling means for coupling and uncoupling the holding members including means for joint rotation of the holding members around the central ray causing the filter body to be fixed relative to the holding members and means for rotation of one of the holding members with respect to the other holding member causing the filter body to move relative to the holding members via the guide means.

5,200,987
REMOTE SUPERVISORY MONITORING AND CONTROL APPARATUS CONNECTED TO MONITORED EQUIPMENT

William F. Gray, Ste. 204, 203 Eldon St., Herndon, Va. 22074

Continuation of Ser. No. 149,671, Jan. 28, 1988, Pat. No. 4,996,703, which is a continuation-in-part of Ser. No. 853,893, Apr. 21, 1986, Pat. No. 4,478,654. This application Jan. 18, 1991, Ser. No. 642,880
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] H04M *11/04, 11/00*
U.S. Cl. 379—40 **8 Claims**

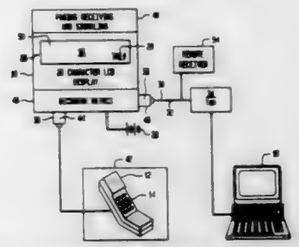


1. A monitoring and control apparatus which monitors conditions of equipment and a power source at a work site, said apparatus comprising:
a programmable microprocessor and a microprocessor bus which carries signals to and from said microprocessor;
input ports connected to said bus providing status signals representing monitored conditions which are carried on said bus to said microprocessor;
output ports connected to said bus providing equipment control signals which are carried on said bus from said microprocessor;
memory means associated with said microprocessor;
operating means including programs and operating parameters stored in said memory means for causing said microprocessor
to process status signals and detect a fault condition by sampling the status signals and comparing with the operating parameters stored in said memory means,
to produce an alarm when it is determined that the fault condition qualifies as an alarm condition, and
to provide signals which represent the alarm condition; and
transmitting/receiving means including a modem and telephone interface for automatically dialing out over a telephone network in response to an alarm, for transmitting information as to the alarm in the form of data signals and/or synthesized voice signals over the telephone network to a remote location in response to an alarm;
said transmitting/receiving means also being operable to receive over the network from the remote location
incoming signals which represent corrective operation of equipment, and
incoming signals which represent modifications to the operating parameters stored in memory; and
said operating means causing said microprocessor to decode the incoming signals and produce equipment control signals or signals which modify the operating parameters stored in said memory means in accordance with the contents of the incoming signals.

5,200,988
METHOD AND MEANS FOR TELECOMMUNICATIONS BY DEAF PERSONS UTILIZING A SMALL HAND HELD COMMUNICATIONS DEVICE

Bernard N. Riskin, Lambertville, N.J., assignor to Fon-Ex, Inc., Lambertville, N.J.

Filed Mar. 11, 1991, Ser. No. 666,954
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—52 **22 Claims**



1. A method for telecommunications particularly usable by deaf persons from a sending telephone to a remote receiving location utilizing a small hand held communications device attachable with respect to the sending telephone having a DTMF keypad, comprising the steps of:
a) spelling a word letter-by letter with one keystroke per letter by utilizing the DTMF keypad on the sending telephone;
b) displaying the word letter-by-letter in numerical DTMF keypad code on the visual display means of the hand held communications device;
c) entering of a completed word signal on the DTMF keypad after completion of said spelling of the word letter-by-letter in numerical DTMF keypad code;
transmitting of the displayed numerical DTMF keypad code, responsive to said entering of a completed word signal, to a remotely located electronic databank having a dictionary of words with their associated numerical DTMF keypad codes stored therein;
e) matching of the transmitted numerical DTMF keypad code with respect to at least one of the words of the dictionary at a remote receiving location, the words of the dictionary for each specific numerical DTMF keyboard code being ordered according to frequency of usage thereof;
f) sending back by a remote receiving location of the most frequently used matching word for display upon the visual display means;
g) entering of a match signal on the DTMF keypad to determine whether the displayed word is the correct matching word for the DTMF keypad code originally entered at the sending telephone, said entering of a match signal including possible signals of a positive match and a negative match;
h) transmitting of a next word signal to the remotely located electronic databank responsive to a negative match signal;
i) sending back by a remote receiving location of the next most frequently used matching word for display upon the visual display means responsive to a negative match signal;
j) entering of a next match signal on the DTMF keypad to determine whether the next displayed word is the correct matching word for the DTMF keypad code originally entered at the sending telephone, said entering of a next match signal including possible specification of a positive next match and a negative next match;

with a radio communication unit of the mobile telephone in response to a call signal supplied from a line, the communi-

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k) repeating of the steps of said transmitting of a next word signal by a small hand held communication device, said sending back of the next most frequently used matching word by a remote receiving location and said entering of a next match signal responsive to a negative next match signal by the user;

l) storing of a displayed word in digital format responsive to a positive match signal by a small hand held communication device; and

m) transmitting of at least one displayed word of a message in digital format by a small hand held communication device to a remote receiving location.

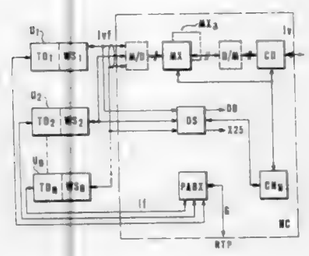
5,200,989

WIDE BAND COMMUNICATION SYSTEM TRANSMITTING VIDEO AND AUDIO SIGNALS AMONG A PLURALITY OF USERS

Francesco Milone, Gaggiano, Italy, assignor to Italtel Societa Italiana, Milan, Italy

PCT No. PCT/EP89/00569, § 371 Date Feb. 15, 1991, § 102(e) Date Feb. 15, 1991, PCT Pub. No. WO89/12944, PCT Pub. Date Dec. 28, 1989
PCT Filed May 23, 1989, Ser. No. 659,314
Claims priority, application Italy, Jun. 16, 1988, 20982 A/88
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—53 **7 Claims**

1. In a wide band communication system in which a plurality of users employing work stations are each connected to a switching node via communication lines, the work stations receiving and/or transmitting audio signals, video signals and data, the switching node comprising:



control means, responsive to signals produced by said work stations on said communication lines, for generating signaling messages identifying the presence of a video signal on a said communication line;

coupling means, responsive to said signalling messages generated by said control means, for selectively coupling a communication line to a selected one of a plurality of internodal lines connected to a selected additional switching node, said coupling means selecting a video path within said node between a said communication line and a said internodal line when the presence of a video signal is identified by said control means; and

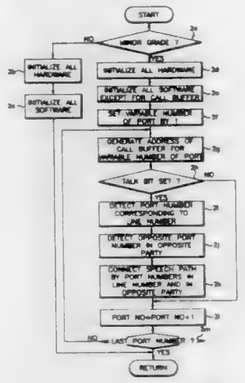
coding means, disposed in said video path, for selectively concentrating or expanding said video signal.

5,200,990

METHOD OF RECOVERING SPEECH PATH OF PRE-ENGAGED CALL ON RESTARTING KEYPHONE EXCHANGE SYSTEM

Seung-Hwan Cho, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 4, 1991, Ser. No. 802,277
Claims priority, application Rep. of Korea, Jun. 17, 1991, 1991 9981
Int. Cl.[5] H04M *3/18, 1/72*
U.S. Cl. 379—165 **19 Claims**



1. A method of recovering a speech path of a pre-engaged call upon restarting a keyphone exchange system after the occurrence of a system failure, comprising the steps of:

initializing all hardware and all software except for a subscriber's table buffer of said keyphone exchange system when a predetermined restarting signal of said system is generated;

initializing a variable number of a port in the communication control software as a given initial value;

generating an address of a port number corresponding to said variable number of said port in said subscriber's table buffer;

checking whether a talk bit of a line status word in a port identified by said port number is set or not, said line status word indicating status of said port;

obtaining a subscriber's port number from a line number buffer and obtaining an opposite subscriber's port number from an opposite party if said talk bit is set, said line number buffer storing said subscriber's port number and said opposite party storing said opposite subscriber's port number; and

forming said speech path of said call by connecting said subscriber's port number in said line number with said opposite subscriber's port number in said opposite party.

5,200,991

IMAGE COMMUNICATION SYSTEM INCLUDING A MOBILE TELEPHONE SET AND A FACSIMILE DEVICE

Teruo Motoyanagi, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 541,977, Jun. 22, 1990, abandoned.
This application Jul. 17, 1991, Ser. No. 731,398
Claims priority, application Japan, Jun. 23, 1989, 1-161789; Mar. 16, 1990, 2-66672
Int. Cl.[5] H04M *11/06*
U.S. Cl. 379—61 **25 Claims**

1. An image communication apparatus comprising:

means for removably connecting a mobile telephone set of a cordless telephone device and a facsimile device;

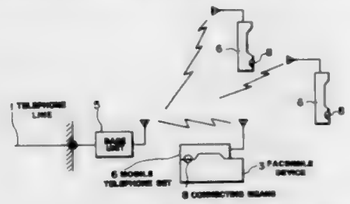
first switching means for selectively switching a connection with a radio communication unit of the mobile telephone set to the connecting means or to a hook switch of the mobile telephone set;

second switching means for selectively switching the connection to the connecting means either to an incoming signal path leading to the hook switch of the mobile telephone set through the connecting means or to a facsimile communication unit of the facsimile device;

means for detecting the connection of the mobile telephone set with the facsimile device by the connecting means;

means for monitoring a state of a telephone line and the presence of an incoming signal from the line; and

control means for switching the first switching means to the connecting means and the second switching means to the incoming signal path when the mobile telephone set is



connected to the facsimile device, and for switching the second switching means to the facsimile communication unit when the monitoring means detects an incoming signal;

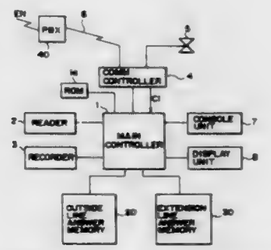
wherein when the mobile telephone set is performing a telephone communication with the facsimile device while the mobile telephone set is disconnected from the facsimile device, the mobile telephone set issues a communication starting command to thereby place the mobile telephone set compulsively in an off-hook state, and thereafter when a reconnection of the mobile telephone set with the facsimile device is recognized, the first switching means is switched to the connection means and the second switching means is switched to the facsimile communication unit to thereby shift to a facsimile communication.

5,200,992

COMMUNICATION APPARATUS HAVING CHANGEABLE COMMUNICATION PROCEDURE SIGNALS

Motoaki Yoshino, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 544,654, Jun. 27, 1990, abandoned.
This application Jan. 13, 1992, Ser. No. 820,024
Claims priority, application Japan, Jun. 30, 1989, 1-66725
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 **8 Claims**



1. A communication apparatus which sends a predetermined communication procedure signal for data communication, including information for identifying a station of the apparatus, in response to a call signal supplied from a line, the communication apparatus comprising:

means for discriminating a plurality of types of call signals supplied from the line; and

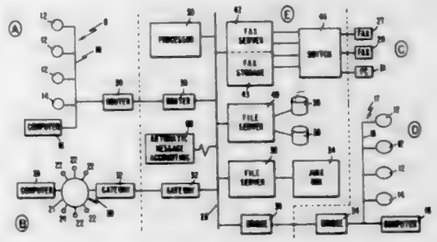
control means for changing the identifying information of said predetermined communication procedure signal for data communication in accordance with the discrimination result by said discriminating means.

5,200,993

PUBLIC TELEPHONE NETWORK INCLUDING A DISTRIBUTED IMAGING SYSTEM

Barbara L. Wheeler, Springfield; Earnest L. Heatwole, Jr., Fairfax, both of Va.; Maureen T. McGinley, Philadelphia, Pa., and Richard M. Selkaly, Falls Church, Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed May 10, 1991, Ser. No. 698,212
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—96 **7 Claims**



1. A real time interactive distributed image processing system, comprising:

(a) a plurality of remote user terminal stations for inputting and processing image processing commands from a plurality of respective users, each of said remote user terminal stations including

(i) local processor means responsive to said image processing commands for supplying image manipulation commands and data retrieval and storage commands,

(ii) original image data input means for receiving image data including multilevel pixel intensity information, and

(iii) composite image data output means for supplying composite image data including multilevel pixel intensity information;

(b) central processor means including

(i) data storage means connected to said central processor means for storing said original and composite image data,

(ii) graphic processor means receiving said image manipulation commands from said local processor means and, in response, retrieving and combining said original image data to form said composite image data,

(iii) routing table storage means for storing sequences of addresses, and

(iv) communications processor means responsive to automatic number identification (ANI) data and to said addresses stored in said routing table for supplying said image data to said original image data input means; and

(c) connectivity means for transmitting said image manipulation commands and said data retrieval and storage commands from said plurality of remote user terminal stations to said central processor means and for transmitting said original image data and said composite image data from said central processor means to said plurality of remote user terminal stations, said connectivity means including

(i) a public telephone network (PTN) for connecting said plurality of remote user terminal stations to said central processor means, and

(ii) automatic number identification means for automati-

cally supplying said ANI data identifying each of said

communications line will be allowed depending on if the

correlating each equipment port with the associated cable pair and with cable pair information corresponding to the

5,200,998

PROCESS AND APPARATUS FOR AUTOMATIC

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cally supplying said ANI data identifying each of said plurality of remote user terminal stations of said public telephone network.

5,200,994

COMMUNICATION TERMINAL APPARATUS AND CONTROL METHOD WITH PARTY IDENTIFICATION FEATURES

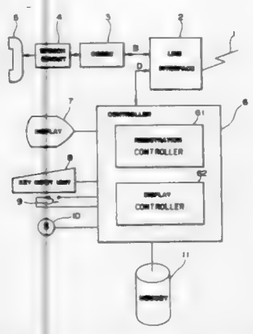
Jun Sasano, Fuchu; Takahiro Endo, Kokubunji, and Akihito Tsukamoto, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 2, 1989, Ser. No. 388,560

Claims priority, application Japan, Aug. 12, 1988, 63-202459; Oct. 20, 1988, 63-264398

Int. Cl.[5] H04J *3/12;* **H04M** *1/57, 3/02*

U.S. Cl. 379—142 **19 Claims**



19. A method of controlling a communication terminal apparatus adapted for use with a plurality of parties and connected to a digital network capable of transmitting call setting data to a called party, said method comprising the steps of:

registering a plurality of calling party identification data and a plurality of called party identification data;

detecting calling party identification data and called party identification data both contained in said call setting data;

comparing said calling party identification data and said called party identification data detected in said detecting step with said calling party identification data and said called party identification data registered in said registering step; and

informing said called party of said calling party and said called party corresponding to said calling party identification data and said called party identification data upon a favorable comparison in said comparing step.

5,200,995

UNIVERSAL OUTGOING CALL RESTRICTION CIRCUIT

John J. Gaukel, 4118 N. 105th St., Omaha, Nebr. 68134; Gerald C. Korth, 16565 Nina Cir., Omaha, Nebr. 68130, and Luis N. Fortun, 5005 N. 93rd Ave., Omaha, Nebr. 68134

Filed Dec. 24, 1990, Ser. No. 632,980

Int. Cl.[5] H04M *1/66*

U.S. Cl. 379—200 **38 Claims**

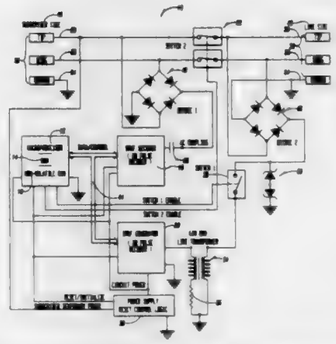
1. An apparatus for restricting selected, pre-determined outgoing communications of voice or data over a communication line comprising:

means for monitoring outgoing dialing signals representing one or more sequences of one or more code characters;

means for sequentially decoding the dialing signals into the sequences of code characters;

means for comparing any part of each entire sequence of code characters of the decoded dialing signals with a predetermined list of at least one pre-determined sequence of code characters; and

means for determining if outgoing communication over the communications line will be allowed depending on if the means for comparing matches any part of a decoded sequence of code characters with any pre-determined sequence of code characters on the pre-determined list.



5,200,996

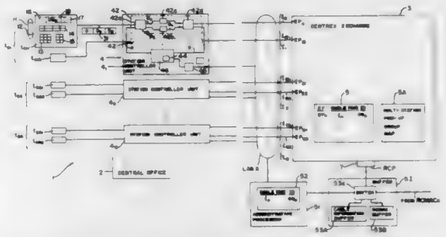
STATION CONTROLLER FOR MULTI-LINE PICK-UP AND AUTOMATIC MONITORING OF TELEPHONE STATION MOVES

John D. Beierle, Danbury, Conn., assignor to Nynex Corporation, New York, N.Y.

Filed Mar. 15, 1991, Ser. No. 670,024

Int. Cl.[5] H04M *3/22, 3/58;* **H04Q** *3/60, 11/04*

U.S. Cl. 379—212 **42 Claims**



1. A telephone system comprising:

a plurality of telephone stations including one or more multi-station pick-up groups, each pick-up group having a primary station and one or more associated secondary stations for picking-up calls to the primary station, and each secondary station of a pick-up group including lamp means for indicating the status of the primary station of the pick-up group and means for generating a pick-up signal for initiating the pick-up of a call to the primary station of the pick-up group, each telephone station further having an identification number;

a plurality of cable pairs, each cable pair being adapted to connect the telephone station connected to the cable pair to an associated equipment port on a centrex exchange;

a centrex exchange for managing the flow of telephone calls to and from said telephone stations, said centrex exchange being responsive to the pick-up signal generated by each secondary station of a pick-up group and including means for transferring a call from a primary station in a pick-up group to a secondary station in the pick-up group in response to a pick-up signal from the secondary station, said centrex exchange further having a plurality of equipment ports each connected to an associated one of said cable pairs and table means within said centrex exchange for correlating each equipment port with the associated cable pair and with cable pair information corresponding to the associated cable pair, said cable pair information including the cable pair number, whether or not the associated cable pair is connected to a telephone station and, if so, the identification number of the telephone station;

and station controller means connected to said plurality of cable pairs and interposed between said telephone stations and said centrex exchange, said station controller means monitoring the status of the primary station of each pick-up group and generating a signal for controlling the state of the lamp means in each of the secondary stations of the pick-up group in dependence on the monitored status of the primary station of the pick-up group, said station controller means further monitoring for each cable pair said cable pair information and communicating the monitored cable pair information to said centrex exchange for enabling said centrex exchange to establish and update said table means.

5,200,997

INTERNAL AUXILIARY FRAME FOR HAND TELEPHONE

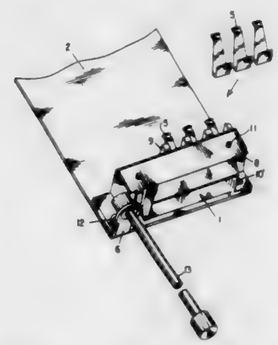
Ari Léman, Pertteli, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Mar. 28, 1991, Ser. No. 676,881

Claims priority, application Finland, Apr. 12, 1990, 901887

Int. Cl.[5] H04M *1/00;* **H04B** *1/46, 1/38*

U.S. Cl. 379—428 **6 Claims**



1. A substantially non-conductive auxiliary frame for location on an attachment base for supporting power contacts, an external antenna having a signal conductor, and an internal disc antenna inside a hand-held telephone, said auxiliary frame comprising:

a lower edge for engaging the attachment base and having at least one first indentation for receiving at least one of the power supply contacts and a second indentation for receiving the signal conductor of the external antenna, the power supply contacts and the signal conductor being pressed between the lower edge of said auxiliary frame and the attachment base when the auxiliary frame engages the attachment base; and

an upper surface of such auxiliary frame for supporting the internal disc antenna.

5,200,998

PROCESS AND APPARATUS FOR AUTOMATIC SAFEGUARDING OF INFORMATION DATA

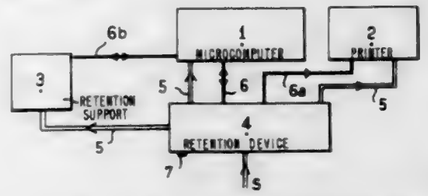
Jean-Pierre Bakaher, Berlaimont; Pierre Lemounier, Vanves; Christophe Marant, Muizon; Thierry Noll, Larouillies, and Eric Verbeecke, Merlaut, all of France, assignors to Cold Automatique, Vitry le Francois, France

Continuation of Ser. No. 368,309, Jun. 9, 1989, which is a continuation-in-part of PCT/FR88/00499 filed Oct. 7, 1988, abandoned. This application Jan. 17, 1992, Ser. No. 826,245

Claims priority, application France, Oct. 9, 1987, 87 13978

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—4 **8 Claims**



7. Device for carrying out a process of automatic retention on a retention support of information data processed by a computer, comprising electronic data retention means having an interface gate connected to an interface gate of a computer, the electronic data retention means also having another interface gate connected to an interface gate of an instruction means, said computer also having an interface gate connected to an interface gate of said retention support, said electronic data retention means being connected to an external electric supply circuit, power connections being provided from said electronic data retention means to the retention support, the computer and the instruction means, the electronic data retention means having also an external switching means for generating a retention request, the generation of which retention request resulting in a power cut-off to the computer followed by a powering on of the computer which actuates the operating system of the computer resulting in the beginning of the program for detecting and executing the retention request, which program effectuates an automatic retention of information data on the retention support by searching for the references of the data to be retained in an instruction file, and searching for the data corresponding to said references, and retaining said data on the retention support.

5,200,999

PUBLIC KEY CRYPTOSYSTEM KEY MANAGEMENT BASED ON CONTROL VECTORS

Stephen M. Matyas; Donald B. Johnson; An V. Le, all of Manassas; Rostislaw Prymak, Dumfries, all of Va.; William C. Martin, Concord; William S. Rohland, Charlotte, both of N.C., and John D. Wilkins, Somerville, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1991, Ser. No. 766,260

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—25 **33 Claims**

1. In a data processing system, a method for managing a public key cryptographic system, comprising the steps of:

generating a first public key and a first private key as a first pair in said data processing system, for use with a first public key algorithm;

generating a second public key and a second private key as a second pair in said data processing system, for use with a second public key algorithm;

assigning a private control vector for said first private key and said second private key in said data processing system, for defining permitted uses for said first and second private keys;

forming a private key record which includes said first private key and said second private key in said data process-

controlling the use of said first key signal in control means with said first control vector signal;

5,201,002

STEREO SOUND PILLOW AND METHOD OF MAKING

Robert L. Dahlen, 204 Hackberry, Streamwood, Ill. 60107

use his or her hands while listening to stereophonic music, said system comprising, in combination:

(a) a casing;

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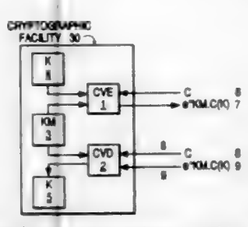
forming a private key record which includes said first private key and said second private key in said data processing system, and encrypting said private key record under a first master key expression which is a function of said private control vector;

forming a private key token which includes said private control vector and said private key record, and storing said private key token in said data processing system;

receiving a first key use request in said data processing system, reguiring said first public key algorithm;



accessing said private key token in said data processing system and checking said private control vector to determine if said private key record contains a key having permitted uses which will satisfy said first request;

decrypting said private key record under said first master key expression in said data processing system and extracting said first private key from said private key record;

selecting said first public key algorithm in said data processing system for said first key use request;

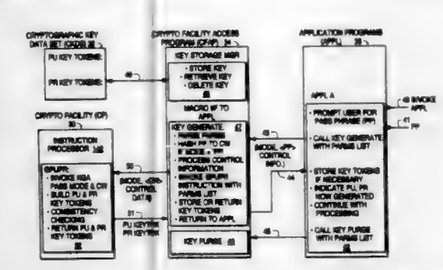
selecting said first public key algorithm in said data processing system using said first private key to perform a cryptographic operation to satisfy said first key use request.

5,201,000

METHOD FOR GENERATING PUBLIC AND PRIVATE KEY PAIRS WITHOUT USING A PASSPHRASE

Stephen M. Matyas; Donald B. Johnson; An V. Le, all of Manassas; Rostislaw Prymak, Dumfries, and John D. Wilkins, Somerville, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1991, Ser. No. 766,533
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—30 **39 Claims**



11. In a data processing system, a method for managing a cryptographic system having a key generator, comprising the steps of:

generating a first random number using a first seed value derived from a passphrase;

generating a second random number using a second seed value unknown to the user;

generating a first key signal in a generating means using said first random number and generating a first control vector signal for controlling the use of said first key signal;

generating a second key signal using said second random number and generating a second control vector signal controlling a second use of said second key signal;

controlling the use of said first key signal in control means with said first control vector signal;

controlling the use of said second key signal with said second control vector signal;

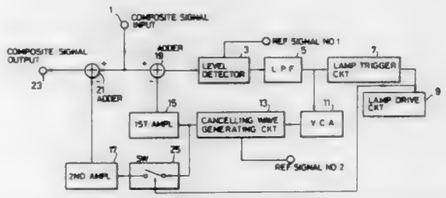
said first use of said first key signal being different from said second use of said second key signal.

5,201,001

PILOT SIGNAL CANCELLING SYSTEM

Masashi Itoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1992, Ser. No. 827,100
Claims priority, application Japan, Jan. 30, 1991, 3-010111
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—13 **6 Claims**



1. A pilot signal cancelling system for an FM stereo receiver, comprising:

an input terminal for inputting a composite signal;

a level detector, connected to the input terminal, for verifying the level of a signal derived by comparing the pilot signal in the composite signal to a pilot cancelling signal produced by a cancelling wave generating circuit for cancelling the pilot signal;

a low pass filter, connected to the level detector, for smoothing an output of the level detector;

a pilot cancelling wave generating circuit for producing the pilot cancelling signal in response to an output of the low pass filter;

a lamp trigger circuit, connected to the low pass filter, for inputting the output of the low pass filter and for outputting a lamp trigger signal;

a lamp drive circuit for inputting the lamp trigger signal so as to indicate a stereo state;

first computing means, connected to the cancelling wave generating circuit and the level detector, for taking the difference between the pilot signal in the composite signal and the pilot cancelling signal produced in the cancelling wave generating circuit;

second computing means, connected to the cancelling wave generating circuit and an output terminal, for taking the difference between the composite signal and the pilot cancelling signal produced in the cancelling wave generating circuit;

an output terminal for outputting the result of the second computing means; and

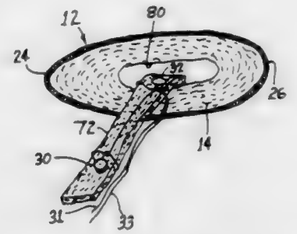
switching means, connected to the cancelling wave generating circuit and the second computing means, for switching on and off the connection of the pilot cancelling signal to the second computing means, by synchronizing the switching with the lamp trigger signal from the lamp trigger circuit.

5,201,002

STEREO SOUND PILLOW AND METHOD OF MAKING

Robert L. Dahlem, 204 Hackberry, Streamwood, Ill. 60107

Filed Jul. 31, 1990, Ser. No. 560,108
Int. Cl.[5] H04R *5/02*
U.S. Cl. 381—24 **13 Claims**



1. A stereo sound pillow, comprising the combination of

a pillow structure having an exterior case and an interior resilient composite;

said case having opposing top and bottom flexible but essentially nonextendable sheets joined together along edge seams, effective for having the case completely enclose the interior composite and define the maximum length, width and thickness dimensions of the interior composite; and

said interior composite being of a fiberous material having a vast plurality of separate strands, each strand being greatly elongated compared to its cross-section and randomly disposed relative to and loosely packed against one another, effective to build up to a resilient mass of a size substantially filling the interior of the case;

audio sound speakers each having an annular frame and an electrically driven cone diaphragm suspended across the frame, and each having a housing holding the annular speaker frame and having open but protective grillwork extended across both the front and rear sides of the cone diaphragm, providing sound outlets from both sides of the speaker;

a narrow strip of a flexible material and means for holding the sound speakers relative to the strip at specific spaced locations therealong;

said strip being surrounded by and held suspended within the interior composite for supporting said speakers inside of the pillow structure at locations spaced apart lengthwise and from the end edges thereof and generally centered between the side edges thereof; and

lead wires connected to each speaker and exiting from the case through one edge seam.

5,201,003

HIGH FIDELITY STEREOPHONIC REPRODUCTION SYSTEM

Andreas Pavel, via Vinzenzo Monti 92, Milan, Italy 20145

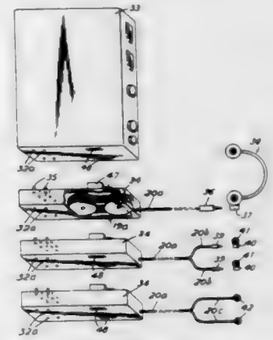
Continuation of Ser. No. 779,112, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 674,412, Mar. 21, 1991, abandoned, which is a continuation of Ser. No. 382,048, Jul. 19, 1989, abandoned, which is a continuation of Ser. No. 105,168, Oct. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 539,232, Oct. 5, 1983, abandoned, Division of Ser. No. 265,124, May 19, 1981, Pat. No. 4,412,106, which is a continuation of Ser. No. 47,967, Jun. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 889,664, Mar. 24, 1978, abandoned. This application Apr. 16, 1992, Ser. No. 869,738
Claims priority, application Italy, Mar. 24, 1977, 21625 A/77; Fed. Rep. of Germany, Jul. 22, 1987, 3724208
Int. Cl.[5] H04R *5/02*
U.S. Cl. 381—25 **14 Claims**

1. A self-contained, portable, personal, stereophonic, high fidelity listening system, to be carried and operated on the body of a listener so that the listener can freely move about and use his or her hands while listening to stereophonic music, said system comprising, in combination:

(a) a casing;

(b) signal-producing means, including a playback device, for producing stereophonic, electrical signals from a carrier of recorded, musical programs, said signal-producing means being disposed within said casing;

(c) at least one pair of lightweight, binaural, stereophonic earphones, electrically matched in impedance and sensitivity to said signal-producing means and physically remote from said means, for producing high fidelity, stereophonic musical sound in response to said signals, said system having no means other than said earphones for the production of stereophonic, musical sound at a level of



fidelity equal to, or greater than, said high fidelity, stereophonic musical sound produced by said earphones;

(d) means for support of said earphones substantially in contact with the ears of said listener;

(e) an electrical conductor for electrically connecting said earphones to said signal-producing means;

(f) lead-reeling means for holding said conductor, and for receiving and dispensing a desired length of said conductor;

(g) a reel pack detachably connected to said casing, said lead-reeling means being disposed within said pack; and

(h) means on said reel pack for mechanical and electrical, releasably-gripped, connection to, and disconnection from, said casing and another like reel pack.

5,201,004

SPEECH RECOGNITION METHOD WITH NOISE REDUCTION AND A SYSTEM THEREFOR

Ryuhei Fujiwara, and Keiko Shimada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,160
Claims priority, application Japan, May 22, 1990, 1-131857; Jun. 30, 1990, 1-173036
Int. Cl.[5] G10L *3/00, 5/00*
U.S. Cl. 381—46 **7 Claims**

1. A method for recognizing a speech uttered as one of a number of reference patterns registered, said method comprising the steps of:

preliminarily storing in a memory noise levels and noise factors which correspond to said noise levels;

producing an input sound signal comprising an input speech signal representative of said speech uttered and a noise accompanying said input speech signal;

analyzing said input sound signal to produce an input pattern signal representative of a pattern of said input sound signal;

detecting a start and an end of said input speech signal in said input sound signal to produce a speech detection signal;

deriving, as a noise portion, a portion of said input pattern signal before said start of said input speech signal is de-

5,201,006

HEARING AID WITH FEEDBACK COMPENSATION

is inserted into the ear canal, said disk is adjacent said first

when open uncovering said battery compartment for

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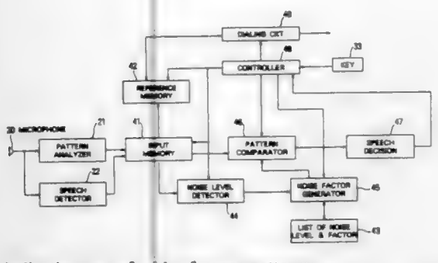
deriving, as a noise portion, a portion of said input pattern signal before said start of said input speech signal is detected to produce an average noise level;

accessing said memory to read one of said noise factors that corresponds to said average noise level;

deriving, as a speech portion, another portion of said input speech pattern during a time duration when said speech detection signal is representative of presence of said input speech signal;



indicating one of said reference patterns;

calculating a difference between a pattern of said speech portion and said one of said reference patterns and producing a product as a dissimilarity by multiplication of said difference and said one of said noise factors; and

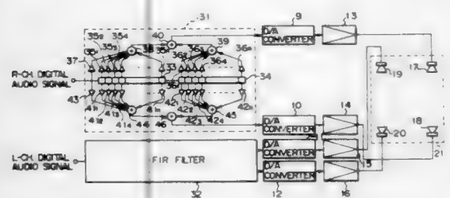
comparing said dissimilarity with a threshold value to recognize said speech as said one of said reference patterns when said dissimilarity is equal to or lower than said threshold value.

5,201,005

SOUND FIELD COMPENSATING APPARATUS

Fumio Matsushita, and Hiroshi Tsubonuma, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 16, 1991, Ser. No. 700,983
Claims priority, application Japan, Oct. 12, 1990, 2-274503
Int. Cl.[5] H03G *3/00*
U.S. Cl. 381—63 **3 Claims**



1. A sound field compensating apparatus comprising;

a plurality of FIR filters, each FIR filter having

(a) delay means, which includes a row of output terminals, for producing a plurality of different delay time data, one at each output terminal, by delaying the input audio signal for each sampling data

(b) multiplier and adder means for multiplying each delay time data by a respective coefficient in order to produce a series of reflected sound data and for adding said reflected sound data together;

means for obtaining driving signals for driving respective loudspeakers in accordance with output signals of said FIR filters, and further characterized in that

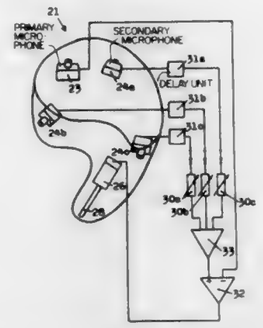
each of said output terminals of said delay means of said FIR filter is connected to a multiplicity of the multiplier and adder means for production of a plurality of output signals for each output terminal in said row of output terminals.

5,201,006

HEARING AID WITH FEEDBACK COMPENSATION

Soren Weinrich, Espergaerde, Denmark, assignor to Oticon A/S, Denmark

Filed Aug. 6, 1990, Ser. No. 563,201
Claims priority, application Denmark, Aug. 22, 1989, 4128/89
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68 **13 Claims**



1. A hearing aid of the type having

a1) a primary microphone for receiving ambient sound and for producing electrical signals corresponding thereto on a primary signal path,

a2) an amplifier for amplifying the electrical signals on said primary signal path to produce amplified signals,

a3) an electro-acoustic transducer for converting said amplified signals into acoustical signals and for directing the acoustic signals toward the user's eardrum or other sound-sensitive organ, and

b) at least two secondary signal paths each leading from a location in a predominant sound-transmission path between said transducer and said amplifier, the transmission times (Δt) along each of said secondary signal paths being substantially equal to the transmission time along said predominant sound-transmission path from each said location to said primary microphone, the output signals from each of said secondary signal paths being delivered to the input of said amplifier substantially in opposite phase and equal amplitude to the signals received by said amplifier from said primary microphone and caused by sound to be propagated along said predominant path.

5,201,007

APPARATUS AND METHOD FOR CONVEYING AMPLIFIED SOUND TO EAR

Gary L. Ward, and M. Duncan MacAllister, both of Roanoke, Va., assignors to Epic Corporation, Hardy, Va.

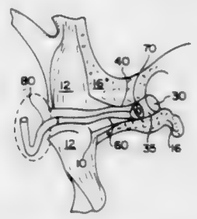
PCT No. PCT/US89/04126, § 371 Date Mar. 5, 1991, § 102(e) Date Mar. 5, 1991
Continuation-in-part of Ser. No. 244,398, Sep. 15, 1988. This PCT application Sep. 14, 1989, Ser. No. 656,186
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68.6 **28 Claims**

1. An earmold comprising:

(a) an acoustic conduction tube open at both ends for conveying amplified sound to the tympanic membrane at the inner end and the ear canal, said tube, when inserted into the ear canal, allowing unamplified sound received at the ear to reach into the ear canal to a first position at least as deep as the osseous portion thereof; and

(b) a flexible disk affixed to said tube so that when said tube

is inserted into the ear canal, said disk is adjacent said first position, said disk generally conforming to the ear canal at



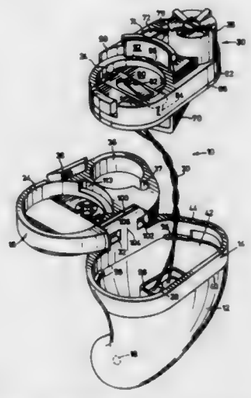
said first position, and having a hole coincident with the opening in the tube.

5,201,008

MODULAR HEARING AID WITH LID HINGED TO FACEPLATE

Horst Arndt, and Edward S. Kroetsch, both of Kitchener, Canada, assignors to Unitron Industries Ltd., Kitchener, Canada

Continuation of Ser. No. 7,032, Jan. 27, 1987, abandoned. This application Nov. 28, 1989, Ser. No. 707,295
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68.6 **14 Claims**



1. A hearing aid comprising:

(a) a shell adapted to fit within a user's ear and having an outer rim,

(b) a faceplate fixed to said outer rim and having an opening therein,

(c) an electronic module comprising a microphone, an amplifier connected to said microphone to amplify sound therefrom, a receiver connected to said amplifier to produce sound for said user, and a battery compartment to house a battery for said amplifier, said module being fitted within said opening of said faceplate and being removably attached to said faceplate,

(d) said battery compartment having an open outer end,

(e) a lid for said faceplate, said lid being adapted substantially to cover said module, there being no other lid to cover said module, said lid having an inside surface, said inside surface defining a closure for said open outer end of said battery compartment,

(f) hinge means connected between said lid and said faceplate for said lid to be opened and closed, said lid when closed substantially covering said module, and said lid when closed being aligned for said closure for said battery compartment to close said battery compartment, said lid when open uncovering said battery compartment for removal of said battery and also uncovering said module so that said module can be removed from said faceplate,

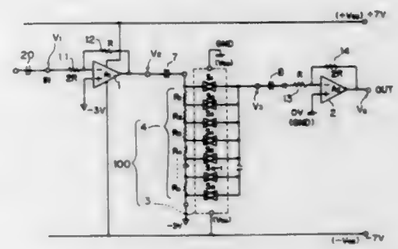
(g) and detent means for retaining said lid in a closed position.

5,201,009

SIGNAL PROCESSOR

Yusuke Yamada, and Tetsuya Murayama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1991, Ser. No. 764,845
Claims priority, application Japan, Mar. 18, 1991, 3-052623
Int. Cl.[5] H03G *3/00*
U.S. Cl. 381—104 **8 Claims**



1. A signal processor comprising:

a first processing part for damping an AC component of an input signal by a predetermined amount, while shifting a DC component of said input signal in a first direction so as to generate a first processing signal;

a second processing part for processing said first processing signal so as to generate a second processing signal; and

a third processing part for shifting a DC component of said second processing signal in a second direction which is opposite to said first direction, by an amount equal to a magnitude of the shifting performed by the first processing part, while amplifying an AC component of said second processing signal by an amount equal to a reciprocal of the predetermined damping amount performed by said first processing part so as to generate a third processing signal.

5,201,010

METHOD AND SYSTEM FOR BUILDING A DATABASE AND PERFORMING MARKETING BASED UPON PRIOR SHOPPING HISTORY

David W. Deaton, and Rodney G. Gabriel, both of Abilene, Tex., assignors to Credit Verification Corporation, Abilene, Tex.

Continuation-in-part of Ser. No. 826,255, Jan. 24, 1992, which is a continuation of Ser. No. 345,475, May 1, 1989, abandoned. This application May 19, 1992, Ser. No. 886,385
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—7 **41 Claims**

1. A method of building a customer database using checks from a variety of different banks comprising:

detecting a customer's checking account identification number for use as a unique customer identification code;

entering the unique customer identification code into a processor containing a database that maintains customer records including the customer's name and address, the checking account identification number, and customer transactional data over a pre-selected time interval;

comparing said checking account identification code with said database;

generating a response with said processor to signal the presence of the customer's identification code or the failure to locate the customer's identification code;

creating a new record in said database for that customer's

5,201,012

DITHER PROCESSING METHOD

varies as a function of a reflectance characteristic of a corresponding document pixel.

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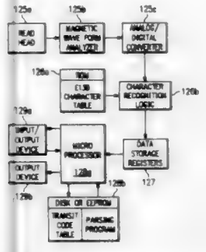
creating a new record in said database for that customer's identification code in response to a processor response indicating the failure to locate, so that the customer's name and address is entered into the record along with the customer's transactional data; and



selecting customers in said database whose last transaction date is prior to a pre-selected interval of inactivity so that that grouping of infrequent customers is available for marketing efforts.

5,201,011

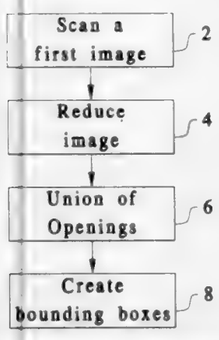
METHOD AND APPARATUS FOR IMAGE HAND MARKUP DETECTION USING MORPHOLOGICAL TECHNIQUES

Dan S. Bloomberg, and Lakshmi Dasari, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1991, Ser. No. 794,275

Int. Cl.[5] G06K *9/34, 9/00*

U.S. Cl. 382—9 **22 Claims**



1. A method for processing a scanned first image in a digital computer to identify a location of non-transparent hand marks and hand marked regions, the method comprising the steps of:

(a) performing a plurality of morphological OPENING operations on the first image using a first set of structuring elements, each OPENING operation using a different structuring element from said first set, and taking a UNION of the results of said plurality of OPENING operations to form a second image; and

(b) creating bounding boxes around mark-up lines in the second image, said bounding boxed identifying the hand marked regions.

5,201,012

IMAGE BINARIZATION THRESHOLD COMPUTING APPARATUS

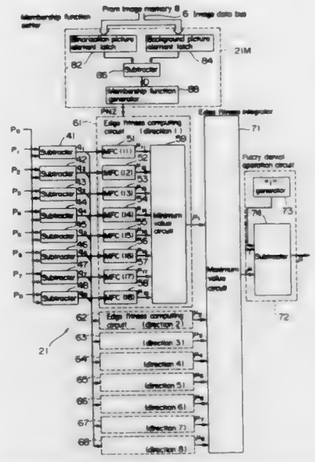
Atushi Hisano, Nagaokakyo; Hiroshi Teramoto, Jyoyo; Atushi Mizoguchi, Hikone; Hiroshi Hisada, Moriyama, and Siro Fujieda, Otokuni, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Jun. 5, 1991, Ser. No. 712,189

Claims priority, application Japan, Jun. 8, 1990, 1-150490; Apr. 17, 1991, 2-112636

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—50 **4 Claims**



1. An apparatus for computing an image binarization threshold value, said apparatus comprising:

a window scanning means for setting a window of predetermined area over a multilevel image and scanning the same image,

a first information generating means for receiving image data from said window scanning means and for generating therefrom a first data indicative of brightness of the image within said window,

a second information generating means for receiving image data from said window scanning means and for generating therefrom a second data indicative of the fitness of non-fitness of the image within said window with respect to a preset fuzzy image edge model data, said second information generating means comprising:

a pattern generating means which, using the brightness of a picture element at a predetermined location of the image within said window as a reference, generates a brightness pattern of other neighboring picture elements within said window,

fitness or non-fitness data generating means for generating data concerning the fitness or non-fitness of said brightness pattern with respect to a fuzzy image edge model constructed by combination of a plurality of membership functions corresponding to the locations of said neighboring picture elements within said window, and

a histogram generating means for generating a histogram of said fitness or non-fitness data,

a third information generating means for receiving said first and second data and generating therefrom a third data serving as a picture quality assessment criterion, and

an optimal threshold computing means for receiving said third data and calculating therefrom an optimal threshold value providing the best picture quality.

5,201,013

DITHER PROCESSING METHOD

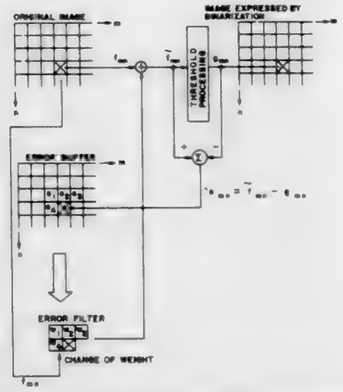
Ryohei Kumagai, Tokyo, Japan, assignor to Ezel, Inc., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,258

Claims priority, application Japan, Apr. 24, 1989, 1-103695; Jun. 9, 1989, 1-147229; Jun. 20, 1989, 1-157164

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—50 **10 Claims**



1. A machine method for generating a binarized image from an original image comprising the steps of:

storing density values of pixels of the original image in a frame memory;

generating pixels for the binarized image corresponding to a set of pixels from a neighborhood of the original image, said neighborhood including a plurality of pixels immediately adjacent to a pixel to be processed;

storing error values for the pixels in the neighborhood in an error buffer;

passing the error values through a filer, said filter modifying error values according to weighting factors, said weighting factors varying as a function of the density value of the pixel to be processed and independently from the density values of the pixels in the neighborhood;

modifying the density value of the pixel to the processed according to the filtered errors of pixels in the neighborhood;

passing the modified density value of the pixel to be processed through a threshold processor, said threshold processor comparing a threshold value to the modified density value and generating a pixel of the binarized image according to the comparison result of the threshold value and the modified density value to be processed.

5,201,014

METHOD AND APPARATUS FOR ESTABLISHING THRESHOLD LEVEL IN A BINARY MODE DOCUMENT SCANNER

Greg A. Degi, Fort Collins, Colo.; Graig L. Miller, Boise, Id., and Irene F. Stein, Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 477,286, Feb. 8, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 835,008

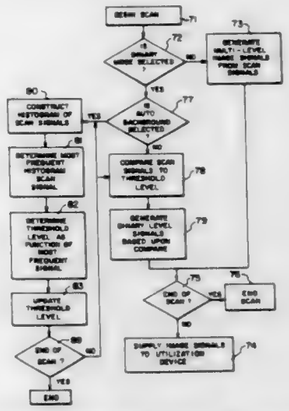
Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—51 **16 Claims**

15. A method for use in a document scanner, comprising the steps of:

scanning a document line by line and generating a plurality of output scan signals, each signal having a magnitude that varies as a function of a reflectance characteristic of a corresponding document pixel,

periodically determining the output scan signal magnitude that is in the majority as said document is scanned,



periodically adjusting the magnitude of a single threshold signal as a function of only said majority scan signal magnitude, and

generating a binary image signal by comparing the magnitude of each output scan signal to said threshold signal.

5,201,015

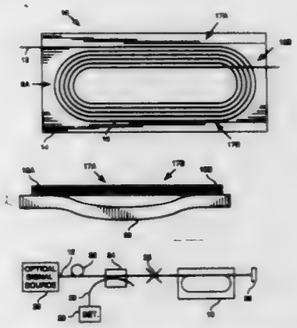
CONFORMAL FIBER OPTIC STRAIN SENSOR

Karlheinz von Bieren, Camarillo; Akbar Arabsadeghabadi, Simi Valley, and Phillip Skochinski, Woodland Hills, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 19, 1991, Ser. No. 762,311

Int. Cl.[5] G02B *6/02*

U.S. Cl. 385—13 **7 Claims**



1. A fiber optic strain sensor for measuring strains along a curved surface, comprising:

a flexible base plate;

a length of optical fiber attached to the base plate at two spaced apart locations with a sensing portion of the optical fiber being between the two spaced apart locations, the base plate having a concave portion formed therein between the two spaced apart locations such that the base plate has a tendency to straighten itself, thereby applying a bias tension to the sensing portion of the optical fiber, and

means for forming an interferometer in the sensing portion of the optical fiber.

5,201,016

optical plastic material and positioned within said waveguide channels.

(a) a first plastic tubular member having an inner surface and an outer surface;

(b) a second plastic tubular member having an inner surface

at a first wavelength with which is associated a first delay, and

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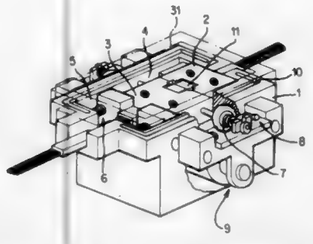
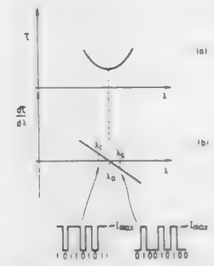
5,201,016
OPTICAL SWITCH
Kunihiko Jinbo, and Yoshikazu Nomura, both of Chiba, Japan, assignors to Fujikura Ltd., Tokyo, Japan
PCT No. PCT/JP91/00099, § 371 Date Sep. 23, 1991, § 102(e) Date Sep. 23, 1991, PCT Pub. No. WO91/11744, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 29, 1991, Ser. No. 752,543
Claims priority, application Japan, Jan. 30, 1990, 2-8046[U]; Jan. 30, 1990, 2-8047[U]; Jan. 30, 1990, 2-8049[U]; Jan. 30, 1990, 2-8050[U]; Jan. 30, 1990, 2-8052[U]; Jan. 30, 1990, 2-19585; Jan. 30, 1990, 2-19586; Jul. 10, 1990, 2-73101[U]; Jul. 10, 1990, 2-181994
Int. Cl.[5] G02B 6/00
U.S. Cl. 385—19 9 Claims



1. In an optical switch in an optical transmission line made of a plurality of optical fibers and having at least two optical fiber groups, the switch having a stationary plug so secured to the end portion of one of the two optical fiber groups that the ends of the optical fibers in the first group are exposed in a face of said stationary plug, and a moving plug so secured to the end portion of the other optical fiber group that the ends of the optical fibers in the second group are exposed in a face of said moving plug, the stationary and moving plugs being in contact with each other at said faces, comprising:
a driving means for sliding said moving plug momentarily for at least one pitch space of the optical fibers normal to the line of said optical fibers while being kept in contact with said stationary plug;
a main body having a plug chamber housing said stationary and moving plugs and in which a matching oil is charged;
a sliding mechanism for smoothing the switching movement of said moving plug inside said plug chamber of said main body;
a push pin extending through said main body to contact and move said moving plug;
an oil-leak preventing mechanism for preventing said matching oil from leaking from between said push pin and main body;
a lateral-pressure adjusting mechanism including a spring and being mounted to apply a lateral pressure to said push pin;
and a cushion mechanism for attenuating fine vibration of said moving plug caused by pressure thereagainst from said push pin.

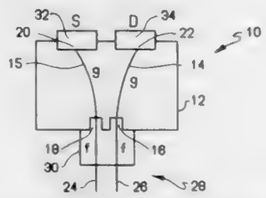
5,201,017
OPTICAL COMMUNICATIONS SYSTEMS
Kevin C. Byron, Bishop's Stortford, Great Britain, assignor to STC PLC, London, England
Filed Oct. 30, 1990, Ser. No. 606,052
Claims priority, application United Kingdom, Nov. 15, 1989, 8925818
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—24 3 Claims

1. A method of eliminating soliton-type interaction in an optical fibre communications system including the steps of launching a first pulsed signal into one end of an optical fibre of the system for transmission therealong to the other end of the optical fibre, which first pulsed optical signal is transmitted at a first wavelength with which is associated a first delay, and simultaneously launching into the one end of the optical fibre a second pulsed optical signal, which second pulsed optical signal comprises dark pulses of the same format as the first pulsed optical signal but at a second wavelength with which is



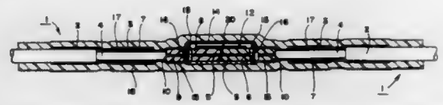
associated a second delay, the first and second wavelengths being chosen so that the delays are equal whereby the light transmitted by the optical fibre is of constant intensity and soliton-type interaction between the pulses of the first pulsed optical signal is prevented.

5,201,018
OPTICAL CONNECTOR WITH WAVEGUIDES FOR DEVICE TO FIBER COUPLING
Michael H. Coden, New York, and Dutt V. Bulusu, Yorktown Heights, both of N.Y., assignors to Codenoll Technology Corporation, Yonkers, N.Y.
Filed Aug. 29, 1991, Ser. No. 751,937
Int. Cl.[5] G02B 6/42
U.S. Cl. 385—88 12 Claims



12. An improvement in an interface between a duplex optical fiber cable and optical devices wherein said duplex optical fiber cable comprises two transmission lines including an input transmission line and an output transmission line, and cladding material surrounding each of said lines to prevent transmission losses, and said optical devices comprise an optical source and an optical detector, said interface being arranged so that light transmits through said input transmission line toward said optical detector and from said optical source to said output transmission line;
the improvement comprising a connector having a connector housing constructed from a plastic material, said connector housing defining two waveguide channels formed therethrough and including means for attaching one line of said two transmission lines of said duplex optical fiber cable to one end of one of said waveguide channels in said connector housing and the other of said two transmission lines of said duplex optical fiber cable to one end of the other of said waveguide channels, and means for attaching said source to an opposite end of said one waveguide channel in said connector housing and said detector to an opposite end of said other waveguide channel in said connector housing, and waveguide core portions utilized to transmit light through said connector constructed of an optical plastic material and positioned within said waveguide channels.

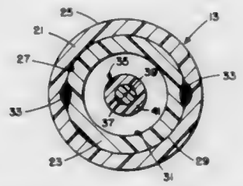
5,201,019
FIBER OPTIC SPLICE CONNECTION AND A METHOD OF MAKING SAME
David O. Gallusser, and John H. Mikolaicyk, both of Oneonta, assignors to Amphenol Corporation, Wallingford, Conn.
Filed Jul. 15, 1991, Ser. No. 729,982
Int. Cl.[5] G02B 6/38
U.S. Cl. 385—99 33 Claims



1. Apparatus for providing a connection between two optical cables, comprising:
alignment means for axially aligning optical fibers in said two cables;
compression means for applying a compressive axial force to said alignment means; and
sealing means including a sealing tube which completely encloses said alignment and compression means for environmentally sealing the connection against infiltration of moisture and other contaminants.

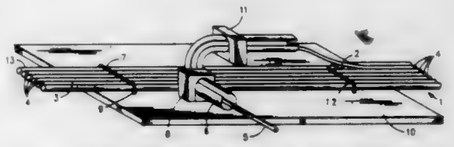
30. A method of effecting a splice connection for two optical cables, comprising the steps of:
(a) stripping an optical fiber cable to expose a length of optical fiber, a length of a cable buffer and a length of cable reinforcement;
(b) inserting a cable support member between said cable buffer and said cable reinforcement;
(c) inserting said exposed length of optical fiber into a bore in a guide member and inserting the guide member into said cable support member;
(d) repeating steps a–c with respect to the second optical fiber cable;
(e) inserting said guide members into an alignment sleeve;
(f) snapping a splice clip onto said cable support members to apply compressive axial force on respective cable support and guide members of said two cables;
(g) enclosing said cable support members, guide members, alignment sleeve, and splice clip within a sealing tube;
(h) securing said sealing tube to said cables.

5,201,020
REINFORCED PROTECTIVE TUBE FOR OPTICAL WAVEGUIDE FIBERS
Rengan Kannabiran, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Nov. 8, 1990, Ser. No. 610,506
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—113 25 Claims



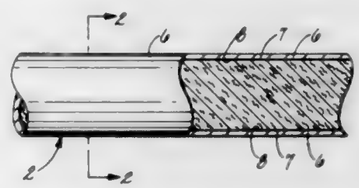
1. A protective loose tube for a single optical waveguide fiber comprising:
(a) a first plastic tubular member having an inner surface and an outer surface;
(b) a second plastic tubular member having an inner surface and an outer surface; and
(c) at least one flexible strength member;
wherein:
(i) substantial portions of the outer surface of the first tubular member and the inner surface of the second tubular member are in contact,
(ii) the at least one flexible strength member lies between and is in contact with both the outer surface of the first tubular member and the inner surface of the second tubular member but is not substantially embedded in either of those tubular members, and
(iii) said protective loose tube has an outside diameter of less than or equal to about 1,000 microns.

5,201,021
BRANCHING ARRANGEMENT FOR OPTICAL FIBER CABLES
Peter Delåge, Jüchen; Ralph Böhme; Reinhard Girbig, both of Mönchengladbach, and Herbert Moers, Korschenbroich, all of Fed. Rep. of Germany, assignors to AEG Kabel Aktiengesellschaft, Fed. Rep. of Germany
Filed May 18, 1992, Ser. No. 885,265
Claims priority, application Fed. Rep. of Germany, May 24, 1991, 4116972
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—114 15 Claims



1. A branching arrangement for a flat cable, comprising:
a flat cable separated in an area of a subscriber connection along cross links which connect an optical vein with the neighboring elements, at least a portion of the optical vein being separated from the flat cable to branch off from the flat cable, so that the optical vein does not require any splice connection within the branching arrangement;
kink protection means for safeguarding the optical vein and curving the optical vein to pass above the flat cable so as to extend at about a right angle thereto, the flat cable and said kink protection means being secured so as to prevent relative movement therebetween.

5,201,022
COATED OPTICAL FIBER
Peter Shifflett, Fremont, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.
Filed May 20, 1991, Ser. No. 703,010
Int. Cl.[5] G02B 6/00, 6/16
U.S. Cl. 385—128 7 Claims



1. An optical fiber thermometer system comprising:

(a) an enclosed high temperature source;
(b) an embrittlement-resistant optically-transmissive fiber

ing air to the room air, said fans moving both room air and recirculating air through the heat exchanger portion,

5,201,026
METHOD OF ARCHITECTING MULTIPLE NEURAL NETWORK AND SYSTEM THEREFOR

output by the management computer and of preparing the image for imprinting;
at least one microprocessor-based device with driving and

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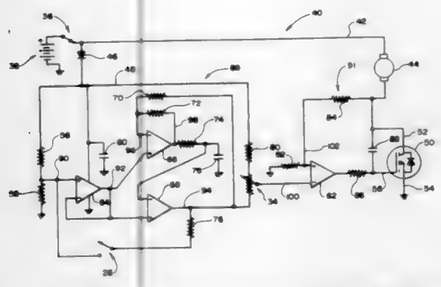
(a) an enclosed high temperature source;
(b) an embrittlement-resistant optically-transmissive fiber comprising a core and coating means secured thereon for insulating the core against penetration by hydroxyl ions;
(c) the fiber including a first end terminating in a temperature sensor in the high temperature source, and a second end terminating at a receptor apparatus outside the high temperature source.

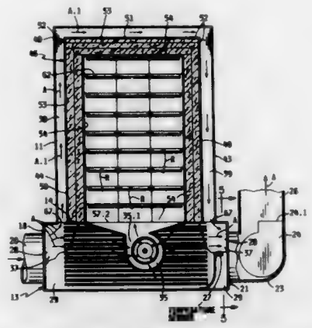
5,201,023
VARIABLE SPEED LATCHING MOTOR CONTROL
Andrew R. Motzko, Burnsville, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Jul. 30, 1991, Ser. No. 735,710
Int. Cl.[5] G05B *5/00*
U.S. Cl. 388—824 **9 Claims**



1. A solid state motor power control for portable paint pumps comprising:
a) a MOSFET power control device having first and second terminals connected in series with a pump motor and a battery power source, the MOSFET power control device having a third terminal operable to control conductivity between the first and second terminals of the MOSFET power control device;
b) solid state control means connected to the third terminal of the MOSFET power control device and selectively operable in response to an operator actuated switch for placing the MOSFET power control device in one of two states, the two states being:
i) a first state having a relatively high impedance, blocking power to the motor, and
ii) a second state having a continuously variable impedance wherein motor speed is regulated by the MOSFET power control device.

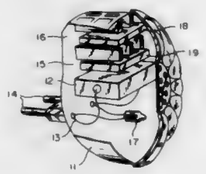
5,201,024
DOUBLE LOOP HEAT STORAGE SPACE HEATING FURNACE USING AN AIR-TO-AIR HEAT EXCHANGER
Paul J. Steffes, 1282 Fairway, Dickinson, N. Dak. 58601
Filed Nov. 26, 1990, Ser. No. 618,267
Int. Cl.[5] F24H *7/00*; **F24D** *11/00*; **F28D** *20/00*
U.S. Cl. 392—344 **9 Claims**

1. A space heating furnace comprising
a housing having a lower section and an upper section above the lower section,
a room air flow course portion for supplying air into the space to be heated and comprising a room air fan,
a recirculating air flow course portion providing a heat source portion for the room air, said recirculating air flow course portion comprising an electrically heated heat storage brick portion and heating the recirculating air at least into the range of 500° F. plus or minus 100° F. to 1350° F. and also comprising a recirculating air fan,
a heat exchanger portion connected into both of said flow course portions and transferring heat from the recirculating air to the room air, said fans moving both room air and recirculating air through the heat exchanger portion,
said lower section of the housing confining said room air flow course portion and said heat exchanger portion, said upper portion of the housing confining said heat storage brick portion, said recirculating air flow course portion traversing both of said upper and lower sections, said



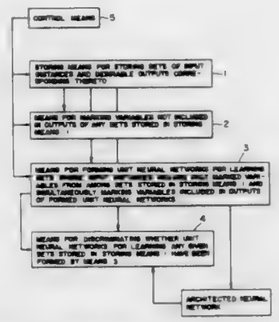
upper section of the housing comprising an outer sheet metal sheath portion embracing and spaced outwardly from the heat storage brick portion and defining a cooling air space between the sheath portion and the brick portion, said room air flow course portions having continuously open access ports into the cooling air space for moving a portion of such room air through the cooling space and for cooling the sheath portion.

5,201,025
DUAL PURPOSE ELECTRIC VAPORIZER FOR TABLETS
Bruno Landesberg, Tel Aviv, Israel, assignor to Sano - Bruno's Enterprises Ltd., Hod Hasharon, Israel
Filed Oct. 28, 1991, Ser. No. 781,805
Int. Cl.[5] A61M *16/00*
U.S. Cl. 392—392 **5 Claims**



1. A dual purpose electric vaporizer comprising a container having an electric heating element heated by an electric current and said heating element is connectable to an external electric power source; and said container having a double deck containing means for tablets to be vaporized located above said heating element; and one lower deck of said containing means for tablets is placed at a position close to said heating element, and the upper deck of said containing means for tablets is positioned at an elevated position above the containing means close to said heating element, at a distance away from said heating element; so that when said containing means for tablets is loaded with either one or two tablets containing either an insecticide, repellant, or an air freshener; and said heating element is connected to an external electric power source, said tablet placed in said upper deck of said container means shall be exposed to a lower temperature than the tablet placed in said lower deck of said container means.

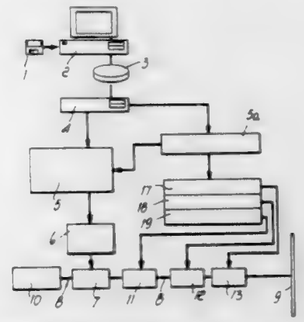
5,201,026
METHOD OF ARCHITECTING MULTIPLE NEURAL NETWORK AND SYSTEM THEREFOR
Makoto Tsuiki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 17, 1991, Ser. No. 716,253
Claims priority, application Japan, Jun. 26, 1990, 2-167917
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—11 **8 Claims**



8. A system for architecting a multiple neural network, the system comprising:
storing means for storing sets of input instances and desirable outputs corresponding thereto;
first marking means, coupled to the storing means, for marking variables not included in outputs of any sets stored in the storing means;
second marking means, coupled to the first marking means, for forming unit neural networks to learn sets whose input instances include only marked variables from among sets stored in the storing means and simultaneously marking variables included in outputs of formed unit neural networks;
discriminating means, coupled to the second marking means, for discriminating whether a unit neural network to learn any given set stored in the storing means has been formed; and
connecting means, coupled to the second marking means, for connecting formed unit neural networks to each other.

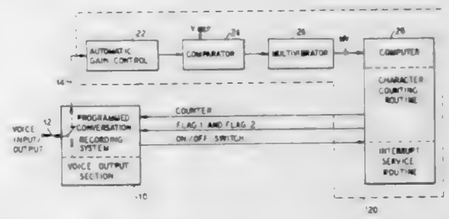
5,201,027
ELECTRONIC APPARATUS FOR THE LASER IMPRINTING OF SCREEN-PROCESS PRINTING STENCILS AND THE LIKE
Pierangelo Casini, Seregno, Italy, assignor to M.S. Servizi Informatici S.r.l., Caronno Pertusella, Italy
Filed Dec. 16, 1991, Ser. No. 807,363
Claims priority, application Italy, Dec. 24, 1990, 22533 A/90
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—107 **5 Claims**

1. Electronic apparatus for imprinting screen-process printing stencils and the like, using the method of electronic image processing and a LASER light source, comprising:
an electronic device for the color acquisition of the image of a manually prepared color design, so as to obtain the information in a digital format which can be stored on a magnetic support;
a computer for the management of the data stored on said magnetic support. suitable for allowing the user to manage said data, i.e. to seleot the fundamental colors, change them and partially superimpose them, with simultaneous on-screen display or printout on paper or the like;
a further computer which is controlled by the management computer and has the functions of controlling the data output by the management computer and of preparing the image for imprinting;
at least one microprocessor-based device with driving and synchronizing functions, which is suitable for translating the data output by said control computer into electric signals which are synchronized with a mirror scanning system for orientating the beam of said LASER toward any point of the plane of the support to be imprinted and



for modulating the intensity of said LASER beam according to the position assumed thereby on the plane of the support, as well as a scanning system constituted by at least one mirror which is arranged on the optical axis of the LASER beam and can be orientated by virtue of motor means, such as a galvanometer or the like, controlled by said control computer by means of an analog circuit.

5,201,028
SYSTEM FOR DISTINGUISHING OR COUNTING SPOKEN ITEMIZED EXPRESSIONS
Peter F. Theis, 3203 Bay View La., McHenry, Ill. 60050
Filed Sep. 21, 1990, Ser. No. 586,089
Int. Cl.[5] G10L *9/00*
U.S. Cl. 395—2 **41 Claims**



19. In a system having a voice processor for processing speech and responsively producing a waveform representing information of said speech, said waveform defining a high amplitude segment above a predetermined reference level and a low amplitude segment below said predetermined reference level, said waveform comprising at least one high amplitude segment and at least one low amplitude segment, at least some of said high amplitude segments indicating speech, at least some of said low amplitude segments indicating periods of non-speech between adjacent speech segments, a speech categorization system for counting spoken itemized expressions comprising, in combination:
sensing means for sensing said waveform;
timer means, interconnected to said sensing means, for generating first and second measured durations, wherein said first measured durations vary as a function of duration of high amplitude segments, and wherein said second mea-

sured durations vary as a function of low amplitude seg-

operand stores and the respective latch arrangements, for

plurality of electrical signals to generate a fifth plurality of

5,201,032
METHOD AND APPARATUS FOR GENERATING

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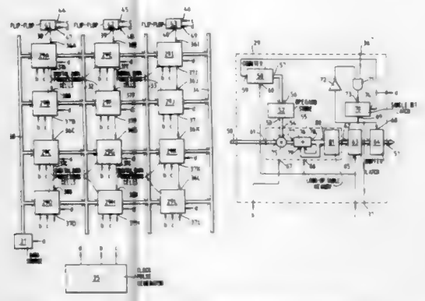
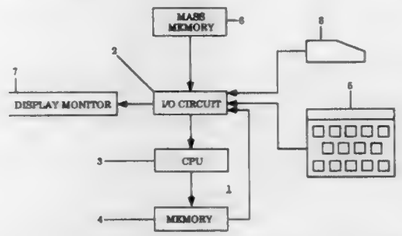
sured durations vary as a function of low amplitude segments;
classification means for classifying a high amplitude segment in a first category when said first and second measured durations corresponding to said high amplitude segment and an adjacent and subsequent in time low amplitude segment satisfy a classification test; and
a counter for counting said high amplitude segments classified in said first category, said high amplitude segments classified in said first category corresponding to said spoken itemized expressions.

5,201,029
DIGITAL DATA PROCESSING APPARATUS USING DAISY CHAIN CONTROL
John Jackson, Lindfield, England, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 427,411, Oct. 24, 1989, abandoned. This application Mar. 24, 1992, Ser. No. 856,883
Claims priority, application United Kingdom, Oct. 24, 1988, 8824843.0
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—27 **9 Claims**



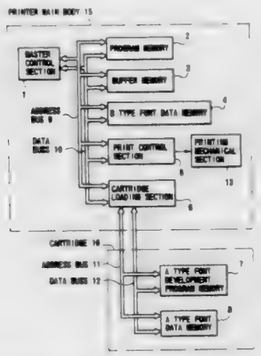
1. Digital data processing apparatus comprising
a) a common input for receiving a set of sequential input digital data items;
b) a common output
c) a set of digital data processing cells for processing the set of sequential input digital data items, each cell comprising
i) respective input means coupled with the common input for receiving the set of sequential input data items, so that all of the ells process the same data,
ii) a respective output for supplying a respective item of digital output data to the common output;
iii) a respective operand store comprising a respective plurality of storage locations, each storage location being for storing a respective operand;
iv) a respective digital multiplier, having a first input coupled to the respective input means and a second input coupled to a data output of the respective operand store, for multiplying successive items of the set of sequential input digital data items by the respective operands;
v) a respective accumulator, having a data input coupled to an output of the respective multiplier, for accumulating results of multiplications performed by the respective multiplier;
vi) a respective latch arrangement for storing and outputting the respective item of digital output data; and
vii) respective data transfer means, coupling an output of the respective accumulator to a data input of the respective latch arrangement, having a non-linear characteristic transfer function;
d) clock pulse generator means, coupled to the respective operand stores and the respective latch arrangements, for causing:
i) the storage locations, of each operand store, to output their respective operands in a first predetermined order and according to a timing which is coordinated with timings of output of corresponding respective operands from storage locations of the other operand stores; and
ii) the latch arrangements to output their contents onto the common output in a second predetermined order,
so that the output from each cell is presented to the common output in turn, whereby no bus arbitration is needed.

5,201,030
METHOD AND APPARATUS FOR DITHERING GRAPHIC IMAGES
Susan Carrie, Mountain View, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.
Continuation of Ser. No. 724,515, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 413,983, Sep. 28, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 925,314
Int. Cl.[5] G06F *3/14;* **H04N** *1/40;* **G09G** *5/10*
U.S. Cl. 395—132 **14 Claims**



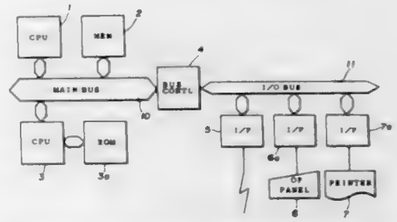
1. A system for dithering an image comprising a plurality of pixels and displaying said image on a graphics display monitor, said system comprising:
an input device for inputting image information to said system;
an input/output circuit coupled to said input device for formatting said image information;
a graphics display monitor for displaying said image on a two-dimensional display screen, said display monitor coupled to said input/output circuit;
a memory circuit coupled to said input/output circuit;
means for generating a first plurality of electrical signals wherein each one of said first plurality of electrical signals corresponds to a separate one of said plurality of pixels and further indicates an input intensity for that separate one of said plurality of pixels;
means for generating a second plurality of electrical signals wherein each one of said second plurality of electrical signals corresponds to a separate one of said plurality of pixels and further indicates an output quantized intensity value for that separate one of said plurality of pixels;
means for generating a third plurality of electrical signals wherein each one of said third plurality of electrical signals corresponds to a dither matrix entry and further indicates a dither matrix value;
means for comparing said first plurality of electrical signals to said second plurality of electrical signals and utilizing the results of said comparisons to generate a fourth plurality of electrical signals, wherein each one of said fourth plurality of electrical signals corresponds to a separate one of said plurality of pixels and further indicates the intensity difference between the output quantized intensity value and the input intensity value for that separate one of said plurality of pixels;
means for modifying said fourth plurality of electrical signals based upon the range of dither matrix values in said third plurality of electrical signals to generate a fifth plurality of electrical signals;
means for comparing said third plurality of electrical signals to said fifth plurality of electrical signals, and utilizing the results of said comparisons to generate a sixth plurality of electrical signals, wherein each one of said sixth plurality of electrical signals corresponds to a separate one of said plurality of pixels and further indicates a dithered output intensity for that separate one of said plurality of pixels;
means for applying said sixth plurality of electrical signals to said graphics display monitor;
means for actuating said plurality of pixels at specified locations and intensities on said graphics display monitor in accordance with the dithered output intensities indicated by said sixth plurality of electrical signals.

5,201,031
PRINTER USING EXTERNAL FONT CARTRIDGE
Nobuhiro Kasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 19, 1992, Ser. No. 854,815
Claims priority, application Japan, Mar. 22, 1991, 3-57565
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—110 **7 Claims**



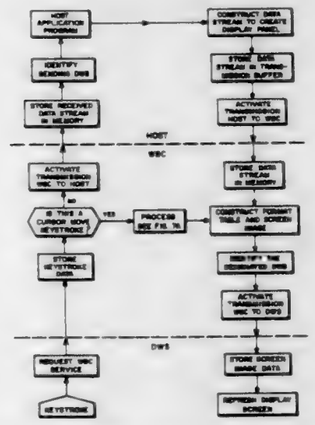
1. A printer using an external font cartridge, comprising:
a printer main body including an internal font data memory for storing internal font data, a program memory for storing at least an internal font development program, control means for performing control to generate print data on the basis of the internal font data stored in said internal font data memory and the internal font development program stored in said program memory, and printing means for printing the print data generated by said control means; and
a cartridge including an external font data memory for storing external font data, and an external font development program memory for storing an external font development program,
wherein when said cartridge is loaded into said printer main body, said control means selects said external font data memory and said external font development program memory in said cartridge, and performs control to generate print data corresponding to a designated character.

5,201,032
METHOD AND APPARATUS FOR GENERATING MULTI-LEVEL CHARACTER
Morisumi Kurose, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 341,201, Apr. 21, 1989, abandoned. This application Aug. 7, 1991, Ser. No. 742,527
Claims priority, application Japan, Jun. 2, 1988, 63-136248
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—150 **44 Claims**



1. A method of generating a multi-level character which is described in more than three levels of tone, said method comprising the steps of:
receiving an instruction to generate an object character; and
generating a plurality of outlines for the object character in response to said instruction, said outlines respectively corresponding to mutually different levels of tone, from the more than three levels of tone, of more than three regions which are defined by said outlines, wherein at least two of the more than three regions are contour regions separating a character core region from a character background region.

5,201,033
METHOD FOR CONTROLLING CURSOR MOVEMENTS ON CERTAIN COMPUTER WORKSTATIONS
Stephen T. Eagen, and Harvey G. Kiel, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 17, 1990, Ser. No. 466,151
The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—155 **6 Claims**



1. A method of expanding and enhancing cursor control and

display in a plurality of dependent workstations connected to a

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5,201,035
DYNAMIC ALGORITHM SELECTION FOR VOLUME

5,201,036
DATA PROCESSOR HAVING WAIT STATE CONTROL

port memory for data transfer from the random access memory part to the serial access memory part and for

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display in a plurality of dependent workstations connected to a workstation controller, comprising the steps of:

a) prestoring, in said workstation controller, format tables to describe cursorable panel items, including selection fields and entry fields relating to cursor position and display, for each of said plurality of dependent workstations;

b) asynchronously receiving cursor keystroke signals in said workstation controller from any of said plurality of dependent workstations;

c) identifying, within said workstation controller, as to each of said asynchronously received cursor keystroke signals, the particular dependent workstation from which such signal is received, and retrieving the format tables for such dependent workstation;

d) developing, within said workstation controller, a new cursor target position and display screen image at an input-capable position corresponding to the particular received cursor keystroke signal and the particular dependent workstation format table; and

e) transmitting the new display screen image to the particular dependent workstation to modify the cursor position and display image on said workstation corresponding to the new cursor target position and display screen image.

5,201,034

INTERACTIVE INTELLIGENT INTERFACE

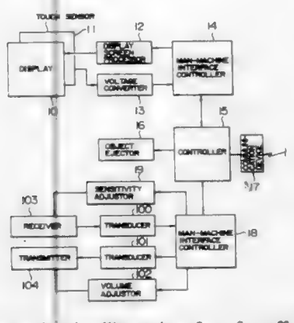
Masayoshi Matsuura, Hitachi; Hiroyuki Ogura, Yokohama; Yuko Teranishi, Koganei; Akito Yamanaka, Akashi; Shinobu Wada, Kawasaki; Masayuki Orimo; Katsumi Kawano, both of Kawasaki; Yasuo Suzuki, Ebina, and Kinji Mori, Yokohama, all of Japan, assignors to Hitachi Ltd. and Hitachi Information and Control System Inc., Tokyo, Japan

Continuation of Ser. No. 413,455, Sep. 27, 1989, abandoned. This application Mar. 24, 1992, Ser. No. 856,804

Claims priority, application Japan, Sep. 30, 1988, 63-244130

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—155 **19 Claims**



1. An interactive intelligent interface for effectively exchanging information between a system and a physically impaired user whose physical impairment otherwise precludes an ability to exchange information with the system, comprising:

means for measuring the extent of impairment of the user of the system;

means for estimating an operating capacity of the user to communicably exchange information with the system on the basis of the measured extent of impairment;

a plurality of means for outputting to the user information from the system;

a plurality of means for inputting to the system information from the user; and,

means for selecting a one of the plurality of outputting means and a one of the plurality of inputting means in accordance with the estimated capacity of the user to communicably exchange information.

5,201,035

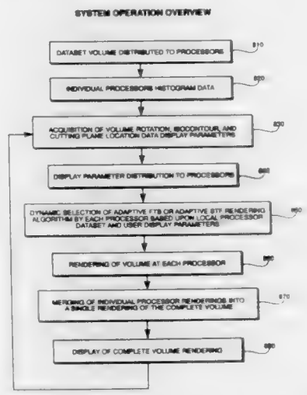
DYNAMIC ALGORITHM SELECTION FOR VOLUME RENDERING, ISOCONTOUR AND BODY EXTRACTION WITHIN A MULTIPLE-INSTRUCTION, MULTIPLE-DATA MULTIPROCESSOR

Martin R. Stytz, Fairborn, Ohio, and Ophir Frieder, Basking Ridge, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 9, 1990, Ser. No. 549,870

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—163 **14 Claims**



6. A dynamic hidden-surface removal method controlled by a user for extracting isocontours and for inserting cutting planes within a three-dimensional volume using a multiple-instruction, multiple-data (MIMD) computer having a plurality of processors, using an adaptive back-to-front procedure comprising the steps:

a. acquiring user display parameters;

b. computing the image space coordinates of rotated object space octant centers;

c. at each processor, placing a back-to-front reference plane at a distance of at least 5N behind the cutting plane, N being the dimension of object space within each processor;

d. sorting image space octant center coordinates in back-to-front order while maintaining pairing with corresponding object space coordinates;

e. generating a next set of object and space octant center coordinates, and returning from a current recursion level when done;

f. determining if this is the deepest level of recursion;

g. if yes, determining if an object space array voxel value being within the isocontour, and if not going to step e;

h. if yes, determining if the image space coordinates are coplanar or behind the cutting plane, and if not going to step e;

i. if yes, copying the voxel value from the object space array to a screen space array, and going to step e;

j. if at step f it is determined that this is not the deepest level of recursion, determining if the distance from the back-to-front reference plane BTFRP is less than the distance from the image space octant center coordinates to the cutting plane, and if not going to step e;

k. also if at step f it is determined that this is not the deepest level of recursion, determining if the distance from the image space octant center coordinates to the cutting plane is less than a current image space octant diameter, and if not going to step e;

l. if at step j and also at step k the decision is "yes" going to the next recursion level, and then going to step e.

5,201,036

DATA PROCESSOR HAVING WAIT STATE CONTROL UNIT

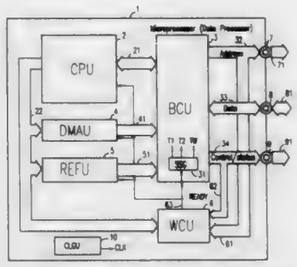
Norifumi Yoshimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,198

Claims priority, application Japan, Nov. 28, 1989, 1-310102

Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—325 **9 Claims**



1. A data processor including a central processing unit, a bus control unit coupled to said central processing unit for performing a bus cycle in response to a request from said central processing unit, and a wait state control unit coupled to said bus control unit for generating a ready signal for instructing said bus control unit to insert a wait state into a bus cycle being currently performed, said wait state control unit comprising:

first means coupled to said bus control unit for judging said bus cycle being currently performed to produce judged bus cycle information;

storage means for storing a plurality of wait cycle number data each representative of a number of wait states to be inserted into a bus cycle;

second means coupled to said first means and to said storage means and responsive to said judged bus cycle information for selecting one of said plurality of wait cycle number data to produce a selected wait cycle number data;

third means coupled to said second means and responsive to said selected wait cycle number data for producing a wait state number to be inserted;

fourth means coupled to said second means to receive said selected wait cycle number data for producing a detection signal when said selected wait cycle number data is not zero before said third means produces said wait state number; and

fifth means coupled to said fourth means for generating said ready signal in response to said detection signal irrespective of absence of said wait state number from said third means, said fifth means being further coupled to said third means to receive said wait state number and continuing to generate said ready signal to cause said bus control unit to insert into said bus cycle being currently performed a predetermined number of wait states corresponding to said wait state number from said third means.

5,201,037

MULTI-PORT MEMORY AS A FRAME BUFFER

Tomohisa Kohiyama, Yokohama; Shigeru Murasaki, Narashino; Yukihiro Seki, Yokohama, and Yoshiaki Kitazume, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 42,704, Apr. 27, 1987, abandoned. This application Oct. 31, 1989, Ser. No. 430,952

Claims priority, application Japan, Apr. 28, 1986, 61-96758

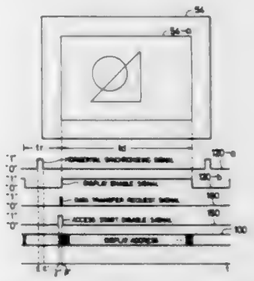
Int. Cl.[5] G06F *3/14, 13/00*

U.S. Cl. 395—164 **25 Claims**

1. A display system using a multi-port memory having at least a random access memory part and a serial access memory part as a frame buffer and a raster scan type display for displaying data read out from the frame buffer, comprising:

a display controller for producing address bits for the multi-port memory for data transfer from the random access memory part to the serial access memory part and for generating a synchronizing signal for synchronizing operation of the raster scan type display;

first means for generating an access start disable signal just prior to said data transfer based on said synchronizing signal, said access start disable signal having an active period being equal to or longer than an access cycle time of drawing data to the multi-port memory;



means for disabling a drawing access to the multi-port memory when said access start disable signal is active; and

second means connected to said display controller for generating a timing signal for said data transfer in response to said address bits corresponding to columns of said multi-port memory so that data, corresponding to a scanning line, on the display means, which is stored in a plurality of rows of the random access memory part, is transferred to the display means in real time.

5,201,038

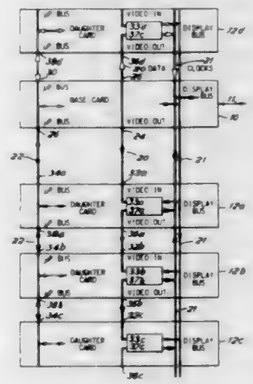
ADDRESS BUS FOR STACKABLE COMPUTER BOARD CONNECTORS

Dennis A. Fielder, Linton, United Kingdom, assignor to Videologic Limited, Hertfordshire, United Kingdom

Continuation of Ser. No. 446,925, Dec. 6, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 785,177

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—325 **27 Claims**



1. A stackable computer board comprising:

a stackable board;

first connector means on said stackable board for connecting said stackable board to a first other stackable board;

second connector means on said stackable board for con-

necting said stackable board to a second other stackable board;

said second address space by executing said second instruction having said operand address in said second ad-

5,201,041

CACHE BYPASS APPARATUS

ing data from the buffer to the cache until said other request is satisfied.

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necting said stackable board to a second other stackable board;

bus means coupled between said first and second connector means on said stackable board for communicating data and address information therebetween, said address information including a first component for determining a stackable board to be addressed, and a second component for determining a local address;

decoder means coupled to said bus means on said stackable board for determining from said first component whether said address information corresponds to said stackable board and for decoding the local address of said second component for access to said stackable board; and

means in said bus means connected between said decoder means and one of said first and second connector means and operable in accordance with a predetermined algorithm for causing the address information carried by signal lines of said bus means at said second connector means to be different from that at said first connector means.

5,201,039

MULTIPLE ADDRESS-SPACE DATA PROCESSOR WITH ADDRESSABLE REGISTER AND CONTEXT SWITCHING

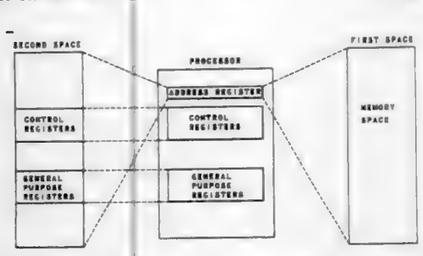
Ken Sakamura, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 173,501, Mar. 24, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,758

Claims priority, application Japan, Sep. 30, 1987, 62-247418

Int. Cl.[5] G06F *9/34*

U.S. Cl. 395—375 **16 Claims**



1. In a data processor for processing data according to a program which includes a plurality of executable instructions, the data processor having a plurality of registers, apparatus for storing information comprising:

a first portion of byte-addressable memory for storing data and programs, at least some of the byte-addresses for said first portion of byte-addressable memory forming a first address space in which programs and data are mapped, each address in said first address space is either an operand address or an instruction address of at least one of said plurality of instructions; and

a second portion of byte-addressable memory, at least some of the byte-addresses for said second portion forming a second address space different from said first address space, at least some addresses of said second address space being addresses which also occur in said first address space, wherein at least a first of said registers has a byte address, said first register being mapped by said byte address to said second address space such that said first register is accessible using a second instruction which has an operand address in said second address space, said byte address of said first register in said second address space being identical to said operand address or instruction address of said one of said instructions in said first address space

whereby said data processor accesses said operand address or said instruction address in said first address space by executing said one of said instructions having said operand address or said instruction address in said first address space; and

whereby said data processor accesses said first register in said second address space by executing said second instruction having said operand address in said second address space.

5,201,040

MULTIPROCESSOR SYSTEM HAVING SUBSYSTEMS WHICH ARE LOOSELY COUPLED THROUGH A RANDOM ACCESS STORAGE AND WHICH EACH INCLUDE A TIGHTLY COUPLED MULTIPROCESSOR

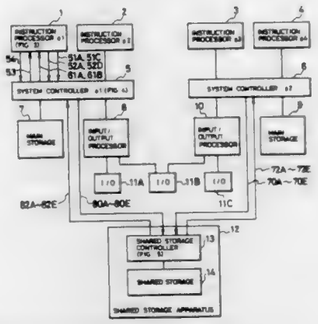
Kenichi Wada, Sagamihara, and Akira Yamaoka, Hachiouji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,073

Claims priority, application Japan, Jun. 22, 1987, 62-153281

Int. Cl.[5] G06F *12/08*

U.S. Cl. 395—400 **20 Claims**



1. A multiprocessor system comprising:

(a) a plurality of loosely-coupled subsystems, each of said subsystems including a main storage device and at least one processor connected to said main storage device;

(b) a shared random access storage device for holding groups of data each accessible by the plurality of subsystems;

(c) first address means responsive to a field of a data transfer instruction which is executed by one of the subsystems and requires transfer of one datum within one data group among the data groups stored in said shared random access storage device between said shared random access storage device and said main storage device of said one subsystem, for generating a real address of a location within said shared random access storage device for the one datum within the one data group, based upon both a data group identifier indicated by said data transfer instruction indicative of the one data group and a relative address within the one data group, designated by said data transfer instruction for the one datum;

(d) second address means provided in correspondence to said one subsystem and responsive to another field of the data transfer instruction for generating a main storage address of said main storage of said one subsystem; and

(e) data transfer means connected to said first and second address means, said main storage of each subsystem and said shared random access storage device, and responsive to said data transfer instruction for transferring said one datum between said shared random access storage device and said main storage device of said one subsystem, based upon the generated real address of said shared random access storage device and said main storage address.

5,201,041

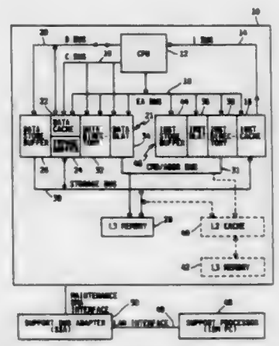
CACHE BYPASS APPARATUS

James E. Bohner; Thang T. Do, both of Endwell; Richard J. Gusefski; Kevin C. Huang, both of Endicott, and Chon I. Lei, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 291,888, Dec. 29, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 662,339

Int. Cl.[5] G06F *9/00, 13/00*

U.S. Cl. 395—425 **6 Claims**



1. A cache bypass apparatus comprising:

a storage device for storing data;

a processor generating read storage requests to read data from a corresponding address in said storage device;

a buffer coupled to said storage device and said processor for receiving data from said storage device and providing the processor with access to said data received from said storage device;

a cache coupled to said processor and said buffer for receiving data from said buffer and providing the processor with access to said data received from said buffer, said buffer having a smaller capacity than said cache whereby access to said buffer is faster than access to said cache;

cache controller means, coupled to the processor and the cache, for

receiving a read storage request from the processor,

determining if data corresponding to the read storage request is stored in the cache, and

if said corresponding data is stored in the cache, controlling said cache to copy said data from said cache to the processor bypassing said buffer;

buffer controller means, coupled to the processor, the cache and the buffer, for

receiving the read storage request from the processor,

determining if data corresponding to said read storage request is stored in said buffer or said cache, and

if said corresponding data is not stored in either said cache or said buffer, copying said data from said storage device to said buffer and then copying said data from said buffer to said processor bypassing said cache,

if said corresponding data is temporarily stored in the buffer, controlling said buffer to copy said corresponding data from said buffer to the processor bypassing said cache;

receiving another read storage request from the processor for said corresponding data,

determining that said corresponding data is stored in said buffer, and

controlling said buffer to copy said corresponding data from said buffer to the processor bypassing said cache;

determining if another subsequent read storage request is pending from said processor, and if no other read storage request is pending copying said corresponding data from said buffer to said cache and if another read storage request is pending delaying said copying of said corresponding data from the buffer to the cache until said other request is satisfied.

5,201,042

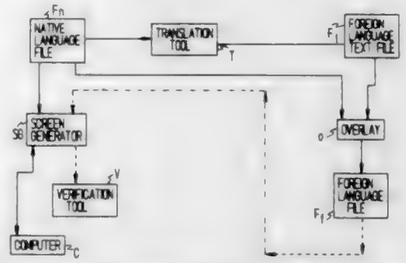
SOFTWARE PROCESS AND TOOLS FOR DEVELOPMENT OF LOCAL LANGUAGE TRANSLATIONS OF TEXT PORTIONS OF COMPUTER SOURCE CODE

Steven J. Weisner; Howard Sumner, both of Bedford; William G. DiMario, Marlborough, and Robert L. Cohn, Marblehead, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 292,666, Dec. 30, 1988, abandoned, which is a continuation of Ser. No. 858,139, Apr. 30, 1986, abandoned. This application Aug. 9, 1990, Ser. No. 565,854

Int. Cl.[5] G06F *5/00*

U.S. Cl. 395—500 **10 Claims**



1. Apparatus for assisting in the translation of designated native text included in computer source code into corresponding foreign text, said foreign text replacing said native text in said source code comprising:

(a) native language file means with memory allocated for:

display native text within said source code to be replaced,

comment native text within said source code, not to be replaced, in neighboring relationship to said display native text,

format information for the display of said display native text and its associated comment native text, and

single character pair text delimiter information for use in identifying said display native text and associated comment native text;

(b) replacement means operating on said native language file means including:

means for reading and displaying said display native text and its associated comment native text, using said text delimiter information, and further including means for indicating the shape and size of the display area spanned by said display native text in accordance with said format information,

means coupled to said reading and display means, for enabling a user to enter display foreign text to replace its corresponding display native text, wherein only display foreign text that fits within the area spanned by said display native text can be entered,

means for displaying said display foreign text including means for indicating shape and size restrictions in accordance with the shape and size of the display area spanned by said display native text, and

means for storing said display foreign text in a foreign language text file; and

(c) merge means for substituting said display foreign text in said foreign language text file for said display native text.

5,201,043

segments in said recorded log file which may span said

said digital network system to a plurality of digital controllers,

base server for storing, retrieving said updating specified directed graph structures in said database; and

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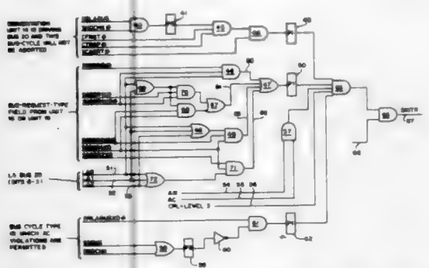
5,201,043

SYSTEM USING BOTH A SUPERVISOR LEVEL CONTROL BIT AND A USER LEVEL CONTROL BIT TO ENABLE/DISABLE MEMORY REFERENCE ALIGNMENT CHECKING

John H. Crawford, Santa Clara, and Ashish B. Dixit, Fremont, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 334,074, Apr. 5, 1989, abandoned. This application Jun. 10, 1992, Ser. No. 897,596
Int. Cl.[5] G06F *11/30*
U.S. Cl. 395—575 10 Claims



8. A microprocessor device for executing instructions, said device having privilege levels 0–3 within which said instructions execute, and having a system for generating memory requests with alignment checking of said memory requests, said device comprising:

a flag register writable by an instruction executed at privilege level 3, said flag register including an alignment control bit for enabling generation of an alignment fault;

a control register writable by an instruction executed at privilege level 0, but not writable by an instruction executed at privilege level 3, said control register including a masking bit; and

logic circuitry coupled to receive the contents of both said flag register and said control register, wherein said logic circuitry generates an enable signal only if both said alignment control bit and said masking bit are set, said enable signal being coupled to said system for generating memory requests such that said system generates an alignment fault if a misaligned memory request occurs and said enable signal is present.

5,201,044

DATA PROCESSING METHOD FOR FILE STATUS RECOVERY INCLUDES PROVIDING A LOG FILE OF ATOMIC TRANSACTIONS THAT MAY SPAN BOTH VOLATILE AND NON VOLATILE MEMORY

Alexander H. Frey, Jr., Pasadena; Richard C. Mosteller, Sierra Madre, both of Calif.; Joel M. Gould, Norwood, Mass.; Noah R. Mendelsohn, Arlington, Mass., and James Perchik, Cambridge, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,853
Int. Cl.[5] G06F *15/00*
U.S. Cl. 395—575 11 Claims

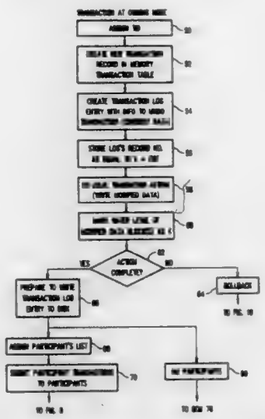
1. In a data processing system which includes a file-based software system and volatile and nonvolatile memory, said data processing system controlled by said software system to modify recorded old data to create new data and to store said new data, said data processing system performing a file status recovery method comprising the computer implemented steps of:

providing a recorded log file of atomic file transactions that may span both said volatile and non volatile memory;

providing a first stored variable indicative of a number of data segments of said log file recorded in nonvolatile memory;

providing a second stored variable indicative of all data segments in said recorded log file which may span said volatile and non volatile memory including data segments in said log file recorded in volatile memory;

commencing a file transaction relating to recorded old data, recording an image of said recorded old data in said log file in volatile memory and assigning to said old data image, a value of said second variable;



performing said file transaction to create new data, recording an image of said new data in said log file in volatile memory and assigning to said new data image, the value of said second variable assigned to said old data image; and

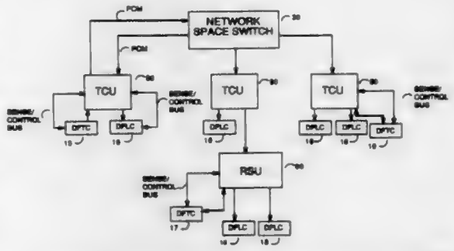
writing said new data image into nonvolatile memory only when the value of said second variable assigned to said new data image is equal to or less than the value of said first variable, indicating that said old data image is already recorded in said nonvolatile memory.

5,201,045

ARRANGEMENT AND METHOD OF DOWNLOADING DATA TO A PLURALITY OF DESTINATIONS IN A DIGITAL TELEPHONE SYSTEM

Michael W. Pflueger, Glendale, Ariz.; Mark S. Dailey, Novato, Calif.; David A. Slobodianuk; Daniel L. Fox, both of Phoenix, Ariz.; Richard Rainer, Scottsdale, Ariz.; Thomas C. Bissonnette; Anthony J. Baca, both of Glendale, Ariz.; Rainer Fischer; Edward Lesniak, both of Phoenix, Ariz., and Ross E. Fraser, Glendale, Ariz., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Nov. 19, 1990, Ser. No. 615,522
Int. Cl.[5] G06F *11/00;* H04M *3/42*
U.S. Cl. 395—575 7 Claims



1. A method for distributing operating program data within a digital network system from the common memory area of said digital network system to a plurality of digital controllers, said method comprising the steps of:

retrieving said operating program data from said common memory and transmitting via a sense/control data bus said operating program data to a remotely located digital maintenance unit, said digital maintenance unit storing a load image of said operating program data in program memory;

polling each of said plurality of digital controllers to establish which of said plurality of digital controllers requires to be loaded with said operating program data;

establishing a PCM network connection from said digital maintenance unit to each of said digital controllers that require loading through said digital network system;

transmitting said stored load image from said digital maintenance unit through said digital network system, via said PCM network connection, to each of said connected digital controllers;

polling each of said connected digital controllers to establish if the load image was recited, and disconnecting the digital controllers that were successfully loaded from said PCM network connection; and

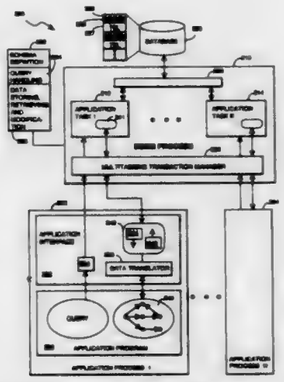
repeating the transmission of said load image from said digital maintenance unit to said connected digital controllers, and polling each of said connected digital controllers until all of said plurality of digital controllers which required loading have received said operating program data.

5,201,046

RELATIONAL DATABASE MANAGEMENT SYSTEM AND METHOD FOR STORING, RETRIEVING AND MODIFYING DIRECTED GRAPH DATA STRUCTURES

Robert N. Goldberg, Redwood City, and Gregory A. Jirak, La Honda, both of Calif., assignors to Xidak, Inc., Palo Alto, Calif.

Filed Jun. 22, 1990, Ser. No. 542,163
Int. Cl.[5] G06F *15/419*
U.S. Cl. 395—600 15 Claims



6. A computer system for storing, retrieving and modifying data stored in a database, comprising:

a database server;

a multiplicity of application processes coupled to said database server, each application process including:

an application program that utilizes directed graph data structures in a corresponding application specific data format; each said directed graph data structure including one or more records of data interconnected by pointers, each record composed of one or more data elements having respective specified data types;

query generating means for sending queries to said database server for storing, retrieving said updating specified directed graph structures in said database; and

at least one application interface that translates directed graph data structures in one respective application specific data format into a predefined intermediate data format and translates directed graph data structures in said predefined intermediate data format into said one respective application specific data format; said at least one application interface coupling said database server to a respective at least one of said application processes;

said database server including:

schema defining means for defining a distinct schema for each of a plurality of tables in said database, each said database table having a plurality of rows and a specified number of columns, wherein each row of said table stores data values in each of said columns of said table; said schema denoting a data type for each column of data values stored in said table, each denoted data type being selected from a set of predefined data types including a reference data type;

each non-empty data value stored in a reference data type column comprising a reference to a row of one of said tables in said database; and

directed graph storage means for storing and retrieving specified directed graph data structures in and from specified tables in said database in accordance with queries received from said application processes;

said directed graph storage means including:

graph storing means for receiving a data storage query that includes a specified directed graph data structure in said predefined intermediate data format and for storing each record of said received directed graph data structure in a distinct row of a respective one of said tables in said database, said graph storing means including means for storing said data elements of said each record in corresponding columns of said one respective table and means for storing references, each reference corresponding to one of said pointers that interconnect said each record to other records of said specified directed graph data structure, in corresponding ones of said reference data type columns of said one respective table; and

directed graph retrieving means for retrieving a specified directed graph from said database in accordance with a single specified query received from one of said application processes, including means for retrieving in accordance with said specified query at least one specified row from at least one respective table in said database and then retrieving additional rows of data from respective tables in said database, said additional rows of data comprising rows of data that are referenced by references in other rows of data retrieved in accordance with said specified query, for converting said retrieved rows of data into a directed graph data structure in said predefined intermediate data a format, and for transmitting said retrieved directed graph data structure to said one application process;

whereby a directed graph having multiple records is retrieved by said database server in response to a signal query from said one application process.

5,201,047

ATTRIBUTE-BASED CLASSIFICATION AND RETRIEVAL SYSTEM

Reino A. Maki, Marietta, and Sujan K. Mukherjee, Roswell, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1989, Ser. No. 452,227
Int. Cl.[5] G06F *15/413, 15/411*
U.S. Cl. 395—600 8 Claims

1. An attribute-based method of item classification and retrieval for group technology applications for implementation on a computer system wherein said computer system has an

(c) creating a binary tree containing a node for each unique

a pool of existing and idle virtual machines each of which is in a ready state for assignment in response to requests from said

5,201,051

APPARATUS FOR INTERRUPT DETECTION AND

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installed database system for storing database files including an item file on an external storage device and an interactive query system for retrieval of information stored in said database system in response to a query made by an operator at a workstation electrically connected to said computer system, said method comprising the steps of:

generating interactively at said workstation a plurality of multi-level classification attribute data structures with each data structure having at least one attribute identifier and, using said database system, storing said plurality of classification attribute data structures in a classification attributes file on said external storage device;

for each item stored in said item file, retrieving an associated item identifier and selecting interactively at said workstation a plurality of attribute identifiers from the plurality of attribute data structures stored in said classification attributes file pertaining to said item identifier to form a plurality of item identifier-attribute identifier pairs, and storing said plurality of item identifier-attribute identifier pairs in an item and classification attributes relationship file; and

entering a first query interactively by said operator at said workstation using said interactive query system to perform a search on at least one attribute identifier in said item and classification attributes file, retrieving each said item identifier that includes said at least one attribute identifier as part of the stored item identifier-attribute identifier pair, and, using said database system, storing each said item identifier retrieved by said query in a query results file.

5,201,048

HIGH SPEED COMPUTER SYSTEM FOR SEARCH AND RETRIEVAL OF DATA WITHIN TEXT AND RECORD ORIENTED FILES

Erick S. Coulter, and Thomas A. Richards, both of Littleton, Colo., assignors to Axxess Technologies, Inc., Littleton, Colo.

Continuation of Ser. No. 278,978, Dec. 1, 1988, abandoned. This application Aug. 21, 1991, Ser. No. 750,745

Int. Cl.[5] G06F *15/40*

U.S. Cl. 395—600 **21 Claims**

21. A method of building a search file in a computer system, said computer system including storage means operable for storing therein information appearing in one or more text or record oriented data files to be searched and a processor means for performing all the steps of said method, said method comprising the steps of:

(a) reading from said storage means in a file list of one or more data files to be searched;

(b) reading from said storage means a predefined number of work files to be created;

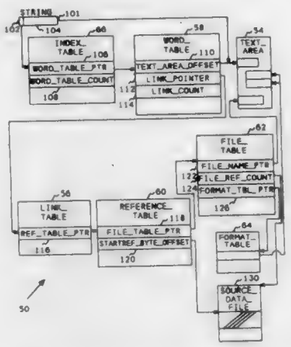
(c) retrieving and processing each of said data files in said file list;

(d) identifying one or more reference pages in each of said data files;

(e) creating a binary tree containing a node for each unique term in said data files;

(f) placing each reference to identical terms within said reference pages in a predefined order within a predefined one of said predefined number of work files;

(g) extracting term information from said binary tree and building a term table having a plurality of entries in collating sequence, said term table including one entry for each unique term in said binary tree, each said one entry having a pointer to a corresponding set of entries in a link table, whereby said binary tree is replaced by said term table;



(h) extracting link information from said work files to build said link table, wherein said link table has a plurality of fixed length entries to connect entries in said term table to said reference pages, said link table including one link table entry for each coincidence of one of said term table entries and one of said reference pages that contains said unique term in said term table entry, wherein each said link table entry further includes a pointer to said one of said reference pages, whereby said work files are replaced by said link table; and

(i) placing said term table and said link table in said search file.

5,201,049

SYSTEM FOR EXECUTING APPLICATIONS PROGRAM CONCURRENTLY/SERIALLY ON DIFFERENT VIRTUAL MACHINES

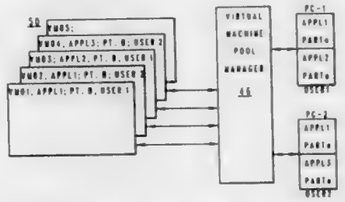
David U. Shorter, Lewisville, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 250,632, Sep. 29, 1988, Pat. No. 5,063,500. This application Sep. 20, 1991, Ser. No. 750,661

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[5] G06F *9/06, 9/30, 9/38, 15/15*

U.S. Cl. 395—650 **10 Claims**



1. A method in a data processing system for the efficient execution of distributed application programs in a data processing network having a plurality of workstations including at least one multi-tasking workstation having a plurality of concurrent and sequential applications and a host processor having a pool of existing and idle virtual machines each of which is in a ready state for assignment in response to requests from said workstations, said method comprising the data processing system implemented steps of:

identifying those applications among said plurality of applications within said multi-tasking workstation which may be executed concurrently;

identifying those applications among said plurality of applications within said multi-tasking workstation which must be executed sequentially; and

automatically assigning a single virtual machine among said pool of virtual machines to process each of said applications identified within said multi-tasking workstation which must be executed sequentially while automatically assigning a different virtual machine among said pool of virtual machines to process each of said applications identified within said multi-tasking workstation which may be executed concurrently in response to requests received from said multi-tasking workstation.

5,201,050

LINE-SKIP COMPILER FOR SOURCE-CODE DEVELOPMENT SYSTEM

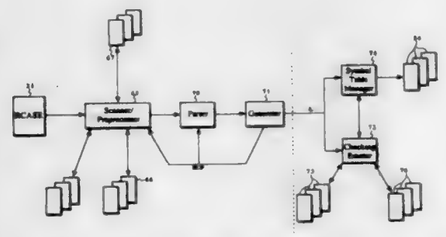
William M. McKeeman, Hollis, and Shota Aki, Weare, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1989, Ser. No. 375,402

The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.

Int. Cl.[5] G06F *9/45*

U.S. Cl. 395—700 **21 Claims**



1. A method of editing source text and recompiling said source text to produce code, said source text having been previously compiled to create a code table, comprising the steps of:

a) editing a module of said source text to change some lines of said source text and leave some lines unchanged, said source text being stored in a source-text buffer as a plurality of lines, said lines having an identification in said buffer as changed or not changed;

b) recompiling said source text to recreate said code table, said recompiling including:

i) scanning said lines of source text in said source text buffer, and, in response to said identification, finding lines of said source text which have been changed, and, skipping any of the lines of source text which have not been changed during said step of editing, said skipping including determining if any increments of lines of said source text in sequence have not been changed and if so skipping said increments in said scanning; and

ii) generating code for recreating said code table using lines of said source text not skipped in said scanning, said code table remaining unchanged for lines which are skipped.

5,201,051

APPARATUS FOR INTERRUPT DETECTION AND ARBITRATION

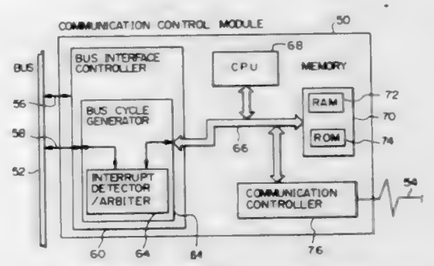
Katsuyoshi Koide, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 590,699

Claims priority, application Japan, Oct. 5, 1989, 1-258742

Int. Cl.[5] G06F *13/14, 13/368*

U.S. Cl. 395—725 **3 Claims**



1. An apparatus for interrupt detection and arbitration in a system which includes a plurality of circuit modules connected to each other by a common bus, said apparatus comprising:

(a) means provided in at lest one of the circuit modules for detecting an interrupt signal on the common bus and generating an interrupt transfer cycle;

(b) means provided in the circuit modules for applying the interrupt signal to the common bus, said interrupt signal being generated in at least one of the circuit modules;

(c) means responsive to the start of the interrupt transfer cycle for dividing the interrupt transfer cycle into an interrupt destination notifying cycle and a succeeding interrupt source notifying cycle;

(d) means responsive to the interrupt destination notifying cycle for applying information identifying at least one destination circuit module on the common bus;

(e) means for arbitrating the information applied on the common bus if a plurality of destination circuit modules are identified, and for selecting a single one of them as an arbitrated destination circuit module;

(f) means responsive to the interrupt source notifying cycle for applying on the common bus information identifying at least one interrupt source circuit module that identified the arbitrated destination circuit module during the interrupt destination notifying cycle; and

(g) means provided in the arbitrated destination circuit module for accepting the information identifying the at least one interrupt source circuit module.

5,201,052

SYSTEM FOR TRANSFERRING FIRST AND SECOND RING INFORMATION FROM PROGRAM STATUS WORD REGISTER AND STORE BUFFER

Toshiharu Ohshima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 477,549, Feb. 9, 1990, abandoned. This application Jun. 17, 1992, Ser. No. 899,946

Claims priority, application Japan, Feb. 10, 1989, 1-31914

Int. Cl.[5] G06F *12/14*

U.S. Cl. 395—725 **16 Claims**

1. A microprocessor capable of connection to an external memory, the external memory accessed by an external bus and including a first predetermined area and a second predetermined area, the first predetermined area and the second predetermined area being separate from each other, the first predetermined area and the second predetermined area of the external memory being assigned corresponding first and second ring information for respectively controlling access to the first and second predetermined areas of the external memory, said mi-

nel while servicing the signals and permitting access to a plu-

ing the address in said first memory from said first storage processor for storing received data from said second mem-

number of address lines, said processor address signals being conducted across said connector;

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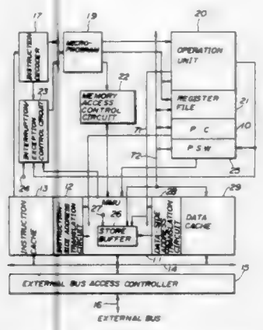
second predetermined areas of the external memory, said microprocessor comprising:

executing means for executing a program having a write instruction;

a register, operatively coupled to said executing means, holding a program status word including the first ring information, the program status word being indicative of a status of the program executed by said executing means;

a store buffer, operatively coupled to said executing means, holding write data and a write address of the external memory associated with the write instruction of the program being executed by said executing means, and holding, in a predetermined area of said store buffer, second ring information indicative of a status of the write instruction of the program being executed by said executing means;

first control means, operatively coupled to said store buffer and to the external memory, for transferring the write data and the write address from said store buffer to the external



memory, the transferring being independent of and without control by the executing by said executing means of the program, wherein the write data and the write address are held in said store buffer until the external bus becomes available and are written into said external memory after the external bus becomes available, thereby said executing means is capable of executing a subsequent instruction to the write instruction when the external bus is unavailable;

second control means, operatively coupled to said register and to the external memory, for transferring the first ring information in the program status word from said register to the first predetermined area of the external memory when an exception concerning access to the external memory occurs; and

third control means, operatively coupled to said store buffer and to the external memory, for transferring the second ring information from said store buffer to the second predetermined area of the external memory when the exception concerning access to the external memory occurs.

5,201,053

DYNAMIC POLLING OF DEVICES FOR NONSYNCHRONOUS CHANNEL CONNECTION

Michael T. Benhase; Florence J. Clark, both of Tucson, Ariz., and William T. Higgins, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 576,049

Int. Cl.[5] G06F *13/00, 13/14*

U.S. Cl. 395—725 **43 Claims**

1. A dynamic polling device for a controller to manage request for access signals from devices for channel connection to a central processing unit by holding the request for access signals for a time required for a delayed response from a channel while servicing the signals and permitting access to a plurality of channels, said dynamic polling device comprising:

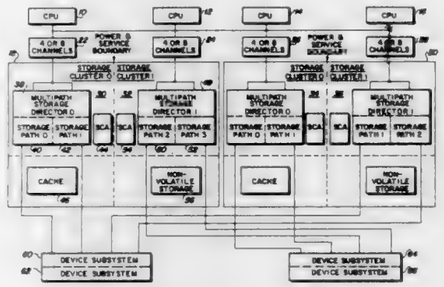
polling means for polling the devices and adapted to receive the request for access signals;

activating means adapted for periodically activating said polling means;

aging storage means including a plurality of sections for receiving and storing the request for access signals;

shifting means controlling said aging storage means and activated by said polling means for shifting the stored request for access signals from one section to another;

time means sensing each of the devices and each of the plurality of channels for determining and storing a communication response time between each device and its channel;



means connected to receive the request for access signals from the channel and for placing the request for access signals in a particular section of said plurality of sections in said aging storage means, said placing means activated by said time means for placing the request for access signals in a particular section determined by said time means; and

means controlled by said aging storage means for connecting the channel with the device if the request for access signal is stored in said aging storage means when the channel requests connection;

whereby the request for access signals are shifted out of said aging storage means by said shifting means when the request for access signal is stored in a last of the plurality of sections in said aging storage means and said shifting means is activated by said polling means.

5,201,054

APPARATUS AND METHOD FOR CONTROLLING THE TRANSFER OF DIGITAL INFORMATION BETWEEN SERVICE PROCESSORS MEMORIES IN A COMPUTER

Narendra B. Dudhela, Santa Clara, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 420,678, Oct. 10, 1989, abandoned, which is a continuation of Ser. No. 137,174, Dec. 23, 1987, abandoned. This application Apr. 16, 1992, Ser. No. 870,781

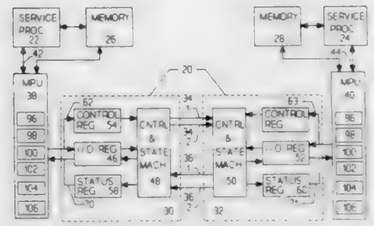
Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—800 **5 Claims**

1. In a multiprocessor system including a first service processor connect to a first memory and a second service processor connected to a second memory, a system for transferring data store in said first memory to said second memory in response to first transfer instructions issued by said first service processor and for transferring data stored in said second memory to said first memory in response to second transfer instructions issued by said second service processor, said system comprising:

first means connected to said first service processor and said first memory for receiving said first transfer instructions from said first service processor, for directly recovering and storing data to and from said first memory, for receiving the address in said first memory from said first storage processor for storing received data from said second memory, for generating first control signals in response to said first transfer instructions for recovering data from said first memory and for controlling the transfer of said data to said second memory and for generating second control signals for controlling the reception of data from said second memory;

second means connected to said second service processor and said second memory for receiving said second transfer instructions from said second service processor, for directly recovering and storing data to and from said second memory, for receiving the address in said second memory from said second service processor for storing receiving data from said first memory and for generating first control signals in response to said second transfer instructions for recovering data from said second memory and for



controlling the transfer of said data to said first memory and for generating second control signals for controlling the reception of data from said first memory; and

third means connected to said first and second means for transferring data from said first means to said second means in response to said first control signals generated by said first means and said second control signals generated by said second means, for transferring data from said second means to said first means in response to said first control signals generated by said second means and said second control signals generated by said first means and for continuously exchanging, between said first and second means, status and control information generated by said first means to said second means and status and control information generated by said second means to said first means whenever data is not being transferred between said first and second means.

5,201,055

MULTIPROCESSING SYSTEM INCLUDES INTERPROCESSOR ENCODING AND DECODING LOGIC USED FOR COMMUNICATION BETWEEN TWO CARDS THROUGH REDUCED ADDRESSING LINES

Javier F. Izquierdo, Houston, and John A. Landry, Tomball, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 3, 1989, Ser. No. 431,659

Int. Cl.[5] G06F *13/00, 15/16*

U.S. Cl. 395—800 **4 Claims**

1. An apparatus for selecting one of a plurality of devices which are addressed using a first number of address lines in a computer system, the apparatus comprising:

an interchangeable card, wherein the plurality of devices are located on said interchangeable card;

a system board including a connector for receiving said interchangeable card and conducting signals between said system board and said interchangeable card;

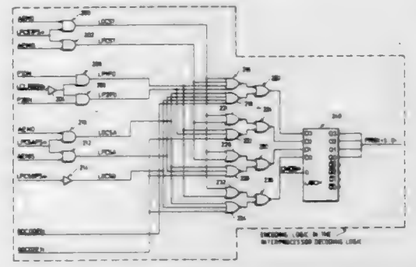
a bus located on said system board and including said first number of address lines;

a processor located on said interchangeable card generating address signals for presentation on said first number of address lines;

means for coupling said processor address signals to said first number of address lines, said processor address signals being conducted across said connector;

means located on said system board and coupled to said bus receiving said first number of address lines for decoding said first number of address lines to produce a plurality of signals each representing selection of a device;

means located on said system board and coupled to said bus and said means for decoding said first number of address lines for encoding said plurality of signals representing selection of a device into a set of addressing signals wherein each encoded value represents one of said devices and the number of signals in said set is less than said first number, said set of addressing signals being provided to said connector for conduction to said interchangeable card;



means located on said interchangeable card and receiving said set of addressing signals after conduction across said connector for decoding said encoded set of addressing signals to produce a signal representing selection of a device; and

means coupled to said encoded signal set decoding means and located on said interchangeable card for selecting the device using said selection signal.

5,201,056

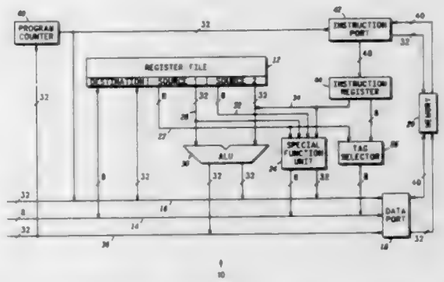
RISC MICROPROCESSOR ARCHITECTURE WITH MULTI-BIT TAG EXTENDED INSTRUCTIONS FOR SELECTIVELY ATTACHING TAG FROM EITHER INSTRUCTION OR INPUT DATA TO ARITHMETIC OPERATION OUTPUT

Samuel M. Daniel, and Brian K. Short, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1990, Ser. No. 517,865

Int. Cl.[5] G06F *7/00, 15/00*

U.S. Cl. 395—800 **13 Claims**



1. A microprocessor, comprising:

a register file having a bi-directional port and first and second outputs and including a plurality of registers for storing data words therein, said data words including a full

precision data portion and a tag field for identifying the data type thereof, wherein said first output provides sepa-

receiving an storing the signals indicating relationships between the instructions stored in said instruction queue;

for sequentially storing the vector data supplied from said first device;

placing the computer into a sleep state if the length of time exceeded the minimum time.

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precision data portion and a tag field for identifying the data type thereof, wherein said first output provides separate data portion and tag field of a first data word and said second output provides a separate data portion and tag field of a second data word;

first computing means having first and second inputs respectively coupled to said first and second outputs of said register file for performing arithmetic computation on said data portions of said first and second data words and providing a resulting data word having a data portion at a first output which is applied at said bi-directional port of said register file;

a memory for storing a plurality of instruction words each having a full precision instruction portion and a tag field;

an instruction register coupled to said memory for receiving an instruction word; and

selector means for selecting between said tag field of said instruction word applied at a first input and said tag field of said first data word applied at a second input under control of predetermined bits from said tag field of said instruction word and providing at an output one of said tag fields applied at said first and second inputs, wherein said tag field provided at said output is applied at said bi-directional port of said register file and combined with said data portion of said resulting data word of said first computing means for storage into said register file.

5,201,057

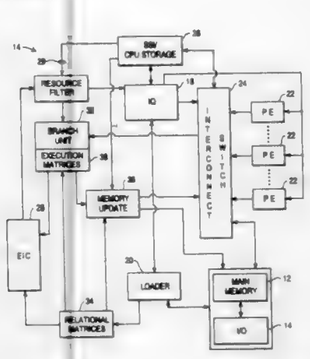
SYSTEM FOR EXTRACTING LOW LEVEL CONCURRENCY FROM SERIAL INSTRUCTION STREAMS

Augustus K. Uht, 44 Torrey Rd., Cumberland, R.I. 02864

Continuation-in-part of Ser. No. 104,723, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 6,052, Jan. 22, 1987, abandoned. This application Feb. 5, 1990, Ser. No. 474,247

Int. Cl.[5] G06F *7/04*

U.S. Cl. 395—800 **33 Claims**



1. A central processing unit for executing a series of instructions in a computing machine having a memory for storing instructions and data elements, the central processing unit comprising:

an instruction queue for storing at least a subset of the series of instructions;

a plurality of processing elements coupled to said instruction queue for receiving signals indicating operations to be performed by said processing elements and for executing instructions by performing the indicated operations;

loader means coupled to said instruction queue and to the memory for loading instructions from the memory to said instruction queue and for generating signals indicating relationships between the instructions stored in said instruction queue;

relational matrix means coupled to said loader means for receiving an storing the signals indicating relationships between the instructions stored in said instruction queue;

a branch unit, said branch unit including execution matrix means for storing signals representing the execution state of a set of iterations of each instruction stored in said instruction queue;

identifying means coupled to said relational matrix means and to said execution matrix means for identifying a plurality of executable instructions from the subset of instructions in said instruction queue in response to the signals stored in the relational matrix means and the signals stored in the execution matrix means;

means for coupling said identifying means to said instruction queue and to said branch unit for transmitting signals to said instruction queue and to said branch unit in response to the identified plurality of instructions;

said instructions queue including means responsive to said signals from said coupling means for transmitting signals to said processing elements indicating the operations to be performed by said processing elements;

said branch unit including means responsive to said signals from said coupling means for updating the execution matrix means to indicate that an instruction iteration has really executed;

said branch unit including means for updating the execution matrix means in response to execution of a branch instruction to indicate that at least one instruction iteration has virtually executed;

sink storage means for storing result data elements generated by the execution of instructions by said processing elements;

interconnect means coupled to said instruction queue, to said processing elements, to said sink storage means, and to the memory, for transmitting data elements to and from said processing elements; and

sink enable means coupled to said identifying means and to said sink storage means for generating signals for coupling selected result data elements to said interconnect means for transmission to a processing element.

5,201,058

CONTROL SYSTEM FOR TRANSFERRING VECTOR DATA WITHOUT WAITING FOR TRANSFER END OF THE PREVIOUS VECTOR DATA

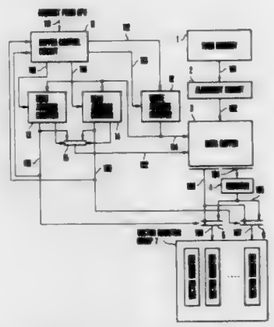
Kouji Kinoshita, Tokyo, and Yukiyoshi Ikeya, Yamanashi, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,215

Claims priority, application Japan, Oct. 8, 1988, 63-252902

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—800 **3 Claims**



1. A data transfer controller for controlling transfer of vector data from a first device to a second device, the vector data consisting of a plurality of elements, comprising:

storing means, located between said first and second devices, for sequentially storing the vector data supplied from said first device;

n read control means for controlling to sequentially transfer the vector data from said first device to said storing means and each for controlling to read out n elements of one vector data from said storing means to said second device;

n/2 switching circuits, each receiving data from one of n/2 unique pairs of read control means and each alternately supplying said storing means with data from a first read control means of a pair and data from a second read control means of said pair in accordance with a predetermined switching condition;

n data transfer paths respectively corresponding to said n read control means and arranged between said storing means and said second device;

n/2 means for delaying alternate elements, included in half of said data transfer paths, each receiving an undelayed element from said storage means and outputting a delayed element; and

n switching circuits in said n data transfer paths, each receiving a delayed element from said n/2 delaying means and an undelayed element from said storing means, selecting elements from said vector data, and supplying said selected elements to said second device.

5,201,059

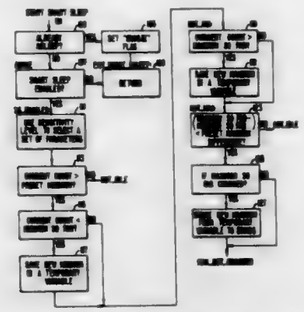
METHOD FOR REDUCING POWER CONSUMPTION INCLUDES COMPARING VARIANCE IN NUMBER OF TIME MICROPROCESSOR TRIED TO REACT INPUT IN PREDEFINED PERIOD TO PREDEFINED VARIANCE

Au H. Nguyen, Santa Clara, Calif., assignor to Chips and Technologies, Inc., San Jose, Calif.

Filed Nov. 13, 1989, Ser. No. 434,200

Int. Cl.[5] G06F *15/00, 11/30*

U.S. Cl. 395—800 **1 Claim**



1. A method for placing a microprocessor into a sleep state while the microprocessor waits for data input from a keyboard, the method being performed in a system controller coupled to said microprocessor and comprising the steps of:

counting a number of times the microprocessor has tried to read data from the keyboard in a predefined amount of time;

comparing said number of times the microprocessor tried to read data in the predefined amount of time with a predefined minimum number;

comparing the variance in said number of times the microprocessor tried to read data in a predefined amount of time to a predefined variance amount, if a number of tires exceeded said predefined minimum number;

comparing a length of time that both said number of times the microprocessor tried to read data exceeded said predefined minimum number and the result was less than the predefined variance to a predefined minimum time if the variance was less than the predefined variance;

placing the computer into a sleep state if the length of time exceeded the minimum time.

5,201,060

BASEBAND SIGNAL COMMUNICATION APPARATUS

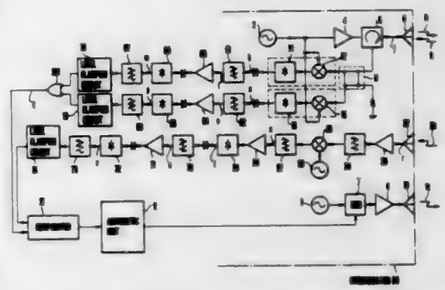
Shinichi Haruyama, Guams; Fusao Sekiguchi, Tokyo; Yoshikazu Kawashima, and Ko Ishikawa, both of Kanagawa, all of Japan, assignors to Yamatake-Honeywell Co., Ltd. and Yokowo Co., Ltd., both of Japan

Filed Apr. 16, 1990, Ser. No. 509,955

Claims priority, application Japan, Apr. 19, 1989, 1-99366

Int. Cl.[5] H04B *7/00*

U.S. Cl. 455—45 **3 Claims**



2. A baseband signal communication apparatus comprising:

transmission means for superposing a subcarrier on one value of a baseband signal consisting of binary values, phase-modulating a carrier wave with the baseband signal on which the subcarrier is superposed, and transmitting the baseband signal as a transmission signal wave;

first reception means for receiving the transmission signal wave, performing homodyne detection of the transmission signal wave by using a homodyne detector so as to obtain a first demodulated signal, extracting the subcarrier from the first demodulated signal by using a first bandpass filter, and detecting an envelope of the subcarrier by using a first detector so as to obtain a first baseband demodulated signal;

second reception means for receiving a harmonic wave which is amplitude-modulated by the baseband signal having the subcarrier superposed thereon and radiated upon phase modulation in said transmission means, frequency-converting the harmonic wave by using a frequency converter so as to obtain an intermediate frequency signal, detecting an envelope of the intermediate frequency signal by using a second detector, extracting the subcarrier from the second demodulated signal by using a second bandpass filter, and detecting an envelope of the subcarrier by using a third detector so as to obtain a second baseband demodulated signal; and

comparing means for comparing the first and second baseband demodulated signals, and outputting at least one of the first and second baseband demodulated signals as a demodulated signal of the baseband signal when the first and second demodulated signals coincide with each other.

5,201,061

METHOD AND APPARATUS FOR SYNCHRONIZING SIMULCAST SYSTEMS

Steven J. Goldberg, Coral Springs, and Venkat Narayanan, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 23, 1990, Ser. No. 556,158

Int. Cl.[5] H04B *7/00*

U.S. Cl. 455—51.2 **16 Claims**

1. A synchronization system for a simulcast system having a

5,201,064

for establishing azimuth and elevation configurations of

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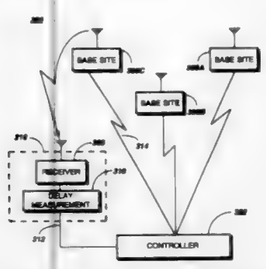
controller capable of transmitting a message signal to a plurality of base sites, the base sites thereafter being capable of retransmitting the message signal as an RF transmission at the same time, said synchronization system comprising:

controller means for transmitting a first signal to a selected one of the plurality of the base sites and to a delay monitor, the base sites further including:

receiving means for receiving the first signal; and

transmitting means for transmitting a second signal to said delay monitor in response to receiving of the first signal at the selected base site;

said delay monitor including:



means for receiving the first signal from said controller and the second signal transmitted from the selected base site subsequent to the receipt of the first signal by the selected one of the plurality of base sites; and

measuring means, responsive to receiving the first and second signals, for measuring a delay between the receipt of the first signal by said selected base site and the receipt of said first signal by said delay monitor; and

means coupled to the delay monitor and the plurality of base sites for programming each of the plurality of base site for delaying the retransmission of the received message signal by the measured delay time associated with each of the plurality of base sites.

5,201,062

NOISE REDUCING CIRCUIT

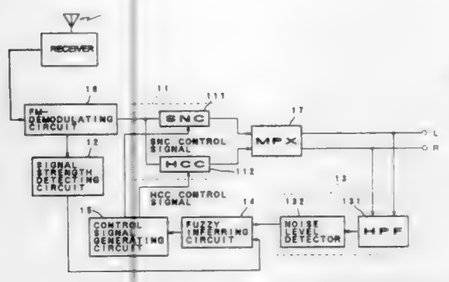
Tetsuo Nakamura; Koichi Kasa, and Toshihito Ichikawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,005

Claims priority, application Japan, Mar. 28, 1990, 2-76738; Mar. 28, 1990, 2-76739

Int. Cl.[5] H04B *15/00, 11/00;* **H04H** *5/00*

U.S. Cl. 455—67.3 **2 Claims**



1. A noise reducing circuit for reducing various noises in an output of a receiver, comprising:

a noise attenuating circuit for attenuating in accordance with a control signal supplied thereto the noise in a demodulated signal supplied to said noise attenuating circuit, said noise attenuating circuit outputting the demodulated signal after the noise is attenuated;

a signal strength detecting circuit for outputting a field intensity signal indicative of a strength of a radio wave signal inputted to the receiver;

an output noise level detecting circuit for outputting a noise level signal indicative of a noise level in the demodulated signal after the noise is attenuated;

a fuzzy inferring circuit for performing fuzzy inference in accordance with fuzzy production rules given by membership functions for said field intensity signal and said noise level signal, respectively so as to output an inference output; and

a control signal generating circuit for producing said control signal on the basis of the inference output to control said noise attenuating circuit.

5,201,063

SETTING OF ELECTRONIC CIRCUITS IN A RADIO TELEPHONE

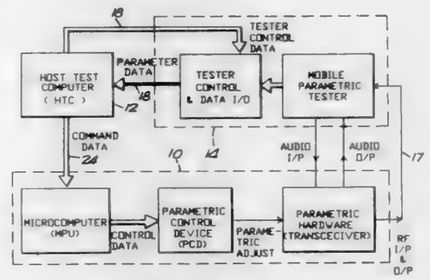
Ambrose W. C. Tam, Taipo, and Francis C. N. Lau, Taikoo Shing, both of Hong Kong, assignors to Astec International Ltd., Hong Kong

Filed Dec. 20, 1989, Ser. No. 453,668

Claims priority, application United Kingdom, Dec. 28, 1988, 8830282

Int. Cl.[5] H04B *17/00*

U.S. Cl. 455—67.4 **2 Claims**



1. A method of setting a plurality of operational parameters in an electronic circuit of a radio telephone having a radio frequency output/input and an audio frequency input/output, said plurality of operational parameters including a transmission frequency, a transmitting power level, a transmission modulation, a receive audio level, a receive data level and a receive signal strength indication level, the method comprising the steps of:

(a) applying a standard signal to said electronic circuit to cause said electronic circuit to provide an output signal corresponding to said operational parameter;

(b) comparing said output signal to a desired standard;

(c) applying an adjusting data signal to said electronic circuit for causing said output signal to approximate said desired standard;

(d) storing said data signal for future control of said operational parameter; and

(e) repeating steps (a) through (d) until said output signal is within a predetermined range of said desired standard.

5,201,064

MULTIPLE-LINE SUPERHETERODYNE TRANSMISSION AND RECEPTION DEVICE

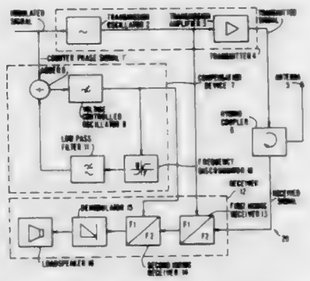
Werner Bauerschmidt, Langenzenn, Fed. Rep. of Germany, assignor to Grundig E.M.V., Furth/Bay, Fed. Rep. of Germany

Filed Jul. 3, 1991, Ser. No. 725,013

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1990, 4021294

Int. Cl.[5] H04B *1/40*

U.S. Cl. 455—75 **4 Claims**



1. A transmitting and multiple line superheterodyne receiving device for radio transmission, operated in a complete duplex mode, including:

means for receiving a modulation signal;

first receiving mixing means responsive to said means for receiving for mixing said signal into a first intermediate frequency, whereby the first intermediate frequency substantially equals the duplex distance between a transmitting frequency and a receiving frequency of a communication system;

a compensation means between a transmitting and a receiving device including means for modulating a second receiving mixer with a counter phase signal thereby modulating a transmission oscillator;

whereby the modulating signal is fed to said compensation device;

wherein said compensation device includes a frequency control circuit with a voltage controlled oscillator with a nominal frequency substantially equal to the sum or the difference of said first intermediate frequency and a second intermediate frequency and which is connected to said second receiving mixer;

wherein said voltage controlled oscillator is connected to an adding means and to a frequency discriminator; wherein the output of said frequency discriminator is connected to a low pass filter; and wherein said counter phase modulating signal and the output of said low pass filter are fed to said adding means.

5,201,065

PLANAR MILLIMETER WAVE TWO AXIS MONOPULSE TRANSCEIVER WITH SWITCHABLE POLARIZATION

Edward C. Niehenke, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 13, 1990, Ser. No. 581,946

Int. Cl.[5] H04B *1/40;* **H01Q** *23/00*

U.S. Cl. 455—83 **27 Claims**

1. A planar millimeter wave transceiver comprising:

a substrate;

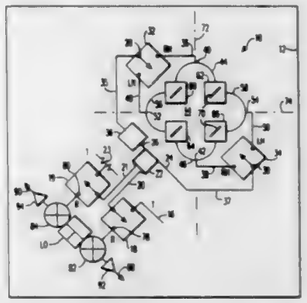
a plurality of antenna elements disposed on the substrate in right and left circularly polarized configuration;

feed means interconnecting adjacent antenna elements and having a feed point therebetween;

first switch means interconnected with the feed points of the feed means coupled to adjacent pairs of antenna elements alternately operable between first and second conditions for establishing azimuth and elevation configurations of the antenna elements;

a sum channel and a difference channel; and

second switch means interconnected with the sum and difference channels, with the first switch means alternately



operable between first and second conditions for establishing transmit and receive modes for the antenna elements, said feed means, said sum and difference channels and said first and second switch means being interconnected without crossovers on the substrate.

5,201,066

RADIO-TELEPHONE SYSTEM EMPLOYING A MANNER OF CHANGING A CHANNEL AND A PRIVACY DIGITAL CODE AND INTERSTORING THEM BETWEEN A STATIONARY APPARATUS AND A PORTABLE APPARATUS BY WIRELESS AND A METHOD OF CHANGING THE PRIVACY DIGITAL CODE

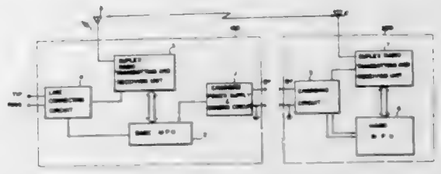
Won B. Kim, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea

Filed Jul. 22, 1991, Ser. No. 733,293

Claims priority, application Rep. of Korea, Jul. 25, 1990, 1990-11321

Int. Cl.[5] H04B *1/38*

U.S. Cl. 455—89 **8 Claims**



1. A method of changing a privacy digital code in a radio-telephone system, the radio-telephone system employing a manner of changing a channel and a privacy digital code and interstoring them by wireless, said system having a stationary apparatus connected to a standard telephone line and portable apparatus connected by wireless to the stationary apparatus for transmission and reception of voice and data, said stationary and portable apparatus each having (+,−) charging terminals, wherein said stationary apparatus comprises: base MPU means containing a first ROM for storing software for controlling the whole operation of the system and also containing a second RAM; charging power supply and sensing means connected between said base MPU means and said stationary apparatus (+,−) charging terminals, for supplying a charging power to said stationary apparatus (+,−) charging terminals and sensing a contact of said stationary apparatus (+,−) charging terminals with said portable apparatus (+,−) charging terminals to output an acknowledge signal in accordance with the sensed result to said base MPU means; first duplex radio trans-

mitting and receiving means connected to said base MPU

digital code change request data until the privacy digital

detecting means for generating a first detection signal in

5,201,070

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mitting and receiving means connected to said base MPU means, for transmitting and receiving a generic voice signal and transmitting a selected channel and privacy digital code data to said portable apparatus and receiving reception completion signal data from said portable apparatus under a control of said base MPU means; first transmitting and receiving PLL means connected to said base MPU means and to said first duplex radio transmitting and receiving means, for determining a plurality of transmission and reception channel frequencies in accordance with channel data from said base MPU means and removing a frequency error in a PLL manner to perform a channel locking; line connecting means connected among said base MPU means, said first duplex radio transmitting and receiving means and said standard telephone line, for providing intercommunication with a generic telephone network; and first antenna means connected to said first duplex radio transmitting and receiving means; and wherein said portable apparatus comprises: hand MPU means containing a first RAM for storing the privacy digital code given by said base MPU means in said stationary apparatus; second duplex radio transmitting and receiving means connected to said hand MPU means, for receiving the selected channel and the privacy digital code data transmitted from said stationary apparatus in the charging of its battery and performing the signal transmission and reception from and/or to said stationary apparatus having the same code; second transmitting and receiving PLL means connected to said hand MPU means and to said second duplex radio transmitting and receiving means, for determining a plurality of transmission and reception channel frequencies in accordance with channel data from said hand MPU means and removing a frequency error in a PLL manner to perform a channel locking; charging means connected to said portable apparatus (+,−) charging terminals, for supplying a charged power to said hand MPU means and said second duplex radio transmitting and receiving means; and second antenna means connected to said second duplex radio transmitting and receiving means; said method comprising the steps of:

(a) setting said second RAM to zero, clearing all flags to zero, performing a privacy digital code get routine, designating an initial value and performing a charging delay for a constant time period, during the contact between said charging terminals of said stationary and portable apparatus for the charging of the battery, in said stationary apparatus; and performing a first RAM clear routine and designating an initial value, in said portable apparatus;

(b) checking if the charging state is continuously maintained after the charging delay for the constant time period, in said stationary apparatus;

(c) performing a privacy digital code transmitting program, in said stationary apparatus; and performing a receiving main routine, in said portable apparatus;

(d) checking whether a preamble and a start bit are present among data received by wireless from said stationary apparatus, storing the privacy digital code in a receiving buffer if a preamble and a start bit are present among the received data from said stationary apparatus, determining if command data existing among the received data is in accord with privacy digital code change request data, performing a privacy digital code change completion data transmitting program if the command data existing among the received data is in accord with the privacy digital code change request data, comparing the privacy digital code in said receiving buffer with contents in said first RAM if the command data existing among the received data is not in accord with the privacy digital code change request data, and performing an operation according to the command data only when the privacy digital code in said receiving buffer is in accord with contents in said first RAM, in said portable apparatus; and

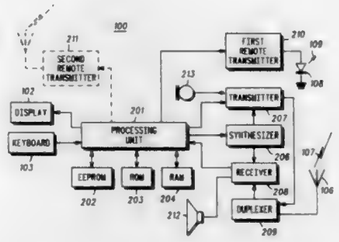
(e) checking whether a preamble and a start bit are present among data received by wireless from said portable apparatus and then whether the privacy digital code change completion data has been received, and unless the privacy digital code change completion data is received, performing repeatedly a transmitting operation of the privacy digital code change request data until the privacy digital code change completion data is received, in said stationary apparatus.

5,201,067

PERSONAL COMMUNICATIONS DEVICE HAVING REMOTE CONTROL CAPABILITY

Gary W. Grube, Palatine, and Steven G. Parmelee, Crystal Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1991, Ser. No. 693,478
Int. Cl.[5] H04B *1/38*
U.S. Cl. 455—89 **20 Claims**



16. A personal communicating device, comprising:

A) a housing;

B) input means for receiving user enter instructions;

C) wireless transceiver means at least partially contained within the housing and being operably coupled to the input means and being responsive thereto for transceiving:

i) at least voice and data user information; and

ii) remote control information;

D) memory means operably coupled to the input means and the wireless transceiver means for storing at least some of the remote control information;

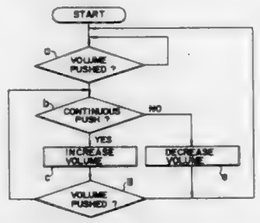
E) first wireless transmitter means at least partially contained within the housing and being operably coupled to the input means and the memory means and being responsive thereto for transmitting remote control signals to a device separate from the personal communicating device, wherein said first wireless transmitter means is at least partially discrete with respect to said wireless transceiver means.

5,201,068

RADIO TELECOMMUNICATIONS APPARATUS

Kazuhiro Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 10, 1990, Ser. No. 550,443
Claims priority, application Japan, Jul. 18, 1989, 1-185765
Int. Cl.[5] H04B *1/38;* **H03G** *3/02*
U.S. Cl. 455—89 **4 Claims**



1. A radio telecommunication apparatus comprising:

a volume key for controlling volume;

detecting means for generating a first detection signal in response to continuous depression of said volume key for a predetermined period, and generating a second detection signal in response to intermittent depression of said volume key, said predetermined period of the continuous depression being longer than a period during which said volume key is being depressed in intermittent depression; and

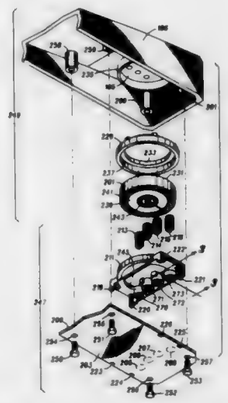
voice volume control means for increasing the volume in response to one of the first and second detection signals, and for decreasing the volume in response to the other of the first and second detection signals.

5,201,069

ELECTROACOUSTIC TRANSDUCER MOUNTING APPARATUS

Mark A. Barabolak, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 18, 1991, Ser. No. 779,480
Int. Cl.[5] H04B *1/38*
U.S. Cl. 455—90 **17 Claims**



1. Apparatus for mounting an electroacoustic transducer in a housing, the apparatus comprising:

a printed circuit substrate having a surface including a first and a second conductive contact disposed thereon;

a side of the housing having at least one hole extending through the housing;

a first and a second side of the electroacoustic transducer, the first side providing an electroacoustic interface and disposed essentially opposite the hole, the second side having at least a first and a second conductive contact;

means for sealing the first side of the electroacoustic transducer to the housing;

first resilient conductive means abutting both the first conductive contact on the printed circuit substrate and the first conductive contact on the electroacoustic transducer; and

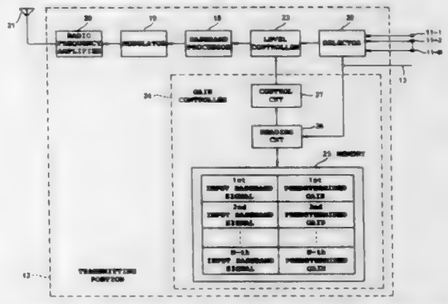
second resilient conductive means abutting both the second conductive contact on the printed circuit substrate and the second conductive contact on the electroacoustic transducer whereby the first and the second resilient conductive means are compressed when the printed circuit substrate is assembled into the housing.

5,201,070

RADIO COMMUNICATION APPARATUS COMPRISING A SINGLE LEVEL CONTROLLER

Koji Iwahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 20, 1990, Ser. No. 512,661
Claims priority, application Japan, Apr. 20, 1989, 1-100614
Int. Cl.[5] H04B *1/02, 7/00*
U.S. Cl. 455—91 **4 Claims**



1. In a radio communication apparatus having a plurality of input terminals supplied with a plurality of input baseband signals and transmitting means connected to said input terminals for selectively transmitting said input baseband signals in response to a selection signal, said transmitting means comprising:

selecting means connected to said input terminals and responsive to said selection signal for selecting one of said input baseband signals as a single selected baseband signal;

level controlling means connected to receive said selected baseband signal and having a controllable gain and including means for controlling said selected baseband signal so that said selected baseband signal has a level which is determined by said controllable gain;

gain controlling means connected to said level controlling means and having a plurality of predetermined gains in correspondence to said input baseband signals and responsive to said selection signals for controlling said controllable gain so that said controllable gain becomes equal to one of said predetermined gains that corresponds to said selected baseband signal; and

converting means connected to said level controlling means for converting said selected baseband signal into a radio signal which carries said selected baseband signal.

5,201,071

METHOD AND APPARATUS FOR REDUCING THE PEAK ENVELOPE VOLTAGE OF AN RF TRANSMITTER WHILE MAINTAINING SIGNAL AVERAGE POWER

Kenneth F. Webb, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 26, 1990, Ser. No. 589,305
Int. Cl.[5] H04B *7/06*
U.S. Cl. 455—101 **5 Claims**

1. A diversity radio transmission apparatus capable of increased power output, comprising:

means for providing first and second information carrying baseband signals comprising a multiplicity of components of different frequencies;

means for shifting the phase of the first baseband signal by a predetermined amount coupled to said means for providing baseband signals;

means for generating an RF signal coupled to said phase shifting means having said first and second baseband signals symmetrically disposed around a common frequency;

DESIGN PATENTS

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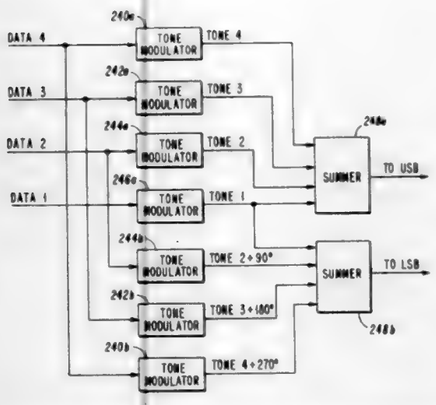
wherein said RF signal may be transmitted to a receiver via an antenna means; and



wherein said shifting evenly distributes the phase differences between the shifted and unshifted tone pairs over a 360 degree span.

5,201,072

TUNER FOR DIVERSITY RECEPTION HAVING A FIXED ANTENNA AND A RETRACTIVE ANTENNA

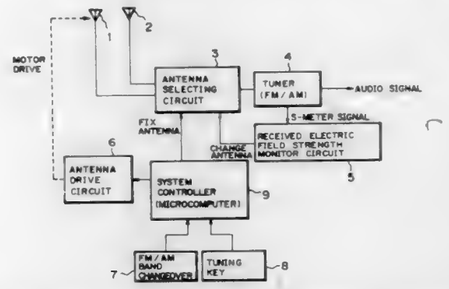
Hiroshi Kobayashi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,504

Claims priority, application Japan, Apr. 5, 1990, 2-89131

Int. Cl.[5] H01Q *1/32*; H04B *7/08*

U.S. Cl. 455—277.1 **7 Claims**



1. In a tuner for diversity reception including a receiving antenna system comprising a fixed antenna and a retractive antenna to be protracted or retracted, wherein one of said fixed antenna and said retractive antenna which has a strongest received electric field strength is selected as the receiving antenna for use in response to the received electric field strength, the tuner for diversity reception comprising:

means for monitoring a driving state of said retractive antenna; and

selecting means coupled to said monitoring means and responsive to an output thereof for automatically selecting the fixed antenna as the receiving antenna to be used, when the retractive antenna is being moved to vary a length thereof.

DESIGN PATENTS

GRANTED Apr. 6, 1993

ERRATA

For CLASS	See PATENT NO.
D14-107	D. 334,553
D14-107	D. 334,554
D14-109	D. 334,555
D14-109	D. 334,556
D14-114	D. 334,557
D14-106	D. 334,558

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1149

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1

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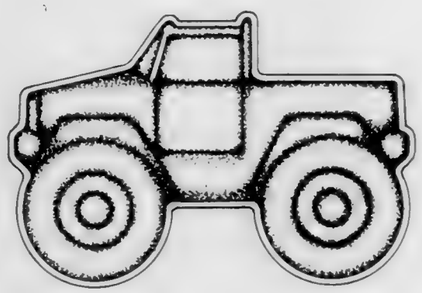
6

1993

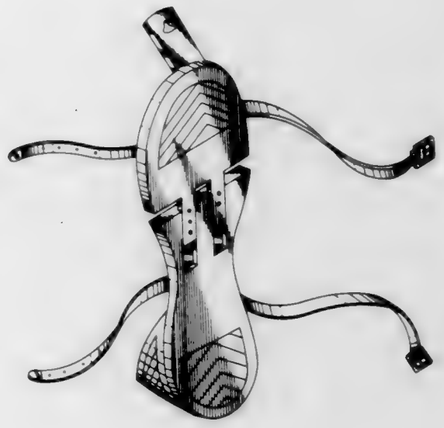
UMI

334,458
FOOD PRODUCT
Lisa G. Korslund, Edina; Donna J. Otto-Schoenauer, Maple Grove, and Eugene P. Buck, St. Paul, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jun. 17, 1991, Ser. No. 716,606
Term of patent 14 years
U.S. Cl. D1—113



334,459
EXTRUDED, PUFFED SNACK FOOD PRODUCT
Pamela J. Forshage, Red Oak, Tex., assignor to Recot, Inc., Plano, Tex.
Filed Mar. 16, 1990, Ser. No. 494,349
Term of patent 14 years
U.S. Cl. D1—120

334,460
SHEETROCK HANGER CONSTRUCTION SHOE
Paul Roden, 101 Porter Dr., P.O. Box 726, Blue Ridge, Tex. 75004
Filed Dec. 7, 1990, Ser. No. 624,266
Term of patent 14 years
U.S. Cl. D2—265



334,461
CATCHER'S SHOE
Michael Moceri, 518 Ridgeview Dr., Big Rapids, Mich. 49307
Filed May 23, 1990, Ser. No. 527,725
Term of patent 14 years
U.S. Cl. D2—311

334,462
INDICIA FOR A SHOE

334,465
SHOE OUTSOLE BOTTOM

334,468
CASE FOR MAGNETIC TAPE CASSETTE

334,471
WAIST POUCH

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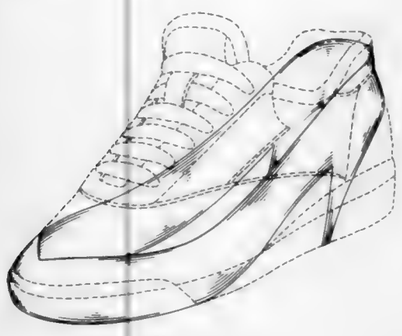
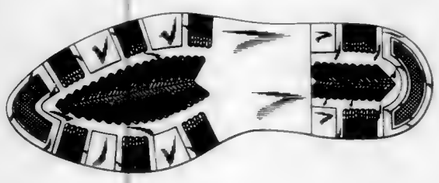
334,462
INDICIA FOR A SHOE
Michael O. Maher, 7702 Del Glen La., Houston, Tex. 77072
Filed Jan. 24, 1991, Ser. No. 645,286
Term of patent 14 years
U.S. Cl. D2—314

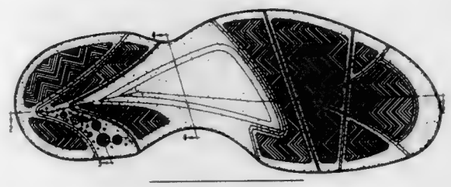


334,463
SHOE SOLE SHOCK ABSORBER
David J. H. Chang, Taichung, Taiwan, assignor to Hi-Tec Sports PLC, South-On-Sea, Great Britain
Filed Jun. 22, 1988, Ser. No. 209,797
Term of patent 14 years
U.S. Cl. D2—314

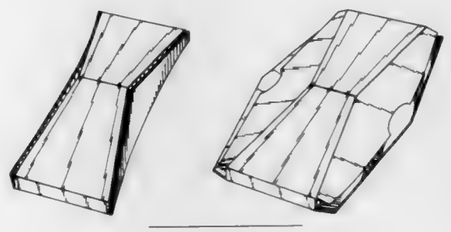
334,464
SHOE SOLE
Russell Dodds, Carlisle, Pa., assignor to Kinney Shoe Corporation, Carlisle, Pa.
Filed Jun. 21, 1991, Ser. No. 718,817
Term of patent 14 years
U.S. Cl. D2—320



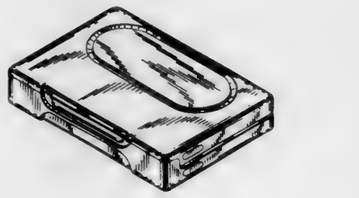
334,465
SHOE OUTSOLE BOTTOM
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,834
Term of patent 14 years
U.S. Cl. D2—320



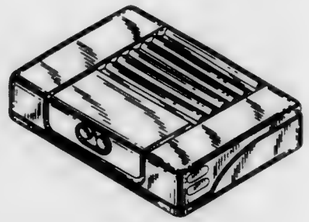
334,466
SPECTACLE CASE
Melanie Oudemans, Regelrecht Consultants, P.O. Box 3616, 1001 AK Amsterdam, Netherlands
Filed Oct. 26, 1990, Ser. No. 605,011
Claims priority, application Hague, May 7, 1990, 200 71-00
Term of patent 14 years
U.S. Cl. D3—34



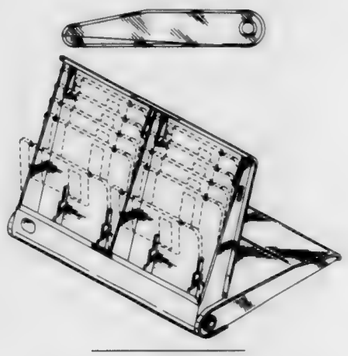
334,467
CASE FOR MAGNETIC TAPE CASSETTE
Masayuki Hata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 9, 1991, Ser. No. 727,474
Claims priority, application Japan, Jan. 24, 1991, 3-1346
Term of patent 14 years
U.S. Cl. D3—35



334,468
CASE FOR MAGNETIC TAPE CASSETTE
Masayuki Hata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 9, 1991, Ser. No. 727,526
Claims priority, application Japan, Jan. 24, 1991, 3-1344
Term of patent 14 years
U.S. Cl. D3—35



334,469
DISKETTE HOLDER
Jon B. Taylor, Lawrence, Kans., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 10, 1991, Ser. No. 775,624
Term of patent 14 years
U.S. Cl. D3—35



334,470
DESIGN FOR A HANDBAG
Alain-Dominique Perrin, Rueil-Malmaison, and Jacques Diltoer, Villeneuve la Garenne, both of France, assignors to Cartier International B.V., Amsterdam, Netherlands
Filed Jan. 28, 1991, Ser. No. 646,934
Claims priority, application France, Jul. 27, 1990, 904899
Term of patent 14 years
U.S. Cl. D3—52

334,471
WAIST POUCH
Victor L. Yerby, Malibu; Richard J. Walter, Westlake Village, and Gerald J. Jacob, Agoura, all of Calif., assignors to Sunburst Products, Inc., Camarillo, Calif.
Filed Sep. 5, 1990, Ser. No. 578,846
Term of patent 14 years
U.S. Cl. D3—106

334,472
TOOTHBRUSH
John P. Curtis, Bloomsbury; Kedar N. Rustogi, Kendall Park, both of N.J.; John C. Crawford, Lake Mahopac, N.Y.; James H. Kemp, Piscataway, N.J.; Thomas E. Mintel, Rahway, N.J.; Bert D. Heinzelman, Tenafly, N.J.; Donald R. Lamond, Lynbrook, and Laura H. Edelman, New York, both of N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 29, 1990, Ser. No. 501,627
Term of patent 14 years
U.S. Cl. D4—104

334,473
SET OF BRISTLES FOR A TOOTHBRUSH

334,475
HAIRBRUSH WITH A PLATE TO REMOVE HAIR FROM

334,477

334,480

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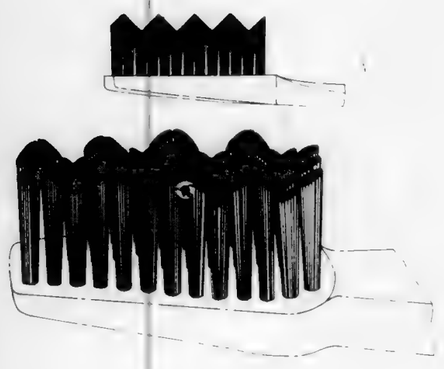
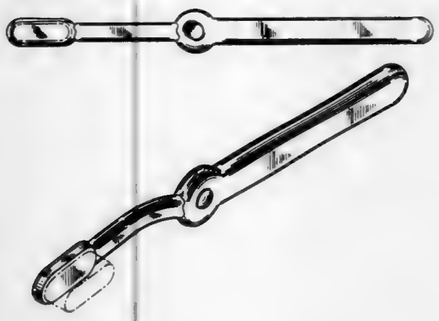
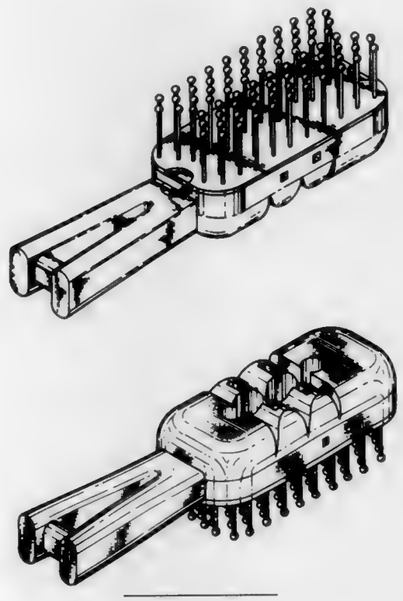
334,473
SET OF BRISTLES FOR A TOOTHBRUSH
Daniel W. Volpenhein, Maineville, and Thomas J. Hall, Cincinnati, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Jul. 13, 1990, Ser. No. 553,193
Term of patent 14 years
U.S. Cl. D4—104



334,474
TOOTHBRUSH HANDLE
Barbara H. Sauceda, Palo Alto, Calif., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 28, 1991, Ser. No. 706,530
Term of patent 14 years
U.S. Cl. D4—104

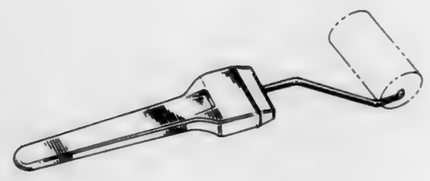


334,475
HAIRBRUSH WITH A PLATE TO REMOVE HAIR FROM THE BRISTLES
George Quondamatteo, 42-15 189th St., Flushing, N.Y. 11358
Filed Jul. 10, 1990, Ser. No. 550,354
Term of patent 14 years
U.S. Cl. D4—116

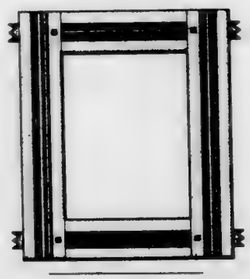


334,476
HANDLE FOR A PAINTING IMPLEMENT
Kurt W. Niemackl, 13503 W. 66th Ter., Shawnee, Kans. 66216
Filed May 14, 1990, Ser. No. 522,869
Term of patent 14 years
U.S. Cl. D4—138

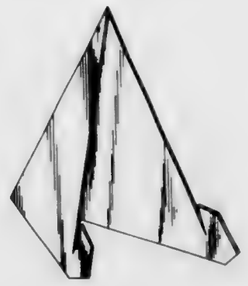
334,477
PAINT ROLLER HANDLE
Robert I. Janssen, 1160 Sibley Hwy., Mendota Heights, Minn. 55118
Filed May 28, 1991, Ser. No. 706,064
Term of patent 14 years
U.S. Cl. D4—138



334,478
PICTURE FRAME
William F. Rogers, 6101 S. Rockwell, Oklahoma City, Okla. 73119
Filed Feb. 11, 1991, Ser. No. 694,312
Term of patent 14 years
U.S. Cl. D6—300

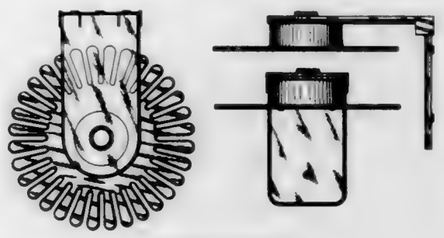


334,479
DISPLAY EASEL
Isaac N. Glick, 7103-111 Street, Edmonton, Alberta, Canada T6G 1G9
Filed Feb. 7, 1990, Ser. No. 476,292
Term of patent 14 years
U.S. Cl. D6—310



334,480
GARMENT HANGER
Alexander Dongas, New South Wales, Australia, assignor to Pro-Plast Pty. Limited, Marrickville, Australia
Filed Jul. 16, 1991, Ser. No. 731,035
Term of patent 14 years
U.S. Cl. D6—318

334,481
TIE RACK
Tyrone Ramotar, 101-24 123rd St., Queens, N.Y. 11419
Filed Aug. 5, 1991, Ser. No. 740,183
Term of patent 14 years
U.S. Cl. D6—322



334,482
CHAIR
Rose Tarlow, 8454 Melrose Pl., Los Angeles, Calif. 90069
Filed Apr. 9, 1990, Ser. No. 506,759
Term of patent 14 years
U.S. Cl. D6—334

334,483

334,485

334,488
CHAIR

334,490
COMBINED FOLDABLE AND PORTABLE

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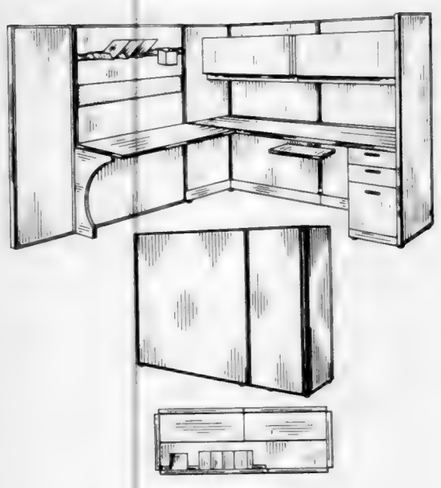
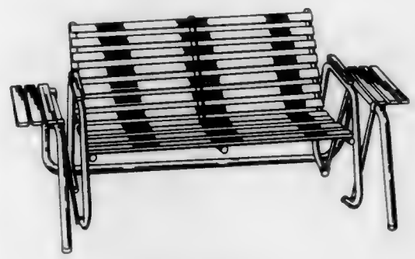
334,483
COMBINED FOLDABLE AND PORTABLE WORKSTATION
Margaret A. Johnson, 6136 E. 97 S. St., Tulsa, Okla. 74137
Filed Feb. 19, 1991, Ser. No. 657,555
Term of patent 14 years
U.S. Cl. D6—430

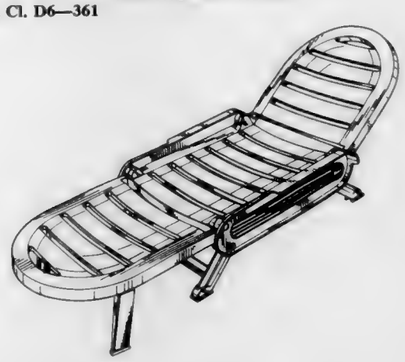


334,484
CHAIR
Andrew C. Gibson, Greensboro, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Oct. 10, 1990, Ser. No. 595,165
Term of patent 14 years
U.S. Cl. D6—334

334,485
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Feb. 21, 1990, Ser. No. 483,422
The portion of the term of this patent subsequent to May 5, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—344



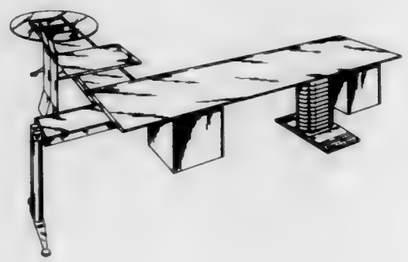
334,486
LOUNGE CHAIR
Jerrold G. Brown, Wooster, Ohio, and Giovanni Pino, Kentwood, Mich., assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 13, 1990, Ser. No. 566,184
Term of patent 14 years
U.S. Cl. D6—361



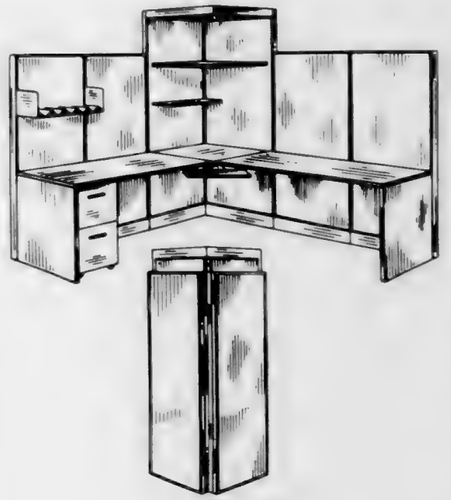
334,487
VIDEO GAME CONTROL SEAT
Harold D. Perry, 204 Parkdale, Wichita, Kans. 67209
Filed Oct. 5, 1990, Ser. No. 593,627
Term of patent 14 years
U.S. Cl. D6—364

334,488
CHAIR
Frank O. Gehry, Santa Monica, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 24, 1990, Ser. No. 587,369
Term of patent 14 years
U.S. Cl. D6—369

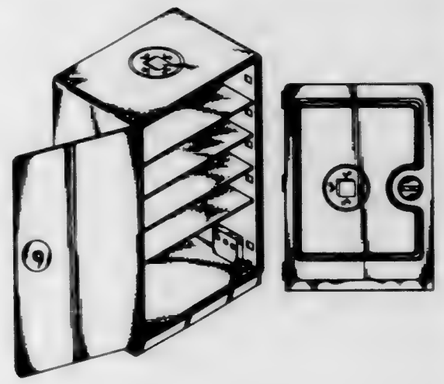
334,489
DESK
Urs Greutmann, and Carmen Greutmann, both of Zärich, Switzerland, assignors to Denz Design, Kempter, Switzerland
Filed Mar. 26, 1990, Ser. No. 499,827
Claims priority, application Switzerland, Sep. 25, 1989, 117742
Term of patent 14 years
U.S. Cl. D6—423



334,490
COMBINED FOLDABLE AND PORTABLE WORKSTATION
Margaret A. Johnson, 6136 E. 97 S. St., Tulsa, Okla. 74137
Filed Feb. 19, 1991, Ser. No. 657,558
Term of patent 14 years
U.S. Cl. D6—430



334,491
VACUUM FOOD STORAGE CABINET
Terry Poland, P.O. Box 30931, Honolulu, Hi. 96820
Filed May 21, 1990, Ser. No. 525,627
Term of patent 14 years
U.S. Cl. D6—432



334,492

334,494

334,496
RUG MERCHANDISE DISPLAY STAND

334,499
COFFEE FILTER DISPENSER

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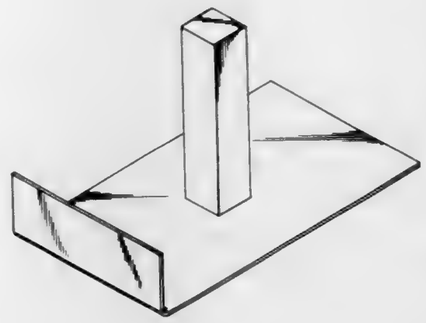
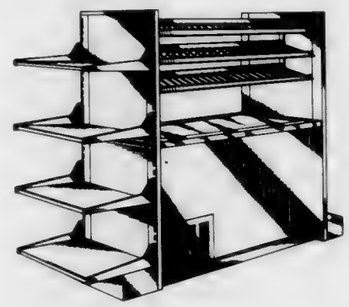
334,492
SPRAY GUN AND STRAINER HOLDER
Tony Morello, 102 Liberty St., Marseilles, Ill. 61341
Filed Apr. 4, 1990, Ser. No. 507,067
Term of patent 14 years
U.S. Cl. D6—462

334,493
POTATO CHIP RACK
Christopher J. Penar, 21159 Flanders, Farmington Hills, Mich. 48024
Filed Sep. 4, 1990, Ser. No. 576,733
Term of patent 14 years
U.S. Cl. D6—462

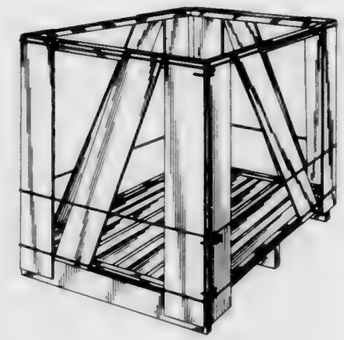
334,494
DISPLAY HOLDER
Linda C. Stein, 1139 Ivy Wall Dr., Houston, Tex. 77079
Filed Apr. 23, 1991, Ser. No. 694,866
Term of patent 14 years
U.S. Cl. D6—466



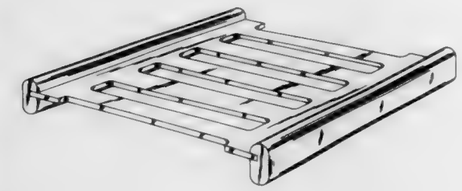
334,495
REFRIGERATED DISPLAY CASE
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Jun. 20, 1991, Ser. No. 718,105
Term of patent 14 years
U.S. Cl. D6—470



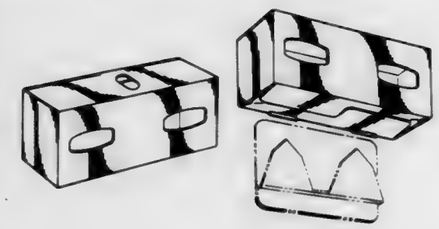
334,496
RUG MERCHANDISE DISPLAY STAND
Fred Schnair, Highland Park, Ill., assignor to Jefferson Industries, Inc., Chicago, Ill.
Filed Apr. 8, 1992, Ser. No. 866,235
Term of patent 14 years
U.S. Cl. D6—475



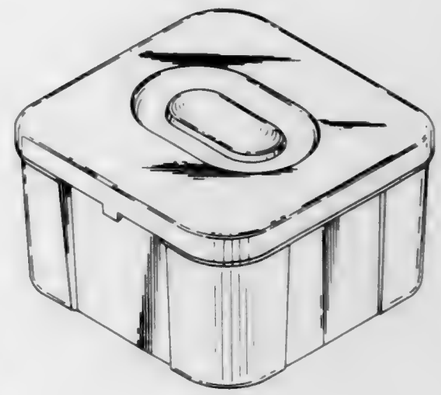
334,497
VENTILATED SHELF
Terry D. Putty, Ocala, Fla., assignor to Clairon International, Ocala, Fla.
Filed Jul. 5, 1990, Ser. No. 548,389
Term of patent 14 years
U.S. Cl. D6—511



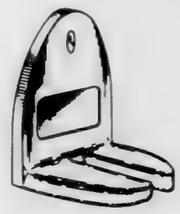
334,498
LENS TISSUE DISPENSING UNIT
Steve J. Romme, Woodstock, and L. Wesley Smith, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 14, 1990, Ser. No. 627,426
Term of patent 14 years
U.S. Cl. D6—515



334,499
COFFEE FILTER DISPENSER
Edward H. Meisner, Short Hills, and Young C. Park, Palisades Park, both of N.J., assignors to Eagle Affiliates, Inc., Brooklyn, N.Y.
Filed Feb. 19, 1991, Ser. No. 657,691
Term of patent 14 years
U.S. Cl. D6—515



334,500
SKI HOOK
Richard LaLonde, Mascouche, Canada, assignor to Dero Enterprises Inc., Montréal Nord, Canada
Filed Jun. 24, 1991, Ser. No. 719,539
Term of patent 14 years
U.S. Cl. D6—552



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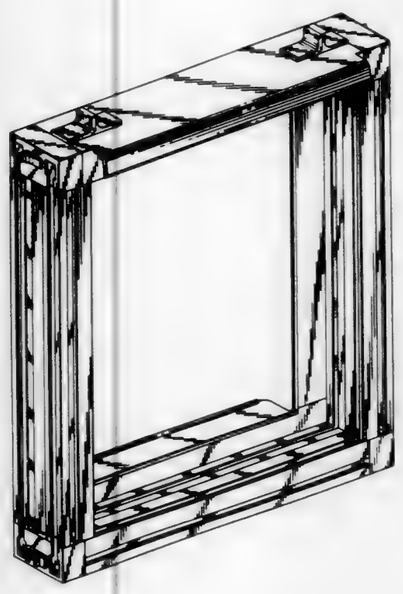
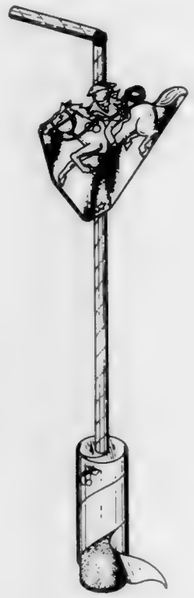
334,501
WINDOW SASH
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Wilmington, Del.
Filed Mar. 2, 1990, Ser. No. 487,233
Term of patent 14 years
U.S. Cl. D6—575

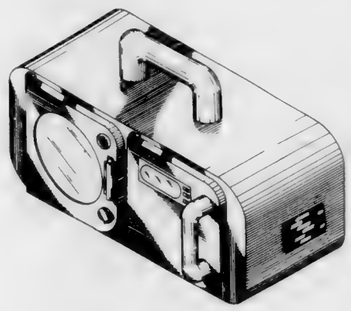


334,502
COMBINATION STORAGE AND MATTRESS SUPPORT UNIT
Vernon L. Hill, 12361 Randolph Pl., Denver, Colo. 80239
Filed May 11, 1990, Ser. No. 522,202
Term of patent 14 years
U.S. Cl. D6—605

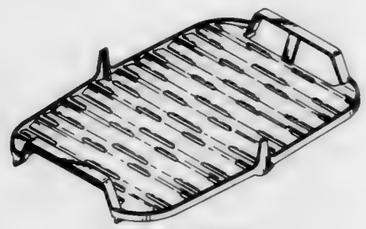
334,503
COMBINED BEVERAGE INGREDIENT HOLDER AND STRAW
Raymond T. Neubert, Sr., 520 El Prado, Ridgecrest, Calif. 93555
Filed Sep. 6, 1990, Ser. No. 578,315
Term of patent 14 years
U.S. Cl. D7—300.2



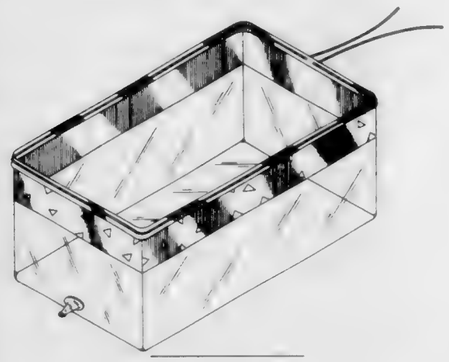
334,504
COMBINED BABY BOTTLE HEATER AND COOLER
Leroy Edwards, 2416 Owen Dr., Wilmington, Del. 19808
Filed Dec. 13, 1991, Ser. No. 806,438
Term of patent 14 years
U.S. Cl. D7—326



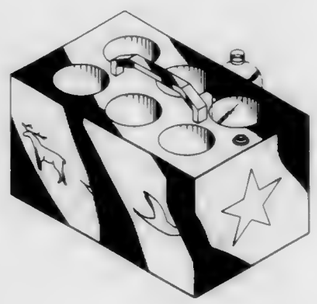
334,505
ROASTING RACK
Russell Gropman, Roslyn Hts., N.Y., assignor to Eagle Affiliates, Brooklyn, N.Y.
Filed Jul. 16, 1990, Ser. No. 552,675
Term of patent 14 years
U.S. Cl. D7—409



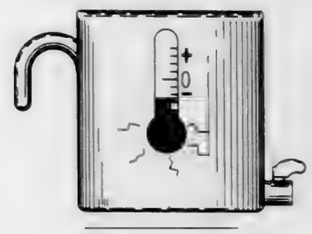
334,506
LINER FOR A COOLER
Steve W. Duncan, 8149 Longshadow La., N. Charlston, S.C. 29418
Filed Oct. 16, 1990, Ser. No. 598,331
Term of patent 14 years
U.S. Cl. D7—605



334,507
COOLER
Jerry R. Erwin, Box 766, Tweed, Ontario, Canada K0K 3J0
Filed Mar. 14, 1991, Ser. No. 669,278
Term of patent 14 years
U.S. Cl. D7—605



334,508
INSULATED BEVERAGE CONTAINER HOLDER
Luis A. Furtado, 248 Hancock St., Fall River, Mass. 02721
Filed May 28, 1991, Ser. No. 705,900
Term of patent 14 years
U.S. Cl. D7—605



334,509
TACO HOLDING RACK
Robert J. Melvin, 1656 W. Milagro Ave., Mesa, Ariz. 85202
Filed Jun. 24, 1991, Ser. No. 719,531
Term of patent 14 years
U.S. Cl. D7—504

334,510
COMBINED SPICE RACK AND KITCHEN GADGET ORGANIZER
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jul. 29, 1991, Ser. No. 735,122
Term of patent 14 years
U.S. Cl. D7—638

334,511
SPOON

334,514
ATTACHABLE FUNNEL

334,516
WRENCH

334,519
SPEEDOMETER REMOVAL TOOL

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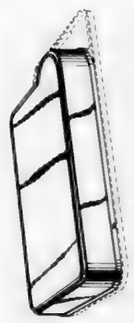
334,511
SPOON
Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 15, 1991, Ser. No. 730,256
Term of patent 14 years
U.S. Cl. D7—662

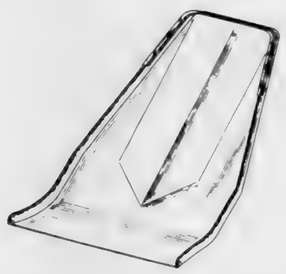
334,512
COMBINED STORAGE UNIT AND HOLDER FOR A JUICER AND GRATER
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jun. 25, 1990, Ser. No. 541,164
Term of patent 14 years
U.S. Cl. D7—665

334,513
COVER
Gary DeGrow, Antioch, Tenn., assignor to Aladdin Synergetics, Inc., Nashville, Tenn.
Division of Ser. No. 394,187, Aug. 15, 1989. This application Aug. 4, 1992, Ser. No. 924,535
Term of patent 14 years
U.S. Cl. D7—392.1



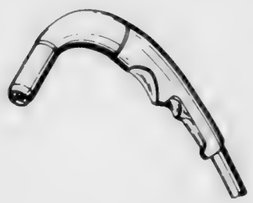
334,514
ATTACHABLE FUNNEL
Herbert Fidler, 12776 S. 200 East Ave., Broken Arrow, Okla. 74014
Filed Aug. 27, 1990, Ser. No. 572,375
Term of patent 14 years
U.S. Cl. D7—700

334,515
SNOW SCOOP
Dean L. Libra, RR 3, Box 124, Canton, S. Dak. 57103, and Michael A. Knopf, 801 Executive Dr., Crooks, S. Dak. 57020
Filed Feb. 13, 1991, Ser. No. 654,913
Term of patent 14 years
U.S. Cl. D3—10

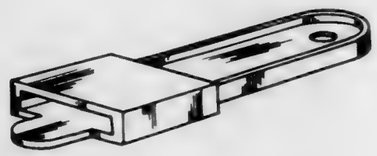


334,516
WRENCH
Yuji Tsunoda, 1535-5 Shimonakano, Yoshida-Town, Niigata-Pref., Japan
Filed May 22, 1991, Ser. No. 704,013
Term of patent 14 years
U.S. Cl. D8—29

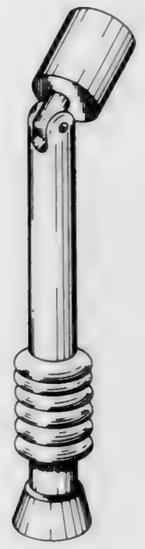
334,517
WELDING GUN
John A. Ingwersen, 50 Thurman Ave., Columbus, Ohio 43206; Thomas L. Montague, 4711 High Vista Dr., Columbus, Ind. 47203, and Robert G. Reed, R.R. #1, Box 427, Rd. 1000 W., Elizabethtown, Ind. 47232
Filed May 10, 1991, Ser. No. 698,070
Term of patent 14 years
U.S. Cl. D8—30



334,518
CAN TAB OPENER
Michael E. Hughes, 7000 Phoenix Ave. NE, Apt. #506, Albuquerque, N. Mex. 87110, and Robert W. Hughes, Albuquerque, N. Mex., assignors to Michael E. Hughes, Albuquerque, N. Mex.
Continuation-in-part of Ser. No. 33,481, Mar. 30, 1987, Pat. No. Des. 316,362, which is a continuation-in-part of Ser. No. 798,577, Nov. 15, 1985, abandoned. This application Apr. 19, 1991, Ser. No. 688,061
Term of patent 14 years
U.S. Cl. D8—40



334,519
SPEEDOMETER REMOVAL TOOL
Steven Arnold, 181 Dix Ave., Hudson Falls, N.Y. 12839
Filed Mar. 12, 1991, Ser. No. 668,450
Term of patent 14 years
U.S. Cl. D8—51



334,520
FIREPLACE TONGS
John S. Adams, 1655 Rockdale Rd., Dubuque, Iowa 52001
Filed Oct. 25, 1990, Ser. No. 603,201
Term of patent 14 years
U.S. Cl. D8—52

334,521

334,523

334,526
FIREPLACE TOOL HANDLE

334,529
GARDEN HOSE HOLDER

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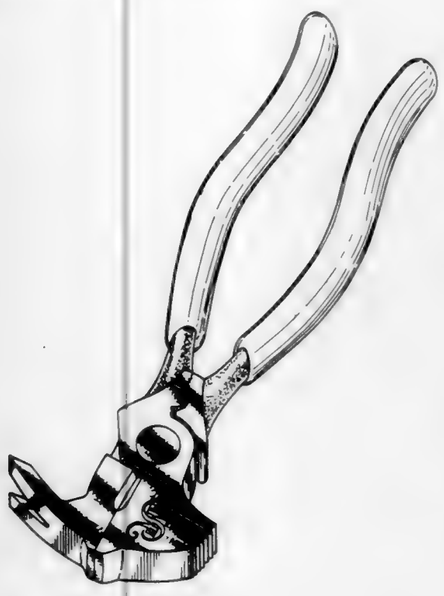
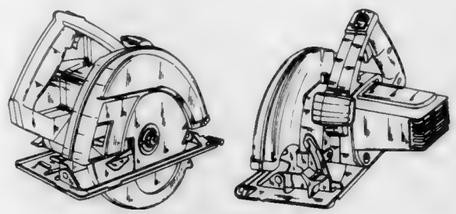
334,521
COMBINATION TOOL
David Simpson, 3381 East Rd., Loxahatchee, Fla. 33470
Filed May 23, 1990, Ser. No. 527,244
Term of patent 14 years
U.S. Cl. D8—55

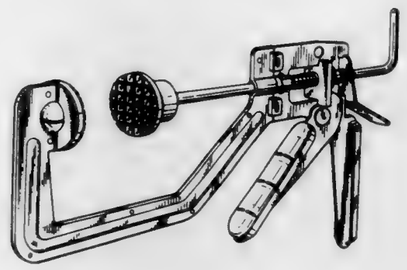


334,522
PORTABLE ELECTRIC SAW
Yasunori Ogawa, Mito; Kazumi Takeishi, Katsuta, and Kazumi Tanaka, Mito, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed Sep. 27, 1990, Ser. No. 588,966
Term of patent 14 years
U.S. Cl. D8—64

334,523
CIRCULAR SAW
Kuyoshi Hoshino, Clemson, and James R. Sistare, Pickens, both of S.C., assignors to Ryobi Motor Products, Easley, S.C.
Filed Aug. 17, 1990, Ser. No. 569,163
Term of patent 14 years
U.S. Cl. D8—66



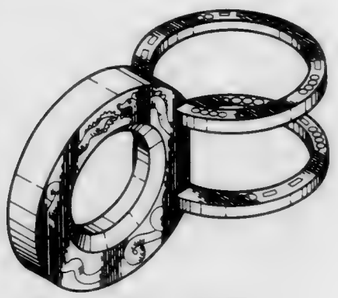
334,524
CLAMP
Kenneth P. Pinkney, Reading, England, assignor to BBA Group PLC, England
Filed Feb. 1, 1991, Ser. No. 649,804
Term of patent 14 years
U.S. Cl. D8—73



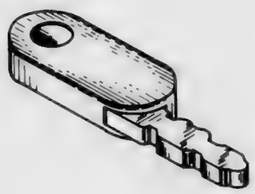
334,525
HANDLE FOR A FIREPLACE TOOL
John S. Adams, 1566 Rockdale Rd., Dubuque, Iowa 52001
Filed Sep. 14, 1990, Ser. No. 582,541
Term of patent 14 years
U.S. Cl. D8—107

334,526
FIREPLACE TOOL HANDLE
John S. Adams, 1566 Rockdale Rd., Dubuque, Iowa 52001
Filed Sep. 17, 1990, Ser. No. 583,363
Term of patent 14 years
U.S. Cl. D8—307

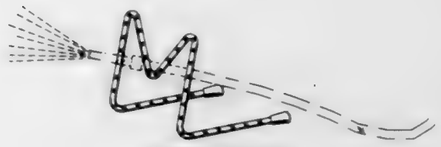
334,527
LOCKING ELEMENT TO BE EMPLOYED WITH A CHAIN OR TETHER FOR ATTACHING SKI POLES TO SKIS
Steve P. Fink, R.R. #3 Box 3572, Hamburg, Pa. 19526
Filed Aug. 22, 1990, Ser. No. 570,710
Term of patent 14 years
U.S. Cl. D8—333



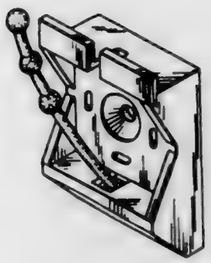
334,528
KEY FOR A LOCK
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,205
Term of patent 14 years
U.S. Cl. D8—347



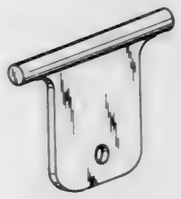
334,529
GARDEN HOSE HOLDER
Peter A. Guilbert, 7049 Solomon Seal Ct., Springfield, Va. 22152
Filed Dec. 14, 1990, Ser. No. 627,374
Term of patent 14 years
U.S. Cl. D8—356



334,530
HOLDER FOR FLEXIBLE ELEMENTS, INCLUDING WIRE, CORDS AND RUBBER HOSES
David E. Rowland, Imperial Beach, Calif., assignor to Janice L. Rowland, Chula Vista, Calif.
Continuation of Ser. No. 575,867, Aug. 31, 1990, Pat. No. 5,062,184. This application Aug. 30, 1991, Ser. No. 752,324
Term of patent 14 years
U.S. Cl. D8—356



334,531
SUPPORT HANGER FOR A RECREATIONAL VEHICLE AWNING
Ralph W. Pelletier, and Ila Pelletier, both of HC-01, P.O. Box 312, Hardwood, Mich. 49844, assignors to The Dometic Corporation, Elkhart, Ind.
Filed May 8, 1989, Ser. No. 349,070
Term of patent 14 years
U.S. Cl. D8—373



334,532

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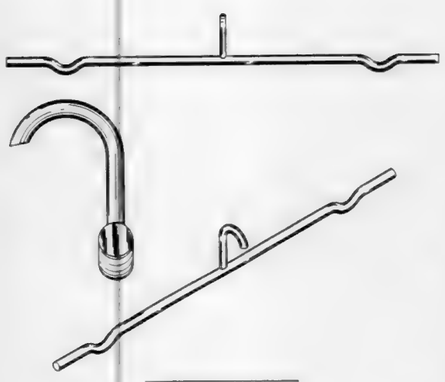
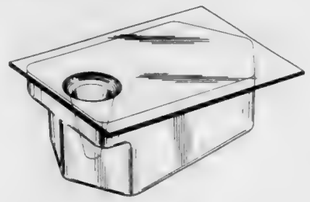
334,532
DEER HANGER
Antonio A. Arana, 245 E. 5th Street, Sutherlin, Oreg. 97479
Filed Aug. 10, 1990, Ser. No. 565,116
Term of patent 14 years
U.S. Cl. D8—373



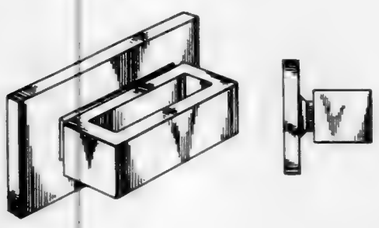
334,534
TOOL CASE
Albrecht Friz, Giengen; Willi Platte, Attendorn, and Hans Bauer, Thyrnau, all of Fed. Rep. of Germany, assignors to Firma Georg Knoblauch, Giegen/Brenz, Fed. Rep. of Germany
Filed Mar. 22, 1991, Ser. No. 674,715
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1990, 9006365
Term of patent 14 years
U.S. Cl. D9—415

334,535
PACKAGE
Joseph Piccione, St. Hubert, and Keith Doherty, Dorval, all of Canada, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Filed Sep. 27, 1991, Ser. No. 766,158
Claims priority, application Canada, Mar. 28, 1991, 28039116
Term of patent 14 years
U.S. Cl. D9—415

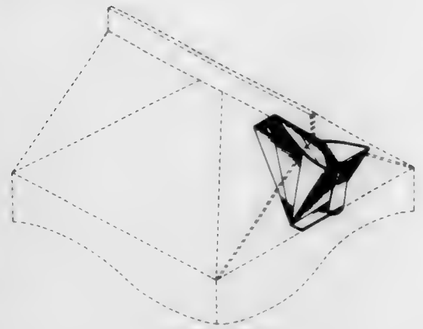
334,536
FLUID CONTAINER
Ernest W. Long, Concord, and Shailendra Singh, Sharon, both of Mass., assignors to P B Diagnostic Systems, Inc., Westwood, Mass.
Filed Jul. 22, 1991, Ser. No. 733,234
Term of patent 14 years
U.S. Cl. D9—425



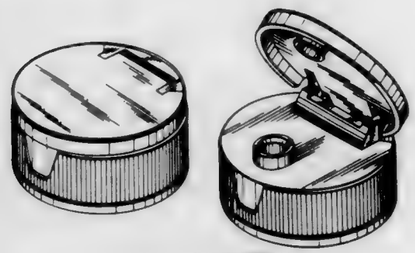
334,533
EYEGLASS HOLDER
Hans-Dieter Brunner, P.O. Box DD, Balboa Island, Calif. 92662
Filed Jan. 7, 1991, Ser. No. 638,418
Term of patent 14 years
U.S. Cl. D8—373



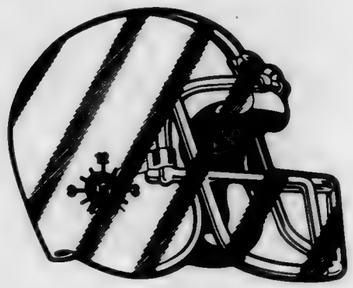
334,537
SPOUT FOR A CARTON
William T. Bryan, 927 Garnoa Dr., Cincinnati, Ohio 45231
Filed Jun. 13, 1989, Ser. No. 365,652
Term of patent 14 years
U.S. Cl. D9—447



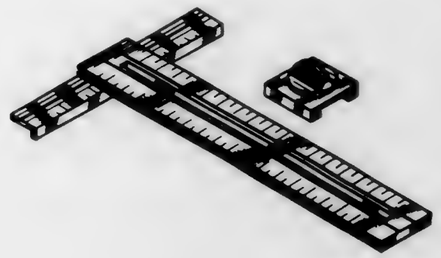
334,538
DISPENSING CLOSURE
Robert J. Bolen, Jr., 10 Gwynne Ct., Closter, N.J. 07624, and Thomas R. Bolen, 64 Wheeler Ave., Westwood, N.J. 07675
Filed Apr. 16, 1990, Ser. No. 509,079
Term of patent 14 years
U.S. Cl. D9—447



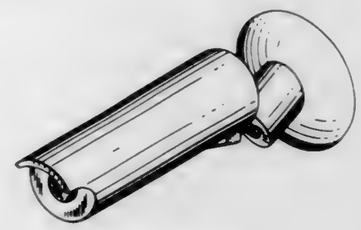
334,539
CLOCK
George Der Garabedian, 2348 Rusk St., Beaumont, Tex. 77702
Filed Oct. 15, 1990, Ser. No. 597,591
Term of patent 14 years
U.S. Cl. D10—6



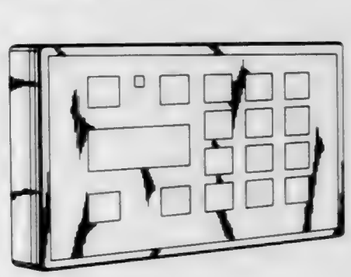
334,540
SHEETROCK CUTTING INSTRUMENT
Christopher Amann, and Grace Amann, both of 56 Eastview Rd., Ronkonkoma, N.Y. 11770
Filed Mar. 12, 1991, Ser. No. 668,429
Term of patent 14 years
U.S. Cl. D10—62



334,541
HOUSING FOR A PASSIVE INFRARED DETECTOR
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Jun. 27, 1990, Ser. No. 544,787
Term of patent 14 years
U.S. Cl. D10—104



334,542
HOUSING FOR A CONTROL PANEL
Peter Lowe, San Francisco, and Peter Muller, Los Gatos, both of Calif., assignors to Burie Industries Ireland, Cork, Ireland
Filed Nov. 16, 1990, Ser. No. 614,745
Term of patent 14 years
U.S. Cl. D10—104



334,543

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334,550
SUN VISOR EXTENSION

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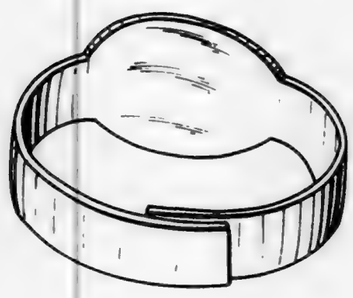
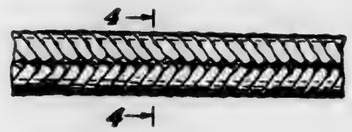
334,543
WATCH GUARD
Thomas Falcone, 9 Compass Ct., Oyster Bay, N.Y. 11771
Filed Oct. 9, 1990, Ser. No. 597,737
Term of patent 14 years
U.S. Cl. D10—132



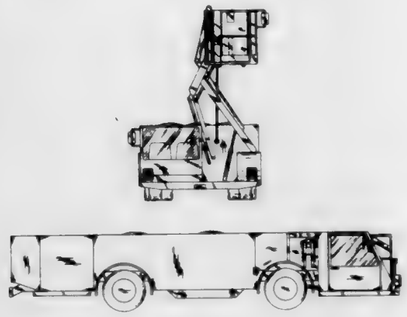
334,544
WATCH BAND
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 6, 1991, Ser. No. 711,437
Term of patent 14 years
U.S. Cl. D11—3

334,545
WATCH BAND
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 6, 1991, Ser. No. 711,438
Term of patent 14 years
U.S. Cl. D11—3

334,546
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A, Zona Industriale S. Zeno, Italy
Filed Jun. 14, 1990, Ser. No. 538,194
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—13

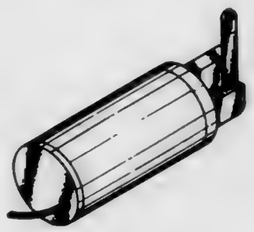


334,547
VEHICLE FOR SERVICING OF AIRCRAFT
Godtfred Vestergaard, Niels Frederiksensvej 18 Kornerup, Roskilde, Denmark 4000
Filed Nov. 13, 1990, Ser. No. 612,897
Claims priority, application Denmark, May 15, 1990, 0627/90
Term of patent 14 years
U.S. Cl. D12—14



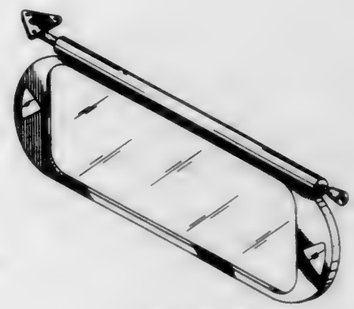
334,548
WHEELCHAIR
Gladys Martinez, and Gladys Santiago, both of 2 Ellwood St., Apt. 4J, New York, N.Y. 10040
Filed Jun. 21, 1990, Ser. No. 541,366
Term of patent 14 years
U.S. Cl. D12—131

334,549
WINDSHIELD WIPER BLADE ATTACHMENT IN BREAKING ICE FORMED BETWEEN THE BLADE AND WINDSHIELD
George R. Esquibel, P.O. Box 575, Pensaco, N. Mex. 87553
Filed Oct. 15, 1991, Ser. No. 775,375
Term of patent 14 years
U.S. Cl. D12—155



334,550
SUN VISOR EXTENSION
David P. Wade, Jr., 604 Traver Trail, Glenwood Springs, Colo. 81601
Filed Feb. 12, 1991, Ser. No. 654,566
Term of patent 14 years
U.S. Cl. D12—191

334,551
TINTED AUTOMOBILE SUN VISOR
Noel Andres, 35 Emerald Crescent, Toronto Ontario, Canada M8V 2B3
Filed Aug. 7, 1991, Ser. No. 741,156
Term of patent 14 years
U.S. Cl. D12—191



334,552
MOTORIZED WATER SKI
Robert E. Montgomery, 53A, Calle Aragon, Laguna Hills, Calif. 92653
Filed Jun. 25, 1990, Ser. No. 543,066
Term of patent 14 years
U.S. Cl. D12—307

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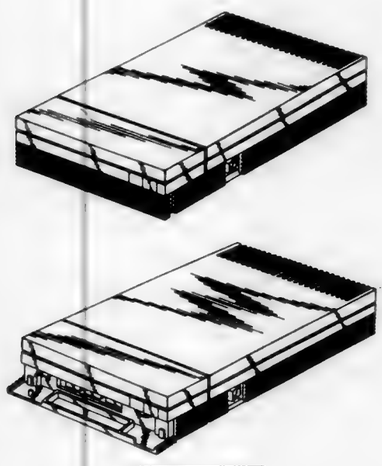
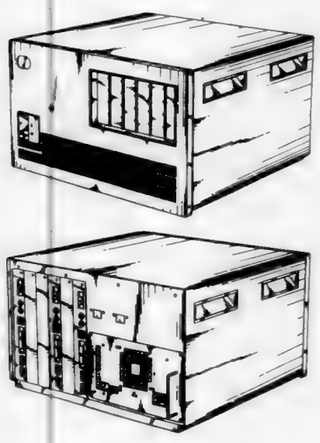
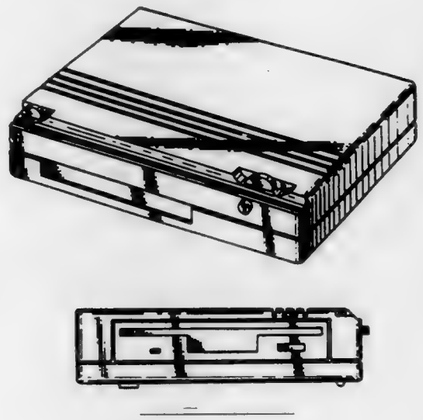
334,553
MODEM FOR DATA COMMUNICATION
Yutaka Kobayashi, Hirakata, and Sadayasu Araki, Kawagoe, both of Japan, assignors to Omron Corporation, Kyoto, Japan
Filed May 18, 1990, Ser. No. 525,393
Claims priority, application Japan, May 19, 1989, 1-18378
Term of patent 14 years
U.S. Cl. D14—107



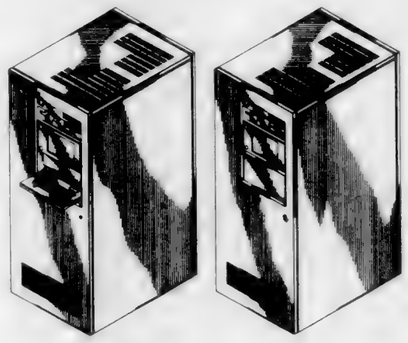
334,554
ENCLOSURE FOR ELECTRONIC SYSTEM
Bruce A. Jones, Ulster Park, and John J. Natoli, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 4, 1990, Ser. No. 577,428
Term of patent 14 years
U.S. Cl. D14—107



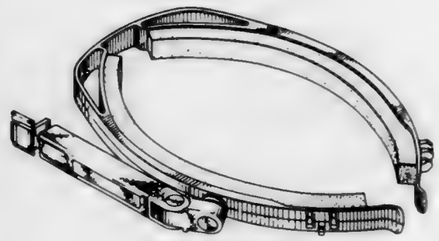
334,555
FLOPPY DISC DRIVE
Kanji Miznsugi; Kensho Tsuji, and Fumikazu Shimanuki, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 18, 1990, Ser. No. 584,185
Claims priority, application Japan, Mar. 20, 1990, 2-9337
Term of patent 14 years
U.S. Cl. D14—109



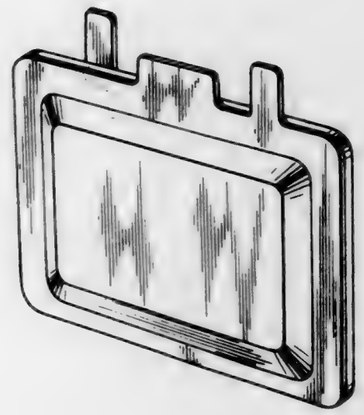
334,556
COMBINED OPTICAL DISK LIBRARY WITH INTERNAL CONTROLLER AND KEYBOARD
Mark A. Bolden; Jerry W. Hammar; Richard D. Kusel; Roland Zapfe, all of Tucson, Ariz., and Heather L. C. Bolden, Legal Representative of said Mark A. Bolden, deceased, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1990, Ser. No. 606,784
Term of patent 14 years
U.S. Cl. D14—109



334,557
COMBINED HEADBAND AND ATTACHMENT ARM FOR A MINIATURE VIDEO DISPLAY BOX
Gregory H. Hunter, Westwood, Mass.; Greydon A. Rhodes, Chester; Armand J. Plasencia, Hopatoong, both of N.J., and Benjamin A. Wells, Newton, Mass., assignors to Reflection Technology, Inc., Waltham, Mass.
Filed Oct. 23, 1990, Ser. No. 602,083
Term of patent 14 years
U.S. Cl. D14—114

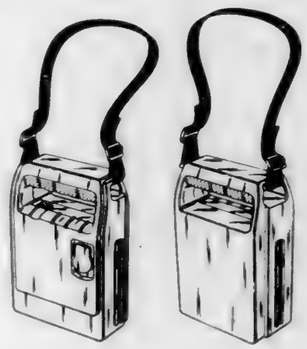


334,559
BATTERY FOR AN IC CARD
Mitsugu Okahisa; Seiichi Mizuani, both of Osaka, and Fumio Daio, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 21, 1991, Ser. No. 795,613
Claims priority, application Japan, Aug. 9, 1991, 3-24308
Term of patent 14 years
U.S. Cl. D13—103



334,558
ELECTRONIC COMPUTER
Masaaki Iino, Yokohama, Japan, assignor to Kabushkik Kaisha Toshiba, Kanagawa, Japan
Filed Oct. 25, 1990, Ser. No. 603,196
Claims priority, application Japan, Apr. 25, 1990, 2-13941
Term of patent 14 years
U.S. Cl. D14—106

334,560
RECHARGEABLE POWER PACK FOR VARIOUS MODULAR DEVICES
Michael Wilson, Mission Viejo, Calif., assignor to Innova Electronics Corporation, Fountain Valley, Calif.
Filed Sep. 30, 1991, Ser. No. 769,674
Term of patent 14 years
U.S. Cl. D13—106



334,561

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334,565
IMAGE PLOTTER

334,567
ELECTRONIC FILING SYSTEM WITH FACSIMILE

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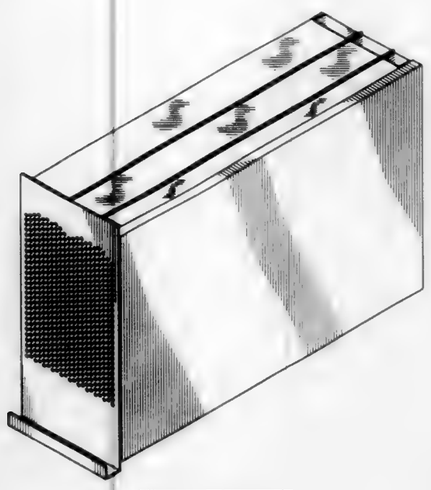
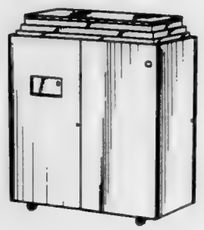
334,561
ELECTRONIC EQUIPMENT POWER SUPPLY MODULE
Arnold Crater, and Carter Hoss, both of Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 4, 1991, Ser. No. 771,913
Term of patent 14 years
U.S. Cl. D13—110



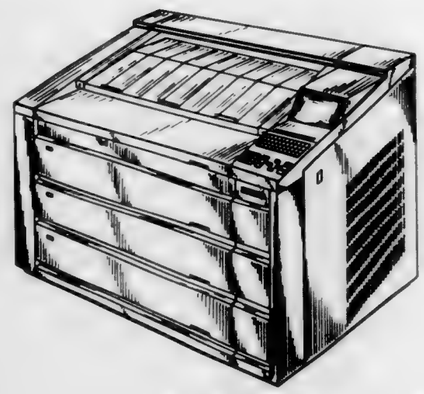
334,562
CABLE DUCT
Kevin Maloney, Long Beach, Calif., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 20, 1990, Ser. No. 540,811
Term of patent 14 years
U.S. Cl. D13—155

334,563
EXTENSION FOR A WALL SWITCH ACTUATOR
Charles E. Burbage, 120 First St., Bridgeville, Del. 19933
Filed Apr. 15, 1991, Ser. No. 685,486
Term of patent 14 years
U.S. Cl. D13—173

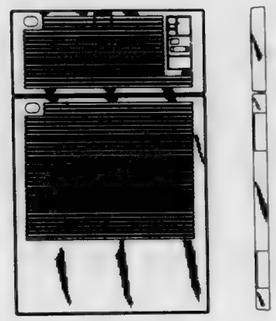
334,564
MAINFRAME COMPUTER
Michael Basara, Rhinebeck; Robert V. Jones, Woodstock; Susan S. Moffatt, Clinton Corners, and John D. Swansey, Tivoli, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 4, 1990, Ser. No. 577,430
Term of patent 14 years
U.S. Cl. D14—100



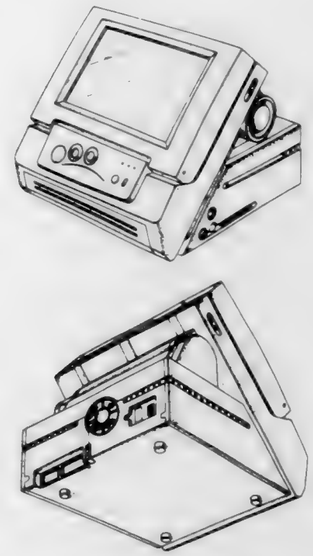
334,565
IMAGE PLOTTER
Joseph A. Rauch, Kiryat Tivon; Aron Shmaiser, Rishon Le Zion, and Dvir Harmelech, Rehovot, all of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands
Filed Jan. 16, 1990, Ser. No. 464,755
Term of patent 14 years
U.S. Cl. D14—107



334,566
FRONT PANEL FOR AN EXPANSION PROCESSOR CONTROLLER FOR A DATA PROCESSING SYSTEM
Wayne L. Aderman, Zumbro Falls, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 28, 1990, Ser. No. 545,267
Term of patent 14 years
U.S. Cl. D14—115



334,567
ELECTRONIC FILING SYSTEM WITH FACSIMILE TRANSMITTER/RECEIVER
Tamaki Someya, Urawa; Yuji Suzuki, and Makoto Sugita, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 600,971
Claims priority, application Japan, Apr. 20, 1990, 2-13637
Term of patent 14 years
U.S. Cl. D14—118



334,568
PORTABLE TELEPHONE HANDSET
Joseph J. Giordano, Jr., Somerset; Sompoppol Jampathom, Oakhurst, and Michael P. Zambelli, Livingston, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 12, 1991, Ser. No. 758,157
Term of patent 14 years
U.S. Cl. D14—138

334,569

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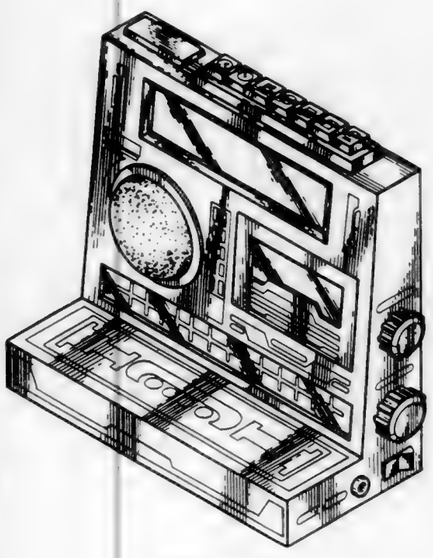
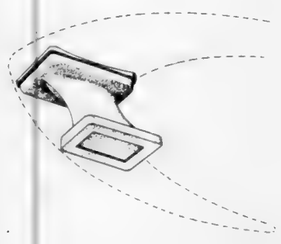
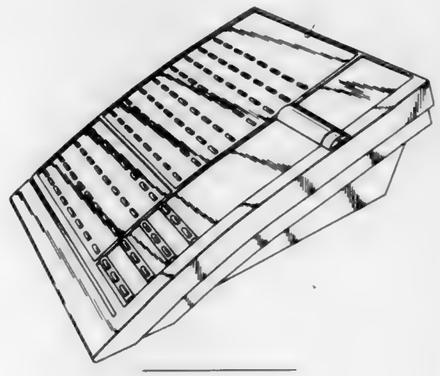
334,569
COMBINED CLOCK RADIO AND TAPE PLAYER
Gregory A. Kubina, 14519 Encantado NE, Albuquerque, N. Mex. 87123-2249
Filed Sep. 6, 1990, Ser. No. 578,855
Term of patent 14 years
U.S. Cl. D14—168



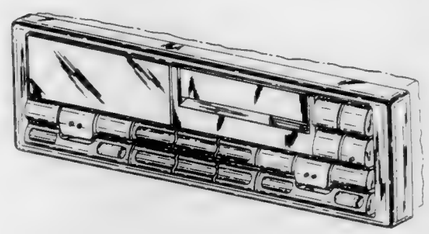
334,570
VEHICULAR ANTENNA BASE
Jefferson C. Wingard, 102 Oak Knoll Ter., Anderson, S.C. 29625
Filed Sep. 4, 1990, Ser. No. 576,723
Term of patent 14 years
U.S. Cl. D14—238



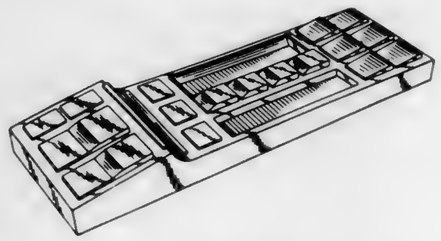
334,571
TELEPHONE CASING FOR A DIRECT STATION SELECTION CONSOLE
John Westwood, Box Hill, Australia, assignor to Telecom Technologies Pty. Ltd., Hawthorn, Australia
Filed Jan. 11, 1991, Ser. No. 638,902
Claims priority, application Australia, Jul. 12, 1990, 2227/90
Term of patent 14 years
U.S. Cl. D14—241



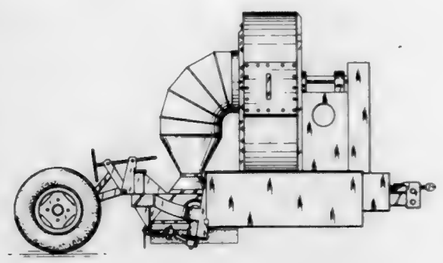
334,572
FRONT CONTROL PANEL FOR A COMBINED AUTOMOTIVE RADIO AND CASSETTE PLAYER
John T. Gauthier, West Bloomfield; Robert P. Scott, Dearborn; Jeff Burgy, Farmington Hills, all of Mich.; John P. Stoddard, and Robin Sarre, both of London, England, assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 16, 1990, Ser. No. 553,501
Term of patent 14 years
U.S. Cl. D14—258



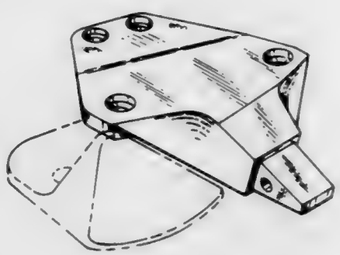
334,573
CONTROL PANEL FOR AN AUTOMOBILE RADIO
Klaus Limberg; Hanspeter Huttisch, and Tino Zink, all of Pforzheim, Fed. Rep. of Germany, assignors to Becker Autoradiowerk GmbH, Karlsbad, Fed. Rep. of Germany
Filed Apr. 17, 1991, Ser. No. 686,567
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, M 9006974.9
Term of patent 14 years
U.S. Cl. D14—258



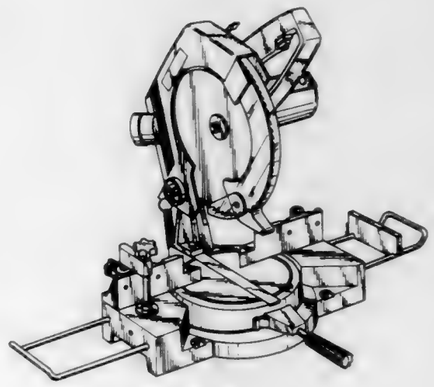
334,574
MACHINE FOR CUTTING THE TOPS OFF OF VEGETABLES
Earl J. Ross, 7472 S. Chestnut Ave., and Rickey L. Ross, 7828 S. Maple Ave., both of, Fresno, Calif. 93725
Filed Oct. 24, 1990, Ser. No. 602,877
Term of patent 14 years
U.S. Cl. D15—27



334,575
IMPLEMENT TOOTH ADAPTER
James A. Garman, Eureka, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Sep. 10, 1990, Ser. No. 580,436
Term of patent 14 years
U.S. Cl. D15—28



334,576
PORTABLE MITER SAW
Hideki Kawakami, Hiroshima, and Naoki Kikuchi, Tokyo, both of Japan, assignors to Ryobi Ltd, Hiroshima, Japan
Filed Apr. 4, 1991, Ser. No. 637,433
Claims priority, application Japan, Jul. 10, 1990, 2-23420
Term of patent 14 years
U.S. Cl. D15—133



334,577
POWER DRILL MOUNTED WEEDING TOOL
Bobby L. Wheat, 3318 E. Kleindale Rd., Tucson, Ariz. 85716
Filed Jun. 6, 1991, Ser. No. 710,945
Term of patent 14 years
U.S. Cl. D15—139

334,578
COLLET WORKPIECE STOP

334,580
PORTABLE VACUUM UNIT FOR AN AUTOMATIC

334,583

334,586
LASER PRINTER

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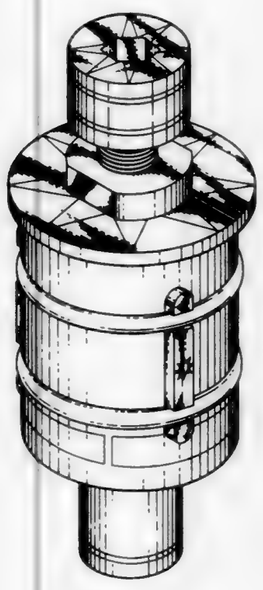
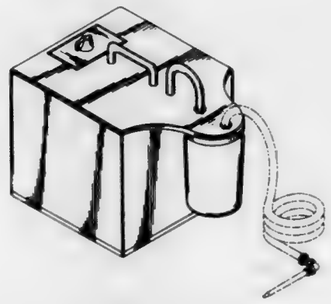
334,578
COLLET WORKPIECE STOP
George V. Elam, 20 W. 284 Drover La., Downers Grove, Ill. 60515
Filed Aug. 24, 1990, Ser. No. 572,030
Term of patent 14 years
U.S. Cl. D15—140

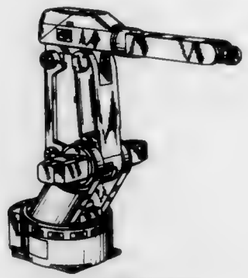


334,579
VIBRATING CHRISTMAS TREE ORNAMENT
Michael D. McGonagle, 6105 Highway 227, Trail, Oreg. 97541
Filed Sep. 25, 1990, Ser. No. 587,432
Term of patent 14 years
U.S. Cl. D15—147

334,580
PORTABLE VACUUM UNIT FOR AN AUTOMATIC DAMPENER SYSTEM IN OFFSET PRINTING
Donald L. Acock, Portland, Oreg., assignor to Beanomatic, Inc., Portland, Oreg.
Filed Apr. 19, 1990, Ser. No. 511,337
Term of patent 14 years
U.S. Cl. D15—199

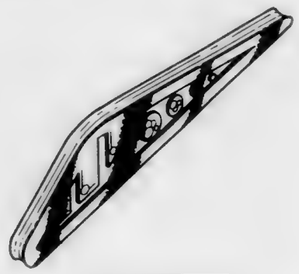


334,581
INDUSTRIAL ROBOT
Akira Yoshikawa, Kawagoe; Masato Shibayama; Shigeki Masatsugu, both of Sayama, and Tatenori Jinriki, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 659,154
Claims priority, application Japan, Feb. 4, 1991, 3-2439
Term of patent 14 years
U.S. Cl. D15—199

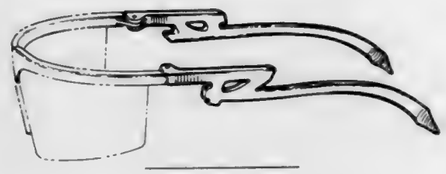


334,582
NOVELTY TUBULAR EYEGLASS FRAME
Curt E. Whitright, Chardon, Ohio, assignor to Sansom, Inc., Philadelphia, Pa.
Filed Aug. 1, 1990, Ser. No. 561,302
Term of patent 14 years
U.S. Cl. D16—122

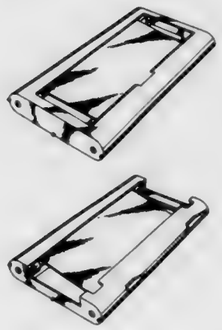
334,583
ADJUSTMENT ATTACHMENT FOR SPECTACLE TEMPLES
Thelma M. Payton, 117 Diplomat Ct, Apt 7, Beech Grove, Ind. 46107
Filed Mar. 12, 1991, Ser. No. 668,448
Term of patent 14 years
U.S. Cl. D16—123



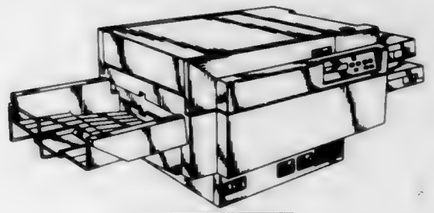
334,584
SUNGLASSES TEMPLE
Ken Wilson, 9926 Prospect Ave., Santee, Calif. 92071
Filed Jul. 19, 1991, Ser. No. 732,677
Term of patent 14 years
U.S. Cl. D16—127



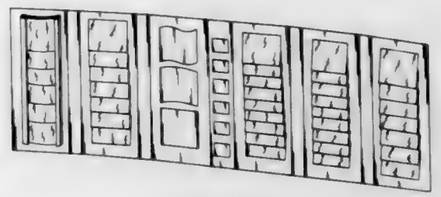
334,585
INKFILM CARTRIDGE
Yoshifumi Okauchi, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Feb. 12, 1990, Ser. No. 479,030
Claims priority, application Japan, Aug. 18, 1989, 1-30303; Dec. 8, 1989, 1-44674
Term of patent 14 years
U.S. Cl. D18—40



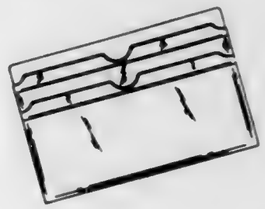
334,586
LASER PRINTER
Akira Imai, Kawasaki, and Tatsuhiro Terasaki, Souka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 17, 1991, Ser. No. 642,367
Claims priority, application Japan, Jul. 17, 1990, 2-024342
Term of patent 14 years
U.S. Cl. D18—54



334,587
WINDOW COVERING SAMPLE BOOK
Michael T. Steinert, 7 S. 441 Old College Rd., Naperville, Ill. 60540
Filed Aug. 15, 1991, Ser. No. 745,368
Term of patent 14 years
U.S. Cl. D19—26



334,588
MULTIPLE FILE POCKET FOLDER
Frank Okola, 15 Hudson St., Staten Island, N.Y. 10304
Filed Apr. 11, 1991, Ser. No. 683,679
Term of patent 14 years
U.S. Cl. D19—27



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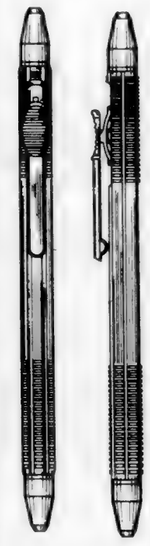
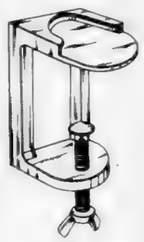
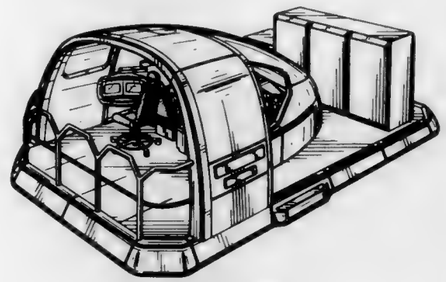
334,589
PLURAL-NIBBED BALL-POINT PEN
Tsutomu Shike; Isao Inoue, and Kenji Yamazaki, all of Shizuoka, Japan, assignors to Tokai Corporation, Kanagawa, Japan
Filed Sep. 6, 1991, Ser. No. 756,125
Claims priority, application Japan, May 15, 1991, 3-14027
Term of patent 14 years
U.S. Cl. D19—36



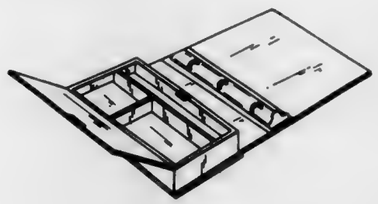
334,590
CLAMP FOR USE IN COSMETIC SCHOOLS FOR TRAINING IN FINGERNAIL PREPARATION
Theresa Villano, 2430 Nearcliff St., Torrance, Calif. 90505
Filed Jun. 29, 1988, Ser. No. 214,096
The portion of the term of this patent subsequent to May 6, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—59



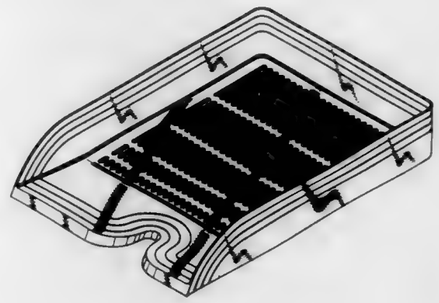
334,591
AIRCRAFT SIMULATOR
Stephen J. Harper, Balsall Common, United Kingdom, assignor to Rediffusion Simulation Limited, Sussex, United Kingdom
Filed Feb. 28, 1991, Ser. No. 662,003
Claims priority, application United Kingdom, Aug. 31, 1990, 2009360
Term of patent 14 years
U.S. Cl. D19—63



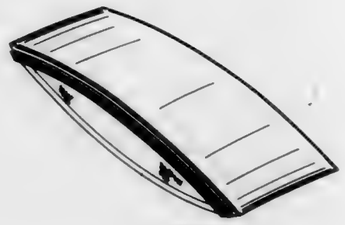
334,592
STATIONERY SUPPLY BOX "OFFICE BOX"
Bui Duc Nghi, Box 633, Quathiaski Cove, British Columbia, Canada V0P 1N0
Filed Dec. 31, 1990, Ser. No. 636,369
Term of patent 14 years
U.S. Cl. D19—27



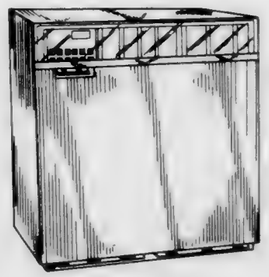
334,593
DESK TRAY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Feb. 11, 1991, Ser. No. 653,122
Term of patent 14 years
U.S. Cl. D19—92



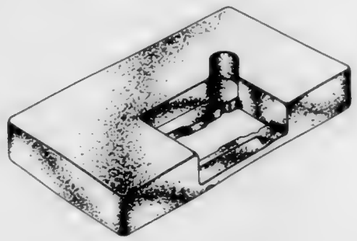
334,594
BLOTTER
Michael Suxdorf, Hamburg, Fed. Rep. of Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Fed. Rep. of Germany
Filed Feb. 6, 1991, Ser. No. 653,454
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1990, M9005701.5
Term of patent 14 years
U.S. Cl. D19—98



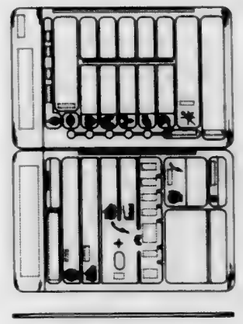
334,595
REFRIGERATED DISPENSER FOR USE IN HOTELS AND THE LIKE
Troy W. Livingston, Northbrook, Ill., assignor to Inn-Room Systems, Inc., Sudbury, Mass.
Filed Apr. 18, 1990, Ser. No. 510,570
Term of patent 14 years
U.S. Cl. D20—5



334,596
PAGER INSERT FOR VIDEO VENDING MACHINES
Karl H. Muehlberger, Lakeland, Fla., assignor to Keyosk Corporation, Lakeland, Fla.
Filed Oct. 12, 1990, Ser. No. 597,749
Term of patent 14 years
U.S. Cl. D20—8

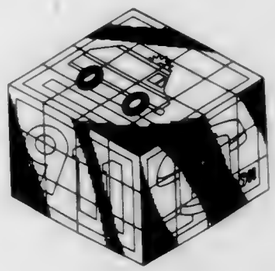


334,597
SET OF MEDICAL ALERT CARDS
Albert B. Busquets, Matilde Diez nº 12, entlº, 08006 Barcelona, Spain
Filed Jun. 4, 1990, Ser. No. 532,996
Claims priority, application Spain, Dec. 5, 1989, 20690 A
Term of patent 14 years
U.S. Cl. D20—40



334,598
FOOD AND BEVERAGE MENU HOLDER FOR RESTAURANT TABLES
Karen E. Burgess, Branford, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
Filed Dec. 30, 1991, Ser. No. 816,094
Term of patent 14 years
U.S. Cl. D20—40

334,599
PUZZLE TOY
Virginia Burke, 603 Susquehanna St., Forest City, Pa. 18421
Filed Dec. 7, 1990, Ser. No. 624,243
Term of patent 14 years
U.S. Cl. D21—104



334,600

334,603

334,605

334,608

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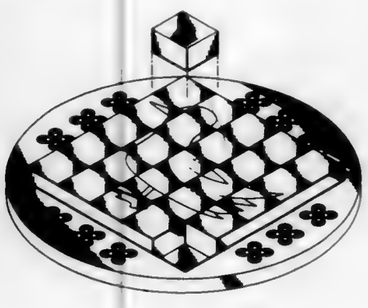
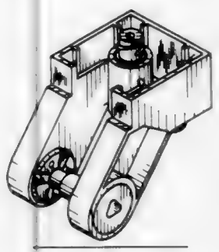
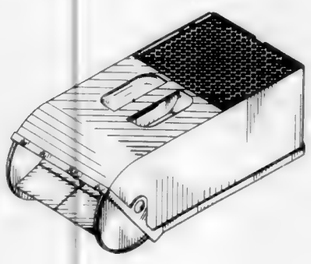
334,600
PUZZLE
Azeez J. Imohi, 474 E. Inabash St. #5, San Bernardino, Calif. 92404
Filed Jan. 18, 1991, Ser. No. 643,018
Term of patent 14 years
U.S. Cl. D21—104



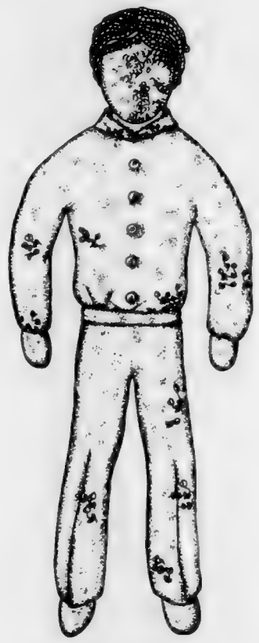
334,601
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,127
Term of patent 14 years
U.S. Cl. D21—108



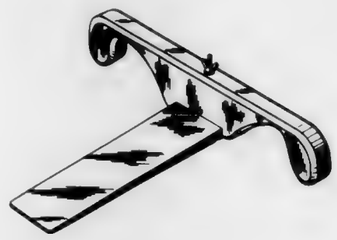
334,602
TOY BRICK COLLECTOR
Jan Ryaa, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,937
Term of patent 14 years
U.S. Cl. D21—122



334,603
DOLL
Jerrie Waine, 119 Chickasaw Dr., Birmingham, Ala. 55214
Division of Ser. No. 249,169, Sep. 26, 1988, Pat. No. D. 316,438.
This application Feb. 3, 1992, Ser. No. 830,265
Term of patent 14 years
U.S. Cl. D21—171

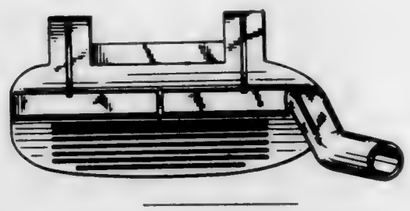


334,604
SIT-UP EXERCISE APPARATUS
William H. Roy, 1669 Clearwater Harbor Dr., Largo, Fla. 33540
Filed Sep. 21, 1990, Ser. No. 586,055
Term of patent 14 years
U.S. Cl. D21—191

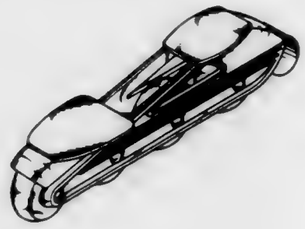


334,605
PHYSICAL EXERCISER
Michael Forgione, 26338 Curie, Warren, Mich. 48091
Filed Feb. 26, 1990, Ser. No. 485,065
Term of patent 14 years
U.S. Cl. D21—198

334,606
GOLF CLUB CHIPPER HEAD
Don T. Cameron, 47 Fallingstar, Irvine, Calif. 92714
Filed Aug. 15, 1990, Ser. No. 567,673
Term of patent 14 years
U.S. Cl. D21—220

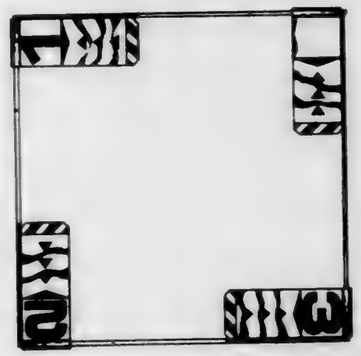


334,607
ROLLER SKATE
Mike Soo, No. 403, Chung Shan Rd., Jen Teh Hsiang, Tainan Haien, Taiwan
Filed Feb. 1, 1991, Ser. No. 649,672
Term of patent 14 years
U.S. Cl. D21—226



334,608
BILLIARD TABLE LEG
Rick Flathers, 20032 Clark St., Orange, Calif. 92669
Filed Sep. 30, 1991, Ser. No. 767,940
Term of patent 14 years
U.S. Cl. D21—232

334,609
SLIDE GAME
Michael L. Valentine, 530 Parish Blvd., Mary Esther, Fla. 32569, assignor to Michael L. Valentine, Mary Esther, Fla.
Filed Mar. 23, 1990, Ser. No. 497,631
Term of patent 14 years
U.S. Cl. D21—244



334,610

334,613

334,616

334,618

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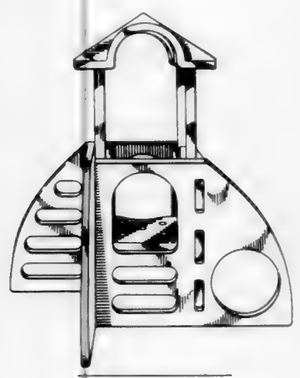
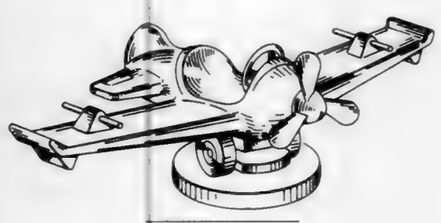
334,610
ACTIVITY SLIDE TOY
Kevin R. Aker, Hudson, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jul. 30, 1990, Ser. No. 561,301
Term of patent 14 years
U.S. Cl. D21—244

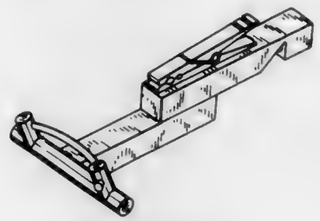


334,611
TEETER TOTTER TOY
James F. Mariol, Cincinnati, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Sep. 14, 1990, Ser. No. 582,550
Term of patent 14 years
U.S. Cl. D21—251

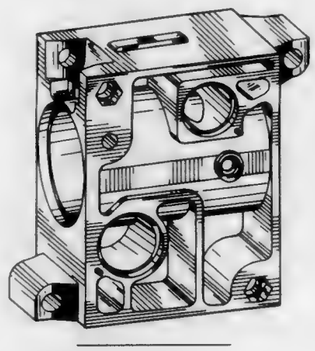


334,612
FLOATING FISHING LURE
Gary Snyder, Dodge Center, Minn., assignor to UMM Holdings, Inc., Dodge Center, Minn.
Filed Jul. 24, 1990, Ser. No. 557,492
Term of patent 14 years
U.S. Cl. D22—126

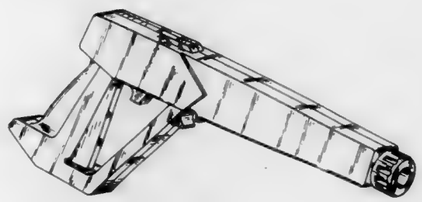
334,613
SLINGSHOT TOY
Michael Laidley, Rte. 1, Box 459-D, Morganton, N.C. 28655
Filed Aug. 13, 1990, Ser. No. 566,719
Term of patent 14 years
U.S. Cl. D22—106



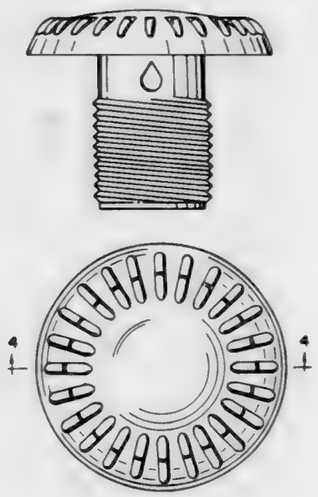
334,614
END MANIFOLD FOR A FILTER CARTRIDGE
Bruce G. Biltoft, North Sydney, and Michael R. L. Selbie, McMahons, both of Australia, assignors to Memtec Limited, Australia
Filed Mar. 29, 1990, Ser. No. 500,851
Claims priority, application Australia, Sep. 29, 1989, 3226/89
The portion of the term of this patent subsequent to Dec. 8, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—209



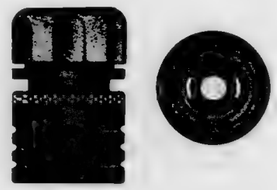
334,615
SPRAYER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Craig A. Seasholtz, Avis, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 15, 1991, Ser. No. 641,555
Term of patent 14 years
U.S. Cl. D23—226



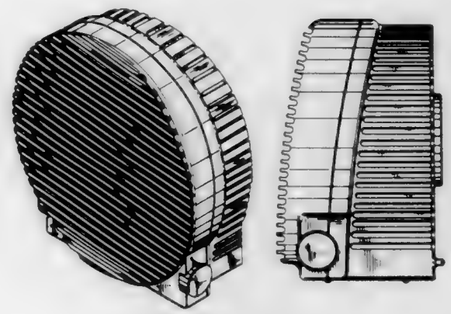
334,616
AIR INTAKE CONTROL VALVE MEMBER FOR SWIMMING POOLS AND SPAS
Craig A. Nimmo, Queensland, Australia, assignor to Opaltech Pty. Ltd., Molendinar, Australia
Filed Jan. 24, 1990, Ser. No. 469,833
Claims priority, application Australia, Jul. 24, 1989, 2375/89
Term of patent 14 years
U.S. Cl. D23—249



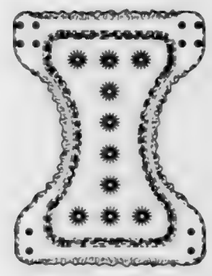
334,617
QUICK-CONNECT COUPLING
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Italy
Filed Oct. 31, 1988, Ser. No. 264,505
Claims priority, application Italy, May 3, 1988, 21169 B/88
The portion of the term of this patent subsequent to Jan. 3, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—262



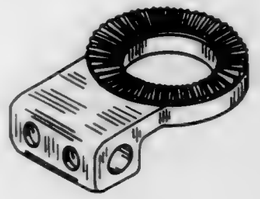
334,618
FAN HEATER
Paul Gilderleeve, Ridgefield, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 28, 1992, Ser. No. 875,109
Term of patent 14 years
U.S. Cl. D23—328



334,619
DIAPER
Kathleen M. Barraza, 3448 Mount St. Helena Dr., San Jose, Calif. 95127
Filed Nov. 29, 1990, Ser. No. 620,328
Term of patent 14 years
U.S. Cl. D24—126



334,620
PIN CLAMP FOR USE WITH AN ORTHOPEDIC APPLIANCE
Harold S. Taylor, Memphis, Tenn., assignor to Engineering & Precision Machining, Inc., Memphis, Tenn.
Filed Feb. 23, 1990, Ser. No. 484,192
Term of patent 14 years
U.S. Cl. D24—143



334,621

334,623

334,625
MEDICAL STORAGE RACK FOR HOLDING STERILE

334,628
CASEMENT WINDOW T-BAR EXTRUSION

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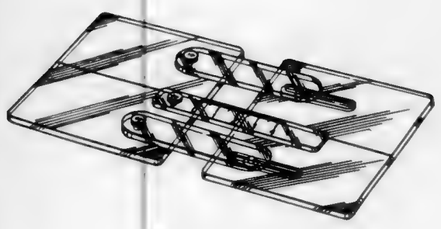
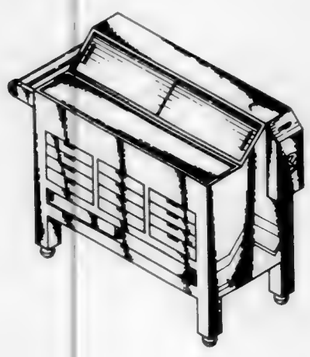
334,621
X-RAY MARKING INSTRUMENT
Michael J. Pope, 1304 E. Main St., Troy, Ohio 45373
Filed Dec. 21, 1990, Ser. No. 631,784
Term of patent 14 years
U.S. Cl. D24—158

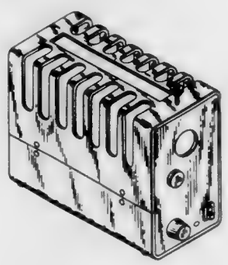


334,622
HOSPITAL CART FOR CARRYING IV SETUPS
Samuel Daniel, 3328 Bouck Ave., Bronx, N.Y. 10469
Filed Aug. 8, 1990, Ser. No. 564,294
Term of patent 14 years
U.S. Cl. D24—185

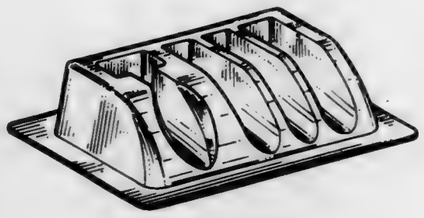


334,623
TRACTION UNIT FOR REMOVING LOADING FROM THE BACK
Charles V. Burton, Excelsior; Gregory K. Peterson, North Oaks; Casey L. Carlson, Edina; Jeffrey A. Weber, and William E. Stumpf, both of Minneapolis, all of Minn., assignors to Spinal Designs International, Inc., Minneapolis, Minn.
Filed Feb. 1, 1990, Ser. No. 473,686
Term of patent 14 years
U.S. Cl. D24—188

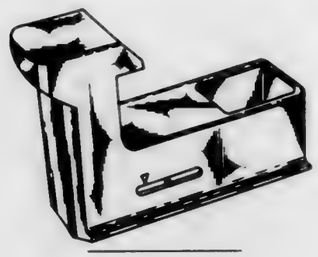
334,624
CHEMICAL DRYER
David H. Kasman, Holliston, Mass., assignor to Laboratory Devices, Inc., Holliston, Mass.
Filed May 6, 1991, Ser. No. 695,757
Term of patent 14 years
U.S. Cl. D24—216



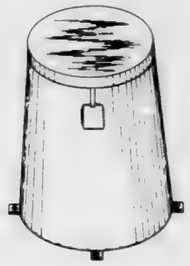
334,625
MEDICAL STORAGE RACK FOR HOLDING STERILE SURGICAL INSTRUMENTS
Marvin E. Chernosky, and Jay M. Chernosky, both of Houston, Tex., assignors to Preven-A-Stik, Inc., Houston, Tex.
Filed Aug. 28, 1990, Ser. No. 574,245
Term of patent 14 years
U.S. Cl. D24—227



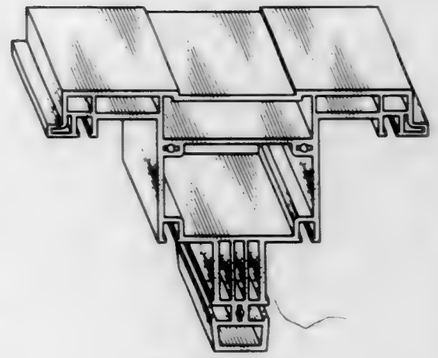
334,626
COMBINED MEDICAL INSTRUMENT BASE AND PROBE COVER DISPENSER
Fred W. Bacher; Dennis M. Lanci, both of San Diego, and Robert J. Rosati, Carlsbad, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Sep. 18, 1990, Ser. No. 584,724
Term of patent 14 years
U.S. Cl. D24—229



334,627
INFLATABLE HUNTING BLIND
Robert M. Morris, 995 Pollys End Rd., Lancaster, Ky. 40444
Filed Jun. 24, 1991, Ser. No. 719,532
Term of patent 14 years
U.S. Cl. D25—16



334,628
CASEMENT WINDOW T-BAR EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Apr. 18, 1991, Ser. No. 687,530
Term of patent 14 years
U.S. Cl. D25—124



334,629
FLOOR LAMP
Leslie A. Meck, Blandon; N. Peter Pettersson, Bernville; John Lehn, Reading, and Michael J. Becker, Lansdale, all of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Jun. 4, 1991, Ser. No. 709,764
Term of patent 14 years
U.S. Cl. D26—106

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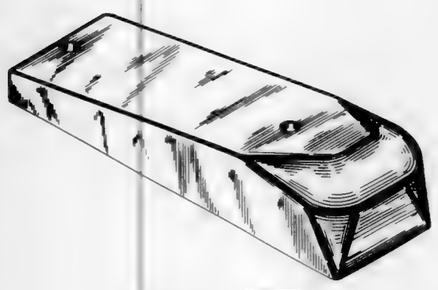
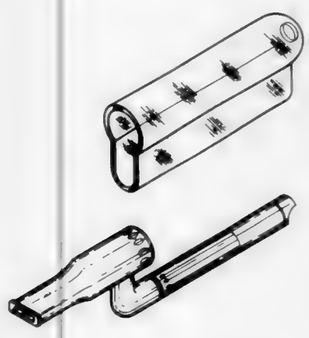
334,630
LENS FOR A COMBINATION SIDE MARKER, CLEARANCE AND REFLEX VEHICLE LIGHT
Edgar C. Paffrath, Barrington, Ill., assignor to Wesbar Corporation, West Bend, Wis.
Filed Apr. 8, 1991, Ser. No. 681,389
Term of patent 14 years
U.S. Cl. D26—120

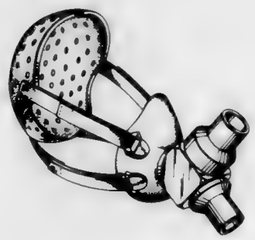


334,631
COMBINED CIGARETTE FILTER AND CONTAINER FOR CIGARETTE SMOKE
William R. Jones, 313 N. Madison Ave., Ottumwa, Iowa 52501
Filed May 9, 1991, Ser. No. 697,462
Term of patent 14 years
U.S. Cl. D27—194

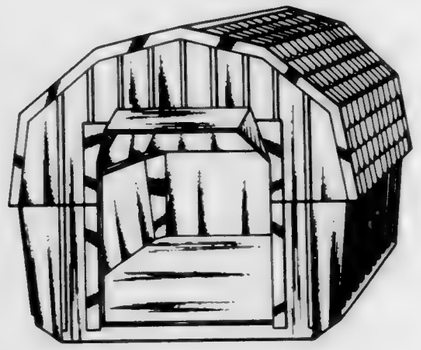


334,632
CUTICLE PUSHER
Antoine Odabach, 2580 Santa Ynez, Los Olivos, Calif. 93441
Filed Oct. 4, 1990, Ser. No. 592,885
Term of patent 14 years
U.S. Cl. D28—57

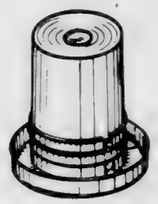
334,633
MASK
Kevin A. Rudolph, Kansas City, Mo., assignor to Hans Rudolph, Inc., Kansas City, Mo.
Filed Mar. 11, 1991, Ser. No. 667,066
Term of patent 14 years
U.S. Cl. D29—7



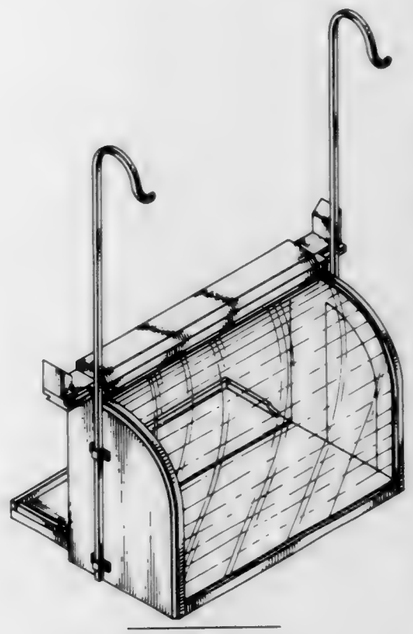
334,634
DOGHOUSE
Steven Greitzer, Encino, Calif., assignor to Camden Industries, Inc., Los Angeles, Calif.
Filed Mar. 8, 1991, Ser. No. 667,055
Term of patent 14 years
U.S. Cl. D30—108



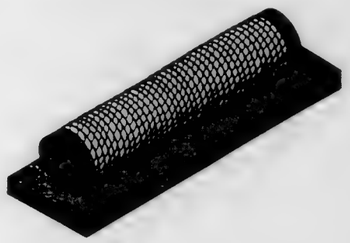
334,635
POULTRY WATERER
Thomas W. Wenstrand, R.R. 4, Mount Pleasant, Iowa 52641
Filed Oct. 15, 1991, Ser. No. 775,369
Term of patent 14 years
U.S. Cl. D30—128



334,636
COMBINED DOMESTIC BIRD FEEDER AND PLANTER FOR WINDOW SILL
Jerry P. Honeycutt, 214 Tonset Rd., Orleans, Mass. 02653
Filed Mar. 5, 1991, Ser. No. 664,994
Term of patent 14 years
U.S. Cl. D30—124



334,637
CAT SCRATCHING POST
Arthur Mitchell, 4 Sequoia La., Plaistow, N.H. 03865
Filed Oct. 7, 1991, Ser. No. 772,013
Term of patent 14 years
U.S. Cl. D30—160



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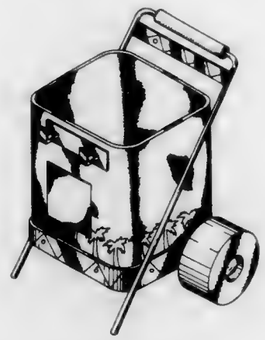
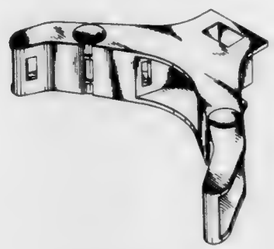
334,638
DOG LITTER SCOOP
Harold R. Blackman, 401 Benton St., Santa Rosa, Calif. 95401
Filed Apr. 1, 1991, Ser. No. 677,848
Term of patent 14 years
U.S. Cl. D30—162

334,639
TRASH CAN FOR USE WITH PLASTIC TRASH BAGS
Randy J. Kroll, 4914 W. Niagara Way, Salt Lake City, Utah 84118
Filed Oct. 18, 1991, Ser. No. 778,625
Term of patent 14 years
U.S. Cl. D34—7

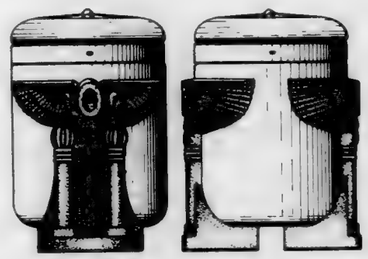
334,640
BEACH CART
Shirley Forish, 716 Ash Ave., Collingdale, Pa. 19023
Filed Dec. 7, 1990, Ser. No. 624,267
Term of patent 14 years
U.S. Cl. D34—24



334,641
TOP BAG HOLDER OF GOLF CART
Ching-Chang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Taipei Hsien, Taiwan
Filed Aug. 23, 1991, Ser. No. 752,227
Term of patent 14 years
U.S. Cl. D34—27



334,642
URN
Frank Allen, Libertyville, Ill., assignor to F.H. Noble & Company, Mundelein, Ill.
Filed May 21, 1991, Ser. No. 703,331
Term of patent 14 years
U.S. Cl. D99—5



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF APRIL, 1993

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aarts, Hubertus H.; and Hamer, Antonius J. M., to Sulzer Brothers Limited. Weft yarn clearing device. 5,199,468, Cl. 139-450.000.
AB Lab. Gruppen Andersson & Bavholm: *See*—
Andersson, Kenneth; and Bavholm, Dan, 5,200,711, Cl. 330-267.000.
Abadi, Khodabandeh; and Hunt, Craig A., to Abadi, Khodabandeh. Method for control of hard water scale deposition in evaporative cooling systems. 5,199,453, Cl. 137-3.000.
ABB Atom AB: *See*—
Johansson, Lennart, 5,200,143, Cl. 376-449.000.
ABB Lummus Crest Inc.: *See*—
Barner, Herbert E.; Huang, Chiung-Yuan; Killilea, William R.; and Hong, Glenn T., 5,200,093, Cl. 210-761.000.
ABB Vetco Gray Inc.: *See*—
Brammer, Norman; Henderson, Herman O., Jr.; and Slyker, Richard W., 5,199,495, Cl. 166-339.000.
Abbott-Interfast Corporation: *See*—
DeHaitre, Lon, 5,199,839, Cl. 411-387.000.
Abbott Laboratories: *See*—
Georgevich, Gradimir G., 5,200,317, Cl. 435-7.400.
McHugh, John R., 5,199,575, Cl. 209-522.000.
Abe, Fumio: *See*—
Harada, Takashi; Abe, Fumio; and Mizuno, Hiroshige, 5,200,154, Cl. 422-174.000.
Abe, Hitoshi; and Nakamori, Tomohiro, to Oki Electric Industry Co., Ltd. Metalorganic chemical vapor deposition of superconducting films. 5,200,388, Cl. 505-1.000.
Abe, Masaru; Kawamoto, Yoshimichi; Ukai, Norio; and Kohata, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Front and rear wheel steering system for a vehicle. 5,199,523, Cl. 180-140.000.
Abe, Seietsu. Balloon storage system and method for assembling the same. 5,199,572, Cl. 206-526.000.
Abe, Tomoyuki: *See*—
Yamamoto, Masahiko; Shibatani, Kanji; Yamaguchi, Hiroaki; Kanemitsu, Yasuo; Shinbo, Tetsuya; Abe, Tomoyuki; Ichimura, Yasuhiko; and Sakanishi, Shoichi, 5,199,818, Cl. 405-142.000.
Abe, Yasuo; and Sasaki, Ayaru, to Tachi-S Co. Ltd. Apparatus for affixing covering member to armrest body used for automotive seat. 5,199,144, Cl. 29-235.000.
Abe, Yoshio: *See*—
Nakayama, Takahiro; Onisawa, Kenichi; Tamura, Katsumi; Taguchi, Kazuo; Sato, Akira; Hashimoto, Kenichi; Abe, Yoshio; and Hanazono, Masanobu, 5,200,277, Cl. 428-690.000.
Abitibi-Price Corporation: *See*—
Juntunen, William H., 5,199,237, Cl. 52-288.000.
Abloy Security Ltd. Oy: *See*—
Merilainen, Jaakko; Isaksainen, Jorma; and Jurvanen, Markku, 5,199,288, Cl. 70-279.000.
Abner, Richard L., Jr.: *See*—
Horton, Douglas J.; and Abner, Richard L., Jr., 5,200,204, Cl. 425-188.000.
Abraham, Carmela R. Proteases causing abnormal degradation of amyloid β-protein precursor. 5,200,339, Cl. 435-212.000.
Abramowitz, Joseph. Device and method for administering interpleural anesthesia. 5,199,946, Cl. 604-51.000.
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Glenn, David F.; Suciu, Dan F.; Harris, Taryl L.; and Ingram, Jani C., to United States of America, Energy. Ice electrode electrolytic cell. 5,200,054, Cl. 205-74.000.

Glennon, Oliver, to Square D Company. Circuit interrupter. 5,200,873, Cl. 361-45.000.

Glickman, Joel I., to Connector Set Limited Partnership. Construction toy system. 5,199,919, Cl. 446-126.000.

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Goetz, Walter: *See*—
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Goff, David. Shopping cart brake. 5,199,534, Cl. 188-74.000.

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Goodman, H. Gene. Cushioned camera case. 5,199,563, Cl. 206-316.200.

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Kato, Tatsuo, to SMK Co., Ltd. Balun transformer with common mode coil. 5,200,718, Cl. 333-25.000.

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Muller, Thomas. Carbon copy set consisting of uninscribed and/or inscribed sheets and/or forms. 5,199,923, Cl. 462-18.000.

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Munjal, Sarat; Wardlow, Thomas M.; and Hall, Andrew F., to Dow Chemical Company, The. Process for preparing polycarbonate having reduced carbonate byproduct content. 5,200,496, Cl. 528-198.000.

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Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, to Sumitomo Rubber Industries, Ltd. Metal composite of rubber, benothiazole sulfenamide and copper alloy. 5,200,273, Cl. 428-465.000.

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Murayama, Kashiwa; Tatsuta, Masakazu; Shibata, Yoshiharu; Yajima, Hideki; Kano, Yuji; Kubo, Tateo; fuchie, Kinji; and Sato, Hiroshi, to Toyo Seikan Kaisha, Ltd. Apparatus for forming plastic grip member of container closure. 5,200,201, Cl. 425-117.000.

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Musgrave, Gary S. Light box with multiple image-forming means therein. 5,199,202, Cl. 40-219.000.

Muyskens, Dale E.; and Hutchison, Ronald A., to Eaton Corporation. Variable pressure range section actuator assembly. 5,199,311, Cl. 74-335.000.

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Naka, Yuji; Sato, Tatsuo; and Kawashima, Akihiro, to NKK Corporation. Method for rectification and apparatus therefor. 5,200,040, Cl 203-25.000.

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Nakahata, Akinobu; Kubota, Hiroshi; Oda, Kenji; and Makiura, Yoshinori, to Mita Industrial Co., Ltd. Cassette for feeding sheet materials. 5,199,695, Cl. 271-9.000.

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Nihon Parkerizing Co., Ltd.: *See*—
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Nika Health Products, Ltd.: *See*—
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Nikuni Machinery Industrial Co., Ltd.: *See*—
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Nilaver, Gajanan; Rosenbaum, Lawrence; and Neuwelt, Edward A., to State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon Health Sciences University, The. Cell surface antigen that binds with L6 monoclonal antibody. 5,200,508, Cl. 530-350.000.

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Nippon Cable System Inc.: *See*—
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Nippon Kayaku Kabushiki Kaisha: *See*—
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Nippon Oil & Fats Co., Ltd.: *See*—
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Nippon Paint Co., Ltd.: *See*—
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Nippon Soda Co., Ltd.: *See*—
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Nishiguchi, Keizo, to Minolta Camera Kabushiki Kaisha. Method and apparatus for supplying and collecting toner in an image forming device. 5,200,787, Cl. 355-298.000.

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Nishihara, Mitsuyuki, to Kubota Corporation. Method of and apparatus for recovering mercury from drainage. 5,200,087, Cl. 210-718.000.

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Nudelman, Sol; and Ouimette, Donald R., to University of Connecticut, The. Lateral effect imaging system. 5,200,838, Cl. 358-443.000.

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Russo, Joseph D.; and Russo, Laurence M., to Rousseau Research, Inc. Packaging for shipment and containment of hazardous wastes. 5,199,795, Cl. 383-113.000.

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Rutkowski, Edward D. Method of controlling the length of metal chips. 5,200,593, Cl. 219-121.690.

RXS Schrumpftechnik-Garnituren GmbH: *See—*
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Rykowska, Hanna E.: *See—*
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Sabee, Reinhardt N., to Tuff Spun Fabrics, Inc. Composite fabrics comprising continuous filaments locked in place by intermingled melt blown fibers and methods and apparatus for making. 5,200,246, Cl. 428-109.000.

Sachtler, J. W. Adriaan: *See—*
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Saint Just, Jacques; Taarit, Yaounes B.; Naccache, Meyer C.; and Dufaux, Michel, to Gaz De France. Catalysts for oxyhydrochlorination of methane. 5,200,376, Cl. 502-60.000.

St. Martin, Michael J.; and Hala, Roger A., to Bently Nevada. Multiple remote sensor system for real time analog sensing and differential cummunication. 5,200,743, Cl. 340-825.070.

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Saito, Keizo, to Sharp Kabushiki Kaisha. Intelligent electronic word processor with plural print wheels and tables used to identify displayed characters supported by designated print wheels. 5,200,892, Cl. 364-419.000.

Saito, Masataka; and Fusanori, I., to Matsushita Electric Industrial Co., Ltd. Audio amplifying circuit. 5,200,709, Cl. 330-126.000.

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Sakamoto, Etsurou, to Sony Corporation. Demodulator for FM modulated video signals with pre-demodulation sideband suppression and post-demodulation sideband restoration. 5,200,835, Cl. 358-330.000.

Sakamoto, Kenji, to Sanyo Electric Co., Ltd. Adapter for external battery and battery system. 5,200,685, Cl. 320-2.000.

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Sakamura, Ken, to Mitsubishi Denki Kabushiki Kaisha. Multiple address-space data processor with addressable register and context switching. 5,201,039, Cl. 395-375.000.

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Sakurai, Kenya, to Fuji Electric Co., Ltd. Conductivity modulation MOSFET. 5,200,632, Cl. 257-212.000.

Sakurai, Tetsuo, to Ricoh Company, Ltd. Digital copier including means for erasing digital image data over a given area, especially suitable for preventing jamming of paper. 5,200,837, Cl. 358-401.000.

Saldin, Dilano K.; and de Andres Rodriquez, Pedro L., to University of Wisconsin - Milwaukee. Method and apparatus for atomic imaging. 5,200,618, Cl. 250-307.000.

Salecker, Roy; and Sloter, Rockwell T., to Spartan Tool, A Div. of Heico, Inc. Torque monitoring system for rotary drain and sewer cleaning apparatus. 5,199,129, Cl. 15-104.330.

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Sam Jung Co., Ltd.: *See—*
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Samejima, Kazuo; Morita, Shigeru; Kawahara, Yoshihiro; Umemoto, Hideya; Takei, Terutaka; Togoshi, Yoshikazu; and Takemoto, Akiyoshi, to Kubota Corporation. Lawn mower having passages for engine cooling air. 5,199,521, Cl. 180-68.100.

Sampson, Tyree. Dispensing apparatus for tennis ball containers. 5,199,598, Cl. 221-194.000

Samsung Electron Devices Co., Ltd.: *See—*
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Yamane, Tsuneo; Ueda, Shunsaku; Imagawa, Shigeki; Tahara, Torakazu; Tokunaga, Yoshiharu; Iesaka, Hiroyuki; and Urakami, Teizi, to Mitsubishi Gas Chemical Company, Inc. Process for preparation of copolymer. 5,200,332, Cl. 435-135.000.

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Yau, Chiou C.; Sanborn, Norman G.; and Ng, Kim H., to Gillette Company, The. Ozone-friendly correction fluid. 5,199,976, Cl. 106-19.00A.

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Yokoyama, Naoki, to Fujitsu Limited. Semiconductor device including schotky gate of silicide and method for the manufacture of the same. 5,200,349, Cl. 437-41.000.

Yoneda, Robert; Gammie, Keith; and Sheldrick, Wayne, to Scientific-Atlanta, Inc. Virtual channels for a multiplexed analog component (MAC) television system. 5,200,823, Cl. 358-146.000.

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Yoshida, Tadahiro, to Matsushita Electric Industrial Co., Ltd. Mantissa processing circuit of floating point arithmetic apparatus for addition and subtraction. 5,200,916, Cl. 364-748.000.

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Young, Barry S., to DCI International, Inc. Actuator for a control valve of a dental syringe. 5,199,871, Cl. 433-80.000.

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Lane, Robert C.; and Lee, Joseph M. Linear release ice machine and method. Re. 34,210, Cl. 62-72.000.

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Bush, Charles S.: *See*—
Cooper, David H.; and Bush, Charles S., B1 4,727,416, Cl. 358-98.000.

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Mengel, Craig. Method of and structure for the joining of substantially rigid parts together. B1 4,883,331, 4-6-93, Cl. 312-195.000.

Mengel, Craig. Method of and structure for the joining of substantially rigid parts together. B1 4,966,421, 4-6-93, Cl. 312-195.000.

Moll, Maurice M.: *See*—
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Bradford, Lowell G.; and Bradford, Norman G., 8,196, Cl. 41.100.
Bradford, Lowell G.; and Bradford, Norman G., 8,197, Cl. 41.300.
Brooks, Lyle A., deceased; and by Heuser, Wallace E., legal representative. Cherry rootstock: Brooks-2 cultivar. 8,194, 4-6-93, Cl. 37.000.
Florida Cuttings, Inc.: *See*—
Gorvel, Ernest A., 8,198, Cl. 88.100.
Gardner, Leith M.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 8,195, Cl. 42.100.
Gorvel, Ernest A., to Florida Cuttings, Inc. Dwarf, variegated Schefflera named Coveen. 8,198, 4-6-93, Cl. 88.100.
Heuser, Wallace E., legal representative: *See*—
Brooks, Lyle A., deceased; and Heuser, Wallace E., legal representative, 8,194, Cl. 37.000.
Moore, Ralph S., to Sequoia Nursery. Miniature rose plant named 'MORalert'. 8,193, 4-6-93, Cl. 10.000.
Sequoia Nursery: *See*—
Moore, Ralph S., 8,193, Cl. 10.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G. Peach tree "Snowbrite". 8,195, 4-6-93, Cl. 42.100.
Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 8,195, Cl. 42.100.
Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 8,195, Cl. 42.100.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 6TH DAY OF APRIL, 1993

A. E. Staley Manufacturing Company: *See*—
Horton, Susan D.; White, Dorothy C.; and Kraut, Charles W., H1165, Cl. 426-555.000.
Akamatsu, Hideo: *See*—
Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, H1167, Cl. 430-506.000.
American Telephone and Telegraph Company: *See*—
Easter, William G.; and Shanaman, Richard H., III, H1174, Cl. 357-49.000.
Berggren, Mark H.; Smit, Francis J.; and Swanson, Wilbur W., to United States of America, Energy. Aqueous coal slurry. H1161, 4-6-93, Cl. 44-280.000.
Binder, Michael: *See*—
Wade, William L., Jr.; Mammone, Robert J.; and Binder, Michael, H1164, Cl. 264-22.000.
Bone, Lee. Pipeline repair method. H1163, 4-6-93, Cl. 156-294.000.
Cray Research, Inc.: *See*—
Schwoerer, Gerald A., H1176, Cl. 371-2.200.
Davis, Walter L.; Drapac, George; and Woltz, Stephen H., to Motorola, Inc. Paging device with alternating alert outputs. H1173, 4-6-93, Cl. 340-825.440.
Drapac, George: *See*—
Davis, Walter L.; Drapac, George; and Woltz, Stephen H., H1173, Cl. 340-825.440.
Easter, William G.; and Shanaman, Richard H., III, to American Telephone and Telegraph Company. Wafer bonded dielectrically isolated structures. H1174, 4-6-93, Cl. 357-49.000.
Fillhart, Ricky M.; and Russo, Donato M., to United States of America, Navy. Cardioid beamformer with noise reduction. H1171, 4-6-93, Cl. 181-125.000.
Giorgio, Paul J., to United States of America, Navy. Dynamic channel selection system. H1175, 4-6-93, Cl. 370-118.000.
Gorniak, Allen. Vehicle battery jumper system. H1172, 4-6-93, Cl. 307-48.000.
Horton, Susan D.; White, Dorothy C.; and Kraut, Charles W., to A. E. Staley Manufacturing Company. Layer cakes prepared with crystalline sweetener blends. H1165, 4-6-93, Cl. 426-555.000.
Ishikawa, Minoru: *See*—
Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, H1167, Cl. 430-506.000.
Iwagaki, Masaru: *See*—
Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, H1167, Cl. 430-506.000.
Kato, Osami: *See*—
Yanou, Manabu; Kato, Osami; and Kuwahara, Kazuo, H1157, Cl. D23-209.000.
Kim, Hyoun-Ee; and Moorhead, A. J., to United States of America, Energy. Process for strengthening silicon based ceramics. H1166, 4-6-93, Cl. 427-255.300.
Konica Corp.: *See*—
Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, H1167, Cl. 430-506.000.
Kosah, David J., to United States of America, Air Force. Radioactively biased optical limiter. H1177, 4-6-93, Cl. 372-11.000.
Kraut, Charles W.: *See*—
Horton, Susan D.; White, Dorothy C.; and Kraut, Charles W., H1165, Cl. 426-555.000.
Kuwahara, Kazuo: *See*—
Yanou, Manabu; Kato, Osami; and Kuwahara, Kazuo, H1157, Cl. D23-209.000.
Machado, Joseph M., to Shell Oil Company. Polymer with improved barrier properties. H1169, 4-6-93, Cl. 525-185.000.
Mammone, Robert J.: *See*—
Wade, William L., Jr.; Mammone, Robert J.; and Binder, Michael, H1164, Cl. 264-22.000.
Maulding, Hawkins V.; and Siverly, James R. Iontophoretic delivery of peptides. H1160, 4-6-93, Cl. 604-20.000.
McKenna, Thomas M.; and Williams, Taffy J., to United States of America, Navy. Inhibitors of protein kinase C activity as protectors against septic shock and reducers of ARDS. H1168, 4-6-93, Cl. 514-28.000.
Miller, Kenneth C.: *See*—
Perkins, Thomas K.; Thach, Sophany; and Miller, Kenneth C., H1158, Cl. 141-11.000.
Moorhead, A. J.: *See*—
Kim, Hyoun-Ee; and Moorhead, A. J., H1166, Cl. 427-255.300.
Motorola, Inc.: *See*—
Davis, Walter L.; Drapac, George; and Woltz, Stephen H., H1173, Cl. 340-825.440.
Negishi, Haruo: *See*—
Yamamoto, Michio; and Negishi, Haruo, H1162, Cl. 156-179.000.
Perkins, Thomas K.; Thach, Sophany; and Miller, Kenneth C. Method and apparatus for supplying foam to tanks. H1158, 4-6-93, Cl. 141-11.000.
Purdy, Andrew, to United States of America, America. Volatile divalent double metal alkoxides. H1170, 4-6-93, Cl. 556-113.000.
Roach, Charles C., to United States of America, Navy. Portable pneumatic aircraft fuel tank air eductor. H1159, 4-6-93, Cl. 417-151.000.
Russo, Donato M.: *See*—
Fillhart, Ricky M.; and Russo, Donato M., H1171, Cl. 181-125.000.
Sato, Kiichi: *See*—
Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, H1167, Cl. 430-506.000.
Schwoerer, Gerald A., to Cray Research, Inc. Bit dispersement method for enhanced SEC-DED error detection and correction in multi-bit memory devices. H1176, 4-6-93, Cl. 371-2.200.
Shanaman, Richard H., III: *See*—
Easter, William G.; and Shanaman, Richard H., III, H1174, Cl. 357-49.000.
Shell Oil Company: *See*—
Machado, Joseph M., H1169, Cl. 525-185.000.
Siverly, James R.: *See*—
Maulding, Hawkins V.; and Siverly, James R., H1160, Cl. 604-20.000.
Smit, Francis J.: *See*—
Berggren, Mark H.; Smit, Francis J.; and Swanson, Wilbur W., H1161, Cl. 44-280.000.

Swanson, Wilbur W.: *See*—
Berggren, Mark H.; Smit, Francis J.; and Swanson, Wilbur W., H1161, Cl. 44-280.000.
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Fillhart, Ricky M.; and Russo, Donato M., H1171, Cl. 181-125.000.

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Berggren, Mark H.; Smit, Francis J.; and Swanson, Wilbur W., H1161, Cl. 44-280.000.

Thach, Sophany: *See*—
Perkins, Thomas K.; Thach, Sophany; and Miller, Kenneth C., H1158, Cl. 141-11.000.

Uezawa, Kuniaki; Iwagaki, Masaru; Sato, Kiichi; Akamatsu, Hideo; and Ishikawa, Minoru, to Konica Corp. Process for manufacturing silver halide color photographic light sensitive material. H1167, 4-6-93, Cl. 430-506.000.

United States of America
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Kosah, David J., H1177, Cl. 372-11.000.
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Purdy, Andrew, H1170, Cl. 556-113.000.
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Wade, William L., Jr.; Mammone, Robert J.; and Binder, Michael, H1164, Cl. 264-22.000.
Energy: *See*—
Berggren, Mark H.; Smit, Francis J.; and Swanson, Wilbur W., H1161, Cl. 44-280.000.
Kim, Hyoun-Ee; and Moorhead, A. J., H1166, Cl. 427-255.300.
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Fillhart, Ricky M.; and Russo, Donato M., H1171, Cl. 181-125.000.
Giorgio, Paul J., H1175, Cl. 370-118.000.
McKenna, Thomas M.; and Williams, Taffy J., H1168, Cl. 514-28.000.
Roach, Charles C., H1159, Cl. 417-151.000.

Wade, William L., Jr.; Mammone, Robert J.; and Binder, Michael, to United States of America, Army. Method of treating the surface of commercially available polymer films. H1164, 4-6-93, Cl. 264-22.000.

White, Dorothy C.: *See*—
Horton, Susan D.; White, Dorothy C.; and Kraut, Charles W., H1165, Cl. 426-555.000.

Williams, Taffy J.: *See*—
McKenna, Thomas M.; and Williams, Taffy J., H1168, Cl. 514-28.000.

Woltz, Stephen H.: *See*—
Davis, Walter L.; Drapac, George; and Woltz, Stephen H., H1173, Cl. 340-825.440.

Yamamoto, Michio; and Negishi, Haruo. Molded composite article and process for producing the same. H1162, 4-6-93, Cl. 156-179.000.

Yanou, Manabu; Kato, Osami; and Kuwahara, Kazuo. Filter. H1157, 4-6-93, Cl. D23-209.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 6, 1993

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 44
336 5,199,959
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CLASS 47
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94 5,199,961

CLASS 49
109 5,199,616
375 5,199,617
381 5,199,618
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CLASS 51
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34 G 5,199,621
105 VG 5,199,622
157 5,199,624
168 5,199,623
214 5,199,625
317 5,199,626
395 5,199,627
417 5,199,628
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CLASS 52
66 5,199,630
79.1 5,199,631
169.14 5,199,633
169.5 5,199,632
200 5,199,634
211 5,199,635
235 5,199,636
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CLASS 53
122 5,199,641
397 5,199,642
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CLASS 55
16 5,199,962
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186 5,199,963
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CLASS 56
15.2 5,199,649
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102 5,199,648
255 5,199,651
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CLASS 57
236 5,199,653
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CLASS 60
39.02 5,199,655
39.182 5,199,656
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CLASS 62
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72 Re.34,210
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CLASS 148
105 5,199,998
239 5,199,999
262 5,200,000
302 5,200,001
304 5,200,002
514 5,200,003
527 5,200,004
648 5,200,005

CLASS 152
454 5,200,006

CLASS 156
64 5,200,007
110.1 5,200,008
134 5,200,009
154 5,200,010
156 5,200,011
169 5,200,012
210 5,200,013
245 5,200,014
304.2 5,200,015
345 5,200,016
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359 5,200,018
520 5,200,020
523 5,200,019
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651 5,200,026
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656 5,200,028
657 5,200,029
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659.1 5,200,031
664 5,200,032

CLASS 159
47.1 5,200,033

CLASS 160
40 5,199,478
84.1 5,199,479

CLASS 162
5 5,200,034
101 5,200,035
164.3 5,200,036
168.2 5,200,037
261 5,200,038

CLASS 164
65 5,199,480
98 5,199,481
120 5,199,482

CLASS 165
1 5,199,483
10 5,199,484
22 5,199,485
47 5,199,486
148 5,199,487

CLASS 166
248 5,199,488
350 5,199,489
270 5,199,490
276 5,199,491
295 5,199,492
297 5,199,493
319 5,199,494
339 5,199,495
366 5,199,496
381 5,199,497

CLASS 168
28 5,199,498

CLASS 169
46 5,199,499
51 5,199,500

CLASS 172
15 5,199,502
221 5,199,503

CLASS 173
17 5,199,504
75 5,199,505
93.6 5,199,506
104 5,199,507
147 5,199,508
211 5,199,508

CLASS 174
65 R 5,200,575
94 R 5,200,576
125.1 5,200,577
152 R 5,200,578
256 5,200,579
264 5,200,580

CLASS 175
50 5,199,509
53 5,199,510
65 5,199,511
67 5,199,512
73 5,199,513
107 5,199,514
213 5,199,515
366 5,199,516

CLASS 177
25.17 5,199,517
211 5,199,518
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CLASS 180
65.5 5,199,520
68.1 5,199,521
68.3 5,199,522
140 5,199,523
237 5,199,524
242 5,199,525
297 5,199,526

CLASS 181
102 5,200,581
256 5,200,582

CLASS 182
187 5,199,527

CLASS 184
6.4 5,199,528

CLASS 187
1 R 5,199,529
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9 R 5,199,531
80 5,199,532
95 5,199,533
126 5,200,583

CLASS 188
74 5,199,534
135 5,199,535
264 G 5,199,536
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CLASS 192
7 5,199,538
60 5,199,539
70.11 5,199,540
84 C 5,199,541
88 A 5,199,542

CLASS 194
207 5,199,543
212 5,199,544
319 5,199,545

CLASS 198
347.3 5,199,546
463.2 5,199,547
502.4 5,199,548
520 5,199,549
626.1 5,199,550
805 5,199,551
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CLASS 200
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50 AA 5,200,585
50 C 5,200,586
265 5,199,553
283 5,199,554
341 5,199,555
345 5,199,556
406 5,199,557
531 5,199,558
715 5,199,597

CLASS 202
197 5,200,039

CLASS 203
25 5,200,040

CLASS 204
78 5,200,041
106 5,200,042
130 5,200,043
153.16 5,200,044
180.1 5,200,045
182.4 5,200,046
194 5,200,047
258 Re.34,213
297 W 5,200,048
298.22 5,200,049
299 R 5,200,050
403 5,200,051
409 5,200,052
435 5,200,053

CLASS 205
74 5,200,054
94 5,200,055
122 5,200,056
313 5,200,057

CLASS 206
5.1 5,199,559
37.3 5,199,560
63.3 5,199,561
151 5,199,562
316.2 5,199,563
330 5,199,564
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369 5,199,567
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CLASS 209
46 5,200,058
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108 5,200,060
131 5,200,061
233 5,199,978
236 5,200,062
400 5,200,063

CLASS 209
315 5,199,574
522 5,199,575
564 5,199,576

CLASS 210
94 5,200,064
104 5,200,065
109 5,200,066
172 5,200,067
198.2 5,200,068
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222 5,200,071
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267 5,200,074
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323.2 5,200,077
500.23 5,200,078
525 5,200,079
607 5,200,080
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667 5,200,082
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725 5,200,089
739 5,200,090
748 5,200,091
758 5,200,092
761 5,200,093
768 5,200,094
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CLASS 211
401 5,199,577
72 5,199,578
90 5,199,579
106 5,199,581
113 5,199,580
135 5,199,582
184 5,199,584
187 5,199,585

CLASS 212
156 5,199,583
175 5,199,586

CLASS 215
1 C 5,199,587
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CLASS 219
10.53 5,200,587
10.55 A 5,200,588
10.55 B 5,200,589
10.55 E 5,200,590
69.17 5,200,591
121.52 5,200,594
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121.67 5,200,592
121.69 5,200,593

CLASS 220
7 5,199,589
222 5,199,590
253 5,199,591
335 5,199,592
359 5,199,593
403 5,199,594
450 5,199,595
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CLASS 221
194 5,199,598
226 5,199,599
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CLASS 222
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153 5,199,613
256 5,199,614
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402.16 5,199,616
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CLASS 223
85 5,199,608

CLASS 224
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CLASS 225
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CLASS 226
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CLASS 227
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CLASS 228
4.5 5,199,628
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102 5,199,630
181 5,199,631
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CLASS 229
103.1 5,199,633
125.09 5,199,635
125.29 5,199,634
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CLASS 235
131 FD 5,200,596
455 5,200,597
472 5,200,598
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CLASS 236
78 R 5,199,637

CLASS 239
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102.2 5,199,641
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CLASS 241
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171 5,199,656
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CLASS 242
54 R 5,199,659
192 5,199,660
195 5,199,661
5,199,662
5,199,663
228 5,199,664
295 5,199,682
305 5,199,665

CLASS 244
93 5,199,667
110 R 5,199,668
145 5,199,669
154 5,199,670
158 R 5,199,671
5,199,672

CLASS 245
2 5,199,673

CLASS 246
434 5,199,674

CLASS 248
62 5,199,675
149 5,199,676
218.4 5,199,677
311.2 5,199,678
394 5,199,679
441.1 5,199,680
488 5,199,681

CLASS 250
201.6 5,200,602
201.9 5,200,603
205 5,200,604
214 LS 5,200,605
216 5,200,606
5,200,607
221 5,200,608
226 5,200,609
227.21 5,200,610
235 5,200,611
239 5,200,612
282 5,200,613
286 5,200,614
302 5,200,615
306 5,200,616
5,200,617
307 5,200,618
5,200,619
324 5,200,620
330 5,200,621
334 5,200,622
338.1 5,200,623
353 5,200,624
363.07 B1 4,588,897
374 5,200,625
390.04 5,200,626
573 5,200,627
574 5,200,628
575 5,200,629
750 5,200,808

CLASS 251
1.3 5,199,683
30.01 5,199,684
212 5,199,685

CLASS 252
8.553 5,200,096
8.75 5,200,097
18 5,200,098
32.7 E 5,200,099
47.5 5,200,100
5,200,101
51.5 R 5,200,103
170 5,200,104
180 5,200,105
181 5,200,106
299.01 5,200,107
299.61 5,200,109
5,200,110
299.66 5,200,111
475 5,200,102
500 5,200,112
518 5,200,113
542 5,200,114
557 5,200,115
586 5,200,116
626 5,200,117

CLASS 254
90 5,199,686
114 5,199,687
126 5,199,688
134.4 5,199,689

CLASS 257
77 5,200,805
81 5,200,631
212 5,200,632
253 5,200,633
291 5,200,634
306 5,200,635
315 5,200,636
368 5,200,637
5,200,638
390 5,200,802
508 5,200,639
560 5,200,803
570 5,200,630
676 5,200,806
693 5,200,640
707 5,200,809
720 5,200,641
724 5,200,642
758 5,200,807

CLASS 261
64.6 5,200,118
94 5,200,119

CLASS 264
1.3 5,200,120
1.8 5,200,121
22 5,200,122
5,200,123
25 5,200,124
39 5,200,125
40.1 5,200,126
85 5,200,127
113 5,200,128
119 5,200,129
232 5,200,130
5,200,131
238 5,200,132
257 5,200,133
532 5,200,134

CLASS 266
47 5,200,135
79 5,200,136

CLASS 267
64.25 5,199,690
140.12 5,199,691

CLASS 269
55 5,199,692
93 5,199,693

CLASS 271
9 5,199,694
5,199,695
10 5,199,696
34 5,199,698
122 5,199,697
131 5,199,699
209 5,199,700
272 5,199,701
274 5,199,702
314 5,199,703

CLASS 273
2 5,199,704
26 C 5,199,705
75 5,199,706
80 C 5,199,707
126 R 5,199,708
146 5,199,709
149 R 5,199,710
153 S 5,199,711
187.2 5,199,712
193 A 5,199,713
299 5,199,714
331 5,199,715
344 5,199,716
426 5,199,717

CLASS 277
29 5,199,718
40 5,199,719
81 S 5,199,720
138 5,199,722
181 5,199,721
235 B 5,199,723
237 R 5,199,724

CLASS 279
123 5,199,725

CLASS 280
11.27 5,199,726
11.28 5,199,727
33.992 5,199,728
47.35 5,199,729
96.1 5,199,730
166 5,199,731
407.1 5,199,732
515 5,199,733
602 5,199,734
615 5,199,735
618 5,199,736
707 5,199,737
732 5,199,739
736 5,199,740
740 5,199,741
766.1 5,199,738
851 5,199,742

CLASS 281
45 5,199,743

CLASS 283
91 5,199,744
117 5,199,745

CLASS 285
8 5,199,746
47 5,199,747
136 5,199,748
197 5,199,749
231 5,199,750
256 5,199,751
258 5,199,752

CLASS 292
188 5,199,753
288 5,199,759

CLASS 293
117 5,199,754
120 5,199,755

CLASS 294
16 5,199,756
104 5,199,757
171 5,199,758

CLASS 296
146 J 5,199,760
5,199,761
180.1 5,199,762

CLASS 297
338 5,199,763
361 5,199,764
391 5,199,765

CLASS 299
5 5,199,766
8 5,199,767
18 5,199,768

CLASS 303
92 5,199,770
114.1 5,199,769

CLASS 305
54 5,199,771

CLASS 307
53 5,200,643
66 5,200,644
82 5,200,645
116 5,200,646
241 5,200,647
269 5,200,648
272.1 5,200,649
272.2 5,200,650
455 5,200,651
465 5,200,652
473 5,200,653
475 B1 5,029,283
491 5,200,654
492 5,200,655
517 5,200,656

CLASS 310
50 5,200,657
89 5,200,658
112 5,200,659
114 5,200,660
184 5,200,661
261 5,200,662
313 D 5,200,663
313 R 5,200,664
323 5,200,665
5,200,666

CLASS 312
7.1 5,199,772
7.2 5,199,773
195 B1 4,883,331
B1 4,966,421
219 5,199,774
257.1 5,199,775
293.3 5,199,776
319.1 5,199,777
408 5,199,778

CLASS 313
478 5,200,667
488 5,200,668
623 5,200,669

CLASS 315
111.91 5,200,670
209 R 5,200,671
248 5,200,672
370 5,200,673

CLASS 318
34 5,200,674
254 5,200,675
444 5,200,676
567 5,200,677
568.13 5,200,678
568.16 5,200,679
571 5,200,680
610 5,200,681
632 5,200,682
661 5,200,683
809 5,200,684

CLASS 320
2 5,200,685
5,200,686
5,200,687
13 5,200,688
20 5,200,689
5,200,690
25 5,200,691

CLASS 323
269 5,200,692
317 B1 4,814,688

CLASS 324
158 D 5,200,693
158 F 5,200,694
158 P 5,200,695
158 R 5,200,696
174 5,200,697
207.22 5,200,698
303 5,200,699
309 5,200,700
5,200,701
321 5,200,702
322 5,200,703
326 5,200,704
338 5,200,705
448 5,200,706

CLASS 330
10 5,200,707
124 R 5,200,708
126 5,200,709
257 5,200,710
267 5,200,711

CLASS 331
1 A 5,200,712
49 5,200,713
66 5,200,714

CLASS 332
185 5,200,715

CLASS 333
17.1 5,200,716
24 R 5,200,717
25 5,200,718
34 5,200,719
181 5,200,720
202 5,200,721
222 B1 4,506,241
252 5,200,722

CLASS 335
14 5,200,723
166 5,200,724
172 5,200,725
207 5,200,726
222 5,200,727
223 5,200,728
284 5,200,729

CLASS 336
90 5,200,730
98 5,200,731

CLASS 337
329 5,200,732

CLASS 338
64 5,200,733

CLASS 340
508 5,200,734
539 5,200,735
586 5,200,736
644 5,200,737
726 5,200,738
730 5,200,739
735 5,200,740
784 5,200,741
825.03 5,200,742
825.07 5,200,743
825.15 5,200,744
825.65 5,200,745
825.8 5,200,746
870.21 5,200,747
953 5,200,748

CLASS 341
87 5,200,749
143 5,200,750
147 5,200,751
168 5,200,752

CLASS 342
14 5,200,753
25 5,200,754
158 5,200,755

CLASS 343
700 MS 5,200,756
786 5,200,757
880 5,200,758
890 5,200,759

CLASS 346
76 PH 5,200,760
5,200,761
76 R 5,200,762
105 5,200,764
107 R 5,200,763
5,200,765
108 5,200,766
139 R 5,200,767
140 R 5,200,768
5,200,769
155 5,200,770

CLASS 351
132 5,200,771
213 5,200,772
219 5,200,773

CLASS 354
62 5,200,774
64 5,200,775
195.12 5,200,776
275 5,200,777

CLASS 355
204 5,200,778
206 5,200,779
208 5,200,780
210 5,200,781
212 5,200,782
246 5,200,783
274 5,200,784
282 5,200,785
284 5,200,786
296 5,200,789
298 5,200,787
5,200,788
308 5,200,790
326 5,200,791

CLASS 356
1 5,200,792
5 5,200,793
71 5,200,794
345 5,200,795
346 5,200,796
363 5,200,797
5,200,798
394 5,200,799
401 5,200,800
428 5,200,801

CLASS 358
12 5,200,811
13 5,200,812
29 5,200,813
60 5,200,814
5,200,815
80 5,200,816
5,200,817
87 5,200,818
93 Re.34,214
98 5,200,819
B1 4,727,416
105 5,200,820
133 5,200,821
142 5,200,822
146 5,200,823
167 5,200,824
181 5,200,825
191.1 5,200,826
211 5,200,827
227 5,200,828
243 5,200,829
296 5,200,830
298 5,200,831
300 5,200,832
320 5,200,833
324 5,200,834
330 5,200,835
335 5,200,836
401 5,200,837
443 5,200,838
448 5,200,839
451 5,200,840
455 5,200,841
483 5,200,842

CLASS 359
40 5,200,843
5,200,844
51 5,200,845
57 5,200,846
59 5,200,847
100 5,200,848
196 5,200,849
208 5,200,850
351 5,200,851
399 5,200,852
443 5,200,853
451 5,200,854
578 Re.34,215
588 5,200,855
630 5,200,856
634 5,200,857
652 5,200,858
662 5,200,861
696 5,200,860
857 5,200,859

CLASS 360
10.1 5,200,862
35.1 5,200,863
48 5,200,864
85 5,200,865
99.08 5,200,866
103 5,200,867
5,200,868
5,200,869
126 5,200,870
133 5,200,871

CLASS 361
25 5,200,872
45 5,200,873
56 5,200,875
91 5,200,876
92 5,200,877
93 5,200,878
5,200,879
311 5,200,880
333 5,200,881
346 5,200,874
386 5,200,882
395 5,200,883
398 5,200,810
401 5,200,884
413 5,200,885

CLASS 362
61 5,199,779
106 5,199,780
145 5,199,781
147 5,199,782
260 5,199,783
294 5,199,784
296 5,199,785
297 5,199,786
310 5,199,787

CLASS 363
49 5,200,886
143 5,200,887

CLASS 364
400 5,200,888
401 5,200,889
410 5,200,890
413.01 5,200,891
419 5,200,892
5,200,893
422 5,200,894
424.05 5,200,895
426.01 5,200,896
426.02 5,200,897
431.05 5,200,898
431.08 5,200,899
431.12 5,200,900
439 5,200,901
5,200,902
464.02 5,200,903
470 5,200,904
474.04 5,200,905
5,200,906
490 5,200,907
491 5,200,908
497 5,200,909
498 5,200,910
578 5,200,911
707 5,200,912
708 5,200,913
724.14 5,200,914
736 5,200,915
748 5,200,916

CLASS 365
51 5,200,917
182 5,200,918
185 5,200,919
5,200,920
189.11 5,200,921
200 5,200,922
201 5,200,923
208 5,200,924
219 5,200,925
233.5 5,200,926

CLASS 366
247 5,199,788

CLASS 367
13 5,200,927
27 5,200,928
88 5,200,929
76 5,200,930
88 5,200,931
174 5,200,932

CLASS 368
113 5,200,933

CLASS 369
13 5,200,934
5,200,935
5,200,936
32 5,200,937
36 5,200,938
44.12 5,200,939
44.15 5,200,940
44.26 5,200,941
44.41 5,200,942
88 5,200,943
5,200,944
99 5,200,945
112 5,200,946
275.1 5,200,947
284 5,200,948

CLASS 370
16 5,200,949
5,200,950
62 5,200,951
79 5,200,952
85.12 5,200,953
94.1 5,200,954
95.1 5,200,956
97 5,200,955
100.1 5,200,957

CLASS 371
16.4 5,200,958
21.6 5,200,959
24 5,200,960
37.1 5,200,961
41 5,200,962
68.1 5,200,963

CLASS 372
26 5,200,964
29 5,200,965
32 5,200,967
46 5,200,968
50 5,200,969
55 5,200,970
58 5,200,971
69 5,200,972
71 5,200,966
87 5,200,973

CLASS 373
94 5,200,974
109 5,200,975

CLASS 374
143 5,199,789
147 5,199,790
185 5,199,791

CLASS 375
8 5,200,976
15 5,200,977
17 5,200,978
19 5,200,979
83 5,200,980
106 5,200,981
118 5,200,982

CLASS 376
209 5,200,138
216 5,200,139
227 5,200,140
321 5,200,141
448 5,200,142
449 5,200,143
463 5,200,144

CLASS 377
57 5,200,983

CLASS 378
110 5,200,984
135 5,200,985
156 5,200,986

CLASS 379
40 5,200,987
52 5,200,988
53 5,200,989
61 5,200,991
93 5,200,992
96 5,200,993
142 5,200,994
165 5,200,990
200 5,200,995
212 5,200,996
428 5,200,997

CLASS 380
4 5,200,998
25 5,200,999
30 5,201,000

CLASS 381
13 5,201,001
24 5,201,002
25 5,201,003
46 5,201,004
63 5,201,005
68 5,201,006
68.6 5,201,007
5,201,008
104 5,201,009

CLASS 382
7 5,201,010
9 5,201,011
50 5,201,012
5,201,013
51 5,201,014
56 5,199,947
88 5,199,948
113 5,199,795

CLASS 384
100 5,199,796
406 5,199,797
462 5,199,798
470 5,199,799
473 5,199,800
506 5,199,801
617 5,199,802

CLASS 385
13 5,201,015
19 5,201,016
24 5,201,017
88 5,201,018
99 5,201,019
113 5,201,020
114 5,201,021
128 5,201,022

CLASS 388
824 5,201,023

CLASS 392
344 5,201,024
392 5,201,025

CLASS 395
2 5,201,028
13 5,201,026
27 5,201,029
107 5,201,027
110 5,201,031
132 5,201,030
150 5,201,032
155 5,201,033
5,201,034
163 5,201,035
164 5,201,037
325 5,201,036
5,201,038
375 5,201,039
400 5,201,040
425 5,201,041
500 5,201,042
575 5,201,043
5,201,044
5,201,045
600 5,201,046
5,201,047
5,201,048
650 5,201,049
700 5,201,050
725 5,201,051
5,201,052
5,201,053
800 5,201,054
5,201,055
5,201,056
5,201,057
5,201,058
5,201,059

CLASS 400
121 5,199,803
160 5,199,804
248 5,199,805
616 5,199,806

CLASS 401
65 5,199,807
133 5,199,808

CLASS 402
4 5,199,809

CLASS 403
13 5,199,810
108 5,199,811

CLASS 404
9 5,199,813
10 5,199,814
18 5,199,815

CLASS 405
101 5,199,812
129 5,199,816
139 5,199,817
142 5,199,818
149 5,199,819
186 5,199,820
202 5,199,821
263 5,199,822
264 5,199,823
282 5,199,824
296 5,199,825

CLASS 406
41 5,199,826

CLASS 407
42 5,199,827
104 5,199,828
120 5,199,829

5,200,195
5,200,290
63 5,199,879

CLASS 502
548 5,200,462

CLASS 558
64 5,200,550
132 5,200,551
486 5,200,557

CLASS 570
27 5,199,941
56 5,199,947
88 5,199,948

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CLASS 408

67	5,199,830
72 R	5,199,831
145	5,199,832
239 R	5,199,833

CLASS 411

5	5,199,834
11	5,199,835
84	5,199,836
107	5,199,837
140	5,199,838
387	5,199,839

CLASS 414

280	5,199,840
412	5,199,841
537	5,199,842
592	5,199,843
694	5,199,844
718	5,199,861
744.1	5,199,845

CLASS 415

119	5,199,846
148	5,199,847
202	5,199,848

CLASS 416

114	5,199,849
153	5,199,850
223 R	5,199,851

CLASS 417

26	5,199,852
43	5,199,853
282	5,199,854
295	5,199,855
312	5,199,856
319	5,199,857
362	5,199,858
410 R	5,199,859
566	5,199,860

CLASS 418

55.1	5,199,862
61.2	5,199,863
68	5,199,864

CLASS 420

129	5,200,145

CLASS 422

23	5,200,146
56	5,200,147
	5,200,148
61	5,200,149
62	5,200,150
100	5,200,151
102	5,200,152
	5,200,153
174	5,200,154
182	5,200,155
186.3	5,200,156
246	5,200,157
292	5,200,158

CLASS 423

140	5,200,159
235	5,200,160
236	5,200,161
239	5,200,162
240 R	5,200,163
265	5,200,164
308	5,200,187
339	5,200,165
584	5,200,166
610	5,200,167
714	5,200,168

CLASS 424

1.1	5,200,169
	5,200,178
45	5,200,170
52	5,200,171
64	5,200,172
	5,200,173
66	5,200,174
70	5,200,175
85.1	5,200,176
85.5	5,200,177
89	5,200,179
94.3	5,200,181
94.5	5,200,182
94.6	5,200,183
94.61	5,200,184
94.64	5,200,340
195.1	5,200,185
	5,200,186
405	5,200,188
	5,200,189
427	5,200,190
443	5,200,191
455	5,200,192
468	5,200,193
473	5,200,194
	5,200,195
	5,200,196
	5,200,197
489	5,200,198
529	5,200,199
663	5,200,200

CLASS 425

113	5,200,206
117	5,200,201
126.1	5,200,202
142	5,200,203
188	5,200,204
200	5,200,205
557	5,200,207
566	5,200,208
577	5,200,209
	5,200,210

CLASS 426

2	5,200,211
	5,200,212
3	5,200,213
	5,200,214
[illegible]	5,200,215
36	5,200,216
50	5,200,217
72	5,200,218
106	5,200,219
231	5,200,220
	5,200,221
241	5,200,222
281	5,200,223
417	5,200,224
510	5,200,225
585	5,200,226
600	5,200,227
615	5,200,228
623	5,200,229

CLASS 427

8	5,200,230
67	5,200,233
118	5,200,234
213	5,200,236
380	5,200,237
569	5,200,232
573	5,200,231

CLASS 428

1	5,200,238
13	5,200,239
34.1	5,200,240
34.6	5,200,241
40	5,200,242
	5,200,243
64	5,200,492
81	5,200,244
100	5,200,245
109	5,200,246
131	5,200,247
	5,200,248
137	5,200,249
144	5,200,250
156	5,200,251
159	5,200,252
195	5,200,253
	5,200,254
212	5,200,255
	5,200,256
217	5,200,257
218	5,200,258
224	5,200,259
234	5,200,260
245	5,200,261
266	5,200,262
323	5,200,263
	5,200,264
325	5,200,265
326	5,200,266
	5,200,267
354	5,200,268
362	5,200,269
403	5,200,270
457	5,200,271
458	5,200,272
465	5,200,273
515	5,200,274
623	5,200,275
629	5,200,276
690	5,200,277

CLASS 429

24	5,200,278
30	5,200,279
65	5,200,280
129	5,200,281
223	5,200,282

CLASS 430

20	5,200,283
33	5,200,284
45	5,200,285
58	5,200,286
108	5,200,287
110	5,200,288
115	5,200,289
	5,200,290
	5,200,291
163	5,200,292
178	5,200,293
191	5,200,294
204	5,200,295
206	5,200,296
232	5,200,297
253	5,200,298
264	5,200,299
281	5,200,300
312	5,200,301
373	5,200,302
376	5,200,303
377	5,200,304
505	5,200,305
	5,200,306
507	5,200,307
508	5,200,308
546	5,200,309
567	5,200,310

CLASS 431

255	5,199,865
353	5,199,866

CLASS 432

13	5,199,867
59	5,199,868

CLASS 433

21	5,199,869
29	5,199,870
80	5,199,871
136	5,199,872
174	5,199,873

CLASS 434

11	5,199,874
62	5,199,875
262	5,199,876
	5,199,877

CLASS 435

4	5,200,311
5	5,200,312
6	5,200,313
	5,200,314
	5,200,315
	5,200,316
7.21	5,200,318
7.24	5,200,319
	5,200,320
7.32	5,200,344
7.4	5,200,317
7.9	5,200,321
13	5,200,322
14	5,200,325
18	5,200,323
20	5,200,324
69.5	5,200,327
101	5,200,328
106	5,200,326
118	5,200,329
128	5,200,330
129	5,200,331
135	5,200,332
172.3	5,200,333
182	5,200,334
190	5,200,335
199	5,200,336
	5,200,337
200	5,200,338
212	5,200,339
252.33	5,200,341
254	5,200,342
262.5	5,200,343

CLASS 436

63	5,200,345
518	5,200,346

CLASS 437

31	5,200,347
33	5,200,348
41	5,200,349
43	5,200,350
44	5,200,351
	5,200,352
52	5,200,353
	5,200,354
	5,200,355
60	5,200,356
180	5,200,357
	5,200,358
192	5,200,359
	5,200,360
194	5,200,361
207	5,200,362
208	5,200,363
209	5,200,364
	5,200,365
211	5,200,366
216	5,200,367
220	5,200,368

CLASS 439

49	5,199,878
63	5,199,879
65	5,199,880
	5,199,881
66	5,199,889
67	5,199,882
72	5,199,883
	5,199,890
74	5,199,884
79	5,199,885
	5,199,886
83	5,199,887
98	5,199,891
142	5,199,888
246	5,199,892
271	5,199,893
321	5,199,894
326	5,199,895
329	5,199,896
357	5,199,897
367	5,199,898
403	5,199,899
557	5,199,900
587	5,199,901
595	5,199,902
610	5,199,903
668	5,199,904
723	5,199,905
	5,199,906
751	5,199,907
	5,199,908
843	5,199,909
	5,199,910
874	5,199,911

CLASS 440

6	5,199,912
47	5,199,913
88	5,199,914

CLASS 441

70	5,199,915
75	5,199,916

CLASS 443

24	5,199,917
50	5,199,918

CLASS 446

126	5,199,919
419	5,199,920

CLASS 452

47	5,199,921
122	5,199,922

CLASS 455

45	5,201,060
51.2	5,201,061
67.3	5,201,062
67.4	5,201,063
75	5,201,064
83	5,201,065
89	5,201,066
	5,201,067
	5,201,068
90	5,201,069
91	5,201,070
101	5,201,071
277.1	5,201,072

CLASS 462

18	5,199,923
26	5,199,924

CLASS 464

111	5,199,925
170	5,199,926

CLASS 470

75	5,199,928
98	5,199,927

CLASS 474

54	5,199,929

CLASS 481

17	5,199,930
26	Re.34,212
52	5,199,931
53	5,199,932
62	5,199,933
79	5,199,934
98	5,199,935
148	5,199,936

CLASS 494

7	5,199,937
10	5,199,938

CLASS 501

66	5,200,369
95	5,200,370
	5,200,371
96	5,200,372
97	5,200,373
98	5,200,374

CLASS 502

53	5,200,375
60	5,200,376
62	5,200,377
	5,200,378
154	5,200,379
166	5,200,380
170	5,200,381
204	5,200,382
300	5,200,383
304	5,200,384

CLASS 503

209	5,200,385
227	5,200,386

CLASS 504

209	5,199,968
225	5,199,970
272	5,199,969

CLASS 505

1	5,200,387
	5,200,388
	5,200,389
	5,200,390
	5,200,391
	5,200,392

CLASS 514

3	5,200,393
9	5,200,394
12	5,200,395
	5,200,396
15	5,200,397
23	5,200,398
	5,200,399
45	5,200,400
63	5,200,401
76	5,200,402
195	5,200,403
206	5,200,404
212	5,200,405
214	5,200,406
234.2	5,200,407
237.2	5,200,408
250	5,200,409
277	5,200,410
291	5,200,411
293	5,200,412
299	5,200,413
	5,200,414
300	5,200,415
307	5,200,416
310	5,200,417
311	5,200,418
323	5,200,419
338	5,200,420
383	5,200,421
387	5,200,422
399	5,200,453
438	5,200,423
450	5,200,424
455	5,200,425
475	5,200,426
561	5,200,427
	5,200,428
766	5,200,429
772	5,200,430

CLASS 521

40.5	5,200,432
64	5,200,433
129	5,200,434
159	5,200,435

CLASS 522

57	5,200,436
89	5,200,437
96	5,200,438
157	5,200,439

CLASS 523

213	5,200,440
221	5,200,441
340	5,200,442

CLASS 524

81	5,200,503
99	5,200,443
	5,200,444
100	5,200,445
173	5,200,446
259	5,200,447
317	5,200,448
323	5,200,449
356	5,200,450
372	5,200,451
398	5,200,452
409	5,200,454
413	5,200,455
430	5,200,456
437	5,200,457
456	5,200,458
459	5,200,459
494	5,200,460
510	5,200,461
548	5,200,462
591	5,200,463

CLASS 525

59	5,200,464
66	5,200,465
133	5,200,466
183	5,200,468
205	5,200,467
245	5,200,469
326.8	5,200,470
326.9	5,200,471
381	5,200,472
	5,200,473
426	5,200,474
486	5,200,475

CLASS 526

67	5,200,476
74	5,200,477
106	5,200,478
212	5,200,479
249	5,200,480
259	5,200,481
262	5,200,497
295	5,200,482
301	5,200,483
331	5,200,484
340	5,200,485
352	5,200,486

CLASS 528

21	5,200,487
28	5,200,488
49	5,200,489
	5,200,490
51	5,200,491
70	5,200,493
111	5,200,494
168	5,200,495
198	5,200,496
323	5,200,498
388	5,200,499
	5,200,500
	5,200,501
494	5,200,502

CLASS 530

304	5,200,504
323	5,200,505
339	5,200,506
344	5,200,507
350	5,200,508
	5,200,509
383	5,200,510

CLASS 534

634	5,200,511
635	5,200,512

CLASS 536

6.4	5,200,513
26.8	5,200,515
28.53	5,200,514
41	5,200,516
103	5,200,517

CLASS 540

63	5,200,518

CLASS 544

144	5,200,519
295	5,200,520
298	5,200,521

CLASS 546

220	5,200,523
250	5,200,522
301	5,200,524

CLASS 548

311.7	5,200,525
375.1	5,200,526
452	5,200,527
453	5,200,528
517	5,200,529

CLASS 549

214	5,200,530
313	5,200,531
462	5,200,532
463	5,200,533
510	5,200,534
546	5,200,535

CLASS 552

653	5,200,536

CLASS 556

11	5,200,537
12	5,200,538
21	5,200,539
87	5,200,540
110	5,200,541
410	5,200,542
434	5,200,543

CLASS 558

44	5,200,544
159	5,200,545
190	5,200,546
265	5,200,547
425	5,200,548

CLASS 560

61	5,200,549
64	5,200,550
132	5,200,551
163	5,200,552
263	5,200,553

CLASS 562

21	5,200,554
401	5,200,555
480	5,200,556

CLASS 564

373	5,200,561

CLASS 570

178	5,200,431

CLASS 600

3	5,199,939

CLASS 602

19	5,199,940
27	5,199,941

CLASS 604

4	5,199,942
22	5,199,943
26	5,199,944
35	5,199,945
51	5,199,946
56	5,199,947
86	5,199,948
88	5,199,949
95	5,199,950
96	5,199,951
156	5,199,952

CLASS 752

299.01	5,200,108

D1—	113	334,458
	120	334,459
	423	334,489
	430	334,483
	52	334,520
	55	334,521
	307	334,551
	309	334,552
D16—	122	334,582
	123	334,583
D23—	126	334,612
	209	334,614

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D1—	113	334,458		423	334,489		52	334,520			334,551	D16—	122	334,582		126	334,612
	120	334,459		430	334,483		55	334,521		307	334,552		123	334,583	D23—	209	334,614
D2—	265	334,460			334,490		64	334,522	D13—	103	334,559		127	334,584		226	334,615
	311	334,461		432	334,491		66	334,523		106	334,560	D18—	40	334,585		249	334,616
	314	334,462		462	334,492		73	334,524		110	334,561		54	334,586		262	334,617
		334,463			334,493		107	334,525		155	334,562	D19—	26	334,587		328	334,618
	320	334,464		466	334,494		307	334,526		173	334,563		27	334,588	D24—	126	334,619
		334,465		470	334,495		333	334,527	D14—	100	334,564			334,592		143	334,620
D3—	10	334,515		475	334,496		347	334,528		106	334,558		36	334,589		158	334,621
	34	334,466		511	334,497		356	334,529		107	334,553		59	334,590		185	334,622
	35	334,467		515	334,498			334,530			334,554		63	334,591		188	334,623
		334,468			334,499		373	334,531			334,565		92	334,593		216	334,624
		334,469		552	334,500			334,532		109	334,555		98	334,594		227	334,625
	52	334,470		575	334,501			334,533			334,556	D20—	5	334,595		229	334,626
	106	334,471		605	334,502	D9—	415	334,534		114	334,557		8	334,596	D25—	16	334,627
D4—	104	334,472	D7—	300.2	334,503			334,535		115	334,566		40	334,597		124	334,628
		334,473		326	334,504		425	334,536		118	334,567			334,598	D26—	106	334,629
		334,474		392.1	334,513		447	334,537		138	334,568	D21—	104	334,599		120	334,630
	116	334,475		409	334,505			334,538		168	334,569			334,600	D27—	194	334,631
	138	334,476		504	334,509	D10—	6	334,539		238	334,570		108	334,601	D28—	57	334,632
		334,477		605	334,506		62	334,540		241	334,571		122	334,602	D29—	7	334,633
D6—	300	334,478			334,507		104	334,541		258	334,572		171	334,603	D30—	108	334,634
	310	334,479			334,508			334,542			334,573		191	334,604		124	334,636
	318	334,480		638	334,510		132	334,543	D15—	27	334,574		198	334,605		128	334,635
	322	334,481		662	334,511	D11—	3	334,544		28	334,575		220	334,606		160	334,637
	334	334,482		665	334,512			334,545		133	334,576		226	334,607		162	334,638
		334,484		700	334,514		13	334,546		139	334,577		232	334,608	D34—	7	334,639
	344	334,485	D8—	29	334,516	D12—	14	334,547		140	334,578		244	334,609		24	334,640
	361	334,486		30	334,517		131	334,548		147	334,579			334,610		27	334,641
	364	334,487		40	334,518		155	334,549		199	334,580		251	334,611	D99—	5	334,642
	369	334,488		51	334,519		191	334,550			334,581	D22—	106	334,613			

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P.—	10	8,193		37	8,194		41.1	8,196		41.3	8,197		42.1	8,195		88.1	8,198

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44—	280	H1161		294	H1163	340—	825.44	H1173	372—	11	H1177	427—	255.3	H1166	525—	185	H1169
D23—	209	H1157	181—	125	H1171	357—	49	H1174				430—	506	H1167	556—	113	H1170
141—	11	H1158	264—	22	H1164	370—	118	H1175	417—	151	H1159						
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,199,111		5,199,559		5,200,217		5,200,972			5,200,838		17 :	5,199,115				
	5,199,280		5,199,560		5,200,232		5,201,011			5,200,996			5,199,118				
	5,199,439		5,199,577		5,200,264		5,201,015		10 :	5,200,269			5,199,129				
	5,199,763		5,199,597		5,200,300		5,201,022		11 :	5,199,619			5,199,140				
	5,200,038		5,199,621		5,200,314		5,201,030		12 :	5,199,179			5,199,152				
04 :	5,199,235		5,199,627		5,200,320		5,201,043			5,199,208			5,199,160				
	5,199,279		5,199,631		5,200,334		5,201,044			5,199,221			5,199,172				
	5,199,339		5,199,636		5,200,347		5,201,046			5,199,225			5,199,180				
	5,199,453		5,199,670		5,200,351		5,201,054			5,199,266			5,199,201				
	5,199,741		5,199,677		5,200,360		5,201,057			5,199,354			5,199,242				
	5,199,944		5,199,707		5,200,365		5,201,059			5,199,358			5,199,243				
	5,199,997		5,199,713		5,200,377		4,727,416			5,199,362			5,199,255				
	5,200,171		5,199,715		5,200,391		4,814,688			5,199,643			5,199,260				
	5,200,617		5,199,716		5,200,504		08 : 5,199,136			5,199,646			5,199,294				
	5,200,715		5,199,717		5,200,509		5,199,337			5,199,705			5,199,353				
	5,200,793		5,199,726		5,200,525		5,199,602			5,199,725			5,199,422				
	5,200,864		5,199,755		5,200,571		5,199,672			5,199,793			5,199,433				
	5,200,934		5,199,782		5,200,587		5,199,681			5,199,838			5,199,471				
	5,201,045		5,199,783		5,200,613		5,199,728			5,199,866			5,199,506				
	5,201,053		5,199,784		5,200,623		5,199,773			5,200,034			5,199,533				
	5,201,056		5,199,795		5,200,642		5,200,177			5,200,066			5,199,568				
05 :	5,199,116		5,199,848		5,200,648		5,200,216			5,200,071			5,199,580				
	5,199,375		5,199,869		5,200,654		5,200,752			5,200,077			5,199,600				
	5,199,668		5,199,876		5,200,656		5,200,866			5,200,451			5,199,616				
	5,200,245		5,199,881		5,200,693		5,201,014			5,200,534			5,199,622				
06 :	Re.34,215		5,199,894		5,200,700		5,201,048			5,200,688			5,199,625				
	5,199,119		5,199,896		5,200,713		5,029,283			5,200,733			5,199,671				
	5,199,120		5,199,935		5,200,740		09 : 5,199,174			5,200,735			5,199,678				
	5,199,147		5,199,939		5,200,743		5,199,177			5,200,825			5,199,687				
	5,199,159		5,199,943		5,200,754		5,199,381			5,200,962			5,199,699				
	5,199,165		5,199,947		5,200,758		5,199,419			5,201,061			5,199,720				
	5,199,173		5,199,948		5,200,770		5,199,432		13 :	5,199,251			5,199,732				
	5,199,175		5,199,949		5,200,795		5,199,529			5,199,289			5,199,733				
	5,199,178		5,199,962		5,200,802		5,199,530			5,199,415			5,199,745				
	5,199,196		5,199,967		5,200,805		5,199,567			5,199,563			5,199,786				
	5,199,199		5,200,014		5,200,809		5,199,578			5,199,574			5,199,809				
	5,199,202		5,200,031		5,200,844		5,199,590			5,199,654			5,199,834				
	5,199,215		5,200,056		5,200,855		5,199,617			5,199,825			5,199,836				
	5,199,241		5,200,070		5,200,867		5,199,624			5,199,993			5,199,837				
	5,199,268		5,200,076		5,200,877		5,199,954			5,200,065			5,199,839				
	5,199,301		5,200,078		5,200,882		5,199,955			5,200,443			5,199,904				
	5,199,305		5,200,082		5,200,900		5,200,009			5,200,514			5,199,924				
	5,199,328		5,200,090		5,200,910		5,200,023			5,201,047			5,199,980				
	5,199,332		5,200,098		5,200,913		5,200,147		15 :	5,199,916			5,199,991				
	5,199,346		5,200,140		5,200,920		5,200,265			5,200,228			5,200,007				
	5,199,350		5,200,141		5,200,922		5,200,316			5,200,845			5,200,059				
	5,199,373		5,200,150		5,200,924		5,200,318		16 :	5,199,730			5,200,060				
	5,199,379		5,200,176		5,200,945		5,200,416			5,200,054			5,200,079				
	5,199,477		5,200,191		5,200,948		5,200,522			5,200,144			5,200,084				
	5,199,483		5,200,194		5,200,953		5,200,583			5,200,338			5,200,089				
	5,199,487		5,200,195		5,200,959		5,200,609			5,200,359			5,200,092				
	5,199,499		5,200,196		5,200,963		5,200,725			5,200,652			5,200,105				
	5,199,516		5,200,197		5,200,969		5,200,819			5,200,917			5,200,106				

	5,200,179		5,200,068		5,200,946		5,200,858		5,199,638		5,200,188						
	5,200,214		5,200,145		5,200,973		5,200,933		5,199,652		5,200,193						
	5,200,220		5,200,149		5,201,023	36 :	5,199,113		5,199,656		5,200,224						

	5,200,689		5,199,386		5,199,958		5,200,987			5,200,692			5,199,480				
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	5,200,751		5,199,511		5,200,152		5,201,000			5,199,493			5,199,586				
	5,200,759		5,199,771		5,200,251		5,201,007			5,199,596			5,199,598				

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	5,200,179		5,200,068		5,200,946		5,200,858		5,199,638		5,200,188
	5,200,214		5,200,145		5,200,973		5,200,933		5,199,652		5,200,193
	5,200,220		5,200,149		5,201,023	36 :	5,199,113		5,199,656		5,200,224
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	5,200,317		5,200,158	28 :	5,199,973		5,199,135		5,199,709		5,200,279
	5,200,427		5,200,164		5,200,457		5,199,163		5,199,712		5,200,281
	5,200,557		5,200,178		5,200,909		5,199,187		5,199,738		5,200,329
	5,200,607		5,200,181	29 :	5,199,220		5,199,200		5,199,751		5,200,358
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	5,200,686		5,200,297		5,199,581		5,199,256		5,199,847		5,200,459
	5,200,712		5,200,311		5,199,584		5,199,265		5,199,905		5,200,467
	5,200,985		5,200,319		5,199,614		5,199,304		5,199,927		5,200,483
	5,201,002		5,200,333		5,199,666		5,199,417		5,199,928		5,200,489
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	5,199,237		5,200,498		5,200,018		5,199,528		5,200,055		5,200,640
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	5,199,829		5,200,970		5,199,704		5,199,840		5,200,259	45 :	5,199,125
	5,199,989		5,201,042		5,200,211		5,199,843		5,200,275		5,199,195
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	5,200,064		5,199,137		5,200,995		5,199,887		5,200,418		5,199,831
	5,200,313		5,199,150	32 :	5,200,218		5,199,892		5,200,495		5,199,860
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19 :	5,199,181		5,199,281		5,199,591		5,199,959		5,200,676		5,200,142
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20 :	5,199,182		5,199,321		5,199,143		5,200,112	40 :	Re.34,212		5,199,472
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	5,200,397		5,200,722		5,200,215		5,199,527		5,199,418		5,199,821
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	5,200,891	27 :	5,199,205		5,200,291		5,199,940		5,199,522		5,199,893
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25 :	Re.34,213		5,199,239		5,200,342		5,200,346		5,199,824		5,200,045
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	5,199,436		5,199,573		5,200,502	39 :	5,199,121		5,199,908		5,200,352
	5,199,470		5,199,637		5,200,503		5,199,142		5,199,910		5,200,362
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	5,200,751		5,199,511		5,200,152		5,201,000		5,199,493		5,199,586
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06 :	334,471		334,528	18 :	334,485		334,612		334,588		334,615
	334,474		334,550		334,583		334,623		334,622		334,629
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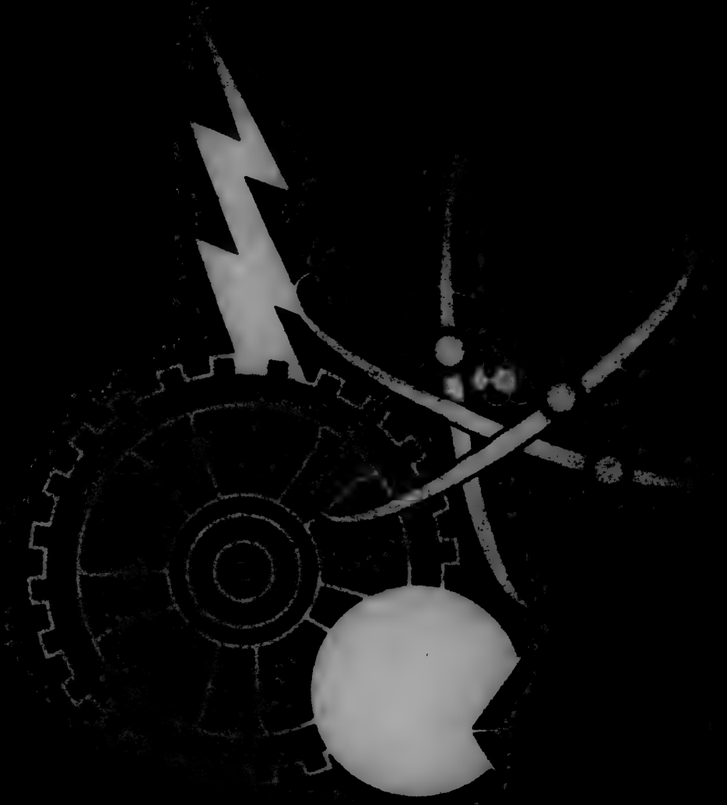

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The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended

4,495,677	06/480,116	1/29/85
4,495,678	06/483,569	1/29/85
4,495,680	06/349,573	1/29/85

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 10, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,914,752 through 4,916,751
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 8, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,580,296 through 4,581,770
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 31, 1993 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,495,657	06/428,688	1/29/85
4,495,665	06/455,537	1/29/85
4,495,667	06/458,099	1/29/85
4,495,671	06/447,268	1/29/85
4,495,672	06/491,954	1/29/85
4,495,673	06/427,114	1/29/85
4,495,675	06/367,249	1/29/85
4,495,677	06/480,116	1/29/85
4,495,678	06/483,569	1/29/85
4,495,680	06/349,573	1/29/85
4,495,689	06/525,851	1/29/85
4,495,699	06/431,286	1/29/85
4,495,716	06/577,914	1/29/85
4,495,720	06/445,925	1/29/85
4,495,726	06/440,165	1/29/85
4,495,728	06/476,109	1/29/85
4,495,730	06/528,614	1/29/85
4,495,733	06/399,884	1/29/85
4,495,735	06/529,138	1/29/85
4,495,737	06/403,580	1/29/85
4,495,738	06/386,329	1/29/85
4,495,747	06/340,354	1/29/85
4,495,757	06/466,647	1/29/85
4,495,762	06/468,887	1/29/85
4,495,766	06/325,032	1/29/85
4,495,768	06/357,495	1/29/85
4,495,770	06/541,828	1/29/85
4,495,773	06/303,144	1/29/85
4,495,774	06/484,918	1/29/85
4,495,775	06/506,791	1/29/85
4,495,776	06/311,059	1/29/85
4,495,778	06/580,047	1/29/85
4,495,782	06/552,555	1/29/85
4,495,783	06/530,125	1/29/85
4,495,796	06/436,239	1/29/85
4,495,797	06/508,081	1/29/85
4,495,803	06/529,192	1/29/85
4,495,805	06/475,590	1/29/85
4,495,807	06/469,596	1/29/85
4,495,809	06/480,180	1/29/85
4,495,811	06/481,903	1/29/85
4,495,817	06/498,007	1/29/85
4,495,823	06/499,300	1/29/85
4,495,825	06/413,343	1/29/85
4,495,827	06/409,741	1/29/85
4,495,829	06/335,510	1/29/85
4,495,831	06/618,759	1/29/85
4,495,832	06/379,508	1/29/85
4,495,833	06/307,266	1/29/85
4,495,836	06/388,055	1/29/85
4,495,837	06/331,391	1/29/85
4,495,838	06/331,393	1/29/85
4 495,839	06/331,397	1/29/85
4,495,840	06/514,389	1/29/85
4,495,845	06/279,495	1/29/85
4,495,848	06/285,174	1/29/85
4,495,849	06/424,818	1/29/85
4,495,850	06/411,744	1/29/85
4,495,852	06/385,007	1/29/85
4,495,859	06/516,678	1/29/85
4,495,863	06/472,592	1/29/85
4,495,869	06/361,452	1/29/85
4,495,882	06/486,818	1/29/85
4,495,883	06/514,571	1/29/85
4,495,886	06/536,021	1/29/85
4,495,890	06/513,361	1/29/85
4,495,891	06/465,764	1/29/85
4,495,893	06/548,621	1/29/85
4,495,898	06/421,139	1/29/85
4,495,903	06/418,957	1/29/85
4,495,908	06/537,519	1/29/85
4,495,910	06/370,355	1/29/85
4,495,911	06/403,646	1/29/85
4,495,916	06/429,432	1/29/85
4,495,920	06/482,884	1/29/85
4,495,922	06/576,833	1/29/85
4,495,926	06/566,418	1/29/85
4,495,932	06/231,249	1/29/85
4,495,933	06/401,846	1/29/85
4,495,935	06/526,449	1/29/85
4,495,938	06/579,989	1/29/85
4,495,942	06/575,532	1/29/85
4,495,949	06/620,272	1/29/85
4,495,950	06/460,094	1/29/85
4,495,951	06/311,316	1/29/85
4,495,952	06/371,578	1/29/85

Patent Number	Serial Number	Issue Date
4,495,955	06/276,788	1/29/85
4,496,233	06/489,622	1/29/85
4,496,234	06/490,616	1/29/85
4,496,236	06/529,195	1/29/85

Patent Number	Serial Number	Issue Date
4,496,834	06/366,080	1/29/85
4,496,835	06/388,699	1/29/85
4,496,836	06/393,285	1/29/85

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Patent Number	Serial Number	Issue Date
4,495,955	06/276,788	1/29/85
4,495,956	06/426,131	1/29/85
4,495,959	06/564,690	1/29/85
4,495,962	06/458,328	1/29/85
4,495,965	06/407,909	1/29/85
4,495,967	06/521,630	1/29/85
4,495,970	06/485,865	1/29/85
4,495,971	06/521,109	1/29/85
4,495,973	06/437,469	1/29/85
4,495,976	06/478,802	1/29/85
4,495,981	06/317,373	1/29/85
4,495,983	06/465,239	1/29/85
4,495,985	06/520,936	1/29/85
4,495,988	06/366,931	1/29/85
4,495,989	06/589,846	1/29/85
4,495,992	06/511,541	1/29/85
4,495,996	06/556,758	1/29/85
4,495,997	06/493,559	1/29/85
4,495,999	06/553,772	1/29/85
4,496,003	06/455,406	1/29/85
4,496,005	06/513,534	1/29/85
4,496,006	06/491,531	1/29/85
4,496,011	06/402,073	1/29/85
4,496,012	06/490,914	1/29/85
4,496,016	06/440,621	1/29/85
4,496,023	06/531,603	1/29/85
4,496,026	06/291,275	1/29/85
4,496,044	06/524,672	1/29/85
4,496,048	06/448,954	1/29/85
4,496,055	06/425,365	1/29/85
4,496,064	06/324,162	1/29/85
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4,496,070	06/583,760	1/29/85
4,496,072	06/428,414	1/29/85
4,496,073	06/469,451	1/29/85
4,496,077	06/471,653	1/29/85
4,496,079	06/339,769	1/29/85
4,496,085	06/400,701	1/29/85
4,496,095	06/484,244	1/29/85
4,496,097	06/619,776	1/29/85
4,496,099	06/586,138	1/29/85
4,496,103	06/534,804	1/29/85
4,496,107	06/398,964	1/29/85
4,496,113	06/481,825	1/29/85
4,496,114	06/398,439	1/29/85
4,496,119	06/527,058	1/29/85
4,496,121	06/420,725	1/29/85
4,496,122	06/508,371	1/29/85
4,496,123	06/449,673	1/29/85
4,496,125	06/411,618	1/29/85
4,496,126	06/397,917	1/29/85
4,496,129	06/446,947	1/29/85
4,496,130	06/433,134	1/29/85
4,496,140	06/533,302	1/29/85
4,496,144	06/409,392	1/29/85
4,496,146	06/403,730	1/29/85
4,496,152	06/317,773	1/29/85
4,496,153	06/569,583	1/29/85
4,496,159	06/497,570	1/29/85
4,496,165	06/443,856	1/29/85
4,496,168	06/373,506	1/29/85
4,496,177	06/391,991	1/29/85
4,496,179	06/449,598	1/29/85
4,496,180	06/515,573	1/29/85
4,496,181	06/366,440	1/29/85
4,496,185	06/427,877	1/29/85
4,496,190	06/465,238	1/29/85
4,496,191	06/413,653	1/29/85
4,496,197	06/484,019	1/29/85
4,496,200	06/430,580	1/29/85
4,496,203	06/380,385	1/29/85
4,496,208	06/370,920	1/29/85
4,496,214	06/349,452	1/29/85
4,496,224	06/426,696	1/29/85
4,496,230	06/395,991	1/29/85
4,496,231	06/400,253	1/29/85
4,496,233	06/489,622	1/29/85
4,496,234	06/490,616	1/29/85
4,496,236	06/529,195	1/29/85
4,496,241	06/476,249	1/29/85
4,496,245	06/472,903	1/29/85
4,496,247	06/454,531	1/29/85
4,496,248	06/342,749	1/29/85
4,496,249	06/421,905	1/29/85
4,496,254	06/476,502	1/29/85
4,496,257	06/571,401	1/29/85
4,496,261	06/272,847	1/29/85
4,496,264	06/364,411	1/29/85
4,496,266	06/446,987	1/29/85
4,496,267	06/450,560	1/29/85
4,496,276	06/414,569	1/29/85
4,496,277	06/367,437	1/29/85
4,496,279	06/448,217	1/29/85
4,496,280	06/452,327	1/29/85
4,496,282	06/375,701	1/29/85
4,496,283	06/594,462	1/29/85
4,496,284	06/476,484	1/29/85
4,496,286	06/514,411	1/29/85
4,496,287	06/387,417	1/29/85
4,496,288	06/452,136	1/29/85
4,496,292	06/328,225	1/29/85
4,496,294	06/451,981	1/29/85
4,496,298	06/395,901	1/29/85
4,496,302	06/385,064	1/29/85
4,496,310	06/513,670	1/29/85
4,496,311	06/607,030	1/29/85
4,496,317	06/507,731	1/29/85
4,496,318	06/379,089	1/29/85
4,496,325	06/407,463	1/29/85
4,496,327	06/440,876	1/29/85
4,496,333	06/400,515	1/29/85
4,496,335	06/449,046	1/29/85
4,496,341	06/367,167	1/29/85
4,496,344	06/405,366	1/29/85
4,496,346	06/523,870	1/29/85
4,496,352	06/517,546	1/29/85
4,496,355	06/442,068	1/29/85
4,496,363	06/554,491	1/29/85
4,496,364	06/488,009	1/29/85
4,496,368	06/505,511	1/29/85
4,496,370	06/481,956	1/29/85
4,496,373	06/617,831	1/29/85
4,496,374	06/467,282	1/29/85
4,496,377	06/473,003	1/29/85
4,496,379	06/584,838	1/29/85
4,496,385	06/520,091	1/29/85
4,496,388	06/402,796	1/29/85
4,496,391	06/459,988	1/29/85
4,496,392	06/472,879	1/29/85
4,496,403	06/445,618	1/29/85
4,496,412	06/567,773	1/29/85
4,496,413	06/474,658	1/29/85
4,496,415	06/366,623	1/29/85
4,496,416	06/478,892	1/29/85
4,496,419	06/529,661	1/29/85
4,496,420	06/597,676	1/29/85
4,496,425	06/575,378	1/29/85
4,496,428	06/422,001	1/29/85
4,496,429	06/478,907	1/29/85
4,496,430	06/338,541	1/29/85
4,496,432	06/508,382	1/29/85
4,496,440	06/617,063	1/29/85
4,496,443	06/386,358	1/29/85
4,496,451	06/377,016	1/29/85
4,496,459	06/549,246	1/29/85
4,496,475	06/413,608	1/29/85
4,496,478	06/584,030	1/29/85
4,496,481	06/329,860	1/29/85
4,496,483	06/531,139	1/29/85
4,496,485	06/555,270	1/29/85
4,496,487	06/415,718	1/29/85
4,496,491	06/401,036	1/29/85
4,496,493	06/369,307	1/29/85
4,496,499	06/359,498	1/29/85

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4,496,502	06/465,548	1/29/85
4,496,506	06/412,960	1/29/85
4,496,511	06/422,039	1/29/89
4,496,523	06/394,491	1/29/85
4,496,534	06/447,227	1/29/85
4,496,536	06/372,474	1/29/85
4,496,551	06/506,895	1/29/85
4,496,552	06/487,773	1/29/85
4,496,555	06/515,335	1/29/85
4,496,558	06/461,058	1/29/85
4,496,561	06/418,762	1/29/85
4,496,563	06/524,202	1/29/85
4,496,564	06/353,423	1/29/85
4,496,568	06/487,355	1/29/85
4,496,571	06/353,422	1/29/85
4,496,573	06/410,959	1/29/85
4,496,574	06/419,077	1/29/85
4,496,579	06/545,191	1/29/85
4,496,589	06/439,067	1/29/85
4,496,591	06/311,306	1/29/85
4,496,593	06/444,382	1/29/85
4,496,597	06/346,540	1/29/85
4,496,599	06/474,104	1/29/85
4,496,606	06/489,974	1/29/85
4,496,611	06/422,162	1/29/85
4,496,616	06/358,496	1/29/85
4,496,627	06/444,191	1/29/85
4,496,628	06/515,403	1/29/85
4,496,635	06/360,117	1/29/85
4,496,636	06/409,135	1/29/85
4,496,640	06/531,577	1/29/85
4,496,641	06/459,016	1/29/85
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4,801,753	07/098,203	1/31/89

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4,802,071	07/123,418	1/31/89
4,802,072	07/016,649	1/31/89
4,802,075	07/122,210	1/31/89
4,802,078	07/042,870	1/31/89
4,802,083	07/117,196	1/31/89
4,802,090	07/065,997	1/31/89
4,802,100	06/897,645	1/31/89
4,802,120	07/096,672	1/31/89
4,802,145	07/199,068	1/31/89
4,802,149	06/943,171	1/31/89
4,802,165	06/916,747	1/31/89
4,802,170	07/043,939	1/31/89
4,802,188	06/780,518	1/31/89
4,802,195	06/832,974	1/31/89
4,802,197	06/943,194	1/31/89
4,802,198	06/843,258	1/31/89
4,802,203	07/105,530	1/31/89
4,802,204	07/100,957	1/31/89
4,802,210	07/064,474	1/31/89
4,802,232	07/025,719	1/31/89
4,802,235	06/727,898	1/31/89

Reissue Applications Filed

Saku Suzuki, et. al., Owner of Record: *Nakamura-Tome Precision Ind., Co., Ltd., Ishikawa, Japan*, Attorney or Agent: Murray

Notice of Expiration of Trademark Registrations Due to Failure to Renew

559,395	71/615,862	5/27/1952
559,396	71/615,913	5/27/1952
559,399	71/615,991	5/27/1952

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Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,507,366, Re. S.N. 08/021,035, Filed Feb. 23, 1992, Cl. 428/682, ROLLING MILL ROLL FOR A HOT TRAIN OF ROLLS, Jean C. Werquin, et. al., Owner of Record: *Chavanne Ketin, Puteaux, France*, Attorney or Agent: Michelle N. Lester, Ex. Gp.: 1103

4,834,825, Re. S.N. 08/001,244, Filed Jan. 21, 1993, Cl. 156/294, ASSEMBLY FOR CONNECTING MULTI-DUCT CONDUITS, Robert Adams, et. al., Owner of Record: *Inventors*, Attorney or Agent: Charles C. Garvey Jr., Ex. Gp.: 1301

4,974,286, Re. S.N. 07/985,918, Filed Dec. 4, 1992, Cl. 16/111, UNIVERSAL HANDLE FOR HAND-HELD IMPLEMENT, Davin Stowell, et. al., Owner of Record: *Oxo International L.P., New York, N.Y.*, Attorney or Agent: Harold V. Stotland, Ex. Gp.: 3201

4,992,308, Re. S.N. 08/016,806, Filed Feb. 11, 1993, Cl. 524/601, AQUEOUS DISPERSIONS OF POLYESTER AND POLYESTERAMIDES CROSS-LINKED WITH METALLIC IONS AND CASTS MADE THEREFROM, Mohan Vishnupad, et. al., Owner of Record: *Connecticut Development Authority, Rocky Hill, Conn.*, Attorney or Agent: Peter Deluca, Ex. Gp.: 1503

4,993,996, Re. S.N. 08/018,758, Filed Feb. 17, 1993, Cl. 474/155, ELECTRICAL CONNECTOR BLOCK, Sidney Levy, Owner of Record: *Thomas & Betts Corp., Bridgewater, N.J.*, Attorney or Agent: James J. Daley, Ex. Gp.: 3506

4,995,187, Re. S.N. 07/975,463, Filed Nov. 12, 1992, Cl. 43/8, CRAB POT MANAGING DEVICE, George M. Smyly, Sr., Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 3205

4,995,189, Re. S.N. 08/019,750, Filed Feb. 19, 1993, Cl. 43/42.310, RATTLING FISH LURE, Michael W. Crihfield, Owner of Record: *Inventor*, Attorney or Agent: Gregory C. Smith, Ex. Gp.: 3205

5,034,900, Re. S.N. 07/988,311, Filed Dec. 9, 1992, Cl. 364/518, METHOD AND APPARATUS FOR BIT OPERATIONAL PROCESS, Koichi Kimura, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Carl J. Brundidge, Ex. Gp.: 2301

5,069,067, Re. S.N. 07/984,931, Filed Dec. 3, 1992, Cl. 73/269, FLUID FLOW METER, Dov Ingman, Owner of Record: *Select Corp., Los Angeles, Calif.*, Attorney or Agent: Norman E. Brunell, Ex. Gp.: 2613

5,087,108, Re. S.N. 08/018,090, Filed Feb. 16, 1993, Cl. 385/27, DOUBLE-CORE ACTIVE FIBER OPTICAL AMPLIFIER HAVING A WIDE-BAND SIGNAL WAVELENGTH, Giorgio Grasso, et. al., Owner of Record: *Pirelli Cari S.P.A., Milan, Italy*, Attorney or Agent: L.P. Brooks, Ex. Gp.: 2501

5,089,863, Re. S.N. 08/023,518, Filed Feb. 26, 1993, Cl. 257/388, A FIELD EFFECT TRANSISTOR WITH T-SHAPED GATE ELECTRODE AND MANUFACTURING METHOD THEREFOR, Shinichi Satoh, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Gene A. Robinson, Ex. Gp.: 2508

5,110,862, Re. S.N. 08/016,808, Filed Feb. 11, 1993, Cl. 524/601, AQUEOUS DISPERSIONS OF POLYESTER AND POLYESTERAMIDES CROSS-LINKED WITH METALLIC AND CASTS MADE THEREFROM, Mohan Vishnupad, et. al., Owner of Record: *Inventors*, Attorney or Agent: Peter Deluca, Ex. Gp.: 1511

5,117,544, Re. S.N. 08/016,810, Filed Feb. 11, 1993, Cl. 29/27C, TWO-SPINDLE OPPOSED TYPE CNC LATHE, Kou Saku Suzuki, et. al., Owner of Record: *Nakamura-Tome Precision Ind., Co., Ltd., Ishikawa, Japan*, Attorney or Agent: Murray Schaffer, Ex. Gp.: 3202

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,064,112, Reexam. No. 90/002,977, Requested Mar. 2, 1993, Cl. 528/272, PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH MOLECULAR WEIGHT POLYTHYLENE TEREPHALATE, Hans Joechim Bathe, et. al., Owner of Record: *Zimmer Aktiengesellschaft, Frankfurt, Germany*, Attorney or Agent: William P. Heath, Kingsport, Tenn., Ex. Gp.: 1503, Requester: The Goodyear Tire & Rubber Co., Akron, Ohio

4,407,832, Reexam. No. 90/002,971, Requested Feb. 23, 1993, Cl. 426/281, PROCESSING OF MUSHROOMS WITH REDUCED WEIGHT LOSS, Andrew M. Ferguson, et. al., Owner of Record: *Mushroom Associates, Kennett Square, Pa.*, Attorney or Agent: Henderson & Strum, Washington, D.C., Ex. Gp.: 1302, Requester: Frank E. Ribbins, Venable, Baetier, Howard & Civiletti, Washington, D.C.

4,421,574, Reexam. No. 90/002,980, Requested Feb. 17, 1993, Cl. 148/111, METHOD FOR SUPPRESSING INTERNAL OXIDATION IN STEEL WITH ANTIMONY ADDITION, Grigory Lyudkovsky, Owner of Record: *Inland Steel Corp., Chicago, Ill.*, Attorney or Agent: Alvin D. Shulman, Marshall, O'Toole, Gerstein, Murray & Bicknell, Chicago, Ill., Ex. Gp.: 1101, Requester: LTV Steel Corp., Inc., Cleveland, Ohio

4,981,091, Reexam. No. 90/002,981, Requested Feb. 19, 1993, Cl. 112/080, COMPUTER CONTROLLED TUFTING MACHINE AND PROCESS OF CONTROLLING THE PARAMETERS OF OPERATION OF A TUFTING MACHINE, Brooks E. Taylor, et. al., Owner of Record: *Card-Monroe Corp., Chattanooga, Tenn.*, Attorney or Agent: George M. Hopkins, Hopkins & Thomas, Atlanta, Ga., Ex. Gp.: 2407, Requester: Owner

5,008,804, Reexam. No. 90/002,976, Requested Mar. 2, 1993, Cl. 364/513, ROBOTIC TELEVISION-CAMERA DOLLY SYSTEM, Gary B. Gordon, et. al., Owner of Record: *Total Spectrum Manufacturing, Inc., Valley Cottage, N.Y.*, Attorney or Agent: Spencer & Frank, Washington, D.C., Ex. Gp.: 2308, Requester: Vinten Broadcast Co., Suffolk, England

5,054,081, Reexam. No. 90/002,975, Requested Feb. 26, 1993, Cl. 318/191, ELECTROSTATIC TRANSDUCER WITH IMPROVED RESPONSE UTILIZING DISTRIBUTED BASS RESONANCE ENERGY, Roger A. West, Owner of Record: *Inventor, Park City, Utah*, Attorney or Agent: None, Ex. Gp.: 2601, Requester: Owner

5,093,080, Reexam. No. 90/002,974, Requested Jan. 25, 1993, Cl. 422/040, CONSERVATION PROCESS FOR AGRICULTURAL PRODUCTS, Elbert S. Killer, Owner of Record: *PCP Partnership, Santa Monica, Calif.*, Attorney or Agent: Keith D. Beecher, Jessup, Beecher & Slehofer, Santa Monica, Calif., Ex. Gp.: 1809, Requester: Harness, Dickey & Pierce, Bloomfield Hills, Mich.

5,142,838, Reexam. No. 90/002,979, Requested Feb. 23, 1993, Cl. 052/640, STANDING SEAM ROOF ASSEMBLY AND SUPPORT APPARATUS, Harold G. Simpson, et. al., Owner of Record: *Fabtec, Inc., & Deroof America, Inc., both of Tulsa, Okla.*, Attorney or Agent: William R. Laney, Laney, Dougherty, Hessin & Beavers, Oklahoma City, Okla., Ex. Gp.: 3504, Requester: Butler Manufacturing Co., Kansas City, Mo.

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATION WHICH EXPIRED MARCH 1, 1993 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
294,183	71/322,812	5/24/1932
294,185	71/323,006	5/24/1932
294,186	71/323,061	5/24/1932
294,201	71/318,471	5/24/1932
294,202	71/319,629	5/24/1932
294,217	71/322,930	5/24/1932
294,218	71/323,084	5/24/1932
294,224	71/323,617	5/24/1932
294,227	71/323,810	5/24/1932
294,244	71/323,229	5/24/1932
294,245	71/323,230	5/24/1932
294,266	71/322,021	5/24/1932
294,287	71/316,055	5/24/1932
294,289	71/315,291	5/24/1932
294,293	71/314,268	5/24/1932
294,364	71/321,215	5/24/1932
294,369	71/323,082	5/24/1932
294,427	71/323,022	5/24/1932
294,438	71/312,694	5/24/1932
559,194	71/527,822	5/27/1952
559,198	71/545,180	5/27/1952
559,202	71/552,025	5/27/1952
559,208	71/564,367	5/27/1952
559,213	71/566,587	5/27/1952
559,218	71/573,523	5/27/1952
559,232	71/583,072	5/27/1952
559,235	71/584,166	5/27/1952
559,246	71/590,303	5/27/1952
559,252	71/592,725	5/27/1952
559,259	71/595,992	5/27/1952
559,260	71/596,157	5/27/1952
559,265	71/598,082	5/27/1952
559,266	71/598,085	5/27/1952
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559,288	71/601,205	5/27/1952
559,292	71/601,590	5/27/1952
559,298	71/602,782	5/27/1952
559,305	71/604,740	5/27/1952
559,318	71/607,169	5/27/1952
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559,326	71/608,994	5/27/1952
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559,377	71/615,163	5/27/1952
559,379	71/615,243	5/27/1952
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559,382	71/615,276	5/27/1952
559,383	71/615,317	5/27/1952
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559,396	71/615,913	5/27/1952
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559,416	71/616,758	5/27/1952
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559,468	71/595,396	5/27/1952
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934,281	72/368,053	5/23/1972
934,288	72/376,842	5/23/1972
934,295	72/382,689	5/23/1972
934,296	72/382,690	5/23/1972
934,297	72/383,733	5/23/1972
934,299	72/383,903	5/23/1972
934,304	72/390,695	5/23/1972
934,306	72/398,538	5/23/1972
934,309	72/385,527	5/23/1972
934,312	72/325,534	5/23/1972
934,313	72/337,221	5/23/1972
934,314	72/363,988	5/23/1972
934,316	72/368,821	5/23/1972
934,319	72/373,949	5/23/1972
934,324	72/388,456	5/23/1972
934,325	72/392,559	5/23/1972
934,334	72/386,372	5/23/1972
934,335	72/365,055	5/23/1972
934,340	72/379,274	5/23/1972
934,341	72/379,587	5/23/1972
934,343	72/380,159	5/23/1972
934,344	72/380,160	5/23/1972
934,345	72/380,493	5/23/1972
934,347	72/387,000	5/23/1972
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934,356	72/403,793	5/23/1972
934,357	72/404,178	5/23/1972
934,358	72/404,504	5/23/1972
934,359	72/385,843	5/23/1972
934,362	72/400,006	5/23/1972
934,363	72/401,410	5/23/1972
934,364	72/398,794	5/23/1972
934,367	72/368,758	5/23/1972
934,368	72/394,554	5/23/1972
934,369	72/396,751	5/23/1972
934,371	72/367,508	5/23/1972
934,372	72/373,889	5/23/1972
934,373	72/370,102	5/23/1972
934,377	72/400,219	5/23/1972
934,378	72/400,748	5/23/1972
934,380	72/328,568	5/23/1972
934,382	72/401,760	5/23/1972
934,383	72/317,928	5/23/1972
934,387	72/335,087	5/23/1972
934,389	72/356,138	5/23/1972
934,390	72/358,751	5/23/1972
934,393	72/361,045	5/23/1972
934,395	72/361,571	5/23/1972
934,396	72/361,688	5/23/1972
934,398	72/366,563	5/23/1972
934,400	72/366,797	5/23/1972
934,411	72/380,633	5/23/1972
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934,440	72/398,791	5/23/1972
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934,442	72/386,871	5/23/1972
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934,717	72/385,231	5/23/1972
934,718	72/385,232	5/23/1972
934,721	72/382,287	5/23/1972

4,889,443 CONNECTION ARRANGEMENT, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,135,413 WINDOW OUTLET, Peter P. Pannizzo, 15 Mount Tom Rd., New Milford, Conn. 06776, (203) 355-9367

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Reg. Number	Serial Number	Reg. Date
934,450	72/368,729	5/23/1972
934,452	72/396,397	5/23/1972
934,453	72/378,047	5/23/1972
934,455	72/397,689	5/23/1972
934,458	72/380,866	5/23/1972
934,462	72/386,100	5/23/1972
934,463	72/386,101	5/23/1972
934,468	72/388,040	5/23/1972
934,469	72/388,084	5/23/1972
934,474	72/371,830	5/23/1972
934,476	72/390,072	5/23/1972
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934,479	72/330,740	5/23/1972
934,485	72/369,499	5/23/1972
934,491	72/373,915	5/23/1972
934,494	72/386,243	5/23/1972
934,495	72/386,885	5/23/1972
934,507	72/368,322	5/23/1972
934,513	72/385,803	5/23/1972
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934,518	72/373,573	5/23/1972
934,520	72/378,195	5/23/1972
934,527	72/349,967	5/23/1972
934,529	72/341,586	5/23/1972
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934,534	72/370,021	5/23/1972
934,536	72/378,538	5/23/1972
934,541	72/378,174	5/23/1972
934,550	72/394,705	5/23/1972
934,551	72/367,572	5/23/1972
934,556	72/287,247	5/23/1972
934,557	72/296,575	5/23/1972
934,560	72/331,373	5/23/1972
934,564	72/334,332	5/23/1972
934,576	72/351,704	5/23/1972
934,580	72/360,579	5/23/1972
934,581	72/360,580	5/23/1972
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934,601	72/382,193	5/23/1972
934,607	72/384,592	5/23/1972
934,609	72/385,805	5/23/1972
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934,621	72/330,894	5/23/1972
934,622	72/340,691	5/23/1972
934,635	72/364,460	5/23/1972
934,638	72/364,647	5/23/1972
934,639	72/364,932	5/23/1972
934,640	72/370,424	5/23/1972
934,641	72/371,111	5/23/1972
934,644	72/371,112	5/23/1972
934,645	72/371,118	5/23/1972
934,646	72/374,314	5/23/1972
934,650	72/379,558	5/23/1972
934,654	72/382,552	5/23/1972
934,655	72/382,593	5/23/1972
934,664	72/375,765	5/23/1972
934,665	72/386,276	5/23/1972
934,667	72/391,436	5/23/1972
934,669	72/306,883	5/23/1972
934,671	72/341,802	5/23/1972
934,672	72/344,391	5/23/1972
934,673	72/354,730	5/23/1972
934,674	72/363,960	5/23/1972
934,675	72/368,595	5/23/1972
934,680	72/358,483	5/23/1972
934,683	72/359,267	5/23/1972
934,684	72/359,809	5/23/1972
934,688	72/367,257	5/23/1972
934,691	72/390,747	5/23/1972
934,692	72/325,771	5/23/1972
934,701	72/398,536	5/23/1972
934,704	72/339,611	5/23/1972
934,706	72/335,892	5/23/1972
934,707	72/358,905	5/23/1972
934,716	72/385,230	5/23/1972
934,717	72/385,231	5/23/1972
934,718	72/385,232	5/23/1972
934,721	72/382,287	5/23/1972
934,727	72/390,480	5/23/1972
934,730	72/378,255	5/23/1972
946,547	72/398,895	11/07/1972

Erratum

"All reference to Patent No. 5,193,309 to Masahiro Nozaki, et. al., Inazawa, Japan for AUTOMOTIVE WEATHERSTRIP appearing in the *Official Gazette* of Mar. 16, 1993 should be deleted since no patent was granted."

Patents Available for License or Sale

07/904,470 LEVELING TEST APPARATUS AND METHOD FOR OPTICAL INSTRUMENT, Horace B. Langford (deceased) and Donna C. Langford, 160-12 Crenshaw Dr., Tallahassee, Fla. 32310 (904) 574-9826

07/793,785 SHOULDER STRAP, Roseanne Puff, P.O. Box 23252, Santa Barbara, Calif. 93120 (805) 965-1408

4,296,611 HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL AND METHOD, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,402,199 DIFFERENTIALLY DAMPED SUPPORT ASSEMBLY FOR WASHING MACHINE, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,408,432 TRIM STRIP ASSEMBLY, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,535,600 TEMPERATURE CONTROL FOR A CYCLE DEFROST REFRIGERATOR INCORPORATING A ROLL-BONDED EVAPORATOR, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,638,826 DISHWASHING APPARATUS, Joseph F. Canosa, 5701 Boulevard East, Apt. 3A, West New York, N.J. 07093

4,716,886 UMBILICAL CORD CLAMP AND CUTTERS, Robert H. Fleming, McGoldrick & McGoldrick, 17601 S. Denver Ave., Gardena, Calif. 90248-3412, (310) 327-8508

4,757,430 ENTRANCE NIGHT DOOR LIGHT, Glenda A. Dubak, 44 Belleview, Mt. Clemens, Mich. 48043

4,778,217 ORTHOPEDIC CHAIR, Bruce E. Lane, 2158 Alice Ave., # 2, Oxon Hill, Md. 20745, (301) 894-5934

4,811,022 SCANNING ANTENNA HAVING PHASE CENTER DIVERSITY, Nicholas J. Cafarelli (deceased) and Glen D. Adams, David Craig Cafarelli, 85 East Street, Pittsfield, Mass. 01201 (413) 499-3371, Glen D. Adams, 4603 Marble Rock Ct., Chantilly, Va. 22021-2483 (703) 818-1577

4,855,550 WHITE TOUCH PADS FOR CAPACITIVE TOUCH CONTROL PANELS, Patent Counsel, General Electric Co., G.E. Appliances, 2-225, Louisville, Ky. 40225

4,865,120 FLOOR STRUCTURE FOR HEATING, Breiner & Breiner, P.O. Box 19290, Alexandria, Va. 22320-0290

4,869,231 LIFT-UP COOKTOP MOUNTING ARRANGEMENT FOR DOMESTIC RANGE, Patent Counsel, General Electric Co., G.E. Appliances, 2-225, Louisville, Ky. 40225

4,872,095 ENTRANCE DOOR NIGHT LIGHT, Glenda A. Dubak, 44 Belleview, Mt. Clemens, Mich. 48043

4,873,408 MAGNETRON WITH MICROPROCESSOR BASED FEEDBACK CONTROL, Patent Counsel, General Electric Co., G.E. Appliances, 2-225, Louisville, Ky. 40225

4,889,443 CONNECTION ARRANGEMENT, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,934,337 RETRACTABLE VENT AND COVER ARRANGEMENT FOR DOWN DRAFT COOKING APPLIANCE, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,938,215 UMBILICAL CORD CLAMP AND CUTTERS, Robert H. Fleming, McGoldrick & McGoldrick, 17601 S. Denver Ave., Gardena, Calif. 90248-3412, (310) 327-8508

4,944,157 REFRIGERATOR FREEZER COMPARTMENT FLOOR COVERING ASSEMBLY, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

4,960,372 COMPRESSOR WITH AN ISOLATED VANE SLOT, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,012,058 MAGNETRON WITH FULL WAVE BRIDGE INVERTER, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,026,971 AN IMPROVED TEMPERATURE CONTROL SYSTEM FOR A HEATING OVEN USING A GLASS-CERAMIC TEMPERATURE SENSOR, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,045,658 MAGNETRON WITH TEMPERATURE PROBE ISOLATION, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,053,740 PORCELAIN ENAMEL TEMPERATURE SENSOR FOR HEATING OVENS, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,059,761 INDUCTIVE DEPTH SENSING AND CONTROLLING METHOD AND SYSTEM FOR LASET DRILLING, Rudolph A. A. Koegl, et. al., Patent Counsel H-17, GE Aircraft Engines, General Electric Co., Cincinnati, Ohio 45215-6301

5,076,525 ANTI-TIP APPARATUS FOR APPLIANCE, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,078,203 HOT WATER TYPE FLOOR HEATING PANEL, Breiner & Breiner, P.O. Box 19290, Alexandria, Va. 22320-0290

5,117,523 HIGH SIDE REFRIGERATION SYSTEM MOUNTING ARRANGEMENT, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,119,802 IMPROVED GAS COOKTOP APPLIANCE FOR USE WITH DOWNDRAFT VENTILATION SYSTEM, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,127,775 FAIL SAFE STOP FOR A DRILL PRESS CONTROL DEVICE, James M. Broadment, et. al., Steven N. Fox, Chapin, Neal & Dempsey, 1331 Main St., Springfield, Mass. 01103

5,129,799 TORSIONAL VANE SPRING, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

5,132,138 WOOD SEALING AND PROTECTING PROCESS, Carole Terphon, Georgeco, P.O. Box 1655, Loganville, Georgia 30249, (404) 972-4155

5,134,416 SCANNING ANTENNA HAVING MULTIPATH RESISTANCE, Nicholas J. Cafarelli (deceased) and Glen D. Adams, Glen D. Adams, 4603 Marble Rock Ct., Chantilly, Va. 22021-2483, (703) 818-1577, David Craig Cafarelli, 85 East Street, Pittsfield, Mass. 01201 (413) 499-3371

5,135,413 WINDOW OUTLET, Peter P. Pannizzo, 15 Mount Tom Rd., New Milford, Conn. 06776, (203) 355-9367

5,141,439 KEYWORD TEACHING AND TESTING METHOD, Edward J. Cousins. P.O. Box 1547, Stafford, Tex. 77497

5,143,343 AUTOMOBILE RADIO SECURITY SYSTEM, Daniel P. Katz, Robert F. Zielinski, Ballard, Spahr, Andrews & Ingersoll, 1735 Market St., 51st Fl. Philadelphia, Pa. 19103-7599

5,151,687 APPARATUS FOR LOGGING ELECTRONIC MEDIA-TAPED MATERIAL, George G. Younger, 10553 Farallone Dr., Cupertino, Calif. 95014

5,152,065 TOOL HEAD HAVING AN EASILY REPLACEABLE HANDLE ATTACHED THERETO, Alfred F. Harding, P.O. Box 7, Orleans, Calif. 95556

5,154,150 REMOTE-START, FAIL-SAFE, DUAL-MODE, ENGINE THROTTLE CONTROL, John Vieira, P.O. Box 146, Glade Park, Colo. 81523

5,199,361 BEACH SAFETY ANCHOR SECURITY SYSTEM, Milton Robinson, Kenneth P. Glynn, Suite 201 (Plaza One), One Route, 12 West, Flemington, N.J. 08822-1731

D. 320,817 DICE DISPLAY UNIT, Martin T. Darchiville, Jaswantie Singh, 86-37 130 St., Richmond Hill, Queens, N.Y. 11418

D. 327,538 RETRACTABLE DOOR DRAFT VENT UNIT FOR REMOVING SMOKE AND GREASE VAPORS OF A COOKING RANGE OR COOK-TOP, Patent Counsel, General Electric Co., GE Appliances, 2-225, Louisville, Ky. 40225

Recordation of Trade Name: "Ashley Furniture Industries, Inc."

Agency: U. S. Customs Service, Dept. of the Treasury.
Summary: On Thursday, Sept. 24, 1992, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ASHLEY FURNITURE INDUSTRIES, INC.", was published in the *Federal Register* (57 FR 44228). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than Nov. 23, 1992. No responses were received in opposition to the notice.

Accordingly, as provided in § 133.14, Customs Regulation (19 CFR 133.14), the name "ASHLEY FURNITURE INDUSTRIES, INC." is recorded as the trade name used by ASHLEY FURNITURE INDUSTRIES, INC., a corporation organized under the laws of the state of California, located at 350 Madison St., Arcadia, Wis. 54612. The trade name is used in connection with furniture.

Effective Date: Nov. 30, 1992.

For Further Information Contact: Gina D'Onofrio, Intellectual Property Rights Branch, 1301 Constitution Ave., N.W., Washington, D.C. 20229, (202) 482-6960.

Nov. 24, 1992 JOHN F. ATWOOD
Chief, Intellectual Property Rights Branch

Registration To Practice

The following list contains the name of a person who successfully passed the registration examination that was held Oct. 14, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

nished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

PATENT NOTICES

Certificates of Correction For Week of April 13, 1993

5,082,393	5,084,517	5,086,765	5,094,950
5,082,429	5,084,955	5,086,963	5,126,867

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nished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

Bade, Annette L., 3332 Spring La., #C30, Falls Church, Va. 22041
Rasser, Jacobus C., Proctor & Gamble, 5299 Spring Grove Ave., Cincinnati, Ohio 45217
Mooi, Leslie A., Burns, Doane, Swecker & Mathis, 3000 Sand Hill Rd., Menlo Park, Calif. 94025

Mar. 23, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Aug. 21, 1991. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

Lo, Allen M., 1600 S. Eads St., #432N, Arlington, Va. 22202

Mar. 23, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Apr. 8, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May 20, 1993.

Marlott, John A., 1515 Jeff. Davis Hwy., #702, Arlington, Va. 22202

Mar. 23, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and TRademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before May. 20, 1993.

Boler, James R., 9422 Thrush La., Potomac, Md. 20854
Cote, France, 219 Petit Bourg, Repentigny, Que. J6A 7B9, Canada
DeKock. Elbie R., #408-2243 Folkestone Way, W. Vancouver, B.C. V7S 2Y7, Canada
Federman, Evan, 5028 S. 25th St., Arlington, Va. 22206
Gowan, Gerald A., 1169 Ballantry Rd., Oakville, Ont., L6H 5N1, Canada
Hoag, Willard E., 4911 Van Walbeek Pl., Annandale, Va. 22203
Leclerc, Alain M., 4332 Harvard Ave., Montreal, Que., H4A 2W9, Canada
Nozick, Bernard, 6405 Grason Ter., Bowie, Md. 20715
Piasetzki, Gregory A. 353 Glencairn Ave., Toronto, Ont. M5N 1V2, Canada
Simpson, Alistair G., 37 Alhambra Ave., Suite 1, Toronto, Ont., M6R 2S4, Canada

Mar. 23, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

PATENT NOTICES

Certificates of Correction For Week of April 13, 1993

Bl. 4,106,739	5,008,275	5,056,792	5,069,708
Des. 319,129	5,008,688	5,056,817	5,069,836
Des. 320,755	5,012,906	5,056,900	5,069,998
Des. 321,676	5,012,954	5,057,097	5,070,004
Des. 322,771	5,013,345	5,057,143	5,070,136
Des. 323,019	5,013,496	5,057,207	5,070,239
Re. 33,790	5,013,927	5,057,433	5,070,976
4,424,446	5,014,198	5,057,472	5,071,037
4,664,115	5,014,972	5,057,569	5,071,208
4,683,071	5,015,379	5,058,038	5,071,264
4,707,080	5,015,424	5,058,222	5,071,276
4,767,761	5,016,129	5,058,276	5,071,482
4,769,513	5,017,919	5,508,285	5,071,517
4,778,018	5,018,127	5,058,598	5,071,556
4,781,075	5,019,277	5,059,143	5,071,756
4,783,421	5,019,721	5,059,163	5,071,834
4,790,959	5,020,054	5,059,453	5,071,885
4,830,938	5,020,055	5,059,455	5,072,327
4,842,697	5,020,634	5,059,600	5,072,363
4,854,974	5,021,128	5,059,662	5,072,796
4,863,718	5,021,760	5,059,833	5,072,826
4,863,779	5,021,828	5,059,887	5,072,986
4,866,679	5,023,462	5,060,059	5,073,043
4,874,947	5,023,630	5,060,280	5,073,186
4,891,345	5,023,688	5,060,644	5,073,200
4,895,049	5,023,988	5,060,719	5,073,260
4,904,318	5,024,371	5,061,196	5,073,285
4,906,446	5,035,007	5,061,704	5,073,326
4,908,642	5,042,908	5,061,713	5,073,430
4,911,232	5,042,945	5,061,818	5,073,474
4,920,063	5,043,945	5,062,802	5,073,573
4,923,028	5,044,428	5,062,884	5,073,702
4,924,072	5,044,911	5,063,280	5,073,929
4,926,179	5,045,140	5,063,322	5,073,991
4,930,615	5,045,434	5,063,398	5,073,995
4,937,515	5,045,505	5,063,469	5,074,009
4,939,722	5,045,885	5,063,582	5,074,043
4,943,587	5,045,967	5,063,736	5,074,205
4,943,612	5,046,889	5,063,842	5,074,370
4,946,734	5,046,947	5,064,080	5,074,946
4,950,327	5,047,233	5,064,148	5,075,020
4,950,775	5,047,564	5,064,272	5,075,128
4,956,723	5,047,935	5,064,475	5,075,300
4,961,591	5,048,391	5,064,623	5,075,336
4,968,987	5,048,398	5,065,133	5,075,356
4,969,870	5,048,404	5,065,216	5,075,447
4,971,434	5,048,552	5,065,320	5,075,501
4,974,094	5,048,800	5,065,332	5,075,556
4,975,973	5,049,085	5,065,337	5,075,876
4,976,905	5,049,140	5,065,341	5,076,222
4,976,923	5,049,178	5,065,521	5,076,411
4,978,171	5,049,335	5,065,787	5,076,516
4,980,500	5,050,097	5,065,814	5,076,585
4,981,352	5,050,126	5,065,999	5,076,659
4,986,796	5,050,138	5,066,131	5,076,770
4,987,151	5,050,406	5,066,298	5,077,218
4,988,405	5,050,439	5,066,324	5,077,283
4,988,417	5,050,857	5,066,402	5,077,563
4,989,611	5,050,987	5,066,449	5,078,204
4,990,437	5,051,276	5,066,743	5,078,221
4,990,708	5,051,539	5,066,792	5,078,461
4,992,259	5,051,599	5,066,866	5,078,546
4,992,983	5,051,787	5,066,928	5,078,838
4,993,381	5,052,256	5,067,063	5,078,989
4,995,110	5,052,286	5,067,155	5,078,995
4,996,222	5,053,182	5,067,179	5,079,084
4,996,606	5,054,326	5,067,223	5,079,232
4,996,610	5,054,390	5,067,288	5,079,356
4,996,945	5,054,608	5,067,379	5,079,655
4,997,777	5,054,619	5,067,705	5,079,697
4,998,510	5,054,831	5,067,868	5,080,488
4,998,532	5,054,958	5,068,087	5,080,613
5,001,017	5,054,983	5,068,149	5,081,117
5,001,535	5,055,081	5,068,237	5,081,652
5,002,087	5,056,241	5,068,354	5,082,075
5,007,020	5,056,416	5,068,565	5,082,165
5,007,043	5,056,641	5,069,036	5,082,298
5,082,393	5,084,517	5,086,765	5,094,950
5,082,429	5,084,955	5,086,963	5,126,867
5,082,638	5,085,294	5,087,498	5,134,063
5,082,977	5,085,348	5,087,532	5,141,785
5,083,394	5,085,382	5,088,342	5,158,819
5,083,497	5,085,514	5,088,676	5,159,935
5,083,640	5,085,690	5,088,820	5,162,828
5,083,651	5,086,284	5,090,037	5,170,396
5,083,897	5,086,336	5,091,054	5,179,697
5,083,927	5,086,372	5,091,375	5,182,746
5,083,995	5,086,473	5,091,490	

Disclaimers

4,534,726—*William J. Simelunas*, Glen Rock, N.J. APPARATUS HAVING SHIMS UNDERLYING PORTIONS OF A DIE. Patent dated Aug. 13, 1985. Disclaimer filed Feb. 11, 1993, by the assignee, Nabisco Brands, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

4,578,027—*Daniel A. Koppa*, Bloomfield; *Walter Schaeder*, Bergenfield, both of N.J. DIE HAVING AIR PASSAGES. Patent dated Mar. 25, 1986. Disclaimer filed Feb. 11, 1993, by the assignee, Nabisco Brands, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

4,693,986—*Jaroslay Vit*, Union, N.J.; *Ronald L. Salsbury*, Dublin; *Don J. Henderson*, Danville, both of Calif. CERAMIC PROCESS AND PRODUCTS. Patent dated Sept. 15, 1987. Disclaimer filed Dec. 17, 1992, by the assignee, Orthomatrix, Inc.

Hereby enters this disclaimer to claims 1-7 of said patent.

4,717,570—*Robert A. Polizzano*, Teaneck, N.J. PROCESS AND DOUGH COMPOSITION FOR PRODUCING MULTI-TEXTURED COOKIES. Patent dated Jan. 5, 1988. Disclaimer filed Feb. 11, 1993, by the assignee, Nabisco Brands, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

4,722,849—*Clemence K. Dartey*, Oakland; *John W. Finley*, Whippany; *Robert R. Thulin*, Wyckoff, all of N.J. PROCESS FOR PREPARING CHOCOLATE CHIP COOKIES CONTAINING LOW MELTING FAT AND PRODUCT. Patent dated Feb. 2, 1988. Disclaimer filed Feb. 11, 1993, by the assignee, Nabisco brands, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

4,929,248—*Toshikazu Fuse*, Nagahama; *Atsushi Yamamoto*, Hikone; *Junji Sano*, Amagasaki, all of Japan. SILK FIBER HAVING GOOD ABRASION RESISTANCE AND GOOD LIGHT RESISTANCE AND METHODS FOR THE PREPARATION THEREOF. Patent dated May 29, 1990. Disclaimer filed Dec. 16, 1992, by the assignee, Kanebo Co., Ltd.

Hereby enters this disclaimer to claims 6 and 8 of said patent.

Disclaimers

4,939,102—*Robert A. Hamm*, Staten Island, N.Y.; *Roger J. Malik*, Summit; *Morton B. Panish*, Springfield; *John F. Walker*, Westfield, all of N.J. METHOD OF GROWING III-V SEMI-

Disclaimers and Dedications

4,745,515—*Daniel L. Fowler*, Kentwood, Mich. ELECTRICALLY OPERATED CONTROL DEVICE AND SYSTEM FOR AN APPLIANCE AND METHOD OF OPERATING THE

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Disclaimers

4,939,102—*Robert A. Hamm*, Staten Island, N.Y.; *Roger J. Malik*, Summit; *Morton B. Panish*, Springfield; *John F. Walker*, Westfield, all of N.J. METHOD OF GROWING III-V SEMICONDUCTOR LAYERS WITH HIGH EFFECTIVE HOLE CONCENTRATION. Patent dated July 3, 1990. Disclaimer filed Sept. 9, 1990, by the assignee, American Telephone and Telegraph Co..

Hereby enters this disclaimer to claims 1, 2, 3, 5, and 6 of said patent.

5,052,787—*Saburo Sugawara*, Kanagawa, Japan. ZOOM FINDER. Patent dated Oct. 1, 1991. Disclaimer filed Aug. 26, 1992, by the assignee, Asahi Kogaku Kogyo Kabushiki Kaisha.

Hereby enters this disclaimer to claim 8 of said patent.

5,088,490—*Joseph P. Pagliolo*, Columbia Heights; *Russell E. Anderson*, Brooklyn Park; *Richard F. Wiespfenning*, *Robert A. Betzold*, both of Fridley, all of Minn. BANDPASS FILTER CLOCK CONTROL. Patent dated Feb. 18, 1992. Disclaimer filed Jan. 29, 1993, by the assignee, Medtronic, Inc.

Hereby enters this disclaimer to claims 1, 4, and 6 of said patent.

Disclaimers and Dedications

4,745,515—*Daniel L. Fowler*, Kentwood, Mich. ELECTRICALLY OPERATED CONTROL DEVICE AND SYSTEM FOR AN APPLIANCE AND METHOD OF OPERATING THE SAME. Patent dated May 17, 1988. Disclaimer and Dedication filed Feb. 19, 1991, by the assignee, Robertshaw Controls Co.

Hereby disclaims and dedicates to the Public claims 1-3 of said patent.

4,764,372—*Corinna Herrnstadt; George G. Soares, Jr.*, both of San Diego, Calif. COMPOSITIONS CONTAINING BACILLUS THURINGIENSIS TOXIN TOXIC TO BEETLES OF THE ORDER COLEOPTERA, AND USES THEREOF. Patent dated Aug. 16, 1988. Disclaimer and Dedication filed Sept. 21, 1992, by the assignee, Mycogen Corp.

Hereby disclaims and dedicated to the Public the entire term of said patent.

5,070,199—*George C. Chiang*, Wilmington, Del. PROCESS FOR THE PREPARATION OF 2-AMINO-4-METHYL-6-METHOXY-1,3,5-TRIAZINE. Patent dated Dec. 3, 1991. Disclaimer and Dedication filed Jan. 7, 1993, by the assignee, E. I. Du Pont de Nemours and Co.

Hereby disclaims and dedicates to the Public the entire term of said patent.

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Box 171	Vacancy Announcement Applications.
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Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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	Pittsburgh, Carnegie Library of	(412) 622-3138
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Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VOL 1149 ISS 2 AP 13 1993 UMI

PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	4/11/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	7/09/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/29/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/29/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	9/05/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	9/17/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/31/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	12/05/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	3/20/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	8/24/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	11/18/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/15/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	6/09/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/12/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	6/12/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/25/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during March 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

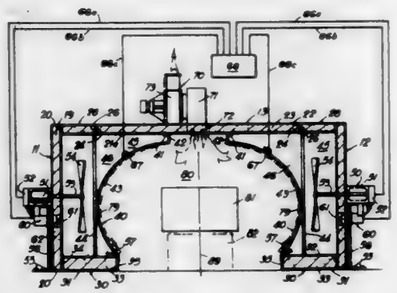
Patents ..... Numbers 3,940,801 to 3,947,895 inclusive
Plant Patents ..... 3,831 to 3,855

REEXAMINATIONS

APRIL 13, 1993

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,546,553 (1975th)
RADIANT WALL OVEN AND PROCESS OF DRYING COATED OBJECTS
Willie H. Best, Columbia, S.C., assignor to Haden Schweitzer Corporation
Reexamination Request No. 90/002,280, Feb. 11, 1991.
Reexamination Certificate for Patent No. 4,546,553, issued Oct. 15, 1985, Ser. No. 519,859, Aug. 3, 1983.
Continuation-in-part of Ser. No. 282,531, Jul. 13, 1991, Pat. No. 4,426,792, which is a continuation-in-part of Ser. No. 104,339, Dec. 17, 1979, abandoned, which is a division of Ser. No. 916,214, Jun. 6, 1978, Pat. No. 4,235,023
Int. Cl.[5] **F26B** *3/28, 23/10*
U.S. Cl. 34—39



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **12** is confirmed.

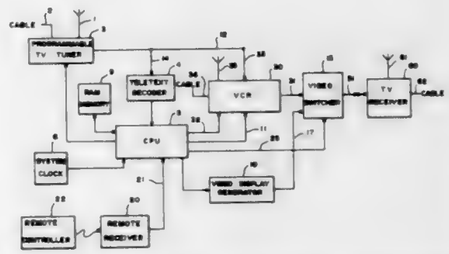
Claims **1, 7–11, 13–16** are determined to be patentable as amended.

Claims **2–6** and **17–23**, dependent on an amended claim, are determined to be patentable.

New claims **24–34** are added and determined to be patentable.

1. A radiant oven comprising:
(a) a housing having opposed side *wall* panels and a top panel extending between the upper ends of said side wall panels;
(b) spaced opposed radiant walls within said housing, said radiant walls being spaced inwardly from said side panels, said radiant walls having inner surfaces curving in opposite directions for defining therebetween a central heating chamber about which both of said **[**wall**]** *walls* are curved;
(c) means connected to said walls for forming outer chambers in which the walls define the inner portions of the outer chambers;
(d) means for providing, to said outer chambers, heated air for heating the outer surfaces of said walls to operating temperatures at which a majority of the radiant energy is emitted from the inner surfaces of said walls at wave lengths of 5 microns or greater.

B1 4,977,455 (1976th)
SYSTEM AND PROCESS FOR VCR SCHEDULING
Patrick Young, San Mateo, Calif., assignor to Insight Telecast, Inc., San Mateo, Calif.
Reexamination Request No. 90/002,678, Mar. 20, 1992.
Reexamination Certificate for Patent No. 4,977,455, issued Dec. 11, 1990, Ser. No. 219,971, Jul. 15, 1988.
Int. Cl.[5] **H04N** *7/087, 7/04, 1/00;* **G11B** *27/02*
U.S. Cl. 358—142



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentablility of claims **1–24** is confirmed.

1. A system to allow interactive selection for presentation to a user of supplemental broadcast information pertaining to a primary broadcast, which comprises a recording device, a broadcast receiver, a data processor connected to said recording device and to said broadcast receiver, said data processor including means responsive to a cue broadcast at a first time with, and in addition to, a program comprising the primary broadcast for presenting the cue on the broadcast receiver during, and simultaneous with presenting the primary broadcast on the receiver, the cue indicating the availability at a second time later than the first time of the supplemental broadcast information pertaining to the primary broadcast, means connected to the data processor for receiving a user response to the cue, and means responsive to the user response to the cue for controlling said recording device to record the supplemental broadcast information at the second time.

REISSUES

APRIL 13, 1993

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,216

METHOD OF AND APPARATUS FOR CONTROLLING ENGINE REVOLUTION SPEED

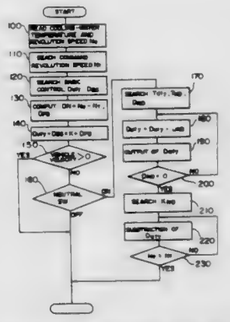
Tomiya Itakura, and Hiroshi Kamifuji, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuto, both of Japan

Original No. 4,879,982, dated Nov. 14, 1989, Ser. No. 234,936, Aug. 22, 1988. Application for reissue Mar. 7, 1991, Ser. No. 666,182

Claims priority, application Japan, Aug. 28, 1987, 62-213106

Int. Cl.[5] F02D *41/08*

U.S. Cl. 123—339 **8 Claims**



3. A method of controlling revolution speed of an engine for use in an automobile having an automatic transmission through which driving power is transmitted from the engine to driving wheels of the automobile, said method comprising the steps of:

(a) supplying auxiliary air by-passing a throttle valve through an auxiliary air control valve;

(b) actuating said auxiliary air control valve using electromagnetic means;

(c) detecting the revolution speed of the engine;

(d) controlling the flow rate of said auxiliary air through said auxiliary air control valve by control of said electromagnetic means in accordance with the detected revolution speed of the engine; and

(e) effecting an incrementing of a level of control of said electromagnetic means after a delay time (Tdly) upon receive of a signal representing that the state of said transmission has been changed from the neutral state to a power transmitting state.

Re. 34,217

MODULAR RACK UNIT

John Edmark, 350 Broadway, Apt. 925, New York, N.Y. 10024

Original No. 5,078,278, dated Jan. 7, 1992, Ser. No. 642,291, Jan. 17, 1991. Application for reissue Mar. 6, 1992, Ser. No. 847,341

Claims priority, application Israel, Jan. 23, 1990, 93138

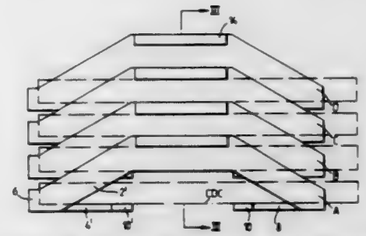
Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—41 **5 Claims**

1. A stackable modular unit for a storage structure for flat objects, comprising:

two lateral, mutually distanced, wall members each having an upper portion and a lower portion to which members are attached or with which are integral at least two bottom members and at least one top member, at lest one of said bottom members joining, and maintaining at a distance, said lateral wall members, said bottom and top members defining supporting and guiding surfaces for said object;

said lateral wall members having cut-outs in their lower portions, the upper portions of said wall members and said cut-outs being so configured as to permit, in the stacked state of said units, the nesting of the upper portion of each



lateral wall member of each unit in the cut-out in the lower portion of the corresponding wall member of the next-higher of said stacked units;

wherein any one of said objects, when introduced into, and slid onto the bottom members of, the nth of said stacked units, mechanically joins said nth unit to the (nth−1) unit.

Re. 34,218

EASILY-CLEANABLE FILTERS

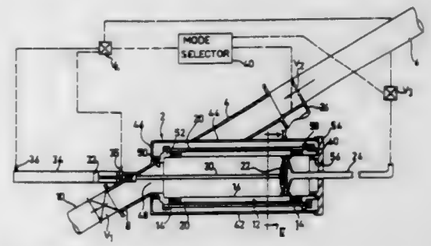
Mordeki Drori, P.O. Box 21538, Tel Aviv, Israel

Original No. 4,624,785, dated Nov. 25, 1986, Ser. No. 647,094, Sep. 4, 1984. Continuation of Ser. No. 148,211, Jan. 25, 1988, abandoned. Application for reissue Oct. 11, 1990, Ser. No. 596,635

Claims priority, application Israel, Sep. 2, 1983, 69638

Int. Cl.[5] B01D *29/46*

U.S. Cl. 210—108 **17 Claims**



1. A filter including

a housing having an inlet, an outlet, and a dirt-purging opening;

a plurality of circular filter discs in said housing with each disc being formed with a central opening, and all the discs being disposed in a stack with the side faces of adjacent discs contacting each other for filtering the fluid flowing through the housing from its inlet to its outlet;

a pair of end rings at the opposite ends of said stack of filter discs and of larger outer diameter than said filter discs, said end rings being formed with a plurality of openings therethrough around a circle of larger diameter than said filter discs;

a circular array of axially-extending rods passing through

said openings in said end discs and circumferentially-spaced from each other;

the outer surfaces of said filter discs constituting upstream

wave guide tube to pass therethrough and communicate with said channel.]

said panel comprising at least one pair of holes, the holes

[hollow] metal member which, when subjected to a compressive load, is adapted to contract heightwise of the member a distance corresponding to at least a major portion of the height

Re. 34,222

PHARMACEUTICAL COMPOSITIONS COMPRISING MAGNESIUM COMPOUNDS

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said openings in said end discs and circumferentially-spaced from each other;

the outer surfaces of said filter discs constituting upstream side of the filter discs and facing said housing inlet and dirt-purging opening, and the inner surfaces of said filter discs defined by their central openings constituting the downstream side of the filter stack and facing said housing outlet; and

a cleaning nozzle movable axially within said central openings of the filter discs for cleaning the filter disc stack, said cleaning nozzle including means for connecting it to a pressurized source of the fluid to be filtered for blowing out the filtered particles from between the filter discs in the stack through said circumferential spaces between the axially-extending rods and said dirt-purging opening, said cleaning nozzle also including means for outletting a fluid jet eccentric to the axis of the nozzle so as to rotate the nozzle by the reaction force applied thereto by said eccentric jet.

4. A filter comprising:

a housing having an inlet and an outlet opening;

a filter element disposed in said housing and having a central longitudinal axis, said filter element having a central open area arranged along said longitudinal axis of said filter element, an inner surface surrounding said central open area and an outer surface, the outer surface defining an upstream side of the filter element and the inner surface of the filter element defining the downstream side of the filter element;

a cleaning nozzle for emitting a pressurized fluid jet, said cleaning nozzle being disposed within said central open area and communicating with a source of pressurized fluid;

means for imparting rotation to said cleaning nozzle by outletting an eccentrically directed fluid jet such that the cleaning nozzle is rotted by a reaction force applied thereto by said eccentric jet; and

means for imparting axial motion to said cleaning nozzle.

Re. 34,219

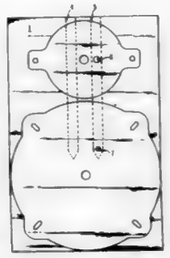
SOUND SYSTEM

Wayne A. Lederer, 1781 Bay Blvd., Atlantic Beach, N.Y. 11509

Original No. 4,933,981, dated Jun. 12, 1990, Ser. No. 333,335, Apr. 5, 1989. Application for reissue Oct. 2, 1990, Ser. No. 591,789

Int. Cl.[5] H04R *1/02*

U.S. Cl. 381—90 **14 Claims**



1. A sound system constructed entirely of magnetically inert *rf-shielded* components which remain unaffected by magnetic fields and do not affect imaging quality,

said system comprising a magnetically inert panel,

at least one pair of magnetically-inert transducers mounted upon said panel one of which is a high-frequency transducer and the other of which is a low frequency transducer,

at least one hollow channel extending into said panel from an edge thereof,

[an rf-tight enclosure,

means to mount said panel in said rf-tight enclosure,

said rf-tight enclosure comprising an opening to allow a wave guide tube to pass therethrough and communicate with said channel,]

said panel comprising at least one pair of holes, the holes positioned to communicate with said channel at one end thereof and to open said channel at an opposite end thereof adjacent said high frequency or low frequency transducer.

4. [The combination of claim 1, additionally comprising] *A sound system constructed entirely of magnetically inert rf-shielded components which remain unaffected by magnetic fields and do not affect imaging quality,*

said system comprising a magnetically inert panel,

at least one magnetically-inert transducer mounted upon said panel,

at least one hollow channel extending into said panel from an edge thereof,

an rf-tight enclosure in which said panel is mounted,

said rf-tight enclosure comprising at least one opening which is effective for enabling a wave guide tube to pass therethrough and communicate with said channel, and

wave guide tubing made of an electrically conductive non-ferrous material mounted in said opening and extending into and out of said enclosure.

6. A sound system constructed entirely of magnetically inert components which remain unaffected by magnetic fields and do not affect imaging quality,

said system comprising a magnetically inert panel,

at least one magnetically-inert transducer mounted upon said panel,

at least one hollow channel extending into said panel from an edge thereof,

a hole positioned in said panel to communicate at one end thereof with said channel and at an opposite end thereof to open adjacent said at least one transducer,

a penetration panel located at a first room in which the magnetically inert panel and an MRI scanner are located; and

an electrical cable leading from the penetration panel to the magnetically inert panel.

Re. 34,220

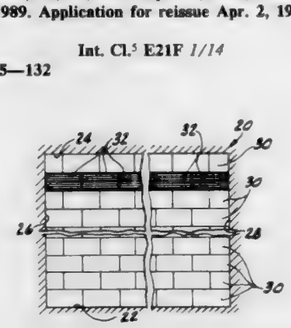
CONTRACTIBLE MINE STOPPING AND CONTRACTIBLE BLOCK MEMBER FOR USE THEREIN

William R. Kennedy, and John M. Kennedy, both of Taylorville, Ill., assignors to Jack Kennedy Metal Products and Buildings, Inc., Taylorville, Ill.

Original No. 4,915,540, dated Apr. 10, 1990, Ser. No. 361,211, Jun. 5, 1989. Application for reissue Apr. 2, 1992, Ser. No. 862,195

Int. Cl.[5] E21F *1/14*

U.S. Cl. 405—132 **21 Claims**



1. A contractible mine stopping adapted to be installed to extend as a vertical wall from the floor to the roof of a passage-way in a mine, said wall comprising a series of rows of substantially solid substantially non-compressible blocks of substantially fire-resistant material stacked one on top of another, and at least one row of contractible substantially fire-resistant [block-like] members adapted to contract without loss of structural integrity when the wall is subjected to a compressive load, as during a convergence of the floor and roof of the passage-way, each [block-like] *contractible* member being a [hollow] metal member which, when subjected to a compressive load, is adapted to contract heightwise of the member a distance corresponding to at least a major portion of the height of the member without loss of structural integrity of the member.

Re. 34,221

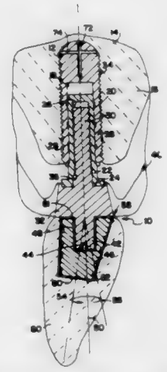
ADJUSTABLE DENTOALVEOLAR IMPLANT SYSTEM

Andras Haris, Radnor, Pa., assignor to Facial Alveodental Implant Rehabilitation, Inc., Bala Cynwyd, Pa.

Original No. 4,780,080, dated Oct. 25, 1988, Ser. No. 533, Jan. 5, 1987. Application for reissue Oct. 24, 1990, Ser. No. 602,841

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—173 **2 Claims**



2. A dental implant system intended for placement in an alveolus of the jawbone and for use with a crown, comprising in combination:

(a) a root having means for fixing the root to the jawbone and a portion extending into the alveolus;

(b) a post with

(1) a first portion fixed in the root and

(2) a second portion having

(a) a post base having a cross section adjacent the root and

(b) a tip

(1) with a cross section smaller than the post base cross section,

(c) extending from the post base, and

(d) a shoulder extending transversely of the second portion between the the tip extending into

(c) a head having

(1) a cavity receiving the tip in close fit,

(2) a head base extending transversely of the cavity, and

(3) a frusto-conical shape having a longitudinal central axis and having a surface opposite the head base in a plane normal to the longitudinal central axis of the head, and said head base having a surface in a plane at an angle to the longitudinal central axis of said head;

the root, the post including its base and tip, and the head cavity lying along a common longitudinal axis; the head base resting against the post shoulder;

(d) means fixing the head on the post at a selective rotational position, and

(e) a crown on the head,

whereby

when said head base rests against said shoulder, the longitudinal central axis of said head forms an angle with said common longitudinal axis of said root, the post including its base and tip, and the head cavity.

Re. 34,222

PHARMACEUTICAL COMPOSITIONS COMPRISING MAGNESIUM COMPOUNDS

Maurice Bloch, 4 Lansdowne Road, London N3 1ES, United Kingdom

Original No. 4,788,180, dated Nov. 29, 1988, Ser. No. 675,900, Nov. 26, 1984. Application for reissue Nov. 28, 1990, Ser. No. 619,055

Claims priority, application United Kingdom, Mar. 24, 1983, 8308126

Int. Cl.[5] A61K *9/22, 3/08, 33/06*

U.S. Cl. 514—26 **23 Claims**

1. A method of treating a human patient suffering from magnesium/potassium deficiency, said method comprising the step of orally administering to such human patient a therapeutically meaningful dosage of a pharmaceutical composition which consists essentially of a magnesium compound selected from the group consisting of magnesium oxide, magnesium hydroxide and pharmaceutically-acceptable salt of magnesium, and a pharmaceutically-acceptable carrier, said pharmaceutically-acceptable carrier functioning to control the release of magnesium into the digestive tract of said human patient [over] *so that duration of action of said pharmaceutical composition is for* a period *of* [*from*] *between 2* [*to*] *and* 24 hours.

Re. 34,223

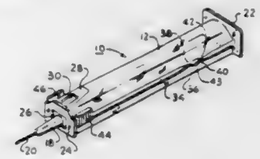
CATHETER INSERTER

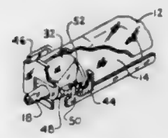
Jean M. Bonaldo, Upland, Calif., assignor to Care Medical Devices, Inc., Ontario, Calif.

Original No. 4,917,669, dated Apr. 17, 1990, Ser. No. 308,137, Feb. 8, 1989. Continuation of Ser. No. 572,900, Apr. 17, 1990, abandoned. Application for reissue Mar. 19, 1992, Ser. No. 857,086

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—164 **20 Claims**





7. A catheter inserter comprising:

an inserter housing of parti-cylindrical configuration having a flat base which is generally parallel to the longitudinal axis of the inserter housing;

a cannula;

a cannula housing disposed within the inserter housing and longitudinally slidable therewithin, said cannula housing having a main body portion of a cross-sectional configuration which is generally complementary with the inserter housing cross-sectional configuration;

said cannula housing including hub means for fixing said cannula to said cannula housing main body portion so as to extend generally parallel to the inserter housing longitudinal axis;

first stop means disposed at said first end of said inserter housing and operable to stop said cannula housing in a first disposition in which the cannula extends outwardly from the inserter housing at a first end of said inserter housing;

second stop means formed on said inserter housing remote from said first stop means; and

locking means formed on said cannula housing so as to be selectively engageable with said second stop means to lock said cannula in a second disposition in which said cannula is retracted within said inserter housing.

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GRANTED APRIL 13, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,199

HYBRID RUGOSA ROSE PLANT NAMED 'MORTEN'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Oct. 29, 1991, Ser. No. 784,270
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of Hybrid Rugosa shrub rose plant of hardy, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of decorative (informal) form, essentially medium red in color, with reverse of petals being a slightly lighter shade of red, and further characterized by the plant of vigorous well rounded shape, with the main stems and shoots being moderately thorny, said plant being easy to propagate from cuttings or by budding, with an abundance of medium to large (Rugosa type) semi-glossy to matte foliage and an abundance of flowers borne in sprays or clusters of 5 to 25 or more.

8,200

MINIATURE ROSE PLANT NAMED 'MORYOU'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Nov. 29, 1991, Ser. No. 799,968
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially deep pink to red in color, with reverse of petals being a slightly lighter shade of red, and further characterized by the plant being of compact well rounded shape, vigorous, with the main stems and shoots being usually sparsley thorny, said plant being easy to propagate from cuttings or by budding, with an abundance of medium to small semi-glossy to matte foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

8,201

FLORIBUNDA ROSE PLANT NAMED 'MORHOOP'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Dec. 23, 1991, Ser. No. 812,434
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of Floribunda rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by slender buds and flowers of unique color pattern, essentially white edged or bordered with pink to medium red, and further characterized by the plant being of compact well rounded shape, vigorous, with the main stems and shoots being moderately thorny, said plant being easy to propagate from cuttings or by budding, with an abundance of medium semi-glossy foliage and an abundance of flowers borne several to the stem in loose clusters.

8,202

JUNIPER PLANT—GOLD LACE VARIETY

John C. Bakker, Jr., St. Catharines, Canada, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 28, 1991, Ser. No. 727,227
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—50.2 1 Claim

1. A new and distinct variety of *Juniperus chinensis*, substantially as herein shown and described, which:

(a) grows more slowly than Juniperus Golden Pfitzer,
(b) exhibits an attractive, deeper and more persistent golden foliage coloration than Juniperus Golden Pfitzer which extends to near the center of the plant, and
(c) exhibits a compact more prostrate growth habit than other golden *Juniperus chinensis* varieties.

8,203

CHRYSANTHEMUM PLANT NAMED LIGHT FALMA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 9, 1991, Ser. No. 756,837
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct Chrysanthemum plant named Light Falma, as described and illustrated.

8,204

ALSTROEMERIA NAMED VICTORIA

G. E. Veldhuyzen Van Zanten, Hillegom, Netherlands, assignor to Gebr. van Zanten, Hillegom, Netherlands

Filed Nov. 29, 1991, Ser. No. 800,216
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—87.2 1 Claim

1. The new and distinct variety of Alstroemeria plant substantially as herein shown and described, characterized by the distinctive burnt orange coloring of the flowers and the yellow coloring at the base of the inside petals, and by the longitudinal pencil stripes on the inside petals.

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GENERAL AND MECHANICAL

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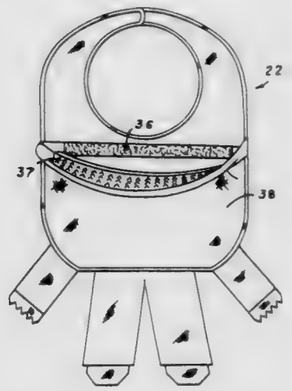
GRANTED APRIL 13, 1993

GENERAL AND MECHANICAL

5,201,073
COMBINATION BIB AND DOLL WITH STORAGE POCKET
Marilyn S. Spanier, 301 E. 76 St., (#4), New York City, N.Y. 10021, assignor to Marilyn Spanier, New York, N.Y.
Filed May 6, 1991, Ser. No. 696,065
Int. Cl.[5] A41B *13/10, 27/20*
U.S. Cl. 3—49 R 1 Claim



1. A combination bib and toy wherein the bib is configured in the shape of a toy having a body and a pair of arms, legs and hands, said combination providing a bib to protect a child while also providing an amusement device for the child, the improvement comprising:

a pocket means having a panel attached to a back of said body portion of said bib, said panel forming an outer panel for said pocket means and said back of said body portion of said bib forming an inner panel of said pocket means;

a first attaching means attached to an upper interior edge of said outer panel;

a second attaching means attached to an upper section of said back of said body portion of said bib for removably attaching said upper interior edge of said outer panel to said upper section of said back of said body portion of said bib to close and open said pocket means; and when said pocket means is filled with diapers and clothes, the bib and toy combination assumes a three dimensional form;

a holder means formed from at least front and back panels attached to each other;

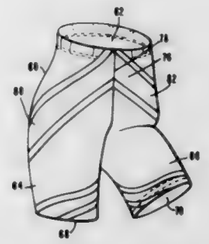
a third attaching means attached to an exterior upper edge of a back of said holder means;

a fourth attaching means attached to a middle section of said back of said body portion of said bib for removably attaching said back of said holder means to said middle section of said back of said body portion of said bib; wherein said holder means is hidden in the pocket means when attached to said bib;

a fifth attaching means attached to the interior top center edges of each panel of said holder means for removably attaching said interior top center edges together to open and to close said holder means;

a sixth attaching means attached to said pair of hands for removably attaching the hands to each other and for alternatively attaching said holder means to either hand of said pair of hands.

5,201,074
EXERCISE SUIT WITH RESILIENT REINFORCING
Timothy P. Dicker, 11359 Dorafield, Lakeview Terrace, Calif.
Continuation-in-part of Ser. No. 712,459, Jun. 10, 1991, Pat. No. 5,109,546. This application Dec. 30, 1991, Ser. No. 814,508
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—70 10 Claims



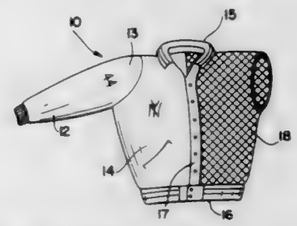
1. Exercise short pants with resilient reinforcement for increasing resistance to a wearer's muscles comprising:

a pair of stretchable form-fitting short pants having an open waist and a pair of short legs each containing an opening at an end thereof;

first and second elongatable resistive bands fastened to said short pants at a back vertical midline thereof adjacent said open waist in a depending inverted V-shape, each said elongatable resistive band spirally encircling each leg and affixed thereto, each said band having a common beginning at said midline and running diagonally downward around a back part of a wearer's thigh and terminating at said opening of said leg after encircling a front portion of said leg above a wearer's knee;

wherein said first and second bands form a resistive constraint upon the wearer's body between the waist and knees for muscular toning and exercise.

5,201,075
SEPARABLE VENTILATED ATHLETIC JACKET
Ronald J. Svetich, 1137 Timber La., Ft. Collins, Colo. 80521
Filed Sep. 4, 1992, Ser. No. 940,477
Int. Cl.[5] A41D *1/02*
U.S. Cl. 2—108 12 Claims



1. Athlete's arm jacket comprising:

(a) a first shell portion for covering one side of the upper torso of a person wearing the jacket;

(b) a first sleeve member attached to and carried by said first shell portion;

(c) a mesh material attached to said first shell portion for covering the opposite side of the upper torso of said person;

(d) closure means for closing said jacket around the upper torso of said person;

(e) a second shell portion detachably secured to said first shell portion for covering said mesh material; and

whereby said top edge having said two strips of loop material secured at opposing sides thereof may engage

5,201,079
TOILET VENTILATION SYSTEM

portion opening upwardly from said base in alignment with said inlet end portion, seal means disposed between said bot-

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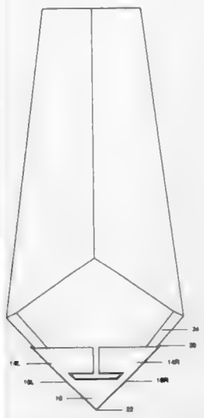
(e) a second shell portion detachably secured to said first shell portion for covering said mesh material; and
(f) a second sleeve member attached to and carried by said second shell portion.

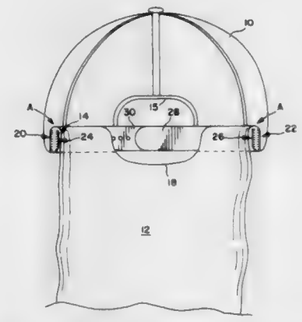
5,201,076
TIE TIP
Edward J. Schemine, Jr., 4551 Haverfield Ct., Hilliard, Ohio 43026
Filed Dec. 10, 1990, Ser. No. 624,543
Int. Cl.[5] A41D *25/16*
U.S. Cl. 2—145 **1 Claim**



1. A v-shaped hollow wedge trim article designed to conform and attach to an apex of a necktie through a crimping process, the interior surfaces of said wedge being smooth; said trim article consisting of a v-shaped wedge enclosure comprising a v-shaped wedge front plate conforming to the apex of necktie and back plate sections and side walls, said back plate sections arranged spaced from said front plate by said side walls, said front plate and said back plate sections and said side walls being formed from stamped material bent up and over to form said side walls and said back plate sections to provide an opening therebetween for accepting said apex of necktie, said front plate and said back plate sections being firmly pinched together with said apex of necktie inserted between, thereby applying force to said apex of necktie as said front and said back plate sections of said trim article are drawn together to securely fasten said trim article to said apex of necktie.

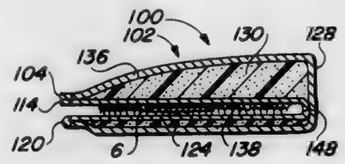
5,201,077
CAP WITH DETACHABLE SUN SHIELD
Steven C. Dondlinger, 5513 Knoll Dr., Edina, Minn. 55436
Filed Apr. 30, 1992, Ser. No. 876,092
Int. Cl.[5] A42B *1/06*
U.S. Cl. 2—199 **20 Claims**

1. A cap with a detachable sun shield comprising:
a. the cap including a cap band having a hook strip material attached to an outer surface of said cap band;
b. a sun shield having two strips of loop material secured at opposing sides of a top edge of the sun shield, a cutout centrally located at said top edge between said two strips of loop material; and,
c. said top edge with the two strips of loop material secured at opposing sides thereof having a fold line along a horizontal axis, whereby said two strips of loop material may be presented for hook and loop strip material engagement with said hook strip material of said cap band, and whereby said top edge having said two strips of loop material secured at opposing sides thereof may engage



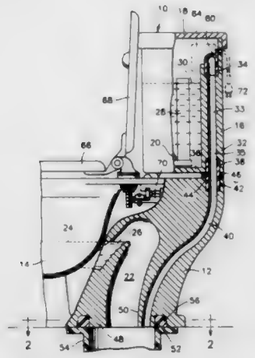
said hook strip material in said cap band to attach said sun shield to said cap.

5,201,078
SHOULDER PAD AND BRASSIERE STRAP PAD APPARATUS
Ardella R. Melton, P.O. Box 6955, Phoenix, Ariz. 85005-6955
Filed Jun. 10, 1991, Ser. No. 712,448
Int. Cl.[5] A41D *27/26*
U.S. Cl. 2—268 **19 Claims**



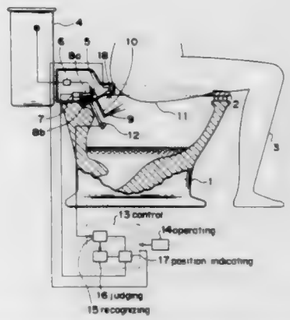
1. Shoulder pad and brassier strap pad apparatus, comprising, in combination:
outer element means having first and second outer ends, which outer ends have a first width, and a center portion having a second width which is less than the first width, and which center portion comprises a first fold area, the first fold area dividing the outer element means into a first and second portion, which first and second portions extend respectively from the first and second outer ends inwardly to the center portion;
pad means disposed on the first portion between the center portion and the first outer end, the pad means including a first pad defining a brassiere strap pad and a second pad spaced apart from the first pad and defining a shoulder pad;
means for securing the second portion over the pad means to the first portion;
fastening means on the second portion, including a first fastener portion adjacent to the first fold area and disposed above the first pad and a second fastener portion adjacent to the outer ends and disposed over the second pad, a second fold area defined between the first and second pads and the first and second fastener portions; and
the first fastener portion is adapted to receive a brassiere strap, and the second fastener portion is adapted to be disposed against the first fastener portion upon the folding of the apparatus on the second fold area to hold the brassiere strap in place, with the outer ends disposed in an overlying relationship on the first fold area and extending outwardly therefrom.

5,201,079
TOILET VENTILATION SYSTEM
Edward W. Sowards, 160 Ridge Rd., Ben Lomond, Calif. 95005
Filed Sep. 24, 1991, Ser. No. 764,635
Int. Cl.[5] E03D *9/04*
U.S. Cl. 4—216 **3 Claims**



1. A toilet of the type including a toilet bowl having a base for support from a floor, a water tank having a bottom and a water tank cover, said water tank including an overflow conduit whereby water in excess of a desired water level in said tank may be dispensed into said bowl and through which odorous air may be educted from said bowl into said tank above said level, said water tank also including a flushing mechanism whereby water may be discharged into said bowl from said tank to flush said bowl, and air space in said tank below said tank cover and above said desired water level, said toilet bowl including a predetermined water level and a siphon-type outlet below said water level with which said bowl water level coacts to form a water seal between said siphon-type outlet and the interior of said bowl, said siphon-type outlet opening downwardly from said base through a thick-walled tubular outlet nipple having inner and outer walls, the outer wall of said outlet nipple being adapted for sealed connection with a soil pipe with which said outlet nipple is registered through the use of a conventional seal, conduit means for providing a passage from said air space to said soil pipe including an outlet end portion extending through and opening downwardly from a predetermined portion of said tubular outlet nipple between the inner and outer walls thereof and an inlet end portion opening outwardly into said air space, blower means for drawing the odorous air out of said air space and forcing it into said conduit means, said blower means being mounted within said tank in said air space including an inlet opening into said air space and an outlet, communication means communicating said blower means outlet with said conduit means inlet end portion in sealed communication therewith, said communication means including pressure differential operated one way air flow controlling valve means for controlling the flow of odorous air, said valve means being normally biased to a closed position to prevent reverse flow of air from said conduit means outlet end portion through said conduit means, communication means and blower means into said air space and operable, responsive to operation of said blower means and the resultant increased upstream pressure from said blower means acting thereon, to allow the flow of air in a downstream direction through said communication means and said conduit means outwardly of said conduit means outlet end, said conduit means inlet end portion being disposed with said tank and opening downwardly though the bottom of said tank and said outlet portion of said conduit means being contained within said base, said inlet end portion of said conduit means being formed integrally with an upstanding wall of said tank and said base being spaced below the portion of said bottom through which said inlet end portion opens, said outlet portion opening upwardly from said base in alignment with said inlet end portion, seal means disposed between said bottom and base sealingly communicating said inlet and outlet end portions of said conduit means, aligned ends of said inlet end portion and said outlet end portion of said conduit means being diametrically enlarged, said seal means including a connecting sleeve extending between and snugly received in said diametrically enlarged adjacent ends, and a resilient seal ring disposed thereabout in sealed engagement with said sleeve and axially compressed between said bottom and base about said diametrically enlarged adjacent ends.

5,201,080
CLEANSING CONTROL APPARATUS
Eiichi Tanaka, Nara, and Hiroshi Fujieda, Kashiwara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 3, 1991, Ser. No. 753,885
Claims priority, application Japan, Sep. 11, 1990, 2-242083; Sep. 11, 1990, 2-242084; Mar. 19, 1991, 3-54517
Int. Cl.[5] E03D *9/08*; **A61H** *33/00*
U.S. Cl. 4—443 **8 Claims**



1. A cleansing control apparatus for a toilet having a seat for a suer, the apparatus comprising:
a cleaning fluid projecting means for projecting a cleaning fluid;
a position controlling means for controlling the position where the fluid from said cleaning fluid projecting means hits an aimed part of a user when sitting on said seat;
a pick-up unit for monitoring the color and brightness of the aimed part; and
a control unit for calculating the position of the aimed part to be cleaned on the basis of an image signal generated by said pick-up unit, and for inputting a control signal to said position controlling means.

5,201,081
SHOWER CURTAIN SUPPORT HAVING COMBINED ANTI BILLOWING AND HANDLE MEANS
Tommy D. Knight, 204 Patricia Rd., Madison, Ala. 35758
Filed Feb. 27, 1991, Ser. No. 661,886
Int. Cl.[5] A47K *3/22*
U.S. Cl. 4—609 **6 Claims**

1. In combination with a curtain having end edge portions, an intermediate portion, and a top edge portion having a plurality of spaced openings therein, a curtain rod extending between a pair of spaced end walls which, with a rear wall, define an enclosure, means for slidably supporting said curtain on said rod, comprising:
a curtain support including an elongated primary arm having opposed ends and a secondary arm having opposed ends with one end of the secondary arm attached to one end of the primary arm in a generally perpendicular orientation

for supporting said curtain for movement into and out of overlapping, sealing relation with a portion of at least one

and which in a closed position prevents fluid from flowing into the toilet bowl;

bers of said seat section with forward end portions of the side members of said back section, the forward portions of the side

into the nut; said pin being retained in the through passage and nut by a circumferential bushing around the inner tube which slidably engages the inner surface of the hollow

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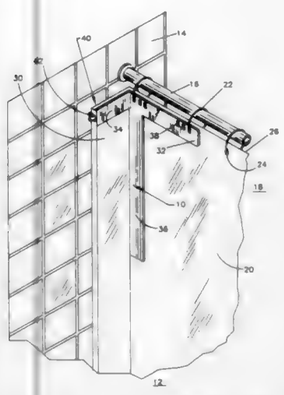
for supporting said curtain for movement into and out of overlapping, sealing relation with a portion of at least one end wall, said primary and secondary arms being disposed for non-movable, non-pivotal relation therebetween, said primary arm having a plurality of spaced openings along the length thereof;

first attachment means for attaching said primary arm and said intermediate portion of said curtain to said curtain rod, said first attachment means defined by a plurality of curtain support members slidably carried on said rod and extending through said spaced openings along the length of said primary arm and through a plurality of said spaced openings along said top edge portion of said curtain whereby said primary arm and said top edge portion of said curtain are attached together along the length of said primary arm and to said curtain rod for slidable movement therealong;



second attachment means for attaching said curtain to said secondary arm, said second attachment means including a hook-like member extending from the distal end of said secondary arm for insertion into a said opening along the top of said curtain near at least one edge portion of said curtain for moving said at least one edge portion of said curtain into and out of overlapping, sealing relation with a portion of said at least one end wall; and

an elongated anti-billowing and handle means depending downwardly from the primary arm so that then said primary arm is attached to the top edge of said curtain, said anti-billowing and handle means will function to prevent billowing of said curtain toward the interior of said enclosure and will serve as a handle for a user to grasp in order to move said curtain into and out of said sealing relation.

5,201,082
GRAY WATER TOILET SYSTEM
Daniel J. Rockwell, 47 Sun River, Cascade Rd., Sun River, Mont. 59483
Filed Sep. 19, 1991, Ser. No. 762,479
Int. Cl.[5] E03C *1/01*; E03D *5/10, 11/10*
U.S. Cl. 4—665 **1 Claim**

1. A gray water toilet system using previously used water containing suspended particulate matter for flushing, the system comprising:

a toilet having a bowl with a discharge opening below the bowl for discharging fluid in the bowl into a sewer line;

a reservoir holding fluid above the bowl;

a discharge passage to allow fluid in the reservoir to flow into the toilet bowl;

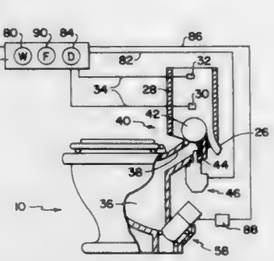
a reservoir valve located in the discharge passage which in an open position allows fluid to flow into the toilet bowl and which in a closed position prevents fluid from flowing into the toilet bowl;

the reservoir valve including a sinkable sphere for resting in a seat, in which position the reservoir valve is at the closed position;

the seat having an inner surface shaped as a truncated cone with a longitudinal axis positioned generally vertically, the inner surface having an opening at the narrowest part of the cone adjacent a bottom of the seat and opening into the bowl;

an electrically actuated solenoid lifting device including a stem element positioned for engagement with the sinkable sphere;

the solenoid lifting device, upon actuation, moves the stem upwardly pushing the sinkable sphere upwardly and out of the seat to open the reservoir valve;



a bowl valve positioned in the discharge opening which in an open position allows fluid in the bowl to be discharged into the sewer line and which in a closed position prevents fluid from being discharged into the sewer line;

the bowl valve including a piston moveable into the discharge opening to close the bowl valve and movable out of the discharge opening to open the bowl valve;

means for biasing the bowl valve piston to the closed position;

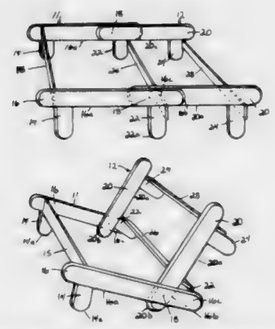
an electrically actuated solenoid which upon actuation moves the piston against the force of the biasing means to open the bowl valve; and

an electrical control means for controlling the actuation of the reservoir valve solenoid and the bowl valve solenoid independently of one another;

the electrical control means further including a selectively actuated timer means for delaying the closing of the bowl valve until after the reservoir valve is closed.

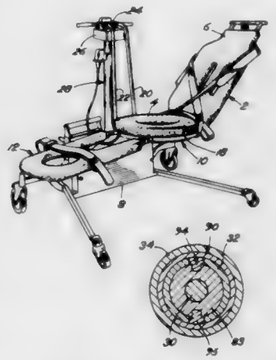
5,201,083
SEATING TYPE ARTICLE OF FURNITURE CONVERTIBLE INTO A BED
Scott C. Johnson, 236 I St., Salt Lake City, Utah 84103
Filed Nov. 1, 1991, Ser. No. 786,712
Int. Cl.[5] A47C *17/04, 17/16*
U.S. Cl. 5—38 **9 Claims**

1. An article of furniture convertible from a seat to a bed and vice versa, comprising a frame assembly having a seat section and a back section pivotally interconnected; said seat section having a pair of opposite side members with means structurally interconnecting them and a pair of legs rigidly affixed to the forward end portions, respectively, of its side members for forwardly supporting said seat section in both seat and bed condition of the article of furniture; the said back section having a pair of opposite side members with means structurally interconnecting them, and pairs of legs affixed to forward and rearward end portions, respectively, of its said side members for forwardly and rearwardly supporting said back section in the bed condition of the article of furniture; and pivot means pivotally connecting rearward end portions of the side members of said seat section with forward end portions of the side members of said back section, the forward portions of the side



members of said back section supporting the rear portion of the seat section in the seat condition of the article of furniture.

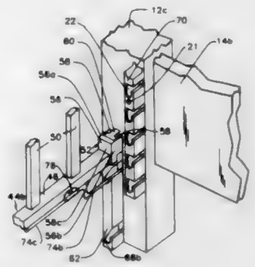
5,201,084
SCREW DRIVEN LIFT MECHANISM FOR A HOSPITAL PATIENT CHAIR TRANSFER SYSTEM
Thomas G. Johnson, Blue Hill, Nebr., assignor to Dutton-Lainson Company, Hastings, Nebr.
Filed Sep. 24, 1991, Ser. No. 765,361
Int. Cl.[5] A61G *7/10*
U.S. Cl. 5—81.1 **7 Claims**



1. In a patient transfer system of the type including a frame, a telescoping lift post supported by the frame, said post including a hollow inner tube telescopically mounted within a hollow outer tube, said outer tube supported by the frame and having a top and, a screw actuator connected to the inner tube for vertically translating the inner tube relative to the outer tube, motor means for driving the screw actuator, said inner tube including a support block assembly at its top end for support of a patient transport chair or the like, said inner tube rotatable about a vertical axis for horizontal transport of patient chair or the like supported on the support block; the improvement comprising:

an improved coupling assembly for coupling the actuator to the inner tube and for simultaneously providing a bearing for the inner tube within the outer tube, said coupling assembly including a nut on the actuator, said nut having thread passage means for receipt of the screw actuator, said nut being slidably positioned within the hollow inner tube and generally congruent with the inner tube, said nut being attached to the inner tube by at least one pin projecting through a through passage in the wall of the inner tube into the nut; said pin being retained in the through passage and nut by a circumferential bushing around the inner tube which slidably engages the inner surface of the hollow outer tube, and retaining means for holding the bushing on the inner tube for movement therewith as the actuator is driven.

5,201,085
CRIB WITH DROP SIDE LOCK
Louis Shamie, 972 Dean St., Brooklyn, N.Y. 11238
Filed Apr. 14, 1992, Ser. No. 868,468
Int. Cl.[5] A47D *7/02*
U.S. Cl. 5—93.1 **8 Claims**



1. A crib comprising:

four vertical corner posts;

connecting means for interconnecting said four vertical corner posts;

mattress support means for supporting a mattress between said four vertical corner posts;

a drop side movable in a vertical direction between a pair of said vertical corner posts, said drop side including a lower rail;

slide means secured to said drop side for slidably guiding said drop side in the vertical direction;

a kick bar rotatably secured to the lower rail of said drop side, said kick bar including rod ends;

guide member means for guiding said slide means so as to slidably guide said drop side in the vertical direction and for retaining said drop side in a raised or lowered position, said guide member means being positioned at lower ends of said pair of vertical corner posts and having a width, and slot means for receiving said rod ends to retain said drop side in the raised or lowered position, said slot means being formed within said guide member means such that said slot means does not increase the width of said guide member means; and

biasing means for biasing said kick bar in a rotatable direction so as to automatically bias said rod ends thereof into said slot means when said kick bar is positioned adjacent said slot means upon lowering of said drop side.

5,201,086
WATER BED SHEET ARRANGEMENT
John W. Decker, and Sandra M. Decker, both of 4347 Bingham, St. Louis, Mo. 63116
Filed Jun. 29, 1992, Ser. No. 905,682
Int. Cl.[5] A47G *9/04*
U.S. Cl. 5—451 **1 Claim**

1. A water bed sheet arrangement, comprising,

a water bed having a water bed container frame, and a mattress contained within the container frame, the container frame including container frame side walls and a container frame foot board directed coextensively between the side walls, and

the mattress including a mattress top surface and a mattress bottom surface, and

a first sheet member and a second sheet member, the first

sheet member and the second sheet member including a

central seat portion and each being pivotally attached to

a stand supporting said table relative to a stable horizontal

5,201,090

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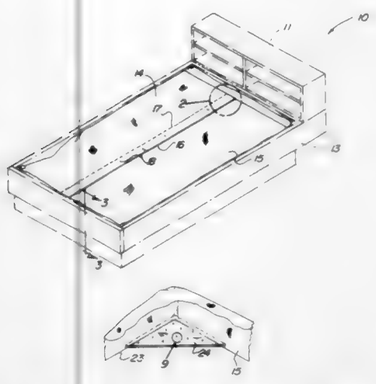
sheet member and the second sheet member including a first sheet member first side edge and a second sheet member second side edge positioned in adjacency in a parallel relationship relative to one another in an overlapped configuration onto a top surface of the mattress, and

the second sheet member includes a row of button members mounted to the second sheet member adjacent the second sheet member first side edge, the first sheet member including a like plurality of button member receiving slots for receiving the button members, wherein the button member receiving slots are directed through the first sheet member adjacent the first sheet member first side edge, and



the first sheet member and the second sheet member are joined at the first side edge and second side edge to include a lower seam directed along the foot board, and

the first sheet member includes a first sheet member second side edge spaced from the first sheet member first side edge, and a second sheet member second side edge spaced from the second sheet member first side edge, and the first sheet member second side edge includes a flexible corner plate positioned adjacent the foot board, and the second sheet member second side edge includes a further corner plate positioned adjacent the foot board, and

each corner plate is of flexible construction and including a matrix of resilient conical tips mounted to the corner plate in communication with the mattress bottom surface.

5,201,087

PATIENT PRESENTATION

John E. A. Wickham, 29 Devonshire Place, London, England W1N 1PE , and Ronald A. Miller, 16 Woodland Gardens, London, England N10 3UA

Continuation-in-part of Ser. No. 314,179, Feb. 22, 1989, abandoned. This application Dec. 12, 1990, Ser. No. 626,040

Claims priority, application United Kingdom, Feb. 25, 1988, 8804576

Int. Cl.[5] **A61G** *13/00*; **B60N** *2/02*; **A47C** *7/02*

U.S. Cl. 5—610 **11 Claims**

1. A wheelchair comprising

a frame;

wheels on said frame,

a back rest portion mounted on said frame for pivotal movement from a normal upright inclined position to a substantially horizontal position,

a central seat portion mounted on said frame and pivotable about a horizontal axis located adjacent the lower end of the back rest portion from a normally substantially horizontal position to a substantially vertical position,

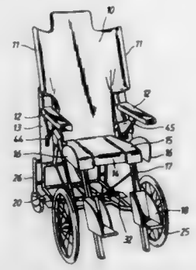
two outer seat portions disposed one on each side of said central seat portion and each being pivotally attached to said frame,

means pivotally supporting, said outer seat portions for movement toward and away from said central seat portion about first and second axes located near the back rest portion,

said first axis extending substantially coextensively with the pivoting axis of said central seat portion and said second axis extending substantially normal thereto,

two foot rests each connected to said outer seat portions, and

means supporting each said foot rest and attaching it to a respective outer seat portion,



said means for supporting and attaching each said foot rest being swingable from a position substantially normal to the plane of said central seat portion in its substantially horizontal position to a position above and outboard of said plane,

the wheelchair being movable from a position in which a patient can be received in the wheelchair in a semi-recumbent position and the back rest portion and seat portions can be tilted to present the back of a patient in a horizontal position with the patient's legs at a higher level than the patient's head, whereafter the central seat portion can be pivoted downwardly and the outer seat portions pivotted outwardly to present the patient in a position for an ano-reno-genito surgical or investigative procedure.

5,201,088

PATIENT EXAMINATION TABLE HAVING A SIMPLIFIED TILT MECHANISM

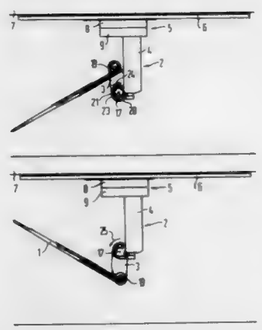
Sten Larsson, Vaellingby, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 4, 1991, Ser. No. 802,222

Claims priority, application Sweden, Dec. 12, 1990, 90039686

Int. Cl.[5] **A61G** *7/00*

U.S. Cl. 5—610 **11 Claims**



1. A patient examination table assembly comprising:

a patient examination table having a longitudinal axis;

a stand supporting said table relative to a stable horizontal surface;

tilting mechanism means, disposed between said table and said stand, for tilting said longitudinal axis of said table up or down relative to said horizontal surface, said tilting mechanism means including a first gear mounted on a first shaft and rigidly attached to said stand, a second gear mounted on a second shaft and rigidly attached to said table, a driveable element to which said second shaft is mounted, and transmission means mechanically linking said first and second gears for rotating said second gear and said table around said first gear when said driveable element is rotated, in a rotational direction opposite to the direction of rotation of said driveable element; and

drive means contained in said stand for rotating said driveable element.

5,201,089

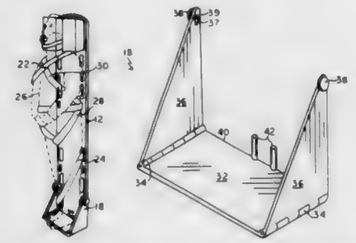
FOOT SUPPORT APPARATUS AND METHOD

Thomas A. Ferreira, P.O. Box 1056, Wellfleet, Mass. 02667

Filed Sep. 22, 1992, Ser. No. 948,685

Int. Cl.[5] **A61G** *1/013, 1/00*

U.S. Cl. 5—627 **7 Claims**



1. A foot support plate integrated with portable patient support apparatus for supporting an upright trauma patient comprising:

a) a portable patient support means for providing rigid support of the head and back of the patient comprising a backboard having a head end and a foot end;

b) strap means for securing the patient when in the upright position to the backboard comprising a plurality of pairs of spaced-apart fabric straps, on opposite sides of the backboard; and

c) a foot support plate, detachably positioned in an orthongonal relationship to the footend of the backboard comprising a rectangular base plate of rigid construction having a first and a second end; first hinge being attached at the first end and a second hinge being attached to the second end; a pair of side support arms attached to the ends of the base plate by said hinges, said base plate and side support arms adapted to move between a flat storage position and a foot supporting position with the side arms substantially perpendicular to said base plate, said side plates further comprising threaded fastening means adapted to releasably engage matching threaded holes in the sides of the backboard, a plurality of dowels positioned in the central portion of the base plate, extending in orthogonical relation thereto and adapted to releasably engage with matching sockets in the bottom edge of the backboard, said foot support plate attached at the foot end of the patient support means for supporting the entire weight of the patient in an initial upright position by providing a rigid support for the patient's feet.

5,201,090

APPARATUS FOR CLEANING THE INSULATORS OF LIVE POWER LINES BY MEANS OF HELICOPTER

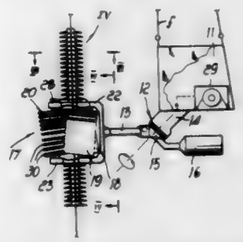
Donato Jans, Via Circonvallazione 17, 11026 Pont Saint Martin (Prov. of Aosta), Italy

Filed Sep. 26, 1991, Ser. No. 765,731

Claims priority, application Italy, Oct. 4, 1990, 67759 A/90

Int. Cl.[5] **A46B** *13/02*

U.S. Cl. 15—88.4 **18 Claims**



1. Apparatus for cleaning the insulators of live power lines by means of helicopters, comprising:

an operating structure having an orientable arm, said operating structure being suspendable from a helicopter barycentric hook, said orientable arm having an end;

a cleaning head connected to said end of said orientable arm and comprising suspension support means;

rotatable cleaning brushes connected to said suspended support means;

motor means for actuating said rotatable cleaning brushes; wherein said suspension support means comprise;

fixed suspension support means including a frame rigidity connected to said orientable arm, and;

movable support means oscillatably supported by said frame and including controlled movement means, said movable support means being movable away from said frame, for locating an insulator to be cleaned between said frame and said movable support means, said movable support means being successively movable towards said frame for moving all of said rotatable cleaning brushes into embracing contact engagement with an insulator to be cleaned.

5,201,091

TOOTHBRUSH

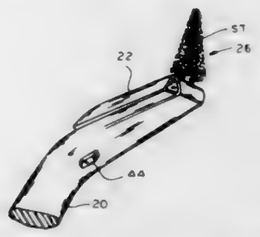
Emanuel B. Tarrson; Dane Maric, and Lew Blahuta, all of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Continuation-in-part of Ser. No. 475,724, Feb. 6, 1990, Pat. No. 5,027,467. This application Aug. 30, 1990, Ser. No. 575,229

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] **A46B** *9/04*

U.S. Cl. 15—167.1 **15 Claims**



1. A toothbrush for holding a twisted wire brush, said toothbrush comprising an elongated handle member having a hinged locking retainer at an end thereof, one of said locking

retainer and said handle having a cantilever latch extending

a video game cartridge in order to clean the electrical contacts, the apparatus comprising:

lever, said linkage including means yieldingly securing the plate and the pivot arm in at least one predetermined

lower hole communicating said cavity with the inside of said cylinder;

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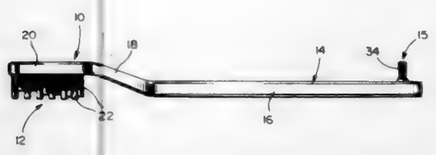
retainer and said handle having a cantilever latch extending outwardly therefrom, the other said locking retainer and handle having a keeper hole which is complementary to said latch, an outer end of the cantilever forming said latch entering said keeper hole when said locking retainer is swung on said hinge to a closed position on said handle member, said locking retainer and handle having smooth and substantially uninterrupted contours when closed, a projecting chimney having a hole formed in one of said handle and said locking retainer near said hinged end, said hole having a dimension for receiving and holding a stem of a twisted wire brush, said projecting chimney strengthening said twisted wire stem, and a groove formed in the other of said handle and said locking retainer, said groove extending from near said hole toward said latch, said groove having a dimension for receiving and holding said twisted wire stem, and contours on said outer end of said cantilever for releasing said latch in response to a downward pressure thereon, said downward pressure acting longitudinally upon and along a length of said cantilever.

5,201,092

PERIODONTAL TOOTHBRUSH

Edward L. Colson, 2422 Timbercreek Clr. NW, Boca Raton, Fla. 33431

Filed Oct. 9, 1991, Ser. No. 773,416
Int. Cl.[5] A46B *9/04*
U.S. Cl. 15—167.1 **4 Claims**



1. A periodontal toothbrush comprising a handle and a toothbrush head supported at one end and forming a continuation of one end of the handle, said toothbrush head including a plurality of bristle tufts with the tufts being disposed in transversely extending, longitudinally spaced rows, said bristle tufts also being arranged in longitudinally extending, transversely spaced rows, alternating transversely extending tuft rows being of different length to engage and clean interproximal spaces of the teeth and the supporting gum tissue in a manner to remove plaque, thereby preventing the accumulation of plaque which may cause severe periodontal disease and resultant loosening of the teeth and damage to the gingiva and supporting bone structure, the transversely extending rows of bristle tufts are arranged in odd numbered and even numbered rows beginning farthest from said handle, the bristle tufts forming all of the odd numbered transversely extending rows being of the same length, the bristle tufts forming the even numbered transversely extending rows being shorter in length than the bristle tufts in the odd numbered rows, the rows of shorter tufts progressively increasing in length from the row of shorter tufts remote from the handle to the row of shorter tufts adjacent the handle.

5,201,093

VIDEO GAME CONSOLE AND CARTRIDGE CLEANING KIT

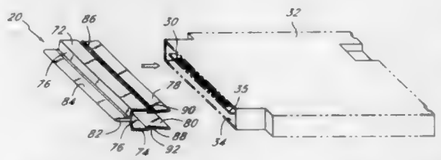
James M. Wells, 1164 N. Oakwood Ave., Rialto, Calif. 92376, and Gary L. Sigritz, 2960 Florine Ct., Riverside, Calif. 92509

Division of Ser. No. 453,983, Dec. 20, 1989. This application Jul. 6, 1992, Ser. No. 909,168
Int. Cl.[5] B08B *11/00*
U.S. Cl. 15—210.1 **17 Claims**

1. An apparatus for cleaning the electrical contacts of a connector located within a video game cartridge receptacle in a vide game console, the apparatus adapted for attachment to a video game cartridge in order to clean the electrical contacts, the apparatus comprising:

a cleaning member having a first planar cleaning surface and an edge;

a first layer of cleaning material on at least a portion of said first planar surface; and



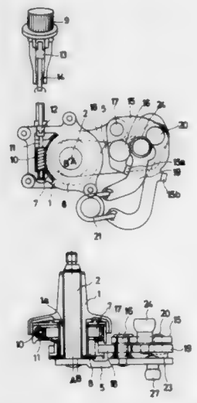
an attachment bracket attached to said cleaning member, said attachment bracket configured to detachably mount said apparatus on a game cartridge, such that when the apparatus is attached to the game cartridge and inserted into the cartridge receptacle, the cleaning material cleans the electrical contacts of the connector.

5,201,094

WIPER APPARATUS WITH ADJUSTABLE LIMIT POSITIONS

Tokihiko Yamamoto, Kariya; Ryoichi Fukumoto, Nagoya; Kazuhiro Sumiya, Hekinan, and Masao Ohhashi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Mar. 29, 1991, Ser. No. 677,183
Claims priority, application Japan, Mar. 30, 1990, 2-85265
Int. Cl.[5] B60S *1/06, 1/18*
U.S. Cl. 15—250.13 **7 Claims**



1. A wiper apparatus for a vehicle windshield, comprising:

a motor secured to a vehicle body;

a motion imparting mechanism including a rod, said mechanism being fixed to said motor for imparting a reciprocating motion to the rod upon rotation of the motor;

a housing secured to the vehicle body;

a main shaft supported rotatably about a central axis in the housing;

a wiper arm fixed to the main shaft, said wiper arm having a wiper blade for wiping a vehicle windshield upon back and forth rotation of the main shaft;

a main lever fixed to the main shaft and rotatable therewith;

a linkage including a plate and a pivot arm pivotably attached to one another;

said plate of the linkage being pivotally attached to the main lever, said linkage including means yieldingly securing the plate and the pivot arm in at least one predetermined position relative to the main lever and to one another;

means securing the arm of the linkage to said rod for rotating the wiper blade through a predetermined path of a vehicle windshield in accordance with a relative angular position between the pivot arm and the main lever;

an eccentric cam rotatable about the main shaft and having an axis of rotation offset from the central axis of the main shaft;

a subordinate lever having one end rotatably mounted on the eccentric cam and another end pivotally coupled to the plate; and

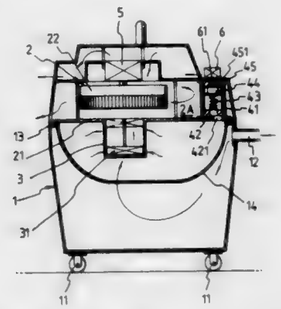
adjusting means for rotating the eccentric cam through a selected angle to change the pivot position of the main lever relative to the pivot arm, by movement of the subordinate lever and thus change a limit position of the predetermined wiping path of the wiper blade.

5,201,095

MOTOR CONTROLLING APPARATUS FOR A VACUUM CLEANER

Soo Y. Choi, Suweon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 1, 1991, Ser. No. 724,592
Claims priority, application Rep. of Korea, Jul. 28, 1990, 90-11165
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—339 **8 Claims**



1. A motor controlling apparatus for a vacuum cleaner comprising:

a collection tank having an open upper portion and being provided with a suction port for collecting dust and washing water through said suction port;

a base member for covering said open upper portion, said base member adapted to seal a cavity formed in said collection tank, and provided with a base member opening formed in said base member and communicating said cavity with the outside atmosphere;

means for sealing said base member opening, said sealing means comprising a float and a float housing, said float housing provided under said base member opening and protruding downwardly from said base member and having a side wall with a plurality of holes, said float enclosed within said float housing and adapted for opening and closing said base member opening in response to said washing water reaching a predetermined level;

blowing means disposed over said base member opening and adapted for sucking air from said collection tank through said base member opening and exhausting said air to the outside atmosphere;

a cylinder mounted on said base member, said cylinder provided with an upper hole and a lower hole formed in said cylinder, said upper hole for communicating the outside atmosphere with an inside of said cylinder, said lower hole communicating said cavity with the inside of said cylinder;

a piston provided in said cylinder, said piston capable of being displaced upward and downward in response to changes in the pressure level inside said collection tank in order to open and close said upper hole of the cylinder;

limit switch means adapted to turn off said blowing means in response to a displacement in one direction of said piston; and

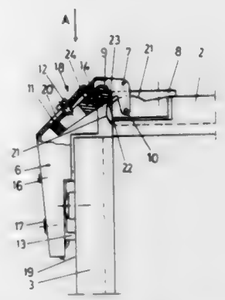
an elastic member provided in said cylinder for urging said piston against said upper hole.

5,201,096

HINGE

Fredi Dubach, Adetswil, Switzerland, and Erich Röck, Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Continuation of Ser. No. 719,494, Jun. 24, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 927,725
Claims priority, application Austria, Jun. 25, 1990, A1342/90
Int. Cl.[5] E05D *7/04*
U.S. Cl. 16—236 **31 Claims**



1. A furniture hinge comprising:

a base member to be mounted on one furniture part;

a hinge arm mounted on said base member and defining a mounting plane, said hinge arm including an end portion extending in a direction inclined at an acute angle to said mounting plane;

a hinge element to be mounted on another furniture part;

an extension member articulated to said hinge element to enable relative pivotal movement therebetween; and

means for mounting said extension member on said inclined end portion of said hinge arm at positions selectively adjustable relative thereto linearly in said direction.

5,201,097

ADJUSTABLE KEY FOR BUTT HINGES

Darrell R. Phillips, 97 Coveland Dr., Avon Lake, Ohio 44012

Filed Mar. 20, 1992, Ser. No. 854,206
Int. Cl.[5] E05D *7/04*
U.S. Cl. 16—248 **3 Claims**

1. A key for a butt hinge which hinge comprises a pair of leaves, the first of said leaves having two axially aligned spaced knuckles, a second of said leaves having a knuckle adapted to be interposed in spaced relation to one of the pair of the knuckles, a pin extending through said knuckles, a lock on said pin, said key comprising a rod, a pair of clips, said clips being carried by said rod and adapted to be brought selectively into space provided between any of said knuckles wherein one of

said pair of clips is slidably mounted on said rod and adapted to

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5,201,101

METHOD OF ATTACHING ARTICLES AND A PAIR OF

taining means being at the bottom edge of the frame mem-

torso may be tilted angularly toward a mourner-viewing side of the casket or c) both of said levels, and

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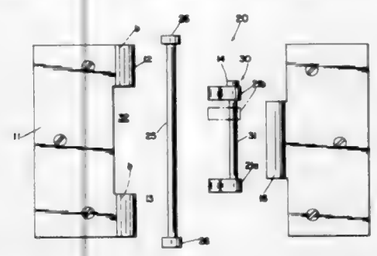
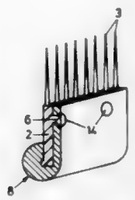
said pair of clips is slidably mounted on said rod and adapted to be moved relative to the other clip and wherein the key is



employed to enable one of said leaves to be raised or lowered with respect to the other of said leaves.

5,201,098
NEEDLE BAR CARRIER
Josef Egerer, Schwabach, Fed. Rep. of Germany, assignor to Staedtler & Uhl, Schwabach, Fed. Rep. of Germany
Filed Oct. 9, 1991, Ser. No. 773,805
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1990, 4033262
Int. Cl.[5] D01G *19/10*
U.S. Cl. 19—129 R **1 Claim**



1. A needle bar carrier with a needle bar, said needle bar comprising a plurality of needles anchored in a plastic bar, said needle bar carrier comprising a plurality of holes, said plastic bar being united by form locking to said needle bar carrier by having projections thereof extending at least partway into said holes,

said needle bar carrier being substantially J-shaped in cross-section to define a retaining groove for said needle bar inside said J-shaped configuration, said retaining groove having a plurality of recesses, said plastic bar having a plurality of locking shoulder corresponding with and being retained within said plurality of recesses.

5,201,099
SEAT BELT ADJUSTER
Terry A. Campbell, Prince George, Canada, assignor to Masterlink Marketing Inc., Prince George, Canada
Filed May 27, 1992, Ser. No. 889,559
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—198 **4 Claims**

1. A seat belt adjuster for holding a shoulder belt to a lap seat belt comprising:

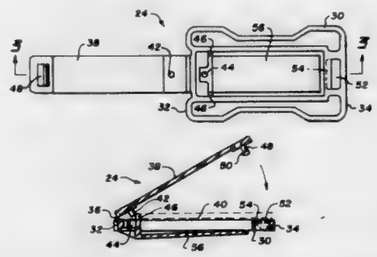
a frame member formed of resilient material having a front portion, a rear portion, a top edge, and a bottom edge, the front portion and the rear portion forming a channel therebetween for containing a lap seat belt;

a hinge extending from the top edge of the frame member and pivotally coupling the rear portion and the front portion together to permit the portions to open for fitting over a lap seat belt;

means for retaining the rear portion and the front portion together to contain a lap seat belt therebetween, the retaining means being at the bottom edge of the frame member;

a clip member forming part of the front portion of the frame member and extending down from the top edge to form an open clip for retaining a shoulder belt;

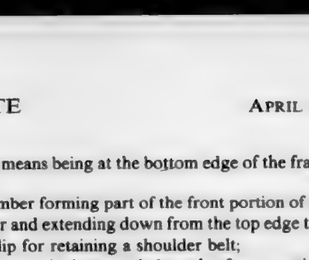
first and second pins coupled to the front portion of the frame member adjacent the hinge, the first and second pins being arranged to receive the rear portion therebe-



tween and to prevent a lap seat belt positioned between the front and rear portions from contacting the hinge; and

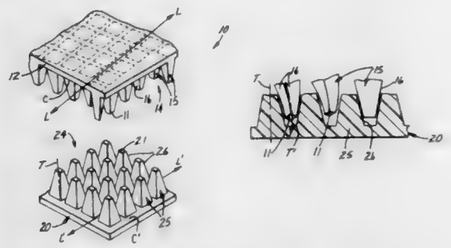
a third pin extending from one of the front and rear portions, the other one of the front and rear portions including a hole for receiving the third pin, the third pin, when positioned in the hole, being between the first and second pins and arranged to prevent a lap seat belt positioned between the front and rear portions from contacting the hinge.

5,201,100
ADJUSTABLE DEVICE FOR HOOK AND LOOP FASTENER
Emanuel Cardinale, Amherst, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands
Filed Jun. 15, 1992, Ser. No. 898,501
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—306 **9 Claims**



1. In combination, a stand alone strap of extended length having a surface of either hook or loop elements forming part of a hook and loop fastener system and a stand alone D-ring having an opening for passing an end of said strap therethrough, said strap being distinct and separate from the assembly of the D-ring, said D-ring having a first tab, extending from one side of the D-ring, which has on at least one surface thereof, a multiplicity of engaging elements for engaging companion hook or loop elements on said strap, and a second tab extending from the opposite side of the D-ring having means for attaching said D-ring to another object, said tabs being much shorter than said strap, whereby when said strap is fitted around an article and threaded through the opening of the D-ring with both ends of the strap attached to the engaging elements on the surface of the first tab it will secure the article to the object to which the second tab is separably attached.

5,201,101
METHOD OF ATTACHING ARTICLES AND A PAIR OF ARTICLES FASTENED BY THE METHOD
Forrest J. Rouser, San Rafael, and Robert L. Erwin, Rohnert Park, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 28, 1992, Ser. No. 875,186
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—575 **18 Claims**



1. Fastened articles comprising:

a first article having at least one major surface at least a portion of that surface being a structured surface;

said first article's structured surface including a plurality of tapered elements, each element having at least one side inclined relative to a common plane at an angle sufficient to form a taper;

said first article's plurality of tapered elements being situated to form a plurality of axes including at least one first article longitudinal axis;

a second article having at least one major surface at least a portion of that surface being a structured surface;

said second article's structured surface including a plurality of tapered elements, each element having at least one side inclined relative to a common plane at an angle sufficient to form a taper;

said second article's plurality of tapered elements being situated to form a plurality of axes including at least one second article longitudinal axis;

wherein said first and second article's tapered elements have a shape in an unfastened position;

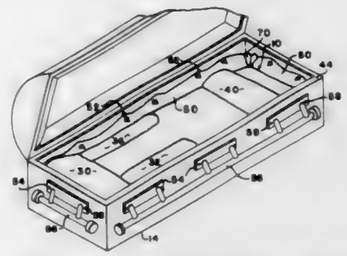
said first and second articles being fastened together with the first longitudinal axis situated at an angle relative to the second longitudinal axis such that at least two of said tapered elements of said first or said second article are torsionally twisted relative to their relaxes, unfastened positions, and said inclined sides of one of said first and second article's tapered elements being frictionally adhered to at least one of said inclined sides of the other of said first and second article's tapered elements, and

wherein said at least two tapered elements are constructed from a flexible material.

5,201,102
CASKET BED SYSTEM
Wilbur F. McClure, 415 S. Plum St., Troy, Ohio 45373
Filed Aug. 6, 1991, Ser. No. 740,939
Int. Cl.[5] A61G *17/00*
U.S. Cl. 27—12 **18 Claims**

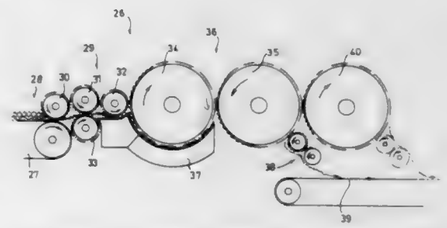
1. A bed system for adjustably supporting the corpse of a human body in a casket having a base including a bottom wall and pairs of opposed end and side walls, said bed system comprising:

an elongated air mattress having a head end and a foot end and being of a horizontal length and width to support said corpse, said mattress having a plurality of independently inflatable and deflatable sections for vertically varying either: a) the head level of said body relative to the foot level, b) one side level of at least the upper torso of the corpse relative to the other side whereby at least the upper torso may be tilted angularly toward a mourner-viewing side of the casket or c) both of said levels, and



valve means for each of said sections for independently controlling the volume of air contained therein in accordance with the desired adjusted head level and body tilt.

5,201,103
METHOD AND APPARATUS FOR JOINING NONWOVEN FIBER FABRICS, IN PARTICULAR TEXTILE FIBER FABRICS
Werner Frosch, Schwanewede, and Werner Lasenga, Duelmen, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany
Filed Jan. 7, 1991, Ser. No. 638,225
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823683
Int. Cl.[5] D04H *1/44*
U.S. Cl. 28—117 **16 Claims**



7. Apparatus for joining nonwoven textile webs which includes means for transporting adjacent textile webs arranged side by side with opposed edges in contact, and means for transporting said joined textile webs away, wherein said apparatus comprises:

rotating feed drums for feeding said adjacent webs in said side by side arrangement into a stuffing area;

rotating stuffing means having a rotational speed less than that of said feed drums and a direction of rotation relative to said direction of rotation of said feed drums such as to cause stuffing or condensing of said adjacent webs which causes fibers of said opposed edges to become mechanically entangled and form a single large-width coherent web; and

take-off means removing and drawing only slightly said large-width web from said stuffing means.

8. The apparatus of claim 7, wherein said rotational speed of said stuffing means relative to said feed drums constitutes a delay in the feed rate in the stuffing means in a range of about 25% to 35%.

5,201,104
EXTRACTING TOOL

alignment with the upper keeper slot and the lower flange also having a rear keeper slot, the outboard end of which is off-set

body, the pressure roller having a variable angular displacement rate;

5,201,107
METHOD OF ASSEMBLING A CONSTANT VELOCITY UNIVERSAL JOINT

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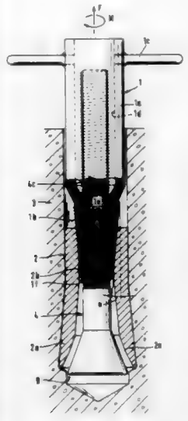
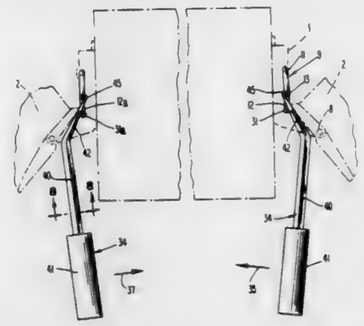
5,201,104
EXTRACTING TOOL
Antonius Winkeljann, Landsberg/Lech, and Franz Popp, Buchloe, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Feb. 11, 1992, Ser. No. 834,169
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1991, 4104073
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—256 4 Claims



1. Extracting tool (**1**, **10**) for tubular objects (**2**, **12**) located in a bore in a structure member (**3**, **12**), said extracting tool (**1**, **10**) comprising an axially extending shaft (**1***a*, **10***a*) having a leading end and a trailing end, said shaft (**1***a*, **10***a*) has a conical external thread (**1***b*, **10***b*) extending axially from the leading end thereof with the diameter of the external thread increasing towards the trailing end, and means (**1***c*, **10***c*) for applying force to the extracting tool (**1**, **10**) located adjacent the trailing end of said shaft (**1***a*, **10***a*) said extracting tool (**1**, **10**) has a central through hole extending through said shaft in the axial direction thereof, the through hole (**1***d*) has an internal thread (**1***e*) in the axially extending region of the external thread (**1***b*) and the axial extent of the internal thread (**1***e*) corresponds substantially to the axial extent of the external thread (**1***b*), wherein the improvement comprises that the external thread (**1***b*, **10***b*) has an inclined angle (n) in the range 2° to 7° relative to the axis of said shaft (**1***a*, **10***a*) in the direction toward the leading end of said shaft.

5,201,105
TOOL FOR REPLACING CORVETTE DOOR HINGE SPRING
James T. Street, Pottstown, Pa., assignor to Street Specialty Products Inc., Pottstown, Pa.
Continuation of Ser. No. 883,159, Jul. 8, 1986, Pat. No. 5,035,038, which is a continuation of Ser. No. 757,470, Jul. 22, 1985, abandoned, which is a division of Ser. No. 490,433, May 2, 1983, Pat. No. 4,617,712. This application Sep. 21, 1990, Ser. No. 586,206
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.
Int. Cl.[5] B25B *27/00*
U.S. Cl. 29—270 2 Claims

1. A hand tool specifically for use in replacing the S-shaped, cam follower spring on the door hinge of a Corvette motor car; the door hinge including a fixed hinge plate mounted on the car body, a movable hinge plate mounted on the car door with the hinge plates being connected by a pivot pin, the fixed hinge plate on the car body having upper and lower flanges with the upper flange having a keeper hole and an upper keeper slot and with the lower flange having a lower keeper slot in vertical alignment with the upper keeper slot and the lower flange also having a rear keeper slot, the outboard end of which is off-set inwardly from the upper and lower keeper slots; the cam follower spring being arranged in planar S-shaped form and having a straight, elongated body, an upper bent section on one end of the body, and a lower bent section on the opposite end of the body with the upper bent section having an inside portion and an outside portion with the inside portion being joined to the elongated body and the outside portion being spaced from the inside portion and having a keeper slot and with the lower bent section having an inside portion and an outside portion with the inside portion being joined to the elongated body and the outside portion being spaced from the inside portion and having a tip; the hand-tool comprising:
an elongated shaft having an axis;
a handle section on one end of the shaft;
an arm on the other end of the shaft having an axis, the axis

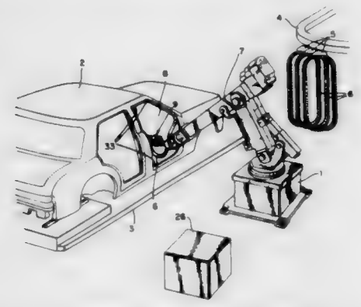


of the arm being oriented at an obtuse angle to the axis of said shaft and the arm terminating in a tip, the tip termination providing that there is no portion of the arm extending back over the arm; and
when said spring is on said fixed hinge plate with the inside portion of the upper bent section disposed in said upper keeper slot and the outside portion of the upper bent section disposed in said keeper hole and also with the inside portion of the lower bent section disposed in said lower keeper slot, the configuration of the periphery of the arm, said tip termination and said obtuse orientation providing:
(a) for the arm to fit inside of and engage the lower bent section of the spring; and
(b) when so engaged for movement of the handle section toward the center of the motor car to cause twisting of the lower bent section to thereby position the tip thereof in vertical alignment with said rear keeper slot.

5,201,106
APPARATUS AND METHOD OF THE CONTROL OF INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING BY A ROBOT
George D. Moore, Oshawa; Thorsten Koseck, Courtice, and William R. M. Ede, Oshawa, all of Canada, assignors to General Motors of Canada Limited, Oshawa, Canada
Filed May 1, 1992, Ser. No. 876,999
Int. Cl.[5] B23Q *17/00*; B23P *11/02, 19/02*
U.S. Cl. 29—407 9 Claims

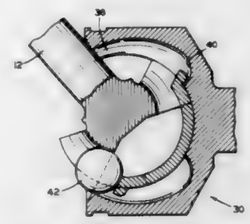
1. A robot for installing a fixed length of weather stripping stored in a loading station into a body opening, the robot in combination comprising:
an arm movable in a predetermined path in at least two axes;
a powered pressure roller rotatively mounted on the end of the arm and moved by the arm for tracing the opening of the body and guiding and applying the fixed length, whereby the fixed length is affixed to the opening of the body, the pressure roller having a variable angular displacement rate;
calibration table means for storage of preprogrammed datums for the pressure roller angular displacement rate and weather stripping feed rates for a plurality of locational segments along the opening of the body during a weather stripping application cycle;
means for delivering a signal representative of the calibration table means preprogrammed datums to the pressure roller;
means for determining the actual angular displacement rate of the pressure roller;
means for determining the actual feed rate of the weather stripping;
means for determining the differential in the actual weather stripping feed rate from the preprogrammed datum in the calibration tables for a first locational segment of the body opening; and
means for signaling the pressure roller to modify the pressure roller rate of angular displacement to integrally compensate within a later segment for the weather stripping feed rate differential in the first segment and any intervening segments.

8. A method of utilizing a robot having an arm and a pressure roller having a variable rotational velocity to install fixed lengths of weather stripping into a body opening including generally straight sections and corner sections, by interacting



and tracing the pressure roller along a straight section of the opening at a first linear speed and at a first rotational speed and interacting and tracing the pressure roller along a corner section at a second linear speed differing from the first linear speed and at a second rotational speed differing from the first rotational speed, whereby the fixed length is guided and affixed with the sections as the fixed length is installed into the body opening and the relative velocity of a point on a periphery of the pressure roller relative to a point on the body opening in the corner section is such that the weather stripping is longitudinally compressed in the corner section, the method comprising:
storing preprogrammed datums for the pressure roller rotational velocity and weather stripping feed rate for a plurality of locational segments along the opening in a calibration table means;
delivering a signal representative of the calibration table means preprogrammed datums to the pressure roller to command the pressure roller's rotational velocity;
determining the actual rotational velocity of the pressure roller and the actual weather stripping feed rate;
determining the differential in the feed rate of the weather stripping from the preprogrammed datum in the calibration table means for a first locational segment; and
signaling the pressure roller to modify the rotational velocity to integrally compensate within a later locational segment for the differential in the first locational segment and any intervening locational segments.

5,201,107
METHOD OF ASSEMBLING A CONSTANT VELOCITY UNIVERSAL JOINT
Philip J. Mazziotti, Toledo, Ohio, assignor to PMX Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 574,075, Aug. 29, 1990, abandoned. This application Nov. 6, 1991, Ser. No. 788,335
Int. Cl.[5] B23P *11/00*; F16D *3/224*
U.S. Cl. 29—434 2 Claims



1. A method of assembling components of a constant velocity universal joint for connecting two shafts, said universal joint comprising a one-piece first shaft and inner race, said inner race having an outer surface of partially spherical configuration, a one-piece second shaft and outer race, said outer race having a closed end and an open end, said outer race having an inner surface of partially spherical configuration with the radius of the outer surface of said inner race being substantially equal to the radius of the inner surface of said outer race, whereby the outer surface of said inner race and the inner surface of said outer race fit closely together in the manner of a ball and socket, said inner race having a plurality of outwardly-facing grooves, said outer race having a plurality of inwardly-facing grooves, a cage having a convex outer surface, bearing balls for the corresponding grooves of said inner and outer races, said bearing balls having diameters slightly less than the diameters of said corresponding grooves, said method comprising placing said cage in said outer race with a portion of the convex outer surface of said cage being in contact with the inner surface of said outer race at the closed end thereof, placing said inner race in said outer race and rotating said inner race to align the grooves thereof with the grooves of said outer race, turning said inner race and first shaft so that a portion of said first shaft is received in an end portion of one of said grooves of said outer race at the open end thereof, and placing one of said bearing balls into corresponding grooves of said races opposite the groove into which said first shaft extends.

5,201,108
METHOD OF ASSEMBLING OFFICE FURNITURE WIRE ROD STACKING CHAIR
Craig A. Clark, Montgomery, Ill., and Robert J. Poortvliet, Jenison, Mich., assignors to Allsteel Inc., Aurora, Ill.
Division of Ser. No. 676,326, Mar. 28, 1991, Pat. No. 5,110,186, which is a division of Ser. No. 528,317, May 23, 1990, Pat. No. 5,064,247. This application Nov. 5, 1991, Ser. No. 788,218
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—434 2 Claims

1. In a chair that includes a back assembly in the form of a fixedly mounted back pan, an inner imperforate opaque back member, and an outer imperforate opaque back member, with said members being of a similar sizing and being disposed in encapsulating relation on either side of said back pan to define oppositely facing back surfaces, with said inner back member and said back pan respectively including first hooks and corresponding first keyholes for adjustable mounting said inner back member on the inner side of said back pan by limited movement of said inner back member in a first direction relative to said back pan, and said outer back member and said back pan respectively including second hooks and corresponding sec-

ond keyholes for adjustably mounting said outer back member on the outer side of said back pan by limited movement of said

5,201,110
PALLET DISMANTLER

inserting arc-shaped magnets within said case and radially

5,201,113
AUXILIARY EQUIPMENT FOR REMOVING PARTS

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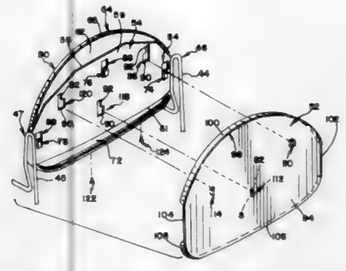
ond keyholes for adjustably mounting said outer back member on the outer side of said back pan by limited movement of said outer back member in a second direction relative to said back pan, the method of attaching said members to said back pan including the steps of:

disposing said inner back member adjacent said back pan with said first hooks disposed through said corresponding first keyholes in said back pan;



shifting said inner back member in said first direction to bring said inner back member into adjustable anchored relation with said back pan;

disposing said outer back member adjacent said back pan with said second hooks disposed through said corresponding second keyholes in said back pan; and

shifting said outer back member in said second direction to bring said outer back member into adjustable anchored relation with said back pan.

5,201,109

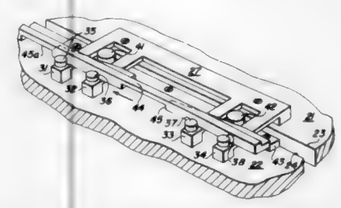
METHOD AND APPARATUS FOR DETACHABLY JOINING TWO MEMBERS

Claude J. Harding, Phoenix, Ariz., assignor to Shintech, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 617,506, Nov. 23, 1990, abandoned. This application Aug. 30, 1991, Ser. No. 752,846

Int. Cl.[5] B23P *11/02;* **B21D** *39/00*

U.S. Cl. 29—451 **53 Claims**



1. A method for detachably joining a first member having a first edge to a second member having a second edge at a plurality of locations along their corresponding first and second edges, the method comprising the steps of:

(a) movably aligning the corresponding edges in predetermined juxtaposition;

(b) moving a plurality of wedges between pairs of first force receiving points coupled to one member and second force receiving points coupled to the other member;

(c) advancing the plurality of wedges in a first direction to separate the first force receiving points from the second force receiving points to draw the corresponding edges toward each other;

(d) substantially limiting displacement between the corresponding edges, as the corresponding edges are drawn into and remain in their joined position.

5,201,110

PALLET DISMANTLER

Marvin L. Bane, P.O. Box 3021, Santa Fe Springs, Calif. 90670

Continuation-in-part of Ser. No. 899,418, Aug. 22, 1986, Pat. No. 4,757,599. This application Jul. 11, 1988, Ser. No. 217,411

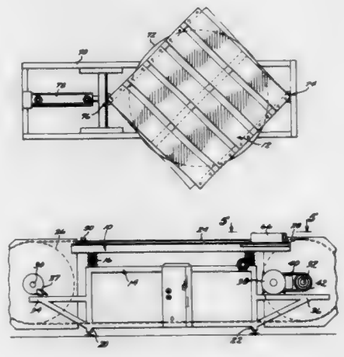
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] B23P *19/04;* **B27H** *3/00*

U.S. Cl. 29—564.3 **10 Claims**

1. A denailer type cutting machine which includes a horizontal flat, not-recessed, cutting surface for receiving base with nails securing stringers pallets;

band saw cutting means including teeth angled uniformly in the same direction, and said band saw cutting means is positioned horizontally by means of guides parallel to and



slightly above said cutting surface of the pallet so as to be able to cut into the nails securing the stringers of the pallet to the base thereof; and driving means engaging said band saw which moves it in the opposite direction from the angle of the cutting teeth so that it bears against said nails of the stringer securing it to a pallet, it melts said nails to produce a smooth surface when cut.

5,201,111

METHOD OF MANUFACTURING AN ELECTRIC MOTOR

Hans Prohaska, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Fed. Rep. of Germany

PCT No. PCT/EP90/01158, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO91/01588, PCT Pub. Date Feb. 7, 1991

PCT Filed Jul. 14, 1990, Ser. No. 659,369

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3923974

Int. Cl.[5] H02K *15/14*

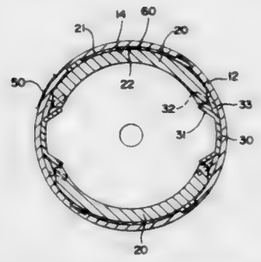
U.S. Cl. 29—596 **11 Claims**

1. A method of manufacturing an electric motor comprising the steps of:

forming a generally tubular metallic housing case;

inserting arc-shaped magnets within said case and radially spaced therefrom by points of adhesive material;

applying a coating material to said case; and



heating said case and magnets sufficiently to simultaneously set said coating material and adhesive.

5,201,112

DEVICE FOR THE SIMULTANEOUS POSITIONING OF A PLURALITY OF THREADED CONNECTING ELEMENTS

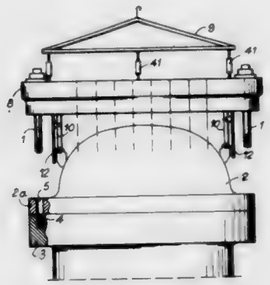
Gerard Sevelinge, Chalon/Saone, France, assignor to Framatome, Courbevoie, France

Filed May 23, 1991, Ser. No. 704,388

Claims priority, application France, May 23, 1990, 90 06465

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—705 **8 Claims**



1. Device for simultaneously positioning a plurality of threaded connecting elements (1) carried by a supporting member (8) and intended for fastening a component (2) to an appliance (3), said component having open-ended bores (5) for receiving said threaded connecting elements (1), and said appliance having threaded holes (4) corresponding to said open-ended bores (5) for receiving said threaded connecting elements (1), said device comprising:

(a) means for continuous checking and correction of the position of the axes of said threaded connecting elements (1) relative to the axes of their corresponding threaded holes (4), said means comprising at least two laser generators (2) mounted on said supporting member (8), each of said laser generators interacting with respective receiver cells (30) mounted on said appliance (3), each laser generator (20) being mounted on said supporting member (8) by means of an adjustment plate (22, 27) which can be adjusted to position said laser generator on an axis parallel to said axes of the threaded connecting elements (1);

(b) means for continuous checking and correction of the horizontality of said supporting member (8); and

(c) means (9) for handling said supporting member (8).

5,201,113

AUXILIARY EQUIPMENT FOR REMOVING PARTS INSTALLED ON CAN END DOUBLE-SEAMING MACHINE OR INSTALLING SUCH PARTS THEREON

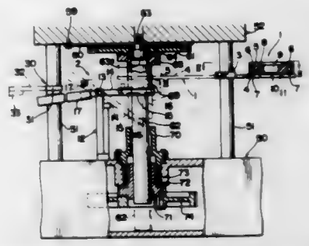
Toru Houma, Ohmiya; Izumi Matsushita, Koshigaya; Yoshiteru Kojika, Saitama, and Noboru Sasaki, Kitamoto, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,781

Claims priority, application Japan, Aug. 27, 1990, 2-222512

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—822 **11 Claims**



1. An auxiliary equipment for removing a cover feed turret from a can end double-seaming machine, and for installing the cover feed turret on the double-seaming machine, wherein the cover feed turret is vertically detachably installed by a screw member on said can end double-seaming machine for seaming a can end on a can body, said equipment comprising:

a swinging member supported proximate said double-seaming machine below the cover feed turret, said swinging member being horizontally swingable to a position underneath the screw member; and

a pedestal replaceably positioned on the swinging member, on which the cover feed turret can be placed when the swinging member is swung to said position underneath the screw member,

said swinging member and said pedestal being each provided with respective operation holes aligned with each other and through which the screw member can be operated by an operating tool passing through the swinging member and pedestal from below the swinging member and pedestal when the swinging member and pedestal are swung to said position underneath the screw member.

5,201,114

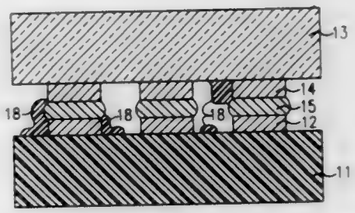
ANALYTIC METHOD FOR USE IN ELECTRONIC CIRCUIT ASSEMBLY OPERATIONS

Iris Artaki, Furlong, Pa.; Heidi M. Gordon, Willingboro, and Urmi Ray, Plainsboro, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 2, 1992, Ser. No. 864,821

Int. Cl.[5] H05K *3/34*

U.S. Cl. 29—840 **9 Claims**



1. A method for assembling electronic circuit devices comprising the steps of:

forming a circuit including an array of first bonding pads on

5,201,116

PROCESS FOR MEASURING UNBALANCE OF TORQUE

where a cut is desired and for reducing the tubing perime-

5,201,119

METHOD OF MANUFACTURING AN ALUMINUM

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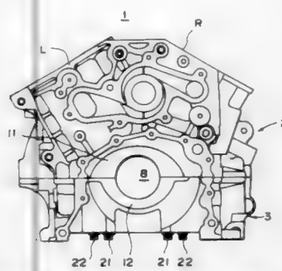
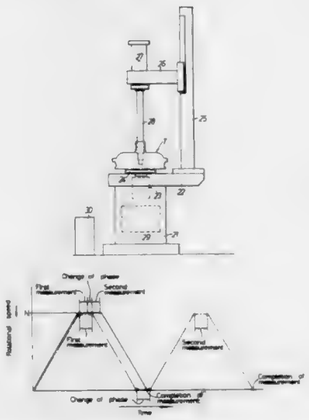
forming a circuit including an array of first bonding pads on a substrate;
forming solder elements over the first bonding pads;
contacting the solder elements with an array of second bonding pads of an electronic device to be bonded to the substrate;
heating the solder to a temperature sufficient to reflow such solder and to solder bond the first and second bonding pads, such bonding being in the presence of solder flux;
cooling the solder to harden it, such cooling resulting in solder flux residue;
subjecting the electronic circuit device to an extraction operation using an extraction solvent;
analyzing the extraction solvent to determine the quantity of solder flux residue remaining on the circuit device; wherein the method is characterized by:
using gel permeation chromatography to analyze the extraction solvent.

5,201,115
METHOD OF MANUFACTURING CYLINDER BLOCK OF AN ENGINE
Yasushi Inoue, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Sep. 11, 1991, Ser. No. 757,634
Claims priority, application Japan, Sep. 17, 1990, 2-246869; May 13, 1991, 3-107448
Int. Cl.[5] B23P *15/00*
U.S. Cl. 29—888.01 **4 Claims**



1. A method of manufacturing a cylinder block for an engine comprising a cylinder block body and a lower block which are cast from an aluminum alloy and are fastened together to support therebetween a crankshaft of the engine, the upper half of a bearing portion for supporting the crankshaft being provided in the cylinder block body and the lower half of the bearing portion being formed by a bearing cap cast in the lower block, said method comprising the steps of;
casting the cylinder block body and the lower block with the bearing cap cast in the lower block,
fastening together the cylinder block body and the lower block by bolts,
performing primary stage finishing of the bearing portion with the cylinder block body and the lower block kept fastened together,
releasing the lower block from the cylinder block body after the primary stage finishing of the bearing portion and permitting the lower block to deform under stress produced by shrinkage of the aluminum alloy,
fastening again the cylinder block body and the lower block together by the bolts, and
performing final stage finishing of the bearing portion with the cylinder block body and the lower block kept fastened together.

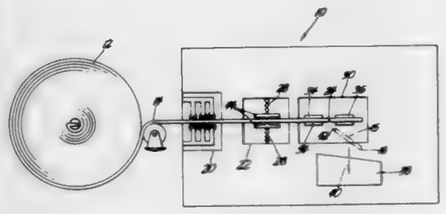
5,201,116
PROCESS FOR MEASURING UNBALANCE OF TORQUE CONVERTER AND PROCESS FOR CORRECTING SUCH UNBALANCE
Tokio Kikuchi; Yasuharu Katsuno; Zenichiro Kumita; Satoru Ichihashi; Mitsunori Murakami; Toshiharu Kano, and Koh Namiki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1991, Ser. No. 689,585
Claims priority, application Japan, Apr. 24, 1990, 2-107832
Int. Cl.[5] F16D *33/00;* **G01M** *1/16, 1/32*
U.S. Cl. 29—889.5 **5 Claims**



1. A process for measuring an unbalance of an outer member of a torque converter by assembling an inner member within an outer member and rotating the two members in unison, comprising the steps of:
conducting a plurality of measurements of the torque converter with a phase of coupling between the outer and inner members in an assembled state differentiated by a predetermined angle for the respective measurements;
increasing a rotational speed of the outer and inner members in said assembled state to a measuring rotational speed, then conducting said plurality of measurements at the measuring rotational speed, and thereafter reducing the rotational speed of said outer and inner members from said measuring rotational speed, and
processing said measurements thereby calculating unbalance due to the outer member while canceling any unbalance due to the inner member.

5,201,117
METHOD AND APPARATUS FOR SIZING AND CUTTING TUBING
William D. Wright, Lyndonville, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 4, 1991, Ser. No. 787,480
Int. Cl.[5] B26F *3/00;* **B23P** *15/26*
U.S. Cl. 29—890.05 **1 Claim**

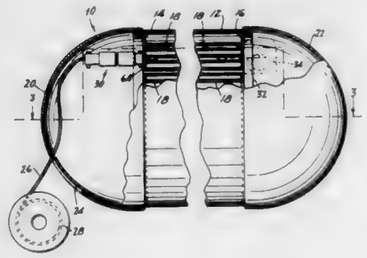
1. Apparatus for cutting lengths of tubing from continuous stock of tubing having flat sides and narrow edges and sizing the tubing perimeter adjacent the ends of cut lengths, comprising:
an embossing station;
a cutting station;
means for feeding continuous tubing first to the embossing station and then to the cutting station, and,
a pair of opposed dies at the embossing station for impressing the flat sides of the tubing, each die having a sharp ridge for forming a transverse groove in a flat side of the tubing where a cut is desired and for reducing the tubing perimeter adjacent the groove, each die also having a face adjacent the ridge conforming to a desired edge shape for forming a shaped surface on the narrow edges of the tubing; and,



the cutting station further having means for fracturing the tubing at the groove, whereby separate lengths of the tubing are formed having a reduced perimeter adjacent the ends thereof.

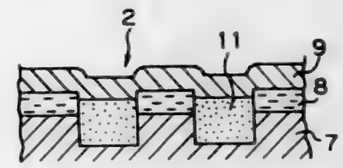
5,201,118
PROCESS FOR REPAIRING HEAT-EXCHANGER TUBES
Kevin W. McParland, 3115 Redding Rd., Fairfield, Conn. 06430
Filed Mar. 9, 1992, Ser. No. 848,156
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—890.031 **18 Claims**

1. The method of repairing a heat-exchanger of the type having a pair of spaced-apart tube sheets in which the respective extremities of exchanger tubes are mounted, which comprises the steps of unrolling tubular insert stock from a supply roll of the same, straightening the unrolled insert stock by passing it through a straightening device which has its output disposed substantially in alignment with one of said exchanger



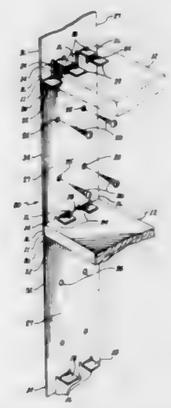
tubes at a location adjacent the mounted extremity of said exchanger tube, pulling the straightened insert stock into and entirely through said one exchanger tube so as to exit at the opposite end of the tube, cutting off the pulled-through insert stock at both of said tube sheets, radially expanding said pulled-through insert stock against the inner wall surface of said one exchanger tube at both ends thereof, and sealing the extremities of the pulled-through insert stock to the said tube sheets.

5,201,119
METHOD OF MANUFACTURING AN ALUMINUM HEAT EXCHANGER
Hiroyoshi Mizuno, Anjo; Masayoshi Nishikawa, Kariya; Noriaki Kishi, Anjo; Hideaki Kaneko, Tokyo; Ryosuke Sako, Hiratsuka, and Naomasa Shimotomai, Kawaguchi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya; Nihon Parkerizing Co., Ltd. and San-Ai Oil Co., Ltd., both of Tokyo, all of Japan
Division of Ser. No. 552,754, Jul. 16, 1990, Pat. No. 5,070,938.
This application Nov. 18, 1991, Ser. No. 793,562
Claims priority, application Japan, Jul. 17, 1989, 1-184329
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—890.047 **4 Claims**



1. A method of manufacturing a heat exchanger made of aluminum, comprising the steps of:
assembling tubes and fins made of aluminum to form a heat exchanger, the tubes and fins having a metal surface of aluminum;
immersing the assembled heat exchanger in an aqueous solution of a chemical conversion treatment agent to form a first protecting film on the metal surfaces of the tubes and fins; and
immersing the heat exchanger having the first protecting film in an aqueous solution of an antimicrobial agent to chemically bond a second protecting film of an antimicrobial agent coating to the first protecting film formed on at least the metal surface defining the fins among the tubes and fins.

5,201,120
METHOD FOR CONSTRUCTING SHELVING
Michael E. Patrick, 9630 N. 100th St., Scottsdale, Ariz. 85258
Filed Jun. 17, 1992, Ser. No. 899,999
Int. Cl.[5] B23P *11/02;* **A47G** *29/02*
U.S. Cl. 29—897.31 **8 Claims**



1. A method for constructing shelving between opposing walls of a storage area, the method comprising the steps of:

a. providing first and second shelf brackets wherein each of the shelf brackets comprises:

closer to said handle than said blade end whereby a major portion of said implement will project inward of the rim.

a first and a second sight mounting slot directed through the third side wall adjacent the handle slot on a first side of the

axes that run at least approximately perpendicular to a plane parallel to said sole layer; wherein the honeycomb body is

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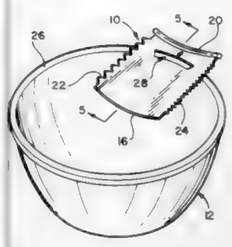
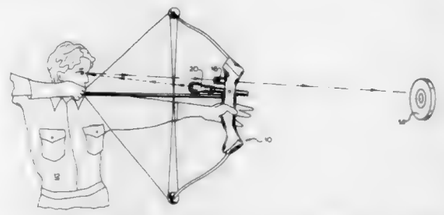
a. providing first and second shelf brackets wherein each of the shelf brackets comprises:
i. a rectangular vertically extending main surface;
ii. a plurality of equally spaced first legs extending vertically from a first end of the main surface, the first legs having a rectangular shape and a predetermined length;
iii. a horizontally extending first arm located between each pair of adjacent first legs;
iv. a plurality of equally spaced second arms extending horizontally from a second end of the main surface in the same direction as the first arms, the second arms adapted to support a board thereon;
v. vertically extending second leg located between each pair of adjacent second arms, each second leg extending in a direction opposite from that of the first legs, each second leg having a shape and length approximately the same as the first legs;
b. placing the first and second shelf brackets against opposing walls; and
c. placing said board on opposing second arms of the shelf brackets.

5,201,121
MULTIPLE PURPOSE KITCHEN IMPLEMENT
Jakob Heiberg, Copenhagen, Denmark, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Sep. 4, 1991, Ser. No. 754,805
Int. Cl.[5] B26B *3/00, 11/00;* **A47J** *43/28*
U.S. Cl. 30—123 **7 Claims**



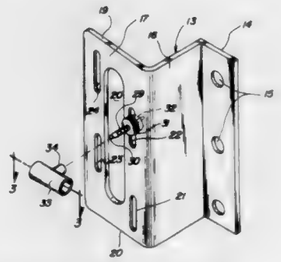
1. A multiple purpose kitchen implement comprising a sheet of shape-sustaining material having a forward blade end, a rear handle end and opposed longitudinal first and second side edges, said sheet being concavo-convex along the length thereof between said ends and defining an arc between said edges, each of said ends following said arc, said blade end being forwardly convex, said handle end, for the complete length thereof along said arc, lying in a single plane and defining a planar base continuously between said side edges for a vertical positioning of the implement on a work surface,
said sheet being of a constant thickness throughout substantially the entire extent thereof, said handle end being relatively thicker and defining a gripping means, said blade end being beveled, and
a mounting opening defined through said sheet for engagement of said implement with a laterally projecting bowl rim for mounting of said implement to a bowl, said opening extending transversely of said sheet along the arc thereof generally parallel to and spaced forward of said handle end, said opening including opposed spaced generally arcuate edges respectively comprising an inner edge for engagement with the inner surface of a bowl adjacent the rim of the bowl, and an outer edge for engagement beneath the bowl rim, said mounting opening including ends extending between said inner and outer opening edges, said sheet, between each opening end and the corresponding sheet edge, being adapted for overlying engagement with the bowl rim upon a mounting of said implement thereto and a retention of said implement generally parallel to the rim, said opening being substantially closer to said handle than said blade end whereby a major portion of said implement will project inward of the rim.

5,201,122
AIM ASSIST DEVICE FOR A WEAPON
Mark J. Annunziata, 626 E. Rosner Dr., Roselle, Ill. 60172
Filed May 18, 1992, Ser. No. 884,147
Int. Cl.[5] F41G *1/467, 1/32;* **G02B** *23/10*
U.S. Cl. 33—265 **2 Claims**



1. Apparatus for attachment to a bow to assist the archer in achieving the proper position of the bow for use of the bow sight, said apparatus comprising:
light beam means for generating and columnating a beam of light, directed toward the archer, wherein said beam of light is visible only when the bow is positioned properly for the archer to use the bow sight; and
means for mounting said light beam means to said bow at a location spaced from the line of sight of the aim of said bow.

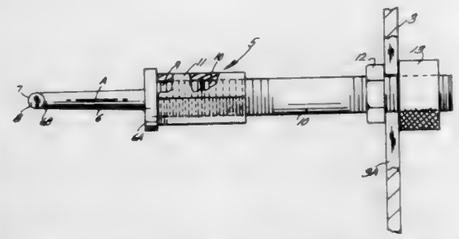
5,201,123
BOW SIGHTING APPARATUS
Eugene Booe, Rte. 2, Box 200, Yadkinville, N.C. 27055
Filed Jun. 19, 1992, Ser. No. 901,039
Int. Cl.[5] F47G *1/34*
U.S. Cl. 33—265 **3 Claims**



1. A bow sighting apparatus, comprising,
a bow member, the bow member having a central grip portion, with the central grip portion including a side wall, and
a support plate, the support plate including a first side wall and a second side wall integrally and orthogonally mounted to the first side wall, and a third side wall integrally and orthogonally mounted to the second side wall, when the first side wall, the second side wall, and the third side wall define a serpentine configuration, with the first side wall mounted to the central grip portion, and the third side wall coplanar with the grip portion side wall, and
the third side wall including a third side wall top edge and a third side wall bottom edge, and
a handle slot orthogonally directed through the third side wall between the third side wall top edge and the third side wall bottom edge, and

a first and a second sight mounting slot directed through the third side wall adjacent the handle slot on a first side of the handle slot, with the first sight mounting slot and the second sight mounting slot longitudinally aligned, and
a first sight member mounted to the first sight mounting slot and a second sight member mounted to the second sight mounting slot, and
a third sight mounting slot and a fourth sight mounting slot longitudinally aligned relative to one another and directed through the third side wall on a second side of the handle slot, wherein the first sight mounting slot, the second sight mounting slot, the third sight mounting slot, and the fourth sight mounting slot are arranged in a parallel relationship, and a third sight member mounted to the third sight mounting slot and a fourth sight member mounted to the fourth sight mounting slot, and
the sight member includes a sight hood, and a mounting tube orthogonally intersecting the sight hood, the mounting tube internally threaded, and an externally threaded sight pin threadedly received within the mounting tube, and the sight pin including a first fastener and a second fastener to secure the sight pin to the third side wall, and the sight pin including a sighting sphere, with the sighting sphere positioned medially of the sight tube.

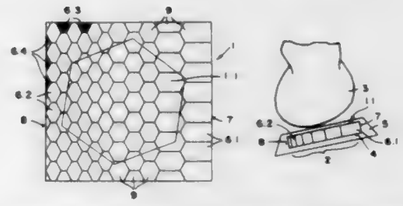
5,201,124
ILLUMINATED ARCHERY SIGHT PIN
James R. Sherman, 2961 Rudo Rd., Orofina, Id. 83544
Filed Jan. 28, 1992, Ser. No. 827,145
Int. Cl.[5] F41G *1/46, 1/32*
U.S. Cl. 33—265 **4 Claims**



1. A sight having a bead illuminated by ambient light, said sight comprising,
a light wave collecting and conducting member having a major segment of elongate tapered configuration having a light absorbing surface for exposure to direct ambient daylight, a remaining portion of said major segment of uniform diameter, said member additionally including a curved segment and an end segment terminating in a face constituting said bead, said curved segment and said end segment being of uniform diameter and extend from end of said tapered segment, said member of a transparent plastic having a fluorescent dye dispersed therein, and
means for coupling said member to a support.

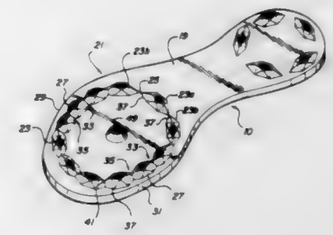
5,201,125
SHOE, ESPECIALLY A SPORT OR REHABILITATION SHOE
Martyn R. Shorten, Portland, Oreg., assignor to Tretorn AB, Helsingborg, Sweden
Filed May 31, 1991, Ser. No. 707,865
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006188[U]
Int. Cl.[5] A43B *13/20, 13/18*
U.S. Cl. 36—29 **19 Claims**

1. Shoe, especially sport shoe or rehabilitation shoe, with a shoe sole comprising at least one sole layer with at least one insert part formed of a honeycomb body made of elastic compressible material, and having honeycomb cells with central axes that run at least approximately perpendicular to a plane parallel to said sole layer; wherein the honeycomb body is provided in the sole layer in an area positioned under the heel



of a wearer; and wherein the honeycomb cells increase in surface area from one side edge of the honeycomb body to an opposite side edge of the honeycomb body, across the sole, as seen in a top view thereof.

5,201,126
CLEATED SOLE FOR AN ATHLETIC SHOE
Michael L. Tanel, Milwaukee, Wis., assignor to Tanel Corporation, Milwaukee, Wis.
Continuation of Ser. No. 407,869, Sep. 15, 1989, abandoned. This application Aug. 6, 1991, Ser. No. 741,042
Int. Cl.[5] A43B *5/00, 5/02*
U.S. Cl. 36—134 **3 Claims**



1. In a cleated field-sports shoe sole of the type having ground-penetrating cleats extending from a main sole surface, and having heel, arch, ball-of-the-foot and toe portions, the improvement comprising:
an annular cleat set projecting from the main sole surface and disposed along a substantially circular path encompassing a major area of the toe and ball-of-the-foot portions, the set having a plurality of cleat nodes each arranged in a substantially abutting relationship to at least one adjacent cleat node;
each cleat node having a base portion which is joined to the main sole surface and has a length measured generally along the path and a thickness measured generally radially to the path, the length substantially greater than the thickness, whereby the cleat set provides excellent pivotability of an cleated field-sports shoe and excellent resistance to forces urging the shoe laterally or longitudinally;
each cleat node having a distal end spaced from the main sole surface and first and second edges on opposite sides of the distal end, each of the edges having a proximal end which terminates substantially on the circular path and, when the cleat node is in contact with the ground, defines with the ground an acute included angle thereby to reduce resistance of the sole to pivoting action; and
each cleat node having a shoulder portion intermediate the distal end and the main sole surface, said abutting relationship occurring at the shoulder portions of abutting cleat nodes.

5,201,127

5,201,130

electrical insulation means to form said one of the gimbal

and having an output member drivable in the Z-axis direc-

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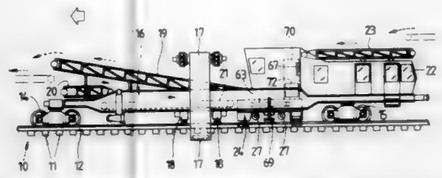
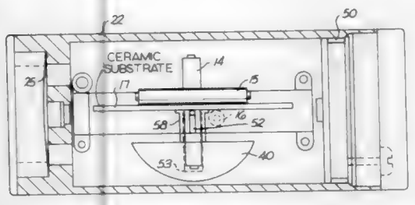
5,201,127
SELF METERING BALLAST SYSTEM
John B. Whitaker, Jr., Wetumpka, Ala., assignor to Keshaw Manufacturing Company, Inc., Wetumpka, Ala.
Filed Feb. 19, 1992, Ser. No. 836,875
Int. Cl.[5] E02F *5/22*; E01B *27/17*
U.S. Cl. 37—107 21 Claims



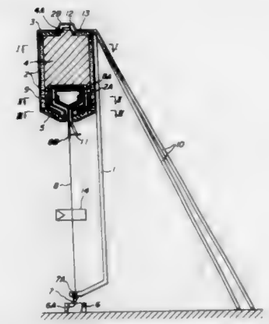
14. A self metering ballast replacement apparatus for automatically distributing ballast beneath a railroad track held in suspension by means engaging the rails of said track and supporting the crosstie thereof comprising:
(a) means supportably on said rails for selectively distributing said ballast laterally and centrally relative said track and for confining said ballast not so distributed; said distributing means comprising a hopper supported on a plurality of rail engaging rollers and displaceable vertically to a non-rail engaging position, said hopper having forward discharge openings and a center discharge opening;
(b) a proximity sensor for continuously sensing the amount of ballast within said distributing means; and
(c) means for grading said distributed ballast to a preselected height.

5,201,128
MINIATURE GIMBAL MOUNTED MAGNETIC FIELD DETECTORS
André W. Olivier, New Orleans, and Walter L. Heston, Arabi, both of La., assignors to The Laitram Corporation, New Orleans, La.
Filed Aug. 23, 1991, Ser. No. 749,324
Int. Cl.[5] G01C *17/18*
U.S. Cl. 33—355 R 26 Claims



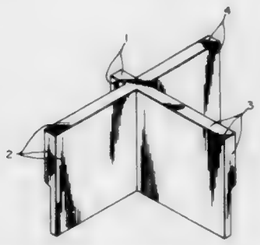
1. An electronic magnetic compass system, comprising in combination,
an electronic circuit assembly,
a gimbal assembly of two gimbal rings with the circuit assembly mounted therein for dynamically maintaining the orientation of the electronic circuit assembly about a pair of coordinate axes,
electronic magnetic field detection means in said electronic circuit assembly sensitive to orientation of the circuit assembly with respect to magnetic fields including the earth's magnetic field,
two conductive metallic pivot shaft portions each electrically insulated from each other, said shafts being aligned along one of said axes for supporting the detection means about that axis for rotation in one of the gimbal rings,
two electrically conductive gimbal ring members joined by electrical insulation means to form said one of the gimbal rings,
journalling means in the two isolated gimbal ring members for rotatably journalling the two pivot shafts for rotation therein, said journalling means further comprising ball races having ceramic balls forming electrically non-conductive bearing surfaces between the respective shafts and the respective gimbal ring members, and
electronic circuit conductor means connected respectively to the two shaft portions and gimbal ring members for communicating electric current signals from the electronic circuit assembly.

5,201,129
VERTICAL INDICATOR UNIT
Fukujiro Ukawa, Machida, Japan, assignor to Kabushiki Kaisha Kito Koei, Tokyo, Japan
PCT No. PCT/JP91/00240, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO91/13320, PCT Pub. Date Sep. 5, 1991
PCT Filed Feb. 25, 1991, Ser. No. 777,237
Claims priority, application Japan, Feb. 27, 1990, 2-44395
Int. Cl.[5] G01C *9/14, 9/18*
U.S. Cl. 33—391 1 Claim



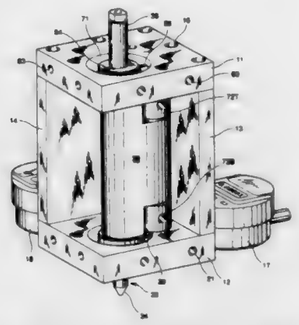
1. A vertical indicator unit for measurement comprising:
(a) a liquid-filled reverse cup-shaped vessel having a reentrant inner wall enclosing an inner space, said space having an upper and lower portion;
(b) a float floating in said vessel and having connected to said float a first doughnut-like magnet surrounding at least said lower portion of said inner space of said vessel;
(c) an external supporting frame secured to the outside of said vessel and having at a lower end a hinge contact point; and
(d) a vertical indicating rod having a head portion, said head portion being disposed in the inner space of said vessel and having a funnel-like doughnut magnet connected thereto, said funnel-like magnet and said first doughnut-like magnet opposing each other and being oppositely polarized so that said first doughnut-like magnet and said funnel-like magnet are diagmagnetically repulsively held from each other at a certain air space;
(e) said vertical indicating rod being secured to a lower portion of said head portion, said vertical indicating rod being connected to said hinge contact point on said external supporting frame such that said vertical indicating rod is vertically held with respect to a predetermined position of the lower portion of said external supporting frame by diamagnetism of both magnets and buoyancy of said float.

5,201,130
TILE TEMPLATE
Peter S. Krchnak, P.O. Box 30934, Bethesda, Md. 20814
Filed Jan. 24, 1992, Ser. No. 825,126
Int. Cl.[5] G01B *3/30*
U.S. Cl. 33—526 5 Claims



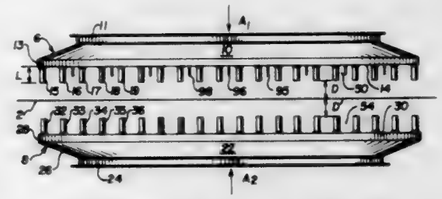
1. A tile-laying template comprising:
first and second opposed arms having substantially equal lengths; and
third and fourth opposed arms disposed at right angles to said first and second opposed arms;
said third arm being relatively short in comparison to said first, second, and fourth arms; and
each of said arms having a top portion and a bottom portion, said top portions all having a first width, said bottom portions all having a second width, and said first width being greater than said second width.

5,201,131
COORDINATE MEASURING MACHINE
Larry C. Wilkins, 1601 Hedden Ct., New Albany, Ind. 47150
Filed Apr. 23, 1990, Ser. No. 512,977
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—556 10 Claims



1. A gage assembly to be mounted on a fixture to which workpieces to be measured can be fastened while measurements are made in mutually perpendicular X-axis and Y-axis coplanar coordinates, the assembly comprising:
a frame mountable to the fixture;
a first position sensor secured to the frame and having an operating plunger extending in the X-axis direction;
a first pivot arm mounted to the frame to pivot about a first Z-axis perpendicular to a plane containing the X-axis and Y-axis;
a second position sensor secured to the frame and having an operating plunger extending in the Y-axis direction;
a second pivot arm mounted to the first pivot arm to pivot about a second axis parallel to the first axis; and
a Z-axis probe guide secured to the second arm;
a powered probe drive actuator secured to the second arm and having an output member drivable in the Z-axis direction; and
a Z-axis probe connected to the output member and slidably mounted to the probe guide to slide in the Z-axis direction.

5,201,132
STRIP COOLING, HEATING OR DRYING APPARATUS AND ASSOCIATED METHOD
William L. Jacob, Pittsburgh, Pa., assignor to Busch Co., Pittsburgh, Pa.
Filed Apr. 26, 1991, Ser. No. 691,708
Int. Cl.[5] F26B *7/00*
U.S. Cl. 34—13 44 Claims



23. A method of cooling treating strip comprising
providing thermal treatment gas handling means with a first unit having a plenum in communication with a plurality of first elongated nozzle members projecting therefrom for directing gas onto said strip as it moves in a path adjacent to said thermal treatment gas handling means,
moving said strip in said path,
directing said gas through said first unit plenum and out of the nozzle elements onto a first side of said strip,
providing said thermal treatment gas handling means with a second unit having a hollow body portion for receipt and discharge of gas and a plurality of second elongated nozzle members projecting therefrom for directing gas onto said strip,
positioning said second unit on the opposite side said of said path from said first unit and directing gas through such second nozzle members onto a second side of said strip,
effecting exhaust of said gas after it has contacted said strip through spent gas recovery regions defined by the exterior surfaces of nozzle elements and a wall of said unit, whereby said gas will flow from said nozzle elements to said strip and subsequently through said spent gas recovery region,
treating metal strip by said method,
employing said method to cool said strip, and
cooling said strip from about 1,000° F. or more to about 350° F. or less.

5,201,133
PHOTOGRAPHIC FRAME ASSEMBLY
Scott D. Best, Troy, and James F. Turner, Farmington Hills, both of Mich., assignors to Saxon, Inc., Ferndale, Mich.
Filed Apr. 20, 1992, Ser. No. 871,072
Int. Cl.[5] B44C *5/00*
U.S. Cl. 40—158.1 7 Claims

1. A frame sheet article (**24**) for displaying a photograph (**22**), said article comprising:
a frame sheet (**24**) having a front surface (**34**) and a back surface (**36**) opposite said front surface (**34**),
said frame sheet (**24**) including a border section (**40**) with an inner margin (**42**) surrounding a center section (**48**),
an adhesive (**46,50**) disposed on said back surface (**34**),
a single removable backing sheet (**52**) covering said adhesive (**46,50**) including a middle portion (**52***a*) thereof covering said center section (**48**) and covering said inner margin (**42**) on said back surface (**36**),
release means (**54**) for allowing complete removal of said

ronment having a bottom surface and for providing spawning cover for adult predatory fish, said structure comprising:

said core including an effervescing reactant including sodium bicarbonate and capable of producing bubbles when

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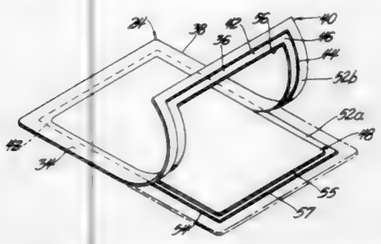
center section (**48**) from said frame sheet and removal of said middle portion (**52***a*) from said backing sheet to expose a border adhesive (**46**) on said back surface (**36**) of said border section (**40**) for holding the photograph (**22**),



characterized by said release means (**54**) including a first die cut (**55**) between said center section (**48**) and said border section (**40**) extending from said front surface (**34**) to said back surface (**36**).

5,201,134

MOLDED-IN ADVERTISING PANEL HAVING RETAINING LIPS AND DEFINED BETWEEN A BASKET WALL SURFACE PLANES

Houston Rehrig; Steven C. Decker; Alan R. Kern, and Lonnie G. Dickerson, all of Richmond, Va., assignors to Rehrig International, Inc., Richmond, Va.

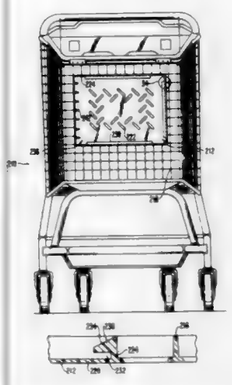
Continuation-in-part of Ser. No. 333,680, Apr. 6, 1989, abandoned, and a continuation-in-part of Ser. No. 190,065, May 4, 1988, Pat. No. 4,922,639, Ser. No. 333,680, May 4, 1988, which is a continuation-in-part of Ser. No. 190,065, May 4, 1988.

This application Jun. 6, 1990, Ser. No. 533,144

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[5] **G09F** *3/00*

U.S. Cl. 40—308 **6 Claims**



1. A nestable basket comprising at least one sidewall comprising latticework and including inner and outer sidewall surface planes; an advertising display panel supported in the sidewall between the inner and outer sidewall surface planes, said display panel comprising a backing plate permanently attached to the sidewall and having an inner surface not extending beyond the inner sidewall surface plane and an outer surface recessed from the outer sidewall surface plane; an edge wall structurally integral with the backing plate extending outwardly from the outer surface of the backing plate around at least part of the perimeter of the plate and towards the outer sidewall surface plane but not substantially beyond said outer sidewall surface plane; retainer lips spaced outwardly from the backing plate, structurally integral with the edge wall and recessed from the outer sidewall surface plane; said lips extending inwardly from the edge wall towards a central area of the backing plate and defining an advertising card receiving slot between said lips and said backing plate.

5,201,135

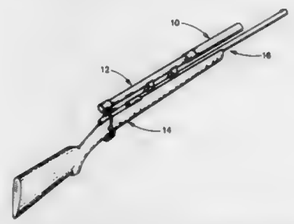
HEAT SHIELD-PARALLAX/GLARE REDUCTION DEVICE

Russell H. Cowles, P.O. Box 942, Indian Hills, Colo. 80454

Filed May 6, 1991, Ser. No. 697,234

Int. Cl.[5] **F41G** *1/38*; **G02B** *23/00*

U.S. Cl. 42—101 **7 Claims**



1. A scope accessory operative to reduce glare and parallax error and adapted for mounting onto an optical scope which has a light collecting end, a viewing end and a viewing axis, said scope accessory comprising:

(a) an elongated tubular member of a selected longitudinal length extending along a longitudinal axis and having opposite first and second ends; and

(b) a scope mount adapted to mount the first end of said elongated tubular member onto the light collecting end of said scope whereby said tubular member is supported in a substantially rigid manner thereon with the longitudinal axis of said elongated tubular member oriented colinearly with the viewing axis of said scope, the length of said tubular member being selected to be of sufficient dimension such that said elongated tubular member allows only those light rays traveling substantially parallel to the longitudinal axis to enter the second end of the tubular member and thereafter reach said light collecting end of said scope thereby both reducing the field of view seen through said scope for any line of sight which diverges from the viewing axis and minimizing glare when in use.

5,201,136

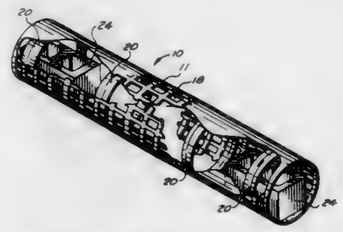
ARTIFICIAL FISH HABITAT STRUCTURES

David L. LaMorte, 2031 E. Gary Cir., Mesa, Ariz. 85213, and Robert L. Hirsch, 6447 E. Lone Mountain, Cave Creek, Ariz. 85331

Filed Jan. 23, 1990, Ser. No. 469,034

Int. Cl.[5] **A01K** *97/04, 61/00*

U.S. Cl. 43—4 **18 Claims**



1. An artificial habitat structure for use in an aquatic environment having a bottom surface and for providing spawning cover for adult predatory fish, said structure comprising:

a) a horizontally supported tubular member formed of plastic and including a sidewall surrounding a longitudinal axis extending generally parallel to said bottom surface and having a pair of opposite open ends;

b) a plurality of openings formed in said sidewall, the dimensions of said openings being selected to allow entrance and exit of fry while preventing entrance of larger predatory fish; and

c) stabilizing means for securing said tubular member in a stable position on said bottom surface, said stabilizing means comprising a pair of weights mounted in opposite ends of said tube, each of said weights including a cinder block, the clearance between the top of said block and the sidewall of said tubular member being sufficient to allow a selected species of adult spawning fish to enter said tube, while preventing entry of larger species of predatory fish.

5,201,137

HYDRODYNAMIC TRAWL OPENING DEVICE

Francois Theret, Lorient; Hervé Guigo, Caudan, and Bernard Kerrest, Brest, all of France, assignors to Institut Francais de Research pour l'Exploitation de la Mer, Issy-Les-Moulineaux, France

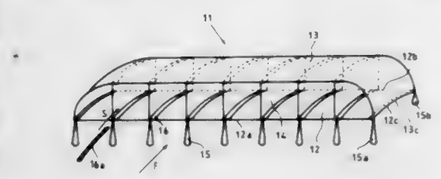
PCT No. PCT/FR89/00541, § 371 Date Jun. 3, 1991, § 102(e) Date Jun. 3, 1991, PCT Pub. No. WO91/01633, PCT Pub. Date Feb. 21, 1991

PCT Filed Jul. 18, 1990, Ser. No. 659,421

Claims priority, application France, Aug. 9, 1989, 89 10860

Int. Cl.[5] **A01K** *73/04*

U.S. Cl. 43—9.7 **16 Claims**



1. Hydrodynamic trawl opening device comprising a structure with at least two flexible superimposed wings, joined together by a plurality of flexible dividing walls which are transverse to said wings, fixing means for rigging said structure to the trawl, close to an opening of the trawl, so that the wings are incident with respect to the flow direction and so that said dividing walls are oriented in the flow direction, said flexible wings and said flexible dividing walls being made of fabric, so that said structure is collapsed out of the water but takes shape in the water to provide a rigid opening device when trawled.

5,201,138

BUBBLING FISH ATTRACTOR

Hugh E. Watkins, Jr., 4253 Pinetree La., Cincinnati, Ohio 45245

Filed May 14, 1992, Ser. No. 882,882

Int. Cl.[5] **A01K** *85/01*

U.S. Cl. 43—42.06 **14 Claims**

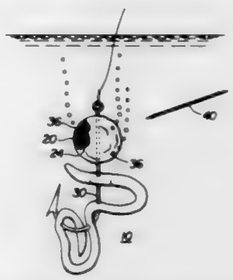
12. A fish attracting device comprising:

a fishing hook,

a malleable soft wax waterproof shell impaled on said fishing hook,

a core within said shell,

said core including an effervescing reactant including sodium bicarbonate and capable of producing bubbles when



placed underwater and said core further including an anti-caking agent.

5,201,139

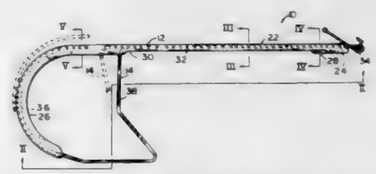
FISH HOOK REMOVER

Forest L. Middleton, C-1506 Barlow Lake, Middleville, Mich. 49333

Filed Sep. 3, 1992, Ser. No. 940,285

Int. Cl.[5] **A01K** *97/00*

U.S. Cl. 43—53.5 **5 Claims**



1. A fish hook removal tool for disengaging a fish hook from the mouth and throat of a fish, comprising:

an elongated, stamped, J-shaped metal sheath including an elongated barrel portion having an outer end, and a curved handle portion integral with said barrel portion;

said sheath having a U-shaped cross section in said handle portion;

an elongated spring wire retained in said sheath, having a curved portion with a free configuration greater in arcuate extent than said sheath handle portion, but being restrained within said handle portion, said spring wire having an elongated linear portion extending the length of said barrel portion, a U-shaped end extending out said outer end of said barrel portion, and a trigger portion extending out of said barrel portion from said linear wire portion to said curved wire portion;

said sheath having a stop on said barrel portion where said wire extends therefrom, to limit the amount said U-shaped end extends out of said barrel portion.

5,201,140

REMOTE CHRISTMAS TREE WATERING APPARATUS

Donald P. Voorhis, 2412 Wembly, Troy, Mich. 48084

Filed Dec. 12, 1990, Ser. No. 626,011

Int. Cl.[5] **A47G** *7/02*

U.S. Cl. 47—40.5 **28 Claims**

1. A watering apparatus comprising:

a first reservoir including at a top end an open section and at an opposite end a spigot for accepting one end of a hose;

a second reservoir positioned remote from said first reservoir, said hose allowing a fluid material to travel between said first reservoir and said second reservoir; and

a cap assembly selectively detachable from said second

reservoir and having a spigot for accepting the opposite

quickly percolating said nutrient solution down the roots, and

window stay including a first arm having one end pivotally attached to said one horizontal side of the window frame and

selecting another slider orientation relative to the channel prior to installation in the channel and then slideably

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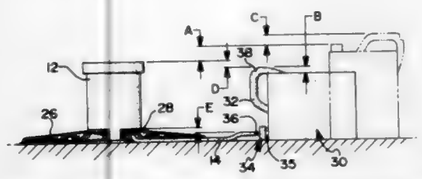
reservoir and having a spigot for accepting the opposite end of said hose, said cap assembly further having means



for preventing the fluid material from flowing through said hose from said first reservoir when said hose is not connected to said second reservoir.

5,201,141

METHOD OF HYDROPONICAL GROWING OF PLANTS AND AN APPARATUS AND A SYSTEM FOR USE BY THE METHOD

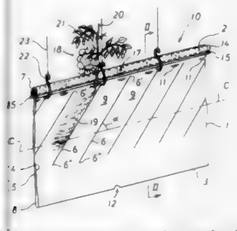
Poul H. Ahm, Gran Canaria, Spain, assignor to Bentle Products AG, Zug, Switzerland

Continuation-in-part of Ser. No. 418,771, Sep. 22, 1989, abandoned, which is a continuation of Ser. No. 25,883, Mar. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 725,161, Apr. 22, 1985, abandoned, which is a continuation of Ser. No. 449,211, Dec. 13, 1982, abandoned. This application Jul. 23, 1990, Ser. No. 557,397

Claims priority, application Denmark, Oct. 19, 1979, 4420/79

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—67 **20 Claims**



1. A method of growing plants, said method comprising the steps of:

using an apparatus comprising a pair of flatwise juxtaposed layers of watertight material, such as plastic film, defining at least one flat interspace for the development of the roots of a plant, said apparatus having a first end and an opposite second end, at least the first end being closed, and said apparatus further being without any growth substrate therein, and said interspace being substantially closed to the surrounding atmosphere at least around the top of the root apart from minor openings for the plant stem and for the exchange of nutrient solution,

suspending said apparatus on at least one suspension means with said first end fixed at said suspension means in a substantially horizontal plane, with the rest of the apparatus suspended therefrom, and with the plane of the interspace vertically or slopingly oriented,

forming at least one minor throughcut in at least one of said layers,

forming at least one drain opening at a lower part of said interspace,

inserting plant roots without any growth substrate inside said interspace at the upper part thereof, with the stem of the plant extending through said minor throughcut,

adding nutrient solution to said interspace at a location above said roots of the plant and guiding it to said roots, quickly percolating said nutrient solution down the roots, and

allowing unabsorbed nutrient solution to drain out from below the roots through said drain opening.

5,201,142

REVOLVING DOOR

Josephus A. M. Rouwendaal, Wormerveer, Netherlands, assignor to Boon Edam B.V., Edam, Netherlands

Filed Dec. 19, 1991, Ser. No. 810,236

Claims priority, application Netherlands, Jan. 21, 1991, 9100092

Int. Cl.[5] E05D *15/02*

U.S. Cl. 49—42 **8 Claims**

1. A revolving door comprising: a number of substantially horizontally turning door wings (2); a drive mechanism for driving said door wings (2), said drive mechanism being provided with elongate driving means (5) running in a substantially horizontal plane along a number of guide units (6) in an essentially polygonal path and operatively engaging at least one door wing (2) by means of carrier means (8), said carrier means (8) comprising at least two hinged carrier elements (9, 10), each engaging the driving means (5) at two spaced apart points (A, B), coupling means (11, 12) interconnecting said carrier elements to each other, said coupling means being movably and drivably connected to said at least one door wing (2).

5,201,143

WINDOW STAY

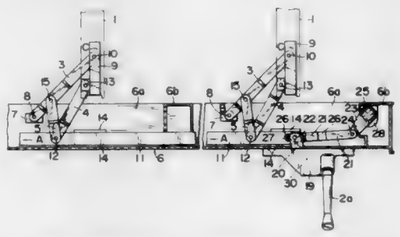
Yoshikazu Nakanishi, 1-11, Kandaizumi-cho, Chiyoda-ku, Tokyo, Japan

Continuation of Ser. No. 391,453, Aug. 9, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 633,161

Claims priority, application Japan, Nov. 26, 1988, 63-298840

Int. Cl.[5] E05F *11/24*

U.S. Cl. 49—339 **5 Claims**



1. A window comprising, a rectangular window frame having oppositely disposed horizontal sides and oppositely disposed vertical sides, a first driving rod associated with one of the horizontal sides of the window frame and reciprocatory longitudinally of said one horizontal side, a first window sash arranged parallel to one of the vertical sides of the window frame and having a top side and a bottom side, and a first

window stay including a first arm having one end pivotally attached to said one horizontal side of the window frame and its other end pivotally attached to the bottom side of the window sash, said first arm serving to swing the window sash about a point of attachment of the first arm to said window frame as the driving rod is operated, a second arm having one end pivotally attached to the bottom side of the window sash and its other end pivotally attached to the driving rod, said second arm effective to swing the window sash about the point of attachment of the first arm to said window sash as the driving rod is operated, and a third arm having one end pivotally attached to the first arm between both ends of said first arm and its other end pivotally attached to the driving rod, and said third arm serving to swing said first arm together with the window sash about the point of attachment of the first arm to the window frame as the driving rod is operated a first mounting plate fixed to said one horizontal side of the window frame at the point of attachment of the first arm to said window frame, and a second mounting plate fixed to the bottom side of the window sash at respective points of attachment of the first arm and the second arm to said window sash, a second driving rod associated with the other horizontal side of the window frame and reciprocatory longitudinally of such other horizontal side, a second window stay corresponding to the first window stay and associated with the top side of said first window sash, a transmitting shaft associated with one of the vertical sides of the window frame and extending vertically between the two horizontal sides of said window frame, a first connection between the bottom end of the transmitting shaft and the first driving rod, and a second connection between the top end of the transmitting shaft and the second driving rod, whereby said first driving rod and said second driving rod are simultaneously operated upon operation of said transmitting shaft, said first connection including a first crank arm fixed to the bottom and of the transmitting shaft, and a first connecting rod between said first crank arm and the first driving rod, and the second connection including a second crank arm fixed to the top end of the transmitting shaft, and a second connection rod between said second crank arm and the second driving rod, a crank handle rotatably mounted on said one horizontal side of the window frame, a worm attached to an inner end of said crank handle, a worm wheel drivable by said worm, a driving arm extending radially from said worm wheel, and a transmitting rod pivotally connecting said driving arm to said first crank arm and drivable without rotation about a longitudinal axis thereof for operation of said transmitting shaft upon rotation of said crank handle, a housing attached to said one horizontal side of the window frame for mounting of the crank handle thereon, and said worm and worm wheel being positioned in said housing.

5,201,144

ECCENTRICALLY LOCATED APERTURE IN A CAM SLIDER FOR WINDOW REGULATOR

Gary W. Krajenke, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

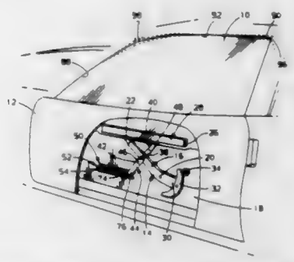
Filed Sep. 14, 1992, Ser. No. 944,613

Int. Cl.[5] E05F *11/44*

U.S. Cl. 49—351 **3 Claims**

1. In a vehicle door having a window raised and lowered by a window regulator mechanism in which a window regulator arm is coupled to a channel by a slider mounted on the arm by a swivel and the slider slideably engaging the channel, the improvement comprising:

the slider having a plurality of paired, spaced apart, opposed side surfaces and a regular polygon mounting surface bounded by the side surfaces and having an eccentrically located mounting means for receiving the swivel, and selecting and locating one of the pairs of side surfaces for slideable engagement with the channel, slideably vertically locates the swivel in the channel determining a specific vertical position of the swivel in the channel, and selecting another slider orientation relative to the channel prior to installation in the channel and then slideably



locating the slider in the channel results in a different specific vertical position of the swivel in the channel.

5,201,145

MONOCRYSTAL INGOT ATTITUDE-ADJUSTING/SURFACE-GRINDING/CONVEYING APPARATUS

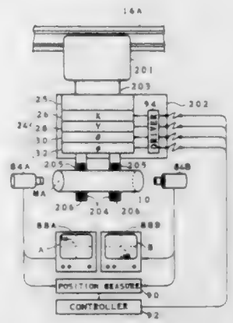
Hiroyuki Ibe, Nyu, Japan, assignor to Shin-Etsu Handotai Company, Limited, Tokyo, Japan

Filed Apr. 1, 1991, Ser. No. 679,509

Claims priority, application Japan, Mar. 31, 1990, 2-85937; Mar. 31, 1990, 2-85938; Mar. 31, 1990, 2-85939

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.71 **9 Claims**



1. A monocrystal ingot conveying/surface-grinding apparatus having a pair of rotational clamp shafts (**70A, 70B**) having aligned rotational centers and disposed to confront each other, means (**54A, 54B, 58** to **64**) for supporting a monocrystal ingot (**10**) by causing the front surfaces of said rotational clamp shafts to press the two end surfaces of said monocrystal ingot which respectively have instructed grinding rotation centers (MA, MB), means (**68A, 68B, 74–78**) for rotating said rotational clamp shafts and means (**48**) for grinding said monocrystal ingot into a cylindrical shape by abutting a grindstone against the surface of the monocrystal ingot, said monocrystal ingot conveying/surface-grinding apparatus comprising:

a plurality of monocrystal ingot surface-grinding devices (**221A** to **225A**) disposed serially;

a rail (**16A**) disposed above and along said monocrystal ingot surface-grinding devices disposed serially; and

a monocrystal ingot conveying/attitude-adjusting device (**20A**) having hands (**205, 206**) for holding said monocrystal ingot, a travelling portion (**201**) which moves along said rail and is disposed above said hands (**206, 207**) and an intermediate portion (**202**) disposed between said hands and said travelling portion and arranged to move said hands so that said grinding rotation centers instructed on

said two end surfaces of said ingot held by said hands are made to coincide with the rotation center line of said

first cutting head and a second cutting head fixedly mounted to the cylindrical body at opposed ends thereof

a body member having a front surface and a rear surface and a central bore extending therethrough in which an end of

the surface of the slurry therein, a blasting gun connected by a slurry delivery conduit to said vessel and adapted for receiving

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said two end surfaces of said ingot held by said hands are made to coincide with the rotation center line of said rotational clamp shaft of said monocrystal ingot surface-grinding device,

said monocrystal ingot surface-grinding device having a base (**24**); and

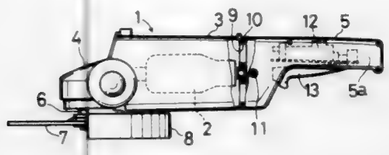
an X-Y-$\theta\phi$ stage (**24**) having an X-stage (**26**) which is moved with respect to said base in a direction of an X-axis, a Y-stage (**28**) which is moved in a direction of a Y-axis, a θ-stage (**3**) which is rotated around an axis which parallels said X-axis and a ϕ-stage (**32**) which is rotated around an axis which parallels said Y-axis.

5,201,146

PORTABLE ROTARY TOOL

Fusao Fushiya, Anjo, Japan, assignor to Makita Corporation, Anjo, Japan

Filed Dec. 13, 1991, Ser. No. 806,258
Claims priority, application Japan, Dec. 20, 1990, 2-413204
Int. Cl.[5] B24B *23/00*
U.S. Cl. 51—170 R **5 Claims**



1. A portable rotary tool comprising:

a body having therein drive means for rotation of a tool for working, said body including an end portion having a cylindrical configuration;

a handle having an operation member mounted thereon for operation of said drive means by an operator, said handle including an end portion opposed to said end portion of said body and having a cylindrical configuration which is substantially the same as that of said end portion of said body, and said handle including a pair of handle halves separated by a separating surface extending through an axis of rotation of said handle;

connecting means for connecting said handle with said body and for permitting rotation of said handle relative to said body, said connecting means including at least one annular recess formed on one of said body and said handle and including at least one annular protrusion formed on the other of said body and said handle, and said at least one annular recess and said at least one annular protrusion being opposed to each other in a radial direction for engagement therewith; and

securing means for securing the rotational position of said handle relative to said body and including fastening means for pressing said handle halves toward each other;

said handle being prevented form rotation relative to said body through close engagement of said at least one annular protrusion with corresponding said at least one annular recess when said fastening means has been tightened, while said handle being permitted to rotate relative to said body when said fastening means has been loosened.

5,201,147

MARINE BATTERY TERMINAL CLEANER TOOL

Daniel L. Francis, 6169 Blue Ribbon, Hillsboro, Ohio 45133

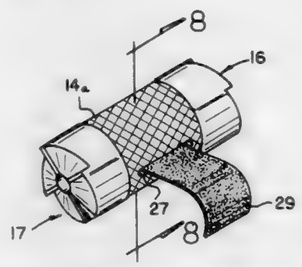
Filed Apr. 27, 1992, Ser. No. 874,436
Int. Cl.[5] B24B *25/00;* **B26B** *11/00*
U.S. Cl. 51—181 R **2 Claims**

1. A marine battery terminal cleaner tool, comprising:

an elongate cylindrical body, the cylindrical body having a cylindrical body side wall, the side wall including a roughened and textured side wall exterior surface, and

the cylindrical body defined about an elongate axis, with a first cutting head and a second cutting head fixedly mounted to the cylindrical body at opposed ends thereof coaxially aligned with the axis, and

the first cutting head includes a first end wall comprising a plurality of first planar surface segments, each of said first segments being angularly oriented relative to the axis, the second cutting head includes a second end wall comprising a plurality of second planar surface segments, each of said second segments being angularly oriented relative to the axis, with the first end wall including a plurality of first cutter blades integrally mounted thereon, and the second end wall including a plurality of second cutter blades integrally mounted thereon, wherein the first cutter blades are orthogonally oriented relative to the axis, the second



cutter blades are orthogonally oriented relative to the axis, and

the first end wall includes a first bore directed into the first cutting head defined by a first diameter, and the second cutting head includes a second bore directed into the second end wall defined along the axis and defined by a second diameter, wherein the first diameter is less than the second diameter, and

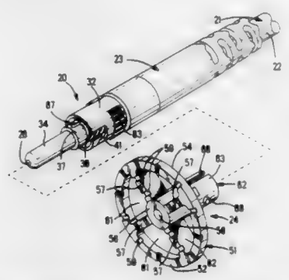
at least one cap arranged for securement respectively about the first cutting head of the second cutting head selectively, wherein the cap is of a ferromagnetic material, the first cutting head and the second cutting head are each of a ferrous material to effect magnetic adherence of the cap relative to the first cutting head.

5,201,148

POLISHING BUSHING FOR POLISHING AN OPTICAL FIBER IN AN OPTICAL FIBER CONNECTOR

Martin R. Rupert, Hummelstown, and Donald W. Thompson, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1992, Ser. No. 859,178
Int. Cl.[5] B24B *41/06, 13/005*
U.S. Cl. 51—217 R **14 Claims**



1. A polishing bushing for polishing an end face of an optical fiber supported in an optical fiber alignment ferrule, comprising:

a body member having a front surface and a rear surface and a central bore extending therethrough in which an end of the alignment ferrule is to be disposed; and

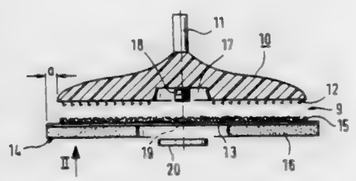
securing means for securing the ferrule to the body member for maintaining an end face of the ferrule and the end face of the optical fiber supported therein to be polished proximate the front surface of the body member, wherein said body member includes a plurality of spaced openings surrounding said bore, each of said openings extending therethrough from the front surface to the rear surface thereof to permit visual monitoring of a polishing operation therethrough.

5,201,149

LAMELLAR END GRINDING TOOL

Gerd Eisenblätter, Königsdorf, Fed. Rep. of Germany, assignor to Gerd Eisenblaetter GmbH, Geretsried, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 720,162
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020461
Int. Cl.[5] B24D *13/16*
U.S. Cl. 51—394 **27 Claims**



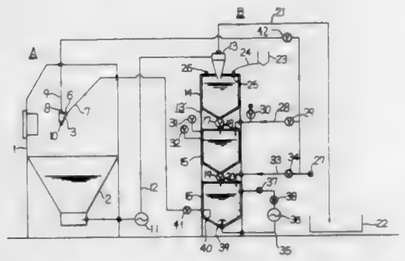
1. A lamellar end grinding tool comprising a support plate provided with a first fastening means for mounting on a driving machine, a grinding wheel having a circular fabric carrier detachably fixable to the support plate and radially oriented grinding flaps partially overlapping one another and fixed thereto, wherein a second fastening means between the carrier and the support plate comprises a self-adhesive, detachable, large-area fitted adhesive medium.

5,201,150

WET ABRASIVE BLASTING APPARATUS USING PRESSURIZED SLURRY

Matao Kuboyama; Mamoru Iwanabe, and Mutsuhiko Suzuki, all of Shizuoka, Japan, assignors to Fuji Seiki Machine Works, Limited, Shizuoka, Japan

Filed Jul. 10, 1991, Ser. No. 728,102
Claims priority, application Japan, Jul. 24, 1990, 2-193917
Int. Cl.[5] B24C *7/00, 9/00*
U.S. Cl. 51—425 **5 Claims**



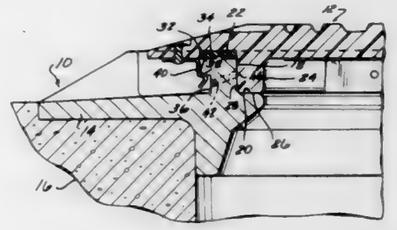
4. In a wet abrasive blasting apparatus using a slurry comprised of abrasive and a liquid carrier therefor, comprising a pressure vessel for containing the slurry, means for applying compressed air to the upper end of said pressure vessel above the surface of the slurry therein, a blasting gun connected by a slurry delivery conduit to said vessel and adapted for receiving the pressurized slurry and blasting the slurry against a workpiece, a secondary compressed air circuit connected to and extending between the upper and lower ends of said pressure vessel, said secondary compressed air circuit including a pressure modulating device which is effective to withdraw air from the upper end of said pressure vessel and above the surface of the slurry therein and deliver the air to the lower end of said pressure vessel so that the slurry in said pressure vessel is continuously agitated by air flowing upwardly therethrough.

5,201,151

MANHOLE RIM AND COVER ASSEMBLY

Leo J. LeBlanc, Bloomfield Hills, and Paul Phillips, White Hall, both of Mich., assignors to EBW, Inc., Muskegon, Mich.

Filed Oct. 11, 1991, Ser. No. 775,728
Int. Cl.[5] E02D *29/14*
U.S. Cl. 52—20 **14 Claims**



8. A manhole cover comprising:

rim means defining a central opening for fixed mounting generally at ground level, said rim means having a lip projecting upwardly from an upper surface of said rim means and extending around a periphery of said central opening, said lip having a generally flat gasket receiving upper surface, and an outer side surface having an undercut recess therein defining a downwardly facing shoulder;

cover means for overlying said central opening, said cover means projecting outwardly from said central opening beyond said outer side surface of said lip;

locating means for maintaining said cover means against horizontal displacement relative to said rim means, said locating means projecting downwardly from a lower surface of said cover means into face-to-face engagement with an inner side surface of said lip;

gasket means for sealingly engaging between said lower surface of said cover means and said flat gasket receiving upper surface of said lip; and

means for releasably retaining said cover means against vertical movement relative to said rim means, said retaining means projecting downwardly into underlying relationship with said downwardly facing shoulder on said lip.

5,201,152

CONTAINMENT DEVICE FOR CONTAMINATED BUILDING DEMOLITION

David C. Heffner, Youngstown, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 31, 1992, Ser. No. 922,881
Int. Cl.[5] E04B *1/343*
U.S. Cl. 52—64 **8 Claims**

1. A containment device for contaminated building demolition, comprising:

a. railroad tracks placed on a supporting surface on opposite sides and extending the length of the contaminated building;

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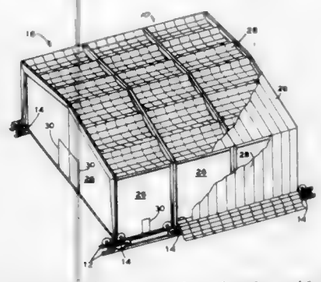
stiffener plates, and having a hole defined vertically top end and an interior surface, a pole top cover assembly,

b. a plurality of rail trucks spaced apart on said railroad tracks for movement along said tracks;
c. a rigid steel frame building having an interior, a bottom, and one open end, said rigid steel frame building being

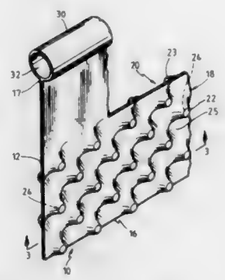


supported by said rail trucks whereby said rigid steel frame building movably covers a portion of the contaminated building; and
d. means for removably sealing the open end and bottom of said rigid steel frame building.

5,201,153
BREAKOUT PANEL CONSTRUCTION
Joerg U. Ferchau, Morgan Hill, and Robert E. Smith, Woodside, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.
Filed Jul. 30, 1991, Ser. No. 737,862
Int. Cl.[5] E04C *2/40*
U.S. Cl. 52—100 **10 Claims**

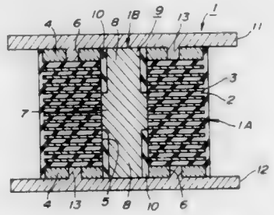
1. A faceplate having a normally viewable surface and a normally non-viewable surface comprising:
a frame having an opening and an circumferential surface facing said opening;
a brakeout panel having a perimetrical side surface spaced from and facing said circumferential frame surface, thereby forming a gap therebetween;
a plurality of connectors coupling said breakout panel to said frame, each of said connectors having a body portion, including a first portion substantially overlapping said breakout panel and a second portion substantially overlapping said frame, said first and second portions being frangibly connected to said breakout panel and frame, respectively, said body portion projecting out from the normally non-viewable surface and being constructed to be grasped and rotated to separate one of said connectors from the breakout panel and the frame.

5,201,154
LANDSCAPE EDGING AND METHODS OF MANUFACTURING AND USING SAME
Franklin B. Thomas, Waco, Tex., assignor to Easy Gardener, Inc., Waco, Tex.
Filed Aug. 23, 1991, Ser. No. 749,201
Int. Cl.[5] E02D *27/00;* **A01G** *1/08*
U.S. Cl. 52—102 **28 Claims**



1. Landscaping edging for forming a boundary between adjacent landscaping areas and for preventing plants such as grass and the like from rooting between adjacent areas, comprising:
an elongated edging structure including a trim member and an anchoring panel;
the anchoring panel being generally configured as an elongated wall when installed in the ground and comprising an upper edge, a lower edge, a first face, a second face opposite said first face, and further comprising a plurality of hollow projections extending transversely outward from the first face of the anchoring panel, the hollow interior of each projection forming a concave soil socket in the second face of the anchoring panel; and
the trim member being continuously affixed to the upper edge of the anchoring panel such that the trim member may be located above the soil surface when the anchoring panel is installed in the ground.

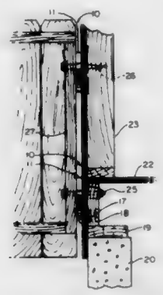
5,201,155
SEISMIC ISOLATING BEARING
Ikuo Shimoda; Masayoshi Ikenaga, and Kouske Sasaki, all of Kanagawa, Japan, assignors to Oiles Corporation, Tokyo, Japan
Filed Oct. 4, 1991, Ser. No. 770,929
Claims priority, application Japan, Oct. 17, 1990, 2-108892; Mar. 18, 1991, 3-78596
Int. Cl.[5] E04B *1/98*
U.S. Cl. 52—167 E **12 Claims**



1. A seismic isolating bearing for supporting an upper structure on a lower structure, comprising:
a laminated body adapted to be interposed vertically between the upper and lower structures, said laminated body comprising alternately arranged viscoelastic layers and

stiffener plates, and having a hole defined vertically therein;
energy absorbing means disposed in said hole, for absorbing energy applied thereto;
said energyabsorbing means comprising a lead block inserted in said hole, said lead block having an intermediate portion held against an inner circumferential surface of said hole; and
said energy absorbing means also comprising a viscoelastic cylindrical body disposed between an outer circumferential surface of at least one of upper and lower end portions of said lead block and the inner circumferential surface of said hole.

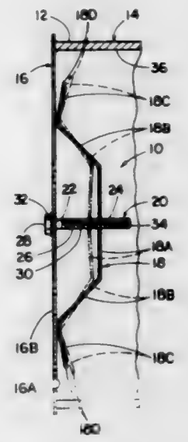
5,201,156
WATER-SHEDDING SPACING MOUNT FOR DECKS AND FENCES
William O. Newman, 12458 Fiori La., Sebastopol, Calif. 95472
Filed May 22, 1991, Ser. No. 704,278
Int. Cl.[5] E04B *5/14*
U.S. Cl. 52—299 **15 Claims**



1. A plate-like mounting block adapted to form a water or moisture-shedding spacer clamped between two parallel structural members attached to each other by a through-bolt assembly adapted to extend perpendicularly through said parallel structural members and said mounting block, comprising:
a) a plate-like body having a predetermined maximum length measured along a longitudinal Y axis;
b) said plate-like body having a predetermined maximum width measured along a transverse X axis perpendicularly intersecting said Y axis medianly of the long dimension of the plate-like body whereby said plate-like body is symmetrical about said transverse and longitudinally extending axes; and
c) an aperture in said plate-like body extending therethrough along a Z axis perpendicularly intersecting said Y axis at a point spaced on one side of said transverse X axis closer to one end of the body than the other whereby a major portion of the mass of said block lies on one side of said aperture, said aperture in said plate-like body accommodating perpendicular passage of said through-body assembly when said mounting block is clamped between said structural members.

5,201,157
POLE TOP COVER EXPANDABLE BRACKET ASSEMBLY
Gerry F. Thornton, Blacksburg, and Thomas D. Hirt, Christiansburg, both of Va., assignors to Hubbell Incorporated, Orange, Conn.
Filed Mar. 16, 1992, Ser. No. 852,290
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—301 **10 Claims**

1. In combination with a tubular hollow pole having an open top end and an interior surface, a pole top cover assembly, comprising:
(a) a substantially flat cover plate having opposite interior and exterior sides, said cover plate at said interior side thereof overlying and seated upon said open top end of said tubular hollow pole, said cover plate having a portion with an aperture formed therethrough open at said opposite interior and exterior sides thereof;
(b) an elongated bracket formed of yieldably resilient, semi-rigid, semi-flexible deformable material and being disposed along said interior side of said cover plate and inside of said open top end of said tubular hollow pole, said bracket having opposite ends and a portion with a hole formed therethrough, said opposite ends of said bracket defining pairs of spaced corners on said bracket; and
(c) an elongated member having an elongated shaft portion rotatably mounted through both said aperture of said cover plate and said hole of said bracket, said member being coupled with said portions of said plate and said bracket forming said respective aperture and hole thereof such that rotation of said member in one direction relative to said cover plate and bracket causes said bracket to



engage said interior side of said plate and to deform and draw toward said interior side of said cover plate and thereby expand in length and forceably engage solely at said pairs of spaced corners on said opposite ends of said bracket with portions of said interior surface of the hollow tubular pole so as to retain said cover plate on said pole top end, whereas rotation of said member in an opposite direction relative to said cover plate and bracket permits said bracket to engage said interior side of said plate and to reform and retract away from said interior side of said cover plate and thereby contract in length and disengage at said pairs of spaced corners on said opposite ends of said bracket from said portions of said interior surface of said hollow tubular pole so as to release said cover plate from said pole top end;
(d) said elongated member also having an enlarged head portion rigidly attached to one end of said shaft portion and being disposed on said exterior side of said cover plate and outside of said open top end of said tubular hollow pole so as to expose said enlarged head portion for engagement by a tool to selectively rotate said shaft portion of said member in said one or opposite of said directions relative to said cover plate.

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shape of cuboctrahedrons, octahedrons and parts of the same supported by diagonal struts, said annular meshworks defining

building and joining, with the joint means, the precast concrete slab and the reinforced concrete containment

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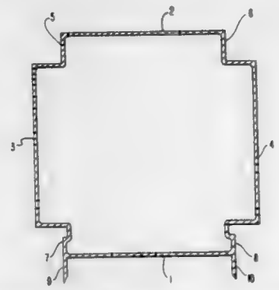
METAL SHEETING
Michael J. Bayley, Bugkinghamshire; Peter G. Buxton, Buckinghamshire, and Tarlochan S. Saini, Berkshire, all of England, assignors to British Alcan Aluminium plc, Gerrards Cross, England
Continuation of Ser. No. 355,021, May 22, 1989, abandoned.
This application Dec. 6, 1990, Ser. No. 624,468
Claims priority, application United Kingdom, May 13, 1988, 8811397
Int. Cl.[5] E04D 3/361
U.S. Cl. 52—537 1 Claim

1. A profiled metal sheet for use as a roof panel and for building cladding purposes, comprising:
a generally planar central portion having a first upstanding hook formation along a first side edge thereof and a second upstanding hook receiving formation along a second side edge thereof, said central portion together with said hook formation and said hook receiving formation defining a total sheet width, and said hook formation and said hook receiving formation both extending upwardly to a height which is a minimum of 10% of said total sheet width;
said first upstanding hook formation comprising a sloping first part (**10**) extending upwardly and outwardly from said central portion, a first wall (**11**) extending upwardly from said sloping part (**10**) at approximately a right angle to said central portion and having a height between 20% and 30% of the height of said first upstanding hook formation, said first wall (**11**) having thereon a first latching surface, a first flat (**12**) extending outwardly approximately at a right angle to said first wall (**11**), a second part (**13**) projecting downwardly and outwardly from said first flat, and a third part (**14**) projecting upwardly and inwardly from said second part (**13**), said second and third parts defining a hook;
a longitudinal portion of said sheet adjacent to said second side edge defining a valley area for receiving fastening means for fastening said sheet directly to a support underlying said sheet thereby avoiding the interposition of separate clips;
said second upstanding hook receiving formation being located inwardly of said valley area and comprising a generally vertical sidewall (**21**) parallel to said first wall (**11**), said vertical sidewall (**21**) having thereon a second latching surface, a platform (**19**) extending inwardly from said sidewall at approximately a right angle thereto, said platform (**19**) being generally co-planar with said first flat (**12**), a sloping third part (**16**) extending upwardly and outwardly from said central portion, a second wall (**16***b*) extending upwardly from said sloping third part (**16**) at approximately a right angle to said central portion, and a hook receiving part shaped to engage said hook and extending downwardly and inwardly from said platform (**19**) and an upper portion of said second wall (**16***b*) shaped to engage said hook;
wherein said first upstanding hook formation and said second upstanding hook receiving formation being so configured that when an identical upstanding hook formation of a second metal sheet is interlocked with said second upstanding hook receiving formation, the hook formation of said second sheet engages said second upstanding hook receiving formation at a position (E) when the second sheet is disposed at angle (F) from the horizontal, and said initial latching of said first latching surface and said second latching surface commences during relative rotation at least 25° prior to said second sheet reaching a final latched position wherein said second sheet extends substantially co-planar with said sheet.

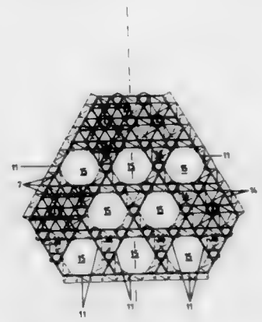
5,201,159
CONSTRUCTION ELEMENT
Per Göranson; Dag Göranson, and Örjan Göranson, all of Falkenberg/Sweden, Sweden, assignors to Silentia AB, Falkenberg/Swenden, Sweden
PCT No. PCT/SE90/00536, § 371 Date Apr. 18, 1991, § 102(e) Date Apr. 18, 1991, PCT Pub. No. WO91/02863, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 17, 1990, Ser. No. 678,952
Claims priority, application Sweden, Aug. 18, 1989, 8902771; Nov. 8, 1989, 8903734
Int. Cl.[5] E04C 3/00
U.S. Cl. 52—580 3 Claims



1. A structural element for use in constructing a continuous surface, such as a screen, a noise barrier, a partition, or the like, said structural element comprising:
first and second parallel opposing surface members;
third and fourth parallel opposing surface members; and
first, second, third, and fourth reversed corner members joining said first, second, third, and fourth surface members to form a substantially quadrilateral hollow member having reversed corners indented into the quadrilateral member, with said first and second surface members substantially at right angles to said third and fourth surface members, the corner members adjacent said first surface member extending beyond said first surface member in a direction away from said hollow member to form a pair of connecting flanges spaced apart by a distance substantially equal to the length of one of said surface members, between the reversed corners adjacent thereto, permitting the connecting flanges to fit over a surface member of an identical structural element and into the reversed corners adjacent such surface member to join the structural elements together.

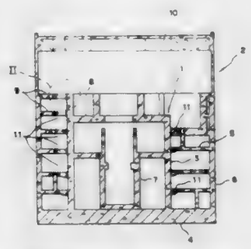
5,201,160
MULTIPLE-LAYER SPACE-FRAMING PLATE OF RODS
Jaime Sanchez, Randersacker-Lindelbach, Fed. Rep. of Germany, assignor to Mero-Raumstruktur, Wurzburg, Fed. Rep. of Germany
Filed Jul. 11, 1991, Ser. No. 728,730
Int. Cl.[5] E04B 1/19
U.S. Cl. 52—645 11 Claims

1. Multiple-layer space-frame plate, comprising a plurality of struts and a plurality of nodes defined by the intersection of at least two of said struts, said struts and nodes forming a plurality of substantially annular meshworks arranged and interconnected in a honeycomb-like structure having an outer surface including top, bottom and side walls, said annular meshworks having elementary structural cells which include cells in the shape of cuboctrahedrons, octahedrons and parts of the same supported by diagonal struts, said annular meshworks defining a plurality of openings in the top and sidewalls of said structure, and further including a plurality of complementary space-



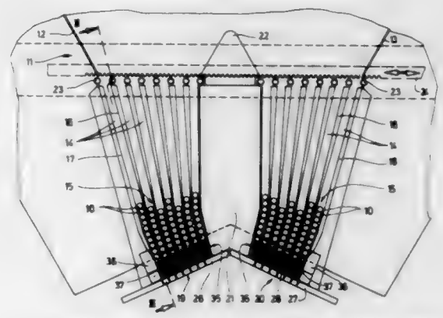
frame members which fit into said openings and form support grids therein which are adjacent the outer surface of said structure, thereby enabling covering members to be supported on said top and side walls of said structure.

5,201,161
NUCLEAR POWER PLANT CONSTRUCTION METHOD
Hideaki Kamei, Abiko, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 3, 1991, Ser. No. 725,613
Claims priority, application Japan, Jul. 4, 1990, 2-175393
Int. Cl.[5] E04B 1/04
U.S. Cl. 52—745.02 7 Claims



1. A method of constructing a nuclear power plant, comprising the steps of:
constructing foundation base mat;
installing a reinforced concrete containment vessel on the base mat;
installing a reactor building around the reinforced concrete containment vessel, said reactor building being provided with a plurality of concrete bodies projecting inwardly from an inner wall surface of the reactor building with spaces between the projected ends of the concrete bodies and an outer surface of the reinforced concrete containment vessel to thereby form staged floors in vertically different levels in the reactor building;
arranging a precast concrete slab in each of the spaces between the concrete body of the reactor building and the outer surface of the reinforced concrete containment vessel with spaces therebetween;
forming joint means between each of spaces between the precast concrete slab and the projected end of the concrete body of the reactor building and between the precast concrete slab and the reinforced concrete containment vessel; and
joining, with the joint means, the precast concrete slab and the projected end of the concrete body of the reactor building and joining, with the joint means, the precast concrete slab and the reinforced concrete containment vessel.

5,201,162
APPARATUS FOR PACKAGING CIGARETTES
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany
Filed Nov. 6, 1991, Ser. No. 788,441
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1990, 4035397
Int. Cl.[5] B65B 19/04
U.S. Cl. 53—150 2 Claims



1. In an apparatus for storing and conveying filter cigarettes in conjunction with a cigarette packaging machine, the improvement:
wherein the filter cigarettes (**10**) are received in a funnel-shaped accumulating container (**11**) having an open top and a lower portion which is formed from a plurality of side-by-side upright magazine shafts (**14**);
wherein each magazine shaft is adapted to receive a row of superposed filter cigarettes (**10**);
wherein the magazine shafts (**14**) are separated from one another by upright shaft walls (**16**);
wherein the shaft walls (**16**) have a smaller dimension than the cigarettes (**10**) in a longitudinal direction of a length of the cigarettes (**10**), such that a clearance is formed between the shaft walls (**16**) and a cover plate (**34**), said clearance being slightly greater than the length of a filter (**29**) of the filter cigarettes (**10**);
means for directing the cigarettes into the magazine shafts (**14**), so that the entire filters (**29**) of the filter cigarettes (**10**) are located in the clearance and beyond the shaft walls (**16**);
wherein the magazine shafts comprise downwardly converging outer walls (**17**, **18**) having a width which is smaller than the length of the cigarettes (**10**), a clearance between the outer wall (**17**, **18**) and the cover plate (**34**) being formed on a same side as the clearance between the shaft walls (**16**) and the cover plate (**34**); and
wherein a middle piece (**21**) is located between two groups (**19**, **20**) of magazine shafts (**14**) and has a width which is smaller than the length of the cigarettes (**10**) in accordance with dimensions of the shaft walls (**16**) and the outer walls (**17**, **18**).

5,201,163
METHOD OF MAKING A MOLDED PLASTIC PACKAGE

means for linearly displacing said container in a predetermined horizontal direction from a first position to a sec-

to cause the carriage to be moved angularly, by upward movement of the slide, from a downwardly directed posi-

and combining the individual clips into a stack of wet wipes, the improvement comprising compressing the stack of wet

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5,201,163

METHOD OF MAKING A MOLDED PLASTIC PACKAGE

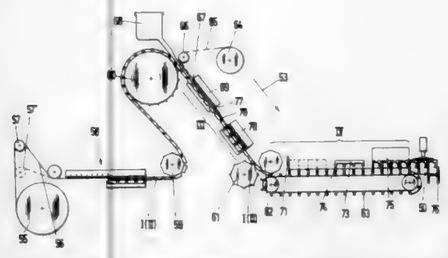
Wilhelm Reil, Bensheim; Ulrich Deutschbein, Muhltal; Gerd Knobloch, Griesheim, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Pak Holdings & Finance S.A., Pully, Fed. Rep. of Germany

Filed Nov. 16, 1990, Ser. No. 614,917

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938874

Int. Cl.[5] B65B *47/00*

U.S. Cl. 53—410 7 Claims



1. A method of manufacturing a package filled with flowable contents from a pair of complementally configured synthetic plastic containers, including the steps of

(1) continuously advancing a first web of synthetic plastics material of a first thickness,

(2) applying heat and relative pressure to form at regular intervals along said web, a pair of complementally configured open tub-shaped containers, said containers being formed with an outwardly extending peripheral rim along the open edge thereof, and said containers being formed with a common adjoining edge,

(3) continuously advancing a second, separate web of plastics material of a second thickness parallel with and in the direction of advance of the first web of plastics material, with the second web being thinner than the first web,

(4) filling said tub-shaped containers with flowable contents,

(5) bringing the first and second webs into overlying contact with each other so that the second web covers the open containers and their rims are then sealed by welding the second web of plastics material to the first web of plastics material along the peripheral rim of the pair of open containers,

(6) cutting said second web of plastics material and the containers sealed thereto transversely to its direction of advance and within said regular intervals sufficiently to allow folding of the pair of sealed containers,

(7) folding the pair of sealed complementally configured containers so as to bring the portions of the second web of plastics material which seal the containers into abutting juxtaposition, as well as bringing the peripheral rims of each container of the pair into matching alignment,

(8) welding the abutting plastics material in the area of the peripheral rims of the tub-shaped containers, thereby forming a package filled with flowable contents.

5,201,164

METHOD FOR IMPROVING THE DISPENSING OF STACKED WET WIPES

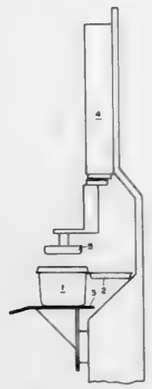
David P. Kaufman, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 17, 1991, Ser. No. 702,641

Int. Cl.[5] B65B *1/24*

U.S. Cl. 53—436 8 Claims

1. In a method for making a stack of wet wipes comprising the steps of forming two or more clips of individual wet wipes and combining the individual clips into a stack of wet wipes, the improvement comprising compressing the stack of wet



wipes sufficiently to increase the degree of adhesion between adjacent wipes of adjacent clips.

5,201,165

GAS DISPLACEMENT DEVICE FOR PACKAGING FOOD AND NON-FOOD PRODUCTS

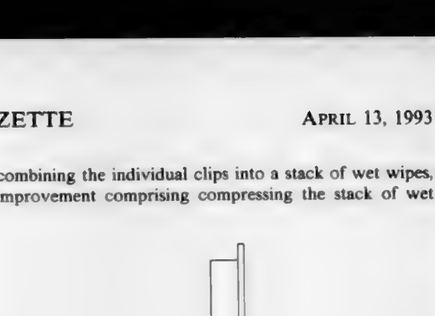
Gerald A. Marano; Donald Evans, both of Mobile; Edwin D. Lomax, Satsuma, and James C. Harbison, Fairhope, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 593,187, Oct. 5, 1990, Pat. No. 5,085,035. This application Sep. 16, 1991, Ser. No. 760,428

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] B65B *31/04*

U.S. Cl. 53—510 6 Claims



1. A gas displacement device for substituting inert gas for ambient air in the headspace of a container prior to closing an opening in the top of said container, comprising:

a hood (**16**) having a passageway (**18**) with first and second openings (**36** and **22**) at respective open ends thereof, said passageway being a circular cylindrical section, and further having a recess (**20**) which communicates with said passageway via said second opening (**22**), said recess having a peripheral edge (**28**) which is a closed contour lying in a horizontal plane, said peripheral edge of said recess defining a third opening (**28**) in said hood;

means (**8**) for supplying a pressurized stream of inert gas to said first opening, said pressurized gas undergoing expansion as it passes through said second opening (**22**); and

means for linearly displacing said container in a predetermined horizontal direction from a first position to a second position such that inert gas exciting said second opening is injected into said headspace when said container is at said first position and is not injected into said headspace when said container is at said second position, at least some portion of said recess overlying at least some portion of said container opening at said first and second positions and every position therebetween,

wherein said third opening (**28**) has a maximum length in said direction of displacement which is greater than the maximum dimension of said container opening in said direction of displacement, and

whereby when said container is in said first position, said recess (**20**) acts as a tunnel through which a blanket of gases flows in a downstream direction which is generally parallel to said direction of container displacement, said downstream flowing gases overlying said headspace when said container is displaced to said second position,

wherein said recess is defined in part by a planar upper wall which is inclined relative to a horizontal plane and which is co-planar with said second opening, the height of said inclined upper wall increasing linearly in said direction of displacement, and is defined in part by a substantially cylindrical side wall terminating at said peripheral edge which forms said third opening, said side wall comprising first and second straight portions disposed substantially vertical and substantially parallel to said direction of displacement, said first and second straight portions being separated by a distance which is less than the maximum dimension of said container opening in a direction transverse to said direction of displacement.

5,201,166

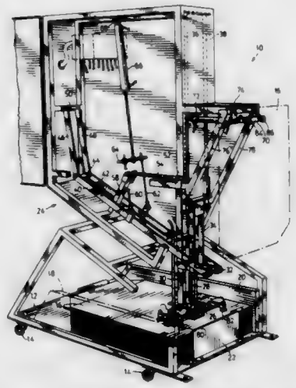
BAG HANDLING MACHINE

Hugo Johnsen, Campbellville, Canada, assignor to Johnsen Machine Company Ltd., Burlington, Canada

Filed Mar. 23, 1992, Ser. No. 855,824

Int. Cl.[5] B65B *43/18, 43/46, 39/02*

U.S. Cl. 53—571 10 Claims



1. Bag handling apparatus for sequentially selecting bags from a supply thereof and positioning them for subsequent opening and filling, said apparatus comprising:

a vertically movable slider positionable above a stack of horizontal closed bags;

means for guiding the slider in a vertical path, said slider carrying a carriage pivotally secured to the slider;

said carriage having means for engaging a bag and retaining the bag in engagement therewith;

means for moving the slider vertically upwardly and downwardly along said vertical path; and

link means pivotally connecting the carriage to a fixed point to cause the carriage to be moved angularly, by upward movement of the slide, from a downwardly directed position adjacent the stack of bags, thereby enabling the bag engaging means to engage and retain a horizontal top bag, to a forwardly directed position to cause the carriage to present a bag engaged and retained by the bag engaging means in a vertically oriented position for subsequent opening and filling.

5,201,167

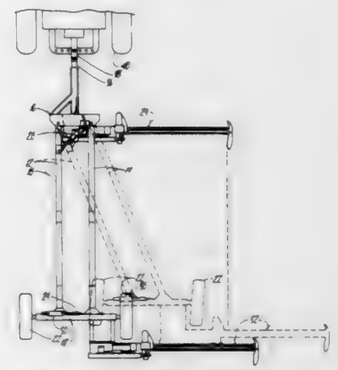
MULTIPLE IMPLEMENT FRAME WITH PARALLEL MOUNTING BARS

Dan D. Rowse, R.R., Burwell, Nebr. 68823

Filed Jan. 29, 1992, Ser. No. 827,265

Int. Cl.[5] A01D *75/30*

U.S. Cl. 56—6 7 Claims



1. A multiple implement frame comprising,

front and rear implement mounting bars,

a frame member means extending between and pivotally interconnecting said front and rear bars, and

power means operatively connected to said frame member means and said front and rear mounting bars to vary the angle between said front and rear mounting bars and said frame member means while maintaining said bars in parallel relationship to each other and maintaining a 90° relationship to the line of travel.

5,201,168

UNDERWATER WEED CUTTING APPARATUS

Benjamin J. Jenson, Rte. 1, Box 198, Dent, Minn. 56528

Filed Feb. 10, 1992, Ser. No. 833,104

Int. Cl.[5] A01D *44/00*

U.S. Cl. 56—8 10 Claims

1. An underwater weed cutting apparatus adapted to be selectively attached to and driven by a first drive shaft of a motor, such as in ice auger motor, comprising:

(a) an elongated tubular housing having an upper first end adapted to be selectively coupled to the motor, and a lower second end;

(b) a second drive shaft extending within said tubular housing having an upper end adapted to be selectively coupled to and driven by said first drive shaft of the motor proximate said upper first end of said tubular housing, said second drive shaft extending to said lower second end of said tubular housing;

(c) coupling means coupled to said lower second end of said tubular housing and having a conversion means coupled to said second shaft drive for converting rotary motion to reciprocating motion; and

(d) cutting means coupled to said coupling means and extending transversely to said tubular housing, said cutting

means comprising a first sharpened cutting member fixedly attached to said coupling means and having a first

5,201,170

SPINNING OR TWISTING SPINDLE HAVING A SPINDLE SHAFT

portions, each end portion being pressed and non-rotatably mounted into a perspective one of said second bores of said outboard end collars, said apparatus comprising:

recover energy from the hot gases, the gas turbine producing exhaust gases;

(f) introducing the exhaust gases into the waste heat boiler to

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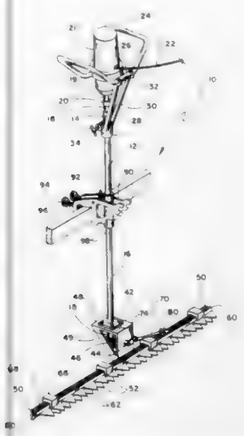
means comprising a first sharpened cutting member fixedly attached to said coupling means and having a first plurality of teeth, said cutting means also comprising a second sharpened cutting member extending substantially parallel to said first sharpened cutting member and having a second plurality of teeth defined proximate said first



plurality of teeth, wherein said second sharpened member is coupled to said conversion means of said coupling means such that said conversion means is adapted to reciprocate said teeth of said second cutting member for severing the weeds positioned between the adjacent teeth of said first and second cutting members when said second drive shaft is rotated.

5,201,169

METALLIC-FOIL-COVERED FANCY YARN AND METHOD OF FAN APPARATUS FOR MANUFACTURING SAME

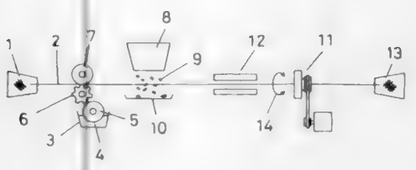
Toru Miyashita, 18-1, Itodashin-machi, Kanazawa-shi Ishikawa 921, Japan

PCT No. PCT/JP90/00271, § 371 Date Oct. 25, 1991, § 102(e) Date Oct. 25, 1991, PCT Pub. No. WO91/13196, PCT Pub. Date Sep. 5, 1991

PCT Filed Mar. 1, 1990, Ser. No. 773,919

Int. Cl.[5] D02G *3/02*

U.S. Cl. 57—7 **4 Claims**



1. A method of manufacturing a metallic-foil-covered fancy yarn, comprising the steps of:

aerially holding a yarn (2) with an adhesive (4) applied thereto horizontally or obliquely under tension;

feeding the yarn (2) in the direction in which the yarn (2) is held under tension;

scattering metallic foil pieces (9) over the yarn (2); and

generating relative swirling air streams (19) around the yarn (2).

5,201,170

SPINNING OR TWISTING SPINDLE HAVING A SPINDLE SHAFT

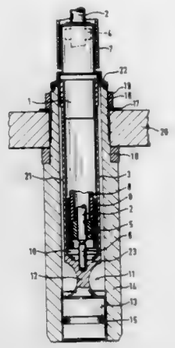
Gerd Stahlecker, Eislingen/Fils, and Hans Braxmeier, Süssen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, Fed. Rep. of Germany

Continuation of Ser. No. 615,277, Nov. 19, 1990, abandoned. This application Mar. 23, 1992, Ser. No. 855,477

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942912

Int. Cl.[5] D01H *7/08, 7/14*

U.S. Cl. 57—133 **21 Claims**



1. Spinning or twisting spindle apparatus comprising:

a spindle bearing housing including a spindle shaft bearing inside the spindle bearing housing for rotatably supporting a spindle shaft, said spindle shaft bearing including a centering sleeve holding a step bearing sleeve, said centering sleeve being disposed inside of said bearing housing, said spindle bearing housing exhibiting a height extending over the length thereof,

a support housing surrounding the spindle bearing housing with a spacing therebetween, said support housing being connectable directly to a spindle rail,

a substantially incompressible connecting element arranged between the support housing and the spindle bearing housing, said connecting element forming a point of discontinuity for flow of structure-borne sound from the spindle shaft bearing to the support bearing and thus the spindle rail,

and a fluid medium filled into the space between the spindle bearing housing and the surrounding support housing to a level at least two-thirds of the height of the spindle bearing housing, said fluid medium being viscous in a temperature range of between 20° C. and 60° C.

5,201,171

METHOD AND APPARATUS FOR RETAINING A TRACK CHAIN JOINT

Peter W. Anderton, Peoria; Morris E. Taft, Metamora, both of Ill.; Michel P. Peeters, Bernin, and Jean-Francois P. C. Villard, Tullins, both of France, assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 26, 1991, Ser. No. 798,444

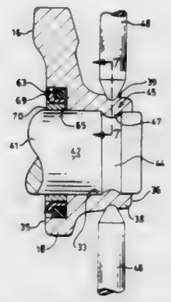
Int. Cl.[5] B21L *17/00;* **F16G** *13/06*

U.S. Cl. 59—901 **8 Claims**

1. Apparatus for retaining the track joints of an endless track chain for track-type vehicles to prevent end play in such joints, each joint including first and second pairs of links and a cylindrical pin, each link of said first pair of links having an inboard end collar with a first bore therethrough, and each link of said second pair of links having an outboard end collar with a pin boss extending a substantial distance outwardly therefrom and a second bore therethrough, and said pin having opposite end

portions, each end portion being pressed and non-rotatably mounted into a perspective one of said second bores of said outboard end collars, said apparatus comprising:

a generally arcuately shaped annular groove formed in each of said opposite end portions of said pin, each groove being disposed within said bore at a location along said pin boss; and



at least one mechanically formed nodule protruding inwardly from each of said second bores into respective ones of said pin grooves, each nodule having a cross-sectional configuration substantially conforming to its groove and being formed from material that has been permanently extruded from its pin boss into said groove.

5,201,172

METHOD FOR TREATING BLACK LIQUOR

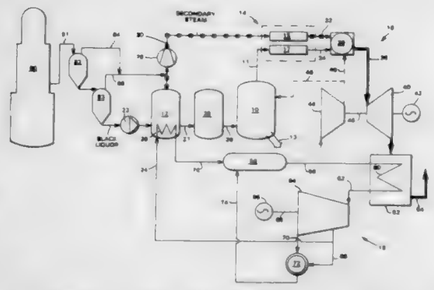
Bertel K. Hakulin, Helsinki; Erkki J. Kiiskilä, and Marjo Kusio, both of Karhula, all of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Nov. 5, 1991, Ser. No. 787,901

Claims priority, application Finland, Nov. 7, 1990, 905507

Int. Cl.[5] F02C *3/28, 6/00*

U.S. Cl. 60—39.05 **20 Claims**



1. A method of treating black liquor from a sulphate pulp process, for recovering chemicals and heat therefrom, utilizing a gas turbine having vanes and preceded by a combustor, a waste heat boiler, and a steam turbine power plant, comprising the steps of:

(a) evaporating black liquor from a sulphate pulp process to produce a concentrated black liquor having a higher dry solids content;

(b) gasifying and/or combusting the concentrated black liquor to produce hot gases and molten and/or solid salts;

(c) recovering sulphate cooking chemicals from the molten and/or solid salts;

(d) purifying the hot gases;

(e) introducing purified hot gases into the combustor for the gas turbine, and then into the gas turbine, in order to recover energy from the hot gases, the gas turbine producing exhaust gases;

(f) introducing the exhaust gases into the waste heat boiler to effect generation of steam;

(g) recovering energy from the waste heat boiler steam in the steam turbine power plant;

(h) pressurizing secondary steam from the sulphate pulp process; and

(i) introducing the pressurized secondary steam as injection steam prior to the gas turbine vanes, to regulate the gas turbine inlet temperature.

5,201,173

CATALYST TEMPERATURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

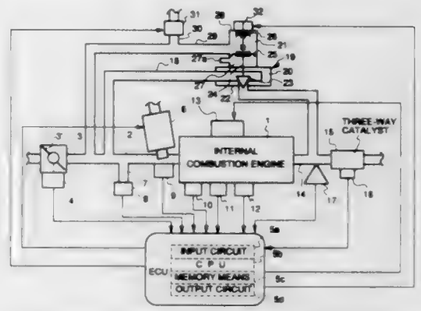
Sachito Fujimoto; Toshikazu Oketani; Yoshiyuki Abe, and Kojiro Tsutsumi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1992, Ser. No. 827,664

Claims priority, application Japan, Mar. 26, 1991, 3-087584

Int. Cl.[5] F01N *3/20*

U.S. Cl. 60—277 **7 Claims**



1. In a catalyst temperature control system for an internal combustion engine having an intake system, an exhaust system, a catalyst having a catalyst bed and arranged in said exhaust system for purifying noxious components in exhaust gases emitted from said engine, and an exhaust gas recirculation passage connected to said intake system and said exhaust system for returning part of said exhaust gases from said exhaust system to said intake system,

the improvement comprising:

temperature detecting means for detecting a temperature of said catalyst bed of said catalyst;

exhaust gas recirculation amount-increasing means for increasing a recirculation amount of exhaust gases flowing through said exhaust gas recirculation passage, when said temperature of said catalyst bed detected by said temperature detecting means is higher than a first predetermined value; and

air-fuel ratio enriching means for enriching the air-fuel ratio of a mixture supplied to said engine, when said temperature of said catalyst bed detected by said temperature detecting means is higher than a second predetermined time period after said exhaust gas recirculation amount-increasing means started to increase said recirculation amount.

5,201,174

AUXILIARY HYDRAULIC PUMP SYSTEM

Dennis R. Barber, Chanhassen, Minn., and Gregory E. Sparks, Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 2, 1991, Ser. No. 801,299

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—405 **4 Claims**

1. In a vehicle having a hydraulic function, an engine-driven

pump for supplying pressurized hydraulic fluid to the hydraulic function, an ground-driven source of pressurized hydraulic

said output member, said actuating device operable by a predetermined operating pressure;

the preference valve distributing fluid in the predetermined amount to the first circuit system and fluid in an excessive

switch for outputting a signal informing of a selected state, said apparatus further comprising:

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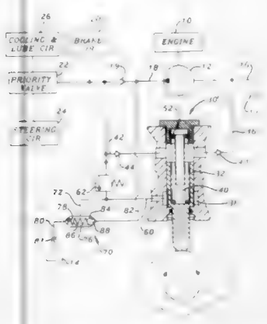
pump for supplying pressurized hydraulic fluid to the hydraulic function, an ground-driven source of pressurized hydraulic fluid and control means for controlling operation of the ground-driven source, the improvement wherein:

the ground-driven source comprises a variable displacement pump, the variable displacement pump comprising a variable stroke cylinder comprising a housing having a bore therein, a piston movable in the bore and cooperating with a wall of the bore to divide the bore into a pilot chamber and a pump chamber, the piston being movable to a de-stroked position in response to fluid pressure in the pilot chamber, and resilient means biased to urge the piston to a stroked position, and a rotatable member having a cam member engageable with the piston to reciprocate the piston in response to rotation of the rotatable member;

the control means comprises means for de-stroking the variable displacement pump when the engine-driven pump is operational, the control means comprising a pilot line for communicating fluid pressure from an outlet of the engine-driven pump to the pilot chamber, an outlet line for



communicating fluid from the pump chamber to the hydraulic function, and an inlet line for communicating fluid from a fluid reservoir to the pump chamber; and

a shuttle valve having an inlet shuttle port communicated with the outlet of the engine-driven pump, a drain shuttle port communicated with a fluid reservoir and a pilot shuttle port communicated with the pilot chamber, a shuttle valve member movable to a first position opening communication between the inlet shuttle port and the pilot shuttle port and blocking communication between the pilot shuttle port and the drain shuttle port when the engine-driven pump is operational, and a second position closing communication between the inlet shuttle port and the pilot shuttle port and opening communication between the pilot shuttle port and the drain shuttle port when the engine-driven pump is not operating, and a resilient member coupled to the shuttle valve member and biased to urge the shuttle valve member to the second position, the shuttle valve member being movable to the first position in response to pressure in the inlet shuttle port.

5,201,175

HYDRAULIC ACTUATING SYSTEM AND METHOD

Manfred Kahrs, Wiesbaden; Gerhard Kunz, Linden; Franz Fleck, Langenscheid, and Gerhard Schudt, Hanau, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 24, 1991, Ser. No. 764,879

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1990, 4030570

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—413 **7 Claims**

1. A hydraulic actuating system comprising:

an actuating device including an output member and a chamber expansible against fluid pressure to cause movement of said output member, said actuating device operable by a predetermined operating pressure;

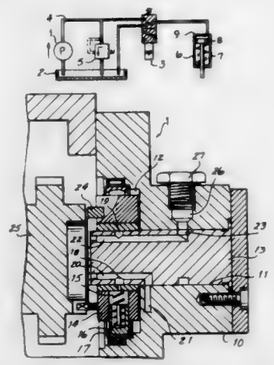
a reservoir of unpressurized hydraulic fluid;

a continuously operated pump having a suction drawing hydraulic fluid out of said reservoir and an outlet receiving a flow of pressurized hydraulic fluid at a predetermined flow rate;

flow passage means receiving pressurized hydraulic fluid from said pump outlet and directing the same to said expansible chamber of said actuator device;

control valve means interposed in said flow passage means normally blocking communication between said pump outlet and said expansible chamber, but selectively operable to establish a period of communication therebetween;

pressure limiter means connected upstream from said con-



trol valve means causing a diverted return flow of hydraulic fluid to said reservoir to limit the pressure in said flow passage means to a predetermined maximum pressure substantially in excess of said operating pressure of said actuating device;

a fixed volume air chamber defined above said flow passage means upstream of said control valve and communicating with said flow passage means to collect air bubbles entrained in said flow of hydraulic fluid prior to opening of said control valve means and establish a volume of air compressed to a pressure substantially in excess of said operating pressure, whereby an accumulating effect is produced, and upon opening of said control valve means, said volume of air expands to create an increased rate of flow to said actuating device in excess of said predetermined flow rate of said continuously operated pump.

5,201,176

HYDRAULIC CONTROL CIRCUIT AND HYDRAULIC CONTROL APPARATUS THEREFOR

Kazumi Oshima, Ageo, Japan, assignor to Kayaba Industry Co. Ltd., Tokyo, Japan

Filed Feb. 4, 1992, Ser. No. 829,892

Claims priority, application Japan, Feb. 7, 1991, 3-38143; Feb. 7, 1991, 3-38144; Feb. 7, 1991, 3-38145

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—422 **5 Claims**

2. A hydraulic control apparatus for a hydraulic control circuit comprising:

a body formed with a port communicating a pump, a first circuit system including an actuator and a second circuit system provided with a plurality of control valves;

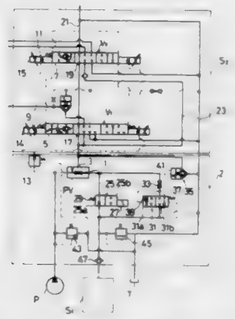
a preference valve arranged at the body and provided with a control flow port and an excess flow port;

the preference valve distributing to the first circuit system all of fluid discharged from the pump when the fluid is in a predetermined amount or below;

the preference valve distributing fluid in the predetermined amount to the first circuit system and fluid in an excessive amount exceeding the predetermined amount to the second circuit system when the amount of fluid discharged from the pump exceeds the predetermined amount;

a solenoid valve provided at the body and arranged between the control flow port of the preference valve and the actuator;

the solenoid valve being operated in a manner to be open when the control valves of the second circuit system are kept at a neutral position and closed when the control valves are changed over to a position other than the neutral position;



an unload valve including a pilot chamber and arranged so as to communicate with the excess flow port of the preference valve;

the unload valve being operated depending upon a pressure in the pilot chamber; and

a change-over valve arranged in the body so as to be in parallel with the solenoid valve;

the change-over valve permitting the pilot chamber of the unload valve to communicate with a tank when the solenoid valve is open;

the change-over valve permitting the flow control port of the preference valve to communicate with the actuator through an orifice and interrupting the communication between the pilot chamber of the unload valve and the tank when the solenoid valve is closed.

5,201,177

SYSTEM FOR AUTOMATICALLY CONTROLLING RELATIVE OPERATIONAL VELOCITY OF ACTUATORS OF CONSTRUCTION VEHICLES

Ju-kyung Kim, Masan, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Rep. of Korea

Filed Jan. 31, 1992, Ser. No. 829,699

Claims priority, application Rep. of Korea, Nov. 26, 1991, 91-21329

Int. Cl.[5] F16D *31/02*

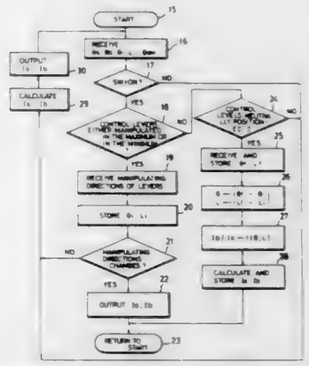
U.S. Cl. 60—426 **3 Claims**

1. An apparatus for automatically controlling actuators of a construction vehicle having a swing part and a travel part, comprising a swing motor, a boom and a boom cylinder; first and second main hydraulic pumps for delivering pressurized fluid for driving the actuators including said swing motor for turning, using the pressurized fluid of said first main hydraulic pump, said swing part with respect to said travel part of the construction vehicle, and said boom cylinder for driving, using the pressurized fluid of said second main hydraulic pump, said boom of the construction vehicle; a pair of directional control valves for controlling flow direction and quantity of the pressurized fluid which is to be distributed to said swing motor and said boom cylinder; control levers for outputting signals corresponding to manipulation values; and an automatic select switch for outputting a signal informing of a selected state, said apparatus further comprising:

a controller;

a boom displacement sensor for sensing positional displacement of said boom cylinder and outputting to said controller a signal corresponding to the sensed positional displacement of said boom cylinder; and

a swing displacement sensor for sensing the rotating angle of said swing motor and outputting a signal corresponding to the sensed rotating angle of said swing motor to said controller,



said controller including means for controlling said swing motor and said boom cylinder in such a manner that it first controls said swing motor and said boom cylinder by the signals corresponding to the manipulation values of said control levers, and thereafter, automatically controls, in each sequential operation, said swing motor and said boom cylinder using electric control currents based on an operational velocity ratio of said boom cylinder to said swing motor determined by the signals outputted from said sensors in a just previous operation.

5,201,178

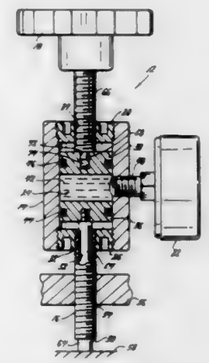
HYDRA-JACK SCREW

Richard Rosemann, 456 S. Clay, Kirkwood, Mo. 63122

Filed Apr. 18, 1991, Ser. No. 687,339

Int. Cl.[5] B60T *17/22*

U.S. Cl. 60—534 **14 Claims**



1. An apparatus for applying a force to an object and for varying a magnitude of the force applied while providing a

visual indication of the magnitude of the force applied, the apparatus comprising:

of said diaphragm so as to compress the diaphragm radially against the cylindrical wall of said shell; and

premixture supply means located inwardly with respect to said

5,201,183

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visual indication of the magnitude of the force applied, the apparatus comprising:

a base member;

means for supporting the base member in a fixed position relative to an object, and for adjusting the position of the base member relative to the object by selectively moving the base member toward or away from the object;

means supported on the base member for applying a force to the object;

means supported on the base member for selectively increasing or decreasing the force applied to the object;

means supported on the base member for providing a visual indication of a magnitude of the force applied to the object;

the means for supporting the base member includes a screw threaded column to be screwed into a complementary screw threaded hole in a stationary member adjacent the object to support the base member relative to the object, the screw threaded column adjusting the position of the base member relative to the object by selectively screwing the column into and out of the screw threaded hole;

the screw threaded column is provided with a hollow center bore extending axially through the column;

the base member houses a piston chamber; and

the means for applying a force to the object includes a first piston mounted for reciprocating movement in the chamber and a first piston rod engaged with the first piston and extending from the piston chamber through the hollow bore of the screw threaded column, the first piston rod extending from the hollow bore and being engagable with the object to apply a force to the object.

5,201,179

BRAKE SUBASSEMBLY FOR A VEHICLE

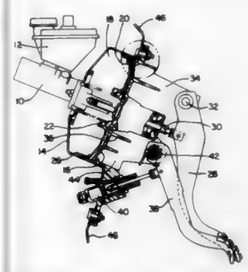
Patrice Moinard, Montreuil, and Philippe Castel, Paris, both of France, assignors to Bendix Europe Services Techniques, Drancy, France

Filed May 11, 1992, Ser. No. 880,788

Claims priority, application France, May 28, 1991, 91 06377

Int. Cl.[5] B60T *13/00;* **F15B** *9/10*

U.S. Cl. 60—547.1 **4 Claims**



1. A brake sub-assembly for a vehicle having an engine compartment and a passenger cell separated by a bulkhead, said sub-assembly comprising a pneumatic booster servomotor controlled by means of a pedal and fixed to said bulkhead, said servomotor comprising, coaxially, a front shell having a cylindrical wall and a rear cover and having, on the inside, two chambers separated in leaktight fashion by a piston provided with a diaphragm ensuring leaktightness between the two chambers, a master cylinder fixed to the front shell and at least one brake pedal, said sub-assembly being characterized by the following features in combination:

the shell and cover each provided with a radial peripheral rim, the rim of the cover bearing directly on that of the shell which bears on the bulkhead at a passenger-cell side;

said cover having a circular centering tongue which projects into said servomotor to engage radially and ensure the centering of the cover on the shell, and an end of the centering tongue grooved and receiving a peripheral end of said diaphragm so as to compress the diaphragm radially against the cylindrical wall of said shell; and

said covering having a plurality of reinforcing ribs which project from an exterior wall and certain of which constitute support pieces for a pivot of the brake pedal and distribute uniformly forces applied to the cover.

5,201,180

METHOD AND APPARATUS FOR MONITORING THE OPERATING CONDITION OF A STEAM TURBINE

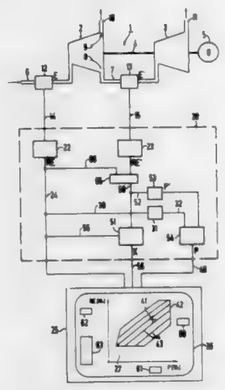
Paul Girbig, Erlangen, Fed. Rep. of Germany, assistor to Siemens Aktiengesellschaft, Muenchen, Fed. Rep. of Germany

Filed Apr. 15, 1992, Ser. No. 869,471

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1991, 4112427

Int. Cl.[5] F01K *13/00*

U.S. Cl. 60—646 **6 Claims**



1. A method for monitoring the operating condition of a steam turbine, to which an adjustable inlet steam quantity can be supplied and from which a variable, partially expanded steam quantity can be extracted, which comprises:

initially ascertaining a relative inlet steam quantity for an adjustable inlet steam quantity as a percentage value, and ascertaining a relative turbine power from the relative inlet steam quantity as a percentage value; and

subsequently displaying an applicable operating point determined from the relative inlet steam quantity and the relative turbine power inside a performance graph for various extraction steam quantities.

5,201,181

COMBUSTOR AND METHOD OF OPERATING SAME

Takashi Ohmori; Yoji Ishibashi; Hiroshi Inoue, all of Hitachi; Fumio Kato, Ibaraki; Takashi Hashimoto, Ushiku; Shigeyuki Akatsu, Hitachi; Michio Kuroda, Hitachi, and Seiichi Kirikami, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

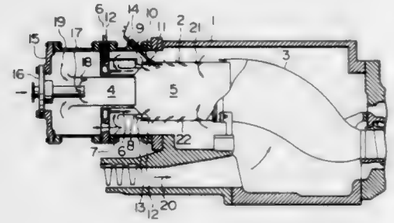
Filed May 14, 1990, Ser. No. 523,347

Claims priority, application Japan, May 24, 1989, 1-128851

Int. Cl.[5] F02C *1/02*

U.S. Cl. 60—737 **9 Claims**

1. A combustor including a combustion cylinder having a combustion chamber and premixture supply means provided on one side of said combustion chamber to supply a combustible mixture to said combustion chamber, said combustion chamber exhausting a combustion gas from the other end of said combustion chamber, p1 wherein, said premixture supply means comprises outer premixture supply means located near an inner wall surface of said combustion cylinder and operable when said combustor is operating at a low load, and inner premixture supply means located inwardly with respect to said outer premixture supply means and near an axis of said combustion cylinder and operable when said combustor is operating at a high load; and



an auxiliary burner operable at the start of the operation of said combustor and having an ignition plug provided near said outer premixture supply means.

5,201,182

METHOD FOR THE THERMAL CONDITIONING OF ELECTRONIC EQUIPMENT MOUNTED IN AIRCRAFT, AND SYSTEMS FOR THE IMPLEMENTATION THEREOF

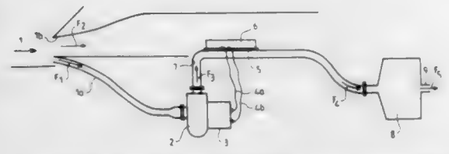
Robert Grignon, Verrieres Le Buisson, and Pascal Trouillot, Courbevoie, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Apr. 22, 1991, Ser. No. 689,375

Claims priority, application France, May 11, 1990, 90 05901

Int. Cl.[5] F25B *21/02;* **B60H** *1/32*

U.S. Cl. 62—3.2 **10 Claims**



1. A system for thermal conditioning of electronic equipment mounted on aircraft, wherein a flow or ram air is tapped and transferred to first cooling means for enabling said flow of air to be given a first negative gradient of temperature after which, when said first negative gradient of temperature is not sufficient to attain a temperature necessary for an appropriate cooling of said electronic equipment, the current of air coming from said first cooling means is subjected to second means for giving a second negative gradient of temperature to said flow of air, is then transferred to the immediate vicinity of the electronic equipment to be cooled, thus achieving an appropriate thermal conditioning of said electronic equipment, and wherein a ram air inlet made on a pod containing the electronic equipment traps said flow of ram air and is divided into two branches; said first cooling means for cooling the flow of ram air being constituted by a pressure-reducing turbine, supplied by one of said branches of the ram air inlet; said second cooling means being constituted by a system of thermoelectric elements, arranged so that all the cold junctions form an element that is added on or fixedly joined to an outlet conduit of the turbine transferring the already cooled air towards the electronic equipment to be cooled, the hot junctions of the system of thermoelectric elements being arranged within the second of said branches coming from the ram air inlet.

5,201,183

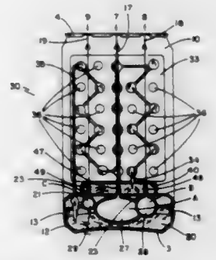
COOLING DEVICE FOR BEVERAGE CANS

John F. Ramos, P.O. Box 607, Double Bay, NSW 2028, Australia

Filed Apr. 29, 1992, Ser. No. 875,662

Int. Cl.[5] F25D *3/10, 5/00*

U.S. Cl. 62—4 **11 Claims**



1. A cooling system inside a beverage can having a bottom and a top for cooling the beverage contained within the can, comprising:

a vacuum chamber positioned within the can and fixed interiorly to said can's bottom;

a plurality of gas producing capsules contained within said vacuum chamber, said gas being of the type which absorbs heat;

a collection chamber formed immediately above and adjacent to said vacuum chamber within said can, said collection chamber having openings formed in conjunction with said vacuum chamber whereby said capsules protrude into said collection chamber;

a plate system having a plurality of vertical, metallic plates in contact with said beverage contained within said can, said plates having a plurality of compartments formed therein, said compartments being interconnected by a network of enclosed channels, said network having a beginning entry channel interconnecting said plate system with said collection chamber through an opening in the collection chamber and said network having a return channel interconnecting said vacuum chamber with said plate system through an opening in said vacuum chamber; and

means for activating said gas producing capsules, wherein activation of said gas causes gas to flow into said collection chamber and into said network of enclosed channels within said plate system and through said return channel to said vacuum chamber, thereby cooling said plates and thereby cooling said beverage in contact with said plates.

5,201,184

METHOD AND APPARATUS FOR PRECOOLING THE HELIUM TANK OF A CRYOSTAT

Gerhard Roth, Karlsruhe, Fed. Rep. of Germany, assignor to Bruker Analytische Messtechnik GmbH, Fed. Rep. of Germany

Filed May 29, 1991, Ser. No. 709,098

Claims priority, application Fed. Rep. of Germany, May 29, 1990, 4017213

Int. Cl.[5] F17C *5/02*

U.S. Cl. 62—47.1 **17 Claims**

1. Method for precooling a helium tank of a cryostat comprising the steps of:

feeding liquid nitrogen from a storage container under low overpressure via a conduit through an opening to the helium tank of the cryostat and into a heat exchanger disposed in the helium tank prior to filling of the helium tank with liquid helium; and

thereafter feeding the liquid nitrogen, via an opening, out of

determining if the transport refrigeration unit is set to oper-

5,201,187

SYSTEM FOR CONTROLLING COOLING EQUIPMENT

5,201,188

REFRIGERANT RECYCLING SYSTEM WITH

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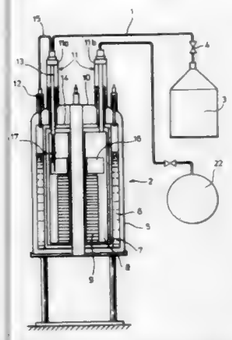
thereafter feeding the liquid nitrogen, via an opening, out of the helium tank and into a nitrogen collecting container

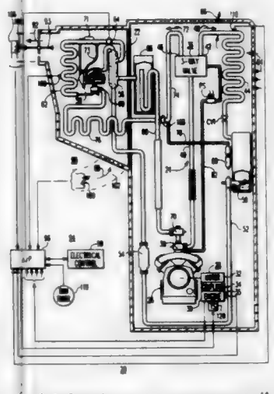


surrounding the helium tank before filling the helium tank with liquid helium.

5,201,185
METHOD OF OPERATING A TRANSPORT REFRIGERATION UNIT

Jay L. Hanson, Bloomington; James E. Nixon, Woodbury; Romuald M. Jurewicz, St. Louis Park; Jeffrey B. Berge, Bloomington, and Jayaram Seshadri, Minneapolis, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Jul. 11, 1991, Ser. No. 728,472
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—81 **9 Claims**



1. A method of defrosting an evaporator coil of a transport refrigeration unit having a refrigerant circuit which includes a compressor and an evaporator coil having a coil temperature sensor, and microprocessor based electrical control for controlling the temperature of a served space by drawing air from the served space, conditioning the air with the evaporator coil, and returning the conditioned air to the served space, comprising the steps of:

requesting a manual defrost operation,

determining whether the evaporator coil temperature sensor is functional, or faulty,

overriding the request for the manual defrost operation when the determining step finds the evaporator coil temperature sensor is faulty,

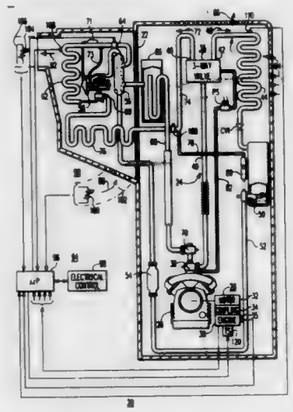
determining if the compressor of the transport refrigeration unit is running,

determining if the transport refrigeration unit is set to operate in a cycling mode when the compressor is not running, and overriding the request for the manual defrost operation when the compressor is not running and the transport refrigeration unit is not set to operate in a cycling mode.

5,201,186
METHOD OF OPERATING A TRANSPORT REFRIGERATION UNIT

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jul. 11, 1991, Ser. No. 728,465
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—126 **12 Claims**



1. A method of modifying the operation of a refrigeration unit when a condition is detected which may result in shutdown of the unit, with the refrigeration unit having a refrigerant compressor driven at low and high speeds by an internal combustion engine, with the engine including a temperature sensor, comprising the steps of:

monitoring the temperature of the engine,

detecting a predetermined over-temperature condition,

initiating a first modification of the refrigeration unit, including the step of switching the engine to low speed when it is in high speed at the time the detecting step detects the predetermined over-temperature condition,

determining if the engine temperature has dropped below a predetermined value after the step of switching to low speed,

initiating a second modification of the refrigeration unit when the engine temperature does not drop below the predetermined value,

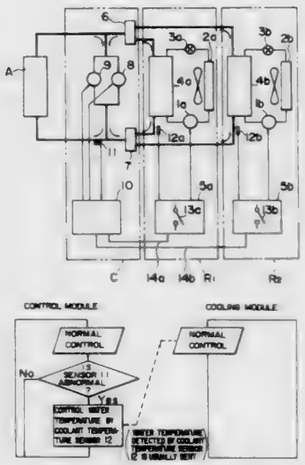
maintaining the engine at low speed when it is in low speed when the detecting step detects the predetermined over-temperature condition, and

initiating the second modification of the refrigeration unit immediately when the engine is in low speed at the time the detecting step detects the predetermined over-temperature condition.

5,201,187
SYSTEM FOR CONTROLLING COOLING EQUIPMENT

Tomio Yoshikawa; Takashi Kato, both of Shimizu; Tetsuji Yamashita, Shizuoka; Kyoshiro Murakami, Shimizu, and Shizuo Zushi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1990, Ser. No. 463,559
Claims priority, application Japan, Jan. 20, 1989, 1-11129
Int. Cl.[5] F25D *29/00, 17/02;* F25B *49/00, 41/00*
U.S. Cl. 62—126 **8 Claims**



1. A system for controlling cooling equipment including a refrigerant circuit for cooling water by heat exchange, said cooling equipment comprising:

a plurality of cooling modules in a backup relationship which have the same structure and are provided with means for adjusting the cooling capability of said refrigerant circuit and a controller for controlling said means for adjusting said cooling capability;

a plurality of pumps in a backup relationship for circulating cooling water from one of said cooling modules to a body to be cooled;

a control module having a coolant temperature sensor for detecting the temperature of said cooling water and a controller for calculating a cooling capability control command on the basis of a value detected by said coolant temperature sensor; and

a transmission line for transmitting information between said controller in one of said cooling modules and the controller in said control module;

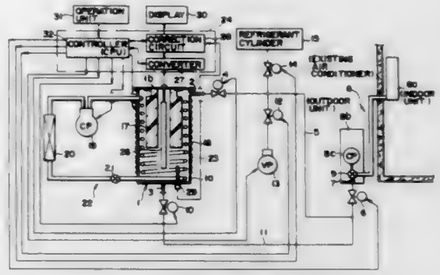
said controller in each of said cooling modules including means for controlling said cooling capability adjusting means on the basis of said cooling capability control command transmitted from said controller of said control module through said transmission line;

said system being characterized in that each of said cooling modules has a coolant temperature sensor for detecting the same water temperature as that detected by said coolant temperature sensor of said control module, and said control module includes means for detecting when an abnormality occurs in said coolant temperature sensor in said control module and means responsive to detection of said abnormality for calculating said cooling capability control command on the basis of a value detected by said coolant temperature sensor in one of said cooling modules and transmitted through said transmission line.

5,201,188
REFRIGERANT RECYCLING SYSTEM WITH REFRIGERATION RECOVERING SCHEME

Tsutomu Sakuma, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 2, 1991, Ser. No. 739,512
Claims priority, application Japan, Aug. 22, 1990, 2-222251
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—149 **14 Claims**



1. A refrigerant recycling system comprising:

a refrigerant recovering sealed container having at least refrigerant passing means;

connecting means for connecting said refrigerant passing means of said refrigerant recovering sealed container to a refrigerant supply/discharge port of an existing refrigeration cycle unit;

cooling means for cooling the interior of said refrigerant recovering sealed container so that a refrigerant filled in said existing refrigeration cycle unit is introduced into said refrigerant recovering sealed container through said connecting means as a gaseous refrigerant and is recovered as a liquefied refrigerant;

measuring means for measuring an amount of the refrigerant recovered in said refrigerant recovering sealed container as the liquefied refrigerant by said cooling means, the measuring means including a liquid level sensor provided inside said refrigerant recovering sealed container, the liquid level sensor including an electrostatic capacitive liquid level sensor that indicates an electrostatic capacitance corresponding to a liquid level of the liquefied refrigerant in said refrigerant recovering sealed container; and

control means for supplying control signals for activating said connecting means, said cooling means, and said measuring means in a predetermined order.

5,201,189
REFRIGERANT COMPRESSOR WITH AN INITIAL SEIZURE PREVENTION MEANS

Naoya Yokomachi; Kazuhiro Tsuikawa; Toshiyuki Nakajima, and Tetsuya Takashima, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 6, 1991, Ser. No. 755,692
Claims priority, application Japan, Sep. 13, 1990, 2-245684
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—196.3 **2 Claims**

1. A rotary swash plate type refrigerant compressor having a suction side from which a refrigerant gas before compression is sucked therein and a discharge side from which a refrigerant gas after compression is delivered, and incorporated in a refrigerating circuit of a car air-conditioning system, comprising:

a bypass passageway means internally provided in said compressor for interconnecting between said discharge side and said suction side to thereby permit a flow of said refrigerant gas after compression from said discharge side

toward said suction side, said refrigerant gas after com-

predetermined amount to open said valve and permit flow of

said widthwise dimension of said support panels which is substantially equal to said widthwise dimension of said

adapted to receive a capsule containing liquified gas, said liquified gas being adapted to flow from said capsule, said

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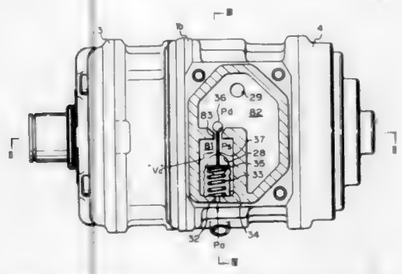
toward said suction side, said refrigerant gas after compression having a lubricant oil suspended therein;

a pressure sensitive valve closing means disposed in said bypass passageway means for opening said bypass passageway means when a lowering of the suction pressure prevailing in said suction side to a level lower than atmospheric pressure level is sensed at a time immediately after the start of the operation of said compressor after a long non-operation of said air-conditioning system, said opening of said bypass passageway means permitting the lubricant oil together with the refrigerant gas after compression to flow directly from said discharge side toward said suction side;

an axially extended cylinder block assembly provided with a rotary swash plate rotated with a drive shaft driven by a car engine, and a swash plate operated reciprocatory piston mechanism for compressing said refrigerant gas



before compression to thereby produce said refrigerant gas after compression; and

front and rear housing means tightly attached to front and rear ends of said axially extended cylinder block assembly for defining front and rear suction chambers for said refrigerant gas before compression and front and rear discharge chambers for said refrigerant gas after compression,

wherein said rotary swash plate type compressor further comprises a flange element fixedly mounted on said cylinder block assembly for defining therebetween a low pressure chamber fluidly communicated with said suction chambers and a high pressure chamber fluidly communicated with said discharge chambers, said bypass passageway means being arranged between said low and high pressure chambers for providing therebetween a fluid connection when said bypass passageway means is opened by said pressure sensitive closing valve means.

5,201,190

REFRIGERATOR WITH SUBCOOLING FLOW CONTROL VALVE

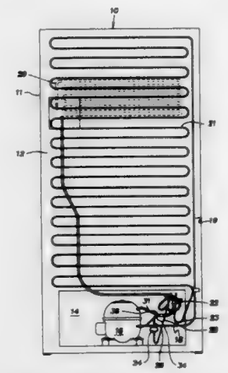
William G. Nelson, St. Cloud, Minn.; Gary R. Peter, Rockford, and Sammie C. Beach, Jr., Gowen, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 24, 1992, Ser. No. 837,011

Int. Cl.[5] F25B *41/04*

U.S. Cl. 62—210 **8 Claims**

1. A refrigerated cabinet comprising a compartment, a compressor, a condenser, an evaporator in said compartment, a capillary tube connecting said condenser and said evaporator in a closed circuit containing a first refrigerant, said circuit including a return line from said evaporator to said compressor, a thermostat responsive to the temperature in said compartment for selectively energizing said compressor to maintain the temperature in said compartment within a predetermined range, a subcooling flow control valve between said condenser and said capillary tube, said flow control valve having a housing, an inlet tube to said housing connected to said condenser, an outlet tube from said housing to said capillary tube, said flow control valve being operable when the subcooling of the refrigerant at said inlet tube is greater than a predetermined amount to open said valve and permit flow of refrigerant from said condenser into said capillary tube and when the subcooling of said refrigerant in said first chamber is less than said predetermined amount to close said valve and prevent flow of refrigerant into said capillary tube, said flow



control valve housing being positioned on said cabinet adjacent said compressor with said inlet tube in heat conducting contact with said return line so that said compressor absorbs heat from said valve when said compressor starts and transfers heat to said valve when said compressor stops.

5,201,191

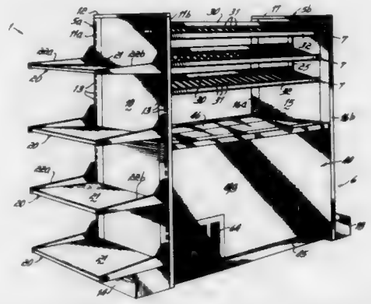
REFRIGERATED MERCHANDISER

Rafael T. Bustos, Alpharetta, Ga., Assignor to Leggett & Platt, Inc., Carthage, Mo.

Filed Sep. 6, 1991, Ser. No. 755,664

Int. Cl.[5] A47F *3/04*

U.S. Cl. 62—249 **14 Claims**



9. A combined refrigerated merchandiser comprising:

a pair of spaced apart generally rectangular upright support panels, each having a widthwise dimension,

a merchandising refrigerator spanning between said upright support panels for refrigerating and displaying soft drinks and the like, said merchandising refrigerator having a depth dimension generally parallel to said widthwise dimension of said support panels which is substantially equal to said widthwise dimension of said panels, said refrigerator being located in a lowermost location and being of the chest-type,

non-refrigerated shelves spanning between said upright support panels for merchandising and displaying non-refrigerated snack items and the like, said non-refrigerated shelves having a depth dimension generally parallel to said widthwise dimension of said support panels which is substantially equal to said widthwise dimension of said support panels, said shelves being located in an uppermost location and comprising a plurality of shelves removably secured to said upright support panels above said refrigerator and being downwardly and forwardly tilted toward either side of said merchandiser, and

merchandising non-refrigerated cantilevered shelves removably secured to said upright support panels on outboard sides thereof,

whereby a customer can access both refrigerated soft drinks and non-refrigerated snack items from either side or end of said combined refrigerated merchandiser.

5,201,192

WATER DROPLET COLLECTOR

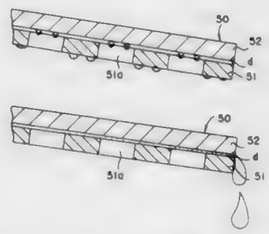
Yasuo Hara, Shimane, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Japan

Filed Jul. 1, 1991, Ser. No. 721,341

Claims priority, application Japan, Jun. 29, 1990, 2-173970; Jun. 29, 1990, 2-173971; Jul. 3, 1990, 2-175585; May 20, 1991, 3-145618; May 23, 1991, 3-149636; May 24, 1991, 3-149884

Int. Cl.[5] F25D *21/14*

U.S. Cl. 62—285 **4 Claims**



1. A water droplet collector for collecting drops of dew condensed from the air onto cool surfaces in a high humidity compartment such as a cooling storage cabinet formed to store foodstuffs therein, comprising:

a perforated plate having first and second surfaces; and

a solid base plate overlapped with the first surface of said perforated plate so as to form a capillary clearance for attraction of drops of dew condensed on the second surface of said perforated plate, wherein both said plates are detachably mounted within said high humidity compartment and inclined at a predetermined angle toward an internal vertical side wall of said compartment such that said solid base plate is arranged to receive drops of dew falling from a ceiling of said compartment and that drops of dew attracted into the capillary clearance flow down toward the vertical side wall of said compartment to be drained away from a bottom of said compartment.

5,201,193

COOLING DEVICE FOR BEVERAGES

Shaam P. Sundhar, 87 Juniper Ave., Westerville, Ohio 43081, and Biharilal B. Lund, 43 Lavender Dr., Edison, N.J. 08820

Filed Feb. 19, 1992, Ser. No. 837,145

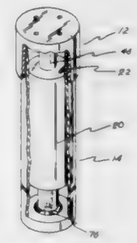
Int. Cl.[5] F25D *3/00*

U.S. Cl. 62—293 **10 Claims**

1. A beverage cooling device comprising

a cap section, said cap section comprising a top having at least one aperture formed therethrough, and a push rod projecting downwardly from said top, and

a base section, said base section detachably secured to said cap section, said base section having a bottom and a base section top, said base section top having formed therein a base section aperture, said base section bottom having a pierce pin projecting upwardly therefrom, said device adapted to receive a capsule containing liquified gas, said liquified gas being adapted to flow from said capsule, said



push rod projects from the center of said cap and has an indentation which interfits with said capsule.

5,201,194

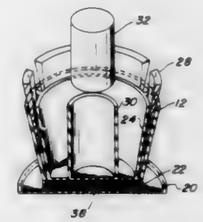
FOOD SERVING AND STORAGE CONTAINER

Martin F. Flynn, Jr., 12 Blakely Rd., Downingtown, Pa. 19335, and Noel Yapsuga, 1707 Main St., Northampton, Pa. 18067

Filed Jan. 2, 1992, Ser. No. 816,004

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—457.3 **16 Claims**



1. An article of manufacture comprising:

a food serving and storage container having an inner and an outer sidewall, said inner and outer sidewalls being so disposed and configured to provide a space therebetween and adapted to receive a coolant so configured to provide substantially uniform cooling, said space between said inner and outer sidewalls being open from above to enable insertion and removal of said coolant, said coolant being a freezable fluid contained in a sealed container and adapted and configured to be slidably received in said space between said inner and outer sidewalls.

5,201,195

BI-FLOW RECEIVER/DEHYDRATOR FOR REFRIGERATION SYSTEM

Michael A. Gavlak, Buffalo, and Ardeean Scoccia, West Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1992, Ser. No. 873,851

Int. Cl.[5] F25B *43/00, 43/04*

U.S. Cl. 62—475 **5 Claims**

1. In a heat pump system selectably operable in heating and cooling modes wherein refrigerant flows through the system in either direction, a receiver for flow of refrigerant in either direction comprising:

a canister for receiving and dispensing refrigerant;

first and second passages leading into the canister, each passage having a mouth near the bottom of the canister for discharging refrigerant and receiving refrigerant,

baffle means between the passage mouths for permitting

flow of liquid refrigerant from one mouth to another and

from an end of said second section through said bend between said first and second sections; and

a return spring means mounted on the machine frame for urging said guide bar toward said patterning element of

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5,201,201

LOCKABLE SEALER FOR END OF THREADED PIPE

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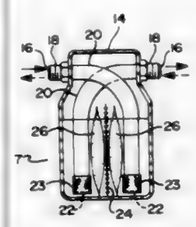
flow of liquid refrigerant from one mouth to another and for separating vapor from the refrigerant, whereby liquid



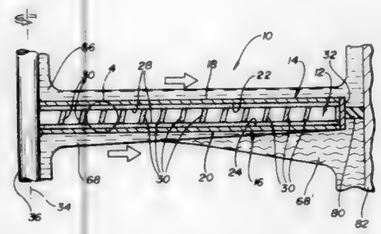
and vapor phase refrigerant flows in through one passage and liquid phase flows out through the other passage.

5,201,196

CENTRIFUGAL HEAT PIPE VAPOR ABSORPTION HEAT PUMP

Amir Faghri, Dayton, Ohio, assignor to Wright State University, Dayton, Ohio

Filed Jun. 4, 1991, Ser. No. 710,085
Int. Cl.[5] F28D *15/02;* **F25B** *15/00*
U.S. Cl. 62—489 **15 Claims**



1. A vapor-absorption heat pump, comprising: a set of operatively interconnected components including an evaporator, an absorber, a vapor generator and a condenser; at least one of said components comprising at least one rotatable plate:

said rotatable plate comprising: a disk-shaped heat pipe including a sealed hollow body having opposing first and second walls, said first and second walls having first and second faces, and opposing first and second inner surfaces, respectively, and a quantity of heat pipe working fluid enclosed in said sealed hollow body;

each such rotatable plate being constructed and arranged for accomplishing heat transfer between said first and second faces of said disk-shaped heat pipe.

5,201,197

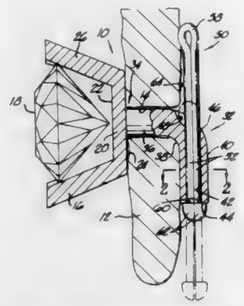
PIERCED EARRING MOUNT LOCKING MEMBER

Johann G. Bakker, 11038 Moorpark St., North Hollywood, Calif. 91602

Filed Jun. 1, 1992, Ser. No. 890,832
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—12 **6 Claims**

1. A single post and locking means for a pierced earring, said earring including a base member on the outside of an ear lobe with said single post and locking means passing into and through said ear lobe, said invention comprising:

a post member including a first section having an end secured to said base member on the outside of said ear lobe, and a second section bent normal to said first section having an elongated axis and a bore is provided extending from an end of said second section through said bend between said first and second sections; and



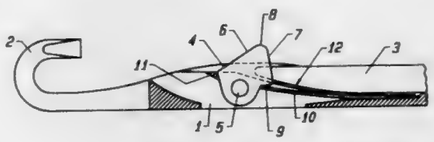
a slidable locking member associated with said second section movable from an ear insertion position to a locking position engaging the rear surface of said ear lobe.

5,201,198

SLIDER NEEDLE WITH STITCH SEPARATOR MEMBER

Gottfried Kuhnert, Westhausen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., Westhausen, Fed. Rep. of Germany

PCT No. PCT/EP89/01006, § 371 Date Mar. 28, 1991, § 102(e) Date Mar. 28, 1991, PCT Pub. No. WO90/03463, PCT Pub. Date Apr. 5, 1990
PCT Filed Aug. 26, 1989, Ser. No. 671,728
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1988, 3832911; Jul. 1, 1989, 3921775
Int. Cl.[5] D04B *35/06*
U.S. Cl. 66—120 **13 Claims**



1. A slider needle for knitting machines, comprising a needle body provided with a needle hook and at least one needle butt, a slider displaceably mounted in the needle body and provided with a slider butt and a swinging member rotatably mounted on the needle body behind the needle hook, the improvement comprising a spring located in the needle body which holds the swinging member in a position projecting out from the needle body.

5,201,199

WARP KNITTING MACHINE WITH DIFFERENTLY RESONANT SPRINGS

Rainer Kemper, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Sep. 1, 1992, Ser. No. 938,713
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1991, 4130030
Int. Cl.[5] D04B *23/00;* **F16F** *7/12*
U.S. Cl. 66—204 **8 Claims**

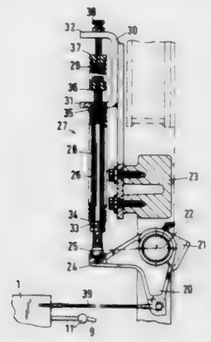
1. A warp knitting machine comprising:

a machine frame;

at least one guide bar mounted to reciprocate upon said machine frame;

a patterning drive having a patterning element for axially displacing said guide bar; and

a return spring means mounted on the machine frame for urging said guide bar toward said patterning element of the patterning drive, said return spring including:



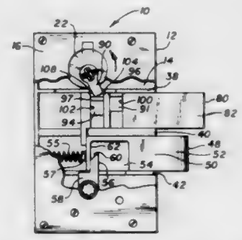
at least two separate springs mounted to act in combination upon said guide bar, said two springs having different resonant frequencies.

5,201,200

READILY REVERSIBLE ENTRY LOCK WITH DOUBLE THROW DEAD BOLT AND SLAM LATCH LOCK

Peter Hauber, 9901 Helen Ave., Sunland, Calif. 91040

Filed Jun. 20, 1991, Ser. No. 717,993
Int. Cl.[5] E05B *59/00*
U.S. Cl. 70—107 **30 Claims**



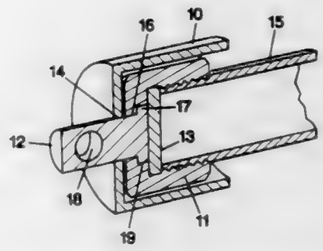
1. An entry lock assembly comprising a housing adapted for installation on a door jamb, a slam latch mounted in said housing a dead bolt mounted in said housing for reciprocal translational movement to and from the housing, a dead bolt actuator, said dead bolt actuator comprising a pawl mounted for multiple turns of angular movement along a predetermined path, said dead bolt comprising an elongated bar having a plurality of steps for engaging said pawl for dead bolt movement, said steps being longitudinally spaced from one another a distance enabling their successive angular movements of said pawl in one direction whereby progressive translational movement of said dead bolt in one direction is effected in a plurality of successive increments each projecting said deadbolt beyond said housing responsive to successive pawl engagement with successive ones of said steps, and stop means carried rearwardly by said dead bolt elongated bar, said stop means acting on said latch to arrest return movement of said slam latch when said dead bolt is engaged beyond said housing.

5,201,201

LOCKABLE SEALER FOR END OF THREADED PIPE

William C. Sylvester, 136 Old Country Rd., Crockett, Calif. 94525, and Douglas C. Gillette, 1315 7th St., Rodeo, Calif. 94572

Filed May 13, 1992, Ser. No. 882,286
Int. Cl.[5] B65D *55/14*
U.S. Cl. 70—165 **8 Claims**



1. A device for lockably sealing a threaded end of a pipe of a predetermined size for preventing any unauthorized person from drawing liquid from said end of said pipe, comprising:

a resilient gasket for providing a fluid-tight seal over said end of said pipe,

a stem having a shaft with an axis and proximal and distal ends, a flange extending from said proximal end of said shaft in a direction generally orthogonal to said axis of said shaft, said flange being sized to engage and to urge said gasket against said end of said pipe so that said gasket will seal said end of said pipe when said flange is urged against said gasket, said distal end of said shaft including locking means for enabling said distal end of said shaft to be lockably enlarged for preventing passage of said distal end through a hole which is not greater than a predetermined size,

a threaded cap nut for engagement with said end of said pipe, said threaded cap nut comprising a cylindrical portion and an end extending across said cylindrical portion, said end having a hole therethrough, said cylindrical portion being threaded for mating with said threaded end of said pipe, said cap nut being turnable by engaging a side surface of said cylindrical portion, said cap nut being sized to urge said gasket against said end of said pipe when said cap nut is tightened so as to cause said gasket to seal said end of said pipe,

a sleeve comprising a cylindrical portion and an end extending across said cylindrical portion, said end having a hole therethrough which is not greater than said predetermined size, said sleeve being sized to cover said cap nut for preventing access to said side surface of said cylindrical portion of said cap nut so as to prevent anyone from turning said cap nut when said sleeve covers said cap nut, said sleeve being free to rotate about said cap nut,

whereby when said gasket is placed against said end of said pipe, said flange is placed against said gasket, said cap nut is threadedly tightened to said threaded end of said pipe to urge said gasket against said end of said pipe, said sleeve is placed over said cap nut, said shaft of said stem extends through said holes in said end of said cap nut and said sleeve, and said distal end of said shaft is lockably enlarged so that said sleeve cannot be removed from said shaft, said gasket will seal said pipe so that one cannot draw fluid from said pipe, but when said distal end of said shaft is unlocked so that said sleeve can be removed therefrom, said cap nut and said stem can be removed so that one can draw fluid from said pipe.

5,201,202

DOOR LOCK SECURITY DEVICE

substantially rectangular lock entrance slot with spaced apart sidewalls, the longitudinal axis of the metal key being aligned

sensor means for sensing strain in a press element which is

(d) applying drying air to the stock with the lubricant carrier

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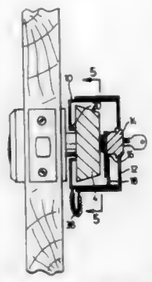
5,201,202

DOOR LOCK SECURITY DEVICE

Hing K. Kam, 64 Rivergrove Drive, Scarborough, Ontario, Canada M1W 3T9

Filed Jun. 24, 1991, Ser. No. 720,104
Int. Cl.[5] E05B *13/00*
U.S. Cl. 70—168 11 Claims



1. A door lock security device for locking over a door lock rotary knob or a door knob, having a shaft of a smaller diameter than the knob, the device comprising:

an inner cover, said inner cover comprised of first and second shell portions which abut along a seam, said inner cover having an opening between said first and said second shell portions for rotatably closing around said shaft, at least one of said first and second shell portions having an inwardly projecting flange,

an outer cover substantially encompassing and overlapping said inner cover, said outer cover sufficiently shielding said inner cover to prevent tampering with said inner cover,

means to prevent rotational movement of said inner and said outer covers about one another when said outer cover overlaps said inner cover, said means comprising corresponding flattened portions on the sides of said inner and said outer covers, and

a single lock for releasably securing said outer cover to said inner cover, said lock being attached to said outer cover and including a locking bar which engages behind said flange to secure said covers together,

said inner and said outer covers when engaged together around said shaft allowing rotational movement of said device about said shaft wile preventing removal of said device over said door lock rotary knob or said door knob, and preventing said door lock rotary knob or said door knob from being rotated from a closed to an open position.

5,201,203

FLAT PLASTIC KEY WITH SHORTENED KEY ALIGNMENT GROOVE

Robert E. Almblad, Scottsdale, Ariz., assignor to Mitsubishi Corp., Tokyo, Japan

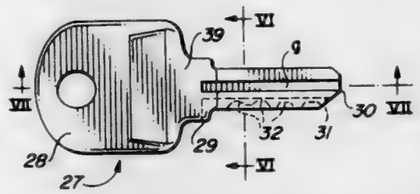
Division of Ser. No. 472,953, Jan. 31, 1990, Pat. No. 5,029,459, which is a continuation of Ser. No. 216,763, Jul. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 155,884, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,492, Sep. 3, 1987, abandoned. This application Jul. 8, 1991, Ser. No. 726,892
Int. Cl.[5] E05B *19/04*
U.S. Cl. 70—406 23 Claims

1. A flat plastic key for replacing a corresponding metal key having a longitudinal axis, a standard length key alignment groove disposed in a side of the key at a location offset from the longitudinal axis by a first distance and defining a first groove length where both the plastic and metal keys are configured to actuate a rotary cylinder lock having lock tumblers, an elongated key receptacle disposed along a lock longitudinal axis for receiving the key and a rotary lock face including a substantially rectangular lock entrance slot with spaced apart sidewalls, the longitudinal axis of the metal key being aligned with the longitudinal axis of the key receptacle when the key is inserted in the lock, the plastic key comprising:

a. a head for receiving a lock actuating input torque within a force input area and having an end surface, a head thickness, a head width and a head length;

b. a shank having a substantially rectangular cross section with substantially parallel sides defining a shank thickness, the shank further including a width, a length, a first end surface joined to the end surface of the head and a spaced apart second end surface;

c. a bit having an edge surface for receiving notches to actuate the lock tumblers and including a thickness, a width and a first end surface joined to the second end surface of the shank; and



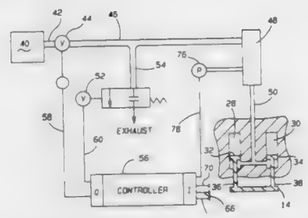
d. a shortened key alignment groove disposed in a side of the key creating a decreased key thickness along the groove, where the groove is oriented parallel to but offset by the first distance from the key longitudinal axis and extends along the entire length of the bit but terminates at a groove termination point spaced well away from the first end of the shank, the shortened groove formed by decreasing the length of the key alignment groove from the first groove length to a shorter second groove length to increase the volume and strength of the plastic key shank relative to the volume and strength of an exact plastic duplicate of the metal key shank by eliminating at least a part of the decreased key thickness created by penetration of the alignment groove into the shank of the exact plastic duplicate key to thereby increase the strength of the plastic key and its capacity to transfer the input torque to the lock.

5,201,204

PRESS COUNTERBALANCE SYSTEM

William Hinterman, G-5034 Fenton Rd., Flint, Mich. 48507, and Timothy Hinterman, 2104 Cadillac St., Flint, Mich. 48504

Filed Aug. 31, 1992, Ser. No. 937,973
Int. Cl.[5] B21D *24/02*
U.S. Cl. 72—19 10 Claims



1. In a press which engages a flywheel to impart energy to reciprocate a ram through interconnected drive components, said press having air-operated cylinder means for automatically counterbalancing the downward working force of said ram, an improved system for adjusting the counterbalancing air pressure in said air cylinder means comprising:

sensor means for sensing strain in a press element which is indicative of the stress imparted to said element;

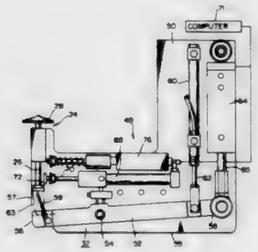
a control system which detects a change in the strain sensed by said sensor means and increases or decreases the air pressure in said air-operated cylinder means according to said detected change to overcome under or over counterbalancing.

5,201,205

TWO AXIS TRACER FOR FASTENER OPERATIONS

Peter B. Zieve; Peter R. Vogeli, and John L. Hartmann, all of Seattle, Wash., assignors to Electroimpact, Inc., Seattle, Wash.

Filed Sep. 16, 1991, Ser. No. 761,227
Int. Cl.[5] B21L *15/28*
U.S. Cl. 72—31 20 Claims



1. A two axis tracer apparatus for use with fastening apparatus operating on selected parts to be fastened, comprising:

a sensing means for two axis positioning of the fastening apparatus relative to the selected parts, the sensing means including at least one sensing member having two sensing surfaces which in operation have a fixed positional relationship relative to each other;

a mounting assembly for the sensing means, arranged and constructed such that the sensing means is capable of movement in two axial directions relative to one of the selected parts;

means for moving the sensing means in said two directions until the one part is contacted by said two sensing surfaces, wherein the two sensing surfaces on the sensing member are so positioned relative to each other and relative to the mounting means that the one part is contacted at two spaced-apart locations, respectively, by said two sensing surfaces; and

means for determining the position of said sensing means in said two directions.

5,201,206

CONTINUOUS WIRE DRAWING PROCESS WITH MECHANICAL DESCALING AND POST-DIE TREATMENT AND APPARATUS

Anthony J. Russo, 950 Schweitzer Pl., North Brunswick, N.J. 08902

Continuation of Ser. No. 754,455, Sep. 3, 1991, abandoned. This application Jul. 28, 1992, Ser. No. 920,516
Int. Cl.[5] B21B *45/02*
U.S. Cl. 72—40 18 Claims

1. A process for drawing and forming a bright wire of a predetermined diameter and cross section from stock of a greater diameter, which comprises, in sequence:

(a) continuously feeding said stock from a supply spool through the process;

(b) mechanically removing substantially all of the scale from said stock by bending the stock in at least three different directions over small enough arcs to cause peeling of scale and subsequent treatment by abrading the stock;

(c) apply a coating of lubricant carrier to the descaled stock;

(d) applying drying air to the stock with the lubricant carrier thereon;

(e) applying a lubricant to the carrier coated stock, said lubricant being selected from the group consisting of soap, calcium stearate or sodium stearate;

(f) drawing the lubricated stock through a plurality of sequential pressure dies and each sequential die has a final diameter less than that of any die preceding it to decrease the diameter to the desired predetermined diameter and applying a coating of lubricant carrier, applying drying air and lubricating the stock in sequence before each die;

(g) buffing the drawn stock with a plurality of buffing wheels, said buffing wheels being applied to the drawn stock at a plurality of angles to the direction of travel of the stock to produce bright wire; and

(h) coiling the resulting bright wire into coils for subsequent use;

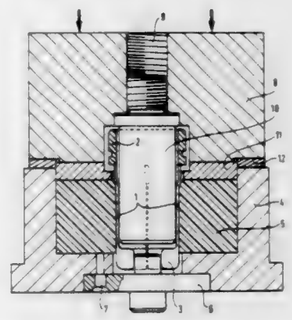
wherein all of the steps in the aforesaid process are continuous, and the speed of the stock is maintained by conventional drive mechanisms to feed into the process and to coil off the process at predetermined speeds.

5,201,207

METHOD OF MANUFACTURING A THIMBLE OF CONTACT FINGERS, AND A THIMBLE MADE BY THE METHOD

Henri Organi, and Roger Sauvat, both of Villeurbanne, France, assignors to GEC Alsthom SA, Paris, France

Filed May 8, 1992, Ser. No. 880,007
Claims priority, application France, May 30, 1991, 91 06522
Int. Cl.[5] B21D *22/10*
U.S. Cl. 72—60 4 Claims



1. A method of manufacturing a thimble of contact fingers from a blank constituted by a tube of material having good conductive properties and good elasticity, said tube including

a first carrier and a second carrier;

length of injection needle extending along the chamber to any desired extent, and in a sterile environment; and

and the screw member upon rotation of the pulling head, and

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a thin-walled portion provided with longitudinal parallel slots and terminated by a ring of material having good electrical conductivity and being capable of withstanding the effects of electrical arcing, said method comprising the following steps:

placing said blank around a cylindrical core of a diameter substantially equal to the diameter of the blank and of a length equal to the length of the blank with the end of the core placed in abutment against the ring;

disposing an annular block of an elastomer material around the blank over the slots with the inside diameter of the block being close to and slightly greater than the outside diameter of the blank and the axial length of the block being substantially equal to the axial length of the slots; and

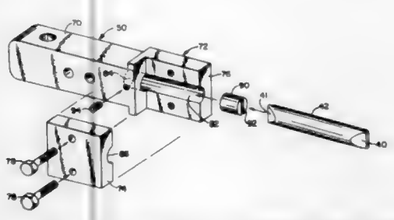
exerting pressure on end surfaces of said elastomer material block, and reducing the inside diameter of said elastomer material block until the desired slot width is obtained.

5,201,208

COILING POINT HOLDER FOR SPRING COILING MACHINE

John D. Jacobson, Southington, Conn., assignor to Newcomb Spring Corporation, Southington, Conn.

Filed Nov. 4, 1991, Ser. No. 787,577
Int. Cl.[5] B21F *3/02*
U.S. Cl. 72—140 **19 Claims**



1. A coiling point assembly for a spring making machine comprising:

coiling point means having a pair of opposed tapered ends adapted for engagement by a wire for coiling said wire;

holder means defining an axial groove for receiving said coiling point means;

insert means receivable in said groove and freely angularly positionable therein, at a given axial position of said groove, said insert means comprising a cylindrical plug comprising slot means defining a diametral slot for engaging one end of said coiling point means at a fixed angular position thereof;

fixing means for fixing said first insert means at a fixed angular position of said holder means; and

clamp means for clamping said coiling point means to said holder means at said pre-established fixed angular position.

5,201,209

PULLER APPARATUS FOR AN EXTRUSION MACHINE

Masao Houmura, Kanazawa; Mitsuo Yasui, Matsutou; Seizo Washizuka, Takaoka; Norio Futakuchi, Shinminato, and Hitoshi Mukaiyama, Toyama, all of Japan, assignors to Giken Kabushiki Kaisha, Nonoichimachi, Japan

Filed Aug. 12, 1991, Ser. No. 743,868
Claims priority, application Japan, Aug. 13, 1990, 2-214600
Int. Cl.[5] B21C *35/02*
U.S. Cl. 72—257 **7 Claims**

1. A puller apparatus for an extrusion machine wherein extruded metal fed from an extrusion machine is pulled on a runout table while the metal is clamped by a clamp head, comprising:

a first guide rail and a second guide rail mounted on one side of said runout table and extending in parallel thereto;

a first carrier and a second carrier;

said first carrier being movable on said first guide rail;

said second carrier being movable on said second guide rail;

a first clamp head and a second clamp head;

a first support and a second support;

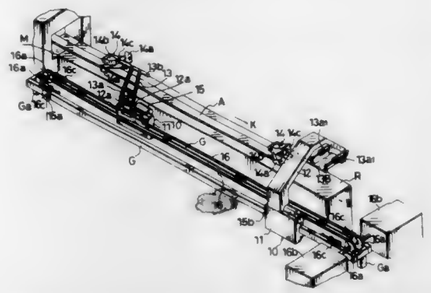
a first swing base and a second swing base;

said first clamp being mounted to said first carrier through said first support said first swing base;

said said second clamp head being mounted to said second carrier through said second support and said second swing base;

each of said first clamp head and said second clamp head being movable between an operative position and a retracted position;

said first carrier with said first clamp head in its operative position and said second carrier with said second clamp head in its retracted position being constructed so as not to interfere with one another when said first carrier and said second carrier are moved back and forth;



said first carrier with said first clamp head in its retracted position and said second carrier with said second clamp head in its operative position being constructed so as not to interfere with one another when said first carrier and said second carrier are moved back and forth;

said first support having an elongated arm extending over said second carrier;

said second clamp head being attached to said second swing base;

said first swing base and said second swing base being pivotably mounted respectively to a front end of said first support and said second support;

said second carrier including a pair of rod-like supports;

said first clamp head and said second clamp head being attached respectively to said first swing base and said second swing base; and

said second swing base being pivotably mounted to ends of said pair of rod-like supports.

5,201,210

NEEDLE BENDING DEVICE

William Stein, III, 4701 Richland Ave., Metairie, La. 70002

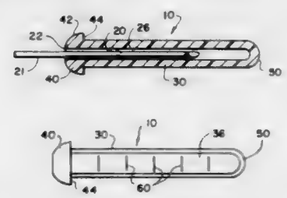
Filed Nov. 12, 1991, Ser. No. 791,027
Int. Cl.[5] B21D *7/022*
U.S. Cl. 72—457 **11 Claims**

1. An injection needle bending device comprising:

a sterile casing defining an elongated chamber with a rear end section and an open front end section opposite from the rear end section, the chamber being adapted to receive a length of injection needle into the open front end section and along at least part of the chamber;

a crown that is curved outwardly from the open front end section and is arranged perpendicularly to the casing and positioned at the front end section of the casing, so that the injection needle can be bent over the crown to form a bent length of injection needle extending along the chamber to any desired extent, and in a sterile environment; and

wherein the casing is made at least partly of a transparent



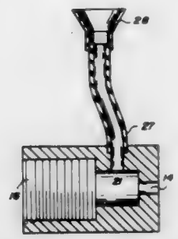
material, and gradation means extending along the casing and visible with a length of needle extending in the chamber for providing a measurement of the length of the needle extending in the chamber.

5,201,211

SHEET METAL PULLING APPARATUS

Anthony G. Golembreski, 51 Eckel Rd., Little Ferry, N.J. 07643

Filed Nov. 14, 1991, Ser. No. 791,342
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—463 **1 Claim**



1. A sheet metal pulling apparatus in combination with a slide hammer, wherein the slide hammer includes a slide shaft and a slide weight slidably mounted upon the slide shaft, and the slide shaft including an abutment at a rear distal end of the slide shaft, and a threaded boss at a forward distal end of the slide shaft, and wherein the apparatus further comprises,

a pulling head, the pulling head including a front wall and a generally cylindrical side wall defined about a predetermined axis, wherein the front wall is orthogonally oriented relative to the predetermined axis, and a first bore directed through the front wall defined by a first diameter, and

a second bore adjacent the first bore defined by a second diameter greater than the first diameter, and an internally threaded third bore defined by a third diameter greater than the second diameter, wherein the third bore projects from the second diameter to a rear distal end of the pulling head spaced from the front wall, and

the third internally threaded bore is arranged for threaded reception of the threaded boss, and

a screw member, the screw member including an externally threaded shank slidably directed through the first bore, and

a screw member head, wherein the screw member head is received within the second bore, and

the screw head is of a generally hexagonal configuration, and the second bore defines a hexagonal bore, and wherein the hexagonal bore is defined by the second diameter and the screw member head is defined by the second diameter, and the pulling head side wall includes a plurality of wrench flat surfaces formed about the side wall to effect simultaneous rotation of the pulling head and the screw member upon rotation of the pulling head, and

the screw member head includes a first fluid conduit directed into the screw member head, and the screw member includes a second fluid conduit in fluid communication with the first fluid conduit directed through a forward distal end of the screw member shank, and the pulling head includes a flexible fluid conduit directed through the side wall in communication with the first fluid conduit when the screw member head is positioned within the second bore, and

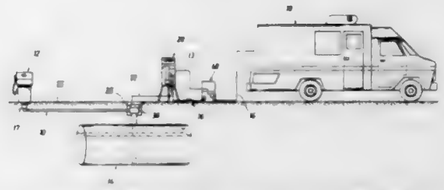
the flexible fluid conduit includes a funnel formed at an upper distal end of the flexible fluid conduit to receive an anti-corrosive fluid through the flexible fluid conduit to direct the fluid through the first fluid conduit and the second fluid conduit forwardly of the screw member.

5,201,212

LINE LEAK DETECTOR AND METHOD

Williams Barry N., Rosharan, Tex., assignor to Tanknology Corporation International, Houston, Tex.

Continuation-in-part of Ser. No. 654,939, Feb. 13, 1991, abandoned. This application Feb. 21, 1993, Ser. No. 840,720
Int. Cl.[5] G01M *3/26, 3/28*
U.S. Cl. 73—40.5 R **16 Claims**



1. An apparatus for analyzing signals representing the pressure in an isolated liquid fluid containing line to test for the presence of a leak in the line, comprising:

means for measuring the temperature of the liquid in the liquid fluid containing line before and after the testing and for transmitting a signal representative thereof;

means for measuring the temperature and pressure of the liquid in a test reservoir in fluid communication with the liquid fluid containing line and for transmitting a signal representative of the measured temperatures and the measured pressure therein;

means for receiving the signals from each of said temperature and temperature and pressure measuring means for calculating therefrom a cumulative leak rate at selected time intervals; and

means for comparing the calculated cumulative leak rate at each selected time interval to develop trending information for analyzing by comparing the calculated leak rate at each successive time interval to ascertain whether a preselected criterium of change is met to determine the rate of liquid fluid leakage from the liquid fluid containing line and validating the calculated cumulative leak rate.

5,201,213

PRESSURE LEAK DETECTION DEVICE

Karl Henning, 11301 71st St., Burr Ridge, Ill. 60525

Filed Mar. 21, 1990, Ser. No. 496,597
The portion of the term of this patent subsequent to Aug. 13, 2009, has been disclaimed.
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—49.2 **4 Claims**

1. A pressure testing device for detecting leaks in containers, comprising

a hand-operated reciprocating pump for creating a pressure differential within a container to be tested, said pump

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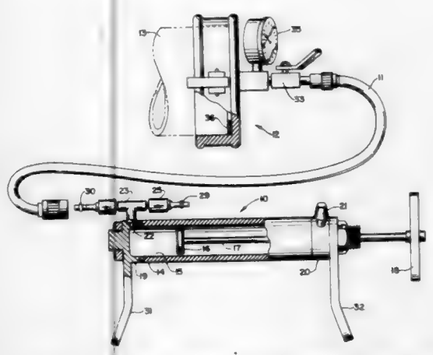
including a cylindrical body enclosing a pressure chamber and a plunger received in the body for reciprocating motion to compress a fluid in the pressure chamber, the plunger having a first handle protruding from the pump body and a second handle on the pump body positioned for simultaneous grasping with the first handle by an operator,

the pump body having a pressure passage terminating in a bifurcated fitting with a first branch having a one-way valve permitting only intake to the pressure chamber, and a second branch having a one-way valve permitting only discharge from the pressure chamber, and each branch terminating in a quick-release coupling means,



a pressure conduit comprising co-operating quick-release coupling means for selectively mating with either one of the coupling means of the pump fitting, a flexible hose, and a test closure adapted to mate with the container,

the test closure having a passage communicating with the interior of the container, a shutoff valve interposed in said passage, a quick-release attachment means for mating in sealing engagement with the container to be tested, and a pressure sensing and indicating means for indicating a change in the differential pressure within the container over time.

5,201,214

ROTARY VISCOSIMETER HAVING PIVOT PROTECTION APPARATUS

Koji Sekiguchi, Komae, and Yoshihiro Kato, Chiba, both of Japan, assignors to Toki Sangyo Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1991, Ser. No. 758,854

Int. Cl.[5] G01N *11/14*

U.S. Cl. 73—54,35 **10 Claims**

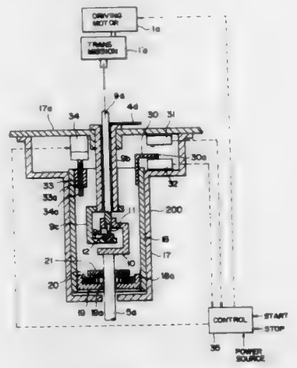
1. In a rotary viscosimeter including a rotor which is driven to be rotated in a liquid, the viscosity of which is to be measured, a first drive shaft (rotor shaft) for supporting the rotor and for transmitting a rotary driving force to the rotor, rotary driving means having a driving power source for driving the rotor to be rotated and an output shaft for outputting the driving force, a second drive shaft for transmitting the driving force to the rotor shaft, a first link means for elastically linking the output shaft with the second drive shaft to transmit the driving force therebetween, support means having a pivot and a bearing for rotatably bearing to support the rotor shaft and second link means which by-passes the support means for linking the rotor shaft with the second shaft, the improvement comprising:

means for detecting the angular displacement between the output shaft and the rotor shaft;

a pivot protection means having a locking mechanism for locking the rotor shaft against rotating and releasing the locking of the rotor shaft and a pivot separating mechanism for separating and contacting between the pivot and the bearing of the support means; and

control means for controlling the driving of the rotary driving means and the pivot protection means,

the pivot protection means having a first state in which the rotor shaft is locked against rotating and the pivot of the



supporting means is separated from the pivot and a second state in which the pivot is in contact with the bearing and the locking of the rotor shaft is released,

the control means having such a capability of controlling that the pivot protection means is in the first and second states on termination and commencement of measurement, respectively.

5,201,215

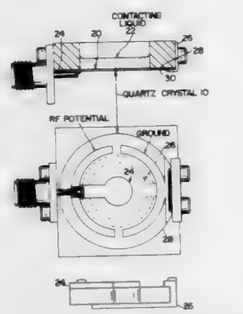
METHOD FOR SIMULTANEOUS MEASUREMENT OF MASS LOADING AND FLUID PROPERTY CHANGES USING A QUARTZ CRYSTAL MICROBALANCE

Victoria E. Granstaff, and Stephen J. Martin, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 17, 1991, Ser. No. 779,727

Int. Cl.[5] G01N *11/00*

U.S. Cl. 73—54.41 **8 Claims**



1. A method to determine total mass of a solid and physical properties of a fluid, contacting the same quartz crystal microbalance, comprising:

(a) applying an oscillating electric field across the thickness of said quartz crystal microbalance;

(b) measuring at least one resonant frequency of said quartz crystal microbalance;

(c) simultaneously measuring the admittance magnitude at said resonant frequencies to characterize an unperturbed state;

(d) applying a solid mass and a fluid onto said quartz crystal microbalance where said quartz crystal microbalance is in contact with said solid mass interposed between said quartz crystal microbalance and said fluid to produce a perturbed state;

(e) measuring at least one resonant frequency of said quartz crystal microbalance in said perturbed state;

(f) simultaneously measuring the admittance magnitude of said quartz crystal microbalance in said perturbed state;

(g) correlating changes in said resonant frequencies and changes in said admittance magnitudes of said unperturbed states to obtain a surface mass density and a fluid viscosity-density product.

5,201,216

AIR FLOW METER FOR INTERNAL COMBUSTION ENGINES AND A MANUFACTURING METHOD THEREOF

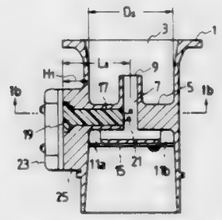
Atsushi Miyazaki; Chihiro Kobayashi, both of Katsuta; Yoshihito Sekine, Chiyoda, and Nobukatsu Arai, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1991, Ser. No. 668,066

Claims priority, application Japan, Mar. 12, 1990, 2-57932; Nov. 30, 1990, 2-329263

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.2 **10 Claims**



1. A method of manufacturing an air flow meter for an internal combustion engine comprising the steps of:

producing a single type of detecting module having a metering element to be exposed to an intake airflow of the engine, a signal processing unit, electrically coupled to the metering element, for processing signals produced by the metering element to generate an output signal in response to the flow rate of the intake airflow, and an arm provided with the metering element at one end thereof and with the signal processing unit at the other end, through which electric connecting means is provided for connecting said metering element to said signal processing unit;

producing plural varieties of body members for engines with the different stroke volumes, each of which body members comprises an axial bore defining an air path through which the intake airflow flows, the respective varieties of body members having axial bores of respectively different bore diameter in accordance with different stroke volumes of the engines, and a transverse bore extending from a hole in the wall of said body member and communicating with said axial bore;

selecting a body member having an axial bore with a bore diameter commensurate with the stroke volume of engine in which the air flow meter is to be used; and

assembling the detecting module with the selected body member, by securing said detecting module into said transverse bore in such a way that, considering the length of the arm of the detecting module and the diameter of the axial bore of the selected body member, the metering element is exposed to the air flowing in a predetermined metering area within the air path, irrespective of the variety of the selected body member.

5,201,217

CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

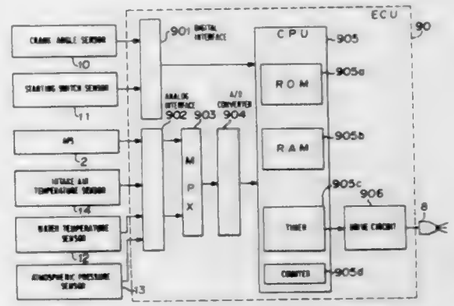
Satoshi Wachi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1992, Ser. No. 826,038

Claims priority, application Japan, Feb. 26, 1991, 3-030719

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—118.2 **1 Claim**



1. A control device for an internal combustion engine, comprising:

a) a hot-wire type air flow sensor, including a temperature dependent resistance, for measuring an intake air flow quantity of an internal combustion engine;

b) a revolution period detecting sensor for detecting a revolution period of the internal combustion engine;

c) an averaging means for sampling measured intake air flow quantities during each revolution period detected by the revolution period detecting sensor to obtain an average air flow quantity;

d) counter means for determining whether a predetermined time has elapsed since power was switched ON;

e) means for limiting the average air flow quantity to an upper limit value only when the predetermined time determined by the counter means has not elapsed, and not thereafter;

f) means for individually sensing atmospheric pressure and intake air temperature;

g) means for correcting the limited average air flow quantity in accordance with the sensed atmospheric pressure and intake air temperature; and

h) means for calculating a fuel injector pulse width based on the corrected limited average air flow quantity to avoid erroneous fuel injector pulse width calculation during an initial warmup period following power ON, during which the air flow sensor resistance is relatively cold and attendantly produces an abnormal, erroneous output.

5,201,218

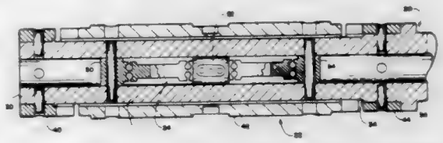
FLEXURE TWO SHELL WITH SEPARATE AXIAL, SIX COMPONENT BALANCE

Philip J. Mole, San Diego, Calif., assignor to General Dynamics Corporation, Space Systems Division, San Diego, Calif.

Filed Nov. 19, 1991, Ser. No. 795,168

Int. Cl.[5] G01M *9/00*

U.S. Cl. 73—147 **7 Claims**



1. A wind tunnel balance comprising: an elongated tubular

inner rod having a predetermined length, said tubular inner rod having a front end, a rear end, a front annular portion, a center

to a temperature effective for causing release of hydrocar-

at least one temperature sensitive resistor deposited on said

the lip on the second fitting member such that the level sensor is exposed to the interior of the vessel and is posi-

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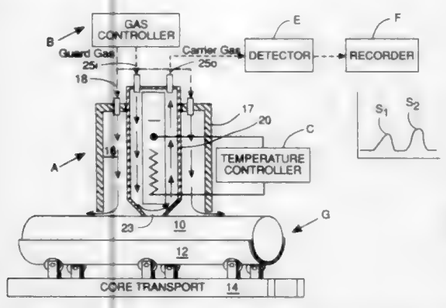
inner rod having a predetermined length, said tubular inner rod having a front end, a rear end, a front annular portion, a center annular portion and a rear annular portion;
the rear end of said tubular inner rod having structure for detachably connecting it to a sting;
a model attachment outer shell assembly formed of a front annular section, a central annular section, and an aft annular section; a forward web section connects said front annular section to said central section; an aft web section connects said aft annular section to said central annular section;
said tubular inner rod being inserted into said outer shell assembly;
means for rigidly securing the front annular section of said outer shell assembly to the front annular portion of said tubular inner rod;
means for rigidly securing the aft annular section of said outer shell assembly to the aft annular portion of said tubular Inner rod;
the inner diameter of the central annular section of each outer shell assembly being greater that the outer diameter of the center annular portion of said tubular inner rod so that said central annular section of said outer shell assembly is free to move axially, laterally and rotationally;
an elongated axial member positioned inside said tubular inner rod;
said axial member having a front disk member, a central disk member and an aft disk member;
means for rigidly connecting the central disk member of said axial member to the central annular section of said outer shell assembly so that they may move as a single unit;
means for rigidly connecting the front disk member and the rear disk member of said axial member to the center annular portion of said inner rod so that they move as a single unit; and
said axial member having a first flexure means connecting its front disk member to its central disk member and a second flexure means connecting its aft disk member to its central disk member.

5,201,219

METHOD AND APPARATUS FOR MEASURING FREE HYDROCARBONS AND HYDROCARBONS POTENTIAL FROM WHOLE CORE

Eric L. Bandurski; John W. Kearns, and Houston B. Mount, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 29, 1990, Ser. No. 546,330
Int. Cl.[5] G01N *1/22;* **E21B** *49/02*
U.S. Cl. 73—153 **18 Claims**



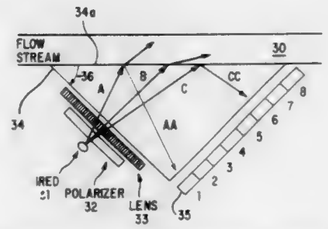
1. Method for evaluating hydrocarbon potential of core taken from a wellbore comprising:
contacting a portion of core surface of whole core taken from a wellbore with a heating probe comprising a high conductivity heating tip;
controlling heat applied to the core by the heating probe in surface contact with the portion of surface of whole core to a temperature effective for causing release of hydrocarbons;
causing at least a portion of released hydrocarbons to flow into a collection chamber; and
collecting released hydrocarbons.

5,201,220

APPARATUS AND METHOD FOR DETECTING THE PRESENCE OF GAS IN A BOREHOLE FLOW STREAM

Oliver C. Mullins, Ridgefield, Conn.; Daniel R. Hines, Lawrenceville, N.J.; Masaru Niwa, Kawasaki, Japan, and Kambiz A. Safinya, Garches, France, assignors to Schlumberger Technology Corp., New York, N.Y.

Division of Ser. No. 574,317, Aug. 28, 1990, Pat. No. 5,167,149.
This application Sep. 8, 1992, Ser. No. 942,005
Int. Cl.[5] E21B *49/08;* **G01V** *9/00*
U.S. Cl. 73—155 **10 Claims**



1. A borehole apparatus for categorizing volumes of gas in a multiphase fluid obtained from a formation, the fluid comprising at least one of oil, water, and gas, the apparatus comprising:
containing means for containing the fluid;
source means for transmitting light toward the fluid in the containing means;
optical means for transmitting light from the source means to the fluid and having an interface with the containing means, the interface comprising a means for reflecting light from the source means at an angle of incidence within a range that extends from less than a Brewster angle to more than a critical angle of gas;
detector means for detecting light which is reflected from the interface;
storing means for storing information related to a plurality of categories of determined gas volumes of formation fluids; and
processing means for obtaining data concerning the angle of incidence of the reflected light from the detector means and the information from the storing means and for determining a category of gas volume of the multiphase fluid in the containing means according to the data related to the angle of incidence of the reflected light using the Brewster angle of gas and the critical angle of gas.

5,201,221

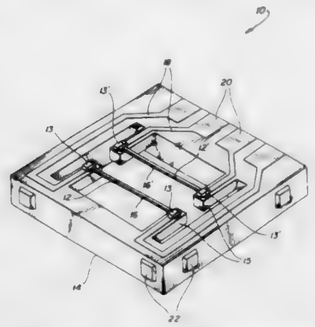
FLOW SENSOR AND METHOD OF MANUFACTURE

Robert L. Forgacs, Dearborn Heights; John L. Bomback, Plymouth, and Shaun L. McCarthy, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 15, 1991, Ser. No. 670,120
Int. Cl.[5] E01F *1/68*
U.S. Cl. 73—204.26 **6 Claims**

1. A flow sensor comprising:
at least one silicon member having a top side and a bottom side, said at least one silicon member attached to a non-silicon base, said non-silicon base constructed of low thermal conductivity epoxy, and said bottom side of said at least one silicon member facing said non-silicon base;

at least one temperature sensitive resistor deposited on said bottom side of said at least one silicon member; and



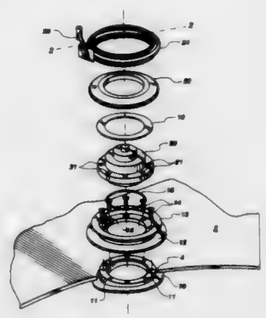
electrical conductors formed on said non-silicon base to contact said at least one silicon member.

5,201,222

VESSEL LEVEL SENSOR MOUNTING STRUCTURE WITH POSITIVE MECHANICAL LOCK

Terence C. Johnson, Salt Lake City, Utah, assignor to EDO Corporation, Salt Lake City, Utah

Filed May 29, 1992, Ser. No. 890,985
Int. Cl.[5] G01F *23/22, 23/28*
U.S. Cl. 73—290 V **12 Claims**



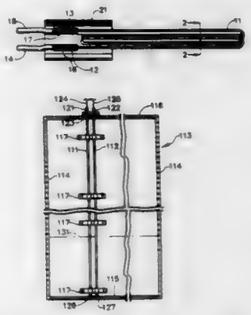
1. A level sensor mounting structure for use with a level sensor with vessels having a wall, the mounting structure comprising:
a first fitting member having a first laterally extending flange, the first laterally extending flange configured to seal against the interior surface of the vessel at an opening in the wall thereof;
a second fitting member having a second laterally extending flange, the second laterally extending flange configured to seal against the exterior surface of the vessel at the opening thereof, the second fitting member having a recess into which the level sensor fits and a lip positioned about the recess;
means for mechanically locking the first fitting member and the second fitting member together such that the wall of the vessel lies between the first laterally extending flange and the second laterally extending flange and cannot be removed therefrom without breaking the integrity of the first or second fitting members or the wall of the vessel; and
clamp means for substantially surrounding the perimeter of the level sensor and for releasably holding the level sensor in the recess by pushing the level sensor in the direction of the lip on the second fitting member such that the level sensor is exposed to the interior of the vessel and is positively mechanically locked in place in the opening.

5,201,223

METHOD OF SENSING FLUID FLOW AND LEVEL EMPLOYING A HEATED EXTENDED RESISTANCE TEMPERATURE SENSOR

Malcolm M. McQueen, Fallbrook, Calif., assignor to Fluid Components, Inc., San Marcos, Calif.

Division of Ser. No. 513,105, Apr. 19, 1990, Pat. No. 5,152,049.
This application Aug. 19, 1992, Ser. No. 932,376
Int. Cl.[5] G01F *23/24*
U.S. Cl. 73—295 **3 Claims**



1. A method for sensing liquid level in a vessel, the apparatus for said sensing comprising elongated distributed resistance temperature sensors of the heated type, each said sensor comprising an elongated resistance temperature detector (RTD) wire having an electrically insulative coating thereon and formed in a longitudinal configuration for direct exposure to the liquid being sensed, means for connecting the ends of said RTD wire to detection circuitry and to an external source of electrical power, and means for heating said RTD wire, said method comprising the steps of:
arranging a matched pair of said elongated sensors in a substantially parallel, generally vertical array in the vessel;
heating one of said sensors, thereby permitting the other of said sensors to function as a thermal reference;
detecting the electrical outputs of each of said sensors;
comparing said electrical outputs;
computing the level of liquid in the vessel;
providing an electrical signal indicative of the liquid level; and
providing an output indicative of the liquid level in the vessel.

5,201,224

APPARATUS AND METHOD FOR SENSING UNBALANCE FORCE AND LOCATION THROUGH FREQUENCY MODULATION

Steven W. Rogers, and Hanford D. Monroe, both of Conway, Ark., assignors to FMC Corporation, Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,128
Int. Cl.[5] G01M *1/22*
U.S. Cl. 73—462 **19 Claims**

17. An unbalance force detection system for a vehicle tire and rim assembly mounted on a rotatable spin shaft for providing the magnitude and location of unbalance compensation mass to be applied to the tire and rim assembly, comprising
means for providing a shaft spin signal indicative of shaft angular position and speed,
force sensing means mounted to sense unbalance force im-

posed on the rotatable spin shaft by the vehicle tire and rim assembly rotating thereon,

bore, said bearing having a central opening for receiving and holding said transducer, said mounting means also including a member mounted in said longitudinal bore and

predetermined set value; means coupled to said first signal output means for setting said predetermined value at a level to

output corresponding with the pressure to be measured is generated on the basis of the amount of strain of the diphragm that develops under the pressure to be measured,

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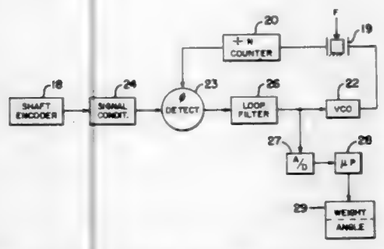
posed on the rotatable spin shaft by the vehicle tire and rim assembly rotating thereon,

means for driving said force sensing means to oscillate at an appropriate predetermined frequency in the absence of sensed unbalance force and providing a frequency output wherein said frequency is indicative of the unbalance force,



means receiving said shaft spin signal and said frequency output for detecting change in frequency output and for converting said output to unbalance force and location outputs corresponding thereto, and

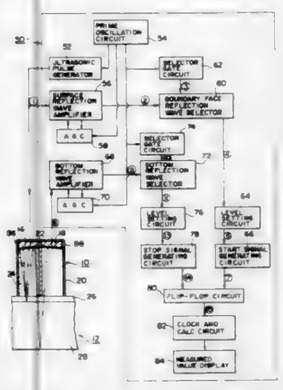
means for processing said unbalance force output and location outputs to provide indication of unbalance compensation mass and spin shaft reference weight application location.

5,201,225

INSTRUMENT FOR MEASURING THICKNESS OF COATED PLATE AND METHOD THEREOF

Osamu Takahashi, Tokyo, and Masaaki Nakata, Yokohama, both of Japan, assignors to Toyo Kanetsu K.K., Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,889
Int. Cl.[5] G01N *29/18*
U.S. Cl. 73—615 **3 Claims**



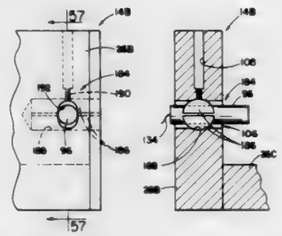
1. An instrument for measuring the thickness of a plate independent of any couplant and adherent coating on the plate between the instrument and the plate, said instrument comprising in combination a dual type ultrasonic probe including a first element for transmitting and receiving an ultrasonic pulse, and a second element aligned in mutual proximity to and spaced by an acoustic partition from said first element for receiving an ultrasonic pulse; ultrasonic pulse generating means coupled to said first element of said ultrasonic probe for causing said first element to transmit ultrasonic pulses; first signal output means connected to said first element of said ultrasonic probe for providing a first signal upon receipt by said first element of an interface reflection wave having an amplitude in excess of a predetermined set value; means coupled to said first signal output means for setting said predetermined value at a level to discriminate against interface reflection waves from all but the top surface of said plate; second signal output means connected to said second element of said ultrasonic probe for providing a second signal corresponding to a bottom reflection wave when said second element receives a bottom reflection wave from the bottom of said plate; signal processing means coupled responsively to said first and second signal output means for determining the difference in reception times between said interface reflection wave and said bottom reflection wave from said first and second signals and calculating therefrom the thickness of said plate; and display means coupled to an output of said signal processing means for displaying the thickness of said plate as calculated by said signal processing means.

5,201,226

ULTRASONIC TUBE INSPECTION STATION FOR A RAPID CHANGEOVER MULTI-DIAMETER TUBE INSPECTION SYSTEM

Clarence D. John, Jr., Penn Hills Twp., Allegheny County, and Richard S. Wengewicz, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 555,347, Jul. 20, 1990, Pat. No. 5,074,151. This application Oct. 21, 1991, Ser. No. 780,185
Int. Cl.[5] G01N *29/24, 29/26, 29/10*
U.S. Cl. 73—622 **2 Claims**



1. An inspection system, comprising the combination of:

(a) a receptacle having interconnected walls defining a cavity for holding energy coupling liquid and receiving an object to be inspected in the liquid, at least one wall having interior and exterior surfaces, a longitudinal bore defined between and spaced from said surfaces and extending within said one wall from one end of said longitudinal bore to an opening at an opposite end of said longitudinal bore located at a top of said one wall above said cavity, and a transverse bore intersecting with said one end of said longitudinal bore and open at both said interior and exterior surfaces of said one wall;

(b) a transducer having first and second opposite ends, said transducer being operable for sending waves of energy from said first end into said cavity toward the object and receiving echoes of energy at said first end from the object for measuring a parameter of the object, said transducer having means at said second end for transmitting input and output signals to and from said transducer;

(c) means removably disposed in said longitudinal and transverse bores of said one wall for removably mounting said transducer in said transverse bore of said one wall such that said first end of said transducer communicates with said cavity and said second end of said transducer communicates with the exterior of said receptacle; and

(d) a transverse cylindrical recess defined in said one wall and intersecting with said transverse bore at said one end of said longitudinal bore intersected by said transverse bore;

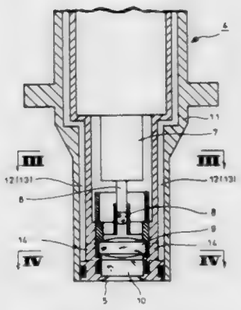
(e) said mounting means including a cylindrical bearing mounted in said cylindrical recess and extending across said transverse bore and said one end of said longitudinal bore, said bearing having a central opening for receiving and holding said transducer, said mounting means also including a member mounted in said longitudinal bore and adjustably engageable with said bearing for holding said bearing and thereby said transducer in a stationary position.

5,201,227

DEVICE FOR MEASURING VIBRATIONS ON ROTATING BLADE

Hideyasu Iinuma, Iruma; Takashi Wakatsuki, Tokyo, and Nobuya Minagawa, Ome, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1992, Ser. No. 846,086
Int. Cl.[5] G01D *5/32*
U.S. Cl. 73—655 **2 Claims**



1. A device for measuring vibration of a blade rotating within a casing having a wall, comprising a probe having light-projecting and light receiving optical fibers, a lens made of quartz glass on a tip of the light projecting optical fiber, a second lens for directing light to said light receiving optical fiber, a protective glass made of quartz for said lenses, and an outer housing accommodating said lenses, optical fibers and protective glass, said housing being mounted on and extending through an outer surface of the wall of said casing for the rotating blade such that an inner end of said probe is directed towards a tip of said rotating blade to project a beam onto, said blade tip and receive reflections from said blade tip; means connected to said light receiving optical fiber for measuring deviations in said reflected beam due to vibration of said rotating blade; channels for liquid coolant within said housing of said probe and through which liquid is fed back in reflux to cool said probe; and an air channel for compressed air extending through said casing for the rotating blade to the interior thereof, the inner end of said probe communicating with said air channel for further cooling as said compressed air flows from said air channel onto said inner end and into said casing.

5,201,228

PRESSURE SENSOR

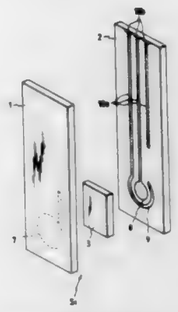
Takao Kojima; Kanehisa Kitsukawa; Toshikatsu Yasuda, and Katsuyoshi Mizumoto, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Aug. 23, 1991, Ser. No. 748,883
Claims priority, application Japan, Aug. 28, 1990, 2-227410
Int. Cl.[5] G01L *7/08, 9/12*
U.S. Cl. 73—724 **8 Claims**

1. A pressure sensor comprising:

at least two ceramic layers formed as elongated sheets and bonded together with a gap therebetween at one end so as to form a diaphragm of a portion of one of the ceramic layers that faces said gap and that receives on an outer surface thereof the pressure to be measured;

a pressure-sensitive electrode portion from which an electric output corresponding with the pressure to be measured is generated on the basis of the amount of strain of the diaphragm that develops under the pressure to be measured, said pressure-sensitive electrode portion being provided on or around the diaphragm; and



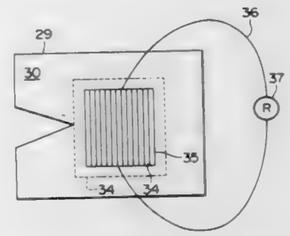
a plurality of conductor paths that are connected to said pressure-sensitive electrode portion and that extend along the length of the ceramic layers, the conductor paths having terminals at the other end of the bonded ceramic layers for connection to an external electric circuit.

5,201,229

SENSOR FOR CONTROLLING WATER QUALITY OF REACTOR AND METHOD OF CONTROLLING SAID WATER CHEMISTRY

Hidefumi Ibe, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1990, Ser. No. 603,328
Claims priority, application Japan, Nov. 1, 1989, 1-283009
Int. Cl.[5] G01N *19/08*
U.S. Cl. 73—799 **20 Claims**



1. An element comprising a non-electrically conductive member and at least one fine-line thin film of a conductor adjacent a surface of said member such that a change in physical properties of one of said member and ambient environment is detected through a change in physical properties of said conductor, with a mixture of material of the conductor and material of the non-electrically conductive member provided at sides of the at least one fine-line thin film of the conductor.

5,201,230

APPARATUS FOR TESTING HOT-MELT ADHESION STRENGTH

a rack secured to said slide holder in depending relation and projecting downwardly between said tracks;

said rack having horizontally extending gear teeth formed

said sample liquid container support means for presenting sample liquids contained in said closed and open sample liquid

ing, to thereby reduce noise and provide smoother operation during rotary motion of said drive plate;

said dished retaining ring being resilient to allow deforma-

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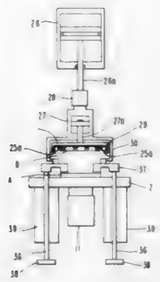
5,201,230
APPARATUS FOR TESTING HOT-MELT ADHESION STRENGTH

Ryohei Sakakibara, Kobe, Japan, assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed May 22, 1991, Ser. No. 703,954
Claims priority, application Japan, May 23, 1990, 2-53935; May 23, 1990, 2-133340
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—827 2 Claims



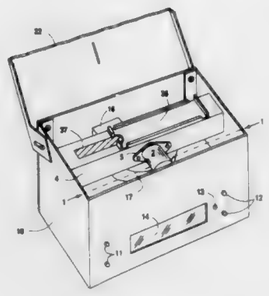
1. A hot-melt adhesion strength testing apparatus for measuring the bonding strength of a hot-melt adhesive by pressing a first test piece with said hot-melt adhesive applied thereto on a second test piece for contact bonding therebetween, and separating both test pieces after the passage of a predetermined period of time to detect a resultant tensile force, characterized in that the apparatus comprises a table supported by a load cell of cantilever beam type, a first actuator for transferring the second test piece from its first position closer to said first test piece fixedly positioned on the table, and a pressing actuator adapted to convey the second test piece transported by the first actuator from the second position so as to place the second test piece on the first test piece for pressing, said first actuator also serving as a means for separating the second testpiece from the first test piece after pressing with a presser actuator for a predetermined period of time, the load cell being capable of detecting the amount of tensile force applied to the first test piece.

5,201,231
VOLUMETRIC AIR SAMPLER FOR COLLECTING MULTIPLE DISCRETE SAMPLES

Edgar G. Smith, San Antonio, Tex., assignor to Dorothy A. Smith, San Antonio, Tex.

Continuation of Ser. No. 704,667, May 20, 1991, abandoned, which is a continuation of Ser. No. 542,638, Jun. 22, 1990, abandoned, which is a continuation of Ser. No. 416,874, Oct. 4, 1989, abandoned. This application Apr. 21, 1992, Ser. No. 873,597
Int. Cl.[5] G01N *31/20*
U.S. Cl. 73—863.22 1 Claim

1. An apparats for automatically collecting multiple discrete airborne particles at up to 24 preselected intervals, comprising:
a box-like enclosure having an open top and a hinged lid closing said open top;
means defining a pair of spaced horizontal parallel tracks adjacent the top of said box;
a microscope slide holder mounted on said tracks for horizontal movements along said tracks;
means on said slide holder for securing a microscope slide in a horizontal position thereon, said microscope slide having a length dimension parallel to said slide holder movements and capable of receiving 24 separate deposits of airborne particles having a width on the order of 1 mm. and spaced apart by at least 2 mm.;
a rack secured to said slide holder in depending relation and projecting downwardly between said tracks;
said rack having horizontally extending gear teeth formed on the bottom surface thereof;
an electric stepping motor fixedly mounted in said box and having a horizontally disposed output shaft extending adjacent and transverse to said rack gear teeth;
a pinion affixed to said motor output shaft and drivingly engaged with said rack gear teeth;
manually setable electrical control means for energizing said stepping motor at up to 24 selected intervals, but only for



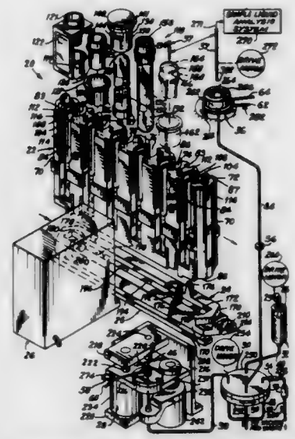
a period sufficient to cause said slide holder to move along said track by a distance not less than 2 mm.;
means on said lid defining a restricted, generally rectangular, aperture overlying the path of said slide holder and communicating with ambient air, the length axis of said aperture being perpendicular to the movement of said slide holder;
an electric motor operated blower mounted within said box and having an inlet positioned to draw ambient air into said box through said aperture; and
control means for energizing said blower motor only during each preselected interval.

5,201,232
INTEGRATED SAMPLER FOR CLOSED AND OPEN SAMPLE CONTAINERS

Kenneth F. Uffenheimer, Mahopac, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

PCT No. PCT/US88/04630, § 371 Date Apr. 4, 1991, § 102(e) Date Apr. 4, 1991, PCT Pub. No. WO90/08307, PCT Pub. Date Jul. 26, 1990
PCT Filed Dec. 29, 1988, Ser. No. 671,713
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—864.23 28 Claims

1. In an integrated sampler for use in conjunction with a sample liquid probe for supplying sample liquids in turn to sample liquid analysis means, the improvements comprising, support means for supporting both closed sample liquid containers and open sample liquid containers on a random sample liquid container basis, and means operatively associated with said sample liquid container support means for presenting sample liquids contained in said closed and open sample liquid

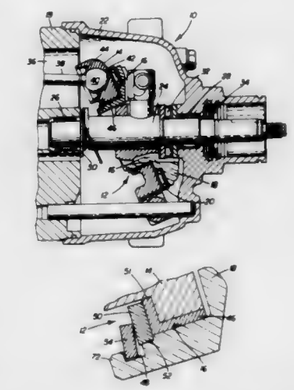


containers to said probe in turn for supply by said probe to said sample liquid analysis means.

5,201,233
RETAINER ASSEMBLY WITH DISHED RETAINING RING

Timothy J. Skinner, East Amherst, and George T. Bennett, Williamsville, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1992, Ser. No. 827,676
Int. Cl.[5] F16H *23/08*; F04B *1/16*; F16B *21/18*
U.S. Cl. 74—60 9 Claims

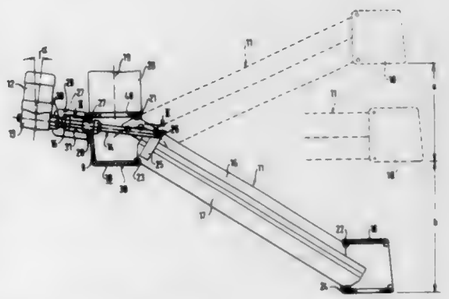


1. In a wobble plate compressor having a non-rotary socket plate mounted for relative rotation on a rotary drive plate, said drive plate further including a journal, a bushing and a thrust bearing to accommodate the relative rotary movement between the plates, an improved retainer assembly comprising:
an annular channel formed in said drive plate;
a thrust washer for engaging and holding said bushing against said socket plate; and
a dished retaining ring received in said channel and engaging said thrust washer so as to press against said washer and provide a preload force biasing said thrust washer against said journal and said socket plate against said thrust bearing, to thereby reduce noise and provide smoother operation during rotary motion of said drive plate;
said dished retaining ring being resilient to allow deformation, directly engaging said channel in the direction of its resilience and characterized by establishing said preload force with a magnitude that is sufficient to maintain said socket plate and drive plate together without play therebetween and also without distorting said thrust bearing and overstressing the drive plate structure defining said channel.

5,201,234
SUPPORT

Kurt Gull, Tuttlingen, Fed. Rep. of Germany, assignor to Delma elektro-und medizinische Geraetebau Gesellschaft mbH, Tuttlingen, Fed. Rep. of Germany

Filed Jan. 6, 1992, Ser. No. 817,178
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1991, 9100250[U]
Int. Cl.[5] F16H *27/02*
U.S. Cl. 74—89.15 15 Claims



1. Support comprising:
a bearing housing (**10**),
a pivot arm (**11**) vertically pivotally hinged on the bearing housing (**10**) and formed to carry a load,
a motor (**12**) for vertical pivoting of the pivot arm (**11**) arranged on the bearing housing (**10**),
a force transmitting device (**13**, **14**, **15**, **25**) positioned between the motor (**12**) and the pivot arm (**11**) which converts a rotary movement of the motor (**10**) into a pivotal movement of the pivot arm (**11**), and
means for rotatably mounting the bearing housing (**10**) to a fixed support element (**20**).

5,201,235
LINKAGE FOR LOADER BUCKET OR OTHER MATERIAL HANDLING DEVICE

Lynn A. Sutton, Kewanee, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 20, 1992, Ser. No. 870,981
Int. Cl.[5] F16H *21/44*
U.S. Cl. 74—105 5 Claims

1. An apparatus, comprising:
an arm having first and second end portions, said arm being pivotally connectable at said first end portion to a frame and pivotally connectable at said second end portion to an attachment;
a first extendable/retractable device having first and second end portions, said first device being pivotally connectable at one of said first and said second end portions to said frame and said first device being pivotally connectable at the other of said first and said second end portions to said arm; and
an equalizer link having first and second end portions and first and second ends, said equalizer link being pivotally

connectable between said first and second ends to said arm;
an output section for transmitting the power to said functional means.

said movable member being slidably supported in said guide-

5,201,240
VEHICLE CONTROL LINKAGE MECHANISM

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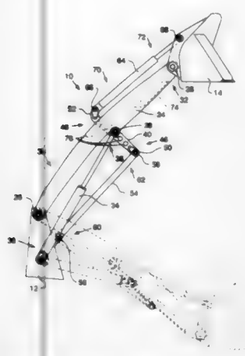
connectable between said first and second ends to said arm;



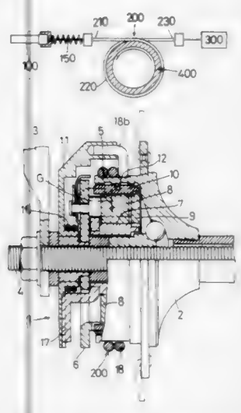
said first extendable/retractable device and said equalizer link being pivotally connectable to said arm at the same location on said arm.

5,201,236

SYSTEM FOR AMPLIFYING MANUAL OPERATING FORCE TRANSMITTED TO A FUNCTIONAL DEVICE OF A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Oct. 17, 1991, Ser. No. 778,374
Claims priority, application Japan, Oct. 20, 1990, 2-282643; Oct. 15, 1991, 3-266036
Int. Cl.[5] G05G *7/00;* **B62L** *3/02;* **F16H** *59/04*
U.S. Cl. 74—388 R **20 Claims**



1. In a bicycle having functional means operable by operating force output from a manual control means, a system amplifying the operating force for transmission to the functional means, said system comprising:

an input section for receiving the operating force output from the manual control means;

power takeout means for taking out the power from a wheel hub based on the force received by said input section, said power takeout means being wound around at least part of said hub, said power takeout means being engageable with said hub as a result of an increase in tension of said power takeout means, to take out the power through a frictional resistance produced by the engagement; and

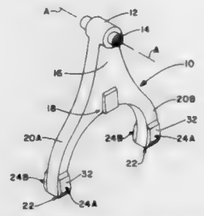
an output section for transmitting the power to said functional means.

5,201,237

SHIFT FORK FOR A VEHICULAR TRANSMISSION

John J. Berndtson, St. Clair Shores, Mich., assignor to Saturn Corporation, Troy, Mich.

Filed Sep. 26, 1990, Ser. No. 588,400
Int. Cl.[5] G05G *3/00;* **F16D** *13/58*
U.S. Cl. 74—473 R **15 Claims**



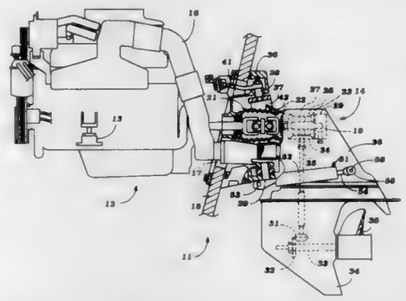
1. A shift fork for a vehicular transmission, said shift fork comprising: a hub portion having a longitudinal axis; an offset arm oriented perpendicularly with respect to said longitudinal axis being connected with and extending radially outwardly from said hub portion to terminate in an outer end portion; contact pad means presented from said outer end portion of said offset arm to provide longitudinally facing wear surfaces; and, each of said longitudinally facing wear surfaces including an angularly inclined portion extending radially with respect to the longitudinal axis, and the inclined portion of said wear surfaces diverge outwardly, each at an angle which equals the angle at which said offset arm deflects at the location of said contact pad means when a predetermined load is applied to said contact pad means.

5,201,238

SHIFTING DEVICE FOR AN ENGINE

Kenichi Hayasaka, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 4, 1992, Ser. No. 830,948
Claims priority, application Japan, Feb. 6, 1991, 3-36921
Int. Cl.[5] B63H *21/28*
U.S. Cl. 74—473 R **10 Claims**



1. A shifting device for shifting a clutch of a transmission comprising a controlled member for moving the clutch to a shift condition, an actuator including a moveable member for actuating said controlled member, a flexible transmitter for transmitting movement to said actuator from a remote location, and a guideway wherein said moveable member includes a piston and a pivotal portion pivotally connected with said piston for movement between an open and a closed position,

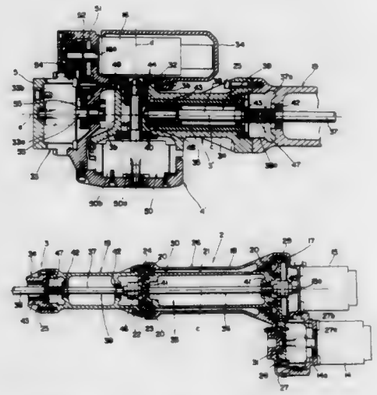
said movable member being slidably supported in said guideway.

5,201,239

INDUSTRIAL ROBOT WITH WRIST ACTUATOR MECHANISM

Isao Bundo, and Hiroshi Miwa, both of Sayama, Japan, assignors to Honda Gikenn Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1991, Ser. No. 774,571
Claims priority, application Japan, Oct. 16, 1990, 2-277019
Int. Cl.[5] G05G *11/00;* **B25J** *18/00*
U.S. Cl. 74—479 **8 Claims**



1. An industrial robot comprising:

a robot base;

a hollow arm extending from said robot base;

a wrist base mounted on a distal end of said hollow arm for rotation about a longitudinal axis of said hollow arm;

a wrist mounted on a distal end of said wrist base for swinging movement about an axis transverse to said longitudinal axis;

a wrist socket mounted on a distal end of said wrist for rotation about an axis parallel to said longitudinal axis;

a first actuator fixedly mounted on a rear end of said arm remotely from said wrist base, for producing rotational drive forces to rotate said wrist base;

first rotation transmitting means for transmitting the rotational drive forces from said first actuator to said wrist base, said first rotation transmitting means having a first rotatable shaft extending through said arm;

a second actuator fixedly mounted on said rear end of said arm, for producing rotational drive forces to swing said wrist;

second rotation transmitting means for transmitting the rotational drive forces from said second actuator to said wrist, said second rotation transmitting means having a second rotatable shaft extending through said arm;

a third actuator fixedly mounted on said wrist, for producing rotational drive forces to rotate said wrist socket; and

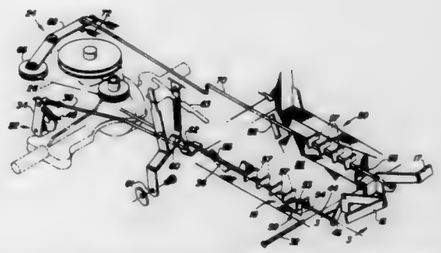
third rotation transmitting means mounted on said wrist, for transmitting the rotational drive forces from said third actuator to said wrist socket.

5,201,240

VEHICLE CONTROL LINKAGE MECHANISM

Eugene G. Hayes, Beaver Dam, and Jon M. Patterson, Wauwatosa, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jun. 14, 1991, Ser. No. 715,205
Int. Cl.[5] G05G *1/14*
U.S. Cl. 74—512 **16 Claims**



1. A mechanism for use with a vehicle, said vehicle having at least one vehicle component selectively shiftable between a plurality of modes by the operator for controlling vehicle operation, said vehicle having a compartment which is generally inaccessible to an operator, said mechanism comprising:

rod means operatively coupled with the vehicle component, said rod means being shiftable in first and second opposite directions for shifting the vehicle component between modes, said rod means also having an end portion;

a control pivotally carried by the vehicle frame and having a recessed portion positioned within the generally inaccessible compartment during operation for receiving and supporting the end portion of the rod means, said control being selectively pivotable by the operator to push the rod means in the second direction;

guide means carried within the compartment for guiding the rod means into alignment with the recessed portion when the rod means has become disengaged from the recessed portion;

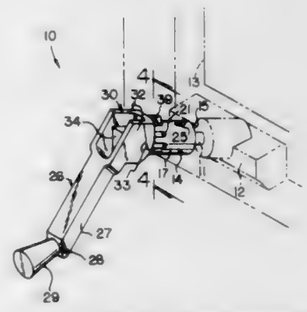
means for biasing the rod means in the first direction for securing the end portion of the rod means within the recessed portion, said biasing means being positioned outside of the inaccessible compartment and spaced from the end portion and recessed portion.

5,201,241

WINDOW CRANK HANDLE APPARATUS

Edward Pollack, Jr., 17 Virginia Ave., Hudson, N.Y. 12534

Filed Feb. 24, 1992, Ser. No. 840,044
Int. Cl.[5] G05G *1/00*
U.S. Cl. 74—528 **5 Claims**



1. A window crank handle apparatus arranged for mounting

to a gear drive shaft to effect pivotment of a window frame within a window framework, wherein the apparatus com-

said tapered surface of said upper bowl, a barrel engaged on said extension of said front fork and including a lower portion

stem, the steering shaft rotatably mounted in the frame head,

5,201,246

LIGHTWEIGHT COMPOSITE CAMSHAFT

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to a gear drive shaft to effect pivotment of a window frame within a window framework, wherein the apparatus comprises,

an extension cylinder, the extension cylinder defined along a predetermined axis, with the extension cylinder including a first end wall spaced from a second end wall, and a cylindrical outer wall, and

the second end wall including a second wall shaft coaxially aligned relative to the predetermined axis extending longitudinally and exteriorly of the extension cylinder, and

a handle member, the handle member including a handle shank, with the handle shank including a lower end and an upper end, the lower end including a projecting knob mounted to the lower end at a predetermined obtuse angle defined between the projecting knob and the handle shank, and

a support boss projecting beyond the shank mounted to the upper end of the shank defining a predetermined obtuse angle between the shank and the support boss, with the support boss oriented parallel relative to the projecting knob, and

the support boss including a support boss cavity, the support boss further including spaced parallel boss flanges defining the support boss cavity therebetween, and

a pivot block mounted within the support boss cavity, the pivot block including a second wall shaft receiving bore directed in the pivot block, with the second wall shaft receiving bore receiving the second wall shaft therewithin, and

a pivot block axle pin bore orthogonally oriented relative to the second wall shaft receiving bore, with the pivot block axle pin bore including an axle pin, with the axle pin orthogonally intersecting the boss flanges and received within the pivot block axle pin bore, and the axle pin bore intersecting the second wall shaft receiving bore, the second wall shaft including an annular groove, and the pivot block axle pin bore and the axle pin received within the annular groove.

5,201,242

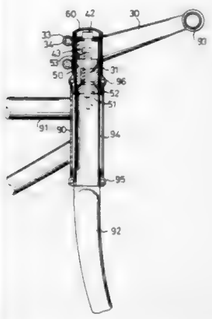
COUPLING FOR SUPPORTING A FRONT FORK IN THE HEAD TUBE OF A BICYCLE

Yi C. Chi, No. 139-5, An Mei Rd., Mei Shan Village, Hou Li Hsiang, Taichung Hsien, Taiwan

Filed Apr. 24, 1992, Ser. No. 873,114

Int. Cl.[5] B62K *21/12*

U.S. Cl. 74—551.1 **6 Claims**



1. A coupling for supporting an extension of a front fork in a head tube of a bicycle comprising a lower bowl and an upper bowl engaged on a lower portion and an upper portion of said head tube of said bicycle respectively and engaged between said head tube and said extension of said front fork, said upper bowl including a tapered surface formed in an upper and inner portion thereof, a ring element engaged between said upper bowl and said extension of said front fork and engaged with said tapered surface of said upper bowl, a barrel engaged on said extension of said front fork and including a lower portion engaged on an upper portion of said ring element and an upper portion extended upward beyond said extension of said front fork, a disc engaged on said upper portion of said barrel, a bolt engaged on said disc and extended into said extension of said front fork, a first cone engaged on said bolt and including a first slanted engaging surface formed on a lower portion thereof, a second cone threadedly engaged on said bolt and located below said first cone and including a second slanted engaging surface formed on an upper portion thereof for engagement with said first slanted engaging surface of said first cone, said first cone and said second cone being caused to move radially outwards of said extension of said front fork by an engagement between said slanted engaging surfaces when said second cone moves toward said first cone and when said bolt is rotated, whereby, said first cone and said second cone are fixed within said extension, and further rotation of said bolt causes said barrel to move downward in order to press said ring element in place.

5,201,243

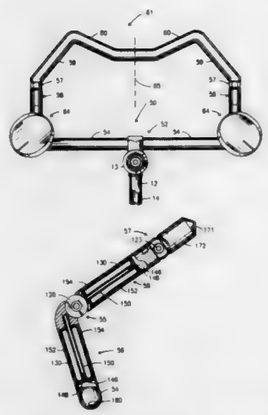
HANDLEBAR ASSEMBLY

Darryl M. Schneider, P.O. Box 291121, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 695,716, May 6, 1991, abandoned. This application Jun. 10, 1992, Ser. No. 896,342

Int. Cl.[5] B62K *21/12, 21/26*

U.S. Cl. 74—551.1 **9 Claims**



1. An improved bicycle handlebar assembly comprising armrests adapted to position a user's arms such that a distance between the user's arms is greater than a maximum width of the user's shoulders, wherein said armrest are adapted to resist a first lateral force directed generally outwardly from a frame of the bicycle, said first lateral force is acting to displace the users arms from said armrests and wherein a portion of said handlebar assembly comprises a plurality of hand grip positions.

5,201,244

BICYCLE HANDLEBAR STEM EXTENDER

John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810-4509, and Cal M. Phillips, 1800 NE. 179 St., Miami, Fla. 33162

Filed Feb. 27, 1992, Ser. No. 846,256

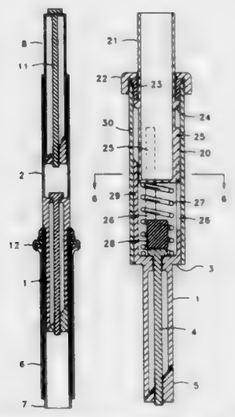
Int. Cl.[5] B62K *25/08*

U.S. Cl. 74—551.3 **7 Claims**

1. A stem extender for raising the handles of a velociped having a frame head, a hollow steering shaft, and a handlebar stem, the steering shaft rotatably mounted in the frame head, the stem extender comprising:

a tube, having a first end and a second end;

the first end fitting closely within the inner diameter of the steering shaft;



fixing means for locking the first end inside the steering shaft;

the second end of the tube having means for engaging the stem in axial alignment with the tube and rotationally fixed relative thereto.

5,201,245

DRIVE CONTROL SYSTEM FOR AN AUTOMOBILE

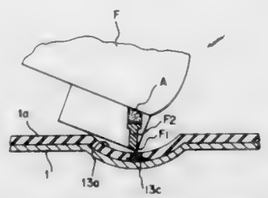
Masuyuki Naruse, 603, Noguchi, Ooaza, Taimei-machi, Tamana-gun, Kumamoto-ken, Japan

Continuation-in-part of Ser. No. 532,423, Jun. 4, 1990, abandoned. This application Jul. 23, 1991, Ser. No. 734,035

Claims priority, application Japan, Sep. 29, 1989, 1-256638; Apr. 17, 1990, 2-99428

Int. Cl.[5] G05G *1/18*

U.S. Cl. 74—564 **4 Claims**



1. An operator positioning apparatus in which a floor structure for an automobile cooperates with a shoe heel, said apparatus comprising:

a heel support pivot firmly and non-resiliently supporting the shoe heel at a position opposite a brake pedal, wherein said heel support pivot comprises a recess formed in said floor structure to rotatably support the shoe heel, and a first magnet disposed in said recess; and said apparatus further comprises

a second magnet disposed in the shoe heel used by an operator of the automobile;

wherein said first and said second magnets are disposed to attract each other, thereby aiding the operator in placing the shoe heel on said support pivot.

5,201,246

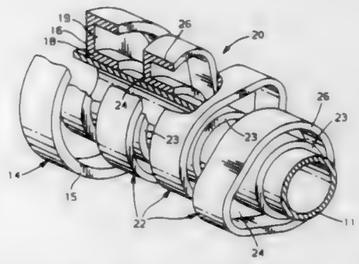
LIGHTWEIGHT COMPOSITE CAMSHAFT

Philip D. Arnold, Mt. Clemens, and Roy G. Kaywood, Jackson, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1992, Ser. No. 916,479

Int. Cl.[5] F16H *53/00;* **F16C** *35/00*

U.S. Cl. 74—567 **3 Claims**



1. A lightweight composite camshaft having a plurality of separately formed cam and journal elements fixed on an outer surface of a hollow tube wherein at least some of the journal elements comprise lightweight journals having

an annular outer wall with a continuous periphery for rotatably engaging a bearing surface,

an annular hub spaced inward of the outer wall and engaging the tube for supporting said one element in predetermined relation with the tube, and

a web extending radially between adjacent ends of the hub and outer wall and connecting the hub and outer wall, the lightweight journals having an open ended annular space extending axially from the web to distal ends of the hub and outer wall.

5,201,247

ASSEMBLED SHAFT AND PROCESS FOR PRODUCTION THEREOF

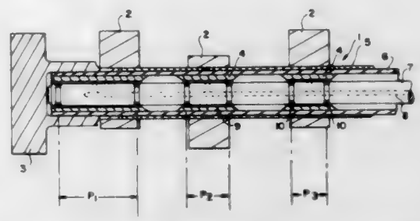
Wolfgang Maus, and Helmut Swars, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 293,746, Jan. 3, 1989, abandoned. This application Oct. 19, 1990, Ser. No. 600,151

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800912

Int. Cl.[5] F16H *53/00;* **F01M** *1/06*

U.S. Cl. 74—567 **1 Claim**



1. An assembled shaft, comprising:

a hollow shaft of a material having a modulus of elasticity;

elements with through-bores attached to the shaft by expansion of the shaft in individual associated longitudinal portions; and

supporting sleeves provided inside individual hollow shaft portions inside individual of the elements, respectively, so as to rest against the hollow shaft and be plastically expanded in situ thereby expanding the shaft, at least the individual elements of both the elements and the hollow shaft, having an elastic pretension in the through-bore

after said accelerator has been released under predetermined conditions;

wherein the execution of said predetermined control on said drive means including a first drive motor and a second drive motor;

tioning valve being arranged to apply pressure at a selectively controllable level to at least one control face of the single

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individual elements of both the elements and the hollow shaft having an elastic pretension in the through-bore thereof, the supporting sleeves being of a material having a modulus of elasticity higher than the modulus of elasticity of the hollow shaft material, the hollow shaft being comprised of two layers over its complete length, the two layers including an outer layer made of a high-tensile bearing material.

5,201,248

MATERIALS FOR BALANCING ROTATORS AND METHOD FOR BALANCING ROTATORS

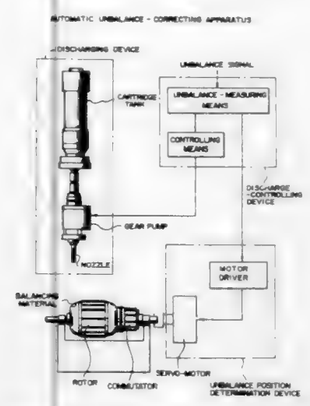
Hiromitu Ibe, Kosai, and Takazou Fujimoto, Fujieda, both of Japan, assignors to Sumitomo Bakelite Company Limited and Asmo Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 584,001, Sep. 18, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 800,732

Claims priority, application Japan, Sep. 19, 1989, 1-240626

Int. Cl.[5] **F16F** *15/22;* **C03J** *4/00;* **B60B** *1/00;* **C08G** *59/40*

U.S. Cl. 74—573 R **8 Claims**



1. In a balanced rotator comprising an unbalanced rotator to which has been added a liquid epoxy resin composition for correcting unbalance of said rotator upon rotation, followed by curing of said liquid epoxy resin, the improvement wherein said liquid epoxy resin composition comprises an epoxy resin, a curing agent, a curing accelerator, an inorganic filler, and an organic thioxtropic agent as main components, wherein said curing agent is dicyandiamide or a dibasic acid dihydrazide and said curing accelerator is a tertiary amino group-containing compound obtained by reacting a polyfunctional epoxy compound, a compound having a tertiary amino group and at least one active hydrogen in the molecule, and a carboxylic acid anhydride.

5,201,249

MULTI-PURPOSE INDEXING TURNTABLE

Bruce A. Sterenberg, Caledonia, Mich., assignor to Progressive Blasting Systems, Grand Rapids, Mich.

Filed Feb. 25, 1992, Ser. No. 841,339

Int. Cl.[5] **B23B** *29/24;* **F16H** *37/06;* **A47B** *11/00*

U.S. Cl. 74—825 **13 Claims**

1. A turntable system for selectively accommodating different types of work pieces comprising:

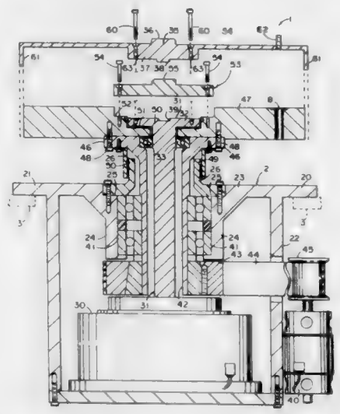
a first table means for supporting one of said work pieces;

a second table means for supporting another of said work pieces;

support means for rotatably supporting said first and second table means;

drive means for rotating said first and second table means; said drive means including a first drive motor and a second drive motor;

a hollow shaft operatively connecting said first drive motor to said first table means for rotatably driving said first table means; and



a second shaft extending through said hollow shaft and selectively operatively connecting said second motor to said second table means for rotatably driving said second table means independently of said first motor.

5,201,250

FUEL CUT-OFF INHIBIT FOR A POWER-OFF UPSHIFT

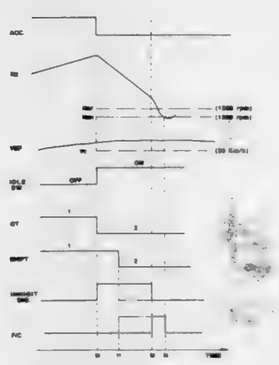
Yuji Kato, Tokyo; Tatsuo Wakahara, Kawasaki; Shigeki Shimanaka, Hadano; Hiroshi Asano, Zama; Shinsuke Nakazawa, Yokohama; Hiroshi Sasaki, Yokohama; Hiroshi Yamaguchi, Yokohama; Kazuhiro Ishigami, Sagamihara, and Shinichi Takenouchi, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 30, 1991, Ser. No. 751,805

Claims priority, application Japan, Aug. 31, 1990, 2-230956

Int. Cl.[5] **F16H** *59/24;* **F02D** *41/12*

U.S. Cl. 74—858 **8 Claims**



2. A motor vehicle, comprising:

an engine;

an accelerator operatively connected to the engine;

an automatic transmission drivingly connected to the engine, said automatic transmission being subject to a shift in gear position after said accelerator has been released; and

means for executing a predetermined control on said engine after said accelerator has been released under predetermined conditions;

wherein the execution of said predetermined control on said engine is inhibited until completion of said shift after said accelerator has been released under said predetermined conditions and the execution of predetermined control is initiated thereafter when the predetermined conditions are maintained.

5,201,251

SHIFT CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION FOR VEHICLE

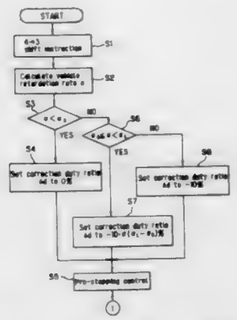
Takeshi Kitagawa, Kyoto; Hiroshi Takuma, Kameoka; Shoji Kan, Kyoto; Yoichi Furuichi, Kyoto, and Takahiro Taki, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1992, Ser. No. 917,168

Claims priority, application Japan, Jul. 31, 1991, 3-192358

Int. Cl.[5] **F16H** *59/48*

U.S. Cl. 74—862 **6 Claims**



1. In an automatic transmission for a vehicle having at least one frictional engaging element and an electromagnetic valve to control hydraulic pressure supplied to the frictional engaging element and achieving a plurality of speed ratios including a predetermined speed ratio achieved by engaging the frictional engaging element, a shift control apparatus comprises retardation rate detection means for detecting retardation rate of the vehicle and electromagnetic valve control means for controlling said electromagnetic valve according to a value detected by said retardation rate detection means.

5,201,252

HYDRAULIC CONTROL FOR SHIFT ELEMENTS OF AN AUTOMATIC TRANSMISSION

Ludwig Prüss, Brunswick, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

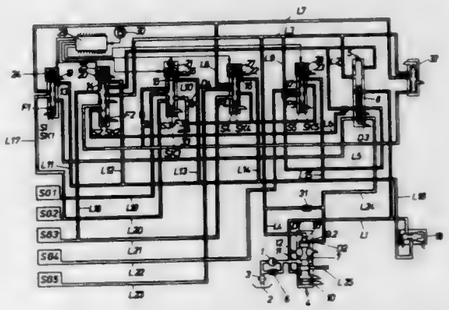
Filed Aug. 20, 1991, Ser. No. 747,683

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 4026619

Int. Cl.[5] **B60K** *41/06*

U.S. Cl. 74—869 **11 Claims**

1. A hydraulic control system for an automatic transmission having a plurality of shift elements comprising pump means for producing main hydraulic pressure, pressure control valve means for controlling the main hydraulic pressure, manually controllable valve means for selecting a transmission condition, transmission control means, and a plurality of electromagnetically operable valve means, each of which individually controls the pressure level at a single corresponding shift element, wherein at least one of the plurality of electromagnetically operable valve means includes an electromagnetic proportioning valve which is responsive to the transmission control means and a single slide valve associated with the electromagnetic proportioning valve, the electromagnetic proportioning valve being arranged to apply pressure at a selectively controllable level to at least one control face of the single



associated slide valve which is capable of being acted on by pressure at the level determined by the associated electromagnetic proportioning valve.

5,201,253

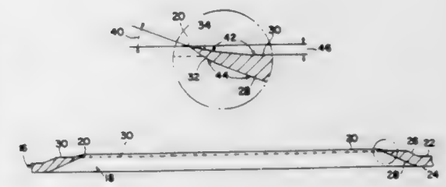
SHAVING SYSTEM

Daniel B. Lazarchik, Boston, and Henryk J. Chylinski, Haverhill, both of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 756,343, Sep. 6, 1991, which is a division of Ser. No. 559,646, Jul. 30, 1990, Pat. No. 5,088,195. This application Jun. 25, 1992, Ser. No. 903,916

Int. Cl.[5] **B21K** *21/00*

U.S. Cl. 76—116 **10 Claims**



1. A method of manufacturing a razor blade comprising the steps of

providing a blade member with an aperture therein,

sharpening the edge of said aperture to provide an annular shaving edge with a first portion that defines a main facet and a second portion that has an ultimate sharpened tip, and

mechanically displacing said second portion of said annular shaving edge immediately adjacent to said ultimate sharpened tip to provide a shaving angle in the range of 15°–35°, and an exposure in the range of about 0.01–0.1 millimeter.

5,201,254

WIRE STRIPPERS

Emrys I. Davies, Kingston, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Jul. 19, 1991, Ser. No. 733,186

Claims priority, application United Kingdom, Aug. 7, 1990, 9017305

Int. Cl.[5] **H02G** *1/12*

U.S. Cl. 81—9.42 **20 Claims**

1. An attachment for wire strippers, said wire strippers being operable to strip insulation from a wire and having a jaw for gripping and cutting associated insulation and in which said attachment comprises a container attachable to the jaw so that

stripped insulation is collected therein and means for preventing stripped insulation from escaping from the container via

nected to one of said hangers and a plunger clevis pivotally connected to the other of said hangers.

first shaft rotation control means (**40**) is engaged with the first engagement means (**27**) whereby the shaft (**28**) is only

ing, to the means for taking and to the cutters to control operation thereof in positioning and performing cuts on

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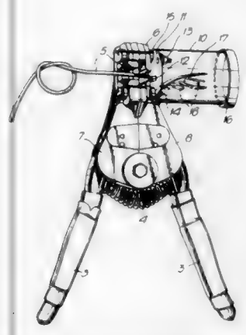
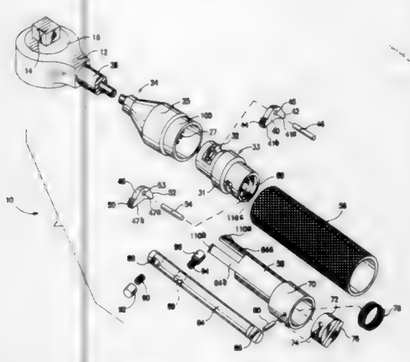
stripped insulation is collected therein and means for preventing stripped insulation from escaping from the container via said jaw in which the means for preventing escape of stripped



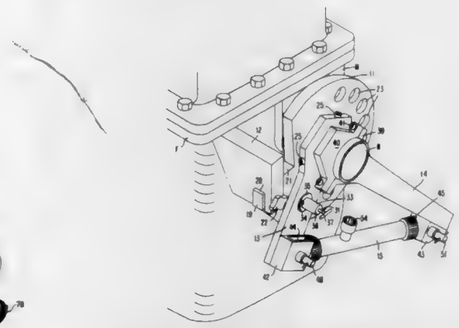
insulation comprises an end-plate located adjacent to the jaw when in use and having a hole through which a wire can be inserted.

5,201,255
RATCHET WRENCH
Michael J. Gegg, 591 Soniat Ave., New Orleans, La. 70123
Continuation-in-part of Ser. No. 9,727, Feb. 2, 1987, abandoned.
This application Mar. 17, 1992, Ser. No. 852,793
Int. Cl.[5] B25B *17/00*
U.S. Cl. 81—57.29 **20 Claims**



15. A wrench comprising:
a) a socket-holding means (**14**) for holding a socket in engagement with the wrench, the socket-holding means being rotatably housed in a first housing (**12**);
b) an elongated, hollow, second housing (**24**) having a first end and a second end which holds, at its first end and in non-rotatable relationship therewith, the first housing (**12**) and which has, at a location proximal to its second end, a first engagement means (**27**);
c) a shaft (**28**) rotatably mounted within the hollow housing (**24**);
d) coupling means (**15, 17**) cooperative with the socket-holding means (**14**) and the shaft (**28**) whereby the rotation of shaft (**28**) about its longitudinal axis effects rotation of the socket holding means (**14**);
e) first shaft rotation control means (**40**) coupled to the shaft (**28**) and selectively movable between a first position and a second position wherein, at the first position, the first shaft rotation control means (**40**) is engaged with the first engagement (**27**) means whereby the shaft (**28**) is only allowed righthand rotation and, at the second position, the first shaft rotation control means (**40**) is engaged with the first engagement means (**27**) whereby the shaft (**28**) is only allowed lefthand rotation;
f) an elongated handle (**56**) rotatably mounted to the hollow housing (**24**), the elongated handle (**56**) having second engagement means (**102**);
g) second shaft rotation control means (**48**) coupled to the shaft (**28**) and selectively movable to a first position and a second position, at the first position, the second shaft rotation control means (**48**) is engaged with the second engagement means (**102** whereby righthand rotation of the handle imparts a righthand rotation to the shaft (**28**) and, at the second position, the second shaft rotation control means (**48**) is engaged with the second engagement means (**102**) whereby lefthand rotation of the handle (**56**) imparts a lefthand rotation to the shaft (**28**); and
h) selection means (**72, 84**) in association with the first and second rotation control means (**40, 48**) for effecting their movement to their respective first and second positions, wherein
the second shaft rotation control means is mounted 180° axially apart from and longitudinally spaced from the first shaft rotation control means.

5,201,256
POWER TOOL FOR TORQUING THREADED PIPES
Irving N. Schneider, Woodbury, and John A. Matteo, Rockville Centre, both of N.Y., assignors to The Brooklyn Union Gas Company, Brooklyn, N.Y.
Filed Apr. 6, 1992, Ser. No. 863,816
Int. Cl.[5] B25B *13/50*
U.S. Cl. 81—57.34 **12 Claims**

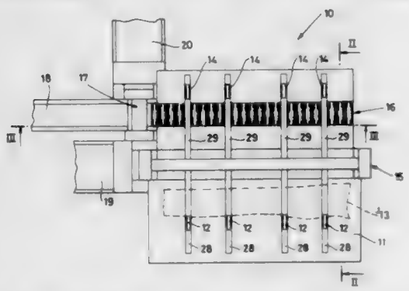


1. A power tool for torquing a threaded member of a movable device, which comprises:
a rigid disk with an approximately centered bore through which said threaded member fits, said disk having a tangential extension and a series of equally spaced perforations along a circular line concentric with said bore,
restraining means attached to said tangenial extension of said disk for engaging a part of said movable device to prevent movement of said disk,
a reaction arm with a bore at one end to fit on said threaded member and a hanger at the free end of said reaction arm, said reaction arm being positioned against said disk and having a locking hole that overlies and can coincide with any of said perforations in said disk, said reaction arm being provided with a locking pin that is insertable in said locking hole and any of said perforations to lock said reaction arm in a chosen angular position on said disk,
a torque arm having clamping means at one end to firmly grip said threaded member and a hanger at the free end of said torque arm, said torque arm being positioned adjacent said reaction arm, and
a hydraulic cylinder having a base clevis pivotally connected to one of said hangers and a plunger clevis pivotally connected to the other of said hangers.

5,201,257
FOLDING LUG WRENCH
Darryl L. Engel, LaOtto, Ind., assignor to Universal Tool & Stamping Co., Inc., Butler, Ind.
Filed Jan. 13, 1992, Ser. No. 819,835
Int. Cl.[5] B25B *23/16*
U.S. Cl. 81—177.6 **4 Claims**

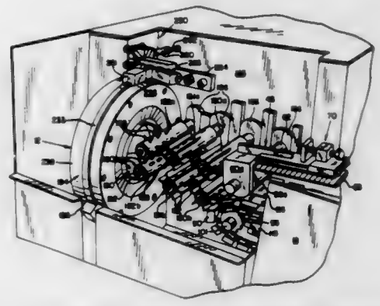
1. A folding lug wrench comprising, a stamped handle (**42**) which is formed with a lug wrench receiving socket (**44**) at one end which has sidewalls (**46, 47**) which are formed with first openings (**50, 55**) a pivot pin **57** which extends through said first and second and second openings (**50, 55**) in said sidewalls (**46, 47**), a lug wrench (**70**) with a hexagonal opening (**91**) in one end thereof, and formed with a flatted portion (**53**) at its other end through which a third opening extends in a direction normal to a plane of the flatted portion, a yoke (**61**) formed with a first side (**62**) that has a fourth opening (**63**) through which said flatted portion (**63**) of said lug wrench extends, a pair of sidewalls (**64, 69**) attached to said first side (**62**) and formed with fifth and sixth openings (**66**) through which said pivot pin (**57**) extends and said pair of sidewalls of said yoke (**61**) are respectively mounted between said sidewalls (**46, 47**) of said wrench receiving socket (**44**) and said flatted portion (**53**) of said lug wrench (**70**).

5,201,258
AUTOMATED CUTTING STATION FOR WOOD BLANKS
Lorenzo Cremona, Monza, Italy, assignor to Angelo Cremona & Figlio S.p.A., Monza, Italy
Filed Feb. 20, 1992, Ser. No. 837,930
Claims priority, application Italy, Feb. 21, 1991, MI91A000455
Int. Cl.[5] B26D *1/06, 7/06*
U.S. Cl. 83—75.5 **19 Claims**



19. Wood sheet cutting station for packages of blanks comprising in combination:
a first cutter,
a second cutter,
first means for positioning a package of sheets under said first cutter cutting along a first direction and operated to sequentially cut parts of the package,
means for taking the cut part and sending the cut part to said second cutter for sequential cutting of the part along a second direction, substantially normal to the first direction, to obtain another division in subparts sequentially and selectively conveyed outside the station,
electronic control means connected to the means of positioning, to the means for taking and to the cutters to control operation thereof in positioning and performing cuts on the package in programmed positions by setting a grid of cuts, wherein
the positioning means comprises first clamps for gripping on a top side of the package and commanded to run along guides between a nonoperative position and a position for positioning of the package under the first cutter,
the taking means comprises an unpowered conveyor leading to the second cutter and second gripping clamps commanded to run along guides between a gripping position on a top side of the cut part of the package released by said first cutter and a position for release thereof on said unpowered conveyor,
the setting means comprises a telecamera for picturing a surface of the package and said telecamera is connected to devices for processing the image taken,
the image processing devices comprise manual means for tracing lines on a screen identifying a corresponding cutting grid to be executed, and
the manual tracing means comprises an input keyboard for position commands of said lines on the screen.

5,201,259
FOOD PROCESSING APPARATUS
Darrell L. Covert, West Linn; Gary D. Cuddeford, Tigard; Kenneth J. Stanley, Aloha, and John C. Julian, Tualatin, all of Oreg., assignors to Lamb-Weston, Inc., Tri-Cities, Wash.
Division of Ser. No. 119,662, Nov. 12, 1987, Pat. No. 4,979,418.
This application Nov. 9, 1990, Ser. No. 611,184
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.
Int. Cl.[5] B26D *3/08*
U.S. Cl. 83—865 **21 Claims**



1. An apparatus for slicing food items into helical strips comprising:
a helical disk-like cutter element adapted to slice food items into helical strips through unidirectional rotation, and having a longitudinal axis, a front surface, an inner edge and an outer periphery;
the cutter element having a radially extending leading slicing edge and a trailing edge, the slicing edge being substantially flush with the cutter element;
a plurality of scoring blades mounted on the front surface and extending substantially perpendicularly away therefrom for concentrically scoring the food item before the item is sliced by the slicing edge; and
a feed structure for advancing the food items one at a time to the cutter element.

5,201,260
HYDROSTATIC MACHINE
Dieter Fetting, Bretzfeld, and Dieter Weigle, Ludwigsburg, both

each said piston including a neck portion having an opening for receiving the first connecting member, said first con-

edge and a base plate which has a peripheral edge that is sealed to said bottom edge of said dome-shaped part;

eral portion of said spill rim having a reduced radial dimension and forming an opening region;

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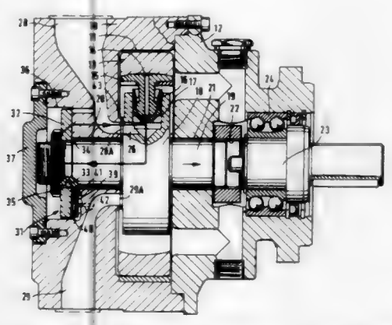
5,201,260

HYDROSTATIC MACHINE

Dieter Fetting, Bretzfeld, and Dieter Weigle, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 475,321
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905936
Int. Cl.[5] F04B 1/04
U.S. Cl. 91—491 3 Claims



1. A hydrostatic machine, comprising a housing having housing openins; a shaft; a rotor fixed on a shaft for joint rotation therewith and having radially extending openings; a plurality of pistons arranged in said radial openings and having ends extending outwardly beyond said openings; a displacement ring arranged so that said ends of said pistons slide on said ring; means for communicating said openings with a pressure medium and including passages which open laterally at said rotor; means for compensating an axial thrust applied by a pressure medium to the rotor and including pressure medium-actuated additional pistons, said means for compensating also including a disc which is fixedly arranged on said shaft so that said additional pistons abut against said disc and are arranged in said housing openings, said shaft and said rotor being formed on one-piece with one another.

5,201,261

PISTON COUPLING MECHANISM FOR A SWASH PLATE COMPRESSOR

Hiroaki Kayukawa; Kazuya Kimura, and Kenji Takenaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 27, 1991, Ser. No. 799,417
Claims priority, application Japan, Nov. 29, 1990, 2-128823[U]
Int. Cl.[5] F01B 3/00
U.S. Cl. 92—71 7 Claims

1. A swash plate type variable displacement compressor comprising;

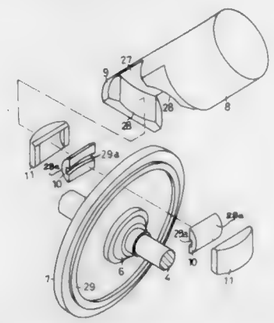
a drive shaft;

a disk shaped swash plate pivotally mounted on the drive shaft for rotation together with the shaft;

a plurality of single head pistons, each piston being arranged to linearly reciprocate in accordance with the rotation of the swash plate;

first and second connecting members between said swash plate and each of said pistons, respectively, each said first connecting member movable in the radial direction relative to said drive shaft and each said second connecting member movable only in a direction perpendicular to the radial direction; and

each said piston including a neck portion having an opening for receiving the first connecting member, said first connecting member being adapted to receive the second connecting member.

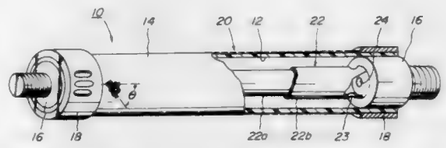


5,201,262

ACTUATOR USING ELASTIC EXTENSIBLE MEMBER

Koichi Negishi, Kodaira, and Teruyoshi Sato, Kawasaki, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,550
Claims priority, application Japan, Jun. 20, 1989, 1-155643
The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.
Int. Cl.[5] F01B 19/04
U.S. Cl. 92—92 18 Claims



10. An actuator comprising:

an elongate and flexible elastic member including a tubular body having an axial direction, and a reinforcing structure surrounding the tubular body, said elastic member being extensible in said axial direction as a pressurized fluid is exhausted from the tubular body; and

guide means arranged within the elastic member for permitting an axial extension of the elastic member while simultaneously restraining the elastic member from moving in directions intersecting the axial direction of the elastic member;

said reinforcing structure having a braided structure with an initial braided angle which is greater than an angle of repose, 54°44'.

5,201,263

COOKING UTENSIL WITH BUILT-IN AUTOMATIC STIRRING DEVICE

Andy C. Teng, 7th Fl., No. 431, Chung-Shaio E. Rd., Sec. 5, Taipei City, Taiwan

Filed Jun. 12, 1992, Ser. No. 897,435
Int. Cl.[5] A47J 27/00, 36/32; B01F 7/16, 7/20
U.S. Cl. 99—335 9 Claims

1. A cooking utensil with a built-in automatic stirring device, comprising:

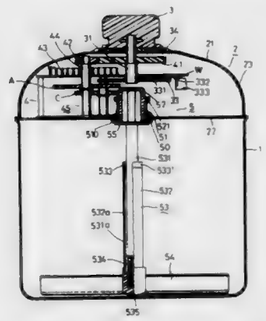
a pot body having an open top and a closed bottom;

a cover provided on said open top of said pot body and confining an enclosed space, wherein said cover comprises a substantially dome-shaped part with a bottom edge and a base plate which has a peripheral edge that is sealed to said bottom edge of said dome-shaped part;

a rotary knob rotatably mounted on said cover and have an axial shaft which extends into said enclosed space, said rotary knob being rotated manually in first direction so as to set a desired stirring period;

a gear set provided inside said enclosed space and rotating with said axial shaft to said rotary knob;

a stirring implement having a shaft portion which is rotatably driven by said gear set and which extends into said pot body, said shaft portion of said stirring implement having an upper end which extends through said base plate and into said enclosed space so as to be rotatably



driven by said gear set, said shaft portion having a lower end which is disposed adjacent to said closed bottom of said pot body and which is provided with at least one radially extending stirring blade, wherein said stirring implement further comprises a mounting cap rotatably mounted on said base plate and meshing with said gear set, said mounting gap detachably engaging said upper end of said shaft portion; and

a spiral spring means connected to said gear set and wound when said rotary knob is rotary know is rotated in the first direction, said spiral spring means gradually unwinding to drive rotatably said gear set and cause axial rotation of said stirring implement for the duration of the stirring period.

5,201,264

COOKING VESSEL

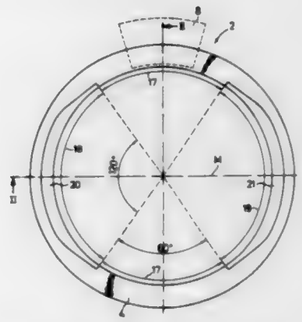
Arnold Thelen, Idar-Oberstein, and Thomas Gerlach, Egenhausen, both of Fed. Rep. of Germany, assignors to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany

PCT No. PCT/EP90/00187, § 371 Date Jul. 19, 1991, § 102(e) Date Jul. 19, 1991, PCT Pub. No. WO90/09133, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 3, 1990, Ser. No. 721,601
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905002
Int. Cl.[5] A47J 27/00, 27/04, 36/06, 36/12
U.S. Cl. 99—403 27 Claims

1. A cooking vessel for receiving product to be cooked and enabling controlled spilling of cooking liquid and ventilation during cooking and spilling, said cooking vessel comprising:

a vessel body including a vessel wall defining an axis of said vessel body and a substantially planar spill rim extending outwardly from and circumferentially around an upper axial end of said vessel wall, said vessel wall including an upper rim segment joined to said spill rim and including at least one peripheral region that is sloped and inclined relative to said axis at a greater angle than a remaining peripheral region of said upper rim segment, said at least one peripheral region extending to and defining a peripheral portion of said spill rim having a reduced radial dimension and forming an opening region;

a cover having extending outwardly therefrom and circumferentially therearound a substantially planar cover rim, said cover being positionable to close said vessel body by said cover rim being positioned on said spill rim and said cover being movable about said axis relative to said vessel body to selected rotational positions, said cover rim having at least one peripheral segment defined by at least one spill arch in said cover rim, said spill arch projecting radially and communicating with said opening region when said cover is at an open rotational position relative to said vessel body whereat said at least one peripheral segment of said cover rim is circumferentially aligned with said at least one peripheral region of said vessel body, thereby defining a spill passage, said at least one peripheral segment of said cover rim having a circumferential dimension no greater than a circumferential dimension of said remaining peripheral region of said upper rim segment of said vessel body;



at least one vessel handle formed of a thermal insulating material and attached to said vessel wall at a position displaced circumferentially by approximately 90° from a radial center line of said at least one peripheral region;

an elongated cover handle formed of a thermal insulating material and attached to said cover with a longitudinal dimension of said cover handle displaced circumferentially by approximately 90° from a radial centerline of said at least one peripheral segment of said cover rim;

whereby, at said open rotational position of said cover relative to said vessel body said cover handle is aligned with said at least one vessel handle; and

whereby, at a closed rotational position of said cover relative to said vessel body, whereat said at least one peripheral segment of said cover rim is circumferentially aligned with said remaining peripheral region of said upper rim segment of said vessel body, said cover handle is displaced circumferentially by approximately 90° from said at least one vessel handle.

5,201,265

APPARATUS FOR PREPARATION OF SUSHI RICE

Shokichi Matsui, Asahikawa, Japan, assignor to Kabushiki Kaisha Kyokuo, Hokkaido, Japan

Continuation-in-part of Ser. No. 541,856, Jun. 21, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 844,048
Claims priority, application Japan, Jun. 22, 1989, 1-158204
Int. Cl.[5] A23B 4/03; B01F 13/02, 15/06
U.S. Cl. 99—476 20 Claims

1. An apparatus for preparation of sushi rice, comprising:

a rotatable container having a horizontal axis of rotation and being in the form of a pail having a cylindrical wall and a closed bottom wall, the container having at an end opposite said closed bottom wall an opening for adding boiled

rice and liquid seasoning mix mainly comprising vinegar and for discharging prepared sushi rice out of the rotat-

exit passageway through which bales are ejected, said side wall located adjacent said exit passageway and movable

5,201,268

INTAGLIO PRINTING PROCESS AND ITS

which is aligned with said longitudinal chain axis of said roller chain.

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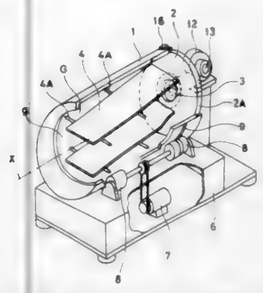
rice and liquid seasoning mix mainly comprising vinegar and for discharging prepared sushi rice out of the rotatable container;

a lid removably secured to the rotatable container to close and open the opening of the container and formed with a ventilation hole comprising a through-hole at a central portion of the lid for supplying cooling air into the container;

at least one partition plate secured to the removable lid, and having a width smaller than an inner diameter of the rotatable container such that when said lid covers said



rotatable container said at least one partition plate projects into said container toward said container bottom wall with space maintained between edges of the at least one partition plate and an inner surface of said cylindrical wall of said rotatable container;

a base for rotatably supporting the rotatable container in its horizontal position, the base comprising a means for rotating the rotatable container about its horizontal axis; and

a blower for blowing cooling air into the rotatable container through said through-hole of said lid so as to cool the rice therein.

5,201,266

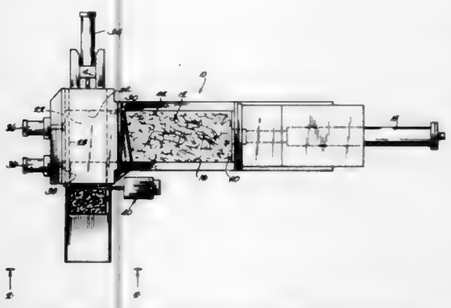
BALER MACHINE AND METHOD OF BALING

Roman Schmalz, Milwaukee; Robert J. Wolf, Waukesha, and Erich E. Salzmann, Milwaukee, all of Wis., assignors to Logemann Bros. Co., Milwaukee, Wis.

Filed Oct. 10, 1991, Ser. No. 774,438

Int. Cl.[5] B30B *13/00, 15/32*

U.S. Cl. 100—35 **6 Claims**



5. A method of forming bales comprising the steps of:

(a) loading material into a charging chamber having a charging passage;

(b) forcing the material in the charging chamber through the charging passage into a bale compression chamber to form a bale therein, said bale compression chamber having a side wall facing the charging passage which is movable horizontally, said bale compression chamber having an exit passageway through which bales are ejected, said side wall located adjacent said exit passageway and movable horizontally to vary the size of said exit passageway;

(c) moving said side wall of said baling chamber horizontally to increase the size of said exit passageway to thereby facilitate ejection of an oversized bale from said baling compression chamber; and

(d) ejecting the oversized bale through the enlarged exit passageway of said baling compression chamber.

5,201,267

BALANCE MECHANISM FOR A PRESS MACHINE

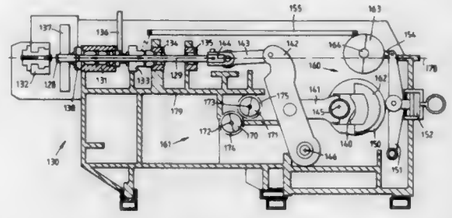
Paul Porucznik, Oxfordshire; Christopher F. Cheers, and Brian Hill, both of Wiltshire, all of United Kingdom, assignors to CarnaudMetalbox PLC, Worcester, United Kingdom

Filed May 6, 1991, Ser. No. 695,915

Claims priority, application United Kingdom, May 16, 1990, 9010918

Int. Cl.[5] B30B *15/14*

U.S. Cl. 100—48 **7 Claims**



1. A balanced press machine including a press machine generating shaking forces at a frequency equal to the frequency of operation of said press machine and a balance mechanism for balancing at least a portion of said shaking forces, said press machine comprising:

a frame,

a tool supported on said frame,

a ram mounted on the frame for reciprocating movement along an operating axis towards and away from the tool,

a crankshaft,

means for rotating the crankshaft, and

a transmission mechanism connected between the crankshaft and the ram, said transmission mechanism including at least one connecting rod, and

said balance mechanism comprising:

at least one rotatably mounted balance mechanism shaft which is separate from the crankshaft,

a first balance weight eccentrically mounted on the crankshaft,

a second balance weight eccentrically mounted on said balance mechanism shaft,

at least one electric motor for rotating the balance mechanism shaft, and

means for controlling said electric motor so that said balance mechanism shaft rotates at the same speed as the crankshaft wherein said controlling means includes:

first sensing means for sensing the rotational position of said crankshaft;

second sensing means for sensing the rotational position of said balance mechanism shaft; and

control means, responsive to said first and second sensing means, for controlling said electric motor so that the balance mechanism rotates at the same speed as the crankshaft, whereby rotation of the first and second balance weights balances at least some of said shaking forces.

5,201,268

INTAGLIO PRINTING PROCESS AND ITS APPLICATION

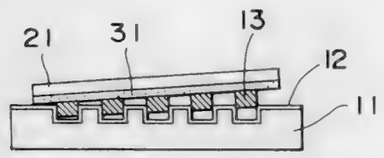
Osamu Yamamoto; Akira Isomi, both of Hirakata, and Masahide Tsukamoto, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 20, 1991, Ser. No. 811,032

Claims priority, application Japan, Dec. 25, 1990, 2-405747; Jan. 24, 1991, 3-6999

Int. Cl.[5] B41M *1/10;* **H05K** *3/12*

U.S. Cl. 101—170 **10 Claims**



1. An intaglio printing process comprising:

(a) forming an intaglio printing plate having groove patterns,

(b) filling said groove patterns with an ink,

(c) after drying said ink, forming a curable resin layer on the whole surface of the intaglio printing plate,

(d) placing a body to be printed thereon without curing said resin layer,

(e) curing the curable resin, and

(f) stripping the body from the intaglio printing plate to form the ink patterns corresponding to the groove patterns of the intaglio on the body.

5,201,269

ROLLER CHAIN FOR PAPER INFEED DEVICE

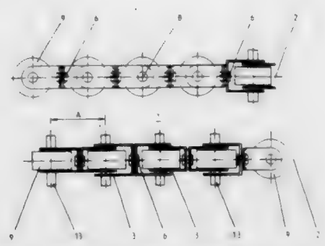
Günther O. Eckert, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Mar. 30, 1992, Ser. No. 859,849

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1991, 4110668

Int. Cl.[5] B41F *13/54*

U.S. Cl. 101—228 **9 Claims**



1. A roller chain for a paper infeed device of a web fed rotary printing press, said roller chain comprising:

a plurality of generally fork shaped butt straps, each said butt strap having a base portion and a pair of spaced fork arms, each said fork arm having an aperture, said plurality of butt straps being positioned in an elongated, repeating inverted arrangement along a longitudinal chain axis of said roller chain with the fork arms of adjacent oppositely facing butt straps overlapping to align their apertures;

a plurality of rollers, each said roller having a roller axle bolt, said roller axle bolt for each said roller extending through said aligned ones of said fork arm apertures of two adjacent ones of said butt straps; and

a plurality of hinge pins, each one of said hinge pins connecting said base portions of adjacent ones of said butt straps, each of said hinge pins having a longitudinal pin axis which is aligned with said longitudinal chain axis of said roller chain.

5,201,270

DISTRIBUTOR ROLLER FOR PRINTING PRESS

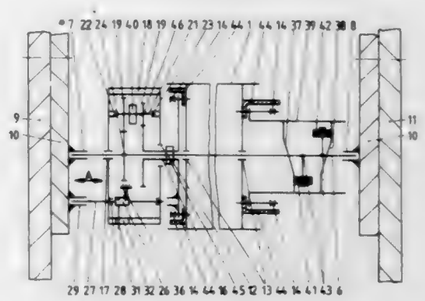
Willi R. L. Dörsam, Höchberg, and Jürgen A. Stiel, Ostheim, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Apr. 10, 1992, Ser. No. 866,505

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1991, 4113491

Int. Cl.[5] B41F *31/14;* **B41D** *27/16*

U.S. Cl. 101—348 **23 Claims**



1. A distributor roller usable in a printing pres for distributing fluids and ink by means of rotating and selective axial oscillatory movement; said distributor roller comprising:

a distributor roller body, said roller body being rotatably driven at a first speed by frictional contact with a cooperating roller;

a roller shaft rotatably supported in side frames of the printing press and rotatably driven by said rotating distributor roller body;

means for effecting selective axial oscillatory motion of said distributor roller body with respect to said roller shaft; and

coupling means for coupling said distributor roller body to said roller shaft to selectively cause said distributor roller body to rotatably drive said roller shaft at said first speed or at a second different speed, where at said first speed said distributor roller body and said roller shaft rotate at the same speed without axial oscillating motion between said distributor roller body and said roller shaft, and where at said second speed there is relative rotation and axial oscillatory motion between said distributor roller body and said roller shaft.

5,201,271

INKING DEVICE FOR A ROTARY OFFSET PRINTING MACHINE

Simon Pierre, Orleans, France, assignor to Komori-Chambon, La Source, France

Filed Mar. 26, 1992, Ser. No. 857,736

Claims priority, application France, Feb. 11, 1991, 91 01545

Int. Cl.[5] B41F *31/06, 31/14, 31/30*

U.S. Cl. 101—350 **10 Claims**

1. An inking device for a rotary offset printing machine to transfer a film of ink from an ink fountain, containing a mass of ink, up to the surface of an inking roller in contact with a plate cylinder and operable in an alternative ink taking mode or in a continuous inking mode, comprising:

a succession of rollers, having parallel axes, form upstream to downstream, including an ink fountain roller driven in rotation, at a low peripheral speed v1, and being in ink receiving relationship with said ink fountain, a taker rol-

ler, a pair of transfer rollers, one of said transfer rollers forming an inking table and being juxtaposed to said taker roller for receiving ink therefrom, said taker roller being mobile roller, in opposite direction, to return said mobile roller to its starting position;

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SHIP MOORING SYSTEM

heads extending between and effectively interconnecting said inner and outer hull skins;

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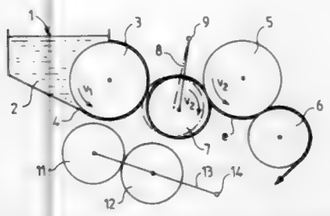
ler, a pair of transfer rollers, one of said transfer rollers forming an inking table and being juxtaposed to said taker roller for receiving ink therefrom, said taker roller being disposed between said ink fountain roller and said inking table, and final roller forming the other of said pair of transfer rollers tangential to said one transfer roller forming said inking table;

means mounting said taker roller on an alternately mobile support for moving said taker roller between said ink fountain roller and said one transfer roller for brining said taker roller alternately into contact with said ink fountain roller and said one transfer roller when the inking device operates in said alternative ink taking mode, and said one transfer roller and said ink fountain roller being driven for rotation in the same direction;

means including at least one pair of intermediate transfer rollers for operating said device in the continuous inking mode;

means mounting said at least one pair of intermediate transfer rollers on at least one mobile support displacing said at least one pair of intermediate transfer rollers between an inactive position in which they are maintained spaced part form said ink fountain roller and said take roller, and an active position in which one of said pair of intermediate transfer rollers is brought into contact with said ink fountain roller, and the other of said at least one pair of intermediate rollers is brought into contact with said taker roller, means for permanently maintaining said taker roller tangential to said one roller of said pair of intermediate transfer rollers and to said one transfer roller, said one pair of said intermediate transfer rollers being maintained tangential to each other in order for said inking device to operate in said continuous inking mode for transferring a film of ink transmitting from said ink fountain roller to said one transfer roller forming said inking table, by means of said two intermediate transfer rollers and said taker roller, said taker roller being tangential to one of said two intermediate transfer rollers and said intermediate transfer rollers being tangential to each other.



5,201,272

DEVICE AND PROCESS FOR DETECTING, IN A MACHINE, THE POSITION OF CONTACT OF TWO PARALLEL-AXIS ROLLERS

Pierre Simon, Orleans, France, assignor to Komori-Chambon, Orleans la Source, France

Filed Mar. 26, 1992, Ser. No. 858,343

Int. Cl.[5] B41F *13/24*

U.S. Cl. 101—485 **7 Claims**

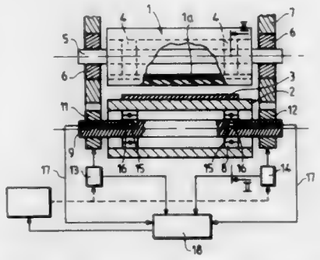
7. A process for placing in parallel the axis of two rollers, at least one of said rollers being mobile, with the aid of a detection device, comprising the steps of:

firstly displacing a first bearing associated with said mobile roller, located on a first side of said mobile roller, in the direction of the other roller until the mobile roller comes into contact with the other roller;

measuring a deformation of an elastic member associated with said mobile roller, and memorizing the position attained by the mobile roller, on this first side, during contacting of the two rollers;

displacing said first bearing, located on said first side of the mobile roller, in opposite direction, to return said mobile roller to its starting position;

repeating these operations for a second mobile bearing located on a second side of the mobile roller, so as to measure and memorize the position of contact between the two rollers, on the second side thereof; and



after having returned the second mobile bearing to said starting position, again displacing the two mobile bearings simultaneously in order to bring them both into their positions of contact measured previously, which ensures parallelism of the axes of the two rollers.

5,201,273

TOP-FEED SEWING MACHINE WITH PRESSER DEVICE

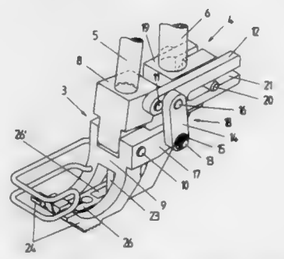
Michael Rosemann, Herford, and Kurt Biermann, Bielefeld, both of Fed. Rep. of Germany, assignors to Dürkopp Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1991, Ser. No. 763,948

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1990, 4030269

Int. Cl.[5] D05B *27/00*

U.S. Cl. 112—311 **24 Claims**



1. In a top-feed sewing machine having a needle which is mounted for exclusively vertical reciprocating movement at a sewing point which is stationary with respect to a sewing material feed direction, a presser device which comprises a feeder foot supported by a vertically movable and swingably suspended feeder bar, and a holding foot which cooperates alternately with said feeder foot and is supported by a vertically movable holding bar, the feeder foot and holding foot each having a respective sole with a non-ski grip side arranged to engage material being sewn at the sewing point,

the feeder foot furthermore having a spur which presses intermittently against the material being sewn,

the improvement comprising transmission means interconnecting the feeder foot and the holding foot, for orienting the spur in a variable position with respect to the material, said position being a function of the position of the holding foot.

5,201,274

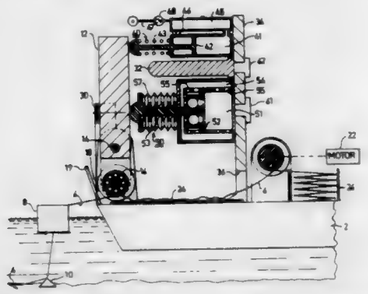
SHIP MOORING SYSTEM

Isaac Rinkewich, 48-22 Garden View Ter., Hightstown, N.J.

Filed Oct. 22, 1991, Ser. No. 780,508

Int. Cl.[5] B63B *21/00*

U.S. Cl. 114—230 **20 Claims**



1. A ship mooring system for securing a ship to a fixed object such as an anchor or a dock by means of a mooring cable having one end secured to the ship and the opposite end secured to the fixed object, comprising:

a displaceable mounting member displaceably mounted on said ship;

a drum rotatably mounted on said mounting member for receiving said one end of the mooring cable;

and dashpot means urging said mounting member and drum to a normal position with respect to said ship but yieldable under tension forces applied to said mooring cable to permit displacement of said mounting member and drum with respect to said ship in order to absorb said tension forces.

5,201,275

MARINE CONSTRUCTION

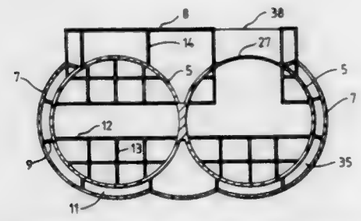
Olav Mo, Kristiansand, Norway, assignor to Offshore Concrete A/S, Kristiansand, Norway

Filed Dec. 3, 1991, Ser. No. 801,934

Claims priority, application Norway, Dec. 4, 1990, 905239; Nov. 6, 1991, 914343

Int. Cl.[5] B63B *3/00*

U.S. Cl. 114—65 A **6 Claims**



1. A monolithic concrete marine vessel hull construction, comprising:

an inner hull skin comprising at least two transversely interconnected, longitudinally, horizontally, coextensive inner hull shells of vertically slip-formed concrete each of which is generally cylindrically curved on inner and outer peripheral surfaces thereof;

each said inner hull shell being closed at opposite ends thereof by a respective endwall means;

an outer hull skin comprising an outer hull shell of vertically slip-formed concrete transversally spaced from and peripherally enclosing said inner hull skin, said outer hull skin being curved perimetrically thereof;

a plurality of longitudinally and transverse concrete bulkheads extending between and effectively interconnecting said inner and outer hull skins;

said outer hull shell being closed at respective opposite ends thereof by a bow member and a stern member and including a concrete deck; and

means mounting said concrete deck on said inner hull shell so that said concrete deck is generally horizontally arranged to face upwards over said inner hull shell.

5,201,276

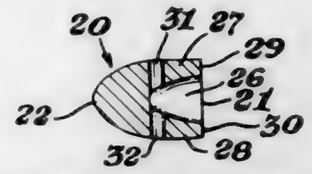
POWER WHISTLE

Randy A. Knight, 11236 Purity Rd., St. Louisville, Ohio 43071

Continuation-in-part of Ser. No. 509,084, Apr. 16, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 805,867

Int. Cl.[5] G10K *5/00*

U.S. Cl. 116—137 R **9 Claims**



1. A mouth whistle consisting of a hemi-oblate body with a front end, rear end and opposed sides and upper and lower walls curving each toward the other to merge into a bit of sidewall and rear wall along the opposed sides and rear end to define a cavity with a rear wall and opening at the front end of the body, the rear end being rounded in three dimensions and the front end being cut off substantially along a single plane transverse to the upper and lower walls, the upper and lower walls being relatively thick and each perforated by a single aperture, the apertures being substantially coaligned and in communication with the cavity.

5,201,277

DISPLAY APPARATUS FOR VEHICLE

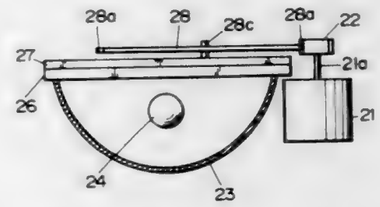
Kunimitsu Aoki; Tadashi Iino, and Yoshiyuki Furuya, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 24, 1991, Ser. No. 812,981

Claims priority, application Japan, Dec. 26, 1990, 2-404670[U]

Int. Cl.[5] G01D *13/22*

U.S. Cl. 116—286 **5 Claims**



1. A display apparatus for a vehicle, comprising:

a transmitting circular pointer plate having a center portion, an outer periphery, and a slit extending from said center portion to said outer periphery;

a dial adjacent to said pointer plate, said dial having a transmitting portion having a generally circular shape which overlies said pointer plate, said dial having graduations at outer peripheral portions of said transmitting portion;

mounting means for rotatably supporting said pointer plate relative to said dial;

a light source means disposed on an opposite side of said dial

lower engagement means situated at said lower end of said

exchange tubes supported by a tubesheet and separated by a

downcomers being connected to said downflow module

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a light source means disposed on an opposite side of said dial from said pointer plate, for generating backlight for said dial including a light dispersion plate and a reflection; and

driving means for driving said outer periphery of said pointer plate to cause rotational movement of said pointer plate, said driving means having a movement which is disposed along side of said reflector for driving said pointer plate according to a value measured by a sensor.

5,201,278

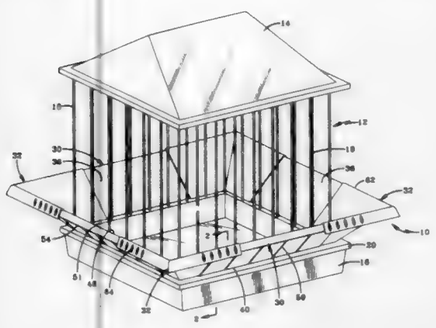
BIRD AND SMALL ANIMAL CAGE APRON

Bruce A. Hehn, 9570 Pondera St., N.W., Massillon, Ohio 44646

Filed Jun. 1, 1992, Ser. No. 890,765

Int. Cl.[5] A01K *31/06*

U.S. Cl. 119—17 **19 Claims**



1. A cage apron adapted for use with a wire pet cage, for redirecting debris scattered from the cage by an enclosed animal, said cage apron comprising:

at least one locking member having spaced locking tabs extending along a portion of the length thereof; and

at least one ratchet member having spaced crenations extending along a portion of the length thereof adapted to engage said locking tabs when said ratchet member is telescopically ratcheted along said locking member to form a circumambient apron adapted to be supported from said cage in an outwardly extending direction from said cage.

5,201,279

FOOD SUPPLEMENT DISPENSING SYSTEM FOR ANIMALS

Frank Impastato, and Debra Grass, both of 204A Trefny, Metairie, La. 70003

Continuation-in-part of Ser. No. 617,135, Oct. 23, 1990, Pat. No. 5,109,798. This application May 4, 1992, Ser. No. 878,814

Int. Cl.[5] A01K *5/00*

U.S. Cl. 119—51.03 **14 Claims**

1. A animal feeder for dispensing fluid food supplements, comprising:

a container; and

a dispenser, including

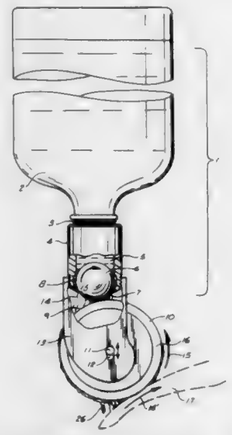
an engagement portion having a longitudinal passage therethrough, said longitudinal passage having circular, inner, side walls and upper and lower ends, said longitudinal passage further having formed therein upper and lower seal areas, and an open, dispensing chamber juxtaposed to said seal area, said upper end of said engagement portion being engaged to said container, said dispenser further including-

a dispenser bearing substantially situated in said dispensing chamber of said engagement portion;

lower engagement means situated at said lower end of said engagement portion;

a dispenser wheel having an axle and contact surface, said dispenser wheel in communication with said dispenser bearing; and

bracket means for supporting said axle of said dispenser wheel, said bracket means being engaged to said lower engagement means of said engagement portion, said bracket means communicating with said dispenser



wheel, said bracket means further configured so as to allow limited movement of said dispenser wheel in a longitudinal fashion via said axle, from a first, lower position, to a second, upper position, wherein said dispenser bearing communicates with said upper seal area in a sliding or rolling fashion when said dispenser wheel is in its second, upper position, and said dispenser bearing communicates with said lower seal area in a somewhat fluid impermeable fashion when said wheel is in its first, lower position.

5,201,280

METHOD FOR PREFERENTIAL PRODUCTION OF FEMALE TURTLES, LIZARDS, AND CROCOIDLES

David Crews, and Thane Wibbels, both of Austin, Tex., assignors to Reproductive Sciences, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 361,930, Jun. 6, 1989, abandoned. This application Mar. 28, 1990, Ser. No. 500,777

Int. Cl.[5] A01K *67/00*; **C12N** *15/00*; **A61K** *31/565*

U.S. Cl. 119—174 **4 Claims**

1. A method for preferential production of female turtles, lizards or crocodiles which have temperature dependent sex determination by treating the developing embryos in ovo, comprising the steps of:

(1) spotting an effective amount of an estrogen into the surface of the turtle, lizard, or crocodile eggshell so as to effect development of female gonads in the developing embryo; and,

(2) incubating the eggs at a temperature known to effect development of male gonads until hatch and thereby obtain viable female turtles, lizards, or crocodiles.

5,201,281

STEAM GENERATOR MAINTENANCE APPARATUS

Alexander Cella, Robinwood Dr., Great Notch, N.J. 07424

Filed Mar. 10, 1992, Ser. No. 848,741

Int. Cl.[5] F22B *37/54*

U.S. Cl. 122—382 **8 Claims**

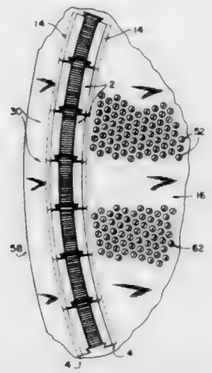
1. In an improved steam generator having a plurality of heat

exchange tubes supported by a tubesheet and separated by a tubelane, said tubesheet comprising a circular annulus surrounding said heat exchange tubes;

wherein the improvement comprises:

at least a portion of said annulus being machined away, forming thereby a pair of support grooves, each groove having upper and lower lips, an upper lip of one groove being machined away at said tubelane forming a keyway;

track means being removably engaged in said support grooves, said track means comprising a plurality of interlocking segments, each segment having a curvature substantially corresponding to a curvature of said circular annulus and being insertable in said support grooves at said keyway;



each segment comprising extension means for securedly engaging said grooves and being movable therein, interlocking means for allowing a succession of segments to be inserted in said grooves, each segment being releasably attachable to a previously inserted segment, shoulder support means for providing a stabilization point for a steam generator maintenance apparatus, and exposed gear means for providing accurate positioning and movement of said maintenance apparatus relative to said track means;

whereby a removable track may be assembled in an annular space of said steam generator for providing a secure and stable platform for a maintenance device.

5,201,282

UPFLOW/DOWNFLOW HEATED TUBE CIRCULATING SYSTEM

Melvin J. Albrecht, Homeworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 568,921, Aug. 17, 1990, abandoned, which is a division of Ser. No. 422,853, Oct. 17, 1989, Pat. No. 4,982,703. This application Oct. 29, 1991, Ser. No. 785,147

Int. Cl.[5] F22B *15/00*, *7/00*

U.S. Cl. 122—406.1 **2 Claims**

1. A fluid flow circuit for a boiler having a combustion chamber for producing a flow of combustion gases and an exhaust passage, comprising:

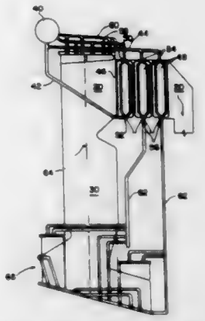
a steam drum for separating steam from water;

upper downcomers connected to said steam drum for receiving water therefrom;

at least one downflow evaporative generating bank module having an upper header and a lower header, and positioned at a location in the exhaust passage for absorbing heat where the heat in the flow of combustion gases from the combustion chamber is below a threshold heat input required to adequately circulate the module in upflow while avoiding flow instability, at least one of said upper downcomers being connected to said downflow module upper header to receive said water;

riser means connected to said steam drum for returning a mixture of saturated steam and water to said steam drum;

lower downcomers connected to said downflow module lower header; and



at least one furnace circuit extending along the combustion chamber for receiving heat therefrom, and having a lower end connected to said lower downcomers and an upper end connected to said riser means.

5,201,283

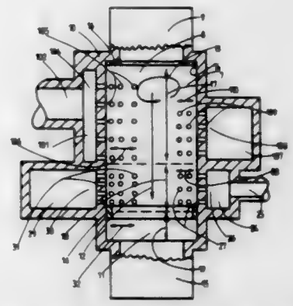
OPPOSED CROSS FLOW PRIMARY REACTORS FOR CYCLIC CHAR BURNING ENGINES AND GASIFIERS

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Continuation-in-part of Ser. No. 725,823, Jul. 3, 1991, Pat. No. 5,109,808. This application Jan. 21, 1992, Ser. No. 823,479

Int. Cl.[5] F02B *45/00*

U.S. Cl. 123—23 **16 Claims**



1. In a cyclic char burning power reactor comprising: at least one combined means for compressing and expanding gases, each said combined means comprising; an internal combustion engine mechanism comprising a variable volume chamber for compressing and expanding gases, and drive means for driving said internal combustion engine mechanism and for varying the volume of said chamber through repeated cycles, each cycle comprising a compression time interval followed by an expansion time interval, each said combined means for compressing and expanding further comprising, intake means for admitting reactant gases into said variable volume chamber prior to each said compression time interval, exhaust means for removing reacted gases from said variable volume chamber after each said expansion time interval; each said combined means for compressing and expanding being connected to a separate primary reaction chamber, containing char fuel, within a pressure vessel container, each said primary reaction chamber comprising; a refuel end with a refuel mecha-

nism means for supplying fresh char fuel particles into said

manifold, and to said inlet of said second reactant gas

liquid coolant discharged from said engine to said radiator means and to direct a portion of said liquid coolant to

a cylinder having a head end and a rearward end closure, a passage in said closure,

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nism means for supplying fresh char fuel particles into said refuel end, an ash collection end, a char fuel direction of motion from said refuel end toward said ash removal end, a peripheral dimension around the outer surface of said primary reaction chamber at right angles to said char fuel motion direction, each said primary reaction chamber further comprising, a char fuel preheat and volatile matter distillation zone positioned toward said refuel end of said primary reaction chamber, an ash collection zone positioned toward said ash collection end of said primary reaction chamber, and a rapid reaction zone positioned between said char fuel preheat and volatile matter distillation zone and said ash collection zone, each said primary reaction chamber further comprising at least one means for removing ashes; said char burning power reactor further comprising a source of supply of reactant gas containing appreciable oxygen gas to each said intake means for admitting reactant gases into said variable volume chamber; said char burning power reactor further comprising: means for preheating said char fuel within said primary reaction chamber to that temperature at which said char fuel reacts rapidly with oxygen in adjacent compressed reactant gases when said char burning power reactor is being started; means for cranking said internal combustion engine mechanism when said char burning power reactor is being started:

an improvement comprising:

dividing said peripheral dimension of said primary reaction chamber into separate inlet portions, separate outlet portions, and separate sealed portions;

and adding to each said primary reaction chamber:

two separate reactant gas manifolds and each said reactant gas manifold comprising an inlet and an outlet; a first reactant gas manifold whose outlet connects to first reactant gas inlet ports into said primary reaction chamber, and these first inlet ports being positioned along that portion of the length of said primary reaction chamber, in said direction of char fuel motion, which is adjacent to said rapid reaction zone, and these first inlet ports being positioned around a first said inlet portion of the periphery of said primary reaction chamber; a second reactant gas manifold whose outlet connects to second reactant gas inlet ports into said primary reaction chamber, and these second inlet ports being positioned along that portion of the length of said primary reaction chamber, in said direction of char fuel motion, which is adjacent to said char fuel preheat and volatile matter distillation zone, and the second inlet ports being positioned around a second said inlet portion of the periphery of said primary reaction chamber;

a producer gas reservoir comprising an inlet, said inlet connecting to producer gas outlet ports out of said primary reaction chamber, and these ports positioned along that portion of said length of said primary reaction chamber along said direction of char fuel motion which is adjacent to said rapid reaction zone, and these ports positioned around a first outlet portion of the periphery of said primary reaction chamber, said first outlet portion of said periphery being on the opposite side of said primary reaction chamber from said first inlet portion of said periphery;

a volatile matter in air mixture reservoir comprising an inlet, said inlet connecting to volatile matter in air mixture outlet ports out of said primary reaction chamber, and these ports positioned along that portion of said length of said primary reaction chamber along said direction of char fuel motion which is adjacent to said char fuel preheat and volatile matter distillation zone, and these ports positioned around a second outlet portion of the periphery of said primary reaction chamber, said second outlet portion of the periphery being on the opposite side of said primary reaction chamber from said second inlet portion of said periphery;

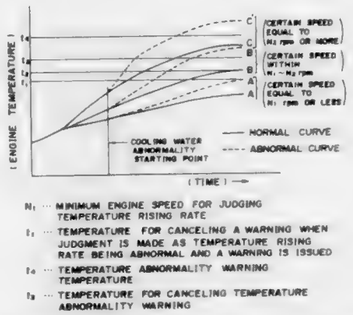
reactant fixed open gas flow connections from said variable volume chamber of said internal combustion engine mechanism to said inlet of said first reactant gas manifold, and to said inlet of said second reactant gas manifold.

5,201,284

OVERHEAT DETECTING APPARATUS FOR ENGINE

Kazuhiro Umehara, Shizuoka, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan

Division of Ser. No. 720,740, Jun. 25, 1991, Pat. No. 5,133,303.
This application May 15, 1992, Ser. No. 884,063
Claims priority, application Japan, Jun. 29, 1990, 2-172316; Jun. 29, 1990, 2-172317
Int. Cl.[5] F01P *5/14*
U.S. Cl. 123—41.15 **4 Claims**



N_1 ··· MINIMUM ENGINE SPEED FOR JUDGING TEMPERATURE RISING RATE

t_2 ··· TEMPERATURE FOR CANCELING A WARNING WHEN JUDGMENT IS MADE AS TEMPERATURE RISING RATE BEING ABNORMAL AND A WARNING IS ISSUED

t_4 ··· TEMPERATURE ABNORMALITY WARNING TEMPERATURE

t_3 ··· TEMPERATURE FOR CANCELING TEMPERATURE ABNORMALITY WARNING

1. An engine ignition timing control apparatus, comprising:

a temperature sensor disposed on or in the vicinity of a cylinder head of an engine, warning means for issuing an operator perceptible warning when said temperature sensor detects an overheating state of the engine, and a main control portion responsive to output signals from said temperature sensor for regulating engine speed and driving said warning means in accordance with necessity; said main control portion including starting time ignition timing control means responsive to said output signals from said temperature sensor for controlling spark advancement according to a starting timing from starting of the engine until the occurrence of one of first and second events, and trolling time ignition timing control means responsive to said output signals from said temperature sensor for controlling spark advancement according to a trolling timing different from said starting timing subsequent to the occurrence of one of said first and second events, wherein said first event occurs upon expiration of a first time interval from starting of the engine, and said second event occurs when the engine temperature is in excess of a predetermined temperature before expiration of said first time interval and after expiration of a second time interval which is less than said first time interval.

5,201,285

CONTROLLED COOLING SYSTEM FOR A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Lester E. McTaggart, Jackson, Tenn., assignor to Touchstone, Inc., Jackson, Tenn.

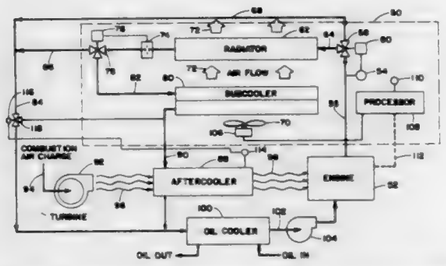
Filed Oct. 18, 1991, Ser. No. 780,708
Int. Cl.[5] F01P *1/06*
U.S. Cl. 123—41.31 **2 Claims**

1. A cooling system for a turbocharged internal combustion engine having heat exchange radiator means, liquid coolant to absorb heat from said engine, pump means to pump said coolant through said cooling system, fan means to force air in heat exchange with said radiator means, and turbocompressor means to increase the density of a combustion air charge, which cooling system comprises:

temperature control valve means to direct a portion of said liquid coolant discharged from said engine to said radiator means and to direct a portion of said liquid coolant to bypass said radiator means in response to the temperature of said liquid coolant after discharge from said engine;

liquid subcooler heat exchange means to lower the temperature of said liquid coolant by passing in heat exchange with forced air from said fan means;

flow control valve means to direct a portion of said liquid coolant discharged from said radiator means to said liquid subcooler heat exchange means and the remainder of said liquid coolant to said engine wherein said flow control



valve means includes a flow sensor to sense liquid coolant and signal means in communication with said flow control means to control the portion of coolant to said subcooler means;

aftercooler heat exchange means to lower the temperature of said combustion air charge discharged from said turbocompressor means by passing said combustion air charge in heat exchange with said liquid coolant from said subcooler heat exchange means; and

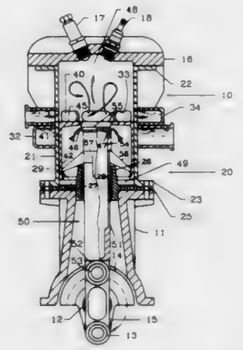
fan speed control means to control the speed of said fan in response to ambient air temperature and in response to load on said engine.

5,201,286

TWO-STROKE CYCLE INTERNAL COMBUSTION ENGINE

Eugene E. Kerrigan, Columbus, Ohio, assignor to Malibu Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 703,508, May 21, 1991, abandoned. This application Mar. 18, 1992, Ser. No. 853,113
Int. Cl.[5] F01L *11/00*
U.S. Cl. 123—47 A **27 Claims**



1. In a two-stroke cycle internal combustion engine having a crankshaft, at least one connecting rod pivotally connected at one end to the crankshaft and a gas charge induction means, the improvement which comprises:

a cylinder having a head end and a rearward end closure, a passage in said closure,

a reciprocating piston positioned in said cylinder and defining therewith a combustion chamber and a charging chamber as the piston moves between its top dead center position and its bottom dead center position,

inlet means normally closed by said piston and being open to said charging chamber when said piston moves to its top dead center position for controlling delivery of a gas charge to said combustion chamber,

exhaust means normally closed by said piston and being open to said combustion chamber when said piston moves to its bottom dead center position for controlling discharge of gas combustion products from said combustion chamber,

means formed in the crown of said piston defining a valve port adapted to establish controlled communication between said charging chamber and said combustion chamber, and,

an operating rod connected to said piston in said cylinder and extending through said passage, said operating rod being connected at its outer end to said connecting rod and having a valve head formed on its inner end to close said valve port,

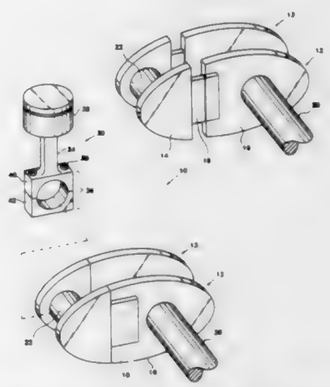
said piston and operating rod being in valveclosing engagement during the operating cycle of the engine, except for a portion of each operating cycle when the piston passes through its bottom dead center position wherein retraction movement is limited by fluid pressure caused by compressed gas in said charging chamber, said operating rod being further retracted by said crankshaft and said connecting rod to open said valve port to admit a gas charge from said charging chamber to said combustion chamber.

5,201,287

VARIABLE STROKE INTERNAL COMBUSTION ENGINE

Nelson A. Blish, 302 Cove Creek, Houston, Tex. 77042

Filed Aug. 3, 1992, Ser. No. 923,607
Int. Cl.[5] F02B *75/04*
U.S. Cl. 123—48 B **5 Claims**



1. A system for effectively increasing the length of a piston stroke of an internal combustion engine comprising:

a piston;

a piston rod attached to said piston at a first end;

a crankpin attached to a second end of said piston rod;

a crankshaft attached to said crankpin via crankwebs for converting reciprocating motion of said piston into rotary motion and, wherein said crankwebs may be extended during engine operation to effectively increase the length of the stroke of said engine.

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TWO-CYCLE ENGINE WITH FUEL INJECTION

a helical piston assembly movably disposed in said annular space;

whereby when said plunger is forced by said spring into contact with said retaining ring, said retaining ring arrests

comparing said energy signal to a predetermined energy threshold and comparing said spectral signal to a predeter-

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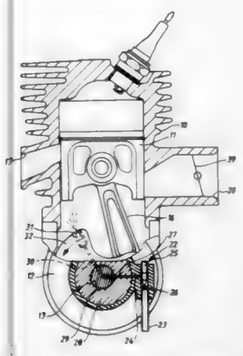
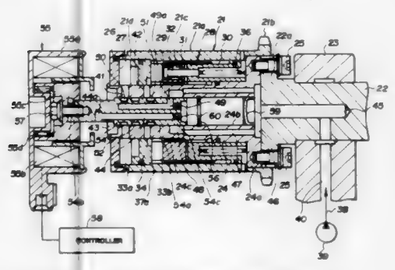
5,201,288
TWO-CYCLE ENGINE WITH FUEL INJECTION
Fridolf A. G. Döragrip, Backsvalevägen, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Apr. 9, 1992, Ser. No. 865,906
Claims priority, application Sweden, May 24, 1991, 9101583-4
Int. Cl.[5] F02B *33/04*
U.S. Cl. 123—73 DA **4 Claims**



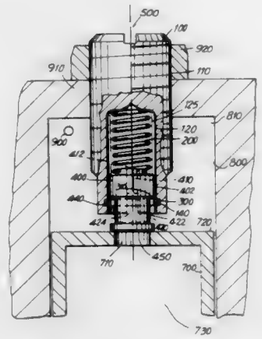
1. A two-cycle engine with a crankshaft, fuel injection, crankcase flushing of combustion gas and an adjustable, piston-controlled air inlet in the cylinder wall, characterized by a passage system for supplying fuel form an inlet (**23**) via a first passage (**27**) in an intermediate member between the inlet and the crankshaft (**28**) and a second passage (**30**) to a nozzle (**31**) provided in a counterweight (**32**) of the crankshaft, said first passage (**27**) and said second passage (**30**) being interconnected in an interval of the revolution of the crankshaft in which underpressure prevails in the crankcase, and said nozzle having a ball valve which closes the nozzle in a non-operative position and opens the nozzle during rotation of the crankshaft due to centrifugal force.

5,201,289
VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE
Hiroaki Imai, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Atsugi, Japan
Filed Aug. 31, 1992, Ser. No. 937,273
Claims priority, application Japan, Aug. 30, 1991, 3-069565[U]
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 **2 Claims**



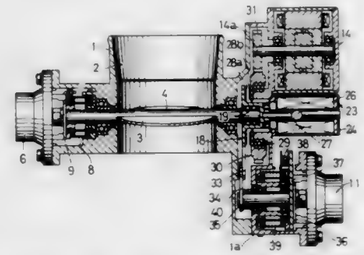
1. A valve timing control system comprising:
a timing sprocket including a cylindrical body;
a camshaft;
a sleeve secured to said camshaft and disposed in said cylindrical body and cooperating therewith to define an annular space therebetween;
a helical piston assembly movably disposed in said annular space;
a floating piston movably disposed in said annular space;
an end plug closing one end of said annular space;
said floating piston and said end plug cooperating with each other to define therebetween a first chamber in said annular space;
said floating piston and said piston assembly cooperating with each other to define therebetween a second chamber in said annular space;
means for causing said sleeve to vary an angular position thereof relative to said cylindrical body in response to movement of said helical piston assembly;
a hydraulic fluid pump;
a valve spool movably disposed in said sleeve, said valve spool having a first position wherein said first and second chambers are drained, a second position wherein said first chamber is allowed to communicate with said hydraulic fluid pump to be supplied with pressurized hydraulic fluid and said second chamber is drained, and a third position wherein said first and second chambers are allowed to communicate with said hydraulic fluid pump to be supplied with the pressurized hydraulic fluid; and
an actuator operatively connected to said valve spool for movement of said valve spool among said first, second and third positions.

5,201,290
COMPRESSION RELIEF ENGINE RETARDER CLIP VALVE
Haoran Hu, Windsor, Conn., assignor to Jacobs Brake Technology Corporation, Wilmington, Del.
Filed Jan. 3, 1992, Ser. No. 816,662
Int. Cl.[5] F02D *13/04*
U.S. Cl. 123—321 **14 Claims**



1. Clip valve apparatus for limiting the travel of a slave piston in a slave piston cylinder in a compression relief engine retarder, said cylinder being connected in a hydraulic circuit so that when hydraulic fluid is forced into said cylinder at one end of said slave piston, said slave piston moves along a longitudinal axis of said cylinder, said clip valve apparatus comprising:
a threaded body;
a first bore in said body, said first bore having side walls which are substantially parallel to said longitudinal axis;
a spring disposed in said first bore; and
a plunger disposed in said first bore for reciprocation relative to said first bore substantially parallel to said longitudinal axis; wherein:
said slave piston and said plunger travel between (a) a first position in which said plunger covers a hole in said slave piston and (b) a second position in which said plunger uncovers said hole; and further comprising:
a retaining ring disposed in a groove in said first bore, whereby when said plunger is forced by said spring into contact with said retaining ring, said retaining ring arrests the motion of said plunger at substantially said second position; and
a second bore in said plunger, said second bore being disposed substantially parallel to said longitudinal axis, said second bore communicating with said first bore via a first aperture, said second bore further communicating with a third bore in said plunger via a second aperture in the walls of said third bore.

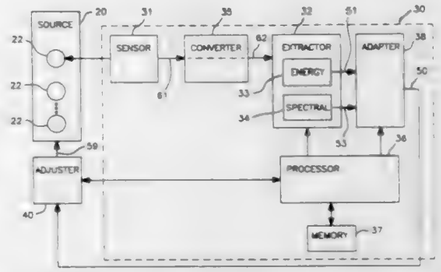
5,201,291
THROTTLE VALVE CONTROLLER
Yukiya Katoh; Takeru Yasuda, and Sunao Kitamura, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Aug. 21, 1992, Ser. No. 933,361
Claims priority, application Japan, Aug. 21, 1991, 3-235501; Nov. 15, 1991, 3-328108
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—399 **9 Claims**



1. A throttle valve controller for an engine comprising:
a throttle valve pivotally movable along with a throttle shaft in an intake passage of the engine;
an electronic control transmission path for transmitting input torque to the throttle shaft;
an electromagnetic actuator for applying torque to the electronic control transmission path;
a mechanical control transmission path for transmitting manipulation force of an accelerator pedal to the throttle shaft; and
switching means for connecting one of the electronic control and mechanical control transmission paths and disconnecting the other.

5,201,292
APPARATUS AND METHOD FOR DETECTING VIBRATION PATTERNS
Kamil A. Grajski, San Jose; Carson Chen, Foster City, and Garry Chinn, Los Angeles, all of Calif., assignors to Loral Aerospace Corp., New York, N.Y.
Filed Aug. 30, 1991, Ser. No. 753,432
Int. Cl.[5] F02D *41/14;* **F02P** *5/15;* **G01H** *17/00;* **G01L** *23/22*
U.S. Cl. 123—425 **15 Claims**

1. An apparatus for detecting event vibration patterns from a vibration source comprising:
sensing means coupled to the vibration source for producing in response to sensing vibration from the vibration source a sensed signal; and
controlling means, coupled to the sensing means, for receiving the sensed signal to provide a detected event signal;
wherein said controlling means comprises feature extracting means coupled to the sensing means for converting the sensed signal into an energy signal and a spectral signal; said controlling means disposed for adaptively processing said energy signal and said spectral signal separately to detect an event vibration pattern and provide said detected event signal in response to said controlling means comparing said energy signal to a predetermined energy threshold and comparing said spectral signal to a predetermined spectral threshold; said energy and spectral thresholds being adapted dynamically according to vibration source conditions.



5,201,293
METHOD OF MONITORING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE
Arnd-Matthias Langner, Korwestheim, and Richard Schleupen, Grossingersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 8, 1991, Ser. No. 790,640
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1990, 4035957
Int. Cl.[5] F02D *41/22;* **F02P** *17/00*
U.S. Cl. 123—436 **2 Claims**

1. A method of monitoring, in a motor vehicle, an internal combustion engine thereof comprising a plurality of cylinders having a predetermine power stroke sequence, means for detecting faltering transmission of torque from said engine, means for monitoring combustion by torque falters, means for electrical monitoring of ignition failure and failure rate and identification of cylinder affected by ignition failure and means for determining conditions for plausible detection of isolated ignition failures, said method including the steps of:
(1) determining whether circumstances of engine operation are such that faltering torque information is useful for detecting combustion failure;
(2) if circumstances of ignition operation are found useful for detecting combustion failures by torque falters, monitoring combustion failures thereby and determining whether torque falters are more frequent then a predetermined falter rate (α);

(3) if torque falters are found more frequent then said predetermined falter rate (α), registering an combustion failure,

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HIGH PRESSURE FUEL INJECTION SYSTEM

producing a signal representative of the determined en- pumping in a fuel injection pump during the pumping strokes

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(3) if torque falters are found more frequent then said predetermined falter rate (α), registering an combustion failure, identifying an affected cylinder and producing a cylinder-specific remedy and thereafter returning to step I 1 of this method for another power stroke;

(4) if circumstances of engine operation are found unfavorable for detecting combustion failures by torque falters, electrically monitoring ignition failure rate and thereby determining whether ignition failures are more frequent than a predetermined ignition failure rate (β);

(5) if an ignition failure rate exceeding said predetermined ignition failure rate (β) is found, registering an ignition failure, identifying an affected cylinder, producing a cylinder-specific remedy and thereby after returning to step (1) of this method for another power stroke;

(6) if an ignition failure rate is found which is not greater than said predetermined ignition rate (β) and if a torque falter rate is found which is not greater than said predetermined torque falter rate (α), determining whether engine operating conditions are such that electrical detection of an individual ignition failure would be plausible, and if so, determining electrically whether in the present power stroke an individual ignition failure takes place;

(7) if an individual ignition failure is found to have taken place in step (6) of this method, registering an isolated ignition error and returning to step (1) of this method for another power stroke, and

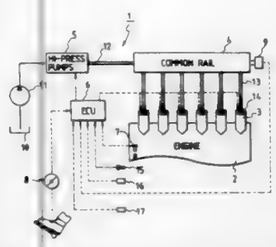
(8) if in step (6) ignition operating conditions are found to be such that the electrical detection of an individual ignition error would be implausible, or if in step (7) no individual ignition error is detected, returning to step (1) of this method for a succeeding power stroke.

5,201,294

COMMON-RAIL FUEL INJECTION SYSTEM AND RELATED METHOD

Isao Osuka, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 27, 1992, Ser. No. 842,522
Claims priority, application Japan, Feb. 27, 1991, 3-033220
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—458 **15 Claims**



1. A common-rail fuel injection system for an engine, comprising:

a common rail storing fuel;

a plurality of pumps supplying fuel to the common rail;

means for injecting fuel into the engine from the common rail;

means for feedback-controlling a pressure of the fuel in the common rail;

means for detecting whether or not at least one of the pumps fails; and

means for decreasing the pressure of the fuel in the common rail when said detecting means detects that at least one of the pumps fails.

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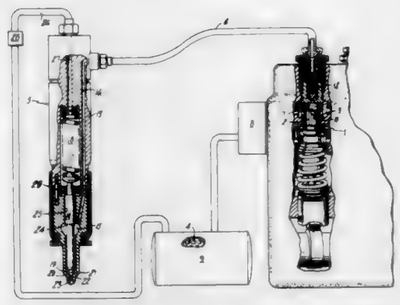
HIGH PRESSURE FUEL INJECTION SYSTEM

John A. Kimberley, East Granby, Conn., and John B. Cavanaugh, W. Springfield, Mass., assignors to AIL Corporation, Columbia, S.C.

Continuation-in-part of Ser. No. 478,199, Feb. 7, 1990, which is a continuation-in-part of Ser. No. 271,111, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 891,933, Jul. 30, 1986, abandoned. This application Apr. 17, 1991, Ser. No. 686,830
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—467 **17 Claims**



1. A fuel injection system for providing a controllable residual fuel pressure within a fuel injector between injections, characterized by:

a fuel injection pump connected to a fuel supply;

at least one fuel injector for periodically injecting fuel into an engine;

conduit means connecting said fuel injection pump with said fuel injector for delivery of fuel thereto;

a check valve disposed between said fuel injection pump and said conduit means to prevent fuel back flow to said fuel injection pump;

fuel return means for returning leakage fuel from said injector to said fuel supply;

pressure influencing means disposed within said fuel return means for controlling fuel pressure within said fuel return means in accordance with engine load, an increase in pressure within said fuel return means producing a corresponding increase in residual pressure within said injector and said conduit means, said pressure influencing means comprising a variable orifice valve.

5,201,296

CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John J. Wunning, Peoria; Errol W. Davis, Chillicothe; Larry E. Schmidt, Peoria; Ronald J. Penick, Peoria; Mohamad Z. Deiri, Peoria, and Paul M. Young, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 30, 1992, Ser. No. 860,657
Int. Cl.[5] F01L *9/04;* **F02D** *43/04, 41/22*
U.S. Cl. 123—479 **11 Claims**

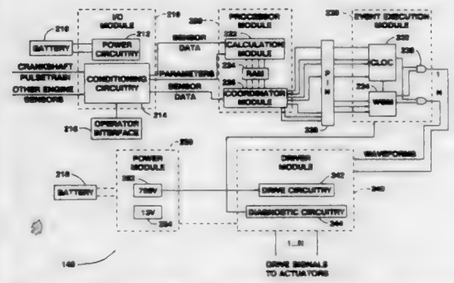
1. A control system for an internal combustion engine having a plurality of cylinders and a rotatable crankshaft, each cylinder having an electronically actuatable intake valve, exhaust valve and fuel injector, comprising:

sensing means for monitoring the rotation of the crankshaft and responsively producing a crankshaft pulsetrain;

operator interface means for producing operator parameter signals, the operator parameter signals including one of a plurality of engine operating modes;

coordinator means for receiving the crankshaft pulsetrain, responsively determining the speed of the engine and producing a signal representative of the determined engine speed;

calculation means for receiving the operator parameter signals and the engine speed signal, responsively determining valve and injection events for each cylinder to responsively achieve the one engine operating mode, and producing signals representative of the determined valve and injection events, said calculation means including a matrix having values representative of safe engine operation and wherein said calculation means compares the valve event values with the values of the matrix;



means for receiving the crankshaft pulsetrain, responsively determining the rotational position of the crankshaft, and producing digital signals indicative of the determined crankshaft position; and

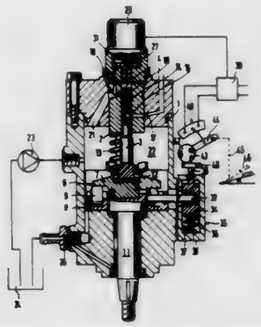
means for receiving the valve and injection event signals and the digital signals, and responsively delivering an event waveform signal to each of the electrically actuatable valves and fuel injectors at an appropriate rotational position of the crankshaft, the event waveform signals being representative of a voltage to be applied to the electrically actuatable valves and fuel injectors.

5,201,297

METHOD AND APPARATUS FOR CONTROLLING A HIGH-PRESSURE FUEL PUMPING TIME IN A FUEL INJECTION PUMP

Ewald Eblen, Stuttgart; Anton Karle, Leonberg; Helmut Laufer, Gerlingen, and Max Straubel, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,433
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729636
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—502 **5 Claims**



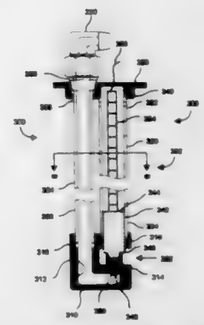
1. A method for controlling the time of high-pressure fuel pumping in a fuel injection pump during the pumping strokes of a pump piston, actuatable by an adjustable cam drive, of the fuel injection pump, by means of determining the time of the closing state of a valve, which is disposed in a relief line leading away from the pump work chamber of the fuel injection pump and is controlled electrically by an electric control unit, wherein by the selection of the time of the closing state in combination with a controlled shift of the cam drive relative to the drive shaft of the fuel injection pump, various regions of variable steepness of the cam driving the pump piston in its pumping stroke become operative, and the injection duration and injection onset are controlled by the electric control unit in accordance with the needs of the engine, comprising shifting the time of high-pressure fuel pumping in a first engine operating range from partial load to full load in the range from the beginning to the middle region of the cam lobe curve of the cam drive, by means of controlling said valve and controlling said cam drive by independent operating parameters and in a second engine operating range, corresponding to low load, shifting the end of the time of the closing stage of the electrically controlled valve constantly to top dead center or to after top dead center of the cam driving the pump piston and shifting of the cam drive in a "early" position, and form there toward "late" with an increasing fuel injection quantity.

5,201,298

COMBINATION SENDING UNIT AND FUEL DRAW AUTOMATIC SHUTOFF VALVE

Kenneth M. Shearn, Maple Valley, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Dec. 27, 1991, Ser. No. 813,993
Int. Cl.[5] F02B *77/00;* **F16K** *31/18;* **F16T** *1/20*
U.S. Cl. 123—514 **12 Claims**



1. A fuel tank system for a vehicle wherein the vehicle is of the type having a combustion engine for consuming a liquid fuel to provide motivating energy to the vehicle, said fuel tank system comprising:

first and second fuel tanks each constructed for storing the liquid fuel, said first and second fuel tanks having top and lower portions;

main draw line means connected for conducting fuel to the combustion engine;

first and second draw tubes each including first and second ends, said first ends of said first and second draw tubes each coupled to said main draw line means for conducting the liquid fuel from said first and second fuel tanks to said main draw line means;

main return line means connected for conducting fuel from the combustion engine;

first and second return tubes each including first and second ends, said first ends of said first and second return tubes each coupled to said main return line means, said second ends of said first and second return tubes being mounted respectively to said top portion of said first and second

into the air intake depending on the operating condition of

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VOLTAGE REGULATOR TUBE FOR IGNITION SYSTEM

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fuel tanks to extend interior of said first and second fuel tanks and terminating in a free end for conducting the liquid fuel from said main return line means to said first and second tanks;

first and second sending unit assemblies mounted respectively to said top portion of said first and second fuel tanks, said first and second sending unit assemblies including respective first and second draw tube portions each including first and second ends, said first ends of said first and second draw tube portions being coupled to said second ends of said first and second draw tubes, respectively, said second ends of said first and second draw tube portions extending inwardly of said first and second fuel tanks toward the bottom portion thereof, said first and second sending unit assemblies further including respective first and second float tubes and first and second float valves, said first and second float tubes being positioned proximate said second ends of said first and second draw tube portions and said first and second float valves being positioned interior of said first and second float tubes, said first and second float valves each including a submerged protion and a floating portion, said first and second float tubes extending substantially from said top portion to said bottom portion of said first and second fuel tanks so that said first and second float valves float substantially atop the liquid fuel in said first and second tanks with said submerged portions in contact with said liquid fuel so that said first and second float valves move along the length of said first and second float tubes in response to changes in the amount of liquid fuel in said first and second fuel tanks, said first and second float valves having first and second stoppers mounted to said submerged portions, said first and second float tubes each including a linear potentiometer mounted proximate said first and second float valves, said first and second float valves each including a magnetic contact mounted proximate said linear potentiometer to provide magnetic coupling between said linear potentiometer and said magnetic contact, said first and second sending unit assemblies further including respective first and second adapter valves wherein said first and second adapter valves each comprise substantially U-shaped members having first and second ends and a channel extending from said frist end to said second end, said first ends of said first and second adapter valves being coupled to said second ends of said first and second draw tube portions for conducting the liquid fuel in said first and second tanks to said first and second draw tube portions, said second ends of said first and second adapter valves being positioned in vertical alignment with said first and second float tubes and having a seat for receiving said first and second stoppers, said second ends of said first and second adapter valves being displaced slightly from said second ends of said first and second float tubes to define an inlet for conducting the liquid fuel from said first and second fuel tanks to said second ends of said first and second adapter valves, said second ends of said first and second adapter valves being slightly displaced from said lower portions of said first and second fuel tanks so that said first and second stoppers will seat within said second ends of said first and second adapter valves before all of the liquid fuel in the first and second fuel tanks is withdrawn thereby to prevent further withdrawal of the liquid fuel from said first and second fuel tanks; and

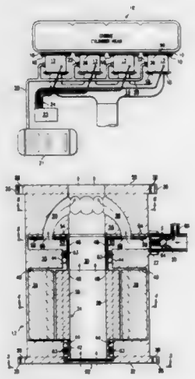
means for determining the change in resistance of said potentiometers as a result of movement of said magnetic contacts to thereby determine the amount of liquid fuel remaining in said first and second fuel tanks.

5,201,299

ROTARY GASEOUS FUEL INJECTOR

Hakchul Kong, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Dec. 11, 1991, Ser. No. 804,994
Int. Cl.[5] F02M *21/04*
U.S. Cl. 123—527 **24 Claims**



1. A fuel injector for injecting gaseous fuel into an internal combustion engine having a fuel injection controller, a gaseous fuel supply, and a fuel supply conduit connecting the fuel supply with the engine, the fuel injector comprising:

an injector body including a bore extending therethrough, a chamber formed therein, passage means therein connecting the chamber with the bore, and an inlet port connected to the chamber and connectable to the fuel supply conduit for supplying the fuel from the fuel supply to the chamber;

a valve member located in the injector body for movement between a first position blocking the flow of fuel from the chamber to the bore through the passage means, and a second position permitting the flow of fuel therethrough; and

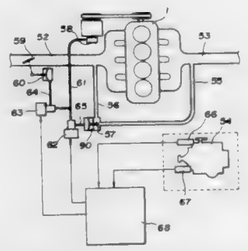
actuating means responsive to the fuel injection controller for selectively moving the valve member between the first and second positions.

5,201,300

DIRECT INJECTION DIESEL ENGINE

Akihiro Iiyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Sep. 10, 1991, Ser. No. 756,209
Claims priority, application Japan, Sep. 12, 1990, 2-241513
Int. Cl.[5] F02B *47/08*; F02M *37/04*
U.S. Cl. 123—569 **24 Claims**



1. A diesel engine having a combustion chamber formed by a cylinder and a piston and into which fuel is directly injected, comprising:

a device for recirculating at least a part of the exhaust gas into the air intake depending on the operating condition of the engine,

a fuel injection valve fitted to a cylinder head of said cylinder substantially parallel to or coaxial with the cylinder axis and facing the center of said combustion chamber, said injection valve lifting in two stages, depending on the fuel pressure, to inject fuel into the chamber,

a fuel injection pump which supplies high pressure fuel to said fuel injection valve in synchronization with the engine, said fuel injection pump having a plunger driven by a cam in synchronization with the engine revolution for pressurizing fuel, a control sleeve sliding on an outer surface of said plunger along the axis of said plunger to advance or delay the time at which fuel is supplied to the engine, and a sleeve drive cam to drive said control sleeve relative to said plunger so as to delay the time at which fuel begins to be supplied and increase the fuel supply rate when the engine is running on partial load, and

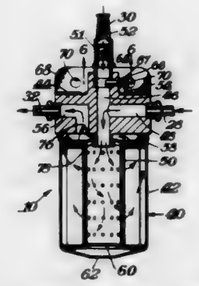
a pressure equalizing valve which maintains the residual fuel pressure in a pipe which leads fuel from said pump to said fuel injection valve at an effectively constant level.

5,201,301

ADJUSTABLE AMBIENT AIR FILTERING SYSTEM AND POLLUTION CONTROL DEVICE

Ron Re, Wilmington, Del., assignor to Re-Tech, Inc., New Castle, Del.

Filed May 28, 1992, Ser. No. 889,420
Int. Cl.[5] F02B *25/06*
U.S. Cl. 123—573 **7 Claims**



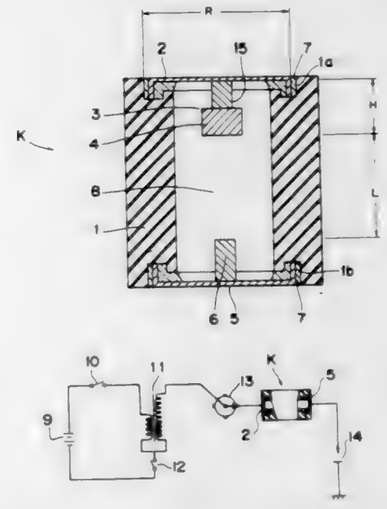
1. An ambient air filtering system and pollution control device for an internal combustion engine comprising a valve housing, an inlet port mounted to said housing for receiving blow by gases from the engine crankcase, and ambient air inlet mounted to said housing, a flow passageway in said housing, said inlet port communicating with said passageway at a first upstream portion of said passageway, said air inlet communicating with said passageway at a second upstream portion of aid passageway, an outlet connector port mounted to said housing, said passageway having a discharge portion downstream from said first upstream portion and said second upstream portion, and said discharge portion including a discharge filter whereby the gases and ambient air may mix in said passageway and the mixture is filtered by said discharge filter before being discharged from said housing through said outlet port, an adjustable air flow control means between said first upstream portion and said second upstream portion, said air flow control means including a flow control screw selectively movable into and out of said flow passageway, said housing comprising an upper chamber and a cartridge detachably mounted to said upper chamber, and a check valve and filter between said ambient air inlet and said air flow control means to filter ambient air entering said flow passageway.

5,201,302

VOLTAGE REGULATOR TUBE FOR IGNITION SYSTEM OF INTERNAL COMBUSTION ENGINE

Tetsuo Furuya, and Nobuto Tsujikawa, both of Fukuchiyama, Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed May 26, 1992, Ser. No. 888,904
Claims priority, application Japan, May 27, 1991, 3-120986
Int. Cl.[5] F02P *15/00*
U.S. Cl. 123—627 **2 Claims**



1. A voltage regulator tube for an ignition system of an internal combustion engine in which a high voltage generated at a secondary winding of an ignition coil is applied to a spark plug such that spark discharge is effected by said spark plug, said voltage regulator tube being inserted between said secondary winding and said spark plug and comprising:

a cylindrical enclosure which is made of electrical insulating material and is formed with a hollow extending therethrough such that the hollow has opposite openings;

a first metallic sealing member for sealing one of the openings of the hollow, which is electrically connected to said secondary winding;

a first main electrode which is mounted on said first metallic sealing member so as to be disposed in the hollow of said enclosure;

a second metallic sealing member for sealing the other of the openings of the hollow, which is electrically connected to said spark plug; and

a second main electrode which is mounted on said second metallic sealing member so as to be disposed in the hollow of said enclosure such that said first and second main electrodes confront each other;

wherein inert gas is hermetically filled in the hollow of said enclosure;

wherein the following equation is satisfied:

$$-1.5 \leqq 0.8L - 0.72R + 3.11H - 5.81 \leqq 1.5$$

where character L denotes a distance between a distal end of said first main electrode and a distal end of said second main electrode in mm, character R denotes a diameter of said first metallic sealing member in mm and character H denotes a height of said first main electrode in mm.

5,201,303

EGR CONTROL DEVICE FOR AN ENGINE

cally movably disposed on said indicating means for movement along the center line of said bow, whereby the

venting said abrasive grains from adhering to said cut portion of said workpiece.

by said insulation on its vertical sides, said insulation containing organic materials capable of resulting in the

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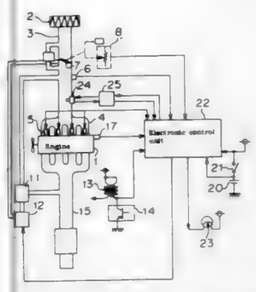
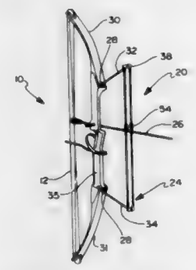
5,201,303
EGR CONTROL DEVICE FOR AN ENGINE
Shinji Kojima, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 16, 1992, Ser. No. 899,246
Claims priority, application Japan, Jul. 12, 1991, 3-172193
Int. Cl.[5] F02M *25/06*
U.S. Cl. 123—704 6 Claims



1. An EGR control device for an engine comprising:
an exhaust gas recirculating passage for connecting an exhaust pipe to an intake pipe of an internal combustion engine;
an exhaust gas recirculating valve provided at the exhaust gas recirculating passage for controlling a quantity of exhaust gas which is recirculated to intake air of an engine;
an oxygen sensor provided at an intake passage on the downstream side of a junction point of the recirculated gas and the intake air for detecting an oxygen concentration of the intake air mixed with the recirculated gas;
an exhaust gas recirculating valve passage area controlling means for controlling a passage area of the exhaust gas recirculating valve;
a running state detecting means for detecting a running state of the engine;
a calculating means for calculating a first exhaust gas recirculation ratio based on an output of the oxygen sensor and for calculating a second exhaust gas recirculation ratio corresponding to a value detected by the running state detecting means; and
a feedback controlling means for performing a feedback control which increases or decreases the passage area of the exhaust gas recirculation valve so that the first exhaust gas recirculation ratio agrees with the second exhaust gas recirculation ratio.

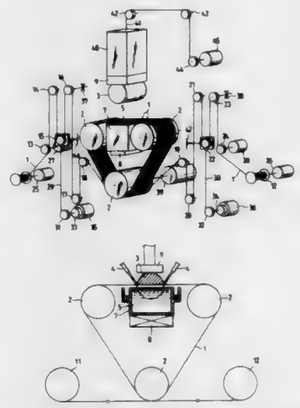
5,201,304
CENTER SHOT GAUGE
Leonard D. Rezmer, Montrose, Mich., assignor to Gametracker, Inc., Montrose, Mich.
Filed Sep. 26, 1991, Ser. No. 766,621
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—24.1 5 Claims

1. An apparatus for attaching to a compound bow having a center line to assist in calibrating an adjustable arrow rest on the bow, the compound bow having a bow string which is offset from the center line of the bow, the apparatus comprising:
(a) means for indicating the center line of the bow, the means for indicating being attachable to the bow, the means for indicating being vertically disposed on the bow along the center line thereof;
(b) means for measuring the position of an arrow shaft with respect to the center line of the bow when the arrow is mounted on the bow, said measuring means being vertically movably disposed on said indicating means for movement along the center line of said bow, whereby the



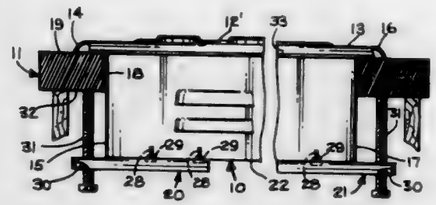
user of the apparatus can compensate for the bow string being offset from the center line of the bow.

5,201,305
BRITTLE MATERIAL CUTTING METHOD
Noriyuki Takeuchi, Kanagawa, Japan, assignor to Nippei Toyama Corporation, Tokyo, Japan
Continuation of Ser. No. 629,163, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 447,338, Dec. 7, 1989, abandoned. This application Nov. 19, 1991, Ser. No. 795,256
Int. Cl.[5] B28D *1/08*
U.S. Cl. 125—21 3 Claims



1. In an apparatus for cutting a workpiece comprising brittle material in which a wire (1) is supplied from a wire supply reel (11), wound over a plurality of grooved rollers (2), and wound on a wire take-up reel (12), and while, between said grooved rollers (2), said wire (1) and said workpiece (3) comprising brittle material are pushed against each other, a machining solution (5) containing abrasive grains is supplied to said workpiece, to cut said workpiece, a method of cutting said workpiece comprising brittle material comprising the steps of:
pushing said workpiece (3) downwardly against said wire (1) from above with a pushing member positioned above said workpiece,
immersing the substantially entire cut portion of said workpiece in a machining solution in a machining solution pooling vessel (7) provided below said workpiece (3); and
maintaining the cut portion of said workpiece substantially in its entirety in said machining solution in said machining solution pooling vessel (7) while said workpiece is being cut with the portion of the workpiece presently being cut not submerged in the machining solution, thereby preventing said abrasive grains from adhering to said cut portion of said workpiece.

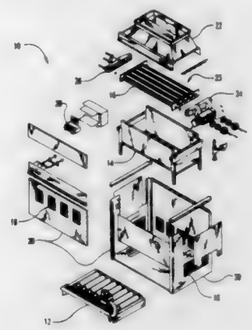
5,201,306
ARRANGEMENT FOR SECURING A DROP-IN DEVICE TO A FIXED SUPPORT
David L. Kinny, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Sep. 9, 1991, Ser. No. 761,165
Int. Cl.[5] F24C *15/10*
U.S. Cl. 126—214 A 20 Claims



1. A drop-in device for disposition in an opening in a fixed support including an upper support surface, said drop-in device including:
a body having a lower portion with a periphery slightly smaller than the opening in the fixed support in which said body is to be disposed;
said body having an upper support portion larger than the opening in the fixed support for engaging the upper support surface of the fixed support to support said drop-in device on the fixed support when said lower portion of said body is disposed in the opening in the fixed support;
said lower portion of said body having a bottom surface having two separate retaining means slidably mounted thereon for retaining said body against movement;
releasably holding means for releasably holding each of said two separate retaining means in a retracted position on said body in which each of said two separate retaining means does not extend beyond the periphery of said lower portion of said body and an extended position in which each of said two separate retaining means extends a selected distance beyond the periphery of said lower portion of said body when slidably moved from said retracted position;
each of said two separate retaining means being movable only in a non-pivoting sliding motion between said retracted and extended positions and substantially parallel to said bottom surface of said lower portion of said body;
said two separate retaining means extending from opposite edges of said body when said two separate retaining means are in their extended positions; and
each of said two separate retaining means including engaging means for engaging a lower surface of the fixed support beneath said upper support surface to retain said drop-in device against movement when each of said two separate retaining means is in its extended position.

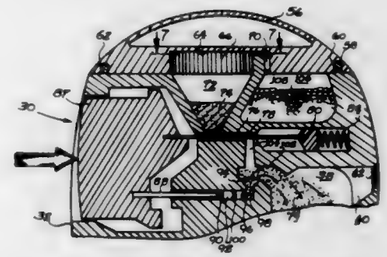
5,201,307
INSULATED FIREBOX FOR SWIMMING POOL OR SPA HEATERS FOR REDUCTION OF SMOKE OR ODOR
Mohammad R. Afshar, Diamond Bar, Calif., assignor to Hydrotech Chemical Corp., City of Industry, Calif.
Filed Nov. 7, 1991, Ser. No. 789,051
Int. Cl.[5] F22B *21/04*
U.S. Cl. 126—344 10 Claims

1. An insulated firebox which forms a portion of the combustion chamber of a pool heater and which is adapted for reducing the emission of smoke and odor from the firebox into the atmosphere, comprising:
insulation material defining a combustion chamber enclosed by said insulation on its vertical sides, said insulation containing organic materials capable of resulting in the generation of smoke or odor; and
a liner extending substantially continuously about said insulation material and sealing the vertical sides of the combustion chamber from the escape therethrough of the organic materials contained by said insulation,



said firebox comprising four upstanding legs defining corners of the combustion chamber, upwardly open channel members extending between respective pairs of said legs, insulation panels extending vertically between respective pairs of said legs and being received in the upwardly open channel members, and liner panels received adjacent the outer surfaces of said insulation panels and being received in the upwardly open channel members.

5,201,308
POWDER INHALER
Michael T. Newhouse, 436 Queen Street South, Hamilton, Ontario, Canada L8P 3T9
Division of Ser. No. 484,069, Feb. 14, 1990, Pat. No. 5,113,855.
This application Mar. 19, 1992, Ser. No. 831,507
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—203.15 6 Claims



1. A powdered medication inhaler comprising a hollow body having a chamber of substantial height for aerosolizing powdered medication, means for admitting air into said chamber, means for connecting said hollow body and said chamber to a living body for inhalation from said chamber into said living body relatively adjacent the top of said chamber, a storage hopper in said hollow body adjacent a lower portion of said chamber for storing powdered medication and having a discharge opening therefrom, a powdered medication discharge station positioned below said chamber adjacent a lower portion thereof, transfer means having a medication transfer recess therein, said transfer means being in communication

with said medication storage hopper through said discharge

the wall of a body cavity within which the tube is inserted, the

(c) exciting an NMR response signal from the first constitu- process across signals having a certain time duration since

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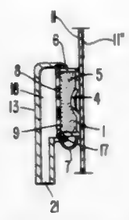
with said medication storage hopper through said discharge opening, and being movable from a position with said recess communicating with said discharge opening for receiving a predetermined quantity of powdered medication in said recess to a position communicating with said discharge station, said discharge station being positioned below said living body connecting means, means providing a passageway extending upwardly from said discharge opening into said chamber, and means adjacent said discharge opening operatively connected to a source of gas under pressure for positively passing gas past said discharge station in timed relation to delivery of powdered medication into and through said passageway into said chamber to carry powdered medication into said aerosolizing chamber for inhalation of said medication adjacent an upper portion of said chamber into said living body.

5,201,309
BREATHING AID FOR LARYNGOTOMY TRACHEOSTOMY PATIENTS

Roland Friberg, Sollentuna, and Inge Blomquist, Vaggeryd, both of Sweden, assignors to Gillis Andersson, Danderyd and Bror Palmcrantz, Vaellingby, both of Sweden

Filed Nov. 21, 1991, Ser. No. 795,566
Claims priority, application Sweden, Nov. 22, 1990, 9003720
Int. Cl.[5] A61M *16/04*; **B65D** *55/16*
U.S. Cl. 128—207.14 **12 Claims**



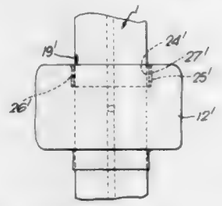
1. A breathing aid for laryngotomy tracheostomy patients of the type having a replaceable filter unit, the aid comprising a filter house adapted to be applied near to and in communication with the opening which is provided in the throat of the patient and which is adapted to receive the replaceable filter unit through which the breathing air passes; a cover with perforations, said cover adapted to close said filter house and hold the filter unit in place and by the opening of which the filter unit may be removed for replacement; and a heat shield releasably connected to the cover, said heat shield having a directed channel and being adapted to direct only air which has passed through said directed channel to pass through the perforations, wherein the filter house is made in one piece with the cover by means of a flexible strip which connects the filter house and the cover to comprise a filter house unit, said strip serving as a hinge for swinging the cover from an open position to a closing position, and wherein said filter house unit and the heat shield have interacting location means for the correct registering of the heat shield in relation to said filter house.

5,201,310
MEDICO-SURGICAL TUBE WITH SEALING CUFF AND A SUCTION LUMEN AT THE TOP OF THE CUFF

Christopher S. Turnbull, Hythe, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Nov. 15, 1991, Ser. No. 792,626
Claims priority, application United Kingdom, Dec. 5, 1990, 9026405
Int. Cl.[5] A61M *16/00, 29/00*
U.S. Cl. 128—207.15 **4 Claims**

1. In a medico-surgical tube of the kind comprising a tube having a bore extending therethrough that opens at both ends of the tube, a sealing cuff embracing the tube with an inflatable portion of the cuff adapted to seal the outside of the tube with the wall of a body cavity within which the tube is inserted, the sealing cuff being attached to the tube by respective proximal and distal collar portions at opposite ends of the cuff, a suction lumen extending along the tube to the region of the proximal end of the cuff, and a suction aperture opening from the lumen to the exterior of the tube adjacent the proximal end of the sealing cuff, the improvement wherein said proximal collar portion is formed by folding back the material of said sealing cuff, at the proximal end of the sealing cuff, towards said distal

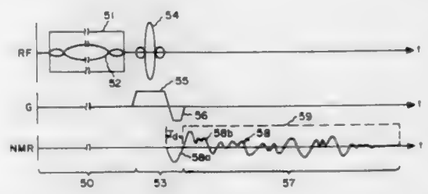


collar portion and along said tube inside the inflatable portion of the sealing cuff so that the inflatable portion of the sealing cuff overlies the proximal collar portion and so that the proximal end of said folded back cuff material does not extend beyond the proximal end of the inflatable portion of the sealing cuff, said suction aperture opening being located such that the bottom of said opening is at substantially the same level as the uppermost extent of said inflatable portion of the sealing cuff to permit secretions collecting in this region to be aspirated through said suction lumen.

5,201,311
SPATIALLY-LOCALIZED CHEMICAL-REACTION-RATE NMR SPECTROSCOPIC IMAGING

Paul A. Bottomley, Clifton Park, and Christopher J. Hardy, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 727,334, Jul. 3, 1991, abandoned, which is a continuation of Ser. No. 392,316, Aug. 11, 1989, abandoned.
This application Aug. 10, 1992, Ser. No. 927,780
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **23 Claims**



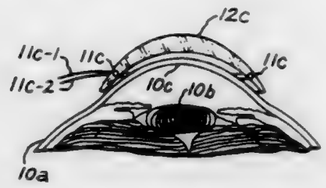
1. A method for providing information about a rate of a selected chemical reaction in each of at least one selected voxel of a sample, comprising the steps of:
(a) immersing the sample having at least a first reaction constituent and a second reaction constituent in a static magnetic field;
(b) labeling the second reaction constituent by applying a chemically-selective RF stimulus to the sample in the absence of a magnetic field gradient, said labeling including the step of substantially inverting resonance magnetization from the second reaction constituent, the chemically-selective RF stimulus being an RF pulse having a frequency substantially centered at a selected characteristic peak of an NMR chemical shift spectrum of the second reaction constituent, and having a bandwidth substantially the width of the selected characteristic peak;

(c) exciting an NMR response signal from the first constituent resonance, and spacially localizing the NMR response signal to a desired one of the at least one selected voxel;
(d) acquiring and storing data characterizing a magnetization amplitude M_A of the NMR response signal from the desired voxel;
(e) substantially inverting a complementary control portion of the NMR spectrum of the second reaction constituent, with respect to the resonance of the second reaction constituent, and
(f) repeating the steps (c) and (d), for the same desired voxel, to obtain data characterizing an inverted magnetization amplitude M'_{0A}; and
(g) calculating from the M_A and M'_{0A} data a quantity substantially proportionate to a reaction rate constant k_A in that desired voxel.

5,201,312
ANTENNAE FOR HIGH-RESOLUTION MAGNETIC RESONANCE IMAGING OF THE EYE

John F. Schenck, Schenectady, N.Y.; Steven P. Souza, Williamstown, Mass., and David R. Eisner, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 707,998, May 23, 1991, abandoned, which is a continuation of Ser. No. 452,176, Dec. 18, 1989, abandoned. This application Aug. 19, 1992, Ser. No. 939,381
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.5 **4 Claims**



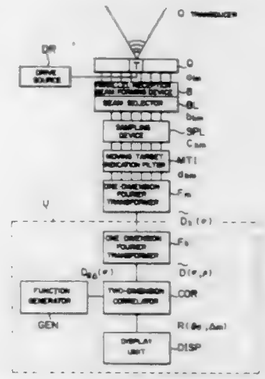
1. An antenna adapted for NMR imaging for an eye of a patient, comprising:
a surface coil having at least one turn of a conductive wire arranged in one of circular and oval shape; and
means for locating and maintaining the surface coil adjacent to an anterior surface of said eye and in an orbital region of said patient bounded by the zygomatic and super-orbital arches;
wherein said means for locating includes a contact-lens-like member supporting the surface coil,
the contact-lens-like member being adapted for holding the surface coil adjacent to a sclerotic portion of said eye.

5,201,313
ULTRASONIC FLOWMETER

Kageyoshi Katakura, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 575,572, Aug. 31, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 860,563
Claims priority, application Japan, Sep. 4, 1989, 1-227360
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—661.09 **9 Claims**

1. An ultrasonic flowmeter comprising: a transducer made up of an array of elements; means for driving part of said transducer elements in a prescribed interval thereby to repeatedly transmit an ultrasonic wave to a target; a parallel reception beam forming means for rectifying phases of signals from said transducer elements and for producing parallel reception signals derived from reception beams with different directivities; a sampling means for sampling each of said parallel reception signals and for storing said sampled signals; filtering means for performing moving target indication through a differential process across signals having a certain time duration since transmission among the signals from said sampling means; a first one-dimension Fourier transform means for performing Fourier tranformation for the output of said filtering means in the direction of alignment of the reception beams; and a second

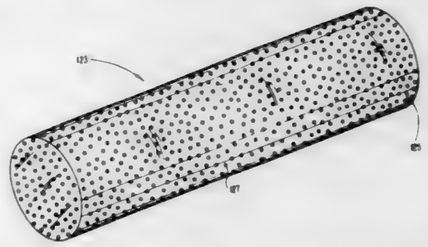


Fourier transform means for performing Fourier transformation sequentially for the outputs of said first Fourier transform means in the direction of repetitive transmission so that lateral velocity and axial velocity of a moving object in said target are obtained form a two-dimensional distribution of the outputs of said second Fourier transform means.

5,201,314
ECHOGENIC DEVICES, MATERIAL AND METHOD

Rodney W. Bosley, Jr., Bloomington; Paul G. Thomson, Fillmore, and Thomas L. Foster, Poland, all of Ind., assignors to Vance Products Incorporated, Spencer, Ind.

Continuation-in-part of Ser. No. 383,174, Jul. 20, 1989, Pat. No. 5,081,997, which is a continuation-in-part of Ser. No. 320,967, Mar. 9, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 823,323
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.02 **21 Claims**



1. An echogenic medical device insertable into a medium and imageable with sonic imaging equipment, comprising:
a member for insertion into a medium having a first acoustic impedance, said member including a first material and an interface layer on said first material, said interface layer having a particulate-type, discontinuous curved surface having a dimension less than a wavelength of a sonic beam from said equipment, said interface including a second material different from said first material and having a second acoustic impedance different from said first acoustic impedance of said medium, said first and second acous-

tic impedances having at least a predetermined difference

ter body, said housing including a distal portion and a

light source to induce autofluorescence of the tissue such that the tissue emits fluorescent radiation at a multiplicity

remains stationary for a fixed time in a squatting position and stands up into a standing position, said measuring

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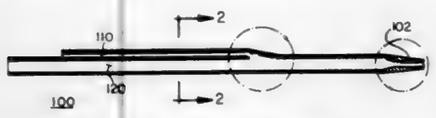
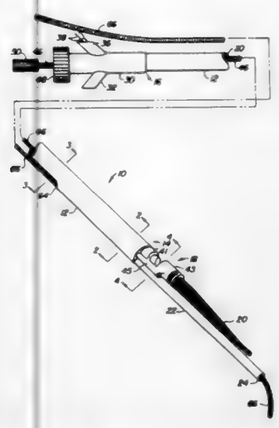
tic impedances having at least a predetermined difference therebetween, whereby said difference between said first and second acoustic impedances and said curved surface cooperate in response to said sonic beam to produce an image of said member.

5,201,315
ULTRASOUND IMAGING SHEATH
James M. Griffith, P.O. Box 15337, Newport Beach, Calif. 92659
Filed Oct. 8, 1991, Ser. No. 773,037
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **7 Claims**



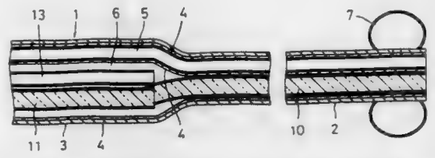
1. An ultrasound imaging sheath comprising:
a flexible distal tip portion with a tip lumen adapted to accept a guide wire;
a flexible dual lumen region comprising a guide wire lumen adapted to accept a guide wire, and a probe lumen adapted to accept an ultrasound probe; and
a flexible intermediate section comprising an intermediate lumen communicating at a proximal end with both the wire lumen and the probe lumen, and communicating at a distal end with the tip lumen, wherein the intermediate lumen is adapted to alternately accept the guide wire and the ultrasound probe.

5,201,316
GUIDE WIRE RECEPTACLE FOR CATHETERS HAVING RIGID HOUSINGS
Mark L. Pomeranz, Los Gatos; Stephen M. Salmon, Sunnyvale, and Pat A. Gingell, San Jose, all of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.
Filed Mar. 18, 1991, Ser. No. 672,069
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **21 Claims**



1. An ultrasonic imaging catheter comprising:
a flexible catheter body having a proximal end and a distal end;
a rigid housing secured to the distal end of the flexible catheter body, said housing including a distal portion and a proximal portion joined by an external metal rod;
a flexible end piece having a tapered distal end and a proximal end secured to the housing, whereby the stiffness of the end piece lessens in the distal direction away form the housing;
means within the housing for forming an ultrasonic image in a plane normal to the housing, whereby the metal rod forms an image artifact; and
a flexible guide wire tube axially-aligned with but separate from the housing and the flexible end piece and having a continuous lumen extending proximally form the distal tip of the end piece to beyond the proximal end of the housing, whereby the flexible guide wire tube may slip relative to the flexible end piece when the tube and end piece are bent.

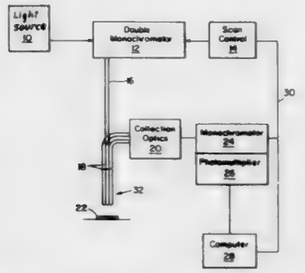
5,201,317
DIAGNOSTIC AND THERAPEUTIC CATHETER
Shin-ichi Kanazawa; Koro Yotsuya; Ichiro Sogawa; Takafumi Uemiya, and Shin-ichiro Niwa, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 465,072, Feb. 6, 1990, abandoned. This application Sep. 10, 1992, Ser. No. 943,141
Claims priority, application Japan, Jun. 6, 1988, 63-138755
Int. Cl.[5] A61B *6/00*
U.S. Cl. 128—665 **2 Claims**



1. A diagnostic and therapeutic catheter comprising:
a small diameter catheter portion which is formed at a distal end portion of said catheter, said small diameter catheter portion having at least one duct;
a large diameter catheter portion connected to said small diameter catheter portion, said large diameter catheter portion having at least one duct coupled to said at least one duct of said small diameter catheter portion; and
a plurality of optical fibers and tubes contained within said at least one duct of said large diameter catheter portion, said tubes and fibers being retractably insertable into said at least one duct of said small diameter catheter portion selectively, said at least one duct of said small diameter catheter portion being of a size so as to exclude a simultaneous insertion of all of said fibers and tubes contained within said at least one duct of said large diameter catheter portion.

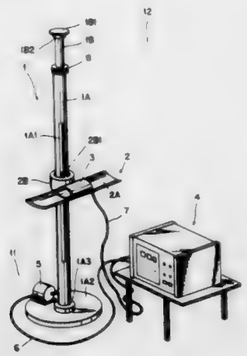
5,201,318
CONTOUR MAPPING OF SPECTRAL DIAGNOSTICS
Richard P. Rava, 395 Marlborough St., #2R, Boston, Mass. 02115; Rebecca Richards-Kortum, 60 Wadsworth, 16A, Cambridge, Mass. 02142; Michael S. Feld, 56 Hinckley Rd., Waban, Mass. 02168, and Joseph J. Baraga, 2922 Fifth Avenue E., Hibbing, Minn. 55746
Continuation of Ser. No. 342,311, Apr. 24, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 772,620
Int. Cl.[5] A61B *6/00*
U.S. Cl. 128—665 **20 Claims**

1. A method of processing spectra generated from the induced fluorescence of tissue comprising:
irradiating a portion of tissue over a range of periodically separated excitation wavelengths with radiation from a light source to induce autofluorescence of the tissue such that the tissue emits fluorescent radiation at a multiplicity of emission wavelengths;
forming a spectrum of the intensity of the emitted radiation from the recorded fluorescing radiation at each of the multiplicity of excitation and emission wavelengths;
repeating the irradiating and forming steps to provide a plurality of spectra;



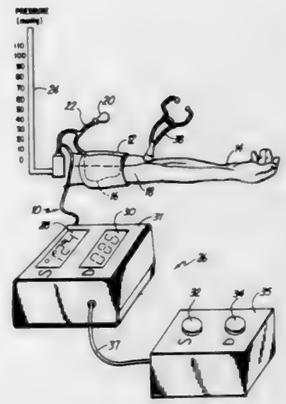
averaging the plurality of spectra to produce an average spectrum; and
identifying fluorophores present in the tissue that have predetermined fluorescence characteristics which correlate with spectral features in the average spectrum, the feature having identified excitation and emission wavelengths present in the average spectrum.

5,201,319
APPARATUS FOR MEASURING BLOOD PRESSURE
Kazuaki Negishi, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan
Division of Ser. No. 713,248, May 29, 1991. This application Jun. 24, 1992, Ser. No. 903,733
Claims priority, application Japan, Feb. 13, 1991, 1-42567
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—672 **3 Claims**



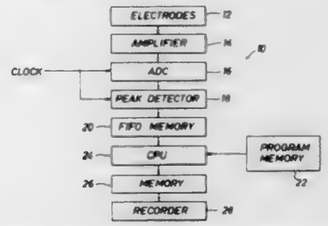
1. An apparatus for measuring blood pressure, comprising:
a pole fixed perpendicular to a floor;
a receiver module for supporting an arm of a patient;
a cuff disposed on said module and adapted to be wound around the arm of said patient;
a measuring device for measuring blood pressure;
means for connecting said cuff with said measuring device for measuring blood pressure of said patient; and
a coupling device mounting the module to the pole and slidable up and down along said pole as the body of said patient moves up and down, wherein after said patient remains stationary for a fixed time in a squatting position and stands up into a standing position, said measuring device measures the blood pressure of said patient.

5,201,320
BLOOD PRESSURE MEASURING DEVICE
Kent R. Barker, Eagan, Minn., assignor to Prevention Sciences Incorporated, Eagan, Minn.
Filed Jun. 13, 1991, Ser. No. 714,654
Int. Cl.[5] A61B *5/0225*
U.S. Cl. 128—680 **7 Claims**



1. A sphygmomanometer comprising:
a nonyielding arm cuff;
an inflatable air bladder in the arm cuff;
means for inflating the air bladder;
a pressure transducer connected to the air bladder and having a pressure reading output signal terminal;
an outlet valve connected to the air bladder;
means responsive to an electrical signal for controlling the outlet valve;
manually operated means for generating systolic and diastolic interrupt signals;
data processing means responsive to the interrupt signals for recording pressure reading output signals; and
display means for displaying indications of pressure from the pressure reading output signals.

5,201,321
METHOD AND APPARATUS FOR DIAGNOSING VULNERABILITY TO LETHAL CARDIAC ARRHYTHMIAS
Keith W. Fulton, 4655 Wild Indigo #211, Houston, Tex. 77027
Filed Feb. 11, 1991, Ser. No. 653,190
Int. Cl.[5] A61B *5/0472*
U.S. Cl. 128—702 **11 Claims**



1. A method of analyzing heart beats to obtain an indication

of heart conditions favorable to heart failure comprising the steps of:

having a pulse width corresponding to the duration of the air flow through the passageway; and
means for receiving the digital output signal from the pulse

5,201,324
DISPOSABLE SKIN PERFORATOR AND BLOOD TESTING DEVICE

first location that is away from the instrument;
mounting means for mounting the instrument to the structural member for movement relative to the structural

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of heart conditions favorable to heart failure comprising the steps of:

(a) measuring a series of N heart beats;

(b) measuring in the N series the relative beat-to-beat timing and providing a series of such measurements; and

(c) analyzing the beat-to-beat timing for chaos in the timing wherein the chaos is represented by an instantaneous value of dimension of the beat timing in a multidimensional representation of the chaos having values up to m dimensions where a healthy heart is represented by a higher dimensional value m and a lower value of m indicates a less healthy heart.

5,201,322

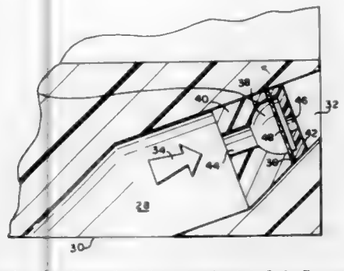
DEVICE FOR DETECTING AIR FLOW THROUGH A PASSAGEWAY

John C. Henry, Upper Merion, and Kyung T. Park, Berwyn, both of Pa., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation of Ser. No. 233,318, Aug. 17, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,335

Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—719 **8 Claims**



7. A device for detecting the magnitude of air flow through the respiratory system of a user comprising:

a passageway having a first opening and a second opening and a predetermined cross-sectional area, the second opening for communicating with the respiratory system of the user, whereby when the second opening communicates with the respiratory system inhalation by the user causes air to flow in a first direction into the passageway through the first opening and out of the passageway through the second opening, and exhalation by the user causes air to flow in a second direction into the passageway through the second opening and out of the passageway through the first opening;

a piezoelectric sensor positioned within the passageway such that air flowing through the passageway impinges upon the sensor and causes the sensor to vibrate, the sensor generating different electrical signals in accordance with a degree of vibration;

flow directing means located within the passageway for directing air flowing through the passageway in the first direction to impact the sensor with a first force to thereby cause the sensor to have a first degree of vibration and for directing air flowing through the passageway in the second direction to impact the sensor with a second force to thereby cause the sensor to have a second degree of vibration, the sensor generating a first electrical signal in response to the first degree of vibration and a second electrical signal in response to the second degree of vibration; and

pulse generating means connected to the sensor for receiving the generated electrical signals from the sensor and for generating a digital output signal comprising a digital pulse having a pulse height proportional to the volume flow rate of the air flow through the passageway and having a pulse width corresponding to the duration of the air flow through the passageway; and

means for receiving the digital output signal from the pulse generating means and utilizing the cross-sectional area of the passageway therewith for determining the magnitude of air flowing through the passageway.

8. A device for detecting the presence of air flow through a passageway comprising:

a passageway having a first opening and a second opening for air to flow therethrough either in a first direction in which air flows into the first opening and out of the second opening, or in a second direction in which air flows into the second opening and out of the first opening;

a piezoelectric sensor positioned within the passageway such that air flowing through the passageway impinges upon the sensor and causes the sensor to vibrate, the sensor generating different electrical signals in accordance with a degree of vibration; and

a first restrictor within the passageway facing the first opening directing air flowing through the passageway in the first direction to impact the sensor with a first force to thereby cause the sensor to have a first degree of vibration and a second restrictor within the passageway facing the second opening for directing air flowing through the passageway in the second direction to impact the sensor with a second force to thereby cause the sensor to have a second degree of vibration, the sensor being located between the first and second restrictors and generating a first electrical signal in response to the first degree of vibration and a second electrical signal in response to the second degree of vibration.

5,201,323

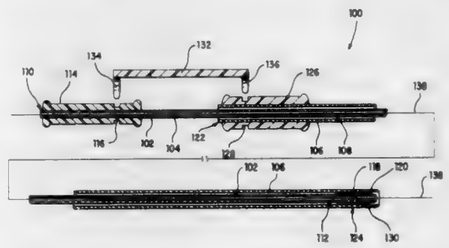
WIRE-GUIDED CYTOLOGY BRUSH

John P. Vermeulen, Jamaica Plain, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.

Filed Feb. 20, 1991, Ser. No. 659,631

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—756 **12 Claims**



1. A cytology brush comprising:

a guide wire;

a first, flexible sheath having a proximal end and a distal end, said first sheath defining a first lumen having a first opening in said proximal end and a second opening in said distal end;

a second, flexible sheath having a proximal end and a distal end, said second sheath defining a second lumen having a third opening in said proximal end and a fourth opening in said distal end, said second sheath being disposed in said first lumen of said first sheath and being adapted for longitudinal movement therethrough such that said distal end of said second sheath may be extended out through said second opening of said first sheath, said second sheath allowing free passage of the guide-wire through said second lumen; and

a plurality of brushing elements disposed on said second sheath at said distal end such that said brushing elements are extendable out from and retractable into said first lumen with said distal end of said second sheath.

5,201,324

DISPOSABLE SKIN PERFORATOR AND BLOOD TESTING DEVICE

Remi Swierczek, 6399 Ledge Lake Ct., Concord, Ohio 44077

Continuation-in-part of Ser. No. 566,160, Aug. 10, 1990, Pat. No. 5,054,499, which is a continuation-in-part of Ser. No. 328,907, Mar. 27, 1989, abandoned. This application Jul. 18, 1991, Ser. No. 732,109

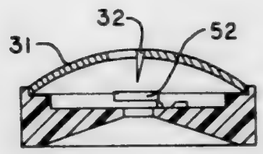
Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—770 **22 Claims**

1. A skin perforator for obtaining a sample of blood by puncturing the skin comprising:

a) a pressure plate containing an aperture formed therein wherein said pressure plate is placed adjacent to and surrounding the area of skin to be punctured;

b) a cover plate having a resilient convex panel formed therein, said cover plate being attached to said pressure plate and said convex panel having a point penetrating barb formed integrally therefrom and directed inward toward said aperture in said pressure plate, said integrally formed barb resulting in an aperture formed in said convex panel, wherein a first and second pressure are applied the convex panel and directed toward said pressure plate,



said second pressure being greater than said first pressure so that said convex panel has a resistance to said first pressure and as said first pressure is increased toward said second pressure, said pressure overcomes the resistance of said convex panel and said convex panel collapses rapidly to cause said barb to suddenly and rapidly penetrate the skin causing a puncture, said convex panel resiliently returning to its original convex shape upon removal of said pressure thereby withdrawing the barb from the skin, and

(c) a means for limiting said barb to a single penetration of the skin wherein said limiting means automatically occludes the aperture of said pressure plate following the initial penetration.

5,201,325

ADVANCED SURGICAL RETRACTOR

James A. McEwen, Richmond; Geoffrey F. Auchinleck, Vancouver, and Carlo R. Bussani, Burnaby, all of Canada, assignors to Andronic Devices Ltd., Canada

Continuation of Ser. No. 401,824, Sep. 1, 1989, abandoned. This application Sep. 18, 1991, Ser. No. 762,639

Int. Cl.[5] A61B *5/103*

U.S. Cl. 428—779 **5 Claims**

1. Apparatus for controlling the pressure applied to tissue by a surgical instrument, comprising:

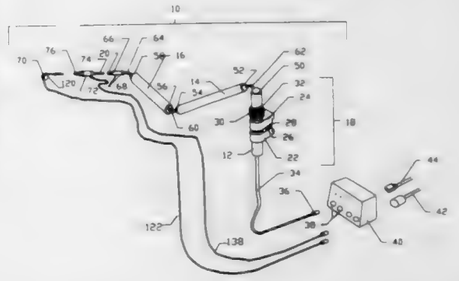
a surgical instrument having a contact surface;

a structural member mounted for movement relative to a first location that is away from the instrument;

mounting means for mounting the instrument to the structural member for movement relative to the structural member through a range of motion;

pressure sensing means for producing a pressure signal proportional to a pressure applied against the contact surface whenever the contact surface is moved into contact with an object; and

control means for receiving the pressure signal and for moving the instrument within the range of motion in response to the pressure signal to change the pressure applied against the contact surface so that the applied pressure level approaches a predetermined pressure range and for moving the structural member when movement of the



instrument within the range of motion does not change the applied pressure level by an amount sufficient to maintain that pressure within the predetermined pressure range.

5,201,326

TAMPON FOR MEDICAL OR HYGIENIC PURPOSES AND METHOD OF MAKING THE SAME

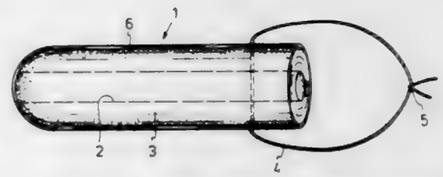
Jörn Kubicki, Nürnberg, and Norbert Rink, Wendelstein, both of Fed. Rep. of Germany, assignors to VP-Schickedanz, Nürnberg, Fed. Rep. of Germany

Filed Aug. 28, 1990, Ser. No. 574,421

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928677

Int. Cl.[5] A61F *6/06*

U.S. Cl. 128—832 **10 Claims**



1. A rod-shaped medical tampon for releasing an active substance, comprising:

(a) a tampon core of compressed fibers selected from the group consisting of cellulose fibers, cotton fibers, and acetate fibers;

(b) a tampon cover surrounding said tampon core and being firmly bonded to one another by a glue, the tampon cover comprising a hardened collagen foam or a hardened gelatin foam impregnated with a retardant including a dissolved active substance to be released; and

(c) a retrieval string connected to at least one of said tampon core and said tampon cover.

5,201,327

ELECTRICALLY CONDUCTIVE COVERING FOR A

or filter rod from the preformed rod, a strip-like second covering material, and a stream of filling material,

to the other body side which is closed but with a small diame- tube being elongated and having an inlet end, the apparatus

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5,201,327

ELECTRICALLY CONDUCTIVE COVERING FOR A HUMAN BODY PART

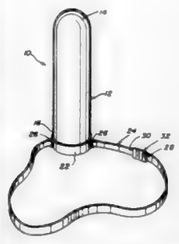
Gary D. Johnson, New York, N.Y., assignor to Charles Mutterperl, Valley Stream, N.Y.

Continuation of Ser. No. 612,837, Nov. 9, 1990, Pat. No. 5,076,287, which is a continuation of Ser. No. 381,135, Jul. 14, 1989, Pat. No. 4,971,071. This application Oct. 9, 1991, Ser. No. 775,153

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] A61F *6/02, 6/04*

U.S. Cl. 128—842 **14 Claims**



1. An electrically conductive covering for a body part of a living body comprising a thin, protective sheath member having an open end for receiving a body part therein and for covering the received body part, and an opposite closed end, said sheath member being made from an elastic, electrically conductive material, which passes electric energy therethrough for increasing sensitivity with respect to adjacent nerve endings of at least one of the body part inserted in and covered by the sheath member and a human body part which is touched or contacted by the body part covered by the sheath member.

5,201,328

METHOD AND APPARATUS FOR THE PRODUCTION OF COAXIAL TOBACCO OR FILTER RODS AND COAXIAL TOBACCO OR FILTER ROD MADE BY SAID METHOD

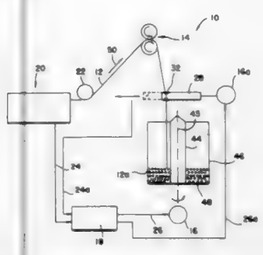
Otto Blaffert, Schenefeld; Meinhard Meyer, Appen-Unterglinde; Herbert Struck, Wedel, and Arno Weiss, Norderstedt, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 8, 1991, Ser. No. 666,771

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1990, 4009657

Int. Cl.[5] A24C *5/14*

U.S. Cl. 131—84.1 **30 Claims**



1. A method for producing coaxial tobacco or filter rods, wherein

a) a first rod-forming machine forms a preformed rod from a strip-like first covering material and a stream of filling material; and

b) a second rod-forming machine forms the coaxial tobacco or filter rod from the preformed rod, a strip-like second covering material, and a stream of filling material,

wherein

c) the preformed rod coming from the first rod-forming machine is intermediately stored before it is further processed in the second rod-forming machine.

5,201,329

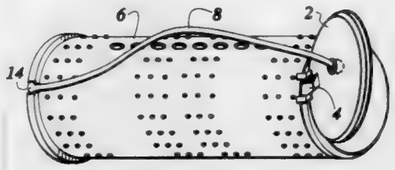
PERMANENT WAVE ROD HAVING HINGED END-CAP

Claire Quackenbush, 2060 Skyhawk Ct., Mt. Pleasant, S.C. 29464

Filed Jan. 21, 1992, Ser. No. 823,357

Int. Cl.[5] A45D *2/14*

U.S. Cl. 132—248 **6 Claims**



1. A permanent wave rod, comprising:

a. a generally cylindrical body;

b. a pivotal end cap which is attached to an end of said body and which is capable of pivoting relative to said body at a hinged point of attachment to said body, said pivotal end cap being of a generally flat, planar construction; and

c. an elastic band which is attached at one end thereof to an end of said body and which is attached at an opposite end thereof to said pivotal end cap, wherein said pivotal end cap is pivoted away from said body to remove tension from said elastic band to allow hair to be placed underneath said elastic band, and wherein said pivotal end cap is pivoted toward said body to apply tension to said elastic band so as to hold said permanent wave rod against said hair.

5,201,330

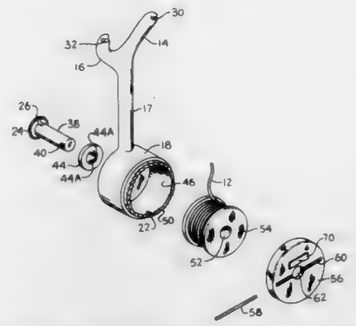
DENTAL FLOSS HOLDER

Se K. Won, 6261 Glacier Dr., Westminster, Calif. 92683

Filed Jul. 10, 1992, Ser. No. 911,963

Int. Cl.[5] A61C *15/00*

U.S. Cl. 132—325 **2 Claims**



1. In a dental floss holder of the type having a body member with an axial bore formed therein so as to extend from one side thereof, which is open and on which unidirectional ratcheting teeth are circularly disposed in axial alignment with the bore,

to the other body side which is closed but with a small diameter opening extending therethrough, a pair of prongs extending outwardly laterally from the body member normal to the bore in a wishbone configuration, each of said prongs having a deep floss receiving groove formed longitudinally along its outer surface, and each prong terminating in a tip across which the groove extends toward the other prong, an axle extending through the body member and having a head with a slot formed on one end thereof so as to be disposed adjacent the small diameter opening and a washer mounted on the axle and fixed thereto adjacent to the slotted head by means of a pair of teeth formed on the washer inner periphery and extending into the head slot at ether end thereof, a spool for holding dental floss mounted on the axle within the body member, and a passageway formed on the body member for passing the floss from the spool through the body member, the combination of:

a locking flange of circular cross-sectional configuration having a central aperture extending therethrough adapted to receive the axle, said flange extending therethrough lip depending therefrom so as to enclose the main body ratcheting recesses when the flange is mounted on the axle, and a circular shoulder formed within the recess formed by the lip and adjacent thereto, said shoulder having ratcheting teeth formed thereon so as to be complementary to the main body ratcheting teeth and engageable therewith when the flange is mounted on the axle; and

locking flange attaching means connected between said locking flange and said body member mounted for attaching said flange to said axle so as to hold said flange ratcheting means in engagement with said main body ratcheting teeth; said locking flange attaching means including

a diametrical groove in the flange on the side thereof opposite the flange ratcheting teeth, said groove diminishing in depth outwardly from the central aperture, and

a pin disposed in said groove so as to extend through a transverse passageway formed in said axle so that said axle holds said pin in a deflected disposition in said groove so as to urge the flange ratcheting teeth against the main body ratcheting teeth.

5,201,331

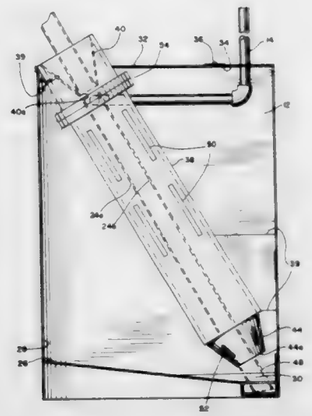
VAPOR CONTAINMENT APPARATUS AND METHOD

Lee C. Tapper, Kosciusko, Ind., assignor to R. R. Donnelley & Sons Co., Lisle, Ill.

Filed Mar. 8, 1991, Ser. No. 666,571

Int. Cl.[5] B08B *3/04*

U.S. Cl. 134—104.2 **6 Claims**



1. A vapor containment apparatus for washing an ink pump and sucker tube with a volatile ink solvent, the pump having an inlet connected with the sucker tube and an outlet, the sucker tube being elongated and having an inlet end, the apparatus comprising:

a closed receptacle having a liquid solvent sump;

an inclined sleeve in the closed receptacle and receiving the sucker tube, said sleeve positioning the inlet end of the sucker tube in said sump for the pump to draw solvent therefrom through the sucker tube, washing the interior surface of the sucker tube and the pump;

a source of volatile liquid ink solvent;

a solvent applicator connected with said source and positioned to direct solvent onto the outer surface of the sucker tube inside the sleeve, the solvent washing the outer surface of the sucker tube and draining into said sump;

means for receiving liquid solvent from the outlet of said pump; and

means for evacuating solvent vapor from within the inclined sleeve and exhausting solvent vapor from the receptacle.

5,201,332

CAP-SHAPED UMBRELLA HELD TO THE HEAD

Tze-Bing Wu, 8, Wu Chuan 5th Str., Taichung City, Taiwan

Filed Oct. 25, 1991, Ser. No. 782,473

Int. Cl.[5] A45B *3/00*

U.S. Cl. 135—16 **1 Claim**

1. A cap-shaped umbrella comprising a folding radial frame, said folding radial frame being comprised of a plurality of main ribs supported by a plurality of supporting ribs, an auxiliary folding frame pivoted to said folding radial frame, said auxiliary folding frame comprising a plurality of a plurality of horizontal ribs connected to a plurality of auxiliary ribs, an umbrella cover stretched over said main ribs of said folding radial frame, a front visor connected to the peripheral edge of said umbrella cover and stretched over said horizontal ribs of said auxiliary folding frame, a fastening loop assembly connected to said auxiliary folding frame for fastening the umbrella to the head, and a control mechanism controlled to stretch or collapse said folding radial frame and said auxiliary folding frame, and characterized in that:

said control mechanism comprises a post, an upper nest plate fixedly fastened on said post at the top for fastening said main ribs, a pull rope fastened in said post at the bottom, said pull rope having one end fastened in said post and an opposite end attached with a cap, a tubular auxiliary nest plate mounted on said pull rope for fastening said supporting ribs and moved to slide on said post, a ring-shaped auxiliary nest plate mounted on said pull rope above said tubular movable nest plate for fastening said auxiliary ribs, said tubular movable nest plate comprising a curved side projection defining therein a groove, said curved side projection having a blind hole thereon at the top, said blind hole having a spring fastened therein, a hook lever pivotably fastened in said groove, said hook lever having a knob at one end stopped against said spring and a hooked portion at an opposite end releasably hooked in a groove on said post to retain said folding radial frame and said auxiliary folding frame in a stretched condition;

said fastening loop assembly is comprised of a loop, a plurality of connecting rods for connecting said loop to said auxiliary ribs, and two fastening bands fastened over an user's lower jaw to secure said loop on the user's head,

said loop being consisted of a flexible band and an elastic

5,201,334

valve plug cavity with the threaded section extending

5,201,337

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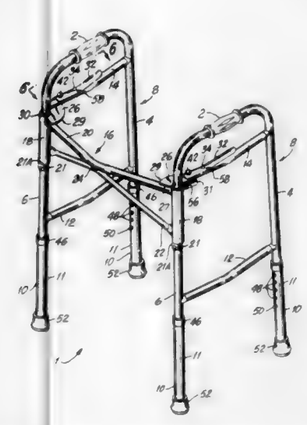
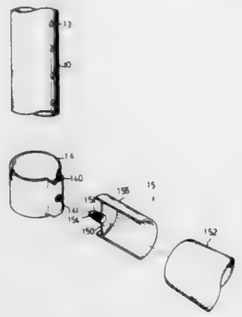
said loop being consisted of a flexible band and an elastic band, said flexible band having a plurality of eyed lugs around the peripheral surface thereof, said connecting rods each having a pivot hole at one end connected to said auxiliary ribs by pins and a unitary hook at an opposite end hooked in either eyed lug, said fastening bands each having a unitary hook at one end hooked in one of said eyed lugs, a fastening element at an opposite end releasably connected to each other for securing the fastening bands over an user's lower jaw, and a plurality of vent holes at the middle.

5,201,333
FOLDING WALKER
Shay Shalmon, Port Washington, and Ronald Simon, Center Moriches, both of N.Y., assignors to Lumex, Inc., Bay Shore, N.Y.
Filed Sep. 10, 1991, Ser. No. 757,200
Int. Cl.[5] A61H *3/00*
U.S. Cl. 135—67 **28 Claims**



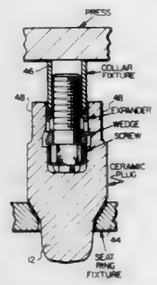
1. A walker for use by the aged or infirmed comprising:
a front frame;
a first side frame that defines a first quadrilateral;
a second side frame;
means for mounting the first side frame to the front frame such that the first side frame can rotate relative to the first frame;
means for mounting the second side frame to the front frame; and
means for securing the first side frame in an open position relative to the front frame, the securing means comprising:
a member fixed to the front frame;
engagement means for rigidly engaging the first side frame to the member when the first side frame is an open position relative to the front frame; and
means for releasing the rigid engagement between the first side frame and the member whereby the first side frame can be folded to a closed position relative to the front frame, wherein the releasing means is mounted within the first quadrilateral defined by the first side frame, and wherein the member is substantially contained within a space defined by the side frames and the front frame of the walker in the open position.

5,201,334
CRUTCH
Jui F. Tseng, No. 29, Ta Yu St., Taichung, Taiwan
Filed Jul. 30, 1992, Ser. No. 922,565
Int. Cl.[5] A61H *3/02*
U.S. Cl. 135—68 **3 Claims**



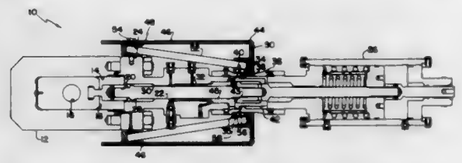
1. A crutch comprising
a tubular body includes an upper portion and a middle portion, an arm support formed in said upper portion, at least one orifice formed in said middle portion;
a hand grip fixed to said middle portion; said hand grip includes a pipe having a bolt fixed to one end;
a sleeve engaged on said middle portion of said tubular body; said sleeve including a pair of flanges superposed with each other and wherein each of said flanges having a screw hole formed therein;
wherein said bolt is threaded through said screw holes of said flanges and engaged in said orifice to secure said hand grip in place.

5,201,335
METHOD AND APPARATUS FOR ATTACHING CERAMIC TO METAL PARTS
Melvin L. Osgood, and Rodney P. Western, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.
Filed Oct. 15, 1991, Ser. No. 776,578
Int. Cl.[5] F16L *55/18;* **F16K** *51/00*
U.S. Cl. 137—15 **12 Claims**



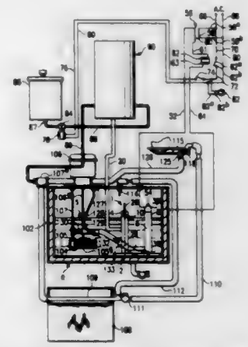
1. A method of attaching a valve plug to a threaded valve stem where the plug and stem are formed of dissimilar materials, comprising the steps of:
providing a cavity at one end of the valve plug;
providing an elongated screw member with a threaded section at one end and an expandable section at the other end;
inserting the screw member expandable section into the valve plug cavity with the threaded section extending beyond the cavity;
pre-wedging the expandable section in the cavity by bending the expandable section until the expandable section is fully bent;
threadably engaging the threaded section into the threaded valve stem; and
final wedging the expandable section in the cavity by threadably tightening the screw member threaded section on the valve stem to ensure substantially uniform contact between the screw member expandable section and the valve plug cavity.

5,201,336
FIRE SAFE VALVE
William M. Taylor, and Gerald S. Baker, both of Houston, Tex., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 10, 1992, Ser. No. 833,150
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—72 **10 Claims**



1. A valve suitable for use in installations needing protection against fire or excessive heat comprising
a body having an inlet and outlet and a valve chamber having an opening through said body,
a valve member movably positioned in the valve chamber to close flow between said inlet and said outlet in one position and to allow flow therebetween in another position,
a bonnet connected to said body and surrounding the opening of said valve chamber,
said bonnet having a bore extending therethrough,
said bonnet defining a seat surrounding the opening to said bore,
means for moving said valve member,
a stem connected to said valve member and extending through said bonnet opening to connect to said moving means,
a shoulder on said stem,
temperature sensitive means for limiting travel of said stem in one direction so that its shoulder is spaced a preselected distance from said bonnet seat,
said temperature sensitive means being preselected to release said travel limitation of said stem when it is exposed to a preselected amount of heat so that the stem shoulder will backseat on said bonnet seat, and
means for rapidly transmitting heat from a portion of said valve spaced from said temperature sensitive means to a position near said temperature sensitive means to ensure that excessive heat to which the valve is exposed to directed to said temperature sensitive means,
said heat transmitting means includes heat pipes mounted on one of said valve and said bonnet adjacent to said body to transmit heat to a position surrounding said temperature sensitive means.

5,201,337
APPARATUS FOR MIXING FLUIDS OF DIFFERENT SPECIFIC GRAVITY
Edwin H. Royse, Dallas, Tex., assignor to Royse Manufacturing Company, Inc., Dallas, Tex.
Filed Apr. 30, 1991, Ser. No. 698,473
Int. Cl.[5] G05D *11/06*
U.S. Cl. 137—91 **4 Claims**



1. A device for controlling the specific gravity of a solution of first and second liquids comprising:
a reservoir;
means for admitting the solution into the reservoir;
actuated valve means adapted to admit first liquid into the means for admitting the solution into the reservoir;
a U-shaped tube in said reservoir, said U-shaped tube having first and second legs, each of said legs being open to atmosphere;
means to admit solution to said first leg to form a column of solution therein;
means associated with said first leg to adjust the height of the column of solution;
control liquid in said second leg forming a column of control liquid therein;
a plurality of electrodes secured to said second leg, each of said electrodes being engagable by said control liquid at a different elevation to sense changes in the level of the column of control liquid, said electrodes being adapted to actuate said actuated valve means.

5,201,338
SYSTEM AND DEVICE FOR FLUSHING WATER MAINS
Daniel G. McKeague, St. Louis County, Mo., assignor to John C. Kupferle Foundry Company, St. Louis, Mo.
Filed Nov. 20, 1991, Ser. No. 795,333
Int. Cl.[5] E03B *7/07, 9/06;* **B08B** *3/04, 9/06*
U.S. Cl. 137—238 **22 Claims**

1. In a water distribution system including a plurality of main ends and flushing means for said main ends, the improvement wherein said flushing means comprises
(a) at each said main end a buried pipe, a valve shoe attached to said buried pipe, a valve in the valve shoe, a vertical barrel attached to the valve shoe, first coupling means on said vertical barrel, and an actuator rod attached to the valve and extending through the vertical barrel,
(b) at least one portable flushing hydrant top stock, said flushing hydrant top stock comprising a casing having an outlet and second coupling means for selectively coupling said casing with said first coupling means on said vertical barrel, and means cooperative with said actuator rod to open said vale when said first and second coupling means

can be easily inserted in and removed from the container as a single unit.

said outlet orifice being one end of a hollow stem having an opposite end passing through a wall of the water chamber;

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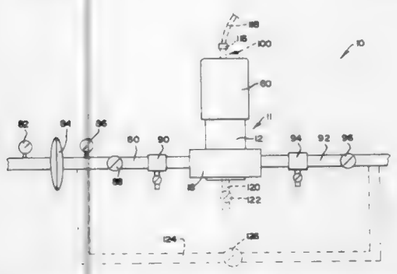
are coupled, for passing water past said valve and through said outlet for flushing said distribution system, and

(c) cover means for protecting said vertical barrel when said top stock is not coupled to said vertical barrel.

5,201,339
TREATMENT OF LIQUIDS
Leon Buchan, Johannesburg, South Africa, and Joseph T. Webb, Newborn, Ga., assignors to Control Chemicals (Proprietary) Limited, South Africa
Filed Dec. 6, 1991, Ser. No. 802,748
Claims priority, application South Africa, Dec. 6, 1990, 90/9811; May 2, 1991, 91/3315; May 22, 1991, 91/3874
Int. Cl.[5] B01F *1/00*
U.S. Cl. 137—268 **13 Claims**



1. A liquid treatment installation, which comprises apparatus for controllably treating a liquid with a liquid treatment substance, the apparatus comprising

a body having a first portion providing an elongate container receiving zone and an opening leading into the zone, a well as a second portion providing a liquid flow path, with the container receiving zone being in communication with the liquid flow path, the second portion having a liquid inlet as well as a liquid outlet, and with the liquid inlet and the liquid outlet being spaced apart on opposite sides of the container receiving zone;

a container for a liquid treatment substance, the container comprising a cylindrical sleeve, end pieces closing off each end of the cylindrical sleeve, and at least one aperture in the sleeve in proximity to a first end thereof, with the container located in the container receiving zone of the body so that its first end protrudes sufficiently into the liquid flow path for the aperture in the sleeve to be exposed to liquid flowing along the liquid flow so that, in use, liquid enters the container through the aperture and a liquid level is established in the container;

a removable closure member closing off the opening in the first body portion and against which the other or second end of the container abuts;

a liquid supply conduit connected to the liquid inlet of the apparatus;

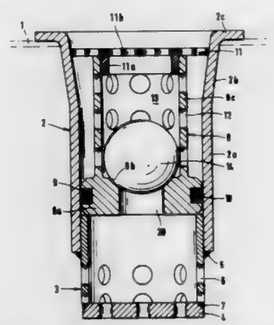
control means in the supply conduit for controlling the supply of liquid along the conduit;

a liquid discharge conduit connected to the liquid outlet of the apparatus and being open to atmosphere so that, on interruption of liquid flow through the apparatus by means of the control means, air can enter the apparatus, and hence the container, through the discharge conduit, so as to restore the air pressure within the container and thus ensure that the liquid rises to the same level in the container each time liquid flow is recommended, thereby to dose the liquid passing along the flow path accurately with liquid treatment substance;

a receiving vessel into which the discharge conduit discharges; and

liquid level measuring means in the vessel, the level measuring means being operatively connected to the control means such that, on the liquid level in the vessel dropping below a predetermined setting, the control means is actuated by means of the level measurement means, to allow liquid flow through the apparatus into the vessel, and on the liquid level in the vessel rising to the predetermined setting or to another predetermined setting, the control means is de-actuated to interrupt or stop the liquid flow through the apparatus.

5,201,340
AUTOMATIC DRAINAGE DEVICE FOR CARGO CONTAINERS
Stephen Teepe, Celle, Fed. Rep. of Germany, assignor to Graaff, GmbH, Elze, Fed. Rep. of Germany
Filed Mar. 3, 1992, Ser. No. 844,841
Int. Cl.[5] F16K *31/22, 33/00, 43/00*
U.S. Cl. 137—315 **13 Claims**



1. An automatic drainage device for a cargo container comprising

an essentially cylindrical outer housing with open upper and lower sections each having respective upper and lower ends and the upper end of the lower section being disposed within the upper section,

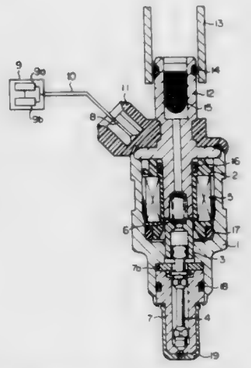
a web mounted in the housing between the upper end of the upper section and the lower end of the lower section and having a passage opening,

a floatable closing member removably seated on the upper side of the web for sealing the passage opening, and

a valve cage in the upper section having a foot mounted and supported on the upper end of the lower section, the foot comprising the web, whereby the entire drainage device

can be easily inserted in and removed from the container as a single unit.

5,201,341
ELECTROMAGNETIC TYPE FLUID FLOW CONTROL VALVE
Kimitaka Saito, Nagoya; Tatsuyoshi Matsumoto, Okazaki, and Toshihiko Igashira, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Mar. 17, 1992, Ser. No. 852,946
Claims priority, application Japan, Mar. 19, 1991, 3-054931; Dec. 27, 1991, 3-346707
Int. Cl.[5] F16K *49/00;* **F02M** *51/00*
U.S. Cl. 137—341 **14 Claims**



1. A fluid flow control valve comprising:

a fluid heating means for supplying a heat energy to a fluid,

a valve means for controlling a flow rate of the fluid,

an electromagnetic coil for generating a magnetic field at the fluid heating means and the valve means so that the fluid heating means can be heated by a fluctuation of magnetic flux to supply the heat energy to the fluid and the valve means can be operated to control the flow rate of the fluid, and

a power source for applying a voltage to the electromagnetic coil to generate the magnetic field, a voltage value being supplied to the electromagnetic coil fluctuating when the fluid heating means supplies the heat energy to the fluid and the voltage supplied to the electromagnetic coil being adjustable to control the flow rate of the fluid in the valve means.

5,201,342
PULSATOR DEVICE
Peretz Rosenberg, Moshav Beit Shearim, Israel
Division of Ser. No. 633,890, Dec. 26, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 847,536
Claims priority, application Israel, Dec. 26, 1989, 92886
Int. Cl.[5] F16K *51/00*
U.S. Cl. 137—624.14 **8 Claims**

1. A pulsator device, comprising:

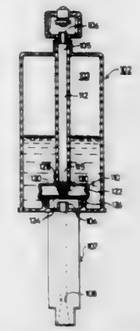
a source of pressurized water;

a housing connectible to said source of pressurized water and defining a water chamber therein having an inlet for inletting water at a relatively low rate in a continuous manner, and a large outlet orifice;

an outlet valve assembly controlling said large outlet orifice to open it in response to a relatively high pressure in said water chamber and to close it in response to a relatively low pressure in said water chamber so as to output the water from the water chamber in the form of pulses;

said outlet orifice being one end of a hollow stem having an opposite end passing through a wall of the water chamber;

said outlet valve assembly comprising an expansible/ contractible control chamber located within and enclosed by said water chamber and normally biassed to its expanded condition but being contractible by a high pressure in the water chamber to a contracted condition;



and a valve member carried by the control chamber effective, in the normal expanded condition of the control chamber to close said one end of the hollow stem, and in the contracted condition of the control chamber to open said one end of the hollow stem and thereby to output a pulse of pressurized water through said opposite end of the hollow stem.

5,201,343
EXTENSIBLE HOUSE FOR REDUCING PRESSURE PULSES
Otto Zimmermann, Frankfurt am Main, and Günter von Steht, Weinheim, both of Fed. Rep. of Germany, assignors to Ingenieurburo H. Luthin AG, Wettingen, Switzerland and Techno-Chemie Kessler & Co. GmbH, Karben, Fed. Rep. of Germany
PCT No. PCT/CH91/00028, § 371 Date Dec. 27, 1991, § 102(e) Date Dec. 27, 1991, PCT Pub. No. WO91/13790, PCT Pub. Date Sep. 19, 1991
PCT Filed Feb. 5, 1991, Ser. No. 773,551
Claims priority, application Switzerland, Mar. 6, 1990, 711/90
Int. Cl.[5] F16L *55/04*
U.S. Cl. 138—26 **7 Claims**

1. An expansion hose for reducing the pressure pulsations and sounds associated therewith in hydraulic systems caused by a pump, specifically for power steering plants of automotive vehicles, said expansion hose comprising: an outer pressure hose connected to an inlet side end member and to an outlet side end member, an inner flexible hollow body arranged coaxially within the outer pressure hose to define an annular space between the inner flexible hollow body and the outer pressure hose, the inner flexible hollow body serving for conducting a pressurized medium and having at an inlet end and an outlet end, a nipple plug carried at the inlet end of the inner flexible hollow body, wherein the nipple plug includes a first

axial passage providing communication between the inlet side end member and the interior of the inner flexible hollow body,

second arm extending outwardly from said plate beyond said two flanges.

and adapted to be fixedly mounted relative to the thread storage (5), the guide guiding the thread generally in the direction of the axis of rotation, a monitoring appliance (4) responsive to

5,201,348
EVACUATING APPARATUS FOR A MICROTITRATION DIAPHRAGM PLATE

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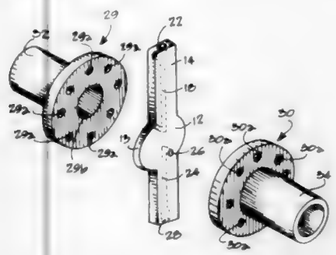
axial passage providing communication between the inlet side end member and the interior of the inner flexible hollow body, and wherein a second axial passage providing communication between the inlet side end member and the annular space between the inner flexible hollow body and the outer pressure hose is defined between an outer surface of the nipple plug and an inner surface of the inlet side end member, and wherein the outlet end of the inner flexible hollow body extends freely into the outlet side end member, and wherein the outer diameter of the inner flexible hollow body at the outlet end is smaller than the inner diameter of the surrounding outlet side end member.

5,201,344

EMISSIONS ELIMINATOR BLIND

Larry G. Lacouture, P.O. Box 77077, Baton Rouge, La. 70879

Filed Jul. 26, 1991, Ser. No. 736,943
Int. Cl.[5] F16L *55/10*
U.S. Cl. 138—94.3 **6 Claims**



1. A pipe blind comprising a generally solid cylindrical plate adapted for connection between a first pipe flange and a second pipe flange to block the flow of fluids therebetween, said first pipe flange and said second pipe flange having a plurality of aligned bolt receiving holes located on said flanges in a circular pattern for receipt of bolts to connect said first pipe flange to said second pipe flange, said first pipe flange having a first pipe connected thereto and said second pipe flange having a second pipe connected thereto, said generally cylindrical plate having:

a. an outer generally cylindrical edge larger in diameter than the outer diameter of each of said two pipes and smaller in diameter than said circular pattern of bolt receiving holes,

b. two generally parallel faces,

c. a first channel means therein for conveying fluids from the interior of said first pipe to the exterior of said first pipe, said first channel means having an exit port and an entrance port, said entrance port of said first channel means being located on one of the faces of said plate, and said exit port of said first channel means being located on said edge of said plate, said entrance port of said first channel means being located in the interior of said plate in alignment within the interior of said first pipe, and

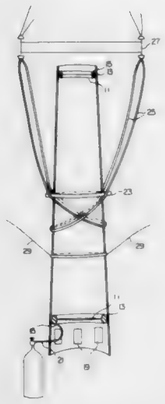
d. a second channel means therein for conveying fluids from the interior of a second pipe to the exterior of said second pipe, said second channel means having an exit port and an entrance port, said entrance port of said second channel means being located on one of the faces of said plate, and said exit port of said second channel means being located on said edge of said plate, said entrance port of said second channel means being located in the interior of said plate in alignment with the interior of said second pipe, said plate has a first arm and a second arm which extend outwardly from said generally cylindrical edge in substantially the same plane as the said generally parallel faces, said exit port of said first channel means is located in the said first arm, said first arm extending outwardly from said plate beyond said two flanges, said exit port of said second channel means is located in the said second arm, and said second arm extending outwardly from said plate beyond said two flanges.

5,201,345

INFLATABLE CONTAINMENT DIAPHRAGM FOR SEALING AND REMOVING STACKS

Gerald R. Meskanick, Elizabeth, and David T. Rosso, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 23, 1991, Ser. No. 734,993
Int. Cl.[5] F16L *55/10*
U.S. Cl. 138—178 **5 Claims**



1. A method for sealing a stack that may contain hazardous substances prior to removal of said stack, comprising:

inserting in the lower portion of the stack just above where the stack is to be cut an inflatable diaphragm, comprising:

a central barrier impermeable to the substances to be contained;

an inflatable torus-shaped ring attached to said central barrier such that the ring is the perimeter of the central barrier, wherein said perimeter is impermeable to the substances to be contained by the diaphragm, and wherein said central barrier and said ring together are impermeable to the substances to be contained;

and a means for inflating said torus-shaped ring;

inflating said diaphragm, whereby the perimeter of the diaphragm expands and forms a seal against the interior surface of the stack; and

sealing the top of said stack.

5,201,346

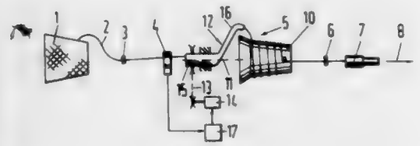
THREAD FEEDING GUIDE ARRANGEMENT TO A WEFT ACCUMULATOR TUBE

Gerardus Cox, BB Geldrop, Netherlands, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 9, 1992, Ser. No. 848,448
Claims priority, application Switzerland, Mar. 19, 1991, 00828/91
Int. Cl.[5] D03D *47/30, 47/34*
U.S. Cl. 139—450 **6 Claims**

1. A thread guiding device for use with a power loom having a fixed weft thread supply bobbin (**1**) and a thread storage (**5**) supplied with a weft thread from the bobbin, the thread guiding device comprising a thread guide (**12**), mounted for rotation about an axis of rotation (**11**), having an inlet channel (**18**, **18***a*) for the weft thread (**2**) and a thread guidance component (**3**) for the weft thread, the guidance component adapted to be located between the supply bobbin (**1**) and the thread storage

and adapted to be fixedly mounted relative to the thread storage (**5**), the guide guiding the thread generally in the direction of the axis of rotation, a monitoring appliance (**4**) responsive to a path of the thread between the thread guidance component (**3**) and the thread storage (**5**) including an optical sensor (**20**)



through which the weft thread (**2**) passes, and guide means cooperating with the thread guide for laterally deflecting a section of the weft thread (**2**) being supplied to the thread guide (**12**) and defined by the inlet channel (**18**) of the thread guide (**12**) being eccentrically offset with respect to the axis of rotation (**11**).

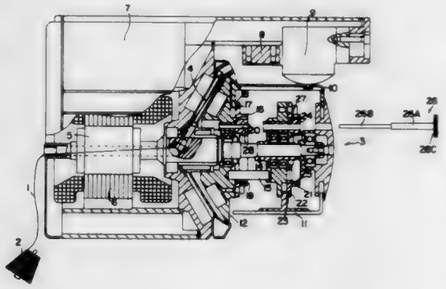
5,201,347

WEFT FEEDER HAVING YARN RESERVE WINDING UNIT WITH ADJUSTABLE CROSS SECTION

Bruno Maina, Valdengo, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

Filed Jul. 31, 1991, Ser. No. 738,429
Claims priority, application Italy, Aug. 3, 1990, 21205 A/90
Int. Cl.[5] D03D *47/34*
U.S. Cl. 139—452 **12 Claims**

1. In a weft feeder for fluid jet looms, of the type comprising a winding unit or drum, a winding arm adapted to distribute on said drum a weft yarn reserve, means to detect the length of



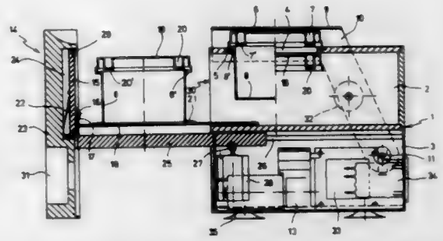
said yarn reserve and to measure the weft yarn length drawn from said reserve at an outlet of the weft feeder, and means to stop the yarn being unwound, and wherein the winding unit has an adjustable cross section and comprises a cage wall formed of two sets of alternating columns mounted on mutually inclined flanges, so as to move forward the yarn reserve in separate turns; the improvement wherein said sets of columns are mounted for radial movement on the respective flanges by means to adjust their radial position for adjusting the yarn turn length, a single control member for simultaneously actuating the last-named means of both sets of columns.

5,201,348

EVACUATING APPARATUS FOR A MICROTITRATION DIAPHRAGM PLATE

Werner Lurz, Kaltenkirchen, Fed. Rep. of Germany, assignor to Eppendorf-Netheler-Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 27, 1992, Ser. No. 843,907
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1991, 4107262
Int. Cl.[5] B65B *43/42;* **B67C** *3/00*
U.S. Cl. 141—130 **20 Claims**



1. An evacuating apparatus for applying suction to the underside of a microtitration diaphragm plate including a plurality of diaphragm receptacles each having an open top and a diaphragm bottom, the evacuating apparatus including a housing (**1**) defining an evacuation chamber (**2**) having an aperture (**4**) provided in a top wall of said chamber (**2**) and having associated therewith peripheral gasket means (**5**) for supporting a rim of said microtitration diaphragm plate (**6**), and further comprising a carrier (**18**) including support means (**8'**) for supporting a microtitration recipient plate (**19**) including a plurality of closed bottom receptacles (**20**) each having an open top and a closed bottom, said carrier (**18**) being adapted to be displaced between an access position wherein said recipient plate (**19**) may be positioned onto or removed from said support means (**8'**), and a loading position wherein said recipient plate (**19**) is disposed within said chamber (**2**) below said diaphragm plate (**6**) so that said diaphragm receptacles (**7**) of said diaphragm plate (**6**) vertically register with said closed bottom receptacles (**20**) of said recipient plate (**19**), said carrier (**18**) having a face plate (**15**) which sealingly engages a peripheral edge of an access opening (**30**) of said chamber (**2**) when said carrier (**18**) is in its loading position.

5,201,349

DEVICE FOR PNEUMATICALLY TRANSFERRING TONER FROM A TRANSPORT CONTAINER INTO A TONER RESERVOIR

Erich Kraehn, Karlsfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 820,030, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 490,675, Mar. 12, 1990, abandoned. This application Sep. 21, 1992, Ser. No. 947,996
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730454
Int. Cl.[5] B65O *1/04*
U.S. Cl. 141—363 **6 Claims**

1. An apparatus for pneumatically transferring toner from a toner container into a toner reservoir from which the toner is then supplied to a developer station of a non-mechanical printer or copier means, comprising:

a toner reservoir having a settling chamber adapted to be in communication with the developer station and adapted to be in communication with the toner container, and the toner reservoir having a suction chamber in communication with the settling chamber; and

a filter separating the suction chamber from the settling

chamber, said filter having a semi-cylindrical shape centered on an axis in said settling space; and

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EDGER FOR A CONVENTIONAL SAWMILL

said first diameter, said pressure plate secured to said one of said first and second sides of said main disc part to thereby lock

preferred position of a wood product relative to the feedline and delivering the wood product at a prepositioning

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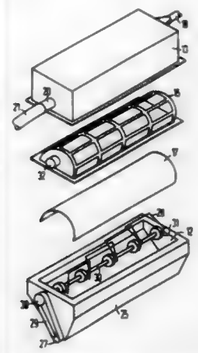
chamber, said filter having a semi-cylindrical shape centered on an axis in said settling space; and

an allocated means for generating a low pressure in said suction chamber to draw toner-ladened air from the toner container into the settling chamber and to draw air from the settling chamber through the filter into the suction chamber thereby depositing toner on the filter;



a scraper means for stripping toner adhering to the filter via scraper elements, said scraper elements being mounted on a rotatable shaft, said rotatable shaft extending substantially along said axis, said scraper elements having a length extending to bear against said filter during rotation of said rotatable shaft; and

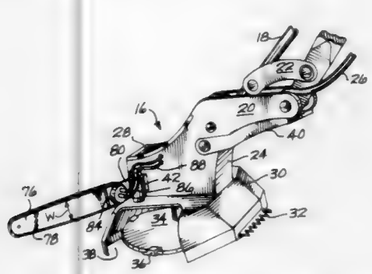
means for driving said rotatable shaft.

5,201,350

WORK HEAD WITH ROTATABLY MOUNTED CHAIN SAW

David E. Milbourn, Rte. 3, Box 696D, Hoquiam, Wash. 98550

Filed Dec. 10, 1991, Ser. No. 805,117
Int. Cl.[5] A01G *23/08;* **B27L** *1/00*
U.S. Cl. 144—2 Z **16 Claims**



5. A work head for a brush cutting machine of the type having a boom structure including at least one boom, comprising:

a main housing mountable on an outer end of said boom;

a cutter wheel rotatably mounted on said housing to rotate about a first vertical axis; and

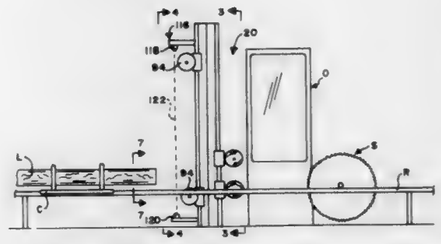
a chain saw rotatably mounted on said housing above said wheel to rotate about a second vertical axis; said chain saw having a nonuse position in which it extends at least substantially over said housing, and a use position in which it projects horizontally beyond said housing; and said chain saw being rotatable about said second vertical axis between said positions.

5,201,351

EDGER FOR A CONVENTIONAL SAWMILL

Ennis J. Hurdle, Jr., Hwy. 57E, Moscow, Tenn. 38057

Continuation-in-part of Ser. No. 867,373, Apr. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 743,937, Aug. 12, 1991, abandoned. This application Aug. 17, 1992, Ser. No. 931,948
Int. Cl.[5] B27C *9/00;* **B27B** *1/00*
U.S. Cl. 144—39 **25 Claims**



1. An edger for use with a conventional sawmill, said edger comprising:

(a) upper and lower cutting means for forming the upper and lower edges, respectively, of a board to be removed from a log, each said cutting means comprising:

i. a rotatable blade;

ii. rotation means for rotating the blade; and,

iii. positioning means for moving the blade upwardly and downwardly with respect to the log and for positioning the blade for cutting the respective edge of the board when the blade is placed in contact with the log;

(b) sizing means for automatically determining the location of the upper and lower edges of the board to be removed from the log;

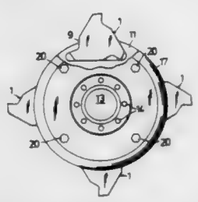
(c) control means, responsive to said sizing means, for controlling the moving and positioning of the blade of each said cutting means by each said positioning means.

5,201,352

ROTATABLE BLADE FOR CLEARING UNITS

Bror E. G. Hult, Filipstad, Sweden, assignor to FMG Timberjack AB, Filipstad, Sweden

PCT No. PCT/SE90/00354, § 371 Date Jan. 30, 1992, § 102(e) Date Jan. 30, 1992, PCT Pub. No. WO90/14934, PCT Pub. Date Dec. 13, 1990
PCT Filed May 28, 1990, Ser. No. 828,925
Claims priority, application Sweden, May 30, 1989, 8901941-8
Int. Cl.[5] B27G *13/08;* **B26D** *1/00*
U.S. Cl. 144—218 **6 Claims**



1. A rotatable blade for a clearing unit comprising a main disc part having first and second sides and an annular peripheral edge, of a first diameter; a plurality of recesses formed in said main disc part, each recess opening towards one of said first and second sides and towards said peripheral edge; each recess receiving a removable and replaceable tooth, each tooth having a symmetrical shape including a peripheral surface provided with a plurality of spaced cutting edges; and a pressure plate having a second diameter substantially the same as

said first diameter, said pressure plate secured to said one of said first and second sides of said main disc part to thereby lock each tooth in its respective recess; and wherein each said recess is shaped and configured such that only one of said spaced cutting edges of each tooth projects radially from a respective recess, and whereby each tooth can be removed from its respective recess beyond said annular peripheral edge, rotated in its own plane and replaced in said respective recess so that another of said plurality of cutting edges projects radially from said recess.

5,201,353

RECONFIGURABLE DEBARKER HEAD

Theodore C. Weill, R.R. #3, Box 161W, Tylertown, Miss. 39667

Filed Jul. 25, 1991, Ser. No. 735,425
Int. Cl.[5] B27G *13/12*
U.S. Cl. 144—236 **20 Claims**

1. A debarker head for use in a tree debarking machine, the head having a number of different assembled arrangements, comprising:

a drive shaft having a predetermined length and a mounting area extending over at least a portion of said predetermined length, said mounting area comprising a number of sides forming a regular polygonal cross sectional shape;

a plurality of generally identical cutting elements, each said cutting element having a peripheral edge and a mounting aperture with a regular polygonal cross sectional shape corresponding to said mounting area, each said cutting element and said drive shaft being adapted for slip fit engagement between said mounting area and each said mounting aperture, each said cutting element engaging said mounting area at a number of rotational positions relative to said drive shaft, said number of rotational positions being defined by said number of sides forming said mounting aperture;

a number of cutting knives disposed at equally spaced intervals about said peripheral edge of each said cutting element; and

means for mounting said cutting elements on said drive shaft with each of said cutting elements engaging said mounting area at a predetermined one of said number of different rotational positions relative to said drive shaft to define one of the number of different assembled arrangements of the debarker head.

5,201,354

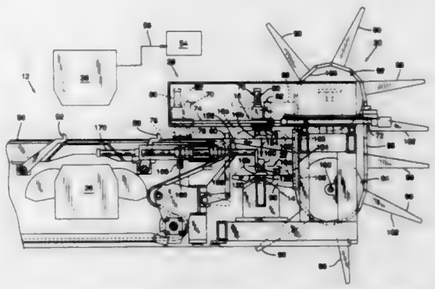
FEED SYSTEM WITH IMPROVED PREPOSITIONING

Larry M. Weissbeck, Vancouver, Wash., assignor to U.S. Natural Resources, Inc., Vancouver, Wash.

Filed Dec. 13, 1991, Ser. No. 807,108
Int. Cl.[5] B27B *1/00, 31/00;* **B27C** *1/12*
U.S. Cl. 144—245 A **15 Claims**

1. An improvement in a wood processing apparatus providing prepositioning of a wood product at a prepositioning stage according to a preferred position of the wood product relative to a feedline along which the wood product moves into a cutting device, the improvement comprising:

an infeed, scanning and prepositioning system determining a preferred position of a wood product relative to the feedline and delivering the wood product at a prepositioning stage offset from said preferred position along a transfer path; and



a conveyor system moving the wood product along the transfer path from the prepositioning stage to a feed stage and into said preferred position, the transfer path being substantially parallel to a least magnitude of one of height and width dimensions of the wood product.

5,201,355

BIOLOGICALLY RESOLVABLE BLIND SLAT AND MANUFACTURING METHOD THEREFOR

Ming Nien, Changhua Hsien, Taiwan, assignor to Nien Made Enterprise Co., Ltd., Changhua Hsien, Taiwan

Filed Mar. 2, 1992, Ser. No. 844,545
Int. Cl.[5] E06B *3/00*
U.S. Cl. 160—236 **4 Claims**

1. A biologically resolvable blind slat which is manufactured in such a manner that stabilizer and calcium carbonate are added to PVC powder and surface-treated starch to mix therewith and then the mixture is heated and processed by a granulating machine into granules and said granules are heated and pressed to form slats.

4. A manufacturing method for biologically resolvable blind slat, wherein stabilizer and calcium carbonate are added to PVC powder and surface-treated starch to mix therewith, and the mixture is then heated and processed by a granulating machine into granules which are heated and pressed by a press machine into strips and then the strips are cut into slats at a certain pattern and by a certain length.

5,201,356

PARTITION, IN PARTICULAR FOR EXHIBITION STANDS, AS WELL AS STANDS PRODUCED USING THIS PARTITION

Guy G. Chenel, 1, rue Marcel Loyau, Boulogne, France

Filed Oct. 31, 1991, Ser. No. 786,062
Claims priority, application France, Nov. 9, 1990, 90 13911
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—351 **12 Claims**

1. Partition in particular for exhibition stands, characterized in that it comprises a supporting structure having at least one upper horizontal cross member (**1**) and at least one lower horizontal cross member (**2**) connected to one another by two vertical uprights (**3**) such that the lower cross member is at a distance from the lower end (3_1) of the uprights and such that it forms an empty space (**4**) with the ground; and in that a flexible material ring (**5**) having two edges is disposed about the upper and lower cross members (**1**, **2**) in order to bear via an upper loop (5_1) on the upper cross member (**1**) and hang via

a lower loop (5_2) under the lower cross member (**2**), ballast (**6**)

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DIE-CASTING MACHINE

ter stream of molten metal against the periphery of said spinning wheel, said orifice having a length from 0.450 to

receives a coolant being located between said inner member and an inner surface of said casting ring.

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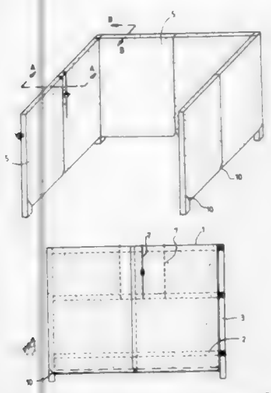
a lower loop (5_2) under the lower cross member (2), ballast (6) being disposed inside the ring (5) at the level of the lower loop



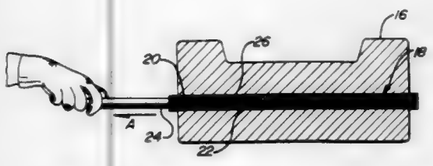
(5_2) so as to be located in the empty space (4) formed under the lower cross member (2).

5,201,357

METHOD FOR FORMING CORED PASSAGEWAYS WITHIN CAST METAL ARTICLES

John W. Kuhn, Bristol, and Richard J. Wylie, Wabash, both of Ind., assignors to CMI International, Inc., Southfield, Mich.

Filed Jan. 16, 1992, Ser. No. 821,225
Int. Cl.[5] B22D *29/00*
U.S. Cl. 164—132 5 Claims



1. A method of forming a cored passageway within a cast metal article, said method comprising:

axially compressing a sleeve (22) of woven refractory material to enlarge its cross-sectional area and perimeter;

disposing a support element (24) within the sleeve (22) thereby supporting the sleeve (22) in the enlarged condition;

disposing the sleeve-covered support element (18) within a casting cavity (14) of a mold (12);

casting molten metal (36) into the cavity (14) and around the sleeve-covered support element (18) and allowing the metal (36) to solidify and form a cast article (16);

removing the support element (24) from within the sleeve (22) with the sleeve (22) remaining in the enlarged condition (26) and attached to the cast article (16); and

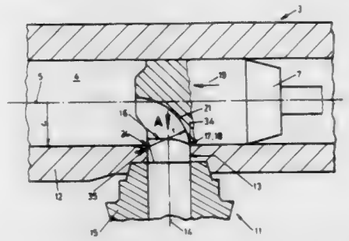
applying a tension force (A) along the length of the sleeve (22) forcing it to stretch into a smaller cross-sectional area with a contracted perimeter whereby the sleeve (22) detaches from the article (16) for easy removal leaving behind a resultant cored passageway (20) within the article (16).

5,201,358

DIE-CASTING MACHINE

Friedrich Stummer, Fellbach; Wilfried Schwab, Weingarten; Wolfgang Schneider, St. Augustin, and Heike Baldering, Bonn, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Müller-Weingarten AG, Weingarten and Vereinigte Aluminium-Werke AG Berlin-Bonn, Bonn, both of Fed. Rep. of Germany

Filed Jan. 13, 1992, Ser. No. 820,083
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1991, 4101592
Int. Cl.[5] B22D *17/10, 17/20*
U.S. Cl. 164—312 20 Claims



1. An improved die-casting machine for producing castings from metals or metal alloys, which castings have a low content of gas, pores and oxides, the die-casting machine including a casting chamber (3), which has an inlet opening and which can be filled with melt from a holding device (10) via a suction tube (11) by means of a vacuum connection to a die, the die-casting machine additionally including a casting plunger (7) which is disposed in the casting chamber (3) and which is movable form an open position to a closed position during a closing operation, the inlet opening (16) being closed by the casting plunger (7) when it is in its closed position, the casting plunger (7) having a closing edge (17) which slides over the inlet opening (16) during the closing operation, wherein the improvement comprises:

a portion of the inlet opening (16) and the closing edge (17) of the casting plunger (7) are configured so that the melt flow is planar or linear as the closing operation is being completed.

5,201,359

RAPID SOLIDIFICATION APPARATUS

Alan T. McMullen, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

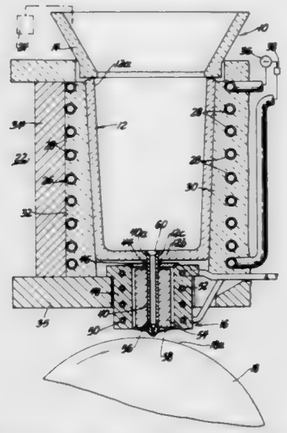
Filed Sep. 24, 1990, Ser. No. 587,927
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—423 8 Claims

1. A melt spinning apparatus having a tundish with an outlet in which is supported a boron nitride nozzle for directing a molten stream of iron-rare earth element-boron containing alloy against a quench wheel supported below the outlet of the nozzle for receiving a molten stream of the alloy and rotatable at a controlled rate for receiving and cooling the molten metal stream from the nozzle to substantially instantaneously solidify the molten metal to form an amorphous product or a very finely grained solid product comprised of such composition and wherein the apparatus is characterized by:

said nozzle having an inlet and a tubular portion having a wall defining a large diameter longitudinal bore in communication with said inlet; said longitudinal bore having a predetermined length for forming a uniformly moving mass of molten metal in the nozzle during a melt spinning run in which the molten metal is directed from the tundish through said nozzle inlet;

an end wall closing said tubular portion having an orifice with an inlet and an outlet for forming a small diameter stream of molten metal and for directing the small diameter stream of molten metal against the periphery of said spinning wheel, said orifice having a length from 0.450 to 0.500 inches;

flow transition means at the inlet of said orifice thereof for providing a transition flow area from said large diameter longitudinal bore through said orifice for reducing flow-induced erosion at the inlet end of said orifice and to flow the molten metal from the large diameter longitudinal bore in a convergent pattern which forms a uniformly contracted inlet stream of molten metal to said orifice for controlling the uniformity of the diameter of the molten stream issuing from said orifice for contact with the periphery of the quench wheel.

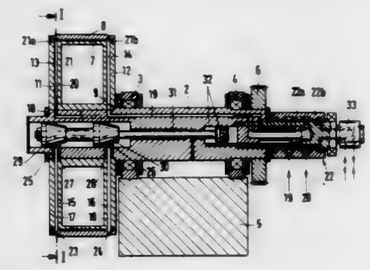


5,201,360

CASTING WHEEL FOR A SINGLE-ROLL CASTING MACHINE

Horst Schenk, Dortmund, and Herbert Gellenbeck, Hemer, both of German Democratic Rep., assignors to Sundwiger Eisenhutte Maschinenfabrik, Hemer-Sundwig, Fed. Rep. of Germany

Continuation of Ser. No. 744,953, Aug. 14, 1991, abandoned. This application Aug. 28, 1992, Ser. No. 938,542
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 4026075
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—429 13 Claims



1. A casting wheel, comprising

an annular inner member which is rotatable about an axis of rotation,

a casting ring having an outer cylindrical generated surface, said casting ring being concentrically disposed about said inner member, an axially extending annular space which receives a coolant being located between said inner member and an inner surface of said casting ring,

a radially extending supply line and a radially extending discharge line disposed in said inner member for supplying said coolant to said annular space, and

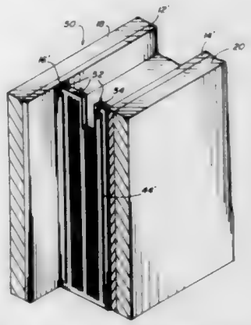
radially adjustable and outwardly acting pressure members disposed in said inner member which engage against said inner surface of said casting ring thereby causing said casting ring to rotate with said inner member.

5,201,361

CONTINUOUS CASTING IN MOLD HAVING HEATED END WALLS

John W. Grove, Seneca, and Frank J. Kowalczyk, Oil City, both of Pa., assignors to Acutus Mold, Inc., Pontiac, Mich.

Filed Apr. 16, 1991, Ser. No. 685,800
Int. Cl.[5] B22D *11/04*
U.S. Cl. 164—459 1 Claim



1. A method of casting a metal slab from a continuous casting mold having a pair of fixed and opposed broad walls and a pair of opposed narrow walls, said broad and narrow walls cooperating to form a molten metal reception cavity adapted to receive molten metal to a predetermined level, said predetermined level being below a certain portion of each of said pair of opposed narrow walls, said method

cooling said received molten metal effective to form a continuous slab; and

locally and continuously applying heat to said certain portion of each of said pair of opposed narrow walls only above said predetermined level, effective to create thermal expansion of said certain portion and thereby prevent the formation of a gap between one of said pair of narrow walls and one of said pair of broad walls as said received molten metal is cooled and formed into said slab.

5,201,362

CONTINUOUS CASTING METHOD OF THIN STRIP

Yasuhiro Yamagami, Futtsu; Hiroyuki Nakajima, Hikari; Kensuke Shimomura, Hikari, and Hidetake Oka, Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 10, 1991, Ser. No. 805,542
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—480 3 Claims

1. A method of continuously casting a thin strip by pressing a pair of side walls onto both side surfaces of a pair of rotating cooling drums to form a metal bath and rotating said cooling drums so as to cool a molten metal inside said metal bath and to cast the thin strip, comprising the steps of:

pressing said side walls pre-heated before the start of casting to said end surfaces of said cooling drums at a predetermined surface pressure between 3 to 30 kg/cm^2 and applying deformation to said side walls corresponding to the shape of said end surfaces of said cooling drums;

lowering said press surface pressure, starting the casting,

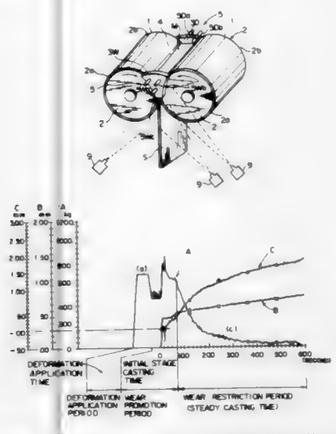
5,201,364

APPARATUS FOR HEATING AND COOLING FOOD

said condenser, to control the degree of cooling by said heat remover,

connection to the condenser interior branching off in the

lowering said press surface pressure, starting the casting, advancing said side walls toward said end surfaces of said cooling drums to generate a predetermined friction on said side walls, and thus forming slide surfaces necessary for stable casting; and



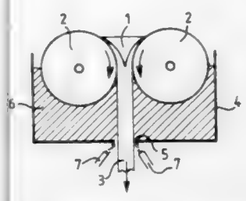
lowering the advancing speed of said side walls after said necessary slide surfaces are formed, and continuing stable casting.

5,201,363

METHOD AND DEVICE FOR MANUFACTURING A SEMI-FERRITIC STAINLESS STEEL STRIP FROM MOLTEN METAL

Philippe Demarez, Labeuvriere, and Jean-Michel Hauser, Ugine, both of France, assignors to Usinor Sacilor, Puteaux, France; Thyssen Stahl Aktiengesellschaft, Duisburg and Thyssen Edelstahlwerke AG, Krefeld, both of Fed. Rep. of Germany

Filed Aug. 12, 1991, Ser. No. 743,891
Claims priority, application France, Aug. 13, 1990, 90 10304
Int. Cl.[5] B22D *11/06, 11/124*
U.S. Cl. 164—480 **7 Claims**



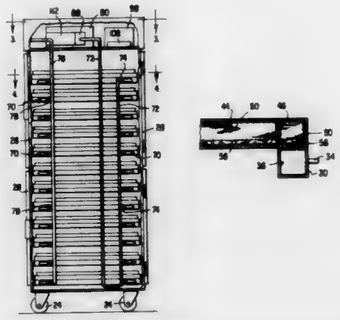
1. A method for manufacturing a semi-ferritic stainless steel strip from a bath of molten metal, said method comprising effecting a solidification of said metal in a continuous casting ingot mould comprising two cooled rolls rotating in opposite directions and disposed in confronting relation so as to define a casting space therebetween, continuously extracting a strip of solidified steel from said ingot mould, and, below said ingot mould, subjecting said strip to a quenching medium so as to rapidly cool said strip for a sufficient period of time to prevent formation of austenite.

5,201,364

APPARATUS FOR HEATING AND COOLING FOOD ARTICLES HAVING REMOVABLE PLATES WITH FLUID SEALED THEREIN

Vincent P. Tippmann, 8605 N. River Rd., New Haven, Ind. 46774, and Joseph R. Tippmann, HRC-33, Box 8419, Rapid City, S. Dak. 57701

Filed Sep. 17, 1990, Ser. No. 583,207
Int. Cl.[5] F25B *29/00, 13/00;* **A47B** *31/02;* **A23L** *1/00*
U.S. Cl. 165—26 **8 Claims**



1. An apparatus for transferring heat to food articles contained within a chamber comprising:

a) a chamber having at least two vertically upstanding spaced-apart side walls and adjacent top and bottom walls;

b) a plurality of vertically spaced-apart mounting means adjacent each of said side walls, each of said mounting means being tubular in shape and having a fluid inlet and outlet thereon;

c) a plurality of vertically spaced-apart, removably mounted support means on said mounting means, said support means having an amount of heat absorbing fluid medium sealed therein;

d) supply header means connecting said inlets of each of said mounting means and return header means connecting said outlets of each of said mounting means; and

d) means for circulating a heated transfer fluid through said supply and return header means and said support means.

5,201,365

WEARABLE AIR CONDITIONERS

Israel Siegel, 2980 Point East Dr., Apt. D-612, N. Miami Beach, Fla. 33160

Filed Jan. 7, 1991, Ser. No. 637,666
Int. Cl.[5] F25D *3/12;* **A61F** *7/02*
U.S. Cl. 165—46 **10 Claims**

1. An air conditioner said air conditioner includes at least one container to act as a heat remover,

said heat remover container having a high surface to volume ratio,

a liquid in said heat remover container to act as a low boiling point refrigerant,

an air vacuum in said heat remover container to lower the boiling point of said liquid,

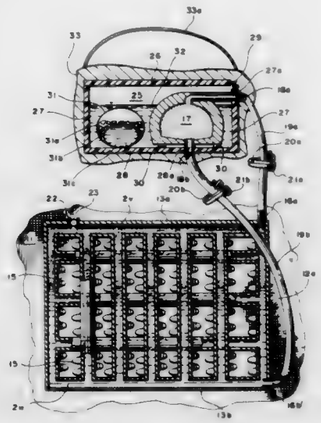
at least one container to act as a condenser container,

means to cool said condenser container,

a communication between said heat remover and said condenser containers,

said communication including a communication between the vapor phase of said heat remover and said condenser,

means to regulate the size of the opening of said vapor communication to obtain different degrees of communication between the vapor phase of said heat remover and said condenser, to control the degree of cooling by said heat remover,



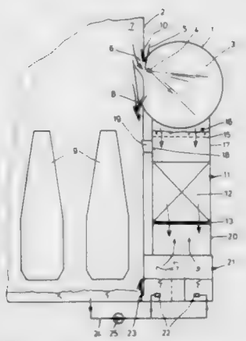
and means to return liquid from the condenser to the heat remover containers.

5,201,366

PROCESS AND EQUIPMENT FOR THE PREHEATING AND MULTI-STAGE DEGASSING OF WATER

Francisco Blangetti, Baden, Switzerland; Hans Eisenbeis, Lienheim, Fed. Rep. of Germany, and Mustafa Youssef, Zürich, Switzerland, assignors to ASEA Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 26, 1991, Ser. No. 721,305
Claims priority, application Switzerland, Jun. 28, 1990, 2162/90
Int. Cl.[5] B01D *19/00;* **B01F** *3/04*
U.S. Cl. 165—112 **6 Claims**



2. Equipment for the preheating and multi-stage degassing of make-up water by means of steam in a power generation installation for carrying out the process as claimed in patent claim 1, which comprises

a mixing chamber which is located on the outside wall of the condenser of the power generation installation and communicates with the condenser interior via a steam inlet and steam outlet and in which a plurality of water injection means are arranged, the steam inlet of the mixing chamber opening towards the condenser neck,

also a separation column which is located upright underneath the mixing chamber and connected thereto and which is fitted at its upper end with a water distributor, a connection to the condenser interior branching off in the wall of the separation column between the water distributor and the elements of the separation column,

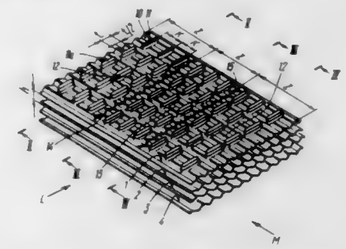
and a receiver which is located underneath the separation column and connected thereto and in which steam-dispersing means are fitted and which is connected via a weir to the condenser interior.

5,201,367

STACK OF PLATES FOR A PLATE-AND-TUBE HEAT EXCHANGER WITH DIVERGING-CONVERGING PASSAGES

Evgeny V. Dubrovsky, ulitsa Chaikovskogo, 18, kv. 203, Moscow; Alexandr A. Kopylov, ulitsa Sukhareva, 36, kv. 55, Orenburg; Vladimir P. Nagornov, ulitsa Turkestanskaya, 41, kv. 120, Orenburg, and Leonid A. Averkiev, ulitsa Gagarina, 40a, kv. 137, Orenburg, all of U.S.S.R.

PCT No. PCT/SU90/00047, § 371 Date Dec. 13, 1991, § 102(e) Date Dec. 13, 1991, PCT Pub. No. WO91/13309, PCT Pub. Date Sep. 5, 1991
PCT Filed Feb. 20, 1990, Ser. No. 778,103
Int. Cl.[5] F28F *1/32*
U.S. Cl. 165—151 **1 Claim**



1. A stack of plates for a plate-and-tube heat exchanger with diverging-converging passages, comprising a plurality of stacked plates (**1,2,3,4**) having a zig-zag profile and defining in the direction (L) of low of a first heat-exchange medium the passages (**5,6,7**) for its flow, the profile of each passage (**5,6,7**) being a succession of alternating diverging and converging portions (**8,9**), each plate (**1,2,3,4**) having in the direction (M) perpendicular to the flow direction (L) of the first medium at least one row (**10**) of uniformly spaced (K) openings (**11**) accommodating therein tubes (**11a**) for the flow of a second heat-exchange medium, wherein each plate (**1,2,3,4**) has in the direction (M) perpendicular to the flow direction (L) of the first medium an odd number of adjacent portions (**12,13**) of the same length (Z), the zig-zag profile of each portion (**12,13**) being offset with respect to the zig-zag profile of each adjacent portion (**13,12**) of the same plate (**1,2,3,4**) by one half of the pitch (t) of the zig-zag pattern of the profile in the flow direction (L) of the first medium, and communicating with the adjacent portions (**13,12**) through a transition zone (**14,15**) disposed between adjacent portions (**12,13**), the length (Z) of each portion (**12,13**) being a multiple of the spacing (K) of the axes of the openings (**11**) in the same row (**10**).

5,201,368

GASKET FOR A TANK AND HEADER ASSEMBLY

Karl P. Kroetsch, Williamsville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 22, 1992, Ser. No. 902,267
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—173 **12 Claims**

1. In a heat exchanger having a tank sealingly secured to a header by a seal assembly, the seal assembly characterized by:

a tank foot at an end of said tank, said foot being outwardly directed from a vertical wall of said tank and having a

lower surface, outer surface, upper surface and inner heel

said inflation chamber to prevent damage to said inflatable well from over-inflation and to maintain said set-

cated outside of said reduced internal diameter and in a plane substantially perpendicular thereto;

safety coupling provided between said drive shaft and said tool holder; and a switching member supported with a bearing axis

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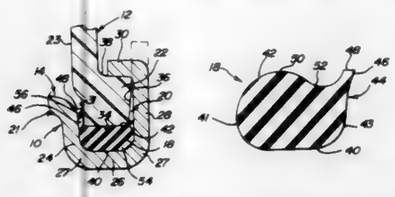
lower surface, outer surface, upper surface and inner heel section;

a header configured to receive the tank foot having an end plate section with a peripheral channel;

said channel having an outer bendable wall for gripping the foot, an inner wall opposed to the heel, and a bottom surface being opposed to and spaced from said lower surface of said foot;

an annular gasket of elastomeric material having a convex



upper section compressed between the bottom surface of said channel and said foot, a truncated lip at an inner side of said annular gasket interposed between said inner wall of said channel and the heel section of said foot, said lip being separated from said convex upper section when said gasket is in a relaxed state by a recess interposed between said lip and said convex upper section, and when installed, being positioned below said end plate section of said header and outboard of an inner surface of said vertical wall of said tank.

5,201,369

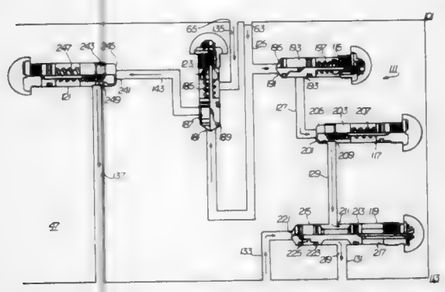
REINFLATABLE EXTERNAL CASING PACKER

Vel Berzin, and John R. Abarca, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 6, 1991, Ser. No. 788,349

Int. Cl.[5] E21B *33/127*

U.S. Cl. 166—187 **15 Claims**



1. An inflatable packer for use in a wellbore, when coupled to a wellbore tubular conduit which passes pressurized fluid through a central bore, for mating against a wellbore surface, comprising:

an inflatable wall disposed exterior of said wellbore tubular conduit and at least in-part defining an inflation chamber;

a valve system for selectively directing pressurized fluid from said central bore of said tubular conduit to said inflation chamber, said valve system being operable in at least three modes, including:

a filling mode, wherein said valve system directs pressurized fluid into said inflation chamber to outwardly radially expand said inflatable wall from a running position in which said inflatable wall is out of contact with said wellbore surface to a setting position in which said inflatable wall is in sealing engagement with said wellbore surface;

a locking mode, wherein said valve system closes to prevent the entry and release of said pressurized fluid from said inflation chamber to prevent damage to said inflatable well from over-inflation and to maintain said setting position with said inflatable wall in sealing engagement with said wellbore surface; and

a reinflation mode, wherein said locking mode is overridden and said pressurized fluid is directed into said inflation chamber to compensate for loss of pressure in said inflation chamber.

5,201,370

ENZYME BREAKER FOR GALACTOMANNAN BASED FRACTURING FLUID

Robert M. Tjon-Joe-Pin, Houston, Tex., assignor to BJ Services Company, Houston, Tex.

Filed Feb. 26, 1992, Ser. No. 842,038

Int. Cl.[5] E21B *43/26*

U.S. Cl. 166—300 **7 Claims**

1. A method of fracturing a subterranean formation which surrounds a well bore comprising the steps of:

formulating a gellable fracturing fluid by blending together an aqueous fluid, a hydratable polymer, a suitable cross-linking agent for crosslinking the hydratable polymer to form a polymer gel, and an enzyme breaker;

pumping the cross-linked polymer gel to a desired location within the well bore under sufficient pressure to fracture the surrounding subterranean formations;

allowing the enzyme breaker to degrade the cross-linked polymer, whereby the fluid can be pumped from the subterranean formation to the well surface;

wherein the enzyme breaker has activity in the pH range of about 2.0 to 11.0 and effective to attack only specific linkages in the cross-linked polymer gel.

5,201,371

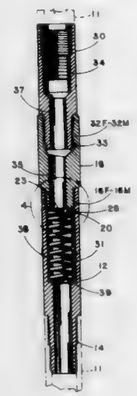
BACK PRESSURE FLAPPER VALVE

Charles W. Allen, 4210 Sarah Street, New Iberia, La. 70560

Filed May 3, 1991, Ser. No. 695,459

Int. Cl.[5] E21B *34/08;* **F16K** *15/03*

U.S. Cl. 166—325 **7 Claims**



1. A flow actuated one way valve for free downward and blocked upward flow operation in oil well tubular assemblies comprising: tubular members of nominally uniform outside diameter for insertion in the oil well tubular assemblies, said tubular members provided with a reduced internal diameter portion above an adjacent enlarged internal diameter portion;

a downwardly-facing circumferential sealing surface adjoining said reduced internal diameter;

mounting means provided outwardly adjacent said circumferential sealing surface, for providing a pivotal axis located outside of said reduced internal diameter and in a plane substantially perpendicular thereto;

a flapper having an upwardly-oriented sealing face and an under face, said flapper pivotally mounted to said mounting means for movement from a first position with said sealing face closely contacting said sealing surface, to a second position substantially disposed between said reduced and enlarged internal diameters; and

a compression spring having coils closely fitting within said adjacent enlarged diameter for free coaxial movement therein for applying a closing force to urge said sealing member to said first position.

5,201,372

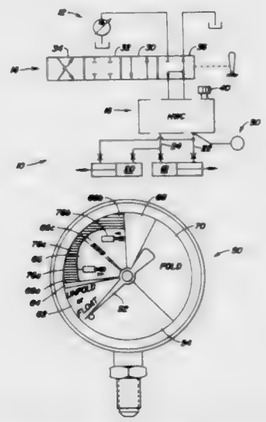
WING FOLD IMPLEMENT WITH HYDRAULIC MODE INDICATOR

Warren L. Thompson, Ankeny, and Marvis L. Landon, Indianola, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 30, 1991, Ser. No. 769,042

Int. Cl.[5] G01L *19/12*

U.S. Cl. 172—430 **12 Claims**



1. In an implement with a first frame, a second tool-carrying frame hinged to the first frame, a hydraulic cylinder connected between the first and second frames and operable in a plurality of modes including fold and unfold modes for respectively folding and unfolding the second frame relative to the first frame and a field working mode for transferring weight between the frames to vary tool penetration, control means for adjusting the pressure of said cylinder to thereby adjust a down force on the tools on the second frame during the field working mode, and sensor means responsive to pressure of said cylinder for providing a visual indication of which of the plurality of modes the cylinder is operating, wherein the sensor means includes means for providing an indication of the amount and direction of weight transfer when the cylinder is operating in the field working position.

5,201,373

HAND HELD POWER TOOL WITH SAFETY COUPLING

Hans Bloechle, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

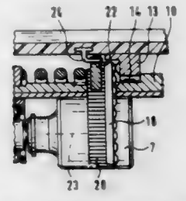
Filed Dec. 12, 1991, Ser. No. 806,888

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1991, 4100185

Int. Cl.[5] B23Q *5/04*

U.S. Cl. 173—109 **15 Claims**

1. A hand held power tool, particularly a hammer drill, comprising a housing; a drive shaft; a rotatable tool holder; a safety coupling provided between said drive shaft and said tool holder; and a switching member supported with a bearing axis extending substantially parallel to said driven shaft and freely movable about said bearing axis in a plane extending substantially perpendicularly to said drive shaft, said switching member being formed so that in response to a jerky rotation of said housing about an axis of said tool holder said switching member engages said safety coupling and releases said safety coupling from said drive shaft.



5,201,374

SCREW JOINT TIGHTENING POWER TOOL

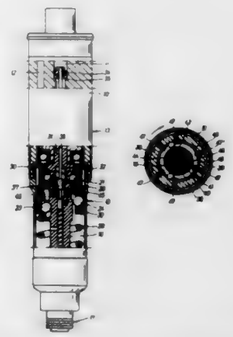
Erik R. Rahm, Upplands Väsby, Sweden, assignor to Atlas Copco Tools AB, Stockholm, Sweden

Filed Jan. 10, 1992, Ser. No. 819,119

Claims priority, application Sweden, Jan. 10, 1991, 9100070

Int. Cl.[5] B25B *23/14*

U.S. Cl. 173—178 **4 Claims**



1. A screw joint tightening power tool, comprising:

a housing (**10**);

a rotation motor (**13**) and power control means (**34**) coupled to said motor (**13**);

power transmitting means coupling said motor (**13**) to an output shaft (**16**) said power transmitting means including a rolling member type override clutch (**15**) having a driving half (**20**) and a driven half (**22**), said clutch halves (**20**, **22**) being coupled by torque transferring cam means (**26**, **27**) which have trapped therebetween rolling members (**24**), and said clutch halves (**20**, **22**) being provided with dwell portions (**28**) for allowing a limited relative rotation of said clutch halves (**20**, **22**) without transferring any torque therebetween;

a control means shifting mechanism for controlling said power control means, said control means shifting mechanism being associated with said clutch (**15**) and including an axially extending and longitudinally displaceable rod (**36**) coupled to said power control means (**34**);

a latch member (**41**) radially movable relative to said output shaft (**16**) for movement between a rest position in which said rod (**36**) is axially supported in a power control means

(**34**) ON-position and an activated position in which said

each cone comprises a body rotatably mounted on a shaft and

pair of upright post arrangements positioned adjacent opposite sides of said base assembly and projecting up-

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5,201,379

FLAT-FLOOR HIGH ROOF CAB-OVER-ENGINE

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(34) ON-position and an activated position in which said rod (36) is released for axial movement towards a power control means (34) OFF-position; and

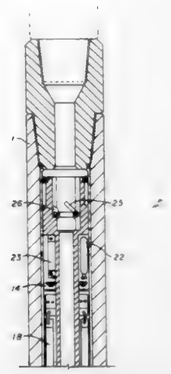
actuating means (45) associated with the driving clutch half (20) for engaging and shifting radially said latch member (41) from said rest position to said activated position at relative rotation of said clutch halves (20, 22), said actuating means comprising a number of rolling elements (45) supported in pockets (48) in said driving clutch half (20), each of said pockets (48) having a peripheral extent so as to provide for peripheral movability of the corresponding roller element (45), thereby enabling self adjustment in both rotation directions of a point of actuating interengagement between said rolling elements (45) and said latch member (41) which corresponds to relative positions between said clutch halves (20, 22) where a maximum transferred torque of said clutch is just passed.

5,201,375

DOWNHOLE DRILLING TOOL SYSTEM

James D. Base, Ormsby St. Margaret, and David Harvey, Great Yarmouth, both of England, assignors to Fontan Limited, Douglas, Isle of Man

Filed Apr. 2, 1990, Ser. No. 503,615
Int. Cl.[5] E21B *7/06*
U.S. Cl. 175—45 **20 Claims**



1. A method of receiving instructions for an implement having a flow passage therethrough, for example, a drill string stabilizer, mounted on a drill string, which instructions are transmitted by varying the rate of flow of, or pressure exerted by, the fluid in the bore of the drill string and said flow passage in accordance with one of a plurality of predetermined sequences; the method comprising the steps of:

(a) monitoring variations in the rate of flow of or pressure exerted by the fluid in the drill string;

(b) comparing the sequence of monitored variations with a plurality of predetermined sequences, each predetermined sequence corresponding to a set of instructions for the implement, and

(c) ignoring the variations if they do not correspond to a predetermined sequence.

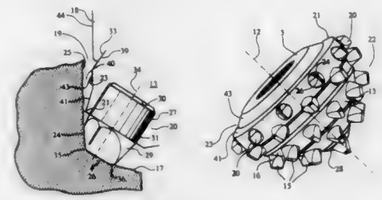
5,201,376

ROCK BIT WITH IMPROVED GAGE INSERT

Mark E. Williams, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 22, 1992, Ser. No. 872,260
Int. Cl.[5] E21B *10/16*
U.S. Cl. 175—374 **9 Claims**

1. In a roller cone drill bit having a predetermined radial gage dimension relative to a central axis of said bit and wherein each cone comprises a body rotatably mounted on a shaft and having a plurality of cutting inserts connected to said body and protruding from the surface thereof for cutting engagement with the bottom of a borehole and including a row of gage inserts mounted therein adjacent the heel of the cone body, the improvement comprising a relief surface formed in said body at the heel thereof and spaced radially away from the gage dimension of said bit and toward the central axis of said bit, each of said gage inserts further including an elongated gage cutting edge for cutting the wall of said borehole to gage and extending generally parallel to the axis of said bit when cutting said borehole wall, and an elongated bottom hole cutting edge formed thereon and disposed at an obtuse angle relative to said gage cutting edge for cutting a portion of the bottom of the hole adjacent the wall thereof.



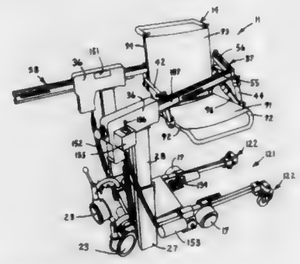
5. A tooth-shaped insert for use in the gage row of a roller cutter of a roller cone bit, said insert having a base of a generally cylindrical shape adapted to be mounted on the roller cutter within a socket formed in the body of the cone, an extension integrally formed with said base along a longitudinal axis, a bottom hole tooth-shaped cutting edge integrally formed with said extension opposite said base, said bottom hole cutting edge having opposite ends and extending lengthwise generally linearly therebetween generally perpendicular relative to said longitudinal axis, and a tooth-shaped borehole wall cutting edge integrally formed with and extending lengthwise linearly away from one of said ends of said bottom hole cutting edge at a predetermined obtuse included angle relative to said bottom hole cutting edge for cutting the borehole wall to gage when utilized in the gage row of said roller cutter.

5,201,377

WHEELCHAIR WITH SIDEWARDLY SWINGABLE SEAT

Harold R. Wilson, Holland, Mich., assignor to Love Lift, L.P., Holland, Mich.

Continuation-in-part of Ser. No. 484,570, Feb. 23, 1990, Pat. No. 5,112,076, which is a continuation-in-part of Ser. No. 749,153, Aug. 23, 1991. This application Nov. 8, 1991, Ser. No. 790,219
Int. Cl.[5] B62D *11/04*
U.S. Cl. 180—6.5 **27 Claims**



1. A wheelchair arrangement, comprising:

a wheeled base assembly having front and rear ends, and opposite sides;

an upright assembly mounted to and projecting upwardly from said base assembly, said upright assembly including a pair of upright post arrangements positioned adjacent opposite sides of said base assembly and projecting upwardly therefrom in generally parallel relationship;

a pair of generally parallel and horizontally-elongated support arm arrangements disposed in sidewardly spaced relationship so as to be positioned generally over opposite sides of said base assembly, each said arm arrangement being disposed adjacent and cooperating with an upper end of one of said upright post arrangements and projecting generally horizontally in a cantilevered manner away from the respective post arrangement toward one of the ends of the base assembly;

an occupant-accommodating seat assembly releasably attached to and positioned between said pair of support arm arrangements, said seat assembly including a seat portion which defines thereon an enlarged upwardly facing surface which is provided for engaging an occupant, said seat portion being positioned generally downwardly from the elevation of said support arm arrangement;

mounting means cooperating between each said support arm arrangement and the upper end of the respective post arrangement for permitting substantially horizontal movement of the support arm arrangement along a longitudinal direction thereof relative to the respective post arrangement; and

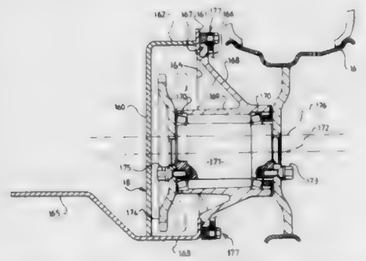
driving means associated with each said arm arrangement for drivingly moving the respective arm arrangement relative to the respective post arrangement along the longitudinal direction of the arm arrangement.

5,201,378

SKID STEER VEHICLE

Joseph C. Bamford, Montreux, Switzerland, assignor to J. C. Bamford Excavators Limited, Rocester, United Kingdom

Filed Feb. 19, 1991, Ser. No. 657,828
Claims priority, application United Kingdom, Feb. 21, 1990, 9003852; Feb. 21, 1990, 9003853; Feb. 21, 1990, 9003854; Feb. 21, 1990, 9003920
Int. Cl.[5] B62D *55/125*
U.S. Cl. 180—6.48 **17 Claims**



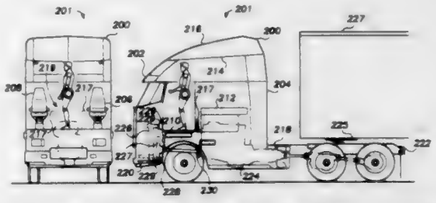
1. A skid steer vehicle comprising a body having a front end and a rear end and ground engageable propulsion wheels disposed on opposite sides of the body, a stub axle for each propulsion wheel, each stub axle having an outer end on which a said propulsion wheel is carried, a stub axle housing member for each stub axle, means to house a stub axle in each stub axle housing member for rotation of the stub axle relative to the housing member about an axis of rotation, a carrier member provided for each stub axle housing member, the carrier member and the body being provided with co-operating guide means to guide the carrier member for rotation about a reference axis, means to mount each carrier member on the body in a selected one of a plurality of any angular positions about said reference axis, the stub axle housing member being positioned relative to the carrier member so that said axis of rotation is disposed eccentrically relative to said reference axis.

5,201,379

FLAT-FLOOR HIGH ROOF CAB-OVER-ENGINE TRACTOR

Roger P. Penzotti, Mount Vernon, and James W. Saunders, Burlington, both of Wash., assignors to Paccar Inc., Kent, Wash.

Filed Jun. 7, 1991, Ser. No. 712,197
Int. Cl.[5] B62D *33/06*
U.S. Cl. 180—89.18 **15 Claims**



1. A tractor for a truck wherein the tractor is constructed for operation by a driver and wherein the tractor is constructed for hauling a trailer, said tractor comprising:

a cab compartment for the driver of the truck, said cab compartment including a driver seat and a passenger seat mounted to a floor of said cab compartment, said floor being substantially flat to provide a substantially unobstructed pathway between said driver seat and said passenger seat, said driver seat being positioned so that when the driver is seated therein the driver faces toward a forward portion of said cab compartment and away from a rearward portion of said cab compartment, said cab compartment including a sleeper bunk mounted to said rearward portion thereof, a bulkhead positioned intermediate said forward and rearward portions of said cab compartment, and a throughway to permit the driver to enter said rearward portion from said forward portion, said cab compartment further including a roof on the top thereof constructed for providing sufficient height interior of said cab compartment to enable the driver to stand upright on said floor;

frame means for supporting said cab compartment, said frame means having a front end and a rear end, said cab compartment being supported proximate said front end of said frame means, said frame means including means for releasably coupling the trailer thereto;

engine means for providing a drive force to the tractor, said engine means being mounted to said frame means and positioned substantially beneath said cab compartment rearward of said floor so that said floor may be positioned lower than the top of said engine means and may be substantially flat;

radiator means for transferring heat from a liquid coolant to air outside said radiator means, said radiator means being mounted to said front end of said frame means, said radiator means including means for conducting said liquid coolant to said engine means for cooling said engine means;

a fan mounted to said front end of said frame means, said fan being mounted proximate said radiator means to create air flow through said radiator means thereby to improve the transfer of heat from said radiator means to air outside said radiator means;

drive shaft means for providing rotational drive movement to said fan, said drive shaft means being positioned substantially beneath said floor and extending from said front end of said frame means to said engine means, said drive shaft means being coupled to said engine means to be rotated by said engine means;

alternator means for generating electrical energy, said alternator means being mounted to said front end of said frame means remote from said engine means, said alternator means being coupled to said drive shaft means for con-

verting rotational energy provided by said drive shaft a nominal travelling speed; an adjusting member acting on the

ing characteristics where the reverse phase side occurs

fork supporting a front wheel in a shock absorbing man-

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verting rotational energy provided by said drive shaft means to electrical energy; and

an aerodynamic fairing mounted to said roof of said cab compartment.

5,201,380

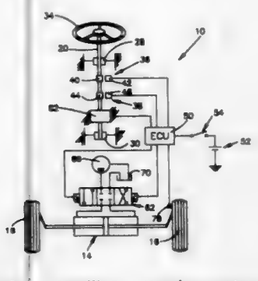
PHASED REDUNDANT SENSOR STEERING CONTROL

William L. Callahan, Lafayette, Ind., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jul. 10, 1991, Ser. No. 728,196

Int. Cl.[5] B62D *5/06*

U.S. Cl. 180—132 **19 Claims**



1. A system for controlling a steering motor for turning a steerable vehicle wheel, said system comprising:

a shaft rotatable about its longitudinal axis;

a plurality of sensors, each of said plurality of sensors providing a signal, the signal of each of said plurality of sensors being indicative of the rotational position of said shaft for different portions of a revolution of said shaft, the signal of each of said plurality of sensors being non-indicative of the rotational position of said shaft for different portions of a revolution of said shaft; and

a control means for operating the steering motor alternately in response to a first signal provided by one of said plurality of sensors for a first portion of rotation of said shaft and a second signal provided by another of said plurality of sensors for a second portion of rotation of said shaft;

wherein said one of said plurality of sensors is a first potentiometer and said another of said plurality of sensors is a second potentiometer.

5,201,381

TRAVELING SPEED REGULATING DEVICE FOR MOTOR VEHICLES

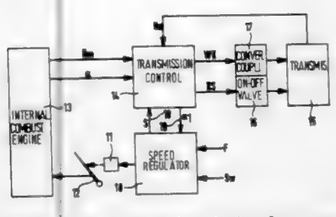
Kurt Neuffer, Stuttgart; Jochen Boeckem, Reutlingen, and Gerhard Eschrich, Tettnang, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1991, Ser. No. 795,787

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1990, 4037248

Int. Cl.[5] B60K *31/08*

U.S. Cl. 180—179 **8 Claims**



1. A traveling speed regulating device for motor vehicle provided with a drive motor and a transmission, the device comprising transmission control means for controlling said transmission; an electronic traveling speed regulator providing a nominal travelling speed; an adjusting member acting on the drive motor and changing a moment of the drive motor in dependence on a travelling speed deviation; and further control means releasable in predetermined marginal conditions and adjusting a traveling speed by acting on said transmission control means of the transmission, said further control means being designed so that a traveling speed which is over a nominal value in connection with a position of said control member which changes the moment of the motor in a zero position when the motor applies no power to wheels are provided as the marginal conditions.

5,201,382

FOUR-WHEEL-STEERED VEHICLE CONTROL SYSTEM

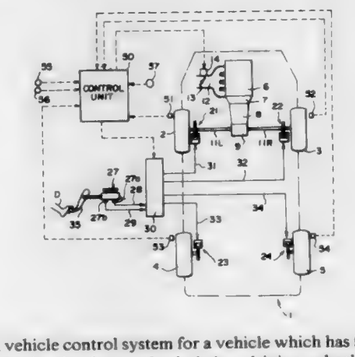
Takeshi Edahiro; Ryuya Akita; Hiroshi Ohmura; Takashi Nakashima, and Takeshi Murai, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 29, 1991, Ser. No. 677,528

Claims priority, application Japan, Mar. 30, 1990, 2-83603

Int. Cl.[5] B62D *7/00;* **B60K** *28/16*

U.S. Cl. 180—197 **6 Claims**



1. A vehicle control system for a vehicle which has front and rear wheels, the front wheels being driving wheels, and is provided with a four-wheel steering system comprising a front wheel turning mechanism which turns the front wheels in response to turning a steering wheel, a rear wheel turning mechanism which turns the rear wheels and a four-wheel steering control means which causes the rear wheel turning mechanism to turn the rear wheels according to first predetermined rear wheel turning characteristics, and a traction control system comprising a slip ratio detecting means for detecting a slip ratio of the front wheels with respect to the road surface where the slip ratio is a function of the relative rotational speeds of the front and rear wheels and a driving force control means which controls the driving force of the front wheels so that the slip ratio of the front wheels converges on a target slip ratio when the slip ratio of the front wheels as detected by the slip ratio detecting means exceeds a preset value where the target slip ratio represents a value that the slip ratio should be converted to after the slip ratio exceed said preset value where the preset value is greater than the target value of the slip ratio, the vehicle control system characterized by having

a failure detecting means which detects that a failure occurs in the traction control system, and

a rear wheel turning characteristic changing means which controls the four-wheel-steering control means to cause the rear wheel turning mechanism to turn the rear wheels according to second rear wheel turning characteristics when the failure detecting means detects that a failure occurs in the traction control system, the second rear wheel turning characteristics being shifted toward a reverse phase side with respect to the first rear wheel turning characteristics where the reverse phase side occurs when the rear wheels are turned in the direction opposite to that of the front wheels.

5,201,383

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

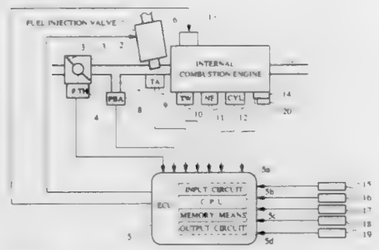
Hiroshi Kitagawa; Shunji Takahashi, and Sachito Fujimoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1991, Ser. No. 813,632

Claims priority, application Japan, Dec. 28, 1990, 2-417317

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 **4 Claims**



1. In an ignition timing control system for an internal combustion engine installed in a vehicle having driving having valve, and slip control means for detecting a predetermined slip state of said driving wheels and controlling said engine so as to reduce output thereof upon detection of said predetermined slip state, said system including engine operating condition detecting means for detecting operating conditions of said engine, setting means responsive to operating conditions of said engine detected by said engine operating condition detecting means for setting a basic spark advance value, correcting means for correcting said basic spark advance value set by said setting means, and retard limiting means for setting a retard limiting value and delimiting said spark advance value corrected by said correcting means, in a spark regarding direction by means of said retard limiting value,

the improvement comprising:

slip control operation detecting means for detecting whether or not said slip control means is operative;

limiting value changing means responsive to an output from said slip control operation detecting means for changing said retard limiting value set by said retard limiting means, to an advanced side relative to a value set when said slip control means is inoperative, when said slip control means is detected to be operative; and

engine operating control means which controls the ignition timing in accordance with the retard limiting value.

5,201,384

MOTORCYCLE HAVING BODY HEIGHT ADJUSTING MECHANISM

Satoshi Kiyota, and Tomomi Machii, both of Hamamatsu, Japan, assignors to Suzuki Kabushiki Kaisha, Japan and Kabushiki Kaisha Showa Seisakusho, Japan

Filed Oct. 26, 1990, Ser. No. 604,561

Claims priority, application Japan, Oct. 26, 1989, 1-277153; Oct. 30, 1989, 1-279961; Oct. 31, 1989, 1-281690

The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.

Int. Cl.[5] B60G *17/02;* **B62K** *21/18*

U.S. Cl. 180—219 **9 Claims**

1. A motorcycle having a body adjustable in height, comprising:

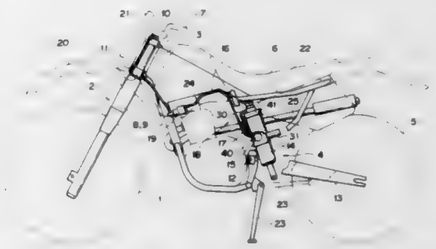
a pair of extendable front suspensions mounted to a front fork supported by a frame of a motorcycle body, said front fork supporting a front wheel in a shock absorbing manner;

an extendable rear cushion unit supported by the body frame, said rear cushion unit supporting a rear wheel in a shock absorbing manner;

an engine unit mounted to the body frame to drive and rotate the rear wheel; and

a body height adjustor for adjusting the body height of the motorcycle by changing lengths of said front suspensions and said rear cushion unit, said body height adjustor including,

first hydraulic jack means for extending and retracting said front suspensions;



second hydraulic jack means for extending and retracting said rear cushion unit; and

a body height adjusting unit for transmitting hydraulic pressure of hydraulic fluid in said rear cushion unit to said first and second hydraulic jack means through hydraulic hoses connected to hose connector means, said hose connector means comprises two parts, one being a front fork side joint member comprised of a piston-cylinder assembly and the other being a body height adjusting unit side joint member comprised of a piston-cylinder assembly, said piston-cylinder assemblies each including a cylinder and a free piston movable in the cylinder by the hydraulic pressure of the hydraulic fluid passing through the hydraulic hoses.

5,201,385

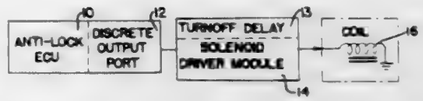
SEAT BELT ACTUATED BY ANTILOCK BRAKE SYSTEM

Alan L. Browne, Grosse Pointe; Jenne-Tai Wang, and Yuen-Kwok Chin, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1990, Ser. No. 558,546

Int. Cl.[5] B60R *22/36*

U.S. Cl. 180—268 **6 Claims**



1. In a vehicle having an antilock brake system which senses a condition of incipient wheel lock and a seat belt retractor actuatable to initiate occupant restraint in response to a sensed condition of vehicle deceleration, the improvement comprising:

signal generating means associated with the antilock brake system generating a signal indicative of sensation of a condition of incipient wheel lock,

and means responsive to the signal generated by the signal generating means actuating the seat belt retractor to initiate occupant restraint in response to the sensed condition of incipient wheel lock.

5,201,386

bers, and a powered rack member having teeth which engage

said fluid medium is capable of being transferred from one side to the other side of said piston;

ably mounted in the cylinder, the method comprising the steps of:

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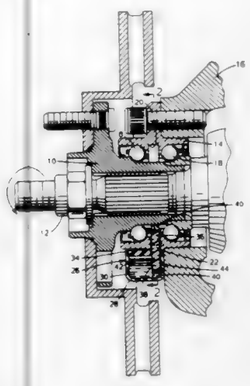
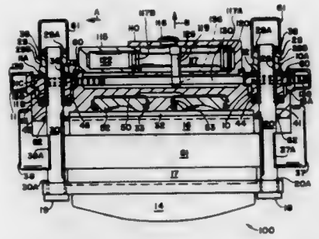
5,201,386
WICK FEED BEARING LUBRICATION SYSTEM
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 30, 1992, Ser. No. 906,345
Int. Cl.[5] F16N *7/12*
U.S. Cl. 184—64 **2 Claims**



1. A wick feed lubrication system for a bearing of the type having a rotating inner race surrounded by a stationary, radially spaced outer race between which a row of rolling elements run, comprising,
reservoir attached beneath said outer race and having a bottom wall spaced from said outer race and having a bottom wall spaced from said outer race,
a wick element of flexible, lubricant absorbent material passing through said wick passage, said wick element having a center section narrow enough to have clearance from said wick passage, enlarged ends, and a free state, end-to-end length sufficient to reach from said inner race to the reservoir bottom wall, and,
a compression spring closely surrounding said wick element center section and biased against said wick element enlarged ends, thereby maintaining said wick element substantially straight and continually biased snugly between said inner race and reservoir bottom wall without interference from said wick passage,
whereby oil is efficiently transferred from said reservoir to said inner race.

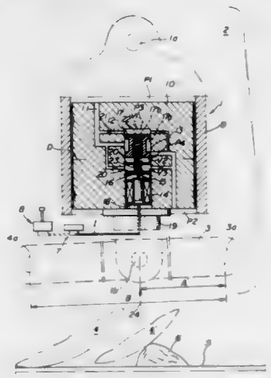
5,201,387
DISC BRAKE WITH VARIABLE WIDTH CALIPER AND POWERED ACTUATION
Alistair G. Taig, Edwardsburg, Mich., assignor to Allied-Signal Inc., Morristown, N.J.
Continuation-in-part of Ser. No. 704,586, May 22, 1991, Pat. No. 5,161,650. This application Nov. 7, 1991, Ser. No. 788,960
The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.
Int. Cl.[5] F16D *55/08*
U.S. Cl. 188—72.8 **20 Claims**

1. A disc brake with a variable width caliper and powered actuation, comprising a pair of spaced-apart movable members extending across a rotor of a vehicle, each movable member connected with a first bridge member and a second bridge member, each of the bridge members including friction lining means, each movable member having at one end thereof thread means receiving threadably thereon nut means, one axial end of each nut means including teeth means, an actuator sleeve about each movable member and having at one axial surface teeth means which engage the teeth means of a respective nut means, each actuator sleeve having gear teeth thereabout, the second bridge member received slidably on the movable members, and a powered rack member having teeth which engage the gear teeth of the actuator sleeves, so that operation of the powered rack member effects rotation of the actuator sleeves



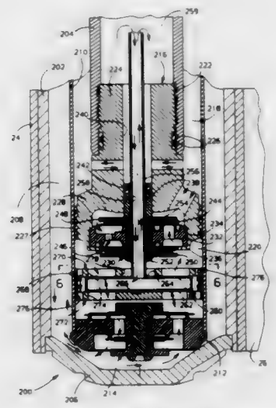
which cause the nut means to rotate and effect translational movement of the movable members whereby the bridge members bring the respective friction lining means into engagement with said rotor.

5,201,388
SHOCK ABSORBER
Tommy Malm, Norrahammar, Sweden, assignor to Ohlins Racing AB, Sweden
Continuation of Ser. No. 711,592, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 384,970, Jul. 25, 1989, abandoned. This application Mar. 27, 1992, Ser. No. 860,305
Claims priority, application Sweden, Jul. 28, 1988, 8802750
Int. Cl.[5] F16F *9/34, 9/18;* **B60G** *11/26*
U.S. Cl. 188—275 **11 Claims**



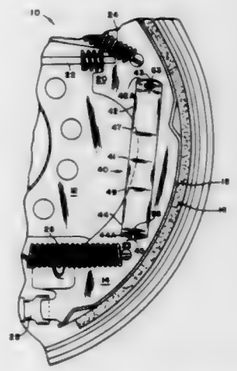
1. A shock absorber having a variable damping function, said shock absorber comprising:
(a) a piston which is slidable within a cylinder of the shock absorber;
(b) a principal medium passage for a principal fluid medium flow, said principal medium passage enabling said fluid medium to be transferred from one side to another side of said piston;
(c) a restriction disposed in a course of said principal medium passage for passing the principal fluid medium flow, the size of said restriction defining the damping effects of the shock absorber;
(d) a longitudinally movable slide mounted in the course of said principal medium passage, the longitudinal movement of said slide being capable of changing the size of said restriction for controlling the principal fluid medium flow via said restriction from either side of said piston to the other side of said piston;
(e) a pilot medium passage for enabling a pilot flow by which said fluid medium is capable of being transferred from one side to the other side of said piston;
(f) a space (V2) facing toward one side of said slide and communicating with said pilot medium passage through a seat which forms a medium passage;
(g) a proportional magnet having an armature which is movable longitudinally in a direction toward a control force of the magnet which is adjustable in response to electric control signals, the direction of movement of said armature being aligned with a direction of an acceleration force acting on said armature as a result of an acceleration of an object to which the shock absorber is coupled; and
(h) positional movement means displaced longitudinally along with the direction of the movement of said armature and being movable responsive to said armature relative to the seat,
said positional movement means and the seat forming a restrictable passage between said space (V2) and said pilot medium passage, and
the movement of said positional movement means away from or toward the seat changing an amount of the pilot flow from said space (V2) through said seat and into said pilot medium passage, the pilot flow through the seat changing the pressure of said space (V2);
wherein the position of said slide and the size of said restriction are defined in response to the pressure difference between a first pressure which is the pressure within said space (V2) and a second pressure which is the larger of the pressures at the upper and lower sides of said piston;
the control force of said proportional magnet regulating the damping effects of the shock absorber;
and an inertial mass of said armature producing a relative displacement movement in response to an acceleration force acting on said armature as a result of an acceleration of said object to which said shock absorber is coupled so that the damping effects of the shock absorber is adjusted.

5,201,389
METHOD OF VARYING A SUSPENSION DAMPING FORCE AS A VEHICLE IS STEERED
Larry D. Miller, Rochester Hills, and Harlan W. Charles, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 558,284, Jul. 26, 1990, Pat. No. 5,080,205. This application Oct. 21, 1991, Ser. No. 779,742
Int. Cl.[5] F16F *9/14*
U.S. Cl. 188—299 **7 Claims**



1. A method for varying the damping force of a hydraulic damper in a vehicular suspension system as a vehicle is steered, the damper of the type having a fluid-filled cylinder divided into upper and lower chambers by a reciprocable piston slidably mounted in the cylinder, the method comprising the steps of:
(a) fixing the piston to the vehicle;
(b) fixing the cylinder for rotation with a steerable wheel assembly;
(c) providing bypass valving means including aperture means between the upper and lower chambers of the cylinder; and
(d) rotating the wheel assembly to open and close the aperture means, thereby varying fluid flow through the bypass valving means.

5,201,390
BRAKE SHOE HOLD DOWN SPRING
Bruce D. Anderson, Granger, and Orla L. Holcomb, Jr., South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.
Filed May 28, 1992, Ser. No. 890,512
Int. Cl.[5] F16D *51/00*
U.S. Cl. 188—340 **10 Claims**



1. A brake shoe hold down spring in a drum brake, the drum brake comprising a pair of brake shoes wherein one brake shoe includes a shoe web having therein a pair of spaced-apart openings, hold down mechanisms connected with a backing plate of said drum brake and extending through the respective openings in said web, and the brake shoe hold down spring comprising a single wave form spring engaged at opposite ends by said mechanisms, the hold down spring having a serpentine shape such that opposite ends of the spring and a middle portion of the spring extend away and are spaced apart from the shoe web, two curved portions of the spring engaging the web, and the opposite ends of the spring having means for receiving the mechanisms so that ends of the mechanisms are captured within said receiving means.

5,201,391
DRIVING APPARATUS FOR TELESCOPIC ANTENNA AND OVERLOAD PREVENTION CLUTCH MECHANISM APPLICABLE TO THE SAME
Kureo Arai, Takasaki; Masamitsu Kojima, Fujisawa, and Kazuo Kato, Yamato, all of Japan, assignors to Yokowo Co., Ltd. and Oiles Corporation, both of Tokyo, Japan
Filed Jan. 13, 1992, Ser. No. 819,847
Claims priority, application Japan, Jan. 19, 1991, 3-19448; May 29, 1991, 3-48402; Sep. 30, 1991, 3-278295
Int. Cl.[5] F16D *31/08*
U.S. Cl. 192—58 B **5 Claims**

1. An apparatus for extending and contracting a telescoping antenna for a vehicle, comprising:
an electric motor having an output shaft to which a worm gear is mounted;

a driving clutch means connected to the electric motor to be

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the clutch disk assembly, relative rotational movement be-

5,201,396
ELECTRONIC COIN MECHANISM AND SYSTEM

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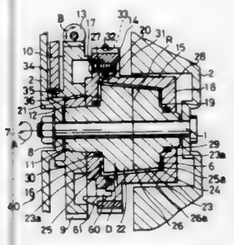
a driving clutch means connected to the electric motor to be rotated by said electric motor, the driving clutch means including a rotator, and a gear fitted to the rotator and having teeth on an outer periphery thereof, the teeth being in mesh with said worm gear;

a driven clutch member opposing said rotator to define a space in association with said rotator, the driven clutch member having teeth on an outer periphery thereof;



a drive cord connected to the telescopic antenna and having rack teeth meshed with the teeth of the driven clutch member; and

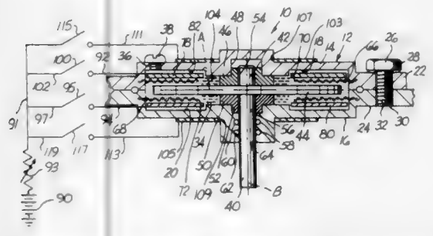
a fluid of high viscosity, the fluid being contained in said space, whereby the fluid transmits torque from the rotator to the driven clutch member based on a shear resistance of said high viscosity fluid when the driven clutch member is subject to normal load, the fluid being sheared when the driven clutch member is in an overload state, so that the rotator rotates relative to the driven clutch member.

5,201,392

CHANGE OF STATE COUPLING

Richard E. Kramer, Damascus, Md., assignor to Fairchild Space and Defense Corporation, Germantown, Md.

Filed May 15, 1992, Ser. No. 883,611
Int. Cl.[5] F16D *35/00, 57/02;* **F16F** *9/46*
U.S. Cl. 192—58 B **11 Claims**



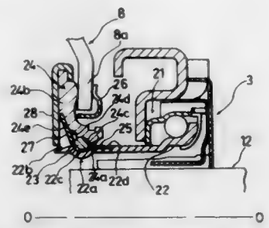
1. A coupling comprising: a housing with a hollow interior; a rotary shaft having a portion thereof extending into the hollow interior of said housing; and means for controlling the rotation of said rotary shaft comprising a member connected to and projecting from the portion of said rotary shaft located within the hollow interior of said housing, at least one heater located within the hollow interior of said housing, a liquid located within the hollow interior of said housing around the member projecting from the portion of said rotary shaft located within the hollow interior of said housing and around at least a portion of said heater located within the hollow interior of said housing, said liquid having a melting point temperature such that said liquid is normally solid at the temperature to which said housing is usually exposed, and at least one perforated member connected to said housing and having a portion thereof extending into the hollow interior of said housing.

5,201,393

ASSEMBLAGE MECHANISM IN A CLUTCH RELEASE ASSEMBLY

Hiroshi Takeuchi, and Hiroshi Uehara, both of Neyagawa, Japan, assignors to Daikin Clutch Corporation, Neyagawa, Japan

Filed Feb. 18, 1992, Ser. No. 836,392
Claims priority, application Japan, Feb. 21, 1991, 3-014603[U]
Int. Cl.[5] F16D *23/14*
U.S. Cl. 192—70.13 **8 Claims**



1. An assembly which releases a pull-type clutch by extracting the radially inward margin of a clutch diaphragm spring in the direction toward an associated transmission; comprising:

a support member fixed to the radially inward margin of the clutch diaphragm spring;

a wire ring retained along the interior of said support member and broken so as to be elastically deformable in the radial direction;

a release bearing including an inner race member which is extended as a sleeve in the direction away from said transmission and is detachably fastened to said support member through said wire ring; and

a retainer part for holding said wire ring in place in said support member during assemblage of said release bearing with said support member, said support member being composed of a hub portion extending axially, and a flange integral with said hub portion and extending radially outward; said hub portion having formed in a rim of its interior a first annular groove for receiving said wire ring along its outer surface, and a second annular groove formed adjacent said first annular groove away from said transmission, having a greater maximum diameter than that of said first annular groove, said retainer part including an elastic member for elastically pressing said wire ring against said first annular groove.

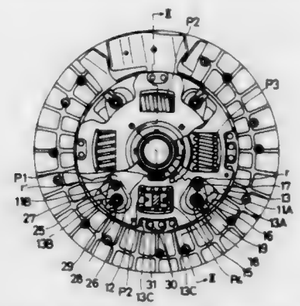
5,201,394

CLUTCH DISK ASSEMBLY

Hiroshi Suzuki, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 4, 1992, Ser. No. 831,063
Claims priority, application Japan, Feb. 5, 1991, 3-35284
Int. Cl.[5] F16D *3/66*
U.S. Cl. 192—106.2 **8 Claims**

1. A clutch disk assembly possessing torsion characteristics comprising: a hub flange; a disk plate disposed on one side of the hub flange; a control plate disposed between the hub flange and the disk plate; elastic means positioned between the hub flange and the control plate for establishing a first stage of the torsion characteristics of the clutch disk assembly; and regulating means for regulating relative rotation between the hub flange and the control plate so that upon high speed rotation of the clutch disk assembly, relative rotational movement between the control plate and the hub flange ceases and operation of the elastic means ceases, said regulating means including a cam connected to the hub flange.

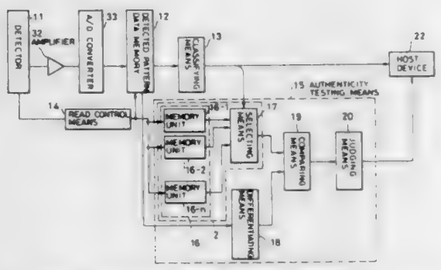


5,201,395

BILL EXAMINATION DEVICE

Ienobu Takizawa; Takashi Yajima, and Mitsunori Shigeta, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 759,159
Claims priority, application Japan, Sep. 27, 1990, 2-255327; Sep. 27, 1990, 2-255328
Int. Cl.[5] G07D *7/00*
U.S. Cl. 194—206 **27 Claims**



1. A bill examination device comprising:

a detecting means for detecting a physical pattern of a bill;

a differentiating means for differentiating the physical pattern to produce a differential pattern;

an allowable range pattern generating means for outputting an allowable range pattern;

a comparing means for comparing the differential pattern with the allowable range pattern, and outputting the result of comparison; and

a judgement means responsive to the result of comparison from the comparing means for making judgement on the authenticity of the bill;

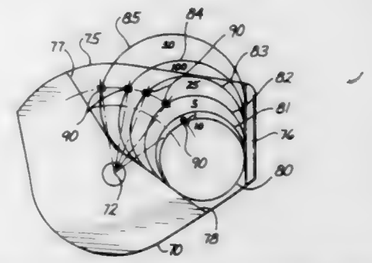
wherein said detecting means comprises a plurality of detecting elements positioned at different lateral positions with respect to the direction in which the bill is moved relative to the detecting means, and said detecting means detects a plurality of physical patterns at different lateral positions along a plurality of scan lines.

5,201,396

ELECTRONIC COIN MECHANISM AND SYSTEM

Jack S. Chalabian, Huntington Beach; Dennis M. Kaloi; Richard A. Simon, both of Agoura; Arden R. Thompson, Murrieta, and Craig A. DeWeese, Anaheim, all of Calif., assignors to K-Jack Engineering Company, Inc., Gardena, Calif.

Filed Nov. 27, 1991, Ser. No. 800,544
Int. Cl.[5] G07D *5/02;* **G07F** *11/02*
U.S. Cl. 194—217 **31 Claims**



1. A coin operated mechanism for counting coins of various values to determine the value of a coin deposited comprising:

a coin wheel normally oriented in a coin receiving position and rotatable about an axis of rotation to a coin release position,

said coin wheel including a coin receiving section,

means to guide deposited coins to said coin wheel and to said coin receiving section whereby said coin wheel is rotated from said coin receiving to the coin releasing position by the weight of the coin,

said coin wheel including a plurality of apertures located in a predetermined array,

light source means on one side of said wheel and positioned to pass light through said apertures as said coin wheel is rotated,

light detector means positioned on the side of said wheel opposite said light source and adapted to be illuminated by light passing through said apertures to produce a series of light pulses as said coin wheel rotates,

said plurality of apertures being in an array such that one or more of said apertures is covered by a coin depending upon the diameter dimension of a coin; and

electronic means to determine the value of each deposited coin.

5,201,397

METHOD AND APPARATUS FOR SEPARATING A STACK OF PRODUCTS INTO A STREAM OF SINGLE PRODUCTS FOR SORTING

Gerald A. Isaacs, Arlington, Tex., assignor to ElectroCom Automation L.P., Arlington, Tex.

Filed Oct. 5, 1990, Ser. No. 593,783
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—395 **6 Claims**

1. A method for separating stacked products along a transport path having a plurality of individually controlled feeder rolls comprising the steps of:

determining the location of products along the transport path;

comparing the present location of products along the transport path with the past location to detect movement;

stopping feeder rolls located under products that have moved;

pausing to augment surface friction contact between the

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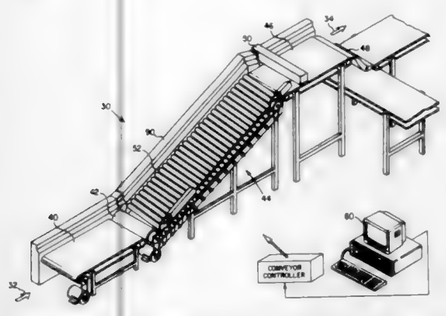
bottom product in the stack and the transport path feeder rolls; and



energizing several feeder rolls beneath the leading edge of the product stack to strip the bottom product out from under the stack.

5,201,398

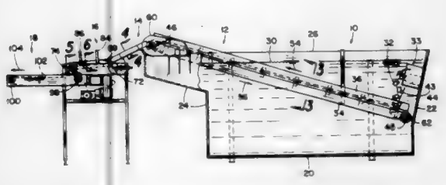
APPARATUS FOR UNSCRAMBLING SEALED CONTAINERS

Charles M. Clugston, Rt. 1, Box 471A, Sapulpa, Okla. 74066

Continuation of Ser. No. 713,392, Jun. 4, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 902,518

Int. Cl.[5] B65G *47/14*

U.S. Cl. 198—396 **20 Claims**



1. An apparatus for unscrambling substantially identical sealed containers each having a preferred orientation comprising:

an upright open top vessel having opposed ends and containing water therein;

an elongated inclined unscrambler bed having an intake end and a discharged end and having an upper surface and a lower surface;

a plurality of sets of belts arranged in paralleled spaced apart vertical planes and supported by said unscrambler bed, each set of belts passing upwardly over said bed upper surface and downwardly below said bed lower surface, each set of belts being formed of a plurality of belts in spaced apart vertical planes and in essentially V-shaped arrangement taken in planes perpendicular the direction of travel having opposed wing portions, there being more belts in one wing portion than the other, the bed being received within said vessel with said bed intake end below said water and said discharge end above said water;

means to receive containers within said vessel in scrambled fashion, the containers settling through said water and onto said belts of said bed;

means of moving said sets of belts whereby containers are carried by said belts up and out of said water substantially all in the preferred orientation to pass off said belts at said bed discharge end; and

means for arraying containers passing off said bed discharge end for further processing.

5,201,399

REORIENTATION METHOD AND APPARATUS FOR MOVING OBJECTS

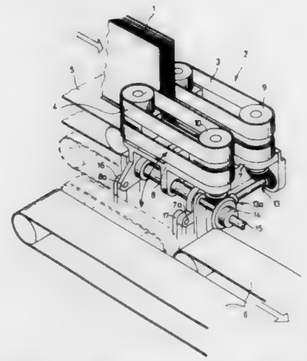
Gunter Dietrich, Hille, Fed. Rep. of Germany, assignor to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Aug. 17, 1992, Ser. No. 931,046

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1991, 4127207

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—409 **16 Claims**



1. Apparatus for transferring moving products between a first orientation and a second orientation comprising:

transfer means, said transfer means comprising a pair of spatially displaced conveyor means, said conveyor means defining an open ended clamping region therebetween;

means for imparting motion to said conveyor means whereby a moving object fed into the said clamping region will continue to move in a forward direction;

pivotal frame means for supporting said conveyor means, said frame means having a first position wherein said conveyor means are oriented such that said clamping region is in registration with a product feed device, said frame means having a second position angularly offset from said first position wherein said clamping region is in registration with product receiving means; and

means for imparting rotational motion to said frame means whereby an object fed into said clamping region will be transferred from said first orientation to said second orientation and released to the receiving means, the rotational motion being superimposed on the forward movement of the object.

5,201,400

APPARATUS FOR CONVEYING ROLL-SHAPED ARTICLE

Etsurou Abe, Aichi, Japan, assignor to Isowa Industry Co., Ltd., Aichi, Japan

Filed Jan. 24, 1992, Ser. No. 825,223

Claims priority, application Japan, Jan. 25, 1991, 3-007629

Int. Cl.[5] B65G *47/34*

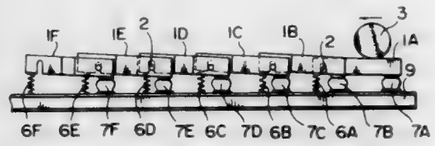
U.S. Cl. 198—463.3 **20 Claims**

1. An apparatus for conveying a roll-shaped article on a conveyance path comprising;

a plurality of flat plate-shaped bases arranged end-to-end in a direction in which said roll-shaped article is conveyed, each of said bases including: a projection on a downstream side thereof and a recess on an upstream side thereof for receiving a corresponding projection on an adjacent one of said plurality of bases; an upper smooth surface extending substantially parallel to a bottom surface of the base; and at least one fulcrum shaft hole, said fulcrum shaft hole being formed through the base;

a plurality of fulcrum shafts, each transversely disposed through said at least one fulcrum shaft hole in a corresponding one of said plurality of bases, wherein each base is pivotably disposed to turn about a corresponding fulcrum shaft disposed through said at least one fulcrum shaft hole, said fulcrum shafts for linking said bases to form said conveyance path;

a plurality of raising and lowering means, each disposed below a corresponding base to raise and lower said base;



a plurality of load sensing means, each disposed below the downstream side of a corresponding base to sense a load on said base and to generate a load sensing signal indicative of said load; and

a controller responsive to said load sensing signal to actuate raising and lowering means disposed below a base at a subsequent stage.

5,201,401

DISCHARGE CONVEYING APPARATUS FOR AN EXTRUSION PRESS

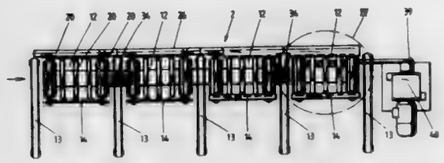
Kurt Haderer, Dusseldorf, and Franz Schall, Dormagen, both of Fed. Rep. of Germany, assignors to SMS Hasenclever GmbH, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 607,039, Oct. 31, 1990, abandoned. This application Jul. 2, 1992, Ser. No. 908,925

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1989, 3936177

Int. Cl.[5] B65G *47/34*

U.S. Cl. 198—463.3 **12 Claims**



1. In a conveying device arranged at the exit of an extrusion press, consisting of beams which are carried by closed rotating chains arranged in pairs and which are moved in the discharge direction of the extruded products to form a longitudinal conveyor, and a transverse conveyor engaging with said longitudinal conveyor for taking up the extruded products and/or portions thereof by vertical relative movement and formed from a plurality of spaced parallel-running conveying elements, the improvement wherein:

said longitudinal conveyor comprises, depending on its length, cooperating individual separate conveyors each having a length corresponding to the space between said conveying elements of said transverse conveyor, said conveying elements being stationary in the conveying region of said longitudinal conveyor.

5,201,402

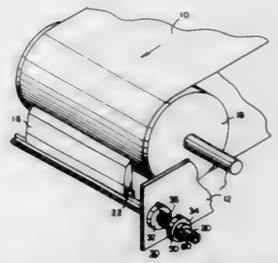
SCRAPER BLADE TENSIONING DEVICE

George T. Mott, Macungie, Pa., assignor to Asgco Manufacturing, Inc., Allentown, Pa.

Filed Aug. 24, 1992, Ser. No. 934,576

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—499 **19 Claims**



1. A tensioning device for adjusting the contacting force of a scraper blade on the surface of an endless conveyor belt mounted in a support structure, said tensioning device comprising a transverse shaft mounted for rotation about its axis in the support structure,

a first adjustment collar designed to receive the elongated shaft and rotatable about the axis of said shaft, said first collar having a sequence of axially-directed apertures spaced circumferentially on a circle of a given radius concentric with the axis of the shaft;

a second adjustment collar fixed to the shaft adjacent said first collar, said second collar having a sequence of axially-directed apertures spaced circumferentially on a circle of the same radius concentric with the axis of the shaft;

a locking pin adapted to engage in apertures of said first and second collars when said apertures are in registry;

said axially-directed apertures of the first collar having a spacing different from the apertures on the second collar,

said collars adapted to be rotated relative to one another in circumferential increments on said shaft axis to bring different apertures of said first and second collars into registry, said different spacing on the second collar allowing said registry when one of said collars is rotated a circumferential increment which is less than the minimum spacing between said apertures on either said first or said second collar; and

a torsion bias mechanism fixed at one end to said support structure and fixed at the other end to said first collar to urge said first collar clockwise about said axis and through said locking pin to urge said second collar and shaft clockwise.

5,201,403

INTERSTAGE WAFER BLOCK ACCUMULATION

Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 513,909, Apr. 24, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 830,800

Claims priority, application Austria, Apr. 28, 1989, 1029/89

Int. Cl.[5] B65G *43/10*

U.S. Cl. 198—575 **11 Claims**

1. An apparatus for the interstage accumulation of wafer blocks in a plurality of successively arranged, independent and like accumulator units, which comprises

(a) a feed station for feeding wafer blocks to a first one of the successively arranged accumulator units and means associated with the feed station for stacking the wafer blocks in the first accumulator unit in a single stack of superposed ones of said wafer blocks,

(b) conveyance means for conveying the single stack of

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toward said rear section and arranged to be placed adjacent

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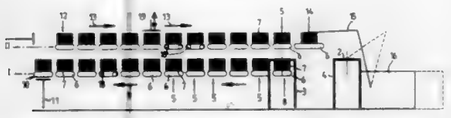
(b) conveyance means for conveying the single stack of superposed wafer blocks from the first accumulator unit to the successively arranged accumulator units including a last one of the accumulator units, the conveyance means comprising

(1) a single horizontal conveyor on each accumulator unit, the horizontal conveyor having a support surface extending in a stationary conveyance plane and supporting the single stack of superposed wafer blocks for conveying the stack from unit to unit,



(2) adjoining ones of the accumulator units being so arranged that the stationary conveyance planes of the support surfaces define a common plane and facing ends of the horizontal conveyors are close enough for transfer of the stack of superposed wafer blocks from each unit to the adjoining unit, and

(c) a delivery station receiving the wafer blocks from the last accumulator unit and means associated with the delivery station for singling the wafer blocks.

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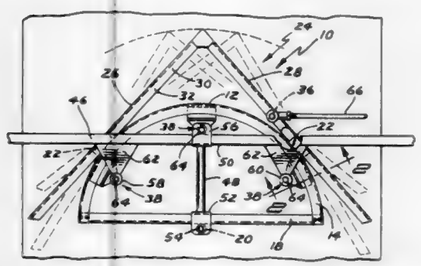
APPARATUS AND METHOD FOR DISTRIBUTING PRODUCT ON A CONVEYER

Ronald D. Hurd, Minnetonka, and James R. Wetzel, Arden Hills, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Sep. 30, 1991, Ser. No. 767,439
Int. Cl.[5] B65G *47/74*
U.S. Cl. 198—636 **14 Claims**



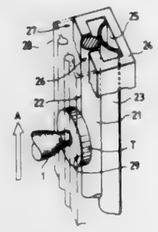
1. An apparatus for distributing a product pile across the width of a conveyer comprising, in combination: a V-shaped plow including first and second legs having their first ends interconnected together at an interconnection defined a prow, with the first and second legs each having a length which is substantial in relation to the width of the conveyer, with the first and second legs extending at a steep angle in the order of less than 90° to each other; and means for supporting the V-shaped plow above and at varying positions relative to the conveyer with the first ends of the first and second legs moveable in a direction across the width of the conveyer and located in the product pile and with the first and second legs extending downstream on opposite sides of the product pile; wherein the supporting means comprises means for varying the angular positioning of the V-shaped plow relative to the conveyer comprising means for moving the V-shaped plow along an arcuate path, with the prow traveling along an arc along a center downstream of the prow.

5,201,405

TRAY CONVEYOR

Shinji Noshi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 23, 1992, Ser. No. 872,591
Claims priority, application Japan, Apr. 26, 1991, 3-29558[U]
Int. Cl.[5] B65G *47/84*
U.S. Cl. 198—803.01 **6 Claims**



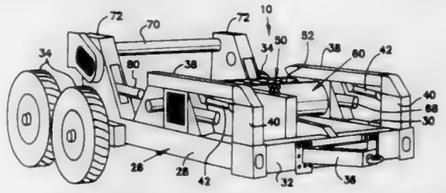
1. A tray conveyor having an elastic member which has a convex cross section, extending in the direction of travel of conveyor, on the opposite side of the surface of a conveyor belt for vertical conveyance of trays.

5,201,406

BELT WINDER

John K. Kellis, Winfield, Ala., assignor to Continental Conveyor & Equipment Co., L.P., Winfield, Ala.

Filed Apr. 14, 1992, Ser. No. 868,109
Int. Cl.[5] B65G *21/14*
U.S. Cl. 198—812 **9 Claims**



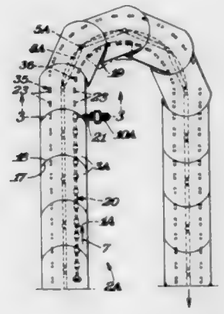
1. A conveyor belt transfer device for insertion and removal of a section of belting in and from an endless belt conveyor comprising frame means, drive conveyor pulley means rotatably mounted on said frame means and having a belt driving cylindrical surface, drive means for said drive conveyor pulley means, conveyor belt means having a separated end portion extending form a belt storage unit portion of said endless belt conveyor and being wrapped about a portion of said surface, pinch roll means adjacent said conveyor pulley means, means to advance said pinch roll means to exert pressure against a portion of said conveyor belt means wrapped about a portion of said surface, said pinch roll means being rotatably driven by contact with said portion of said conveyor belt means and exerting sufficient pressure on said portion of said conveyor belt means so that a belt reach between a zone of said belt means contacted by said pinch roll means and said storage unit portion is under tension caused by rotation of said conveyor pulley means while a portion of said belt means from said zone to a separated end of said belt means is free of such tension, spool means mounted on said frame and engaging said belt for winding said belt means in a coil, and variable speed drive means for said spool means.

5,201,407

STEEL PLATE CONVEYOR WITH DRIVE

Hans Proske, Reinheim, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Jul. 17, 1992, Ser. No. 916,203
Claims priority, application European Pat. Off., Nov. 14, 1991, 91119467.8
Int. Cl.[5] B65G *23/14*
U.S. Cl. 198—833 **4 Claims**



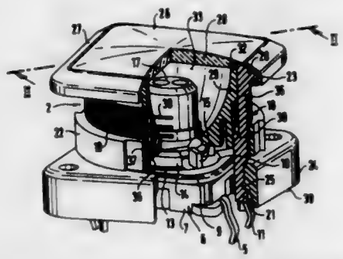
1. A curve traveling steel plate conveyor comprising a plurality of conveyor plates, a series of interconnected chain links flexibly interconnecting the conveyor plates, means guiding the conveyor plates over a path of travel that includes a curved segment, a drive including a driven conveyor belt below the conveyor plates in frictional engagement with the conveyor plates at least over a selected portion of the path of travel of the steel plate conveyor, and support means for the conveyor plates positioned below the plates and extending along the path of travel of the steel plate conveyor, the support means having one line of spaced apart rollers in engagement with the conveyor plates and a second line of support rollers generally parallel to the first line, and the second line including an interrupted portion where the conveyor belt is positioned.

5,201,408

HOUSING FOR ELECTRIC SWITCHES

Mikael Torma, Schweiz, and Hansjörg Portmann, Gerlafingen, both of Switzerland, assignors to Elektro-Apparatebau Olten AG, Olten, Switzerland

Division of Ser. No. 530,653, May 30, 1990, Pat. No. 5,099,094. This application Aug. 21, 1991, Ser. No. 748,741
Claims priority, application Switzerland, Jun. 12, 1989, 2186/89
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] H01H *9/02, 9/00*
U.S. Cl. 200—294 **8 Claims**



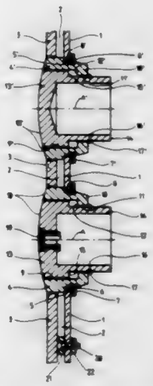
1. A housing for housing electric switch components adapted to cooperate with a circuit board, comprising a front section and a rear section, said front section having a first surface facing toward said rear section and arranged to be placed adjacent one side of a switch mounting plate, said rear section having a second surface facing away from said first surface and arranged to be positioned adjacent said circuit board, means for separably coupling said front and rear sections to each other, said rear section including means adapted to be secured to said circuit board at least one projection being provided on said front section and extending into said rear section, said at least one projection having a portion extending beyond said second surface and adapted to engage said circuit board whereby said first surface is spaced a predetermined distance from said circuit board, and means for holding said first surface at a predetermined distance from the one side of the mounting plate.

5,201,409

VANDAL RESISTANT PUSH BUTTON ASSEMBLY

Adolf Martin, Glenview, and Richard A. Gregory, Chicago, both of Ill., assignors to Inventio AG, Hergiswil, Switzerland

Filed Sep. 4, 1990, Ser. No. 577,454
Int. Cl.[5] H01H *13/70, 9/02*
U.S. Cl. 200—345 **12 Claims**



1. A vandal resistant push button assembly comprising:

a mounting plate having a front surface and a rear surface, an opening of a predetermined diameter formed therein between said front surface and said rear surface and means for attaching to a rear surface of a face plate;

a guide ring extending through said opening in said mounting plate and having a pair of spaced apart ends and an axially extending opening formed therein between said ends of said guide ring, said axially extending opening having an internal larger diameter cylindrical first guide surface and an internal smaller diameter cylindrical second guide surface connected together by a stop surface, said guide ring having a larger diameter external surface and a smaller diameter external surface connected together by a first step shaped shoulder, said first step shaped shoulder abutting said front surface of said mounting plate and said smaller diameter external surface being smaller in diameter than said opening in said mounting plate by a predetermined width gap, said guide ring having means for removably retaining said guide ring in said opening in said mounting plate;

a push button extending through said axially extending opening in said guide ring and having a generally cylindrical body with a pair of spaced apart ends and an external surface slidably engaging said first and second guide surfaces, said push button having a second step shaped shoulder formed on said external surface and being limited in travel in an actuating direction along an actuation path in

said axially extending opening by abutment of said second shoulder with said stop surface on said guide ring; and

resilient displacement of said legs of said slide contact member

the angle between a side reinforcing section and the side panel being a relatively small acute angle and the angle

carton formed from said first and second cartons, positioned across two adjacent, coplanar, exterior walls of said

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said axially extending opening by abutment of said second shoulder with said stop surface on said guide ring; and

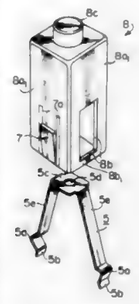
a spring clip retained on said push button adjacent an inner one of said ends of said push button for limiting travel of said push button in a direction opposite said actuating direction along said actuation path by engagement of said spring clip with one of said ends of said guide ring whereby the other ends of each of said guide ring and said push button form a generally seamless surface and said predetermined width gap permits movement of said guide ring and said push button with respect to said mounting plate in a direction transverse to said actuation path to align said guide ring with an opening in the face plate through which said guide ring and said push button extend when said mounting plate is attached to the rear surface of the face plate.

5,201,410

PUSH-BUTTON SWITCHES

Tsunesuke Takano, and Kouichi Sinzawa, both of Tokyo, Japan, assignors to Daichi Denso Buhin Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 756,857
Claims priority, application Japan, Sep. 12, 1990, 2-95889[U]
Int. Cl.[5] H01H *13/12, 13/14*
U.S. Cl. 200—531 **8 Claims**



1. A push-button switch comprising:

a housing having opposed pairs of side walls defining an interior space, and including an opposed pair of fixed contact members;

a push-button assembly which is received within said interior space of said housing for reciprocal movements between extended and including a pair of opposed side windows having lower extents established by a bridge wall; and

a spring said push-button assembly includes a support post and for exerting a bias force to move said push-button assembly into said extended position thereof; wherein

said push-button assembly includes a slide contact member which is movable with said push-button assembly between said extended and retracted positions, said slide contact member having a pair of resilient legs each having an outwardly curved contact region which protrudes through a respective one of said side windows for contacting a respective one of said pair of fixed contact members when said push-button assembly is moved into one of said extended and retracted positions whereby an electrical circuit is made, and for breaking contact with at least one of said fixed pair of contacts when said push-button assembly is moved into another of said extended and retracted positions, whereby an electrical circuit is broken, and wherein

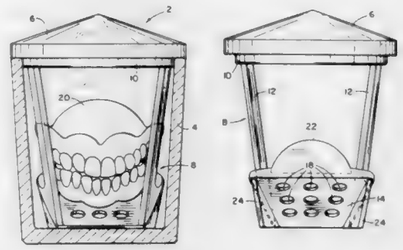
said slide contact member further includes terminal end flanges extending from said curved contact regions, said terminal end flanges being positioned so as to contact a respective one of said bridge walls associated with said side windows and thereby limit the extent of outward resilient displacement of said legs of said slide contact member.

5,201,411

APPARATUS FOR CLEANING A PROSTHESIS

William E. Elkins; William K. Kerr, and Louis M. Ohls, all of Tulsa, Okla., assignors to DeBron International, Tulsa, Okla.

Filed Apr. 5, 1991, Ser. No. 681,563
Int. Cl.[5] A61C *19/10*
U.S. Cl. 206—83 **8 Claims**



8. An apparatus for cleaning a prosthesis comprising:

a container having an opening at the top thereof;

a cover removably positionable over said opening; and

a holding means, removably positionable in said container for holding said prosthesis, said holding means comprising two upwardly extending elongate members and a first support member having a sloping upper surface, said first support member being connected to said elongate members such that said elongate members and said sloping upper surface form a restriction for gravitationally holding said prosthesis on said sloping upper surface and against said elongate members, said holding means further comprising an upwardly extending second support member connected to said first support member and having an arcuate upper edge which is positionable beneath said prosthesis.

5,201,412

CLIP-TYPE ARTICLE CARRIER

Richard L. Schuster, Monroe, and Leonard M. Cooper, West Monroe, both of La., assignors to Riverwood Natural Resources Corporation, Denver, Colo.

Filed Apr. 30, 1992, Ser. No. 876,595
Int. Cl.[5] B65D *71/00*
U.S. Cl. 206—153 **15 Claims**

1. A carrier for supporting a plurality of articles each of which has an upper surface and an outwardly projecting lip adjacent the upper surface, comprising:

a top panel assembly;

side panels connected to the top panel by first fold lines;

a bottom panel connected to the side reinforcing sections by second fold lines interrupted by slits;

the side reinforcing sections being connected to the side panels by third fold liens, said side reinforcing sections including stress relief score lines extending from the slits to the third fold lines;

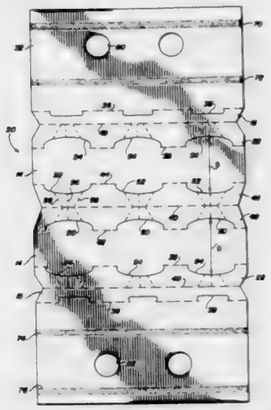
the slits interrupting the second fold liens being spaced from each other and from the second fold lines, the slits being dimensioned with respect to an article to be supported by the carrier so as to enable the projecting lip of the article to extend through the spaced slits;

each slit forming n adjacent support edge in the adjacent side reinforcing section, the support edges being adapted to contact the underside of the lip of the article to thereby support the article;

means for adhering the top panel to the bottom panel; and

cutouts in the side panels for receiving the lip of the article;

the angle between a side reinforcing section and the side panel being a relatively small acute angle and the angle



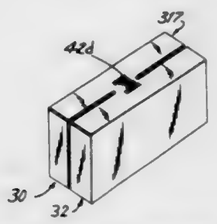
between the top panel and the side panel being a relatively large obtuse angle.

5,201,413

DUAL CIGARETTE CARTON WITH SEPARABLE OR DIVISIBLE LABEL CONTAINING UNIVERSAL PRODUCT CODE

James A. DeBlasio; Susan J. A. Douglas, both of Midlothian; Johnny L. Miller; Xuan M. Pham, both of Richmond, and Robert E. Talley, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 774,529, Oct. 8, 1991, Pat. No. 5,141,106. This application Nov. 15, 1991, Ser. No. 792,617
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] B65D *85/10*
U.S. Cl. 206—256 **61 Claims**



1. A dual cigarette carton of dimensions compatible with tax-stamping machinery used in the automated processing of cigarette cartons, said dual cigarette carton comprising:

a first carton having four substantially vertical walls, an exterior top wall, and an exterior bottom wall; said four substantially vertical walls including an interior front wall, an exterior rear wall substantially parallel and spaced from said interior front wall, and first and second substantially rectangular exterior side walls connecting juxtaposed vertical edges of said interior front wall and said exterior rear wall;

a second carton substantially identical to said first carton, said first and second cartons positioned adjacent one another with the interior front wall of said first carton coextensive with the interior front wall of said second carton such that the borders of the interior front walls are aligned; and

a label, bearing indicia encoded for the pricing of the dual carton formed from said first and second cartons, positioned across two adjacent, coplanar, exterior walls of said first and second cartons; said indicia positioned such that the indicia are rendered unreadable by automatic scanning equipment upon separating said first and second cartons.

48. A method of packaging cigarette packs which are to be passed through tax-stamping machinery used in the automated processing of cigarette cartons and later may be separated into groups of cigarette packs, said method comprising:

(i) providing a first carton having four substantially vertical walls, an exterior top wall, and an exterior bottom wall; said four vertical walls including an interior front wall, an exterior rear wall substantially parallel and spaced from said interior front wall, and first and second exterior side walls connecting juxtaposed vertical edges of said interior front wall and said exterior rear wall;

(ii) providing a second carton substantially identical to said first carton;

(iii) positioning said first and second cartons adjacent one another with the interior front wall of said first carton coextensive with the interior front wall of said second carton such that the borders of the interior front walls are aligned;

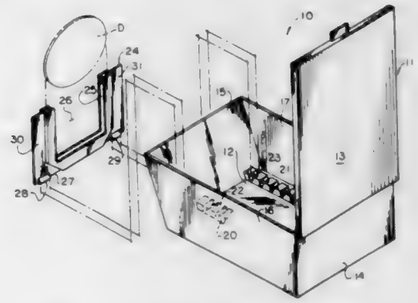
(iv) then releasably attaching said first and second cartons together so that said first and second cartons will maintain their relative positions in a subsequent passage through a tax-stamping machine, said attaching step including positioning an adhesive-bearing label across two adjacent, coplanar, exterior walls of said first and second cartons with the adhesive-bearing surface in operative contact with said adjacent coplanar, exterior walls, the opposite surface of said label bearing indicia encoded for the pricing of the dual carton formed by said first and second cartons.

5,201,414

COMPACT DISC STORAGE APPARATUS

Richard R. Kaszubinski, 103 Palmer St., Passaic, N.J. 07055

Filed May 11, 1992, Ser. No. 881,173
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—309 **4 Claims**



1. A compact disc storage apparatus, comprising,

a housing, the housing having a floor, the floor including a rear wall, a first side wall spaced from a second side wall a predetermined length, and a forward wall, the forward wall canted at a first obtuse angle relative to the floor projecting beyond the floor, and

the floor including at least one track, the track having spaced parallel grooves directed therethrough, the grooves oriented orthogonally relative to the first side wall and the second side wall, and the track directed coextensively along the floor, and

at least one U-shaped holder, the U-shaped holder including a holder upper edge, the upper edge having a holder opening directed into the holder from the upper edge, and

a U-shaped slot directed into the holder at the opening, and

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HEMOSTATIC CLIP CARTRIDGE

neck portion and an aperture closure means, said aperture being capable of providing access to the interior of said recep-

portion through said lid of desired lengths of chain, said integral chain dispensing and retaining means being

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a U-shaped slot directed into the holder at the opening, and

the holder defined by a holder width equal to the predetermined length between the first side wall and the second side wall, and

the holder including a holder lower edge, the lower edge including at least one roller, the roller arranged for reception within at least one of said grooves.

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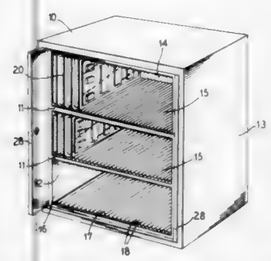
TRANSPORT AND STORAGE SYSTEM FOR ELECTROSTATIC DISCHARGE SENSITIVE ELECTRONIC DEVICES

Carl W. Metz, 803 S. 4th St., St. Charles, Ill. 60174

Continuation-in-part of Ser. No. 390,119, Aug. 7, 1989, abandoned. This application Feb. 4, 1992, Ser. No. 830,765

Int. Cl.[5] **B65D** *85/42*

U.S. Cl. 206—332 **6 Claims**



1. A manufacturing-to-use transport and storage system for electrostatic-discharge-sensitive electronic devices, the system including in combination:

transport devices and portable storage devices and fixed storage devices for co-operable use with one another, each of said transport devices comprising a semi-rigid tray of anti-static and dissipative material having an internal cavity snugly receiving and supporting at least one of said electronic devices in a fully enclosed condition protected from static accumulation or discharge relative to an environment outside said tray, said anti-static and dissipative material having a surface resistivity in a range of approximately 10^5 to 10^{12} ohms per square;

said portable and fixed storage devices each including a plurality of rigid shelf means disposed in parallel relation for defining an opening between adjacent shelf means, each of said shelf means comprising an anti-static and dissipative material having a surface resistivity in a range of 10^5 to 10^{12} ohms per square and having spaced grooves extending transversely of said shelf means wherever a respective shelf means faces another of said shelf means across an opening and each of said grooves having resilience in a direction perpendicular to its respective shelf means;

said trays being at least partially transparent to sensible radiation permitting sensing of any contents of said trays by an external sensing mechanism and having electronic device-contacting raised areas for dissipatively supporting the electronic device within said internal cavity and having external edges extending into said grooves, with an edge-to-edge width of said tray providing a resilient contact fit in opposing ones of said grooves of said opening; and

said portable storage device comprising a manually transportable box containing a pair of said shelf means mounted in opposed relation and conductively connected to a conductive outer housing of said transportable box.

5,201,416

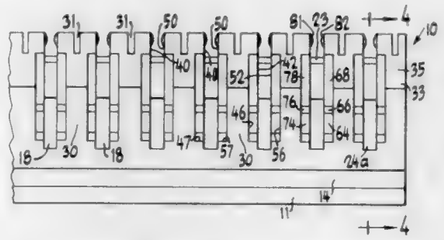
HEMOSTATIC CLIP CARTRIDGE

Warren Taylor, Cary, N.C., assignor to Edward Weck Incorporated, Research Triangle Park, N.C.

Filed Oct. 22, 1990, Ser. No. 601,833

Int. Cl.[5] **B65D** *85/00*

U.S. Cl. 206—339 **6 Claims**



1. A cartridge for retaining hemostatic clips comprising:

a body portion having a plurality of clip retaining compartments longitudinally spaced along said body portion, each compartment formed by a pair of upwardly extending walls, each said compartment having a central post for supporting the hinge portion of a clip and provided, adjacent the distal end of said walls, with a pair of opposed, inwardly extending protrusions, one protrusion extending inwardly from each wall, each pair of said protrusions adapted to extend into the associated compartment above a clip situated within the compartment, each of said protrusions having a bottom edge which terminates on a respective transverse wall at a predetermined distance from the top of said post such that said protrusions are spaced from said clip when said clip rests on said post, said protrusions adapted to be deflected by the clip as it is removed from said compartment.

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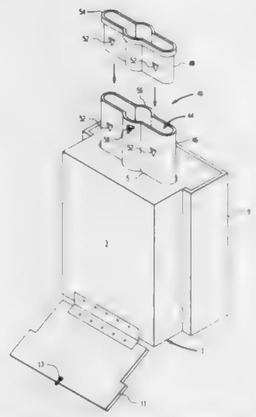
DISPOSABLE INFECTIOUS WASTE CONTAINER ASSSEMBLY

Thomas J. Outlaw, III, Monroe, Conn., assignor to B&D Molding Products Inc., Shelton, Conn.

Filed May 12, 1992, Ser. No. 881,608

Int. Cl.[5] **B65D** *83/02;* **B65F** *1/16*

U.S. Cl. 206—366 **25 Claims**



1. An infectious waste disposal container assembly which comprises a receptacle housing, an aperture with an elongated neck portion and an aperture closure means, said aperture being capable of providing access to the interior of said receptacle housing and said aperture closure means having a shape such that it can be removed from said container assembly, inverted and inserted into said elongated neck portion via said aperture such that infectious waste contained within said receptacle housing cannot escape through said aperture.

5,201,418

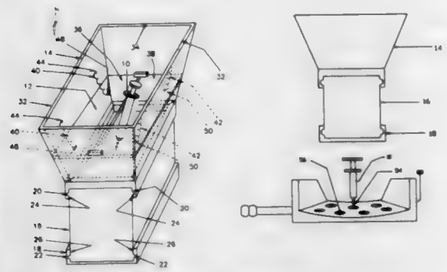
NEEDLE DISPOSAL SYSTEM

Ronnie Hanlon, 5307 E. 33 St., Tulsa, Okla. 74135

Continuation of Ser. No. 746,776, Aug. 16, 1991, abandoned. This application Jul. 28, 1992, Ser. No. 921,454

Int. Cl.[5] **B65D** *83/02*

U.S. Cl. 206—366 **5 Claims**



1. A needle disposal system comprising:

a tray containing sticky, needle-retaining material adaped to collect contaminated needles inserted therein from a syringe,

a funnel member having

an open top portion adapted to receive said needle-retaining material and the inserted contaminated needles from the tray,

a pair of spring-biased doors which are biased upwardly against a pair of stops on the funnel member,

a pair of parallel sides,

a flange member along each of the two parallel sides near the bottom of the funnel member, and

a disposal container having

a pair of parallel sides,

a ridge member along each of the parallel sides near the top of the disposal container, and

the ridge members of the disposal container being adapted to cooperate with the flange members on the funnel member for slidably positioning the funnel member on the disposal container in order to collect contaminated needles placed upon the doors of the funnel member.

5,201,419

CHAIN CONTAINER

Richard D. Hayes, Edwardsville, Ill., assignor to Laclede Chain Manufacturing Company, St. Louis, Mo.

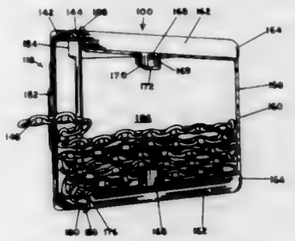
Filed Feb. 21, 1992, Ser. No. 839,938

Int. Cl.[5] **B65D** *85/62, 85/66*

U.S. Cl. 206—409 **21 Claims**

1. A unitary container for storing and dispensing continuous lengths of chain;

said container comprising a box-shaped chain holder portion having a continuous open top edge adapted for receipt of a selectively removable lid, a bottom wall, and first and second pairs of opposed side walls which extend between and connect said open top edge and said bottom wall, a one-piece lid, means for connecting said lid for secure yet selectively easily removable attachment to said continuous open top edge of said chain holder portion, said lid having integral chain dispensing and retaining means for permitting access to and removal from said chain holder portion through said lid of desired lengths of chain, said integral chain dispensing and retaining means being formed so as to permit effecting snug engagement of an



adjacent portion of chain therewith for preventing chain removed from said chain holder portion from unintentionally returning completely thereinto.

5,201,420

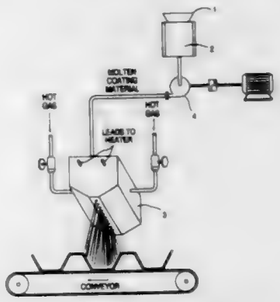
NON-TACKY HOT MELT ADHESIVE CONTAINING PACKAGE

Martin D. Thaler, Somerville; Robert W. Giese, Wall; Paul Puletti, Pittstown, and Robert Schmidt, Great Meadows, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 533,301, Jun. 4, 1990. This application May 21, 1992, Ser. No. 886,720

Int. Cl.[5] **B65D** *57/00, 85/00;* **B29C** *39/06*

U.S. Cl. 206—447 **8 Claims**



1. A tackless hot melt package which is produced by the method comprising melt blowing molten hydrogenated castor oil through orifices of a heated die plate which is curtained by a stream of hot inert gas to form droplets which deposit a thin, adherent, continuous coating in a preformed support cavity,

the molten hydrogenated castor oil being heated to a temperature of about 190° to 300° F., the inert gas being at a temperature of from about 190° to 300° F. and a pressure of from about 10 to 50 psig,

the hydrogenated castor oil being at a sufficient flow rate to deposit a coating of about 0.05 to 1% by weight of hydrogenated castor oil based on the weight of the hot melt, and

casting a hot melt adhesive into the preformed cavity, and

depositing a similar thin melt blown coating of hydrogenated castor oil on the uncoated adhesive top surface of the formed hot melt package.

5,201,421

PACKAGING CONTAINER FOR HOLDING A

an outlet pipe protruding into said casing from the top of said casing and terminating at a bottom end thereof within said

to each other and said end faces are located in the same planes, said planes being situated generally perpendicular

formed on one side thereof and for forwarding sheets therefrom, including:

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5,201,421

PACKAGING CONTAINER FOR HOLDING A PLURALITY OF ARTICLES

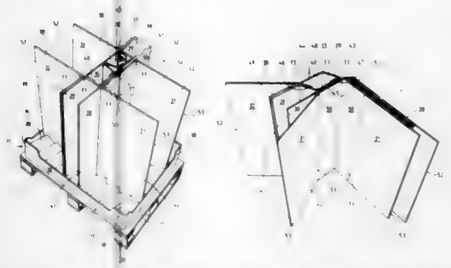
Hans Maier, Weisenthal, Fed. Rep. of Germany, assignor to Jacobs Suchard AG, Zurich, Switzerland

Filed Jan. 28, 1992, Ser. No. 826,730

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1991, 4102569

Int. Cl.[5] **B65D** *19/00*

U.S. Cl. 206—600 **3 Claims**



1. A packaging container for holding a plurality of articles, comprising:

a base member; and

a top member releasably connectable to the base member and including a multitude of blanks having a plurality of partition walls, and a plurality of connecting flaps connecting the blanks together,

the top member being foldable between

i) a first folded position in which the top member has a generally flat shape, and

ii) an open position in which the blanks of the top member form a central vertical column, and the partition walls of the blank form a plurality of compartments for receiving the articles;

wherein the blanks are connected together for pivotal movement relative to the central vertical column; and one of said blanks includes a central hinge axis, and the blanks are foldable about said central hinge axis from said first folded position and into a second folded position in which the top member also has a generally flat shape; and

wherein when the top member is in the first folded position, the top member has a given surface area; and when the top member is in the second folded position, the top member has a surface area approximately half said given surface area.

5,201,422

CLASSIFIER FOR POWDERY MATERIAL

Yoshitaka Ihara; Akira Ganse; Hidemasa Ishikawa, and Takashi Katsurazako, all of Yao, Japan, assignors to Kubota Corporation, Osaka, Japan

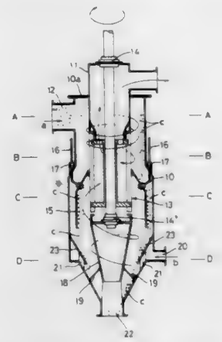
Filed Jul. 22, 1991, Ser. No. 733,302

Claims priority, application Japan, Jul. 23, 1990, 2-196701

Int. Cl.[5] **B04C** *3/00*

U.S. Cl. 209—144 **2 Claims**

1. A classifier for classifying powdery material, said classifier comprising: a casing including a cylindrical side wall, a material inlet port extending tangentially to said cylindrical wall and open to the interior of said casing at an upper portion of said casing such that material to be classified can be introduced into said casing through said material inlet port, an inverted conical bottom defining a discharge port through which coarse particles are to be discharged, and a fluid inlet port extending tangentially to said cylindrical wall in substantially the same direction as said material inlet port and open to the interior of said casing at a lower portion of said casing such that a fluid can be introduced into said casing through said fluid inlet port; a conical tube disposed within said casing adjacent the location where said fluid inlet port is open to the interior of said casing; an outlet pipe protruding into said casing from the top of said casing and terminating at a bottom end thereof within said casing, said material inlet port being open to the interior of said casing at a location that is higher in the classifier than the bottom end of said outlet pipe; an externally-driven vane wheel rotatably supported in said casing about the central longitudinal axis of the cylindrical side wall of said casing so as to be disposed in a concentric relationship with said casing, said vane wheel being disposed under said outlet pipe and above the location where said fluid inlet port is open to the interior of said casing; and a cylindrical body interposed between said vane wheel and the cylindrical side wall of said casing and spaced at predetermined distances therefrom, respectively, said cylindrical body having a top portion of a smaller diameter than the remaining portion thereof, the top portion of said cylindrical body extending around said vane wheel proximate the outer periphery thereof thereby surrounding only a lower portion of said vane wheel while leaving uncovered a portion of said vane wheel located between the top portion of said cylindrical body and the bottom end of said outlet pipe.



5,201,423

FIBER SUSPENSIONS SORTER HAVING A PLURALITY OF SCREEN BASKETS

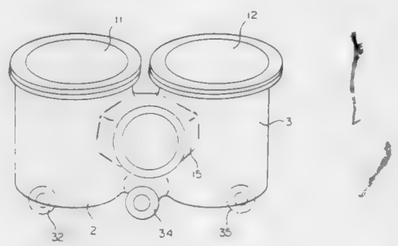
Reimund Rienecker, Heidenheim; Peter Schweiss, Langenau, and Theodor Bahr, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Nov. 20, 1991, Ser. No. 796,054

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1990, 4037042

Int. Cl.[5] **B07B** *1/04*

U.S. Cl. 209—273 **12 Claims**



1. A sorter for fiber suspensions, comprising:

a housing unit;

a plurality of screen baskets positioned in said housing unit, each screen basket having a longitudinal center axis and having respective end faces, said screen baskets being spaced such that said center axes extend generally parallel to each other and said end faces are located in the same planes, said planes being situated generally perpendicular to said longitudinal center axes of the screen baskets;

a rotor disposed interiorly of each screen basket;

a plurality of pulsation elements attached to each rotor;

an inlet socket for said fiber suspension and an outlet socket for passing an accepts portion of said suspension from each said basket, wherein said inlet and outlet sockets are positioned generally symmetrical to the longitudinal center axes of said screen baskets;

in which said sorter includes two screen baskets situated generally side by side, each screen basket being enclosed in a separate housing wherein said housings are connected to one another and supported by way of said inlet socket, said inlet socket being arranged midway of said housings, and by way of said outlet socket.

5,201,424

APPARATUS FOR TESTING THE STIFFNESS OF A SHEET

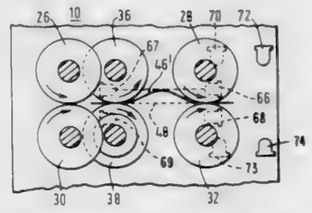
David A. Hain, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 30, 1991, Ser. No. 785,368

Claims priority, application United Kingdom, Jul. 4, 1991, 9114469

Int. Cl.[5] **B07C** *5/00*

U.S. Cl. 209—534 **19 Claims**



1. Apparatus for testing the stiffness of a sheet, comprising:

transport means for feeding said sheet along a feed path, said transport means including first and second rotary means arranged to engage with said sheet so as to urge said sheet along said feed path, said second rotary means being spaced from said first rotary means downstream thereof, said transport means also including drive means for driving said first and second rotary means simultaneously when said sheet is being fed from said first rotary means to said second rotary means, whereby the peripheral speed of said first rotary means is greater than that of said second rotary means, said first rotary means being arranged to engage frictionally with said sheet and to exert on said sheet a lower feeding force along said feed path than the feeding force along said feed path exerted on said sheet by said second rotary means; and

sheet deflection sensing means for sensing a deflection of a portion of said sheet between said first and second rotary means away from said feed path by at least a predetermined amount to measure the stiffness of said sheet.

5,201,425

SHEET TRAY WITH AN ENERGY ABSORBING BACKSTOP AND SCUFFER MECHANISM

Mary A. Roux; Thomas W. Rathbun, and Stephen A. Demchock, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1992, Ser. No. 840,201

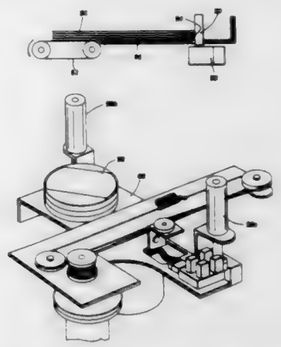
Int. Cl.[5] **B65H** *31/36*

U.S. Cl. 271—3.1 **8 Claims**

1. An apparatus for collecting sheets having an image formed on one side thereof and for forwarding sheets therefrom, including:

a tray for collecting the sheets; and

a roll mounted on said tray with the longitudinal axis thereof substantially perpendicular to said tray, said tray including a sheet discharge outlet with said roll being locating in the marginal region of said tray opposed from said sheet discharge outlet, said roll being positioned on said tray to engage an edge of the sheets being collected thereon and to arrest movement thereof, said roll being adapted to deflect upon being contacted by the sheet edge so as to absorb energy, thereby increasing the contact area with the edge of the sheet so as to minimize denting of the sheet and deletions of the edge of the image on the sheet, said roll includes a rotating tubular member adapted to deflect upon being contacted by the sheet edge.



5,201,426

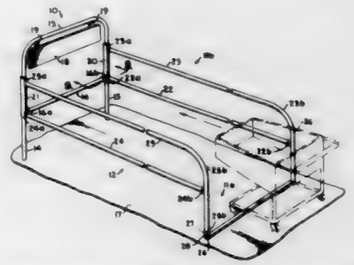
SHOPPING CART CORRAL

Ernest A. Cruwell, Jr., 16875 E. US 40 Hwy., Independencce, Mo. 64055

Filed Jul. 15, 1991, Ser. No. 731,122

Int. Cl.[5] **A47F** *5/00*

U.S. Cl. 211—17 **10 Claims**



1. An improved shopping cart corral comprising, in combination:

(1) a closed end structure for said corral comprising a substantially A-shaped frame member having (a) a pair of first and second, spaced apart, normally vertical, substantially parallel side legs, (b) a normally substantially horizontal upper beam rigidly connecting together the said side legs adjacent the tops thereof and (c) a normally substantially horizontal, intermediate height beam rigidly joining together said vertical side legs substantially intermediate the upper and lower ends thereof,

(2) a first, elongate, side wall beam member connected at an inboard end thereof to a first one of said side legs intermediate the ends thereof and having connected thereto, at an

outboard end thereof, a stub leg substantially vertical in at

(a) and sensor means adapted to monitor selective access to each of the cells, and

defining a plurality of rows, each row having at least two spikes, said rows of spikes defining a plurality of spaced

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outboard end thereof, a stub leg substantially vertical in at least a portion thereof supporting said first side wall member in a substantially horizontal position above the ground,

(3) a second, elongate, side wall beam member connected at an inboard end thereof to a second one of said side legs intermediate the ends thereof and having connected thereto, at an outboard end thereof, a stub leg substantially vertical in at least a portion thereof supporting said second side wall member in a substantially horizontal position above the ground,

(4) means connecting the inboard end of each respective side wall beam member to the respective vertical side wall leg in such manner as to enable the A-shaped frame member, under certain conditions, to pivot with respect to said side wall beam members in a manner so as to collapse itself and one of said side wall beam members essentially against the other side wall beam member, in substantially parallel position relative thereto,

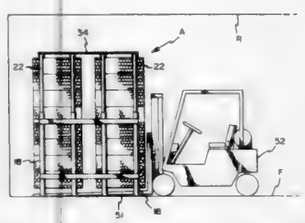
(5) said connecting means also connecting the inboard end of each respective side wall beam member to the respective vertical side leg in such manner as to be able to lock the inboard ends of said side wall members, under certain conditions, to the said respective vertical side leg and to the normally substantially horizontal intermediate height beam of said A-shaped frame member in such manner that the side wall members are fixed, substantially parallel to one another and, as well, fixed in extension at substantial right angles to the A-shaped frame member, each in the same direction.

5,201,427

RACK FOR STACKING AND MAINTAINING STACKED ARTICLES UNDER COMPRESSION

Alvis E. Dowty, Jonesboro, Ark., assignor to MDR Cartage, Inc., Jonesboro, Ark.

Filed Feb. 6, 1992, Ser. No. 831,923
Int. Cl.[5] A47F *7/04*
U.S. Cl. 211—23 **15 Claims**



1. A rack for stacking articles and maintaining stacked articles under compression for compact storage, said rack comprising:

a) upper and lower cooperating U-shaped members;

b) said U-shaped members each including a horizontal support and a leg extending vertically from opposite ends of said horizontal support;

c) said vertical legs of at least one of said upper and lower members cooperating with the vertical legs of the other of said upper and lower members for vertical adjustment of said upper member relative to said lower member;

d) each said horizontal support includes:

i) a plurality of spaced-apart frame members integrated with a plurality of respective upright sections corresponding to said vertical legs;

ii) means for rigidly interjoining said plurality of frame members; and

iii) said interjoining means including a means for adjusting its length and thus the depth of the rack, said adjusting means being disposed substantially on the exterior of said spaced-apart frame members; and

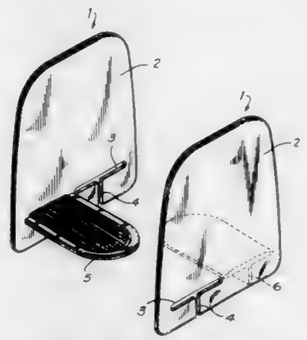
e) means for locking said upper and lower members from relative movement with each other, subsequent to adjustment of said upper and lower members.

5,201,428

NAPKIN HOLDER

Irene Pasinski; William J. Kolano, and Lorraine Opperman, all of Pittsburgh, Pa., assignors to Hutzler Manufacturing Company, Inc., Canaan, Conn.

Filed May 3, 1989, Ser. No. 347,334
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—50 **5 Claims**



1. A napkin holder comprising first and second main parts engageable with one another and having, respectively, first and second vertical walls defining an inner space therebetween, and first and second horizontal projections for supporting a stack of napkins in said inner space, each of said first and second vertical walls having a lower surface, said first and second projections extending from said first and second walls, respectively, at a same predetermined distance from a respective lower surface, and each of said first and second walls having an opening at said predetermined distance laterally spaced from a respective one of said first and second projections for slidably receiving another one of said first and second projections whereby said inner space is adjusted in accordance with a quantity of napkins in the stack of napkins; each of said first and second main parts comprising a vertical projection extending downward from a respective one of said first and second horizontal projections, and each of said first and second walls comprising a slot extending downward from a respective opening for slidably receiving a respective vertical projection, said slot opening at the lower surface of a respective one of said first and second vertical walls; said vertical projection extending downward a distance equal to said predetermined distance, and being connected to a respective one of said first and second horizontal projections along an entire length of said respective one of said first and second horizontal projections.

5,201,429

GRAVITY-FEED FLOW-RACK STORAGE SYSTEM

Tadayoshi Hikosaka; Yukio Hisada, and Toshihiro Nakano, all of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co. Ltd., Japan

Filed Mar. 5, 1992, Ser. No. 846,389
Claims priority, application Japan, Dec. 27, 1991, 3-113229[U]
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—59.2 **5 Claims**

1. A storage system comprising

a plurality of gravity-feed flow-rack cells forming a rack unit for shelving different stock,

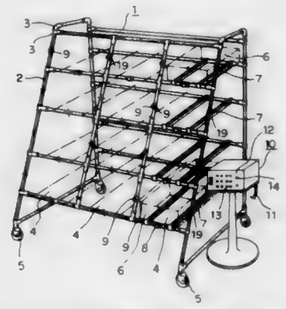
each of the cells carrying at a front end thereof

(a) and sensor means adapted to monitor selective access to each of the cells, and

(b) an indicator lamp adapted to provide guidance and indication for the selective access to the stock shelved therein,

an electronic control unit having a plurality of operation buttons and simultaneously receiving a signal from the sensor means and for transmitting information on production line orders each responsively associated with one of the indicator lamps,

a memory in the control unit, and



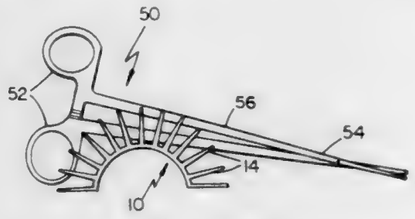
a selection switch for switching a signal which selects between a first stock-selection position and a second pick-up position, wherein when the first position of the selection switch permits the setting or resetting of the operation buttons and the simultaneously receiving of the signal from the sensor means to input in the memory of the control unit data for designating responsive indicator lamps to come on for stock-unloading access to a predetermined group of cells input in the memory, and when the selection switch is in the second pick-up position which sets the rack unit for unloading from the cells, the signal received from the sensor is turned on to do detection thereof.

5,201,430

INSTRUMENT HOLDER

Craig S. Artzer, Sterling, Colo., assignor to Advent Medico, Inc., Evergreen, Colo.

Continuation of Ser. No. 622,326, Nov. 27, 1990, abandoned, which is a continuation of Ser. No. 355,977, May 23, 1989, abandoned. This application Jan. 13, 1992, Ser. No. 821,328
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.6 **10 Claims**



1. An instrument holder, comprising:

(a) an elongated body member having a base portion and an upper portion, said elongated body member having an upraised cross section, and

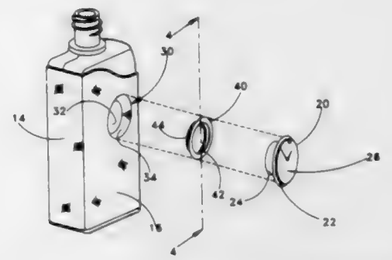
(b) a plurality of upward-standing, spaced apart, finger-like spikes disposed on the upper portion of the elongated body member; said spikes being oriented so that they are generally perpendicular to the longitudinal axis of the elongated body member, and being disposed in an array defining a plurality of rows, each row having at least two spikes, said rows of spikes defining a plurality of spaced apart slots, each slot oriented at approximately a right angle to the longitudinal axis of the elongated body member; and said spikes being resiliently flexible so that adjacent spikes are urged apart when an instrument is pressed downwardly into one of said slots, and are urged together and against said instrument to support it once the instrument is in place.

5,201,431

FRAGRANCE BOTTLE HAVING REMOVABLY AFFIXED JEWELRY TIMEPIECE

Joshua Berger, 14 Wallenberg Clr., Monsey, N.Y. 10952, and Leon Weiss, 2792 Casiano Rd., Los Angeles, Calif. 90077

Filed Jun. 19, 1991, Ser. No. 901,570
Int. Cl.[5] B65D *23/12*
U.S. Cl. 215—100 R **14 Claims**



1. A fragrance bottle having a removably affixed timepiece ornament, comprising:

a. a glass fragrance bottle having a flat front surface, the front surface having a round shallow basin, and the front basin having a flat bottom and a tapered sidewall;

b. a metallic circular mounting ring having a front end, a rear end, a tapered exterior sidewall and a straight interior sidewall, the thickness of the mounting ring being substantially the same as the depth of said front basin of said bottle, the rear end having substantially the same diameter as said bottom of said front basin of said bottle, the tapered exterior sidewall substantially conforming with said tapered sidewall of said front basin of said bottle, and the straight interior sidewall defining a cylindrical cavity;

c. a timepiece having a metallic casing, the casing having a front time displaying portion and a cylindrical rear base portion, the rear portion having substantially the same diameter as said cavity of said mounting ring and substantially the same thickness as said mounting ring;

d. said mounting ring permanently affixed to said bottle within said front basin by adhesive material, wherein said tapered exterior sidewall of said circular mounting ring further has an outer circular channel for facilitating the spreading of said adhesive material and retaining any excessive adhesive material applied between said tapered exterior sidewall of said circular mounting ring and said tapered sidewall of said front basin of said fragrance bottle;

e. said timepiece removably attached to said mounting ring by inserting said base portion of said casing of said timepiece into said cavity of said mounting ring; and

f. means for securing the engagement between said casing of said timepiece and said mounting ring;

g. whereby said timepiece is securely yet interchangeably attached to said front surface of said fragrance bottle, which provides a unique combination of a glass fragrance bottle and a timepiece.

5,201,432

CONTAINERS

ient projections to releaseably hold said cover plate over said first plate

(a) an inner steel tank having a base wall, and side walls for containing volatile inflammable liquids,

5,201,437

WIDEMOUTH STEEL DRUM OF CONICAL SHAPE

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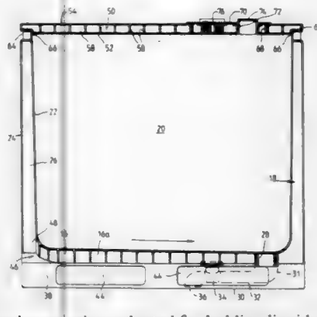
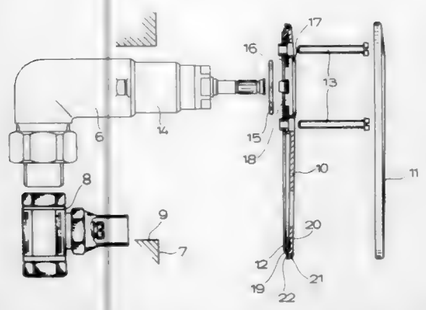
5,201,432
CONTAINERS
Flemming Elvin-Jensen, 4655 Wildgreen Drive, West Vancouver, British Columbia, Canada V7S 2V4
Filed Oct. 3, 1991, Ser. No. 771,142
Claims priority, application Australia, Oct. 10, 1990, 63937/90
Int. Cl.[5] B65D *5/00*
U.S. Cl. 220—1.5 28 Claims



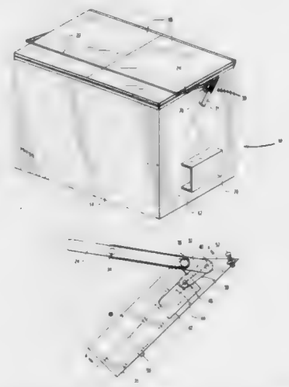
1. A plastics container adapted for holding liquid comprising a base wall, a pair of sidewalls and a pair of end walls, said base wall, sidewalls and endwalls having been integrally formed as an injection molding, wherein said pairs of side walls and said pairs of end walls each have a reinforced double wall construction comprising a pair of parallel surfaces connected together and reinforced by integral cross pieces, said cross pieces extending vertically in the direction of mold movement, said container being of a size for holding at least about 200 liters.

5,201,433
ESCUTCHEON FOR COVERING CONCEALED SANITARY FITTINGS
Alfons Thul, Mehren, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Filed Nov. 1, 1991, Ser. No. 786,497
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4034898
Int. Cl.[5] H02G *3/14*
U.S. Cl. 220—241 5 Claims



1. An escutcheon assembly for covering an opening in a wall through which a sanitary fitting extends, comprising a first plate, attachment means for releasably attaching said first plate about said opening on the outside of said wall, a cover plate removably coupleable over said first plate for covering said first plate and for providing a finished appearance to said assembly, said first plate including resilient projections on the outer periphery thereof and said cover plate including an outer rim edge that is bent inwardly for cooperation with said resilient projections to releaseably hold said cover plate over said first plate.

5,201,434
DUMPSTER LOCKING MECHANISM
Mario DeVivo, Newtown, and Mariano Tucciarone, Stamford, both of Conn., assignors to De Vivo Industries, Inc., Newtown, Conn.
Filed Jan. 27, 1992, Ser. No. 826,539
Int. Cl.[5] B65D *45/00*
U.S. Cl. 220—315 4 Claims

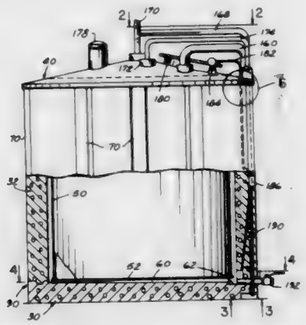


2. In a dumpster of the type having a lid opening toward the front and designed to be emptied by inversion and having a locking bar disposed to prevent opening of said lid, at least one side arm pivotally mounted to said dumpster for upward, arcuate motion toward the rear of said dumpster, said side arm being coupled to said locking bar, a gravity responsive locking mechanism comprising:
- a locking arm having a first and second end;
- a removable connection selectively engaging said first end of said locking arm to said side arm;
- a link having a first and second end, said first end pivotally coupled to the second end of said locking arm;
- a lock block, having an upper and lower end disposed for linear movement generally along an axis defined by said upper and lower ends,
- a pivot coupling connecting said upper end of said lock block to said second end of said link to permit arcuate motion of said lock block between a first position when said container is in an upright position and a second position when said container is inverted;
- a stop disposed to limit linear movement of said lock block when said lock block is in its first position and the dumpster is upright;
- wherein inversion of said dumpster causes said lock block to pivot away from said stop into said second position, permitting linear movement of said lock block.

5,201,435
STORAGE TANK FOR COMBUSTIBLE LIQUIDS
Charles W. Harding, Clarkston; John L. Hilfiker, White Lake, and James H. Hull, Grosse Pointe Woods, all of Mich., assignors to Clawson Tank Company, Clarkston, Mich.
Filed Sep. 26, 1991, Ser. No. 766,452
Int. Cl.[5] B65D *90/16*
U.S. Cl. 220—415 16 Claims

1. An above ground storage container for volatile liquids which comprises:

(a) an inner steel tank having a base wall, and side walls for containing volatile inflammable liquids,
(b) an outer surface container having a base and side walls surrounding said inner tank, the base and side walls of said concrete container being separated from the walls of said inner tank to provide an air envelope around the base and side walls of said inner tank, and

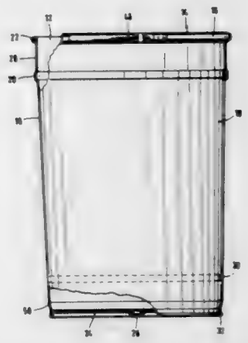


(c) an enclosing top wall sealingly carried by the side walls of said inner tank to contain volatile inflammable liquids within said inner tank, and said enclosing top wall overlying the outer side walls of said concrete container and being spaced vertically above said concrete container to allow air flow into said air envelope from exterior of said concrete container and from said air envelope to the exterior and for protecting said envelope from the elements.

5,201,436
CAN COATING OF EPOXY RESIN, ACRYLIC COPOLYMER AND ACRYLIC SURFACTANT
Phillip M. Owens, Parma, and Gary C. Pompignano, North Royalton, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio
Division of Ser. No. 435,340, Nov. 13, 1989. This application May 12, 1992, Ser. No. 881,761
Int. Cl.[5] B65D *1/16, 85/72;* C08L *63/10*
U.S. Cl. 220—458 3 Claims

1. A protective coating composition containing a polymeric binder comprising on a weight basis:
- epoxy-acrylic copolymer containing by weight between about 20%–90% epoxy resin and between 10% and 80% acrylic copolymer of copolymerized ethylenically unsaturated monomers comprising between 10% and 90% acrylic ester of acrylic or methacrylic acid between 5% and 25% carboxyl functional monomer, with the balance of monomers being other ethylenically unsaturated monomer;
- based on the weight of said epoxy-acrylic copolymer, between 0.02% and 0.3% of a terpolymer surfactant comprising copolymerized monomers on a weight basis consisting of between 20% and 90% of 2-ethyl hexyl acrylate, between 2% and 50% methyl methacrylate, and between 5% and 50% of an acrylic acid, where the Acid No. of said terpolymer surfactant is above about 50 and said terpolymer surfactant has a number average molecular weight between about 1,500 and 20,000;
- wherein said composition is applied as a protective coating to the interior surface of a can.

5,201,437
WIDEMOUTH STEEL DRUM OF CONICAL SHAPE
Märten Burgdorf, Heimerzheim, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany
Continuation of Ser. No. 698,511, May 10, 1991, abandoned. This application Aug. 31, 1992, Ser. No. 939,385
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1990, 9011586[U]
Int. Cl.[5] B65D *41/00*
U.S. Cl. 220—601 10 Claims



1. In a widemouthed open topped steel drum of conical shape having a large top filling and emptying opening defined by rolled rim (22) at the upper end of the sidewall of the drum, the drum being closable in a liquid-tight manner by means of a lid and tension ring, and having a sidewall near the top opening with an encircling stacking bead directed radially outwardly and which, upon nesting of at least two such empty steel drums, provides an outer ledge on the upper stacked drum for resting on the rim (22) of the top opening of the second drum, stacked beneath to define a closed space between the stacked drums beneath the rim (22) of the top opening of said second drum, the improvement characterized in that the steel drum (10) has at least one bunghole (26) in the bottom wall (24) of the drum, closable in a liquid-tight manner by means of a bung cover, said bunghole (26) communicating with said closed space to connect said space to atmosphere through the upper stacked drum and to permit insertion of a tool through the upper stacked drum and said bunghole (26) to assist in pulling the upper stacked drum from said second drum.

5,201,438
COLLAPSIBLE FACETED CONTAINER
Peter M. Norwood, 600 Plaza Middlesex, Middletown, Conn. 06457
Filed May 20, 1992, Ser. No. 885,869
Int. Cl.[5] B65D *1/40*
U.S. Cl. 220—666 6 Claims

1. A container comprising a top and a bottom, spaced apart along a longitudinal axis, connected by a multi-faceted generally cylindrical sidewall comprised of:
- a plurality of axially stacked rings comprises of a multiplicity of pyramidal segment, adjacent rings joined each to the other at zig-zag generally horizontal ring fold lines having a first nominal circumference, to form a collapsible portion of the cylindrical sidewall; adjacent pyramidal segment sin each ring joined to each other at generally vertical ring fold lines lying in vertical planes containing the longitudinal axis;
- each pyramidal segment having an apex, the apex projecting upwardly and outwardly from the periphery of the ring;
- each pyramidal segment comprised of two upper facets joined at a first vertical segment fold line and two lower facets joined at a second vertical segment fold line, the

pair of upper facets joined to the pair of lower facets at a zig-zag generally horizontal segment fold line;

paint in said apparatus when said apparatus is positioned with

- a rotor defining an axis and being arranged in said housing for transporting material, said rotor including a disk later-

pump drive means in said housing connected to said pump to drive said pump;

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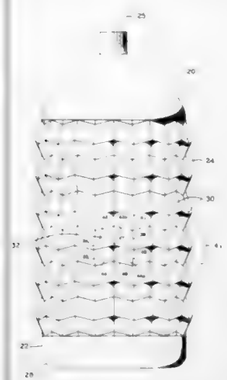
pair of upper facets joined to the pair of lower facets at a zig-zag generally horizontal segment fold line;

the horizontal segment fold line intersecting the vertical segment fold lines and forming said apex therewith, said apex being the upwardmost point of said horizontal segment fold line;

the horizontal segment fold line lying along a portion of a second nominal circumference, the second circumference being greater than the first nominal circumference; said vertical segment fold lines lying in vertical planes containing the longitudinal axis and connected to each other at the pyramidal segment apex; the upper facets having greater lengths int eh longitudinal axis plane than the lower facets;



said zig-zag generally horizontal ring fold lines intersecting said vertical segment fold lines at points, said points project upwardly and become the upwardmost points of said horizontal ring fold lines;

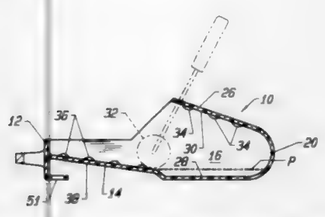
wherein, under sufficient vertical force, the lower facets fold under the rest beneath the upper facets, to vertically collapse the sidewall.

5,201,439

APPARATUS FOR HOLDING AND TRANSPORTING PAINT

Scott Davies, Citrus Heights, Calif.

Filed Jun. 1, 1992, Ser. No. 891,184
Int. Cl.[5] B65D *83/10*
U.S. Cl. 220—735 **12 Claims**



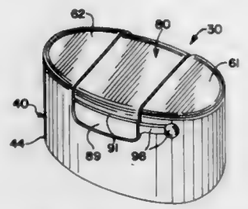
1. Apparatus for holding and transporting paint, said apparatus including a front, a bottom, side walls, and a back wall, said front, said side walls, and said back wall being interconnected and projecting from said bottom, a top element connected to said side walls and said back wall and in registry with a first portion of said bottom and spaced therefrom, said top element having an inner surface engageable by a paint roller having a predetermined diameter and radius of curvature to remove excess paint from said paint roller, and said side walls, top element and said bottom first portion defining a receptacle for paint in said apparatus when said apparatus is positioned with said apparatus front disposed upwardly relative to said rear wall, said back wall being smoothly curved between said bottom and said top element and having a radius of curvature exceeding the radius of curvature of a paint roller, and said bottom and top element being spaced apart a distance exceeding the diameter of a paint roller.

5,201,440

CLOSURE WITH TAMPER-EVIDENT TEAR-OFF PANEL UNITARY WITH A FLOW CONTROL ELEMENT

Richard A. Gross, Oconomowoc, Wis., assignor to Seaquist Closures, a division of Pittway Corporation, Mukwonago, Wis.

Filed Oct. 11, 1991, Ser. No. 775,719
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **20 Claims**



1. A tamper-evident dispensing closure comprising:

a body suitable for mounting on a container, said body defining a dispensing orifice for communicating with said container for dispensing the contents thereof, and said body defining an anchor-receiving aperture;

a flow control means disposed on said body for being moved between positions opening and closing said dispensing orifice;

a tamper-indicating member adjacent said flow control means and body;

a first frangible connecting means for connecting said tamper-indicating member to said flow control means;

an anchor means for being retained by said body and defining locking means for being inserted through said anchor-receiving aperture for engaging said body and preventing removal of said anchor means from said body; and

a second frangible connecting means for connecting said anchor means to said tamper-indicating member whereby said tamper-indicating member can be pulled to sever said member from both said flow control means and anchor means along said first and second frangible connecting means and thereby permit the opening of said flow control means while providing evidence of tampering with said closure.

5,201,441

ROTARY FEEDER WITH IMPROVED SEAL ARRANGEMENT BETWEEN THE LATERAL ROTOR DISK AND THE PERTAINING BEARING COVER

Hans Hoppe, Vogt; Walter Beirle, Ravensburg, and Rudolf Fühl, Vogt, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

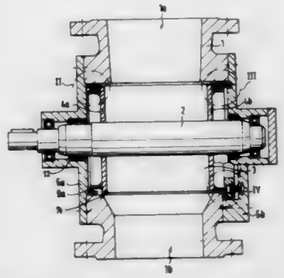
Filed Jul. 1, 1991, Ser. No. 723,938
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1990, 4021630; Apr. 26, 1991, 4113738
Int. Cl.[5] G01F *11/10*
U.S. Cl. 222—368 **14 Claims**

1. A rotary feeder; comprising:

a housing defining a cylindrical housing wall and including a lateral bearing cover at each axial side thereof for closing said housing in axial direction;

a rotor defining an axis and being arranged in said housing for transporting material, said rotor including a disk laterally arranged at each axial end at a distance from said pertaining bearing cover; and

sealing means arranged between said disk and said bearing cover and including a metal ring which extends coaxial to said rotor axis and perpendicular to said bearing cover, with said metal ring being affixed to said disk at the side facing said bearing cover, a substantially stationary filler ring made of plastic material and surrounding the outer circumferential area of said metal ring, with said filler ring defining an outer surface being spaced from said housing wall of said housing by the width of a sealing gap, and spring means cooperating with said filler ring for loading same in axial and radial directions, said spring means including an elastic profile ring received by said filler ring and projecting beyond said filler ring in axial and radial directions so as to be slightly compressed when abutting said bearing cover and said housing wall.

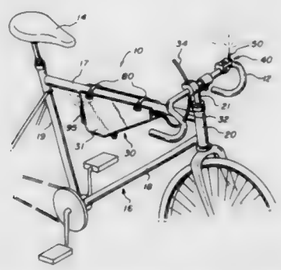


5,201,442

REMOTE CONTROL WATER DEVICE

Aram Bakalian, 323 Homans Ave., Closter, N.J. 07624

Filed Apr. 30, 1991, Ser. No. 693,363
Int. Cl.[5] A45F *5/00*; **B62J** *11/00*; **B05B** *9/04*
U.S. Cl. 222—610 **12 Claims**



1. An apparatus for dispensing liquid by remote actuation comprising:

a housing;

a reservoir, having an inlet and an outlet disposed in said housing;

a manifold, having a inlet and a plurality of outlets, disposed in said housing;

pumping means disposed in said housing having an inlet and an outlet, the outlet of said reservoir connected to the inlet of said pumping means, the outlet of said reservoir disposed in the housing such that regardless of the position in which the housing is disposed, liquid may flow from said reservoir to said inlet of said pump, the outlet of said pumping means connected to the inlet of said manifold;

pump drive means in said housing connected to said pump to drive said pump;

a delivery tube extending from one of said outlets of said manifold;

a dispensing tube connected to the other end of said delivery tube;

remote actuating means remotely disposed from said pump drive means for actuating said pump drive means;

receiver means for receiving and communicating said remote actuating means to said pump drive means to drive said pumping means to deliver liquid from said reservoir to said manifold, then to said delivery tube and then to said dispensing tube;

the receiver means comprising:

an electrical actuating means;

a radio receiver within said housing connected to said electrical actuating means;

said radio receiver having an antennae extending out of said housing for receiver radio signals from said remote actuating means; and

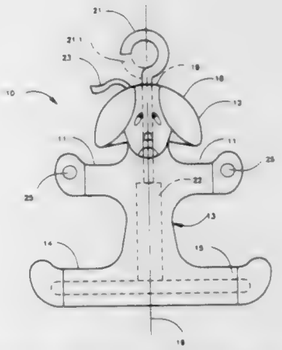
a relay connecting said electrical actuating means to said pump drive means to actuate said pump upon receipt of a signal by said receiver means.

5,201,443

GARMENT HANGER AND TOY COMBINATION

Walter A. Oswald, 13544 Crestview Drive, Surrey, Canada V3R 6T2

Filed Apr. 4, 1991, Ser. No. 680,369
Int. Cl.[5] A47G *25/14, 25/40*
U.S. Cl. 223—85 **18 Claims**



1. A garment hanger and toy combination depicting a figure having a head and a body, said combination comprising:

(a) said head and said body disposed about a longitudinal axis, and a pair of limbs extending outwardly from the body generally transversely of the axis, the head having a top portion and a recess within the top portion disposed adjacent the axis, the limbs being cantilevered from the body to support a load thereon when the body is hanging,

(b) support means for hanging the combination, the support means being axially extendable outwardly from the recess within the head, and axially retractable into the recess.

5,201,444

DISPENSING APPARATUS

Susan S. Simonet, 174 Sandstone Dr., Taylors, S.C. 29687

Filed Apr. 29, 1991, Ser. No. 693,159
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—183 **5 Claims**

1. A dispensing apparatus comprising:

a strap for placement around the wrist of a user;

a permanent magnet in the form of a ring defining a center aperture therethrough whereby objects responsive to

at said lower end portion thereof serving as a bottom when enfolded, and serving as a fruit guiding chute when

one to the other when respectively fixed to said retainer means and said semi-rigid pouch.

5,201,449

PNEUMATICALLY POWERED OR

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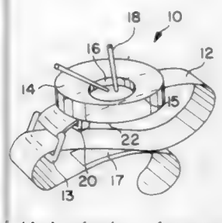
a permanent magnet in the form of a ring defining a center aperture therethrough whereby objects responsive to magnetic attraction may be retained for dispensing, said ring being annular and comprising an outer edge and an inner edge and having a saucer-shaped surface such that said ring sloped downwardly from said outer edge to said



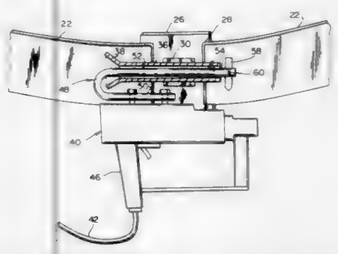
inner edge said ring having a base member below said saucer-shaped surface to which said strap is attached, wherein said center aperture extends through said saucer-shaped surface and said base member to said strap whereby objects placed on said saucer-shaped surface are able to contact said strap through said center aperture.

5,201,445

TOOL HOLDER WITH SELF-STABILIZING SWIVEL MOUNT

Bart I. Axelman, 23 Russell St., Winooski, Vt. 05404

Filed May 20, 1991, Ser. No. 703,173
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—197 **13 Claims**



1. A tool holder adapted to support a hand-held air driven power tool comprising receptacle means for accommodating the tool, pivot means for rotatably displacing the receptacle means, hook means attachable to the tool for engaging the receptacle means to suspend the tool therefrom, said tool being swingable about the pivot means to a weight stabilized equilibrium position, locking means for securing the hook means to the receptacle means when the tool is in the equilibrium position, said hook means including a leg member spaced from a surface of the tool and extending substantially parallel to said surface, said locking means including a rotatable locking lug within the leg member, said locking lug providing the securement of the leg member within the receptacle means.

5,201,446

FRUIT PICKER'S SUPPORTED CONTAINER

Fred J. Martin, Rte. 5, Box 5249B, East Wenatchee, Wash. 98802

Continuation-in-part of Ser. No. 478,670, Feb. 12, 1990, abandoned. This application Sep. 30, 1991, Ser. No. 768,153
Int. Cl.[5] A01D *46/22*
U.S. Cl. 224—205 **20 Claims**

20. A fruit picker's support container, comprising:

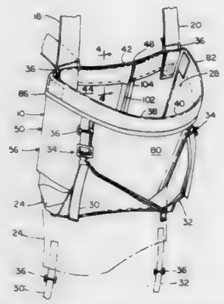
a) a container with an upright portion having upper and lower end portions;

b) a skirt portion foldably connected to said upright portion at said lower end portion thereof serving as a bottom when enfolded, and serving as a fruit guiding chute when unfolded;

c) said upright portion including front, rear and sides;

d) said front, rear and sides comprising initially only a pliable material and forming with the folded skirt portion a bag-like configuration;

e) said front, rear and sides with the folded skirt portion defining a volume for receiving the picked fruit;



f) said front subsequently also including rigid, firm, fixed, non-yielding means completely covering the entire front side, for protecting the picked fruit received in said volume; and

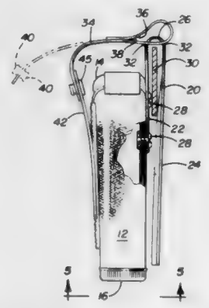
g) wherein said upright portion of the container is rigid, firm, fixed, non-yielding in the front and pliable in the rear.

5,201,447

QUICK RELEASE HOLSTER

George Bumb, and Gerald L. Campagna, both of San Jose, Calif., assignors to Bumb & Associates, San Jose, Calif.

Filed Oct. 16, 1991, Ser. No. 777,613
Int. Cl.[5] F41C *33/02*
U.S. Cl. 224—243 **10 Claims**



1. A holster assembly for use with a clothed person, comprising:

a relatively semi-rigid pouch having an enlarged open upper end and a smaller lower end, said pouch formed to receive an article in its enlarged open upper end;

rigid retainer means affixed to one side of said pouch for removably affixing said pouch to an article of clothing worn by the person;

a separable strap comprising a first piece and a second piece wherein one of said first or second pieces is removably fixable to said retainer means and the other side of said first or second pieces is removably fixable to said semi-rigid pouch, said first piece and said second pieces fixable one to the other when respectively fixed to said retainer means and said semi-rigid pouch

said rigid retainer means comprising a U-shaped member defining a first leg and a second leg, said first leg connected to said second leg by a cross member, said first and second leg each defining a co-axial elongated slot each slot defining a long axis, said coaxial elongated slots adjacent to said cross member with said long axis substantially parallel to the plane of said cross member

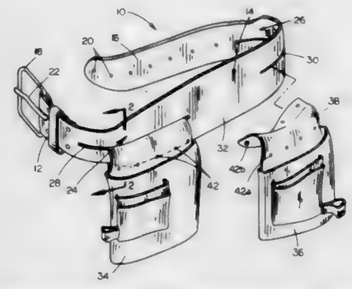
and further wherein said pouch is affixed to said first leg.

5,201,448

UTILITY BELT WITH BACK SUPPORT

Richard M. Schue, 2313 34th Ave. S., Fargo, N. Dak. 58104

Filed Oct. 31, 1991, Ser. No. 786,098
Int. Cl.[5] B25H *3/00*; **B25B** *29/00*
U.S. Cl. 224—253 **2 Claims**



1. A construction utility belt with back support, comprising:

an elongated belt having first and second end portions, a mid portion and upper and lower edges;

an operable buckle mounted to said first end portion;

said second end portion having apertures therein adapted for selective connection to said buckle;

said mid portion having a width, as measured transverse to the longitudinal axis, from the upper edge to the lower edge, greater than the width of said first and second end portions;

said mid portion having a thickness and width so as to provide abdominal and lower back support when the belt is tightened around the lower abdomen of a person;

said mid portion having a constant width greater than said first and second end portions and extending approximately one-fourth the length of the belt;

said belt including a first taper portion located between the first end portion and mid portion, and a second taper portion located between the second end portion and mid portion;

said taper portion upper and lower edges tapering equally towards the longitudinal axis of the belt such that the mid portion and end portions are coaxial;

a first slot through said belt along the longitudinal axis thereof to which article holding pouches may be attached, said first slot extending from said first end portion through said first taper portion and into said mid portion;

a second slot through said belt along the longitudinal axis thereof to which article holding pouches may be attached, said second slot extending from said second portion through said second taper portion and into said mid portion; and

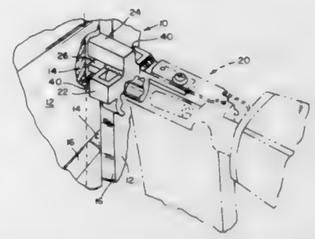
said first and second slots separated by a solid uncut section in the middle of said mid portion.

5,201,449

PNEUMATICALLY POWERED OR COMBUSTION-POWERED FASTENER-DRIVING TOOL USEFUL WITH BRICK-FACED SIDING

Charles D. Miller, Mundelein, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Jun. 29, 1992, Ser. No. 905,460
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—8 **5 Claims**



1. A powered fastener-driving tool for driving a fastener into a gap located between two raised surfaces of a workpiece, such as a gap having a predetermined width and defined between two brick faces affixed to a backing board of a siding panel, comprising:

a workpiece-contacting element, having a pair of oppositely extending workpiece-contacting regions disposed along a first axis upon opposite sides of said gap for contacting said raised surfaces of said workpiece, movable between an extended position and a retracted position, and biased toward said extended position;

a nosepiece extending beyond said workpiece-contacting element and into said gap, at least when said workpiece-contacting regions of said workpiece-contacting element contact said raised surfaces of said workpiece and said workpiece contacting element is moved to said retracted position, for guiding said fastener, driven by said tool, into said gap of said workpiece, said nosepiece having a second axis disposed perpendicularly to said first axis of said workpiece-contacting element; and

a probe fixed to said workpiece-contacting element and having a third axis laterally offset from but disposed parallel to said second axis of said nosepiece, said probe extending forwardly of said workpiece-contacting element and comprising parallel side portions spaced apart a distance which is substantially equal to said predetermined width of said gap defined between said two brick faces so as to be able to be disposed within said gap when said workpiece-contacting regions of said workpiece-contacting element contact said respective ones of said raised surfaces and thereby facilitate location of said nosepiece within said gap whereby said fastener, driven by said tool, can be properly driven into said gap defined between said two raised surfaces of said workpiece and into a substrate upon which said siding panel is to be affixed.

5,201,450

HEAT BLOCK OF WIRE BONDING MACHINE

Tae K. Ahn, Choongcheongbook-Do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Mar. 3, 1992, Ser. No. 845,095
Claims priority, application Rep. of Korea, Jul. 15, 1991, 10945/1991
Int. Cl.[5] B23K *37/00*
U.S. Cl. 228—4.5 **7 Claims**

1. A heat block of a wire bonding machine comprising:

an inner lead heating part for bonding each one end of wires to each inner lead of a lead frame;

a chip heating part for bonding the other ends of said wires located beneath the outer lead bonding area of the circuit-

(a) providing an integrated circuit having a conductive bond

supplying said filler metal at said bolt hole, said filler metal

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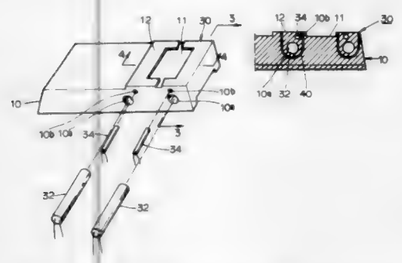
a chip heating part for bonding the other ends of said wires to a semiconductor chip; and

heating means comprising at least a pair of heaters and a pair of thermocouples provided with a thermal insulation



member to differentially heat said inner lead heating part and said chip heating part such that said inner lead heating part has a relatively higher temperature than that of said chip heating part.

5,201,451

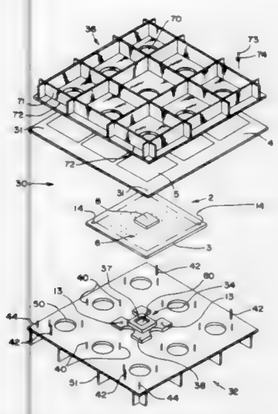
METHOD AND APPARATUS FOR MOUNTING A FLEXIBLE FILM SEMICONDUCTOR CHIP CARRIER ON A CIRCUITIZED SUBSTRATE

Kishor V. Desai, Vestal; Nelson P. Franchak, Binghamton; Robert H. Katyl, Vestal; Harold Kohn, Endwell; Endwell; Tamar A. Sholtes, Endicott, all of N.Y.; Vilakkudi G. Veeraraghavan, Lexington, Ky., and Charles G. Woychik, Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 644,528, Jan. 23, 1991, which is a division of Ser. No. 365,326, Jun. 13, 1989, Pat. No. 5,159,535, which is a continuation of Ser. No. 24,499, Mar. 11, 1987, abandoned. This application Jul. 9, 1991, Ser. No. 727,047

Int. Cl.[5] B23K *37/00*

U.S. Cl. 228—5.5 **7 Claims**



1. An apparatus for outer lead bonding at least one circuitized, flexible film onto a corresponding bonding site on a circuitized substrate, comprising:

a base plate sized and configured to hold the circuitized, flexible film in position relative to its corresponding bonding site on the circuitized substrate;

a pressure insert, including a resilient member, which is sized and configured to be positioned on the base plate beneath the circuitized, flexible film with the resilient member located beneath the outer lead bonding area of the circuitized, flexible film;

a top plate sized and configured to match the base plate and to form a fixture with the base plate and the pressure insert; and

clamping means for clamping together the circuitized, flexible film and the circuitized substrate between the base plate and the top plate with the pressure insert located beneath the circuitized, flexible film.

5,201,452

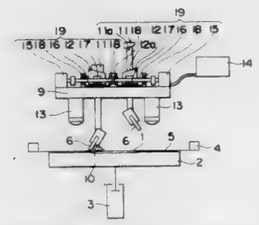
SCREEN PRINTING APPARATUS

Ken Takahashi, Kofu; Takao Naito; Hiroyuki Miyake, both of Yamanashi, and Takashi Sasaki, Kofu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 24, 1992, Ser. No. 917,979

Int. Cl.[5] B23K *31/02, 37/00*

U.S. Cl. 228—8 **8 Claims**



1. A screen printing apparatus comprising:

a stage for positioning a substrate thereto;

a screen plate positioned above the stage;

a squeegee, positioned above the screen plate, for printing material to be printed on the substrate;

an adjusting means for adjusting a movement range of the squeegee with respect to the substrate;

a surface state-recognizing means for recognizing a surface state of the screen plate after the material is printed on the substrate; and

a control means for processing information obtained by the surface-recognizing means and operating the adjusting means so as to adjust the movement range of the squeegee to the substrate.

5,201,453

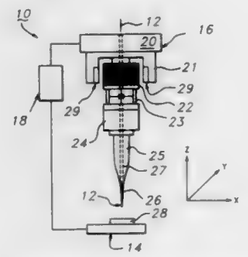
LINEAR, DIRECT-DRIVE MICROELECTRONIC BONDING APPARATUS AND METHOD

Gonzalo Amador, Dallas; Rafael C. Alfaro, The Colony, and Robert A. Davis, Irving, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1991, Ser. No. 767,731

Int. Cl.[5] B23K *1/06*

U.S. Cl. 228—110 **12 Claims**



1. A method of forming a microelectronic bond, the method comprising the steps of:

(a) providing an integrated circuit having a conductive bond site, the integrated circuit presenting a substantially horizontal lengthwise plane;

(b) providing a wire having a bond end, and orienting the wire to extend perpendicular relative to the lengthwise plane of the integrated circuit; and

(c) contacting the bond end of the wire to the bond site by a substantially linear stroke perpendicular to the lengthwise plane of the integrated circuit, the bond end and the bond site presenting an interface therebetween.

5,201,454

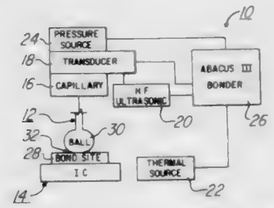
PROCESS FOR ENHANCED INTERMETALLIC GROWTH IN IC INTERCONNECTIONS

Rafael C. Alfaro, The Colony, Tex.; Lau B. Howe, Subanq Java, Malaysia, and Thomas H. Ramsey, Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1991, Ser. No. 768,501

Int. Cl.[5] H01L *21/607*

U.S. Cl. 228—110 **15 Claims**



1. A method of forming an intermetallic bond structure, the method comprising the steps of:

providing a conductive metal bond site;

providing a conductive metal wire having a bond end;

contacting the bond end of the wire to the bond site such that the bond end and the bond site present an interface therebetween;

providing ultrasonic energy having a frequency of at least approximatley 100 kHZ; and

effecting intermetallic phase growth over substantially the entire interface, including the step of applying the ultrasonic energy at the interface, wherein the ultrasonic energy is applied throughout a desired bonding time period, and wherein the intermetallic phase growth is completed during the bonding time period.

5,201,455

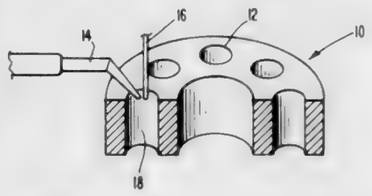
METHOD FOR METALLURGICAL ENHANCEMENT OF A FAILED BOLT HOLE

Samuel D. Reynolds, Jr., Oviedo, and Ashoke K. Mukherjee, Orlando, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1992, Ser. No. 933,168

Int. Cl.[5] B23P *6/00*

U.S. Cl. 228—119 **16 Claims**



1. A method for metallurgical enhancement of failed threaded material of a bolt hole, comprising the steps of:

(a) removing said failed material from said bolt hole;

(b) selecting a filler metal to replace said failed material and supplying said filler metal at said bolt hole, said filler metal metallurgically compatible with the base metal of said bolt hole; and

(c) arc welding said filler metal on said base metal.

5,201,456

PROCESS FOR ASSEMBLY OF A METAL CAN ON A SUBSTRATE BEARING AN INTEGRATED CIRCUIT

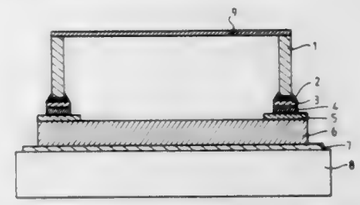
Florence de Reynal, St Mande, and Dominique Coujard, Chilly Mazarin, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 10, 1991, Ser. No. 774,346

Claims priority, application France, Oct. 12, 1990, 90 12607

Int. Cl.[5] H01J *9/26;* **B23K** *1/20*

U.S. Cl. 228—122 **8 Claims**



1. Process for assembly of a metal can on a substrate bearing an integrated circuit according to which successive applications by serigraphy are made, on a annular zone of the substrate around the perimeter of the can, of a layer of dielectric paste insulating strip conductors on the substrate from the metal can, then a layer of metallic ink serving to adhere to a layer of welding alloy enabling welding of the metal can, which further comprises applying a mixture of the dielectric paste and the metallic ink by serigraphy as an intermediate layer between said layer of dielectric paste and said layer of metallic ink.

5,201,457

PROCESS FOR MANUFACTURING CORROSION-RESISTANT WELDED TITANIUM ALLOY TUBES AND PIPES

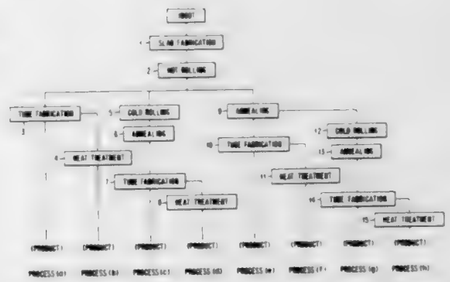
Shiroh Kitayama, Kobe, and Yoshiaki Shida, Ikoma, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1991, Ser. No. 729,213

Claims priority, application Japan, Jul. 13, 1990, 2-186724

Int. Cl.[5] B21D *39/00*

U.S. Cl. 228—144 **20 Claims**



1. A process for manufacturing a welded titanium alloy tube or pipe having good resistance to crevice corrosion from a titanium alloy which consists essentially, by weight, of one or more of the platinum group metals in a total amount of

0.01–0.14%, at least one of Ni and Co each in an amount of

(a) a tubular straw which is deformable repeatedly to and

access means for receiving said straw, said access means

a spout protruding outward from said upper side tilted plate

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0.01–0.14%, at least one of Ni and Co each in an amount of 0.1%–2.0%, not more than 0.35% of oxygen, not more than 0.30% of iron, optionally at least one of Mo, W, and V each in an amount of 0.1%–2.0%, and a balance of Ti, the process comprising the steps of:

(1) preparing a slab by hot working from an ingot of the titanium alloy after the ingot has been heated in a temperature range of from 750° C. to a temperature 200° C. above the beta-transus point;

(2) hot-rolling the slab with a finishing temperature of not lower than 400° C. to form a hot-rolled strip after the slab has been heated in a temperature range of from 650° C. to a temperature 150° C. above the beta-transus point; and

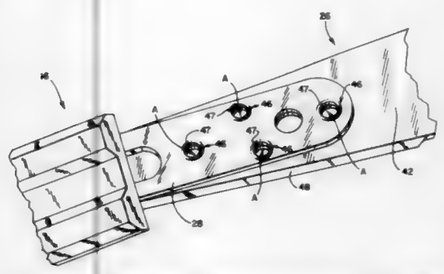
(3) forming and welding the hot-rolled strip to form a welded tube or pipe.

5,201,458

METHOD OF WELDING A HEAD SUSPENSION ASSEMBLY

Tracy M. Hagen, Edina, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Oct. 31, 1990, Ser. No. 606,573
Int. Cl.[5] G11B *5/49*
U.S. Cl. 228—199 **23 Claims**



1. A method of making a suspension assembly in a magnetic disc drive, the suspension assembly including a head, a gimbal for supporting the head, and a load beam for supporting the gimbal, the method comprising:

forming a load beam aperture extending through the load beam and having a perimeter;

forming a gimbal aperture extending through the gimbal and having a perimeter;

placing a surface of the gimbal in contact with a surface of the load beam so that the gimbal aperture is aligned with the load beam aperture to form a pair of aligned apertures, the pair of apertures having a circumferential periphery; and

welding the gimbal to the load beam by impinging a laser beam on a weld spot positioned proximate the circumferential periphery of the pair of aligned apertures so that the weld spot has a weld aperture extending therethrough to reduce stress induced strains in the material surrounding the weld spot which cause the load beam to deform.

5,201,459

BEVERAGE CONTAINER WITH NOVEL DISPENSING MEANS

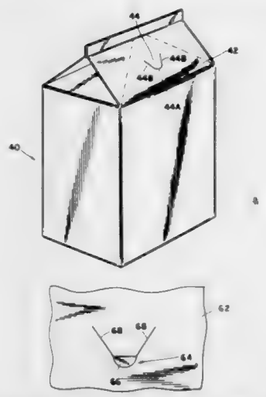
Griscom Bettle, Jr.; Griscom Bettle, III, and Patricia Jeruzal, all of Bradenton, Fla., assignors to Tropicana Products, Inc., Bradenton, Fla.

Continuation of Ser. No. 570,211, Aug. 21, 1990, abandoned. This application Nov. 14, 1991, Ser. No. 794,300
Int. Cl.[5] B65D *5/72*
U.S. Cl. 229—103.1 **6 Claims**

1. A container and straw combination comprising:

a straw having a preselected cross section defined by a peripheral wall;

a container including a body having an upper surface and an access means for receiving said straw, said access means being defined by a cut made in said upper surface, said cut including a central portion and a side portion, said central portion partially conforming to said preselected cross section, and said side portion extending away from said central portion, wherein when said straw is inserted into said body through said central portion, said central portion is in contact with a portion of said peripheral wall and said side portion cooperates with said straw to form a pressure relief opening through said body to minimize unintentional forcing of said liquid through said body into said straw under pressure within said container;



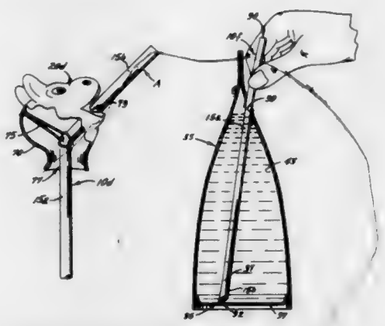
wherein said body has a cardboard wall and wherein said central portion is formed of a substantially semi-circular cutout, said cardboard wall being provided on both sides with a plastic coating, said plastic coating having a thickness selected to allow said straw to puncture said coating when said straw is inserted through said access means; and wherein said cut is formed as a slit extending through said cardboard wall, said coating spanning and covering said slit and said cutout, one end of said slit terminating at said cutout.

5,201,460

SPILL-RESISTANT DRINKING STRAW

R. Scott Caines, Greenville, S.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Apr. 30, 1990, Ser. No. 516,758
Int. Cl.[5] A47G *19/22*
U.S. Cl. 229—103.1 **27 Claims**



1. A spill-resistant drinking straw comprising:

(a) a tubular straw which is deformable repeatedly to and from a substantially sealed state in which liquid is substantially prevented from flowing through the straw and an open state in which liquid can readily flow through the straw; and

(b) a biasing means for biasing the tubular straw in the substantially sealed state and for retracting the tubular straw from the open state to the sealed state;

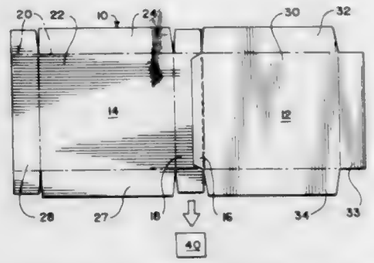
the tubular straw being manually deformable to the open state for use in drinking and returned to the sealed state by the biasing means in the absence of external force.

5,201,461

COMPOSITE FLAT BLANK FOR CONTAINERS AND METHOD

John M. Sykora, Palos Hills, Ill., assignor to Field Container Co., L.P., Elk Grove Village, Ill.

Filed Jul. 5, 1991, Ser. No. 726,342
Int. Cl.[5] B65D *5/32*
U.S. Cl. 229—125.08 **11 Claims**



1. A paperboard flat blank, scored for folding to form a container, which flat blank comprises:

at least first and second flat paperboard blank portions sealed together along seal line means to form the entire flat blank, each flat blank portion having a portion thereof that is free of contact with the other flat blank portion;

said first flat blank portion exhibiting at least one physical property that is different from the corresponding physical property of said second flat blank portion, other than the scoring, and the shape and size in the plane of said flat blank by having a different physical property of strength based on the organic macromolecules present in said paperboard that relates at least to one of the properties that include amount of macromolecules and type of macromolecules present in the paperboard of the blank portions.

5,201,462

LIQUID CONTAINER

Jun Sada; Yoshiaki Take; Toshihide Togi; Masatoshi Fujima; Masahiro Uematsu; Takashi Ito; Rie Hirahara; Makoto Igarashi, and Nobumasa Yamazaki, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

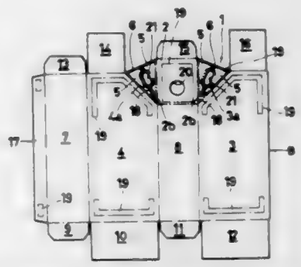
Filed Mar. 18, 1992, Ser. No. 853,054
Claims priority, application Japan, Mar. 19, 1991, 3-23782[U]; Mar. 19, 1991, 3-32783[U]; Jun. 11, 1991, 3-52307[U]; Jul. 31, 1991, 3-67342[U]; Oct. 25, 1991, 3-95857[U]; Nov. 12, 1991, 3-295814; Jan. 20, 1992, 4-5784[U]
Int. Cl.[5] B65D *43/06*
U.S. Cl. 229—125.15 **7 Claims**

1. A liquid container comprising:

a carton including a front plate, a rear plate, a pair of side plates each connecting adjacent side edges of said front and rear plates, and an upper side tilted plate having an aperture therein;

an inner bag disposed in said carton;

a spout protruding outward from said upper side tilted plate through said aperture;



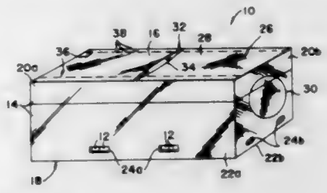
a pair of foldable portions each disposed between said upper side tilted plate and each of said front and rear plates, each foldable portion having a cutout aligned with said aperture.

5,201,463

PACKAGING SYSTEM

Michael George, Jacksonville, Fla., assignor to Kraft General Foods, Inc., Northfield, Ill.

Filed Nov. 19, 1991, Ser. No. 794,200
Int. Cl.[5] B65D *65/26*
U.S. Cl. 229—203 **10 Claims**



1. A packaging system comprising:

a plurality of packages which are vulnerable to damage when cut into by a sharp instrument;

a generally parallelpiped container for holding said plurality of packages, said container enclosing all of said packages and being formed of two container portions having generally rectangular bases, each container portion base having first opposed edges and second opposed edges extending generally perpendicular to the first opposed edges, said container portions also having side walls extending from the bases towards the other container portion to form the said generally parallelpiped container which has first opposed ends formed between the said first opposed edges and second opposed ends formed between the said second opposed edges,

a wrapping means which encircles said container for holding said container portions against the plurality of packages contained therein to form said generally parallelpiped container configuration, said wrapping means being a shrink wrap material applied about said container and shrunk into engagement therewith; and

removal means for facilitating easy manual removal of the shrink wrap material from the container, said removal means including a slot formed in the shrink wrap material and extending substantially across the exterior of one of said container portion bases in a direction from one of said second opposed ends to the other of said second opposed ends, and weakening means comprising a pair of weakened lines formed in the shrink wrap material and extending from the slot, generally perpendicular thereto in both directions from the slot toward the first opposed ends of

the container, said weakening means being positioned

perpendicular to said third and fourth strips, longitudi-

orifice; a nozzle mounted on said housing assembly coaxially of

5,201,468

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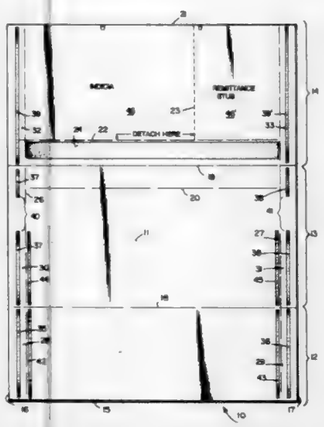
the container, said weakening means being positioned close enough to an adjacent one of said second opposed ends that when the weakening means is manually broken, the shrink wrap material is easily removed sufficiently from the container to permit direct essentially unobstructed removal of one of said container portions off of the packages.

5,201,464

PRESSURE SEAL C-FOLD TWO-WAY MAILER

Jerry E. File, Mundelein, Ill., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Aug. 8, 1991, Ser. No. 742,344
Int. Cl.[5] B65D *27/06, 27/04*
U.S. Cl. 229—305 **19 Claims**



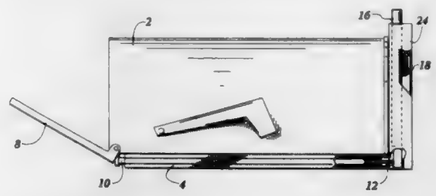
1. A mailer type business form intermediate, comprising:
a sheet of paper having a first face, adapted to provide the majority of the interior of the mailer when constructed, and a second face, adapted to provide the majority of the exterior of the mailer when constructed;
said sheet having first and second opposite, parallel longitudinal edges extending the entire length thereof, and opposite ends;
first and second longitudinal lines of weakness formed in said sheet parallel to and adjacent, but spaced from, said first and second longitudinal edges, respectively, said lines of weakness defining, with said longitudinal edges, longitudinal marginal portions;
first and second longitudinal strips of adhesive disposed in said first and second longitudinal marginal portions, respectively, of said first face, extending the majority of the lengths of said longitudinal marginal portions, and parallel to said first and second longitudinal edges;
third and fourth longitudinal strips of adhesive disposed parallel to said first and second strips, and disposed adjacent said first and second lines of weakness on the opposite side thereof from said first and second strips, on said first face, said third and fourth longitudinal strips disposed closer to one end of said ends than the other, and extending a distance substantially less than the extent of said first and second strips;
fifth and sixth longitudinal strips of adhesive parallel to said first and second longitudinal edges and disposed in said first and second marginal portions, respectively, on said second face, said fifth and sixth strips located adjacent the same end of said sheet as said third and fourth strips, and having a longitudinal extent at the most equal to said and fourth strips;
means defining a transverse adhesive strip on said first face, perpendicular to said third and fourth strips, longitudinally spaced from said third and fourth strips; and
means defining a line of weakness adjacent said transverse strip, on the opposite side thereof from said third and fourth strips, to allow ready separation of the paper at that line.

5,201,465

MAILBOX SIGNALING DEVICE

Terry Limehouse, 103 Quarterhorse Cir., Summerville, S.C. 29483

Filed May 12, 1992, Ser. No. 881,644
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—35 **7 Claims**



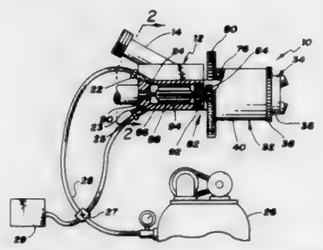
1. A mailbox signaling device, comprising:
(a) a platform on which a mailbox is mounted;
(b) a lever which is slidably located within said platform and which is displaced by a door of said mailbox as said door contacts said lever upon movement of said door;
(c) a trigger which is pivotally mounted to said platform by a pivot at a pivot point of said trigger, said trigger having a first end extending from said pivot point and having a second end which extends in an opposite direction from said pivot point, wherein, in use, said lever contacts and displaces said first end upon displacement of said lever, causing said trigger to pivot; and
(d) a signal rod having a slot formed therein which engages said second end of said trigger so that said signal rod is held in position by said trigger, whereupon said second end of said trigger is disengaged from said slot in said rod as said trigger pivots, releasing said signal rod from engagement with said trigger.

5,201,466

SPRAY GUN HAVING A ROTATABLE SPRAY HEAD

James E. Hynds, 7174 Creeks Crossing, West Bloomfield, Mich. 48322

Continuation of Ser. No. 510,174, Apr. 17, 1990, abandoned. This application Jan. 17, 1992, Ser. No. 823,603
Int. Cl.[5] B05B *3/02*
U.S. Cl. 239—263 **11 Claims**



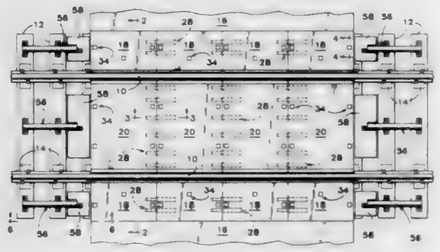
1. In a spray gun including a housing assembly; an annular spray head mounted at the forward end of said housing assembly; said spray head having a central air discharge orifice extending coaxially therethrough and at least one shaping air orifice; a nozzle mounted on said housing assembly coaxially of said air discharge orifice; said nozzle having a liquid discharge orifice at its forward end for discharging liquid under pressure in a forwardly directed stream coaxially of said air discharge orifice; first passage means in said housing assembly for supplying liquid under pressure to said liquid discharge orifice; chamber means in the housing assembly; means for communicating pressurized air having a flow rate in excess of 5 CFM and a delivery pressure of less than 15 psi over atmospheric pressure to the chamber means; second passage means in said housing assembly for communicating air from the chamber means to said air discharge orifice to atomize liquid discharged from said liquid discharge orifice into a spray; third passage means in said spray head for communicating air from the chamber means to said shaping air orifices in said spray head to control fanning of the spray; the improvement comprising: means for rotatably mounting the spray head on the housing assembly; drive means for rotatably driving the spray head relative to the housing assembly to create at least one spiral flow of shaping air; wherein said drive means includes a reversible motor to drive the spray head and automatic control means for automatically controlling the reversible motor and for automatically controlling movement of the spray gun wherein the at least one spiral flow of shaping air is capable of automatically flowing in opposite directions dependent on the direction of movement of the spray gun.

5,201,467

APPARATUS FOR INTERCONNECTING ELASTOMERIC GRADE CROSSING PANELS

Gerald R. Kennel, McHenry, and John A. Perry, Harvard, both of Ill., assignors to Riedel Omni Rubber Products, Inc., Portland, Oreg.

Filed Sep. 3, 1991, Ser. No. 754,055
Int. Cl.[5] E01B *21/04;* **E01C** *5/20*
U.S. Cl. 238—8 **10 Claims**



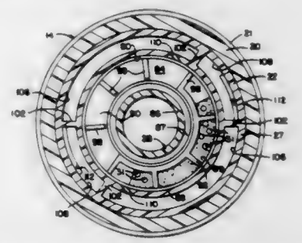
1. A system for interconnecting elastomeric panels, that extend between a pair of parallel rails and between each rail and the edge of a roadway that crosses the rails, to form integral multiple panel grade crossing units, said system comprising:
(a) a plurality of elastomeric panels each having opposed vertical faces which abut adjacent panels and a plurality of elongate passageways that extend between said opposed faces, said passageways being tapered so as to present a relatively smaller opening on one of said faces and a relatively larger opening on the opposed face, and being aligned with the rails when the panels are in place in a grade crossing; and
(b) elongate pins that snugly communicate with said passageway, each of said pins being divided into a larger end that corresponds to said larger openings and a smaller end that corresponds to said smaller openings.

5,201,468

PULSATING FLUID SPRAY APPARATUS

Donald P. Freier, Sheboygan; Jay K. Wissmueller, Grafton, and John Rudelick, Milwaukee, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jul. 31, 1991, Ser. No. 738,418
Int. Cl.[5] B05B *1/16, 1/18, 3/08*
U.S. Cl. 239—383 **17 Claims**



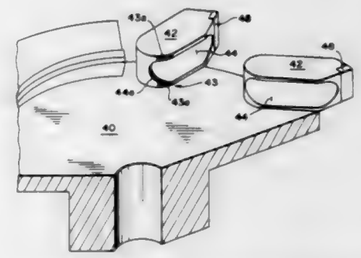
1. In a fluid spray apparatus that includes a housing having a fluid inlet and a fluid discharge outlet, means in said housing defining a flow path from the inlet to the outlet, and a pulsating means in said flow path for cyclically interrupting the fluid flow from the inlet to the outlet and causing a pulsating spray to be discharged from the apparatus; an improvement wherein said pulsating means comprises:
a means that forms a circular chamber in which a forced vortex is created by fluid flow from the inlet to the outlet, a wall of said chamber having a plurality of circumferentially spaced apertures therethrough which form the outlet, and an interior surface of the wall having a rough textured surface; and
a turbine disposed within said chamber for rotational movement in response to the forced vortex, said turbine having a base plate which serves as a valve to alternately cover and expose the apertures as said turbine moves within said chamber, a surface of the base plate which contacts the interior surface of the wall also having a rough textured surface;
the textures of said surfaces cooperating to reduce friction between said turbine and the wall of said chamber.

5,201,469

COMMINUTING MILL

Joe R. Urschel, Valparaiso, Ind., assignor to Urschel Laboratories, Inc., Valparaiso, Ind.

Continuation-in-part of Ser. No. 580,552, Sep. 11, 1990, abandoned. This application Mar. 27, 1991, Ser. No. 675,965
Int. Cl.[5] B02C *13/18*
U.S. Cl. 241—5 **18 Claims**



1. An impeller for use in a comminuting mill in which a product is comminuted by moving radially outwardly over a rotating impeller, comprising:

a) a generally circular impeller body rotatable about a rota-

drawn by the motor for rotation of said rod mill will result in a consistent solids concentration

conveying a measured quantity of said material after loosening, comprising:

for delivering ground beans to said collection receptacle means, such that said beans made a single pass through a grind-

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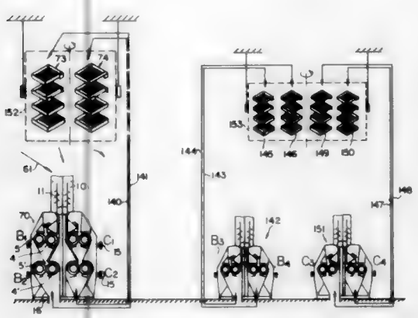
a) a generally circular impeller body rotatable about a rotational axis; and,
b) a plurality of impeller blades attached to the impeller body, each of the impeller blades having a product directing surface extending parallel to and concavely curved about an axis extending in a generally chordal direction across the impeller body.

5,201,470

METHOD FOR THE PRODUCTION OF MILLED GRAIN PRODUCTS AND ROLLER MILL

Werner Baltensperger, Oberuzwil, and Robert Linzberger, Abtwil, both of Switzerland, assignors to Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 350,702, Mar. 22, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 794,296
Claims priority, application Switzerland, Oct. 6, 1987, 03893/87; PCT Int'l Appl., Oct. 6, 1988, PCT/CH88/00182
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] **B02C** *9/04*
U.S. Cl. 241—13 **4 Claims**



1. A method for production of milled grain products, by means of repeated roll-grinding and sifting of specific product fractions, corresponding to a system of advanced milling, comprising the steps of:
guiding the material to be milled through a combination of double-grinding passes, each having no more than two grinding passes, and single-grinding passes without intermediate sifting in each double-grinding pass;
controlling and monitoring every grinding pass individually; and sifting the material to be milled between double grinding passes and single grinding passes.

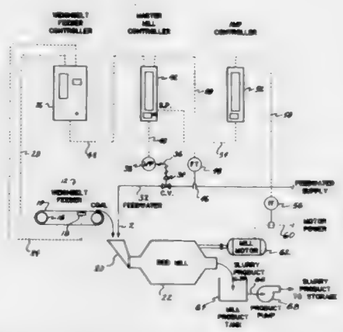
5,201,471

METHOD FOR OPERATING A ROD MILL TO OBTAIN UNIFORM PRODUCT SLURRY

Neal W. Janway, Baton Rouge, and William P. White, Greenwell Springs, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1992, Ser. No. 891,552
Int. Cl.[5] **B02C** *25/00*
U.S. Cl. 241—21 **11 Claims**

1. A method for operating a rod mill for the production of a uniform product slurry, said method comprising the steps of
a) weighing a solid friable material on a continual basis as a first feed stream to the inlet chute of said rod mill.
b) measuring a liquid material as a second feed stream to said chute.
c) feeding to said chute a predetermined ratio of said first feed stream and said second fed stream, said second feed stream forming the continuous phase of said slurry, and
d) controlling said second feed stream in relation to said first feed stream so that the predetermined amount of current drawn by the motor for rotation of said rod mill will result in a consistent solids concentration,



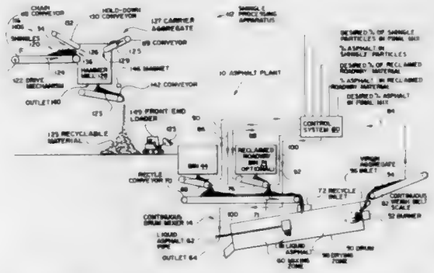
thereby forming a uniform slurry product of predetermined viscosity based on the ratio of said friable solid material to said liquid material fed and said current drawn by said motor.

5,201,472

METHOD FOR PREPARING AND STORING A RECYCLABLE SHINGLE MATERIAL

J. Don Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Continuation of Ser. No. 737,056, Jul. 29, 1991, abandoned, which is a division of Ser. No. 606,892, Oct. 1, 1990, abandoned. This application Jun. 23, 1992, Ser. No. 902,759
Int. Cl.[5] **B02C** *19/00*
U.S. Cl. 241—22 **10 Claims**



10. A method for preparing and storing a recyclable asphaltic shingle material, comprising the steps of:
comminuting roofing shingles to particles which can be accurately flowed and metered;
screening said shingle particles into a mixer;
mixing said shingle particles with a carrier aggregate in said mixer at a temperature below the melting point of asphalt to form a mixture in which said shingle particle resist adhering to one another; and
maintaining said mixture at a temperature below the melting point of asphalt in a flowable state for a period of storage.

5,201,473

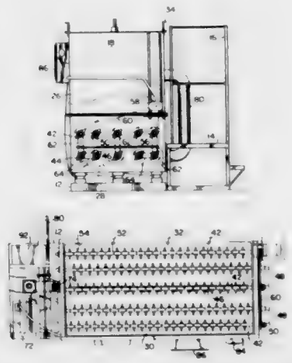
DRY MATERIAL FEEDER AND MEASURING DEVICE

John E. Pollock, Wellsville, Kans., assignor to Central Fiber Corporation, Wellsville, Kans.

Filed Mar. 22, 1991, Ser. No. 673,750
Int. Cl.[5] **B02C** *17/16*
U.S. Cl. 241—36 **21 Claims**

1. A device for loosening a mass of particulate material and

conveying a measured quantity of said material after loosening, comprising:
a housing defining an accessible bin therein, and said housing including an exit flange allowing further access to said bin;
a plurality of agitators rotatably mounted to said housing within said bin for causing said loosening of said mass of particulate material;



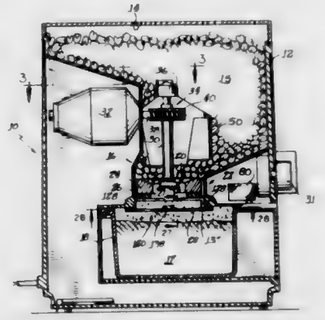
at least one auger rotatably mounted to said housing and extending at least into proximity of said exit flange whereby rotation of said auger will cause the material to be conveyed into said exit flange;
means for causing rotation of said agitators and auger; and
fluid stream conveyance means operatively connected to said exit flange whereby the material conveyed by said auger to said exit flange is entrained in a fluid stream for conveyance from said exit flange.

5,201,474

COFFEE GRINDER

William E. Midden, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Aug. 3, 1990, Ser. No. 562,757
Int. Cl.[5] **B02C** *19/00*
U.S. Cl. 241—100 **18 Claims**



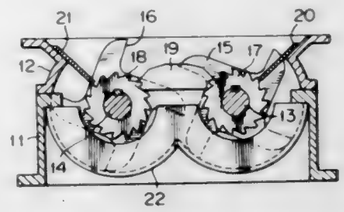
1. A coffee grinder comprising: bin means for holding a supply of coffee beans to be ground; grinding means for receiving said beans from said bin means and grinding the beans to a desired grind size, and collection receptacle means for receiving the ground coffee from said grinding means; wherein said grinding means comprises blade means and burr means, said blade means being configured and located for cutting the beans to a predetermined size and for feeding the cut beans in an auger-like fashion to said burr means; said burr means including means for grinding the cut beans to a desired grind size and for delivering ground beans to said collection receptacle means, such that said beans made a single pass through a grinding path comprising said blade means and said burr means; wherein said burr means comprise a rotatable burr and a stationary burr spaced apart therefrom to define a gap therebetween; wherein said rotatable burr and said stationary burr are substantially annular in form whereby the coffee is ground and discharged to said collection receptacle substantially about 360°; wherein said rotatable and stationary burrs have facing, substantially annular coffee-grinding faces defining radii, and wherein said faces contain a plurality of elongate teeth extending at least partially across said annular faces at an angle to the radii thereof, the teeth of said stationary burr extending at an angle opposite the teeth of said rotatable burr when said annular faces are in face-to-face relation for achieving a scissors-like action therebetween, and further including dechaffing means located adjacent said burr means for substantially retaining chaff with the ground beans and for substantially preventing chaff from accumulating in other portions of said coffee grinder.

5,201,475

DOUBLE SHAFT BREAKER

Shoji Nakagomi, 518-1, Shirakuwa, Urawa-shi, Saitama, Japan

Filed Jun. 11, 1992, Ser. No. 896,957
Claims priority, application Japan, Jul. 17, 1991, 3-202564
Int. Cl.[5] **B02C** *18/44*
U.S. Cl. 241—236 **5 Claims**



1. A double shaft breaker according to the present invention, comprising two driving shafts supported rotatably in parallel with each other in apparatus frames, a plurality of shredding large cutters fixed to each of said driving shafts with a prescribed interval between the shredding large cutters, a pair of breaking small cutters fixed between the shredding large cutters with a prescribed interval between the shredding small cutters, stationary blades located between the pair of the breaking small cutters, a pair of guide plates located between said shredding large cutters and the apparatus frame, drop preventive covers located along the rotational radius of said pair of shredding large cutters, and a driving apparatus for rotating the driving shafts in such directions that objects to be broken may be broken by the edges of said breaking small cutters and the edges of the stationary blades.

5,201,476

WELDED VIDEO CASSETTE

Paul J. Gelardi, P.O. Box 127, Cape Porpoise, Me. 04014; John A. Gelardi, and David A. Capotosto, both of Cape Porpoise, Me., assignors to Paul J. Gelardi, Kennebunkport, Me.

Continuation-in-part of Ser. No. 522,361, May 11, 1990, Pat. No. 5,092,536, and Ser. No. 639,516, Jan. 10, 1991, Pat. No. 5,114,092. This application Sep. 24, 1991, Ser. No. 764,526
Int. Cl.[5] **G11B** *23/087*
U.S. Cl. 242—199 **46 Claims**

1. An integrally molded, welded video cassette apparatus comprising a unitary shell having a base, a rear wall connected to the base, a cover livingly hinged to the rear wall, a front wall extending perpendicularly from the base towards the cover, first and second opposite side walls extending between

respective ends of the front wall and rear wall, a dust door

capable of ground travel in any direction with said tail projecting below the airplane while in flight to provide means for

upwards therefrom with the opposite end of said vertical restraint being fixedly attached to a landing gear strut attachment

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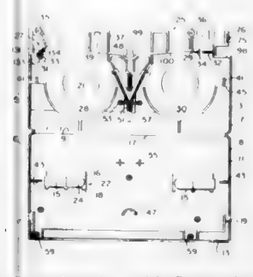
respective ends of the front wall and rear wall, a dust door livingly hinged to downward extensions of the cover opposite the connection with the rear wall for pivoting over the front wall, reel wells provided on the base for holding reels, a reel lock molded to the shell for engaging the reels within the reel wells, downwardly extending reel springs molded into the cover opposing the reel wells, first and second interior guide means interposed between the reel wells and the exterior of the shell proximal the front wall, first and second exterior guide



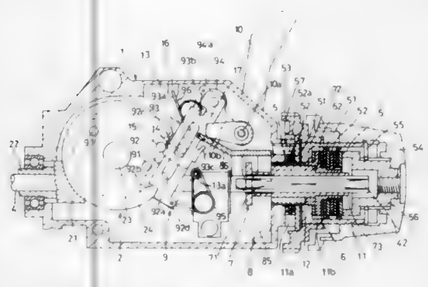
means for use in conjunction with first and second interior guide means respectively, first and second tape gaps provided between first interior and exterior guide means and second interior and exterior guide means for communicating tape from and to the reel wells, interior and exterior guide means extending perpendicularly from the base towards the cover, alignment means extending between the base and the cover for facilitating alignment and closing of the shell, and welding energy directors provided between at least one of the structures extending between the base and the cover.

5,201,477

SPINNING REEL WITH DRAG BRAKE MECHANISM AND CLUTCH

Yuzo Kawabe, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Apr. 10, 1990, Ser. No. 506,783
Claims priority, application Japan, Apr. 11, 1989, 1-42270[U]; Nov. 2, 1989, 1-122872[U]
Int. Cl.[5] A01K *89/027*
U.S. Cl. 242—245 **9 Claims**



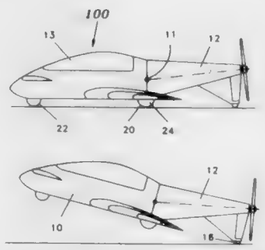
1. A spinning reel comprising:
a reel body (**1**),
a rotatable and axially movable spool (**41**) and a spool shaft (**4**), the spool (**41**) being connected to the spool shaft (**4**) such that said spool (**41**) and said spool shaft (**4**) rotate in unison and move axially in unison,
a drag brake mechanism (**5**) for applying a braking force to resist rotation of said spool shaft (**4**), said drag brake mechanism (**5**) being provided at a rear position of said reel body (**1**), said braking force being adjustable through an adjusting element (**54**), wherein said adjusting element (**54**) is located at a rear position of said reel body (**1**) such that said braking force is adjustable by a user from outside of said reel body (**1**),
a retainer sleeve (**6**) rotatably but axially immovably supported by said reel body (**1**) for holding said drag brake mechanism (**5**),
a clutch sleeve (**7**) unrotatably and axially movably supported on said spool shaft (**4**), said clutch sleeve including a forward engaging portion (**71**), said clutch sleeve further including a rear engaging portion (**72**) for engaging said retainer sleeve (**6**), said forward engaging portion being located in front of said rear engaging portion (**72**),
a control member (**8**) located inside of said reel body (**1**) and including first and second contact portions (**81**, **81**) for engaging said forward engaging portion (**71**) of said clutch sleeve and for reciprocating said clutch sleeve (**7**) along said axis, and
a clutch lever (**10**) provided on said reel body (**1**) and separately from said control member (**8**) for operating said control member (**8**) to move said clutch sleeve (**7**) into and out of engagement with said retainer sleeve (**6**), said clutch lever being pivotable with respect to said reel body, said clutch lever having first and second ends, said clutch lever being arranged such that pivotably moving said first end of said clutch lever in a first direction causes said second end (**10***b*) of said clutch lever to press against said control member (**8**) and cause said rear engaging portion (**72**) of said clutch sleeve (**7**) to move out of engagement with said retainer sleeve (**6**), and such that said control member moves said rear engaging portion (**72**) into engagement with said retainer sleeve (**6**) when said first end of said clutch lever is pivotably mounted in a second direction, said second direction being opposite to said first direction,
said drag brake mechanism including drag brakes (**5**), said drag brakes being disposed rearwardly of said control member (**8**) and adjacent to said adjusting element (**54**), such that said braking force is adjusted by operating said adjusting element.

5,201,478

AIRPLANE EFFICIENCY, SAFETY AND UTILIZATION

Don H. Wooley, 252 Las Miradas Dr., Los Gatos, Calif. 95030

Continuation-in-part of Ser. No. 505,413, Apr. 6, 1990, abandoned. This application Jun. 26, 1991, Ser. No. 725,217
Int. Cl.[5] B64C *37/00, 1/30*
U.S. Cl. 244—2 **20 Claims**



1. An airplane with a two section body with an aft body connected to a front body by means that allow the two bodies to displace in pitch angular rotation relative to one another through an arc that provides for aft body ground clearance at all times and provides for aft body alignment with the air flow during flight with means that provide angular displacement control, passive holding of angular displacement, passive release of angular displacement control of the aft body and passive built-in restraint of unwanted angular movement of the aft body for all operational conditions and with a tail located at the aft end of said aft body that projects downward with a ground support means located at the bottom of said tail that is

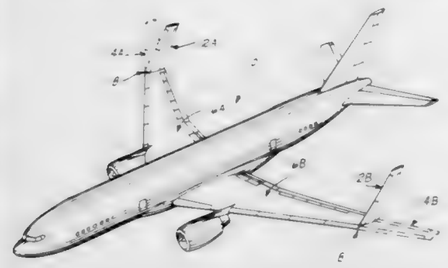
capable of ground travel in any direction with said tail projecting below the airplane while in flight to provide means for positive yaw/roll coupling forces for coordinated turning and banking without aileron control assistance.

5,201,479

SELF-MONITORING LATCH PIN LOCK FOR FOLDING WING AIRCRAFT

Michael E. Renzelmann, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 30, 1992, Ser. No. 828,308
Int. Cl.[5] B64C *3/56*
U.S. Cl. 244—49 **9 Claims**



1. For use on an aircraft having folding wing tips, where an end portion of each aircraft wing is hingedly connected to an inboard portion of said wing, in a manner so that said end portion is swingable between an extended position, where it and said inboard portion together form a contiguous airfoil for aircraft flight, and a folded position, for reducing the total wing span of said aircraft when it is on the ground, a wing tip latch pin and locking unit, comprising:
a in housing that is mountable to one of said wing portions, and a latch pin that is generally cylindrical in shape and reciprocatably movable between an extended and retracted condition relative to said pin housing, said latch pin having an outer end portion that projects forwardly of said pin housing, at least when said latch pin is in said extended condition, and an inner end portion that is slidably received within said pin housing and travels back and forth therein in correspondence with extension and retraction of said latch pin, and a locking body that extends through a portion of said pin housing, said locking body having a pin-blocking portion that is rotatable about an axis between locked and unlocked positions, said locking body being positioned immediately inwardly of the outwardmost position of said latch pin inner end portion when said latch pin is in said extended condition, at least a portion of said pin-blocking portion being fully disposed across the path of travel of said latch pin inner end portion when said pin-blocking portion is rotated into said locked position.

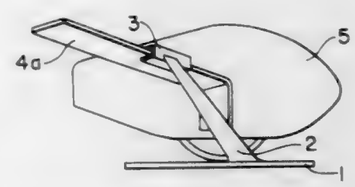
5,201,480

SAFE START

Frank S. Nenstiel, P.O. Box 91222, Long Beach, Calif. 90809-1222

Filed Aug. 27, 1991, Ser. No. 750,242
Int. Cl.[5] B64F *1/16*
U.S. Cl. 244—110 R **5 Claims**

1. A restraining device for an aircraft having a plurality of wheels with tires thereon, covered by wheel coverings and supported by aircraft landing gear struts which comprises: a base plate means including side and end portions comprising a generally flat platform for one of said tires to roll onto and rest upon, and having a rigid vertical restraint means fixedly attached to one side portion of said base plate, constrained from any movement in a direction parallel to the direction of rolling movement of said tire on said flat platform and extending upwards therefrom with the opposite end of said vertical restraint being fixedly attached to a landing gear strut attachment fitting, said fitting being shaped to directly engage said aircraft



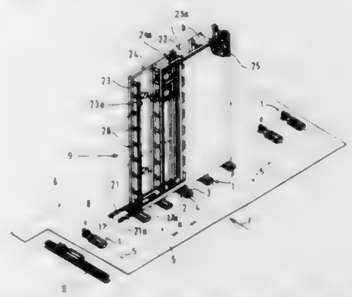
landing gear strut at a point along its forward facing surface, which prevents movement of said tire over said base plate means and does not engage the wheel or the wheel covering.

5,201,481

DEVICE FOR INTERCEPTING AND RETAINING OF CARGO PIECES IN A CARGO HOLD

Mohammad Hararat-Tehrani, Bremen, Fed. Rep. of Germany, assignor to Deutsche Aerospace Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 5, 1991, Ser. No. 802,499
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1990, 4038709
Int. Cl.[5] B64C *1/20*
U.S. Cl. 244—118.1 **6 Claims**



1. A device for intercepting and retaining cargo pieces in a cargo space having a floor and a plurality of support rails arranged in parallel to one another and lengthwise on said floor, said device comprising a retaining wall for separating cargo space into two compartments, said retaining wall comprising first and second wall sections and first energy absorbing means interconnecting said first and second wall sections with each other, and a further plurality of mounting means for securing said retaining wall to said rails of said floor, each of said mounting means comprising two second energy absorbing means, a wall holding claw and a mounting block connected to a respective support rail of said support rails of said floor, said two second energy absorbing means being arranged in parallel to each other, a first journal pin for securing said two second energy absorbing means to said support rail through said mounting block, each of said two second energy absorbing means comprising an energy absorbing section and a damper rod movable with one end in said energy absorbing section, a second journal pin connecting said claw in a tiltable manner to free ends of said damper rods, whereby said claw supports said retaining wall in a tiltable manner, wherein one of said wall sections facing in a forward direction comprises a forward lower frame member (**21**) received in said claw (**8**) in a form-locking manner, and wherein the other of said wall sections facing rearwardly in said aircraft comprises a lower frame

member (**21***a*) resting on a surface of said two second energy

5,201,485

APPARATUS AND METHOD FOR REDUCING

oriented transverse to a longitudinal direction of the rail, said

said connecting means comprising means for hingeably connecting said ski restraining means to said backplate

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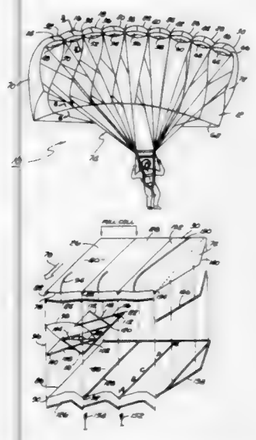
member (21*a*) resting on a surface of said two second energy absorbing means.

5,201,482

RAM AIR INFLATABLE GLIDING WING

Stanley M. Ream, 20525 Emelita St., Lake Mathews, Calif. 92570

Filed Oct. 30, 1991, Ser. No. 785,577
Int. Cl.[5] B64D *17/02*
U.S. Cl. 244—145 **23 Claims**



1. A ram-air inflated gliding wing (**10**) having a leading edge (**66**) and a closed trailing edge (**68**) comprising:

A. a plurality of interconnected cells (**14–30**), each of said cells including

(1) first means (**78**) defining an upper surface (**80**) having side edges (**82–84**);

(2) second means (**86**) defining a lower surface (**88**) having side edges (**90–92**);

(3) third means (**32–46**) for securing said first and second means side edges directly together over the length thereof;

(4) an air intake (**96**) at said leading edge; and

(5) reinforcing tape (**114–116**) having first and second ends, said tape being disposed span-wise between and secured at said first and second ends to opposed ones of said side edges of said upper and lower surfaces at a pre-selected chord-wise position between said leading and trailing edges.

5,201,483

PROCESS AND SYSTEM FOR MEASURING AXLE AND BEARING TEMPERATURES

Ivan Sutnar, Leoben, and Wolfgang Nayer, Zweltweg, both of Austria, assignors to Voest-Alpine Eisenbahnsysteme Gesellschaft m.b.H., Vienna, Austria

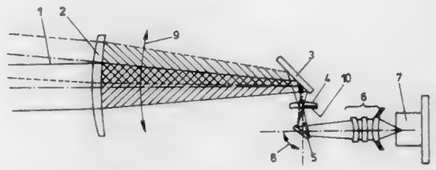
Filed May 20, 1991, Ser. No. 703,260
Claims priority, application Austria, May 18, 1990, 1114/90
Int. Cl.[5] B61L *3/06*
U.S. Cl. 246—169 A **16 Claims**

9. A system for measuring axial and bearing temperatures to locate hot wheels in a vehicle adapted for traveling on a rail by using an infrared receiver with an oscillating scanning beam oriented transverse to a longitudinal direction of the rail, said system comprising:

means for measuring a wheel element temperature with said infrared receiver to obtain at least two sets of measured values, each value in said at least two sets of measured values representing the temperature of a sub-area of said wheel element;

means for digitizing aid at least two sets of measured values to obtain at least two sets of digitized values;

generating means for generating a set of average measured values wherein each of said average measured values is equal to the mean of corresponding values in said at least two sets of digitized values;



repeating means for operating said generating means over at least one of: a predetermined maximum number of oscillations of said scanning beam; and the duration of a wheel element signal indicative of a given wheel element being within range of said scanning beam; and

output means for providing the largest average value of the set of average values as a hot spot indicator;

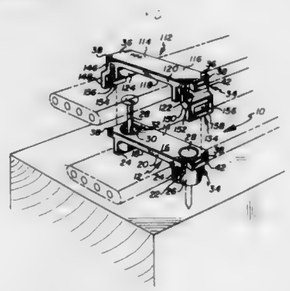
wherein said measuring means operates in synchronization with an oscillation frequency of said scanning beam.

5,201,484

STACKING CABLE CLAMP

Bud Thoen, 1201 Fireman's Lodge Rd., Alexandria, Minn. 56308

Filed Sep. 12, 1991, Ser. No. 757,976
Int. Cl.[5] F16L *3/22*
U.S. Cl. 248—68.1 **20 Claims**



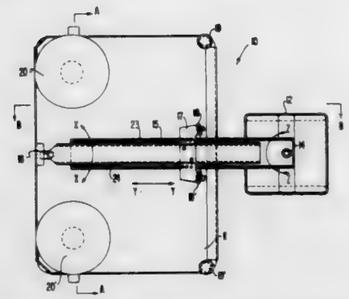
1. Clamp for clamping cables comprising, in combination: a substantially rigid, one-piece staple comprising, in combination: a top having first and second ends and a bottom surface; first and second legs integrally extending from the bottom surface of the top and spaced from the ends of the top and having free ends; and first and second latching hooks integrally extending from the bottom surface of the top separate from and spaced outwardly from the first and second legs and adjacent to the ends of the top, with the latching hooks extending beyond the free ends of the legs.

5,201,485

APPARATUS AND METHOD FOR REDUCING REPETITIVE OR MAINTAINED STRESS INJURIES

Thomas J. Moss, Cocoa; Marilyn Moss, and James R. Moss, both of Satellite Beach, all of Fla., assignors to Product Innovation, Inc., Satellite Beach, Fla.

Division of Ser. No. 550,442, Jul. 10, 1990, Pat. No. 5,058,840.
This application Aug. 2, 1991, Ser. No. 739,456
Int. Cl.[5] B43L *15/00*
U.S. Cl. 248—118 **1 Claim**



1. A method for preventing fatigue and stress injuries to an arm of an operator, comprising the steps of

supporting at least one of the operator's forearms in at least one cradle;

pivoting the at least one cradle in at least one multi-part slide assembly mounted at an underside of a thin profile, planar platen assembly such that a pivot axis of the at least one cradle is substantially perpendicular to the planar platen assembly;

pivoting the at least one slide assembly relative to the platen assembly about a pivot axis substantially parallel to the first-mentioned pivot axis; and

allowing relative linear movement between parts of the at least one slide assembly wherein one part of the at least one slide assembly allows the pivoting relative to the platen assembly and another part of the at least one slide assembly pivotably receives the at least one cradle.

5,201,486

PORTABLE SKI PROP

Jimmy E. Holbrook, 2513 W. Marsha Brook Cir., Bennion, Utah 84118

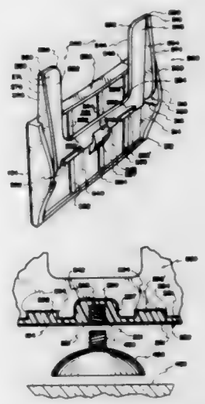
Filed Apr. 17, 1992, Ser. No. 870,361
Int. Cl.[5] A47G *1/17*
U.S. Cl. 248—206.5 **9 Claims**

1. A lightweight portable prop for at least one pair of skis comprising:

a rigid backplate comprising means for releasibly attaching at a rear side of said backplate to a ski supportable, substantially vertical surface;

means for restraining the skis in a nested, propped attitude against lateral movement relative to the vertical surface, said restraining means being thin relative to the height of said backplate and comprising means for integrally connecting to said backplate;

said connecting means comprising means for hingeably connecting said ski restraining means to said backplate



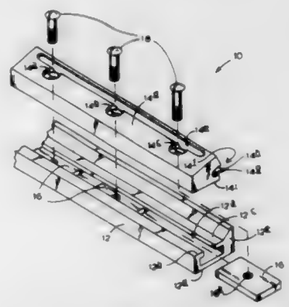
whereby said lightweight portable prop is folded into a substantially planar orientation for transport and storage.

5,201,487

VEHICULAR ROOFTOP RAIL MOUNT-TO-GUTTER MOUNT ADAPTOR SYSTEM

Richard E. Epplett, 88500 Greenhill Rd., Eugene, Oreg. 97402

Filed Apr. 17, 1992, Ser. No. 870,273
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—298 **11 Claims**



1. For use with a vehicular rooftop rail system including plural laterally spaced channel members and with a vehicular rooftop accessory including means for gripping a vehicular rooftop gutter, such gutter-gripping means including a downwardly depending standoff member, an adaptor device comprising:

a bracket member including a generally planar bottom surface configured for mating an upper surface of one of such channel members, said bracket member further including an edge region having a recess therein for receiving such standoff member, said edge region being securely engageable by such gripping means with such standoff member extending downwardly into said recess;

a slide member slidably receivable within such one channel member; and

means for securing together said bracket member and said slide member such that said bracket member and said slide member securely capturably slidably are engageable with such one channel member to provide for the secure grip-

ping engagement of said edge region by such gripping

drive assembly for transmitting rotative torque from the engine

shoulder to define a groove, passage means being formed

5,201,492

METAL DIAPHRAGM FOR DIAPHRAGM-TYPE VALVE

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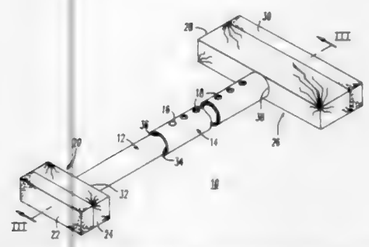
ping engagement of said edge region by such gripping means.

5,201,488
TELESCOPING TUBULAR BODY
David L. Hadbavny, P.O. Box 283, Westmoreland City, Pa. 15692
Filed Dec. 23, 1988, Ser. No. 289,256
Int. Cl.[5] E04H 17/00
U.S. Cl. 248—354.5 1 Claim

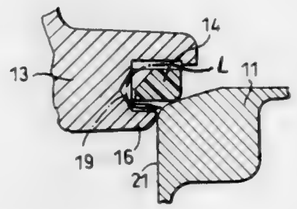


1. A telescoping tubular body having adjustable lengths for use as a means of holding vehicle pedals, doors, hood lids, trunk lids, other masses spaced apart and the like, comprising:
a male section having a first end and a second end;
a female section suitable for receiving said male section axially having a first end and a second end, wherein said female section has a plurality of diametrically parallel spaced openings for engagement of a pin secured to a spring means, said pin capable of passing through said openings to enable said telescoping tubular body to extend or retract to variable lengths;
said plurality of diametrically parallel spaced openings consist of a first row and 180 degrees therefrom a second row located ajar to said first row making said telescoping tubular body more capable of length adjustment;
said spring means being located inside said male section for securing said male section and said female section at variable lengths, wherein said spring means is a leaf spring located on an inside diameter of said male section, said pin vertically secured to said leaf spring for passage through said plurality of diametrically parallel spaced openings, such that by depressing said pin and sliding said male section through said female section, said telescoping tubular body is capable of said variable lengths and is structurally capable of transmitting an axial force through a male foot means and a female foot means to outside opposing masses;
said female foot means being located at said second end of said female section for bracing said telescoping tubular body at said second end of said female section;
said male foot means being located at said first end of said male section, longitudinally opposed to said female foot means for bracing said telescoping tubular body at said first end of said male section.

5,201,489
SURFACE BEARING AND METHOD FOR ITS PRODUCTION
Franz J. Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to Woco Franz-Josef Wolf & Co., Soden-Salmünster, Fed. Rep. of Germany
Continuation of Ser. No. 462,399, Jan. 8, 1990, abandoned. This application Jul. 13, 1992, Ser. No. 911,372
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1989, 3901898
Int. Cl.[5] F16F 9/10
U.S. Cl. 248—638 1 Claim

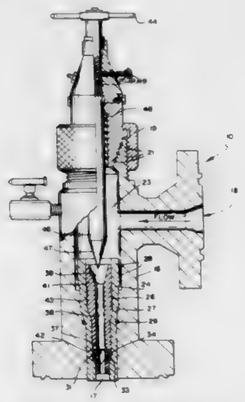
1. In an automotive vehicle having an engine and wheels rotatably mounted to a chassis containing the engine and a drive assembly for transmitting rotative torque from the engine to the wheels, and a surface bearing disposed between the automotive drive assembly and the engine for cushioning and acoustically decoupling same, the improvement comprising said surface bearing including a plate made of resilient elastomer material interspersed with a plurality of hollow channels and cavities intersected by said channels, all of said hollow channels and cavities in said plate lying in a single plane extending at least essentially parallel to a principal load bearing surface of the plate or complementary in shape to the principal surface, each said cavity intersected by only one of said hollow channels, wherein none of the hollow channels intersect each other and said hollow channels are open at least at one end thereof and have a cross-section which is at least about ¼ of the size of the largest cross-sectional area of the nearest cavity intersected by said associated hollow channel.

5,201,490
VALVE WITH A FLOATING STOP SEAL FOR HIGH FLOW RATES
Bruno Maraud, La Bruffiere; Joel Guicheteau, Rue du Viaduc, and Jean Bonnefous, La Bruffiere, all of France, assignors to Defontaine S.A., Saint Herblain, France
Filed Mar. 6, 1992, Ser. No. 846,720
Claims priority, application France, Mar. 11, 1991, 91 02907
Int. Cl.[5] F16K 1/34
U.S. Cl. 251—120 10 Claims



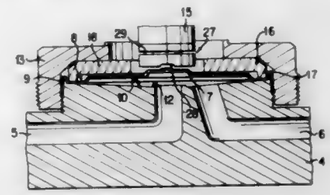
1. A valve, comprising:
a housing;
an outlet pipe communicating with said housing, said outlet pipe having an internal surface;
a valve seat associated with said outlet pipe;
valve means slidably disposed in said housing for linear movement between a sealing position wherein said valve means seats on said valve seat so as to seal said outlet pipe, and an open position wherein liquid flows through said valve into said outlet pipe, said valve means comprising a valve member having in spaced apart relationship an upper shoulder and a lower shoulder connected by an inner peripheral surface, said lower shoulder having an outer peripheral surface in close proximity with said internal surface of said outlet pipe, said inner peripheral surface of said valve member cooperating with a lower surface of said upper shoulder and an upper surface of said lower shoulder to define a groove, passage means being formed on said inner peripheral surface of said valve member; and a seal, floatingly disposed in said groove, so that, when said valve member is in said sealing position, said seal is held between said lower surface of said upper shoulder and said valve seat so as to seal said outlet pipe, and so that, when said valve member is moved toward said open position, flow of liquid around said seal is limited until said outer peripheral surface of said lower shoulder is completely removed from said internal surface of said outlet pipe.

5,201,491
ADJUSTABLE WELL CHOKE MECHANISM
Kenneth J. Domangue, Houma, La., assignor to Texaco Inc., White Plains, N.Y.
Filed Feb. 21, 1992, Ser. No. 838,986
Int. Cl.[5] F16K 1/38
U.S. Cl. 251—122 5 Claims



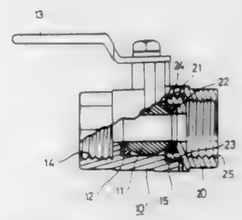
1. Adjustable choke for regulating fluid flow from the well conductor producing a pressurized fluid mixture comprising crude oil, gas and water, together with particulated solids, which choke includes
an elongated body (16) having a fluid discharge port (17) downstream end spaced longitudinally from an inlet port (18)
means forming a longitudinal cavity through said elongated body communicating said inlet port (18) with said discharge port (17) and
a sleeve (24) removably positioned in said longitudinal cavity
a fluid flow limiting bean (31) removably positioned at the downstream end of said sleeve (24), having uniform diameter axial flow passage (34) which opens into said discharge port (17)
a flow adjusting valve means (in said) cooperative with said sleeve, having a seat segment (39) which (opens into) communicates with said uniform diameter axial flow passage (34)
said flow adjusting valve means including a valve stem (46) operably positioned in said body (16) to define with said seat segment (39), an adjustable, tapered wall flow channel through said seat segment (39).

5,201,492
METAL DIAPHRAGM FOR DIAPHRAGM-TYPE VALVE
Jacques Beauvir, Chez-Le-Bart, Switzerland, assignor to Transfluid SA, Saint Aubin, Switzerland
Filed Jun. 8, 1992, Ser. No. 895,117
Claims priority, application France, Jun. 7, 1991, 91 07192
Int. Cl.[5] F16K 7/16
U.S. Cl. 251—331 11 Claims



1. A metal diaphragm having a top side and a bottom side for use with a diaphragm-type valve having a base extending in a plane, said diaphragm being in the form of a disk having an outer collar located on an outer periphery of said disk designed to abut the base in sealing fashion and connected to a central part of the diaphragm, on which an actuating device is designed to act, by a plurality of annular surfaces stepped away from the plane in which the diaphragm abuts the base, said annular surfaces being successively inclined from said outer collar to said central part of said diaphragm, one of said annular surfaces being parallel to said plane when no force is exerted on said diaphragm.

5,201,493
ELECTRICALLY INSULATED BALL VALVE DEVICE
Young M. Kim, Yoowon Apt. 4-802, Bub-Dong, Daeduk-ku, Daejeon City, Rep. of Korea
Filed Jun. 4, 1992, Ser. No. 894,138
Claims priority, application Rep. of Korea, Mar. 12, 1992, 92-4012; May 15, 1992, 92-8333
Int. Cl.[5] F16K 5/06
U.S. Cl. 251—315 10 Claims



1. A ball valve device comprising:
a ball having a penetration;
a valve body, rotatably accommodating said ball therein, including a first threaded portion formed at its one end for coupling a first pipe, a second threaded portion formed at the other end and a first ball seat for supporting one side of said ball;
a valve cap including a third threaded portion at its one end for engaging with said second threaded portion, a fourth threaded portion formed at the other end for coupling a second pipe and a second ball seat for supporting the other side of said ball; and
an insulating layer, formed on and conforming to at least one of said first, second, third and fourth threaded portions, for electrically insulating the first and second pipes from each other.

5,201,494
TAPE MEASURE WITH ANNULAR FISH TAPE COMPARTMENT

pivot means pivotally connecting one of said cheek plates of such that the panels are connected together with each provid-

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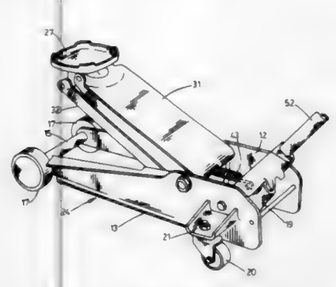
5,201,494

HYDRAULIC JACK AND PUMP USABLE THEREWITH

Philip L. Lundman, 3631 Fredonia-Kohler Dr., Fredonia, Wis. 53021

Continuation of Ser. No. 765,952, Sep. 26, 1991, abandoned. This application Sep. 24, 1992, Ser. No. 951,942
Int. Cl.[5] B60P 1/48
U.S. Cl. 254—8 B 5 Claims



1. A hydraulic jack comprising linkage means movable from a first position to a second position for engaging and elevating a load, a hydraulic ram coupled to said linkage means for moving the same toward its second position upon the application of fluid pressure, said hydraulic ram including a cylinder and a piston reciprocal relative to said cylinder, said hydraulic jack further including pump means coupled to said hydraulic ram for applying fluid pressure thereto, said pump means including a tubular body having an inner surface, said pump means further including piston means operable for delivering a first quantity of hydraulic fluid to said ram through a first path at a first pressure and a second quantity of hydraulic fluid to said ram through a second path at a second pressure, said first quantity being substantially larger than said second quantity and said first pressure being substantially lower than said second pressure, said piston means including a cylindrical movable piston reciprocal in said tubular body and having a central cylindrical axially extending bore defining an inner cylindrical surface, having an open end defining a first work surface, and having a closed end including an inner surface adjacent said bore defining a second work surface, said piston means including a fixed piston disposed axially within said bore and having an outer surface, said movable piston being movable relative to said tubular body and over said fixed piston, a first cavity being defined by said inner surface of said tubular body, by said outer surface of said fixed piston, and by said first work surface, and a second cavity being defined by said inner cylindrical surface of said movable piston, by said second work surface and by the outer surface of said fixed piston, said first cavity being in fluid communication with said first path and said second cavity being in fluid communication with said second path, and said pump means including pressure relief means coupled to said first path means for venting the same when the back pressure from said hydraulic ram exceeds a predetermined value whereby said linkage is advanced at a first, higher speed from its first position to engagement with said load and at a second, lower speed but with increased force after said load has been engaged for elevating the same.

5,201,495

FISH TAPE REEL AND REEL ASSEMBLY

Thomas B. Crates, and Donald N. Hesprich, both of Charlotte, N.C., assignors to Jameson Corporation, Charlotte, N.C.

Continuation of Ser. No. 703,798, May 21, 1991, Pat. No. 5,106,056. This application Apr. 17, 1992, Ser. No. 870,409
Int. Cl.[5] H02G 1/08
U.S. Cl. 254—134.3 FT 8 Claims

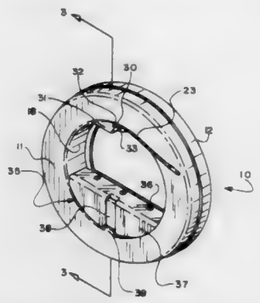
1. A fish tape reel, comprising:

(a) first and second hollow annular reel segments mated together to define a fish tape reel having an enclosed annular fish tape compartment for receiving a length of coiled fish tape;

(b) said reel defining first and second spaced-apart and opposing side walls, and inner and outer spaced-apart and opposing peripheral walls, said inner peripheral wall defining a through void in said reel;

(c) fish tape access means in the inner peripheral wall of the reel for extending and retracting therethrough a length of fish tape contained in the compartment;

(d) storage compartment means positioned in the void in said



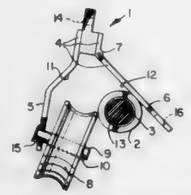
reel, said storage compartment comprising first compartment wall means substantially flush with one of said first or second side walls, second compartment wall means spaced-apart from said first compartment wall means to define a storage space therebetween, said second compartment wall means being substantially flush with the other of said first or second side walls, hinge means cooperating with said first and second compartment side walls to permit hinged movement of one of the compartment side walls relative to the other, and fastener means for securing the storage compartment in a closed position.

5,201,496

LINE RELEASING PULLEY SYSTEM

Jean-Marc Bradette, Embrun, and Jeffrey E. Toycen, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Solicitor General of Canada, Canada

Filed Jul. 5, 1991, Ser. No. 725,974
Claims priority, application Canada, Jul. 9, 1990, 2020774
Int. Cl.[5] B66D 3/04
U.S. Cl. 254—405 3 Claims



1. A line releasing pulley system comprising:

a pulley frame comprising a pair of cheek plates, each cheek plate having a pin receiving aperture disposed therein;

a pulley supporting pin cooperating with the pin receiving apertures of the cheek plates, the pin being rotatably mounted in one of the cheek plates and loosely fitted in the aperture, to allow tilting of the pin upon release of the other end of the pin from the other cheek plate, and wherein the tilting is sufficient to allow a line to be released from the pulley;

a pulley rotatably supported by said pulley supporting pin;

pivot means pivotally connecting one of said cheek plates of said frame for pivoting about an axis perpendicular to the rotational axis of the pulley;

retention means for releasably retaining the cheek plate in a closed position to confine a line between the cheek plates; and

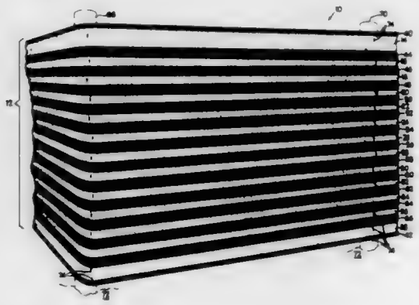
cheek plate separating means comprising a breaker member attached to the line and breaker contacting portions disposed on said cheek plates said breaker member and contacting portions cooperating to separate the cheek plates as the breaker member on the line passes over the pulley.

5,201,497

END FABRIC WOVEN FENCE

Mark B. Williams, Marietta; Richard W. Carriker, Woodstock; Edward Barkis, Marietta; Larry M. Bailey, Decatur, and Thomas G. Cabanis, Smyrna, all of Ga., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 558,800, Jul. 27, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 844,137
Int. Cl.[5] G01F 7/02
U.S. Cl. 256—12.5 20 Claims



1. A fence comprising:

a leno fabric woven from thermoplastic yarns; and

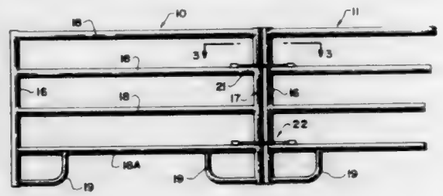
a plurality of stripes of a thermoplastic resin integrally adhered to said leno fabric, said stripes being separated by areas of said fabric without stripes, wherein said striped fabric is attached to a post secured to or in ground so that said stripes are substantially parallel to said ground.

5,201,498

FLEXIBLE FENCING SYSTEM

Edward A. Akins, Box 158, Winnipeg, Canada R2H 3B4

Filed Jan. 21, 1992, Ser. No. 822,692
Int. Cl.[5] E04H 17/18
U.S. Cl. 256—26 16 Claims



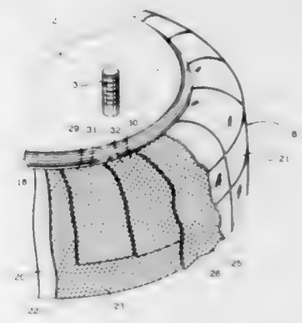
1. A fencing system for confining an animal comprising a plurality of fencing panels, each comprising an integral substantially rectangular rigid structure including a bottom, a top, a first end and a second end, means at the bottom for resting of the panel on the ground such that the top is supported at a height from the ground to confine the animal, means connecting one end of each panel to at least one next adjacent panel such that the panels are connected together with each providing support for the next to hold the panels vertical, said connecting means including a first elastic spring at an upper portion to the first end and a second elastic spring at a lower portion of the first end, each said first and second elastic springs having a first end attached to said one end and a second end attached to the adjacent panel, said elastic springs allowing flexible movement of said one end relative to said at least one next adjacent panel, wherein each of the first and second elastic springs comprises a block formed of an elastic material having one end face of the block attached to the first end and a second end face of the block attached to the next adjacent panel.

5,201,499

FABRIC REINFORCED STIFFENER FOR AIR SPRINGS

Robert F. Elliott, Westfield; Phyllis S. Woodrum, and Michael E. Leakey, both of Noblesville, all of Ind., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Aug. 28, 1991, Ser. No. 751,412
Int. Cl.[5] F16F 9/04; B60G 11/62
U.S. Cl. 267—64.27 16 Claims



1. An air spring of the type having an elastomeric bellows mounted on and extending between a pair of axially spaced end members, said bellows including:

an inner body ply of elastomeric coated cords biased at a first angle with respect to the longitudinal axis of the bellows;

an outer body ply of elastomeric coated cords biased at a second angle with respect to the longitudinal axis of the bellows;

clamp means for sealingly clamping the inner and outer body plies against one of the end members;

a first reinforcing strip of elastomeric coated cords bonded to the inner body ply with the cords of said first strip biased in a generally opposite direction to the angle of bias of the cords of said inner body ply, said first reinforcing strip extending from adjacent the clamp means of said one end member toward the opposite end member a distance less than one-fourth the axial distance between the two end members; and

a second reinforcing strip of elastomeric coated cords bonded between the first reinforcing strip and the outer body ply, with the cords of said second strip biased in a generally opposite direction to the angle of the cords of said outer body ply and in a generally opposite direction to the angle of bias of the cords of said first reinforcing strip and extending from adjacent the clamp means of said one end member for a distance generally equal to that of the first reinforcing strip.

5,201,500

e) first, second and third grasping and clamping elements

bars which are adjustable relative to each other in the

forming apparatus into said sheet storers, and discharging

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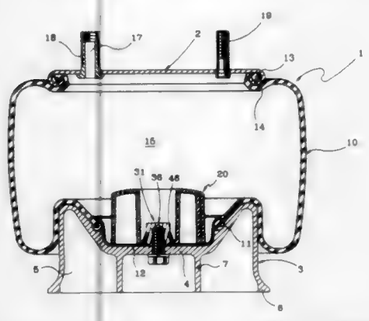
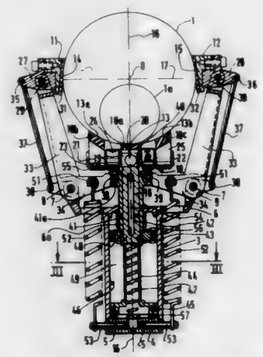
5,201,500
SNAP-ON BUMPER FOR AIR SPRING
Jack D. Ecktman, Indianapolis, and Michael M. Brown, Fishers, both of Ind., assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Feb. 26, 1991, Ser. No. 661,280
Int. Cl.[5] F16M *1/00, 3/00, 9/00, 11/00*
U.S. Cl. 267—140 **17 Claims**



1. An improved air spring of the type having a pair of spaced end members adapted to be mounted at spaced locations and a flexible sleeve formed of an elastomeric material sealingly engaged with the end members and forming a pressurized fluid chamber therebetween, said improvement including a post mounted on one of the end members and extending into the fluid chamber, said post having an enlarge end portion and an undercut formed beneath said end portion; and a shock absorbing bumper mounted on the post for possible impact engagement with the other of said end members, said bumper being formed of a one-piece plastic member having a base formed with a central opening defined by a plurality of circumferentially spaced flexible fingers, said finger being inclined inwardly and upwardly toward the enlarged and portion of the post and are snap-fitted over the enlarged end portion of the post and seated in the undercut thereof for mounting said bumper on the post.

5,201,501
UNIT FOR GRASPING AND CLAMPING CIRCULAR OBJECTS
Georges Fassler, Charenton le Pont, France, assignor to Essilor International Compagnie Generale d'Optique, Creteil Cedex, France
Filed Feb. 11, 1992, Ser. No. 833,875
Claims priority, application France, Feb. 18, 1991, 91 01898
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 **10 Claims**

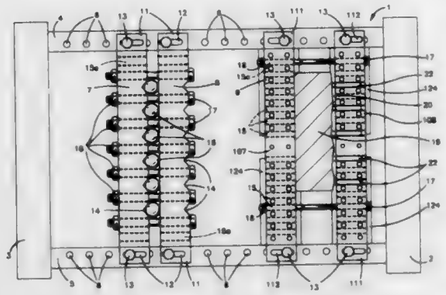
1. A unit for grasping and clamping a generally circular shaped part at three points or regions of tangential contact forming, pairwise, angles greater than 90°, comprising:
a) a central body having a longitudinal axis;
b) a central push rod, having first and second opposite ends, mounted on said central body for movement along said longitudinal axis;
c) first and second levers positioned symmetrically with respect to said axis, each of said levers including a clamping arm and an operating arm, each arm having a distal end and joined together at a junction point spaced from said distal end to form an angle between the arms;
d) means for pivotally mounting each of said levers on the central body at said junction point of the clamping and operating arms for pivoting movement between a first open position and a second clamping position, with the distal ends of the clamping arms spaced closer to said axis in said clamping position than in said open position;
e) first, second and third grasping and clamping elements mounted on aid central body,
1) the first of said grasping and clamping elements lying on the longitudinal axis of said central body and connected to the first end of the central push rod, and
2) the second and third of said grasping and clamping elements being mounted symmetrically with respect to said axis, each at said distal end of one of the clamping arms of said levers;
f) at least one clamping spring engaging against said push rod and producing a reaction force urging said push rod away from the central body in the direction of said axis;
g) a first piston operatively connected to the second end of said push rod;
h) at least one lever spring connected to each of said levers



for producing a reaction force urging said levers toward said second clamping position;
i) a sliding member mounted on said central body for sliding movement along said axis, said sliding member having first and second opposite ends with said first end pivotally connected to the distal end of the operating arm of each lever;
j) a second piston operatively connected to the second end of said sliding member;
k) means for urging said first piston in a direction opposing the reaction force of said clamping spring and said second piston in a direction opposing the reaction force of said lever springs; and
l) the reaction force of the two lever springs applied to the levers being higher than the reaction force of said clamping spring applied to said push rod.

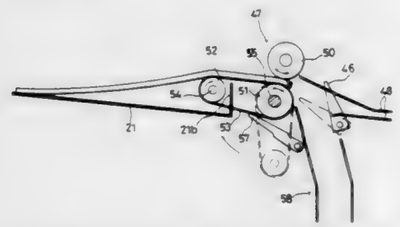
5,201,502
APPARATUS FOR CLAMPING WORKPIECES WHICH HAVE TO BE MACHINED BY A MACHINE TOOL
Rudolf Schneider, Stansstad, Switzerland, assignor to Erowa AG, Reinach, Switzerland
Continuation-in-part of Ser. No. 534,527, Jun. 6, 1990, abandoned. This application Aug. 28, 1991, Ser. No. 751,158
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919078
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—43 **19 Claims**

1. An apparatus for clamping a workpiece to be machined by a machine tool, said apparatus comprising:
rectangular frame means including two longitudinal frame members and two transverse frame members;
clamping means for fixing said workpiece to be machined to said rectangular frame means, said clamping means comprising at least one auxiliary frame means which is removably inserted in said rectangular frame means;
each of said auxiliary frame means including two clamping bars which are adjustable relative to each other in the longitudinal direction of said longitudinal frame members to enable clamping of said workpiece therebetween, said clamping bars defining a plurality of first bores for selectively receiving clamping screw means, said first bores running essentially parallel to said longitudinal frame members when said clamping bars are connected to said longitudinal frame members, each clamping bar having one end releasably connected to one of said longitudinal frame members and an opposite end releasably connected to the other one of said longitudinal frame members;



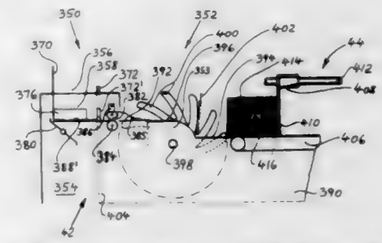
means for connecting said ends of each clamping bar to said longitudinal frame members; and
clamping screw means for, when selectively received in said first bores, providing a clamping force to clamp said workpiece between said clamping bars and to thereby fix said workpiece to said rectangular frame means when said clamping bars are adjusted relative to each other to enable clamping of said workpiece and are connected to said longitudinal frame members.

5,201,503
SHEET SORTER WITH COMMON SUPPLY AND DISCHARGE ROLLERS
Toshikazu Matsui, Kishiwada; Hiromi Sakata, Suita; Masanori Itakiyo, Sakai; Kunihiko Ishikawa, Osaka, and Kenzo Ono, Habikino, all of Japan, assignors to Mita Industrial Co., Ltd., Japan
Filed Oct. 17, 1991, Ser. No. 778,361
Claims priority, application Japan, Oct. 25, 1990, 2-289783
Int. Cl.[5] B42B *2/00;* **B65H** *39/02*
U.S. Cl. 270—53 **18 Claims**



1. A sorter incorporating a stapler for sorting and stapling sheets discharged from a discharger of an image forming apparatus, comprising:
a plurality of sheet storers arranged vertically;
means for stapling stacks of sheets stored in said sheet storers;
supply/discharge means, including a plurality of pairs of main rollers rotatable in both sheet supplying and discharging directions, for supplying sheets from said image forming apparatus into said sheet storers, and discharging the sheets stored in said sheet storers; and
a stacker for storing the sheets discharged from said sheet storers by said supply/discharge means.

5,201,504
ON-EDGE STACKER
George Fallos, Easton; Harry C. Noll, Jr., Whitehall, and David P. Nyffenegger, Bethlehem, all of Pa., assignors to Bell & Howell Company, Skokie, Ill.
Division of Ser. No. 338,171, Apr. 14, 1989, Pat. No. 5,029,832.
This application May 28, 1991, Ser. No. 707,261
Int. Cl.[5] B65H *5/00*
U.S. Cl. 271—2 **21 Claims**



1. An on-edge stacker for stacking envelopes, comprising:
means for receiving and transporting envelopes;
means including a conveyor belt for accumulating envelopes;
means for stacking and delivering envelopes to said means for accumulating; and,
means for diverting envelopes received by said means for receiving and transporting, said means for diverting being operative in diverting envelopes to said means for stacking;
wherein said means for receiving and transporting comprises an upper level including means for conveying envelopes therealong; and
wherein said means for stacking and delivering comprises stacking spider means for capturing diverted envelopes delivered thereto and for delivering envelopes side-on-side onto said conveyor belt edge-on substantially in vertical orientation; and,
wherein said means for diverting comprises:
a lower level disposed beneath said upper level;
a divert gate disposed in said upper level, said divert gate being selectively openable to intercept and to divert envelopes to said lower level; and,
means for propelling diverted envelopes along said lower level for delivery to said stacking spider means, said means for propelling including a rotatable paddle arrangement having substantially radially oriented paddles, said paddles being operative in engaging trailing edges of envelopes diverted to and disposed in said lower level and propelling the envelopes toward said stacking spider.

5,201,505
DOCUMENT FEEDER OVERLAID TRAYS CONFIGURATION
Narendra C. Shah, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 23, 1991, Ser. No. 812,610
Int. Cl.[5] B65H *1/26*
U.S. Cl. 271—3 **3 Claims**

1. In a document handler for a copier or scanner imaging station having a document loading input tray and a separate document restacking output tray, with both said document loading input tray and said document restacking output tray

being positioned to be vertically superposed over said imaging

portion of said holding means is movable to a position

means from a paper feeding position where an operation mode of operation of the drive unit wherein the rated torque is

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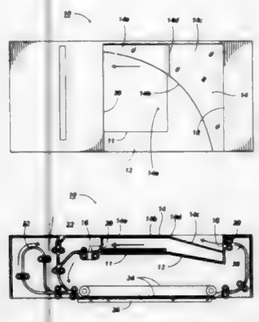
being positioned to be vertically superposed over said imaging station for overall compactness of said document handler; and wherein documents are fed from said document loading input tray into an input end of said document handler and wherein documents are fed from an opposite, output, end of said document handler into said restacking output tray; the improvement wherein:

said document loading input tray comprises a substantially planar and fully supportive tray surface for fully supporting documents feeding into said input end of said document handler,

said document restacking output tray is spaced above said document input tray and is adapted to receive thereon but only partially support documents for restacking thereon which are ejected from said opposite, output, end of said document handler,



said document restacking output tray being adapted to support only a minor portion of said restacking documents therein,

said document restacking output tray primarily comprising only a thin, rear edge, shelf portion overlying only a minor rear portion of said document loading input tray,

said document restacking output tray having only a minor initial portion adjacent only said output end of said document handler having a front to rear width substantially overlying said document input tray, and

said width of said document restacking output tray rapidly narrows to said thin, rear edge shelf portion as said document restacking output tray extends away from said output end of said document handler,

so as to provide unobstructed document loading access to a major area of said document loading input tray.

5,201,506

SHEET FILM LOADING APPARATUS

Hiroshi Kushima, and Mikio Tsuyuki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 478,399, Feb. 12, 1990, Pat. No. 5,080,343. This application Oct. 8, 1991, Ser. No. 773,004

Claims priority, application Japan, Feb. 14, 1989, 1-34153; Mar. 3, 1989, 1-24677[U]

Int. Cl.[5] B65H *3/08*

U.S. Cl. 271—5 **11 Claims**

1. A sheet film loading apparatus for selectively taking out a sheet film from a plurality of magazines and loading the sheet film into a cassette, comprising:

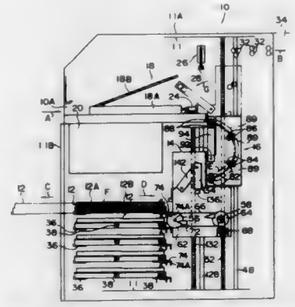
means for taking out a sheet film from one of said magazines;

means, connected to said taking-out means and adapted to receive, via a receiving end portion of said means, the sheet film supplied from said taking-out means, for holding the sheet film in a state in which at least part of the sheet film is curved, and for supplying the sheet film from a sheet film-supplying end portion of said holding means into said cassette, wherein said sheet film-supplying end portion of said holding means is movable to a position corresponding to said cassette; and

means for integrally driving said taking-out means and said holding means from a first position where said taking-out means reaches a position corresponding to one of said magazines to a second position where said sheet film-supplying end portion of said holding means reaches the position corresponding to said cassette;

wherein said holding means comprises a plurality of pairs of rollers, and

wherein, of said plurality of pairs of rollers, a pair of rollers disposed in said sheet film-supplying end portion of said holding means is movable toward said cassette.



5,201,507

CASSETTE TYPE SHEET SUPPLYING DEVICE FOR USING A PLURALITY OF STANDARD CASSETTES OR A SINGLE LARGE CASSETTE

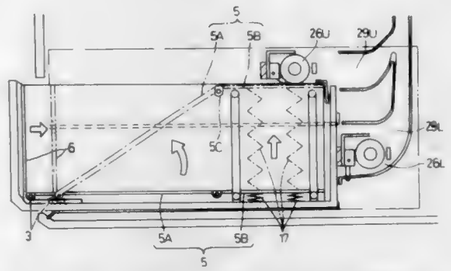
Hiroshi Tokuda, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 30, 1992, Ser. No. 828,189

Claims priority, application Japan, Mar. 27, 1991, 3-63288

Int. Cl.[5] B65H *3/44*

U.S. Cl. 271—9 **19 Claims**



1. A cassette type sheet supplying device comprising:

a cassette installation main body having an opening portion to a mounting space for installation of a plurality of cassettes, said mounting space accommodating said cassettes in vertical relationship with respect to one another;

a plurality of standard cassettes for storing cut sheets;

a large cassette for storing cut sheets in an amount larger than that of said standard cassettes, said mounting space alternatively accommodating said large cassette and said plurality of standard cassettes;

a plurality of paper feeding means for extracting a top sheet of said cut sheets from said cassettes, said paper feeding means being provided for each said cassette, said paper feeding means comprising a to paper feeding means and at least one lower paper feeding means;

a retracting means for retracting said lower paper feeding means from a paper feeding position where an operation of extracting a top cut sheet from each said cassette is effected, to a retracted position where said retracted paper feeding means does not obstruct an insertion of said large cassette; and

a drive means for driving unretracted paper feeding means to extract said top cut sheet from at least one of said cassettes.

5,201,508

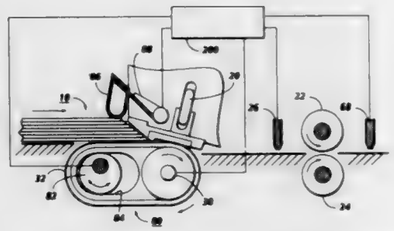
SELF-ADJUSTING CLOSED-LOOP FRICTION FEEDER

Youti Kuo, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 767,456, Sep. 30, 1991, Pat. No. 5,163,666. This application Aug. 14, 1992, Ser. No. 929,351

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—10 **6 Claims**



1. An apparatus for feeding and separating sheets individually from a stack of sheets, comprising:

a mechanism, disposed adjacent a sheet to be separated from the stack, including a friction feed belt thereon for sheet feeding engagement of the sheet;

a nudger bumper, adapted to be urged toward at least a portion of the stack;

sensor means, for detecting a lead edge of a sheet being fed at at least one location relative to the mechanism;

urging means for urging the mechanism and the nudger bumper toward at least a portion of the stack, thereby creating a normal force on at least a portion of the stack between the mechanism and the nudger bumper; and

control means, responsive to the sensor means, for regulating the normal force via the urging means.

5,201,509

METHOD AND DEVICE FOR CONTROLLING A DRIVE UNIT OF A PILE-LIFTING DEVICE AT A SHEET-FED PRINTING MACHINE

Stephan Kirchhoff, Birkenau; Helmut Meyer, Weinheim, and Christian Thomas, Walldorf, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

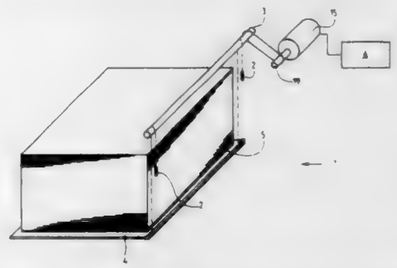
Filed Jun. 27, 1991, Ser. No. 721,955

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020429

Int. Cl.[5] B65H *1/26*

U.S. Cl. 271—157 **4 Claims**

3. Device for performing a method of controlling a drive unit of a pile-lifting device located at a sheet-fed printing machine, comprising electronic circuit means for operating the drive unit in a first mode wherein rated torque is high and rated speed is low for respectively lifting and lowering a pile of sheets and, after a given time period, for switching to a second mode of operation of the drive unit wherein the rated torque is low and the rated speed is high if the speed has exceeded a



preset value during a lifting of the pile, and has not exceeded a preset value during a lowering of the pile.

5,201,510

SHEET FILM MAGAZINE FOR A FILM CHANGER

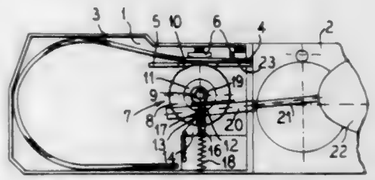
Erik Bjoerk, Sundbyberg; Ola Wiklund, Jaerfaella, and Johan Egerstroem, Nacka, all of Sweden, assignors to Siemens Aktiegesellschaft, Munich

Filed Mar. 2, 1992, Ser. No. 844,310

Claims priority, application European Pat. Off., Mar. 5, 1991, 91103366.0

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—118 **11 Claims**



1. In a sheet film magazine for a film changer, said magazine comprising a housing and a cover that form a space for storing a stack of unseparated film sheets that lie against a film plane, and a conveyor means for conveying individual sheets of the film from the film stack through a film exit opening of the sheet film magazine and into a receptacle part of the film changer, the film plane being formed by a plate that extends to the film exit opening and is axially aligned with a lower edge of said opening, the improvements comprising the sheet film magazine being provided with control means adjoining an exit side of the magazine, said control means guaranteeing that only one sheet of film is conveyed out of the magazine at each time, the control means including the film exit opening, whose height amounts to less than the thickness of two sheets of film, and at least one first hold-down means, which is positioned adjacent the film exit opening and presses at least one sheet of film against the plate, the first hold-down means including a head which is attached to one end of a shaft that proceeds parallel to the film plane and said shaft having a second end rotatably mounted on an axle.

5,201,511

ply drawer slidable to a first location for loading a receiver

pivoting lever acting on a linear element mounted at one end

said abutment (3) and aligning wheel (16) being positively coupled such that when said abutment (3) is moved out of

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5,201,511

DEVICE FOR RESTRAINING ABRUPT POURING OF PAPERS FOR PAPER SUPPLY CASSETTE

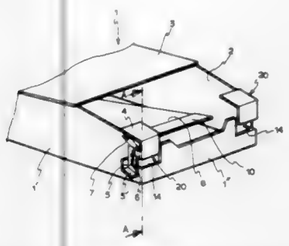
Dong S. Kim, Seoul, Rep. of Korea, assignor to Goldstar, Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 30, 1991, Ser. No. 738,173

Claims priority, application Rep. of Korea, Jul. 31, 1990, 11307/1990

Int. Cl.[5] B65H *1/04*

U.S. Cl. 271—127 3 Claims



1. A device for restraining abrupt pouring of papers from a box-shaped housing of a paper supply cassette comprising:

a pair of turning members disposed at the sides of said box-shaped housing where each turning member includes,

a supporter having a horizontal part and a vertical part vertically extending from an end of said horizontal part, said supporter moveable to a vertical position for contacting with ends of papers in order to restrain pouring of said papers and movable to a horizontal position free from contact with said papers in order to allow said papers to be drawn one by one from said housing,

an actuating lever having a horizontally extending connecting part integrally formed with said vertical part of the supporter and hinged at a hinge connection to a side wall of said housing, and a downwardly extending actuating part integrally formed with said connecting part and having an actuating surface,

a tension coil spring disposed between said side wall of the housing and said connecting part in order to bias said turning member counterclockwise,

said turning member being able to turn clockwise by means of pressing means for providing a pressing force acting on said actuating surface of said actuating lever and to turn counterclockwise by virtue of the restoring force of said tension coil spring if said pressing force having acted on said actuating surface is removed.

5,201,512

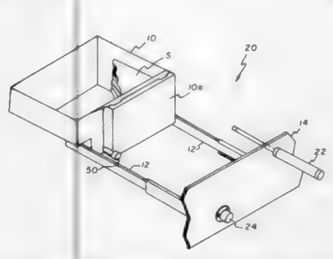
RECEIVER SHEET SUPPLY DRAWER CLOSURE MECHANISM WITH A DAMPING FEATURE

Yury K. Rabin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1992, Ser. No. 827,301

Int. Cl.[5] B65H *1/22*

U.S. Cl. 271—164 10 Claims



1. In a reproduction apparatus having a receiver sheet supply drawer slidable to a first location for loading a receiver sheet stack in said supply drawer and a second location relative to said reproduction apparatus where receiver sheets may be fed in register from said supply drawer, a closure mechanism for said receiver sheet supply drawer, said closure mechanism comprising:

a variable damper including a pneumatic cylinder, a piston located within said pneumatic cylinder, a plunger attached to said piston and extending outwardly from said pneumatic cylinder in a direction toward said receiver sheet supply drawer, and a port defined through a wall of said pneumatic cylinder opposite said plunger, said port being of a predetermined diameter such that when said receiver sheet supply drawer strikes said plunger at a relatively low speed, pneumatic fluid in said pneumatic cylinder readily escapes through said port so that movement of said supply drawer is substantially unaffected, and when said receiver sheet supply drawer strikes said plunger at a speed substantially higher than the slow speed, pneumatic fluid in said pneumatic cylinder is restricted in its escape through said port so that movement of said supply drawer is substantially slowed whereby movement of said receiver sheet supply drawer from the first location to the second location is damped to assure that said receiver sheet supply drawer approaches the second location at a speed sufficiently slow to prevent receiver sheet stack dishevelment irrespective of the initial speed of said receiver sheet supply drawer as it leaves the first locatoin; and

means for releasably latching said receiver sheet supply drawer at a predetermined accurate position in the second location.

5,201,513

DEVICE FOR CONVEYING AND PILING SHEETS INTO STACKS

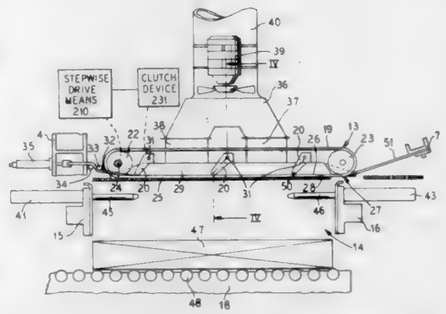
Jean-Luc Mion, La Tour du Pin, France, assignor to SA Martin, France

Filed Feb. 24, 1992, Ser. No. 840,128

Claims priority, application France, Feb. 26, 1991, 91 02522

Int. Cl.[5] B65H *29/44, 29/32*

U.S. Cl. 271—180 9 Claims



1. A device for conveying and piling flat workpieces, said device comprising a frame having endless conveyor belts arranged side-by-side, means for advancing the conveyor belts in a stepwise manner, a separate vacuum chamber for each belt being arranged with a lower surface of the vacuum chamber contacting an upper surface of a lower run of the conveyor belt, said vacuum chambers being separated from one another by a duct and being provided with aspiration holes situated in the vicinity of a side edge of the respective endless belt, said vacuum chambers being interconnected to a common aspiration hood, ejectors being arranged within the duct which separate the vacuum chambers, each ejector comprising a pivoting lever acting on a linear element mounted at one end on the frame of the device at a fixed point and having the other end connected to compensating means to enable expansion and contraction of the linear element, said linear element closing an aperture on a lower part of said duct, which aperture is arranged on substantially the same surface as the lower surface of the vacuum chamber so that when the ejectors are in a retracted position, the linear element closes the duct and when the ejectors are moved to an ejecting position, the linear element opens the duct to enable air in the duct to flow into the vacuum chambers to break a suction on a workpiece formed by the chambers.

5,201,514

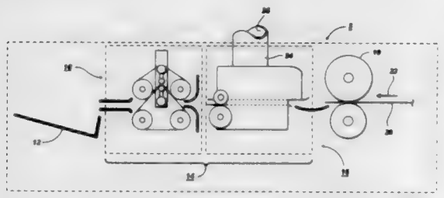
APPARATUS FOR DECURLING A SHEET

Robert P. Rebres, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1992, Ser. No. 864,007

Int. Cl.[5] B65H *29/70*

U.S. Cl. 271—188 13 Claims



1. An apparatus for decurling a sheet, comprising:

a decurler shaft;

a first belt positionable to contact an arcuate portion of said decurler shaft;

a second belt positionable to contact said first belt and to bend around the arcuate portion of said decurler shaft;

means for advancing the sheet between said first belt and said second belt so as to bend the sheet around the arcuate portion of said decurler shaft; and

means for supporting said decurler shaft, said supporting means contacting said decurler shaft at a location between the end portions of said decurler shaft.

5,201,515

DEVICE FOR DEPOSITING AND ALIGNING SHEETS INDIVIDUALLY SUPPLIED TO A STACK

Helmut Funk, Remshalden, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1992, Ser. No. 834,956

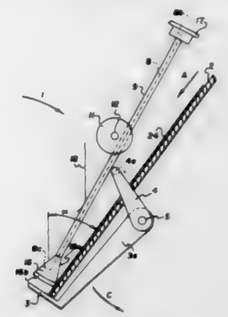
Claims priority, application Fed. Rep. of Germany, May 24, 1991, 4116991

Int. Cl.[5] B65H *31/34*

U.S. Cl. 271—224 13 Claims

1. Device for aligning sheets which are individually supplied to, and stacked in a collecting tray, having a stacking surface and a lateral limiting member extending parallel with the sheet entrance direction as well as an abutment associated with the front end sides of the sheets said device comprising:

a drivable aligning wheel (**16**) which rests on an incoming sheet and aligns said sheet with both said lateral limiting member and said front abutment (**3**), said front abutment (**3**) movable out of the transport path of sheet stack (**7**), said aligning wheel (**16**) liftable off the sheet stack (**24**) and said abutment (**3**) and aligning wheel (**16**) being positively coupled such that when said abutment (**3**) is moved out of



the transport path, said aligning wheel (**16**) is also lifted off the sheet stack (**24**).

5,201,516

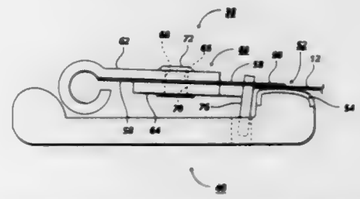
SHEET GRIPPING APPARATUS

Abraham Cherian, Webster; Roger M. Swanson, Fairport, and Eric A. Merz, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 7, 1992, Ser. No. 879,399

Int. Cl.[5] B65H *5/00, 29/04*

U.S. Cl. 271—277 14 Claims



1. An apparatus for gripping a sheet having a first gripping member and a second gripping member movable relative to said first gripping member, the second gripping member comprising:

a base, defining a stop member extending therefrom; and

a plate secured to said base, said plate substantially spanning the width of the sheet and being adapted to cooperate with said first gripping member to grip the sheet, said plate defining an aperture therein;

said stop member extending through said aperture in said plate and extending into a zone between said first gripping member and said second gripping member.

5,201,517

ORBITING NIP PLURAL MODE SHEET OUTPUT WITH FACEUP OR FACEDOWN STACKING

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1992, Ser. No. 903,291

Int. Cl.[5] B65H *29/22*

U.S. Cl. 271—291 55 Claims

26. In a method of transporting sheets in an output path to a sheet stacking area with opposing first and second sheet feeding rollers forming a sheet transporting nip, including engaging the leading edge of a sheet delivered to said nip, and producing a relative orbital motion of said opposing rollers to progressively angularly pivot said nip for changing the angular direc-

tion of the leading edge of the sheet while the sheet is in said

sheet member into the selected transport path by changing

5,201,520

shaft includes an elastomeric band extending between the

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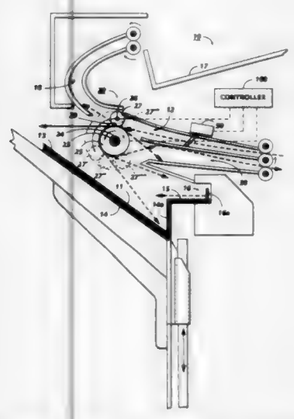
tion of the leading edge of the sheet while the sheet is in said nip without other substantial displacement of said nip;

the improvement providing plural mode selectable operation, wherein said step of producing said orbital motion of



said opposing rollers to pivot said nip further includes selecting between different said orbital motions providing plural selectable different sheet orientation and stacking modes corresponding to different said pivotings of said nip.

5,201,518

SHEET TRANSPORT MECHANISM HAVING FLAPPER

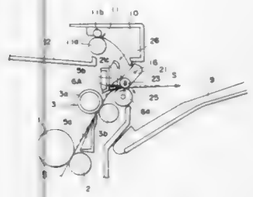
Yuzo Isoda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

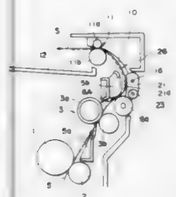
Continuation of Ser. No. 672,033, Mar. 19, 1991, abandoned. This application Sep. 2, 1992, Ser. No. 938,530

Claims priority, application Japan, Mar. 24, 1990, 2-74093

Int. Cl.[5] **B65H** *39/10*

U.S. Cl. 271—305 **12 Claims**





1. A sheet transport mechanism, comprising:

means for providing a plurality of transport paths for a sheet member;

a transport rotary member provided at a branch section at which the transport paths are branched;

a flapper provided at the branch section, said flapper selecting one of the plurality of transport paths and guiding the sheet member into the selected transport path by changing its posture, said flapper being rockably supported about a support point to be rocked between a first posture and a second posture; and

a flapper rotary member supported on said flapper by a rotatable shaft apart from said support point, said flapper rotary member pinching the sheet member in cooperation with said transport rotary member to transport the sheet member when said flapper is in said first posture, but not forming a nip with said transport rotary member when in said second posture.

5,201,519

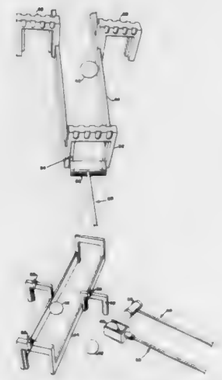
CROQUET SET, PARTICULARLY, FOR MINIATURE CROQUET GAME

Johannes Sorteberg, 111 Glover Ave., Norwalk, Conn. 06850

Filed Jul. 17, 1990, Ser. No. 553,986

Int. Cl.[5] **A63B** *67/00*

U.S. Cl. 273—56 **20 Claims**



1. In a croquet set comprising at least two distinctly visually coded mallets, each having a head, and corresponding coded balls each bearing the same code as a corresponding mallet, the improvement comprising:

A. a plurality of wickets assembled into a unitary structure, each of said wickets having at least two marker receiving means for receiving direction markers, at least two correspondingly coded direction markers each bearing the same code as a corresponding mallet, said markers each adapted to engage said marker receiving means in two positions so as to indicate passage through a wicket of the correspondingly coded ball in either of two directions, and;

B. at least two correspondingly coded ball retainers each bearing the same code as a corresponding mallet, said ball retainers comprising a handle having an elongated axis and having a head at one end thereof, said head comprising spaced members for fitting over and loosely confining one of said balls and having opposed openings on opposite sides of said head of a size smaller than said ball so as to permit a confined ball to make contact with another croquet ball and to permit the confined ball to be struck by said mallet and said spaced members having means operated by said handle to cause said spaced members to hold a confined ball and to permit it to be lifted from a playing surface.

5,201,520

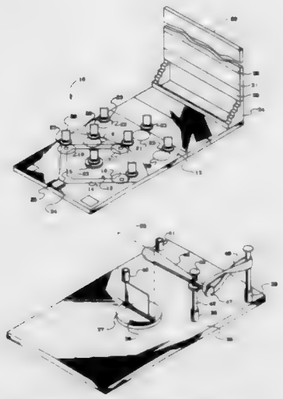
BASEBALL GAME APPARATUS

Michael R. Castle, and Jason M. Castle, both of 3015 Voorheis Lake Ct., Lake Orion, Mich. 48360

Filed Jan. 27, 1992, Ser. No. 826,079

Int. Cl.[5] **A63F** *7/20*

U.S. Cl. 273—88 **4 Claims**



1. A baseball game apparatus, comprising,

a game board, the game board including an infield surface area projecting from a first end of the game board and an outfield surface area projecting from the infield surface area towards a second end of the game board, with the infield surface area including a diamond shaped game path to include a home base portion, a first base circle, a second base circle, and a third base circle, each oriented at an apex of the diamond shaped path, with a fourth short-stop circle positioned rearwardly and medially between the second base circle and the third base circle, and

the outfield surface area including a fifth circle, a sixth circle, and a seventh circle, with a first team including a predetermined number of first players and a second team including a predetermined number of second players, each of the players of the first team and second team being depicted by a baseball card, wherein each of the first players is mountable onto a player base, with each player base including a plurality of spaced parallel ribs defining a card slot therebetween for receiving one of said first players within the card slot, and

each of the second players being positionable onto a second team batter space, and the second team batter space positioned adjacent to and rearwardly of the home base portion, and an outfield wall orthogonally mounted to a forward distal end of the game board and divided into a first horizontal portion defining a lower third portion of the wall, a second horizontal portion defining a medial third portion of the wall, and a third horizontal portion defining a top third of the wall, and

batting means for projecting each of the baseball cards depicting each of the second players, and the batting means including a base plate positioned medially of the second team batter space and the base plate including a vertical support flange diametrically directed along the base plate projecting orthogonally upwardly thereof for mounting one of said baseball cards depicting one of said second players thereon, and a first socket tube and a second socket tube positioned rearwardly of the base plate, wherein the first socket tube includes a first support shaft slidably positioned therewithin, and the second socket tube includes a second support shaft slidably positioned therewithin, the first socket tube includes a bat member pivotally and orthogonally mounted adjacent an upper distal end of the first support shaft, and the second support shaft includes an elastomeric band extending between the second support shaft and the bat member.

5,201,521

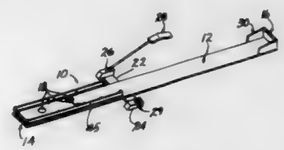
PUTTING PRACTICE AND GAME APPARATUS

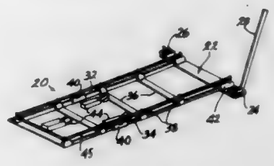
Charles W. Healy, 723 - 12th St., SW., Massillon, Ohio 44646

Filed Mar. 22, 1991, Ser. No. 673,735

Int. Cl.[5] **A63B** *69/36*

U.S. Cl. 273—176 K **13 Claims**





1. A putting practice and game apparatus comprising;

an elongated playing surface having first and second ends and at least one target hole formed therein at a position relative to said playing surface first end, wherein balls will be putted from said second end towards said first end and said at least one target hole,

said at least one target hole includes retaining means being formed as having at least one elongated channel with side walls and a bottom wall, wherein said bottom wall has a first end thereof positioned adjacent said playing surface and is inclined downwardly from said first end and of said bottom wall relative to said playing surface to form a ramp on which a plurality of balls can be retained and supported,

a first frame means positioned adjacent said first end of said playing surface and adapted to support and carry said first end of said playing surface therewith, said first frame means having associated therewith a lift base being positioned intermediate said first and second ends of said playing surface,

means associated with said lift base to allow said first frame means to be pivoted upwardly about said lift base so as to allow said first end of said playing surface to be selectively raised, wherein any balls on said playing surface or within said means to retain a plurality of balls associated with said at least one target hole will be returned to said second end of said playing surface, wherein upon raising of said playing surface, said bottom wall of said retaining means will be inclined upwardly relative to said playing surface due to the raising of said playing surface such that any balls within said retaining means will be made to roll down said bottom wall and out of said target hole onto said playing surface.

5,201,522

GOLF BALL

Terence W. Pocklington, Tupelo, and William L. Cransby, Pontotoc, both of Miss., assignors to Ram Golf Corporation, Melrose Park, Ill.

Filed Nov. 20, 1991, Ser. No. 795,918

Int. Cl.[5] **A63B** *37/14*

U.S. Cl. 273—232 **5 Claims**

1. In a golf ball construction wherein dimples are formed on

a spherical surface, said surface defining opposite poles and an surface and said surface being substantially devoid of any

b) means for converting said trading cards into at least two suits of playing cards, so that said playing cards can be

sticks from the ground through the air and onto the resiliently-tensioned net being the objective of the game.

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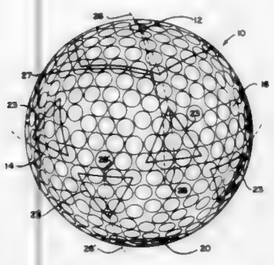
a spherical surface, said surface defining opposite poles and an equator midway between said poles dividing said surface into two hemispheres, the improvement in the pattern of dimples formed on said surface, said pattern including:

(a) a pole dimple located at each pole;

(b) a pentagon formation of dimples in each hemisphere comprising five equally-spaced lines of dimples radiating outwardly from said pole dimple to thereby define five triangular area of dimples in said pentagon formation, the bases of said triangular areas comprising five interconnected lines of dimples equally spaced from said pole dimple, said interconnected lines defining a pentagon shape, and additional dimples located between said lines;



(c) five equally-spaced additional triangular areas of dimples in each hemisphere of dimples, the bases of said additional triangular areas in each hemisphere being included in a line of dimples in that hemisphere adjacent the equator with the bases of the additional triangular areas on opposite sides of the equator being disposed in an alternating relationship;

(d) a plurality of dimples disposed in a non-uniform fashion about the remaining surface of said golf ball outside of said pentagon and triangular formations to enhance the aerodynamic symmetry of said golf ball surface; and

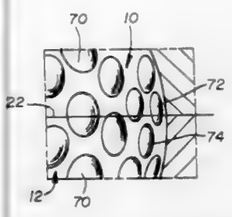
(e) each of said pentagon formations including 51 dimples, each of said additional triangular areas including 10 dimples, and said entire golf ball surface having 442 dimples formed thereon.

5,201,523

MOLDED SEAMLESS GOLF BALL

Seward S. Miller, Avon Lake, Ohio, assignor to WPI Acquisition Corporation, Elyria, Ohio

Division of Ser. No. 735,182, Jul. 23, 1991, Pat. No. 5,112,556.
This application Oct. 28, 1991, Ser. No. 787,503
Int. Cl.[5] A63B *37/14, 37/12*
U.S. Cl. 273—233 2 Claims



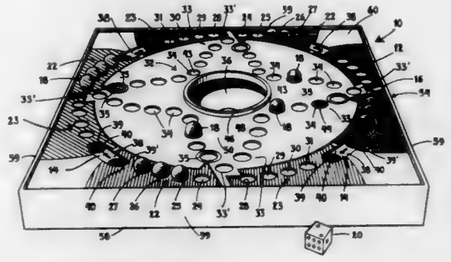
1. A golf ball having an outer spherical dimpled surface and made by a process wherein said surface is formed by molding between a pair of hemispherical concave mold halves, said mold halves meeting at a parting line corresponding to an equator on said outer surface, said golf ball comprising, upon removal from said mold halves, a plurality of dimples on said surface and said surface being substantially devoid of any flashing or runners at said equator.

5,201,524

MARBLE BOARD GAME

Dezso Csanady, and Christopher A. Csanady, both of 404 Willmette Ave., Glenview, Ill. 60025

Filed Feb. 19, 1992, Ser. No. 837,148
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—248 12 Claims



1. A game comprising:

a top board having a game path, said game path including a plurality of spaced apart game holes;

a rotatable bottom board positioned underneath the top board, said bottom board including a plurality of spaced apart sink holes;

at least one game article for moving along said game path, said one game article being dimensioned to pass through said game holes and said sink holes;

a guide ramp for moving said game article angularly downward to one location, said game article falling on to said guide ramp after one of said sink holes is aligned with one of said game holes and the game article is positioned in said one game hole; and

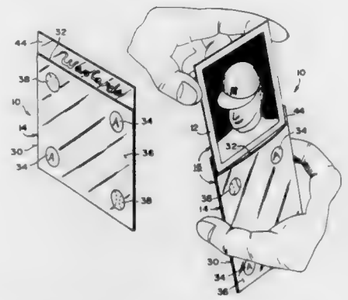
said top board including a centrally positioned top bore said bottom board including a centrally positioned bottom bore aligned with the top bore, said one location being centrally positioned underneath said bores, said game article positioned at said one location being retrievable through said bores.

5,201,525

CARD GAME UTILIZING BASEBALL TRADING CARDS

Wendell R. Castro, P.O. Box 10971, Hilo, Hi. 96721

Filed Apr. 13, 1992, Ser. No. 867,381
Int. Cl.[5] A63F *1/00*
U.S. Cl. 273—293 9 Claims



1. An improved card game which comprises:

a) a plurality of trading cards;

b) means for converting said trading cards into at least two suits of playing cards, so that said playing cards can be utilized in said improved card game, said converting means includes a plurality of clear plastic protective cover holders, with each having a pocket to receive one of said trading cards, a first indicia representing one of a plurality of different playing card values disposed on the front face of each said protective cover holders to provide a playing card value to each of said trading cards received in said pockets, a second indicia representing one of at least two different playing card suits disposed on the front face of each said protective cover holders to provided a playing card suit to each of said trading cards received in said pockets, wherein the protective cover holders of a common suit each having a different playing card value of said plurality of different playing card values;

c) means for producing a random output count to determine the order of play for each player;

d) a set of rules for playing said improved card game, whereby the object of the game is for a player to win the most trading cards from each of the opponent players; and

e) a container for storing said trading cards said converting means, said random output count producing means and said set of rules therein when not being used, said container is a rectangular shaped box having a plurality of compartments therein for storing the various articles when not being used, said container further includes a rectangular shaped lid for covering said rectangular shaped box to protect the various articles within the compartments when not being used.

5,201,526

OUTDOOR LAWN-TYPE GAME

F. Burk Ketcham, Jr., 29 Fernway, Cohasset, Mass. 02025

Filed Aug. 13, 1992, Ser. No. 928,477
Int. Cl.[5] G09B *67/00*
U.S. Cl. 273—342 3 Claims

1. A competitive game having rules and a scoring system designed for play by two or more individuals on a lawn area and the like, where the several elements of the game apparatus depend upon and interact with each other, the apparatus comprising, in combination;

a plurality of discs of flying saucer configuration with the flat side tapering to form a rounded edge at the circumference of the circle;

a plurality of flipping sticks comprised of an elongated handle portion and an affixed two-tined fork portion with the tines positioned at a distance from each other which is slightly less than the outside diameter of the discs and with the tines bent near their outer ends at an angle of about 45° so that a player may position the two-tined fork end under a disc where it rests on the ground prior to initiating the flipping action which propels the discs into the air;

an easily assembled and disassembled trampoline device constructed in such a manner as to have a resiliently-tensioned net held horizontally at a distance above the ground, with the positioning of discs flipped by flipping sticks from the ground through the air and onto the resiliently-tensioned net being the objective of the game.

5,201,527

TOSSING GAME TARGETS AND METHOD

George T. Koket, 322 Forest Dr., Erie, Pa. 16505

Filed Feb. 21, 1992, Ser. No. 839,632
Int. Cl.[5] A63B *63/00*
U.S. Cl. 273—402 5 Claims

1. A tossing game comprising a first target, a second target and tossing bags;

said first target having a first leg, a second leg, a first side wall, a second side wall, a first end wall, a second end wall and a front wall;

said front wall of said first target having a central target opening;

said second target having a first leg, a second leg, a first side wall, a second side wall, a first end wall, a second end wall and a front wall;

said front wall of said second target having a central target opening;

said legs being adapted to fold into a folded position parallel to said front wall;

said legs adapted to be unfolded to an unfolded position extending outwardly and downwardly from said front wall generally parallel to said end walls and resting on said side walls;

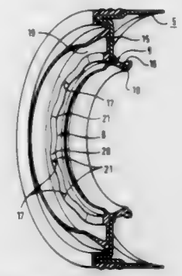
said legs each having a side remote from said front wall inclined to said front wall when said legs are in an unfolded position whereby said legs hold said front wall in an inclined position relative to a supporting surface when said legs rest on said supporting surface.

5,201,528

UNITIZED SHAFT SEAL

Gerd Upper, Hoisdorf/Hamburg, Fed. Rep. of Germany, assignor to Dichtungstechnik G. Bruss GmbH & Co. KG, Hoisdorf/Hamburg, Fed. Rep. of Germany

Filed Mar. 27, 1992, Ser. No. 859,214
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1991, 4110154
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—35 10 Claims



1. A shaft seal assembly, comprising:

a first annular casing member;

a sealing lip mounted on said first casing member;

a second annular casing member cooperating with said first

ing portion spaced from and opposed to the radially ex-

pressure and extending toward said other circumferential edge

stuffing box for sealing against the shaft or stuffing box

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a second annular casing member cooperating with said first casing member and disposed in sealing contact with said sealing lip, said second casing member comprising a radial engagement surface;

an elastomeric support provided on said first casing member for resiliently engaging said engagement surface and for supporting axial loads generated between said first and second casing members, said elastomeric support comprising an annular undulating surface defining a plurality of circumferentially-spaced, axially-extending apices and an inclined surface rising axially toward and meeting each of said apices so as to form a hydrodynamic surface adjacent each of said apices, said undulating surface including a plurality of axially-extending recesses defined between said apices; and

a lubricant provided between said first and second casing members and flowable into said recesses such that upon relative rotation between said first and second casing members, and elastohydrodynamic film of lubricant is formed between said inclined surfaces and said engagement surface and between said apices and said engagement surface.

5,201,529

SEALING DEVICE

Stephen R. Heinzen, Morton Grove, Ill., assignor to NOK Corporation, Tokyo, Japan

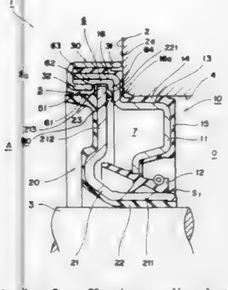
PCT No. PCT/JP91/00193, § 371 Date Oct. 15, 1991, § 102(e) Date Oct. 15, 1991

PCT Filed Feb. 16, 1991, Ser. No. 768,254

Claims priority, application Japan, Feb. 16, 1990, 2-14544[U]; Jun. 15, 1990, 2-63339[U]

Int. Cl.[5] F16J *15/34*

U.S. Cl. 277—37 **20 Claims**



1. A sealing device for effecting sealing between two members adapted for concentric relative rotation, of the type in which there is provided between a pair of annular seal members respectively attached to said two members, a main seal portion for sealing an object of sealing and an auxiliary seal portion which is provided on the opposite side of said object of sealing with respect to said main seal portion and which serves to prevent intrusion of external foreign matter into said main seal portion;

wherein said auxiliary seal portion comprises a minute gap having a spiral flow passage which exerts a screw pump action to discharge any external foreign matter to the side opposite to said main seal portion by the relative rotation of said two seal members;

one member being sealed comprising a housing having an axial hole, said axial hole having a peripheral surface;

one annular seal member comprising an axially extending portion disposed in the axial hole of said housing and a radially extending portion extending radially outward from the peripheral surface of the axial hole and abutting an end of the housing;

another annular seal member comprising a radially extending portion spaced from and opposed to the radially extending portion of said one annular seal member;

a buffer member for buffering axial load disposed between the radially extending portion of said another seal member and the radially extending portion of said one seal member at a location radially outward from said peripheral surface of said axial hole.

5,201,530

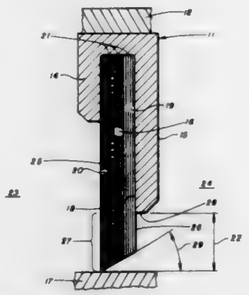
MULTI-LAYERED BRUSH SEAL

George W. Kelch, Palm Beach Gardens, and John L. Shade, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 18, 1991, Ser. No. 778,554

Int. Cl.[5] F16J *15/447*

U.S. Cl. 277—53 **22 Claims**



1. A brush seal comprising:

a backing plate having a first surface terminating in a first edge;

a first layer including a plurality of first bristles, each first bristle having a first cross-sectional area and aligned parallel to the first surface;

a second layer including a plurality of second bristles sandwiched between and contacting the first layer of first bristles and the first surface, each second bristle having a second cross-sectional area greater than the first cross-sectional area and aligned parallel to the first surface;

each of the first and second bristles having a tip portion which extends beyond the first edge and terminates in a second end; and,

means for securing a first end of each of the first and second bristles in fixed relation to the backing plate.

5,201,531

FACE SEAL WITH DOUBLE SPIRAL GROOVES

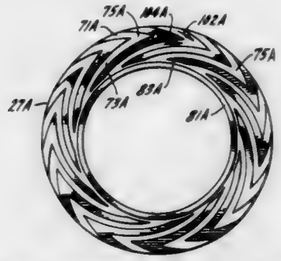
Wei-Tang Lai, Hoffman Estates, Ill., assignor to John Crane Inc., Morton Grove, Ill.

Filed Apr. 2, 1992, Ser. No. 862,463

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—96.1 **20 Claims**

1. A mechanical seal construction comprising a stationary housing, a shaft rotatably supported in said housing, a pair of relatively rotatable sealing rings surrounding said shaft, one of said rings being rotatable with said shaft and the other being fixed relative to said housing, said rings having confronting, generally radial faces, means normally biasing one of said rings toward other, said rings having a first set of circumferential edges adapted to be exposed to a fluid under pressure to be sealed in said housing and having other circumferential edges adapted to be exposed to a lower pressure outside of said housing, spiral groove means in the confronting face of one of said rings, said spiral groove means including a plurality of uniformly disposed downstream pumping grooves formed to communicate with the fluid to be sealed at said circumferential edge of said ring adapted to be exposed to the fluid under pressure and extending toward said other circumferential edge of said one ring, the downstream pumping grooves having an included angle at the point of intersection with a tangent of the circumferential edge of said ring which is exposed to the fluid under pressure, said downstream groove included angle being in a range of from 5° to 20°, said downstream pumping grooves being operable during rotation of said shaft to pump fluid from said circumferential edge exposed to the fluid to be sealed toward the other circumferential edge of said ring, said spiral groove means further including a plurality of uniformly disposed upstream pumping grooves intersection only a respective one of said downstream pumping spiral grooves and inclined oppositely thereto, the upstream pumping grooves having an included angle at the point of intersection with the tangent of the circumferential edge of said ring which is exposed to the relatively lower pressure in the environment outside of said housing, said upstream pumping groove included angle being in a range of from about 5° to about 20°, said upstream pumping grooves operable to pump fluid which is between said confronting ring faces back toward said circumferential edge exposed to the fluid to be sealed, said downstream pumping grooves terminating at the intersection thereof with said upstream pumping grooves.



5,201,532

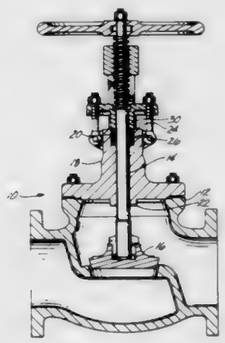
FLEXIBLE NON-PLANAR GRAPHITE SEALING RING

William J. Salesky, Irvine, and Harold A. Lacquement, Bellflower, both of Calif., assignors to Mark Controls Corporation, Long Beach, Calif.

Filed Dec. 12, 1991, Ser. No. 806,593

Int. Cl.[5] F16J *15/10*

U.S. Cl. 277—124 **13 Claims**



1. A shaft seal comprising:

a shaft;

a stuffing box around the shaft;

a packing between the shaft and stuffing box comprising a graphite ring having at least one non-planar end face; and

means engaging each face of the ring for biasing at least one edge of the non-planar face of the ring toward the shaft or stuffing box for sealing against the shaft or stuffing box respectively; and wherein

the ring is formed substantially entirely of axially compressed exfoliated graphite having bonded faces transverse to the axis of the shaft.

5,201,533

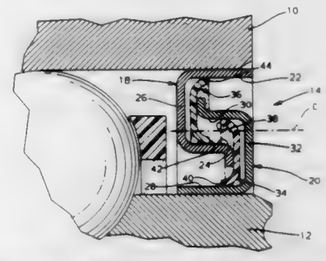
UNITIZED SEAL WITH EXTRA SEALING CONTACT AND METHOD OF MAKING

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1992, Ser. No. 916,452

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—152 **2 Claims**



1. A unitized seal for installation in an annular space between outer and inner, relatively rotatable members, said annular space having a central dividing line, said members also being subject to a running eccentricity of predetermined degree that varies the radial width of said annular space, said seal comprising,

an outer, generally channel-shaped casing having a cylindrical installation wall adapted to be secured to said outer member and a radially spaced cylindrical seal wall extending in one axial direction and located at a diameter intermediate said inner member and said central dividing line,

an inner, generally channel-shaped casing coaxial to said outer casing and having an installation wall adapted to be secured to said inner member and a radially spaced cylindrical seal wall extending in the opposite axial direction and located at a diameter intermediate said outer member and said central dividing line, whereby said respective seal walls axially overlap with one another with a radial space therebetween,

a first generally annular disk of sealing material having a width that exceeds the radial space between the walls of said inner casing by at least said degree of eccentricity so as to create two lines of sealing contact within said inner casing, and,

a second generally annular disk of sealing material having a width that exceeds the radial space between the walls of said outer casing by at least said degree of eccentricity so as to create two lines of sealing contact within said outer casing,

whereby said first and second disks together make four lines of assured sealing contact with said casing walls, two of which are located within the radial space between said seal mounting walls, with two of said lines of sealing contact increasing in pressure due to said running eccentricity at any point around the circumference of said seal.

5,201,534

at least two front leg pipes with wheels at lower ends

5,201,537

BICYCLE FRAME

ground, said wheel means including at least one rotatable rear wheel and a rotatable and steerable front wheel;

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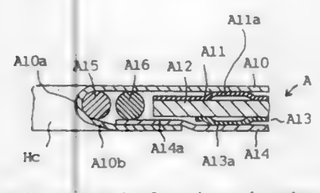
5,201,534
METAL LAMINATE GASKET WITH DOUBLE SEAL RINGS

Yoshio Miyaoh, Tokyo, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1992, Ser. No. 833,432
Claims priority, application Japan, Feb. 19, 1991, 3-031724
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—235 B 9 Claims

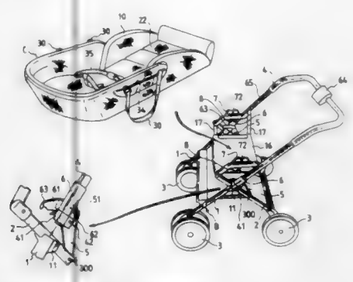


1. A metal laminate gasket for an internal combustion engine having at least one hole to be sealed, comprising,
first and second outer plates extending substantially throughout an entire area of the engine and having holes corresponding to the hole of the engine,
at least one middle plate situated between the first and second outer plates and having a hole larger than the hole of the engine,
a sealing member situated adjacent the hole of the engine to surround and define the same,
a first seal ring situated outside the sealing member relative to the hole of the engine,
a second seal ring situated outside the first seal ring relative to the hole of the engine, said second seal ring having a cross-sectional diameter substantially equal to a cross-sectional diameter of the first seal ring, and
a supporting member integrally formed with one of the first outer plates, the second outer plate and the middle plate, said supporting member being disposed over the the second seal ring without being disposed over the first seal ring so that when the gasket is tightened, the second seal ring provides surface pressure greater than that on the first seal ring to securely seal around the hole of the engine away from the same.

5,201,535
FOLDING STROLLER WITH DETACHABLE SEAT

Hitoshi Kato, and Yuichi Arai, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,535
Claims priority, application Japan, Oct. 16, 1990, 2-276883
Int. Cl.[5] B62B *7/06, 9/12*
U.S. Cl. 280—30 10 Claims

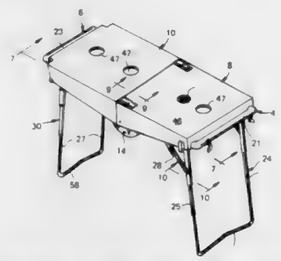


1. A folding stroller, comprising:
a foldable body, said body comprising;
at least two front leg pipes with wheels at lower ends thereof;
at least two rear leg pipes with wheels at lower ends thereof;
upper end portions of said front leg pipes are pivotally connected to upper end portions of a respective one of said rear leg pipes;
a handle having lower ends which are connected to respective upper ends of said front leg pipes, said handle extending essentially along a longitudinal axis of said front leg pipes when said body is in an unfolded position; and
a bracket pivotally mounted to each lower end of said handle and a respective one of said rear leg pipes so as to cause said body to assume a shape wherein said rear leg pipes and respective ones of said front leg pipes intersect at a predetermined angle when said body is in said unfolded position;
a seat having a backrest and a seat portion that are swingably attached to each other, at a hinge, so as to allow said backrest to be folded onto said seat portion or reclined respective to said seat portion; and
a retaining piece pivotally mounted on said body so as to extend between said upper end portions of said rear leg pipes and lower end portions of said handle, said retaining piece having a recessed portion formed therein, a portion of said seat fitting in said recessed portion, said retaining piece having a closing lever pivotally mounted thereon, said closing lever closes said recessed portion so as to retain said portion of said seat in said recessed portion when said closing lever is pivoted to a closed position.

5,201,536
COMBINATION CARRIER CART/TABLE DEVICE

Julian M. Bono, Savannah, Ga., and Jonathan Hoffman, Flanders, N.J., assignors to BSP Corporation, Savannah, Ga.

Filed Sep. 26, 1990, Ser. No. 588,233
Int. Cl.[5] B62B *1/04*
U.S. Cl. 280—30 30 Claims

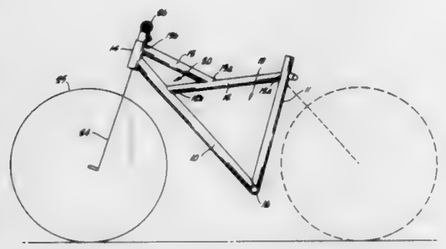


30. A combination carrier/table device supportable on a supporting surface, said device comprising a first and second body section; a pivot about which said body sections can be rotated; a roller connected to said body sections; a means for arranging said body sections in a first orientation to form a compact case for carrying or storage; a means for arranging said body sections in a second orientation to form a table wit the body sections providing the table top, said device, when in said second orientation, including leg means for supporting the table top on said supporting surface with the roller out of engagement with said supporting surface; and a means for arranging said body sections in a third orientation to form a carrying cart with the roller engaging said supporting surface.

5,201,537
BICYCLE FRAME

Christopher P. D'Aluisio, West Redding, Conn., assignor to Cannondale Corporation, Georgetown, Conn.

Filed Jun. 11, 1991, Ser. No. 714,138
Int. Cl.[5] B62K *19/00*
U.S. Cl. 280—281.1 3 Claims

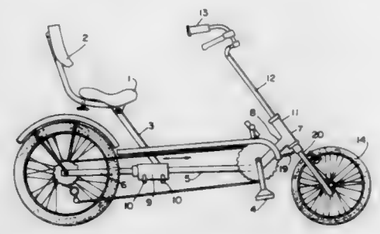


1. A bicycle frame comprising
a downtube having first and second ends,
a seat tube having first and second ends,
a heat tube,
the first end of the downtube being connected to the head tube, and the second end of the downtube being connected with the second end of the seat tube to form means for receiving a pedal crank assembly,
a back top tube having first and second ends, with the first end thereof being attached intermediate the ends of the downtube, and the second end thereof being attached toward the first end of the seat tube, and
a first portion of the downtube, a first portion of the seat tube, and the back top tube forming a first large triangle, and
a front top tube having first and second ends, with the first end affixed to the head tube near the first end of the downtube, and the second end being affixed intermediate the ends of the back top tube, a second portion of the downtube, a portion of the back top tube, and the front top tube forming a small triangle for providing increased strength to the bicycle frame.

5,201,538
ERGONOMIC CYCLES

Charles R. Mayn, 2701 N. Ocean, #307, Boca Raton, Fla. 33431

Filed May 29, 1991, Ser. No. 707,018
Int. Cl.[5] B62K *17/00, 5/00*
U.S. Cl. 280—288.1 9 Claims

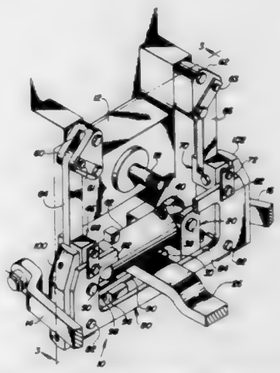


1. A vehicle adapted to be operated by a rider, said vehicle comprising:
a) a seat standard having a seat and a backrest at an upper end, an elongate intermediate portion, and a lower end;
b) wheel means for permitting said vehicle to roll on the ground, said wheel means including at least one rotatable rear wheel and a rotatable and steerable front wheel;
c) an elongate rigid, straight, non-bendable steering column means for supporting said front wheel at a first, lower end and having steering handle means at a second, upper end for steeringly turning said front wheel;
d) front wheel support means for steeringly supporting said steering column means at an angle to the vertical such that said front wheel is forward of said steering handle means;
e) an elongate main frame member means arranged substantially horizontal to the ground and connected at a forward end to said front wheel support means and at a rear end to a rear wheel support means for supporting at least one rear wheel;
f) a foot pedal assembly mounted on the forward end of said main frame member means arranged behind said steering column means;
g) said lower end of said seat standard having infinitely adjustable attaching means for adjustably attaching to said main frame member means, said attaching means being infinitely slidable along said main frame member means to thereby position said rider at that distance from both said steering handle means and said pedal assembly for most effective leg muscle function and arm extension while maintaining said seat at a fixed elevation above the ground; and
h) said intermediate portion of said seat standard extending upward and rearward to position said seat at an elevation greater than said at least one rear wheel.

5,201,539
ACTUATING MECHANISM FOR A HITCH GUIDANCE SYSTEM

Robert L. Mayfield, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 19, 1991, Ser. No. 762,198
Int. Cl.[5] B60D *1/00;* A01B *59/043*
U.S. Cl. 280—479.2 13 Claims



1. A hitch guidance mechanism for an agricultural vehicle having a hitch assembly mounted on a frame of the vehicle, the hitch assembly having a pair of movable draft links for coupling to an implement, the hitch guidance mechanism characterized by:
a movable guidance unit comprising a pair of sway blocks and a movable plate having one end fixed to one of the pair of sway blocks and having a second end fixed to the other of the pair of sway blocks, each sway block being engageable with one of the pair of draft links, the plate and both sway blocks together forming a structure which is movable as a unit with respect to the frame;
support means for movably supporting the guidance unit adjacent to a rear end of the frame; and

5,201,541

engaging said first member inner wall and said second

protector base being connected to a body of the automo-

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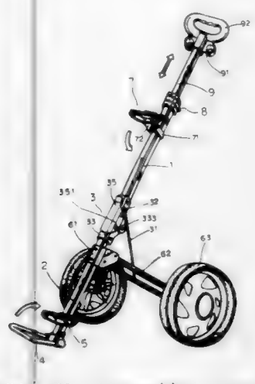
an actuator coupled between the frame and the guidance unit for controlling lateral movement of the guidance unit.

5,201,540
COLLAPSIBLE GOLF CART
Fang-Li Wu, Tainan Hsien, Taiwan, assignor to Sports World Enterprise Co., Ltd., Tainan, Taiwan
Filed Jul. 28, 1992, Ser. No. 921,014
Int. Cl.[5] B62B *1/04*
U.S. Cl. 280—646 **2 Claims**



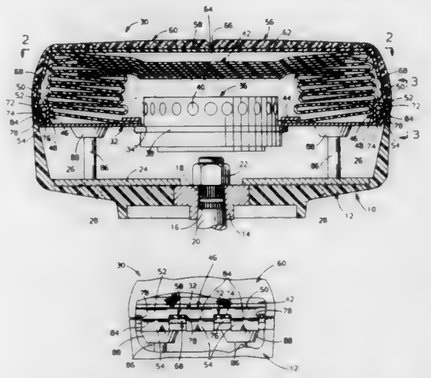
1. A collapsible golf cart comprising; an upper frame foldably connected with a lower frame by means of a connector and having a passageway for an extensible rod to fit therein from an upper end hole and move therein in a telescopic fashion;

a lower frame connected with said upper frame by said connector and combined with two wheels by means of a connecting plate and two feet respectively extending to both sides from the connecting plate and attached with a wheel at their outer ends, said connecting plate fixed to said lower frame;

said connector including an upper connecting member to be attached to a lower end of the upper frame, a lower connecting member to be attached to an upper end of the lower frame, a locating hook pivotally attached to the connecting member, and having a curved notch respectively in each of two opposite sides to selectively engage a projection in each of two opposite sides of the lower connecting member, two inclined-outward elastic plates respectively placed at the lower end of the upper connecting member and at the upper end of the lower connecting member to contact and press each other when said upper frame is folded or swung to become in a straight line with the lower frame, and an elongated plate spring placed between said upper connecting member and the locating hook to bias the locating hook to engage said notches with the projections on the lower connecting member; and,

said extensible rod having a smaller size than the size of the passageway in the upper frame so as to move therein in a telescopic fashion to adjust the whole height of this golf cart, and having a grip fixed at an outer end thereof, said rod being held immovable at any of a plurality of positions in relation to the upper frame by a thumb screw screwing through a socket fixed to the upper end of said upper frame.

5,201,541
OCCUPANT RESTRAINT MODULE
Robert L. Jones, Centerville, and Bruce S. Albright, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 19, 1991, Ser. No. 717,605
Int. Cl.[5] B60R *21/20;* **B65D** *41/16*
U.S. Cl. 280—731 **2 Claims**



1. An occupant restraint module comprising an inflator, a folded air bag, a support member having the inflator and the folded air bag mounted thereon and having a peripheral edge defined by a plurality of tabs spaced there along and projecting away from the air bag, a box-like cover assembly for covering the cushion and support member and including a base wall and side walls depending from the base wall and having an inturned flange having a plurality of slots spaced therealong in matching alignment with the tabs of the support member, and said tabs projecting from the support member having a length sufficient to extend through and beyond the slots of the cover assembly flange whereby the cover assembly is mounted on the support member by installing the flange of the cover over the support member with each one of the plurality of slots receiving a complementary one of the tabs of the support member and the tabs being crimped to permanently retain the cover assembly on the support member.

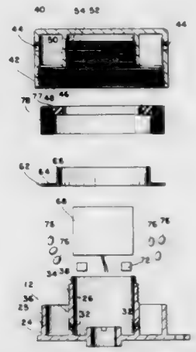
5,201,542
TWO PIECE INFLATOR HOUSING
Torbjorn Thuen, Morris Plains, and Allen Breed, Boonton Township, both of N.J., assignors to Breed Automotive Corporation, Boonton Township, N.J.
Filed Jul. 10, 1991, Ser. No. 728,890
Int. Cl.[5] B60R *21/26*
U.S. Cl. 280—736 **4 Claims**

1. An inflator for a motor vehicle passenger restraint system, said inflator comprising:

a first member having a first member base, a first member circular inner wall mounted transversely on said first member base, and a first member circular outer wall mounted transversely on said base annularly around said first member inner wall, said first member walls being threaded and being formed integrally with said first member base;

a second member having a second member base, a second member circular inner wall mounted transversely on said second member base, and a second member circular outer wall mounted transversely on said second member base anularly around said second member inner wall, said second member walls being threaded and being formed integrally with said second member base;

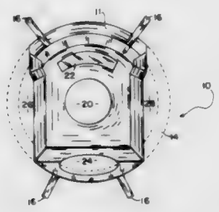
said first and second members being coupled by threadedly engaging said first member inner wall and said second member inner wall and by simultaneously threadedly engaging said first member outer wall and said second member outer wall to form an inner and an outer chamber respectively;



gas generator means disposed in said outer chamber; and

gas generator activating means disposed in said inner chamber for activating said gas generator means to produce an inflator gas.

5,201,543
STEERING WHEEL PROTECTIVE CUSHION
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and William A. Young, 2200 Hudson Dr., Carson City, Nev. 89701
Filed Jan. 13, 1992, Ser. No. 820,137
Int. Cl.[5] B60R *21/05*
U.S. Cl. 280—750 **4 Claims**



1. An inflatable cushion adapted to be mounted on the steering wheel of a vehicle comprising; a bladder, said bladder having air-inflating and deflating means, said cushion having removable mounting means to attach said cushion to said steering wheel, said cushion having at least one cavity and said cavity having a transparent covering.

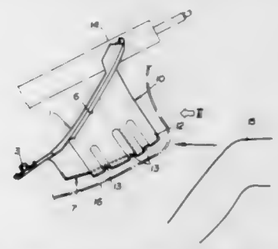
5,201,544
KNEE PROTECTOR DEVICE FOR AUTOMOTIVE VEHICLE
Minoru Matano, and Naofumi Ito, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 17, 1991, Ser. No. 686,450
Claims priority, application Japan, May 22, 1990, 2-132304
Int. Cl.[5] B60R *21/04*
U.S. Cl. 280—751 **2 Claims**

1. A knee protector device for an automotive vehicle which is disposed opposite to driver's knees and crosses over a steering column of the automotive vehicle, said knee protector device comprising:

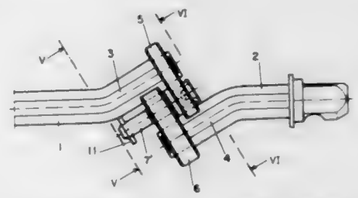
a protector base having first and second side portions opposite to each other relative to the steering column, said protector base being connected to a body of the automotive vehicle;

an inner protector of a generally semicylindrical shape fixedly connected to said first and second side portions of said protector base so as to be located opposite to the driver's knees, said inner protector having a supporting wall portion which projects at its center portion to said protector base, an end portion of said supporting wall portion being connected to said protector base; and

an outer protector of a generally semicylindrical shape located between said inner protector and the driver's knees, said outer protector being connected to said first and second side portions of said protector base, at least a part of said outer protector being overlapped on at least a part of said inner protector.



5,201,545
STEERING SHAFT FOR MOTOR VEHICLES
Sape J. Boersma, Bludesch, Austria, assignor to Etablissement Supervis, Vaduz, Liechtenstein
Filed Jan. 13, 1992, Ser. No. 820,092
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1991, 4102516
Int. Cl.[5] B62D *1/19*
U.S. Cl. 280—777 **9 Claims**



1. In a steering shaft for motor vehicles including at least two shaft portions which are movable relative to each other for reducing the length of the steering shaft in case of an axial load due to an accident, each shaft portion having an angled end portion, the end portions of the shaft portions being mounted so as to face each other and being arranged so as to be located next to each other, overlapping flanges being mounted on each end portion, wherein, in overlapping areas of the flanges, one of the flanges has bores, sleeves of macromolecular material being mounted in the bores, and wherein guide bolts fastened to another of the flanges extend into the bores, free ends of the guide bolts projecting beyond the flange with the bores, the improvement comprising tearable stop members mounted at the free ends of the guide bolts.

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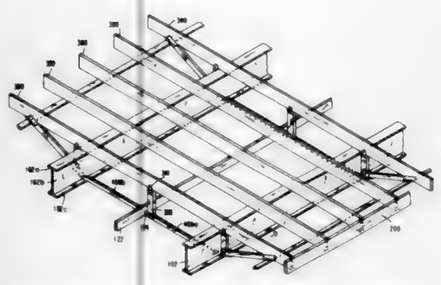
5,201,546

TOWABLE FLOOR FRAME ASSEMBLY

Fredrick H. Lindsay, Seminole, Fla., assignor to Lindsay Industries, Inc., Seminole, Fla.

Filed Oct. 11, 1991, Ser. No. 774,939
Int. Cl.[5] B62D *63/06*
U.S. Cl. 280—789 **16 Claims**



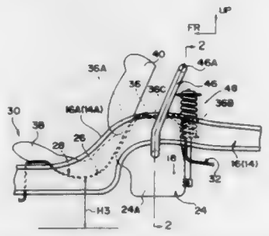
1. A towable unified floor frame assembly, comprising:
two elongate inner load-supporting steel I-beams disposed parallel to a longitudinal axis of said floor frame assembly, each of said I-beams having respective front and rear ends;
a front member and a rear member, connected normal to and between the respective front and rear ends of said I-beams;
a plurality of elongate metal cross members, each having an L-shaped cross-section with a vertical portion thereof disposed above a horizontal portion, said cross members extending normal to and between the I-beams and connected to at least lower flanges thereof;
an elongate inner member disposed longitudinally along said axis, said inner member being provided with a plurality of vertical notches which are shaped, sized and located to fit over and closely receive said vertical portions of said L-shaped cross members;
two elongate outer members attached to said front and rear end members to define therewith a perimeter of said floor frame assembly, said perimeter having substantially vertical inner and outer perimeter surfaces substantially defined by corresponding inner and outer surfaces of said outer members and said front and rear end members;
a plurality of trusses disposed normal to said I-beams and said outer members, said trusses being disposed at predetermined locations inwardly of said front and rear ends of said outer beams in correspondence with respective ones of said cross members, each truss being connected at respective outermost ends to said elongate outer members at said inner perimeter surface provided thereby, wherein each of said trusses comprises
an upper horizontal element disposed above said I-beams and having an uppermost surface coplanar with respective uppermost surfaces of said front and rear end members and said elongate outer members,
a vertically depending inner element located to fit to a side of said inner member and to end inside a corresponding L-shaped cross member,
two vertically depending outer elements, respectively located to each fit closely to the outermost edge of an upper flange of a corresponding one of said I-beams, and
two bracing members, each extending outwardly and upwardly from the lowermost end of a corresponding one of said outer elements to connect underneath the upper horizontal element at a location intermediate the closest I-beam and the closest distal end of said upper horizontal element;
a plurality of metal connecting elements, each attached underneath one of said inclined bracing elements beneath the respective lowermost end thereof and attached at a distal end to the closest I-beam, whereby each of said trusses is securely connected to both I-beams;
a floor mounted atop and to said elongate outer beams, said front and rear end members, and said trusses;
carrier means comprising a plurality of load-bearing wheels, said carrier means being shaped and sized to detachably attach underneath said I-beams; and
towing means securely attachable to said I-beams at the respective front ends thereof for applying a towing force to said floor frame assembly.

5,201,547

REAR UNDER BODY STRUCTURE

Hisashi Ogawa, and Masao Inoue, both of Okazaki, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 10, 1992, Ser. No. 848,211
Claims priority, application Japan, Apr. 10, 1991, 3-77875; Apr. 10, 1991, 3-77876; Apr. 10, 1991, 3-77877; Apr. 10, 1991, 3-77878
Int. Cl.[5] B60K *15/08*
U.S. Cl. 280—834 **16 Claims**



1. A rear under body structure of a front-engine front drive vehicle, comprising:
a rear floor pan;
a fuel tank disposed on a rear side of a seat back and on a lower side of said rear floor pan, said fuel tank being arranged on substantially the same straight line as an axis of a rear axle connecting left and right rear wheels;
rear floor side members connected to opposing sides of said rear floor pan; and
a subframe surrounding four sides of said fuel tank, said subframe being supported by said rear floor side members.

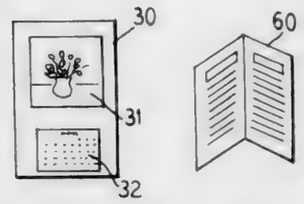
5,201,548

METHOD AND MEANS FOR PUBLISHING IMAGES HAVING COLORATION AND THREE-DIMENSIONAL TEXTURE

Stefan Lang, Scarborough, and Harvey Kalef, Toronto, both of Canada, assignors to Artagraph Reproduction Technology Incorporated, Ontario, Canada

Division of Ser. No. 507,743, Apr. 12, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 830,470
Int. Cl.[5] B42D *5/04*
U.S. Cl. 283—2 **4 Claims**

1. A reproduction of a sensible image having coloration and three-dimensional texture in fine detail, comprising:
a carrier made of an embossible material selected from a class including cellulosic paper and plastic sheet film and having a pictorial print of the sensible image affixed to one face of the carrier, which pictorial print has multiple colors displayed in an array of fine detail;
a three-dimensional image embossed in said carrier in registry with the pictorial print in accordance with the coloration and three-dimensional texture of said sensible image;



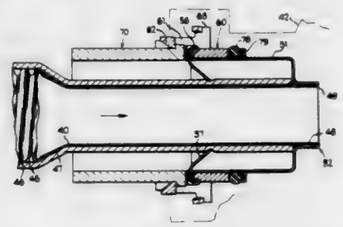
said carrier and the pictorial print affixed thereon thereby comprising a reproduction of the sensible image in substantially faithful detail.

5,201,549

THERMAL ISOLATION COUPLING SYSTEM

Mark J. Davey, North Aurora, Ill., assignor to Senior Engineering Investments, B.V., Amsterdam, Netherlands

Filed Jan. 17, 1992, Ser. No. 822,618
Int. Cl.[5] F16L *37/00*
U.S. Cl. 285—39 **12 Claims**



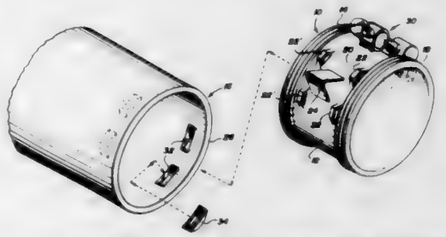
1. A thermal isolation coupling system for operably maintaining an end of a tube in substantially sealed insertably received attached alignment, within a housing aperture, having an inner surface, and having at least one engagement surface operably disposed adjacent said aperture, and said housing further having a substantially atmospheric ambient temperature fluid flow established therein, wherein the tube has a substantially greater than atmospheric ambient temperature fluid flow directed therethrough into said housing, said thermal isolation coupling system operably promoting transfer of heat away from the tube to, in turn, reduce the heat of said tube where it is attached to said housing, said thermal isolation coupling system comprising:
locking means operably associated with the tube end and cooperating with the housing to removably affix the tube end into a predetermined position relative to the aperture and the substantially atmospheric ambient temperature fluid flow;
a tube support member, having an extreme tip, operably interconnecting the tube end to the locking means, said tube support means being affixed at said extreme tip thereof to an extreme tip of the tube end, said tube support member circumferentially surrounding said tube end, the tube support member further being interlockingly received and circumferentially surrounded by the locking means at an end of the tube support member distal to the extreme tip thereof to enable positioning of the extreme tips of the tube end and of the tube support member, respectively, operably within said established substantially atmospheric ambient temperature air flow and to thermally isolate said tube support member, and in turn, said tube end from said inner surface of said aperture to substantially preclude heat conductive contact between said inner surface of said aperture and said tube support member; and
sealing means, operably associated with said tube support member and said locking means, for precluding escape of fluid from said substantially greater than atmospheric ambient temperature fluid flow from said aperture, and for facilitating said isolation of said tube support means.

5,201,550

PIPE COUPLING SYSTEM WITH THRUST RESTRAINT

John W. Burkit, P.O. Box 19, Kempton, Pa. 19529

Continuation-in-part of Ser. No. 643,744, Jan. 22, 1991, Pat. No. 5,092,633. This application Feb. 28, 1992, Ser. No. 843,554
Int. Cl.[5] F16L *21/02*
U.S. Cl. 285—109 **15 Claims**



1. In combination with a pair of aligned tubular members joined in end-to-end relationship by an internal expansion coupling device, the combination comprising
(a) each said tubular member characterized by the end thereof having at least one circumferentially disposed recess about its wall, and
(b) an elongated open ended tubular joint member formed from at least one relatively rigid, rectangular sheet-like member, said member being defined by a pair of opposing sheet ends and a pair of opposing sheet sides, where the sheet ends overlap such that the end portions thereof lie contiguous with each other; and at least one pair of axially aligned raised projections about the formed tubular joint member;
a continuous circumferential gasket sealing sleeve formed of an elastomeric material and overlapping each said sheet side about each open end of said tubular joint member, where said gasket sealing sleeve is adapted to lie adjacent to and be compressed against the inside wall of said tubular member; and
means accessible externally thereof for expanding said sheet-like member to bring said sheet ends towards one another, whereby said extending sheet-like member uniformly urges said elastomeric gasket sealing sleeve against the inside walls of said tubular member thereabout and said raised projections into engagement with said at least one recess.

5,201,551

TWIST CANISTER FOR ROTATING JOINT

William E. Rumberger, Newton Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 26, 1991, Ser. No. 736,202
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—119 **15 Claims**

1. A twist canister for connecting a conduit between structural members, said canister comprising:
a first member;
a second member positioned adjacent said first member and rotatable with respect to said first member about an axis common to both members through a predetermined angle;
means for connecting one end of said conduit to said first member; and

means for connecting the other end of said conduit to said

pipe and the small pipe coaxially overlapping when coupled by

wall of said recess, whereby said coupling can be perma-

means for mounting the pivotable member rotatably to the

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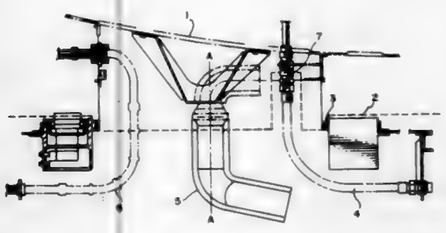
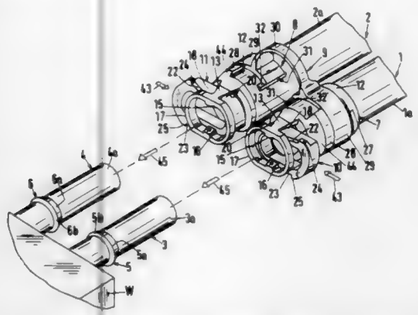
means for connecting the other end of said conduit to said second member after said conduit has been flexed about the rotational axis an angular amount equal to one half of



said predetermined angle when said first and second members are at the extreme of the predetermined angle with respect to each other about the rotational axis.

5,201,552
TWIN HOSE COUPLING
Ralf Hohmann; Ralf Spors, both of Bruchköbel, and Gerhard Winterstein, Bab Vilbel, all of Fed. Rep. of Germany, assignors to Rasmussen GmbH, Maintal, Fed. Rep. of Germany
Filed Nov. 7, 1991, Ser. No. 788,830
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1990, 4037308
Int. Cl.[5] F16L *39/02*
U.S. Cl. 285—137.1 **20 Claims**

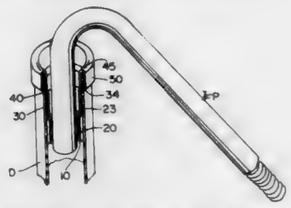


1. A device for separably coupling terminal portions of a first set of two tubular components with terminal portions of a second set of two tubular components, one for each component of the first set, comprising tubular connectors, one for each component of the first set and the respective component of the second set; and a flexible holder for said connectors, said holder and said connectors having means for separably securing said holder to at least one of said connectors, said holder comprising a discrete collar for each of said connectors and each of said collars extending along an arc of at least 180°, said holder further comprising two flexible uniting members connecting said collars to each other.

5,201,553
PIPE CONNECTOR FOR WASHING MACHINE DRAINAGE
William T. Grisham, 313 Westburg Ave., Huntsville, Ala. 35801
Filed Oct. 9, 1992, Ser. No. 958,831
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—177 **13 Claims**

1. A connector of pliable rubbery material for coupling a large pipe to a small pipe, the large pipe having an inner diameter greater than an outer diameter of the small pipe, the large pipe and the small pipe coaxially overlapping when coupled by said connector, said connector comprising:

a mutually coaxial plurality of right cylindrical smooth-walled sleeve sections each being of substantially identical uniform thickness and each having unique sleeve radius throughout its axial length, each one of said sleeve sections being joined at a respective sleeve end to another one of said sleeve sections to form a staggered configuration of said sleeve sections, said staggered configuration having a sequence of increasing sleeve radii; and



annular shoulders joining said sleeve sections to form said staggered configuration;

wherein when the small pipe is inserted coaxially into the large pipe and coupled thereto by said connector, one of said sleeve sections has an outside diameter dimensioned for gripping an interior surface of the large pipe by circumferential tension and compression of the rubbery material, and another of said sleeve sections has an inside diameter dimensioned for gripping an exterior surface of the small pipe by circumferential tension and compression of the rubbery material.

5,201,554
SWIVEL COUPLING WITH CORRUGATED TUBE, O-RING SEAL AND SPLIT RING CLIP
Jonathan W. Gagg, Llangyidr, Wales, and Michael J. Daisley, Barnet, England, assignors to Senior Flexonics Limited, England
Filed Feb. 26, 1991, Ser. No. 660,858
Claims priority, application United Kingdom, Feb. 28, 1990, 9004487; Sep. 21, 1990, 9020665
Int. Cl.[5] F16L *37/088*
U.S. Cl. 285—321 **12 Claims**

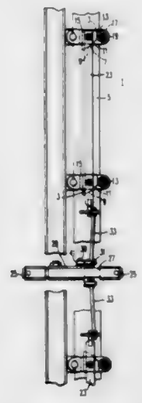
1. A coupling arrangement for providing a fluid tight swivel coupling between two fluid carrying members comprising:

a first fluid carrying member in the form of a continuously corrugated tube;

a second fluid carrying member having a cylindrical recess of substantially the same diameter as the largest outside diameter of said tube so that an end of said tube may be telescopically received within said recess, said second member having a grooved abutment formed in said recess;

a radially expandable split ring clip disposed in a corrugation of said tube adjacent the end thereof to engage with said abutment to retain said tube within said recess; and an o-ring seal disposed in a corrugation of the end portion of said tube spaced further from the end than said split ring to provide a fluid tight seal between said tube and the inner wall of said recess, whereby said coupling can be permanently assembled by merely manually inserting said tube end into said recess until said ring expands radially outwardly to engage said abutment.

5,201,555
DOGGING MECHANISM
Jeffry R. Meyer, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 14, 1991, Ser. No. 669,258
Int. Cl.[5] E05C *9/06*
U.S. Cl. 292—48 **6 Claims**



1. A dogging mechanism for a closure, the dogging mechanism comprising a plurality of lugs having a ramp portion and a plateau portion, a plurality of links pivotally mounted to cooperate with the lugs, a connecting bar pivotally connected to said links to form a parallel bar linkage, a roller rotatably connected to each of the links and disposed to engage the ramp portion of a cooperatively associated lug and roll thereon and onto the plateau portion of the cooperatively associated lug as the links are pivoted by the connecting bar, the roller mounted on a shaft having an eccentric portion for adjusting the position of the roller on said links as the shaft is rotated, an operating handle mounted for rotation and having a link rigidly connected to said handle and an operating bar connecting said handle link to the connecting bar to move the parallel bar linkage as the operating handle is turned and force the closure into a tightly closed position.

5,201,556
AMMUNITION COMPARTMENT BLAST DOOR LOCK
Donald H. Kendall, Almont, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. No. 845,282, Mar. 3, 1992, abandoned. This application Jun. 1, 1992, Ser. No. 891,249
Int. Cl.[5] E05C *9/20*
U.S. Cl. 292—257 **15 Claims**

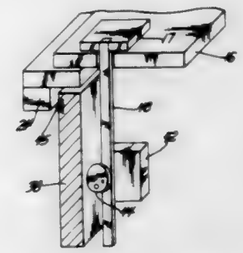
1. A locking mechanism for the door of a compartment, the locking mechanism actuated by motion of a compartment panel, the locking mechanism comprising:

a frame member fixed relative to the compartment;

a pivotable member remote from the panel;

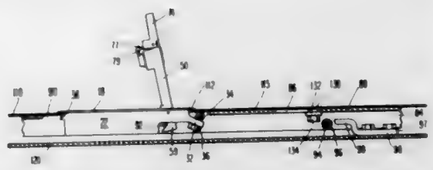
a door engagement zone on the pivotable member;

means for mounting the pivotable member rotatably to the frame member;



linkage means for rotating the pivotable member in response to motion of the panel, the linkage means connected between the pivotable member and the panel.

5,201,557
SLIDE FASTENER
Richard E. Schlack, Unionville, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Sep. 24, 1991, Ser. No. 764,897
Int. Cl.[5] E05C *00/00*
U.S. Cl. 292—161 **7 Claims**



1. A slide fastener for securing a door of an electrical cabinet to the cabinet frame, the door having an inner and an outer surface and an aperture formed therein proximate an edge thereof, the frame including an inner and an outer surface, the slide fastener releaseably retaining the door against the frame when the door and the frame are latched together, the slide fastener comprising a door assembly secured to the door and at least one slide keeper attached to the frame, the door assembly comprising:

a) a handle assembly including a lever assembly and a housing for rotatably mounting the lever assembly for rotation by an operator between a closed position to an open position;

(1) the housing including:

an upper plate having an opening formed therein and an inner surface, the inner surface of the upper plate abutting the outer surface of the door proximate the aperture when the slide fastener is mounted therein;

a pair of generally parallel side walls extending inward from the inner surface of the upper plate;

a pair of generally parallel end walls extending inward from the inner surface of the upper plate, the end walls being joined to the side walls;

a bottom plate joined to the side walls and an end wall, and generally parallel to the upper plate, the bottom plate having an opening formed therein; and

a keeper securing the lever assembly when the lever assembly is in the closed position, the keeper extending outward from the bottom plate and through the side walls;

(2) the lever assembly including:

a handle having a first end and a second end, the first end pivotably attached to the housing, and a first cam and a second cam, the first and second cams extend-

ing inwardly from the first end and within the opening

5,201,559

5,201,560

adjacent a forward edge thereof by first hinge means to

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ing inward from the first end and within the opening in the bottom plate of the housing;

a first biasing means engaging the first end of the handle and the housing, the first biasing means urging the second end of the handle away from the housing and the lever assembly from the closed position to the open position;

a button pivotably attached to the second end of the handle, the button having a lower surface and a catch formed thereon, the catch adapted to pass over and engage the keeper of the housing as the second end of the handle is pivoted by an operator toward the housing;

a second biasing means engaging the handle and the button, the second biasing means pivoting the button to a position in which the top surface of the button is flush with the top surface of the handle;

b) the slide assembly including:

a base plate having an opening formed therein for receiving the lever assembly, the base plate having at least one slot formed therein for slidably mounting the slide assembly on the inner surface of the door, the door having at least one slide post extending from the inner surface of the door and through the at least one slot;

a pair of generally parallel side plates extending from the base plate;

a cammed member extending between the side plates for engagement by the first and second cams of the lever assembly as the lever assembly is moved by an operator between the closed position and the open position, the slide being adapted for sliding movement in response to the rotation of the lever assembly; and

at least one locking member extending between the side plates and adapted to engage a respective slide keeper mounted on the frame when the lever assembly is rotated from the open position to the closed position.

5,201,558

FOLD-BACK DEFORMATION ARRANGEMENT

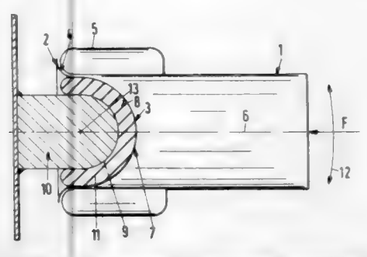
Holger M. Thum, Brunswick, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 10, 1992, Ser. No. 848,866

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1991, 4108681; Aug. 21, 1991, 4127652

Int. Cl.[5] B60R *19/02*

U.S. Cl. 293—133 **9 Claims**



1. A fold-back deformation arrangement comprising a tubular deformation member made of plastically deformable material and stop means having a fold-back surface engaging an end of the deformation member, the stop means being shaped so that, upon application of a force to be absorbed having a component directed in the longitudinal direction of the deformation member the deformation member is continuously folded back without buckling, wherein the stop means is arranged to permit angular motion of the deformation member with respect to the stop means about a point adjacent to the stop means.

5,201,559

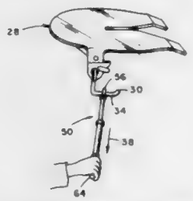
KING PIN RELEASE TOOL

Russell W. Boring, 3275 Twisted Oaks La., Jacksonville, Fla. 32223, and Walter Guntharp, Jr., 661 Holiday Dr., Fortville, Ind. 46040

Filed Dec. 3, 1990, Ser. No. 621,336

Int. Cl.[5] B25F *1/04*

U.S. Cl. 294—19.1 **20 Claims**



1. A tool for use when releasing the king pin from a fifth wheel coupling mechanism used for coupling a trailer to a tractor vehicle wherein the coupling mechanism includes a handle which must be moved from a lock position at which the king pin is captured by the coupling mechanism and a release position at which the king pin is released from the coupling mechanism and further includes a safety catch which must be moved to an out-of-the-way condition before the handle can be moved from its lock position to its release position, said tool comprising:

a pair of telescoping shafts, one shaft of which is mounted within the other shaft and which is telescopically movable relative to the other shaft between extended and retracted positions as the one shaft moves into and out of one end of the other shaft, the distance through which the one shaft is capable of moving relative to the other shaft between extended and retracted positions being at least 8.5 inches; and

a hook affixed to a telescoping end of one of the shafts for hooking the handle of the coupling mechanism;

said shafts being cooperable with one another so that said one shaft is prevented from being totally removed from the other shaft and so that when the shafts are positioned in the retracted position, the hook is hooked about the handle of the coupling mechanism, and the shaft to which the hook is not affixed is suddenly pulled away from the handle in a direction which corresponds generally with the direction in which the handle is moved when the handle is moved from its lock position to its release position and so that the tool suddenly telescopes to the extended position and the pulled shaft thereby moves through a distance which is at least as great as 8.5 inches, the momentum of the pulled shaft is transferred to the coupling mechanism handle through the hook so that the handle moves from its lock position to its release position; and

the shafts include cooperating means providing abutment surfaces for abutting one another over a relatively large area so that the momentum transferred from the pulled shaft to the coupling mechanism handle through the shaft to which the hook is attached is distributed over the relatively large area of the abutment surfaces; and

said hook has a C-shaped body portion opening generally in one direction and a flange portion attached to the C-shaped portion which defines a surface oriented to one side of the longitudinal axis of the shaft to which the hook is affixed and disposed to one side of the C-shaped portion opposite said one direction for moving the safety catch to its out-of-the-way condition when the safety catch is struck with said surface of said flange portion and so that movement of the safety catch to its out-of-the-way condition with the flange portion surface positions the C-shaped body portion in condition for hooking the coupling mechanism handle.

5,201,560

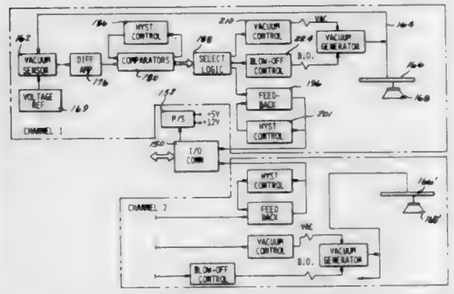
VACUUM CUP CONTROL APPARATUS

Michael J. Golden, Sterling Heights, Mich., assignor to John A. Blatt, Grosse Pointe Farms, Mich.

Continuation-in-part of Ser. No. 645,135, Jan. 24, 1991. This application Sep. 9, 1991, Ser. No. 756,497

Int. Cl.[5] B25J *15/06;* **F04F** *5/48*

U.S. Cl. 294—64.2 **9 Claims**



1. A vacuum control apparatus for applying a flow or pressurized air through a venturi to create a vacuum in a vacuum responsive device, the vacuum control apparatus comprising:

sensor means, disposed in fluid flow communication with a fluid flow conduit connected to the vacuum responsive device, for sensing the vacuum level applied to the vacuum responsive device and providing an output signal proportional thereto;

connector means, for receiving electrical signals specifying the application and release of vacuum in the vacuum responsive device;

first valve means for controlling the flow of pressurized air to the venturi;

control means, responsive to the sensor means and the connector means, for controlling the selective application of a predetermined vacuum pressure to the vacuum responsive device and the re-application of vacuum to the vacuum responsive device in the event of a decrease of vacuum below a predetermined level after vacuum is applied to the vacuum responsive device, the control means including:

comparator means, responsive to the sensor means output signal and a plurality of discrete, different reference signals, for comparing the sensor means output signal with each of the reference signal and generating one of a plurality of discrete outputs, each corresponding to a different vacuum level output;

means for selecting one of the comparator means outputs as an output specifying a predetermined amount of vacuum to the vacuum responsive device; and

first driver means, responsive to the output of the selecting means, for energizing the first valve means to supply pressurized air to the venturi to supply a specified vacuum level to the vacuum responsive device when the output signal of the sensor means indicates a vacuum level in the vacuum responsive device less than the selected vacuum level.

5,201,561

STORAGE UNIT FOR USE IN PICKUP TRUCKS

Michael F. Brown, 44 Hector La., Novato, Calif. 94949

Filed Feb. 15, 1991, Ser. No. 656,217

Int. Cl.[5] B60R *9/00*

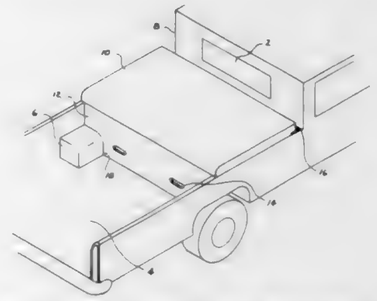
U.S. Cl. 296—37.5 **1 Claim**

1. A storage unit for use in pickup trucks, comprising:

a first member, a generally flat and horizontal panel which is attached to a forward topmost edge of a pickup truck bed by means of removable fasteners, and;

a second member, a generally flat panel pivotally mounted adjacent a forward edge thereof by first hinge means to the first member, thus allowing the second member to rotate to a generally vertical orientation parallel to and just behind a rear cab window, and;

a third member, a generally flat panel pivotally mounted by second hinge means to the second member at a rearward-most edge of the second member which allows said third member to rotate relative to the second member such that



with the second member generally horizontal and the third member generally vertical, said first, second, and third members form an enclosed space with the truck bed which can be made secure by latch means and which when the second and third members are raised, the second and third members articulate about the first and second hinge means to become parallel to one another in said generally vertical orientation.

5,201,562

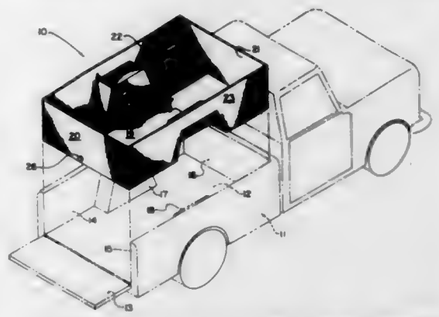
TRUCK POOL APPARATUS

Johnathan D. Dorsey, 5512 N. Garrison Ave., Tulsa, Okla. 74126

Filed Apr. 7, 1992, Ser. No. 864,589

Int. Cl.[5] B62D *33/02*

U.S. Cl. 296—39.2 **8 Claims**



1. A truck pool apparatus for reception within a truck bed, with the truck bed having a truck bed floor, a truck bed tailgate, and a truck bed forward wall, a truck left side wall spaced from a truck right side wall, and a truck right wheel well housing projecting through the floor adjacent the truck right side wall, and a truck left wheel well housing projecting through the truck bed floor adjacent the truck left side wall, the apparatus comprising,

a fluid container, the fluid container having fluid container floor arranged for complementary reception upon the truck bed floor,

and

a container rear wall spaced from a container forward wall, a container left side wall spaced from a container right

side wall, and a container left wheel well housing spaced

through, said washer-shaped body having aperture means

said rear end in said slot to releasably secure said cover

5,201,567

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side wall, and a container left wheel well housing spaced from a container right wheel well housing, with the container left wheel well housing arranged for receiving the truck right wheel well housing therewithin, and the container right wheel well housing arranged for receiving the truck right wheel well housing therewithin,

and

the container rear wall having a drain conduit directed therethrough adjacent the container floor,

and

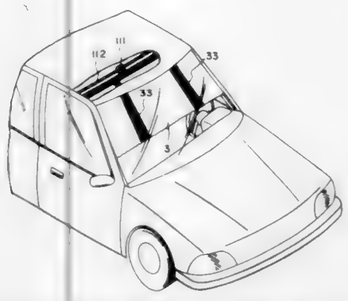
a conduit plug arranged for projection selectively within the drain conduit.

5,201,563

MOTOR VEHICLE WINDSHIELD CURTAIN CONTROL

Chuen R. Liao, No. 10, Alley 3, Lane 127, Lei Chung Street, Taichung City, Taiwan

Filed Mar. 17, 1992, Ser. No. 852,981
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.4 **5 Claims**



1. A motor vehicle windshield curtain control comprising: a casing located behind the windshield of a motor vehicle adjacent to a top portion of the windshield; side tracks located behind said windshield adjacent to opposite sides of the windshield; a curtain received inside said casing said curtain having a rear end edge, a front end edge and opposite side edges; and a driving mechanism including endless drive belts set inside said casing and controlled to let out or take up said curtain from the casing such that said curtain can be hung between said two side tracks to cover said windshield or be received inside said casing wherein said curtain has the rear end edge secured to said casing, the front end edge secured to said endless drive belts, and the two opposite side edges slidably secured by loops to a rod located inside each of said two side tracks.

5,201,564

SNAP-IN VISOR MOUNT

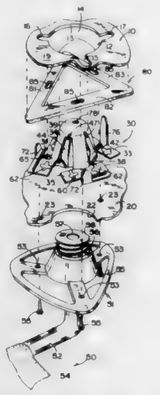
Rodger A. Price, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Continuation-in-part of Ser. No. 577,330, Sep. 4, 1990, Pat. No. 5,061,005, which is a continuation-in-part of Ser. No. 394,937, Aug. 16, 1989, Pat. No. 4,989,911. This application Sep. 18, 1991, Ser. No. 763,652
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.9 **24 Claims**

1. A mounting system for the snap-in mounting of a vehicle visor within an aperture formed in a sheet metal support member of a vehicle roof comprising:

a mounting member having a first support surface facing one side of a vehicle support member when installed and support means for extending through an aperture in the vehicle support member for engagement with an opposite side of the vehicle support member, said system including visor bracket means for attaching a visor thereto; and

an anti-rotation compression member having a substantially flat thin planar generally washer-shaped body having a central opening for receiving said support means therethrough, said washer-shaped body having aperture means for receiving fastening means therethrough for attaching said visor bracket means to said mounting member, said compression member extending between said mounting



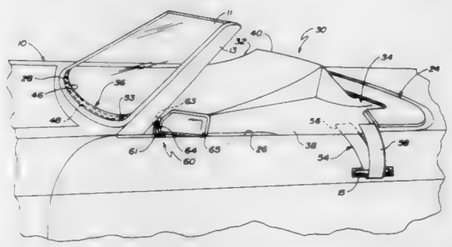
member and at least one side of said vehicle support member to be compressed between said mounting member and the vehicle support member once said mounting member is installed.

5,201,565

METHOD AND APPARATUS FOR COVERING A VEHICLE INTERIOR

Anthony J. Berardino, 135 Golden Ridge Rd., Danville, Calif. 94526

Filed Dec. 11, 1991, Ser. No. 805,038
Int. Cl.[5] B60J *11/00*
U.S. Cl. 296—136 **21 Claims**



1. An interior cover for a vehicle interior of a vehicle including a rear interior portion and a front dashboard portion having vertically extending windshield posts on opposed sides of the vehicle, said vehicle further including a slot extending transversely across the vehicle form proximate one side of the vehicle to proximate the other side of the vehicle, said slot being defined by one of a body panel defining a trunk opening and a movable trunk lid, and a convertible top storage compartment wall and a movable compartment top, said interior cover comprising:

flexible sheet-like cover means extending from a rear end positioned proximate said rear interior portion to a front end positioned proximate said dashboard portion to substantially cover said interior;

rear securing means coupled to said cover means proximate said rear end and formed for fastener-free securement of

said rear end in said slot to releasably secure said cover means to said rear interior portion; and

front securing means coupled to said cover means proximate said front end and formed for fastener-free securement of the front end between the windshield posts to releasably secure said cover means over said interior proximate said dashboard portion.

5,201,566

FRONT BODY STRUCTURE FOR VEHICLES

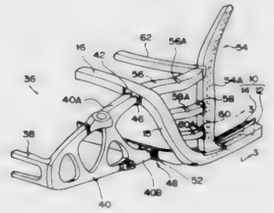
Takeo Mori, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 20, 1992, Ser. No. 854,870
Claims priority, application Japan, Mar. 25, 1991, 3-060430
Int. Cl.[5] B62D *25/08*
U.S. Cl. 296—192 **18 Claims**

1. A front body structure for vehicles comprising:

a first frame having a closed cross-sectional structure extending in a lengthwise direction of a vehicle body and forming a part of a side sill, said first frame curving at a front portion of said first frame toward an upper side in a vertical direction of the vehicle body and again curving at a front portion of said first frame toward an inner side in a transverse direction of the vehicle body to form a cowl front portion;

a second frame having a closed cross-sectional structure extending in the lengthwise direction of the vehicle body and forming together with said first frame the side sill, said



second frame curving at a front portion of said second frame toward the inner side in the transverse direction of the vehicle body to form a dash cross portion; and

a front side frame provided in a vicinity of a side portion of a front portion of the vehicle body and bifurcated, from a front side in the lengthwise direction of the vehicle body toward a rear side in the lengthwise direction of the vehicle body, into an upper bifurcated portion and a lower bifurcated portion, said upper bifurcated portion joining said cowl front portion from the front side in the lengthwise direction of the vehicle body so as to be substantially horizontal to and even with said cowl front portion, said lower bifurcated portion joining said dash cross portion from the front side in the lengthwise direction of the vehicle body so as to be substantially horizontal to and even with said dash cross portion.

5,201,567

STORABLE SEATING UNIT

Kim A. Beasley, Alexandria, Va., assignor to Paralyzed Veterans of America, Washington, D.C.

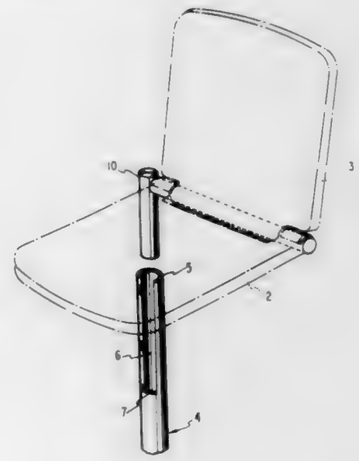
Continuation of Ser. No. 579,548, Sep. 10, 1990, Pat. No. 5,083,386. This application Jan. 2, 1992, Ser. No. 815,520
The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.
Int. Cl.[5] A47C *1/121*
U.S. Cl. 297—335 **9 Claims**

1. A storable seating unit comprising:

(a) an at least approximately vertical pedestal member in the form of a hollow pipe having a central axis, said hollow pipe having a first abutment surface and a second abutment surface angularly spaced about said central axis from said first abutment surface;

(b) an L-shaped slide comprising:

(i) an at least approximately vertical leg received in said hollow pipe and sized and shaped to slide vertically therein and



(ii) an at least approximately horizontal leg connected to the upper end of said at least approximately vertical leg of said L-shaped slide and extending radially outwardly of said hollow pipe;

(c) a seat back mounted on said at least approximately horizontal leg of said L-shaped slide;

(d) a seat bottom comprising a first tubular bearing means that is pivotably mounted on said at least approximately horizontal leg of said L-shaped slide for pivotable movement of said seat bottom relative to said at least approximately horizontal leg of said L-shaped slide into a position juxtaposed against said seat back,

whereby said storable seating unit can be manipulated back and forth between:

(e) a first position in which:

(i) said L-shaped slide is supported by said first abutment surface and

(ii) said seat bottom and said seat back are pivoted away from each other, allowing a person to sit in said storable seating unit, and

(f) a second position in which:

(i) said L-shaped slide is supported by said second abutment surface and

(ii) said seat bottom and said seat back are juxtaposed against each other.

5,201,568

5,201,571

of the variable-volume chamber of one sensor is substantially

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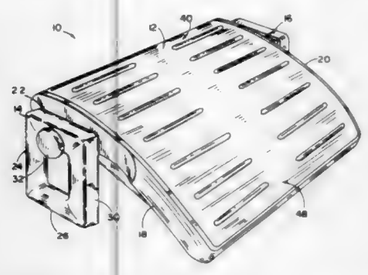
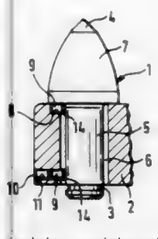
5,201,568
FOOT REST
Terry B. Christensen, Jr., Sunnyvale, Calif., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 10, 1991, Ser. No. 712,506
Int. Cl.[5] A47C 7/50
U.S. Cl. 297—439 24 Claims



1. An adjustable foot rest, comprising:
a foot pad having an upper surface and lateral sides, said upper surface having an elliptical shape inside elevation along said lateral sides to permit users to place their feet at different foot angles throughout the length of said pad;
a pair of rectangular legs, each leg having four sides; and
pivot means operatively connected to said legs for eccentrically mounting and pivoting said legs to said lateral sides of said foot pad whereby said upper surface may be adjusted with respect to ground to four different height positions corresponding to which sides of the rectangular legs are in contact with the ground upon pivoting of said legs.

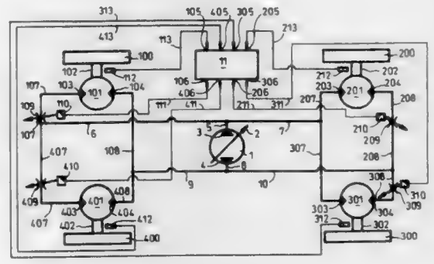
5,201,569
MOUNTING FOR RECEIVING A MINING PICK BIT
Jädke Jürgen, Hölterbusch 8, 4320 Hattingen, Fed. Rep. of Germany
Filed Feb. 25, 1992, Ser. No. 841,014
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1991, 9102668
Int. Cl.[5] E21C 35/18
U.S. Cl. 299—86 8 Claims



1. A housing for receiving a mining pick bit having a head and a fully round shaft which is to be secured and rotatable within said housing, wherein said housing is provided at at least one end, with at least two local supports for guiding said bit shaft at equally spaced positions around said shaft whilst providing free spaces between said shaft and an interior wall surface of said housing for conveying out spoil mining material which has entered between said bit and said housing;
wherein at least at the upper end of said housing said supports are made from or include carbide; and
wherein each support comprises a carbide bolt which is secured in a cavity in a wall of said housing.

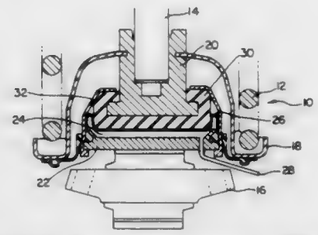
5,201,570
VEHICLE EQUIPPED WITH AN ANTI-SKID SYSTEM
Jean A. Heren, Compiegne; Jacques P. Fontaine, Verberie, and Pierre Fillion, Pontpoint, all of France, assignors to Societe Anonyme: Poclain Hydraulics, France
Filed Mar. 3, 1992, Ser. No. 845,176
Claims priority, application France, Mar. 19, 1991, 91 03347
Int. Cl.[5] B60K 28/16
U.S. Cl. 303—10 2 Claims

1. A vehicle equipped with a plurality of displacement members, at least certain of which being coupled to a fluid motor and comprising a pressurized fluid supply circuit comprising, in addition to said motors:
a source of pressurized fluid connected to a fluid delivery conduit;
at least two fluid supply conduits each connected, in parallel, to said fluid delivery conduit; and to a particular one of said fluid motors, the latter each comprising a fluid exhaust conduit;
devices for measuring the speed of at least those of the displacement members coupled to said particular motors;
restrictions of adjustable values which are disposed on at least one of the fluid supply and fluid exhaust conduits of said particular motors, one on at least one of each fluid supply and fluid exhaust conduit, and are provided with individual devices for adjusting their values;



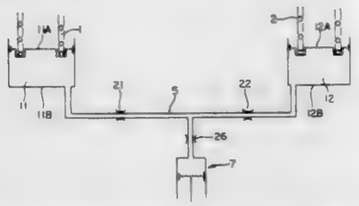
a reference speed of displacement members is selected;
a processing device, incorporated in the vehicle, which compares each measured speed of said displacement members coupled to the particular motors, with said reference speed and which generates, for each particular motor, a correction signal, the processing device comprising as many output connections, where the correction signals are available, as there are restrictions, each correction signal corresponding to the measured speed of a displacement member coupled to one of said particular motors;
while each outlet connection is connected to the device for adjusting the value of the restriction placed on either the fluid supply conduit or on the fluid exhaust conduit of the particular motor corresponding to the correction signal generated by the processing device from the measured speed of the displacement member coupled to said particular motor, wherein it comprises front and rear displacement members, each coupled to one of said particular motors, each particular motor being of a reversible type, while a restriction of adjustable value is placed on the supply conduit of each particular motor coupled to the rear displacement members, another restriction of adjustable value likewise being placed on the exhaust conduit of each motor coupled to the front displacement members.

5,201,571
BEARING PIECE FOR A SUSPENSION ELEMENT
Philippe Castel, Paris, France, assignor to Bendix Europe Services Techniques, Drancy, France
Continuation of Ser. No. 557,270, Jul. 25, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 832,672
Claims priority, application France, Aug. 31, 1989, 89 11410
Int. Cl.[5] B60G 7/00
U.S. Cl. 303—22.5 19 Claims



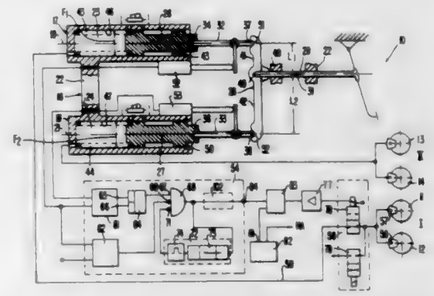
1. A suspension unit of a motor vehicle, the suspension unit including a pressure sensor for a fluid-controlled brake regulator and a bearing piece mounted between a suspension element and a part of the vehicle by means of an elastic bearing, the sensor comprising piston means which moves counter to pressure prevailing in an adjacent leaktight chamber, and pressure means for effecting a minimum threshold pressure in the leaktight chamber so that a negative pressure cannot occur in said leaktight chamber, the threshold pressure being an overpressure of fluid contained in the leaktight chamber and created by the pressure means which includes a layer of elastic material connected with the piston means and engaging a diaphragm of said leaktight chamber, and the elastic material prestressed against the diaphragm by the bearing piece which is a stationary cap engaging the elastic material.

5,201,572
CIRCUIT CONTROLLING A FLUIDICALLY CONTROLLED BRAKE REGULATOR
Philippe Castel, Paris, France, assignor to Bendix Europe Services Techniques, Drancy, France
Filed Oct. 31, 1990, Ser. No. 606,976
Claims priority, application France, Nov. 30, 1989, 89 15771
Int. Cl.[5] B60T 8/18
U.S. Cl. 303—22.5 3 Claims



1. A circuit controlling a fluidically controlled brake regulator in dependence on the load of a vehicle having at least two suspension members, each suspension member cooperating with a respective fluidic pressure sensor to control said brake regulator in dependence on the load carried by only one of the suspension members, namely the suspension member carrying the lighter load, wherein the pressure sensors are connected to one another and to said regulator and each sensor located apart from said regulator, each of said sensors comprising a variable-volume chamber whose volume is variable between a value substantially equal to zero and a predetermined maximum value, and wherein the circuit containing the sensors and the regulator is filled with a volume of fluid such that the volume of the variable-volume chamber of one sensor is substantially equal to said predetermined maximum value when the volume of the variable-volume chamber of the other sensor is substantially equal to zero during which the regulator operates responsively to the one sensor and the suspension member carrying the lighter load.

5,201,573
HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM
Heinz Leiber, Oxerriexingen; Manfred Steiner, and Walter Klinkner, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Aug. 31, 1990, Ser. No. 575,634
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928874
Int. Cl.[5] B60T 8/32, 11/24, 15/02
U.S. Cl. 303—92 22 Claims



1. A hydraulic dual-circuit brake system for a road vehicle having front-axle and rear-axle brake circuits for respective front-wheel and rear-wheel brakes, comprising a brake booster which as a first output pressure chamber allocated to the front-axle brake circuit through a first master brake line and a second output pressure chamber allocated to the rear-axle brake circuit through a second master brake line, master cylinders having master cylinder pistons displaceable therein to different positions under pedal force control for building up brake pressures in the chambers coupled into the front-wheel and the rear-wheel brakes, a valve arrangement operatively connected with the brake circuits selectively to block off a malfunctioning, poorly bled or leakage-failing brake circuit constituted by one of the front-axle and rear-axle brake circuits from the respective first and second master brake line, sensors individually associated with each of the master cylinder pistons and operatively arranged to emit electrical output signals characteristic of the different positions of the master cylinder pistons, and an electronic control device operatively associated with the sensors for processing the output signals to generate a control signal for the valve arrangement, at least when the piston positions represented by the output signals of the sensors deviate by more than a tolerance margin compatible with proper functioning of the brake system, such that the valve arrangement blocks off the malfunctioning, poorly bled or leakage-failing brake circuit, which causes a deviation of a position of the master cylinder piston associated therewith from a set point range, from the master brake line associated with the malfunctioning, poorly bled or leakage-failing brake circuit, wherein the electronic control device includes a comparator operatively arranged to compare positions, represented by the two output signals of the sensors, of the master cylinder pistons to one another and to generate a signal to drive the valve arrangement into a blocking position as soon as the position of the master cylinder piston associated with the front-axle brake circuit corresponds to a stroke which is greater by more than a threshold value than the stroke of the master cylinder piston associated with the rear-axle brake

circuit represented by an output signal generated by the sensor

rected flange member at the front edge of each cabinet

a counter for supporting a light transmissive object, said

5,201,579
LAMP HOUSING MOUNTING ARRANGEMENT

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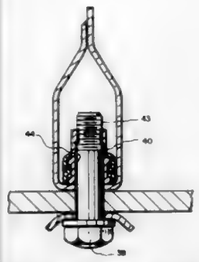
circuit represented by an output signal generated by the sensor associated therewith and allows the output signal to decay again when a difference of strokes of the pistons falls below a smaller threshold value.

5,201,574

CLEAT RETAINING BOLT AND NUT FOR VEHICLE ENDLESS TRACK

M. Elmer James, Mendon, and Micheal G. Beeley, Logan, both of Utah, assignors to Logan Manufacturing Company, Logan, Utah

Filed Mar. 2, 1992, Ser. No. 844,769
Int. Cl.[5] B62D *55/26*
U.S. Cl. 305—35 EB **3 Claims**



1. A cleat to be mounted upon the flexible belting of a vehicle endless track, the track comprising at least one endless flexible belt carrying longitudinally spaced sets of holes for mounting the cleat transversely to the belt, said cleat comprising:

an elongate grouser plate having a generally planar belt contacting portion, having mounting holes therethrough matching the holes of one of the sets carried by the belt;

an elongate backing plate laterally spanning the belt, and having holes matching the mounting holes of the grouser;

a mounting bolt operable through each of the matching holes to secure the backing plate, the belt and the grouser together, said bolt having an enlarged head portion and an elongate unthreaded shank portion extending a substantial distance beyond the grouser mounting hole to join with an end portion carrying external threads; and

a torque nut having an elongate body spanning from the bolt threads to the grouser, having a longitudinal bore therethrough with an internally threaded end portion joining an unthreaded, shank clearing portion, the latter spanning from the threaded portion to an opposite, grouser-bearing end thereof.

5,201,575

CONTAINER STORAGE CABINET

Peter Stolzel, 613 Mary Street North, Oshawa, Ontario, Canada L1G 5E8

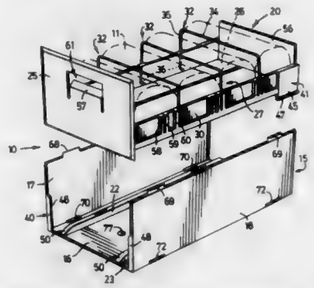
Filed Dec. 20, 1991, Ser. No. 811,053
Int. Cl.[5] A47B *88/18*
U.S. Cl. 312—323 **19 Claims**

1. A container for storing articles in a readily accessible manner, comprising:

an open ended channel shaped cabinet body having a bottom and two side walls, and rail means upstanding from said cabinet body bottom and extending longitudinally thereof;

a drawer slidable in said cabinet body on said rails and having a front end, a back wall, a bottom, and side walls upstanding from the bottom; and

cooperating pivoting means located near the front of said cabinet body and the rear of said drawer to permit a hinging-like rotation of the drawer on the body, whereby to enable the drawer to hang downwardly from the front end of said body for article handling, said cooperating pivoting means comprising an upstanding, inwardly directed flange member at the front edge of each cabinet body side wall, and a ledge member extending beneath the drawer bottom and outwardly of each of the drawer side



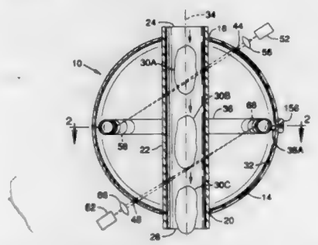
walls, said flanges and ledges cooperating to permit said hinging-like rotation, to enable said drawer to hang substantially vertically downwardly.

5,201,576

SHADOWLESS SPHERICAL ILLUMINATION SYSTEM FOR USE IN AN ARTICLE INSPECTION SYSTEM

Henry P. Squyres, Medford, Oreg., assignor to Simco/Ramic Corporation, Medford, Oreg.

Filed Apr. 30, 1992, Ser. No. 876,922
Int. Cl.[5] G03B *15/00*
U.S. Cl. 362—3 **20 Claims**



1. A shadowless illumination system, comprising:

a spherical chamber having a reflective inside surface, and chamber entrance and exit openings;

a transparent tube positioned inside the chamber between the chamber entrance opening and the chamber exit opening;

a light source providing illumination inside the chamber; and

the chamber including a number of viewing openings positioned such that a corresponding number of inspection cameras may be positioned to view all portions of an article passing through the tube.

5,201,577

SUPPORT STRUCTURE HAVING BUILT-IN LIGHT SOURCE

Hirotsugu Suzuki, 514, Nougayamachi, Machida-shi, Tokyo, and Michio Terajima, Machida, both of Japan, assignors to Hirotsuga Suzuki, Tokyo, Japan

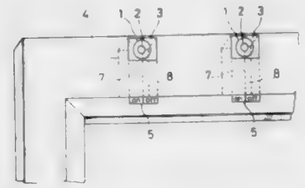
Continuation of Ser. No. 700,366, May 13, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 894,862
Claims priority, application Japan, Jan. 16, 1991, 2-70233
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 **15 Claims**

1. A support structure having a built-in light source for illuminating the interior of a light transmissive object positioned above said light source comprising:

a counter for supporting a light transmissive object, said counter having an aperture therein;

a light source positioned to send light upwardly through said aperture in said counter;

a convex lens spaced above said light source and below but adjacent to said counter for concentrating the light from



said light source into a focused beam shining upwardly out of said aperture in said counter; and

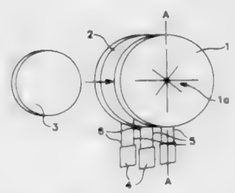
a transparent plate substantially even with said counter covering said aperture in said counter for supporting a light transmissive object to be illuminated by the focused beam of light from said convex lens.

5,201,578

LIGHTED JEWELRY

Randy C. Westmoland, P.O. Box 92, Skiatook, Okla. 74070

Filed Aug. 2, 1991, Ser. No. 739,856
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—104 **37 Claims**



1. An article of jewelry, comprising:

a body consisting of first and second plate members, each of said first and second plate members having an upper surface, a lower surface, and an outside edge positioned between said upper surface and said lower surface, said first and second plate members being held in parallel and spaced apart relationship by resilient means and having electrically conductive means associated therewith,

at least one lighting element having two electrically conductive leads,

a battery sized to fit between and be confined by and contact said plate members and said electrically conductive means,

means to attach said article of jewelry to a person or an article of clothing, wherein

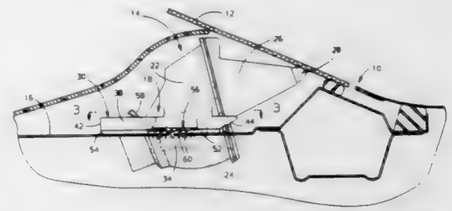
each of said plate members is provided with at least one hole extending from the outside edge of said plate member into said plate member between said upper surface and said lower surface of said plate member and intersecting said electrically conductive means, said electrically conductive leads are attached in an electrically conductive manner to said plate members, one lead being attached to said first plate member and the other lead being attached to said second plate member by insertion of said leads into said holes, said leads being electrically connected to said electrically conductive means of said plate members via said holes, and said battery supplying electricity through said electrically conductive means and said lighting element leads to illuminate said lighting elements.

5,201,579

LAMP HOUSING MOUNTING ARRANGEMENT

James A. Roof, West Bloomfield, and Kenneth J. Foley, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 741,019, Aug. 6, 1991, abandoned. This application Mar. 30, 1992, Ser. No. 859,793
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—368 **10 Claims**



1. A mounting arrangement for connecting a lamp housing to a support panel having a slot formed therein, said slot including an access portion and a retainer portion, a pawl formed in said support panel adjacent of the slot, a hold-down member formed with said housing and cooperating with said slot and the pawl for maintaining the lamp housing in a fixed position relative to the support panel, said hold-down member including a body portion fixed with said lamp housing, a lock arm having one end thereof connected to said body portion by a hinge means which biases the lock arm towards the support panel, a plurality of ratchet teeth formed on said lock arm for engagement with the pawl, the other end of the lock arm being formed with a release means for moving the lock arm in a direction away from the support panel for releasing the lock arm from engagement with the pawl, and an insert member connected to said body portion and including a leg depending from said body portion and terminating with a contact foot so as to allow the contact foot of the insert member to be initially inserted through the access portion of said slot after which the lamp housing together with the hold-down member is shifted towards the retainer portion of the slot whereupon the ratchet teeth of the lock arm engage the pawl and the contact foot is located in the retainer portion for cooperation with the underside of the support panel to lock the lamp housing to the support panel.

5,201,580

IMPINGEMENT MIXING DEVICE

Adolf Bauer, Olching, Fed. Rep. of Germany, assignor to Krauss Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 327,379, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 884,917, Jul. 14, 1986, abandoned. This application Aug. 29, 1990, Ser. No. 576,107
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 352500
Int. Cl.[5] B01F *15/02*
U.S. Cl. 366—159 **36 Claims**

1. An impingement mixing device comprising:

a mixing chamber housing;

a control piston axially displaceable within said mixing chamber housing between an extended position and a retracted position;

a mixing chamber within said housing defined by an end face of said control piston when in the retracted position and a mixing chamber outlet corresponding with an end face of said control piston when in the extended position;

a first component feed line associated with a first inlet duct in said mixing chamber housing in a first radial plane;

a first component recirculation return line disposed in said mixing chamber housing in said first radial plane and associated with said first component feed line;

first passage means for establishing fluid communication

a valve for controlling the flow of sample gas to the chamber

steel alloy comprising 23–27 weight % chromium, 5–11%

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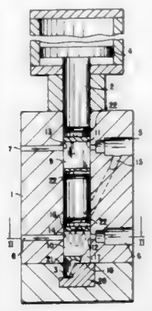
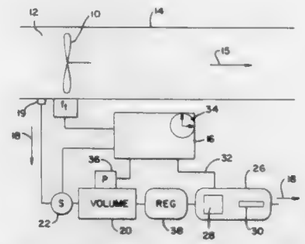
first passage means for establishing fluid communication between said first component feed line and said first component recirculation return line, in said control piston, when said control piston is in the extended position;
a first material input duct disposed in a wall of said mixing chamber in a second radial plane wherein said first material input duct is blocked when said control piston is in the extended position;
a first component bypass line between said first component feed line and said first material input duct;
a second component feed line in said mixing chamber housing between said first radial plane and said mixing chamber outlet;
a second component recirculation return line in said mixing chamber housing between said first radial plane and said mixing chamber outlet;



second passage means for establishing fluid communication between said second component feed line and said second component recirculation return line when said control piston is in the extended position;
a second material input duct associated with said second component feed line disposed in a wall of said mixing chamber in said second radial plane;
wherein said first and second material input ducts are exposed, and said first and second component recirculation return lines and first inlet duct are blocked, when said control piston is in the retracted position;
wherein said second component feed line and said second component recirculation return line are disposed in said second radial plane; and
said control piston exhibits a stepped end face and a stepped end portion wherein a lateral surface of said stepped end portion blocks said second recirculation return line when said control piston is in said retracted position.

5,201,581
METHOD AND APPARATUS FOR MEASURING MASS FLOW AND ENERGY CONTENT USING A LINEAR FLOW METER
William H. Vander Heyden, Mequon, Wis., and William H. Clingman, Jr., Dallas, Tex., assignors to Badger Meter, Inc., Milwaukee, Wis.
Filed Nov. 18, 1991, Ser. No. 793,753
Int. Cl.[5] G01N *25/22*; G01F *9/00, 1/00*
U.S. Cl. 374—36 **33 Claims**

1. An apparatus to be used with a linear flow meter to measure a ratio of a mass flow rate of a pipeline gas through a pipeline compared to a mass flow rate of a sample gas tapped from the pipeline, the apparatus comprising:
a chamber having a section with a fixed volume for containing the sample gas, the sample gas being maintained at substantially the same temperature as the pipeline gas in the pipeline when contained in the chamber section;
means for routing the sample gas to the chamber section;
a valve for controlling the flow of sample gas to the chamber section;
a flow controller for flowing the sample gas from the chamber section at a selected rate;
a pressure sensor for measuring the sample gas pressure in the chamber section;
means for closing the valve when the sample gas pressure in the chamber section reaches the pressure of the pipeline gas in the pipeline; and
a timer for measuring a time interval for the sample gas to flow from the chamber section at the selected rate beginning when the sample gas pressure in the chamber section



drops below a first pressure, and ending when the sample gas pressure in the chamber section drops below a second pressure, the first pressure being greater than about one-half of the pipeline gas pressure in the pipeline and the second pressure being less than about one-half of the pipeline gas pressure in the pipeline; and
a controller which receives a signal from the timer and a signal from the linear flow meter representing the volumetric flow of the pipeline gas through the pipeline and derives the ratio of the mass flow rate of the pipeline gas through the pipeline compared to the mass flow rate of the sample gas.

11. A method for measuring a mass flow ratio

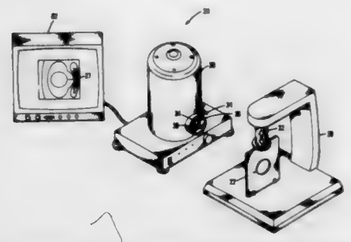
$$\left(\frac{\omega_f}{\omega_m}\right)$$

of a pipeline gas through a pipeline compared to a sample gas tapped from the pipeline, the method comprising the steps of:
measuring the volumetric flow rate of the pipeline gas through the pipeline with a linear flow meter;
flowing the sample gas to a chamber having a section with a fixed volume;
maintaining the temperature of the sample gas at substantially the same temperature as the pipeline gas in the pipeline when the sample gas is in the chamber section;
stopping the flow of sample gas to the chamber section when the pressure in the chamber section reaches the pressure of the pipeline gas in the pipeline;
flowing the sample gas from the chamber section after the flow of the sample gas to the chamber section is stopped, thereby reducing the sample gas pressure in the chamber section;
timing the interval of time t_m for the sample gas to flow from the chamber section at a selected rate beginning when the sample gas pressure in the chamber section drops below a first pressure and ending when the sample gas pressure in the chamber section drops below a second pressure wherein the first pressure is greater than about one-half of the pipeline gas pressure in the pipeline and the second pressure is less than about one-half of the pipeline gas pressure in the pipeline; and
deriving the mass flow ratio

$$\left(\frac{\omega_f}{\omega_m}\right)$$

of the pipeline gas through the pipeline compared to the sample gas tapped from the pipeline from a signal f_f from the linear flow meter that is related to the volumetric flow rate of the pipeline gas, and the time interval t_m.

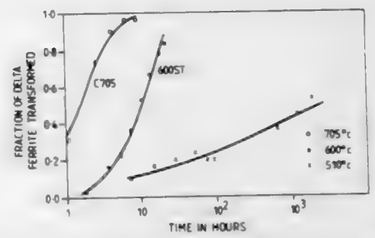
5,201,582
DIFFERENTIAL TEMPERATURE STRESS MEASUREMENT EMPLOYING ARRAY SENSOR WITH LOCAL OFFSET
Jon R. Lesniak, Madison, Wis., assignor to Stress Photonics, Inc., Madison, Wis.
Filed May 15, 1992, Ser. No. 884,067
Int. Cl.[5] G01N *25/00, 3/32*
U.S. Cl. 374—45 **29 Claims**



1. An apparatus for measuring the stress distribution in an object comprising:
a) an infrared detecting array having a plurality of infrared sensors wherein the array is adapted to receive an infrared image corresponding to an object, and wherein each detector has a capacitor adapted to charge in response to the photon flux incident upon said sensor;
c) a read out circuit adapted to periodically measure the charge on each capacitor;
d) a memory adapted to store a local off-set value for each sensor within the array;
e) a digital-to-analog convertor adapted to produce an analog voltage proportional to a local off-set value corresponding to a particular array sensor read from the memory; and
f) an analog-to-digital convertor operably connected to the read out circuit and the digital-to-analog convertor to provide a digital signal proportional to the differential of the charge on each sensor capacitor and its corresponding analog local off-set value.

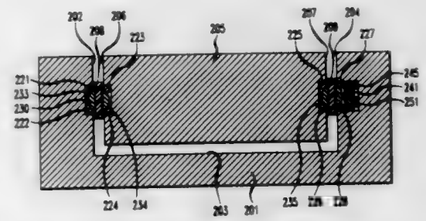
5,201,583
TEMPERATURE HISTORY INDICATOR
Joseph K. L. Lai, Kowloon, and Brian J. Duggan, Hong Kong, both of Hong Kong, assignors to British Technology Group Limited, London, England
Continuation of Ser. No. 567,374, Aug. 15, 1990, Pat. No. 5,096,304. This application Mar. 16, 1992, Ser. No. 851,499
Claims priority, application United Kingdom, Aug. 17, 1989, 8918774
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] G01K *7/38*
U.S. Cl. 374—176 **9 Claims**

8. A method of obtaining information about the temperature history of a thing, comprising the steps of:
associating a thing beforehand with a temperature history indicator being a non-structural piece of a duplex stainless steel alloy comprising 23–27 weight % chromium, 5–11% nickel, and at least about 63% iron,
allowing the temperature to fluctuate in such a way as irreversibly to alter its magnetic properties, thereafter



measuring the magnetic properties of said piece, and from the change in magnetic properties, deducing such information.

5,201,584
MECHANISM FOR PRELOADING LINEAR BEARING SLIDES
Everett F. Simons, Cedar Knolls, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 762,515, Sep. 18, 1991, abandoned. This application Oct. 1, 1992, Ser. No. 956,434
Int. Cl.[5] F16C *29/04, 29/12*
U.S. Cl. 384—49 **3 Claims**



1. A linear slide for a rectilinear motion device; comprising:
an outer member having a primary channel and an inner member located within the primary channel;
first and second linear bearing mechanisms on opposing sidewalls of the primary channel to support and guide the inner member;
a preloading bar contiguous with the second linear bearing mechanism;
a longitudinal spring having a substantially longitudinal sinusoidal contour and being extended longitudinally along the second linear bearing mechanism and located adjacent an inner surface of the outer member and positioned for applying a compressive force against the preloading bar;
the outer member including a secondary longitudinal channel in the wall adjacent to the second linear bearing mechanism into which the preloading bar and the longitudinal spring are inserted with the spring fitted between the base of the longitudinal channel and the preloading bar; and
the preloading bar including a longitudinal groove for accepting and positionally constraining the adjacent spring and a longitudinal pedestal extending along the length of the preloading bar and in contact with a base surface of the secondary longitudinal channel to supply a force operative to reduce rotational compliance of the preloading bar relative to the outer member.

5,201,585
TAPERED JOURNAL BEARING WITH SQUEEZE

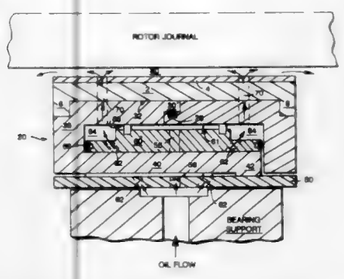
actuated by the controller and which acts upon said adjustable

proper and openably with respect thereto, an openable free end

5,201,590
IMAGE RECORDING APPARATUS

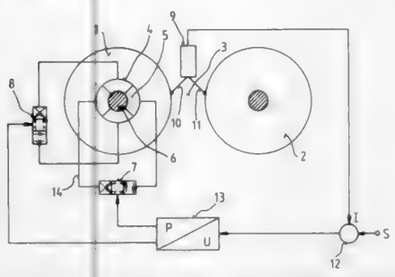
VOL 1149 ISS 2 AP 13 1993 UMI

5,201,585
FLUID FILM JOURNAL BEARING WITH SQUEEZE FILM DAMPER FOR TURBOMACHINERY
Bruce E. Gans, Beverly, Mass., and John H. Vohr, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 31, 1991, Ser. No. 814,900
Int. Cl.[5] F16C *17/02*
U.S. Cl. 384—99 **13 Claims**



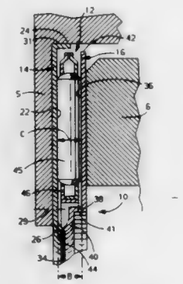
1. A bearing for a rotatable shaft comprising:
a journal bearing having a cylindrical bearing surface supporting a journal surface of said shaft,
a spring support having a cylindrical surface supporting said journal bearing, a plurality of spring bars extending radially outward of said cylindrical surface, and
a stationary ring assembly around said spring support having an annular inner surface supporting said spring bars.

5,201,586
ARRANGEMENT FOR THE DYNAMIC COMPENSATION OF ECCENTRICITIES OF SOLIDS OF ROTATION
Clifton Zimmermann, Karlsruhe; Norbert Holl, Battenberg; Helmut Lewin, Bobenheim-Roxheim, and Juergen Wippel, Sinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 409,335, Sep. 19, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 643,709
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832236
Int. Cl.[5] F16C *23/10, 32/04;* **B21B** *31/26;* **B65H** *20/00*
U.S. Cl. 384—247 **4 Claims**



1. An arrangement for keeping the nip between two rolls at a constant width comprising an adjustable bearing supporting one of said rolls at either end, said adjustable bearing is adjustable perpendicularly to its axis of rotation in a first direction toward and away from the other of said rolls as well as in a second direction perpendicular to said first direction, a measuring means which senses the running of the rolls at their peripheral surface, a controller which has an actual value input and a target value input, and which is connected to the measuring means at the actual value input, and a control element which is actuated by the controller and which acts upon said adjustable bearings so as to keep the width of said nip constant despite eccentricitites of the bearing supporting the rolls and of the shape of said rolls.

5,201,587
DISENGAGING NEEDLE ROLLER THRUST BEARING ASSEMBLY
James A. Springer, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 30, 1992, Ser. No. 860,400
Int. Cl.[5] F16C *19/30*
U.S. Cl. 384—620 **11 Claims**

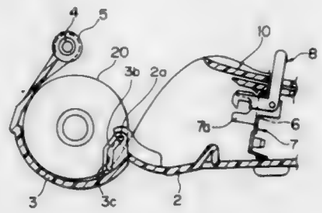


1. A thrust bearing for use between a first member and a second member, that rotate relative to one another about an axis and are intermittently pressed toward each other, the bearing comprising:
a first generally annular race associated with the first member having a first thrust surface opposite the first member;
a second generally annular race associated with the second member having a second thrust surface facing the first member;
a caged needle roller assembly including
a generally annular roller retention cage disposed between the first race and the second race, and
a complement of rollers retained in the cage generally parallel to the thrust surfaces and engaged between the races when the members are loaded; and
resilient means for axially displacing the races to provide a gap width between the races exceeding a diameter of the rollers, thereby reducing contact between the rollers and thrust surfaces and reducing bearing noise.

5,201,588
PRINTER WITH OPENABLE PAPER WEB CASSETTE MOUNTING A PLATEN ROLLER
Katsuyuki Sakai, Nara; Kenichi Shiraishi; Shigeru Kida, both of Yamatokoriyama, and Ryoichi Kawai, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 26, 1992, Ser. No. 857,769
Claims priority, application Japan, Mar. 27, 1991, 3-63473
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—120 **3 Claims**

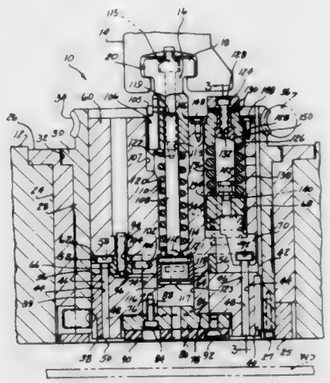
1. A printer in which a rolled recording paper is housed in a recording paper cassette and printing onto the recording paper is carried out by conducting electrical current to a thermal recording head while the recording paper being clamped by the thermal recording head and a platen roller, wherein the recording paper cassette is formed integrally with a printer

proper and openably with respect thereto, an openable free end of the recording paper cassette is mounted with the platen



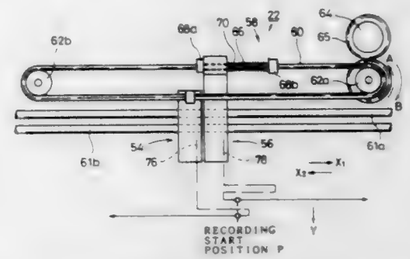
roller and the thermal recording head is disposed in said printer proper.

5,201,589
MARKING TOOL HOLDER FOR A PUNCH PRESS
Victor L. Chun, Holland; James R. Hunter, Chadds Ford, and George Jaworski, Bala Cynwyd, all of Pa., assignors to Murata Wiedemann, King of Prussia, Pa.
Continuation-in-part of Ser. No. 354,945, May 22, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 479,944
Int. Cl.[5] B41J *1/54*
U.S. Cl. 400—134 **7 Claims**



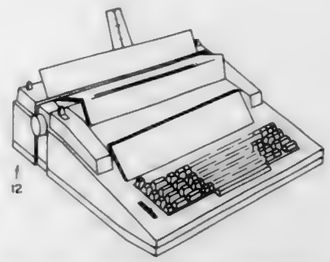
1. In combination with a marking tool holder (**10**) for a punch press of the type including a ram (**14**) adapted to be stroked and cause a selected one of a plurality of marking tools (**46**) carried in the holder (**10**) to be forced against the surface of a workpiece (W) and make an impression therein, driving means (**124, 126, 138, 134, 150, 70**) acting between said ram (**14**) and said selected marking tool (**46**) causing said movement of marking tool (**46**);
characterized by stiff spring means (**138**) interposed between said ram (**14**) and said selected marking tool (**46**), said driving means causing advance of said selected marking tool (**46**) a distance towards a workpiece such that said stiff spring means is only very slightly compressed by stroking of said ram (**14**) to force a marking tool (**46**) against the surface of a workpiece (W), whereby said interposed stiff spring means (**138**) accommodates slight variations in said marking tool position to insure proper marking pressure without adjustment of said marking too position.

5,201,590
IMAGE RECORDING APPARATUS
Kunio Hakkaku, Ashigarakami; Satoshi Morita, Ayase; Susumu Tomoda, Ayase; Akira Masuda, Ayase, and Shinji Odagiri, Ayase, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 1, 1991, Ser. No. 769,304
Claims priority, application Japan, Oct. 1, 1990, 2-263485; Mar. 20, 1991, 3-056552; May 27, 1991, 3-121468
Int. Cl.[5] B41J *1/50*
U.S. Cl. 400—150 **5 Claims**



1. An image recording apparatus comprising:
first and second recording heads each used to record a visible image on a recording medium; and
a drive means for moving said first and second recording heads along a first axis which intersects a second axis along which said recording medium is fed, said driving means moving said first recording head in a first direction along the first axis and said second recording head in a direction opposite the first direction, such that said first and second recording heads retreat from each other while simultaneously and independently recording a visible image on the recording medium.

5,201,591
CHARACTER PRINTING DEVICE WITH PRESSURE IMPACT CONTROL
Hiroyuki Ueda, and naoki Shimada, both of Irvine, Calif., assignors to Canon Business Machines, Inc., Costa Mesa, Calif.
Continuation of Ser. No. 638,546, Jan. 8, 1991, abandoned. This application Apr. 27, 1992, Ser. No. 873,988
Int. Cl.[5] B41J *1/34*
U.S. Cl. 400—166 **27 Claims**



1. An impact-type printing device for printing in a normal and copy modes of operation, comprising:
means for printing a character with a plurality of impression pressures including a high impression pressure sufficient for printing on all the sheets of a set of copy sheets;
selecting means for manually selecting one of a plurality of impression pressures when said device operates in the normal mode; and
means for manually switching said device between the nor-

mal operation mode and a copy mode of operation,

said shifting means so that said shift lever can be ro-

row form an area to accommodate a long fingernail, which

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DRAFT PAPER PACK FOR A COMPUTER

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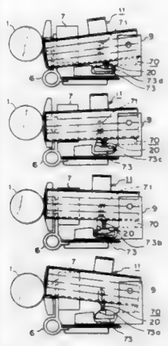
mal operation mode and a copy mode of operation, wherein in the normal mode said printing means is capable of printing with nay of said plurality of impression pressures selected by said selecting means, wherein in the copy mode said printing means prints only with the high pressure sufficient for printing on all of the sheets of the set of copy sheets, and wherein said manual switching means comprises a separate component or components from said selecting means.

5,201,592

REINKING COLOR RIBBON CASSETTE AND INK RIBBON SELECTION MECHANISM

Minoru Mizutani, and Masanori Maekawa, both of Tokyo, Japan, assignors to Oki Elecric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 737,999
Claims priority, application Japan, Aug. 7, 1990, 2-207670
Int. Cl.[5] B41J *32/00*
U.S. Cl. 400—194 **27 Claims**



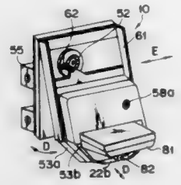
1. A reinking color ribbon cassette for a printer, comprising
(a) plural ink ribbons of different colors, said ink ribbons being arranged independently from one another in a stacked relationship;
(b) shifting means for selecting at least one ink ribbon of a desired color, said shifting means shifting said ink ribbons in a direction perpendicular to a feeding direction of said ink ribbons;
(c) plural ink feeding means for feeding color inks to the response ink ribbons, said ink feeding means being arranged in a stacked relationship corresponding to said ink ribbons;
(d) ribbon drive means for driving a ribbon feeder;
(e) ribbon feeding means for independently feeding the respective ink ribbons, said ribbon feeding means including
(1) a drive gear holder;
(2) drive gears having axial bores stacked corresponding to said ink ribbons, respectively, said drive gears being held by said drive gear holder;
(3) idle gear holders;
(4) idle gears stacked corresponding to said respective drive gears, each said idle gear being held by said respective idle gear holder so that each idle gear is pressed against a corresponding drive gear with a corresponding ink ribbon being pressed therebetween;
(5) a drive shaft engageable with said ribbon drive means, said drive shaft rotating integrally with said ribbon drive means;
(6) a shift gear rotatable integrally with said drive shaft; and
(7) a shift lever provided in parallel with said drive shaft, said shift lever being engageable in an axial bore of the drive gear corresponding to the ink ribbon selected by said shifting means so that said shift lever can be rotated; and
(f) a single casing enclosing therein said ink ribbons, said ink feeding means and said ribbon feeding means.

5,201,593

PRINTING APPARATUS WITH MULTIPLE RIBBON CASSETTES

Takeshi Yamagata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 25, 1991, Ser. No. 796,802
Claims priority, application Japan, Nov. 27, 1990, 2-324299
Int. Cl.[5] B41J *33/54*
U.S. Cl. 400—214 **10 Claims**



1. A printing apparatus comprising:
driving means including a reversible motor being able to rotate in both a forward direction and a reverse direction;
first transmission means comprising a gear for transmitting torque of the driving means;
second transmission means comprising a gear for transmitting torque transmitted from said first transmission means;
swaying means comprising an arm located at an end of said first transmission means;
means for printing comprising a plurality of ink ribbon cassettes wherein one of said ribbon cassettes is disposed in a printing position to print an image on a recording medium, said ribbon cassettes being connected to one another in a superposed relationship;
ink ribbon take-up means for taking up ink ribbons contained in the ribbon cassettes; and
means for changing the position of the ribbon cassettes so as to replace one ribbon cassette with another ribbon cassette in said printing position;
said swaying arm means being able to be swayed so as to be selectively engageable with either said ink ribbon take-up means or said ink ribbon cassette changing means for selectively transmitting the torque from said driving means to either said ribbon take up means or said cassette changing means.

5,201,594

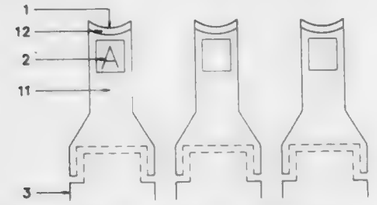
NAIL SAVER EXTENSION KEYS

Raphael Adinolfi, 515 72 St., Brooklyn, N.Y. 11209, and Axa Larriuz-Moe, 914 E. 19 St., Brooklyn, N.Y. 11230

Filed Jun. 9, 1992, Ser. No. 895,719
Int. Cl.[5] B41J *5/16*
U.S. Cl. 400—490 **14 Claims**

1. A keyboard for business machines of the electronic type comprising a plurality of keys arranged in rows across the keyboard from right to left, each of said keys having an anterior wall facing an operator, a posterior wall, and a top surface, the posterior wall being substantially flat and vertical, the anterior wall being formed with a concave recess such that the distance between the posterior and an anterior walls decreases as these walls approach the top surface, the anterior and posterior walls become parallel adjacent the top surface, whereby said concave recesses in the anterior surface of the keys of one

row form an area to accommodate a long fingernail, which extends from a finger placed on a top surface of a key in a row



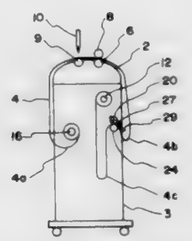
in front of said one row, so that upon depression of a key, a long fingernail will not contact any other key.

5,201,595

ROLLED SHEET FEEDING MECHANISM OF PAPER-DRIVE TYPE AUTOMATIC DRAFTING MACHINE

Seiji Oda, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Filed Feb. 13, 1992, Ser. No. 834,786
Claims priority, application Japan, Mar. 25, 1991, 3-83054
Int. Cl.[5] B41J *15/16*
U.S. Cl. 400—618 **4 Claims**



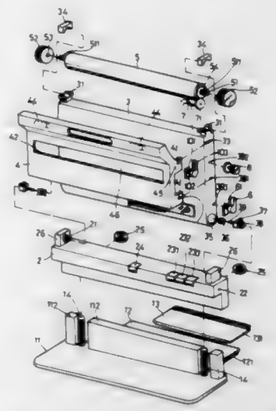
1. In a rolled paper feeding mechanism of a paper-drive type automatic drafting machine, which mechanism comprises: pressing rollers, drive rollers, a platen, a pair of leg plates and rolled paper supporting means for storing paper sheets in rolled form on which a drawing operation is to be performed, the improvement comprising:
said platen secured on said pair of leg plates,
said rolled paper supporting means rotatably mounted between said pair of leg plates and below said platen to feed said paper sheets to said platen and said pressing and drive rollers,
first and second tension rollers both of which include a central axis secured to one of said pair of leg plates, said first and second tension rollers being provided in a paper sheet conveying route between the rolled paper supporting means and the platen with a gap therebetween, slightly larger than a thickness of the paper sheet, and
a tension braking means having a predetermined weight for applying a braking force to the paper sheet passing through the gap, said tension braking means being secured to the central axis of the first tension roller to swingably face said second tension roller and press against said second tension roller with a predetermined force, through the paper sheet, in correspondence to the predetermined weight of said tension braking means.

5,201,596

DRAFT-PAPER RACK FOR A COMPUTER

Yeong-San Yang, Tao-Yuan, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 18, 1992, Ser. No. 854,546
Int. Cl.[5] B41J *29/15*
U.S. Cl. 400—718 **1 Claim**



1. A draft-paper rack structure to be used with a computer for holding paper, comprising:
a three-piece chassis including three base elements, which are assembled together by means of a plurality of mating flanges and first grooves thereof, wherein at least one of said base elements being able to extend outwardly, and at least one of said base elements having guard blocks and screw rods on top thereof;
a supporting seat having a seat block on both ends thereof, a step key, a forward rotation key, a backward rotation key, and a switch key, all of which being electrically connected to a circuit board; a power supply terminal being furnished at one end of said supporting seat; a ratchet receiving means; and at least two nuts being furnished thereon to be mated with said corresponding screw rods respectively, for adjustably mounting said supporting seat on said chassis;
a rack for holding paper; said rack having an upper end, a lower end, two sides and a front face, and a first roller seat at both upper and lower ends thereof; each of said first roller seats having a second groove and a first round hole, in which a ball and a first spring are loaded therewithin; a plurality of second round holes and a sliding slot at both said upper and lower ends of said rack; a second spring and a ratchet fastening block in said second round hole at said lower end whereby said second spring being adapted to push against said ratching fastening block so as to engage it with said ratchet receiving means on said supporting seat after said rack is mounted on said supporting seat; a battery seat and a circuit board being mounted below said rack; a third round hole on one side of said rack; a pushing knob and a pushing plate; a pin receivable by said third round hole for mounting said pushing knob and said pushing plate;
a transparent hood having a rear side and a plurality of cylindrical studs to be mated with said second round holes and said sliding slot on said rack for mounting said transparent hood on said front side of said rack; a window with a line indicator; a rear side having a plurality of roller supporting arms thereon; and a first roller connected to each of said roller supporting arms;
a second roller being mounted on said second groove of each of said first roller seats; said second roller containing a fastening stud on both ends thereof for mounting said

second roller on said first roller seat, said two second

and is convex when seen in a direction normal thereto, the

pletely filled, and with a substantially centrally arranged bal- mount on the annular top face, the method comprising the

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second roller on said first roller seat, said two second roller seats being mated with said two first roller seats, respectively; each of said fastening studs having a spline portion which pushes said ball in said first roller seat slightly downward; an adjusting knob mounted on said second roller which can be rotated manually to move a draft paper mounted on said rack; an electro-motive adjusting knob; and a motor and a gear being controlled by said electro-motive adjusting knob for rotating said roller to move said draft paper; and means for mounting

said structure on a computer key board so as to place a draft paper between a computer screen and a keyboard thereof at different slanting angles to provide a clear and easy key-in operation.

5,201,597

COMPOUND ELEMENT

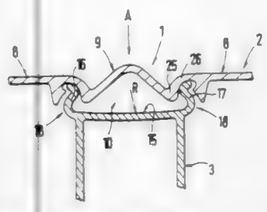
Willi Wurl, Niefern-Oeschelbronn, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Apr. 2, 1991, Ser. No. 679,201

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012206

Int. Cl.[5] **F16B** *11/00*; **B21D** *39/03*

U.S. Cl. 403—274 **16 Claims**



1. A compound element comprising:

at least one plate-shaped element having substantially flat, exterior wall portions and a profiled deformable holding web that has edge portions, the plate-shaped element formed by an extruded profile made of light metal and having a molded-on downward-projecting supporting arm, said holding web being freely accessibly arranged adjacent to the wall portions of the plate-shaped element, said edge portions having a cross-sectional widening and a curved transition area; and

an oblong profile part formed by an extruded profile and having a receiving device corresponding to the holding web, said receiving device having at least one lateral boundary formed by a thin-walled, approximately S-shaped molded-on part of the profile part, said holding web interacting with the receiving device of the profile part in such a manner that by the deformation of the holding web, a form-fitting joined connection of the compound element is formed;

wherein the cross-sectional widening, the curved transition area, and the downward-projecting supporting arm encloses both sides of the S-shaped molded-on part of the profile part in a form-fitting manner when the compound element is formed.

5,201,598

ATTACHMENT OF CORD TO TUBE END USING LOCKING SLEEVE TO PERMIT EASY CORD REPLACEMENT

Frank V. Tehan, 1801 Eastshore Hwy., Berkeley, Calif. 94710

Filed Jul. 31, 1991, Ser. No. 738,320

Int. Cl.[5] **B25G** *3/14*

U.S. Cl. 403—372 **10 Claims**

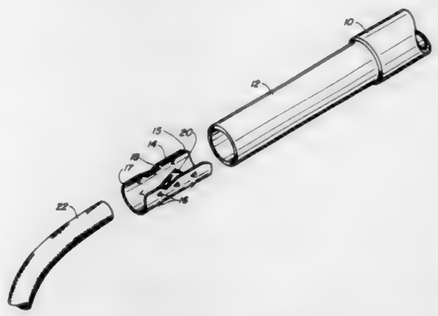
1. A section of tubing having a locking cord attached to one end of said section of tubing, comprising:

a locking sleeve comprising a resilient member having two opposing major surfaces, one of which is an outer surface and is convex when seen in a direction normal thereto, the other of which is an inner surface and is concave when seen from a direction normal thereto, said locking sleeve having a longitudinal gap defined by opposed edges,

said resilient member being concentric to a longitudinal axis thereof,

said resilient member having sleeve locking means protruding from said outer surface of said resilient member and extending in one direction relative to said longitudinal axis, said sleeve locking means engaging an inner wall of said section of tubing so as to lock said sleeve within said section of tubing adjacent an end thereof,

said resilient member having cord locking means protruding from said inner surface of said resilient member in a second direction opposite to said one direction relative to



said longitudinal axis said cord locking means comprising a plurality of prongs on the edges defining said longitudinal gap and a tongue on said inner surface,

said cord comprising an elongated length of cord having one end thereof inserted into said locking sleeve so that said cord locking means engages said cord and locks said cord within said sleeve,

whereby said cord can be easily replaced from one side of said section of tubing if said cord frays, tears, or is broken by cutting said cord off adjacent to said sleeve so as to leave a section of said cord remaining in said sleeve, removing said section of cord remaining in said sleeve by pushing it back in said second direction so as to disengage it from said sleeve, and inserting an end of a new cord into said locking sleeve.

5,201,599

STABILIZED BARREL-LIKE TRAFFIC CONTROL ELEMENT

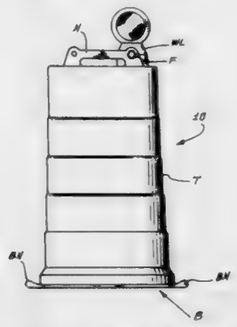
Jack H. Kulp, San Juan Capistrano, Calif.; John D. McKenney, Taos, N. Mex., and James P. Sullivan, Orange, Calif., assignors to TrafFix Devices, Inc., San Clemente, Calif.

Continuation of Ser. No. 666,916, Mar. 11, 1991, abandoned, which is a division of Ser. No. 443,517, Nov. 29, 1989, Pat. No. 5,026,204. This application Sep. 22, 1992, Ser. No. 949,333

Int. Cl.[5] **E01F** *13/00*

U.S. Cl. 404—6 **10 Claims**

1. A method of ballasting the base element of a separable, two-piece traffic channelizing element comprising the steps of providing a base element for a two-piece traffic control element wherein one piece comprises a hollow element having a barrel-like configuration adapted to traffic channelization signalling purposes and a second piece is a base element and wherein the two pieces are attachable together and completely detachable from one another including upon a substantial impact with a motor vehicle, molding the base element from a preselected plastic material to have a dome-like outer configuration with a hollow interior chamber of a preselected volume for receiving a preselected quantity of a solid ballast means for providing a preselected weight when said volume is completely filled, and with a substantially centrally arranged ballast receiving aperture, and a separate cover for releasably closing the ballast receiving aperture to maintain any ballast means within the chamber in an essentially leak-free relationship when the cover closes said receiving aperture, selecting the vertical height of the base element to permit the base element including when the cover is secured thereto to be driven over with a motor vehicle without engaging the underside of the motor vehicle when said hollow element is detached from the base element, reinforcing the bottom side of the base element with corrugations shaped into parallel grooves and ridges for stiffening the base element, the ridges being defined to engage a supporting surface for the base element whereby the base element is prevented from sagging in response to the weight of ballast means stored within the base, selecting ballast



means from a preselected, solid ballast means capable of filling the complete hollow interior chamber of the base element and filling the chamber with the selected ballast means by packing the ballast means therein, and then closing the ballast receiving aperture with the cover to provide a ballasted base element for the two-piece traffic channeling element for maintaining the ballast means in place within the base element for preventing any loss of the selected ballast means from said chamber including when the hollow element is impacted and separated from the base element, the selected ballast means being characterized as being sufficiently compressible and deformable so that said preselected plastic material will deform slightly along with said ballast means when packed therein for completely filling said chamber, in response to the weight of a motor vehicle thereon thereby preventing the destruction of said base element by the motor vehicle.

5,201,600

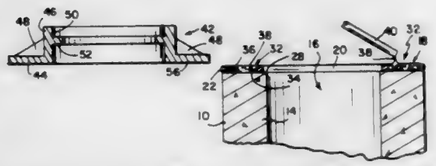
MANHOLE SEALING APPARATUS AND METHOD

Henry E. Topf, Jr., Roachdale, and Gregg A. Gillentine, Greenwood, both of Ind., assignors to Miller Pipeline Corporation, Indianapolis, Ind.

Filed Sep. 26, 1991, Ser. No. 766,626

Int. Cl.[5] **E02D** *29/14*

U.S. Cl. 404—25 **53 Claims**



1. A method of providing a sealed bond between a manhole having an annular top face and a manhole frame configured to mount on the annular top face, the method comprising the steps of

establishing an annular channel on the annular top face of the manhole,

filling the annular channel with a liquid sealing material, then

putting the manhole frame over the annular top face of the manhole in contact with the liquid sealing material in the channel, and

curing the liquid sealing material to bond the manhole to the manhole frame and establish a fluid-tight seal therebetween to block inflow of fluid into the manhole through a space between the manhole and the manhole frame.

5,201,601

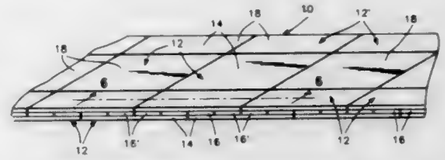
BOARD MAT CONSTRUCTION

T. K. Stanley, and Cary S. Farrar, both of P.O. Box 31, Waynesboro, Miss. 39367

Filed Sep. 17, 1991, Ser. No. 760,917

Int. Cl.[5] **E01C** *5/14*, *9/08*

U.S. Cl. 404—35 **11 Claims**



1. A board mat construction for soft ground, said mat construction including a plurality of rectangular, panel-like first and second mat structures, said mat structures each including opposite transverse end margins and opposite side longitudinal margins and defining a first rectangular surface, a second rectangular surface facing opposite and paralleling said first surface, said second surface including a pair of opposite end portion elongated long structures disposed transverse to the corresponding mat structure having remote longitudinal sides generally flush with said end portions and opposite ends generally flush with said longitudinal margins, the area of said second surface between each pair of log structures being substantially rectangular and of a length, taken longitudinally of said mat, substantially equal to one-half the length of said mat, the width of said log structures being substantially equal to one-fourth the length of said mat, the surfaces of said log structures facing in the direction of said second surface being generally co-planar and spaced a predetermined distance outward of said second surface, said first mat structures being arranged in a first row of end abutted and aligned first mat structures with said first surfaces thereof facing upwardly, said second mat structures being arranged in a second row of end abutted and aligned second mat structures with said second mat structures disposed in one-half lengthwise staggered relation relative to said first mat structures and with said first surfaces of said second mat structures facing downwardly and the end log structures of adjacent ends of said second mat structures snugly received upwardly into the spacing of the first mat structure disposed thereabove between the end log structures thereof and the end log structures of adjacent ends of said first mat structures being snugly received downwardly into the spacing of the second mat structure disposed therebelow between the end log structures thereof.

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screed for leveling and compressing the paving material into a

its spring-load to form a circumferential opening in combi-

side portion, the hollow cylinder including at least one

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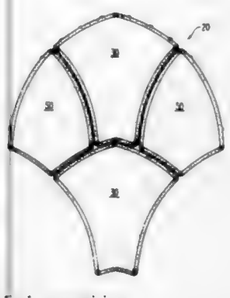
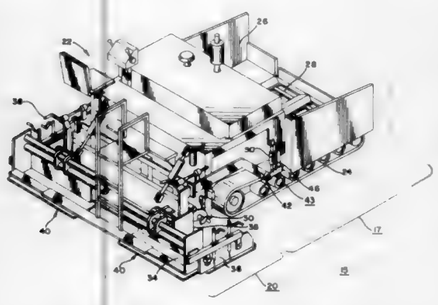
5,201,602
PAVING BLOCK ASSEMBLY AND PAVING BLOCKS THEREFOR
John Repasky, Hanover, Pa., assignor to Hanover Architectural Products, Inc., Hanover, Pa.
Continuation-in-part of Ser. No. 666,702, Mar. 8, 1991, abandoned. This application Sep. 5, 1991, Ser. No. 755,183
Int. Cl.[5] E01C *5/00*
U.S. Cl. 404—41 **38 Claims**



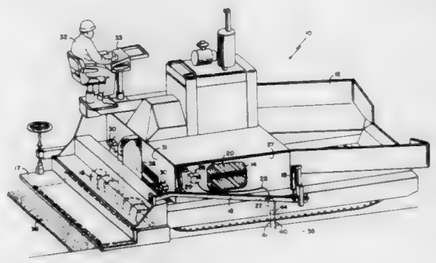
1. A paving block comprising:
a top surface;
a bottom surface;
side surfaces extending between the top surface and the bottom surface, the side surfaces including
first and second substantially concave side surfaces,
a third substantially concave side surface positioned on a first side of the paving block between the first and second concave side surfaces, and
a substantially convex side surface positioned between the first and second concave side surfaces on a second side of the paving block which is opposite the first side; and
at least one spacer disposed on the substantially convex side surface, the spacer having a base adjacent the convex surface and an opposing end spaced outwardly therefrom, the base having a larger cross-sectional area than the opposing end.

5,201,603
TOW POINT FOR AN ASPHALT PAVER
James H. Bassett, Sycamore; Jay A. King, Maple Park; Andrew W. Green, and David Emerson, both of Geneva, all of Ill., assignors to Caterpillar Paving Products Inc., Minneapolis, Minn.
Filed May 17, 1991, Ser. No. 702,067
Int. Cl.[5] E01C *19/00*
U.S. Cl. 404—84.1 **12 Claims**



1. A tow point assembly for a finishing paver having a traction unit for providing motive force, a screw auger for laterally distributing paving material onto a roadbed, and a floating screed for leveling and compressing the paving material into a compacted mat, the tow point assembly, comprising:
(a) a leveling arm extending forward from the floating screed and having a forward end bearing aperture means; a row point plate connected to the traction unit and having a rear end bearing aperture means which slideably engages the forward end of said leveling arm; and
(c) fastening means for connecting the forward end of said leveling arm and the rear end of said tow point plate together in a manner such that they may be adjusted into either fixed or sliding connection, and they may be horizontally adjustably engaged prior to such connection so that a selectively variable horizontal distance between the floating screed and the auger is obtained.

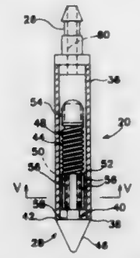
5,201,604
FIELD CONFIGURABLE SONIC GRADE CONTROL
Christopher Ferguson, Framingham, Mass., and Joseph E. Musil, Ely, Iowa, assignors to Raytheon Company, Lexington, Mass.
Filed Jul. 30, 1991, Ser. No. 738,060
Int. Cl.[5] E01C *19/18*
U.S. Cl. 404—110 **11 Claims**



1. A road paver comprising:
a leveling instrument;
means coupled to said leveling instrument for changing the position of said leveling instrument; and
means for controlling said position changing means, said controlling means comprising:
a) sonic means for transmitting sonic signals and receiving reflections of said sonic signals;
b) means responsive to said sonic means for providing a reference signal corresponding to the round trip travel time of a sonic signal between said sonic means and a datum;
c) means for adjusting said reference signal by a predetermined increment;
d) means for displaying said predetermined increment; and
e) operator actuable means for adjusting said predetermined increment.

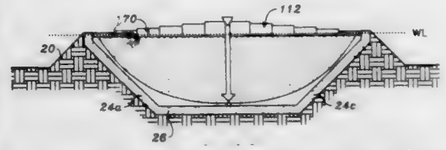
5,201,605
POSITIVELY CLOSING NOZZLE AND METHOD OF USE IN UNDERGROUND IRRIGATION
Robert J. Lang, 5663 Encina Rd., #102, Goleta, Calif. 93117, and Thomas W. Morgan, 318 Gainsborough Rd., Thousand Oaks, Calif. 91360
Filed Nov. 20, 1991, Ser. No. 795,065
Int. Cl.[5] E02B *13/00*
U.S. Cl. 405—37 **16 Claims**

1. An underground irrigation nozzle, comprising
a cylindrical housing having inlet means at one end for connection to a water source, the cylindrical housing being open at its other end,
a spring-loaded valve member urged by its spring into positive closing engagement with the other end of the cylindrical housing, the valve member being movable against its spring-load to form a circumferential opening in combination with the other open end of the cylindrical housing, and



a flow distributing emitter arranged within the housing adjacent its other end for developing a circumferential flow pattern when the valve member is in an open position.

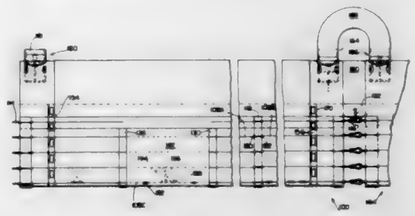
5,201,606
THERMAL STORAGE TANK AND ASSOCIATED TOP STRUCTURE
Thomas L. Davis; Robert N. Elliott, III, both of Raleigh, and Carsie K. Denning, Coats, all of N.C., assignors to Carolina Power & Light Company, Raleigh and North Carolina Alternative Energy Corporation, Research Triangle Park, both of N.C.
Division of Ser. No. 543,360, Jun. 25, 1990. This application Feb. 21, 1991, Ser. No. 658,527
Int. Cl.[5] B65G *5/00*
U.S. Cl. 405—55 **8 Claims**



1. A thermal storage tank of the type that stores thermal energy in a floating agglomerated ice mass, said tank including a floating agglomerated ice mass, a top floating on said floating agglomerated ice mass to produce a downward counter-buoyant force to the ice mass, said top having a greater weight per unit area in portions that overlie thicker parts of the ice mass and less weight per unit area in portions that overlie thinner parts of the ice mass.

5,201,607
VALUE ASSEMBLY FOR INFLATING AND DEFLATING CHAMBERS OF A FLOATABLE BOOM
Malcolm B. Whidden, Jr., P.O. Box 280, South Harpswell, Me. 04079
Division of Ser. No. 571,148, Aug. 23, 1990, Pat. No. 5,087,152. This application Dec. 10, 1991, Ser. No. 804,588
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—68 **25 Claims**

1. An arrangement of first and second substantially identical boom valve assemblies especially suitable for use in inflating and deflating chambers of a floatable boom, the arrangement comprising:
A) the first and second substantially identical boom valve assemblies having respective openings slightly smaller than the chambers' cross sectional area so as to allow low-pressure, high-volume inflation of the chambers, each of the first and second boom valve assemblies including:
a) a hollow cylinder having an inside portion and an outside portion, the hollow cylinder including at least one port at a position on the inside portion such that when the cylinder is installed in the boom's chamber the at least one port is within the chamber providing gas communication between the chamber and the interior of the cylinder;
b) a diaphragm slidingly disposed within the hollow cylinder having at least:
1) a closed position in which it is sealingly positioned between the outside portion of the cylinder and the at least one port to prevent gas from passing between (a) the inside of the chamber and (b) the cylinder's outside portion; and



2) an open position in which the diaphragm is positioned further from the open portion of the cylinder than the closed position to allow gas to pass between (a) the inside of the chamber and (b) the cylinder's outside portion through the at least one port and through the cylinder; and
c) urging means, operatively connected to the diaphragm and having a small urging force of predetermined magnitude, for normally urging the diaphragm into the closed position, the urging force's predetermined magnitude being even less than that of the low pressure air pumped from through the first valve assembly through the opening to the second valve assembly.

5,201,608
PROCESS FOR SEALING SOIL FORMATIONS, ESPECIALLY WASTE DUMPS
Jost-Ulrich Kügler, Im Teelbruch 61, 4300 Essen 18, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 347,780, Jun. 12, 1989, abandoned. This application Nov. 8, 1990, Ser. No. 610,700
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727978; Aug. 25, 1987, 3727819
Int. Cl.[5] C02F *11/14;* **B09B** *1/00*
U.S. Cl. 405—129 **27 Claims**

1. Process for sealing a soil formation such as an old source of pollution or a waste dump, which process comprises:
mixing sewage sludge or river mud with approximately 30 to 70 wt %, based on the sludge or mud dry weight, a water absorbent, grain stable aggregate;
forming a non-hardening compressible mixture of the aggregate and the sludge or mud;
applying the resultant mixture to the soil formation; and
compressing the resultant, applied mixture mechanically.

5,201,609
CELLULAR LANDFILL PROCESS AND APPARATUS
Paul H. Johnson, McIntosh, N. Mex., assignor to Johnson Research and Development Corp., McIntosh, N. Mex.
Filed Jul. 23, 1991, Ser. No. 734,796
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—129 **65 Claims**

1. A method of disposing of waste comprising the steps of:
(a) providing an impermeable base at a predetermined landfill site;

(b) constructing upon the impermeable base a plurality of

being substantially chemically inert towards deposit and injected fluids under the operating conditions of the pro-

5,201,614
ROTARY CUTTING TOOL

when said alignment means is in contact with said struc-

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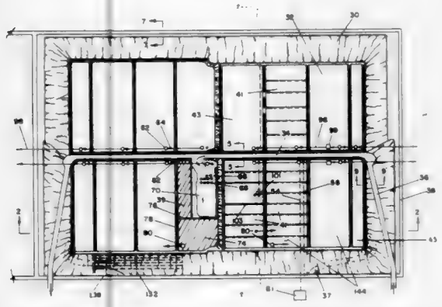
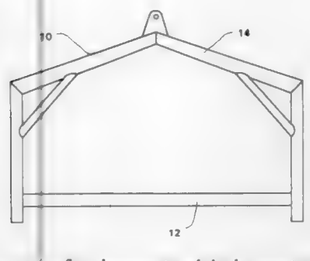
(b) constructing upon the impermeable base a plurality of berms and thereby defining in a cell-by-cell manner a plurality of conterminous waste-containing cells with common berms between adjacent waste-containing cells;
(c) constructing an overlying plurality of berms and thereby defining in a cell-by-cell manner a plurality of conterminous waste-containing cells in overlying relationship to the waste-containing cells disposed on the impermeable base;



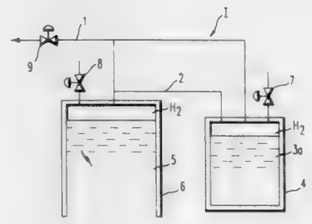
(d) installing means for removing fluids from at least two levels in each waste-containing cell;
(e) filling the waste-containing cells with waste;
(f) providing in a cell-by-cell manner an impermeable cover for the waste-containing cells; and
(g) providing in a cell-by-cell manner impermeable side coverings for the waste-containing cells.

5,201,610
GROUT BAG DEPLOYMENT PALLET
Steven E. Mansfield, Houston, Tex., and Neil A. Stagg, Tinamba, Australia, assignors to Diverless Systems, Inc., Houston, Tex.
Filed Feb. 7, 1991, Ser. No. 651,763
Int. Cl.[5] F16L *1/04*
U.S. Cl. 405—172 **8 Claims**



1. An apparatus for placement and deployment of a support for structures on a surface, the support formed by grout provided into a foldable grout bag having a place for alignment with the structure, the apparatus comprising:
planar pallet means for securing the folded grout bag during placement of the apparatus; and
alignment means attached to said pallet means for positioning said pallet means relative to said structure without attachment of said alignment means to said structure, wherein said alignment means is formed so that when said alignment means is in contact with said structure, the alignment place of the grout bag is in alignment with said structure,
wherein said pallet means is adapted to rest on said surface when said alignment means is in contact with said structure and the grout bag is folded.

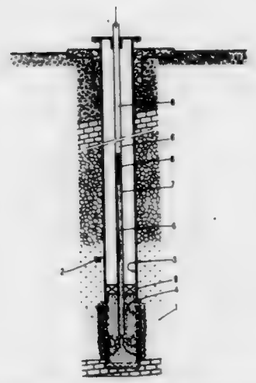
5,201,611
PRESSURE EQUALIZER FOR USE AT DEEP SEA
Hideaki Komaki, Tokyo; Shinji Taira, Yokosuka, and Tadashi Shibue, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1992, Ser. No. 821,061
Claims priority, application Japan, Jul. 30, 1991, 3-211434
Int. Cl.[5] B63C *11/44*
U.S. Cl. 405—193 **1 Claim**



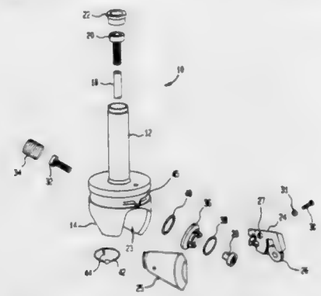
1. A pressure equalizer for use for storing, generating and dispensing gas from substantially thin walled tanks at great depth beneath the sea comprising a gas generating tank containing a low-temperature, liquified gas which upon the application of heat generates a high-pressure gas, a gas storage tank into and out of which sea water freely flows through the bottom thereof, a gas supply line connected at one end by branches to the tops of the respective tanks and at the other end to a device utilizing gas generated in said gas generating tank, and a pipeline interconnecting the respective tanks at their tops, said tanks having pressure equalizing valves.

5,201,612
PROCESS FOR THE CONSOLIDATION OF A GEOLOGICAL FORMATION BY A SUBSTANCE POLYMERIZABLE AT THE TEMPERATURE AND PRESSURE OF THE FORMATION
Claude Gadelle, Rueil Malmaison, and Jean Lesage, Maurepas Elancourt, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison Cedex, France
Continuation of Ser. No. 718,138, Jun. 20, 1991, abandoned. This application Sep. 23, 1992, Ser. No. 948,625
Claims priority, application France, Jun. 21, 1990, 90 07916
Int. Cl.[5] E02D *3/12*
U.S. Cl. 405—264 **16 Claims**

1. A process for consolidating a permeable geological formation without significantly reducing the permeability thereof, comprising:
injecting a polymerizable liquid mixture into the formation, said mixture containing an aqueous resin solution and at least one Lewis acid catalyst;
polymerizing said mixture at substantially the temperature and the pressure of the formation, into a solid substance bonding unconsolidated elements of the formation;
injecting at least one gas into said formation at least during the period of polymerization of said mixture, said gas being substantially chemically inert towards deposit and injected fluids under the operating conditions of the process, said injecting substantially maintaining the permeability of the formation.

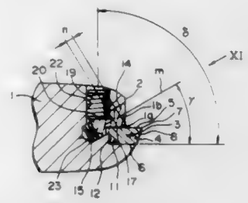


5,201,613
SINGLE POINT ADJUSTABLE CUTTING INSERT HOLDER
Samuel P. Jeffery, 11 Havazelet Hasharon St., Kfar Saba, POB 268, Hod Hasharon, Israel
Filed Sep. 16, 1991, Ser. No. 760,360
Int. Cl.[5] B23C *5/24*
U.S. Cl. 407—36 **12 Claims**



1. A single point adjustable triangular carbide insert (TCI) holder comprising:
an elongated member having a shank portion and a base portion, said base portion having formed therein a substantially conically-shaped cavity having a central axis; and
jaw assembly means comprising a pair of cone-shaped jaw clamps for retaining therebetween a TCI arranged for cutting a workpiece, said jaw clamps being seated in lockably releasable fashion within said conically-shaped cavity so as to be rotatably adjustable therein about said central axis, enabling adjustment of the rake and relief angle of said TCI with respect to the workpiece;
wherein a maximum portion of said TCI is exposed when locked in said jaw clamps.

5,201,614
ROTARY CUTTING TOOL
Masaaki Nakayama, and Masayuki Okawa, both of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Mar. 5, 1992, Ser. No. 846,617
Claims priority, application Japan, Mar. 7, 1991, 3-12446
Int. Cl.[5] B23C *5/22*
U.S. Cl. 407—41 **10 Claims**



1. A rotary cutting tool comprising:
a tool body having an insert-receiving recess and a clamp member-receiving aperture formed in an outer surface thereof, said insert-receiving recess having a bottom and at least two bearing walls disposed so as to be inclined with respect to each other, said clamp member-receiving aperture having an immediate portion formed in open communication with said insert receiving recess, said tool body having a bearing portion defined between an opening end of said clamp member-receiving aperture and said intermediate portion of said clamp member-receiving aperture;
a cutting insert including a plate having a front face serving as a rake surface and a rear face, said cutting insert being releasably received in said recess with said rear face being mated with said bottom, said insert being partly located in said intermediate portion of said clamp member-receiving aperture;
a clamp member having an axis therethrough and an engagement portion, said clamp member being releasably accommodated in said clamp member-receiving aperture so as to be axially slidable, with said engagement portion being held in abutment with said front face of said cutting insert; and
a clamp screw threaded into said tool body so as to be held in abutting engagement with said clamp member, to thereby press said clamp member against said insert,
said clamp member having first and second notches formed therein, said first notch having a face defining a first abutment face held in abutment with said insert, said second notch having a face defining a second abutment face to be held in abutment with said clamp screw.

5,201,615
REUSABLE BREAK-OUT SUPPORT TOOL AND METHOD
Matthew J. Patterson, Bloomfield, Conn., and Keith J. Rockcastle, Aston, Pa., assignors to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 589,661, Sep. 28, 1990, abandoned. This application Aug. 17, 1992, Ser. No. 931,570
Int. Cl.[5] B23B *47/32*
U.S. Cl. 408—87 **10 Claims**

1. A reusable break-out support tool for use in the drilling operation of a workpiece, comprising:
a movable piston;
a housing cylinder having one end open and its other end adaptable to receive the movable piston; and
media, normally in a granulated state, within said housing cylinder, whereby said movable piston is displaced relative to said housing cylinder, when said housing cylinder engages said workpiece, to pressurize said media which is

thereby formed into a solid state and defines a load bearing

5,201,617

oriented relative to the axis of said workpiece surface so ond securing means for securing the tool holder to the body

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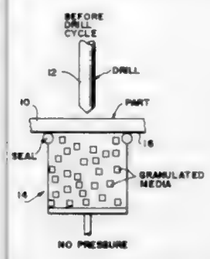
thereby formed into a solid state and defines a load bearing surface which applies a substantially uniform load acting against the engaged workpiece surface, and whereby said



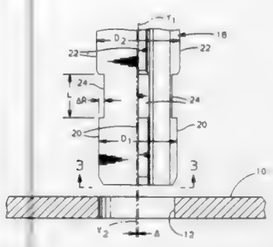
movable piston is reciprocally displaced relative to said housing cylinder to depressurize said media thereby removing the substantially uniform load and allowing said solid state to return to said granulated media.

5,201,616

HOLE FINISHING TOOL WITH IMPROVED AXIAL ALIGNMENT

John Alverio, Shelby Township Oceana County, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1992, Ser. No. 871,790
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—224 **2 Claims**



1. A hole finishing tool for use in final sizing a rough hole in a workpiece of predetermined thickness, said hole having its axis misaligned from a desired hole design axis and having a rough diameter less than a desired final diameter, said tool comprising,

a series of generally cylindrical cutting sections, each axially adjacent to a trailing cutting section and each having a progressively larger diameter that is still less than the hole final diameter, but for the final cutting section, which has a diameter substantially equal to the hole final diameter, and,

a relieved, noncutting section in said tool axially separating each adjacent pair of cutting sections each of said relieved sections separating an adjacent pair of cutting sections and having a reduced diameter, relative to said cutting sections, sufficient to clear said hole, and an axial length greater than said workpiece thickness,

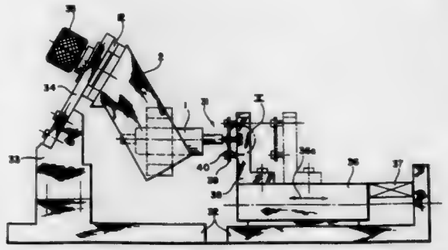
whereby, when said tool is rotated about said design axis and driven toward said hole, said cutting sections enter said hole one after another, enlarging said hole progressively, with said relieved sections allowing said tool to shift back to said design axis to relieve any axial bending of said tool away from said design axis caused by radial interference of said hole with the preceding cutting section, thereby taking said hole to final diameter and nearer to said design axis.

5,201,617

APPARATUS FOR SUPPORTING A MACHINE TOOL ON A ROBOT ARM

Jacques Delaval, Palaiseau; Guy Lienhart, Limeil Brevannes; Jean-Yves M. Nioche, Saint Maurice Montcouronne, and Jean-Marie Pontier, Evry, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris, France

Division of Ser. No. 592,523, Oct. 4, 1990, Pat. No. 5,157,823.
This application Jul. 1, 1992, Ser. No. 907,141
Claims priority, application France, Oct. 4, 1989, 89 12956
Int. Cl.[5] B25J *15/04*
U.S. Cl. 409—131 **1 Claim**



1. A method of adjusting the prestressing force of torsion springs of a tool support comprising the steps of:

a) providing first and second tool support members with the second support member pivotally attached to the first support member by torsion spring means such that second support member is movable with respect to the first support member in a single degree of freedom;

b) attaching a machine tool to the second support member;

c) attaching the first support member to a fixed support;

d) bringing a centering element defining a hole into operative axial and longitudinal relationship with the machine tool; and,

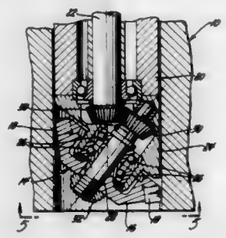
e) adjusting the prestressing force of the torsion spring means.

5,201,618

METHOD FOR MACHINING AN ELLIPITICAL BORE

Antoni J. Malarz, Troy; Michael J. Brink, Shelby Township, Macomb County, and Richard D. Specht, Auburn Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1991, Ser. No. 764,310
Int. Cl.[5] B23C *3/00*
U.S. Cl. 409—132 **3 Claims**



1. A method of machining an axially extending surface having an elliptical cross section of predetermined major and minor axis on a workpiece, comprising the steps of;

providing a circular cutter body with an effective diameter substantially equal to said predetermined major axis,

determining the tilt angle at which said cutter body must be oriented relative to the axis of said workpiece surface so that a projection of said effective diameter into a plane perpendicular to said workpiece surface axis creates said predetermined minor axis,

providing a drive means sized to fit within said projection with radial clearance while rotating said cutter body at said tilt angle, and,

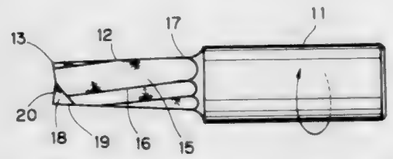
advancing said drive means along said workpiece surface axis while simultaneously rotating said cutter body at said tilt angle.

5,201,619

TAPERED SLOT END MILL

Shigeyasu Yodoshi, Osaka, Japan, assignor to Hitachi Tool Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 549,542, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 365,558, Jun. 13, 1989, abandoned.
This application Jan. 27, 1992, Ser. No. 826,248
Claims priority, application Japan, Jun. 14, 1988, 63-79631[U]
Int. Cl.[5] B23C *3/30, 5/04*
U.S. Cl. 409—132 **12 Claims**



1. A method for cutting tapered deep rib slots with a depth at least five times a width of the slot comprising the steps of:

installing a tapered slot end mill for right hand rotation into an end of a spindle of a rotating cutting machine via a chuck, said tapered slot end mill comprising a shank and a tapered section having a hexagonal shape and disposed at the end of said shank, a helical form cutting edge formed at each vertex of said hexagonal shape along the axis of said end mill and wherein said tapered section is tapered to have a smaller diameter at the end of said mill for cutting tapered deep rib slots with a depth of at least five times a slot width, a pair of end cutting edges is formed symmetrically at ends of said cutting edges with a part of said end cutting edge including in said cutting edge, and a pair of peripheral cutting edges respectively is provided adjacent to said end cutting edges via rake angle surfaces and said end mill is characterized in that said helical form cutting edge is formed in a left hand helix and said peripheral cutting edges are formed in a right hand cut;

cutting into a workpiece from a top a depth less than a length of said peripheral cutting edge;

moving said tapered end mill perpendicular to an axis of said cut in said workpiece to form a slot; and

repeating the cutting and moving steps until a desired depth for said slot is reached.

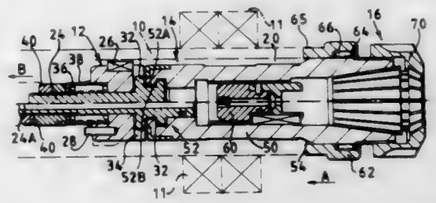
5,201,620

CUTTING TOOL HOLDING ASSEMBLY

David Forrest; Keith A. Jones, both of Longford, and Dennis A. Butler, Coventry, all of England, assignors to Morris Tooling Limited, England

Filed Feb. 25, 1992, Ser. No. 842,026
Claims priority, application United Kingdom, Feb. 26, 1991, 9103930; Oct. 9, 1991, 9121373
Int. Cl.[5] B23B *31/02*
U.S. Cl. 409—232 **9 Claims**

1. A cutting tool assembly including a tool holder, a drive spindle with a central bore and an adaptor for locating the tool holder in the drive spindle, the adaptor comprising a base member arranged to be secured against removal from the spindle, a body member having first securing means for securing the body member releasably to the base member and second securing means for securing the tool holder to the body member, the base member being secured in the base of the bore of the spindle and the body member being releasably securable against rotation relative to the spindle, the base member being of two part construction having a first part secured in the base of said bore and a second part secured to the first part, the first



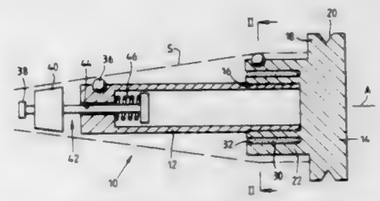
and second parts having interposed between the parts resilient means whereby the parts are relatively movable in the axial direction of the spindle, wherein the resilient means is arranged to urge the second part in a direction towards the base of the bore, and further comprising stop means whereby the extent of said relative movement is limited in each direction.

5,201,621

SHANK FOR A TOOL

David R. McMurtry, Wotten-Under-Edge, and Peter C. Willis, Bristol, both of United Kingdom, assignors to Renishaw plc, Glouchestershire, England

PCT No. PCT/GB91/00156, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO91/11282, PCT Pub. Date Aug. 8, 1991
PCT Filed Feb. 4, 1991, Ser. No. 768,931
Claims priority, application United Kingdom, Feb. 2, 1990, 9002364
Int. Cl.[5] B23B *31/00;* **B23C** *5/26*
U.S. Cl. 409—233 **6 Claims**



1. A shank for retaining a tool or probe in a machine tool spindle, the spindle having a frusto-conical socket defined by a wall and a gripper for pulling the shank into the socket, the shank comprising: an elongate body having an axis parallel to the direction of its length; means engagable by the gripper to enable the shank to be pulled into the socket; at one end means providing at least three relatively rigid areas of surface for bearing against the wall, thereby to locate said one end of the shank in the socket, and at the other end means providing at least three further areas of surface for bearing against the wall, thereby to locate said other end of the shank in the socket, at least one of said further areas of surface being resiliently movable relative and in a direction radial to said axis; and means provided on the shank for limiting the load applied to the shank by the gripper to a predetermined maximum value.

5,201,622

each of said legs having an inwardly directed latch portion,

the aperture when forcefully inserted therein to resist pullout of the anchor from the aperture and with the flat side resisting

the receiver plate to respective unloading positions for successively building up a longitudinal row of transverse rows of

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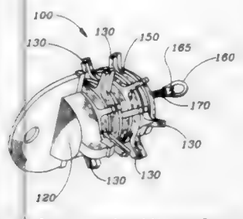
5,201,622

TRAIN APPARATUS FOR REMOVING BLISTERS FROM A FIBER CONDUIT

Robert P. Agopian, 213 N. Lucerne Blvd., Los Angeles, Calif. 90004, and Shoji Tanaka, Montebello, Calif., assignors to Robert P. Agopian, Los Angeles, Calif.

Filed Aug. 5, 1991, Ser. No. 740,150
Int. Cl.[5] B08B 9/04
U.S. Cl. 409—299 24 Claims



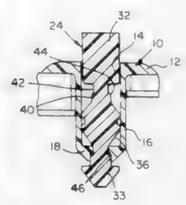
1. A cutting unit for removing blisters from a fiber conduit, comprising:
a. a longitudinal central shaft having a front end and a rear end;
b. a lead guide having a longitudinal flat panel, the flat panel having an arch-shaped front rim and an opening;
c. six circular cutting stars each having a disc-shaped body portion, the disc-shaped body portion having a transverse front side, a transverse rear side and a longitudinal central opening for accommodating said central shaft, the rear side having four radially disposed transverse slots set 90° apart with cutting blades mounted laterally therein by blade mounting means;
d. alignment means for aligning said cutting stars so that the cutting blades of one cutting star are offset from the cutting blades of the other cutting stars;
e. said six regular cutting stars being assembled onto said central shaft with a circular clamp and fastened by a screw nut threaded on said central shaft; and
f. an eye nut attached to said rear end of said central shaft by a split pin;
g. whereby when said cutting unit is pulled through a fiber conduit by a pulling cable attached to said lead guide, said lead guide will prevent said cutting unit from going off center of the conduit and digging itself into the interior sidewall of the conduit, and said cutting blades of said cutting stars will remove the blisters from the fiber conduit.

5,201,623

TWO STAGE RIVET

Nicholas Benedetti, Macomb, and Zdravko Kovac, Mt. Clemens, both of Mich., assignors to Emhart Inc., Newark, Del.

Filed Feb. 18, 1992, Ser. No. 838,581
Int. Cl.[5] F16B 13/06
U.S. Cl. 411—48 2 Claims



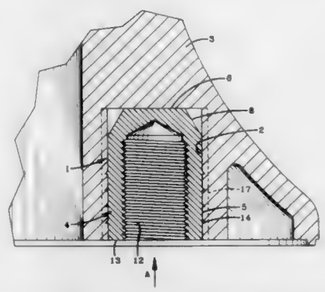
1. A two stage rivet comprising:
a grommet having a head portion with a hole therein and a plurality of legs extending rearwardly from said head portion,
each of said legs having an inwardly directed latch portion, and
a cylindrical pin having a head at one end, a bulbous portion at the other, a central enlarged portion having an annular groove and first and second reduced diameter portions on either side of said enlarged central portion for receiving said latch portions while permitting said legs to be unflexed,
said first reduced diameter portion being selectively located so that said pin and said grommet will be interconnected with the end of said head of said pin protruding beyond said grommet head portion when said latche portions are located in said first reduced diameter portion,
said enlarged portion being selectively located so that said pin and said grommet will be interconnected with the end of the said head of said pin flush with said grommet head portion when said latch portions are located within said annular groove,
said second reduced diameter portion being selectively located so that said pin and said grommet will be interconnected with the end of the head of said pin extending into said grommet head portion when said latche portions are located within said second reduced diameter portion whereby said rivet can be removed from the hole,
said first and second reduced diameter portions having
a first cylindrical portion and an adjacent second cylindrical portion having a diameter smaller than the diameter of said first cylindrical portion,
conical surface means interconnecting said first and second reduced diameter portions with said central enlarged portion, and
said latch portions defining when located within said first or second reduced diameter portions first cylindrical surface means for engaging said first cylindrical portion of said first and second reduced diameter portions and second cylindrical surface means for engaging said second cylindrical portion of said first and second reduced diameter portions.

5,201,624

ONE-PIECE FASTENER ANCHOR

Jack D. Ecktman, Indianapolis, Ind., assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Apr. 16, 1992, Ser. No. 869,974
Int. Cl.[5] F16B 37/04, 15/06
U.S. Cl. 411—180 21 Claims



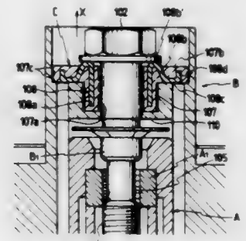
1. A one-piece fastener anchor adapted to be forcefully inserted into a complementary shaped aperture of an object that is formed of a softer material than said anchor, said anchor including a body formed with at least one flat side and having a plurality of axially spaced retaining barbs formed integrally on said body and extending generally throughout the width of said flat and in an outwardly inclined direction from said body in a direction complementary to the direction of insertion of the anchor into the aperture of the object to facilitate the insertion of said anchor into said aperture, said barbs being adapted to cut into the softer material of the object adjacent the aperture when forcefully inserted therein to resist pullout of the anchor from the aperture and with the flat side resisting rotation of the anchor within said aperture; and a fastener receiving aperture extending into the body of the anchor for receiving a fastener therein after the anchor has been installed in said object.

5,201,625

CONNECTOR HOUSING OF THREADED CONNECTION TYPE HAVING SEALING MEMBER AND BOLT FOR SECURING THE HOUSING

Kenji Takenouchi, and Makoto Yamanashi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 685,766, Apr. 16, 1991, Pat. No. 5,165,834.
This application May 22, 1992, Ser. No. 886,810
Claims priority, application Japan, Apr. 23, 1990, 2-42490[U]
Int. Cl.[5] F16B 33/00, 43/02; H01R 13/627
U.S. Cl. 411—369 4 Claims



1. A connector housing in which a pair of male and female connector housings are united together by tightening a bolt provided through a seal member on one of said male and female housings with a nut provided on the other one of said male and female housings, said connector housing comprising:
an externally-threaded portion formed on said bolt from its tip end by a predetermined length;
a non-threaded portion formed on said bolt, extending from said externally-threaded portion and having a smaller diameter than said externally-threaded portion so that when said male and female connector housings are fittingly connected together completely, threaded engagement of said externally-threaded portion with said nut is released and said nut is disposed around said non-threaded portion; and
means for pressing and retaining said bolt in a direction to contact said externally-threaded portion with said nut when said male and female connector housings are fittingly connected together completely.

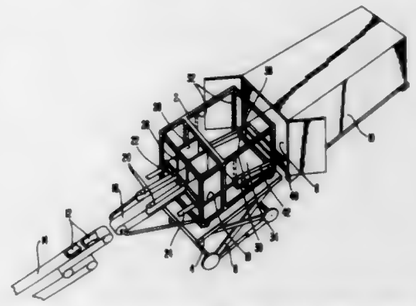
5,201,626

METHOD AND AN APPARATUS FOR LOADING FILLED SACKS OR SIMILAR ARTICLES INTO ENDWISE OPEN CONTAINERS OR CORRESPONDING CARGO SPACES

Egon Hansen, Åbollingvej 14, DK-6683 Fovling, Denmark

PCT No. PCT/DK89/00291, § 371 Date Aug. 12, 1991, § 102(e) Date Aug. 12, 1991, PCT Pub. No. WO90/06892, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 12, 1989, Ser. No. 689,248
Claims priority, application Denmark, Dec. 12, 1988, 6896/88
Int. Cl.[5] B65G 57/112
U.S. Cl. 414—398 7 Claims

1. A loading apparatus for consecutively loading received articles into open ended cargo containers, each said cargo container having a longitudinal axis, the loading apparatus comprising a receiver plate arranged transversely to said longitudinal axis of said cargo container, means for laterally displacing articles received on the receiver plate so as to build a transverse row of articles on the receiver plate, means for consecutively transferring said transverse row of articles from the receiver plate to respective unloading positions for successively building up a longitudinal row of transverse rows of piles of articles, the unloading being effected by retraction of article carrier plate means against an action of abutment means engaging respective rear ends of the articles so as to non-retractably hold the articles, a frame structure adapted to be rollingly supported on a support surface of the container, said frame structure having said receiver plate and an associated article displacing means arranged in a stationary position in a rearmost portion thereof, and a vertically movable lift plate arranged at a foremost portion thereof, said lift plate being



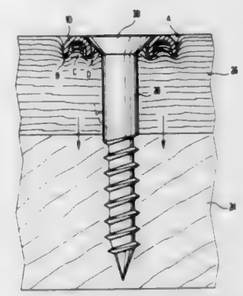
vertically displaceable between a receiver position flush with the receiver plate such that the lift plate can receive an entire transverse row of articles from the receiver plate by actuation of a transferring means, and a plurality of unloading positions in respective different height positions, said lift plate further being forwardly displaceable from said frame structure in each of said plurality of unloading positions, and wherein vertically movable abutment means are provided so as to operatively engage the rear ends of the articles resting on the lift plate in the forwardly displaced position of the lift plate to thereby effect an unloading of the row of articles in response to a retraction of the lift plate.

5,201,627

WASHER FOR SCREWS

Marita Biedenbach, Hünfeld, Fed. Rep. of Germany, assignor to Hubert J. Koch, Hunfeld, Fed. Rep. of Germany

Filed Aug. 14, 1990, Ser. No. 566,929
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930209
Int. Cl.[5] F16B 33/00, 43/00
U.S. Cl. 411—531 14 Claims



1. A ring-shaped washer for use with wood screws, wherein:
an external end section of the washer is formed straight to extend in a direction parallel to an axis of the washer away from a portion of the washer to be contacted by a screw

head ad the washer comprises a curved central annular

nected to the respective adjacent one of said plurality of members and a far end opposite said near end,

a tower structure projecting upwardly from the vehicle inter-

speed along said trace, except while it is in an acceleration zone of said trace which starts at said initial position and a

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head ad the washer comprises a curved central annular section extending into said external end section concentric with the axis of the washer, the curved central annular section having an essentially semicircular cross-section, and wherein

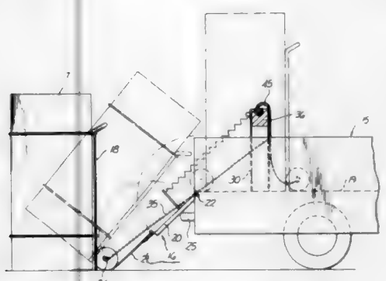
an internal end section of the washer is formed straight and is directed away from the screw head in the same direction as said external edge portion.

5,201,628

MANUALLY OPERATED PICKUP TRUCK HOIST

Wilfred D. Driver, 357 East 28th Street, Hamilton, Ontario, Canada

Filed Jan. 17, 1992, Ser. No. 822,155
Int. Cl.[5] B60P *1/43*
U.S. Cl. 414—538 **4 Claims**



1. A manually operable pickup truck hoist system for power assisting wheeled dollies up a ramp onto the truck loading platform, comprising in combination:

a tailgate pivoted on said truck,

ramp forming means for holding the tailgate as a ramp element inclined downwardly from said loading platform towards the ground,

flap means movable on the tailgate for rigidly extending the tailgate to the ground as a loading ramp,

a wheeled dolly for moving up the ramp element with a load,

line feed means for extending and withdrawing a load bearing pulley line,

mount means for the line feed means affixed to the truck and extending above the loading platform,

positioning means for extending the line from the mount means to connect with the dolly in the vicinity of the ground for moving it up the loading ramp,

counterforce means attached to the line in the vicinity of the mount means to produce a lifting tension force in the line when connected with the dolly as it moves from the ground to the loading platform, and

securing means for attaching the pulley line to said wheeled dolly for exerting a counterforce for movement of the dolly up the loading ramp.

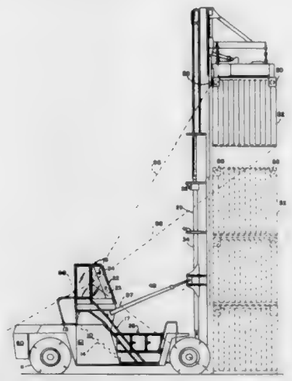
5,201,629

CONTAINER TRANSPORTER

Clark Simpson, Nicholasville, and John Hodgman, Lexington, both of Ky., assignors to Clark Material Handling Company, Lexington, Ky.

Filed Apr. 9, 1991, Ser. No. 682,758
Int. Cl.[5] B66F *9/22*
U.S. Cl. 414—632 **10 Claims**

1. In a container transporter vehicle having ground engaging front and rear wheels to propel and maneuver it over a surface, a counterweight supported at the rear of the vehicle, load lifting means supported at the front of the vehicle for picking up, transporting, lifting, and spotting standard ISO shipping containers having a maximum lift height capable of stacking up to four containers on the surface, an improvement comprising a tower structure projecting upwardly from the vehicle intermediate the front and rear wheels thereof spaced longitudinally a greater distance from the load lifting means than from the counterweight, a cab containing an operator's station defining an eye level position from which up to four containers may be viewed in stacked relation to each other, said cab being mounted on the tower structure and having a front window inclined rearwardly relative to the load lifting means, the longitudinal axis of said window extending above and below the eye-level position in the cab providing a vertical range of vision encompassing the stacked shipping containers from the eye-level position, said load lifting means comprising parallel



outer rails, parallel inner rails mounted on rollers extensible upwardly from the outer rails, hydraulic cylinder means connected between the outer and inner rails for extending or collapsing the inner rails within the outer rails, first and second pumps hydraulically powering the cylinder means, the output of the first pump confined to the hydraulic cylinder means to provide a first lift speed, the output of the second pump connected normally to a separate function associated with operating the vehicle and valve means including pressure differential sensing means for measuring the difference in pressure between the two outputs for diverting the output of the second pump to augment that of the first when the pressure differential exceeds a predetermined setting to provide a second lift speed.

5,201,630

INDUSTRIAL ROBOT WITH SERVO SYSTEM

Tatsuzo Ishida; Kazuhito Hori, both of Tokyo, and Sigeru Nakamura, Chiba, all of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 517,545, Apr. 27, 1990, abandoned, which is a continuation of Ser. No. 172,979, Mar. 23, 1988, abandoned, which is a continuation of Ser. No. 769,253, Aug. 26, 1985, abandoned. This application May 28, 1991, Ser. No. 707,933

Claims priority, application Japan, Sep. 7, 1984, 59-187333; Dec. 7, 1984, 59-258924
Int. Cl.[5] B25J *9/06*
U.S. Cl. 414—744.5 **3 Claims**

2. A robot device comprising:

a base,

a plurality of mechanical members connected successively to each other to said base, including a first one of said members at a first end of said plurality of members connected to said base and a second one of said members at the other end of said plurality of members from said first member, each successive adjacent pair of said members and base having a respective relative motion therebetween, and said second member having a near end connected to the respective adjacent one of said plurality of members and a far end opposite said near end,

a plurality of mechanical power sources selectively mounted on said base and members, each said mechanical power source controlling said respective relative motion of a respective adjacent pair of said base and members,

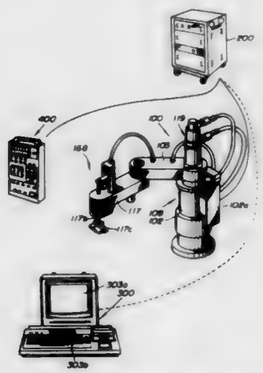
a plurality of indicator means distributed on said members and base for allowing determination of incremental changes in the relative positions of said adjacent pairs of base and members during each of a repeated predetermined interval, corresponding to the respective ones of said relative motions, and

control means for controlling each said source of mechanical power for moving said far end of said second member along a trace from an initial position to a working position without coming to a halt between said initial and working positions,

wherein:

said trace is nonlinear:

said control means operates to determine said trace based on preset operational data, said preset operational data including the coordinates, in a respective coordinate system, of said initial and working positions, coordinates of further points for characterizing at least in part the path of said trace between said initial and working positions, at least one speed variation pattern which takes into account



acceleration and deceleration characteristics of said plurality of members with said mechanical power sources and indicator means; and

said control means operates repeatedly at each said predetermined interval to determine 1) the location of said far end of said second member based on inputs from said indicator means indicating each of said incremental changes during the preceding interval, 2) information corresponding to the desired speed and direction of the motion of said far end of said second arm for the next interval, including components of velocity with respect to said coordinate system for the motion of said far end of said second arm along said trace, based on each said speed variation pattern, and 3) corresponding signals to be supplied simultaneously during the next interval to said mechanical power sources for driving respective ones of said mechanical power sources at respective rates of change of the corresponding ones of said relative positions to move said far end of said second member along said trace; and

each said speed variation pattern comprising data specifying desired values of said respective ones of said velocity components in said coordinate system as a function of respective relative position values of said adjacent pairs of base and members, each said speed variation pattern having nonlinearly rising and falling parts, said far end of said second arm accordingly moving over said trace with smooth transitions of speed and direction;

said far end of said second member is moved at constant speed along said trace, except while it is in an acceleration zone of said trace which starts at said initial position and a deceleration zone which ends at said working position,

said far end of said second member moves linearly in at least a portion of each of said acceleration and deceleration zones based on corresponding data included in said operational data, and

each said linear part of each said acceleration or deceleration zone corresponds to a respective portion of one of said rising or falling parts of a respective one of said at least one speed variation pattern;

said plurality of said mechanical members further comprising a third one of said members, said first member having a near end connected to said base and a far end opposite said near end thereof, said third member having a near end connected to said far end of said first member and a far end connected to said near end of said second member,

said first member being connected at said near end thereof to said base to rotate in a horizontal plane about a vertical axis extending through said base,

said third member being connected to said first member to rotate in a horizontal plane about a second vertical axis,

said second member being oriented vertically and connected at said near end thereof to said far end of said third member so that said far end of said second member can be moved vertically with respect to said far end of said third member,

the respective one of said mechanical power means for controlling the rate of change of said relative motion between said base and said first member being a first servo motor mounted on said base,

the respective one of said mechanical power means for controlling the rate of change of said relative motion between said first and third members being a second servo motor mounted on said first member,

the respective one of said mechanical power means for controlling the rate of change of said relative motion between said third and second members being a third servo motor mounted on said third member,

said control means including servo control circuits for said first, second and third servo motors; and

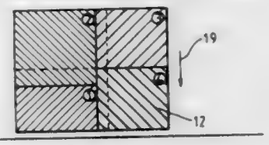
said trace includes two curved segments respectively adjacent said linear portions of said acceleration and deceleration zones and a linear segment between said two curved segments.

5,201,631

PROCESS FOR PROTECTING A LOAD RECEIVING PLANE

Jean-Marc Ringot, Carnin, and Henri Sauvaige, Lille, both of France, assignors to Societe Anonyme: Cartonneries de la Lys-Ondulys, Lomme, France

Filed Sep. 4, 1991, Ser. No. 754,602
Int. Cl.[5] B65D *19/00*
U.S. Cl. 414—786 **12 Claims**



1. Process for protecting a surface of a load receiving plane, comprising:

covering the surface of the load receiving plane with a plurality of modular protective sheets by successively depositing the plurality of modular protective sheets on the surface of the load receiving plane so that adjacent edges of the modular protective sheets overlap;

said step of successively depositing the plurality of modular

unit in axial position at the base of said receiving bore to

exchanger and direct said captured condensed material

signals for calculating a force-position pattern value indi-

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said step of successively depositing the plurality of modular protective sheets comprising:

depositing with a loader a first protective sheet of at least two modular protective sheets on the surface of a linear conveyor, advancing the loader in a transverse direction at least one more time and depositing at least one further of the at least two modular protective sheets with an edge overlapping the first protective sheet, advancing the linear conveyor and depositing a protective sheet of at least two additional modular protective sheets with an edge overlapping at least one adjacent edge of the at least two modular protective sheets, and transversely advancing the loader at least one more time and depositing at least one further of the at least two additional modular protective sheets with at least one edge overlapping adjacent edges of modular protective sheets.

5,201,632

Patent Not Issued For This Number

5,201,633

VERTICAL CENTRIFUGAL HYDRAULIC PUMP ASSEMBLY

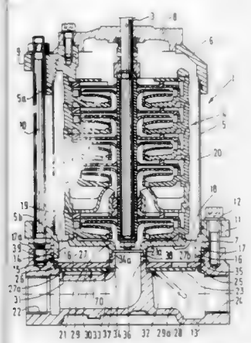
Jean C. Peu, Laval, France, assignor to Pompes Salmson, Rueil Malmaison, France

Filed Apr. 23, 1991, Ser. No. 690,145

Claims priority, application France, Apr. 24, 1990, 90 05194

Int. Cl.[5] **F04D** *1/08, 13/14, 15/00*

U.S. Cl. 415—146 **6 Claims**



1. A vertical centrifugal hydraulic pump assembly comprising:

a) a plurality of hydraulic interstage pumping assemblies enclosed in at least one replaceable cartridge constituting a block clamped vertically between two flanged end plates with a sleeve portion engaging therewith;

b) a pump body having:

(i) a receiving bore with a base, center and internal wall defining an outer edge and into which said cartridge is secured by one of said flanged end plates, and

(ii) a central inlet connector with an outer wall;

c) said cartridge respectively being connected at the center of said bore to the central inlet connector for said pump assembly and at the outer edge of said bore to a pump delivery outlet;

d) a flat annular non-return check valve unit opening in a delivery sense of said pump assembly, said non-return valve unit being arranged at the base of said receiving bore between the internal wall of said bore and the outer wall of said central inlet connector;

e) a first shoulder at the base of said receiving bore;

f) a second shoulder on the outer wall of said central inlet connector; and

g) retaining means for retaining said flat non-return valve unit in axial position at the base of said receiving bore to keep said non-return valve unit in operation against a prevailing delivery pressure of said pump assembly after removal of said cartridge containing said hydraulic interstage pumping assemblies.

5,201,634

COOLED AEROFOIL BLADE

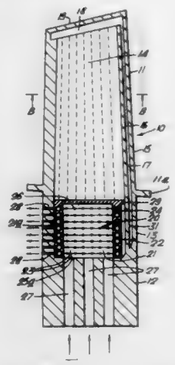
Geoffrey S. Hough, Littleover, England, assignor to Rolls-Royce plc, London, England

Filed Mar. 19, 1982, Ser. No. 361,845

Claims priority, application United Kingdom, Apr. 28, 1981, 8113068

Int. Cl.[5] **F01D** *5/18*

U.S. Cl. 416—96 R **1 Claim**



1. A closed cycle cooling system in a rotary aerofoil blade having an aerofoil portion, a root portion for the attachment of said aerofoil blade to the periphery of a rotary disc, and a shank portion interconnecting said aerofoil portion and said root portion, said closed cycle cooling system comprising:

a heat exchanger enclosed within said shank portion,

a plurality of lengthwise extending passages interconnecting said heat exchanger and a chamber defined within the tip of said aerofoil portion, at least one of said passages being located in a central region of said aerofoil portion remote from the external surface thereof, the remainder of said passages being spaced adjacent to and over a substantial portion of the external surface of said aerofoil portion;

a material partially filling said cooling system, said material being in the liquid state at the temperature at which said heat exchanger operates and in a vapor state at the temperatures at which said aerofoil portion operates, said heat exchanger comprising a chamber defined within said shank portion, the interior of said heat exchanger chamber and said tip portion being interconnected by said at least one passage located in the central region of said aerofoil portion, said shank heat exchanger chamber being partially occupied by a core member having an outer surface and an interior surface, said core member defining an interior chamber and including inlet means to permit a flow of cooling air to said interior chamber along said interior surface of said core member, and outlet means in said core member for permitting said cooling air to flow out of said core member; and

liquid directing means for directing any condensed material within said shank heat exchanger chamber to the remainder of said passages interconnecting said heat exchanger and said tip chamber, and for preventing any such condensed material from being centrifugally urged into said at least one passageway in the central region of said aerofoil portion, said liquid directing means including a plurality of gutter members and a further chamber defined within said shank portion, said gutter members interconnecting said core member and said further chamber and being so disposed as to capture condensed material within said heat exchanger and direct said captured condensed material into said further chamber, said further chamber being interconnected in turn with said remainder of said passages adjacent the outer surface of said aerofoil portions so that any condensed material directed into said further chamber by said gutter members subsequently flows into said remainder of said passages adjacent the outer surface of said aerofoil portion.

5,201,635

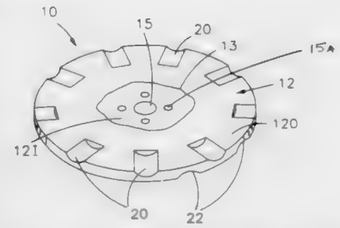
COMPOSITE POLYURETHANE MIXING IMPELLER

Michael Steinmetz, Moscow, Pa., assignor to Norstone, Inc., Melrose Park, Pa.

Filed Jan. 17, 1991, Ser. No. 642,522

Int. Cl.[5] **F04D** *29/26*

U.S. Cl. 416—228 **13 Claims**



1. An impeller adapted to be attached to a rotatable shaft, comprising a disk including oppositely outwardly directed faces, said disk having inner and outer portions of polyurethane resin having different flexibilities, the outer portion being bonded to the inner portion and having greater flexibility than the inner portion.

5,201,636

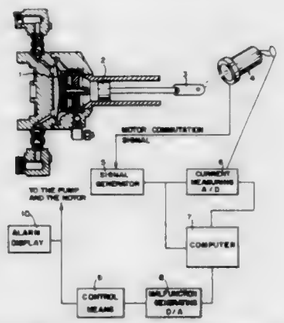
STATOR CURRENT BASED MALFUNCTION DETECTING SYSTEM IN A VARIABLE FLOW DELIVERY PUMP

Henry Mikulski, Churchville, Pa., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Feb. 19, 1991, Ser. No. 657,528

Int. Cl.[5] **F04B** *49/06*

U.S. Cl. 417—18 **13 Claims**



1. Apparatus for monitoring performance of a displacement pump, comprising:

(a) means responsive to positions of a displacement part of said pump for producing positional trigger signals;

(b) means responsive to said positional trigger signals for measuring force exerted on said displacement part at different positions;

(c) means responsive to said force and said positional trigger signals for calculating a force-position pattern value indicating a performance status of said pump to determine a malfunction in said pump, said force-position pattern value being independent of displament speeds or pump flow rates, said force-position pattern value being generated from a plurality of force measurements from step (b), said calculating means generating a malfunction signal based upon a comparison between said force-position pattern value and a range of empirically established adaptive value limits representing force-position pattern values during normal operations of pumps which have particular characteristics for such normal operations; and

(d) means responsive to said malfunction signal for responding in a selected manner.

5,201,637

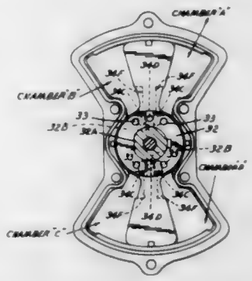
HYDRAULIC PISTON PUMP WITH SERVO DISPLACEMENT CONTROL

Kevin V. Folland, and Xudong Yu, both of Omaha, Nebr., assignors to Vickers, Incorporated, Troy, Mich.

Filed Oct. 28, 1991, Ser. No. 783,520

Int. Cl.[5] **F04B** *1/26*

U.S. Cl. 417—218 **43 Claims**



1. A servo displacement control for mounting on a variable displacement hydraulic pump comprising,

a housing,

an inlet for admitting fluid to said housing,

an outlet for discharging fluid from said housing,

a vane actuator movably mounted within said housing,

means connecting said vane actuator to a pump to vary the displacement thereof,

a port plate associated with said vane actuator,

control means for moving said port plate for controlling fluid flow to hydraulically move said vane actuator, and

manual control means for transmitting torque from said control means to said vane actuator.

5,201,638

HYDRAULIC ENERGY SUPPLY CART

Hans Bieri, Pfäffikon, Switzerland, assignor to Hydrostress AG, Pfäffikon, Switzerland

Filed Apr. 8, 1991, Ser. No. 682,139

Claims priority, application Switzerland, Apr. 10, 1990, 01208/90

Int. Cl.[5] **F04B** *17/00, 39/06*

U.S. Cl. 417—234 **15 Claims**

1. Hydraulic energy supply cart having

a chassis (**5**, **8**);

at least one hydraulic pump element (**3**) having a pump shaft (**56**);

an electric drive motor element (**2**) having a motor drive shaft (**27**), and

comprising

separable coupling means (**14**, **32**, **33**) having at least two

separable parts (**14**; **32**), separably coupling said drive

whereby liquid is forced from the input end of said tubular

which have a gas inlet opening (**101**, **120a**) and a gas outlet, second position, said second position being at an axial distance

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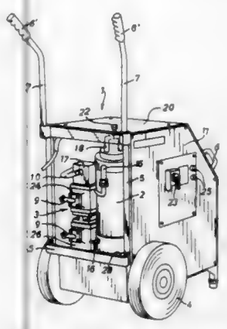
separable parts (**14**; **32**), separably coupling said drive motor element (**2**) and said pump element (**3**); and

transmission means (**30**) rotatably connected to said coupling means interposed between the drive motor element and the pump element,

wherein said drive motor element is essentially vertically positioned on the chassis and said motor drive shaft (**27**) extends essentially vertically downwardly towards a lower portion of the chassis;

said pump element (**3**) is located laterally adjacent the drive motor element (**2**), and said pump shaft (**56**) extends essentially vertically and essentially parallel to said drive motor shaft (**27**),



one (**2**) of said elements (**2**, **3**) is connected to one (**32**) of said coupling means parts,

said transmission means is located below the pump element and said drive motor element and connected to the other of said coupling means parts (**32**);

means (**42**, **58**) for coupling said transmission means to the other (**3**) of said elements (**2**, **3**);

a handle (**18**) coupled to an upper portion of said drive motor element (**2**);

and releasable clamping means (**22**) coupling said handle to the chassis (**5**, **8**).

5,201,639

IN-LINE HAND PUMP DEVICE

Donald R. Reineck, 9296 Mulberry Rd., Blissfield, Mich. 49228

Filed Mar. 3, 1992, Ser. No. 845,048

Int. Cl.[5] **F04B** *41/00, 21/04*

U.S. Cl. 417—236 **18 Claims**

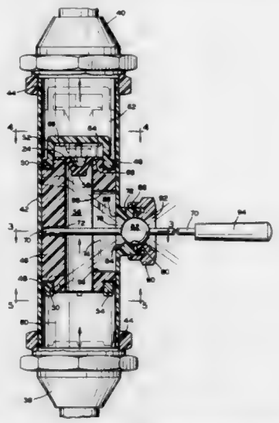
1. A hand pump device comprising:

a) a tubular element provided with an opening at an input end and an opening at an output end, the input end and output end each being adapted for in-line connection to a segment of pipe;

b) a piston provided with a linear center bore extending the full length of said piston, said piston being disposed within said tubular element such that an outer surface of said piston slidingly engages an inner surface of said tubular element;

c) valve means mounted on said piston and extending across the center bore; and

d) drive means extending laterally from said piston through a side aperture in said tubular element for reciprocating said piston longitudinally within said tubular element whereby liquid is forced from the input end of said tubular element through the center bore of said piston and



through said valve means to the output end of said tubular element.

5,201,640

SUCTION MUFFLER ASSEMBLY FOR HERMETIC COMPRESSORS

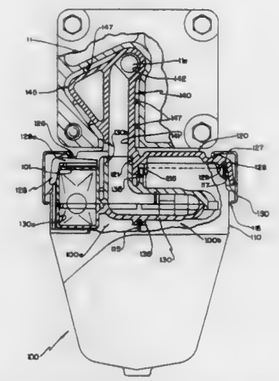
Gilberto Heinzelmann; Marcio L. Todescat, and Dietmar E. B. Lilie, all of Joinville, Brazil, assignors to Empresa Brasileira De Compressores S/A -EMBRACO, Joinville, Brazil

Filed May 28, 1992, Ser. No. 890,571

Claims priority, application Brazil, May 28, 1991, PI9102288

Int. Cl.[5] **H04B** *39/00*

U.S. Cl. 417—312 **14 Claims**



1. Suction muffler assembly for hermetic compressors of the type including a hermetic case (**3**) which defines a sump of lubricant oil at its bottom; a motor-compressor unit (**6**, **10**, **15**) mounted in the inside of the hermetic case (**3**) and including a cylinder block (**4**), which is disposed in an upper part of the case (**3**) above the motor (**6**) and sprinkled by the lubricant oil discharged from the bottom of the case, said cylinder block (**4**) being provided with a cylinder (**10**) lodging a reciprocating piston (**15**) and having an open end; a valve plate (**11**) attached to the open end of the cylinder (**10**) and provided with a suction orifice (**11***a*); a suction muffler assembly attached to the cylinder block (**4**) and including a hollow muffler body (**100**) which has a gas inlet opening (**101**, **130***a*) and a gas outlet opening (**121**); and a suction duct (**140**) having one inlet end (**141**) connected to the gas outlet opening (**121**) of the muffler body (**100**) and an opposite outlet end (**142**) in communication with the suction orifice (**11***a*) of the valve plate (**11**), said suction muffler assembly being characterized in that said hollow muffler body (**100**) is formed of a lower part (**110**), presenting a peripheral edge (**117**) at its open upper end, and a cover upper part (**120**) carrying the gas outlet opening (**121**) of the muffler body (**100**) and including a peripheral lower seating surface portion (**127**) to be seated onto the end peripheral edge (**117**) of the lower part (**110**) of the muffler body (**100**) and an outer peripheral skirt (**128**) which extends downwardly from and surrounds said peripheral lower seating surface portion (**127**), the gas inlet opening (**101**, **130***a*) being defined, at least partially, at the lower part (**110**) of the muffler body (**100**), the muffler assembly being further provided with attaching means (**150**) to hold and press the cover upper part (**120**) onto the end peripheral edge (**117**) of the lower part (**110**) of the muffler body.

5,201,641

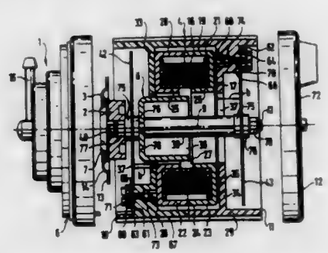
ELECTRICALLY DRIVEN DIAPHRAGM SUCTION OR PRESSURE PUMP

Siegfried Richer, Rudolfstrasse 3, W-7798 Pfullendorf, Fed. Rep. of Germany

Filed Jan. 9, 1992, Ser. No. 818,783

Int. Cl.[5] **F04B** *35/04*

U.S. Cl. 417—417 **18 Claims**



1. An electrically driven diaphragm suction or pressure pump, comprising: driving means including an oscillating anchor magnet, said anchor magnet including a circular magnet coil with a substantially cylindrical interior space, said substantially cylindrical interior space being concentrically enclosed by a ferromagnetic closing cage, said ferromagnetic closing cage being discontinuous in a circumferential direction; a case, said ferromagnetic closing cage being tightly positioned in said case; an oscillating anchor including a ferromagnetic solenoid plunger and a central anchor shank; a pump diaphragm connected to said oscillating anchor; a first leaf-type vibratory spring and a second leaf-type vibratory spring, each of said first leaf-type vibratory and said second leaf-type vibratory spring being connected to said oscillating anchor for mounting said oscillating anchor in an interior space of said closing cage in coaxial arrangement with respect to a common system axis of said magnet coil and said closing cage, said closing cage forming two pole rings in said interior space of said magnet coil, said two pole rings being separated from one another in an axial direction by a circular slot, said first leaf-type vibratory spring and said second leaf-type vibratory spring including a centered end section projecting out of a first side of each of said first and second leaf-type vibratory spring, said first leaf-type vibratory spring being shaped the same as said second leaf-type vibratory spring, said first leaf-type vibratory spring having a second side substantially opposite said first side and said second side is attached to said case at a first position, said first position being at an axial distance from said closing cage at one end of said case and said second leaf-type vibratory spring having a second side substantially opposite said first side and said second side is attached to said case at a second position, said second position being at an axial distance from said closing cage at another end of said case such that said second sides of each of said first and second leaf-type vibratory springs contact surfaces of said case, said second sides of said first leaf-type vibratory spring and said second leaf-type vibratory spring being arranged diametrically opposite on different sides of said system axis and at equal distances from said system axis.

5,201,642

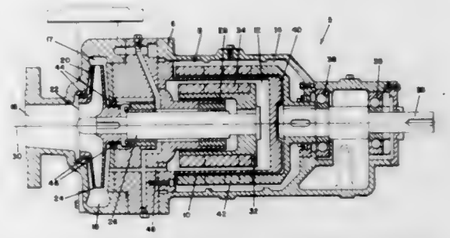
MAGNETIC DRIVE PUMP

Charles J. Hinckley, Hardwick, Mass., assignor to Warren Pumps, Inc., Warren, Mass.

Filed Nov. 27, 1991, Ser. No. 800,058

Int. Cl.[5] **F04B** *17/00*

U.S. Cl. 417—420 **7 Claims**



1. A magnetic drive pump for a product fluid comprising:

(a) a housing having a central longitudinal axis, a chamber, an inlet opening at one end of the housing and an outlet opening which is spaced from said inlet opening,

(b) a cylindrical containment shell within said chamber which is concentric with said axis and which divides said chamber into an inner compartment and an outer compartment, said inner and outer compartment being completely separate from each other, said inlet and outlet openings being connected to said inner compartment,

(c) a drive shaft at an end of said housing which is opposite said one end and which is mounted on said housing for rotation about said axis, said drive shaft extending beyond said housing,

(d) an outer magnet ring which is located in said outer compartment and which is concentric with said axis,

(e) a first holder which is fixed to said outer magnet ring, said holder being coupled to said drive shaft so that said outer magnet ring rotates about said axis when said drive shaft rotates,

(f) an inner magnet ring which is located in said inner compartment within said outer magnet ring and which is concentric with said axis,

(g) an impeller which is located within said inner compartment and which is journaled to said housing for rotation about said axis relative to said housing, said impeller being effectively positioned between said inlet and outlet openings for conveying product fluid from said inlet opening to said outlet opening upon rotation of said impeller, and

(h) a second holder which is fixed to and supports said inner magnet ring, said second holder being fixed to said impeller so that rotation of said outer magnet ring causes rotation of said inner magnet ring and said impeller, said second holder being cantilevered from said impeller and supported entirely by said impeller.

5,201,643

5,201,646

slots in the rotor with one end of each vane engaging the

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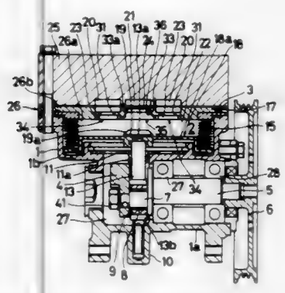
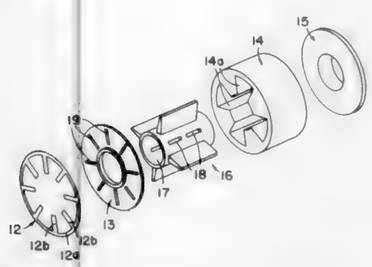
5,201,643
COMPRESSION MACHINE
Koichiro Hirosawa, and Hiroshi Kubo, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Mar. 29, 1991, Ser. No. 677,323
Claims priority, application Japan, Mar. 31, 1990, 2-35015
Int. Cl.[5] F04B *43/00, 21/02*
U.S. Cl. 417—472 **4 Claims**



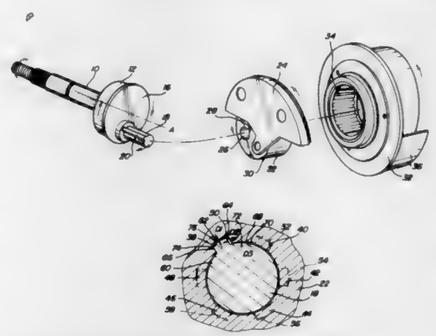
1. A compression machine comprising:
a casing having an inner wall;
a movable body mounted within said casing such that a compression chamber is formed by the movable body and the inner wall of the casing;
a single discharge valve formed in the casing and comprising means for discharging fluid from the compression chamber;
two intake valves formed in the casing and comprising means for permitting entry of fluid into the compression chamber, the two intake valves being arranged symmetrically with respect to the axial direction of the discharge valve; and
a rod connected to the movable body so as to transmit reciprocal movement to the movable body;
whereby changes in the volume of the compression chamber opens or shuts the intake valves and discharge valve,
wherein each of said intake valves has an aperture area equal to an aperture area of said discharge valve.

5,201,644
VALVE ARRANGEMENT FOR PUMP OR COMPRESSOR
Leif D. Henriksen, Porsgrunn, Norway, assignor to 3H Invent A/S, Skein, Norway
Continuation of Ser. No. 488,079, Jun. 20, 1990, abandoned.
This application Jun. 12, 1992, Ser. No. 898,180
Claims priority, application Norway, Dec. 23, 1987, 875407
Int. Cl.[5] F04C *21/00*
U.S. Cl. 417—48.4 **12 Claims**



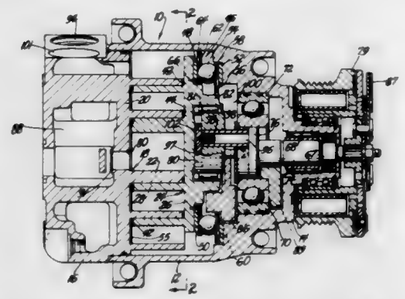
1. A compressor comprising
a housing member including a plurality of partition walls defining working chambers therebetween;
a rocking piston element pivotally mounted in said housing member and having radially directed wings disposed in said chamber between said partition walls, said rocking piston element including a hollow hub portion defining a flow path for a pressure medium, said hub portion having said wings mounted radially thereon and having a plurality of inlet slots between said wings for passage of the pressure medium therethrough into said respective working chambers;
a radially extending end wall at one end of said housing member having a plurality of circumferentially spaced grooves in an end face remote from said working chambers and a plurality of slots, each slot being disposed within a respective groove to communicate with a respective working chamber;
a plurality of valve seats, each valve seat being disposed about a respective slot on a side remote from said working chambers; and
a plurality of valve members, each valve member being disposed within a respective groove in sealing relation with a respective valve seat over a respective slot.

5,201,645
COMPLIANT DEVICE FOR A SCROLL-TYPE COMPRESSOR
Duane F. Steele, Onsted, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 20, 1992, Ser. No. 916,355
Int. Cl.[5] F04C *18/04*
U.S. Cl. 418—14 **9 Claims**



1. A scroll-type fluid compressor comprising:
a drive shaft having an axis of rotation;
a disc-shaped rotor affixed at one end of said drive shaft, said disc-shaped rotor including a drive pin extending from a side of said rotor opposite said drive shaft at a location eccentric to said axis of rotation said drive pin including at least one external spline extending therefrom;
a bushing having an axis of revolution;
an orbiting fluid displacement member which is movable in a cooperating relationship with said bushing;
said bushing having an aperture adapted to receive said drive pin, said aperture including at least one internal spline mating with said external spline, said at least one external and internal splines defining a clearance therebetween to allow displacement of said disc-shaped rotor in relation to said bushing upon rotation of said drive shaft.

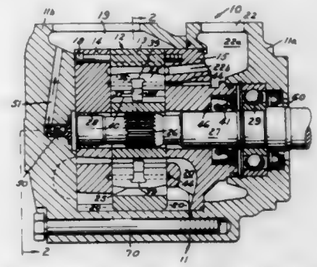
5,201,646
SCROLL COMPRESSOR ECCENTRIC BUSHING RETAINER
Michael L. Dees, Kettering, Ohio; Mark J. Bookbinder, Bertrange, Luxembourg; Ronald E. Marker, New Lebanon; Michael E. Greene, Kettering, both of Ohio; Dwayne L. Johnson, LaCrescent, Minn., and Edward R. La Marca, Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 20, 1992, Ser. No. 870,980
Int. Cl.[5] F04C *18/04, 29/02*
U.S. Cl. 418—55.5 **5 Claims**



1. A scroll type compressor having a housing with a front section and a rear section; a fluid inlet in the housing; a fluid outlet in the housing, a fixed scroll with an end plate, a spiral wrap and a central discharge aperture through the end plate, mounted in the rear section of the housing; an orbital scroll with an end plate and a spiral wrap cooperating with the fixed scroll to form fluid pockets; a rotation prevention assembly mounted in the housing which prohibits rotation and allows orbital movement of the orbital scroll; an axial thrust assembly for limiting axial movement of the scrolls; an orbital scroll drive including a crankshaft with an integral disk and an eccentric crank pin rotatably supported in the front section of the housing, a boss on the forward wall of the end plate of the orbital scroll, a bore in the boss, an eccentric bushing journaled in the bore in the boss on the orbital scroll and an aperture in the eccentric bushing which receives the crankshaft crank pin; a cavity in the front section of the housing forming a crankcase that is in communication with the fluid inlet port; a lubrication passage through the crank pin which allows fluid and entrained lubricant to pass from the crankcase to the bore on the Orbital scroll in which the eccentric bushing is journaled; an eccentric bushing retainer including a shank portion and an enlarged head portion with the shank portion pressed into the lubrication passage, the enlarged head portion limiting axial movement of the eccentric bushing on the crank pin and a passage through the shank portion and the enlarged head portion for metering the flow of lubricant through the crank pin.

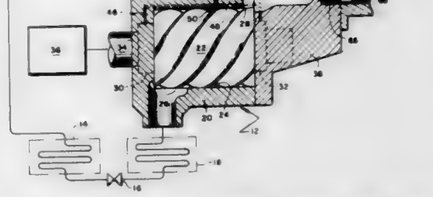
5,201,647
ROTARY HYDRAULIC VANE DEVICE HAVING A SHAF SEAL
Albin J. Niemiec, Sterling Heights, Mich., and Louis J. Cardinale, Omaha, Nebr., assignors to Vickers, Incorporated, Troy, Mich.
Filed Oct. 23, 1991, Ser. No. 780,621
Int. Cl.[5] F03C *2/22;* **F04C** *2/344, 15/00;* **F16J** *15/24*
U.S. Cl. 418—102 **6 Claims**

1. A hydraulic fluid pressure energy translating device comprising
a housing,
a cartridge assembly positioned in said housing,
said cartridge assembly including a cam ring, a rotor having a plurality of vanes rotatable therewith and slidable in slots in the rotor with one end of each vane engaging the internal contour, a support plate on each side of said cam ring, and means securing said cam ring and support plates in assembled relation such that the cartridge assembly may be positioned in and removed from said housing as a unit,
said housing including a body and a removable cover,
a shaft extending through said body and one of said support plates and engaging said rotor,
said one of said support plates including an annular recess adjacent said body,



a shaft seal positioned and secured in said recess in said one support plate of said cartridge assembly and engaging said shaft,
a shaft bearing in said body supporting one end of said shaft,
said one support plate extending into and engaging said body,
such that when the cover is removed, the cartridge assembly including said shaft seal can be removed such that the shaft seal is readily accessible for service.

5,201,648
SCREW COMPRESSOR MECHANICAL OIL SHUTOFF ARRANGEMENT
Rodney L. Lakowske, La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.
Filed Sep. 1, 1992, Ser. No. 938,801
Int. Cl.[5] F01C *1/24*
U.S. Cl. 418—201.2 **14 Claims**



1. A refrigerant gas compressor of the screw type comprising:
a housing defining a working chamber, said housing further defining a suction port, a discharge port and an oil supply passage, all in flow communication with said working chamber, said housing still further defining an oil flow cutoff passage in flow communication with said oil supply passage;
a pair of screw rotors meshingly disposed for rotation in said working chamber; and
integral valve means disposed within said compressor and

positionable (i) to simultaneously occlude said oil supply

fuel and air streams are fed to said premixer at a fuel to air

means for sensing an operating temperature in said guid-

toward said admitting means and into said first combus-

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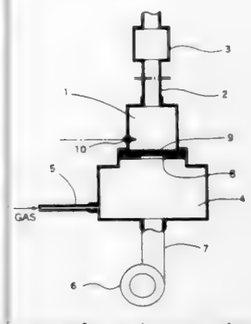
positionable (i) to simultaneously occlude said oil supply passage to prevent the flow of oil therethrough and to stop the backflow of previously compressed gas back to the compressor's working chamber at compressor shutdown and (ii) to simultaneously open said oil passage to permit the flow of oil therethrough and permit the discharge of compressed gas from said compressor immediately subsequent to compressor startup, all in direct response to ambient conditions in said compressor, downstream of said discharge port, which inherently exist at compressor shutdown and startup respectively.

5,201,649
PULSE COMBUSTOR

Yutaka Aoki, Sapporo, and Tadashi Itakura, Ebetu, both of Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 7, 1992, Ser. No. 926,902
Claims priority, application Japan, Aug. 13, 1991, 3-228828
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 **1 Claim**



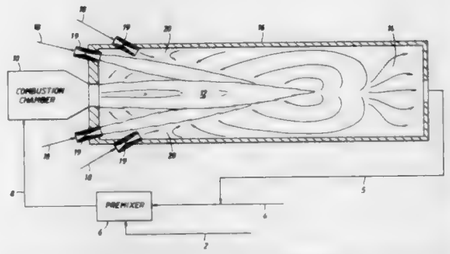
1. A pulse combustor for continuous combustion of air/fuel mixture, comprising:
a combustion chamber receiving mixture of air and fuel gas for pulsative combustion;
a tail pipe connecting to said combustion chamber for exhausting combustion byproducts from said combustion chamber;
a mixing chamber being coupled with and connected to said, combustion chamber via an opening provided with a flame trap, for mixing air and fuel gas and supplying the air/fuel mixture to said combustion chamber;
a gas supply conduit for supplying fuel gas to said mixing chamber;
an air supply conduit for supply air to said mixing chamber; and
a fan for feeding air into said air supply conduit;
wherein the total volume of the mixing chamber, the gas supply conduit, and the air supply conduit is larger than the volume of the combustion chamber.

5,201,650
PREMIXED/HIGH-VELOCITY FUEL JET LOW NO BURNER

Gregory L. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 9, 1992, Ser. No. 865,538
Int. Cl.[5] F23M *3/00*
U.S. Cl. 431—9 **12 Claims**

1. A process for combusting a gaseous fuel in a burner having low NO_x emissions comprising:
(a) feeding a gaseous fuel stream and an air stream to a premixer wherein said fuel and air streams are substantially fully mixed to form a fuel-air mixture wherein said fuel and air streams are fed to said premixer at a fuel to air equivalence ratio of less that 1;
(b) passing said fuel-air mixture to a combustion chamber wherein said fuel is substantially combusted to produce a combustion chamber jet and flue gases whereby said combustion chamber jet and flue gases pass into a heating zone selected from a furnace, heater, or boiler;
(c) passing to said heating zone, comtemporaneously with said combustion chamber jet and flue gases, at least two high-velocity fuel streams, wherein said high-velocity fuel

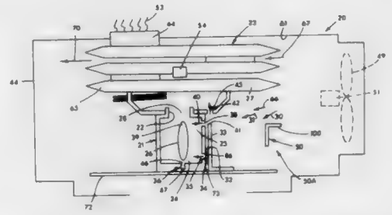


streams are diluted by up to about 300% wt. based on the weight of the high-velocity fuel streams with a nonreactive thermal ballast selected from water, steam, recycled or recirculated flue gas, or mixtures thereof, prior to coming into contact with said combustion chamber jet, wherein said high-velocity fuel streams entrain at least a portion of said flue gases, wherein the fuel in the high-velocity fuel streams is substantially combusted prior to coming into contact with the combustion chamber jet; and
(d) removing said flue gases from said heating zone.

5,201,651
CONSTRUCTION HEATER AND METHOD OF MANUFACTURE OF HEATER

Mark R. Niksic, Bailey, Colo., and Charles Hokes, Seven Hills, Ohio, assignors to T.A. Pelsue Company, Englewood, Colo.

Filed Mar. 11, 1991, Ser. No. 667,794
Int. Cl.[5] F23N *3/00*
U.S. Cl. 431—12 **8 Claims**



1. In a forced-air, gas-fired hot air construction furnace having:
a burner for supplying the gas, a combustion chamber having an inlet wall and being adapted to contain the gas and products of combusting the gas, a plenum for receiving forced draft combustion air and directing the forced draft combustion air toward said combustion chamber, a closed duct having an exhaust inlet for receiving the combustion products and an exhaust outlet for discharging the combustion products, means for guiding air to be heated over said closed duct, means for supplying forced air to said guiding means and to said plenum, means for discharging the heated air from said guiding means, means for sensing the pressure of the forced air in said supplying means, and

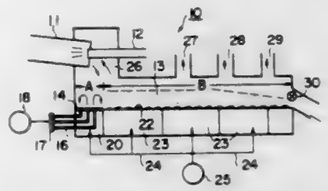
means for sensing an operating temperature in said guiding means; the improvement in said furnace comprising:
means for rendering said furnace capable of operating without manual adjustment of air flow to said combustion chamber, such operation of said furnace being in compliance with a selected standard which does not permit such manual adjustment but which limits the maximum percent of a given chemical compound which is permitted to exit said exhaust outlet when the rate of supplying the gas to said burner varies within a defined range and when voltage supplied to said supplying means varies within a preset range and causes variation of the pressure at which the forced air is supplied, such variation being relative to a low limit, said rendering means comprising:
combustion air inlet means provided in said inlet wall of said combustion chamber and having separate fixed inlet areas for admitting draft combustion air to said combustion chamber at first, second and third locations that are progressively closer and closer to said exhaust inlet to said closed duct;
baffle means mounted close to said wall of said combustion chamber for selectively blocking the forced draft in said plenum so that only natural draft air is admitted to said first and third locations and both forced and natural draft air are admitted to said second location;
said pressure sensing means being adjusted for responding to pressure of the forced air below the low limit, said low limit pressure being the lowest pressure at which said maximum percent of the given chemical compound does not appear in the combustion products exiting said exhaust outlet;
said temperature sensing means being adjusted for responding to the operating temperature exceeding a selected maximum temperature, said maximum temperature being selected to permit the pressure of the gas supplied to said burner to be at a maximum required by said selected standard when said forced air pressure is at the lowest required by said selected standard; and
means responsive separately to said pressure sensing means responding to pressure below said low limit or to said temperature sensing means responding to an operating temperature above said maximum temperature for interrupting the operation of said burner.

3. A method of rendering a forced-air, gas-fired hot air construction heater capable of operating in conformance with an emissions standard, said heater having a burner for supplying the gas, a combustion chamber having an inlet wall and being adapted to contain the gas and products of combusting the gas in first, second and tertiary combustion zones, a plenum for receiving forced draft combustion air and supplying forced draft combustion air to said combustion chamber, a closed duct having an inlet for receiving the combustion products and an exhaust outlet for discharging the combustion products, means for guiding air to be heated over said closed duct, means for supplying forced draft air to said guiding means and to said plenum, manually adjustable means for admitting primary combustion forced air from said plenum into said first combustion zone, means for discharging the heated air from said guiding means, means for sensing the pressure of the forced air in said guiding means, means for sensing the operating temperature in said closed duct as said duct receives the combustion products, said method rendering said heater capable of operating without manual adjustment of said means for admitting the primary combustion forced air, such operation of said heater being in compliance with the emissions standard, the emissions standard not permitting such manual adjustment, the emissions standard limiting the maximum percent of a given chemical compound which is permitted to exit said exhaust outlet when the rate of supplying the gas to said burner varies within a predetermined rate range and when said forced air supplying means supplies the forced air at varying pressure within a predetermined pressure range, said method comprising:
blocking the forced draft air flowing in said plenum toward said admitting means so that only natural draft air flows toward said admitting means and into said first combustion zone of said combustion chamber;
fixing the area of said admitting means at a selected non-variable area;
providing in said wall of said combustion chamber secondary combustion air inlet means having separate second fixed inlet areas for admitting secondary combustion air to said second zone of said combustion chamber;
partially blocking the forced draft air flowing in said plenum toward said secondary combustion air inlet means to permit both forced draft air and natural draft air to enter said separate second fixed inlet areas;
providing in said inlet wall or said closed duct third fixed tertiary combustion air inlet means for admitting natural draft tertiary combustion air to said third combustion zone of said combustion chamber;
adjusting said pressure sensing means for interrupting operation of said burner when the pressure of the forced draft air decreases below a specified pressure, said specified pressure being the lowest forced draft air pressure at which said maximum percent of the given chemical compound does not appear in the combustion products exiting said exhaust outlet; and
said adjusting temperature sensing means for interrupting operation of said burner when the operating temperature in said guiding means exceeds a selected maximum temperature, said maximum temperature being selected to permit the pressure of the gas supplied to said burner to be at the maximum end of said predetermined rate range defined by said selected standard.

5,201,652
METHOD OF COOLING CLINKER AND CLINKER COOLING APPARATUS

Youji Kawamura; Chiaki Sasaki; Hiuma Kaneko, and Takeshi Omi, all of Tokyo, Japan, assignors to Onoda Cement Co., Ltd., Japan

Filed Jun. 25, 1991, Ser. No. 720,910
Int. Cl.[5] F27D *15/02*
U.S. Cl. 432—78 **7 Claims**



1. A method of cooling a hot clinker sintered in a kiln comprising the steps of, fluidizing and cooling said clinker by an injection of high pressure cooling air from a row of high pressure nozzles on a stationary hearth in a fluidized mixing and cooling zone, said high pressure nozzles on said stationary hearth being provided in a plurality of rows arranged to run parallel to the direction of travel of the clinker, transporting said cooled clinker to a grate cooling zone following said fluidized mixing and cooling zone, and further cooling said cooled clinker by an injection of low pressure cooling air in said grate cooling zone; the successively switching of the rows of high pressure nozzles is carried out from the rows of high pressure nozzles on the side wall sides of the fluidized mixing and cooling zone to the rows of high pressure nozzles in the central portion thereof.

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hose, each nozzle having an internal bore through

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the dental casting to raise the die relative to the teeth in

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5,201,653

SUBSTRATE HEAT-TREATING APPARATUS

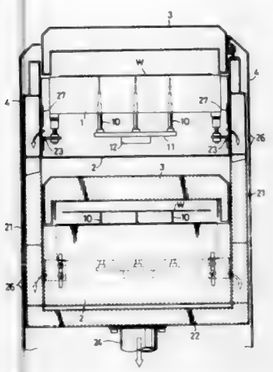
Moriyoshi Hasegawa; Yoshio Matsumura, and Yoshiteru Fukutomi, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 30, 1991, Ser. No. 767,588

Claims priority, application Japan, Oct. 2, 1990, 2-265923; Oct. 4, 1990, 2-105053[U]

Int. Cl.[5] F27B *3/04*

U.S. Cl. 432—170 **5 Claims**



1. An apparatus for heat-treating substrates in a plurality of heat-treating units arranged vertically, wherein each of said heat-treating units includes a heat-treating plate, and a box-like casing which has an open top and houses said heat-treating plate in a manner to define a space in combination with said heat-treating plate, said apparatus comprising:

at least one hollow column for supporting said heat-treating units;

an exhaust line for communicating said heat-treating units with said column to exhaust gases from said heat-treating units through said column; and

substrate lift means mounted in said space and comprising a plurality of substrate supporting pins vertically extending through said heat-treating plate to support a substrate placed on said heat-treating plate, said substrate supporting pins being movable above and below an upper surface of said heat-treating plate.

5,201,654

DENTAL HOSE CLEANING METHOD AND APPARATUS

Paul Kuehn, Eau Clair, Wis., and Thomas A. Lansing, Pine Springs, Minn., assignors to Pinnacle Products, Inc., Eau Claire, Wis.

Filed Apr. 1, 1991, Ser. No. 678,798

Int. Cl.[5] A61C *17/06, 17/14*

U.S. Cl. 433—25 **20 Claims**

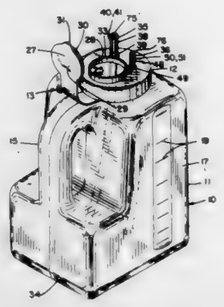
1. An apparatus for cleaning hoses used in the course of a dentist's work, comprising:

(a) a container having a mouth through which fluid may be added to the container; and

(b) a top adapted to snugly cover the mouth of the container, the top having

(i) two nozzles protruding upwardly from a surface of the top to the exterior of the container, comprising a high volume suction (HVS) nozzle adapted to receive an HVS attachment which is attached firmly to the end of an external HVS hose, so that the HVS attachment fits snugly over the HVS nozzle, and a low volume suction (LVS) nozzle adapted to receive an LVS attachment which is attached firmly to the end of an external LVS hose, so that the LVS attachment fits snugly over the LVS nozzle, wherein suction may be applied simultaneously or separately to the HVS hose and the LVS hose, each nozzle having an internal bore through which fluid in the container may pass,

(ii) a hollow internal tube attached firmly to each nozzle and extending into the lower interior portion of the container and terminating close to the bottom of the container, such that fluid may be drawn by suction through each internal tube and the nozzle to which it is attached,



(iii) wherein the top has a surface with an aperture therein such that the container may be filled with fluid either by adding fluid through the mouth of the container or by adding fluid through the aperture in the top, and

(iv) a cap sized and adapted to close the aperture in the top and to be released therefrom to allow the container to be filled through the aperture in the top.

5,201,655

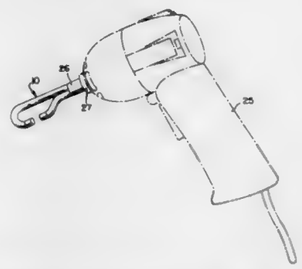
OPTICAL LIGHT GUIDE FOR CONTROLLING THE IRRADIATION OF A DENTAL RESTORATIVE MATERIAL

Joshua Friedman, 13 Fairfield Ct., Ridgefield, Conn. 06877

Continuation of Ser. No. 287,867, Dec. 21, 1988, abandoned. This application Aug. 2, 1991, Ser. No. 742,179

Int. Cl.[5] A61C *1/00, 3/00, 5/00*

U.S. Cl. 433—29 **7 Claims**



1. A light guide for use in combination with a light source for irradiating a single tooth for curing a dental restorative material in such tooth, comprising two fiber optic rods selected from the class consisting of glass, quartz or plastic with each rod having a proximal end joined together to form a common end, means for inserting said common end into said light source, with each optical conductor having a distal end spaced a predetermined distance apart in an opposing coaxially aligned relationship to form a gap adapted to be juxtaposed about opposite sides of said one tooth for directing optical energy of identical wavelength and substantially equal intensity from said light source uniformly into such tooth from such opposite sides, with said opposite sides corresponding to the labial or buccal and lingual sides of said tooth.

5,201,656

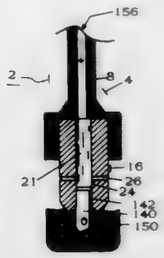
METHOD AND APPARATUS FOR REPAIRING DENTAL IMPLANTS

Robert J. Sicurelli, Jr., 438 Bay Ridge Pkwy., Brooklyn, N.Y. 11209

Filed Oct. 4, 1990, Ser. No. 592,718

Int. Cl.[5] A61C *3/06*

U.S. Cl. 433—166 **16 Claims**



1. An apparatus for repairing a dental implant having a cylindrical core and an external cylindrical surface, said apparatus comprising:

shank means for mounting upon a dental drill drive, said shank means having shank bore means for delivering fluid to a hollow circular bore in an abrasive element for lubricating and cooling the dental implant during abrasive polishing operations;

mounting means affixed to said shank means for mounting the abrasive element; and

the abrasive element,

said abrasive element comprising

the hollow circular bore defined by a bore wall, and

a substantially radial bore extending through said abrasive element for draining said lubricating and cooling fluid,

said bore wall comprising

an outer internal diameter adapted for closely fitting said external cylindrical surface of said dental implant,

a plurality of abrasive units affixed upon said outer internal diameter and projecting radially inward such as to define an inner internal diameter equal to said outer internal diameter minus the average radially inward projection of said abrasive units, said inner internal diameter being substantially equal to the diameter of said cylindrical core of said dental implant, said abrasive units being of a hardness greater than said external cylindrical surface of said dental implant.

5,201,657

DENTAL PROSTHESIS AND METHOD OF MANUFACTURE

Theodore J. Koukos, 10 Savin Park, West Haven, Conn. 06516

Filed Feb. 25, 1992, Ser. No. 840,806

Int. Cl.[5] A61C *11/00, 13/00*

U.S. Cl. 433—213 **4 Claims**

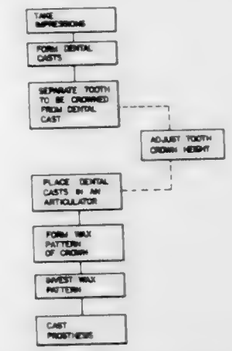
1. A method for manufacturing a dental prosthesis comprising:

(a) forming dental castings of upper and lower impressions of teeth taken in a patient's mouth;

(b) preparing a die of the tooth or teeth from the casting for which the prosthesis is desired so it can be removed and replaced in the casting, the die having an upper part containing the tooth or teeth for the prosthesis and a lower base;

(c) mounting the dental castings containing the die in a dental articulator or other such device;

(d) inserting a thin material between the base of the die and the dental casting to raise the die relative to the teeth in the dental casting;



(e) forming a pattern of the desired tooth configuration over the tooth portion of the die as determined by the articulator or other such device;

(f) removing the pattern and casting the prosthesis.

5,201,658

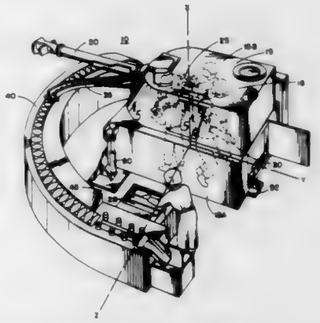
ARTILLERY GUN SIMULATOR HAVING FIXED GUN TUBE AND RECOILING BREECH ASSEMBLY

Stephen P. Taylor, Hurstpierpoint; Douglas J. Steptoe, Horsham, both of England, and Patrick J. Morello, Deltona, Fla., assignors to ECC International Corporation, Orlando, Fla.

Filed Nov. 18, 1991, Ser. No. 793,476

Int. Cl.[5] F41A *33/00*

U.S. Cl. 434—18 **5 Claims**



1. An artillery gun simulator comprising:

a gun tube;

supporting means, connected to said gun tube, for supporting said gun tube;

a simulated breech assembly, for receiving a simulated round therein, said breech assembly being movably mounted with respect to said tube, such that said breech assembly is movable between an in battery position and a recoil position by reciprocating action;

a source of pressurized hydraulic fluid;

a double acting hydraulic cylinder, mechanically coupled to said breech assembly and fluidically coupled to said source such that said source positively drives said cylinder and breech assembly from the in battery position to the recoil position to simulate breech recoil and then said source positively drives said cylinder and breech assembly from said recoil position to the in battery position to simulate breech counter-recoil; and

said upper terminals all having a base with equal lengths, step-like manner towards the forward mating face to

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means for holding said gun tube in a fixed position during recoil and counter-coil of said breech assembly.

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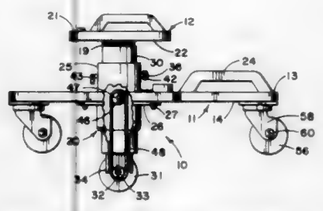
MOTORIZED GYMNASTIC TRAINING APPARATUS

Riley H. Nelson, 5504 Alhambra Dr., Orlando, Fla. 32808

Filed Aug. 28, 1992, Ser. No. 936,345
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—255 **12 Claims**



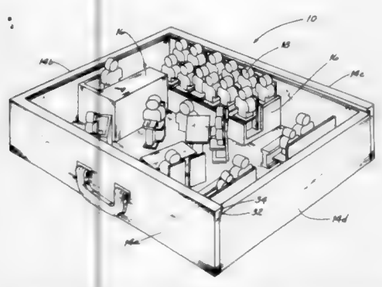
1. A gymnastic training device comprising:
first planar support member having an upper side and a lower side;
second planar support member having an upper side and a lower side;
central support member having first and second ends and having outer sleeve attached through said first planar support, said central support member having a flange attached thereto between the ends thereof, said flange being attached to said first planar support, and said central support member having an inner housing slidable in said outer sleeve, said inner housing having two ends, one end thereof being attached to said second planar support;
at least one wheel rotatably attached to one of said ends of said central support member;
electric drive means, including an electric motor mounted in said central support member and coupled to said wheel for powering said wheel;
an electric power source coupled to said electric drive means and providing electric power to said electric drive means; and
a switch mounted on said second support member and electrically coupled to said electric drive means for actuating said electric drive means.

5,201,660

KIT AND METHOD FOR DEMONSTRATING COURTROOM AND TRIAL PROCEDURE

Lynn Copen, 4109 - 86th St., Kenosha, Wis. 53142, and Harvey Knapp, 5103 - 30th Ave., Kenosha, Wis. 53140

Filed Mar. 18, 1992, Ser. No. 853,096
Int. Cl.[5] G09B *25/00*
U.S. Cl. 434—365 **20 Claims**



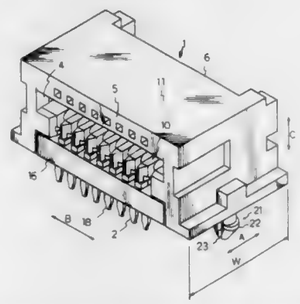
1. A therapeutic/educational kit for visual demonstration of courtroom and trial procedure comprising:
a substantially horizontal base member representing a courtroom, said base member having upper and lower surfaces; and
a plurality of interrelated members representing courtroom fixtures and figurines on and above the base member upper surface, each of said interrelated members being erect in demonstration position, having a proximal portion adjacent to the base member, and extending substantially upward to terminate in a distal portion above the base member, each of said interrelated members movable with respect to the base member,
whereby apprehension and concerns associated with a courtroom appearance are alleviated through assembly and movement of the fixture and figurine members.

5,201,661

PRINTED CIRCUIT BOARD FLAT FLEXIBLE CABLE CONNECTOR

Hidehiro Ii, Yokohama, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed May 13, 1992, Ser. No. 882,333
Claims priority, application Japan, Jun. 18, 1991, 3-173243
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—79 **6 Claims**



1. A connector to make electrical contact between the exposed conductors of a flat, flexible cable and a printed circuit board and to maintain the cable parallel to said board comprising:
a housing having front, rear, top and bottom walls,
a cable insertion slot formed in the housing front wall into which said cable is inserted,
a plurality of terminal insertion slots in the housing front and rear walls,
a plurality of lower terminals inserted into the front terminal insertion slots,
said lower terminals having a base with a length alternating between adjacent lower terminals,
said lower terminal base held in the housing parallel to and just above the housing bottom wall having flexible contact arms extending into said cable insertion slot from a "C" shaped bend at one end of the front terminal base which is first inserted into the housing front, said arms making electrical contact at contact points with the exposed conductors of the bottom portion of said flat, flexible cable, and tails extending from an "L" shaped bend at the end of the base opposite said "C" shaped bend, so that the tails pass through the bottom housing wall perpendicular to the printed circuit board where, due to the alternating length of the lower terminal base, the tails alternate passing through the housing bottom wall at different distances from the housing front wall whereby the tails form two rows parallel to the housing front and alternating in a staggered relationship, and
a plurality of upper terminals inserted into the rear terminal insertion slots,

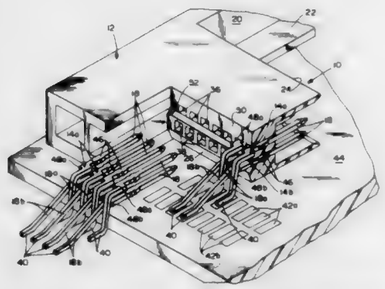
said upper terminals all having a base with equal lengths,
said upper terminal base held in the housing parallel to and just below the housing top wall having flexible contact arm extending into said cable insertion slot from a "C" shaped bend at one end of the upper terminal base which is first inserted into the housing rear, said arms making electrical contact at contact points with the exposed conductors of the upper portion of said flat, flexible cable, and tails extending from an "L" shaped bend at the end of the base opposite said "C" shaped bend so that the tails travel down along the rear housing wall, said tails being bent a second time so that the tails travel parallel to and above the housing bottom wall and bent a third time forming lengths between the second and third bends alternating between adjacent terminals so that the tails are perpendicular to the printed circuit board where, due to the alternating length of the tail formed by the third bend, the tails alternate passing through the housing bottom wall at different distances from the housing rear wall whereby the tails form two rows parallel to the housing rear wall and alternating in a staggered relationship.

5,201,662

ELECTRICAL CONNECTOR FOR MOUNTING ON A PRINTED CIRCUIT BOARD

Peter G. Roche, Limerick, Ireland, assignor to Molex Incorporated, Lisle, Ill.

Filed Aug. 23, 1991, Ser. No. 749,250
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—79 **2 Claims**



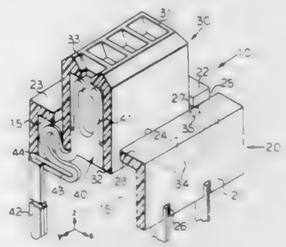
1. In a right angle electrical connector for mounting on a surface of a printed circuit board wherein the connector includes
a dielectric housing having a bottom mounting face, a forward mating face, a rearward terminating face, and a plurality of terminal passages extending between the forward mating face and the rearward terminating face and defining top and bottom rows and vertical columns of passages with at least a pair of passages in each column, and
a plurality of conductive terminals secured in the passages each having a contact section projecting from said forward mating face and a terminating section projecting from the rearward terminating face including a board-engaging end connectable to corresponding circuit traces on the printed circuit board at a given board angle, the board angle of the terminating sections of the top row being greater than the board angle of the terminating sections of the bottom row, each terminating section defining a mounting arm deflectable about a point generally defined between the contact section and the terminating section in response to a force applied to the board-engaging end of the terminal by the printed circuit board,
the improvement comprising:
the section of the rearward terminating face from which the top row of terminating sections project is recessed in a step-like manner towards the forward mating face to provide greater flexibility of the terminating sections of the top row in response to said forces applied to the board-engaging ends by the printed circuit board.

5,201,663

CONNECTOR WITH FLEXIBLE MOUNTING FEATURES

Shoji Kikuchi, Hiratsuka; Akihito Ono, Machida, and Tatsuya Nakamura, Kawasaki, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 15, 1992, Ser. No. 884,093
Claims priority, application Japan, Jun. 19, 1991, 3-173337
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—83 **15 Claims**



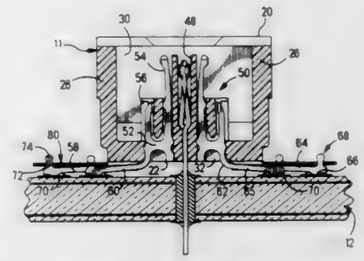
1. An electrical connector, comprising:
a dielectric housing having a first housing part and a second housing part, said first housing part having an opening through which said second housing part extends with a space therebetween for relative movement therebetween;
electrical contacts having contact portions secured in said first housing part and termination portions secured in said second housing part and extending outwardly therefrom; and
intermediate portions of said contacts between said contact portions and said termination portions permitting relative movement between the housing parts.

5,201,664

ALIGNMENT MEMBER FOR USE WITH SURFACE MOUNT CONTACTS

Iosif Korsunsky, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 12, 1992, Ser. No. 834,460
Int. Cl.[5] H01R *23/72*
U.S. Cl. 439—83 **19 Claims**



1. An electrical connector for mounting on a printed circuit board has a housing with terminal receiving cavities provided therein, the terminal receiving cavities have terminals positioned therein, the terminals have circuit board mating portions which extend from a circuit board mating surface of the connector housing, the circuit board mating portions of the

terminals are configured to cooperate with contact pads pro-

chanical and electrical outer-surface connection to said cable

electrical terminals are accommodated therein and are

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terminals are configured to cooperate with contact pads provided on the surface of the printed circuit board for surface mounting thereto, the electrical connector comprising:

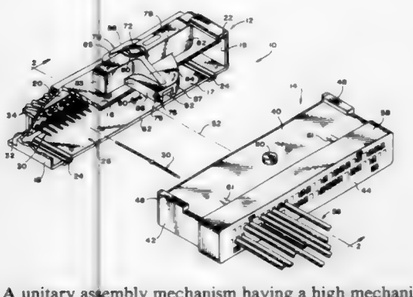
a terminal positioning member which cooperates with the circuit board mating portions of the terminals to ensure that the circuit board mating portions of the terminals are maintained in proper position relative to the connector housing, the circuit board mating portions have positioning sections which cooperate with the terminal positioning member, whereby as the electrical connector is positioned adjacent the printed circuit board the terminal positioning member cooperates with the positioning sections of the circuit board mating portions to ensure that the circuit board mating portions are positioned in alignment with the contact pads of the printed circuit board.

5,201,665

CAM LOCK CONNECTOR

Willard B. McCardell, Jr., Rochester, and Charles R. Schotthoefer, Bloomfield Hills, both of Mich., assignors to Cardell Corporation, Rochester Hills, Mich.

Filed Sep. 24, 1991, Ser. No. 764,640
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—157 **2 Claims**



1. A unitary assembly mechanism having a high mechanical advantage for assembling a multiterminal connector, comprising:

a terminal plug connector element including a plug housing of generally rectangular cross-section defining a first cavity enclosing a multiplicity of parallel terminal pins, said housing having at least a first planar wall portion;

a terminal socket connector element including a socket housing of generally rectangular cross-section defining a second cavity enclosing a multiplicity of parallel terminal sockets, and having at least a second planar wall portion, said terminal socket housing being shaped to matingly engage said terminal plug housing with the cavity of one of said plug and socket housings telescopically receiving the other of said housings to interconnect corresponding terminal pins and sockets with said first and second planar wall portions in engagement with each other;

cam means;

shaft means integrally mounting said cam for rotation between open and closed positions on one of said plug and socket connector element planar wall portions, said cam including a generally semicircular body portion having upper and lower parallel, spaced planar surfaces and a peripheral edge wall, the lower planar surface of said cam being adjacent the planar wall portion on which it is mounted and including a lever portion integral with said body portion, said shaft means providing an axis of rotation for said cam means extending generally perpendicular to said, upper and lower cam surfaces and to the planar wall portion on which said cam is mounted;

a cam channel formed in said lower planar surface of said cam body portion, said channel having an entry portion in said peripheral edge wall of said body portion in alignment with said axis of rotation with said entry portion and said axis of rotation defining a connector assembly axis when said cam is in said open position, the assembly axis being perpendicular to and passing through said axis of rotation, said channel further having a distal end locking portion including a channel portion at a constant radius from said axis of rotation and having a curved portion within said body portion extending between said entry and said distal portions and having spaced walls at a radius from said axis of rotation which varies along the length of the channel from a first radius R_0 at said entry portion to a second radius R_1 at said distal end to define spiral camming surfaces concentric with said axis of rotation;

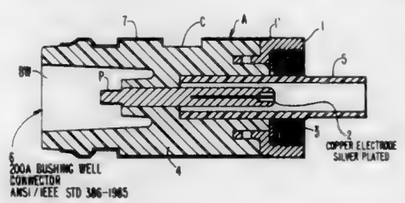
an upwardly extending cam follower integrally mounted on the other of said plug and socket connector planar wall portions and located to enter said entry portion of said cam channel upon initial assembly of said connector elements along said assembly axis when said cam is in its open position and to engage said spiral camming surfaces, subsequent rotation of said cam body portion through substantially 180° in a first direction about said axis of rotation to its closed position causing said camming surfaces to draw said cam follower into said cam channel toward said distal portion and along said assembly axis a distance equal to R_0–R_1 to thereby draw said plug and socket connector elements together along said assembly axis into complete mating engagement of said pin and socket terminals for assembly of said connector, entry of said cam follower into said distal end locking portion preventing further rotation of said cam body portion in said first direction from drawing said plug and socket connector elements into closer mating engagement, and rotation of said cam body portion through substantially 180° in a second direction about said axis of rotation causing said camming surfaces to force said follower along said cam channel away from said distal portion and toward said entry portion and along said assembly axis to thereby separate said plug and socket terminal elements and to disengage said pin and socket terminals for disassembly of said connector elements.

5,201,666

ADAPTER FOR ENABLING CONNECTION OF VINTAGE OIL FUSE CUTOUTS AND THE LIKE WITH MODERN CABLE LEAD CONNECTOR SYSTEMS

James P. Markham, Barrington, Ill., assignor to Hotsplicer Corporation, Wauconda, Ill.

Continuation of Ser. No. 481,577, Feb. 16, 1990, abandoned.
This application Nov. 14, 1991, Ser. No. 794,373
Int. Cl.[5] H01R *13/53, 17/04*
U.S. Cl. 439—186 **11 Claims**



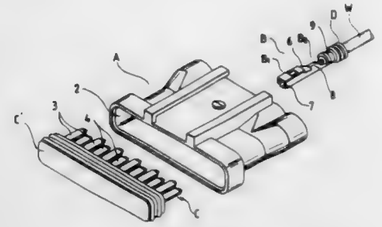
1. In combination with an oil fuse cutout, having a cable entrance of the type for use with a sleeve adapted for cable solder and taping connection, an adpater for converting said cable entrance to interface with bushing-well type cable connector systems, said adapter comprising an externally ground-shielded cylindrical insulating adapter body provided at one end with an internal conductive member slidingly fitted to a high voltage terminal of said cable entrance to establish electrical connection therewith, and further provided at said one end with a surrounding external securing means establishing mechanical and electrical outer-surface connection to said cable entrance, the adapter body being integrally provided at its other end with a re-entrant bushing-well type connector adapted to receive a standardized bushing insert connector for enabling cable connection to the bushing-well type connector, and the bushing-well type connector being provided with an inner terminal extended from said conductive member within and along the adapter body to complete an electrical connection of the cable to said high voltage terminal of said cable entrance.

5,201,667

BRANCH CIRCUIT STRUCTURE

Takayoshi Endo; Sakai Yagi; Masanori Tsuji, and Kimihiro Abe, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 720,127
Claims priority, application Japan, Jun. 27, 1990, 2-67256[U]; Jun. 27, 1990, 2-67257[U]; Aug. 1, 1990, 2-81162[U]
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—189 **23 Claims**



1. A branch circuit structure, comprising:

a housing including a plurality of independent juxtaposed terminal chambers, said chambers being isolated from one another;

a plurality of metal terminals each having a wire connection portion and an electrical contact portion, and being insertable into said terminal chambers from one end of said terminal chambers;

a short-circuit member disposed in the other end of said terminal chambers, and having a plurality of contact portions to be connected to said metal terminals respectively;

a plurality of rubber plugs fixed to the wire connecting portion of each of said terminals to be fitted within each of said terminal chambers, respectively, such that each of said terminals is waterproofed, each of said plugs including a pressure receiving body for retaining said plugs within said chambers; and

a rear holder adapted to be engaged with said housing at said one end, said rear holder abutting against each of said pressure receiving bodies to retain said bodies in place.

5,201,668

ELECTRICAL CONNECTOR

Takayoshi Endo; Sakai Yagi, and Masanori Tsuji, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

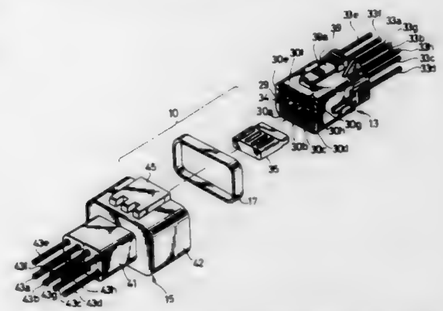
Filed Aug. 6, 1991, Ser. No. 740,908
Claims priority, application Japan, Aug. 7, 1990, 2-83086[U]
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—189 **1 Claim**

1. An electrical connector, comprising:

a first connector housing having front and rear portions, including a plurality of cavities which are arranged in first and second rows so as to have a space therebetween, and a plurality of electrical terminals connected to wires extending from the rear portion thereof, wherein each of said cavities communicates with said space such that said electrical terminals are accommodated therein and are partially exposed to said space;

a second connector housing having front and rear portions, said second connector housing including a plurality of cavities which are arranged in first and second rows so as to have a space therebetween, and a plurality of electrical terminals connected to wires extending from the rear portion thereof, said front portion of said second connector housing being adapted to fit to said front portion of said first connector housing to establish electrical connection between the respective terminals in said first and second connector housings, and wherein each of the cavities communicates with said space such that the electrical terminals are accommodated therein and are partially exposed to said space; and

a connecting member having a resin body, which is a separate part from said first and second connector housings,



for establishing electrical connection among at least two of said terminals in one of said first and second connector housings, said connector member being adapted to be removably fitted into one of said first and second connector housings from said front portion thereof in said space and including a conductive member embedded in said resin body such that only a part of each contact is exposed beyond an outer surface of said resin body between said at least two electrical terminals to achieve electrical connection therebetween through said connecting member when fitted to one of said first and second connector housings; said connecting member being adapted to be removably fitted into said space;

wherein each of said at least two electrical contact means has an elongated semi-cylindrical shape which extends toward an insertion direction of said connecting member in said space.

5,201,669

CONNECTION DEVICE OF A COMPUTER CONNECTION

Chao-Tsung Lin, Hsin-Tien, Taiwan, assignor to Advanced-Connectek Inc., Taipai, Taiwan

Filed Sep. 16, 1991, Ser. No. 760,499
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—357 **5 Claims**

1. A connection device of a computer connector comprising a clip piece including a metal spring leaf and a press-button fixed onto said metal spring leaf, and an insertion socket having a long sheet provided on the side surface of a shell of the connection device, which is characterized in that the central portion of the metal spring leaf of the clip piece has two corresponding hooks extending outwardly beyond the shell in order to engage the insertion socket; one end of the metal spring leaf

of the clip piece is in the form of a hook for hook-coupling with

ate portion of said manual operating lever between said

5,201,672

CORROSION PROTECTION APPARATUS

a socket member fitted into the support member and mated with said plug, said socket member including a socket

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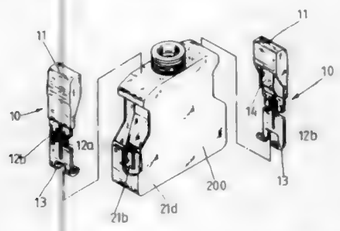
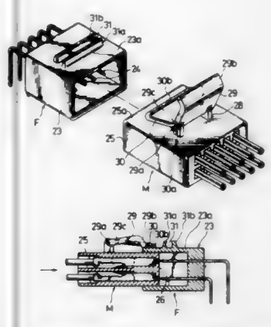
of the clip piece is in the form of a hook for hook-coupling with the head portion of the computer connector; and the other end



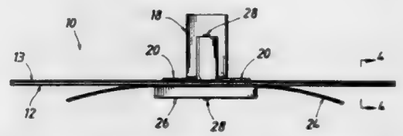
of the metal spring leaf of the clip piece is clutched with the press-button.

5,201,670
CONNECTORS
Tamio Watanabe; Masanori Tsuji; Takayoshi Endo, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Nov. 26, 1991, Ser. No. 797,949
Claims priority, application Japan, Nov. 30, 1990, 2-128199[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—372 **6 Claims**



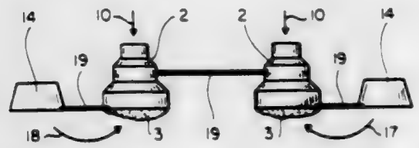
1. A pair of connectors for electrically connecting a first terminal with a second terminal which are electrically connected with corresponding wires thereof, comprising:
a first connector holding said first terminal;
a second connector, having a first wall thickness, being connected with said first connector in a detachable manner, holding said second terminal which is connected with said first terminal in a detachable manner, said first connector slidably inserted into said second connector along a substantially linear path;
a manual operating lever for connecting and disconnecting said first connector and said second connector, provided with a base-end portion and a free-end portion, said base-end portion being pivotably connected to mounting means which extend from said first connector a distance at least equal to said first wall thickness, the lever being rotatable in a plane parallel to a direction in which said first connector is so moved as to be inserted into said second connector, whereby said first connector is connected and disconnected with said second connector in a direction substantially parallel to the direction of insertion of said first connector with said second connector;
an engaging arm provided with a base-end portion and a free-end portion formed into an engaging portion, said base-end portion of said engaging arm being rotatably mounted on said manual operating lever in an intermediate portion of said manual operating lever between said base-end portion of said manual operating lever and said free-end portion of said manual operating lever; and
engaging means for being releasably engaged and disengaged with said engaging portion of said engaging arm, said engaging means being provided in said second connector; said engaging means including a hook portion for catching said engaging portion of said engaging arm, and an abutting portion on which said engaging portion of said engaging arm abuts, said engaging arm being substantially parallel to the outer periphery of the second connector in the fully engaged position, said engaging portion of said engaging arm being urged with a controlled force against said abutting portion for disengaging said second connector from said first connector along a direction substantially parallel to the direction of insertion of said first connector with said second connector; and
a biasing means for biasing said connectors in a direction in which said connectors are separated from each other so that said connectors are constrained to a substantially parallel orientation relative to the insertion direction during the connecting and disconnecting operation.

5,201,671
FLEX PULL TAB FOR SURFACE MOUNT CONNECTOR
Simon G. Elias, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed Jan. 24, 1992, Ser. No. 825,160
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—483 **12 Claims**



1. An apparatus for allowing a user to disconnect a first electrical connector from a second electrical connector, the apparatus comprising:
a flexible conductor having a first side and a second side, the first electrical connector being attached to said first side of said flexible conductor;
first attaching means for attaching the first electrical connector to said first side of said flexible conductor;
a flexible tab having a first side, a second side, a first end, and a second end, said first side of said tab being attached to said second side of said flexible conductor at a location opposite the first electrical connector, said first end and said second end extending freely away from said location of attachment of said tab to said flexible conductor a sufficient distance to allow said first end and said second end to be readily grasped by a user for disconnecting the first electrical connector from the second electrical connector; and
second attaching means for attaching said tab to said second side of said flexible conductor adjacent the first electrical connector.

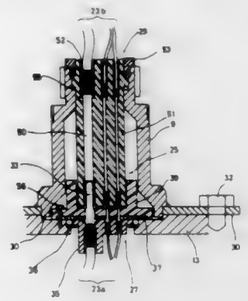
5,201,672
CORROSION PROTECTION APPARATUS
Martha F. Story, Atlanta, Ga.; Glen W. Ragland, St. Louis, Mo.; William H. Humphries, Patterson, Calif.; Lowell Koht, Foster City, Calif., and William D. Uken, Fremont, Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 826,346, Jan. 27, 1992, abandoned, which is a continuation of Ser. No. 677,021, Mar. 28, 1991, Pat. No. 5,085,597, which is a continuation-in-part of Ser. No. 523,158, May 14, 1990, abandoned, which is a continuation of Ser. No. 398,697, Aug. 25, 1989, abandoned, which is a continuation of Ser. No. 320,357, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 253,302, Sep. 30, 1988, abandoned, which is a continuation of Ser. No. 183,366, Apr. 12, 1988, abandoned, which is a continuation of Ser. No. 767,555, Aug. 20, 1985, abandoned. This application Aug. 6, 1992, Ser. No. 926,568
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—521 **20 Claims**



1. An apparatus for protecting a substrate, comprising:
at lease one reservoir (2); and a sealing material therein; characterized in that:
the sealing material comprises an elastic gel (3) having a cone penetration value between 100 and 350 (10^{-1} mm) and an ultimate elongation of at least 200%, the gel being contained within the reservoir (2); and
(i) the apparatus has means for pumping at least some of the gel out of the reservoir and in contact with the substrate so as not to exceed the ultimate elongation of the gel and so as at least partially to collapse the reservoir; and/or
(ii) the apparatus has first, second, third and fourth reservoirs, and means for interconnecting the reservoirs such that the third and fourth reservoirs can be moved from a first position whereat an open side of each of the reservoirs lies in substantially a common plane to a second position whereat the open sides of the third and fourth reservoirs confront open sides of the first and second reservoirs.

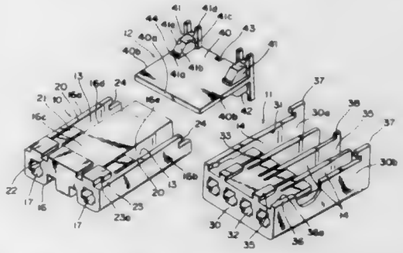
5,201,673
WIRING CONNECTION STRUCTURE FOR A VEHICLE MOTOR
Yukihiro Minezawa, Tokyo, and Satoru Wakuta, Anjo, both of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed Apr. 24, 1991, Ser. No. 690,837
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—559 **3 Claims**

1. A wiring connection structure for connecting wiring internal to the casing of a vehicle electric motor to vehicle wiring external to the motor casing, wherein the electric motor is supported on a vehicle through a support member fixed to the casing, said wiring connection structure comprising:
a plug member attached to the casing and including a plug connected to the internal wiring, a plug guide for holding said plug, a rubber bushing for sealing the interior of said casing from the exterior thereof and a plug cover;
a C-ring attaching said plug guide to the casing; and
a socket member fitted into the support member and mated with said plug, said socket member including a socket



connected to external wiring and a socket tube for holding said socket.

5,201,674
WIRING CONNECTOR
Yoshio Okura, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan
Filed Jun. 10, 1992, Ser. No. 896,449
Claims priority, application Japan, Jun. 13, 1991, 3-44445[U]
Int. Cl.[5] H01R *13/424*
U.S. Cl. 439—595 **2 Claims**



1. A connector comprising:
an upper housing and a lower housing connected with each other vertically and each having terminal accommodating chambers arranged in parallel with each other therein, said terminal accommodating chambers including upper and lower end surfaces; and
a cover, interposed between said upper housing and said lower housing, having projections extending upwardly and downwardly therefrom in such a manner that a position of each of said projections corresponds respectively to a position of each terminal accommodating chamber; and both upper and lower edges of each of said projections being disposed rearwardly of a rear end of the upper and lower end surfaces of said terminal accommodating chambers of said upper and lower housings so that an electric wire is fixedly sandwiched between each of said projections and the rear end of the upper and lower end surfaces of said terminal accommodating chambers.

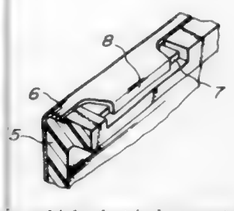
5,201,675

a third molded housing surrounding and attaching to a por-

contact portion curved in a circumferential direction to be

compressing, and deforming, when a predetermined

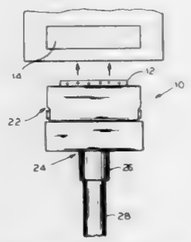
5,201,675
MINIATURE MULTIPLE ELECTRICAL CONNECTOR
Yoshiaki Igarashi; Yukio Saitoh; Fumio Furuya, and Akio Yamada, all of Tokyo, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Japan
Filed Dec. 23, 1991, Ser. No. 814,405
Claims priority, application Japan, Dec. 27, 1990, 2-405192[U]
Int. Cl.[5] H01R *13/502, 13/658*
U.S. Cl. 439—607 **1 Claim**



1. A miniature multiple electrical connector comprising, a plug connector and a receptacle connector, said plug connector including an insulating block and a fitting protrusion with contacts arranged thereon, a metal shell fixed to the plug connector insulating block to surround the fitting protrusion with clearances therearound, said receptacle connector including an insulating block and a fitting recess with contacts arranged thereon, a metal shell fixed to the receptacle connector insulating block arranged to be in contact with the inside of the metal shell of the plug connector upon fitting the plug and receptacle connectors with each other, said receptacal connector insulating block and the metal shell fixed thereto being fixed to each other by fitting anchoring protrusions provided along both sides of said receptacle connector insulating block in anchoring apertures of fixing tongues provided on the metal shell of the receptacle connector, the metal shell of the receptacle connector being formed in the proximity of its center with anchoring tongues, one on each side thereof, formed by extending and bending an upper end insert edge of the metal shell, the insulating block of the receptacle connector being formed in the proximity of the center of an upper end insert edge thereof with anchoring stepped portions, one on each side thereof, for anchoring the anchoring tongues of the metal shell of the receptacle connector, each of the anchoring tongues being formed by bending rearwardly the inwardly facing upper end of the metal shell, and each of the anchoring stepped portions being formed by a shoulder of the insulating block with which the downwardly extending end of the anchoring tongue is engaged.

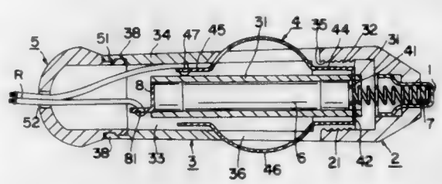
5,201,676
MOLDED CABLE ASSEMBLY
Douglas D. Duffield, New Paris, and William J. Weber, Eaton, both of Ohio, assignors to Cooper Industries, Inc., Houston, Tex.
Filed Jan. 27, 1992, Ser. No. 826,123
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 **14 Claims**

1. A cable assembly for connecting a connector shell to a mating connector comprising:
- a cable having a plurality of wires attached to a connector shell to form an interface between said wires and said connector shell;
- a first molded housing covering at least a portion of said connector shell and all of said connector shell to wire interface and providing a substrate for a cable shield;
- said able shield covering said cable along its entire length and a portion of said first molded housing;
- a second molded housing covering said first molded housing and locking the cable assembly to the mating connector; and
- a third molded housing surrounding and attaching to a portion of said cable and a portion of said second molded



housing to secure said cable and said connector shell to said second molded housing.

5,201,677
CAR PLUG
Hisao Takayama, Tokyo, Japan, assignor to Shinwa Electric Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1992, Ser. No. 907,691
Claims priority, application European Pat. Off., Jan. 10, 1992, 92300255
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—668 **1 Claim**

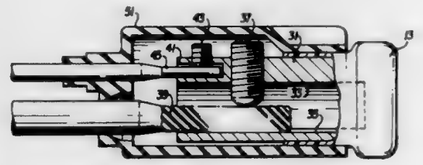


1. A car plug, which is composed of a tip terminal, a tip member with said tip terminal protruding toward the tip member and with a female thread portion interiorly on a base side, a cylindrical member with said tip member threadably attached at its tip, a projection terminal projected outwardly from said cylindrical member, a base member attached at a base end of said cylindrical member, an inner cylinder provided inside said cylindrical member, a tubular fuse housed in said inner cylinder, a coil spring provided between said tubular fuse and said tip terminal, and a metal terminal abutting against the base end of said tubular fuse and with a lead wire connecting portion, comprising

said cylindrical member, being formed as a double cylinder consisting of said inner cylinder and an outer cylinder connected by an annular connecting portion with an annular clearance formed toward the base end; a male thread portion, being formed in said connecting portion, to be threadably engaged with the female thread portion of said tip member; at least three slits, being formed at equal intervals in said male thread portion and said outer cylinder in an axial direction at positions in a radial direction from an axial center; said projection terminal, having a central circular hole with the tip of said inner cylinder of said cylindrical member inserted in the hole and a washer-shaped base to be flush with the tip surface of the connecting portion, and having strips as many as said slits, extending from a circumferential edge of said washer-shaped base at positions corresponding to the slits; and each of said respective strips, being folded at its end portions almost at right angles in the same direction to form a board portion to be inserted into the corresponding slit of the connecting portion and to form an insert portion to be inserted through said annular clearance, with a resilient

contact portion curved in a circumferential direction to be protruded outside of said outer cylinder, as an intermediate portion to connect said board portion and said insert portion, wherein said insert portion of the projection terminal are inserted through said annular clearance of the cylindrical member; the female thread portion of the tip member is engaged with the male thread portion of the cylindrical member; and the resilient contact portions of the projection terminal are protruded at least in three directions from the slits of the outer cylinder of the cylindrical member.

5,201,678
SET SCREW BUS CONNECTOR
J. William Venezia, Orlando, Fla., assignor to Homac Mfg. Company, Ormond Beach, Fla.
Filed Nov. 6, 1991, Ser. No. 788,675
Int. Cl.[5] H01R *11/09*
U.S. Cl. 439—723 **2 Claims**



1. A set screw bus connector for use with electric cables comprising

a bus;

at least one secondary outlet means extending outwardly from and substantially perpendicular to said bus;

at least one service outlet means extending outwardly from and substantially perpendicular to said bus, said service outlet means comprising

a rigid elongated terminal;

a first borehole in said terminal extending from the distal end of said terminal substantially perpendicular to said bus;

a first set screw means extending through said terminal and into said first borehole for securing a service cable within said first borehole;

a second borehole in said terminal extending from the distal end of said terminal substantially parallel with and adjacent to said first borehole, said second borehole having a substantially smaller diameter than said first borehole and terminating within said terminal short of said first set screw means;

second set screw means extending through said terminal and into said second borehole for securing a streetlight cable within said second borehole, said second set screw means being between said first set screw means and said distal end of said terminal; and

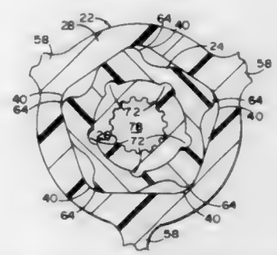
a single watertight cover surrounding said terminal and adapted for providing a watertight fit with both a service cable and a streetlight cable.

5,201,679
MARINE PROPELLER WITH BREAKAWAY HUB
Carl J. Velte, Jr., and James L. Kusiak, both of Grand Rapids, Mich., assignors to Attwood Corporation, Lowell, Mich.
Filed Dec. 13, 1991, Ser. No. 806,653
Int. Cl.[5] B63H *1/20*
U.S. Cl. 440—49 **29 Claims**

1. A propeller comprising:

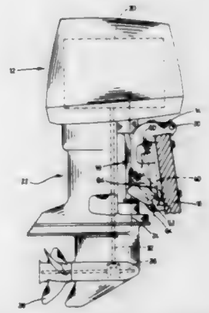
a hub having a longitudinal axis and a first aperture with a generally polygonal cross-sectional shape extending coaxially through at least a portion of said hub; and

an insert corresponding to and positioned in said first aperture, said insert comprising a resilient material, said insert compressing and deforming when a predetermined amount of torque is applied to said propeller whereby the



entire insert moves in a rotational direction about said longitudinal axis, separate and apart from said hub, and relative to said hub when said torque is applied.

5,201,680
MARINE PROPULSION DEVICE HAVING QUICK-DISCONNECT CONNECTOR
Gregory J. Binversie, Grayslake, Ill.; H. Norman Petersen, Kenosha, Wis., and David J. Hall, Zion, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Sep. 18, 1991, Ser. No. 762,859
Int. Cl.[5] B63H *19/00, 5/20, 5/12, 21/26*
U.S. Cl. 440—113 **20 Claims**



1. An outboard motor comprising a propulsion unit adapted to be mounted on a boat for pivotal movement relative thereto about a generally horizontal axis, said propulsion unit including a propeller shaft, and an engine drivingly connected to said propeller shaft, and said outboard motor further comprising means for pivoting said propulsion unit about the generally horizontal axis, said pivoting means being adapted to be mounted outside the boat, and said pivoting means comprising a housing having an interior and an exterior, an electric motor in said interior, and a first quick-disconnect connector portion which is electrically connected to said motor, which is fixed to said housing, and which is accessible from said exterior of said housing for selective mating with another quick-disconnect connector portion.

a pairs of cams disposed on the ends of said second axle;

5,201,685

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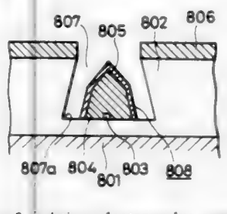
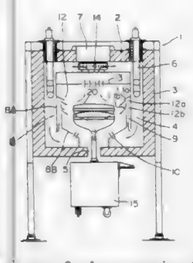
5,201,681
METHOD OF EMITTING ELECTRONS
Masahiko Okunuki, Itsukaichi; Akira Suzuki, Yokohama; Isamu Shimoda, Zama; Tetsuya Kaneko, Yokohama; Takeo Tsukamoto, Atsugi; Toshihiko Takeda, Tokyo; Takao Yonehara, Atsugi, and Takeshi Ichikawa, Sendai, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 746,154, Aug. 14, 1991, which is a continuation of Ser. No. 463,783, Jan. 8, 1990, abandoned, which is a division of Ser. No. 151,961, Feb. 3, 1988, abandoned. This application Mar. 9, 1992, Ser. No. 848,727
Claims priority, application Japan, Feb. 6, 1987, 62-024872; Feb. 6, 1987, 62-024873; Feb. 23, 1987, 62-038075; Feb. 23, 1987, 62-038076; Mar. 4, 1987, 62-047816; Mar. 6, 1987, 62-050344; Mar. 9, 1987, 62-052113; Mar. 24, 1987, 62-067892; Mar. 26, 1987, 62-070467; Mar. 27, 1987, 62-073601
Int. Cl.[5] **H01J** *1/30*
U.S. Cl. 445—24 **3 Claims**



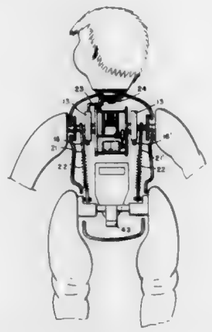
1. A method of emitting electrons by applying a voltage between a voltage application electrode and a target to be irradiated with the electrons emitted from an electron emission electrode with a conical portion in an electron emission device comprising said electron emission electrode, the voltage application electrode formed to oppose the electron emission electrode so as to sandwich an insulating layer therebetween and the target, wherein a charge of the electron emission electrode which is lost by electron emission during an electron emission operation is supplied after the electron emission operation is completed.

5,201,682
CRT EXHAUST OVEN
Hiroshige Nakagawa, Sakurai, and Shigeo Yamamto, Tondabayashi, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan
Filed Nov. 13, 1991, Ser. No. 791,247
Claims priority, application Japan, Nov. 21, 1990, 2-319915
Int. Cl.[5] **H01J** *9/385*
U.S. Cl. 445—73 **5 Claims**



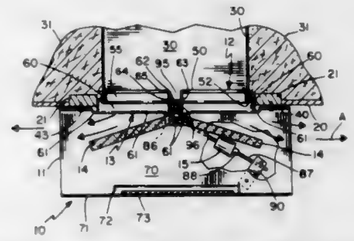
1. A CRT exhaust oven for heat-treating CRTs, comprising:
an oven housing having a heater for heating the atmosphere in said oven housing;
a plurality of exhaust carts capable of intermittently travelling below said oven housing in a direction of travel, each said exhaust cart having two adjacent exhaust heads extending upwardly therefrom to different heights, said adjacent exhaust heads being aligned in the direction of travel and positioned on said exhaust cart for providing, as viewed from above, no apparent clearance between two CRTs to be mounted on said adjacent exhaust heads of each said exhaust cart; and
a baffle structure in said oven housing for circulating the atmosphere in said housing, said baffle structure having sides extending in the direction of travel and a plurality of upper and lower holes in said sides along the direction of travel, said lower holes being positioned in a lower portion of said sides of said baffle structure for upwardly directing atmosphere entering said baffle structure through said lower holes, said upper holes being positioned in an upper portion of said sides of said baffle structure for downwardly directing atmosphere entering said baffle structure through said upper holes, said holes comprising a plurality of holes defining a plurality of vertically-spaced horizontally-extending rows of said holes, said holes in said rows alternating between said rows such that said holes in one said row are horizontally offset with respect to said holes in another said row.

5,201,683
INTERNAL STRUCTURE FOR A CRAWLING AND TALKING DOLL
Jaime Ferri, Onil, Spain, assignor to Fabricas Agrupadas de Munecas de Onil S.A., Onil, Spain
Filed Aug. 7, 1991, Ser. No. 741,667
Claims priority, application Spain, Jul. 31, 1991, 9101801
Int. Cl.[5] **A63H** *3/28, 29/22*
U.S. Cl. 446—299 **8 Claims**



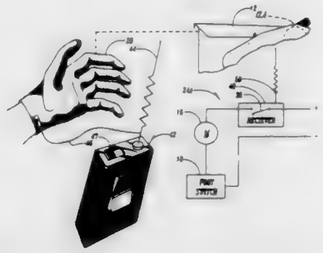
1. A crawling and talking doll having movable arms, legs, trunk and head, comprising:
an activation motor for powering a general mechanism for moving said arms, legs and head through a series of movements, said series of movements comprising crawling, stopping, simultaneously raising said trunk and moving said head, and stopping;
a synchronized sound device which emits one of two messages, said sound device being activated by an independent motor;
said general mechanism comprising:
first and second cog wheels, one of said cog wheels having one more cog than the other of said cog wheels,
a cog cylinder for engaging said first and second cog wheels;
a transmission means for providing rotational movement to said cog cylinder;
wherein said first cog wheel is fixed to an axle assemblage, said second cog wheel being capable of axial displacement relative to said axle assemblage;
said second cog wheel having a pinion disposed on an opposite side of said second cog wheel than said first cog wheel, said pinion being capable of engaging a third cog wheel on a second axle;
a pairs of cams disposed on the ends of said second axle;
a pair of swinging levers disposed so that ends of said levers rest on said pair of cams;
one of said pair of levers being connected to means for moving said head, a second of said pair of levers being connected to a first arm joined to a second arm carrying a needle of said sound device;
said first and second cog wheels have protrusions with oblique edges forming ramps, on sides facing each other, so that the second cog wheel moves axially toward and away from said first cog wheel;
wherein when said first and second wheels are rotated, said second cog wheel moves away from said first cog wheel, said pinion engages said third cog wheel to rotate said pair of cams, thus raising said trunk and turning said head while said sound device emits a first message,
wherein one of said pair of cams has a secondary cam joined thereto, to disconnect said first motor and stop movement of said trunk and head and emission of said first message; and
wherein when said pinion is out of engagement with said third cog wheel, said axle assemblage is rotated so that said arms and legs move, creating a crawling motion of said doll while said sound device emits a second message.

5,201,685
INTEGRAL AIR INTAKE APPARATUS
Nillo A. A. Raisanen, Cokato, Minn., assignor to Raydot, Incorporated, Cokato, Minn.
Filed Apr. 25, 1991, Ser. No. 691,383
Int. Cl.[5] **F24F** *13/10*
U.S. Cl. 454—259 **6 Claims**



1. An air intake apparatus for regulating air flow into a structure and for mounting a duct through which the air flows, comprising:
a moldable plastic housing with air inlet and outlet ports, each of the ports including a periphery, the housing including a groove duct seat molded about the air inlet port periphery for seating the duct,
a valve swingably mounted on the housing adjacent the air outlet port and responding to differential air pressure for allowing outside air through the outlet port and into the structure, the valve comprising a foam plastic panel for closing the air outlet port and an adjustable counterweight extending from the panel to set the valve for opening in response to the differential air pressure, and
a valve seat portion engageable with the form plastic panel adjacent the air outlet port and extending from and being integrally formed and molded with the housing, the valve seat portion comprising an integrally formed and molded elongate convex portion which is disposed transversely of where the valve is swingably affixed to the housing and which engages the valve when the valve is closed to minimize contact between the valve and valve seat and to permit the air to flow smoothly over the valve seat portion.

5,201,684
SAFETY MEANS FOR POWERED MACHINERY
Gerald N. DeBois, III, Pleasant Hill, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Continuation of Ser. No. 864,233, Apr. 6, 1992, Pat. No. 5,160,289, which is a continuation-in-part of Ser. No. 659,514, Feb. 21, 1991, Pat. No. 5,148,053, which is a continuation-in-part of Ser. No. 419,124, Oct. 10, 1989, Pat. No. 5,025,175. This application Jun. 29, 1992, Ser. No. 905,662
Int. Cl.[5] **F16P** *3/00;* **B26D** *7/22;* **A22B** *5/16*
U.S. Cl. 452—127 **2 Claims**



1. A safety means for a meat skinning machine comprising a rotationally powered gripping roll means which functions in conjunction with a cutting knife to sever the skin from a portion of meat comprising:
a safety glove adapted for wearing by a machine operator, said glove having an electroconducting surface,
an electrically powered skinning machine having a frame,
a rotationally powered gripping roll means on said frame,
a wireless electromagnetic signal receiver actuated control means on said meat skinning machine to control the rotation of said gripping roll,
a wireless electromagnetic signal transmitter means connected to said electroconducting surface of said glove so that when said electroconducting surface engages said skinning machine, said transmitter means will cause said signal receiver actuated control means to interrupt the rotation of said gripping roll.

5,201,686
PROCESS AND APPARATUS FOR PRODUCING A LOCK NUT
Kunihiko Ozawa, 39-6 Tsurukawa 4-chome, Machida-shi, Tokyo, Japan
Continuation-in-part of Ser. No. 574,158, Aug. 27, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 789,813
Int. Cl.[5] **B21D** *53/24*
U.S. Cl. 470—19 **9 Claims**

5. An automatic apparatus for producing a lock nut from a crude block comprising, in combination,
a holder assembly including a horizontal table provided thereon with a shaping center,
a compression mould positioned at said shaping center and provided with a truncated shaping recess of a polygonal transverse cross section for compression of the crude block and compressing means for pressing said mould against the crude block when the block is positioned at said shaping center to form the block into a lock nut,
a supply chute for crude blocks attached to said table of said holder assembly, and
a delivery chute for lock nuts attached to said table of said holder assembly,
said holder assembly further including means for periodically and intermittently transferring said crude blocks from said supply chute to said shaping center and said lock nuts from said shaping center to said delivery chute,

means, arranged adjacent said shaping center, for monitor-

second sheave relative to the first flange of said second sheave;

formed of a plurality of sheathed filaments, the filaments

from the main power input shaft to the fixed transmission

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means, arranged adjacent said shaping center, for monitoring a dimension of said lock nut resulting from said compression by said compressing means; and

means for selectively applying supplementary compression to said lock nut only when said dimension does not conform to a required dimension, in which said transferring means includes

a first substantially linear guide path which is formed in said

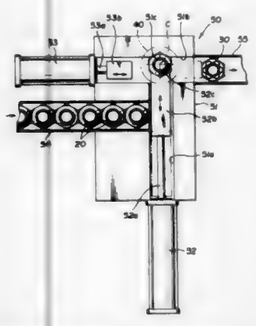


table in communication with said supply chute and leading to said shaping center,

a first pneumatic unit including a piston plunger reciprocal in said first guide path,

a second substantially linear guide path which is formed in said table in communication with said delivery chute and extending past said shaping center, and

a second pneumatic unit including a piston plunger reciprocal in said second guide path.

5,201,687

CONTINUOUSLY VARIABLE TRANSMISSION WITH HYDRAULICALLY ADJUSTABLE SHEAVES

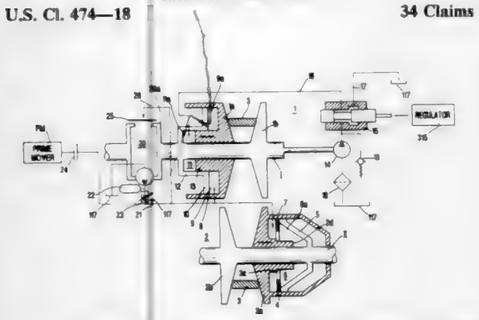
Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GMBH, Bühl, Fed. Rep. of Germany

Filed Nov. 21, 1990, Ser. No. 616,371

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938593; Dec. 7, 1989, 3940460

Int. Cl.[5] F16H *55/52*

U.S. Cl. 474—18 **34 Claims**



1. A continuously variable transmission comprising rotary input and output members; a prime mover for said input member; a first sheave on said input member; a second sheave on said output member, each of said sheaves having a first flange affixed to and a second flange movable axially of the respective member; an endless flexible element trained over said sheaves; means for displacing said flexible element radially of said sheaves including a first fluid-operated device having means for moving the second flange of said first sheave relative to the first flange of said first sheave, and a second fluid-operated device having means for moving the second flange of said second sheave relative to the first flange of said second sheave; and means for varying the pressure of fluid in said devices as a function of variations of torque which is transmitted between said members, comprising a pump continuously operated by said prime mover and transmitting torque to said input member.

5,201,688

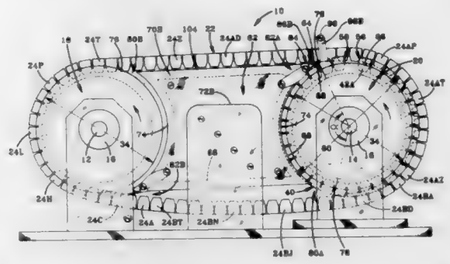
TORQUE TRANSMISSION SYSTEM FOR CONNECTING PARALLEL SHAFTS

Hamid Vahabzadeh, Oakland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1991, Ser. No. 786,148

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—111 **8 Claims**



1. A torque transmission system for operatively connecting laterally spaced driving and driven shaft means, said system comprising:

a first wheel means mounted on the driving shaft means;

a second wheel means mounted on the driven shaft means;

each said wheel means having substantially identical pitch diameters;

an endless flexible torque transmitting means operatively connecting said first and second wheel means;

a traveling insert band means to circumscribe and operatively to engage one of said wheel means at a time and to be located radially inwardly of said endless flexible torque transmitting means;

said traveling insert band means having leading and trailing ends located in substantially circumferential opposition when said traveling insert band means operatively engages said wheel means;

means selectively to derail said leading end of said traveling insert band means from said wheel means;

said traveling insert band means adapted when its leading end is derailed from one of said wheel means to travel to the other said wheel means and to circumscribe and operatively engage said other pulley means radially inwardly of said endless torque transmitting means thereby providing a different speed ratio between said driving and driven shafts.

5,201,689

STIFF CORD

Franciscus A. T. Lijten, Heveadorp, and Gerrit Ruitenberg, ED Velp, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 5, 1991, Ser. No. 787,893

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1990, 4035058

Int. Cl.[5] F16G *1/00*

U.S. Cl. 474—268 **12 Claims**

1. A V-belt comprising:

a body;

a stiff cord within the body, the stiff cord comprising yarns

formed of a plurality of sheathed filaments, the filaments being formed of spinnable polymers, almost all of the sheathed filaments having a complete sheath and wherein the percentage of sheathed filaments, A, as a percentage of the sheathed filaments in the yarn, with the sheath of each sheathed filament being (M ± 0.1 M) percent by volume of the respective sheathed filaments, simultaneously satisfy the following conditions:

$A \leqq 100$

$M \geqq 0.5$

$A \geqq 30 + (0.1\ M)^8$.

5,201,690

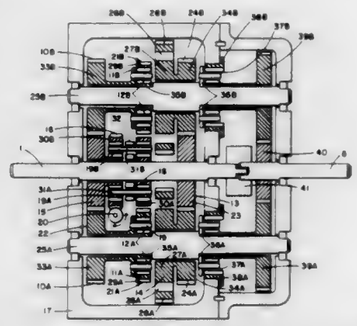
GEAR SYSTEM FOR MOTION TRANSFORMATION

David B. Dooner, P.O. Box 109, Quincy, Fla. 32351, and Ali A. Seireg, 2670 S.W. 14th Dr., Gainesville, Fla. 32608

Filed Mar. 30, 1992, Ser. No. 860,161

Int. Cl.[5] F16H *3/72*

U.S. Cl. 475—17 **8 Claims**



1. A gear system for motion transformation comprising:

an input shaft for introduction of motion into the system;

a first set of gears connected to the input shaft for division of the motion;

a means for controlling phase shift in the division of motion attached to the first set of gears;

a second set of gears connected by intermediate shafts to the first set of gears;

"on/off" clutches for selection of desired segments from the second set of gears;

a third set of gears connected by intermediate shafts to the "on/off" clutches for summing the motion output from the clutches; and

an output means for transmission of a resulting motion from the system to a load connected to the output means.

5,201,691

VARIABLE SPEED TRANSMISSION ASSEMBLY

James V. Doyle, Wexford, Ireland, assignor to Doyle Transmissions Limited, Coolballow, Ireland

Filed Oct. 24, 1991, Ser. No. 781,856

Claims priority, application Ireland, Nov. 7, 1990, 1647/90; Nov. 21, 1990, 4202/90; Aug. 20, 1991, 2942/91

Int. Cl.[5] F16H *47/04, 37/00*

U.S. Cl. 475—53 **11 Claims**

1. A variable speed transmission assembly comprising:

a main power input shaft;

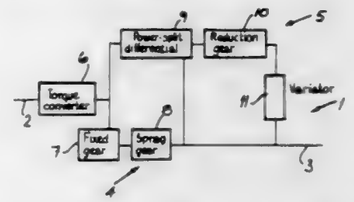
a main power output shaft;

a variable transmission having a variator and being connected between the main power input and output shafts;

a fixed transmission connected in parallel with the variable transmission between the main power input and output shafts;

means for switching power between the fixed and variable transmissions;

a torque magnification means mounted for delivery of power from the main power input shaft to the fixed transmission at start-up and low output speeds generally; and



means in the variable transmission for splitting the input power between the variator and the main power output shaft so that the variator handles only a portion of the input power during operation of the variable transmission.

5,201,692

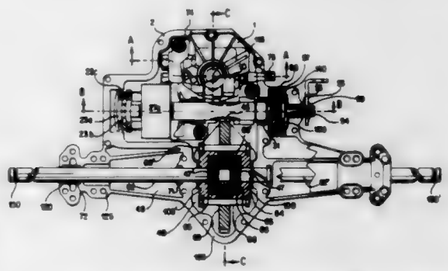
RIDER TRANSAXLE HAVING HYDROSTATIC TRANSMISSION

Alan W. Johnson, Ames, Iowa, and Ray M. Hauser, Decatur, Ill., assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.

Filed Jul. 9, 1991, Ser. No. 727,463

Int. Cl.[5] F16H *39/16*

U.S. Cl. 475—74 **26 Claims**



1. A transaxle including a hydrostatic transmission for use in a vehicle to convert rotational power from the vehicle engine to output axle means, comprising

(a) a housing for said transaxle providing a sump cavity and separate axle cavities;

(b) a hydrostatic transmission including:

(1) a first hydraulic displacement unit mounted in said sump cavity and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons and receiving a displacement unit mounted in said sump cavity and having a rotatable cylinder block containing a plurality of chambers for holding reciprocal pistons and engaging one end of a rotatable drive shaft to drive said rotatable drive shaft, said rotatable drive shaft supported and arranged within said housing so as not to extend through said thrust bearing;

(2) a center section mounted in said sump cavity and having means for rotatably mounting said first hydraulic displacement unit and said second hydraulic displacement unit, said means including means for hydraulically connecting said first and second hydraulic displacement units, a first running surface positioned to rotatably mount said first hydraulic displacement unit, a second running surface positioned to rotatably mount said second hydraulic displacement unit and a bottom face, porting means for hydraulically connecting said first displacement unit to said second hydraulic dis-

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placement unit integrally formed therein, and bearing means integrally formed in said center section for receiving and fully supporting said rotatable drive shaft;

(3) a thrust bearing mounted in and fully supported by said housing so as to engage said reciprocal pistons of said second hydraulic displacement unit;

(4) means for reducing the speed of said rotatable input shaft, wherein at least a portion of said speed reduction is accomplished through said porting means and said piston chambers of said first and said second hydraulic displacement units;

(5) a check valve mechanism comprising valve openings formed into the bottom face of said center section and extending to s id porting means, a plate mounted on said bottom face of said center section and plurality of plate openings formed therein and corresponding to said valve openings, a raised annular surface formed on the top surface of said plate around each said plate opening, said raised annular surface acting to form a seal between said plate and said bottom face of said center section, a plurality of balls, one of said balls being mounted in each of said valve openings and said plate openings, and means for releasably securing said balls against said plate openings;

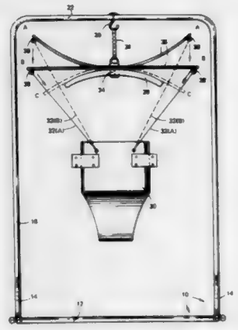
(c) a differential gear mechanism connected to said rotatable drive shift comprising a ring gear engaged to and driven by said input drive means, a plurality of planet gears securely connected to said ring gear in a manner to allow rotation of said planet gears around an axis perpendicular to the axis of rotation of said ring gear, a plurality of bevel gears engaged and driven by said planet gears, said bevel gears being mounted on and driving said output axle means; and clamping means for securing said bevel gears such that said bevel gears are solely supported by said planet gear unit and said clamping means, said output axle means being connected to and driven by said

(d) means for diverting said hydraulic fluid out of said porting means and said first displacement means and said second displacement means to enable said vehicle to be moved with minimal resistance from said hydraulic fluid; and

(e) said sump cavity containing said hydraulic fluid for said hydrostatic transmission and said output drive means, and said axle cavities formed within said housing separate from said sump cavity for enclosing said output axle means and a lubricating fluid for said drive axles.

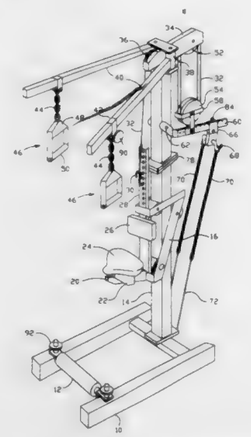
5,201,693
BABY BOUNCER
Curtis A. Sparkes, Altrincham, England, assignor to Lamondine S. A., Geneva, Switzerland
Filed May 2, 1991, Ser. No. 694,493
Claims priority, application United Kingdom, May 2, 1990, 9009923; Jun. 20, 1990, 9013732
Int. Cl.[5] A63B *22/00;* **A61H** *3/00*
U.S. Cl. 482—69 **17 Claims**

1. A baby bouncer apparatus comprising: a spring; overhead suspension means for suspending the spring, said spring being connected to the overhead suspension means; and a harness for receiving a baby which is suspended below the spring, said spring comprising elongate cantilever spring means having oppositely positioned end regions, said cantilever spring means being arranged transversely relative to the overhead suspension means and relative to the direction in which load is to be



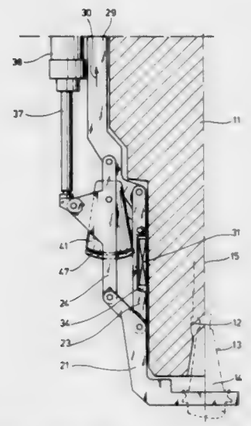
applied thereto, the harness being suspended from the respective end regions of the cantilever spring means.

5,201,694
SQUAT-PULL EXERCISE APPARATUS
Joseph Zappel, 22253 N. DeAnza Cir., Cupertino, Calif. 95014
Filed Nov. 13, 1991, Ser. No. 792,035
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—133 **12 Claims**



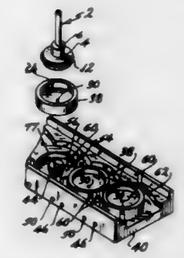
1. A multipurpose exercise apparatus comprising,
an upright rail column,
a pair of arms mounted to said rail column, each arm being generally horizontal and having a handle suspended therefrom,
a seat rollably mounted on said rail column, said seat having a vertical range of motion along said rail column, said seat being at a level below said arms, and
adjustable restoring means operatively attached to said seat for applying a controllable upward restoring force to said seat, said force being proportional to the vertical displacement of said seat along said rail column and tending to restore the seat to a rest position.

5,201,695
MACHINE TOOL
Eugen Ruetschle, Muehlheim, and Hans-Henning Winkler, Tuttlingen, both of Fed. Rep. of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany
Filed Oct. 7, 1991, Ser. No. 772,696
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1990, 4031997
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 483—3 **3 Claims**



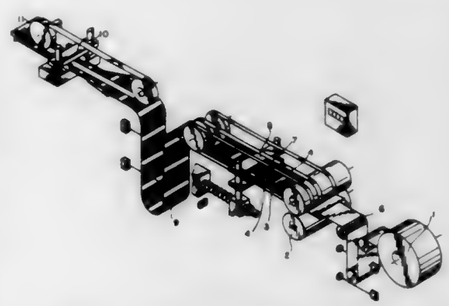
1. Machine tool, comprising:
a spindle means, said spindle means rotating about a spindle axis;
a quill means, said quill means being displaceable relative to said spindle axis;
a plurality of gripper arm means arranged at intervals around said spindle means and fastened to said quill means;
a plurality of tool holder means each comprising a cone arrangement, each of said tool holder means having a longitudinal axis and being carried by a respective gripper arm means;
a pivotable swinging support for supporting said gripper arm means and for individually displacing said gripper arm means between a magazine position located at a distance from said spindle means and a working position provided in said spindle means, the remaining ones of said tool holder means being retained in said magazine position; and
a plurality of separate sheath means open at the bottom and forming a cover at least for a respective cone arrangement, each one of said sheath means having a longitudinal axis and being provided for a respective tool holder means, and being located at said respective gripper arm means, in said magazine position each of said tool holder means being inserted into said respective sheath means;
wherein said longitudinal axis of said tool holder means and said longitudinal axis of said sheath means are essentially always aligned parallel to said spindle axis; and
wherein said gripper arm means are part of a parallelogram mechanism arrangement having two rod means parallel to one another, whereby said respective sheath means is mounted by means of a first pivot means on said first rod means and by means of a second pivot means on said second rod means, an imaginary connecting line being aligned between said two pivot means, essentially parallel to sides of said parallelogram mechanism arrangement, said sides being different from said rod means.

5,201,696
APPARATUS FOR REPLACEMENT OF VACUUM NOZZLES
Jack A. Kinback, Binghamton, and Paul M. Overby, Endicott, both of N.Y., assignors to Universal Instruments Corp., Binghamton, N.Y.
Filed May 5, 1992, Ser. No. 880,072
Int. Cl.[5] B23Q *3/155;* **B23P** *19/04;* **B66C** *1/02*
U.S. Cl. 483—54 **14 Claims**



1. In a pick and place machine for mounting electronic components on printed circuit boards or substrates wherein a vacuum nozzle mounted on a spindle containing a vacuum conduit is utilized to pick-up a component from a feeder and place it on said board or substrate, the improvement comprising:
a replaceable vacuum nozzle having a depending tip, an upper planar surface, and a pneumatic conduit therethrough;
an adapter mounted on said spindle, said adapter having a lower planar surface and a pneumatic conduit therethrough;
at least one of said planar surfaces having a lip projecting therefrom so as to define a recess; and
means for applying vacuum to said tip, through said recess, so as to provide that a means for vacuum holding said component is combined with a means for vacuum fastening together said adapter and nozzle.

5,201,697
PROCESS AND APPARATUS FOR MAKING A WRAPPING FROM A THIN PLEATED SHEET
Gilbert Capy, La Botte 69640, Jarnioux, France, assignor to Gilbert Capy and Akiva Buchberg, Paris, France
Filed Aug. 30, 1991, Ser. No. 752,866
Claims priority, application France, May 29, 1991, 90 12267
Int. Cl.[5] B31B *5/60;* **B65D** *65/08*
U.S. Cl. 493—22 **19 Claims**



1. A method of making a continuous tape separable into pleated wrappings, said method comprising the steps of:
providing an elongated tape having a longitudinal axis;

5,201,698

material to begin to take on a first arc shape forming an

at least one folding cylinder (2, 3);

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folding sections of said tape along fold lines transversal to said longitudinal axis to form pleats with end edges;
fixing said end edges by securing the end edge of one pleat to the end edge of an adjacent pleat to prevent separation of the pleats;
folding the fixed end edges to form pleats with hemmed edges;
fixing the hemmed edges by securing the hemmed edge of one pleat to the hemmed edge of an adjacent pleat; and
separating the pleats into wrappings.

5,201,698

PULL TAB FOR OPENING BEVERAGE CARTONS AND METHOD OF OPENING

Tunetoshi Kobayashi, 15-7, Nagasaki 2-chome, Toshima-ku, Tokyo 171, Japan

PCT No. PCT/JP89/00128, § 371 Date May 15, 1991, § 102(e) Date May 15, 1991, PCT Pub. No. WO89/12004, PCT Pub. Date Dec. 14, 1989
PCT Filed Feb. 9, 1989, Ser. No. 460,065
Claims priority, application Japan, Jun. 8, 1988, 63-139441
Int. Cl.[5] B31B *1/90*; B65D *5/74*
U.S. Cl. 493—87 **2 Claims**

1. A method of opening a beverage carton wherein said beverage carton has a foldable opening member secured by carton adhering members, said method comprising the steps of:
supplying a film strip of a polymeric material, said film strip having an upper leading portion and a lower trailing portion and wherein said film strip is a polyethylene terephthalate film strip;
applying an adhesive to said upper leading portion of said film strip, wherein said adhesive contains a nitrile rubber and has a stronger bonding strength than the carton adhering members;
placing the adhesive coated portion of said film strip in contact with said opening foldable member of said carton and adhering in place; and
pulling on the lower trailing portion of said adhered film strip to open said foldable opening member of said carton.

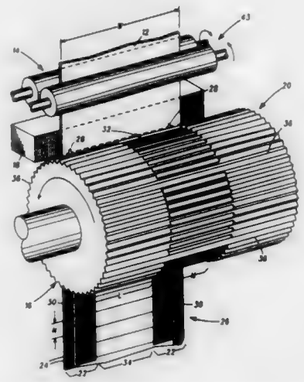
2. A method of opening a beverage carton wherein said beverage carton has a foldable opening member secured by carton adhering members, said method comprising the steps of:
supplying a film strip of a polymeric material, said film strip having an upper leading portion and a lower trailing portion and wherein said film strip is a polyester film strip;
applying an adhesive to said upper leading portion of said film strip, wherein said adhesive contains a nitrile rubber and has a stronger bonding strength than the carton adhering members;
placing the adhesive coated portion of said film strip in contact with said opening foldable member of said carton and adhering in place; and
pulling on the lower trailing portion of said adhered film strip to open said foldable opening member of said carton.

5,201,699

METHOD OF MAKING A RIBBON GARLAND

William F. Protz, Jr., Manitowoc, Wis., assignor to National Tinsel Manufacturing Company, Manitowoc, Wis.

Continuation of Ser. No. 651,664, Feb. 6, 1991, Pat. No. 5,091,226. This application Feb. 11, 1992, Ser. No. 833,861
Int. Cl.[5] A41G *1/04*
U.S. Cl. 493—346 **8 Claims**



1. A method of making a decorative garland, comprising the steps of:
providing a starting web of film material;
cutting said starting web film material between longitudinal edges, said cutting being selectively performed by cutting means to generate a cut pattern with said starting web film material having an uncut longitudinal web strip near each said longitudinal edge to maintain support of said cut pattern of said starting web film material and said cut pattern comprised of a shorter transverse length of cut web film material on one side of each said uncut web strip and a longer transverse length of cut web film material on the other side of said uncut web strip;
folding said web film material only once along a longitudinal axis of said but web film material and along a single fold line about in the middle of said web film material to form a plurality of loops from said cut web film material; and
applying a wirelike spine to said folded cut web film material to form a plurality of loops extending radially outward from said wirelike spine, said wirelike spine further twisted about said cut web film material such that said shorter transverse length of cut web film material is disposed radially closer said wirelike spine than the ends of said loops.

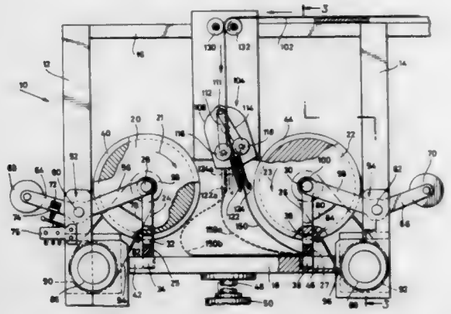
5,201,700

METHOD FOR FOLDING MATERIAL FED FROM A CONTINUOUS BAND INTO ACCORDION-LIKE MANNER AT A HIGH SPEED

Luciano Meschi, Castiglioncello, Italy, assignor to Industria Grafica Meschi S.r.L., Leghorn, Italy

Division of Ser. No. 744,816, Aug. 12, 1991, Pat. No. 5,139,247, which is a continuation of Ser. No. 430,512, Nov. 1, 1989, abandoned. This application May 22, 1992, Ser. No. 886,877
Claims priority, application Italy, Nov. 7, 1988, 22536 A/88
Int. Cl.[5] B65H *45/20*; B41F *13/60*; B41L *1/32*
U.S. Cl. 493—415 **7 Claims**

1. Method for folding sheet material fed from a continuous band into an accordion-like manner at a high speed, comprising:
advancing said sheet material between a pair of rollers travelling at a first peripheral speed until it contacts a first fixed obstacle and a supporting plane to cause said sheet material to begin to take on a first arc shape forming an increasingly narrow loop as the sheet material is pushed against the first fixed obstacle and said supporting plane;
carrying the loop near the apex thereof to a first roller having a peripheral speed higher than the speed of the first pair of rollers advancing the sheet material and causing the sheet material to impinge against a second fixed obstacle with the periphery of said first roller coming into contact with said sheet material for pressing the sheet material against said supporting plane to cause the sheet material to take on a straight and sharp fold line so that the continuously advancing sheet material forms a second arc in a direction opposite to said first arc and narrowing the loop as the sheet material is advanced; and
further carrying the loop near its apex after being removed from the second fixed obstacle and advancing the sheet material towards said first obstacle by means of a second roller having a peripheral speed which is higher than the advancing speed of the sheet material and compelling the



sheet material to impinge against the first fixed obstacle into engagement with the periphery of said second roller and said supporting plane for sharply pinching the last-mentioned loop to impart to the sheet a straight folding line;
guiding said sheet for imparting a zig-zag configuration forming the accordion-like folding by the sheet material remaining in abutment with said fixed obstacles and engaged with said rollers by alternate movement against said first and said second fixed obstacles as the sheet material is advanced to said supporting plane; and
guiding and orienting the sheet material as it is fed from the continuous band and held in a position above said support plane firstly towards said first fixed obstacle and then towards said second fixed obstacle and said second and first rollers, respectively, by inclining the sheet material firstly towards said first obstacle and then inclining the sheet material secondly towards said second obstacle while advancing the sheet material at said first speed.

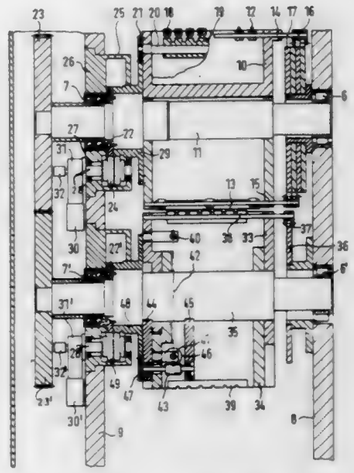
5,201,701

ADJUSTABLE FOLDING CYLINDER SYSTEM

Heinz Roettger, Aystetten, and Michael Neber, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 17, 1992, Ser. No. 822,345
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1991, 4103160.1
Int. Cl.[5] B65H *45/16*; B41F *13/62*
U.S. Cl. 493—425 **19 Claims**

1. Adjustable folding apparatus having
two side frames or walls (**8**, **9**), each defining an inward side facing the other frame or wall and an outward side remote from the inward side;
at least one folding cylinder (**2**, **3**);
the at least one folding cylinder including
a cylinder shaft (**11**, **35**);
bearing means (**6**, **7**) rotatably retaining said shaft in each of said side walls or frames;
a base body (**10**; **33**, **34**) concentrically secured to the cylinder shaft;
movable, elements (**18**, **38**) mounted on the base body and controllably movable with respect thereto;
a positioning spindle (**20**, **43**) operably coupled to the movable element (**18**, **38**), rotatably retained within the base body and extending parallel to the axis of the base body (**10**, **33**, **34**);
a first gear element (**21**, **47**) coupled to the positioning spindle (**20**, **43**);
a second gear element (**22**) located on the cylinder shaft (**11**, **35**) for rotation therewith;
a positioning or adjusting gearing (**24**, **49**) having a rotation input coupled to said second gear element (**22**) to receive rotary movement form the second gear element,
said positioning or adjusting gearing having a rotation output providing delivered rotation, said output being coupled (**29**) to said first gear element (**21**, **47**) to deliver rotary movement to said first gear element and hence to the positioning spindle (**20**, **43**) and further providing additional adjustment or positioning movement thereto; and



position control means (**28**, **30**, **31**) coupled to a positioning and control input of said positioning and adjusting gearing (**49**) for imparting an additional or superimposed positioning movement thereto,
said positioning or adjusting gearing (**24**, **49**) being operable to change the relative angular relationship between the input rotation received at said rotation input from said second gear element and the output, or delivered rotation,
wherein said positioning or adjusting gearing (**24**, **49**) is located at the inward side of one (**9**) of the side frame of walls (**8**, **9**) and positioned in close vicinity to that one (**7**) of said bearing means located on said one (**9**) or the side frames of walls (**8**, **9**); and
wherein said position control means (**28**, **30**, **31**) is located immediately adjacent said positioning or adjusting gearing (**24**, **49**) on said one side wall (**9**).

5,201,702

least one portal extends into the interior of said inner flexible

5,201,705

posite yarn consisting of an elastic yarn and a non-elastic yarn,

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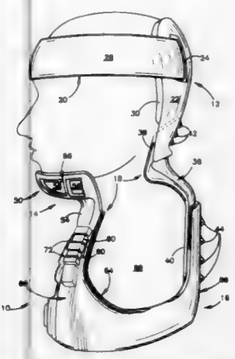
5,201,702

BRACE FOR SUPPORTING THE HEAD IN AN UPRIGHT POSITION

Suzanne P. Mars, 23649 Duffield Rd., Shaker Hts., Ohio 44122

Filed Apr. 17, 1990, Ser. No. 510,126
Int. Cl.[5] A61F 5/01
U.S. Cl. 602—17 19 Claims



1. An apparatus for supporting the head, the neck, and the upper body, the apparatus comprising:
first support means for supporting an upper portion of the head;
second support means for supporting a lower portion of the head, a portion of the second support means being disposed proximate to the chin;
third support means for supporting a portion of the upper body, the third support means including a front portion and a rear portion, said front and rear portions cooperating to encompass a substantial portion of the upper body;
first interconnecting means for detachably connecting the first support means to the rear portion of the third support means;
second interconnecting means for detachably connecting the second support means to the front portion the third support means; and
whereby the first support means, the second support means, and the third support means cooperatively function to significantly reduce bio-mechanical thrust and to allow for maintenance of the head in a substantially upright position.

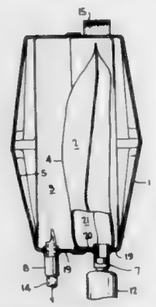
5,201,703

APPARATUS FOR COLLECTING BLOOD FROM A CHEST DRAINAGE UNIT AND REINFUSION OF THE BLOOD

John S. Gentelia, Madison; Stephen J. Roberts, Sauquoit, and Frank R. Williams, Utica, all of N.Y., assignors to Conmed Corporation, Utica, N.Y.

Continuation of Ser. No. 427,958, Oct. 25, 1989, Pat. No. 5,078,677, which is a continuation of Ser. No. 102,480, Sep. 29, 1987, abandoned. This application Jan. 6, 1992, Ser. No. 817,090
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.[5] A61M 37/00
U.S. Cl. 604—4 6 Claims

1. An apparatus for the collection of blood directly from a chest drainage unit which is attached to a patient, said apparatus permitting subsequent reinfusion of the collected blood directly into a patient, comprising a self-contained unit having a non-separable unitary outer rigid container enclosing an inner flexible container; said unit having at least two portals as an indivisible part of said outer rigid container each having first and second ends, at least one of said portals extending through a wall of said outer rigid container and through a wall of said inner flexible container so that said first end of said at least one portal extends into the interior of said inner flexible container; said inner flexible container being sealingly attached to said first end of said at least one portal and thereby being fixedly connected to said outer rigid container, and said second end of said at least one portal extends externally of said outer rigid container; said second end being constructed and arranged for attachment to a tubular member, said tubular member being the means by which said blood is transferred to or from said apparatus from said chest drainage unit or patient; a second of said at least two portals extending through a wall of said outer rigid container so that said first end of said second portal extends into a space between the inner wall of said outer rigid container and the outer wall of said inner flexible container, and the second end of said second portal extends external of said rigid container and being constructed and arranged for attachment to a vacuum source.

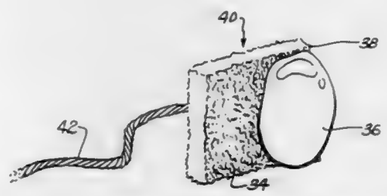


5,201,704

METHOD OF MAKING AND USING A HEMOSTATIC AGENT APPLICATOR

Joel W. Ray, 6367 Alvarado Ct., Suite 304, San Diego, Calif. 92120

Continuation-in-part of Ser. No. 432,906, Nov. 7, 1989, abandoned. This application May 23, 1991, Ser. No. 704,343
Int. Cl.[5] A61B 17/56
U.S. Cl. 604—49 5 Claims



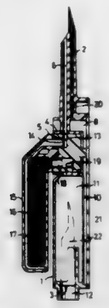
1. A method of achieving hemostasis of bone surfaces during surgery, comprising
a) integrally attaching a dry flexible absorbent member to a solid mass of bone was remote from said bone surface, said mass projecting from a surface of said absorbent member;
b) applying said bone wax to an open bone surface;
c) manipulating said flexible absorbent member to press said bone wax into the open bone surface to cover said surface; and
d) removing said flexible absorbent member from the situs of the bone while laving a quantity of the bone wax in contact with said surface.

5,201,705

DEVICE FOR RELEASE OF A SUBSTANCE

Bengt G. Berglund, Göteborg; Billy N. Nilson, Mjölby, and Åke S. Nilsson, Göteborg, all of Sweden, assignors to Aktiebolaget Hassle, Sodertalje, Sweden

PCT No. PCT/SE87/00319, § 371 Date Feb. 14, 1989, § 102(e) Date Feb. 14, 1989, PCT Pub. No. WO88/00476, PCT Pub. Date Jan. 28, 1988
Continuation of Ser. No. 297,245, Feb. 14, 1989, abandoned. This PCT application Jul. 6, 1987, Ser. No. 520,129
Claims priority, application Sweden, Jul. 10, 1986, 8603072
Int. Cl.[5] A61M 31/00, 37/00; E03B 11/00
U.S. Cl. 604—56 10 Claims



1. A device for release of a solid preparation into a flowing liquid during simultaneous parenteral administration of the liquid to a patient, the device comprising a connector having:
an inlet and an outlet connectable into a system for parental administration of a liquid; and
a valve means in fluid communication with the inlet; wherein the valve means includes a valve housing, a valve core rotatable in the valve housing between a bypass position and a working position; wherein the valve core has an outer coupling surface containing an external outlet port and an external inlet port spaced from the outlet port for connection to a releasable container; wherein the valve means further includes first passage means for directing fluids from the connector inlet to the connector outlet when the valve core is in the bypass position; and wherein the valve means includes second passage means for directing fluids from the connector inlet to the external outlet port, and third passage means for directing fluids from the external inlet port to the connector outlet, when the valve core is in the working position, wherein the connector includes first and second flow paths between the valve core and the connector outlet; wherein the first flow path is essentially unrestricted; wherein the second flow path includes a filter means; wherein the first passage means communicates with the first flow path when the valve core is in the bypass position; and wherein the third passage means communicates only with the second flow path when the valve core is in the working position.

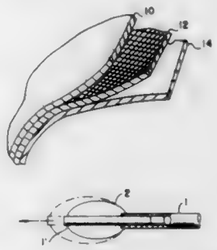
5,201,706

CATHETER WITH A BALLOON REINFORCED WITH COMPOSITE YARN

Noriyasu Noguchi, Shiga; Yoshiharu Yamazaki, Ohtsu; Mitsuyuki Hagio, Kamakura, and Yasuhiko Futami, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 587, Feb. 26, 1987, abandoned. This application, Mar. 11, 1991, Ser. No. 666,987
Claims priority, application Japan, May 9, 1989, 1-116607
Int. Cl.[5] A61M 29/00, 25/00
U.S. Cl. 604—96 10 Claims

1. A catheter comprising a balloon reinforced with a composite yarn consisting of an elastic yarn and a non-elastic yarn, said non-elastic yarn having a larger free length than that of



said elastic yarn, wherein the ratio of free length of said elastic yarn to said non-elastic yarn is in the range of 0.15–0.5.

5,201,707

INTRA-AORTIC BALLOON PUMP APPARATUS

Naritoshi Kanai, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 27, 1992, Ser. No. 858,404
Claims priority, application Japan, Mar. 29, 1991, 3-065989
Int. Cl.[5] A61M 29/00
U.S. Cl. 604—100 6 Claims

1. An intra-aortic balloon pump apparatus comprising:
a catheter;
a balloon connected to said catheter;
a negative pressure source for withdrawing a fluid from said catheter and applying a negative pressure to said balloon through said catheter; and
check valve means disposed between said catheter and said negative pressure source for allowing the fluid flow therethrough from said catheter to said negative pressure source and preventing the fluid from flowing from said negative pressure source to said catheter, said check valve means defining therein a pressure chamber communicated with said catheter, said check valve means being deformed when the negative pressure is applied to said pressure chamber.

5,201,708

the flange means on the plunger, and whereby subsequent

cavity of said second cylinder, said needle being provided with

5,201,712

CATHETER ASSEMBLY WITH RECIPROCABLE

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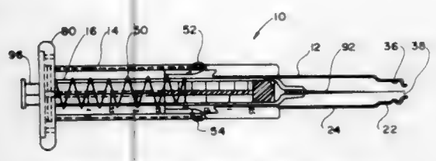
5,201,708
SELF-LOCKING SAFETY SYRINGE

Robin Martin, McAllen, Tex., assignor to Timothy A. Kershenstine, Metairie, La.

Filed Feb. 3, 1992, Ser. No. 829,708
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **20 Claims**



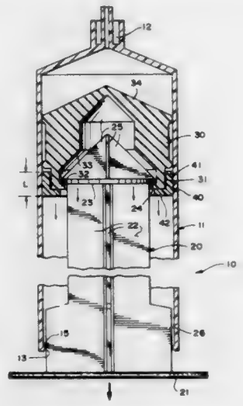
1. A self-locking safety syringe device, comprising:
an elongated tubular casing;
a syringe barrel having a needle assembly affixed thereto, said syringe barrel being securely attached to one end of the casing;
an elongated hollow needle guard telescopically co-axially engaged with the casing, said needle guard being movable between a first position, substantially covering the needle assembly and a second, retracted position, exposing the needle assembly;
a resilient depressible means for locking the needle guard in the first position, said locking means being carried by the needle guard;
a tension spring means continuously urging the needle guard to the first position, thereby preventing accidental movement of the needle guard into the second position even after the locking means have been depressed; and
means for preventing misalignment of the needle guard in relationship to the casing, said means comprising at least one outwardly extending runner mounted on an outer surface of the needle guard and at least one elongated groove formed in an interior wall of the casing, the groove being sized and shaped to receive the runner in slidable engagement therein.

5,201,709
SINGLE USE, SELF DESTRUCTING DISPOSABLE SYRINGE

Nicholas G. Capra, 2200 De Forest Ave., East Hanover, N.J. 07936; Kirk G. McElney, 206 Euclid, Long Beach, Calif. 90803, and James D. Pauls, Sr., 520 Brickell Key Dr., Penthouse #4, Miami, Fla. 33131

Continuation of Ser. No. 367,143, Jun. 16, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 825,790
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—110 **14 Claims**

1. In a hypodermic syringe having an elongate, cylindrical barrel with an adapter means on one end for attachment of a needle and an open other end, and in which a plunger and piston carried thereby are reciprocable, the improvement comprising:
releasable, interengaged flange mans on the piston and plunger for holding the piston and plunger assembled together during initial retraction of the plunger and piston in the barrel, the flange means on the piston including a cylindrical skirt projecting coaxially with the end of the plunger, said flange means including an annular, radially inwardly projecting flange on the skirt; and
a retaining collar telescopically engaged over the skirt, holding it and the associated flange in operative engagement with the flange on the plunger, said collar being slidably engaged in the barrel with sufficient frictional resistance that forward movement of the plunger and piston in the barrel results in said collar becoming lodged in the barrel and disengaged from the skirt, whereby the flange means on the piston can become disengaged from the flange means on the plunger, and whereby subsequent retraction of the plunger results in separation of the piston

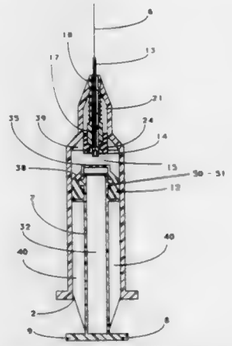


and plunger, rendering the syringe inoperative for subsequent reuse.

5,201,710
SYRINGE FITTED WITH A CLAMPING DEVICE FOR THE NEEDLE AND WITH MEANS TO ENABLE THE NEEDLE TO BE AUTOMATICALLY RETRACTABLE INTO THE SYRINGE BODY AT THE END OF AN INJECTION

Paolo Caselli, Via Fiesole, 42, 47023 Cesena (Forli), Italy

Filed Mar. 4, 1992, Ser. No. 845,965
Claims priority, application European Pat. Off., May 29, 1991, 91830226.6
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **10 Claims**

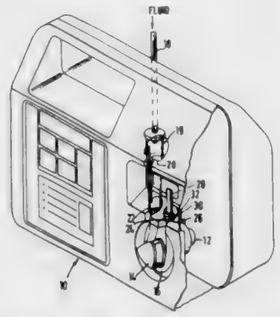


1. A syringe fitted with a clamping device for a needle and with means to enable said needle to be automatically retractable into the syringe body at the end of an injection comprising: a first outer cylinder and a second inner cylinder, said second cylinder having a cavity; a first and a second opening at the ends of said first cylinder, said second opening having a seat which widens from the inside to the outside of the syringe; a third opening at an end of said second cylinder, said third opening being for the entering into said cavity of said second cylinder; closing means for closing said third opening in order to enable said second cylinder to operate as a plunger, said closing means comprising diaphragm means; a needle extending outward a syringe and being able to be housed in said cavity of said second cylinder, said needle being provided with a head, and piercing means cooperating with said head to pierce said closing means; sealing means in said closing means to prevent a fluid from being transferred into a part of said first cylinder between said closing means and said first opening; a spring device able to push said needle against said closing means to pierce said closing means and to push said needle toward the cavity of said second cylinder; and a clamping device stressed by spring means;
wherein
said clamping device is able to move outward said syringe; said clamping device being fitted with elastic parts which cooperate with said seat to clamp said needle in order to maintain said needle outward said syringe when said spring means are compressed and to release said needle when said spring means are extended; at the end of the translation of said second cylinder toward said second opening of said first cylinder said second cylinder pushing said clamping device outward said syringe to move said elastic parts away from said seat in order to release said needle.

5,201,711
SAFETY INTERLOCK SYSTEM FOR MEDICAL FLUID PUMPS

Joseph Pasqualucci, and Frederick F. Schweitzer, both of Watertown, N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Continuation of Ser. No. 442,030, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 103,432, Sep. 30, 1987, Pat. No. 4,913,703. This application Jun. 7, 1991, Ser. No. 713,554
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—153 **5 Claims**

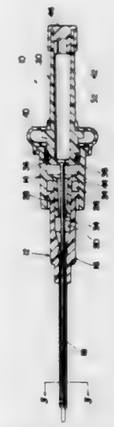


1. A disposable medical fluid delivery set designed to be mounted on a separate fluid control apparatus in a predetermined and operation activating alignment, the fluid delivery set comprising a conduit and a magnetic field source mounted on said conduit for the controlled flow of a medical liquid to a patient therethrough; and
said fluid delivery set further including a fluid reservoir, a flexible tubing section and a further tubing section for the delivery of liquid to a patient therethrough and said magnetic field source forms an abutment on said conduit adjacent said flexible tubing section and said further tubing section.

5,201,712
CATHETER ASSEMBLY WITH RECIPROCABLE OBTURATOR

Peter L. Bryant, Libertyville, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 19, 1991, Ser. No. 762,701
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 **7 Claims**



1. A catheter assembly, comprising:
a catheter including a base portion, and a proximal tubular portion extending from said base portion having a distal free end opposite said base portion and defining a lumen in fluid communication with an interior defined by said base portion;
obturator means mounted on said catheter for controlling the flow of liquid into said free end of said tubular portion, said obturator means including an elongated obturator rod, having a distal free end, extending telescopically within the lumen of said tubular portion of said catheter for selective reciprocable movement axially of said tubular portion, between a first portion wherein said obturator rod cooperates with said tubular portion to inhibit flow of liquid into the free end of said tubular portion, and a second position wherein liquid can flow through said lumen of said tubular portion and past said obturator rod, wherein said free end portion of said obturator rod has a cross-sectional configuration complemental to the cross-sectional configuration of said lumen of said tubular portion of said catheter for cooperation with said tubular portion for inhibiting liquid flow into said lumen, and said obturator rod further defines at least one axially extending groove means extending axially within said tubular portion for permitting liquid flow through said tubular portion and past said obturator rod in the second position thereof; and biasing means operatively connected to said obturator means for biasing said obturator rod toward said first position.

5,201,713
ONE-WAY INTRAVENOUS CATHETER WITH NEEDLE GUARD

Alessandro Rossetti, Via del Mare, Italy, assignor to Critikon, Inc., Tampa, Fla.

Filed May 29, 1991, Ser. No. 706,619
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—165 **8 Claims**

1. One way intravenous catheter with needle guard comprising:
a hollow catheter attached to a hollow catheter hub, said

cylindrical support, the first and second hollow needle

5,201,718

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catheter hub having tapered inner and outer surfaces and a proximal and distal end so that the proximal end of said hub is larger in diameter than the distal end of said hub attached to said catheter;

a hollow cylindrical needle having a diametral size capable of fitting within said catheter, and having a proximal end and a sharpened distal tip;

a needle housing at the proximal end of said needle, said needle attached to said needle housing, said needle housing having a generally cylindrical shape and further containing a pair of peripheral finger gripping means, said finger gripping means connected to said generally cylindrical shaped housing by a longitudinal connecting element containing a central portion;

a hollow tubular needle guard with an internal and external surface and a proximal end and distal end, and having a length greater than the needle and needle housing combi-

nation, said needle guard having a diameter capable of surrounding both said cylindrical shaped portion of said needle housing and said catheter attached to said needle, and said needle guard provided with a longitudinal slot extending for the length of said needle guard with said slot terminating at one end of said needle guard, said slot allowing passage of said longitudinal connecting element therein, and said needle guard configured to allow said finger gripping means to slide peripherally around said needle guard;

said needle guard containing locking means and said connecting element containing opposite locking means capable of interengaging said needle guard locking means; and

said needle housing containing a plurality of longitudinally extending guiding ribs, said guiding ribs capable of engaging the internal surface of said needle guard in sliding relationship thereon along the entire length of said needle guard.

5,201,714

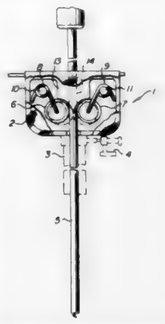
LAPAROSCOPIC CANNULA

John S. Gentelia, Madison; Frank Williams, Frankfort; William Wheatley, Utica; Sharyn Longo, Frankfort, and Deborah Forbey, Smyrna, all of N.Y., assignors to Conmed Corporation, Utica, N.Y.

Filed Mar. 5, 1992, Ser. No. 846,386

Int. Cl.[5] A61M *5/178;* **F16L** *37/28;* **A61B** *17/34*

U.S. Cl. 604—167 **8 Claims**



6. A cannula for use with laparoscopic instruments compris-

ing, in combination, a hollow housing having top, bottom and side walls, aligned apertures in the top and bottom walls to form a passageway between the apertures, a pair of spring mounted rollers disposed within said housing, said rollers being urged together to close the passageway between said aligned apertures and means for sealing closed at least one of said aligned apertures.

5,201,715

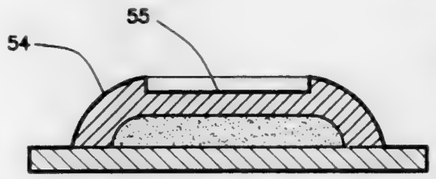
IMPLANTABLE DEVICES HAVING ULTRASONIC ECHOGRAPHIC SIGNATURE

Martin Masters, Santa Barbara, Calif., assignor to McGhan Medical Corporation, Santa Barbara, Calif.

Filed Nov. 19, 1991, Ser. No. 797,115

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—175 **5 Claims**



1. A device for implantation beneath the skin thereafter to be located by non-invasive ultrasonic means, said device having a target affixed thereto, said target comprising a biocampatible material having a plurality of ultrasonically reflective surfaces, said plurality of ultrasonically reflective surfaces, in combination, providing a characteristic ultrasonic echographic signature.

5,201,716

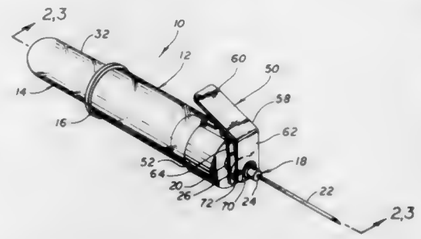
BLOOD SAMPLE NEEDLE SUPPORT AND EJECTION MECHANISM

Lewis G. Richard, 1302 Euclid St., Apt 105, Santa Monica, Calif. 90404

Filed Jun. 22, 1992, Ser. No. 901,918

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—187 **20 Claims**



1. A blood specimen collecting system, comprising:

a hollow cylindrical support adapted to receive a blood collection tube through a rear end thereof and support a needle assembly within a small aperture provided through a front end thereof;

a blood collection tube adapted to fit at least partially within the hollow cylindrical support, the collection tube being sealed at one of its ends by a septum breakable with a needle;

a needle assembly having an intermediate base portion adapted to be supported within the small aperture provided in the front end of the cylindrical support, a first hollow needle portion extending axially outwardly from the cylindrical support, and a second hollow needle portion extending axially inwardly into the interior of the

cylindrical support, the first and second hollow needle portions being in fluid communication with one another, wherein the first hollow needle portion is adapted to pierce a person's veins, and wherein the second hollow needle portion is adapted to pierce the septum; and

an ejector mechanism pivotally mounted with respect to the hollow cylindrical support, the ejector mechanism including means for biasing the needle assembly rearwardly into the small aperture of the cylindrical support when the ejector mechanism is pivoted into a first position, and means for simultaneously removing a rearwardly biasing force on the needle assembly and applying a forwardly directed ejection force to the needle assembly when the ejector mechanism is pivoted into a second position, to remove the needle assembly from the hollow cylindrical support.

5,201,717

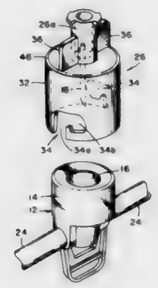
SAFETY ENCLOSURE

Philip Wyatt, 1018 Marengo Dr., Glendale, Calif. 91206; Gary Schaeffer, 25428 Via Escovar, Valencia, Calif. 91355, and Eli Shemesh, 31 Shave-Tzion St. P.B. 6675, Ashdod 77100, Israel

Filed Dec. 5, 1990, Ser. No. 622,868

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **11 Claims**



1. An enclosure for use in conjunction with an injection site comprising a body portion including a chamber accessible via a septum by a penetrating member, such as a cannula, having a fluid passageway, said chamber having first and second fluid ports each connected to a length of tubing, said enclosure comprising;

(a) supporting means for rigidly supporting the penetrating member;

(b) fluid flow means operably associated with the penetrating member for conducting fluid toward and away from the fluid passageway of the penetrating member;

(c) enclosure means connected to said supporting means for enclosing the penetrating member, said enclosure means including a shroud portion receivable over the body portion of the injection site;

(d) closure means for closing said shroud portion in a manner to encapsulate the penetrating member therewithin, said closure means comprising a closure member having a yieldably deformable side wall; and

(e) locking means for lockably interconnecting said closure means with said supporting means, said locking means comprising a shoulder provided on said shroud portion of said enclosure means and a radially inwardly protruding locking member provided on said closure means for locking engagement with said shoulder, said locking member comprising a circumferentially extending shoulder provided on said side wall, said side wall further having spacer means for preventing accidental interlocking of said closure member with said enclosure means.

5,201,718

PARENTERAL DEVICE

Maxwell E. Whisson, 15 Loftus Street, Nedlands, Western Australia, Australia 6009

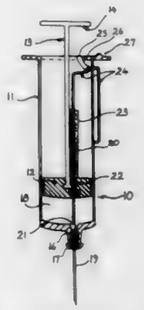
PCT No. PCT/AU88/00111, § 371 Date Jun. 14, 1989, § 102(e) Date Jun. 14, 1989, PCT Pub. No. WO88/08315, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 15, 1988, Ser. No. 368,297

Claims priority, application Australia, Apr. 22, 1987, PI1542; Aug. 18, 1987, PI3749

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—194 **11 Claims**



1. A parenteral device comprising a hollow body having a wall which defines a chamber; a passageway formed through a portion of the wall, said portion of the wall being fixed in relation to the body; an opening provided at the outer end of the passageway; a needle body comprising a needle having a lumen, a first aperture at one end; the needle body being slidable within the body; a second aperture in the wall of the needle body which opens into the lumen of the needle; the needle body further comprising an axial extension supported from the other end of the hollow needle, said axial extension having a handle means to enable manual manipulation to effect the slidable movement of the needle body in the body; the needle body being freely slidable via the handle from a first position at which the one end of the needle extends through the passageway beyond the opening and at which the needle is sealingly received in the passageway, the needle extending through the passageway; to a second position at which the one end of the needle is located inward from the opening; the needle body also being freely slidable vie the handle from the second position to the first position; the second aperture in the wall of the needle body providing communication between the chamber and the lumen of the needle when the needle body is in the first position; and a seal provided between the body and the axial extension to slidably and sealingly engage the axial extension between the second aperture and the handle means.

5,201,719

DISPOSABLE HYPODERMIC NEEDLE AND MEDICATION CATRIDGE

Cary C. Collins, P.O. Box 4104, 4104 Garth Rd., SE., Huntsville, Ala. 35802, and Robert L. Kurtz, P.O. Box 12213, 2619 Gawain Rd., SE., Huntsville, Ala. 35815

Filed May 6, 1991, Ser. No. 695,718

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—195 **11 Claims**

1. A hypodermic syringe assembly comprising of:

a tubular portion comprising both medication and a hollow needle cannula for injecting said medication into a patient;

proximal and distal sealed compartments, formed by the engagement of the interior portion of said tubular portion by slidable sealing means, said distal compartment being formed between distal end of said tubular portion and said

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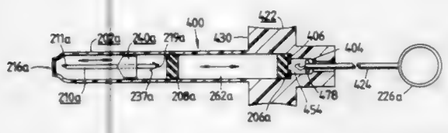
proximal compartment for containing said medication and needle, respectively;

a plunger slidably and axially secured in a proximal end of said tubular portion to be insertable and engagable with a proximal end of said proximal sealed compartment to extend said needle out of said tubular portion of said hypodermic syringe assembly with a proximal end of said needle being urged into fluid communication with said



proximal compartment immediately before said injection of said medication into a patient without said needle being touched by human hands; and

means for arresting retraction of said plunger to enable the separation of said plunger from said tubular portion subsequent to retraction of said proximal compartment and said needle completely within said tubular portion to enable disposal of said tubular portion containing the contaminated needle and enabling reuse of said plunger.

5,201,720

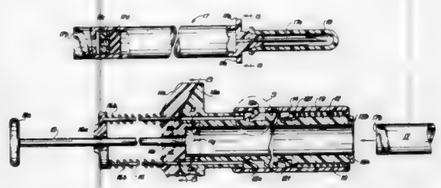
SYRINGE HOLDING AND EJECTING ASSEMBLY

Joseph Borgia, 2723 Riverview Dr., and Dawn Borgia, 4611 Dominium Dr., both of Naples, Fla. 33962

Filed Apr. 21, 1992, Ser. No. 871,821

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—198 **6 Claims**



1. A syringe holding and ejecting assembly comprising

an elongated open ended cylindrical syringe holder,

a syringe holder cap rotatably mounted on the rear end of the syringe holder and having a stud on its internal front surface,

an elongated plunger slidable along an axis of the cap and the syringe holder,

said plunger having a threaded front end,

a cylindrical tubular shield slidably mounted on the outside of the syringe holder,

an elongated cylindrical syringe filled with liquid medicant, a sharpened hypodermic needle axially fitted into the front end of the syringe, and a liquid sealing piston at its rear end attached to a body with an axially threaded recess,

the syringe being sized to fit into the open end of the syringe holder and the front end of the plunger being screwed into the threaded recess in the syringe,

said rear end of the syringe having therein an external groove for receiving the stud of the syringe cap holder whereby rotation of the syringe cap holder will lock the syringe into the syringe holder, and

means including a coiled spring for sliding said shield forward to a position surrounding said needle as it is being withdrawn from a body into which the needle and the medicant have been injected by forward axial movement of the plunger.

5,201,721

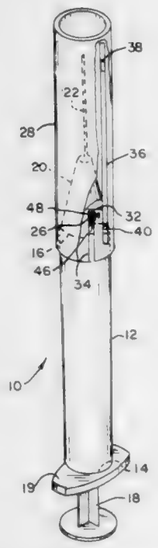
MEDICAL SAFETY NEEDLE AND METHOD

Chooi T. Lee, 1668 Weatherwood Dr., Manchester, Mo. 63021, and Danny J. Edwards, 2207 N. Missouri, Springfield, Mo. 65803

Filed Jun. 28, 1991, Ser. No. 722,901

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—198 **21 Claims**



1. A safety needle comprising:

a hollow elongated needle having a sharpened end at one end thereof;

a hub adapted to be connected to a medical device;

said hub including at least one radially outwardly extending protrusion;

a generally cylindrical hollow sheath positioned telescopically around said hub for sliding reciprocal longitudinal movement with respect to said hub;

a longitudinally extending retracting groove formed in the interior surface of said sheath sized to accept therewithin said protrusion on said hub such that said protrusion rides within said groove as said sheath is longitudinally reciprocated with respect to said hub, said retracting groove having disposed therein coming means for holding the sheath at least temporarily in one or more predetermined positions with respect to the hub;

said sheath being movable from a first position wherein said sheath extends beyond said sharpened end for shielding said sharpened end, to a second position wherein said sheath is retracted to expose said needle for use;

said retracting groove includes temporary locking means therein adjacent one end of said retracting groove for engaging said protrusion to hold said sheath in said second position and to release said protrusion and said sheath from said second position upon a longitudinal force being exerted on said sheath toward said needle's sharpened end;

said temporary locking means including a radially inwardly extending projection within said retracting groove adjacent said one end of said retracting groove; and

said projection having a camming surface on both sides thereof to allow said protrusion to pass over said projection in both direction of movement within said groove.

5,201,722

TWO-WAY OUTDWELLING SLIT VALVING OF MEDICAL LIQUID FLOW THROUGH A CANNULA AND METHODS

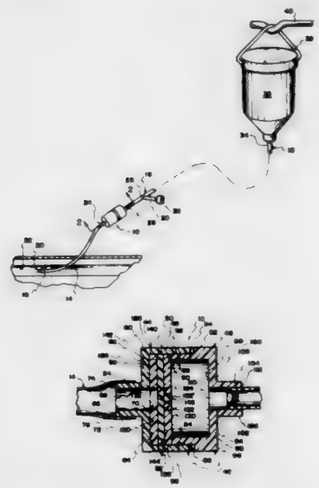
Robert H. Moorehead, 1694 E. 5685 South, Salt Lake City, Utah 84121, and Thomas A. Wiita, 1127 Goldenrod, Corona del Mar, Calif. 92625

Filed Sep. 4, 1990, Ser. No. 577,941

The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—247 **10 Claims**



2. A cardiovascular assembly comprising:

a cannula comprising a hollow interior for placement, at a distal end thereof, in a cardiovascular system of a patient;

a source of liquid disposed external of and above the patient at a height above the patient which provides a gravity caused liquid pressure for selective infusion flow;

a hollow tube disposed external of the patient, a proximal interior of the hollow tube being in communication with the liquid at the source;

two way valve structure interposed between the hollow tube and the cannula external of the patient, a proximal part to the two way valve structure being in communication with the interior of the hollow tube, at a distal end thereof, and a distal part of the two way valve structure being in communication with the hollow interior of the cannula, at a proximal end thereof;

the two way valve structure comprising centrally interior normally closed bi-directionally pressureresponsive slit valve means selectively accommodating liquid flow across the valve structure in a first direction without human assistance between the interiors of the hollow tube and the cannula when the pressure differential is controlled by the liquid from said source is applied across said slit valve means and in a second direction between the interiors of the cannula and the hollow tube when an oppositely directed pressure differential is imposed across said slit valve means;

the two way valve structure comprising hollow housing means comprising means to which the slit valve means are sealingly secured peripherally;

the sealingly securing means comprising opposed abutment means which collectively compressively engage a peripheral portion of the slit valve means.

5,201,723

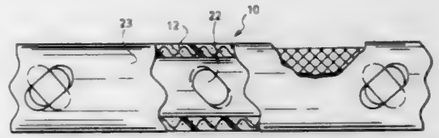
INCLINED SIDE HOLES IN THE DISTAL END OF A CATHETER

David M. Quinn, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Aug. 27, 1991, Ser. No. 750,498

Int. Cl.[5] A61M *5/00, 25/00*

U.S. Cl. 604—264 **10 Claims**



1. A catheter for use in an angioplasty system, said catheter comprising:

a tubular body with a proximal end, a distal end and a distal end portion having a plurality of holes in and along opposite sides of said distal end portion;

each hole having an elongate shape and a center axially aligned with the center of a hole on the opposite side of said distal end portion, said centers of said holes being located on an imaginary line parallel to the longitudinal axis of said catheter;

each elongate hole being inclined not less than 30 degrees and not more than 60 degrees upwardly or downwardly relative to said imaginary line; and

each elongate hole on one side of said catheter being inclined upwardly or downwardly relative to said imaginary line and each opposite side hole on the other side of said catheter being inclined to the imaginary line at an angle different than the aligned hole on the one side so that each pair of opposed holes form an X.

5,201,724

CATHETER

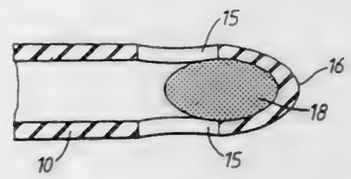
David W. Hukins, Chorltonville; Averil J. Cox, Bolton; Joanna M. Bibby, Hebdon Bridge; Terence M. Sutton, West Sussex, and Ian Capstick, Essex, all of Great Britain, assignors to The Victoria University of Manchester, Manchester, England

Continuation-in-part of Ser. No. 820,915, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 488,078, Jun. 22, 1990, abandoned. This application Jul. 23, 1992, Ser. No. 917,225

Claims priority, application United Kingdom, Dec. 23, 1987, 8729977

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—265 **22 Claims**



1. A catheter for drainage or collection of a bodily fluid, which catheter comprises a tube of non-biodegradable flexible material having a portion which throughout its period of use is retained within a body cavity characterized in that at least part of the said portion supports within the tube a solid biodegradable material which encapsulates or provides a medically beneficial substance which is thus released as a result of biodegradation, such that a controlled and continuous release of biodegradation products takes place throughout the said period when retained within the body cavity.

5,201,725

cup through a spray device, and a sump formed in a second

second adhesive portions, provided on said portion of the

laser comprising applying a laser beam to a herniated disk having a nucleus while deflecting the laser beam away from a

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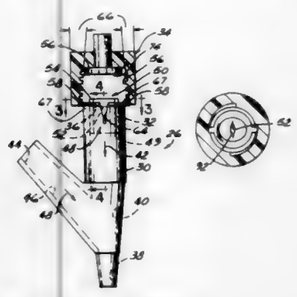
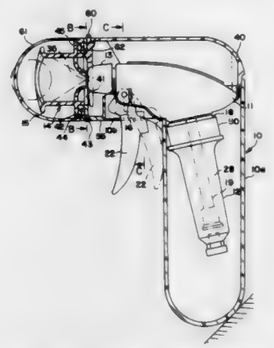
5,201,725
NEEDLE FREE I.V. ADAPTER
John E. Kling, San Diego, Calif., assignor to IVAC, San Diego, Calif.
Filed Sep. 26, 1991, Ser. No. 765,807
Int. Cl.[5] A61M 27/00
U.S. Cl. 604—284 26 Claims



1. A medical connector comprising:
a connector body having first and second openings and a first internal wall joining said first and second openings, first internal wall forming a first fluid passage for communicating a first fluid between said first and second openings,
a valve member disposed in said first fluid passage, said valve member adapted to prevent said first fluid from communicating between said first and second openings through said first fluid passage,
flow permitting means, responsive to a compressive force placed on said medical connector, for permitting said first fluid to freely communicate between said first and second openings through said first fluid passage;
said connector body further comprises a third opening and a second internal wall, said second internal wall joining said third opening to said first fluid passage, said second internal wall forming a second fluid passage for communicating a second fluid between said third opening and said first fluid passage, and
further including a female fastener adapted to engage and compress said medical connector thereby activating said flow permitting means and allowing said first fluid to communicate between said first and second openings through said first fluid passage.

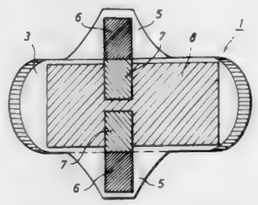
5,201,726
EYE-BATHING DEVICES
Clive Kirkham, Folkestone, United Kingdom, assignor to Hans Rohl, Kent, England
PCT No. PCT/GB89/00707, § 371 Date Jan. 30, 1991, § 102(e) Date Jan. 30, 1991, PCT Pub. No. WO89/12434, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 23, 1989, Ser. No. 623,804
Claims priority, application United Kingdom, Jun. 24, 1988, 8815155; Nov. 24, 1988, 8827421
Int. Cl.[5] A61M 35/00
U.S. Cl. 604—294 14 Claims

1. An eye-bathing device comprising an eye cup supported by a housing and adapted to receive the eye being bathed, a hand-operated pump mounted within a first portion of said housing, said pump having a pivotally-mounted actuating lever projecting through an aperture in said first portion of said housing for delivering an eye-bathing solution from a separate reservoir connected to said pump in said housing to the eye cup through a spray device, and a sump formed in a second portion of said housing, said first portion of the housing having



an internal passage for draining waste solution from a first outlet of the eye cup to said sump.

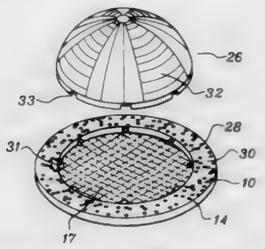
5,201,727
ABSORBENT ARTICLE
Hirofumi Nakanishi, Ichikai; Hiromi Baba, and Akira Sakurai, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Sep. 19, 1991, Ser. No. 762,434
Claims priority, application Japan, Sep. 27, 1990, 2-258154; Jun. 28, 1991, 3-159028
Int. Cl.[5] A61F 13/15, 13/20
U.S. Cl. 604—390 4 Claims



1. An absorbent article having a body with generally elongated sides, comprising:
a liquid permeable outer material top layer to be located next to a wearer's body;
a liquid impermeable antileakage material bottom layer;
a liquid retentive absorbent element interposed between said top and said bottom layer;
said bottom layer having a front side in contact with said liquid retentive absorbent element and a back side to be located next to a pair of shorts about said wearer's body;
at least said bottom layer extending beyond a periphery defined by said elongated sides of the body so as to form a pair of fixing elements;
said fixing elements being provided with first adhesive portions on said back side of the bottom layer making up said fixing elements, such that when said fixing elements are folded so as to remain within said periphery defined by the elongated sides of the body, said first adhesive portions are sandwiched between said fixing elements and a portion of said bottom layer within said periphery defined by the elongated sides of the body;
said first adhesive portions being non-separably adhered to said fixing elements and separably adhered to said portion of said bottom layer within said periphery defined by the elongated sides of the body;
said first adhesive portion requiring no release paper; and

second adhesive portions, provided on said portion of the bottom layer within said periphery defined by the elongated sides of the body, and opposite to said first adhesive portions, said second adhesive portions are separably adhered to said first adhesive portions without a release paper.

5,201,728
SUBCUTANEOUS IMPLANTABLE MULTIPLE-AGENT DELIVERY SYSTEM
Vincent C. Giampapa, 89 Valley Rd., Montclair, N.J. 07042
Filed May 3, 1991, Ser. No. 695,107
Int. Cl.[5] A61K 9/22
U.S. Cl. 604—891.1 5 Claims



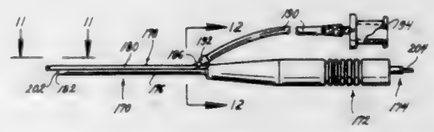
1. A subcutaneously implantably, multi-agent delivery system, comprising:
(a) a pod for subcutaneous implantation beneath the dermis of the human body, said pod comprising a porous surface between an interior and exterior thereof and, further comprising, fluid transfer means in fluid communication with said porous surface, said pod having an opening at the top thereof, said pod formed of a bio-compatible material, said porous surface between said interior and exterior of said pod provided with one or more vascular growth factors to promote growth of blood capillaries into and about said porous surface of said pod;
(b) a dome portioned for complemental detachable securement within said opening of said pod, said dome including at least one chamber having selectable fluid communication with said fluid transfer means of said pod, in which bio-acting materials may be stored within said chamber of said dome prior to implantation, said dome formed of a biocompatible material, attached to said pod; and
(c) time dependent material release means interfaced between said chamber of said dome and said fluid transfer means of said pod,
whereby said bio-acting materials are controllably released from said chamber of said dome, into said pod and, therefrom, through said porous surface into the bloodstream, in which said dome, after exhaustion of the materials therewithin, may be removed, refilled and re-secured to said pod.

5,201,729
METHOD FOR PERFORMING PERCUTANEOUS DISKECTOMY USING A LASER
Peter S. Hertzmann, Palo Alto, Calif., and Jordan K. Davis, Boca Raton, Fla., assignors to Laserscope, San Jose, Calif.
Continuation-in-part of Ser. No. 463,759, Jan. 12, 1990, Pat. No. 5,084,043. This application Nov. 30, 1990, Ser. No. 621,451
The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.
Int. Cl.[5] A61N 5/06
U.S. Cl. 606—2 1 Claim

1. A method of performing percutaneous diskectomy using a laser comprising applying a laser beam to a herniated disk having a nucleus while deflecting the laser beam away from a

longitudinal axis of the laser beam in the nucleus of the disk, said laser beam having a wavelength of 1.44 microns.

5,201,730
TISSUE MANIPULATOR FOR USE IN VITREOUS SURGERY COMBINING A FIBER OPTIC ENDOILLUMINATOR WITH AN INFUSION/ASPIRATION SYSTEM
James C. Easley, St. Charles; Kurt W. Gampp, Jr., Ellisville, and Gregg D. Scheller, Ballwin, all of Mo., assignors to Surgical Technologies, Inc., Chesterfield, Mo.
Division of Ser. No. 425,936, Oct. 24, 1989, Pat. No. 5,078,712.
This application Jan. 3, 1992, Ser. No. 816,823
Int. Cl.[5] A61B 17/36
U.S. Cl. 606—4 1 Claim



1. A surgical instrument for use in penetrating and working in the vitreous humor of an eye, the instrument comprising:
a finger grip member having a first end and a second end;
at least one conduit extending through the grip member between the first and second ends;
a rigid needle extending from the first end of the grip member, the needle having first and second ends with the second needle end being securely attached to the first end of the grip member and the first needle and terminating in a plane substantially normal to the needle;
a bore hole extending through the needle between its first and second ends and communicating with the conduit of the grip member;
a flexible tube extending from the second end of the grip member, the tube having a first end and a second end with a hollow channel extending through the tube between the first and second ends, the first tube end being securely attached to the second end of the grip member communicating the tube channel with the grip member conduit and the second tube end being adapted to be illuminated by a source of illumination;
a single continuous fiber optic member having first and second ends extending through the tube channel, the grip member conduit, and the needle bore between the second end of the tube and the first end of the needle, the fiber optic member projecting a beam of light from its first end adjacent the first end of the needle when the second end of the fiber optic member is illuminating by a source of illumination; and,
a rigid hollow pipe having three sections including a middle

section connected to and extending parallel with the nee-

between said proximal end and said distal end, said tubular

rod and another structure for use in a spinal implant system, through said bone screw aperture and into said bone when said

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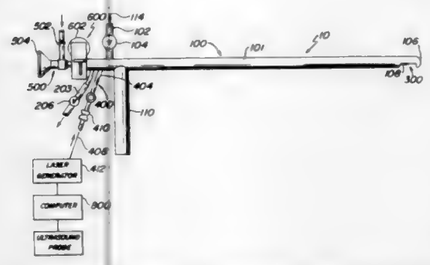
section connected to and extending parallel with the needle, a first end section extending at an angle beyond the first end of the needle, and a second end section extending at an angle away from the second end of the needle,

the first end section of the pipe extending along a line that does not intersect a beam of light projected from the first end of the fiber optic member when the second end of the fiber optic member is illuminated by a source of illumination.

5,201,731
LASER RESECTOSCOPE WITH ULTRANSONIC IMAGING MEANS

Said I. Hakky, 8547 Merrimoor Blvd. East, Largo, Fla. 34647-3145

Continuation of Ser. No. 540,072, Jun. 19, 1990, Pat. No. 5,061,266, which is a division of Ser. No. 175,014, Mar. 30, 1988, Pat. No. 4,955,882. This application Jun. 26, 1991, Ser. No. 721,032
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—15 **18 Claims**



1. A surgical apparatus for coagulating tissue of the prostate of a living being, said apparatus comprising:

elongated introduction means configured for introduction through the urethra into said being, said introduction means being positionable adjacent said prostate within said being;

laser means associated within said introduction means and configured for introduction by said introduction means to a location within said urethra adjacent said prostate, said laser means being controllable for producing and directing a laser beam through said urethra into said prostate tissue adjacent said introduction means for coagulating said prostate tissue;

ultrasonic imaging means coupled to said laser means for introduction into the body of said being adjacent said prostate to provide an image of at least a portion of said prostate tissue as said laser means is operated to enable said laser means to be controlled to coagulate said adjacent prostate tissue while precluding injury to other adjacent tissue; and

tissue removal means for removing at least a portion of said coagulated prostate tissue from said prostate.

5,201,732
BIPOLAR SPHINCTEROTOMY UTILIZING SIDE-BY-SIDE PARALLEL WIRES

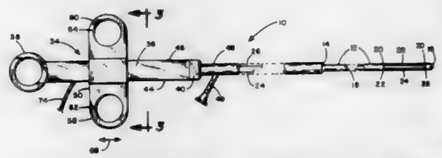
David J. Parins, Corcoran, and Michael J. Hollenhorst, Brainerd, both of Minn., assignors to Everest Medical Corporation, Minneapolis, Minn.

Filed Apr. 9, 1992, Ser. No. 866,320
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—47 **8 Claims**

1. A bipolar electrosurgical instrument for performing a sphincterotomy comprising:

(a) an elongated, flexible, plastic, tubular member of a predetermined diameter about a longitudinal axis having a proximal end, a distal end and at least one lumen extending between said proximal end and said distal end, said tubular member normally being rectilinear and including a pair of apertures extending through its wall into said lumen at a predetermined distance proximal of said distal end; and

(b) a pair of conductive wires extending through said lumen from said proximal end and out through said apertures, said wires having distal ends attached to said tubular member proximate said distal end of said tubular member, said pair of wires being electrically insulated from one

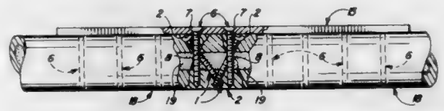


another along the length of said lumen and extending parallel, spaced relation and being free of insulation between said apertures and the attachment point to said tubular member to form bipolar electrodes, at least one of said pair of wires being free to move longitudinally within said lumen to bow said tubular member in the location between said apertures and the points of attachment of said pair of wires to said tubular member when a pulling force is applied to said one of said pair of wires at said proximal end of said tubular member.

5,201,733
METHOD AND APPARATUS FOR INTERNAL FIXATION OF FRACTURES

James L. Etheredge, III, 935 Thora Blvd., Shreveport, La. 71106

Filed Jan. 21, 1992, Ser. No. 823,253
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—53 **11 Claims**



1. A method for internal fixation of bone fractures comprising the steps of positioning bone elements of the fractures in correct anatomical relationship; drilling at least one temporary fixation hole in the bone elements across the fractures; inserting at least one non-metallic fixation device in said temporary fixation hole for temporarily securing the bone elements in the correct anatomical relationship; fitting at least one metal permanent reconstruction means to the bone elements; drilling at least two permanent fixation holes in the bone elements without regard to the location of said non-metallic fixation device; and inserting metallic fixation devices in said permanent fixation holes for securing said reconstruction means on said bone elements and said bone elements in the correct anatomical relationship.

5,201,734
SPINAL LOCKING SLEEVE ASSEMBLY

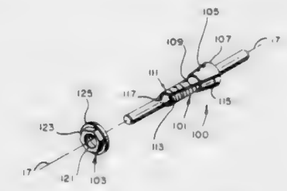
Trent E. Cozad, Fort Wayne; Antony J. Lozier, Warsaw, and Jerry L. Lower, Bourbon, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Division of Ser. No. 287,245, Dec. 21, 1988, Pat. No. 5,074,864. This application May 14, 1991, Ser. No. 700,224
The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.
Int. Cl.[5] A61F *5/01*
U.S. Cl. 606—62 **25 Claims**

1. A spinal locking sleeve assembly and an elongated spinal rod and another structure for use in a spinal implant system, wherein said assembly interconnects the elongated rod with the structure, wherein said structure has a tapered passage therethrough and a sidewall adjacent to a terminus of said passage, said assembly comprising:

a) an elongated sleeve having a continuous bore therethrough, said sleeve having a first end with a tapered outer surface and a

b) at least one split in said sleeve extending into at least a portion of each of said first and second ends thereof;



c) a lock nut having an internal passageway with threads complementary to the threads of said second end;

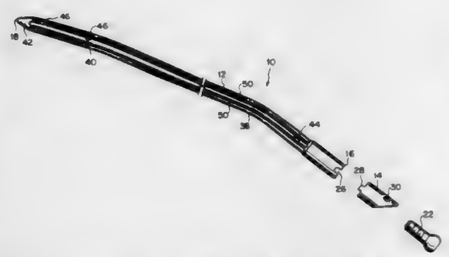
d) said bore being sized to slidably receive said rod therethrough;

e) said tapered outer surface of said sleeve being insertable into said tapered passage of said structure with said rod in said bore, to form an interference fit between the two tapered surfaces, and wherein said passage includes an open back wherein the open back has a width greater than the diameter of said elongated spinal rod.

5,201,735
APPARATUS AND METHOD FOR TREATING A FRACTURE

Michael W. Chapman, Sacramento, Calif.; Dana C. Mears, Pittsburgh, Pa., and Charles C. Edwards, Baltimore, Md., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Division of Ser. No. 305,840, Feb. 2, 1989, Pat. No. 5,066,296. This application Mar. 4, 1991, Ser. No. 664,160
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—67 **16 Claims**

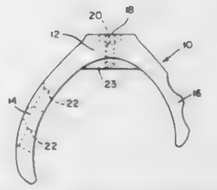


1. A bone implant comprising a tab member having a proximal end and a distal end, the distal end of said tab member being configured to be removably engageable with the proximal end of an intramedullary rod which is properly disposed within an intramedullary canal of a bone and which has been inserted into said intramedullary canal through an implant incision in the flesh; means for removably engaging the proximal end of an intramedullary rod disposed at the distal end of said tab member; and having at least one bone screw aperture located proximally with respect to said engaging means and sufficiently close to the proximal end of said tab member so as to allow passage of a bone screw through said implant incision, through said bone screw aperture and into said bone when said tab member is removably engaged to the proximal end of said intramedullary rod.

5,201,736
MAXILLOFACIAL BONE CLAMP

Sorrell I. Strauss, 1890 Northwest River Trail, Stuart, Fla. 34994

Filed Jan. 13, 1992, Ser. No. 819,811
Int. Cl.[5] A61C *8/00*
U.S. Cl. 606—69 **15 Claims**



1. A maxillofacial bone clamp for attachment to a maxillofacial bone, comprising:

means for engaging the maxillofacial bone, the means for engaging comprising arch with a facial wing and a posterior wing for conforming to a facial cortical surface and an antifacial cortical surface, respectively, of the maxillofacial bone or clamping the maxillofacial bone between the facial wind and the posterior wing;

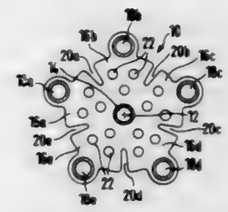
a stabilizing ridge extending from a concave side of the arch between the facial wind and the posterior wing and connected to a concave portion of at least one of the facial wing and the posterior wing for strengthening the bone clamp and for antirotationally engaging a crestal groove in the maxillofacial bone; and

at least one threaded fastener for engaging the engaging means and attaching the engaging means to the maxillofacial bone.

5,201,737
PLATE FOR COVERING A DRILL HOLE IN A SKULL CAP AND FOR FIXING A CRANIAL BONE COVER

Karl Leibinger, Tuttlingen-Mohringen, and Franz Leibinger, Mühlheim-Stetten, both of Fed. Rep. of Germany, assignors to Oswald Leibinger GmbH, Muhlheim, Fed. Rep. of Germany

Filed Mar. 30, 1992, Ser. No. 859,656
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1991, 4111856
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—69 **17 Claims**



1. A cranial implant for fixation to the cranial vault of a bone cover, previously removed by a procedure including drilling of at least one hole at an edge of the bone cover, and for covering the drill hole, said implant comprising:

a plate formed of a body-compatible metal which is rotational-symmetrical with respect to a center and has a plurality of vanes which extend radially with respect to said center

end and are separated from each other by slots for providing

an outer instrument sleeve having a longitudinal axis,

5,201,741

at right angles to the plane of the planar surface on the

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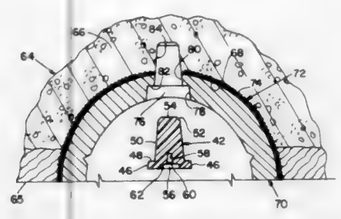
and are separated from each other by slots for providing visibility of at least some of the skull area beneath a plate being implanted, at least some of said vanes each having a hole at its outer peripheral portion for receiving a bone screw, with plate being adapted for centering over a drill hole during implentation whereby the holes in said vanes are so positioned relative to the drill hole that bone screws received through the holes are adapted to screw the plate to bone surrounding the drill hole and thereby fix the bone cover to the cranial vault, wherein said plate has a central hole formed therein concentric with the center of said plate, and said plate has a plurality of hole therethrough, distributed around said central hole, for allowing blood and other fluids to flow through the plate following fixation of the cranial bone cover.

5,201,738
BIODEGRADABLE BIOCOMPATIBLE ANTI-DISPLACEMENT DEVICE FOR PROSTHETIC BONE JOINTS

Richard D. Scott, Dedham, Mass., and Deger C. Tunc, East Brunswick, N.J., assignors to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Filed Dec. 10, 1990, Ser. No. 624,829
Int. Cl.[5] A61F *2/30*
U.S. Cl. 606—77 **16 Claims**

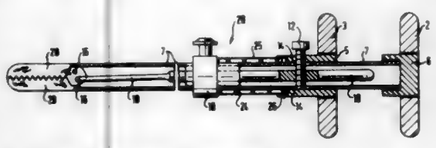


1. A device for sufficiently limiting displacement of a cup of an implanted prosthetic bone joint to allow bone tissue growth at the cup to fix said prosthetic bone joint to the bone, comprising: an elongate member, at least a portion of which is formed of a biodegradable biocompatible polymer, said portion of the elongate member extending through said cup and in interfering contact with said cup, and into interfering contact with bone tissue, whereby displacement of the cup of the prosthetic bone joint is sufficiently limited to allow bone tissue growth at the cup to fix said prosthetic bone joint to the bone, and whereby the elongate member is thereafter biodegraded by body fluid at the bone tissue contacting the elongate member.

5,201,739
MEDICAL INSTRUMENT

Kurt Semm, Kiel, Fed. Rep. of Germany, assignor to WISAP Gesellschaft fur Wissenschaftlichen Apparatebau mbH, Sauerlach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 352,471, May 16, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,051
Claims priority, application Fed. Rep. of Germany, May 17, 1988, 3816798
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—106 **10 Claims**

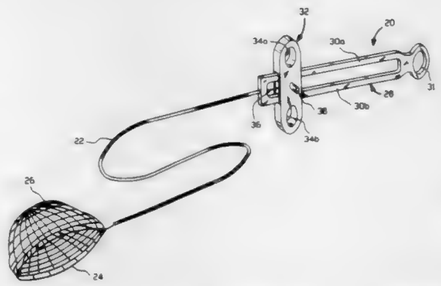


9. A medical instrument comprising:
an outer instrument sleeve having a longitudinal axis,
an inner operating rod axially movable within said outer instrument sleeve,
forcep instrument members located at a distal end of said outer instrument sleeve,
two gripping members, both of said gripping members being operable by one hand and arranged at a proximal end of said outer instrument sleeve,
said two gripping members being constructed as a substantially circular rear gripping disk and a substantially circular front gripping disk, said disks being disposed in parallel planes perpendicular to said axis,
said rear gripping disk, in operation, being disposed in a palm of a hand of a user while said front gripping disk is gripped by fingers of the hand of the user at any location over its 360 degree outer circumference,
said rear gripping disk being rigidly connected to said outer instrument sleeve,
said front gripping disk being rigidly connected to said inner operating rod for operating said forcep instrument members,
said front gripping disk being moved rearwardly by the fingers of the user towards said rear gripping disk when closing the hand of the user for applying a force to said forcep instrument members,
said operating rod being connected by means of a radial driving member to the front gripping disk,
said radial driving member being axially displaceably guided in a slot formed in the outer instrument sleeve.

5,201,740
SURGICAL RETRIEVAL ASSEMBLY AND RELATED METHOD

Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022, and Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023

Filed Nov. 5, 1991, Ser. No. 788,035
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—113 **23 Claims**



21. A surgical instrument assembly for use in retrieving objects from internal body cavities, comprising:
an elongate tubular sheath member;
an elongate wire having a limited degree of flexibility, said elongate wire being slidably inserted through said sheath member, said elongate wire being longer than said sheath member;
a flexible metallic loop connected to said elongate wire at a distal end thereof;
electrical means for feeding an electrical current to said loop via said wire; and
a flexible web member connected to said loop via a plurality of spaced ringlets to form a capture pocket, said loop defining a mouth opening of said pocket, said loop passing through each of said ringlets so as to expose said wire to enable direct contact between said wire and organic tissues to be cauterized and severed in a cauterization procedure.

5,201,741
SURGICAL SNARE WITH SHAPE MEMORY EFFECT WIRE

David H. Dulebohn, Tonka Bay, Minn., assignor to Andrew Surgical, Inc., Plymouth, Minn.

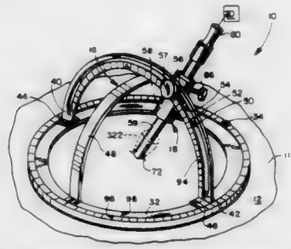
Filed Jul. 24, 1990, Ser. No. 557,536
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—113 **12 Claims**

7. A surgical snare instrument including a handle, a tip with hemispherical distal end extending from the handle, a wire loop extending from the tip having first and second ends positioned in the handle with intermediate portions extending through at least a portion of the handle to the tip, and control means attached to the first and second ends of the wire moveable with respect to the handle to in turn contract or expand the loop, the improvement comprising:
the wire loop being comprised of shape memory material trained to a loop shape;
the wire loop being adjustable between a fully expanded and a fully contracted loop end size, the wire loop being trained to a loop end size intermediate between the fully expanded and fully contracted loop end sizes so that said wire loop can be contracted to a size equal to or only slightly larger than the inside diameter of the tip to allow the inside diameter of the tip to be as small as possible for passage of the tip and wire loop through as small an opening as possible, and allowing expansion of the loop end beyond said intermediate size to assist in surrounding a targeted item, the fully expanded and fully contracted loop end sizes not exceeding the limits of elasticity of the shape memory effect material.

5,201,742
SUPPORT JIG FOR A SURGICAL INSTRUMENT

Harrith M. Hasson, 2043 N. Sedgwick, Chicago, Ill. 60614

Filed Apr. 16, 1991, Ser. No. 686,149
Int. Cl.[5] A61B *19/00, 17/00*
U.S. Cl. 606—130 **21 Claims**



11. A jig for allowing consistent placement of a surgical instrument in a predetermined orientation relative to a subjacent tissue on which the jig is supported, said jig comprising:
a base having a first part with a planar surface for placement facially against a tissue in the vicinity of where a surgical procedure is to be performed,
a yoke;
a second base part having means for supporting said yoke;
means interconnecting the first and second base parts for allowing pivoting of the second base part and yoke relative to the first base part about an axis that is substantially at right angles to the plane of the planar surface on the first base part;
an instrument support member on the yoke having a sleeve defining a passageway for the introduction of a surgical instrument to be extended into the tissue;
means for mounting the sleeve to the yoke for movement relative to the yoke in an arcuate path which is in a plane that is transverse to the plane of the planar surface on the first base part; and
means for maintaining the sleeve in a plurality of selected positions relative to the yoke,
whereby with the base placed against a subjacent tissue, an instrument on the instrument support member can be consistently directed through the sleeve passageway against the tissue in a consistent orientation.

5,201,743
AXIALLY EXTENDABLE ENDOSCOPIC SURGICAL INSTRUMENT

Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corp., Laguna Hills, Calif.

Filed May 5, 1992, Ser. No. 878,957
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—147 **5 Claims**

1. An extendable endoscopic surgical instrument comprising:
an elongate body having a distal end and a proximal end;
a tip assembly at said distal end;
means at said proximal end for operating said tip assembly;
an inner extension assembly comprised of (a) an inner rod member, externally threaded, and (b) an inner tubular member, internally threaded, to receive said inner rod member;
an outer extension assembly comprised of (a) an outer rod member, externally threaded, and (b) an outer tubular member, internally threaded, to receive said outer rod member;
one of said inner rod member and said inner tubular member joined to said tip assembly such that said tip assembly is axially movable by rotation of one of said inner rod member and said inner tubular member relative to the other; and
said inner extension assembly joined to said outer extension assembly such that axial extension of said outer extension assembly causes axial extension of said inner extension assembly.

5,201,744

ing one of said side surfaces, said indentation being com-

within said handle member extending substantially over

opposite to said output side, a longitudinal groove milled into said casing, and a holding groove in said flange sec-

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5,201,744

METHOD AND DEVICE FOR SUTURING USING A ROD WITH A NEEDLE HOLDER

Mark W. Jones, 841 Audubon St., East Lansing, Mich. 48823

Filed Dec. 5, 1991, Ser. No. 802,486
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—148 **13 Claims**

1. A surgical instrument, for use with a needle connected to a length of a suture thread and a driver means to close a wound in a body cavity, which comprises:

an elongate rod having a first end and a second end, wherein the first end has a face that is positioned adjacent to the wound and the second end is for manipulating the rod from a position outside of the body cavity, wherein the face of the rod has a guide means defined by a notch across the face for the suture thread and a holding means defined by a slot across the face and along a side of the rod at a depth substantially greater than a depth of the notch to receive and hold the needle connected to the length of suture thread.

5,201,745

VISCERAL SURGERY PATCH

Jean-Louis Tayot, La Tour De Salvagny; Jacques Marescaux, Scharrachbergheim; Henri Dumas, and Michel Tardy, both of Lyon, all of France, assignors to Imedex, Lyon, France

Continuation of Ser. No. 458,748, Dec. 15, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 746,199
Claims priority, application France, Mar. 15, 1988, 8803321
Int. Cl.[5] A61B *17/00;* **A61F** *13/00;* **A61L** *13/00*
U.S. Cl. 606—151 **14 Claims**

1. A visceral surgery patch which is fully biodegradable comprising:

a first biodegradable layer forming a film selected from the group consisting of biodegradable collagen, gelatin and mixtures thereof, and

a second biodegradable porous layer of fibrous biodegradable collagen,

said first and second biodegradable layers being directly superimposed and said first biodegradable layer at least partially impregnating said second biodegradable layer, and said patch having a density of at most 8 mg/cm^2.

5,201,746

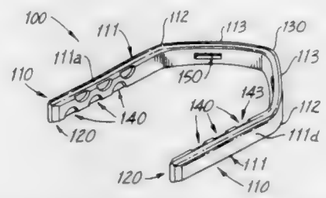
SURGICAL HEMOSTATIC CLIP

Daniel Shichman, Trumbull, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 16, 1991, Ser. No. 777,083
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—151 **19 Claims**

1. A hemostatic clip for application to body tissue, which comprises:

first and second legs, each leg having a tissue contacting surface and at least two side surfaces intersecting said tissue contacting surface and defining a width of said leg therebetween, said tissue contacting surface having at least one indentation disposed thereon across less than the entire width of the tissue contacting surface and intersecting one of said side surfaces, said indentation being completely defined by at least one wall which intersects said



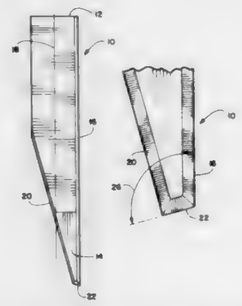
tissue contacting surface and an indentation base surface which intersects said wall and said one side surface.

5,201,747

OPHTHALMOLOGICAL SURGICAL INSTRUMENT HAVING A TRIPLE EDGE TIP

Douglas Mastel, 2843 Sanco Rd., Suite V, Rapid City, S. Dak. 57702-9368

Filed Feb. 20, 1992, Ser. No. 837,969
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—167 **13 Claims**



1. An ophthalmologic surgical blade which comprises:

an elongated blade having a primal end adapted to be connected to a support means and a distal end adapted to penetrate and cut tissue;

said blade having first and second opposed cutting edges;

said first and second edges converging toward each other at an angle of from about 10 to 30 degrees;

said edges terminating at a transverse flat tip extending between said edges, said tip having a width of from about 0.05 to 0.30 mm and an angle to said first edge of from about 60° to 120°; and

said edges and tip being shaped to provide sharp cutting edges.

5,201,748

RETRACTABLE-BLADED SURGICAL SCALPEL

Philip H. Newman, 98 Rim Rd.; B. Michael Jackson, 3917 West Rd.; Charles T. Gregg, 424 Kiva, and David Platts, 1932-B 42nd St., all of Los Alamos, N. Mex. 87544

Filed Jun. 1, 1992, Ser. No. 891,756
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—167 **5 Claims**

1. A surgical scalpel having a retractable blade, comprising in combination:

a. a generally flat, elongated handle member having a forward end and a rearward end, and further having two generally flat sides each having an interior flat recessed inner surface which together form an elongated cavity

within said handle member extending substantially over the long dimension thereof and opening to the outside at the forward end of said handle member, a first side having two spaced-apart windows therethrough between the first flat recessed inner surface and the outside of said handle member, the window closest the forward end of said handle member being elongated along the long dimension of said handle member, and the second side having an interior elongated slot therein which terminates before reaching the forward end of said handle member and opening into the cavity toward the first side, the cavity and the interior slot in the second side both opening at the rearward end of said handle member;

b. a surgical cutting blade;

c. a flat, elongated slide member adapted to slidably move longitudinally through the cavity in said handle member, said slide member further being adapted to receive said surgical cutting blade, having a portion adapted to be engaged by and actuated by a digit through the elongated window in the first side of said handle member, having a raised, deformable latch member in the region of the end of said slide member away from the end thereof which is adapted to receive said surgical cutting blade and on the side thereof having the digit-engaging portion, and having a tab portion disposed in a direction perpendicular to the flat dimension thereof and away from the side thereof having the digit-engaging portion adapted to slidably move in the interior slot in the second side of said handle member; and

d. coil spring means located within the interior slot in the second side of said handle member disposed generally along the long dimension thereof and adapted to continuously contact the tab portion of said slide member, thereby providing a force on said slide member directed toward the rearward end of said handle member;

whereby said surgical cutting blade may be reversibly locked either entirely within said handle member or extend outside thereof through the opening therein in the forward end thereof for use in surgical procedures without continuous contact being required with the digit-engaging portion when said slide member is moved sufficiently toward the rearward end of said handle member to permit said raised, deformable latch member to extend through the window located toward the rearward end of said handle member and counteract the action of said coil spring means, or when said slide member is moved sufficiently toward the forward end of said handle member to permit said raised, deformable latch member to extend through the window closest to the forward end of said handle member and counteract the action of said coil spring means, respectively, a nd whereby said slide member may be reversibly removed for replacement thereof when said raised, deformable latch member is depressed when located in the window closest to the rearward end of said handle member and said slide member is moved away from the forward end thereof.

5,201,749

CIRCULARLY OSCILLATING SAW

Rainer E. Sachse, 917 Dacian Ave., #7, Durham, N.C. 27701, and Hans Sachse, Lerchenstrasse 55, 8500 Nurnberg, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,846
Int. Cl.[5] A61B *10/00*
U.S. Cl. 606—177 **12 Claims**

1. A circular oscillating saw comprising:

a slender gear casing having an output side, a flange section opposite to said output side, a longitudinal groove milled into said casing, and a holding groove in said flange section;

an eccentric disposed within said casing;

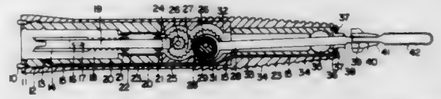
a gear disposed in said casing for driving said eccentric;

an exchangeable saw blade;

a saw blade holder directly driven by said eccentric and having a holding device disposed at an end thereof for easily exchanging said saw blade, said saw blade holder also being disposed within said gear casing;

a pendulum slide bearing disposed about said saw blade holder for guiding said saw blade holder through said output side;

said gear casing having at least two parts at least in the area of said eccentric, and fitting means for connecting said at least two parts;



a holding sleeve surrounding said gear casing to provide means for holding said at least two parts in said gear casing in the proper positions;

said holding sleeve having spray nozzles integrally formed therein in the area of said holding sleeve which surrounds said output side of said gear casing;

an elastic protective sealing device disposed between said holding sleeve and said output side of said gear casing;

an internally guided cooling device inserted into said longitudinal groove of said gear casing and being connected to said spray nozzles in said holding sleeve;

a driving element for driving said gear; and

a stop for preventing rotation of said saw, said stop being received in said holding groove.

5,201,750

DILATION CATHETER WITH MOTOR DRIVE FOR DILATION OF BLOOD VESSELS

Manfred Höcherl, Rheinfelden, and Jörg Reinhardt, Grenzach-Wyhlen, both of Fed. Rep. of Germany, assignors to VascoMed Institut fur Kathetertechnologie gmbH, Weil am Rhein, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 572,874
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929575
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—180 **13 Claims**

1. Motor drive and dilation catheter for reopening of blood vessels, the dilation catheter is insertable through vessels leading to a constriction point and includes a working head for reopening the vessel constriction, wherein the improvement comprises a metal housing shaped for gripping, holding and handling by the half-closed hand of a surgeon between his row of fingers and his thumb, means for sealing said housing in a gas tight manner up to at least 130° C. and 3 bars pressure and said means including a front and a rear bearing package, an electrical battery-driven motor with a motor gearing train mounted in said housing, a hollow spindle open at opposite ends thereof is positioned inn said housing and is supported therein in the front bearing package with a seal and the rear bearing package with a seal, a junction point at one end of the spindle for receiving and holding the dilation catheter means for effecting force transmission from the motor to the spindle, the housing comprises a spindle channel having a front end ad a rear end, the front bearing package is located in the front end of said spindle channel and comprises a front sleeve, a front bearing and an annular support with a front bearing seal located within the front sleeve, the rear bearing package comprises a rear bearing

and a rear sleeve, and the front and rear bearing packages are jaws being mounted on a forcep body dimensioned for insert-

receiving said electrical signal and for electronically pro-

5,201,755

METHOD AND APPARATUS FOR EARLY DETECTION

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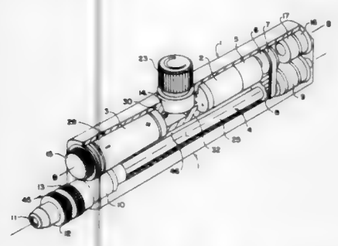
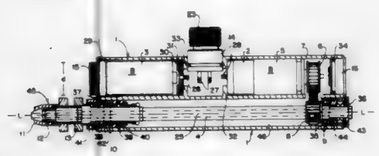
and a rear sleeve, and the front and rear bearing packages are arranged in the spindle channel in a gas-tight manner by seal sleeves, the motor and the motor gearing being round and having substantially the same diameter and are aligned on a





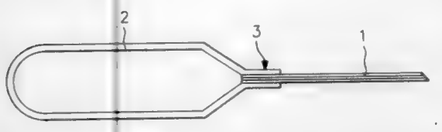
longitudinal axis parallel with a spindle axis of the spindle, and intermediate wall being arranged in the housing parallel to the spindle axis and the longitudinal axis and dividing the housing into a spindle channel and a separate compartment for the battery and motor.

5,201,751

ACUPUNCTURE NEEDLE FOR MIXED USE

Andre Cohen, 65, Avenue General Leclerc, Nimes, France 30 000

Filed Sep. 20, 1990, Ser. No. 585,783
Int. Cl.[5] A61B *17/34*
U.S. Cl. 606—189 7 Claims



1. An apparatus for acupuncture treatment and injection of a treating substance in two successive steps, comprising:
a tank having an external diameter less than 15 mm, a mouthpiece at one end, and designed to contain said treating substance; and
an acupuncture needle having a distal end, a proximal end, and an axial passage therethrough communicating with said tank for conducting said treating substance which complements the energetics action of the puncture of the needle, wherein said proximal end of said acupuncture needle is axially and lengthwise connected to said mouthpiece of said tank.

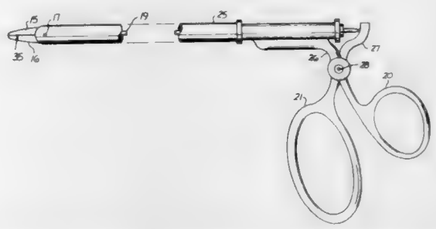
5,201,752

CHOLECYSTECTOMY DISSECTOR INSTRUMENT

Michael A. Brown, Bluemont, and Joseph McWhinney, Millwood, both of Va., assignors to Pod, Inc., Boyce, Va.

Filed Sep. 27, 1990, Ser. No. 588,713
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—190 13 Claims

10. A special purpose endo cholecystectomy dissection forcep instrument for manipulating a cystic duct and for spreading and removing tissue by means of two double acting jaws each of which is shaped with a hooked end profile, said jaws being mounted on a forcep body dimensioned for inserting into an expanded stomach cavity during endo cholecystectomy thereby to located said jaws beneath the cystic duct to snugly grasp and hold the cystic duct by means of a hollow



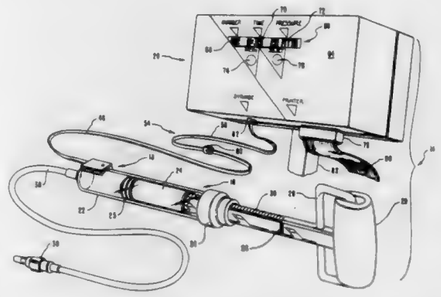
cradle dimensioned by the hooked end for fitting about the cystic duct of the gall bladder, a mechanism for operating said jaws by a surgeon from the outside of the stomach cavity comprising a manually operable handle on the forcep body coupled to the mechanism for operating said jaws.

5,201,753

TOTALLY SELF-CONTAINED, DIGITALLY CONTROLLED, DISPOSABLE SYRINGE INFLATION SYSTEM, AND METHOD FOR MONITORING, DISPLAYING AND RECORDING BALLOON CATHETER INFLATION DATA

Fred P. Lampropoulos; Steven R. Taylor, both of Salt Lake City; Thomas D. Stout, Sandy, and Jeffrey D. Salisbury, Ogden, all of Utah, assignors to Merit Medical Systems, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 324,938, Mar. 17, 1989, Pat. No. 5,135,488. This application Mar. 4, 1991, Ser. No. 664,587
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—192 31 Claims



1. A system for monitoring inflation of a balloon-type member and for automatically recording inflation data, comprising:
a syringe connected to said member through tubing, said syringe comprising a barrel and a plunger selectively operable to inflate said member by applying fluid pressure to said member through said tubing by sliding the plunger within the barrel;
transducer means for sensing said applied fluid pressure and for outputting an electrical signal proportional to said sensed fluid pressure, said transducer means being placed in fluid communication with said syringe and the tubing connected thereto;
electronic circuit means, electrically connected to said transducer means and mounted on said syringe barrel, for

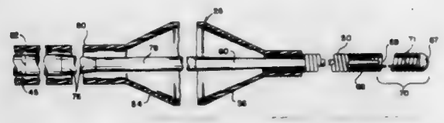
receiving said electrical signal and for electronically processing said signal so as to derive and so as to automatically display or record therefrom electronic data representing the magnitude of said fluid pressure applied to said member and the length of time said fluid pressure is applied to said member; and
display means, electrically connected to said electronic circuit means and mounted on said syringe barrel, for outputting a visual display of the magnitude of said applied fluid pressure and the corresponding length of time said pressure is applied to said member.

5,201,754

BALLOON DILATATION CATHETER WITH VARYING RADIOPACITY

James F. Crittenden, Hollis, N.H., and Bryan J. White, Lowell, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 303,908, Jan. 30, 1989, Pat. No. 4,917,088, which is a division of Ser. No. 729,541, May 2, 1985, Pat. No. 5,102,390. This application Feb. 2, 1990, Ser. No. 475,417
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—194 11 Claims



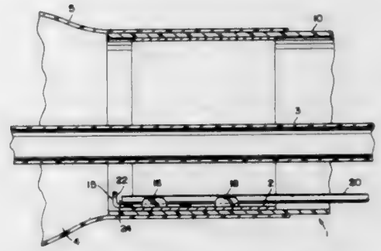
1. A balloon angioplasty catheter comprising:
an elongate longitudinally flexible tubular proximal segment having a proximal end and a distal end;
an elongate distal segment extending distally beyond the distal end of the proximal segment, the distal segment being shorter and more flexible than the proximal segment and having nonuniform radiopacity;
a balloon carried by the distal segment;
the tubular proximal segment defining a lumen for communicating the proximal end of the catheter with the interior of the balloon to enable inflation and deflation of the balloon;
the distal segment comprising a support wire having a smaller diameter than the outer diameter of the distal end of the proximal segment and a highly radiopaque means carried by the support wire distally of the balloon;
moderately radiopaque means carried by the support wire proximally of the highly radiopaque means and extending along a substantial length of the support wire;
the balloon being supported on the support wire with the support wire extending through the balloon;
means for communicating the lumen of the proximal tubular segment with the interior of the balloon;
the proximal segment and support wire being sufficiently torsionally rigid so that when the catheter is in a configuration corresponding to that of a human aortic arch and with the distal segment in a coronary artery, the catheter is capable of transmitting controllably from its proximal to its distal end rotation applied at the proximal end.

5,201,755

METHOD AND APPARATUS FOR EARLY DETECTION OF LEAKAGE AND FAILURE OF A BALLOON MEMBRANE OF A BALLOON CATHETER

Haim Klement, Montvale, N.J., assignor to Datascope Investment Corp., Montvale, N.J.

Filed Sep. 11, 1990, Ser. No. 580,472
Int. Cl.[5] A61B *17/00, 5/027*
U.S. Cl. 606—194 43 Claims



1. A method for detecting a contaminant in a balloon catheter comprising the steps of:
a) transmitting light radiation to a region within said balloon catheter where the presence of a contaminant is to be detected;
b) reflecting said radiation to sensor means;
c) permitting the presence of said contaminant to change a physical characteristic of said reflected radiation; and,
d) detecting said change in said physical characteristic.

5,201,756

RADIALLY-EXPANDABLE TUBULAR ELEMENTS FOR USE IN THE CONSTRUCTION OF MEDICAL DEVICES

Michael J. Horzewski, San Jose; John W. Danforth, San Francisco; Jeff L. Kraus, San Jose, and Hugh R. Sharkey, San Francisco, all of Calif., assignors to Danforth Biomedical, Inc., Menlo Park, Calif.

Continuation of Ser. No. 541,006, Jun. 20, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 846,742
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—198 12 Claims

1. A composite tube for an intravascular medical device, the composite tube capable of conveying an object of a first cross-sectional profile therethrough, the composite tube comprising:
an outer tube having a first elasticity and radially expandable between a first position and a second position, the first position having a second cross-sectional profile smaller than the first cross-sectional profile, the second position having a third cross-sectional profile larger than the first cross-sectional profile; and
an inner member disposed inside the outer tube and extending longitudinally through the outer tube, the inner member having a second elasticity less than the first elasticity and defining a coaxially self-supporting channel, the inner member formed to include a sheet of material having a first edge and a second edge slidably overlapped in a rolled configuration forming a slit between the first edge and the second edge; said outer tube being circumferen-

tially continuous and fluid-impermeable and extending the

side of the backing plate and the inner side of the flexible

5,201,760

first wedge shaped portion and having a continuous slope

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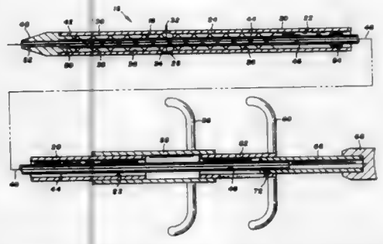
tially continuous and fluid-impermeable and extending the full length of said inner tube.

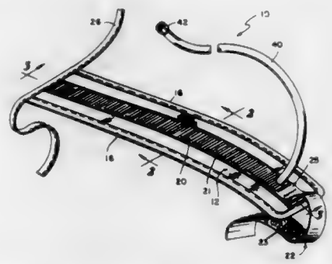
5,201,757
MEDIAL REGION DEPLOYMENT OF RADIALLY SELF-EXPANDING STENTS
Lawrence R. Heyn, Maple Grove; Liann M. Johnson, Minneapolis; Matthew T. Yurek, Bloomington, all of Minn.; Peter A. Basile, Lawrenceville, N.J., and Robert L. Berger, New Hope, Pa., assignors to Schneider (USA) Inc., Plymouth, Minn.
Filed Apr. 3, 1992, Ser. No. 863,231
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—198 **37 Claims**



1. An apparatus for deploying a radially self-expanding stent within a body lumen, including:
a retaining means for maintaining an elongate, radially self-expanding stent in a delivery configuration wherein the stent has a reduced radius along its entire axial length, the retaining means including a proximal member radially confining a proximal end region of the stent and a distal member radially confining a distal end region of the stent, the proximal and distal members being movable axially with respect to one another toward and away from a confinement position in which the members, while so confining their respective end regions of the stent, cooperate to maintain the stent in the delivery configuration; and
a flexible, elongate delivery means for delivering the stent, when in the delivery configuration and disposed near a distal end of the delivery means, to a deployment site in the body lumen, the delivery means including a control means operably associated with the confinement means for moving the proximal and distal members axially with respect to each other away from the confinement position to allow an initial radial self-expansion of the stent only along a medial region between the end regions as the proximal and distal members continue to radially confine said respective end regions, and further for moving the proximal and distal members axially relative to said respective end regions following the initial self-expansion, to release the stent for radial self-expansion along its entire axial length.

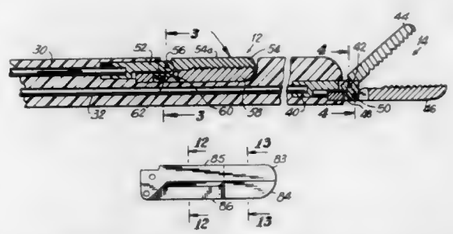
5,201,758
DISPOSABLE TOURNIQUET CUFF
Dennis Glover, Jackson, Mich., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.
Filed Jan. 7, 1992, Ser. No. 817,664
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—202 **21 Claims**

1. A tourniquet cuff for reducing blood flow in a patient's limb, the tourniquet comprising,
a backing plate having an inner and outer side,
a flexible covering having an inner and outer side, formed to be substantially more pliable than the backing plate, the backing plate and the flexible covering being attached together to define an inflation cavity between the inner side of the backing plate and the inner side of the flexible covering,
an inflatable bladder positioned in the inflation cavity, and



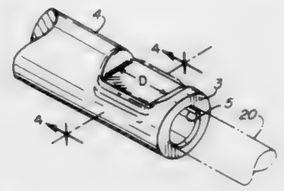
means for securing the tourniquet about a patient's limb with the outer side of the flexible covering in contact with the patient's limb.

5,201,759
LAPAROSCOPIC INSTRUMENT
George S. Ferzli, 48 Merrick Ave., Staten Island, N.Y. 10301
Continuation-in-part of Ser. No. 692,422, Apr. 29, 1991. This application May 21, 1991, Ser. No. 703,529
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—207 **12 Claims**



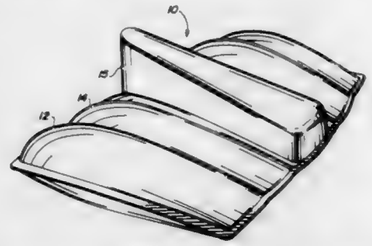
1. A laparoscopic instrument for use in laparoscopic surgery for handling a thread used to form a suture, comprising an elongated member having a proximal end and a distal end, an end jaw means and an intermediate jaw means on said elongated member, each of said jaw means being movable between open and closed positions with one of said jaw means having cutting means for cutting said thread, said end jaw means being disposed at said distal end and being operable to engage one part of said thread, said intermediate jaw means being disposed intermediate said proximal and distal ends and being operable to engage another part of said thread simultaneously while said one part of said thread is engaged by said end jaw means, and finger grip means on said proximal end of said elongated member, said finger grip means being operably connected to said intermediate jaw means and to said end jaw means for actuating said intermediate jaw means and said end jaw means between said open and closed positions, whereby said simultaneous engagement of said one and said other part of said thread by said intermediate jaw means and said end jaw means respectively facilitates handling and cutting of said thread.

5,201,760
SURGICAL NEEDLE-SUTURE COMBINATION AND APPARATUS AND METHOD FOR ATTACHING THE SAME
John L. West, Wolcott, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 632,553, Dec. 24, 1990. This application Aug. 15, 1991, Ser. No. 746,022
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—226 **16 Claims**



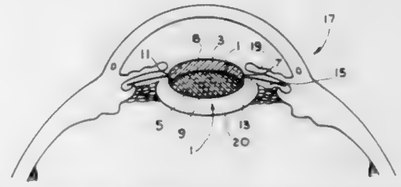
1. A surgical needle having a butt, the butt comprising a proximal and a distal end, and having essentially a circular cross section adjacent to the distal end;
a blind hole in the butt, the hole originating at the proximal end and terminating at about the distal end of said butt; and
a crimp adjacent to said butt, the improvement to the crimp comprising a first and a second side that are essentially parallel, the exterior distance between the first and second sides being from about 1½ to 3 percent larger than the exterior diameter of said butt adjacent to said distal end, a third side that is essentially perpendicular to the first and second side, and a fourth side that is curvilinear, wherein the length of the curvilinear fourth side is at least about 1.1 times greater than the length of the third side.

5,201,761
DEVICE AND METHOD FOR REDUCING LUMBAR LORDOSIS WHILE SUPINE AND SUPPORTING THE LUMBAR CURVE WHEN SEATED
Richard J. Serola, 6600 Kalanianaole Hwy., Suite 208, Honolulu, Hi. 96825
Filed Nov. 12, 1991, Ser. No. 790,518
Int. Cl.[5] A61G *15/00*; **A61F** *5/00*
U.S. Cl. 606—240 **5 Claims**



1. A dual purpose pillow for support of the lumbar spine while the user is sitting and reduction of lumbar lordosis with simultaneous traction of the lumbosacral spine while the user is supine comprising:
a base member for engaging a flat supporting surface,
said base member forming a first wedge shaped portion having a continuous slope along substantially its full length with the high end of said first wedge shaped portion being at one end of the pillow and the low end of said first wedge shaped portion being at the other end of said pillow, and
a second wedge shaped portion extending outwardly of said first wedge shaped portion and having a continuous slope with the high end of said second wedge shaped portion being at the high end of said first wedge shaped portion and the low end of said second wedge shaped portion being at the other end of said first wedge shaped portion,
said second wedge shaped portion being narrower in width than said first wedge shaped portion and extending substantially along the full length of the longitudinal axis of said first wedge shaped portion,
said first wedge shaped portion of said pillow resting essentially against the user's pelvis with said second wedge shaped portion being positioned to cradle the user's sacrum to displace its apex anteriorly when the user is in a supine position,
whereby the pillow pulls the sacrum into its articulation with the iliac bones of the pelvis thereby reducing stress on the sacroiliac ligaments of the user when the user is in a supine position.

5,201,762
INTRAOCULAR ARCHROMATIC LENS
Frederick A. Hauber, 13910 Fivay Rd., Hudson, Fla. 33567
Continuation of Ser. No. 496,159, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 340,288, Apr. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 51,825, May 20, 1987, abandoned. This application Sep. 27, 1991, Ser. No. 767,556
Int. Cl.[5] A61F *2/16, 2/14*
U.S. Cl. 623—6 **27 Claims**



1. An intraocular achromatic lens system comprising two intraocular lenses having distinct refractive indices and distinct optical powers for surgically positioning in optical alignment within an eye, the plural lenses being joined together as an achromatic lens and means connected to the achromatic lens for mounting the lens totally within a posterior or anterior chamber of an eye.

5,201,763
THIN INTRAOCULAR LENS
Dan G. Brady, Mission Viejo; Bernard F. Grisoni, Aliso Viejo, and Christopher E. Doyle, Irvine, all of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Feb. 28, 1992, Ser. No. 843,527
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **22 Claims**

1. An intraocular lens for implantation in an eye comprising:
a resilient, deformable silicone based optic having at least about 20 diopter power, said optic having a periphery and being configured so that the optic can be resiliently deformed from a normal optical condition into a deformed insertion condition to permit the intraocular lens to be passed through a scleral tunnel incision of no longer than about 3.2 millimeters into the eye;
fixation means coupled to the optic for retaining the optic in the eye; and
said optic when implanted in the eye being in the normal optical condition and having sufficient rigidity to be substantially free of optical distortion resulting from force

from the eye acting on the intraocular lens and said optic comprising a non-deformable elongated engagement member

5,201,767
FLUTED-WEDGE OSTEAL PROSTHETIC COMPONENT

surface, and wall means extending from said lower surface

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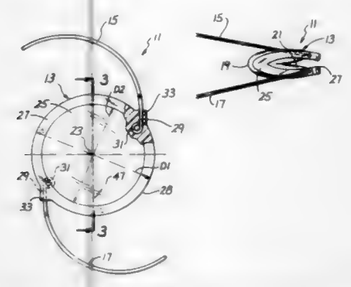
from the eye acting on the intraocular lens and said optic when implanted in the eye being of sufficient size to substantially prevent glare resulting from interaction of light and the periphery of the optic.



5,201,764

BIOLOGICALLY COMPATIBLE COLLAGENOUS REACTION PRODUCT AND ARTICLES USEFUL AS MEDICAL IMPLANTS PRODUCED THEREFROM

Charles D. Kelman, New York, N.Y., and Dale P. Devore, Chelmsford, Mass., assignors to Autogenesis Technologies, Inc., Acton, Mass.

Division of Ser. No. 486,558, Feb. 28, 1990, Pat. No. 5,104,957. This application Jan. 22, 1992, Ser. No. 824,838

Int. Cl.[5] **A61F** *2/14, 2/02, 13/00, 2/00*

U.S. Cl. 623—6 **9 Claims**

1. A shaped article useful for medical implantation comprising a biocompatible collagenous polymer of collagen modified with an acylating agent selected from the group consisting of glutaric anhydride, succinic anhydride, and maleic anhydride and at least one other acylating agent selected from the group consisting of methacrylic anhydride, beta-styrene sulfonyl chloride, ethylene-maleic anhydride copolymer, styrene-maleic anhydride copolymer and poly(vinyl) sulfonic acid.

5,201,765

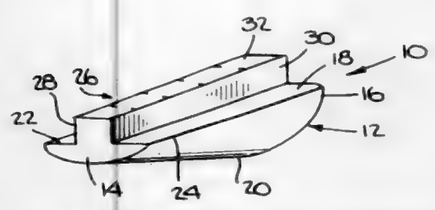
VOCAL CORD MEDIALIZATION PROSTHESIS

James L. Netterville, Nashville, Tenn., and James B. Hissong, Jacksonville, Fla., assignors to Xomed-Treace Inc., Jacksonville, Fla.

Filed Sep. 20, 1991, Ser. No. 763,390

Int. Cl.[5] **A61F** *2/02, 2/20, 2/04;* **A61M** *16/00*

U.S. Cl. 623—11 **10 Claims**



1. An implantable prosthesis for vocal cord medialization comprising a non-deformable elongated engagement member of a first predetermined longitudinal extent with longitudinally spaced opposite and portions, a base surface, a vocal cord engagement surface projecting away from said base surface and having a first range of steadily increasing elevation from said base surface, from a minimum elevation at one end portion of said engagement member to a maximum elevation at the opposite end portion of said engagement member, indicia means on said engagement means for indicating the elevation of said engagement surface from said base surface in a longitudinal direction between said minimum and said maximum elevations, said engagement member being formed of a biocompatible trimmable material to permit removal of selected longitudinal portions of said engagement member proximate said opposite end portions to provide a predetermined longitudinal foreshortening of said engagement member with a selected second range of steadily increasing elevation of said engagement surface from said base surface.

5,201,766

PROSTHETIC DEVICE WITH POROUS MATRIX AND METHOD OF MANUFACTURE

Frederick S. Georgette, Memphis, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.

Continuation of Ser. No. 291,532, Dec. 29, 1988, abandoned, which is a continuation of Ser. No. 65,179, May 29, 1987, abandoned, which is a continuation of Ser. No. 774,957, Sep. 11, 1985, abandoned. This application Feb. 28, 1991, Ser. No. 663,291

Int. Cl.[5] **A61F** *2/28, 2/54*

U.S. Cl. 623—16 **15 Claims**

1. A method of forming a porous matrix on a portion of the outer surface of a prosthetic device, comprising the steps of:

(a) providing a prosthetic device having an outer surface portion on which a porous matrix is to be formed;

(b) attaching an enclosure around said outer surface portion that conforms to the shape of the prosthetic device outer surface and spaced therefrom, said enclosure having a smooth inner surface for engaging metallic particles contained within the enclosure, and wherein the enclosure is formed of a collapsible material capable of withstanding elevated temperature;

(c) charging the space between the enclosure inner surface portion and the outer surface of the prosthetic device with metallic particles;

(d) evacuating substantially all air from said enclosure;

(e) subjecting the outer surface of said enclosure to an elevated pressure in an atmosphere of inert gas at an elevated temperature;

(f) wherein in step "e" said pressure and temperature are sufficient to fuse the particles together and to said portion of the prosthetic device so that the inner surface of the collapsed enclosure deforms at least some of the metallic particles to define a smooth but porous outer surface of the prosthetic collapsed metallic particles at a temperature below that which would transform the microstructure of the metallic substrate to a weakened state;

(g) cooling said prosthetic device;

(h) removing said enclosure to expose said particles; and

(i) wherein in step "h" the prosthesis outer surface remains smooth but porous after removal of the enclosure.

5,201,767

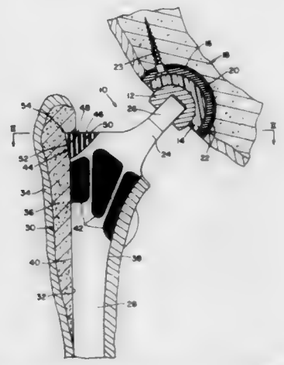
FLUTED-WEDGE OSTEAL PROSTHETIC COMPONENT

Salvatore Caldarise, Hanson, and Thomas S. Thornhill, Dover, both of Mass., assignors to Johnson & Johnson Orthopaedics, Inc., Raynham, Mass.

Filed Jul. 15, 1991, Ser. No. 729,674

Int. Cl.[5] **A61F** *2/30, 2/32, 2/36*

U.S. Cl. 623—18 **10 Claims**



1. An osteal prosthetic component of a prosthetic joint for disposition within a medullary canal of a bone, comprising:

a) a neck:

b) a stem extending from the neck along a longitudinal axis, the stem including a tissue ingrowth portion for allowing bone tissue growth from the bone into the stem to substantially prevent micromotion of the stem relative to the bone; and

c) fluted wedge extending from the stem, the fluted wedge having wedge portions which define at least one flute between the portions, each wedge portion including a ramp, which extends generally along the longitudinal axis, and a base portion extending generally transversely to said longitudinal axis, the ramp and the base portion intersecting to form a rim, whereby an interference fit is formed between the rims and the bone during implantation of the stem into the medullary canal, wherein the interference fit can cause contact of at least a portion of the ramps and the base portions with the bone, thereby sufficiently limiting the movement of the stem relative to the bone to allow tissue growth at the tissue-ingrowth portion to substantially prevent micromotion of the stem relative to the bone.

5,201,768

PROSTHESIS FOR IMPLANT ON THE TIBIAL PLATEAU OF THE KNEE

Richard B. Caspari, 2192 Sheppard Town Rd., Maidens, Va. 23102; Jeffrey G. Roberts, 3688 Montclair Dr., Palm Harbor, Fla. 34684, and James T. Treace, 2701 Bluffs Dr., Largo, Fla. 34640

Division of Ser. No. 462,528, Jan. 8, 1990, Pat. No. 5,171,276. This application Oct. 9, 1991, Ser. No. 773,268

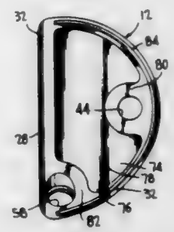
Int. Cl.[5] **A61F** *2/30*

U.S. Cl. 623—20 **7 Claims**

1. A prosthesis for implant on the tibial plateau of the knee comprising

a body having a lower surface for engaging the tibial plateau, an end wall spaced from said lower surface to define a cavity between the tibial plateau and said end wall when said lower surface is positioned on the tibial plateau, a peripheral wall joined to said lower surface, said lower surface having a periphery defined by said peripheral wall, said peripheral wall having a lower portion extending beyond said end wall in the direction of said lower surface, and wall means extending from said lower surface substantially continuously along said periphery for penetrating the tibial plateau; and

channel means extending through said lower portion of said peripheral wall for providing communication between said cavity and externally of said body to allow cement to be supplied, from externally of said body, between said body and the tibial plateau after said lower surface is positioned on the tibial plateau.



5,201,769

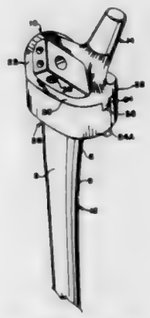
HIP STEM WITH PROXIMAL BUILD-UP BLOCKS

Steven F. Schutzer, 85 Seymour St., Hartford, Conn. 06106

Filed Sep. 23, 1991, Ser. No. 764,342

Int. Cl.[5] **A61F** *2/36, 2/30*

U.S. Cl. 623—23 **7 Claims**



1. A prosthetic implant having a first portion including a neck and a second portion including a stem, with a flange extending outwardly from a junction of said first and second portions, said stem extending longitudinally away from said flange and comprising a distal portion for seating within an intramedullary canal of a bone, and a buildup block having a predetermined height, wherein said flange includes a keel extending downward from a lower surface of said flange, said buildup block includes a groove formed in an upper surface thereof, said flange keel being accommodated within said buildup block groove with said buildup block connected to said flange and said surfaces in contact with one another, and said buildup block for contacting said bone to space said first portion of said implant a predetermined distance from said bone.

5,201,770

in a cotyloid cavity and a medullary canal of a femoral bone,

5,201,773

exterior surface of the model and over the attached valve

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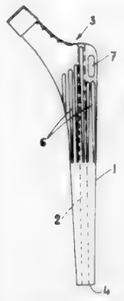
5,201,770

FEMORAL INSERT FOR TOTAL HIP PROSTHESIS

Enrique P. Sola, C. Coso, 77, 50001 Zaragoza, Spain

Filed Dec. 20, 1991, Ser. No. 811,316
Claims priority, application Spain, Jan. 2, 1991, 9100003
Int. Cl.[5] A61F 2/36
U.S. Cl. 623—23 3 Claims



1. Femoral insert for total hip prosthesis, of the type which is of hollow configuration, said insert comprising

a piece having an upper part, an exterior and a longitudinally extending lower section, said longitudinally extending lower section having an interior and a back side,

a longitudinal hollow running in said interior of said longitudinally extending section, said longitudinal hollow having a uniform diameter,

a longitudinal slot placed on said exterior of said piece on said back side, said longitudinal slot having edges, said longitudinal hollow connected to said exterior of said piece by means of said longitudinal slot,

lateral depressions on said upper part near said edges of said longitudinal slot,

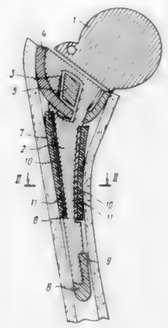
said upper part of said insert lacking pronounced thicker sections.

5,201,771

ENDOPROSTHESIS OF THE HIP JOINT

Sergei I. Belykh, tovsky pereulok, 4, kv.66; Anatoly B. Davydov, Krasny Kazanets, 19, korpus 1, kv.283, both of, Moscow; Algimantas Y. Petrulis, pekt Krasnoi Armii, 122, kv.12, and Sigitas V. Prantskyavichus, Myaures, 39, kv.13, both of, Kaunas, all of U.S.S.R.

PCT No. PCT/SU89/00243, § 371 Date May 22, 1991, § 102(e) Date May 22, 1991, PCT Pub. No. WO91/03991, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 15, 1989, Ser. No. 700,181
Int. Cl.[5] A61F 2/36, 2/32
U.S. Cl. 623—23 7 Claims



1. An endoprosthesis for a hip joint, for surgical implantation in a cotyloid cavity and a medullary canal of a femoral bone, comprising

a femoral element having a head to be inserted into the cotyloid cavity;

a shaft having a predetermined length and upper, middle and lower portions to be inserted into the medullary canal, said upper portion of said shaft has a through hole and said middle portion of said shaft has two longitudinal slots having a length less than said length of said shaft;

at least one U-clamp and a stud formed of resorbable material;

inserts having a first part and a second part, said first and second part being made of a resorbable material wherein said second part has a faster rate of resorbtion than said first part, said inserts being movably mounted in said slots such that said first part is adjacent to the shaft and said second part is adjacent to the bone;

an end cap configured to be disposed over the lower portion of said shaft;

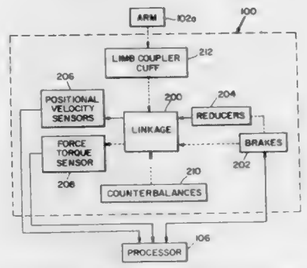
wherein said U-clamp is configured to pass through said through hole and said stud is shaped to fit in said through hole adjacent said U-clamp thereby stabilizing said U-clamp with respect to the shaft.

5,201,772

SYSTEM FOR RESISTING LIMB MOVEMENT

Scott M. Maxwell, 250 Mercer St, #C317, New York, N.Y. 10012

Filed Jan. 31, 1991, Ser. No. 648,733
Int. Cl.[5] A61F 2/48; G09B 19/00
U.S. Cl. 623—24 14 Claims



11. A system for resisting limb movement comprising:

a) a plurality of links joined by joints to form a linkage system including at least three parallelograms of links and joints between a fixed point in space and a movable end point of said linkage system;

b) a limb coupler for coupling a limb to said end point;

c) a plurality of brakes for resisting translational link movement in at least three mutually orthogonal directions and for resisting rotational link movement about at least three mutually orthogonal axes;

d) a plurality of position sensors for sensing the degree of translational and rotational movement of said links about said joints in the three directions and three axes;

e) a plurality of velocity sensors for sensing the rate of said translational and rotational movement;

f) a first cylinder with a first diameter coupled to the brake;

g) a second cylinder with a second diameter which is wider than said first diameter coupled to a rotating joint of the linkage system;

h) a cable with one end connected to the second cylinder, said cable is wrapped around the first cylinder to amplify the brake torque; and

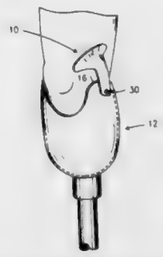
i) a computer wherein the sensed positions and rates generate signals which are coupled to at least one brake to vary the amount of resistance generated by the brake.

5,201,773

ARTICULATING SUPRACONDYLAR SUSPENSION

Joseph F. Carideo, Jr., 1560 Powder Ridge Ct., Palm Harbor, Fla. 34683

Filed Apr. 23, 1992, Ser. No. 872,574
Int. Cl.[5] A61F 2/60, 2/78
U.S. Cl. 623—32 6 Claims



1. A prosthesis of the patella tendon bearing type, comprising:

a prosthesis socket having a flat rim;

an articulating supracondylar suspension means having a top part and a lower part;

said lower part being pivotally mounted to said socket at a preselected location below said rim and said top part projecting upwardly above said rim;

said top part adapted to bear against a residual limb when a residual limb is positioned in said socket;

said top part adapted to bear against said limb above the medial femoral condyle of said limb;

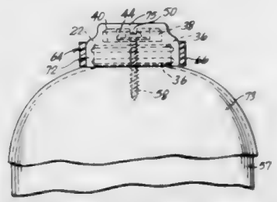
whereby said socket can be suspended from said limb.

5,201,774

PROSTHETIC VALVE SYSTEM AND PROCESS FOR SEALING A SOCKET

Ted J. Greene, La Canada, Calif., assignor to United States Manufacturing Company, Pasadena, Calif.

Filed Aug. 23, 1991, Ser. No. 749,258
Int. Cl.[5] A61F 2/80
U.S. Cl. 623—34 15 Claims



1. A process for making a prosthetic socket for an amputation and for sealing an air relief valve in a wall of the socket, the process comprising:

forming a rigid model having an exterior surface shaped as the interior configuration of a tubular prosthetic socket with a closed end;

fastening an annular valve housing in a fixed position on the exterior surface of the model, the valve housing having a first annular end face disposed on the exterior surface of the model and a second annular end face spaced from the model, the valve housing having an opening extending through it with a dummy plug removably disposed in the valve opening;

applying heat to a sheet of thermoplastic material for use in forming the socket, said heat being sufficient to produce a heat softened condition of the thermoplastic sheet;

thereafter placing the heat softened plastic sheet over the exterior surface of the model and over the attached valve housing and conforming the heat softened plastic sheet to the model, the valve housing, and the dummy plug, thereby forming a thin-walled tubular prosthetic socket with a closed end and having a hollow interior in the shape of the model with the valve housing encased in the thermoplastic material;

removing the socket from the model after the plastic hardens to provide a thin-walled, flexible, tubular, closed-ended socket for an amputation with the valve housing sealed in the wall of the socket;

removing the dummy plug from the valve opening, leaving an annular lip of plastic covering the second annular end face of the valve housing for providing a means of resisting axial force on the valve housing in a direction away from the inside of the socket to thereby mechanically interlock and seal the valve housing in the wall of the socket; and

placing an air relief valve in the valve opening in place of the dummy plug so the air relief valve controls air flow through the valve housing from the interior of the socket.

5,201,775

ADJUSTABLE LOWER LIMB PROSTHESIS

Joseph Arbogast, and Robert Arbogast, both of Mount Sterling, Ohio, assignors to Ohio Willow Wood Company, Mount Sterling, Ohio

Continuation of Ser. No. 512,260, Apr. 20, 1990, Pat. No. 5,133,777. This application Feb. 3, 1992, Ser. No. 829,319
Int. Cl.[5] A61F 2/62, 2/76
U.S. Cl. 623—38 3 Claims

1. A lower limb prosthesis comprising:

a prosthetic foot; and

an elongate rod having one end fixed to said foot and having a proximal end, said elongate rod being formed substantially of unidirectional long fibers embedded in a thermoplastic matrix, said fibers extending substantially parallel to the length of said rod,

whereby said rod can absorb torsional loads.

5,201,776

ORTHOPAEDIC AND PROSTHETIC JOINT

Mark Freeman, Camberley, England, assignor to Hugh Steeper Limited, England

Filed Oct. 15, 1991, Ser. No. 776,617
Claims priority, application United Kingdom, Oct. 23, 1990, 9023038
Int. Cl.[5] A61F 2/64
U.S. Cl. 623—46 6 Claims

1. An orthopaedic or prosthetic joint comprising:

(a) a first fixed-length link member provided with two spaced-apart pivotal connections at one end thereof and a third pivotal connection remote from that end;

(b) a second fixed-length link member pivotally connected at

forming an outer material having a low porosity and an inner

said injection tip thereby expanding said flaps and passing

5,201,781

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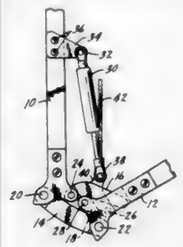
(b) a second fixed-length link member pivotally connected at one end thereof to one of said first two pivotal connections on said first link member;
(c) a third fixed-length link member pivotally connected at one end thereof to the other one of said first two pivotal connections on said first link member, said third link member being provided with a further pivotal connection at an intermediate portion thereof;
(d) a fourth fixed-length link member arranged end-to-end with respect to said first link member but spaced therefrom by said second link member, said fourth link member being provided with two spaced-apart pivotal connections at that end nearer the first link member with one of said pivotal connections, on the fourth link member being pivotally connected to said second link member at that end of the second link member remote from the first link member;
(e) a fifth fixed-length link member pivotally connected at one end thereof to the other one of said two pivotal connections on said fourth link member and pivotally con-



nected at the other end thereof to that end of said third link member remote from the first link member whereby the second link member on the one hand and the third and fifth link members on the other hand extend between, and connect together, the opposing ends of the first and fourth link members;
(f) a pivotal connection on the third link member between the ends thereof;
(g) a spring link extending between said third pivotal connection on the first link member and said further pivotal connection on the intermediate portion of the third link member, said spring link being arranged to hold the joint in any selected one of a plurality of angular positions of the fourth link member with respect to the first link member; and
(h) joint-release means connected to said third link member whereby the joint-holding function of the spring link may be overcome by operation of the joint-release means in order to permit the fourth link member to move to another angular position with respect to the first link member.

5,201,777

Patent Not Issued For This Number

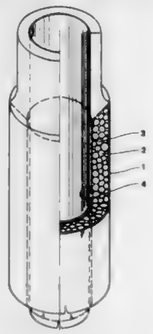
5,201,778

VASCULAR PROSTHESIS CONTAINING IN THE WALL MICROCAPSULES, INCLUDING HORMONE-PRODUCING CELLS

Giovanni Brotzu, Piazza Garibaldi, 4, 09134 Cagliari, and Riccardo Calafiore, Perugia, both of Italy, assignors to Giovanni Brotzu, Cagliari, Italy

Division of Ser. No. 548,372, Jul. 5, 1990, Pat. No. 5,104,403. This application Jan. 13, 1992, Ser. No. 820,006
Claims priority, application Italy, Jul. 4, 1989, 21086 A/89
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—66 **5 Claims**

1. A process for the preparation of a vascular prosthesis comprising:
forming an outer material having a low porosity and an inner tubular porous mesh of synthetic material said porous mesh having a porosity to allow oxygen and hormones to pass therethrough; disposing microcapsules between said outer material and said inner tubular mesh, said microcapsules being made of a semi-permeable material and con-



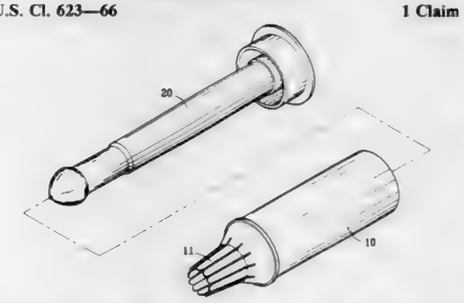
taining hormone-producing cells; and introducing into said prosthesis a spindle of plastic material sized to be introduced into said prosthesis.

5,201,779

DISPOSABLE IMPLANT INJECTOR

I-Sen Shiao, 1F, No. 1, Alley 17, Lane 111, Fu-Hsing S Rd. Sec. 2, Taipei, Taiwan

Filed Feb. 13, 1992, Ser. No. 835,248
Int. Cl.[5] A61F *2/76*
U.S. Cl. 623—66 **1 Claim**



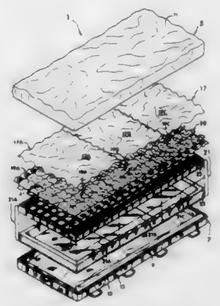
1. A disposable implant injector system comprising a hollow injection barrel, a guiding rod and a plunger;
said injector barrel is formed with a material having good flexibility and terminating at opposite ends, said injector barrel having at one end thereof multiple flaps forming an injection tip, each said flaps being adjacent one another in an initial state and adapted to deflect outwardly when an implant element is forced therethrough;
said guiding rod having an outer dimension to be housed within said barrel and having at one end thereof a tapered tip configured to penetrate the injection tip of the injector and an enlarged opposite end to limit the axial displacement of said rod within said barrel; and
said plunger being configured to slide freely within said barrel, said plunger having a front end adapted to push said implant within said barrel outwardly through the injection tip whereby said guiding rod is disposed within said barrel with said front end protruding outwardly from said injection tip when said injection tip is inserted into an incision in the tissue of a patient to locate the barrel in the incision, the guiding rod is removed and the implant is disposed within said barrel and said plunger is inserted into the barrel for pushing said implant therethrough to said injection tip thereby expanding said flaps and passing the implant into the tissue.

5,201,780

ANTI-DECUBITUS MATTRESS PAD

John C. Dinsmoor, III, Westminster; Grant C. Denton; Eric C. Jay, both of Boulder, and Richard R. Runkles, Englewood, all of Colo., assignors to Jay Medical, Ltd., Boulder, Colo.

Filed Sep. 6, 1991, Ser. No. 756,320
Int. Cl.[5] A61G *7/057*; **A47C** *27/18*
U.S. Cl. 5—455 **65 Claims**



1. A multi-layered pad primarily intended for use to reduce the development of decubitus ulcers in patients using the pad by reducing the frictional drag between layers of the pad, said pad including:
first and second layers,
means for securing said first and second layers to each other for sliding movement relative to each other, and
means for enhancing the relative, sliding movement between said first and second layers by reducing the frictional drag therebetween, said enhancing means including a plurality of substantially spherical microbeads positioned between said first and second layers, said microbeads maintaining their spherical shape in use and not breaking under the weight of the patient on the pad.

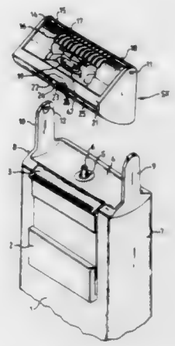
38. A multi-layered pad primarily intended for use to reduce the development of decubitus ulcers in patients using the pad, said pad including:
first and second layers,
said first layer including bladder means for containing a fluid, said bladder means including a plurality of discrete pouches containing said fluid,
said second layer being positioned beneath said first layer and including resilient spring means, said spring means having a plurality of discrete spring elements that are at least partially separated and spaced from each other, and
means for attaching at least a first one of said bladder pouches to a first one of said discrete, resilient spring elements for movement therewith under the weight of the patient on said pad.

5,201,781

COUPLING FOR THE CUTTER ASSEMBLY OF TWIN-HEAD SHAVERS

Albrecht Jestädt, Friedrichsdorf; Helmut Dürr, Frankfurt, and Hans-Eberhard Heintke, Wächtersbach, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

PCT No. PCT/DE90/00550, § 371 Date Feb. 6, 1992, § 102(e) Date Feb. 6, 1992, PCT Pub. No. WO91/02629, PCT Pub. Date Mar. 7, 1991
PCT Filed Jul. 21, 1990, Ser. No. 829,068
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3926894
Int. Cl.[5] B26B *19/02*
U.S. Cl. 30—43.92 **12 Claims**



1. A dry shaving apparatus comprising an electric drive, drive structure coupled to said electric drive, said drive structure including a bearing bore, coupling structure, a pair of parallel elongate shaving heads having their inner cutters resiliently mounted on said coupling structure, said coupling structure being detachably coupled to said drive bearing bore in said drive structure, said bearing pin structure having a prismatic groove with two beveled surfaces, at least one spring element adapted to hold said coupling structure in abutting engagement with said drive structure, said spring element and said prismatic groove cooperating as a locking device with said spring element resting resiliently against one of said beveled surfaces in a locked position, said locking device being releasable from its locking engagement against the pressure of said spring element by means of said beveled surface of said prismatic groove against which said spring element rests.

5,201,782

UNIVERSALLY-ADJUSTABLE AXLE-MOUNTABLE TOOL FOR TRUING A BICYCLE WHEEL

Christopher B. Bartlett, 954 Lincoln Pl., Boulder, Colo. 80302

Filed May 26, 1992, Ser. No. 888,978
Int. Cl.[5] G01B *5/255*
U.S. Cl. 33—203.19 **19 Claims**

1. A tool for aiding in truing a bicycle wheel, said tool comprising:
(a) at least three elongated segments having substantially the same lengths and shapes, each of said segments having a substantially rigid structure being similarly progressively twisted along the longitudinal extent thereof; and
(b) releasably adjustable means for pivotally connecting and clamping said segments to one another so as to permit articulating of said segments about a pair of spaced-apart transversely-extending axes relative to one another and erecting of said tool from a storage condition in which

said segments are disposed in a retracted nested relation-

tion of said first, first short side, and second, second short

projection extending downwards from a center portion of said

angle to one another for determining accurately each corner of a building, said arms being securable to two

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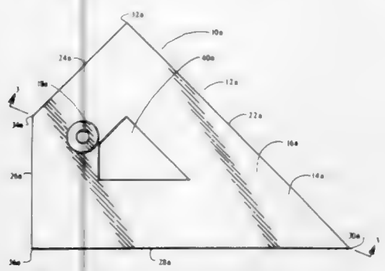
said segments are disposed in a retracted nested relationship with one another to an operational condition in

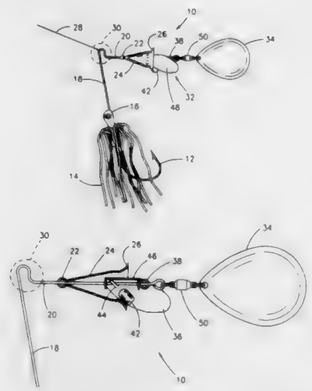
which said segments are disposed in an extended end-to-end relationship with one another.

5,201,783
PLANAR DRAFTING INSTRUMENT
Mark R. Peters, 2012 W. Hadden Ave., #3, Chicago, Ill. 60622-3604
Filed Sep. 3, 1991, Ser. No. 753,924
Int. Cl.[5] B43L *7/027, 7/033*
U.S. Cl. 33—474 **9 Claims**



1. A drafting instrument compromising:
a quadrilateral integrally formed planar body having an upper face and a lower face, having four perimeter sides being a first, first short side with first and second ends, a second, second short side with first and second ends, a third, first long side with first and second ends, and a forth, second long side with first and second ends, with said second end of said first, first short side intersecting said first end of said second, second short side, said second end of said second short side interconnected to said first end of said third, first long side, said second end of said third, first long side interconnected to said first end of said fourth, second long side, said second end of said fourth, second long side interconnected to said first end of said first, first short side, with said first and second sides being of equal length, and said third and fourth sides being of equal length, which form the symmetrical quadrilateral configuration of the drafting instrument;
a handle integrally formed within said planar body, said handle being positioned on a center line defined by said intersection of said first, first short side, and said second, second short side and said intersection of said third, first long side, and said fourth, second long side and located rear the intersection of said first, first short side and said second, second short side,
and extending outwardly from said upper face of said body, so as to provide sufficient grip and pivoting operation when used in conjunction with a T-square or horizontal bar;
a multiplicity of points extending outwardly from said lower face, with one of said points located between said intersection of said first, first short side, and second, second short side and said handle along said center line functioning for pivoting operation of said body with said handle, with all of said points extending outwardly from said lower face an equal distance so as to contact a planar surface upon which the drafting instrument is positioned with said body of the drafting instrument parallel to said planar surface.

5,201,784
SPINNER BAIT FISHING LURE
Arthur D. McWilliams, 6901 Ogden St., Omaha, Nebr. 68104
Filed Aug. 17, 1992, Ser. No. 930,807
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 **7 Claims**

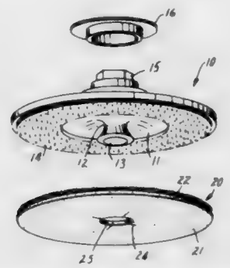


1. A spinner bait fishing lure comprising:
an elongated member having two ends and a bend therebetween, forming a shaft portion and an arm portion;
a hook attached to said shaft portion end;
a spinner rotatably attached to said arm portion end;
a carriage having a body and two walls attached thereto and extending outwardly and downwardly therefrom and being slidably mounted on said arm portion, between said spinner and said bend;
a generally conical shaped water diverting member having a hole therethrough and adapted to be slidably mounted on said arm between said bend and said carriage, and adapted to receive said carriage therein; and
a rattle pivotally mounted on said arm and within said carriage such that upon rotation of said spinner, said arm and said carriage are reciprocated side to side causing said rattle to strike said walls emitting sounds therefrom.

5,201,785
DISC-HOLDER ASSEMBLY
Yasuhiko Nagano, Sagamihara, Japan, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 698,469, May 10, 1991, abandoned. This application Jan. 30, 1992, Ser. No. 827,894
Int. Cl.[5] B24D *17/00*
U.S. Cl. 51—358 **4 Claims**

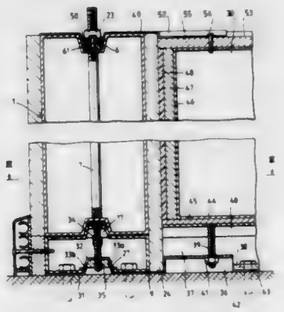
1. A disc holder assembly comprising: a disc holder including means for attachment to a rotary tool and a disc member, said disc member including a surface finishing member on a first surface, a first sheet fastener on a second surface opposite to said first surface, and a central opening extending through said first and second surfaces and extending through said surface finishing member and said first sheet fastener, said disc holder having a lower surface which includes a concave portion coaxially within a flat annular surface portion, a mounting

projection extending downwards from a center portion of said concave portion having a shaft portion having a shaft portion diameter and a distal head portion having a head portion diameter which is somewhat larger than said shaft diameter, and a second sheet fastener adapted to be detachably secured to said first sheet fastener fixed to said annular surface, said disc member central opening having a diameter which is substantially the same as said shaft portion diameter but which will elastically expand to permit the forced entry of said distal head portion, said central opening having at least one slit which



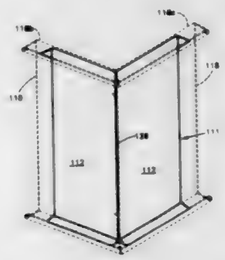
extends from the edge of said opening outwards, said disc member being capable of being mounted with said first and second sheet fasteners detachably secured and said distal portion head protruding through said disc central opening with said disc central opening aligned around said shaft portion of said mounting projection to securely hold said disc member with said surface finishing member deployed in a plane for use, and with the mounting projection distal head extending to a point which is located inwards from said plane, wherein one of said sheet fasteners is a hook fastener sheet and the other of said sheet fasteners is a loop fastener sheet.

5,201,786
PREFABRICATED BUILDING
Peter W. Larsen, Residence Quatre Soleils, CH-3974 Mollens, Switzerland
PCT No. PCT/GB89/01128, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO90/03475, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 26, 1989, Ser. No. 679,007
Claims priority, application United Kingdom, Sep. 26, 1988, 8822562
Int. Cl.[5] E04B *1/99;* **E06B** *1/00*
U.S. Cl. 52—227 **17 Claims**



1. An assembly for a building which comprises
a portable foundation adapted to be placed on a ground and comprising a plurality of box-shaped cross-section beams each of which defines the base of an external wall of the building,
a plurality of corner pieces each having arms fixed at an angle to one another for determining accurately each corner of a building, said arms being securable to two beams to thereby define such corner,
means for attaching the beams to the ground,
a plurality of portable wallframes which define substantially the entire external wall and are securable to the foundation,
first securing means for rigidly securing each corner piece to its associated beam comprising a first cooperating slot and ridge extending in the longitudinal direction of such beam and of the associated corner piece arm, one of the first slot and ridge being formed on the beam and the other of the first slot and ridge being formed on the associated corner piece arm, each side of each of the first ridge and slot having mating substantially horizontal surfaces; and
second securing means for rigidly securing each wallframe onto an upper surface of a beam comprising a second cooperating slot and ridge extending in the longitudinal direction of the beam and wallframe, one of the second slot and ridge being formed on an upwardly facing surface of the beam and the other of the second slot and ridge being formed on a downwardly facing surface of the wallframe, each of the second slot and ridge having on each side mating substantially horizontal surfaces,
each said first and second ridges having inclined sides thereby promoting insertion into its respective slot.

5,201,787
TRIM SYSTEM FOR SUSPENSION CEILINGS
Paul D. LaLonde, Avon; J. Wesley Sroub, Parma, and James A. Fetterick, Olmsted Falls, all of Ohio, assignors to USG Interiors, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 708,975, May 31, 1991. This application Jan. 10, 1992, Ser. No. 819,272
Int. Cl.[5] E04B *5/52*
U.S. Cl. 52—484 **14 Claims**



1. A splice plate for connecting elongated channel-shaped suspension ceiling members, said splice plate comprising a channel-shape body having a central planar face portion and opposed flanges proportioned to bridge between and lock with abutting ends of said channel-shaped members adjacent to said abutting ends thereof, said face portion providing means producing a bend line when said splice plate is bent to provide an inside corner, said flanges providing continuous portions extending uninterrupted past said bend line and maintaining said splice plate straight past said bend line when said splice plate interconnects aligned and abutting channel-shaped members, said continuous portion being severed permitting bending of said splice plate along said bend line when said splice plate interconnects channel-shaped members abutting at an inside corner.

5,201,788
METHOD OF AND DEVICE FOR CUTTING OFF THE

5,201,790
FUEL CONTROL APPARATUS OF AN ENGINE

said high temperature profile is from about 800° F.–1200° F. (427°–649° C.) and said low temperature profile is from

discharging air downwardly toward said needle cylinder and said box;

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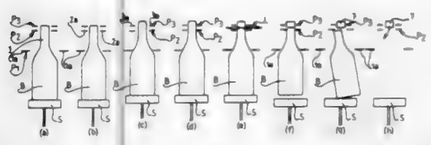
5,201,788

METHOD OF AND DEVICE FOR CUTTING OFF THE UPPER PART OF A CLOSED CONTAINER OF PLASTICS OR OTHER MATERIAL

Laurent J. Le Naour, Vernouillet, France, assignor to Stork Dardaine Industries S.A., France

Filed Feb. 26, 1992, Ser. No. 841,554
Claims priority, application France, Feb. 26, 1991, 91 02281
Int. Cl.[5] B65B *61/08*
U.S. Cl. 53—468 8 Claims



1. A method for cutting off the upper portion of a closed container, such as a bottle having a neck, comprising

holding a bottle having a neck in order to allow severing of the neck by a blade member,

resting the bottle upon a vertically movable support,

closing a first clamp located at the level of an upper portion of the bottle below the neck,

lifting the support of the bottle to cause the upper portion of the bottle to abut with the first clamp thus defining a reference stop,

closing a second clamp located above the first clamp about the neck of the bottle,

closing a third clamp located above the second clamp about the neck of the bottle,

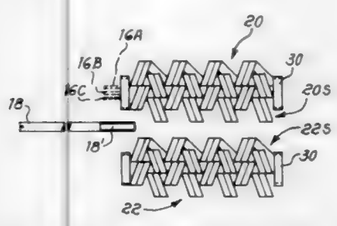
actuating the blade member to pass between the second and third clamps in order to sever the neck of the bottle, and opening the first, second and third clamps to separate the bottle from a separated end of the neck severed by the blade member.

5,201,789

WOVEN METAL BAND IN PARTICULAR FOR WATCHES INCORPORATING REMOVABLE AND JOINTED LINKS

Fernando Fontana, Sesto Calende, Italy, assignor to G.T.F. S.r.l., Sesto Calende, Italy

Filed Mar. 23, 1992, Ser. No. 855,292
Claims priority, application Italy, Dec. 23, 1991, MI91A003450
Int. Cl.[5] F16G *13/00*
U.S. Cl. 59—80 8 Claims



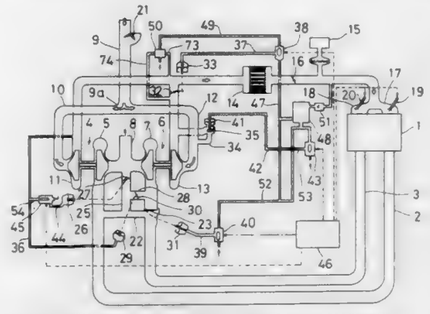
1. A woven metal band for watches and bracelets consisting of a plurality of links (**20**)(**22**), each link being formed by at least two turns (**12**,**14**), said turns being juxtaposed, partially penetrating each other and forming cylindrical seats, and pins (**16***a*), (**16***b*), (**16***c*), said pins being inserted into said cylindrical seats, at least one of said turns having threads in the interior thereof, a screw (**18**) having a threaded end (**18'**), said threaded end being inserted into said turn which has threads in the interior thereof, said screw connecting two links.

5,201,790

FUEL CONTROL APPARATUS OF AN ENGINE

Manabu Mukai; Shigeo Kato; Shinichi Wakutani, and Shoji Imai, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 4, 1991, Ser. No. 650,179
Claims priority, application Japan, Feb. 5, 1990, 2-25707
Int. Cl.[5] F02B *27/02*, *37/00*
U.S. Cl. 60—612 12 Claims



1. A fuel control apparatus of an engine comprising;

fuel supply means for supplying fuel to the engine;

intake pressure detecting means for detecting an intake pressure of an intake passageway through which intake air is fed into the engine;

fuel control means for controlling the fuel supply means so that an amount of the fuel supplied to the engine corresponds to the intake pressure on the basis of a signal outputted from the intake pressure detecting means;

exhaust resistance changing means for changing an exhaust resistance of an exhaust passageway through which gas is exhausted from the engine according to the operating condition of the engine; and

correction means for correcting a supply amount of the fuel to be controlled by the fuel control means when the exhaust resistance of the exhaust passageway is changed by the exhaust resistance changing means;

wherein the correction means performs correction in such a manner that the amount of fuel supplied from the fuel supply means is increased when the exhaust resistance of the exhaust passageway is reduced.

5,201,791

SINGLE ALLOY SYSTEM FOR TURBINE COMPONENTS EXPOSED SUBSTANTIALLY SIMULTANEOUSLY TO BOTH HIGH AND LOW TEMPERATURE

Robert E. Clark, Orlando, Fla.; Dennis R. Amos, Rock Hill, S.C., and Robert L. Novak, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 495,880, Mar. 19, 1990, abandoned. This application Jun. 27, 1991, Ser. No. 725,938
Int. Cl.[5] F01K *13/00*
U.S. Cl. 60—645 10 Claims

1. A method of operating an electric power plant having a single alloy system turbine rotor exposed to a high temperature and high pressure steam source and a low temperature and a low pressure exit end, comprising:

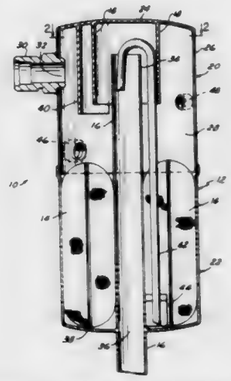
providing a single alloy system rotor consisting essentially of a 9Cr-1Mo, mod. alloy which has been normalized and then tempered at an elevated temperature of about 1275°–1300° F. (690°–704° C.) for one hour per inch of its thickness; and operating said rotor in an electric power plant at a power generation turbine service temperature profile of about 75° F. (24° C.) at the exit end up to about 1200° F. (649° C.) at the source, said profile encompassing a high temperature and low temperature profile whereby said high temperature profile is from about 800° F.–1200° F. (427°–649° C.) and said low temperature profile is from about 75° F. to about 800° F. (24°–427° C.).

5,201,792

ACCUMULATOR FOR VEHICLE AIR CONDITIONING SYSTEM

Alan L. Study, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1991, Ser. No. 812,717
Int. Cl.[5] F25B *43/00*
U.S. Cl. 62—503 12 Claims



1. An accumulator for use in an air conditioning system, the accumulator comprising:

a housing including a first section and a second section which together define an interior chamber, the housing having an inlet opening through which refrigerant may be introduced into the interior chamber and an outlet opening through which refrigerant may exit the interior chamber;

an outlet tube disposed in the interior chamber of the housing and extending at least to the outlet opening;

an outlet tube shield extending into the interior chamber between the inlet opening and the outlet tube to prevent the direct passage of liquid refrigerant into the outlet tube; and

a deflector attached to the first section adjacent the inlet opening.

5,201,793

REMOVER OF DUST OF FLOCKS, ETC. IN CIRCULAR KNITTING MACHINE

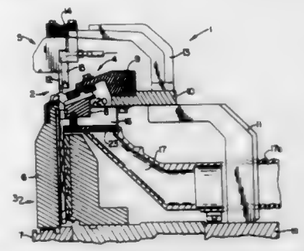
Toshiro Izumi, and Hiroyuki Ueda, both of Hyogo, Japan, assignors to Precision Fukuhara Works, Ltd., Hyogo, Japan

Filed Apr. 16, 1992, Ser. No. 869,307
Claims priority, application Japan, Apr. 19, 1991, 3-116851
Int. Cl.[5] D04B *35/32*
U.S. Cl. 66—168 11 Claims

1. Apparatus for removing fiber waste from a circular knitting machine having a rotary needle cylinder and a rotary sinker dial, comprising:

a fiber waste collection box adjacent said rotary needle cylinder and said sinker dial;

an air ejection nozzle located above said sinker dial for discharging air downwardly toward said needle cylinder and said box;



a rotatable fiber waste collecting member within said box; and

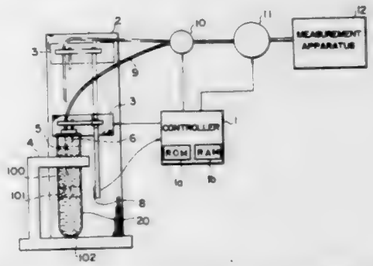
suction means for removing fiber waste from said box.

5,201,794

METHOD FOR SAMPLING BLOOD SPECIMEN

Masaaki Kasai, and Sakae Yamazaki, both of Nakakoma, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 449,892, Jan. 10, 1990, abandoned. This application Feb. 5, 1992, Ser. No. 830,992
Claims priority, application Japan, Jun. 18, 1987, 62-150241
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.01 5 Claims



1. A blood specimen sampling method for sampling a blood specimen from a blood-collecting tube having a film stopper at an opening portion thereof, said method comprising:

providing a blood-collecting tube having a film stopper fused to an opening portion thereof, said film stopper comprising a gas-barrier film layer having a thickness of 10–200 μm and a resealable layer having thickness of 0.3—2 mm on said gas-barrier film layer, and said blood-collecting tube containing a blood specimen including a serum layer and a clot layer separated by a serum separating agent layer;

introducing a needle having a distal end into the interior of said blood-collecting tube by moving a holding body which holds said needle in a direction toward said film stopper to cause said distal end of said needle to penetrate said film stopper;

detecting said blood specimen serum separating agent layer by means of a sensor coupled to said holding body and positioned outside of said blood-collecting tube at a predetermined distance forward of said distal end of said needle in the direction of movement of said holding body toward said film stopper;

adjusting the position of said distal end of said needle to be located in said blood specimen serum layer by moving said holding body further in the direction toward said film stopper a distance based on the predetermined distance between said distal end of said needle and said sensor; and

drawing only said blood specimen serum layer into said needle from said distal end portion of said needle.

aligned and longitudinally offset, establishing a low pressure shaft end and a high pressure shaft end;

said cylindrical induction coil being encased by an iron cylinder disposed concentrically along with said cylindri-

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5,201,799

CLIP ATTACHMENT FOR COMBUSTOR PANEL

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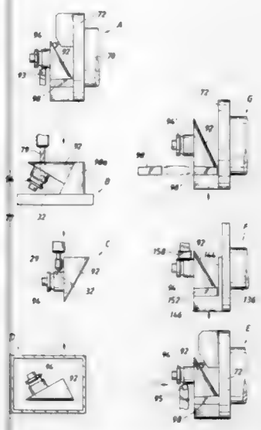
drawing only said blood specimen serum layer into said needle from said distal end portion of said needle.

5,201,795
ROCK BIT MANUFACTURING METHOD
Danny B. Howard, and Daura Palmo, both of Harris County, Tex., assignors to Cummins Tool Company, Houston, Tex.
Filed May 11, 1992, Ser. No. 881,412
Int. Cl.[5] B21K *5/02*
U.S. Cl. 76—5.1 **32 Claims**



1. A method of forming a base for use on a roller-cone-type rock bit of the type wherein a leg extension of the base is joined along a generally transverse end surface to a leg stub of a main body member to form a complete bit leg, comprising the steps of:

providing a workpiece at least rough formed to comprise a leg extension work portion, having a preliminary end surface, and a trunnion work portion extending angularly from the leg extension work portion;

on a rotatable holder portion of a lathe, mounting a first interface member with an indexing surface thereof facing generally radially inwardly but angled to correspond to a desired angular orientation of a trunnion in a finished bit;

removably mounting the workpiece on the first interface member, with the preliminary end surface abutting the indexing surface, by connector means comprising at least one pin-type connector projecting from one of said surfaces into the other; and

turning the trunnion work portion on the lathe.

5,201,796
GAS TURBINE ENGINE ARRANGEMENT
Robert L. Glinski, Wellington, and Gary M. Perkins, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 15, 1991, Ser. No. 775,865
Int. Cl.[5] F02C *3/06, 7/06*
U.S. Cl. 60—39.161 **2 Claims**

1. A gas turbine arrangement for a power system comprising:

a low pressure shaft;

a high pressure shaft;

a low pressure compressor rotor on said low pressure shaft;

a low pressure turbine rotor on said low pressure shaft;

a high pressure compressor rotor on said high pressure shaft;

a high pressure turbine rotor on said high pressure shaft;

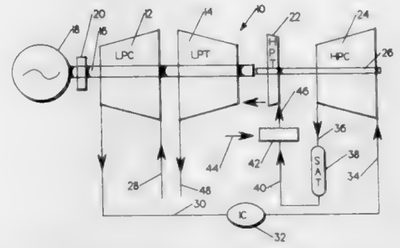
said low pressure shaft and said high pressure shaft axially aligned and longitudinally offset, establishing a low pressure shaft end and a high pressure shaft end;

said low pressure compressor rotor and said low pressure turbine rotor on said low pressure shaft at the low pressure end;

said high pressure compressor rotor and said high pressure turbine rotor on said high pressure shaft at said high pressure end;

a power output unit connected to said low pressure shaft;

said low pressure shaft and said high pressure shaft being independently rotatable;



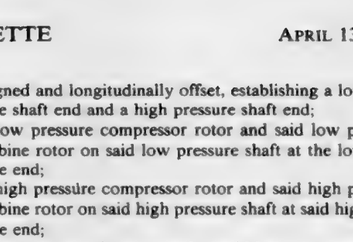
a first bearing comprising a journal and thrust bearing between static structure and said low pressure shaft at the outboard end of said low pressure shaft;

a second bearing comprising a journal bearing between static structure and said low pressure shaft at the inboard end of said high pressure shaft;

a third bearing comprising a roller bearing between the inboard end of said low pressure shaft and the inboard end of said high pressure shaft; and

a fourth bearing comprising a ball and thrust bearing between static structure and the outboard end of said high pressure shaft.

5,201,797
INDUCTION HEATER HAVING CYLINDRICAL COOKING RECEPTACLE
Shun-Te Weng, No. 9, Yung Kuang Lane, Herming Village, Show Shui Hsiang, Chang Hwa Hsien, Taiwan
Filed Oct. 31, 1991, Ser. No. 786,165
Int. Cl.[5] A23L *3/10*
U.S. Cl. 99—359 **1 Claim**



1. An induction heater having a cylindrical cooking receptacle comprising:

a housing provided with an electromagnetic circuit;

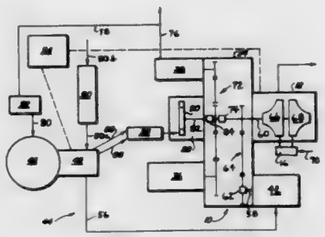
an electromagnetic induction coil for heating;

a housing composed of at least a cylindrical portion having therein a cylindrical receptacle encased by said electromagnetic cylindrical induction coil controlled by said electromagnetic circuit to induce electric current in a conducting material of a container placed in said cylindrical receptacle so that food contained in said container is heated;

said cylindrical induction coil being encased by an iron cylinder disposed concentrically along with said cylindrical portion and said cylindrical induction coil, and wherein said housing comprises a plurality of heat radiating holes arranged circularly; and

wherein said cylindrical portion contains thereunder a recessed portion comprising therein a movable piece capable of moving upwardly and downwardly by means of a biasing means and having therein at least a temperature-sensing resistance and a temperature fuse.

5,201,798
MULTIFUNCTION INTEGRATED POWER UNIT AND POWER TRANSFER APPARATUS THEREFOR
Clarence C. Hogan, Mesa, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 24, 1990, Ser. No. 587,709
Int. Cl.[5] F02C *1/06*
U.S. Cl. 60—39.161 **17 Claims**



11. A combined auxiliary and emergency power unit comprising:

a gear box;

energy producing equipment mechanically coupled to said gear box to be driven when said gear box is provided with a rotary power input;

first and second turbine wheels for producing said rotary power input;

first and second clutches respectively coupled to said first and second turbine wheels;

a rotary compressor connected to said first turbine wheel to be driven thereby and for providing a compressed air source;

a first combustor for receiving fuel and compressed air from said compressor and combusting the same;

a first nozzle connected to said first combustor and for directing products of combustion therefrom at said first turbine wheel to drive the same and thus cause auxiliary power unit operation when said first clutch is engaged;

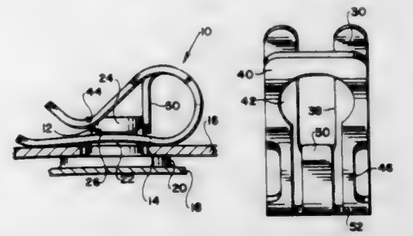
a high pressure storage container for storing a compressed air-based oxidant;

a second combustor for receiving fuel and compressed oxidant from said storage container and combusting the same;

a second nozzle connected to said second combustor for receiving combustion gas therefrom and directing the same at said second turbine wheel to drive the same and thus cause emergency power unit operation when said second clutch is engaged; and

a power transfer unit mounted in said gear box and including a tubular member, in which said first and second clutches are mounted for delivering said rotary power input thereto, and said tubular member externally defining a gear portion for delivering said rotary power input to said gear box.

5,201,799
CLIP ATTACHMENT FOR COMBUSTOR PANEL
Donald E. Johnson, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed May 20, 1991, Ser. No. 702,468
Int. Cl.[5] F02C *7/20;* **F02G** *3/00*
U.S. Cl. 60—39.32 **4 Claims**



1. In combination: a combustor for a gas turbine engine having an outer shell and a plurality of inner segmented floating members, movable circumferentially and axially with respect to said outer shell in response to thermal expansion;

a plurality of posts secured to each of said segmented members, each post extending radially through an opening in said shell;

each post having a reduced thickness clip receiving portion remote from the ends of said posts, with a thicker portion outboard of said reduced thickness portion with respect to the segmented member to which said each post is secured;

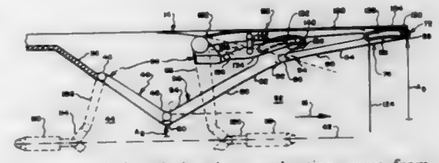
a substantially U-shaped clip for each post having an inboard leg adjacent said shell and an outboard leg bent inwardly towards said inboard leg;

a slot in said inboard leg sized to encompass said reduced thickness portion, but of a width less than said thicker portion;

said outboard portion having a hole overlaying said post to receive said post, said post extending radially into said hole; and

a resilient finger on said clip resiliently abutting said post and urging said outboard portion of said clip against said post.

5,201,800
METHOD FOR DISCHARGING COMBUSTION GASES FROM AN EXHAUST NOZZLE
Jeremiah P. Wolf, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 484,942, Feb. 26, 1990, Pat. No. 5,103,639.
This application Jul. 29, 1991, Ser. No. 737,127
Int. Cl.[5] F02K *1/00*
U.S. Cl. 60—204 **15 Claims**



1. A method for discharging combustion gases from an engine powering an aircraft at subsonic and supersonic velocities, said engine including an exhaust nozzle having primary flaps defining a generally converging channel for channeling said combustion gases, and secondary flaps extending downstream from said primary flaps in flow communication therewith and defining an exhaust channel having an outlet for discharging said combustion gases from said nozzle, the method comprising the steps of:

contouring said secondary flaps to a first contour at a first

metals and noble metals to reduce nitrogen oxides in-

said control means including a hydraulic cylinder coupled to

fixed frame that is located in the direction of movement of

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contouring said secondary flaps to a first contour at a first position for discharging said combustion gases through said exhaust channel at a first value of a nozzle pressure ratio NPR defined across said converging and exhaust channels; and

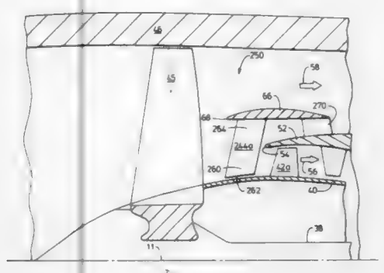
contouring said secondary flaps to a second contour at a second position for discharging said combustion gases through said exhaust channel at a second value of said NPR, said second contour, said second position, and said second NPR value being different than said first contour, said first position, and said first NPR value, respectively.

5,201,801

AIRCRAFT GAS TURBINE ENGINE PARTICLE SEPARATOR

Leroy H. Smith, Jr., Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 4, 1991, Ser. No. 709,852
Int. Cl.[5] F02K *3/02*
U.S. Cl. 60—226.1 **2 Claims**



1. A front fan gas turbine engine subassembly comprising:

(a) an aft-most row of generally radially outwardly extending full-size from fan rotor blades;

(b) a flow splitter having a leading edge disposed longitudinally aft of said fan rotor blades for separating air exiting said fan rotor blades into a core engine airflow and a coaxially surrounding bypass airflow; and

(c) a row of stator vanes each having:

(1) a first portion disposed longitudinally adjacent, radially inward of, and longitudinally forward of said leading edge of said flow splitter and longitudinally adjacent said fan rotor blades;

(2) a second portion which extends radially outward from, and longitudinally forward of, said leading edge of said flow splitter and which is shroudless; and

(3) a third portion which extends radially outward from, and longitudinally aft of, said leading edge of said flow splitter and which is attached to said flow splitter.

5,201,802

EXHAUST GAS PURIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Shinya Hirota, Susono, and Kenji Katoh, Shizuoka, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 31, 1992, Ser. No. 829,212
Claims priority, application Japan, Feb. 4, 1991, 3-033366; Feb. 20, 1991, 3-045662
Int. Cl.[5] F01N *3/20*
U.S. Cl. 60—276 **22 Claims**

1. An exhaust gas purification system for an internal combustion engine comprising:

an internal combustion engine capable of fuel combustion at lean air-fuel ratios and having an exhaust conduit;

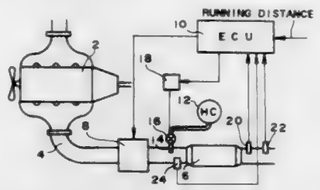
a catalyst installed in the exhaust conduit of the engine and constructed of zeolite, said catalyst carrying at least one metal selected from the group consisting of transition metals and noble metals to reduce nitrogen oxides included in exhaust gas from the engine under oxidizing gas conditions and in the presence of hydrocarbons;

means for determining degradation of the catalyst; and

means for increasing the amount of hydrocarbons supplied to the catalyst when the means for determining degradation of the catalyst determines that the catalyst has been degraded.

14. An exhaust gas purification system for an internal combustion engine comprising:

an internal combustion engine capable of fuel combustion at lean air-fuel ratios and having an exhaust conduit;



a catalyst installed in the exhaust conduit of the engine and constructed of zeolite, said catalyst carrying at least one metal selected from the group consisting of transition metals and noble metals to reduce nitrogen oxides included in exhaust gas from the engine under oxidizing gas conditions and in the presence of hydrocarbons;

means for determining degradation of the catalyst; and

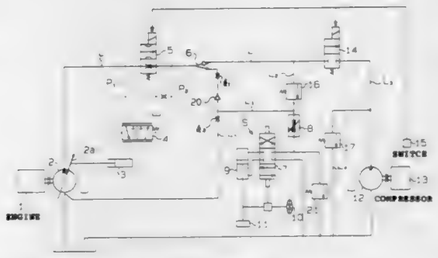
means for changing a catalyst temperature to a higher side when the means for determining degradation of the catalyst determines that the catalyst has been degraded.

5,201,803

HYDRAULIC SYSTEM FOR A VEHICLE

Kunifumi Goto; Shigeru Suzuki, and Tatsuyuki Hoshino, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 4, 1991, Ser. No. 787,056
Claims priority, application Japan, Nov. 6, 1990, 2-301874
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—422 **10 Claims**



1. A hydraulic system for a vehicle comprising:

a hydraulic motor for driving an air conditioning compressor;

a power steering mechanism;

a variable capacity pump for supplying pressurized fluid to the hydraulic motor and the power steering mechanism;

a control means for controlling the discharge capacity of the variable capacity pump in accordance with loads on the hydraulic motor and the upper steering mechanism;

said variable capacity pump having a swash plate, and the discharge capacity of the pump being arranged to change in accordance with a tilt angle of the swash plate;

said control means including a hydraulic cylinder coupled to the swash plate, and a direction switching valve coupled to said hydraulic cylinder and having a first position for supplying said pressurized fluid to said hydraulic cylinder to move said hydraulic cylinder forward when said power steering mechanism is operated alone, and a second position for discharging said pressurized fluid said hydraulic cylinder to move said hydraulic cylinder backward when said compressor is operating alone and when both said power steering mechanism and said compressor are operating simultaneously, said direction switching valve adjusting the fluid flow amount supplied to and discharged from said hydraulic cylinder;

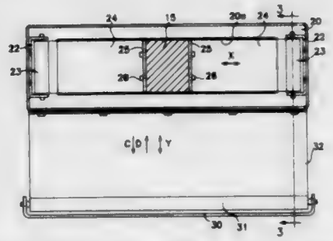
said control means including a pressure control valve for controlling a fluid pressure of fluid discharged from the variable capacity pump, the pressure control valve having a constricted position and an open position, an instruction switch for directing the activation and deactivation of the compressor, the instruction switch being coupled to the pressure control valve for switching the pressure control valve between the constricted and open positions and a pilot fluid path, connected between the direction switching valve and a position downstream of the pressure control valve, for controlling the position of the direction switching valve based on the position of the pressure control valve.

5,201,804

SEMICONDUCTOR MANUFACTURING APPARATUS HAVING A MOVABLE-AREA COVERING MECHANISM

Yoshimitsu Hisajima, Tokyo, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 749,295
Claims priority, application Japan, Aug. 24, 1990, 2-221143
Int. Cl.[5] A47B *13/08*
U.S. Cl. 108—90 **4 Claims**



1. A semiconductor manufacturing apparatus having a movable area covering mechanism for covering an X-Y table while the X-Y table is being moved characterized in that said mechanism comprising:

an X-Y table comprising a base, a Y-direction guide table provided on said base, a Y-table guided by said Y-direction guide table, an X-direction guide table provided on said Y-table and an X-table guided by said X-direction guide table,

a movable member which is provided above and mounted on said X table,

a fixed cover which is secured to said X-direction guide table, said fixed cover being provided with an opening formed in a direction of movement of the X table,

an X-direction cover shaft which is secured to an end of the fixed cover on a side located in the direction of movement of the X table,

an X-direction mobile cover with one end thereof being fastened to and wrapped around the X-direction cover shaft and an other end thereof being fastened to the movable member,

a fixed frame which is secured to said base,

a Y-direction cover shaft which is fastened to an end of the fixed frame that is located in the direction of movement of the Y-table, and

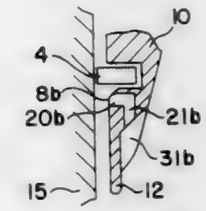
a Y-direction mobile cover with one end thereof being fastened to and wrapped around the Y-direction cover shaft and an other end thereof being fastened to the fixed cover.

5,201,805

WEAR REDUCING PISTON FOR COMBUSTION ENGINE

Hans Schubert, 925 Alma St., Palo Alto, Calif. 94301

Filed Apr. 6, 1992, Ser. No. 864,218
Int. Cl.[5] F01M *11/02*
U.S. Cl. 123—196 M **12 Claims**



1. A wear reducing piston for a cylinder of an internal combustion engine having a crankshaft, and a connecting rod, said connecting rod moving during operation in a plane, said piston comprising

a top, a cylindrical body, an inner open space, a wrist pin for linking said piston to said connecting rod of said engine and an oil ring;

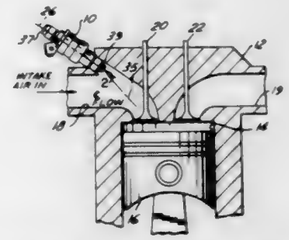
a plurality of lubrication channels located substantially symmetrical to said plane in said piston wall for guiding lubricants through said body and ejecting lubricants below said oil ring directly against the wall of said cylinder in close vicinity to said plane.

5,201,806

TILTED FUEL INJECTOR HAVING A THIN DISC ORIFICE MEMBER

Ross W. Wood, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Jun. 17, 1991, Ser. No. 716,168
Int. Cl.[5] F02M *55/02, 61/00*
U.S. Cl. 123—470 **10 Claims**



1. In an internal combustion engine having one or more target zones toward each of which an electrically operated fuel injector directs a corresponding stream of liquid fuel via orifice means in a thin disc orifice member via which fuel exits the fuel injector, said fuel injector having a longitudinal axis, said orifice means being disposed in a cone-shaped dimple that is centrally located in said thin disc orifice member and protrudes in a direction away from the fuel injector to terminate in a tip, said cone-shaped dimple having an axis that is co-axial with said axis of the fuel injector, the improvement which comprises the co-axis of said dimple and said fuel injector being non-par-

allel to a line projected from the tip of the dimple to such target

voltage across said lead and said reference point to derive

5,201,810

ROLLER SHADE FOR AN OPENING HAVING A

define respective first and second portions of a said core to be formed in said apparatus;

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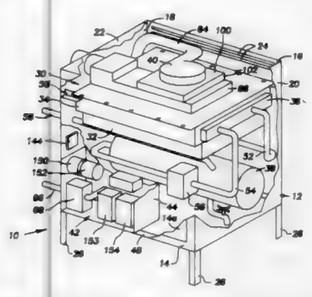
allel to a line projected from the tip of the dimple to such target zones, and said orifice means comprising a pattern that consists of one or more distinct orifices and that is located within one diametrical half of said dimple extending 180 degrees about the axis of said dimple, the opposite diametrical half of said dimple being imperforate.

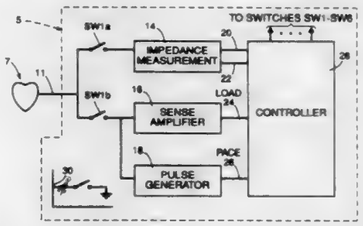
5,201,807
GAS-FIRED WATER HEATER
Gary W. Liljenberg, Brooklyn; Richard K. Nelson, Brecksville, and John E. Schmidt, Sr., Cleveland, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.
Filed Feb. 26, 1992, Ser. No. 842,071
Int. Cl.[5] F22B *5/02*
U.S. Cl. 122—18 28 Claims



1. A gas-fired booster water heater for heating water to a temperature of about 180° F. for use in a sanitizing cycle of high-temperature commercial dishwashing or warewashing machines, said heater including an outer housing sized to be installed beneath a counter and containing burner means including a burner box and a combustion chamber separated by an infrared burner combustion surface facing into the combustion chamber, a heat exchanger assembly including finned tubes disposed in said combustion chamber for circulation therethrough of water to be heated, fuel supply means for supplying a combustible gaseous mixture of air and fuel gas to said burner box for combustion within said combustion chamber at or near said combustion surface and with the formation of hot flue gases, said finned tubes being arranged to provide multiple passes across the combustion surface in close proximity thereto with the hot flue gases flowing over the finned tubes whereby said combustion surface provides both radiant and convective heat transfer to said heat exchanger and circulating water therein, said flue gases being vented from said combustion chamber through a restricted vent opening means for imposing a positive pressure on the combustion surface to retain combustion at or near the combustion surface.

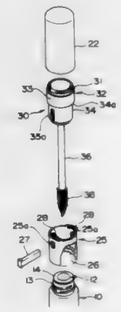
5,201,808
MINUTE VOLUME RATE-RESPONSIVE PACEMAKER EMPLOYING IMPEDANCE SENSING ON A UNIPOLAR LEAD
Bruce M. Steinhaus, Parker; Tibor A. Nappholz, Englewood; James A. Nolan, Conifer, and Robert A. Morris, Palmer Lake, all of Colo., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.
Filed Feb. 10, 1992, Ser. No. 833,435
Int. Cl.[5] A61N *1/365*
U.S. Cl. 128—419 PG 44 Claims

23. A rate-responsive pacemaker comprising:
pulsing means for providing pacing pulses at a controlled rate;
a unipolar lead coupled to said pulsing means and having an electrode adapated to couple said pulsing means to a patient's heart;
means for periodically introducing a measuring current between said lead and a reference point and measuring the voltage across said lead and said reference point to derive a spatial impedance signal; and



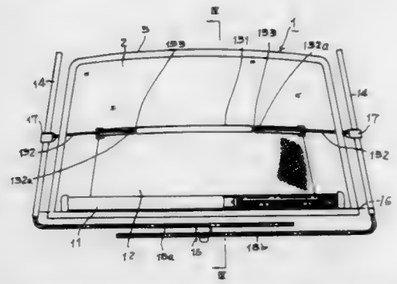
means coupled to said pulsing means for adjusting said controlled rate as a function of said spatial impedance signal.

5,201,809
APPLICATOR FOR COSMETICS
Akiyoshi Miura, Yokohama, Japan, assignor to Shinwa-Seisakusho Co., Ltd., Yokohama, Japan
Filed Mar. 27, 1992, Ser. No. 858,640
Claims priority, application Japan, Apr. 9, 1991, 3-76424
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—218 5 Claims



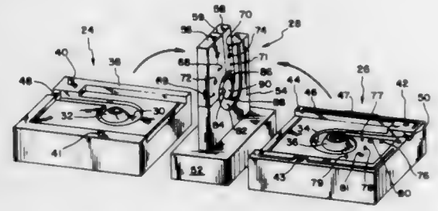
1. A cosmetics applicator comprising:
a container having an opening at one end and external threads formed in a portion of said container adjacent to the opening; and
a cosmetics applicator assembly adapted for sealing the opening of said container by engaging with the external threads of said container, and adapted to access a cosmetic contained in said container, said cosmetic applicator assembly being movable from a first position to a second position further into said container when said cosmetic applicator assembly does not engage with the external threads of said container,
said cosmetic applicator assembly including an outer cylindrical member, a shaft member fixedly secured at one end thereof to said outer cylindrical member and having an applicator member attached to the other end thereof, and a cylindrical inner plug having internal threads for mating with the external threads of said container, said cylindrical inner plug having spring means for facilitating downward movement of said shaft member to said second position from said first position, said cylindrical inner plug and said spring means being formed in one piece of synthetic resin, said inner plug being disposed around a portion of said shaft member.

5,201,810
ROLLER SHADE FOR AN OPENING HAVING A CURVED FRAME
Juji Ojima, and Ken Suzuki, both of Kanagawa, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan
Filed May 21, 1992, Ser. No. 886,734
Claims priority, application Japan, May 23, 1991, 3-147830
Int. Cl.[5] E06B *9/20*
U.S. Cl. 160—265 9 Claims



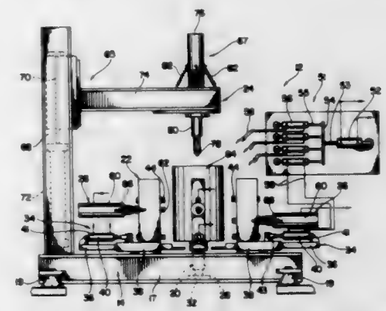
1. A roller shade for selectively covering a designated area, comprising:
a retractor mounted on a first side of said area that is to be covered;
a screen sheet retracted in said retractor and being connected to said retractor at one end thereof;
a pull rod attached to the other end of said screen sheet and moveable between a first position adjacent said retractor and a second position adjacent a second side of said designated area opposing said first side;
guide means for guiding movement of said pull rod between said first position and said second position;
drive means for actuating said pull rod between said first position and said second position; and
bending means for bending said pull rod at said second position so as to make said pull rod conform to said second side of said area.

5,201,811
METHOD AND APPARATUS FOR THE MANUFACTURE OF UNITARY COMPLEX CORES
Donald R. Lebold, Fort Wayne, and Christopher J. Lichtle, Decatur, both of Ind., assignors to The Hamilton Foundry & Machine Co., Harrison, Ohio
Filed Jan. 28, 1992, Ser. No. 826,791
Int. Cl.[5] B22C *13/12*
U.S. Cl. 164—28 18 Claims



1. An apparatus for manufacturing a core, the apparatus comprising:
a core box including separable first and second sections, said first and second sections having respective first and second interior faces, said first and second interior faces having respective first and second cavities therein which define respective first and second portions of a said core to be formed in said apparatus;
an investment aperture means in said box for receiving core material, said aperture means being in communication with said first and second cavities; and
a segmented mandrel disposed intermediate said first and second sections defining separate first and second chambers respectively with said first and second cavities, said segmented mandrel having an opening therethrough allowing communication between said first and second chambers for forming an interconnecting portion between said first and second portions of a said core.

5,201,812
INVESTMENT REMOVAL APPARATUS
Douglas J. Goss, North Kingstown, R.I., assignor to Conley Casting Supply Corp., Warwick, R.I.
Filed Jan. 10, 1992, Ser. No. 820,293
Int. Cl.[5] B22D *29/00*
U.S. Cl. 164—404 10 Claims



1. Investment removal apparatus for removing investment material from a tree-shaped investment casting having a central trunk and a plurality of cast parts which are connected to said trunk by a plurality of gates, said investment casting being cast within an open-ended cylindrical flask having an investment mold therein, said apparatus comprising:
a) spring-biased seating means for receiving a first end of said central trunk when said flask is vertically disposed on said seating means;
b) centering means having spring-biased shoulder mounts for engaging said flask at spaced circumferential locations for centering and holding said flask so that said central trunk is in vertical alignment with said seating means;
c) horizontal impact means in engagement with said flask for imparting horizontal vibratory impact to said flask whereby said spring-biased shoulder mounts cause said flask to resiliently resonate in a horizontal direction;
d) vertical impact means in engagement with a second end of said central trunk for imparting vertical vibratory impact thereto whereby said spring-biased seating means cause said investment casting to resiliently resonate in a vertical direction, said horizontal and vertical vibratory impacts cooperating to cause said investment material to break, crumble and disintegrate.

5,201,813
ROLL MONITOR SLED DATA HANDLING SYSTEM
Kenneth D. Ives, Center Township, Porter County; Roy D. Egren, Valparaiso, both of Ind., and James J. Karaganis, Jr., Geneva, Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 20, 1991, Ser. No. 672,307
Int. Cl.[5] B22D *11/16*
U.S. Cl. 164—451 10 Claims

1. A method of monitoring sets of rolls of a continuous

casting machine arranged in opposed pairs and having work-engaging faces separated by spaced gaps and defining a path of

sleeve and said inner sleeve are relatively moveable, a frangible means having a predetermined tensile strength

a. a vehicular main frame having a first and second side edge;
b. a tiltable substructure mounted transversely across said

a torque sensor for detecting a steering torque exerted onto a steering wheel;

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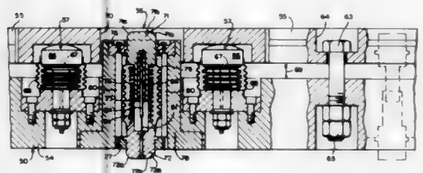
casting machine arranged in opposed pairs and having work-engaging faces separated by spaced gaps and defining a path of travel for a workpiece, said method comprising the steps of:

passing a roll monitor sled along said path of travel;

generating analog signals representative of particular measurements of said roll using sensors carried by said roll monitor sled;

converting said analog signals to digitized analog signals;

processing said digitized analog signals with a processor on



board said roll monitor sled activated to generate processed digital signals corresponding to analog signals created when said sensors are in contact with said work-engaging faces;

transmitting said processed digital signals from said roll monitor sled;

receiving said processed digital signals transmitted from said roll monitor sled; and

processing the received processed digital signals into user accessible form.

5,201,814

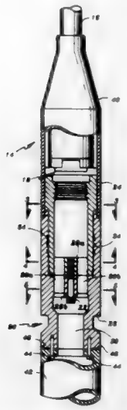
BREAKAWAY COUPLING DEVICE

Ricky W. Kitchell, and Larry L. Newlin, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 23, 1992, Ser. No. 824,668

Int. Cl.[5] E21B *23/00*

U.S. Cl. 166—65.1 **12 Claims**



1. An apparatus for working in a wellbore, comprising:

at least one downhole tool for operation in a wellbore;

a cable for lowering and raising said tool in the wellbore, said cable including signal conductors for transmitting signals between said tool and the earth's surface;

a coupling device connecting one end of said cable to said tool, said coupling device comprising an outer sleeve for connecting to one end of said cable and having an axial bore therein, an inner sleeve for connecting to said tool and having an axial bore therein generally aligned with said axial bore of said outer sleeve, said inner sleeve slidably disposed within said outer sleeve wherein said outer sleeve and said inner sleeve are relatively moveable, a frangible means having a predetermined tensile strength connecting said outer and inner sleeves through said axial bores, and a passage means extending through said outer and inner sleeves from said cable to said tool, said passage means located longitudinally adjacent to said axial bores, wherein said coupling device allows disconnection between the cable and the tool when tension applied to the coupling device exceeds the predetermined tensile strength of the frangible means.

5,201,815

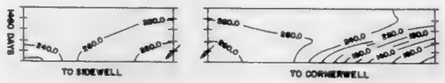
ENHANCED OIL RECOVERY METHOD USING AN INVERTED NINE-SPOT PATTERN

Ki C. Hong, Orange, and Victor M. Ziegler, Bakersfield, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Dec. 20, 1991, Ser. No. 811,399

Int. Cl.[5] E21B *43/24, 43/30*

U.S. Cl. 166—245 **5 Claims**



1. A method of enhanced oil recovery in an areally homogeneous oil reservoir comprising:

(a) injecting steam in a pattern having a steam injection well at the center of the pattern, a production well at each of the four corners of the pattern, and a production well at the center of each side of the pattern, and

(b) producing oil from sidewells and corner wells of the pattern,

wherein the completion of the sidewells is restricted to the lower 20% of the reservoir.

5,201,816

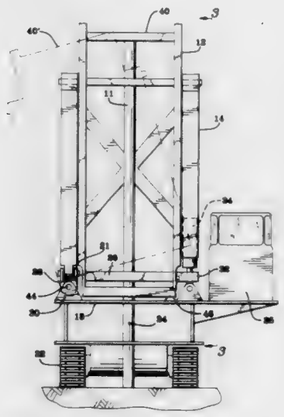
SIDE ANGLE DRILLING APPARATUS

George P. Schivley, Jr., Richardson, Tex., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 779,551, Oct. 18, 1991, abandoned. This application Oct. 15, 1992, Ser. No. 962,155

Int. Cl.[5] F21C *11/02*

U.S. Cl. 173—184 **5 Claims**



1. A tiltable drilling apparatus comprising:

a. a vehicular main frame having a first and second side edge;

b. a tiltable substructure mounted transversely across said mainframe, said substructure including:

(i) first and second oppositely spaced ends;

(ii) said first end pivotally attached to said main frame adjacent a first side edge of said mainframe, for pivoting about a first pivot axis;

(iii) said second end attached to said main frame adjacent a second side edge of said mainframe by an extension member, whereby actuation of said extension member pivots said substructure about said first pivot axis;

c. a tower support pivotally attached to said substructure for pivoting about a second pivot axis, said second pivot axis being adjacent to said first side edge of said main frame and transverse to said first pivot axis; and

d. a tower mounted on said tower support.

5,201,817

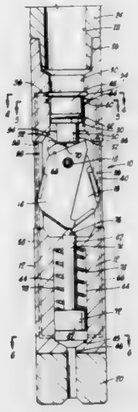
DOWNHOLE CUTTING TOOL

Charles D. Hailey, 11628 Burning Oaks, Oklahoma City, Okla. 73150

Filed Dec. 27, 1991, Ser. No. 815,327

Int. Cl.[5] E21B *10/32, 29/06*

U.S. Cl. 175—269 **14 Claims**



11. A downhole cutting tool, comprising:

an elongate body member having upper and lower ends and including a slot defined laterally therethrough;

a cutting assembly pivotally retained within said body member slot;

first piston means disposed above said cutting assembly and actuatable to force said cutting assembly radially outward into operative position; and

second piston means disposed below said cutting assembly and actuatable simultaneously with said first piston means actuation to reinforce said cutting assembly radially outward into operative position.

5,201,818

POWER STEERING APPARATUS

Mitsuhiko Nishimoto, Yoshino, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Apr. 16, 1991, Ser. No. 686,107

Claims priority, application Japan, May 9, 1990, 2-120343; May 9, 1990, 2-120344

Int. Cl.[5] B62D *5/04*

U.S. Cl. 180—79.1 **3 Claims**

1. A power steering apparatus which comprises:

a detecting means for detecting the speed of a vehicle;

a torque sensor for detecting a steering torque exerted onto a steering wheel;

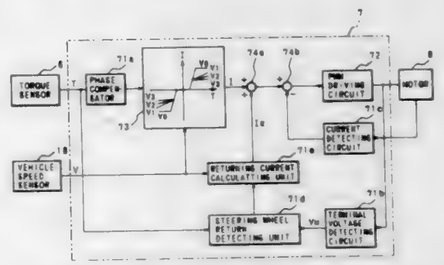
driving current generating means, responsive to the torque sensor, for generating a driving current corresponding to the steering torque detected by said torque sensor;

a motor for assisting steering force, driven by the driving current;

wherein the driving current generating means comprises:

a means for detecting the terminal voltage of said motor;

a steering wheel return detecting means for detecting whether the steering wheel is being returned to the neutral position on the basis of the detected result of



said terminal voltage detecting means and of said torque sensor;

a returning current calculating means, responsive to the vehicle speed detecting means, for calculating a current to drive said motor to assist the return of the steering wheel on the basis of the detected result of said vehicle speed detecting means when said steering wheel return detecting means detects that the steering wheel is being returned; and

a means for driving said motor by the driving current calculated by said returning current calculating means when said steering wheel return detecting means detects that the steering wheel is being returned.

5,201,819

DRIVING WHEEL ELEVATING APPARATUS IN SELF-PROPELLED TRUCK

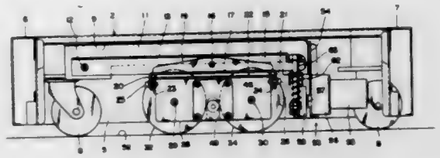
Itsuo Shiraishi, Ebina, and Minoru Otuka, Zama, both of Japan, assignors to Yugen Kaisha Takuma Seiko, Kanagawa, Japan

Filed Oct. 2, 1991, Ser. No. 769,663

Claims priority, application Japan, May 10, 1990, 2-120456

Int. Cl.[5] B62D *1/24*

U.S. Cl. 180—168 **3 Claims**



3. A self-propelled truck adapted to automatically run along a guide tape installed on a floor face, comprising;

a base portion provided with a plurality of non-driving wheels attached to a lower face thereof,

an elevating plate so as to vertically move relative to said base portion,

driving wheels attached to said elevating plate at stable relative height positions,

an electric motor attached to said base portion,

a pressure rod adapted to vertically move due to rotation of said motor, and

springs installed between said pressure rod and said base

against rotation thereon, said friction disc means being

top plate, said second horizontal rib having a length ex-

open position, with the first and second portions being spaced

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springs installed between said pressure rod and said base portion,

wherein, when the driving wheels move to their upper storage position, the pressure rod pushes up the elevating plate, and when the driving wheels move to the lower running position, the pressure rod is adapted to push down the elevating plate through said springs.

5,201,820

POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

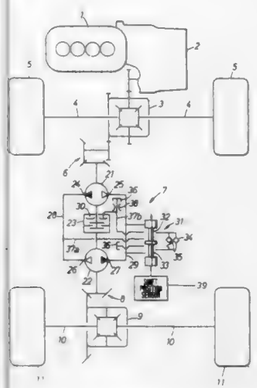
Tetsuro Hamada; Kazunori Shibuya, and Kentaro Arai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1990, Ser. No. 614,788

Claims priority, application Japan, Nov. 4, 1989, 1-295727; Sep. 7, 1990, 2-238244

Int. Cl.[5] B60K *17/34;* **F16D** *25/063*

U.S. Cl. 180—233 **19 Claims**



1. A power transmission system for a four-wheel drive vehicle equipped with front wheels that are directly driven by an engine and rear wheels that are driven by said engine via a fluid pressure actuated clutch, comprising:

a first fluid pressure pump which is actuated in synchronism with said front wheels;

a second fluid pressure pump which is actuated in synchronism with said rear wheels;

a communication passage communicating an outlet port of said first fluid pressure pump with an inlet port of said second fluid pressure pump;

a fluid pressure supply passage communicating said communication passage with an actuation fluid pressure chamber of said fluid pressure actuated clutch.

5,201,821

DISC BRAKE ELEVATOR DRIVE SHEAVE

Richard J. Ericson, Southington, and Michael Lang, Middletown, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jan. 8, 1992, Ser. No. 818,316

Int. Cl.[5] B66B *11/04*

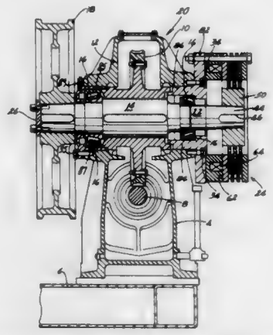
U.S. Cl. 187—20 **6 Claims**

1. In combination with an elevator drive system which includes a drive machine having a rotatable output shaft mounted in a casing, a sheave mounted on said output shaft and rotatable therewith, and a plurality of hoist cables reeved over the sheave, and wherein the drive machine casing is fixed to a bedplate, a brake assembly comprising:

a) friction disc means operably connected to and rotatable with said output shaft and sheave;

b) brake plate means connected to said casing and fixed against rotation thereon, said friction disc means being interposed between components of said brake plate means;

c) actuating means for selectively causing said brake plate means to clamp said friction disc means against rotation thereby selectively stopping rotation of said output shaft and sheave; and



d) said output shaft including a generally cylindrical extension formed integrally with one end thereof, said extension protruding form said casing, and said friction disc means being mounted on said extension.

5,201,822

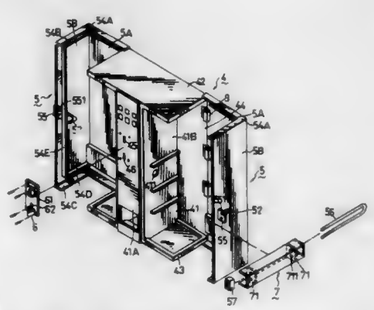
ARRANGEMENTS FOR AN AUTOMATIC VENDING MACHINE

Ming-Ho Chen, No. 166, Fu-Hsing Rd., Hsin-Ying City, Tainan Hsien, Taiwan

Filed Dec. 2, 1991, Ser. No. 801,015

Int. Cl.[5] G07F *11/00*

U.S. Cl. 194—350 **6 Claims**



1. An automatic vending machine comprising:

a housing including a vertical support frame having a side wall through which a latch hole is formed, a top plate mounted securely on a top of said support frame, and a bottom plate mounted securely on a bottom of said support frame;

an L-cross-sectioned side plate comprising a pivoted plate portion and a fastening plate portion disposed generally perpendicular to and connected with each other, said pivoted plate portion pivotally connected to said side wall, said fastening plate portion connectable to said side wall;

a rib arrangement provided on said side plate, said rib arrangement comprising:

an L-shaped first horizontal rib positioned just over said top plate;

an L-shaped second horizontal rib positioned just under said top plate, said second horizontal rib having a length extending under an intermediate portion of said first horizontal rib;

an L-shaped third horizontal rib positioned just under said bottom plate;

an L-shaped fourth horizontal rib positioned just over said bottom plate, said fourth horizontal rib having a length extending over an intermediate portion of said third horizontal rib; and

a vertical rib projecting from said fastening plate portion of said side plate and connecting an end of said second horizontal rib to an end of said fourth horizontal rib;

a double lock arrangement for fastening said side plate to said support frame, said double lock arrangement comprising:

a key driven element, mounted rotatably on said side plate, rotatable about a horizontal axis, having a keyhole formed therein;

an L-shaped latch element secured to said key driven element at an end thereof and extending into said latch hole of said support frame so as to fasten said side plate to said support frame, rotation of said key driven element enabling said latch element to be removed from said latch hole of said support frame;

two first positioning lugs projecting from an outer surface of said side plate;

two second positioning lugs projecting from an outer surface of said support frame, each of said first and second positioning lugs having a first shackle hole formed therethrough;

a cover having a generally U-shaped cross-section and being positioned so as to cover said key driven element and said first and second positioning lugs on said side plate and said support frame;

two positioning plates secured in said cover, each of said positioning plates having two second shackle holes formed therethrough in alignment with said first shackle holes; and

a lock unit consisting of a shackle extending through said first shackle holes of said first and second positioning lugs and said second shackle holes of said positioning plates, and a lock body connected to said shackle and positioned in an end of said cover;

whereby, when said lock body is opened with a key, said lock unit and said cover can be removed from said side plate and said support frame, so that another key can be inserted into said keyhole of one of said key driven elements, thereby opening said corresponding side plate.

5,201,823

CONTAINER METERING DEVICE HAVING MECHANICALLY FORCED SEPARATION

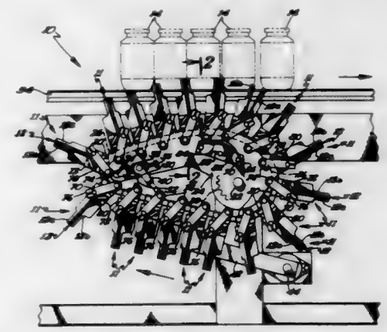
Irvan L. Pazdernik, Alexandria, Minn., assignor to APV Douglas Machine Corporation, Alexandria, Minn.

Filed Jun. 25, 1992, Ser. No. 904,219

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—419.3 **20 Claims**

1. In a device for metering at least one lane of containers on a conveyor and including a pin system having pins, with the containers abutting each other in the lane and having windows between adjacent containers into which the pins of the pin system are insertable, with the pin system including a driven flexible member in the form of an endless loop including the pins, an improved pin system wherein each of the pins are longitudinally split generally perpendicular to the lane of containers into a first portion and a second portion, with the metering device further comprising, in combination: means for movably mounting the first portions relative to the second portions between an abutting position and an open position, with the pins being insertable into the windows when the first and second portions are in the abutting position and movable to the open position, with the first and second portions being spaced in the open position to gap the containers in the lane; and



means for moving the first portions relative to the second portions.

5,201,824

PUSH BUTTON SWITCH

Takafumi Kato, Tamari, and Kazutoshi Watanabe, Iwaki, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

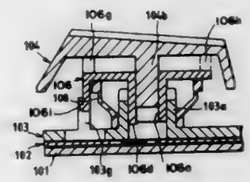
Division of Ser. No. 584,558, Sep. 18, 1990, Pat. No. 5,120,932.

This application Jan. 13, 1992, Ser. No. 820,451

Claims priority, application Japan, Oct. 6, 1989, 1-117693; Dec. 22, 1989, 1-331150

Int. Cl.[5] H01H *17/28*

U.S. Cl. 200—520 **7 Claims**



1. A push button switch comprising:

a fixed contact and a movable contact:

a base member having a guide cylinder;

a key top having a stem;

a restoring member for upwards urging said key top;

an actuator having upper and lower end portions disposed between said guide cylinder and said stem so as to be able to move with respect to said guide cylinder and said stem, wherein a pressing portion for pressing said movable contact to contact with said fixed contact is formed in the lower end portion of said actuator, and at least one elastic leg which is arranged to come in contact with said key top is formed in the upper end portion of said actuator so as to be deflected when said key top is depressed.

5,201,825

STERILE ENVIRONMENT PACKAGING

Aldo Artusi, and Reto Artusi, both of Trüllikon, Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

Filed Feb. 25, 1992, Ser. No. 841,148

Claims priority, application Switzerland, Mar. 1, 1991, 00631/91

Int. Cl.[5] B65D *81/02*

U.S. Cl. 206—523 **9 Claims**

1. A sterile environment packaging for an oblong rigid body

comprising an elongated plastic supporting shell having a T-pin body portion lower end for removable attachment

5,201,828

support member being rotatable relative to the nose about

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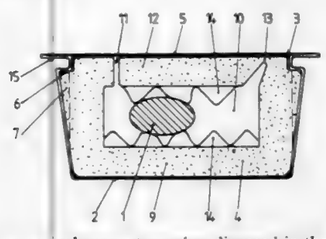
comprising an elongated plastic supporting shell having a bottom, upright sides, upright ends and an open top, the sides defining on an inside of the shell sets of aligned, outwardly protruding pockets; a lid for closing and sealing the shell airtight; and support members made of compressible foam on the inside of the shell including protrusions extending into the pockets to position the support members transversely to the sides of the shell, the support members defining end support members engaging shell pockets proximate the shell ends and



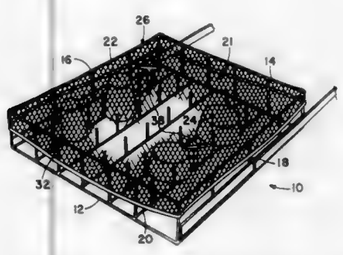
at least one central support member disposed in the shell and engaging shell pockets located intermediate the end support members, the central support member defining a central opening for receipt of the rigid body and including, on a portion of the central support member proximate the top opening, a slit to provide access to the opening, the end support member defining partitions between the rigid body in the opening and the ends of the shell preventing the rigid body from contacting the shell ends.

5,201,826

APPARATUS FOR SECURING ARTICLES IN AN AUTOMATIC DISHWASHER

Dayton E. Zimmermann, 2600 SW. Freeway, Ste. 415, Houston, Tex. 77098

Filed Oct. 10, 1991, Ser. No. 774,588
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—41 **13 Claims**



11. In combination with an open top generally rectangular wire basket as used in domestic automatic dishwashers in which the wire basket has a front and back, and opposed sides with a bottom formed of crossed, generally paralleled wire members, the basket being configured to receive food preparation and serving articles therein, such as cups, glasses, bowls, saucers and the like, for washing as water is sprayed upwardly through the basket in a dishwasher, the basket having an open top defined by an upper circumferential periphery of wire construction, apparatus for holding such food preparation articles against dislodgment by the force of water spray during washing action comprising:

a flexible open mesh positionable across said open top wire basket; and

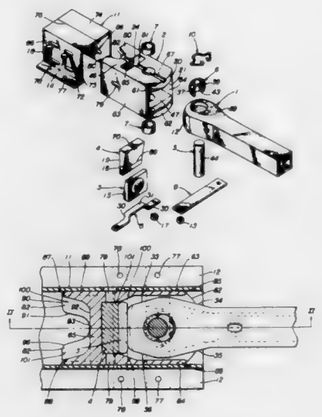
a T-pin member having an elongated slender body portion with an upper end and a lower end, an integrally slender elongated cross-member affixed to the upper end extending normal to the body portion, attachment means at said T-pin body portion lower end for removable attachment to a basket bottom forming wire member, the body portion being extendable through said open mesh member with the attachment means secured to a basket bottom forming wire member, the cross-member serving to downwardly restrain said open mesh member against upward dislodgment to thereby more effectively retain food preparation and serving articles in the basket against the spray of water during washing action.

5,201,827

SLACKLESS DRAWBAR SYSTEM

Mary A. Glover, Pittsburgh, and Peter S. Mautino, Verona, both of Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1992, Ser. No. 855,439
Int. Cl.[5] B61G *7/00*
U.S. Cl. 213—61 **20 Claims**



1. In a slackless drawbar system for attachment to one end of a railway car having a center sill equipped with weld slots and a longitudinal opening of generally rectangular cross-section;

a support member of generally rectangular external cross-section closely fitting inside such opening in such center sill and comprising

a top plate,

a bottom plate,

a pair or spaced apart side plates joining said top plate and said bottom plate to form a generally hollow rectangular member and having welding chambers at each of their ends to enable securement of said support member to such center sill by welding,

a back wall joining said top plate and said bottom plate and said pair of side plates at a point spaced from one end of said support member,

a pair of aligned bores in said top plate and said bottom plate located between said back wall and said one end of said support member, and

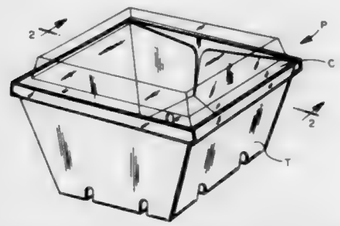
a bushing in each of said aligned bores, one receiving one end and another receiving another end of a cylindrical pivot pin.

5,201,828

INTERLOCKING TRAY AND COVER ARRANGEMENT

Roger L. Martin, San Jose, Calif., assignor to Container Corporation of America, Clayton, Mo.

Filed May 18, 1992, Ser. No. 884,386
Int. Cl.[5] B65D *5/68, 43/06*
U.S. Cl. 229—125.27 **4 Claims**



1. A combination interlocking tray and cover arrangement, comprising:

(a) a tray member formed from a unitary blank of foldable sheet material and including a generally rectangular bottom wall panel and opposed pairs of side wall panels foldably joined to opposed side edges of said bottom wall panel and extending upwardly and outwardly therefrom;

(b) said side wall panels being foldably joined to each other to form, with said bottom wall panel, an open top structure;

(c) certain of said side wall panels having, adjacent upper ends thereof, laterally outward extending projections arranged and disposed for readily releasable interlocking engagement within a complementary channel of a separate cover member;

(d) said cover member being a generally rectangular domed structure formed of molded plastic material;

(e) said cover member having a hollow, central, raised portion, including a top wall with side walls extending downwardly and outwardly therefrom to form therewith said domed structure, and a peripheral flange formed integrally with said center portion;

(f) said flange including:

(i) an upper wall extending outwardly from lower edges of said center portion side walls;

(ii) pairs of opposed flange side walls extending downwardly from outer edges of said upper wall;

(iii) a lower wall extending inwardly from lower edges of said flange side walls and forming with said flange side walls and upper wall an enclosed, internal, peripheral channel arranged and and disposed to releasably receive said tray member projections in interlocking engagement therewith.

5,201,829

FLIGHT CONTROL DEVICE TO PROVIDE DIRECTIONAL CONTROL

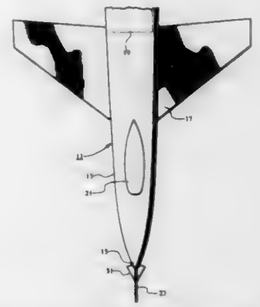
Spence E. Peters, Jr., Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Dec. 19, 1991, Ser. No. 810,700
Int. Cl.[5] B64C *5/00*
U.S. Cl. 244—75 R **12 Claims**

1. In an airplane having a fuselage which has a forebody terminating in a fuselage nose, the forebody creating forebody vortices during high angle of attack flight, the airplane having a pair of wings extending from opposite sides of the fuselage to provide lift, an improved apparatus for controlling yaw of the airplane during high angles of attack, comprising in combination:

a chine support member carried forward of the nose of the airplane, the chine support member having a chine axis which extends along the length of the airplane, the chine support member being rotatable relative to the nose about the chine axis;

a chine mounted to the chine support member, the chine comprising a pair of substantially thin flight control surfaces mounted on opposite sides of the chine support member forward of the nose and configured for creating chine vortices independent of the forebody vortices;



a drive motor in engagement with the chine support member for rotating the chine support member and the chine about the chine axis; and

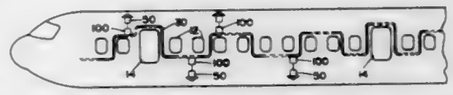
control means for controlling the drive motor to position the chine at selected vortices to interact with and move the forebody vortices to generate directional control moments to control yaw.

5,201,830

SYSTEM FOR CONTROLLING AMBIENT PRESSURE WITHIN AN ENCLOSED ENVIRONMENT

Marion M. Braswell, 26 Hellberg Ave., Chalfont, Pa. 18914

Filed Mar. 15, 1990, Ser. No. 493,994
Int. Cl.[5] B64D *13/00*
U.S. Cl. 244—118.5 **1 Claim**



1. A system for controlling the ambient pressure within an aircraft cabin, said system comprised of:

means for directly sensing a failure of the structural integrity of the aircraft cabin wherein said means comprises:

a signal transmission means dispersed throughout the cabin;

a means for inputting a first signal into said signal transmission means; and

a means for sensing a change in the signal transmission means by determining the relative change in the said first signal over time and outputting a second signal based upon a determination of a change in the signal transmission means;

said system further comprises:

an actuation means for receiving said second signal and instantaneously altering the ambient cabin pressure in response to the value of the second signal through selected rupture of the aircrafts fuselage to the outside atmosphere.

5,201,831

a spacecraft having propellant tanks that have a front end

5,201,834

when the outer tubular member has fully received the

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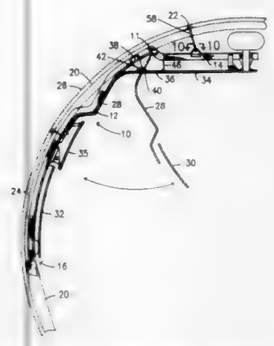
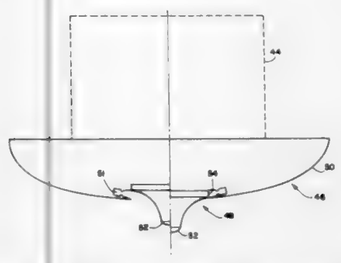
5,201,831
AIRCRAFT INTERIOR SHELL
William R. Higgins, Clearwater, Fla., and Otto C. Pobanz, Cincinnati, Ohio, assignors to ATR International, Inc., Clearwater, Fla.
Filed Nov. 15, 1991, Ser. No. 792,719
Int. Cl.[5] B64D *11/00*; B64C *1/06*
U.S. Cl. 244—119 8 Claims



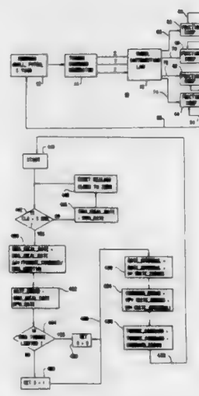
1. An aircraft interior shell spaced apart from the aircraft fuselage comprising:
(a) multiple parallel U-shaped upright arched rib members spaced apart from corresponding fuselage upright frame members on a port and starboard side of the aircraft,
(b) an overhead connecting member attached to a top portion of each opposing port and starboard rib member,
(c) a noise dampening member joining a bottom portion of each rib member to a fuselage frame member,
(d) multiple parallel longitudinal intercostal members joining adjacent port rib members,
(e) multiple parallel longitudinal intercostal members joining adjacent starboard rib members,
(h) interior panels hinged from the intercostal members and overhead connecting members to form the interior portion of the aircraft and
(g) means to support the interior shell from movement within the fuselage.

5,201,832
INTEGRATED AEROSPIKE ENGINE AND AEROBRAKE FOR A SPACECRAFT
John W. Porter, San Diego, and Paul H. Sager, Jr., Rancho Santa Fe, both of Calif., assignors to General Dynamics Corporation, Space Systems Division, San Diego, Calif.
Filed Mar. 23, 1992, Ser. No. 855,398
Int. Cl.[5] B64G *1/00*
U.S. Cl. 244—158 R 6 Claims



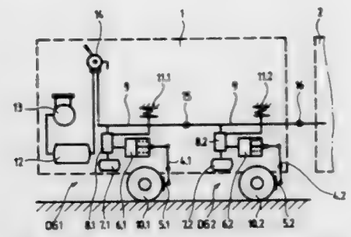
1. An integrated aerospike engine and aerobrake for a spacecraft comprising:
a spacecraft having propellant tanks that have a front end and a rear end;
an aerobrake having a front end that is connected to the rear end of said spacecraft, said aerobrake having a convex shaped rear wall with a centrally located aperture of a predetermined size;
an aerospike engine having an outwardly extending engine plug, a front wall and a rear wall, and an annular combustion chamber, said aerospike engine being mounted in the centrally located aperture in the rear wall of said aerobrake; and means for axially moving the engine plug of said aerospike engine between a retracted position and an extended position, in said retracted position the annular combustion chamber of said aerospike engine is exposed to and in communication with the centrally located aperture in the rear wall of said aerobrake, in said extended position the annular combustion chamber of said aerospike engine mates flush with the rear wall of said aerobrake.

5,201,833
ATTITUDE CONTROL SYSTEM WITH REACTION WHEEL FRICTION COMPENSATION
Neil E. Goodzeit, East Windsor; Michael A. Paluszek, Lawrenceville, and Walter J. Cohen, Hightstown, all of N.J., assignors to General Electric Company, East Windsor, N.J.
Filed Jul. 19, 1991, Ser. No. 732,963
Int. Cl.[5] B64G *1/28*
U.S. Cl. 244—165 5 Claims



1. A spacecraft attitude control system comprising:
generating means for generating a torque control signal;
reaction wheel means adapted for responding to a torque drive signal for torquing said spacecraft;
reaction wheel speed monitoring means coupled to said reaction wheel means for generating speed signals representative of the speed of said reaction wheel means; and
coupling means coupled to said generating means, to said speed monitoring means and to said reaction wheel means, for modeling the response of an ideal reaction wheel in response to said torque control signal, and for taking the difference between the calculated speed of said ideal reaction wheel under the influence of said torque control signal and the actual speed of said reaction wheel means as represented by said speed signals, to produce a speed error signal, and for summing said speed error signal with said torque control signal to produce said torque drive signal for driving said reaction wheel means.

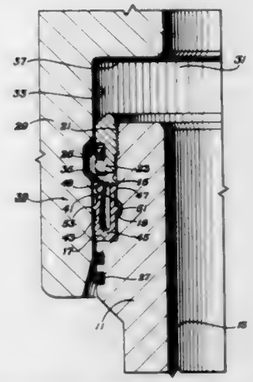
5,201,834
METHOD FOR THE TESTING AND MONITORING OF BRAKES IN RAIL VEHICLES
Mario Grazioli, Chur, and Kurt Anderegg, Rheineck, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland
Continuation of Ser. No. 504,577, Apr. 4, 1990, abandoned. This application Apr. 27, 1992, Ser. No. 876,111
Claims priority, application Switzerland, Apr. 5, 1989, 01258/89
Int. Cl.[5] B61L *23/02*; G01L *5/28*
U.S. Cl. 246—169 R 5 Claims



1. A method for the testing and monitoring of brakes of railroad vehicles individually and coupled together in a train comprising the steps of;
placing sensors at predetermined points in a railroad vehicle braking system to obtain information as to the status of a braking system function at each said point, said information being generated as information signals by said sensors;
storing said information signals for each bogie of the railroad vehicle in a bogie processor mounted in the railroad vehicle;
reading said information signals from said bogie processors and storing said information signals related to a predetermined operational period in a car processor mounted in the railroad vehicle;
selectively reading said information signals stored in said car processor, performing diagnostic tests on said information signals to generate test results and storing said test results; and
issuing status reports representing said test results, said status reports including faulty sensor reports, travel clearance reports, braking system fault diagnoses reports, orders and instructions for fault elimination and advisories for maintenance operations that are due.

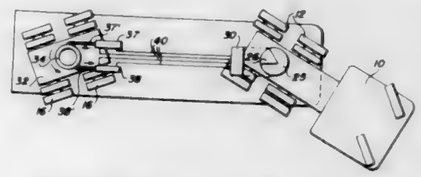
5,201,835
WELLHEAD SEAL WITH PROTECTIVE RIB
Stanley Hosie, Aberdeen, Scotland, assignor to ABB Vetco Gray Inc., Houston, Tex.
Filed Dec. 19, 1991, Ser. No. 810,751
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—1 6 Claims

1. In an apparatus having an inner tubular member having an external sidewall surface, an outer tubular member which receives the inner tubular member, the outer tubular member having an axial bore and an internal sidewall surface that is spaced radially outward from the external sidewall surface, defining an annular clearance, an improved means for sealing the annular clearance, comprising in combination:
an annular, resilient, seal member located in the annular clearance, the seal member having an inner wall and an outer wall radially spaced apart from each other and connected on one end by a base, the inner and outer walls each having a free end opposite the base, the inner wall having a protruding, inner sealing band, located on the free end of the inner wall, that sealingly engages the external sidewall surface, and the outer wall having a protruding, outer sealing band, located on the free end of the inner wall, that sealingly engages the internal sidewall surface when the outer tubular member has fully received the inner tubular member;
a rigid rib located on and protruding from one of the walls of the seal member between the base and one of the sealing bands, the rib engaging one of the sidewall surfaces while the outer tubular member is in the process of receiving the inner tubular member and deflecting said one of the walls of the seal member to prevent said one of the sealing bands



from contacting said one of the sidewall surfaces during insertion movement; and
an annular recess formed in said one of the sidewall surfaces and spaced to receive the rib when the outer tubular member has fully received the inner tubular member, allowing said one of the walls of the seal member to spring back until said one of the sealing bands sealingly engages said one of the sidewall surfaces.

5,201,836
AUTOMATIC TRAILER STEERING MECHANISM
Nicklas R. DeWitt, 7550 Travois Trail, Carefree, Ariz. 85377
Filed Mar. 13, 1992, Ser. No. 851,697
Int. Cl.[5] B62D *53/06*
U.S. Cl. 280—426 15 Claims



1. A steering mechanism for a trailer towed by a tractor having a fifth wheel member, said steering mechanism including in combination:
a support plate for mounting on a forward end of the trailer;
a kingpin mounted on said support plate for engagement with the fifth wheel member of the tractor;
first rotating plate means rotatably mounted on said support plate for rotation about said kingpin;
means for releasably locking said first rotating plate means to the fifth wheel member of the tractor;
at least one pair of steerable wheels having an axle thereof attached to a frame pivotally mounted under said trailer, and spaced from the forward end thereof;
steering operating means coupled with said frame for said steerable wheels for pivoting said frame; and
steering control means coupled with said first rotating plate means, and further coupled with said steering operating

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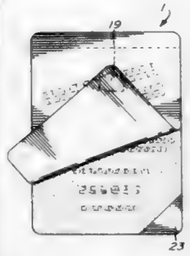
means for controlling the pivoting of said frame, said steering control means including limit means for limiting a maximum pivot of said frame when a relative rotation between said rotating plate means and said support plate reaches and exceeds a predetermined number of degrees of rotation.

5,201,837

FILM COVERED CHANCE TICKET OR THE LIKE

Yves Lafontaine, 546, Saint-Malo East, Ile-Bizard-Montréal, Canada H9C 2PC

Filed Mar. 5, 1992, Ser. No. 846,622
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—108 **16 Claims**



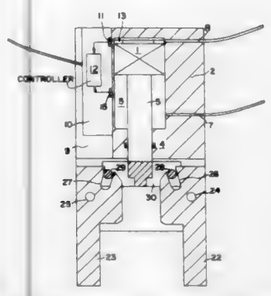
1. A card comprising:
a plate like substrate having first printed material on one face thereof,
a film adhesively and removably covering said one face of said plate like substrate having said first printed material thereon,
said film having second printed material on one side thereof away from said one face of said plate like substrate,
means enabling to repeatedly peel said film off said substrate and thereafter to replace said film over said substrate in adhesive contact therewith,
said means also producing an audible attention raising sound when said film is being peeled off from said substrate.

5,201,838

POSITION INDICATOR FOR A PISTON CONTROLLED ROBOT PART

Philippe Roudaut, 142, rue du Général Leclerc, F-95120 Ermont, France

Continuation of Ser. No. 578,427, Sep. 5, 1990, abandoned. This application May 20, 1992, Ser. No. 887,583
Claims priority, application France, Sep. 5, 1989, 89 11732
Int. Cl.[5] B25J *19/02;* **G01R** *33/06*
U.S. Cl. 294—88 **3 Claims**



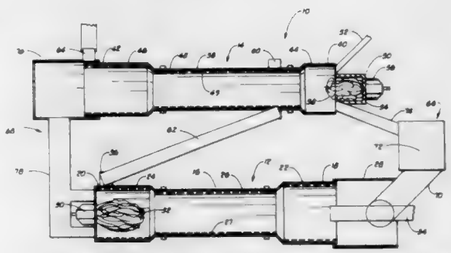
1. A piston-cylinder assembly comprising a piston (**1**) capable of axially sliding in a cylinder (**2**), at least one permanent magnet (**3**) which is mounted as one piece with the piston (**1**), one or more Hall effect linear magnetic sensors (**11, 15**) mounted on the cylinder (**2**), said sensors being responsive to magnetic field of said permanent magnet (**3**) and delivering signals corresponding to positions of said piston (**1**) in the cylinder (**2**), a programmable control device (**12**), an automaton (**31**) which controls a robot according to the position of the piston (**1**) in the cylinder (**2**), a microcontroller (**16**) having input ports (**18, 19, 20**) respectively connected to said sensors (**11, 15**) and at least one output port (**21**) connected, via a digital link to said automaton (**31**), said control device (**12**) having at least a memory wherein data calculated by said control device (**12**) are stored or received from the automaton (**31**), said data being representative of predetermined positions of the piston (**1**) in said cylinder (**2**), said control device (**12**) supplying validation signals to the automaton, said validation signals being in a first state when the piston (**1**) stops in a position in which the signals delivered by the sensors (**11, 15**) correspond to data that has been previously stored in the control device memory, and being in a second state when the piston (**1**) stops in a second position in which the signals delivered by the sensors (**11, 15**) do not correspond to data previously stored in the control device memory.

5,201,839

COUNTERCURRENT DRUM MIXER WITH SECOND HEAT SOURCE

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 581,242, Sep. 7, 1990, abandoned, which is a continuation of Ser. No. 351,371, May 15, 1989, abandoned. This application Sep. 19, 1991, Ser. No. 762,055
Int. Cl.[5] B01F *3/20*
U.S. Cl. 366—4 **10 Claims**



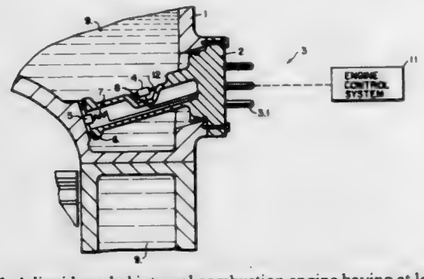
6. A method for producing an asphaltic composition comprising the steps of:
introducing virgin material into a first inclined rotating drum such that the virgin material flows through the first drum;
creating a first stream of hot gases;
directing the first stream of hot gases through the first drum such that the hot gases travel in the opposite direction as the virgin material;
introducing recycle material into a second inclined rotating drum such that the recycle material flows through the second drum;
creating a second stream of hot gases;
directing the second stream of hot gases through the second drum such that the hot gases travel in the same direction as the recycle material;
collecting the virgin material from the first drum;
mixing the collected virgin material with the recycle material by adding the collected virgin material to the second drum at an intermediate point on the second drum; and
collecting the mixed materials from the second drum.

5,201,840

TEMPERATURE TRANSDUCER

Andreas Sausner, Frankfurt, and Klaus Mertens, Hemsbach, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Mar. 18, 1992, Ser. No. 854,043
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1991, 4113294
Int. Cl.[5] G01K *1/14;* **F01P** *11/14*
U.S. Cl. 374—145 **12 Claims**



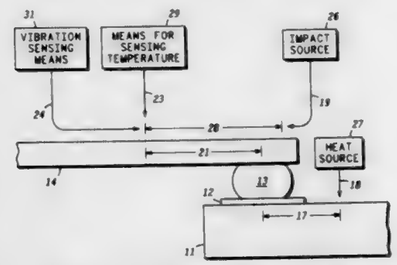
1. A liquid-cooled internal combustion engine having at least one cylinder member with an internal opening for the passage of a cooling liquid and a temperature transducer arranged in said cylinder member and comprising in combination: a housing, a temperature sensor arranged in the housing for sensing the temperature of the engine coolant, a first lead connected to the coolant-temperature sensor and extending through a wall of the housing for presenting temperature-dependent signals, at least one component-temperature sensor arranged in the housing that rests against a component of the cylinder member and a second lead connected to the component-temperature sensor and extending through a wall of the housing for presenting temperature-dependent signals.

5,201,841

THERMAL DELAY NON-DESTRUCTIVE BOND INTEGRITY INSPECTION

Christopher J. Lebeau, and Shay-Ping T. Wang, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Feb. 20, 1992, Ser. No. 838,643
Int. Cl.[5] G01N *25/00, 25/20, 29/00*
U.S. Cl. 374—5 **8 Claims**



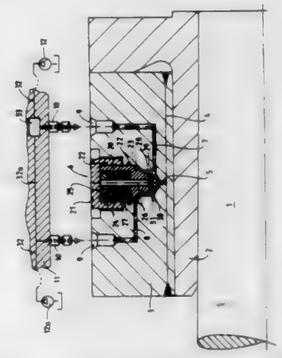
1. A method for non-destructive bond integrity inspection for a semiconductor chip comprising:
defining a bond evaluation path, wherein the bond evaluation path has a first input area located a predetermined distance from at least one bond, has a second input area located a predetermined distance from an output area, has a thermal path which passes serially through the at least one bond to be evaluated, and said output area being located a predetermined distance from the at least one bond.
heating said first input area of the bond evaluation path which creates a thermal gradient across said at least one bond and said thermal path from the first input area to the output area;
disturbing the second input area thereby creating a mechanical vibration for determining heat transfer through said at least one bond;
measuring a time delay for an arrival of said mechanical vibration at said output area, said time delay corresponding to heat transfer through said at least one bond; and
comparing said time delay to a plurality of time delays of known good bonds characterized under substantially equal conditions thereby determining said at least one bond integrity.

5,201,842

COUPLING WITH A HYDRAULICALLY PRESSURIZED HUB

Ernst Elsner, Herbrechtingen, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jan. 29, 1992, Ser. No. 827,407
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1991, 4102847
Int. Cl.[5] F16B *2/04*
U.S. Cl. 403—5 **12 Claims**



1. A coupling for transmitting torque from a hub to a shaft, said hub including a cylindrical annular chamber slightly spaced from the shaft which can be filled with a pressurized medium, said hub further including a first channel connecting said cylindrical chamber to a high pressure supply, and a second hydraulic fluid channel disposed within said hub, said coupling comprising:
a servo valve through which said pressurized medium to said cylindrical annular chamber is routed permitting pressurized closure of said first channel, said servo valve actuable by hydraulic fluid and pressurization via said second hydraulic fluid channel.

5,201,843

INTERLOCKING PAVING STONE FOR OPEN DRAINAGE GROUND COVER PATTERN

Roberta A. Hair, 7554 Wooster Rd., Cincinnati, Ohio 45227

Filed Feb. 11, 1992, Ser. No. 834,127
Int. Cl.[5] E01C *5/00*
U.S. Cl. 404—41 **20 Claims**

1. An interlocking paving stone capable of being laid in a plurality of open patterns, including a straight runner bond pattern, a reverse runner bond pattern and a herringbone pattern, the stone comprising:
an integral block of molded ceramic material having a generally horizontal upper surface, a generally identical and generally parallel lower surface spaced from the upper

surface a distance defining the thickness of the stone, six

an aft portion of said HPC stub shaft mounted to the outside

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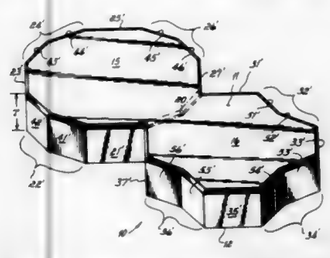
surface a distance defining the thickness of the stone, six generally vertical multifaced interlocking side surfaces, and eight generally vertical corner surfaces;

the horizontal surfaces each being a two portion horizontal surface defined by a first portion and a second portion;

each of the portions of the horizontal surfaces having eight sides, including a common side and alternating corner sides and multisegment sides;

each of the portions of the horizontal surfaces being joined together at their common sides to define an integral two portion stone having fourteen side surfaces, including the six multifaced side surfaces and the eight corner surfaces



each having an upper and lower edge bounded by corresponding sides of corresponding portions of the upper and lower surfaces; and

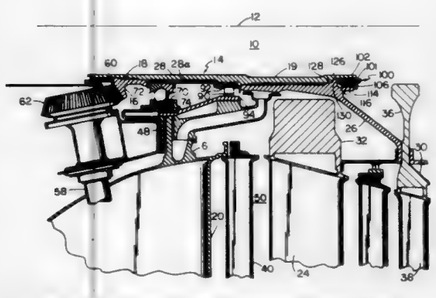
the multisegment sides of each portion being identical, and each of the multisegment sides of the second portion being complementary with each of the multisegment sides of the first portion, such that, when a multifaced side surface of the first portion of one stone is placed against a multifaced side of another stone in either a straight runner bond pattern, a reverse runner bond pattern or a herringbone pattern, the faces so placed interlock, and drainage areas, each surrounded by corner surfaces of interlocking stones, are produced adjacent each stone of the pattern.

5,201,844

ROTOR AND BEARING ASSEMBLY

Anthony P. Greenwood, Mason, and Anthony G. O'Meara, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 9, 1991, Ser. No. 756,653
Int. Cl.[5] F01D *25/16*
U.S. Cl. 415—122.1 **5 Claims**



1. A gas turbine engine rotor apparatus comprising:

in generally axial serial relationship about an engine centerline,

a rotor mounted power takeoff gear mounted to the outside of a forward portion of a gear shaft,

an HPD rotor mounted to an aft portion of an HPC stub shaft,

an aft portion of said HPC stub shaft mounted to the outside of an aft portion of said gear shaft, and

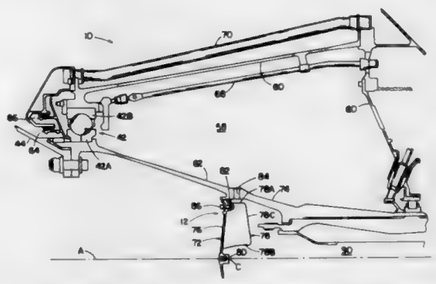
at least one bearing having an inner race mounted to said outside of said gear shaft to help rotatably support said shaft and said rotor.

5,201,845

LOW PRESSURE DROP RADIAL INFLOW AIR-OIL SEPARATING ARRANGEMENT AND SEPARATOR EMPLOYED THEREIN

Barry L. Allmon, Maineville, and Kevin B. Tongeman, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 30, 1991, Ser. No. 784,847
Int. Cl.[5] F01D *25/32*
U.S. Cl. 415—169.1 **9 Claims**



1. In a gas turbine engine having a sump with a rotatable annular wall structure, an air-oil separating arrangement, comprising:

(a) an annular section of said sump wall structure having a plurality of circumferentially spaced air metering orifices defined therein; and

(b) an air-oil separator including a circular plate attached to said annular section of said sump wall structure and rotatable therewith, said circular plate having a center and a pair of opposite faces, said separator also including a plurality of separator fins attached to and extending from one of said opposite faces of said plate, said separator fins being spaced circumferentially from one another and extending radially from said center of said plate and defining spaces between said fins which are in flow communication with said orifices through said annular section of said sump wall structure.

5,201,846

LOW-PRESSURE TURBINE HEAT SHIELD

Derek J. Sweeney, Dublin, Ireland, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 29, 1991, Ser. No. 799,799
Int. Cl.[5] B63H *1/14*
U.S. Cl. 415—173.6 **17 Claims**

1. A heat shield for incorporation in a turbine of a gas turbine engine comprising:

a sheet metal ring having four sections connected in series as follows: a rearmost substantially cylindrical first section having a predetermined diameter, a substantially conical second section connected to said first section, a substantially cylindrical third section having a diameter less than the predetermined diameter of said first section and connected to said second section, and a folded-back fourth section connected to and radially outside of said third section.

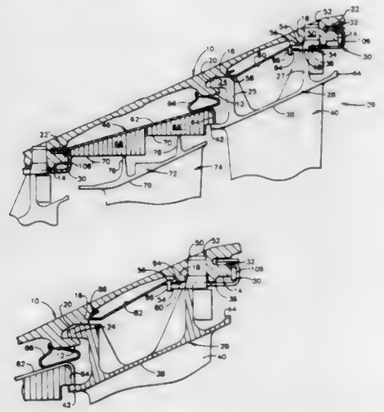
a plurality of axial recesses circumferentially distributed along and extending from a rearward edge of said first section, wherein each of said axial recesses terminates along a corresponding arc of a circle, and

a plurality of axial stops joined to said sheet metal ring, said axial stops being respectively arranged with a portion thereof disposed inside a corresponding axial recess, and each of said axial stops having rearwardly facing abutment surface which lies substantially in a radial plane.

2. A turbine for a gas turbine engine having an inlet, an outlet and an annular passageway for gas flow from said inlet to said outlet, comprising:

an outer casing surrounding said annular passageway and having an annular cavity situated between first and second annular projections, said first annular projection being located at a first axial position and said second annular projection being located at a second axial position downstream of said first axial position;

a plurality of nozzle segments circumferentially arranged end to end inside said outer casing to form a stator stage, each of said nozzle segments comprising an outer platform



having a first portion which forms a part of said annular passageway, a second portion which is operatively supported by said outer casing at a point upstream of said cavity and a third portion which is operatively supported by said outer casing at a point downstream of said cavity, said outer platform and said outer casing defining a space therebetween that comprises said annular cavity; and

an annular heat shield arranged inside said space, said heat shield being dimensioned and disposed so that after thermal expansion due to the heat from hot gases flowing through said turbine, a first portion of said heat shield abuts said first annular projection substantially contiguously along a circumference and a second portion of said heat shield abuts said second annular projection substantially contiguously along a circumference for forming a gas tight chamber between said shield and said outer casing.

5,201,847

SHROUD DESIGN

Graydon L. Whidden, Orlando, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

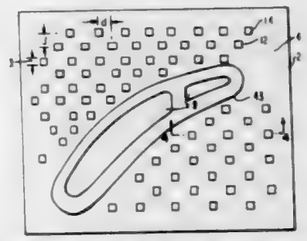
Filed Nov. 21, 1991, Ser. No. 796,568
Int. Cl.[5] F01D *5/08*
U.S. Cl. 415—177 **18 Claims**

1. A gas turbine comprising:

a) a combustion section having a means for producing hot gas;

b) a turbine section having a plurality of vanes bounded by a shroud disposed therein, each shroud having an outer and inner surface, the turbine section having means for directing hot gas to flow over at least one of the inner surfaces and means for directing impinging cooling air to flow over at least one of the outer surfaces; and

c) a grid pattern of roughness elements on at least one of the



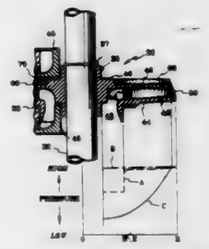
outer surfaces wherein the elements have a pitch to height ratio of from about 1 to about 30 and wherein the height of the elements is from about 0.04 cm (0.015 in.) to about 0.3 cm (0.13 in.).

5,201,848

DEEP WELL ELECTRICAL SUBMERSIBLE PUMP WITH UPLIFT GENERATING IMPELLER MEANS

Maston L. Powers, Oklahoma City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 1, 1991, Ser. No. 770,071
Int. Cl.[5] F04D *29/54*
U.S. Cl. 415—199.1 **18 Claims**



1. A multi-stage centrifugal submersible pumping apparatus for pumping well fluids from the bottom of a wellbore to the surface, comprising:

generally cylindrical pump housing means;

shaft means axially positioned within said housing means and mounted for rotation relative thereto;

a plurality of impeller assemblies mounted on said shaft means in vertically spaced relation for rotation therewith and having a plurality of vanes radially extending from near the shaft means toward the housing means to form impeller passages having an inlet end near the shaft means and an outlet end near the housing means;

top shroud means covering the top of the impeller passages, said top shroud means having an outer upper surface formed on the top side of said top shroud means;

bottom shroud means covering the bottom of the impeller passages;

a plurality of diffuser means on said housing positioned above and below said impeller assemblies and spaced therefrom to form a partially enclosed chamber in the space between said top shroud on said impeller assembly and an adjacent diffuser means spaced thereabove, said diffuser means having diffuser passages for directing fluids form the outlet end of said impeller passages to the inlet end of said impeller passages in an upwardly adjacent stage; and

open impeller means on at least a portion of said impeller

plunger being connected to a runner means (17), which by a

5,201,853

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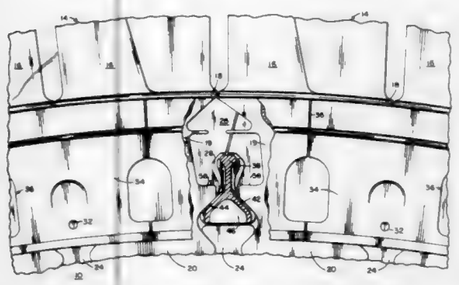
assemblies and extending upwardly from the outer upper surface of said top shroud means for moving fluids from said chamber between said impeller assembly and said adjacent diffuser means thereabove to thereby generate a relatively low pressure within said chamber when said impeller assembly is rotated relative to said diffuser means for applying a net upthrust force to said impeller assembly having said open impeller vane.

5,201,849
TURBINE ROTOR SEAL BODY

Stephen M. Chambers, Cincinnati; Richard L. Stanley, Loveland, both of Ohio, and Robert R. Bittle, Ames, Iowa, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 10, 1990, Ser. No. 639,842
Int. Cl.[5] F01D *5/08*
U.S. Cl. 416—95 **5 Claims**



1. Apparatus for thermal protection of a disk post in a gas turbine engine, the disk post being defined by adjacent slots in a turbine rotor disk, each of the slots being adapted for receiving a root portion of a turbine rotor blade, each blade having a shank extending radially outward from the root portion and a platform atop the shank, the apparatus comprising:

(a) a first end plate sized for generally covering a forward end of an opening above a respective disk post, the opening being defined by a top of the disk post, the shanks of the rotor blades on each side of the disk post and the platforms atop the shanks;

(b) a second end plate positioned generally within an aft end of the opening;

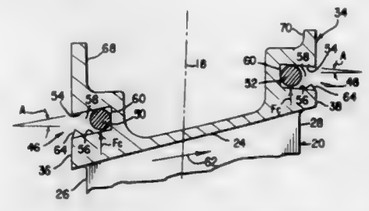
(c) a connecting member extending between the first and second end plates for maintaining a preselected orientation and spacing of the end plates, the connecting member including first and second legs extending therefrom and defining a channel over the top of the disk post; and

(d) an aperture formed in the first end plate and opening into the channel for admitting a controlled flow of air axially into the channel for providing an insulative layer of air over the top of and in direct contact with the disk post; and wherein each of said first and second legs include distal ends which are sized such that a clearance between each of said distal ends and said top of the disk post establishes a controlled degree of air leakage around each of said distal ends for reducing a temperature in a portion of said opening located radially outward from said channel and for increasing a pressure in said portion of said opening, thereby providing increased protection from ingestion of combustion gasses into said portion of said opening.

5,201,850
ROTOR TIP SHROUD DAMPER INCLUDING DAMPER WIRES

Christopher H. Lenhardt; Carl Grant, and Chellappa Balan, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 15, 1991, Ser. No. 655,701
Int. Cl.[5] F01D *5/10*
U.S. Cl. 416—190 **8 Claims**



1. A rotor comprising:

a disc having a perimeter and an axial centerline axis;

a plurality of circumferentially spaced blades extending outwardly from said disc perimeter;

a plurality of tip shrouds, each tip shroud being joined to a respective one of said blades and including:

a first axial end having a U-shaped first slot disposed therein and extending generally parallel to said axial centerline axis;

a second axial end having a U-shaped second slot disposed therein and extending generally parallel to said axial centerline axis;

each of said first and second slots including:

a radially outer surface;

a radially inner surface;

an axially facing entrance defined at first ends of said outer and inner surfaces; and

a base joining second ends of said outer and inner surfaces;

a first circumferential face extending between said first and second axial ends;

a second circumferential face extending between said first and second axial ends; and

respective ones of said first and second circumferential faces of adjacent tip shrouds being circumferentially spaced from each other to define an axially extending gap;

first and second arcuate damper wires disposed in said first and second slots, respectively, and having outer diameters less than radial widths of said first and second slots for damping vibration of said rotor by friction between said wires and said slots; and

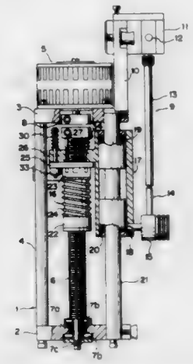
wherein each of said radially outer surfaces of said first and second slots is axially straight and inclined at an acute angle relative to said axial centerline axis so that centrifugal force acting on said damper wires urges said wires against said outer surfaces and said base.

5,201,851
PUMP AND METERING APPARATUS

Torbjörn Holmström, Upsala, Sweden, assignor to Pharacia Biosensor AB, Upsala, Sweden

PCT No. PCT/SE90/00259, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO90/12960, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 17, 1990, Ser. No. 768,514
Claims priority, application Sweden, Apr. 18, 1989, 8901399
Int. Cl.[5] F04B *35/00, 13/00;* **F16H** *29/20*
U.S. Cl. 417—415 **17 Claims**

1. A pump and metering apparatus, comprising a frame (1) supporting a liquid container (13) with a movable plunger therein for discharging respectively drawing in liquid, said plunger being connected to a runner means (17), which by a nut portion (16) thereof threadedly engages a screw (6) rotatably mounted in the frame (1) and coupled to a driving motor (5), characterized in that said nut portion (16) of the runner

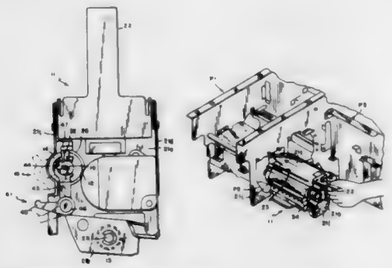


means (17) is movable in relation to the remaining structure of the runner means (17) in the radial direction of the screw (6) for the nut portion (16) to be self-centering on the centre axis of the screw (6).

5,201,852
FIXING DEVICE

Toshihide Ogoshi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1992, Ser. No. 885,725
Claims priority, application Japan, May 20, 1991, 3-115008
Int. Cl.[5] G03G *15/20*
U.S. Cl. 432—60 **3 Claims**



1. A fixing device comprising:

a heating roller rotatably supported by front and rear frames of a fixing device body;

a cleaning roller pressed against the heating roller;

an insertion opening which is formed on the front frame of the fixing device body and through which the cleaning roller is inserted and pulled out in an axial direction;

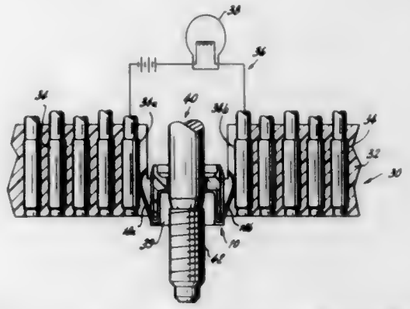
a front side supporting means which rotatably supports a front side end of a rotation axis of the cleaning roller so that the front side end is moved in an axial direction to be detached from the front side supporting means and which biases the front side end toward the heating roller; and

a rear side supporting means which rotatably supports a rear side end of the rotation axis of the cleaning roller so that the rear side end is moved in an axial direction to be detached from the rear side supporting means and which biases the rear side end toward the heating roller.

5,201,853
SWITCHING CONNECTOR ASSEMBLY

K. Troy Alwine, Warren, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 693,257, Apr. 29, 1991, Pat. No. 5,145,391. This application Apr. 24, 1992, Ser. No. 873,125
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—188 **5 Claims**

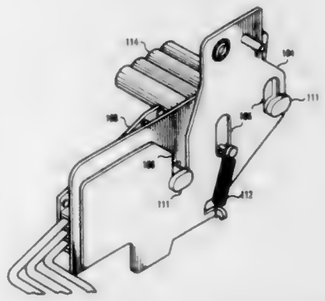


1. In a connector assembly having a first housing containing a plurality of electrical contacts; a second housing for mating with said first housing; holding means for maintaining said housings in a mated condition; and normally open switch means between said housings; the improvement wherein said normally open switch means comprises an annular body having oppositely disposed, transversely projecting arms each including a reentrant portion and a terminal portion; said body further including retention means whereby said body is fixed in one of said first or second housings, said retention means comprising a plurality of projections formed on said body; and switch opening means formed on the other of said housings not containing said body and in engagement with said terminal portions whereby said switch remains open while said housings are mated but closes if said housings become un-mated.

5,201,854
ELECTRICAL CONNECTOR FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

David K. Ahl, Rochester; Roger M. Swanson, Fairport; Timothy G. Struczewski, Rochester; James C. Fox, Ontario; Roy Lee, Webster; Michael Terletzki; Gary R. Skillman, both of Rochester, and Ross E. Schroll, East Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1991, Ser. No. 755,945
Int. Cl.[5] H01R *13/631*
U.S. Cl. 439—247 **11 Claims**



1. An apparatus for mounting an electrical connector in an electrophotographic printing machine comprising:

(a) a base bracket in theform of a plate being fixedly secured

5,201,856

shaped configuration, one end portion of the cross of said

5,201,859
VERTICAL RETRIEVE SPINNER DEVICE

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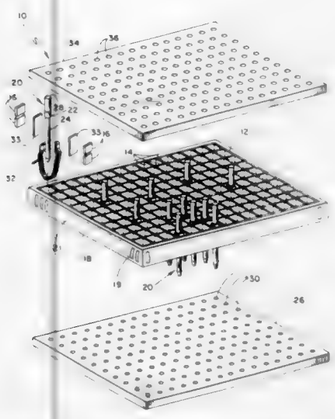
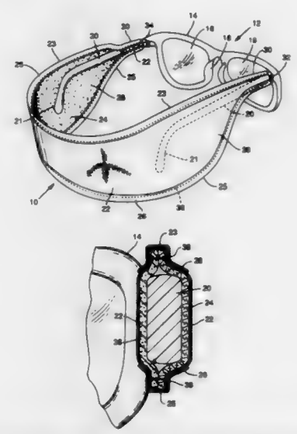
(a) a base bracket in theform of a plate being fixedly secured to said machine, said plate having a vertical slot therein;
(b) a movable plate having extending therefrom a pin for extending into the said slot and said movable plate being secured for movement relative to said base plate along a path defined by said slot;
(c) a transfer module comprising a sheet transfer assembly, said module having a first connector attached thereto;
(d) a second complementary connector for electrical engagement with said first connector;
(e) said second complementary connector being fixed to said movable plate;
(f) said movable plate being movable between a first position for engagement of said first and second connectors and a second position displaced vertically from said first position, a spring for biasing said movable plate towards said first position; and
(g) a wire channel assembly fixed to said machine, wires extending from said second complementary member through said wire channel assembly with said wires being fixed to said wire assembly but a sufficient length of said wires being exposed between said wire channel assembly and said movable plate to permit vertical movement of said plate without restraining force being imposed by said wires.

5,201,855
GRID SYSTEM MATRIX FOR TRANSIENT PROTECTION OF ELECTRONIC CIRCUITRY
Dennis D. Ikola, 2866 Lakeshore Ave., Maple Plain, Minn. 55359
Filed Sep. 30, 1991, Ser. No. 768,379
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—608 **19 Claims**



1. An electrical connector module, comprising:
(a) a conductive lattice including a plurality of intersecting substrate strips defining a plurality of orifices, each orifice defined by a plurality of facing walls of the lattice;
(b) a plurality of integrated circuit dies each having a first surface conductivity affixed to and disposed on selected ones of said facing walls of predetermined ones of said plurality of orifices and a conductive second surface generally opposite said first surface;
(c) a plurality of contact pins received in predetermined ones of said orifices;
(d) a plurality of conductive interfacing means for establishing an electrical path from said pins to said second surface of said integrated circuit dies; and
(e) a conductive housing coupled to a periphery of said conductive lattice.

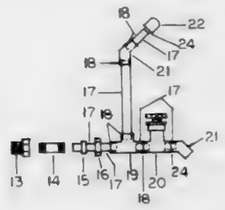
5,201,856
EYEGLASSES AND RETAINER THEREFOR INCLUDING EAR PROTECTOR
Michael D. Edwards, Hood River, Oreg., assignor to Shred Alert Products, Inc., Hood River, Oreg.
Continuation of Ser. No. 487,783, Mar. 5, 1990, abandoned. This application Sep. 24, 1991, Ser. No. 766,891
Int. Cl.[5] A42B *1/06*; **G02C** *3/02*
U.S. Cl. 2—209 **3 Claims**



1. A combination eye glasses and retainer therefor worn by a user comprising:
a conventional pair of eyeglasses including a frame having a nose piece engaging the user's nose and a pair of bows extended rearwardly from the sides of the frame along the temples of the user's head and overlying the user's ears;
an elongated retainer of cloth-like material having opposed ends attached by adjustable attachment means to the eyeglasses' bows at the user's temples;
said attachment means provided by the retainer ends being configured into sleeves that surround the eyeglasses' bows, said sleeves each comprising a combination of materials including a layer of cloth-like material which is secured to a separate elastomeric pad, said layer of cloth-like material extending directly adjacent one side of each respective eyeglass bow, and said separate elastomeric pad extending directly adjacent an opposite side of each respective eyeglass bow for gripping the eyeglasses' bows to resist sliding of the eyeglasses bows through the sleeves, said combination of materials as provided in said sleeves having the property of permitting user adjustment and placement of the retainer ends at the desired position along said bows to enable the user to customfit the combination of the eyeglasses and retainer to the user's head and thereby avoid undesired tension on the eyeglasses,
said retainer further including shaped portions rearwardly of said sleeve end portions shaped to cover the user's ears.

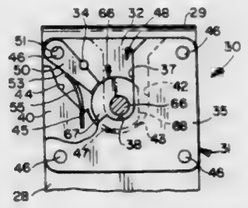
5,201,857
COOL SPRAY RETURN ADAPTOR
Terry G. Nix, 130 Couch St., Easley, S.C. 29640-2418
Continuation-in-part of Ser. No. 579,037, Sep. 7, 1990, abandoned. This application Sep. 19, 1991, Ser. No. 762,841
Int. Cl.[5] E04H *4/14*
U.S. Cl. 4—492 **6 Claims**

1. A fountain adapter for swimming pools having at least one removable jet threaded into a circulation system water return line mounted in a wall thereof, said fountain adapter comprising:
a plurality of tubing sections connected together in a "T"-shaped configuration, one end portion of the cross of said T being threaded for connection to said return line upon removal of said jet therefrom, an opposite end portion of said cross having an adjustable control valve connected thereto for controlling water flow therethrough, a free end portion of the leg of said T having a hollow, angled



fitting connected thereto, said T being oriented generally upside down when connected to said return line with said angled fitting directed towards an interior of the pool;
whereby, water flowing from said return line can be caused selectively to exit said angled fitting by manipulation of said control valve.

5,201,858
QUICK-RELEASE CONNECTOR
Edward C. Otrusina, 8118 Nueport Dr. South, Willow Springs, Ill. 60480
Filed Aug. 7, 1992, Ser. No. 925,862
Int. Cl.[5] A45F *5/00*
U.S. Cl. 24—597 **20 Claims**

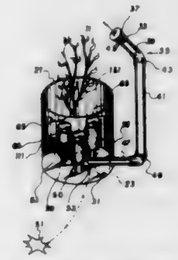


1. Apparatus for detachably interconnecting two objects including, in combination: a female member adapted to be secured to one of the objects and defining a receptacle and an entrance leading into said receptacle, a male member adapted to be secured to the other object and including a shank with an axis and an enlarged head on said shank adapted for movement into and out of said receptacle through said entrance and rotatable about said axis while in said receptacle, pawl means movable between a locking position projecting into said entrance for interference with passage of said head therethrough and a release position disposed out of said entrance, said head being non-symmetrical with respect to said axis so that while passing through said entrance in one rotational orientation thereof said head will clear said pawl means in its locking position and in all other rotational orientations it will engage said pawl means in its locking position, and bias means resiliently urging said pawl means to its locking position and yieldably accommodating movement of said pawl means to its release position, whereby said pawl means is yieldably movable by said head to permit passage thereof into said receptacle and is non-yieldably engageable by said head to prevent removal thereof from said receptacle in all but said one rotational orientation.

5,201,859
VERTICAL RETRIEVE SPINNER DEVICE
William A. Rosek, Rte. 4, Box 244, Waverly, Va. 23890
Filed Mar. 10, 1992, Ser. No. 848,774
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.19 **2 Claims**

1. An improved vertical retrieve spinner device forming a fishing lure; wherein, the spinner device consists of:
a spinner unit including a multi-bladed spinner member having a plurality of rigid spinner blades radially disposed around an integrally formed axle element provided with an enlarged central aperture;
a pair of bearing units disposed on the top and bottom of the spinner unit and comprising spherical bearing members provided with central apertures;
an elongated weight member having rounded ends and an elongated axial aperture; wherein, the upper end of the weight member is disposed beneath the lower one of the spherical bearing members;
a primary wire support unit including an elongated strand of wire having an intermediate portion which is dimensioned to be received in said apertures; wherein the upper end of said strand of wire is provided with an eyelet member and the lower end of said strand of wire is formed into a looped snap member; and,
a fish hook equipped with an eyelet dimensioned to be releasably received by said looped snap member; and, an attractor unit disposed intermediate the lower end of the weight member and the looped snap member.

5,201,860
AIR PURIFICATION PLANTER
Dean C. Richardson, 13141 SW. 96th Ave., Miami, Fla. 33176
Filed Nov. 12, 1991, Ser. No. 789,947
Int. Cl.[5] A01G *27/00*
U.S. Cl. 47—39 **13 Claims**



1. An air purification planter comprising

a receptacle;

wall temperature of the cylinder (2) during the pasteuriz-

said saw table; said lateral edges defining two tracks ex-

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MEDICAL LEAD IMPEDANCE MEASUREMENT

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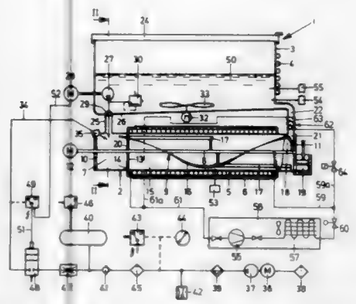
a receptacle;
an aeration assembly;
a pot-growing plant including roots; and,
a potting media;
said potting media and roots of said pot-growing plant being contained by said receptacle;
a portion of said aeration assembly being embedded in said potting media and in proximity to the roots of said pot-growing plant;
said aeration assembly including forced air circulation means for forcing air to circulate through said air purification planter, a conduit section, and an aerating section,
said conduit section including an exterior end and an interior end;
said aerating section connecting to said interior end.

5,201,861

APPARATUS FOR THE PREPARATION OF ICE CREAM, MILKSHAKES, SORBETS, FROZEN DESSERTS, AND THE LIKE, IN EACH CASE FROM A PUMPABLE STARTING MIXTURE

Waldemar Menzel, Kulmbach-Burghaig, Fed. Rep. of Germany, assignor to Lumen GmbH Nahrmittel- und Maschinenfabrik, Kulmbach, Fed. Rep. of Germany

PCT No. PCT/EP89/01197, § 371 Date May 2, 1991, § 102(e) Date May 2, 1991, PCT Pub. No. WO90/04927, PCT Pub. Date May 17, 1990
PCT Filed Oct. 11, 1989, Ser. No. 681,519
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 3837604
Int. Cl.[5] A23G *9/12*
U.S. Cl. 62—135 **1 Claim**



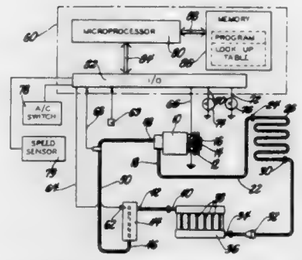
1. An apparatus for the preparation of ice cream, milkshakes, sorbets, frozen desserts, and the like, each from a pumpable starting mixture, comprising
a storage container (**1**, **1'**) for the starting mixture;
a cooling or freezing cylinder (**2**) with a first end portion and a second end portion, an inlet chamber (**7**) being formed at the first end portion in the cylinder (**2**), and a discharge valve (**19**) being provided at the second end portion;
a supply conduit (**25**, **25'**), which connects the storage container (**1**, **1'**) with the inlet chamber (**7**);
a connecting conduit (**22**), which connects the second end portion of the cylinder (**2**) with the storage container (**1**, **1'**);
a rotatably drivable stirring and scraping mechanism (**9**) arranged in the cylinder (**2**);
a cooling jacket (**5**) surrounding the cylinder (**2**);
a cooling aggregate (**58**), which is connected with the cooling jacket (**5**) via coolant lines (**59**, **61**) for the cooling of the cylinder (**2**) during the preparation and storage of ice cream, milkshakes, sorbets, frozen desserts and the like in the cylinder (**2**);
a heater (**6**) for the pasteurizing of the starting mixture, which surrounds only the cylinder (**2**);
a thermostat (**53**) controlling the heater (**6**) for limiting the wall temperature of the cylinder (**2**) during the pasteurizing of the starting mixture;
transportation means for transporting the starting mixture from the inlet chamber (**7**) to the discharge valve (**19**);
a pump (**27**) for transporting the starting mixture from the storage container (**1**, **1'**) into the inlet chamber (**7**) and from the second end portion—at least during the pasteurizing process—through the connecting conduit (**22**) back into the storage container (**1**, **1'**);
wherein the connecting conduit (**22**) is provided with a freezing device (**62**), which surrounds it and is fixedly mounted to it, and which is connected with the cooling aggregate (**58**) via coolant lines (**59**, **59***a*, **61**, **61***a*), and wherein, in at least one coolant line (**59***a*), a valve (**64**) is provided for interrupting any cooling of the freezing device during the pasteurizing of the starting mixture.

5,201,862

LOW REFRIGERANT CHARGE PROTECTION METHOD

Edward D. Pettitt, Burt, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1989, Ser. No. 309,570
Int. Cl.[5] G05D *23/32*
U.S. Cl. 62—157 **5 Claims**



1. In an automotive air conditioning system of the cycling clutch orifice tube type using lubricant in the refrigerant for compressor lubrication and wherein low refrigerant results in short compressor on times and high suction gas temperature, the method of protecting against operation with inadequate refrigerant comprising the steps of:
establishing a table of the maximum allowable suction gas temperature for various ambient air temperatures,
measuring suction gas temperature and ambient air temperature,
comparing the measured suction gas temperature with the corresponding table value,
measuring compressor on time,
comparing the compressor on time to a preset value,
periodically repeating the measuring and comparing steps, and
disabling the compressor when the on time is repeatedly less than the preset value or when the measured suction gas temperature is repeatedly greater than the table value.

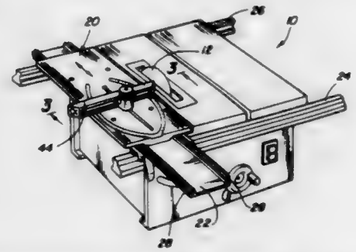
5,201,863

MITER TABLE ASSEMBLY FOR A TABLE SAW

David G. Peot, Easley, S.C., assignor to Ryobi Motor Products Corporation, Easley, S.C.

Filed Mar. 2, 1992, Ser. No. 844,462
Int. Cl.[5] B27B *25/00*
U.S. Cl. 83—432 **8 Claims**

1. In a circular saw table having a rotatable blade for cutting a workpiece and a miter table movable with respect to said circular saw table for guiding said workpiece with respect to said rotatable blade, the improvement in the miter table comprising:
an elongated guide plate having lateral edges mountable to said saw table; said lateral edges defining two tracks extending generally parallel to the rotatable blade when the guide plate is mounted to said saw table;
said miter table including linearly oriented adjustable follower means for slidably engaging each said track for longitudinal movement therealong; said follower means being adjustable transversely to said track to position said miter table transversely with respect to said guide plate, said follower means including a rotatable eccentric locator for locating said follower means on said miter table; said eccentric locator being rotatable to effect positioning of said miter table with respect to said guide plate thereby to provide precise alignment of the workpiece with respect to the rotatable blade during such movement.

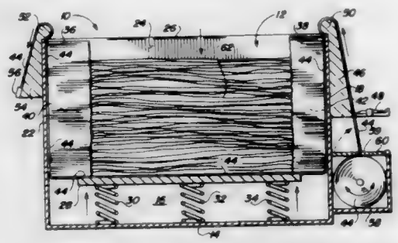


5,201,864

NEWSPRINT TRASH COMPACTOR

Ted Brackett, 102 Rosecrans Ave., Manhattan Beach, Calif. 90266

Filed May 4, 1992, Ser. No. 878,088
Int. Cl.[5] B65B *13/18*
U.S. Cl. 100—34 **8 Claims**



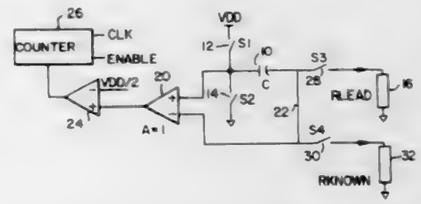
1. An improved trash compactor for newsprint or the like, said compactor comprising, in combination:
a) a housing having an open top and a plurality of opposed closed substantially vertical sides and substantially a closed bottom defining a central space;
b) a platform in and adjacent the bottom of said central space;
c) spring means supporting and biasing said platform upwardly in said space;
d) opposed resilient, flexible newsprint holders lining the interior of at least two opposed sides of said housing above said platform, said opposed holders having opposed vertical grooves therein running the entire height thereof;
e) strapping and lifting tape extending into said space over said platform and in said opposed grooves for binding a bundle of newsprint held by said holders on said platform and for lifting said bundle out said top.

5,201,865

MEDICAL LEAD IMPEDANCE MEASUREMENT SYSTEM

Kevin P. Kuehn, White Bear Lake, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 28, 1991, Ser. No. 783,651
Int. Cl.[5] A61N *1/08*
U.S. Cl. 128—419 PT **3 Claims**



1. A method of measuring the impedance of an implantable medical lead having an unknown impedance, comprising:
a. Coupling said implantable lead to a pulse generator which includes an output capacitor and a precision resistor having a known resistance;
b. Charging said output capacitor to a first predetermined voltage, discharging said output capacitor through said precision resistor and measuring the time interval during the discharge of said output capacitor from said first predetermined voltage to a second predetermined voltage;
c. Charging said output capacitor to said first predetermined voltage, discharging said output capacitor through said lead and measuring the time interval during discharge of said output capacitor from said first predetermined voltage to said second predetermined voltage; and
d. Determining the ratio of said measured time interval during discharge of said output capacitor through said lead impedance to said measured time interval during discharge of said output capacitor through said precision resistor and multiplying said ratio by said known resistance of said precision resistor to provide a measurement of the impedance of said lead.

5,201,866

STRUCTURE FOR DISSIPATION OF HEAT HAVING SLIDABLY ENGAGED FINS FOR CONFORMAL DISPOSITION AGAINST A HEAT GENERATING SURFACE

Lawrence S. Mok, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1992, Ser. No. 829,862
Int. Cl.[5] F28F *7/00*; **H05K** *7/20*
U.S. Cl. 165—80.3 **20 Claims**

1. A structure for removing heat at a surface comprising:
a plurality of fin assemblies;
each of said plurality of fin assemblies have at least a part thereof being disposed adjacent at least a part of another of said plurality of fin assemblies so that said adjacent parts of said fin assemblies are slidably engaged with respect to each other;
said base of each of said plurality of fin assemblies is adapted for being disposed in thermal contact with said surface;
a bias means for biasing each of said plurality of fin assemblies towards said surface;
a housing enclosing said fin assemblies and permitting channelling of a fluid between said fins;

said housing is formed form folded sheet metal and has a top

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INSULATED SHIPPING CONTAINER

opening through which the lowermost container of said stack

5,201,871

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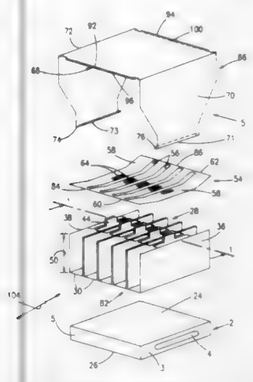
said housing is formed form folded sheet metal and has a top portion and two side portions, said housing has engage-



ment means for holding said bias means in attachment with said housing.

5,201,867

WATERPROOF PHOTOEQUIPMENT BAG

Dieter Morszeck, Scheffelstr. 21, D-5000 Koln 41, Fed. Rep. of Germany

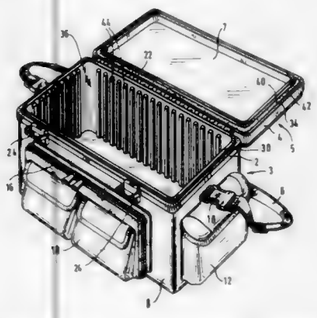
PCT No. PCT/EP89/01088, § 371 Date Apr. 24, 1991, § 102(e) Date Apr. 24, 1991, PCT Pub. No. WO90/03128, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 19, 1989, Ser. No. 678,356

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1988, 3832071

Int. Cl.[5] B65D *33/02, 43/16, 43/22*

U.S. Cl. 206—316.2 **16 Claims**



1. A photoequipment bag comprising a unilaterally open container part defining a dividable inner space, a closing part, hinge means for hinging said closing part to said container part for effecting opening and closing of said inner space, locking means for locking said container part and said closing part when said inner space is closed, said container part and closing part being each defined by a plastic material layer defining bounding opposing peripheral edge frame portions of said container part and said closing part, said frame portions being in contiguous relationship when said inner space is closed, said locking means being carried by said frame portions, means defined by the plastic material layer of said frame portions for forming a tongue and groove seal, and a metal profile reinforcing said closing part frame portion.

5,201,868

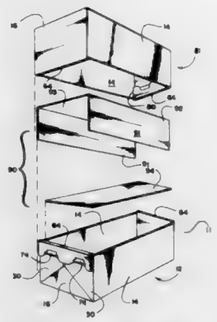
INSULATED SHIPPING CONTAINER

Roberta L. Johnson, Atlanta, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Jan. 22, 1991, Ser. No. 644,003

Int. Cl.[5] B65D *5/60, 43/02*

U.S. Cl. 220—403 **17 Claims**



1. An insulated container, comprising:

a bottom tray comprising:

a bottom panel having an upwardly facing inner surface; and

at least two bottom side panels extending upwardly from said bottom panel, each bottom side panel having an outwardly facing surface;

a top cover comprising:

a top panel having a downwardly facing inner surface, and

at least two top side panels extending downwardly from said top panel, each top side panel having an inwardly facing surface,

said top cover being positioned over said bottom tray such that each inwardly facing surface of said top side panels overlaps and faces one of said outwardly facing surfaces of said bottom side panels, the overlap of said inwardly and said outwardly facing surfaces defining a pair of channels; and

an insulating barrier positioned between said channels and below said inner surface of said top panel, comprising two end sections positioned within said channels, and a middle section positioned between said end sections and between said top panel and the interior of said bottom tray.

5,201,869

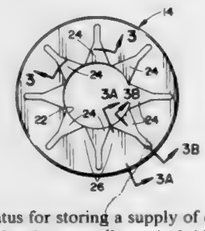
DISPENSER FOR CUPS AND CUP-LIKE ARTICLES

Henry G. Roethel, Ravenna, Ohio, assignor to The Meyer Company, Cleveland, Ohio

Filed Sep. 5, 1991, Ser. No. 755,093

Int. Cl.[5] A47F *1/08*

U.S. Cl. 221—304 **20 Claims**



1. In an apparatus for storing a supply of containers having an open upper end and a generally conical side wall tapering to a smaller bottom end, said apparatus comprising a housing for maintaining the containers in a stacked telescopically interfitted relationship and including a resilient diaphragm having an opening through which the lowermost container of said stack extends and which diaphragm acts to retain said stack in the housing while permitting the lowermost container to be withdrawn, the improvement wherein said diaphragm comprises a unitary piece of resilient elastomeric material with the diaphragm continuous about the opening and having a variable thickness to produced a resistance to elongation in directions circumferentially of the opening which increases progressively radially outward of the opening.

5,201,870

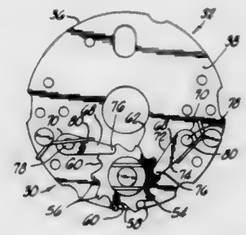
REVERSE STOP RACHET AND PAWL FOR A FISHING REEL

Carl W. Newell, 955 Avonoak, Glendale, Calif. 91206

Filed Dec. 14, 1990, Ser. No. 627,247

Int. Cl.[5] A01K *89/02*

U.S. Cl. 242—298 **2 Claims**



1. A reverse stop assembly for a fishing reel wherein said reel includes a bridge plate associated with one of two side plate structures of said reel having a spool rotatably mounted between said plate structures, a bridge sleeve rotatably mounted on said bridge plate and projecting therefrom, and a crank handle mounted on said bridge sleeve for clockwise rotation and linked to said spool by gears, said stop assembly including:

a rachet wheel mounted on said bridge sleeve, said wheel including an annular edge and a plurality of ratchet teeth circumferentially spaced around said wheel and each tooth including an elongated straight pawl engagable edge projecting from said annular edge into said wheel and an arcuate pawl engaging end surface extending from said straight edge back to said annular edge; and

a spring biased pawl pivotally mounted on said bridge plate exteriorly of said ratchet wheel and adapted to be biased against and slip freely over said ratchet teeth and said annular edge of said ratchet when said wheel is rotated in a clockwise direction, but engagable with one of said teeth without damaging said teeth upon reversal of said ratchet wheel to prevent counter clockwise rotation of said ratchet wheel, said pawl including an outer end and a smaller arcuate ratchet tooth engaging inner end with a pair of tapered elongated flat side walls each of equal length and taper extending between said two ends, either of said elongated sides and said smaller end of said pawl are complementary with said elongated straight pawl engagable edge and said arcuate pawl engaging end surface respectively of said ratchet teeth and said rachet and pawl are each assured of surface locking contact wherein said ratchet teeth are prevented from breakage upon engagement with said tooth engaging inner end due to the arcuate shape of said arcuate pawl engaging end surface and said arcuate pawl engaging surface no matter which of said elongated flat side walls of said pawl is in contact with said ratchet.

5,201,871

Patent Not Issued For This Number

5,201,872

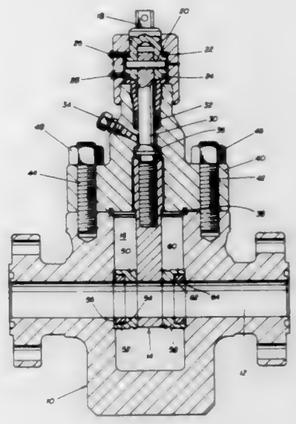
GATE VALVE IMPROVEMENT

Michael L. Dyer, Sugar Land, Tex., assignor to Superior Oilfield Products, Inc., Houston, Tex.

Filed Jan. 27, 1992, Ser. No. 826,127

Int. Cl.[5] F16K *25/02*

U.S. Cl. 251—172 **2 Claims**



2. A gate valve having a body with a bore, a bonnet, a bonnet gasket positioned between said bonnet and said body, connecting means for connecting said bonnet and said body, and a gate movable in said body by a stem, wherein the improvement comprises a first assembly positioned in said bore on one side of said gate and a second assembly positioned in said bore on the other side of said gate, each of said first assembly and said second assembly including in combination a substantially circular seat having a substantially circular protrusion extending on the outer portion of said seat, a substantially circular insert positioned in said seat and having a recess along the outer edge on one side of said insert and a circular groove in the outer side of said insert, an elastomeric seal postioned in said recess between said seat and said insert, and a seal ring positioned in said circular groove of said insert adjacent said body whereby continuous metal to metal sealing areas are provided between said seat and said gate and between said insert and said body in said gate valve.

5,201,873

SHEET FEEDING APPARATUS HAVING THE ABILITY TO RETRACT THE SHEET SUPPLY

Yutaka Kikuchi, Kawasaki; Kazuo Takeuchi, Iwai; Ryuichi Inaba, Tokyo; Hitoshi Ishihama, Mitsukaido; Yasunori Kawakami, Shimotsuma; Akihito Nagayama, Koganei; Kenichi Horikoshi; Hideo Saito, both of Mitsukaido; Hidetaka Fukiharu, Fuchu, and Fumio Asano, Noda, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1991, Ser. No. 724,882

Claims priority, application Japan, Jul. 4, 1990, 2-176744; Jul. 4, 1990, 2-176745; Jul. 4, 1990, 2-176746; Jul. 4, 1990, 2-176747; Jul. 4, 1990, 2-176748; Jul. 4, 1990, 2-176749

Int. Cl.[5] B65H *3/44, 1/12, 1/24*

U.S. Cl. 271—9 **20 Claims**

1. A sheet feeding apparatus comprising:

a sheet containing means adapted to support a plurality of

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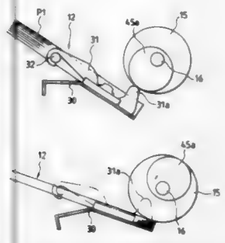
sheets and being shiftable between a sheet supplying position and a standby position;

a sheet supply means for feeding out the sheet supported by said sheet containing means at said sheet supplying position;

a driving force transmitting means connected to said sheet supply means and adapted to transmit a driving force from a drive source; and



a holding means connected to said driving force transmitting means for shifting said sheet containing means to said sheet supplying position by the driving force transmitted to said sheet supply means and for holding said sheet containing means at said sheet supplying position while the plurality of sheets are being supplied continuously by said sheet supply means.

5,201,874

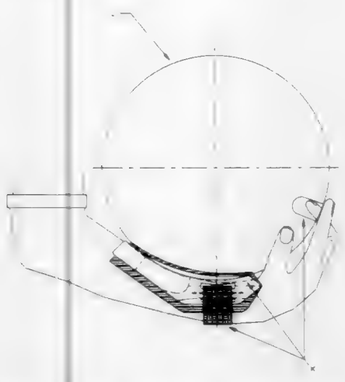
BOWLING BALL SUPPORT FOR THE FOREARM

Walter Kiehn, 7030 Flamingo Way, Sacramento, Calif. 95828

Filed Jul. 3, 1991, Ser. No. 725,298

Int. Cl.[5] A63B *71/14*

U.S. Cl. 273—54 B **7 Claims**



1. A bowling device to be worn on the forearm of a bowler and for use with a bowling ball comprising a main part with an angularly extending U-shaped portion extending from an end of the main part, said main part and extending portion having a topside (G), an underside (J) and opposed sides, the underside having a contoured shape adapted to fit the shape of the forearm of a bowler, the topside having a concave shape having a radius of curvature substantially equal to that of the bowling ball and a means to adjustably connect said main part to the forearm of the bowler.

5,201,875

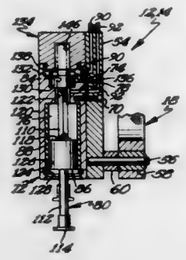
PROBE AND INVERTING APPARATUS

Robert R. Tessier, White Bear Lake; Dennis H. Jensen, and Jeffrey J. Hertz, both of Blaine, all of Minn., assignors to Aetrium, Inc., North St. Paul, Minn.

Continuation-in-part of Ser. No. 466,015, Jan. 16, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 740,146

Int. Cl.[5] B66C *1/02;* **B25J** *15/06*

U.S. Cl. 294—64.1 **17 Claims**



1. Probe for picking up an article comprising, in combination: a housing; a pin for removable attachment to the article; a passage for reciprocally mounting the pin in the housing; an upper portion of the pin which has a cross section which is non-circular; an insert mounted in the passage for slideably receiving the upper portion of the pin and including at least one upstanding tab; and a key slot formed in the housing for receipt of the tab of the insert, with the insert having a shape and size complementary to that of the upper portion for preventing rotation of the pin relative to the housing.

5,201,876

METHOD OF ADJUSTING THE IMPACT ENERGY OF A LETTER KEY OR TYPE ELEMENT OF A PRINTING MACHINE AND TYPEWRITER, PRINTER OR THE LIKE PRINTING MACHINE USING THAT METHOD

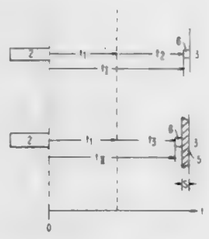
Werner Stengel, Langenzenn, Fed. Rep. of Germany, assignor to TA Triumph-Adler AG, Fed. Rep. of Germany

Filed Aug. 2, 1991, Ser. No. 739,696

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1990, 4025359

Int. Cl.[5] B41J *9/48*

U.S. Cl. 400—166 **5 Claims**



1. Method for determining an impact energy of a type element of a printing machine, said printing machine comprising a roll for supporting a substrate; a hammer electromagnet and a hammer associated with the hammer electromagnet, said hammer being moveable by a current flow through the hammer electromagnet; a plurality of type elements, each of the type elements being positionable relative to the hammer to impact the substrate on the roll when the hammer is energized by the hammer electromagnet; and sensing means for detecting an impact of one of the type elements on the substrate, the method comprising the steps of:

a. providing at least two different-length flight paths for the type elements by changing a distance between a resting position of the hammer and a place of impact of the type elements by at least one known amount;

b. measuring at least two different hammer flight times corresponding to the at least two different-length flight paths of the type elements differing by the at least one known amount, each of the different hammer flight times being equal to a difference between a time of impact of one of the type elements and a time of onset of the current flow in the hammer electromagnet;

c. forming a difference between two of the different hammer flight times;

d. dividing the at least one known amount by which the two different-length flight paths associated with the two different hammer flight times differ by the difference determined in step c) for the two different hammer flight times to obtain a speed of the type element at impact and thus the impact energy of the type element.

5,201,877

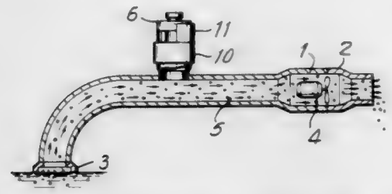
SUCTION TRANSPORTING DEVICE

Arkadi Relin, 2301 Woodward St., Apt. A-14, and Anatole Milstein, 3 Covered Bridge Path, both of Philadelphia, Pa. 19115

Filed Apr. 24, 1992, Ser. No. 874,122

Int. Cl.[5] B65G *53/66, 53/24*

U.S. Cl. 406—85 **4 Claims**



1. A suction transporting device for transporting a material, comprising suction means; a transporting line connected with said suction means and having an inlet for receiving a material to be transported and an outlet for discharging the material to be transported; and means for modulating a suction force of a suction produced in said transporting line by said suction means, said modulating means including a passage adapted to communicate the interior of said transporting line with atmosphere, an adjusting element operative for adjusting an initial area and shape of a minimal cross-section of said passage, and a valve mechanism including a drive, a speed controller for controlling a speed of said drive and a valve body connected with said drive and cooperating with said passage, wherein said drive comprises means for displacing said valve body, and said valve body comprises means for periodically changing the initial area and shape of the minimal cross-section of said passage.

5,201,878

VANE PUMP WITH PRESSURE CHAMBERS AT THE OUTLET TO REDUCE NOISE

Ryutaro Abe, Toyokawa; Yoshiyuki Takeuchi, Gamagori, and Michihiro Kitamura, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 8, 1991, Ser. No. 772,884

Claims priority, application Japan, Oct. 11, 1990, 2-274292

Int. Cl.[5] F04C *2/344, 15/00*

U.S. Cl. 418—133 **2 Claims**

1. A vane pump comprising:

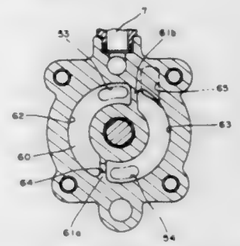
a pump housing having a cylindrical inner space, an inlet port and a fluid outlet port;

a rotating shaft rotatably supported by said pump housing;

a rotor received in the cylindrical space to be rotated by said rotating shaft;

a cam ring disposed in the cylindrical inner space, an inner cam surface of said cam ring facing an outer peripheral surface of said rotor;

a plurality of vanes held by said rotor to define plural pump chambers between said rotor and said cam ring, wherein said cam ring is shaped such that fluid in said pump chambers is compressed at two circumferentially spaced regions of said pump housing, fluid in said inlet port being sucked into said pump chambers and pressurized fluid being discharged from said pump chambers to exhaust ports located at positions circumferentially corresponding to said plural regions



first and second pressure chambers, each of said pressure chamber communicating with said pump chambers via said exhaust ports to receive pressurized fluid from said pump chambers, wherein said second pressure chamber is communicated with said fluid outlet port and said first pressure chamber is communicated with said second pressure chamber via a throttle passage such that pressurized fluid from said first pressure chamber is discharged to said second pressure chamber, whereby pressurized fluid pulsations from said first pressure chamber reach said fluid outlet port at a time which is out of phase with pressurized fluid pulsations from said second pressure chamber.

5,201,879

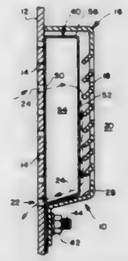
VENT FOR ENCLOSURES

Edward A. Steele, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Sep. 18, 1991, Ser. No. 761,582

Int. Cl.[5] F24F *13/20*

U.S. Cl. 454—184 **14 Claims**



10. In a vent structure for an enclosure of the type which includes an array of openings on the exterior of the enclosure, wherein the improvement comprises a double layer of mesh material disposed behind the array of openings and being spaced apart in a first direction generally perpendicular to the array of openings, said mesh material in combination with said vent structure being arranged to define a closed path in cross-section in a plane defined by said first direction.

5,201,880

between the tray and said insert which allows the insert to

and a second series of elongate, strip-form contacts, re-

(f) mobile unit positioning means for positioning said mobile

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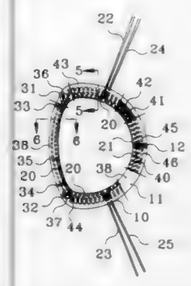
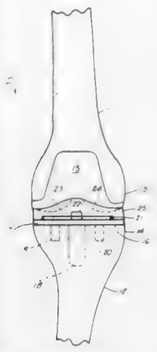
5,201,880
MITRAL AND TRICUSPID ANNULOPLASTY RINGS
John T. M. Wright, Conifer; Donald P. Elliott, Denver, both of Colo., and Francis C. Wells, Sandy, England, assignors to Pioneering Technologies, Inc., Wheat Ridge, Colo.
Filed Jan. 27, 1992, Ser. No. 826,405
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **1 Claim**



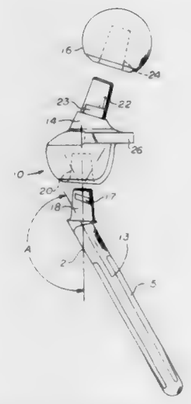
1. An inplantable annuloplasty ring for use in repairing a human heart valve comprising a ring having a first face constructed and configured to lie, when in use, against an annulus defined by tissue surrounding a human heart valve, and a second face opposite the first face, a major portion of the ring comprising flexible biocompatible contractible fabric, first and second pairs of drawstrings extending through said flexible, biocompatible, contractible fabric, said first and second pair of drawstrings comprising filiform, biocompatible strings, the first pair of drawstring being constructed and positioned to contruct one half of said major portion and the second pair of drawstrings being constructed and adapted to contract the other half of said major portion, whereby drawing either or both of said pairs of drawstrings will cause the ring to contract.

5,201,881
JOINT PROSTHESIS WITH IMPROVED SHOCK ABSORPTION
David L. Evans, Bartlett, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.
Filed Aug. 13, 1991, Ser. No. 744,425
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 **9 Claims**



1. A knee prosthesis comprising:
a) a tibial component comprising a tray having a bone engaging surface and an opposite insert engaging surface, and an insert having a bottom surface for engaging said insert engaging surface; and
b) wherein bottom surface has a recess that defines a gap between the tray and said insert which allows the insert to flex so as to act as a shock absorber for reducing impact loads transmitted through the implant to the bone.

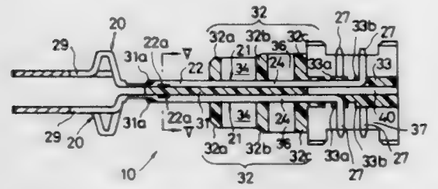
5,201,882
MODULAR HIP JOINT PROSTHESIS WITH ADJUSTABLE ANTEVERSION
Robert D. Paxson, 577 Arbor Hollow Cir. #101, Cordova, Tenn. 38018
Continuation of Ser. No. 431,412, Nov. 3, 1989, Pat. No. 5,025,881. This application Nov. 1, 1990, Ser. No. 608,097
Int. Cl.[5] A61F *2/32*
U.S. Cl. 623—23 **6 Claims**



1. A modular hip joint prosthesis comprising:
a ball;
a stem component having a longitudinal first axis and terminating in opposite proximal and distal ends,
said proximal end configured with a first connection portion and defining a second axis which forms an obtuse angle with the longitudinal axis; a trochanteral module component having a neck element extending outwardly from a proximal portion thereof and a distal portion configured with a second connection portion for mating engagement with said first connection portion, said trochanteral module defining a shape generally corresponding to that of the trochanteral portion of the proximal femur and connecting with said stem in a variety of rotational positions; and
means or the prosthesis for indicating to a surgeon the relative rotational alignment between the trochanteral module and the stem corresponding to the natural anteversion angle of the femur.

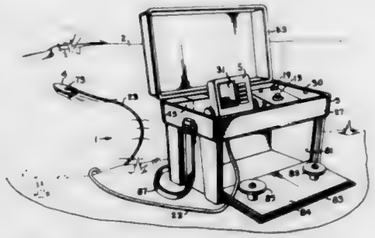
5,201,883
METHOD OF MAKING IN-MOLDED PLUG CONNECTOR
Kiyoshi Atoh, Tokyo, and Shinji Tanabe, Kawasaki, both of Japan, assignors to KEL Corporation, Tokyo, Japan
Filed Nov. 27, 1991, Ser. No. 800,829
Claims priority, application Japan, Aug. 30, 1991, 3-245089
Int. Cl.[5] H01R *43/16*
U.S. Cl. 29—883 **7 Claims**

1. A method for manufacturing a plug connector of the type comprising a first and a second series of elongate, strip-form contacts having elongate connecting portions adjacent leading ends with front connecting surfaces exposed on respective opposite faces of a supporting insulating base for engagement with complementary surfaces of a female connector to establish electrical connection therewith, comprising the steps of:
providing first and second contact strips comprising a first and a second series of elongate, strip-form contacts, respectively each contact having a connecting portion adjacent a leading end with an elongate, front connecting surface and an underlying back surface joined thereto by side surfaces the contacts of respective series being, attached at respective leading ends to respective, transversely extending carrier strips;
supporting respective contact strips in a mold with the contacts extending in the same direction away from the respective carrier strips and the contacts of one strip located with respective back surfaces in opposed, back-to-back, coplanar relation with, and at a predetermined spac-



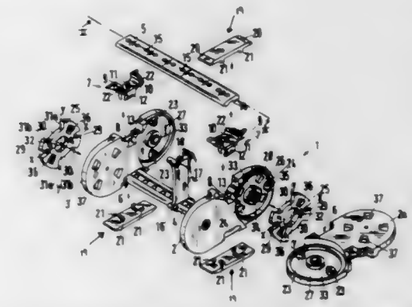
ing apart from the respective back surfaces of the contacts of the other strip;
forming a supporting base by injecting plastic material into the mold at locations between the two contact series covering the opposed back surfaces of the connecting portions and at least part of the side surfaces of portions of the contacts adjacent the carrier strips, while maintaining the front, connecting surfaces exposed so as to extend in parallel relation rearwardly across opposite faces of the base from a leading end thereof;
forming a connector base by removing the carrier strips from the series of supported contacts; and,
locating a cover on the connector base so formed.

5,201,884
AQUATIC LOCATOR APPARATUS
Mike W. Nicholas, 2000 E. Evanston, Wichita, Kans. 67219
Filed Dec. 12, 1991, Ser. No. 806,885
Int. Cl.[5] A01K *97/00*
U.S. Cl. 43—26.1 **14 Claims**



1. A marine object detecting system, comprising:
(a) a buoyant mobile unit;
(b) a base unit including a container having:
(1) a first compartment such that said user controls are mounted therein; and
(2) a second compartment such that the remainder of said system is storable therein;
(c) transducer means mounted on said mobile unit;
(d) communication linkage means for linking said transducer means with said base unit;
(e) user signaling means for signaling a user; said user signaling means being linked to said transducer means by said communication linkage means and responsive to said signals generated by said transducer means; and
(f) mobile unit positioning means for positioning said mobile unit.

5,201,885
GUIDE CHAIN FOR GUIDING ENERGY LINES
Herbert Wehler, Neunkirchen; Paul-Werner Mack, Wenden, and Willibald Weber, Netphen, all of Fed. Rep. of Germany, assignors to Kabelschlepp GmbH, Siegen, Fed. Rep. of Germany
Filed Feb. 21, 1992, Ser. No. 839,580
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1991, 4105652
Int. Cl.[5] F16G *13/16*
U.S. Cl. 59—78.1 **4 Claims**



1. A guide chain for guiding energy lines from a stationary connection to a movable consuming device, said guide chain comprising:
a plurality of chain members being pivotably connected with one another, each one of said chain members being comprised of:
two side portions arranged at a distance parallel to one another;
two transverse elements connected to said side portions each one of said transverse elements having a longitudinal groove and a plurality of bores extending from a bottom of said groove through said transverse element; and
at least one separating cross-piece arranged between said transverse elements, said separating cross-piece, at ends thereof facing said transverse elements, having a holder with at least one pin of a length corresponding to a depth of said groove, with said transverse elements in a first arrangement connected to said side portions such that said grooves face said separating cross-piece and said pins engage said grooves, and in a second arrangement connected to said side portions such that said grooves face away from said cross-piece and said pins engage said bores.

5,201,886
METHOD OF OPERATING A PULSE THRUSTER
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Division of Ser. No. 481,333, Feb. 20, 1990, Pat. No. 5,148,672. This application Sep. 21, 1992, Ser. No. 948,019
Int. Cl.[5] F02K *7/02, 11/00*
U.S. Cl. 60—204 **2 Claims**

1. A method of propulsion comprising the steps of:
providing a plate having an electrical charge;
depositing fuel particles of opposite charge to said plate in the presence of an oxidizer;

operation of the engine in the possible fear ratios of the gear, thereby actuate the other brake releasing means to release the

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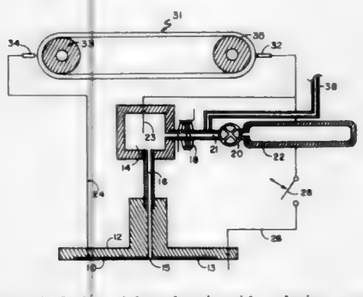
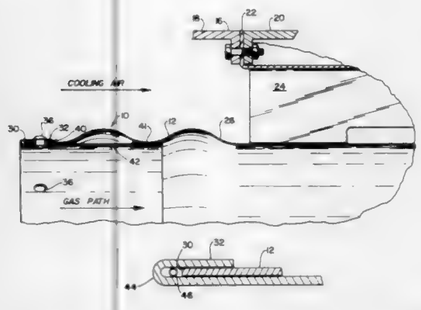
attracting said oppositely charged fuel particles to said plate; and



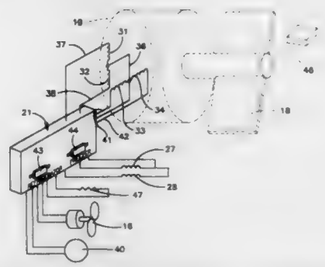
igniting said fuel particles wherein said explosion moves said plate.

5,201,887
DAMPER FOR AUGMENTOR LINERS
Raymond J. Bruchez, Jr., North Palm Beach; James Hurchalla, and Steven B. Johnson, both of Stuart, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Nov. 26, 1991, Ser. No. 798,433
Int. Cl.[5] F02K *3/10*
U.S. Cl. 60—261 **7 Claims**



1. A damper for a liner for an augmentor of a gas turbine engine, said augmentor including a pair of generally cylindrically shaped axially aligned casing members having opposing complementary flanges, support means between said flanges for supporting said liner in cantilever relationship, said liner is generally cylindrically-shaped and concentric to said casing members and includes an annular leading edge, said damper comprising an annular member having a U-shaped cross section extending over the edge of said leading edge, said U-shaped cross section including a pair of parallelly disposed axially extending members and a forward portion connected to said pair of parallelly disposed axially extending members having the forward portion disposed in front of said leading edge and with said pair of parallelly disposed axially extending members being contiguous to said liner and encapsulating said leading edge.

5,201,888
TEMPERATURE CONTROL SYSTEM FOR REFRIGERATOR/FREEZER COMBINATIONS
Sammie C. Beach, Jr., Greenville, and Gary R. Peter, Rockford, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Nov. 14, 1991, Ser. No. 792,308
Int. Cl.[5] F25D *17/08*
U.S. Cl. 62—187 **10 Claims**

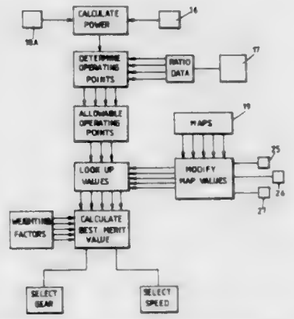


9. A refrigerator/freezer combination comprising a refrigeration compartment for storage of unfrozen items, a freezer compartment for storage of frozen items, a refrigeration system including a compressor and an evaporator for cooling both compartments, passage means connecting both of said compartments, a fan operable to cause flow of air over said evaporator and to deliver air chilled by said evaporator to said passage means, an adjustable damper in said passage means operable to determine the division between the amount of chilled air delivered to said refrigeration compartment and the amount of chilled air delivered to said freezer compartment, a step motor connected to rotate said damper between predetermined positions for controlling said division, and the control means including first temperature sensor means and said refrigeration compartment and a second temperature sensor means in said freezer compartment, said control means operating said step motor to adjust said damper in response to signals from said first and second temperature sensor means and thereby adjust the division of chilled air to maintain said compartments at a desired temperature, said first sensor means also operating to control the operation of said compressor, said control means operating said step motor to move said damper to one of said predetermined positions each time power is first supplied to said refrigerator/freezer combination.

5,201,889
POWER UNIT
Peter C. Mason, Leicester, England, assignor to Lucas Industries public limited company, England
Filed Aug. 30, 1991, Ser. No. 753,253
Claims priority, application United Kingdom, Sep. 5, 1990, 9019400
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 **4 Claims**

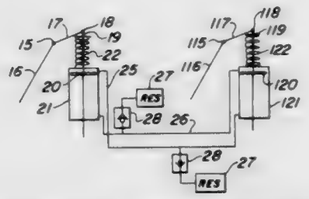
1. A power unit for a vehicle, the power unit including an internal combustion engine and a gear box coupled to the engine, the gear box in use being coupled to the driving wheels of the vehicle, a fuel control system operable to control the delivery of fuel to the engine in response to a power demand signal set by the driver of the vehicle, a plurality of maps containing prerecorded data relative to the constituents of the engine exhaust and the engine fuel consumption within a given engine speed and power range, means demand for determining allowable engine operating speeds at a given vehicle speed and driver demand, means for determining from the data in the maps, the values of fuel consumption and exhaust constituents at individual allowable engine operating speeds, means for storing weighting factors for fuel consumption and exhaust constituents, and means for calculating merit figures for the

operation of the engine in the possible fear ratios of the gear box using the values of fuel consumption and exhaust constitu-



ents as modified by the weighting factors, and further means operable to indicate which gear ratio will provide the higher or highest merit figure or the lowest cost figure.

5,201,890
RAILROAD CAR HANDBRAKE RELEASE SYSTEM
Robert J. Sauer, Blackwood, N.J., and Michael J. Pavlick, Blue Bell, Pa., assignors to Transit America, Inc., Philadelphia, Pa.
Filed Nov. 27, 1991, Ser. No. 799,335
Int. Cl.[5] F16D *65/14*
U.S. Cl. 188—107 **11 Claims**



1. A manually operated railroad car handbrake release system for simultaneously releasing the manually set car brakes at opposite ends of the car whenever the brakes at either end of the car are released, comprising in combination,

a) first and second manually operated handbrakes each including a brake setting mechanism and a brake releasing means, said first handbrake being fixedly located at one end of the railroad car and said second handbrake being fixedly locatable at the other end of the railroad car,

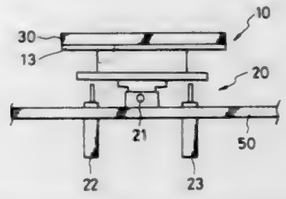
b) a first actuatable hydraulic cylinder mechanically coupled to an actuatable by said brake releasing means of said first manually operated handbrake, said first hydraulic cylinder having upper and lower ports and a piston connected to a piston rod having a free end, and means biasing said piston to one end of said cylinder with the piston rod and its free end positioned out of said cylinder,

c) a second actuatable hydraulic cylinder mechanically coupled to and actuatable by said brake releasing means of said second manually operated handbrake, said second hydraulic cylinder having upper and lower ports and a piston connected to a piston rod having a free end, and means biasing said piston to one end of said cylinder with the piston rod and its free end positioned out of said cylinder,

d) hydraulic fluid carrying means intercoupling said first and second hydraulic cylinders,

each of said first and second hydraulic cylinders being effective responsive to actuation by its associated brake releasing means to actuate the other of said first and second hydraulic cylinders via said hydraulic fluid carrying means and to thereby actuate the other brake releasing means to release the brakes of both of said first and second manually operated handbrakes. compression spring disposed about its associated piston rod outside of said cylinders.

5,201,891
VIBRATION PARTS ALLIGNMENT APPARATUS
Teruo Tsuchiya, Iruma, Japan, assignor to Myotoku Ltd., Tokyo, Japan
Continuation of Ser. No. 445,630, Dec. 27, 1989, abandoned. This application Feb. 18, 1992, Ser. No. 836,168
Claims priority, application Japan, Feb. 28, 1988, 63-45556; Apr. 17, 1988, 63-93699
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—383 **3 Claims**



1. A vibration parts alignment apparatus, comprising:

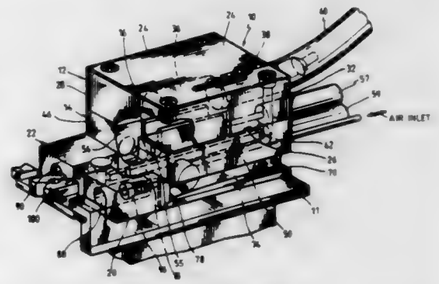
a vibration generator;

a tiltable means for supporting said vibration generator at a selectable inclination;

a parts alignment tray fixedly supported by said vibration generator, said parts alignment tray having a plurality of alignment holes for alignment of parts during vibration of said vibration generator;

a plurality of parts alignment trays are provided to enable a plurality of parts to be aligned and assembled by positioning said plurality of parts alignment trays in such a manner that one of said plurality of parts alignment trays presses and retains parts aligned in another one of said plurality of parts alignment trays placed under the former one of said plurality of parts alignment trays.

5,201,892
RIVET ORIENTATING DEVICE
James R. Salter, Spring, Tex., assignor to LTV Areospace and Defense Company, Dallas, Tex.
Continuation of Ser. No. 213,715, Jun. 30, 1989, abandoned. This application May 17, 1990, Ser. No. 534,133
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—389 **4 Claims**



1. A rivet handling device comprising:

a. a chute for receiving rivets;

b. a manifold having a passageway in communication with the chute for receiving rivets from the chute;

10. A prepackaged irrigation kit comprising in releasably

motion is inhibited when said valves are closed to prevent the motion of fluid between said fluid activated means.

pivotal movement of the second mounting plate and the audio speaker attached thereto about a second axis extend-

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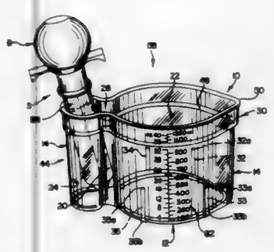
c. a body having a trough in communication with the passageway;
d. a shuttle movably disposed in the trough for receiving rivets from the passageway and providing them at the end of the trough;
e. means for reciprocally moving the shuttle in the trough;
f. an output device having an adjustably gapped slot for receiving the rivet from the trough;
g. means for adjusting the gap of the slot; and
h. where the output device and means for adjusting the gap comprise:
i. two blocks movably disposed on the front of the body that form the gapped slot where one block is disposed on each side of the trough;
ii. two leaf spring recesses where the recesses are disposed on opposite sides of the body;
iii. two leaf springs where one leaf spring is disposed in each of the leaf spring recesses;
iv. one end of each leaf spring is in communication with the block disposed on the side of the body on which the leaf spring is disposed;
v. two pistons where one piston is slidable disposed on each of the body in communication with the leaf spring disposed on the side of the body in which the piston is disposed; and
vi. a means for actuating each piston to adjust the distance between the blocks.

5,201,893

IRRIGATION CONTAINER AND SYRINGE

Joan M. Holloway, Bartlett, and Stephen J. Klein, Cordova, both of Tenn., assignors to Vollrath Group, Inc., Sheboygan, Wis.

Filed Jul. 25, 1991, Ser. No. 735,997
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—571 **20 Claims**



1. An irrigation unit adapted for holding and delivering irrigation liquid, the unit comprising:
(i) an irrigation syringe comprising a barrel body; and
(ii) an irrigation container comprising:
(a) a generally flat bottom portion;
(b) a substantially upright sidewall extending upward from the bottom portion and including a first portion defining a first chamber, a second portion defining a second chamber and a neck portion defining a flow channel between the first and second chambers with the second chamber having an interior diameter larger than the barrel body of the syringe, the sidewall terminating in an upper edge extending about the first portion, second portion and neck portion of the container and defining an opening to the top of the container, such that the opening, first chamber, second chamber and flow channel cooperate with each other when irrigation liquid is present to allow the liquid to flow between the first chamber and the second chamber; and
the neck portion having a width smaller than the interior diameter of the second chamber and the exterior diameter of the barrel body of the irrigation syringe.

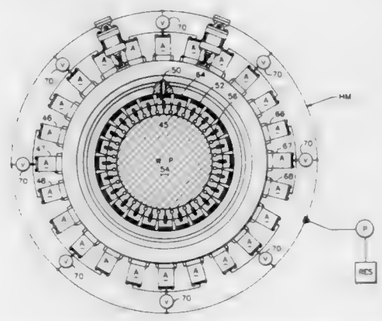
10. A prepackaged irrigation kit comprising in releasably sealed relationship:
(i) an irrigation syringe comprising a barrel body;
(ii) an irrigation container comprising:
(a) a generally flat bottom portion;
(b) a substantially upright sidewall extending upward from the bottom portion and including a first portion defining a first chamber, a second portion defining a second chamber and a neck portion defining a flow channel between the first and second chambers with the second chamber having an interior diameter larger than the barrel body of the syringe, the sidewall terminating in an upper edge extending about the first portion, second portion and neck portion of the container and defining an opening to the top of the container, such that the opening, first chamber, second chamber and flow channel cooperate with each other when irrigation liquid is present to allow the liquid to flow between the first chamber and the second chamber; and
the upper edge of the first portion defining a spout configured to deliver a liquid in a relatively narrow stream when liquid is placed in the first chamber and poured;
(iii) a basin having an open upper edge including a rim, a substantially flat bottom and a sidewall extending upward from the bottom, the sidewall having a height about equal to the height of the sidewall of the container, and an interior diameter sufficiently greater than the overall exterior dimension of the container and syringe when the container and syringe are received therein with the container in an upright position and in side-by-side relationship with the syringe; and
(iv) a sealing means about the basin to releasably seal the container and syringe received in side-by-side relationship.

5,201,894

BALANCED FORCE WORKPIECE LOCATION MEANS

James L. Deal, Amston; Joseph A. Gosselin, and John J. Kolesnik, both of Southington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 27, 1992, Ser. No. 858,920
Int. Cl.[5] B23K *20/12*
U.S. Cl. 228—2 **3 Claims**



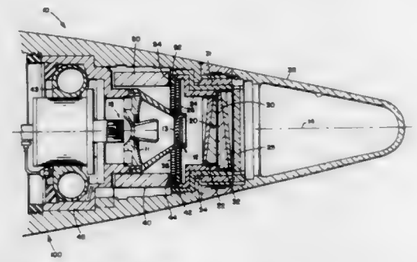
1. A non-centering workpiece holder and support comprising:
fluid activated means for generating a plurality of forces directed into the workpiece;
said plurality of forces, when added in a vector sense producing no net force couple on said workpiece;
said plurality of fluid activated means being interconnected by fluid passageways containing valves so that workpiece motion can occur when said valves are open and fluid can move between said fluid activated means, but workpiece motion is inhibited when said valves are closed to prevent the motion of fluid between said fluid activated means.

5,201,895

OPTICALLY BEAM STEERED INFRARED SEEKER

Vincent A. Grosso, Hopkinton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 23, 1992, Ser. No. 824,953
Int. Cl.[5] F41G *7/26*
U.S. Cl. 244—3.16 **7 Claims**



1. A seeker comprising:
(a) a first rotatable optical wedge having a rotational position;
(b) a second rotatable optical wedge having a rotational position, the second rotatable optical wedge disposed juxtapositional with the first rotatable optical wedge;
(c) means, connected tot eh first and second rotatable optical wedges, for controllign the rotational position of the first rotatable optical wedge with respect to the rotational position of the second rotatable optical wedge, wherein the controlling means comprises:
(i) means, connected to the first rotatable optical wedge, for moving the rotational position of the first rotatable optical wedge;
(ii) means, connected to the second rotatable optical wedge, for moving the rotational position of the second rotatable optical wedge;
(iii) means for providing a signal indicative of the rotational position of the first rotatable optical wedge; and
(iv) means for providing a signal indicative of the rotational position of the second rotatable optical wedge; and
(d) wherein each of the first and the second rotatable optical wedges comprises a first portion fabricated from a first material and a second portion fabricated from a second different material.

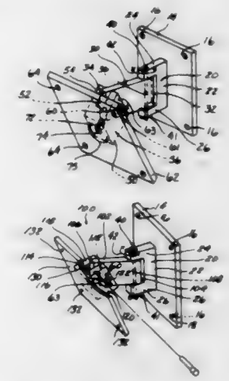
5,201,896

UNIVERSAL AUDIO SPEAKER MOUNTING BRACKET

Kevin W. Kruszewski, 1981 Petrolia Dr., Union Lake, Mich. 48387

Filed Jun. 20, 1991, Ser. No. 717,977
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—278 **19 Claims**

1. An audio speaker bracket for adjustably mounting an audio speaker to a support surface comprising:
a first mounting plate removably attachable to a support surface;
a link having first and second opposed ends;
first connector means, mounted on the first mounting plate, for pivotally and releasably lockingly connecting the first end of the link to the first mounting plate for pivotal movement of the link about a first axis extending through the first connector means;
a second mounting plate attachable to an the audio speaker;
second connector means, mounted on the second mounting plate, for pivotally and releasably lockingly connecting the second end of the link to the second mounting plate for pivotal movement of the second mounting plate and the audio speaker attached thereto about a second axis extending through the second connector means substantially perpendicular to the first axis;
means for rotatably connecting the second mounting plate to



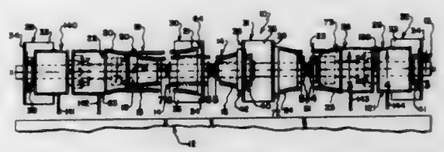
the second connector means for rotation of the second mounting plate about a third, distinct axis substantially perpendicular to the first and second axes; and
rotation locking means for locking the second mounting plate in a fixed position with respect to the second connector means.

5,201,897

SPRING BALANCER FOR A ROLL-UP DOOR

Lauren C. Whiting, Corfu, N.Y., assignor to Whitling Roll-Up Door Mfg. Corp., Akron, N.Y.

Filed Jan. 30, 1992, Ser. No. 828,029
Int. Cl.[5] F16F *1/10*
U.S. Cl. 267—155 **14 Claims**



1. A spring balancer mounted on a support for use with an object arranged to be selectively raised and lowered relative thereto, comprising:
a shaft mounted on said support for rotation relative thereto about an axis;
a first spring surrounding said shaft, said first spring having one end fixed to said support and having another end;
first means operatively connecting said first spring other end to said object such that said first spring will absorb energy when said object is lowered and will give up energy when said object is raised;
a second spring surrounding said shaft, said second spring having one end fixed to said support and having another end;
second means journalled on said shaft for rotation relative thereto and operatively connecting said second spring other end to said object such that such second spring will absorb energy when said object is lowered and will give up energy when said object is raised
a third spring surrounding said shaft, said third spring having one end and having another end; and

third means operatively connecting said third spring other

5,201,899

each other, the bridge member and prong members being bearing blocks being in the notch of first leaf where it is gener-

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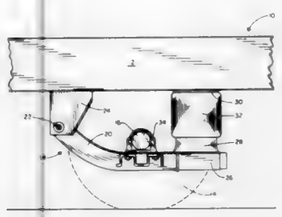
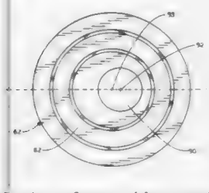
third means operatively connecting said third spring other end to said object such that said third spring will give up energy when said object is raised.

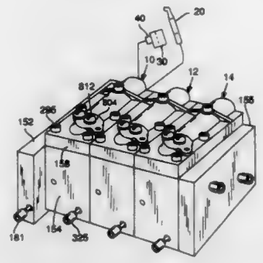
5,201,898
ALIGNMENT MECHANISM FOR VEHICLE SUSPENSIONS
Wiliam C. Pierce, Muskegon, Mich., assignor to Neway Corp., Muskegon, Mich.
Filed Nov. 26, 1991, Ser. No. 798,635
Int. Cl.[5] B60G *7/02*
U.S. Cl. 280—68 **21 Claims**





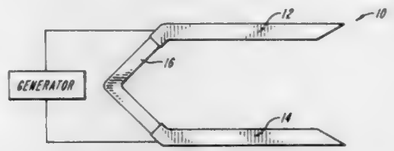
1. In a vehicle having a frame with ground-engaging wheels suspended therefrom by two trailing arms, first connections pivotably connecting the trailing arms to the frame at opposite lateral sides thereof for substantially coaxial swinging vertical movement, second connections connecting a wheel carrying axle to and between the trailing arms, and a spring mounted in load transmitting relationship between the frame and the trailing arms, at least one of said first and second connections having first and second plates movable relative to each other, said plates having mutually complementary formed surface portions cooperable for mechanical interengagement and having aligned openings for adjusting the relative position of the axle with respect to the frame, said at least one connection further having a pin extending through the aligned openings in the plates for selectively holding the plates together in the aligned position, the improvement comprising:
the complementary formed surface portions being configured to limit the relative movement between the plates to rotational movement about an axis extending through or in substantially horizontal alignment with the aligned openings; and
a first of said openings being eccentrically disposed relative to the axis and having a cross section shaped to interface with the pin so that the pin can move with the first opening, and a second of said openings being larger than the first opening,
whereby upon loosening of the pin and rotation of the first and second plates relative to each other, the pin moves about the axis within the second opening, and upon tightening of the pin, the position of the axle relative to the frame is fixed in adjusted position.

5,201,899
CONTROL SYSTEM FOR DENTAL HANDPIECES
George K. Austin, Jr.; Paul D. Sturges, both of Newberg, and Sandor Johannes, West Linn, all of Oreg., assignors to A-DEC, Inc., Newberg, Oreg.
Continuation of Ser. No. 722,669, Jun. 28, 1991, abandoned. This application Dec. 13, 1991, Ser. No. 808,946
Int. Cl.[5] A61C *1/02*
U.S. Cl. 433—98 **15 Claims**



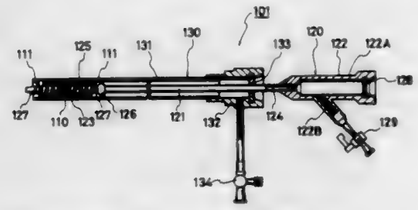
1. A control system for controlling the supply of air and water to a plurality of dental handpieces and the like comprising:
a plurality of control blocks each having an upper face, a pair of opposed side faces, and a bottom face;
said control blocks arranged side by side in a row;
a manifold block positioned at one end of said row and a closure block at the at the other end of said row, said manifold block having a pair of parallel faces, one of which faces the adjacent control block;
a plurality of inlet means in said manifold block and a plurality of passages in said manifold block extending therethrough to outlets in said one face thereof;
a plurality of fluid passages through said control blocks having entrance ports in registry with the fluid outlets of said manifold block;
a plurality of outlets in each of said control blocks;
a plurality of valve means in each of said control blocks;
each said valve means comprising an integral cartridge valve member removably mounted in said control blocks and removable through the bottom surface thereof; and
passageways in said control blocks for conveying fluid from said manifold block to said valve means and from said valve means to certain of said control block outlets.

5,201,900
BIPOLAR SURGICAL CLIP
Paul C. Nardella, North Easton, Mass., assignor to Medical Scientific, Inc., Taunton, Mass.
Filed Feb. 27, 1992, Ser. No. 842,899
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—157 **11 Claims**



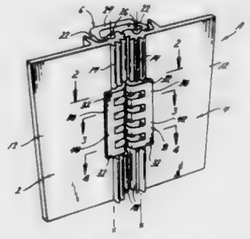
1. A surgical clip for tissue closure, comprising
a pair of opposed prong members each having a conductive surface over at least a portion of the prongs for contact of tissue adjacent thereto;
a bridge member joining the two prong members, the bridge member being constructed of a highly resistive material and serving to electrically isolate the prong members from each other, the bridge member and prong members being of a unitary construction.

5,201,901
EXPANSION UNIT AND APPARATUS FOR EXPANDING TUBULAR ORGAN LUMEN
Fumiaki Harada, and Toshinobu Ishida, both of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP88/01029, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO89/03197, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 7, 1988, Ser. No. 477,843
Claims priority, application Japan, Oct. 8, 1987, 62-252457; Nov. 2, 1987, 62-275655
Int. Cl.[5] A61M *29/00;* **A61F** *2/06*
U.S. Cl. 606—198 **30 Claims**



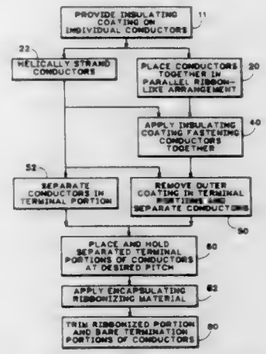
1. A tubular-organ expansion unit comprising:
a mesh-like cylindrical body comprising a plurality of thin-woven wires that are formed of a shape memory alloy which is insertable into a tubular body organ and which is capable of maintaining an inside diameter of a lumen of the tubular body organ, said cylindrical body having a given X-ray contrast; and
X-ray contrast enhancing means on at least a portion of said cylindrical body for improving the X-ray contrast of at least said portion of said cylindrical body relative to said given X-ray contrast.

5,201,902
GEAR HINGE WITH KNUCKLE-TYPE BEARING
Austin R. Baer, 430 Kolber Ct., Villa Park, Ill. 60181
Filed Jun. 6, 1991, Ser. No. 710,967
Int. Cl.[5] E05D *1/00*
U.S. Cl. 16—354 **22 Claims**



1. A hinge comprising: a first leaf having a gear segment that establishes an axis and a notch opening out of the gear segment; a second leaf having a gear segment that is presented toward the gear segment of the first leaf and establishes another axis that is parallel to the axis of the gear segment on the first leaf, the second leaf also having a notch which opens out of its gear segment and is presented opposite the notch in the gear segment of the first leaf so that the notches of the gear segments on the leaves open torward each other; a clamp engaged with the gear segments of the first and second leaves such that it prevents the gear segments from moving apart, yet permits relative rotation between the gear segments; a plurality of bearing blocks located at the notches in the leaves, one of the bearing blocks being in the notch of first leaf where it is generally fixed in position with respect to the first leaf, another of the blocks being located in the notch of the second leaf where it is generally fixed in position with respect to the second left; the blocks having knuckles which interlock and prevent the blocks from shifting relative to each other in the direction of the axes of the gear segments, so that hinge leaves cannot shift relative to each other in the direction of the axes of their gear segments, at least one of the plurality of blocks having a plurality of knuckles and a base, with the plurality of knuckles projecting from the base.

5,201,903
METHOD OF MAKING A MINIATURE MULTI-CONDUCTOR ELECTRICAL CABLE
Scott S. Corbett, III, Portland; W. Eugene Skiens, Wilsonville; John J. Stobie, Portland, and Doris A. Beck, Beaverton, all of Oreg., assignors to PI (Medical) Corporation, Portland, Oreg.
Filed Oct. 22, 1991, Ser. No. 781,494
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—872 **18 Claims**



1. A method of making a miniature multiconductor electrical cable, comprising:
(a) coating a plurality of fine elongate electrical conductors with a first continuous layer of a first insulating material;
(b) arranging respective intermediate portions of all of said plurality of fine elongate electrical conductors closely adjacent one another;
(c) placing and holding a respective terminal portion of each of said fine elongate electrical conductors in a fixture in a terminal configuration with said terminal portions of said conductors substantially parallel with one another and spaced apart from one another in a planar arrangement at a predetermined pitch;
(d) ribbonizing said terminal portions of said fine elongate electrical conductors by applying and curing a layer of insulating ribbonizing material over said terminal portions, embedding said terminal portions in said material and thereby holding said terminal portions in a terminal configuration.

5,201,904
TORQUEING TOOL
Ralph E. Dawson, 277 Camby Dr., Kingsport, Tenn. 37664
Filed Apr. 7, 1992, Ser. No. 864,672
Int. Cl.[5] B25G *1/00;* **B25B** *13/06*
U.S. Cl. 81—177.2 **6 Claims**

1. A device for applying torque to a rotatable workpiece for loosening or tightening thereof, said device comprising a tool receiving member having opposite sides, an elongated tension transmitting member, tool reception means located on said tool

receiving member and a compression transmitting member

a controller connected to the means for moving, the means

5,201,908

ends of said spring elements being fastened to said carrier

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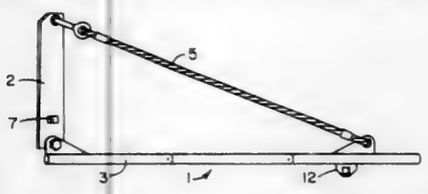
receiving member and a compression transmitting member, said compression transmitting member being comprised of at least two tubular sections loosely connected to each other in an end-to-end relationship, said compression transmitting member being pivotally attached at one end thereof to said tool receiving member at one of said opposite sides and to said tension transmitting member adjacent its opposite end to provide means to receive force, at least one of said loosely connected ends of said compression transmitting member is beveled at least about 1° to permit the compression member to be slightly bowed away from said tension transmitting member when the device is being used to aid in the final end-to-end alignment of



the tubes when force is being applied, said tension transmitting member being moveably attached to said tool receiving member at the other of said opposite sides, the tool receiving member, the tension transmitting member and the compression transmitting member define generally a triangle and all lie generally in the same plane, whereby when a torque moment force is applied to said means for receiving force, the torque moment force is converted to a compression force transmitted to said tool receiving member by said compression transmitting member and a tension force transmitted to said tool receiving member by said tension transmitting member to thereby cause the tool receiving member to rotate.

5,201,905

Patent Not Issued For This Number

5,201,906

ANTI-PIGGYBACKING: SENSOR SYSTEM FOR SECURITY DOOR TO DETECT TWO INDIVIDUALS IN ONE COMPARTMENT

Milan Schwarz, 4985 Old Ranch Rd., LaVerne, Calif. 91711, and Robert Mayer, Pleasanton, Calif., assignors to Milan Schwarz, LaVerne, Calif.

Continuation-in-part of Ser. No. 607,236, Oct. 31, 1990, Pat. No. 5,097,454, which is a continuation of Ser. No. 419,760, Oct. 11, 1989, Pat. No. 5,012,455. This application Sep. 9, 1991, Ser. No. 756,451

Int. Cl.[5] G08B *13/16*

U.S. Cl. 109—8 **14 Claims**

1. A control system for a security door having a housing with a first portal, a second portal, and movable door member, forming at least one compartment, for normally blocking passage between the first and second portals, the control system comprising:

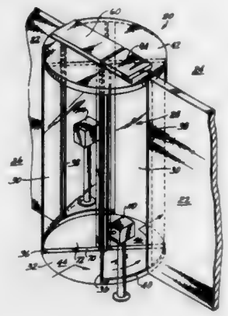
means for identifying an authorized user;

means for moving the door member to move a compartment containing the authorized user from the first portal to the second portal;

means for tracking movement of the door member and the compartment containing the authorized user from the first portal to the second portal;

sensing means disposed in the housing for emitting energy waves into the housing between the first and second portals, and for detecting echoing of the energy waves due to any objects or users in the housing; and

a controller connected to the means for moving, the means for identifying, the sensing means, and the means for tracking for driving the means for moving in response to identification of an authorized user, said controller including means for detecting successive heights in response to echoes detected b the sensing means and means for determining that there is a second user in the compartment containing the authorized user on the basis of the successive detected heights.



5,201,907

INTERNAL COMBUSTION ENGINE

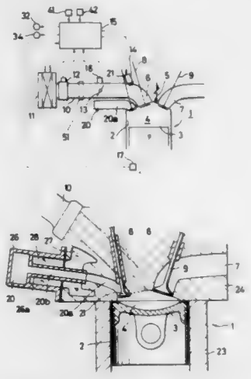
Mitsuo Hitomi; Shunji Masuda; Toshihiko Hattori; Kenji Kashiyama, and Junsou Sasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 25, 1992, Ser. No. 904,475

Claims priority, application Japan, Jun. 28, 1991, 3-183654; Jul. 30, 1991, 3-212610

Int. Cl.[5] F02B *19/10*

U.S. Cl. 123—48 D **28 Claims**



1. An internal combustion engine, comprising:

an auxiliary chamber having an opening communicated to a combustion chamber of the internal combustion engine; and

an auxiliary chamber valve for opening or closing the opening of said auxiliary chamber to the combustion chamber;

wherein a timing of opening or closing said auxiliary chamber valve is set in such a manner that said auxiliary chamber valve is opened in a middle stage of a compression stroke and closed in a final stage of the compression stroke or in an initial stage of explosion stroke so as to cool a charge accepted by said auxiliary chamber.

5,201,908

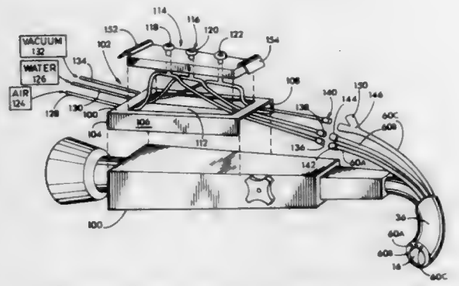
SHEATH FOR PROTECTING ENDOSCOPE FROM CONTAMINATION

Jeffrey S. Jones, Salem, Va., assignor to EndoMedical Technologies, Inc., Roakoke, Va.

Filed Jun. 10, 1991, Ser. No. 713,178

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 **5 Claims**



1. A detachable valve system for a conventional endoscope, wherein the endoscope includes an endoscope body and an elongated portion having a distal end and a proximal end, the proximal end being attached to the endoscope body, wherein the valve system is adapted for use with a protective covering for the endoscope, wherein the protective covering includes a sheath adapted to encompass the elongated portion of the endoscope, the sheath including a proximal end and a distal optical end, wherein the distal optical end is adapted to be placed adjacent the distal end of the elongated portion of the endoscope such that the endoscope retains its visual acuity when the covering is in place on the endoscope, the protective covering further including at least one axially-directed instrument manipulation access channel adapted to extend alongside and exterior to the elongated portion of the endoscope, the valve system comprising:

(a) a manifold cover adapted to detachably connect at least one valve to the endoscope body, wherein the valve communicates with the access channel of the protective covering to enable the endoscope user to perform a required task;

(b) connecting means to detachably connect the valve to the at least one access channel; and

(c) means to secure the manifold cover to the endoscope body.

5,201,909

LIQUID-COOLED CONTINUOUS CASTING MOLD

Horst Von Wyl, Duisburg; Franz-Ulrich Laumeier, Essen; Hans-Joachim Biedermann; Martin Brüggemann, both of Duisburg; Ralf Schneider, Mettmann, and Hans Siemer, Essen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 23, 1991, Ser. No. 734,437

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1990, 4023672; May 22, 1991, 4117052

Int. Cl.[5] B22D *11/04*

U.S. Cl. 164—418 **16 Claims**

1. A liquid cooled mold for the continuous casting of steel along a direction of casting comprising:

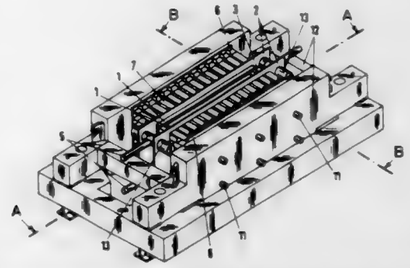
a stationary base frame;

a support plate within said base frame, said support plate comprising first and second opposed sides;

a metallic shaping wall mounted on said support plate and having a longitudinal axis in the direction of casting;

a carrier plate attached to said base frame;

a plurality of spring elements each having two ends and being uniformly distributed over and fastened at one end thereof to said first side of said support plate, said other ends of said spring elements being fastened to said carrier plate, said first side of said support plate facing away from said shaping wall, said spring elements extending in a direction transverse to said direction of casting and having a stiffness which is substantially less in said direction of casting than in the direction transverse thereto.



5,201,910

APPARATUS FOR HANDLING TREE SEEDLINGS

Eric Sheeter, C.22 Beaver Point Road, R.R.1, Fulford Harbour, B.C., Canada VOS 1CO

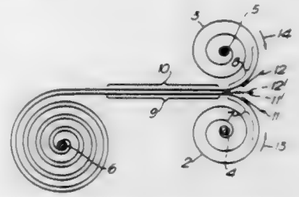
PCT No. PCT/GB90/00368, § 371 Date Nov. 8, 1991, § 102(e) Date Nov. 8, 1991, PCT Pub. No. WO90/10373, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 12, 1990, Ser. No. 776,238

Claims priority, application United Kingdom, Mar. 10, 1989, 8905469

Int. Cl.[5] B65G *1/00*

U.S. Cl. 198—347.3 **12 Claims**



1. Apparatus for handling objects comprising first and second belts (**2**, **3**) each having a working face and together defining a nip between the working faces, and means defining first (**26**) and second (**27**) path section for the first and second belts, respectively, which are directed into the nip, characterised by comprising also a third path section (**28**, **29**) for both of the belts with their working faces in face to face relationship, and by comprising a plurality of grippers (**30–35**) arranged in longitudinal sequence on each of the working faces paired so that a gripper on one belt (**31**) presses against the gripper (**35**) on the other belt and being resiliently biased towards the opposing gripper so that an object (**36**) can be gripped between a pair of opposing grippers, wherein the grippers comprise blades (**30–35**), fixed to the belts with their planes generally parallel to the belt planes and connected to the belts adjacent the blade end which is more distant from the nip in the third path section.

5,201,911

MOUNT FOR BICYCLE RACK

Douglas Lee, 8957 Sepulveda Blvd., Sepulveda, Calif. 91343

Filed Sep. 26, 1991, Ser. No. 765,667

Int. Cl.[5] B60R *9/00*

U.S. Cl. 224—321 **1 Claim**

1. A sports rack mountable on the roof of a vehicle having

parallel rails extending longitudinally along said roof, said rails

ported at said rear side, and each tubular member extend-

channel member, together with said open channel member

sponding apertures which together constitute a threaded

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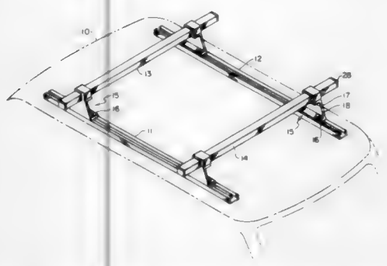
parallel rails extending longitudinally along said roof, said rails having an upwardly directed channel with inwardly directed flanges along said channel;

a pair of elongated cross members for detachably carrying a sports article;

front and rear pairs of standoffs adapted to be secured to said parallel roof rails, said pair of elongated cross members slidably secured to said pairs of standoffs, respectively, whereby said elongated cross members are critically loaded on said roof to accommodate a fixed distance between said parallel rails;



each of said standoffs includes a base member and a top member integrally joined by a side member;

a pair of anchor elements disposed beneath each said base member and adapted to be slidably received in said channel and beneath said flanges of said rails;

an open-ended receptacle carried on each standoff top member for insertably receiving an end portion of a cross member; and pI fasteners securing each of said receptacles to each of said cross members, respectively, and securing each of base members to each of said anchor elements, respectively, thereby securing said cross members to said vehicle.

5,201,912

BUMPER APPARATUS FOR AUTOMOBILE

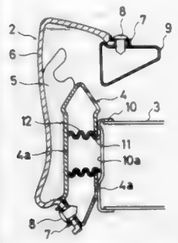
Haruhiko Terada, Obu; Shinichi Haneda, Hoi; Masataka Ohashi, Nagoya; Kiyohito Gyobu, Imizu, and Kazunari Azuchi, Himi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Keikinzoku Kabushiki Kaisha, Japan

Filed Mar. 12, 1992, Ser. No. 851,686

Claims priority, application Japan, Mar. 29, 1991, 3-066611

Int. Cl.[5] B60R *19/06*

U.S. Cl. 293—120 **10 Claims**



1. A bumper apparatus for use in an automotive vehicle in which the vehicle has a pair of laterally spaced side members positioned at the front end of the vehicle body, comprising:

a bumper reinforcement extending in a direction laterally of the vehicle and having a rectangular configuration in cross-section, including a rear side for being secured to the side members, a front side spaced from the rear side, and upper and lower sides connecting the rear and front sides;

a pair of tubular energy absorbing members, each of which is mounted within the bumper reinforcement and supported at said rear side, and each tubular member extending in a longitudinal direction from the front side to the rear side;

a support member positioned above the side members at the front end portion of the vehicle body;

a cover member having an upper end connected to the support member and a lower end connected to the lower side of the bumper reinforcement; and

an urethane absorber disposed within the cover member adjacent the front side of the bumper reinforcement.

5,201,913

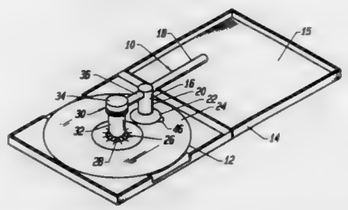
COMPACT DISC REMOVAL DEVICE

Kevin V. Vliet, 1866 Royal Ct., Walnut Creek, Calif. 94595

Filed Mar. 19, 1992, Ser. No. 853,632

Int. Cl.[5] B25J *15/06*

U.S. Cl. 294—64.1 **10 Claims**



1. A compact disc removal device for removing and transporting a compact disc, having a smooth, flat surface with a central hole from a protective storage case with a center retainer that engages and retains the disc at the central hole, the removal device comprising:

a hand implement with a handle having a suction engagement means mounted on the handle for engaging the surface of the disc without the disc or case interfering with a user's hand on the handle, the handle having further, fulcrum extension means for contacting the center retainer of the storage case when the suction engagement means engages the surface of the disc during leveraged disengagement of the disc from the storage case.

5,201,914

ELECTRICAL CONNECTOR

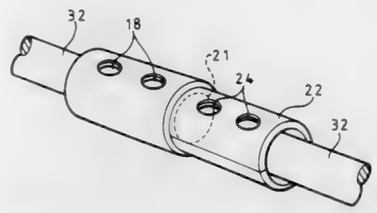
David J. Hollick, Chinnor, England, assignor to B & H (Nottm) Ltd., England

Filed Dec. 17, 1991, Ser. No. 809,881

Claims priority, application United Kingdom, Dec. 18, 1990, 9027369; Sep. 14, 1991, 9119694

Int. Cl.[5] H01R *4/30*

U.S. Cl. 439—801 **8 Claims**



1. An electrical connector for end-to-end connection of electrical conductors, said connector having a plurality of sockets, each of said sockets being adapted to receive an end of an electrical conductor, at least one of said sockets comprising

an open channel member into which the end of the conductor may be laid laterally,

a cover member which, in use, when placed over said open channel member, together with said open channel member surrounds the end of the conductor,

a sleeve member fitting, in use, around said open channel member and said cover member,

said cover member and said sleeve member having corresponding apertures which together constitute a threaded bore, and

a locking screw extending through said threaded bore to engage the conductor, thereby releasably securing the end of the conductor to said open channel member.

CHEMICAL

5,201,915

PROCESS FOR FADING DYED TEXTILE PRODUCTS

as an abrasive grit in an abrasive article, said method comprising the steps of:

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5,201,915

PROCESS FOR FADING DYED TEXTILE PRODUCTS AND FADED PRODUCTS MANUFACTURED ACCORDING TO THE PROCESS

Francesco Ricci, Santarcangelo di Romagna, Italy, assignor to Golden Trade S.r.l., Italy

Filed Jul. 11, 1991, Ser. No. 728,216
Claims priority, application Italy, Jul. 11, 1990, 20901 A/90
Int. Cl.[5] D06P *5/12*; **D06L** *3/6, 3/11*
U.S. Cl. 8—447 **21 Claims**

1. A process for fading or discoloring dyed textile products comprising the steps of:

a) charging the dyed textile products to be faded and a wax in a mixer;

b) heating the textile products and said wax in the mixer up to a temperature higher than the softening or melting point of said wax;

c) tumbling said wax and textile products together for a time long enough to secure the complete coating of a surface of the textile products;

d) cooling the textile products coated with said wax and forming a coating that is capable of being broken up to create discontinuous crevices in said coating;

e) breaking-up said coating in a random fashion and in a plurality of locations to generate discontinuous crevices;

f) treating the textile products of step (e) with an aqueous solution of a bleaching and/or discoloring chemical agent selected from the group consisting of sodium hypochlorite and potassium permanganate for a time sufficient to obtain the desired fading effect;

g) removing said bleaching and/or discoloring chemical agents from said textile products;

h) drying the textile product; and

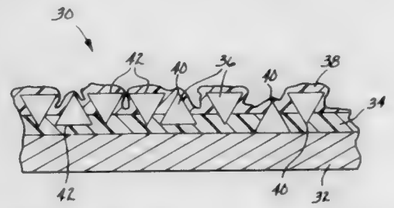
i) removing said wax from said textile products.

5,201,916

SHAPED ABRASIVE PARTICLES AND METHOD OF MAKING SAME

Todd A. Berg, Louis Park; Donley D. Rowenhorst, Maplewood; James G. Berg, Lino Lakes, all of Minn., and William K. Leonard, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 23, 1992, Ser. No. 919,179
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **34 Claims**



1. Method for preparing an abrasive particle suitable for use as an abrasive grit in an abrasive article, said method comprising the steps of:

(a) providing a dispersion comprising particles that can be converted into alpha alumina in a liquid, which liquid comprises a volatile component;

(b) providing a mold having a first generally planar surface and a second surface opposed to said first surface, said first surface having a first opening to a mold cavity having a specified shape;

(c) introducing said dispersion into said mold cavity such that no exposed surface of said dispersion extends substantially beyond said plane of said first surface of said mold;

(d) removing a sufficient portion of said volatile component of said liquid from said dispersion while said dispersion is in said mold cavity, thereby forming a precursor of an abrasive particle having a shape approximately corresponding to the shape of said mold cavity;

(e) removing said precursor of said abrasive particle from said mold cavity;

(f) calcining said removed precursor of said abrasive particle; and,

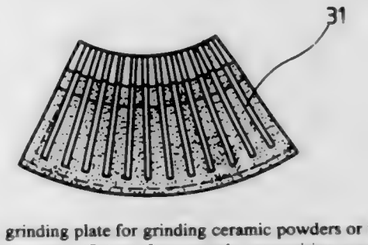
(g) sintering said calcined precursor of said abrasive particle to form said abrasive particle.

5,201,917

PLATE WITH AN ABRASION-PROOF SURFACE AND PROCESS FOR THE PRODUCTION THEREOF

Pierre Brunet, Saint Pierre D'Albigny, and Guy Maybon, Saint Jorioz, both of France, assignors to Technogenia S.A., Saint Jorioz, France

Filed Oct. 1, 1991, Ser. No. 769,450
Claims priority, application France, Oct. 11, 1990, 90 12712
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—309 **8 Claims**



1. A grinding plate for grinding ceramic powders or for the defibration and refining of paper pulp, comprising a grooved grinding surface formed of a hard abrasion-proof material, wherein:

the grinding surface is composed of the external surface of a layer of composite material formed of tungsten carbide powder bonded in a soldering alloy,

said external surface has a smooth and even mold finish,

said layer contains a regular and essentially uniform compact random distribution of tungsten carbide grains.

5,201,918

APPARATUS AND METHOD FOR THE CAPTURE AND STORAGE OF VOLATILE GASES

Arnold R. Vobach, 11114 Ashcroft, Houston, Tex. 77096

Filed Mar. 4, 1991, Ser. No. 665,039
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—43 **1 Claim**

1. A method of capturing a volatile gas comprising the steps of

releasing the gas into a zone of variable pressure and variable temperature containing a liquid quantity of polar chemical solvent which exhibits a negative deviation from Raoult's Law with respect to the gas which is to be captured;

dissolving the gas in the solvent to form a solution by pres-

chamber and being horizontally displaced above said inlet

5,201,921

propagating a shock wave to the starting material to develop

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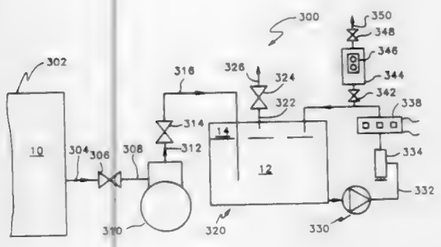
dissolving the gas in the solvent to form a solution by pressurizing and cooling the zone;

isolating the gas and solvent solution within the zone;



dissociating the gas from the solution by heating and depressurizing the zone; and

venting and capturing the gas thus dissociated from the solution.

5,201,919

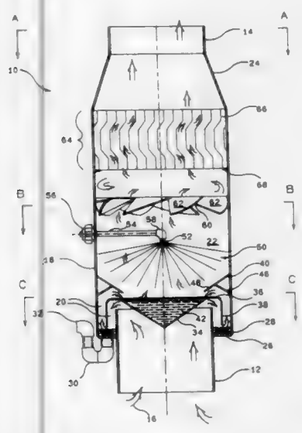
INTEGRAL IN-LINE GAS SCRUBBER

Glenn Jahn, Arvada; Frank Conner, and Dennis Graber, both of Aurora, all of Colo., assignors to Inline Scrubber Corporation, Commerce City, Colo.

Filed Dec. 17, 1991, Ser. No. 808,682

Int. Cl.[5] B01D *47/02, 47/06*

U.S. Cl. 55—223 **9 Claims**



1. A gas scrubbing device for removing contaminates contained in a gas stream, said scrubbing device comprising:

a vertical inlet port for receiving said gas stream in a first vertical direction;

main chamber means having side walls;

a first sump containing scrubbing liquid, said sump being formed between outside walls of said inlet port and said side walls of said main chamber;

first baffle means mounted inside said side walls of said main chamber and being horizontally displaced above said inlet port, said first baffle means being oriented to reverse a direction of flow of said gas stream to direct said gas stream in a second vertical direction, opposite said first vertical direction, toward said sump;

second baffle means connected to said first baffle means and extending toward said sump between said outside walls of said inlet port and said side walls of said main chamber, said second baffle being oriented to form two air passageways between said outside walls of said inlet port and said side walls wherein said direction of flow of said gas stream is reversed a second time within said two passageways, whereby said gas stream again flows in said first vertical direction after passing said second baffle;

a second sump containing scrubbing liquid, said second sump being mounted within said main chamber;

third baffle means connected to said main chamber side walls above said second baffle means, said third baffle means being oriented to reverse said flow of said gas stream and directing said gas stream toward said second sump;

spray nozzle means attached to a side wall of said main chamber for introducing a scrubbing liquid mist into said gas stream;

vertically displaced serpentine vane means connected to a top of said main chamber for removing liquid droplets from said stream of gas; and

outlet port means connected to a top of said serpentine vane means for directing said gas in said first vertical direction out of said device.

5,201,920

METHOD FOR PRODUCING AN OPTICAL FIBER OF HALIDE GLASS, PARTICULARLY AN INFRARED PERMEABLE FIBER OF FLUORIDE GLASS

Hartmut Schneider, and Armin Staudt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 594,664, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 335,686, Apr. 10, 1989, abandoned, which is a continuation of Ser. No. 122,448, Nov. 19, 1987, abandoned. This application Jan. 17, 1992, Ser. No. 823,610

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701977

Int. Cl.[5] C03B *37/025*

U.S. Cl. 65—3.11 **9 Claims**

1. A method for manufacturing optical fibers from a halide glass, said method comprising the steps of providing a molten halide glass and drawing a fiber from said molten halide glass; surrounding both the halide glass and fiber being drawn therefrom with a gas atmosphere containing an agent selected from a group consisting of SO_2, acid anhydrides which chemically react with water, acid chlorides and acid fluorides; and then removing the fiber from said gas atmosphere and inserting the fiber into an acid neutralizing gas atmosphere.

5,201,921

PROCESS FOR IDENTIFYING PLASTICS BY ADDITION OF FLUORESCENT DYE

Klaus Luttermann, Lohmar; Uwe Claussen; Aziz El Sayed, both of Leverkusen, and Reinhard Riess, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 756,339

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1990, 4029167

Int. Cl.[5] B07C *5/34;* **B29B** *17/02;* **C08J** *3/20, 11/04*

U.S. Cl. 8—506 **11 Claims**

1. Process for sorting plastic waste or plastic refuse, wherein plastics which have been rendered identifiable by adding 5 to 10,000 ppb of a fluorescent marker to the plastic during or after the manufacture of the plastic are classified according to each type of plastic based on the fluorescence radiation emitted from the plastic.

5,201,922

DISPERSE DYE MIXTURE AND DYEING METHOD EMPLOYING IT: ORANGE AND YELLOW AZO DISPERSE DYE MIXTURE FOR POLYESTER FIBERS

Kouichi Seto, and Riyouichi Sekioka, both of Kitakyushu, Japan, assignors to Hoechst Mitsubishi Kasei Co., Ltd., Tokyo, Japan

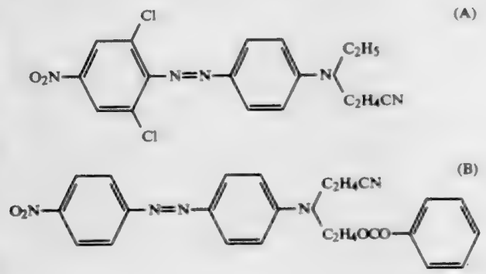
Filed Dec. 12, 1991, Ser. No. 805,676

Claims priority, application Japan, Dec. 18, 1990, 2-403391

Int. Cl.[5] C09B *67/22;* **D06P** *1/18*

U.S. Cl. 8—639 **10 Claims**

1. A disperse dye mixture comprising from 20 to 80% by weight of an orange disperse dye of the following formula A) and from 20 to 80% by weight of an orange disperse dye of the following formula (B), as dye components:



5,201,923

STOICHIOMETRIC B1-TYPE TANTALUM NITRIDE AND A SINTERED BODY THEREOF AND METHOD OF SYNTHESIZING THE B1-TYPE TANTALUM NITRIDE

Tsutomu Mashimo; Minoru Nishida, both of Kumamoto; Susumu Yamaya, and Hisashi Yamasaki, both of Kawasaki, all of Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Filed Jul. 25, 1991, Ser. No. 735,923

Claims priority, application Japan, Jul. 27, 1990, 2-199622; Apr. 30, 1991, 3-124447

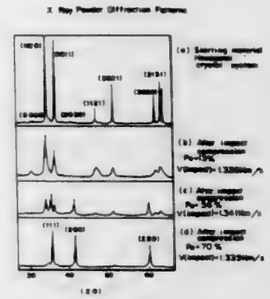
Int. Cl.[5] C01B *21/06;* **C04B** *35/58*

U.S. Cl. 23—293 R **19 Claims**

1. A method of synthesizing a stoichiometric cubic tantalum nitride, comprising the steps of:

providing a starting material selected from the group consisting of a powder mass, a compressed powder mass and a sintered mass comprising a stoichiometric hexagonal tantalum nitride having a porosity of 30% or above,

propagating a shock wave to the starting material to develop a shock pressure of about 5 GPa or more, and



converting the hexagonal tantalum nitride in the starting material to a cubic tantalum nitride.

5,201,924

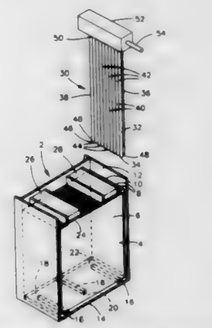
FILLING MAT-IMMOBILIZED-ELECTROLYTE BATTERIES

Renard E. Mix, Yorktown, and Robert L. Galyen, Jr., Noblesville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1991, Ser. No. 753,487

Int. Cl.[5] H01M *10/44*

U.S. Cl. 29—623.5 **10 Claims**



1. In a method of assembling a mat-immobilizing-electrolyte Pb-acid storage battery comprising the principle steps of assembling a galvanic cell element containing compressible, absorbent mats sandwiched between positive and negative polarity electrodes, compressing said element so as to compress said mats inserting said compressed element into a container so as to position at least one face of said element in close proximity to a wall of said container, and impregnating said element with sufficient electrolyte to coat substantially the entire internal surface area of said mat and said electrodes, the improvement comprising:

inserting an injection nozzle into said container for directing said electrolyte into said container between said face and said wall to the underside of said element without first wetting said face with said electrolyte; and

injecting said electrolyte into said container beneath said element and upwardly into said element so as to displace air and internally generated gases in said element upwardly and out the top of said element.

5,201,925

b) a second coating of an alloy of about 80 weight-percent

5,201,928

means for collecting the flakes from the substrate after the

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5,201,925
DEVICE FOR TRANSCUTICULAR APPLICATION OF ACTIVE SUBSTANCES TO PLANTS

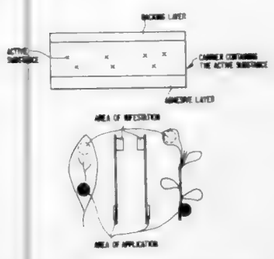
Hanshelmut Itzel, Gau-Algesheim; Bernd Zierenberg, Bingen; Christo Drandarevski, Ingelheim am Rhein, and Wilfried Heupt, Malborn, all of Fed. Rep. of Germany, assignors to Celaflor GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 727,362, Jul. 9, 1991, abandoned, which is a continuation of Ser. No. 601,604, Oct. 23, 1990, abandoned, which is a continuation of Ser. No. 453,176, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 74,277, Jul. 16, 1987, abandoned. This application Mar. 2, 1992, Ser. No. 844,866

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624074

Int. Cl.[5] A01B *79/02*

U.S. Cl. 47—58 **10 Claims**



1. A method for transcuticular administration to a plant of a substance systemically active in the plant, which comprises adhering to the plant a device in the form of a laminate including a systemically active substance to be released to the plant in metered quantities, said laminate comprising in order
(1) a backing layer impervious to the active substance,
(2) an internal active substance reservoir layer formed of a carrier matrix in the form of a polymeric or absorbent material layer having incorporated therein said active substance and
(3) an outer adhesive layer adherable to the plant and permeable to the active substance, said laminate being adhered to said plant through contact with said adhesive layer, and releasing said active substance in metered quantities from said reservoir layer through said adhesive layer to said plant.

5,201,926
METHOD FOR THE PRODUCTION OF COATED GLASS WITH A HIGH TRANSMISSIVITY IN THE VISIBLE SPECTRAL RANGE AND WITH A HIGH REFLECTIVITY FOR THERMAL RADIATION

Joachim Szczyrbowski, Goldbach; Anton Dietrich, Wiesenfelden, and Klaus Hartig, Ronneburg, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

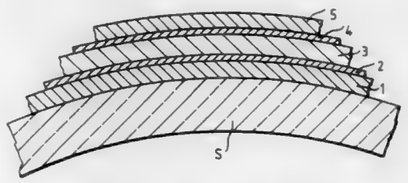
Continuation-in-part of Ser. No. 115,264, Oct. 30, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 230,681

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726488

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—60.2 **9 Claims**

1. Method for the production of coated glass with a high transmissivity in the visible spectral range and with a low surface electrical resistivity and a high reflectivity for thermal radiation by cathode sputtering of coatings on a substrate consisting of mineral glass, the cathode sputtering comprising providing on the mineral glass:
a) a first coating comprising at least one oxide from the group consisting of tine oxide, silicon dioxide, aluminum oxide, tantalum oxide and zirconium oxide,
b) a second coating of an alloy of about 80 weight-percent nickel and about 20 weight-percent of chromium,
c) a third coating of silver or silver alloy containing at least 50 weight-percent of silver,
d) a fourth coating of the alloy forming the second coating, and



e) a fifth coating of an oxide form the oxides forming the group of said first coating,
the substrate then being heated with the coatings a) through e) on it to at least the softening temperature of the glass, plastically shaped in the heated state, and cooled in the shaped state.

5,201,927
METHOD OF PRODUCING THE OPTICAL ELEMENT

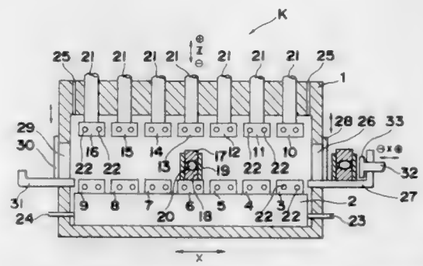
Shoji Nakamura; Takasi Inoue, both of Hirakata; Masaaki Sunohara, Nishinomiya, and Tadao Shioyama, Sakurai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 782,363, Oct. 24, 1991. This application Apr. 9, 1992, Ser. No. 865,586

Claims priority, application Japan, Oct. 26, 1990, 2-288688; Jun. 4, 1991, 3-132583; Jul. 10, 1991, 3-169949

Int. Cl.[5] C03B *11/00*

U.S. Cl. 65—64 **14 Claims**



1. A method of producing an optical element, comprising:
a first step of assembling a molding block by mounting upper and lower molding dies in a sleeve die with a glass blank disposed between said upper and lower molding dies and one of said upper and lower molding dies being slidable within said sleeve die;
a second step of heating said molding block from above and below in a chamber having a non-oxidizing atmosphere;
a third step of deforming said glass blank in said chamber by pressing the slidable one of said upper and lower molding dies to slide in said sleeve die and press against said glass blank, and by stopping the sliding of said slidable one of said upper and lower molding dies at a predetermined position prior to said slidable one of said upper and lower molding dies contacting the other of said upper and lower molding dies, so as to cause the glass blank to be deformed into an optical element having an optically functional portion and a heat insulating portion formed about a periphery of said optically functional portion; and
a fourth step of cooling said molding block from above and below in said chamber.

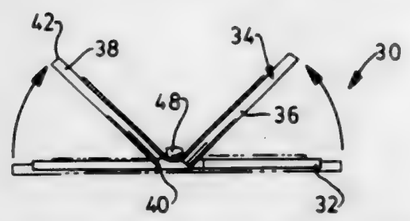
5,201,928
GLASS SHEET FORMING METHOD AND APPARATUS

Karl-Heinz Dicks, Simmerath, Fed. Rep. of Germany, and Eustace H. Mumford, Ottawa Lake, Mich., assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Jun. 20, 1991, Ser. No. 718,001

Int. Cl.[5] C03B *23/023*

U.S. Cl. 65—106 **39 Claims**



1. A glass sheet forming apparatus for forming a heated glass sheet, the forming apparatus comprising:
a forming station including;
a roller conveyor defined by a plurality of first conveyor rolls and also a plurality of second conveyor rolls; said first and second conveyor rolls being interposed with one another; each of said first conveyor rolls being mounted in a respective vertical plane for conveying the glass sheet in a direction of conveyance in a horizontal plane; each of said second conveyor rolls also being mounted in a respective vertical plane for conveying the glass sheet in a horizontal direction of conveyance; each of said second conveyor rolls including independent first and second roll portions; each of said roll portions having inward and outward ends; at least one of said first and second roll portions being vertically movable to establish movement of said at least one roll portions with respect to the horizontal plane; and
a first actuator for moving said one of said first and second roll portions so that part of said on roll portions are elevated above said first conveyor rolls whereby the roller conveyor becomes non-planar, as said one roll portions of said second conveyor rolls are moved vis a vis said first conveyor rolls, sand the heated glass sheet is formed as a result of the non-planar conveyor shape and upward action of said second conveyor rolls.

5,201,929
APPARATUS FOR PRODUCING FLAKES OF GLASS

Toshiaki Mizuno; Takashi Yamagishi; Koji Yokoi, and Kazuhiro Doushita, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

PCT No. PCT/JP91/00291, § 371 Date Jul. 31, 1991, § 102(e) Date Jul. 31, 1991

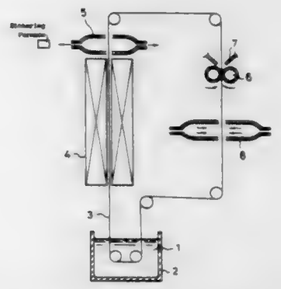
PCT Filed Mar. 5, 1991, Ser. No. 741,496

Claims priority, application Japan, Mar. 9, 1990, 2-58519; Jun. 4, 1990, 2-145959; Jun. 11, 1990, 2-152355; Jul. 2, 1990, 2-174937

Int. Cl.[5] C03B *37/005*

U.S. Cl. 65—142 **2 Claims**

1. An apparatus for producing flakes, comprising,
a substrate in a form of loop, said substrate being rotated endlessly,
means for applying a solution containing an organic metal compound to the substrate,
means for drying the solution on the substrate applied by the applying means, said drying means being situated near the substrate and drying the solution on the substrate to form a film of the organic metal compound, said film, while drying, shrinking and forming flakes by cracking of the film,
means for collecting the flakes from the substrate after the flakes are formed by the drying means, and



means for washing and drying the substrate after the flakes were collected so that the flakes are continuously formed while the substrate is endlessly moving.

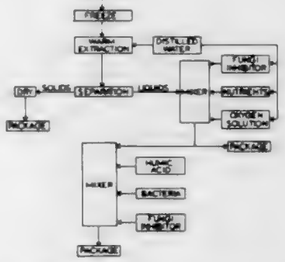
5,201,930
PLANT GROWTH PRODUCT

William E. Campbell, Morehead City, N.C., assignor to Aqua-10 Corporation, Beaufort, N.C.

Filed Sep. 30, 1991, Ser. No. 769,135

Int. Cl.[5] C05F *11/00*

U.S. Cl. 71—23 **9 Claims**



1. A seaweed-containing plant stimulant product, comprising:
(a) an extract of seaweed obtained by a process comprising freezing a dried seaweed powder to cause cellular rupture and retain biological activity, and warming said extract to allow extraction of the seaweed, wherein about 1 lb of dried seaweed is added to about 22–176 lb of water to prepare said extract; and
(b) an oxygen-containing liquid prepared from a peroxide and aloe, containing about 10% aloe and about 10% peroxide by volume, wherein the peroxide comprises about 0.25% of the product.

5,201,931

deuterium, and when R^7 is oxo, it maybe linked to the

radical selected from the group consisting of 2-tetrahy-

the following radicals; halogen, nitro, cyano,

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5,201,931

ABSCISIC ACID-RELATED PLANT GROWTH REGULATORS - GERMINATION PROMOTERS

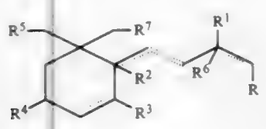
Suzanne R. Abrams, and Lawrence V. Gusta, both of Saskatoon, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the National Research Council of Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 280,102, Dec. 1, 1988, abandoned. This application Dec. 1, 1989, Ser. No. 444,704

Int. Cl.[5] **A01N** *31/04, 43/08, 35/04*

U.S. Cl. 504—291 **6 Claims**

1. A method for enhancing germination and growth of plants which comprises treating plant parts used in propagation with a solution comprising an effective amount of a compound having the following general formula:



(I)

wherein

R is carboxyl, aldehyde, hydroxy, hydroxyloweralkyl, alkoxyloweralkyl, loweralkoxycarbonyl, loweracyloxyloweralkyl, acetylloweralkyl, loweralkanoyl, loweralkylamino, diloweralkylamino, loweralkoxy, loweracyloxy, loweralkylthio, loweralkyl sulphonyl, loweralkyl sulphinyl, amino, carbonyl, halogen, thio, phosphate, sulfoxide, sulfone or deuterium;

R^1 is loweralkyl hydrogen, oxo, hydroxyloweralkyl, loweralkoxy, halogen, thio, sulfoxide, sulfone, phosphate or deuterium;

R^2 may be hydrogen, oxo, hydroxy, halogen, thio, phosphate, sulfoxide, sulfone or deuterium;

R^3 is carboxyl, aldehyde, loweralkyl, hydroxyloweralkyl, alkoxyloweralkyl, loweralkoxycarbonyl, loweralyloxyloweralkyl, acetylloweralkyl, loweralkanyol, loweralkylamino, diloweralkylamino, loweralkoxy, loweracyloxy, loweralkylthio, loweralkyl sulphonyl, loweralkyl sulphinyl, or carbonyl;

and when R^2 is oxo or thio, R^2 maybe linked to both C_1 and C_2 carbon atoms to form an epoxy or a thioepoxy ring; R^4 is hydrogen, oxo, halogen, thio, phosphate, sulfoxide, sulfone, deuterium, hydroxy, loweralkylsiloxane, carboxyl, aldehyde, hydroxyloweralkyl, alkoxyloweralkyl, loweralkoxycarbonyl, loweracyloxyloweralkyl, acetylloweralkyl, loweralkanoyl, loweralkylamino, diloweralkylamino, loweralkoxy, loweracyloxy, loweralkylthio, loweralkyl sulphonyl, loweralkyl sulphinyl, amino, carbonyl, cycloalkyl or cycloalkoxy having from 4 to 6 carbon atoms which is optionally substituted by loweralkyl, halogen, oxygen, hydroxy or loweralkoxy;

R^5 is carboxyl, hydroxy, aldehyde, hydroxyloweralkyl, alkoxyloweralkyl, loweralkoxycarbonyl, loweracyloxyloweralkyl, acetylloeralkyl, acetoxyloweralkyl, loweralkanoyl, loweralkylamino, diloweralkylamino, loweralkoxy, loweracyloxy, loweralkylthio, loweralkyl sulphonyl, loweralkyl sulphinyl, amino, carbonyl, halogen, hydrogen oxo, thio, phosphate, sulfoxide, sulfone or deuterium, and when R^5 is oxo, it maybe linked to the carbon atom bearing R^3;

R^6 is hydrogen, oxo, hydroxyloweralkyl, loweralkoxy, halogen, thio, sulfoxide, sulfone, phosphate or deuterium;

R^7 may be carboxyl, hydroxy, aldehyde, hydroxyloweralkyl, alkoxyloweralkyl, loweralkoxycarbonyl, loweracyloxyloweralkyl, acetylloweralkyl, acetoxyloweralkyl, loweralkanoyl, loweralkylamino, diloweralkylamino, loweralkoxy, loweracyloxy, loweralkylthio, loweralkyl sulphonyl, loweralkyl sulphinyl, amino, carbonyl, halogen, hydrogen, oxo, thio, phosphate, sulfoxide, sulfone or deuterium, and when R^7 is oxo, it maybe linked to the carbon atom bearing R^3; and wherein

the dotted lines may each represent a single bond and the double dotted line represents either a double bond or a triple bond,

R^1 or R^6 is absent if the dotted line adjacent to R^1 and R^6 is a single bond,

R_2 is absent if either of the dotted lines adjacent to R_2 is a single bond,

the alkyl group bearing R_7 is absent if the dotted line adjacent to the alkyl group bearing R_7 is a single bond.

and isomers and functional derivatives thereof, in admixture with an acceptable agricultural carrier comprising an agriculturally acceptable carrier cation when R, R^1, R^2, R^4, R^5, R^6 or R^7 are phosphate, sulfoxide or sulfone.

5,201,932

CARBOXAMIDES

Volker Maywald, Ludwigshafen; Wolfgang Freund, Neustadt; Gerhard Hamprecht, Weinheim; Thomas Kuekenhoehner; Peter Plath, both of Frankenthal; Bruno Wuerzer, Otterstadt, and Karl-Otto Westphalen, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

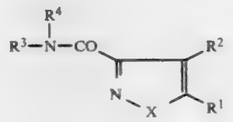
Continuation of Ser. No. 585,174, Sep. 20, 1990, abandoned. This application May 4, 1992, Ser. No. 877,365

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931627; Oct. 11, 1989, 3933898

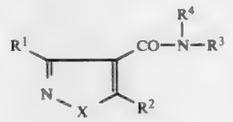
Int. Cl.[5] **A01N** *43/40;* **C07D** *413/02, 261/06*

U.S. Cl. 504—271 **27 Claims**

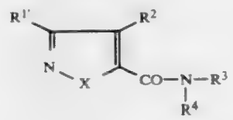
1. A carboxamide of the formula Ia, Ic or Id



Ia



Ic



Id

where

X is oxygen;

R^1 is

hydrogen, halogen, C_1–C_6-alkyl which may carry from one to five halogen atoms or a cyano radical or one to two C_1–C_4-alkoxy groups;

C_1–C_4-alkoxy or C_1–C_4-alkylthio;

benzyl which may be monosubstituted, disubstituted or trisubstituted by C_1–C_4-alkyl, partially or fully halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, cyano or nitro;

phenyl which may also carry from one to three of the following radicals: cyano, nitro, halogen, C_1–C_6-alkyl, partially or fully halogenated C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkylthio;

phenoxy or phenylthio, each of which may be monosubstituted, disubstituted or trisubstituted by C_1–C_4-alkyl, partially or fully halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, halogen, cyano or nitro;

a 5- to 6-membered saturated or aromatic heterocyclic radical selected from the group consisting of 2-tetrahydrofuranyl, 3-tetrahydrofuranyl, 2-tetrahydrothienyl, 3-tetrahydrothienyl, 2-tetrahydropyranyl, 3-tetrahydropyranyl, 4-tetrahydropyranyl, 2-furanyl, 3-furanyl, 2-thienyl, or 3-thienyl, which may carry one or two of the following substituents: halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy and C_1–C_3-alkoxycarbonyl;

C_3–C_6-cycloalkyl-substituted C_1–C_6-alkyl;

C_2–C_6-alkenyl whose double bond may be epoxidized, or C_2–C_6-alkynyl, it being possible for both groups to be monosubstituted, disubstituted or trisubstituted by halogen, C_1–C_3-alkoxy and/or monosubstituted by cyclopropyl or phenyl, it also being possible for the phenyl radical to carry up to three of the following substituents: halogen or C_1–C_4-alkyl;

C_3–C_8-cycloalkyl or C_3–C_6-cycloalkenyl, it being possible for both groups to be monosubstituted, disubstituted or trisubstituted by C_1–C_4-alkyl or halogen;

R^1 is

C_3–C_8-cycloalkyl-substituted C_1–C_6-alkyl;

C_2–C_6-alkenyl whose double bond may be epoxidized, or C_2–C_6-alkynyl, it being possible for both groups to be monosubstituted, disubstituted or trisubstituted by halogen, C_1–C_3-alkoxy and/or monosubstituted by cyclopropyl or phenyl, it also being possible for the phenyl radical to carry up to three of the following substituents: halogen or C_1–C_4-alkyl;

C_3–C_6-cycloalkenyl, which may be monosubstituted, disubstituted or trisubstituted by halogen or C_1–C_4-alkyl;

R^2 is

formyl, 4,5-dihydrooxazol-2-yl, $COYR^5$ or $CONR^6R^7$, where

Y is oxygen or sulfur;

R^5 is

hydrogen;

C_1–C_6-alkyl which may carry from one to five halogen atoms and/or up to three hydroxyl and/or C_1–C_4-alkoxy groups and/or one of the following radicals;

cyano,

C_1–C_4-alkoxy-C_2–C_4-alkoxy,

C_1–C_3-alkylthio,

C_1–C_3-alkylamino, di(C_1–C_3)-alkylamino, C_3–C_6-cycloalkylamino or di(C_3–C_6)-cycloalkylamino,

trimethylsilyl,

C_1–C_3-alkylsulfinyl or C_1–C_3-alkylsulfonyl,

carboxyl, C_1–C_3-alkoxycarbonyl, C_1–C_3-alkoxycarbonyl-C_1–C_3-alkoxy or C_1–C_3-alkoxycarbonyl-C_1–C_3-alkoxy-C_1–C_3-alkoxycarbonyl,

di(C_1–C_3)-alkylaminocarbonyl,

di(C_1–C_3)-alkoxyphosphonyl,

C_1–C_6-alkaneiminoxy or C_5–C_6-cyloalkaneiminoxy,

N-phthalimido, N-succinimido, benzyloxy, benzoyl, it being possible for these cyclic radicals to additionally carry from one to three of the following groups: halogen, C_1–C_3alkyl or C_1–C_3-alkoxy,

phenyl, which may also carry up to three of the following substituents: halogen, nitro, cyano, C_1–C_3-alkyl, partially or fully halogenated C_1–C_3-alkyl, C_1–C_3-alkoxy or partially or fully halogenated C_1–C_3-alkoxy;

$—CR^{10}=N—R^{11}$, where

R^{10} is hydrogen or C_1–C_6-alkyl and

R^{11} is C_1–C_6-alkoxy, C_3–C_6-alkenyloxy or C_3–C_6-alkynyloxy, each of which may carry up to 3 halogen atoms and/or a phenyl radical with, if desired, up to three of the following radicals: halogen, nitro cyano, C_1–C_3-alkyl or C_1–C_3-alkoxy; phenoxy, which may also carry up to three of the following substituents: halogen, nitro, cyano, C_1–C_3-alkyl or C_1–C_3-alkoxy; C_1–C_6-alkylamino, di(C_1–C_6)alkylamino or phenylamino, it being possible for the aromatic ring to additionally carry up to three of the following radicals; halogen, nitro, cyano, C_1–C_3-alkyl or C_1–C_3-alkoxy;

C_3–C_8-cycloalkyl;

C_3–C_6-alkenyl, C_5–C_6-cycloalkyenyl, C_3–C_6-alkynyl, it being possible for these radicals to carry one of the following groups: hydroxyl, halogen, C_1–C_4-alkoxy or phenyl, it being possible for the aromatic radical to itself carry from one to three of the following groups: halogen, nitro, cyano, C_1–C_4-alkyl,

phenyl, which may carry from one to three of the following groups: halogen, nitro, cyano, C_1–C_4-alkyl, partially or fully halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or fully halogenated C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl;

N-phthalimido, tetrahydrophthalimido, succinimido, maleiimido;

2,2-dimethyl-1,3-dioxolan-4-ylmethyl or 1,3-dioxolan-2-on-4-ylmethyl;

in the case where Y=O: one equivalent of a cation from the group comprising the alkali and alkaline earth metals, manganese, copper, iron, ammonium and ammonium which is substituted by up to 4 C_1–C_3-alkyl groups; or

$—N=CR^8R^9$, where

R^8 and R^9 are hydrogen; C_1–C_4-alkyl, which may be unsubstituted or partially or fully halogenated and may carry a C_1–C_3-alkoxy or phenyl radical, it being possible for the aromatic radical to itself also be monosubstituted, disubstituted or trisubstituted by halogen, nitro, cyano, C_1–C_3-alkyl, partially or fully halogenated C_1–C_3-alkyl, C_1–C_3-alkoxy or partially or fully halogenated C_1–C_3-alkoxy; C_3–C_6-cycloalkyl; C_1–C_4-alkoxy; furanyl or phenyl, which may additionally carry up to three of the following substituents: halogen, nitro, cyano, C_1–C_3-alkyl, partially or fully halogenated C_1–C_3-alkyl, C_1–C_3-alkoxy or partially or fully halogenated C_1–C_3-alkoxy; or R^8 and R^9 together are a methylene chain having from 4 to 7 members;

—W—Z, where W is C_2–C_4-alkylene, ethoxyethylene, but-2-enylene or but-2-ynylene, and Z is a molecular moiety which is bonded to W in the ω-position and is the same as that linked to W in the α-position of W;

R^6 is

hydrogen, C_1–C_6-alkyl or C_3–C_6-cycloalkyl, and

R^7 is

hydrogen, C_1–C_6-alkyl, $—C(OR^{12})=N—H$ or $—C(OR^{12})=N—(C_1$–$C_4)$-alkyl, where R^{12} is C_1–C_4-alkyl, or

R^6 and R^7 together are methylene having 4 or 5 members;

R^3 is

hydrogen;

C_1–C_6-alkyl, which may carry from one to three of the following substituents: hydroxyl, halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio or di(C_1–C_4)-alkylamino;

C_3–C_8-cycloalkyl, which may be monosubstituted, disubstituted or trisubstituted by halogen, C_1–C_4-alkyl or partially or fully halogenated C_1–C_4-alkyl;

R^4 is

hydrogen, hydroxyl, C_1–C_4-alkoxy;

C_1–C_6-alkyl, which may carry from one to three of the following radicals: halogen, cyano, C_1–C_4-alkoxy, partially or fully halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or fully halogenated C_1–C_4-alkylthio, di-C_1–C_4-alkylamino, C_3–C_8-cycloalkl or phenyl, it being poossible for the phenyl ring to itself carry from one to three of the following radicals; halogen, cyano, nitro, C_1–C_4-alkyl, partially or fully halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or fully halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio or partially or fully halogenated C_1–C_4-alkylthio;

2-Chloro-N-[1-(2,4,6-trimethylphenyl)ethenyl]aceta-

nylthio, where these groups may carry from one to three

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C_3–C_6-cycloalkyl, which may carry from one to three of the following radicals: halogen, nitro, cyano, C_1–C_6-alkyl, partially or fully halogenated C_1–C_6-alkyl, C_1–C_4-alkoxy or partially or fully halogenated C_1–C_4-alkoxy;

C_3–C_6-alkenyl or C_3–C_6-alkynyl, each of which may be monosubstituted, disubstituted or trisubstituted by halogen and/or monosubstituted by phenyl, it being possible for the phenyl radical to itself carry from one to three of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, halogen, cyano or nitro;

di(C_1–C_4)-alkylamino;

phenyl, which may carry from one to four of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, halogen, nitro, cyano, formyl, C_1–C_4-alkanoyl, C_1–C_4-haloalkanoyl or C_1–C_4-alkoxycarbonyl;

naphthyl, which maybe monosubstituted, disubstituted or trisubstituted by C_1–C_4-alkyl or halogen; or

R^3 and R^4 together are methylene having from 4 to 7 members which maybe interrupted by oxygen, sulfur or N-methyl, or are —$(CH_2)_3$—CO—,

R^3 and R^4 in the compounds Ia or Ic not simultaneously being hydrogen if

R^1 is hydrogen, methyl or phenyl and R^2 is $CONH_2$, COOH or $COOCH_3$, or if

R^1 is $CH(OCH_2CH_3)_2$ and R^2 is $CONH_2$,

and the agriculturally acceptable salts of the compounds Ia, Ic, or Id.

5,201,933

SAFENING HERBICIDAL BENZOIC ACID DERIVATIVES

Knudt J. Miller, Milton, Wis., and Brett H. Bussler, St. Louis Park, Minn., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 486,470, Feb. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 462,197, Jan. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 369,461, Jun. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 226,928, Aug. 1, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 596,453

Int. Cl.[5] **B21D** *17/04, 15/04, 3/02, 19/00*

U.S. Cl. 504—104 **83 Claims**

1. Composition consisting essentially of

(a) a herbicidally-effective amount of one or more compounds of the formula

I

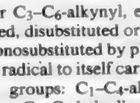
agriculturally-acceptable salts thereof wherein

R_3 is halogen, C_{1-5} alkoxy or C_{1-4} alkyl-substituted amino and

n is 0–5 and

(b) an antidotally-effective amount of

(i) a compound of the formula



II

wherein R can be selected from the group consisting of haloalkyl; haloalkenyl; alkyl; alkenyl; cycloalkyl; cycloalkylalkyl; halogen; hydrogen; carboalkoxy; N-alkenylcarbamylalkyl; N-alkenylcarbamyl; N-alkyl-N-alkynylcarbamyl; N-alkyl-N-alkynylcarbamylalkyl; N-alkenylcarbamylalkoxyalkyl; N-alkyl-N-alkynylcarbamylalkoxyalkyl; alkynoxy; haloalkoxy; thiocyanatoalkyl; alkenylaminoalkyl; alkylcarboalkyl; cyanoalkyl; cyanatoalkyl; alkenylaminosulfonoalkyl; alkylthioalkyl; haloalkylcarbonyloxyalkyl; alkoxycarboalkyl; haloalkenylcarbonyloxyalkyl; hydroxyhaloalkyloxyalkyl; hydroxyalkylcarboalkyoxyalkyl; hydroxyalkyl; alkoxysulfonoalkyl; furyl, thienyl; alkyldithiolenyl; thienalkyl; phenyl and substituted phenyl wherein said substituents can be selected from halogen, alkyl, haloalkyl, alkoxy, carbamyl, nitro, carboxylic acids and their salts, haloalkylcarbamyl; phenylalkyl; phenylhaloalkyl; phenylalkenyl; substituted phenylalkenyl wherein said substituents can be selected from halogen, alkyl, alkoxy, halophenoxy, phenylalkoxy; phenylalkylcarboxyalkyl; phenylcycloalkyl; halophenylalkenoxy; halothiophenylalkyl; halophenoxyalkyl; bicycloalkyl; alkenylcarbamylpyridinyl; alkynylcarbamylpyridinyl; dialkenylcarbamylbicycloalkenyl; alkynylcarbamylbicycloalkenyl;

R_1 and R_2 can be the same or different and can be selected from the group consisting of alkenyl; haloalkenyl; hydrogen; alkyl; haloalkyl; alkynyl; cyanoalkyl; hydroxyalkyl; hydroxyhaloalkyl; haloalkylcarboxyalkyl; alkylcarboxyalkyl; alkoxycarboxyalkyl; thioalkylcarboxyalkyl; alkoxycarboalkyl; alkylcarbamyloxyalkyl; amino; formyl; haloalkyl-N-alkylamido; haloalkylamido; haloalkylamidoalkyl; haloalkyl-N-alkylamidoalkyl; haloalkylamidoalkenyl; alkylimino; cycloalkyl; alkylcycloalkyl; alkoxyalkyl; alkylsulfonyloxyalkyl; mercaptoalkyl; alkylaminoalkyl; alkoxycarboalkenyl; haloalkylcarbonyl; alkylcarbonyl; alkenylcarbamyloxyalkyl; cycloalkylcarbamyloxyalkyl; alkoxycarbonyl; haloalkoxycarbonyl; halophenylcarbamyloxyalkyl; cycloalkenyl; phenyl; substituted phenyl wherein said substituents can be selected from alkyl, halogen, haloalkyl, alkoxy, haloalkylamido, phthalamido, hydroxy, alkylcarbamyloxy, alkenylcarbamyloxy, alkylamido, haloalkylamido or alkylcarboalkenyl; phenylsulfonyl; substituted phenylalkyl wherein said substituents can be selected from halogen or alkyl; dioxyalkylene, halophenoxyalkylamidoalkyl; alkylthiodiazolyl; piperidyl; piperidylalkyl; dioxolanylalkyl, thiazolyl; alkylthiazolyl; benzothiazolyl; halobenzothiazolyl; furyl; alkyl-substituted furyl; furylalkyl; pyridyl; alkylpyridyl; alkyloxazolyl; tetrahydrofurylalkyl; 3-cyano, thienyl; alkyl-substituted thienyl; 4,5-polyalkylenethienyl; α-haloalkylacetamidophenylalkyl; α-haloalkylacetamidonitrophenylalkyl; α-haloalkylacetamidohalophenylalkyl; cyanoalkenyl;

R_1 and R_2 when taken together can form a structure consisting of piperidinyl; alkylpiperidinyl; pyridyl; di- or tetrahydropyridinyl; alkyltetrahydropyridyl; morpholyl; alkylmorpholyl; azabicyclononyl; diazacycloalkanyl; benzoalkylpyrrolidinyl; oxazolidinyl; perhydrooxazolidinyl; alkyloxazolidyl; pyrimidinyloxazolidinyl; benzooxazolidinyl; C_{3-7} spirocycloalkyloxazolidinyl; alkylaminoalkenyl; alkylideneimino; pyrrolidinyl; piperidonyl; perhydroazepinyl; perhydroazocinyl; pyrazolyl; dihydropyrazolyl; piperazinyl; perhydro-1,4-diazepinyl; quinolinyl; isoquinolinyl; dihydro-, tetra- hydro- and perhydroquinolyl- or -isoquinolyl; indolyl and di- and perhydroindolyl and said combined R_1 and R_2 members substituted with those independent R_1 and R_2 radicals enumerated above; or

(ii) one of the following compounds

α-[(Cyanomethoxy)imino]benzeneacetonitrile,

α-[(1,3-Dioxolan-2-yl-methoxy)imino]benzeneacetonitrile,

O-[1,3-Dioxolan-2-ylmethyl]-2,2,2-trifluoromethyl-4′-chloroacetophenone oxime,

Benzenemethamine, N-[4-(dichloromethylene]-1,3-dithiolan-2-ylidene]-α-methyl, hydrochloride,

Diphenylmethoxy acetic acid, methyl ester,

1,8-Naphthalic anhydride,

4,6-Dichloro-2-phenyl-pyrimidine,

2-Chloro-N-[1-(2,4,6-trimethylphenyl)ethenyl]acetamide,

Ethylene glycol acetal of 1,1-dichloroacetone.

5,201,934

CARBOXAMIDES AND THEIR USE AS HERBICIDES

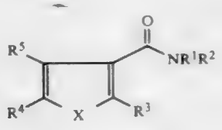
Peter Muenster, Neulussheim; Gerd Steiner, Kirchheim; Wolfgang Freund, Neustadt; Bruno Wuerzer, Otterstadt, and Karl-Otto Westphalen, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 3, 1990, Ser. No. 592,287

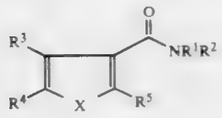
Int. Cl.[5] **A01N** *57/24, 43/10;* **C07D** *333/04*

U.S. Cl. 504—289 **15 Claims**

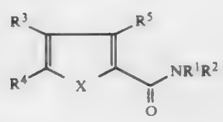
1. A carboxamide of the formula Ia, Ib and Ic



Ia



Ib



Ic

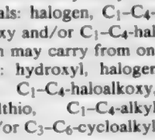
where

X is sulfur;

R^1 is hydrogen;

C_3–C_8-cycloalkyl which may carry from one to three of the following radicals: halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy and/or C_1–C_4-haloalkoxy;

C_1–C_6-alkyl which may carry from one to three of the following radicals: hydroxyl, halogen, C_3–C_8-cycloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino and/or C_3–C_6-cycloalkylamino and/or a radical



where

R is cyano; nitro; halogen; C_1–C_4-alkyl; C_1–C_4-haloalkyl; C_1–C_4-alkoxy; C_1–C_4-haloalkoxy; C_2–C_4-alkynyloxy; C_1–C_4-alkylthio; C_1–C_4-haloalkylthio; C_3–C_6-alkoxycarbonylalkoxy and/or C_1–C_4-alkoxycarbonyl and

m is 0, 1, 2 or 3, and the radicals R may be different when m is 2 or 3;

R^2 is hydroxy; C_1–C_4-alkoxy; C_2–C_6-cyanoalkyl;

C_3–C_6-alkenyl, C_3–C_6-alkynyl, phenyl or naphthyl, where these groups may carry from one to three of the radicals stated for R; or

one of the organic groups stated for R^1

R^3 and R^4 are each nitro; cyano; halogen; amino which carries one or two C_1–C_4-alkyl groups and/or a C_1–C_4-alkylcarbonyl group;

C_1–C_4-alkoxy or C_1–C_4-alkylthio, where these groups may carry from one to nine halogen atoms;

C_2–C_6-alkenyl, C_2–C_6-alkynyl, phenyl, phenoxy or phenylthio, where these groups may carry from one to three of the radicals stated for R, or

one of the groups stated for R^1;

R^5 is formyl, 4,5-dihydrooxazol-2-yl or a group $COYR^6$;

Y is oxygen or sulfur;

R^6 is hydrogen;

C_3–C_8-cycloalkyl;

C_1–C_6-alkyl which may carry from one to five halogen atoms or hydroxyl groups and/or one of the following radicals: cyano, aminocarbonyl, carboxyl, trimethylsilyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, C_1–C_4-alkoxycarbonyl, C_2–C_4-alkoxycarbonyl-C_1–C_3-alkoxy, C_2–C_4-alkoxycarbonyl-C_1–C_5-alkoxycarbonyl, C_1–C_4-alkylaminocarbonyl, di-C_1–C_4-alkylaminocarbonyl, di-C_1–C_4-alkylphosphonyl, C_1–C_4-alkyliminoxy, phenyl, thienyl, benzyloxy, benzylthio, furyl, tetrahydrofuryl, phthalimido, pyridyl and/or benzoyl, where the cyclic radicals in turn may carry from one to three of the radicals stated for R;

C_3–C_6-alkenyl, C_3–C_6-alkynyl or C_5–C_7-cycloalkenyl, where these groups may carry one of the following radicals: hydroxy, halogen, C_1–C_4-alkoxy or phenyl, and the phenyl radical in urn may carry from one to three of the radicals stated for R;

phthalimido; tetrahydrophthalimido; succinimido; maleimido; benzotriazolyl;

phenyl which may carry from one to three of the radicals stated for R;

a group —N=CR^7R^8, where

R^7 is hydrogen or C_1–C_6-alkyl and

R^8 is C_3–C_6-cycloalkyl, phenyl or a radical R^7 or

R^7 and R^8 together form a 4- to 7-membered alkylene chain, and if

R^5 is carboxyl, methoxycarbonyl or ethoxycarbonyl and R^2 is hydrogen, R^3 is not hydrogen and R^4 is not hydrogen or methyl, and if

R^5 is carboxyl, methoxycarbonyl or ethoxycarbonyl and R^4 is hydrogen, R^3 is not hydrogen and R^2 is not one of the following groups: hydrogen; C_1–C_4-alkyl; phenyl; 2-(3,4-dimethoxyphenyl)ethyl or 2,5-dichlorothien-3-yl,

or their agriculturally suitable salts.

5,201,935

CYCLOHEXENONE DERIVATIVES

Dieter Kolassa, Ludwigshafen; Juergen Kasi, Boehl-Iggelheim; Thomas Kuekenhoehner, Frankenthal; Norbert Meyer, Ladenburg; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

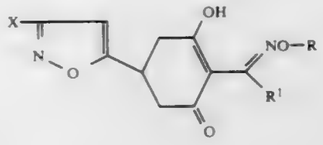
Continuation of Ser. No. 619,997, Nov. 30, 1990, abandoned, which is a division of Ser. No. 572,357, Sep. 19, 1989, Pat. No. 5,034,047. This application Aug. 26, 1992, Ser. No. 934,304

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833264

Int. Cl.[5] **A01N** *43/80;* **C07D** *413/04*

U.S. Cl. 504—271 **4 Claims**

1. Cyclohexenone derivatives of the following formula:



wherein:

X is 2-tetrahydrofuranyl, 3-tetrahydrofuranyl, 2-tetrahydropyranyl, 3-tetrahydropyranyl or 4-tetrahydropyranyl;

they pass through said plasma to vaporize at least a por-

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R is ethyl, allyl, 2-butenyl or 3-chlor-2-propenyl; and
R^1 is ethyl or n-propyl.

5,201,936

SUBSTITUTED THIENO[3,2-B]PYRAN-5,7-DIONES

Heinz-Jürgen Bertram, Holzminden; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach; Andrew Plant, Odenthal-Steinhaus; Bernd-Wieland Krüger, Bergisch Gladbach; Achim Harder, Cologne, and Norbert Mencke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

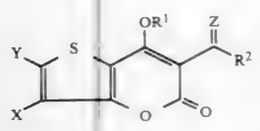
Filed Oct. 15, 1991, Ser. No. 777,878

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1990, 4033904; Apr. 10, 1991, 4111652

Int. Cl.[5] **A01N** *43/32;* **A61K** *31/38;* **C07D** *497/04*

U.S. Cl. 504—289 **6 Claims**

1. A substituted thieno[3,2-b]pyran-5,7-dione of the formula



or a tautomer thereof,
in which
R^1 represents hydrogen, or a straight-chain or branched radical selected from the group consisting of alkyl, alkenyl, alkynyl, alkylsulphonyl, alkylcarbonyl, alkenylcarbonyl, and in each case optionally substituted phenyl, benzoyl or benzenesulphonyl,
R^2 represents a straight-chain or branched radical selected from the group consisting of alkyl, alkenyl, alkynyl, halogenoalkyl, cycloalkyl, and in each case optionally substituted phenyl or benzyl,
X and Y independently of one another represent hydrogen, halogen, cyano, nitro, straight-chain or branched alkyl, alkenyl, alkynyl, halogenoalkyl, cycloalkyl, alkylcarbonyl, alkoxycarbonyl, alkyloxy, alkylthio, halogenoalkoxy, halogenoalkylthio, alkylamino, dialkylamino, or in each case optionally substituted aryl, aralkyl, aryloxy or arylthio, or
X and Y together with the adjoining C atoms form a carbocyclic ring which consists of 4 to 8 carbon atoms and which is optionally interrupted by at least one of nitrogen, oxygen and sulphur, and
represents oxygen or NOR^3,
where
R^3 represents hydrogen, or a straight-chain or branched radical selected from the group consisting of alkyl, alkenyl, alkynyl, halogenoalkyl, halogenoalkyenyl, halogenoalkinyl, cycloalkyl, and optionally substituted phenyl or phenylalkyl,
or a salt thereof.

5,201,937

SALICYCLIC ACID DERIVATIVES

Joachim Rheinheimer, Ludwigshafen; Karl Eicken, Wachenheim; Uwe J. Vogelbacher, Ludwigshafen; Karl-Otto Westphalen, Speyer; Matthias Gerber, Mutterstadt, and Helmut Walter, Obrigheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

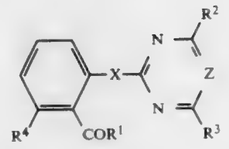
Filed Oct. 16, 1991, Ser. No. 778,318

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 4034045

Int. Cl.[5] **A01N** *43/54;* **C07D** *239/34, 239/52, 239/60*

U.S. Cl. 504—242 **4 Claims**

1. A salicylic acid compound of the formula I



I

where
R^1 is succinimidoxy; a 5-membered heteroaromatic radical which contains two or three nitrogen atoms and which can carry one or two halogen atoms and/or one or two of the following: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and/or C_1–C_4-alkylthio; —OR^5 where
R^5 is C_3–C_{12}-cycloalkyl which can carry one to three C_1–C_4-alkyl radicals; C_4–C_{10} -alkyl which can carry one to five halogen atoms and/or one of the following:
C_1–C_4-alkoxy, C_1–C_4-alkylthio, cyano, C_1–C_8-alkylcarbonyl, C_3–C_{12}-cycloalkyl, C_1–C_8-alkoxycarbonyl, phenyl, phenoxy or phenylcarbonyl, it being possible for the aromatic radicals in turn to carry one to five halogen atoms and/or one to three of the following: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and/or C_1–C_4-alkylthio;
C_2–C_6-alkyl which carries in position 2 one of the following: C_1–C_6-alkoxyimino, C_3–C_6-alkenyloxyimino, C_3–C_6-haloalkenyloxyimino or benzyloxyimino; C_3–C_6-alkenyl or C_3–C_6-alkynyl, each of which in turn can carry one to five halogen atoms; phenyl which is unsubstituted or substituted one to three times by C_1–C_4-alkyl or C_1–C_4-alkoxy or one to five times by halogen; or —N=CR^6R^7 where R^6 and R^7 are each C_1–C_{20}-alkyl which can carry phenyl, C_1–C_4-alkoxy and/or C_1–C_4-alkylthio, or are phenyl or together form a C_3–C_{12}-alkylene chain which can carry one to three C_1–C_3-alkyl groups;
or
—OR^8 where
R^8 is hydrogen, an alkali metal cation, an alkaline earth metal cation, ammonium or an organic ammonium ion;
R^2 and R^3 are each C_1–C_4-alkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_2-haloalkoxy and/or C_1–C_4-alkylthio;
R^4 is ethynyl or vinyl which can carry one to three halogen atoms;
X is oxygen or sulfur;
Z is =CH—.

3. A method for controlling unwanted plant growth, which comprises treating the unwanted plants and/or their habitat with a herbicidal amount of a derivative I as claimed in claim **1**.

4. A method for controlling plant growth, which comprises exposing the seeds, the plants and/or their habitat to a growth-regulating amountof a salicylic acid derivative of the formula I as claimed in claim **1**.

5,201,938

N-PYRAZOLYL-1,2,4-TRIAZOLO[1,5-C]PYRIMIDINE-2-SULFONAMIDE HERBICIDES

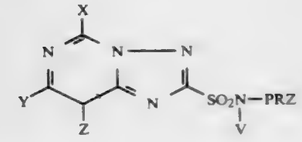
Mark J. Costales; John C. Van Heertum, both of Concord, Calif.; William A. Kleschick, Indianapolis, Ind.; Robert J. Ehr, Vallejo, and Patricia G. Ray, Walnut Creek, both of Calif., assignors to DowElanco, Indianapolis, Ind.

Filed Jul. 19, 1991, Ser. No. 733,048

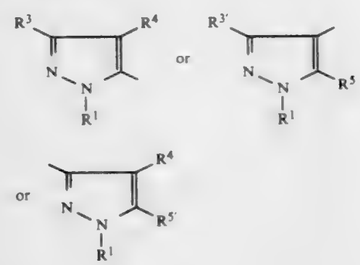
Int. Cl.[5] **A01N** *43/54;* **C07D** *487/04*

U.S. Cl. 504—241 **40 Claims**

1. An N-pyrazolyl-1,2,4-triazolo[1,5-c]pyrimidine-2-sulfonamide compound of the formula:



wherein
X represents OCH_3 or OC_2H_5; and
Y and Z each, independently represent H, OCH_3, OC_2H_5, CH_2OCH_3, CH_3, C_2H_5, F, Cl, Br, or I;
V represents H or C(O)R^2 and when V represents H, the agriculturally acceptable salts thereof;
PRZ represents



R represents (C_1–C_3)alkyl;
R^1 represents CH_3;
R^2 represents (C_1–C_3) alkyl optionally singly to completely substituted with F;
R^3 and $R^{5'}$ each independently represent H, R^2, F, Cl, Br, or I;
$R^{3'}$ and R^5 each independently represent H, R^2, F, Cl, Br, I, NO_2, COR^2, CO_2R, or phenyl optionally substituted with up to two substituents selected from CH_3, CF_3, F, Cl, Br, OCH_3, and SCH_3; and
R^4 represents F, Cl, Br, I, R^2, SR^2, NR_2, COR^2, SO_2R^2, COphenyl, or phenyl, each phenyl optionally substituted with up to two substituents selected from CH_3, CF_3, F, Cl, Br, OCH_3, and SCH_3.

5,201,939

METHOD OF MODIFYING TITANIUM ALUMINIDE COMPOSITION

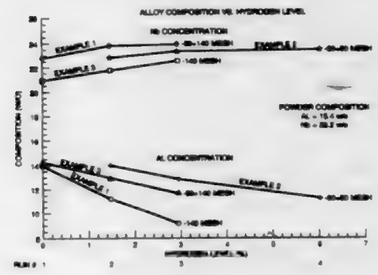
Paul A. Siemers, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,203

Int. Cl.[5] **C22C** *1/00*

U.S. Cl. 75—10.19 **7 Claims**

1. A method of forming a deposit of an alloy to precise atomic ratio of constituent elements which comprises,
providing an alloy specimen having an atomic ratio of constituents which is slightly above a predetermined value with respect to the more volatile constituents,
converting said alloy specimen into finely divided powdered form,
plasma-spray depositing said powdered specimen through a RF activated plasma, and
imparting a superheat to metal particles of said powder as they pass through said plasma to vaporize at least a portion of the more volatile constituent of said powdered specimen and to bring said atomic ratio to a predetermined value.



5,201,940

PRE-HEATING AND PRE-REDUCTION OF A METAL OXIDE

Robin J. Batterham, Sandringham; Roderick M. Grant, Doncaster; James V. Happ, Ringwood, all of Australia, and Glenn A. Thiele, Williams Lake, Canada, assignors to CRA Services Limited, Melbourne, Australia

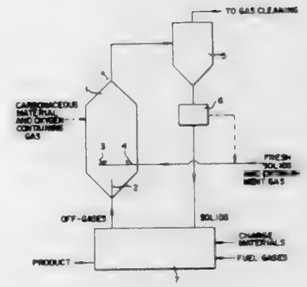
PCT No. PCT/AU90/00232, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO90/15162, PCT Pub. Date Dec. 13, 1990

PCT Filed May 30, 1990, Ser. No. 768,431

Claims priority, application Australia, Jun. 2, 1989, PJ 4545

Int. Cl.[5] **C22B** *34/32*

U.S. Cl. 75—414 **11 Claims**



1. A process for pre-heating and pre-reducing a metal oxide comprising the step of introducing metal oxide particles into a stream of hot reducing gas to heat to reduce, at least partially, the metal oxide particles wherein the hot reducing gas has a temperature in excess of that at which the metal oxide particles, or the metal oxide particles while contained in the stream of reducing gas exhibit sticky characteristics.

an integer of 6 to 20; X and Y independently represent H or part by weight per one part by weight of the organoborosila-

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5,201,941

PROCESS FOR INTRODUCING ADDITIVE SUBSTANCES WHICH ARE CAPABLE OF FLOW INTO A METALLURGICAL VESSEL AND A VESSEL FOR THAT PROCESS

William Wells, Aylesbeare/Exeter, Great Britain, assignor to Kortec AG, Switzerland

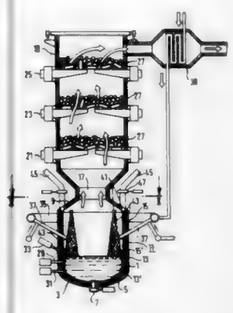
PCT No. PCT/EP90/01902, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO91/06683, PCT Pub. Date May 16, 1991

PCT Filed Oct. 26, 1990, Ser. No. 720,467

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3936715

Int. Cl.[5] C21C *5/40, 7/00*

U.S. Cl. 75—414 16 Claims



1. A process for introducing additive substances which are capable of flow into a metallurgical smelting and refining vessel for metallurgical treatment of a molten metal bath, the vessel including a furnace hearth of refractory material for accommodating the molten metal bath, underbath nozzles opening into the furnace hearth for the injection of a refining gas, a generally cylindrical vessel wall adjoining the hearth in an upward direction and having an inward side and an upper peripheral region, and a vessel cover over the vessel wall, said process including the steps of:

supplying the additive substances in a granular to dust state to the upper peripheral region of the inward side of the vessel all and flowing downwardly along the inward side of the vessel wall during at least during part of a refining phase; and

covering the inward side of the vessel wall with the additive substances supplied to the upper peripheral region of the inward side of the vessel wall and flowing downwardly along the inward side of the vessel wall so that a portion of the additive substances remain clinging to the inward side of the vessel wall thus forming a protective coating for the vessel wall.

5,201,942

RECOVERY OF RHODIUM

George P. Demopoulos, Outremont; Elyse Benguerel, Montreal, and Garfield B. Harris, Beaconsfield, all of Canada, assignors to McGill University, Montreal, Canada

Filed Nov. 18, 1991, Ser. No. 793,638

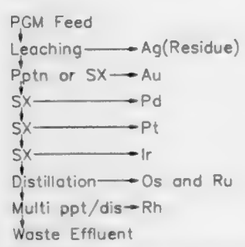
Int. Cl.[5] C22B *11/04*

U.S. Cl. 75—744 22 Claims

1. A method of recovering rhodium from an aqueous solution containing rhodium comprising:

i) contacting an aqueous solution containing rhodium with stannous chloride at a Sn:Rh molar ratio of at least 2:1 to produce an activated Rh solution,

ii) solvent extracting rhodium from the activated solution with an organic extractant in an organic vehicle with formation of an aqueous phase, derived from said aqueous



solution, of diminished Rh content, and an organic phase containing Rh, and

iii) recovering rhodium from the organic phase.

5,201,943

PROCESS FOR RECYCLING AND REFURBISHMENT OF WATER-WIPE INTAGLIO INKS USED IN WATER WIPE INTAGLIO PRINTING

Andre R. L. Monnerat, Chemin de la Golliesse, Lutry, Switzerland CH-1095

Filed Dec. 3, 1991, Ser. No. 802,045

Claims priority, application Switzerland, Apr. 18, 1990, 1289/90

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 A 44 Claims

1. A method for recovering wasted intaglio ink which is wasted in an intaglio printing process; said method comprising the steps of:

mixing the wasted ink with an alkaline or acid aqueous solution to form an ink/water mixture;

neutralizing the ink/water mixture to a pH of 5 to 10 with an acid, base or a buffer; and then

separating the ink and a portion of the water from the mixture to recover ink having a water content of about 1% to 45% by weight.

5,201,944

SIZE COMPOSITION FOR PAPERMAKING

Tomohiko Nakata, Kakogawa; Hirofumi Aoki, Himeji; Shoichi Yano, Kakogawa; Yoshihide Ishikawa, Himeji, and Masao Hamada, Kakogawa, all of Japan, assignors to Harima Chemicals, Inc., Hyogo, Japan

Filed May 30, 1991, Ser. No. 707,791

Claims priority, application Japan, Apr. 2, 1991, 3-98231

Int. Cl.[5] C09D *189/00*

U.S. Cl. 106—144 7 Claims

1. A rosin-containing size composition containing a solids content of 10–60%, the composition comprising a surfactant represented by formula (1) shown below in a ratio of 1 to 10 wt % of the solids content of the size composition and casein in a ratio not exceeding 10 wt % of the solids content of the size composition dispersed in a mixture of an esterification product of a rosin and an alkanol tertiary amine which is produced by adding the alkanol tertiary amine in a ratio of 1.5 to 10 wt % of the total rosin content in the size composition, and (b) a fortified rosin produced by adding an α, β-unsaturated carbonyl compound in a ratio of 3 to 11 wt % of the total rosin content in the size composition, to give a solids content of 10 to 60 wt % in the size composition;

$$R-O(CH_2CH_2O)_nOC-\underset{X}{CH}-\underset{Y}{CH}-COOM \quad (1)$$

wherein in the above formula (1), R represents a C_{10-24} alkylphenyl group or a linear or branched alkyl group; n represents

an integer of 6 to 20; X and Y independently represent H or SO_3M; and M represents sodium, potassium or an ammonium group.

5,201,945

POLYMER SCALE PREVENTIVE AGENT, POLYMERIZATION VESSEL FOR PREVENTING POLYMER SCALE DEPOSITION, AND PROCESS OF PRODUCING POLYMER USING SAID VESSEL

Toshihide Shimizu, Urayasu, and Minoru Shigemitsu, Kamisu, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1992, Ser. No. 853,516

Claims priority, application Japan, Mar. 19, 1991, 3-080789; Jul. 26, 1991, 3-210310

Int. Cl.[5] C08L *1/00*

U.S. Cl. 106—203 7 Claims

1. A polymer scale preventive agent for use in polymerization of a monomer having an ethylenically unsaturated double bond, comprising:

(A) a chitosan selected from the group consisting of organic acid salts of chitosans having a deacetylization degree of 40 to 100%, inorganic acid salts of chitosans having a deacetylication degree of 40 to 100%, water-soluble 5- to 20-mers of glucosamine, polyoxyethylene chitosans, polyoxypropylene chitosans, phosphated chitosans, N-glycidyltrimethylammonium chitosans and dihydropropyl chitosans; and

(B) an organic carboxylic acid compound selected from the group consisting of carboxylic acid anhydride, hydroxycarboxylic acids, acyl halides and thiocarboxylic acids.

5,201,946

LIQUID SPRAY MASK AND METHOD

Patrick W. Marsek, 408 Tanglewood Ct., Vernon Hills, Ill. 60061

Division of Ser. No. 494,392, Mar. 16, 1990, Pat. No. 5,104,711, which is a continuation-in-part of Ser. No. 438,732, Nov. 17, 1989, Pat. No. 5,028,350. This application Dec. 17, 1991, Ser. No. 808,737

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] C08L *5/00*

U.S. Cl. 106—208 1 Claim

1. A masking system including a water soluble liquid masking composition to be spray-applied in film form to a limited area of a configured surface having a contiguous area to be coated, the masking composition suppressing dust in the limited area to prevent such dust from migrating to and marring the quality of the coating in the contiguous area, said composition comprising about 10 to about 30 weight percent glycerol as an aliphatic polyhydroxy liquid carrier in which are dispersed about 0.05 to about 5 weight percent surfactant and about 0.05 to about 5 weight percent xanthan gum as a thickner, balance substantially water, the surfactant aiding wetting and spreading of the masking liquid when applied and effective to produce sudsing of the film for easy removal by a water wash after the coating has dried, and the viscosity of the film being such that it remains substantially continuous on a vertical panel.

5,201,947

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 29, 1989, Ser. No. 414,464

Int. Cl.[5] C09K *15/02*

U.S. Cl. 106—287.11 8 Claims

1. An intimate dispersion consisting essentially of a metal boride other than silicon boride or aluminum boride in an organic solvent solution containing an organoborosilazane polymer, wherein the amount of metal boride is about 0.4–1 part by weight per one part by weight of the organoborosilazane polymer, said polymer having been prepared by mixing about 0.25–20 parts by weight of a trialkoxy-, triaryloxy-, or tri(arylalkoxy)boroxine with an organic solvent solution of one part by weight of a polysilazane.

5,201,948

METHOD FOR IMPROVING SCRUB RESISTANCE

David M. Fasano, Maple Glen; Linus W. Linder, Lansdale, and Elmer Williams, Jr., King of Prussia, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1991, Ser. No. 705,471

Int. Cl.[5] C08L *101/00*

U.S. Cl. 106—311 8 Claims

1. A method of improving the scrub resistance of a paint containing at least one polymeric binder having a glass transition temperature greater than about 20° C. and an average particle size diameter of from about 70 nanometers to about 150 nanometers when said binder is formed from at least one acrylic monomer,

said improvement comprising adding to said paint containing said binder, at least one coalescent at a concentration of about 10% to about 35% by weight based on the weight of the polymeric binder and where said coalescent is a solvent for the polymeric binder.

5,201,949

TiO_2 MANUFACTURING PROCESS

Alvin Allen, Claymont, and Glenn R. Evers, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 641,804, Jan. 16, 1991, abandoned, which is a continuation of Ser. No. 430,895, Oct. 31, 1989, abandoned, which is a continuation of Ser. No. 298,809, Jan. 18, 1989, abandoned, which is a continuation of Ser. No. 60,875, Jun. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 853,423, Apr. 18, 1986, abandoned. This application May 20, 1992, Ser. No. 887,415

Int. Cl.[5] C09C *1/36*

U.S. Cl. 106—436 25 Claims

1. A process for producing pigmentary titanium dioxide which comprises:

(a) reacting titanium tetrachloride and an oxygen containing gas in the vapor phase,

at a reaction zone temperature of at least about 800° C., and a pressure of at least 10 pounds per square inch gage,

in the presence of water vapor in the amount of about 50–100,000 parts per million, based on the weight of the TiO_2 under production, and a nucleant consisting essentially of a cesium substance wherein the cesium substance is present in the amount of about 8–2,000 parts per million, based on the weight of the TiO_2 under production, and

(b) thereafter recovering the resulting titanium dioxide pigment.

5,201,950

ing means and a moisture removal means, said pretreat-

5,201,953

5,201,954

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5,201,950

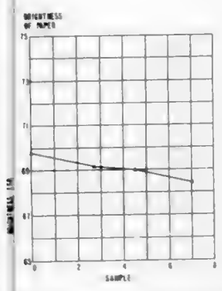
LOW BRIGHTNESS MAGNESIUM SILICATE SLR FILLER LOW BRIGHTNESS PAPER CONTAINING THE FILLER AND METHODS TO PRODUCE THE FILLER AND USE IT IN LOW BRIGHTNESS PAPERS

Leif B. Martensson, and Kaarina Heikkila, both of Hamina, Finland, assignors to J. M. Huber Corporation, Rumson, N.J.

Continuation of Ser. No. 262,930, Oct. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 243,398, Sep. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 34,991, Apr. 6, 1987, Pat. No. 4,780,297. This application Mar. 22, 1991, Ser. No. 674,293

Int. Cl.[5] **C09C** *1/24, 1/02, 1/28*

U.S. Cl. 106—457 **8 Claims**



1. A low-structure magnesium silicate silica leach residue filler, comprising

about 50 to 75 wt % SiO_2;

about 5 to 12 wt % MgO;

about 10 to 50 wt % silica leach residue;

about 1 to 6 wt % Fe_2O_3; and

about 0 to 7 wt % Al_2O_3; wherein the proportion MgO:SiO_2 is about 1:2.0–4.0.

5,201,951

DEVICE FOR COATING A PHOTOSENSITIVE FILM ON A PLATE ROLL

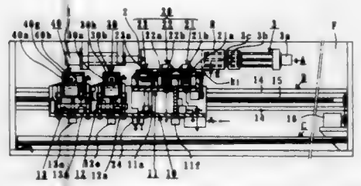
Tatsuo Shigeta, Nagareyama, Japan, assignor to Think Laboratory Co., Ltd., Chiba, Japan

Filed Jan. 10, 1992, Ser. No. 818,926

Claims priority, application Japan, Jun. 1, 1991, 3-157792

Int. Cl.[5] **B05C** *9/10, 1/08*

U.S. Cl. 118—73 **8 Claims**



2. A photosensitive film coating device for a plate roll comprising;

a roll chucking means comprised of a spindle chuck, a tail chuck and motors, said means holding and rotating said plate roll, and

a multi-treatment-means comprised of a pretreatment means, a photosensitive film coating means and a protective film coating means which are respectively provided on three separate table devices that can be raised and lowered relative to said plate roll, and means for translating said table devices in a reciprocating motion in the direction of the length of the plate roll surface, wherein

said pretreatment means comprises a cleaning means, a rinsing means and a moisture removal means, said pretreatment means consecutively cleaning on said plate roll, rinsing on said plate roll and then removing a moisture from said plate roll, as another of said table devices with said pretreatment means thereon is translated,

said photosensitive film coating means consists of a photosensitive film coating roll and a photosensitive liquid tank, said coating means coating photosensitive liquid on said plate roll following a pretreatment operation performed by said pretreatment means, as another of said table devices with said photosensitive film coating means thereon is translated, and

said protective film coating means consists of a protective film coating roll and a protective liquid tank, said coating means coating protective liquid on said plate roll following a photosensitive liquid coating operation performed by said photosensitive film coating means, as another of said table devices with said protective film coating means thereon is translated.

5,201,952

METHOD AND APPARATUS FOR APPLYING A UNIFORM ADHESIVE COAT TO A RESIN-COATED MANDREL

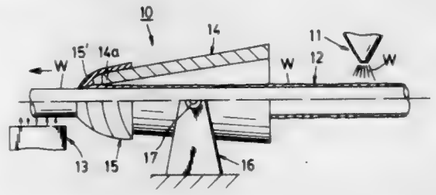
Masakazu Yahagi; Takeo Sato, and Masahiro Ebisawa, all of Ibaragi, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,063

Claims priority, application Japan, Apr. 16, 1990, 2-97638

Int. Cl.[5] **B05C** *11/02*

U.S. Cl. 118—109 **3 Claims**



1. Apparatus for applying a uniform adhesive coating to a resin-coated mandrel comprising applicator means for continuously applying a coating of an adhesive compound peripherally to and over an axially moving elongated and round resin-coated mandrel, heater means, located remote from and downstream of said applicator means with respect to the direction of travel of said mandrel, for drying said adhesive compound that has been coated on said mandrel, control means for controlling the thickness of said coating of adhesive compound located between said applicator means and said heater means, said control means comprising a conical tube having an inner surface that tapers to a leading tip end relative to said direction of travel of the mandrel, said tip end having a circular opening therein through which said mandrel passes that is larger in size than said mandrel, scraper means comprising a circular knitted web of stretchable long length nylon fibers mounted on the tip end of said tube, said web having a circular opening therein axially aligned with the opening in the tube and smaller in size than said mandrel for scraping off any excess of said adhesive coating as the mandrel passes through it and means allowing said control means to pivot about on an axis perpendicular to the axis of said mandrel.

5,201,953

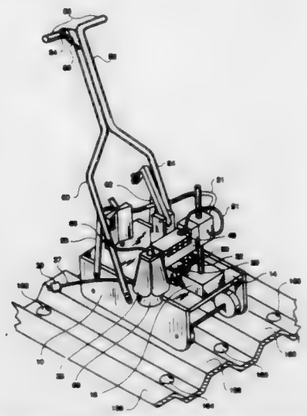
VEHICULAR PAINT APPLICATOR FOR CORRUGATED SURFACES

Joseph W. Lowry, 14498 Dan Patch Clr., Libertyville, Ill. 60048

Filed May 31, 1991, Ser. No. 708,903

Int. Cl.[5] **B05C** *9/00*

U.S. Cl. 118—305 **33 Claims**



1. A continuous or intermittent paint applicator for applying paint to a desired surface, comprising:

(A) a carriage body having two side walls opposite each other integral with or joined to an upper plate, each side wall being attached near separate ends of a pair of wheel bearing axles;

(B) a wheel roller-skid assembly having four wheels each of which are rotatably mounted near separate ends of said pair of wheel bearing axles, and a first skid guard attached adjacent to one side wall and a second skid guard attached adjacent to the other side wall, each skid guard extending laterally between the wheels on the same side of each side wall and extending downwardly beyond said side wall to a point 1/16th to ¼th inch above the bottom of said wheels;

(C) handle means attachable to said carriage body and extending upwardly therefrom for gripping by an operator to push or pull said carriage body relative to said surface;

(D) an electric power assembly mounted to said carriage body including interconnecting electric lines providing an electric circuit, and at least two electrical outlets, one for electric circuit communication with an electric power source, and the other for electric circuit operation of an airless cup suction pump paint dispenser by a jog control switch capable of selectively activating an electric circuit to initiate and terminate the release of paint from said paint dispenser as desired;

(E) means attached to the carriage body for holding a paint container in fluid communication with means for delivering the contents of the paint container to a suction delivery line of said paint dispenser for spraying therefrom;

(F) a fixture for securing fixed position including a vertical rod attached to said carriage body at its lower end and mountably supporting a detachable horizontal arm at a selectable distance above said lower end, said detachable horizontal arm including means for clamping said arm to the vertical rod in adjustable position vertically, traversely, or invertedly, and having two portions, a first portion capable of being locked to a second portion to, when locked together, secure a squeeze trigger of said paint dispenser in operational mode.

5,201,954

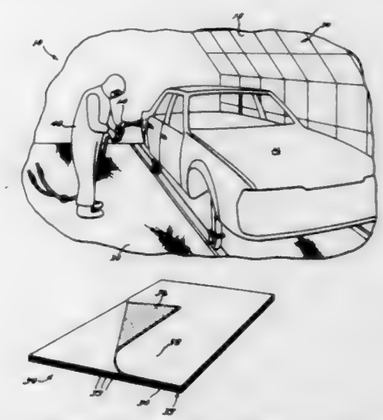
MULTILAYER PEELABLE WALL COVERING

Earl R. Holt, Rochester Hills, Mich., assignor to Hose Specialties Company/Capri, Inc., Highland Park, Mich.

Filed Oct. 18, 1991, Ser. No. 778,775

Int. Cl.[5] **B05B** *15/12;* **B05C** *15/00*

U.S. Cl. 118—309 **16 Claims**



1. A booth for spraying a coating of material on an article comprising:

means for spraying said material proximate to said article so as to apply said coating of material to said article, said means for spraying generating overspray;

means for containing said overspray within said booth, said means for containing said overspray including a wall; and

a plurality of wall covering units disposed on said wall, each of said wall covering units including:

(a) a base layer having first and second substantially parallel surfaces, said first surface of said base layer having means for securing said base layer to said wall,

(b) first and second removable sheets having first and second surfaces,

(c) means for securing said first removable sheet to said base layer, and

(d) means for securing said second removable sheet to said first removable sheet,

whereby said overspray generated by said means for spraying may be removed from said booth by removal of at least one of said removable sheets from said booth.

5,201,955

ANNULAR GRADIENT OPTICAL LENS TINT SYSTEM

Hani E. Chika, 4521 Park Blvd., San Diego, Calif. 92116, and Tariq J. Elias, 7358 Margerum Ave., San Diego, Calif. 92120

Filed Mar. 11, 1991, Ser. No. 667,175

Int. Cl.[5] **B05C** *3/09*

U.S. Cl. 118—416 **7 Claims**

1. An optical tinting apparatus for tinting at lens which substantially defines a lens plane, said apparatus comprising:

(a) a lens engaging and rotating means for gripping said lens;

(b) said lens engaging and rotating means including means for rotating said lens in said lens plane;

(c) reciprocating means including a vertically reciprocating substantially horizontally extended boom having said lens engaging and rotating means attached thereto for impart-

ing a motion having a vertical component to said lens such

5,201,957

a first fluid drain conduit in communication with the tank at

5,201,960

METHOD FOR REMOVING PHOTORESIST AND

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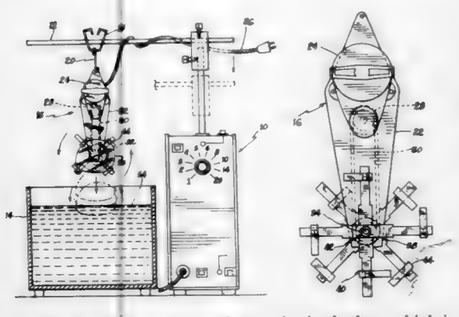
ing a motion having a vertical component to said lens such that said lens can be vertically reciprocated and rotated in

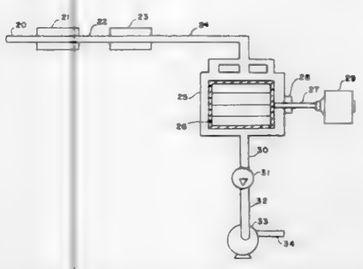


lens tinting solution to produce a tint in the lens which is both graduated and arcuate.

5,201,956
CELLULAR TUMBLE COATER

Bruce J. Humphrey, Clear Lake, and Roger A. Olson, Amery, both of Wis., assignors to Specialty Coating Systems Inc., Danbury, Conn.

Filed Jun. 26, 1992, Ser. No. 904,643
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—716 **16 Claims**



15. In an apparatus for coating articles with parylene by vapor deposition under vacuum conditions, comprising:

i) a vaporization zone to which parylene dimer can be introduced;

ii) a pyrolysis zone connected to the vaporization zone;

iii) a housing connected to the pyrolysis zone;

iv) a fixture for tumbling the articles rotatably mounted within the housing; and

v) means for creating a vacuum within the housing;

the improvement wherein the fixture is a cellular fixture comprising multiple cells disposed radially about a common axis of rotation, each cell comprising:

(a) a hollow member having a side wall with a plurality of openings therethrough, said openings being large enough to permit vapors of parylene to flow through said openings and being small enough to contain the articles within the cell;

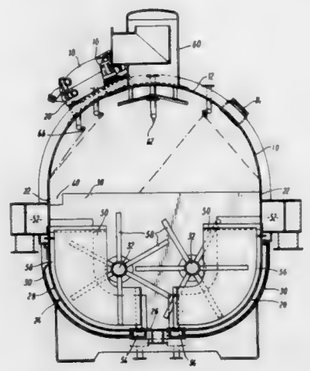
(b) a first end, and

(c) a second end.

5,201,957
SUGAR PRODUCTION APPARATUS

John C. D. C. Thelwall, Derby, England, assignor to Fletcher Smith Limited, Derby, United Kingdom

PCT No. PCT/GB90/01172, § 371 Date Mar. 2, 1992, § 102(e) Date Mar. 2, 1992, PCT Pub. No. WO91/01785, PCT Pub. Date Feb. 21, 1991
PCT Filed Jul. 27, 1990, Ser. No. 809,539
Claims priority, application United Kingdom, Jul. 28, 1989, 8917313
Int. Cl.[5] C13D *3/00;* **C13F** *1/00*
U.S. Cl. 127—9 **12 Claims**



1. An evaporator including a shell having an inlet and an outlet, at least one heating fin extending into the shell, and at least one rotatable shaft extending through the shell, characterised in that, at least part of the shell (**10**) is partitioned between the inlet and the outlet into a plurality of transversely extending compartments (**42–46**) by spaced partitions (**38**) over which, in use, fluid may flow from each compartment to the adjacent downstream compartment, at least one heating fin (**50**) extending transversely into each compartment, each fin (**50**) being supported on the shell (**10**) such that there is a gap defined between the fin (**50**) and the shell (**10**), and the rotatable, longitudinally extending shaft (**32**) being provided with vanes (**58**) which pass over the surface of the respective fins (**50**) to agitate the fluid to be evaporated within the compartments (**42–46**), including the fluid at the surfaces of the fins (**50**) and the fluid in the gaps between the fins (**50**) and the shell (**10**).

5,201,958
CLOSED-LOOP DUAL-CYCLE PRINTED CIRCUIT BOARD CLEANING APPARATUS AND METHOD

Rex Breunsbach, Clackamas, and Paul M. Austen, Milwaukie, both of Oreg., assignors to Electronic Controls Design, Inc., Portland, Oreg.

Filed Nov. 12, 1991, Ser. No. 789,964
Int. Cl.[5] B08B *3/12, 5/00*
U.S. Cl. 134—1 **48 Claims**

1. An apparatus for cleaning electronic assemblies comprising:

a tank for receiving the assemblies for cleaning,

a first fluid source in communication with the tank for filling the tank with a first cleaning fluid to immerse the assemblies,

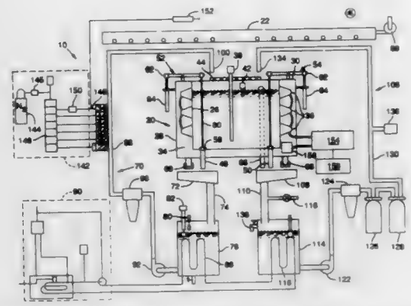
a first fluid drain aperture defined in the tank for draining the first cleaning fluid from the tank,

a second fluid source in communication with the tank for filling the tank with a second cleaning fluid to immerse the assemblies,

a second fluid drain aperture separate from the first fluid drain aperture, and defined in the tank for draining the second cleaning fluid from the tank,

a first fluid drain conduit in communication with the tank at the first fluid drain aperture,

a second fluid drain conduit in communication with the tank at the second fluid drain aperture,



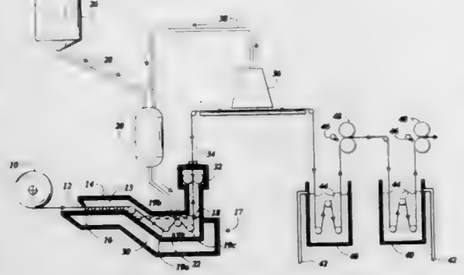
shutoff means for preventing the first fluid from entering the second conduit and the second fluid from entering the first conduit, and

an ultrasonic generator operably connected to the tank for transmitting ultrasonic energy through the fluid therein to facilitate cleaning the assemblies.

5,201,959
APPARATUS FOR DYEING CARPET

Benjamin F. Fuller, 9729 Mountainair Dr., Ooltewah, Tenn. 37363

Continuation-in-part of Ser. No. 672,349, Mar. 20, 1991, abandoned, which is a division of Ser. No. 561,161, Aug. 1, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 837,651
Int. Cl.[5] D06B *3/10, 23/14*
U.S. Cl. 68—9 **13 Claims**



1. An apparatus for dyeing fabric materials in which steam fixation of the dye onto the fabric materials is unnecessary, comprising:

a. a dye bath means containing a dye;

b. a heating means which heats the dye to a temperature higher than 212° F. at standard temperature and pressure;

c. a dyeing means for applying the dye to the fabric materials;

d. a removal means for removing excess of the dye from the fabric materials;

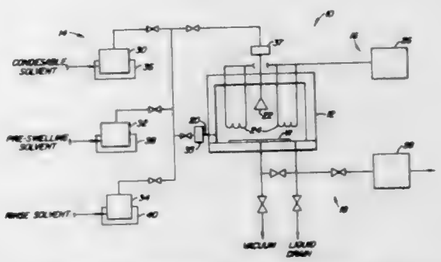
e. a recovering means for recovering excess of the dye from the fabric materials; and

f. a dyeing process halting means for halting the dyeing process and aiding in fixing the dye on the fabric; wherein said dye bath means, said dyeing means, said removal means, said recovering means and said dyeing process halting means are open to the atmosphere.

5,201,960
METHOD FOR REMOVING PHOTORESIST AND OTHER ADHERENT MATERIALS FROM SUBSTRATES

Vladimir Starov, Redwood City, Calif., assignor to Applied Photonics Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 650,509, Feb. 4, 1991, abandoned. This application Feb. 26, 1992, Ser. No. 841,856
Int. Cl.[5] B08B *3/00, 5/00, 7/00*
U.S. Cl. 134—11 **36 Claims**



1. A method for removing an adherent matrix which is a cross-linked photoresist which has been hardened by baking, ion implantation, ultraviolet radiation, or exposure to a plasma from a substrate surface, said method comprising:

exposing the adherent matrix to a non-oxidizing vapor phase solvent for at least 30 seconds under temperature and pressure conditions selected to allow penetration of the vapor phase solvent into the matrix while the matrix remains substantially intact, wherein said solvent has a vapor pressure of at least one atmosphere at room temperature;

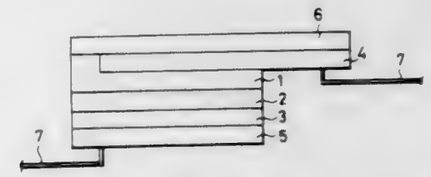
condensing the vapor phase solvent after the matrix has been penetrated but while the matrix remains intact to produce a liquid phase within the adherent matrix, whereby the matrix is structurally disrupted without substantial oxidation to produce non-adherent fragments; and

removing the fragments from the substrate surface.

5,201,961
PHOTOVOLTAIC DEVICE CONTAINING ORGANIC MATERIAL LAYERS AND HAVING HIGH CONVERSION EFFICIENCY

Masao Yoshikawa, and Tetsuroo Suzuki, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,723
Claims priority, application Japan, May 23, 1990, 2-131319
Int. Cl.[5] H01L *31/06, 31/0344*
U.S. Cl. 136—263 **8 Claims**



1. A photovoltaic device comprising a portion containing three layers disposed between two electrodes, of which at least one of said electrodes is light transmittable; wherein said three layers consist of a first layer of organic electron acceptor material, a second layer of organic electron donor material and a third layer of organic electronic donor material different from the material of the second layer; or a first layer of organic electron donor material, a second layer of organic electron

acceptor material and a third layer of organic electron accep-

Mn: 2% or less,

treatment and final aging of the cold worked alloy, the improvement which comprises first aging the cold worked alloy

age grain size of 1 to 100 μm and an induced anisotropy P

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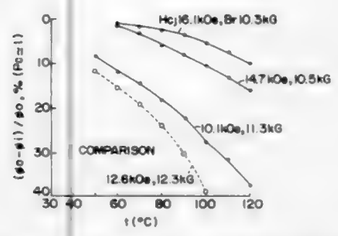
acceptor material and a third layer of organic electron acceptor material different from the acceptor material of the second layer and the sequence of the three films is arranged in this order from a light-incident side.

5,201,962

METHOD OF MAKING PERMANENT MAGNET CONTAINING RARE EARTH METAL AND FERROUS COMPONENT

Fumitoshi Yamashita, Ikoma, and Masami Wada, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1990, Ser. No. 552,683
Claims priority, application Japan, Jul. 12, 1989, 1-181135
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 **7 Claims**



1. A method of manufacturing a permanent magnet, which comprises providing at least one billet having a relative density within the range of 70 to 90% and containing compacted alloy flakes, said alloy flakes being made of at least one rare earth metal and a ferrous component and being obtained by a melt quenching process; and applying one directional pressure and an electric current to said billet through a pair of electrodes to cause said billet to undergo a plastic deformation, wherein the application of the pressure is carried out at least at a stage of application of a Joule heat at a pressure of 200 to 500 kgf/cm^2 with a final axial sectional surface area taken as a reference, thereby to expand an area of said billet perpendicular to the direction of the applied pressure.

5,201,963

RARE EARTH MAGNETS AND METHOD OF PRODUCING SAME

Toshio Mukai; Tatsuo Fujimoto, and Toru Inaguma, all of Kawasaki City, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 603,993, Oct. 26, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 800,712
Claims priority, application Japan, Oct. 26, 1989, 1-279483
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—104 **4 Claims**

1. A method of producing an anisotropic rare earth magnet, comprising the steps of:

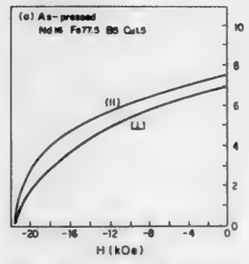
rapidly quenching a melt and forming an alloy powder consisting essentially of 12 to 20 at % R (where R denotes rare earth elements including at least one member selected from the group consisting of neodymium and praseodymium), 2 to 10 at % boron, up to 5 at % copper, with the remainder being TM (where $TM=Fe_{1-x}Co_x$ ($0 \leqq x \leqq 0.4$)) and unavoidable impurities;

hot-pressing the alloy powder to form a pressed body by consolidating the powder to 90% or more of the full density of the alloy powder;

recrystallization heat treating the pressed body at 750°–1150° C.; and

aging the pressed body at 450°–750° C.;

wherein the resultant anisotropic rare earth magnet has recrystallization grains of $R_2Fe_{14}B$ intermetallic compound having a tetragonal crystal structure with an average grain size of 1 to 100 μm and an induced anisotropy P of 0.1 or more where $P=(Br(\parallel)-Br(\perp))/(Br(\parallel)+Br(\perp))$, $Br(\parallel)$ being residual magnetic flux density along the easy magnetization axis and $Br(\perp)$ being residual magnetic flux density perpendicular to the easy magnetization axis.

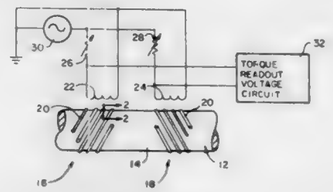


5,201,964

MAGNETOSTRICTIVE TORQUE SENSOR

Howard T. Savage, Greenbelt; Arthur E. Clark, Adelphi; Marilyn Wun-Fogle, Gaithersburg; Lawrence T. Kabacoff, Columbia, all of Md.; Antonio Hernando, Madrid, Spain, and Bruce Beihoff, Wauwatosa, Wis., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1989, Ser. No. 374,112
Int. Cl.[5] C21D *1/04*
U.S. Cl. 148—108 **10 Claims**



1. In a method of making a sensor for a member having an external surface on which an elongated magnetostrictive element is positioned, including the step of helical deformation of the element into fixed contact with said surface of the member; the improvement residing in the step of: imparting an inductive magnetic anisotropy to said element during said deformation thereof.

5,201,965

HEAT-RESISTANT CAST STEEL, METHOD OF PRODUCING SAME, AND EXHAUST EQUIPMENT MEMBER MADE THEREOF

Koki Ohtsuka, Mouka, and Norio Takahashi, Oomiya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 14, 1992, Ser. No. 868,120
Claims priority, application Japan, Apr. 15, 1991, 3-109819
Int. Cl.[5] C22C *38/34*
U.S. Cl. 148—333 **27 Claims**

1. A heat-resistant cast steel having a metal matrix substantially consisting of a ferrite phase and a pearlitic-colony phase and having a composition consisting essentially, by weight, of:

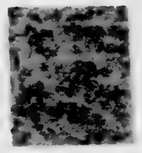
C: 0.05–0.25%,

Si: 2.5–3.5%,

Mn: 2% or less,

Cr: 4–8%,

N: 0.05% or less,



W and/or Co: 0.1–2%, and

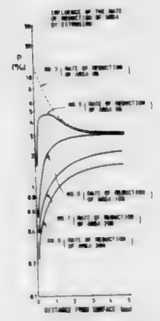
Fe and inevitable impurities: balance.

5,201,966

METHOD FOR MAKING CYLINDRICAL, IRON-BASED SINTERED SLUGS OF SPECIFIED POROSITY FOR SUBSEQUENT PLASTIC DEFORMATION PROCESSING

Yoshiki Hirai, Tokyo, Japan, assignor to Hitachi Powdered Metals, Co., Ltd., Tokyo, Japan

Division of Ser. No. 573,471, Aug. 24, 1990, Pat. No. 5,129,961.
This application Mar. 18, 1992, Ser. No. 853,641
Claims priority, application Japan, Aug. 31, 1989, 64-224920
Int. Cl.[5] B22F *9/00*; C22F *1/00*
U.S. Cl. 148—514 **1 Claim**



1. A method for forming an iron-based sintered slug, comprising the steps of: providing a porous iron-based sintered alloy material having a surface hardness represented by an HRB of 40–90, the iron-based sintered alloy material being formed with an interior porosity greater than 0% and less than or equal to 5% and with a surface layer region lying at most at 1 millimeter below outer and inner surfaces having a porosity fixed at a porosity greater than 0% and less than or equal to 3%, and providing a distribution of pores decreasing from said interior to said surface region; and plastically extruding said iron-based sintered alloy material by providing a rate of reduction of sectional area in a diametrical direction which is at least 10%; and subsequently annealing the iron-based sintered based material.

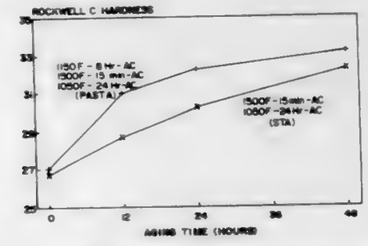
5,201,967

METHOD FOR IMPROVING AGING RESPONSE AND UNIFORMITY IN BETA-TITANIUM ALLOYS

Ronald W. Schutz, Canfield, and Stanley R. Seagle, Warren, both of Ohio, assignors to RMI Titanium Company, Niles, Ohio

Filed Dec. 11, 1991, Ser. No. 806,077
Int. Cl.[5] C22C *14/00*
U.S. Cl. 148—671 **24 Claims**

1. In the process of improving the rate and uniformity of aging responses by cold working a beta titanium alloy, solution treatment and final aging of the cold worked alloy, the improvement which comprises first aging the cold worked alloy



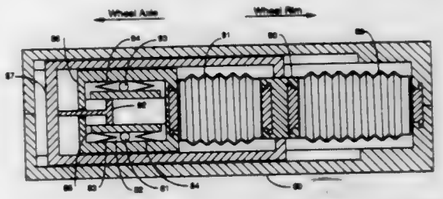
by heating said alloy at elevated temperature prior to the step of solution treatment.

5,201,968

TIRE PRESSURING AND REGULATING APPARATUS

Grant J. Renier, Allison Park, Pa., assignor to Cycloid Company, Pittsburgh, Pa.

Filed Aug. 27, 1991, Ser. No. 750,606
Int. Cl.[5] B60C *23/10*; F04B *19/02*
U.S. Cl. 152—418 **34 Claims**



1. Apparatus for utilizing a cyclic resultant force of a centrifugal force and a gravitation force, said apparatus including:

a vehicle wheel including a pneumatic tire;

pump means including a piston reciprocal in a cylinder in response to the cyclically changing resultant force of centrifugal and gravitational forces acting on said piston for pressurizing air to inflate said pneumatic tire, said piston being acted upon by an air cushion for providing a restoring force; and

attachment means at a site eccentric to the axis of rotation of said vehicle wheel for support of said pump means by said vehicle wheel externally of the pneumatic tire.

5,201,969

RADIAL TIRE FOR HEAVY DUTY VEHICLE INCLUDING A FOLDED BELT LAYER

Minoru Nishi, Kobe; Yoshiyuki Takada, and Naoki Asakawa, both of Shirakawa, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jul. 23, 1990, Ser. No. 555,625
Claims priority, application Japan, Jul. 24, 1989, 1192084
Int. Cl.[5] B60C *9/26, 9/20, 9/18*
U.S. Cl. 152—527 **5 Claims**

1. A radial tire for heavy duty vehicles comprising a carcass with a radial structure extending from a tread through side walls and wrapped around a bead core in each of two beads, a steel belt layer with triangular structure composed of at least three belt plies each containing steel belt cords and laid radially outside said carcass, and a middle layer containing cords consisting of aromatic polyamide fibers, wherein:

the first belt ply positioned outermost in the radial direction, among said belt plies has belt cords inclined at an angle of from 10 to 30 degrees to the tire equator;

the second belt ply positioned radially inside first belt ply has

belt cords inclined in the opposite direction to the belt

5,201,971

least outer load carrying members are displaced in a circu- bidirectional motion of said carrier means, said carrier control

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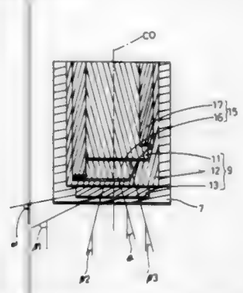
belt cords inclined in the opposite direction to the belt cords of said first belt ply at an angle of from 10 to 30 degrees to the tire equator;

said middle layer has a main portion provided between said first and second belt plies and includes skirts folded over onto said first belt ply from both axial outer ends of said main portion so as to wrap around each axial outer end of said first belt ply; and



said cords of said middle layer at the main portion slant in the same direction as the belt cords of said first belt ply and are arranged at an inclined angle of 3 degrees or less to the belt cords of said first belt ply, wherein said cords of middle layer are embedded in a rubber compound of which the 100% modulus is 25–50 kg/cm^2, the 300% modulus is 100–200 kg/cm^2, the JISA hardness is 75–80 deg., the complex modulus of elasticity is 50–200 kg/cm^2, and the loss factor is 0.1–0.2.

5,201,970

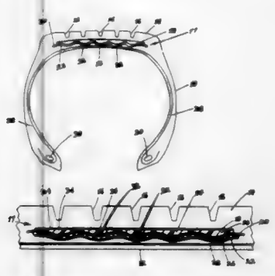
PNEUMATIC TIRES INCLUDING A CORRUGATED BELT STRUCTURE

Robert E. Jefferson, 11826 Cindlewick Rd. South, DeMotte, Ind. 46310

Continuation-in-part of Ser. No. 398,002, Aug. 24, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 771,725

Int. Cl.^{5} B60C *9/18, 9/20*

U.S. Cl. 152—532 **10 Claims**



1. In a belted pneumatic tire having a toroidal carcass, a tread surrounding the crown region of said carcass, said tread having a plurality of grooves extending substantially circumferentially, said tire having an improved reinforcing belt structure comprising a flat belt extending circumferentially between said tread and said carcass; a corrugated belt extending circumferentially juxtaposed to said flat belt, said corrugated belt having at least one inwardly depending depression, each said depression being radially aligned with a respective one of said grooves; and a hard rubber layer sandwiched between said flat belt and said corrugated belt, said flat belt, said corrugated belt and said hard rubber layer bonded together into a substantially transversely rigid belt structure.

5,201,971

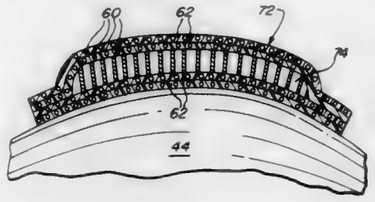
PNEUMATIC TIRES CONTAINING A COMPOSITE BELT

James H. Gifford, Orange, Conn., assignor to Pirelli Armstrong Tire Corporation, New Haven, Conn.

Continuation of Ser. No. 340,253, Apr. 19, 1989. This application Jul. 20, 1992, Ser. No. 918,894

Int. Cl.^{5} B60C *9/00, 9/18;* **B32B** *3/12*

U.S. Cl. 152—536 **4 Claims**



1. A pneumatic tire including:

a plurality of resin impregnated plies;

each ply comprising a plurality of cords having a high modulus of elasticity and a high tenacity and formed of a material selected from the group consisting of aramid, steel, fiberglass, carbon and polyester;

said cords being surrounded by a matrix of resin selected from the group consisting of epoxies, polyesters, nylons and polyphenylene ethers; and

a honeycomb separator substantially radially centered between said plies; said honeycomb separator being between about 1.3 mm and about 3.8 mm in thickness, having a weight lighter than the resin, and having high resistance to compression;

said matrix of resin binding said plurality of resin impregnated plies and said honeycomb separator together to form a monolithic reinforcing belt.

5,201,972

PNEUMATIC VEHICLE TIRE HAVING BEADS THAT ARE TURNABLE

Wolfgang Brettschneider, Seelze/Velber, Fed. Rep. of Germany; Carsten Boltze, Uniontown, Ohio, and Heinrich Huinink, Garbsen, Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 366,648, Jun. 14, 1989. This application Jun. 21, 1991, Ser. No. 718,415

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820135

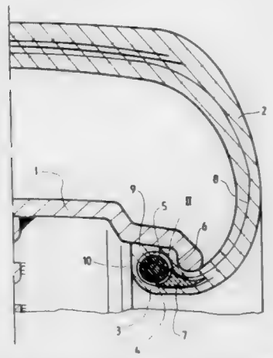
Int. Cl.^{5} B60C *15/04*

U.S. Cl. 152—540 **12 Claims**

1. A pneumatic vehicle tire, comprising:

a carcass that is looped about two bead cores that are disposed in respective beads of said tire and with each bead core comprising at least outer load-carrying members, with said bead being capable of turning from a vulcanizing position into an operating position when said tire is being mounted on a wheel rim, and with said load-carrying members of said bead cores having surfaces that during said turning prevent adhesion to vulcanized rubber, at least to the extent that said load-carrying members are immersed in rubber in said vulcanizing position, so that each of said load-carrying members is individually rotatable about its longitudinal axis relative to the surrounding rubber of the pertaining bead, such that, relative to an external frame of reference, during said turning, said at

least outer load carrying members are displaced in a circular path without rotation about said individual axis,



thereby facilitating said ability of said beads to turn when said tire is being mounted on said rim.

5,201,973

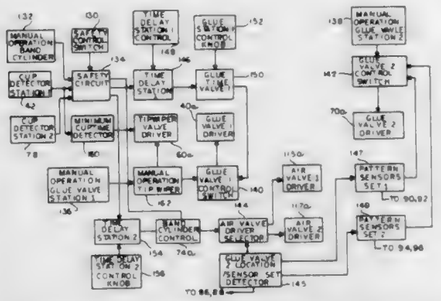
NON-CONTACT GLUING APPARATUS

Roger E. Castaldo, Alsip; Edward Nigohosian, Lansing, and James DeCamp, Crete, all of Ill., assignors to Mactron, Inc., Alsip, Ill.

Filed Mar. 18, 1991, Ser. No. 670,716

Int. Cl.^{5} B05C *5/00, 5/02*

U.S. Cl. 118—669 **13 Claims**



1. Apparatus for applying a predetermined glue pattern to a predetermined surface of a cup blank or similar workpiece, which workpiece is moved in a stepwise, indexed fashion, such that said predetermined surface thereof follows a given, generally arcuate path of travel, said predetermined pattern including a first, generally linear portion which extends along a line intersecting said given path of travel, said apparatus comprising: a non-contact glue valve having an outlet; carrier means for mounting said glue valve for bidirectional motion along said line intersecting said given path of travel with the outlet thereof in alignment with said first portion of said predetermined pattern and spaced closely above said predetermined surface of said workpiece; control means for turning said glue valve on and off in a predetermined fashion for depositing glue upon said predetermined surface of said workpiece in said first portion of said pattern while said workpiece is in a stationary position between steps in said stepwise indexed motion thereof; edge sensor means for sensing the arrival of a predetermined portion of said workpiece in said stationary position intermediate steps of said stepwise indexing thereof, and for producing a corresponding edge control signal; wherein said control means further includes carrier control means for controlling said bidirectional motion of said carrier means, said carrier control means being responsive to said edge control signal for initiating movement of said carrier means in either direction of said bidirectional motion thereof in such a manner that said glue valve deposits the same said first portion of said pattern on each of a succession of workpieces as the same are indexed into registry with said glue valve, with the glue valve depositing said first portion of said pattern upon another said workpiece each time the glue valve reverses its direction in said bidirectional motion thereof in response to said edge sensor means; wherein said control means comprises glue valve position sensor means for detecting a plurality of predetermined positions of said glue valve along said line of bidirectional motion thereof and for producing respective open and close signals for opening and closing said glue valve at selected ones of said predetermined positions of said glue valve for initiating and terminating the dispensing of glue in such a manner as to deposit the same upon the workpiece surface in said first portion of said pattern in both directions of travel of said glue valve, compensating for time delays between opening and closing of said glue valve and the time at which glue actually reaches and ceases to reach the surface of the workpiece in each of the directions of motion, and wherein said control means are responsive to said open and close signals for respectively opening and closing said glue valve; wherein said glue valve position sensor means comprises two independent sets of glue valve position sensors located at relatively offset positions, each set for initiating and terminating the dispensing of glue by said glue valve in one direction of said bidirectional motion thereof.

5,201,974

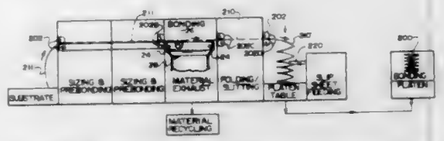
METHOD AND APPARATUS FOR MAKING PATTERNED ELECTRICALLY CONDUCTIVE STRUCTURES

Frederick A. West, 12722 Gorda Cir., Largo, Fla. 34643

Filed Feb. 6, 1990, Ser. No. 475,578

Int. Cl.^{5} H01B *13/00*

U.S. Cl. 156—47 **23 Claims**



1. Method of forming a self-supporting substrate-less laminar structure with patterned electrical circuitry portions, comprising the steps of

sizing a removable flexible substrate strip with both

a bondable electrically conductive sizing material in the configuration of at least one circuit element pattern, and

a bondable electrically non-conductive sizing material in lateral contiguity with the configured conductive sizing material; wherein the sizing materials comprise a configurable composition adapted to be consolidated into self-supporting condition upon bonding exposure, including heating above ambient temperature;

bonding the respective sizing materials in place and together after each sizing step, including one or more steps of so exposing the sized substrate to bonding temperature, thus consolidating both the conductive and the non-conductive sizing materials into a single self-supporting substrate-less lamina;

flexing and removing the substrate to leave the electrically conductive and non-conductive materials bonded together as a single lamina without any covering layer;

including configuring the sizing materials on length segments of the substrate strip as a succession of identical side-by-side patterns, and then transversely severing

lengths thereof from one another, each as a self-supporting

(c) applying a second adhesive layer to said web second surface;

5,201,978

METHOD OF FABRICATING A BLANKET FOR AN

sheet of fibers against a resin impregnation promoting roller located in close proximity to an opening between the pair of

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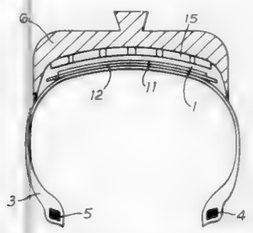
lengths thereof from one another, each as a self-supporting lamina containing a preselected number of identically patterned length segments.

5,201,975
TIRE MANUFACTURE

Colin Holroyd, Southport, and Anthony G. Goodfellow, Liverpool, both of England, assignors to Bridgestone/Firestone Inc., Akron, Ohio

Continuation of Ser. No. 474,130, May 1, 1990, abandoned. This application Jul. 25, 1991, Ser. No. 737,581
Claims priority, application United Kingdom, Nov. 13, 1987, 8726629
Int. Cl.[5] B29C *30/18*
U.S. Cl. 156—124 10 Claims



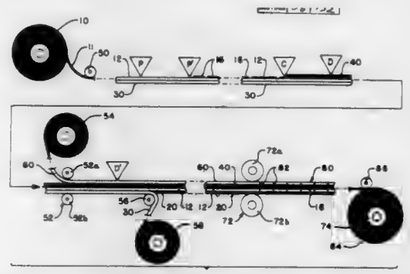
1. A method of manufacturing a tire comprising the steps of:
a) assembling an annular tread package which includes at least one breaker layer and uncured tread rubber into a pattern ring to impart a pattern on the tread rubber;
b) heating the pattern ring so as to partially pre-cure the imparted tread formation whilst partially pre-curing the tread package as a whole;
c) retaining said tread package in said pattern ring whilst positioning an uncured carcass of the tire within said tread package in such a manner that a radially outer surface of said carcass contacts uncured radially inner portions of said tread package thereby assembling a complete tire;
d) separating the pattern ring from the tread rubber after said complete tire has been assembled;
e) placing the assembled tire within a mold devoid of means to impart a tread pattern to the tire; and
f) heating the mold completely to effect bonding between said radially outer carcass surface and said radially inner tread package portions, and to cure the entire assembled tire completely.

5,201,976
METHOD OF PRODUCING A CONTINUOUS LABEL WEB

David L. Eastin, Hudson, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Filed May 6, 1991, Ser. No. 697,231
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—152 21 Claims

1. A method of producing a continuous label web comprising the steps of:
(a) applying a first adhesive layer to a web first surface of a web of label stock having a first and a second surface;
(b) releasably contacting a release liner to said adhesive, said release liner having a low energy bonding surface and a high energy bonding surface, said low energy bonding surface in contact with said first adhesive;
(c) applying a second adhesive layer to said web second surface;
(d) removing said release liner from said first adhesive layer;

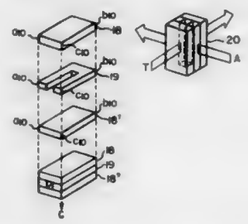


(e) reapplying said release liner to said second adhesive on said web second surface, such that said high energy bonding surface engages said second adhesive.

5,201,977
PROCESS FOR PRODUCING STRUCTURES FROM SYNTHETIC SINGLE-CRYSTAL PIECES

Hiroaki Aoshima, 4-34-14 Yayoicho, Nakano ku, Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,838
Claims priority, application Japan, Aug. 9, 1989, 1-207212; Apr. 27, 1990, 2-112568
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] B32B *31/22*; G02B *1/02*
U.S. Cl. 156—153 12 Claims

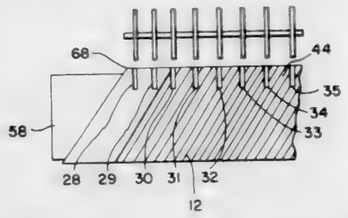


1. A process for producing structures by chemically bonding selected synthetic single-crystal pieces having identical major components and crystal systems comprising; shaping a plurality of synthetic single-crystal pieces to have identical prime components of crystal system axes, axial angle, and axial ratios for respective sides of said plurality synthetic single-crystals; optically polishing said respective sides of said plurality of synthetic single-crystal pieces; stacking said plurality of synthetic single-crystal pieces with said respective sides of said optically polished surface in intimate optical contact so they are optically combined; said selected synthetic single-crystal pieces containing color impurities; said synthetic single-crystal pieces being selected from synthetic single-crystal pieces having color tones associated with a particular predetermined spectra; stacking said selected synthetic single-crystal pieces to produce a filter structure having a particular predetermined spectrum of transmission or absorption; uniformly heating said stack of synthetic single-crystal pieces to a predetermined temperature; gradually cooling said stack of synthetic single-crystal pieces; said heating and gradual cooling being performed at least twice so that said stack of synthetic single-crystal pieces are integrated and assimilated together into a single-crystal unit with said respective optically contacting faces chemically bonded.

5,201,978
METHOD OF FABRICATING A BLANKET FOR AN EXTENDED NIP PRESS

Paul McCarten, Clarks Summit, and Eugene Slagowski, Waverley, both of Pa., assignors to Beloit Technologies, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 566,402, Jul. 31, 1990, Pat. No. 5,062,924, which is a continuation-in-part of Ser. No. 179,086, Apr. 8, 1988, Pat. No. 4,944,820. This application May 24, 1991, Ser. No. 705,487
Int. Cl.[5] B29C *53/60*
U.S. Cl. 156—154 3 Claims



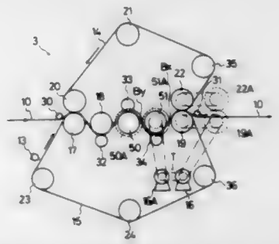
1. A method of fabricating a blanket for an extended nip press which includes a shoe and a felt, said method including the sequential steps of:
weaving a base from a first plurality of filaments disposed in a machine direction and a second plurality of filaments disposed in a cross-machine direction, said first plurality of filaments having a modulus of elasticity which permits flexing of the blanket during movement of the blanket through the extended nip press, the second plurality of filaments having a modulus of elasticity which is higher than the modulus of elasticity of the first pluraltiy of filaments for inhibiting flexing of the blanket in a cross-machine direction;
saturating the woven base with polyurethane;
wrapping the saturated woven base around a smooth mandrel such that several layers of said woven base are built around the mandrel;
heating the wrapped mandrel such that the polyurethane gels;
further heating the wrapped mandrel within a heating oven for curing the polyurethane;
cooling the cured blanket;
grooving the outer surface of the blanket while the blanket is still supported on the mandrel such that at least two of said layers of said woven base are grooved; and
removing the finished blanket from the mandrel.

5,201,979
METHOD OF MANUFACTURING A SHEET-PREPREG REINFORCED WITH FIBERS

Tomohito Koba; Toshiyuki Nakakura, both of Yokohama; Hideo Sakai, Ebina; Satoru Kishi, Yukosuka, and Chiaki Maruko, Kamakura, all of Japan, assignors to Research Association for New Technology Development of High Performance Polymer, Tokyo, Japan

Continuation of Ser. No. 535,135, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 189,955, May 3, 1988, abandoned. This application Feb. 27, 1992, Ser. No. 841,204
Claims priority, application Japan, May 8, 1987, 62-112045; Aug. 24, 1987, 62-210610; Aug. 28, 1987, 62-216251; Aug. 28, 1987, 62-216253
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—161 14 Claims

1. A method of impregnating fibers with a thermoplastic resin and manufacturing a sheet-prepreg reinforced with the fibers comprising coating only an upper face of a lower band belt of a pair of facing band belts with a film of thermoplastic resin, said belts having been heated to a temperature higher than the softening point of the thermoplastic resin, passing a sheet of fibers against a resin impregnation promoting roller located in close proximity to an opening between the pair of facing band belts and thereafter passing the sheet of fibers between the pair of facing band belts, said facing belts including a plurality of resin impregnation promoting rollers in offset positions so that facing band belts follow a non-linear path, said impregnation promoting rollers contacting an upper face of an

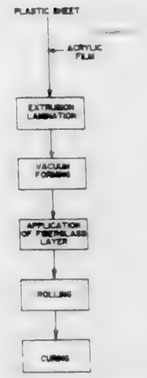


upper band belt or the lower face of the lower band belt so as to promote impregnation of the sheet with the thermoplastic resin whereby the fiber sheet is pushed through the coated film of resin so as to contact the upper face of the lower band belt, and applying tension to the sheet of fibers conveyed between the pair of facing band belts, said tension being different in at least two locations of the non-linear path.

5,201,980
METHOD FOR MAKING LINER FOR INTERMENT CONTAINER

Warren Chandler, and Kyle Coffman, both of Marshall, Ill., assignors to Doric Products, Inc., Marshall, Ill.

Division of Ser. No. 624,723, Dec. 10, 1990, Pat. No. 5,140,728. This application May 14, 1992, Ser. No. 883,286
Int. Cl.[5] B32B *31/14*
U.S. Cl. 156—196 4 Claims



1. A method of manufacturing an interment container liner comprising providing a first plastic layer, providing a second layer including glass fibers, providing a third layer comprising an acrylic material between said first layer and said second layer, and laminating the first, second and third layers to one another and forming an interment container liner from the resulting lamination.

5,201,981

folding tools work in the same working direction, and

5,201,984

having a cooling region at an exit end closest to a vacuum

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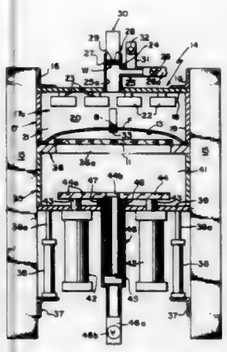
5,201,981
METHOD OF FORMING SYNTHETIC PLASTIC FILM-PROJECTED BUILDING SIDING

Robert C. Whiteside, Harrison, Mich., assignor to Citadel Architectural Products, Inc., Federal Way, Wash.

Filed Aug. 16, 1991, Ser. No. 745,748
Int. Cl.[5] E04C *1/00*; B32B *31/20*
U.S. Cl. 156—212 **14 Claims**



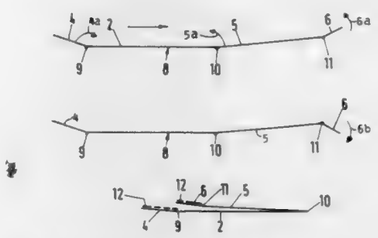
1. A method of forming synthetic plastic film-protected board in a molding press having a frame with an upper box which is closed except at its lower end, the upper box functioning as a heating chamber for a heater system associated therewith, the press further having a board-supporting system below said upper box; comprising the steps of:
(a) placing a rigid board core on said board supporting system and a thermoplastic synthetic plastic film of a thickness substantially in the range of 0.0001 to 0.0010 inches, having side and end edges extending beyond said core to overlie the side and edges of the core, in a disposition above said core;
(b) bringing said upper clamp box and said film into engagement to form a closed, substantially air-tight heating chamber, and communicating such air-tight heating chamber with a source of vacuum and creating a differential pressure to billow said plastic film upwardly in said heating chamber to only a degree to avoid overheating;
(c) applying heat to said heating chamber via said heater system while said film is billowed to raise said film to molding temperature;
(d) reversing the differential pressure on said film and molding it to the upper surface and side and end edges of said core so tightly and intimately that the plastic film can take on the grain of the core; and
(e) cooling the product formed.

5,201,982
METHOD FOR PRODUCING SELF-SEALING ENVELOPES

Alfons Schmidt, Horhausen, Fed. Rep. of Germany, assignor to Winkler & Duennebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

Filed Sep. 26, 1991, Ser. No. 766,806
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1990, 4030414
Int. Cl.[5] B31B *1/26*
U.S. Cl. 156—227 **2 Claims**

1. A method for producing self-sealing envelopes, comprising the following steps:
(a) providing envelope blanks from flat stock so that each blank has an envelope front with two side flaps, a closure flap, and an envelope bottom flap with an edge strip along a free edge of said envelope bottom flap,
(b) producing all precreases on one side of said blank along score lines where folds are to be made, whereby all pre-folding tools work in the same working direction, and whereby said score lines bias all flaps and said edge strip toward said one side,
(c) first, folding said side flaps along respective score lines in directions toward said one side and applying adhesive to said side flaps,
(d) second, folding said bottom flap against said adhesive on said side flaps to form a partly finished envelope in which adhesive receiving surfaces of said closure flap and of said

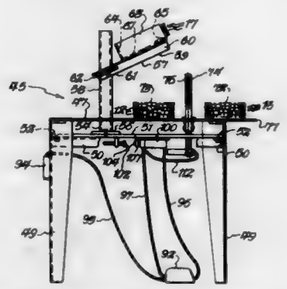


edge strip extend in parallel and next to each other and said edge strip extend in parallel and next to each other and said edge strip is still biased toward said one side by its respective score line,
(e) applying self-adhesive to said adhesive receiving surfaces of said closure flap and of said edge strip, and
(f) third, folding said closure flap toward said one side in the direction of said bias and folding said edge strip away from said one side in a direction opposite to its bias to form the finished envelope.

5,201,983
APPARATUS FOR FABRICATING A FIVE-PIECE EXPANDING POCKET

Thomas J. Corey, 481 Delaware Ave., Buffalo, N.Y. 14202

Filed Dec. 10, 1991, Ser. No. 805,310
Int. Cl.[5] B32B *31/04*; B31F *5/04*
U.S. Cl. 156—539 **17 Claims**

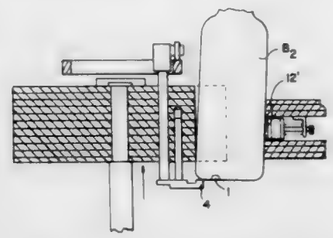


1. A fixture for assembling a five-piece pocket comprising a base, first support means on said base for supporting a stack of front inner panels, second support means on said base for supporting a stack of rear inner panels, third support means on said base for supporting a stack of front outer panels, fourth support means on said base for supporting a stack of rear outer panels, a first locating plate mounted on said base for positioning a front inner panel and a front outer panel thereon, a second locating plate mounted on said base for positioning a rear inner panel and a rear outer panel thereon, moving means on said base for moving said first and second locating plates together and apart, and gusset-locating means on said base for locating a gusset relative to said first and second locating plates.

5,201,984
DEVICE FOR THE ORIENTING OF BOTTLES APPLICABLE, IN PARTICULAR, TO BOTTLING MACHINES

Jean Bedin, Château Ysard Camblanes, 33360 Latresne, France

Filed Nov. 26, 1991, Ser. No. 798,625
Claims priority, application France, Nov. 30, 1990, 90 15031
Int. Cl.[5] B65C *9/00*
U.S. Cl. 156—566 **7 Claims**

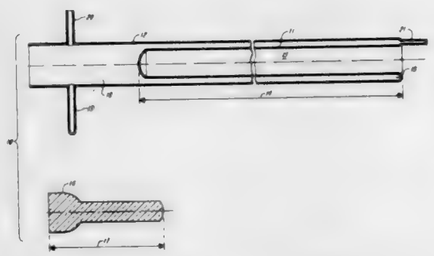


1. An arrangement for orienting bottles to a predetermined angular position, each bottle having a bottle axis, a bottle side wall, a bottle bottom wall and a bottle mark, said arrangement comprising:
(a) a rotary selector wheel having a plurality of compartments rotatable about a wheel axis;
(b) means for successively conveying the bottles into the compartments;
(c) means for turning each bottle about its respective bottle axis until the bottle mark is positioned at said predetermined angular position;
(d) tilting means for tilting each bottle in its respective compartment during turning to said predetermined angular position to a tilted position in which the respective bottle axis is inclined relative to the wheel axis at an angle other than a right angle; and
(e) said turning means including braking means for engaging a reduced braking zone on a respective bottle side wall in the tilted position of the respective bottle.

5,201,985
METHOD AND APPARATUS FOR THE PURIFICATION AND CONTROL OF THE COMPOSITION OF NON-STOICHIOMETRIC AND STOICHIOMETRIC CRYSTALLINE COMPOUNDS

Serge Medvedieff, Boston, Mass., assignor to Harald A.T.O. and Irene B. Reiche, both of Boston, Mass.

Filed Mar. 7, 1991, Ser. No. 667,601
Int. Cl.[5] C30B *23/00*
U.S. Cl. 156—609 **19 Claims**

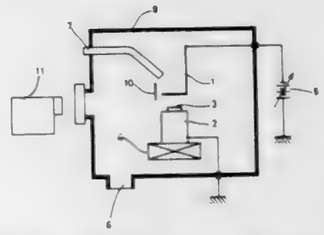


1. A method of purification of a non-stoichiometric compound comprising the steps of:
providing a vacuum tube under dynamic vacuum, said tube having a cooling region at an exit end closest to a vacuum source;
charging the vacuum tube at an entry end opposite the exit end with a material to be purified;
providing a temperature gradient movable along the length of the vacuum tube, a portion of the temperature gradient at a temperature sufficient to sublime the material to be purified and a portion of the temperature gradient at a temperature sufficient to condense the sublimed material, thereby subjecting the material to multiple sublimation and condensation steps as the material moves down the length of the vacuum tube towards the cooling region; and
collecting a purified non-stoichiometric compound in the cooling region.

5,201,986
DIAMOND SYNTHESIZING METHOD

Nobuhiro Ota; Naoji Fujimori, both of Hyogo, and Takayuki Shibata, Hokkaido, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 2, 1991, Ser. No. 739,995
Claims priority, application Japan, Aug. 7, 1990, 2-210021; Aug. 10, 1990, 2-213097
Int. Cl.[5] C30B *25/14*
U.S. Cl. 156—610 **2 Claims**



1. A diamond synthesizing method comprising the steps of introducing a mixed gas of hydrocarbon gas and hydrogen gas into a reaction vessel and causing a dc discharge across a cathode an anode under a pressure of 1 to 100 Torr thereby depositing diamond on a substrate being placed on said anode, wherein concentration of said hydrocarbon gas with respect to said hydrogen gas is increased until emission intensities of Hα (656.3 nm) and CH (431.4 nm) satisfies an emission condition of Hα>CH in the emission spectrum of a positive column produced during discharge, and adding gas containing oxygen to said mixed gas for stably maintaining said positive column under said emission condition of Hα>CH and for effectively removing non-diamond carbon.

5,201,987
FABRICATING METHOD FOR SILICON STRUCTURES

William G. Hawkins, Webster; Donald J. Drake, Rochester, and James F. O'Neill, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 533,203, Jun. 4, 1990, abandoned. This application Jun. 18, 1992, Ser. No. 899,597
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—633 **12 Claims**

1. A method of fabricating a precision etched, three dimensional device from a silicon wafer, the wafer having a frontside and a backside surface, the device being produced by etching only the frontside surface of the wafer comprising the steps of:
(a) depositing an etch resistant masking layer on the frontside and backside surfaces of a clean silicon wafer;
(b) depositing a mechanical damage protective layer over the masking layer on both the frontside and backside surfaces of the wafer,
(c) placing the backside surface of the wafer, covered by said

masking layer and over lying protective layer, on a chuck

cies are formed so as to enable said tag to be identified, com-

nitrogen-containing gas, selected from the group consist-

gate of said field region and simultaneously a predeter-
mined part of said second dielectric layer is exposed;

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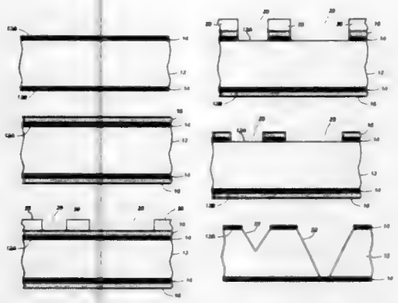
masking layer and over lying protective layer, on a chuck means suitable for use in applying a photoimagable layer, whereby the protective layer over the masking layer on the wafer backside surface prevents crack-producing damage to said masking layer resulting from mechanical contact with said wafer during said placement of the wafer on said chuck means;

(d) applying and patterning a photoimagable layer on the protective layer on the wafer frontside surface to produce a pattern of vias in the photoimagable layer, thereby exposing the protective layer through the vias, while the protective layer on the wafer backside surface prevents damage to the masking layer which could produce cracks in said masking layer, during the application and patterning of the photoimagable layer;



(e) sequentially etching the protective layer first and then the masking layer exposed through the vias in the photoimagable layer to produce aligned vias therein exposing the frontside surface of the wafer;

(f) stripping the patterned photoimagable layer from the frontside surface of the wafer; and

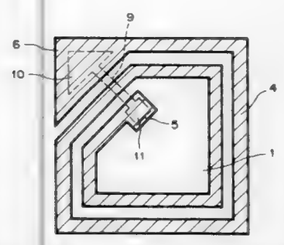
(g) anisotropically etching the wafer in an etch bath, so that the exposed frontside surface of the wafer is etched through the vias in the protective and masking layers to produce the three dimensional device without undesired etching of the backside surface of the wafer through inadvertently produced cracks in the masking layer on the wafer backside surface.

5,201,988

METHOD OF MANUFACTURING A RESONANT TAG

Takeshi Matsumoto, and Yuji Suzuki, both of Yokohama, Japan, assignors to Tokai Metals Co., Ltd., Kanagawa, Japan

Division of Ser. No. 774,158, Oct. 15, 1991, Pat. No. 5,119,070, which is a continuation of Ser. No. 469,168, Jan. 24, 1990, abandoned. This application Nov. 21, 1991, Ser. No. 795,677
Claims priority, application Japan, Jan. 25, 1989, 1-14149
Int. Cl.[5] B44C *1/22;* **C23F** *1/00*
U.S. Cl. 156—634 **3 Claims**



1. A method of manufacturing a resonant tag on which at least two resonant circuits having different resonant frequencies are formed so as to enable said tag to be identified, comprising the steps of:

coating a conductive thin film having a predetermined thickness on two surfaces of an insulating thin film;

printing a plurality of first conductive patterns on a surface of one of said conductive thin films and a corresponding plurality of second conductive patterns on a surface of the other conductive thin film using an anti-etching ink, each of said first conductive patterns and a corresponding one of said second conductive patterns defining separate and distinct resonant circuit, each of said first conductive patterns containing at least an inductor element and one element of a capacitor which corresponds to a distinct resonant frequency of a separate resonant circuit, each of said second conductive patterns containing at least another element of the capacitor which corresponds to the distinct resonant frequency of the separate resonant circuit, each said capacitor element of said second conductive patterns being disposed at a position where it faces said capacitor element of a corresponding one of said first conductive patterns;

etching said conductive thin films to remove non-printed portion of said conductive films; and

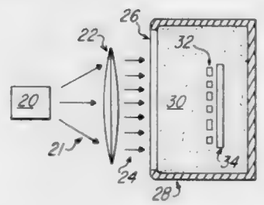
forming LC resonant circuits by selectively electrically connecting the one and the other capacitor elements of at least two of said first conductive and second conductive patterns.

5,201,989

ANISOTROPIC NIOBIUM PENTOXIDE ETCH

Monte A. Douglas, Coppell; Howard R. Beratan, Richardson, and Scott R. Summerfelt, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 20, 1992, Ser. No. 872,701
Int. Cl.[5] B44C *1/22;* **C23F** *1/00*
U.S. Cl. 156—635 **13 Claims**



1. A method to anisotropically etch niobium pentoxide comprising the steps of

(a) submersing a surface of said niobium pentoxide in a liquid ambient; and

(b) illuminating portions of said surface with radiation, thereby etching said illuminated portions of said surface at a substantially greater rate than the unilluminated portions of said surface.

5,201,990

PROCESS FOR TREATING ALUMINUM SURFACES IN A VACUUM APPARATUS

Mei Chang, Cupertino; Ashok Sinha, Palo Alto; Turgut Sahin, Cupertino; Alfred Mak, Union City, and Cissy Leung, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

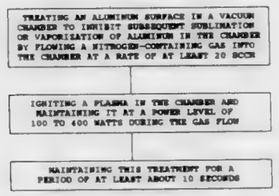
Filed May 23, 1991, Ser. No. 704,523
Int. Cl.[5] B44C *1/22;* **C23F** *1/00;* **B05D** *3/06*
U.S. Cl. 156—643 **21 Claims**

1. A process for treatment of an aluminum surface in a vacuum chamber used for the processing of materials on a semiconductor wafer which comprises:

a) flowing into said chamber one or more gases, including a nitrogen-containing gas, selected from the group consisting of:

i) a mixture of nitrogen (N_2) and hydrogen (H_2); and

ii) ammonia (NH_3); and



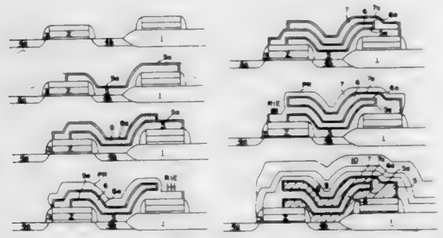
b) igniting a plasma in said chamber and maintaining said plasma in said chamber during said flow of said nitrogen-containing gas into said chamber.

5,201,991

PROCESS FOR FORMATION OF CAPACITOR

Chang-Jae Lee, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea

Filed Feb. 21, 1991, Ser. No. 659,004
Claims priority, application Rep. of Korea, Feb. 23, 1990, 90-2345
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **1 Claim**



1. A process for formation of capacitor comprising steps of:

forming a field region and an active region on a substrate;

forming a gate with a sidewall on a field region and an active region, respectively;

forming a source region and a drain region by implanting impurities in two predetermined regions of said substrate and then diffusing said impurities;

forming a first storage node polysilicon over the exposed whole surface;

defining said first storage node polysilicon so that said first storage node polysilicon is only remained between a gate of said active region and a gate of said field region;

forming a first dielectric layer on said defined first storage node polysilicon;

forming a first plate node polysilicon over the exposed whole surface;

defining said first plate node polysilicon so that said first plate node polysilicon is only remained between a gate of said active region and a gate of said field region and simultaneously a predetermined part of said first dielectric layer is exposed;

removing the exposed part of said first dielectric layer;

forming a second dielectric layer over the exposed whole surface;

forming a second storage node polysilicon contacted with said first storage node polysilicon through the removed part of said first dielectric layer;

defining said second storage node polysilicon so that it is only remained between a gate of said active region and a gate of said field region and simultaneously a predetermined part of said second dielectric layer is exposed;

removing the exposed part of said second dielectric layer;

forming a third dielectric layer on said defined second storage node polysilicon; and

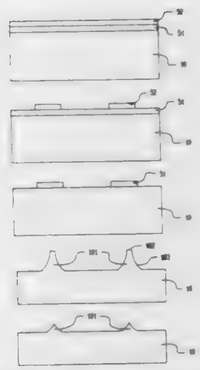
forming a second plate node polysilicon contacted with said first plate node polysilicon through the removed part of second dielectric layer.

5,201,992

METHOD FOR MAKING TAPERED MICROMINIATURE SILICON STRUCTURES

Robert B. Marcus, Murray Hill; Tirunelveli S. Ravi, Eatontown, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Continuation of Ser. No. 551,771, Jul. 12, 1990, abandoned. This application Oct. 8, 1991, Ser. No. 774,361
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **13 Claims**



4. A method of making a silicon structure comprising an array of a plurality of apices of uniform sharpness having radii of curvature of less than 10 nanometers comprising the steps of

exposing an array of silicon protuberances to an essentially dry oxidizing environment at a temperature not exceeding 1050 degrees C.,

stripping surface oxides from said protuberances, and

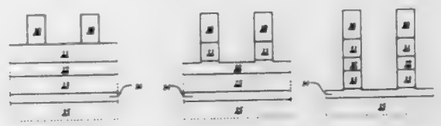
subsequently repeating said steps of exposing and stripping to attain the enhanced sharpness and uniformity of said apices in said array.

5,201,993

ANISOTROPIC ETCH METHOD

Rod C. Langley, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 382,403, Jul. 20, 1989, abandoned. This application Aug. 27, 1990, Ser. No. 574,578
Int. Cl.[5] H01L *21/308*
U.S. Cl. 156—643 **6 Claims**



1. A method of anisotropically etching dielectric layer on a substrate, comprising the steps of:

a) providing a parallel plate plasma etch reactor, having a

first electrode whereupon the substrate is mounted, and

transporting said chemical equilibrium system into contact

5,201,998

said shoe means, the arrangement being such that a first portion of water is removed through said first wire when

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first electrode whereupon the substrate is mounted, and having a second electrode that is non-erodible by plasma;

b) providing an atmosphere within said reactor, consisting essentially of C_2F_6, CHF_3, CF_4, and an inert carrier gas, whereby said atmosphere contains more C_2F_6 than CF_4, and more CF_4 than CHF_3;

c) exposing the dielectric layer to a plasma maintained in said atmosphere.

5,201,994

DRY ETCHING METHOD

Mikio Nonaka, and Hiroyuki Hara, both of Zama, Japan, assignors to Kabushiki Kaisha Tokuda Seisakusho, Kanagawa, Japan

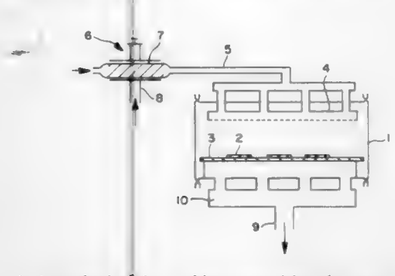
PCT No. PCT/JP89/01174, § 371 Date Jul. 17, 1990, § 102(e) Date Jul. 17, 1990, PCT Pub. No. WO90/05994, PCT Pub. Date May 31, 1990

PCT Filed Nov. 17, 1989, Ser. No. 536,568

Claims priority, application Japan, Nov. 18, 1988, 63-291736; Jan. 9, 1989, 1-2461; May 29, 1989, 1-135189

Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **5 Claims**



1. A method of dry etching comprising the steps of:

introducing reacting gas into a vacuum chamber, said reacting gas being a mixture of fluoride gas, oxygen and alcohol; applying a microwave electric field to generate a plasma; and injecting activated particles in said plasma to a workpiece to be etched in said vacuum chamber.

5,201,995

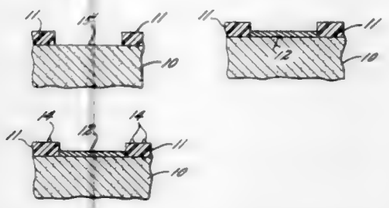
ALTERNATING CYCLIC PRESSURE MODULATION PROCESS FOR SELECTIVE AREA DEPOSITION

Arnold Reisman, and Dorota Temple, both of Raleigh, N.C., assignors to MCNC, Research Triangle Park, N.C.

Filed Mar. 16, 1992, Ser. No. 852,411

Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C23F** *1/00;* **C23C** *16/00*

U.S. Cl. 156—646 **29 Claims**



1. A process for depositing a predetermined thickness of a solid-phase material on a substrate located in a chemical reactor, said process comprising the steps of:

combining a predetermined quantity of supply components to produce a confined vapor-phase chemical equilibrium system capable of both depositing and etching said material;

transporting said chemical equilibrium system into contact with said substrate;

flowing into said reactor and into a vapor-phase mixture with said chemical equilibrium system an independent flow of an auxiliary gas; and

cyclically modulating said flow of said auxiliary gas into said reactor while maintaining the production and transportation of said chemical equilibrium system therein to alternatively stimulate said system toward deposition and then etching of said material on and from said substrate or visa-versa, said cyclical flow modulation being continued for a duration and at a frequency sufficient to yield net deposition of said material on said substrate.

5,201,996

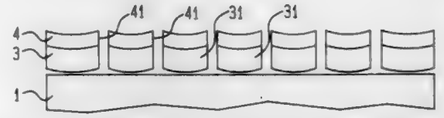
PATTERNING METHOD FOR EPITAXIAL LIFT-OFF PROCESSING

Thomas J. Gmitter, Lakewood, and Eli Yablonovitch, Leonardo, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 30, 1990, Ser. No. 516,173

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—655 **15 Claims**



1. In the fabrication of microelectronic, optoelectronic, or photonic devices, a method for removing a structure from a substrate, said structure comprising an epitaxial semiconductor film grown on a release layer on said substrate, said method comprising the steps of

forming on a surface of said structure a layer of a support material,

patterning said layer of support material by heated mechanical means, thereby selectively exposing said surface,

etching exposed surface material, and

undercut-etching said release layer,

whereby said support material supports said surface of said structure being released by undercut etching.

5,201,997

CHEMICAL MILLING OF NIOBIUM

Robert E. Fishter, Boca Raton; Kenneth C. Long, Stuart, and Henry M. Hodgens, II, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1991, Ser. No. 816,499

Int. Cl.[5] B44C *1/22;* **C23F** *1/00*

U.S. Cl. 156—664 **3 Claims**

1. An aqueous acid solution for chemically milling niobium and niobium alloys comprising, in percent by weight, 24–30% HNO_3 (70% by weight), 17–22% HF (48% by weight), balance H_2O to which is added 6–8 grams/liter citric acid, 2–3 grams/liter ammonium formate, and 0.02–0.20 millimoles/liter of a metal chosen from the group consisting of Cu, Ru, Rh, Pd, Os, Ir, Pt and Au and combinations thereof.

3. A method of chemically milling niobium metal which is susceptible to embrittlement by hydrogen whereby a surface of said metal is contacted by the chemical milling solution as recited in claim **1** at a temperature between about 60° F. and 80° F. for a time sufficient to remove the desired amount of metal.

5,201,998

PROCESS FOR SIZING PAPER WITH ANIONIC HYDROPHOBIC SIZING AGENTS AND CATIONIC RETENTION AIDS

Rosemarie Töpfl, Dornach; Michael Bernheim, Arlesheim; Hubert Meindl; Hans Wegmüller, both of Riehen; Peter Rohringer, Schönenbuch, and Dieter Werthemann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 257,132, Oct. 7, 1988, abandoned, which is a continuation of Ser. No. 860,375, May 6, 1986, abandoned, which is a continuation of Ser. No. 497,461, May 23, 1983, abandoned. This application Feb. 28, 1990, Ser. No. 486,679

Claims priority, application Switzerland, May 28, 1982, 3315/82; Feb. 25, 1983, 1060/83; Mar. 30, 1983, 1754/83; Mar. 30, 1983, 1755/83; Mar. 30, 1983, 1756/83

Int. Cl.[5] D21H *17/14*

U.S. Cl. 162—158 **11 Claims**

1. A process for sizing paper or cardboard, which comprises adding to an aqueous dispersion of cellulose fibers, in any order or simultaneously at least

(A) 0.02 to 3% by weight of a sizing agent which contains one acidic group selected from the group consisting of $-P(=O)(OH)_2$, $-COOH$ and $-SO_3H$ which is either free or in the form of a salt and at least two hydrophobic substituents which each have at least 5 carbon atoms, and at least one of the hydrophobic substituents having at least 8 carbon atoms, and at least two adjacent hydrophobic substituents being bonded to each other with a linking member of the formula

$$-Q_1-(O)-A_1-(O)_{m-1}-Q_2- \quad (1)$$

or

$$-O-A_2-O- \quad (2)$$

wherein m is 1 or 2, A_1 is a divalent aliphatic or cycloaliphatic radical, A_2 is a divalent aromatic radical and Q_1 and Q_2 are

wherein the linking member has 4 to 15 carbon atoms and 2 hetero atoms and the sizing agent has a molecular weight of 400 to 3000, and

(B) 0.02 to 3% by weight of a polymeric cationic retention aid.

5,201,999

TWIN WIRE FORMING APPARATUS

Roderic Field, Bury, England; John W. Harwood, Janesville, Wis., and Peter Jackson, Bury, England, assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Jun. 10, 1991, Ser. No. 713,186

Int. Cl.[5] D21F *1/00*

U.S. Cl. 162—301 **6 Claims**

1. A forming apparatus arrangement for forming a web from stock having an ash content above 20 percent, said apparatus comprising:

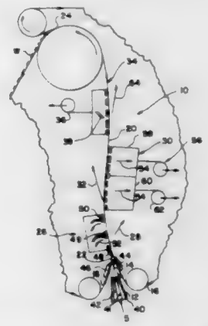
a headbox for vertically ejecting a stream of the stock;

first and second endless looped forming wires cooperating together to define therebetween a vertical forming section having an upstream and a downstream end, said upstream end being disposed closely adjacent to said headbox such that said stream of stock is directed vertically upwardly into said upstream end of said forming section;

curved shoe means cooperating with said second wire, said shoe means being disposed immediately downstream relative to said upstream end of said forming section, said second wire being disposed between said first wire and said shoe means, the arrangement being such that a first portion of water is removed through said first wire when said wires and the stock move over said shoe means;

a stationary dewatering means disposed between said shoe means and said downstream end of said forming section, said dewatering means cooperating with said first wire and being disposed on the opposite side of said wires relative to said shoe means, said dewatering means having a radius of curvature which is less than that of said curved shoe means, said dewatering means having a curvature in an opposite sense than the curvature of said curved shoe means, the arrangement being such that a second portion of water is removed from the stock through said second wire during movement of the stock and said wires over said dewatering means;

a further dewatering shoe disposed between said dewatering means and said downstream end of said forming section, said further shoe cooperating with said second wire and being disposed on the same side of said wires as said shoe means, said further shoe being connected to a source of partial vacuum such that a third portion of water is removed from the stock through said second wire during movement of the stock and said wires over said further shoe, the arrangement being such that from said upstream end to said downstream end of said forming section, water is progressively and evenly removed from the stock through both wires, so that two-sidedness of the resultant



web is minimized while maintaining maximum retention of the ash within the web;

said further dewatering shoe being a curved shoe;

said further shoe having a radius of curvature in the same sense as the radium of curvature of said curved shoe means such that a fifth portion of water is removed through said first wire during movement of the stock and wires over said further shoe; and

said forming apparatus further including:

a first and second turning bar disposed within said first and second looped wires, respectively, for guiding said wires into close proximity relative to said headbox, so that the distance between said headbox and said upstream end of said forming section is minimized;

said curved shoe means including:

a plurality of shoes, each shoe of said plurality of shoes extending in a cross-machine direction, each shoe of said plurality of shoes defining a gap between an adjacent shoe in a machine direction, the arrangement being such that a further portion of water is removed from the stock through said second wire, said further portion of water being removed between said gap defined between said adjacent shoes; and

said further portion of water and said second portion of water being substantially equal in volume to said first portion of water and a fourth portion of water removed through said first wire during movement of the stock and said wires over said dewatering means, the arrange-

ment being such that ash within the stock is evenly

5,202,001

5,202,003

plurality of points wherein measured tip currents locate

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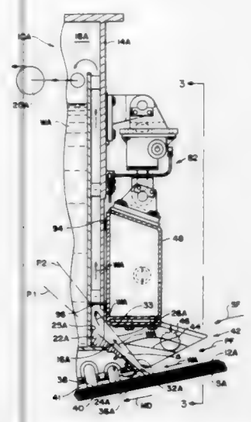
ment being such that ash within the stock is evenly distributed on both sides of the web so that during a subsequent supercalendering of the web, the resultant web exhibits enhanced printing characteristics on both sides thereof.

5,202,000

SAVEALL APPARATUS FOR A TWIN-WIRE FORMER

Richard W. Phillips, Beloit, Wis., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Sep. 30, 1991, Ser. No. 768,495
Int. Cl.[5] D21F *1/52*
U.S. Cl. 162—363 15 Claims



1. A saveall apparatus for collecting water ejected from stock through a forming wire of a papermaking machine, said apparatus comprising:

a box disposed closely adjacent to the forming wire, said box defining an enclosure which is connected to a source of partial vacuum such that the water ejected from the stock through the forming wire is collected within said enclosure;

a fixed throat rigidly secured to said box, said fixed throat wall having an upstream and a downstream end, said upstream end of said fixed throat wall slidingly engaging the forming wire;

a movable throat wall cooperating with said fixed throat wall for defining therebetween a vacuum slot which is connected to said enclosure such that the water ejected from the stock through the forming wire is drawn by said partial vacuum through said vacuum slot into said enclosure;

said fixed throat wall being disposed in a first plane and said movable throat wall being disposed in a second plane at an angle to said first plane;

means for moving said movable throat wall relative to said fixed throat wall, structured and arranged such that the angle defined between said first and second planes remains constant;

frame means rigidly secured to said moveable throat wall; and

bearing means disposed between said frame means and said box such that said frame means is disposed spaced and parallel relative to said box for spaced parallel sliding movement relative thereto.

5,202,001

PREPARATION OF URETHANE PREPOLYMERS HAVING LOW LEVELS OF RESIDUAL TOLUENE DIISOCYANATE

William E. Starner, Nesquehoning; Bernard A. Toseland; Reinaldo M. Machado, both of Allentown, all of Pa.; Albert J. Siuta, Sewell, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 412,953, Sep. 26, 1989, Pat. No. 5,051,152. This application Jul. 9, 1991, Ser. No. 727,501
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.
Int. Cl.[5] B01D *1/00, 3/00*
U.S. Cl. 203—49 15 Claims

1. In a process for reducing the amount of residual organic diisocyanate ("di-NCO") in a polyurethane prepolymer reaction product mixture which comprises passing the prepolymer reaction product mixture through a wiped film evaporation zone, the improvement which consists essentially of passing an inert gas through a quantity of the prepolymer which has passed through the evaporation zone and passing the inert gas in a countercurrent flow through the evaporation zone such that

$$0.06\left(\frac{\text{mol wt}\ \frac{\text{gas}}{\text{mol wt}\ \text{di-NCO}}}{}\right) < \frac{\text{mass flow rate inert gas}}{\text{mass flow rate prepolymer}} < 1.55\left(\frac{\text{mol wt}\ \frac{\text{gas}}{\text{mol wt}\ \text{di-NCO}}}{}\right)$$

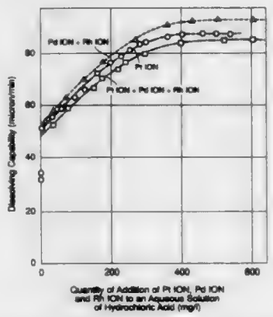
to provide a resulting prepolymer product which contains less than about 0.1 wt % residual organic diisocyanate.

5,202,002

PROCESS FOR PICKLING STEEL-BASED METALLIC MATERIALS AT A HIGH SPEED

Masamitsu Tsuchinaga, and Seizaburo Abe, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 13, 1992, Ser. No. 882,498
Claims priority, application Japan, May 14, 1991, 3-109265
Int. Cl.[5] C25F *1/06*
U.S. Cl. 204—145 R 12 Claims



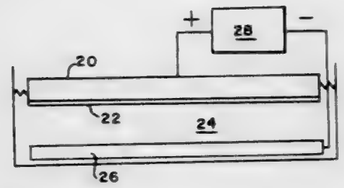
1. A process for pickling a steel-based metallic material at a high speed comprising: dipping said metallic material in or subjecting to electrolytic treatment in an aqueous solution of hydrochloric acid which contains at least one kind of the ion selected from a group comprising a platinum ion, a palladium ion and a rhodium ion by a quantity of 500 mg/l or less, in a hydrochloric acid having a concentration of 100 to 450 g/l and of which temperature is elevated to a range of 50 to 110° C.

5,202,003

ELECTROLYTIC REMOVAL OF TIN OXIDE OR TITANIUM NITRIDE FROM A COATER

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Division of Ser. No. 484,129, Feb. 23, 1990. This application Feb. 3, 1992, Ser. No. 830,773
Int. Cl.[5] C25F *1/00, 5/00*
U.S. Cl. 204—146 4 Claims



1. A method for the electrolytic removal of titanium nitride from a coater surface which comprises:

providing an electrolytic cell having an electrolyte and a pair of electrodes, the titanium nitride coated coater surface functioning as the anode and the other electrode functioning as the cathode; and

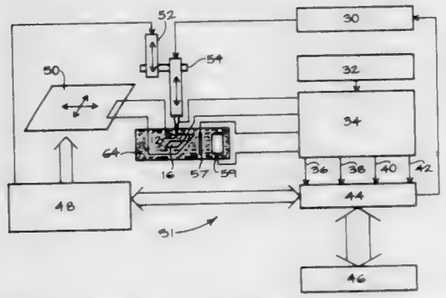
applying a voltage across the electrodes sufficient to remove the titanium nitride from the surface of the coater.

5,202,004

SCANNING ELECTROCHEMICAL MICROSCOPY

Juhyoun Kwak, Pasadena, Calif.; Allen J. Bard, and Fu-Ren F. Fan, both of Austin, Tex., assignors to Digital Instruments, Inc., Santa Barbara, Calif.

Filed Dec. 20, 1989, Ser. No. 452,841
Int. Cl.[5] G01N *27/00*
U.S. Cl. 204—153.1 45 Claims



1. A method of locating a chemical substance on a surface of a material comprising the steps of:

immersing said surface in a solution selected to be capable of supporting redox processes with said chemical substance;

positioning a tip of a working electrode in said solution proximate said surface at a distance of 1 nm to 10 microns;

connecting a controllable electric potential between said tip and said material;

setting said electric potential to produce an electrochemical reaction carried by said redox process immediate said working tip, said reaction generating a current through said tip;

moving said working electrode tip relative to said surface and proximal to a plurality of points in a reference plane wherein said plurality of points comprises at least one point proximal said chemical substance, wherein a substantially constant distance of said working electrode tip from said reference plane is maintained; and

measuring working tip faradaic current at each point of said plurality of points wherein measured tip currents locate said chemical substance on said surface.

5,202,005

GADOLINIUM PHOTOIONIZATION PROCESS

Jeffrey A. Paisner, San Ramon; Brian J. Comaskey, Stockton; Christopher A. Hayaam, and Jon H. Eggert, both of Pleasanton, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 14, 1991, Ser. No. 744,748
Int. Cl.[5] B01D *5/00*
U.S. Cl. 204—157.22 6 Claims

1. A method for isotopically selective ionization of an isotope of gadolinium having odd-numbered atomic mass in an atomic vapor containing a plurality of isotopes of gadolinium comprising the steps of applying to said vapor a photon of linearly or circularly polarized radiant energy sufficient to excite said odd-numbered atomic mass isotope of gadolinium from the ground state having an orbital angular momentum, J, value of 2, to a first excited state at an energy level of 16923 cm^{-1}, relative to the zero energy of said ground state;

applying a photon of similarly polarized radiant energy sufficient to excite atoms in said first excited state to a second metastable excited state at an energy level of 32660 cm^{-1}, relative to the zero energy of said ground state having an orbital angular momentum value, J, of 1; and

applying a photon of similarly polarized radiant energy sufficient to excite the atoms in said second excited state to an autoionized state having an orbital angular momentum value, J, of 0.

5,202,006

ANALYSIS OF HEMOGLOBIN VARIANTS BY CAPILLARY ZONE ELECTROPHORESIS

Fu-Tai A. Chen, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 17, 1992, Ser. No. 870,531
Int. Cl.[5] G01N *27/447, 27/26;* B01D *57/02*
U.S. Cl. 204—180.1 16 Claims

1. A method for analyzing hemoglobin and the variants of hemoglobin by capillary zone electrophoresis comprising the steps of:

a) introducing a sample comprising hemoglobin and the variants of hemoglobin into a capillary tube, said tube comprising a buffer, said buffer comprising at least about 100mM of a compound selected from the group consisting of barbituric acid, derivatives of barbituric acid, combinations of barbituric acid and the derivatives of barbituric acid, and combinations of the derivatives of barbituric acid, said buffer having a pH of at least about 8.0;

b) applying an electric field to the tube of sufficient voltage to allow for separation from each other of hemoglobin and any of the variants of hemoglobin which may be present in the sample; and

c) detecting said hemoglobin and variants of hemoglobin which are present.

5,202,007

HYDROPHILIC SYNTHETIC GELS AND THEIR USE IN ELECTROPHORESIS

Branko Kozulic, Georg Kempfstrasse 7, 8046 Zurich, Switzerland

Continuation-in-part of Ser. No. 688,752, Apr. 22, 1991, Pat. No. 5,185,466, and Ser. No. 293,840, Jan. 5, 1989, abandoned. This application May 7, 1991, Ser. No. 696,696
Claims priority, application United Kingdom, Apr. 20, 1990, 9008873
Int. Cl.[5] G01N *27/26, 27/447;* B01D *57/02*
U.S. Cl. 204—182.8 18 Claims

1. A method of separating molecules which comprises sub-

jecting such molecules to electrophoresis while in effective

Ca^{2+}, and NH^{4+}, and X^- is selected from ClO_4^-, $CF_3SO_3^-$,

a measuring sensor for detecting gaseous components in the

5,202,013

PROCESS FOR COLORING METAL SURFACES

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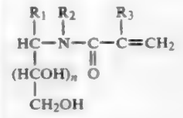
jecting such molecules to electrophoresis while in effective contact with a separation medium comprising a polymer comprising a monomer of the formula:



wherein

R_1 is H, CH_2OH or $(CHOH)_mCH_2OH$, m being 1 or 2;

R_2 is hydrogen, monohydroxyalkyl, polyhydroxyalkyl, or hydrocarbon radical;

R_3 is H or CH_3; and

n is an integer of 1–4;

migrating ionic species of said molecules in said medium thereby separating said species from each other.

5,202,008

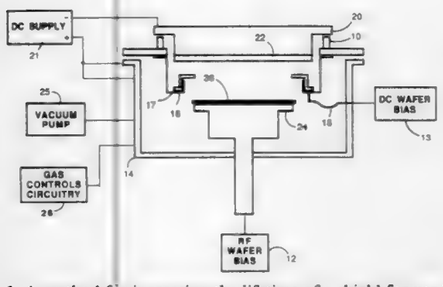
METHOD FOR PREPARING A SHIELD TO REDUCE PARTICLES IN A PHYSICAL VAPOR DEPOSITION CHAMBER

Humoyoun Talieh, Santa Clara; Haim Gilboa, Palo Alto, and Donald M. Mintz, Sunnyvale, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 715,883, Jun. 17, 1991, abandoned, which is a continuation of Ser. No. 487,567, Mar. 2, 1990, abandoned. This application Jun. 8, 1992, Ser. No. 895,209

Int. Cl.[5] C23C *14/34;* **B44C** *1/22;* **B24B** *1/00*

U.S. Cl. 204—192.32 **25 Claims**



1. A method for increasing the lifetime of a shield for use in a physical vapor deposition process, the method comprising the steps of:

(a) bead blasting the shield, and

(b) sputter-etch cleaning the shield, thereby roughening the surface of the shield and increasing its surface area, prior to using the shield in a physical vapor deposition process.

5,202,009

ELECTROLYTE SOLIDE POLYMERE RETICULE

Xavier Andrieu, and Jean-Pierre Boeuve, both of Bretigny sur Orge, France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Oct. 26, 1990, Ser. No. 603,510

Claims priority, application France, Oct. 26, 1989, 89 14061

Int. Cl.[5] C25B *13/08*

U.S. Cl. 204—296 **11 Claims**

1. A cross-linked polymer solid electrolyte usable at ambient temperature comprising a polyether having amine functions cross-linked by a curing compound including two epoxy functions, the electrolyte being characterized by that said amine functions are two terminal functions, thereby defining a three-dimensional lattice which complexes an ionizable salt of the formula M^+X^-, where M^+ is selected from Li^+, Na^+, K^+, Ca^{2+}, and NH^{4+}, and X^- is selected from ClO_4^-, $CF_3SO_3^-$, SCN^-, BF_4^-, I^-, Br^-, N_3^-, BH_4^-, $CF_3CO_3^-$, AsF_6^-, and PF_6^-, the proportion by weight of said salt in the electrolyte lying in the range 5% to 40%.

5,202,010

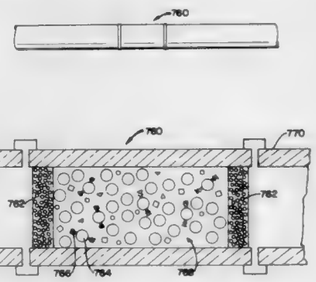
AUTOMATED CAPILLARY ELECTROPHORESIS APPARATUS

Norberto A. Guzman, East Brunswick, N.J., assignor to Princeton Biochemicals, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 270,788, Nov. 14, 1988, Pat. No. 5,045,172, which is a continuation-in-part of Ser. No. 125,544, Nov. 25, 1987, abandoned. This application Aug. 28, 1991, Ser. No. 751,307

Int. Cl.[5] G01N *27/26, 27/447;* **B01D** *57/02*

U.S. Cl. 204—299 R **12 Claims**



1. Capillary electrophoresis apparatus comprising

a capillary tube structure of the type which can be electrically charged, said tube structure having first and second ends,

first means at said first end of said capillary tube structure providing a source of sample substance to be transmitted through said capillary tube structure,

second means coupled to said apparatus for applying electrical potential across said capillary tube structure whereby a sample flows through said capillary tube structure and past a detector associated therewith, said first means includes a rotatable table carrying a plurality of sample cups and a holder for holding an end of said capillary tube structure in operative relation with one of said cups, and

an analyte concentrator disposed in operative relation with said capillary tube structure and containing a support means carrying at least one chemical substance of a type having a specific action with respect to constituent molecules contained within a sample flowing along said capillary tube structure and either attracting a molecule for later elution or permitting a molecule to pass along said capillary tube structure,

said analyte concentrator comprising a tubular structure containing fluid-pervious end plates and a plurality of small bodies carrying antibody material (or other chemical substance) which is adapted to attract antigens (or other chemical substances) in sample fluid which passes through said analyte concentrator.

5,202,011

MEASURING SENSOR FOR DETECTING GASEOUS COMPONENTS

Herbert Kiesele, and Jürgen Sohege, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft

Filed Jun. 7, 1991, Ser. No. 711,802

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1990, 4018597

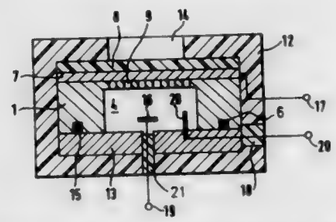
Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—415 **12 Claims**

1. A method of making a measuring electrode structure for a measuring sensor for detecting gaseous components in the ambient, the measuring sensor including an electrolyte chamber for accommodating an electrolyte therein, the method comprising the steps of:

applying a permeable, electrically-conductive coating to a closed front face of a support body so as to form an adhering interface therewith, said coating defining a measuring electrode having an electrochemically active surface at said interface;

applying a membrane layer directly to said coating so as to form an adhering connection thereto, said membrane



being permeable to the gaseous components and impermeable to the electrolyte;

forming a break through in said support body by removing a portion thereof starting from a rear face of said support body and continuing to said front face thereby causing said break through to extend to said active surface, said rear face being opposite said front face; and,

said break through being formed by removing said portion of said support body through to said coating so as to permit the electrolyte from the electrolyte chamber to penetrate through said break through to said coating and said electrochemically active surface thereof.

5,202,012

METHOD FOR MANUFACTURING ZINCIFEROUS ELECTROPLATED STEEL SHEET EXCELLENT IN PRESS-FORMABILITY

Masaki Abe; Yukimitsu Shiohara, and Masaru Sagiyama, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 13, 1992, Ser. No. 835,202

Claims priority, application Japan, Mar. 5, 1991, 3-62425

Int. Cl.[5] C25D *7/06*

U.S. Cl. 205—109 **6 Claims**

1. A method for manufacturing a zinciferous electroplated steel sheet excellent in press-formability, which comprises the steps of:

electroplating a steel sheet in a zinciferous acidic electroplating solution, which contains nitric acid ions or nitrous acid ions in an amount within a range of from 0.1 to 50 g per liter of the electroplating solution, and oxide particles of a metal or a semimetal, uniformly dispersible into the electroplating solution, in an amount within a range of from 0.1 to under 0.5 g per liter of the electroplating solution, to form, on at least one surface of said steel sheet, a zinciferous electroplating layer in which zinc hydroxide particles having said oxide particles as nuclei thereof are uniformly dispersed.

5,202,013

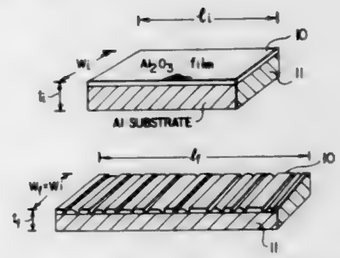
PROCESS FOR COLORING METAL SURFACES

Bryn Chamberlain; Harry Sang; Dan Fern, all of Ontario; Prasad, Apté Alberta, and Lorne D. Keuny, Ontario, all of Canada, assignors to Alcan International Limited, Montreal, Quebec, Canada

Filed Oct. 15, 1991, Ser. No. 776,611

Int. Cl.[5] C25D *5/00*

U.S. Cl. 205—229 **8 Claims**



1. A process for coloring a surface of a metal layer having a thickness, which process comprises:

forming a layer of metal oxide on said surface; and

causing permanent plastic deformation of said surface such that said thickness is reduced of said metal layer by 5% or more;

wherein said layer of metal oxide is of such a thickness and said deformation is of such a degree that said oxide layer generates a visible color when illuminated with white light.

5,202,014

ZEOLITE SSZ-25

Stacey I. Zones, San Francisco; Dennis L. Holtermann, Crockett; Robert A. Innes, San Rafael; Theresa A. Pecoraro, Blackhawk; Donald S. Santilli, Larkspur, and James N. Ziemer, Hercules, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation of Ser. No. 333,666, Apr. 5, 1989, abandoned, which is a division of Ser. No. 14,958, Feb. 17, 1987, Pat. No. 4,826,667. This application Nov. 6, 1991, Ser. No. 788,656

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] C10G *11/05;* **C01B** *33/34*

U.S. Cl. 208—46 **34 Claims**

1. A zeolite having a mole ratio of an oxide selected from the group consisting of silicon oxide, germanium oxide and mixtures thereof to an oxide, selected from the group consisting of aluminum oxide, gallium oxide, iron oxide, boron oxide and mixtures thereof greater than about 20:1, having the X-ray diffraction lines of Table 2 and having equilibrium sorption capacities of greater than about 10 wt. % for n-hexane.

5,202,015

PROCESS FOR DISTILLATE DEWAXING COINCIDENT WITH LIGHT OLEFIN OLIGOMERIZATION

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 22, 1991, Ser. No. 644,144

Int. Cl.[5] C10G *11/04, 11/05*

U.S. Cl. 208—119 **20 Claims**

1. A process for the production of C_5+ gasoline and dewaxed distillate, comprising:

contacting hydrocarbon feedstreams comprising light olefin and distillate containing waxy n-paraffins with a fluidized bed of medium pore acidic shape selective metallosilicate catalyst particles of 5–7 angstroms pore size, said catalyst particles having an acid cracking activity or alpha value

between about 1 to 10, under reaction conditions compris-

which said test samples enter and leave said bore, the system

5,202,018

placement in the opposite axial direction of said piston rod and

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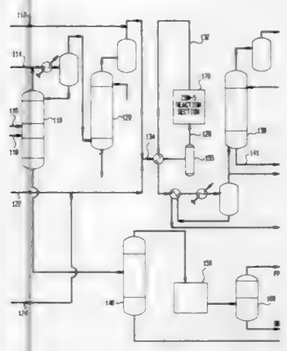
between about 1 to 10, under reaction conditions comprising pressure between 140 kPa and 1500 kPa, temperature between about 342° C. and 482° C. and weight hourly space velocity greater than 0.1 sufficient to concurrently



oligomerize said light olefins while cracking said n-paraffins, whereby an effluent vapor is produced containing products comprising said C_5+ gasoline and dewaxed distillate having a low pour point.

5,202,016

STREAMING CURRENT DETECTOR WITH HEAD-CREATING PASSAGEWAY AND FLUID TREATMENT SYSTEM USING SAME

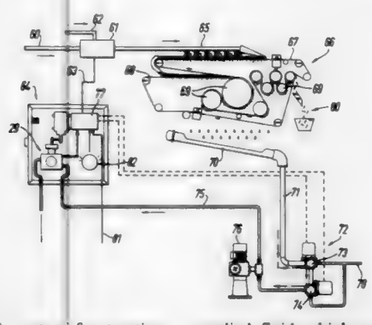
Garry Church, Beverley, and Graham R. Willard, Hull, both of England, assignors to Lasertrim Limited, Hull, England

Filed Aug. 28, 1990, Ser. No. 573,854

Claims priority, application United Kingdom, Aug. 29, 1989, 8919513

Int. Cl.[5] **B01D** *35/00, 37/03;* **G01N** *27/60*

U.S. Cl. 210—85 **16 Claims**



6. A system for treating a supplied fluid which contains charge-influencing particles suspended therein in relatively high concentrations, said system including means for adding flocculant to the supplied fluid to cause charge-influencing particles therein to agglomerate, a filtration machine for separating the agglomerated particles from the fluid, and a streaming current detector for receiving test fluid obtained from the supplied fluid to provide a test output for use in controlling the amount of flocculant added to the supplied fluid, the streaming current detector including a piston arranged to reciprocate in a bore of a piston-receiving member to cause test samples of the test fluid repeatedly to flow into and from said bore for the generation across electrodes spaced apart along the bore of signals representing a charge-related parameter of the test fluid, and means defining a passageway for conducting a main flow of the test fluid across an open end of the bore through which said test samples enter and leave said bore, the system further including means for selectively cleaning said streaming current detector by supplying to said passageway a flow of cleaning liquid instead of the test fluid, and means for conveying filtrate from said filtration machine to said streaming current detector as the test fluid.

7. A system according to claim **6** wherein said cleaning means comprises valve means switchable between a first valve state for conveying test fluid toward said streaming current detector and a second valve state for blocking the test fluid flow and for conveying cleaning fluid to said streaming current detector.

8. A system according to claim 7, further including control means for controlling the system, said control means comprising means for storing a held signal representative of one of said signals representing a charge-related parameter existing immediately prior to actuation of said means for supplying cleaning liquid to said passageway and for controlling the addition of the flocculant in response to said held signal during said cleaning, thereby to maintain the operation of the system during said cleaning.

5,202,017

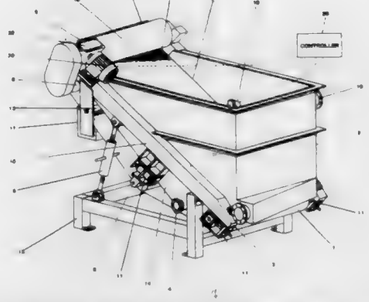
CONTINUOUS MEDIA FILTER WITH MONITORING OF LIQUID LEVEL IN DISTRIBUTOR

Grey O. Hunter, R.R. 5, Box 116, Queensbury, N.Y. 12804

Filed Aug. 21, 1991, Ser. No. 747,987

Int. Cl.[5] **B01D** *33/80, 33/048*

U.S. Cl. 210—143 **18 Claims**



1. A continuous media filter device comprising:

an endless filter media belt extending around a plurality of rollers and along an inclined frame;

a means for retaining and distributing a liquid contaminated with particles onto said filter media belt;

a means for monitoring the level of said contaminated liquid in said retaining and distributing means;

a means to advance said filter media belt around said rollers;

a means to control the speed of the advancement of said filter belt media around said rollers;

means for varying the area of filter media belt submerged in the particle contaminated liquid by adjusting the inclination of the frame;

a collection and distribution means for retaining and distributing filtered liquid; and

a means for cleaning said filter belt media.

5,202,018

PROCESS FOR ELECTROCHEMICAL DISSOLUTION OF SEMICONDUCTORS

Tamás Horányi; Péter Tüttö, and Gàbor Endrédi, all of Budapest, Hungary, assignors to SEMILAB Felvezeto Fizikai Labortorium Rt., Budapest, Hungary

Filed Jul. 11, 1991, Ser. No. 728,609

Claims priority, application Hungary, Jul. 12, 1990, 4176/90

Int. Cl.[5] **C25F** *3/12*

U.S. Cl. 204—129.2 **24 Claims**

10. A process for the determination of a semiconductor characteristic varying with the depth in a semiconductor that may be n-type or p-type, as a function of depth, comprising contacting said semiconductor with an electrolyte suitable for its anodic dissolution, applying alternately anodic and cathodic direct currents to the interface of the semiconductor with said electrolyte such that the progress of said electrochemical dissolution is determined by the charge applied in the anodic phase, and simultaneously measuring a parameter proportionate with said semiconductor characteristic to be determined.

5,202,019

DEVICE FOR THE MECHANICAL SEPARATION OF INSOLUBLE SOLIDS FROM A LIQUID CONTAINING SAID SOLIDS

Magne Skogland, N-5540 Fordesfjorden, Fordesfjorden, Norway

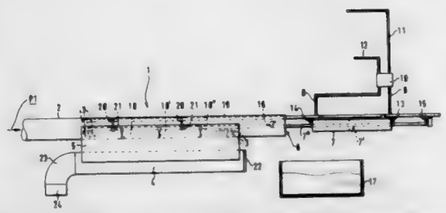
PCT No. PCT/NO90/00016, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO90/09352, PCT Pub. Date Aug. 23, 1990

PCT Filed Jan. 24, 1990, Ser. No. 721,548

Claims priority, application Norway, Feb. 14, 1989, 890612

Int. Cl.[5] **B01D** *29/23, 29/25, 35/02*

U.S. Cl. 210—159 **3 Claims**



1. A device for the mechanical separation of insoluble solids from a liquid containing said solids, comprising first and second interconnected, mutually parallel pipes, said first pipe being in the form of a strainer pipe, said strainer pipe being provided with perforations over a substantial longitudinal portion thereof, said perforations being situated in the lower region of the strainer pipe when the latter is extending horizontally, said second pipe being in the form of a liquid-collecting pipe situated beneath and connected to the strainer pipe in opposing relationship thereto, said liquid-collecting pipe having aperture means in the longitudinal portion thereof opposing the perforated longitudinal portion of the strainer pipe, and receiving mechanically separated liquid from the strainer pipe, said strainer pipe having an end opening positioned axially outside the longitudinal perforated portion thereof and being internally provided with a scraper device for pushing out more or less solid substances collected on the bottom of said strainer pipe through said end opening of said strainer pipe, said scraper device comprising pivotable mounted carrier means suspended from an extension of a piston rod included into a double-acting pressure cylinder, said carrier means function to take a first, active position substantially perpendicular to the axial direction of said piston rod and its extension during displacement toward said end opening of said strainer pipe, as well as a second, inactive, swung-up position wherein said carrier means slide over underlying the solid substances accumulated in the bottom region of said strainer pipe during displacement in the opposite axial direction of said piston rod and its extension.

5,202,020

LIQUID FILTERING DEVICE FOR SWIMMING POOLS IN PARTICULAR

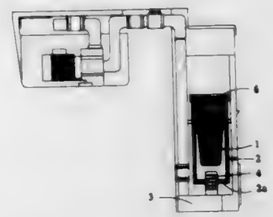
Jean L. Desjoyaux, Catherine Desjoyaux épouse Jandros, and Pierre L. Desjoyaux, all of R. N. 82, 42480 La Fouillouse, France

Continuation of Ser. No. 592,969, Oct. 4, 1990, abandoned. This application Jul. 20, 1992, Ser. No. 915,402

Claims priority, application France, Oct. 11, 1989, 89 13638

Int. Cl.[5] **B01D** *29/11*

U.S. Cl. 210—169 **4 Claims**



1. A gravity flow swimming pool filter device comprising a filter of nonwoven textile material, said filter defining substantially of funnel configuration and being opened at one water receiving first end and closed at its opposite second end, said second end being truncated, said filter being coaxially mounted internally at its first end in a cylindrical vertically disposed support means, said support means defining a housing open at a first end and a constricted drain opening at a second end, and a removable circular attaching means positioned internally of said first end of said filter to secure the water receiving first end of said filter internally of the first end of the support means wherein a portion of said first end of said filter is sandwiched between said circular attaching means and said first end of said support means.

5,202,021

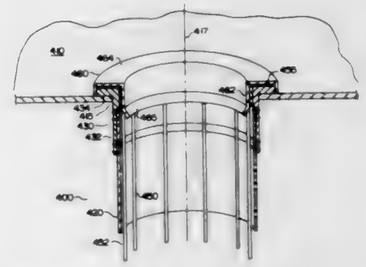
INTEGRATED MOLDED COLLAR, FILTER BAG, CAGE AND LOCKING RING ASSEMBLY FOR BAGHOUSES

James W. Griffin, Graniteville; Billy A. Bunn, Aiken; Darrell Dunning, Edgefield, and Larry E. Patterson, Aiken, all of S.C., assignors to Hosokawa Micron International Inc., New York, N.Y.

Filed Aug. 26, 1991, Ser. No. 749,607

Int. Cl.[5] **B01D** *29/13*

U.S. Cl. 210—232 **20 Claims**



1. A filter assembly for use in a baghouse having a cell plate provided with openings, said filter assembly comprising:

a filter bag for filtering particulate material carried in gas or

liquid passing through the baghouse, said filter bag ex-

5,202,023

low fiber membranes at the opposite face of the first tube-

arranged in a gas-containing chamber, the rotor casing having a number of cavities positioned on the outside surface of the

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liquid passing through the baghouse, said filter bag extending from below the cell plate longitudinally along a central axis of a respective opening in the cell plate;

a collar for supporting said filter bag, said collar having a longitudinally extended portion and a flange portion, the longitudinally extended portion being affixed to said filter bag below the cell plate and the flange portion extending along the cell plate as a rim around a respective opening;

a tubular supporting cage for structurally supporting said filter bag, said cage having a longitudinally extended portion and a collar portion, the longitudinally extended portion of said cage supporting said filter bag and the collar portion of said cage partially overlapping the flange portion of said collar; and

a locking ring for locking an arrangement of said filter bag, collar and cage in place, said locking ring including an annular rim for locking said arrangement along the perimeter of a respective opening in the cell plate and an annular channel collar for protecting said arrangement above the cell plate.

5,202,022

POROUS FILTER MEDIA SUPPORT PLATE

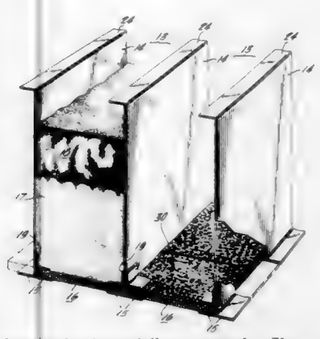
Joseph E. Ferri, 206 Lester Ave., Shillington, Pa. 19607

Continuation of Ser. No. 172,519, Mar. 24, 1988. This application Nov. 3, 1989, Ser. No. 431,525

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[5] B01D *24/22*

U.S. Cl. 210—293 **7 Claims**



1. An elongated substantially rectangular filter media support plate comprised of a porous heat-fusible organic plastic material, said plate being exposed to a loading by a porous filter media, the pores in the support plate being sized to retain the filter media and waste particulate matter while permitting passage of water in a first direction first through the filter media and then through the support plate and in the reverse direction first through the support plate and then through the filter media, said plate comprising means forming a plurality of relatively narrow, non-porous heat-fused zones extending across the plate from one side edge to the other and from the upper surface to the lower in vertical planes, each said zone sub-dividing the plate into end-to-end abutting porous sub-sections, said plate being preformed with each said heat-fused zone forming an integral part of said plate with the composition of the material in the said zone being homogeneous with the material outside of the zone and forming within the zone a substantially rigid, load-bearing beam extending from said one side edge to the other and from the said upper surface to the said lower surface, and wherein at least one of said heat-fused zones comprises a heat-fused butt joint formed between two of said porous subsections of said rectangular plate.

5,202,023

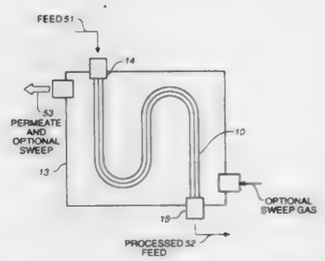
FLEXIBLE HOLLOW FIBER FLUID SEPARATION MODULE

Johnny L. Trimmer, Antioch; George E. Mahley, III, Berkeley; Stephen A. Dunning, Lafayette, and Daniel O. Clark, Benica, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 812,260, Dec. 20, 1991, abandoned. This application Jul. 2, 1992, Ser. No. 908,905

Int. Cl.[5] B01D *63/02, 63/04*

U.S. Cl. 210—321.8 **53 Claims**



1. A non-linear shaped fluid separation module having boreside feed, comprising:

A. a plurality of hollow fiber membranes, wherein the hollow fiber membranes are arranged in a bundle form having a first end and a second end and are adapted for the separation of one or more fluids from one or more other fluids;

B. a first tubesheet comprising a thermoset or thermoplastic polymeric material at the first end of the bundle, arranged such that the hollow fiber membranes are embedded in the first tubesheet and communicate through the first tubesheet and are open on the opposite face of the first tubesheet, and the disposition of the second end of the fiber bundle is selected from the group consisting of:

(a) the hollow fiber bundle having the hollow fiber bores sealed at the second end;

(b) the hollow fiber bundle having the second end embedded in the first tubesheet and communicating through the first tubesheet, wherein the hollow fiber bores at the second end are also open on the opposite face of the first tubesheet; and

(c) the hollow fiber bundle having the second end embedded in an optional second separate tubesheet such that the optional second tubesheet wherein when present the optional second tubesheet comprises a thermoset or thermoplastic polymeric material at the second end of the bundle, arranged such that the hollow fiber membranes are embedded in the second tubesheet, and the bores communicate through the second tubesheet and are open on the opposite face of the second tubesheet such that the membranes in the tubesheet have means for enabling said fluid separation module to be reshaped or reformed to a shape or size to meet the space or volume requirements of a particular fluid separation application;

C. bundle protection means for protecting the bundle from mechanical damage;

D. optional tubesheet and bundle casing means which comprises an envelope which encloses the bundle wherein the casing means is bonded to, embedded in, or attached to the first tubesheet, and the casing means is optionally bonded to, embedded in, or attached to the optional second tubesheet;

E. a feed inlet means adapted for introducing a feed mixture of fluids to be separated into the bores of the hollow fiber membranes by contacting the feed mixture with the hollow fiber membranes at the opposite face of the first tubesheet;

F. optionally a non-permeate outlet means adapted for removing the fluids, which do not permeate through the hollow fiber membranes, from the bore of the hollow fiber membranes at the opposite face of the optional second tubesheet;

G. exit means for removing the fluids which permeate through the hollow fiber membranes from the vicinity of the hollow fiber membranes, wherein said exit means are optionally located near to the first tubesheet to obtain countercurrent flow of the permeate;

H. a feed inlet region adjacent to the opposite face of the first tubesheet arranged to form a cavity into which the feed inlet means introduces the feed mixture, wherein the region is sealed such that fluid can only enter or leave the region through the feed inlet means or the hollow fiber membranes, and the feed inlet region is arranged to introduce the feed fluid mixture into the bores of the hollow fiber membranes;

I. an optional non-permeate outlet region adjacent to the opposite face of the optional second tubesheet arranged to form a cavity into which the hollow fiber membranes convey those fluids which do not permeate the membrane, and from which the non-permeate outlet removes the non-permeating fluids from the module, wherein the non-permeate outlet region is sealed such that fluid can only enter or leave the region through the bores of the hollow fiber membranes or the non-permeate outlet means;

J. optionally a means for forming a connection between the first tubesheet means and the casing means, such that fluid cannot communicate between the feed inlet region and the region beyond the first tubesheet which is outside of the exterior surface of the hollow fibers;

K. optionally a means for forming a connection between the optional second tubesheet means or the casing means, such that fluid cannot communicate between the non-permeate outlet region and the region beyond the first tubesheet to the optional tubesheet; and further includes either

L. a first end capping means arranged for sealing the first tubesheet means, thereby forming the feed inlet region and,

a first attachment means arranged for attaching the first end capping means to the tubesheet means or the casing means; or

M. a second end capping means arranged for sealing the optional second tubesheet means, thereby forming the non-permeate outlet region with

second attachment means arranged for attaching the second end capping means to the optional second tubesheet or casing means.

5,202,024

CENTRIFUGAL SEPARATOR

Per-Olof Andersson, Västerhaninge; Bengt Lahti, Södertälje, and Otto Hellekant, Rönninge, all of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

PCT No. PCT/SE90/00374, § 371 Date Feb. 12, 1991, § 102(e) Date Feb. 12, 1991, PCT Pub. No. WO90/15667, PCT Pub. Date Dec. 27, 1990

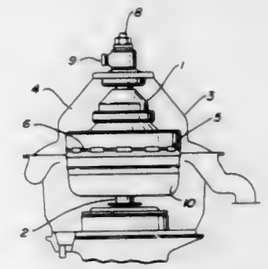
Continuation of Ser. No. 655,391, Feb. 12, 1991, abandoned. This PCT application May 31, 1990, Ser. No. 879,555

Claims priority, application Sweden, Jun. 13, 1989, 8902127

Int. Cl.[5] B01D *24/32*

U.S. Cl. 210—360.1 **20 Claims**

1. A centrifugal separator for separating constituents of a liquid mixture supplied thereto, comprising a rotor, the rotor having a casing and rotated about its central longitudinal axis, means forming an inlet for receipt of the liquid feed mixture into the rotor casing, the rotation of the rotor separating the liquid feed mixture into heavy and light constituent parts thereof, an outlet for discharge of the light and heavy constituent parts of the feed mixture from the rotor casing, the rotor arranged in a gas-containing chamber, the rotor casing having a number of cavities positioned on the outside surface of the rotor and located at a distance from each other in the rotational direction of the rotor, the cavities open to the chamber during



the rotation of the rotor, the outside of the rotor casing having at least one irregularity means thereon for disturbing the generation of a tone nearby and in front of the cavity in the rotational direction of the rotor, the irregularity means disturbing the resonance frequency of the wave movement in the cavity.

5,202,025

POROUS MEMBRANE AND METHOD FOR PREPARING THE SAME

Makoto Onishi, and Kenichi Shimura, both of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 507,511, Apr. 11, 1990, abandoned. This application Jan. 14, 1992, Ser. No. 821,844

Claims priority, application Japan, Apr. 12, 1989, 1-92354

Int. Cl.[5] B01D *53/22, 71/78*

U.S. Cl. 210—500.35 **32 Claims**

1. A porous hydrophilic membrane comprising a porous membrane substrate having at least part of the surface of its pores formed with a polymer radical as a starting point for polymerization and then grafted with a polymer having a glass transition temperature of not more than 300 K, wherein said porous membrane has pores having a pores size of 0.02 to 10.0 μm, a void volume of 30 to 95% and an elongation at break of 10% or more when drawn monoaxially.

5,202,026

COMBINED CENTRIFUGAL FORCE/GRAVITY GAS/LIQUID SEPARATOR SYSTEM

Luis E. Lema, North Attleboro, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1992, Ser. No. 862,689

Int. Cl.[5] B01D *53/24*

U.S. Cl. 210—512.1 **6 Claims**

1. A gas/liquid separator system comprising:

an outer enclosing tank filled with a demisting packing material, said tank having a gas outlet port and a liquid outlet port located at a top and bottom, respectively, of said tank;

at least one generally cylindrical, centrifugal force gas/liquid separator vertically aligned and centrally located within said tank and surround by said packing material, said separator comprising I) a hollow generally cylindrical separator body having: 1) an inlet port in a top sidewall thereof for receiving a tangential inflow of a gas/liquid mixture, and 2) a liquid escape port in a bottom sidewall thereof for allowing liquid separated from the mixture to tangentially exit said cylindrical separator body, wherein said inlet port and said liquid escape port are located 90° apart, and ii) a hollow cylindrical vortex finder positioned concentrically within said cylindrical separator body, said vortex finder having: 1) first gas entrance ports aligned with said inlet port of said separator body for receiving a

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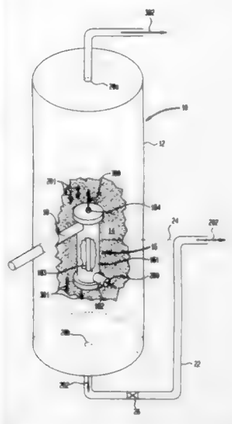
primary gas flow separated from the mixture, and 2) second gas entrance ports aligned with said outlet port of said separator body for receiving a secondary gas flow separated from the mixture, wherein said cylindrical vortex finder is further provided with a gas escape port to allow the primary and secondary gas flows to exit same, wherein said separator receives a gas/liquid mixture, separates the mixture into respective substantially gas and substantially liquid components, and allows the substantially gas components to exit said gas escape port and the substantially liquid components to exit said liquid escape port, whereby the substantially gas components rise through said packing material for further separation into residual liquid components and separated gas components, and whereby the substantially liquid components drain, under the force



of gravity, through said packing material for further separation into residual gas components and separated liquid components, the residual gas components rising through said packing material and mixing with the separated gas components such that a mixture of the residual and separated gas components exit said tank's gas outlet port, and the residual liquid components falling, under the force of gravity, through said packing material and mixing with the separated liquid components such that a mixture of the residual and separated liquid components exit said tank's liquid outlet port; and

an inflow line for introducing the mixture into said inlet port, said inflow line being upwardly inclined in a direction of flow of the mixture at a point where said inflow line communicates with said inlet port.

5,202,027

SECONDARY SEWAGE TREATMENT SYSTEM

William L. Stuth, 28620 Maple Valley Highway S.E., Maple Valley, Wash. 98038

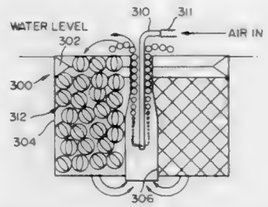
Continuation-in-part of Ser. No. 559,427, Jul. 23, 1990, Pat. No. 5,030,353, which is a continuation of Ser. No. 297,294, Jan. 13, 1989. This application Jul. 2, 1991, Ser. No. 724,836

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] C02F *3/06*

U.S. Cl. 210—615 **22 Claims**

7. A process for secondarily treating waste water liquor comprising the steps of providing a vertical waste water treatment region having an upper turbulent zone, an intermediate mixing zone, a lower settling zone, and a bottom sludge-collecting zone below said settling zone, each extending across the region with said settling zone and said sludge-collecting zone occupying a major portion of said region; providing a plurality of aerating cages within said mixing zone and being in fluid communication with the bottom of said mixing zone and with said turbulent zone, each aerating cage providing a barrier between said turbulent and mixing zones to retain a buoyant media within said mixing zone and prevent such buoyant media from escaping into said turbulent zone; providing a buoyant media in sufficient volume to substantially fill each aerating cage; introducing waste water liquor into said treatment region in said turbulent zone to fill said treatment region up to and including said turbulent zone, and to float said buoyant media into occupancy of said mixing zone, beneath said barrier; introducing air into said cages in sufficient quantity to create a pumping effect of a magnitude that will continuously draw waste liquor from the bottom of said mixing zone, aerate the withdrawn waste liquor portion and expel the aerated



portion into said turbulent zone with sufficient force to create turbulence within said turbulent zone, and that will cause waste liquor to pass through said barrier and into and gently downwardly through said mixing zone whereby aerobic microbial growth on said buoyant media will be established; regulating air introduction into said aerating zones to establish a non-turbulent flow rate of waste liquor through said mixing zone sufficient to enable said buoyant media to be self-cleaning but insufficient to wash said microbial growth off said buoyant media; permitting treated waste liquor to settle from said mixing zone into said settling zone in the absence of aeration below said mixing zone; permitting waste liquor portions to settle out from said settling zone into said sludge-collecting zone in the absence of aeration; and drawing off treated waste liquor from with said settling zone.

5,202,028

REMOVAL OF METAL COMPLEX DYES FROM WASTEWATERS

Wolf-Dieter Kermer, Fussgoenheim; Ingrid Steenken-Richter, Ludwigshafen, and Juergen Paulig, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshaften, Fed. Rep. of Germany

Filed Sep. 3, 1992, Ser. No. 940,333

Claims priority, application Japan, Sep. 7, 1991, 3-4129802

Int. Cl.[5] C02F *1/26*

U.S. Cl. 210—634 **2 Claims**

1. A process for removing from wastewaters metal complex dyes which are free of reactive groups and have at least one hydroxysulfonyl group, comprising treating the wastewater with one or more primary, secondary or tertiary amines of at least 6 carbon atoms and optionally with a water-immiscible inert organic solvent, then separating the phases, treating the organic phase with aqueous alkali, and finally separating off the metal complex dye, which is present in the resulting aqueous phase, and the amine, which may be present mixed with the organic solvent.

5,202,029

PROCESS FOR PURIFICATION OF HMG-COA REDUCTASE INHIBITORS

Peter N. Haytko, Rahway, and Arthur S. Wildman, Jr., Martinsville, both of N.J., assignors to Caron Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1991, Ser. No. 668,831

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—656 **10 Claims**

10. A process for purifying a crude HMG-CoA reductase inhibitor which comprises:

(1) placing a solution of the crude HMG-CoA reductase inhibitor on a high performance liquid chromatography column wherein the column is packed with silica optionally coated with a stationary phase selected from the group consisting of triorganosilyl, a cyanoorganosilyl and a polystyrene-divinylbenzene copolymer with an organosilyl, or the column is packed with a porous graphitic carbon;

(2) eluting with a solvent mixture comprising:

(a) an organic solvent selected from the group consisting of acetonitrile, methanol, ethanol, acetone, tetrahydrofuran, isopropanol, ethyl acetate, methylene chloride and chloroform, or a mixture thereof and optionally,

(b) water or an aqueous solution selected from the group consisting of phosphoric acid and acetic acid; and

(3) removing about 60 to 65% of the solvent mixture to crystallize a purified HMG-CoA reductase inhibitor of purity ≧99.5%.

5,202,030

METHOD FOR REMOVING ORGANIC CONTAMINANTS FROM ACIDIC AQUEOUS EFFLUENT

Anders Axnäs, Bromma, Sweden, assignor to Solvator Process AB, Bromma, Sweden

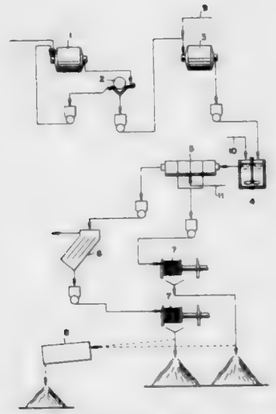
PCT No. PCT/SE90/00300, § 371 Date Nov. 8, 1991, § 102(e) Date Nov. 8, 1991, PCT Pub. No. WO90/13518, PCT Pub. Date Nov. 15, 1990

PCT Filed May 8, 1990, Ser. No. 784,443

Claims priority, application Sweden, May 9, 1989, 8901646

Int. Cl.[5] C02F *1/52*

U.S. Cl. 210—695 **16 Claims**



1. A process for removing organic materials from of acidic aqueous effluents contaminated with organic materials, said effluents having a pH of less than about 3, consisting essentially of:

(a) bringing the aqueous effluent containing organic contamination in contact with a source of iron-containing material in particulate form, wherein said source of iron includes particles of iron in the metallic state;

(b) subjecting said material to abrasive mechanical processing in contact with the aqueous effluent while dissolving at least part of the metallic iron and forming a complex between dissolved metallic iron and said organic contamination;

(c) increasing the pH of the aqueous effluent in two stages after said mechanical processing to an essentially neutral pH wherein limestone is added in the first stage and a strong base is added in the second stage;

(d) causing precipitation of three-valent iron together with said organic contamination under oxidizing conditions after completion of step (c); and

(e) separating the precipitate formed in step (d) from the aqueous phase.

5,202,031

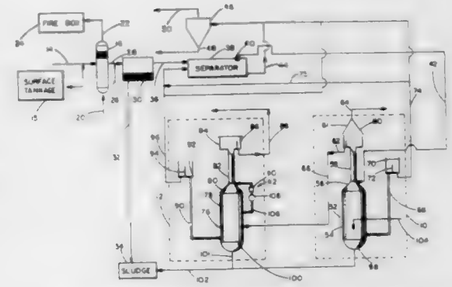
WASTE WATER TREATMENT SYSTEM

Theodore R. Rymal, Jr., 7400 Jones Rd., Apt. 269, Galveston, Tex. 77551

Division of Ser. No. 560,436, Jul. 31, 1990, Pat. No. 5,147,534. This application Jul. 30, 1992, Ser. No. 904,212

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—703 **13 Claims**



1. A method of separating a mixture of oil and water, comprising

forming a water storage chamber;

forming a separation chamber spaced above and adjoining the water storage chamber, the separation chamber having a horizontal cross-section area which continually decreases with increased spacing from the water storage chamber;

forming an oil leg flow line spaced above the separation chamber, the oil leg flow line having a substantially uniform cross-sectional flow area, an oil inlet adjoining the separation chamber, and an oil outlet above the oil inlet;

forming a water leg flow line spaced in parallel with the separation chamber, the water leg flow line having a water inlet in fluid communication with a lower portion of the water storage chamber and a water outlet spaced vertically below the oil outlet;

continually inputting the mixture of oil and water into the separation chamber;

monitoring the elevation of an oil/water interface within the separation chamber; and

adjusting the elevation of the oil outlet for the oil leg flow line relative the water outlet for the water leg flow line to maintain the oil/water interface within the separation chamber.

5,202,032

ferrous sulfate, so that under conditions which support the

of (1) a polyphosphate intermediate produced by reacting

based on the total composition weight, of a nonionic surfactant, and

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5,202,032

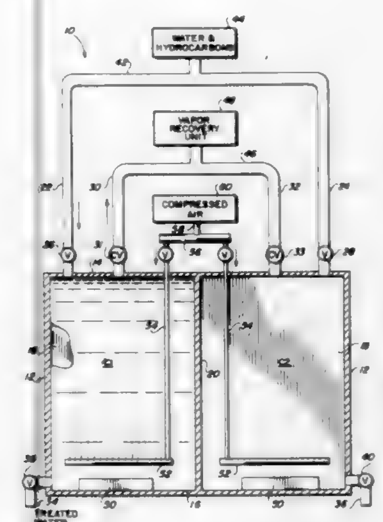
METHOD OF REMOVING AND RECOVERING HYDROCARBONS FROM HYDROCARBON/WATER MIXTURES

D. Dennis Shoemaker, Findlay, Ohio, assignor to Marathon Oil Company, Findlay, Ohio

Filed Apr. 22, 1991, Ser. No. 689,384

Int. Cl.[5] B01D *17/035*

U.S. Cl. 210—718 **1 Claim**



1. A method of removing dissolved or entrained hydrocarbons from hydrocarbon/water mixtures, comprising the steps of:
introducing a hydrocarbon/water mixture into a closed tank;
preventing the mixture from exiting the tank;
introducing bubbles of inert gas or air into the mixture in the tank at a rate in the range of about 2 to 10 cubic feet per minute to strip hydrocarbons therefrom;
venting vapor from the tank to a vapor recovery unit, the vapor comprising the inert gas or air and stripped hydrocarbons, so as to recover hydrocarbons therefrom;
introducing another hydrocarbon/water mixture into a second closed tank while hydrocarbons are being stripped from the mixture in the first-mentioned tank;
preventing the mixture in the second tank from exiting;
introducing bubbles of inert gas or air into the mixture in the second tank at a rate in the range of about 2 to 10 cubic feet per minute while draining treated water from the first tank; and
venting vapor from the second tank to said vapor recovery unit.

5,202,033

IN SITU METHOD FOR DECREASING HEAVY METAL LEACHING FROM SOIL OR WASTE

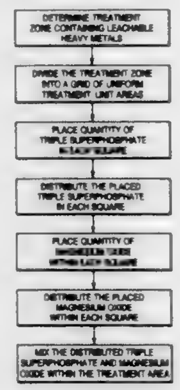
Robert R. Stanforth, and Ajit K. Chowdhury, both of Madison, Wis., assignors to RMT, Inc., Madison, Wis.

Filed Sep. 30, 1991, Ser. No. 767,520

Int. Cl.[5] C02E *11/14;* **B09B** *3/00*

U.S. Cl. 210—747 **13 Claims**

1. A method for treating disposed solid waste or soils containing unacceptable levels of chromium, the method comprising the step of mixing the solid disposed waste or soil with ferrous sulfate, so that under conditions which support the reaction between the ferrous sulfate and the chromium, the chromium will be converted to non-leachable forms which are stable under normal environmental conditions.



5,202,034

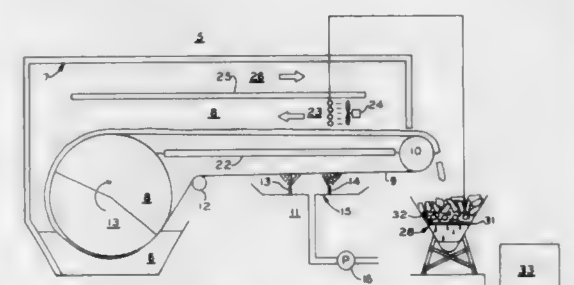
APPARATUS AND METHOD FOR REMOVING WATER FROM AQUEOUS SLUDGES

Courtland J. Martel, Jr., R.R. 2, Box 372 (Bud Mil Rd.), Enfield, N.H. 03748

Filed Jul. 12, 1991, Ser. No. 729,303

Int. Cl.[5] B07D *33/048, 33/58*

U.S. Cl. 210—770 **11 Claims**


DEWATERING APPARATUS

6. A method for dewatering aqueous sludge comprising:
partially immersing a porous drum in a sludge chamber;
suspending a porous belt about said drum, and about a drive roller positioned near an exit of said sludge chamber, whereby sludge accumulates on said porous belt;
drawing a vacuum on the interior of said rotating drum, whereby moisture is removed from accumulated sludge to the interior of said drum; and,
freezing sludge accumulated on said porous belt as it approaches said exit, thereby further reducing the moisture in said sludge.

5,202,035

LIQUID ALUMINUM PHOSPHATE SALT GELLING AGENT

David A. Huddleston, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 552,974, Jul. 16, 1990, Pat. No. 5,110,485. This application Feb. 12, 1992, Ser. No. 834,685

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[5] E21B *43/26*

U.S. Cl. 252—8.551 **5 Claims**

1. A method of fracturing an oil well which comprises:
pumping (A) a liquid hydrocarbon; (B) a liquid aluminum phosphate salt gelling agent comprising the reaction product of dialkyl phosphate formed from the reaction product of (1) a polyphosphate intermediate produced by reacting triethyl phosphate and phosphorous pentoxide and (2) a mixture of C_6 to C_{10} aliphatic alcohols, an aluminum sulfate, and a solvent; (C) an activator; and (D) a proppant material, into a well bore; and
mixing said gelling agent, activator and proppant material with said hydrocarbon as they are being pumped downhole thereby forming a gelled hydrocarbon; whereby premixing of said hydrocarbon, gelling agent and activator prior to being pumped into said well bore is eliminated.

5,202,036

DIESEL LUBRICANTS AND METHODS

David E. Ripple, Kirtland; Jack L. Karn, Richmond Heights, and Daniel M. Vargo, Willoughby, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 545,376, Jun. 28, 1990. This application May 29, 1992, Ser. No. 890,410

Int. Cl.[5] C10M *141/06*

U.S. Cl. 252—33.4 **37 Claims**

1. A diesel lubricant having a TBN of about 6 to about 15, comprising a major amount of an oil of lubricating viscosity and a minor amount, sufficient to minimize undesirable viscosity increases of the lubricant when used in diesel engines, of a composition comprising
(A) at least one carboxylic derivative composition produced by reacting at least one substituted succinic acylating agent with at least one amino compound containing at least one —NH— group wherein said acylating agent consists of substituent groups and succinic groups wherein the substituent groups are derived from polyalkene characterized by an Mn value of at least about 1200 and an Mw/Mn ratio of at least about 1.5, and wherein said acylating agents are characterized by the presence within their structure of an average of at least about 1.3 succinic groups for each equivalent weight of substituent groups, and
(B) from about 0.5 to about 10% by weight of at least one basic alkali or alkaline earth metal salt of at least one acidic organic compound having a metal ratio of at least about 2, provided that the carboxylic derivative of component (A) contributes between about 0.5 and 1.5 TBN to the composition, and further provided that basic alkali or alkaline earth metal salt or salts of component (B) include a quantity of magnesium salt or salts such that the maganesium salt or salts contribute no more than about 30% of the TBN of the composition.

5,202,037

HIGH SOLIDS LUBRICANT

Grant E. Lavelle, Wood Haven; Charles Rossio, Carleton, and Dwight Davis, Detroit, all of Mich., assignors to Diversey Corporation, Mississauga, Canada

Filed Oct. 2, 1989, Ser. No. 416,149

Int. Cl.[5] C10M *173/00*

U.S. Cl. 252—33.6 **11 Claims**

1. A high solids lubricant composition suitable for use in an aqueous lubrication system, consisting essentially of:
(a) from about 25 percent to about 70 percent by weight, based on the total composition weight, of a fatty acid lubricant component comprising one or more C_9 to C_{20} fatty acids;
(b) from about 12 percent to about 22 percent by weight, based on the total composition weight, of a neutralizing component comprising:
(1) a primary amine or a secondary amine; and
(2) an alkali metal hydroxide;
(c) from about 10 percent to about 30 percent by weight, based on the total composition weight, of a viscosity control agent selected from the group consisting of alcohols, glycols, triols, and mixtures thereof;
(d) from about 1 percent to about 20 percent by weight, based on the total composition weight, of a nonionic surfactant, and
(e) from about 0 percent to about 15 percent by weight, based on the total composition weight, of a chelant; and wherein the composition forms a gel in water, the gellation being reversible by the action of mechanical means.

5,202,038

SALTS OF FATTY AMINES AND OF POLYFLUORO-CARBOXYLIC ACIDS AND THEIR USE AS ADDITIVES FOR LUBRICANTS

Elisabeth Schoch, Rambouillet, and Christian Collette, Paris, both of France, assignors to ELF Atochem S.A., Puteaux, France

Filed Feb. 27, 1992, Ser. No. 842,679

Claims priority, application France, Feb. 27, 1991, 91 02345

Int. Cl.[5] C10M *131/12*

U.S. Cl. 252—33.6 **12 Claims**

1. Fatty amine salts of a mixture containing at least one monocarboxylic acid of formula:

$$R_F(CH_2)_{10}COOH \quad (I)$$

and at least one dicarboxylic acid of formula:

$$\begin{array}{c} R_FCH_2CH(CH_2)_8COOH \\ | \\ R_FCH_2CH(CH_2)_8COOH \end{array} \quad (II)$$

where R_F denotes a linear or branched perfluoroalkyl radical containing from 4 to 16 carbon atoms and wherein the molar proportion of monocarboxylic acid salt (I) is between about 59% and 75%.

5,202,039

TRIALKYLAMINE COMPLEXES OF CERTAIN BORATED ALKYL CATECHOLS AND LUBRICATING OIL COMPOSITIONS CONTAINING THE SAME

Vernon R. Small, Jr., Rodeo; Thomas V. Liston, San Rafael, and Anatoli Onopchenko, Concord, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation of Ser. No. 553,487, Jul. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 407,602, Sep. 15, 1989, abandoned. This application Feb. 24, 1992, Ser. No. 841,256

The portion of the term of this patent subsequent to Nov. 3, 2009, has been disclaimed.

Int. Cl.[5] C10M *139/00*

U.S. Cl. 252—49.6 **21 Claims**

14. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor amount of a hydrolytically stable trihydrocarbylamine borated alkyl catechol complex wherein said trihydrocarbylamine has the formula:

$$\begin{array}{c} R'' \\ | \\ R'-N-R''' \end{array}$$

where R', R'', and R''' are the same or different and each is an aliphatic radical having from 1 to 9 carbon atoms; or an alicyclic radical having 5 or 6 carbon atoms; and each R', R'' and R''' has from 0 to 3 hydroxyl groups and wherein the catechol to boron mole ratio is about 3:2 and further wherein said borated alkyl catechol has at least one alkyl group which contains from 10 to 30 carbon atoms.

5,202,040

5,202,042

5,202,045

alkali metal detergent builder salt and an alkali metal

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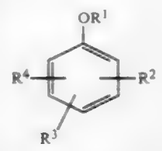
5,202,040

SYNTHETIC LUBRICANT BASE STOCKS BY CO-REACTION OF OLEFINS AND ANISOLE COMPOUNDS

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jun. 12, 1990, Ser. No. 536,906
Int. Cl.[5] C10M *111/02*
U.S. Cl. 252—52 R 27 Claims

1. A synthetic lubricant base stock having a higher viscosity, comprising a mixture of (1) oligomers prepared from a linear olefin having from 10 to 24 carbon atoms; and (2) a compound having the following formula:



where R^1=an alkyl group containing from 1 to about 10 carbon atoms; R^2=an alkyl group containing from 10 to 24 carbon atoms; and R^3 and R^4=H or an alkyl group containing up to about 10 carbon atoms, wherein the mixture contains from about 1 to about 80 wt. % of said compound.

13. A process for preparing synthetic lubricant base stocks having an increased viscosity, comprising co-reacting anisole and a linear olefin having from 10 to 24 carbon atoms in a weight ratio of anisole to linear olefin of about 1:99 to about 2:3 in the presence of an acidic montmorillonite clay having a moisture content ranging up to about 20 wt. %, a residual acidity in the range of about 3 to about 30 mg KOH/g, and a surface area of about 300 m^2/g or greater.

5,202,041

SKI LUBRICANT COMPRISING PARAFFINIC WAX AND A HYDROCARBON COMPOUND CONTAINING A PERFLUORO SEGMENT

Enrico Traverso, Monza, and Antonio Rinaldi, San Donato Milanese, both of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Filed Mar. 1, 1991, Ser. No. 663,417
Claims priority, application Italy, Mar. 2, 1990, 19537 A/90
Int. Cl.[5] C10M *139/00, 111/04;* A63C *5/00*
U.S. Cl. 252—58 7 Claims

1. Composition affording sliding characteristics, which comprises:

a paraffinic wax, and

a compound or mixture of compounds with formula (I):

$$CF3—CnF2n—Cm—H2m—CH3 \quad (I)$$

wherein:

n is a numeral comprised within the range of from 1 to 21;

m is a numeral comprised within the range of from 3 to 25;

n+m is a numeral equal to, or higher than, 18;

with the chain of carbon atoms being either linear or branched.

5,202,042

HETEROCYCLIC ELECTROLYTE SALTS FOR ELECTROLYTIC CAPACITORS

Tatsunori Tsuji; Makoto Shimizu; Fumihiko Shinozaki, and Yutaka Yokoyama, all of Tokyo, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Continuation of Ser. No. 330,605, Mar. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 165,835, Mar. 9, 1988, abandoned. This application Jul. 3, 1991, Ser. No. 725,344
Claims priority, application Japan, Mar. 9, 1987, 62-51885; Mar. 9, 1987, 62-51886
Int. Cl.[5] H01G *9/02*
U.S. Cl. 252—62.2 12 Claims

1. An electrolyte for an electrolytic capacitor containing a carboxylic acid salt of a cationic nitrogen-containing heterocyclic compound within an aprotic solvent or a mixed solvent comprising a major aprotic solvent and a minor polyol solvent, said cationic nitrogen-containing heterocyclic compound having a 5- or 6-membered heterocyclic ring containing one nitrogen atom, characterized in that the carboxylic acid employed as the anion is a hydroxycarboxylic acid selected from the group consisting of glycolic acid, lactic acid and malic acid; and in that the nitrogen-containing heterocyclic compound employed as the cation is selected from the group consisting of pyrrolidinium, compounds piperidinium compounds, and pyridinium compounds.

5,202,043

PROCESS FOR THE PREPARATION OF ISOMETRIC MAGNETIC IRON OXIDE

Jürgen Wiese; Gunter Buxbaum, and Wilfried Burow, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 813,411, Dec. 26, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 267,978
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500471
Int. Cl.[5] C01G *49/02*
U.S. Cl. 252—62.56 3 Claims

1. A process for the preparation of isometric magnetic iron oxides comprising the steps of 1) oxidizing an aqueous solution containing iron (II) sulfate with air at a pH less than 3 until the resulting aqueous solution contains from about 1 to 25 mol %, based on the total iron, iron (III), 2) precipitating the aqueous solution with an alkaline precipitating agent, 3) oxidizing the precipitant at a temperature of from 20° C. to 100° C., 4) washing, then drying, the thus formed iron oxide and 5) heat treating the iron oxide by tempering in a non-oxidizing atmosphere at 200° C. to 600° C., tempering with a reducing agent which increases the magnetic remanence of said oxide at 200° C. to 600° C. or oxidizing with air at 300° to 450° C.

5,202,044

WORKING FLUID COMPOSITION FOR REFRIGERATING MACHINE

Toshiya Hagihara, Izumisano, and Akimitsu Sakai, Wakayama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 10, 1991, Ser. No. 757,136
Claims priority, application Japan, Sep. 12, 1990, 2-243069; Jun. 17, 1991, 3-173089; Jul. 20, 1991, 3-204884
Int. Cl.[5] C09K *5/04;* C10M *105/38*
U.S. Cl. 252—68 20 Claims

1. A working fluid composition for a refrigerating machine comprising:

(a) a hydrofluorocarbon; and

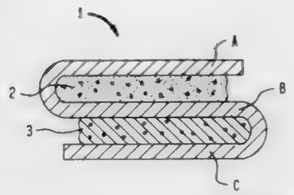
(b) a refrigeration oil prepared by combining (i) a compound having an epoxycyclohexyl group and/or a compound having an epoxycyclopentyl group with (ii) an ester formed between a neopentylpolyol and a saturated branched aliphatic monocarboxylic acid having a carbon number of 7 to 9 in a ratio or 0.05 to 2.0 parts by weight to 100 parts by weight of the ester.

5,202,045

S-SHAPED DETERGENT LAMINATE

William M. Karpusiewicz, Floral Park; Jesse J. Kiefer, Valley Cottage, both of N.Y., and Martin N. Dunckley, Bedford, England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Jan. 5, 1989, Ser. No. 293,721
Int. Cl.[5] C11D *17/00;* B65D *73/00, 90/04;* B05D *3/12*
U.S. Cl. 252—90 15 Claims



1. An article for delivering a cleaning composition to a wash water comprising;

(i) a flexible substrate folded into a unitary S-shaped construction, said construction including three substrate areas each lying in substantially parallel planes one above another;

(ii) a detergent composition comprising an effective amount for cleaning fabrics of a surfactant and a builder, said composition being spread in a region between a first and second of said substrate areas and having an adhesive strength sufficient to bind said first and second areas together, and at least one edge length of said first area not being bonded, other than through said detergent composition, to an adjacent edge length of said second area thereby allowing egress of said composition into said wash water, and said substrate separating into but a single sheet upon exhaustion of detergent composition therefrom; and

(iii) a further composition for cleaning fabrics which is spread in a region between said second area and a third adjacent one of said substrate areas and having an adhesive strength sufficient to bind said second and third area together, and at least one edge length of said second area not being bonded, other than through said further composition, to an adjacent edge length of said third area and thereby allowing egress of said further composition into said wash water, said further composition comprising a component selected from the group consisting of bleaches, bleach precursors, enzymes, fabric softeners and mixtures thereof.

5,202,046

PROCESS FOR PREPARING A LINEAR VISCOELASTIC AQUEOUS LIQUID AUTOMATIC DISHWASHER DETEREGENT COMPOSITION

Nagaraj Dixit, Kendall Park; Makarand Shevade, Hamilton; Rhyta Rounds, Flemington, and Marta Delsignore, Fort Lee, all of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Division of Ser. No. 353,712, May 18, 1989, Pat. No. 5,064,553. This application Jun. 7, 1991, Ser. No. 711,835
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] C11D *7/00*
U.S. Cl. 252—94 15 Claims

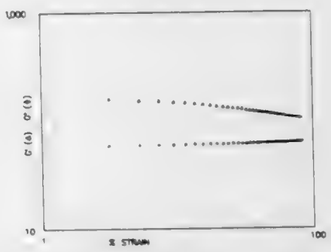
1. A process for preparing for a linear viscoelastic liquid automatic dishwasher detergent composition which comprises the steps of:

(a) forming a uniform dispersion in water of a cross-linked polyacrylic acid thickening agent having a molecular weight of from about 1,000,000 to 4,000,000;

(b) neutralizing said dispersion by adding to said dispersion an alkali metal hydroxide to form a gelled dispersion;

(c) adding with mixing to said gelled dispersion at least one alkali metal detergent builder salt and an alkali metal silicate;

(d) forming an emulsion of water, a long chain fatty acid or a salt thereof and a chlorine bleach stable, water dispersible, organic detergent active material; and



(e) adding with stirring said emulsion to said gelled dispersion containing said alkali metal detergent builder salt and said alkali metal silicate to form said linear viscoelastic liquid automatic dishwasher detergent composition.

5,202,047

CLEANING/DISINFECTING PROCESS AND COMPOSITION

Michael P. Corby, Ravenshead, England, assignor to Diversey Corporation, Mississauga, Canada

Continuation of Ser. No. 293,013, Jan. 3, 1989, Pat. No. 5,047,164, which is a continuation of Ser. No. 796,849, Nov. 12, 1985, Pat. No. 4,822,513. This application Dec. 6, 1990, Ser. No. 623,212
Claims priority, application United Kingdom, Nov. 12, 1984, 8428564
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] C11D *3/43*
U.S. Cl. 252—106 14 Claims

1. An aqueous cleaning and disinfecting composition, comprising:

(a) from about 2% to about 25%, by weight, based on the total weight of the composition, of an interhalogen selected from the group consisting of iodine chloride, iodine trichloride, iodine bromide, bromine chloride, and mixtures thereof; and

(b) from about 24% to about 95% by weight, based on the total weight of the composition of at least one acid which is not appreciably oxidized by the interhalogen, selected from the group consisting of nitric acid, phosphoric acid, hydrochloric acid, sulfamic acid, sulfuric acid, and mixtures thereof.

5,202,048

PERSONAL CLEANSING PRODUCT WITH ODOR COMPATIBLE BULKY AMINE CATIONIC POLYMER WITH REDUCED ODOR CHARACTERISTICS

Robert G. Bartolo, Cincinnati, and Louis F. Wong, Mason, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 374,315, Jun. 30, 1989, abandoned. This application Dec. 30, 1991, Ser. No. 816,523
Int. Cl.[5] A61K *7/50;* C11D *3/37, 3/46, 13/18*
U.S. Cl. 252—117 8 Claims

1. A personal cleansing composition comprising from about 5% to about 90% by weight of surfactant selected from the group consisting of synthetic surfactant, alkali metal soap, and mixtures thereof; and from about 0.2% to about 5% by weight bulky amine cationic polymer, said bulky amine cationic polymer being essentially free of potential labile odoriferous amine

groups; wherein said bulky amine cationic polymer is: Guar

5,202,051

5,202,055

ALKENYL ETHER COMPOUND AND A COMPOSITION

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groups; wherein said bulky amine cationic polymer is: Guar (POLYMER)-$CR^1HCR^2R^3$-$CH_2NR^4R^5R^6$ wherein R^1–R^3 is a —H or —OH substituent, and wherein at least one of R^4, R^5 and R^6 are selected from the group consisting of alkyl having a chain length of from about 2 to about 24 carbon atoms, and alkoxy alkyl containing from about 2 to about 12 carbon atoms, and mixtures thereof; and wherein said personal cleansing composition has an alkaline pH of at least about 7.5 in a 1% aqueous solution.

6. A process for preparing the personal cleansing composition of claim 1 comprising the steps of:

(a) forming a mixture of said cationic polymer and alkali metal soap mix noodles wherein said polymer is present in said mixture at a level to provide from about 0.2% to about 5% by weight of said polymer in said composition; said mixture containing from about 6% to about 15% moisture;

(b) milling said mixture into a uniform mixture;

(c) plodding said uniform mixture;

(d) extruding said milled and plodded mixture; and

(e) stamping said extruded mixture into toilet bars.

5,202,049

SEALER FINISH REMOVER COMPOSITIONS

Mary E. Bingham, Santa Ana, Calif., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation of Ser. No. 610,196, Nov. 6, 1990, abandoned. This application Sep. 11, 1991, Ser. No. 759,206

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] C11D *7/22, 7/32;* B08B *7/00*

U.S. Cl. 252—162 10 Claims

1. A sealer finish remover composition comprising effective amounts of (a) a solvent selected from diethylamine, diethanolamine, monoethanolamine, ethylene glycol monobutyl ether, ethylene glycol phenyl ether, and mixtures thereof, (b) water, (c) about 4–8 weight % of a metasilicate, and (d) about 1–30 weight % of a linear, 6–10 carbon, organic compound selected from caprylic acid, n-octane sulfonate, caproic acid, decylenic acid, and their alkali salts.

5,202,050

METHOD FOR CLEANING HARD-SURFACES USING A COMPOSITION CONTAINING ORGANIC SOLVENT AND POLYCARBOXYLATED CHELATING AGENT

Stephen Culshaw, Meise, and Eddy Vos, Linden, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 285,337, Dec. 14, 1988, abandoned, which is a continuation of Ser. No. 177,708, Apr. 5, 1988, abandoned. This application Sep. 19, 1990, Ser. No. 587,477

Claims priority, application United Kingdom, Apr. 6, 1987, 8708151; Apr. 23, 1987, 8709621

Int. Cl.[5] C11D *7/26, 7/50*

U.S. Cl. 252—170 10 Claims

1. A method for cleaning a hard surface which comprises applying thereto a hard surface cleaning composition containing from 1% to 20% of organic solvent having a boiling point above 90° C., said solvent consisting of solvent selected from the group of glycol ethers and diols having 6 to 16 carbon atoms in their molecular structure and from 1% to 20% of chelating agent consisting essentially of agent selected from the group consisting of carboxymethyltartronic acid, tetrahydrofurantetracarboxylic acid, combinations of tartrate monosuccinic acid and tartrate disuccinic acid, oxydisuccinic acid, and mixtures thereof or their alkali metal salts, the ratio of said organic solvent to said chelating agent being from 2:3 to 2:1.

5,202,051

STABILIZATION OF EPOXY/NITROPARAFFIN SOLUTIONS

John A. Lopez, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 43,717, Apr. 29, 1987, Pat. No. 4,816,502. This application Nov. 17, 1988, Ser. No. 272,287

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—183.12 11 Claims

1. A method for retarding gelation of a composition comprising an epoxy resin having, on the average, more than one vicinal epoxide group per molecule and a nitroparaffin of the formula C_nX_{2n+2}, in which n is an integer from 1 to about 4, each X is independently selected from hydrogen, halogen and NO_2, and at least one X is NO_2, the method comprising adding to the composition a sulfonic acid of the formula $R—SO_3H$, in which R is a substituted or unsubstituted hydrocarbyl moiety.

5,202,052

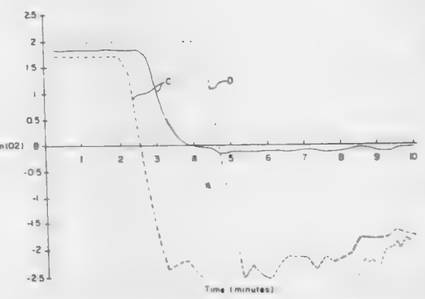
AMINO POLYCARBOXYLIC ACID COMPOUNDS AS OXYGEN SCAVENGERS

Bruce D. Zenner, Alameda, Calif.; Fred N. Teumac, Conyngham, Pa.; Larrie A. Deardurff, Alameda, Calif., and Bert A. Ross, Conyngham, Pa., assignors to Aquanautics Corporation, Alameda, Calif.

Filed Sep. 12, 1990, Ser. No. 581,507

Int. Cl.[5] C09K *15/16*

U.S. Cl. 252—188.28 23 Claims



1. An oxygen scavenging composition comprising a carrier which is permeable to both oxygen and water or water vapor and an oxygen scavening material consisting essentially of a transition metal chelate or complex of an amino polycarboxylic acid, or a salt thereof, dispersed relatively uniformly throughout the carrier in an amount effective to act as an oxygen scavenger, wherein the transition metal amino polycarboxylic acid chelate or complex is activated for scavenging oxygen by contact with water or water vapor which is present in or permeates into the carrier.

5,202,053

POLYMERIZABLE NEMATIC MONOMER COMPOSITIONS

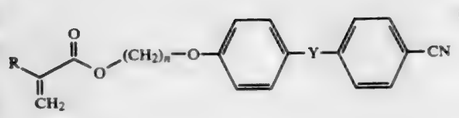
Paul J. Shannon, Exton, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 22, 1991, Ser. No. 658,915

Int. Cl.[5] C09K *19/52, 19/12;* C08F *18/00, 18/16*

U.S. Cl. 252—299.01 9 Claims

1. A polymerizable nematic monomer composition consisting essentially of (A) 20 to 80 weight % of at least one monomer having the general formula (I) wherein n is 10, 12 or 14, and (B) 80 to 20 weight % of at least one monomer having the general formula (I) wherein n is 4, 6 or 8:



(I)

wherein R is CH_3 or H and Y is covalent bond or $—CO_2—$.

5,202,054

LIQUID CRYSTAL COMPOUND

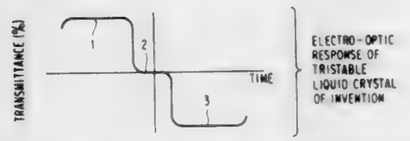
Yoshiichi Suzuki; Hiroyuki Mogamiya, and Noriko Yamakawa, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 646,898

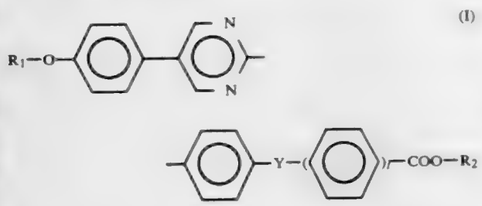
Claims priority, application Japan, Jan. 26, 1990, 2-17458

Int. Cl.[5] C09K *19/34;* C07D *239/02*

U.S. Cl. 252—99.61 3 Claims

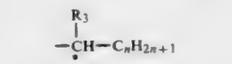


1. A liquid crystal compound represented by formula (I):

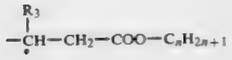


(I)

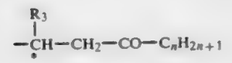
wherein R_1 represents an alkyl group having from 1 to 18 carbon atoms; R_2 represents an optically active group represented by formula (II), (III) or (IV):



(II)



(III)



(IV)

wherein R_3 represents a lower halo-alkyl group having from 1 to 2 carbon atoms; Y represents —COO— when l is 1, and Y represents 0 or 1; n represents an integer of from 1 to 18; and * indicates an optically active center.

5,202,055

ALKENYL ETHER COMPOUND AND A COMPOSITION CONTAINING THE SAME

Manabu Uchida; Kisei Kitano; Shinichi Sawada, and Keiko Uchida, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 14, 1989, Ser. No. 407,286

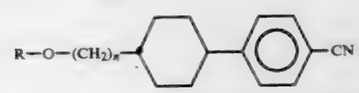
Claims priority, application Japan, Sep. 19, 1988, 63-234531

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] C09K *19/30;* C07C *255/00*

U.S. Cl. 252—299.63 7 Claims

1. An alkenyl ether compound expressed by the formula



(I)

wherein R represents an alkenyl group of 2 to 8 carbon atoms having a double bond at its end or a double bond of trans configuration in any other position and n represents an integer of 0 to 4.

5,202,056

COMPOSITION OF MATTER FOR OLIGOMERIC ALIPHATIC ETHERS AS ASPHALTENE DISPERSANTS

Rodney L. Sung, Fishkill, N.Y.; Thomas F. Derosa, Passaic; David A. Storm, Montvale, both of N.J., and Benjamin J. Kaufman, Hopewell Jct., N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 30, 1991, Ser. No. 814,533

Int. Cl.[5] B01F *17/00;* C10C *3/02;* C01L *1/26*

U.S. Cl. 252—351 1 Claim

1. A composition of matter useful as an asphaltene dispersant comprising mixture of:

(a) poly[di(propylene oxide-400)phosphite]-g-poly(propylene oxide-400) alcohol;

(b) poly[di(propylene oxide-1000)phosphite]-g-poly(propylene oxide-400) alcohol;

(c) poly[di(propylene oxide-400)phosphite]-g-poly(propylene oxide-1000) alcohol;

(d) poly[di(propylene oxide-1000)phosphite]-g-poly(propylene oxide-1000) alcohol;

(e) poly{star[di(propylene oxide-400)phosphite]-g-poly(propylene oxide-400)} alcohol;

(f) poly(star[di(propylene oxide-1000)phosphite]-g-poly(-propylene oxide-400)} alcohol;

(g) poly(star[di(propylene oxide-400)phosphite]poly(propylene oxide-1000)} alcohol; and

(h) poly(star[di(propylene oxide-1000)phosphite]-g-poly(-propylene oxide-1000)} alcohol.

5,202,057

PRODUCTION OF AMMONIA SYNTHESIS GAS

David M. Nicholas, New Tripoli; Joseph P. Bushinsky; Ravi Kumar, both of Allentown, and Wilbur C. Kratz, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 612,053, Nov. 8, 1990, abandoned, which is a division of Ser. No. 244,429, Sep. 14, 1988, Pat. No. 4,988,490. This application Apr. 28, 1992, Ser. No. 876,683

Int. Cl.[5] C01B *21/00, 3/02*

U.S. Cl. 252—376 8 Claims

1. A method for producing ammonia synthesis gas comprising:

(a) combusting a gaseous hydrocarbon fuel in air in a reforming furnace to provide an elevated temperature in said reforming furnace and forming a flue gas comprising nitrogen, oxygen, carbon dioxide, argon and water;

(b) reforming a methane-rich hydrocarbon charge by react-

ing said methane-rich hydrocarbon charge with steam in

5,202,059

group consisting of a substituted and unsubstituted

from the group consisting of poly(vinyl alcohol) and

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ing said methane-rich hydrocarbon charge with steam in said reforming furnace to form an intermediate reformate;
(c) reacting carbon monoxide and water contained in said intermediate reformate by shift conversion to form a hydrogen-rich reformate containing one or more contaminants which include carbon dioxide, water, carbon monoxide, and methane;
(d) purifying said flue gas by removing said water by condensation and separation, reacting said oxygen with hydrogen to form additional water, removing said additional water by condensation and separation, and removing said carbon dioxide and residual water by passing said carbon dioxide and residual water through a first adsorbent bed, to yield a nitrogen product.
(e) removing said contaminants from said hydrogen-rich reformate by passing said hydrogen-rich reformate through said first adsorbent bed to remove said carbon dioxide and water and then through a second adsorbent bed to remove said carbon monoxide and methane, to yield a final hydrogen product; and
(f) mixing said nitrogen product and said final hydrogen product to form said ammonia synthesis gas.

5,202,058
CORROSION INHIBITING METHOD AND INHIBITION COMPOSITIONS

Olen L. Riggs, Jr., Oklahoma City, Okla., assignor to A.S. Incorporated, Benicia, Calif.

Filed Nov. 6, 1991, Ser. No. 788,530
Int. Cl.[5] C23F *11/10*
U.S. Cl. 252—387 **46 Claims**

1. A method of inhibiting corrosion of a corrodible metal in a cooling water system including water, air which comprises maintaining in said water a minor amount of a stannous salt having at least 0.1 weight percent water solubility and a minor amount of a hydrocarbyl substituted succinimide of a polyethylene polyamine wherein (i) said substituent is aliphatic and contains in the range of 1 to 16 carbon atoms, (ii) said polyamine contains in the range of from 2 to about 8 ethylene groups and from 3 to about 9 amino groups, and (iii) said minor amounts are in the range of from about 0.1 to 100 parts per million parts of said water of said system.

34. A corrosion inhibiting cooling water composition comprising
(i) a stannous salt in an amount from 0.1 to 100 parts per million parts of said cooling water, (ii) a hydrocarbyl substituted succinimide of a polyethylene polyamine in an amount from 0.1 to 100 parts per million parts of said cooling water, (iii) a pre-treatment solvent medium and (iv) a polysorbate surfactant wherein said amount of said salt and said amount of said imide are in the range of from about 5 weight percent of said medium to about the saturation value of said salt and imide in said medium wherein said hydrocarbyl substituent is selected from the group consisting of aliphatic groups having a carbon atom content in the range of from 1 to about 16, said polyethylene polyamine containing from about 2 to about 8 ethylene groups and from 3 to about 9 amino groups, said medium having a lower alkanol content in the range of from about 15 to 100 volume percent wherein said surfactant is selected from the group consisting of mono-9-octadeceneoate poly (oxy-1, 2-ethanediyl) sorbitols containing in the range of from 8 to 50 (oxy-1, 2-ethanediyl) groups, and wherein the relative amounts of said imide to said salt are in the range from about 0.5 to 10 parts by weight.

5,202,059
COATED CERAMIC FILLER MATERIALS

Christopher R. Kennedy, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Filed Jun. 12, 1987, Ser. No. 61,854
Int. Cl.[5] C09K *3/00*; B32B *9/04*
U.S. Cl. 252—389.31 **21 Claims**

1. A coated ceramic filler material adapted for use as a reinforcing component in a composite comprising a ceramic matrix formed by the directed oxidation reaction of a molten precursor metal with an oxidant and embedding said filler material, said ceramic filler material having a plurality of superimposed coatings comprising a first coating in substantially continuous contact with said filler material forming a first zonal junction between said filler material and said first coating, and an outer coating in substantially continuous contact with the underlying coating forming a second zonal junction between superimposed coatings and a third zonal junction between the outermost coating and the ceramic matrix, and the zonal shear strength of at least one of the zonal junctions being weak relative to a remainder of the other zonal junctions to permit (1) debonding of said filler material on application of stress prior to fracture of said filler material and (2) pull-out of said filler material upon fracture of said filler material.

5,202,060
COMPOSITIONS OF ELECTRICALLY CONDUCTIVE POLYMERS DERIVED FROM PYRROLE, SUBSTITUTED OR OTHERWISE, PROCESS FOR OBTAINING THEM AND USE OF THESE COMPOSITIONS

Elise Destryker, Sint-Pieters-Leeuw, and Etienne Hannecart, Tervuren, both of Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Jul. 19, 1991, Ser. No. 732,220
Claims priority, application Belgium, Jul. 31, 1990, 09000760
Int. Cl.[5] H01B *1/14*
U.S. Cl. 252—500 **16 Claims**

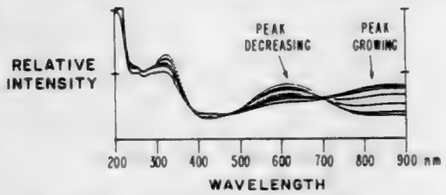
1. A composition comprising an electrically conductive polymer chosen from polypyrrole or substituted polypyrrole, a vanadium compound and an anion.

5,202,061
ELECTRICALLY CONDUCTIVE POLYMERIC MATERIALS AND USES THEREOF

Marie Angelopoulos, Briarcliff Manor; Wu-Song Huang, Poughkeepsie; Richard D. Kaplan, Wappingers Falls, all of N.Y.; Marie-Annick Le Corre, St Fargeau Ponthierry, France; Stanley E. Perreault, Wappingers Falls, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Michel R. Tissier, Noisy sur Ecole, France, and George F. Walker, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 357,565, May 26, 1989. This application Jun. 20, 1991, Ser. No. 717,968
Int. Cl.[5] A01B *5/14*
U.S. Cl. 252—500 **9 Claims**

1. A structure comprising:
a substrate having a surface;
at least a part said substrate being a dielectric body housing an electronic device;
said solid solution containing materials selected from the group consisting of a substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfuranes, polypyrroles, polyselenophene, polyacetylenes formed

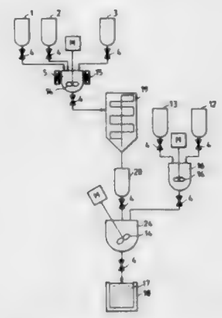


from soluble precursors and combinations thereof and containing a dissociated doping precursor selected from the group consisting of onion salts, iodonium salts, triflate salts, borate salts and tosylate salts and sulfonyloximides; their being sufficient dissociated depart precursor for said solid solution to be electrically conducting.

5,202,062
DISPOSAL METHOD OF RADIOACTIVE WASTES

Tsutomu Baba; Koichi Chino; Masami Matsuda; Takashi Nishi, all of Hitachi; Kiyomi Funabashi; Takashi Ikeda, both of Katsuta; Akira Sasahiro, Hitachi; Makoto Kikuchi, Hitachi, and Shin Tamada, Hitachi, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,997
Claims priority, application Japan, Mar. 2, 1990, 2-49274
Int. Cl.[5] G21F *9/12*
U.S. Cl. 252—633 **12 Claims**



1. A disposal method of radioactive wastes containing sodium sulfate, comprising the steps of adding an alkaline earth metal compound to the wastes;
reducing sulfate groups in the radioactive wastes so as to produce sulfide of alkaline earth metal present in the alkaline earth metal compound; and
solidifying the sulfide of alkaline earth metal produced by said reduction step.

5,202,063
METHOD FOR MAKING ENCAPSULATED LIQUID CRYSTAL MATERIAL

Brackin L. Andrews; Gilbert Garza, both of Fremont; Mark F. Wartenberg, San Jose, and William Seeley, Newark, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

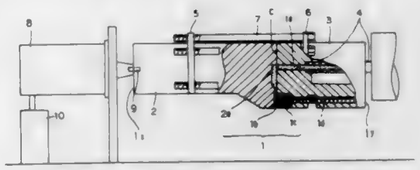
Continuation-in-part of Ser. No. 653,795, Feb. 11, 1991, abandoned. This application Feb. 12, 1992, Ser. No. 834,438
Int. Cl.[5] B01J *13/02*; G02F *1/13*; C09K *19/00*
U.S. Cl. 264—4.6 **9 Claims**

1. A method of making an encapsulated liquid crystal material, comprising the steps of:
providing liquid crystals and a containment medium selected from the group consisting of poly(vinyl alcohol) and poly(vinyl alcohol) copolymers, gelatin, polymethyl vinyl ether/maleic anhydride, carboxy polymethylene polymer, poly(ethylene oxide), poly(vinyl pyrrolidone), cellulosic polymers, and natural gums;
providing a carrier medium comprising a water-miscible monohydric alcohol and water in the proportion between 5:95 and 60:40 weight/weight;
mixing the liquid crystals, containment medium, and carrier medium to form an emulsion;
applying the emulsion onto a substrate; and
drying the emulsion to remove the carrier medium.

5,202,064
METHOD OF EXTRUSION MOLDING AND APPARATUS THEREFOR

Toshihiro Furusawa; Atsushi Satoh, both of Chiba; Takashi Nakajima, and Noriaki Matsugishi, both of Tokyo, all of Japan, assignors to Idemitsu Kosan Co., Ltd. and Seidensha Electronics Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP91/00062, § 371 Date Sep. 16, 1991, § 102(e) Date Sep. 16, 1991, PCT Pub. No. WO91/10552, PCT Pub. Date Jul. 25, 1991
PCT Filed Jan. 21, 1991, Ser. No. 762,027
Claims priority, application Japan, Jan. 20, 1990, 2-10930
Int. Cl.[5] B06B *3/00*; B29C *47/12*
U.S. Cl. 264—23 **10 Claims**



1. An extrusion molding method comprising,
preparing a molding apparatus including an extruder for supplying a molding material; a die formed separately from the extruder, said die having an entrance for receiving the molding material from the extruder and an extrusion orifice for extruding the molding material from the entrance; extrusion orifice gap adjustment means attached to the die, said adjustment means having a movable member to define a gap of the extrusion orifice and an adjusting device attached to the movable member for moving the movable member to adjust the gap; and a vibration producing device attached to the die for providing resonant vibration to the die, and
extruding the molding material through the die while vibrating the die without substantially transmitting vibration to the extruder by means of said vibration producing device so that the extrusion orifice is located to register with a loop of resonant vibration to reduce frictional resistance between the molding material and the extrusion orifice, and the adjusting device is located to register with a node of the resonant vibration to effectively vibrate the die.

6. An extrusion molding apparatus comprising,
an extruder for supplying a molding material,
a die formed separately from the extruder, said die having an entrance for receiving the molding material from the extruder and an extrusion orifice for extruding the molding material from the entrance,
extrusion orifice gap adjustment means attached to the die, said adjustment means having a movable member to define a gap of the extrusion orifice and an adjusting device attached to the movable member for moving the movable member to adjust the gap, and
a vibration producing device attached to the die for providing resonant vibration to the die, said vibration producing device providing vibration to the die without substantially transmitting vibration to the extruder so that the extrusion

orifice is located to register with a loop of resonant vibra-

5,202,066

plied thereto through said end of said projecting section

suring the actual rate of decompression for said pressing

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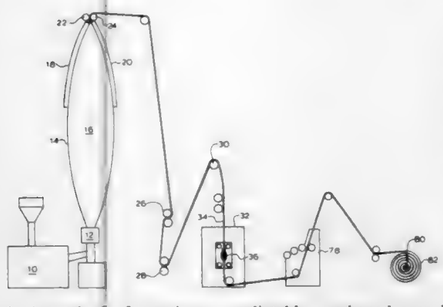
orifice is located to register with a loop of resonant vibration to reduce frictional resistance between the molding material and the extrusion orifice, and the adjusting device is located to register with a node of the resonant vibration to effectively vibrate the die.

5,202,065

ULTRASONIC METHOD OF PRODUCING A SCORE IN A THERMOPLASTIC FILM POUCH

John G. Lenander, Gurnee, and Robert W. Hinley, Spring Grove, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Apr. 11, 1991, Ser. No. 683,638
Int. Cl.[5] B29C *53/06*
U.S. Cl. 264—23 19 Claims



1. A method of creating a predictably weakened area in thermoplastic film, comprising the steps of:

extruding a molten thermoplastic material through an annular orifice to create a molten continuous tube;

introducing a gas inside said molten continuous tube to control the size of said tube in which varying the quantity of gas introduced in said tube will vary the diameter of said molten tube to form a blow-up ratio between said molten tube and said annular orifice;

allowing said molten continuous tube to harden into a thermoplastic film tube;

collapsing said film tube to allow opposite sides of said film tube to touch one another to form a flattened tube having first and second edges;

slitting said first edge of said flattened tube to form a slit-flattened tube having first and second sides connected to one another at said second edge;

maintaining first and second tips at predetermined distances from an anvil, said anvil having first and second surfaces separated by a blade rim, said first tip being located a first predetermined distance from said first surface and said second tip being located a second predetermined distance from said second surface;

drawing said second edge of said slit-flattened tube over said anvil such that said first side of said tube is between said first tip and said first surface of said anvil and said second side of said tube is between said second tip and said second surface of said anvil; and

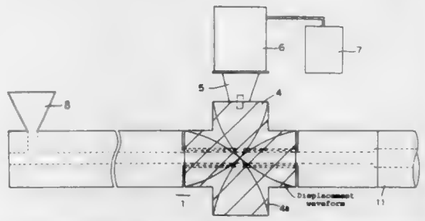
continuously applying an ultrasonic energy source through said first and second tips to said first and second sides of said slit-flattened tube to create a line of predictable weakness on said first and second sides of said slit-flattened tube.

5,202,066

METHOD OF PLASTICIZING MOLDING MATERIAL AND APPARATUS THEREFOR

Toshihiro Furusawa; Atsushi Satoh, both of Sodegaura; Takashi Nakajima, and Noriaki Matsugishi, both of Tokyo, all of Japan, assignors to Idemitsu Kosan Co., Ltd. and Seidensha Electronics Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 512,875, Apr. 23, 1990. This application Jan. 15, 1992, Ser. No. 823,043
Claims priority, application Japan, Apr. 25, 1989, 1-103530; Jan. 23, 1990, 2-12865
Int. Cl.[5] B29B *13/08*
U.S. Cl. 264—23 11 Claims



1. A method of plasticizing a molding material by supplying the molding material to a cylinder having a rotatable built-in screw therein for moving the molding material in said cylinder, said cylinder having zones consisting of a supply zone and a compression zone for the molding material, the method comprising the steps of:

(a) generating a first ultrasonic-wave vibration having a frequency in the range of 10 Hz to 10 MHz with a first ultrasonic transducer which is energized by a first ultrasonic-wave oscillator;

(b) transmitting said first ultrasonic-wave vibration to an ultrasonic-vibration direction changing means mounted on said cylinder in the manner that a part of said ultrasonic-vibration direction changing means constitutes a part of said cylinder and is disposed in one of said zones of said cylinder, said ultrasonic-vibration direction changing means having at least one section outwardly projecting from said cylinder, said projecting section having an end, wherein said first ultrasonic-wave vibration is transmitted through said end of said projecting section;

(c) changing the direction of said first ultrasonic-wave vibration transmitted to said ultrasonic-wave vibration direction changing means with said ultrasonic-wave vibration direction changing means by approximately 90 degrees;

(d) applying said first ultrasonic-wave vibration to said cylinder in the direction parallel to the moving direction of said molding material; and

(e) resonating at least one of said zones of said cylinder by said first ultrasonic-wave vibration at a frequency in the range of 10 Hz to 10 MHz, wherein the resonance is an n wavelength resonance, where n is m/2 and m is one of the integers of 1 to 20.

7. An apparatus for plasticizing a molding material including a cylinder having a screw insertion hole therein and a rotatable built-in screw inserted into said screw insertion hole for moving said molding material in said cylinder, said cylinder having zones consisting of a supply zone and a compression zone for the molding material, said apparatus comprising:

(a) an ultrasonic-vibration direction changing means mounted on said cylinder in the manner that a part of said ultrasonic-vibration direction changing means constitutes a part of said cylinder and is disposed in one of said zones of said cylinder, said ultrasonic-vibration direction changing means having at least one section outwardly projecting from said cylinder, said projecting section having an end, said ultrasonic-vibration direction changing means being capable of changing the direction of vibration applied thereto through said end of said projecting section by approximately 90 degrees;

(b) a first ultrasonic transducer for generating a first ultrasonic-wave vibration having a frequency in the range of 10 Hz to 10 MHz;

(c) a first ultrasonic-wave oscillator for energizing said first ultrasonic transducer; and

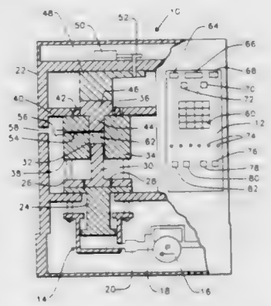
(d) means for transmitting said first ultrasonic-wave vibration to said ultrasonic-vibration direction changing means through said end of said projecting section of said ultrasonic-vibration direction changing means so that said ultrasonic-vibration direction changing means changes the direction of said first ultrasonic-wave vibration by approximately 90 degrees and said first ultrasonic-wave vibration is applied to said cylinder in the direction parallel to the moving direction of said molding material, wherein at least one of said zones of said cylinder is resonated by said first ultrasonic-wave vibration at a frequency in the range of 10 Hz to 10 MHz, wherein the resonance is an n wavelength resonance, where n is m/2 and m is one of the integers 1 to 20.

5,202,067

POWDER COMPACTING PRESS APPARATUS AND METHODS

Michael C. Solazzi, Hillsdale, N.J., and Monte J. Solazzi, Jupiter, Fla., assignors to Chemplex Industries, Inc., Tuckahoe, N.Y.

Filed Nov. 12, 1991, Ser. No. 790,344
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—40.5 20 Claims



1. A briquette press apparatus having a compression stroke wherein a ram advances against, and compacts, a sample of powdered material and a decompression stroke wherein said ram is withdrawn from said sample, said apparatus comprising:

a variably programmable control means for controlling said compression stroke and said decompression stroke, such that during said compression stroke the pressure said ram applies to said sample is maintained at a programmed pressure for a programmed dwell time, and during said decompression stroke, the rate of decompression is maintained at a programmed decompression rate.

14. A briquette forming method in which a sample of powdered material is compressed into a briquette, said method including the steps of:

1) placing said sample into a pressing means;

2) compressing said sample, measuring the actual pressure being applied to said sample;

3) comparing said actual pressure measured with a desired reference pressure;

4) regulating said pressing means so as to conform said actual pressure with said desired reference pressure for a predetermined dwell time;

5) decompressing said sample in said pressing means, measuring the actual rate of decompression for said pressing means;

6) comparing said actual rate of decompression with a desired reference decompression rate; and

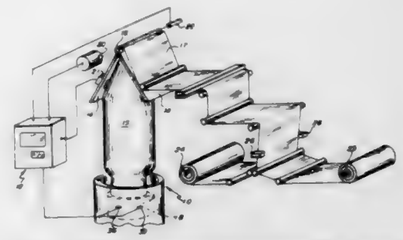
7) regulating said pressing means so as to conform said actual rate of decompression with said desired reference decompression rate.

5,202,068

METHOD AND APPARATUS FOR CONTROLLING BLOWN FILM THICKNESS

Daniel W. Mayer, Arden Hills, Minn.; Roger C. Oestreich, River Falls, Wis., and Richard Rosik, Minneapolis, Minn., assignors to Modern Controls, Inc., Minneapolis, Minn.

Continuation of Ser. No. 602,621, Oct. 24, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 765,453
Int. Cl.[5] B29C *49/78, 55/28*
U.S. Cl. 264—40.1 7 Claims



1. An apparatus for controlling thickness of film formed in a blown film machine having a rotatable die for producing a rotatable film bubble, a collapsing frame for collapsing the film bubble, and haul-off rollers for transporting the film away from the collapsing frame, comprising:

a) means for sensing the rotational position of said die and means for identifying an index point on said die, whereby the rotational position of said die is sensed relative to said index point;

b) means for subdividing the die and film bubble rotational position into a plurality of N angular segments relative to said index point, whereby said angular segments rotate coincidentally with said die;

c) a film thickness sensor fixedly mounted to said collapsing frame;

d) means for receiving signals from said film thickness sensor over all of said angular segments and developing a profile comprising a collection of each of the angular segment average film thickness values;

e) means for developing a set point film thickness value TS_1, TS_2, . . . TS_N for said N angular segments corresponding to said profile of angular segment average film thickness values, and means for storing said set point film thickness values;

f) means for receiving signals from said film thickness sensor over any of said plurality of angular segments, and forming an average film thickness value therefrom;

g) means for comparing said average film thickness value formed for any angular segment against the stored set point film thickness value for the same angular segment and developing a drive signal from said comparison;

h) a variable speed drive motor connected to said haul-off rollers;

i) means for sensing the rotational speed of said haul-off rollers; and

j) means for applying said drive signal to said variable speed drive motor.

7. A method of controlling film thickness to a set point thickness T_s in a blown film machine having a rotating die and rotating blown film bubble, and a variable speed motor con-

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nected to haul-off rollers for transporting the blown film away

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5,202,072

PITCH CARBON FIBER SPINNING PROCESS

impregnating said unitary fabric with a selected settable

cooling the shaped filaments or films to produce gel-like filaments or gel-like films, each containing solvent; and

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nected to haul-off rollers for transporting the blown film away from the machine, comprising the steps of:

a) subdividing the rotating film bubble into N angular segments, whereby the angular segments rotate with the die;

b) measuring the blown film thickness at a point fixed in space and across each of the rotating N angular segments;

c) calculating an average film thickness T for an angular segment N;

d) increasing the speed of the variable speed motor if $T > T_s$; and

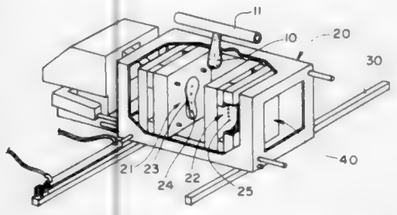
e) decreasing the speed of the variable speed motor if $T < T_s$.

5,202,069

METHOD FOR PRODUCING FOAMED, MOLDED THERMOPLASTIC ARTICLES

Thomas M. Pontiff, Gansevoort, assignor to Astro-Valcour, Inc., Glens Falls, N.Y.

Filed Apr. 23, 1991, Ser. No. 689,533
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—51 **15 Claims**



1. A method of producing a foamed, molded article, comprising:

(a) preparing a foamable melt comprising a molten mass of a foamable thermoplastic resin at a temperature and a pressure at which said foamable melt is prevented from foaming;

(b) extruding a quantity of said foamable melt through an orifice, into an atmosphere maintained at a lower pressure to expand it into a foam, said thermoplastic resin becoming almost fully foamed essentially immediately after said extruding;

(c) capturing at least a portion of the extruded resin within a mold cavity while said foamable melt is expanding into a foam and while it is depending from said orifice, said mold cavity having at least two substantially vertically-oriented mold sections with complimentary-shaped configurations, said mold sections being movable relative to each other; and

(d) then compressing and maintaining said foam within said mold cavity to cause said foam to fill depressions within said mold cavity and to cause said foam to solidify into a foamed molded article of the desired form.

5,202,070

METHOD FOR MAKING COMPOSITE PRODUCTS HAVING AN INTEGRAL KNIT MATRIX

Robert J. Schneider, 1 Sunset Drive N., Chappaqua, N.Y. 10514

Filed Feb. 1, 1991, Ser. No. 649,634
Int. Cl.[5] B29C *41/20*
U.S. Cl. 264—103 **11 Claims**

1. The method of forming a rigid composite varied shaped product comprising performing in a selected order the following steps:

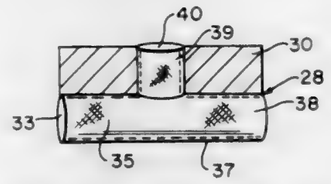
selecting a mandril of a desired shape and size for said product;

knitting an enclosed unitary fabric and maintaining substantially the same tension during knitting to conform said fabric in shape and size to said product;

inserting said mandril into said fabric;

impregnating said unitary fabric with a selected settable substance;

setting said substance whilst said impregnated fabric is supported on said mandril; and



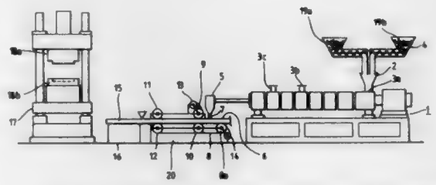
removing said mandril from said product formed as a composite of said fabric and said set substance.

5,202,071

METHOD OF PRODUCING FIBER REINFORCED PLASTIC MOLDINGS

Kazuyuki Nakamura; Shigeki Inoue, and Tadamoto Sakai, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Jun. 13, 1991, Ser. No. 714,524
Claims priority, application Japan, Jun. 20, 1990, 2-159655
Int. Cl.[5] B29C *43/02, 47/06*
U.S. Cl. 264—137 **6 Claims**



1. A method of producing fiber reinforced plastic moldings comprising the steps of;

supplying a thermosetting resin component and a thermoplastic resin component into an extruder;

kneading said thermosetting resin component and said thermoplastic resin component into each other in said extruder so as to produce a fused material in which fine particles of said thermoplastic resin component are dispersed in said thermosetting resin component;

supplying a liquid monomer into said extruder so that said liquid monomer is mixed with said fused material so as to reduce the viscosity of said fused material;

supplying a reaction initiator into said extruder so that said reactive initiator is mixed with said fused material at a temperature not higher than a reaction initiation temperature so as to produce a reactive kneaded material;

continuously discharging said reactive kneaded material from a die of said extruder so as to apply said reactive kneaded material onto a long fiber mat;

pressing and cooling said long-fiber mat coated with said reactive kneaded material to shape said long-fiber mat into a sheet;

cutting said sheet of long-fiber mat into pieces having a predetermined length;

shaping the thus cut pieces into moldings of a desired form by means of a press molding machine; and

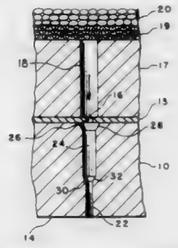
heating said moldings at a high temperature so as to harden said moldings.

5,202,072

PITCH CARBON FIBER SPINNING PROCESS

Roger A. Ross, Chattanooga, and Uel D. Jennings, Signal Mountain, both of Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 311,511, Feb. 16, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 606,675
The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.
Int. Cl.[5] B29C *47/12*
U.S. Cl. 264—177.13 **11 Claims**



1. In a process for spinning substantially round carbon fibers from pitch comprising extruding molten mesophase pitch through a spinneret having a round cross-section discharge capillary and a round cross-section counterbore upstream of the capillary, said counterbore being larger in diameter than the capillary, the improvement comprising first directing the flow of molten pitch through an opening upstream of the counterbore, said opening having an aspect ratio of at least 3:1 and an area substantially larger than the cross-sectional area of the capillary.

5,202,073

PRODUCTION OF STRETCHED POLYMERIC MATERIAL HAVING HIGH STRENGTH AND HIGH MODULUS

Shosuke Nanri; Tokio Kawaguchi, and Hiroshi Yasuda, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 519,315, May 8, 1990, abandoned, which is a continuation of Ser. No. 341,296, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 135,545, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 925,481, Oct. 28, 1986, abandoned, which is a continuation of Ser. No. 640,635, Aug. 15, 1984, abandoned. This application Jan. 28, 1991, Ser. No. 647,684
Claims priority, application Japan, Aug. 15, 1983, 58-149437; Aug. 19, 1983, 58-152261
Int. Cl.[5] B29C *47/12;* **D01D** *5/12*
U.S. Cl. 264—210.6 **11 Claims**

1. A method of preparing a stretched polymeric material of high tensile strength and high modulus, which comprises the steps of:

preparing gel-like globules (a) of a synthetic polymer having a solvent occluded therein and having an average particle size of not more than 1 mm by dissolving the synthetic polymer in the solvent and cooling the resulting solution, or preparing fine powders (b) of a synthetic polymer having an average particle weight of not more than 5×10^{-5} mg per particle in a solvent by dissolving the synthetic polymer in the solvent, cooling the resulting solution and lyophilizing the produced gel-like globules, said synthetic polymer having an average molecular weight of not less than 3×10^5;

preparing a solution or dispersion, for shaping, from the gel-like globules (a) or the fine powders (b) with a solvent, said solution or dispersion being heated to retain said solution and convert the dispersion to a solution;

shaping eight solution into filaments or films;

cooling the shaped filaments or films to produce gel-like filaments or gel-like films, each containing solvent; and

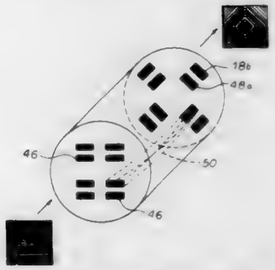
stretching the gel-like filaments or gel-like films at a high stretch ratio of a at least 2, resulting in a stretched polymeric material having a tensile strength of not less than 30 g/d and an initial modulus of not less than 800 g/d.

5,202,074

METHOD FOR PRODUCING INJECTION MOLDED MULTILAYER ARTICLES

Walter J. Schrenk; Ranganath K. Shastri, both of Midland; Herbert C. Roehrs, Beaverton, and Ralph E. Ayres, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 456,718, Dec. 26, 1989, abandoned. This application Apr. 11, 1991, Ser. No. 684,467
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—241 **14 Claims**



1. A method of making a multilayer plastic article, consisting essentially of:

coextruding a first composite stream comprised of discrete, generally planar and parallel layers of at least first and second diverse thermoplastic materials;

manipulating the first composite stream to form a second composite stream having an increased number of discrete, generally planar and parallel layers of the first and second materials compared to the first composite stream;

directly injection molding the second composite stream into a desired configuration; and

selecting a layer thickness for the layers of the first and second materials in the second composite stream so that at least about 90 percent of the layers are substantially continuous after the second composite stream is injection molded into the desired configuration.

5,202,075

PROCESS FOR MOULDING ARTICLES FROM CURABLE COMPOSITIONS

John Barnard, and William J. Ould, both of Blackburn, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 617,932, Nov. 26, 1990, abandoned, which is a continuation of Ser. No. 902,960, Aug. 29, 1986, abandoned. This application Dec. 20, 1991, Ser. No. 810,572
Claims priority, application United Kingdom, Aug. 30, 1985, 8521652
Int. Cl.[5] B29C *45/16;* **B32B** *31/00*
U.S. Cl. 264—245 **7 Claims**

1. A process of producing a moulded article having areas of colour contrast on the surface of the article in which a highly filled curable methyl methacrylate composition is cured between corresponding mould halves comprising applying a pigmented composition to pre-selected areas of at least one of the mould halves whilst the mould halves are held at elevated temperatures, closing the mould halves to form a mould cavity, introducing the curable composition into the mould cavity and

curing the composition in the cavity characterised in that the

means of said heated pressurized fluid in order to create

5,202,079

deflector plate including a lower edge positioned in close

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curing the composition in the cavity characterised in that the pigmented composition comprises

(a) a fluid carrier comprising a mixture of 0–100 parts by weight of a polymerisable liquid and correspondingly 100 to 0 parts by weight of a non-polymerisable, volatile, organic solvent,

(b) from 0.1 to 10% by weight of the total composition of a colourant in the form of an inorganic pigment or carbon black, or 0.0001 to 1% by weight of an organic pigment or dye,

(c) from 0 to 60% by weight of the total composition of a finely divided filler, having a mean particle size of less than 5 microns

(d) 0.1 to 50% by weight of a drying oil-modified alkyd resin soluble in the fluid carrier, and

(e) a preformed polymer soluble in the fluid carrier present at a concentration of at least half that of the concentration of drying oil-modified alkyd resin,

the constituents (a), (b), (c), (d) and (e) totalling 100% and (a) being present at a concentration of at least 25% by weight of the total composition.

5,202,076

METHOD FOR PRODUCING MULTI-LAYER PIPE CONDUIT COMPONENTS OF PLASTIC MATERIAL, INORGANIC FILLER MATERIAL AND GLASS FIBERS

Börge Carlström, Oberwil, Switzerland, assignor to Hobas Engineering & Durotec AG, Basel, Switzerland

Filed Sep. 22, 1989, Ser. No. 411,562

Claims priority, application Switzerland, Sep. 23, 1988, 3542/88

Int. Cl.[5] **B29C** *41/04*

U.S. Cl. 264—255 **19 Claims**

18. A method for producing pipe components, the method comprising the steps of:

inserting a mixture consisting of filler material and resin into a rotating mold;

separating said filler material and said resin in said mold by rotating said mold at a predetermined speed and for a predetermined time;

inserting fibrous material into said mold; and

forcing said fibrous material into said filler material and said resin by rotating said mold at another predetermined speed and for another predetermined time.

5,202,077

METHOD FOR REMOVAL OF SUBSTRATE MATERIAL BY MEANS OF HEATED PRESSURIZED FLUID STREAM

Francis W. Marco, Pauline; Colman B. O'Connell, Inman; Howard C. Willauer, Jr., and James A. Jacobs, Jr., both of Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 10, 1990, Ser. No. 550,428

Int. Cl.[5] **B26F** *1/26*

U.S. Cl. 264—504 **4 Claims**

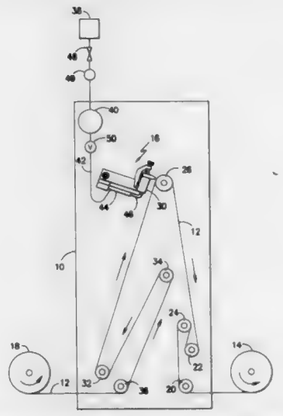
1. A method for creating structurally weakened recesses in a moving web of textile material thereby facilitating separation comprising the steps of:

(a) treating said web of textile material with a chemical solution wherein the chemical solution is a mixture of acrylic melamine resin, acrylic polymer and aqueous media that provides a hardened finish to said web of textile material to prevent frayed or jagged edges upon separation;

(b) moving said web of textile material past a station for removing textile material form said web of textile material;

(c) directing a continuous sheet of heated pressurized fluid against the surface of said web of textile material; and

(d) melting, removing and weakening textile material by means of said heated pressurized fluid in order to create said structurally weakened recess in said web of textile



material thereby facilitating separation at said weakened recess.

5,202,078

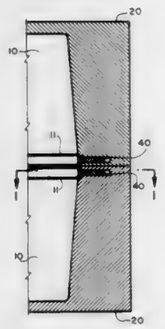
PROCESS AND APPARATUS FOR MANUFACTURING CONTAINERS WITH THICKENED FLANGES AND LONGITUDINAL REINFORCING RIBS AND CONTAINERS THEREBY

Richard L. Moore, Fairhope, Ala., assignor to Lerio Corporation, Mobile, Ala.

Filed Nov. 15, 1991, Ser. No. 792,938

Int. Cl.[5] **B29C** *49/00*

U.S. Cl. 264—527 **10 Claims**



1. A process for molding material into a joined pair of containers, each of said containers having a pair of thickened flanges, said process comprising the steps of:

(a) capturing a parison of moldable material between a plurality of separable major mold elements and a plurality of minor mold elements, said mold elements enclosing a mold chamber;

(b) expanding said parison of material to contact said major and minor mold elements;

(c) moving said minor mold elements radially inward towards each other and towards the axial center line of said mold chamber to contact and substantially bond together adjacent layers of said expanded parison of material, thereby forming said thickened flanges; and

(d) releasing said pair of containers from said major and minor mold elements.

5,202,079

MEANS AND METHOD FOR DETERMINING THE DEGREE OF WEAR OF A GAS INJECTION DEVICE

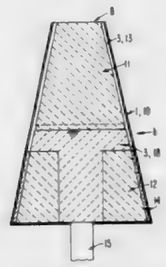
Manfred Winkelmann, Krefeld; Hans Rothfuss, Taunusstein, and Herbert Metzger, Duisburg, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,655

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802657

Int. Cl.[5] **C21B** *7/16*

U.S. Cl. 266—47 **24 Claims**



1. In a gas permeable injection device for introducing gas into a metallurgical vessel containing molten metal, said device having a surface to be exposed to and progressively worn away by the molten metal during operation of the vessel, said device including an outer body and an inner body within said outer body, at least said inner body being formed of a fireproof refractory material, the improvement comprising means for enabling the relative degree of wear of said device to be determined by optical examination of said surface, said means comprising:

a gas permeable space extending throughout said device in the direction of wear thereof, said space having a plurality of different geometric shapes spaced in said direction; and

means for, after the metallurgical vessel has been emptied of molten metal, passing gas through said space such that said gas exits from said surface as an optically recognizable image in a particular said geometric shape as a function of the relative degree of wear of said device.

5,202,080

FLUIDIZED BED APPARATUS

David E. Bannick, Roseville, and James S. Nelson, Moundsview, both of Minn., assignors to BGK Finishing Systems, Inc., Blaine, Minn.

Filed Dec. 17, 1991, Ser. No. 808,914

Int. Cl.[5] **C22B** *1/10*

U.S. Cl. 266—172 **2 Claims**

1. An apparatus for heat treating a granular material, said apparatus comprising:

volume defining means for defining a volume sized to receive a bed of fluidizing particles with said bed selected to exceed a predetermined elevation within said volume;

means for urging said bed to flow in a predetermined generally horizontal path of travel from a first end of said volume to a second end of said volume;

a plurality of heating elements disposed submerged within said bed;

flow control means for directing particulate material from an upper elevation of said bed toward said plurality of heating elements; and

said flow control means including a deflector plate disposed within said bed and at least partially blocking said path of travel of said fluidizing particles within said bed, said deflector plate generally perpendicular to said path, said deflector plate including a lower edge positioned in close proximity to said plurality of heating elements with said

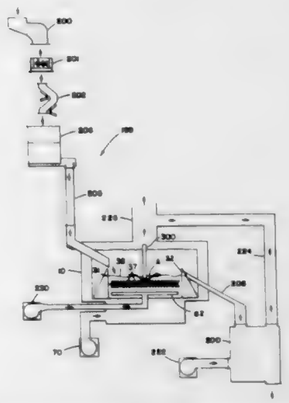


plate being substantially solid from said lower edge to a point above said elevation.

5,202,081

LAUNDER SYSTEM FOR SUPPLYING MOLTEN METAL AND A LAUNDER NOZZLE

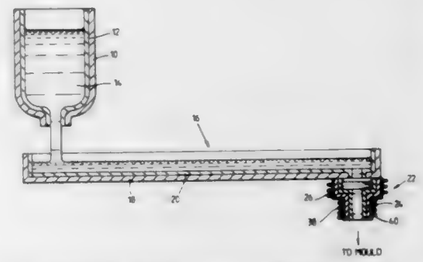
Paul W. Lake, Yorkshire, and Gordon J. S. Higginbotham, Derby, both of England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 672,676, Mar. 20, 1991, abandoned. This application Apr. 16, 1992, Ser. No. 869,848

Claims priority, application United Kingdom, Apr. 17, 1990, 9008538

Int. Cl.[5] **B22D** *35/04*

U.S. Cl. 266—231 **14 Claims**



1. A continuous launder system for supplying molten metal from a source of molten metal to at least one casting mould or a secondary process, comprising:

at least one channel member having an inlet and an outlet for conveying said molten metal from said inlet to said outlet without any interruptions between said inlet and said outlet, and

at least one nozzle attached to said outlet of the at least one channel member to supply the molten metal from said outlet of the at least one channel member to the at least one casting mould or secondary process, each of the at least one nozzle having a through-bore located therein with a filter disposed therein across said through-bore to define an assembly to filter molten metal as it flows through the nozzle, said nozzle and filter assembly being removably attached to the at least one channel member.

5,202,082

heat transport path by said main coolant pump through a core

5,202,085

FUEL ASSEMBLY AND REACTOR CORE

5,202,087

CEMENT COOLER GRATE ALLOY

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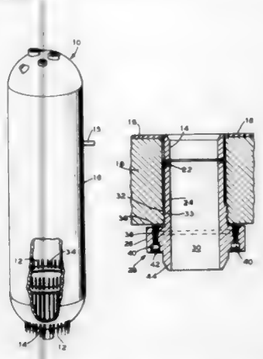
5,202,082
METHOD AND APPARATUS FOR REPLACING A NOZZLE

Steve K. Brown, Lynchburg; Larry D. Dixon, Forest, and Samuel J. Moses, Lynchburg, all of Va., assignors to B&W Nuclear Service Company, Lynchburg, Va.

Filed Dec. 17, 1991, Ser. No. 808,506
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—260 **4 Claims**



3. A method of replacing a damaged nozzle in a nuclear reactor coolant system pressurizer wherein the nozzle extends into the pressurizer through a nozzle bore in the wall of the pressurizer, comprising:

a. removing the original nozzle on the exterior of the pressurizer and a portion of the original nozzle in the nozzle bore;

b. partially tapping the nozzle bore to provide threads therein;

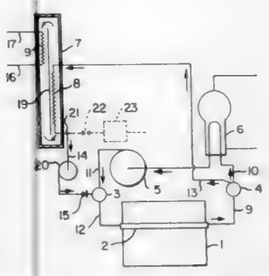
c. threading a replacement nozzle having a first seal ring positioned on one end into the nozzle bore such that said first seal ring is pressed against the remaining portion of the original nozzle, said replacement nozzle having a flange extending radially therefrom and adjacent the lower end of said nozzle; and

d. providing a seal between the flange on said replacement nozzle and the exterior of the pressurizer.

5,202,083
PASSIVE SHUTDOWN COOLING SYSTEM FOR NUCLEAR REACTORS

Norman J. Spinks, Deep River, and Ronald H. Shill, Saint Lamberts, both of Canada, assignors to Atomic Energy of Canada Limited, Chalk River, Canada

Filed Feb. 28, 1992, Ser. No. 843,219
Int. Cl.[5] G21C *15/18*
U.S. Cl. 376—299 **20 Claims**

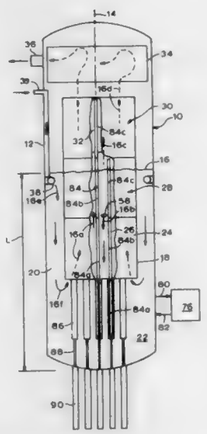


1. A nuclear reactor system comprising a reactor core and a main heat transport path containing a first heat removal component, at least one main coolant pump and coolant wherein, during normal operation, the coolant is pumped in the main heat transport path by said main coolant pump through a core of the reactor to said heat removal component and back to the reactor core to transport heat generated in the reactor core to the heat removal component; the system comprising a further decay heat removal path connected in parallel with the heat removal component and main coolant pump, the further decay heat removal path including a heat exchange component located at an elevation such that a natural convection flow will occur in the decay heat removal path from a high temperature outlet for coolant from the reactor core through the heat exchange component and to a low temperature inlet of the reactor core when said main coolant pump is shutdown; the further decay heat removal path includes a means to prevent flow in a direction opposite to the intended natural convection flow and a means to maintain a small flow of coolant from said outlet and through the heat exchange component during normal operation of the main coolant pump.

5,202,084
BI-LEVEL REACTOR INCLUDING STEAM SEPARATORS

Larry E. Fennern, San Jose, and Daniel R. Wilkins, Saratoga, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 553,073, Jul. 10, 1990, Pat. No. 5,116,567. This application Aug. 14, 1991, Ser. No. 744,855
Int. Cl.[5] G21C *3/04*
U.S. Cl. 376—433 **13 Claims**



1. A nuclear reactor comprising:

a vessel containing water;

a first core disposed in said vessel and containing a plurality of first fuel bundles configured in a first two-dimensional array for boiling said water to form a steam and water mixture;

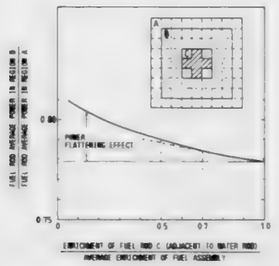
a plurality of steam separators disposed above said first core for receiving said steam and water mixture and being effective for separating said water from said steam; and

a second core disposed in said vessel and containing a plurality of second fuel bundles configured in a second two-dimensional array disposed above said steam separators for receiving and heating said separated steam to form superheated steam.

5,202,085
FUEL ASSEMBLY AND REACTOR CORE

Motoo Aoyama, Mito; Taro Ueki, Hitachi; Akinobu Nakajima, Hitachi; Sadao Uchikawa, Katsuta, and Junichi Yamashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 760,964
Claims priority, application Japan, Sep. 19, 1990, 2-249108
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—435 **24 Claims**



1. A fuel assembly comprising:

a plurality of first fuel rods,

a means for moderating material having a larger cross sectional area in an upper region than a lower region in an axial direction of the fuel assembly and being surrounded with the first fuel rods, and

at least one second fuel rod having a lower enrichment than a cross sectional average enrichment of the fuel assembly and being arranged in locations adjacent to the lower region of the means for the moderating material,

wherein a width of the horizontal cross sectional area at the lower region of said means for moderating material is so set that minimum values of both thermal neutron flux and resonance flux in a vertical direction to the axis of the fuel assembly are located in an outer region with respect to the location of said second fuel rod in the vertical direction to the axis of the fuel assembly, and

wherein the enrichment of said second fuel rod is at most 0.7 of the horizontal cross sectional average enrichment of the fuel assembly.

5,202,086
ARAMID FABRIC FOR GARMENTS OF IMPROVED COMFORT

Bantwal J. Baliga, Chesterfield, Va., and Donald E. Hoffman, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1992, Ser. No. 899,281
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—225 **3 Claims**

1. A woven fabric for use in protective apparel of improved comfort consisting essentially of spun yarns of uncrystallized poly(m-phenylene isophthalamide) staple fiber having a 0.8 to 1.5 denier per filament; said fabric having a basis weight of from 4.0 to 8 ounces per square yard and a construction as follows:

weave:	plain or twill
Yarn:	37/2 or finer
warp count:	75 to 125 ends/inch
fill count:	at least 40 end/inch but not greater than 80% of the warp count.

5,202,087
CEMENT COOLER GRATE ALLOY

John H. Culling, St. Louis, Mo., assignor to The Carondelet Corporation, Pevely, Mo.

Filed Jul. 31, 1992, Ser. No. 922,824
Int. Cl.[5] C22C *38/36*
U.S. Cl. 420—17 **8 Claims**

1. An aluminum-free heat resistant alloy having good high temperature hardness, consisting essentially of:

CHROMIUM	11–20% By Weight
NICKEL	3–10.5%
MOLYBDENUM	1–4%
CARBON	2–4.5%
NITROGEN	Up to about 0.25%
SILICON	2.7–4%
COPPER	Up to about 4%
COBALT	Up to about 4%
MANGANESE	Up to about 4%
ALUMINUM	Up to about 0.2% Maximum
COPPER + COBALT	Up to 4% Total
COPPER + COBALT + MANGANESE	Up to 8% Total
IRON & IMPURITIES provided that NICKEL + COPPER + COBALT is and further provided that NICKEL + COPPER + COBALT + MANGANESE is	Essentially Balance 6–12.5% 6–15%

CHROMIUM	11–20% By Weight
NICKEL	3–10.5%
MOLYBDENUM	1–4%
CARBON	2–4.5%
NITROGEN	Up to about 0.25%
SILICON	2.7–4%
COPPER	Up to about 4%
COBALT	Up to about 4%
MANGANESE	Up to about 4%
ALUMINUM	Up to about 0.2% Maximum
COPPER + COBALT	Up to 4% Total
COPPER + COBALT + MANGANESE	Up to 8% Total
IRON & IMPURITIES provided that NICKEL + COPPER + COBALT is and further provided that NICKEL + COPPER + COBALT + MANGANESE is	Essentially Balance 6–12.5% 6–15%

5,202,088
FERRITIC HEAT-RESISTING CAST STEEL AND A PROCESS FOR MAKING THE SAME

Yoshikazu Genma; Shinji Katou, both of Aichi; Masami Suzuki, Okazaki; Shinya Mizuno, and Tsutomu Sekiguchi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 27, 1991, Ser. No. 813,697
Claims priority, application Japan, Dec. 28, 1990, 2-417095; Jun. 27, 1991, 3-183235
Int. Cl.[5] C22C *38/22, 38/24;* **C21D** *6/00*
U.S. Cl. 420—40 **9 Claims**

1. A ferritic heat-resisting cast steel consisting essentially of: on a weight basis, 0.05 to 0.5% C, 1.0 to 2.0% Si, less than

0.6% Mn, less than 0.04% P, less than 0.04% S, less than

and for feeding the combustible particles into the intro-

5,202,092

portion, the outer surface of which is adapted to provide

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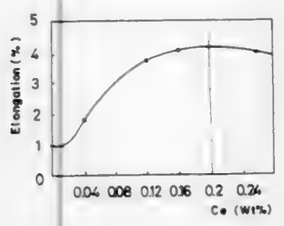
0.6% Mn, less than 0.04% P, less than 0.04% S, less than 0.5% Ni, 10 to 20% Cr, 0.1 to 1.0% V, 0.5 to 1.0% Nb,



0.08 to 0.50% Mo, less than 0.01 W and 0.01 to 0.2% Ce, the balance thereof being iron.

5,202,089

PRECIPITATION-HARDENABLE TOOL STEEL

Lars-Åke Norström, and Henrik Jespersson, both of Hagfors, Sweden, assignors to Uddeholm Tooling Aktiebolag, Hagfors, Sweden

Filed May 16, 1991, Ser. No. 700,962
Int. Cl.[5] C22C *38/06, 38/40*
U.S. Cl. 420—63 **14 Claims**

1. Precipitation-hardenable tool steel suitable for manufacturing plastic forming tools therefrom, the said tool steel at the manufacturing of the tool and prior to hardening through ageing treatment but after solution heat treatment and cooling to room temperature having a hardness less than 40 HRC, but after the manufacturing of the tool and the subsequent age hardening treatment being harder than 45 HRC and having a high corrosion resistance and a toughness sufficient for plastic forming tools, wherein the steel contains in weight-%

max	0.08	C,
max	1	Si,
max	2	Mn,
	9–13	Cr,
	7–11	Ni,
max	1	Mo,
	1.4–2.2	Al, and

balance being essentially only iron, impurities and accessory elements in normal amounts, which steel does not contain carbon and nitrogen stabilizing elements selected from the group consisting of Nb, Ti, Ta and Zr in amounts more than as unavoidable impurities.

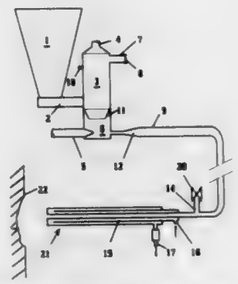
5,202,090

APPARATUS FOR CERAMIC REPAIR

Charles M. Zvosec, Lorain, Ohio, and Léon P. Mottet, Nalinnes, Belgium, assignors to Glaverbel, Brussels, Belgium and Fosbel, Inc., Cleveland, Ohio

Division of Ser. No. 343,650, Apr. 28, 1989. This application Nov. 27, 1991, Ser. No. 798,884
Claims priority, application United Kingdom, Jul. 26, 1988, 8817764
Int. Cl.[5] C21B *7/04*
U.S. Cl. 266—281 **19 Claims**

1. Apparatus for repairing a refractory body, comprising:
means for projecting a particle mixture comprising combustible particles in an oxygen-rich carrier gas against a refractory body to cause oxidation of the combustible particles in a reaction zone adjacent the refractory body and thereby the generation of heat required for one of dressing the refractory body and forming a refractory weld mass thereon;
a chamber including an introduction zone and comprising respective entry means for admitting a flow of a first gas and for feeding the combustible particles into the introduction zone; and
an entrainment zone in communication with the introduction zone and comprising entry means for admitting a flow of oxygen-rich gas thereinto and exit means including a conduit which leads from the entrainment zone to the reaction zone, which flow of oxygen-rich gas produces an aspirating effect in the entrainment zone as it passes



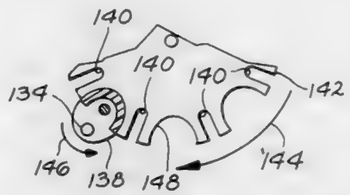
through the entrainment zone and exits the entrainment zone through the conduit whereby a flow of the combustible particles and the first gas is induced by aspiration from the introduction zone into the entrainment zone and the induced flow of combustible particles and first gas is entrained in and carried along with the flow of the oxygen-rich gas as the flow of oxygen-rich gas exits the entrainment zone.

5,202,091

LUMINESCENCE MEASUREMENT ARRANGEMENT

Wayne F. Lisenbee, 5103 Lillian St., Torrance, Calif. 90501

Division of Ser. No. 707,496, Mar. 1, 1985, Pat. No. 4,772,453. This application Apr. 4, 1988, Ser. No. 177,590
Int. Cl.[5] G01N *21/76*
U.S. Cl. 422—52 **6 Claims**



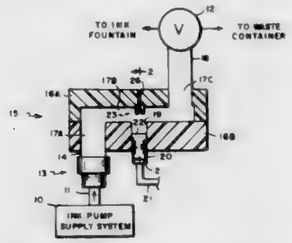
1. In a luminescence measuring arrangement of the type having a luminescence detection means for selectively and sequentially detecting and measuring the luminescence emitted from a plurality of samples, the improvement comprising, in combination:
tray means, having a plurality of cuplike sample wells for containing the samples whose luminescence is to be detected and measured, said cuplike sample wells having a predetermined cross sectional area at an open end thereof, and said luminescence to be detected and measured emitted from the samples in each of said plurality of sample wells through said open end of said sample wells;
mask plate means, having walls defining a plurality of mask apertures therethrough, adjacent said open ends of said plurality of cuplike sample wells, and said number of said plurality of mask apertures in said mask plate means corresponding to said number of said plurality of cuplike sample wells, and each of said cuplike sample wells alignable with one of said apertures.

5,202,092

DEVICE FOR MONITORING THE PH OF WATER BASED INKS

Robert A. Norcross, Jr., Newton, Mass., assignor to Norcross Corporation, Newton, Mass.

Filed Dec. 3, 1991, Ser. No. 801,889
Int. Cl.[5] G01N *21/00, 27/416, 27/26*
U.S. Cl. 422—62 **5 Claims**



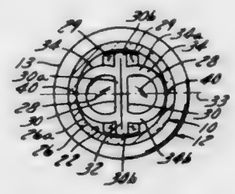
1. A device for automatically and continually monitoring the pH characteristic of a water based printing ink flowing through such device, said device comprising
a pH probe housing assembly positioned in-line in a flow line through which a water based printing ink flows, said housing having an input port and an output port coupled to said flow line;
a main channel formed in said housing between and in communication with said input and output ports so that said water based printing ink flows through said main channel;
a recessed channel formed in said housing in communication with said main channel below the flow path of said main channel;
means in said main channel for directing a first portion of said water based printing ink flowing through said main channel downwardly into said recessed channel, a second remaining portion thereof flowing directly through said main channel;
a pH probe member inserted into said recessed channel, an exposed surface of said probe member being contacted by the first portion of said water based printing ink that is directed into said recessed channel for monitoring the pH characteristic of said ink, a residual portion of the ink flowing in said recessed channel remaining therein in contact with said exposed surface when the flow of ink through said housing is stopped.

5,202,093

SEALING CAP WITH A ONE WAY VALVE HAVING SEMI-CYLINDRICAL VALVE CLOSURE SPRINGS

William C. Cloyd, Lexington, Ky., assignor to Medical Robotics, Inc., Lexington, Ky.

Filed May 20, 1991, Ser. No. 703,153
Int. Cl.[5] B01L *3/14*
U.S. Cl. 422—102 **9 Claims**



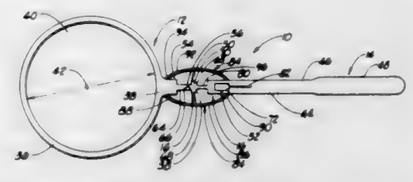
1. A cap for a container comprising
(a) an annular upper member adapted to be positioned in the mouth of the container, said annular member defining a cavity open at the top and having a circular upper wall portion, the outer surface of which is adapted to provide a fluid tight seal against the inner surface of said container when said annular member is pressed into the mouth of said container;
(b) a downwardly extending lower member connected to said annular upper member and having a pair of lower member walls spaced from the inner surface of said container when said annular upper member is pressed into the mouth thereof, said lower member walls defining a normally closed slit seal at the bottom end of said lower member; and
(c) a pair of flexible spring elements each located on opposite sides of said slit seal and connected to one said lower member wall, each spring element defining an abutment wall intersecting with one said lower member wall along at least two lines of intersection spaced from one another about the midpoint of said slit,
each of said abutment walls having a portion aligned with said circular upper wall portion outer surface so as to abut the inner surface of said container when said annular member is pressed into the mouth thereof and each of said abutment walls together with one of said lower member walls, defining an interior volume adjacent the midpoint of said slit seal, each of said lower member walls flexing into a respective said interior volume when said slit seal opens due to the penetration thereof by an instrument.

5,202,094

SPECIMEN CUP HOLDER

Timothy B. Jones, 3030 SW. 89, Apt. #E, Oklahoma City, Okla. 73159; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401

Filed Oct. 15, 1991, Ser. No. 776,627
Int. Cl.[5] B01L *3/00*
U.S. Cl. 422—102 **15 Claims**



1. A specimen cup holder comprising:
specimen cup engaging means for supportingly engaging a specimen cup in a stable, specimen receiving position, the specimen cup engaging means having an opening therein for receiving and supporting a specimen cup;
a handle member having a first and an opposed second end portion;
first connector means for connecting the first end portion of the handle member to the specimen cup engaging means such that the opposed second end portion of the handle member extends outwardly from the specimen cup engaging means and provides a gripping portion so that a person grasping the gripping portion of the handle member can position a specimen cup disposed within the opening of the specimen cup engaging means for receipt of a specimen without contact with the specimen, the first connector means comprising:
a female member having a male-receiving opening therein, the female member supported by either the specimen cup engaging means or the first end portion of the handle member; and
a male member positionable within the male-receiving opening, the male member supported by the other of the specimen cup engaging means or the first end portion of the handle member, the male member having a retaining means for abuttingly engaging the female member when the male member is positioned through the male-receiv-

ing opening of the female member for connecting the

in fluid communication with the outlet of said first adsorp-

sleeve, said first sleeve and said second sleeve being per-

a serpentine flow path through the valve housing, and one

ing opening of the female member for connecting the handle member to the specimen cup engaging means; and

hinge means supported by the handle member and located a selected distance from the opposed second end portion of the handle member such that the gripping portion defined by the opposed second end portion of the handle member can be disposed substantially parallel to an upper portion of a specimen cup supported within the opening of the specimen cup engaging means for facilitating placement of a specimen cup for receipt of a specimen.

5,202,095

MICROWAVE PLASMA PROCESSOR

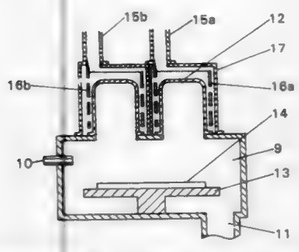
Ryuzoh Houchin, and Naoki Suzuki, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 457,425, Dec. 27, 1989, abandoned. This application Mar. 27, 1992, Ser. No. 861,179

Claims priority, application Japan, Dec. 27, 1988, 63-332908

Int. Cl.[5] **B01J** *19/08*

U.S. Cl. 422—186 **7 Claims**



1. A microwave plasma processor comprising:

a chamber, including a first chamber for a sample, and a plurality of second chambers for generating plasma;

a plurality of microwave radiation antennas outside said second chambers; and

a plurality of microwave introduction inlets from which microwave energy is introduced into said chamber through said microwave radiation antennas,

said first chamber including a gas introduction inlet, an exhaust port, and a sample table for loading thereon a sample, and said second chambers composed of a dielectric material;

and wherein said plurality of microwave energy introduction inlets corresponds in number to said microwave radiation antennas.

5,202,096

APPARATUS FOR LOW TEMPERATURE PURIFICATION OF GASES

Ravi Jain, Piscataway, N.J., assignor to The BOC Group, Inc., Murray Hill, N.J.

Division of Ser. No. 467,673, Jan. 19, 1990, Pat. No. 5,110,569. This application Aug. 15, 1991, Ser. No. 724,094

Int. Cl.[5] **B01J** *8/04*

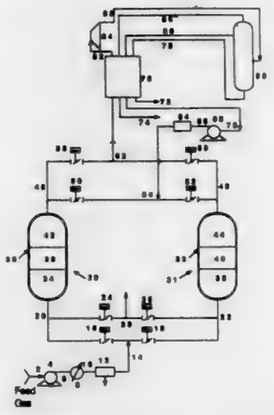
U.S. Cl. 422—190 **8 Claims**

1. Apparatus useful for producing a substantially pure nitrogen stream from a gas stream containing nitrogen, hydrogen, carbon monoxide, carbon dioxide, water vapor and oxygen comprising:

a) a first adsorption zone having an inlet and an outlet and containing an adsorbent which adsorbs moisture and carbon dioxide from a gas stream,

b) a catalytic reaction zone having an inlet and an outlet and containing a catalyst which, in the presence of oxygen, converts carbon monoxide to carbon dioxide and hydrogen to water, the inlet of said catalytic reaction zone being in fluid communication with the outlet of said first adsorption zone,

c) a second adsorption zone having an inlet and an outlet and containing an adsorbent which adsorbs moisture and carbon dioxide, the inlet of said second adsorption zone being in fluid communication with the outlet of said catalytic reaction zone,



d) a cryogenic gas separation unit adapted to separate nitrogen from oxygen having an inlet in fluid communication with the outlet of said second adsorption zone, and

e) conduit means connecting said cryogenic gas separation unit with at least one of said first and second adsorption zones for purging said first and second adsorption zones with a waste stream from said cryogenic separation unit.

5,202,097

REACTOR WITH A LOWER WALL AND/OR AN UPPER WALL HAVING A LAYER OF A FLEXIBLE REFRACTORY MATERIAL

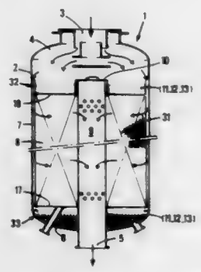
Bernard Poussin, Carrieres Sur Seine, France, assignor to Institut Francais du Petrole, France

Filed Jun. 14, 1991, Ser. No. 715,191

Claims priority, application France, Jun. 15, 1990, 90 07614; Jun. 15, 1990, 90 07615; May 16, 1991, 91 05997

Int. Cl.[5] **B01J** *35/02, 8/02*

U.S. Cl. 422—218 **23 Claims**



1. An apparatus for carrying out gas phase chemical reactions at a given temperature comprising:

a reactor vessel;

a first sleeve positioned in said vessel so as to define an annular fluid distribution envelope between said first sleeve and an interior of said vessel;

a second sleeve positioned in said vessel so as to define an annular space between said first sleeve and said second sleeve, said first sleeve and said second sleeve being permeable to a reaction fluid;

upper and lower walls sealing said annular space so as to define an annular compartment, said annular compartment being filled with reaction catalyst particles;

a feed inlet in flow communication with said distribution envelope such that introduced reaction fluid radially or transversely circulates through said compartment; and

said upper wall comprising at least one layer of at least one flexible refractory material which is inert to the chemical reaction and impermeable to the reaction fluid and which has a texture and porosity such that the presence of the layer produces a pressure drop higher than that produced by the compartment of catalyst particles.

5,202,098

MEDICAL INSTRUMENT STERILIZATION CONTAINER WITH PRESSURE INDUCED POSITIVE DRAINAGE

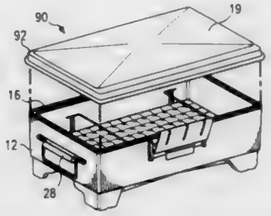
Robert L. Nichols, 4555 N. Jackson, Jacksonville, Tex. 75766

Continuation-in-part of Ser. No. 505,882, Apr. 6, 1990, Pat. No. 5,080,874, which is a continuation of Ser. No. 208,730, Jun. 17, 1988, Pat. No. 4,915,918, which is a continuation of Ser. No. 821,136, Jan. 22, 1986, Pat. No. 4,752,453, which is a division of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617,178. This application Apr. 8, 1991, Ser. No. 682,429

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[5] **A61L** *2/06;* **B65D** *51/16*

U.S. Cl. 422—300 **16 Claims**



1. A medical instrument sterilization container comprising:

a housing having sidewalls, a bottom sloped to a drain having a filter disposed therein and means defining an opening for transferring medical instruments in and out of said container; and

a removable lid with no apertures therethrough for sealing to said means defining an opening.

5,202,099

ANGLE OF REPOSE VALVE

James E. Boone; David W. Owens; Robert E. Farritor, all of Baton Rouge, La., and Wesley D. Blank, Pasadena, Tex., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 346,219, May 2, 1989, abandoned, which is a continuation of Ser. No. 59,038, Jun. 8, 1987, abandoned, which is a division of Ser. No. 761,434, Aug. 1, 1985, abandoned. This application Oct. 26, 1989, Ser. No. 426,846

Int. Cl.[5] **G01F** *11/28*

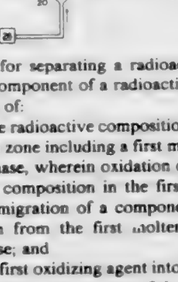
U.S. Cl. 422—310 **4 Claims**

1. An angle of repose valve for dispensing high purity solids from a protective environment, said valve comprising:

(a) a valve housing having a top inlet and a bottom outlet;

(b) an inlet tube sealingly coupled to said top inlet for receiving a flow of high purity solids from a protective environment, said inlet tube having an interior surface which is non-contaminating to said high purity solids for contacting said solids;

(c) a series of horizontally disposed plates, each plate having an aperture defined therethrough, said plates being vertically mounted within said housing so that said apertures of said plates and air gaps between said plates together define a serpentine flow path through the valve housing, and one of said plates defining a horizontal blocking surface along said serpentine flow path; and



(d) motive gas means for moving solids collected on said horizontal blocking surface to discharge said solids through the portion of said serpentine flow path below said blocking surface.

5,202,100

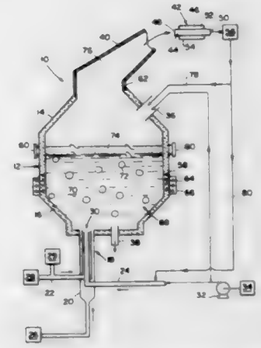
METHOD FOR REDUCING VOLUME OF A RADIOACTIVE COMPOSITION

Christopher J. Nagel, Boston, Mass.; Robert D. Bach, Grosse Pointe, Mich., and William M. Haney, III, Boston, Mass., assignors to Molten Metal Technology, Inc., Waltham, Mass.

Filed Nov. 7, 1991, Ser. No. 788,804

Int. Cl.[5] **C22B** *60/00*

U.S. Cl. 423—5 **29 Claims**



1. A method for separating a radioactive first component from a second component of a radioactive composition, comprising the steps of:

a) directing the radioactive composition into a reaction zone, the reaction zone including a first molten metal phase and a second phase, wherein oxidation of a component of the radioactive composition in the first molten metal phase will cause migration of a component of the radioactive composition from the first molten metal phase to the second phase; and

b) directing a first oxidizing agent into the first molten metal phase, whereby a component of the radioactive composition is oxidized, causing migration of a component of the radioactive composition from the first.

5,202,101

of solid sulfur oxide acceptor on a finely-divided porous

depleted in sulfur dioxide and which comprises water solutions, comprising treating a hydrochloric acid solution

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5,202,101

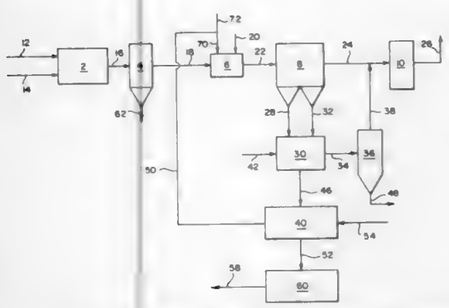
REGENERATIVE PROCESS AND SYSTEM FOR THE SIMULTANEOUS REMOVAL OF PARTICULATES AND THE OXIDES OF SULFUR AND NITROGEN FROM A GAS STREAM

Mitchell R. Cohen, Troy, N.Y., and Eli Gal, Lititz, Pa., assignors to General Electric Environmental Services, Lebanon, Pa.

Continuation of Ser. No. 672,999, Mar. 21, 1991, abandoned. This application Jun. 23, 1992, Ser. No. 905,133

Int. Cl.[5] B01J *8/00*; **C01B** *17/00, 21/00*

U.S. Cl. 423—239 **10 Claims**



1. A process for simultaneously removing from a gaseous mixture, sulfur oxides by means of a solid sulfur oxide acceptor on a porous carrier, nitrogen oxides by means of ammonia gas and particulate matter by means of filtration and for regenerating loaded solid sulfur oxide acceptor, the method comprising:

(a) optionally, filtering the gaseous mixture to remove particulate matter when particulate matter in the gaseous mixture is coarser than or about the same size as the solid sulfur oxide acceptor;

(b) forming an entrained bed of solid sulfur oxide acceptor in the gaseous mixture to deplete sulfur oxides in the gaseous mixture and thereby convert solid sulfur oxide acceptor to loaded solid sulfur oxide acceptor, the solid sulfur oxide acceptor being dispersed on a finely-divided porous carrier material wherein the porous carrier material has a particle size up to about 200 microns when the gaseous mixture is filtered in step (a) or a particle size of about 20 microns to about 200 microns when filtering of the gaseous mixture in step (a) is omitted;

(c) injecting ammonia gas or a precursor capable of forming ammonia gas into the gaseous mixture prior to, during or after the formation of the entrained bed of solid sulfur oxide acceptor in the gaseous mixture to form a gas depleted of nitrogen oxides;

(d) filtering the gas depleted of sulfur oxides and nitrogen oxides and containing entrained loaded solid sulfur oxide acceptor and any particulate matter, to separate a clean gas from filtration solids comprising loaded solid sulfur oxide acceptor on a porous carrier material and particulate matter, the particulate matter being present if filtering step (a) is omitted;

(e) passing the clean gas to exhaust in an exhaust gas stream, optionally using an air preheater in the exhaust gas stream;

(f) optionally, classifying by size the filtration solids comprising both loaded solid sulfur oxide acceptor and particulate matter into relatively coarse particles of loaded solid sulfur oxide acceptor on a porous carrier material and into relatively fine particles of particulate matter when particulate matter is present in the filtration solids;

(g) regenerating the loaded solid sulfur oxide acceptor on a porous carrier material from step (d) or step (f) to form a sulfur dioxide-rich gas and regenerated solid sulfur oxide acceptor; and

(h) recycling the regenerated solid sulfur oxide acceptor on a finely-divided porous carrier to form the entrained bed of solid sulfur oxide acceptor on a finely-divided porous carrier in a gaseous mixture.

5,202,102

GAS PHASE DEHYDROHALOGENATION USING A PRETREATED CATALYST

Hong A. Nguyen, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1991, Ser. No. 703,976

Int. Cl.[5] C01B *7/00*

U.S. Cl. 423—240 **18 Claims**

1. A process which comprises:

(A) contacting dry alumina under conditions essentially free of oxygen and water with a gaseous mixture comprising elemental chlorine gas and a hydrogen chloride under conditions effective to improve the ability of the catalyst to dehydrohalogenate halogenated hydrocarbons;

(B) contacting the alumina with a halogenated hydrocarbon feedstock containing one or more chlorinated hydrocarbons selected from the group consisting of 1,1,1,-trichloroethane 1,1-dichloroethane, chloroethane, 1,2-dichloroethane, and 1,1,2-trichloroethane, the halogenated hydrocarbon feedstock with or without a carrier gas, wherein the gas hourly space velocity of the halogenated hydrocarbons feedstock is between about 100 hr^{-1} and 5000 hr^{-1} in the gas phase at a temperature between 50° C. and 500° C. under dehydrohalogenation conditions to produce an unsaturated, dehydrogenated product; and

(C) recovering the unsaturated, dehydrohalogenated product.

5,202,103

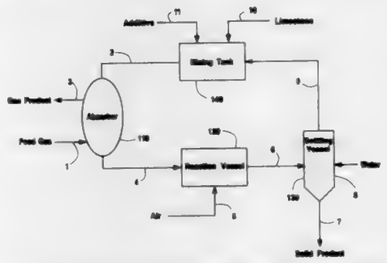
REMOVAL OF SULFUR DIOXIDE FROM GAS STREAMS

John C. Chang, Cary, N.C.; Leo E. Hakka, and Veronique Roy, both of Montreal-East, Canada, assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 20, 1991, Ser. No. 811,813

Int. Cl.[5] C01B *17/00*

U.S. Cl. 423—242.7 **20 Claims**



1. A process for removing sulfur dioxide from a gas stream comprising;

(a) contacting a feed gas containing sulfur dioxide with an aqueous slurry comprising:

(i) an absorbent selected from lime, limestone and mixtures thereof in an amount effective to obtain a loading of at least 0.8 gram of sulfur dioxide per gram of calcium in said slurry; and

(ii) an additive comprising a polyamine in a partial salt form having an available alkalinity of at least about 0.5 meq/gram between a pH of 3.0 and 5.5, said polyamine being present in an amount of from about 100 to 5000 ppmw based on the total weight of the slurry;

at conditions effective to absorb the sulfur dioxide from the feed gas, said conditions including a temperature of up to about 80° C. and a pH of less than 6.0;

(b) withdrawing a gas product which is at least partially depleted in sulfur dioxide and which comprises water vapor; and

(c) withdrawing a spent slurry comprising at least one of calcium sulfate or calcium sulfite.

5,202,104

PROCESS FOR PREPARING SILICA HAVING A LOW SILANOL CONTENT

Naotake Watanabe, Yokosuka; Koichi Orii, Yokohama; Junsuke Yagi, Yokohama, and Iwao Ohshima, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 481,235

Claims priority, application Japan, Feb. 20, 1989, 1-038168

Int. Cl.[5] C01B *33/12*

U.S. Cl. 423—335 **15 Claims**

1. A process for preparing amorphous silica which comprises heating amorphous silica, in at least one atmosphere selected from the group consisting of dry air, inert gases and vacuum, said atmosphere having a dew point of −50° C. or less to maintain the amorphous silica at a temperature in a range of not less than 600° C. but less than 1000° C. at a first heating step and then, without cooling the amorphous silica, heating it to maintain it at a temperature of 1200° C. or more, in an atmosphere of a low partial pressure of water vapor, at a second heating step.

5,202,105

METHOD FOR MAKING HEXAGONAL SILICON CARBIDE PLATELETS WITH THE ADDITION OF A GROWTH ADDITIVE

Wolfgang D. G. Boecker, Lewiston; Stephen Chwastiak, East Amherst; Tadeusz M. Korzekwa, Lewiston, and Sai-Kwing Lau, East Amherst, all of N.Y., assignors to Stemcor Corporation, Cleveland, Ohio

Continuation of Ser. No. 185,183, Apr. 22, 1988, Pat. No. 4,981,665, which is a division of Ser. No. 899,523, Aug. 22, 1986, Pat. No. 4,756,895. This application Jul. 5, 1990, Ser. No. 548,044

Int. Cl.[5] C01B *31/36*

U.S. Cl. 423—345 **3 Claims**

1. A method of forming separate platelets of alpha silicon carbide comprising heating fine beta silicon carbide powder in an inert gas, nitrogen gas, or vacuum to a temperature of at least about 2150° C. and not greater than 2400° C. in the presence of vapor phase boron, aluminum, or mixtures thereof for at least 15 minutes to effect conversion of substantially all of the beta silicon carbide powder into single crystal platelets of alpha silicon carbide.

5,202,106

PURIFICATION OF HYDROCHLORIC ACID WITH FERRIC CHLORIDE PRETREATED ACTIVATED CARBON

Noël Vanlautem, Jemeppe-sur-Sambre, Belgium, assignor to Solvay S.A., Brussels, Belgium

Division of Ser. No. 633,766, Dec. 26, 1990, Pat. No. 5,141,913. This application May 20, 1992, Ser. No. 886,334

Claims priority, application Belgium, Dec. 27, 1989, 8901407

Int. Cl.[5] G01B *7/07*; **B01D** *15/04*

U.S. Cl. 423—488 **4 Claims**

1. A process for the purification of a hydrochloric acid solutions, comprising treating a hydrochloric acid solution with pretreated activated carbon prepared by treating said activated carbon with an aqueous concentrated hydrochloric acid solution of ferric chloride salt, in which the concentration of acid in water is equal to or higher than about 10% by weight and the concentration of ferric chloride is at least equal to about 3 g/l.

5,202,107

PROCESS FOR IMPROVING THE SULPHUR YIELD OF A COMPLEX FOR THE PRODUCTION OF SULPHUR FOLLOWED BY A PURIFICATION UNIT

Georges Kvasnikoff, Pré Marca; André Philippe, Lotissement de la Trinité , and Robert Voirin, Lotissement des Cascades, all of France, assignors to Societe National Elf Aquitaine (Prod.), Courbevoie, France

Continuation of Ser. No. 460,966, Feb. 1, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 809,220

Claims priority, application France, Jun. 8, 1988, 88 07649

Int. Cl.[5] C01B *17/04*

U.S. Cl. 423—574 R **21 Claims**

1. A process for improving the sulphur yield of a complex for the production of sulphur from an acid gas containing H_2S, said complex comprising, (i) a sulphur plant into which said acid gas is introduced together with a controlled amount of a gas containing free oxygen and in which a controlled oxidation of the H_2S in the acid gas is carried out by means of the oxygen in the gas containing free oxygen in order to produce sulphur and which comprises at least one catalytic Claus zone, and at the outlet of which a residual gas is withdrawn which contains water vapour and, in an overall amount of between 0.2 and 4% by volume, sulphur compounds selected from the groups consisting of H_2S, SO_2 and at least one of the derivatives COS and CS_2, and, (ii) a purification unit, into which the residual gas is passed in which the compounds H_2S and SO_2 which it contains are reacted with one another to form sulphur, said reaction being carried out at a temperature below the dew point of the sulphur formed, and to give a purified residual gas at the outlet of said unit, said process comprising the steps of

a) contacting the residual gas issuing from the sulphur plant with a catalyst hydrolyzing the compounds COS and CS_2, said catalyst being situated in a hydrolyzing zone outside the sulphur plant and operating at a sufficient temperature to produce a hydrolyzed residual gas containing H_2S and SO_2 and substantially free from COS and CS_2,

b) bringing the hydrolyzed residual gas to the temperature required for it to pass into the purification unit and then directing said hydrolyzed residual gas to said purification unit as the residual gas to be introduced into this unit, and

c) maintaining the H_2S to SO_2 molar ratio in the hydrolyzed residual gas introduced into the purification unit at a value substantially equal to 2:1 by varying the ratio of the flow rates of acid gas and gas containing free oxygen which are introduced into the sulphur plant.

5,202,108

5,202,110

5,202,113

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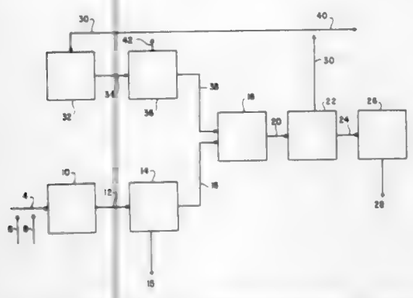
5,202,108
PROCESS FOR PRODUCING FERRATE EMPLOYING BETA-FERRIC OXIDE
J. Paul Deininger, Colorado Springs, Colo., assignor to Analytical Development Corporation, Colorado Springs, Colo.
Filed Oct. 12, 1990, Ser. No. 596,877
Int. Cl.[5] C01G *49/00*
U.S. Cl. 423—594 **33 Claims**



1. A method for making an alkali metal ferrate comprising:
(a) mixing $FeCl_3$, a carbonate salt, an oxidizing agent and a phosphate to form a first reaction mixture;
(b) subjecting said first reaction mixture to a sufficient temperature for a sufficient period of time to produce monohydrated beta-Fe_2O_3;
(c) recovering said monohydrated beta-Fe_2O_3 from said first reaction mixture;
(d) combining said monohydrated beta-Fe_2O_3 with a caustic chlorinated solution comprising a hypohalite and an alkali metal hydroxide to form a second reaction mixture;
(e) subjecting said second reaction mixture to a sufficient temperature for a sufficient period of time to bring about a reaction to produce alkali metal ferrate.

5,202,109
CONJUGATES FOR BONE IMAGING AND BONE CANCER THERAPY
Alan R. Fritzberg, Edmonds; Jean-Luc E. Vanderheyden, Seattle; Sudhakar Kasina, Kirkland, and Jeffrey N. Fitzner, Seattle, all of Wash., assignors to NeoRX Corporation, Seattle, Wash.
Division of Ser. No. 207,686, Jun. 16, 1988, Pat. No. 5,089,249, which is a continuation-in-part of Ser. No. 205,156, Jun. 10, 1988. This application Jan. 31, 1991, Ser. No. 643,578
Int. Cl.[5] A61K *49/02*
U.S. Cl. 424—1.1 **5 Claims**

1. A conjugate of a radiolabeled compound and a targeting agent that is capable of associating with calcified tissue, wherein said targeting agent is a phosphorus-containing compound which contains a C—O—P bond, a P—O—P bond, a C—C—P bond, a P—C—P bond, a P—N—P bond or combinations thereof, and wherein said radiolabled compound comprises the formula:

$$^{*}X—Ar—R$$

wherein
*X is a radioisotope of iodine, bromine, fluorine, or astatine;
Ar is aromatic or heteroaromatic ring;
R is a chemical bond or a substituent containing 1 to 12 straight-chain carbon atoms that does not activate Ar toward electrophilic substitution on the order produced by hydroxy or amino substitution of the ring, wherein said bond or said substituent has attached thereto a functional group suitable for conjugation.

5,202,110
FORMULATIONS FOR DELIVERY OF BECLOMETHASONE DIPROPRIONATE BY METERED DOSE INHALERS CONTAINING NO CHLOROFLUOROCARBON PROPELLANTS
Richard N. Dalby, and Peter R. Byron, both of Richmond, Va., assignors to Virginia Commonwealth University, Richmond, Va.
Filed Jan. 22, 1992, Ser. No. 824,030
Int. Cl.[5] A61L *9/04*
U.S. Cl. 424—45 **21 Claims**

1. An aerosol formulation for use in a metered dose inhaler, comprising:
a pharmaceutically acceptable inhalable propellant; and
a clathrate or molecular association of beclomethasone diproprionate employed as inhalable medicant dissolved or dispersed in said propellant, said clathrate or molecular association of beclomethasone diproprionate being formed with a compound selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,1-dichloro-1-fluoroethane, and dimethyl ether, said clathrate or molecular association being of a particle size which permits inhalation.

5,202,111
PHOSPHORYLATED POLYHYDROXY COMPOUNDS FOR TARTAR CONTROL
Suree M. Spaltro, Denville, N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed May 9, 1991, Ser. No. 697,835
Int. Cl.[5] A61K *7/16, 13/70*
U.S. Cl. 424—49 **12 Claims**

1. An antitartar oral composition comprising:
(i) an anticaries agent present in an effective amount to reduce caries; and
(ii) an antitartar agent present in an effective amount to inhibit tartar accumulation, said agent being formed by phosphorylation of a polyhydroxy starting compound of molecular weight no higher than 5000, the phosphorylated polyhydroxy compound having a molar substitution of at least 2 based on molecular weight of an average repeat unit in the starting polyhydroxy compound and possessing phosphate ester linkages satisfying at least one criteria selected from the group consisting of:
(a) at least one multi-substituted phosphate ester linked through an oxygen atom to a single carbon of the polyhydroxy compound; and
(b) at least two monophosphate groups separated by no more than three carbon atoms.

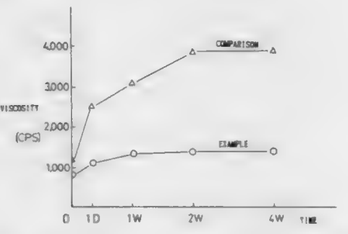
5,202,112
VISCOELASTIC DENTIFRICE COMPOSITION
Michael Prencipe, East Windsor, and Gary A. Durga, Edison, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Aug. 1, 1991, Ser. No. 738,766
Int. Cl.[5] A61K *7/16, 7/18*
U.S. Cl. 424—52 **21 Claims**

1. A linear viscoelastic dentifrice composition in the form of a toothpaste or dental gel with a pH of about 4 to about 9 comprising an orally acceptable water/humectant vehicle, an orally acceptable dental polishing agent and, in an amount effective to render the composition linearly viscoelastic, a synthetic linearly viscoelastic cross-linked polymeric thickening agent having in a 1 wt. % aqueous solution an elastic or storage modulus G' and a viscous or loss modulus G'' substantially independent of frequency in an applied frequency range of 0.1 to 100 radians/sec, a G' minimum value of 1,000 dynes/sq. cm which varies less than 1 order of magnitude of its original value, and a ratio of G''/G' ranging from more than 0.05 to less than 1.

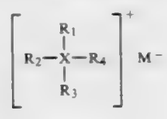
5,202,113
PLAQUE-INHIBITING PROTEIN FROM BACTEROIDES LOESCHEI AND METHODS FOR USING THE SAME
Jack London, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Apr. 30, 1990, Ser. No. 516,463
Int. Cl.[5] A61K *37/02, 7/16*
U.S. Cl. 424—54 **6 Claims**

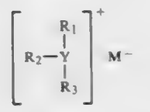
2. A method for inhibiting plaque formation in the oral cavity of a host which comprises administering to the host an effective amount of a purified, characterized surface protein from *Bacteroides loeschei* having a molecular mass of about 450 kD and an N-terminal amino acid sequence as follows:
ala-tyr-ser-his-val-lys-asn-ala-thr-gly-glu-asp-ileu-glu-arg-ileu-lys-glu-gly-asp-val-asp-asp-asp-ileu-glu-val-asn.

5,202,114
GEL COMPOSITION AND NAIL POLISH
Yoshiyuki Ogusu, Tokyo; Yoshikazu Soyama, Zami; Makoto Takahashi; Tooru Okamoto, both of Yokohama; Masaaki Ishiwatari, and Motokiyo Nakano, both of Sagamihara, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan
Filed Feb. 22, 1990, Ser. No. 526,108
Claims priority, application Japan, Jun. 24, 1988, 63-154622
Int. Cl.[5] A61K *7/04, 7/043*
U.S. Cl. 424—61 **8 Claims**

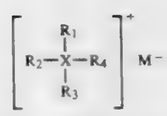


1. A gel composition comprising, as essential components, a cationic surfactant having PO chain and/or an EO chain represented by the following general formulas:


(1)


(2)

wherein X represents nitrogen or phosphorus, Y is sulfur, M^- is chlorine ion, bromine ion, iodine ion, nitrous acid ion, hydroxyl ion, acetic acid ion, methyl sulfate ion or a combination thereof, R_1 is a hydrocarbon group having 1 to 30 carbon atoms with or without a substituent, and at least one of R_2, R_3 and R_4 represents a hydrocarbon group having 1 to 30 carbon atoms and a PO chain and/or an EO chain with or without hydrogen or a substituent at the end of the hydrocarbon group and the remaining R_2, R_3 and R_4 groups being a hydrocarbon group having 1 to 30 carbon atoms with or without the same or different substituents;
an organic modified clay mineral, said mineral being modified by a quaternary ammonium salt cation surfactant represented by the following general formula



wherein R_1 represents an alkyl group having 10 to 22 carbon atoms or a benzyl group, R_2 is a methyl group or an alkyl group having 10 to 22 carbon atoms, each of R_3 and R_4 is an alkyl group having 1 to 3 carbon atoms or a hydroxyalkyl group and M is a halogen atom or a methyl sulfate residue;
and a solvent.

5,202,115
BASIC ALUMINUM ANTIPERSPIRANT ACTIVE MATERIAL HAVING ENHANCED ACTIVITY, ANTIPERSPIRANT ACTIVE COMPOSITION CONTAINING SUCH MATERIAL, AND METHODS FOR PREPARATION OF SUCH MATERIAL AND COMPOSITION
Paul J. Vincenti, Jefferson, and Morton L. Barr, Rockaway, both of N.J., assignors to The Mennen Company, Morristown, N.J.
Continuation-in-part of Ser. No. 233,008, Aug. 17, 1988, abandoned. This application May 2, 1990, Ser. No. 518,516
Int. Cl.[5] A61K *7/38, 7/34*
U.S. Cl. 424—66 **25 Claims**

1. An antiperspirant active composition comprising:
(1) a basic aluminum material, with enhanced antiperspirant activity, having the empirical formula:

$$Al_2(OH)_{6-a}X_a$$

where $0.5 \leqq a \leqq 5.0$ and X is an anion that is a univalent complex oxoanion of nitrogen or a halogen, which anion forms salts with Al^{3+} in aqueous solution so that these salts are substantially completely disocciated, which anion is readily soluble in water with metallic ions in the solutions, and which anion forms conjugate acids that are strong acids; wherein said basic aluminum material is characterized by:
(a) size exclusion high performance liquid chromatography peaks corresponding to peak 3 and peak 4 of size exclusion chromatograms formed by HPLC technique;
(b) a peak 4 relative area of at least 25%, a peak 3 relative area of less than 60%, the sum of the relative peak 3 and peak 4 areas being at least 50%;
(c) less than 10% chromatographic peaks eluting at shorter retention times than peak 3, corresponding to peaks 1 and 2; and
(2) an antiperspirant active material containing a metal cation selected from the group consisting of Zr, Hf, Ti and Sn.

5,202,116
METHODS FOR CONTROLLING HUMAN ENDOTHELIAL CELL PROLIFERATION AND EFFECTOR FUNCTIONS USING ONCOSTATIN M
Thomas J. Brown, Poulsbo, and Paul R. Gladstone, Seattle, both of Wash., assignors to Oncogen, Seattle, Wash.
Filed Apr. 10, 1989, Ser. No. 335,399
Int. Cl.[5] A61K *45/00*
U.S. Cl. 424—85.1 **10 Claims**

1. A method for inhibiting endothelial tissue immunogenicity comprising treating endothelial cells that are responsive to Oncostatin M with an effective amount of Oncostatin M so that the cytokine-stimulated expression of MHC antigens on those endothelial cells is suppressed.

5,202,117

5,202,119

permeation enhancing amount of an enhancer consisting essen-

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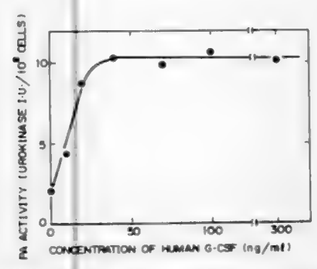
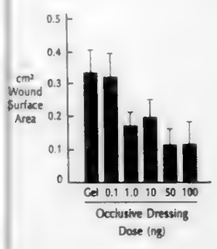
5,202,117
METHOD OF TREATING THROMBI WITH G-CSF
Koichiro Tsuji, 6598, Toyota, Suwa-shi, Nagano-ken, and Masayoshi Ono, 1369-7, Yamaguchi, Tokoroazawa-shi, Saitama-ken, both of Japan
Filed Aug. 22, 1989, Ser. No. 396,949
Claims priority, application Japan, Aug. 24, 1988, 63-210376
Int. Cl.[5] A61K *37/02*
U.S. Cl. 424—85.1 17 Claims



1. A method for the dissolution of thrombi in a mammal which comprises:
(a) providing a composition comprising purified human granulocyte colony stimulating factor (G-CSF) in a pharmaceutically-acceptable medium; and
(b) administering the composition to the mammal:wherein the G-CSF is present in the composition in an amount sufficient to increase the production of plasminogen activator activity in the blood so as to lyse fibrin and dissolve thrombi.

5,202,118
METHOD FOR PROMOTING WOUND HEALING USING IL-1
Steven Gillis, Mercer Island, and Cindy A. Jacobs, Seattle, both of Wash., assignors to Immunex Corporation, Seattle, Wash.
Continuation-in-part of Ser. No. 650,380, Feb. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 134,680, Dec. 18, 1987, abandoned. This application May 6, 1991, Ser. No. 695,860
Int. Cl.[5] A61K *37/02*
U.S. Cl. 424—85.2 8 Claims



1. A method for promoting wound healing in a mammal, comprising the step of contacting a wound site with interleukin-1 (IL-1) formulated in a physiologically acceptable hydrophilic vehicle in an amount effective to promote wound healing.

5,202,119
METHOD OF STIMULATING IMMUNE RESPONSE
Ross G. Clark, Pacifica, and Paula M. Jardieu, Berkeley, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.
Filed Jun. 28, 1991, Ser. No. 722,813
Int. Cl.[5] A61K *37/26, 39/00, 37/36*
U.S. Cl. 424—88 16 Claims

1. A method for stimulating a mammal's or avian's antibody-mediated immune system comprising administering to the mammal or avian an immune-stimulating effective amount of IGF-I.

5,202,120
METHODS OF REDUCING GLIAL SCAR FORMATION AND PROMOTING AXON AND BLOOD VESSEL GROWTH AND/OR REGENERATION THROUGH THE USE OF ACTIVATED IMMATURE ASTROCYTES
Jerry Silver, Lyndhurst; George M. Smith, Cleveland, and James W. Jacobberger, Chesterland, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio
Continuation-in-part of Ser. No. 96,373, Sep. 11, 1987, Pat. No. 4,900,553. This application Oct. 27, 1989, Ser. No. 428,147
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] A61K *35/12;* C12N *5/06*
U.S. Cl. 424—93 U 57 Claims

1. A method for promoting central nervous system axon regeneration comprising:
(a) providing activated immature astrocytes; and
(b) administering an effective amount of the activated immature astrocytes to damaged axons to promote axon regeneration.

5,202,121
THROMBOLYTIC COMPOSITIONS
Gunnar Pohl, Odalvägen, and Christer Mattsson, Rinkebyvägen, both of Sweden, assignors to Kabigen AB, Stockholm, Sweden
Filed Dec. 29, 1989, Ser. No. 459,210
Claims priority, application Sweden, Jan. 10, 1989, 8900067
Int. Cl.[5] A61K *37/54*
U.S. Cl. 424—94.64 16 Claims

1. A thrombolytically active composition comprising in combination a modified tissue-type plasminogen activator (modified t-PA) having an extended biological half-life and exhibiting a lag phase with respect to in vitro thrombolytic activity when compared with normal t-PA as a major component and a normal human t-PA, or streptokinase as a minor component in a pharmaceutically acceptable excipient.

5,202,122
PROCESS FOR ENHANCING THE HYPOCHOLESTEROLEMIC EFFECT OF EDIBLE PULP AND THE PRODUCT OBTAINED THEREBY
Frederic A. Graves, Ham Lake, and Ani Huang, Fridley, both of Minn., assignors to Humanetics Corporation, Chaska, Minn.
Continuation-in-part of Ser. No. 664,490, Mar. 4, 1991, abandoned, which is a continuation of Ser. No. 479,964, Feb. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,166, Oct. 30, 1989, abandoned, Continuation-in-part of Ser. No. 664,490, Mar. 4, 1991, abandoned, which is a continuation of Ser. No. 479,964, Feb. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,166, Oct. 30, 1989, abandoned. This application Apr. 9, 1991, Ser. No. 682,567
Int. Cl.[5] A61K *35/78;* C07H *23/00*
U.S. Cl. 424—195.1 4 Claims

1. A process for enhancing the hypocholesterolemic effect of edible pulp comprising the step of treating edible pulp with calcium chloride at a pH of less than about 7 so as to increase the concentration of calcium ions chemically coupled to the pulp.

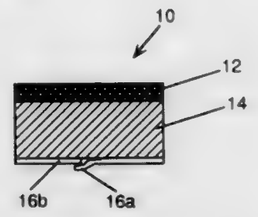
5,202,123
SURFACE MODIFIED ALUMINUM AND ALUMINUM-ZIRCONIUM SALTS
Dimitris E. Katsoulis, Midland, Mich., assignor to Somerville Technology Group, Inc., Huguenot, N.Y.
Division of Ser. No. 511,686, Apr. 20, 1990, Pat. No. 5,017,360. This application Jan. 22, 1991, Ser. No. 643,296
Int. Cl.[5] A61K *7/34, 7/38*
U.S. Cl. 424—401 9 Claims

1. A process for producing novel aluminum and aluminum-zirconium salts comprising
A) reacting
i) a metal salt selected from the group consisting of aluminum halohydrate and aluminum-zirconium halohydrate, with
ii) an organophilic salt compound selected from the group consisting of monovalent alkyl carboxylates, polyvalent alkyl carboxylates, acyl lactylates, alkyl ether carboxylates, N-acyl sarcosinates, N-acyl glutamates, fatty acid-peptide condensates, alkyl sulfates, ethoxylated alkyl sulfates, alpha olefin sulfonates, phosphated ethoxylated alcohols and mixtures thereof, in
iii) a liquid medium in which the metal salt and organophilic salt are both soluble; and
B) recovering the reaction product of A.

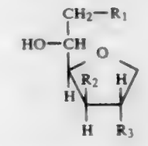
5,202,124
ATTRACTANTS FOR THE ROSE CHAFER, MACRODACTYLUS SUBSPINOSUS (F.), CONTAINING α-IONONE
Roger N. Williams, Wooster; Dan S. Fickle, Burbank, both of Ohio, and Terrence P. McGovern, deceased, Bowie, Md. by Mary Jo McGovern, sole heir , assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Dec. 13, 1990, Ser. No. 626,937
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—405 21 Claims

1. A composition for attracting insects comprising a mixture of (1) α-ionone, and (2) an organic acid component selected from the group consisting of valeric acid, hexanoic acid and mixtures thereof and wherein the concentration of α-ionone is between about 0.1 and 99.9%.

5,202,125
METHOD AND SYSTEMS FOR ADMINISTERING NITROGLYCERIN TRANSDERMALLY AT ENHANCED TRANSDERMAL FLUXES
Charles D. Ebert, Salt Lake City; Dinesh Patel, Murray, and Sonja Heiber, Salt Lake City, all of Utah, assignors to Thera-Tech, Inc., Salt Lake City, Utah
Filed Dec. 10, 1990, Ser. No. 625,906
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 13 Claims

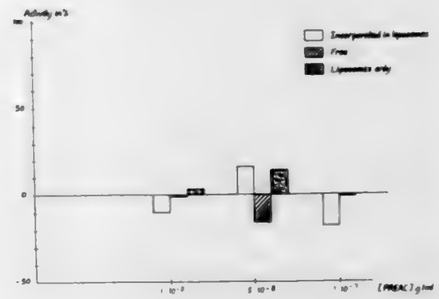


1. A method for providing nitroglycerin therapy to an individual in need of such therapy, wherein the method comprises administering transdermally through a predetermined area of skin a therapeutically effective amount of nitroglycerin and a permeation enhancing amount of an enhancer consisting essentially of
(a) a sorbitan ester having the structural formula



wherein R_1 has the formula —O(CO)R', R' is selected from the group consisting of saturated, mono-unsaturated, di-unsaturated, and tri-unsaturated aliphatic hydrocarbon substituents of 7 to 21 carbon atoms optionally containing 1 to 3 hydroxyl groups, and R_2 and R_3 are independently selected from the group consisting of hydroxyl and —O(CO)R'; and
(b) an alcohol R—OH, wherein R is a saturated, mono-unsaturated, di-unsaturated or tri-unsaturated aliphatic hydrocarbon substituent of 8–22 carbon atoms and may be either unsubstituted or substituted with 1–3 additional hydroxyl groups.

5,202,126
COMPOSITION CONTAINING PREGNENOLONE OR A PREGNENOLONE ESTER INCORPORATED IN LIPOSOMES, AND A METHOD FOR REGENERATING, OR REVITALIZING THE SKIN THEREWITH
Pierre Perrier, Orleans; Gérard Redziniak, Saint Cyr en Val, and Patrice Andre, Neuville Aux Bois, all of France, assignors to Parfums Christian Dior, Paris, France
Continuation of Ser. No. 477,811, Feb. 16, 1990, Published Application No.
Claims priority, application France, Aug. 20, 1987, 87 11773
Int. Cl.[5] A61K *31/47*
U.S. Cl. 424—450 13 Claims



1. A composition comprising liposomes containing pregnenolone or a pregnenolone ester in the lipidic phase in an amount of between about 0.05 and 20% by weight of the lipidic phase.

5,202,127

with the opening of the pouring funnel, and at least one

stamp design assembly, to create a design in a recently

to 4, sufficient to enable initiation of release of the active

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5,202,127

MOTH-PROOFING METHOD USING TRIOXANE AS SOLE ACTIVE

Mutsuhiko Takeda, Tokyo; Minoru Kakuda, Matsudo, and Masafumi Shimpo, Kashiwa, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

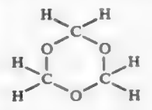
Continuation of Ser. No. 468,945, Jan. 23, 1990, abandoned, which is a continuation of Ser. No. 116,150, Nov. 3, 1987, abandoned. This application Dec. 30, 1991, Ser. No. 816,544

Claims priority, application Japan, Nov. 4, 1986, 61-260770; Apr. 28, 1987, 62-103226; Aug. 18, 1987, 62-203477

Int. Cl.[5] A01N *43/32*

U.S. Cl. 514—452 **9 Claims**

1. A moth-proofing method which comprises applying a moth-proofing effective amount of tableted or granulated 1,3,5-trioxane having the following structural formula:



as the sole active moth-proofing agent to an area from which moths are to be excluded, said 1,3,5-trioxane containing no more than about 20 ppm of formic acid and no more than about 50 ppm of formaldehyde.

5,202,128

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION

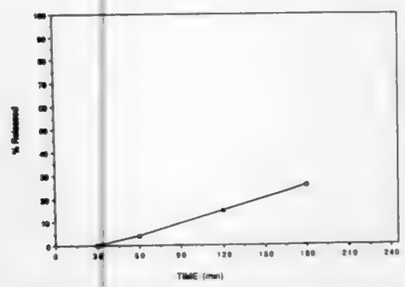
Angelo M. Morella, Campbelltown, and Mark C. Fisher, Birkenhead, both of Australia, assignors to F. H. Faulding & Co. Limited, Salisbury South, Australia

Continuation-in-part of Ser. No. 461,370, Jan. 5, 1990, abandoned. This application Aug. 24, 1990, Ser. No. 574,551

Claims priority, application Australia, Jan. 6, 1989, PJ2192

Int. Cl.[5] A61K *9/24, 9/58*

U.S. Cl. 424—469 **26 Claims**



1. A pH-dependent sustained release pharmaceutical pellet composition for administration to a patient at a predetermined dosage and interval which comprises: a core element containing a therapeutically effective amount of at least one active ingredient having an aqueous solubility of at least 1 in 30 and a coating on said core element which comprises the following components:

(a) at least 35% by weight of a matrix polymer which is insoluble at a pH of from 1 to 7.5 and contributes to the control of the rate of release of the active ingredient in the stomach and intestines;

(b) from 1 to 30% of an enteric polymer which is substantially insoluble at a pH of from 1 to 4, sufficient to delay the release of the active ingredient in the stomach, but which is soluble at a pH of from 6 to 7.5 so as not to substantially delay release in the intestines;

(c) from 1 to 60% of a compound soluble at a pH of from 1 to 4, sufficient to enable initiation of release of the active ingredient in the stomach;

said percentages being by weight based on the total weight of components (a), (b), and (c); the ratio of the components (a), (b), and (c) in said coating being effective to allow the initiation of the release of the active ingredient in the stomach at a slow rate and to control the release in the intestines at a rate faster than that in the stomach such that a dose of the pellet composition delivers to the patient a therapeutically effective amount of said active ingredient over the course of said predetermined interval.

5,202,129

PROCESS FOR MICRONIZING SLIGHTLY-SOLUBLE DRUG

Masayoshi Samejima, Mino; Kazuo Noda, Takarazuka; Masao Kobayashi, Kyoto, and Takashi Osawa, Toyonaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Aug. 3, 1990, Ser. No. 563,091

Claims priority, application Japan, Aug. 4, 1989, 1-204132

Int. Cl.[5] A61K *9/14, 9/16*

U.S. Cl. 424—489 **7 Claims**

1. A process for micronizing a slightly-soluble drug comprising subjecting a mixture of said drug and a sugar or sugar alcohol, the weight ratio of said sugar or sugar alcohol being at least 2.5 or more parts by weight to one part by weight of the drug, to high-speed stirring comminution or impact comminution to give a micronized drug having an average diameter of less than 1 μm.

5,202,130

SUPPRESSION OF ECZEMATOUS DERMATITIS BY CALCIUM TRANSPORT INHIBITION

Anhalt Grant, Towson, Md., and Diezel Wolfgang, Berlin, Fed. Rep. of Germany, assignors to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 31, 1989, Ser. No. 400,657

Int. Cl.[5] A61K *33/24, 31/28*

U.S. Cl. 424—617 **27 Claims**

1. A method for the treatment of cutaneous delayed-type hypersensitivity (DTH) in an animal comprising administering to said animal a therapeutically effective amount of a calcium flux inhibiting compound selected from the group consisting of lanthanide ions which are calcium analogs and organic calcium channel blockers.

12. A method for the treatment of atopic eczema comprising topically applying a calcium flux inhibitor selected from the group consisting of lanthanide ions which are calcium analogs and organic calcium channel blockers to an animal having atopic eczema in an amount sufficient to reduce the inflammation caused by atopic eczema.

5,202,131

APPARATUS FOR MAKING METAL POWDER, WITH A SUPPLY TANK, A POURING LADLE AND A FALL SHAFT

Leo Emiljanow, Maintal; Franz Höhne, Bruchköbel, and Wolfgang Schwarz, Geislitz, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany

Filed Dec. 20, 1991, Ser. No. 812,587

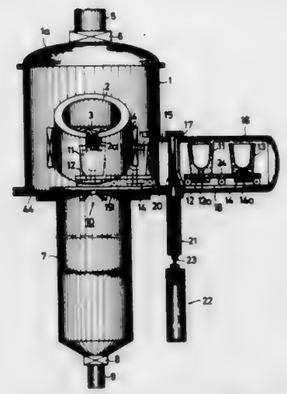
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1991, 4129991

Int. Cl.[5] B22F *9/06*; C22B *11/00*

U.S. Cl. 425—7 **7 Claims**

1. Apparatus for making metal powder comprising:

a supply tank for keeping molten starting material hot and for controlled dispersing thereof, an exchangeable pouring funnel with an outlet opening for the temporary gathering of melt and the production of a pouring stream of a precisely defined cross section and length, an atomizing nozzle having an annular slit and disposed concentrically with the opening of the pouring funnel, and at least one substantially perpendicular fall shaft disposed under the atomizing nozzle for the solidification and collection of metal powder, and a chamber enveloping the supply tank and the pouring funnel and disposed on the fall shaft and separatable hermetically from the fall shaft, the chamber having in the area of the pouring funnel a closable lateral opening, a clock chamber place thereat for the introduction of the at least one pouring funnel, the chamber and the lock chamber having tracks aligning the chamber and the lock chamber with one another and interrupted only by a first closing device, a car disposed on said tracks and



which selectively enters the chamber and withdraws completely into the lock chamber and on whose bottom a number of atomizing nozzles corresponding to the number of pouring funnels is fastened, an adjoining outlet spout which is inserted concentrically into the atomizing nozzle, and on the car the pouring funnels being placed such that an outlet opening communicates with the adjoining outlet spout, the fall shaft being provided with a coupling system which, after the positioning of the group of components comprising pouring funnel and atomizing nozzle over the fall shaft, produces a thoroughly gas-tight connection between fall shaft and atomizing nozzle.

5,202,132

PRODUCTION LINE EQUIPMENT TO MANUFACTURE LARGE CONCRETE PANELS

Douglas W. Myers, Redmond, Wash., and R. Gary Fjelland, Salem, Oreg., assignors to Concrete Products Incorporated, Redmond, Wash.

Filed Sep. 30, 1991, Ser. No. 770,086

Int. Cl.[5] B28B *1/08, 7/06, 7/36, 7/42*

U.S. Cl. 425—62 **54 Claims**

1. Production line equipment to produce large concrete panels having designs formed in the surfaces thereof, comprising:

a. an overall form assembly to receive poured concrete creating a large concrete panel;

b. a main frame positioned over the overall form assembly;

c. a rocker frame movably suspended from the main frame;

d. a stamp design assembly secured to the rocker frame; and

e. actuators connected between the main frame and the rocker frame to move the rocker frame, carrying the stamp design assembly, to create a design in a recently poured large concrete panel.

5,202,133

APPARATUS FOR SPREADING A PARTICLE MASS

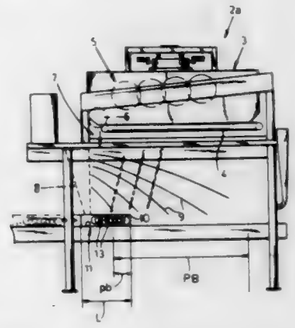
Jürgen Pesch, Krefeld-Traar, and Friedrich Böttger, Haan, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 727,621

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021939

Int. Cl.[5] B29C *39/14*; B28B *5/02*

U.S. Cl. 425—83.1 **9 Claims**



1. A spreader for depositing at least one layer of a particle and glue containing mass of a flowable material upon a conveyor belt as a ray material in the forming of a mat to be pressed into pressed board, said mass containing fine particles for forming a face layer of said pressed board, said spreader comprising:

a bunker containing said mass and provided with a discharge conveyor receiving said mass from said bunker and discharging said mass in a downward raw-material discharge;

an air classifier below said bunker directing at least one flow of air transverse to said raw-material discharge and in a direction opposite to a direction of travel of said conveyor belt to generate from said mass a multiplicity of discharge parabolas along which said particles of said mass travel downwardly toward said conveyor belt as a function of particle mass, the particle mass of the discharge parabolas being greater closer to a direct-fall path of said raw-material discharge for heavier particles and further from said direct-fall path for said fine particles;

a ball-catching device traversable by particles of said raw-material discharge and elongated in a direction of travel of said conveyor belt, said ball-catching device extending from said direct-fall path to a region below said discharge parabolas and terminating short of an end of said region remote from said direct-fall path for catching balls of agglomerated glue contained in said raw-material discharge while permitting passage of the particles of said discharge parabolas of said region below which said device is located, at least said fine particles at said end of said region depositing directly upon said conveyor belt without traversing said device; and

means at a discharge side of said device for carrying off balls caught on said device.

5,202,134

generally horizontal support means at said trimming sta-

5,202,137

lected from the group consisting of coconut oil, corn

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5,202,134

OSCILLATING DEVICE FOR A CONTINUOUS CASTING MOLD

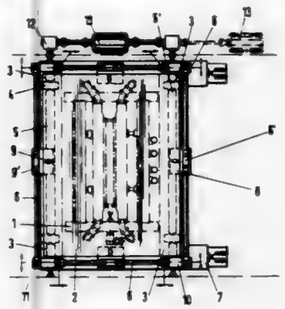
Gerd Moellers, Oberhausen; Dieter Kothe, Moers, and Dietmar Lohse, Wesel, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 4, 1990, Ser. No. 592,850

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1989, 3933526

Int. Cl.[5] **B22D** *11/04*

U.S. Cl. 425—425 **4 Claims**



1. An oscillating device for a continuous-casting mold, comprising:

a generally rectangular base frame;

two eccentric shafts arranged in parallel on the base frame and arranged to be driven in rotation;

each of said two eccentric shafts being connected to a respective pair of eccentrics that are arranged on corners of the base frame and by which oscillation can be imparted to the mold;

a support plate having a centrally arranged opening in which the mold is fastened;

a respective wear plate positioned at each corner of the support plate below the support plate, each wear plate resting on a respective eccentric outer ring that, in turn, is mounted for rotation on one of the pair of eccentrics that is driven in rotation; and

spring bars arranged parallel to edges of the support plate and having connections at corner points to the base frame and, between the corner points, to the support plate, wherein each of the connections between the spring bars and the base frame comprises a support pedestal attached to the base frame and a fastening element which, in operating condition, is connected in force-locked manner to the support pedestal and the spring bar, such that said spring bars substantially transfer the weight of the mold and support plate to the base frame.

5,202,135

BOTTLE FLASH TRIMMING APPARATUS

John E. Yawn, Memphis, Tenn., assignor to Ring Can Corporation, Oakland, Tex.

Filed Apr. 9, 1991, Ser. No. 682,231

Int. Cl.[5] **B29C** *49/72*

U.S. Cl. 425—527 **20 Claims**

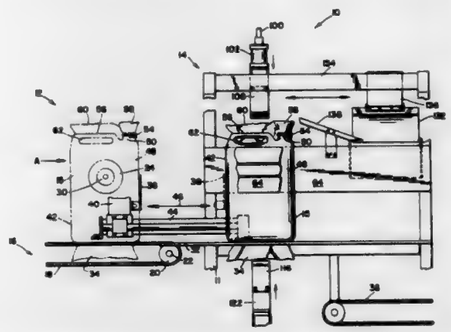
1. Trimming apparatus for trimming flash from a blown plastic bottle, said apparatus comprising:

a. a frame;

b. a conveyor supported by the frame for conveying, from a blowing station to a trimming station, blow molded plastic bottles including a handle, a top with a bottle neck opening, and a bottom, the bottles having molding flash to be removed from a hand-receiving opening defined by the handle, from the bottle top, and from the bottle bottom; generally horizontal support means at said trimming station for engaging the bottle and supporting the bottle in the upright position with the bottle neck opening facing upwardly;

c. a punch supported by the frame for punching plastic flash from the hand-receiving opening, the punch including a stop bar for engagement with one side of the bottle handle to restrain the bottle from lateral movement during a punching operation to remove the hand-receiving-opening flash;

d. bottom flash removal apparatus supported by the frame for removing the bottom flash from the bottle, the bottom flash removing apparatus including a bottom flash gripper movable in a vertical direction toward and away from the bottle for gripping and pulling the bottom flash from the



bottle while the bottle is held in its upright position at the trimming station;

e. top flash removal apparatus supported by the frame for removing top flash from the bottle, the top flash removal apparatus including a top flash gripper movable in a vertical direction toward and away from the bottle for gripping and pulling top flash from the bottle while the bottle is held in its upright position at the trimming station;

f. a flash removal conveyor positioned below the trimming apparatus for carrying away bottle flash is received by the flash removal conveyor; and

g. a top flash collector pan movable between a retracted position in which the top flash collector allows plastic to drop onto the flash removal conveyor and an extended position at which the top flash collector pan is positioned to allow top flash to be received.

5,202,136

ANIMAL FEED RATION

David S. Evans; Frederick H. Wellons, and Michael G. Reiser, all of Greensboro, N.C., assignors to CBP Resources, Inc., Greensboro, N.C.

Filed Oct. 9, 1991, Ser. No. 773,509

Int. Cl.[5] **A23K** *1/00*

U.S. Cl. 426—2 **10 Claims**

1. A process for enhancing the growth performance of edible meat-producing animals selected from the group consisting of swine, poultry, and beef cattle, consisting essentially of feeding to said animals, along with conventional feed ingredients, no more than 10% by weight of waxy granules of a highly saturated fat having at least 10 carbon atoms selected from the group consisting of monoglycerides, diglycerides, triglycerides, free fatty acids, and esterified fatty acids, said highly saturated fat having an iodine value in the range of 5 to 35, a particle size diameter of approximately 1,000 microns and being fed to said animals during at least a portion of the growing-finishing cycle, said process eliminating pale, soft and exudative meat and improving carcass firmness and meat quality.

5,202,137

METHOD OF INHIBITING FAT AND OIL MIGRATION FROM AN OILY SUBSTRATE OF A FOOD PRODUCT INTO A COATING LAYER OF A FOOD PRODUCT

Brian F. Duffy, North Wales; Susan M. Grillo, Quakertown, and Angela B. Tarpey, Lansdale, all of Pa., assignors to Berwind Pharmaceutical Services, Inc., West Point, Pa.

Filed Jun. 29, 1990, Ser. No. 546,582

Int. Cl.[5] **A23P** *1/08*

U.S. Cl. 426—89 **57 Claims**

1. A method of inhibiting fat and oil migration from a food product substrate having an oily component or an oily surface into a coating layer covering the food product substrate, comprising the steps of

mixing a shellac solution and an alcohol together to form a barrier coating solution, the shellac solution being in a range of 30% to 70% by weight of the barrier coating solution, the alcohol being in a range of 30% to 70% by weight of the barrier coating solution,

forming a barrier coating layer of film surrounding the oily food product substrate by coating the oily food product substrate with an effective amount of the barrier coating solution,

covering the barrier coating layer of film with a coating layer, and

inhibiting fat and oil migration from the food product substrate into the coating layer with the barrier coating layer of film.

5,202,138

STABLE PIZZA FOOD ARTICLE, PROCESS FOR PREPARING SAME AND COATING COMPOSITION USED IN SAME

Richard J. Stypula, Colts Neck, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,157

Int. Cl.[5] **A23L** *1/0522, 1/0524, 1/0526;* **A23P** *1/08*

U.S. Cl. 426—94 **19 Claims**

1. A pizza food article consisting essentially of:

(a) a pizza dough lamina having a first pizza dough lamina surface and a second pizza dough lamina surface;

(b) a substantially continuous tomato sauce composition lamina having a substantially horizontal planar upper tomato sauce composition lamina surface and a substantially horizontal planar lower tomato sauce composition lamina surface; and

(c) a cheese composition lamina having a substantially planar cheese composition lamina upper surface and a substantially planar cheese composition lamina lower surface; and, optionally,

(d) a condiment coating having a lower condiment surface and an upper condiment surface;

and coated on at least one of the surfaces of the pizza dough lamina, the tomato sauce composition lamina surfaces, the cheese composition lamina surfaces and/or the condiment composition surfaces, a coating comprising either:

I.

(i) from 5 up to 20% whey protein concentrate;

(ii) from 30 up to 60% water;

(iii) from 0.4 up to 3% of methyl cellulose;

(iv) from 20 up to 50% of an unsaturated edible oil selected from the group consisting of coconut oil, corn oil, olive oil and lard;

(v) from 0.2% up to 1% of an emulsifier; and

(vi) optionally, from 1 up to 8% of a starch;

or

II.

(i) from 40 up to 75% of a starch;

(ii) from 5 up to 20% of methyl cellulose;

(iii) from 0.05 up to 0.5% by weight of xanthan gum;

(iv) from 8% up to 20% by weight of a salt composition; and

(v) from 9 up to 20% by weight of a sugar

said pizza article having the properties subsequent to reheating of:

(x) high shelf stability;

(y) original flavor nuance retention; and

(z) original mouthfeel retention.

5,202,139

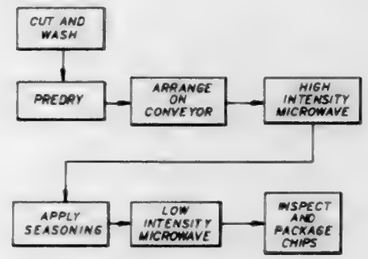
PROCESS FOR PREPARING FAT FREE SNACK CHIPS

David Gaon, San Jose, Calif., and John Wiedersatz, Jeffersonville, Ind., assignors to TGTBT, Ltd., Santa Barbara, Calif.

Continuation-in-part of Ser. No. 712,196, Jun. 7, 1991, Pat. No. 5,180,601. This application Jan. 31, 1992, Ser. No. 828,406

Int. Cl.[5] **A23L** *1/00;* **H05B** *6/00*

U.S. Cl. 426—242 **39 Claims**



1. A process for making low fat chips from uncooked product slices, comprising the steps of:

removing surface moisture from the product slices;

exposing the product slices to a microwave field having a sufficiently high intensity to reduce the water content by weight of the slice by at least half and to puff the slices within an interval of about three minutes; and

subsequently drying the product slices to form a chip.

5,202,140

STABILIZING COLOR IN KIWI FRUIT AND PRODUCT

Conrad O. Perera, and Jennifer A. Venning, both of Auckland, New Zealand, assignors to Her Majesty The Queen in Right of New Zealand of Department of Scientific and Industrial Research, Division of Horticulture and Processing, Auckland, New Zealand

Continuation of Ser. No. 326,339, Mar. 21, 1989, abandoned. This application Jun. 30, 1992, Ser. No. 908,552

Claims priority, application New Zealand, Mar. 22, 1988, 223971

Int. Cl.[5] **A23L** *3/42*

U.S. Cl. 426—268 **19 Claims**

1. A method of stabilizing color in acidic kiwifruit, during drying of said fruit by preventing degradation of chlorophyll in said fruit, comprising:

infusing said fruit in an infusion solution comprising a low molecular weight carbohydrate;

incorporating a citrate buffering salt in said infusion solution to buffer the acidity at substantially pH 4.5 for stabilizing chlorophyll pigments in said fruit; and

drying the infused fruit at a temperature between about 40°

C. and about 50° C. to produce a moisture content in said

sufficient to obtain clouding of the juice and a stabilizing agent

mediate mixture is from 6.3 to 6.5 and sufficient to form a

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METHOD FOR MAKING A MAGNETIC RECORDING

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C. and about 50° C. to produce a moisture content in said fruit of between about 2% and about 4% by weight.

5,202,141

COMPOSITIONS AND METHODS FOR INHIBITING BROWNING IN FOODS AND BEVERAGES

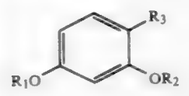
Arthur J. McEvily, 56 Nonesuch Rd., Weston, Mass. 02193; Radha Iyengar, 43 Flett Rd., Belmont, Mass. 02178, and Akiva Gross, 78 Vine St., Newton, Mass. 02167

Continuation-in-part of Ser. No. 537,361, Jun. 13, 1990, Pat. No. 5,059,438, which is a continuation-in-part of Ser. No. 475,150, Feb. 5, 1990, abandoned. This application Jun. 10, 1991, Ser. No. 712,794

Int. Cl.[5] A23B *7/00*

U.S. Cl. 426—268 **37 Claims**

1. A method for inhibiting enzymatic browning of foods or beverages susceptible to such browning, comprising applying to the foods or beverages a composition comprising at least one substituted resorcinol derivative and at least one additive selected from the group consisting of a reducing agent, a chelating agent, an acidulant, an inorganic salt and combinations thereof, the amount of additive and resorcinol derivative being sufficient to inhibit browning of the foods, wherein the resorcinol derivative has the following formula:



wherein R_1 and R_2 are independently selected from the group consisting of H, CH_3, COR', CR', $PO_3R'R''$ and $SO_3R'R''$ wherein R' and R'' are independently H or an alkyl group having from 1 to 6 carbon atoms in a linear, branched or cyclic configuration or a substituted aromatic compound; and wherein R_3 is selected so that the resorcinol derivative inhibits enzymatic browning.

5,202,142

PROCESS FOR THE PRODUCTION OF CLOUDY JUICE WHICH IS CLOUDING-STABLE

Walter Gresch, Niederweningen, Switzerland, assignor to Bucher- Guyer AG, Niederweningen, Switzerland

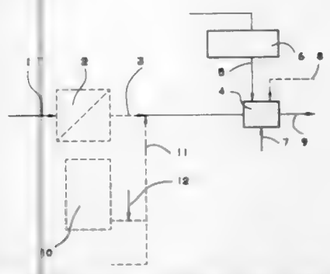
PCT No. PCT/CH91/00087, § 371 Date Feb. 13, 1992, § 102(e) Date Feb. 13, 1992, PCT Pub. No. WO91/15968, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 15, 1991, Ser. No. 778,946

Claims priority, application Switzerland, Apr. 17, 1990, 292/90

Int. Cl.[5] A23L *2/06*

U.S. Cl. 426—330.3 **24 Claims**



1. A process for production of cloudy juice which is clouding-stable from plant products comprising the steps of subjecting a raw juice extracted from plant products to a crossflow filtration to obtain a resultant juice and a retentate having a filter residue therein, crushing the filter residue, and mixing with the resultant juice the crushed filter residue in an amount sufficient to obtain clouding of the juice and a stabilizing agent to obtain a clouding-stable juice.

5,202,143

REMOVAL OF FREE WATER FOR PACKAGING COOKED MEAT

Svein A. Berg, Angelholm, and Jonas P. Halden, Helsingborg, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 855,123, Mar. 18, 1992, Pat. No. 5,186,966, which is a continuation of Ser. No. 642,413, Jan. 17, 1991, abandoned. This application Oct. 22, 1992, Ser. No. 964,748

Claims priority, application European Pat. Off., Jan. 24, 1990, 90101389.6

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

Int. Cl.[5] A23L *1/31*

U.S. Cl. 426—402 **9 Claims**

1. A process for preparing a meat product comprising cooking meat to obtain a cooked meat, contacting the cooked meat with a water-absorbing material for a time period sufficient to remove free, unbound water from the cooked meat, removing the water-absorbing material from the cooked meat and then packaging the cooked meat from which free, unbound water and the water-absorbing material have been removed.

5,202,144

POULTRY-DERIVED GROUND MEAT SUBSTITUTE AND ITS METHOD OF MANUFACTURE

Leonard Yaiko, Midlothian, Ill., assignor to Griffith Laboratories Worldwide, Inc., Alsip, Ill.

Filed Aug. 9, 1991, Ser. No. 743,119

Int. Cl.[5] A23J *1/00*

U.S. Cl. 426—574 **10 Claims**

1. A process for preparing a poultry-derived proteinaceous material suitable as a ground meat substitute, comprising:

a) extracting salt-soluble proteinaceous material from poultry;

b) subjecting the extracted proteinaceous material to dry heat until gelled into a solid mass; and

c) grinding the solid mass.

5,202,145

METHOD OF MAKING A SHELF-STABLE MILK-CONTAINING BEVERAGE PRODUCT

John R. Wisler, New Hope, Pa.; Pilar Cobos, Hackensack, N.J., and Raymond J. Laudano, New Fairfield, Conn., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Jun. 5, 1991, Ser. No. 710,614

Int. Cl.[5] A23C *9/156*

U.S. Cl. 426—580 **14 Claims**

1. A method for making a self-stable beverage product comprising the steps of:

(a) providing a homogenized milk mixture comprising water, milk solids and a two component stabilizer system comprising a first component comprising at least one monoglyceride and up to 10% by weight of diglycerides based on the weight of the first component, and a second component comprising carrageenin or pectin or both;

(b) providing a buffered aqueous flavoring solution containing an acidic flavoring agent and a buffering system comprising disodium phosphate and potassium bicarbonate in amounts such that the pH of the aqueous flavoring solution is from 6.8 to 7.2;

(c) mixing said homogenized milk mixture and said aqueous flavoring solution to form an intermediate liquid mixture having a pH of from 6.8 to 7.2; and

(d) heating said intermediate liquid mixture at a temperature and for a time sufficient to thermally decompose substantially all of said potassium bicarbonate to potassium hydroxide and carbon dioxide such that the pH of the intermediate mixture is from 6.3 to 6.5 and sufficient to form a shelf stable beverage product, said shelf stable beverage product having milk solids, the milk fat content of said milk solids being at least about 15% and the milk protein content of said milk solids being at least about 25% by weight based on the total weight of milk solids, the milk solids content of the beverage product being at least about 1% by weight of the beverage product.

5,202,146

FLAVOR DELIVERY SYSTEM FOR FAT FREE FOODS

Norman S. Singer, Highland Park; Suseelan Pookote; Leora C. Hatchwell, both of Buffalo Grove; Gale Anderson, Round Lake Beach; Arlette G. Shazer, Hoffman Estates, and Barbara J. Booth, Hinsdale, all of Ill., assignors to The Nutrasweet Company, Deerfield, Ill.

Continuation of Ser. No. 371,761, Jun. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 216,681, Jul. 7, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 544,044

Int. Cl.[5] A23G *9/00*

U.S. Cl. 426—613 **5 Claims**

1. A method for the delivery of fat soluble flavor compounds into nonfat and low-fat food products selected from the group consisting of analogs of non-vanilla frozen dessert products in which fat components have been replaced by non-lipid fat substitutes comprising the step of introducing into said food products less than 1% by weight of fat globules comprising elevated levels of fat soluble flavor compounds partitioned therein.

5,202,147

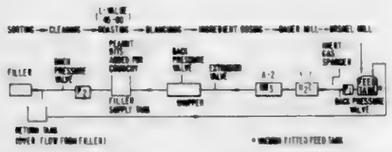
PEANUT BUTTER AND A METHOD FOR ITS PRODUCTION

Alexander Traska, Ellicott City, and Frank A. DiSciullo, Baltimore, both of Md., assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Mar. 16, 1990, Ser. No. 495,251

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—633 **28 Claims**



1. A method of aerating a peanut butter, comprising a) subjecting at a temperature of from about 140° to about 170° F. a molten mass of peanut butter to pressures of from about 200 to about 500 psi, b) rapidly deep chilling the mass to a temperature within the range from about 35° to about 50° F., c) after the 200 to 500 psi pressure has been imposed but prior to culmination of the deep chilling step, injecting inert gas into the molten mass, and d) passing the chilled mass through a narrow orifice from one side to a second side to create a pressure drop, the first side of said orifice having the pressure of 200 to 500 psi and the second side of said orifice having a pressure of from 0 to 80 psi.

5,202,148

Patent Not Issued For This Number

5,202,149

METHOD FOR MAKING A MAGNETIC RECORDING MEDIUM

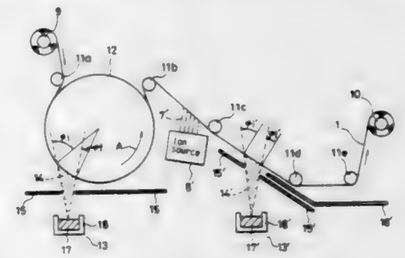
Tatsuaki Ishida, Sakai; Ryuji Sugita; Kiyokazu Tohma, both of Hirakata; Kazuyoshi Honda, Takatsuki; Yasuhiro Kawawake, Suita, and Yoshiki Goto, Kitakatsuragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 735,030, Jul. 24, 1991, abandoned. This application Jun. 2, 1992, Ser. No. 892,478

Claims priority, application Japan, Jul. 25, 1990, 2-197325

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—534 **6 Claims**



1. In a method for making a cobalt-based magnetic recording medium by continuous vacuum evaporation wherein at least two magnetic layers are formed on a substrate,

the improvement comprising

before forming on a previous magnetic layer a subsequent magnetic layer, irradiating accelerated ions onto a surface of said previous magnetic layer for etching an oxidized layer and/or for removing adhering impurities on the surface of said previous magnetic layer by ion etching action.

5,202,150

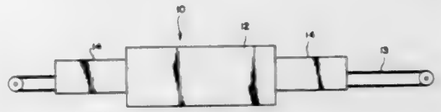
MICROWAVE IMPREGNATION OF POROUS MATERIALS WITH THERMAL ENERGY STORAGE MATERIALS

David K. Benson, Golden, and Richard W. Burrows, Conifer, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 668,522, Mar. 13, 1991. This application Apr. 27, 1992, Ser. No. 874,141

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—595 **27 Claims**



1. A method for impregnating a porous, non-metallic solid material with a phase-change material, the method comprising the steps of:

(a) providing a phase-change material having a melting point above room temperature; wherein said phase-change material absorbs microwave energy to an extent sufficient to cause melting thereof;

(b) applying said phase-change material to the surface of said porous material; and

(c) exposing said phase-change material to microwave energy in a manner such that said phase-change material melts and is absorbed into said porous material.

5,202,151

5,202,153

cover selected portions of the electrode films together

5,202,156

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5,202,151

ELECTROLESS GOLD PLATING SOLUTION, METHOD OF PLATING WITH GOLD BY USING THE SAME, AND ELECTRONIC DEVICE PLATED WITH GOLD BY USING THE SAME

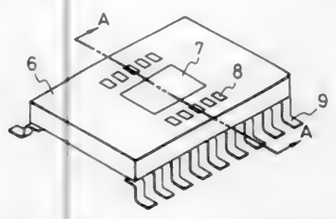
Jiro Ushio, Yokohama; Osamu Miyazawa, Yokosuka; Akira Tomizawa, Yokohama; Hitoshi Yokono, Ibaraki; Naoya Kanda; Naoko Matsuura, both of Yokohama; Setsuo Ando, Kawasaki, and Hiroaki Okudaira, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 184,061, Apr. 20, 1988, Pat. No. 4,963,974, which is a continuation-in-part of Ser. No. 143,959, Jan. 14, 1988, Pat. No. 4,880,464, which is a continuation of Ser. No. 918,498, Oct. 14, 1986, abandoned. This application Jun. 4, 1990, Ser. No. 532,656

Claims priority, application Japan, Oct. 14, 1985, 60-226738; Apr. 18, 1986, 61-88269

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—98 14 Claims



1. A method of plating with gold comprising the steps of:

immersing a substrate in an electroless gold plating solution comprising monovalent gold ions, said monovalent gold ions being supplied by reaction between a tetrahalogenoaurate (III) and a thiosulfate, a reducing agent, and a complexing agent which has a greater bond energy to a monovalent gold ion than a hydroxide ion has, said substrate having predetermined portions on which the gold is to be deposited; and

depositing gold on said predetermined portions of the substrate while said substrate is immersed in said electroless gold plating solution so as to form a gold layer on the predetermined portions of the substrate by electroless deposition, with substantially no deposition of gold on other portions of the substrate.

5,202,152

SYNTHESIS OF TITANIUM NITRIDE FILMS

Emmanuel P. Giannelis; Joseph L. Keddie, and Y. Y. Shacham-Diamond, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 25, 1991, Ser. No. 782,401

Int. Cl.[5] B05D *5/12, 3/12, 3/02*

U.S. Cl. 427—108 33 Claims

1. A method of producing a substantially stoichiometric film of titanium nitride on the surface of a substrate, in which the film is particularly suitable for diffusion barriers and planarization and interconnect materials in electronic devices, the method comprising:

applying a solution containing hydrolyzed and condensed titanium alkoxide to the surface of a substrate at a substantially ambient temperature to provide a titanium containing gel-film on the surface of the substrate; and

heating the substrate in an ammonia atmosphere to a temperature of at least about 700° C., and at a rate of temperature change of at least about 50° C. per minute for a time sufficient to form a substantially stoichimetric film of titanium nitride.

5,202,153

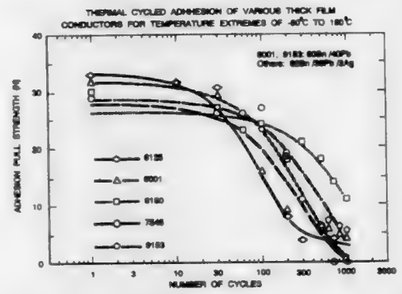
METHOD FOR MAKING THICK FILM/SOLDER JOINTS

Vincent P. Siuta, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 23, 1991, Ser. No. 749,161

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—125 10 Claims



1. A method for making thick film/solder joints having a preselected area comprising the sequential steps of

(1) applying to an electrically-non-conductive substrate a patterned layer having a preselected solder pad area of a first thick film conductive composition comprising finely divided particles of (a) 85.0–98.5% wt. of a pure unalloyed ductile conductive metal or low alloy thereof having a particle size of 0.5–5 microns, (b) 1–10% wt. inorganic binder; and (c) 0.5 to 5.0% wt. spinel-forming metal oxide, all of (a), (b) and (c) being dispersed in organic medium;

(2) firing the first thick film conductive composition layer to effect volatilization of the organic medium therefrom and liquid phase sintering of the inorganic binder;

(3) applying over only the solder pad area of the fired first thick film conductive layer a layer of second thick film conductor composition comprising (a) 94.0–99.3% wt. pure unalloyed conductive metal or low alloy of a metal selected from Au, Ag, and Cu having a particle size of 0.5–10 microns, (b) 0.2–1.0% wt. inorganic binder, and (c) 0.5–5.0% wt. spinel-forming metal oxide, all of (a), (b) and (c) being dispersed in organic medium;

(4) firing the second thick film conductive layer to effect volatilization of the organic medium therefrom and liquid phase sintering of the inorganic binder; and

(5) forming the solder joint by applying to the solder pad area of the fired second thick film conductive layer a layer of soft solder having a melting point of 120–300C.

5,202,154

METHOD OF PRODUCING THICK-FILM GAS SENSOR ELEMENT HAVING IMPROVED STABILITY

Toshitaka Matsuura; Keizo Furusaki; Mineji Nasu, and Akio Takami, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 394,825, Aug. 17, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 565,994

Claims priority, application Japan, Sep. 19, 1988, 63-234633

Int. Cl.[5] C23C *26/00*

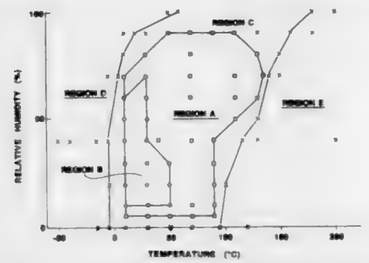
U.S. Cl. 427—125 15 Claims

1. A method of producing a thick film gas sensor element, comprising the steps of:

(a) forming at least one pair of electrode films on a surface of a ceramic substrate wherein at least one metal selected from the group consisting of the platinum group of the periodic chart is the principal material of the electrode films;

(b) applying a paste comprising a powder of a gas sensitive material to said surface of the ceramic substrate so as to cover selected portions of the electrode films together with a selected area of said surface and firing the applied paste to thereby form a porous thick film of the gas sensitive material;

(c) impregnating said porous thick film with a solution of at least one compound of a metal selected from the group consisting of the platinum group of the periodic chart; and



(d) after step (c), maintaining the substrate in a reducing gas, which includes a controlled amount of water vapor such that the relative humidity in the reducing gas and the temperature in said reducing gas are within the region A indicated in FIG. **16** of the accompanying drawings to thereby deposit a conductor comprising at least one metal of the platinum group at the interface between said porous thick film and each of the electrode films.

5,202,156

METHOD OF MAKING AN OPTICAL ELEMENT MOLD WITH A HARD CARBON FILM

Kiyoshi Yamamoto, Yokohama; Keiji Hirabayashi; Noriko Kurihara, both of Tokyo; Yasushi Taniguchi, Kawasaki, and Keiko Ikoma, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

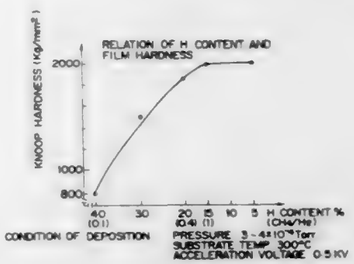
Division of Ser. No. 394,208, Aug. 15, 1989, Pat. No. 5,026,415.

This application Apr. 10, 1991, Ser. No. 683,537

Claims priority, application Japan, Aug. 16, 1988, 63-202739; Sep. 16, 1988, 63-230148; Sep. 16, 1988, 63-230149; Sep. 19, 1988, 63-232234; Jul. 11, 1989, 1-177144

Int. Cl.[5] C03B *19/02, 40/02, 40/033*

U.S. Cl. 427—135 1 Claim



1. A method of manufacturing a mold for molding an optical element by heating and pressing glass material, said method comprising the steps of:

coating an amorphous carbon hydride film on at least a molding surface of a base material of the mold, said film containing hydrogen in the range of 5 to 40 atom percent, and having a film density of at least 1.5 g/cm^3;

heat treating said mold base material coated with said amorphous carbon film at a temperature of 400° to 750° C. in an atmosphere of a partial pressure of oxygen less than 1×10^{-1} Torr;

forming by said heat treatment, a hard carbon film comprising 0 to 5 atoms percent of hydrogen, having a spin density of less than 1×10^{18} spin/cm^3 and a film density of at least 1.5 g/cm^3, said hard carbon film being coated on said molding surface of said mold.

5,202,155

METHOD FOR STABILIZING MAGENTIC METAL PARTICLES

Tzeng-Shii Tsai, Hsinchu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 17, 1992, Ser. No. 900,177

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—127 4 Claims

1. A method for stabilizing magnetic metal particles comprising the steps of:

(a) subjecting said magnetic metal particles to a reduction reaction;

(b) isolating said reduced magnetic metal particles from air and dipping them in an organic solvent;

(c) allowing said organic solvent to vaporize slowly in air, thereby forming oxidized layers on said magnetic metal particles; and

(d) mixing said magnetic metal particles in step (c) with a titanate coupling agent solution to form absorbed layers of a titanate coupling agent on the surfaces of said magnetic metal particles, said titanate coupling agent solution including an organic solvent and having a concentration of 0.1 wt % to 10 wt %, said titanate coupling agent having a formula of $(R_1—O)_m—Ti(O—X—R_2—Y)_n$, m=1, n=1–3, said X being selected from the group consisting of an alkyl group, an carbonyl group, a sulfonate, a phenolate and a phosphate, said Y being a thermosetting functional group selected from a group consisting of methacrylate and amine, said R_1 and R_2 being a hydrocarbon group having a carbon number of 4 to 40.

5,202,157

METHOD FOR LINING INTERNAL SURFACES OF PIPELINES

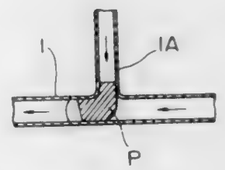
Takaharu Tomoyasu, and Kanji Miyamoto, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 749,336

Claims priority, application Japan, Aug. 28, 1990, 2-226092

Int. Cl.[5] B05G *13/00*; B41N *1/24*; B05D *7/22*

U.S. Cl. 427—142 11 Claims



1. A method for lining an internal surface of a pipeline having a multi-branched piping in which a plurality of branched pipelines are branched from a main pipeline, which comprises the steps of:

pouring a coatink composition into the pipeline from one composite material for lowering porosity of a porous fiber

restraining the advancement of said metallic workpiece on

than (A) having a melting point in the range of about

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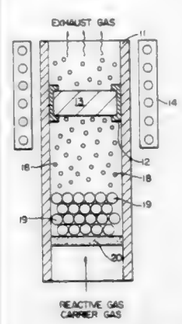
pouring a coating composition into the pipeline from one end of a main pipeline or a branched pipeline;
feeding air into the pipeline in order to thereby line the internal surface of the pipeline with said coating composition;
inserting into the pipeline a columnar or spherical shaped synthetic resin-made sponge consisting of an elastic continuous foam body having a larger diameter than the inside diameter of the pipes constituting the pipeline and having a load-flexure characteristic such that a load at 70% of flexure is 60 kg or less, and a load at 70% of compression rate is 6 times or less than the load at 10% of compression rate, said columnar shape having dimensions such that D is $1.0\times d_2$ or more and length is $0.5\times D$ to $3.0\times D$ and said spherical shape having a dimension such that D is $1.1\times d_2$ to $2.0\times d_1$, wherein D is the diameter of the sponge, d_1 is the minimum inside diameter of pipe in said pipeline and d_2 is a maximum inside diameter of pipe in said pipeline; and
pushing said sponge with the aid of air pressure to shape the lining surface.

5,202,158

APPARATUS FOR AND METHOD OF PRODUCING HIGH DENSITY FIBER REINFORCED COMPOSITE MATERIAL

Seigou Sakagami; Makoto Kawase; Satoshi Wakamatsu, all of Hyogo; Kouichi Iwata, Osaka, and Tadafumi Adschiri, Miyagi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 530,232, May 30, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 689,306
Claims priority, application Japan, May 31, 1989, 1-139846
Int. Cl.[5] C23C *16/46*
U.S. Cl. 427—185 **11 Claims**



1. An apparatus for producing a high density fiber reinforced composite material for lowering porosity of a porous fiber reinforced composite material by forming matricies in pores of said porous fiber reinforced composite material through chemical vapor infiltration, said apparatus comprising:
a reaction tube having a gas inlet port and a gas outlet port;
gas supply means for supplying a reactive gas for serving as a raw material for said matricies and a carrier gas into said reaction tube through said gas inlet port;
heating means for heating said reaction tube;
a large number of particles arranged in said reaction tube and pushed up by the pressure of said gases flowing from said gas inlet port toward said gas outlet port; and
holding means for holding said porous fiber reinforced composite material in a floating region of said particles in said reaction tube,
wherein said particles are adapted to strike against a surface of the porous fiber reinforced composite material and thereby remove soot from said surface.

7. A method of producing a high density fiber reinforced composite material for lowering porosity of a porous fiber reinforced composite material by forming matricies in pores of said porous fiber reinforced composite material through chemical vapor infiltration, said method comprising the steps of:
arranging a porous fiber reinforced composite material in a reaction tube having a gas inlet port and a gas outlet port;
arranging a large number of particles in said reaction tube;
introducing a reaction gas for serving as a raw material for said matricies and a carrier gas into said reaction rube through said gas inlet port;
pushing up said large number of particles by the pressure of said gases flowing from said gas inlet port toward said gas outlet port for bringing the same into floating states; and
forming matricies in pores of said porous fiber reinforced composite material while removing soot by striking said floating particles against said porous fiber reinforced composite material.

5,202,159

PREPARATION METHOD OF MICRODISPERSED TABLET FORMULATION OF SPRAY-DRIED SODIUM DICLOFENAC ENTERIC-COATED MICROCAPSULES

Li J. Chen, Hsin-Ying; Chun N. Chen, Chia-Yi, and Shan Y. Lin, Taipei, all of Taiwan, assignors to Standard Chemical & Pharmaceutical Corp., Ltd., Taiwan

Filed Dec. 31, 1990, Ser. No. 636,121
Int. Cl.[5] A61K *9/20, 9/26;* **B01J** *13/20*
U.S. Cl. 427—213.31 **4 Claims**

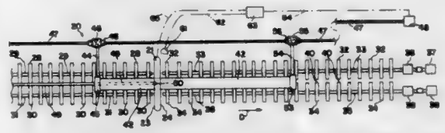
1. A preparation method of microdispersed tablet formulation with sodium diclofenac enteric-coated microcapsules by spray drying technique comprising the steps of
(a) dissolving sodium diclofenac in an appropriate amount of distilled water;
(b) adding an effective amount of excipients to the above solution to form a suspension;
(c) adding methacrylic acid-ethyl acrylate copolymers and polyethyleneglycol 6000 as the enteric-coating material to form a slurry;
(d) atomizing the slurry to form spray-dried powder;
(e) mixing the spray-dried powder with a mixture of microcrystalline cellulose and pregelatinized starch; and
(f) compressing the powder mixture into a microdispersed enteric tablet.

5,202,160

HOLDBACK CONTROL IN APPARATUS FOR COATING THE INTERNAL SURFACES OF METAL TUBES

James L. Schuppe, and David M. Kolaga, both of Milwaukee, Wis., assignors to Inductametals Corporation, Chicago, Ill.

Filed May 24, 1991, Ser. No. 705,494
Int. Cl.[5] B05D *7/22*
U.S. Cl. 427—231 **27 Claims**



27. A method for processing an elongated metallic workpiece which includes:
passing the workpiece through an induction heating device,
providing an axial advancing device for longitudinally advancing the metallic workpiece through said induction heating device,
providing an induction heating coil in the induction heating device and advancing the workpiece through the coil with the magnetic effect of the coil advancing the workpiece faster than the speed of the axial advancing device,
coating the workpiece with a coating material, and

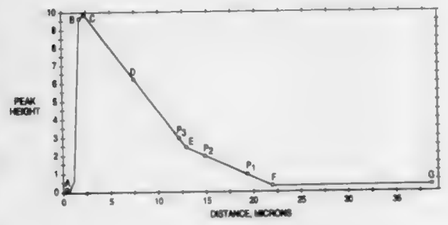
restraining the advancement of said metallic workpiece on the outlet side of said induction heating device to a predetermined rate of speed to assist in providing a uniform coating on the workpiece and to thereby overcome thermal and magnetic effects of said induction heating device which would otherwise advance the metallic workpiece faster than the speed of the axial advancing device.

5,202,161

HIGH SULFUR LEVEL PLASTIC CONTAINER SULFONATION PROCESS AND ARTICLE PRODUCED THEREBY

Robert D. Seizert, Brooklyn; Mark Nulman, Birmingham, both of Mich., and Glenn T. VanVolkom, Fairless Hills, Pa., assignors to Solvay Automotive, Inc., Houston, Tex.

Filed Jan. 18, 1991, Ser. No. 643,037
Int. Cl.[5] B05D *7/22*
U.S. Cl. 427—237 **31 Claims**



1. A process for treating a container comprising a normally solid, polymer surface with a sulfur-containing compound comprising the steps of:
(A) contacting the surface at a temperature of about 120° to about 140° F. with the sulfur-containing compound;
(B) contacting the surface with a neutralizing agent, the steps (A) and (B) being carried out for a sufficient period of time and with a sufficient concentration of the sulfur-containing compound and the neutralizing agent so that the container has average permeability to unleaded gasoline having octane number of 93 (unleaded gasoline) of not greater than about 0.021 grams/hr (g/hr).

5,202,162

THERMOPLASTIC COATING COMPOSITIONS AND PROCESS USING SAME FOR THE PREPARATION OF DECORATIVE COATINGS

Donald P. Hart, Jr., and Robert C. Stroup, both of Pittsburgh, Pa., assignors to Ferro Corporation, Cleveland, Ohio

Filed Oct. 6, 1989, Ser. No. 418,399
Int. Cl.[5] B05D *1/32, 5/00*
U.S. Cl. 427—282 **16 Claims**

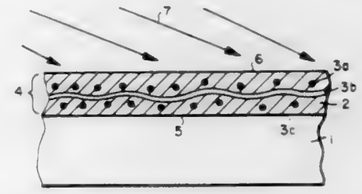
1. A process for decoration coating a substrate comprising the steps of:
(1) providing a coating composition comprising:
(A)(i) at least one homopolymer of ethylene having a melt index of at least about 220 grams per ten minutes as determined by ASTM D1238, condition 190/2.16, or (ii) at least one copolymer of ethylene and a second ethylenically unsaturated monomer having a melt index of at least about 20 grams per ten minutes as determined by ASTM D1238, condition 190/2.16, or (iii) a mixture of the (i) and (ii); and
(B) at least one thermoplastic polymeric material different than (A) having a melting point in the range of about 80° C. to about 130° C. and being miscible with (A);
(2) heating the coating composition to a temperature in the range of about 70° C. to about 135° C.; and
(3) applying the coating composition to such substrate.

5,202,163

SURFACE COATING FOR PROTECTING A COMPONENT AGAINST TITANIUM FIRE AND METHOD FOR MAKING THE SURFACE COATING

Thomas Uihlein, Karlsfeld, and Gerhard Wydra, Oberschleisheim, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 625,747, Dec. 11, 1990, Pat. No. 5,087,512. This application Nov. 5, 1991, Ser. No. 788,094
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—314 **9 Claims**



1. A method of forming a protective coating on a structural component made of metal, said coating providing protection against damage by molten titanium droplets by substantially preventing an ignition of said molten titanium droplets, comprising the following steps:
(a) heating a ceramic fiber material made of an oxide selected from a group consisting of silicon oxide, aluminum oxide, zirconium oxide, and mixtures of the foregoing oxides, sufficiently to clean the individual fiber surfaces of said ceramic fiber material,
(b) infiltrating or impregnating said fiber material with a silicate after said heating step (a),
(c) coating a surface of said structural component with a high temperature inorganic lacquer of a silicate binder and an aluminum powder dispersed as a filler in said silicate binder,
(d) placing said infiltrated or impregnated fiber material on said coated surface of said structural component,
(e) coating said fiber material with said high temperature inorganic lacquer of a silicate binder and an aluminum powder dispersed as a filler in said silicate binder,
(f) baking said high temperature inorganic lacquer applied in steps (c) and (e), and
(g) coating a surface of said fiber material with a gas-tight layer of a silicate.

5,202,164

METHOD AND APPARATUS FOR APPLYING A THIN FILM OF MAGNETIC LIQUID FROM AN EXTRUSION-TYPE HEAD TO A FLEXIBLE BAND-LIKE WEB

Shinsuke Takahashi, and Norio Shibata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1991, Ser. No. 683,905
Claims priority, application Japan, Apr. 13, 1990, 2-96285
Int. Cl.[5] B05D *3/12, 1/26*
U.S. Cl. 427—356 **4 Claims**

1. A method of application, in which a liquid to be applied is

continuously discharged from the slot of an extrusion-type

tion elements of uniform thickness and having outer flat sur-

an upper pressure sensitive adhesive layer between the light

5,202,170

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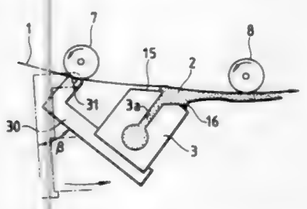
continuously discharged from the slot of an extrusion-type application head having a back edge portion and a doctor edge portion facing the surface of a flexible carrier having a transverse width and being continuously run while being supported on path rollers, so that a thin film of the applied liquid is provided on said surface, comprising the following steps:

initially positioning said carrier along the entire transverse width thereof and the back edge portion only of said head near each other or in slip contact with each other;

discharging said liquid from said slot in said head so that any scraped chips formed by the initial contact between said head and said carrier are removed by said liquid in a downstream direction beyond the doctor edge; and



lapping said carrier and the doctor edge portion of said head, which is located downstream of said slot with regard to the direction of the conveyance of said carrier, with each other at a prescribed lap angle for said application, and thereafter performing said application.

5,202,165

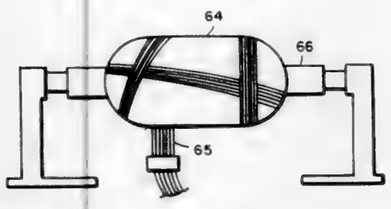
VESSEL CONSTRUCTION

Richard W. Lusignea, Brighton; David A. Evans, Chelmsford, and Joseph W. Piche, Concord, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 395,548, Aug. 18, 1989, abandoned. This application Aug. 17, 1990, Ser. No. 569,148

Int. Cl.[5] B32B *1/02*

U.S. Cl. 428—1 **20 Claims**



1. In a vessel for containing a mobile or permeating fluid, a barrier layer comprising a lyotropic liquid crystal polymer film.

5,202,166

COMPOSITE STRUCTURE

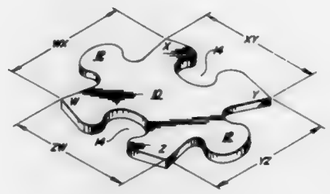
Todd F. Crompton, 613 2nd St., Ct., Sherrard, Ill. 61281, and Steven P. Brutsche, 2710 38th St., Rock Island, Ill. 61201

Filed Sep. 6, 1990, Ser. No. 578,168

Int. Cl.[5] B32B *3/14*

U.S. Cl. 428—33 **17 Claims**

1. An assemblage of a plurality of substantially flat construction elements of uniform thickness and having outer flat surfaces and arranged with said surfaces essentially coplanar for the construction of floors, walls and patios, said elements including a base area made up of a first group of identical elements, each having a perimetrical outline configured to provide at least one knob and one socket wherein the knobs and sockets throughout are congruent and interfit knob-to-socket fashion to provide positive interlocks among the elements and the outlines of the elements apart from the knobs



and sockets being so shaped as to closely mate with neighboring elements in edge-to-edge fashion, a second group of elements bordering on the first group and having shapes different from those of the first group and including knobs and sockets adapted to interfit among each other as well as with those of the first group, and a third group of elements bordering on the second group and having shapes different from those of the first and second groups and including knobs and sockets adapted to interfit among each other as well as with those of the second group.

5,202,167

Patent Not Issued For This Number

5,202,168

PRECISION RETRO-REFLECTIVE TARGET TAPE

Glenn V. Turner, Newport Beach, and Dean N. Michael, Downey, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Sep. 18, 1990, Ser. No. 584,309

Int. Cl.[5] A61F *13/02*

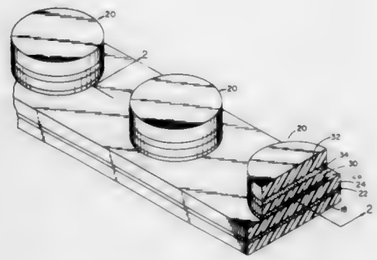
U.S. Cl. 428—40 **3 Claims**

3. A precision retroreflective tape for use in photogrammetric measurement of an object, comprising a transparent first backing with a release sheet adhesively adhered to a lower surface thereof by a lower pressure sensitive adhesive nd having a plurality of circular reflective targets tenaciously adhered to an upper surface of the first backing, the lower pressure sensitive adhesive remaining with the first backing upon removal of the release sheet and having low adhesive power for removably adhering the first backing to the object, wherein each circular reflective target comprises

a light reflective layer,

a transparent second backing therebeneath,

an upper pressure sensitive adhesive layer between the light reflective layer and the second backing, the upper pressure sensitive adhesive layer having high adhesive power for tenaciously adhering the light reflective layer to the second backing, and



an intermediate pressure sensitive adhesive layer between the second backing and the first backing, the intermediate pressure sensitive adhesive layer having high adhesive power for tenaciously adhering the second backing, and the light reflective layer tenaciously adhered thereto to the first backing.

5,202,169

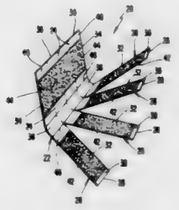
RELEASABLE FASTENER, METHOD OF RELEASABLY FASTENING, AND RELEASABLE FASTENER DISPENSER

Max J. Spendlove, 13121 Clifton Rd., Silver Spring, Md. 20904

Filed Jan. 23, 1991, Ser. No. 644,971

Int. Cl.[5] B65D *65/28*

U.S. Cl. 428—43 **16 Claims**



1. A fastener for fastening together a plurality of sheets, comprising:

a piece of base material, said base material piece including

at least one interleaving portion having front and back oppositely-facing sides wherein at least a portion of said front and back sides are covered with an adhesive, and

at least one cover portion connected to said interleaving portion and having front and back oppositely-facing sides, wherein at least a portion of said back side of said cover portion is covered with an adhesive and said front side of said cover portion being free of adhesive.

5,202,170

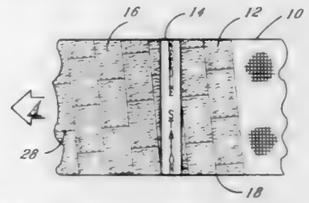
PAPERMAKING FELT WITH A NON-SPIRALLED MACHINE DIRECTION FIBER BATT

Chien-Yeh Hsu, Greer, and Vaughn M. Renwick, Clinton, both of S.C., assignors to Wangner Systems Corporation, Greenville, S.C.

Filed Apr. 8, 1991, Ser. No. 681,771

Int. Cl.[5] B32B *5/06, 5/08;* **D21F** *3/02, 7/08*

U.S. Cl. 428—48 **12 Claims**



1. A wet felt press felt comprising:

a dimensionally stable base fabric having an upper and lower surface;

a plurality of juxtaposed fiber batts needled to said base fabric;

said fiber batts are arranged to extend across the width of said base fabric substantially transverse to a machine direction of said felt; and

individual fibers forming said batts extend substantially transverse to the length direction of said batts; whereby

said wet press felt includes a base fabric having transversely disposed fiber batts needled thereto with the fibers forming said batts extending in the machine direction of said felt.

5,202,171

OPTICAL INFORMATION RECORDING MEDIUM

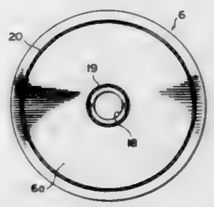
Yoshikazu Anezaki, and Koji Sasaki, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,667

Claims priority, application Japan, Feb. 22, 1990, 2-39795; Oct. 31, 1990, 2-294286

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 **7 Claims**



1. An optical information recording medium comprising:

a disk shaped glass substrate having a center hole, and an annular recess formed in the vicinity of at least one of an outer circumferential edge and an inner circumferential edge of said glass substrate, wherein said annular recess has a width of substantially 0.5 to 2.0 mm and a depth of substantially 0.2 to 0.3 mm;

an ultraviolet ray hardened resinous layer formed on said substrate;

an edge area of said ultraviolet ray hardened resinous layer being substantially terminated at said annular recess formed in the vicinity of at least one of said outer circumferential edge and inner circumferential edge; and

optical information formed on said resinous layer.

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5,202,175

ment with one another; an irreversible energy absorbing de-

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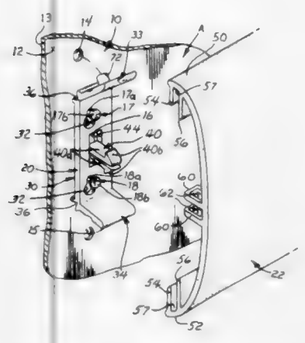
5,202,172
MOLDING AND RETAINER ASSEMBLY
Edward J. Graf, Oxford, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 20, 1991, Ser. No. 702,861
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—100 4 Claims



1. In combination, a panel having spaced apertures and front and back surfaces and a reveal molding and retainer assembly for attachment to said panel,

said retainer having a generally planar bottom and first and second end portions integrally connected to the bottom at its opposite ends via living hinges,

means attaching said bottom of said retainer to said apertured panel and with said bottom being against the front surface of said panel,

said first and second end portions of said retainer, when in their normal free state position, extending transversely of said front surface of said panel, said end portions having their free ends laterally spaced from each other a given distance,

said molding being elongated, transversely arcuate in shape and terminating in ends along its elongated sides which are engageable with said apertured panel,

said molding adjacent each end having first and second spaced flanges extending chordally inwardly toward each other and with said first flanges being located closest to said ends,

said first flanges being laterally spaced apart a distance greater than said given distance between the free ends of said end portions of said retainer, said second flanges being laterally spaced apart a distance less than said given distance,

said second flanges engaging said end portions of said retainer and causing said end portions of said retainer to deflect about said living hinges when said molding is moved toward said panel front surface and over said retainer until the ends of the molding engage and are positioned against said panel, said end portions of said retainer being captured between said first and second flanges when the molding is so positioned against the front surface of the panel,

first deflectable fastener means retaining said molding to said retainer when the molding is moved over the retainer and positioned against the panel, and

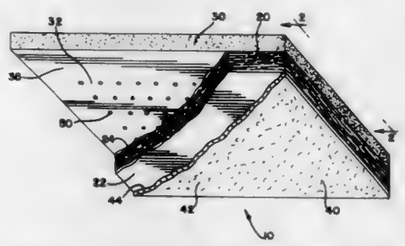
second fastener means including means on said end portions of said retainer which are received within said apertures of said panel when said end portions are positioned against said front surface of said panel for retaining said end portions of said retainer and for tightly holding said molding in place against the panel.

5,202,173
ULTRA SOFT CLOTH-LIKE EMBOSSED PLASTIC FILM HAVING POST-EMBOSSED STRETCHED AREAS
Pai-Chuan Wu, Cincinnati, Ohio; Thomas R. Ryle, Burlington, Ky.; Robert M. Mortellite, Hamilton, and J. David Toppen, Loveland, both of Ohio, assignors to Clopay Corporation, Cincinnati, Ohio
Continuation of Ser. No. 478,935, Feb. 12, 1990, abandoned.
This application Jan. 13, 1992, Ser. No. 821,342
Int. Cl.[5] B32B *5/14, 3/30*
U.S. Cl. 428—131 14 Claims

1. An ultra soft embossed plastic film suitable for use as a cloth or fabric having the appearance and feel of non-woven or woven fabric and having liquid barrier properties comprising:

a thermoplastic film selected from the group consisting of polyethylene, polypropylene and copolymers thereof having a thickness on the order of about 0.5 to about 10 mils and a pattern embossed therein in its normal unstretched state having thick and thin areas and a plurality of post-embossed stretched areas along lines spaced substantially uniformly across the surface areas on both sides of the embossed film, said stretched areas being separated by unstretched areas and having a thickness less than the unstretched areas, said thin areas of said embossed plastic film in its normal unstretched state being stretched preferentially to the thick areas due to the lower resistance to the stretching force, said film being ultra soft and quiet when used as a cloth or fabric upon comparison with the embossed plastic film in its normal unstretched state.

5,202,174
LAY-IN CEILING PANEL
Raymond W. Capaul, Aurora, Ill., assignor to Capaul Corporation, Plainfield, Ill.
Division of Ser. No. 639,877, Jan. 11, 1991. This application May 13, 1991, Ser. No. 699,458
Int. Cl.[5] B32B *7/02, 13/04, 13/14;* E04B *1/88*
U.S. Cl. 428—138 5 Claims

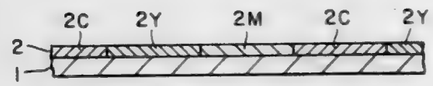


1. A lay-in ceiling panel structure, comprising a glass fiber ply, and a gypsum board, said gypsum board being secured to said glass fiber ply at spaced locations, said ply remaining horizontally flat even if said board warps during use.

5,202,175
THIN FILMS OF METAL PHOSPHATES AND THE METHOD OF THEIR FORMATION
Gustavo R. Paz-Pujalt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 421,889, Oct. 16, 1989, Pat. No. 5,073,410.
This application Sep. 19, 1991, Ser. No. 762,123
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—142 4 Claims

1. An article comprising a substrate capable of withstanding a temperature of 500° C. overcoated on at least a portion of its irregular shape surface with a film of metal phosphate wherein said metal phosphate consists of phosphates of at least one member of the group consisting of lithium, sodium, potassium, magnesium, strontium, and barium and wherein said film thickness is about 500 to about 20,000 angstroms.

5,202,176
HEAT TRANSFER RECORDING MATERIALS
Youichi Higuchi; Katsuyuki Oshima, and Mineo Yamauchi, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan
Filed Oct. 4, 1990, Ser. No. 593,009
Claims priority, application Japan, Oct. 4, 1989, 1-257837; Oct. 4, 1989, 1-257838; Oct. 4, 1989, 1-257839; Oct. 4, 1989, 1-257840
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 5 Claims

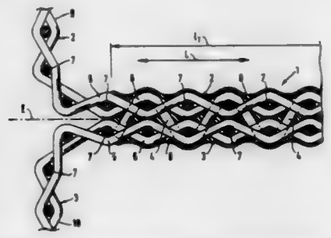


1. A heat transfer image-receiving sheet comprising:

a substrate film; and

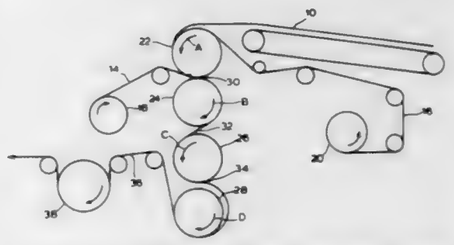
a dye-receiving layer formed on one side of said substrate film, said dye-receiving layer comprising a resin and containing therein or thereon a silane coupling agent having a polymerizable double bond, said silane coupling agent being present in an amount of 0.1 to 120 parts by weight per 100 parts by weight of the resin.

5,202,177
TEAR WEBBING
Hans-Werner Kämper, Würselen, Fed. Rep. of Germany, assignor to Spanset Inter AG, Oetwil am See, Switzerland
Filed Dec. 13, 1990, Ser. No. 626,846
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941305
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—257 11 Claims



1. In a tear webbing including two woven straps each having a first length portion and an adjoining second length portion; said woven straps being, along said first length portion, in a parallel, superimposed orientation and in a face-to-face engagement with one another; an irreversible energy absorbing device including a binding yarn connecting said woven straps to one another along said first length portion; said woven straps being separate from one another along said second length portion said woven straps being adapted to be exposed, in said second length portion, to pulling forces causing a progressive separation of the woven straps along said first length portion under an irreversible energy absorption effected by a tearing away of the woven straps from the irreversible energy absorbing device; the improvement wherein said irreversible energy absorbing device comprises an elastic coating matrix; said woven straps being at least partially embedded in said coating matrix along said first length portion to thereby increase the resistance of the irreversible energy absorbing device to pulling forces tearing away the woven straps from the irreversible energy absorbing device.

5,202,178
HIGH-STRENGTH NYLON BATTERY SEPARATOR MATERIAL AND RELATED METHOD OF MANUFACTURE
Larry Turner, Cumberland, R.I., assignor to International Paper Company, Purchase, N.Y.
Filed Feb. 28, 1992, Ser. No. 843,709
Int. Cl.[5] B32B *27/34*
U.S. Cl. 428—287 27 Claims



1. A battery separator material having a laminated construction comprising a first nonwoven web of staple fibers sandwiched between second and third nonwoven webs of spunbonded fibers.

5,202,179
ELECTROSTATIC ATTRACTING SHEET
Keiji Kasahara, 1128-14 Kakegawa, Kakegawa-shi, Shizuoka, Japan
Filed Apr. 10, 1990, Ser. No. 507,130
Claims priority, application Japan, May 20, 1989, 1-127392
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—323 17 Claims

1. An electrostatic attracting sheet comprising a high polymer substance and electrically conductive crystal whiskers dispersed in said high polymer substance in sheet form, wherein said electrostatic attracting sheet is capable of forming an electrostatic charge therein to attract a desired object thereto.

5,202,180
hered on the substratum a layer of an adhesive comprising an

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THERMAL PROTECTION SLEEVE FOR REDUCING

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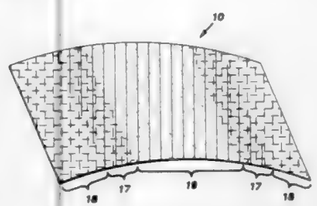
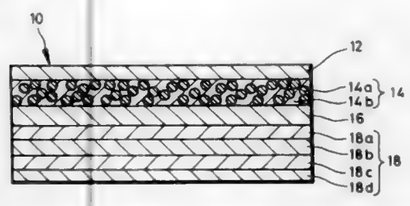
5,202,180
DECORATIVE WEB
Gary R. Watts, Ashtabula, Ohio, assignor to Avery Dennison Corporation, Pasadena, Calif.
Filed Feb. 6, 1990, Ser. No. 475,707
Int. Cl.[5] B32B 5/16
U.S. Cl. 428—324 4 Claims



1. A decorative web for application to a support surface, comprising a flexible film material having a thickness of about between 0.002 inch to 0.005 inch, the film including a chromatic pigment, an iridescent pigment and metallic flake pigment, the iridescent pigment being in the form of platelets that reflect light of a characteristic color that is distinctive from the color of the chromatic pigment, the volume proportions of the chromatic pigment, iridescent pigment and metallic flake pigment relative to each other being selected to produce an appearance that varies depending on the angle of view of an observer and the angle of incident white light, the web exhibiting three separate and readily perceptible appearances including an appearance where the chromatic pigment has its most prominent effect, an appearance where the iridescent pigment has its most prominent effect and an intermediate appearance being the result of a combination of the chromatic pigment and iridescent pigment, the metallic flake pigment visually heightening the effect of the iridescent pigment by a visually evident sparkle in the zone in which the iridescent pigment is most visually predominant and in a highlighting zone in which the intermediate appearance occurs, the metallic flakes forming the metallic flake pigment having face area dimensions and a thickness that is small in comparison to their face area dimensions, the metallic flake face area dimensions being of the same order of magnitude as the thickness of the web, the metallic flakes being aligned with the web so that they are visible as discreet elements with the unaided eye, the volume proportion of the metallic flake pigment being limited so that the metallic flakes extend over less than about 28% of the total surface area of the web.

5,202,181
ADHESIVE WITH VARIABLE ADHESIVITY
Yoshio Hara, and Nobuo Sugiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 316,928, Feb. 28, 1989, abandoned. This application Apr. 3, 1992, Ser. No. 864,186
Claims priority, application Japan, Feb. 29, 1988, 63-47132
Int. Cl.[5] C09J 7/02
U.S. Cl. 428—350 2 Claims



1. An adhesive assembly comprising a substratum, and adhered on the substratum a layer of an adhesive comprising an intimate dry mixture of:
a peelable pressure-sensitive adhesive which is an acrylic resin adhesive;
an adhesive which becomes strongly adherent only in the presence of water and which is a vinyl acetate emulsion resin; and
a tackifier for preventing deterioration of adhesivity of the peelable pressure-sensitive adhesive, said tackifier being a maltodextrin tackifier;
the nature and proportions of said peelable pressure-sensitive adhesive and adhesive which becomes strongly adherent only in the presence of water being such that the adherence of said substratum to another surface via said layer of adhesive, when said layer of adhesive is wet with water, is substantially greater than the adherence of said substratum to said another surface via said layer of adhesive when said layer of adhesive is dry and only said pressure-sensitive adhesive adheres said substratum to said another surface.

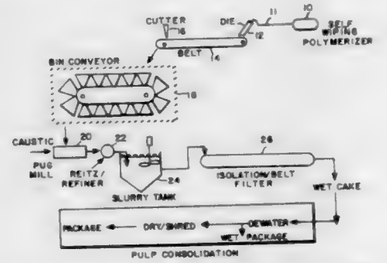
5,202,182
MULTIFILAMENT APPAREL YARNS OF NYLON
Benjamin H. Knox, West Chester, Pa.; Francis J. Malone, Jr., Hixson, Tenn.; Gary D. Milosovich, Columbia, S.C.; Frank H. Overton, Signal Mountain; Ronald E. Steele, Hixson, both of Tenn., and Paul G. Zmick, Beaumont, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 540,132, Jun. 21, 1990, Pat. No. 5,137,666. This application Mar. 13, 1992, Ser. No. 851,461
Claims priority, application United Kingdom, Jul. 10, 1989, 89015736
Int. Cl.[5] D01F 1/10, 6/60; D02G 1/00, 3/02, 3/04
U.S. Cl. 428—364 29 Claims

1. A partially-oriented nylon 66 polymer multifilament yarn of denier about 15 to about 250 and of elongation (E_b) about 70 to about 100%, the polymer being of relative viscosity about 50 to about 80 and having been derived by adding to a nylon 66 end product precursor prior to isolating the end product, wherein a minor amount of a bifunctional polyamide comonomer or of a non-reactive additive capable of hydrogen bonding with the nylon 66 polymer, and that the yarn has a draw-tension (DT) in g/d of at least about 0.8 and less than about 1.2.

5,202,183
ALKALI-RESISTANT SYNTHETIC FIBER
Yoshihiko Hosako; Yoshifumi Furutani; Takashi Tabuchi, all of Hiroshima, and Yasushi Yamaguchi, Aichi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 377,950, Jul. 11, 1989, abandoned. This application May 28, 1991, Ser. No. 707,941
Claims priority, application Japan, Jul. 11, 1988, 63-170991; Mar. 29, 1989, 1-74848
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—364 8 Claims

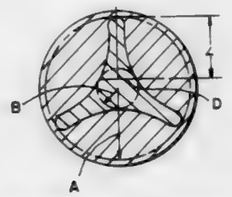
1. An alkali-resistant synthetic fiber, comprising:
a polymer mixture consisting of (A) from 15 to 80% by weight of polysulfone, (B) from 20 to 85% by weight of polyvinyl chloride having a degree of polymerization of from 800 to 2500, and (C) up to 65% by weight of a vinyl polymer selected from the group consisting of polymethylmethacrylate and polystyrene, each based on the total weight of the components (A), (B), and (C).

5,202,184
METHOD AND APPARATUS FOR PRODUCING PARA-ARAMID PULP AND PULP PRODUCED THEREBY
Roland T. Brierre, Richmond, Va.; Stephan C. De La Veaux, Wilmington, Del.; James E. Geary, Jr., Boothwyn, Pa.; Wesley Memeger, Jr., Wilmington, Del., and Michael L. Trancynger, Chesterfield, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 358,811, Jun. 5, 1989, Pat. No. 5,028,372. This application Jul. 1, 1991, Ser. No. 723,877
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—371 7 Claims



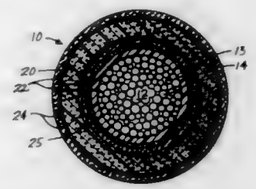
1. Para-aramid pulp consisting essentially of pulp-like short fibers comprised of bundles of sub-micron diameter fibrils of para-aramid free of sulfonic acid groups and having an inherent viscosity of between 2.0 and 4.5, having a diameter of between 1μ to 150μ and a length of between 0.2 mm and 35 mm, having a crystallinity index of less than 50, a crystallite size of less than 40 Å, and a surface area of greater than 2 m^2/g.

5,202,185
SHEATH-CORE SPINNING OF MULTILOBAL CONDUCTIVE CORE FILAMENTS
Harry V. Samuelson, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 356,051, May 22, 1989, abandoned. This application May 3, 1991, Ser. No. 695,372
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—373 1 Claim



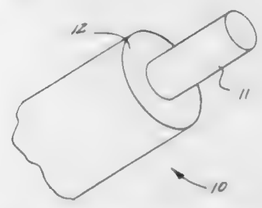
1. A novel synthetic sheath-core bicomponent filament having antistatic properties comprising a continuous nonconductive sheath of a synthetic thermoplastic fiber forming polymer selected from the group consisting of polyester and polyamide surrounding an electrically conductive polymeric core, constituting from 0.3% to 35% of the filament cross-section, said polymeric core comprised of 20 to 35% of electrically conductive carbon black dispersed in polyethylene, the cross-section of said core having from three to six lobes and a modification ratio of at least 2, with each lobe having an L/D ratio of from 1 to 20, where L is the length of a line drawn from the center point of the line between low points of adjacent valleys on either side of the lobe to the farthest point on said lobe, and D is the greatest width of the lobe as measured perpendicular to L.

5,202,186
THERMAL PROTECTION SLEEVE FOR REDUCING OVERHEATING OF WIRE BUNDLES UTILIZED IN AIRCRAFT APPLICATIONS
Mickey A. Williamson, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 355,619, May 23, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,100
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—375 1 Claim

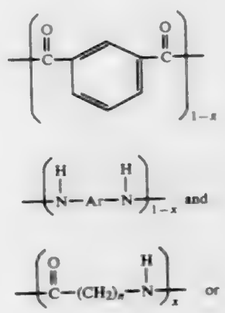


1. An electrical cable having a wire bundle core surrounded by a thermal and chafe guard protection sleeve, said thermal and chafe guard protection sleeve comprising a sandwich structure;
said sandwich structure including a laminate of silicone foam sandwiched between acrylic adhered layers of fiber glass;
said thermal and chafe guard sleeve surrounded by a fluorosilicone coating on the outer layer.

5,202,187
COATED WIRE
Hamid M. Ghorashi, Midlothian, Va., and John C. Norman, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 12, 1990, Ser. No. 508,863
Int. Cl.[5] B32B 15/00, 15/02, 15/20
U.S. Cl. 428—379 3 Claims



1. A metallic wire insulated with a melt-coated adherent sheath comprising a polymer consisting essentially of the following repeat units:



-continued

5,202,190

copolymer or block copolymer represented by the for-

5,202,192
ADHESIVE BLENDS AND MULTI-LAYERED

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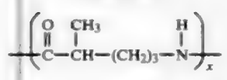
-continued



wherein n is 4 or 5; X is from 0.01 to 0.50; and Ar is at least one divalent aromatic radical selected from the group consisting of 1,3-phenylene, 1-methyl-2,4-phenylene and 3,4'-oxydiphenylene.

5,202,188

VINYLIDENE CHLORIDE FILM

Solomon Bekele, Taylors, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Aug. 23, 1991, Ser. No. 749,057

Int. Cl.[5] B32B *27/38*

U.S. Cl. 428—414 **8 Claims**

1. A multi-layer polymeric film comprising:
(a) first and second polymeric surface layers; and
(b) a vinylidene chloride polymeric layer disposed between said surface layers comprising:
(1) 1% to 4% plasticizer;
(2) 1 to 4% acrylate/styrene polymer; and
(3) the balance of 92% to 98% comprising at least one vinylidene chloride polymer.

5,202,189

FIRE-RESISTANT REINFORCED PLASTIC MATERIAL AND ARTICLES AND METHODS FOR THEIR MANUFACTURE BASED ON RESORCINOL NOVOLACS

Lawrence E. Shea, P.O. Box 1236, San Bruno, Calif. 94066-0760

Continuation of Ser. No. 92,892, Sep. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 79,676, Jul. 30, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,399

Int. Cl.[5] C08G *8/28*; C08F *283/00*; B32B *17/10, 27/42*

U.S. Cl. 428—436 **35 Claims**

1. A lightweight, fire-resistive, reinforced structural material exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing, comprising:
(1) a fire-resistive, reinforcing material, embedded in a fire resistive resin,
(2) said fire-resistive resin comprising the cured reaction product of:
(a) a solvent-carried hydroxyl-group component selected from the group consisting of resorcinol and a mixture of resorcinol and phenol containing not over 2 mols phenol per mol resorcinol, and
(b) a solvent-carried first aldehyde component providing a molar ratio of less than one mol of aldehyde per one mol of said component (a),
said (a) and (b) being premixed to provide a novolac resin in solvent with a shelf life of about 6 months at a solids content of about 64% to 83% of the total resin weight and at a viscosity of about 300 to 3500 cps,
(c) the resin viscosity of the premixed (a) and (b) been reduced to about 250 to 550 c.p.s. by the addition of an organic viscosity-reducing solvent for said novolac resin wherein the solids content is reduced to about 62% to 81% of the total resin weight, and
(d) a second aldehyde component being added to bring the molar ratio of total aldehyde to one or more mols aldehyde per mol of component (a), aldehyde solids being present in said second aldehyde component in an amount of from 5% to 12% by weight of said components (a) and (b),
(3) said solvent being removed the embedded material of (1) and (2) being thermoset cured at ambient temperatures.

5,202,190

METHOD OF MAKING VINYL-SILICONE COPOLYMERS USING MERCAPTO FUNCTIONAL SILICONE CHAIN-TRANSFER AGENTS AND RELEASE COATINGS MADE THEREWITH

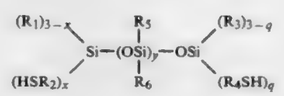
Steven S. Kantner, St. Paul; Ramesh C. Kumar, Maplewood, and Gilbert L. Eian, Mahtomedi, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 708,971, May 31, 1991, which is a division of Ser. No. 393,554, Aug. 14, 1989, Pat. No. 5,032,460. This application Mar. 18, 1992, Ser. No. 855,119

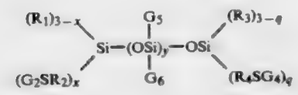
Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—447 **8 Claims**

1. A stack of superimposed sheets of coated sheet material wherein the coated sheet material comprises:
(a) a flexible sheet; and
(b) a release coating covering at least a portion of one major surface of one side of said flexible sheet wherein said release coating comprises a vinyl-silicone copolymer formed according to the method of:
(a) mixing (1) free radically polymerizable monomer mixed, if needed, with sufficient solvent to produce a charge which possesses a net dielectric constant greater than about 2.5, (2) a mercapto functional silicone compound represented by the formula



wherein
R_1 are monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, hydroxyl, hydrogen, and fluoroalkyl;
R_2 can independently be the same or different and are divalent linking groups;
R_3 are monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, hydroxyl, hydrogen, and fluoroalkyl;
R_4 can independently be the same or different and are divalent lining groups;
R_5 are monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, hydroxyl, hydrogen, fluoroalkyl and -ZSH, wherein Z is a divalent linking group;
R_6 are monovalent moieties which can independently be the same or different and are selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, ahydroxyl, fluoroalkyl, hydrogen, and -ZSH wherein Z is a divalent linking group;
wherein
x is an integer of 0 to 3;
y is an integer of 10 or greater;
q is an integer of 0 to 3;
R_5 comprises 0 to y -ZSH moieties;
R_6 comprises 0 to y -ZSH moieties; and
wherein at least one of the following is true:
q is an integer of at least 1:
x is an integer of at least 1;
R_5 comprises at least one -ZSH moiety;
R_6 comprises at least one -ZSH moiety; and
(3) an initiator capable of forming free radicals upon being subjected to a means of initiation wherein said free radicals are capable of abstracting the -ZSH hydrogen atoms of the mercapto functional silicone compound to form mercapto functional silicone free radicals,
wherein said mercapto functional silicone free radicals are capable of initiating free radical polymerization of said free radically polymerizable monomer to form a graft copolymer or block copolymer represented by the formula



wherein
G_5 are monovalent moieties which can independently be the same of different selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA;
A is a vinyl polymeric segment or block consisting essentially of polymerized free radically polymerized monomer;
G_6 are monovalent moieties which can independently be the same or different selected from the group consisting of alkyl, aryl, alkaryl, alkoxy, alkylamino, fluoroalkyl, hydrogen, and -ZSA;
G_2 comprises A;
G_4 comprises A; and
R_1, R_2, R_3, R_4, x, q, y, and Z are as previously defined;
(b) initiating free-radical polymerization; and
(c) sustaining said free-radical polymerization until said vinyl-silicone copolymer is produced, wherein A comprises at least about 40 weight percent of copolymer and possesses a Tg or Tm above about −20° C., and wherein a silicone segment of the copolymer has a number average molecular weight above about 1000 and wherein the silicone segment is present at a weight percent great enough to provide said copolymer with a surface release value not greater than about 50 Newtons/dm, wherein the release agent is on one side of the sheet and a pressure sensitive adhesive is on the other side, the pressure-sensitive adhesive on each sheet being in contact with the release agent on an immediately adjacent sheet, and wherein the pressure sensitive adhesive is a normally tacky pressure-sensitive adhesive.

5,202,191

COATED ARTICLE WITH METALLIC FINISH

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 640,467, Jan. 11, 1991, abandoned, which is a continuation of Ser. No. 515,775, Apr. 25, 1990, Pat. No. 4,994,327, which is a continuation of Ser. No. 204,848, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 18,744, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 618,774, Jun. 11, 1984, abandoned, which is a continuation of Ser. No. 384,345, Jun. 2, 1982, abandoned. This application Sep. 30, 1991, Ser. No. 768,347

Claims priority, application Japan, Jun. 19, 1981, 56-95672

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—447 **19 Claims**

1. A coated article with metallic finish which comprises a substrate of a member selected from the group consisting of metals, wood, thermosetting moldings and thermoplastic moldings, a base layer of a paint containing metallic powder on the substrate and a topcoat on the base layer, the topcoat composed mainly of a silyl group-containing vinyl polymer or copolymer having a main chain composed substantially of a vinyl polymer and at least one silicon atom connected to a hydrolyzable group at a terminal or side chain per molecule.

5,202,192

ADHESIVE BLENDS AND MULTI-LAYERED STRUCTURES COMPRISING THE ADHESIVE BLENDS

Philip S. Hope, Stirling, and Peter J. Malley, Clackmannanshire, both of Scotland, assignors to BP Chemicals Limited, London, England

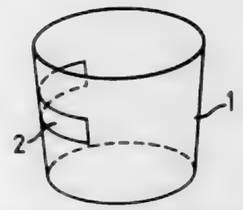
PCT No. PCT/GB90/00769, § 371 Date Dec. 11, 1990, § 102(e) Date Dec. 11, 1990, PCT Pub. No. WO90/14395, PCT Pub. Date Nov. 29, 1990

PCT Filed May 17, 1990, Ser. No. 623,757

Claims priority, application United Kingdom, May 19, 1989, 8911609

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—475.8 **9 Claims**



1. A polyolefin-containing adhesive blend comprising;
(A) 2 to 30 parts by weight of a graft copolymer of a polypropylene backbone grafted with 0.001 to 30% by weight of at least one polymerisable ethylenically unsaturated carboxylic acid or derivative thereof,
(B) 10 to 50 parts by weight of a very low density polyethylene and
(C) 20 to 80 parts by weight of a polypropylene the sum of (A), (B) and (C) being 100 parts by weight.

5,202,193

N-SUBSTITUTED ACRYLAMIDE COPOLYMER

Hideyuki Sumi, Osaka; Hiroshi Hotta, Kyoto; Masabu Kikuta, Tsuzuki; Nario Uejyukkoku; Masashi Takeda, both of Shiga; Osamu Wada, Nagoya; Tomomi Ueda, Kyoto; Toshiaki Doyama, Kusatsu; Shoichi Wakatake, Kyoto, and Kanji Tanaka, Shiga, all of Japan, assignors to Kai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto and Toray Industries, Inc., Tokyo, both of Japan

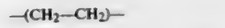
Filed Nov. 26, 1991, Ser. No. 797,868

Claims priority, application Japan, Nov. 28, 1990, 2-331072; Nov. 28, 1990, 2-331073; Nov. 28, 1990, 2-331074; Nov. 28, 1990, 2-331075; Nov. 28, 1990, 2-331076; Nov. 28, 1990, 2-331077; Nov. 28, 1990, 2-331078; Nov. 28, 1990, 2-331079; Nov. 28, 1990, 2-331083; Nov. 28, 1990, 2-331084; Nov. 28, 1990, 2-331085

Int. Cl.[5] B32B *27/34*

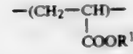
U.S. Cl. 428—479.6 **14 Claims**

12. An electrostatic recording paper comprising paper, a high resistant dielectric layer and an electroconductive layer comprising an olefinic resin containing a linear random N-substituted acrylamide copolymer comprising:
(1) 65 to 99% by mole of ethylene units having the formula (I):



(I)

(2) 1 to 15% by mole of acrylate units having the formula (II):



(II)

wherein R^1 is an alkyl group having 1 to 4 carbon atoms, and

(3) 1 to 35% by mole of acrylamide units having the formula (III)

buffer device and an electrolyte, wherein the electrolyte comprises:

site polarity interleaved with said first group of plates, separator means for separating said plates one from the other, an

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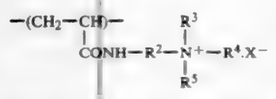
(3) 1 to 35% by mole of acrylamide units having the formula (III):



(III)

wherein R^2 is an alkylene group having 2 to 8 carbon atoms, R^3 and R^4 are the same or different and each is an alkyl group having 1 to 4 carbon atoms, R^5 is an alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 6 to 12 carbon atoms or an alicyclic alkyl group having 6 to 12 carbon atoms, and X is a halogen atom, a group having the formula: CH_3OSO_3— or a group having the formula: $C_2H_5OSO_3$—;

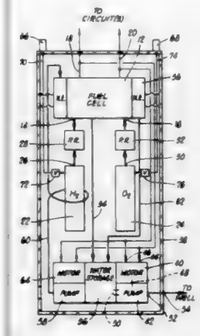
said copolymer having a weight average molecular weight of 1000 to 50000.

5,202,194

APPARATUS AND METHOD FOR PROVIDING ELECTRICAL POWER IN A WELL

Charles F. VanBerg, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 10, 1991, Ser. No. 713,197
Int. Cl.[5] H01M *8/00*
U.S. Cl. 429—13 **24 Claims**



1. A downhole apparatus, comprising:

a tool adapted to be lowered into a well, said tool including at least one electrical circuit requiring electricity; and

a power supply connected to said at least one electrical circuit for providing electricity thereto, said power supply including a fuel cell for generating electricity downhole in the well when said tool and said power supply are disposed in the well.

5,202,195

METHOD OF AND ARRANGEMENT FOR REPLENISHING HYDROGEN CONSUMED BY A FUEL CELL DEVICE

James K. Stedman, and John C. Trocciola, both of Glastonbury, Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Dec. 14, 1990, Ser. No. 628,059
Int. Cl.[5] H01M *8/04, 8/06*
U.S. Cl. 429—17 **6 Claims**

1. An arrangement for replenishing hydrogen consumed in a fuel cell device, comprising

means for confining in an enclosed space having an inlet portion and an outlet portion, a gas-permeable bed of a solid material that releases hydrogen on contact with water in an exothermic reaction;

means for enriching a hydrogen-containing gaseous medium with water at a water addition rate commensurate with a consumption rate at which hydrogen is being consumed in the fuel cell device;

means for passing the water-enriched hydrogen-containing gaseous medium through said bed from said inlet portion to said outlet portion of said enclosed space for the water contained in said water-enriched gaseous medium to exothermically react with said solid material and remove heat from said material bed by convection;

means for supplying said gaseous medium from said outlet portion to the fuel cell device at a supply rate at least equal to said consumption rate; and

means for enhancing the removal of heat from said bed to achieve a heat removal rate sufficient to maintain a temperature differential between said inlet portion and said outlet portion below a level at which local overheating of said bed occurs, including

means for recirculating a portion of said gaseous medium from said outlet portion to said inlet portion, and

means for cooling at least said portion of said gaseous medium that is being recirculated by said recirculating means.

4. A method of replenishing hydrogen consumed in a fuel cell device, comprising the steps of

confining a gas-permeable bed of a solid material that releases hydrogen on contact with water in an exothermic reaction in an enclosed space having an inlet portion and an outlet portion;

enriching a hydrogen-containing gaseous medium with water at a water addition rate commensurate with a consumption rate at which hydrogen is being consumed in the fuel cell device;

passing the water-enriched hydrogen-containing gaseous medium through said bed from the inlet portion to the outlet portion of said enclosed space for the water contained in said water-enriched gaseous medium to exothermically react with said solid material and remove heat from the bed by convection;

supplying said gaseous medium from the outlet portion to the fuel cell device at a supply rate at least equal to the consumption rate; and

enhancing the removal of heat from the bed to achieve a heat removal rate sufficient to maintain a temperature differential between the inlet portion and the outlet portion below a level at which local overheating of said bed occurs, including

recirculating a portion of the gaseous medium from the outlet portion to the inlet portion, and

cooling at least that portion of the gaseous medium that is being recirculated.

5,202,196

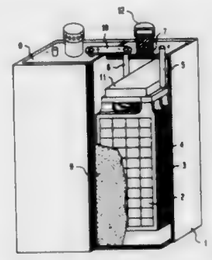
HIGH CAPACITY COLLOIDAL STORAGE BATTERY, A COLLODIAL ELECTROLYTE USED IN IT, AND THE PROCESSES FOR PRODUCING THEM

Lianxiang Wang; Anchen Zheng; Shuo Zheng, and Hang Zheng, all of Room 101, 12 Naner Lane, Changjiang Road, Lushuenkuo District Dalian, China

Filed Apr. 26, 1991, Ser. No. 692,129
Claims priority, application China, Apr. 26, 1990, 90192353.1; Apr. 28, 1990, 90205334.5
Int. Cl.[5] H01M *10/10*
U.S. Cl. 429—86 **17 Claims**

1. A high capacity colloidal storage battery which comprises a battery case, anode plates, cathode plates, isolating plates, a buffer device and an electrolyte, wherein the electrolyte comprises:

a) 3 to 9.9% by weight of silica sol (SiO_2);



b) 48.1 to 75% by weight of sulfuric acid; and

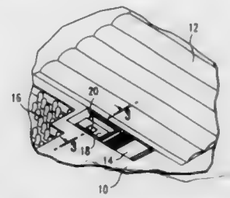
c) 15.1 to 48.9% of water.

5,202,197

DATA PROCESSING DEVICE HAVING AN IMPROVED MANUALLY OPERATED BATTERY EJECT MECHANISM AND A WARNING LIGHT

Daniel F. Ansell, Coral Springs, and Hunter T. Foy, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1991, Ser. No. 778,533
Int. Cl.[5] H01M *2/00*
U.S. Cl. 429—97 **5 Claims**



1. In a battery operated data processing device having a housing and a battery pack mounted therein by a releaseable latch mechanism, a battery eject warning system comprising:

a selectively operated eject button mounted in said housing, said eject button being operative in response to manual actuation thereof to release said latch mechanism allowing said battery pack to be removed from said device;

a manually moveable door mounted on said housing, said door being moveable from a normally closed position in which said eject button is hidden from external view to an open position in which said eject button is exposed for view and for manual actuation thereof;

and selectively activated illuminating means mounted in said housing and providing a light source emanating from said eject button, which source is viewable by a user when said door is open.

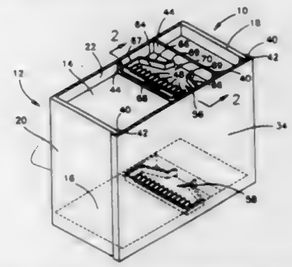
5,202,198

BATTERY CONSTRUCTION AND METHOD OF CONNECTING TERMINALS TO ELECTRODES

Renard E. Mix, Yorktown, and George W. Brutchen, Winchester, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1992, Ser. No. 858,054
Int. Cl.[5] H01M *2/24*
U.S. Cl. 429—160 **7 Claims**

4. A lead-acid storage battery comprising a case having walls of a heat sensitive plastic material, a first group of laterally spaced leady plates having a first polarity mounted in said case, a second group of laterally spaced leady plates of opposite polarity interleaved with said first group of plates, separator means for separating said plates one from the other, an elongated slot through a wall in said case, said plates of said first group each having a lug extending therefrom through said slot to define a file of laterally spaced lugs in said slot, a bed of



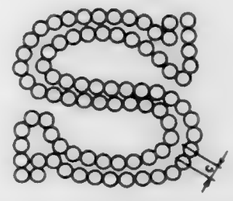
heat-insulating and molten-lead-barrier particulates disposed in said slot and around each of said lugs and a lead plate strap fused to the lugs of each of said groups of plates, said bed serving to insulate said wall from heat and prevent molten lead from entering said container while said plate strap is being fused to said lugs.

5,202,199

BATTERY MARKED WITH IRRADIATED TRACE DOTS

Seiichi Mitzutani; Kazumitsu Jibiki; Koji Arai; Masao Nakamura; Kunihide Miura, all of Osaka, and Fumio Daio, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed Nov. 8, 1991, Ser. No. 789,590
Int. Cl.[5] H01M *2/02, 2/04*
U.S. Cl. 429—176 **3 Claims**



1. A battery with a mental container containing battery system elements, wherein the container is marked by a plurality of irradiated trace dots arranged to provide a desired design, the dots having a diameter of from 30 to 160 μm, a depth of 10 μm or less, a distance between neighboring dots from 20 to 300 μm and neighboring dots do not overlap.

5,202,200

AUTOMOTIVE AND MARINE BATTERY CONVENIENCE POUCH

Alexander McMillan, Jr., 305 Lamport St., Osceola, Ind. 46561, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Jul. 18, 1991, Ser. No. 732,573
Int. Cl.[5] H01M *2/00*
U.S. Cl. 429—187 **5 Claims**

1. An automotive battery convenience pouch comprising:

a) a box-like housing formed of heat resistant thermal retaining material having a bottom wall, a top wall, two side walls and two end walls disposed about an automotive battery to help increase the life span of the automotive battery, said top wall having two apertures therein for

protrusion of two terminals of the automotive battery

5,202,202

5,202,205

TRANSPARENCIES COMPRISING METAL HALIDE OR

developing the electrostatic latent image; and (10) transferring the developed image to a receiver sheet

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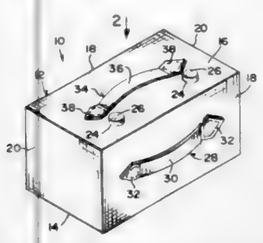
protrusion of two terminals of the automotive battery therethrough;

b) a gripping means disposed on at least one said side wall of said housing so that a person can hold said gripping means to help mount the automotive battery into an awkward position; and

c) a lifting means disposed on said top wall of said of said housing so that a person with one hand can carry said



housing with the automotive battery therein; wherein said heat resistant thermal retaining material comprises:

d) an outer sheet made of nylon;

e) an inner liner made of polyethylene insulation; wherein said gripping means includes at least one handle affixed to at least one said side wall of said housing; wherein said lifting means includes a handle affixed to said top wall of said housing.

5,202,201

COMPOSITE ELEMENT HAVING A TITANIUM CHALCOGENIDE OR OXYCHALCOGENIDE LAYER, MORE PARTICULARLY USABLE AS THE POSITIVE ELECTRODE IN A THIN FILM ELECTROCHEMICAL CELL

Georges Meunier, Labrede; Richard Dormoy, and Alain Levasseur, both of Gradignan, all of France, assignors to Centre National De La Recherche Scientifique, Paris, France

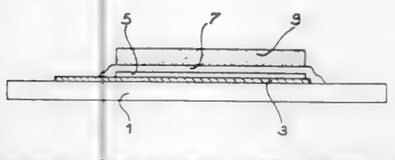
PCT No. PCT/FR89/00568, § 371 Date May 2, 1991, § 102(e) Date May 2, 1991, PCT Pub. No. WO90/05387, PCT Pub. Date May 17, 1990

PCT Filed Nov. 2, 1989, Ser. No. 675,917

Claims priority, application France, Nov. 4, 1988, 88 14435

Int. Cl.[5] C23C *14/34*; H01M *4/58, 6/18*

U.S. Cl. 429—193 **11 Claims**



4. Electrochemical cell having a positive electrode, a negative electrode able to release an alkali metal ion or proton and an ionic conductive electrolyte positioned between the two electrodes, characterized in that the positive electrode is formed by a homogenous, continuous, composite, thin coating of isotropic, X-ray-amorphous material, deposited by cathodic sputtering and in accordance with the formula:

$$TiO_aX_b$$

in which X represents S, Se or Te, and a and b are such that $0.01 \leqq a \leqq 2$, $0.01 \leqq b \leqq 2$ and $2 \leqq a+b \leqq 3$, said coating having a thickness of 200 nm to 10 μm, an amorphous structure and a density lower than that of crystallized TiO_2 or TiS_2, without surface porosity.

5,202,202

CELL COMPRISING POLYANILINE POSITIVE ELECTRODE AND METHOD FOR PRODUCING POLYANILINE POWDER THEREFOR

Ryo Nagai, Hirakata; Hiroshi Hattori, Suita; Hiroyuki Higuchi, Takatsuki, and Masao Abe, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd. and Nitto Denko Corporation, both of Ibaraka, Japan

Filed Jun. 21, 1990, Ser. No. 541,743

Claims priority, application Japan, Jun. 23, 1989, 1-161120; Jul. 12, 1989, 1-179956

Int. Cl.[5] H01M *4/60*

U.S. Cl. 429—193 **7 Claims**

1. A cell comprising a negative electrode made of metal lithium or a lithium alloy, a positive electrode which comprises polyaniline particles which are homogeneously dispersible in a liquid medium selected form the group consisting of water and ethanol by the application of ultrasonic wave and has a main peak around 3.0 V versus a lithium electrode and a sub-peak around 3.6 V versus a lithium electrode with a height ratio of the sub-peak to the main peak being not smaller than 0.25 in a discharge capacity distribution curve in the discharge voltage range between 3.8 V and 2.5 V versus a lithium electrode, and a non-aqueous organic electrolytic solution containing a lithium salt dissolved therein.

5,202,203

CHLOROMETHYL CHLOROSULFATE AS A VOLTAGE DELAY INHIBITOR IN LITHIUM CELLS

Frank M. Delnick, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1991, Ser. No. 680,973

Int. Cl.[5] H01M *6/14, 6/16*

U.S. Cl. 429—196 **17 Claims**

1. A lithium electrochemical cell having an electrolyte mixture comprising chloromethyl chlorosulfate.

5,202,204

PROCESS OF PRODUCING EXPOSURE MASK

Hiroichi Kawahira; Takehiko Gunji, and Satoru Nozawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 536,303

Claims priority, application Japan, Jun. 13, 1989, 1-150289

Int. Cl.[5] G03F *9/00*

U.S. Cl. 430—5 **5 Claims**

1. A process of producing an exposure mask wherein a mask film is formed on a transparent substrate, and then, exposure processing and selective etching processing are performed for the mask film to form a mask pattern of the mask film, comprising the steps of:

determining a ratio of an area of mask film which is to remain after etching to a total area of a mask substrate; and

correcting, during exposure for formation of the mask pattern, a position of the mask pattern by a correction amount that depends on the ratio determined in the preceeding step.

5,202,205

TRANSPARENCIES COMPRISING METAL HALIDE OR UREA ANTISTATIC LAYER

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,577

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.[5] G03C *3/00*

U.S. Cl. 430—17 **43 Claims**

1. A transparent substrate material for receiving or containing an image consisting essentially of a supporting substrate, an ink toner receiving coating composition on both sides of the substrate and comprised of an adhesive layer and an antistatic layer contained on two surfaces of the adhesive layer, which antistatic layer is comprised of metal halides selected from the group consisting of potassium iodide, sodium iodide, lithium bromide, zinc chloride, mercuric chloride, magnesium chloride, and cadmium chloride with polymers containing oxyalkylene segments, or urea compounds with polymers containing oxyalkylene segments.

5,202,206

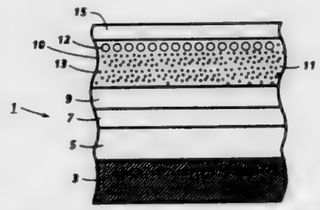
PROCESS FOR SIMULTANEOUS PRINTING OF FIXED DATA AND VARIABLE DATA

Man C. Tam, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1991, Ser. No. 770,819

Int. Cl.[5] G03G *5/04*

U.S. Cl. 430—41 **20 Claims**



1. An imaging process for simultaneous printing of fixed and variable data which comprises, in the order stated, (1) providing a migration imaging member comprising a substrate, a softenable layer comprising a softenable material and migration marking material contained at or near the surface of the softenable layer, and a charge transport material capable of transporting charges of one polarity; (2) uniformly charging the imaging member; (3) exposing the charged imaging member to activating radiation in an imagewise pattern corresponding to the fixed data, thereby forming an electrostatic latent image on the imaging member; (4) thereafter causing the softenable material to soften by the application of heat, thereby enabling the migration marking material exposed to radiation to migrate through the softenable material toward the substrate in an imagewise pattern corresponding to the fixed data; (5) uniformly charging the imaging member to the same polarity as the polarity of the charges that the charge transport material in the softenable layer is capable of transporting; (6) exposing the charged imaging member to activating radiation in an imagewise pattern corresponding to the variable data, thereby creating an electrostatic latent image on the imaging member corresponding to the variable data in areas of the imaging member wherein the migration marking material has not migrated; (7) uniformly charging the imaging member to the polarity opposite to the polarity of the charges that the charge transport material in the softenable layer is capable of transporting; (8) uniformly exposing the charged member to activating radiation, thereby forming an electrostatic latent image corresponding to both the fixed data and the variable data; (9) developing the electrostatic latent image; and (10) transferring the developed image to a receiver sheet.

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ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

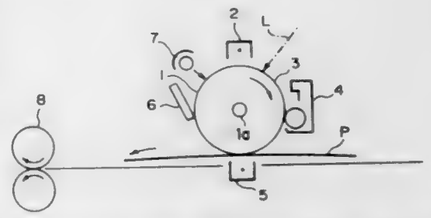
Tetsuro Kanemaru; Shin Nagahara, and Akihiro Sesoo, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,368

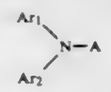
Claims priority, application Japan, Mar. 30, 1990, 2-80800

Int. Cl.[5] G03G *5/06*

U.S. Cl. 430—59 **9 Claims**

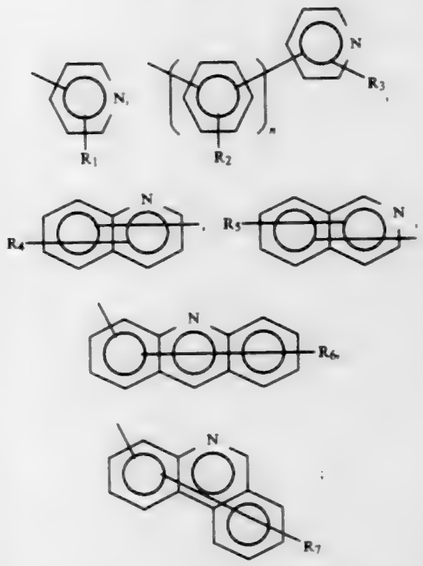


1. An electrophotographic photosensitive member comprising an electroconductive support and a photosensitive layer formed thereon, the photosensitive layer containing a compound represented by the general formula [I] below:



[I]

where Ar_1 and Ar_2 are each an aryl group which may be substituted; and A is a group selected from



where R_1, R_2, R_3, R_4, R_5, R_6, and R_7 are each hydrogen, a

substituted or unsubstituted alkyl group or a substituted or

represents a hydrogen atom, a halogen atom, a cyano group, a

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substituted or unsubstituted alkyl group or a substituted or unsubstituted alkoxy group; and n is an integer of 1 or 2.

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ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1991, Ser. No. 655,606

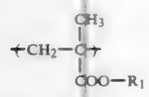
Claims priority, application Japan, Feb. 16, 1990, 2-33954; May 24, 1990, 2-132586

Int. Cl.[5] **G03G** *5/087*

U.S. Cl. 430—96 **13 Claims**

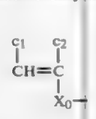
1. An electrophotographic light-sensitive material having a photoconductive layer containing at least an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises (A) at least one AB block copolymer (Resin (A)) having a weight average molecular weight of from 1×10^3 to 2×10^4 and composed of an A block comprising at least one polymer component containing at least one acidic group selected from $—PO_3H_2$, —COOH, $—SO_3H$, a phenolic hydroxy group,

(wherein R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group, and a B block containing at least a polymer component represented by following formula (I):



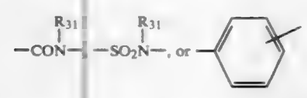
(I)

wherein R_1 represents a hydrocarbon group, and wherein the content of the polymer component containing the acidic group in the AB block copolymer is from 0.5 to 20 parts by weight per 100 parts by weight of the AB block copolymer; and (B) at least one copolymer (Resin (B)) having a weight average molecular weight of not less than 3×10^4 and formed from at least a monofunctional macromonomer (MB) having a weight average molecular weight of not more than 2×10^4 and a monomer represented by the general formula (V) described below, the macromonomer (MB) comprising at least a polymer component corresponding to a repeating unit represented by the general formula (IVa) or (IVb) described below, and the macromonomer (MB) having a polymerizable double bond group represented by the general formula (III) described below bonded to only one terminal of the main chain thereof;

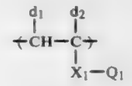


(III)

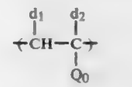
wherein X_0 represents —COO—, —OCO—, $—CH_2OCO—$, —O—, $—SO_2—$, —CO—, —CONHCOO—, —COHN-CONH—, $—CONHSO_2—$,



(wherein R_{31} represents a hydrogen atom or a hydrocarbon group), and c_1 and c_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z_4 or —COO—Z_4 bonded via a hydrocarbon group (wherein Z_4 represents a hydrocarbon group which may be substituted);

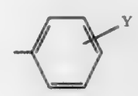


(IVa)

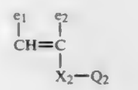


(IVb)

wherein X_1 has the same meaning as X_0 in the general formula (III); Q_1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; d_1 and d_2, which may be the same or different, each has the same meaning as c_1 or c_2 in the general formula (III); and Q_0 represents —CN, $—CONH_2$, or



(wherein Y represents a hydrogen atom, a halogen atom, an alkoxy group, a hydrocarbon group or $—COOZ_3$ (wherein Z_5 represents an alkyl group, an aralkyl group, or an aryl group));



(V)

wherein X_2 has the same meaning as X_1 in the general formula (IVa); Q_2 has the same meaning as Q_1 in the general formula (IVa); and e_1 and e_2, which may be the same or different, each has the same meaning as c_1 or c_2 in the general formula (III).

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TONER AND DEVELOPER COMPOSITIONS WITH SURFACE ADDITIVES

Francoise M. Winnik, Toronto; William Riske, Burlington; Anthony R. Davidson, Agincourt; Paul J. Gerroir, Oakville, and Richard P. N. Veregin, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1991, Ser. No. 782,949

Int. Cl.[5] **G03G** *9/083*

U.S. Cl. 430—106.6 **33 Claims**

1. A toner composition consisting essentially of resin particles, pigment particles, an optional charge enhancing additive component, or components, and a surface additive, or additives comprised of a metal oxide containing a coating thereover of a surfactant; and wherein said additives have a particle diameter of from about 4 to about 100 nanometers, and which additives are prepared by mixing said surfactant and an organic solvent immiscible with water to form a stable microemulsion with water; adding to the mixture formed a solution of a hydrolyzing reagent and water to form a microemulsion of water domains within a continuous phase of the organic solvent; and adding to the microemulsion an oil soluble metal oxide precursor which reacts with the hydrolyzing agent to form in the water domains a metal oxide coated with said surfactant, and wherein said toner particles possess improved flow characteristics and which toner particles have triboelectric characteristics substantially independent of the relative humidity.

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CARRIER FOR MAGNETIC BRUSH DEVELOPER

Hirotaka Matsuoka; Masanori Ichimura, and Masaru Miura, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,834

Claims priority, application Japan, Nov. 22, 1990, 2-316071

Int. Cl.[5] **G03G** *9/107, 9/113*

U.S. Cl. 430—106.6 **6 Claims**

1. A carrier for magnetic brush developer comprising a core material having coated thereon a coated layer containing a graft copolymer comprising a polymer of a nitrogen-containing vinyl monomer or a phosphorus-containing vinyl monomer having a molecular weight of from 1,000 to 5,500 graft-copolymerized thereto a vinyl monomer and wherein the copolymer proportions of said nitrogen- containing vinyl monomer or phosphorus- containing vinyl monomer are from 1 to 10 wt % based on the total amount of said graft copolymer.

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TONER POWDER COMPRISING PARTICLES HAVING A COATING OF FLUORINE-DOPED TIN OXIDE PARTICLES

Gerardus C. P. Vercoulen, EA Velden, and Ronald Groothuijse, SC Sevenum, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Feb. 5, 1991, Ser. No. 650,945

Claims priority, application Netherlands, Feb. 5, 1990, 9000268

Int. Cl.[5] **G03G** *9/08*

U.S. Cl. 430—109 **9 Claims**

1. A toner powder comprising toner particles having electrically conductive material on the surface and/or in an edge zone close to the surface thereof, wherein the electrically conductive material comprises fluorine-doped tin oxide.

5,202,212

TONER COMPOSITION FOR ELECTROPHOTOGRAPHY

Masaaki Shin; Kazuo Hagiwara; Akira Misawa; Kazuo Hisamatsu, and Keiichi Ishikawa, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 640,859, Jan. 14, 1991, abandoned. This application Jul. 29, 1992, Ser. No. 919,387

Claims priority, application Japan, Jan. 16, 1990, 2-4495

Int. Cl.[5] **G03G** *9/087;* **C08F** *20/00*

U.S. Cl. 430—109 **6 Claims**

1. A toner composition for electrophotography comprising, as a principal component, a reaction product of (i) a diisocyanate with (ii) a mixture which comprises:

(a) 20 to 80% by weight of a polyester resin (A) whose number average molecular weight ranges from 1,000 to 5,000, whose glass transition point ranges from 0° to 41° C., whose OH value ranges from 20 to 60 KOHmg/g and which is prepared by polycondensing at least one dicarboxylic acid, at least one diol, and at least on trifunctional alcohol in an amount of from 2 to 10 mole % on the basis of the total amount of starting raw alcohols consisting of at least one diol and at least one trifunctional alcohol; and

(b) 80 to 20% by weight of a polyester resin (B) whose number average molecular weight ranges from 1,000 to 5,000, whose glass transition point ranges from 50 to 90° C. and whose OH value is not more than 5 KOHmg/g.

5,202,213

DEVELOPER WITH SURFACE TREATED SILICIC ACID FOR DEVELOPING ELECTROSTATIC IMAGE

Toshiaki Nakahara, Tokyo; Hirohide Tanikawa, Yokohama; Satoshi Yoshida, Kawasaki; Masatsugu Fujiwara, Yokohama, and Kiichiro Sakashita, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 398,397, Aug. 25, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 823,331

Claims priority, application Japan, Aug. 31, 1988, 63-215162

Int. Cl.[5] **G03G** *9/097*

U.S. Cl. 430—110 **24 Claims**

1. In a developer for developing electrostatic latent images, comprising a mixture of a toner and fine powder of silicic acid; the improvement wherein the fine powder of silicic acid is surface-treated and silicic acid fine powder particles having a size of less than 74 microns are present in amounts of at least 90% based on the total amount of the fine powder of silicic acid in the mixture.

5,202,214

PROCESS OF PRODUCING-ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

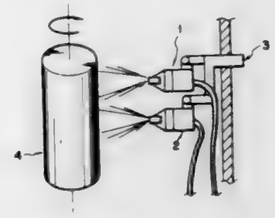
Yoichi Kawamorita, Yokohama; Hisao Maruyama, Kamakura, and Shin Nagahara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,451

Claims priority, application Japan, Dec. 19, 1989, 1-327156

Int. Cl.[5] **G03G** *5/10*

U.S. Cl. 430—133 **9 Claims**



1. A process of producing an electrophotographic photosensitive member which comprises the step of spraying two or more kinds of charge generating materials on an electroconductive support by a coating apparatus in which each of independent spray devices is disposed for each of said charge generating materials, in order to form a photosensitive layer containing said two or more kinds of charge generating materials on said electroconductive support, whereby said electrophotographic photosensitive member is obtained in which said photosensitive layer is formed on said electroconductive support.

5,202,215

METHOD OF PRODUCING A TONER COMPRISING SILICONE CONTAINING ORGANIC RESIN MICROPARTICLES

Akihiro Kanakura, Hirakata; Koichi Fukuda, Suita; Chikayuki Otsuka, Kadoma; Masayuki Maruta, Neyagawa, and Naoya Yabuuchi, Suita, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 7, 1991, Ser. No. 666,667

Claims priority, application Japan, Mar. 7, 1990, 2-56255

Int. Cl.[5] **G03G** *9/087*

U.S. Cl. 430—137 **13 Claims**

1. A process for preparing a toner comprising dispersion-polymerizing a vinyl monomer in the presence of a dispersion polymerization stablizer, a polymerization initiator and silicone-containing organic resin microparticles in a dispersion

medium which dissolves said vinyl monomer, dispersion poly-

having from 1 to 30 carbon atoms, a polycyclic alkyl tive oxide layer one above the other on the second surface of

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medium which dissolves said vinyl monomer, dispersion polymerization stabilizer and polymerization initiator and which does not dissolve said silicone-containing organic resin microparticles and resulting toner particles, wherein the silicone in said silicone-containing organic resin microparticles has a viscosity of 10 to 10,000 cp.

5,202,216

POSITIVE WORKING PHOTOSENSITIVE COMPOSITION

Yoshimasa Aotani; Akira Umehara, both of Shizuoka, and Tsuguo Yamaoka, Funabashi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

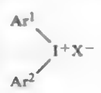
Filed Nov. 5, 1990, Ser. No. 608,801

Claims priority, application Japan, Nov. 13, 1989, 1-294422

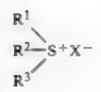
Int. Cl.[5] G03C *1/56, 1/72*

U.S. Cl. 430—176 **17 Claims**

1. A positive working photosensitive composition comprising a polymeric compound insoluble in water but soluble in an aqueous alkaline solution and an aromatic sulfonic acid salt of an onium compound, wherein the aromatic sulfonic acid salt of the onium compound is at least one member selected from the group consisting of the compounds represented by the following general formula (1) or (2):



(1)



(2)

wherein:

Ar^1 and Ar^2 may be the same or different and each represents a substituted or unsubstituted aromatic group,

R^1, R^2 and R^3 may be the same or different and each represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aromatic group, and

X represents an aromatic sulfonic acid anion derived from an acid selected from the group consisting of a condensed polycyclic aromatic sulfonic acid, an anthraquinonesulfonic acid, a phenanthraquinonesulfonic acid, a naphthoquinonesulfonic acid, a sulfonic acid group-containing dye and 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid.

5,202,217

SOLUBILIZATION-INHIBITOR AND POSITIVE RESIST COMPOSITION

Masaaki Todoko, Fujisawa; Takashi Taniguchi, Machida; Toru Seita, Atsugi; Shinji Sato, Machida, and Katuya Shibata, Higashimurayama, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,655

Claims priority, application Japan, Aug. 8, 1989, 1-203856; Sep. 22, 1989, 1-245306; Jan. 23, 1990, 2-11702; Feb. 9, 1990, 2-28566

Int. Cl.[5] G03C *1/52*

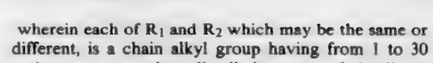
U.S. Cl. 430—191 **7 Claims**

1. A positive resist composition comprising as the main components:

(A) an aromatic group-containing alkali-soluble resin AND

(B) a compound having an ammonium salt skeleton which is acid decomposable and which contains an acid-forming agent which generates an acid when irradiated with active radiation; AND

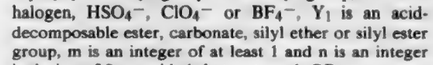
(1) wherein the said ammonium salt is represented by the following formula (I),



(I)

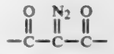
wherein each of R_1 and R_2 which may be the same or different, is a chain alkyl group having from 1 to 30 carbon atoms, a polycyclic alkyl group, a chain alkoxy group, a polycyclic alkoxy group or an allyl group, R_3 is a chain alkyl group having from 1 to 30 carbon atoms, a polycyclic alkyl group or an allyl group, X^- is a halogen, HSO_4^-, ClO_4^- or BF_4^-, Y_1 is an acid-decomposable ester, carbonate, silyl ether or silyl ester group, m is an integer of at least 1 and n is an integer inclusive of 0, provided that $m+n=4$, OR

(2) wherein the said ammonium salt is represented by the following formula (II),



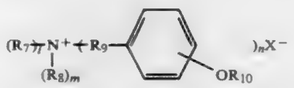
(II)

wherein each of R_4 and R_5 which may be the same or different, is a chain alkyl group having from 1 to 30 carbon atoms, a polycyclic alkyl group, a chain alkoxy group, a polycyclic alkoxy group or an allyl group, R_6 is a hydrogen atom, a chain alkyl group having rom 1 to 30 carbon atoms, a polycyclic alkyl group or an allyl group, X^- is a halogen, HSO_4^-, ClO_4^- or BF_4^-, Y_2 is a radiation-decomposable group of the formula:



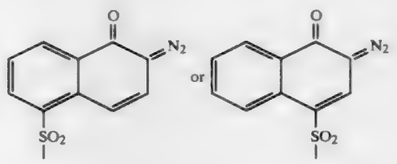
m is an integer of at least 1, and n is an integer inclusive of 0, provided that $m+n=4$, OR

(3) wherein said ammonium salt is represented by the following formula (III),



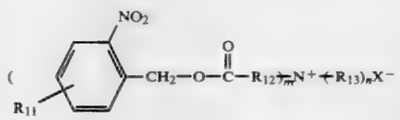
(III)

wherein each of R_7, R_8 and R_9 which may be the same or different, is a chain alkyl group having from 1 to 3 carbon atoms, a polycyclic alkyl group, a chain alkoxy group, a polycyclic alkoxy group or an allyl group, R_{10} is:



X^- is a halogen, HSO_4^-, ClO_4^- or BF_4^-, each of l and m is an integer inclusive of 0, and n is an integer of at least 1, provided that $l+m+n=4$, OR

(4) wherein ammonium salt is represented by the following formula (IV),



(IV)

wherein R_{11} is a hydrogen atom, a chain alkyl group

having from 1 to 30 carbon atoms, a polycyclic alkyl group or a nitro group, R_{12} is a chain alkyl group having from 1 to 30 carbon atoms, a polycyclic alkyl group or an allyl group, R_{13} is a chain alkyl group having from 1 to 30 carbon atoms, a polycyclic alkyl group or an allyl group, X^- is a halogen, HSO_4^-, ClO_4^- or BF_4^-, m is an integer of at least 1, and n is an integer inclusive of 0, provided that $m+n=4$.

5,202,218

SCANNING EXPOSING TYPE LITHOGRAPHIC PRINTING PLATE WITH 1.5 WT. % OF WATER OR LESS

Akio Yoshida; Keisuke Iguchi; Hiroyuki Ishikura, and Hiroshi Nishinoiri, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Mar. 19, 1991, Ser. No. 671,439

Claims priority, application Japan, Mar. 23, 1990, 2-074241; Apr. 3, 1990, 2-088673

Int. Cl.[5] G03C *5/54;* **G03F** *7/06*

U.S. Cl. 430—204 **3 Claims**

1. A lithographic printing plate material for silver complex diffusion transfer process by scanning type exposure which comprises a film support and, provided thereon, at least a silver halide emulsion layer and a surface physical development nuclei layer, wherein water content in the whole lithographic printing plate material including the support is 1.5% by weight or less.

3. A method for making a lithographic printing plate which comprises imagewise exposing the lithographic printing plate of claim 1 or 2 to a scanning type exposure light source and diffusion transfer developing the exposed material in the presence of a silver halide solvent to form a silver image on the physical development nuclei layer.

5,202,219

IMAGE RECEIVING MATERIAL FOR SILVER COMPLEX DIFFUSION TRANSFER WITH UPPERMOST LAYER

Tatsuhito Taniguchi; Hiroaki Nagamatsu; Susumu Baba, and Kazuhiko Sunada, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 681,710

Claims priority, application Japan, Apr. 13, 1990, 2-098653

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—232 **8 Claims**

1. An image receiving material for silver complex diffusion transfer process which comprises a support and, provided thereon, at least an image receiving layer containing physical development nuclei and an uppermost layer containing substantially no physical development nuclei,

wherein the uppermost layer contains at least 0.8 g/m^2 of hydrophilic colloid in terms of solid content;

and wherein ratio of solid content of hydrophilic colloid in the uppermost layer to solid content of hydrophilic colloid in the image receiving layer is more than 1.0;

and wherein the image receiving layer contains substantially no hardener and the uppermost layer contains a hardener.

5,202,220

METHOD OF PRODUCING AN OPTICAL RECORDING MEDIUM WITH A TRANSPARENT CONDUCTIVE LAYER

Gyou-Tae Park, Choongchungnam-Do, and Dong-Soo Lee, Seoul, both of Rep. of Korea, assignors to SKC Limited, Kyongi-Do, Rep. of Korea

Filed Jan. 9, 1992, Ser. No. 818,292

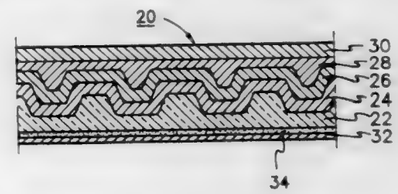
Claims priority, application Rep. of Korea, Mar. 18, 1991, 91-4273; May 20, 1991, 91-8155

Int. Cl.[5] G11B *7/26*

U.S. Cl. 430—276 **5 Claims**

1. In a method of producing an optical recording medium by way of: providing a transparent substrate having first and second opposite surfaces, forming a resin layer and a conductive oxide layer one above the other on the second surface of said substrate, and depositing a recording layer on the first surface of said substrate, the improvement which comprises:

depositing said resin layer on the second surface of said



substrate prior to forming any other layers of the optical recording medium; and, thereafter,

placing said conductive layer over the resin layer, said conductive layer having a light transmittance of no less than 85% and a sheet resistivity of no greater than $10^3\Omega/cm^2$.

5,202,221

LIGHT-SENSITIVE COMPOSITION

Masanori Imai; Noriaki Watanabe, and Kouichi Kawamura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 9, 1989, Ser. No. 433,975

Claims priority, application Japan, Nov. 11, 1988, 63-285404; Nov. 14, 1988, 63-287115; Apr. 13, 1989, 1-93647

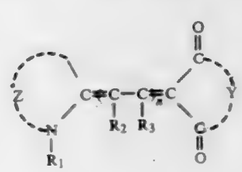
Int. Cl.[5] G03F *7/038;* **G03C** *1/52, 1/60*

U.S. Cl. 430—283 **12 Claims**

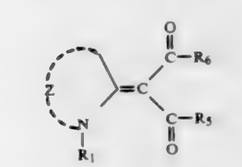
1. A light-sensitive composition which comprises:

(a) a photo-crosslinkable polymer having a maleimido group at a side chain, and

(b) a sensitizer selected from the group consisting of those represented by the following general formulae (I) and (II):



(I)



(II)

wherein Z represents a group of nonmetallic atoms required for forming a heterocyclic nucleus containing a nitrogen atom; Y represents a group of nonmetallic atoms required for forming a ring; R_1 represents a substituted or unsubstituted alkyl group; R_2 and R_3 may be the same as or different from each other and each represents a hydrogen atom, an alkyl group having one to three carbon atoms, or a halogen atom; R_5 and R_6 may be the same or different and each represents an alkyl, aryl or heterocyclic group; and n is an integer of 0 to 4,

wherein said photo-crosslinkable polymer is selected from polymers having, at a side chain, a maleimido group represented by the following general formula (A):

5,202,223

upon a coupling reaction with the oxidized product of a devel-

form a carbocyclic group or heterocyclic ring in Formula (I-2).

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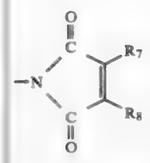
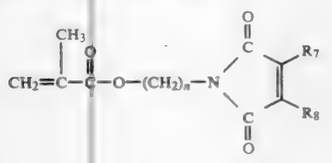
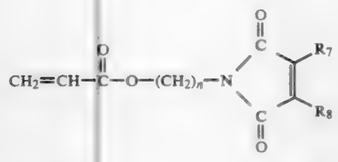


wherein R_7 and R_8 may be the same or different from each other and such represents a hydrogen atom, a halogen atom or an alkyl group, provided that R_7 and R_8 may form a 5-membered or 6-membered ring and which polymer is prepared by copolymerizing a monomer selected from the group consisting of those represented by the following general formulae (B) to (D):

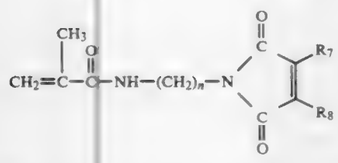
(B)



(C)



(D)



wherein R_7 and R_8 each has the same meaning as those defined above and n is an integer of 1 to 6, with a monomer having an alkali-soluble group in a molecule at a molar ratio of 95/5 to 30/70.

5,202,222

SELECTIVE AND PRECISE ETCHING AND PLATING OF CONDUCTIVE SUBSTRATES

Martin J. Harris, Leominster, and Ivan K. Ho, Marlboro, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Mar. 1, 1991, Ser. No. 663,321

Int. Cl.[5] **G03C** *5/00*

U.S. Cl. 430—315 **22 Claims**

1. A process for plating a lead frame, the lead frame having leads extending from a mounting area on which an integrated circuit or other electronic device can be mounted, the process comprising:

(a) electrophoretically applying a photoresist composition on the lead frame;

(b) exposing and developing the photoresist whereby the top face of the leads are selectively bared of photoresist;

(c) after said exposing and developing of the photoresist, cleaning the top face of the leads that are bared of photoresist to remove essentially all traces of organic substances thereon; and

(d) after said cleaning of the top face of the leads that are bared of photoresist, metal plating the bared top face of the leads.

5,202,223

SILVER HALIDE LIGHT-SENSITIVE FILM MATERIAL SUBJECTED TO ANTISTATIC TREATMENT

Yoshio Shibata; Seiichi Sumi, both of Nagaokakyo, and Akira Furukawa, Tsukuba, all of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Sep. 12, 1991, Ser. No. 758,602

Claims priority, application Japan, Sep. 14, 1990, 2-245654; Sep. 14, 1990, 2-245655; Sep. 14, 1990, 2-245656; Sep. 14, 1990, 2-245657; Sep. 14, 1990, 2-245658; Sep. 14, 1990, 2-245660

Int. Cl.[5] **G03C** *1/76*

U.S. Cl. 430—529 **12 Claims**

1. A silver halide light-sensitive film material which has an electrically conductive polymer layer between a film base and a backcoat layer wherein the electrically conductive polymer is a copolymer of N-methylol(meth)acrylamide and styrenesulfonic acid.

5,202,224

DYE-FORMING COUPLER, A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING SAME, AND A METHOD FOR PROCESSING THE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

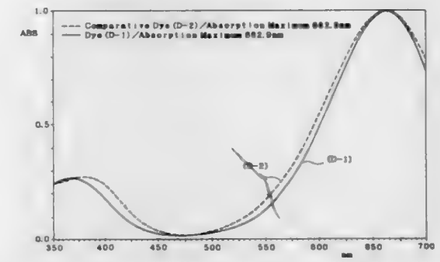
Katsuyoshi Yamakawa, and Hideaki Naruse, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 8, 1991, Ser. No. 638,810

Claims priority, application Japan, Jan. 9, 1990, 2-919

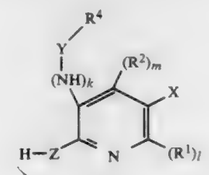
Int. Cl.[5] **G03C** *7/38*

U.S. Cl. 430—558 **18 Claims**



1. A silver halide color photographic material which comprises at least one dye-forming coupler represented by formula (II)

Formula (II)



wherein H—Z— represents an unsubstituted amino group or an aliphatic amino, aromatic amino, or heterocyclic amino group, which may be substituted, R^1 and R^2 each represent an electron-donating group, l and m each are 0 or 1, provided that $l+m \geqq 1$, k is 0 or 1, Y represents —CO— or SO_2—, R^4 represents an aliphatic group, an aromatic group, a heterocyclic group, an amino group, an aliphatic amino group, an aromatic amino group, an aliphatic oxy group, or an aromatic oxy group, and X represents a hydrogen atom, a halogen atom, an aliphatic or aromatic oxy group, an aliphatic or aromatic thio group, an aliphatic or aromatic oxycarbonyloxy group, an aliphatic or aromatic carbonyloxy group, or an aliphatic or aromatic sulfonyloxy group that is capable of being released

upon a coupling reaction with the oxidized product of a developing agent.

7. The silver halide color photographic material as claimed in claim 1, wherein the silver halide color photographic material is a direct positive color photographic material that contains, in it photographic emulsion layer, silver chlorobromide or silver chloride.

5,202,225

SILVER HALIDE PHOTOGRAPHIC MATERIALS WITH REDOX RELEASERS CONTAINING NUCLEOPHILIC GROUPS

Takeshi Nakamine; Takayuki Ito; Naoto Matsuda; Koki Nakamura, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1991, Ser. No. 744,741

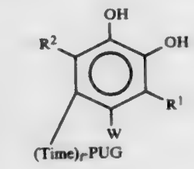
Claims priority, application Japan, Aug. 15, 1990, 2-215626

Int. Cl.[5] **G03C** *5/54, 1/42, 1/06*

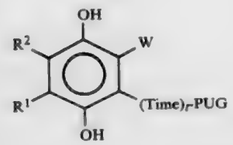
U.S. Cl. 430—566 **5 Claims**

1. A silver halide photographic material comprising a support, having thereon at least one silver halide emulsion layer, wherein there is contained in the silver halide emulsion layer or other hydrophilic colloid layer a compound of which an oxidized form is produced in accordance with development of silver halide and is capable of releasing a photographically useful group by means of a conjugated addition-elimination mechanism due to an intramolecular nucleophilic group attack, wherein said compound is represented by formula (I-1) or (I-2):

General Formula (I-1)



General Formula (I-2)



wherein Time represents a timing group, t represents 0 or 1, PUG represents a photographically useful group,

W represents a nucleophilic group represented by —Y—X—H wherein Y represents a divalent linking group,

X represents

—O—, or —S—, wherein R^3 represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group or an acyl group,

R^1 and R^2 are the same or different and each represents a hydrogen atom, a halogen atom, a cyano group, a carboxyl group, a sulfo group, a nitro group, an alkyl group, an aryl group, an alkylthio group, an arylthio group, an alkoxy group, an aryloxy group, an amino group, an amido group, a sulfonamido group, an alkoxycarbonylamino group, a ureido group, a carbamoyl group, an alkoxycarbonyl group, a sulfamoyl group, a sulfonyl group, an acyl group, a heterocyclic group or -(Time)-PUG and wherein R^1 and R^2 may be joined together to form a carbocyclic group or heterocyclic ring in Formula (I-2).

5,202,226

PROCESS FOR PRODUCING SILVER HALIDE EMULSION

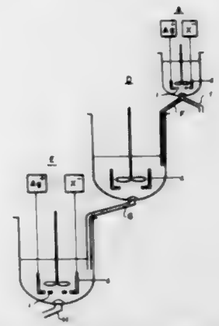
Mitsuo Saitou, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 565,093, Aug. 10, 1990, abandoned. This application Aug. 3, 1992, Ser. No. 921,604

Claims priority, application Japan, Aug. 10, 1989, 1-207513; Jul. 17, 1990, 2-188243

Int. Cl.[5] **G03C** *1/015*

U.S. Cl. 430—569 **12 Claims**



1. A process of producing a silver halide emulsion containing at least a dispersion medium and silver halide grains, which comprises:

carrying out nucleation of the silver halide grains in at least one reaction apparatus having a middle capacity comprising 5 top 500 liters to form a nucleus emulsion,

transferring said nucleus emulsion into an intermediate vessel having a large capacity comprising at least 200 liters maintained at a temperature of from 10° to 45° C., which prevents the nuclei from undergoing further physical ripening and/or crystal growth,

repeating said nucleation and transferring steps twice or more to accumulate a large amount of the nucleus emulsion in the intermediate vessel,

thereafter transferring the nucleus emulsion into a reaction apparatus having a large capacity comprising at least 200 liters, and

carrying out physical ripening and/or crystal growth of the nucleus emulsion in said reaction apparatus having a large capacity,

wherein a ratio y of the capacities of the large capacity reaction apparatus used for physical ripening and/or crystal growth to the middle capacity reaction apparatus is at least 3.

5,202,227

CONTROL OF CELL ARRANGEMENT

Takehisa Matsuda, Minoo; Kazuhiko Inoue, Kobe, and Nobutaka Tani, Osaka, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1990, Ser. No. 531,596

Claims priority, application Japan, Jun. 3, 1989, 1-141964; Jun. 3, 1989, 1-141965

Int. Cl.[5] **G03F** *7/008, 7/00*

U.S. Cl. 430—320 **3 Claims**

1. A process for preparing a cell arrangement control device which consists essentially of applying a photosensitive, cell non-adhesive polymer to a cell adhesive surface, irradiating patternwise the resulting photosensitive cell non-adhesive

polymer layer with a light, and developing the irradiated layer

contacting said stained tissue section with a substrate,

hyrolyzable by protease, containing the following amino

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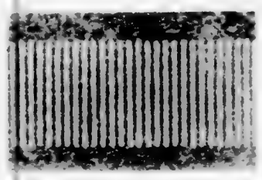
polymer layer with a light, and developing the irradiated layer to leave the irradiated portion on said cell adhesive surface,



thereby providing a pattern of said cell non-adhesive polymer on said cell adhesive surface.

5,202,228

Patent Not Issued For This Number

5,202,229

METHOD FOR FORMING A COLOR PHOTOGRAPHIC IMAGE

Satoru Kuse, and Hiroaki Kobayashi, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,790

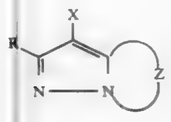
Claims priority, application Japan, Jul. 26, 1990, 2-200209; Jul. 26, 1990, 2-200210

Int. Cl.[5] G03C *5/30, 5/305, 5/31*

U.S. Cl. 430—399 **20 Claims**

15. A method for forming a color photographic image comprising steps of

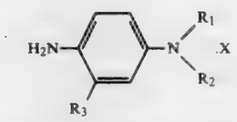
imagewise exposing a silver halide color photographic light-sensitive material which has a silver halide emulsion layer containing silver halide grains having a silver chloride content of not less than 50 mol% and a magenta coupler represented by the following Formula M-I, and the amount of silver coated on said light-sensitive material is not less than 2 g/m^2 in total;



(M-I)

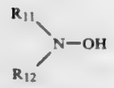
wherein Z is a group of atoms necessary for forming a heterocyclic ring; X is a hydrogen atom or a substituent capable of splitting of upon reaction with the oxidation product of a color developing agent; and R is a hydrogen atom or substituent, and

developing said exposed light-sensitive material with a color developer containing a color developing agent represented by the following Formula I in an amount of from 1×10^{-2} mol to 2×10^{-1} mol per liter, a compound represented by the following formula A or B in an amount of from 0.4 g to 100 g per liter, and a chloride in an amount of from 3.5×10^{-1} mol to 20×10^{-2} mol per liter, and said developer is replenished with a developer replenisher in a ratio of from 20 ml to 700 ml per square meter of said light-sensitive material processed in said developer;



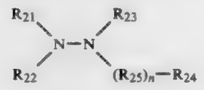
(I)

wherein R_1, R_2 and R_3 are independently a methyl group, an ethyl group, a propyl group, a hydroxyethyl group, a sulfonalkyl group or a β-methanesulfonamidoethyl group, provided that at least one of the groups represented by R_1, R_2 and R_3 is a β-methanesulfonamidoethyl group; X is sulfuric acid, hydrochloric acid, p-toluene-sulfonic acid or phosphoric acid;



(A)

wherein R_{11} and R_{12} are independently a hydrogen atom, an alkyl group, an aryl group or a R′—CO— group, provided that R_{11} and R_{12} are not hydrogen atoms at the same time, R′ is an alkoxy group, an alkyl group or an aryl group, R_{11} and R_{12} may be bonded to form a ring;



(B)

wherein R_{21}, R_{22} and R_{23} are independently a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group; R_{24} is a hydroxyl group, a hydroxyamino group, an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, a carbamoyl group, or an amino group; R_{25} is a —CO— group, a —SO_2— group or a

group; n is 0 or 1; and R_{23} and R_{24} may be bonded to form a ring.

5,202,230

METHODS OF DETECTING CUT CELLS IN A TISSUE SECTION

Louis A. Kamentsky, 180 Beacon St., Apt. #17G, Boston, Mass. 02116

Continuation of Ser. No. 579,049, Sep. 7, 1990, abandoned. This application Jul. 9, 1992, Ser. No. 912,028

Int. Cl.[5] C12Q *1/68;* **C12N** *13/00;* **G01N** *33/48*

U.S. Cl. 435—6 **4 Claims**

3. A method of identifying a sectioned cell in a tissue section comprising

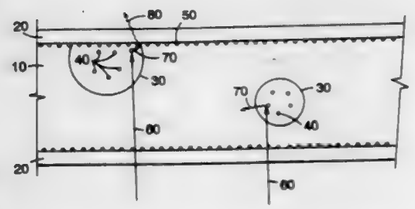
supplying a tissue section,

supplying an energy emitting dye,

staining the cells of said tissue section with said dye,

contacting said stained tissue section with a substrate,

passing light through said substrate parallel to the plane of the tissue section and measuring the emission of light of the wavelength emitted by said dye when said dye is



excited by evanescent light passing through the interface between the substrate and the tissue section, the emission of said light indicating close proximity of said cell to said substrate.

5,202,231

METHOD OF SEQUENCING OF GENOMES BY HYBRIDIZATION OF OLIGONUCLEOTIDE PROBES

Radoje T. Drmanac, Zvecanska 46 11000 , and Radomir B. Crkvenjakov, Bulevar JNA 118, both of Beograd, Yugoslavia 11000

Continuation of Ser. No. 175,088, Mar. 30, 1988, abandoned. This application Jun. 18, 1991, Ser. No. 723,712

Claims priority, application Yugoslavia, Apr. 1, 1987, 570/87

Int. Cl.[5] C12Q *1/68;* **C07H** *15/12;* **G01N** *33/566, 33/48*

U.S. Cl. 435—6 **4 Claims**

1. A method of sequencing a nucleic acid fragment, comprising:

(a) contacting a nucleic acid fragment with a set of oligonucleotide probes of predetermined sequence and length under hybridization conditions that allow differentiation between (i) those probes of said set which are exactly complementary to part of said fragment and (ii) those probes of said set which are not exactly complementary to part of said fragment;

(b) detecting those probes of said set which are exactly complementary to part of said fragment; and

(c) determining the sequence of said fragment from the subset of those probes of said set which are detected as exactly complementary to part of said fragment by compiling their overlapping sequences.

5,202,232

IGA BINDING PROTEIN

Milan Blake; Emil Gotschlich, both of New York, N.Y., and Gregory J. Russell-Jones, E. Roseville, Australia, assignors to The Rockefeller University, New York, N.Y.

Continuation of Ser. No. 217,822, Jul. 12, 1988, abandoned, which is a continuation of Ser. No. 829,708, Feb. 13, 1986, Pat. No. 4,757,134, which is a continuation-in-part of Ser. No. 446,319, Dec. 2, 1982, abandoned. This application Sep. 16, 1991, Ser. No. 759,866

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/535;* **G07K** *13/00*

U.S. Cl. 435—7.1 **4 Claims**

1. A method of detecting a pathogenic *Neisseria meningitides* or *Neisseria gonorrhoeal* infection characterized by the presence of an IgA protein in a body fluid which comprises the steps of:

A. exposing an absorbing surface to a solution of an IgA binding protein which is characterized as having a molecular weight of about 132,000 when determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis, reacting specifically with the Fc portion of the human IgA, hyrolyzable by protease, containing the following amino acids in the residues per 130,000 molecular weight indicated:

Asp	158	Thr	81	Ser	58
Glu	204	Pro	57	Gly	37
Ala	62	Met	18	Val	75
Ile	52	Leu	86	Tyr	23
Phe	27	His	26	Lys	158
		Arg	19		

the N-terminal amino acid sequence, as determined by Edman degradation, being Ser-Lys-Leu-Val-Lys-Asp-Lys-Leu-Val-Lys-Thr-Lys-Glu-, at a pH of from 6 to 11 at ambient temperature to coat the absorbing surface with said binding protein,

B. washing the surface with aqueous isotonic sodium chloride solution containing a non-ionic detergent,

C. exposing the surface to an aqueous solution of IgA at a concentration of 0.2 to 250 ug/ml at pH 5 to 10 thereby to bind the IgA to the binding protein on the absorbing surface,

D. incubate a secretory fluid from the mammal suspected of harboring the infection for 15 minutes to 4 hours at ambient temperature,

E. washing the surface as in step 2,

F. incubating with alkaline phosphate conjugated anti-human light chain serum for at least 30 minutes at ambient temperature,

G. washing the surface as in step 2,

H. incubating with para nitrophenol phosphate in a buffer at a pH of at least 7 for 5 to 60 minutes at ambient temperature, and

I. determining the optical density of the resulting medium at 405 nm.

5,202,233

PROCESS FOR THE DETECTION OF SUBSTANCES WITH HYDROLASE ACTIVITY

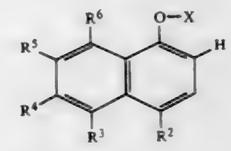
Rupert Herrmann; Hans-Joachim Geder, both of Weilheim; Werner Güthlein; Manfred Kuhr, both of Mannheim, all of Fed. Rep. of Germany; Johann Berger, and Harvey Buck, both of Indianapolis, Ind., assignors to Boehringer Mannheim GMBH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 217,383, Jul. 11, 1988, abandoned. This application Jan. 3, 1992, Ser. No. 816,795

Int. Cl.[5] G01N *33/573*

U.S. Cl. 435—7.4 **9 Claims**

1. In a process for the detection of hydrolase activity by mixing a hydrolase-containing sample with a hydrolase substrate and an oxidizing agent and then evaluating the resultant colour intensity, the improvement which comprises employing as the hydrolase substrate a compound of the formula



(I)

in which

R^2 is C_1–C_4 alkoxy;

each of R^3, R^4, R^5 and R^6, which can be the same or different, is hydrogen; halogen; carboxy; carbamoyl optionally substituted once or twice by acetyl or C_1–C_4 alkyl; sulpho; amino optionally substituted once or twice by acetyl or C_1–C_4 alkyl; C_1–C_4 alkyl; C_1–C_4 alkoxy optionally substituted by halogen or amino; the group

5,202,236

METHOD OF PRODUCING BIOADHESIVE PROTEIN

5,202,238

PRODUCTION OF CHIMERIC ANTIBODIES BY

His, Ile, Lys, Leu, Met, Asn, Pro, Gln, Ser, Thr, Val, Trp, and Tyr, with the proviso that X_{11} is not Asp,

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$$-O-(CH_2CH_2O)_n-R^7$$

in which n is a whole number from 1 to 3 and R^7 is hydrogen, C_1–C_4 alkyl or a radical of formula (I) without the hydrogen atom; aralkoxy having from 6 to 10 carbon atoms in the aryl moiety and from 1 to 4 carbon atoms in the alkyl moiety; C_1–C_4 alkylcarbonyl; or C_1–C_4 alkoxycarbonyl; and

X is a glycosyl residue, a phosphate residue, an acyl residue having from 2 to 20 carbon atoms or an aminoacyl residue of a naturally occurring α-L-amino acid;

or R^3 and R^4 and/or R^5 and R^6 together form a benzene ring; and using no further coupling components.

5,202,234

MYOCARDIAL INFARCTION IMMUNOASSAY

Vipin D. Shah, Saratoga; Shing-Erh Yen, Foster City, both of Calif., and Gerald M. Anchin, Bellaire, Tex., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 76,038, Jul. 21, 1987, Pat. No. 4,900,662. This application Jan. 23, 1989, Ser. No. 299,277

Int. Cl.[5] G01N *33/573;* **A61K** *39/395*

U.S. Cl. 435—7.4 **13 Claims**

1. An immunological method for determining the time of occurrence of an acute myocardial infarction in a patient, wherein infarction is associated with an amount of a first isoform of a creatine kinase enzyme in a body fluid greater than the amount of said first isoform in the fluid prior to infarction, where a first epitope on the first isoform is structurally modified in vivo by loss of a terminal lysine residue after the infarction to form a second epitope on a second isoform of said creatine kinase enzyme and the concentration of the first and second isoforms in the fluid changes in a known pattern with time, wherein said first and second isoforms are selected from the group consisting of CK-Mm isoforms, comprising the steps of:

(1) determining the concentration A of said first isoform in the fluid,

(2) determining the concentration B of said second isoform, wherein one of the first and second determining steps comprises detecting the amount of the first or second isoform in the fluid by specifically binding an antibody to the first epitope on said first isoform or the second epitope on said second isoform in the fluid, and

(3) correlating increase in concentration A and the change in concentration B relative to concentration A to the known pattern of concentration change to determine the time of occurrence of the infarction.

5,202,235

ENZYMATIC METHOD FOR THE SYNTHESIS AND SEPARATION OF PEPTIDES

Guillermo A. Iacobucci, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 897,679, Aug. 18, 1986, Pat. No. 5,037,741. This application Dec. 28, 1990, Ser. No. 635,941

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] C12P *21/02;* **C12N** *11/18;* **C12M** *1/00*

U.S. Cl. 435—68.1 **13 Claims**

1. A method for the enzymatic synthesis of peptides, comprising the steps of:

condensing a N-acyl-β-substituted-L-aspartic acid having an α-carboxylate group with a phenylalanine lower alkyl ester having an α-ammonium group, in an aqueous reaction mixture including a condensation enzyme to form N-acyl-L-aspartyl-(β-substituted)-L-phenylalanine lower alkyl ester) an uncharged peptide; and

transporting the uncharged peptide from the aqueous reaction mixture across an ion rejection membrane into a product mixture.

5,202,236

METHOD OF PRODUCING BIOADHESIVE PROTEIN

Kathy J. Maugh, Walnut, Calif.; David M. Anderson, Rockville; Robert Strausberg, and Susan L. Strausberg, both of Silver Spring, Russ McCandliss, Gaithersburg; Tena Wei, Rockville; David Filpula, Gaithersburg, all of Md., assignors to Enzon Labs Inc., Gaithersburg, Md.

Division of Ser. No. 82,456, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,945, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,128, Sep. 13, 1984, abandoned. This application May 25, 1990, Ser. No. 528,762

Int. Cl.[5] C12P *21/02, 21/06;* **C12N** *15/12, 15/62*

U.S. Cl. 435—69.1 **24 Claims**

1. A method of producing a bioadhesive protein said method comprising:

(a) culturing a transformed microorganism that has been transformed with an expression vector comprising:

(i) a DNA segment encoding the native amino acid sequence of a mussel bioadhesive precursor protein; and

(ii) promoter and transcription initiation signals, operably linked to said DNA segment, which are capable of effecting microbial expression of said bioadhesive precursor protein;

(b) expressing said bioadhesive precursor protein and recovering it from the transformed microorganism; and

(c) hydroxylating and oxidating said bioadhesive precursor protein, said bioadhesive precursor protein being capable of function as a bioadhesive after expression and upon hydroxylation and oxidation.

5,202,237

METHOD OF REGULATING EXPRESSION IN *BACILLUS SUBTILIS* USING OPERATOR DNA

Patrick Dhaese, Drongen, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 175,047, Mar. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 171,941, Mar. 23, 1988, abandoned. This application Mar. 15, 1991, Ser. No. 670,498

Claims priority, application Netherlands, Mar. 30, 1987, 87.00740

Int. Cl.[5] C12N *15/63, 15/75, 15/09*

U.S. Cl. 435—69.1 **3 Claims**

1. A method of regulating the expression of a structural gene in a *Bacillus subtilis* which comprises:

(a) transforming the *Bacillus subtilis* with one or more recombinant plasmids including a plasmid comprising a gene encoding a temperature-sensitive phi 105 repressor and the same plasmid or a second plasmid comprising the structural gene whose expression is to be regulated operably linked to a promoter and phi 105 operator DNA sequence, wherein the phi 105 operator DNA sequence is positioned about 220 bp downstream of the promoter, has no twofold rotational symmetry, is made at least in part by chemical synthesis and is selected from the group consisting of the 14-bp sequence 5'-GACGGAAATACAAG-3', the 14-bp sequence 5'-GTCGGAAATACAAT-3', the 13-bp sequence 5'-GACGAAATTCAAG-3'or the 14-bp sequence 5'-GTCGTGAATACCAT-3'; and p1 (b) growing the transformed *Bacillus subtilis* under low temperature conditions to inhibit expression of the structural gene or under high temperature conditions to allow expression of the structural gene.

5,202,238

PRODUCTION OF CHIMERIC ANTIBODIES BY HOMOLOGOUS RECOMBINATION

H. Perry Fell, Jr., Redmond, and Kim R. Folger-Bruce, Seattle, both of Wash., assignors to Oncogen, Seattle, Wash.

Continuation-in-part of Ser. No. 243,873, Sep. 14, 1988, and a continuation-in-part of Ser. No. 113,800, Oct. 27, 1987, abandoned. This application Jan. 22, 1990, Ser. No. 468,035

Int. Cl.[5] C12P *21/00;* **C12N** *15/00*

U.S. Cl. 435—69.6 **2 Claims**

2. A method for the production of a chimeric antibody molecule, comprising:

(a) culturing a chimeric-antibody-producing cell line which was prepared by transfecting an antibody-producing lymphoid cell line with a first and second target vector, the first vector comprising:

(i) a replacement gene to modify a portion of the genomic sequence of an immunoglobulin heavy chain gene of the lymphoid cell line, and

(ii) a target sequence homologous to a DNA sequence adjacent to the immunoglobulin heavy chain sequence to be modified,

and the second vector comprising:

(i) a replacement gene to modify a portion of the genomic sequence of an immunoglobulin light chain gene of the lymphoid cell line and

(ii) a target sequence homologous to a DNA sequence adjacent to the immunoglobulin light chain sequence to be modified,

such that the first vector modifies the heavy chain gene of the cell line by site specific homologous recombination with genomic chromosomal DNA in vivo and the second vector modifies the light chain gene of the cell line by site specific homologous recombination with genomic chromosomal DNA in vivo, and the chimeric antibody is expressed by the transfected cell line; and

(b) isolating the chimeric antibody molecule from the culture.

5,202,239

EXPRESSION OF RECOMBINANT POLYPEPTIDES WITH IMPROVED PURIFICATION

S. Joseph Tarnowski, Sunnyvale; Sandra Hilliker, Riverside, and W. Scott Willett, San Francisco, all of Calif., assignors to Scios Nova Inc., Mountain View, Calif.

Filed Aug. 7, 1990, Ser. No. 564,259

Int. Cl.[5] C12N *15/62, 15/12*

U.S. Cl. 435—69.7 **8 Claims**

1. A method for producing a purified peptide, said method comprising:

(a) expressing a gene encoding a fusion protein within a host cell, wherein said fusion protein comprises

(i) a carrier protein of about 10 to about 50 kDa which does not contain Glu residues or Asp-Gly sequences as a Staph V8 cleavage site, wherein said carrier protein consists essentially of the sequence:

Asn—Pro—Met—Tyr—Asn—Ala—Val—Ser—Asn—Ala—Asp—Leu—Met—Asp—Phe—Lys—Asn—Leu—Leu—Asp—His—Leu—X_1—X_2—Lys—Met—Pro—Leu—X_3—Asp—X_4—Val—Val—Pro—Pro—Gln—Val—Leu—Ser—X_5—Pro—Asn—X_6—X_7—Ala—Gly—Ala—Ala—Leu—Ser—Pro—Leu—Pro—X_8—Val—Pro—Pro—Trp—Thr—Gly—X_9—Val—Ser—Pro—Ala—Gln—Arg—X_{10}—X_{11}—Gly—Ala—Leu—Gly—Arg—Gly—Pro—Trp—Asp—Ser—Ser—Asp—Arg—Ser—Ala—Leu—Leu—Lys—Ser—Lys—Leu—Arg—Ala—Leu—Leu—Thr—Ala—Pro—Arg—Ser—Leu—Lys—Phe—;

wherein

X_{1-9} are each independently selected from the group consisting of Ala, Asp, Cys, Phe, Gly, His, Ile, Lys, Leu, Met, Asn, Pro, Gln, Arg, Ser, Thr, Val, Trp, and Tyr; and

X_{10} and X_{11} are each independently selected from the group consisting of Ala, Arg, Asp, Cys, Phe, Gly, His, Ile, Lys, Leu, Met, Asn, Pro, Gln, Ser, Thr, Val, Trp, and Tyr, with the proviso that X_{11} is not Asp, and if X_{10} is Asp then X_{11} is not Gly;

(ii) a Staph V8 cleavage site positioned at the C-terminal of said carrier protein; and

(iii) said peptide, not containing a Staph V8 cleavage site, fused to said cleavage site;

wherein said fusion protein exhibits a pI of about 8.0 or greater;

(b) separating said fusion protein from proteins endogenous to said host cell by a process, at least one step of which consists essentially of cation exchange chromatography under conditions wherein said fusion protein is adsorbed to a cation exchange column while proteins endogenous to said host cells are not adsorbed to said column;

(c) eluting said fusion protein;

(d) cleaving said fusion protein at said cleavage site to liberate said carrier protein from said peptide; and

(e) recovering said peptide free from said carrier protein.

5,202,240

PREPARATION OF SPORE FREE, CONCENTRATED PROTEIN PREPARATIONS FROM *BACILLUS THURINGIENSIS* SEROVAR.*ISRAELENSIS*, WHICH IS TOXIC

Hans Zachner; Konrad Bernhard, both of Tuebingen, and Harald Weisser, Rottweil, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 603,784, Oct. 26, 1990, abandoned, which is a division of Ser. No. 22,830, Mar. 6, 1987, Pat. No. 4,996,156. This application Apr. 6, 1992, Ser. No. 864,141

Int. Cl.[5] C12N *1/20, 1/00;* **A61K** *37/10*

U.S. Cl. 435—71.1 **4 Claims**

1. A method for producing a spore-free bacterial insecticide active against insects of the Order Diptera in the larval stage which comprises growing a biologically pure culture of the asporous strain *Bacillus thuringiensis* serovar. *israelensis*, DSM 3439, in a culture medium until the sporangium and prespore lyse, and separating the crystalline toxin from the culture medium.

2. A method for producing a spore-free bacterial insecticide active against insects of the Order Diptera in the larval stage comprising growing a biologically pure culture of the asporous strain *Bacillus thuringiensis* serovar. *israelensis*, DSM 3440, in a culture medium at a temperature below 28° C. until sporulation occurs, and then maintaining the culture at a temperature above 35° C. until the sporangium and vegetative cells lyse, and separating the crystalline toxin from the culture medium.

5,202,241

ANTIBIOTIC GE 2270

Enrico Selva, Via Di Vittorio; Nicoletta Montanini, Via Capuana; Graziella Beretta, Via Belgirate; Beth P. Goldstein, Corso Garibaldi, and Maurizio Denaro, Sporting Mirasole, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Division of Ser. No. 401,278, Aug. 31, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 713,567

Claims priority, application United Kingdom, Sep. 9, 1988, 8821160

Int. Cl.[5] C12P *21/04*

U.S. Cl. 435—71.3 **2 Claims**

1. A process for preparing Antibiotic GE 2270 factor A having the following characteristics, in the non-salt form:

A) ultraviolet absorption spectrum, which exhibits the following absorption maxima:

	$E_{1\ cm}^{1\%}$	Lambda max (nm)
0.1 M HCl		245 (shoulder)
		310
0.1 M KOH		245 (shoulder)
		313

continued

indicates the following composition: carbon, hydrogen,

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-continued

	$E_{1\ cm}^{1\%}$	Lambda max (nm)
Phosphate buffer pH 7.4		245 (shoulder)
		314
Methanol		244 (shoulder)
	265	310

B) infrared absorption spectrum in nujol mull which exhibits the following absorption maxima (cm^{-1}): 3700–3060; 3060–2660 (nujol); 1650; 1590–1490; 1490–1420 (nujol); 1375 (nujol); 1310; 1245; 1210; 1165; 1090; 1060; 1020; 970; 930; 840, 810, 750, 720 (nujol), 700;
The main functional I.R. absorption bands of this spectrum can be attributed as:

ν, (cm^{-1})	Assignment
3600–3100	νNH, νOH
1650	amide I (νC=O)
1545	heterocyclic νC=C and νC=N
1525, 1495	amide II (δNH)
1250, 1205	aromatic δCH
870	heterocyclic γCH
745, 700	aromatic γCH

^{1}H-NMR spectrum which is shown in FIG. 3 and exhibits the following groups of signals (in ppm) at 500 MHz recorded in DMSO-d_6 (hexadeuterodimethylsulfoxide) using TMS as the internal standard (0.00 ppm); the number of protons for each signal is reported between parenthesis:
9.02 (1); 8.68 (1); 8.70 (1); 8.57 (1); 8.50 (1); 8.43 (1); 8.37 (1); 8.26 (1); 8.25 (1); 7.4–7.20 (9); 6.96 (2); 6.02 (1); 5.30–5.18 (3); 5.01 (1); 4.97 (2); 4.80 (1); 4.56 (1); 4.30 (1); 4.26 (1); 3.98 (1); 3.81 (1); 3.79 (1); 3.38 (3); 2.72 (1); 2.58 (3); 2.48 (3); 2.16 (1); 2.13 (1); 1.96 (2); 1.88 (1); 1.34 (1); 0.87 (3); 0.84 (3);
D) ^{13}C-NMR spectrum which is reported in FIG. 4 of the accompanying drawings exhibiting the following groups of signals (ppm) at 125 MHz in DMSO-d_6 with TMS as the internal reference (0.00 ppm), Q means quaternary carbon atoms or C=O groups;
173.69, Q; 171.10, Q; 169.83, Q; 169.51, Q; 168.45, Q; 168.26, Q; 167.84, Q; 165.68, Q; 164.75, Q; 161.40, Q; 161.23, Q; 160.46, Q; 160.29, Q; 159.35, Q; 153.42, Q; 150.31, Q; 150.11, Q; 149.41, Q; 146.93, Q; 144.73, Q; 143.75, Q; 142.10, Q; 141.78, Q; 141.33, CH; 140.97, Q; 139.53, Q; 128.68, CH; 127.99, 2[CH]; 127.67, Q; 127.67, CH; 126.88, CH; 126.76, 2/[CH]; 123.17, CH; 118.66, CH; 116.42, CH; 73.81, CH; 69.41, CH_2; 67.97, CH; 67.36, CH_2; 60.12, CH; 58.63, CH_3; 58.24, CH; 55.41, CH; 48.15, CH; 47.03, CH_2; 41.19, CH_2; 37.60, CH_2; 34.06, CH; 29.76, CH_2; 25.85, CH_3; 24.28, CH_2; 18.49, CH_3; 17.98, CH_3; 11.99, CH_3;
E) retention-time (R_t) of 14.9 min when analyzed by reverse phase HPLC under the following conditions:
column: Ultrasphere ODS (reverse phase silanized silica gel; 5 micrometer) Altex (Beckman) 4.6 mm (i.d.)×250 mm
pre-column: Brownlee Labs RP 18 (octadecylsilane silica gel; 5 micrometer)
eluent A: acetonitrile:18 mM sodium phosphate 70:30 (v/v), adjusted to pH 7.0
eluent B: acetonitrile:18 mM sodium phosphate 10:90 (v/v), adjusted to pH 7.0
elution mode: linear gradient of eluent A in eluent B from 45% to 70% in 20 min
flow rate: 1.8 ml/min
U.V. detector: 254 nm
internal standard: Chloramphenicol (R_t=3.7 min)
F) elemental analysis, after the sample has been previously dried at about 140° C. under inert atmosphere, which indicates the following composition: carbon, hydrogen, nitrogen, sulfur;
G) R_f value of 0.37 in the following chromatographic system: dichloromethane:methanol, 9:1 (v/v) using silica gel plates (silica gel 60F_{254}, Merck Co)
Visualization: U.V. light at 254 nm, yellow spot with iodine vapors or bioautography using *B. subtilis* ATCC 6633 on minimal Davis medium; internal standard: chloramphenicol (Rf 0.56)
H) FAB-MS analysis showing the lowest mass isotope of the protonated molecular ion at m/z 1290.3±0.1 dalton. All other peaks above 800 m/z mass units (not counting isotope peaks) in the spectrum were lower than 20% of the molecular ion, upon analysis with a Kratos MS-50 double focusing mass spectrometer under the following experimental conditions: Xe fast atom bombardment at 6 Kv; glycerol matrix; positive ionization mode
I) an aminoacid analysis of the hydrochloric hydrolysate showing the presence of the following natural aminoacids: glycine, (L)proline and (L)serine, under the following experimental conditions:
the sample is hydrolyzed at 105° C. for 20 hours in the presence of 6N HCl containing 1% phenol and then derivatized in two steps as follows:
a) formation of the n-propyl esters of the carboxylic acid functions with 2M HCl in anhydrous pronapol (90° C., 1 h), and followed by drying under nitrogen;
b) conversion of the free amino groups to amides with pentafluoropropionic anhydride/anhydrous dichloromethane, 1/9 (v/v) at room temperature for 1 h followed by drying under nitrogen;
the derivatized residue so obtained is dissolved in dichloromethane and analyzed by GC-MS using a HP5985B system under the following conditions: column: chiral n-propionyl-L-valine t-butylamide polysiloxane coated fused silica capillary column (25 m×0.2 mm i.d.; C.G.C. ANALYTIC); temperature program 80° C. for 4 min, then 4° C./min
L) Ionization studies
No ionizable functions are detected by titration with 0.1N HCl and 0.1N NaOH in Methylcellosolve/water; a weak basic function is revealed by titration with 0.1N $HClO_4$ in a non-aqueous medium (acetic acid);
M) Specific rotation
[alpha]$_D^{20}$ = +140.8; absolute ethanol, at a concentration of about 5 gr/l,
which comprises cultivating *Planobispora rosea* ATCC 53773 or a GE 2270 producing variant or mutant under submerged aerobic conditions in the presence of assimilable sources of carbon, nitrogen and inorganic salts and recovering the produced antibiotic therefrom.

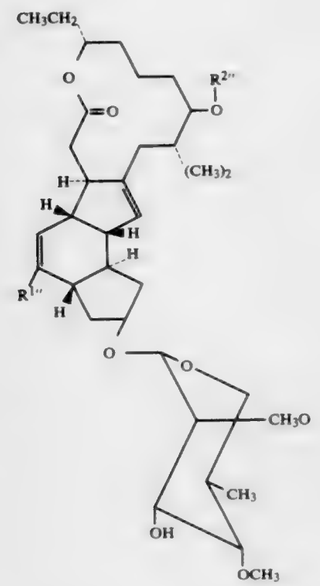
5,202,242

A83543 COMPOUNDS AND PROCESSES FOR PRODUCTION THEREOF

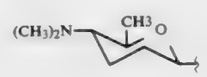
Jon S. Mynderse, Indianapolis; James W. Martin, Coatesville; Jan R. Turner, Carmel; Lawrence C. Creemer, Indianapolis; Herbert A. Kirst, Indianapolis; Mary C. Broughton, Indianapolis, and Mary L. B. Huber, Danville, all of Ind., assignors to DowElanco, Indianapolis, Ind.

Filed Nov. 8, 1991, Ser. No. 790,287
Int. Cl.^{5} C12P *19/62, 19/60;* C12R *1/01*
U.S. Cl. 435—76 **7 Claims**

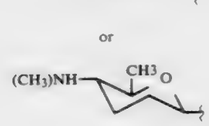
1. A process for preparing a compound of formula 2



wherein
$R^{1''}$ is hydrogen or methyl; and
$R^{2''}$ is a group of formula



or



which comprises culturing, in a suitable culture medium under submerged aerobic fermentation conditions until a recoverable amount of a compound of formula 2 is produced, an A83543J-producing strain of *Saccharopolyspora spinosa* derived from mutants of culture NRRL 18395 and recovering a compound of formula 2 from the culture medium.

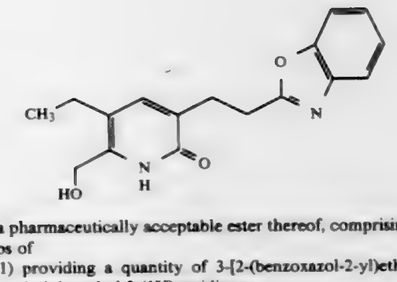
5,202,243

METHOD OF HYDROXYLATING 3-[2-(BENZOXAZOL-2-YL)ETHYL]-5-ETHYL-6-METHYL-2-(1H)-PYRIDINONE BY INCUBATION WITH LIVER SLICES

Suresh K. Balani, Hatfield, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 771,594, Oct. 4, 1991, abandoned. This application Mar. 16, 1992, Ser. No. 852,483
Int. Cl.^{5} C12P *17/16*
U.S. Cl. 435—118 **1 Claim**

1. A method of preparing the compound



or a pharmaceutically acceptable ester thereof, comprising the steps of
(1) providing a quantity of 3-[2-(benzoxazol-2-yl)ethyl]-5-ethyl-6-methyl-2-(1H)pyridinone,
(2) incubating the compound of step 1 with rat liver slices, and
(3) isolating the compound.

5,202,244

PROCESS FOR PRODUCING APHIDICOLIN USING THE MICRORGANISM VERTICILLIUM SP

Tokiyuki Hiramitsu; Atsushi Mouri, and Nobuyoshi Niizama, all of Kitaibaraki, Japan, assignors to Nippon Mektron Limited, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 731,876
Claims priority, application Japan, Aug. 8, 1990, 2-209557
Int. Cl.^{5} C12P *7/02*
U.S. Cl. 435—132 **1 Claim**

1. A process for the production of aphidicolin comprising culturing Verticillium sp. FERM BP-3430 in a nutrient medium containing assimilable sources of carbon and nitrogen until a substantial amount of aphidicolin is produced and recovering the aphidicolin.

5,202,245

Patent Not Issued For This Number

5,202,246

TREATMENT OF IMMOBILIZED MATRICES FOR PREPARATION OF PHARMACEUTICAL AND BIOLOGICAL PRODUCTS WITH ANTI-MICROBIAL AGENTS TO REMOVE PYROGEN-PRODUCING ORGANISMS AND PYROGENS

Robert Kruse; Sudhish Chandra, both of Bourbonnais, and Fred Feldman, Park Forest, all of Ill., assignors to Armour Pharmaceutical Company, Collegeville, Pa.

Continuation of Ser. No. 395,115, Aug. 16, 1989, abandoned. This application Nov. 18, 1991, Ser. No. 798,255
Int. Cl.^{5} C12N *11/00;* C07K *17/02;* B01D *15/08;* A61K *35/14*
U.S. Cl. 435—174 **41 Claims**

1. A method of depyrogenating immobilized matrices comprising the steps of:
contacting the immobilized solid matrix with a pyrogen inactivating aqueous solution for a time sufficient to inactivate pyrogen producing microorganisms and pyrogenic substances, said pyrogen inactivating aqueous solution consisting of about 0.1M to 1.5M of an inorganic salt selected from the group consisting of sodium chloride, potassium chloride, calcium chloride, barium chloride and magnesium chloride, and about 0.15M to 1.0M of an organic acid selected from the group consisting of saturated and unsaturated fatty acids having from 1 to 10 carbon atoms; and
washing said immobilized solid matrix with a buffer solution having a pH of about 6.0 to 8.0.

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5,202,247

CELLULOSE BINDING FUSION PROTEINS HAVING A SUBSTRATE BINDING REGION OF CELLULASE

Douglas G. Kilburn; Robert C. Miller; Richard A. J. Warren, and Neil R. Gilkes, all of Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada

Division of Ser. No. 216,794, Jul. 8, 1988, Pat. No. 5,137,819. This application Oct. 25, 1990, Ser. No. 603,987

Int. Cl.[5] C12N *9/14, 11/12, 15/00;* **C12P** *21/00*

U.S. Cl. 435—195 **8 Claims**

1. A hybrid protein comprising a polypeptide and an amino acid sequence having a substrate binding region of a cellulase with the proviso that said substrate binding region is essentially lacking in cellulase activity, wherein said polypeptide is fused to said substrate binding region.

5,202,248

METHOD FOR CLONING AND PRODUCING THE NCO I RESTRICTION ENDONUCLEASE AND METHYLASE

Elizabeth M. VanCott, Malden, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.

Filed Nov. 2, 1990, Ser. No. 608,228

Int. Cl.[5] C12N *9/22, 15/55*

U.S. Cl. 435—199 **6 Claims**

1. Isolated DNA coding for the NcoI restriction endonuclease, wherein the isolated DNA is obtainable from the vector pEV19OR612-22C-29.

5,202,249

XYLANASE FOR BIOBLEACHING

Dieter Kluepfel, Montreal; Rolf Morosoli, Ville St-Laurent, and Francois Shareck, Dollard-des-Ormeaux, all of Canada, assignors to Imperial Chemical Industries PLC, London, Great Britain

Filed Aug. 13, 1991, Ser. No. 744,570

Int. Cl.[5] C12N *9/26*

U.S. Cl. 435—201 **10 Claims**

1. An isolated and purified high-activity endo-xylanase which has a specific activity of greater than 5,000 IU/mg of purified protein, an apparent Mr of 22,000 daltons as measured by SDS polyacrylamide gel electrophoresis, and a pI greater than 10.5 and which is obtained from a strain of the species *Streptomyces lividans*, or from a recombinant microorganism produced by the introduction of a hybrid plasmid into a host microorganism mutant strain of the genus Streptomyces, said hybrid plasmid being constructed by the insertion of a xylanase gene, denoted as xln C, obtained from a xylanase gene-containing microorganism of the species *Streptomyces lividans*, into a vector plasmid.

5,202,250

METHOD FOR ISOLATION AND PURIFICATION OF AMYLASES, AND ADSORBENTS USED FOR THE SAME AS WELL AS DEVICES FOR THE ISOLATION AND PURIFICATION

Masahiko Ishida; Ryoichi Haga; Yuusaku Nishimura, all of Hitachi, and Masami Satoh, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 104,984

Claims priority, application Japan, Oct. 6, 1986, 61-236147

Int. Cl.[5] C12N *9/26, 9/28, 9/30;* **B01J** *20/00*

U.S. Cl. 435—201 **3 Claims**

1. A method for isolation and purification of one or both of microorganism-derived glucoamylase and microorganism-derived β-amylase which comprises the steps of:

contacting a crude enzyme aqueous solution containing one or both of microorganism-derived glucoamylase and microorganism-derived β-amylase with a three-dimensional, cross-linked high molecular weight substance which is obtained by cross-linking an α-1,4-linked glucose homooligomer intermolecularly by use of an epilialogen or by cross-linking intermolecularly or intramolecularly and intermolecularly glycogen or amylopectin having branched chains which have been previously treated with an amylase to shorten the branched chains, thereby to adsorb one or both of the microorganism-derived glucoamylase and microorganism-derived β-amylase forming a hydrated gel;

separating from said solution said hydrated gel of the three-dimensional, cross-linked high molecular weight substance to which one or both of microorganism-derived glucoamylase and microorganism-derived β-amylase have been adsorbed;

contacting said hydrated gel with a weakly alkaline aqueous salt solution of at least 0.5M to desorb and or both of said adsorbed microorganism derived glucoamylase and microorganism derived β-amylase amylase; and

recovering one or both of said desorbed microorganism derived glucoamylase and microorganism-derived β-amylase.

5,202,251

MONOCOT-SPECIFIC MONOCLONAL ANTIBODIES AGAINST ACETOHYDROXYACID SYNTHASE

Bijay K. Singh, Hamilton Square; Bosco S. Wang, Cranbury, and Araceli L. Lumanglas, Jersey City, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 3, 1990, Ser. No. 560,677

Int. Cl.[5] C12N *5/20, 15/02;* **C07K** *15/28;* **C12P** *21/08*

U.S. Cl. 435—240.27 **3 Claims**

1. A monoclonal antibody produced by immunization with a peptide having the amino acid sequence Trp-His-Asp-Glu-Leu-Asp-Gln-Gln-Asp-Arg-Glu-Phe-Pro-Leu-Gly, wherein said monoclonal antibody specifically binds to Acetohydroxyacid Synthase (AHAS) produced by monocotyledonous plants.

5,202,252

MONOCLONAL ANTIBODIES AGAINST LENS EPITHELIAL CELLS AND METHODS FOR PREVENTING PROLIFERATION OF REMNANT LENS EPITHELIAL CELLS AFTER EXTRACAPSULAR EXTRACTION

Jared M. Emery, Houston; Dominic M-K Lam, and Peter J. Kelleher, both of The Woodlands, all of Tex., assignors to Houston Biotechnology Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 905,735, Sep. 9, 1986, abandoned, which is a continuation of Ser. No. 472,795, Mar. 7, 1983, abandoned, which is a division of Ser. No. 355,081, Mar. 5, 1982, Pat. No. 4,432,751. This application Jun. 14, 1988, Ser. No. 206,610

Int. Cl.[5] C12N *5/12;* **C07K** *15/28*

U.S. Cl. 435—240.27 **17 Claims**

1. A composition comprising:

a hybridoma cell culture producing monoclonal antibodies which bind specifically to lens epithelial cells and have low or no cross reactivity with other cells found in the anterior segment of the eye and which activate complement.

5,202,253

MONOCLONAL ANTIBODY SPECIFIC FOR PROTEIN C AND ANTIBODY PURIFICATION METHOD

Charles T. Esmon, and Naomi L. Esmon, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation of Ser. No. 292,447, Dec. 30, 1988, abandoned. This application Jul. 12, 1991, Ser. No. 730,040

Int. Cl.[5] C12N *5/20, 15/02;* **C07K** *15/28, 3/20*

U.S. Cl. 435—240.27 **5 Claims**

1. A calcium dependent monoclonal antibody specific for an epitope in the activation peptide region of the heavy chain of Protein C and calcium, produced by the hybridoma cell line HPC-4 deposited with the American Type Culture Collection, Rockville, Md., on Nov. 2, 1988, and assigned accession No. HB 9892.

5,202,254

PROCESS FOR IMPROVING MASS TRANSFER IN A MEMBRANE BIOREACTOR AND PROVIDING A MORE HOMOGENEOUS CULTURE ENVIRONMENT

Bruce P. Amiot, Roseville, Minn.; Martin H. Banas, Modesto, Calif.; Allen S. Reichler, Indianapolis, Ind., and Scott T. Waniger, Andover, assignors to Endotronics, Inc., Minneapolis, Minn.

Filed Oct. 11, 1990, Ser. No. 595,939

Int. Cl.[5] C12N *5/00, 5/02;* **C12M** *1/18*

U.S. Cl. 435—240.242 **4 Claims**

1. A process for improving mass transfer between a liquid source medium and a liquid medium containing cells in a membrane bioreactor comprising:

circulating the liquid media through at least one bioreactor having at least one semi-permeable membrane and simultaneously circulating the second liquid media inoculated with a cell culture through said at least one bioreactor on the opposite side of said membrane.

5,202,255

Patent Not Issued For This Number

5,202,256

BIOADHESIVE PRECURSOR PROTEIN EXPRESSION VECTORS

Kathy J. Maugh, Walnut, Calif.; David M. Anderson, Rockville, Md.; Robert Strausberg; Susan L. Strausberg, both of Silver Spring, Md.; Russ McCandliss, Gaithersburg, Md.; Tena Wei, Rockville, Md., and David Filpula, Gaithersburg, Md., assignors to Enzon Labs, Inc., Gaithersburg, Md.

The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.

Division of Ser. No. 530,449, May 30, 1990, Pat. No. 5,049,504, which is a continuation of Ser. No. 82,456, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,945, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,128, Sep. 13, 1984, abandoned. This application Aug. 16, 1991, Ser. No. 745,695

Int. Cl.[5] C12N *01/19, 01/21, 15/81, 15/12*

U.S. Cl. 435—252.3 **16 Claims**

1. A vector expression of a bioadhesive precursor protein comprising:

(a) a DNA segment encoding the native amino acid sequence of a bioadhesive precursor protein of a mussel;

(b) promoter and transcription initiation signals, operably linked to said DNA segment, which are capable of effecting microbial expression of the bioadhesive precursor protein, wherein said promoter is a GAL1-MF-alpha 1 hybrid promoter.

5,202,257

ISOLATED NUCLEIC ACIDS ENCODING GLUTAMATE RECEPTOR PROTEIN

Stephen F. Heinemann, La Jolla; James R. Boulter, San Diego; Michael Hollmann, Del Mar; Bernhard Bettler, Solana Beach, and Jan E. Jensen, San Diego, all of Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation of Ser. No. 6,153, Sep. 13, 1984, which is a continuation-in-part of Ser. No. 428,116, Oct. 27, 1989. This application Jun. 21, 1991, Ser. No. 718,575

Int. Cl.[5] C12N *15/12, 15/63*

U.S. Cl. 435—252.3 **14 Claims**

1. Substantially pure DNA capable of hybridizing with at least one polynucleotide selected from GluR1 (Sequence ID No. 1), GluR2 (Sequence ID No. 3), GluR3 (Sequence ID No. 5), GluR4 (Sequence ID No. 7), GluR5 (Sequence ID No. 9), GluR6 (Sequence ID No. 11), or GluR7 (Sequence ID No. 13) under low stringency hybridization conditions, said DNA encoding protein characterized as having electrophysiological and pharmacological properties of at least one glutamate receptor subtype selected from the N-methyl-D-aspartate (NMDA) subtype, the α-amino-3-hydroxy-5-methyl-isoxasole-4-propionic acid (AMPA) subtype, the kainate (KA) subtype, or the 2-amino-4-phosphonobutyrate (APB) subtype.

5,202,258

IMMUNOSUPPRESSANT-PRODUCING CULTURE

Shieh-Shung T. Chen, Morganville; Byron H. Arison, Watchung; George M. Garrity, Westfield; Edward S. Inamine, Rahway, all of N.J.; Sagrario Mochales, Madrid, Spain, and Linda S. Wicker, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 637,998, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 229,365, Aug. 5, 1988, abandoned. This application Mar. 9, 1992, Ser. No. 847,873

Int. Cl.[5] C12N *1/20;* **C12R** *1/045*

U.S. Cl. 435—252.6 **1 Claim**

1. A biologically pure culture of Actinoplanacete sp., (MA 6559) ATCC No. 53771.

5,202,259

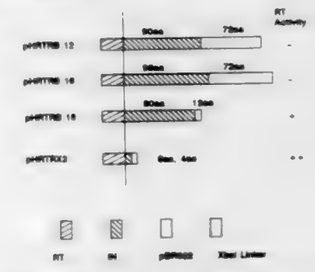
EXPRESSION OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) REVERSE TRANSCRIPTASE

Stephen P. Goff, Tenafly, N.J., and Naoko Tanese, Berkeley, Calif., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 865,156, May 20, 1986, abandoned. This application Dec. 28, 1988, Ser. No. 291,125

Int. Cl.[5] C12N *1/21, 9/12, 15/10*

U.S. Cl. 435—252.33 **3 Claims**



1. A plasmid identified as pHRTRX2 and deposited in *E. coli* HB101 under ATCC Accession No. 67828.

5,202,260

RESOLUTION OF α-TERTIARY CARBOXYLIC ACID ESTERS USING LIPASE FROM *CANDIDA LIPOLYTICA*

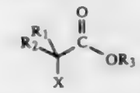
Christopher Yee, Needham; Todd A. Blythe, Boston, and Alan E. Waits, Reading, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Filed May 8, 1991, Ser. No. 697,152

Int. Cl.[5] C12P *7/40*

U.S. Cl. 435—280 **18 Claims**

1. A method of separating the enantiomers of racemic carboxylic acid esters of general formula



wherein R_1 represents alkyl, substituted alkyl, arylalkyl or substituted arylalkyl; R_2 represents alkyl or substituted alkyl;

R_3 represents an alkyl moiety having from 1 to 8 carbon atoms,

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longitudinally along the radially projecting marginal

5,202,266

25-HYDROXY VITAMIN D_3 DERIVATIVES, PROCESS

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R_3 represents an alkyl moiety having from 1 to 8 carbon atoms, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, arylalkyl or substituted arylalkyl; and X represents amino, alkylamino, arylalkylamino, acylamino, hydrazino, alkylhydrazino, arylalkylhydrazino, arylhydrazino, acylhydrazino, hydroxyl, or alkoxy, provided that R_1, R_2 and X are different from each other, by the enzymatic hydrolysis of one by the (S)-enantiomer of the ester, said method comprising contacting the racemic ester in an aqueous medium with an enzyme obtained from *Candida lipolytica* to hydrolyze from about 5% to about 95% of the ester, and separating the hydrolysis product from the unreacted starting material.

5,202,261

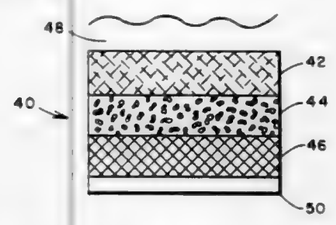
CONDUCTIVE SENSORS AND THEIR USE IN DIAGNOSTIC ASSAYS

Matthew K. Musho, Elkhart; J. Oakey Noell, and Pius H. Tse, both of Mishawaka, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 554,393, Jul. 19, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 793,180

Int. Cl.[5] C12M *1/40, 1/34*; G01N *27/26*

U.S. Cl. 435—288 **21 Claims**



1. A conductive sensor for assaying a test sample for the presence or concentration of glucose, said conductive sensor comprising:

a) a semipermeable membrane capable of effectively separating cellular material and interfering components from a test sample and capable of allowing glucose to permeate through the semipermeable membrane at a uniform rate said semipermeable membrane having a diffusion constant for glucose in the range of from about 1×10^{-9} cm^2/sec to about 5×10^{-8} cm^2/sec and a diffusion constant for molecular oxygen in the range of from about 5×10^{-7} cm^2/sec to about 5×10^{-6} cm^2/sec and having a thickness of from about 3μ to about 15μ;

b) a layer of a host matrix in contact with the semipermeable membrane and permeable to the glucose, said hose matrix layer having homogeneously incorporated therein glucose oxidase, a compound having peroxidase activity and a dopant compound precursor, wherein the glucose, the glucose oxidase, the compound having peroxidase activity and the dopant compound precursor interact to form a dopant compound;

c) a layer of a polymer in its reduced form which demonstrates an increase in electrical conductivity when it is converted to its oxidized form in contact with the host matrix layer such that at least a portion of the dopant compound generated in the host matrix layer migrates to and oxidatively dopes the polymer layer to thereby increase the conductivity of this layer; and

d) means operatively connected to the polymer layer for measuring a change in conductivity of polymer layer.

5,202,262

APPARATUS FOR MICROBIOLOGICAL TESTING OF LIQUIDS

Jean Lemounier, Le Vesinet, France, assignor to Millipore Corporation, Bedford, Mass.

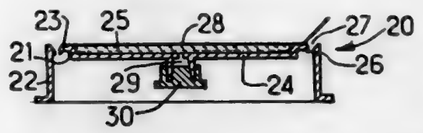
Continuation of Ser. No. 204,649, Jul. 25, 1988, abandoned, which is a division of Ser. No. 691,687, Jan. 15, 1985, Pat. No. 4,773,137. This application Sep. 29, 1989, Ser. No. 414,991

Claims priority, application France, Jan. 31, 1984, 84 01470

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] C12M *1/16*

U.S. Cl. 435—299 **4 Claims**



1. A container for receiving a culture medium to be used for microbiological testing of a liquid sample which comprises

a first cylindrical element having a hollow portion for receiving said medium, said hollow portion being formed from a bottom portion and a first cylindrical wall, said first cylindrical wall having a first top surface,

a second cylindrical element surrounding and being concentric with said first cylindrical element, said second cylindrical element having a second top surface and a second cylindrical wall being slightly conical in a direction away from said first cylindrical wall,

a circular planar connection crown connecting said first top surface of said first cylinder wall and said second top surface of said second cylinder wall, said crown having at least one axial hole extending through said crown,

said first cylindrical wall and said second cylindrical wall extending in the same direction away circular planar connection,

said hollow portion being sealed at said first top surface by a removable element without sealing said at least one axial opening and

said bottom portion of said hollow portion including a sealable opening.

5,202,263

STEEPING VATS FOR MALTHOUSES

Karl L. Becker, and Francesco Beldevere, both of Madrid, Spain, assignors to Seeger Industrial, S.A., Madrid, Spain and Inamex de Cerveza y Malta, S.A. de C.V., Texoco, Mexico

Filed Apr. 16, 1991, Ser. No. 686,421

Claims priority, application Spain, Apr. 27, 1990, 9001227

Int. Cl.[5] C12C *1/00*

U.S. Cl. 435—306 **6 Claims**

4. In a malthouse having a floorage area for steeping or pregermination of a product, a central column in said malthouse, and arm rotatably mounted on said column and extending radially outwardly therefrom for dispensing the product to said floorage area or gathering the product therefrom; wherein the improvement comprises:

a plurality of hollow upright members disposed vertically within said malthouse, each of said upright members having an upper end and a lower end;

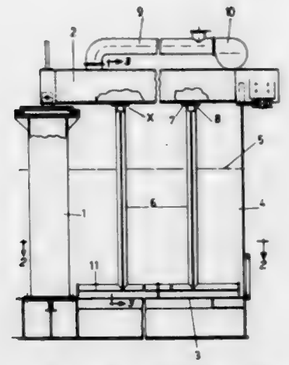
a plurality of hollow elongated head members disposed horizontally within said malthouse and positioned above and adjacent to said floorage area, said head members being axially aligned to each other and projecting in a direction radially outwardly from said central column;

each of said head members having air exit slots extending

longitudinally along the radially projecting marginal edges of said members;

the upper ends of said upright members being connected to said arm to provide internal communication therebetween;

the lower end of each of said upright members being connected to each associated head member to provide internal communication therebetween;



said head members being connected to said arm via said upright members for conjoint rotation with said arm; and

means for conveying air under pressure internally to said arm;

whereby compressed air conveyed internally to said arm is transmitted to said head members via said upright members and exits from said head members via said exit slots in a circumferentially sweeping motion relative to said floorage area upon rotation of said arm.

5,202,264

ELISA USING MULTI-SPECIES ANTIBODIES FOR DETECTION OF VON WILLEBRAND FACTOR IN MULTIPLE SPECIES

Roger E. Benson, Albany; James L. Catalfamo, South Bethlehem, both of N.Y., and W. Jean Dodds, Santa Monica, Calif., assignors to Health Research, Incorporated, Albany, N.Y.

Continuation-in-part of Ser. No. 428,161, Jan. 11, 1990. This application Oct. 26, 1990, Ser. No. 604,885

The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.

Int. Cl.[5] G01N *33/53, 33/543*; C07K *15/02, 15/28*

U.S. Cl. 435—7.94 **82 Claims**

1. An antibody directed to von Willebrand factor antigen characterized by being capable of factor antigen, the epitope being evolutionarily conserved among vertebrate species.

5,202,265

TONER TAGGANT PROCESSES

Karen L. LaMora, Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1991, Ser. No. 782,171

Int. Cl.[5] C01N *21/75, 31/22, 33/26*

U.S. Cl. 436—56 **24 Claims**

24. A process for the authentication of toner compositions which comprises adding said toner containing an alkali metal carbonate, or an alkali metal bicarbonate to an acid thereby causing effervescence.

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25-HYDROXY VITAMIN D_3 DERIVATIVES, PROCESS FOR THEIR PRODUCTION, AND ASSAY METHOD USING THE SAME

Nobuaki Nakagawa; Shigeru Ikuta, and Miyuki Tanabe, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 258,017, Oct. 14, 1988, Pat. No. 5,075,465. This application Jul. 22, 1991, Ser. No. 733,628

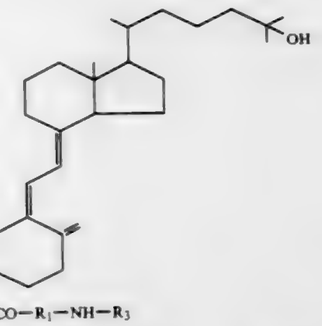
Claims priority, application Japan, Oct. 14, 1987, 62-258584; Aug. 25, 1988, 63-211364

Int. Cl.[5] G01N *33/537*

U.S. Cl. 436—501 **4 Claims**

2. An assay method for 25-hydroxy vitamin D_3 in a specimen, which comprises the following steps:

adding to a specimen containing 25-hydroxy vitamin D_3 a radioisotope iodine-labeled 25-hydroxy vitamin D_3 derivative of the formula



wherein R_1 is $C_{1\text{-}10}$ alkylene and R_3 is a radioisotope iodine labeled residue selected from the group consisting of 3-(4-hydroxy-3-iodo [^{125}I] phenyl)propionyl, 3-(3,5-diiodo [^{125}I]-4-hydroxyphenyl) propionyl, 2-(4-hydroxy-3-iodo [^{125}I] phenyl) acetyl, 2-(3,5-di-iodo [^{125}I]-4-hydroxyphenyl) acetyl, 2-iodo [^{125}I] acetyl, 4-iodo [^{125}I] benzoxymethyl carbonyl and N-substituted-3-iodo [^{125}I] tyrosine residue;

adding to the mixture thus formed a vitamin D binding protein (hereinafter designated as DBP);

separating the thus-generated bound form of radioisotope iodine-labeled 25-hydroxy vitamin D_3 derivative-DBP and unreacted free form of radioisotope iodine labeled 25-hydroxy vitamin D_3 derivative; and

measuring the amount of labeled radioisotope iodine in a bound or free form.

5,202,267

SOL CAPTURE IMMUNOASSAY KIT AND PROCEDURE

Charles C. Ditlow, Brockton; L. Edward Cannon, Wayland; Francis X. Cole, Stow; Gene A. Davis, Lexington; Eric C. Sigillo, Meuthen, and Alicia G. Danti, Billerica, all of Mass., assignors to Hygeia Sciences, Inc., Newton, Mass.

Filed Apr. 4, 1988, Ser. No. 177,114

Int. Cl.[5] G01N *33/553*

U.S. Cl. 436—525 **90 Claims**

1. In a process for the determination and detection of an immunologically reactive analyte in a urine sample, which process includes the steps of (a) providing a labelled component comprising the coupling product of a first immunologically reactive substance and a colored particle of a first color, (b) providing a solid phase component comprising the coupling product of a second immunologically reactive substance and a solid phase particle, (c) forming a mixed aqueous suspension of said components and which contains a urine sample to be analyzed for analyte, said substances being capable of bind-

ing directly or indirectly as a function of the presence of said

whereby liquid deposited at the sample site is transferred to the

R is a linking group including up to 4 heteroatoms and

providing a body of semiconductor material including at least one planar surface;

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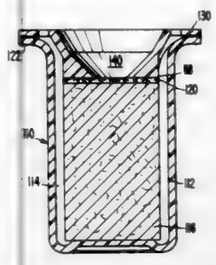
ing directly or indirectly as a function of the presence of said analyte to thereby form a filterable, solid phase composite which contains said colored component, (d) collecting the composite on a filter element and (e) determining or detecting the analyte in the sample by evaluating, through direct visual examination, the presence of said colored component in the collected composite, the improvement of such process which comprises:

treating the urine sample to be analyzed for analyte to remove undesirable contaminants therefrom without affecting the analyte content thereof;

coating said filter element with a blocking agent effective to reduce non-specific binding of unreacted immunologically reactive substances thereto;



including a suffidient amount of a color forming material of a second color in said aqueous suspension to provide the suspension and initially the filter element and the collected composite with the second color that is capable of masking the first color of the colored particle; and

thereafter removing the second color of the color forming material from the filter element and the collected composite to expose the inherent color of the filter element or the first color of the colored particle if present,

whereby flow of aqueous phase media and unreacted components through the filter element and direct visual evaluation of the results of the assay are facilitated and false positive readings of the first color on said filter element are minimized.

5,202,268

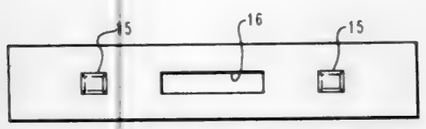
MULTI-LAYERED TEST CARD FOR THE DETERMINATION OF SUBSTANCES IN LIQUIDS

Raymond Kuhn, Clemmons, and Gene H. MacDonald, Greensboro, both of N.C., assignors to Environmental Diagnostics, Inc., Burlington, N.C.

Filed Dec. 30, 1988, Ser. No. 292,322

Int. Cl.[5] G01N *33/553*

U.S. Cl. 436—525 **15 Claims**



1. A composite device for detecting or determining the presence of components in liquids which comprises in combination at least a first and a second layer of porous material in contact with each other and having differential wicking characteristics, at least one sample receiving site in said device on said first layer, and at least one reaction site on said first layer said reaction site being distant from said sample receiving site and in communication with said sample receiving site via said second layer and a liquid flow path in and through said layers whereby liquid deposited at the sample site is transferred to the reaction site along a path from one layer to the other.

5,202,269

METHOD FOR IMMUNOCHEMICAL DETERMINATION OF HAPTEN

Michio Ito; Minoru Ogura, both of Yokohama, and Hideki Kohno, Kawasaki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,612

Claims priority, application Japan, Oct. 6, 1989, 1-261397

Int. Cl.[5] G01N *33/553, 33/546*

U.S. Cl. 436—526 **20 Claims**

1. A method for immunochemical determination of the concentration of a hapten in a sample, comprising the steps of:

dispersing

(A) a high-molecular weight compound to which the hapten is bound (reagent A),

(B) insoluble carrier particles carrying thereon an antibody which specifically binds the hapten (reagent B), and

(C) magnetic substance-containing insoluble carrier particles carrying thereon an antibody which specifically binds an antigenic determinant in the high-molecular compound and different from the hapten (reagent C),

in the sample to form a reaction mixture;

applying a magnetic field to separate from the reaction mixture unreacted reagent (C) and agglutinated particles formed from the reagent (B) and the reagent (C) through the reagent (A); and

correlating the amount of the reagent (B) remaining dispersed in the reaction mixture, with the concentration of hapten in the sample.

5,202,270

COCAINE AND COCAINE METABOLITES ASSAY TRACERS, IMMUNOGENS AND ANTIBODIES

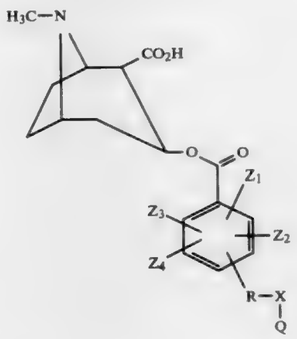
Frank S. Ungemach, Lake Villa; Daniel S. Nam, Chicago, both of Ill., and Oliver H. Meek, Flower Mound, Tex., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 372,206, Jun. 26, 1989, abandoned, which is a continuation of Ser. No. 284,829, Dec. 13, 1988, abandoned, which is a continuation of Ser. No. 863,671, May 15, 1986, abandoned. This application Aug. 30, 1990, Ser. No. 576,085

Int. Cl.[5] G01N *33/533;* **C07D** *451/02;* **C07K** *13/00*

U.S. Cl. 436—537 **16 Claims**

1. A compound comprising the structure:



wherein

Q is fluorescein, or a fluorescein derivative other than carboxyfluorescein;

X is NH or CO;

R is a linking group including up to 4 heteroatoms and having a total of from 1 to 8 carbon atoms and heteroatoms; and

Z_1, Z_2, Z_3 and Z_4 are each independently H or F.

14. A process for detecting or measuring the concentration of benzoyl ecgonine and substituted benzoyl ecgonine compounds which comprises the steps of:

(a) contacting a sample with riboflavin binding protein, with a benzoyl ecgonine antiserum and with a compound according to claim 1 capable of producing a detectable fluorescence polarization response to the presence of the benzoyl ecgonine antiserum,

(b) passing plane polarized light through the resulting solution from step (a) to obtain a fluorescence polarization response; and

(c) detecting the fluorescence polarization response of the solution of step (b) as a measure of the presence or the amount of benzoyl ecgonine and substituted benzoyl ecgonine compounds in the sample.

5,202,271

MANUFACTURING METHOD OF PHOTOVOLTAIC DEVICE

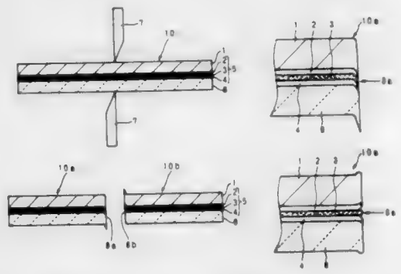
Shinichi Kouzuma, Hirakata; Hiroshi Inoue, Osaka; Kenji Murata, Kyoto; Hiroyuki Tanaka, Kadoma, and Yasuo Kishi, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 16, 1991, Ser. No. 808,444

Claims priority, application Japan, Dec. 27, 1990, 2-408211; Sep. 11, 1991, 3-231781

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—3 **16 Claims**



1. A manufacturing method of a photovoltaic device, comprising:

a step of forming a laminated body by laminating a first resin layer with light-transmitting property, a photoelectric converting element consisting of a transparent electrode layer, a thin-film semiconductor layer and a back electrode layer, and a second resin layer in this order;

a step of cutting said laminated body into an optional size; and

a step of heating the cut laminated body in a temperature range softening said first and second resin layers.

5,202,272

FIELD EFFECT TRANSISTOR FORMED WITH DEEP-SUBMICRON GATE

Chang-Ming Hsieh; Louis L. Hsu, both of Fishkill; Shantha A. Kumar, Hopewell Junction, all of N.Y., and Zu-Jean Tien, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1991, Ser. No. 744,724

Int. Cl.[5] H01L *21/70*

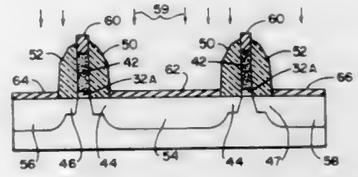
U.S. Cl. 437—29 **13 Claims**

1. A method of forming a semiconductor structure comprising the steps of:

providing a body of semiconductor material including at least one planar surface;

forming a mesa having at least one vertical wall over said planar surface;

forming a layer of material conformally over said mesa and said planar surface so as to form a vertical spacer on said vertical wall;



forming a protective mask selectively on the upper portion of said vertical spacer; and

using said protective mask to etch and remove the unmasked portions of said layer of material and said mesa while leaving said vertical spacer.

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METHOD OF MANUFACTURING A VERTICAL SEMICONDUCTOR DEVICE

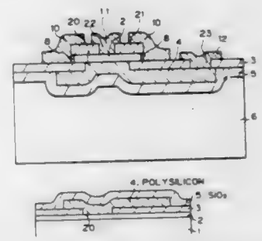
Shunji Nakamura, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1991, Ser. No. 729,239

Claims priority, application Japan, Jul. 12, 1990, 2-186203

Int. Cl.[5] H01L *21/86*

U.S. Cl. 437—40 **12 Claims**



1. A method of producing a semiconductor device comprising:

a first process of forming, on a temporary substrate, a semiconductor layer of a first conduction type and having a smaller etching rate than that of the temporary substrate under the same etching condition, forming a first insulation film on the semiconductor layer, and opening a contact hole in and extending through the first insulation film to expose the semiconductor layer;

a second process of forming a first electrode on the first insulation film and over the contact hole therein, such that the first electrode connects through the contact hole in the first insulation film with the semiconductor layer;

a third process of indirectly adhering a reinforcing material through an insulator, or directly adhering a reinforcing insulation material, onto the structures formed by the first and second processes on the temporary substrate and etching and removing the temporary substrate utilizing the semiconductor layer as an etching stopper, the reinforcing material thereupon being employed as a support substrate;

a fourth process of forming a second insulation film on the semiconductor layer and patterning same thereby to form a protruding pattern of the semiconductor layer and the second insulation film, laminated one upon another, on the

support substrate, the protruding pattern of the semicon-

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SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

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etching said buffer film using said upper portions of said gate

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support substrate, the protruding pattern of the semiconductor layer and the second insulation film protruding from the support substrate and defining at least one protruding and exposed side face of the semiconductor layer; and

a fifth process of forming a gate electrode on each exposed side face of the semiconductor layer and in non-electrically conducting relationship with the exposed side face, opening a contact hole in the second insulation film thereby to expose the semiconductor layer, forming a second electrode on the second insulation film and over the contact hole therein such that the second electrode connects through the contact hole in the second insulation film with the semiconductor layer, opening a contact hole in the first insulation film, and forming an output electrode on the first insulation film and over the contact hole therein such that the output electrode connects through the contact hole in the first insulation film with the first electrode and thereby with the semiconductor layer.

5,202,274

METHOD OF FABRICATING THIN FILM TRANSISTOR

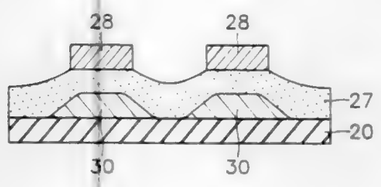
Byungseong Bae, Seoul; Insik Jang, Kyunggi, and Namdeog Kim, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kwonseon, Rep. of Korea

Continuation of Ser. No. 811,799, Dec. 20, 1991, abandoned. This application Dec. 23, 1991, Ser. No. 812,112

Claims priority, application Rep. of Korea, Jun. 14, 1991, 91-9886

Int. Cl.[5] H01L *21/335, 21/311*

U.S. Cl. 437—40 **6 Claims**



1. A method of fabricating a thin film transistor comprising the steps of:

depositing an aluminum alloy layer on a substrate;

forming an Al_2O_3 layer having a given thickness by anodic oxidation of said aluminum alloy layer;

forming photoresist patterns on said Al_2O_3 layer that correspond to electrode wirings to be formed on the aluminum alloy layer;

dry-etching said Al_2O_3 layer and aluminum alloy layer to a predetermined depth using said photoresist patterns as a mask; and

anodically oxidizing said aluminum alloy layer to form a new Al_2O_3 layer up to the surface of the substrate between the portions of the aluminum layer left to form electrode wirings, using said photoresist patterns as a mask, whereby said new Al_2O_3 layer is used as an insulating layer of the electrode wirings.

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SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE, PROCESS FOR FABRICATING THE SAME, AND APPARATUS FOR FABRICATING THE SAME

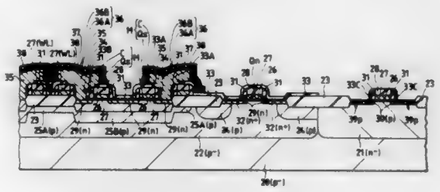
Jun Sugiura, Musashino; Osamu Tsuchiya, Ohme; Makoto Ogasawara, Ohme; Fumio Ootsuka, Ohme; Kazuyoshi Torii, Kodaira; Isamu Asano, Ohme; Nobuo Owada, Ohme; Mitsuaki Horiuchi, Hachioji; Tsuyoshi Tamaru, Ohme; Hideo Aoki, Ohme; Nobuhiro Otsuka, Kokubunji; Seiichirou Shirai, Hamura; Masakazu Sagawa, Ohme; Yoshihiro Ikeda, Ohme; Masatoshi Tsuneoka, Ohme; Toru Kaga, Urawa; Tomotsugu Shimmyo, Kawagoe; Hidetsugu Ogishi, Hachioji; Osamu Kasahara, Hinode; Hiromichi Enami, Tachikawa; Atsushi Wakahara, Ohme; Hiroyuki Akimori, Ohme; Sinichi Suzuki, Ohme; Keisuke Funatsu, Ohme; Yoshinao Kawasaki, Yamaguchi; Tunehiko Tubone, Kudamatsu; Takayoshi Kogano, Iruma, and Ken Tsugane, Ohme, all of Japan, assignors to Hitachi Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,330

Claims priority, application Japan, Mar. 20, 1989, 1-65849

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **23 Claims**



1. A process for fabricating a semiconductor integrated circuit device comprising a DRAM including: a memory cell constructed of a series circuit of a memory cell selecting MISFET and an information storing capacity element of the stacked structure; and a complementary MISFET having the LDD structure and constructing a peripheral circuit, comprising: the step of sequentially forming the individual gate insulating films and gate electrodes of the memory cell selecting MISFET of said memory cell and the n-channel MISFET and p-type MISFET of said peripheral circuit; the step of forming lightly doped semiconductor regions in self-alignment with said gate electrodes for forming the individual LDD structures of said memory cell selecting MISFET, said n-channel MISFET and said p-channel MISFET; the step of forming a first side wall spacer on the side walls of the individual gate electrodes of said memory cell selecting MISFET, said n-type MISFET and said p-channel MISFET; the step of forming the highly doped semiconductor regions of said n-channel MISFET in self-alignment with said first side wall spacer; the step of forming an information storing capacity element of a stacked structure of said memory cell; the step of forming a second side wall spacer on the side walls of the gate electrodes of said p-channel MISFET through said first side wall spacer and in self-alignment with said gate electrodes; and the step of forming the highly doped semiconductor regions of said p-channel MISFET in self-alignment with said second side wall spacer.

5,202,276

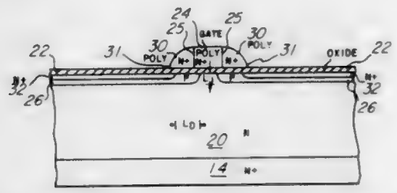
METHOD OF FORMING A LOW ON-RESISTANCE DMOS VERTICAL TRANSISTOR STRUCTURE

Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 570,094, Aug. 20, 1990, abandoned. This application Nov. 8, 1991, Ser. No. 789,780

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **4 Claims**



1. A method of forming a DMOS vertical transistor structure on a substrate, said method comprising:

forming n- epi drain region on an n+ substrate;

forming a polycrystalline silicon central gate region;

forming a first region in the substrate self-aligned to said central gate region;

forming polycrystalline silicon gate sidewalls adjacent to said gate region; and

forming a source region in a portion of said first region self-aligned to the edges of the sidewalls, whereby a remaining portion of said first region providing a channel region which is significantly wider than it is high can be produced between said source region and said drain region and thus a DMOS vertical transistor structure having a MOS channel length longer than its parasitic JFET channel length, and thus the method provides an optimization of the DMOS vertical transistor structure for lower on-resistance.

5,202,277

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Shuichi Kameyama, Itami; Atsushi Hori; Hiroshi Shimomura, both of Moriguchi, and Mizuki Segawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 621,358, Dec. 3, 1990, abandoned. This application Jul. 22, 1992, Ser. No. 918,933

Claims priority, application Japan, Dec. 8, 1989, 1-319692; Feb. 8, 1990, 2-31158

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **25 Claims**

1. A method of fabricating a semiconductor device having MOSFETs, comprising the steps of:

forming an insulating film as a gate insulator on a semiconductor layer of a first conductivity type;

forming a first conductive film on said insulating film;

forming a buffer film on said first conductive film, said buffer film having openings in gate line regions of said buffer film;

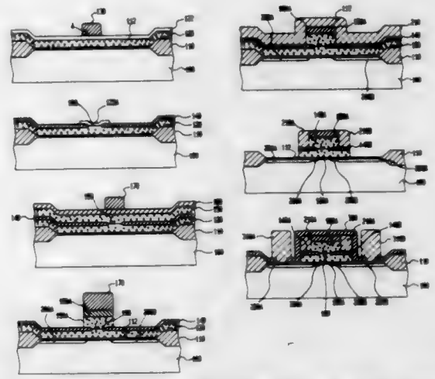
forming a second conductive film on said buffer film;

etching said second conductive film into wiring shape to form upper portions of gate lines of said MOSFETs, said upper portions covering said openings of said buffer film functioned as an etch stop and having a width which is wider than that of said openings;

implanting ions of a second conductivity type into said semiconductor layer using said paper portions of said gate lines as an implant mask to form sources and drains in said semiconductor layer;

forming sidewall spacers on the sides of said upper portions of said gate lines;

etching said buffer film using said upper portions of said gate lines and said sidewall spacers as an etching mask; and



etching said first conductive film using said upper portions of said gate lines and said side spacers as an etching mask, thereby forming under portions of said gate lines.

5,202,278

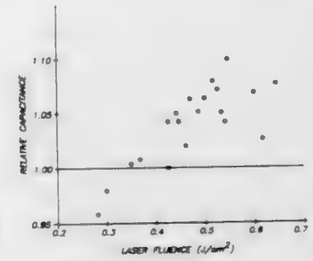
METHOD OF FORMING A CAPACITOR IN SEMICONDUCTOR WAFER PROCESSING

Viju K. Mathews; Chang Yu; Mark E. Tuttle, and Trung T. Doan, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 10, 1991, Ser. No. 757,197

Int. Cl.[5] H01L *21/265, 21/70*

U.S. Cl. 437—47 **24 Claims**



1. A method of forming a capacitor in semiconductor wafer processing comprising the following steps:

providing a conductively doped first layer of polysilicon atop a silicon wafer to a first thickness;

depositing an undoped second layer of polysilicon over the conductively doped first layer of polysilicon to a second thickness, the layer of undoped polysilicon being deposited at a deposition temperature of at least 590° and having a smooth upper surface, said upper surface being smoother than upper surfaces of polysilicon layers deposited at temperatures less than 590° C.;

impinging laser energy onto the upper surface of the second polysilicon layer at a laser fluence of 0.3 J/cm^2 or greater to roughen the smooth upper surface and thereby increase the capacitance of the second polysilicon layer;

patterning and etching the first and second polysilicon layers to define a lower capacitor plate;

providing a layer of capacitor dielectric atop the roughened second polysilicon layer upper surface; and

providing a layer of conductive material atop the capacitor

forming a tantalum oxide layer for a capacitive layer on said

metal into a silicide at the portion in contact with the gate

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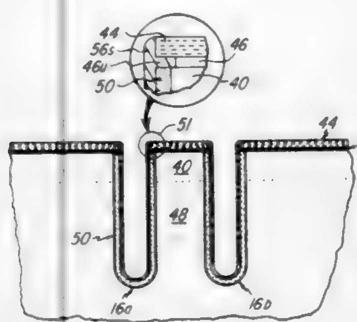
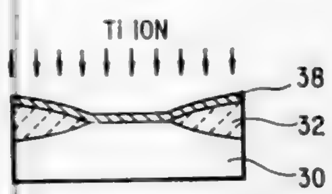
providing a layer of conductive material atop the capacitor dielectric to define an upper capacitor plate.

5,202,279
POLY SIDEWALL PROCESS TO REDUCE GATED DIODE LEAKAGE
Gishi Chung, Garland; William R. McKee, and Clarence W. Teng, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 5, 1990, Ser. No. 622,465
Int. Cl.[5] H01L *21/302, 21/311, 21/70*
U.S. Cl. 437—47 **8 Claims**



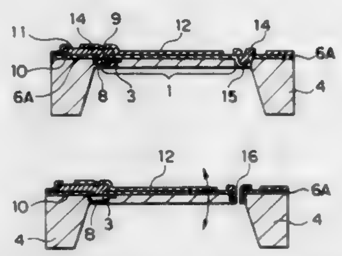
1. A method of making trench type field plate isolated dynamic random access memory cells, comprising the steps of:
applying and developing a resist to a face of a body of semiconductor material to create mask oxide a trench pattern;
etching trenches into the face of the body of semiconductor material according to the trench pattern, the trenches having top portions near the face of the semiconductor body and sidewalls extending into the semiconductor body;
removing the mask oxide, the mask oxide removing creating an undercut area into the body of semiconductor material near the top of the trenches;
forming storage nodes in the body of semiconductor material surrounding the trenches;
forming polysilicon sidewalls onto the trench sidewalls, the polysilicon sidewalls extending into the undercut area near the top of the trenches;
forming storage dielectric layers on the trench sidewalls, overlying the polysilicon sidewalls; and
forming a field plate in the trenches.

5,202,280
METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE
Satoshi Kamiyama, and Yuchiro Numasawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jun. 8, 1992, Ser. No. 894,938
Claims priority, application Japan, Jun. 6, 1991, 3-134533
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—47 **9 Claims**



1. A method for fabricating a semiconductor device, comprising the steps of:
providing a semiconductor substrate formed with layers and regions for said semiconductor divice;
forming a tantalum oxide layer for a capacitive layer on said semiconductor substrate;
injecting titanium ions having a predetermined does into said tantalum oxide layer with a predetermined injection energy; and
heating said tantalum oxide layer to be fined.

5,202,281
METHOD OF MANUFACTURING SILICON SEMICONDUCTOR ACCELERATION SENSOR DEVICES
Kiyoshi Ishibashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 20, 1991, Ser. No. 763,224
Claims priority, application Japan, Feb. 12, 1991, 3-38906
Int. Cl.[5] H01L *21/72*
U.S. Cl. 437—51 **2 Claims**

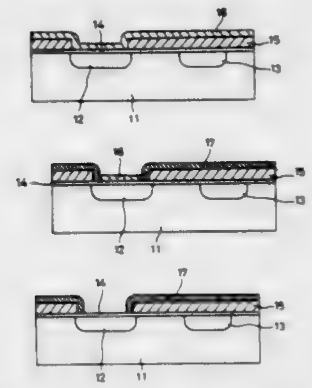


1. A method of manufacturing a semiconductor acceleration sensor comprising:
oxidizing a silicon wafer to form an oxide film;
removing the oxide film and underlying silicon in a U-shaped pattern at a front surface of the wafer by etching to form a portion that is to become a cantilever;
depositing a thin metal film covering the U-shaped pattern that is to become the cantilever;
etching a recessed portion in the rear surface of the silicon wafer encompassing the U-shaped pattern, thereby forming the cantilever;
dicing the silicon wafer into chips; and
removing at least part of the thin metal film by mechanically deflecting the cantilever, thereby releasing the cantilever.

5,202,282
METHOD FOR PRODUCING A SELF-ALIGNMENT TYPE CCD SENSOR
Dong K. Son, Kyungki, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea
Filed Jul. 10, 1991, Ser. No. 728,199
Claims priority, application Rep. of Korea, Jul. 10, 1990, 10423/1990
Int. Cl.[5] H01L *21/339, 21/72*
U.S. Cl. 437—53 **15 Claims**

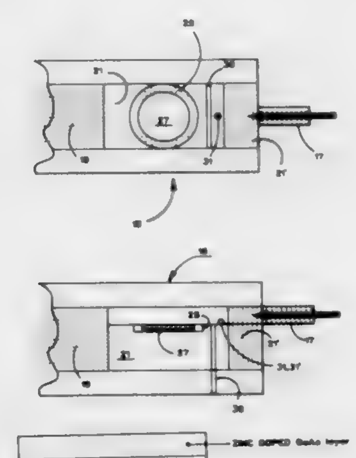
1. A process for producing a self-alignment type CCD image sensor comprising the steps of:
providing a light-receiving region and a transmission region by injecting ions into a substrate at a predetermined distance, the injected ions being different in type from the substrate;
covering the surface of the substrate with a gate oxide and a gate polysilicon, the gate polysilicon being over the gate oxide, then eliminating the gate polysilicon only at the portion over the photo-receiving region through photo and etching processes;
producing a refractory metal on the whole etched surface by vacuum evaporation and then converting the refractory

metal into a silicide at the portion in contact with the gate polysilicon through annealing process; and



eliminating the refractory metal at the unconverted portion which remains on the gate oxide through a predetermined etching process.

5,202,283
TECHNIQUE FOR DOPING MOCVD GROWN CRYSTALLINE MATERIALS USING FREE RADICAL TRANSPORT OF THE DOPANT SPECIES
Charles R. Younger, Anaheim Hills; Kenneth L. Hess, Yorba Linda; Stuart J. C. Irvine, Moorpark; Edward R. Gertner, Moorpark, and Shawn L. Johnston, Moorpark, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Feb. 19, 1991, Ser. No. 656,940
Int. Cl.[5] H01L *21/20, 21/36*
U.S. Cl. 437—81 **36 Claims**

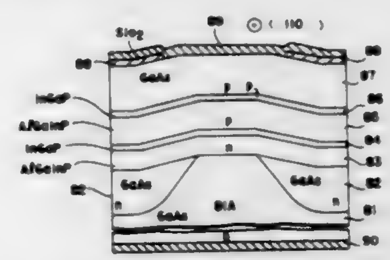


12. A method for precisely and reproducibly establishing predetermined levels of dopant species in semiconductor materials, comprising the steps of:
heating a source of dopant in a chamber; introducing gas comprising aliphatic radicals and metal organic precursors for reaction therein to form semiconductors, and, transporting dopant species from the source by free radical transport to the semiconductor material being formed.

5,202,284
SELECTIVE AND NON-SELECTIVE DEPOSITION OF $SI_{1-x}GE_x$ ON A SI SUBSRATE THAT IS PARTIALLY MASKED WITH SIO_2
Theodore I. Kamins, Palo Alto; David B. Noble, Sunnyvale; Judy L. Hoyt, Palo Alto; James F. Gibbons, Palo Alto, and Martin P. Scott, San Francisco, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 1, 1989, Ser. No. 444,464
Int. Cl.[5] H01L *21/20, 21/205*
U.S. Cl. 437—89 **5 Claims**

1. A method of depositing a silicon-germanium layer on a partially oxide-masked silicon substrate, the method comprising:
growing a silicon dioxide layer on a silicon substrate;
preparing a pattern of windows to be etched through the silicon dioxide layer wherein the total area of the windows to be etched is maximized with respect to the total area of the silicon dioxide layer that is not to be etched;
etching windows through the silicon dioxide layer according to the pattern to expose the silicon substrate; and
selectively depositing a silicon-germanium layer on the exposed substrate in the windows,
whereby any defects in the silicon-germanium layer are minimized.

5,202,285
SEMICONDUCTOR LASER HAVING DOUBLE HETEROSTRUCTURE AND METHOD OF PRODUCING SAME
Mami Sugano, Hadano; Akira Furuya; Toshiyuki Tanahashi, both of Atsugi; Makoto Kondo, and Chikashi Anayama, both of Isehara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 691,620, Apr. 25, 1991, abandoned.
This application Jun. 4, 1992, Ser. No. 892,680
Claims priority, application Japan, Apr. 26, 1990, 2-108889; Jun. 20, 1990, 2-159997
Int. Cl.[5] H01L *21/208*
U.S. Cl. 437—129 **20 Claims**



1. A method of producing a semiconductor laser comprising the steps of:
(a) patterning a dielectric layer which is formed on a (100) face of a substrate into a stripe;
(b) forming a stripe of a first mesa by making a mesa etching of the substrate using the stripe of the dielectric layer as a mask, said stripe of the first mesa including a (111)B face as its sloping surface;
(c) removing eaves of the dielectric layer which is used as the mask in said step (b) by an etching;
(d) forming a buried layer by a metal organic vapor phase epitaxy (MOVPE) using the remaining dielectric layer as a mask so that the buried layer is formed on said substrate excluding a top surface of the stripe of the first mesa and the (111)B face of the stripe of the first mesa is covered a sloping surface part of said buried layer, said top surface of the stripe of the first mesa being the (100) face of the substrate and forming a stripe of a second mesa together with the sloping surface of said buried layer, said stripe of the second mesa having a smaller inclination than said stripe of the first mesa;

(e) removing the dielectric layer by an etching; and
(f) forming a double heterostructure made up of a plurality

thereon and located in a deposition apparatus, the method comprising the steps of:

said heat conducting body for support thereof, to said peripheral elongate portions of said mounting surface

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PROCESS FOR MANUFACTURE OF QUANTUM DOT

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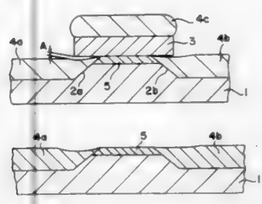
(e) removing the dielectric layer by an etching; and
(f) forming a double heterostructure made up of a plurality of semiconductor layers on the stripe of the second mesa by a metal organic vapor phase epitaxy (MOVPE), said double heterostructure including an active layer and first and second cladding layers which sandwich the active layer, and is provided along the (100) face of the first mesa and along the sloping surface of the second mesa.

5,202,286

METHOD OF FORMING THREE-DIMENSIONAL FEATURES ON SUBSTRATES WITH ADJACENT INSULATING FILMS

Mitsunori Nakatani, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 452,044, Dec. 18, 1989, abandoned. This application Aug. 14, 1991, Ser. No. 745,229
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—181 **16 Claims**



1. A method of producing a three-dimensional feature on a substrate and adjacent electrically insulating films comprising:
producing a resist on a portion of a surface of a substrate;
etching the substrate to remove portions of the substrate not covered by the resist, leaving an etched surface on part of the substrate, and producing a three-dimensional feature having side walls intersecting the etched surface of the substrate underlying and undercutting the resist so that the resist includes overhanging portions spaced from the etched surface of the substrate, the three-dimensional feature having a height between the resist and the etched surface of the substrate;
depositing, in an electron cyclotron resonance chemical vapor deposition process at a temperature below 150° C., a discontinuous electrically insulating film to a thickness no greater than the height of the three-dimensional feature in a first segment on the resist and in a second segment, discontinuous from the first segment, on the etched surface of the substrate adjacent the three-dimensional feature, and including on the etched surface of the substrate between the etched surface of the substrate and the overhanging portions of the resist; and
lifting off the resist and the first segment of the insulating film disposed on the resist to produce a flattened surface including the second segment of the insulating film and the three-dimensional feature.

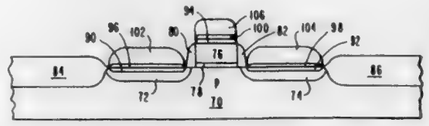
5,202,287

METHOD FOR A TWO STEP SELECTIVE DEPOSITION OF REFRACTORY METALS UTILIZING SiH_4 REDUCTION AND H_2 REDUCTION

Rajiv V. Joshi, Yorktown Heights, N.Y.; Choon-Sik Oh, Seoul, Rep. of Korea, and Dan Moy, Behtel, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 763,194, Sep. 20, 1991, which is a division of Ser. No. 322,486, Mar. 13, 1989, Pat. No. 5,084,417, which is a continuation-in-part of Ser. No. 294,014, Jan. 6, 1989, abandoned. This application Jan. 6, 1992, Ser. No. 817,048
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—192 **13 Claims**

1. A method for selectively depositing a refractory metal on exposed surfaces of a silicon substrate having oxide regions thereon and located in a deposition apparatus, the method comprising the steps of:
(a) introducing a mixture of silane gas and a refractory metal halide gas into said deposition apparatus such that said gases react to selectively deposit a first refractory metal layer on said exposed silicon surfaces; and



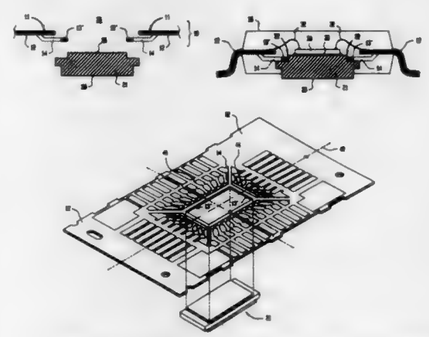
(b) stopping the introduction of silane and introducing hydrogen with said refractory metal hexahalide gas in said deposition apparatus such that said hydrogen reacts with said refracting metal hexahalide to further selectively deposit refractory metal on said exposed silicon surfaces.

5,202,288

METHOD OF MANUFACTURING AN ELECTRONIC CIRCUIT COMPONENT INCORPORATING A HEAT SINK

Anton Doering, Pliezhausen, and Ludger Olbrich, Reutlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 709,654, Jun. 3, 1991, abandoned. This application Aug. 13, 1992, Ser. No. 930,474
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1990, 4017697
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—209 **10 Claims**



1. A method of producing an electric circuit component containing at least one semiconductor chip, incorporating a heat conducting body in contact with said at least one chip and mounted on a single lead frame, said method comprising the steps of:
piercing an opening (20) in a mounting surface member (13) of said single lead frame (10), which member is connected to the remainder of said lead frame only by several elongate support strips (14) of said lead frame (10), said opening being sufficient to surround an adjacent mounting surface (25) of a heat conducting body (21) and said opening being also sufficient to leave only peripheral elongate portions (13') of said lead frame mounting surface member (13) which peripheral elongate portions define said opening (20) and are attached to said lead frame by said elongate support strips (14);
inserting at least said mounting surface (25) of said heat conducting body (21) in said opening (20) and attaching

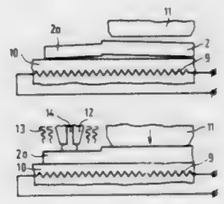
said heat conducting body for support thereof, to said peripheral elongate portions of said mounting surface member (13) defining said opening (20) which are attached to said lead frame (10) by said elongate support strips (14);
affixing said at least one chip on said mounting surface (25) of said heat conducting body (21), and
thereafter connecting contact areas of said at least one chip to respective tongues (41) of said same lead frame by bonding wires.

5,202,289

METHOD OF PLASTICALLY DEFORMING A SEMICONDUCTOR DEVICE LEAD FRAME IN PREPARATION FOR ULTRASONIC BONDING

Johannes M. A. M. van Kempen, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1991, Ser. No. 706,823
Claims priority, application Netherlands, Jun. 29, 1990, 9001491
Int. Cl.[5] H01L *21/58, 21/60, 21/603, 21/607*
U.S. Cl. 437—220 **2 Claims**



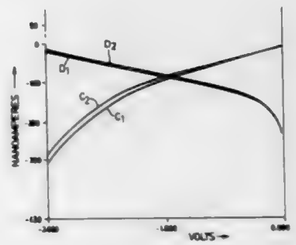
1. A method of manufacturing a semiconductor device of the type including a plurality of conductors formed of metal strips, a semiconductor crystal provided on one of said plurality of conductors, and a plurality of electrically conducting connections from said semiconductor crystal to remaining ones of said plurality of conductors, said method comprising the steps of
(a) forming each of said plurality of conductors from a metal strip,
(b) providing an anvil having a surface with two adjoining surface portions, said two adjoining surface portions being at an angle with respect to each other,
(c) providing ends of said remaining ones of said plurality of conductors between one of said two surfaces and a matching sloped coining die surface,
(d) plastically deforming said ends to impose said angle between said ends and said remaining ones of said plurality of conductors to form a deformed plurality of conductors,
(e) providing each of said deformed plurality of conductors between a heating member and a clamping member to flatten and heat said deformed plurality of conductors over their entire lengths, and
(f) applying ultrasonic energy to said ends to connect said plurality of electrically conducting connections to said ends.

5,202,290

PROCESS FOR MANUFACTURE OF QUANTUM DOT AND QUANTUM WIRE SEMICONDUCTORS

Martin Moskovits, 145 Chiltern Hill Road, Toronto, Ontario, Canada M5C 3C3

Filed Dec. 2, 1991, Ser. No. 801,404
Int. Cl.[5] H01L *21/00, 21/02, 21/20, 21/205*
U.S. Cl. 437—233 **14 Claims**



1. A process for preparing nanosized quantum dot or quantum wire semiconductors in the form of an array of substantially mutually parallel, substantially uniform-sized rods of semiconducting material, said process comprising the steps of:
providing an aluminum or aluminum alloy substrate in sheet or foil form;
anodizing said substrate electrolytically in an acid bath, to deposit thereon an oxide film having micropores of substantially mutually parallel axial disposition and substantially uniform diameter in the range from about 1 to about 500 nanometers;
electrolytically depositing in said pores at least one metal capable of forming a semiconductor material on appropriate chemical reaction;
etching away at least a portion of said oxide film from the substrate surface to expose at least a portion of the deposited metal;
and chemically reacting the exposed metal with a gaseous or liquid chemical reactant to form a semiconductor compound therefrom.

5,202,291

HIGH CF_4 FLOW-REACTIVE ION ETCH FOR ALUMINUM PATTERNING

Peter K. Charvat, Portland, and Chris Kardas, Tigard, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 588,462, Sep. 26, 1990, abandoned. This application May 8, 1992, Ser. No. 883,067
Int. Cl.[5] H01L *21/465*
U.S. Cl. 437—245 **16 Claims**

1. A process for anisotropic etching of aluminum, comprising the steps of:
forming a plasma gas mixture having a carbon containing gas and Cl_2 wherein said concentration ratio of said carbon containing gas to said Cl_2 is at least 2:1 ; and
subjecting said aluminum to said plasma gas mixture.

from 8 to 40 wt % of B_2O_3,

produce at least partially regenerated catalyst and flue

R^1 and R^2 are identical or different and are hydrocarbyl

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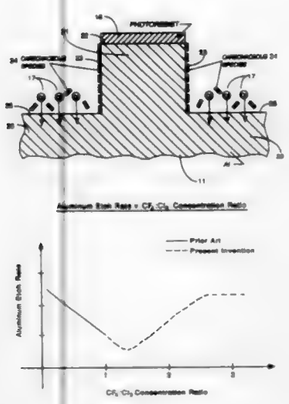
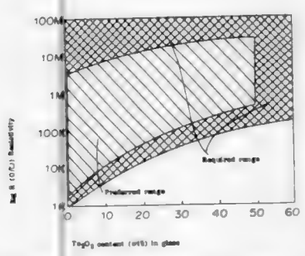


5,202,292
RESISTOR PASTE AND CERAMIC SUBSTRATE
Ryuichi Tanabe, Yokohama, and Yoshiyuki Nishihara, Kawasaki, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
Continuation of Ser. No. 531,750, Jun. 1, 1990, abandoned. This application Jun. 15, 1992, Ser. No. 899,156
Claims priority, application Japan, Jun. 9, 1989, 1-145486; Jul. 14, 1989, 1-180565
Int. Cl.[5] C03C *8/14*
U.S. Cl. 501—17 3 Claims

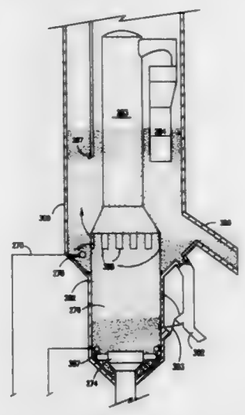


1. A composition of matter consisting essentially of an inorganic component which consists essentially of
from 20 to 70 wt % of glass powder and
from 30 to 80 wt % of a powder selected from the group consisting of SnO_2 powder, Sb-doped SnO_2 powder and a mixture thereof,
wherein said glass powder consists essentially of
from 12 to 50 wt % of SiO_2,
from 0 to 20 wt % of Al_2O_3,
from 0 to 40 wt % of MgO,
from 0 to 40 wt % of CaO,
from 0 to 60 wt % of SrO,
from 16 to 60 wt % of MgO+CaO+SrO,
from 0 to 10 wt % of $Li_2O+Na_2O+K_2O+Cs_2O$,
from 0 to 10 wt % of PbO,
from 0 to 20 wt % of ZnO,
from 0 to 10 wt % of ZrO_2+TiO_2,
from 8 to 40 wt % of B_2O_3,
either from 0.5 to 50 wt % of Ta_2O_5, or
from 0.5 to 45 wt % of Nb_2O_5, or
from 0.2 to 60 wt % of $Ta_2O_5+Nb_2O_5$, and
from 0.1 to 20 wt % of Sb_2O_3.

5,202,293
CARBON FIBER REINFORCED CARBON
Mamoru Okamoto, Aichi; Hirohisa Miura, Okazaki; Shoichi Tsuchiya, Toyota; Yoshio Huwa, Toyota; Hirohumi Michioka, Toyota; Masatoshi Kubota, Toyota; Yoshiteru Nakagawa, Yamatokoriyama, and Satoru Nakatani, Takatsuki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Osaka Gas Company Limited, both of Japan
Continuation of Ser. No. 759,136, Sep. 11, 1991, abandoned, which is a continuation of Ser. No. 464,879, Jan. 17, 1990, abandoned. This application Jun. 3, 1992, Ser. No. 892,481
Claims priority, application Japan, Jan. 17, 1989, 1-9132; Jan. 19, 1989, 1-11030; Jan. 19, 1989, 1-11031; Nov. 24, 1989, 1-305281
Int. Cl.[5] C04B *35/76*
U.S. Cl. 501—95 47 Claims

1. A sintered body of carbon fiber reinforced carbon formed by sintering a green compact molded of a mixture comprising precursor carbonaceous fiber which has not been completely carbonized and self-sintering carbonaceous powder.

5,202,294
LOW PRESSURE DROP REGENERATION OF A CATALYST
Michael F. Raterman, Doylestown, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 25, 1991, Ser. No. 797,662
Int. Cl.[5] B01J *38/36, 38/34, 29/38;* C10G *11/18*
U.S. Cl. 502—43 11 Claims



1. A process for low pressure drop, fast or turbulent fluidized bed regeneration of spent, coke containing fluidized catalytic cracking catalyst in a single regenerator vessel having a ceiling and a base and containing at least a primary and a secondary contiguous relatively dense phase fluidized beds, comprising:
charging said spent catalyst to a fast or turbulent fluidized bed primary regeneration stage having a coked catalyst inlet means, an oxygen containing regeneration gas inlet means in a lower portion of said primary stage, and a primary stage flue gas outlet in an upper portion thereof;
at least partially regenerating said coked catalyst by contacting said coked catalyst with said regeneration gas at fast or turbulent fluidized bed catalyst regeneration conditions to produce at least partially regenerated catalyst and flue gas;
vertically discharging flue gas and some entrained catalyst from said upper portion of said primary stage into a dilute phase region and into a primary stage flue gas outlet;
laterally removing at least a portion of said partially regenerated catalyst by passing same though at least one lateral opening in a side of said primary stage at an elevation intermediate said primary stage regeneration gas inlet and said primary stage flue gas outlet;
collecting said at least partially regenerated catalyst in said second fluidized bed; and
removing regenerated catalytic cracking catalyst from said second fluidized bed as a product of the process.

5,202,295
INTERCALATED CLAY HAVING LARGE INTERLAYER SPACING
John R. McCauley, Louisville, Md., assignor to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 583,788, Sep. 17, 1990, Pat. No. 5,059,568, which is a continuation-in-part of Ser. No. 304,319, Jan. 31, 1989, Pat. No. 4,957,889, which is a continuation-in-part of Ser. No. 21,972, Mar. 5, 1987, Pat. No. 4,952,544. This application Oct. 18, 1991, Ser. No. 779,462
Int. Cl.[5] B01J *21/16, 29/04*
U.S. Cl. 502—65 14 Claims

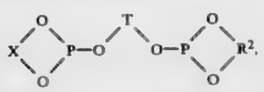
11. A composition comprising a zeolite and an intercalated clay having an interlayer spacing greater than about 21 angstroms, with the clay having pillars which comprise a rare earth metal and a pillaring metal chosen from the group consisting of aluminum, zirconium, chromium and iron.

5,202,296
CHEMICALLY TREATED AIR FILTER FOR ENRICHING THE OXYGEN PRESENT IN AN AIRSTREAM
Don M. Osborne, 10320 W. 17th Pl., Lakewood, Colo. 80215
Filed Feb. 25, 1992, Ser. No. 840,843
Int. Cl.[5] B01J *31/00*
U.S. Cl. 502—158 16 Claims

1. An air filter for increasing the concentration of oxygen in an airstream directed through said filter comprising:
a layer of cellulosic material, and
a film bonded to said cellulosic layer, said film being composed of an organosilicone, solvent and catalyst bonded to said cellulosic layer.

5,202,297
RHODIUM HYDROFORMYLATION CATALYSTS CONTAINING BISPHOSPHITE LIGANDS
Peter M. Lorz, Mannheim; Werner Bertleff, Viernheim; Michael Roeper, Wachenheim, and Dieter Koeffer, Weinheim, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 20, 1991, Ser. No. 747,596
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1990, 4026406
Int. Cl.[5] B01J *31/24*
U.S. Cl. 502—106 6 Claims

1. A rhodium hydroformylation catalyst containing bisphosphite ligands of the formula I



where
—X—is a divalent bisarylene radical or R^1,
T is a divalent arylene or bisarylene radical, and
R^1 and R^2 are identical or different and are hydrocarbyl substituted or unsubstituted alkylene or ortho-arylene.

5,202,298
PROCESS FOR PREPARING CARBONATE SUPPORTS AND CATALYSTS
Paul F. Schubert, Sunnyvale, Calif.; Ralph E. Bounell, Dewey, Okla.; Norman L. Freeman, Jr., Oologah, Okla.; Denton C. Fentress; Kent E. Mitchell, both of Bartlesville, Okla.; Richard E. Lowrey, Muscatine, Iowa; Donald H. Kubicek, and Warren M. Ewert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 5, 1990, Ser. No. 624,800
Int. Cl.[5] B01J *27/232, 23/04*
U.S. Cl. 502—174 19 Claims

1. A process to prepare a catalyst support comprising the steps of:
a) preparing a thick paste comprising potassium carbonate and water, wherein said water to potassium carbonate weight ratio is within a range of about 0.23 grams per gram to about 0.29 grams water per gram potassium carbonate;
b) extruding said paste to form an extrudate; and
c) drying said extrudate to produce a dried extrudate.

5,202,299
CATALYTIC WASHCOAT FOR TREATMENT OF DIESEL EXHAUST
Walter T. Symons, Davison, and Richard F. Beckmeyer, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 23, 1991, Ser. No. 812,327
Int. Cl.[5] B01J *21/06, 23/26, 23/40, 23/72*
U.S. Cl. 502—242 14 Claims

1. A catalyst for treatment of exhaust emissions from diesel engines comprising a support member carrying a catalytically active washcoat layer,
the washcoat layer consisting essentially of refractory oxide particles having dispersed thereon smaller particles of at least one catalytically active metal, and colloidal silica disposed in a thin layer overlying the refractory oxide particles and their dispersed metal coating, and
the refractory oxide particles being at least one selected from the group consisting of silica, alumina, titania and zirconia.

5,202,300
CATALYST FOR PURIFICATION OF EXHAUST GAS
Masaki Funabiki, Mishima; Kunihide Kayano, and Teiji Yamada, both of Numazu, all of Japan, assignors to Engelhard Corporation, Iselin, N.J.
Continuation of Ser. No. 302,505, Jan. 26, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 602,889
Claims priority, application Japan, Feb. 18, 1988, 63-34060
Int. Cl.[5] B01J *21/04, 21/06, 23/10, 23/58*
U.S. Cl. 502—304 5 Claims

1. An exhaust gas purifying catalyst comprising a monolithic refractory support material having a three-dimensional network structure, said support material having deposited thereon an active layer comprising (a) a platinum group metal component consisting essentially of from 0.1 to 10 grams of palladium per liter of catalyst volume and from 0.01 to 2 grams of rhodium per liter of catalyst volume, the palladium and rhodium both being deposited on the same particles of active alumina, said alumina being present in the amount of from 30 to 200 grams of active alumina per liter of catalyst volume; and (b) from 1 to 150 grams, calculated as cerium oxide, of cerium compound per liter of catalyst volume; from 0.1 to 40 grams, calculated as strontium oxide, of strontium compound per liter of catalyst volume; and from 0.1 to 30 grams, calculated as zirconium oxide, of zirconium compound per liter of catalyst volume.

5,202,301

5,202,303

5,202,305
SUPERCONDUCTING STRUCTURE FOR MAGNETIC

compound being selected from the class consisting of Y_2BaCuO_5, Ca_2CuO_3, Sr_2CuO_3, $(Ca, Sr)_1CuO_2$ and $CaCuO_2$.

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5,202,301
PRODUCT/PROCESS/APPLICATION FOR REMÓVAL OF MERCURY FROM LIQUID HYDROCARBON

James D. McNamara, Crafton, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1989, Ser. No. 441,034
Int. Cl.[5] B01J *20/02*
U.S. Cl. 502—417 3 Claims

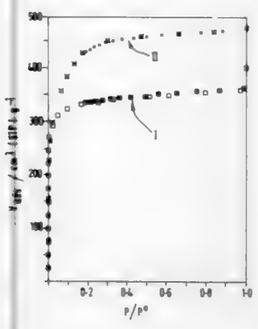
1. An activated carbon adsorbent for the removal or mercury from liquid hydrocarbon, said carbon adsorbent being impregnated with a reactant metal halide wherein said metal is selected from the group consisting of metals from Groups 1*a* and 2*a* of the periodic table of elements and said halide being selected from the group consisting of I, Br and Cl, said metal halide comprising from about 0.5% to 25% by weight of said impregnated carbon adsorbent.

5,202,302
PREPARATION OF ACTIVATED CARBONS BY IMPREGNATION WITH A BORON COMPOUND AND A PHOSPHORUS COMPOUND

John M. D. De La Pena, Old Farm House, Hanwell, Nr. Banbury, Oxon OX17 1HN, and Richard A. Roberts, 5 York Close, Towcester, Northants NN12 7JE, both of Great Britain

PCT No. PCT/GB89/01135, § 371 Date Jul. 19, 1990, § 102(e) Date Jul. 19, 1990, PCT Pub. No. WO90/03458, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 26, 1989, Ser. No. 476,362
Claims priority, application United Kingdom, Sep. 26, 1988, 8822518
Int. Cl.[5] C01B *31/12;* D01F *9/12*
U.S. Cl. 502—425 13 Claims

1. A process for manufacturing activated carbon from cellulose fibre or film including the steps of carbonising the cellulose and activating the resulting carbon, each step occurring at

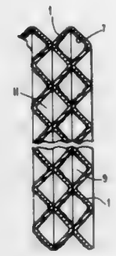


a temperature between 200° C. and 1100° C. in an oxidation suppressing atmosphere, said activation being continued for a sufficient time to produce activated carbon having an apparent surface area in excess of 700 m^2g^{-1}, wherein prior to the activation step, the cellulose or carbon is impregnated with at least one boron-containing acidic compound and at least one phosphorous-containing acidic compound.

5,202,303
COMBUSTION APPARATUS FOR HIGH-TEMPERATURE ENVIRONMENT

William B. Retallick, West Chester, Pa., and William R. Alcorn, Chagrin Falls, Ohio, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 315,048, Feb. 24, 1989, abandoned. This application Sep. 18, 1989, Ser. No. 408,521
Int. Cl.[5] B21D *53/00*
U.S. Cl. 502—439 4 Claims



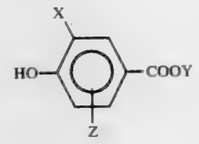
1. A method of making a catalytic reactor from a strip of metal, the method comprising the steps of:
a) corrugating the strip of metal,
b) coating one side of the strip with a catalyst, and leaving the other side of the strip uncoated, and
c) folding the strip back and forth upon itself, wherein the coating step is completed before beginning the folding step, and
wherein the steps of corrugating and coating the strip are performed continuously on the strip while it is moving.

5,202,304
RECORDING MEDIUM

Ken Iwakura; Yuuichi Fukushige, and Shintaro Washizu, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1991, Ser. No. 714,521
Claims priority, application Japan, Jun. 14, 1990, 2-156381
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—209 9 Claims

1. A recording medium which comprises a support having thereon at least one layer containing an electron-donating achromatic dye included in microcapsules and an electron-accepting compound, wherein said electron-accepting compound is represented by formula (i):



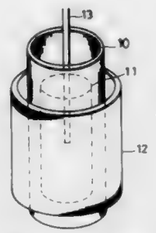
(I)

wherein X is a halogen atom, Y represents an acryloyloxyalkyl group or a methylacryloyloxyalkyl group, each having from 5 to 20 carbon atoms and Z represents a hydrogen atom, an alkyl group or an alkoxy group, each having from 1 to 5 carbon atoms.

5,202,305
SUPERCONDUCTING STRUCTURE FOR MAGNETIC SHIELDING

Keiichiro Watanabe, Nagoya; Hitoshi Yoshida, Okazaki; Hitoshi Sakai, Komaki; Shuichiro Oki, Aichi, and Manabu Yoshida, Bisai, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 509,438, Apr. 16, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 800,731
Claims priority, application Japan, Apr. 17, 1989, 1-97196; Apr. 17, 1989, 1-97197; May 15, 1989, 1-120686; Jul. 12, 1989, 1-179662; Mar. 2, 1990, 2-51518
Int. Cl.[5] H01L *39/12;* B32B *15/04*
U.S. Cl. 505—1 15 Claims

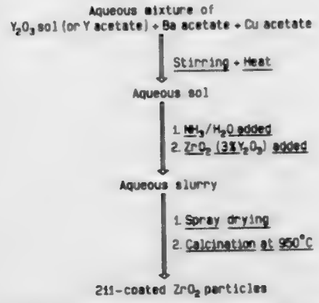


1. A superconducting structure for magnetic shielding, which comprises:
a superconducting layer having a thickness of 0.1–2 mm;
a substrate consisting of a metal material;
an intermediate layer consisting of a ceramic material or a glass material between the superconducting layer and the substrate; and
a noble metal layer between the superconducting layer and the intermediate layer.

5,202,306
FRACTURE TOUGHNESS FOR COPPER OXIDE SUPERCONDUCTORS

Kenneth C. Goretta, Downers Grove, Ill., and Marc L. Kullberg, Lisle, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 18, 1991, Ser. No. 761,551
Int. Cl.[5] H01B *12/06;* H01L *39/12, 39/02*
U.S. Cl. 505—1 23 Claims

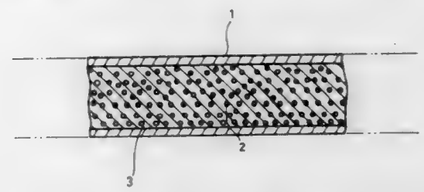


1. A ceramic copper oxide superconductor having dispersed therethrough an oxide-based strengthening and toughening agent selected from the class consisting of ZrO_2, Al_2O_3, MgO, $Al_2O_3.SiO_2$, SiO_2 and mixtures thereof present in a amount in the range of from about 10 mole percent to about 30 mole percent, said agent being present as a discrete phase coated with a compound chemically inert to the superconductor, said compound being selected from the class consisting of Y_2BaCuO_5, Ca_2CuO_3, Sr_2CuO_3, $(Ca, Sr)_1CuO_2$ and $CaCuO_2$.

5,202,307
METHOD OF MANUFACTURING SUPERCONDUCTING WIRE

Kazuhiko Hayashi, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 648,321, Jan. 29, 1991, abandoned, which is a continuatioe of Ser. No. 178,405, Mar. 24, 1988, abandoned. This application May 15, 1992, Ser. No. 885,065
Claims priority, application Japan, Mar. 30, 1987, 62-77238
Int. Cl.[5] H01L *39/12*
U.S. Cl. 505—1 3 Claims



1. A method of manufacturing a high temperature superconductive superconducting wire, comprising the steps of:
(a) mixing ceramic powder selected from a group consisting of Y-Sr-Cu-O, Y-Ba-Cu-O, La-Sr-Cu-O, La-Ba-Cu-O and Bi-Sr-Ca-Cu-O ceramic with a particle size of 10 μm or less showing high temperature superconductivity with metal powder wherein the volume ratio of the ceramic powder to the metal powder is in the range of about 15:85 to 70:30;
(b) filling the mixture in a metal pipe; and
(c) elongating the same by extrusion, drawing or swaging so as to form a high temperature superconductive superconducting wire without heating said wire after said step (c), the wire having superconductivity which is not reduced upon distortion of the wire by external stress.

5,202,308
FABRICATION OF SINTERED OXIDE SUPERCONDUCTING WIRES

Susumu Yamamoto; Nozomu Kawabe, and Teruyuki Murai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 438,986, Nov. 20, 1989, Pat. No. 5,100,865, which is a continuation of Ser. No. 180,494, Apr. 12, 1988, abandoned. This application Dec. 13, 1991, Ser. No. 806,996
Claims priority, application Japan, Apr. 17, 1987, 62-96044
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] H01B *5/02;* H01L *39/24*
U.S. Cl. 505—1 17 Claims

1. A method of making a sintered wire of a ceramic copper oxide superconductive material, comprising the steps of:
packing powders of metal oxides or a mixture of powders of metal oxides and metal carbonates, which, when sintered, form the ceramic copper oxide superconductive material, said oxides and said carbonates each having an oxidation potential (ΔG°) higher than or equal to that of copper, in a metallic cylinder formed from a high-pressure oxidation-resistant material, which high-temperature oxidation-resistant material does not react with said powders of metal oxides and metal carbonates, with the proviso that said high-temperature oxidation-resistant material is not selected from the group consisting of high-temperature oxidation-resistant stainless steel and high-temperature oxidation-resistant nickel alloy;

drawing said docked cylinder, and sintering said drawn

5,202,311

animals an aromatiase inhibiting effective amount of at least

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drawing said packed cylinder, and sintering said drawn packed cylinder in air to form said wire;

wherein said cylinder is removed prior to the final step of sintering.

5,202,309

ANTIBIOTIC CYCLOPEPTIDE FERMENTATION PRODUCT

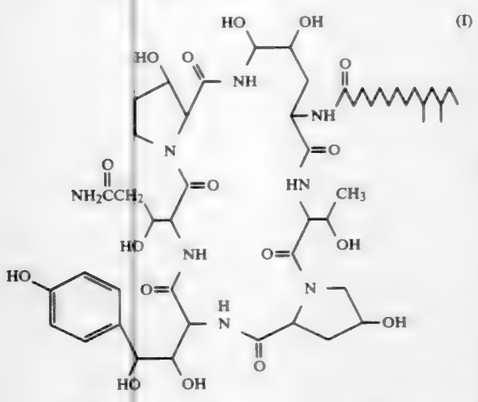
Robert E. Schwartz, Westfield; Jerrold M. Liesch, Princeton Junction; Raymond F. White, Englishtown; Otto D. Hensens, Red Bank, all of N.J.; Henry Joshua, Staten Island, N.Y., and Dennis M. Schmatz, Cranford, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 492,025, Mar. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 374,416, Jun. 30, 1989, abandoned. This application Aug. 19, 1991, Ser. No. 749,633

Int. Cl.[5] **A61K** *37/02;* **C07K** *7/54*

U.S. Cl. 514—11 **10 Claims**

1. A compound having the formula



(I)

5. A method for inhibiting fungal growth comprising applying to the area where growth is to be controlled an antifungally effective amount of the compound of claim 1.

9. A method for treating or for inhibiting *Pneumocystis carinii* infections in mammals which comprises administering to mammals an anti-infective amount of the compound of claim 1.

5,202,310

CYCLOSPORINE METABOLITES

Gary A. Levy, 15 Gainsville Avenue, Unionville, Ontario, Canada L3R 1W7, and Pui Y. Wong, 5 Radway Avenue, Etobicoke, Ontario, Canada M9C L17

Filed Jun. 6, 1990, Ser. No. 534,090

Int. Cl.[5] **A61K** *37/00, 37/02;* **C07K** *5/00, 7/00*

U.S. Cl. 514—11 **10 Claims**

1. A cyclosporine metabolite having a molecular weight determined by mass spectrometry of about 1205 and having the following properties:

a) being immunologically distinct from cyclosporine metabolites OL-1, OL-17 and OL-8;

b) being more polar than OL-1 or OL-17 and less polar than OL-8 when eluated from a gradient high performance liquid chromatography;

c) being extractable from bile of test animals which have been administered cyclosporine A; and

d) being substantially free of other cyclosporine metabolites and cyclosporine A,

or a physiologically acceptable salt or stereoisomer thereof.

5,202,311

STABILIZED FGF COMPOSITION

Moses J. Folkman, Brookline, and Yuen Shing, Randolph, both of Mass., assignors to Children's Medical Center Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 382,263, Jul. 10, 1989, Pat. No. 5,175,147, which is a continuation-in-part of Ser. No. 234,966, Aug. 18, 1988, abandoned. This application May 15, 1990, Ser. No. 524,144

Int. Cl.[5] **A61K** *37/02, 37/36, 31/715*

U.S. Cl. 514—12 **13 Claims**

2. A method of treating a mammal having an ulcerating disease of the gastrointestinal tract which comprises administering to said mammal an effective amount of a pharmaceutical composition comprising SOS-stabilized FGF and a pharmaceutically acceptable carrier.

5,202,312

IMIDAZOLE-CONTAINING PEPTIDES HAVING IMMUNOMODULATORY ACTIVITY

Kazuo Matsumoto, Ibaraki; Kimiaki Hayashi, Suita; Kenichi Nunami, Kobe; Tadashi Sato, Takatsuki, and Isao Takata, Toyono, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

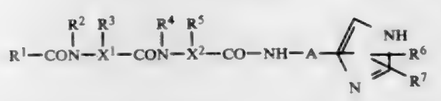
Filed Dec. 1, 1989, Ser. No. 444,315

Claims priority, application Japan, Dec. 7, 1988, 63-310867

Int. Cl.[5] **A61K** *37/02;* **C07K** *5/08*

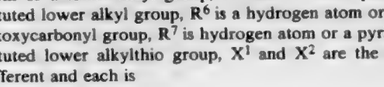
U.S. Cl. 514—18 **7 Claims**

1. An imidazole-containing peptide of the formula:



(I)

wherein R^1 is a branched C_{3-6} alkyl group, a branched C_{3-6} alkyloxy group or a phenyl-substituted lower alkyloxy group, R^2 and R^4 are the same or different and each is a hydrogen atom or a lower alkyl group, R^3 and R^5 are a phenyl-substituted lower alkyl group, R^6 is a hydrogen atom or a lower alkoxycarbonyl group, R^7 is hydrogen atom or a pyridyl-substituted lower alkylthio group, X^1 and X^2 are the same or different and each is



A is a lower alkylene group which may be substituted with a substituent selected from the group consisting of a lower alkoxycarbonyl group, hydroxymethyl group and a group of the formula $—CON(R^8)(R^9)$, and R^8 and R^9 are hydrogen atoms, or a pharmaceutically acceptable salt thereof.

5,202,313

BILOBALIDE DERIVATIVES, THEIR APPLICATIONS AND FORMULATIONS CONTAINING THEM

Ezio Bombardelli, and Giuseppe Mustich, both of Milan, Italy, assignors to Indena S.P.A., Milan, Italy

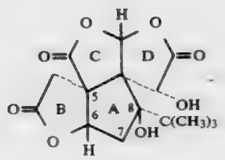
Filed Feb. 6, 1991, Ser. No. 651,598

Claims priority, application Italy, Feb. 9, 1990, 19324 A/90

Int. Cl.[5] **A61K** *31/665;* **C07F** *9/28*

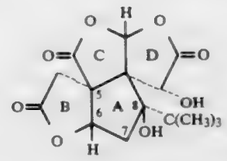
U.S. Cl. 514—100 **5 Claims**

1. A complex of bilobalide with a natural or synthetic, saturated or unsaturated phospholipid, having the formula:



wherein R and R_1 are the same or different, and each is an acyl residue of a C_{16}–C_{22} saturated or unsaturated fatty acid; R_2 is one of the residues: $—CH_2—CH_2—N—(—CH_3)_3$, $—CH_2—CH_2—NH_3$, and $—CH_2—CH(COOH)—NH_3$.

5. The method of combating an inflammation and treating a neuropathy in a living subject which consists of administering to said subject a complex of bilobalide with natural or synthetic, saturated or unsaturated phospholipids, having the following formula:



wherein R and R_1, which can be the same or different, are each an acyl residue of a C_{16}–C_{22} saturated or unsaturated fatty acid; R_2 is one of the following residues: $—CH_2—CH_2—N—(—CH_3)_3$, $—CH_2—CH_2—NH_3$, $—CH_2—CH(COOH)—NH_3$ in the amount of 1–500 mg/day.

5,202,314

10-THIOETHYL-STEROIDS

Jean-Francois Gourvest, Joinville Le Pont, and Dominique Lesuisse, Paris, both of France, assignors to Roussel Uclaf, Romainville, France

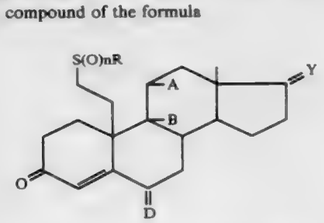
Filed May 21, 1992, Ser. No. 886,977

Claims priority, application France, May 27, 1991, 91 06332

Int. Cl.[5] **A61K** *31/58;* **C07J** *1/00*

U.S. Cl. 514—172 **7 Claims**

1. A compound of the formula



I

wherein R is selected from the group consisting of alkyl, alkenyl and alkynyl of up to 4 carbon atoms, Y is =O or

R_1 is
hydrogen or acyl, n is 0, 1 or 2, D is =O

and A and B form a second carbon-carbon bond or an α-epoxy.

6. A method of inhibiting aromatase activity in warm-blooded animals comprising administering to warm-blood animals an aromatiase inhibiting effective amount of at least one compound of claim 1.

5,202,315

CEPHALOSPORIN COMPOUNDS

Yong Z. Kim; Hun S. Oh; Jae H. Yeo; Jong C. Lim; Won S. Kim; Chan S. Bang, and Hyeon J. Yim, all of Daejeon-si, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea

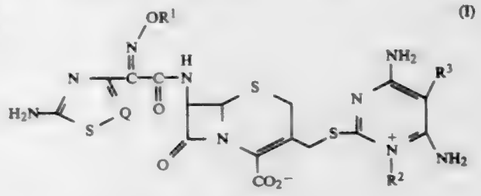
Filed Mar. 15, 1990, Ser. No. 494,163

Claims priority, application Rep. of Korea, May 11, 1989, 89-6431; Jun. 7, 1989, 89-7827; Jun. 7, 1989, 89-7828; Jul. 28, 1989, 89-10755; Feb. 5, 1990, 90-1351

Int. Cl.[5] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 514—206 **58 Claims**

1. A cephalosporin compound of the formula



(I)

wherein

R^1 is a C_{1-4} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl group, or $—C(R^a)(R^b)CO_2H$, wherein R^a and R^b are the same or different, and each is a hydrogen atom or a C_{1-4} alkyl group, or R^a and R^b form a C_{3-7} cycloalkyl group with the carbon atom to which they are linked;

R^2 is a C_{1-4} alkyl group, C_{3-4} alkenyl group, C_{3-4} cycloalkyl group, an amine group substituted by 0–2 C_{1-4} alkyl groups, or a phenyl group substituted by 0–2 substituents selected from the group consisting of C_{1-4} alkyl, C_{1-3} alkoxy, halogen and hydroxy;

R^3 is hydrogen or a C_{1-4} alkyl group; and

Q is N or CH;

or a pharmaceutically acceptable non-toxic salt thereof, or a physiologically hydrolyzable ester or solvate thereof.

5,202,316

N,N,N',N'-6-(1-PIPERAZINYL)-2,5-PYRIDINEDIAMINES

André Claussner, Villemomble; Jacques Leclaire, Massy; Lucien Nedelec, le Raincy, and Daniel Philibert, la Varenne Saint Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

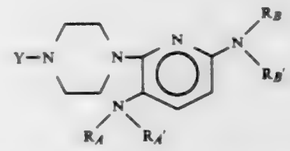
Continuation of Ser. No. 497,563, Mar. 21, 1990, abandoned. This application Oct. 9, 1991, Ser. No. 774,568

Claims priority, application France, Mar. 22, 1989, 89 03740

Int. Cl.[5] **A61K** *31/58;* **C07J** *43/00;* **C07D** *401/02*

U.S. Cl. 514—176 **29 Claims**

1. A compound selected from the group consisting of the formula



I

wherein R_A, $R_{A'}$, R_B and $R_{B'}$ are individually selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms or R_A and $R_{A'}$ or R_B and $R_{B'}$ together with the nitrogen atom to which they are attached form pyrrolidine or piperidine optionally substituted with alkyl of 1 to 3 carbon atoms or

pyrrole optionally substituted with alkyl of 1 to 3 carbon atoms and X is hydrogen or

which has an interfacial and extrafacial plane, and each of which is capable of chelating a transition metal ligand;

-continued

carbonyl, heteroaryllowеralkylcarbonyl, trifluoromethylcarbonyl or arylcarbonyl; and

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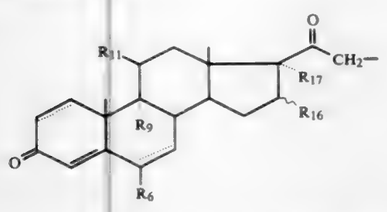
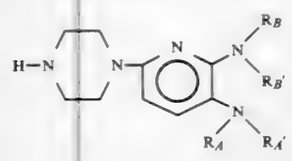
pyrrole optionally substituted with alkyl of 1 to 3 carbon atoms and Y is hydrogen or



wherein R_6 is selected from the group consisting of hydrogen, $-CH_3$, —F and —Cl, R_9 and R_{11} form a second bond at 9(11) or R_9 is hydrogen or —F and R_{11} is hydrogen, —OH or =O, R_{16} is $-CH_3$ or hydrogen, R_{17} is hydrogen, —OH or acyloxy of an organic carboxylic acid, the dotted lines indicate the possible presence of a second bond at 1(2) and 6(7) positions and the wavy line indicates the α- and β-position for R_{16}, with proviso that when Y is is hydrogen, the compound is essentially free of the isomer compound of the formula



I'

or its non-toxic, pharmaceutically acceptable addition salt.

20. A method of inducing antioxidant activity in warm-blooded animals comprising administering to warm-blooded animals an anti-oxidantly effective amount of a compound of claim 1.

5,202,317

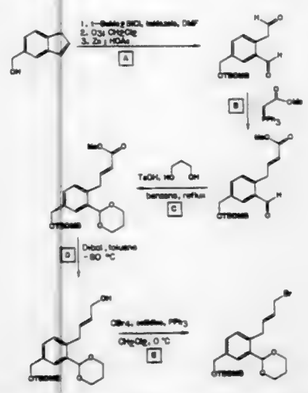
SYNTHETIC DRUG MOLECULES THAT MIMIC METALLOENZYMES

Thomas C. Bruice, Santa Barbara, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 13, 1990, Ser. No. 582,626

Int. Cl.[5] A61K *31/40;* **E07D** *487/22*

U.S. Cl. 514—185 **31 Claims**



1. A synthetic catalyst for biological reactants which comprises:

(a) two quasi-planar π-conjugated ring systems, each of which has an interfacial and extrafacial plane, and each of which is capable of chelating a transition metal ligand;

(b) two transition metal ligands such as iron, manganese, copper, or cobalt, each of which is chelated by one of the ring systems;

(c) at least two bridging units, each of which is covalently linked to the two ring systems, so that the ring systems are fixed to an interfacial plane separation in the range of about 4 to 7 angstroms; and

(d) two capping groups, each of which is situated on the extrafacial plane side of one of the ring systems, and each of which is attached to the ring systems through at least one direct or indirect covalent linkage, so that extrafacial access to the ring systems for naturally occurring biological molecules is barred,

wherein the ring systems are tetrapyrrole derivatives.

5,202,318

TRICYCLIC COMPOUNDS ACTING AT SEROTONIN RECEPTOR SUBTYPES

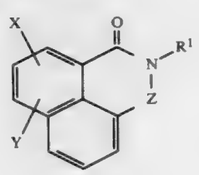
Jacob Berger, Los Altos Hills; Robin D. Clark, Palo Alto; Richard M. Eglen, Mountain View; William L. Smith, Sunnyvale, and Klaus K. Weinhardt, San Francisco, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 523,090, May 14, 1990, abandoned. This application May 28, 1991, Ser. No. 708,260

Int. Cl.[5] C07D *471/08;* **A61K** *31/55, 31/455*

U.S. Cl. 514—211 **52 Claims**

1. A compound of Formula I:

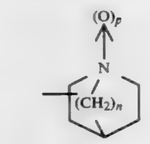


I

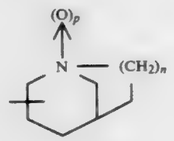
in which

Z is CH_2 or C=0;

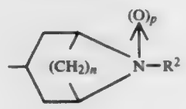
X and Y are independently selected from hydrogen, halogen, hydroxy, lower alkoxy, lower alkyl, nitro, amino, aminocarbonyl, (lower alkyl)amino, di(lower alkyl)amino and (lower alkanoyl)amino; and R^1 is a group selected from Formulae (a), (b), (c), (d) and (e):



(a)

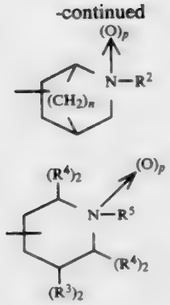


(b)



(c)

-continued



in which

p is 0 or 1;

n is 1, 2 or 3;

R^2 is hydrogen, lower alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl, or a group R^6-C_{1-2} alkyl in which R^6 is thienyl, pyrrolyl or furyl optionally substituted by one or two substituents selected from lower alkyl, lower alkoxy, trifluoromethyl or halogen, or is phenyl optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy, and C_{1-4} alkyl optionally further substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolyzable acyloxy; each R^3 is independently selected from hydrogen, hydroxy, alkyl and alkoxy; each R^4 is independently hydrogen or alkyl; and R^5 is hydrogen, lower alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl, alkenyl, alkynyl or a group R^7-C_{1-3} alkyl in which R^7 is phenyl or phenoxy optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy, and C_{1-4} alkyl optionally further substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolyzable acyloxy; and the pharmaceutically acceptable salts, individual isomers, and mixtures of isomers thereof.

5,202,319

SUBSTITUTED 3-AMINO-2,3,4,5-TETRAHYDRO-1-ARYLOXY-3-BENZAZEPINES

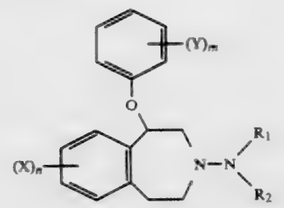
Richard C. Effland, and Joseph T. Klein, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Sep. 23, 1991, Ser. No. 763,711

Int. Cl.[5] A61K *31/55;* **C07D** *223/16*

U.S. Cl. 514—213 **17 Claims**

1. A compound of the formula



where

n is 1 or 2;

m is 1 or 2;

each X is independently hydrogen or loweralkoxy;

Y is hydrogen, halogen or trifluoromethyl;

R_1 is hydrogen, loweralkyl, arylloweralkyl, heteroarylloweralkyl, pyridinyl, loweralkylcarbonyl, arylloweralkylcarbonyl, heteroarylloweralkylcarbonyl, trifluoromethylcarbonyl or arylcarbonyl; and

(d)

R_2 is hydrogen, loweralkyl, loweralkoxycarbonyl, aminoloweralkylcarbonyl, loweralkylaminoloweralkylcarbonyl or diloweralkylaminoloweralkylcarbonyl; the term aryl in each occurrence signifying a phenyl group substituted with 0, 1 or 2 substituents each of which being independently loweralkyl, loweralkoxy, halogen or trifluoromethyl, and the term heteroaryl signifying imidazolyl, thienyl, pyridinyl or pyrrolyl;

(e)

or a pharmaceutically acceptable acid addition salt thereof.

5,202,320

METHOD FOR TREATING LEISHMANIASIS

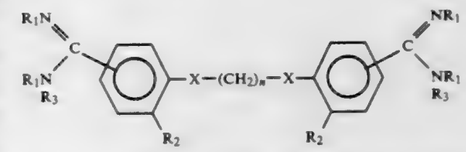
Richard R. Tidwell, 101 Forest Ridge Dr., Chapel Hill, N.C. 27514; J. Dieter Geratz, 713 Kenmore Rd., Chapel Hill, N.C. 27514; James E. Hall, 2440 Springview Trail, Chapel, N.C. 27514; Dennis E. Kyle, 9415 Curran Rd., Silver Spring, Md. 20901; Max Grogl, 3404 Tan Terra Cir., Brookville, both of Md. 20833, and Kwasi A. Obeneng, 112 Overlook Dr., Clinton, N.J. 08809

Filed Apr. 6, 1989, Ser. No. 334,730

Int. Cl.[5] A61K *31/55, 31/505, 31/415, 31/155*

U.S. Cl. 514—218 **1 Claim**

1. A method for treating leishmaniasis which comprises administering to an afflicted host patient, a therapeutically effective amount for treating leishmaniasis of a compound having the structure of the formula I;



wherein X is O or NH; R_1 is H or two R_1 of the same amidine group together represents $-(CH_2)_m-$, wherein m=2, 3, or 4; R_2 is H, NH_2, OCH_3, Cl or NO_2; R_3 is H, CH_3 or CH_2CH_3 and n=2–6 or a pharmaceutically acceptable salt thereof provided that when X is O both R_2 and both R_3 can not be H.

5,202,321

THIOPYRANO(2,3,4-C,D)INDOLES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

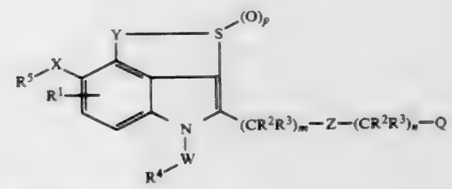
John H. Hutchinson, Montreal; Yves Girard, Bizard; Rejean Fortin, Montreal Nord; Dwight MacDonald, Ile Bizard; John Scheigetz, Dollard des Ormeaux; Daniel Delorme, St. Lazare; Michel Therien, Laval, and Pierre Hamel, Vimont, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Jun. 13, 1991, Ser. No. 714,478

Int. Cl.[5] C07D *401/00;* **A61K** *31/54*

U.S. Cl. 514—727.5 **15 Claims**

1. A compound of the formula:



I

wherein:

R^1 is H, lower alkyl, cycloalkyl, lower alkoxy, perhalo lower alkenyl, CN, NO_2, CF_3, N_3, $N(R^6)_2$, NR^6COR^7,

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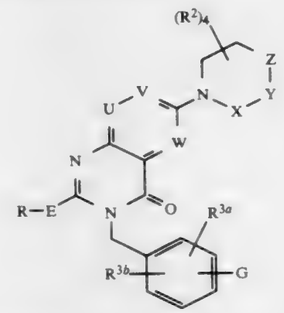
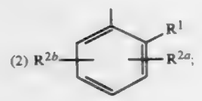
$NR^6CON(R^6)_2$, OR^6, SR^8, $S(O)R^8$, $S(O)_2R^8$, $S(O)_2N(R^6)_2$, COR^7, $CON(R^6)_2$, CO_2R^9, or halogen;
R^2 is H, lower alkyl, hydroxy, or lower alkoxy, or two R^2 groups on adjacent carbon atoms may be a bond;
R^3 is H or lower alkyl;
R^2 and R^3 on the same carbon atom may be a double-bonded oxygen (=O);
R^4 is H, $[aryl(R^{10})_2]_l$, lower alkyl, alkyl, cycloalkyl, lower alkenyl, phenyl lower alkenyl, perhalophenyl, or substituted lower alkyl wherein the substituted is $[aryl(R^{10})_2]_l$, phenoxy, or N-morpholino;
R^5 is alkyl, cycloalkyl, $aryl(R^{10})_2$, $CONR^6R^{11}$, substituted lower alkyl wherein the substitutent is $[aryl(R^{10})_2]_l$, or substituted tetrahydropyridyl wherein the substituent is phenyl or lower alkyl;
R^6 is H or lower alkyl, or two R^6 groups attached to the same nitrogen may form a saturated ring of 5 or 6 members, optionally containing a second heteroatom chosen from O, S, or NR^2;
R^7 is H, lower alkyl, phenyl, p-tolyl, or CF_3;
R^8 is lower alkyl, phenyl, p-tolyl, or CF_3;
R^9 is H, lower alkyl, or benzyl;
R^{10} is H, lower alkyl, cycloalkyl, lower alkoxy, benzyl, benzyloxy, perhalo lower alkenyl, CN, NO_2, CF_3, N_3, $N(R^6)_2$, NR^6COR^7, $NR^6CON(R^6)_2$, OR^6, SR^8, $S(O)R^8$, $S(O)_2R^8$, $S(O)_2N(R^6)_2$, COR^7, $CON(R^6)_2$, CO_2R^9, halogen hydroxy- or lower alkoxy-tetrahydropyranyl, or 1-hydroxy- or 1-lower alkoxy-1-thiazol-2,4, or 5-yl lower alkyl;
R^{11} is R^{10}-phenyl lower alkyl;
R^{12} is H or lower alkyl;
R^{13} is H or lower alkyl;
R^{14} is lower alkyl, R^{10}-phenyl, CF_3, or $N(R^6)_2$;
R^{15} is CO_2H, $N(R^6)_2$, or $NHCOR^7$;
R^{16} is $—(CH_2)_s—C(R^{17})_2—(CH_2)_s—R^{18}$ or $—CH_2CON(R^{20})_2$;
R^{17} is H or lower alkyl;
R^{18} is
a) 2,5-dioxo-1-pyrrolidinyl, (3-pyridinylcarbonyl)amino, 1,3-dihydro-1,3,-dioxo-2H-isoindol-2-yl, 1,3-dihydro-2H-isoindol-2-yl, 2,4-imidazolinedion-1-yl, 2,6-piperidinedion-1-yl, 2-imidazolyl, 2-oxo-1,3,-dioxolen-4-yl, piperidin-1-yl, morpholin-1-yl, or piperazin-1-yl, or
b) the radical V-R^{19};
R^{19} contains up to 20 carbon atoms and is (1) an alkyl group or (2) an alkyl carbonyl group of an organic acyclic or monocyclic carboxylic acid containing not more than 1 heteroatom in the ring;
R^{20} is H or lower alkyl or 2 R^{20} groups attached to the same nitrogen may form a saturated ring of 5 or 6 members, optionally containing a second heteroatom chosen from O, S, or NR^2;
R^{21} is H, lower alkyl, lower alkylcarbonyl, or lower alkylsulfonyl;
Q is CO_2R^9, CN_4H, —OH, $—CH_2OH$, —CHO, $—CON(R^6)_2$, $—CON(OH)R^6$, $—CONHS(O)_2R^{14}$, $—COCN_4H$, $—CONR^6(CH_2)_rR^{15}$, $—N(R^6)_2$, $—NHCOR^7$, $—NHS(O)_2R^{14}$, $—NHCOCO_2R^9$, $—CO_2R^{16}$, —CONHCN, or $—CONHCN_4H$;
U is CH_2, O, or S;
V is O, S, or NR^9;
W is CH_2 or CO, or $S(O)_2$ when R^4 is not H;
X is $(CH_2)_qU—$, $—U(CH_2)_q—$, —CH=CH—, or $—CH_2OCH_2—$;
Y is $—CH_2C(R^{12})_2—$, $—CH=CR^{13}—$, $—CH_2=CHCH_2—$, or $—(CH_2)_3—$;
Z is a bond, O, S, NR^{21}, or $CONR^9$;
m is 0 to 3;
n is 1 to 3 when Z is O, S, NR^{21}, or $CONR^9$;
n is 0 to 3 when Z is a bond;
p is 0 to 2;
q is 0 to 3;
r is 1 to 3;
s is 0 or 1;
t is 1 or 2;
aryl is phenyl, pyridinyl, quinolinyl, isoquinolinyl, thiazolyl, thienyl, oxazolyl, pyrimidinyl, pyrazinyl, furopyridinyl, naphthyl, 1,8-naphthyridinyl, or methylenedioxyphenyl or the N-oxides thereof;
or a pharmaceutically acceptable salt thereof.

5,202,322
QUINAZOLINONE AND PYRIDOPYRIMIDINE A-II ANTAGONISTS
Eric E. Allen, Edison, N.J., and Richard E. Olson, Wilmington, Del., assignors to Merck & Co., Inc., Rahway, N.J. and E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 25, 1991, Ser. No. 765,626
Int. Cl.[5] **A61K** *31/54, 31/505;* **C07D** *239/90, 239/96*
U.S. Cl. 514—228.2 **12 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:
G is
(1) R^1 or



E is
(1) a single bond,
(2) —CH(OH)—,
(3) —O—,
(4) —CO—,
(5) $—S(O)_x(CH_2)_s—$wherein x is 0, 1, or 2, and s is 0–5, or
(6) $—NR^3(CH_2)_s—$ wherein R^3 is
(a) —H,
(b) C_{2-4} alkanoyl,
(c) C_{1-6} alkyl,
(d) C_{2-6} alkenyl,
(e) C_{3-7} cycloalkyl,
(f) phenyl, or
(g) benzyl;
R is
(1) aryl,
(2) heteroaryl,
(3) C_{3-7} cycloalkyl,
(4) polyfluoro-C_{1-4} alkyl,
(5) —H,
(6) C_{2-6} alkenyl,
(7) C_{2-6} alkynyl,
(8) C_{1-6} alkyl, either unsubstituted or substituted with:
(a) aryl,
(b) C_{3-7} cycloalkyl,
(c) halo,
(d) $—NH_2$,
(e) $—NH(C_{1-4}$ alkyl),
(f) $—N(C_{1-4}$ alkyl)$_2$,
(g) $—OR^4$, wherein R^4 is
(i) —H,
(ii) aryl,
(iii) heteroaryl,
(iv) C_{1-6} alkyl, or
(v) aryl-C_{1-6} alkyl;
(h) $—COOR^4$,
(i) $—NHSO_2R^4$, or
(j) $—SO_2NHR^5$, wherein R^5 is
(i) —H
(ii) C_{1-5} alkyl,
(iii) aryl or
(iv) $—CH_2—$aryl;
R^1 is
(1) $—CO_2R^4$
(2) $—SO_3R^6$, wherein R^6 is
(a)—H
(b)$—CH(R^4)—O—CO—R^{4a}$ wherein R^{4a} is
(i) C_{1-6} alkyl,
(ii) aryl or
(iii) $—CH_2—$aryl;
(3) $—P(O)(OR^6)_2$,
(4) $—CONHNHSO_2CF_3$,
(5) $—SO_2NHCN$,
(6) $—P(O)(OR^6)(OR^4)$,
(7) $—SO_2NHR^7$, wherein R^7 is
(a) —H
(b) aryl,
(c) heteroaryl,
(d) C_{3-7} cycloalkyl,
(e) polyfluoro-C_{1-4} alkyl, or
(f) C_{1-10} alkyl, either unsubstituted or substituted with:
(i) aryl,
(ii) heteroaryl,
(iii) —OH,
(iv) —SH,
(v) C_{1-4} alkoxy,
(vi) C_{1-4} alkylthio
(vii) halo
(viii) $—NO_2$
(ix) $—CO_2R^{11}$, wherein R^{11} is —H or C_{1-4} alkyl,
(x) $—NH_2$,
(xi) $—NH(C_{1-4}$ alkyl)
(xii) $—N(C_{1-4}$ alkyl)$_2$
(xiii) $—PO_3H_2$,
(xiv) $—P(O)(OH)(OC_{1-4}$ alkyl), or
(xv) $—P(O)(OR^4)(R^8)$ wherein R^8 is
(a) —H
(b) $—C_{1-5}$ alkyl,
(c) -aryl or
(d) $—CH_2—$aryl,
(8) $—NHSO_2R^7$,
(9) $—SO_2NHCOR^7$,
(10) $—CH_2SO_2NHCOR^7$,
(11) $—CONHSO_2R^7$,
(12) $—CH_2CONHSO_2R^7$,
(13) $—NHSO_2NHCOR^7$,
(14) $—NHCONHSO_2R^7$,
(15) $—SO_2NHCONR^4R^7$,
(16) $—CH_2SO_2NHR^7$,
(17) $—C(OH)(R^8)—P(O)(OR^6)_2$,
(18) $—P(O)(R^8)(OR^6)$,
(19) tetrazol-5-yl, substituted with R^9 wherein R^9 is
(a) —H,
(b) C_{1-6} alkyl,
(c) C_{2-4} alkenyl,
(d) C_{1-4} alkoxy-C_{1-4} alkyl
(e) benzyl, either unsubstituted or substituted with
(i) $—NO_2$,
(ii) $—NH_2$,
(iii) —OH, or
(iv) $—OCH_3$,
(20) $—CH_2$-tetrazol-5-yl substituted with R^9,
(21) —CONH-tetrazol-5-yl substituted with R^9,
(22) —1,3,4-triazol-2-yl substituted with R^{10} wherein R^{10} is
(a) —CN,
(b) $—NO_2$,
(c) $—CF_3$ or
(d) $—CO_2R^4$;
(23) 1,2,3-triazol-4-yl substituted with R^{10},
(24) $—SO_2NHSO_2R^7$,
(25) —OH or

(26) $—SO_2NHCON$ Z;

R^2 is:
(1) —H,
(2) —CO-aryl,
(3) C_{3-7} cycloalkyl,
(4) halo,
(5) —OH,
(6) $—OR^7$
(7) polyfluoro-C_{1-4} alkyl,
(8) $—S(O)_xR^7$,
(9) $—COOR^4$,
(10) $—SO_2H$,
(11) $—NR^4R^7$,
(12) $—NHCOR^7$,
(13) $—NHCO_2R^7$
(14) $—SO_2NR^8R^{11}$, wherein R^{11} is
(a) —H or
(b) C_{1-4} alkyl,
(15) $—NO_2$
(16) $—NHSO_2R^7$
(17) $—NHCONR^4R^7$,
(18) $—OCONR^7R^8$,
(19) aryl,
(20) heteroaryl,
(21) $—NHSO_2$polyfluorophenyl,
(22) $—SO_2NH—$heteroaryl,
(23) $—SO_2NHCOR^7$,
(24) $—CONHSO_2R^7$,
(25) $—PO(OR^4)_2$,
(26) $—PO(OR^4)R^8$,
(27) tetrazol-5-yl,
(28) —CONH(tetrazol-5-yl),
(29) $—COR^4$
(30) $—SO_2NHCN$,
(31) —CO—heteroaryl,
(32) $—NHSO_2NR^7R^8$, or
(33) C_{1-6} alkyl, either unsubstituted or substituted with
(a) —OH,
(b) —guanidino,
(c) $—C_{1-4}$ alkoxy,
(d) $—N(R^4)_2$,
(e) $—CO_2R^4$,
(f) $—CON(R^4)_2$,
(g) $—O—COR^4$
(h) -aryl,
(i) -heteroaryl,
(j) $—S(O)_xR^7$
(k) -tetrazol-5-yl,
(l) $—CONHSO_2R^7$,
(m) $—SO_2NH—$heteroaryl,
(n) $—SO_2NHCOR^7$,
(o) $—PO(OR^4)_2$,
(p) $—PO(OR4)R^9$,
(q) $—SO_2NHCN$,
(r) $—NR^{11}COOR^7$,
(s) -morpholino,
(t) $—N(C_{1-6}$ alkyl)piperazine or
(u) $—COR^4$, with the proviso that the R^2 groups can be the same or different; or two R^2 groups joined to the same carbon taken together represent

(a) =O

branched C_1–C_4 alkyl group, or R^{15} and R^{16} together

together with a benzene ring, form

(a) =O
(b) =S or
(c) —[$(CH_2)_{2-6}$]—;

R^{2a}, R^{2b}, R^{3a} and R^{3b} independently represent
(1) C_{1-5} alkyl,
(2) polyfluoro-C_{1-5} alkyl,
(3) halo;
(4) hydroxy or
(5) C_{1-5} alkoxy;

U, V and W are —CH= or

Z is:
(1) —O—,
(2) —$S(O)_x$— wherein R[12] is
(a) —H or
(b) —R[13] wherein R[13] is
(i) C_{1-4} alkyl,
(ii) C_{3-7} cycloalkyl
(iii) aryl,
(iv) heteroaryl,
(v) polyfluoro-C_{1-4} alkyl,
(vi) polyfluoro-C_{3-7} cycloalkyl, or
(vii) polyfluorophenyl;
(4) —N(COR[13])—,
(5) —N(CONHR[13])—,
(6) —N(CON(R[13])$_2$)—,
(7) —N(CO_2R[13])—,
(8) —N(SO_2NHR[13])—,
(9) —N(SO_2N(R[13])$_2$)—,
(10) —N(SO_2R[13])—, or
(11) —C(R[2])$_2$—,

X is
(1) a single bond
(2) —SO_2—
(3) —O—
(4) —C(R[2])$_2$—
(5) —N(R[12])—
(6) —N(COR[13])—
(7) —N(CONHR[13])—
(8) —N(CON(R[13])$_2$)—
(9) —N(CO_2R[13])—
(10) —N(SO_2NHR[13])—
(11) —N(SO_2N(R[13])$_2$)—
(12) —N(SO_2R[13])—

Y is
(1) —O—
(2) —$S(O)_x$— where x is 0, 1, or 2,
(3) —C(R[2])$_2$—
(4) —N(R[12])—
(5) —N(COR[13])—
(6) —N(CONHR[13])—
(7) —N(CON(R[13])$_2$)—
(8) —N(CO_2R[13])—
(9) —N(SO_2NHR[13])—
(10) —N(SO_2N(R[13])$_2$)—
(11) —N(SO_2R[13])—.

5,202,323

5 ARYLMETHYLAMINO 6 OXY SUBSTITUTED 3(2H)-PYRIDAZINONES

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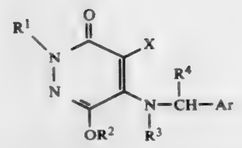
PCT No. PCT/JP91/00517, § 371 Date Oct. 16, 1991, § 102(e) Date Oct. 16, 1991, PCT Pub. No. WO91/16314, PCT Pub. Date Oct. 31, 1991
PCT Filed Apr. 19, 1991, Ser. No. 768,182
Claims priority, application Japan, Apr. 25, 1990, 2-109914
Int. Cl.[5] A61K *31/50;* **C07D** *237/16*
U.S. Cl. 514—236.5 **8 Claims**

1. A 3(2H)-pyridazinone of the formula:

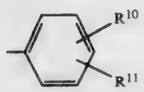


wherein R^1 is a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_3–C_4 alkenyl group or $(CH_2)_nCO_2R^5$ (where n is an integer from 1 to 4, R^5 is a hydrogen atom or a straight chain or branched C_1–C_4 alkyl group;

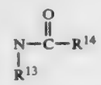
R^2 is A^1–Y^1 (where A^1 is a straight chain or branched C_1–C_{12} alkylene group, Y^1 is CO_2R^5, a cyano group, OR^6 (where R^6 is a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group or a phenyl group),

(where R^7 and R^8 are independently a hydrogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_3–C_8 cycloalkyl group, a phenyl group or a thiazolyl or thiadiazolyl group which is unsubstituted or substituted at any position, or R^7 and R^8 together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain or branched C_1–C_3 alkyl group or a phenyl group, or form a morpholine ring with a nitrogen atom),

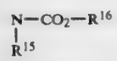
(where R^5 is as defined above and R^9 is a straight chain or branched C_1–C_4 alkyl group or a phenyl group which is unsubstituted or substituted with a straight chain or branched C_1–C_4 alkyl group or a halogen atom),



(where R^{10} and R^{11} are independently a hydrogen atom, a halogen atom, a straight chain or branched C_1–C_4 alkyl group, a C_1–C_4 acylamino group, OR^5, $NHSO_2R^9$ or $S(O)_m$-R^{12} (where m is an integer from 0 to 2 and R^{12} is a straight chain or branched C_1–C_4 alkyl group), provided that R^{10} and R^{11} are not hydrogen atoms at the same time),



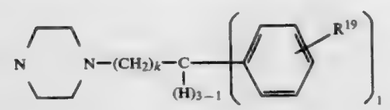
(where R^{13} is a hydrogen atom and R^{14} is a phenyl group, or R^{13} and R^{14} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group),



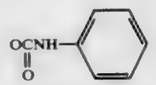
(where R^{15} is a hydrogen atom or a straight chain or branched C_1–C_4 alkyl group, R^{16} is a straight chain or

branched C_1–C_4 alkyl group, or R^{15} and R^{16} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group),

(where R^{17} and R^{18} are independently a straight chain or branched C_1–C_4 alkyl group, or R^{17} and R^{18} together form a C_2–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group),



(where l is 1 or 2, k is an integer from 0 to 3, and R^{19} is a hydrogen atom or a halogen atom), or

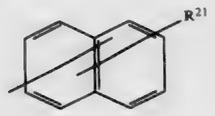


) or R^2 is A^2–Y^2 (where A^2 is a C_2–C_{10} alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group, except where a carbon chain connecting an oxygen atom with Y^2 has one carbon, and Y^2 is a phenyl group);

R^3 and R^4 are independently a hydrogen atom or a straight chain or branched C_1–C_3 alkyl group;

X is a chlorine atom, a bromine atom, a hydrogen atom or a cyano group; and

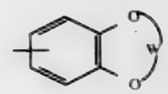
Ar is



where R^{21} is a hydrogen atom or OR^5 (where R^5 is as defined above), or

(where Z^2 and Z^3 are independently a hydrogen atom, a halogen atom, a straight chain or branched C_1–C_4 alkyl group, OR^{22} (where R^{22} is a hydrogen atom or a straight chain or branched C_1–C_8 alkyl group), or O—A^1—Y^3 (where A^1 is as defined above and Y^3 is a phenyl group which is unsubstituted or substituted with a straight chain or branched C_1–C_4 alkyl group or a halogen atom, CO_2R^5, or

(where R^5, R^7 and R^8 are as defined above)), or Z^2 and Z^3 together with a benzene ring, form



(where W is a C_1–C_8 alkylene group which is unsubstituted or substituted with a straight chain C_1–C_3 alkyl group)); or a pharmaceutically acceptable salt thereof.

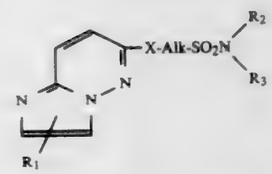
5,202,324

IMIDAZOPYRIDAZINES

Akio Miyake, Hirakata; Masaaki Kuwahara, Itami, and Hisashi Kuriki, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 31, 1990, Ser. No. 472,804
Claims priority, application Japan, Jan. 31, 1989, 1-023355; Dec. 29, 1989, 1-0342258
Int. Cl.[5] A61K *31/50, 31/535, 31/55;* **C07D** *487/04*
U.S. Cl. 514—248 **20 Claims**

1. An imidazo[1,2-b]pyridazine compound of the formula (I):



(I)

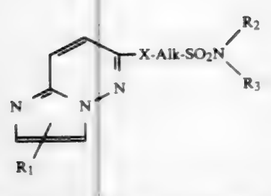
wherein R_1 is a hydrogen or halogen atom, or a lower alkyl group optionally having substituent(s) selected from the group consisting of hydroxy, amino, a mono-lower alkylamino, a lower alkoxy and a halogen, R_2 and R_3 are, independently, a hydrogen atom, a lower alkyl group optionally having substituent(s) as above, a cyclo alkyl group or a phenyl group optionally having substituent(s) selected from the group consisting of amino, a mono- or di-lower alkylamino, a lower alkoxy and a halogen, or R_2 and R_3 together with the adjacent nitrogen atom to which they bond may form a 4 to 7 membered heterocyclic ring having at least one nitrogen atom and optionally oxygen and/or sulfur atoms and optionally having substituent(s) selected from the group consisting of hydroxy, amino, mono- or di-lower alkylamino, lower alkoxy and a halogen, X is an oxygen atom or $S(O)_n$ (n=0 to 2), Alk is a straight or branched chain alkylene group containing 1–10 carbon atoms and optionally having substituent(s) selected from the group consisting of hydroxy, amino, a halogen, phenyl, benzyl, a mono-lower alkylamino, a lower alkoxy or a heterocycle, provided that X should be an oxygen atom when R_1 is a hydrogen atom, one of R_2 and R_3 is a hydrogen and the remaining one is a hydrogen atom, one of R_2 and R_3 is a hydrogen and the remaining one is a hydrogen atom or a lower alkyl group and Alk is a straight chain alkylene group containing 2–4 carbon atoms, or its pharmaceutically acceptable salt.

18. A method of treating asthma which comprises administering a therapeutically effective amount of a compound of the formula (I'):

5,202,326

A-B-C together with the pyrimidinone to which it is attached form a member selected from the group:

VOL 1149 ISS 2 AP 13 1993 UMI



(I)

wherein R_1 is a hydrogen or halogen atom, or a lower alkyl group optionally having substituent(s) as defined in claim 1, R_2 and R_3 are, independently, a hydrogen atom, a lower alkyl group optionally having substituent(s) as defined in claim 1, a cycloalkyl group or a phenyl group optionally having substituent(s) as defined in claim 1 or R_2 and R_3 together with the adjacent nitrogen atom to which they bond may form a 4 to 7 membered heterocyclic ring having at least one nitrogen atom and optionally oxygen and/or sulfur atoms and optionally having substituent(s) as defined in claim 1, X is an oxygen atom or $S(O)_n$ (n=0 to 2), Alk is a straight or branched chain alkylene group containing 1–10 carbon atoms and optionally having substituent(s) as defined in claim 1, or its pharmaceutically acceptable salt, optionally together with a pharmaceutically acceptable carrier or diluent, to mammals.

5,202,325

USE OF ERGOLINE DERIVATIVES IN TREATING EMESIS

Alessandro Rossi; Metilde Buonamici, both of Parabiago; Lorenzo Pegrassi, Milan, and Enzo Brambilla, Mariano Comense, all of Italy, assignors to Farmitalia Carlo Erba S r l., Milan, Italy

PCT No. PCT/EP89/01263, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO90/04396, PCT Pub. Date May 3, 1990

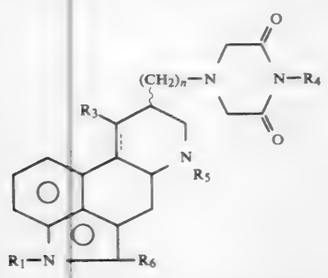
PCT Filed Oct. 20, 1989, Ser. No. 499,413

Claims priority, application United Kingdom, Oct. 21, 1988, 8824744

Int. Cl.[5] A01N *43/60, 43/42*

U.S. Cl. 514—255 **8 Claims**

1. A method of treating emesis, which method comprises administering to a patient in need of said treatment a therapeutically effective amount of a compound of the formula I:



(I)

wherein n is 1 or 2, R_1 represents a hydrogen atom or a C_1–C_4 alkyl group, R_3 represents a hydrogen atom or a hydroxy group, the dash line represents optional ethylenic unsaturation, R_4 represents a hydrogen atom or a phenyl or C_1–C_4 alkyl group, R_5 represents a C_1–C_4 alkyl group or an allyl group and R_6 represents a hydrogen or halogen atom; or a pharmaceutically acceptable salt thereof.

5,202,326

HETEROCYCLIC ETHERS

Graham C. Crawley, Macclesfield, England, and Jean-Marc M. M. Girodeau, Puisieulx, France, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Cergy, France

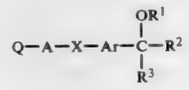
Continuation of Ser. No. 485,486, Feb. 27, 1990, abandoned. This application Nov. 25, 1991, Ser. No. 796,898

Claims priority, application European Pat. Off., Feb. 28, 1989, 89400557

Int. Cl.[5] C07D *215/44, 401/12;* **A61K** *31/495, 31/44*

U.S. Cl. 514—255 **9 Claims**

1. A heterocyclic ether of the formula I



I

wherein Q is a 6-membered monocyclic or 10-membered bicyclic heterocyclic moiety selected from pyridyl, pyrimidinyl, pyrazinyl, quinolyl, isoquinolyl, quinazolinyl and quinoxalinyl which may optionally bear one, two or three substituents selected from halogeno, hydroxy, oxo, cyano (1–4C)alkyl, (1–4C)alkoxy, fluoro-(1–4C)alkyl, (1–4C)alkylamino-(1–4C)alkyl, di-[(1–4C)alkyl]amino-(1–4C)alkyl and phenyl-(1–4C)alkyl;

wherein A is (1–6C)alkylene, (3–6C)alkenylene or (3–6C)alkynylene;

wherein X is oxy;

wherein Ar is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, cyano, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylthio, (1–4C)alkylsulphinyl, (1–4C)alkylsulphonyl, (1–4C)alkylamino, di-[1–4C)alkyl]amino, fluoro-(1–4C)alkyl, (2–4C-)alkanoylamino, cyano-(1–4C)alkoxy and carbamoyl-(1–4C-)alkoxy; or

Ar is 3,5-pyridylene;

wherein R' is (1–6C)alkyl, (3–6C)alkenyl or (3–6C)alkynyl;

wherein R^2 is (1–6C)alkyl, fluoro-(1–4C)alkyl, hydroxy-(1–4C)alkyl or (1–4C)alkoxy-(1–4C)alkyl; and

wherein R^3 is hydroxy-(1–4C)alkyl, mercapto-(1–4C)alkyl, (1–4C)alkoxy-(1–4C)alkyl, (1–4C)alkythio-(1–4C)alkyl, (1–4C)alkylsulphonyl-(1–4C)alkyl, (1–4C)alkoxycarbonyl-(1–4C)alkyl, (2–4C)alkanoyloxy-(1–4C)alkyl, cyano-(1–4C)alkyl, (3–4C)alkenyloxy-(1–4C)alkyl or (3–4C)alkynyloxy-(1–4C)alkyl;

or pharmaceutically-acceptable salt thereof.

5,202,327

PHOSPHORUS-CONTAINING HMG-COA REDUCTASE INHIBITORS

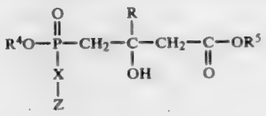
Jeffrey A. Robl, Holland, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 10, 1991, Ser. No. 727,788

Int. Cl.[5] A61K *31/505;* **C07F** *9/02*

U.S. Cl. 514—256 **18 Claims**

1. A compound having the following formula (I):



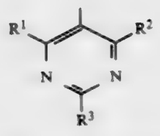
(I)

where

X is $-(CH_2)_a-$, $-CH=CH-$, $-C\equiv C-$, or $-CH_2O-$ (where either $-CH_2-$ or $-O-$ is attached to Z) and "a" is 1, 2, or 3;

R is hydrogen or lower alkyl;

Z is

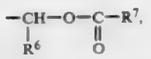


where R^1, R^2 and R^3 are independently

(i) hydrogen,
(ii) alkyl,
(iii) aryl,
(iv) aralkyl,
(v) aralkoxy,
(vi) heterocyclo,
(vii) cycloalkyl,
(viii) alkoxy,
(ix) alkenyl,
(x) cycloalkenyl, or
(xi) halogen; and

R^4 and R^5 are independently

(i) hydrogen,
(ii) alkyl,
(iii) aryl,
(iv) the group



where R^6 is hydrogen, alkyl or aryl and R^7 is alkyl or aryl,

or

(v) if not already covered above, a group forming, together with the atoms to which it is bonded, an ester group which is hydrolyzable in vivo;

or a salt thereof.

5,202,328

SUBSTITUTED FUSED PYRIMIDINONES

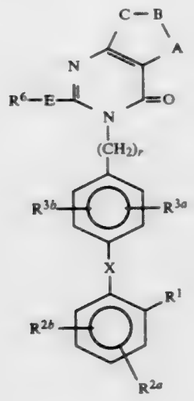
Stephen E. de Laszlo, Atlantic Highlands; Eric E. Allen, Edison; William J. Greenlee, Teaneck, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 6, 1991, Ser. No. 665,517

Int. Cl.[5] A61K *31/505, 31/52;* **C07D** *487/00, 473/00*

U.S. Cl. 514—258 **7 Claims**

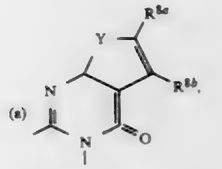
1. A compound of the Formula (I)



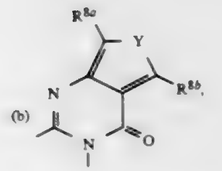
(I)

wherein:

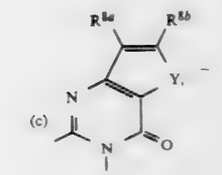
(I) A-B-C together with the pyrimidinone to which it is attached form a member selected from the group:



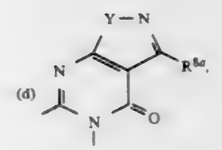
(a)



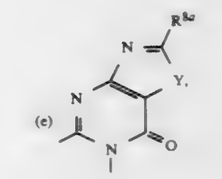
(b)



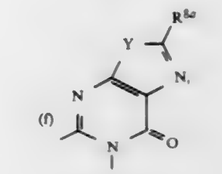
(c)



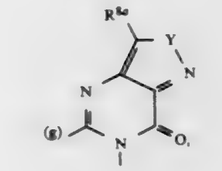
(d)



(e)



(f)



(g)

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R^{4a} is aryl, C_1–C_6 alkyl, or substituted C_1–C_6 alkyl with an aryl substituent;

stituted C_1–C_8-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl with a substituent selected from the group consisting of

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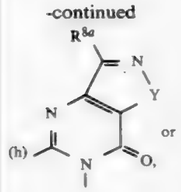
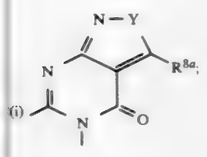


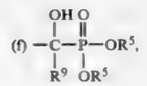
or

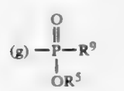


Y is O, S or NR^7;

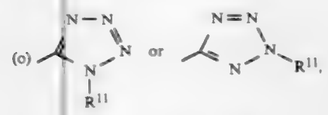
R^1 is

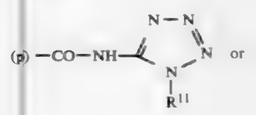
(a) $-CO_2R^4$,
(b) $-SO_3R^5$,
(c) $-NHSO_2R^{22}$,
(d) $-PO(OR^5)_2$,
(e) $-SO_2-NH-R^{22}$,

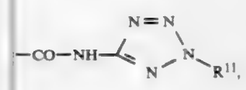




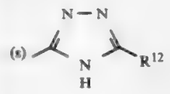
(h) $-CH_2SO_2NH-R^{22}$,
(i) $-SO_2NH-CO-R^{22}$,
(j) $-CH_2SO_2NH-CO-R^{22}$,
(k) $-CONH-SO_2R^{22}$,
(l) $-CH_2CONH-SO_2R^{22}$,
(m) $-NHSO_2NHCO-R^{22}$,
(n) $-NHCONHSO_2-R^{22}$,







(q) $-CONHNHSO_2CF_3$,
(r) $-SO_2NH-CN$,



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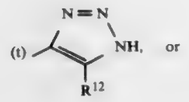


(u) $-SO_2NHCONR^4R^{22}$,

wherein

heteroaryl is an unsubstituted, monosubstituted or disubstituted five or six membered aromatic ring which contains from 1 to 3 heteroatoms selected from the group consisting of O, N or S and wherein the substituents are members selected from the group consisting of —OH, —SH, —C-$_1$-C_4-alkyl, —C_1-C_4-alkoxy, —CF_3, Cl, Br, F, I, —NO_2, —CO_2H, —CO_2—(C_1-C_4-alkyl), —NH_2, —NH(C_1-C_4-alkyl) and —N(C_1-C_4-alkyl)$_2$;

R^{2a} and R^{2b} are each independently

(a) H,
(b) Cl, Br, I, or F,
(c) NO_2,
(d) NH_2,
(e) C_1-C_4-alkylamino,
(f) di(C_1-C_4-alkyl)amino,
(g) SO_2NHR^9,
(h) CF_3,
(i) C_1-C_6-alkyl,
(j) C_1-C_6-alkoxy,
(k) C_1-C_6-alkyl-S—,
(l) C_2-C_6-alkenyl,
(m) C_2-C_6-alkynyl,
(n) aryl,
(o) aryl(C_1-C_4-alkyl), or
(p) C_3-C_7-cycloalkyl;

R^{3a} is

(a) H,
(b) Cl, Br, I, or F,
(c) C_1-C_6-alkyl,
(d) C_1-C_6-alkoxy, or
(e) C_1-C_6-alkoxyalkyl;

R^{3b} is

(a) H,
(b) Cl, Br, I, or F,
(c) NO_2,
(d) C_1-C_6-alkyl,
(e) C_1-C_6-acyloxy,
(f) C_3-C_7-cycloalkyl,
(g) C_1-C_6-alkoxy,
(h) $-NHSO_2R^4$,
(i) hydroxy(C_1-C_4-alkyl),
(j) aryl(C_1-C_4-alkyl),
(k) C_1-C_4-alkylthio,
(l) C_1-C_4-alkyl sulfinyl,
(m) C_1-C_4-alkyl sulfonyl,
(n) NH_2,
(o) C_1-C_4-alkylamino,
(p) di(C_1-C_4-alkyl)amino,
(q) fluoro-C_1-C_4-alkyl-,
(r) $—SO_2—NHR^9$,
(s) aryl,
(t) furyl,
(u) CF_3,
(v) C_2-C_6-alkenyl, or
(w) C_2-C_6-alkynyl;

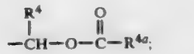
wherein

aryl is phenyl or naphthyl or substituted phenyl or naphthyl with one or two substituents selected from the group consisting of Cl, Br, I, F, $N(R^4)_2$, CO_2R^4, C_1-C_4-alkyl, C_1-C_4-alkoxy, NO_2, CF_3, C_1-C_4-alkylthio, or OH;

R^4 is H, aryl, C_1-C_6 alkyl, or substituted C_1-C_6 alkyl with an aryl or heteroaryl substituent;

R^{4a} is aryl, C_1-C_6 alkyl, or substituted C_1-C_6 alkyl with an aryl substituent;

R^5 is H,



E is a single bond, $—NR^{13}(CH_2)_s—$, $—S(O)_x(CH_2)_s—$ where x is 0 to 2 and s is 0 to 5, —CH(OH)—, —O—, CO—;

R^6 is

(a) aryl or substituted aryl with 1 or 2 substituents selected from the group consisting of Cl, Br, I, F, —O—C_1-C_4-alkyl, C_1-C_4-alkyl, $—NO_2$, $—CF_3$, $—SO_2NR^9R^{10}$, —S—C_1-C_4-alkyl, —OH, $—NH_2$, C_3-C_7-cycloalkyl, or C_3-C_{10}-alkenyl,

(b) C_1-C_6-alkyl, C_2-C_5-alkenyl or C_2-C_5-alkynyl or substituted C_1-C_6-alkyl, C_2-C_5-alkenyl or C_2-C_5-alkynyl substituted with a substituent selected from the group consisting of aryl, C_3-C_7-cycloalkyl, Cl, Br, I, F, CF_3, CF_2CF_3, $—NH_2$, —NH(C_1-C_4-alkyl), $—OR^4$ —N(-C_1-C_4-alkyl)$_2$, $—NH—SO_2R^4$, $—COOR^4$, or $—SO_2NHR^9$,

(c) an unsubstituted, monosubstituted or disubstituted heteroaromatic **5** or **6** membered cyclic ring which contains one to three members selected from the group consisting of N, O, S, and wherein the substituents are members selected from the group consisting of —OH, —SH, C_1-C_4-alkyl, C_1-C_4-alkoxy, $—CF_3$, Cl, Br, I, F, or NO_2,

(d) C_3-C_7-cycloalkyl,

(e) perfluoro-C_1-C_4-alkyl, or

(f) H;

R^7 is:

(a) H,

(b) C_1-C_6-alkyl, C_2-C_6-alkenyl or C_2-C_6-alkynyl or substituted C_1-C_6-alkyl, C_2-C_6-alkenyl or C_2-C_6-alkynyl substituted with a substituent selected from the group consisting of C_3-C_7-cycloalkyl, Cl, Br, I, F, —OH, $—NH_2$, —NH(C_1-C_4-alkyl), —N(C_1-C_4 alkyl)$_2$, $—NHSO_2R^4$, $—COOR^4$, C_1-C_4-alkoxyl, C_1-C_4-alkylthio, $—CONH_2$, $—COR^4$, or $—SO_2R^4$, —NR-^{4}COR^{22}, $—NR^4CO_2R^{22}$, $—NR^4CONR^4R^{22}$, or —CO heteroaryl,

(c) $—COR^4$,

(d) aryl, or substituted aryl wherein the substitutents are V or W,

(e) aryl-C_1-C_6-alkyl in which the aryl group is unsubstituted, mono- or disubstituted with V or W,

(f) $—OR^4$,

(g) heteroaryl, or

(h) $—CON(R^4)_2$;

V and W are independently:

(a) H,
(b) C_1-C_5-alkoxy,
(c) C_1-C_5-alkyl,
(d) hydroxy,
(e) C_1-C_5-alkyl-$S(O)_x$—,
(f) CN,
(g) NO_2,
(h) $N(R^4)_2$,
(i) $CON(R^4)_2$,
(j) CO_2R^4,
(k) COR^4,
(l) CF_3,
(m) Cl, Br, I, or F,
(n) hydroxy-C_1-C_5-alkyl,
(o) C_1-C_5-alkylthio,
(p) $—SO_2NR^9R^{10}$,
(q) C_3-C_7-cycloalkyl, or
(r) C_2-C_{10}-alkenyl;

R^{8a} and R^{8b} are independently

(a) H,

(b) C_1-C_8-alkyl, C_2-C_6-alkenyl or C_2-C_6-alkynyl or substituted C_1-C_8-alkyl, C_2-C_6-alkenyl or C_2-C_6-alkynyl with a substituent selected from the group consisting of —OH, -guanidino, C_1-C_4-alkoxy, $—N(R^4)_2$, $COOR^4$, $—CON(R^4)_2$, —O—COR^4, -aryl, -heteroaryl, $—S(O)_x$-R^{22}, -tetrazol-5-yl, $—CONHSO_2R^{22}$, $—SO_2NH$-heteroaryl, $—SO_2NHCOR^{22}$, $—PO(OR^4)_2$, $—PO$-$(OR^4)R^9$, $—SO_2NH—CN$, $—NR^{10}COOR^{22}$, $—(CH_2$-$)_{1-4}R^4$, Cl, Br, F, or I,

(c) —CO-aryl,

(d) $—C_3$-C_7-cycloalkyl,

(e) Cl, Br, I, or F,

(f) —OH,

(g) $—OR^{22}$,

(h) $—C_1$-C_4-perfluoroalkyl,

(i) $—S(O)_x—R^{22}$,

(j) $—COOR^4$,

(k) $—SO_3H$,

(l) $—NR^{22a}R^{22}$,

(m) $—NR^4COR^{22}$,

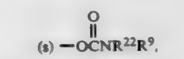
(n) $—NR^4COOR^{22}$,

(o) $—SO_2NR^4R^9$,

(p) $—NO_2$,

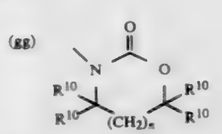
(q) $—N(R^{22a})SO_2R^{22}$,

(r) $—NR^{22a}CONR^4R^{22}$,



(t) -aryl or -heteroaryl,
(u) $—SO_2NH$-heteroaryl,
(v) $—SO_2NHCOR^{22}$,
(w) $—CONHSO_2R^{22}$,
(x) $—PO(OR^4)_2$,
(y) $—PO(OR^4)R^4$,
(z) -tetrazol-5-yl,
(aa) —CONH(tetrazol-5-yl),
(bb) $—COR^4$,
(cc) $—SO_2NHCN$
(dd) $—NR^4SO_2NR^4R^{22}$,
(ee) $—NR^4SO_2OR^{22}$,
(ff) $—CONR^4R^{22}$,

(gg)



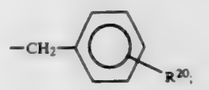
where n=0 or 1, or

(hh) $—N(R^{22a})—CR^{22}$ (=NR^{12});

R^9 is H, C_1-C_5-alkyl, aryl or arylmethyl;

R^{10} is H, C_1-C_4-alkyl;

R^{11} is H, C_1-C_6-alkyl, C_1-C_4-alkenyl, C_1-C_4-alkoxy alkyl, or



R^{12} is —CN, $—NO_2$, $—CF_3$ or $—CO_2R^4$;

R^{13} is H, (C_1-C_4-alkyl)CO—, C_1-C_6-alkyl, allyl, C_3-C_6-cycloalkyl, aryl or arylmethyl;

R^{14} is H, C_1-C_8-alkyl, C_1-C_8-perfluoroalkyl, C_3-C_6-cycloalkyl, aryl or arylmethyl;

R^{15} is H, C_1-C_6-alkyl;

(n) —CH=CH—,

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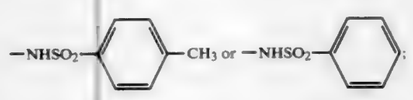
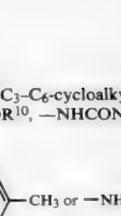
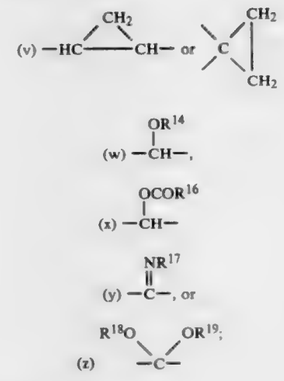
R^{15} is H, C_1–C_6-alkyl;
R^{16} is H, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, aryl or arylmethyl;
R^{17} is $—NR^9R^{10}$, $—OR^{10}$, $—NHCONH_2$, $—NHCSNH_2$,



R^{18} and R^{19} are independently C_1–C_4-alkyl or taken together are $—(CH_2)_q—$ where q is 2 or 3;
R^{20} is H, $—NO_2$, $—NH_2$, —OH or $—OCH_3$;
R^{21} is
(a) aryl,
(b) heteroaryl, or
(c) C_1–C_4-alkyl or substituted C_1–C_4-alkyl with a substituent selected from the group consisting of aryl, heteroaryl as defined above, —OH, $—NH_2$, $—NH(C_1$–C_4-alkyl), $—N(C_1$–C_4-alkyl)$_2$, $—CO_2R^{4a}$, Cl, Br, F, I, or $—CF_3$;
R^{22} is
(a) aryl,
(b) heteroaryl,
(c) C_3–C_7-cycloalkyl,
(d) C_1–C_6-alkyl or substituted C_1–C_6-alkyl with a substituent selected from the group consisting of aryl, heteroaryl, —OH, —SH, C_1–C_4-alkyl, $—O(C_1$–C_4-alkyl), $—S(C_1$–C_4-alkyl), $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, $CO_2—(C_1$–C_4-alkyl), $—NH_2$, $—NH(C_1$–C_4-alkyl), $—N(C_1$–C_4-alkyl)$_2$, $—PO_3H_2$, $—PO(OH)(O—C_1$–C_4-alkyl), $—PO(OR^4)R^9$, morpholinyl or N—C_1–C_4 alkyl piperazinyl, or
(e) perfluoro-C_1–C_4-alkyl;
R^{22a} is
(a) hydrogen,
(b) aryl,
(c) heteroaryl,
(d) C_3–C_7-cycloalkyl,
(e) C_1–C_6-alkyl or substituted C_1–C_6-alkyl with a substituent selected from the group consisting of aryl, heteroaryl, —OH, —SH, C_1–C_4-alkyl, $—O(C_1$–C_4-alkyl), $—S(C_1$–C_4-alkyl), $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, $CO_2—(C_1$–C_4-alkyl), $—NH_2$, $—NH(C_1$–C_4-alkyl), $—N(C_1$–C_4-alkyl)$_2$, $—PO_3H_2$, $—PO(OH)(O—C_1$–C_4-alkyl), $—PO(OR^4)R^9$, morpholinyl or N—$(C_1$–C_4-alkyl)piperazinyl, or
(f) perfluoro-C_1–C_4-alkyl;
X is
(a) a carbon-carbon single bond,
(b) —CO—,
(c) —O—,
(d) —S—,



(h) $—OCH_2—$,
(i) $—CH_2O—$
(j) $—SCH_2—$,
(k) $—CH_2S—$,
(l) $—NHC(R^9)(R^{10})$,
(m) $—NR^9SO_2—$,
(n) $—SO_2NR^9—$,
(o) $—C(R^9)(R^{10})NH—$,
(p) —CH=CH—,
(q) —CF=CF—,
(r) —CH=CF—,
(s) —CF=CH—,
(t) $—CH_2CH_2—$,
(u) $—CF_2CF_2—$,



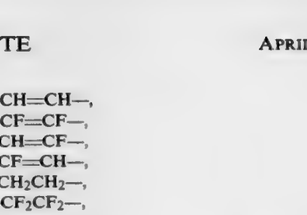
r is 1 or 2; and
a pharmaceutically acceptable salt thereof.

5,202,329
PYRIMIDINYLOXY(THIO)QUINOLINE DERIVATIVE, AND AGRI-HORTICULTURAL FUNGICIDE COMPRISING THE DERIVATIVE AS ACTIVE INGREDIENT

Katsutoshi Ishikawa; Yukihiro Yoshikawa; Tsutomu Ishii; Hiroharu Tanikawa; Sunao Maeda; Hideo Kawashima; Yuji Yanese, all of Mobara; Hitoshi Shimotori, Chiba, and Ryuichi Mita, Ohmuta, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 828,311, Jan. 30, 1992. This application Mar. 11, 1992, Ser. No. 849,714
Claims priority, application Japan, Jan. 31, 1991, 3-10648; Apr. 25, 1991, 3-95122
Int. Cl.[5] **C07D** *239/24, 239/38;* **A01N** *43/54*
U.S. Cl. 514—274 **20 Claims**

1. A pyrimidinyloxy(thio)quinoline derivative represented by the formula (I):



(I)

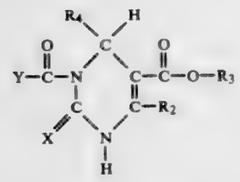
wherein X is an oxygen atom or sulfur atom, Y is a hydrogen atom, halogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or trifluoromethyl, Z is a hydrogen atom or methyl, each of R^1 and R^2 is individually an alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 3 carbon atoms, trifluoromethyl or hydrogen atom, R^3 is a hydrogen atom or alkyl having from 1 to 2 carbon atoms, and n is an integer of 1 or 2.

5,202,330
2-THIO OR OXO-4-ARYL OR HETEROCYCLO-1,5(2H)-PYRIMIDINEDICARBOXYLIC ACID DIESTERS AND 3-ACYL-5-PYRIMIDINECARBOXYLIC ACIDS AND ESTERS

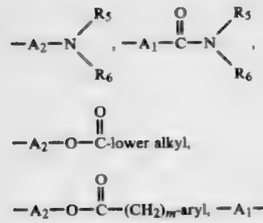
Karnail Atwal, Cranbury; George C. Rovnyak, Hopewell, and Spencer D. Kimball, East Windsor, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

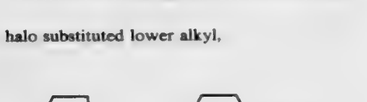
Continuation-in-part of Ser. No. 864,687, May 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 740,800, Jun. 3, 1985, abandoned, and Ser. No. 839,860, Mar. 14, 1986, abandoned. This application Jan. 5, 1987, Ser. No. 618
Int. Cl.[5] **A61K** *31/495;* **C07D** *239/22*
U.S. Cl. 514—274 **30 Claims**

1. A compound of the formula

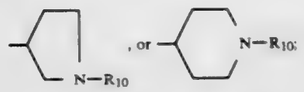


including a pharmaceutically acceptable salt thereof wherein:
X is oxygen or sulfur;
Y is R_{11} or $—O—R_1$;
R_1 is lower alkyl, aryl, cycloalkyl, -A_1-aryl, -A_1-cycloalkyl, -A_1-heterocyclo, -A_2—OH, -A_2—O—lower alkyl, -A_2—O—$(CH_2)_m$-aryl, -A_2—SH, -A_2—S—lower alkyl, -A_2—S—$(CH_2)_m$-aryl,

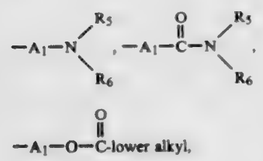




halo substituted lower alkyl,



R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, aryl, -A_1-cycloalkyl, -A_1-aryl, -A_1-heterocyclo, -A_1—OH, -A_1—O—lower alkyl, -A_1—O—$(CH_2)_m$-aryl, -A_1—SH, -A_1—S—lower alkyl, -A_1—S—$(CH_2)_m$-aryl,



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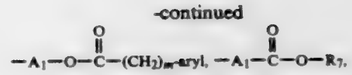
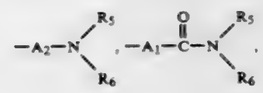
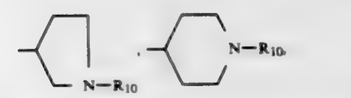
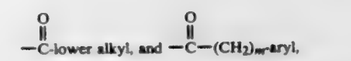


or halo substituted lower alkyl;
R_3 is hydrogen, lower alkyl, aryl, cycloalkyl, -A_1-aryl, -A_1-cycloalkyl, -A_1-heterocyclo, -A_2—OH, -A_2—O—lower alkyl, -A_2—O—$(CH_2)_m$-aryl, -A_2—SH, -A_2—S—lower alkyl, -A_2—S—$(CH_2)_m$-aryl,

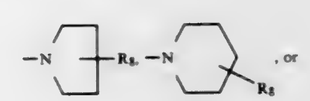


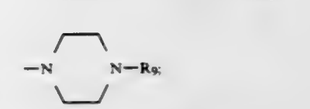


substituted lower alkyl, or a pharmaceutically acceptable salt forming ion;
R_4 is heterocyclo or aryl;
R_5 and R_6 are independently selected from the group consisting of hydrogen, lower alkyl, $—(CH_2)_m—$aryl,

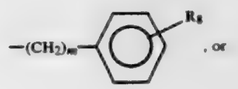


or R_5 and R_6 taken together with the N-atom to which they are attached complete a heterocyclic ring of the formula





R_7 is hydrogen, lower alkyl, $—(CH_2)_m—$aryl or a pharmaceutically acceptable salt forming ion;
R_8 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, CF_3, nitro, or hydroxy;
R_9 is hydrogen, lower alkyl of 1 to 4 carbons,



chain hydrocarbon radicals of two to eight carbons with

5,202,332

(lower alkyl)amino, di(lower alkyl)amino, and (lower

VOL 1149 ISS 2 AP 13 1993 UMI

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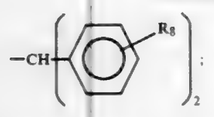
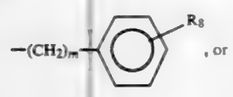
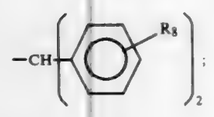
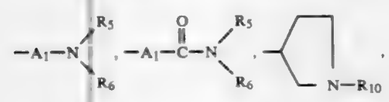


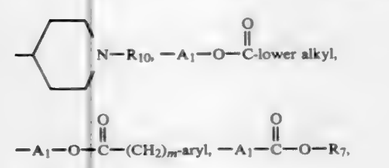
R_{10} is lower alkyl of 1 to 4 carbons,



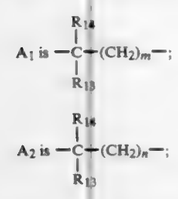


R_{11} is lower alkyl, aryl, cycloalkyl, heterocyclo, -A_1-aryl, -A_1-cycloalkyl, -A_1-heterocyclo, -A_1-OH, -A_1—O—lower alkyl, -A_1—O—$(CH_2)_m$—aryl, -A_1—SH, -A_1—S—lower alkyl, -A_1—S—$(CH_2)_m$—aryl,

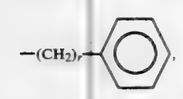




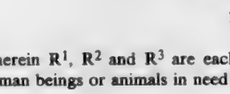
or halo substituted lower alkyl;



m is zero or an integer from 1 to 6;
n is an integer from 1 to 6;
R_{13} and R_{14} are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbons,



and —$(CH_2)_r$—cycloalkyl;
r is zero or an integer from 1 to 3;
the term "lower alkyl" refers to straight or branched chain hydrocarbon radicals of one to eight carbons;
the term "lower alkenyl" refers to straight or branched chain hydrocarbon radicals of two to eight carbons with one double bond;
the term "lower alkynyl" refers to straight or branched chain hydrocarbon radicals of two to eight carbons with one triple bond;
the term "cycloalkyl" refers to saturated rings of 4 to 7 carbons;
the term "halo" refers to chloro, bromo, and fluoro;
the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl, mono substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, nitro, cyano, hydroxy, amino, —NH—alkyl wherein alkyl is of 1 to 4 carbons, —N(alkyl)$_2$wherein alkyl is of 1 to 4 carbons, —CF_3, —NCS, —$OCHF_2$,



—O—CH_2—cycloalkyl,

or

—S—CH_2-cycloalkyl, and di-substituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituents are selected from the group consisting of methyl, ethoxy, methylthio, halo, CF_3, nitro, amino, and $OCHF_2$; and

the term "heterocyclo" refers to 2- or 3-thienyl, 2-or 3-furyl, 2-, 3- or 4-pyridinyl, imidazolyl, 4-, 5-, 6-, or 7-indolyl, 4-, 5-, 6-, or 7-isoindolyl, 5-, 6-, 7, or 8-quinolinyl, 5-, 6-, 7- , or 8-isoquinolinyl, 4-, 5-, 6- or 7-benzothiazolyl, 4-, 5-, 6-, or 7-benzoxazolyl, 4-, 5-, 6-, or 7-benzimidazolyl, 4-, 5-, 6-, or 7-benzoxadiazolyl, 4-, 5-, 6-, or 7-benzofuranyl, and substituted 2-, 3- or 4-pyridinyl wherein said substituent is methyl, methoxy, or methylthio.

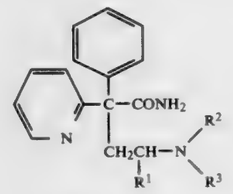
5,202,331

THERAPEUTIC AGENT FOR DYSURIA COMPRISING A-PHENYL-A-PYRIDYLALKANOIC ACID DERIVATIVES

Masaaki Tomoi, Osaka, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 1, 1991, Ser. No. 678,244
Claims priority, application Japan, Apr. 18, 1990, 2-103903
Int. Cl.[5] A61K *31/435*; A01N *43/40*
U.S. Cl. 514—277 **2 Claims**

1. A method for the therapeutic treatment of dysuria which comprises administering an effective amount of a compound of the formula:



wherein R^1, R^2 and R^3 are each lower alkyl, or its salt to human beings or animals in need of treatment.

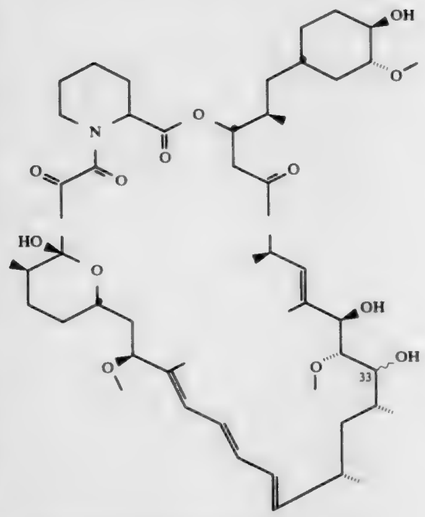
5,202,332

RAPAMYCIN ANALOG AS IMMUNOSUPPRESSANT

Philip F. Hughes, Chapel Hill, N.C., and John H. Musser, Alameda, Calif., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 741,714, Aug. 7, 1991, Pat. No. 5,138,051.
This application Aug. 5, 1992, Ser. No. 924,985
Int. Cl.[5] A61K *31/395*
U.S. Cl. 514—291 **1 Claim**

1. A method of treating transplantation rejection, host vs. graft disease, autoimmune diseases, and diseases of inflammation in a mammal by administering thereto an effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof.

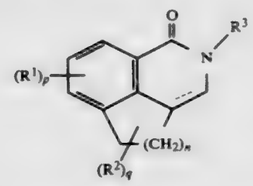
5,202,333

TRICYCLIC 5-HT$_3$ RECEPTOR ANTAGONISTS

Jacob Berger, Los Altos Hills; Robin D. Clark, Palo Alto; Richard M. Eglen, Mountain View; William L. Smith, Sunnyvale, and Klaus K. Weinhardt, San Francisco, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

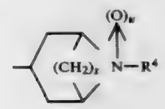
Continuation-in-part of Ser. No. 442,082, Nov. 28, 1989, abandoned. This application May 22, 1991, Ser. No. 704,565
Int. Cl.[5] C07D *471/08*; A61K *31/55, 31/455*
U.S. Cl. 514—296 **50 Claims**

1. A compound of Formula I



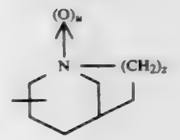
I

in which
the dashed line denotes an optional double bond;
n is 1, 2 or 3;
p is 0, 1, 2 or 3;
q is 0, 1 or 2;
each R^1 is independently selected from halogen, hydroxy, lower alkoxy, lower alkyl, nitro, amino, amino carbonyl, (lower alkyl)amino, di(lower alkyl)amino, and (lower alkanoyl)amino;
each R^2 is lower alkyl; and
R^3 is a group selected from Formulae (a), (b), (c) and (d):

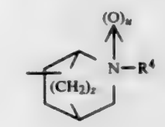


(a)

(b)



(c)



(d)

in which
u is 0 or 1;
z is 1, 2 or 3; and
R^4 is C_{1-7} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl, or a group $(CH_2)_tR^5$ where t is 1 or 2 and R^5 is thienyl, pyrrolyl, or furyl, each optionally further substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-6} alkoxy, trifluoromethyl or halogen, or is phenyl optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy, and C_{1-4} alkyl optionally substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolyzable acyloxy; the pharmaceutically acceptable salts, individual isomers, or mixtures of isomers thereof.

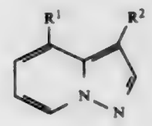
5,202,334

PYRAZOLO(1,5-A)PYRIDINE COMPOUNDS, AND PRODUCTION AND USE THEREOF

Shoji Takemura, Yao; Yasuyoshi Miki, Osaka; Jun Yamada, Takarazuka, and Kunihiro Miyazeki, Takatsuki, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 12, 1991, Ser. No. 729,352
Claims priority, application Japan, Jul. 18, 1990, 2-191075; Jan. 21, 1991, 3-82058
Int. Cl.[5] A61K *31/435*; C07D *471/04*
U.S. Cl. 514—300 **8 Claims**

1. A pyrazolo [1,5—a]pyridine compound represented by the formula:



wherein
R^1 represents —OH, —OCH_2 —phenyl,

carboxy-(C_{1-6}) alkyl group, a (C_{1-6}) alkoxycarbonyl-(C_{1-6}) alkyl group, a (C_{2-6}) alkenyloxycarbonyl-(C_{1-6})-

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or —O—CH_2—CH(OH)—CH_2—NH—$CH(CH_3)_2$; and R^2 is H, with the proviso that when R^1 is —OCH_2—phenyl, R^2 is COOR, wherein R is a C_1–C_3 alkyl group.

5,202,335

SUCCINIC ACID COMPOUNDS

Fumiyasu Sato; Atsushi Tsubaki; Hiroshi Hokari; Nobuyuki Tanaka; Masaru Saito; Kenji Akahane, and Michihiro Kobayashi, all of Nagano, Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

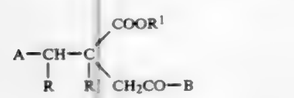
Filed Mar. 30, 1992, Ser. No. 860,023

Claims priority, application Japan, Mar. 30, 1991, 3-142275; Apr. 25, 1991, 3-188416; Dec. 27, 1991, 3-361519

Int. Cl.[5] A61K *31/47, 31/40;* **C07D** *209/44, 217/06*

U.S. Cl. 514—307 **9 Claims**

1. A compound represented by the formula



wherein A represents a thienyl group, a furyl group, a pyridyl group, a 3 to 8-membered cycloalkyl group or a phenyl group which may have one or more substituents selected from the group of a halogen atom, a lower alkyl group having 1 to 6 carbon atoms and a lower alkoxy group having 1 to 6 carbon atoms; B represents a bicyclic amino group which consists of a 5 or 6-membered cyclic amino ring fused with a 5 or 6-membered cycloalkyl ring, which may have 1 or 2 unsaturated bonds, with the proviso that B bonds to the carbon atom of the carbonyl group at the nitrogen atom; R represents a hydrogen atom or combine with each other to form a chemical bond; R^1 represents a hydrogen atom, a lower alkyl group having 1 to 6 carbon atoms or an aralkyl group having 7 to 10 carbon atoms; when there is an asymmetric carbon atom; enantiomers thereof and racemic mixtures thereof; when there are geometrical isomers, each geometrical isomer, E-isomers thereof, Z-isomers thereof, cis-isomers thereof and trans-isomers thereof; and pharmaceutically acceptable salts thereof.

5,202,336

ANTIFLAMMATORY QUINOLIN METHOXY PHENYLSULPHONAMIDES

Klaus Mohrs; Elisabeth Perzborn; Friedel Seuter, all of Wuppertal; Romanis Fruchtmann, Cologne, and Christian Kohlsdorfer, Erftstadt, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 614,329, Nov. 15, 1990, Pat. No. 5,070,096, which is a division of Ser. No. 587,594, Sep. 24, 1989, Pat. No. 5,093,340, which is a continuation of Ser. No. 402,934, Sep. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 294,958, Jan. 6, 1989, abandoned, which is a continuation of Ser. No. 94,239, Sep. 8, 1987, abandoned. This application Jul. 12, 1991, Ser. No. 729,020

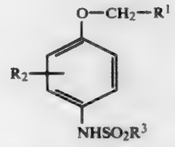
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632329

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—311 **4 Claims**

1. A method for inhibiting lipoxygenase enzymatic reactions in a human or animal patient which comprises administering to such patient an amount effective therefor of a phenylsulphonamide of the formula



wherein

R^1 represents a quinolyl radical which is unsubstituted or substituted by fluoride chlorine, alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms or by trifluoromethyl,

R^2 represents hydrogen, cyano, fluorine, chlorine, methyl, ethyl, propyl, isopropyl, methoxy, ethoxy, trifluoromethyl, methoxycarbonyl, ethoxycarbyonyl or propoxycarbonyl, and

R^3 represents phenyl which is unsubstituted or substituted by fluorine, chlorine trifluoromethyl, trifluoromethoxy, alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms, cyano or alkoxycarbonyl having up to 4 carbon atoms, or represents pentafluorophenyl, or represents a straight-chain or branched alkyl, having up to 6 carbon atoms, which is unsubstituted or substituted by fluorine, chlorine, or phenyl,

or a physiologically acceptable salt thereof.

5,202,337

7-(2,7-DIAZABICYCLO[3.3.0]OCTYL)-3-QUINOLONE-AND-NAPHTHYRIDONE-CARBOXYLIC ACID DERIVATIVES

Uwe Petersen; Thomas Schenke, both of Leverkusen; Michael Schriewer, Odenthal; Klaus Grohe, Odenthal; Andreas Krebs, Odenthal; Ingo Haller, Wuppertal; Karl G. Metzger, Wuppertal; Klaus-Dieter Bremm, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeiler, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

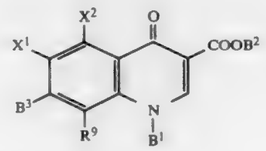
Filed Oct. 3, 1991, Ser. No. 771,700

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1990, 4032560

Int. Cl.[5] A61K *31/47;* **C07D** *521/00*

U.S. Cl. 514—312 **11 Claims**

1. 7-(2,7-Diazabicyclo[3.3.0]octyl-3-quinolonecarboxylic acid derivatives of the formula



(I)

in which

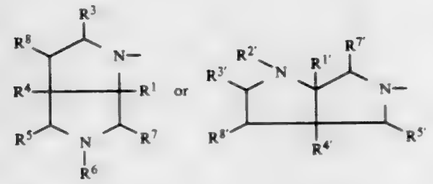
X^1 represents halogen,

X^2 represents hydrogen, amino, alkylamino having 1 to 4 carbon atoms, dialkylamino having 1 to 3 carbon atoms per alkyl group, hydroxyl, alkoxy having 1 to 4 carbon atoms, mercapto, alkylthio having 1 to 4 carbon atoms, arylthio, halogen or methyl,

B^1 represents alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, 2-hydroxyethyl, 2-fluoroethyl, methoxy, amino, methylamino, ethylamino, dimethylamino, or phenyl which is optionally substituted by 1 or 2 fluorine atoms,

B^2 represents hydrogen, alkyl having 1 to 4 carbon atoms or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,

B^3 represents a radical of the structure



where

R^1, R^3, R^4, R^5, R^7 and R^8 are identical or different and in each case represent hydrogen or methyl which can optionally be substituted by halogen or hydroxyl, or represent C_1–C_3-alkoxycarbonyl or carboxyl,

R^4 and R^8 can additionally represent halogen, amino, hydroxyl or methoxy,

R^6 represents hydrogen, C_1–C_6-alkyl, benzyl, C_6–C_{12}-aryl, C_1–C_3-alkanoyl, benzoyl or C_1–C_5-alkoxycarbonyl,

$R^{1'}$, $R^{2'}$, $R^{3'}$, $R^{5'}$, $R^{7'}$ and $R^{8'}$ are identical or different and in each case represent hydrogen or methyl,

$R^{4'}$ represents halogen, amino, hydroxyl, methoxy or methyl which can optionally be substituted by halogen, amino, hydroxyl or methoxy, or represents hydrogen when

$R^{2'}$ and $R^{3'}$ together denote a C_2–C_4-alkylene bridge or a CH_2—S—CH_2 bridge which can optionally be monosubstituted or disubstituted by hydroxyl, methoxy, amino or methyl,

R^9 represents H, halogen, methyl, cyano, nitro, hydroxyl or methoxy,

and their hydrates and acid addition salts which can be used in pharmaceuticals, as well as their alkali metal salts, alkaline earth metal salts, silver salts and guanidinium salts.

5,202,338

DIHYDROQUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE OF DIHYDROQUINOLINE DERIVATIVES AS MODULATORS OF THE ARACHIDONIC ACID CASCADE

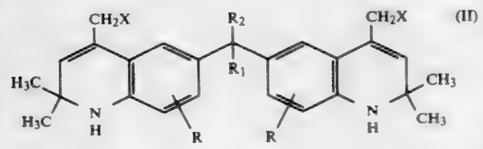
Vilmos Bar; Zsuzsa Pollak, both of Otthon u. 27, H-1118 Budapest, and Istvan Penzes, Josef A. u. 24, H-2092 Budakeszi, all of Hungary

Filed Oct. 31, 1990, Ser. No. 606,424

Int. Cl.[5] C07D *401/06;* **A61K** *31/47*

U.S. Cl. 514—314 **19 Claims**

16. A method of substantially simultaneously inhibiting a cyclooxygenase pathway and a lipoxygenase pathway in a mammal suspected of requiring said inhibition comprising administering to the mammal an effective amount of a compound of the formula:



(II)

wherein:

R_1 is a C_{1-6} alkyl group, a (C_{1-6}) alkylcarbonyl group, a C_{2-6} alkenyl group, a hydroxy group, a C_{1-6} alkoxy group, a C_{2-6} alkenyloxy group, a halo-(C_{1-6}) alkyl group, a halo-(C_{2-6} alkenyl group, a hydroxy -(C_{1-6}) alkyl group, a (C_{1-6}) alkoxy-(C_{1-6})alkyl group, a (C_{2-6}) -alkenyloxy-(C_{1-6}) alkyl group, a halo-(C_{1-6}) alkoxy-(C_{1-6}) alkyl group, a halo-(C_{2-6}) alkenyloxy-(C_{1-6}) alkyl group, a carboxy-(C_{1-6}) alkyl group, a (C_{1-6}) alkoxycarbonyl-(C_{1-6}) alkyl group, a (C_{2-6}) alkenyloxycarbonyl-(C_{1-6})-alkyl group, a halo-(C_{2-6}) alkoxycarbonyl-(C_{1-6})-alkyl group, a halo-(C_{2-6}) alkenyloxycarbonyl-(C_{1-6}) alkyl group, a (C_{2-6}) alkenylcarbonyl group, a (C_{2-6}) alkanoyl-(C_{1-6}) alkyl group, a C(=0) H—C_{1-6} alkyl group, a nitro-(C_{1-6}) alkyl group or a nitroso-(C_{1-6}) alkyl group or a group of the formula —NR_3R_4 and in the latter R_3 and R_4 may represent, independently from each other, a hydrogen atom, a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a halo-C_{1-6} alkyl group or a halo-C_{2-6} alkeynl group;

R is hydrogen or its meaning is identical to the meaning of R_1,

R_2 is hydrogen or its meaning is identical to the meaning of R_1, with the proviso that it cannot be hydroxy; and

X is hydrogen or —SO_2Me group, where Me is an alkaline metal or earth alkaline metal atom, with the proviso that Me cannot mean barium;

as well as their pharmaceutically acceptable acid addition salts.

5,202,339

HYDANTOIN DERIVATIVES

Ei Mochida, Tokyo; Kimihiro Murakami, Suntou; Kazuo Kato, Mishima; Katsuaki Kato, Tokyo; Jun Okuda, and Ichitomo Miwa, both of Nagoya, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 426,021, Oct. 24, 1989, Pat. No. 5,004,751. This application Feb. 25, 1991, Ser. No. 660,562

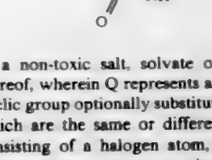
Claims priority, application Japan, Aug. 28, 1987, 62-214549; Feb. 25, 1989, 1-43422; Feb. 23, 1990, 2-43420

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/445, 31/425, 31/415*

U.S. Cl. 514—327 **1 Claim**

1. A pharmaceutical composition for use as hypoglycemic agents and/or hypolipidemic agents which comprises at least one hydantoin derivative represented by the formula (I):



(I)

or a non-toxic salt, solvate or solvate of a non-toxic salt thereof, wherein Q represents a monocyclic or a fused heterocyclic group optionally substituted by one or more substituents which are the same or different and selected from a group consisting of a halogen atom, a lower alkyl group, a nitro group, a cyano group, an optionally protected carboxy group, an optionally protected carboxymethyl group, a lower haloalkyl group, a lower alkylthio group, a lower alkylcarbonyl group, a lower alkoxy group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, an optionally protected hydroxy group, an optionally protected amino group, a carbamoyl group and a phenyl group, with a pharmaceutically acceptable carrier.

5,202,340

AMINO ACID DERIVATIVES

Masanori Kawamura; Yoshinobu Arai, and Hideki Aishita, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 347,673, May 5, 1989, Pat. No. 5,017,589. This application Apr. 2, 1991, Ser. No. 679,214

Claims priority, application Japan, May 6, 1988, 63-109191; Oct. 3, 1988, 63-249433

Int. Cl.[5] A61K *31/54;* **C07D** *277/82*

U.S. Cl. 514—367 **14 Claims**

1. A compound of the formula:

in which R^8 represents a hydrogen atom or an alkyl

is an alkyl group having 1 to 3 carbon atoms, a phenyl, benzyl

8-fluoro-1,2,3,9-tetrahydro-3-[(5-methyl-1H-imidazol-4-yl) methyl]-4H-carbazol-4-one;

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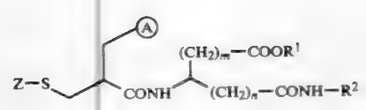


(I)

wherein
R^1 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,
R^2 represents a heterocyclic ring selected from the group consisting of benzthiazole, thiazole, isothiazole, benzoxazole, oxazole and isoxazole wherein the said ring represented by R^2 is unsubstituted or substituted by 1 to 3 R^3s, one of the R^3s representing
(1) a group of the formula:

$-NR^5R^6$

in which R^5 and R^6 independently represent a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,
(2) a group of the formula:

$-CONR^5R^6$

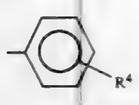
in which R^5 and R^6 are as hereinbefore defined,
(3) a group of the formula:

$-SO_2NR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,
(4) a cyano group,
(5) a nitro group, or
(6) a group of the formula:

$-NHCO-R^7$

in which R^7 represents an alkyl group of 1 to 4 carbon atoms or a phenyl group substituted by a hydrogen atom, a halogen atom, a trihalomethyl group, a hydroxy group, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms,
and the other R^3s representing independently:
(1) a halogen atom,
(2) a trihalomethyl group,
(3) a hydroxy group,
(4) an alkyl group of 1 to 15 carbon atoms,
(5) an alkoxy group of 1 to 4 carbon atoms,
(6) an alkylthio, alkylsulfinyl or alkylsulfonyl group, of 1 to 4 carbon atoms,
(7) a group of the formula



in which R^4 represents a hydrogen atom, a halogen atom, a trihalomethyl group, a hydroxy group, an alkyl group of 1 to 4 carbon atoms or an alkoxy group of 1 to 4 carbon atoms,
(8) a group of the formula:

$-NR^5R^6$

in which R^5 and R^6 independently represent a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,
(9) a group of the formula:

$-CO-R^7$

in which R^7 is as hereinbefore defined,
(10) a group of the formula:

$-COOR^8$

in which R^8 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,
(11) a group of the formula:

$-CONR^5R^6$

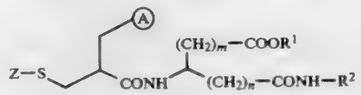
in which R^5 and R^6 are as hereinbefore defined,
(12) a group of the formula:
$-SO_2NR^5R^6$

in which R^5 and R^6 are as hereinbefore defined,
(13) a cyano group,
(14) a nitro group, or
(15) a group of the formula:

$-NHCO-R^7$,

in which R^7 is as hereinbefore defined,
Z represents a hydrogen atom,
Ⓐ represents a phenyl or cycloalkyl group of 4 to 7 carbon atoms, substituted by R^{13}, in which R^{13} represents a hydrogen atom, a halogen atom, a trihalomethyl group, an alkyl group of 1 to 4 carbon atoms or an alkoxyl group of 1 to 4 carbon atoms, and
m and n represent:
(1) when m is zero, n is an integer of 1 to 4, and
(2) when n is zero, m is an integer of 1 to 4;
or a non-toxic salt thereof.

6. A method for the prevention and treatment of pain, anxiety or convulsion, which comprises the administration of an effective amount of a compound of the formula:



(I)

wherein the various symbols are as defined in claim **1**, or a non-toxic salt thereof, and a pharmaceutically acceptable carrier.

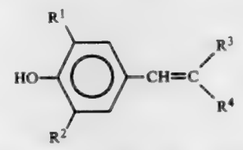
5,202,341

HYDROXYSTYRENE COMPOUNDS HAVING TYROSINE KINASE INHIBITING ACTIVITY

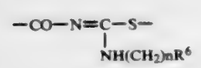
Tadayoshi Shiraishi, Takasago; Keiji Kameyama, Kakogawa; Takeshi Domoto, Kakogawa; Naohiro Imai, Kakogawa; Yoshio Shimada, Kakogawa; Yutaka Ariki, Himeji; Kazunori Hosoe; Masaji Kawatsu, both of Takasago; Ikuo Katsumi; Takayoshi Hidaka, both of Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 584,683, Sep. 19, 1990, Pat. No. 5,089,516, which is a division of Ser. No. 283,992, Nov. 10, 1988, Pat. No. 4,971,996. This application Jul. 25, 1991, Ser. No. 735,581
Claims priority, application Japan, Nov. 3, 1987, 62-55965; Nov. 3, 1987, 62-55966; Dec. 3, 1987, 62-57256
Int. Cl.[5] C07D *207/44*
U.S. Cl. 514—369 **3 Claims**

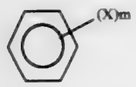
1. A hydroxy styrene compound of the formula:



wherein R^1 is an alkyl group having 1 to 3 carbon atoms, a phenyl or benzyl group, or R^5O- in which R^5 is hydrogen, an alkyl group having 1 to 5 carbon atoms or a benzyl group; R^2 is an alkyl group having 1 to 3 carbon atoms, a phenyl, benzyl or $PhSCH_2$-group; and R^3 and R^4 taken together are



in which R^6 is



in which X is hydrogen, a halogen atom, or a methyl, ethyl, methoxy, ethoxy, nitro, aminosulfonyl or amino group, and m is 1 or 2; and n is 0 or an integer of 1 to 3; or a salt thereof.

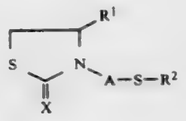
5,202,342

N-ALKYL THIAZOLIDINE DERIVATIVES

Takakazu Morita, Toyonaka; Shiro Mita, Ashiya, and Yoichi Kawashima, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 3, 1991, Ser. No. 725,012
Claims priority, application Japan, Jul. 18, 1990, 2-191070
Int. Cl.[5] C07D *277/14*; **A61K** *31/425*
U.S. Cl. 514—369 **7 Claims**

1. A compound of the formula [I] and or pharmaceutically acceptable salts thereof,



[I]

wherein
X is oxygen or sulfur;
R^1 is lower alkyl which can be substituted by hydroxy, carboxy or lower alkoxycarbonyl;
R^2 is hydrogen, lower alkanoyl, phenyl lower alkanoyl or phenyl lower alkyl, and said phenyl ring of phenyl lower alkanoyl or phenyl lower alkyl can be substituted by lower alkyl or lower alkoxy; and
A is straight or branched C_1–C_6 alkylene.

5,202,343

TRICYCLIC KETONES USEFUL AS HT_3-RECEPTOR ANTAGONISTS

Ian H. Coates, Hertford; John Bradshaw; James A. Bell, both of Royston; David C. Humber, London; George B. Ewan, Gerrards Cross; William L. Mitchell, London, and Barry J. Price, Tewin Wood, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 770,720, Oct. 4, 1991, abandoned, which is a continuation of Ser. No. 476,537, Feb. 7, 1990, abandoned, which is a continuation of Ser. No. 320,622, Mar. 8, 1989, abandoned, which is a division of Ser. No. 281,031, Dec. 7, 1988, Pat. No. 4,859,662, which is a continuation of Ser. No. 199,792, May 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,202, Nov. 27, 1987, Pat. No. 4,822,881. This application May 22, 1992, Ser. No. 887,607
Claims priority, application United Kingdom, Nov. 28, 1986, 8628473; Nov. 12, 1987, 8726537; May 20, 1989, 8912002
Int. Cl.[5] **A61K** *31/415*; C07D *403/06*
U.S. Cl. 514—397 **5 Claims**

1. A compound selected from:
8-fluoro-1,2,3,9-tetrahydro-9-methyl-3-[(5-methyl-1H-imidazol-4-yl)methyl]-4H-carbazol-4-one;
8-fluoro-1,2,3,9-tetrahydro-3-[(5-methyl-1H-imidazol-4-yl) methyl]-4H-carbazol-4-one;
and physiologically acceptable salts thereof.

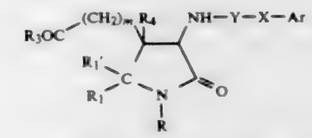
5,202,344

N-SUBSTITUTED LACTAMS USEFUL AS CHOLECYSTOKININ ANTAGONISTS

Daniel P. Becker, Glenview; Daniel L. Flynn, Mundelein, and Clara I. Villamil, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Dec. 11, 1990, Ser. No. 626,590
Int. Cl.[5] **A61K** *31/40*; C07D *207/12*
U.S. Cl. 514—423 **26 Claims**

1. A compound according to claim 1 having the formula



II

and isomer thereof; or a pharmaceutically acceptable acid or base addition salt thereof:
wherein
Ar is
aryl;
substituted aryl which can be substituted one or more by alkyl of 1 to 6 carbon atoms, alkoxy wherein the alkyl is 1 to 6 carbon atoms, trifluoromethyl, halogen, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms; fused bicyclic aromatic hydrocarbon radical having 9 or 10 carbon atoms; substituted fused bicyclic aromatic hydrocarbon radical having 9 or 10 carbon atoms which can be substituted one or more by alkyl of 1 to 6 carbon atoms, halogen, trifluoromethyl, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms or alkoxy wherein the alkyl is 1 to 6 carbon atoms;
R is
alkyl having 1 to 8 carbon atoms wherein one of the carbon atoms may be replaced by oxygen;
aryl;
substituted aryl which can be substituted one or more by halogen, alkyl having 1 to 6 carbon atoms, alkoxy wherein the alkyl is 1 to 6 carbon atoms, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms, trifluoromethyl or methylene dioxy; aralkyl wherein the alkyl is 1 to 8 carbon atoms; substituted aralkyl wherein the alkyl is 1 to 8 carbon atoms and the substituent or substituents are selected from the group consisting of halogen, alkyl having 1 to 6 carbon atoms, alkoxy wherein the alkyl is 1 to 6 carbon atoms, amino, alkyl or dialkyl substituted amino wherein the alkyl is 1 to 6 carbon atoms, trifluoromethyl or methylene dioxy;
X is a direct bond or a substituent selected from the group consisting of NH, oxygen or alkylene having 1 to 3 carbon atoms;
R_1 and R_1' are each independently hydrogen or alkyl having 1 to 4 carbon atoms;
m is an integer from 0 to 3;
R_3 is OH, OR_5 wherein R_5 is alkyl having 1 to 6 carbon atoms or NR_6R_7 wherein R_6 and R_7 are each independently hydrogen or alkyl of 1 to 6 carbon atoms;
R_4 is hydrogen or alkyl having 1 to 4 carbon atoms; and
Y is C=O.

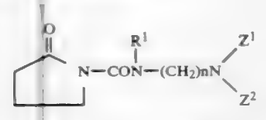
5,202,345

CARBAMOYLPYRROLIDONE DERIVATIVES AND DRUGS FOR SENILE DEMENTIA

Hiromu Matsumura; Toshisada Yano; Akira Matsushita, all of Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 571,402, Aug. 23, 1990, Pat. No. 5,120,733, which is a division of Ser. No. 233,142, Aug. 17, 1988, Pat. No. 4,977,167. This application Feb. 7, 1992, Ser. No. 832,407
Claims priority, application Japan, Aug. 19, 1987, 62-205956
Int. Cl.[5] A61K *31/40;* **C07D** *207/63*
U.S. Cl. 514—423 **8 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen, or C_1–C_6 alkyl; n is an integer of from 2 to 3; Z^1 is phenyl, benzyl, or isoxazolyl and each is optionally substituted by a halogen, a methoxy, or a methyl group; Z^2 is hydrogen, C_1–C_5 alkyl, allyl, unsubstituted phenyl, or phenyl substituted by halogen, methyl, or methoxy; or a pharmaceutically acceptable acid addition salt thereof.

5,202,346

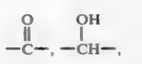
PIPERIDINYL AND PIPERAZINYL DERIVATIVES

John A. Butera, Kendall Park; Jehan F. Bagli, and John W. Ellingboe, both of Princeton, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

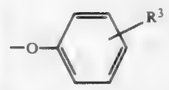
Filed Feb. 25, 1992, Ser. No. 841,922
Int. Cl.[5] A61K *31/445;* **C07D** *211/20, 211/30, 401/12*
U.S. Cl. 514—326 **8 Claims**

1. A compound of the formula:

in which
R^1 is alkylsulfonamido of 1 to 6 carbon atoms, alkylsulfonamido of 6 to 10 carbon atoms, —NO_2, —CN, 1-imidazolyl or 1,2,4-triazol-1-yl;
Y is



—CH_2—, —O—, —S—, or —SO_2—;
X is —CH═;
R^2 is hydrogen when n is 0, otherwise it is hydrogen or —OH;
n is one of the integers 0,1,2,3,4,5 or 6;
A is



where R^3 is alkylsulfonamido of 1 to 6 carbon atoms, arylsulfonamido of 6 to 10 carbon atoms, —NO_2, —CN, 1-imidazolyl or 1,2,4-triazol-1-yl;
or a pharmaceutically acceptable salt thereof.

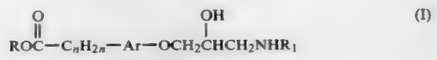
5,202,347

SOFT BETA-ADRENERGIC BLOCKING AGENTS

Nicholas S. Bodor, 6219 SW. 93rd Ave., Gainesville, Fla. 32608

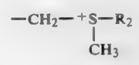
Division of Ser. No. 692,260, Apr. 26, 1991, Pat. No. 5,135,926, which is a continuation of Ser. No. 286,879, Dec. 20, 1988, abandoned, which is a division of Ser. No. 922,462, Oct. 23, 1986, Pat. No. 4,829,086, which is a continuation of Ser. No. 741,846, Jun. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 589,359, Mar. 14, 1984, abandoned. This application Jan. 17, 1992, Ser. No. 822,127
Claims priority, application Canada, Mar. 13, 1985, 476391
Int. Cl.[5] A61K *31/38;* **C07D** *333/08;* **C07C** *313/00, 229/00*
U.S. Cl. 514—432 **21 Claims**

1. A compound of the formula

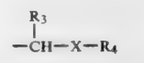


(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein:
n is an integer from 0 to 10 inclusive;
R is —CH_2—X—R_2 wherein X is SO, SO_2 and R_2 is C_1–C_7 alkyl or C_3–C_{12} cycloalkyl;



wherein R_2 is defined as above; or



wherein X is defined as above and wherein R_3 is C_1–C_7 alkyl and R_4 is C_1–C_7 alkyl or wherein R_3 and R_4 together represent —$(CH_2)_m$—wherein m is 3 or 4 and —(CH_2)—$_m$is optionally substituted by one to three C_1–C_7 alkyl;
R_1 is C_1–C_7 alkyl;
and Ar is a divalent radical selected from the group consisting of:
(a) unsubstituted phenylene; and
(b) phenylene substituted by C_1–C_7 alkyl, C_1–C_7 alkyl—O—C_1—C_7 alkylene-, C_2–C_8 alkenyl, C_1–C_7 alkyl-S-, C_2–C_8 alkenyl-O-, C_3–C_{12} cycloalkyl, C_1–C_7-alkyl-CONH-, C_1–C_7 alkyl-CO- or H_2NCO-C_1–C_7 alkylene-.

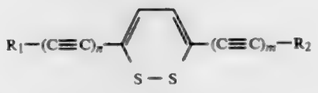
5,202,348

THIARUBRINE ANTIFUNGAL AGENTS

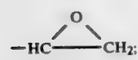
G. H. Neil Towers, Vancouver, Canada; Reimer C. Bruening, San Carlos, Calif.; Felipe Balza, Vancouver, Canada; Zyta A. Abramowski, Vancouver, Canada, and Isabel Lopez-Bazzochi, Vancouver, Canada, assignors to The University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 447,893, Dec. 7, 1989, abandoned. This application Aug. 17, 1990, Ser. No. 568,940
Int. Cl.[5] A61K *31/385;* **C07D** *339/08*
U.S. Cl. 514—436 **14 Claims**

1. An isolated substance having antifungal activity of the formula



where
R_1 is CH_3 or $HOCH_2$;
R_2 is



—CHOHCH$_2$OH; —CHClCH$_2$OH; —CHOHCH$_2$Cl; or —CH═CH$_2$
n is 1;
m is 2;
, provided that when R_1 is CH_3, then R_2 is not CH═CH_2, and pharmaceutically acceptable salts thereof.

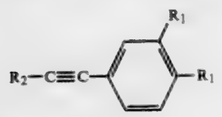
5,202,349

SUBSTITUTED PHENYLACETYLENES, PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS AND PROCESSES FOR THE PREPARATION OF THESE COMPOUNDS AND COMPOSITIONS

Oswald Zimmer, Dueren; Werner Vollenberg, Stolberg; Ulrich Seipp, Aachen; Werner Englberger, Stolberg; Michael Haurand, Aachen; Brigitte J. Bosman, Simmerath-Lammersdorf, and Johannes Schneider, Stolberg, all of Fed. Rep. of Germany, assignors to Gruenenthal GmbH, Aachen, Fed. Rep. of Germany

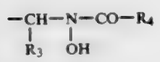
Filed Jul. 18, 1991, Ser. No. 732,168
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1990, 4023742
Int. Cl.[5] A61K *31/38;* **C07D** *307/52*
U.S. Cl. 514—438 **16 Claims**

1. A substituted phenylacetylene of the formula

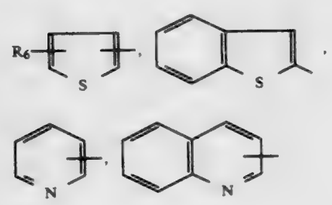


I

wherein
one of the symbols R_1 represents a hydrogen atom while the other represents the group of the formula

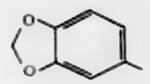


in which
R_3 is hydrogen, methyl or ethyl and R_4 represents a methyl or an amino group and
R_2 represents a mono- or binuclear group which is a mono- or binuclear heterocyclic radical containing sulfur nitrogen or oxygen selected from the group consisting of radicals of the formulae



and

-continued



wherein R_6 represents a hydrogen or a chlorine atom or a methyl group
or a stereoisomer or optically active form thereof.

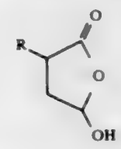
5,202,350

FURANONE ANTI-INFLAMMATORY AGENTS

F. Christopher Zusi, Tonowanda; Suresh Marathe, Amherst; William Somerville, Buffalo, and Kenneth M. Tramposch, East Amherst, all of N.Y., assignors to Bristol-Myers Squibb Co., Mew Uprl., N.Y.

Filed Aug. 29, 1991, Ser. No. 752,104
Int. Cl.[5] A61U *31/34;* **C07D** *305/12*
U.S. Cl. 514—461 **19 Claims**

1. A compound of the following structure:



wherein R is a straight alkyl group containing at least 6 carbons, or phenylalkyl wherein the alkyl chain contains at least 6 carbons.

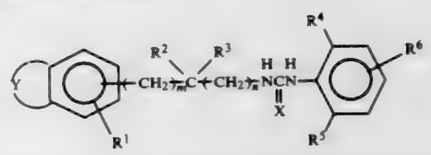
5,202,351

1-PHENYLALKYL-3-PHENYLUREA DERIVATIVE

Tetsuo Sekiya, Yokohama; Shinya Inoue, Tokyo; Chiaki Hyodo, Machida; Hiromi Okushima, Kawasaki; Kohei Umezu, Yokohama, and Kazuo Suzuki, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 643,983
Claims priority, application Japan, Jan. 22, 1990, 2-12235; Feb. 8, 1990, 2-28768
Int. Cl.[5] C07D *317/44*
U.S. Cl. 514—450 **16 Claims**

1. A 1-phenylalkyl-3-phenylurea derivative represented by the following formula (I):



(I)

wherein R^1 and R^6 represent independently hydrogen, C_1–C_{15} alkyl or R^3 represents together with R^2 C_2–C_9 alkylene; R^4 and R^5 represent independently C_1–C_5 alkyl, C_1–C_5 alkoxyl or halo; X represents oxygen or sulfur; Y represents —O—$(CH_2$-$)$l—O-13 wherein l is an integer of 1 to 3 or —$(CH_2)_p$— wherein p is an integer of 3 to 5; m is 0 or an integer of 1 to 5; and n is 0 or an integer of 1 to 3.

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5,202,352

INTRAVASCULAR EMBOLIZING AGENT CONTAINING ANGIOGENESIS-INHIBITING SUBSTANCE

Hiroaki Okada, Suita; Shigeru Kamei, Takarazuka, and Toshio Yoshioka, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 6, 1991, Ser. No. 740,849
Int. Cl.[5] A61K *31/00, 31/335*
U.S. Cl. 514—475 19 Claims

1. An intravascular embolizing agent containing an angiogenesis-inhibiting substance and an intravascular embolizing substance, said agent being in the state of an oil solution, an emulsion or a suspension.

5,202,353

IRON ENHANCEMENT OF COPPER BASED FUNGICIDAL AND BACTERICIDAL COMPOSITIONS

Milton N. Schroth, Orinda; Yung-Ann Lee, Albany, and Mavis D. Chong, El Sobrante, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jan. 22, 1991, Ser. No. 644,997
Int. Cl.[5] A01N *55/02*
U.S. Cl. 514—500 8 Claims

1. A bactericidal composition which comprises:
(a) a biologically inert carrier;
(b) a fixed copper based bactericidal composition which provides a concentration of free copper of from about 1 to about 30 ppm so as to be toxic to bacteria in the presence of an activity enhancing amount of iron (Fe^{+3}); and
(c) an activity enhancing amount of Fe^{+3} which amount is not more than about 300 ppm.

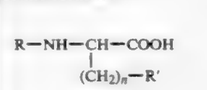
5,202,354

COMPOSITION AND METHOD FOR REDUCING ACETALDEHYDE TOXICITY

Masayoshi Matsuoka, Habikino, and Go Kito, Yao, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 13,443, Feb. 10, 1987, abandoned. This application Feb. 21, 1992, Ser. No. 839,265
Claims priority, application Japan, Feb. 18, 1986, 61-34494
Int. Cl.[5] A01N *37/00, 43/08*
U.S. Cl. 514—562 7 Claims

1. A composition for reducing acetaldehyde toxicity associated with drinking alcohol which comprises, as combined active components, an effective amount of
(a) a compound of the formula:



wherein R is hydrogen or an alkylcarbonyl group having 1-4 carbon atoms in the alkyl moiety; R′ is a thiol or sulfonic group; and n is an integer of 1 or 2,
(b) ascorbic acid or a physiologically acceptable salt thereof, and
(c) a member selected from the group consisting of thiamine disulfide, bisbentiamine, bisbutitiamine, bisibutiamine, prosultiamine, fursultiamine, octotiamine and a physiologically acceptable salt thereof.

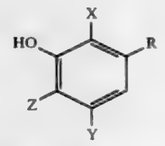
5,202,355

METHOD OF INHIBITING ALDOSE REDUCTASE IN DIABETIC HOSTS USING PHENOL DERIVATIVES

Tetsuo Nakatsu, Walnut Creek, Calif., assignor to Takasago Institute for Interdisciplinary Science Inc., Walnut Creek, Calif. and Takasago International Corporation, Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 713,883
Int. Cl.[5] A01N *37/10, 31/08*
U.S. Cl. 514—568 2 Claims

1. A method of inhibiting the action of aldose reductase enzyme in a diabetic host in need of treatment of diabetic conditions, which comprises administering to the host an aldose reductase enzyme inhibiting amount of a compound having the formula:



or a pharmaceutically acceptable salt thereof, wherein R is alkyl having from 15 to 17 carbon atoms or alkenyl having from 15 to 17 carbon atoms; X is hydrogen or carboxyl; Y is hydrogen or hydroxyl; and Z is hydrogen or alkyl having from one to four carbon atoms.

5,202,356

PESTICIDAL CYCLOPROPYL-2,4-DIENEAMIDES

Robert J. Blade; George S. Cockerill, and John E. Robinston, all of Hertfordshire, England, assignors to The Wellcome Foundation Limited, London, England

Continuation of Ser. No. 436,803, Nov. 15, 1989, abandoned.
This application Jul. 12, 1991, Ser. No. 729,847
Claims priority, application United Kingdom, Nov. 16, 1988, 8826760
Int. Cl.[5] A01N *37/18*
U.S. Cl. 514—617 15 Claims

1. A compound of the formula (I):

$$QQ^1\ CR^2{=}CR^3\ CR^4{=}CR^5C\ (=X)\ NHR^1$$

or a salt thereof, wherein Q is a substituted monocyclic aromatic ring, or fused bicyclic ring system of which at least one ring is aromatic containing 9 or 10 atoms of which one may be nitrogen and the rest carbon or the bicyclic ring system is substituted by one to four groups selected from C_{1-6} hydrocarbyl, C_{1-6} alkoxy or methylenedioxy, or C_{1-6} hydrocarbyl, C_{1-6} alkoxy or methylenedioxy substituted by one to three halos, or from halo, cyano or nitro,
or the substituent on the Q ring is a group $S(O)_nR^7$ wherein n is 0, 1 or 2 and R^7 is C_{1-6} alkyl or C_{1-6} alkyl substituted by one or more halos or R^7 is amino or amino substituted by one or two C_{1-6} alkyl groups or the substituent is a group NR^8R^9 where R^8 and R^9 are independently selected from hydrogen, C_{1-6} alkyl or a group COR^{10} where R^{10} is C_{1-6} alkyl,
or Q is a dihalovinyl group or a group R^6—C≡C— where R^6 is C_{1-4} alkyl, tri C_{1-4} alkylsilyl, halogen or hydrogen;
Q^1 is a 1,2-cyclopropyl ring or a 1,2-cyclopropyl ring substituted by one or more groups selected from C_{1-3} alkyl, halo, C_{1-3} haloalkyl, alkynyl, or cyano;
R^2, R^3, R^4 and R^5 are the same or different with at least one being hydrogen and the others being independently selected from hydrogen, halo, C_{1-4} alkyl or C_{1-4} haloalkyl;
X is oxygen or sulfur; and
R^1 is selected from hydrogen, C_{1-8} hydrocarbyl and C_{1-8} hydrocarbyl substituted by dioxalanyl, halo, cyano, trifluoromethyl, trifluoromethylthio or C_{1-6} alkoxy,
provided that the compound of formula (I) is not
(±)-2E,4E)-N-Isobutyl-5-[trans-2-(2,6-dichloro-4-pyridyl) cyclo-propyl]-3-methylpenta-2,4-dienamide
(±)-2E,4E)-N-(1,2-Dimethylpropyl)-5-[trans-2-(3,4-dichloropheny)cyclopropyl]penta-2,4-dienamide
(±)-2e,4E)-N-(1,2-Dimethylpropyl)-5-[trans-2-(4-methoxyphenyl)cyclopropyl]penta-2,4-dienamide.

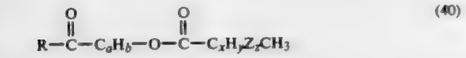
5,202,357

SKIN TREATMENT COMPOSITION

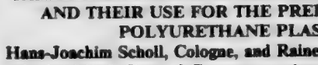
Paul A. Bowser, Merseyside, England; Albert Froling, Vlaardingen, Netherlands; Lammert Heslinga, Maassluis, Netherlands; Udo M. T. Houtsmuller, Vlaardingen, Netherlands; Diederik H. Nugteren, Rhoon, Netherlands; Hendrik J. J. Pabon, Vlaardingen, Netherlands, and Colin Prottey, Merseyside, England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 505,005, Jun. 16, 1983, Pat. No. 4,950,688. This application Jun. 21, 1990, Ser. No. 541,993
Claims priority, application United Kingdom, Jun. 16, 1982, 8217413; Jun. 16, 1982, 8217414; Jul. 14, 1982, 8220442
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] A61K *7/40, 7/48, 9/07, 9/12*
U.S. Cl. 514—847 7 Claims

1. A composition suitable for topical application to human skin for restoring or enhancing skin barrier function so as to eliminate or at least reduce moisture loss particularly when the skin surface has become excessively dry, fissured, eroded or otherwise damaged, which composition comprises:
i) from 0.0001 to 5% by weight of an active ingredient; and
ii) from 15 to 99.9999% by weight of a vehicle to act as a diluent, dispersant or solvent for the active ingredient;
the active ingredient being an ester comprising one or more compounds having the structure:



where
R is chosen from HO—, N-sphingosyl and N-(glycosylsphingosyl);
Z is —OH, or an epoxy oxygen;
a is an integer of from 7 to 49;
b is an integer of from 10 to 98;
x is an integer of from 16 to 20;
y is an integer of from 24 to 36; and
z is 0, or an integer of from 1 to 4;
the substructure



being an all-cis n-6,9 fatty acid.

5,202,358

PROCESS FOR THE PREPARATION OF LIQUID STORABLE ORGANIC ISOCYANATES CONTAINING CARBODIIMIDE AND/OR URETONE IMINE GROUPS AND THEIR USE FOR THE PREPARATION OF POLYURETHANE PLASTICS

Hans-Joachim Scholl, Cologne, and Rainer Welte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed May 18, 1992, Ser. No. 884,143
Claims priority, application Fed. Rep. of Germany, May 28, 1991, 4117384
Int. Cl.[5] C08G *18/77*
U.S. Cl. 521—160 9 Claims

1. A process for the preparation of liquid storable organic isocyanates containing carbodiimide and/or uretone imine groups comprising
(a) partially carbodiimidizing isocyanate groups of an organic isocyanate with a catalyst of the phospholine type, and
(b) terminating the carbodiimidization reaction by the addition of a silylated acid corresponding to the formula

$$X—[Si(CH_3)_3]_n$$

in which
X represents the neutral acid residue obtained by removal of the acidic hydrogen atoms from an n-basic acid having a pK_a value of at most 3, other than a hydrohalic acid, and
n is an integer of 1 to 3.

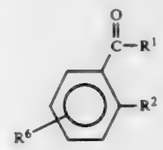
5,202,359

PHOTOINITIATORS THAT ARE SOLUBLE IN HIGHLY FLUORINATED MONOMERS

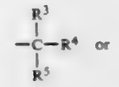
Daniel K. McIntyre, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

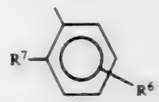
Filed May 17, 1990, Ser. No. 525,154
Int. Cl.[5] C08G *2/46*
U.S. Cl. 522—44 17 Claims

1. A phenolic hydroxyl free compound having the structural formula:



wherein
R^1 represents





wherein
each of R^3, R^4, and R^5 independently represents a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl group, alkoxy group, and phenyl group, provided that at least one of R^3, R^4, or R^5 is selected from the group consisting of halogen, hydroxy, and alkoxy group, or any two of R^3, R^4, and R^5 together represent a branched or unbranched alkylene group that forms together with the carbon atoms to which they are attached a 5- or 6-membered carbocyclic ring, or any two of R^3, R^4, and R^5 together represent carbonyl oxygen, provided that the remaining R^3, R^4, or R^5 is selected from the group consisting of halogen, hydroxy, alkoxy group, and phenyl group;
each of R^2 and R^7 independently represents a member selected from the group consisting of hydrogen, halogen, and lower alkyl group having one to six carbon atoms, or R^2 and R^7 together represent a coordinate bond, an oxygen atom, or a sulfur atom joining the phenyl group of Formula I to the phenyl group of the moiety of Formula III;
each R^6 group independently represents a member selected from the group consisting of hydrogen, lower alkyl group having 1 to 6 carbon atoms, and polyfluoroaliphatic group, —XR_fY, in which X represents a polyvalent connecting group joining —R_fY to a phenyl group of Formula I or of a phenyl group of the moiety of Formula II or the moiety of Formula III, R_f represents either (a) a polyfluorinated, saturated, divalent aliphatic group that is straight-chain, branched-chain, or cyclic, and contains no more than one hydrogen atom per four fluorine atoms, or (2) divalent poly(fluorooxyalkylene) group having a num-

ber average molecular weight of from about 200 to 20,000,

initiator and a polyfunctional acrylate crosslinker; and (iii)

film-forming constituent, an aqueous dispersion prepared by a process comprising the steps of:

heating said formed composition in the mold, at a tempera-

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ber average molecular weight of from about 200 to 20,000, and Y represents a fluorine atom or X, and when Y represents X, the divalent group-13 XR_fX—joins two phenyl groups of Formula I, provided that at least one of R^6 groups is —XR_fY and said compound is soluble in ethylenically-unsaturated fluorocarbon compounds.

5,202,360

FLUORINE-CONTAINING ALICYCLIC AND AROMATIC CYCLIC COMPOUNDS, PROCESS THEREOF AND ADHESIVE COMPOSITION CONTAINING THE COMPOUND

Akira Ohmori, Ibaraki; Yoshiki Shimizu, Nabari; Motonobu Kubo, Toyonaka; Kouzaburou Nakamura, Tokyo; Tohru Maruno, Mito; Norio Murata, Tokyo, and Hideo Kobayashi, Settsu, all of Japan, assignors to Daiken Industries, Ltd., Osaka and Nippon Telegraph & Telephone Corp., Tokyo, both of Japan

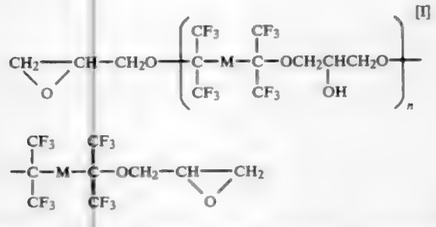
Continuation of Ser. No. 586,846, Oct. 18, 1990, abandoned, which is a division of Ser. No. 205,853, Jun. 13, 1988, abandoned. This application Jul. 29, 1991, Ser. No. 737,577

Claims priority, application Japan, Jun. 15, 1987, 62-149784; Dec. 8, 1987, 62-308556

Int. Cl.[5] **C08F** *2/46;* **C07D** *303/00;* **C07C** *69/62*

U.S. Cl. 522—100 **2 Claims**

1. An adhesive composition comprising a photopolymerization initiator or curing agent and the compound represented by the formula (I)



[I]

wherein M is a divalent organic group comprising at least one substituted or unsubstituted alicyclic hydrocarbon group of a divalent organic group comprising at least two substituted or unsubstituted aromatic hydrocarbon groups, the alicyclic hydrocarbon group or aromatic hydrocarbon group may be linked by O, S or CH_2 or may form a condensed ring, n is zero or a positive number.

5,202,361

PRESSURE-SENSITIVE ADHESIVE

Patrick G. Zimmerman, St. Paul; Gaddam N. Babu, Woodbury; Lang N. Nguyen, St. Paul, all of Minn.; Ingrid E. Blair, and George F. Vesley, both of Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1991, Ser. No. 812,280

Int. Cl.[5] **C08J** *3/28;* **C09J** *7/02;* **B32B** *27/30*

U.S. Cl. 522—120 **29 Claims**

1. A radiation-curable tackifier-free composition comprising:

a) 100 parts by weight (pbw) of a blend of:

i) 60 to 100 pbw acrylic acid esters of monohydric alcohols having an average of 4 to 12 carbon atoms; and

ii) 0 to about 40 pbw monoethylenically-unsaturated copolymerizable monomer whose homopolymer has a T_g greater than about 50° C.;

b) 10 to 100 pbw of polymer of alpha-olefins having a T_g in the range of about −70° C. to −10° C. and having a weight average molecular weight of about 25,000 to about 5,000,000 wherein at least 60 mole percent of the alpha-olefins have 6 to 18 carbon atoms; and

c) photochemically effective amount of a material selected from the group consisting of: (i) photoinitiator, (ii) photoinitiator and a polyfunctional acrylate crosslinker; and (iii) a photoinitiator that is also a photocrosslinker.

5,202,362

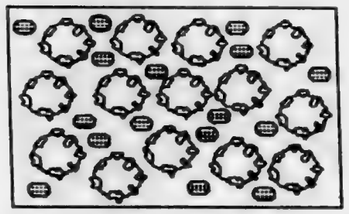
SYRINGEABLE EAR PLUG MOLDING PUTTY COMPOSITION

Jules J. Hermele, Farmingville, N.Y., assignor to Intech Specialties Co., Inc., N. Massapequa, N.Y.

Filed Sep. 9, 1991, Ser. No. 756,894

Int. Cl.[5] **C08J** *9/32*

U.S. Cl. 523—218 **9 Claims**



1. A syringeable ear plug molding putty composition suitable for room temperature application and curing, having a viscosity of 1 million centipoise, and used for creating instant floating ear plugs,

the base composition thereof including a silicone reactive fluid with additives dispersed therein, and the putty composition further comprising:

an admixture of surface treated thermoplastic microspheres and a diatomaceous functional filter, the microsphere to diatomaceous filler having a ratio of 3 to 1 by weight, the admixture comprising 25 to 35 percent by weight of the putty composition.

5,202,363

ANHYDROUS METAL SALTS OF α,β-ETHYLENICALLY UNSATURATED CARBOXYLIC ACIDS AND RELATED METHODS

Arthur E. Oberster, North Canton, and Takatsugu Hashimoto, Akron, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio and Bridgestone Corporation, Tokyo, Japan

Filed Apr. 16, 1990, Ser. No. 509,278

Int. Cl.[5] **C08K** *5/09*

U.S. Cl. 523—333 **3 Claims**

1. A method for the preparation of an anhydrous metal salt of an α,β-ethylenically unsaturated carboxylic acid having a crystalline structure consisting essentially of plates and fibers comprising the steps of:

reacting an organometallic salt of a metal selected from the group consisting of zinc, iron (II), copper (II) and alkaline earth metals with an α,β-ethylenically unsaturated carboxylic acid having from 3 to about 30 carbon atoms in an organic hydrocarbon solvent with vigorous agitation;

removing said solvent; and

recovering said anhydrous metal salt.

5,202,364

AQUEOUS DISPERSION COATING MATERIAL CONTAINING EPOXY DENATURED ALKYD

Hitoshi Taniguchi, Kamakura; Masahiro Ishidoya, Yokohama; Ken Nakashima, Nishinomiya, and Hisao Ogawa, Zushi, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,477, Jun. 13, 1988, abandoned. This application Jun. 24, 1991, Ser. No. 719,668

Int. Cl.[5] **C08K** *3/20*

U.S. Cl. 523—403 **10 Claims**

1. An aqueous dispersion coating material comprising, as a film-forming constituent, an aqueous dispersion prepared by a process comprising the steps of:

reacting a first resin having an acid value of 20 to 50, a hydroxyl value of 100 to 300 and a number-average molecular weight of from 1,000 to 10,000, with a second resin comprising an epoxy resin having a molecular weight of 2,000 to 30,000, an epoxy equivalent of 1,500 or more and a solid state at room temperature, said first resin comprising a polymeric water-soluble epoxy-denatured alkyd resin obtained by reacting a polyol, a bisphenol epoxy resin, a polycarboxylic acid and an alkyl group-providing material, said alkyl group-providing material having in its molecular 8 to 30 carbon atoms and being selected from the group consisting of fatty acids, monohydric alcohols, fatty acid esters and aliphatic epoxy compounds, and which contains 30 to 60 weight % of the bisphenol epoxy resin moiety and 10 to 35 weight % of alkyl groups having 8 to 30 carbon atoms, said first resin being reacted with said second resin in a weight ratio of from 80:20 to 20:80 to cause an esterification of 10 to 50% of the groups in the first resin to form a resin reaction product having an acid value of 10 to 30 and unesterified carboxyl groups;

neutralizing the resin reaction product with a base; and

emulsifying the neutralized resin reaction product in an aqueous medium to prepare said aqueous dispersion.

5,202,365

PACKAGED ADHESIVE

Richard B. Wallace, Bloomfield Hills, Mich., assignor to Reactive Industries, Inc., Troy, Mich.

Filed Jun. 13, 1991, Ser. No. 725,595

Int. Cl.[5] **C08K** *5/01, 59/00*

U.S. Cl. 523—463 **7 Claims**

1. In a fluid adhesive mixture of different fluids in which one of said fluids comprises an uncured, curable fluid resin and another of said fluids comprises a fluid curing agent for said resin, said mixture being in the form of a multiplicity of substantially discrete contiguous deposits of the different fluids in which adjacent deposits are separated by a thin flexible rupturable barrier film formed of the cured resin as reacted by the curing agent, and wherein said adhesive mixture has the potential for forming a reactive, noncompressible crust, the improvement comprising, said mixture being substantially free of a reactive, noncompressible crust and wherein said uncured, curable fluid resin is free-flowing at room temperature and said fluid curing agent includes a thickener in an amount sufficient to render said fluid curing agent non-free-flowing at room temperature and to prevent the formation of any substantial amount of a noncompressible crust in said mixture, wherein said thickener is selected from the group consisting of linseed oil and ethoxylated bisphenol A dimethylacrylate.

5,202,366

CROSSLINKABLE POLYESTER COMPOSITIONS WITH IMPROVED PROPERTIES

Carroll G. Reid, Charleston, and Gary C. Rex, Cross Lanes, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 332,587, Apr. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 221,651, Jul. 20, 1988, abandoned. This application Aug. 20, 1991, Ser. No. 750,714

Int. Cl.[5] **C08L** *67/06*

U.S. Cl. 523—516 **8 Claims**

1. A process for producing molded parts, comprising:

forming a polyester-based curable molding composition into a desired shape in a mold under pressure; and

heating said formed composition in the mold, at a temperature in the range of greater than 140° C. to about 200° C.;

said polyester-based curable molding composition being an improved curable molding composition containing a resin system of the type which includes as resin system components:

i) a thermosetting unsaturated polyester resin which is the reaction product of an olefinically unsaturated dicarboxylic acid or anhydride with a polyol;

ii) an ethylenically unsaturated monomer which is copolymerizable with said unsaturated polyester resin to provide crosslinking; and

iii) a thermoplastic low profile additive material for shrinkage control;

wherein the improvement comprises the combination of said resin system components and:

iv) from 1% to 10% by weight, based on the total weight of the resin system, of at least one highly reactive olefinically unsaturated material which is different from said ethylenically unsaturated monomer, and is present in the molding composition in an amount which is less than the amount of said ethylenically unsaturated monomer and which is sufficient to improve the cracking or blistering resistance of the cured molding composition without adversely affecting its surface smoothness, said highly reactive olefinically unsaturated material being selected from the group consisting of:

a) the di- acrylate or methacrylate of a diol selected from the group consisting of hexane diols, neopentyl glycol, butylene glycol, diethylene glycol, tetraethylene glycol, and tripropylene glycol;

b) the tri- acrylate or methacrylate of trimethylol propane;

c) the tetra- acrylate or methacrylate of pentaerythritol;

d) the di- acrylate or methacrylate of an ethoxylated Bis Phenol A;

e) the acrylate or methacrylate of isobornyl alcohol; and

f) divinyl benzene;

whereby the surfaces of molded parts so produced are superior, in terms of cracking and blistering, to surfaces of parts produced in an otherwise similar process in which highly reactive olefinically unsaturated material of paragraph iv is not employed.

5,202,367

EPOXY SELF-PRIMING TOPCOATS

Charles R. Hegedus, Warrington, Pa.; Donald J. Hirst, Mt. Laurel, N.J., and Anthony T. Eng, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 739,921, Aug. 2, 1991, Pat. No. 5,130,361, and Ser. No. 812,174, Dec. 20, 1991, each is a continuation-in-part of Ser. No. 701,406, May 13, 1991, Pat. No. 5,124,385. This application Mar. 31, 1992, Ser. No. 860,837

Int. Cl.[5] **C08L** *75/04*

U.S. Cl. 524—204 **12 Claims**

1. A corrosion-resistant self-priming coating comprising from about 5 to 50 parts by weight of an epoxy resin binder, 0 to 35 parts by weight of an alkaline earth metal phosphate, 0.1 to 5 parts by weight of a zinc benzoate, 1 to 30 parts weight of an alkaline earth phosphosilicate, 1 to 35 parts by weight of titanium dioxide, 0 to 3.0 parts by weight of an oil soluble surface active agent and 0 to 50 parts by weight of at least one organic solvent.

5,202,368

SILICONE COATING COMPOSITIONS

5,202,372

CURABLE COMPOSITIONS BASED ON

5,202,375

5,202,376

SOLUTIONS FOR FLASH-SPINNING DRY POLYMERIC

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5,202,368

SILICONE COATING COMPOSITIONS

Stephen P. Davies, Buckinghamshire, England; Alois Babicka, Blacktown, and Geoffrey B. Anderson, Richmond, both of Australia, assignors to ICI Australia Operations Proprietary Limited, Melbourne, Australia

PCT No. PCT/AU90/00028, § 371 Date Sep. 27, 1990, § 102(e) Date Sep. 27, 1990, PCT Pub. No. WO90/08810, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 30, 1990, Ser. No. 585,098
Claims priority, application Australia, Jan. 31, 1989, PJ2482
Int. Cl.[5] C08J *3/26;* C08K *5/24*
U.S. Cl. 524—266 14 Claims

1. An aqueous silicone compound coating composition comprising an addition polymer dispersion and at least one silicone compound, the silicone compound forming part of the disperse phase of a dispersion of multi-polymer particles formed by polymerization of one or more unsaturated monomers in the presence of the silicone compound and a surfactant comprising at least one ethylenically unsaturated double bond.

5,202,369

Patent Not Issued For This Number

5,202,370

BUTENE-1 COPOLYMER COMPOSITION

Takashi Yamawaki, and Nobumasa Kita, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan and Neste Oy, Finland

Continuation of Ser. No. 629,166, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 218,395, Jul. 13, 1988, abandoned. This application Apr. 20, 1992, Ser. No. 870,220
Claims priority, application Japan, Jul. 14, 1987, 62-175311
Int. Cl.[5] C08J *3/10*
U.S. Cl. 524—436 5 Claims

1. A butene-1 copolymer composition consisting essentially of 20–55% by weight of a butene-1 copolymer containing 80–99 mol % of a butene-1 unit and 1–20 mol % of α-olefin unit having at least 5 carbon atoms, and having an intrinsic viscosity [η] of 1.0–7.0 dl/g measured in decalin at 135° C., a maximum melting point of 80°–120° C. measured by differential scanning calorimetric analysis and a blocking property of the α-olefin unit measured by nuclear magnetic resonance spectrum analysis of 0.005 or less; and

80–45% by weight of an inorganic metal hydoxide or an inorganic metal hydrate having an average particle size of 0.05–6 μm.

5,202,371

FREE-FLOWING RUBBER GRANULES

Walter Goetz, Ludwigshafen; Eckhard M. Koch, Fussgoenheim; Herbert Gutsche, Beindersheim, and Richard Pflueger, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 522,041, May 11, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 784,077
Int. Cl.[5] B44D *1/22;* B44C *1/08;* C08K *3/34*
U.S. Cl. 524—447 2 Claims

1. A process for the preparation of free-flowing granules of a thermoplastic elastomer which comprises admixing granules of a thermoplastic elastomer of a granular size of from 1 to 20 mm with 0.005 to 0.2%, based on the amount of elastomer, of a finely divided powder of a silicate selected from the group consisting of wollastonite, kaolinite and mica, said finely divided powder being applied to the surfaces of the granules.

5,202,372

CURABLE COMPOSITIONS BASED ON FLUOROELASTOMERS VULCANIZABLE WITH PEROXIDES

Giovanni Moggi, Milan; Gianna Cirillo, Genoa; Alberto Fontana, Milan; Silvana Modena, Monza, and Raffaele Ferro, Milan, all of Italy, assignors to Ausimont S.p.A, Milan, Italy

Continuation of Ser. No. 342,621, Apr. 24, 1989, abandoned, which is a continuation of Ser. No. 67,155, Jun. 29, 1987, abandoned. This application May 26, 1992, Ser. No. 890,376
Claims priority, application Italy, Jun. 30, 1986, 20973 A/86
Int. Cl.[5] C08K *5/02;* C08L *15/02, 27/12*
U.S. Cl. 524—462 5 Claims

1. Cured fluoroelastomeric compositions obtained by curing fluoroelastomers containing peroxide cure sites with peroxides or with mixed peroxidic and ionic curing systems, said compositions comprising additives, in amounts within the range of from 0.5 to 10 parts by weight per 100 parts by weight of fluoroelastomer, said additive having the formula:

$$R-\{(CH_2CF_2)_n-(C_3F_6)_m-(C_2F_4)_p-(C_2F_3Cl)-\}_q-X \quad (I)$$

wherein:

X is either Br or I; the units with n, m, p, q indices are randomly distributed along the telomer chain, R is a linear or branched C_1–C_{20} alkyl radical, which may also contain halogen atoms or ester or ether groups, and wherein:

n=an integer from 1 to 30;

m=an integer of from 0 to 10;

p and q are integers within the range of from 0 to 20, said additives having an average molecular weight within the range of from 600 to 2,500.

5,202,373

RUBBER COMPOSITIONS FOR TIRE TREADS

Kinya Kawakumi, Kanagawa, and Takao Muraki, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Japan

Continuation of Ser. No. 287,372, Dec. 21, 1988, abandoned. This application Aug. 26, 1991, Ser. No. 752,896
Claims priority, application Japan, Dec. 21, 1987, 62-321379
Int. Cl.[5] C08K *3/04*
U.S. Cl. 524—495 2 Claims

1. A rubber composition for use in automotive tire treads, comprising: (a) 100 parts by weight of a starting rubber; and (b) 50–150 parts by weight of carbon black having an N_2SA in the range of 140–160 m^2/g as defined by nitrogen adsorption surface area, a DBP of more than 120 ml/100 g as defined by dibutyl phthalate adsorption, a ΔDBP of greater than 30 ml/100 g as defined by the DBP - 24 M4 DBP equation and a ΔDst of not more than 50 mμ as defined by the half value width of a centrifugally classified aggregate size distribution.

5,202,374

TERNARY MIXTURES

Klaus Horn, Krefeld, and Klaus Kircher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1991, Ser. No. 744,762
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1990, 4026475
Int. Cl.[5] C08L *69/00, 23/08;* C08K *7/14*
U.S. Cl. 524—508 5 Claims

1. A thermoplastic molding composition comprising

(A) about 49.9 to 96.9% of at least one member selected from the group consisting of a thermoplastic aromatic polycarbonate and a thermoplastic aromatic polyester carbonate,

(B) about 5 to 20% of glass fibers, and

(C) about 0.4 to 3% of a C2–C8-olefin/acrylic acid ester/-maleic acid anhydride terpolymer, said percentages relating to the weight of said composition.

5,202,375

WATER-RESISTANT POLYMERIC EMULSIONS

John Biale, Anaheim, Calif., assignor to Rohm and Haas Company, Phildelphia, Pa.

Continuation of Ser. No. 386,886, Jul. 28, 1989, abandoned. This application May 6, 1991, Ser. No. 700,332
Int. Cl.[5] C08K *33/06*
U.S. Cl. 524—562 20 Claims

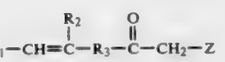
1. A polymeric emulsion comprising (i) a polymer, (ii) water, and (iii) a surfactant, wherein the emulsion comprises less than about 1 weight percent surfactant and at least about 40 percent total solids, and the polymer has an average particle size of about 85 to about 200 nm and a T_g of about 0° to about 20° C. and comprises:

(a) a soft monomer whose homopolymer has a T_g of less than about −20° C., the soft monomer being selected from the group consisting of non-functional acrylic monomers, non-functional methacrylic monomers, ethylene, and mixtures thereof;

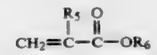
(b) a hard monomer whose homopolymer has a t_g of greater than about 30° C., the hard monomer being selected from the group consisting of alkenyl aromatic monomers, non-functional methacrylic monomers, and mixtures thereof;

(c) about 1 to about 5 weight percent of an olefinic carboxylic acid monomer; and

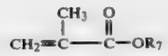
(d) about 0.5 to about 5 weight percent of a cross-linking monomer selected from the group consisting of N-methylol acrylamide, N-methylol methacrylamide, diacrylates, dimethacrylates, triallyl cyanurate, diallyl maleate, methyl acrylamidoglycolate methyl ether, olefinically unsaturated monomers having the formula



and mixtures thereof, R_1 being selected from the group consisting of hydrogen and halogen, R_2 being selected from the group consisting of hydrogen, halo, thio, and monovalent organic radicals, R_3 being a divalent radical, and Z being selected from the group consisting of organoacyl and cyano, wherein the weight ratio of the hard monomer to the soft monomer in the polymer is about 1:1 to about 1.5:1, the combined weight percent of hard and soft monomers present in the polymer is at least about 90 weight percent, the soft non-functional acrylic and methacrylic monomers have the formula



R_5 being selected from the group consisting of hydrogen and methyl and R_6 being an alkyl group containing up to about 15 carbon atoms, and the hard non-functional methacrylic monomers have the formula



wherein R_7 is an alkyl group that preferably contains up to about 6 carbon atoms.

5,202,376

SOLUTIONS FOR FLASH-SPINNING DRY POLYMERIC PLEXIFILAMENTARY FILM-FIBRIL STRANDS

Don M. Coates, Midlothian; Gary S. Huvard, Quinton, both of Va., and Hyunkook Shin, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 382,092, Jul. 24, 1989, Pat. No. 5,043,109, which is a continuation-in-part of Ser. No. 238,639, Aug. 30, 1988, abandoned, which is a continuation of Ser. No. 378,177, Jul. 14, 1989, abandoned. This application May 2, 1991, Ser. No. 693,851
Int. Cl.[5] C08K *5/00*
U.S. Cl. 524—583 3 Claims

1. A solution particularly useful for flash-spinning substantially dry polymeric plexifilamentary film-fibril strands, comprising 18 to 33 percent fiber-forming polyolefin by weight of the solution, 42 to 73 percent methylene chloride by weight of the solution and 9 to 25 percent carbon dioxide by weight of the solution.

5,202,377

POLYISOCYANATE MIXTURE

Stephen J. Thorne, Reading, and Alan J. Backhouse, South Ascot, both of England, assignors to Imperial Chemical Industries, London, England

Filed May 15, 1992, Ser. No. 883,527
Claims priority, application United Kingdom, May 30, 1991, 9111622
Int. Cl.[5] C08G *18/06*
U.S. Cl. 524—591 17 Claims

1. A polyisocyanate mixture comprising;

(i) an isocyanate functional oligomer, which is the reaction product of;

(a) a polyisocyanate having tertiary isocyanate groups, and

(b) a hydrophilic polyether having a group which will react with tertiary isocyanate groups, and

(ii) a polyisocyanate having tertiary isocyanate groups.

5,202,378

PROCESS FOR PRODUCING AN EXTERIOR LATEX PAINT HAVING IMPROVED CHALK ADHESION

Gerald W. Barnett, Middleburg Hts., Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation of Ser. No. 666,625, Mar. 8, 1991, abandoned. This application Apr. 14, 1992, Ser. No. 868,176
Int. Cl.[5] C08L *31/00*
U.S. Cl. 524—833 9 Claims

1. A process for producing an aqueous, air-dry, protective surface coating containing opacifying pigment and adapted to air-dry at ambient temperatures, the coating composition containing an emulsion copolymer film-forming binder, where the coating composition is free of external adhesion promoters but exhibits chalk adhesion to weathered surfaces, the process steps comprising:

a two-step process for producing the emulsion copolymer binder by emulsion copolymerizing ethylenically unsaturated monomers in an aqueous polymerization medium where said ethylenically unsaturated monomers comprise on a weight basis between 0.8% and 6% of fatty acid methacrylate monomer selected form stearyl methacrylate, lauryl methacrylate, cetyl methacrylate, myristyl methacrylate or mixtures thereof, with the balance of said ethylenically unsaturated monomers being other ethylenic monomer other than said fatty acid methacrylate monomer, where said emulsion copolymer is produced by a two-step emulsion copolymerization process of:

a) said fatty acid monomer copolymerized with said other ethylenic monomers in the first step wherein between 5% and 50% by weight of said ethylenically unsaturated monomers are emulsion copolymerized,

b) and the remaining said ethylenically unsaturated mono-

mers copolymerized in the second step to produce said improves the impact strength thereof, comprising a blend of an

5,202,383

5,202,386

MODIFICATION OF (CO)POLYMERS EMPLOYING

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mers copolymerized in the second step to produce said emulsion copolymer binder,

said emulsion binder having a weight average molecular weight between 100,000 and 1,000,000 and an average copolymer particle size between about 0.05 and 0.5 microns, where the air-dry paint coating is adapted to coalesce and air-dry at ambient temperatures.

5,202,379

IMPACT RESISTANT THERMOPLASTIC RESIN COMPOSITION

Yuji Aoki, and Makoto Watanabe, both of Yokkaichi, Japan, assignors to Monsanto Kasei Company, Tokyo, Japan

Continuation of Ser. No. 450,400, Dec. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 365,430, Jun. 13, 1989, Pat. No. 4,987,185. This application Mar. 9, 1992, Ser. No. 845,788

Claims priority, application Japan, Jun. 17, 1988, 63-149840

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 **13 Claims**

1. An impact resistant thermoplastic resin composition which comprises:

100 parts by weight of a resin mixture comprising from 20 to 80% by weight of a polyamide resin (A) and from 20 to 80% by weight of a graft polymer (B) composed of from 45 to 60 parts by weight of a conjugated diene rubber and from 40 to 55 parts by weight of a monomer mixture consisting essentially of from 60 to 80% by weight of an aromatic vinyl monomer component and from 20 to 40% by weight of a vinyl cyanide monomer component (provided that the total amount of said monomer mixture is 100% by weight) wherein the average particle size of conjugated diene rubber is from 0.2 to 1.0 μm, the graft ratio is from 40 to 80%, and the weight average molecular weight of the acetone-soluble resinous component, composed of said monomer components, is from 220,000 to 450,000;

from 0.01 to 40 parts by weight of a copolymer (C) comprising from 50 to 80% by weight of an aromatic vinyl monomer component, from 0.01 to 30% by weight of an α,β-unsaturated dicarboxylic anhydride monomer component from 5 to 47% by weight of at least one monomer component selected, from the group consisting of maleimide, N-substituted maleimide monomer component and a vinyl cyanide comonomer component, and from 0 to 30% by weight of a methyl methacrylate monomer component (provided that the total amount of the monomer components is 100% by weight); and

from 0 to 15 parts by weight of a copolymer (D) comprising from 60 to 90% by weight of an aromatic vinyl monomer component, from 0 to 40% by weight of a vinyl cyanide monomer component and from 0 to 40% by weight of a methyl methacrylate monomer component (provided that the total amount of the monomer components is 100% by weight).

5,202,380

POLYOLEFIN COMPOSITIONS WITH IMPROVED IMPACT STRENGTH

Casmir S. Ilenda, Hulmeville; David L. Dunkelberger, Newtown, and Dennis J. Labanoski, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 831,260, Jan. 21, 1992, Pat. No. 5,147,932, which is a division of Ser. No. 616,485, Nov. 21, 1990, Pat. No. 5,109,066, which is a division of Ser. No. 413,824, Sep. 28, 1989, Pat. No. 4,997,884, which is a continuation-in-part of Ser. No. 315,501, Mar. 1, 1989, Pat. No. 4,957,974. This application Jun. 24, 1992, Ser. No. 903,426

Int. Cl.[5] C08L *51/06;* **C08F** *255/02, 255/06, 255/08*

U.S. Cl. 525—71 **1 Claim**

1. A polymeric blend which when added to a polyolefin improves the impact strength thereof, comprising a blend of an acrylic core-shell polymer and a copolymeric compatibilizer, wherein said compatibilizer is comprised of:

(i) a non-polar polyolefin trunk selected from the group consisting of polyethylene, polypropylene, polybutylene, poly(4-methylpentene), copolymers of said olefins with each other, and one or more copolymers of said olefins with minor amounts of 1-alkenes, vinyl esters, vinyl chloride, (meth)acrylic ester, and (meth)acrylic acid, said trunk having a Mw of between about 50,000 and 1,000,000; and

(ii) at least one methacrylate chain grafted with a covalent bond to said trunk having a weight ratio with said trunk of from about 1:9 to about 4:1, said chain being a polymer derived from at least about 80% of a monomer of a methacrylic ester of the formula $CH_2{=}C(CH_3)COOR$, where R is alkyl, aryl, substituted alkyl, substituted aryl, or substituted alkaryl, and less than about 20% of an acrylic or styrenic monomer copolymerizable with the methacrylic ester, said chain having a Mw of from about 20,000 to 200,000.

5,202,381

POLYMER BLENDS INCLUDING IONOMERS

Hsing-Yeh Parker, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 4, 1990, Ser. No. 505,081

Int. Cl.[5] C08L *33/04, 51/06*

U.S. Cl. 525—85 **20 Claims**

1. A composition comprising:

a. a polymer of vinyl chloride;

b. an additive polymer containing at least 30 weight percent of units derive from at least one alkyl acrylate or alkyl methacrylate, wherein the alkyl group contains from 1 to 12 carbon atoms, from 0 to about 70 parts of unit derived from at least one other vinyl or vinylidene monomer, and from about 0.5 to about 10 parts, per 100 parts of all other units of the additive polymer, of units derived from an unsaturated acid, the unsaturated acid being partially to completely in the form of an alkali metal salt.

5,202,382

THERMOSETTING POWDER COATING COMPOSITION CONTAINING A MIXTURE OF LOW TG AND HIGH TG POLYMERS WITH ACID FUNCTIONAL GROUPS

Paul H. Pettit, Jr., Wexford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 590,718, Oct. 1, 1990, Pat. No. 5,098,955, which is a division of Ser. No. 408,856, Sep. 18, 1989, Pat. No. 4,988,767. This application Jan. 9, 1992, Ser. No. 818,661

Int. Cl.[5] C08L *33/02*

U.S. Cl. 525—108 **6 Claims**

1. A method for preparing a powder coating composition comprising the steps of:

(a) preparing an acid group-containing polymer blend consisting of (i) from about 1 percent to about 25 percent by weight based on the weight of resin solids of a first acid group-containing acrylic polymer having a Tg in the range of about −20° C. to about 30° C. and (ii) from about 40 percent to about 75 percent by weight based on the weight of resin solids of a second acid group-containing acrylic polymer having a Tg in the range of 40° C. to about 100° C.; and

(b) forming a co-reactable particulate mixture of the polymer blend formed in step (a) and (iii) a polyepoxide curing agent capable of reacting with acid groups in the polymer blend to form a crosslinked product.

5,202,383

HIGH THROW POWER ELECTRODEPOSITION SYSTEM

Thomas C. Moriarity, Wexford; Gregory J. McCollum, Gibsonia; Robert R. Zwack, Allison Park; Matthew S. Scott; Steven R. Zawacky, both of Pittsburgh, all of Pa., and Victor G. Corrigan, North Olmsted, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 19, 1991, Ser. No. 732,534

Int. Cl.[5] C08L *75/04*

U.S. Cl. 525—124 **14 Claims**

1. An electrodepositable composition, comprising an active hydrogen-containing ionic resin and a gamma hydroxy urethane curing agent which is the reaction product of a polyisocyanate and a blocking agent which is a 1,3-polyol wherein the equivalent ratio of isocyanate groups to hydroxyl groups from the 1,3-polyol is less than 1.

5,202,384

POLYESTER REINFORCED RUBBER

James B. Pyke, Akron; Richard G. Bauer, Kent, and Donald J. Burlett, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 329,214, Mar. 27, 1989, Pat. No. 4,996,262. This application Nov. 7, 1990, Ser. No. 609,858

Int. Cl.[5] C08L *9/00, 7/00, 23/16;* **C08G** *81/02*

U.S. Cl. 525—167 **7 Claims**

1. A process for preparing a rubber composition having a high modulus which comprises reacting at least one dithio diacid having the structural formula HOOC—A-S-S-A—COOH, wherein A represents an alkylene group containing from 1 to about 10 carbon atoms with at least one polydiene rubber and at least one polyester elastomer having a melting point of less than about 240° C.

5,202,385

POLYMER MIXTURE HAVING AROMATIC POLYCARBONATE, POLYESTER AND THERMOPLASTIC ELASTOMER, ARTICLE FORMED THEREFROM

Christian M. E. Bailly, Kalmthout, Belgium, and Robertus E. de Jong, La Bergen op Zoom, Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 6, 1990, Ser. No. 492,522

Claims priority, application Netherlands, Mar. 7, 1989, 8900550

Int. Cl.[5] C08L *67/02, 69/00*

U.S. Cl. 525—425 **18 Claims**

1. A polymer mixture which comprises 40–80 parts by weight of an aromatic polycarbonate (A), 10–50 parts by weight of a polyester built up entirely or substantially from units derived from an alkanediol and a benzene dicarboxylic acid (B), and 1–10 parts by weight of a thermoplastic elastomer (C), calculated per 100 parts by weight of A+B+C, characterized in that the thermoplastic elastomer (C) is built up from polyester units which are bonded by means of groups of the formula $R_1[NHC(O)]p$, wherein R_1 is a polyfunctional group having at most 30 carbon atoms and p has a value of 2 or 3, and in which the polyester units are built up from blocks having a number of ester units of the formula —OGOC(O)R_2C(O)— and blocks having a number of ester units which are capable of forming a bifunctional polyester or polyester amide having a melting-point lower than 100° C., which blocks are bonded together by ester bonds, at least 80 mol % of the R_2-groups being 1,4-phenylene radicals and at least 80 mol % of the G-groups being a tetra methylene group.

5,202,386

MODIFICATION OF (CO)POLYMERS EMPLOYING ORGANIC PEROXIDES

Andreas H. Hogt, Enschede; John Meijer, Deventer; Peter Hope, Twello, and Jernej Jelenic, Deventer, all of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

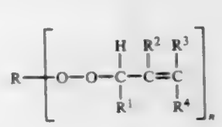
Division of Ser. No. 283,676, Dec. 13, 1988, Pat. No. 5,037,892. This application May 22, 1991, Ser. No. 703,965

Claims priority, application Netherlands, Dec. 14, 1987, 8703014; European Pat. Off., Dec. 6, 1988, 88202797.2

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—298 **3 Claims**

1. An epoxide group-containing (co)polymer prepared by the process for modifying (co)polymers employing an organic peroxide wherein said peroxide is brought into contact with the (co)polymer and the peroxide is decomposed, said peroxide being an organic peroxide of the general formula



(I)

wherein

n=1, 2 or 3

R^1 stands for hydrogen, an alkyl group having 1–4 carbon atoms or an alkenyl having 2–4 carbon atoms; and

R^2, R^3 and R^4 may be the same or different and represent hydrogen atoms or alkyl groups containing 1–4 carbon atoms;

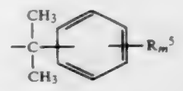
when n=1

R=

a t-alkyl group substituted or not with a hydroxyl group and containing 4–18 carbon atoms, p-menth-8-yl,

a t-alkenyl group containing 5–18 carbon atoms, 1-vinylcyclohexyl or

a group of the general formula



wherein m=0, 1 or 2 and R^5 represents an isopropenyl group or a 2-hydroxyisopropyl group;

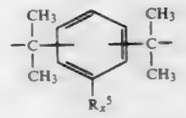
when n=2,

R=

an alkylene group with 8–12 carbon atoms which at both ends has a tertiary structure,

an alkynylene group with 8–12 carbon atoms which at both ends has a tertiary structure, or

a group of the general formula



wherein x=0 or 1 and R^5 has the above-indicated meaning

when n=3,

R=

1,2,4-triisopropylbenzene-α,α',α''-triyl or

1,3,5-triisopropylbenzene-α,α',α''-triyl.

5,202,387

5,202,389

5,202,393

BLEND OF A POLYESTER AND A POLYCARBONATE

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5,202,387

ELASTOMER WITH OUTSTANDING CHARACTERISTICS FOR USE IN MAKING TIRE TREAD COMPOUNDS

Adel F. Halasa, Bath, and Wen-Liang Hsu, Copley, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 8, 1992, Ser. No. 880,394
Int. Cl.[5] C08F 4/08, 279/02, 297/04; C08L 53/02
U.S. Cl. 525—316 15 Claims

1. A rubber polymer which has an excellent, combination of properties for use in making tire treads which is comprised of (a) a first segment which consists essentially of repeat units which are derived essentially from 1,3-butadiene and styrene monomer, wherein the first segment has a vinyl content which is within the range of about 6% to about 15%, and wherein the first segment has a number average molecular weight which is within the range of about 25,000 to about 350,000; and (b) a final segment which is comprised of repeat units which are derived from 1,3-butadiene and styrene, wherein the repeat units in the final segment are in essentially random order, wherein the final segment has a vinyl content of about 20% to about 95%, wherein the final segment has a number average molecular weight which is within the range of about 25,000 to about 350,000 and wherein the sum of (1) the product of 1.7 and the weight percent of styrene in the second segment and (2) the percentage of 1,2-linkages in the second segment is within the range of about 50% to about 92%.

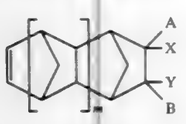
5,202,388

PROCESS FOR PRODUCING HYDROGENATION PRODUCT OF RING-OPENING POLYMER

Akira Iio, Yokkaichi; Noboru Oshima, Suzuka; Yosihiro Ohira, Yokkaichi; Masao Sakamoto, Yokkaichi, and Hiroshi Oka, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 800,231
Claims priority, application Japan, Nov. 30, 1990, 2-330269
Int. Cl.[5] C08F 8/04
U.S. Cl. 525—338 13 Claims

1. A process for producing a hydrogenation product of ring-opening polymer by hydrogenating, in the presence of a hydrogenation catalyst, the non-aromatic carbon-to-carbon double bond present in a ring-opening polymer obtained by subjecting to ring-opening polymerization at least one norbornene derivative represented by general formula (I):



(I)

wherein A and B independently represent hydrogen atoms or hydrocarbon groups having 1–10 carbon atoms, X and Y independently represent hydrogen atoms, halogen atoms or monovalent organic groups, and m is 0 or 1, alone or in combination with a monomer copolymerizable with said norbornene derivative, characterized by using, as the hydrogenation catalyst, a ruthenium compound represented by general formula (II):

$$RuH_kQ_nT_pZ_q \quad \text{(II)}$$

wherein Q represents a halogen atom, T represents at least one atomic group selected from the group consisting of CO, NO and $CH_3COCH_2COCH_3$, Z represents $PR^1R^2R^3$ (R^1, R^2 and R^3 independently represent alkyl groups, alkenyl groups or phenyl groups), k is 1 or 2, n is 0, 1 or 2, p is 1 or 2, and q is 2 or 3.

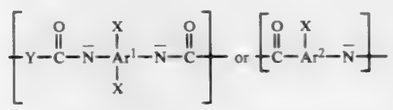
5,202,389

PREPARATION OF POLYBENZOXAZOLES FROM HALOGENATED POLYAMIDE ANTIONS

Robert R. Burch, Jr., Exton, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 545,039, Jun. 28, 1990, Pat. No. 5,093,436.
This application Dec. 2, 1991, Ser. No. 801,345
Int. Cl.[5] C08G 69/48
U.S. Cl. 525—420 33 Claims

1. A process for the production of benzoxazole containing polymers, comprising, heating to a temperature of at least 100° C., for a period of time sufficient to produce the benzoxazole group, a polyamide anion comprising units of the formula



wherein:

each Y is independently hydrocarbylene or substituted hydrocarbylene;

each X is independently chloride or each X is independently fluorine, bromine or iodine;

Ar^1 is a tetravalent aromatic group in which each amido nitrogen is ortho to at least one of said X;

Ar^2 is a trivalent aromatic group in which the amido nitrogen is ortho to X; and

provided that when any X is chloride, cuprous ion is present.

5,202,390

BUTADIENE/POLAR COMONOMER COPOLYMER AND AROMATIC REACTIVE END GROUP-CONTAINING PREPOLYMER

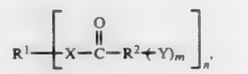
Rolf Mülhaupt, and Werner Rüfenacht, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 384,958, Jul. 25, 1989, Pat. No. 5,073,601.
This application Sep. 26, 1991, Ser. No. 766,883
Claims priority, application Switzerland, Jul. 28, 1988, 2869/88
Int. Cl.[5] C08L 9/02, 67/04, 71/02, 77/10
U.S. Cl. 525—426 12 Claims

1. A composition comprising

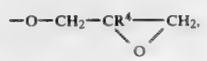
A) a liquid copolymer based on butadiene and at least one polar, ethylenically unsaturated comonomer, and

B) a capped prepolymer of formula I:

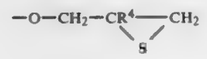


(I)

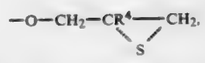
wherein m is 1 or 2, n is 2 to 6, X is —O—, —S— or $—NR^3—$, Y is a radical selected from the group comprising —OH, $—NHR^3$, —OH reacted with a cyanogen halide to introduce —OCN, —OH reacted with an epichlorohydrin to introduce



and —OH reacted with an epichlorohydrin to introduce an epoxide which is reacted with potassium thiocyanate or thiourea to introduce



and



R^1 is a radical of a polyether prepolymer with hydroxyl, mercapto or amino end groups or of a segmented polyester, polythioester or polyamide prepolymer with hydroxyl, mercapto or amino end groups, containing at least 30 mol %, based on the said segmented prepolymer, of polyether segments after removal of the terminal functional groups, R^2 is a carbocyclic aromatic or araliphatic radical of valency m+1 with groups Y bonded directly to the aromatic ring, R^3 is hydrogen, C_1–C_6-alkyl or phenyl and R^4 is methyl or hydrogen.

5,202,391

POLYURETHANE ADHESIVE OF EPOXY RESIN, POLYISOCYANATE, PHOSPHORUS OXY ACID, AND CARBOXYLIC ACID

Kyuya Yamazaki, Ibaraki; Hiroto Ryoshi, Shimizu, and Teruo Hori, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 370,747, Jun. 20, 1989, Pat. No. 5,096,980.
This application Dec. 12, 1991, Ser. No. 805,931
Claims priority, application Japan, Jun. 28, 1988, 63-162256
Int. Cl.[5] C08L 63/02, 67/02, 75/06
U.S. Cl. 525—438 9 Claims

1. A polyurethane adhesive composition which comprises an organic polyisocyanate, a polyol, from about 0.01–10% by weight of an oxy acid of phosphorus or a derivative thereof, from about 0.01–20% by weight of a carboxylic acid or an anhydride thereof, a silane coupling agent and from about 0.1–50% by weight of an epoxy resin, all percentages based on the weight of the whole composition, wherein the ratio of the number of NCO groups of the organic polyisocyanate to the number of active hydrogen groups of the polyol, oxy acid of phosphorus or a derivative thereof and epoxy resin (NCO/H) is about 1.2–20:1 for a one-can adhesive or 0.4–01:1 for a two-can adhesive.

5,202,392

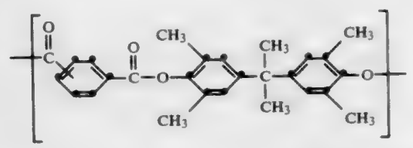
BLEND OF A POLYESTER AND A POLYCARBONATE

Hsinjin Yang, Fairport, and Daniel Y. Paul, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

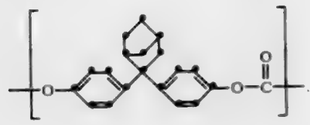
Filed Aug. 22, 1991, Ser. No. 748,489
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 6 Claims

1. A polymeric blend comprising a polyester and a polycarbonate, wherein:

the polyester contains recurring units having the structure



and the polycarbonate contains recurring units having the structure



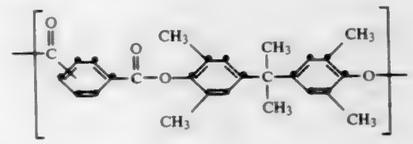
5,202,393

BLEND OF A POLYESTER AND A POLYCARBONATE

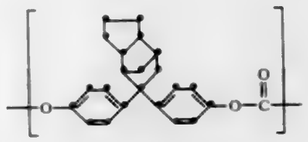
Hsinjin Yang, Fairport, and Paul D. Yacobucci, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1991, Ser. No. 748,490
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 6 Claims

1. A polymeric blend comprising a polyester and a polycarbonate, wherein the polyester contains recurring units having the structure



and the polycarbonate contains recurring units having the structure



5,202,394

GRAFT POLYMERS WITH A POLYURETHANE GRAFT BASE, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Matthias Kroggel, Liederbach; Karl J. Rauterkus, and Detlev Seip, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Continuation of Ser. No. 247,694, Sep. 22, 1988, abandoned. This application Dec. 18, 1991, Ser. No. 810,721
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732089
Int. Cl.[5] C08L 75/04
U.S. Cl. 525—455 15 Claims

1. A graft polymer with a polyurethane graft base, the graft base containing at least 2 urethane groups in the molecular and monomer units derived from diisocyanates and monomer units derived from diols wherein the polyurethane graft base contains lower alkoxy radicals and/or hydroxyl groups and optionally end group units derived from monoisocyanates and wherein polymer radicals of units of carboxylic acid vinyl esters with 3 to 20 carbon atoms and/or hydrolysis products thereof are grafted onto the polyurethane graft base by polymerization in organic solution or bulk polymerization.

5,202,395

MANUFACTURING PROCESS CONTROL AND PRODUCT CHARACTERIZATION

Francois Chambon, Brussels, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jun. 17, 1991, Ser. No. 716,193
Claims priority, application United Kingdom, Mar. 11, 1991, 9105078
Int. Cl.[5] C08F 2/00
U.S. Cl. 526—60 7 Claims

1. A process for the manufacture of a polymer that is viscoelastic in fluid form, which comprises supplying a feed comprising at least one monomer to a polymerization reactor, polymerizing the feed, recovering the resulting polymer from

the reactor, measuring the entrance pressure drop through a narrow die of a sample in fluid form of the polymer recovered

5,202,397

prising the water-soluble, ethylenically unsaturated monomer, water, a water-soluble polymerization initiator and an optional

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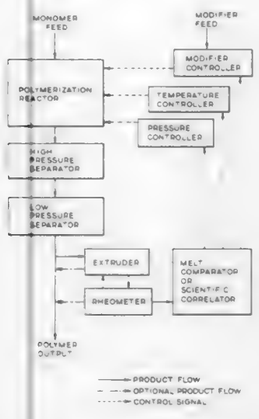
the reactor, measuring the entrance pressure drop through a narrow die of a sample in fluid form of the polymer recovered from the reactor, computing an elasticity function from the measured entrance pressure drop, comparing said elasticity



function of the sample with a target elasticity function or elasticity function range and, if required, adjusting the polymerization process to produce polymer of said target elasticity function or elasticity function range.

5,202,396

PROCESS FOR FEEDING CATALYST TO FLUIDIZED BED FOR VAPOR PHASE POLYMERIZATION

Kunimichi Kubo, Meguro; Motokazu Watanabe; Mamoru Yoshikawa, both of Kawasaki; Masatoshi Morikawa, Setagaya, and Yoshihisa Yamaguchi, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

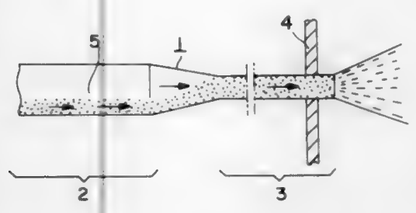
PCT No. PCT/JP91/00968, § 371 Date Mar. 19, 1992, § 102(e) Date Mar. 19, 1992, PCT Pub. No. WO92/01722, PCT Pub. Date Feb. 6, 1992

PCT Filed Jul. 19, 1991, Ser. No. 842,094

Claims priority, application Japan, Jul. 20, 1990, 2-192424

Int. Cl.[5] C08F *2/34*

U.S. Cl. 526—88 **4 Claims**



1. In the vapor phase polymerization of olefin using a intermittently fluidized bed reactor to feed a powdered catalyst into a high pressure reactor using a gas, the process for feeding a catalyst which is characterized in that the cross-sectional area of a catalyst feeding pipe is reduced in its midway.

5,202,397

Patent Not Issued For This Number

5,202,398

PROCESS FOR THE PREPARATION OF A 1-OLEFIN POLYMER

Martin Antberg; Hartmut Lüker, both of Hofheim am Taunus, and Ludwig Böhm, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

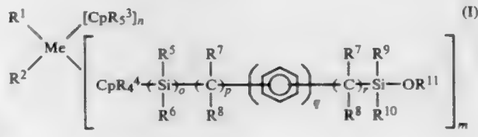
Continuation of Ser. No. 201,460, Jun. 2, 1988, abandoned. This application Dec. 13, 1989, Ser. No. 453,147

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718888

Int. Cl.[5] C08F *4/656, 4/655, 10/00*

U.S. Cl. 526—129 **12 Claims**

1. In a process for the preparation of 1-olefin polymer by polymerizing a 1-olefin of the formula R—CH=CH$_2$ in which R is hydrogen or a straight-chain or branched alkyl group having 1 to 12 carbon atoms, at a temperature of −60° to 100° C., at a pressure of 0.5 to 64 bar, in suspension or in the gas phase, in the presence of a catalyst which comprises a transition metal component and an aluminoxane, the improvement comprising carrying out the polymerization in the presence of a catalyst whose transition metal component has been prepared by reacting a metallocene compound with a support material having hydroxyl groups reactive with at least one chemical moiety provided on the metallocene, said metallocene compound having the formula I


(I)

in which

Me is titanium, zirconium or hafnium,

Cp denotes the cyclopentadienyl ring,

R^1 and R^2, independently of one another, denote a hydrogen atom, a halogen atom, a C$_1$–C$_4$-alkyl group or a C$_6$–C$_{10}$-aryl group,

R^3 and R^4, independently of one another, denote a hydrogen atom, a halogen atom, a C$_1$–C$_4$-alkyl group, a C$_1$–C$_4$-alkoxy group, a C$_6$–C$_{10}$-aryl group or a C$_2$–C$_6$-alkenoxy group,

R^5 and R^6, independently of one another, denote a C$_1$–C$_4$-alkyl group, a C$_6$–C$_{10}$-aryl group or a C$_1$–C$_4$-alkoxy group,

R^7 and R^8, independently of one another, denote a hydrogen atom, a C$_1$–C$_4$-alkyl group or a C$_6$–C$_{10}$-aryl group,

R^9 and R^{10}, independently of one another, denote a C$_1$–C$_4$-alkyl group, a C$_6$–C$_{10}$-aryl group or a C$_1$–C$_4$-alkoxy group,

R^{11} denotes a C$_1$–C$_4$-alkyl group,

m is 1 or 2,

n is 2 - m,

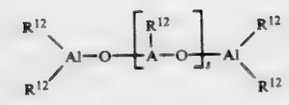
o is zero or 1,

p is a number from zero to 6,

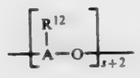
q is zero or 1, and

r is a number from zero to 6,

and wherein the aluminoxane is one for the formula II


(II)

for the linear type and/or of the formula (III)


(III)

for the cyclic type, where, in the formulae II and III, R^{12} denotes a C$_1$–C$_6$-alkyl group and s is an integer from 2 to 40.

prising the water-soluble, ethylenically unsaturated monomer, water, a water-soluble polymerization initiator and an optional water-soluble crosslinking agent and the continuous phase of an organic solvent containing a dispersant, characterized in that said aqueous monomer solution is added to said organic solvent at such a temperature as to form an oil-in-water type of dispersion, and the oil-in-water type of dispersion is then heated at least to a phase reversal temperature at which it is transformed into said water-in-oil type of dispersion.

5,202,399

POLY(B-ALKENYL-BORAZINE) CERAMIC PRECURSORS

Larry G. Sneddon, Havertown, Pa., and Anne T. Lynch, Fairfield, Conn., assignors to Truste of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 585,049, Sep. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 198,149, May 24, 1988, abandoned. This application Jan. 21, 1992, Ser. No. 824,705

Int. Cl.[5] C08F *30/06*

U.S. Cl. 526—239 **17 Claims**

1. Polymers comprising condensation products of borazines which are mono- or di-b-substituted with an alkenyl group and which are substituted at each N-atom with hydrogen.

5,202,400

PROCESS FOR THE PRODUCTION OF HIGHLY WATER ABSORPTIVE POLYMERS

Kiichi Itoh; Shuhei Yada, and Kenji Yoshinaga, al of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 746,991

Claims priority, application Japan, Aug. 21, 1990, 2-219454

Int. Cl.[5] C08F *30/04, 2/24, 2/32*

U.S. Cl. 526—240 **8 Claims**

1. A process for producing a highly water absorptive polymer by polymerizing a water-soluble, ethylenically unsaturated monomer in a water-in-oil type of dispersion consisting of the dispersion phase of an aqueous monomer solution com-

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5,202,401

ACRYLIC ELASTOMER AND ITS VULCANIZABLE COMPOSITION

Kazuma Yokoi, Takahagi, Japan, assignor to Nippon Miktron Limited, Tokyo, Japan

Division of Ser. No. 543,589, Jun. 26, 1990. This application Sep. 9, 1991, Ser. No. 756,872

Claims priority, application Japan, Jun. 6, 1989, 1-174945; Jun. 14, 1989, 1-182289

Int. Cl.[5] C08F *24/00*

U.S. Cl. 526—273 **2 Claims**

1. An elastomer which comprises a copolymer of

(a) at least one acrylate selected from the group consisting of

(1) an alkyl acrylate having an alkyl group having 1 to 8 carbon atoms, and

(2) an alkoxyalkyl acrylate having an alkoxyalkyl group having 2 to 8 carbon atoms, and

(b) an epoxy group-containing vinyl monomer, and

(c) an α, β unsaturated carboxylic acid aryl ester.

5,202,402

STYRENE COPOLYMER AND PROCESS FOR PRODUCING SAID COPOLYMER

Keisuke Funaki; Masakazu Abe, and Michitake Uoi, all of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

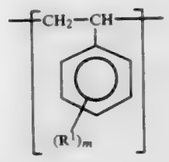
Continuation of Ser. No. 358,340, May 11, 1989, abandoned. This application Apr. 11, 1991, Ser. No. 684,474

Claims priority, application Japan, Oct. 8, 1987, 252532/1987; Oct. 8, 1987, 252533/1987

Int. Cl.[5] C08F *212/06, 4/64*

U.S. Cl. 526—336 **18 Claims**

1. A styrene copolymer having a repeating unit (I) represented by the formula:



wherein R^1 is a hydrogen atom; a halogen atom; or an alkyl group having 1–4 carbon atoms, at the meta- and/or para-posi-

tion of repeating unit (I), m is an integer of 1 to 3; and when m

wherein R^1 and R^2 are as defined above, and n is a positive

ide group per molecule and (B) at least one phosphonium or

-continued

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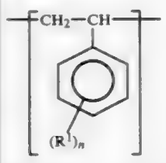
tion of repeating unit (I); m is an integer of 1 to 3; and when m is plural, R^1s may be the same or different;

0.1 to 50 mol. % based on the copolymer, of a repeating unit (II) represented by the formula:



wherein R^2 is an unsaturated hydrocarbon group containing a terminal vinyl group and having 2 to 10 carbon atoms, n is an integer of 1 or 2, and when n is 2, R^2s may be the same or different; and

the syndiotacticity of said copolymer is at least 30% in pentads.

5,202,403

LIGNIN MODIFIED PHENOL-FORMALDEHYDE RESINS

Glen A. Doering, Gig Harbor, Wash., assignor to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Jan. 15, 1992, Ser. No. 821,939
Int. Cl.[5] C08H *5/02;* **C08G** *63/48, 63/91*
U.S. Cl. 527—403 **45 Claims**

1. A lignin-modified resole resin prepared by:

(a) reacting formaldehyde and a phenol at a mole ratio of formaldehyde to phenol of less than about 1.0 at a low level of alkalinity to form a precursor resin;

(b) reacting precursor resin with lignin to form a lignin-modified phenolformaldehyde precursor resin; and

(c) then reacting the lignin-modified phenol-formaldehyde precursor resin with additional formaldehyde sufficient to provide a cumulative formaldehyde to phenol mole ratio of between about 2.0 and about 4.0.

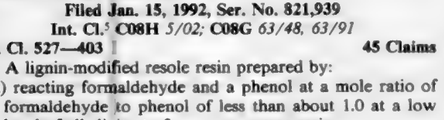
5,202,404

SILICONE BLOCK POLYMERS AND THEIR PREPARATION

Mitsuhiro Takarada, and Kenichi Isobe, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,469
Claims priority, application Japan, Mar. 23, 1990, 2-73970
Int. Cl.[5] C08G *77/04, 77/42*
U.S. Cl. 528—34 **7 Claims**

1. A silicone block polymer consisting essentially of the cohydrolysis reaction product of a both end reactive diorganopolysiloxane of general formula (1):



(1)

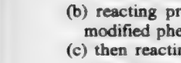
wherein

R^1 is independently selected from the group consisting of a substituted or unsubstituted alkyl radical, acyl radical, alkoxyalkyl radical, and alkenyl radical,

R^2 is independently selected from the group consisting of a substituted or unsubstituted alkyl radical, alkenyl radical, and aryl radical, and

n is an integer of 1 to 100; and

at least one silane of general formula (2), or a partial hydrolyzate thereof;



(2)

wherein R^1 and R^2 are as defined above, and p is a positive number within the range: $0 \leqq p \leqq 3$;

wherein 0.5 to 200 parts by weight of said diorganopolysiloxane of formula (1) is present in said copolymer per 100 parts by weight of said silane of formula (2).

5,202,405

SILICON CARBIDE PRECURSORS

Michael J. Michalczyk, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 573,419, Aug. 27, 1990, abandoned. This application Aug. 29, 1991, Ser. No. 751,520
Int. Cl.[5] C08G *77/24*
U.S. Cl. 528—42 **8 Claims**

1. A process for making polychlorocarbosilane comprising reacting chloromethyltrichlorosilane with magnesium in a non cyclic aliphatic ether at temperatures from 20° C. to reflux of said non cyclic aliphatic ether.

5,202,406

HIGH SOLIDS, CHIP RESISTANT POLYURETHANE COATING MADE FROM KETOXIME BLOCKED POLYISOCYANATE AND CYCLOHEXANE DICARBOXYLIC ACID POLYESTER

Randall S. Dearth, Lake Orion, Mich.; Richard R. Roesler, Wexford; Neil H. Nodelman, Upper St. Clair, both of Pa., and Peter D. Schmitt, Glen Dale, W. Va., assignors to Miles Inc., Pittsburgh, Pa.

Filed Dec. 30, 1991, Ser. No. 816,317
Int. Cl.[5] C08G *18/80*
U.S. Cl. 528—45 **15 Claims**

1. A high solids, chip resistant, sprayable polyurethane coating composition comprising the reaction mixture of a ketoxime-blocked polyisocyanate and a polyester polyol, said polyol being characterized in that it has a functionality of 2.1 to 5 and a hydroxyl number of about 80 to 250 and in that it contains the reaction product of

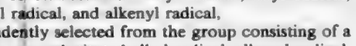
(a) a polyol component

(b) a dicarboxylic acid component,

wherein said polyol component contains predominantly a diol and a complementary amount of an alcohol having a higher functionality and wherein said dicarboxylic acid component contains

(i) about 40 to 100 mole % of 1,4-cyclohexane dicarboxylic acid (CHDA),

(ii) about 0 to 60 mole % of at least one dicarboxylic acid of the formula



where n is an integer of from 2 to 10, and

(iii) 0 to 20 mole percent of at least one cyclic dicarboxylic acid or at least one cyclic dicarboxylic acid anhydride selected from the group consisting of dimer acid, terephthalic acid, phthalic acid anhydride, isophthalic acid, isophthalic acid anhydride, tetrahydrophthalic acid, tetrahydrophthalic acid anhydride, hexahydrophthalic acid and hexahydrophthalic acid anhydride.

5,202,407

PRECATALYZED CATALYST COMPOSITIONS, PROCESS FOR PREPARING EPOXY RESINS CURABLE COMPOSITIONS, ARTICLES RESULTING FROM CURING THE RESULTANT COMPOSITIONS

Ha Quoc Pham, and Pamela A. Hardcastle, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 24, 1992, Ser. No. 825,466
Int. Cl.[5] C08G *59/68*
U.S. Cl. 528—89 **5 Claims**

1. In a precatalyzed composition comprising (A) at least one compound containing an average of at least one vicinal epoxide group per molecule and (B) at least one phosphonium or phosphine catalyst; the improvement which comprises employing as the phosphonium or phosphine catalyst, one having at least three C_1 to C_4 alkyl phenyl groups attached to the phosphorus atom per molecule.

5,202,408

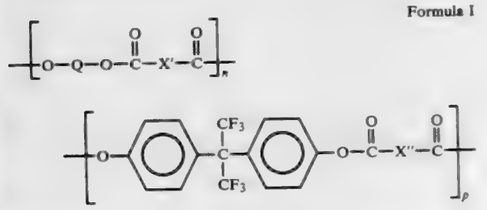
ARYLAMINE CONTAINING TERPOLYMERS WITH CF3 SUBSTITUTED MOIETIES

John F. Yanus, Webster; William W. Limburg, Penfield; Dale S. Renfer, Webster, and Damodar M. Pai, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1991, Ser. No. 797,746
Int. Cl.[5] C08G *69/00, 5/087*
U.S. Cl. 528—203 **2 Claims**

1. A polyarylamine polymer represented by the formula:

Formula I



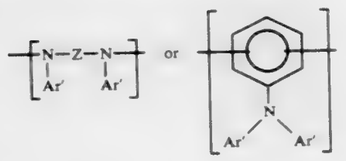
wherein:

n is between about 5 and about 5,000

p is between about 5 and about 5,000

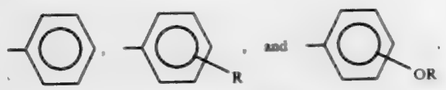
X′ and X″ are independently selected from a group having bifunctional linkages,

Q is a divalent group derived from a hydroxy terminated arylamine reactant containing the group:

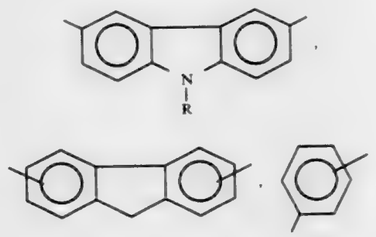


wherein:

Ar′ is selected from the group consisting of:



Z is selected from the group consisting of:



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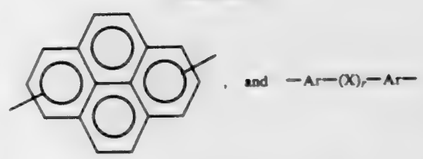
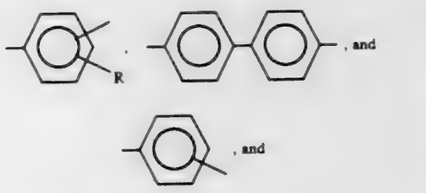


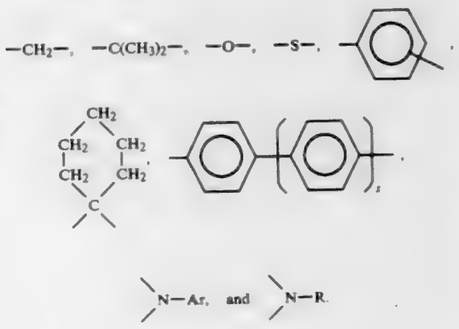
r is 0 or 1,

R is selected from the group consisting of $-CH_3$, $-C_2H_5$, $-C_3H_7$, and $-C_4H_9$,

Ar is selected from the group consisting of:



X is selected from the group consisting of:



5,202,409

POLYHYDROXYPHENYLENE ETHER RESIN AND PROCESS FOR PREPARING THE SAME

Toru Tsukahara; Mitsutoshi Aritomi; Yusuke Arashiro; Shinichi Yamauchi, and Hiromi Nishimura, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 799,967
Claims priority, application Japan, Nov. 29, 1990, 2-325793; Aug. 29, 1991, 3-218290
Int. Cl.[5] C08L *71/12;* **C08G** *75/00, 65/48*
U.S. Cl. 528—219 **9 Claims**

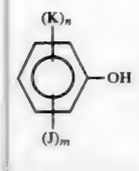
1. A process for preparing a polyhydroxyphenylene ether resin which comprises subjecting to oxidation polymerization at least one phenol-substituted compound represented by the formula (I):

-continued

two identical terminal portions selected from the group consisting of acid anhydride and amine;

(I)

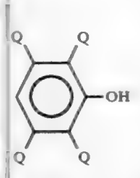
VOL 1149 ISS 2 AP 13 1993 UMI



(I)

wherein m and n each represents an integer satisfying the formulae $1 \leqq m$ and $m+n \leqq 4$; J represents $\}(HO)_a—R^1—S\}_b—R^2—$ where a and b each represents an integer of 1 to 6; and R^1 and R^2 each represents an unsubstituted or halogen-substituted alkylene group having 1 to 20 carbon atoms, an alkenylene group having 1 to 20 carbon atoms or arylene group, or an alkylene group having 1 to 20 carbon atoms and having an unsubstituted or halogen-substituted ether linkage; when m is 2 or more, J may be the same or different; K represents a halogen atom, a primary or secondary alkyl group, an alkenyl group, phenyl group, an aminoalkyl group, a haloalkyl group, a hydrocarbonoxy group or a halohydrocarbonoxy group; and when n is 2 or more, K may be the same or different

with at least one phenol-substituted compound represented by the formula (II):



(II)

wherein Qs each represents a hydrogen atom, a halogen atom, a primary or secondary alkyl group, an alkenyl group, an aromatic group, an aminoalkyl group, a haloalkyl group, a hydrocarbon oxy group or a halohydrocarbon oxy group in the presence of the catalyst selected from a group consisting of cuprous salt-amine catalysts, cupric salt-amine - alkali metal hydroxide catalysts and manganese salt-primary amine catalysts.

5,202,410

POLYIMIDES FROM SUBSTITUTED BENZIDINE

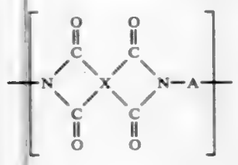
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1991, Ser. No. 783,703

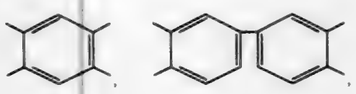
Int. Cl.[5] C08G *69/12*

U.S. Cl. 528—327 **7 Claims**

1. A polyimide comprising repeat units of the formula



where X is



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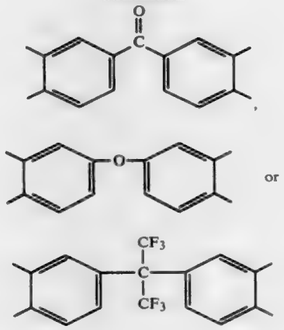
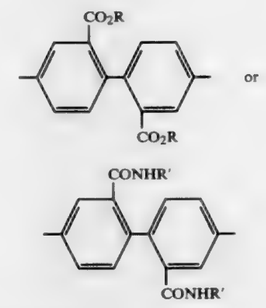
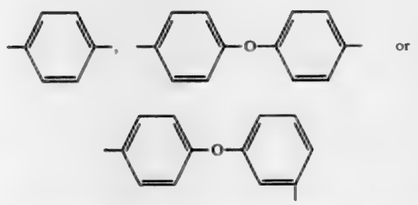


and where A is



and mixtures thereof with



where R is 1–6 carbon primary or secondary alkyl and R′ is methyl or ethyl.

5,202,411

TRI-COMPONENT POLYIMIDE COMPOSITION AND PREPARATION THEREOF

Hiroshi Itatani, Chiba, Japan, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

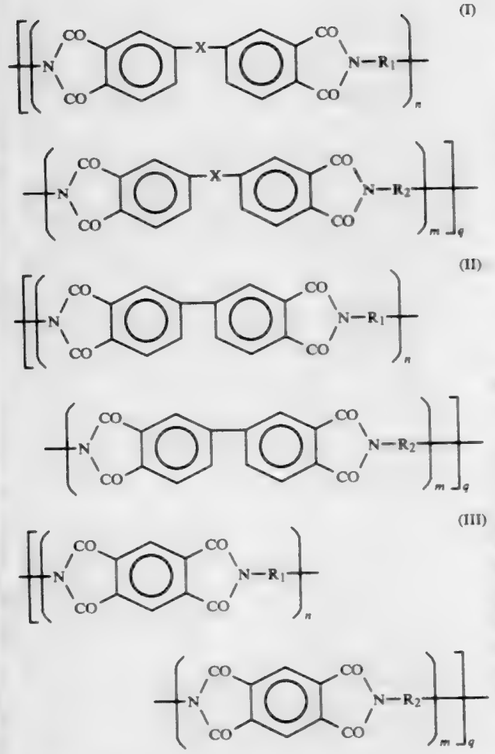
Filed Apr. 3, 1991, Ser. No. 679,963

Claims priority, application Japan, Apr. 6, 1990, 2-91946; Oct. 8, 1990, 2-270334

Int. Cl.[5] C08C *69/26, 73/10*

U.S. Cl. 528—353 **23 Claims**

1. A tri-component polyimide composition comprising one of the repeating units represented by formulae (I), (II), (III),



(I)

(II)

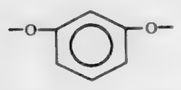
(III)

wherein

R_1 is a first aromatic diamine whose amino groups are deleted;

R_2 is a second aromatic diamine whose amino groups are deleted;

X is —CO—, —O—, —S—, $—SO_2—$, $—C(CH_3)_2—$,



or $—C(CF_3)_2—$;

n integer of 1 to 4 and the content of the segment of n equal to 1 is at least 70%;

m is an integer of 1 to 6 and;

q is an integer of 10 to 100; and the tri-component polyimide having a molecular weight of 50,000 to 200,000, based on the standard polystyrene molecular weight.

5,202,412

POLYIMIDE COPOLYMER PRECURSORS

Brian C. Auman, Newark, Del., and John D. Summers, Newtown Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1990, Ser. No. 591,225

Int. Cl.[5] C08L *79/08*; C08G *69/26*

U.S. Cl. 528—353 **14 Claims**

1. A method of making a polyimide copolymer precursor containing a first segment and a second segment, comprising the steps of:

(a) reacting a first acid dianhydride with a first diamine in a molecular ratio to obtain a first amic acid segment having two identical terminal portions selected from the group consisting of acid anhydride and amine;

(b) imidizing the first amic acid segment to form the first segment to a degree which prevents amine and anhydride rearrangment

(1) within the first segment, and

(2) between the first and the second segment; and

(c) reacting the first segment with a second acid dianhydride and a second diamine to form a second segment attached to the first segment through an amide group having a carbon-nitrogen bond.

5,202,413

ALTERNATING (ABA)N POLYLACTIDE BLOCK COPOLYMERS

Maria Spinu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1991, Ser. No. 816,201

Int. Cl.[5] C08G *63/08*

U.S. Cl. 528—354 **25 Claims**

1. A block copolymer of the formula $R—A—B—A—L)_x$-A—B—A—R where -B- is an oligomeric diol residue or an oligomeric diamine residue having a having a number average molecular weight of 500 to 20,000, -A- is a polylhydroxy acid block comprising either a polylactide, polyglycolide, or copolymer thereof having a number average molecular weight 500 to 40,000, x is 1 to 100, and -L- is a diacyl residue derived from an aromatic diacyl halide or diisocyanate containing 8 to 20 carbon atoms, and -R is hydrogen or an end-capping group, wherein said block copolymer has a number average molecular weight of greater than 10,000.

5,202,414

PYROLZED AMINE CURED POLYMER OF DITHIOETHER-LINKED PHTHALONITRILE MONOMER

Teddy M. Keller, Alexandria, Va., and Thomas R. Price, deceased, late of Fort Washington, Md. by Carolyn R. Price, legal representative , assignors to The United States of America as Represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 274,216, Nov. 21, 1988, Pat. No. 5,004,821.

This application Oct. 19, 1990, Ser. No. 599,939

Int. Cl.[5] C08G *73/02, 75/00*

U.S. Cl. 528—481 **7 Claims**

1. A polymer produced by:

(1) polymerizing a phthalonitrile monomer represented by the formula:

wherein A is selected from the group consisting of an aliphatic hydrocarbon having from 2 to 30 carbon atoms, a cyclic hydrocarbon having from 4 to 30 carbon atoms, and mixtures thereof;

(2) curing the resulting polymer with an amine, and

(3) pyrolyzing the resulting amine-cured polymer.

5,202,415

DISULFIDE PRECURSORS

5,202,417

60 AMINO ACID POLYPEPTIDE

from the functional group of the individual functionalized compartment receiving the measured quantity;

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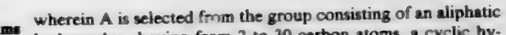
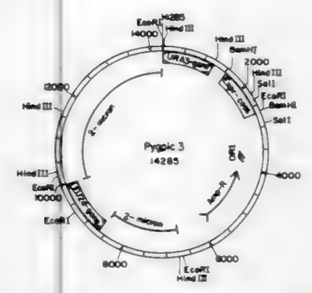


5,202,415
INSULIN PRECURSORS

Ib Jonassen, Valby; Ib G. Clausen, Charlottenlund; Einer B. Jensen, Virum, and Allan Svendsen, Birkerod, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK89/00152, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO89/12647, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 19, 1989, Ser. No. 623,739
Claims priority, application Denmark, Jun. 20, 1988, 3361/88
Int. Cl.[5] A61K *37/02, 37/26;* **C07K** *5/00*
U.S. Cl. 530—303 **6 Claims**



1. Insulin precursor having the amino acid sequence

B(1-29)-*Asp-Lys-Arg-A*(1-21)

wherein B(1-29) are the 29 first amino acid residues of the B chain of human insulin starting from the N-terminus, A(1-21) are the 21 amino acid residues of the A chain of human insulin, the positions A6 and A11, A7 and B7 and A20 and B19, respectively, are connected through sulphur bridges, and, optionally, one or more of the glutamic acid residues in the positions A4, A17, B13 and B21 are substituted by another naturally-occurring alpha-amino acid residue having an uncharged side chain.

5,202,416
PROTEASE ABSORBENT FOR ISOLATING AND PURIFYING PROTEASES, A PROCESS FOR THE PREPARATION THEREFOR, AND THE METHOD FOR PURIFYING A PROTEASE

Werner Stülber, Lahntal, and Eric P. Pâques, Marburg, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Aug. 10, 1989, Ser. No. 392,072
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827415
Int. Cl.[5] A61K *37/02;* **C07K** *5/08*
U.S. Cl. 530—322 **5 Claims**

1. A peptide derivative of the Formula I

R—Y—Leu—Pro—NH—CH(CH_2—CH_2—CH_2—NH—C(=NH)—NH_2)—X

in which Y is HN—$(CH_2)_n$—CO with n=1 to 8 or a bond,
X is CN, CH_2OH or CHO and
R is a support matrix suitable for affinity chromatography or is a hydrogen atom.

5,202,417
60-AMINO-ACID POLYPEPTIDE

Kyozo Hayashi, Gifu, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 21, 1989, Ser. No. 396,937
Claims priority, application Japan, Feb. 16, 1989, 1-35111
Int. Cl.[5] A61K *37/00, 37/02;* **C07K** *5/00, 7/00*
U.S. Cl. 530—324 **1 Claim**

1. The claim A polypeptide consisting of the amino acid sequence:

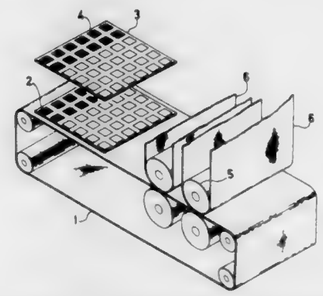
EAQTETCTVAPRERQNCGFPGVTPSQCANK

GCCFDDTVRGVPWCFY?NTIDVPPEEECEF.

5,202,418
METHOD OF PERFORMING MULTIPLE SYNTHESIS OF PEPTIDES ON SOLID CARRIER

Michal Lebl, Praha, Czechoslovakia; Jutta Eichler, Berlin, Fed. Rep. of Germany; Vít Pokorny, Praha; Jirí Jebnicka, Praha; Petr Mudra, Praha; Karel Zenísek, Praha; Alena Stierandová, Cerven Kostelec; Jan Kalousek, Praha, and Jan Bolf, Praha, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed Jan. 24, 1991, Ser. No. 645,121
Claims priority, application Czechoslovakia, Feb. 2, 1990, 508-90
Int. Cl.[5] A61K *37/02;* **G01N** *21/00*
U.S. Cl. 530—334 **4 Claims**



1. A method of synthesizing peptides, comprising the steps of:
providing a planar carrier on a disk, which carrier is divided into a plurality of individual compartments, each compartment containing an inert porous material, a circular path being defined around said disk, said compartments being circumferentially spaced along said circular path;
anchoring at least one functional group for synthesis of at least one peptide onto the inert porous material of each compartment to form a plurality of individual functionalized compartments;
arranging a dosing head at a fixed location adjacent said circular path, the dosing head including means for directly applying measured quantities of at least one liquid component from a common reservoir of such component;
positioning the disk so that one of the individual functionalized compartments is positioned to receive a liquid component directly applied by the closing head;
directly applying a measured quantity of a liquid component to an individual functionalized compartment from the common reservoir thereof, via the dosing head, the applied component providing an amino acid to form a covalent bond with the functional group of the individual functionalized compartment positioned to receive the liquid component for beginning the synthesis of a peptide

from the functional group of the individual functionalized compartment receiving the measured quantity;
rotating the disk to position another individual compartment along the circular path to receive a liquid component applied by the dosing head; and
subsequently applying at least one other amino acid to another individual functionalized compartment in at least one other step for completing the synthesis of peptides.

5,202,419
ANTICOAGULATIVE PROTEIN PP4-X

Ulrich Grundmann, Lahntal-Grossfelden; Karl-Josef Abel, and Egon Amann, both of Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg-/Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 265,843, Nov. 1, 1988, abandoned. This application Feb. 28, 1992, Ser. No. 841,293
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 3737237
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 **4 Claims**

1. Isolated PP4-X, which has the amino acid sequence shown in Table 1.

5,202,420
TRACHEAL ANTIMICROBIAL PEPTIDES, DNA SEQUENCES AND METHODS FOR THE PRODUCTION AND USE THEREOF

Michael A. Zasloff, Merion; Charles L. Bevins, Drexel Hill, and Gill Diamond, Philadelphia, all of Pa., assignors to The Children's Hospital of Philadelphia, Philadelphia, Pa.

Filed Oct. 25, 1990, Ser. No. 603,451
Int. Cl.[5] C07K *7/10;* **A61K** *37/02*
U.S. Cl. 530—324 **10 Claims**

1. A substantially pure, peptide essentially comprising the amino acid sequence defined in SEQ ID NO:1.

5,202,421
ANTICOAGULANT SUBSTANCE OBTAINED FROM URINE AND PROCESS FOR THE PREPARATION THEREOF

Yasuyuki Kunihiro; Ryo Tanaka; Michio Ichimura, all of Fujieda; Akio Uemura, Numazu; Nobuo Ohzawa, Shizuoka, and Ei Mochida, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,178
Claims priority, application Japan, Dec. 27, 1988, 63-330413; Nov. 1, 1989, 1-285240
Int. Cl.[5] C07K *15/14, 3/18*
U.S. Cl. 530—350 **5 Claims**

1. A substantially purified glycoprotein having anticoagulant activity and obtained from human urine, which is characterized by
having affinity to thrombin,
ability to stimulate thrombin-catalyzed protein C activiation, and
an amino acid composition (mol %) of

Aspartic acid	9.5 ± 2.0,
Threonine	4.0 ± 1.5,
Serine	5.1 ± 1.5,
Glutamic acid	10.9 ± 2.5,
Proline	9.3 ± 1.5,
Glycine	11.0 ± 3.0,
Alanine	11.7 ± 3.0,
Cysteine	8.0 ± 4.0,
Valine	5.9 ± 1.5,
Methionine	1.1 ± 0.5,
Isoleucine	2.8 ± 1.5,
Leucine	7.5 ± 2.0,
Tyrosine	1.6 ± 1.5,
Phenylalanine	3.7 ± 1.5,
Histidine	2.5 ± 1.0,
Lysine	0.8 ± 0.5, and
Arginine	4.6 ± 1.5,

as measured after complete acid-hydrolyzation according to the method of Moore et al.;
wherein the amino terminus of the glycoprotein is as follows:

Ala—Pro—Ala—Glu—Pro—Gln—Pro—Gly—Gly—Ser—Gln—Cys—Val—Glu—His—Asp—Cys—Phe—Ala—Leu—Tyr—Pro—Gly—Pro—Ala—Thr—Phe—Leu—
wherein the carboxyl terminal is
—Leu—Val—Arg or —Ala—Arg; and

having stability at pH 2to 10,
at 60° C. for 300 min.,
in 1% (W/V) SDS,
in 6M guanidine hydrochloride, and
in 8M urea;
a molecular weight of
72,000±3,000 as measured by SDS-polyacrylamide gel electrophoresis under non-reduced conditions;
a sugar composition (% W/W) of
neutral sugar: 5.5±1.0 as measured by Phenol-Sulfuric acid method,
amino sugar: 2.2±1.0 as measured by Elson-Morgan's method (Blix's modification) and
sialic acid: 2.8±1.5 as measured by Warren's method;
an absorbance at 280 nm of
7.7±1.0 (in 1% aqueous solution, 1 cm light path); and
an isoelectric point of
pH 3.9±0.2.

3. A process for preparing a glycoprotein with anti-coagulant activity and obtained from human urine having the following properties:
having affinity to thrombin,
ability to stimulate thrombin-catalyzed protein C activation, and
an amino acid composition (mol %) of

Aspartic acid	9.5 ± 2.0,
Threonine	4.0 ± 1.5,
Serine	5.1 ± 1.5,
Glutamic acid	10.9 ± 2.5,
Proline	9.3 ± 1.5,
Glycine	11.0 ± 3.0,
Alanine	11.7 ± 3.0,
Cysteine	8.0 ± 4.0,
Valine	5.9 ± 1.5,
Methionine	1.1 ± 0.5,
Isoleucine	2.8 ± 1.5,
Leucine	7.5 ± 2.0,
Tyrosine	1.6 ± 1.5,
Phenylalanine	3.7 ± 1.5,
Histidine	2.5 ± 1.0,
Lysine	0.8 ± 0.5, and
Arginine	4.6 ± 1.5,

as measured after complete acid-hydrolyzation according to the method of Moore et al.;
wherein the amino terminus of the glycoprotein is as follows:

Ala—Pro—Ala—Glu—Pro—Gln—Pro—Gly—Gly—Ser—Gln—Cys—Val—Glu—His—Asp—Cys—Phe—Ala—Leu—Tyr—Pro—Gly—Pro—Ala—Thr—Phe—Leu—
wherein the carboxyl terminal is
—Leu—Val—Arg or —Leu—Ala—Arg; and

having stability at pH 2 to 10,
at 60° C. for 300 min.,

(c) it is non-reactive with BSA, collagen I, RNAse or chemi-

5,202,427
DNA SEGMENT CONTAINING STREPTOMYCIN

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having stability at pH 2 to 10,
at 60° C. for 300 min.,
in 1% (W/V) SDS,
in 6M guanidine hydrochloride, and
in 8M urea, comprising:
adjusting pH of human urine to 8.3±0.3 and removing the precipitates;
adjusting pH of the urine to 7.3±0.2;
heating the urine at 60°±5° C. for 15±5 min.; and
fractionating the treated urine by affinity chromatography using thrombin-binding resin, ion exchange chromatography, gel filtration or combinations thereof to collect said glycoprotein.

5,202,422
COMPOSITIONS CONTAINING PLANT-PRODUCED GLYCOPOLYPEPTIDE MULTIMERS, MULTIMERIC PROTEINS AND METHOD OF THEIR USE

Andrew C. Hiatt, San Diego, and Mich B. Hein, Fallbrook, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 427,765, Oct. 27, 1989. This application Oct. 2, 1990, Ser. No. 591,823
Int. Cl.[5] C07K *15/28; 17/02;* **A61K** *39/44, 49/02*
U.S. Cl. 530—387.3 **5 Claims**

1. A composition comprising a glycopolypeptide multimer and plant material, wherein said multimer comprises an immunologically active glycosylated immunoglobulin molecule free of sialic acid residues.

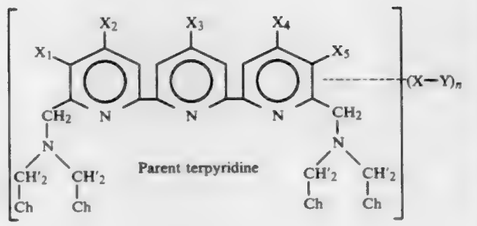
5. A glycopolypeptide multimer composition produced according to the method comprising:
(a) introducing into the genome of a first member of a plant species a first mammalian gene coding for an autogenously linking immunoglobulin heavy chain monomeric polypeptide having an N-linked glycosylation signal, to produce a first trnasformant;
(b) introducing into the genome of a second member of said plant species a second mammalian gene coding for an autogenously linking immunoglobulin light chain monomeric polypeptide, to produce a second transformant;
(c) generating from said first and second transformants a progeny population;
(d) isolating from said progeny population a transgenic plant species that produces an immunologically active glycopolypeptide multimer; and
(e) recovering from said transgenic plant species a composition comprising said glycopolypeptide multimer and plant material.

5,202,423
TERPYRIDINE DERIVATIVES

Jouko Kankare; Harri Takalo; Elina Hänninen; Matti Helenius, all of Turku, and Veli-Matti Mukkala, Kaarina, all of Finland, assignors to Wallac OY

Continuation of Ser. No. 466,414, Mar. 5, 1990, abandoned. This application Apr. 19, 1991, Ser. No. 687,498
Claims priority, application Sweden, Jul. 8, 1988, 8802575
Int. Cl.[5] C07K *15/28, 17/02;* **A61K** *39/44, 49/02*
U.S. Cl. 530—391.5 **7 Claims**

1. A lanthanide chelate in which a lanthanide selected from the group consisting of Eu^{3+}, Tb^{3+}, Sm^{3+} and Dy^{3+} is chelated to a terpyridine compound having the structure



Parent terpyridine

wherein
(i) n=1 or 2,
(ii) $X_1=X_5$ hydrogen,
(iii) X_2, X_3 and X_4 are selected from the group consisting of hydrogen, hydroxy, amino, amido, alkoxy, alkyl, alkynyl, aryl, aralkyl, aryloxy, arylamino and arylethynyl, with the proviso that alkyl has less than 12 carbon atoms and aryl is selected from phenyl, quinolyl, naphthyl, pyridyl and pyrimidyl,
(iv) Ch is a chelating group selected from $—COO^-$, $—O-PO_3^{2-}$ and- PO_3^{2-},
(v) X-Y is a substituent replacing a group X_1–X_5 or H', in which X is a bridge hot participating in the chelating and consisting of a pure hydrocarbon chain of 1–12 carbon atoms and at least one structural element selected from the group consisting of secondary and tertiary amines, aliphatic disulfides, aliphatic thioethers, ethers, esters and diaza, and
Y is a residue of a compound selected from the group consisting of antigens, haptens, antibodies and nucleic acids, said residue retaining the biospecific affinity of said compound.

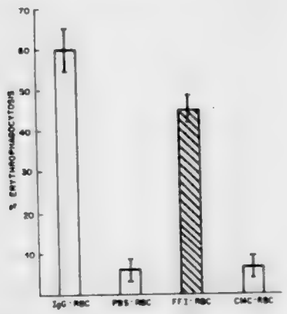
5,202,424
MESANGIAL CELL-DERIVED RECEPTORS FOR ADVANCED GLYCOSYLATION ENDPRODUCTS AND USES THEREOF

Helen Vlassara, New York, and Anthony Cerami, Shelter Island, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 453,958, Dec. 20, 1989, abandoned, which is a division of Ser. No. 91,534, Sep. 3, 1987, Pat. No. 4,900,747, which is a continuation-in-part of Ser. No. 907,747, Sep. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Aug. 23, 1991, Ser. No. 749,444
Int. Cl.[5] C07K *3/00;* **C12Q** *1/00;* **A01N** *37/52;* **A61K** *31/155*
U.S. Cl. 530—395 **6 Claims**

1. An isolated receptor protein reactive with advanced glycosylation end products, characterized as follows:
(a) it has a molecular mass from 30 to 50 kD;
(b) it is reactive with AGE-BSA, AGE-RNAse, AGE-collagen I and AGE-BSA reduced with $NaBH_4$ and has a binding affinity of $2.0\pm0.4\times10^{-6}M^{-1}$ (kD=500 nM);

(c) it is non-reactive with BSA, collagen I, RNAse or chemically synthesized FFI-BSA; and



(d) it is present on mesangial cell membranes prior to purification.

5,202,425
OLIGODEOXYNUCLEOTIDE PROBES FOR *CAMPYLOBACTER FETUS* AND *CAMPYLOBACTER HYOINTESTINALIS*

Irene V. Wesley, and Ronald D. Wesley, both of Ames, Iowa, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

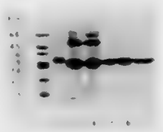
Filed Oct. 26, 1990, Ser. No. 603,503
Int. Cl.[5] C07H *15/12;* **C12Q** *1/68, 1/02*
U.S. Cl. 536—24.3 **5 Claims**

1. A labelled, single-stranded DNA probe having a length of about 15–50 bases, wherein the base sequence of said probe consists essentially of a sequence encompassed by SEQ ID NO. 5 and including at least one of the bases N in a region of SEQ ID NO. 5 extending from position 51 through position 80, wherein said bases N are selected to be uniquely complementary to either *C. fetus* or *C. hyointestinalis.*

5,202,426
EUCARYOTIC NAD CYCLASES

Felix Strumwasser, Falmouth; Mark R. Hellmich, Woods Hole, and David L. Glick, Falmouth, all of Mass., assignors to Marine Biological Laboratory, Woods Hole, Mass.

Continuation-in-part of Ser. No. 404,733, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 266,145, Nov. 2, 1988, abandoned. This application Dec. 17, 1990, Ser. No. 629,101
Int. Cl.[5] C12N *15/60*
U.S. Cl. 536—23.2 **1 Claim**



1. A purified deoxyribonucleic acid comprising the nucleic acid sequence shown as SEQ. ID NO. 3.

5,202,427
DNA SEGMENT CONTAINING STREPTOMYCIN RESISTANCE GENE AND BEING CAPABLE OF CONTROLLING EXPRESSION OF SAID GENE

Hamao Umezawa, deceased, late of Tokyo, Japan by Mieko Umezawa, legal representative ; Yoji Umezawa, heir; Yoji Umezawa, heir, and Yoshiro Okamo, heir, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Continuation of Ser. No. 93,530, Jul. 20, 1987, abandoned. This application Feb. 25, 1991, Ser. No. 659,469
Claims priority, application Japan, Nov. 20, 1985, 60-258622
Int. Cl.[5] C12N *15/52, 15/31, 15/00, 15/74*
U.S. Cl. 536—24.1 **2 Claims**

1. A DNA segment containing a streptomycin resistance gene and a function to control the expression of the gene, said DNA segment consisting essentially of an SpH I-Sph I DNA segment having a length of about 3.8 kb which is obtained by excising a Bgl II-Bgl II fragment with a restriction endonuclease Sph I, said Bgl II-Bgl II fragment having been obtained by excising a hybrid plasmid pST 141 with a restriction endonuclease Bgl II, said Bgl II-Bgl II fragment having been derived from the DNA of *Streptomyces griseus* and containing the streptomycin resistance gene therein and having the restriction endonuclease site, shown in the restriction endonuclease map of FIG. 1 of the accompanying drawings and a length of 7.0 kg; and said hybride plasmid pST 141 having been constructed by ligating a Bgl II fragment of the DNA of a plasmid pIJ 702 with such a Bgl II fragment of length of 7.0 kb which is obtained by excising with the restriction endonuclease Bgl II the chromosome DNA containing the streptomycin resistance gene of *Streptomyces griseus;* and said hybrid plasmid pST 14 also having the restriction endonuclease cleaving sites shown in the restriction endonuclease map of FIG. 2 of the accompanying drawings and having a length of about 12.6 kb, said DNA segment consisting essentially of such DNA segment having a length of about 3.8 kb and containing internally the streptomycin resistance gene and a DNA region possessing the function to control the expression of the streptomycin resistance gene.

5,202,428
DNA ENCODING NEUROTROPIC GROWTH FACTOR

David Schubert, La Jolla, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 541,276, Jun. 20, 1990, abandoned. This application Sep. 27, 1990, Ser. No. 590,359
Int. Cl.[5] C07H *15/12;* **C07K** *13/00*
U.S. Cl. 435—320.1 **7 Claims**

1. An essentially purified and isolated recombinant DNA fragment consisting essentially of a DNA sequence encoding a protein including the amino acid sequence:

VIKPKENKTEGEKSSEKPKRKKKG
GKGGKGRRNRKKKKNPCAAKFQNFCIHGE-
CRYIENLEVVTCHCHQDYFGERCG
EKTMKTQKKDDSDLSKIALAAIIVFVSAV-
SVAAIGIITAVLLRKRFFREYEEAEERRRLRQENGTAHAIA.

5,202,429

5,202,432

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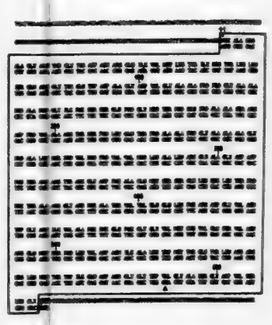
5,202,429
DNA MOLECULES HAVING HUMAN BCL-2 GENE SEQUENCES

Yoshihide Tsujimoto, Landsdowne, and Carlo A. Croce, Philadelphia, both of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Continuation of Ser. No. 883,687, Jul. 9, 1986, Pat. No. 5,015,568. This application Mar. 19, 1991, Ser. No. 663,010
Int. Cl.[5] C07H *17/00*
U.S. Cl. 536—23.5 7 Claims



1. A cDNA molecule which consists essentially of at least about 15 nucleotides of human bcl-2 gene sequences.

5,202,430
TRANSMISSIBLE GASTROENTERITIS VIRUS GENES

David A. Brian, Knoxville, Tenn., and Paul A. Kapke, Ames, Iowa, assignors to University of Tennessee, Knoxville, Tenn.

Continuation of Ser. No. 465,570, Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 41,704, Apr. 23, 1987, abandoned. This application Jan. 10, 1991, Ser. No. 639,404
Int. Cl.[5] C07H *17/00*
U.S. Cl. 536—23.72 4 Claims

1. A purified and isolated DNA molecule consisting essentially of a DNA sequence encoding procine transmissible gastroenteritis virus (TGEV) nucleocapsid protein.

5,202,431
PARTIAL ESTERS OF HYALURONIC ACID

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Continuation of Ser. No. 663,324, Mar. 1, 1991, abandoned, which is a division of Ser. No. 562,267, Aug. 3, 1990, abandoned, which is a division of Ser. No. 339,919, Apr. 19, 1989, Pat. No. 4,965,353, which is a division of Ser. No. 881,454, Jul. 2, 1986, Pat. No. 4,851,521. This application Nov. 20, 1991, Ser. No. 794,703
Claims priority, application Italy, Jul. 8, 1985, 48322 A/85; Jun. 30, 1986, 48202 A/86
Int. Cl.[5] A61K *31/70*; C07G *3/00*; C07H *1/00*
U.S. Cl. 536—55.1 5 Claims

1. A partial ester of hyaluronic acid with an alcohol of the aliphatic, araliphatic, cycloaliphatic or heterocyclic series wherein at least a first portion of the carboxylic acid groups of said hyaluronic acid are salified with a therapeutically active amine.

5,202,432
ASSAY FOR AN ANALYTE ON A SOLID POROUS SUPPORT

G. B. Del Campo, Milan, Italy, assignor to Chemetron, Milan, Italy

Division of Ser. No. 132,877, Dec. 14, 1987, Pat. No. 4,990,442. This application Feb. 4, 1991, Ser. No. 650,082
Int. Cl.[5] G01N *33/53, 33/543, 33/544*; B01D *39/00*
U.S. Cl. 536—76 4 Claims

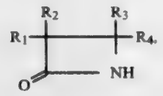
1. An assay device comprising:
a membrane formed of amphiphilic cellulose acetate capable of binding proteins by essentially only hydrogen bonding.

5,202,433
POLYSACCHARIDE DERIVATIVES AS SEPARATING AGENTS

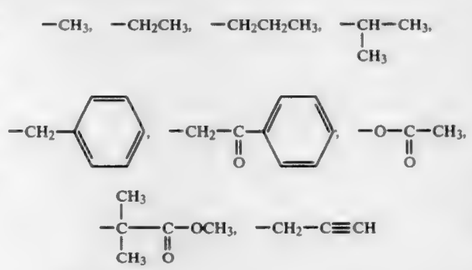
Yoshio Okamoto, Hyogo, and Koichi Hatada, Osaka, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

PCT No. PCT/JP90/00743, § 371 Date Jan. 18, 1991, § 102(e) Date Jan. 18, 1991, PCT Pub. No. WO91/02006, PCT Pub. Date Feb. 21, 1991
PCT Filed Jun. 7, 1990, Ser. No. 646,726
Claims priority, application Japan, Jul. 27, 1989, 1-194925
Int. Cl.[5] C07D *205/08, 487/00*
U.S. Cl. 540—200 8 Claims

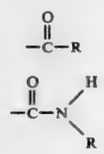
8. In a process of separating a racemic mixture represented by the formula



wherein R_1, R_2, R_3 and R_4 are each a member selected from the group consisting of



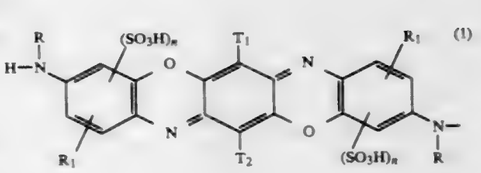
and $-CH_2-C{\equiv}N$, with the proviso that if R_1 and R_2 are the same, R_3 and R_4 are different from each other, and if R_3 and R_4 are the same, R_1 and R_2 are different from each other, by passing the racemic mixture through a separating agent, the improvement comprising said separating agent comprising a polysaccharide derivative in which some or all of the hydrogen atoms of at least one group selected from among hydroxyl groups and amino groups of the polysaccharide are replaced with one or more atomic groups of the formula (1), (2) or (3):



(1)

(2)

-continued



(3)

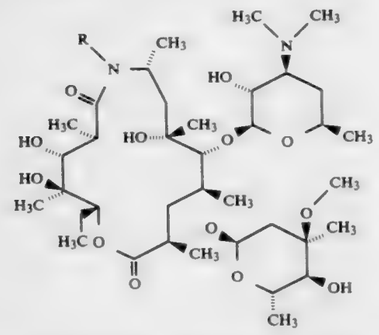
wherein the number of carbon atoms constituting R is 1 to 30 and R is a group having at least one asymmetric carbon atom.

5,202,434
8A-AZA-8A-HOMOERYTHROMYCIN LACTAMS

Robert R. Wilkening, Maplewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 681,223, Apr. 5, 1991, abandoned. This application Mar. 27, 1992, Ser. No. 856,267
Int. Cl.[5] C07D *267/00*; A61K *31/395*
U.S. Cl. 540—454 4 Claims

1. A compound of the formula:



and the pharmaceutically acceptable salts and esters thereof, wherein R is hydrogen or C_{1-10} alkyl.

5,202,435
PROCESS FOR THE PREPARATION OF MORICIZINE HYDROCHLORIDE

Gary O. Page, Newark, Del., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Nov. 12, 1991, Ser. No. 789,487
Int. Cl.[5] C07D *279/30*
U.S. Cl. 544—39 15 Claims

1. A process for preparing moricizine hydrochloride, comprising the steps of:
(a) contacting a first solution comprising moricizine end ethanol with hydrochloric acid under reaction conditions effective to form a second solution comprising moricizine hydrochloride; and
(b) isolating said moricizine hydrochloride from said second solution;
wherein said process is characterized in that at least one of the following process conditions is present:
said first solution comprises at least 30 equivalents ethanol per equivalent moricizine; or
the molar ratio of hydrogen chloride to moricizine is at least 1.1:1.

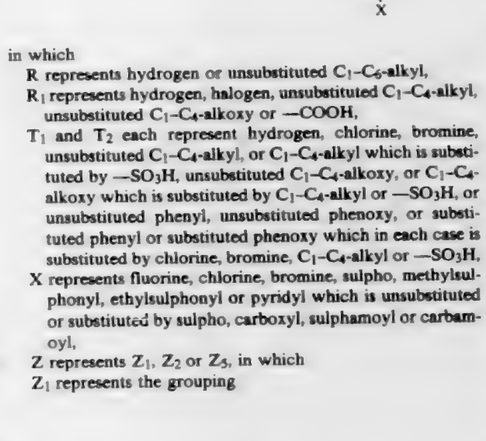
5,202,436
TRIPHENDIOXAZINE DYESTUFFS

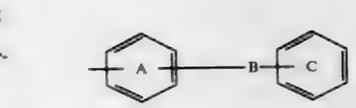
Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1991, Ser. No. 666,092
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010223
Int. Cl.[5] C09B *19/00, 62/04*
U.S. Cl. 544—76 1 Claim

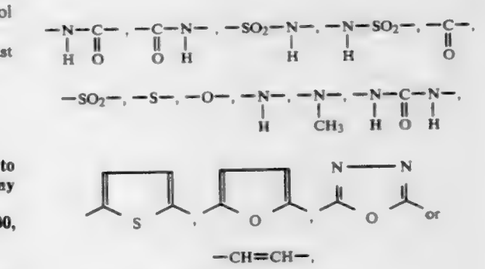
1. Triphendioxazine dyestuffs of the formula

in which
R represents hydrogen or unsubstituted C_1–C_6-alkyl,
R_1 represents hydrogen, halogen, unsubstituted C_1–C_4-alkyl, unsubstituted C_1–C_4-alkoxy or —COOH,
T_1 and T_2 each represent hydrogen, chlorine, bromine, unsubstituted C_1–C_4-alkyl, or C_1–C_4-alkyl which is substituted by $-SO_3H$, unsubstituted C_1–C_4-alkoxy, or C_1–C_4-alkoxy which is substituted by C_1–C_4-alkyl or $-SO_3H$, or unsubstituted phenyl, unsubstituted phenoxy, or substituted phenyl or substituted phenoxy which in each case is substituted by chlorine, bromine, C_1–C_4-alkyl or $-SO_3H$,
X represents fluorine, chlorine, bromine, sulpho, methylsulphonyl, ethylsulphonyl or pyridyl which is unsubstituted or substituted by sulpho, carboxyl, sulphamoyl or carbamoyl,
Z represents Z_1, Z_2 or Z_5, in which
Z_1 represents the grouping





in which
A represents a substituted or unsubstituted phenylene or naphthalene radical, and
C represents a substituted or unsubstituted phenyl- or naphthyl radical,
and
B represents a direct bond or a bridging member of the formula



Z_2 represents a radical of the formula

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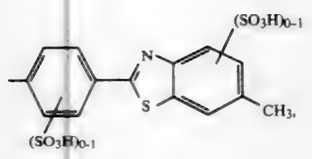
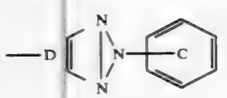
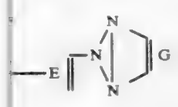


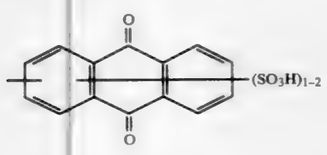


or

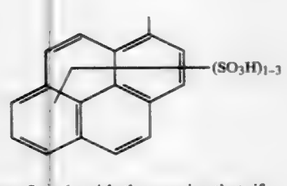


in which
C has the abovementioned meaning,
D and E each represent the radical of a substituted or unsubstituted phenylene or naphthalene ring, and
G represents the radical of a substituted or unsubstituted benzene or naphthalene ring;
Z_5 represents

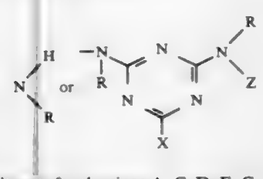
in which
L represents a radical of the formula:



or



n represents 0 or 1, with the proviso that, if
n is 1, the sulpho groups are in each case in the orthoposition relative to the substituents



and the substituents for the rings A, C, D, E, G, L are selected from the group consisting of fluorine, chlorine, or bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, sulpho, carboxyl hydroxyl, C_1–C_4-alkylcarbonylamino, unsubstituted or chlorine-, methoxy-, methyl-substituted phenylcarbonylamino, phenylureido, ureido, and Ring C can also be substituted by phenyl and naphthylazo groups.

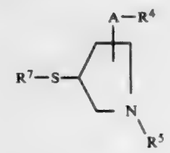
5,202,437

3-PYRROLIDINYLTHIO-1-AZABICYCLO(3.2.0)-HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS

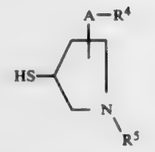
Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonoka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 323,404, Mar. 14, 1989, Pat. No. 4,925,838. This application Mar. 6, 1990, Ser. No. 489,036
Claims priority, application United Kingdom, Mar. 18, 1988, 8806428; May 23, 1988, 8812159; Sep. 16, 1988, 8821760
Int. Cl.[5] C07D *403/6, 401/6*
U.S. Cl. 544—141 **5 Claims**

1. A compound of the formula which is selected from the group consisting of the formula:



and the formula:



wherein R^4 is an aliphatic heterocyclic group selected from the group consisting of pyrrolidinyl, imidazolidinyl, pyrazolidinyl, piperidino, piperazinyl, morpholino, oxoimidazolidinyl, dioxoimidazolidinyl and piperazinyl protected with phenyl- or nitrophenyl-substituted lower alkoxycarbonyl, said aliphatic heterocyclic group being about to A at a heterocyclic nitrogen and being unsubstituted or substituted up to 2 times with the same or different members selected from the group consisting of amino, protected amino, carbamoyl, lower alkyl, oxo, lower alkylsulfonyl, hydroxy(lower)alkyl, and carbamoyl(lower)alkyl, said protected amino being protected with a protecting group selected from the group consisting of lower alkanoyl, lower alkylsulfonyl, carbamoyl, N-methylcarbamoyl, N-ethylcarbamoyl, lower alkoxycarbonyl, lower alkenyloxycarbonyl, lower alkenoyl, cyclo(lower)alkanecarbonyl, C_6–C_{10} aroyl, N-(C_6–C_{10}) arylcarbamoyl, C_6–C_{10} arenesulfonyl, and phenyl(lower)alkoxycarbonyl, said protecting group being unsubstituted or substituted with a nitro group;
R^5 is hydrogen, lower alkyl or imino-protective group selected from the group consisting of lower alkanoyl, lower alkylsulfonyl, carbamoyl, N-methylcarbamoyl, N-ethylcarbamoyl, lower alkoxycarbonyl, lower alkenyloxycarbonyl, lower alkenoyl, cyclo(lower)alkanecarbonyl, C_6–C_{10} aroyl, N-(C_6–C_{10}) arylcarbamoyl, C_6–C_{10} arenesulfonyl, and phenyl(lower)alkoxycarbonyl, said imino-protective group being unsubstituted or substituted with a nitro group;
A is lower alkylene; and
R^7 is a mercapto-protective group selected from the group consisting of (C_6–C_{10})ar(lower)alkyl, di- and triphenyl(lower)alkyl and acyl groups selected from the group consisting of lower alkanoyl, lower alkylsulfonyl, carbamoyl, N-methyl carbamoyl, N-ethylcarbamoyl, lower alkoxycarbonyl, lower alkenyloxycarbonyl, lower alkenoyl, cyclo(lower)alkanecarbonyl, C_6–C_{10} aroyl, N-(C_6–C_{10}) arylcarbamoyl, C_6–C_{10} arenesulfonyl, and phenyl(lower)alkoxycarbonyl, said acyl group being unsubstituted or substituted with a nitro group;
and salts thereof.

5,202,438

PROCESS FOR THE SYNTHESIS OF MELAMINE CYANURATE

Jean-Michel Paul, Portet/Garonne, France, assignor to Elf Atochem S.A., La Defense, France

Filed Apr. 6, 1992, Ser. No. 863,974
Claims priority, application France, Apr. 4, 1991, 91 04086
Int. Cl.[5] C07D *401/12, 251/70*
U.S. Cl. 544—198 **20 Claims**

1. In a process for the synthesis of melamine cyanurate, by the reaction of cyanuric acid and melamine in an aqueous medium, the improvement which comprises conducting the reaction at a pH not above 1, in the presence of a strong mineral acid.

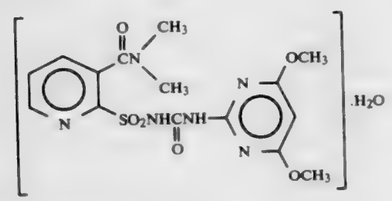
5,202,439

PROCESS FOR THE INTERCONVERSION OF TWO SEPARATE CRYSTAL FORMS OF A HERBICIDAL PYRIDINE SULFONAMIDE

Ngoc Le-Si, Greenville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

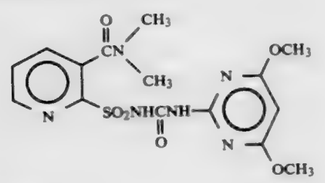
PCT No. PCT/US89/05052, § 371 Date May 8, 1991, § 102(e) Date May 8, 1991
Continuation of Ser. No. 274,463, Nov. 21, 1988, abandoned. This PCT application Nov. 17, 1989, Ser. No. 675,933
Int. Cl.[5] C07D *401/12*
U.S. Cl. 544—320 **3 Claims**

1. A process for the preparation

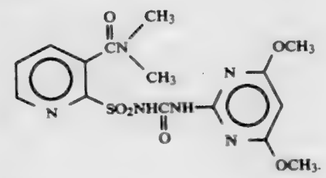


II

which comprises hydrating



or hydrating



in the presence of heat.

5,202,440

CERTAIN 9-AMINO-2-(OR 4)-OXA 1,2,3,4-TETRAHYDRO-OR 1,2,3,4,5,6,7,8-OCTAHYDRO-ACRIDINES

Manoj C. Desai, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US88/01070, § 371 Date Apr. 27, 1990, § 102(e) Date Apr. 27, 1990, PCT Pub. No. WO89/02740, PCT Pub. Date Apr. 6, 1989
PCT Filed Mar. 30, 1988, Ser. No. 474,717
Claims priority, application PCT Int'l Appl., Oct. 5, 1987, PCT/US87/02546
Int. Cl.[5] C07D *491/052;* A61K *31/44*
U.S. Cl. 546—89 **1 Claim**

1. A compound selected from the group consisting of:
9-amino-4-oxa-1,2,3,4-tetrahydroacridine;
9-amino-2-oxa-1,2,3,4,-tetrahydroacridine;
9-amino-8-fluoro-4-oxa-1,2,3,4-tetrahydroacridine;
9-amino-4-oxa-1,2,3,4,5,6,7,8-octahydroacridine; or a pharmaceutically acceptable salt thereof.

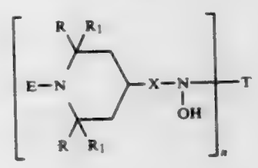
5,202,441

POLYMER STABILIZERS CONTAINING BOTH HINDERED AMINE AND HYDROXYLAMINE MOIETIES

Joseph Suhadolnik, Ossining; Ramanathan Ravichandran, Nanuet, both of N.Y.; Valerio Borzatta, and Graziano Vignali, both of Bologna, Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,403
Claims priority, application Italy, Nov. 7, 1989, 22293 A/89
Int. Cl.[5] C07D *211/56*
U.S. Cl. 546—223 **14 Claims**

1. A compound of formula II



(II)

Ib

wherein
E is hydrogen, oxyl, hydroxyl, alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, hydroxyalkyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 20 carbon atoms, alkanoyl of 1 to 18 carbons atoms, alkoxy of 1 to 18 carbon atoms, cycloalkoxy of 5 to 12 carbon atoms, aryloxy of 6 to 10 carbon atoms, hydroxyalkoxy of 2 to 6 carbon atoms, alkoxyalkoxy of 2 to 20 carbon atoms, aralkoxy of 7 to 15 carbon atoms or a bicyclo or tricycloaliphatic oxy radical of 7 to 12 carbon atoms,

Ia

R and R_1 are independently alkyl of 1 to 4 carbon atoms or together R and R_1 are pentamethylene,
X is a direct bond,
n is 1, and
T is hydrogen, alkyl of 1 of 36 carbon atoms, said alkyl interrupted by one or more oxygen atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms, or said aralkyl substituted by alkyl of 1 to 4 carbon atoms or by one or two halogen atoms; cyanoethyl, alkenyl of 2 to 8 carbon atoms, or alkoxycarbonylalkyl of 4 to 36 carbon atoms where alkyl is of 1 to 4 carbon atoms.

5,202,442

5,202,443

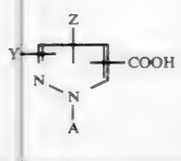
VOL 1149 ISS 2 AP 13 1993 UMI

5,202,442
PROCESS FOR PREPARING PYRAZOLECARBOXYLIC ACID COMPOUNDS

Shinichiro Takigawa, and Shuzo Shinke, both of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 367,428, Jun. 16, 1989, Pat. No. 5,053,517. This application Jun. 27, 1991, Ser. No. 722,533
Claims priority, application Japan, Jul. 4, 1988, 63-166274
Int. Cl.[5] C07D *231/10, 231/14;* C07C *51/16*
U.S. Cl. 546—279 **22 Claims**

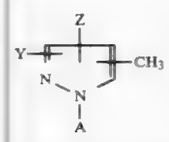
1. A process for preparing a pyrazolecarboxylic acid compound represented by the formula (II):



(II)

wherein Y and Z each represent a hydrogen atom, a halogen atom, a nitro group, a cyano group, $COOR_1$, NR_1R_2, $CONR_1R_2$, SR_1, $SO_2NR_1R_2$, SO_2R_3, R_3CO, OR_4, CHX_2 or CX_3; A represents a hydrogen atom, an alkyl group having 2 to 4 carbon atoms, a substituted or unsubstituted phenyl, a substituted or unsubstituted pyridyl group or OR_5 wherein the substituents on the phenyl and the pyridyl are a halogen atom, a nitro group, a cyano group, $COOR_1$, NR_1R_2, $CONR_1R_2$, SR_1, $SO_2NR_1R_2$, SO_2R_3, R_3CO, OR_4, CHX_2 or CX_3; where R_1 and R_2 each represent a hydrogen atom or an alkyl group having 1 to 10 carbon atoms; R_3 represents an alkyl group having 1 to 10 carbon atoms; R_4 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted phenyl group wherein the substituents on the phenyl are a halogen atom, a nitro group, a cyano group, $COOR_1$ NR_1R_2, $CONR_1R_2$, SR_1, $SO_2NR_1R_2$, SO_2R_3, R_3CO, OR_4, CHX_2 or CX_3 where R_1, R_2, R_3 and R_4 are the same as defined above, CHF_2, CF_3 or CF_3CH_3; R_5 represents an alkyl group having 1 to 10 carbon atoms; and X represents a halogen atom,

which comprises oxidizing a pyrazole compound represented by the formula (I):



(I)

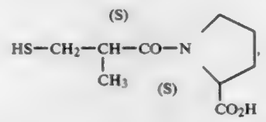
wherein Y, Z and A have the same meanings as defined above, by contacting said compound of the formula (I) with an oxygen-containing gas in the presence of a metal compound catalyst at a temperature of 20° to 200° C., the oxygen partial pressure of said oxygen-containing gas being from atmospheric pressure to 80 kg/cm^2 and said metal compound catalyst is in an amount of 0.1 to 20 gram-atom based on 100 moles of the compound of the formula (I) and is at least one compound selected from the group consisting of iron compounds, cobalt compounds, nickel compounds, manganese compounds, cerium compounds and zirconium compounds.

5,202,443
PROCESS FOR PREPARING 1-(2S)-3MERCAPTO-METHYL-1-OXOPROPYL)-L-PROLINE

Géza Schneider; Gábor Blaskó; Agnes Kovács née Palotai; Gabriella Ürmös née Lassu; Judit Kun; Ilma Dinnyés née Nagy; Ivan Beck; Elemér Jákfiavi, and András Dietz, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary

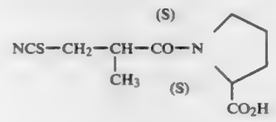
Filed Sep. 20, 1991, Ser. No. 762,688
Claims priority, application Hungary, Sep. 21, 1990, 5998/90
Int. Cl.[5] C07D *207/09*
U.S. Cl. 548—533 **5 Claims**

1. A process for the preparation of 1-[(2S)-3-mercapto-2-methyl-1-oxopropyl]-L-proline of the formula (I)



(I)

which comprises hydrogenolysing 1-[(2S)-2-methyl-1-oxo-3-rhodanidopropyl]-L-proline of the formula (II)



(II)

in an inert solvent in the presence of a hydrogenating catalyst at a temperature of 50° to 120° C. under a pressure of 10^6 to 10^7 Pa.

5,202,444
OPTICALLY ISOMERIC INOSITOL AND PROCESS FOR MAKING OPTICALLY ACTIVE COMPOUND

Shoichiro Ozaki; Takahiko Akiyama, both of Matsuyama; Kunio Kageyama, Yokohama, and Morihiss Machida, Kanagawa, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1991, Ser. No. 795,801
Claims priority, application Japan, Nov. 27, 1990, 2-323779
Int. Cl.[5] C07D *317/72*
U.S. Cl. 549—214 **7 Claims**

1. The compound of 1L-1,2:5,6-di-O-cyclohexylidene-3-O-methoxymethyl-chiro-inositol.

5,202,445
PREPARATION OF POTASSIUM MAGNESIUM L-ASCORBATE 2-PHOSPHATE

Walter Dobler, Heidelberg; Hartwig Voss, Frankenthal; Friedhelm Balkenhohl, Limburgerhof, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 20, 1991, Ser. No. 747,573
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1990, 4026787
Int. Cl.[5] C07D *307/62*
U.S. Cl. 549—315 **10 Claims**

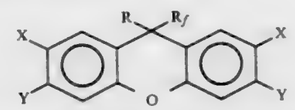
1. A process for preparing potassium magnesium L-ascorbate 2-phosphate from an aqueous solution of potassium L-ascorbate 2-phosphate which is heavily contaminated with potassium chloride, which comprises adding to the aqueous solution of potassium L-ascorbate 2-phosphate sufficient magnesium chloride for the solution to contain about 0.90 to 1.3 equivalents of magnesium ions per equivalent of L-ascorbate 2-phosphate, substantially removing the potassium chloride present in the solution by electrodialysis, and isolating the potassium magnesium L-ascorbate 2-phosphate from the remaining solution by crystallization.

5,202,446
FLUORIDATED MONOMERS BASED ON 9-PHENYL-9-PERFLUOROALKYLXANTHENE

Swiatoslaw Trofimenko, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 527,740, May 23, 1990, Pat. No. 5,051,520. This application Jun. 21, 1991, Ser. No. 718,932
Int. Cl.[5] C07D *311/80*
U.S. Cl. 549—391 **28 Claims**

1. A monomer of the formula



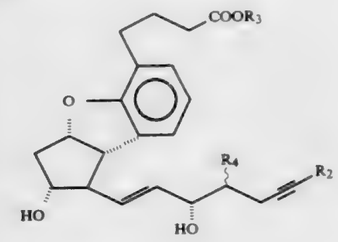
wherein R is selected from the group consisting of phenyl, perfluorohexylphenyl and perfluoroalkyl of 1 to 16 carbon atoms; R_f is perfluoroalkyl of 1 to 16 carbon atoms; X is selected from the group consisting of H, CH_3, CO_2H, COCl, NH_2halogen, SO_2alkyl and NCO; Y is selected from the group consisting of X and OH; and X and Y together are —CO—O—CO—.

5,202,447
PROCESS OF PRODUCING 5,6,7-TRINOR-4,8-INTER-M-PHENYLENE PGI2 DERIVATIVES

Kiyotaka Ohno, Fujisawa; Hiroshi Nagase, Kamakura; Yutaka Hosono, Yokohama; Hisanori Wakita; Koji Kawai, both of Kamakura, and Hideo Yoshiwara, Nagoya, all of Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP90/00237, § 371 Date Jan. 2, 1991, § 102(e) Date Jan. 2, 1991, PCT Pub. No. WO90/10003, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 27, 1990, Ser. No. 601,783
Claims priority, application Japan, Feb. 27, 1989, 1-46873; Feb. 27, 1989, 1-46874
Int. Cl.[5] A61K *307/93*
U.S. Cl. 549—458 **6 Claims**

1. A process of preparing 5,6,7-trinor-4,8-inter-m-phenylene PGI_2 derivatives of the formula (VII)

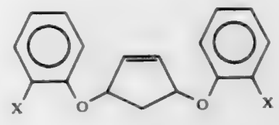


(VII)

(wherein R_2 represents methyl or ethyl;
R_3 and R_4 represent hydrogen or methyl) comprising the steps of:
reacting 3,5-cis-dibromocyclopentene of the formula

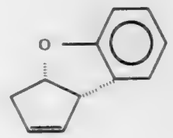
5

with potassium salt of an o-halophenol to form 3,5-cis-bis(2-halophenoxy)cyclopentene of the formula 6



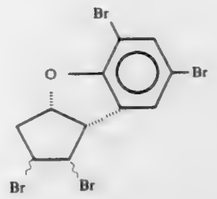
6

(wherein X represents chlorine, bromine or iodine);
treating said compound of the formula 6 with magnesium metal to convert to a Grignard reagent;
cyclizing said Grignard reagent in the presence of a metal catalyst to form a cyclopentabenzofuran of the formula 7;



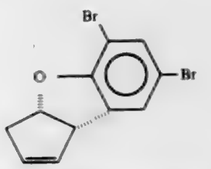
7

brominating said compound of the formula 7 to form a tetrabromide of the formula 8;



8

reductively removing the bromine of the 5-membered ring moiety of said compound of the formula 8 to form 3a,8b-cis-dihydro-3H-5,7-dibromocyclopenta[b]benzofuran of the formula 1

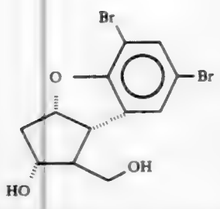


1

converting said compound by Prins reaction and hydrolysis to a diol of the formula 2;

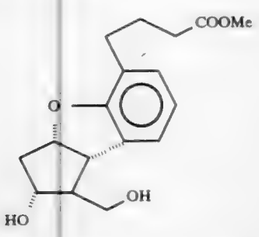
5,202,449

lected from the group consisting of a phenylene group having



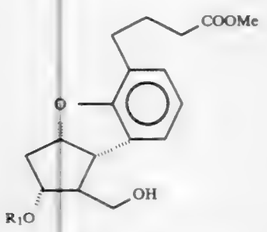
2

reacting said compound of the formula 2 with a Grignard reagent so as to carry out metal-halogen exchange;
reacting the resulting product with methyl 3-formyl propionate;
subjecting the resulting product to hydrogenolysis to give a diol ester of the formula 3;



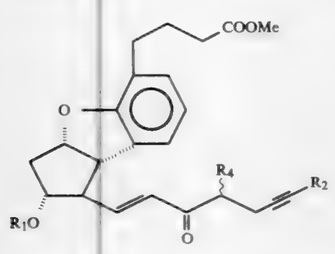
3

subjecting said compound of the formula 3 to protection of the primary hydroxyl group, esterification of the secondary hydroxyl group and removal of the protective group of primary hydroxyl group so as to convert said compound of the formula 3 to a compound of the formula (I);



(I)

(wherein R_1 represents acetyl, p-toluoyl, o-toluoyl, benzoyl m-toluoyl, p-t-butylbenzoyl, p-phenylbenzoyl, 3,5-dinitrobenzoyl, N-phenylcarbamoyl, α-naphthoyl, β-naphtholyl or p-nitrobenzoyl);
converting said compound of the formula (I) to a compound of the formula (III)

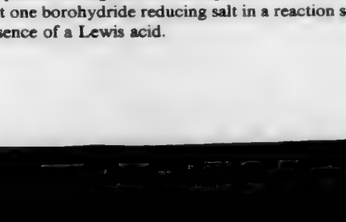


(III)

(wherein R_1, R_2 and R_3 represent the same meanings as mentioned above) by oxidizing said compound of the formula (I) and reacting the resulting product with a compound of the formula (II) in the presence of a strong base;

(II)

(wherein R_2 and R_4 represent the same meanings as mentioned above)
reducing said compound of the formula (III) with a reducing agent to form a compound of the formula (IV);



(IV)

(wherein R_1, R_2 and R_4 represent the same meanings as mentioned above) and
solvolyzing or hydrolyzing said compound of the formula (IV) to form said compound of the formula (VII).

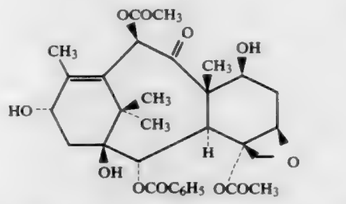
5,202,448

PROCESSES OF CONVERTING TAXANES INTO BACCATIN III

David R. Carver; Timothy R. Prout, both of Boulder; Hernita A. Ewald, Englewood, and Donia L. Henderson, Boulder, all of Colo., assignors to NaPro BioTherapeutics, Inc., Boulder, Colo.

Filed Aug. 14, 1992, Ser. No. 930,840
Int. Cl.[5] C07D *305/14*
U.S. Cl. 549—510 21 Claims

1. A process for the preparation of a compound of formula (I)



Formula (I)

comprising contacting a mixture containing at least one taxane compound having an ester linkage at the C-13 position with at least one borohydride reducing salt in a reaction solvent in the presence of a Lewis acid.

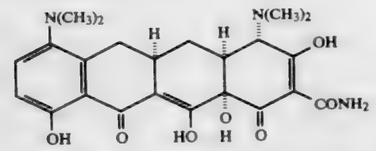
5,202,449

PROCESS FOR PURIFYING 7-DIMETHYLAMINO-6-DEMETHYL-6-DEOXYTETRACYCLINE

Ryoichi Hasegawa, Yono; Hiroaki Ohno, Tokyo; Kazuaki Sano, Hoya; Yoshinori Saito, Yono; Hiroaki Nishiyama, Gunma, and Shin'ichi Umeda, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 468,578, Jan. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 222,886, Jul. 22, 1988, Pat. No. 4,918,208. This application Aug. 27, 1991, Ser. No. 758,274
Claims priority, application Japan, Jul. 28, 1987, 62-186563; Aug. 18, 1987, 62-203540; Jan. 30, 1989, 1-17589
Int. Cl.[5] C07C *233/11*
U.S. Cl. 552—206 3 Claims

1. A process for purifying 7-dimethylamino-6-demethyl-6-deoxytetracycline represented by the following formula (I)



(I)

from impurities formed when said 7-dimethylamino-6-demethyl-6-deoxytetracycline is obtained by reductive dimethylation of 7-amino-6-demethyl-6-deoxytetracycline with formaldehyde, comprising dissolving 7-dimethyl-6-demethyl-6-deoxytetracycline or its hydrochloride having a lower purity in a mixed solvent of an alcohol and water by using hydrochloric acid and then adjusting the pH of the solution to 3.5 to 4.5 to recrystallize the hydrochloride salt having a higher purity.

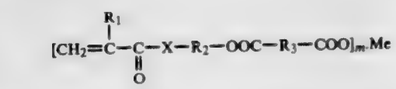
5,202,450

PHTHALIC ACID DERIVATIVE METAL SALT AND SHADING AND LIGHT-RESPONSIVE PLATE CONTAINING THE METAL SALT

Toshimi Satake; Tomoaki Nagai; Hiroshi Fukui; Miyuki Yokoyama, and Akio Sekine, all of Kita, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 589,372
Claims priority, application Japan, Sep. 27, 1989, 1-250863
Int. Cl.[5] C07F *1/08, 15/02, 15/04, 15/06*
U.S. Cl. 556—44 2 Claims

1. A novel phthalic acid derivative metal salt represented by the formula (I):



(I)

wherein R_1 is selected from the group consisting of a hydrogen atom and a lower alkyl group; —X— is selected from the group consisting of —O— and —NH—; R_2 is a $-(CH_2)_n-$ group which may be substituted by a substituent selected from the group consisting of a lower alkyl group, a halogen atom, at least one methylene group in the formula $-(CH_2)_n-$ may be substituted by at least one substituent selected from the group consisting of a phenylene group having the formula

—CH=CH— and combinations thereof; R_3 is a member selected from the group consisting of a phenylene group having the formula

and a cyclohexylene group having the formula

Me is selected from the group consisting of Cu, Nd, Co, Fe, Ni, V, VO, W and Ce; m is 2 or 3; and n is an integer of from 1 to 5.

5,202,451

ANCHIMERIC RADIOMETAL CHELATING COMPOUNDS

Alan R. Fritzberg, Edmonds, and Ananthachari Srinivasan, Kirkland, both of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Filed Feb. 17, 1988, Ser. No. 157,284
The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.
Int. Cl.[5] C07F *7/04;* C07C *321/00*
U.S. Cl. 556—419 22 Claims

1. A chelating compound comprising a first site at which a complex of a radionuclide metal forms, a second site at which a chelate of the radionuclide metal forms, and a conjugation group capable of reacting with a protein to bind the chelating compound to the protein, wherein said first site comprises two or more atoms selected from oxygen, nitrogen and phosphorous, said second site comprises a heteroatom chain containing at least one sulfur atom and at least two nitrogen atoms, and said complex formed at said first site has a faster rate of formation and a lower thermodynamic stability than said chelate formed at said second site, such that when the radionuclide metal is combined with said compound, the complex at the first site forms initially, and the radionuclide metal subsequently is transferred to the second site to form the chelate.

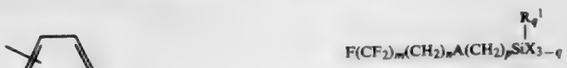
5,202,452

TERMINAL PERFLUOROALKYLSILANE COMPOUND AND A PROCESS FOR PREPARING THE SAME

Kazufumi Ogawa, Hirakata; Norihisa Mino, Settsu; Toshinobu Ishihara, Joetsu; Mikio Endo, Joetsu; Toru Kubota, Joetsu, and Yasuhisa Tanaka, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Shin-Etsu Chemical Co., Ltd., Tokyo, both of Japan

Filed Sep. 3, 1991, Ser. No. 753,522
Claims priority, application Japan, Sep. 7, 1990, 2-237531
Int. Cl.[5] C07F *7/12*
U.S. Cl. 556—435 2 Claims

1. A silane compound represented by the following general Formula (I):



(I)

wherein
R^1 is an alkyl group with 1 to 4 carbon atoms;
A is oxygen atom (—O—), carboxyl group

unsubstituted or substituted by a member chosen from the

a peptide, an alkane group, an alkene group, an polye-

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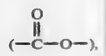
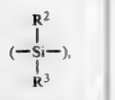


or an alkylsilylene group



wherein each
R^2 and R^3 is an alkyl group with 1 to 4 carbon atoms;
X is a halogen atom or an alkoxyl group;
m is an integer from 1 to 8;
n is an integer from 0 to 2;
p is an integer from 5 to 25; and
q is an integer from 0 to 2.

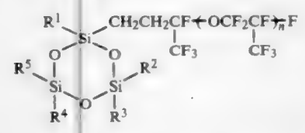
5,202,453

FLUORINATED CYCLIC ORGANIC SILICON COMPOUNDS AND METHOD FOR MAKING

Hirofumi Kishita; Kouji Takano, both of Annaka; Koichi Yamaguchi, Takasaki, and Toshio Takago, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 569,961, Aug. 20, 1990, abandoned. This application Oct. 1, 1991, Ser. No. 769,487
Claims priority, application Japan, Aug. 21, 1989, 1-214664
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—448 **10 Claims**

1. A fluorinated cyclic organic silicon compound of the general formula:



(I)

wherein R^1, R^2, R^3, R^4, and R^5 are independently selected from alkyl groups having 1 to 6 carbon atoms and n is an integer of from 1 to 6.

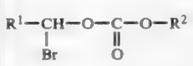
5,202,454

PROCESS FOR THE MANUFACTURE OF 1-BROMOALKYL HYDROCARBYL CARBONATES

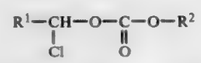
Gary Wooden, Mennecy; Gérard Sennyey, Saint-Aubin, and Jean-Pierre Senet, Herbeauvilliers-Buthiers, all of France, assignors to Societe Nationale Des Poudres Et Explosifs, Paris, France

Continuation of Ser. No. 427,916, Oct. 24, 1989, abandoned, which is a continuation of Ser. No. 298,269, Jan. 17, 1989, abandoned, which is a continuation of Ser. No. 71,917, Jul. 10, 1987, abandoned. This application Nov. 21, 1991, Ser. No. 794,842
Claims priority, application France, Jul. 11, 1986, 86 10185
Int. Cl.[5] C07C *69/96*
U.S. Cl. 558—260 **21 Claims**

1. Process for the preparation of 1-bromoalkyl carbonates of the formula:



in which R^1 represents a straight-chain or branched, C_1–C_{20} aliphatic or C_5–C_{15} alicyclic radical and R^2 represents a C_1–C_{12} aliphatic, C_5–C_{20} alicyclic or C_6–C_{14} aromatic radical, unsubstituted or substituted by a member chosen from the group consisting of aryl, aryloxy, alkoxy, chlorine, fluorine, and bromine, by reacting an alpha-chlorinated carbonate of the formula:



in which R^1 and R^2 have the above meanings, with anhydrous hydrobromic acid in the presence of a catalyst wherein the catalyst is chosen from the group consisting of tertiary aromatic heterocyclic amines, quaternary ammonium or phosphonium halides, hexasubstituted guanidinium halides, alkali metal halides in combination with 18-crown-6 crown ether and alkaline earth metal halides, in a quantity of between 0.5 and 10 mole percent relative to the alpha-chlorinated carbonate and at a temperature of between 40° and 150° C.

5,202,455

PROCESS FOR THE LIQUID-PHASE PREPARATION OF NITRILES FROM ALIPHATIC DICARBOXYLIC ACIDS

Karl Schmitz, Gladbeck, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 755,766
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040253
Int. Cl.[5] C07C *253/22, 253/20*
U.S. Cl. 558—313 **10 Claims**

1. A process for the melt liquid phase preparation of a C_{14-18} aliphatic or a C_{5-6} cycloaliphatic nitride, comprising:
heating a first liquid mixture of a straight-chain or branched C_{4-18} aliphatic or a C_{5-6} cycloaliphatic dicarboxylic acid and ammonia at a temperature of from 200° C. to 350° C. in the presence of a catalyst selected from the group consisting of phosphoric acid, metaphosphoric acid, polyphosphoric acid, salts of these acids, esters of these acids and mixtures thereof, said catalyst being adsorbed by an adsorbent selected from the group consisting of kieselguhr, diatomaceous earth, calite, Tonsil bleaching earth and frankonite, to produce a second liquid mixture containing said nitrile.

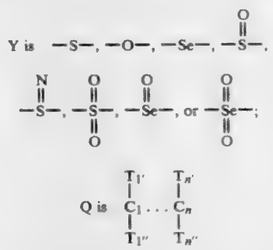
5,202,456

COMPOUNDS FOR INHIBITION OF PROTEIN METHYLATION

Robert R. Rando, Newton Center, Mass., assignor to The President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 15, 1991, Ser. No. 685,597
Int. Cl.[5] C07C *255/00, 321/00, 53/00, 249/00*
U.S. Cl. 558—438 **22 Claims**

1. A compound of the formula
W-Y-Q-Z or W-Y-Z wherein W is a farnesyl group, a geranyl group, a geranylgeranyl group, a substituted farnesyl group or a substituted geranylgeranyl group;



wherein n=1, 2, 3, 4, 5, or 6; each of $T_{1'} \ldots T_{n'}$ and $T_{1''} \ldots T_{n''}$ is independently: H, Fl, Br, —$NHCOCH_3$, —NH_2,

a peptide, an alkane group, an alkene group, an polyethyleneglycol group, a saturated fatty acid, an unsaturated fatty acid, a monosaccharide, or a disaccharide; and
Z is —COOH or salts or esters thereof, —$CONH_2$, —NO_2, —PO_3 or salts or esters thereof, —C≡N, or —SO_3 or salts or esters thereof, provided that when W is farnesyl, Y is —S—, n=2, and either $T_{2'}$ or $T_{2''}$ is —$NHCOCH_3$, then Z is not —COOH.
said compound being characterized by interfering with enzymatic methylation of a peptide having the carboxyl-terminal motif —CAAX wherein C=cysteine, A=aliphatic amino acid, and X=any amino acid.

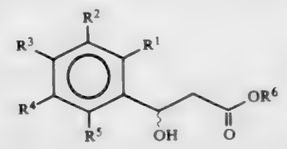
5,202,457

OPTICALLY ACTIVE ALKYL 3-ARYL-3-HYDROXYPROPIONATES AND A METHOD FOR PRODUCING THEREOF

Kazutoshi Miyazawa, and Naoyuki Yoshida, both of Ichihara, Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 682,111, Apr. 8, 1991, abandoned. This application Jul. 28, 1992, Ser. No. 920,526
Claims priority, application Japan, Dec. 4, 1990, 2-95004; Dec. 4, 1990, 2-95005
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—60 **2 Claims**

1. A method for producing an optically active alkyl 3-aryl-3-hydroxypropionate which comprises reacting, in the presence of esterase produced by a micro-organism or esterase obtained from an animal, a triglyceride with an alkyl 3-aryl-3-hydroxypropionate represented by the general formula:



(I)

wherein R^1, R^2, R^3, R^4 and R^5 are hydrogen, hydroxyl, alkoxy of 1–4 carbon atoms, benzyloxy, fluorine, chlorine, or bromine and R^6 is alkyl, to effect a transesterification reaction, and resolving to an optically active alkyl 3-aryl-3-hydroxypropionate represented by the general formula:

(II)

wherein R^1, R^2, R^3, R^4, R^5 and R^6 have the same meanings as described above, and an optically active alkyl 3-aryl-3-acyloxy propionate.

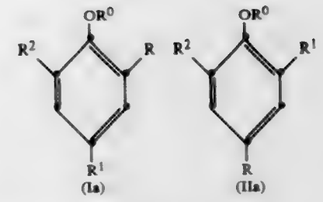
5,202,458

STABILIZERS FOR COLOR PHOTOGRAPHIC RECORDING MATERIALS

David G. Leppard, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

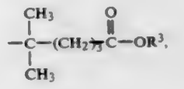
Division of Ser. No. 590,038, Sep. 28, 1990, Pat. No. 5,059,515, which is a continuation of Ser. No. 250,850, Sep. 28, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 740,587
Claims priority, application Switzerland, Sep. 28, 1987, 3751/87
Int. Cl.[5] C07C *69/88*
U.S. Cl. 560—67 **3 Claims**

1. A compound of the formula Ia or IIa



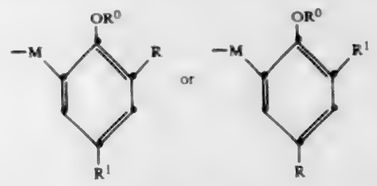
(Ia) (IIa)

in which R is a group of the formula III

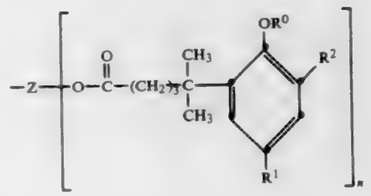


(III)

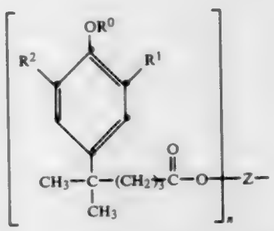
R^1 is hydrogen, C_1–C_8alkyl, cyclohexyl, phenyl-C_1–C_4alkyl of a group of the formula III, and R^2 is as defined for R^1, subject to the condition that R^1 and R^2 cannot simultaneously be hydrogen in the formula IIa, or R^2 is a group of the formula



in which M is a direct bond, —CH_2— or —S—, R^3 is C_1–$_{20}$alkyl which is unsubstituted or substituted by —OH, and/or which can be interrupted by one or more O atoms, C_2–C_{18}alkenyl, or is group of the formula V or VI



(V)



(VI)

in which n is a number from 1 to 3 and Z is a C_2–C_{18} alkyl radical which has 2 to 4 valences and can be interrupted by one or more O and/or atoms, R^0 is —CO—R^5, —CO—$COOR^3$, or a group of the formula VII,

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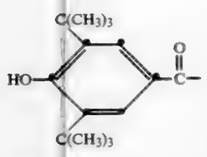


(VII)

and R^7, R^8 and R^9 independently of one another are C_1–C_4alkyl, phenyl or benzyl.

5,202,459

PROCESS FOR PRODUCING CYCLOBUTANE DERIVATIVE

Chikara Kaneko, and Nobuya Katagiri, both of Sendai, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

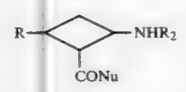
Filed Oct. 16, 1990, Ser. No. 598,233

Claims priority, application Japan, Nov. 7, 1989, 1-287810; Jan. 29, 1990, 2-016044

Int. Cl.[5] **C07D** *473/00;* **C07C** *215/42*

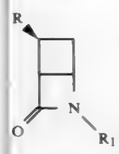
U.S. Cl. 560—123 **12 Claims**

1. A process for producing a cyclobutane derivative represented by the general formula (28):



(28)

(wherein R represents a substituent selected from the group consisting of an alkyl group, a hydroxy group which may be protected, and a hydroxymethyl group which may be protected; R_2 represents an electron attracting group selected from the group consisting of —CONHR′ and —COR″, wherein R′ is selected from the group consisting of hydrogen, an acyl group, an alkyl group, and an aryl group and R″ is selected from the group consisting of an alkyl group, an alkoxy group and a phenyl group and Nu represents a substituent corresponding to a nucleophilic reagent $Nu^{\ominus}$ selected from the group consisting of an alkoxy group, a cyano group, an amino group, a substituted amino group, a hydroxy group and an acetoxy group) which comprises reacting a compound represented by general formula (27):



(27)

(wherein R has the same significance as defined above and R_1 represents an electron attracting group selected from the group consisting of —CONHR′ and —COR″, wherein R′ is selected from the group consisting of hydrogen, an acyl group, an alkyl group, and an aryl group and R″ is selected from the group consisting of an alkyl group, an alkoxy group and a phenyl group) with said nucleophilic reagent $Nu^{\ominus}$ in a solvent.

5,202,460

TERPENE DERIVATIVES, THEIR PREPARATION AND THEIR USE

Claude Mercier, Lyons, France, assignor to Rhone Poulenc Sante, Antony, France

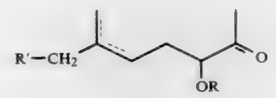
Division of Ser. No. 543,115, Jun. 21, 1990, abandoned. This application Dec. 12, 1991, Ser. No. 805,894

Claims priority, application France, Jun. 22, 1989, 89 08319

Int. Cl.[5] **C07C** *49/24, 45/65, 67/00*

U.S. Cl. 560—126 **6 Claims**

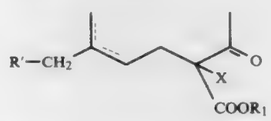
1. A process for preparing terpene derivatives of formula I:



I

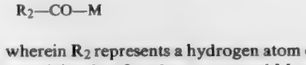
wherein R represents an alkanoyl radical containing 1 to 4 carbon atoms and R′ represents a hydrogen atom or an aliphatic hydrocarbon radical containing 1 to 20 carbon atoms comprising:

a. acylating a compound of formula II:



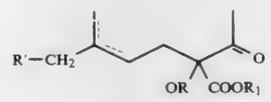
II

wherein R′ is defined above, X represents a halogen atom and R_1 represents an alkyl radical containing 1 to 4 carbon atoms, by means of an alkali metal salt of an acid of formula IV:



IV

wherein R_2 represents a hydrogen atom or an alkyl radical containing 1 to 3 carbon atoms and M represents an alkali metal atom, to obtain a compound of formula III:



III

wherein R′ and R_1 are defined as above and R represents an alkanoyl radical containing 1 to 4 carbon atoms, and

b. decarboxylating the compound of formula III to obtain a compound of formula I.

5,202,461

3-SUBSTITUTED 2-HYDROXY-3-FORMYLPROPIONIC ESTERS, THE PREPARATION THEREOF AND THE USE THEREOF FOR PREPARING 3-SUBSTITUTED 3-FORMYLACRYLIC ESTERS

Franz Merger, Frankenthal, and Juergen Frank, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

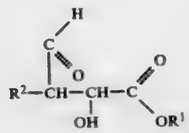
Filed Oct. 5, 1990, Ser. No. 593,891

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933334

Int. Cl.[5] **C07C** *69/675*

U.S. Cl. 560—177 **2 Claims**

1. A 3-substituted2-hydroxy-3-formylpropionic ester of the formula I



(I)

where

R^1 is alkyl of 1 to 4 carbon atoms, and

R^2 is straight-chain or branched alkyl of 1 to 10 carbon atoms.

5,202,462

PROCESS FOR PRODUCING A HALOMETHYL PIVALATE

Naoto Yazawa, Shizuoka, and Keinosuke Ishikame, Tokyo, both of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 686,921, Apr. 18, 1991, abandoned. This application Jul. 28, 1992, Ser. No. 920,529

Claims priority, application Japan, Apr. 20, 1990, 2-104544

Int. Cl.[5] **C07C** *69/62*

U.S. Cl. 560—236 **14 Claims**

1. A process for producing a halomethyl pivalate which comprises reacting an aqueous solution of a metal salt of pivalic acid with a dihalomethane selected from the group consisting of bromochloromethane, chloroiodomethane and bromoiodomethane in the presence of a phase transfer catalyst.

5,202,463

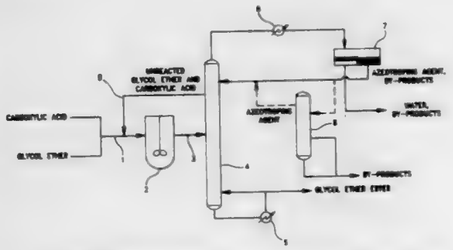
PROCESS FOR THE PREPARATION OF A GLYCOL ETHER ESTER

Jude T. Ruszkay, Coatesville, Pa., assignor to ARCO Chemical Technology, L.P., Wilmington, Del.

Filed Sep. 10, 1991, Ser. No. 757,399

Int. Cl.[5] **C07C** *67/48;* **B01D** *3/34*

U.S. Cl. 560—248 **20 Claims**



1. An improved process for preparing and purifying a glycol ether ester, said process comprising:

(a) reacting a glycol ether with a carboxylic acid to form a product mixture containing a glycol ether ester, water, unreacted glycol ether, unreached carboxylic acid, and various by-products;

(b) separating the product mixture by a first distillation into three components: a low-boiling component that includes water; a medium-boiling component that includes unreacted glycol ether and unreacted carboxylic acid; and a high-boiling component that includes the glycol ether ester;

(c) introducing at a controlled rate during said first distillation step an azeotroping agent in an amount effective to (i) concentrate the by-products, water, and the azeotroping agent in the low-boiling component, and (ii) concentrate the unreacted carboxylic acid and unreacted glycol ether in the medium-boiling component; and

(d) isolating the purified glycol ether ester; wherein the glycol ether can form a cyclic 5- or 6-membered ether in the presence of an acid catalyst.

5,202,464

OPTICALLY ACTIVE AMINOCYCLITOLS

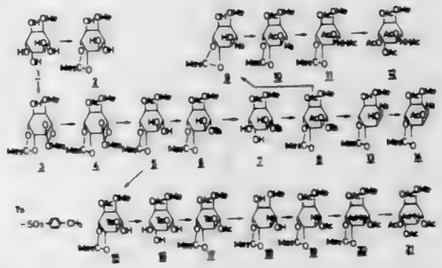
Seiichiro Ogawa; Akihiro Isaka, both of Tokyo; Kunio Kageyama, Yokohama, and Morihisa Machida, Kanagawa, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1991, Ser. No. 684,334

Claims priority, application Japan, Apr. 16, 1990, 2-99802; Apr. 16, 1990, 2-99803; Apr. 16, 1990, 2-99804; Apr. 16, 1990, 2-99805; Apr. 16, 1990, 2-99806; Jun. 7, 1990, 2-149452

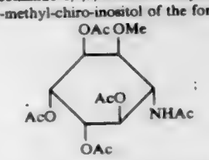
Int. Cl.[5] **C07C** *67/02*

U.S. Cl. 560—250 **16 Claims**



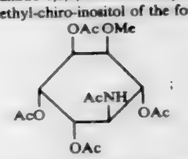
1. An inositol compound having stereospecific structure and optical activity selected from the group consisting of

1L-3-acetamido-1,4,5,6-tetra-O-acetyl-3-deoxy-2-O-methyl-chiro-inositol of the formula



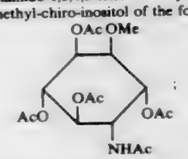
(I)

1L-3-acetamido-1,2,4,6-tetra-O-acetyl-3-deoxy-5-O-methyl-chiro-inositol of the formula



(II)

1D-2-acetamido-1,3,4,5-tetra-O-acetyl-2-deoxy-6-O-methyl-chiro-inositol of the formula



(III)

1L-2-acetamido-1,3,4,6-tetra-O-acetyl-2-deoxy-5-O-methyl-chiro-inositol of the formula

carbon atoms), and X is the same as defined above, with a

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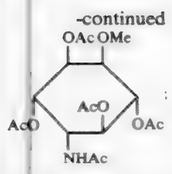
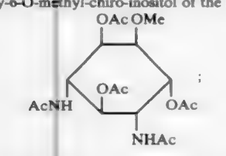
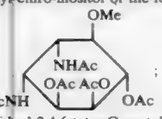


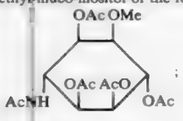
1D-2,4-diacetamido-1,3,5-tri-O-acetyl-2,4-dideoxy-6-O-methyl-chiro-inositol of the formula (V)



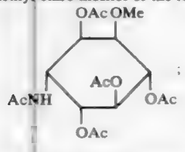
1D-1,2-diacetamido-4,5,6-tri-O-acetyl-1,2-dideoxy-3-O-methyl-chiro-inositol of the formula (VI)



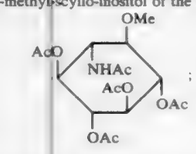
1L-3-acetamido-1,2,4,6-tetra-O-acetyl-3-deoxy-5-O-methyl-muco-inositol of the formula (VII)



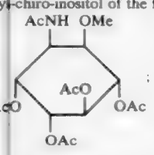
1L-1-acetamido-2,3,4,6-tetra-O-acetyl-3-deoxy-5-O-methyl-chiro-inositol of the formula (VIII)



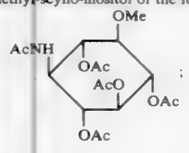
1D-1-acetamido-3,4,5,6-tetra-O-acetyl-1-deoxy-2-O-methyl-scyllo-inositol of the formula



1L-1-acetamido-3,4,5,6-tetra-O-acetyl-1-deoxy-2-O-methyl-chiro-inositol of the formula

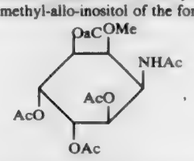


1L-1-acetamido-2,4,5,6-tetra-O-acetyl-1-deoxy-3-O-methyl-scyllo-inositol of the formula

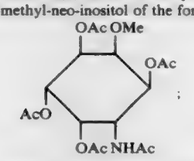


-continued

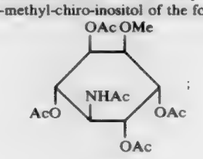
1D-2-acetamido-1,4,5,6-tetra-O-acetyl-2-deoxy-3-O-methyl-allo-inositol of the formula (XII)



1D-1-acetamido-2,3,4,6-tetra-O-acetyl-1-deoxy-5-O-methyl-neo-inositol of the formula (XIII)

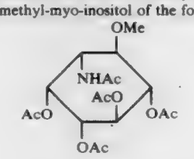


1D-3-acetamido-1,2,4,5-tetra-O-acetyl-3-deoxy-6-O-methyl-chiro-inositol of the formula (XIV)



and

1L-1-acetamido-2,3,4,5-tetra-O-acetyl-1-deoxy-6-O-methyl-myo-inositol of the formula (XV)



5,202,465

(IX) **PREPARATION OF 2-METHYLENEPROPANE-1,3-DIOL DICARBOXYLATES**

Franz Merger, Frankenthal; Tom Witzel, Ludwigshafen, and Martin Brudermueller, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

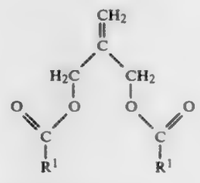
Filed Jun. 26, 1992, Ser. No. 904,925

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1991, 4121048

Int. Cl.[5] C07C *67/02*

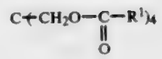
(X) **U.S. Cl. 560—261** **5 Claims**

1. A process for preparing 2-methylenepropane-1,3-diol dicarboxylates of the formula I



(XI) I

where R^1 is hydrogen or alkyl of 1 to 4 carbons, which comprises reacting pentaerythritol tetracarboxylates of the formula II



II

where R^1 has the abovementioned meaning, on solid catalysts at from 150° to 450° C. and under from 1 mbar to atmospheric pressure.

5,202,466

2-AMINO-7-HYDROXYTETRALINE ETHERS

Robert Boigegrain, Castelnau le Lez, France; Roberto Cecchi, Lodi-Milano, and Sergio Boveri, Tortona, both of Italy, assignors to Sanofi, Paris, France

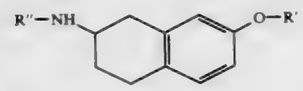
Division of Ser. No. 825,841, Jan. 28, 1992, Pat. No. 5,159,103, which is a continuation of Ser. No. 365,853, Jun. 13, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 922,486

Claims priority, application France, Jun. 14, 1988, 88 07948

Int. Cl.[5] C07C *229/00*

U.S. Cl. 560—45 **6 Claims**

1. A N-protected 2-amino-7-hydroxytetraline of formula (IV):



(IV)

in which

R′ represents a methyl group substituted by a carboxy or lower carbalkoxy group, and

R″ represents a N-protecting group liable of being eliminated by catalytic hydrogenation or by mild acid hydrolysis,

or a salt thereof.

5,202,467

PROCESS FOR PREPARING HALOKETO ACID DERIVATIVES

Takaharu Ikeda, Ibaraki; Seiichi Kai, Nara, and Masayoshi Minai, Moriyama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

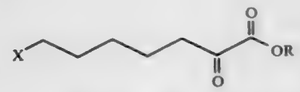
Filed Feb. 7, 1991, Ser. No. 651,971

Claims priority, application Japan, Feb. 8, 1990, 2-30013; Feb. 8, 1990, 2-30014

Int. Cl.[5] C07C *69/675, 59/76*

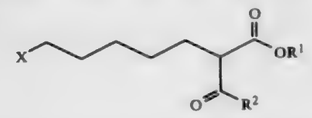
U.S. Cl. 560—174 **26 Claims**

1. A process for preparing a haloketo acid derivative of the formula:



[I]

wherein R is hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and X is chlorine atom or bromine atom, which comprises reacting a β-oxo-acid ester of the formula [II]:



[II]

wherein R^1 is an alkyl group having 1 to 6 carbon atoms, R^2 is an alkyl group having 1 to 5 carbon atoms or a group of the formula: OR^3 (wherein R^3 is an alkyl group having 1 to 6 carbon atoms), and X is the same as defined above, with a nitrosating agent of the formula [IV]:

$$ONOR^4 \qquad [IV]$$

wherein R^4 is an alkyl group having 1 to 12 carbon atoms, or a group of the formula: SO_3H to give 7-halo-2-hydroxyiminoheptanoic acid ester of the formula [III]:

[III]

wherein R^1 and X are the same as defined above, followed by reacting the compound [III] with an aldehyde compound or a ketone compound in the presence of an acid.

5,202,468

PROCESS FOR PRODUCING METHYL ACETATE FROM METHYL FORMATE

Jean A. Cordier, St. Saulve; Francis P. Petit; Yves Castanet, both of Villeneuve d'Asq; Serge Melloul, Paris, and André Mortreux, Hem, all of France, assignors to Sollac, Puteaux, France

Continuation of Ser. No. 776,687, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 460,325, Feb. 22, 1990, abandoned. This application Jun. 9, 1992, Ser. No. 896,721

Claims priority, application France, Apr. 25, 1988, 8805462

Int. Cl.[5] C07C *67/00, 67/02, 69/00*

U.S. Cl. 560—265 **11 Claims**

1. A process for the preparation of methyl acetate starting from methyl formate, comprising the step of converting methyl formate to methyl acetate with good selectivity at a temperature of 170° to 220° C. in the presence of

a) a catalytically effective amount of a catalyst based on rhodium,

b) an iodine-containing promoter selected from alkaline iodides, alkaline earth iodides, phosphonium iodides, ammonium iodides, and the covalent compounds of iodine supplemented with a phosphine or a tertiary amine in a ratio of 1 to 2 with said promoter, this promoter being present in a molar concentration of 0.05 to 1 mole/liter, and

c) a solvent selected from cyclic N-alkyl amides.

5,202,469

PARTIALLY FLUORINATED DICARBOXYLIC ACID AND THE ACID CHLORIDE THEREOF, AND A PROCESS FOR THEIR PREPARATION

Freimund Röhrscheid; Wolfgang Appel, both of Kelkheim, and Günter Siegemund, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

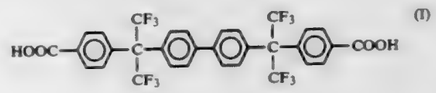
Filed Jun. 20, 1991, Ser. No. 718,009

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1990, 4020185

Int. Cl.[5] C07C *51/265, 51/60, 63/331*

U.S. Cl. 562—416 **25 Claims**

1. A compound of the formula



(I)

and the acid chloride thereof.

5,202,470

pressure in the range of 100 psig to 2,000 psig and a tem-

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5,202,470

HYDRAZINIUM SULPHOSALICYLATE

Erich Ruf, Auf'm Gartenstück 10, 4300 Essen-Haarzopf, Fed. Rep. of Germany

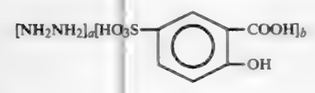
Filed Nov. 19, 1990, Ser. No. 615,223

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 3938472

Int. Cl.[5] **C07C** *317/46*

U.S. Cl. 562—429 **3 Claims**

1. A composition of the formula



where

a is 1 and

b has a value of from 1 to 2.

5,202,471

ALKYL, ALKOXY AND THIOALKOXY SUBSTITUTED DIPHENYL ACETYLENES HAVING RETINOID LIKE ACTIVITY

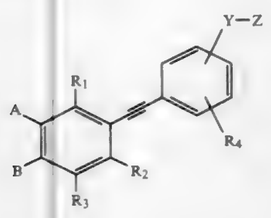
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Feb. 6, 1990, Ser. No. 475,690

Int. Cl.[5] **C07C** *65/00*

U.S. Cl. 562—473 **46 Claims**

1. Compounds of the formula



wherein

R_1–R_4 independently are hydrogen, lower alkyl, cycloalkyl or lower alkenyl, A and B independently are hydrogen, tertiary butyl, 4-methylpentyl, 1,1,4-trimethylpentyl, cycloalkyl, lower alkenyl, or OR* where R* is lower brach chained alkyl, cycloalkyl or lower alkenyl with the proviso that one of A and B is not hydrogen;

Y is lower alkenyl, lower alkynyl lower cycloalkyl, lower branched chain alkyl, or $(CH_2)_n$ where n is 0–6; and

Z is —C))H or a pharmaceutically acceptable salt, or ester thereof.

5,202,472

ASYMMETRIC HYDROGENATION OF AROMATIC-SUBSTITUTED OLEFINS USING ORGANONICKEL CATALYST

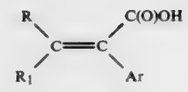
Thanikavelu Manimaran; W. Dirk Klobucar, and Charles H. Kolich, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 17, 1991, Ser. No. 716,012

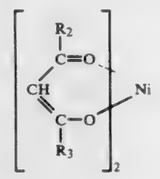
Int. Cl.[5] **C07C** *63/04;* **C07F** *00/00, 15/02*

U.S. Cl. 562—493 **12 Claims**

1. A process for preparing optically active α-aryl aliphatic carboxylic acids which comprises catalytically, asymmetrically hydrogenating a carboxylic acid of the formula



or the amine salt thereof, where R and R_1 are the same or different and are hydrogen, alkyl, cycloalkyl, or haloalkyl; and Ar is aryl or substituted aryl; by utilizing a catalytically effective amount of a nickel-containing material of the formula



or the hydrate thereof, where R_2 and R_3 are the same or different and are alkyl, haloalkyl, aryl, substituted aryl, phenylalkyl or substituted phenylalkyl and a chiral phosphene compound.

5,202,473

RUTHENIUM-BINAP ASYMMETRIC HYDROGENATION CATALYST

Albert S. C. Chan, St. Louis, and Scott A. Laneman, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 665,069, Mar. 6, 1991, which is a continuation-in-part of Ser. No. 620,672, Dec. 3, 1990, which is a continuation-in-part of Ser. No. 487,465, Mar. 2, 1990, which is a continuation-in-part of Ser. No. 369,875, Jun. 22, 1989, Pat. No. 4,994,607. This application Jul. 23, 1992, Ser. No. 917,874

Int. Cl.[5] **C07C** *53/134*

U.S. Cl. 562—496 **6 Claims**

1. A method for preparing optically active α-arylpropionic acids comprising asymmetrically hydrogenating an α-arylpropenoic acid in the presence of a ruthenium-phosphine complex represented by the formula:

$$[RuXY(BINAP)]_n$$

wherein n is an integer from 1 to about 10; and X and Y independently represent nonchelating anionic ligands.

5,202,474

ASYMMETRIC CATALYTIC HYDROGENATION OF α-ARYLPROPENOIC ACIDS

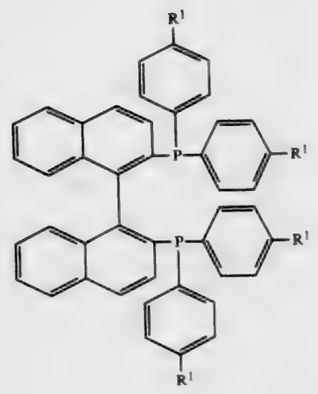
Albert S. C. Chan, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 369,875, Jun. 22, 1989, Pat. No. 4,994,607. This application Mar. 2, 1990, Ser. No. 487,465

Int. Cl.[5] **C07C** *53/134*

U.S. Cl. 562—496 **7 Claims**

1. Process for preparing α-arylpropionic acid comprising catalytically asymmetrically hydrogenating an α-arylpropenoic acid utilizing a ruthenium asymmetric hydrogenation catalyst selected from the group consisting of optically active bisphosphine binaphthyl compounds of the formula $Ru(BINAP)(OCOR)_2$, $Ru_xH_yCl_z$, $(BINAP)_2(S)_p$ and $[Ru(BINAP)XY]_n$, wherein BINAP represents a tertiary phosphine of the formula:



R represents substituted and unsubstituted alkyl radicals having from 1 to about 6 carbon atoms, substituted and unsubstituted halogenated alkyl radials having from 1 to about 6 carbon atoms, and substituted and unsubstituted aryl, aralkyl and alkaryl radicals, R′ represents hydrogen, substituted and unsubsituted alkyl radicals having 1 to about 6 carbon atoms, and substituted and unsubsituted aryl, aralkyl and alkaryl radicals, S is a tertiary amine, X and Y independently represent a nonchelating anionic ligand or a noncoordinating anion, y is 0 or 1, and when y=0, X=1, z=4 and p=0 or 1, and when y=1, x=1, z=1 and p=0, in the presence of a base and at a temperature of less than about 30° C.

5,202,475

PROCESS FOR PREPARATION OF CYCLOHEXANEDICARBOXYLIC ACID

Steven L. Cook, Kingsport; Gether Irick, Jr., Gray, and Crispen S. Moorehouse, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 760,680, Sep. 16, 1991, Pat. No. 5,118,841, which is a continuation-in-part of Ser. No. 588,787, Sep. 27, 1990, abandoned. This application Feb. 4, 1992, Ser. No. 831,124

The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.

Int. Cl.[5] **C07C** *61/09*

U.S. Cl. 562—509 **2 Claims**

1. A process for preparation of 1,3- or 1,4-cyclohexanedicarboxylic acid comprising

(A) preparing a solution which has a pH in the range of 7 to 13, a temperature in the range of 20° to 100° and is comprised of 0.5 to 30.0 weight percent of the disodium salt of terephthalic acid or isophthalic acid and 99.5 to 70.0 weight percent water,

(B) continuously preparing the disodium salt of 1,3- or 1,4-cyclohexanedicarboxylic acid by continuously contacting the solution with hydrogen and the combination of ruthenium metal and a carbon support in a packed column at a pressure in the range of 100 psig to 2,000 psig and a temperature in the range of 20° to 200° C.,

(C) preparing 1,3- or 1,4-cyclohexanedicarboxylic acid by contacting the disodium salt of 1,3- or 1,4-cyclohexanedicarboxylic acid with a sulfuric acid or hydrochloric acid at a pressure in the range of atmospheric to 40 psig. and

(D) recovering the 1,3- or 1,4-cyclohexanedicarboxylic acid by crystallization of the 1,3- or 1,4-cyclohexanedicarboxylic acid at a temperature in the range of about 110° to 20° C. and a pressure in the range of 15 to 0.1 psig.

5,202,476

PURIFICATION OF 2-KETO-L-GULONIC ACID

Masahiko Tsuda, Kobe, and Kimio Iwai, Takatsuki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 343,257, Apr. 26, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 692,788

Claims priority, application Japan, Apr. 29, 1988, 63-106731

Int. Cl.[5] **C07C** *51/00, 59/147*

U.S. Cl. 562—513 **9 Claims**

1. A method for purifying 2-keto-L-gulonic acid or its water-soluble salt, which consists essentially of the steps of

contacting an aqueous solution containing 2-keto-L-gulonic acid or its water-soluble salt and an acid impurity whose acidity is higher than that of 2-keto-L-gulonic acid with an anion-exchange resin to obtain a processed solution, wherein at least a portion of the acid impurity in the aqueous solution is adsorbed by the anion-exchange resin, and

precipitating the 2-keto-L-gulonic acid or the water-soluble salt thereof from the processed solution,

wherein the acid impurity in the processed solution is in an amount of 30% or less in terms of equivalent ratio relative to 2-keto-L-gulonic acid.

5,202,477

Patent Not Issued For This Number

5,202,478

PROCESS FOR THE PREPARATION OF ALPHA, OMEGA-ALKANEDIOIC ACIDS

Karl Schermanz, Graz; Manfred Schöftner, Linz; Engelbert Kloimstein, Eferding; Josef Schaller, Linz; Eduard Perndorfer, Traun; Klaus Reiter, and Rudolf Neuhofer, both of Linz, all of Austria, assignors to Chemie Linz Gesellschaft M.B.H., Linz, Austria

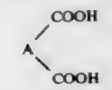
Filed Dec. 12, 1990, Ser. No. 626,292

Claims priority, application Austria, Dec. 14, 1989, 2839/89

Int. Cl.[5] **C07C** *51/16, 51/235*

U.S. Cl. 562—531 **9 Claims**

1. Process for the preparation of alpha, omega-alkane-dicarboxylic acids of the formula I



in which A is an alkylene radical having 4–14 C atoms, com-

the 6-position of an alpha carbon chain, and containing at

-continued

VOL 1149 ISS 2 AP 13 1993 UMI

in which A is an alkylene radical having 4–14 C atoms, comprising reacting a cycloalkene of the formula II

II

in which A has the abovementioned meaning with ozone in the presence of an inert solvent, hydrogenating the peroxide solution formed catalytically, followed by oxidation of the dialdehyde formed to the diacid of the formula I in the presence of an inert aprotic solvent.

5,202,479

PROCESS FOR PREPARING GLYCINE

Kenji Fujiwara; Nobutaka Ueda; Yuji Matsuu; Hiroshi Kato, and Atsuhiko Hiai, all of Osaka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Feb. 1, 1991, Ser. No. 649,021

Claims priority, application Japan, Feb. 6, 1990, 2-25266; Feb. 6, 1990, 2-25267; Oct. 15, 1990, 2-273282

Int. Cl.[5] **C07C** *101/06, 229/08, 227/12*

U.S. Cl. 562—575 **13 Claims**

1. A process for preparing glycine by reacting glycolonitrile, carbon dioxide, ammonia and water in a reaction zone which comprises the steps of:

reacting glycolonitrile, carbon dioxide, ammonia and water at a high temperature in the range of 100° to 200° C. for 30 minutes to 20 hours to obtain a reaction solution containing glycine; and

concentrating the thus obtained reaction solution including glycine to remove water under the conditions of a temperature in the range of 50° to 200° C. and for a time in the range of 10 seconds to 20 hours represented by the formula

$$\ln(\tau) < (16800/T) - 37.8$$

wherein τ is the concentration time in minutes and T is the concentration temperature in °K. whereby substantially no diketopiperazine is formed, thereby separating substantially pure glycine and recycling at least a part of the mother liquor to the reaction zone.

5,202,480

FLUORINATION OF ACETALS, KETALS AND ORTHOESTERS

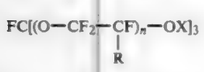
Thomas R. Bierschenk; Timothy Juhlke, both of Round Rock; Hajimu Kawa, and Richard J. Lagow, both of Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation of Ser. No. 413,785, Sep. 28, 1989, Pat. No. 5,053,536, which is a continuation-in-part of Ser. No. 250,384, Sep. 28, 1988, abandoned. This application Aug. 30, 1991, Ser. No. 752,703

Int. Cl.[5] **C07C** *59/245, 43/32*

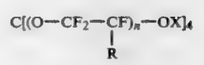
U.S. Cl. 562—582 **4 Claims**

1. A perhalogenated polyether having an average formula:



wherein X i selected from the group consisting of $-(CF_2)_rCOOH$, $-(CF_2)_rOCF_3$, $-(CF_2)_rCOF$ and $-C_rF_{2r+1-q}Cl_q$ where r is an integer from 1 to 12 and q is an integer from 0 to 25; wherein n is an integer from 1 to 50; and wherein R is selected from the group consisting of —F, $-CF_2Cl$, $-CFCl_2$, CCl_3 and perfluoroalkyl on one to ten carbons.

2. A perhalogenated polyether having an average formula:



wherein X and Z are the same or different and are selected from the group consisting of $-(CF_2)_rCOF$, $-((CF_2)_rOCF_3$, $-(CF_2O_rCOOH$ and $-C_rF_{2r+1-q}Cl_q$, wherein r is an integer from 1 to 12 and q is an integer from 0 to 25, wherein R_1 and R_2 are the same or different and are selected from the group consisting of —F, —Cl, $-CF_2Cl$, $-CFCl_2$, $-CCl_3$, perfluoroalkyl of one to ten carbon atoms and perfluoroalkoxyalkyl of one to ten carbon atoms, wherein one or more of the fluorine atoms may be substituted by a halogen atom or other than fluorine, provided that R_1 and R_2 together are not F, wherein n is an integer from 2 to 1000.

5,202,481

PURIFICATION OF ACETIC ACID PRODUCED BY THE LOW WATER CARBONYLATION OF METHANOL BY TREATMENT WITH OZONE

Mark O. Scates, Pearland; Russell K. Gibbs, Jr., Houston, and G. Paull Torrence, Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 657,963, Feb. 20, 1991, abandoned, Continuation of Ser. No. 447,450, Dec. 7, 1989, abandoned, Continuation-in-part of Ser. No. 137,844, Dec. 23, 1987, abandoned. This application Mar. 5, 1992, Ser. No. 845,368

Int. Cl.[5] **C07C** *51/10, 51/14*

U.S. Cl. 562—608 **3 Claims**

1. A method for improving the permanganate time of acetic acid produced by the low water carbonylation of methanol in a reaction medium comprising methanol, carbon monoxide, from 0.5 to 30 wt. % methyl acetate, from 5 to 20 wt. % methyl iodide, from 2 to 20 wt. % soluble alkali metal iodide, and a halogen-promoted rhodium catalyst in the presence of less than 14 wt. % water which comprises contacting said acid with ozone for a period of time sufficient to provide an acetic acid product having an improved permanganate time.

5,202,482

MALIGNANCY-ASSOCIATED CATABOLITE

Bing D. Jiang, Indianapolis, Ind., assignor to Oncologic Labs, Inc., Tenafly, N.J.

Filed Oct. 13, 1989, Ser. No. 420,931

Int. Cl.[5] **C07C** *211/00*

U.S. Cl. 564—1 **1 Claim**

1. An endogenous malignancy-associated catabolite characterized by:

(i) a molecular weight of about 135 daltons as determined by mass spectrum analysis;

(ii) a UV absorption maximum at 237 nm;

(iii) a 15 centimeter C18-type HPLC column retention time at a 1 ml/minute flow rate of from about 1.00 to about 2.00 minutes as compared to a retention time of about 2.5 to about 3.0 minutes for an internal standard marker;

(iv) containing no aromatic ring structures, containing one methyl group at the 1-position and one methyl group at the 6-position of an alpha carbon chain, and containing at least one nitrogen moiety as determined by nuclear magnetic resonance; and

(v) being present in elevated amounts in the urine substantially exclusively of individuals suffering from malignant or premalignant conditions, other than those younger than about 12 years of age, having nephritis or rheumatoid arthritis or who are taking Chinese herbal medicines.

5,202,483

ETHYLENICALLY UNSATURATED COMPOUNDS

Gerd Rehmer, Beindersheim, and Kaspar Bott, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

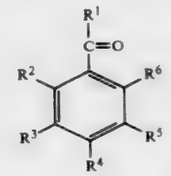
Filed Mar. 1, 1991, Ser. No. 663,302

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007318

Int. Cl.[5] **C07C** *233/09*

U.S. Cl. 564—207 **4 Claims**

1. An unsaturated compound of the formula I

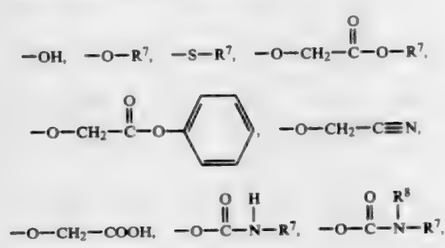


(I)

where

R^1 is alkyl of 1 to 4 carbon atoms, cyclopropyl, cyclopentyl, cyclohexyl, phenyl or phenyl in which some or all of the hydrogen atoms have been replaced by radicals R^4, not more than two substituents R^4 being identical, or R^1 together with R^2 or together with R^6 forms a $-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-$ bridge,

R^4 is alkyl of 1 to 24 carbon atoms,



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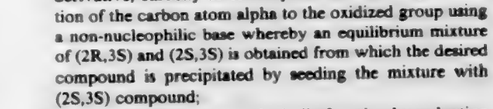
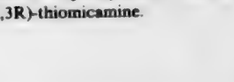


R^2 or R^6, independently of one another, both are hydrogen, or is the said bridge with R_1 as above defined, or where R^1 is aryl, R^2 or R^6 is a direct bond to R^1 in the ortho-position with respect to the carbonyl group, and R^3 or R^5 are each hydrogen, one of the radicals R^4 or a group of the formula II



(II)

where

R^7 and R^8 are each alkyl of 1 to 4 carbon atoms,

R^9 is cycloalkyl of 5 or 6 carbon atoms,

R^{10} is hydrogen or alkyl of 1 to 4 carbon atoms and

R^{11} is hydrogen or alkyl of 1 to 4 carbon atoms, with the proviso that either R^3 or R^5 is a group of the formula II which is photoinitiatable by exposure to UV light.

5,202,484

PROCESS FOR THE STEREOCHEMICAL INVERSION OF (2S,3S)-2-AMINO-3-PHENYL-1,3-PROPANEDIOLS INTO THEIR (2R,3R) ENANTIOMERS

Marco Villa, Milan; Claudio Giordano, Monza; Silvia Cavicchioli, Bellinzago Lombardo, and Silvio Levi, Milan, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Oct. 19, 1990, Ser. No. 599,881

Claims priority, application Italy, Oct. 22, 1989, 22075 A/89

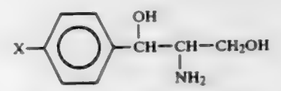
Int. Cl.[5] **C07C** *209/00*; **C07B** *57/00*

U.S. Cl. 564—302 **18 Claims**

1. A process for the inversion of both the stereogenic centres of (2S,3S)-thiomicamine comprising the following steps:

A) protection of the amino group and of the hydroxy in position 3 of (2S,3S)-3-(4-methylthiophenyl)-2-amino-1,3-propanediol, (2S,3S)-thiomicamine, of formula II

[II (2S,3S)]



B) oxidation of the CH_2OH group to formyl or formyl derivative, carboxy or carboxy-derivative and epimerization of the carbon atom alpha to the oxidized group using a non-nucleophilic base whereby an equilibrium mixture of (2R,3S) and (2S,3S) is obtained from which the desired compound is precipitated by seeding the mixture with (2S,3S) compound;

C) restoring of the primary alcoholic function by reduction of the oxidized group;

D) removal of the protective groups introduced in step A and epimerization of the benzylic centre in position 3 under acidic conditions until an equilibrium ratio of (2R,3S) and (2R, 3R) is substantially attained; cooling the solution to precipitate a salt of the optically active (2R,3R)-thiomicamine.

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5,202,485

PROCESS FOR PREPARING N-ALKYLAMINOPHENOLS

Hiroshi Maki; Michihiro Kawasaki; Horishi Shimizu, and Yoshiaki Ito, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 610,900, Nov. 9, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 692,437
Claims priority, application Japan, Nov. 10, 1989, 1-293392; Nov. 10, 1989, 1-293393
Int. Cl.[5] C07C *209/26*
U.S. Cl. 564—398 **7 Claims**

1. A process for preparing an N-alkylaminophenol comprising subjecting an aminophenol to reductive alkylation with an aldehyde or a ketone in the presence of methanol or ethanol as an organic solvent and hydrogen, wherein the reductive alkylation is carried out at a temperature of from 20° to 70° C. in the further presence of a catalyst for reduction comprising platinum and at least one metal element selected from metal elements belonging to the IB group, IIB group, IVB group, VB group, and VIB group of the Periodic Table, supported on activated carbon, or comprising palladium and at least one metal element selected from metal elements belonging to the IB group, IIB group, IVB group, VB group, and VIB group of the Periodic Table, supported on activated carbon.

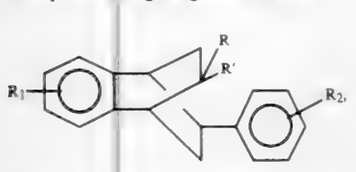
5,202,486

TETRAHYDROETHANONAPHTHALENEAMINE DERIVATIVES

Joel C. Barrish, Holland, and Steven H. Spergel, Bensalem, both of Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

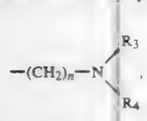
Filed Jul. 31, 1990, Ser. No. 560,518
Int. Cl.[5] C07C *211/45, 211/58*
U.S. Cl. 564—427 **8 Claims**

1. A compound having the general formula

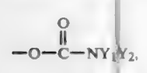


I

including pharmaceutically acceptable slats thereof, wherein one of R and R′ is hydrogen and the other is



R_1 is hydrogen, halogen, alkyl, haloalkyl, hydroxy, alkoxy, aryl, arylalkoxy, arylalkyl, fluorosubstituted alkyl;
R_2 is hydrogen, halogen, alkyl, alkoxy, arloxy, arylalkoxy, arylalkyl, hydroxy,



fluoro substituted alkoxy, fluoro substituted alkyl, (cycloalkyl)alkoxy, $—NO_2$, $—NY_3Y_4$,
n is 0, 1, 2 or 3;
q and r are independently 0, 1, 2, or 3, with the proviso that one of q and r must be other than zero;
R_3 and R_4 are each independently hydrogen, alkyl, cycloalkyl or arylalkyl;
Y_1 and Y_2 are each independently hydrogen, alkyl or aryl;
Y_3 and Y_4 are each independetly hydrogen, or alkyl.

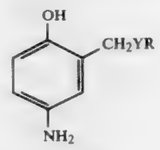
5,202,487

2-SUBSTITUTED PARA-AMINOPHENOLS AND THEIR USE FOR DYEING KERATINOUS FIBRES

Alex Junino, Livry-Gargan; Gerard Lang, Saint-Gratien, and Alain Genet, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 645,404, Jan. 24, 1991, abandoned, which is a division of Ser. No. 633,190, Dec. 28, 1990, Pat. No. 5,053,052, which is a continuation of Ser. No. 406,269, Sep. 12, 1989, abandoned. This application Aug. 24, 1992, Ser. No. 933,583
Claims priority, application France, Sep. 13, 1988, 8811926
Int. Cl.[5] C07C *323/29*
U.S. Cl. 564—443 **6 Claims**

1. A 2-substituted para-aminophenol of formula (I):



(I)

in which Y denotes an oxygen atom, and R denotes a C_1–C_6 alkyl, a C_1–C_6 hydroxylalkyl or a C_2–C_6 polyhydroxylalkyl radical or a salt thereof; with the condition that R is not methyl or ethyl.

5,202,488

METHOD FOR THE MANUFACTURE OF 3-AMINOPHENOL

Stephen E. Jacobson, Princeton Junction, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1991, Ser. No. 685,365
Int. Cl.[5] C07C *215/76*
U.S. Cl. 564—443 **8 Claims**

1. A method for manufacture of 3-aminophenol comprising the dehydrogenation of 3-amino-2-cyclohexene-1-one in the presence of a transition metal catalyst in a solvent and introducing a catalytic amount of base into the reaction mass; then heating said reaction mass at a temperature in the range of about 130° C. to about 350° C.

5,202,489

AMINES CATALYSIS

Arthur R. Doumaux, Jr., Charleston; David J. Schreck, Cross Lanes, both of W. Va.; George A. Skoler, White Plains, N.Y., and Stephen W. King, Scott Depot, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 136,615, Dec. 22, 1987, abandoned. This application Aug. 8, 1989, Ser. No. 390,829
Int. Cl.[5] C07C *209/60*
U.S. Cl. 564—479 **40 Claims**

1. A process of making polyalkylene polyamines which comprises condensing an amino compound comprising at least one of ammonia and one or more organic compounds containing nitrogen to which is bonded an active hydrogen, with a high surface area Group IVB metal oxide condensation catalyst selected from the group consisting of hafnium oxide having a surface area greater than about 70 m^2/gm, zirconium oxide having a surface area greater than about 70 m^2/gm, titanium oxide having a surface area greater than about 140 m^2/gm and mixtures thereof.

5,202,490

PROCESS FOR THR MANUFACTURE OF DIETHYLENETRIAMINE AND AMINOETHYLETHANOLAMINE

Lloyd M. Burgess, South Charleston, W. Va.; Charles A. Gibson, Centerville, Va., and David J. Schreck, Cross Lanes, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 102,927, Sep. 30, 1987, abandoned. This application May 25, 1990, Ser. No. 528,555
The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.
Int. Cl.[5] C07C *209/16*
U.S. Cl. 564—480 **4 Claims**

1. A process of manufacturing an alkyleneamines reaction product mixture without a net increase in piperazine in the reaction product mixture comprising, based on 100% of the moles of the mixture and exclusive of any MEA and water present,
a. about 15 to about 35 mole % DETA,
b. about 15 to about 55 mole % EDA (net generated),
c. about 10 to about 35 mole % AEEA,
d. about 3 to about 25 mole % of the combination of PIP, EAP and HEP,
e. about 3 to about 10 mole % of one or more of TETAs and TEPAs,
f. less than about 1 mole % of other polyalkylene polyamines, and
g. a DETA and AEEA mole ratio greater than about 0.77 to less than about 1.35,
which comprises feeding hydrogen, ammonia, MEA and a recycle stream comprising water, PIP and EDA to a reaction zone containing a fixed bed of a reductive amination catalyst in a tubular reactor, wherein the hydrogen comprises about 10 to about 50 mole percent of the feed in the reaction zone, the mole ratio of EDA to MEA is less than about 0.25 and the mole ratio of ammonia to MEA is about 1 to about 10, the temperature of the reaction zone is about 120° C. to about 300° C., the pressure of the reaction zone is about 1800 to about 2500 psig, the conversion of MEA is about 20 to about 60 weight percent, and recovering said alkyleneamines reaction product mixture from the reaction zone.

5,202,491

PROCESS FOR THE MANUFACTURE OF DIETHYLENETRIAMINE

Lloyd M. Burgess, South Charleston, W. Va.; Charles A. Gibson, Centerville, Va., and David J. Schreck, Cross Lanes, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 102,929, Sep. 30, 1987, abandoned. This application May 25, 1990, Ser. No. 528,554
The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.
Int. Cl.[5] C07C *209/02*
U.S. Cl. 564—480 **3 Claims**

1. A process of manufacturing an alkyleneamines reaction product mixture without a net increase in piperazine in the reaction product mixture comprising, based on 100% of the moles of the mixture and exclusive of any MEA and water present,
a. about 20 to about 40 mole % DETA,
b. about 15 to about 60 mole % EDA (net generated),
c. about 5 to about 18 mole % AEEA,
d. about 3 to about 25 mole % of the combination of PIP, AEP and HEP,
e. less than about 1 mole to about 5 mole % of one or more of TETAs and TEPAs,
f. less than about 1 mole % of other polyalkylene polyamines,
g. a DETA and AEEA mole ratio greater than about 1.35, and
h. an EDA to DETA mole ratio less than 2.60,
which comprises feeding hydrogen, ammonia, MEA and a recycle stream comprising water, PIP and EDA to a reaction zone containing a fixed bed of a reductive amination catalyst in a tubular reactor, wherein the hydrogen comprises about 1 to about 30 mole percent of the feed in the reaction zone, the mole ratio of EDA to MEA is greater than 0.25 and the mole ratio of ammonia to MEA is about 1 to about 15, the temperature of the reaction zone is about 120° C. to about 300° C., the pressure of the reaction zone is about 1800 to about 2500 psig, the conversion of MEA is about 20 to about 60 weight percent, and recovering said alkyleneamines reaction product mixture from the reaction zone.

5,202,492

AMINES CATALYSIS USING METALLIC PHOSPHATE CONDENSATION CATALYSTS HAVING A CYCLIC STRUCTURE

Arthur R. Doumaux, Jr., Charleston, and David J. Schreck, Cross Lanes, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Aug. 8, 1989, Ser. No. 390,706
Int. Cl.[5] C07C *209/00*
U.S. Cl. 564—480 **83 Claims**

1. A process of making polyalkylene polyamines which comprises condensing an amino compound, said amino compound comprising ammonia, one or more compounds containing nitrogen to which is bonded an active hydrogen or mixtures thereof, in the presence of a metallic phosphate condensation catalyst having a cyclic structure, said condensation catalyst being selected from the group consisting of one or more metallic metaphosphates, metallic ultraphosphates, metallic metaphosphimates, metallic imidophosphates and mixtures thereof.

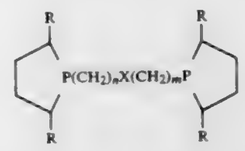
5,202,493

CHIRAL TRIDENTATE BIS(PHOSPHOLANE) LIGANDS

Mark J. Burk, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 26, 1991, Ser. No. 691,954
Int. Cl.[5] C07F *9/02, 9/00*
U.S. Cl. 568—12 **26 Claims**

1. A compound represented by the following formula comprising:



wherein:
X is O, S, NR″, PR″, AsR″, SbR″, divalent aryl, divalent fused aryl, divalent 6-membered ring heterocyclic group, divalent 5-membered ring heterocyclic group, or divalent fused heterocyclic group, wherein R″ is hydrogen, C_1–C_8 alkyl, C_1–C_8 fluoroalkyl or C_1–C_8 perfluoroalkyl, aryl, substituted aryl, aralkyl, ring-substituted aralkyl, or $CR'_2(CR'_2)_qZ(CR'_2)_pR'$ wherein
Z is O, S, NR′, PR′, AsR′, or SbR′;
q and p are each integers, the same or different, ranging from 1 to about 8; and
R′ is H, F, aryl, C_1–C_8 alkyl, C_1–C_8 fluoroalkyl, or C_1–C_8 perfluoroalkyl;
n and m are each integers, the same or different, ranging from 1 to about 8; and
R is a radical comprising C_1–C_8 alkyl, C_1–C_8 fluoroalkyl or C_1–C_8 perfluoroalkyl, aryl, substituted aryl, aralkyl, ring-substituted aralkyl, or—$CR'_2(CR'_2)_qX(CR'_2)_pR'$ wherein

q and p are each integers, the same or different, ranging

5,202,499

LIQUID TELECHELIC POLYMERS HAVING HIGH

5,202,500

PROCESS FOR THE PREPARATION OF

acetone in the vapor phase in the presence of a catalyst made

VOL 1149 ISS 2 AP 13 1993 UMI

q and p are each integers, the same or different, ranging from 1 to about 8;

R′ is H, F, aryl, C_1–C_8 alkyl, C_1–C_8 fluoroalkyl or C_1–C_8 perfluoroalkyl; and

X is O, S, NR″, PR″, AsR″, SbR″, divalent aryl, divalent fused aryl, divalent 6-membered ring heterocyclic group, divalent 5-membered ring heterocyclic group, or divalent fused heterocyclic group, wherein R″ is hydrogen, C_1–C_8 alkyl, C_1–C_8 fluoroalkyl, C_1–C_8 perfluoroalkyl, aryl, substituted aryl, aralkyl, ring-substituted aralkyl, or $CR'_2(CR'_2)_qZ(CR'_2)_pR'$ wherein

Z is O, S, NR′, PR′, AsR′, or SbR′;

q and p are each integers, the same or different, ranging from 1 to about 8; and

R′ is H, F, aryl, C_1–C_8 alkyl, C_1–C_8 fluoroalkyl, or C_1–C_8 perfluoroalkyl.

5,202,494

CONTINUOUS PROCESS FOR THE PRODUCTION OF DISULFIDES

John S. Roberts; Harold R. Hunt, both of Bartlesville, and Charles A. Drake, Nowata, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1990, Ser. No. 531,289

Int. Cl.[5] **C07C** *319/24*

U.S. Cl. 568—26 **21 Claims**

1. A continuous process for making disulfides comprising continuously reacting a mercaptan-based feedstream and an oxygen-bearing feedstream in the presence of a catalyst selected from the group consisting of (a) alkaline earth metal oxides on a refractory metal oxide support, (b) alkaline earth metal oxides and alkali metal oxides in combination on a refractory metal oxide support, and (c) a polymer consisting essentially of a basic form of macroreticular polystyrene-divinyl benzene copolymer thereby producing a continuous disulfide product stream and a depleted oxygen-bearing stream.

5,202,495

CHEMICAL PROCESS

Sidney E. Callander, Beecham Pharmaceuticals, Clarendon Road, Worthing, West Sussex BN14 8QH, England

Continuation-in-part of Ser. No. 374,592, Jun. 29, 1989, abandoned, which is a continuation of Ser. No. 172,714, Mar. 24, 1988, abandoned. This application Oct. 10, 1990, Ser. No. 595,786

Claims priority, application United Kingdom, Mar. 26, 1987, 8707200

Int. Cl.[5] **C07C** *45/62*

U.S. Cl. 568—315 **7 Claims**

1. A process for the preparation of 3-(6′-methoxy-2′-naphthylmethyl)-2,4-pentanedione which comprises condensing 6-methyoxy-2-naphthaldehyde with acetylacetone in an inert solvent at a temperature of from about 15° C. to about 100° C. to form 3-(6′-methoxy-2′-naphthylmethylene)-2,4-pentanedione and subjecting this compound to catalytic hydrogenation in an inert solvent to form 3-(6′-methoxy-2′-naphthylmethyl)-2,4-pentanedione.

5,202,496

METHOD OF MAKING ISOPHORNE

Alain A. Schutz, Penn Township, Westmoreland County, and Leonard A. Cullo, Hempfield Township Westmoreland County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 766,938, Sep. 27, 1991, Pat. No. 5,153,156, which is a continuation-in-part of Ser. No. 576,909, Sep. 4, 1990, Pat. No. 5,055,620, which is a division of Ser. No. 339,745, Apr. 18, 1989, Pat. No. 4,970,191. This application Feb. 28, 1992, Ser. No. 842,950

Int. Cl.[5] **C07C** *45/45*

U.S. Cl. 568—388 **3 Claims**

1. Method of making isophorone comprising condensing acetone in the vapor phase in the presence of a catalyst made from a synthetic clay having the general formula

$$(Mg_{1-x}Al_x)(OH)_2 \cdot x\ A$$

where x is a number from 0.1 to 0.5, A is a univalent organic anion of the formula $RCOO^-$, R is C_nH_{2n+1} and n is 0–4, by a method comprising (a) spray-drying a slurry of said synthetic clay containing about 10% to about 60% (based on the final calcined catalyst) diatomaceous earth, to produce particles having sizes between about 10 to about 100 microns in diameter and a residual water content of about 5 to about 50%, (b) making a plasticized mixture of said particles by adding water thereto, (c) forming said plasticized mixture into desired physical shapes and sizes, and (d) drying and calcining said physical shapes, said catalyst having a bimodal porosity, including micropores of about 10 to about 200 Angstroms and macropores of about 1000 to 10,000 Angstroms.

5,202,497

PROCESS FOR PREPARING UNSATURATED ALDEHYDES

Pierre Chabardes, Sainte Foy Les Lyon, and Serge Henrot, Saint Genis Laval, both of France, assignors to Rhone-Poulenc Nutrition Animale, Commentry, France

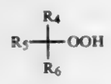
Filed Apr. 1, 1992, Ser. No. 863,455

Claims priority, application France, Apr. 2, 1991, 91 03946

Int. Cl.[5] **C07C** *45/00, 45/27, 209/00*

U.S. Cl. 568—436 **22 Claims**

1. A process for preparing an unsaturated aldehyde and its enamine, comprising oxidizing the corresponding allylic tertiary amine in the presence of an alkyl hydroperoxide and a vanadium-based catalyst wherein the allylic tertiary amine is of the formula $(R_1)(R_2)N(R_3)$ wherein R_1, R_2 and R_3, which may be the same or different, are chosen from C_1 to C_{30} alkyl or C_2 to C_{30} alkenyl groups, and may be linear, branched, substituted, unsubstituted, homocyclic, heterocyclic or containing a ring; and wherein said alkyl hydroperoxide corresponds to the formula:



in which R_4, R_5 and R_6, which may be the same or different, are selected from:

hydrogen atoms;

linear or branched alkyl groups containing 1 to 3 carbon atoms;

cycloalkyl groups containing from 3 to 12 carbon atoms; and

alkyl- or cycloalkylaromatic groups containing from 7 to 30 carbon atoms.

5,202,498

INHIBITING COLOR CHANGE IN CUMENE HYDROPEROXIDE

Carole L. Elias, Allegheny County, Pa., assignor to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1992, Ser. No. 874,957

Int. Cl.[5] **C07C** *409/10*

U.S. Cl. 568—559 **4 Claims**

1. Method of treating freshly manufactured cumene hydroperoxide to inhibit color formation comprising adding thereto about 15 ppm to about 120 ppm of sodium hydroxide and maintaining the cumene hydroperoxide so treated at a temperature of from about 50° C. to about 70° C. for a period of about 0.5 to about two hours.

5,202,499

LIQUID TELECHELIC POLYMERS HAVING HIGH 1,4-DIENE STRUCTURE

I. Glen Hargis, Tallmadge; Hubert J. Fabris, Akron; John A. Wilson, Akron, and Russell A. Livigni, Akron, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

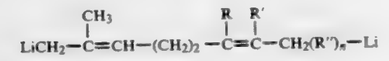
Continuation-in-part of Ser. No. 541,104, Jun. 19, 1990, Pat. No. 5,063,190, which is a continuation of Ser. No. 426,929, Oct. 26, 1989, abandoned, which is a division of Ser. No. 200,286, May 31, 1988, abandoned. This application Jan. 8, 1991, Ser. No. 638,706

Int. Cl.[5] **C07C** *43/00;* **C07F** *1/02*

U.S. Cl. 568—587 **7 Claims**

1. A composition comprising a telechelic polymer having functional endcapping groups which polymer has been crosslinked through said endcapping groups, said polymer made from one or more diene monomers having from 4–12 carbon atoms, and optionally a vinyl substituted aromatic comonomer having from 8–12 carbon atoms,

said polymer formed in the presence of a trimetallic initiator comprising a blend of an organopolylithium component, and a preformed complex component, said organopolylithium component having the formula



where

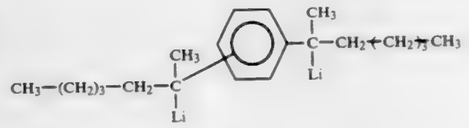
R=H or CH_3,

R′=CH_3 or H with the proviso that R′ is not the same as R,

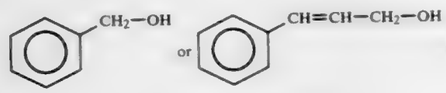
R″=1,4 and 3,4 isoprene adducts,

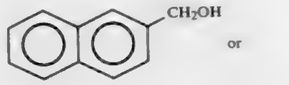
n=approximately 4.0,

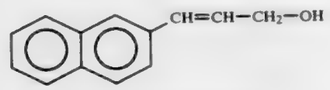
or the formula



said preformed complex component made from a trialiphatic substituted aluminum compound and a barium salt of at least one aromatic alcohol having the formula







wherein the mole ratio of said aluminum metal to said barium metal being from about 3.5 to about 4.5, and the mole ratio of said barium metal to said lithium metal being from about 0.10 to about 0.50.

5,202,500

PROCESS FOR THE PREPARATION OF ARYLACETALDEHYDE-DIALKYLACETALS

Christoph Theis, and Wilfried Latz, both of Niederkassel, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

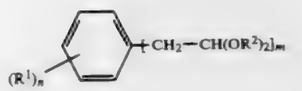
Continuation of Ser. No. 528,135, May 23, 1990, abandoned. This application Nov. 21, 1991, Ser. No. 799,664

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919890

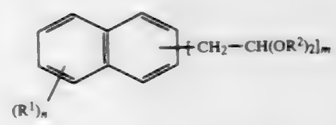
Int. Cl.[5] **C07C** *41/50*

U.S. Cl. 568—592 **5 Claims**

1. In a process for the preparation of an aryl acetaldehyde-dialkylacetal of the formula



or



wherein

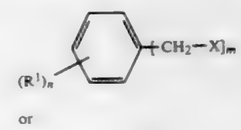
R^1 is hydrogen, straight or branched alkyl of 1 to 6 carbon atoms, fluorine, chlorine, bromine, iodine, straight or branched alkoxy of 1 to 6 carbon atoms, trifluoromethyl, trichloromethyl, pentafluoroethyl or pentachloroethyl,

R^2 is straight or branched alkyl of 1 to 6 carbon atoms,

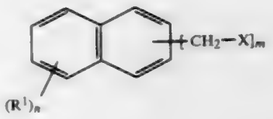
m is an integer from 1 to 3, inclusive, and

n is an integer from 1 to 5, inclusive,

by reacting a halomethyl-aromatic compound of the formula



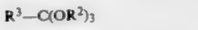
or



wherein

R^1, n and m have the meanings previously defined, and

X is chlorine, bromine or iodine, in the presence of a carbonyl compound of a metal of the 8th subgroup of the periodic system as a catalyst, with at least equivalent amounts of carbon monoxide and hydrogen at elevated pressure and elevated temperature and in the presence of at least one equivalent of a basic compound as a hydrogen halide acceptor, the improvement which comprises performing the reaction in the presence of an orthoester of the formula



wherein

R^2 has the meanings previously defined, and

R^3 is hydrogen or straight or branched alkyl of 1 to 6 carbon atoms, and recovering the reaction product.

5,202,501

5,202,503

5,202,506

5,202,501
PERFLUOROPOLYETHERS
Richard J. Lagow, Georgetown; Thomas R. Bierschenk, and Timothy J. Juhlke, both of Roundrock, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.
Continuation of Ser. No. 328,862, Mar. 27, 1989, abandoned, which is a division of Ser. No. 92,228, Sep. 2, 1987, Pat. No. 4,827,042, which is a continuation-in-part of Ser. No. 796,622, Nov. 8, 1985, abandoned. This application Aug. 27, 1991, Ser. No. 754,184
Int. Cl.[5] C07C *41/50*
U.S. Cl. 568—603 9 Claims

1. A method of preparing a perfluoropolyether having a chain structure consisting essentially of $—OCF_2—$ and —OY— repeating units and having perfluoroalkyl end groups, wherein Y is $—CF_2CF_2—$, $—CF_2CF_2CF_2—$, $—CF(CF_3)CF_2—$, $—CF_2CF_2CF_2CF_2—$, $—CF(C_2F_5)CF_2—$, $—CF_2CF_2OCF_2CF_2—$, or $—CF_2CF(CF_2Cl)—$, the repeating units being randomly distributed along the chain, the ratio of the number of $—OCF_2—$ units to —OY— units is greater than 1 but less than about 100, the perfluoropolyether has a molecular weight from about 300 to about 50,000 atomic mass units, comprising the steps of:

a) copolymerizing an ether which contains methylene oxide units with an ether containing a C2 to C4 alkylene oxide unit or epichlorohydrin unit to thereby produce a hydrocarbon copolyether consisting essentially of methylene oxide units and at least two alkylene oxide units selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, diethylene oxide unit and epichlorohydrin for about every 100 methylene oxide units, wherein the alkylene oxide units are randomly distributed along the polymeric chain and provide termination sites for carbon-oxygen bond cleavage that occurs during perfluorination; and

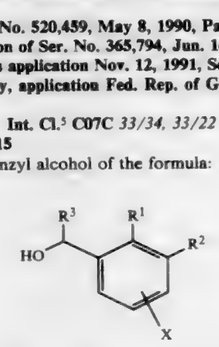
b) perfluorinating the hydrocarbon copolyether by:

i) exposing the copolyether to a mixture of an inert gas and fluorine gas, wherein the concentration of fluorine gas is from about 1 to about 25%; and

ii) gradually increasing the concentration of fluorine gas until the copolyether is exposed to pure fluorine gas thereby perfluorinating the copolyether to produce the perfluoropolyether.

5,202,503
BENZONITRILES, BENZALDEHYDES AND BENZYL ALCOHOLS
Bernd Wolf, Mutterstadt; Hans Theobald, Limburgerhof, and Norbert Goetz, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Division of Ser. No. 520,459, May 8, 1990, Pat. No. 5,101,061, which is a division of Ser. No. 365,794, Jun. 14, 1989, Pat. No. 4,950,796. This application Nov. 12, 1991, Ser. No. 791,016
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820896
Int. Cl.[5] C07C *33/34, 33/22*
U.S. Cl. 568—715 16 Claims

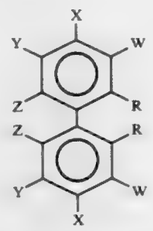
1. A novel benzyl alcohol of the formula:



wherein R^1 is methyl or ethyl, R^2 is C_{3-20} alkyl, C_{3-20} alkenyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkenyl, C_{5-12} bicycloalkyl, C_{5-12} bicycloalkenyl, C_{1-5} alkyl-substituted-C_{3-8} cycloalkyl, C_{1-5} alkyl-substituted-C_{3-8} cycloalkenyl, C_{1-5} alkyl-substituted-C_{5-12} bicycloalkyl or C_{1-5} alkyl-substituted-C_{5-12} bicyloalkenyl, X is hydrogen, chlorine or fluorine and R^3 is hydrogen, cyano, C_{2-4} alkynyl, C_{2-4} alkenyl or C_{1-4} alkyl, with the proviso that R^2 is not $—CH_2—CH=CH—B$, where B is hydrogen, alkyl, or alkenyl and at the same time R^1 is methyl.

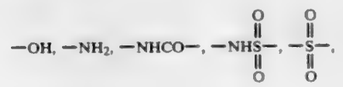
5,202,504
OPTICALLY ACTIVE BIPHENYL DERIVATIVE AND PROCESS FOR OPTICAL RESOLUTION
Fumio Toda, Ehime, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan
Filed Jan. 25, 1991, Ser. No. 646,096
Claims priority, application Japan, Oct. 29, 1990, 2-293412
Int. Cl.[5] C07C *39/12*
U.S. Cl. 568—730 10 Claims

1. An optically active biphenyl derivative represented by the general formula (I):



(I)

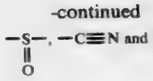
wherein W, X and Y are selected from among H, F, Cl, Br, I, CH_3, CF_3, OH, OCH_3, NH_2 and $N(CH_3)_2$ and Z is selected from among Cl, Br, I, CH_3 and OCH_3; R is a group having 1 to 20 carbon atoms and containing a polar functional group selected from among



5,202,502
PROCESS FOR PRODUCING OPTICALLY ACTIVE ALCOHOLS
Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.
Division of Ser. No. 729,610, Jul. 15, 1991, Pat. No. 5,159,116. This application Mar. 23, 1992, Ser. No. 855,247
Int. Cl.[5] C07C *29/136, 35/06, 35/08*
U.S. Cl. 568—700 10 Claims

1. A process for producing optically active alcohols comprising treating a prochiral ketone with a haloborane reducing agent represented by the formula Eap_2BX wherein Eap is (+)- or (−)-2-ethylapopinocampheyl essentially 100% ee, B is boron and X is halo.

-continued



5,202,505
PURIFICATION OF HYDROXYPHENYL ALKANES
Mark A. Murphy, Corpus Christi, Tex., and Mike R. Czarny, Charles City, Iowa, assignors to Hoechst Celanese Corporation, Del.
Filed Mar. 24, 1992, Ser. No. 858,383
Int. Cl.[5] C07C *37/68*
U.S. Cl. 568—756 19 Claims

1. A process for the purification of an hydroxyphenylalkane from an impure mixture containing an hydroxyphenylalkane, comprising:

a) dissolving said mixture in an alcohol to form an alcoholic hydroxyphenylalkane solution,

b) adding an alkaline aqueous solution consisting essentially of an alkali metal dithionite and an alkalinity agent in water to said hydroxyphenylalkane solution, and

c) isolating said hydroxyphenylalkane from said solution of step (b).

5,202,506
OXIDATIVE DROWN PROCESS FOR 2-PERFLUOROALKYLETHYL ALCOHOLS
Jack R. Kirchner; Leonard H. Beck, both of Wilmington, and James E. Dowd, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 2, 1992, Ser. No. 864,819
Int. Cl.[5] C07C *31/40, 31/38*
U.S. Cl. 568—842 4 Claims

1. A process for converting 2-perfluoroalkylethyl iodide to 2-perfluoroalkylethyl alcohol comprising contacting 2-perfluoroalkylethyl iodide with oleum of a strength sufficient to provide a mole ratio of SO_3 to 2-perfluoroalkylethyl iodide of from about 2 to 1 to about 10 to 1 at about 50° C. to 130° C. to produce 2-perfluoroalkylethylsulfate, contacting the 2-perfluoroalkylethylsulfate with enough water to bring the SO_3 content to below 30% calculated as sulfuric acid and an oxidant of sufficient strength to produce 2-perfluoroalkylethylalcohol while minimizing the production of 2-perfluoroalkylethyl iodide.

5,202,507
METHOD FOR DRYING ERYTHRITOL CRYSTALS
Yoshikazu Ohshima; Tetsuo Yamada, and Yoshimitsu Tanaka, all of Fukuoka, Japan, assignors to Mitsubishi Kasei Corporation and Nikken Chemicals Co., Ltd., both of Tokyo, Japan
Filed Jun. 25, 1992, Ser. No. 904,508
Claims priority, application Japan, Jul. 30, 1991, 3-190058
Int. Cl.[5] C07C *31/22*
U.S. Cl. 568—868 9 Claims

1. A method for drying erythritol crystals having a moisture content of from 1 to 10% by weight to reduce to the moisture content of 0.15% by weight or below, which comprises drying under fluidized state wherein a temperature of a gas to be used in the fluidized drying is controlled within a range of from 10 to 60° C. at least until the moisture content of said crystals is reduced to 0.5% by weight or below.

5,202,508
COMPOSITION
Paritosh R. Dave, Little Falls, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 4, 1992, Ser. No. 878,346
Int. Cl.[5] C07C *79/08*; C06B *25/00*
U.S. Cl. 568—941 1 Claim

1. 2,2,4,4,6,6-Hexanitroadamantane.

5,202,509
CATALYSTS FOR LIQUID PHASE FLUORINATION
Charles Laviron, Lyon, and Andre Lantz, Vernaison, both of France, assignors to Societe Atochem, Puteaux, France
Continuation of Ser. No. 576,875, Sep. 4, 1990, abandoned. This application May 20, 1992, Ser. No. 890,343
Claims priority, application France, Sep. 1, 1989, 89 11490
Int. Cl.[5] C07C *17/08*
U.S. Cl. 570—167 14 Claims

1. Process for liquid phase fluorination of a halogenated hydrocarbon using hydrofluoric acid comprising fluorinating a halogenated hydrocarbon by contacting the halogenated hydrocarbon with a reactant mixture consisting of hydrofluoric acid and a catalyst consisting of a mixture of an antimony trihalide and of a titanium tetrahalide wherein the antimony remains in the trivalent state.

5,202,510
ACTIVATION OF NOBLE METAL CATALYSTS FOR USE IN HYDRODEHALOGENATION OF HALOGEN-SUBSTITUTED HYDROCARBONS CONTAINING FLUORINE AND AT LEAST ONE OTHER HALOGEN
Carl S. Kellner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 526,720, May 22, 1990, Pat. No. 5,057,470. This application Jul. 11, 1991, Ser. No. 728,378
Int. Cl.[5] C07C *19/08*
U.S. Cl. 570—176 20 Claims

1. A process for the catalytic hydrodehalogenation of a compound having the formula $C_nH_mF_pX_q$, where each X is independently selected from Cl and Br, wherein n is an integer from 1 to 6, m is an integer from 0 to 12, p is an integer from 1 to 13, and q is an integer from 1 to 13, and wherein $m+p+q$ equals $2n+2$ when the compound is saturated and acyclic, $m+p+q$ equals 2n when the compound is saturated cyclic or the compound is olefinic and acyclic, and $m+p+q$ equals $2n-2$ when the compound is olefinic and cyclic, characterized by using a supported metal catalyst containing noble metal which has been contacted with an atmosphere comprising chlorine gas at a temperature from about 100° C. to 400° C. for a time sufficient to improve the catalytic activity thereof for said hydrodehalogenation; wherein the catalyst improved by said chlorine contact either is fresh or has been deactivated by use for said hydrodehalogenation.

5,202,511
CATALYST DILUENT FOR OXYCHLORINATION PROCESS
Leopoldo Salinas, III; Thomas E. Morris, both of Lake Jackson, Tex., and Arnold D. Harley, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Aug. 16, 1989, Ser. No. 394,406
Int. Cl.[5] C07L *17/156*
U.S. Cl. 570—245 2 Claims

1. In the method of producing 1,2-dichloroethane by an oxychlorination process wherein ethylene is reacted with HCl and oxygen over a copper chloride catalyst promoted with an alkali metal salt on a high surface area support and wherein a diluent is employed, the improvement which comprises employing a low surface area diluent wherein the diluent is a chi-alumina.

(c) contacting the remaining transalkylation product mixture including the initial step of removing an ethylene-contain-

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5,202,512

PROCESS FOR THE PREPARATION OF HALOGENOALKANES

Peter-Paul Winkler, Kastl, and Ulrich Goetze, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 594,846, Oct. 9, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,474

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 3938089

Int. Cl.[5] C07C *17/16*

U.S. Cl. 570—258 16 Claims

1. A process for the preparation of methyl chloride which comprises reacting methanol with hydrogen chloride in a concentration below the particular azeotropic concentration in the liquid phase in the presence of an amine hydrohalide selected from the group consisting of hydrochlorides of an aromatic amine.

5,202,513

PROCESS FOR PRODUCING AROMATIC HYDROCARBONS

Junichi Kanai, Sodegaura, Japan, assignor to Research Association for Utilization of Light Oil, Tokyo, Japan

Continuation of Ser. No. 643,152, Jan. 18, 1991, abandoned, which is a continuation of Ser. No. 512,559, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 206,226, Jun. 13, 1988, abandoned. This application Feb. 21, 1992, Ser. No. 840,647

Claims priority, application Japan, Jul. 15, 1987, 62-174845

Int. Cl.[5] C07C *2/82*

U.S. Cl. 585—407 10 Claims

1. A process for producing aromatic hydrocarbons which comprises contacting hydrocarbons having 2 to 12 carbon atoms with a catalyst comprising a crystalline galloalumino silicate having a ZSM-5 type crystal structure which was formed by a hydrothermal reaction, wherein said crystalline galloalumino silicate is prepared with a source of gallium, and then contacted with a 0.1 to 2 N aqueous alkali hydroxide solution, and then modified by calcination at 700° to 1,000° C., to produce aromatic hydrocarbons.

5,202,514

DECHLORINATED BENZYLTOLUENE/DIBENZYLTOLUENE OLIGOMER DIELECTRIC LIQUIDS

Raymond Commandeur, Vizille, and Daniel Missos, Grenoble, both of France, assignors to Atochem, Puteaux, France

Filed Dec. 28, 1990, Ser. No. 635,673

Claims priority, application France, Dec. 28, 1989, 89 17365

Int. Cl.[5] C07C *2/02*

U.S. Cl. 585—426 8 Claims

1. A process for the preparation of benzyltoluene oligomers essentially devoid of contaminating amounts of chlorine values, comprising (a) condensing benzyl chloride with toluene or with lower benzyltoluene oligomers in the presence of a catalytically effective amount of ferric chloride, and then (b) directly dechlorinating the crude product of condensation without first performing a washing operation to remove said ferric chloride.

5,202,515

PROCESS FOR PREPARING ALKYL-SUBSTITUTED AROMATIC HYDROCARBONS

Masami Fukao, Kurita; Takuo Hibi, Toyonaka; Kiyoshi Ikimi, Otokuni, and Gohfu Suzukamo, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 399,974, Aug. 29, 1989, Pat. No. 5,043,507. This application May 14, 1991, Ser. No. 699,586

Claims priority, application Japan, Aug. 31, 1988, 63-219502; Aug. 31, 1988, 63-219503; Sep. 2, 1988, 63-220845; Aug. 4, 1989, 1-203605

Int. Cl.[5] C07C *2/72*

U.S. Cl. 585—452 29 Claims

1. A process for preparing an alkyl-substituted hydrocarbon comprising alkylating an alkyl aromatic hydrocarbon having at least one hydrogen atom at an alpha-position in a side chain with an olefin in the presence of a solid base which is obtained by heating and reacting an alumina with at least one carbonate of an alkali metal and at least one material selected from the group consisting of potassium and alkali metal hydrides at a temperature of from 180° to 800° C. in an inert gas atmosphere, wherein said solid base is selected from the group consisting of:

(A) a solid base which is obtained by reacting alumina with an alkali metal carbonate and then with an alkali metal at

(A-1) a temperature not lower than 180° C. and lower than 400° C. when said alkali metal carbonate is potassium carbonate and said alkali metal is sodium or

(A-2) a temperature of 180° C. to 800° C. when said alkali metal carbonate is potassium carbonate and said alkali metal is other than sodium, or when the alkali metal carbonate is other than potassium carbonate; and

(B) a solid base which is obtained by reactmg alumina with an alkali metal carbonate and then with an alkali metal hydride at a temperature of 180° C. to 800° C.

5,202,516

PROCESS OF RECOVERING MONOALKYLBENZENE AND PURE 1,3,5-TRIALKYBENZENE FROM A MIXTURE OF DIALKYL-AND TRIALKYLBENZENES

Guo-shuh J. Lee; Michael M. Olken; Juan M. Garces, all of Midland, and Garmt R. Meima, Terneuzen, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 718,741, Jun. 21, 1991, which is a continuation-in-part of Ser. No. 689,411, Apr. 22, 1991, which is a continuation-in-part of Ser. No. 455,677, Dec. 22, 1989, which is a continuation-in-part of Ser. No. 323,530, Mar. 14, 1989, Pat. No. 5,004,841, which is a continuation-in-part of Ser. No. 123,741, Nov. 23, 1987, Pat. No. 4,891,448. This application Aug. 19, 1991, Ser. No. 747,172

Int. Cl.[5] C07C *4/18, 7/12*

U.S. Cl. 585—467 20 Claims

1. A process of recovering monoalkylbenzene and pure 1,3,5-trialkylbenzene from an isomeric mixture of trialkyl- and dialkylbenzenes, the process comprising:

(a) contacting a monocyclic aromatic compound with a transalkylating mixture containing at least one isomer of dialkylbenzene and at least one isomer of trialkylbenzene, wherein the alkyl groups each independently contain from one to about five carbon atoms, the contacting occurring in the presence of an acidic mordenite zeolite catalyst under reaction conditions such that a transalkylation product mixture is obtained containing monoalkylbenzene, 1,3,5-trialkylbenzene, residual amounts of 1,2,4- and/or 1,2,3-trialkylbenzenes, and optionally unreacted dialkylbenzenes, the catalyst being characterized by a SiO_2/Al_2O_3 molar ratio of at least about 30:1 and a crystalline structure having a Symmetry Index of at least about 1.0 as determined by X-ray diffraction, and the catalyst showing essentially no deactivation up to at least about 500 hours of use;

(b) separating monoalkylbenzene, and optionally, unreacted dialkylbenzenes from the transalkylation product mixture:

(c) contacting the remaining transalkylation product mixture comprising 1,3,5-trialkylbenzene and residual amounts of 1,2,4- and/or 1,2,3-trialkylbenzenes with a zeolite Y aluminosilicate having a SiO_2/Al_2O_3 molar ratio of at least about 50:1 under conditions such that the 1,2,4- and/or 1,2,3-trialkylbenzene isomers are selectively adsorbed by the zeolite while the 1,3,5-trialkylbenzene isomer is not significantly adsorbed: and

(d) collecting the essentially pure fraction of 1,3,5-trialkylbenzene isomer.

5,202,517

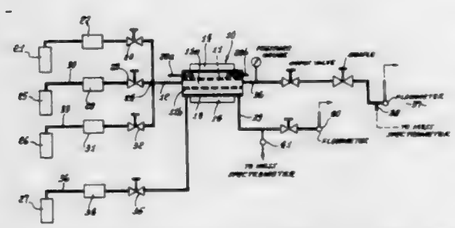
PROCESS FOR PRODUCTION OF ETHYLENE FROM ETHANE

Ronald G. Minet, South Pasadena; Theodore T. Tsotsis, Huntington Beach, and Althea M. Champagnie, Los Angeles, all of Calif., assignors to Medalert Incorporated, South Pasadena, Calif.

Filed Oct. 27, 1989, Ser. No. 427,517

Int. Cl.[5] C07C *5/333*

U.S. Cl. 585—655 7 Claims



1. The process for dehydrogenating ethane to produce ethylene, that includes

a) providing a generally tubular, highly porous, asymmetric, ceramic membrane, and providing a heated reaction zone in a container into which the membrane is received,

b) said membrane having been impregnated with a catalytically active metallic substance so as to create an intramembrane catalytic profile, with pore diameters less than 100 Å,

c) and passing an inlet stream of ethane carrying hydrogen in the range of 0.1% to 20% by volume into contact with the treated membrane, at one side thereof at elevated temperature between 300° and 800° C. and in such manner as to cause hydrogen diffusion through the membrane to the opposite side thereof faster than ethane and ethylene, and removing an outlet stream of hydrogen from said opposite side of the membrane, and removing an outlet stream of ethylene from said one side of the membrane,

d) whereby the dehydrogenation reaction, ethane to ethylene, proceeds relatively rapidly, with the result that the conversion of ethane to ethylene exceeds the normal thermodynamic equilibrium value for the temperature and pressure of the reactor without removal of hydrogen from the reaction zone,

e) the membrane characterized as having relative permeabilities for H_2, C_2H_6 and C_2H_4 of at least 3.5, 0.9, and 10, respectively, and that are within 90% of Knudsen flow component diffusivities,

f) controlling the flow of said inlet and outlet streams to maintain a differential pressure between said inlet ethane stream, and said outlet hydrogen stream of between 10 and 100 psi,

g) and maintaining said container at said elevated temperature and radiating heat from said container toward said reaction zone to maintain said elevated temperature,

h) and providing a pelleted catalyst material adjacent to the side of the membrane to which said stream of ethane is passed,

i) said container being metallic and substantially tubular, and including the initial step of removing an ethylene-containing gas stream from the container,

j) and employing argon or steam to sweep H_2 away from said opposite side of the membrane, and employing argon or steam to mix with C_2H_6 fed to said one side of the membrane.

5,202,518

LIQUID ACID ALKYLATION CATALYST AND ISOPARAFFIN:OLEFIN ALKYLATION PROCESS

Kenneth J. Del Rossi, Woodbury, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 18, 1991, Ser. No. 761,567

Int. Cl.[5] C07C *2/60, 2/62;* B01J *27/02*

U.S. Cl. 585—724 2 Claims

1. An acid catalyst composition for alkylation of an isoparaffin with an olefin comprising from about 40 to about 90 percent hydrofluoric acid together with from about 10 to about 60 weight percent of a carboxylic acid having the formula R—COOH wherein R is C_6H_5 or CF_3.

5,202,519

ISOMERIZATION PROCESS AND CATALYST THEREFOR

Gyanesh P. Khare, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 4, 1992, Ser. No. 941,360

Int. Cl.[5] C07C *5/13*

U.S. Cl. 585—741 11 Claims

1. A process for isomerizing saturated hydrocarbons comprising contacting at least one feed hydrocarbon selected from the group consisting of alkanes containing 4–10 carbon atoms per molecule and cycloalkanes containing 5–10 carbon atoms per molecule with a catalyst composition at a temperature of up to about 300° C., at such contacting conditions as to convert said at least one feed hydrocarbon to at least one product isomer; wherein said catalyst composition has been prepared by a method comprising the steps of:

(a) mixing at least one aluminum halide selected from the group consisting of $AlCl_3$ and $AlBr_3$ with at least one copper(II) salt, calcium aluminate and at least one alcohol containing 1–12 carbon atoms per molecule, at a molar ratio of said at least one aluminum halide to said at least one alcohol in excess of about 1:1;

(b) shaping the mixture obtained in step (a); and

(c) removing said at least one alcohol from the shaped particles obtained in step (b) so as to obtain dry shaped particles.

5,202,520

METHOD FOR AROMATIC HYDROCARBON RECOVERY

Paulino Forte, Yonkers, N.Y., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 712,800, Jun. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 321,033, Mar. 9, 1989, Pat. No. 5,073,669. This application Apr. 20, 1992, Ser. No. 871,349

Int. Cl.[5] C07C *7/00, 7/10;* C10G *17/04, 21/28*

U.S. Cl. 585—808 14 Claims

14. In a method for recovering aromatic hydrocarbons from an extract phase from an aromatic-selective, solvent extraction zone which comprises the steps of:

a) introducing the extract phase comprising aromatic hydrocarbons, non-aromatic hydrocarbons and aromatic-selective solvent into an upper section of a stripping zone;

b) introducing a stripping medium comprising rectification zone bottoms into the stripping zone;

c) withdrawing from the upper section of the stripping zone a first vapor fraction comprising water and non-aromatic hydrocarbons;

d) withdrawing from an intermediate section of the stripping

5,202,523

similar to that of said elongate opening, and which

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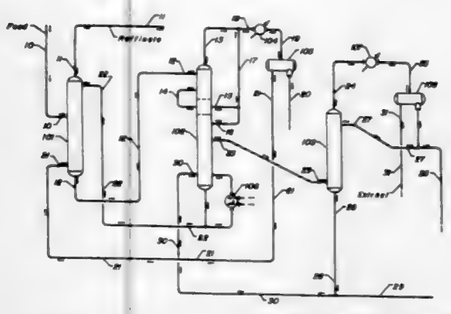
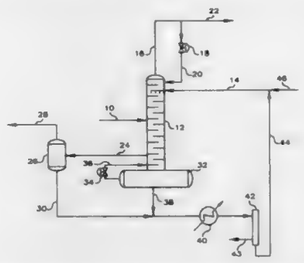
zone a second vapor fraction comprising aromatic hydrocarbons, water and solvent;
e) passing the second vapor fraction to a rectification zone;
f) withdrawing from an upper section of the rectification zone a third vapor fraction comprising aromatic hydrocarbons and water;
g) condensing the third vapor fraction to provide an aromatic hydrocarbon stream and a liquid water stream;
h) passing at least a portion of the liquid water stream into the upper section of the rectification zone;
i) withdrawing from a lower section of the rectification zone a rectification zone bottoms comprising solvent and water;
j) withdrawing from a lower section of the stripping zone a



stripper bottoms stream comprising aromatic selective solvent; and
k) reboiling a portion of a fluid at the bottom of the stripper and introducing the reboiled portion at a point in the lower section of the stripping zone; the improvement which comprises maintaining a weight ratio of the water to the aromatic hydrocarbons in the second vapor fraction to a value of between about 0.05 and about 0.3; providing heat to the lower section of the rectification zone; withdrawing a majority of the water from the rectification zone bottoms and introducing said majority of the water to the lower section of the stripping zone at or near the point where the reboiled portion of the stripper bottoms is introduced; and recovering the aromatic hydrocarbon stream comprising less than 5 wt. ppm solvent.

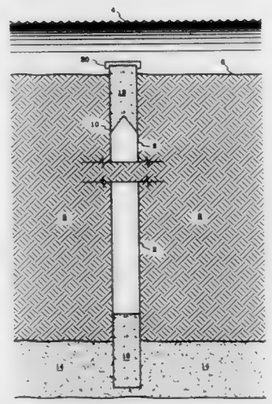
5,202,521
MONOOLEFIN/PARAFFIN SEPARATION BY SELECTIVE ABSORPTION
Ronald E. Brown, and Robert L. Hair, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jun. 5, 1992, Ser. No. 893,630
Int. Cl.[5] **C07C** *7/148, 7/17;* **B01D** *3/00, 47/00*
U.S. Cl. 585—848 **11 Claims**

1. A process for separating ethylene from light alkanes which comprises:
(1) contacting in an absorption column a gaseous feed stream comprising ethylene and at least one alkane selected from the group consisting of methane, ethane, propane, butane and isobutane with at least one liquid extractant selected from the group consisting of dissolved copper(I) hydrocarbonsulfonates, wherein said at least one liquid extractant is introduced into said absorption column at an entry point located above the entry point of said gaseous feed stream;
(2) withdrawing a gaseous overhead product stream in which the concentration of ethylene is less than in said gaseous feed stream, wherein said gaseous overhead product stream is withdrawn at an exit point located in said absorption column above the entry point of said at least one liquid extractant;
(3) withdrawing a gaseous side product stream in which the concentration of ethylene is higher than in said gaseous feed stream, wherein said gaseous side product stream is withdrawn at an exit point located in said absorption



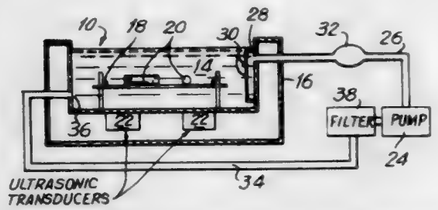
column below the entry point of said gaseous feed stream; and
(4) withdrawing a liquid bottoms stream comprising said at least one liquid extractant, at an exit point located in said absorption column below the exit point of said gaseous product stream.

5,202,522
DEEP WELL STORAGE OF RADIOACTIVE MATERIAL
Billy J. Williams, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Jun. 7, 1991, Ser. No. 712,231
Int. Cl.[5] **B09B** *1/00*
U.S. Cl. 588—250 **20 Claims**



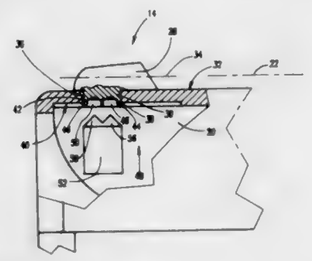
1. A process for storing radioactive waste below potable aquifers in a stable geological hydrocarbon-containing formation, said formation being traversed by a generally vertical steel tubular member, the process comprising:
(a) sealing the bottom of said vertical steel tubular member in order to isolate any hydrocarbon containing zones
(b) mixing the radioactive waste with concrete
(c) placing the mixture of radioactive waste and concrete in the steel tubular member
(d) sealing the top portion of the steel tubular member containing the mixture of radioactive waste and concrete.

5,202,523
FIREARM CLEANING SYSTEM
Dennis L. Grossman, and Robert S. Grossman, both of 33 Edgewood Pl., Great Neck, N.Y. 11024
Filed Jul. 29, 1991, Ser. No. 737,393
Int. Cl.[5] **F41A** *29/00;* **B08B** *3/12*
U.S. Cl. 42—95 **6 Claims**



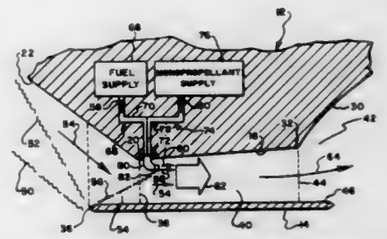
1. An apparatus for the cleaning and lubrication of firearms, comprising a rack dimensioned to support a plurality of disassembled firearm elements, a tank dimensioned to accept said rack, said tank having a bottom surface surrounded by an upstanding side wall; an oil-based fluid mixture having lubricating and cleaning components within said tank and surrounding said firearm elements for the removal of ignition residue and other unwanted particles from the surfaces of said firearm elements and placing said removed particles in suspension within the fluid while providing a lubricating film thereon; means for enhancing the contact between said fluid and said firearm elements; and pump means for providing a flow of said fluid within said tank, from said tank to filter means and from said filter means to said tank; said filter means adapted to remove said suspended particles from said solution and onto a filter media portion of said filter means external to said tank.

5,202,524
GUN AND METHOD OF MOUNTING A SIGHT THEREON
Aharon Nechushtan, Kibbutz Hagoshrim, Israel, assignor to Scopus Light (1990) Ltd., Kibbutz Maayan Zvi, Israel
Filed Jul. 9, 1991, Ser. No. 727,073
Int. Cl.[5] **F41G** *1/02*
U.S. Cl. 42—100 **11 Claims**



1. A gun comprising:
a main body including a barrel and defining an elongate opening; and
a sight mounted onto said main body, and including:
a top portion which protrudes externally of said main body and which defines a rearward facing front planar surface and an optical axis extending transversely thereto and in generally coplanar registration with the longitudinal axis of said barrel; and
base means rigidly connected to and extending from said top portion and into said elongate opening arranged in said main body, wherein said base means has a free end portion which has an external configuration generally similar to that of said elongate opening, and which further has formed therein a recess surrounded by a side wall which extends through said opening so as to protrude beyond an inward-facing surface of said main body,
and wherein at least two non-adjacent portions of said side wall are flared equally in respective radially outward directions so as to tightly engage said opening and said inward-facing surface of said main body, thereby to rigidly connect said sight to said main body and as to retain said optical axis in coplanar registration with the longitudinal axis of said barrel.

5,202,525
SCRAMJET ENGINE HAVING IMPROVED FUEL/AIR MIXING
George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Jan. 29, 1990, Ser. No. 471,588
Int. Cl.[5] **C06D** *5/04*
U.S. Cl. 60—218 **20 Claims**



1. A method of operating a scramjet engine for powering an aircraft at supersonic velocity, said engine including in serial flow communication an inlet, combustor and exhaust nozzle, comprising the steps of:
providing supersonic compressed airflow from said inlet to said combustor;
supplying fuel to said compressed airflow in said combustor;
providing a monopropellant in said combustor adjacent to said compressed airflow and said fuel, said monopropellant being effective for expanding in said combustor for mixing said airflow and said fuel for combustion of said airflow and said fuel to generate combustion gases; and
discharging said combustion gases from said combustor through said exhaust nozzle for powering said aircraft.

5,202,526
APPARATUS FOR INTERPRETING WRITTEN MUSIC FOR ITS PERFORMANCE
Mayumi Ohya, Hamamatsu, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1991, Ser. No. 809,299
Claims priority, application Japan, Dec. 31, 1990, 2-417457; Dec. 31, 1990, 1-417458; Dec. 31, 1990, 2-417459; Dec. 31, 1990, 2-417460; Dec. 31, 1990, 2-417461; Dec. 31, 1990, 2-417462; Jan. 31, 1991, 3-29074; Jan. 31, 1991, 3-29075; Jan. 31, 1991, 3-29076; Jan. 31, 1991, 3-29077; Jan. 31, 1991, 3-29078; Jan. 31, 1991, 3-29079
Int. Cl.[5] **G10G** *3/04;* **G10H** *1/38, 1/46*
U.S. Cl. 84—462 **9 Claims**

1. An apparatus for interpreting a notated music, comprising:
music symbol string storage means for storing a string of coded music notational symbols which represent a written music, said string of coded music notational symbols being vague to an extent that musical interpretation of said string is required for its performance realization; and
interpreting means for interpreting said string from said

music symbol string storage means to provide perfor-

natively adaptable to single stage and multiple state reloading operations from a single common foundation, comprising:

5,202,530
LIGHT ARMOR PIERCING AUTOMATIC RIFLE

supporting points essentially eliminating wobble of the

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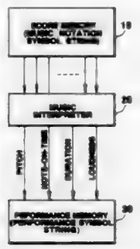
music symbol string storage means to provide performance data which specifies a pitch, note-on time, duration and loudness, of each note to be played and which is thus



specific to an extent that an automatic performance of said written music can be realized based on said performance data without any further musical interpretation.

5,202,527

GUITAR STANCHION

John D. Gracie, 7013 Pomelo Dr., West Hills, Calif. 91307

Continuation-in-part of Ser. No. 354,126, May 22, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 720,014
Int. Cl.[5] G10D *3/00*
U.S. Cl. 84—327 7 Claims

1. An stanchion for supporting a guitar in a fixed position, said guitar having a side wall and a front, said stanchion comprising:

a saddle plate conforming to the side wall of the body of a guitar to physically support in a fixed position the body of the guitar, said conforming causes said saddle plate to be arcuate when observed from the front of said guitar; and

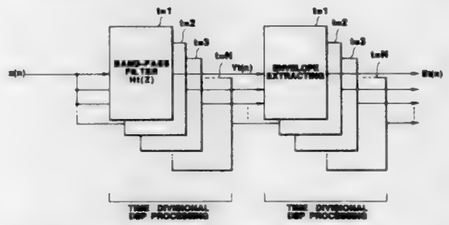
a stand adapted to be located on a supportive surface, said stand having an upper end spaced furthest from the supportive surface, said saddle plate being mounted by attachment means on said upper end, said attachment means permitting separate rotational adjusting movement of said saddle plate on the X-axis and the Y-axis and the Z-axis with said X-axis not intersecting said Y-axis or said Z-axis and said Y-axis not intersecting said Z-axis, said attachment means including a rod section, a threaded both attached to said rod section, the longitudinal center axis of said threaded both and said rod section being in alignment forming said X-axis, a box member fixed to said saddle plate, said box member being pivotally mounted on said rod section and said threaded bolt, said rod section providing a first supporting point for said saddle plate, said threaded both providing a second supporting point for said saddle plate, said first supporting point being spaced from said second supporting point, said first and second supporting points essentially eliminating wobble of the guitar.

5,202,528

ELECTRONIC MUSICAL INSTRUMENT WITH A NOTE DETECTOR CAPABLE OF DETECTING A PLURALITY OF NOTES SOUNDED SIMULTANEOUSLY

Makoto Iwaooji, Hamuramachi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,339
Claims priority, application Japan, May 14, 1990, 2-123789
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—616 6 Claims



1. A musical instrument, comprising:

means for receiving an acoustic signal to output a digital waveform signal representing said acoustic signal;

digital signal processing means for sequentially performing

(i) digital bandpass filtering operations on said digital waveform signal carried out on a time divisional basis using center frequencies corresponding to respective notes, and

(ii) extracting operations to extract envelopes of waveform signals resulting from the bandpass filtering operations to detect respective levels of spectra of frequencies corresponding to said notes;

detecting means coupled to said digital signal processing means for detecting at least one note contained in said acoustic signal on the basis of the extracted envelopes representing respective levels of said spectra:

means coupled to said detecting means for generating at least one musical sound signal each having a predetermined timbre and a frequency respectively corresponding to the at least one note detected by said detecting means, and including a predetermined number of musical sound generating channels to which the at least one note detected sequentially by said detecting means are allocated to generate a corresponding musical sound signal; and

control means for allocating a note to an empty one of the predetermined number of musical sound generating channels to generate the corresponding musical sound signal when that note is different from those allocated already to the predetermined number of musical sound generating channels and is detected by said detecting means, and for instructing the musical sound generating channel to stop further generation of the musical sound signal corresponding to that note when the note allocated to the musical sound generating channel becomes not detected by said detecting means.

5,202,529

CONVERTIBLE AMMUNITION RELOADING PRESS

Steven R. Shields, Oroville, Calif., assignor to Blount, Inc., Portland, Oreg.

Filed Dec. 16, 1991, Ser. No. 806,909
Int. Cl.[5] F42B *33/02*
U.S. Cl. 86—23 3 Claims

1. A system wherein a spent cartridge case reloader is alter-

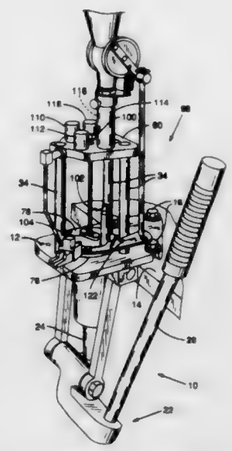
natively adaptable to single stage and multiple state reloading operations from a single common foundation, comprising;

a base, a ram slidably mounted in said base for reciprocal vertical movement, a plurality of support columns fixedly secured to said base and extended above said base, and an actuator for actuating sliding movement of said ram relative to said base and said support columns,

a first tool holder plate and a second tool holder plate, releasable mated fasteners provided on said columns and said first and second tool holder plates for alternatively mounting said first and second tool holder plates in spaced overhead relation to said base in the path of the reciprocating ram;

a first shell holder device and a second shell holder device, releasable mated fasteners provided on said ram and said first and second shell holder devices for alternatively mounting said first and second shell holder devices to said ram,

said first tool holder plate and said first shell holder device both dedicated to single stage reloading operation and when mounted to the columns and ram respectively, providing said reloader with single stage reloading capability, only,



wherein the shell holder device holds a single cartridge on the end of the ram, and the tool holder device holds a single tool in overhead alignment with said single cartridge, said tool holder adapted for selectively and alternatively holding a selection of individual tools for performing sequential reloading operations on the cartridge held in the first shell holder device, and

said second tool holder plate and said second shell holder device both dedicated to multiple stage reloading operation and when mounted to the columns and ram respectively, providing said reloader with multiple stage reloading capabilities,

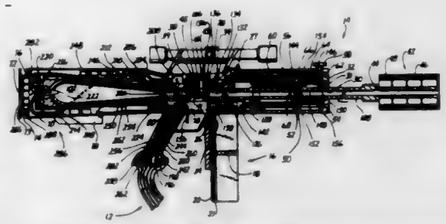
said second tool holder plate including fixed multiple stations for simultaneously holding a plurality of selected tools, and said second shell holder device including a rotatable shell holding plate adapted to hold a plurality of cartridges to be reloaded that are rotatably mounted to said ram, and a ratchet mechanism for sequential positioning of the rotatable shell holding plate for simultaneously aligning cartridges in the shell holding plate with the tools in the multiple stations of the tool holding plate, and said ratchet mechanism being selected from one of manual operation and automatic operation.

5,202,530

LIGHT ARMOR PIERCING AUTOMATIC RIFLE

Mark L. Stephens, 546½ N. 5th St., Upland, Calif. 91786

Filed Apr. 6, 1992, Ser. No. 864,270
Int. Cl.[5] F41A *1/04, 13/00*
U.S. Cl. 89—7 19 Claims



1. A liquid propellent gun for the launching of rocket propelled projectiles comprising:

rifle means for launching said projectiles, said rifle means comprising a barrel through which said projectiles are launched and a combustion chamber coupled to said barrel for igniting and launching said projectiles through said barrel;

propellent means for providing a plurality of liquid propellent components to said rifle means for combination within said combustion chamber,

cooling means for cooling said combustion chamber within said rifle means, said cooling means comprising a closed loop cooling system; and

wherein said closed loop cooling system is comprised of a pump within said rifle means, a closed circuit at least partly within said rifle means, said closed circuit in heat exchanging relationship with said combustion chamber, a liquid cooling fluid disposed in said closed circuit and pumped therethrough by said pump, and heat exchanging means for transferring heat out of said cooling fluid; and

wherein said heat exchanging means is disposed within said propellent means, said heat exchanging means comprising an air-to-cooling fluid heat exchanger,

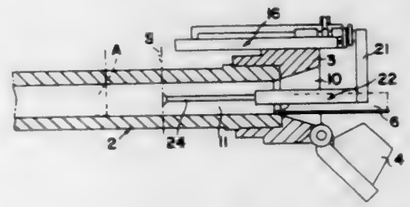
whereby high velocity projectiles are launched from a light weight gun.

5,202,531

RAMMER

Stig Månsson, and Lars Månsson, both of Karlskoga, Sweden, assignors to Swedish Ordnance FFV/Bofors AB, Karlskoga, Sweden

PCT No. PCT/SE90/00365, § 371 Date Feb. 3, 1992, § 102(e) Date Feb. 3, 1992, PCT Pub. No. WO90/15300, PCT Pub. Date Dec. 13, 1990
PCT Filed May 30, 1990, Ser. No. 777,374
Claims priority, application Sweden, Jun. 1, 1989, 8901976
Int. Cl.[5] F41A *9/44*
U.S. Cl. 89—47 7 Claims



1. A rammer for use with an artillery piece having a rifled barrel with a breech casing which is separately charged with a shell and a propellant, said rammer adapted to charge said shell

into said barrel from a charge cradle which is positioned adja-

fire circuit comprising means for applying energy from

suction means for flowing a liquid developer into said ergy through a gap between bodies having conductive surfaces

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into said barrel from a charge cradle which is positioned adjacent a charge opening in said barrel and to drive said shell into a rammed position in a charge space provided in said barrel for said propellant and in contact with rifling in said barrel;

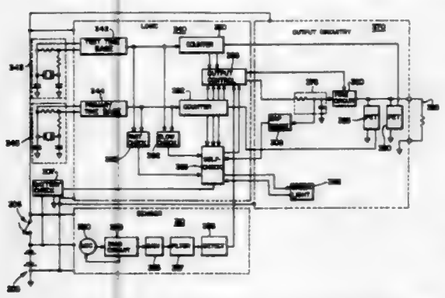
said rammer comprising primary and secondary piston-cylinder systems having pistons which are axially disposed parallel to each other and to said barrel, and a transverse arm member having first and second end portions connecting said piston-cylinder systems together so that their combined travel corresponds to the distance by which said rammer will move said shell, the cylinder of said primary piston-cylinder system being fixed relative to said breech casing and the piston thereof being connected to said first end portion of said transverse arm member, and directed rearwardly along the rear section of the barrel, and the cylinder of said secondary piston-cylinder system being securely connected to said second end portion of said transverse arm member, the piston thereof having its direction of rammer movement oriented toward said charge space so that when the piston of the primary piston-cylinder is in a fully projected position and the piston of the secondary piston-cylinder is in a completely retracted position, said piston of said secondary piston cylinder is adapted to be positioned inwardly behind a shell lying on said charge cradle.

5,202,532

AUTONOMOUS ACOUSTIC DETONATION DEVICE

Steven A. Haglund; Dennis L. Kurschner, both of Minnetonka, and Kenneth W. Paulson, Eden Prairie, all of Minn., assignors to Alliant Techsystems Inc., Edina, Minn.

Continuation of Ser. No. 525,929, May 21, 1990, abandoned.
This application Aug. 16, 1991, Ser. No. 747,393
Int. Cl.[5] F42D *1/055*
U.S. Cl. 102—217 **19 Claims**



1. An autonomous detonating device for detonating a blasting cap with use of a primary charge having a specific acoustic frequency band and a specific acoustic threshold level within a predetermined area when said primary charge is detonated, said device comprising:

(a) an acoustic sensor comprising a microphone, a bandpass filter and a detector, said microphone comprising means for sensing an explosion of said primary charge and for producing a first signal, said acoustic sensor further comprising conditioning means for receiving and conditioning said first signal and for applying said conditioned first signal to said bandpass filter, said bandpass filter comprising means for passing a portion of said conditioned first signal within said specific frequency band, thus forming a second signal, said second signal being provided to said detector, said detector comprising means for comparing said second signal to said specific acoustic threshold level and for producing a third signal as a function thereof; and

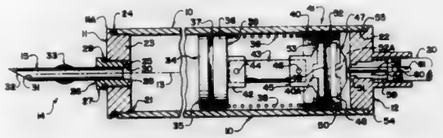
(b) an output circuit comprising an energy source and a fire circuit adapted to be connected to said blasting cap, wherein said third signal is input into said fire circuit, said fire circuit comprising means for applying energy from said energy source to said blasting cap.

5,202,533

DRUG INJECTION APPARATUS FOR AN ANIMAL

Douglas G. A. Vandersteen, Box 98, Chatfield, Manitoba, Canada R0C 0N0

Filed Jan. 28, 1992, Ser. No. 826,360
Int. Cl.[5] F42B *12/54*; **A61M** *5/20*
U.S. Cl. 102—512 **13 Claims**



1. A drug injection apparatus for remotely injecting an animal with a liquid comprising a cylindrical barrel defining a longitudinal axis of the barrel, a needle assembly at a forward end of the barrel, a piston slidable longitudinally within the barrel from a retracted position remote from the needle assembly, in which a liquid to be injected is introduced into the barrel between the needle assembly and a forward end of the piston, and a forward dispensing position in which the forward end of the piston is moved forwardly to force the liquid through the needle assembly for injecting into the animal, spring means biasing the piston into the forward dispensing position, and a release means actuable to hold the piston in the retracted position and to release the piston to move to the forward dispensing position in response to a forward axial force on the release means, the release means comprising cooperating means having a first portion attached to said barrel and held against movement longitudinally thereof and defining a surface facing radially inwardly of the axis of the barrel and a second portion connected to the piston so as to be movable longitudinally therewith, said cooperating means being shaped for said second portion to pass through said first portion, said cooperating means including an annular O-ring which is formed of a resilient material such that said O-ring can be deformed to allow passage of said second portion through said first portion when an axial force thereon exceeds a predetermined maximum force, and means adjusting said annular O-ring in a radial direction so as to vary said predetermined force.

5,202,534

DEVELOPING APPARATUS USING A LIQUID DEVELOPER AND HAVING A SYSTEM FOR CLEANING THE DEVELOPMENT REGION WITH A VACUUM PRESSURE

Yoshiumi Tamiya, Yokohama; Seiichi Miyakawa, Nagareyama; Kazuaki Iizuka, Tokyo; Kenichi Shimizu, Kawasaki; Shigeru Suzuki; Kiyoshi Ohshima, both of Yokohama, and Tadahiro Suzuki, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

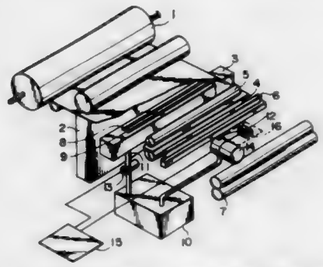
Filed Oct. 18, 1991, Ser. No. 779,257
Claims priority, application Japan, Dec. 16, 1990, 2-411152
Int. Cl.[5] G03G *15/10*
U.S. Cl. 118—660 **7 Claims**

1. A developing apparatus for developing an image formed on a recording medium, comprising:

means for transporting a medium along a medium transport path;

a developing head having a groove facing a medium being transported along the medium transport path, said groove extending in a widthwise direction to said medium;

suction means for flowing a liquid developer into said groove so that an image on the medium is developed; and



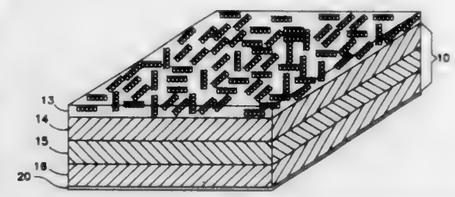
means for causing a suction in said groove to be greater after the medium is developed than during development.

5,202,535

CHIRAL ABSORBER

Jan M. A. Dauwen, Bekkevoort; August T. Timmerman, Westerlo; Michel A. C. Van Craenendonck, Mol, and Hugo F. Pues, Keerbergen, all of Belgium, assignors to Grace N.V., Westerlo, Belgium

Filed Apr. 10, 1992, Ser. No. 866,598
Claims priority, application United Kingdom, Jun. 28, 1991, 9113993
Int. Cl.[5] B32B *9/00*
U.S. Cl. 174—35 R **17 Claims**



1. A structure for absorbing electromagnetic radiation in the range of frequencies from about 10 megahertz to about 100 gigahertz comprising:

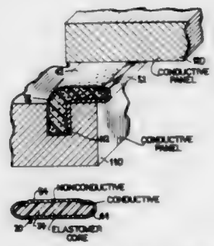
a lossy dielectric medium; and chiral elements disposed outside the lossy dielectric medium.

5,202,536

EMI SHIELDING SEAL WITH PARTIAL CONDUCTIVE SHEATH

Samuel S. Buonanno, Fairport, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Feb. 3, 1992, Ser. No. 829,898
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 GC **18 Claims**



1. A seal for blocking propagation of electromagnetic energy through a gap between bodies having conductive surfaces at least adjacent the gap, comprising:

an elongated core element defining a resiliently compressible cross section;

at least one flexible elongated conductive sheath portion attached to the core element at a surface of the core element exposed to the conductive surfaces of the bodies, the conductive sheath portion extending only part way around said cross section and defining ends which are spaced on the core element and non-overlapping; and,

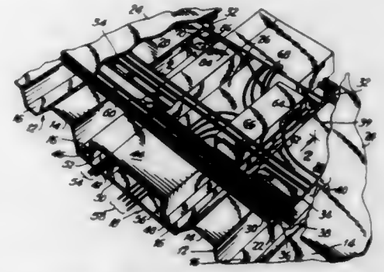
at least one additional sheath portion attached to the core element, the additional sheath portion being flexible and elongated, and extending between said ends of the conductive sheath portions, the conductive sheath portion and the at least one additional sheath portion together extending fully around the cross section of the core element, the conductive sheath portion defining a conductive exterior surface of the seal extending around a first part of the cross section of the seal and the at least one additional sheath portion defining a nonconductive exterior surface of the seal extending around a second part of the cross section of the seal, the additional sheath portion being lapped with at least one of the spaced, non-overlapping ends of the conductive sheath portion, whereby the conductive sheath portion and the additional sheath portion respectively define electromagnetic and environmental barriers bridging across the gap.

5,202,537

UNDERFLOOR CABLE DISTRIBUTION SYSTEM WITH INCREASED TRENCH CAPACITY

Arthur Nusbaum, Fort Lee, N.J., assignor to Robert Nusbaum; Howard Nusbaum, both of New York, N.Y. and Barbara Selick, Teaneck, N.J.

Filed May 13, 1991, Ser. No. 699,319
Int. Cl.[5] H02G *3/28*
U.S. Cl. 174—48 **11 Claims**



1. An underfloor cable distribution system for a building, comprising:

(a) a plurality of elongated, corrugated, metal flooring units extending along a longitudinal direction;

(b) a plurality of elongated, metal, cable distribution ducts extending along the longitudinal direction in a side-by-side relationship with the flooring units;

(c) at least one elongated, metal, cable trench extending along a transverse direction generally normal to the longitudinal direction over and across the flooring units, and also over and across the distribution ducts at intersections;

(d) each distribution duct and cable trench having power cells in open communication with each other at the intersections, for routing electrical power cables along the trench to the distribution ducts, and also having cable cells in open communication with each other at the intersections, for routing communication and data cables along the trench to the distribution ducts, said power cells being

(d) at least two stacked, spaced, electrically conductive rings

mal gradient along the mid-span region during the con-

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separate from the cable cells to maintain the power cables apart from the communication and data cables;

(e) an electrically-powered device mounted at at least one of the intersections, said device having an input for connection to one of the communication and data cables in the trench, and at least one output for connection to one of the communication and data cables in the duct at said at least one intersection; and

(f) an electrical junction box for supplying electrical power to the device, said junction box being mounted remotely from the trench and being located at said at least one intersection to increase trench capacity.

5,202,538

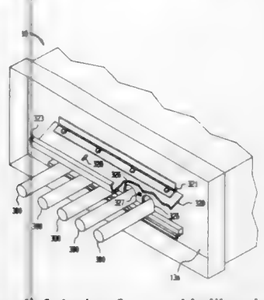
PORTABLE POWER DISTRIBUTION CABINET

Stephen J. Skirpan, Port Washington, N.Y., assignor to Union Connector Co., Inc., Roosevelt, N.Y.

Continuation-in-part of Ser. No. 496,412, Mar. 20, 1990, Pat. No. 5,070,429. This application Aug. 20, 1991, Ser. No. 747,853

Int. Cl.[5] H02G *3/22*

U.S. Cl. 174—65 R **12 Claims**



1. A stress relief device for a cable-like element, which comprises:

a panel forming an opening for passage of the cable-like element therethrough; and

a door rotatably mounted to the panel for rotation between an open position and a closed position and arranged so that the door is clear of obstruction of the opening when in the open position and partially obstructs the opening when in the closed position;

each of the panel and the door being dimensioned relative to one another so that said door engages and clamps the cable-like element against said panel when the cable-like element is passed through the opening and the door is in the closed position.

5,202,539

EMERGENCY BRAKE APPARATUS FOR AN ELEVATOR

Miles P. Lamb, Bedminster, N.J., assignor to Inventio AG, Hergiswil, Switzerland

Filed Aug. 28, 1991, Ser. No. 751,089

Int. Cl.[5] B66B *5/02*

U.S. Cl. 187—109 **9 Claims**

1. An emergency brake apparatus for an elevator containing a car, counterweight, hoist ropes, drive sheave, brake, motor, and an elevator car safety, comprising:

a rotatable drive sheave for driving the car;

the rotatable drive sheave having an end surface;

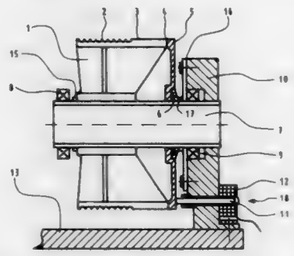
a brake element comprising a brake star;

means for mounting the brake element for conjoint rotational movement with the rotatable drive sheave;

means for continuously pressing under spring load the brake star against the end surface of the drive sheave;

an axially displaceable arresting bolt;

means for axially displacing the axially displaceable arresting bolt for engagement with the brake star; and



the axially displaceable arresting bolt, when engaging the brake star, blocking rotational movement of the brake star and producing a braking torque at the drive sheave.

5,202,540

TWO-WAY RING COMMUNICATION SYSTEM FOR ELEVATOR GROUP CONTROL

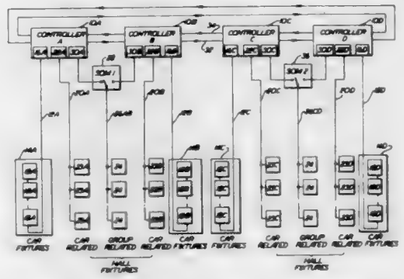
Bruno Auer, and Jurgen Schlotter, both of Berlin, Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 23, 1987, Ser. No. 29,495

Claims priority, application European Pat. Off., Apr. 3, 1986, 86104551.6

Int. Cl.[5] B66B *5/02*

U.S. Cl. 187—101 **3 Claims**



1. A multicar elevator system, characterized in that:

a controller is associated with each car to process intercar messages; and

the controllers are linked together in serial fashion on a two-way communication system so that the messages of each controller are passed along to and processed by each of the other controllers in two directions on two independent lines.

5,202,541

MICROWAVE HEATING OF WORKPIECES

Mark C. L. Patterson; Raymond Y. Roy, both of Kingston; Robert M. Kimber, Sydenham, and Prasad S. Apté, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Jan. 28, 1991, Ser. No. 647,572

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 M **19 Claims**

1. A method of heating a heat-densifiable workpiece assembly, comprising constructing a load assembly comprising:

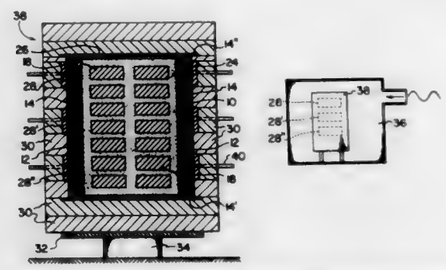
(a) a crucible,

(b) a powder bed in the crucible,

(c) a workpiece assembly embedded in the powder bed,

(d) at least two stacked, spaced, electrically conductive rings closely adjacent to the crucible surrounding the workpiece assembly, and

(e) thermal insulation surrounding the crucible and said



rings, and irradiating said load assembly with microwave energy in a multimode cavity whereby to subject the workpiece assembly to substantially isothermal conditions in which a variation in density of a finished article is no more than ±1%.

5,202,542

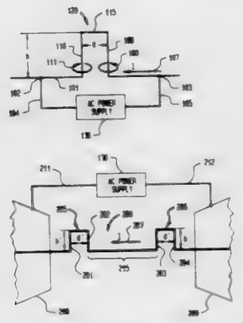
TEST SPECIMEN/JAW ASSEMBLY THAT EXHIBITS BOTH SELF-RESISTIVE AND SELF-INDUCTIVE HEATING IN RESPONSE TO AN ALTERNATING ELECTRICAL CURRENT FLOWING THERETHROUGH

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Poestenkill, N.Y.

Filed Jan. 18, 1991, Ser. No. 645,190

Int. Cl.[5] G01N *3/18;* **H05B** *3/00*

U.S. Cl. 219—50 **35 Claims**



1. A testing specimen for undergoing controlled heating in a materials testing system having two opposing jaw assemblies for retaining the specimen at opposing ends thereof, said heating to occur by virtue of an alternating current that is to be supplied by said system and will flow through said specimen, wherein the specimen is formed of a pre-defined conductive material capable of being self-resistively heated and having eddy current flow induced therein, said specimen comprising:

a mid-span region centrally located between the opposing ends of the specimen; and

a heating section formed in the specimen at a location intermediate said mid-span region and at least one of said ends, wherein said heating section has a pre-defined shape and size such that said section will undergo self-induction in response to flow of the alternating current through said specimen and generate both self-inductive and self-resistive heat therein which, in conjunction with self-resistive heat generated in the mid-span region of the specimen by said current, will establish a pre-defined longitudinal thermal gradient along the mid-span region during the controlled heating of the specimen.

5,202,543

MANUFACTURING PROCESS OF A FUEL DELIVERY RAIL ASSEMBLY

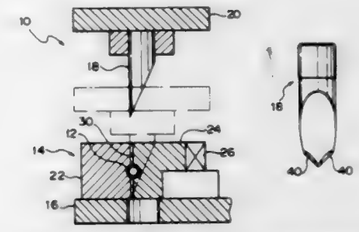
Toshiaki Yoshimura, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Oct. 28, 1991, Ser. No. 783,193

Claims priority, application Japan, Oct. 31, 1990, 2-292103

Int. Cl.[5] B23K *11/14, 101/04*

U.S. Cl. 219—117.1 **1 Claim**



1. A manufacturing process of an offset-type fuel delivery rail assembly for an internal combustion engine, said assembly including a conduit having a fuel passage therein and a plurality of tubular sockets disposed along said conduit for receiving fuel injectors therein, comprising the steps of:

clamping a conduit with a chucking tool to hold the conduit in a fixed position;

lowering cutting blades of a pressing machine onto the conduit to form, on the conduit, arcuate edges corresponding to outside curvatures of tubular sockets and projections upon the arcuate edges;

attaching the tubular sockets to the arcuate edges of the conduit by spot welding;

brazing or welding around the arcuate edges to form an integral assembly; and

wherein each of said cutting blades has the shape of a solid circular configuration having an oblique plane and a pair of longitudinal slots, said slots being used to make said projections upon the arcuate edges, said projections being used to concentrate electrical current during said spot welding.

5,202,544

METHOD OF MACHINING PLATE MATERIALS WITH A PLASMA CUTTER AND PLASMA TORCH

Makoto Inoue, Chigasaki; Kunio Horiai, Hiratsuka; Toshiya Shintani, Kanagawa, and Yoshihiro Yanaguchi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP89/01071, § 371 Date Jul. 9, 1991, § 102(e) Date Jul. 9, 1991, PCT Pub. No. WO90/04486, PCT Pub. Date May 3, 1990

PCT Filed Oct. 19, 1989, Ser. No. 543,801

Claims priority, application Japan, Oct. 20, 1988, 63-265133

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.5 **16 Claims**

1. A method of machining a workpiece with a plasma torch having a main body, said main body having a front end facing said workpiece, a nozzle having a nozzle opening, the diameter of said nozzle opening being 1.5 mm or less, said nozzle opening having an axis extending therethrough, said nozzle being disposed on the front end of said main body to direct a plasma arc column toward said workpiece, and an electrode disposed within said plasma torch and engaged with said main body and having an electrode material facing said nozzle opening, said method comprising:

at least two electrodes in electrical contact with said honey-

control means for synchronizing the illuminating means such

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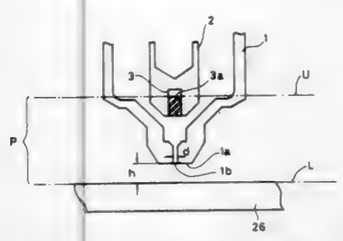
emitting a plasma arc through said nozzle opening to produce a plasma arc column of charged particles extending between said nozzle opening and said workpiece with a current of less than one hundred and several tens of amperes to cut the workpiece while utilizing a magnet to maintain a magnetic flux between the vicinity of a surface



of said electrode material and the vicinity of said nozzle opening, said magnetic flux having a magnetic flux density in the range of 10 to 200 gauss so that the charged particles in said plasma arc column are stabilized in a uniform converged state without being diffused and so that the double-arc phenomenon is avoided.

5,202,545

PROCESS FOR POINT-WELDING A HIGHLY CORROSION RESISTANT METAL COVER PLATE ON A METAL SUPPORT

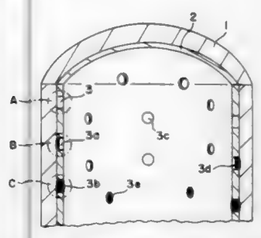
Theodor Hoffmann; Karl-Heinz Leinweber, both of Altena, and Armando Manfrohn, Haiger, all of Fed. Rep. of Germany, assignors to VDM Nickel-Technologie AG, Werdohl, Fed. Rep. of Germany

Filed Jul. 24, 1991, Ser. No. 734,930

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023814

Int. Cl.[5] **B23K** *9/007*

U.S. Cl. 219—127 **5 Claims**



1. Process for point welding a thin, highly corrosion-resistant cover plate having a predetermined thickness onto a surface of a thicker, less corrosion-resistant metal support, said cover plate including a plurality of holes which pass through said cover plate, comprising

placing said cover plate on top of said metal support,

introducing a highly corrosion-resistant additive welding material into said holes,

while under an inert gas atmosphere, producing in said holes a first weld layer which is thinner than the thickness of said cover plate and completely covers the exposed surface of said metal support in said holes,

allowing said first weld layer to harden while under said inert gas atmosphere, and

while said first weld layer is still warm and while still maintaining said inert gas atmosphere, producing in said holes a second weld layer, thereby forming in said holes a buildup weld comprising said first and second weld layers, said cover plate being welded to said metal support along edges of said holes,

wherein said inert gas atmosphere is maintained until hardening of said second weld layer is completed,

wherein said first and second weld layers are produced by a metal-inert gas (MIG) welding process with wire electrode, and

wherein said first weld layer is produced by spray arc welding and said second weld layer is produced by impulse arc welding.

5,202,546

ROOT PASS BEAD WELDING METHOD

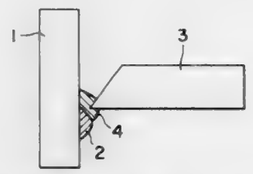
Shigeru Nakayama; Hisao Hasegawa; Masaki Tanaka, and Katsumi Miyagawa, all of Kobe, Japan, assignors to Kawasaki Kogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 30, 1991, Ser. No. 814,429

Claims priority, application Japan, Dec. 28, 1990, 2-418825

Int. Cl.[5] **B23K** *9/00*

U.S. Cl. 219—137 R **4 Claims**



1. A root pass bead welding method of or joining two metal base members, said method comprising the steps of:

welding one of said metal base members to form a dike bead on a rear surface of said one of said metal base members;

placing the distal end of the other of said metal base members on said dike bead or in the vicinity thereof so as to define a groove at said distal end open at a front surface of said other of said metal base members and extending towards a rear surface thereof; and

forming a root pass bead extending from said dike bead to the rear surface of said other of said metal base members by welding both of said base members at said groove from the front surface of said other of said base members.

5,202,547

RESISTANCE ADJUSTING TYPE HEATER

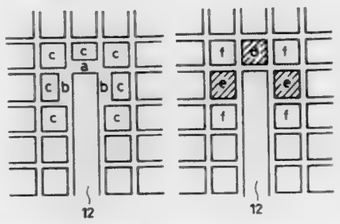
Fumio Abe, Handa; Hiroshige Mizuno, Tajimi; Takashi Harada, Nagoya, and Tomoharu Kondo, Toki, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 28, 1992, Ser. No. 842,964

Claims priority, application Japan, Mar. 5, 1991, 3-063943

Int. Cl.[5] **H05B** *3/10;* **F01N** *3/10;* **B01D** *53/36*

U.S. Cl. 219—552 **4 Claims**



1. A resistance adjusting type heater comprising:

a honeycomb structure having a number of passages defined by passage walls;

at least two electrodes in electrical contact with said honeycomb structure; and

at least one slit extending at least partially through said honeycomb structure to alter the electrical resistance thereof, wherein a passage wall defining a front edge of said slit where said slit terminates in said honeycomb structure has an increased thickness, said edge corresponding to an area of relatively high current density.

5,202,548

RESISTANCE ADJUSTING TYPE HEATER

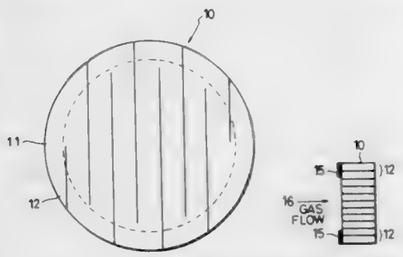
Tomoharu Kondo, Toki, and Fumio Abe, Handa, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 26, 1991, Ser. No. 813,606

Claims priority, application Japan, Jan. 16, 1991, 3-015880

Int. Cl.[5] **H05B** *3/10;* **F01N** *3/10;* **B01D** *53/36*

U.S. Cl. 219—552 **7 Claims**



1. A heater for heating fluid flowing therethrough, comprising:

an electrically conductive integral honeycomb structure having a radial periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends;

at least one slit formed though said partition walls of said honeycomb structure;

at least two electrodes in electrical contact with said honeycomb structure wherein said at least one slit is disposed between said electrodes to adjust the resistance of the honeycomb structure; and

sealing means for sealing a heat non-generating portion of the honeycomb structure whereby gas flow is restricted from the passages of the heat non-generating portion.

5,202,549

TRANSACTION MACHINE HAVING LIGHTED USER PROMPTS

Dale D. Decker, Harrisburg, and Otis J. Holder, II, Gastonia, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1991, Ser. No. 767,451

Int. Cl.[5] **G06F** *15/30*

U.S. Cl. 235—379 **14 Claims**

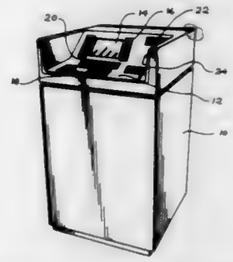
1. A transaction machine suitable for allowing a user to conduct a transaction by using various input and output devices on the machine, said transaction machine comprising:

a plurality of input devices for the user to enter information or objects into the machine;

a plurality of output devices for the user to receive information or objects from the machine;

illuminating means, which provides illumination at specific physical locations of at least some of said input and output devices, for indicating those locations for a user action; and

control means for synchronizing the illuminating means such that the user is prompted about the location of an awaiting



user action by illuminating the input or output device at that location.

5,202,550

DEVICE FOR MACHINE COMMUNICATION IN DATA TRANSMISSION

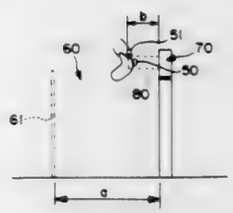
Wolfram Koczaar, Innsbruck, and Kurt Wallerstorfer, Strasswalchen, all of Austria, assignors to Skidata Computer Gesellschaft M.B.H., St. Leonard-Gartenau, Austria

Continuation of Ser. No. 392,534, Jun. 23, 1989, abandoned. This application Jul. 7, 1992, Ser. No. 911,269

Claims priority, application Austria, Oct. 23, 1986, 2819/86; Oct. 23, 1986, 2820/86; Oct. 23, 1986, 2828/86

Int. Cl.[5] **G06K** *5/00;* **G07C** *9/00;* **G07F** *7/08;* **G07B** *15/04*

U.S. Cl. 235—382 **16 Claims**



1. A data carrier for a non-contact remote data communication with a control station, the control station controlling a passage to one of a plurality of different areas or spaces by checking and/or changing data of authorization of passages on the data carrier when the data carrier is approached to the control station, the data carrier comprising:

a memory designed to store data of at least two independent authorizations, each authorization being specific to one of the different areas or spaces;

A microprocessor, the microprocessor partially comprising the memory, the microprocessor further comprising means for performing discretionary functions on the data of each authorization and further comprising means for controlling operations of the data carrier;

a power-supply unit for providing power to the data carrier;

a data sending-receiving unit for receiving data from the control unit and transmitting data to the control unit;

an electronic clockwork for maintaining an indication of the time of day;

a digital display for selectively displaying the data of each authorization stored in the microprocessor;

an operating button for selecting what will be displayed on the digital display; and

a fastening means for connection of the data carrier to the owner of the data carrier.

back resistor means to define a first mode low optical

5,202,555

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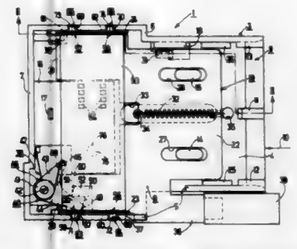
5,202,551
READING DEVICE FOR AN INTEGRATED CIRCUIT CARD

Peter Parrer, Bad Vöslau, and Radko Pavlovec, Vienna, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1991, Ser. No. 706,812
Claims priority, application Austria, Jun. 1, 1990, 1197/90
Int. Cl.[5] G06F *13/04*; G06K *7/06*
U.S. Cl. 235—486 21 Claims

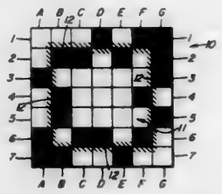


1. A reading device for an integrated circuit card having electrical contacts, said device comprising:
a frame with a holding space for the integrated circuit card, said frame having an inlet opening through which the integrated circuit card is insertable in an insertion direction past a read position of the circuit card into an over-position of the circuit card, said over position being spaced further from said inlet opening than said read position;
a slide movable over said frame substantially parallel to said insertion direction between a rest position and an operating position;
a slide spring biasing said slide in the direction opposite said insertion direction for moving said slide from said rest position to said operating position;
a contact carrier having contacts for contacting the contacts on the circuit card, said contact carrier being movable into a contact position in which said carrier contacts engage the circuit card contacts in both said over- and read positions of the circuit card;
coupling means coupling said contact carrier to said slide for moving said contact carrier into said contact position upon movement of said slide into said operating position;
a locking device switchable between a blocking position, in which said slide is disposed in said rest position and locked against movement towards said operating position, and first and second release positions in which said slide is released to move towards said operating position, said locking device being in said first release position when the circuit card is in said over-position, and said locking device resting against a portion of said slide in said second release position;
a lock spring biasing said locking device for moving said locking device from said release positions to said blocking position, said lock spring biasing said locking device with substantially less force than that which said slide spring biases said slide;
said locking device including a control stop actuatable by the integrated circuit card for moving said locking device into said first release position upon insertion of the circuit card into said over-position, the card being insertable into said over-position with an insertion force sufficient to overcome said lock spring;
in said first release position of said locking device, said slide being moved by said slide spring from said rest position to said operating position and said contact carrier being moved into said contact position, upon release of said insertion force on the circuit card said lock spring moving said locking device from said first release position to said second release position and said control stop on said locking device moving the circuit card from said over-position to said read position with said carrier contacts engaging the circuit card contacts, in said second release position said locking device resting against a portion of said slide in its operating position such that said control stop does not bias the circuit card towards the inlet opening;
a manual control connected to said slide and actuatable for moving said slide from said operating position to said rest position against the biasing of said slide spring;
upon actuation of said manual control and movement of said slide from said operating position to said rest position, said locking device being moved from said second release position into said blocking position by said lock spring and the integrated circuit card being moved from the reading position in a direction opposite said insertion direction to said inlet opening by said control stop.

5,202,552
DATA WITH PERIMETER IDENTIFICATION TAG

Warren D. Little, and Peter J. M. Baker, both of Victoria, Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Filed Apr. 22, 1991, Ser. No. 688,400
Int. Cl.[5] G06K *19/06, 9/00*
U.S. Cl. 235—494 18 Claims



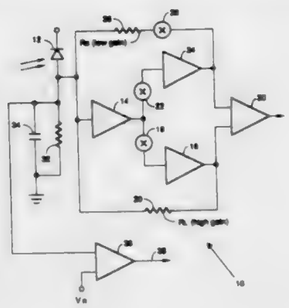
1. A data tag comprising means defining a tag structure including a body means having machine readable indicia providing a plurality of data cells and a plurality of border cells defining a cell arrangement, said border cells being on the side of said data cells remote from a central portion of said cell arrangement and cooperating with adjoining of said data cells to define a reference perimeter for said tag, said perimeter extending along at least 2 abutting sides of said data cells, each of said data cells being one of a first set of cells each of which has a first identifying feature or one of a second set of cells each having a second identifying feature clearly distinguishable from the first identifying feature, each of said border cells being selected from the opposite set of said first and second sets of cells to that from which its respective said adjoining data cell was selected thereby to define said reference perimeter by the junction of said border cells and their respective adjoining data cells.

5,202,553
ENHANCED PERFORMANCE OPTICAL RECEIVER HAVING MEANS FOR SWITCHING BETWEEN HIGH AND LOW AMPLIFIER CONFIGURATIONS

William L. Geller, Foster City, Calif., assignor to Raynet Corporation, Menlo Park, Calif.

Filed Mar. 24, 1992, Ser. No. 856,800
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 A 10 Claims

1. A transimpedance front end for an optical receiver including a photodetector coupled optically to an optical fiber for receiving optical signals over the fiber and connected electrically to the front end, the front end comprising:
a buffer connected to the photodetector,
a first amplifier selectively connected to the buffer through first switching means and through first high value feedback resistor means to define a first mode low optical signal level amplifier configuration,
a second separate amplifier selectively connected to the buffer through second switching means and through second switched low value feedback resistor means to define

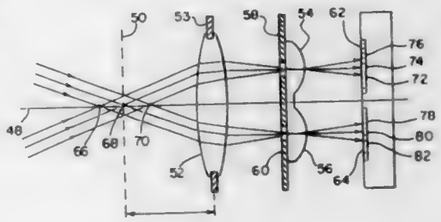


a second mode high optical signal level amplifier configuration, and
optical level sensing and switching control means connected to the photodetector for sensing an incoming optical signal level and for switching between the first and second amplifier configurations as a function thereof.

5,202,555
FOCUS DETECTING DEVICE FOR USE WITH CAMERAS WITH CORRELATION AND CONTRAST DETECTING MEANS

Tokuji Ishida, Daito, and Masataka Hamada, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 733,961, Jul. 22, 1991, Pat. No. 5,138,143, which is a continuation of Ser. No. 565,043, Aug. 8, 1990, abandoned, which is a continuation of Ser. No. 455,815, Dec. 19, 1989, Pat. No. 4,950,879, which is a continuation of Ser. No. 374,623, Jun. 29, 1989, abandoned, which is a continuation of Ser. No. 307,180, Feb. 3, 1989, abandoned, which is a continuation of Ser. No. 180,293, Apr. 11, 1988, abandoned, which is a continuation of Ser. No. 921,339, Oct. 20, 1986, abandoned, which is a continuation of Ser. No. 570,012, Jan. 10, 1984, Pat. No. 4,636,624. This application Jul. 29, 1992, Ser. No. 922,168
Claims priority, application Japan, Jan. 10, 1983, 58-2622; Jun. 23, 1983, 58-113936
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.8 3 Claims

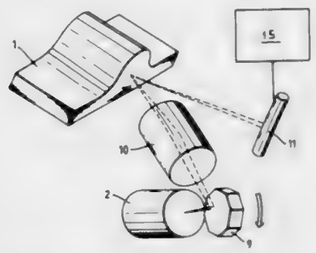


1. A focus detection system for detecting the focus condition of an objective lens, comprising:
optical means for forming displaced first and second images of an object;
first and second image signal generating means having first and second sensors positioned to receive the first and second object images and adapted to generate the first and second object image signals corresponding to the light intensity distributions of the object images of the first and second sensors, respectively;
correlation calculating means for calculating correlation between the first and second image signals while repeatedly shifting the second image signal relative to the first image signal by a given pitch to provide a correlation value for each shift;
best correlation finding means for finding a best correlation based on the plurality of correlations;
contrast detecting means for detecting a contrast of one of the object images on the first and second sensors;
discriminating means for discriminating whether the best correlation is under a predetermined value determined in accordance with the detected contrast;
detecting means for detecting a focus condition of the objective lens on the basis of the first and second image signals; and
determining means for determining whether the focus condition detected by said detecting means is reliable in accordance with the result of said discriminating means.

5,202,554
METHODS OF AND APPARATUS FOR SEPARATING AND DETECTING SHEETS

Christopher G. L. Wilton, Hampshire, and Colin A. Langstone, Portsmouth, both of England, assignors to De La Rue Systems Limited, England

Filed May 31, 1991, Ser. No. 708,690
Claims priority, application United Kingdom, Jun. 1, 1990, 9012204; Feb. 4, 1991, 9102338
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—222.2 19 Claims



1. A method of detecting sheets within a stack, the method comprising causing portions of sheets in a sheet stack to separate between the ends of the stack; causing a radiation beam to impinge on said separated portions of said sheets; and detecting the presence of respective sheets by monitoring the radiation after impingement on said stack.

5,202,556

said light source means for which said light emitting ele-

5,202,558
FLEXIBLE FIBER OPTIC PROBE FOR HIGH-PRESSURE

the pyramid-shaped recess form a line polygon having corners adjacent final bearing positions of the switching

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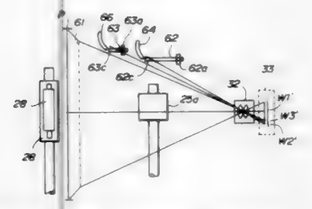
5,202,556

DOCUMENT READING APPARATUS HAVING PHOTOCONDUCTIVE DETECTOR FOR DETECTING DOCUMENTS AND DOCUMENT EDGES

Takashi Kawabata, Isehara; Shinobu Fukuoka; Daiya Teranishi, both of Atsugi; Eiji Kamijo, Isehara, and Seiji Hoshino, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 662,636
Claims priority, application Japan, Mar. 2, 1990, 2-51212; Aug. 13, 1990, 2-214578
Int. Cl.[5] H04N *1/024*
U.S. Cl. 250—208.1 14 Claims



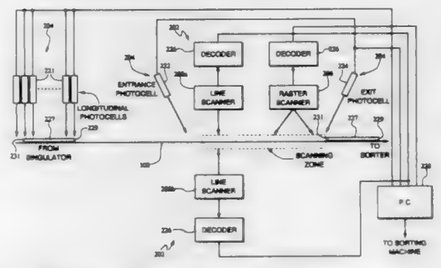
1. A document reading apparatus comprising:
a document board on which a plurality of documents are placed;
a transport path along which a document among the plurality of documents is transported to a reading position where image information is read from the document;
light source means for generating a light beam which scans a document at the reading position along a main scan line by a predetermined scan width in parallel to the main scan line, said light source means having a plurality of light emitting elements aligned in a direction parallel to the main scan line, said plurality of light emitting elements being divided into a scanning group;
photoconductive means for supplying a signal outputted when said photoconductive means is illuminated by a light beam from said light source means, said photoconductive means having a plurality of photoconductive elements aligned within a predetermined width in a direction parallel to the main scan line, said plurality of photoconductive elements of said photoconductive means extending in a direction parallel to the main scan line by a width different by which said predetermined width of said plurality of photoconductive elements is greater than said optical width on said optical means, said plurality of photoconductive elements of said photoconductive means being divided into an image reading group arranged to read said image information from said document and a document detecting group arranged to detect the presence of said document on the document board and/or a front edge or rear edge of said document in said transport path;
optical means for focusing a light beam reflected from said document at the reading position into a reduced light beam and for irradiating said reduced light beam to said photoconductive means by an optical width on said photoconductive means in a direction parallel to the main scan line;
rotatable lever means having a first end placed in said transport path and rotatable about a point outside said path wherein a second end forms a document detection means which is formed on said second end portion wherein said second end projects over an optical path of a light beam from said detection group of light emitting elements in which said light beam is directed by said optical means to said document detecting group of photoconductive elements is partially cut off by said end portion when said document detection means is not rotated by the document placed on the document board or transported along the transport path; and
on-time period control means for controlling a turn-on time period of said scanning group of light emitting elements in said light source means for which said light emitting elements of said scanning group are turned ON continuously;
wherein a transport condition of a document being placed or transported within said document reading apparatus is detected on the basis of a signal outputted from said document detecting group in said photoconductive means when a light beam supplied from said detection group in said light source means and directed to said document detecting group in said photoconductive means is partially cut off by said end portion of said document detection means, thereby allowing said on-time period control means to control said turn-on time period of said scanning group of light emitting elements in said light source means.

5,202,557

METHOD AND APPARATUS FOR DETECTING OVERLAPPING PRODUCTS IN A SINGULATED PRODUCT STREAM

Gary S. Robertson, Euless, Tex., assignor to ElectroCom Automation L.P., Arlington, Tex.

Filed Apr. 6, 1992, Ser. No. 864,433
Int. Cl.[5] G01N *9/04*
U.S. Cl. 250—223 R 34 Claims



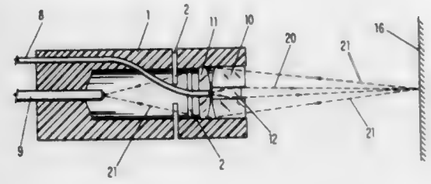
1. Apparatus for detecting overlapping products in a singulated product stream wherein each single and overlapping product in the singulated steam defines a product shadow, comprising:
transport means for moving a singulated stream of products downstream;
sensor means for generating a measurement related to the width of each product shadow in the singulated stream;
sensor means for generating a measurement related to the length of each product shadow in the singulated stream;
means for storing the measurements related to the width and length of each product shadow in the singulated stream;
means responsive to the stored measurements related to length and width for calculating an average length for previous product shadows in the singulated stream having a measured width substantially identical to the measured width of a current product shadow; and
means for comparing the measurement related to the length of the current product shadow with the calculated average length for previous product shadows in the stream having a substantially identical measured width, whereby an overlapping product is detected for the current product shadow if the measurement related to length for the current shadow exceeds the average length for previous shadows by more than a preselected amount.

5,202,558

FLEXIBLE FIBER OPTIC PROBE FOR HIGH-PRESSURE SHOCK EXPERIMENTS

Lynn M. Barker, 13229 Circulo Largo NE., Albuquerque, N. Mex. 87112

Filed Mar. 4, 1992, Ser. No. 846,526
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.21 14 Claims



1. A fiber optic probe for the instrumentation of high-pressure shock experiments, comprising
a frame to which and in which optical fibers and optical elements are attached, with adjustable flexure for the purpose of alignment of said optical fibers and said optical elements;
a specimen-illuminating optical fiber for the transmission of light from a laser, the end of said fiber being held at an optimal position in said frame;
a reflected-light optical fiber for the transmission of laser light, which has been reflected from a specimen surface whose velocity is to be measured, to light diagnostics instrumentation, the end of said reflected-light fiber being held in said frame at a point of concentration of the reflected light from said specimen surface;
one or more optical elements so disposed on or within said frame as to concentrate the light emanating from said specimen-illuminating fiber onto said specimen surface, and to concentrate light reflected from said specimen surface onto the end of said reflected-light optical fiber; and means for attaching or fixing said optical fibers and said optical elements to their assigned locations in or on said frame.

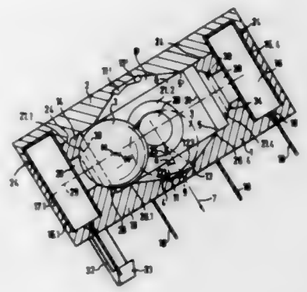
5,202,559

BALL-AND-SOCKET SWITCH FOR DETECTING AND SIGNALLING SELECTABLE INCLINATION DIRECTIONS OF A BASE PLANE

Klaus Durst, Bruchsal, Fed. Rep. of Germany, assignor to Nokia (Deutschland) GmbH, Fed. Rep. of Germany

Filed May 18, 1992, Ser. No. 884,769
Claims priority, application Fed. Rep. of Germany, May 21, 1991, 9106217[U]
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.1 9 Claims

1. A ball-and-socket switch for signalling selectable inclination directions of a base plane, comprising:
a ball-guiding socket housing containing a base plane and having a pyramid-shaped recess, the pyramid-shaped recess contains a base bearing position for a switching ball that determines a tilting angle thereof, the base plane and the pyramid-shaped recess form a line polygon having corners adjacent final bearing positions of the switching ball that define chosen directions of inclination and constitute switching positions of the ball-and-socket switch, each of the final bearing positions is a circular bearing position having gradually narrowing, rotation-symmetric recess in a side wall of the socket housing that rises from the base plane;
a switching ball mounted for movement within said ball-guiding socket housing between the base bearing position and the final bearing positions, the switching ball being



dimensionally sized where each of the rotation-symmetric recesses accommodate less than half of the switching ball and a center point of the switching ball will pass an axis of symmetry of the associated rotation-symmetric recess when the switching ball is about to come into contact with the associated corner of the line polygon; and
light transmission and light reception elements arranged at the final bearing positions of the switching ball as to be covered in a light-tight manner when the switching ball comes to bear against the appropriate final bearing position.

5,202,560

SYSTEM FOR MEASURING THE CONCENTRATION OF A GASEOUS COMPONENT BY DETECTING POSITIONS OF MODE JUMPS IN A LASER DIODE

Edmund Koch, Lübeck; Jens-Uwe Hagenah; Christoph Maurer, both of Bad Schwartau; Ulrich Heim, Lübeck; Wilfried Diekmann, Lübeck, and Johann Ottes, Bad Schwartau, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 26, 1992, Ser. No. 904,676
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1991, 4122572
Int. Cl.[5] H01J *7/24*
U.S. Cl. 250—238 4 Claims

1. A measuring system for spectroscopically measuring the concentration of a gas component in a gas sample, the gas component having absorption lines, the measuring system comprising:
laser diode means for generating laser radiation and transmitting said radiation along a beam path through the gas sample;

said laser diode means including a laser diode subject to

for primary ions which emerge from an ion source, comprising

nels, respectively, said first and second flight channels,

5,202,566

VHT RADIATION PROTECTION SYSTEM

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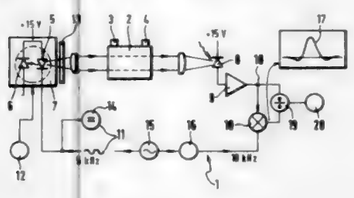
said laser diode means including a laser diode subject to mode jumps defining spectral positions and being operable by an operating current I and having a temperature-current operating point;

a thermostat unit operatively connected to said laser diode for adjusting the temperature T of said laser diode;

direct-voltage source means for supplying an operating current I to said laser diode;

detector means for receiving the radiation passed through said gas sample and supplying a detector signal in dependence upon the detected radiation;

an optical filter mounted in said beam path;



evaluation circuit means for receiving said detector signal and supplying an output signal;

control means for adjusting said temperature T and/or said operating current I of said laser diode while monitoring said output signal so as to permit the spectral positions of said mode jumps to be determined which encompass said absorption lines; and,

said control means being adapted to thereafter adjust the temperature-current operating point of said laser diode so as to locate the distance of said operating point not to be less than a fixed spacing apart from the positions of said mode jumps in the region of said absorption lines.

5,202,561

DEVICE AND METHOD FOR ANALYSING IONS OF HIGH MASS

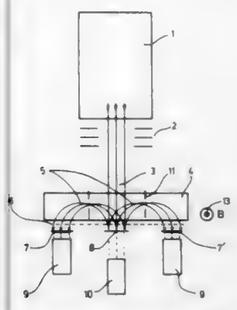
Ulrich-Peter Giessmann, Bremen; Franz Hillenkamp, Münster, and Michael Karas, Münster-Roxel, all of Fed. Rep. of Germany, assignors to Finnigan GmbH, Bremen, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 707,881

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4019005

Int. Cl.[5] B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—281 **4 Claims**



1. A detector device for analyzing ions of high mass using a time-of-flight mass spectrometer (TOF) with a focusing device for primary ions which emerge from an ion source, comprising a conversion dynode for generating secondary ions from the primary ions, means for generating an electric or magnetic field, the secondary ions passing the electric or magnetic field and being selected according to mass, including means for stopping out certain mass ranges of the secondary ions, and means for detecting the selected secondary ions.

5,202,562

HIGH SENSITIVE ELEMENT ANALYZING METHOD AND APPARATUS OF THE SAME

Masataka Koga; Toyoharu Okumoto, both of Katsuta; Masatoshi Kitagawa, Mito; Masamichi Tsukada, Minori, and Yukio Okamoto, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1991, Ser. No. 724,179

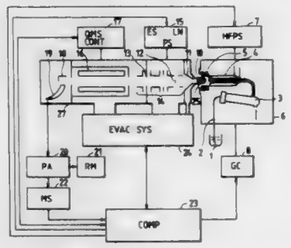
Claims priority, application Japan, Jul. 6, 1990, 2-178675

Int. Cl.[5] H01J *49/26*

U.S. Cl. 250—281 **15 Claims**

1. An analyzing method for detecting ionized elements of a sample which are transmitted through a mass spectrometer by a secondary electron multiplier and for counting the number of ionized elements reaching the secondary electron multiplier using a pulse counter so as to detect a concentration of the sample comprising the steps of:

decreasing a transmitting rate of the ionized elements through the mass spectrometer by a predetermined value



when the concentration of the ionized elements is above a measuring range,

detecting said ionized elements of said sample and ionized elements of a standard having a known concentration by said secondary electron multiplier, and

calculating said concentration of said sample based on the detected ionized elements of said standard and said sample and the known concentration of said standard.

5,202,563

TANDEM TIME-OF-FLIGHT MASS SPECTROMETER

Robert J. Cotter, and Timothy J. Cornish, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed May 16, 1991, Ser. No. 700,697

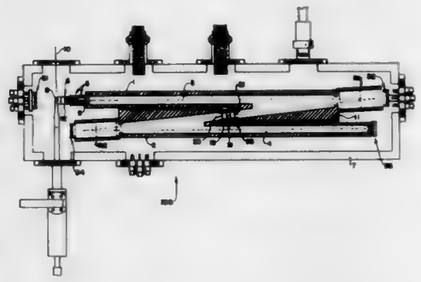
Int. Cl.[5] H01J *49/40*

U.S. Cl. 250—287 **33 Claims**

1. A tandem time-of-flight mass spectrometer comprising:

a grounded vacuum housing; and

first and second reflecting-type mass analyzers, disposed in the grounded vacuum housing, being coupled via a collision chamber and comprising first and second flight channels, respectively, said first and second flight channels, said grounded vacuum housing and said collision chamber



being electrically isolated to permit electric potential variation in relation to each other.

5,202,564

Patent Not Issued For This Number

5,202,565

RADIATION IMAGE INFORMATION RECORDING AND READING APPARATUS

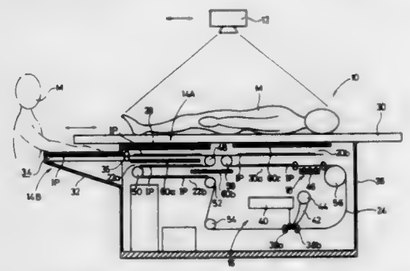
Shumpeita Torii, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1992, Ser. No. 870,304

Claims priority, application Japan, Apr. 19, 1991, 3-088598

Int. Cl.[5] G03B *42/02*

U.S. Cl. 250—327.2 **10 Claims**



1. A radiation image information recording and reading apparatus comprising:

first recording means for storing and recording radiation image information of an object on a stimulable phosphor sheet disposed via a scattered-radiation removing grid;

second recording means placed side by side with said first recording means, for recording radiation image information of an object on a stimulable phosphor sheet;

reading means for reading accelerated light obtained by irradiating the stimulable phosphor sheet with stimulating rays and generating an image signal corresponding to the radiation image information of the object from the read accelerated light;

erasing means for radiating the energy of the remaining radiation from the stimulable phosphor sheet from which the radiation image information has been read; and

a feed system for cyclically feeding the stimulable phosphor sheet among said first and second recording means, said reading means and said erasing means.

5,202,566

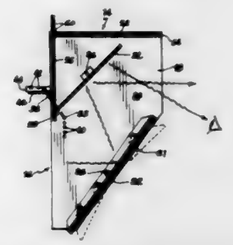
VDT RADIATION PROTECTION SYSTEM

Hani E. Chika, 4521 Park Blvd., San Diego, Calif. 92116, and Tariq J. Elias, 7358 Margerum Ave., San Diego, Calif. 92120

Filed Dec. 26, 1991, Ser. No. 813,441

Int. Cl.[5] G21F *3/00*

U.S. Cl. 250—515.1 **22 Claims**



1. A radiation reduction system which attaches to the front of a VDT comprising:

(a) a frame including an anti-glare enclosure having an opaque top wall and spaced opaque sidewalls defining an open front viewing area;

(b) mounting means for mounting said frame on a CRT;

(c) a first reflector mounted in said enclosure substantially in front of said VDT and being positioned to reflect on image from said VDT to a second reflector and a non-visible wavelength blocking means coupled with said first reflector to at least partially block radiation frequencies outside the visible spectrum;

(d) a second reflector being mounted in said enclosure and positioned to reflect an image from said first reflector to a viewing station in front of said first reflector, such that a person sitting at said viewing station can observe substantially all of an image on said VDT through said viewing area while being substantially shielded from non-visible radiation from the VDT by said first reflector and by ambient glare, by said top wall and said sidewalls.

5,202,567

OPTICAL INFORMATION TRANSMITTING DEVICE AND METHOD OF MANUFACTURING SAME

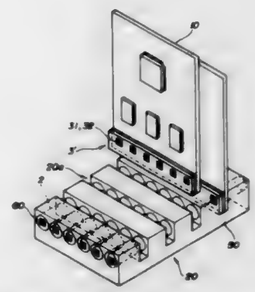
Kenjiro Hamanaka, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sep. 23, 1991, Ser. No. 764,005

Claims priority, application Japan, Sep. 21, 1990, 2-253829; Sep. 21, 1990, 2-253830; Sep. 21, 1990, 2-253831; Nov. 9, 1990, 2-304552; Nov. 9, 1990, 2-304553; Feb. 26, 1991, 3-053949; Feb. 26, 1991, 3-053950; Mar. 1, 1991, 3-059764

Int. Cl.[5] G02B *27/00*

U.S. Cl. 250—551 **5 Claims**



1. An optical information transmitting device for transmit-

ting information on a light beam emitted along an optical path

5,202,569

trode and said protective layer, and said insulating layer being provided with a pair of openings through which the

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ting information on a light beam emitted along an optical path by a light source, comprising:

an electronic circuit board having electronic circuits thereon; and

an optical input/output port mounted on said electronic circuit board and electrically connected to the electronic circuits, said optical input/output port comprising:

a glass substrate attached to said electronic circuit board;

an array of optical sensors for absorbing a portion of a light beam applied thereto from the light source and photoelectrically converting said portion of the light beam, and for transmitting the remainder of the light beam therethrough;

an array of spatial light modulators for modulating the transmittance with respect to a light beam applied thereto; and

said arrays of optical sensors and spatial light modulators being disposed on a surface of said glass substrate in superposed relationship to each other along the optical path.

5,202,568

DETERMINING THE PRESENCE, POSITION, AND INTEGRITY OF REINFORCING MOUNTING CLIPS BY UTILIZING PHOTOELECTRIC MEANS

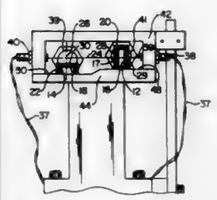
Larry Woods, Corning, Ohio, assignor to Central Ohio Plastic Corporation, Johnstown, Ohio

Filed Sep. 3, 1991, Ser. No. 753,986
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 10 Claims

1. A method for testing the proper positioning of metal clips that reinforce fastener perforations on the extending mounting arms of plastic components to be attached to a frame member during subsequent assembly comprising:

a) positioning said arms so that said perforations and clips are positioned on a flat surfaces consistent with the desired position of said arms and clips;

b) projecting a signal beam juxtaposition said arms with signal means so as to signal any interruption of such beam and indicate any distortion of such arm.



5,202,569

Patent Not Issued For This Number

5,202,570

GAS DETECTION DEVICE

Hiroaki Tanaka; Masayuki Matsuura; Hideo Tai, and Kiyoji Uehara, all of Tokyo, Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan

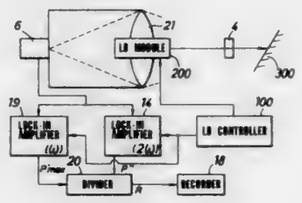
Filed Mar. 22, 1991, Ser. No. 673,886
Claims priority, application Japan, Mar. 27, 1990, 2-78498; Jul. 10, 1990, 2-183667; Sep. 18, 1990, 2-246331
Int. Cl.[5] G01N *21/59*; G01J *3/42*
U.S. Cl. 250—575 1 Claim

1. A gas detection device, aimable at a reflective surface, for detecting the presence of a predetermined gas between said detecting device and said reflective surface, said device comprising:

mounting means, having an axis;

laser means, disposed within said mounting means and along said axis, to project a coherent beam of light along said axis toward said reflective surface;

a convergent lens, having an optical axis, disposed within said mounting means, said optical axis substantially coincident with said mounting means axis;



a light detector disposed substantially at a focal point of said converging lens and responsive to said coherent beam reflected from said surface through said convergent lens;

means, responsive to the output of said light detector, for determining the presence of the gas to be detected, wherein said means for determining the presence of the gas to be detected comprises:

means for establishing a central wavelength of said coherent beam of light, said central wavelength being at a predetermined spectral line of said gas to be detected;

means for modulating the wavelength of said coherent beam of light about said central wavelength at a predetermined modulation frequency;

a first lock in amplifier, responsive to the fundamental frequency of said detected output;

a second lock in amplifier, responsive to the second harmonic frequency of said detected output;

a divider, coupled to the first lock in amplifier and second lock in amplifier, providing a signal proportional to the ratio of the fundamental and second harmonic frequencies of said beam; and

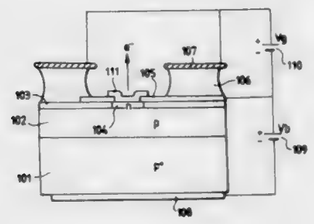
means, responsive to said divider, for determining the presence of the gas to be detected in said sample.

5,202,571

ELECTRON EMITTING DEVICE WITH DIAMOND

Keiji Hirabayashi; Noriko Kurihara, both of Tokyo; Takeo Tsukamoto, Atsugi; Nobuo Watanabe, Gotenba, and Masahiko Okunuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,476
Claims priority, application Japan, Jul. 6, 1990, 2-177443; Jul. 6, 1990, 2-177444
Int. Cl.[5] H01L *29/161*
U.S. Cl. 257—10 31 Claims



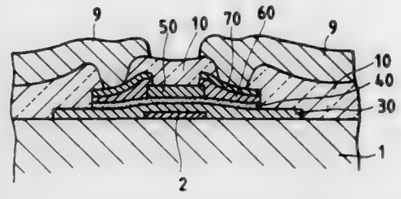
1. An electron emitting device provided with a p-semiconductor layer formed on a semiconductor substrate, wherein said p-semiconductor layer is composed of a diamond layer.

5,202,572

THIN FILM TRANSISTOR

Kenichi Kobayashi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 528,912, May 29, 1990, abandoned, which is a continuation of Ser. No. 410,094, Sep. 20, 1989, abandoned. This application Jan. 23, 1992, Ser. No. 826,636
Claims priority, application Japan, Sep. 21, 1988, 63-234711
Int. Cl.[5] H01L *29/784*
U.S. Cl. 257—60 2 Claims



1. In a thin-film transistor comprising an insulating substrate, a gate electrode formed on the substrate, a gate insulating layer covering the gate electrode, a first semiconductor layer formed on the gate insulating layer, and source and drain electrodes electrically connected to the first semiconductor layer, the improvement comprising:

a protective layer formed on the first semiconductor layer above the gate electrode;

an insulating layer interposed between the source and drain electrodes and the first semiconductor layer, said insulating layer having a portion which overlies said gate electrode and said protective layer, and said insulating layer being provided with a pair of openings through which the source and drain electrodes are electrically connected to the first semiconductor layer; and

source and drain electrical connection members disposed between said insulating layer and the first semiconductor layer, for electrically connecting the source and drain electrodes to the first semiconductor layer;

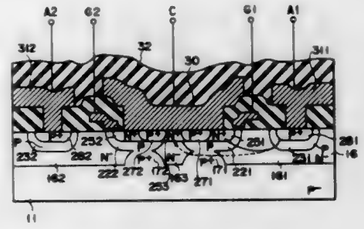
wherein each said electrical connection member comprises a second semiconductor layer containing p-type or n-type impurity atoms and formed on the first semiconductor layer, and a diffusion preventive layer disposed between said second semiconductor layer and both said source and drain electrodes and said insulating layer for preventing metal constituting the source and drain electrodes from diffusing into said second semiconductor layer; said second semiconductor layer and said diffusion preventive layer partially overlap said protective layer; said insulating layer partially overlaps said second semiconductor layer and said diffusion preventive layer; and said source and drain electrodes overlie said insulating layer.

5,202,573

DUAL ANODE MOS SCR WITH ANTI CROSSTALK COLLECTING REGION

Koji Shirai, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

PCT No. PCT/JP90/01295, § 371 Date May 21, 1991, § 102(e) Date May 21, 1991, PCT Pub. No. WO91/05372, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 5, 1990, Ser. No. 689,743
Claims priority, application Japan, Oct. 6, 1989, 1-261347
Int. Cl.[5] H01L *29/74*, *29/78*
U.S. Cl. 257—140 9 Claims



1. An integrated circuit device comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of a second conductivity type on said semiconductor substrate of the first conductivity type;

a pair of first impurity regions in said semiconductor layer extending from a surface of said semiconductor layer to said semiconductor substrate, which pair of first impurity regions divide said semiconductor layer into first and second side element regions and a central island region;

a first main layer comprising a first high-concentration region of the second conductivity type in a surface region of said island region of said semiconductor layer, second high-concentration regions of the first conductivity type in surface regions of said first impurity regions in contact with both sides of said first high-concentration region of the second conductivity type, third high-concentration regions of the second conductivity type in the surface regions of said first impurity regions in contact with said second high-concentration regions;

a first main electrode on a surface of said first main layer;

second impurity regions of the first conductivity type on

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LEADFRAME HAVING A PARTICULAR DAM BAR

a current output terminal,

a current input terminal between the signal input terminal

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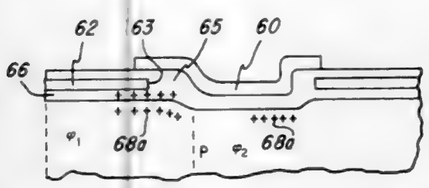
second impurity regions of the first conductivity type on surface regions of said first and second element regions of said semiconductor layer of the second conductivity type;
second main electrodes in electric contact with said second impurity regions in said first and second element regions; and
gate electrodes on opposite sides of said island region on a gate insulating film and above p-n junction portions exposed on surfaces of outer peripheral portions of said first impurity regions, surfaces of said first and second element regions, and surfaces of said second impurity regions.

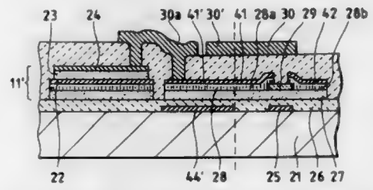
5,202,574
SEMICONDUCTOR HAVING IMPROVED INTERLEVEL CONDUCTOR INSULATION
Horng-Sen Fu, Sunnyvale, Calif.; Al F. Tasch, Jr., Richardson, and Pallab K. Chatterjee, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 614,546, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 178,827, Apr. 5, 1988, abandoned, which is a continuation of Ser. No. 928,715, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 739,751, May 31, 1985, abandoned, which is a continuation of Ser. No. 657,456, Oct. 3, 1984, abandoned, which is a continuation of Ser. No. 276,324, Jun. 22, 1981, abandoned, which is a continuation of Ser. No. 146,938, May 2, 1980, Pat. No. 4,356,040. This application Aug. 21, 1992, Ser. No. 933,606
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—215 **2 Claims**



1. A charge coupled device semiconductor structure, comprising:
(a) a first conductor of polysilicon over a semiconductor layer;
(b) a thin insulating layer between said first conductor and said semiconductor layer;
(c) a side wall insulator of silicon dioxide on a side wall of said first conductor, said side wall insulator being substantially thicker than 1.4 times the thickness of the thin insulating layer;
(d) a second conductor of polysilicon laterally adjacent said first conductor and abutting said side wall insulator; and
(e) a modified surface potential region in a surface of the semiconductor layer, said modified surface potential region being essentially uniform, whereby there is no perturbation which will impede transfer of charge in the device.

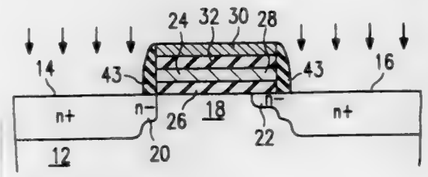
5,202,575
TFT-DRIVEN IMAGE SENSOR INCLUDING A REDUCED-SIZE CAPACITOR STRUCTURE
Kazuhiro Sakai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 10, 1991, Ser. No. 698,151
Claims priority, application Japan, May 18, 1990, 2-126975
Int. Cl.[5] H01L *27/14*
U.S. Cl. 257—292 **19 Claims**

1. An image sensor comprising:
a photoelectric conversion element formed by sequentially depositing a metal electrode, a photoconductive layer and a transparent electrode;
a thin film transistor switching element having a gate electrode, a source electrode and a drain electrode, a portion of said drain electrode being extended toward said photoelectric conversion element so that a conductive line from said transparent electrode is connected to said extended portion of said drain electrode; and



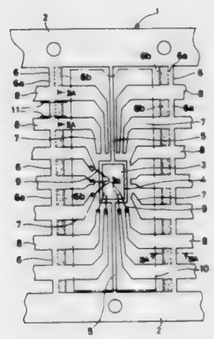
a capacitor having a first metal layer formed below said extended portion of said drain electrode, said first metal layer being separated from said drain electrode by a first insulating layer, and a second metal layer formed above said extended portion of said drain electrode, said second metal layer being separated from said drain electrode by a second insulating layer.

5,202,576
ASYMMETRICAL NON-VOLATILE MEMORY CELL, ARRAYS AND METHODS FOR FABRICATING SAME
David K. Liu, and Man Wong, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 575,105, Aug. 29, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 723,700
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—315 **10 Claims**



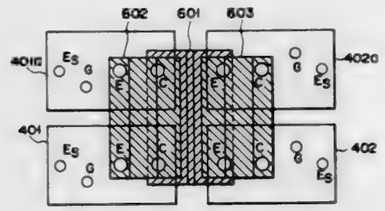
1. A non-volatile memory cell formed in a face of a layer of a semiconductor of a first conductivity type, comprising:
first and second heavily doped regions formed in said layer of semiconductor to be of a second conductivity type opposite said first conductive type, said first and second highly doped regions spaced by a channel region;
a first lightly doped region formed in said layer of a semiconductor to be of said second conductivity type, said lightly doped region formed adjacent said second heavily doped region;
a second lightly doped region formed adjacent said first heavily doped region wherein the dopant concentration of said second lightly doped region is substantially lower than the dopant concentration of said first lightly doped region;
a floating gate conductor insulatively overlying said channel area and insulatively overlying said first lightly doped region but not overlying said second lightly doped region; and
a control gate conductor capacitively coupled with said floating gate conductor.

5,202,577
LEADFRAME HAVING A PARTICULAR DAM BAR
Kikuo Ichigi; Soichiro Shimamura, and Masahiro Fuse, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1991, Ser. No. 651,144
Claims priority, application Japan, Feb. 6, 1990, 2-26346; Dec. 27, 1990, 2-407876
Int. Cl.[5] H01L *23/48, 23/54*
U.S. Cl. 257—667 **7 Claims**



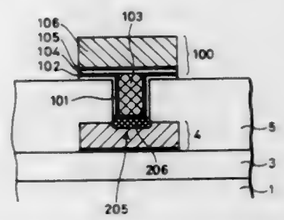
1. A leadframe comprising a lead member having an inner lead portion and an outer lead portion and a dam bar projecting from the lead member at a location between the inner lead portion and the outer lead portion, the dam bar having a first portion and a second portion, said first portion being of greater thickness than said second portion whereby said second portion has a lower cutting strength than said first portion, and said first and second portions being traversed by a cutting line that extends closely adjacent to the lead member, the extent of said first portion of the dam bar along said cutting line being less than the extent of said second portion of the dam bar along said cutting line, whereby the dam bar can be cut along said cutting line more readily than if said second portion were as thick as said first portion.

5,202,578
MODULE-TYPE SEMICONDUCTOR DEVICE OF HIGH POWER CAPACITY
Makoto Hideshima, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 579,661, Sep. 10, 1990, abandoned. This application Sep. 16, 1991, Ser. No. 760,281
Claims priority, application Japan, Sep. 11, 1989, 1-235240
Int. Cl.[5] H01L *23/28, 23/02;* **H05K** *7/11, 7/00*
U.S. Cl. 257—685 **27 Claims**



1. A subassembly for a semiconductor device of a high power capacity comprising:
a fist casing having terminals extending from a top surface including
a signal input terminal,
a current output terminal,
a current input terminal between the signal input terminal and the current output terminal, and
a power semiconductor device having a control input coupled to the signal input terminal, and a current path coupled between the current input terminal and the current output terminal;
a second casing, of substantially equivalent type of the first casing, having terminals extending from a top surface including
a signal input terminal,
a current input terminal, opposed to the current output terminal of the first casing,
a current output terminal between the signal input terminal and the current input terminal, and
a power semiconductor device having a control input coupled to the signal input terminal, and a current path coupled between the current input terminal and the current output terminal; and
means for electrically interconnecting the current output terminal of said first casing with the current input terminal of said second casing,
wherein said first and second casings are on a plane in a pair such that the current output terminal of said first casing and current input terminal of said second casing are in proximity, and opposed to each other.

5,202,579
SEMICONDUCTOR DEVICE HAVING MULTILAYER INTERCONNECTION STRUCTURE
Hiroyuki Fujii, and Shigeru Harada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 21, 1992, Ser. No. 822,284
Claims priority, application Japan, Jan. 30, 1991, 3-9547
Int. Cl.[5] H01L *23/485, 29/460, 29/540*
U.S. Cl. 257—751 **5 Claims**



1. A semiconductor device having a multilayer interconnection structure, comprising:
first aluminum interconnection;
an interlayer insulating film covering said first aluminum interconnection and having a contact hole whose bottom surface is the surface of said first aluminum interconnection;
a first titanium film formed on said interlayer insulating film and on the inner surface of said contact hole;
a first titanium compound film formed on said first titanium film;
a tungsten plug buried in said contact hole with said first titanium film and said first titanium compound film interposed therebetween;
a second titanium film formed on said tungsten plug and on said first titanium compound film;
a second titanium compound film formed on said second titanium film; and second aluminum interconnection formed on said second titanium compound film.

5,202,580
IMAGE SHIFT FOR AUTOMOBILE

control circuit is designed to accommodate windshield wipers

said appliance, said switch connected to said electrical components for disabling operation of said components

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5,202,584
HIGH ENERGY DISSIPATION HARMONIC FILTER

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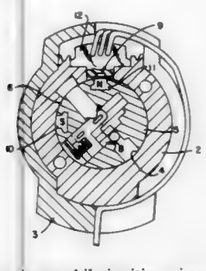
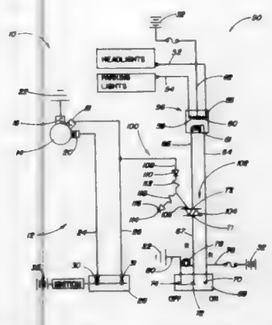
5,202,580
ANTI-TAMPERING MAGNET FOR AUTOMOBILE IGNITION LOCK
David Janssen, Whitefish Bay, Wis., assignor to Briggs & Stratton, Wauwatosa, Wis.
Filed Nov. 1, 1990, Ser. No. 607,583
Int. Cl.[5] E05B 17/20, 47/00; B60R 25/04
U.S. Cl. 307—10.3 6 Claims



4. A lock for an automobile ignition circuit, comprising;
a hollow sleeve defining a cylindrical inner surface;
cylinder member rotatably mounted within said sleeve and having a cylindrical outer surface defining a cylindrical interface with the inner surface of said sleeve, said cylinder member having a keyway therein for receiving a key used to rotate said cylinder between off and start positions;
sensor means on said sleeve for detecting when said cylinder member is rotated to its start position;
means on said cylinder member for activating said sensor means when said cylinder member is rotated to its start position; and
means on said cylinder member for disabling said sensor means when said cylinder member is in its off position,
wherein said sensor means is a magnetically responsive sensor and said activating means and disabling means are magnets, and
wherein said magnet of said disabling means is located directly adjacent to said magnetically responsive sensor when said cylinder member is in its off position.

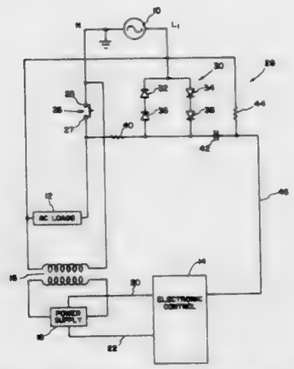
5,202,581
WINDSHIELD WIPER AND HEADLIGHT CONTROL CIRCUIT
John T. Moore, 102 Barden Dr., Havelock, N.C. 28532
Filed Dec. 11, 1991, Ser. No. 804,678
Int. Cl.[5] B60Q 1/08; B60L 1/14
U.S. Cl. 307—10.8 6 Claims



1. A windshield wiper headlight control system for automatically actuating the headlights of a vehicle in response to the windshield wipers being turned on and wherein the headlight control circuit is designed to accommodate windshield wipers circuits of different polarity, the control circuit comprising:
(a) a windshield wiper circuit having a wiper switch and adapted to provide a light actuating signal in response to the windshield wiper circuit being actuated, the light actuating signal being either a positive voltage signal or a ground voltage signal depending on the polarity of the windshield wiper circuit;
(b) a headlight circuit having a headlight switch; and
(c) a latching circuit connected between the windshield wiper circuit and the headlight circuit for actuating the headlight circuit in response to the closing of the windshield wiper switch and maintaining the headlight circuit in an "on" stage independently of the "on-off" state of the windshield wiper circuit, and wherein the latching circuit is reversible and adapted to function and receive the light actuating signal, the latching circuit comprising:
(1) an actuating gate;
(2) a positive actuating lead connected to the actuating gate for transmitting a positive voltage signal from the windshield wiper circuit to the actuating gate and actuating the latching circuit, the positive actuating lead including means for prohibiting the transfer of a ground voltage signal from the windshield wiper circuit to the actuating gate;
(3) a ground actuating lead connected to the actuating gate for transmitting a ground voltage signal from the windshield wiper circuit to the actuating gate and actuating the latching circuit, the ground actuating lead including means for prohibiting the transfer of a positive voltage signal from the windshield wiper circuit to the actuating gate; and
(4) a reversible switch having first and second terminals connected in the latching circuit, and wherein the reversible switch is operative to conduct current in either of two orientations but wherein in each orientation the reversible switch can only be actuated in response to a single and different windshield wiper input signal, the positive or ground voltage signal, being directed to the actuating gate, thereby enabling the reversible switch to be actuated and thereby closed with either the positive voltage signal or the ground voltage signal, depending on the polarity of the windshield wiper motor, by selectively orienting the reversible switch of the latching circuit.

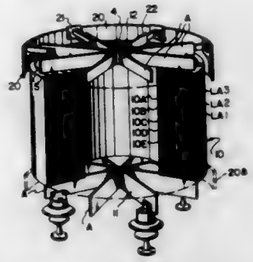
5,202,582
ELECTRONIC CONTROL FOR A DISHWASHER
Joseph M. Szynal, Center Township, Laporte County, Ind., and Kevin K. Borgerding, Benton Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jul. 25, 1991, Ser. No. 735,786
Int. Cl.[5] H02J 3/00
U.S. Cl. 307—39 7 Claims

1. A control circuit for an appliance, said appliance including a cabinet having an access opening therein for providing access to the interior of said cabinet, an access door movable between open and closed positions for selectively opening and closing said access opening, and electrical components for performing a plurality of operations, said appliance adapted to be connected to a source of electric power, said source of power having a grounded side and an ungrounded side, said circuit comprising:
a power supply including means for connection to the source of electric power, and including means for electrically isolating an output side of said power supply from the source of electric power;
a microprocessor connected to said power supply, said microprocessor including means for controlling said appliance during a cycle of operations;
a door switch including means for mounting said switch on said appliance, said switch connected to said electrical components for disabling operation of said components when said door is in the open position and for enabling operation of said components when said door is in the closed position, said switch including only two contacts and means for bridging said contacts, one of said contacts being connected to the grounded side of the source of electric power;



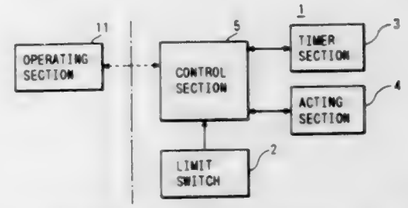
conditioning circuit means for conditioning a voltage signal and including means for connection to the ungrounded side of the source of electric power and connected to the other of said switch contacts and to said microprocessor for providing an indication input to said microprocessor regarding the condition of said door switch.

5,202,584
HIGH ENERGY DISSIPATION HARMONIC FILTER REACTOR
Patrick E. Burke, North York, Canada, and Norbert Peway, Gressen, Fed. Rep. of Germany, assignors to BBA Canada Limited, Scarborough, Canada
Filed Aug. 30, 1991, Ser. No. 753,050
Int. Cl.[5] H02J 3/01; H03H 7/09
U.S. Cl. 307—105 22 Claims

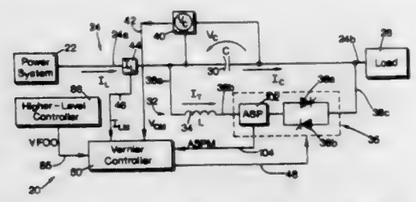


7. A filter arrangement, for a power transmission system having a power system operating frequency, comprising an LC circuit wherein the inductor of said LC circuit is an air core reactor having a resistance element operative solely by direct electromagnetic coupling with coil windings of said reactor for lowering the quality factor Q of the reactor at a selected frequency or band of frequencies higher than said power system operating frequency, said resistance element conductively insulated from the inductor.

5,202,585
ELECTRONIC DEVICE INCLUDING IMPROVED CONNECTION DEVICE
Yoshio Aoyagi, and Mayumi Satoh, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 605,328, Oct. 30, 1990, abandoned.
This application Jun. 22, 1992, Ser. No. 900,788
Claims priority, application Japan, Mar. 9, 1990, 2-56602
Int. Cl.[5] H01H 7/00; H04B 1/08; B60R 11/02
U.S. Cl. 307—116 5 Claims



1. An electronic device having an operating section which has a plurality of input keys and which is detachably connected to a body of said electronic device in such a manner that said operating section is electrically connected to said body, characterized in that
said body comprises:
connection detecting means for detecting the connection of said operating section to said body and for outputting a connection detection signal when such connection has been detected; and
control means responsive to said connection detection signal for making the electrical connection between said body and said operating section effective a predetermined period of time after said connection detection means provides said connection detection signal, for preventing the elec-



1. A method of controlling a thyristor controlled series capacitor system having a capacitor in series with a substantially inductive transmission line, and a thyristor switched inductive commutating circuit in parallel with the capacitor, the method comprising the steps of:
monitoring a capacitor voltage across the capacitor;
monitoring a line current flowing through the transmission line;
predicting an upcoming firing time from the monitored capacitor voltage;
switching the commutating circuit to conduct a thyristor current pulse therethrough; and
synchronizing the switching step to switch at the predicted upcoming firing time using the monitored line current.

trical connection between said operating section and said body from being accidently operated while said operating

node, said inverter input receiving said output signal from said intermediate node, and said inverter output providing

5,202,589
APPARATUS FOR DETECTING THE CONDITION OF

5,202,590
SUBTHRESHOLD SENSE CIRCUIT FOR CLAMPING AN

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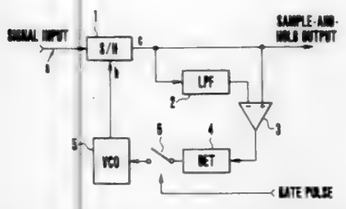
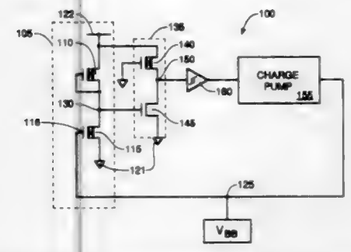
trical connection between said operating section and said body from being accidently operated while said operating section is being connected to said body.

5,202,586
SAMPLE-AND-HOLD CIRCUIT
Masashi Hori, and Tsutomu Takayama, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 15, 1991, Ser. No. 792,440
Claims priority, application Japan, Nov. 20, 1990, 2-312924
Int. Cl.[5] H03K *5/153;* **H03F** *1/30*
U.S. Cl. 307—352 **19 Claims**



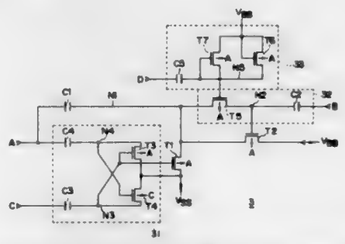
1. A sample-and-hold circuit for sampling and holding a given input signal and for outputting a sampled and held signal, comprising:
a) sample-and-hold means for sampling and holding the input signal according to a sample-and-hold clock signal input thereto and providing an output signal;
b) detection means for detecting presence of a pulse leak component in said output signal of said sample-and-hold means and providing a detection signal indicative of an amount of said pulse leak component; and
c) control means responsive to said detection signal for controlling a phase of the sample-and-hold clock signal.

5,202,587
MOSFET GATE SUBSTRATE BIAS SENSOR
Loren L. McLaury, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Dec. 20, 1990, Ser. No. 633,716
Int. Cl.[5] H03K *3/01, 5/13*
U.S. Cl. 307—296.2 **22 Claims**



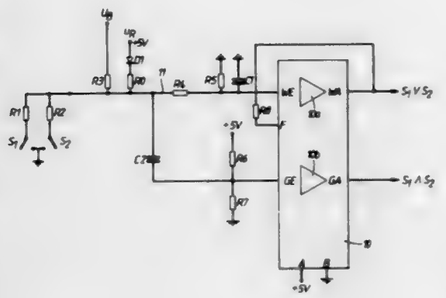
1. A low current substrate bias generator for regulating the magnitude of a desired potential of a substrate layer in an integrated circuit, comprising:
a) a bias node coupled to the substrate layer;
b) an intermediate node for providing an output signal;
c) a sense element coupled between a reference node and said intermediate node, said sense element electrically connected to said bias node at a minimal current draw control input, and providing said output signal in response to the potential of the substrate layer at the bias node;
d) an inverter having an inverter input and an inverter output, said inverter input being coupled to the intermediate node, said inverter input receiving said output signal from said intermediate node, and said inverter output providing a control signal; and
e) a charge pump capable of affecting the potential of the substrate layer and having a charge pump input coupled to the inverter output and a charge pump output coupled to said bias node, said charge pump input receiving said control signal, said control signal capable of activating and deactivating said charge pump, thereby providing the desired potential to the substrate layer.

5,202,588
SUBSTRATE BIAS CIRCUIT
Ryosuke Matsuo, and Masaru Koyanagi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 29, 1992, Ser. No. 827,267
Claims priority, application Japan, Jan. 29, 1991, 3-28106
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—296.2 **5 Claims**



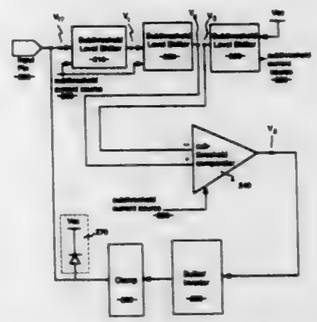
1. A substrate bias circuit comprising: an oscillation circuit oscillating at a predetermined frequency;
a control signal generation circuit operative to generate a control signal for changing, on the basis of an output from said oscillation circuit, a substrate potential in a direction to ensure a threshold level of a transistor so that it becomes greater; and
a charge pump circuit including a capacitor and operative in response to said control signal to control the charge and discharge of said capacitor by to thereby change said substrate potential at two stages;
wherein said charge pump circuit comprises: a capacitor series circuit comprised of said first mentioned capacitor and second capacitor connected in series through a first transistor, a second transistor for which conduction is controlled by a potential at the junction of said first transistor and said second capacitor, and operative to introduce a potential on the output terminal of said charge pump circuit to the junction of said first transistor and said first capacitor; a third transistor for introducing a potential at the junction of said first transistor and said first capacitor to a reference potential terminal; a first gate control circuit operative to control a gate voltage of said third transistor to allow said second and third transistors to be interchangeably conductive; and a second gate control circuit operative to allow said first transistor to be conductive within a time period during which said second transistor is non-conductive, to cause a change of the substrate potential of said second stage.

5,202,589
APPARATUS FOR DETECTING THE CONDITION OF SWITCHES IN ONE TRANSMISSION LINE
Klaus Hüser, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/EP88/00533, § 371 Date Sep. 13, 1990, § 102(e) Date Sep. 13, 1990, PCT Pub. No. WO89/12928, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 16, 1988, Ser. No. 549,009
Int. Cl.[5] H03K *5/153, 5/159*
U.S. Cl. 307—350 **17 Claims**



1. Apparatus having two external sensors in the form of a first switch device (S1) and a second switch device (S2), each responding to external influences by shifting between a closed switch condition and an pen switch condition,
including means for obtaining two binary output signals which together indicate the switch conditions of both of said switch devices using only a single analog transmission line (11) to which said first and second switch devices (S1, S2) are connected, in parallel, via respective resistances (R1, R2),
said means including first and second trigger switching devices (10*a*, 10*b*) having respective inputs (WE, GE) which are connected to the transmission line, and respective outputs (WA, GA) which provide said binary output signals,
means for applying a reference voltage (UR) to the inputs of said trigger switching devices (10*a*, 10*b*), means for setting the threshold of the two trigger switching devices (10*a*, 10*b*), and
a differentiating network (C2, R6, R7),
wherein
the input (WE) of said first rigger switching device is connected directly to said single analog transmission line (11);
the input (GE) of said second trigger switching device is connected via said differentiating network to said single analog transmission line (11);
said second trigger switching device also has a control or feedback input (F) which is connected to the output (WA) of the first trigger switching device (10*a*) to ensure that the second trigger switching device (10*b*) only switches when the binary output signal of the first rigger switching device is low;
whereby the binary output signal of the first triger switching device indicates when either of said sensors (S1, S2) is in a closed switch condition, and the binary output signal of said second trigger switching device indicates when both of said sensors (S1, S2) are in a closed switch condition, said two binary output signals thereby together defining the respective switch conditions of both sensors without any additional analog-to-digital conversion circuitry.

5,202,590
SUBTHRESHOLD SENSE CIRCUIT FOR CLAMPING AN INJECTED CURRENT
Carl F. Liepold, Mesa, and James T. Doyle, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.
Filed Nov. 6, 1991, Ser. No. 788,491
Int. Cl.[5] H03K *5/153, 5/08;* **H03B** *1/04*
U.S. Cl. 307—362 **11 Claims**



1. A subthreshold comparator for detecting a voltage difference between an input voltage and a subthreshold voltage, comprising:
subthreshold current source means for generating a subthreshold current;
comparator means coupled to said subthreshold current source means to be driven by said subthreshold current, said comparator means comparing said input voltage with said subthreshold voltage, said comparator means being turned on when said input voltage exceeds said subthreshold voltage, said comparator means comprising:
first and second FETs having their gates connected together, said gates of said first and second FETs being coupled to the source of said first FET;
third and fourth FETs having their sources connected together, the drain of said third FET being coupled to the source of said first FET, the drain of said fourth FET being coupled to the source of said second FET to form an output node, the gates of said third and fourth FETs being first and second input nodes to receive said input and subthreshold voltages, respectively, said output node being pulled up when said first input node has a voltage above said second input node; and
fifth FET having its drain coupled to the sources of said third and fourth FETs, said fifth FET being driven by said subthreshold current from said subthreshold current source means such that said subthreshold current drives said fifth FET in the linear region, wherein the drain current through said fifth FET is linearly proportional to its drain voltage.

5,202,591
DYNAMIC CIRCUIT DISGUISE FOR MICROELECTRONIC INTEGRATED DIGITAL LOGIC CIRCUITS
Robert H. Walden, Newbury Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 9, 1991, Ser. No. 742,799
Int. Cl.[5] H03K *17/16, 19/20*
U.S. Cl. 307—450 **13 Claims**

1. A microelectric integrated digital logic circuit, comprising:
at least one input terminal;
an output terminal;
a first microelectric digital logic switching element having a first maximum switching speed which is higher than a

predetermined operating switching speed at which the circuit is designed to operate; and

and outputting an inverted signal in parallel to the input signal;

5,202,594
LOW POWER LEVEL CONVERTER

a yoke member composed of a central portion, upper/lower fringes and left/right fringes forming magnetic paths;

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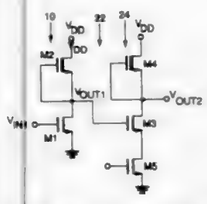
predetermined operating switching speed at which the circuit is designed to operate; and

a second microelectric digital logic switching element which is connected with the first switching element to provide a predetermined logical function between said at least one input terminal and said output terminal and has a second maximum switching speed which is lower than the operating switching speed and higher than a predetermined



maximum test switching speed at which the circuit is capable of being tested;

the first and second switching elements both switching at switching speeds lower than the test switching speed, and only the first switching element switching at the operating switching speed, such that the circuit operates differently at the test switching speed than at the operating switching speed.

5,202,592

PROGRAMMABLE LOGIC DEVICE

Masato Yoneda, Ichihara, and Hisaya Keida, Chiba, both of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

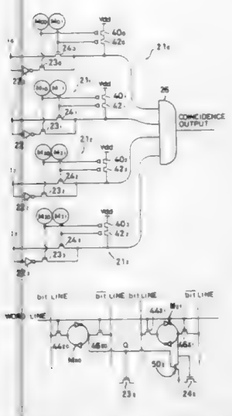
PCT No. PCT/JP90/01597, § 371 Date Sep. 11, 1991, § 102(e) Date Sep. 11, 1991, PCT Pub. No. WO91/09468, PCT Pub. Date Jun. 27, 1991

PCT Filed Dec. 7, 1990, Ser. No. 741,466

Claims priority, application Japan, Dec. 8, 1989, 1-319624

Int. Cl.[5] H03K *19/094, 14/177*

U.S. Cl. 307—465 **18 Claims**



1. A programmable logic device, comprising at least one logic circuit, each logic circuit comprising a coincidence detector and a plurality of input signal selectors connected to the coincidence detector, each of the plurality of selectors having an input signal having a logic level, and selectively outputting an output signal to the coincidence detector, each of the plurality of selectors comprising:

an inverter for inverting the logic level of the input signal and outputting an inverted signal in parallel to the input signal;

a non-inverted switching element for selectively outputting the input signal to a common output line in response to a first memory signal;

an inverted switching element for selectively outputting the inverted signal to the common output line in response to a second memory signal;

a first memory cell for outputting the first memory signal;

a second memory cell for outputting the second memory signal, wherein at least one of the plurality of selectors further comprises a first switching element and a second switching element, connected in series between an input terminal having a predetermined signal and the common output line, for selectively outputting as the output signal one of the predetermined signal, the input signal and the inverted signal in response to the first and second memory signals; and

means for forcing, when one of the first and second memory cells outputs its memory signal having one of a high logic level and a low logic level, the other of the first and second memory cells to output its memory signal having the other of the high and low logic levels.

5,202,593

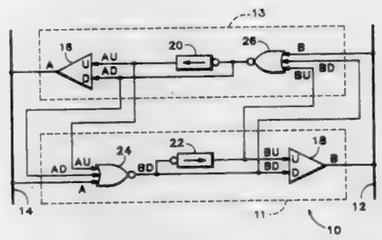
BI-DIRECTIONAL BUS REPEATER

Thomas B. Huang, San Jose, Calif.; Yih-Chyun Jenq, Lake Oswego, and Keith Lofstrom, Hillsboro, both of Oreg., assignors to I-Cube Design Systems Inc., Santa Clara and PiE Design Systems Inc., Sunnyvale, both of Calif.

Filed Oct. 30, 1991, Ser. No. 785,299

Int. Cl.[5] H03K *17/0175, 17/16*

U.S. Cl. 307—475 **7 Claims**



1. A bi-directional bus repeater for transmitting signals between first and second buses comprising:

first unidirectional bus repeater means, connected for receiving a first logic signal carried on said first bus and at least one first indicating signal, for generating a second logic signal on said second bus when said first logic signal is asserted and said first indicating signal is not asserted, and for asserting at least one second indicating signal when generating said second logic signal; and

second unidirectional bus repeater means, connected for receiving said second logic signal and said at least one second indicating signal, for generating said first logic signal when said second logic signal is asserted and said second indicating signal is not asserted, and for asserting said at least one first indicating signal when generating said first logic signal.

5,202,594

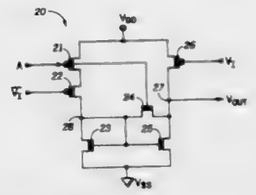
LOW POWER LEVEL CONVERTER

Ray Chang, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1992, Ser. No. 831,022

Int. Cl.[5] H03K *19/094*

U.S. Cl. 307—475 **12 Claims**



1. A low power level converter comprising:

a first transistor having a first current electrode coupled to a first power supply voltage terminal, a control electrode for receiving a control signal, and a second current electrode;

a second transistor having a first current electrode coupled to said second current electrode of said first transistor, a control electrode for receiving a first input signal, and a second current electrode;

a third transistor having a first current electrode coupled to said second current electrode of said second transistor, a control electrode coupled to said second current electrode of said second transistor, and a second current electrode coupled to a second power supply voltage terminal;

a fourth transistor having a first current electrode coupled to said first current electrode of said third transistor, a control electrode coupled to said control electrode of said first transistor for receiving said control signal, and a second current electrode;

a fifth transistor having a first current electrode coupled to said second current electrode of said fourth transistor, a control electrode coupled to said second current electrode of said second transistor, and a second current electrode coupled to said second power supply voltage terminal; and

a sixth transistor having a first current electrode coupled to said first power supply voltage terminal, a control electrode for receiving a second input signal, and a second current electrode coupled to said first current electrode of said fifth transistor and for providing an output signal.

5,202,595

YOKE MEMBER FOR VOICE COIL MOTOR

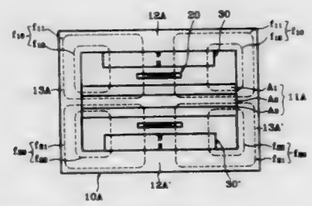
Jun-seok Sim, and Byeong-sang Yun, both of Seoul, Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Kyunggi, Rep. of Korea

Filed Dec. 31, 1991, Ser. No. 815,047

Claims priority, application Rep. of Korea, May 31, 1991, 91-9327

Int. Cl.[5] H02K *41/00*

U.S. Cl. 310—13 **15 Claims**



1. A voice coil motor comprising:

a yoke member composed of a central portion, upper/lower fringes and left/right fringes forming magnetic paths;

a moving coil movably around the central portion of said yoke member; and

permanent magnets adhered on the upper/lower fringes of said yoke member, said permanent magnets applying a magnetic field to the moving coil and generating a flux flow,

wherein at least a portion of said yoke member comprises at least two abutting members of different permeabilities arranged parallel to a direction of flux flow in the permanent magnets so as to cause reluctance lines of magnetic force being generated from said permanent magnets and flowing through said yoke member to become uniform.

2. The voice coil motor as claimed in claim 1, wherein the central portion of said yoke member is composed of two fringe members and a central member, the central member being of higher permeability than the two fringe members, so that fringe flux generated by said permanent magnets passes through the member of low permeability and central flux generated by said permanent magnets passes through the member of high permeability.

5,202,596

ELECTRIC MOTOR

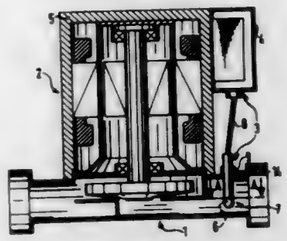
Niels D. Jensen; Thomas Blad, both of Bjerringbro, and Bjarne D. Pedersen, Hammel, all of Denmark, assignors to Grundfos International a/s, Bjerringbro, Denmark

Filed May 10, 1991, Ser. No. 698,590

Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4014918

Int. Cl.[5] H02K *5/18, 11/00, 1/00, 7/20*

U.S. Cl. 310—64 **7 Claims**



1. An electric motor comprising:

a frequency converter for rotational speed control of said motor, said frequency connecter having an input circuit, an intermediate circuit, a control circuit and a power supply circuit,

a sealed modular housing remotely disposed and thermally independent from said electric motor,

a replaceable, enlarged surface area heat transfer body in heat transferring connection with said module housing,

said power supply being disposed within said module housing,

a terminal box disposed on a motor housing of said motor, said input circuit, said intermediate circuit, and said control circuit being disposed within said terminal box, and

a connecting cable connecting said power supply with said terminal box and said motor, whereby heat generated by said power supply is dissipated at a chosen location.

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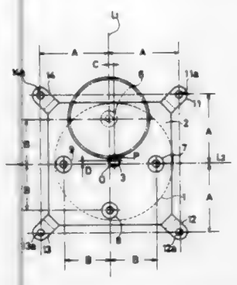
5,202,597

MOTOR WITH DECELERATING APPARATUS

Hideki Iahida, Yao; Hiroshi Kusumoto, Wakayama, and Hideo Fukuda, Nishinomiya, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1991, Ser. No. 772,331
Claims priority, application Japan, Nov. 16, 1990, 2-312150
Int. Cl.[5] H02K 7/116; F16H 3/08
U.S. Cl. 310—83 9 Claims



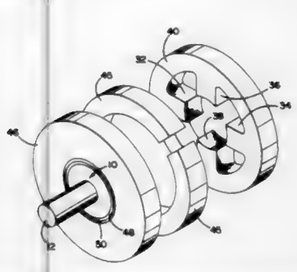
1. A decelerating apparatus for a motor with an output shaft, comprising:
a pinion gear mounted on the output shaft of the motor;
a plurality of decelerating gears for selectively engaging with said pinion gear, each of said decelerating gears being integrally formed with a rotation shaft;
means for supporting each of said decelerating gears, said supporting means comprising a plurality of selectively usable bearings; and
means for connecting the decelerating apparatus to a load, wherein an output end of said rotation shaft of each of said decelerating gears is selectively connectable to a rotating load.

5,202,598

BACK-UP BEARING FOR PERMANENT MAGNET BIASED MAGNETIC BEARING

Shin Katsumata, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 26, 1992, Ser. No. 858,055
Int. Cl.[5] H02K 7/09
U.S. Cl. 310—90.5 8 Claims



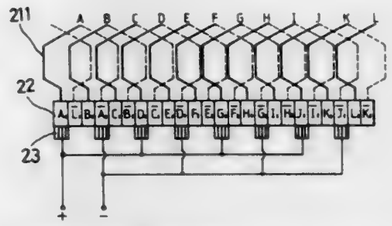
1. A permanent magnet biased magnetic bearing assembly comprising:
a rotor formed at least in part of magnetic material;
at least two diametrically opposed magnetic poles about said rotor part and terminating in ends slightly spaced from said rotor part to define a first gap:
electrical windings associated with each said pole;
a collar of magnetic material axially spaced from said poles and having an opening receiving said rotor part such that a small peripheral space exists between said opening and said rotor part;
an array of permanent magnets in magnetic conducting relation with said collar and said poles; and
a sleeve of bearing material disposed in said peripheral space to be carried by one of said collar and said rotor part and normally spaced by a second small gap from the other of said collar and said rotor part.

5,202,599

ELECTRIC MOTOR

Wen-Chung Kao, No. 416, Chung-Shan Road, Chia-Li Chen, Tainan Hsien, Taiwan

Filed May 8, 1992, Ser. No. 879,914
Int. Cl.[5] H02K 13/04
U.S. Cl. 310—234 3 Claims



1. An electric motor, comprising:
a longitudinally extended stator having a cylindrical tubular contour, said stator having a plurality of permanent magnets disposed on an inner surface thereof in angular spaced relation with respect to a central axis extending in a longitudinal direction, said plurality of permanent magnets each being separated one from another by a respective one of a plurality of silicon steel members to define a plurality of permanent magnetic poles;
an armature disposed within a central bore of said stator for rotation about said central axis, said armature including:
a. a plurality of pole segments equally spaced about said central axis;
b. a plurality of coils, each of said coils being wound on a respective one of said plurality of pole segments;
c. a commutator having a M number of conductive contact members, where M is defined by three times a number of permanent magnet poles of said stator, each of said plurality of coils being electrically coupled on opposing ends thereof to a distinct pair of said conductive contact members, said plurality of coils defining N number of coils where N equals one half M; and,
a plurality of pairs of brushes secured to said stator for electrical contact with respective pairs of said conductive contact members of said commutator, whereby a predetermined number of said plurality of coils are independently and simultaneously energized to contribute to a torque output of said motor.

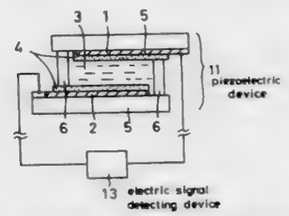
5,202,600

PIEZOELECTRIC DEVICE AND RELATED CONVERTING DEVICES

Masanori Fujita; Shinichi Okamoto, and Hirokazu Ono, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 400,612, Aug. 30, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 580,052
Claims priority, application Japan, Aug. 31, 1988, 63-217690
The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—338 3 Claims

1. A piezoelectric module comprising a ferroelectric liquid crystal panel having a first electrode; a second electrode disposed in opposing relation to said first electrode; a ferroelectric liquid crystal interposed between said first and second electrodes; and a first alignment layer formed between said ferroelectric liquid crystal and said first electrode; whereby said ferroelectric liquid crystal panel generates electric signals when a pressure is applied thereto; and electric signal detecting means coupled to said electrodes for detecting said electric



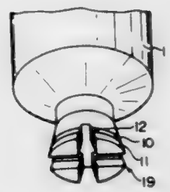
signals, said piezoelectric module further comprising a second alignment layer between said second electrode and said ferroelectric liquid crystal, said first alignment layer and said second alignment layer having homogeneous alignments that are neither parallel not anti-parallel with respect to one another.

5,202,601

SPARK PLUG FOR INTERNAL COMBUSTION ENGINE WITH RECESS IN ELECTRODE TIP

Kozo Takamura, Nagoya; Yasuyuki Sato, Kasugai, and Kiyoaki Tanaka, Numazu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 26, 1990, Ser. No. 634,351
Claims priority, application Japan, Dec. 27, 1989, 1-343737; Dec. 27, 1989, 1-343738; Jun. 5, 1990, 2-147997; Nov. 14, 1990, 2-310094
Int. Cl.[5] H01T 13/20
U.S. Cl. 313—142 33 Claims



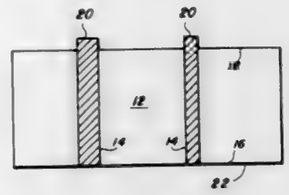
1. A spark plug for use in an internal combustion engine comprising:
a pair of electrodes each made of base metal;
a noble metal tip portion provided on one of said electrodes to define a spark discharge gap between said noble metal tip portion and the other one of said electrodes; and
recess means formed in a surface of said noble metal tip portion defining said spark discharge gap, and diametrically extending to divide said noble metal tip portion into a plurality of section,
wherein said noble metal tip portion includes a tip layer made of noble metal, and a thermal stress-relieving layer disposed between said noble metal tip layer and said one electrode, and
wherein said recess means axially extend to said one electrode.

5,202,602

METAL-GLASS COMPOSITE FIELD-EMITTING ARRAYS

Jack D. Ayers, Oakton, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 607,955, Nov. 1, 1990. This application Dec. 10, 1991, Ser. No. 804,558
Int. Cl.[5] H01J 1/30, 1/90
U.S. Cl. 313—309 8 Claims



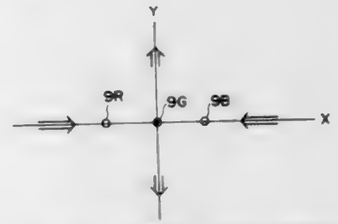
1. A field-emitting array comprising:
an insulating wafer of a material selected from the group consisting of glass, pyro-ceramic, and fine-grained polycrystalline oxide, and wherein said wafer is less than about 1.0 mm thick and has two substantially parallel surfaces;
electrically conducting filaments extending between said substantially parallel surfaces, wherein the diameter of said filaments is less than about 10 μm, and wherein said filaments are made of a material selected from the group consisting of germanium, gallium arsenide, silicon, copper, gold, silver, platinum, palladium, iron, nickel and alloys thereof, said filaments extending beyond one of said substantially parallel surfaces; and
an electron-emitting coating on the surfaces of said filaments that extends beyond said surface of said wafer, wherein said electron-emitting coating extends beyond the end of said extending filaments, and wherein said electron-emitting coating is made of a material selected from the group consisting of platinum, rhodium, iridium, osmium, rubidium, tungsten, tantalum, tantalum carbide, titanium carbide, titanium nitrate, zirconium carbide, zirconium nitride, and lanthanum hexaboride.

5,202,603

IN-LINE ELECTRON GUN FOR A COLORED CATHODE RAY

Shigeru Sugawara, Saitama, and Shinpei Koshigoe, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 17, 1991, Ser. No. 642,687
Claims priority, application Japan, Jan. 18, 1990, 2-7159; Mar. 20, 1990, 2-68236
Int. Cl.[5] H01J 29/62
U.S. Cl. 313—414 10 Claims



7. An in-line electron gun for a color cathode ray tube, comprising:
generating means for generating, accelerating, and control-

ling first, second, and third electron beams in an in-line

5,202,605

MIM COLD CATHODE ELECTRON EMISSION

a hollow focusing tube of electrically insulating material and a lamp side connected to the lamp, the lamp having a first side connected to the ballast and a second side not connected

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ling first, second, and third electron beams in an in-line arrangement;

emitting means for emitting light rays when the first, second, and third electron beams are landed thereon;

first second, and third electrodes arranged between the emitting means and the generating means,

the first electrode having a first single aperture for allowing the first, second, and third electron beams to pass therethrough, the first single aperture having a first width along the in-line arrangement and including a rectangular portion extending along the in-line arrangement and extended portions on both sides thereof,

the second electrode having a first single aperture arranged to oppose the first single aperture of the first electrode, for allowing the first, second, and third electron beams to pass therethrough, and a set of three apertures, each for allowing one of the first, second, and third electron beams to pass therethrough, respectively, the first single aperture of the second electrode having a first width substantially same as the first width of the first single aperture of the first electrode along the in-line arrangement and including a rectangular portion extending along the in-line arrangement and extended portions on both sides thereof, and

the third electrode having a set of three apertures, each arranged to oppose a corresponding aperture of the set of the second electrode, each for allowing the first, second, and third electron beams to pass therethrough, respectively; and

a pair of plate members each extending from the second electrode into the first aperture of the first electrode, the plate members each having a first width smaller than the first width of the first single aperture of the first electrode, a distance between the plate members being smaller than the first width of the first single aperture of the first electrode.

5,202,604

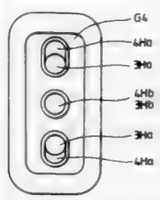
ELECTRON GUN FOR CATHODE RAY TUBE

Yong-geol Kweon, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed May 8, 1990, Ser. No. 520,217

Int. Cl.[5] H01J *29/50*

U.S. Cl. 313—414 **9 Claims**



1. A main lens of an electron gun for a cathode ray tube, comprising:

a focus electrode having two outer beam passing holes of a selected shape each outer beam passing hole having a radius; and

an anode disposed adjacent said focus electrode, said anode including two outer beam passing holes of a different shape from the outer beam passing holes of said focus electrode, each outer beam passing hole of said anode having an elongated slot with semi-circular end arcs facing one another, the radius of each semi-circular end arc being substantially identical to the radius of a respective one of the two outer beam passing holes of the focus electrode.

5,202,605

MIM COLD-CATHODE ELECTRON EMISSION ELEMENTS

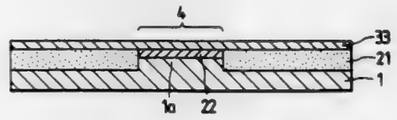
Akira Kaneko, Tokyo; Toru Kanno, Kawasaki, and Kaoru Tomii, Isehara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 31, 1989, Ser. No. 429,526

Claims priority, application Japan, Oct. 31, 1988, 63-274852; Nov. 4, 1988, 63-278702; Nov. 4, 1988, 63-278707; Dec. 22, 1988, 63-324107; Dec. 23, 1988, 63-326613

Int. Cl.[5] H01J *29/46*

U.S. Cl. 313—444 **6 Claims**



1. An electron emission element comprising an electrically conducting layer which includes an upwardly protruding portion, a first electrically insulating layer formed on said upwardly protruding portion, a second electrically insulating layer formed on a surface region of said conducting layer excluding said upwardly protruding portion, with an upper surface of said second insulating layer being co-planar with an upper surface of said first insulating layer, and a metal layer formed upon said first and second insulating layers.

5,202,606

CATHODE-RAY TUBE WITH FOCUSSING STRUCTURE AND GETTER MEANS

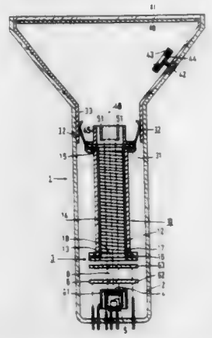
Gerardus A. H. M. Vrijssen; Willem M. Van Alphen, and Gerwim J. Goorhuis, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 541,001, Jun. 20, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 827,520

Claims priority, application Netherlands, Jun. 23, 1989, 8901587; Jan. 18, 1990, 9000117

Int. Cl.[5] H01J *29/06, 29/94*

U.S. Cl. 313—450 **10 Claims**



1. A cathode ray tube comprising an envelope having a display window bearing a luminescent screen and a neck portion containing an electron gun for producing an electron beam directed to the luminescent screen, said envelope containing getter means for producing within the envelope during a gettering operation a distribution of getter material, characterized in that:

a. the electron gun includes a focusing structure comprising a hollow focusing tube of electrically insulating material disposed about an axis, said tube having an inner surface on which a layer of material having a high electrical resistance is disposed in a predetermined pattern and having at least one open end; and

b. the cathode ray tube includes means for inhibiting the deposition of the getter material on the layer of high electrical resistance material, comprising:

(1) first means for orienting the getter means such that it deposits the getter material at a substantial distance from said at least one open end of the focusing structure; and

(2) second means for shielding the layer of high electrical resistance material against deposition thereon of the getter material, during the gettering operation.

5,202,607

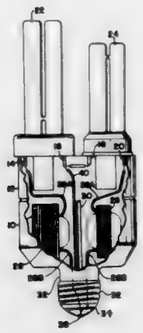
ADAPTER FOR FLUORESCENT LAMPS

Gary Broyer, 463 Stanhope Rd., Sparta, N.J. 07871, and Gregory Murphy, 287 Alexandria Dr., Hackettstown, N.J. 07840

Filed Apr. 22, 1991, Ser. No. 688,673

Int. Cl.[5] H01J *7/44;* **H05B** *41/36*

U.S. Cl. 315—58 **14 Claims**



1. An adapter for independently and selectively powering two fluorescent lamps, each of said lamps being selectively powerable either alone or together, comprising:

a case having two sockets adapted to connect to said two fluorescent lamps;

ballast means mounted in said case for inductively conveying current; and

a base mounted on said case and having first, second and third contacts, said ballast means having first and second ballast inductors, said first and said third contacts having serially connected between them said first ballast inductor and one of said sockets, the other one of said sockets being serially connected with said second ballast inductor between said second and said third contacts.

5,202,608

EMERGENCY LIGHTING SYSTEM UTILIZING IMPROVED AND RAPIDLY INSTALLABLE FLUORESCENT INVERTER

James C. Johnson, Conyers, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

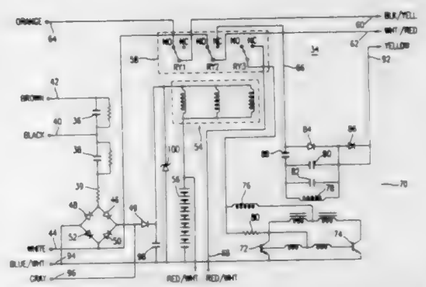
Filed Mar. 26, 1991, Ser. No. 675,165

Int. Cl.[5] H02J *9/06;* **H05B** *41/29*

U.S. Cl. 315—86 **5 Claims**

1. An emergency lighting system readily wirable to existing fluorescent lighting fixture without the necessity for cutting and striping leads on a lamp side of a previously wired fixture, the emergency lighting system having a ballast, a discharge lamp and an inverter circuit, the ballast having a primary side and a lamp side connected to the lamp, the lamp having a first side connected to the ballast and a second side not connected to the ballast in emergency mode, the inverter circuit having first and second power output leads and a lamp connection lead, comprising:

first means for connecting the first and second power output leads of the inverter circuit to the primary side of the ballast, the inverter circuit being self-driven;



second means for connecting the lamp connection lead of the inverter circuit to the second side of the lamp, installation of the inverter circuit of the emergency lighting system being simplified by reducing connections required between the inverter circuit and the lamp; and, voltage doubling means for modifying inverter output to produce either a high voltage DC output or a pulsating DC output through the lamp connection lead to the lamp.

5,202,609

FLAT CONFIGURATION IMAGE DISPLAY APPARATUS

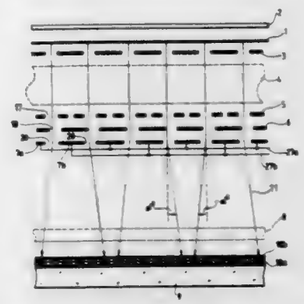
Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama, and Yoshikazu Kawauchi, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 31, 1990, Ser. No. 473,087

Claims priority, application Japan, Feb. 1, 1989, 1-22871

Int. Cl.[5] H01J *29/70, 31/12, 31/20*

U.S. Cl. 315—366 **5 Claims**



1. In a flat configuration cathode ray tube comprising an electron beam source for producing at least one row of electron beams, a fluorescent material layer formed in a predetermined pattern on a surface of a transparent plate, and a plurality of electrode means successively disposed between said electron beam source and said fluorescent material layer, said plurality of electrode means comprising horizontal deflection electrode means defining a first plurality of vertically extending apertures for passing respective ones of said electrode beams, and at least one other electrode means, located upstream from said horizontal deflection electrode means and defining a second plurality of vertically extending apertures for

passing said respective electron beams, the improvement wherein:

servo motor shafts are to be synchronously controlled on the basis of the synchronization data provided by said

tor, a differential amplifier, a variable speed setting circuit for generating reference pulses, a speed control circuit and

and outputs a first binary word of a first number of binary digits;

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passing said respective electron beams, the improvement wherein:

a central axis of each of said first plurality of vertically extending apertures of the horizontal deflection electrode means and a central axis of a corresponding one of said second plurality of vertically extending apertures of said at least one other electrode means being mutually separated by a predetermined distance, and

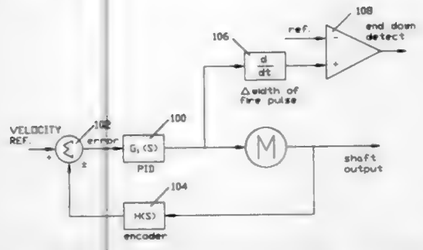
further comprising trajectory correction voltage generating means for supplying to said at least one other electrode means a trajectory correction voltage which varies in amplitude during each vertical scanning interval, for dynamically correcting respective beam landing positions of said electron beams during said each vertical scanning interval.

5,202,610

METHOD AND APPARATUS FOR YARN END-DOWN DETECTION IN A TEXTILE YARN WINDING MACHINE

Jesse C. Frye, Cliftside, N.C., and Scott G. Bradshaw, Chester, La., assignors to Platt Saco Lowell, Greenville, S.C.

Filed Aug. 30, 1991, Ser. No. 752,379
Int. Cl.[5] B65H *59/38*
U.S. Cl. 318—6 **8 Claims**



1. In textile yarn winding apparatus having a commutated DC motor for rotatably driving a yarn package support member to wind a yarn strand thereon, and closed-loop motor control means for maintaining a desired velocity of the motor and for signaling commutation of the phase of the motor during yarn winding operations; the improvement therein comprising means for monitoring the conduction angles delivered to commutate the phase windings of the motor, means for detecting a sudden minimum preestablished decrease in the monitored conduction angles indicative of breakage of a yarn strand being wound on the yarn package support member, and means for generating a control signal in response to said sudden decrease in conduction angle indicative of yarn strand breakage.

5,202,611

SYNCHRONIZATION CONTROL SYSTEM FOR SERVO MOTORS

Shinichiro Uehara, Higashimurayama, and Yasuhiro Yuasa, Fuchu, both of Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 565,268
Claims priority, application Japan, Aug. 24, 1989, 1-216136
Int. Cl.[5] H02P *5/46*
U.S. Cl. 318—85 **6 Claims**

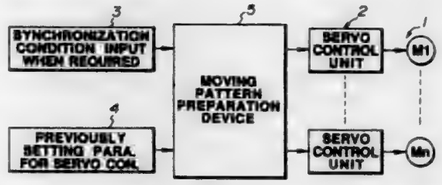
1. A synchronization control system for servo motors comprising:

a plurality of servo motors and servo control units for driving a plurality of shafts;

input means for providing synchronization data which determines whether any servo motors of the respective shafts are to be synchronously controlled;

setting means for setting parameters for servo control individually for the shafts; and

moving pattern preparation means for determining which servo motor shafts are to be synchronously controlled on the basis of the synchronization data provided by said input means and preparing a moving pattern for synchronization on the basis of the parameters for servo control with respect to each servo motor shaft to be synchronously controlled;



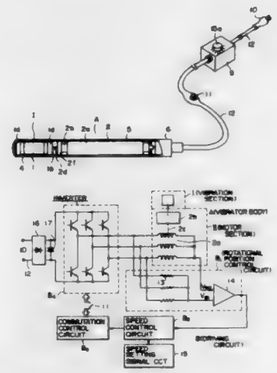
wherein positioning command data corresponding to the prepared moving pattern is supplied to the servo control unit corresponding to each shaft thereby to synchronously control the servo motor corresponding to each shaft.

5,202,612

CONCRETE VIBRATOR

Kenji Yoshida, Tokyo; Akinobu Shionoya, Musashino; Kazuo Matsushita, Ohmiya, and Isao Baba, Chino, all of Japan, assignors to Sinano Electric Co., Ltd. and Mikasa Sangyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 524,676, May 16, 1990, abandoned, which is a continuation of Ser. No. 299,269, Jan. 23, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 802,693
Claims priority, application Japan, Jan. 29, 1988, 63-17112
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—138 **5 Claims**



1. A concrete vibrator comprising,

a motor,

an eccentric pendulum, driven by the motor for effectively reducing a drop in speed of rotation of the eccentric pendulum upon immersion into a fresh concrete mass,

a cable for supplying electric power to said motor,

said motor having a permanent magnet rotor and three-phase stator windings,

a driving circuit disposed remote from said motor and pendulum provided in the cable to drive the motor by electric power and comprising components in the cable remote from the motor and pendulum sufficiently to preclude vibrations of the vibrator affecting said components,

said driven circuit components comprising, a frequency changer of a semiconductor inverter coupled to said motor, a differential amplifier, a variable speed setting circuit for generating reference pulses, a speed control circuit and a commutation control circuit connected for controlling the frequency changer to control a vibration frequency of the concrete vibrator with pulse-modulated commutation signals, a start-stop switch disposed in said cable near to the motor and pendulum connected to the inverter and the commutation control circuit for starting and stopping the vibrator, and

a neutral point of the stator windings effective to feed a neutral point potential as an input to the differential amplifier;

the neutral point potential occurring at an artificial neutral point at a stator winding input being fed as another input of the differential amplifier so that a detected voltage is obtained at an output of the differential amplifier as third harmonic voltage components of the three-phase stator windings,

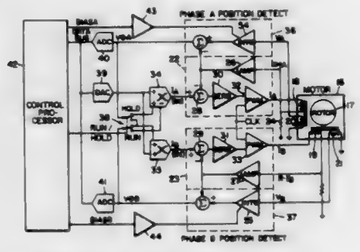
the differential amplifier being connected so that the detected voltage is compared with the reference pulses in the speed control circuit to obtain an error signal for influencing the degree of modulation of the pulse-modulated commutation signals at the commutation control circuit to reduce said error signal to zero.

5,202,613

TWO-PHASE BRUSHLESS DC MOTOR CONTROLLER

David L. Kruse, 25222 Vespucci Rd., Laguna Hills, Calif. 92653

Division of Ser. No. 706,167, May 28, 1991, Pat. No. 5,134,349.
This application May 5, 1992, Ser. No. 878,486
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 **17 Claims**



1. A control circuit comprising,

motor means with a plurality of phases;

a plurality of phase position detector circuit means connected to receive first signals form each of said phases, respectively;

a plurality of power amplifier means connected to receive second signals from each of said phases, respectively;

multiplier means connected to supply signals to respective ones of said power amplifier means as a function of the operating mode of said control circuit; and

controller means for supplying control siganls to said multiplier means to determine the operating mode of said control circuit.

5,202,614

SELF-COMMUTATING, BACK-EMF SENSING, BRUSHLESS DC MOTOR CONTROLLER

David H. Peters, Westminster, and Jeff Harth, Tustin, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Sep. 25, 1989, Ser. No. 411,712
Int. Cl.[5] H02K *29/02;* **H02P** *7/28*
U.S. Cl. 318—254 **9 Claims**

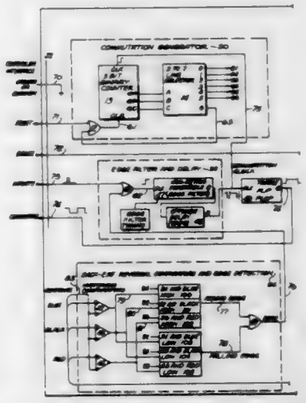
1. A circuit for commutating the voltage supply for a polyphase DC motor comprising:

a commutation generator that receives as input a first signal and outputs a first binary word of a first number of binary digits;

a commutation decoder that decodes said binary first word output of said commutation generator and generates a second binary word composed of a second number of bits;

a motor driver which receives said second binary word and outputs a plurality of drive signals on a plurality of output lines, said plurality of output lines being connected to a plurality of terminals on a controlled motor;

a transformation network attached to said plurality of output lines from said motor driver, said transformation network deriving a pseudo-reference voltage level from said plurality of output lines;



a plurality of comparator circuits for comparing the voltage level on each of said output lines with said pseudo-reference voltage level and for providing as output a second signal dependent on the comparison of said levels;

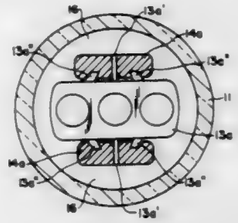
a logic circuit connected to the output of said plurality of comparators, said logic circuit deriving a third signal by combining said output of said plurality of comparators with said first binary word of said commutation generator.

5,202,615

ARC SUPPRESSING MEANS FOR CATHODE RAY TUBE

Byeong-yong An, Pusan, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Aug. 29, 1990, Ser. No. 574,217
Int. Cl.[5] H01J *29/46*
U.S. Cl. 313—456 **2 Claims**



1. An improved arc suppressing electron gun in a cathode ray tube, said cathode ray tube having an evacuated glass envelope which includes a funnel having a panel portion housing a shadow mask therein and a neck portion housing said arc suppressing electron gun therein, said electron gun comprising:

a plurality of electrodes including an anode electrode and a

charging currents at the requisite charging voltage for the

associated with two of said plurality of circuits, said first

ing an electromotive force, generated by said reactor as

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a plurality of electrodes including an anode electrode and a focusing electrode disposed adjacent to each other; and

at least one supporting bead to support said plurality of electrodes, said supporting bead having an inner surface facing said electrodes and an outer surface facing an inside surface of said neck portion;

wherein one of said plurality of electrodes includes on an outer surface thereof at least one projecting metal piece, said metal piece passing entirely through said supporting bead such that an end of said metal piece is level with the outer surface of said supporting bead so as to suppress arcing in a space region of said neck portion defined by the outer surface of said at least one supporting bead and said inside surface of said neck portion.

5,202,616

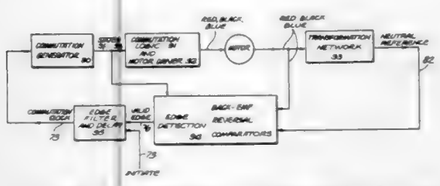
BIPOLAR OR UNIPOLAR DRIVE BACK-EMF COMMUTATION SENSING METHOD

David Peters, Westminster, and Jeff Harth, Tustin, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Continuation-in-part of Ser. No. 411,712, Sep. 25, 1989. This application Nov. 7, 1990, Ser. No. 610,103

Int. Cl.[5] H02P *07/00*

U.S. Cl. 318—254 **16 Claims**



1. A circuit for commutating a voltage supply of a motor, said voltage supply switchably coupled to said motor, comprising:

detection means coupled to said motor for detecting back-EMF voltage of said motor, said detection means providing a first output signal during unipolar and bipolar operation of said motor;

state generating means coupled to said detection means for providing a second output signal corresponding to a commutation state of said motor; and,

translating means coupled to said second output signal for translating said second output signal into motor drive signals, said motor drive signals coupled to said motor for advancing said motor to a next commutation state and for selectably operating said motor in bipolar mode and unipolar mode.

5,202,617

CHARGING STATION FOR ELECTRIC VEHICLES

Jiri K. Nor, Oakville, Canada, assignor to Norvik Technologies Inc., Mississauga, Canada

Filed Oct. 15, 1991, Ser. No. 775,319

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—2 **22 Claims**

1. A charging station for electric vehicles that are equipped with a rechargeable battery, a traction motor and a traction controller for said traction motor, said charging station comprising:

a power section, a power controller section, a power connector for connecting said power section to an electric vehicle for recharging the battery thereof, an interface between said charging station and said electric vehicle, power cables capable of carrying high charging currents from said power section through said power connector to said electric vehicle, signal cable means capable of carrying control signals between said power controller section and said electric vehicle, and lockout means;

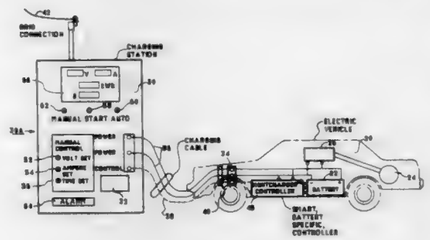
wherein said power section is capable of delivering high charging currents at the requisite charging voltage for the battery being charged within predetermined limits of power to be delivered, wherein the rate of delivery of said charging current is controllable;

wherein said power section comprises a power source, rectifying means, and means for controlling the flow of charging current to the rechargeable battery;

wherein said signal cable carries signals from said battery to said power controller that are at least indicative of the voltage of the battery at any instant in time;

wherein said power controller section and said means for controlling the flow of charging current to said rechargeable battery are each fast acting so as to be able to turn delivery of said charging current on and off in less than a few milliseconds;

means for measuring the resistance free voltage of said battery during intervals when delivery of said charging current to said battery has been turned off, whereby operation of said power controller section may be affected by said resistance free voltage, and thereby operation of said means for controlling the flow of charging current to said battery and of said charging station may be controlled as a function of said resistance free voltage of said battery;



wherein at least said power cables and said signal cable means are associated with said interface; and

wherein said lockout means is associated with said power connector, and will preclude delivery of charging current to said battery except when said lockout means is locked closed;

whereby operation of said charging station to recharge a battery in an electric vehicle is contingent upon said lockout means being locked closed so as to assure flow of charging current and control signals on their respective cables, and said operation is controlled so that the power being delivered is within said predetermined limits.

5,202,618

POWER SUPPLY SYSTEM FOR ELECTRIC CIRCUITS DIFFERENT IN OPERATING VOLTAGE

Kouichi Nishimura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 27, 1992, Ser. No. 825,998

Claims priority, application Japan, Feb. 6, 1991, 3-14630

Int. Cl.[5] G05F *1/44*

U.S. Cl. 323—270 **6 Claims**

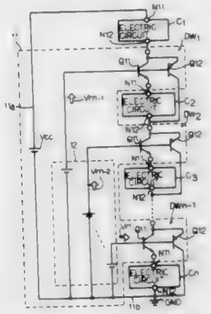
1. An electric power supply system associated with a plurality of circuits including first, second, third through nth circuits that operate at voltage levels which are different from one another, said system comprising:

a) a first power supply line coupled to a first power node of said first circuit;

b) a second power supply line coupled to a second power node of said nth circuit;

c) a plurality of step-down units including first and second step down units having similar circuit arrangement with respect to one another, each of said step-down units being

associated with two of said plurality of circuits, said first and second step-down units being associated with said first and second circuits and with said second and third circuits, respectively, said first step-down unit comprising c-1) a first step-down transistor of a first conductivity type having an emitter-and-collector current path coupled between a second power node of said first circuit and a first power node of said second circuit for supplying a first branch current taken from current flowing out from said first circuit to said first power node of said second circuit, and c-2) a second step-down transistor having a conductivity type of a base region which is different from that of said first step-down transistor, and having an emitter-and-collector current path coupled between said second power node of said first circuit and a second power node of said second circuit for enabling a second branch current taken from said current from said first circuit to said second step-down unit, said second step-down unit comprising c-3) a third step-down transistor having an emitter-and-collector current path coupled between a second power node of said second circuit and a first power node of said third circuit for supplying a third sub-branch current of said second branch current to said first power node of said third circuit and c-4) a fourth step-down transistor having a conductivity type of a base region which is different from that of said third step-down transistor, and having an emitter-and-collector current path coupled between said second power node of said second circuit and a second power node of said third circuit for enabling a fourth sub-branch current of said second sub-current to another step-down unit associated with said third circuit and another of said plurality of circuits next to said third circuit; and



d) a bias circuit producing at least a first reference voltage level supplied to the base nodes of said first and second step-down transistors.

5,202,619

CONTROL CIRCUIT FOR A SWITCHING TRANSISTOR

Shoichi Furuhata; Naoto Fujisawa, and Seiki Igarashi, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 30, 1991, Ser. No. 751,932

Claims priority, application Japan, Sep. 5, 1990, 2-235119

Int. Cl.[5] H02M *3/155*

U.S. Cl. 323—349 **20 Claims**

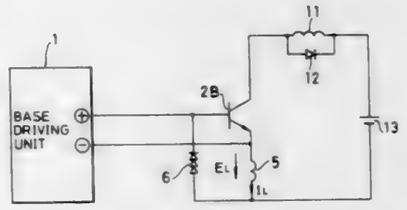
1. A control circuit for a switching transistor, comprising;

a switching transistor having a control electrode and first and second main circuit electrodes;

a reactor connected in series with the first main circuit electrode of said switching transistor to receive a main circuit current through said switching transistor;

circuit means connected between one end of said reactor which is remote from said first main electrode and said control electrode of said switching transistor for supplying an electromotive force, generated by said reactor as the main circuit current decreases when said switching transistor is turned off, to said control electrode; and

control electrode driving means, connected between said control electrode and one of said first main circuit electrode and a predetermined intermediate position on said reactor, for supplying a drive signal to said control electrode for selectively turning said switching transistor on and off.



5,202,620

APPARATUS FOR MEASURING THE TIME CONSTANT OF THE DIRECT-AXIS DAMPER OF A SYNCHRONOUS MACHINE

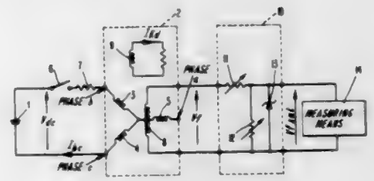
Mitsuhiro Kawamura, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,573

Claims priority, application Japan, Apr. 12, 1991, 3-106505

Int. Cl.[5] G01R *31/34*

U.S. Cl. 324—158 MG **19 Claims**



1. An apparatus for measuring the time constant of the direct-axis damper of a synchronous machine, said synchronous machine having a rotor, a first phase winding, and a second phase winding, said apparatus comprising:

means for applying a step voltage waveform across said first phase winding and said second phase winding when said rotor is at a position where a direct-axis magnetomotive force is generated by a resulting current flowing between said first phase winding and said second phase winding;

means responsively connected to said first phase winding and said second phase winding for measuring a length of a time interval between a first time when a voltage across said first phase winding and said second phase winding reaches a first prescribed value and a second time when said voltage falls to a second prescribed value.

5,202,621

within the cavity for engaging one of the leads on the

b) said chamber having a small orifice to allow said plasma

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METHOD OF TESTING INTERCONNECTIONS IN

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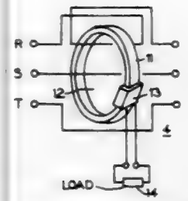
CURRENT TRANSFORMER ARRANGEMENT FOR THREE-WIRE THREE-PHASE SYSTEMS TO DETECT THE ACTUAL CURRENT VALUE FOR CONTROLLED DC LOADS POWERED VIA POWER CONVERTERS

Wilhelm Reischer, Vienna, Austria, assignor to Siemens Aktiengesellschaft Osterreich, Austria

PCT No. PCT/EP90/00261, § 371 Date Nov. 6, 1991, § 102(e) Date Nov. 6, 1991, PCT Pub. No. WO90/10940, PCT Pub. Date Sep. 20, 1990
PCT Filed Feb. 16, 1990, Ser. No. 752,565
Claims priority, application Austria, Mar. 9, 1989, A539/89
Int. Cl.[5] H01F 40/06
U.S. Cl. 323—358 3 Claims



1. A current transformer arrangement for three-wire three-phase systems to detect actual current value for controlled DC loads powered via power converters having rectifiers controlled via control pulses, comprising: a single current transformer comprising a bushing transformer with a primary side and a secondary, said bushing transformer being on a three-phase side of the three phase system and only two phase conductor wires of the three phase conductor wires are passed through the primary side of the current transformer, in order to avoid the occurrence of a zero resultant magnetic flux the two phase conductor wires pass through the current transformer with the same current flow direction and a ratio of the number of turns per unit length of 1:2; a correcting circuit means connected to said secondary side for halving a double measuring voltage occurring on the secondary side as a result of resultant double magnetic flux, and said correcting circuit means including means for deriving correction control pulses for switching the correcting circuit means in and out from the control pulses for the rectifiers of the power converter.

5,202,622

ADAPTER AND TEST FIXTURE FOR AN INTEGRATED CIRCUIT DEVICE PACKAGE

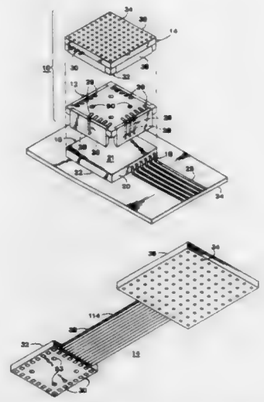
Paul A. Cole, Aloha; Bozidar Janko; Richard G. Chambers, both of Portland; Wolfgang H. Herr, Beaverton; Douglas W. Trobough, Beaverton, and Peter M. Compton, Beaverton, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Division of Ser. No. 530,141, May 24, 1990, Pat. No. 5,166,609.
This application Jun. 24, 1991, Ser. No. 720,072
Int. Cl.[5] G01R 31/02, 1/073
U.S. Cl. 324—158 F 5 Claims

1. A test fixture for probing a surface mounted integrated circuit device wherein the integrated circuit device has top and bottom surfaces and a periphery from which leads extend that are soldered directly to conductive runs on a substrate, the test fixture comprising:

a housing positionable on the integrated circuit device mounted directly on the substrate with the housing having a top and vertically depending sidewalls with inner and outer surfaces, each sidewall having a solid portion adjacent to the top with inwardly angled grooves formed in the outer surface normal to the top and a second portion wherein the grooves extend through the sidewalls forming a comb structure of alternating ribs and slots, the top and inner surface sidewalls, forming a cavity for receiving the integrated circuit device;

electrically conductive elements disposed within the housing with each element having one end being exposed within the cavity for engaging one of the leads on the surface mounted integrated circuit device and the other end forming an electrical contact pad that is exposed on the top of the housing, the electrically conductive elements fitting within the grooves of the solid portion of the sidewalls and extending through the slots in the second portion into the cavity with the ribs of the comb structure providing electrical isolation between the conductive elements;



coverplates coextensive with the outer sidewall surfaces for securing the electrically conductive elements within the housing;

means for securing the housing on the surface mounted integrated circuit; and

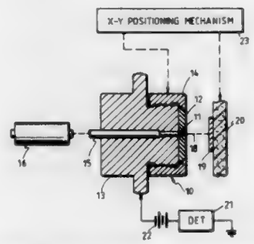
a test head assembly having electrically conductive contact pads coupled to corresponding test points being mounted on the top of the housing with the electrically conductive contact pads of the test head assembly being electrically connected to the electrical contact pads exposed on the top of the housing.

5,202,623

LASER-ACTIVATED PLASMA CHAMBER FOR NON-CONTACT TESTING

Andrew J. LePage, Hampstead, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 26, 1992, Ser. No. 842,043
Int. Cl.[5] G01R 31/02
U.S. Cl. 324—158 F 16 Claims



1. Apparatus for testing an electrical part having a plurality of conductive paths thereon, comprising:

a) means for directing a laser pulse to impinge upon gaseous contents of a small chamber having conductive walls to generate in said chamber a plasma;

b) said chamber having a small orifice to allow said plasma to exit by expansion of the plasma;

c) means for positioning said chamber to direct said plasma from said orifice toward a conductor of a part under test;

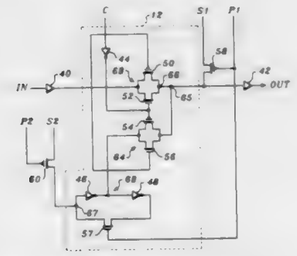
d) detector means responsive to the amount of conduction via said plasma between said conductive walls and said conductor.

5,202,624

INTERFACE BETWEEN IC OPERATIONAL CIRCUITRY FOR COUPLING TEST SIGNAL FROM INTERNAL TEST MATRIX

Tushar R. Gheewala, Cupertino, and Hector R. Sucar, Fremont, both of Calif., assignors to Cross-Check Technology, Inc., San Jose, Calif.

Filed Aug. 12, 1991, Ser. No. 744,205
Claims priority, application United Kingdom, Aug. 31, 1990, 9019021
Int. Cl.[5] G01R 31/02
U.S. Cl. 324—158 R 8 Claims



3. An integrated circuit having primary I/O pins, operational circuitry, a built in test structure, and interface apparatus, the test structure including a grid of probe lines and sense lines, a probe line and a sense line being coupled an interface apparatus, each interface apparatus coupling a primary I/O pin to the operational circuitry, an interface apparatus comprising:

a latch receiving a test signal from a sense line for latching said test signal, the latch coupled to a probe line which controls latching of the latch;

a first transmission gate coupled to the primary pin and the operational circuitry receiving an input signal from one of the primary pin or operational circuitry and receiving a control signal, for passing the input signal when the control signal activates said first transmission gate, to:

a) the operational circuitry when the input signal is received from the primary pin and

b) to the primary pin w hen the input signal is received from the operational circuitry;

a second transmission gate, receiving said control signal and coupled to said latch to receive said test signal and to said primary pin for passing said test signal when the control signal activates said second transmission gate to:

a) the operational circuitry when the test signal is received from the latch and

b) to the primary pin when the test signal is received from the operational circuitry;

wherein said control signal activates only one of said first and second transmission gates at a given time; and

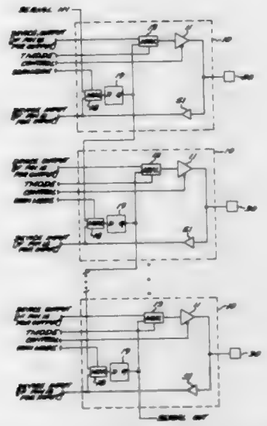
wherein said control signal is a global control signal common to each interface apparatus which is generated from the test structure.

5,202,625

METHOD OF TESTING INTERCONNECTIONS IN DIGITAL SYSTEMS BY THE USE OF BIDIRECTIONAL DRIVERS

William D. Farwell, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 3, 1991, Ser. No. 725,866
Int. Cl.[5] G06F 11/00; H04B 17/00
U.S. Cl. 324—158 R 4 Claims



2. A boundary scan circuit cell for use in a scan chain in a device having a plurality of input/output (I/O) pins wherein each scan cell is associated with a specific I/O pin, the boundary scan cell circuit comprising:

input buffering means responsive to signals applied to the associated I/O pin for providing a buffered input signal;

multiplexer for controllably outputting said buffered input signal or a scan input signal;

a scan flip-flop for storing the output of said multiplexer; and

output buffering means responsive to said scan flip-flop for driving the associated device I/O pin;

wherein for scan test purposes the scan cell is configurable for driving the signal on the associated I/O pin in accordance with the scan input stored in said scan flip-flop, and is capable of storing in said flip-flop the signal observed on its associated I/O pin, where the observed signal is provided either by said output buffering means or by the output buffering means of the scan cell of another device which is interconnected to the I/O pin.

5,202,626

ON-CHIP SELF-TEST CIRCUIT

Phuc C. Pham, Chandler, and Paul B. Soflanos, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1991, Ser. No. 782,955
Int. Cl.[5] G06F 11/00
U.S. Cl. 324—158 R 7 Claims

1. A test circuit for testing a device, the device having an input and an output, the test circuit comprising:

a voltage controlled oscillator circuit having an input and an output, said input of said voltage controlled oscillator circuit being coupled to receive a control voltage;

a multiplexer circuit having first, second and select inputs and an output, said first input of said multiplexer circuit being coupled to said output of said voltage controlled oscillator circuit, said second input of said multiplexer circuit being coupled to receive an external signal, said select input of said multiplexer circuit being coupled to receive a select control signal, and said output of said

multiplexer circuit being coupled to the input of the de-

mined number of said output vectors for each revolution

output signal with a predetermined reference value to

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THIN FILM SQUID DETECTOR INCLUDING A LOOP

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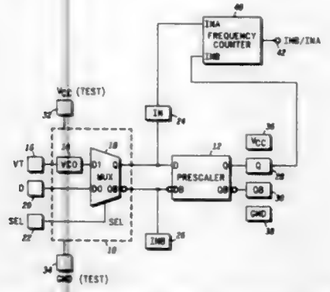
multiplexer circuit being coupled to the input of the device;

independent power supply pads coupled to the test circuit for independently rendering the test circuit operative; and

a frequency counter having first and second inputs and an output, said first input of said frequency counter being



coupled to said output of said multiplexer circuit, said second input of said frequency counter being coupled to the output of the device, said output of said frequency counter providing an output signal which is a function of the ratio of the frequencies of the signals respectively appearing at the input and the output of the device.

5,202,627

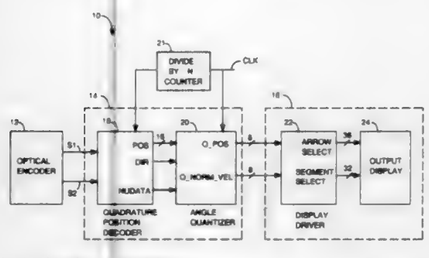
PEDALING MONITOR FOR DISPLAYING INSTANTANEOUS PEDAL VELOCITY AND POSITION

Darryl L. Sale, 3909 W. Denver St., Chandler, Ariz. 85226

Filed Jun. 17, 1991, Ser. No. 716,217

Int. Cl.[5] G01P *3/48, 3/36;* **A63B** *21/00, 23/04*

U.S. Cl. 324—166 **6 Claims**



1. A circuit, comprising:

an optical encoder for providing first and second output signals, said first and second output signals having a predetermined frequency which is a function of an angular velocity of said optical encoder;

a computing unit responsive to said first and second output signals of said optical encoder for providing first and second digital words, said first digital word being a function of a normalized angular velocity of said optical encoder, said second digital word being a function of an angular position of said optical encoder corresponding to said normalized angular velocity, said computing unit including:

a position decoder for digitally converting said first and second output signals of said optical encoder to a position word and a corresponding direction bit; and

means for quantizing said position word and said corresponding direction bit of said position decoder to an output vector having first and second components, said first component corresponding to said first digital word, said second component corresponding to said second digital word, said means for quantizing providing a predetermined number of said output vectors for each revolution of said optical encoder; and

a display unit responsive to said first and second digital words of said computing unit for displaying said normalized angular velocity of said optical encoder with respect to said corresponding angular position of said optical encoder.

5,202,628

EVALUATING CIRCUIT FOR LINEARIZING THE OUTPUT SIGNAL OF DIFFERENTIAL-CHOKE DISPLACEMENT TRANSMITTER

Johannes Locher, Stuttgart; Werner Fischer, Heimsheim, and Joerg Barth, Muehlacker-Lienzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

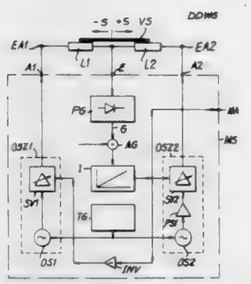
PCT No. PCT/DE91/00177, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/15735, PCT Pub. Date Oct. 17, 1991

PCT Filed Feb. 28, 1991, Ser. No. 777,281

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 4010772

Int. Cl.[5] G01B *7/14;* **G08C** *19/06, 19/12*

U.S. Cl. 324—207.12 **6 Claims**



1. Evaluating circuit for a differential-choke displacement transmitter having two inductance coils (C1, C2) connected with one another in a connecting point and an adjusting rod (VS) mounted movably in the vicinity of the two inductance coils, the evaluating circuit comprising:

a first output terminal (A1);

a first oscillator means (OSZ1) including a first amplitude adjusting means (SV1), said first oscillator means (OSZ1) being connected to the first output terminal (A1) to provide a first alternating voltage at the first output terminal (A1), said first alternating voltage having a constant frequency and an amplitude adjustable by the first amplitude adjusting means;

a second output terminal (A2);

a second oscillator means (OSZ2) including a second amplitude adjusting means (SV2), said second oscillator means (OSZ2) being connected to the second output terminal (A2) to provide a second alternating voltage at the second output terminal (A2), said second alternating voltage having a constant frequency and an amplitude adjustable by the second amplitude adjusting means (SV2);

an input terminal (E) for receiving an input signal from the connecting point of the two inductance coils (L1, L3) and depending on a position of the adjusting rod (VS) of the differential-choke displacement transmitter,

a phase-controlled rectifier (PG) connected with the input terminal (E) for rectifying an alternating voltage component of the input signal to produce a rectifier output signal,

a comparison device (AG) connected with the phase-controlled rectifier (PG) to receive the rectifier output signal as an actual value signal and to compare the rectifier

output signal with a predetermined reference value to form a regulating deviation signal, and

an integrator (I) connected with the comparison device (AG) to receive and integrate the regulating deviation signal to produce an integrated signal as an amplitude adjusting signal, said integrator also being connected to said first and second amplitude adjusting means so that said amplitude adjusting means are acted on by said integrated signal and are controlled by said integrated signal so that the sum of the amplitudes of the first and second alternating voltages at said output terminals is constant.

5,202,629

OPTICAL MAGNETIC-FIELD SENSOR HAVING AN INTEGRALLY BONDED MAGNETOOPTICAL ELEMENT, POLARIZER, ANALYZER AND SUBSTRATE

Shoji Seike, Nagoya; Masanobu Yamamoto, Handa, and Hisakazu Okajima, Nishikasugai, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 9, 1991, Ser. No. 727,092

Claims priority, application Japan, Jul. 19, 1990, 2-189450

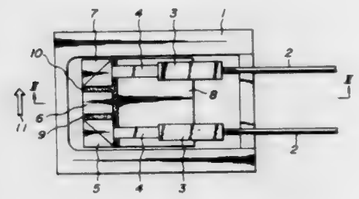
Int. Cl.[5] G01R *33/032, 31/02;* **G02F** *1/09*

U.S. Cl. 324—244.1 **3 Claims**

1. An optical magnetic-field sensor of a fault point detecting system, comprising:

a magnetooptical element;

an analyzer and a polarizer disposed on opposite sides of said magnetooptical element such that the optical axis of said analyzer, said polarizer and said magnetooptical element are aligned, said analyzer, said polarizer and said magnetooptical element being bonded together with synthetic



resin disposed in spaces between said magnetooptical element and said analyzer, and between said magnetooptical element and said polarizer;

a substrate, wherein said analyzer, said polarizer and said magnetooptical element are disposed along and bonded to a side surface of said substrate with synthetic resin such that said analyzer, said polarizer, said magnetooptical element and said substrate form an integral structure;

a first rod lens and a first ferrule positioned on and fixed to a top surface of said substrate to pass light into said polarizer, and a second rod lens and a second ferrule positioned on and fixed to said top surface of said substrate to receive light from said analyzer, wherein said substrate has a predetermined pattern along said top surface for positioning and receiving said first and second rod lenses and said first and second ferrules; and

a protective casing for housing said integral structure such that said substrate is fixed to said casing.

5,202,630

THIN FILM SQUID DETECTOR INCLUDING A LOOP RESPONSIVE TO A MAGNETIC FLUX COMPONENT LYING IN THE PLANE OF THE THIN FILM

James R. Maraden, San Diego, Calif., assignor to Biomagnetic Technologies, Inc., San Diego, Calif.

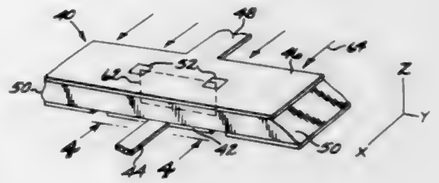
Division of Ser. No. 634,026, Dec. 26, 1990, Pat. No. 5,142,229.

This application Mar. 12, 1992, Ser. No. 850,984

Int. Cl.[5] G01R *33/035;* **H01L** *39/22*

U.S. Cl. 324—248 **9 Claims**

1. A thin-film SQUID detector operable at a preselected temperature to measure a component of a magnetic flux lying in the plane of the thin film, comprising:



a thin-film base electrode made of a material that is superconducting at the preselected temperature;

a thin-film counter electrode overlying the base electrode and spaced at least about 1 micrometer therefrom, the counter electrode being made of a material that is superconducting at the preselected temperature;

an insulating layer between the base electrode and the counter electrode; and

two laterally spaced-apart Josephson junctions extending substantially perpendicularly between the base electrode and the counter electrode through respective openings in the insulating layer, the two Josephson junctions electrically interconnecting the base electrode and the counter electrode at the spaced-apart locations to form a loop in which an electrical current flows responsive to the penetration of the loop by a component of a magnetic flux lying in the plane of the thin film.

5,202,631

MAGNETIC RESONANCE IMAGING TECHNIQUES UTILIZING MULTIPLE SHAPED RADIOFREQUENCY PULSE SEQUENCES

Steven E. Harms, 3100 Beverly Dr., Dallas, Tex. 75205; Duane P. Flamig, 1411 Scottsboro La., Richardson, Tex. 75082, and Richard H. Griffey, San Marcos, Calif., assignors to Steven E. Harms and Duane P. Flamig, Dallas, Tex.

Filed Aug. 9, 1991, Ser. No. 743,523

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **19 Claims**

1. A method of producing an image of an object, comprising the steps of:

generating a uniform magnetic field to magnetize said object;

selecting a shaped pulse sequence for each of waveform, phase and frequency components of an RF signal;

generating an RF signal comprised of said selected waveform, amplitude and frequency pulse sequences, said generated signal producing transverse magnetization in said object;

generating first, second, and third changing magnetic fields

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HIGH TEMPERATURE NMR SAMPLE SPINNER

each coil having a controllable switch connected between

focusing the light output from said electrical lamp on a photo transistor;

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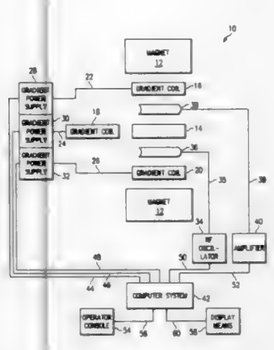
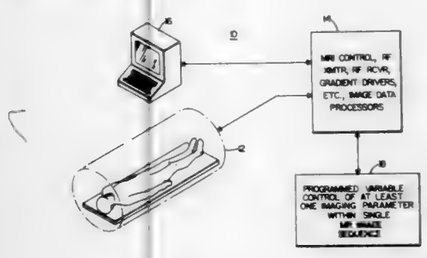
generating first, second, and third changing magnetic fields in said object;



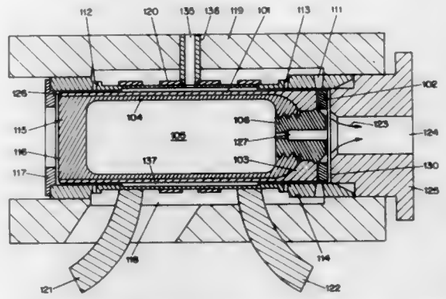
receiving a series of gradient echoes in response to said generated RF pulse sequence; and
producing an image of said object.

5,202,632
MRI USING VARIABLE IMAGING PARAMETER(S) WITHIN A SINGLE IMAGE SEQUENCE
Leon Kaufman, San Francisco; David M. Kramer, San Rafel, and John M. Coleman, Millbrae, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Filed Aug. 3, 1990, Ser. No. 562,869
Int. Cl.[5] G01R *33/20;* **A61B** *5/055*
U.S. Cl. 324—309 **5 Claims**



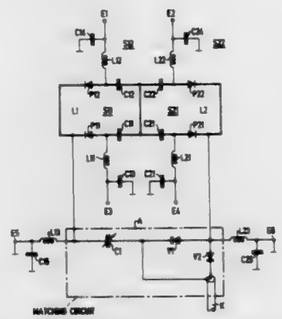
1. A method for acquiring MR image data within a predetermined limited data acquisition time with T1 image contrast and signal-to-noise ratio for lower spatial frequencies of said image data being characteristic of a data acquisition time longer than said predetermined limited data acquisition time, said method comprising:
during MR image data acquisition for lower spatial frequencies, changing at least one MR imaging parameter to produce greater NMR RF signal responses from nuclei having longer T1 NMR parameters as compared to MR image data acquisition for higher spatial frequencies, and
wherein an NMR nutation angle θ is made different for a subset of lower spatial frequencies.

5,202,633
HIGH TEMPERATURE NMR SAMPLE SPINNER
F. David Doty, Columbia; Jonathan B. Spitzmesser, Blythewood, both of S.C., and David G. Wilson, Winchester, Mass., assignors to Doty Scientific, Inc., Columbia, S.C.
Filed Nov. 1, 1990, Ser. No. 607,521
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—321 **10 Claims**



1. A cylindrical, ceramic NMR sample holder for spinning samples in an NMR experiment, said holder comprising:
an outer hard ceramic thin-walled cylindrical rotor shell, substantially closed by a drive plate at one end;
a soft ceramic disposable sample container capsule, said capsule completely filling the internal cavity in said hard shell;
symmetric fluid impeller means externally on said drive plate to effect high speed spinning of said sample holder.

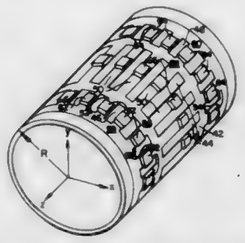
5,202,634
DOUBLE SURFACE COIL FOR A NUCLEAR MAGNETIC RESONANCE APPARATUS
Andreas Potthast, Erlangen; Guenther Decke, Hemhofen, and Hermann Requardt, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 23, 1991, Ser. No. 763,641
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1990, 4030877
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 **9 Claims**



1. A double surface coil for use in a nuclear magnetic resonance apparatus having a transmission/reception circuit with a matching network connected thereto, said double surface coil comprising:
first and second individual coils having a common junction, each individual coil having a terminal connectable to said matching network; and

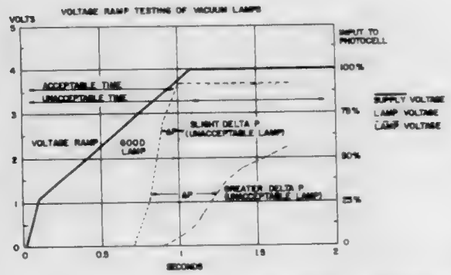
each coil having a controllable switch connected between said common junction and said terminal, said controllable switches being operable in combination for selectively connecting one or both of said individual coils to said matching circuit.

5,202,635
RADIO FREQUENCY VOLUME RESONATOR FOR NUCLEAR MAGNETIC RESONANCE
Ravi Srinivasan, Philadelphia, and Joseph Murphy-Boesch, Lafayette Hills, both of Pa., assignors to Fox Chase Cancer Center, Philadelphia, Pa.
Filed Jan. 17, 1991, Ser. No. 642,411
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 **50 Claims**



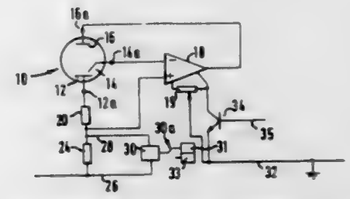
1. An RF resonator for use in NMR comprising:
at least four coaxial high frequency ring current paths distributed along the axis thereby defined;
at least four high frequency current paths interconnecting each pair of at least three pairs of ring current paths, adjacent interconnecting paths forming current loops with connecting segments of ring current paths which they interconnect; and
at least one discrete capacitor interposed in each interconnecting current path whereby in combination with the inductance in each loop, including inherent inductance in the conductors, each loop is resonant, but such that all of the ring current paths are uninterrupted by a capacitor.

5,202,636
METHOD OF NON-DESTRUCTIVE LAMP TESTING BY SENSING LIGHT OUTPUT
Robert A. Powell, Cookeville, Tenn., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 22, 1991, Ser. No. 658,939
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—414 **1 Claim**



1. A method for testing an electrical lamp comprising the steps of:
supplying a voltage to an electrical lamp;
focusing the light output from said electrical lamp on a photo transistor;
measuring the voltage output of said photo transistor;
measuring the supplied voltage to the electrical lamp;
measuring, from the time that said voltage is supplied, the time difference between the time it takes the voltage output of said photo transistor to reach a predetermined voltage and the time it takes the supplied voltage to the electrical lamp to reach said predetermined voltage;
rejecting those lamps wherein the time difference is above a predetermined value.

5,202,637
FAULT DETECTION IN ELECTROCHEMICAL GAS SENSING EQUIPMENT
Gareth J. Jones, Great Abington, United Kingdom, assignor to Neotronics Limited, Hertfordshire, United Kingdom
PCT No. PCT/GB90/00507, § 371 Date Sep. 25, 1991, § 102(e) Date Sep. 25, 1991, PCT Pub. No. WO90/12315, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 4, 1990, Ser. No. 761,976
Claims priority, application United Kingdom, Apr. 4, 1989, 8907564
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—425 **11 Claims**



1. A gas monitor for detecting the presence of a certain gas in an atmosphere being monitored, which monitor comprises:
an amperometric electrochemical gas sensor comprising electrolyte and a sensing electrode, a reference electrode and a counter electrode all in contact with the electrolyte,
means for maintaining an average value for a first potential between the sensing- and reference-electrodes when there is no gas in the atmosphere of the type being monitored,
means for impressing at least one pulse of potential or for impressing a fluctuating potential between the reference electrode and the sensing electrode, the peak potential of each pulse or of the said fluctuating potential being a second potential that is different from the first potential (or average potential) and that is insufficient to cause a potential within the sensor that electrolyses the sensor electrolyte,
means for detecting a current flowing at the sensing electrode or at counter electrode when the said second potential is impressed, and
means for giving an indication when the said current is less than a threshold value.

5,202,638
POWER DENSITY MEASURING APPARATUS AND METHOD
Arvin L. Kolz, Lakewood, Colo., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Apr. 1, 1991, Ser. No. 677,930
Int. Cl.[5] G01N *27/08*
U.S. Cl. 324—444 **23 Claims**

1. Apparatus for measuring power density within an energized liquid body comprising:
probe means for measuring a parameter for electrical field measurement at a selected location within an energized

liquid body having electrical power applied to said liquid

(iv) taking a set of test measurements from second nodes

5,202,641

summer and to said reference frequency register, for gen-

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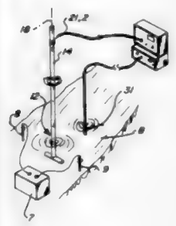
liquid body having electrical power applied to said liquid body and providing a first electric signal corresponding to said measured parameter for electrical field measurement, conductivity measuring means including a conductivity probe in said energized liquid body providing a second electric signal corresponding to the conductivity of said energized liquid body at said selected location, and



calculating means receiving said first and second signals, said calculating means performing selected mathematical operations on said first and second signals to provide an output electrical signal that is a measure of the power density at said location of said energized liquid body.

5,202,639

METHOD AND APPARATUS FOR TESTING ANALOGUE CIRCUITS

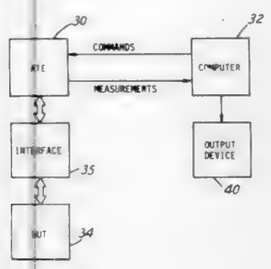
Alice McKeon, Wadhurst, and Antony Wakeling, Fleet, both of United Kingdom, assignors to Schlumberger Technologies Limited, Farnborough, United Kingdom

Continuation of Ser. No. 462,555, Jan. 9, 1990, abandoned. This application Feb. 19, 1992, Ser. No. 839,735

Claims priority, application United Kingdom, Jan. 9, 1989, 8900386

Int. Cl.[5] **G01R** *31/02*

U.S. Cl. 324—537 **17 Claims**



1. A method of testing an analogue circuit, the circuit comprising a network of electrical modules interconnected by nodes, each module comprising an electrical component or set of electrical components, the method comprising a measurement routine including the steps of

(1) interfacing the circuit to automatic test apparatus, said test apparatus comprising means for interfacing with said circuit, means for applying stimuli to said circuit and means for taking test measurements from said circuit,

(ii) selecting a set of stimuli, including supply potentials, for application to the circuit,

(iii) applying said set of stimuli to first nodes of said circuit via said interfacing means,

(iv) taking a set of test measurements from second nodes of the circuit via said interfacing means,

(v) conducting at least one analysis cycle, employing the automatic test apparatus for each analysis cycle, each analysis cycle comprising the steps of

(a) analyzing the circuit as a network of nodes connected by modules which impose constraints on signals passing between the nodes,

(b) using the set of stimuli, the test measurements, and the constraints, taking into account tolerances in all of said stimuli, measurements, and constraints, to derive at least two differently derived ranges of values of a signal variable propagated within the network at at least one of a complete set of nodes,

(c) detecting a fault if said differently derived ranges of the variable do not overlap so as to indicate an inconsistency, and

(d) if a fault is detected, repeating the analysis cycle which has led to a fault being detected with the constraints on a selected module removed, other than the constraint that all the currents into the module sum to zero, and treating said selected module as potentially faulty if such removal of constraints leads to a removal of the inconsistency.

5,202,640

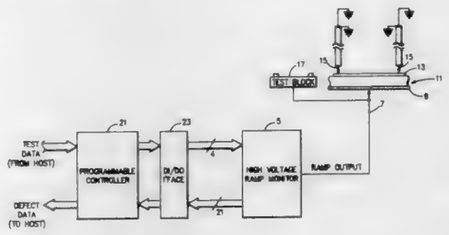
CAPACITANCE AND LEAKAGE TEST METHOD AND APPARATUS

Robert L. Schaaf, Vestal, N.Y.; Floyd W. Olsen, Athens, Pa., and Edward J. Tasillo, Newark Valley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1991, Ser. No. 709,476

Int. Cl.[5] **G01R** *27/26*

U.S. Cl. 324—537 **24 Claims**



1. Apparatus for checking a net on a circuit board or substrate separated by a dielectric from a plane of electrically conductive material, comprising:

current source means connectable to one, and grounding means connectable to the other, of the net and the plane, for ramping up and maintaining a voltage therebetween;

means for measuring the voltage between the net and the plane;

means for measuring the time required for the voltage across the net and the plane, to increase a predetermined amount when being charged by said current source means;

means for limiting and maintaining the voltage across the plane and net to a predetermined limit value; and

means for monitoring the current supplied by said current source for maintaining the voltage at the predetermined limit value, so that current supplied after the limiting voltage is reached is indicative of leakage to another net.

5,202,641

METHOD, TEST PROBE AND APPARATUS FOR THE MEASUREMENT OF ALTERNATING CURRENT POTENTIAL DROP BY CONFINING TEST CURRENT TO A SKIN REGION OF A TEST SPECIMEN

Bhikhu A. Unvala, London, England, assignor to Matalect Limited, London, England

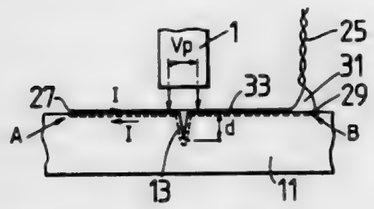
PCT No. PCT/GB89/00849, § 371 Date Jan. 25, 1991, § 102(e) Date Jan. 25, 1991, PCT Pub. No. WO90/01159, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 26, 1989, Ser. No. 640,301

Claims priority, application United Kingdom, Jul. 26, 1988, 8817725

Int. Cl.[5] **G01R** *27/14*; **G01N** *27/20*

U.S. Cl. 324—715 **14 Claims**



1. A method of measuring alternating current potential drop in a specimen, comprising the steps of:

a) passing an electric current between a pair of spaced contact means in contact with the specimen so as to supply said electric current through said specimen and so as to produce a voltage therein, said pair of contact means being spaced from each other in a first direction along said specimen, and said current having an alternating frequency which causes the flow of said electric current to be spatially confined to a skin region of said specimen; and

b) passing said electric current through a conductor which extends substantially in said first direction and which is located so close to a surface of said specimen that current distribution in said skin region is influenced to cause the flow of said electric current through said specimen to be confined in a second direction substantially transverse to said first direction; and

c) measuring the voltage between a pair of spaced points on the surface of the specimen.

5,202,642

APPARATUS AND METHOD FOR FRACTIONAL FREQUENCY DIVISION

Glenn B. Dixon, Roy, Utah, assignor to Iomega Corporation, Roy, Utah

Filed May 9, 1991, Ser. No. 697,797

Int. Cl.[5] **G06F** *1/04*; **H03K** *5/153*

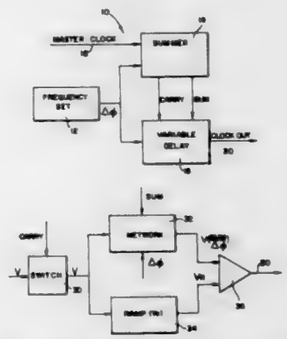
U.S. Cl. 328—014 **16 Claims**

1. A fractional frequency synthesizer for generating a desired clock signal having a desired frequency in relation to the master frequency of a master clock signal, said master clock signal having a master period, said synthesizer comprising:

a reference frequency register for providing a frequency set value, which frequency set value is proportional to said desired frequency;

a summer, connected to receive said frequency set value and having a finite storage capacity, for adding the frequency set value to a summed value stored in said summer to form a new summed value in response to said master clock signal which new summed value is stored as the summed value, for generating a carry signal when said new summed value exceeds said finite storage capacity, wherein when said carry signal is generated only that portion of the new summed value in excess of said finite storage capacity is stored as the summed value; and

a variable time delay clock generator, connected to said summer and to said reference frequency register, for generating said desired clock signal in response to said carry signal and for delaying each pulse by a delay period equal to said master period minus a fraction of said master period which fraction is proportional to the ratio of the summed value and the frequency set value, wherein said clock generator comprises delay means for both generating said delay period and for delaying each pulse by said delay period.



5,202,643

DEMODULATOR FOR DEMODULATING A π/4-SHIFT DQPSK SIGNAL

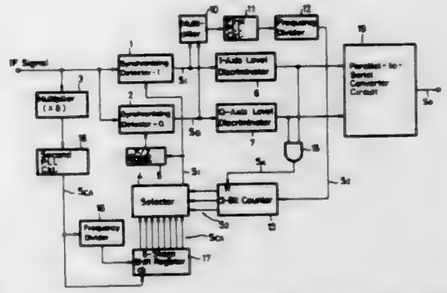
Teruo Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1992, Ser. No. 854,364

Claims priority, application Japan, Mar. 20, 1991, 3-081412; Mar. 20, 1991, 3-081413

Int. Cl.[5] **H03D** *3/00*; **H03K** *9/04*

U.S. Cl. 329—309 **6 Claims**



1. A differential phase-shift keying (PSK) signal demodulator comprising:

(a) a synchronizing detector for synchronizing-detecting a digital modulated signal;

(b) a detecting signal generating circuit for generating a plurality of detecting signals whose phases are different by a predetermined angle;

(c) a detection signal selecting circuit for selecting one detecting signal from said detecting signal generating circuit and supplying a selected signal to said synchronizing detector as a symbol detecting signal; and

(d) a detecting reference axis control circuit for shifting a phase of said detecting signal output from said detecting signal selecting circuit by a predetermined angle each in

5,202,647

with said at least one waveguide and said at least one

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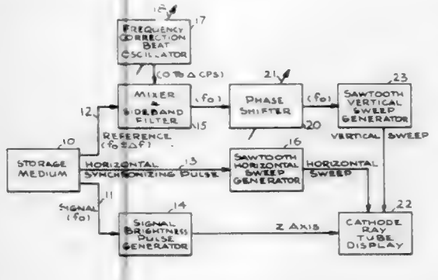
synchronism with a timing at which a symbol to be detected is supplied.

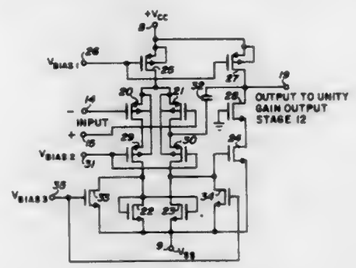
5,202,644
RECEIVER APPARATUS
Matthew E. Brady, Inglewood, Calif., assignor to Ail Systems, Inc., Deer Park, N.Y.
Filed Jun. 11, 1959, Ser. No. 819,778
Int. Cl.[5] H04L *27/22*
U.S. Cl. 329—313 **18 Claims**



1. Receiver apparatus for demodulating phase-coded message signals and visually displaying the resultant information, said apparatus comprising: a memory unit including a storage medium upon which is recorded a reference signal and the phase-coded message signals at substantially the same frequency, and means for periodically generating a pulse; a first sweep generator coupled to said storage medium and operable in response to the reference signal recorded thereon to produce a first sawtooth signal whose repetition rate is equal to the frequency of said reference signal; a second sweep generator coupled to said means and operable in response to the pulses produced thereby to produce a second sawtooth signal whose repetition rate is equal to the pulse repetition rate; an oscilloscope coupled to said first and second sweep generators for receiving said first and second sawtooth signals, said oscilloscope being operable in response to said first and second sawtooth signals to produce corresponding vertical and horizontal sweeps on the cathode ray tube face thereof; and a brightening pulse generator coupled between said storage medium and the cathode of the cathode ray tube of said oscilloscope, said pulse generator being operable in response to each phase-coded message signal to produce voltage spikes at predetermined polarity crossover points of the message signal carrier oscillation, said voltage spikes being applied to the cathode of said cathode ray tube to produce a bar of bright spots on the screen thereof for each message signal, the vertical positions of said bars corresponding to the phase modulation of the message signal carriers.

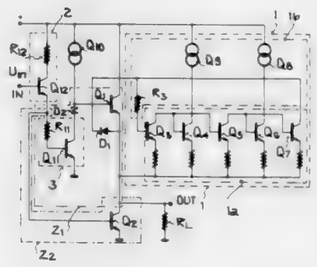
5,202,645
STABILIZED TRANSIENT RESPONSE OF A CASCODE CMOS AMPLIFIER
Christina P. Q. Phan, Milpitas, and James B. Wieser, Pleasanton, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Dec. 12, 1991, Ser. No. 805,758
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **8 Claims**

1. In an operational amplifier employing a differential input stage followed by a gain stage with the input stage employing a current mirror load and cascode connected transistors isolating said current mirror load, said operational amplifier further employing a stabilizing frequency compensation capacitor coupled between said gain stage output and said cascode transistor in said input stage, the improvement comprising:
means for coupling the output of said operational amplifier to its inverting input so that the operational amplifier functions as a voltage follower; and



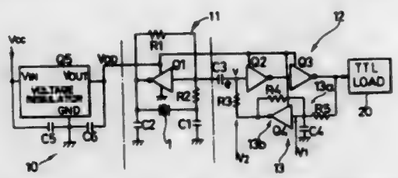
first and second constant current transistors coupled across the elements of said current mirror load whereby said operational amplifier is immune from ringing following the application of a step transient to said input stage.

5,202,646
OUTPUT STAGE FOR AMPLIFIERS
Gutsch Henrik; Rebmann Volkmara, both of Heilbronn, and Schnabel Jürgen, Ilsfeld, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany
Filed Oct. 23, 1991, Ser. No. 780,784
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1990, 4036406
Int. Cl.[5] H03F *3/26*
U.S. Cl. 330—271 **18 Claims**



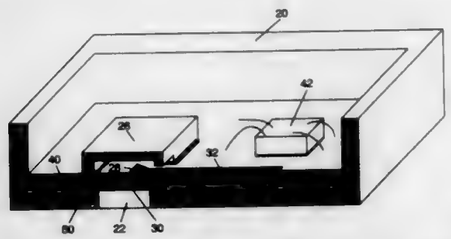
1. An output stage for an amplifier comprising:
first and second load current-carrying n-p-n output transistors disposed in different respective amplifier branches having different amplification properties; and
negative feedback and current limiting means for providing a negative feedback current to the first circuit to the first output transistor to a preselected maximum value over a predetermined output current range
whereby the amplification properties of the first output transistor are affected for a range of output voltages of the amplifier stage.

5,202,647
APPARATUS AND METHOD FOR GENERATING CLOCK PULSES HAVING A STABLE DUTY RATIO
Yoichi Muraki, and Setsuo Hori, both of Shiga, Japan, assignors to Kyocera Corporation, Kyoto, Japan
Continuation of Ser. No. 605,962, Oct. 29, 1990, abandoned.
This application Mar. 11, 1992, Ser. No. 849,826
Claims priority, application Japan, Oct. 31, 1989, 1-285595
Int. Cl.[5] H03B *5/32*
U.S. Cl. 331—74 **24 Claims**



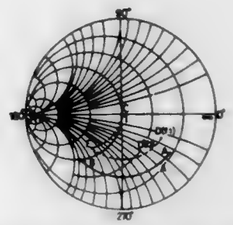
1. An apparatus for generating clock pulses comprising:
an output terminal for providing clock pulse output signals;
an oscillator having an inverter and a resonator connected in parallel with said inverter; and
an electronic circuit electrically coupled between the oscillator and the output terminal, the electronic circuit having:
a direct-current bias voltage circuit electrically coupled, to the output of the oscillator so as to add a direct-current bias signal to the output of the oscillator to provide an added output signal; and
an amplifier for amplifying the added output signal and outputting said clock pulses, said amplifier having an input terminal electrically coupled with the input terminal of said inverter.

5,202,648
HERMETIC WAVEGUIDE-TO-MICROSTRIP TRANSITION MODULE
Jay H. McCandless, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 9, 1991, Ser. No. 804,305
Int. Cl.[5] H01P *5/107*
U.S. Cl. 333—26 **6 Claims**



1. A waveguide-to-microstrip transition module for transmitting captured electromagnetic energy between a waveguide and signal processing circuitry, the module comprising:
a base including at least one waveguide through which said electromagnetic energy is transmitted into the module to the signal processing circuitry, said at least one waveguide locatable anywhere on said base;
a circuit board having one continuous side hermetically sealed to the base and the opposite side including at least one microstrip connected to signal processing circuitry and cooperatively oriented with said at least one waveguide;
at least one backshort, mounted on said opposite side of the circuit board, said backshort cooperatively associated with said at least one waveguide and said at least one microstrip;
a housing containing the base and circuit board; and
a cover hermetically sealed to the housing to enclose the circuit board in the housing.

5,202,649
MICROWAVE INTEGRATED CIRCUIT DEVICE HAVING IMPEDANCE MATCHING
Takao Kashiwa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 24, 1991, Ser. No. 764,824
Claims priority, application Japan, Mar. 20, 1991, 3-083398
Int. Cl.[5] H01P *5/08*
U.S. Cl. 333—33 **9 Claims**



1. A microwave integrated circuit comprising:
an input terminal;
signal processing means electrically connected to said input terminal for processing a signal applied to said input terminal;
an input impedance matching circuit electrically connected to and between said input terminal and said signal processing means and including (i) a main transmission line comprising a strip line having an input end, an output end, an impedance, and a phase shift and connected to said input terminal at said input end and to said signal processing means at said output end and (ii) one of a shorted stub and an open stub connected to said input terminal and to said input end of said main transmission line, said main transmission line and stub being arranged on a semiconductor substrate; and
phase control means connected in parallel with and to said main transmission line and to said signal processing means for controlling the phase shift of said main transmission line wherein said signal processing means comprises a field effect transistor.

5,202,650
MATCHED SPURIOUS MODE ATTENUATOR AND TRANSITION FOR CIRCULAR OVERMODED WAVEGUIDE
Jerry A. Krill; William A. Huting, both of Ellicott City, and Edward P. Irzinski, deceased, late of Gaithersburg, all of Md. by Diane M. Irzinski, personal representative , assignors to The Johns Hopkins University, Baltimore, Md.
Filed Jun. 26, 1991, Ser. No. 720,279
Int. Cl.[5] H01P *1/62*
U.S. Cl. 333—034 **24 Claims**

3. In a waveguide system having a circular overmoded waveguide for propagating electromagnetic signals at an operating frequency in the circular TE_{01} mode, the improvement comprising,
at least one mode suppressing waveguide section for suppressing unwanted modes of said electromagnetic signals, and
a transition section for connecting said circular overmoded waveguide to said at least one mode suppressing waveguide section, said transition section having a length and

electrode which confronts said first coupling electrode to form said capacitance coupling element means, and a third

tively coupling electrical signals into said second inductor and for forming, at at least one frequency, a second series

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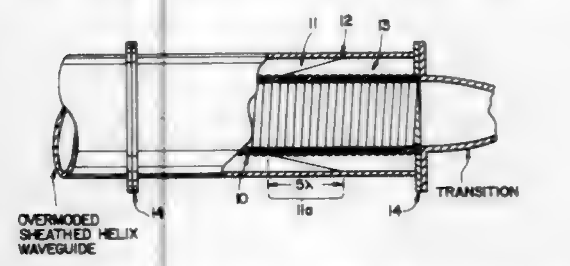
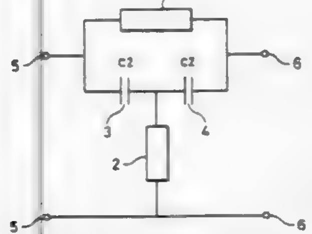
also impedances respectively matched to impedances associated with the TE_{01} mode and the unwanted modes, whereby said unwanted modes are efficiently coupled to said at least one mode suppressing waveguide section to



minimize spurious resonances within said waveguide system, and wherein said transition section has a length of approximately 5λ, where λ=freespace wavelength of said electromagnetic signals at the operating frequency of the waveguide system.

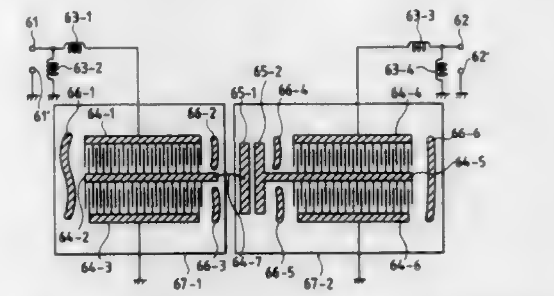
5,202,651
BAND-STOP FILTER CIRCUIT SUITABLY MADE INTO MONOLITHIC MICROWAVE INTEGRATED CIRCUITS
Toshihiko Yoshimasu, Souraku, Japan, assignor to Sharp Kabushiki Kaisha, Japan
Filed Dec. 24, 1991, Ser. No. 813,369
Claims priority, application Japan, Dec. 27, 1990, 2-407476
Int. Cl.⁵ H03H *7/07;* **H01P** *1/20*
U.S. Cl. 333—170 **13 Claims**



1. A band-stop filter circuit comprising:
input and output terminals,
a transmission line connecting said input and output terminals, and
a T circuit connected in parallel to said transmission line, said T circuit including:
series-connected first and second capacitance means connected in parallel to said transmission line, and
a stub having one end connected to a node between said first and second capacitance means and the other end short-circuited,
said stub having a line length which becomes inductive in an undesired signal band so as to filter out said undesired signal band.

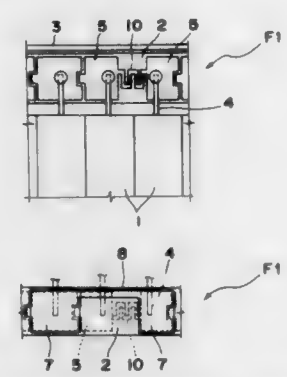
5,202,652
SURFACE ACOUSTIC WAVE FILTER DEVICE FORMED ON A PLURALITY OF PIEZOELECTRIC SUBSTRATES
Toyoji Tabuchi, Kanagawa; Mitsutaka Hikita, Hachioji; Nobuhiko Shibagaki, Kokubunji, and Tetsuya Hirashima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 595,178
Claims priority, application Japan, Oct. 13, 1989, 1-264920
Int. Cl.⁵ H03H *9/64*
U.S. Cl. 333—193 **12 Claims**

1. A surface acoustic wave filter device comprising:
a first surface acoustic wave sub-filter having a first filter characteristic; and
a second surface acoustic wave sub-filter having a second filter characteristic;
wherein said first and second surface acoustic wave sub-filters are provided on first and second piezoelectric substrates having mutually distinctive electro-mechanical



coupling coefficients, respectively, and said first and second filter characteristics are such characteristics that the synthesis of said first and second filter characteristics forms a combined filter having a desired filter characteristic.

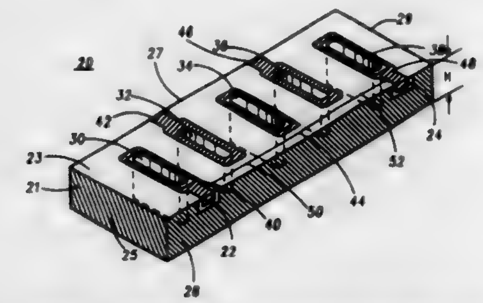
5,202,653
BAND-PASS FILTER INCLUDING RESONANCE ELEMENTS COUPLED BY A COUPLING LINE AND A BY-PASS COUPLING LINE
Yasuo Yamada; Tadahiro Yorita, and Hitoshi Tada, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Apr. 16, 1991, Ser. No. 686,193
Claims priority, application Japan, Apr. 17, 1990, 2-101090; Jun. 29, 1990, 2-174193
Int. Cl.⁵ H01P *1/20, 1/202*
U.S. Cl. 333—202 **19 Claims**



1. A band-pass filter which comprises a plurality of a parallel resonance circuit element means, a coupling line, a bypass coupling line, and a dielectric substrate having first and second surfaces;
said coupling line including at least one capacitance coupling element means and at least one inductance coupling element means connected in series with each other at a first junction;
at least one of said parallel resonance circuit element means being connected, at a first end, to said first junction;
said bypass coupling line including a bypass capacitance coupling element means, and being connected in parallel with said coupling line;
said inductance coupling element means being located between at least one pair of said parallel resonance circuit element means;
said coupling line including a plurality of coupling electrodes on said first surface, a first one of said coupling electrodes forming said first junction, a second coupling

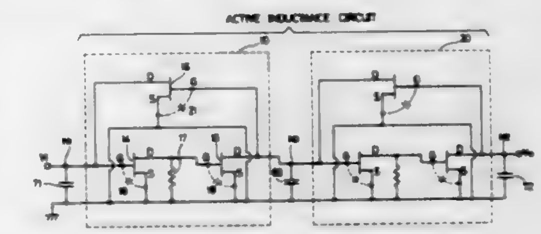
electrode which confronts said first coupling electrode to form said capacitance coupling element means, and a third coupling electrode, said inductance coupling element means being connected in series between said first and third coupling electrodes; and
said bypass capacitance coupling element means being formed by at least one confronting electrode on said second surface facing at least one of said second and third coupling electrodes through the dielectric substrate; and said bypass coupling line further comprising connecting means for connecting said bypass capacitance coupling element means to the other one of said second and third coupling electrodes.

5,202,654
MULTI-STAGE MONOLITHIC CERAMIC BANDSTOP FILTER WITH ISOLATED FILTER STAGES
David R. Heine, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 22, 1991, Ser. No. 733,584
The portion of the term of this patent subsequent to Dec. 22, 2009, has been disclaimed.
Int. Cl.⁵ H01P *1/205*
U.S. Cl. 333—206 **19 Claims**



1. A multistage monolithic ceramic block bandstop filter for suppressing desired frequency electrical signals comprising:
a filter body comprised of a block of dielectric material having at least top, side, and bottom surfaces, said filter body having at least first and second holes extending through said filter body, said holes having first ends at the top surface of said block and second ends at said bottom of said block, said filter body and interior surfaces of said first and second holes being substantially covered with a conductive material forming an electrical ground, with the exception of said top surface, said coated interior surfaces of said first and second holes having first and second inductances and forming first and second inductors, shorted to ground at their second ends, at at least one frequency;
an isolator within said filter body, suppressing electrical coupling between said first and second inductors, comprised of a third hole extending at least partially through said block, located between said first and second holes, said third hole having a first end at said top surface and a second end at said bottom surface, surfaces within said third hole being substantially covered with conductive material that is electrically coupled at both said first and second ends to said conductive material coating surfaces of said filter body;
input means comprised of a conductive material surrounding the first end of the first hole, coupled to the first end of the first inductor, for capacitively coupling signals into said bandstop filter, for capacitively coupling electrical signals into the first end of the first inductor and for forming, at at least one frequency, a first series resonant circuit to ground with said first inductor;
output means comprised of a conductive material surrounding the first end of said second hole, coupled to the first end of the second inductor, for capacitively coupling electrical signals out of said bandstop filter, for capacitively coupling electrical signals into said second inductor and for forming, at at least one frequency, a second series resonant circuit to ground with said second inductor; and
an impedance inverter means, coupled between the input and output means, having first and second ends, for providing an impedance at one end that is substantially the mathematical inverse of an impedance at the opposite end.

5,202,655
MICROWAVE ACTIVE FILTER CIRCUIT USING PSEUDO GYRATOR
Shinji Hara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 27, 1991, Ser. No. 813,995
Claims priority, application Japan, Dec. 28, 1990, 2-408684
Int. Cl.⁵ H03H *11/08*
U.S. Cl. 333—215 **7 Claims**



1. An active filter circuit comprising:
cascaded first and second pseudo gyrator means,
first capacitor means connected between an input node of said first pseudo gyrator means and a predetermined reference potential,
a second capacitor means connected between a common connection node of an output node of said first pseudo gyrator means and an input node of said second pseudo gyrator means and the reference potential, and
third capacitor means connected between an output node of the second pseudo gyrator means and the reference potential,
wherein each of said first and second pseudo gyrator means comprises
first inverting amplifier means including a first field effect transistor,
second inverting amplifier means coupled to the output of said first inverting amplifier means, and including a second field effect transistor,
said first field effect transistor having a gate electrode coupled to the input node of a corresponding pseudo gyrator means, and a source electrode connected to reference potential,
said second field effect transistor having a gate electrode coupled to a drain electrode of said first field effect transistor, a source electrode connected to the reference potential, and a drain electrode coupled to an output node of said corresponding pseudo gyrator means,
negative feedback means for feeding back negatively the voltage of the output node of said corresponding pseudo gyrator means to the input node.

5,202,656
FREQUENCY SHIFTING TUNING PROCESS AND FILTER STRUCTURE
Gary J. Clark, Constantia, and Joseph A. Zennamo, Jr., Skaneateles, both of N.Y., assignors to Eagle Comtronics, Inc., Clay, N.Y.
Filed Oct. 22, 1991, Ser. No. 780,308
Int. Cl.⁵ H03H *7/00*
U.S. Cl. 333—174 **6 Claims**

1. A Method of tuning a filter including at least first and second isolated filtering sections, said method comprising the steps of: applying a test signal across an input of the first filter-

ing section and an output of the second filtering section; tuning

connecting the signal source to said first end of said micro-

cal drive signals to produce an ink droplet having a con-

5,202,661
METHOD AND SYSTEM FOR FUSING DATA FROM

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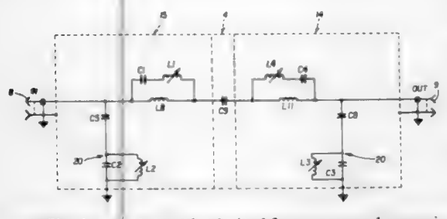
ing section and an output of the second filtering section; tuning the operation of the first filtering section to a desired frequency; frequency shifting the operation of first filtering section from the desired frequency; tuning the operation of the



second filtering section to the desired frequency; and removing the frequency shifting from the first filtering section in order to return the operation of the first filtering section to the desired frequency.

5,202,657

TRANSMISSION LINES FOR WAFER-SCALE INTEGRATION AND METHOD FOR INCREASING SIGNAL TRANSMISSION SPEEDS

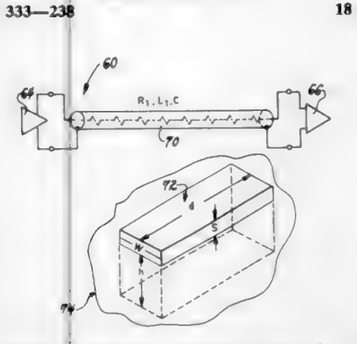
Herbert Stopper, Orchard Lake, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Division of Ser. No. 492,420, Mar. 6, 1990, Pat. No. 5,097,232, which is a continuation of Ser. No. 368,992, Jun. 16, 1989, abandoned, which is a continuation of Ser. No. 253,411, Oct. 10, 1988, abandoned, which is a continuation of Ser. No. 9,275, Jan. 1, 1987, abandoned. This application Oct. 16, 1991, Ser. No. 777,188

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] H01P *3/08*

U.S. Cl. 333—238 **18 Claims**



1. A method of minimizing transmission delays from a signal source to a signal receiver in a microelectronic circuit, comprising the steps of:

forming a ground plane conductor which provides a common current return path for the signal source and the signal receiver;

depositing a layer of dielectric material on said ground plane conductor;

constructing a nonhomogeneous micro-strip transmission line by disposing a micro-strip conductor on said layer of dielectric material, said micro-strip conductor having a first end and a second end, said micro-strip conductor constructed with dimensions and resistivity relative to the permittivity of said dielectric material whereby the ratio between the per unit length resistivity and the characteristic impedance of said transmission line remains relatively constant, and the characteristic impedance monotonically increases from said first end to said second end;

connecting the signal source to said first end of said micro-strip conductor; and

connecting the signal receiver to said second end of said micro-strip conductor.

5,202,658

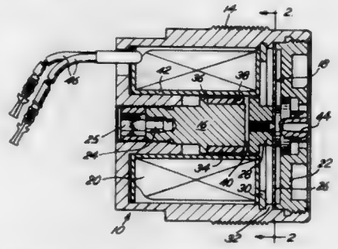
LINEAR PROPORTIONAL SOLENOID

William F. Everett, Goshen; Kevin C. Heick, South Bend, both of Ind.; Peter G. Hutchings, Rockaway, N.J., and Matthew E. Leinheiser, South Bend, Ind., assignors to South Bend Controls, Inc., South Bend, Ind.

Filed Mar. 1, 1991, Ser. No. 662,911

Int. Cl.[5] H01F *7/08*

U.S. Cl. 335—230 **9 Claims**



1. A linear proportional solenoid comprising a housing, a moveable armature assembly within said housing, a polepiece carried within said housing and spaced from and in axial alignment with said armature assembly, an electromagnetic coil means within said housing for inducing magnetic flux through said polepiece and said armature assembly in response to an electrical input into said coil means, a permanent magnet carried by said polepiece and located adjacent said armature assembly, said magnet extending annularly about said polepiece.

5,202,659

METHOD AND APPARATUS FOR SELECTIVE MULTI-RESONANT OPERATION OF AN INK JET CONTROLLING DOT SIZE

William J. DeBonte, Kent, Mass., and Stephen J. Liker, Danbury, Conn., assignors to Dataproducts, Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 660,917, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 126,476, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 821,599, Nov. 23, 1986, abandoned, which is a continuation of Ser. No. 600,785, Apr. 16, 1984, abandoned. This application Feb. 4, 1992, Ser. No. 830,761

Int. Cl.[5] B41J *2/045, 2/205*

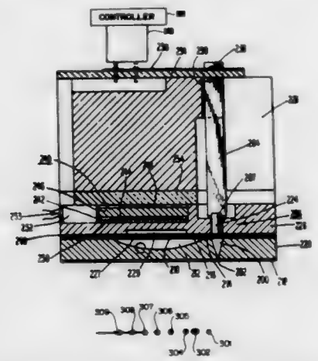
U.S. Cl. 346—1.1 **15 Claims**

13. A method of operating a drop-on-demand ink jet printing system in a resonant mode for providing high resolution printing upon a recording medium, said system comprising an ink jet having an ink cavity, an orifice communicating with said ink cavity, a transducer means in communication with said ink cavity, a source of electrical drive pulses or signals repeatable at a drop-on-demand production rate, responsive to said electrical drive signals to force droplets of ink from said orifice, said method comprising:

operating said transducer means to produce a dominant resonant frequency within said ink cavity;

repeatedly producing series of said electrical drive signals, each of said series being produced at a drop-on-demand production rate and each of signals within said series being separated by dead time, and having a repetition rate substantially equal to the dominant resonant frequency of the ink jet printing system or a subharmonic thereof; and

actuating said transducer means with each of said electrical drive signals to produce an ink droplet having a controlled volume from said orifice, said ink droplets merging



into a single drop of ink prior to or at the time the drop reaches the print medium for printing whereby each drop size can be controlled.

5,202,660

LYTE-COM PORTABLE VISUAL SIGNALLING DEVICE

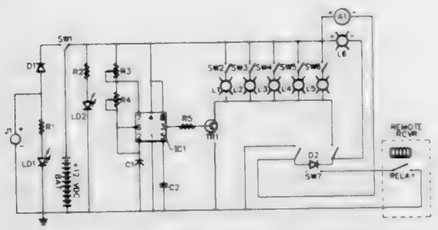
Randall L. Hartman, P.O. Box 3585, Gastonia, N.C. 28054

Continuation of Ser. No. 393,412, Aug. 14, 1989, Pat. No. 5,103,204. This application Mar. 25, 1992, Ser. No. 857,625

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] G08B *5/00*

U.S. Cl. 340—332 **2 Claims**



1. A portable visual signalling device comprising:

a housing having a face;

a battery power supply disposed within said housing;

at least one colored light mounted on the face of said housing for visually conveying at least one respective message to an observer;

at least one manual switch mounted on the face of said housing and operatively connected between said battery supply and a respective at least one colored light to operate same via the battery supply;

an audible signal device and a first manual switch associated therewith each mounted on said housing, said first manual switch for operating said audible signal device via the battery power supply for indicating a quick response desired to a message;

a first colored light mounted on the face of said housing and operatively connected to said first manual switch, said first manual switch for also operating said first colored light via the battery power supply for further indicating a quick response to a desired message; and

a remote control unit for remotely operating said first colored light via the battery power supply for indicating a quick response desired to a message.

5,202,661

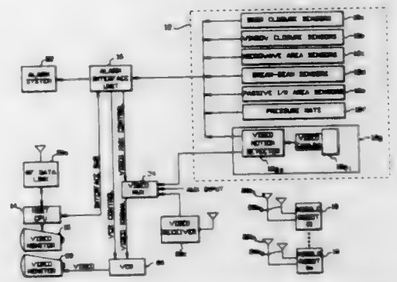
METHOD AND SYSTEM FOR FUSING DATA FROM FIXED AND MOBILE SECURITY SENSORS

Hobart R. Everett, Jr., and Gary A. Gilbreath, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1991, Ser. No. 697,128

Int. Cl.[5] G08B *19/00*

U.S. Cl. 340—522 **11 Claims**



1. A system for detecting intrusion in a secured environment, comprising:

a first sensor fixedly positioned and operably disposed to provide a first output signal corresponding to detection of a first perturbation in said environment;

a mobile platform operably disposed to be directed to travel along a path through said environment in response to receiving path control output signals;

a second sensor mounted to said mobile platform and operably disposed to provide a second output signal corresponding to detection of a second perturbation in said environment;

a digital data processor, communicatively coupled to receive said first output signal from said first sensor and to receive said second output signal from said second sensor, for assigning weighting coefficients to representations of each of said first and second output signals to generate weighted first and second values, for determining a sum of said weighted first and second values, for providing an intrusion alert output signal when said sum exceeds a reference value, and for providing said path control output signals to said mobile platform, to direct said mobile platform to a particular location in said environment;

an alarm system for generating an intrusion alert in response to receiving said intrusion alert output signal from said digital data processor.

5,202,662

RESETTABLE CIRCUIT BREAKER FOR USE IN GROUND FAULT CIRCUIT INTERRUPTERS AND THE LIKE

Wolfgang F. Bienwald, Melville, and Herbert W. Tumsuden, Jr., Floral Park, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 532,838, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 404,802, Sep. 8, 1989, abandoned, which is a continuation of Ser. No. 219,413, Jul. 14, 1988, abandoned, which is a continuation of Ser. No. 126,535, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 771,439, Aug. 30, 1985, abandoned, which is a continuation of Ser. No. 540,078, Oct. 7, 1983, Pat. No. 4,568,997, which is a continuation of Ser. No. 940,224, Sep. 7, 1978, Pat. No. 4,412,193. This application Jan. 17, 1992, Ser. No. 822,481

Int. Cl.[5] H01H *73/00*

U.S. Cl. 335—18 **6 Claims**

1. A method of interrupting an electrical connection between input conductors and output conductors of a circuit in

response to a current imbalance across phase and neutral

distinction that the layer contains finely divided metallic plati-

of a position of said electromagnet assembly relative to

itance characteristic of air or said fluids that contact said

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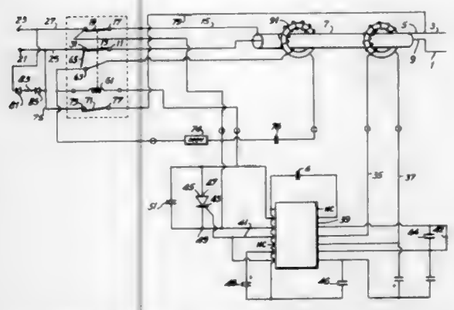
response to a current imbalance across phase and neutral power lines of said circuit, comprising the steps of:

(a) sensing said current imbalance by means of a differential transformer and generating a voltage pulse in response thereto;

(b) integrating said voltage pulse by means of an integrating circuit directly connected to said differential transformer;



(c) causing an element of said circuit to conduct current and open a switch in response to an integrated voltage pulse of a predetermined magnitude and duration, and

(d) causing an interrupting of said electrical connection in response to the opening of said switch.

5,202,663

SMALL SIZED ELECTROMAGNETIC RELAY

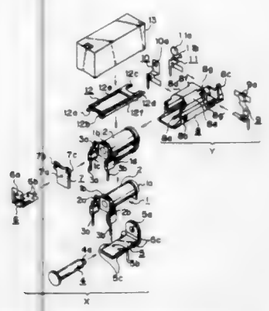
Noboru Tomono, Nagano; Takahiro Nakabayashi, Saku; Tomohima Ichikawa, Saku; Hisao Ozawa, Saku; Takeshi Shibusawa, Saku, and Atsuto Kobayashi, Saku, all of Japan, assignors to Takamisawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1991, Ser. No. 801,209

Claims priority, application Japan, Feb. 27, 1991, 3-032842; Apr. 12, 1991, 3-80049; Aug. 5, 1991, 3-88576

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—86 **7 Claims**



1. An electromagnetic relay comprising:

an electromagnet assembly (X) having a core (**4**);

a bobbin (**1**) for inserting said core thereinto;

a yoke (**5**) fixed to an end of said core;

a hinge spring (**6**);

an armature (**7**) coupled via said hinge spring to said yoke and coupled to the other end of said core; and

a base block assembly (Y) having a base block (**8**) and a contact spring assembly (**9**, **10**, **11**) including a movable contact (*9a*) and a stationary contact (**10***a*, **11***a*) adhered to said base block,

wherein an adjustment of said armature to said contact spring assembly is carried out prior to fixing an adjustment of a position of said electromagnet assembly relative to said base block.

5,202,664

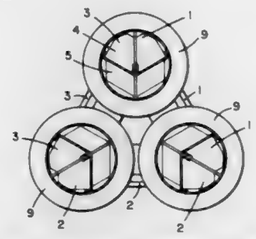
THREE PHASE TRANSFORMER WITH FRAME SHAPED WINDING ASSEMBLIES

Peder U. Poulsen, Huntington Rd. Box 197, Stratford, Conn. 06497

Filed Jan. 28, 1992, Ser. No. 826,608

Int. Cl.[5] H01F *27/08, 27/30*

U.S. Cl. 336—5 **5 Claims**



1. Three phase transformer comprising three substantially identical frame shaped winding assemblies, each containing low voltage and high voltage windings insulated between each other, and forming together half legs of substantially semi-circular cross section, said winding assemblies being placed together to form a triangular structure wherein the half legs of adjacent assemblies combine into three legs of substantially circular cross section, said winding assemblies being interlinked by three hollow, cylindrical cores wound from ferromagnetic strip material, each core surrounding one of said substantially circular legs and wherein each winding assembly contains said low voltage winding having rectangular turns of uniform width, with each turn placed upon the previous turn in a staggered fashion to form together a rhombordly shaped part section, and said high voltage winding wound several turns to a layer, the layers being of varying width and offset mutually to form an offset part section, said rhomboidly shaped part section and said offset part section forming said semi-circular cross section of each of said half legs.

5,202,665

TEMPERATURE SENSOR AND PROCESS FOR ITS PRODUCTION

E. Hafele, Karlsruhe, Fed. Rep. of Germany, assignor to Roth-Technik GmbH & Co., Gaggenau, Fed. Rep. of Germany

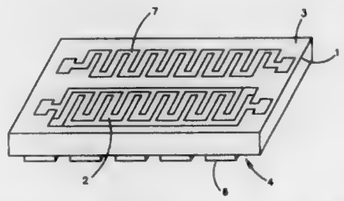
PCT No. PCT/DE90/00527, § 371 Date Mar. 22, 1991, § 102(e) Date Mar. 22, 1991, PCT Pub. No. WO91/01561, PCT Pub. Date Feb. 7, 1991

PCT Filed Jul. 13, 1990, Ser. No. 671,920

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924518

Int. Cl.[5] H01C *3/04*

U.S. Cl. 338—25 **12 Claims**



1. A temperature sensor with a temperature-sensitive layer containing platinum applied on a support substratum, with the distinction that the layer contains finely divided metallic platinum in oxide ceramic and with the distinction that the layer contains metallic platinum in a proportion of 60 to 90% by weight.

5,202,666

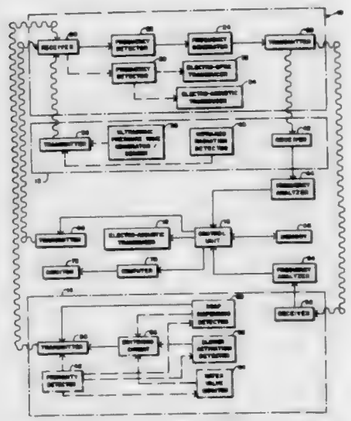
METHOD AND APPARATUS FOR ENHANCING HYGIENE

Hermann Knippscheer, Baldwin, N.Y., assignor to Net/Tech International Inc., Baldwin, N.Y.

Filed Jan. 18, 1991, Ser. No. 643,545

Int. Cl.[5] G08B *23/00, 13/18;* **H04B** *1/40*

U.S. Cl. 340—573 **26 Claims**



1. An apparatus for enhancing hygiene, comprising:

first monitoring means for automatically and simultaneously monitoring each of a plurality of preselected individuals upon entry of same into a washroom, to automatically determine whether each of said individuals has executed a predetermined action for cleaning his hands;

second monitoring means for automatically detecting that any one of said individuals has exited said washroom; and

alert indicator means operatively connected to said first monitoring means and said second monitoring means for automatically generating an alert signal cognizable by a human being, upon detecting that said one of said individuals has exited said washroom and has not executed said predetermined action while in said washroom.

5,202,667

ELECTRIC LEAKAGE DETECTOR FOR UNDERGROUND STORAGE TANK SYSTEMS

David W. Alvin, Glen Ellyn, Ill., assignor to Monitoring Systems, Inc., Oak Brook, Ill.

Filed Oct. 19, 1990, Ser. No. 600,538

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—605 **29 Claims**

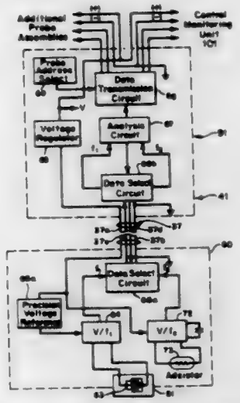
1. A fluid detection system for identifying the presence or absence and the identity of fluids within confined areas within an underground storage tank system, said confined areas including accumulation areas on which fluids unintentionally or accidentally entering the confined area can generally accumulate, said fluid detection system comprising:

a probe assembly sized and shaped for deployment within said confined areas and adjacent to one of said accumulation areas, said probe assembly including a sensor for detecting the presence or absence and identity of said fluids collecting on said one of said accumulation areas;

said sensor including capacitor means that develops a capacitance characteristic of air or said fluids that contact said capacitor means;

said probe assembly including a converter responsive to the capacitance of said capacitor means for generating a variable frequency output signal;

an analyzer unit including circuitry by which said variable frequency signal is edited to provide selected frequencies as an edited output signal; and



a transmitter for digitalizing and transmitting said edited output signal to a display, said display for indicating the presence or absence and the identity of said fluids within said one of said confined areas or a multiple of said confined areas, whereby said fluids unintentionally or accidentally entering said tank system are identified and displayed.

5,202,668

CONTROL SYSTEM FOR A HEAD-UP DISPLAY FOR AUTOMOTIVE VEHICLES

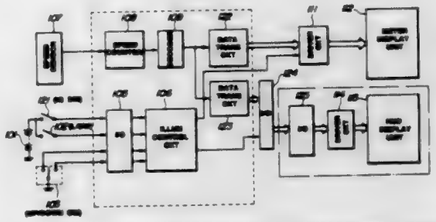
Masafumi Nagami, Omiya, Japan, assignor to Kanto Seiki Co., Ltd., Omiya, Japan

Filed Apr. 12, 1989, Ser. No. 337,134

Claims priority, application Japan, Apr. 12, 1988, 63-48262[U]; May 12, 1988, 63-61563[U]; May 12, 1988, 63-61565[U]; May 12, 1988, 63-61567[U]; May 12, 1988, 63-61568[U]; May 12, 1988, 63-61568[U]; May 12, 1988, 63-62239[U]; May 12, 1988, 63-113471[U]; Apr. 3, 1989, 1-39400[U]; Apr. 3, 1989, 1-39401[U]

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—705 **19 Claims**



1. A display arrangement for use in an automotive vehicle comprising:

vehicular operating parameter sensor means for sensing a magnitude of a vehicular operating parameter and for outputting a signal indicative thereof;

first and second display units;

display control means, responsive to said vehicular operat-

interpolating means for performing interpolation operations

said blocks having a predetermined extent in said second

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ing parameter sensor means, for generating signals which are supplied to said first and second display units and for inducing said first and second display units to selectively produce images;

illumination control means for controlling a degree of illumination of said images produced by said first and second display units, said illumination control means being arranged to be responsive to an input indicative of a level of external illumination in a manner to induce selective use of first and second illumination control schedules; and

noise attenuation means for attenuating the effect of electromagnetic noise on images produced by said second display unit, said noise attenuation means being interposed between said illumination control means and said second display unit and being included in a second of first and second serially connected interface circuits which provide an operative connection between said second display unit and said illumination control means and between said second display unit and said display control means, said first and second interface circuits being connected such that data is bussed therebetween.

5,202,669

DISPLAY CONTROL DEVICE FOR SUPERIMPOSING DATA WITH A BROADCAST SIGNAL ON A TELEVISION SCREEN

Haruki Ishimochi, Nikko; Kimio Yamamura, Yaita; Yuji Fukuyama, Yaita; Masato Yanai, Yaita, and Satoshi Takahashi, Yaita, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

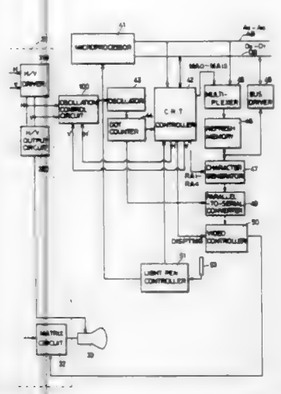
Continuation of Ser. No. 524,866, Aug. 19, 1983, Pat. No. 4,899,139. This application Jan. 11, 1990, Ser. No. 450,166

Claims priority, application Japan, Aug. 24, 1982, 57-146573; Aug. 25, 1982, 57-148399; Aug. 26, 1982, 57-148542; Aug. 30, 1982, 57-151341

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] **G09G** *1/00*

U.S. Cl. 340—721 **1 Claim**



1. A system for superimposing information from an electronic processing device onto a television broadcast being displayed on a display screen of a television receiver, comprising:

a television receiver including display means for displaying a television broadcast and information;

data processing means for generating actual data and information; and

control means, operatively connected to said television receiver and said data processing means, for controlling an exchange of data between said television receiver and said data processing means;

said control means including,

storage means, operatively connected to said data processing means, for storing said actual data and information from said processing means, said actual data and information to be displayed on said display means,

oscillator means, operatively connected to said television receiver, for producing clock signals in synchronism with horizontal and vertical synchronizing signals developed by said television receiver,

timing means, operatively connected to said oscillator means, for defining a horizontal scanning display period, a horizontal scanning retrace period, a vertical scanning display period, and a vertical retrace period corresponding to said clock signals, and

transfer means, operatively connected to said storage means and said display means, for transferring said actual data and information stored in said storage means to said display means in response to said timing means;

said timing means providing a signal representing said vertical retrace period to said data processing means;

said data processing means generating said actual information and data to be displayed on said display means when said signal representing said vertical retrace period is received from said timing means;

said timing means developing a character timing signal, said character timing signal including a plurality of character representation pulses each representative of a character having a predetermined number of display dots, each plurality of character representation pulses having a frequency distinct from a chrominance subcarrier frequency of a broadcast signal being supplied to said television receiver;

said timing means including,

count means for counting said character representation pulses, and

modification means, operatively connected to said count means, for modifying the count of said count means so as to alter a length of said character representation pulses developed during each horizontal retrace period so that the chrominance subcarrier frequency is a multiple frequency of a frequency of all of said character representation pulses developed during both said horizontal scanning retrace period and said horizontal scanning display period.

5,202,670

IMAGE PROCESSING APPARATUS

Shinichi Oha, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 517,420, May 3, 1990, abandoned, which is a continuation of Ser. No. 86,622, Aug. 18, 1987, abandoned. This application Feb. 14, 1992, Ser. No. 836,162

Claims priority, application Japan, Aug. 20, 1986, 61-192964; Aug. 20, 1986, 61-192965; Aug. 22, 1986, 61-195682; Aug. 22, 1986, 61-196894

Int. Cl.[5] **G09G** *1/00*

U.S. Cl. 340—728 **45 Claims**

1. An image processing apparatus for interpolating an input image and outputting the interpolated input image, said image processing apparatus comprising:

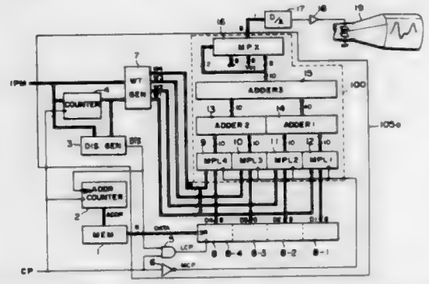
selecting means for selecting one of a plurality of interpolation magnifications on the basis of an input image pixel count, an output medium pixel count, a designated output image count, and a designated output image layout,

wherein the plurality of interpolation magnifications are represented by:

$$B^n \times k/L$$

where B and L are constants in which B is a positive integer and L is an integer not less than 2, and n and k are variables in which n is a non-negative integer and k is an integer not less than L and less than B×L:

interpolating means for performing interpolation operations at the selected magnification, wherein said interpolating means further comprises a signal generator for generating a control signal in response to the selected magnification and means for performing the interpolation operations while controlling the flow of data on the basis of the control signal; and



output means for outputting an image interpolated by said interpolating means, in accordance with the designated output image layout,

wherein the input image is interpolated at a magnification determined such that a size of an output image falls within an area of an output medium.

5,202,671

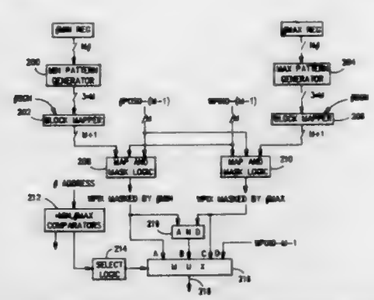
PICK FUNCTION IMPLEMENTATION IN A PARALLEL PROCESSING SYSTEM

Michael A. Aranda, Saugerties, N.Y.; Yoshio Iida, Yokohama, and Akishi Kamei, Tokyo, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 426,143, Oct. 24, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 777,477

Int. Cl.[5] **G09G** *1/14*

U.S. Cl. 340—747 **20 Claims**



1. In a graphics system in which a predetermined number of pixels representing a fragment of a two-dimensional pixel image are generated in parallel for display by a raster scan device, a method of detecting the generation of pixels within a defined window having a boundary extending along a first dimension of said image, said method comprising the steps of:

(a) (1) generating a mask fragment comprising mask bits corresponding to contiguous pixels distributed along a portion of a second dimension of said image perpendicular to said first dimension on either side of said boundary, each of said mask bits indicating the side of said boundary on which the corresponding pixel lies;

(2) masking said image fragment with said mask fragment to produce a masked image fragment; and

(b) (1) partitioning said image into contiguous blocks distributed along said second dimension of said image, each of said blocks having a predetermined extent in said second dimension;

(2) associating said image fragment with one of said blocks in accordance with the position of said fragment in said image;

(3) trivially determining the location of said image fragment relative to said window in accordance with the position of said block relative to said window;

(c) logically combining said masked image fragment with said trivial determination of the location of said image fragment to generate a detection signal indicating the presence of an image fragment within said window.

5,202,672

OBJECT DISPLAY SYSTEM

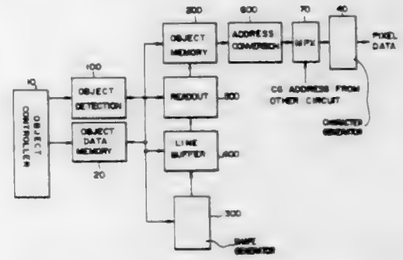
Shigeichi Nakamura; Toru Ogawa, both of Tokyo; Makoto Inoue, Yokohama, and Seiichi Sato, Tokyo, all of Japan, assignors to Namco Ltd., Tokyo, Japan

Continuation of Ser. No. 291,156, Dec. 28, 1988, abandoned. This application May 8, 1992, Ser. No. 882,258

Claims priority, application Japan, Dec. 30, 1987, 62-335708

Int. Cl.[5] **G09G** *5/36*

U.S. Cl. 340—747 **15 Claims**



1. An object display system for displaying an object using a set of object data including object identification data, vertical display position data and horizontal display position data for each object to be displayed, said object display system comprising:

a raster display for displaying an image of the object;

an object data memory for storing the object data corresponding to one scene;

an object detecting circuit for detecting the object to be displayed on each of horizontal scan lines in the raster display in synchronism with said horizontal scan lines based on the object data stored in said object data memory, said object detecting circuit reading the object data of each detected object from said object data memory, calculating and outputting a vertical in-block scan position of the detected object;

a shape generator pre-registered with the image of each object as block information represented by binary pixel data which are representative of transparent and opaque sections of the image, said shape generator outputting the binary pixel data corresponding to one horizontal scan in the block of the object as transparent or opaque data for each pixel based on the object identification data of each object read out and the calculated vertical in-block scan position data;

an object memory for storing the object data of each object detected and read out from the object data memory by said object detecting circuit sequentially in predetermined storage areas;

a line buffer counter being responsive to the object data of each of the detected objects from said object data memory, said line buffer counter using a write start address specified by the horizontal display position data included in said object data, starting to count the number of pixels corresponding to the horizontal size of the object from

said write start address sequentially, outputting said count

detected light pulses and the absence of detected light

5,202,675

N-DIMENSIONAL SCANNING TYPE DISPLAY

strate, a plurality of common electrodes being formed on said first substrate, a second substrate, a plurality of segment elec-

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said write start address sequentially, outputting said count number sequentially as a write address signal;

a line buffer memory having storage areas corresponding to pixels for one horizontal scan, said buffer memory using each of the binary pixel data outputted from said shape generator as a write signal to allow to store data into said storage areas corresponding to opaque pixels so that the write address of the detected object for said object memory are sequentially stored into storage areas specified by the write address signals from said line buffer counter and corresponding to the opaque sections of the image;

a readout circuit for reading the information of an object to be displayed on one horizontal scan line from said object memory for each dot in synchronism with the horizontal scan, based on the address data corresponding to one horizontal scan line stored in said line buffer memory; and

a character generator pre-registered with the image of each object as block information specifying a color of said image by a color code for each pixel, said character generator being adapted to output the color code of the corresponding object for each pixel, based on the information of object read out from said object memory for each dot to produce pixel data for said raster display.

5,202,673

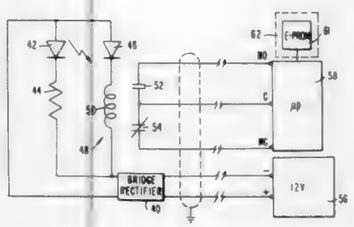
SECURITY METHOD AND APPARATUS

Rodney Conrad, Arvada, Colo., assignor to Valve Security Systems, Inc., Westminster, Colo.

Continuation-in-part of Ser. No. 408,760, Sep. 19, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 627,725

Int. Cl.[5] G08B *25/00*

U.S. Cl. 340—524 **11 Claims**



1. In a security apparatus comprising plural devices each having a movable control member and plural optical fibers each coupled to one of the movable control members and mounted to optical connectors such that the optical fiber has to be removed from its connector in order to move its coupled control member; means for determining the removal or breakable of an optical fibre, said optical fiber removal or breakage determining means comprising:

(a) means for generating light pulses within a range of predetermined frequencies, and transmitting said light pulses via a connector to one end of a fiber,

(b) means at the other end of the fiber for detecting light and converting same into electrical signals representative of detected light pulses if present,

(c) signal processing means connected to the light detecting means for processing its electrical signals,

(d) a power source connected to the means of elements (a), (b), and (c) for operating same,

(e) means connected to the signal processing means for indicating when the power source is not sufficient to operate the means of elements (a), (b) and (c), said indicating means comprising a means for filtering out signals at frequencies outside said range of predetermined frequencies,

(f) means connected to the means of element (c) for distinguishing among electrical signals representative of the detected light pulses and the absence of detected light pulses due to removal or breakage of an optical fiber.

5,202,674

APPARATUS FOR AND METHOD OF DRIVING ELECTRODES OF FLAT DISPLAY

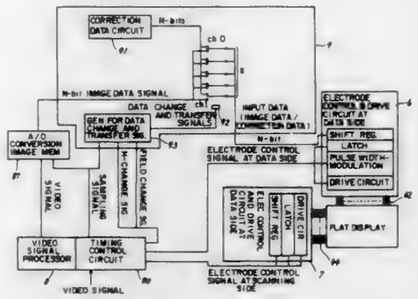
Daisuke Takemori, Suita, and Katsumi Terada, Tuzuki, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 29, 1991, Ser. No. 677,053

Claims priority, application Japan, Mar. 30, 1990, 2-87147

Int. Cl.[5] G09G *3/30*

U.S. Cl. 340—781 **4 Claims**



1. A flat display, comprising:

a front panel having a fluorescent screen on a rear surface thereof with phosphor dots being arranged in a delta pattern;

a rear panel opposed to the front panel in parallel thereto and defining a closed flat space along with the front panel;

a cathode provided on an inner surface of the rear panel;

an address electrode board interposed between the cathode and the front panel, wherein the address electrode board includes a plurality of first address electrodes extending in parallel to one another on one surface of a substrate in the form of a flat plate, and a plurality of second address electrodes arranged on the other surface of the substrate and extending in parallel to one another in a direction intersecting the first address electrodes, wherein the address electrode board includes at least one aperture formed in each of the portions thereof where the first address electrodes are lapped over the second address electrodes with the substrate provided therebetween in a delta pattern and

a driving means for driving the electrodes of the flat display, wherein the driving means comprises a scanning-side control-drive circuit connected to the second address electrodes on the scanning side of the address electrode board for applying a horizontal scanning signal voltage to the scanning-side electrodes successively, a data-side control-drive circuit connected to the first address electrodes on the data side of the board for applying an image signal to every other data-side address electrode, and a correction signal circuit for applying a correction voltage signal of a specified fixed voltage value to the first address electrodes on opposite sides of each first address electrode receiving the image signal so that for every scan with each scanning-side address electrode, the image signal and the correction signal are alternately applied to the data-side address electrodes upon a changeover of the connection thereto.

5,202,675

N-DIMENSIONAL SCANNING TYPE DISPLAY APPARATUS

Toyotaro Tokimoto, 23-19 Shinkamata 3-chome, Ohta-ku, Tokyo, and Hiroshi Yajima, Tokyo, both of Japan, assignors to Toyotaro Tokimoto, Tokyo, Japan

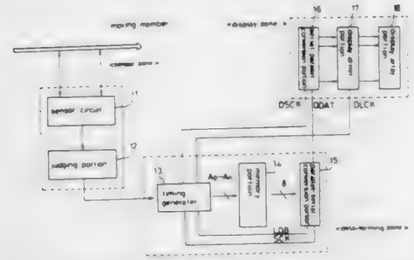
PCT No. PCT/JP89/00907, § 371 Date May 1, 1990, § 102(e) Date May 1, 1990, PCT Pub. No. WO90/03022, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 1, 1989, Ser. No. 459,800

Claims priority, application Japan, Sep. 2, 1988, 63-219950; Sep. 2, 1988, 63-219951; Feb. 15, 1989, 1-35844; Aug. 15, 1989, 1-210423

Int. Cl.[5] G09G *3/32*

U.S. Cl. 340—782 **32 Claims**



1. An n-dimensional scanning type display apparatus being at least one of: a two dimensional display apparatus and a three dimensional display apparatus, said apparatus having:

a display zone provided an $n-1(n=2,3)$-dimensional display array zone for obtaining an n-dimensional image by accomplishing an image scanning operation in a direction of the display based on a display changeover operation of said display array zone and the moving of a moving member for having an observer thereon,

said display apparatus comprising means in a sensor zone for detecting the passage of the moving member past a reference position and outputting movement information including moving speed information, and

means for indicating moving direction,

a data-forming zone forming a display changeover control signal based on the movement information from the sensor zone and said means for indicating moving direction,

said data-forming zone outputting display data, and

said display zone having an $(n-1)$-dimensional display area zone fixedly arranged along a path of the moving member, and

said display zone constructed by many emission elements, said display zone arranged for receiving display data based on the display changeover control signal from the data-forming zone and changing over and displaying $(n-1)$-dimensional images in a succession of images, said succession of images operatively being responsive to at least one of the moving speed information and the moving direction information and generating moving signal information for moving said images, in a succession, along with the moving member along said path.

5,202,676

CIRCUIT FOR DRIVING A LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR DRIVING THEREOF

Katsunori Yamazaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

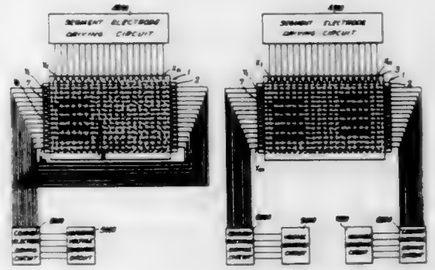
Continuation-in-part of Ser. No. 232,750, Aug. 15, 1988, Pat. No. 5,010,326. This application Oct. 12, 1990, Ser. No. 597,904

Claims priority, application Japan, Oct. 12, 1989, 1-265662

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **8 Claims**

1. A method for driving a matrix liquid crystal display device for displaying characters or a pattern having a first substrate, a plurality of common electrodes being formed on said first substrate, a second substrate, a plurality of segment electrodes being formed on said second substrate, a liquid crystal layer sandwiched between said first substrate and said second substrate, said liquid crystal display having a capacitance and resistance, comprising the step of applying a common voltage waveform to at least one of the common electrodes at both ends of said at least one common electrodes;



applying a segment voltage waveform to said segment electrodes; and

varying said common voltage waveform at both ends of said common electrode in accordance with said characters or pattern to be displayed to compensate at least in part the common voltage waveform for crosstalk produced by said liquid crystal display capacitance and resistance.

5,202,677

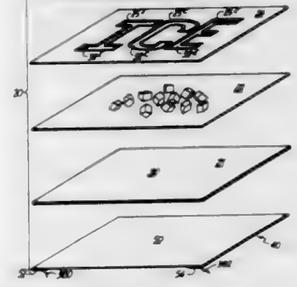
DISPLAY APPARATUS USING THERMOCHROMIC MATERIAL

Robert Parker, Alamo, and Stephen Phillips, Walnut Creek, both of Calif., assignors to Crystal Images, Inc., Boca Raton, Fla.

Filed Jan. 31, 1991, Ser. No. 648,727

Int. Cl.[5] G09G *3/34*

U.S. Cl. 340—786 **23 Claims**



1. A visual display apparatus comprising:

a substrate having a visible display area;

means for controlling the temperature of the visible display area of the substrate;

a first thermochromic material covering a first portion of the visible display area, the first thermochromic material changing, as a result of a first temperature change, from a

first colored state to a second generally transparent state;

5,202,679

MID VALUE SIGNAL SELECTION SYSTEM

5,202,680

SYSTEM FOR DRILL STRING TALLYING, TRACKING

5,202,682

DATA ENCODEMENT AND READING METHOD AND

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first colored state to a second generally transparent state; and

a second thermochromic material covering a second portion of the visible display area, the second thermochromic material changing as a result of a second temperature change, from a first colored state to a second generally transparent state,

wherein the first and second thermochromic materials combine to form a substantially single thermochromic layer on the visible display area of the substrate,

wherein one of the first and second portions defines, at least in part, a positive representation of a desired display image and the other one of the first and second portions defines, at least in part, a negative representation of the same desired display image at the same place on the visible display area, and

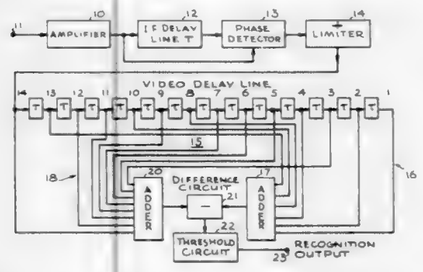
wherein the first and second thermochromic materials have the same color when in their respective first colored states.

5,202,678

RECOGNITION UNIT

John E. Taber, Gardena, and Bernard H. Dell, Hawthorne, both of Calif., assignors to AIL Systems, Inc., Deer Park, N.Y.

Filed Feb. 13, 1959, Ser. No. 793,212
Int. Cl.[5] H03K *5/159;* **G08C** *19/28*
U.S. Cl. 328—119 **9 Claims**



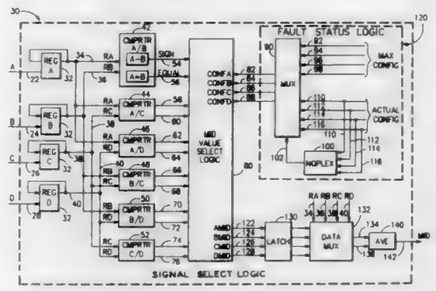
1. A recognition unit for identifying a train of bi-phase pulsed carrier signals defining a series of n pulses at a predetermined pulse repetition frequency, said unit comprising: delay means for delaying each pulsed carrier signal by an interval of time substantially equal to a pulse period; phase detector means coupled to said delay means and receptive of the train of pulsed carrier signals for comparing the relative phase between the carrier of each pulsed carrier signal with that of the next preceding pulsed carrier signal to produce a corresponding train of bi-polar video pulses, a video pulse of one polarity being produced when the compared carriers are in phase and a video pulse of opposite polarity being produced when the compared carriers are out of phase; a video delay line receptive of said video pulse train and having an input tap and a plurality of output taps the sum of said input and output taps being equal in number to n-1, the time delay between each pair of adjacent taps being equal to the pulse period of the video pulses; a first adder circuit coupled to those of said taps whereat the video pulses are of said one polarity, said first adder circuit simultaneously summing said video pulses to produce a first pulse having said one polarity; a second adder circuit coupled to those of said taps whereat the video pulses are of said opposite polarity, said second adder circuit simultaneously summing said video pulses to produce a second pulse having said opposite polarity; and a difference circuit for subtracting said second pulse from said first pulse to produce an output pulse having said one polarity.

5,202,679

MID-VALUE SIGNAL SELECTION SYSTEM

Bhalchandra R. Tulpule, Farmington, and Steven A. Avritch, Bristol, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 1, 1991, Ser. No. 678,500
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.160 **14 Claims**



5. A signal selection system, having input thereto a plurality of input signals with varying values, each input signal having a multiple bit digital format representing the value of the input signal, the system comprising:

comparison means, for simultaneously comparing all possible pairwise combinations of the input signal to determine which input signal in each of the input signal pairs has the greater value and to determine if both input signals in each of the input signal pairs have equal values, and for providing corresponding comparison signals indicative of the result of said simultaneous comparing;

selection means, responsive to said comparison signals, for determining the one or more of the plurality of input signals that meets a predetermined mid value selection criterion, said selection means having a plurality of combinational logic elements arranged to execute predetermined Boolean logic equations in determining the one or more of the plurality of input signals whose value represents a mid value from among the plurality of input signals, and for providing a mid value indicator signal indicative of the one or more of the input signals whose value represents said mid value from among the plurality of input signals; and

fault logic means, for providing a plurality of fault signals to said selection means, each of said fault signals being indicative of how a corresponding one of the plurality of input signals is to be used by said selection means, said fault signals being provided in a first instance when all of the plurality of input signals are in a failed condition, said fault signals in said first instance being indicative of a maximum number of the plurality of input signals, and said fault signals being alternatively provided in a second instance when not all of the plurality of input signals are in a failed condition, said fault signals in said second instance being indicative of the actual health status of the plurality of input signals; and

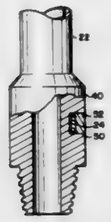
said selection means comprising means responsive to said fault signals for determining which one or more of the plurality of input signals meets said predetermined mid value selection criterion.

5,202,680

SYSTEM FOR DRILL STRING TALLYING, TRACKING AND SERVICE FACTOR MEASUREMENT

George M. Savage, Grove, Okla., assignor to Paul C. Koomey, Houston and Tom L. McDaniel, Dallas, both of Tex.

Filed Nov. 18, 1991, Ser. No. 795,943
Int. Cl.[5] G01V *1/00*
U.S. Cl. 340—853.1 **14 Claims**



1. An identifying apparatus for use in drilling operations utilizing a drill bit and drill string comprising:

said drill string having a wall with a recess therein, opening to the exterior thereof;

an electronic identification tag;

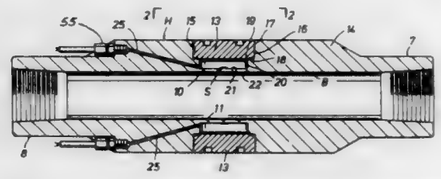
an electromagnetically conductive material secured within and substantially filling said recess for holding said tag in place within said recess.

5,202,681

INTEGRAL TRANSDUCER HOUSING AND METHOD

Wilbur L. Dublin, Jr., 308 Texas Ave., Ste. 104, Round Rock, Tex. 78664, and Boyd B. Moore, Houston, Tex., assignors to Wilbur L. Dublin, Jr.

Continuation of Ser. No. 496,657, Mar. 21, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 831,623
Int. Cl.[5] G01V *1/00*
U.S. Cl. 340—856.4 **5 Claims**



1. A transducer assembly having a longitudinal bore therethrough and adapted to be connected at each end with a conduit, said assembly comprising:

a housing;

a chamber formed in the housing and having a bottom surface adjacent the bore of the assembly;

a recessed diaphragm integrally formed in the bottom surface of the chamber, said diaphragm extending longitudinally within said chamber;

at least one sensor positioned on said diaphragm and adapted for producing a first signal in response to strain induced in the diaphragm;

means for transmitting said signal from the sensor to a predetermined location remote from said assembly; and

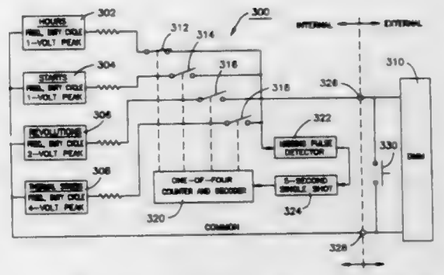
a second sensor attached to the bottom surface of the chamber and spaced from said diaphragm, said second sensor adapted for producing a second signal in response to strain induced in said bottom surface whereby the first and second signals are provided to permit remote analysis of physical conditions proximate the assembly.

5,202,682

DATA ENCODEMENT AND READING METHOD AND APPARATUS

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Continuation-in-part of Ser. No. 377,571, Jul. 13, 1989, abandoned. This application Oct. 18, 1991, Ser. No. 780,409
Int. Cl.[5] G08C *19/16*
U.S. Cl. 340—870.19 **28 Claims**



1. A method of processing and reading a single data signal having a value and representing a parameter, comprising:

(a) electronically encoding said single data signal with a first variable indicating full-scale range of said value;

(b) electronically encoding said single data signal with a second variable indicating the magnitude of said value;

(c) reading said first variable in said single data signal to determine said full-scale range; and

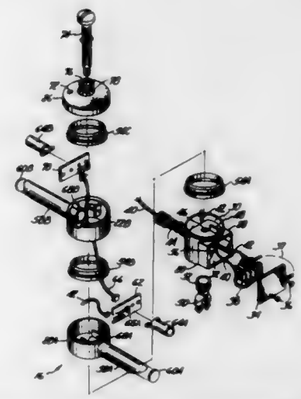
(d) reading said second variable in said single data signal to determine said value.

5,202,683

OPTICAL TRAFFIC PREEMPTION DETECTOR

Steven M. Hamer, Willernie, Minn.; Thomas J. Luna, Hudson, Wis., and David L. Wortman, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 24, 1991, Ser. No. 721,095
Int. Cl.[5] G08G *1/07*
U.S. Cl. 340—906 **29 Claims**



1. A detector assembly for receiving pulses of light from an emergency vehicle and sending an output signal to a remote phase selector, the detector assembly comprising:

A, a detector housing capable of being installed near a traffic

an encoder for encoding an output of said altitude informa-

selectively supplying output signals of one of the analog-

verter cell to convert the analog input signal to an n-bit representation thereof; and wherein

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A. a detector housing capable of being installed near a traffic intersection, the detector housing comprising:
1) a base for attachment to a support structure;
2) at least one detector turret rotatably coupled to the base and having light access means for allowing said pulses of light from a direction to be received therein; and
3) a cap coupled to the detector turret for covering an end of the detector housing;
B. lens means positioned within said light access means for concentrating said received light pulses; and
C. a detector circuit positioned in at least one said detector turret, the detector circuit comprising:
1) circuit board means for providing conduction paths for components;
2) photocell means positioned adjacent said lens means to receive said concentrated light pulses therefrom, and coupled to the circuit board means for providing an electrical signal that varies with an intensity of light concentrated thereon; and
3) output means coupled to the photocell means, for processing the electrical signal produced by the photocell means into the output signal capable of being received by a phase selector not in proximity to the detector assembly.

5,202,684

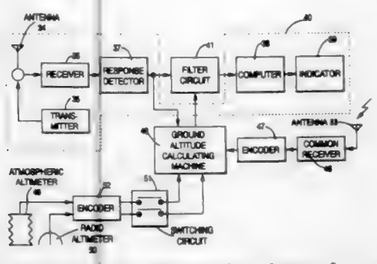
SYSTEM OF AN AIRCRAFT COLLISION AVOIDANCE SYSTEM FOR SUPPRESSING USELESS ALARMS

Chuhei Funatsu, Kanagawa, Japan, assignor to Toyo Communication Equipment Co., Ltd., Kanagawa, Japan

Division of Ser. No. 373,205, Jun. 30, 1989, Pat. No. 4,978,945, which is a continuation-in-part of Ser. No. 65,217, Jun. 5, 1987, abandoned. This application Apr. 19, 1990, Ser. No. 511,321

Int. Cl.[5] G08G *5/04*

U.S. Cl. 340—961 **2 Claims**



1. A system for suppressing useless alarms of an aircraft collision avoidance system which has a function of determining whether or not a subject aircraft is in danger of colliding with another aircraft and which generates an alarm when it has determined that the subject aircraft is in danger of colliding with another aircraft, through utilization of a response signal received from the other aircraft, said system for suppressing useless alarms comprising a variable threshold generator and said collision avoidance system comprising:
a receiver for receiving at least said response signal from the other aircraft;
a collision avoidance system logic circuit which receives said response signal received by said receiver and which is controlled in accordance with a threshold valve output by said variable threshold generator, said logic circuit for actuating an alarm when a difference between an altitude of the other aircraft denoted by said response signal and an altitude of said subject aircraft is within the threshold value; and
a display which is controlled by an output of said collision avoidance system logic circuit;
said system for suppressing useless alarms comprising:
an altitude information detector for obtaining altitude information of said subject aircraft;
an encoder for encoding an output of said altitude information detector into a coded signal; and,
said variable threshold generator is controlled in response to said coded signal output by said encoder of said altitude information detected by said altitude information detector;
wherein when said subject aircraft descends to a predetermined altitude, the threshold value output by said variable threshold generator is reduced according to an altitude of said subject aircraft so as to thereby prevent an alarm from being generated on the basis of said response signal from said other aircraft located at an altitude which is lower than an altitude value resulting from subtracting said threshold value from said altitude of said subject aircraft, whereby the generation of a useless alarm is suppressed.

5,202,685

DIGITAL SIGMA-DELTA MODULATOR HAVING A LIMITER CIRCUIT

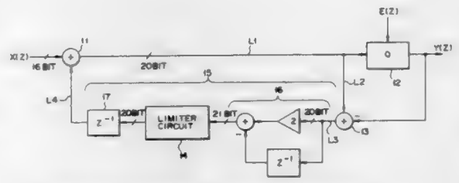
Mitsuru Nagata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1991, Ser. No. 762,375

Claims priority, application Japan, Sep. 20, 1990, 2-248855

Int. Cl.[5] H03M *3/00*

U.S. Cl. 341—76 **4 Claims**



1. A digital sigma-delta modulator comprising:
adder means for adding input digital data and feedback data;
quantizer means for quantizing output data of said adder means;
subtractor means for calculating a difference between the output data of said adder means and that of said quantizer means;
filter means for digitally processing output data of said subtractor means to generate the feedback data; and
limiter means, arranged in at least one position within an operation loop which loops said adder means, said subtractor means, and said filter means, for extracting (n-m)-bit data acquired by eliminating a significant m bit other than MSB, from an n-bit data line, producing a saw-tooth wave output.

5,202,686

INFRARED FOURIER TRANSFORMATION SPECTOMETER WITH PLURAL ANALOG-TO-DIGITAL CONVERTERS AND INTERLEAVED AMPLIFICATION FACTORS

Norbert Rapp, Malsch, Fed. Rep. of Germany; Jean-Francois Blavier, Fleron, Belgium, and Arno Simon, Karlsruhe, Fed. Rep. of Germany, assignors to Bruker Analytisch MeBtechnik GmbH, Fed. Rep. of Germany

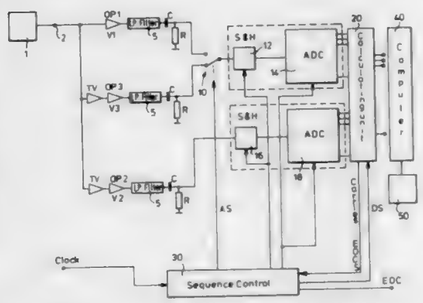
Filed Oct. 23, 1990, Ser. No. 602,172

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935617

Int. Cl.[5] H03M *1/18*

U.S. Cl. 341—139 **9 Claims**

1. Infrared Fourier transformation spectrometer comprising:
a non-linear analog-to-digital converter device having at least two analog-to-digital converters having outputs connected to a first controllable switching means for selectively supplying output signals of one of the analog-to-digital converters to a calculating unit,
a plurality of amplifier means of different but constant amplification factors disposed upstream of said analog-to-digital converters for amplifying input to each of the analog-to-digital converters with sequential gain factors alternating between said analog-to-digital converters, said input signals being amplified by a constant but different amplification factor;



a second controllable switching means for selecting one of the input signals, which has been amplified by one of the plurality of amplifiers, and
a sequence control means for switching said first controllable switching means, said first controllable switching means being switched with a certain time delay, when switching occurs, after switching of the second controllable switching means.

5,202,687

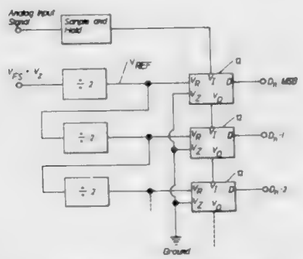
ANALOG TO DIGITAL CONVERTER

Robert J. Distinti, Fairfield, Conn., assignor to Intellectual Property Development Associates of Connecticut, Trumbull, Conn.

Filed Jun. 12, 1991, Ser. No. 714,246

Int. Cl.[5] H03M *1/38*

U.S. Cl. 341—158 **35 Claims**



1. An analog to digital converter comprising a first analog to digital converter cell and a second analog to digital cell, each of said cells comprising:
means for comparing an analog input signal to a first reference signal, said comparing means having an output for providing a signal that indicates whether a magnitude of the analog input signal is greater than or less than the first reference signal;
means for providing an analog output signal expressive of an algebraic function of the magnitude of the analog input signal;
means for repetitively coupling the analog output signal of said cell to an input of said comparing means;
means for alternately selecting either the first analog to digital converter cell or the second analog to digital converter cell to convert the analog input signal to an n-bit representation thereof; and wherein
each of said analog to digital converter cells includes means for zeroing an error voltage during a time that the other analog to digital converter cell is selected for converting the analog input signal.

5,202,688

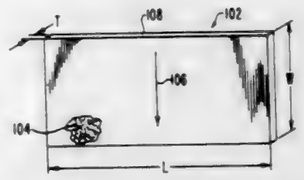
BULK RF ABSORBER APPARATUS AND METHOD

Ronald N. Hubbard, Carlsbad; Gregory A. Kaiser, San Diego, and James E. Staley, Escondido, all of Calif., assignors to Brunswick Corporation, Del.

Division of Ser. No. 415,854, Oct. 2, 1989, Pat. No. 5,125,992. This application May 21, 1991, Ser. No. 685,421

Int. Cl.[5] H01Q *17/00*

U.S. Cl. 342—1 **24 Claims**



1. An electromagnetic radiation absorber, comprising:
a block of a reticulated dielectric material having a predetermined surface for receiving incident radiation to be absorbed, said block being formed of a plurality of randomly oriented filaments of the dielectric material; and
at least one layer of electromagnetic radiation absorbing material on each of said plurality of filaments of said block, the radiation absorptivity of said at least one absorbing material layer varying in accordance with a predetermined function along a gradient direction that is at a predetermined angle relative to said predetermined surface.

5,202,689

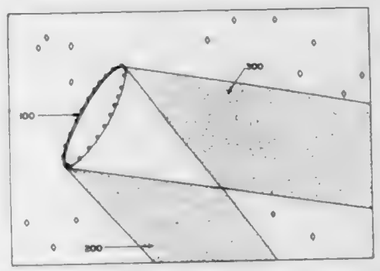
LIGHTWEIGHT FOCUSING REFLECTOR FOR SPACE

Robert W. Bussard, Manassas, Va., and Thomas H. Wallace, Gainesville, Fla., assignors to APTI, Inc., Washington, D.C.

Filed Aug. 23, 1991, Ser. No. 748,877

Int. Cl.[5] H01Q *15/20*

U.S. Cl. 342—10 **24 Claims**



1. An adjustable focal length reflector for operation in space, said adjustable focal length reflector comprising:
(a) a membrane, located in space, having a reflective surface, said membrane being subjected to incident radiation pressure; and
(b) an assembly located at a perimeter of said membrane to exert force on said membrane to counteract said incident

radiation pressure such that a focal length of said reflective surface is varied

ments of moving targets in the presence of noise, said method comprising the following steps:

millimeter wave radiation detected by said pair of conductive elements; and

through and issuing this sequence of clock pulses at the output terminal, the first clock control means further

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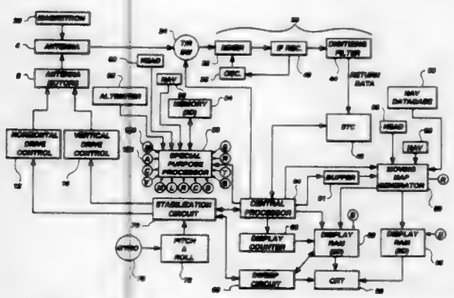
radiation pressure such that a focal length of said reflective surface is varied.

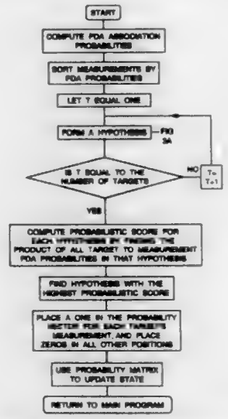
5,202,690
AUTOMATIC HORIZONTAL AND VERTICAL SCANNING RADAR
Philip R. Frederick, 632 17th Ave., Salt Lake City, Utah 84103
Filed Jun. 2, 1992, Ser. No. 892,158
Int. Cl.[5] G01S *13/00*
U.S. Cl. 342—26 **14 Claims**



1. An automatic horizontal and vertical scanning weather radar system for an aircraft comprising
antenna means mounted in the aircraft for receiving reflected radar signals and responsive to a transmit signal for producing and directing outwardly therefrom a radar beam, and responsive both to horizontal drive signals for sweeping the radar beam back and forth horizontally, and to vertical drive signals for moving the radar beam up and down vertically,
means for periodically supplying transmit signals to the antenna means,
receiver means coupled to the antenna means for digitizing reflected radar signals received by the antenna means,
means for storing the digitized signals in a three-dimensional array representing voxels in three-dimensional space transversed by the radar signals,
display means responsive to the digitized signals for displaying both a plan view image of weather over a preselected horizontal range represented by reflected radar signals received by the antenna means sweeping back and forth horizontally, and a vertical view image of weather for a preselected height range represented by reflected radar signals received by the antenna means moving up and down vertically,
means for supplying horizontal drive signals and vertical drive signals to the antenna means,
control means for selectively retrieving from the storing means digitized signals specified by plan view altitude range (pvar) signals and supplying the retrieved digitized signals to the display means, and
manually operable pvar signal generating means for selectively supplying pvar signals to the control means to define a uniform vertical range of the plan view image displayed, and the vertical view image displayed.

5,202,691
HICK'S PROBABILISTIC DATA ASSOCIATION METHOD
Richmond F. Hicks, Nashua, N.H., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Apr. 28, 1992, Ser. No. 877,432
Int. Cl.[5] G01S *13/00*
U.S. Cl. 342—90 **8 Claims**

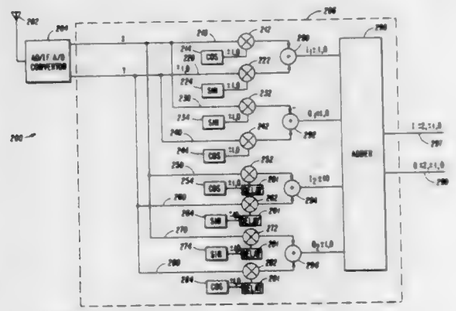
1. A method for improving the performance of a radar tracking system which includes means for acquiring measurements of moving targets in the presence of noise, said method comprising the following steps:
generating a predicted state for each of a plurality of crossing targets;
acquiring actual measurements of said targets along with noise;
using actual measurements and predicted states of said targets, to calculate and store the Probabilistic Data Association (PDA) probabilities;
sorting the PDA probabilities in a matching matrix;
forming a hypothesis for each target using all possible assumptions as to which measurement represent said targets;
calculating the probabilistic score for each of the hypotheses by calculating the product of the PDA probabilities; and
selecting the probability with the highest product.



5,202,692
MILLIMETER WAVE IMAGING SENSORS, SOURCES AND SYSTEMS
Richard G. Huguenin, South Deerfield; Paul F. Goldsmith, Leverett; Naresh C. Deo, Conway, and David K. Walker, Northfield, all of Mass., assignors to Millitech Corporation, South Deerfield, Mass.
Continuation of Ser. No. 194,774, May 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 874,461, Jun. 16, 1986, Pat. No. 4,940,986, and a continuation-in-part of Ser. No. 117,600, Nov. 6, 1987, Pat. No. 4,910,523, and a continuation-in-part of Ser. No. 183,215, Apr. 19, 1988, Pat. No. 4,901,084. This application Apr. 17, 1991, Ser. No. 686,841 The portion of the term of this patent subsequent to Mar. 19, 2007, has been disclaimed.
Int. Cl.[5] G01S *13/89;* **H01L** *27/146*
U.S. Cl. 342—179 **19 Claims**

1. A millimeter wave imaging sensor, comprising:
an array of sensing elements, each comprising an antenna element consisting of a pair of conductive elements, said conductive elements being adapted to detect millimeter wave radiation, and a nonlinear circuit element connected across each pair of conductive elements for rectifying millimeter wave radiation detected by said pair of conductive elements; and
means for focusing millimeter wave radiation from a field of view onto said array, said means for focusing being aligned along an optical axis with said array of sensing elements;
an oscillator for emitting linearly-polarized millimeter-wave radiation, disposed off said optical axis;
a polarizing grid on said optical axis for dividing said radiation emitted by said oscillator into major and minor components, and for directing said major component of said radiation into the field of view, said minor component of said radiation passing through said polarizing grid; and
means for rotating the polarization of said minor component and reflecting it onto said polarizing grid, whereby said polarizing grid reflects said minor component onto said array of sensing elements as a local oscillator signal.

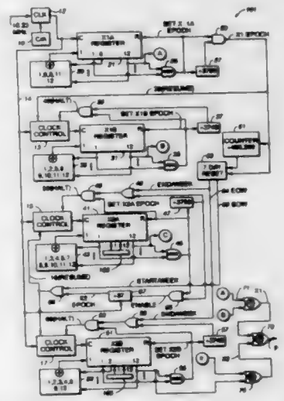
5,202,693
GPS SIGNAL PROCESSING WITH 5-LEVEL CARRIER INJECTION DEMODULATION FUNCTION USING DUAL 3-LEVEL SINGLE SIDEBAND MIXERS
Wai-Cheung Lee, Marion, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.
Filed Mar. 25, 1992, Ser. No. 857,201
Int. Cl.[5] H04B *7/185*
U.S. Cl. 342—357 **5 Claims**



1. A GPS receiver comprising:
means for receiving analog signals from a satellite;
means for down-converting, said analog signal and generating a down-converted digital signal in response thereto; and,
means for digitally demodulating said down-converted signal by utilizing a first 3-level digital phase rotator and a second 3-level digital phase rotator, which utilizes a delayed 3-level digital sine injection signal approximater and a delayed 3-level digital cosine injection signal approximater.

5,202,694
P-CODE GENERATION
Dominic Farmer, Mountain View, and Kreg Martin, Cupertino, both of Calif., assignors to Trimble Navigation, Sunnyvale, Calif.
Filed Sep. 10, 1991, Ser. No. 757,332
Int. Cl.[5] H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **24 Claims**

1. Apparatus for generation of a code sequence P(t) as a function of time t for use in determining position on a surface of a body such as the Earth from position data provided from one or more satellites, the apparatus comprising:
a clock pulse source that provides a sequence of clock pulses of predetermined period T;
first clock control means having a clock pulse input terminal and a clock pulse output terminal, for receiving the sequence of clock pulses at the input terminal and passing through and issuing this sequence of clock pulses at the output terminal, the first clock control means further having a first control input terminal for halting pass-through of clock pulse sequences when a halt signal is received at this first control input terminal, and having a second control input terminal for resuming pass-through of clock pulse sequences when a reset signal is received at the second control input terminal after receipt of a halt signal at the first control input terminal;
second clock control means having a clock pulse input terminal and a clock pulse output terminal, for receiving the sequence of clock pulses at the input terminal and passing through and issuing this sequence of clock pulses at the output terminal, the second clock control means further having a first control input terminal for halting pass-through of clock pulse sequences when a halt signal is received at this first control input terminal, having a second control input terminal for resuming pass-through and issuance of clock pulse sequences when a reset signal is received at the second control input terminal after receipt of a halt signal at the first control input terminal;
third clock control means having a clock pulse input terminal and a clock pulse output terminal, for receiving the sequence of clock pulses at the input terminal and passing through and issuing this sequence of clock pulses at the output terminal, the third clock control means further having a first control input terminal for halting pass-through of clock pulse sequences when a halt signal is received at this first control input terminal, and having a second control input terminal for resuming pass-through of clock pulse sequences when a reset signal is received at the second control input terminal after receipt of a halt signal at the first control input terminal;
first, second, third and fourth register means that receive a clock pulse sequence from the first clock control means, from the clock pulse source, from the second clock control means and from the third clock control means, respectively, and generate and issue a predetermined code sequence X1B(t), X1A(t), X2A(t) and X2B(t), respectively, for each clock pulse received at a sequence of times $t=mT$ $(m=1, 2, \ldots)$;
first decoder means, connected to the first register means, for receiving the code sequence values X1B(t) ($t=m_1T$; $m_1=1, 2, \ldots M1$) issued by the first register means, for detecting occurrence of a predetermined code sequence value X1B0, and for producing and issuing a first halt signal that is received by the first control input terminal of, and halts the pass-through of clock pulses at, the first clock control means when the predetermined code sequence value X1B0 is received, where M1 is a predetermined positive integer;



5,202,695
ORIENTATION STABILIZATION BY SOFTWARE

dependent on the extent to which said tue is telescoped relative to said base;

main line and spaced by one wavelength on said main line wherein said directional array comprises an insulative substrate

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quence value X1B0 is received, where M1 is a predetermined positive integer;

second decoder means, connected to the second register means, for receiving the code sequence values X1A(t) ($t=m_2T; m_2=1, 2, \ldots M2$) issued by the second register means, for detecting occurrence of a predetermined code sequence value X1A0, and for producing and issuing a first reset signal that is received by the second control input terminal of, and resumes the pass-through and issuance of clock pulses at, the first clock control means when the predetermined code sequence value X1A0 is received, where M2 is a predetermined positive integer;

third decoder means, connected to the third register means, for receiving the code sequence values X2A(t) ($t=m_3T$; $m_3=1, 2, \ldots M3$) issued by the third register means, for detecting occurrence of a predetermined code sequence value X2A0, and for producing and issuing a first halt signal that is received by the first control input terminal of, and halts the pass-through of clock pulses at, the second clock control means when the predetermined code sequence value X2A0 is received, where M3 is a predetermined positive integer;

fourth decoder means, connected to the fourth register means, for receiving the code sequence values X2B(t) ($t=m_4T$; $m_4=1, 2, \ldots M4$) issued by the fourth register means, for detecting occurrence of a predetermined code sequence value X2A0, and for producing and issuing a first halt signal that is received by the first control input terminal of, and halts the pass-through of clock pulses at, the third clock control means when the predetermined code sequence value X2B0 is received, where M4 is a predetermined positive integer;

a period counter that receives and counts the number of first reset signals issued by the second decoder means, that issues a first period counter output signal when this count has reached a fifth predetermined integer M5-1, and that issues a second period counter output signal when this count has reached the integer M5

precession means for receiving a sequence of clock pulses from the clock pulse source, for receiving output signals from the third decoder means and from the fourth decoder means, and for receiving the first and second period counter output signals, for counting a predetermined number M6 of clock pulses, after receipt of a predetermined output signal from the third decoder means, and after receipt of a predetermined output signal from the first period counter, and for then issuing a second reset signal that is received by and commands the second clock control means and the third clock control means to resume pass-through and issuance of the sequence of clock pulses;

first logic means for receiving the first and second code sequences X1B(t) and X1A(t) and for forming and issuing an Exclusive-Or combination signal $X1(t)=X1B(t) \oplus X1A(t)$ as an output signal;

second logic means for receiving the third and fourth code sequences X2A(t) and X2B(t) and for forming and issuing a time delayed Exclusive-Or combination signal $X2(t)=X2A(t-KT) \oplus X2B(t-KT)$ as an output signal, where K is a predetermined non-negative integer;

third logic means for receiving the code sequence signal X1(t) and X2(t) and for forming and issuing an Exclusive-Or combination signal $P(t)=X1(t) \oplus X2(t)$;

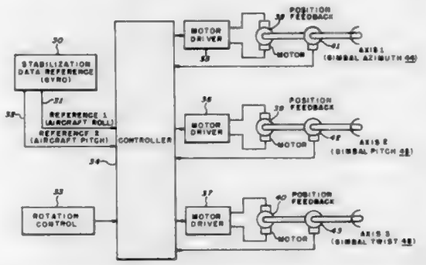
where the third register means and the fourth register means include a first latch with a first latch choice input terminal and a second latch with a second latch choice input terminal, respectively, that allows a choice of the contents of the first and second register means, respectively, from among M6 different initial code sequence values for the third register means and from among M7 different code sequence values for the fourth register means, where M6 and M7 are predetermined positive integers.

5,202,695

ORIENTATION STABILIZATION BY SOFTWARE SIMULATED STABILIZED PLATFORM

Paul E. Hollandsworth, Charlottesville, and Clifford Cantrell, North Garden, both of Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Sep. 27, 1990, Ser. No. 589,122
Int. Cl.[5] H01Q *3/00*
U.S. Cl. 342—359 17 Claims



1. A stabilization system, for mounting on a moving vehicle having vehicle reference axes, for stabilizing a pointing device, having center line, to point in controlled direction with respect to inertial reference axes irrespective of motions of said vehicle with respect to said inertial axes, said controlled direction being controlled by a pointing signal, said system being responsive to a stabilization data reference providing stabilization signals in accordance with said motions of said vehicle about said reference axes, said stabilization signals being referenced to said vehicle reference, said system comprising

a set of three gimbals interposed between said vehicle and said pointing device, said set of three gimbals having three gimbal axes and three gimbal drives one axis and one gimbal drive for each gimbal, said three gimbals constructed and arranged to rotate about said three gimbal axes, respectively, and

coordinate transformation means responsive to said stabilization signals and said pointing signal for performing a coordinate transformation on said stabilization signals and said pointing signal by converting said stabilization signals from said vehicle reference axes to said gimbal axes and combining said pointing signal therewith to provide respective gimbal drive signals in accordance therewith, so that said gimbal drive signals applied to said gimbal drives, respectively, rotate said gimbals of said set of three gimbals about said gimbal axes, respectively, so as to maintain said pointing device pointing in said controlled direction.

5,202,696

END FED HALF WAVE DIPOLE ANTENNA

Jack W. Sheriff, 2167 Calle Guaymas, La Jolla, Calif. 92037

Filed Nov. 18, 1991, Ser. No. 793,555
Int. Cl.[5] H01Q *11/14*
U.S. Cl. 343—741 15 Claims

1. A low cost, high efficiency, end fed half wave folded dipole antenna which comprises:

an upstanding tubular electrically conductive base;

means for connecting two electrically isolated electrical connections to an external electrical cable secured to said base;

two conductive wires extending rom within said base and connected to said electrical connections;

sleeves of electrical insulating material surrounding each of said wires to lower the antenna impedance;

an electrically conductive tube telescoped relative to said base and substantially surrounding said two wires;

at least one slot between said tube and said base, an externally exposed area of said slot, said exposed area being dependent on the extent to which said tue is telescoped relative to said base;

means for fastening said tube to said base with a selected exposed area of said slot; and

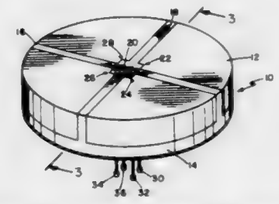
an electrically conductive wire loop connected to and extending from said two wires.

5,202,697

LOW-PROFILE STEERABLE CARDIOID ANTENNA

Mark E. Bonebright, La Mesa; Bernard Berkowitz, San Diego, both of Calif., and James Boelens, Arlington, Tex., assignors to Cubic Defense Systems, Inc., San Diego, Calif.

Filed Jan. 18, 1991, Ser. No. 642,842
Int. Cl.[5] H01Q *13/10*
U.S. Cl. 343—770 8 Claims



1. An antenna assembly comprising: a first resonant cavity having first and second opposing walls, with plural intersecting radiating slots disposed in said first wall;

a second resonant cavity disposed on said second wall having at least one circumferential radiating slot;

first feed means comprising at least four feed probes, one such feed probe located equidistant from symmetric points on said intersecting radiating slots for feeding radio-frequency energy to said first resonant cavity;

generating means connected to said feed probes for creating a plurality of circularly-polarized, radio-frequency signals with counter-rotating phases;

second feed means for feeding radio-frequency energy to said second resonant cavity; and

said plural intersecting radiating slots being curvilinear and elongated to form a symmetrical curved configuration within the perimeter of said first wall.

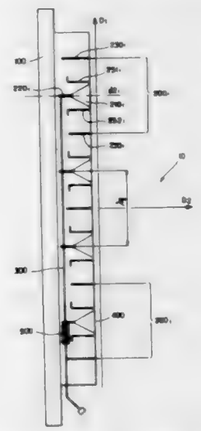
5,202,698

DIRECTIONAL RADIOCOMMUNICATION ARRAY

Mostafa Jelloul, Verrieres-le-Buisson, France, assignor to Societe Technique d'Application et de Recherche Electronique, France

Filed Sep. 20, 1991, Ser. No. 763,298
Claims priority, application France, Sep. 21, 1990, 90 11672
Int. Cl.[5] H01Q *13/10*
U.S. Cl. 343—770 8 Claims

1. Directional radiocommunication array comprising an array of N adjacent radiating elements connected in series by a main line and spaced by one wavelength on said main line wherein said directional array comprises an insulative substrate on a first side of which are disposed along a first direction adjacent radiating elements in the form of thin metal layers, each radiating element comprising a radiating slot which widens in a linear manner to either side of an axis from a short-circuited secondary slot line oh said axis perpendicular to said first direction and parallel to a second or main propagation direction, each radiating element is isolated from an adjacent element by a decoupling short-circuited quarter-wavelength



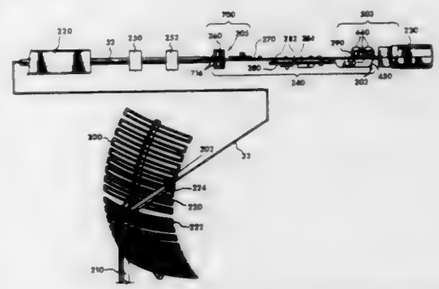
slot line, and said main line is a coaxial cable substantially perpendicular to each secondary slot line and having a central core and an outer conductive sheath, the sheath of said coaxial cable being stripped at each secondary slot line over a length substantially equal to the width of said secondary slot line and connected to two excitation points of said secondary slot line in the case of the first N—1 radiating elements, the sheath and the central core of said coaxial cable being connected to respective excitation points of the Nth and final radiating element.

5,202,699

INTEGRATED MMDS ANTENNA AND DOWN CONVERTER

Dale L. Hemmie, and Marc D. Mills, both of Burlington, Iowa, assignors to Conifer Corporation, Burlington, Iowa

Filed May 30, 1991, Ser. No. 707,918
Int. Cl.[5] H01Q *19/130, 9/200*
U.S. Cl. 343—840 14 Claims



14. An integrated semi-parabolic antenna/down converter MMDS receiving system comprising:

a semi-parabolic antenna,

a pair of driven feed elements, a support boom connected to

5,202,701

releasing and retracting said cleaning member after said

selected ones of said apertures toward said back electrode;

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a pair of driven feed elements, a support boom connected to said semi-parabolic antenna for holding said driven feed elements in the focal area of said semi-parabolic antenna, said support boom having a formed hollow interior,

a down converter formed in an elongated shape to fit entirely within said formed hollow interior of said support boom, said down converter at least comprising:

(a) a printed circuit board, said printed circuit board having an input end and an output end,

(b) an RF filter having an input located on the input end of said printed circuit board, the input of said RF filter being directly connected to said driven feed elements by soldering said driven feed elements directly to said input of said RF filter on said printed circuit board,

(c) a first ground shield electrically shielding said connection of said RF filter input to said driven feed elements, said first ground shield engaging said support boom,

(d) an output amplifier on the opposing end of said printed circuit board, said output amplifier having an output end,

(e) means connected to said output amplifier for providing a coaxial connection,

(f) a second ground shield electrically shielding said connection of said providing means to said output end, said second ground shield engaging said support boom,

(g) means on said first and second ground shields and located within said formed interior for centering said down converter in said formed interior of said support boom,

a coaxial cable connected to said coaxial connection.

5,202,700

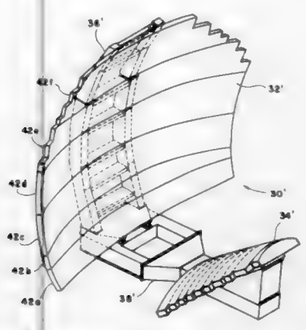
ARRAY FED REFLECTOR ANTENNA FOR TRANSMITTING & RECEIVING MULTIPLE BEAMS

Coleman J. Miller, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 267,088, Nov. 3, 1988, abandoned. This application Jan. 24, 1991, Ser. No. 645,317

Int. Cl.[5] H01Q *19/17*

U.S. Cl. 343—840 **6 Claims**



1. An antenna comprising:

a reflector having a portion with a dual parabolic shape, wherein said portion of said reflector has a horizontal focal length and a vertical focal length which is less than the horizontal focal length; and

a distributed feed array for transmitting and receiving a plurality of electromagnetic energy beams, and distributed feed array positioned adjacent to and offset from, said reflector, so that said reflector reflects the transmitted and received electromagnetic energy beams, said distributed feed array having a curved surface including a plurality of rows of radiating elements.

5,202,701

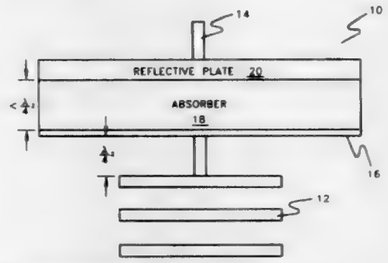
LOW RADAR CROSS SECTION REFLECTOR ANTENNA

James A. Casey, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 23, 1991, Ser. No. 734,542

Int. Cl.[5] H01Q *17/00*

U.S. Cl. 343—909 **6 Claims**



1. An antenna system comprising:

A. an antenna for transmitting signals at frequencies within a predetermined frequency range;

B. a first reflector proximate to the antenna, which further comprises a reflector grid, wherein signals within the predetermined frequency range hit said reflector grid and are reflected, while a portion of the signals which are at a higher frequency pass through said reflector grid and another portion of signals of said higher frequency hit said reflector grid and are reflected;

C. an absorber proximate to the reflector for attenuating signals which are passed by the reflector grid; and

D. a second reflector proximate to the absorber for reflecting signals passing through the absorber back to the absorber, such that the reflected signals are twice attenuated.

5,202,702

INK JET RECORDING APPARATUS AND A METHOD OF CLEANING A RECORDING HEAD USED IN THE APPARATUS

Koji Terasawa; Akira Miyakawa, both of Tokyo, and Hideki Yamaguchi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 746,214, Aug. 16, 1991, abandoned, which is a continuation of Ser. No. 598,778, Oct. 18, 1990, abandoned, which is a continuation of Ser. No. 449,411, Dec. 18, 1989, abandoned, which is a continuation of Ser. No. 267,632, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 846,887, Apr. 1, 1986, abandoned. This application Feb. 14, 1992, Ser. No. 834,999

Claims priority, application Japan, Apr. 8, 1985, 60-70491; Apr. 8, 1985, 60-70496; Apr. 8, 1985, 60-74092; Apr. 8, 1985, 60-74093; Apr. 8, 1985, 60-74094; Apr. 8, 1985, 60-74095

Int. Cl.[5] B41J *2/165*

U.S. Cl. 346—1.1 **28 Claims**

1. A cleaning method comprising the steps of:

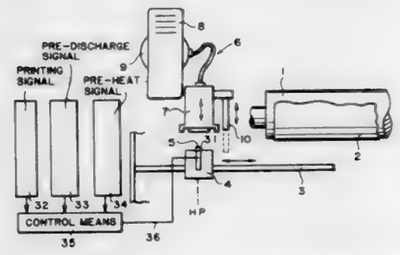
moving a carriage, on which a recording head for discharging ink is mounted, from a recording area where recording is performed to a non-recording area opposing a cap member having a cleaning member for cleaning a front surface of said recording head by contacting said front surface;

moving said cleaning member toward said carriage from a non-cleaning position to a cleaning position in accordance with a capping operation for capping said front surface of said recording head, said capping operation being initiated when said

locking said cleaning member in the cleaning position with locking means;

cleaning said front surface of said recording head with said cleaning member by moving said carriage from the recording area into the non-recording area; and

releasing and retracting said cleaning member after said front surface is cleaned by moving said carriage further into the non-recording area causing said locking means to be released.



5,202,703

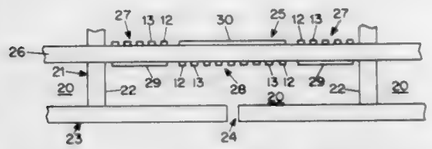
PIEZOELECTRIC TRANSDUCERS FOR INK JET SYSTEMS

Paul A. Hoisington, Norwich, Vt., and Bruce A. Paulson, Newport, N.H., assignors to Spectra, Inc., Hanover, N.H.

Filed Nov. 20, 1990, Ser. No. 615,898

Int. Cl.[5] B41J *2/045*

U.S. Cl. 346—140 R **20 Claims**



11. An ink jet system comprising ink jet chamber means having walls forming an ink jet chamber and an aperture through which ink may be ejected and transducer means forming a wall of the ink jet chamber, the transducer means comprising a sheet-like piezoelectric element having a movable region disposed adjacent to an ink jet chamber and an array of at least three spaced electrodes on one surface of the movable region, and means for applying one potential to alternate electrodes in the spaced array and a different potential to other electrodes in the spaced array.

5,202,704

TONER JET RECORDING APPARATUS HAVING MEANS FOR VIBRATING PARTICLE MODULATOR ELECTRODE MEMBER

Naoto Iwao, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 23, 1991, Ser. No. 781,416

Claims priority, application Japan, Oct. 25, 1990, 2-288203; Oct. 25, 1990, 2-288204

Int. Cl.[5] B41J *2/415, 2/005*

U.S. Cl. 346—140 R **12 Claims**

1. A toner jet recording apparatus, comprising:

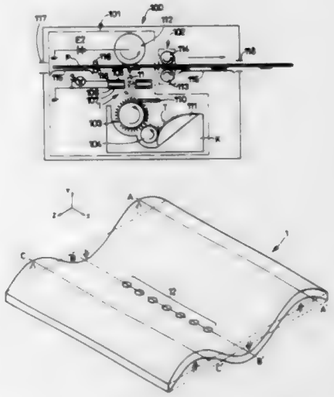
a toner supply for providing a crowd of electrostatically charged toner particles;

a particle-flow modulating electrode member including an aperture portion which has a multiplicity of apertures;

a back electrode disposed in opposed relation with a surface of said modulating electrode member which is remote from said toner supply, said back electrode supporting a recording medium which is interposed between said back electrode and said modulating electrode member;

a control circuit for applying controlled electric signals to said modulating electrode member and said back electrode, for causing flows of said charged particles through selected ones of said apertures toward said back electrode; and

an oscillating device for vibrating said modulating electrode member, in a vibration mode wherein a vibration of said modulating electrode member produced by said oscillating device has an antinode which is substantially aligned with said aperture portion of said modulating electrode member.



5,202,705

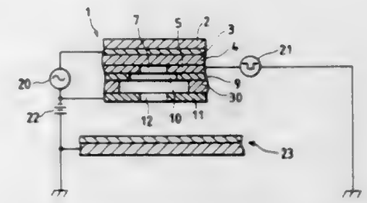
ELECTROSTATIC LATENT IMAGE FORMING DEVICE HAVING A CERAMIC INSULATING LAYER

Kazuo Asano; Koji Masuda, and Yuji Suemitsu, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,926

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—159 **14 Claims**



1. An ion producing device for an electrostatic latent image former, comprising:

a plurality of first electrodes;

a plurality of second electrodes, each of said second electrodes having an aperture;

an electrically insulating layer arranged between said first and second electrodes and in contact with said first and second electrodes, said insulating layer being a ceramic material comprising alumina or zirconia; and

a voltage source means for applying a voltage to at least one of said second electrodes, whereby ions are generated in said aperture of said at least one of said second electrodes.

5,202,706

ble to engage the head of the eyeglasses wearer, the improve-

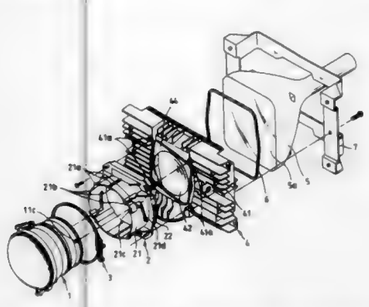
a laser beam from a laser source at a measurement point in source and means for directing a beam of light along an optical

5,202,706

FOCUSING APPARATUS IN PROJECTION TELEVISION

Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,656
Claims priority, application Japan, Oct. 6, 1988, 63-130397[U]
Int. Cl.[5] G02B *7/02, 15/00*
U.S. Cl. 359—819 6 Claims



1. A focusing apparatus for a projection television comprising:

a cylindrical lens barrel having lenses mounted therein, said cylindrical lens barrel being supported by a cylindrical support member within which said cylindrical lens barrel is operatively slidable to allow focusing of said projection television;

shaft-like guide protrusions integrally formed on the outside surface of said cylindrical lens barrel, and guide grooves formed in the surface of said cylindrical support member so that said shaft-like guide protrusions fit in said grooves, said grooves being inclined relative to the axial direction of said cylindrical support member;

inlet means for passing said shaft-like guide protrusions into said guide grooves formed on the surface of said cylindrical support member;

a plurality of axially extending ribs on the outside surface of said cylindrical support member and a plurality of axially extending protrusions on the inside surface of said cylindrical support member at positions corresponding to positions of said plurality of axially extending ribs;

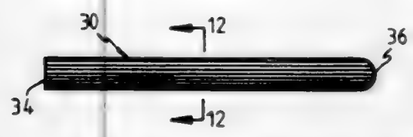
a tightening ring encircling said cylindrical support member and in contact with said ribs, whereby tightening of said ring elastically deforms said cylindrical support member to cause said plurality of axially extending protrusions to press against said lens barrel and to hold said lens barrel in position.

5,202,707

FLAVORED BOOT FOR EYEGLASSES

Adam S. Halbridge, 431 Hedwig Rd., Houston, Tex. 77024

Filed Dec. 24, 1990, Ser. No. 632,923
Int. Cl.[5] G02C *5/14, 1/00*
U.S. Cl. 351—123 9 Claims



1. In eyeglasses having temple arms attached to eyeglass frames, each of said temple arms having an end portion operable to engage the head of the eyeglasses wearer, the improvement comprising:

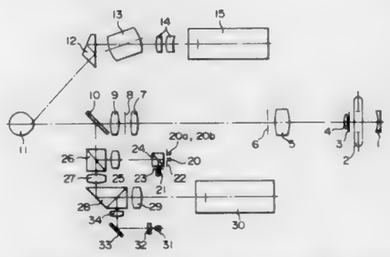
a boot member for at least one of the temple arm end portions, the boot member being impregnated with a fruit, candy, or spice flavor, whereby upon an eyeglasses wearer chewing or sucking upon the boot member, the flavor of the boot member is imparted to the eyeglasses wearer.

5,202,708

APPARATUS FOR PHOTOGRAPHIC RETROILLUMINATION IMAGE ON EYEGROUND

Kazuyuki Sasaki, Kanazawa, and Nobuyuki Yano, Okazaki, both of Japan, assignors to Nidek Co., Ltd., Aichi, Japan

Filed Aug. 9, 1991, Ser. No. 744,059
Claims priority, application Japan, Aug. 10, 1990, 2-213195
Int. Cl.[5] A61B *3/14*
U.S. Cl. 351—206 5 Claims



1. A retroillumination image photographing apparatus for photographing of a crystalline lens of the eye in which an illuminating light is projected on an eye to be examined along an optical axis, and said crystalline lens of the eye is retroilluminated with reflected light at a fundus of the illumination light, comprising:

a photographing optical system;

alignment means for aligning said photographing optical system with a predetermined region of an eye to be examined;

storage means for storing an alignment position of said photographing optical system aligned by said alignment means, wherein a direction used for determining the alignment position is the direction of said optical axis;

origin computing means for determining a specific region of the eye to be examined as an origin of an image pickup position of said photographing optical system based on the alignment position stored by said storage means;

detecting means for detecting a movement quantity of said image pickup position of said photographing optical system; and

display means for displaying said image pickup position of said photographing optical system based on the detection result of said detecting means.

5,202,709

OPHTHALMOLOGICAL ALIGNMENT AND MEASUREMENT APPARATUS

Tadashi Ichihashi, Tokyo; Takashi Hirano, Shiki, both of Japan, assignors to Kowa Company Ltd., Japan

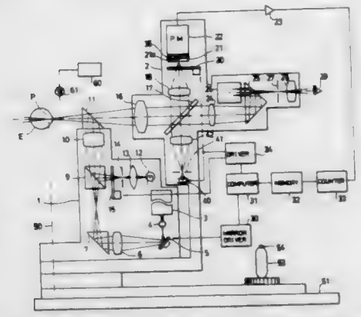
Filed Feb. 28, 1991, Ser. No. 662,786
Claims priority, application Japan, Mar. 14, 1990, 2-61178
Int. Cl.[5] A61B *3/14, 3/10*
U.S. Cl. 351—208 15 Claims

1. An ophthalmological measurement apparatus wherein ophthalmological measurement is performed by projecting a laser beam at a selected point in a subject's eye and detecting the light scattered therefrom, comprising:

laser beam projection means for projecting and converging a laser beam from a laser source at a measurement point in a subject's eye;

a mask having an aperture of a prescribed size and disposed at a position that is a conjugate of the point of convergence of the laser beam;

means for deflecting the laser beam in a prescribed direction for scanning a measurement zone beyond the size of the mask aperture during alignment of the apparatus with the eye and during measurement so that during each scan, the laser beam sequentially strikes the mask at one side of the aperture, passes through the aperture, and strikes the mask at the other side of the aperture;



light receiving means including a photosensor operative during both alignment and measurement for receiving, during the portion of each scan when the laser beam passes through the aperture, scattered laser light from the measurement point and noise light to produce therefrom a main signal and for receiving, during the portions of each scan when the laser beam strikes the mask at opposite sides of the aperture, noise light to produce therefrom respective side signals; and

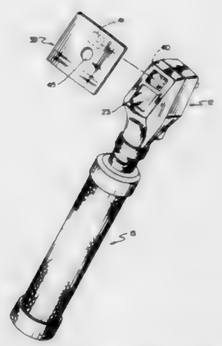
processing means operable during alignment for processing the main and side signals to produce information indicative of the state of alignment and operable during ophthalmological measurement for processing the main and side signals to produce ophthalmological information.

5,202,710

FIXATION CARD ATTACHMENT FOR RETINOSCOPE

David G. Perkins, Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Sep. 11, 1991, Ser. No. 757,896
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—211 10 Claims



7. An improved instrument for examining the eye of a patient having a handle connected to an instrument head, a light source and means for directing a beam of light along an optical axis to the patient's eye, the improvement comprising:

a fixation card having indicia on the front face thereof and a centrally located hole formed in said card; and

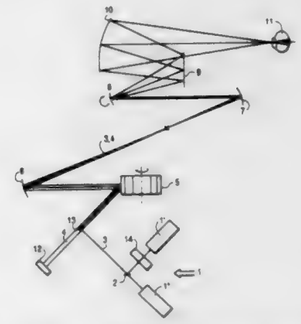
magnetic connecting means for removably attaching the card to the patient's side of the instrument with the opening of the hole centered upon the optical axis of said instrument.

5,202,711

APPARATUS FOR EXAMINING THE FIELD OF VISION

Ulrich Klingbeil, München, Fed. Rep. of Germany, assignor to Vorrichtung zur Fesichtsfeldprufung, Ottobrunn-Riemerling, Fed. Rep. of Germany

Continuation of Ser. No. 759,857, Sep. 16, 1991, abandoned, which is a continuation of Ser. No. 477,877, Jun. 8, 1990, abandoned. This application Apr. 10, 1992, Ser. No. 865,749
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1988, 3834327; Jul. 7, 1989, 3922471
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—224 20 Claims



1. An apparatus for examining the field of vision, having a scanning device, which is provided with beam deflecting and beam imaging elements, via which an illumination light beam from an illumination light source is at least one of guided onto the region of the fundus oculi to be imaged and the light reflected from the fundus oculi is guided to a detector device, from the time-sequential output signal of which an evaluation and synchronization unit generates an image of the scanned section by points, and having a control unit, which controls the intensity of the illumination light beam scanning the fundus oculi in such a manner that marks are projected onto a predetermined region of the fundus oculi with predetermining brightness, which the person under examination perceives or does not perceive in the event of defects in the field of vision, wherein, in order to set a specific value of brightness of said marks, said control unit switches said illumination light beam within a time span, during which said illumination light beam illuminates a scanning point, from a first intensity value to at least a second intensity value for a specific fraction of said time span which is sufficient for a field of vision examination.

5,202,712

CAMERA SUPPORT

Erich Fitz, Vagen, and Klaus Resch, Munich, both of Fed. Rep. of Germany, assignors to HTG High Tech Geratebau GmbH, Oberhaching, Fed. Rep. of Germany

Filed Sep. 16, 1991, Ser. No. 760,356
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1990, 4029275
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—81 20 Claims

1. Camera support for a camera stand, crane, or camera car

with a support column extending substantially vertically and

5,202,714

from sheet material with short carbon fibers enveloped in

said predetermined lens group and the other lens groups

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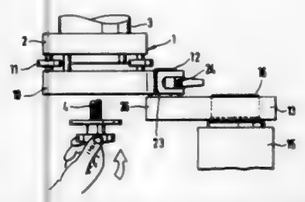
with a support column extending substantially vertically and having an upper end for supporting a camera having a base thereon, comprising:

adapter means on said upper end of said support column and having a substantially vertical axis;

a leveling head engageable with said camera base and having a vertical camera mounting axis;

screw fastening means for fastening said camera base to said leveling head on said camera mounting axis;

swivel mounting means for mounting said leveling head on said adapter means; and



swivel means on said swivel mounting means laterally displaced relative to both said adapter axis and said camera mounting axis and having a substantially vertical swivel axis for rotatably mounting said leveling head on said swivel mounting means so that said leveling head is laterally displaceable between a first position where said screw fastening means is substantially above said adapter means and a second extended position where said screw fastening means is laterally displaced from said adapter means.

5,202,713

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE AND FILM FEEDER AND PACKAGE HOLDER FOR FILM PROCESSOR

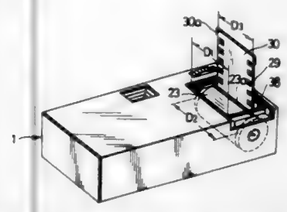
Norihiro Nakai; Tatsuya Mochizuki; Toshiyuki Ogura, and Takashi Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 18, 1991, Ser. No. 717,344

Claims priority, application Japan, Jun. 18, 1990, 2-159341; Jul. 9, 1990, 2-180992; Jul. 13, 1990, 2-75110[U]; Jul. 30, 1990, 2-81074[U]

Int. Cl.[5] G03B *1/00*

U.S. Cl. 354—212 **18 Claims**



1. A lens-fitted photographic film package having a film housing formed with a film supply chamber holding an unexposed film and a film take-up chamber containing a cassette for winding up said film therein after exposure, said lens-fitted photographic film package comprising:

a removable light-shielding segment forming a part of said film take-up chamber; and

a film removal opening formed by removing said light-shielding segment from said film take-up chamber, said film removal opening being of size smaller than a width of said cassette but larger than a width of said film, such that said exposed film can be pulled out from said film package leaving said cassette in said film housing.

5,202,714

FINDER OPTICAL SYSTEM

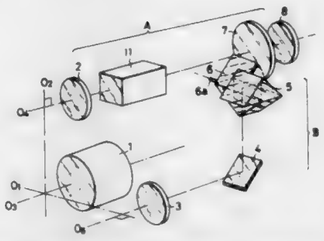
Noriyuki Iwata, Fujisawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1992, Ser. No. 827,430

Claims priority, application Japan, Jan. 29, 1991, 3-29316

Int. Cl.[5] G03B *13/02*

U.S. Cl. 354—219 **8 Claims**



1. A finder optical system of a camera, comprising:

a main finder constructed by a real image type finder having a main finder objective lens, an ocular lens system, and an optical system disposed between said main finder objective lens and the ocular lens system for forming an erect real image, an optical axis of said main finder objective lens being perpendicular to a vertical symmetry axis of an image pickup lens of said camera and being parallel to an optical axis of said image pickup lens; and

an auxiliary finder constructed by a real image finder having an auxiliary finder objective lens and another optical system disposed between said auxiliary finder objective lens and said ocular lens system for forming an erect real image, an optical axis of said auxiliary finder objective lens being perpendicular to a lateral symmetry axis of said image pickup lens and being parallel to said optical axis of said image pickup lens,

said another optical system being adapted in such a manner that an optical path of said auxiliary finder is led nearly on a real image forming plane of said main finder into a part of an optical path of said main finder.

5,202,715

PLATE MEMBER FOR USE AS MATERIAL OF LIGHT SHIELDING BLADES

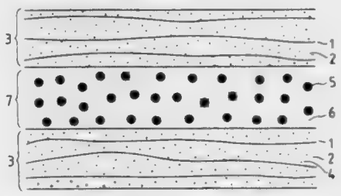
Takashi Matsubara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 621,887, Dec. 4, 1990, abandoned. This application Jun. 23, 1992, Ser. No. 905,137

Claims priority, application Japan, Dec. 7, 1989, 1-318244; Sep. 18, 1990, 2-247917

Int. Cl.[5] G03B *9/40*

U.S. Cl. 354—246 **16 Claims**



15. A shutter blade comprising a laminate of at least three blade-layers of carbon fiber reinforced resin sheet material, including:

an intermediate blade-layer having at least one layer made from sheet material with short carbon fibers enveloped in matrix resin; and

surface blade-layers on both sides of said intermediate blade-layer, each said surface blade-layer including at least one layer made from sheet material with long carbon fibers enveloped in matrix resin and uni-directionally oriented.

5,202,716

RESIST PROCESS SYSTEM

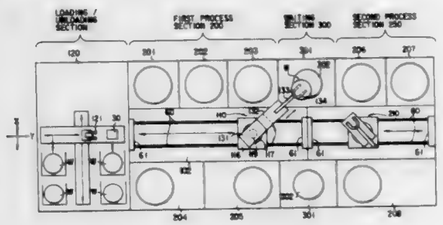
Kiyohisa Tateyama; Masami Akimoto, both of Kumamoto, and Mitsuru Ushijima, Tama, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Tokyo Electron Kyushu Limited, Kumamoto, both of Japan

Continuation-in-part of Ser. No. 627,357, Dec. 14, 1990, which is a continuation of Ser. No. 308,470, Feb. 10, 1989, Pat. No. 4,985,722. This application Jun. 25, 1992, Ser. No. 904,505

Claims priority, application Japan, Feb. 12, 1988, 63-30219; Nov. 5, 1991, 3-318441

Int. Cl.[5] G03D *5/04;* **B65G** *1/06;* **F27B** *9/00*

U.S. Cl. 354—319 **11 Claims**



1. A resist process system comprising;

conveying means for conveying a wafer;

a passage along which the conveying means is movable;

a plurality of process units arranged beside the passage; and

at least one waiting unit for temporarily keeping the wafer which is to be processed;

wherein said waiting unit is arranged beside the passage and between the process units.

5,202,717

OPTICAL LENS SYSTEM-DRIVING CONTROL APPARATUS FOR DRIVING A PLURALITY OF LENS GROUPS IN ACCORDANCE WITH SMALL AMOUNT OF DATA

Mitsumasa Ookubo; Tsuyoshi Yaji; Yasushi Toizumi; Toyoji Sasaki, and Shigeru Kato, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 7, 1991, Ser. No. 696,858

Claims priority, application Japan, May 8, 1990, 2-118210; Jun. 29, 1990, 2-170234

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **24 Claims**

1. A zooming lens system-driving control apparatus, comprising:

a plurality of lens groups movably provided so as to be movable along a direction of an optical axis therebetween;

a plurality of motors provided in order to drive the plurality of lens groups, respectively;

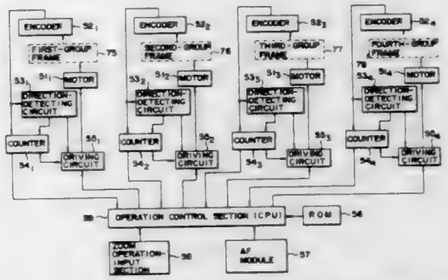
focusing distance-detecting means for detecting a position of a predetermined lens group which is one of said plurality of lens groups and which is changed in the position in accordance with a change in a focusing distance, and for outputting focusing distance data in accordance with data representing a detected position;

lens position-detecting means for detecting positions of the lens groups other than said predetermined lens group of the plurality of lens groups;

storage means for storing positional relationships between said predetermined lens group and the other lens groups of the plurality of lens groups;

zooming operation means for commanding a zooming operation; and

driving control means for actuating a motor which drives to said predetermined lens group of the plurality of motors in accordance with the zooming operation commanded by said zooming operation means such that the motor is



driven by a driving distance determined on the basis of the focusing distance data, calculating driving distances of the other lens groups in accordance with the positions detected by the lens position-detecting means and with the positional relationships stored in the storage means being referred to, and actuating the motors which drive the other lens groups in accordance with the driving distances of the other lens groups.

5,202,718

FOCUS DETECTION APPARATUS

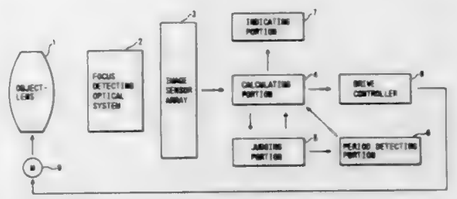
Shigeyuki Uchiyama, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 490,417, Mar. 8, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 754,154

Claims priority, application Japan, Mar. 10, 1989, 1-59455

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—407 **16 Claims**



1. A focus detection apparatus comprising:

first photoelectric conversion means having a plurality of first light receiving regions for outputting electrical signals corresponding to light receiving amounts;

second photoelectric conversion means having a plurality of second light receiving regions for outputting electrical signals corresponding to light receiving amounts;

third photoelectric conversion means having a plurality of third light receiving regions for outputting electrical signals corresponding to light receiving amounts;

fourth photoelectric conversion means having a plurality of fourth light receiving regions for outputting electrical signals corresponding to light receiving amounts;

said first and second photoelectric conversion means being arranged to be perpendicular to said third and fourth photoelectric conversion means;

optical means for splitting an object image into two images

to cause the two images to be focused on said first and

5,202,720

PHOTOGRAPHIC CAMERA WITH FLASH UNIT

shutter opening means for normally closing said first

mined polarity and for uniformly applying the charged

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to cause the two images to be focused on said first and second photoelectric conversion means, and for splitting the object image into two images to cause the two images to be respectively focused on said third and fourth photoelectric conversion means;

judging means for obtaining a plurality of differences between different pairs of electrical signals, each pair corresponding to a part of said first light receiving regions and a part of said second light receiving regions, comparing the obtained differences to determine a first local minimum value, and determining that the object image has a periodic contrast pattern when there are at least two first local minimum values; and

outputting means for, when said judging means determines that the object image has the periodic contrast pattern, obtaining a plurality of differences between different pairs of electrical signals, each pair corresponding to a part of said third light receiving regions and a part of said fourth light receiving regions, comparing the obtained differences to determine a second local minimum value, and for, when one first local minimum value is present in a predetermined range having the second local minimum value as the center, outputting the first local minimum value as focus detection data.

5,202,719

CAMERA HAVING A BUILT-IN ELECTRONIC FLASH DEVICE AND A DETACHABLE FLASH DEVICE SELECTIVELY OPERATED TO ELIMINATE RED-EYE PHENOMENA

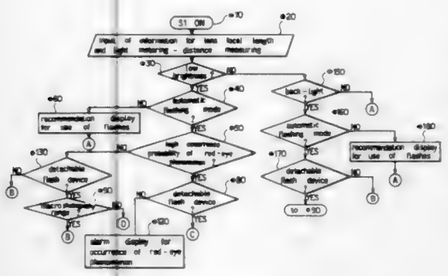
Nobuyuki Taniguchi, Nishinomiya; Hidehiko Fujii, Sakai; Tsutomu Ichikawa, Hashimoto; Takeshi Fukunaga, and Atsushi Sumitani, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 562,748, Aug. 6, 1990, abandoned. This application Jul. 31, 1992, Ser. No. 924,438

Claims priority, application Japan, Aug. 4, 1989, 1-203628

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—413 **16 Claims**



1. A camera comprising:

a built-in electronic flash device;

a flash attaching portion to which a detachable electronic flash device can be attached;

first means for detecting whether or not a red-eye phenomenon tends to occur in a current photographing condition;

second means for detecting whether or not the detachable electronic flash device is attached to the camera; and

means for prohibiting the built-in electronic flash device from emitting light when it is detected that said detachable electronic flash device is attached to the camera and the red-eye phenomenon tends to occur as well.

5,202,720

PHOTOGRAPHIC CAMERA WITH FLASH UNIT

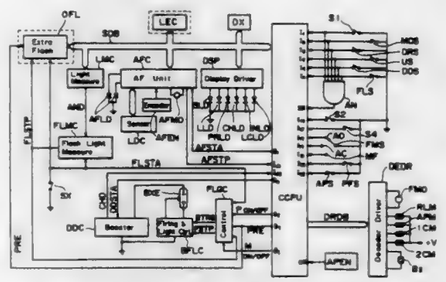
Akihiko Fujino; Kenji Tsuji; Hidehiko Fujii; Nobuyuki Taniguchi, and Sadafusa Tsuji, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1990, Ser. No. 747,713

Claims priority, application Japan, Feb. 2, 1989, 1-25411; Feb. 3, 1989, 1-26402

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—415 **20 Claims**



1. A photographic camera which comprises:

flash firing means for firing a flash light for illuminating a target object to be photographed when an image of the target object is desired to be exposed on a light sensitive film;

preliminarily flash firing means activated prior to the flash light fired by the flash firing means to emit a preliminary flash light necessary to cause the pupils of the target object to constrict;

mode selecting means for selecting a mode by a manual operation, between a first mode in which the preliminarily flash firing means is enabled and a second mode in which the preliminarily flash firing means is disabled;

determining means for determining the necessity of the preliminary flash light under a predetermined condition; and

display means for providing, on the basis of a result of the determination made by the determining means, an indication that the preliminary flash light is necessary under the second mode.

5,202,721

SHUTTER DEVICE IN AUTOMATIC FOCUSING AND EXPOSURE CAMERA

Takumi Kobayashi, and Kiyoshi Kawano, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 574,780

Claims priority, application Japan, Sep. 1, 1989, 1-102932; Sep. 1, 1989, 1-226524; Sep. 19, 1989, 1-243104

Int. Cl.[5] G03B *7/08*

U.S. Cl. 354—441 **24 Claims**

1. A shutter device for a camera comprising:

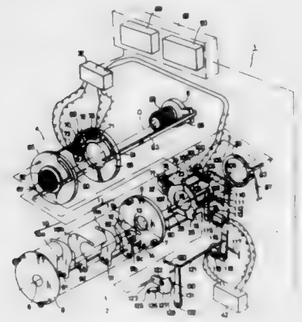
first and second sector mechanisms comprising a lens shutter and which are independently opened and closed to define an aperture;

photometer means for detecting the luminance of an object to be photographed;

diaphragm control means for controlling the aperture defined by said second sector mechanism in accordance with luminance data detected by said photometer means, said diaphragm control means comprising a stepping motor which rotates by a predetermined number of pulses in accordance with luminance data of said photometer means;

a single drive source for said first and second sector mechanisms, said single drive source comprising;

shutter opening means for normally closing said first sector mechanism and opening said first sector mechanism when said second sector mechanism is held to define a predetermined aperture determined by said diaphragm control means; and



shutter closing means for closing said second sector mechanism at a predetermined timing in accordance with the luminance data of said photometer means after said first sector mechanism is opened by said shutter opening means.

5,202,722

IMAGE-FORMING SYSTEM

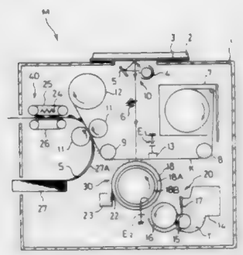
Mitsuru Ohta, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 3, 1992, Ser. No. 863,232

Claims priority, application Japan, Apr. 17, 1991, 3-85289

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **31 Claims**



1. An image-forming system, comprising:

a photosensitive/pressure sensitive recording medium which includes a support and a uniform layer of photocurable microcapsules containing a first color forming ingredient on the support;

charging means for uniformly charging said photosensitive/-pressure sensitive recording medium to a predetermined polarity;

a photosensitive member having a conductive layer and a photoconductive layer arranged in a superposed manner, said conductive layer being coupled to a first direct current power source having said predetermined polarity, said photoconductive layer being located on an outermost surface of said photosensitive member so as to be arranged in face-to-face relation with respect to the uniform layer of said photocurable microcapsules on said photosensitive/pressure sensitive recording medium;

developing means for charging a developer which is capable of combining with the first color forming ingredient to develop an image, to a polarity opposite to said predetermined polarity and for uniformly applying the charged developer onto the photoconductive layer; and

exposing means for simultaneously irradiating an image information containing light on both the photoconductive layer and the uniform coating of the photocurable microcapsules.

5,202,723

METHOD AND DEVICE FOR DRIVING A MIRROR FOR A PHOTOGRAPHIC PRINTER

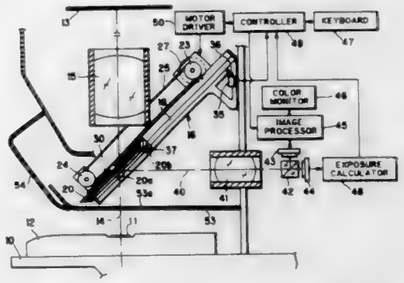
Takashi Yamamoto, and Yoshio Ozawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1992, Ser. No. 859,954

Claims priority, application Japan, Apr. 1, 1991, 3-94702

Int. Cl.[5] G03B *13/28*

U.S. Cl. 355—45 **17 Claims**



1. A mirror driving device for a photographic printer, comprising:

a mirror movable into and out of a printing light path between a photographic film and a printing lens, in a direction diagonal to said printing light path;

means for moving said mirror between a first position and a second position, wherein said mirror is disposed in said printing light path in said first position, for reflecting light passing through said photographic film and directing the reflected light toward a photometric system of said photographic printer during light measurement, whereas said mirror is disposed out of said printing light path in said second position; and

a lock mechanism for locking said mirror at said second position.

5,202,724

MICROFILM CAMERA

Koichi Nagata, Machida; Keijiro Ishii, Sagamihara, and Fumio Fukumoto, Yamato, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1991, Ser. No. 798,113

Claims priority, application Japan, Nov. 28, 1990, 2-327020; Nov. 28, 1990, 2-327021

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—64 **13 Claims**

1. A microfilm camera which comprises:

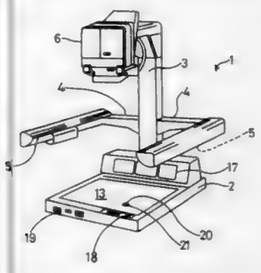
photographing means for photographing an image of a document to be microfilmed on a microfilm;

marking means for imprinting a marking on the microfilm indicative of a position of the image of the document which has been photographed by the photographing means;

determining means for determining a size of the document to be microfilmed; and

control means for controlling the marking means so that, in

the event that the determining marking indicates that the document is of a size larger than a predetermined size, said



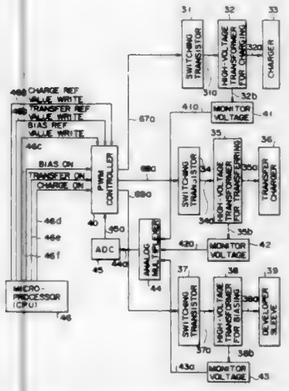
marking means imprints a plurality of markings at intervals corresponding to said predetermined size.

5,202,725

HIGH VOLTAGE POWER SUPPLY CONTROL APPARATUS

Juntaro Oku, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1991, Ser. No. 735,300
Claims priority, application Japan, Jul. 27, 1990, 2-197852
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—69 **14 Claims**



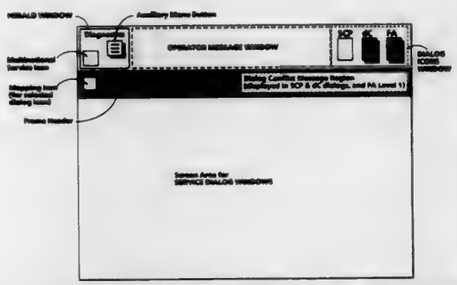
1. A power supply control apparatus comprising:
means for generating electric power in response to switching control signals having given duty ratios;
means for detecting the electric power generated by said generating means so that monitor voltages corresponding to the detected electric power are provided;
means for selecting one of the monitor voltages sequentially in accordance with a prescribed timing to output a selected monitor voltage; and
means for controlling the generated electric power to a prescribed value in accordance with the selected monitor voltage, by changing the duty ratio of the switching control signal.

5,202,726

FACILITATION OF THE DIAGNOSIS OF MALFUNCTIONS AND SET-UP OF A REPRODUCTION MACHINE

DeWayne L. McCulley, Penfield; C. Nelson Bright, Walworth; Lawrence E. Peck, Macedon; Alan B. Cottrill, Fairport; Jocelyn R. Basley; Kris A. Schneider, both of Rochester, and Frederick J. Morton, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1991, Ser. No. 809,112
Int. Cl.[5] G03G *15/00*; G06F *11/00*
U.S. Cl. 355—206 **26 Claims**



1. A reproduction machine including a user interface for facilitating at least one of diagnosis of malfunctions in the machine and set-up of the machine, said user interface including a display comprising:
identifying means for identifying a particular defective component; and
displaying means for displaying at least one of parameters of selected machine components and diagrams of selected machine components on said display, wherein said user interface further includes:
keyboard means enabling input of information;
touch responsive means enabling any of a plurality of possible programming selections for the machine to be selected for performance by the machine;
mouse means enabling remote selection of any of the plurality of possible programming selections;
selection means for selecting any of a series of servicing procedures for performance during the diagnosis of malfunction in the machine; and
storage means for storing the selected servicing procedures, wherein said display includes servicing procedure display means for providing a dynamic display of all previously selected servicing procedures so that the servicing procedures performed are readily identified.

5,202,727

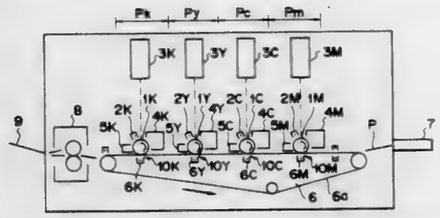
MULTI-COLOR IMAGE FORMING APPARATUS WITH BLACK AND WHITE IMAGE FORMING MODE

Masami Izumizaki, Yokohama, and Ikuo Kuribayashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1991, Ser. No. 774,330
Claims priority, application Japan, Oct. 11, 1990, 2-273583; Oct. 9, 1991, 3-262096
Int. Cl.[5] G03G *5/00, 15/01*
U.S. Cl. 355—211 **32 Claims**

1. An image forming apparatus, comprising:
a plurality of image bearing bodies each having a surface protective layer; and
a plurality of image forming means for forming an image of different colors onto each of said image bearing bodies;
wherein said image forming apparatus has a first mode where image formation is effected by all of said image bearing bodies, and a second mode where image formation is effected only by at least one predetermined image

bearing body, and the surface protective layer of said at least one predetermined image bearing body is selected so



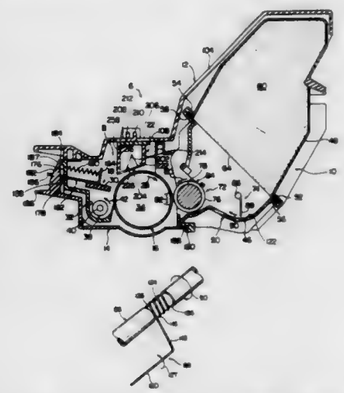
as to be thicker than that of the other image bearing bodies.

5,202,728

IMAGE-FORMING MACHINE WITH IMPROVED DEVELOPER AGITATING MEANS, DEVELOPER REGULATING BLADE MEANS, CLEANING DEVICE, AND TONER RECOVERY SYSTEM

Masanobu Maeshima, Sakai; Hiroyuki Maede, Otsu; Toshihiro Sato, Neyagawa; Masao Otsuka, Ashiya; Hiroaki Tsuchiya, Nishinomiya; Shigeo Koyama, Ibaraki, and Eiji Tsutsui, Amagasaki, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed May 2, 1989, Ser. No. 346,543
Claims priority, application Japan, May 9, 1988, 63-110362; May 9, 1988, 63-112036
Int. Cl.[5] G03G *15/08, 21/00*
U.S. Cl. 355—245 **24 Claims**



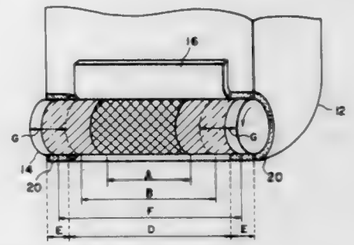
1. An image-forming machine comprising a latent electrostatic image developing device for developing a latent electrostatic image formed on an electrostatographic material, said developing device including a development housing for holding a developer, a developer applicator means for applying the developer in the development housing to the electrostatographic material and a developer agitating means for agitating the developer in the development housing, said developer agitating means having a rotatable shaft adapted to rotate in a rotation direction and an agitating member mounted on the rotatable shaft, the agitating member having a coil spring-shaped mounting portion, and being mounted on the rotatable shaft by elastically increasing the inside diameter of the mounting portion and elastically fitting it over the shaft, the coils of the mounting portion being wound on the shaft such that the agitating member is loosened with respect to the shaft if the agitating member is rotated about the shaft in a direction of rotation that is opposite to the rotation direction of the shaft, wherein the agitating member is disposed on the rotatable shaft such that when a rotation resisting force above a certain limit acts on the agitating member, the agitating member can slip with respect to the rotatable shaft.

5,202,729

DEVELOPING APPARATUS HAVING A COATED DEVELOPING ROLLER

Toshio Miyamoto, Tokyo; Yasushi Sato, Kawasaki; Akihiko Takeuchi, Yokohama; Hiroshi Sasame, Yokohama; Katsuhiko Nishimura, Yokohama; Hiroto Hasegawa, Kawasaki; Hideyuki Yano; Tatsunori Ishiyama, both of Yokohama; Hideo Nanataki, Tokyo, and Harumi Kugoh, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1991, Ser. No. 783,184
Claims priority, application Japan, Oct. 26, 1990, 2-289343; Feb. 20, 1991, 3-026174
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **23 Claims**



1. A developing apparatus, comprising:
a container for containing a one component developer;
a rotatable developing roller disposed faced to an image bearing member to carry the developer from said container to a developing zone where the developer is supplied to an electrostatic latent image carried on the image bearing member, said developing roller comprising a metal base member and a resin coating layer thereon in which fine conductive particles are dispersed, and wherein said developing roller has a surface including an end region adjacent an end of the roller and an intermediate region, wherein, in the end region, the base member is not roughened and the resin layer is not provided, and in the intermediate region, the base member is roughened and is coated with the resin layer; and
a sealing member for preventing leakage of the developer from said container at an end of said developing roller, said sealing member being faced to the end region of said developing roller.

5,202,730

DEVELOPING PROCESS USING TWO-COMPONENT TYPE MAGNETIC DEVELOPER

Kazuo Fuji, Higashi; Akira Nakakuma, Takaishi; Noriaki Tsubota, Himeji; Masahiko Kubo, Yao, and Kazuhisa Edahiro, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 28, 1991, Ser. No. 723,212
Claims priority, application Japan, Jun. 29, 1990, 2-172860
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **9 Claims**

1. A developing process comprising supplying an amount of a two-component type magnetic developer comprising a magnetic carrier and a toner to a developing zone by a rotary developing sleeve and developing an electrostatic latent image formed on a support arranged to confront the developing sleeve in the developing zone, the carrier and the toner each have a true density, the carrier and the toner each comprise a

percentage by weight concentration of the developer, the

tween the toner-carrying member and the latent image-bearing

toner from said toner tank via a toner supply portion, said device comprising:

the transfer drum in response to varying ambient conditions.

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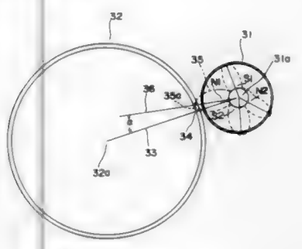
percentage by weight concentration of the developer, the rotary developing sleeve has a position which is closest to the support and the sleeve contains therein a main pole of developing magnetic poles, and the main pole exhibits a flux density in magnetic force distribution of the main pole, wherein the main pole of developing magnetic poles in the developing sleeve is arranged upstream of the position, where the support becomes closest to the developing sleeve, in the rotation direction of the developing sleeve, said closest position between the support and the developing sleeve is included in a region where the flux density in the magnetic force distribution of the main pole decreases toward the downstream side in the rotation direction of the sleeve, an alternating current voltage is applied between the developing sleeve and the support to form an alternating electric field between the highest voltage and the lowest voltage of the electrostatic latent image, and the development is carried out while supplying the developer so that the occupancy ratio R of the developer in the developing zone, defined by the following formula:



$$R = M \times (T/D \times 1/\rho t + C/D \times 1/\rho c)H$$

wherein M represents the amount (g/cm^2) of the developer delivered per unit area of the sleeve, H represents the distance (cm) between the support and the developing sleeve at the position where both are closest to each other, T/D represents the concentration (% by weight) of the toner in the developer, C/D represents the concentration (% by weight) of the carrier in the developer, ρt represents the true density (g/cm^3) of the toner, and ρc represents the true density (g/cm^3) of the carrier, satisfies the requirement of $30 < R < 75$, and wherein the electrostatic latent image support has a drum-like shape, and the main pole deviates by 2° to 30° toward the upstream side of the rotation direction of the developing sleeve from a line connecting the center of the drum to the center of the developing sleeve.

5,202,731

IMAGE FORMING APPARATUS HAVING AN ALTERNATING BIAS ELECTRIC FIELD

Hirohide Tanikawa; Yasutaka Akashi, both of Yokohama; Masaki Taya, Kawasaki; Kuniko Kobayashi, Koganei, and Masaki Uchiyama, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 588,436, Sep. 26, 1990, Pat. No. 5,175,070. This application Aug. 26, 1992, Ser. No. 935,431

Claims priority, application Japan, Sep. 27, 1989, 1-249061; Oct. 12, 1989, 1-263848; Dec. 7, 1989, 1-316528

Int. Cl.[5] G03G *15/09*

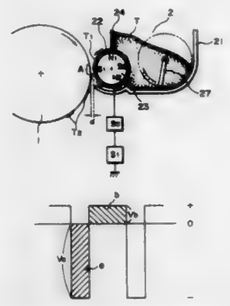
U.S. Cl. 355—251 **23 Claims**

1. An image forming apparatus, comprising: a latent image-bearing member for holding an electrostatic image thereon, a toner-carrying member for carrying a layer of a magnetic toner thereon, a toner vessel for holding the magnetic toner to be supplied to the toner-carrying member, a toner layer-regulating member for regulating the magnetic toner layer on the toner-carrying member, and a bias application means for applying an alternating bias voltage comprising a DC bias voltage and an unsymmetrical AC bias voltage in superposition between the toner-carrying member and the latent image-bearing member, wherein

the latent image-bearing member and the toner-carrying member are disposed with a prescribed gap therebetween at a developing station;

the toner layer-regulating member is disposed to regulate the magnetic toner layer on the toner-carrying member in a thickness thinner than the prescribed gap;

the magnetic toner comprises a binder resin and magnetic powder and has a particle size distribution including 12% by number or more of magnetic toner particles of 5 microns or smaller, 33% by number or less of magnetic toner particles of 8–12.7 microns and 2% by volume or less of



magnetic toner particles of 16 microns or larger so as to provide a volume-average particle size of 4–10 microns; and

the bias application means is disposed to provide an alternating bias electric field comprising a development-side voltage component and a reverse-development side voltage component, the development-side voltage component having a magnitude equal to or larger than that of the reverse development-side voltage component and a duration smaller than that of the reverse-development side voltage component, so that the magnetic toner on the toner-carrying member is transferred to the latent image-bearing member to develop the electrostatic image thereon at the developing station.

5,202,732

DEVELOPING DEVICE FOR IMAGE FORMING EQUIPMENT

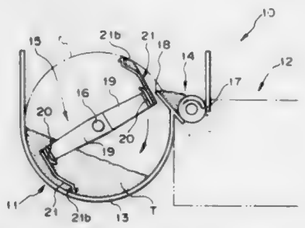
Masasumi Yahata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 12, 1992, Ser. No. 834,202

Claims priority, application Japan, Feb. 15, 1991, 3-21958

Int. Cl.[5] G03G *15/08*

U.S. Cl. 355—260 **14 Claims**



1. A developing device incorporated in image forming equipment and having a toner tank storing a toner and a developing section connected to said toner tank for receiving said

toner from said toner tank via a toner supply portion, said device comprising:

bladed wheel means disposed in said toner tank and comprising a rotary shaft, support members affixed to said rotary shaft, and a blade constituted by an elastic member supported by said support members, said bladed wheel means rotating said blade for feeding the toner from said toner tank to said toner supply portion wherein the rotating of said blade causes said blade to travel along a path of movement with a radially outermost portion of said blade defining a radius of rotation, said path of movement extending through a supply of toner in said tank, said blade having a surface which collects a portion of toner thereon as said blade travels through the supply of toner; and

a projection member located at an upstream position in an intended direction of toner feed from said toner tank to said toner supply portion, said projection member also located at a position along said path of movement of said blade which is downstream of said supply of toner such that said surface of said blade carries the portion of toner as said blade reaches the position of said projection member, said projection member at least partially protruding into the radius of rotation of said blade to remove the portion of toner from said surface of said blade and feed said portion of toner toward the toner supply portion of the image forming apparatus.

5,202,733

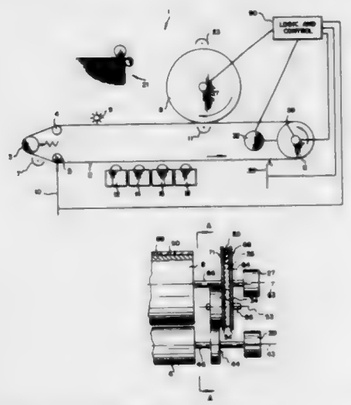
IMAGE FORMING APPARATUS HAVING A TRANSFER MEMBER

Edwin A. Hediger, Fairport, and John R. Thompson, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1992, Ser. No. 896,849

Int. Cl.[5] G03G *15/14, 21/00*

U.S. Cl. 355—271 **15 Claims**



1. Image forming apparatus comprising:

an endless web image member movable at a speed through an endless path,

a transfer drum having an outside transfer surface rotatable through transfer relationship with said image member and having at least one layer of material which causes the diameter of the transfer surface to vary in response to varying ambient conditions,

a rotatable drive member, fixed to or integral with said transfer drum, which drive member has a drive surface of the same diameter as the transfer drum and a layer of material of substantially the same thickness and respense to ambient conditions as said at least one layer of the transfer drum to vary the outside diameter of the drive surface the same as the variance in the outside diameter of the transfer drum in response to varying ambient conditions,

first drive means movable through an endless path for engaging and frictionally driving the drive surface of said rotatable drive member, and

second drive means for driving said first drive means at the same speed as said image member.

5,202,734

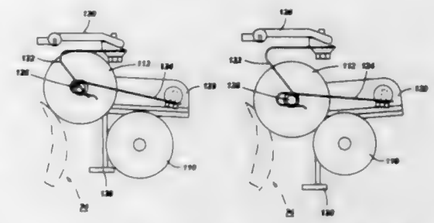
SPRING LOADED OIL DISTRIBUTING PREHEATED DONOR ROLL

Robert S. Pawlik, Webster; Richard G. Palmatier, Springwater, and Robert Gary, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 10, 1991, Ser. No. 757,089

Int. Cl.[5] G03G *15/20, 21/00*

U.S. Cl. 355—284 **12 Claims**



1. Apparatus for applying offset preventing liquid to one member of a contact fuser for fixing powder images to a substrate, said apparatus comprising

a supply of release agent material including a sump;

a release agent metering member supported for movement in an endless path and in contact with said supply of release agent material;

a donor member;

means for supporting said donor member;

means for urging said donor member against a heated fuser member during a first mode of operation and out of contact with said metering member; and

means for moving said donor member for effecting engagement of said donor member with said metering member and said heated fuser member during a second mode of operation whereby said release agent material is supplied by said metering member directly from said sump to said donor member.

5,202,735

METHOD TO CONTROL HOUSING AIR INLET GAP AND MEANS THEREFOR

Bruce E. Thayer, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1992, Ser. No. 904,087

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—298 **17 Claims**

1. In an electrophotographic apparatus, an improved cleaning means for removing residual toner from the image forming surface of a moving photoreceptor, said cleaning means employing an air current, comprising:

a cleaner housing arranged adjacent said image forming surface of said photoreceptor;

a means for controlling air inlet flow volume and direction through said cleaner housing including:

an air inlet baffle removably attached to said housing; and

a film seal fixedly attached to said air inlet baffle which extends laterally across, contacts and rests upon said image forming surface, allowing said image forming sur-

face to pass unobstructed beneath said film seal while

a nip through which the sheet material advances and

job segment to assigned available bins in one or more towers according to the computed job segment size;

operative position and a non-operative position away therefrom;

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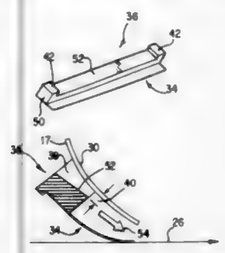
face to pass unobstructed beneath said film seal while acting in sealing engagement with said image forming



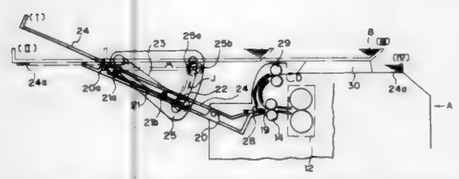
surface to prevent emissions of said residual toner from said housing.

5,202,736

IMAGE RECORDING EQUIPMENT HAVING MOVABLE TRAY RECEIVING SHEETS HAVING IMAGES FORMED THEREON

Takeshi Komurasaki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 737,649
Claims priority, application Japan, Jul. 30, 1990, 2-199080
Int. Cl.[5] G03G *21/00*; B65H *29/00*
U.S. Cl. 355—308 4 Claims



1. Image recording equipment for recording an image on a sheet and then discharging said sheet outside a housing of the equipment, comprising:

a first tray provided on an operating side of said equipment adjacent which an operator is expected to stand for stacking sheets sequentially driven out of said equipment and each carrying an image thereon, such that sheets loaded in said first tray can be removed by an operator standing adjacent said operating side of said equipment;

a second tray provided on a side opposite to said operating side for stacking sheets sequentially driven out of said equipment and each carrying an image thereon;

selecting means for selecting either one of said first and second trays to be loaded with sheets; and

moving means for moving said second tray loaded with sheets to a predetermined position on said operating side of said equipment with said predetermined position external to said housing of said equipment, such that sheets loaded in said second tray can be removed by an operator standing adjacent said operating side of said equipment.

5,202,737

METHOD AND APPARATUS FOR DECURLING SHEETS IN A COPYING DEVICE

Thomas C. Hollar, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

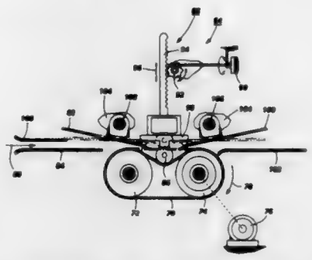
Filed Jun. 12, 1992, Ser. No. 897,697
Int. Cl.[5] G03G *21/00*; B31F *7/00*
U.S. Cl. 355—308 19 Claims

1. An apparatus for decurling sheet material, including:

flexible means for advancing the sheet material;

a rod positioned in contact with said flexible means to define a nip through which the sheet material advances and bends about a portion thereof;

means, positioned adjacent said flexible means, for guiding the sheet material; and



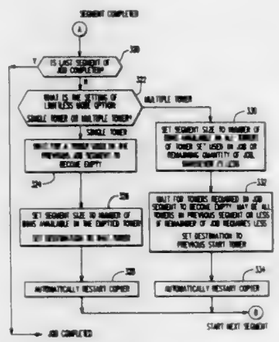
means for moving said rod to adjust deflection of said flexible means in the nip to change the bending of the sheet material about said rod, said moving means moving said guiding means and said rod in unison with one another.

5,202,738

HIGH-VOLUME DUPLICATOR SYSTEM AND METHOD PROVIDING EFFICIENT SYSTEM OPERATION IN THE COLLATED SIMPLEX LIMITLESS MODE

Charles D. Braswell, Henrietta, and Riley L. Warddrip, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 13, 1991, Ser. No. 744,103
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—323 5 Claims



1. A copy system comprising:

means for duplicating successive original documents;

means for sorting output copies delivered from said duplicating means;

said sorting means including a plurality of towers each of which includes a plurality of bins;

means for transporting output copies to each of said towers;

means for directing output copies in each tower to each bin therein;

means for controlling said duplicating means and said tower transporting and bin directing means in the collated simplex mode; and

said controlling means including:

means for computing the size of each segment of an entered job as a function of an entered copy quantity and as a function of available sorting means resources;

means for operating said tower transporting means and said bin directing means to deliver successive copies in a first job segment to assigned available bins in one or more towers according to the computed job segment size;

means for detecting a single tower loading or multiple tower loading selection for limitless mode operation;

means for operating said tower transporting means and said bin directing means to deliver successive copies to assigned available gins in each job segment subsequent to the first job segment in accordance with the tower loading selection detected by said detecting means;

means for shutting down said duplicating and sorting means after the completion of each job segment in the multiple tower loading mode, or after the completion of each job segment in the single tower loading mode, or after the completion of each job segment in the single tower loading mode if an empty tower is unavailable;

means for restarting said duplicating and sorting means in the single tower loading mode when an empty tower becomes available with the next segment size set to the number of bins in the empty tower and the destination of copies in the next job segment set to the empty tower;

means for restarting said duplicating and sorting means in the multiple tower loading mode when the number of towers required for the next job segment are emptied and available with the start destination of copies in the next job segment set to the next previous start tower; and

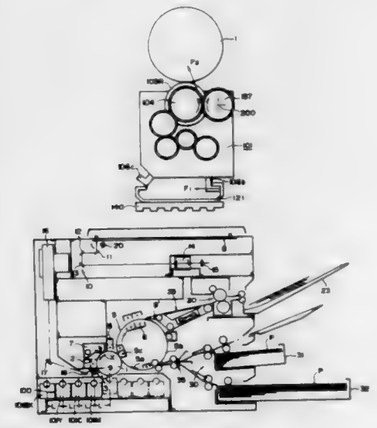
means for ending the job when the last job segment is completed.

5,202,739

IMAGE FORMING APPARATUS HAVING A DEVELOPING MEANS MOVABLE BETWEEN AN OPERATIVE POSITION AND INOPERATIVE POSITION

Takuya Hatakeyama, Tokyo, and Michiro Koike, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 572,420, Aug. 27, 1990, abandoned.
This application May 17, 1991, Ser. No. 701,315
Claims priority, application Japan, Aug. 30, 1989, 1-223694
Int. Cl.[5] G03G *15/01*, *15/06*
U.S. Cl. 355—327 18 Claims



1. An image forming apparatus, comprising:

image bearing means;

means for forming an electrostatic latent image on said image bearing means;

developing means for developing a latent image formed on said image bearing means, said means including a developing unit having a developer carrying member for carrying thereon and supplying a developer to said image bearing means;

moving means for moving said developing unit between an operative position and a non-operative position away therefrom;

supporting means for supporting said developing unit for rotation about an axis, said supporting means rotatably supporting said developing unit at one side and supporting said developing unit at the other side for rotation and movement in a predetermined direction;

urging means for urging said developing unit toward said image bearing means adjacent to the other side; and

means for applying driving force to said developer carrying member of said developing unit at said one side;

wherein, when said developing unit is rotated about the axis and moved to the operating position by said moving means, said developing unit is urged toward said image bearing means about the axis by the driving force of said driving means, and

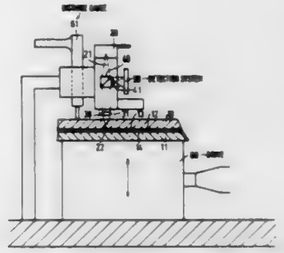
wherein said developing means has a plurality of such developing units.

5,202,740

METHOD OF AND DEVICE FOR DETERMINING THE POSITION OF A SURFACE

Cornelis M. H. M. Kivits, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1990, Ser. No. 523,965
Claims priority, application Netherlands, Jun. 7, 1989, 8901442
Int. Cl.[5] G01C *3/08*, *1/20*; G01B *10/06*
U.S. Cl. 356—4 3 Claims



1. A method of determining the position of a surface, which method comprises the following steps:

irradiating the surface with a radiation beam directed substantially perpendicularly to the surface and focusing the radiation beam by means of a focusing objective in a focus proximate to the surface;

periodically displacing the focus formed in a direction perpendicular to the surface around an average position;

detecting the radiation reflected by the surface on a radiation-sensitive detection system having a plurality of radiation-sensitive elements; and

deriving a signal from the radiation distribution on the radiation-sensitive detection system, which signal is modulated due to said periodical displacement;

characterized in that the amplitude of said periodical displacement is larger than the depth of focus of the focusing objective and in that the surface and said average position are displaced with respect to each other until a maximum amplitude of the modulated signal is obtained.

5,202,741

measuring the position of reflected pulse modulated beam on

microscope, the area of incidence of the secondary light beam

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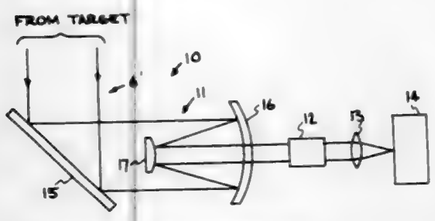
5,202,741

ACTIVE IMAGING SYSTEM WITH FARADAY FILTER

James J. Snyder, San Jose, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 29, 1992, Ser. No. 905,989
Int. Cl.[5] G01C 3/08
U.S. Cl. 356—4 20 Claims



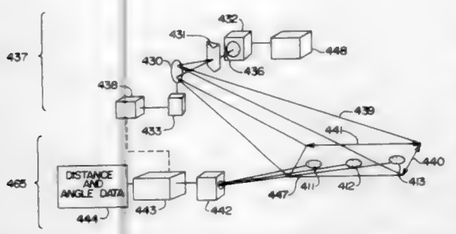
1. An active imaging system comprising:
a Faraday filter having a center wavelength in the visible to near infrared;
means for receiving laser light reflected from a distant target and transmitting said light to said filter; and
a non-intensified CCD camera for receiving a filtered version of the laser light from the distant target from the filter.

5,202,742

LASER RADAR FOR A VEHICLE LATERAL GUIDANCE SYSTEM

Andrew A. Frank, El Macero, Calif., and Masahiko Nakamura, Ann Arbor, Mich., assignors to Aisin Saiki Kabushiki Kaisha, Japan

Filed Oct. 3, 1990, Ser. No. 592,235
Int. Cl.[5] G01C 3/08, 1/00; G01B 11/26; B60T 7/16
U.S. Cl. 356—5 44 Claims



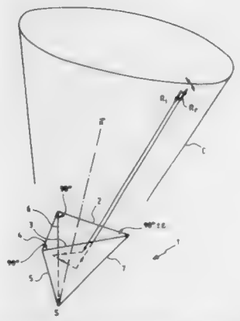
1. In a vehicle guidance system for guiding a vehicle traveling on a non-fixed path comprising an apparatus for continuously generating a beam of electromagnetic radiation for scanning a stationary reflecting surface and an apparatus for receiving reflected electromagnetic radiation from said stationary reflecting surface, a method for detecting the shape of the vehicle path by measuring distance and incident angle between the vehicle and the stationary reflecting surface comprising the steps of:
continuously generating at said vehicle a beam of electromagnetic radiation of predetermined dimensions;
modulating at least one pulse on said beam to produce a pulse modulated beam;
transmitting said pulse modulated beam from said vehicle towards at least one stationary reflecting surface;
receiving a reflected pulse modulated bean from said at least one stationary reflection surface;
focusing said reflected pulse modulated beam onto a detector array;
measuring the position of reflected pulse modulated beam on said detector array;
measuring a propagation delay between said pulse modulated beam and said reflected pulse modulated beam;
calculating the distance between said vehicle and said at least one stationary reflecting surface as a proportion of said measured propagation delay; and
calculating the incident angle between said vehicle and said at least one stationary reflecting surface as a proportion of the position of said reflected pulse modulated beam on said detector array,
wherein the shape of the vehicle path is detected from the distance and angle between said vehicle and said at least one stationary reflecting surface and said vehicle is guided to follow said detected path.

5,202,743

LONG RANGE LASER RANGING DEVICE

Glenn Lund, Pellion, and Hervé Renault, Cannes, both of, France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Mar. 23, 1992, Ser. No. 854,723
Claims priority, application France, Mar. 28, 1991, 91 03795
Int. Cl.[5] G01C 3/08
U.S. Cl. 356—5 10 Claims



1. A long range laser ranging device which includes a transmitter-receiver unit for transmitting a laser signal and receiving a reflected laser signal, and a retroreflector target for receiving said laser signal and returning said reflected laser signal to said transmitter-receiver unit in a direction substantially parallel to said laser signal, wherein said transmitter-receiver unit travels along a path at a relative velocity V to said retroreflector target, such that said transmitter-receiver unit has a transverse relative velocity which is substantially normal to an instantaneous line between said transmitter-receiver unit and said retroreflector target, wherein said retroreflector target comprises:
at least one retroreflector having a field of view which intersects at least a portion of said path of said transmitter-receiver unit, said at least one retroreflector having three reflecting planar faces defining three dihedral angles converging towards an apex, said at least one retroreflector having a normal which is equi-angled from said three dihedral angles, a first and second planar face of said three reflecting planar faces being substantially perpendicular to a third planar face of said three reflecting planar faces, said first and second planar faces defining a first dihedral angle therebetween which deviates from 90° by a deviation value ϵ, said first dihedral angle defining a plane with said normal of said at least one retroreflector, said plane being approximately perpendicular to an average orientation of said transverse relative velocity;
wherein said deviation value ϵ is between minimum and maximum values, in radians, of the equation:

$v_p/(c \sin \theta)$

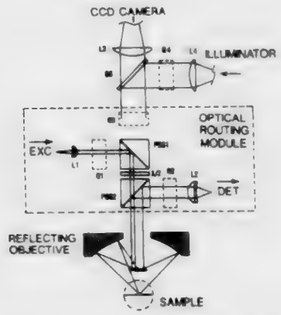
wherein v_t is said transverse relative velocity, θ is an angle defined between said first dihedral angle and said instantaneous line between said transmitter-receiver unit and said retroreflector target, and c is the speed of light.

5,202,744

ELECTRO-OPTICAL MEASURING INSTRUMENTS

Thomas A. Louis, Max-Reger-Strasse 22, D-7032 Sindelfingen 1, Fed. Rep. of Germany

PCT No. PCT/GB89/00845, § 371 Date Mar. 22, 1991, § 102(e) Date Mar. 22, 1991, PCT Pub. No. WO90/01692, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 25, 1989, Ser. No. 669,407
Claims priority, application United Kingdom, Jul. 29, 1988, 8818106; Sep. 13, 1988, 8821470
Int. Cl.[5] G01N 21/64; G02B 21/00
U.S. Cl. 356—73 25 Claims



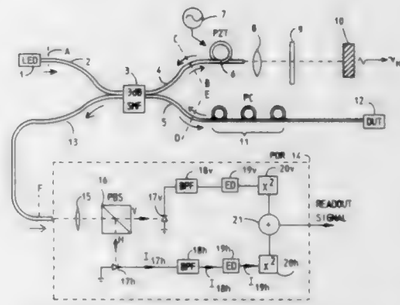
1. An optical routeing module device suitable for use in a light microscope for sample inspection simultaneously with a primary light source and a secondary light source of different wavlength to said primary light source, which device comprises a housing mounting first and second polarising beam splitter means along a primary light beam pathway through said device and having secondary light beam inlet and outlet means disposed opposite different, ones of said first and second polarising beam splitter means, said first and second polarising beam splitter means each having a narrow predetermined operating wavelength range, defined between s-plane and p-plane transitional wavelengths, which substantially excludes the primary light source wavelength band and is substantially above or below the wavelength band of said primary light source and such that the wavelength band of each of the secondary light source and a secondary light output from the sample responsive to incidence of said secondary light source on a said sample in use of the device is substantially below the s-plane transitional wavelength or above the p-plane transitional wavelength, of a respective one of said first and second polarising beam splitter means, respectively whereby, in use of the device, at least one polarising plane component of each of the secondary light source and said secondary light output is subjected to a different one of transmission and reflection from that to which the primary light source is subjected at each of the first and second polarising beam splitter means, said first and second polarising beam splitter means further being formed and arranged for defining a secondary light beam pathway from said inlet to said outlet so that the secondary light beam pathway is brought substantially into alignment with an outward leg of said primary beam pathway upstream of the sample by said first polarising beam splitter means and is separated back out from a return leg of said primary light beam pathway downstream of the sample by said second polarising beam splitter means whereby in use of the device in a light microscope, the area of incidence of the secondary light beam with the sample may be monitored via the primary light beam.

5,202,745

POLARIZATION INDEPENDENT OPTICAL COHERENCE-DOMAIN REFLECTOMETRY

Wayne V. Sorin, Mountain View, and Brian L. Heffner, Redwood City, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 610,188, Nov. 7, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 844,905
Int. Cl.[5] G01B 9/02; G01N 21/84
U.S. Cl. 356—73.1 8 Claims



1. An optical reflectometer for measuring an optical parameter of a device under test, the reflectometer comprising:
means for providing a broadband reference signal;
means for applying a broadband test signal to a device under test and receiving a response signal from said device;
a plurality of optical sensors responsive to optical signals of differing polarities for receiving the reference and response signals;
polarization control means for controlling the polarization of the reference signal to balance the sensor responses; and
output means responsive to the sensors for providing an output signal indicative of an optical parameter of the device under test, the output signal being substantially independent of polarization in the response signal when the sensor responses have been balanced by the polarization control means.

5,202,746

METHOD AND APPARATUS FOR IDENTIFYING AN OPTICAL TRANSMISSION MEDIUM

Shintaro Sentsui, Chiba; Akira Fujisaki, Ichihawa; Haruki Ogoshi, Yokohama; Morinobu Mizutani, Tokyo, and Mitsuo Miyazaki, Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd. and The Tokyo Electric Power Co., Incorporated, both of Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,045
Claims priority, application Japan, Mar. 2, 1989, 1-50680; Mar. 2, 1989, 1-50681; Nov. 16, 1989, 1-298595; Nov. 16, 1989, 1-298596
Int. Cl.[5] G01N 21/84, 21/21
U.S. Cl. 356—73.1 8 Claims

1. A method for identifying an optical transmission medium out of a plurality of single-mode-type optical transmission media by using longitudinal middle portions of the media as an identification section, comprising the steps of:
exciting a particular optical transmission medium to be identified by means of a polarized light;
applying either an electromagnetic action or a mechanical action to the particular optical transmission medium to be

emitted from the object in the form of a picturing path of

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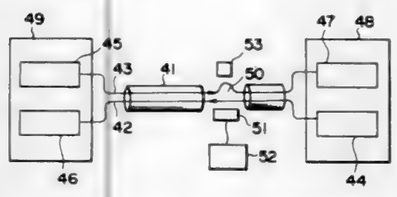
identified at said identification section to modulate said polarized light; and



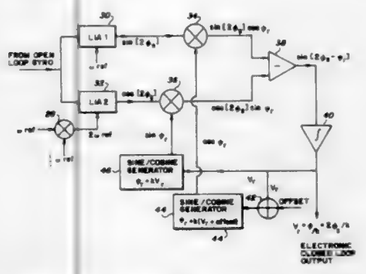
identifying said particular optical transmission medium based on the deviation of the polarized plane of said polarized light.

5,202,747

FIBER OPTIC GYROSCOPE WITH WIDE DYNAMIC RANGE ANALOG PHASE TRACKER

Alan D. Kersey, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1991, Ser. No. 736,327
Int. Cl.[5] G01C *19/72*
U.S. Cl. 356—350 **17 Claims**



1. An analog phase tracker, comprising:

means for receiving a first signal having a phase shift representative of an optically phase modulated interferometric output; and

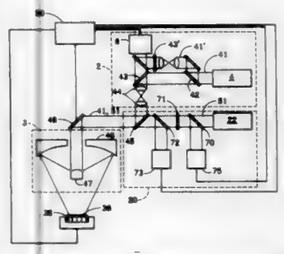
means for electronically nulling the phase shift to provide an electronic phase tracking signal.

5,202,748

IN SITU PROCESS CONTROL SYSTEM FOR STEPPERS

Bruce G. MacDonald, San Diego; Robert O. Hunter, Jr., Rancho Santa Fe, and Adlai H. Smith, San Diego, all of Calif., assignors to Litel Instruments, San Diego, Calif.

Filed Jun. 7, 1991, Ser. No. 711,869
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—360 **30 Claims**



1. A process control system for a wafer stepper for monitoring conditions which affect exposure across an entire optical field before, during and after projection of an illumination beam carrying a pattern from a reticle through an optical train to be focused on a wafer, said wafer being at least partially reflective, said process control system comprising:

an interferometric subsystem comprising:

at least one reference laser for emitting a reference beam;

at least one reference beamsplitter for redirecting a portion of said reference beam;

a plurality of optical elements for directing said reference beam into a common path with said illumination beam through said optical train, said plurality of optical elements further directing a reflected reference beam to retrace said common path and return to said at least one reference beamsplitter;

at least one detector array for receiving an interference fringe generated by a combination of said portion of said reference beam and said reflected reference beam and said reflected reference beam, said at least one detector array generating a first set of electrical signals corresponding to said interference fringe; and

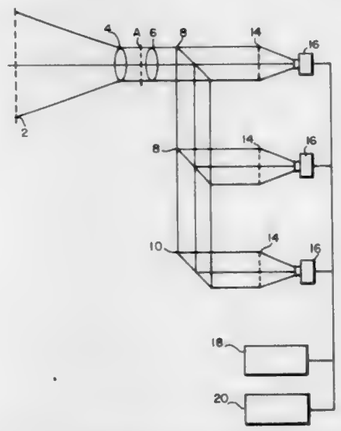
a control processor for receiving and analyzing a plurality of electrical signals and generating a plurality of output signals therefrom, wherein said first set of electrical signals is analyzed to determine a first set of exposure conditions comprising at least one first optical path difference map.

5,202,749

PROCESS AND DEVICE FOR OBSERVING MOIRE PATTERNS OF SURFACES TO BE TESTED BY APPLICATION OF THE MOIRE METHOD USING PHASE SHIFTING

Klaus Pfister, Vagener Weg 76, D-8206 Bruckmühl, Fed. Rep. of Germany

PCT No. PCT/DE89/00788, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/07691, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 22, 1989, Ser. No. 690,917
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843396; Mar. 8, 1989, 3907430
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 **21 Claims**



1. A device for observing moiré patterns of surfaces to be tested, said device applying the moiré method by phase shifting, comprising:

observation objective means for receiving an object grating emitted from the object in the form of a picturing path of rays;

a first auxiliary grating for generating a moiré pattern from the picturing path of rays;

camera means for observing the moiré pattern generated from the picturing path of rays;

means for storing and/or evaluating the observed moiré pattern generated from the picturing path of rays, said storing means connected to said camera means;

wherein the improvement comprises:

at least two additional auxiliary gratings, said second and third auxiliary gratings positioned near said first auxiliary grating with all of said auxiliary gratings adjustably positioned in the path of the rays, between said observation objective means and said camera means, so as to be in a phase-shifted relationship to each other by a corresponding phase angle, each of said at least three auxiliary gratings generating a phase-shifted moiré pattern; and

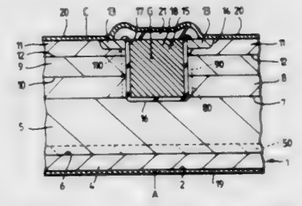
said camera means respectively detecting the phase-shifted moiré patterns simultaneously from each of the at least three auxiliary gratings.

5,202,750

MOS-GATED THYRISTOR

Paul A. Gough, Ifield, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 664,172, Mar. 4, 1991, abandoned. This application Jun. 3, 1992, Ser. No. 894,166
Claims priority, application United Kingdom, Apr. 9, 1990, 9008020
Int. Cl.[5] H01L *29/74, 29/747, 29/10, 27/02*
U.S. Cl. 257—133 **9 Claims**



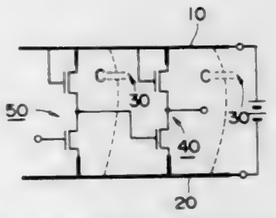
1. A semiconductor device comprising a semiconductor body having formed therein a thyristor having first and second main electrodes and a gate electrode and having a first region of one conductivity type provided with the first main electrode, a second region of the opposite conductivity type forming a first pn junction with the first region, a third region of the one conductivity type forming a second pn junction with the second region and provided with the gate electrode, and a fourth region of the opposite conductivity type forming a third pn junction with the third region, characterized in that a fifth region of the one conductivity type forms with a fourth region a fourth pn junction separating the fourth region from the second main electrode, a sixth region of the opposite conductivity type is electrically connected to the second main electrode and forms a fifth pn junction with the fifth region, and an insulated gate overlies a conduction channel area of the fifth region for defining a gateable conductive path from the second main electrode and into the fourth region for charge carriers of the opposite conductivity type for initiating thyristor action, and in that an electrical connection is made to the fifth region to provide a path for extraction of charge carriers of the one conductivity type during turn-off of the thyristor.

5,202,751

SEMICONDUCTOR INTEGRATED CIRCUIT

Fumio Horiguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 425,502, Oct. 20, 1989, abandoned, which is a continuation of Ser. No. 348,125, May 3, 1989, abandoned, which is a continuation of Ser. No. 111,076, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 717,802, Mar. 29, 1985, abandoned. This application Jun. 29, 1992, Ser. No. 905,232
Claims priority, application Japan, Mar. 30, 1984, 59-62926
Int. Cl.[5] H01L *27/02, 29/68, 23/48*
U.S. Cl. 257—532 **27 Claims**



1. A semiconductor integrated circuit, comprising:

a semiconductor substrate;

a dynamic RAM memory cell array having bit lines mounted on said substrate;

a power source line and a ground line, mounted on said substrate, for supplying an internal power supply voltage; and

a charging circuit, mounted on said substrate, for charging the bit lines of the memory cell array at said given voltage for a data sensing operation;

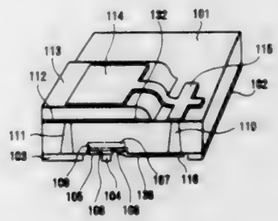
said power source line and said ground line being disposed one over the other in a laminated manner along their length with a layer of dielectric substance located between said power source line and said ground line to form a capacitance element having a predetermined capacitance value that prevents said internal power supply voltage from dropping below a given voltage.

5,202,752

MONOLITHIC INTEGRATED CIRCUIT DEVICE

Kazuhiko Honjo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 13, 1991, Ser. No. 699,279
Claims priority, application Japan, May 16, 1990, 2-126158; May 16, 1990, 2-126159
Int. Cl.[5] H01P *3/08*
U.S. Cl. 257—678 **6 Claims**



1. A semiconductor device comprising:

a semiconductor element formed in a first main surface of a substrate;

a first metal ground film and an electrode independently

formed on the first main surface of said substrate, said

trenches having a high aspect ratio of depth to width of

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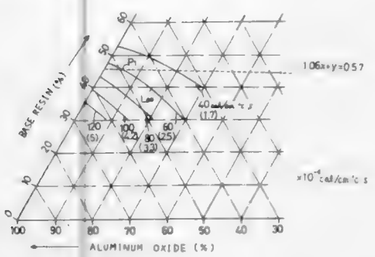
formed on the first main surface of said substrate, said electrode being connected to said semiconductor element,
a second metal ground film formed on a second main surface of said substrate;
a microstrip antenna conductor formed on a dielectric film, said dielectric film being formed on said second metal ground film;
a first via hole conductor formed in said substrate to connect said first metal ground film to said second metal ground film; and
a second via hole conductor formed in said substrate to connect said electrode to said microstrip antenna conductor.

5,202,753

RESIN-SEALED SEMICONDUCTOR DEVICE

Akira Shintai, Oobu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 27, 1991, Ser. No. 766,347
Claims priority, application Japan, Nov. 26, 1990, 2-324872
Int. Cl.[5] H01L *23/30;* **C08L** *91/00*
U.S. Cl. 257—787 **3 Claims**



1. A resin-sealed semiconductor device comprising:
a lead frame;
a silicon chip formed on said lead frame and electrically connected with said lad frame; and
a thermosetting resin, arranged to seal at least a pat of said lead frame and said silicon chip, and consisting essentially fo a base resin, aluminum oxide and fused silica in predetermined proportions satisfying the following equation:

$$1.06X+y>0.57,$$

where x is the percent volume of aluminum oxide and y is the percent volume of fused silica.

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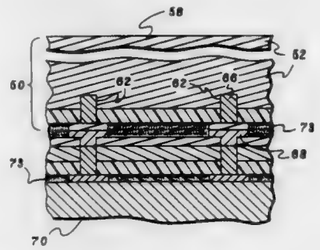
THREE-DIMENSIONAL MULTICHIP PACKAGES AND METHODS OF FABRICATION

Claude L. Bertin; Paul A. Farrar, Sr., both of South Burlington; Howard L. Kalter, Colchester; Gordon A. Kelley, Jr., Essex Junction; Willem B. van der Hoeven, Jericho, and Francis R. White, Essex, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1991, Ser. No. 760,041
Int. Cl.[5] H01L *29/78;* **B44C** *1/22*
U.S. Cl. 257—684 **6 Claims**

1. A multichip package comprising:
a carrier having an upper surface;
a first integrated circuit device having a first surface and a second surface in substantially parallel opposing relation, said integrated circuit device having an active layer adjacent said first surface and a substrate adjacent said second surface, the thickness of said first device from said first surface to said second surface being less than thirty micrometers, said first device further including a plurality of metallized trenches therein extending from said first surface to said second surface thereof, each of said metallized trenches having a high aspect ratio of depth to width of approximately twenty to one, at least some of said plurality of metallized trenches being in electrical contact with the active layer of said first integrated circuit device, said first integrated circuit device being disposed on said carrier with said first surface of said device opposing said upper surface of said carrier; and
a second integrated circuit device having a first surface and a second surface in substantially parallel opposing relation, said second integrated circuit device having an active layer adjacent said first surface and a substrate adjacent said second surface, the thickness of said second device from said first surface being less than thirty micrometers, said second device including a plurality of



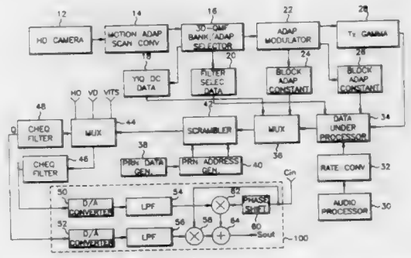
metallized trenches therein extending from said first surface to said second surface thereof, at least some of said plurality of metallized trenches in said second device being in electrical contact with the active layer thereof, said second integrated circuit device being disposed on said first integrated circuit device such that said first surface of said second device is opposing said second surface of said first device in a spaced relationship and such that said metallized trenches of said first device provide electrical connection between said active layer of said first device and said active layer of said second device, said metallized trenches of said second device providing electrical contact to said second device's active layer.

5,202,755

ENCODING SYSTEM OF A SIMULCAST HIGH DEFINITION TELEVISION AND METHOD THEREOF

Tae-Kwon Yang, and Dong-Il Song, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 24, 1991, Ser. No. 812,943
Claims priority, application Rep. of Korea, Jan. 22, 1991, 1991-1022
Int. Cl.[5] H04N *7/00, 11/00*
U.S. Cl. 358—12 **7 Claims**



4. A encoding method of a simulcast high definition television, comprising the steps of:

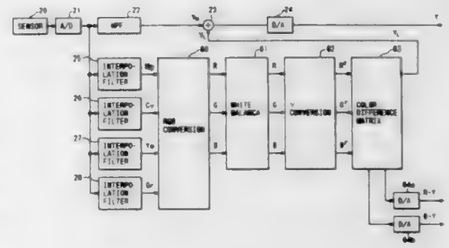
a) dividing a base band signal of a high definition television into 8:8:4 with respect to horizontal axis: vertical axis: time axis into sub-blocks, to thereby transmit a first sub-block having twelve sub-blocks of a luminance low frequency component and a chrominance component through an exclusive analog channel and to transmit a second sub-block having twenty-two sub-blocks through a data-under-channel together with digital location information by adaptively selecting said second sub-block among said 256 sub-blocks in response to motion information of an input image signal;
b) extracting a low frequency region, said low frequency region at which a DC component per transmission frame being dense, in response to the adaptive selection, converting the extracted data into digital data, to thereby transmit said extracted digital data through an exclusive digital channel, and transmitting a luminance high frequency component to said data-under-channel;
c) converting location information of said second sub-block in response to said adaptive selection into digital data, so as to transmit the converted digital data through said data-under-channel;
d) adaptively modulating said first sub-block having twelve sub-blocks and the adaptive selected second sub-block having twenty-two sub-blocks;
e) transmitting a first block adaptive constant with respect to the luminance low frequency component and chrominance component through said exclusive digital channel, and transmitting a second block adaptive constant with respect to the luminance high frequency component through said under channel, in response to the adaptive modulation;
f) non-linearly processing the adaptive modulated signal, to thereby raise a low level signal thereof;
g) encoding an audio signal in a MUSE and converting a transmission rate;
h) reducing the analog signals of said location information with respect to said second sub-block, said second block adaptive constant, the transmission gamma processed image signal and the transmission rate converted audio signal, and substituting data bits into the first two or more most significant bits to transmit a signal in the form of the analog signal component being added to the digital signal component through said data-under-channel;
i) multiplexing the transmission data of step b), said first block adaptive constant of step e) and the transmission data of step h) in a transmission format, and carrying out scrambling by pseudo random number (PRN) data and PRN row and column addresses in dependence on said PRN data;
j) multiplexing the scrambled signal in the order of even numbers, a horizontal synchronizing signal, a vertical synchronizing signal and a channel deterioration compensation signal in an in-phase channel transmission format, and multiplexing the scrambled signal in the order of odd numbers in a quadrature phase channel transmission format; and
k) channel-equalizing-filtering the multiplexed in-phase and quadrature channel data and carrying out a double side band-quadrature modulation (DSB-QM).

5,202,756

COLOR SIGNAL PROCESSING APPARATUS USING PLURAL LUMINANCE SIGNALS

Takashi Sasaki, Yokohama; Akihiko Shiraishi, Kawasaki, and Mayumi Yamamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 433,349, Nov. 8, 1989, abandoned. This application Jul. 16, 1992, Ser. No. 913,978
Claims priority, application Japan, Nov. 9, 1988, 63-281456; Nov. 22, 1988, 63-296731; Nov. 22, 1988, 63-296733; Nov. 22, 1988, 63-296734
Int. Cl.[5] H04N *9/67*
U.S. Cl. 358—41 **9 Claims**



1. An image pickup apparatus wherein a solid-state image pickup element having at least three types of complementary color filters outputs color signals correspondign to said at least three types of complementary color filters and a first luminance signal is generated by using outputs of said solid-state image pickup element, and wherein linear matrix conversion of the color signals is determined according to spectral characteristics of said complementary color filters, and R, G, and B signals are generated by said linear matrix conversion using all of said color signals output from said solid-state image pickup element, a R-Y signal, a B-Y signal and a second luminance signal are generated by using said R, G and B signals, and a third luminance signal is generated by using said first and secodn luminance signals.

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Patent Not Issued For This Number

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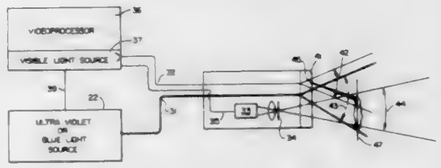
FLUORESCENT PENETRANT MEASUREMENT BORESCOPE

Richard A. Tamburrino, Auburn, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Sep. 16, 1991, Ser. No. 760,495
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—98 **9 Claims**



1. A fluorescent type borescope having an elongated inser-

tion tube that has a proximal end, a distal end, a distally dis-

the control station via a telephone line, one or more detectors

highest resolution which is to be transmitted into adjacent

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tion tube that has a proximal end, a distal end, a distally disposed optical pickup for viewing remotely located targets, and target measuring means including:

a first light source that emits light causing an illuminated indication to fluoresce;

a second light source that emits visible light;

auxiliary image creating means operatively associated with said second light source, and being disposed to cause an image created to change at least one characteristic in proportion to the distance between an indication to be measured and the distal end of said insertion tube;

measuring means for determining the change in characteristic of said created image, so that the true physical size of the indication to be measured can be determined;

a first fiber optic bundle extending from said proximal end to said distal end of said insertion tube and being connected to said first light source; and

a second fiber optic bundle extending from the proximal end to the distal end of said insertion tube, having an optical axis, and being connected to said second light source, said first and second fiber optic bundles terminating in spaced apart relationship at the distal end of the insertion tube, whereby a target that may include an indication can be viewed.

5,202,759

SURVEILLANCE SYSTEM

John Laycock, Alton, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

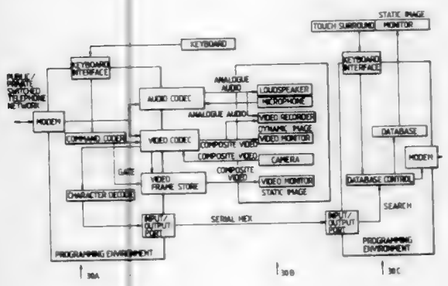
Filed Jan. 24, 1992, Ser. No. 825,531

Claims priority, application United Kingdom, Jan. 24, 1991, 9101548

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—108 **4 Claims**

1. A remote surveillance system, including a plurality of surveyed stations and a common control station, first programmable means disposed one at each said surveyed station and second programmable means disposed at the control station, said first and second programmable means being adapted to effect communication between each said surveyed station and the control station via a telephone line, one or more detectors disposed at each said surveyed station, video means disposed at each said surveyed station, data compressors one at each surveyed station and adapted to compress video signals to a form suitable for transmission over a said telephone line to the control station, and a data expander provided at the control station and adapted to receive video signals from compressed data received from a surveyed station, said data compression and expansion being effected via said first and second programmable means respectively, the arrangement being such that activation of a said detector initiates telephone communication between the corresponding surveyed station and the control station whereby to transmit video information to the control station, wherein means are provided for transmitting an identifier code from a surveyed station to the control station at the commencement of communication therebetween, and wherein said control station has data compressor means for transmitting video signals to one or more said surveyed stations, said surveyed stations having data expander means for removing said video data.



5,202,760

INFORMATION COMPRESSION METHOD AND DEVICE FOR COMPATIBLE DECODING OF A GROUP OF TELEVISION SIGNALS WITH INCREASING RESOLUTIONS

Philippe Tourtier, Rennes, and Yves-Marie Le Pannerer, St Gregoire, both of France, assignors to Thomson-CSF, Puteaux, France

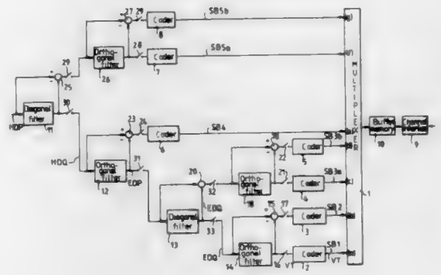
PCT No. PCT/FR90/00101, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO90/10353, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 13, 1990, Ser. No. 582,920

Claims priority, application France, Feb. 21, 1989, 89 02235

Int. Cl.[5] H04N *7/00, 7/12*

U.S. Cl. 358—141 **11 Claims**



1. A method for information compression intended for compatible decoding of a group of television signals with increasing resolutions, the signals being transmitted between at least a transmitting coder and a receiving decoder, comprising the steps of:

at the transmitting coder

strobing the spatial frequency band of the signals with the highest resolution which is to be transmitted into adjacent subbands to generate a plurality of resolution groups, each resolution group representing a complete television signal of a predetermined resolution, wherein the subbands are divided by means of diagonal and/or orthogonal spatial filters;

coding the signals independently in each subband;

multiplexing the subbands by separating the coded signals in each subband according to non-imitable synchronization patterns;

and at each receiving decoder

decoding the signals which are received relative to each subband, only taking into consideration those which are necessary to reconstitute at least one member of the groups of resolution.

5,202,761

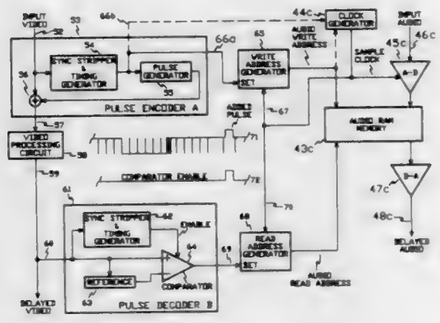
AUDIO SYNCHRONIZATION APPARATUS

J. Carl Cooper, 1373 Sydney, Sunnyvale, Calif. 94087

Continuation of Ser. No. 100,740, Sep. 24, 1987, abandoned, which is a continuation of Ser. No. 675,030, Nov. 26, 1984, abandoned. This application May 28, 1991, Ser. No. 707,423

Int. Cl.[5] H04N *5/04*

U.S. Cl. 358—149 **27 Claims**



1. An apparatus for equilizing video to audio frequency signal timing in a television system of the type having a video signal processing path separate from the audio path, and having a video processing circuit having an input and an output, comprising:

an audio write address circuit responsive to the timing of the video input to said video processing circuit for generating an audio write address signal;

an audio read address circuit responsive to the timing of the video output from said video processing circuit for generating an audio read address signal;

a digital audio memory responsive to said audio read address signal and to said audio write address signal and having an input and an output;

an analog to digital converter having an input responsive to an analog audio signal and having an output compatible with and communicating with the input of the audio memory, and;

a digital to analog converter responsive to the output of said digital audio memory for converting the output of said digital audio memory to analog signals.

5,202,762

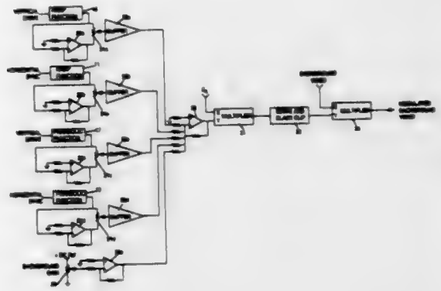
METHOD AND APPARATUS FOR APPLYING CORRECTION TO A SIGNAL USED TO MODULATE A BACKGROUND VIDEO SIGNAL TO BE COMBINED WITH A FOREGROUND VIDEO SIGNAL

David F. Fellinger, Westlake Village, Calif., assignor to Ultimatte Corporation, Chatsworth, Calif.

Filed Sep. 10, 1991, Ser. No. 757,234

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—163 **10 Claims**



1. An apparatus for applying correction to a key signal used to modulate a background video signal to be combined with a foreground video signal, said foreground video signal having a vertical drive component and a horizontal sync component, to produce a composite video signal, said correction for compensating errors in the key signal due to at least one of i) non-uniform lighting of a backing used in creating the foreground video signal, and ii) lens vignetting in the camera used to create the foreground video signal, said apparatus comprising:

a) first means (**15**) for generating a variable video field synchronized ramp function signal based upon said vertical drive component;

b) second means (**17**) for generating a variable video field synchronized parabolic function signal based upon said vertical drive component;

c) third means (**11**) for generating a variable line synchronized ramp function signal based upon said horizontal sync component;

d) fourth means (**13**) for generating a variable line synchronized parabolic function signal based upon said horizontal sync component;

e) fifth means (**81***e*) for generating a variable reference function signal based upon a direct current reference voltage;

f) summing means (**29**) for summing the function signals generated by said first, second, third, fourth and fifth means;

g) first multiplier means (**31**) coupled to said summing means for modulating said key signal based upon said summed signals;

h) clip means (**33**) coupled to said first multiplier means to clip the modulated key signal to a level which is at least 0 volts and less than the video level of the background video signal;

i) second multiplier means (**35**) coupled to said clip means for modulating said background video signal based upon said modulated and clipped key signal.

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variation amounts for pixel values of coded input image

5,202,766

coupled to the output of said DQPSK interface, and at

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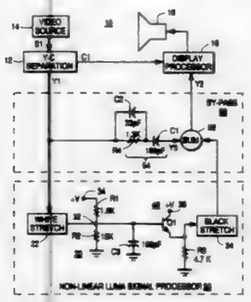
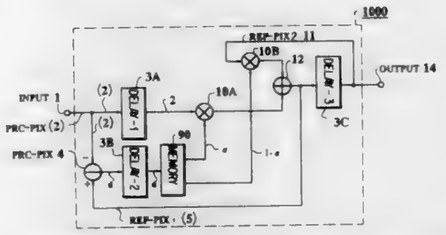
5,202,763
TELEVISION RECEIVER WITH PARTIALLY BY-PASSED NON-LINEAR LUMINANCE SIGNAL PROCESSOR
Gene K. Sendelweck, and Roger L. Lineberry, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed May 6, 1991, Ser. No. 695,804
Int. Cl.[5] H04N *5/208*
U.S. Cl. 358—166 **4 Claims**



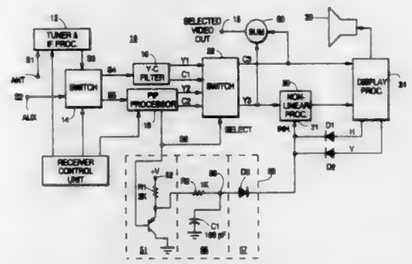
4. A television receiver, comprising:
a signal separation filter for separating a composite video input signal supplied thereto into a luminance component and a chrominance component;
a display processor having a chrominance signal input coupled to receive said chrominance component, having a luminance signal input coupled via a non-linear luminance signal processor to receive said luminance signal component and having an output coupled to a display device for displaying images having enhanced detail in luminance signal level ranges determined by said non-linear luminance signal processor;
first circuit means connected in parallel with said non-linear luminance signal processor for by-passing high frequency components of said luminance component around said non-linear luminance signal processor;
second circuit means in said non-linear luminance signal processor for attenuating high frequency components of said luminance component processed by said non-linear luminance signal processor;
said first circuit means comprising a high pass filter having a given corner frequency;
said second circuit means comprising a low pass filter having a corner frequency substantially equal to said given corner frequency; and wherein:
said non-linear luminance signal processor comprises first and second non-linear processors coupled in cascade by a buffer amplifier, said first non-linear processor having a predetermined load impedance and said second circuit means comprises a capacitor coupled between said load impedance and a source of reference potential.

5,202,764
METHOD FOR REMOVING CODING/DECODING DISTORTION FROM MOVING-PICTURE IMAGE DATA AND IMAGE PROCESSING APPARATUS CAPABLE OF SMOOTHING IMAGE DISTORTION
Takashi Ida, Chiba, and Kenshi Dachiku, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 3, 1992, Ser. No. 816,724
Claims priority, application Japan, Mar. 4, 1991, 3-037110
Int. Cl.[5] H04N *5/217*
U.S. Cl. 358—167 **19 Claims**

1. An image processing apparatus comprising:
memory means for previously storing plural coefficients of variation amounts for pixel values of coded input image data;
subtraction means for performing a subtraction between the pixel value of said coded input image data and a pixel value of reference image data to obtain a difference pixel value, said reference image data being obtained from distortion-free image data acquired during one image-data processing cycle before a present image-data processing cycle for said coded image data; and,
means for removing a coding/decoding distortion contained in said coded input image data by processing said pixel value of the coded image data base upon said coefficients read out from said memory means in response to said difference pixel value, whereby distortion-free input image data is produced.

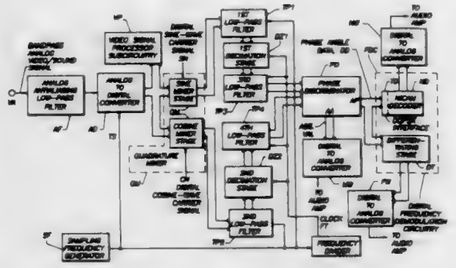


5,202,765
TELEVISION RECEIVER WITH PICTURE IN PICTURE AND NON-LINEAR PROCESSING
Roger L. Lineberry, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed May 6, 1991, Ser. No. 695,809
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—183 **14 Claims**



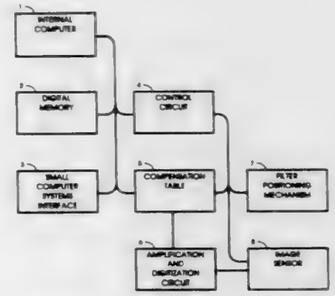
13. A picture-in-picture television system, comprising:
a first source providing a main picture video signal;
a second source providing a inset picture video signal;
a switch for inserting said inset picture video signal in said main picture video signal to provide a picture-in-picture video signal for display by a display device; characterized by:
a non-linear video processor for coupling said picture-in-picture video signal to a display device, said non-linear processor having an ON/OFF control input terminal; and
circuit means, coupled to said ON/OFF input terminal of said non-linear processor, for turning said non-linear processor ON during display of said main picture video signal and for turning said non-linear processor OFF during display of said inset picture.

5,202,766
SOUND CHANNEL CIRCUIT FOR DIGITAL TELEVISION RECEIVERS
Sönke Mehrgardt, March; Heinrich Pfeifer, Denzlingen, and Thomas Hilpert, Gundelfingen, all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany
PCT No. PCT/EP87/00682, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO89/04576, PCT Pub. Date May 18, 1989
PCT Filed Nov. 6, 1987, Ser. No. 455,348
Int. Cl.[5] H04N *5/60*
U.S. Cl. 358—198 **6 Claims**



5. A sound channel for digital television receivers, said sound channel circuit receiving a baseband analog sound and video signal developed by a television receiver and outputting an analog audio signal, the video portion of such baseband signal including a chrominance-subcarrier frequency and the audio portion of said baseband signal having a predetermined bandwidth associated with a television-standard-dependent sound carrier frequency said sound channel circuit comprising:
an analog antialiasing low-pass filter having an input receiving said baseband signal and low-pass filtering said baseband signal;
a single analog-to-digital converter having an input coupled to the output of said analog antialiasing low-pass filter and having a sampling signal at a frequency on the order of four times the chrominance-subcarrier frequency of said baseband signal;
a quadrature mixture having an input coupled to the output of said analog-to-digital converter for separating out the sound signal portion of said band pass video and sound signal, said quadrature mixture including a sine mixer stage and a cosine mixer stage;
first and second digital low-pass filters having inputs coupled to, respectively, the outputs of said sine mixture stage and said cosine mixer stage, and having high frequency characteristics falling off to zero just below one-half the sampling frequency reduced by the predetermined bandwidth of the audio portion of said baseband signal;
first and second decimation stages having inputs connected, respectively, to the outputs of said first and second low-pass filters, said decimation stages having a common clock signal at a frequency equal to one quarter that of the frequency of the sampling signal;
third and fourth digital low-pass filters having inputs coupled, respectively, to the outputs of said first and second decimation stages, said third and fourth low-pass filters having frequency characteristics falling off to zero just above said bandwidth and substantially flat in the pass region to pass said bandwidth;
a phase descriminator having first and second inputs coupled to said third and fourth low-pass filters, respectively, and having an absolute-value output and a phase-angle output;
a digital frquency demodulation circuit including a DQPSK interface for processing DPSK data pairs and having an input coupled to the output of said phase discriminator, a decoder for the "NICAM" standard having an input coupled to the output of said DQPSK interface, and at least one differentiating stage having an input coupled to the output of said phase discriminator; and
first, second, and third digital-to-analog converters having their inputs coupled, respectively, to said absolute-value output of said phase discriminator, to the output of said decoder, and to the output of said differentiating stage.

5,202,767
MULTIMODE COMPUTERIZED MULTICOLOR CAMERA AND METHOD THEREFOR
David R. Dozier, and Kendall Preston, Jr., both of Tucson, Ariz., assignors to Pathology Imaging Corporation, Tucson, Ariz.
Filed Dec. 26, 1990, Ser. No. 634,323
Int. Cl.[5] H04N *9/07*
U.S. Cl. 358—209 **17 Claims**



1. A camera apparatus for providing multiple digital signal representations of multiple monocolor images of an object comprising, in combination:
color selection means within said camera apparatus for sequentially selecting multiple colors from said object;
electronic scanning means within said camera apparatus for scanning an entire monocolor image of said object in one scanning operation in an x and y direction and for generating analog electronic signals from said scanning operation, the color of said monocolor image of said object being determined by said color selection means, said electronic scanning means performing said scanning operation for each of said multiple monocolor images when said color selection means selects each of said multiple colors;
conversion means within said camera apparatus for converting said analog electronic signals into said multiple digital signal representations of said multiple monocolor images of said object;
multiple output means within said camera apparatus coupled to said conversion means for providing both real-time and slow scan video outputs from said conversion means; and
computer means within said camera apparatus for controlling said color selection means, said electronic scanning means, and said conversion means and for transmitting said multiple digital signal representations over a computer network interface.

5,202,768
CRT FACE PANEL CENTERING APPARATUS
Andrew J. Oboza, Niles, and Vincent W. Skowronski, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Dec. 27, 1991, Ser. No. 814,736
Int. Cl.[5] H04N *5/65*
U.S. Cl. 358—247 **11 Claims**

1. A centering member for centering a rectangular face panel of a cathode ray picture tube in a cabinet, the centering

member comprising a body attached to the cabinet and not

5,202,770

ning line where the picture element undergoes a transition from white to black or vice versa;

lected distance and at preselected screen angles from the dot center of the center halftone dot;

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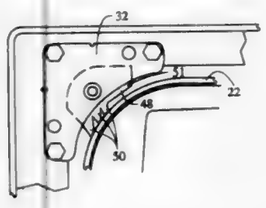
member comprising a body attached to the cabinet and not attached to the escutcheon and extending into the cabinet, the body having at least three fingers of different lengths extending



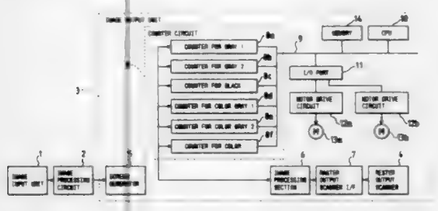
therefrom for resiliently pressing against the perimeter of the face panel, thereby compensating for variances in the diagonal fit dimensions of the face panel.

5,202,769

DIGITAL ELECTROSTATIC PRINTING APPARATUS USING A COUNTED NUMBER OF PIXELS OF VARIOUS DENSITIES TO DETERMINE AND CONTROL AN AMOUNT OF TONER USED DURING IMAGE DEVELOPMENT

Tadaomi Suzuki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 624,636
Int. Cl.[5] H04N *1/29*
U.S. Cl. 358—300 **5 Claims**



1. An image output apparatus using toner for developing an image formed from pixels of various gradation densities, wherein the image is represented by digital data and each pixel has an associated gradation density value and color value, the apparatus comprising:

means for counting pixels of the various gradation densities contained in the image data to produce a counted number, wherein the counting means counts on an basis of both a gradation density value and a color value;

means for estimating, in accordance with the counted number, an amount of toner that will be consumed during development of the image data; and

means for controlling, in accordance with the estimated amount, an actual amount of toner supplied for developing the image.

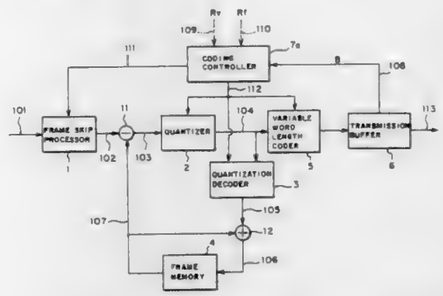
2. The apparatus as claimed in claim 1 wherein said digital image data is represented as image pages and wherein said means for counting counts one page of pixels at a time.

5,202,770

PICTURE CODING APPARATUS INCLUDING A CODING CONTROLLER FOR SELECTING CODING BETWEEN BLOCKS AND FRAMES OF IMAGE DATA

Tokumichi Murakami, and Kazuhiro Matsuzaki, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 605,362
Claims priority, application Japan, Nov. 6, 1989, 1-288180
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—426 **12 Claims**



1. A picture coding apparatus comprising differential signal generating means for outputting a differential signal from a digitized input picture data and a prediction signal, transmission picture data output means for quantizing and coding the differential signal using a quantization characteristics control signal, and for outputting transmission picture data, decoded picture signal generating means for decoding a quantization index based upon the quantization characteristics control signal and the decoded differential signal and for outputting a decoded picture signal from the decoded differential signal and the prediction signal, a memory for storing the decoded picture signal and for outputting a delayed version of the prediction signal, and a coding controller for receiving a buffer occupancy from a buffer of said transmission picture data output means and for outputting a quantization characteristics control signal,

said coding controller comprising:

first calculation means for calculating a number of bits created by coding a first prescribed processing unit;

second calculation means for calculating a number of bits created by coding a second prescribed processing unit; and

determination means for determining the quantization characteristics of at least one of the first and second prescribed processing units among a plurality of quantization characteristics using an output from said first and second calculation means and for outputting the quantization characteristics control signal.

5,202,771

IMAGE DATA COMPRESSION SYSTEM AND FACSIMILE MACHINE EMPLOYING THE IMAGE DATA COMPRESSION SYSTEM

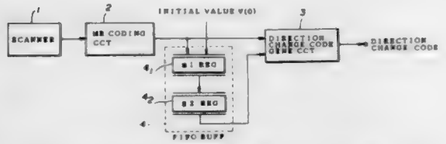
Noboru Murayama, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 385,085, Jul. 26, 1989, abandoned. This application Aug. 8, 1991, Ser. No. 742,534
Claims priority, application Japan, Aug. 8, 1988, 63-196126
Int. Cl.[5] H04N *1/41*
U.S. Cl. 358—426 **10 Claims**

1. An image data compression system comprising:

first detecting means supplied with an input image data for detecting a transition edge of a picture element on a scanning line where the picture element undergoes a transition from white to black or vice versa;

second detecting means coupled to said first detecting means for detecting any change in the inclination which is denominated as a inclination change quantity between a direction of a transition edge of a picture element on an



object scanning line and a direction of a transition edge of a picture element on a reference scanning line which precedes said object scanning line; and

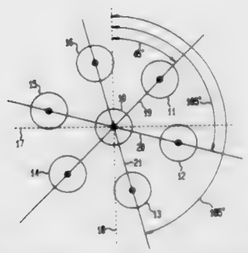
coding means coupled to said second detecting means for coding said direction change quantity into a inclination change code which is output as a compressed image data of said input image data.

5,202,772

COLOR HALFTONE SCREEN UTILIZING PRESELECTED HALFTONE DOTS PLACED AT PRESELECTED DISTANCE AND SCREEN ANGLES FROM CENTER HALFTONE DOTS

Max K. Muir, Calabasas, Calif., assignor to Volt Information Sciences, Inc., New York, N.Y.

Filed Feb. 28, 1991, Ser. No. 663,726
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—459 **34 Claims**



16. A method for processing and reproducing artwork into halftone images in an electronic image processing system having a memory device associated therewith, comprising the steps of:

(a) maintaining values representative of the light stopping ability of artwork to be reproduced as a halftone image in a data base;

(b) arranging a preselected halftone screen density data structure as

(i) at least one halftone dot pattern corresponding to a printing color including:

(1) a plurality of bits arranged as a bit map, each one of the plurality of bits in the bit map having a value assigned to it in a predetermined fashion,

(2) a plurality of halftone dots superimposed over the bit map, each one of the plurality of halftone dots having a dot center,

(3) the plurality of halftone dots being arranged so that each one of the plurality of halftone dots is a center halftone dot surrounded by a preselected number of the plurality of halftone dots,

(4) the dot centers of the preselected number of the plurality of halftone dots being placed at a preselected distance and at preselected screen angles from the dot center of the center halftone dot;

(c) retrieving the preselected halftone data structure into the memory device;

(d) comparing a value stored in the data base to a current preselected portion of the plurality of bits in the preselected halftone data structure;

(e) setting each one of the bits in the preselected portion of the plurality of bits in the preselected halftone data structure that correspond to the value from the data base; and

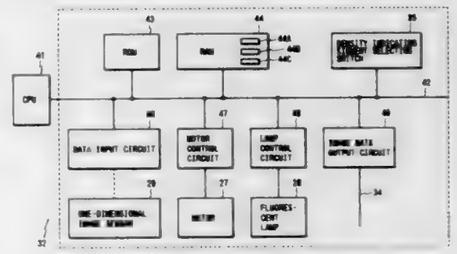
(f) repeating steps (d) and (e) for each value stored in the data base to create a screened halftone separation, each time comparing the value stored in the data base to a next preselected portion of the plurality of bits in the preselected halftone data structure.

5,202,773

MULTIPLE VALUE IMAGE INPUT DEVICE WITH CHROMATIC GRADATION CORRECTION

Yasuo Kato, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 596,292
Claims priority, application Japan, Dec. 22, 1989, 1-331363; Dec. 22, 1989, 1-331364; Dec. 28, 1989, 1-341751
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 **18 Claims**



1. A method for correcting image data read by an image scanner with at least one pixel detector, the image data represented by image pixels expressed in density gradation levels, the method comprising the steps of:

providing a plurality of density indicating segments, each segment having a known density gradation level;

selecting at least one of the plurality of density indicating segments;

scanning at least one selected density indicating segment to obtain actually read density gradation levels for each pixel detector; and

comparing the actually read density gradation levels to the known density gradation levels;

wherein less than all of the density indicating segments are selected.

5,202,774

IMAGE READING APPARATUS

Yoshiyuki Ishimitsu, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,064
Claims priority, application Japan, Jul. 14, 1989, 1-180177; Jul. 10, 1990, 2-183668
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—488 **5 Claims**

1. An image reading apparatus comprising:

an irradiating means for irradiating light beam onto an image medium in main-and-subscanning directions;

a reading means for reading light beam transmitted through or reflected from said image medium in the main scanning direction;

a reading control means for inhibiting said reading means from reading said transmitted or reflected light while said

radial phase transition points and optimized radial phase

recovery conductor pattern being located in said bonding peripheral region and sealed by said sealing material;

5,202,777

LIQUID CRYSTAL LIGHT VALVE IN COMBINATION

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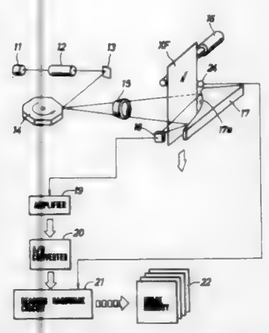
from reading said transmitted or reflected light while said irradiating means irradiates light beam onto said image medium in the subscanning direction from its tip edge across predetermined distance;

a photoelectric conversion means for converting said transmitted or reflected light read by said reading means into an image signal;

a memory means for storing a predetermined threshold value;



a comparison means for comparing signal output from said photoelectric conversion means with said threshold value;

a discriminating means for discriminating relative position of said image medium with respect to said reading means or size of said image medium based on the signal output from said comparison means; and

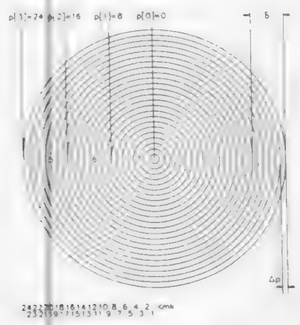
a reading-area setting means for setting reading area of said image medium based on the signal output from said discriminating means.

5,202,775

RADICALLY SYMMETRIC HOLOGRAM AND METHOD OF FABRICATING THE SAME

Michael R. Feldman; W. Hudson Welch, and James E. Morris, all of Charlotte, N.C., assignors to University of North Carolina, Charlotte, N.C.

Filed Nov. 4, 1991, Ser. No. 787,075
Int. Cl.[5] G03H *1/08*
U.S. Cl. 359—11 **21 Claims**



1. A method of fabricating a radially symmetric hologram, having a plurality of concentric fringes of constant radial phase, comprising the steps of:

determining a plurality of radial phase transition points and radial phase values between said radial phase transition points for each concentric fringe;

repeatedly optimizing said plurality of radial phase transition points and said radial phase values to obtain optimized radial phase transition points and optimized radial phase values; and

fabricating a radially symmetric hologram having concentric fringes of constant radial phase corresponding to said optimized radial phase transition points and said optimized radial phase values

wherein said repeatedly optimizing step comprises repeatedly performing the following steps:

determining an optical system error function for said hologram;

changing said plurality of radial phase transition points and radial phase values;

determining whether said changed plurality of radial phase transition points and radial phase values reduces said optical system error function; and

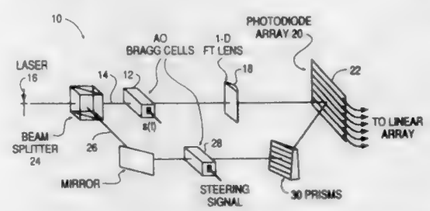
retaining said changed radial phase transition points and radial phase values if said error function is reduced.

5,202,776

TIME DELAY BEAM FORMATION

Leslie H. Gesell, and James L. Lafuse, both of Columbia, Md., assignors to Essex Corporation, Columbia, Md.

Filed Dec. 12, 1991, Ser. No. 806,697
Int. Cl.[5] G02B *5/32, 27/00*; G02F *1/33, 1/11*
U.S. Cl. 359—17 **15 Claims**



1. A system for generating at least one time delay signal from an input signal, comprising:

a source of coherent light,

beam splitter means for splitting the coherent light into a first leg and a second leg,

first modulation means associated with the first leg for modulating the coherent light with a modulation signal and for s the modulated coherent light into a spectrum, wherein the first modulation means defining a Fourier transform plane,

second modulation means associated with the second leg for modulating the coherent light with a steering signal,

optical element means associated with the second leg for receiving an input beam from the second modulation means at an incidence angle and for producing a plurality of reference waves having a plurality of orientations that are a function of the incidence angle,

an array of photodiodes arranged substantially in the Fourier transform plane of the first modulation means for detecting interference between the spectrum associated with the first leg and the reference waves associated with the second leg and for producing an output signal corresponding to the detected interference,

whereby each photodiode produces an output signal corresponding to the modulation signal delayed by a time factor that is a function of the angle of incidence of the reference wave on the photodiode.

5,202,777

LIQUID CRYSTAL LIGHT VALVE IN COMBINATION WITH CATHODE RAY TUBE CONTAINING A FAR-RED EMITTING PHOSPHOR

Esther Sluzky, Encinitas; Mary A. Lemoine, Oceanside, and Kenneth R. Hesse, Escondido, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 708,552, May 31, 1991, abandoned. This application Apr. 1, 1992, Ser. No. 861,680
Int. Cl.[5] G02F *1/1335, 1/135*
U.S. Cl. 359—50 **5 Claims**

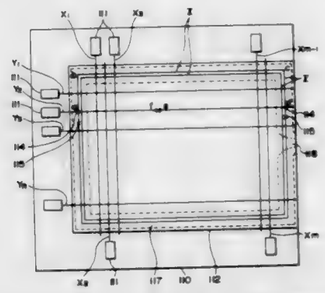
1. In combination, a liquid crystal light valve including a photosensitive layer consisting essentially of hydrogened amorphous silicon and a cathode ray tube containing a far-red emitting phosphor operatively coupled thereto, characterized in that said phosphor consists essentially of $Y_{3-y}Gd_yAl_{5-x}Ga_x-O_{12}:A$, where x has a value within the range of from 0 to 5, y has a value within the range of from 0 to 3, and A is at least one of chromium and neodymium, where chromium has a value within the range of about 0.33 to 2 at% and neodymium has a value of about 1 at%.

5,202,778

MATRIX-ADDRESSED TYPE LIQUID CRYSTAL DISPLAY APPARATUS AND METHOD FOR PRODUCTION THEREOF

Kenichi Niki, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 711,901
Claims priority, application Japan, Jun. 8, 1990, 2-151252
Int. Cl.[5] G02F *1/1339, 1/1343*
U.S. Cl. 359—54 **6 Claims**



1. A matrix-addressed type liquid crystal display device comprising:

(a) a matrix-addressed substrate having a dielectric property:

(b) an opposing substrate positioned parallel to said matrix-addressed substrate with at least one side edge thereof aligned with a counterpart side edge of said matrix-addressed substrate as viewed from right above said matrix-addressed substrate;

(c) sealing material applied to a bonding peripheral region of said opposing substrate for bonding said opposing substrate to said matrix-addressed substrate, a predetermined portion of said bonding peripheral region being devoid of sealing material for defining an inlet for the infusion of liquid crystal thereat;

(d) a display element conductor pattern formed on said matrix-addressed substrate, said display element conductor pattern being composed of a plurality of data electrodes spaced from each other in parallel and a plurality of scanning electrodes spaced from each other in parallel and positioned at right angles relative to said data electrodes;

(e) a recovery conductor pattern formed on said matrix-addressed substrate coplanar with the display element conductor pattern and being disposed thereon so as to cross each said electrode thereof at right angles, said recovery conductor pattern being located in said bonding peripheral region and sealed by said sealing material;

(f) a dielectric layer formed over said matrix-addressed substrate, said dielectric layer being adapted to effect insulation between said data electrodes and said scanning electrodes, and between said data electrodes and said recovery conductor pattern; and

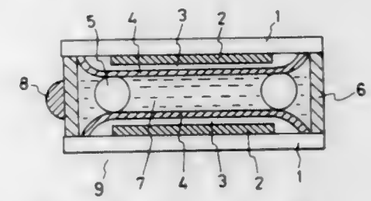
(g) liquid crystal stored in a space between said matrix-addressed substrate and said opposing substrate, said liquid crystal defining a display element at the intersection of said data electrodes with said scanning electrodes.

5,202,779

FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE WITH POLYIMIDE ORIENTATION FILM OF BIS(4-AMINOCYCLOHEXYL) METHANE AND AROMATIC TETRACARBOXYLIC ACID ANHYDRIDE

Tokihiko Shinomiya, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1990, Ser. No. 527,960
Claims priority, application Japan, May 26, 1989, 1-133740
Int. Cl.[5] G02F *1/1337*; C09K *19/00*
U.S. Cl. 359—78 **4 Claims**

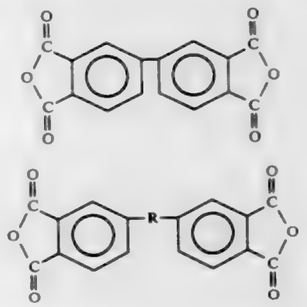


1. A liquid crystal display device, comprising:

a pair of opposite transparent substrates;

an orientation film provided on the facing side of each of said substrates over a transparent electrode, said orientation film having a rubbed surface in one direction;

ferroelectric liquid crystals capable of exhibiting a smectic phase sandwiched between said pair of substrates, said orientation film being made of a polyimide resin formed from bis(4-aminocyclohexyl) methane as a base component and an aromatic tetracarboxylic acid anhydride selected from the group consisting of pyromellitic acid dianhydride and a compound of the formula:



wherein R is —O—, —CO— or $-(CH_2)-_n$ wherein n is 1 to 6.

5,202,780

OPTICAL COMMUNICATION SYSTEM FOR THE

wavelength bands being separated by a predetermined

second light sources in accordance with a command sig-

transmission code to the provided friendly objects code

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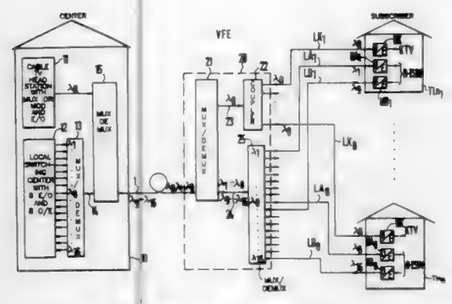
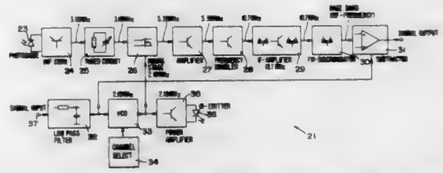
5,202,780
OPTICAL COMMUNICATION SYSTEM FOR THE SUBSCRIBER AREA
Kurt Fussgänger, Remseck, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands
Filed Apr. 17, 1990, Ser. No. 510,608
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1989, 3913300
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—125 **20 Claims**



1. An optical communication system for transmitting subscriber-assigned information signals in two directions between a center and a plurality of subscribers.
wherein for each of a plurality of groups of subscribers, a remote distribution unit is provided in the vicinity of said group of subscribers,
wherein the subscriber-assigned information signals to be transmitted from the center to said group of subscribers are first transmitted to the remote distribution unit over a single optical waveguide using wavelength-division multiplexing with subscriber-assigned wavelengths,
wherein in the remote distribution unit, a wavelength-division multiplexed signal received from the center is separated by optical means into individual optical signals having the subscriber-assigned wavelength,
wherein said optical signals re transmitted from the remote distribution unit in individual optical signals having the subscriber-assigned wavelengths,
wherein said optical signals are transmitted from the remote distribution unit to the subscribers over individual lines, and
wherein the subscriber-assigned information signals to be transmitted from said group of subscribers to the center are transmitted from the subscribers to the remote distribution unit over the individual lines, and thence to the center over the same optical waveguide using the wavelength-division multiplexing with subscriber-assigned wavelengths,
characterized in
that, using an additional wavelength which is common to all subscribers, a composite signal containing signals to be distributed from the center to the subscribers is transmitted over the same optical waveguide from the center to the remote distribution unit, where it is separated from the wavelength-division multiplexed signal and distributed, by optical means and over individual lines to the subscribers of said group,
that a wavelength band containing the subscriber-assigned wavelengths is clearly separated from a wavelength band containing the additional wavelength,
that the subscriber-assigned wavelengths used for transmission from the center to the subscribers lie in a first wavelength band, and the subscriber-assigned wavelengths used for transmission from the subscribers to the center line in a second wavelength band, said first and second wavelength bands being separated by a predetermined distance, and
that in each of the two wavelength bands, adjacent wavelengths are separated by a short distance.

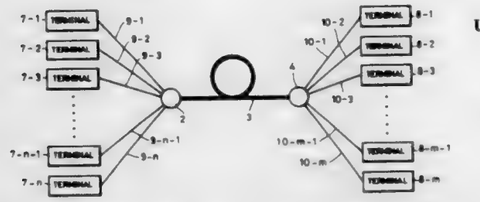
5,202,781
ARRANGEMENT FOR THE WAVEGUIDE-FREE BIDIRECTIONAL LIGHT OR INFRARED TRANSMISSION OF ELECTRICAL SIGNALS
Marco Heck, Neuss, Fed. Rep. of Germany, assignor to SenSys AG, Kaiserstuhl, Switzerland
Filed Feb. 5, 1991, Ser. No. 650,909
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005517
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—152 **12 Claims**



1. A simultaneous, bidirectional waveguide-free optical communication system comprising a plurality of optical transceivers, each transceiver comprising:
frequency oscillator means for frequency modulating a first information signal onto a subcarrier signal having a particular mean frequency to produce a first frequency modulated signal,
emission means for emitting an optical signal corresponding to said first frequency modulated signal produced by said frequency oscillator means,
detector means for, simultaneously with emission of said optical signal by said emission means, receiving at least one other optical signal including a second frequency modulated signal from another second optical transceiver,
mixing means for mixing said first frequency modulated signal produced by said frequency oscillator means and said optical signals received by said detector means to produce an intermediate frequency signal,
frequency demodulation means responsive to said intermediate frequency signal output by said mixing means and said first information signal, for recovering a second information signal from said intermediate frequency signal.

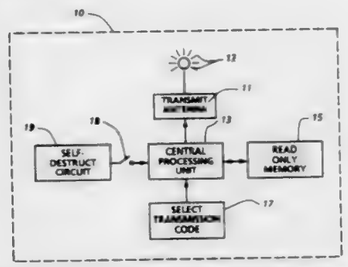
5,202,782
OPTICAL COMMUNICATION METHOD AND OPTICAL COMMUNICATION SYSTEM
Kenji Nakamura, Hatano, and Jun Nitta, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 14, 1991, Ser. No. 640,938
Claims priority, application Japan, Jan. 19, 1990, 2-008367; Jan. 19, 1990, 2-010332
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—152 **27 Claims**

10. An optical communication system, comprising:
a plurality of first light transceivers, each of which comprises detecting means for detecting, from a predetermined wavelength range, fist and second wavelengths which are different from each other and which have not been used in other light transceivers, a first light source for transmitting a light signal using light having the first wavelength, a second light source for transmitting a light signal using light having the second wavelength, and switching means for selectively operating said first and second light sources in accordance with a command signal;
a plurality of second transceivers, each of which comprises first light receiving means for receiving the light signal which has the first wavelength and which is sent from one of said first light transceivers, second light receiving means for receiving the light signal having the second wavelength, and control means for controlling communications using the light signal having the first wavelength and for generating the command signal which instructs



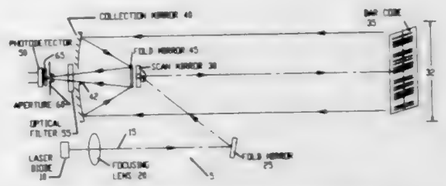
the switching means of one of said first light transceivers to transmit signals using the light having the second wavelength, instead of the light having the first wavelength, when the quality of the communications deteriorates; and
a transmission line for mutually connecting the plurality of first light transceivers and the plurality of second light transceivers, wherein the light signal having the first wavelength and the light signal having the second wavelength are transmitted through a common transmission line.

5,202,783
SECURE AND PROGRAMMABLE FRIENDLY TARGET RECOGNITION SYSTEM
O. Thomas Holland, Fredericksburg, and Henry C. Seavey, King George, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 24, 1991, Ser. No. 719,457
Int. Cl.[5] H04B *10/00;* **G01S** *1/00*
U.S. Cl. 359—152 **14 Claims**



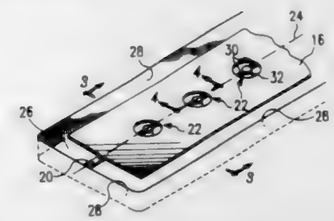
8. In a combat zone having friendly and unfriendly objects residing therein, a system comprising:
at least one transmitter, mounted on each friendly object, for radiating an infrared signal simultaneously in all directions therefrom in the form of code, short burst data packets, wherein the infrared signal is indicative of a particular digital transmission code;
an infrared receiver, mounted on each friendly object, configured to selectively target one of the objects in the combat zone and detect the presence of the infrared signal; and
processing means, connected to said receiver and provided with a code indicative of friendly objects, for decoding the detected infrared signal into the particular digital transmission code and for comparing the particular digital transmission code to the provided friendly objects code wherein a match therebetween indicates that the selectively targeted object is friendly.

5,202,784
OPTICAL SYSTEM FOR DATA READING APPLICATIONS
Brad R. Reddersen, Eugene, Oreg., assignor to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.
Filed Jan. 10, 1992, Ser. No. 819,324
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—196 **27 Claims**



1. An optical system for data reading, comprising:
a light source generating an optical beam along an outgoing optical path toward an object to be scanned;
a detector for detecting light reflected off the object;
a scan mirror in the outgoing optical path directing light toward the object;
a collection mirror positioned behind the scan mirror for collecting light reflecting off the object, the collection mirror having a central aperture;
a fold mirror positioned between the collection mirror and the scan mirror for directing light along a collected light path from the collection mirror through the central aperture of the collection mirror to the detector.

5,202,785
METHOD AND DEVICE FOR STEERING LIGHT
William E. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 20, 1991, Ser. No. 811,408
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—214 **9 Claims**



1. A method for periodically steering a beam of incident light through an angle comprising the steps of:
reflecting a beam of light off a mirror only comprised of reflective material fabricated monolithically so as to be suspended by at least two supporting elements, at least one of the supporting elements being displaced from an edge of the mirror, the elements forming an axis of rotation; and
periodically applying a voltage to a first electrode fabricated monolithically with said mirror to cause the mirror to rotate about the axis of rotation, the first electrode being displaced outwardly from the axis of rotation in a first direction.

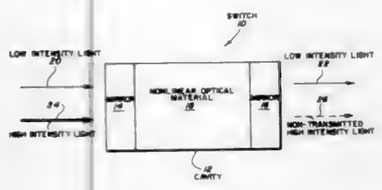
5,202,786

from the transparent layer has a first amplitude ratio of the

5,202,788

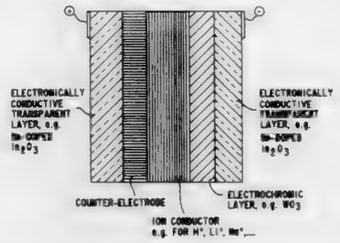
which can be operated only by illumination of a light beam to the surface of said photo-driving element.

5,202,786
OPTICAL SWITCHING DEVICES
Michael E. Boyle, Burke, and James S. Shirk, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 12, 1991, Ser. No. 758,143
Int. Cl.[5] G02F *1/35*; F21V *9/04*; G03C *1/00*
U.S. Cl. 359—243 11 Claims



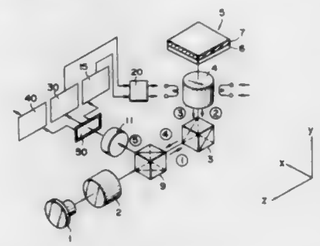
1. An optical switch comprising:
switching means, comprising of a pair of spaced, partially reflecting mirrors defining a cavity therebetween; and a body of nonlinear optical material which substantially fills said cavity for providing an open state wherein in response to light incident thereon of an intensity below a first level a substantial portion of the incident light passes therethrough, and for providing a closed state wherein in response to light incident thereon of an intensity greater than a second level a substantial portion of the incident light does not pass therethrough, said nonlinear optical material comprising a rare earth bis-phthalocyanine.

5,202,788
ELECTROCHROMIC DEVICE WITH IONICALLY OR MIXED IONICALLY-ELECTRONICALLY CONDUCTIVE ELECTROLYTE
Werner Weppner, Stuttgart, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany
Filed Aug. 6, 1991, Ser. No. 740,773
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1990, 4025032
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—270 17 Claims



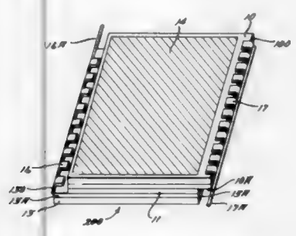
1. Electrochromic device which is especially suitable as a window, mirror or display element, characterized by a multilayer construction with at least one layer, enclosed between two coated electrodes, of a material which is a member selected from a group consisting of (a) ionically-conductive material and (b) mixed ionically- and electronically-conductive material, whereby at least one of the two electrode layers consists of transparent material is at least transparent so long as no excitation takes place by the application of voltage via the electrodes.

5,202,789
OPTICAL SYSTEM FOR PRESERVING A STATE OF POLARIZATION OF LIGHT BEAM
Masahiko Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 257,520, Oct. 14, 1988, abandoned.
This application Feb. 19, 1991, Ser. No. 657,362
Claims priority, application Japan, Oct. 16, 1987, 62-261187; Nov. 25, 1987, 62-296820
Int. Cl.[5] G02B *1/09, 27/12*; G11B *5/127*
U.S. Cl. 359—281 28 Claims



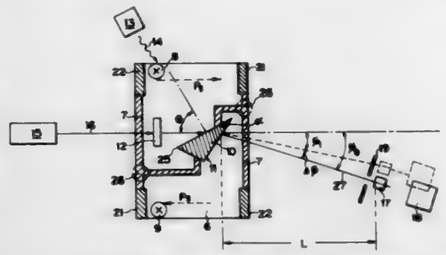
1. An optical system, comprising:
means for generating a linearly polarized light beam;
an optical memory including a reflection layer and a birefringent transparent layer provided on the reflection layer, wherein the polarized light beam is incident on the birefringent transparent layer at a non-zero angle with respect to the fast and slow axes thereof to form two components of said light beam and to give an optical retardation to one component of the beam, and the light beam emerging from the transparent layer has a first amplitude ratio of the two components;
means for converging the polarized light beam onto the reflection layer of said optical memory through the transparent layer of said optical memory;
a first beam splitter, having an optical characteristic, for reflecting the light beam reflected from the reflection layer and passing through the transparent layer and said converging means to have a second amplitude ratio of two components different from the first amplitude ratio;
a λ/4 plate disposed between said converging means and said first beam splitter; and
a second beam splitter, having the same optical characteristic as said first beam splitter, for reflecting the light beam from the first beam splitter to have a third amplitude ratio of the two components which is the same as the first amplitude ratio.

5,202,787
ELECTRO-OPTIC DEVICE
Harlan J. Byker; William L. Tonar, and Larry L. Barrett, all of Holland, Mich., assignors to Gentex Corporation, Zeeland, Mich.
Filed Jan. 10, 1992, Ser. No. 819,264
Int. Cl.[5] G02F *1/153, 1/1333*; G02B *5/08*
U.S. Cl. 359—267 15 Claims



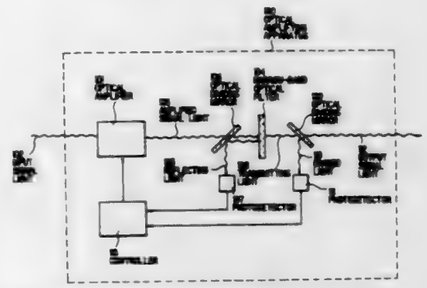
1. An electro-optic device including a plurality of walls defining a compartment, at least one of said walls comprising a sheet of glass coated with a transparent electronic conductive layer such that the coated glass scatters between 0.2 and 4.0% of the visible white light passing through the coated glass when it is in contact with air.

5,202,790
PHOTO-DRIVEN LIGHT BEAM DEFLECTING APPARATUS
Kenji Uchino, Yokohama; Kazuyasu Hikita; Yoshiaki Tanaka, both of Chichibu, and Mikiya Ono, Tokorozawa, all of Japan, assignors to Mitsubishi Mining and Cement Company, Ltd., Japan
Filed May 30, 1990, Ser. No. 530,294
Claims priority, application Japan, May 30, 1989, 1-134766
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—323 10 Claims



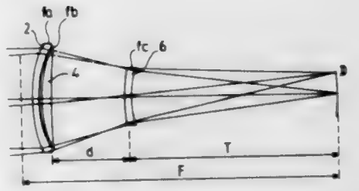
1. A photo-driven apparatus in which a light beam is deflected by only using light beams, comprising:
(a) a planar dielectric substrate having a photovoltaic effect;
(b) at least one pair of first electrodes formed on at least portions of the upper surface of said substrate so as to polarize that portion of said substrate positioned between said pairs of said first electrodes such that a photovoltaic effect is generated at the portion between the pair of first electrodes;
(c) at least one photo-receiving element located on the upper surface of said dielectric substrate, between said pairs of first electrodes, having a polarization direction arranged in one certain direction, and having a photovoltaic effect so as to generate a photo-voltage between the pair of first electrodes;
(d) a dielectric transparent prism having upper and lower surfaces and electrooptic effects, located on the upper surface of said substrate, having a second pair of electrodes provided on two of the surfaces of the prism, which surfaces of said prism are parallel with the optic axis of a first light source, and a polarizer provided on the surface of said prism through which said beam enters;
(e) leads electrically connecting the first pair of electrodes of said photo-receiving element, respectively, to said second pair of electrodes of said prism;
whereby the light beam to be deflected enters through the polarizer into said prism through which the light beam is deflected; and said prism being operated directly by the photovoltage generated by said photo-receiving element which can be operated only by illumination of a light beam to the surface of said photo-driving element.

5,202,791
OPTICAL AMPLIFYING APPARATUS
Kazuhisa Kaede, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 16, 1992, Ser. No. 821,064
Claims priority, application Japan, Jan. 16, 1991, 3-002931
Int. Cl.[5] H01L *31/12*; H01S *2/20*
U.S. Cl. 359—345 8 Claims



1. An optical amplifying apparatus, comprising:
amplifying means for amplifying a signal light;
removing means for removing spontaneous light emitted, from said signal light as amplified by said amplifying means;
first detecting means for detecting a first light which is transmitted through said removing means to provide a first electric signal;
second detecting means for detecting a second light which reflects at said removing means to provide a second electric signal; and
controlling means for controlling a gain of said amplifying means by comparing intensities of said first and second lights in accordance with said first and second electric signals.

5,202,792
SYSTEMS OF OBJECTIVES WITH OPTICAL ATHERMALIZATION
Joël Rollin, Vanves, France, assignor to Thomson TRT Defense, Guyancourt, France
Filed Oct. 3, 1991, Ser. No. 770,411
Claims priority, application France, Oct. 9, 1990, 90 12444
Int. Cl.[5] G02B *9/10, 13/14*
U.S. Cl. 359—356 12 Claims



1. An objective device that is achromatic and passively athermalized, said device comprising:
at least one convergent assembly cooperating with at least one divergent assembly, said convergent assembly comprising at least one convergent lens and one divergent lens, said divergent assembly being constituted by at least one divergent lens, wherein:
the constituent materials of said three lenses are different and

chosen from among those materials that can be used in the

lens and an image lens, said object lens facing said object

elements and a negative lens component, characterized in that the lens component except the lens components proximate to

5,202,797
DISK DRIVE DEVICE HAVING A SINGLE MOTOR FOR

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chosen from among those materials that can be used in the 8 to 12 μm spectral band; and

a focal length F of the device does not change with temperature if f_a, f_b and f_c satisfy the following equation:

$$\frac{1}{f_a \cdot \eta_a} \quad \frac{1}{f_b \cdot \eta_b} + \frac{(1-k)}{f_c}\left(\frac{1}{\eta_c} + \alpha\right) = 0; \text{ and}$$

a first order defocusing ϵ for a passively athermalized objective undergoing a temperature gradient is expressed as follows:

$$\epsilon = \frac{T^2}{(1-k)^2}(dt_2 - dt_1)\left[\frac{1}{f_a \cdot \eta_a} + \frac{1}{f_b \cdot \eta_b} + \frac{k\alpha}{2}\left(\frac{1}{f_a} + \frac{1}{f_b}\right)\right]$$

wherein:

f_a is the focal length of the at least one divergent lens of the convergent assembly;

f_b is the focal length of the at least one convergent lens of the convergent assembly;

f_c is the focal length of the at least one divergent lens of the divergent assembly;

η_a, η_b and η_c correspond to thermal Abbe pseudo-numbers defined for the divergent and convergent lenses of the convergent assembly and the divergent lens of the divergent assembly;

α is the expansion coefficient for a support; and

dt_1, dt_2 are respective temperature variations of the convergent assembly and the divergent assembly.

5,202,793

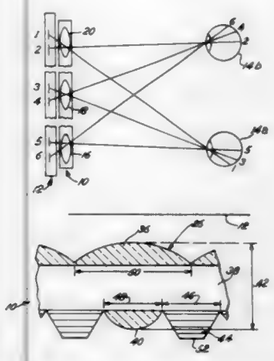
THREE DIMENSIONAL IMAGE DISPLAY APPARATUS

Charles W. Auge, Elk Grove Village, Ill., assignor to John Mc Carry, El Toro, Calif.

Filed Nov. 23, 1990, Ser. No. 618,363

Int. Cl.[5] G02B *27/22*

U.S. Cl. 359—463 **1 Claim**



1. An apparatus for viewing a two-dimensional image, said two-dimensional image composed of a multiplicity of adjacent image elements generated from a single view and defining an object plane, comprising:

a two-dimensional array of lens assemblies placed closely adjacent said object plane for separation of said adjacent image elements for independent viewing by the right and left eyes, each of said lens assemblies comprising an object lens and an image lens, said object lens facing said object plane and said image lens facing the viewer.

5,202,794

ATTENUATOR FOR A LASER BEAM

Peter Schnee, Stuttgart, and Thomas Hall, Wildberg, both of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

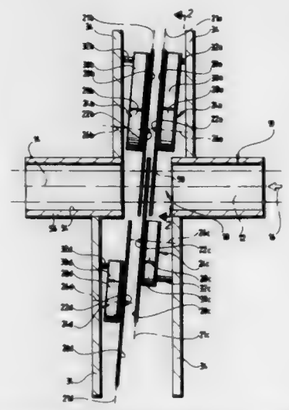
PCT No. PCT/EP90/00865, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991, PCT Pub. No. WO90/15348, PCT Pub. Date Dec. 13, 1990

PCT Filed May 30, 1990, Ser. No. 640,373

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1989, 3918197

Int. Cl.[5] G02B *27/44*

U.S. Cl. 359—568 **20 Claims**



1. An attenuator for a laser beam of a high-power laser comprising:

a diffraction element moveable from an ineffective position into an attenuating position in which the diffraction element extends in a section oriented transversely to a beam direction of said laser beam and is irradiated by said laser beam,

said diffraction element in said attenuating position extending beyond said laser beam in the direction transverse to said beam direction so that only a partial region of said diffraction element is irradiated by said laser beam, and

said diffraction element in said attenuating position being continuously moveable in said transverse direction by a drive such that said laser beam irradiates constantly changing partial regions of said diffraction element.

5,202,795

EYEPIECES

Shingo Kashima, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1991, Ser. No. 781,993

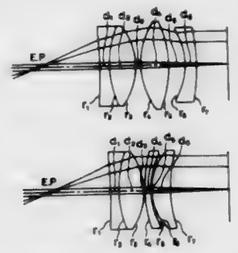
Claims priority, application Japan, Oct. 23, 1990, 2-285247

Int. Cl.[5] G02B *25/00, 13/18, 9/12, 9/14*

U.S. Cl. 359—645 **12 Claims**

1. An eyepiece comprising three lens components including a cemented doublet consisting of positive and negative lens

elements and a negative lens component, characterized in that the lens component except the lens components proximate to



the object and eye sides is provided with a plastic lens element having at least one aspherical surface.

5,202,796

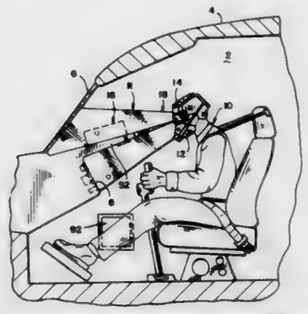
EMERGENCY VISUAL ASSURANCE APPARATUS FOR AN AIRCRAFT COCKPIT

Bertil Werjefelt, P.O. Box 5011, Kaneohe, Hi. 96744-5011

Filed Apr. 9, 1992, Ser. No. 865,430

Int. Cl.[5] G02B *27/00*

U.S. Cl. 359—894 **24 Claims**



1. An emergency visual assurance apparatus for an aircraft cockpit, comprising:

a) an inflatable enclosure having inflated and deflated states, said enclosure being adapted to fill the visual path between a pilot and at least one of an instrument panel and a windshield of an aircraft when in said inflated state;

b) said inflatable enclosure including means for permitting the pilot to see through said enclosure, thereby enabling the pilot a clear path of visibility to the instrument panel or the windshield during a smoke emergency in the cockpit;

c) means including a housing for inflating said inflatable enclosure with transparent fluid during an emergency to maintain the visual path between the pilot and at least the instrument panel or the windshield;

d) a member carried in said housing and separable therefrom; and

e) means associated with said member for activating said inflating means when said member is separated from said housing.

5,202,797

DISK DRIVE DEVICE HAVING A SINGLE MOTOR FOR ROTATING A PLURALITY OF DISKS

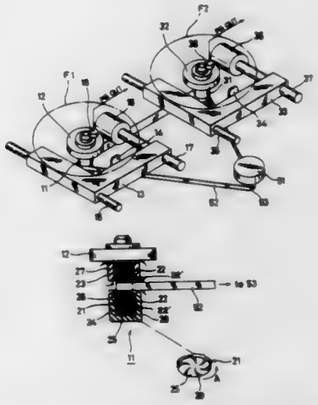
Yuichi Kurosawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,111

Claims priority, application Japan, Sep. 22, 1989, 1-247105

Int. Cl.[5] G11B *5/86, 19/00*

U.S. Cl. 360—15 **7 Claims**



1. A device for driving a plurality of disks, said device comprising:

means for supporting said plurality of disks, said supporting means including a plurality of bearing mechanisms, each bearing mechanism respectively and individually rotatably supporting at least one of said plurality of disks;

a single motor;

means for transmitting a rotation of said motor to at least two of said bearing mechanisms, said transmitting means comprising an endless belt; and

wherein each of said bearing mechanisms comprises a tubular bearing member, a rotatable shaft being operatively connected to one of said disks and being rotatably supported in said tubular bearing member, said rotatable shaft having first and second ends and an outer surface, the diameter of said shaft being substantially uniform between said first and second ends, and each said rotatable shaft having a contacting portion formed on said outer surface of said shaft at a middle portion thereof, said endless belt being wound around said contacting portion.

7. A device for dubbing signals recorded on a first magnetic disk onto a second magnetic disk, said device comprising:

means for supporting said first and second disks, said supporting means including a plurality of bearing mechanisms, each bearing mechanism individually rotatably supporting a respective said first and second disks, each of said bearing mechanisms comprising a tubular bearing member, a rotatable shaft being connected to a respective one of said first and second disks, said rotatable shaft being rotatably supported in said tubular bearing member, said rotatable shaft having first and second ends and an outer surface, the diameter of said shaft being substantially uniform between said first and second ends;

a single motor;

means for transmitting a rotation of said motor to said bearing mechanisms, said transmitting means comprising an endless belt, wherein each said rotatable shaft includes a contacting portion formed on said outer surface of said shaft at a middle portion thereof, said endless belt being wound around said contacting portion;

means for reproducing signals recorded on said first magnetic disk; and

tion of said signals, alternatively controlling said switches, with no overlapping of their closed states,

pendent of and different than said first and second voltages to said first and third amplifier means;

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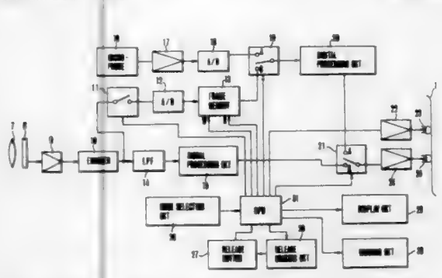
means for inputting the reproduced signals to said second magnetic disk.

5,202,798

STILL IMAGE SIGNAL RECORDING APPARATUS OPERABLE BY A MANUALLY OPERABLE MEMBER

Masahiro Takei; Koji Takahashi, both of Kanagawa, and Yoshitake Nagashima, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 490,498, Feb. 28, 1990, abandoned, which is a continuation of Ser. No. 34,766, Apr. 6, 1987, abandoned. This application Sep. 13, 1991, Ser. No. 759,843
Claims priority, application Japan, Apr. 15, 1986, 61-85086
Int. Cl.[5] **H04N** *5/782*
U.S. Cl. 360—35.1 **20 Claims**



1. A still image signal recording apparatus comprising:
(a) recording means for recording video signals corresponding to one picture as a still image signal on a recording medium in a predetermined time:
(b) a manually operable member for giving a recording instruction for recording said still image signal by said recording means;
(c) control means for controlling said recording means to continue the recording of said still image signal irrespective of whether or not a new recording instruction for recording a new still image signal is being given by said manually operable member before an elapse of a time corresponding to said predetermined time after a last recording instruction given by said manually operable member;
(d) display means for displaying, before the elapse of the time corresponding to said predetermined time after the last instruction given by said manually operable member for recording of said still image signal by said recording means, that said recording means is under operation for recording said still image signal; and
(e) warning means for warning, in response to the new recording instruction given before the elapse of the time corresponding to said predetermined time after the last recording instruction, that recording the new still image signal is impossible.

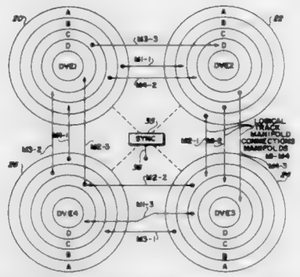
5,202,799

LOGICAL DATA TRACKS EXTENDING AMONG A PLURALITY OF ZONES OF PHYSICAL TRACKS OF ONE OR MORE DISK DEVICES

Steven R. Hetzler, Sunnyvale; Jaishankar M. Menon, and Michael F. Mitoma, both of San Jose, all of Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,379
Int. Cl.[5] **G11B** *5/09*
U.S. Cl. 360—48 **31 Claims**

1. In apparatus for storing data in a plurality of spaced apart physical tracks in a first predetermined number of disk data storage devices, said first predetermined number being greater than unity, each said device having at least one rotatable data-storage disk; including, in combination:
each said device having one or more disk recording surfaces, each surface having a second predetermined number of recording zones, all of the recording zones having a like predetermined number of addressable data storing physical tracks, each physical track in each zone storing a like-number of data bytes, the physical tracks in different zones storing a different number of data bytes wherein a radially outwardmost zone has physical tracks storing a maximal number of data bytes and zones of decreasing radial positions respectively having physical tracks storing fewer data bytes; and



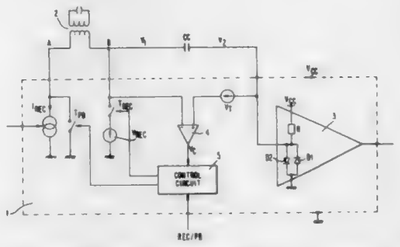
manifold means connected to said each said device for establishing a given plurality of groups of predetermined ones of the physical tracks for enabling addressably-accessing each of said groups of physical tracks as one logical track, predetermined ones of the plurality of physical tracks in each of said given plurality of groups being in a plurality of the recording zones, said manifold means having a given plurality of manifold indicating means for establishing a plurality of manifolds of said groups of physical tracks, each of said established manifolds having logical tracks beginning in respective ones of said devices.

5,202,800

COIL SWITCHING DEVICE

Philippe Perroud, Meylan, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Oct. 28, 1991, Ser. No. 782,248
Claims priority, application France, Oct. 29, 1990, 90/13740
Int. Cl.[5] **G11B** *5/09*
U.S. Cl. 360—62 **6 Claims**



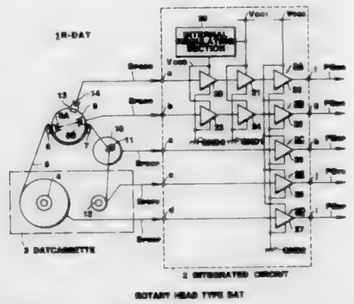
1. A switching device for switching a coil between a first state where it is connected between a supply source and ground through a variable current source and a second state where it is connected between ground and the input of an amplifier through a coupling capacitor comprising:
a first controlled switch connected in parallel to the current source;
a second controlled switch placed between the supply source and said coil;
a threshold comparator, the inputs of which are connected across the capacitor;
a logic control circuit receiving a state control signal and the output signal of the threshold comparator and, as a function of said signals, alternatively controlling said switches, with no overlapping of their closed states.

5,202,801

INTEGRATED CIRCUIT FOR PRODUCING SENSOR DETECTION SIGNALS IN A RECORDING/REPRODUCING APPARATUS

Shinichi Fukuda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,203
Claims priority, application Japan, Nov. 15, 1989, 1-296474
Int. Cl.[5] **G11B** *21/04, 15/46*
U.S. Cl. 360—70 **4 Claims**



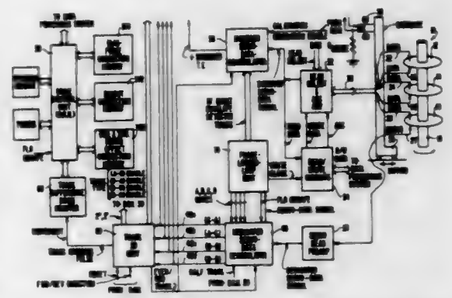
1. An integrated circuit for generating predetermined sensor detection signals in a recording and/or reproducing apparatus adapted for recording and/or reproducing predetermined information data on or from a tape-shaped recording medium wound on a rotary head, comprising:
drum phase detection signal generating means including first and second amplifier circuit means for amplifying a drum phase signal obtained from said rotary head, and a first comparator means for generating a drum phase detection signal by comparing the amplified drum phase signal to a predetermined threshold;
drum frequency detection signal generating means including third and fourth amplifier means for amplifying a drum frequency signal produced by said rotary head, and a second comparator means for generating a drum frequency detection signal by comparing the amplified drum frequency signal to a predetermined threshold;
capstan frequency signal generating means including a third comparator means for generating a capstan frequency detection signal by comparing a capstan frequency signal produced by a capstan motor driving said tape-shaped recording medium in a running condition to a predetermined threshold;
supply reel frequency detection signal generating means including a fourth comparator means for generating a supply reel frequency detection signal by comparing a supply reel frequency signal obtained from a supply reel of said tape-shaped recording means to a predetermined threshold;
take-up reel frequency detection signal generating means including a fifth comparator means for generating a take-up reel frequency detection signal by comparing a take-up reel frequency signal obtained from a take-up reel of said tape-shaped recording medium to a predetermined threshold;
power source means for supply predetermined power sources to each of said first and third amplifier means, second and fourth amplifier means, and said first to fifth comparator means:
said power source means supply a first voltage to said first through fifth comparator means, a second voltage independent of and different than the first voltage to the second and fourth amplifier means, and a third voltage independent of and different than said first and second voltages to said first and third amplifier means;
said first and third amplifier means being connected to a first grounding line, the second and fourth amplifier means being connected to a second grounding line which is independent of the first grounding line, and the first through fifth comparator means being connected to a third grounding line which is independent of the first and second grounding lines; and
the drum phase signal and the drum frequency signal produced by said rotary head having voltage levels which are in a microvolt range and are substantially smaller than voltage levels of said capstan frequency signal, supply frequency signal, and take-up reel frequency signal in a millivolt range.

5,202,802

METHODS OF WRITING AND DETECTING DIBIT SERVO ENCODING

Michael D. Sidman, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 490,504, Feb. 28, 1990, Pat. No. 5,109,307, which is a continuation of Ser. No. 308,963, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 106,017, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 926,885, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 376,971, May 10, 1982, abandoned. This application Mar. 1, 1991, Ser. No. 503,151
Int. Cl.[5] **G11B** *5/596*
U.S. Cl. 360—77.05 **1 Claim**



1. A method for writing servo positioning dibit transitions on a magnetic data surface having circular data tracks with first and second magnetic polarizations, said transactions each having a radial extend greater than the spacing between adjacent track centerlines, comprising the steps of:
A) prepolarizing said magnetic surface to said first polarization;
B) positioning the centerline of a magnetic head of width greater than the spacing between adjacent track centerlines over the centerline of one of said circular data tracks; and
C) writing upon said track positioning dibit transitions by switching write currents on in said magnetic head to provide said second polarization followed by said first polarization and switching said write currents off at least when said head passes a previously written dibit in an adjacent track.

5,202,803

first and second elastic elements for holding the arm por-

5,202,806

sliding surface, β is an angle formed between an inflow direc-

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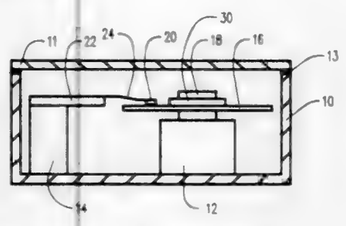
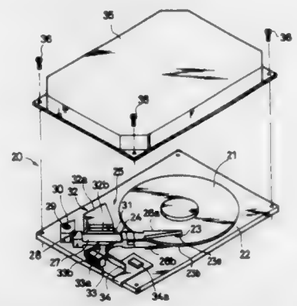
5,202,803
DISK FILE WITH LIQUID FILM HEAD-DISK INTERFACE
Thomas R. Albrecht, San Jose; John S. Foster, and Andrew M. Homola, both of Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 2, 1991, Ser. No. 724,646
Int. Cl.[5] G11B *17/02, 5/60*
U.S. Cl. 360—97.02 **22 Claims**



1. A data recording disk file comprising:
at least one data disk having a thin film of lubricant thereon;
a motor connected to the disk for rotating the disk;
means located near the inside diameter of the disk for holding a supply of lubricant;
a supply of lubricant in the holding means and in fluid communication with the lubricant film on the disk for replenishing the lubricant film on the disk during rotation of the disk;
a transducer for writing data to or reading data from the disk;
a transducer carrier having at least one ski foot extending therefrom, the end of the ski foot and the disk surface defining an angle sufficient to permit the ski foot to ski on the lubricant film on the disk during rotation of the disk;
an actuator for moving the carrier generally radially across the disk so the transducer may access different regions of data on the disk;
means connecting the carrier to the actuator for urging the end of the ski foot on the carrier into contact with the the lubricant film on the disk during rotation of the disk; and
a housing surrounding and providing a substantially sealed environment for the motor, actuator, transducer carrier, disk, and lubricant supply holding means; and wherein the lubricant supply holding means has no means for return of lubricant depleted from the disk.

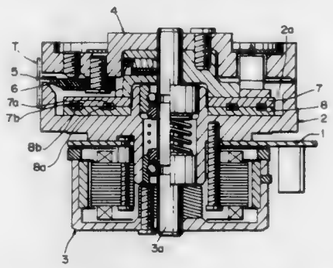
5,202,804
MAGNETIC DISK DRIVE WITH A MAGNETIC HEAD ROTATIONALLY ACTUATED
Shigeru Takekado, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 16, 1991, Ser. No. 700,863
Claims priority, application Japan, May 18, 1990, 2-128710
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 **10 Claims**

1. A magnetic disk drive with a magnetic head rotationally actuated for reading information stored in a recording disk and/or writing information to the recording disk, comprising:
a magnetic head for reading and/or writing information to the recording disk;
an arm portion for carrying the magnetic head on one end thereof;
an elastic portion for elastically supporting another end of the arm portion, the elastic portion including a first elastic element extended in the longitudinal direction of the arm portion and a second elastic element extended in the lateral direction of the arm portion;
a fixed portion connected with the arm portion through the first and second elastic elements for holding the arm portion through the elastic portion; and



a driver for rotating the arm portion by a driving force, the magnetic head carried on the arm portion being moved in the radial direction of the recording disk.

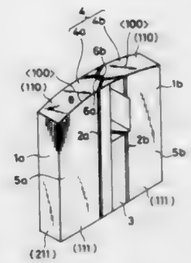
5,202,805
ROTARY MAGNETIC HEAD APPARATUS
Kazuhiko Sato; Masami Kimura; Takayoshi Yoshida, and Noriaki Kaneko, all of Yamagata, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jan. 30, 1991, Ser. No. 650,375
Claims priority, application Japan, Jul. 27, 1990, 2-197738
Int. Cl.[5] G11B *5/52, 5/17*
U.S. Cl. 360—108 **5 Claims**



1. A rotary magnetic head apparatus comprising:
a rotary transformer having a primary winding and a secondary winding; and
a rotating magnetic head having a coil which is connected to the primary winding of the rotary transformer;
whereby the number of turns of said coil on the magnetic head is set to 10 or less, the number of turns of said secondary winding on the rotary transformer is set to 16 or less, and the number of turns of said primary winding on the rotary transformer is set so that a product of a step-up ratio"a"—defined as the number of secondary winding turns divided by the number of primary winding turns—and the number of turns of said coil"n_H" satisfies the following equation:

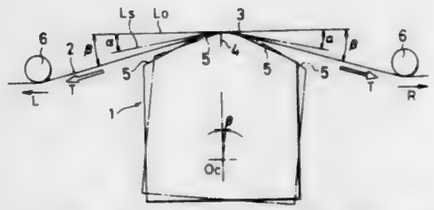
$$a \times n_H \approx 50.$$

5,202,806
MAGNETIC HEAD
Masahiro Kawase, Higashimatsuyama, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan
Filed Apr. 17, 1991, Ser. No. 686,402
Claims priority, application Japan, Apr. 24, 1990, 2-109659
Int. Cl.[5] G11B *5/235*
U.S. Cl. 360—120 **7 Claims**



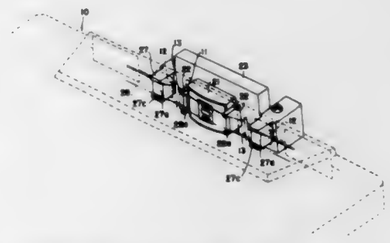
1. A magnetic head comprising:
a single crystal ferrite core;
a magnetic gap formed in said ferrite core; and
a high saturation flux metal film disposed in close proximity to said magnetic gap;
wherein said ferrite core has a sliding surface on which a recording medium slides relative to the ferrite core in a sliding direction, said sliding surface being in a (110) plane, and the easy magnetization directions <100> of said (110) plane makes an angle equal to or greater than 20° with the sliding direction.

5,202,807
MAGNETIC HEAD DEVICE FOR PROVIDING HIGH RECORDING DENSITIES AT HIGH SPEEDS
Hideo Okada, Nara; Hiroaki Takeuchi, Teuri, and Tohru Okuda, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of Ser. No. 591,045, Oct. 1, 1990, abandoned. This application Mar. 13, 1991, Ser. No. 669,135
Claims priority, application Japan, Oct. 5, 1989, 1-260647
Int. Cl.[5] G11B *5/187*
U.S. Cl. 360—122 **6 Claims**



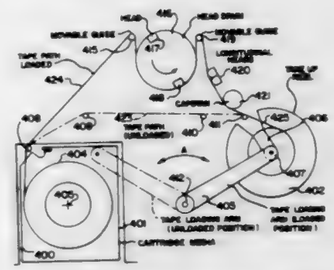
1. A magnetic head device comprising a magnetic head having a convexly curved sliding surface on which a flexible magnetic recording medium slides, said convexly curved sliding surface having a magnetic gap formed on a substantially vertex portion thereof and serving to record or reproduce an information signal on or from said flexible magnetic recording medium, a form of said magnetic head and a location and tension of said flexible magnetic recording medium being arranged to assume a parameter value obtained at at least one end of said convexly curved sliding surface by an equation of $T \times \sin(\beta - \alpha)$ to be in a range of 0.02 gram-force/mm to 0.15 gram-force/mm, in which α is an angle formed between a tangent drawn at a vertex of said convexly curved sliding surface and a tangent drawn at the end of said convexly curved sliding surface, β is an angle formed between an inflow direction of said flexible magnetic recording medium into said convexly curved sliding surface and the tangent drawn at the vertex of said convexly curved sliding surface, and T is tension applied on said flexible magnetic recording medium per unit width.

5,202,808
MAGNETIC HEAD DEVICE WITH TAPE GUIDES FOR MAGNETIC TAPES
Akio Saito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Saitama, Japan
Filed Feb. 15, 1991, Ser. No. 655,692
Claims priority, application Japan, Feb. 16, 1990, 2-35464; Oct. 5, 1990, 2-268007; Nov. 20, 1990, 2-314805
Int. Cl.[5] G11B *15/60*
U.S. Cl. 360—130.21 **9 Claims**



1. A magnetic head device comprising:
a head supporting member to be secured to a chassis of a recorder, the head supporting member having a) an opening and b) tape guide means which are integrally formed on said head supporting member, said tape guide means for guiding a magnetic tape;
the tape guide means including a) a pair of inside tape guides and b) a pair of outside tape guides, the inside tape guides being disposed on opposite sides of the opening of the head supporting member; and
a magnetic head secured to walls of the opening of the head supporting member.

5,202,809
MAGNETIC TAPE CARTRIDGE FOR HELICAL SCAN TRANSPORTS WITH A SINGLE REEL
William C. Dodt, Broomfield, and Donald F. McCarthy, Westminster, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed May 13, 1991, Ser. No. 699,143
Int. Cl.[5] G11B *23/027*
U.S. Cl. 360—132 **11 Claims**



1. A magnetic tape cartridge comprising:
a substantially rectangular exterior housing having a top side, a bottom side and a front side thereto for enclosing a

single reel of magnetic tape rotatably mounted within said

beam transmitted through said element in accordance with the magnetic field induced by the current to be

corresponding to a target fluid pressure of the duty solenoid valve;

single reel of magnetic tape rotatably mounted within said exterior housing, said exterior housing being directly mountable in a tape drive equipped with a fixed takeup reel and a tape threading arm that extracts said magnetic tape from said exterior housing for threading onto said takeup reel, said tape having a recording surface facing outward when said magnetic tape is wound on said single reel.

a drive spindle affixed coaxially to said single reel on said bottom side of said exterior housing for providing a mechanical coupling of said single reel to a tape drive in which said magnetic tape cartridge is mounted;

slot means located in said front side of said exterior housing, on the left side thereof as said magnetic tape cartridge is viewed from said top side to provide access to said magnetic tape to said tape threading arm.

5,202,810

MAGNETIC DISK HAVING AN IMPROVED SURFACE CONFIGURATION

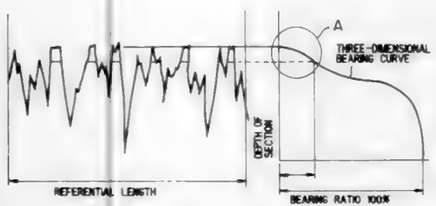
Takao Nakamura; Nobuya Sekiyama, both of Yokohama; Masaki Ohura, Odawara; Yoshiki Kato, Tokyo; Noriaki Okamoto, Ibaraki, and Masami Masuda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,609

Claims priority, application Japan, Apr. 27, 1989, 1-105921; Jun. 1, 1989, 1-137555; Jun. 10, 1989, 1-147302

Int. Cl.[5] G11B *5/82, 5/66;* **B05D** *5/12;* **B44C** *1/22*

U.S. Cl. 360—135 **14 Claims**



1. A magnetic disk comprising a non-magnetic substrate with a surface processed layer having fine irregularities formed at least on a main surface thereof, said surface processed layer of said non-magnetic substrate having protrusions whose surfaces are essentially made level, and having a surface configuration, which exhibits a three-dimensional bearing curve, and has a bearing ratio of between 0.1% and 10% at a depth from a top of the protrusions which corresponds to a portion of the surface processed layer deformed by a head load during contact start-stop operation, and a thin film magnetic layer and a protecting layer are formed in that order on said non-magnetic substrate in such a manner that said fine irregularities are duplicated thereon.

5,202,811

ELECTRICAL POWER SYSTEM WITH HIGH VOLTAGE PROTECTION RESPONSIVE TO PLURAL CONTROL VOLTAGES

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32743

Continuation of Ser. No. 311,071, Feb. 14, 1989, abandoned. This application Aug. 20, 1990, Ser. No. 569,924

Int. Cl.[5] H02H *3/20*

U.S. Cl. 361—56 **4 Claims**

1. An electrical power system with high voltage protection, comprising:

a source of alternating current power;

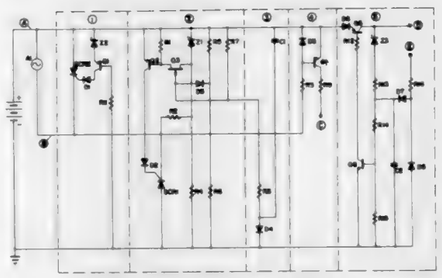
a direct current load;

a first controllable rectifying means controlling the flow of power from said source to said load;

means responsive to a first selected voltage of said load, said means responsive to said first selected voltage controlling said first controllable rectifying means;

sample and hold means sensitive to a second selected voltage of said load, wherein said second voltage is higher than said first voltage, said sample and hold means connected to prevent the conduction of said first controllable rectifying means for many cycles of the source of alternating current following a voltage output exceeding said second selected level; and wherein

said means responsive to said first selected voltage is not responsive to the time holding required in said sample and hold means.



5,202,812

APPARATUS FOR DETECTING FAULTS ON POWER TRANSMISSION LINES

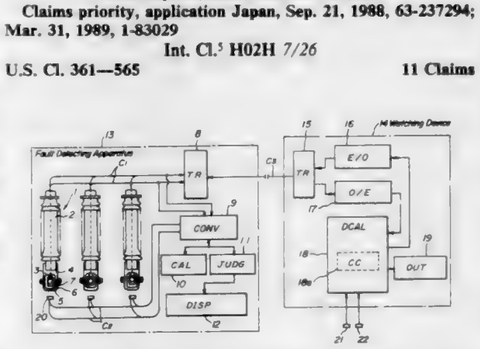
Katsuro Shinoda, Nagoya; Toshiyuki Kawaguchi, Inuyama; Hiroyuki Katsukawa, Niwa; Genzo Kimura, Nagoya; Naoki Tanaka, Kuwana; Hiroyuki Abe, Anjyo, and Yasuhisa Sakurai, Komaki, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 14, 1989, Ser. No. 407,319

Claims priority, application Japan, Sep. 21, 1988, 63-237294; Mar. 31, 1989, 1-83029

Int. Cl.[5] H02H *7/26*

U.S. Cl. 361—565 **11 Claims**



1. An apparatus for detecting a fault on an over-head power transmission line supported by power transmission towers comprising:

optical current sensing means including at least one optical current sensor which comprises an opto-magnetic element for detecting a current passing through a power transmission conductor to generate a first optical signal and an insulator for securing said opto-magnetic element to a power transmission tower such that the opto-magnetic element is positioned to sense the magnetic field induced by said current passing through the power transmission conductor supported by said power transmission tower, said insulator having a central hole formed therein, said opto-magnetic element being formed by a Faraday's element which serves to rotate a polarization plane of a light beam transmitted through said element in accordance with the magnetic field induced by the current to be sensed;

optical voltage sensing means including at least one optical voltage sensor which comprises an opto-electric field element for detecting a voltage applied to the power transmission conductor to generate a second optical signal representing the voltage;

first optical signal transmitting means for transmitting said first optical signal generated by said opto-magnetic element and having optical fibers which are inserted into said central hole formed in said insulator and transmit the first optical signal in an electrically insulating manner from conductive portions of the power transmission line and tower;

second optical signal transmitting means for transmitting said second optical signal generated by said opto-magnetic field element in an electrically insulating manner from conductive portions of the power transmission line and tower; and

judging means for receiving the first and second optical signals transmitted through said first and second optical signal transmitting means, respectively, and judging the occurrence of a fault on the power transmission line in accordance with the first and second optical signals.

5,202,813

DRIVER DEVICE FOR A DUTY SOLENOID VALVE

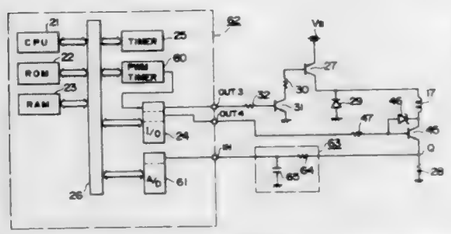
Kosaku Uota, and Munehiko Mimura, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,980

Claims priority, application Japan, Nov. 24, 1989, 1-305914

Int. Cl.[5] H01H *47/18;* **G05F** *1/56*

U.S. Cl. 361—154 **4 Claims**



1. A driver device for a duty solenoid valve which controls fluid pressure by adjusting a duty ratio of an excitation of a solenoid coil, said driver device comprising:

first driver means for controlling a current level of an excitation current through said solenoid coil, in response to a duty ratio of a first pulse signal;

second driver means for turning on and off an excitation current flowing through said solenoid coil, in response to a second pulse signal having a substantially longer period than said first pulse signal;

current detector means for detecting a level of the excitation current flowing through said solenoid coil;

first pulse width modulation signal generating means for generating, in response to the level of the excitation current detected by said current detector means, said first pulse signal having a duty ratio corresponding to a target excitation current level, said first pulse width modulation signal generating means including means for storing a reference value corresponding to the duty ratio of said first pulse signal and means for comparing said reference value to a value contained in a counter means wherein said first pulse signal is output based upon said comparison; and

second pulse width modulation signal generating means for generating said second pulse signal having a duty ratio corresponding to a target fluid pressure of the duty solenoid valve;

wherein said first and second pulse width modulation signal generating means are comprised in a microcomputer.

5,202,814

NONREDUCING DIELECTRIC CERAMIC COMPOSITION

Yoshiaki Kohno, and Nobuyuki Wada, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 666,786, Mar. 8, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 902,784

Claims priority, application Japan, Mar. 13, 1990, 2-63664

Int. Cl.[5] H01G *4/10;* **C04B** *35/46*

U.S. Cl. 361—321 **2 Claims**

1. A monolithic ceramic capacitor, comprising a dielectric ceramic body including a multi-layer body of dielectric ceramic material, an internal electrode located in said dielectric ceramic body, the internal electrode comprising nickel, and an external electrode located at an edge portion of said dielectric ceramic body, the external electrode being connected to said internal electrode, wherein said dielectric ceramic material comprises a main component consisting of respective oxides of Ba, Ca, Mg, Sr, Ce, Ti and Zr, the main component having the following formula:

$$(Ba_{1-l-m-n-o}Sr_lCa_mMg_nCe_o)_q(Ti_{1-p}Zr_p)O_3$$

wherein l, m, n, o, p and q are the following:

$0.05 \leqq l \leqq 0.30$

$0.005 \leqq m \leqq 0.22$

$0.0005 \leqq n \leqq 0.05$

$0.0005 \leqq o \leqq 0.02$

$0 \leqq p \leqq 0.02$

$1.002 \leqq q \leqq 1.03$,

and wherein for 100 mole % of said main component, the dielectric ceramic material includes between 0.02 to 2.0 mole % of an oxide selected from the group consisting of MnO_2, Fe_2O_3, Cr_2O_3, CoO and mixtures thereof.

5,202,815

PROTECTIVE CASE FOR AN INDUSTRIAL CONTROLLER

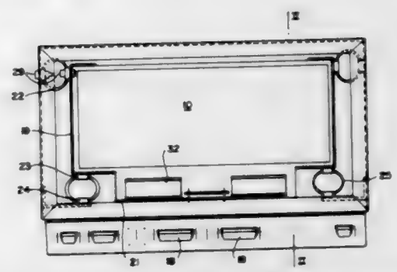
André Le Boennec, Biviers; Robert Jean, Seyssins, and Bernard Dalban, Theys, all of France, assignors to Merlin Gerin, France

Filed Oct. 30, 1991, Ser. No. 784,871

Claims priority, application France, Nov. 14, 1990, 90 14243

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—384 **4 Claims**



4. The protective housing of claim 1, wherein the electronic device is housed by a box which is fixed to said cradle by bolts, and wherein said cradle substantially conforms to an outer shape of said box.

5,202,816

HIGH DENSITY CIRCUIT BOARD CHASSIS COOLING

5,202,817

HAND HELD DATA CAPTURE SYSTEM WITH

5,202,820

SATURABLE INDUCTOR PROTECTION CIRCUIT FOR

(a) a corner piece having two sides which face an interior

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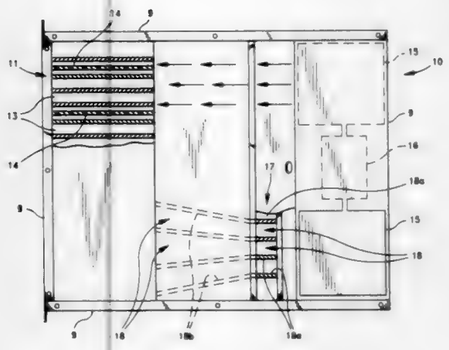
5,202,816

HIGH DENSITY CIRCUIT BOARD CHASSIS COOLING SYSTEM

Mark A. DeWilde, 8 Ocean Dr., Freeville, N.Y. 13068

Filed May 20, 1991, Ser. No. 702,559
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—384 20 Claims



1. A system cooling a plurality of circuit boards in a high density chassis, comprising:

a) a circuit board cage having means defining a number of slots supporting a plurality of circuit boards, and means disposed in each of said slots for providing insertion, removal and support of a circuit board therein, without substantially changing air flow distribution to all the slots of said circuit board cage;

b) filtering means disposed adjacent said circuit board cage for filtering air, creating air turbulence, and for providing a pressure head adjacent said plurality of circuit boards, said adjacent pressure head ensuring substantially equal air flow through said slots, with or in the absence of, a circuit board resident in any slot of said circuit board cage;

c) air flow generating means disposed proximate said filtering means for providing air flow through said filtering means to said slots of said cage at air pressures and air flow rates sufficient to carry heat from any resident circuit boards in said cage;

d) diffusing means operatively disposed between said air flow generating means and said circuit board cage, said diffusing means having a plurality of channels for individually directing air generated from said air flow generating means to respective slots in said cage, and for individually distributing air to each of said slots in a substantially equal volume to ensure uniform cooling of each resident circuit board in said circuit board cage despite an absence of a circuit board in any one of said slots of said circuit board cage; and

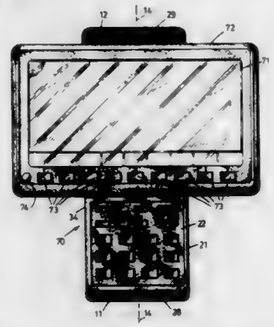
said filtering means located between said diffusing means and said circuit boards.

5,202,817

HAND-HELD DATA CAPTURE SYSTEM WITH INTERCHANGEABLE MODULES

Steven E. Koenck; Phillip Miller, both of Cedar Rapids; Arvin D. Danielson, Solon; Ronald L. Mahany, Cedar Rapids; Dennis A. Durbin, Cedar Rapids; Keith K. Cargin, Jr., Cedar Rapids; George E. Hanson, Cedar Rapids; Darald R. Schultz, Cedar Rapids; Robert G. Geers, Cedar Rapids; Darrell L. Boatwright, Cedar Rapids; William T. Gibbs, Cedar Rapids, and Stephen J. Kelly, Marion, all of Iowa, assignors to Norand Corpoation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 626,711, Dec. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 364,594, Jun. 7, 1989, abandoned, and Ser. No. 364,902, Jun. 8, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 633,500
Int. Cl.[5] H05K 7/10, 7/14; G06F 1/00
U.S. Cl. 361—393 22 Claims



1. A modular hand-held data collection terminal unit comprising:

a base module selected as a preferred one of a plurality of base modules;

a keyboard module selected as a preferred one of a plurality of functionally different keyboard modules and including differently configured keys available for assembly into said terminal unit;

a display screen module attached to one end of the selected keyboard, said display screen module being selectable from either a first display screen module type or a second display screen module type, said first and second display screen module types being interchangeable with the selected keyboard module, said first display screen module type being as wide as the width of the selected base module, said second display screen module type being wider than the width of the selected base module of the terminal unit and extending beyond at least one side of the lateral confines of the selected base module of said terminal unit when said second display type is connected to the selected keyboard, said base module being assembled with the selected keyboard module including a display screen module of said second display screen module type.

5,202,818

SEALED SWITCHGEAR CABINET

Frédéric Betsch, Bettwiller; Pierre Carle, "Chevillard", both of France; Luis Xaus, Barcelona, Spain, and Roland Goutay, Grenoble, France, assignors to Merlin Gerin, Meylan, France

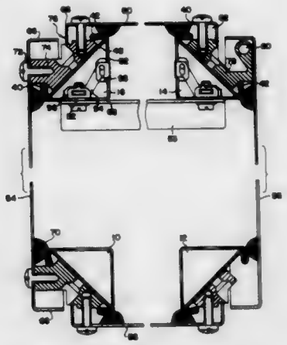
Filed May 29, 1990, Ser. No. 529,542
Claims priority, application France, Jun. 5, 1989, 89 07506
Int. Cl.[5] H02B 1/01
U.S. Cl. 361—429 7 Claims

1. A parallelepipedic cabinet having twelve edges, comprising:

a support framework formed of tubular frame sections affixed to each other at their ends to define said edges of said cabinet, each of said tubular frame sections comprising:

(a) a corner piece having two sides which face an interior of said cabinet, holes disposed along said two sides for fixation of switchgear, and longitudinal edges defined by folded portions folded inwards substantially perpendicular to said sides;

(b) an external sealing partition joining said longitudinal edges of said corner piece, said external sealing partition



and said corner piece forming a tubular internal space having a triangular cross-section, and having a symmetry plane bisecting said corner piece;

plates affixed to said framework defining walls of said cabinet; and

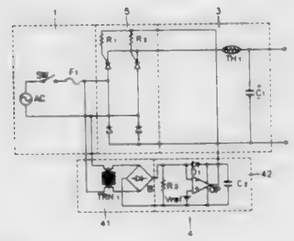
elastic seals fitted between said plates and said folded portions of said corner pieces.

5,202,819

CAPACITOR INPUT TYPE RECTIFIER HAVING A CIRCUIT FOR PREVENTING INRUSH CURRENT

Kyeongseol Min, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Apr. 3, 1992, Ser. No. 863,027
Claims priority, application Rep. of Korea, Jun. 13, 1991, 91-9764
Int. Cl.[5] H01G 9/16; H02P 13/24
U.S. Cl. 361—436 3 Claims



1. A capacitor input type rectifier having a circuit for preventing an inrush current, comprising:

an AC phase detector for detecting a phase of the time that an AC voltage input is the smallest and for providing an output signal indicative thereof;

a phase control rectifier having a control terminal connected to said AC phase detector for initiating rectification for the AC voltage input according to the output signal of said AC phase detector; and

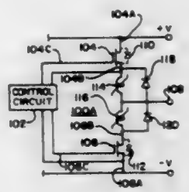
means for smoothing connected to said phase control rectifier for smoothing the output of said phase control rectifier.

5,202,820

SATURABLE INDUCTOR PROTECTION CIRCUIT FOR INDUCTIVE LOAD DRIVER

John M. Miller, Saline, Mich., and Fenton L. Rees, Everett, Wash., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1991, Ser. No. 807,250
Int. Cl.[5] H02M 7/5395
U.S. Cl. 363—56 10 Claims



1. A drive circuit for inductive loads comprising:

first and second switching means comprising power MOSFET devices for connecting power to a load, said first switching means having an first power unit terminal connected to a positive power bus, a first power output terminal and a first control terminal for receiving a switching signal controlling the conduction of power from said first power input terminal to said first power output terminal, said second switching means having a second power input terminal connected to a negative power bus, a second power output terminal and a second control terminal for receiving a switching signal controlling the conduction of power from said second power input terminal to said second power output terminal;

a drive terminal for connecting said drive circuit to a load;

a first saturable inductor connected between said first power output terminal and said drive terminal, said first saturable inductor being sized to saturate for standard current levels within the drive circuit but remain unsaturated during reverse recovery of body diodes inherently included within the structure of said power MOSFET devices;

a second saturable inductor connected between said second power output terminal and said drive terminal, said second saturable inductor being sized to saturate for standard current levels within the drive circuit but remain unsaturated during reverse recovery of body diodes inherently included within the structure of said power MOSFET devices; and

free-wheeling means connected to said first and second switching means for initially conducting free-wheeling current through said load upon termination of conduction of said first and second switching means, said free-wheeling means comprising:

a first diode connected in parallel with said first saturable inductor and having an anode connected to said drive terminal and a cathode connected to said first power output terminal; and

a second diode connected in parallel with said second saturable inductor and having a cathode connected to said drive terminal and an anode connected to said second power output terminal.

5,202,821

SAMPLED-DATA CONTROL SYSTEM EXHIBITING REDUCED PHASE LOSS

Randall C. Bauck, Boulder; Scott E. Chase, Longmont, and James W. Hargarten, Lafayette, all of Colo., assignors to Maxtor Corporation, San Jose, Calif.

Filed Jun. 28, 1991, Ser. No. 722,866
Int. Cl.[5] G05B 13/02
U.S. Cl. 364—162 20 Claims

1. A digital control system for controlling an output signal of a plant comprising:

difference sensing means for generating an error signal rep-

c) eavesdropping to all communications from the controller

5,202,824

for printing customer transaction records and means for

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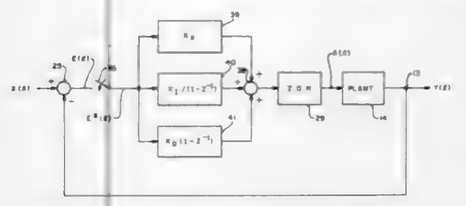
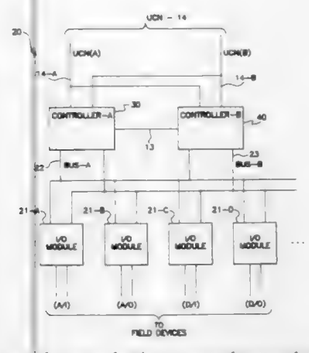
difference sensing means for generating an error signal representative of the difference between a reference input and said output signal;
sampling means for sampling said error signal;
digital compensator means including proportional, derivative, and integral control elements for developing an actuating signal proportional to said error signal, said



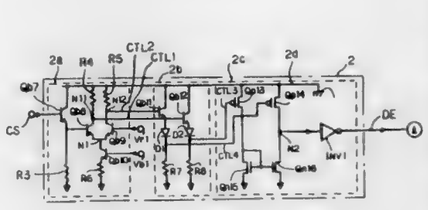
actuating signal being applied to said plant for correction of said output signal, said derivative control element producing an output waveform and comprising a digital differentiator coupled to an associated zero-order hold, wherein said derivative control element implements an algorithm based only on the present error sample of said error signal such that, within a given sampling period, said output waveform is characterized as a doublet.

5,202,822
UNIVERSAL SCHEME OF INPUT/OUTPUT REDUNDANCY IN A PROCESS CONTROL SYSTEM
Paul F. McLaughlin, Hatfield, and Robert W. Bristow, Hatboro, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 26, 1990, Ser. No. 588,386
Int. Cl.[5] G05B 9/02
U.S. Cl. 364—187 **10 Claims**



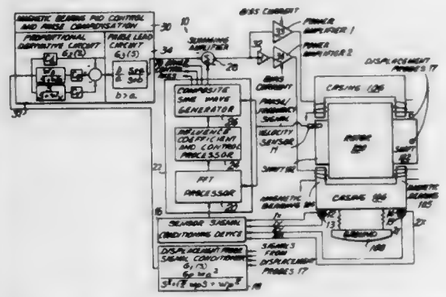
1. In a control system, having a control network for controlling a process, said control network interfacing with a controller, the controller having a slave input/output processor (IOP) connected thereto for communication with at least one device of a predetermined type, the predetermined types including analog input, analog output, digital input, and digital output, the slave IOP executing a predetermined task and having a data base associated therewith, said controller also having a backup slave IOP connected thereto of the same type as the slave IOP, the slave IOP being operatively connected to said device and operating as a primary IOP to said device, a method for providing backup to the slave IOP by the backup slave IOP comprising the steps of:
a) loading the backup slave IOP with the same data base and the same predetermined task as the slave IOP;
b) causing the backup slave IOP to execute essentially in parallel to the slave IOP;
c) eavesdropping to all communications from the controller to the slave IOP by the backup slave IOP, such that:
i) when a write command is communicated to the slave IOP, updating the backup slave IOP data base by the backup slave processor; otherwise
ii) ignoring the communication to the slave IOP;
d) ignoring communications from the slave IOP to the controller by the backup slave IOP, the updating of the backup slave IOP data base being performed by the backup slave IOP as a result of the execution of the same predetermined task on the same data base by the backup slave IOP, thereby maintaining the data base of the backup slave IOP the same as the data base of the slave IOP;
e) upon detecting a fault by either of said slave IOP or said backup slave IOP, communicating the detection of said fault to the other IOP;
f) failing over by said IOPs whereby said backup slave IOP is operatively connected to said device and said slave IOP is operatively disconnected from the device; and
g) acknowledging by the controller that the backup slave IOP is now operating as a primary source to the device, wherein the failing over from the primary IOP to the backup slave IOP occurs without any loss of communication within the control system.

5,202,823
SEMICONDUCTOR MEMORY DEVICE HAVING SIGNAL RECEIVING FACILITY FABRICATED FROM BI-CMOS CIRCUITS
Kenjyu Shimogawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 25, 1991, Ser. No. 673,998
Claims priority, application Japan, Mar. 29, 1990, 2,82683
Int. Cl.[5] G11C 13/00
U.S. Cl. 365—230.06 **11 Claims**



1. A semiconductor memory device comprising:
a) a plurality of memory cells arranged in rows and columns;
b) a plurality of word lines respectively coupled to the rows of said plurality of memory cells;
c) a row address buffer unit coupled between first and second power voltage sources and supplied with row address bits for producing internal row address signals;
d) a row address decoder unit responsive to said internal address signals and producing decode signals;
e) a control signal buffer unit coupled between said first and second power voltage sources and supplied with an external control signal for producing a decode enable signal;
f) a word line driving unit responsive to said decode signals and selectively driving said word lines in the presence of said decode enable signal; and
g) a monitoring unit operative to monitor the power voltage level of one of said first and second power voltage sources and enabling said control signal buffer unit to produce said decode enable signal when said power voltage level allows said internal address signals to become effective to said row address decoder unit.

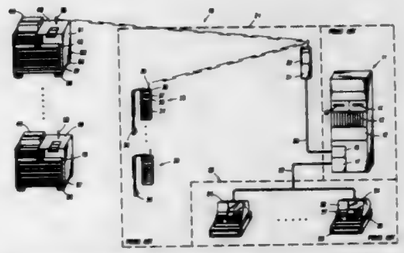
5,202,824
ROTATING FORCE GENERATOR FOR MAGNETIC BEARINGS
Hsiang M. Chen, Latham, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.
Continuation of Ser. No. 541,621, Jun. 21, 1990, abandoned. This application Aug. 6, 1992, Ser. No. 925,899
Int. Cl.[5] G05B 19/02; H02K 7/09
U.S. Cl. 364—508 **14 Claims**



1. An apparatus for stabilizing rotational machinery, comprising:
sensing means coupled to the rotational machinery for detecting vibrations of the rotational machinery;
a feedforward processing means response to said sensing means for calculating amplitude and phase information of at least one frequency component of said vibrations, said processing means including determining means for periodically determining if said amplitude information exceeds a predetermined threshold, said processing means further including updating means, responsive to said determining means, for updating an array of output of said information only when said predetermined threshold is exceeded;
a calculating means to calculate signals from said amplitude and phase information to compensate for said vibrations;
said calculating means including means for outputting experimental signals and calculating an array of coefficients from a response to said experimental signals and means for multiplying said array of coefficients by said array of output from said processing means;
generating means to generate said signals in said analog form; and
magnetic coils within the rotational machinery controlled to stabilize said rotational machinery by said signals in analog form.

5,202,825
TRANSACTION CONTROL SYSTEM INCLUDING PORTABLE DATA TERMINAL AND MOBILE CUSTOMER SERVICE STATION
Phillip Miller; Steven E. Koenck; George E. Hanson, and Roger L. Wolf, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa
Division of Ser. No. 345,146, Apr. 28, 1989, Pat. No. 5,031,098. This application Jul. 8, 1991, Ser. No. 727,021
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] G07G 1/14
U.S. Cl. 364—405 **9 Claims**

1. A transaction control system comprising:
(a) at least one portable data terminal, said data terminal including means for entering data relating to customer transactions and means for transmitting uniquely identifiable data messages based on the entered data;
(b) at least one mobile customer service station, said service station including a self-contained power source, a printer for printing customer transaction records and means for receiving customer transaction-related messages pertaining to customer transactions which originate at the portable data terminal;
(c) wireless communications station means including means for receiving said uniquely identifiable data messages transmitted from said portable data terminal, and for transmitting to said portable data terminal and to said mobile customer service station customer transaction-related data messages pertaining to customer transactions which originate at said portable data terminal; and
(d) computer means, said computer means being communicatively interconnected with said wireless communications station means for transfer of said uniquely identifiable data messages from said wireless communications



station means to said computer means, means for receiving from said wireless communications station means said uniquely identifiable data messages which originate at said portable data terminal, means for processing said uniquely identifiable data messages and generating customer transaction-related data messages pertaining thereto, means for uniquely addressing such customer transaction-related data messages to a selected one of said portable data terminal and said mobile customer service station, and means for transferring said customer transaction-related data messages to said wireless communications station means,
(e) said mobile customer service station upon receipt of said customer transaction-related data messages from the wireless communications station means being controllable to cause said printer to print customer transaction records in accordance therewith.

5,202,826
CENTRALIZED CONSUMER CASH VALUE ACCUMULATION SYSTEM FOR MULTIPLE MERCHANTS
Patrick D. McCarthy, 4384 Bowling Blvd., Louisville, Ky. 40207
Continuation of Ser. No. 510,446, Apr. 18, 1990, Pat. No. 5,117,355, which is a continuation of Ser. No. 303,319, Jan. 27, 1989, Pat. No. 4,941,090. This application Nov. 26, 1991, Ser. No. 797,401
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] G07G 1/12
U.S. Cl. 364—405 **40 Claims**

14. A centralized consumer cash value system for transactions between consumers and multiple merchants comprising:
at each merchant location at least:
consumer data input means at the point-of-sale for inputting an account number unique to the customer independent of how the consumer pays for the transaction;
processor means for determining a credit value for the transaction; and
first communication means for electronically transmitting to the central system the consumer's account number and the credit value related to each transaction; and
at a central location, a central system having at least:

second communication means for electronically receiving

means for processing said marked data in accordance with

5,202,830

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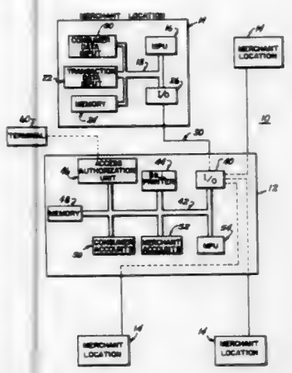
second communication means for electronically receiving the consumer's account number and the credit value related to each transaction;

consumer account memory means for storing cash values for a plurality of consumer accounts, each consumer account being associated with a respective, unique account number;



processor means for incrementing the cash value in a consumer account associated with a received consumer account number by an amount related to the received credit value; and

unit means for selectively providing to at least a plurality of consumers access to funds in an amount based upon the cash value in the consumer account associated with that consumer.

5,202,827

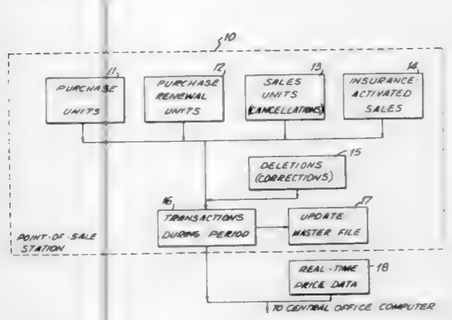
APPARATUS FOR INSURING FUTURES CONTRACTS AGAINST CATASTROPHIC LOSS

Michael S. Sober, 60 Sutton Pl. S., New York, N.Y. 10022

Filed May 10, 1990, Ser. No. 521,531

Int. Cl.[5] G06F *15/20*; G06G *7/52*

U.S. Cl. 364—408 **1 Claim**



1. A data processing system for administering an insurance program to insure against uncertainty of a futures contract price, the data processing system comprising:

data communications means for remotely entering customer transaction data relating to a futures contract sales transaction into a central processor of the data processing system;

the futures contract sale transaction being a particular one of a group of futures contract sale transactions consisting of customer-initiated sale, broker-initiated sale, and insurance-activated sale;

the customer transaction data including (i) identification of the futures contract, (ii) customer identification, (iii) transaction type identification, the transaction being one of a group of transaction types consisting of insurance unit purchase, insurance unit renewal, and futures contract sale, and (iv) a futures contract purchase price;

means responsive to receipt by the central processor of the customer transaction data including data concerning the insurance-activated ale, for determining portions of a loss resulting from the insurance-activated sale which are to be (i) borne entirely by the customer, (ii) shared by at least one predetermined ratio by the customer and an insurer, and (iii) borne entirely by the insurer;

means for receiving and storing the customer transaction data in the central processor;

means for determining an insurance activation price based upon the futures contract purchase price stored in the central processor;

means for receiving real-time data concerning a current price of the futures contract;

means for comparing the current price of the futures contract with the insurance activation for the futures contract; and

means for transmitting an order to the data communication means to sell the futures contract upon decline of the current futures contract price below the insurance activation price.

5,202,828

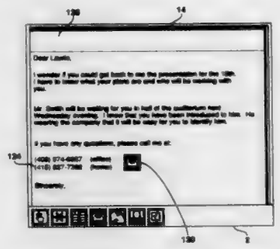
USER INTERFACE SYSTEM HAVING PROGRAMMABLE USER INTERFACE ELEMENTS

Laurie J. Vertelney, San Carlos; Thomas D. Erickson; S. Joy Mountford, both of Mountain View; John J. Thompson-Rohrlich, Palo Alto; Gitta B. Salomon, Palo Alto; Yin Y. Wong, Palo Alto; Daniel S. Venolia, Soquel; Kathleen M. Gomoll, San Francisco, and Eric A. Hulteen, Los Gatos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 15, 1991, Ser. No. 700,729

Int. Cl.[5] G06F *15/403*

U.S. Cl. 364—419 **20 Claims**



1. A user interface system for use in a computerized system having a processor, a memory, a display and an interactive input/output system in communication with the processor, the memory and the display for operating the user interface system, comprising:

a user interface element including means for identifying said user interface element to a user, and means for marking data displayed within one or more documents on said display with said identifying means in such a manner that said marked data can be subsequently found, organized and processed by said computerized system through utilization of said identifying means;

means for storing one or more of said identifying means for one or more user interface elements in said memory as a proxy to said marked data;

means for finding said marked data in said memory by searching for said proxy in said memory;

means for organizing said marked data in accordance with predetermined organizing commands corresponding to said identifying means;

means for processing said marked data in accordance with predetermined processing commands corresponding to said identifying means; and

means for displaying said marked data on said display.

5,202,829

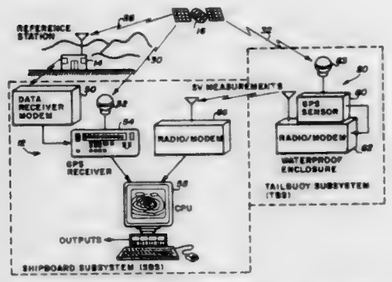
EXPLORATION SYSTEM AND METHOD FOR HIGH-ACCURACY AND HIGH-CONFIDENCE LEVEL RELATIVE POSITION AND VELOCITY DETERMINATIONS

George J. Geier, Santa Clara, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Jun. 10, 1991, Ser. No. 713,438

Int. Cl.[5] G01S *5/02*

U.S. Cl. 364—449 **10 Claims**



1. A mobile fleet exploration system for obtaining high accuracy relative earth position and velocity determinations amongst individual mobile units in the fleet from a plurality of GPS receiving stations distributed throughout the mobile fleet, the exploration system comprising:

at least one outlying individual mobile unit including means for obtaining a first time-sequence of pseudo-ranges and pseudo-range-rates to a plurality of GPS satellites;

a main mobile unit including means for obtaining a second time-sequence of pseudo-ranges and pseudo-range-rates to said plurality of GPS satellites;

navigation computer means for calculating a plurality of relative earth positions and velocities from an input comprising a sequence of delta-pseudo-ranges and delta-pseudo-range-rates relative to said plurality of GPS satellites derived from the respective pseudo-ranges and pseudo-range-rates relative to said individual mobile fleet units and said main mobile unit and including a Kalman filter for filtering said delta-pseudo-ranges using information from said delta-pseudo-range-rates;

associative means for pairing each pseudo-range in said first and second time-sequences of pseudo-ranges with a time-code indicating a time each respective pseudo-range was obtained;

communication means for transferring said first and second time sequences of pseudo-ranges to the navigation computer means and associative means; and

differencing means for time-aligning according to said time code and subtracting the corresponding pseudo-ranges and pseudo-range-rates of said first time-sequence of pseudo-ranges and pseudo-range-rates from said second time-sequence of pseudo-ranges and pseudo-range-rates to produce a sequence of delta-pseudo-ranges and delta-pseudo-range-rates and for communicating said delta-pseudo-ranges and delta-pseudo-range-rates to the navigational computer means wherein a difference in relative positions and velocities amongst the individual mobile fleet units can be determined.

5,202,830

MOTOR DRIVE CONTROL CIRCUIT

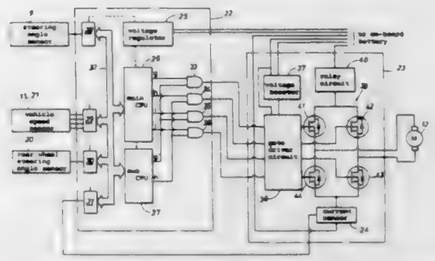
Osamu Tsurumiya, and Masataka Izawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 498,209

Claims priority, application Japan, Mar. 22, 1989, 1-070038

Int. Cl.[5] B62D *5/04*

U.S. Cl. 364—424.05 **12 Claims**



1. A PWM motor drive control circuit for an electric power steering system, comprising:

a bridge circuit having a pair of input terminals which are adapted to be connected to a DC electric power source, a pair of output terminals adapted to be connected to an electric motor, and four arms each defined by a transistor;

a main control unit for producing a first continual direction control signal for activating a selected one of said transistors, and a torque control signal of a variable duty ratio for activating the transistor diametrically opposed to said selected transistor to activate said electric motor in a desired direction at a desired torque according to a steering command signal supplied thereto;

a sub control unit for exclusively producing a second direction control signal according to said steering command signal; and

a gate drive control circuit for transmitting said first direction control signal and said torque control signal to said diametrically opposed transistors only when said first direction control signal produced by said primary control unit coincides with said second direction signal produced by said sub control unit.

5,202,831

METHOD AND APPARATUS FOR CONTROLLING AN OCCUPANT RESTRAINT SYSTEM USING REAL TIME VECTOR ANALYSIS

Brian K. Blackburn, Rochester; Joseph F. Mazur, Washington, and Scott B. Gentry, Shelby Township, Macomb County, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jul. 9, 1991, Ser. No. 727,610

Int. Cl.[5] B60R *21/32*

U.S. Cl. 364—424.05 **23 Claims**

1. An apparatus for restraining a vehicle occupant during a crash of the vehicle comprising:

first crash sensor means securable to the vehicle and having a sensitivity axis parallel with a front-to-rear axis of the vehicle for providing a signal having a value functionally related to crash energy directed parallel to the front-to-rear axis of the vehicle and substantially impervious to crash energy directed parallel to a side-to-side axis of the vehicle;

second crash sensor means securable to the vehicle and having a sensitivity axis parallel with the side-to-side axis of the vehicle for providing a signal having a value func-

tionally related to crash energy directed parallel to the

coupling the turbine of the torque converter assembly to

5,202,835

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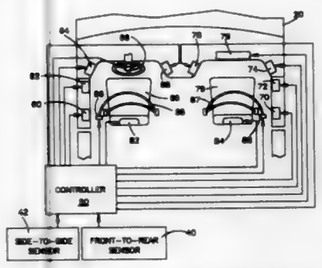
tionally related to crash energy directed parallel to the side-to-side axis of the vehicle and substantially impervious to crash energy directed parallel to the front-to-rear axis of the vehicle, said first crash sensor means and said second crash sensor means having their sensitivity axes oriented along mutually orthogonal axes;

control means electrically connected to said first crash sensor means and to said second crash sensor means for determining a crash vector of a crash condition in response to the signals from said first crash sensor means and said second crash sensor means; and

a plurality of actuatable occupant restraint devices, each electrically connected to said control means, said control means controlling which of said plurality of actuatable occupant restraint devices is or are actuated in response to the determined crash vector.



5,202,832

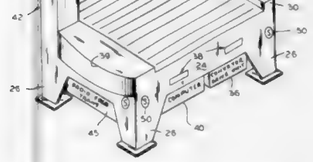
MATERIAL HANDLING AUTOMATION SYSTEM USING PORTABLE TRANSFER MODULE

Donald J. Lisy, Downers Grove, Ill., assignor to R. R. Donnelley & Sons Co., Lisle, Ill.

Filed Jan. 29, 1991, Ser. No. 647,146

Int. Cl.[5] G06F *15/50;* **B65G** *67/02*

U.S. Cl. 364—424.02 **21 Claims**



1. A portable material handling module for transferring materials between an automatic guided vehicle which is not preprogrammed to follow a predetermined route and a truck, said module comprising:

a platform having a top surface approximating the height of a top surface of a corresponding platform on said automatic guided vehicle; and

means for transmitting a signal indicative of an exact position of said module for assisting said automatic guided vehicle in being directed to travel along a route in real time for alignment of said vehicle with said module located at or near any selected destination irrespective of any predetermined module location.

5,202,833

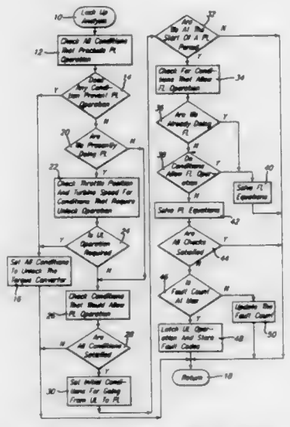
METHOD OF CONTROLLING THE PARTIAL LOCK-UP OF A TORQUE CONVERTER IN AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Francis M. Fodale, 16996 Madoline, Beverly Hills, Mich. 48809

Continuation of Ser. No. 399,682, Aug. 28, 1989, abandoned. This application Apr. 23, 1991, Ser. No. 691,151

Int. Cl.[5] B60K *41/02;* **F16D** *31/08*

U.S. Cl. 364—424.1 **6 Claims**



1. In a vehicle having an engine and a throttle means and a transmission system including an input member, an output member, a torque converter assembly for transmitting torque between the engine and the input member of the transmission, the torque converter assembly having a turbine operatively connected to the input member, a gear assembly for changing the ratio of torque between the input member and output member, a frictional unit for coupling the turbine of the torque converter assembly to the engine, at least one solenoid-actuated valve being movable in response to the presence or absence of electrical power for directing fluid flow from a fluid source, a slave valve, a plurality of input sensors for providing signals indicative of predetermined conditions, and a controller having memory for processing and storing the signals and predetermined values and providing output signals, a method of controlling the difference between the rotational speed of the output member of the engine and the rotational speed of the turbine of the torque converter assembly, said method comprising the steps of:

checking a plurality of first predetermined conditions by the input sensors to determine whether the turbine of the torque converter assembly is precluded from being partially frictionally coupled to the engine;

determining whether any of the checked plurality of first predetermined conditions prevent the turbine from being partially frictionally coupled to the engine by comparing them to stored values for the first predetermined conditions in memory which prevent partial frictional coupling of the turbine;

setting a plurality of second predetermined conditions to uncouple the turbine from the engine if any first predetermined condition prevents the turbine from being partially frictionally coupled to the engine;

setting predetermined initial conditions to control a duty cycle of the solenoid-actuated valve which allows and prevents fluid flow to the slave valve to allow or prevent fluid flow to a frictional unit which frictionally couples the turbine to the engine;

determining whether the method is at the start of a duty cycle period of the solenoid-actuated valve for partially coupling the turbine of the torque converter assembly to the engine;

checking a plurality of third predetermined conditions by the input sensors that would allow the turbine to be fully frictionally coupled to the engine to eliminate the difference between speeds if the method is at the start of a duty cycle period of the solenoid-actuated valve for controlling the slave valve;

determining whether the checked plurality of third predetermined conditions allow the turbine to be fully frictionally coupled;

solving a first set of predetermined equations for the duty cycle of the solenoid-actuated valve for full frictional coupling of the turbine if determined that the turbine is allowed to be fully frictionally coupled;

calculating a predetermined change for the duty cycle of the solenoid-actuated valve to control slip during partial frictional coupling of the turbine of the torque converter assembly; and

duty cycling the solenoid-actuated valve based on the value for the solved duty cycle.

5,202,834

MAIL ITEM PROCESSING SYSTEM

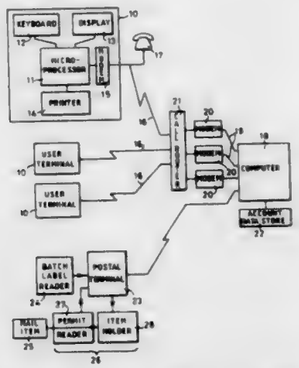
Dennis T. Gilham, Brentwood, United Kingdom, assignor to Alcatel Business Systems Limited, Essex, United Kingdom

Filed May 29, 1990, Ser. No. 529,436

Claims priority, application United Kingdom, May 30, 1989, 8912324

Int. Cl.[5] G07B *17/02*

U.S. Cl. 364—464.02 **9 Claims**



8. A method of processing mail items comprising:

at a mail sending location the steps of determining a postage charge in respect of a batch of mail items; transmitting to a computer at a postal authority location an identification corresponding to the mail sending location and postage charge data in respect of the batch of mail items; receiving an authorization signal from the computer to enable a printing device at the mail sending location to print a postage permit on each mail item of the batch of mail items and to print batch data relating to the batch of mail items and the postage charge therefor on a batch label; and

at a postal authority mail receiving location the steps of feeding the mail items of the batch past permit reading means to produce permit data signals; feeding the batch label past batch data reading means to produce batch data signals; communicating with the computer to receive the postage charge data; comparing the permit data signals, the batch data signals and the postage charge data and, in response to said comparison being successful, accepting the mail items of the batch for delivery to destination addresses.

5,202,835

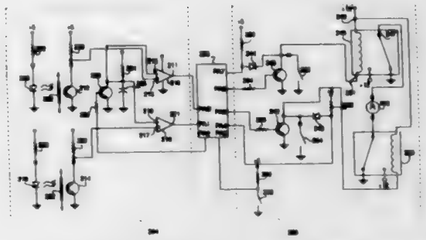
TROLLING MOTOR WITH HEADING LOCK

Steven J. Knight, Mapleton, Minn., assignor to Johnson Fishing Inc., Mankato, Minn.

Continuation of Ser. No. 537,586, Jun. 14, 1990, Pat. No. 5,172,324. This application Jul. 27, 1992, Ser. No. 920,254

Int. Cl.[5] B63H *25/00*

U.S. Cl. 364—457 **28 Claims**



1. A heading lock coupled to a trolling motor producing a thrust disposed to pull a watercraft, said heading lock comprising:

a steering motor coupled to said trolling motor, said steering motor being disposed to affect the orientation of said trolling motor in response to input signals;

a steering circuit electrically coupled to said steering motor, said steering circuit begin disposed to generate said input signals to said steering motor in response to heading signals; and

a heading detector electrically coupled to said steering circuit, said heading detector being disposed to transmit said heading signals to said steering circuit.

11. A heading lock for a bow-mounted motor, said motor having a thrust, comprising:

a steering motor connected to said bow-mounted motor and controllable by a steering signal input;

a heading detector circuit having a first output indicative of the heading of the thrust of the motor;

a desired heading circuit having a second output indicative of a desired heading; and

a steering control circuit comparing said first output to said second output and generating said steering signal input based on the difference between said first output and said second output.

5,202,836

AUTOMATED MANAGEMENT SYSTEM FOR CAR FRAMES AND PRODUCTION METHOD

Kouji Iida; Noboru Kagano; Yasuhiro Nobuoka; Kouichi Yamada, and Hiromi Mitsumoto, all of Suzuka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1991, Ser. No. 687,001

Claims priority, application Japan, Apr. 19, 1990, 2-103790; May 31, 1990, 2-142618; May 31, 1990, 2-142619; Jun. 6, 1990, 2-148058; Jun. 6, 1990, 2-148059; Jun. 11, 1990, 2-151834; Jun. 27, 1990, 2-169204; Jun. 27, 1990, 2-169205

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—468 **10 Claims**

1. An automated process of managing production of mixed model groups of vehicles in a common production line wherein:

a model group consists of a plurality of vehicles of one model type,

each and every vehicle in said model group processed on said line is provided with a common series of serialized identification numbers, and

each and every model group is provided with a production ratio defined in terms of a ratio of

a number of vehicles of said model scheduled to be pro-

duced on said line within a production period to a total

5,202,839

method implemented by a computer and comprising the steps

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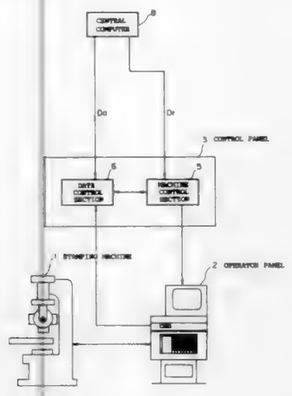
duced on said line within a production period to a total number of vehicles scheduled to be produced on said line within said production period,

wherein said total number is the sum of the number of vehicles scheduled to be produced within said production period; said process comprising the steps of:

(a) a first processing step for generating and registering said model groups of identification numbers and to generate and assign said ratio to each of said model groups, and



(b) a second processing step for generating said serialized identification numbers in conformity wit said production ratio for each model group and for arranging said identification numbers in an order of scheduled assembly sequence, and

(c) a third processing step for displaying said arranged identification numbers on display means, and for placing said identification numbers automatically on corresponding vehicles.

5,202,837

MATERIAL CONSOLIDATION MODELING AND CONTROL SYSTEM

Carlos J. Coe, 1847 Ware Rd., Falls Church, Va. 22043; Elizabeth A. Godfrey, 1131 University Blvd. W., #720, Silver Spring, Md. 20902; Benjamin L. Henniges, 6111 Bristol Way, Alexandria, Va. 22310; David W. O'Brien, 140 N. Union St., Alexandria, Va. 22314; Jeffery E. Payne, 1121 Arlington Blvd., No. N-108, Arlington, Va. 22209; Michael F. Ashby, 51 Maids Cause Way, Cambridge, C858DE, United Kingdom; Nikolaos Aravas, 32 Saint James Ct., Philadelphia, Pa. 19106; Robert M. McMeeking, 2047 Cielipo La., Santa Barbara, Calif. 93105; Richard J. Fields, 15812 Amelung La., Rockville, Md. 20855; Phillip A. Parrish, 8602 Powder Horn Rd., Springfield, Va. 22152, and Hayden N. G. Wadley, Rte. 1, Box 1350, Keswick, Va. 22947

Division of Ser. No. 551,313, Jul. 12, 1990, Pat. No. 5,136,497. This application Apr. 7, 1992, Ser. No. 832,870

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—476 **7 Claims**

1. An apparatus for simulating a consolidation process of a material form, comprising:

input means for providing parameters of the material, container and consolidation process;

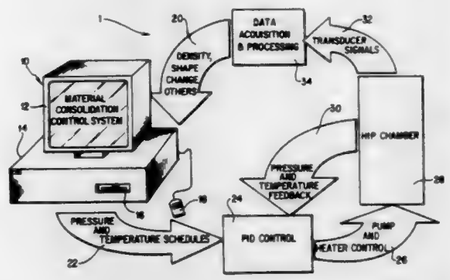
setup means for determining the constitutive relations governed by multiple densification mechanisms including plasticity, power-law creep and diffusion;

relation means for repetitively interrelating the constitutive relations based upon an estimate of a stage of densification at various times during the consolidation process;

calculation means for providing convergent numerical solutions to the interrelated constitutive relations;

estimating means for predicting physical properties of the material form at various times during the consolidation process;

output means for providing visual and graphical representations of said physical properties; and



control means for controlling a consolidation process based upon estimated predicted physical properties.

5,202,838

NON-CONTACT IC CARD

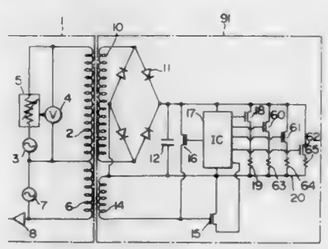
Takesi Inoue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1991, Ser. No. 686,435

Claims priority, application Japan, Apr. 19, 1990, 2-101705; Sep. 14, 1990, 2-242604

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—480 **8 Claims**



1. A non-contact IC card comprising:

power receiving means for receiving power from a terminal device without direct electrical connection to said terminal device;

signal processing means connected to said power receiving means for processing a signal;

signal transmitting/receiving means connected to said signal processing means for exchanging signals between said terminal device and said signal processing means; and

power consuming means sequentially controlled by said signal processing means to consume electrical power when the consumption of electrical power by said signal processing means and said signal transmitting/receiving means is relatively small.

5,202,839

PROCESS FOR THE STORING OF DRAWING DATA BY MEANS OF A CAD FILM-CARD LASER PLOTTER, A MICROFILM CARD AND A CAD FILM-CARD LASER FOR ITS IMPLEMENTATION

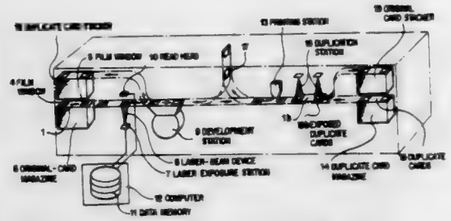
Ulrich Welp, Bad Nauheim; Stephan Welp, Bad Homburg, and Dan Hossu, Giessen, all of Fed. Rep. of Germany, assignors to Microbox Dr. Welp KG, Bad Nauheim, Fed. Rep. of Germany

Filed Jul. 5, 1990, Ser. No. 548,305

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921905; Oct. 17, 1989, 3934565

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—488 **16 Claims**



4. A CAD film-card laser plotter, comprising:

a laser exposure station;

a development station;

an inscription station; and

a duplication station;

wherein the laser exposure station, the development station, and the duplication station act on microfilm cards having film provided in a first window for storing binary data and film provided in a second window for storing graphics data; and

wherein the laser exposure station is designed to expose CAD model data on the film in the first window and is designed to expose vector and/or raster data on the film in the second window.

5,202,840

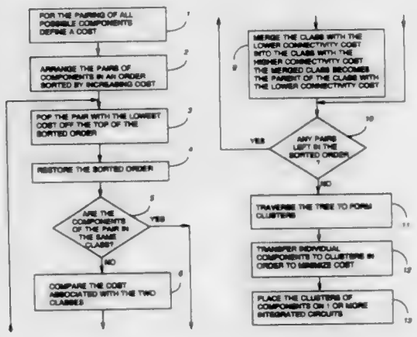
METHOD FOR PARTITIONING OF CONNECTED CIRCUIT COMPONENTS BEFORE PLACEMENT IN ONE OR MORE INTEGRATED CIRCUITS

Dale M. Wong, San Francisco, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 19, 1990, Ser. No. 630,284

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—490 **18 Claims**



1. A computer implemented method for partitioning components of an integrated circuit into clusters in preparation for placement of the clusters onto an integrated circuit, the method implemented by a computer and comprising the steps of:

(a) assigning, by the computer, a connectivity cost to every pair of connected components;

(b) beginning with a pair of connected components with a lowest assigned connectivity cost and proceeding to a pair of connected components with a highest assigned connectivity cost, placing, by the computer, the components in a cluster tree so that when merging cluster tree nodes, a cluster tree node with a higher connectivity cost is made a parent cluster tree node of a cluster tree node with a lower connectivity cost; and,

(c) traversing, by the computer, the cluster tree to partition the components into clusters.

5,202,841

LAYOUT PATTERN VERIFICATION SYSTEM

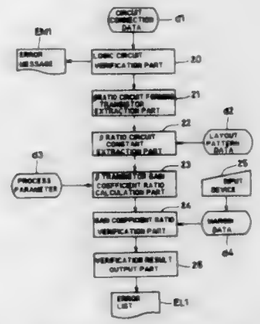
Takahiro Tani, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1990, Ser. No. 544,901

Claims priority, application Japan, Jul. 14, 1989, 1-183212; Feb. 7, 1990, 2-29151

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—491 **11 Claims**



1. A layout pattern verification system for verifying the electrical property of a layout pattern forming a prescribed logic circuit, said layout pattern verification system comprising:

circuit connection data supply means for supplying circuit connection data defining a connection relationship among elements forming said logic circuit and a large-small charge supplying capability relationship of specific ones of said elements;

layout pattern data supply means for supplying layout pattern data defining said layout pattern of said logic circuit;

process parameter supply means for supplying various process parameters required for fabricating said logic circuit;

first data extraction means for extracting said specific ones of said elements whose large-small charge supplying capability relationship is defined form said circuit connection data as verification elements;

second data extraction means for extracting circuit constants relating to charge supplying capability of said verification elements from said layout pattern data as reference circuit constants;

verification data calculation means for calculating verification data expressing a charge supplying capability ratio of said verification elements on the basis of said reference circuit constants and said process parameters; and

verification data judging means for judging effectiveness/defectiveness of the electrical property of said logic circuit formed by said layout pattern on the basis of said verification data.

5,202,842

5,202,843

5,202,846

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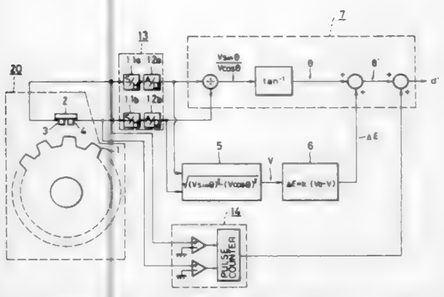
5,202,842

ROTATIONAL POSITION DETECTING DEVICE WHICH COMPENSATES FOR ECCENTRICITY OF ROTATING OBJECT

Masumi Suzuki, Niwa, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Continuation of Ser. No. 610,109, Nov. 7, 1990, abandoned. This application Jul. 17, 1992, Ser. No. 913,992
Claims priority, application Japan, Nov. 29, 1989, 1-310235
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—571.01 4 Claims



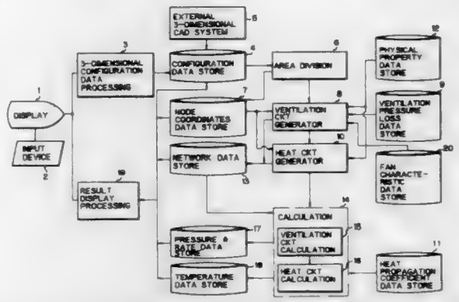
1. An apparatus for detecting a rotational position of a rotating object, said apparatus comprising:
a gear having teeth and mounted on the rotating object, said gear being of a magnetic permeable material;
a first sensor located adjacent said gear for generating a first sine-wave signal E_1 in response to said teeth of said gear;
a second sensor located adjacent said gear for generating a second sine-wave signal E_2 having a phase difference of 90° with respect to said sine-wave signal E_1, said second signal being generated in response to said teeth of said gear;
a pair of comparators for outputting two-phase pulse signals by respectively comparing said first sine-wave signal E_1 and said second sine-wave signal E_2 with a threshold;
an up-down pulse counter for counting a number of said two-phase pulse signals output from said pair of comparators and for detecting a higher digit portion N of a positional information;
a pair of sample-and-hold circuits for respectively detecting and outputting instantaneous values of said first sine-wave signal E_1 and said second sine-wave signal E_2;
a pair of analog/digital converters for respectively converting said detected instantaneous values output by said pair of sample-and-hold circuits into digital values S_1 and S_2; and
a digital computing circuit for calculating the rotational position of the rotating object using said digital values S_1 and S_2 and said higher digit portion N, wherein said digital computing circuit includes means for performing the following steps:
(i) calculating a position θ at a lower digit portion of the positional information using one of equations: $\theta=\tan^{-1}(S_1/S_2)$ and $\theta=\tan^{-1}(S_2/S_1)$;
(ii) calculating an amplitude V of the first sine-wave signal E_1 and the second sine-wave signal E_2 using an equation $V=\sqrt{S_1^2+S_2^2}$;
(iii) calculating an eccentricity error $\Delta\epsilon$ caused by an eccentricity of the gear at the higher digit portion N from the amplitude V;
(iv) detecting the rotational position of the rotating object using the higher digit portion N, the lower digit portion θ and the eccentricity error $\Delta\epsilon$.

5,202,843

CAE SYSTEM FOR AUTOMATIC HEAT ANALYSIS OF ELECTRONIC EQUIPMENT

Naoki Kunimine, and Noboru Kimura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo

Filed Apr. 24, 1991, Ser. No. 690,586
Claims priority, application Japan, Apr. 25, 1990, 2-111509; May 25, 1990, 2-136242
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—578 19 Claims



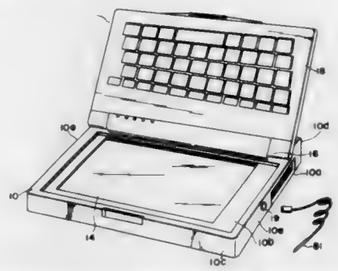
11. A system for effecting thermal analysis of equipment by numerical calculations, comprising:
storing means for storing first data representative of parameters including a tridimensional configuration of the equipment;
first processing means for processing said first data to generate second data representative of a wire frame in a tridimensional space of the equipment;
second processing means for dividing said second data into a plurality of blocks to generate nodes representative of said plurality of blocks, and for executing thermal analysis of the equipment on the basis of said nodes to output third data representative of a result of said thermal analysis; and
outputting means for superimposing said third data on said second data to output said second data and said third data visually on a display thereof.

5,202,844

COMPUTER HAVING INTEGRAL TYPE HAND WRITING INPUT/DISPLAY DEVICE AND KEYBOARD

Shizuo Kamio; Fumitaka Sato; Shimpei Kunii, and Masayoshi Murayama, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 21, 1991, Ser. No. 702,810
Claims priority, application Japan, May 22, 1990, 2-130361; May 22, 1990, 2-130363; Jun. 8, 1990, 2-150461; Aug. 30, 1990, 2-228653
Int. Cl.[5] G06F *3/00*
U.S. Cl. 364—709.11 10 Claims



1. An information processing apparatus comprising:

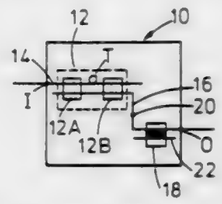
an apparatus body;
an integral type hand writing input/display device, having a tablet device for coordinate input integrally superimposed on a display device, for inputting coordinate data representing a location indicated on the tablet device;
a keyboard;
a rotary support mechanism, provided on a top portion of the apparatus body, for rotating said integral type hand writing input/display device and said keyboard from a position, in which a display input surface of the integral type hand writing input/display device and a surface of the keyboard face each other, to a position of a desired opening angle, and for keeping the opening angle;
attitude detecting means for detecting an attitude of the apparatus body, in accordance with an installation state of the apparatus body; and
changing means for changing the display contents and coordinate data detection location of the integral type hand writing input/display device in accordance with the detection result of the attitude detecting means.

5,202,845

OPTICAL SIGNAL PROCESSING METHOD AND APPARATUS USING COUPLED CHANNELS

Ivan Andonovic, Glasgow; Brian Culshaw, Kilmacolm, and Mohammed Shabeer, Glasgow, all of England, assignors to British Telecommunications public limited company, London, England

PCT No. PCT/GB89/01241, § 371 Date Jun. 17, 1991, § 102(e) Date Jun. 17, 1991, PCT Pub. No. WO90/04823, PCT Pub. Date May 3, 1990
PCT Filed Oct. 19, 1989, Ser. No. 689,899
Claims priority, application United Kingdom, Oct. 20, 1988, 8824625; Oct. 29, 1988, 8825377
Int. Cl.[5] G06F *1/04;* G06E *1/02*
U.S. Cl. 364—713 12 Claims



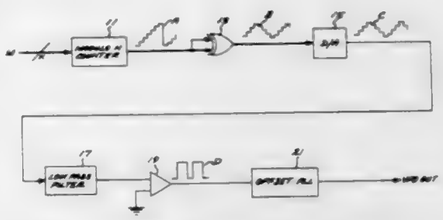
1. An optical processing device for processing an optical data input to determine matching or mismatching between the data input and a predetermined reference, said optical processing device comprising at least two couplers each having a principal channel and a coupled channel, the principal channels of said couplers being connected in series with a time delay T between adjacent couplers, the coupled channels of said couplers being connected in series with a time delay between adjacent couplers which is minimal in comparison to time delay T, each optical coupler being presettable to enable or to inhibit optical coupling of an input data signal from its principal channel to its coupled channel, and the output of the optical processing device being taken from the coupled channel, wherein the output of the optical processing device is coupled to optical switch means, said optical switch means being presettable to provide an output signal when the optical input thereto exceeds a threshold value.

5,202,846

PRIME NUMBER SPUR REDUCTION FOR DIGITAL SYNTHESIS

Kurt E. Rasmussen, Torrance, and Tom C. Bryan, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1990, Ser. No. 632,248
Int. Cl.[5] G06F *1/02*
U.S. Cl. 364—721 2 Claims



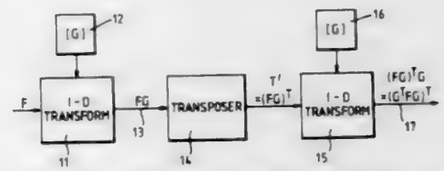
1. A variable frequency synthesizer comprising:
modulo N counting means responsive to a digital control word for providing a digital ramp signal representative of the phase of a sinewave, the count limit N being a product of prime numbers;
gating means responsive to said digital ramp signal for producing a digital periodic signal having a frequency determined by the control word; and
conversion means for converting said digital periodic signal to an analog periodic signal;
whereby selecting the count limit N as a product of prime numbers substantially reduces spurious distortion due to time step quantization of said digital ramp signal.

5,202,847

DIGITAL SIGNAL PROCESSING

Martin J.P. Bolton, Bristol, and Kenneth N. Burgin, Stonehouse, both of United Kingdom, assignors to Inmos Limited, Bristol, England

Filed Jul. 31, 1990, Ser. No. 560,114
Int. Cl.[5] G06F *15/332*
U.S. Cl. 364—725 13 Claims



1. Digital signal processing circuitry comprising first and second processors each for effecting a linear transform on respective blocks of digital data, each of said processors including transform variation circuitry for varying the linear transform effected by the respective processor, said first and second processors being coupled as a linear pipeline by means of pipeline circuitry, said pipeline circuitry including timing controlled circuitry arranged to control the transmission of a succession of blocks of digital data through each of said first and second processors in succession to effect a combined transform, and selection circuitry coupled to the transform variation circuitry of each of said first and second processors and arranged to select the linear transform effected by the respective processor independently of the selection of linear transform of the other processor, whereby the combined transform to be performed on each block of data by the digital signal

processing circuitry is selectable independently of the com-

5,202,849

5,202,850

having at least one input terminal for receiving address signals;

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processing circuitry is selectable independently of the combined transform to be performed on a successive block of data.

5,202,848

READ ONLY MEMORY DEVICE

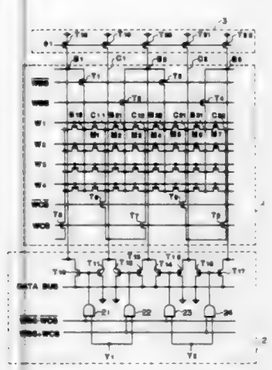
Akira Nakagawara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,931
Claims priority, application Japan, Oct. 27, 1989, 1-280162
Int. Cl.[5] G11C *17/12*
U.S. Cl. 365—104 **7 Claims**

1. A read-only memory device for storing programmed data and subsequently reading out the stored data, comprising

a plurality of memory cells arranged in rows and columns in a matrix configuration and including MIS (metal insulated semiconductor) transistors which may be selectively set to a high threshold voltage or to a low threshold voltage in accordance with programmed data,

a plurality of word lines used in common in each row of said cells and connected to gates of said MIS transistors,



a plurality of bit lines arranged substantially orthogonally to said word lines, said bit lines connected as one of the sources or the drains of said MIS transistors and being used in common for data read-out by one of adjacent columns of said memory cells,

a plurality of column lines arranged between said bit lines in alternation with and parallel to said bit lines, said column lines being used in common by the other of adjacent columns of said memory cells and functioning as the other of said sources or drains of said MIS transistors of columns of said cells, a potential difference higher than said low threshold voltage and lower than said high threshold voltage of said MIS transistor being applied on selection with respect to the voltage at said word line,

first selection means for selecting groups each consisting of a plurality of said bit lines and a plurality of said column lines,

second selection means for selecting said bit lines in each group, and

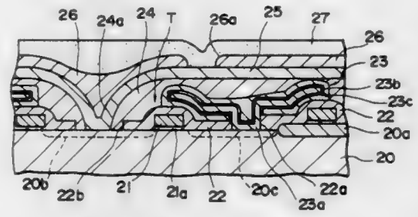
third selection means for selecting said column lines in each group.

5,202,849

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Shigeki Nozaki, Miyazaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 599,937, Oct. 19, 1990, abandoned.
This application Aug. 18, 1992, Ser. No. 929,488
Claims priority, application Japan, Oct. 20, 1989, 1-273970
Int. Cl.[5] G11C *11/24*
U.S. Cl. 365—149 **6 Claims**



1. A dynamic random access memory comprising:

a semiconductor substrate having an upper major surface;

a transfer transistor provided on the semiconductor substrate, said transistor comprising first and second diffusion regions that are formed in the semiconductor substrate and exposed at the upper major surface of the substrate;

a memory cell capacitor provided on the semiconductor substrate, said memory cell capacitor comprising a first electrode in contact with the first diffusion region at the upper major surface of the semiconductor substrate and located above the upper major surface with respect to the semiconductor substrate, a second electrode opposing with the first electrode and a dielectric film interposed between the first and second electrodes;

a first conductor pattern provided on the semiconductor substrate to extend in a first direction as a word line of the dynamic random access memory;

a first insulator layer provided on the upper major surface of the semiconductor substrate so as to bury the memory cell capacitor and the first conductor pattern, said first insulator layer having an upper major surface that is located above the memory cell capacitor and the first conductor pattern;

a first contact hole provided on the first insulator layer so as to expose the second diffusion region;

a second conductor pattern having an upper major surface and a lower major surface, said second conductor pattern being provided on the upper major surface of the first insulator layer and extending in a second, different direction, said second conductor pattern extending along the upper major surface of the first insulator layer, passing above the memory cell capacitor, said second conductor pattern being provided such that the lower major surface thereof makes a contact with the second diffusion region at the first contact hole;

a second insulator layer having an upper major surface and a second major surface, said second insulator layer being provided on the second conductor pattern;

a second contact hole provided on the second insulator layer at a part thereof that locates above, and in correspondence to the memory cell capacitor so as to expose the upper major surface of the second conductor pattern; and

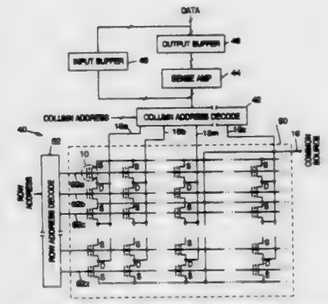
a third conductor pattern having a lower major surface, said third conductor pattern being provided on the second insulator layer so as to extend in the second direction substantially coincident with the second conductor pattern as a bit line of the dynamic random access memory, said third conductor pattern being provided such that the lower major surface thereof makes a contact with the upper major surface of the second conductor pattern at the second contact hole.

5,202,850

SINGLE TRANSISTOR NON-VOLATILE ELECTRICALLY ALTERABLE SEMICONDUCTOR MEMORY DEVICE WITH A RE-CRYSTALLIZED FLOATING GATE

Ching-Shi Jenq, San Jose, Calif., assignor to Silicon Storage Technology, Inc., Sunnyvale, Calif.

Division of Ser. No. 467,918, Jan. 22, 1990, Pat. No. 5,067,108.
This application Aug. 21, 1991, Ser. No. 748,627
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **8 Claims**



1. An electrically programmable and erasable memory device comprising:

a substrate of semiconductor material of a first conductivity type;

first and second spaced-apart regions in said substrate of a second conductivity type, with a channel region therebetween;

a first insulating layer disposed over said substrate including over said first, second and channel regions;

an electrically conductive single crystalline floating gate disposed over said first insulating layer and extending over a portion of said channel region and over a portion of said second region to maximize a capacitive coupling therewith;

a second insulating layer disposed over and adjacent said floating gate and having a thickness permitting Fowler-Nordheim tunneling of charges therethrough; and

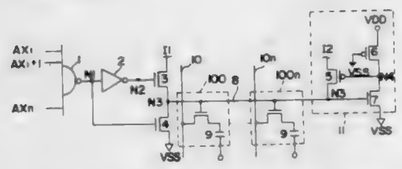
an electrically conductive control gate having two electrically connected sections, a first section disposed over said first insulating layer, spaced apart from said floating gate and adjacent to said second insulating layer, extending over a portion of said first region; said second section disposed over said second insulating layer to minimize capacitive coupling with said floating gate.

5,202,851

WORD LINE DRIVING CIRCUIT

Jung-Kee Do, Anyang, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea

Filed Mar. 7, 1991, Ser. No. 665,698
Claims priority, application Rep. of Korea, Mar. 9, 1990, 903167
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—189.01 **3 Claims**



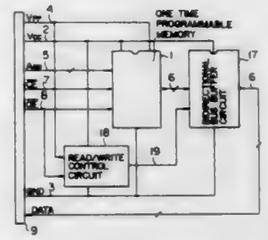
1. A word line driving circuit comprising: a NAND gate having at least one input terminal for receiving address signals; a first N-MOS transistor with its gate connected to an output terminal of said NAND gate; a second N-MOS transistor, with its gate connected through an inverter to the output terminal of said NAND gate; said first N-MOS transistor being connected to a ground terminal and to said second N-MOS transistor, said second N-MOS transistor being configured for receiving a first input signal, and a node of said first N-MOS transistor being connected to a word line for at least one memory cell; the above components constituting the word line driving circuit; and an accelerating circuit added to said word line and to the side opposite from said word line driving circuit.

5,202,852

PROGRAMMABLE READ ONLY MEMORY CARD WITH IMPROVED BUFFER CIRCUIT

Masaharu Mizuta, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 372,777, Jun. 29, 1989, abandoned.
This application Jun. 10, 1991, Ser. No. 713,560
Claims priority, application Japan, Feb. 9, 1989, 1-28596
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.01 **5 Claims**



1. A programmable read only memory card comprising:

memory means, including at least one programmable read only memory having an external data port that can withstand an electrostatic discharge up to a first magnitude without damage, for storing data written into said memory means;

a connector for electrical connection of said programmable read only memory card to external circuitry;

distinct input and output lines connected between said memory means and said connector including a power supply line for supplying power to said programmable read only memory card, a ground line for connection to an electrical ground, a write power supply line for supplying power during writing in said memory means, an address bus for supplying an address for reading data from and writing data into said memory means, a data bus for supplying data to and transmitting data from said programmable read only memory card, a card enable control line for controlling operation of said programmable read only memory card, and an output enable control line for controlling output of data from said programmable read only memory card;

a bidirectional buffer circuit connected to said data bus for selectively enabling transmission of data to said at least one programmable read only memory for writing data into said at least one programmable read only memory and transmission of data from said at least one programmable read only memory in response to a directional control signal, said bidirectional buffer circuit withstanding an electrostatic discharge up to a second magnitude without damage, the second magnitude exceeding the first magnitude; and

a read/write control circuit connected to said output enable control line and said write power supply line for controlling writing of data into and reading of stored data from said at least one programmable read only memory in

response to the voltages on said output enable control line

on the basis of said control clock signal inputted from

active level after said transfer signal has been changed to

multiplexing means for selectively coupling each of said data

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response to the voltages on said output enable control line and said write power supply line and for generating the directional control signal supplied to said bidirectional buffer circuit in response to the voltages of said output enable control line and said write power supply line, said read/write control circuit including:

a first differential amplifier having a first input connected to the write power supply line and a second input connected to a first reference voltage, the first differential amplifier generating an output signal indicative of a difference between the voltage on the write power supply line and the reference voltage; and

control logic means connected to said output enable control line and receiving the output signal from said first differential amplifier for outputting the directional control signal in response to the voltage on the output enable control line and the output signal.

5,202,853

CIRCUIT FOR PERFORMING A PARALLEL WRITE TEST OF A WIDE MULTIPLE BYTE FOR USE IN A SEMICONDUCTOR MEMORY DEVICE

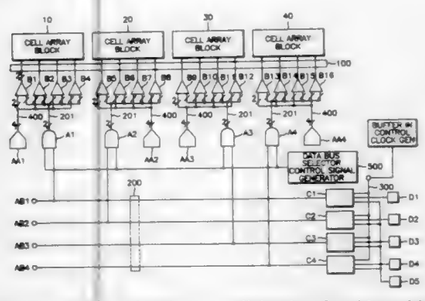
Yoon-Ho Choi, Inchun, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 28, 1990, Ser. No. 488,739

Claims priority, application Rep. of Korea, Jun. 13, 1989, 1989-8098

Int. Cl.[5] G11C *29/00*

U.S. Cl. 365—201 **17 Claims**



1. A circuit for performing a parallel write of a wide multiple byte in a semiconductor memory disk having a plurality of cell array blocks comprised of a plurality of input/output lines, a plurality of data input buffers for buffering, to a plurality of data bus lines, input data from a data input pad and multiple data from a plurality of input/output multiplexed pads on the basis of a buffer input control clock signal, comprising:

a plurality of data bus selectors for selecting the data bus lines, said data bus lines being respectively connected to outputs of the data input buffers, on the basis of a control clock signal received from a data bus selector control clock generator;

a plurality of individual data input drivers for driving the output of respective ones of said data bus selectors and simultaneously providing an output to said input/output lines, each of said input/output liens being coupled to respective data bit lines of said cell array blocks one to one, on a basis of a clock pulse generated from clock pulse generators; wherein

each of said data bus selectors comprise:

first gating means for performing a logical operation on data received from a first input of said data bus lines, on a basis of the control clock signal received from said data bus selector control clock generator to provide an output signal;

second gating means for performing a logical operation on data received from a second input of said data bus lines, on the basis of said control clock signal inputted from said data bus selector control clock generator;

first means for inverting the output signal of said first gating means, said inverted output signal being coupled to said individual data input drivers; and

second means for inverting the output signal of said second gating means, said inverted output signal being coupled to said individual data input drivers;

said input and output of said first inverting means being complementary to said input and output of said second inverting means.

5,202,854

SEMICONDUCTOR MEMORY CIRCUIT

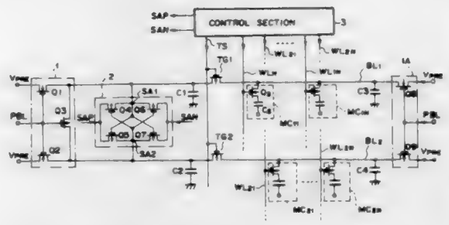
Hiroki Koike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,229

Claims priority, application Japan, Sep. 5, 1990, 2-234808

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—203 **2 Claims**



1. A semiconductor memory circuit comprising:

a first bit line and a second bit line;

a plurality of first word lines and a plurality of second word lines;

a plurality of first memory cells which are respectively connected to said first word lines and said first bit line and which communicate memory data with said first bit line when said first word lines are of a selecting level;

a plurality of second memory cells which are respectively connected to said second word lines and said second bit line and which communicate memory data with said second bit line when said second word lines are of a selecting level;

a first transfer gate and a second transfer gate whose each one end is correspondingly connected to each of said first bit line and said second bit line and which are switched ON and OFF in response to a transfer signal;

a sense amplifier whose first and second input-output terminals are respectively and correspondingly connected to the other ends of said first and second transfer gates and which are activated for amplifying signals between said first and second input-output terminals when an activating signal is at an activate level;

a precharge circuit which precharges said first and second input-output terminals of the sense amplifier to a predetermined level when a precharge signal is at an active level; and

a control section which sets said transfer signal to its active level thereby turning said first and second transfer gates to their ON-states after said precharge signal has been changed from its active level to its non-active level, which sets a predetermined word line of said plurality of first and second word lines to its selecting level after said transfer signal has been changed to its active level, which sets said transfer signal to its non-active level thereby turning said first and second transfer gates to their OFF-states after said predetermined word line has been changed to its selecting level, and which sets said activating signal to its

active level after said transfer signal has been changed to its non-active level.

5,202,855

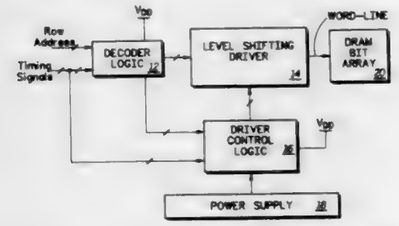
DRAM WITH A CONTROLLED BOOSTED VOLTAGE LEVEL SHIFTING DRIVER

Bruce L. Morton, Round Rock, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 14, 1991, Ser. No. 640,776

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—226 **10 Claims**



9. A controlled level shifting DRAM driver circuit for driving a predetermined one of a plurality of word-lines in a DRAM having an array of memory cells located at intersections of bit lines and the word-lines, each memory cell having a transistor and a capacitor wherein the transistor has a control electrode connected to a predetermined word-line, comprising:

level shifting driver means having a control input for receiving a control signal to place the word-line in an active state, the word-line being placed in the active state by being electrically driven to a first predetermined voltage for a first time period; and

control means coupled to the level shifting driver means for selectively providing a second predetermined voltage which is a predetermined amount greater than the first predetermined voltage, the second predetermined voltage being coupled to the word-line during a second time period immediately after the word-line is placed in the active state by being electrically driven to the first predetermined voltage during the first time period, the word-line being placed in an inactive state by initially returning the word-line to the first predetermined voltage for a predetermined amount of time before the word-line is discharged to a third voltage.

5,202,856

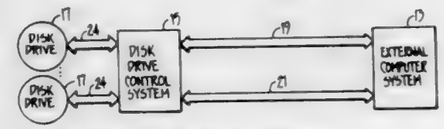
METHOD AND APPARATUS FOR SIMULTANEOUS, INTERLEAVED ACCESS OF MULTIPLE MEMORIES BY MULTIPLE PORTS

Joseph S. Glider, Palo Alto; Kaushik S. Shah, Santa Clara, and Edward E. Asato, Sunnyvale, all of Calif., assignors to Micro Technology, Inc., Sunnyvale, Calif.

Filed Apr. 5, 1990, Ser. No. 505,297

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—230.05 **10 Claims**



5. A memory buffering system comprising:

a plurality of memories;

a plurality of data ports;

multiplexing means for selectively coupling each of said data ports to each of said memories;

sequencing means, coupled to said multiplexing means, for providing control signals to said multiplexing means to alternately couple said data ports to each of said memories for the concurrent transfer of a first block of data between a first port and a first memory and a second block of data between a second port and a second memory, each of said memories having a capacity of a plurality of blocks of data;

a plurality of address bus inputs, one associated with each of said data ports;

multiplexing means for coupling each of said address bus inputs to one of said memories to which its corresponding data port is coupled;

a separate address counter coupled to each of said address bus inputs; and

a number of bits of each said address bus sufficient to address said plurality of memories coupled as inputs to said sequencing means.

5,202,857

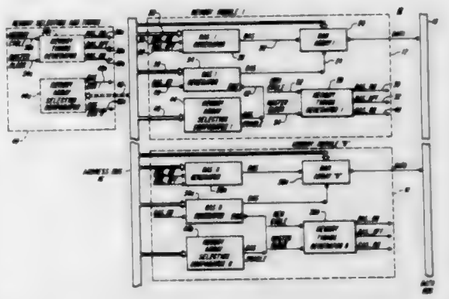
SYSTEM FOR GENERATING MEMORY TIMING AND REDUCING MEMORY ACCESS TIME

Moshe Yanai, Framingham; Natan Vishlitzky, Brookline; Bruno Alterescu, Newton, and Daniel Castel, Framingham, all of Mass., assignors to EMC Corporation, Hopkington, Mass.

Filed Nov. 7, 1990, Ser. No. 610,424

Int. Cl.[5] G11C *8/04*

U.S. Cl. 365—233 **4 Claims**



1. A system for generating memory timing signals and for reducing memory access time, comprising:

means for providing memory addresses, each memory address including at least a memory array address portion, a row address portion, and a column address portion;

a plurality of memory modules, each memory module having a unique memory module address, said modules responsive to a memory array address portion of a provided memory address which corresponds to said unique memory module address, each of said memory modules including an array of memory cells operative for storing data, each memory cell addressable in response to at least one row address select signal and at least one column address select signal;

each memory module further including:

an associated row address select signal generator, responsive to said row address portion of each of said provided memory addresses and to at least one row address select timing signal, each row address select signal generator for providing said at least one row address select signal to each of said array of memory cells on said associated memory module; and

an associated column address select signal generator, responsive to said column address portion of each of said provided memory addresses, to at least one column

5,202,860

5,202,861

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address select timing signal, and to a column address select signal generator enable signal, for decoding said column address portion of each of said provided memory addresses while each of said row address signal generators is providing said at least one row address select signal to each of said arrays of memory cells, and for providing said at least one column address select signal to a selected column of said array of memory cells within one selected memory module;

at least one memory array selection comparator associated with each of said memory modules, for comparing said memory array address portion of a provided memory address with said unique memory module address while each of said row address signal generators is providing said at least one row address select signal to each of said arrays of memory cells, and for identifying said one selected memory module from among said plurality of memory modules, and for providing said column address select signal generator enable signal to one column address select signal generator associated with the one selected memory module upon the equivalence of said memory array address portion of said provided memory address and said unique memory module address; and

at least one memory timing generator associated with each of said memory modules, responsive to at least one memory cycle initiate signal and to a clock signal, for sequentially providing said row address select timing signal and said column address select timing signal, said row address select timing signal from each memory timing generator associated with each of said memory modules operative for enabling each row address select signal generator associated with each of said plurality of memory modules to generate a row address select signal to each memory module prior to the time that the memory array selection comparator associated with the one selected memory module identifies the selected one memory module and provides said column address select signal generator enable signal to enable only the one column address select signal generator associated with the one selected memory module, thereby enabling only said one column address select signal generator associated with said one selected memory module, said one column address select signal generator subsequently providing said at least one column address select signal to said selected column of memory cells of said one selected memory module.

5,202,858

ANALOG ELECTRONIC TIMEPIECE HAVING AN ELECTRIC-OPTICAL DISPLAY DEVICE

Takashi Kanzaki, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,698

Claims priority, application Japan, Nov. 28, 1990, 2-322676; Dec. 31, 1990, 2-417463

Int. Cl.[5] **G04B** *25/00, 19/04*

U.S. Cl. 368—71 **34 Claims**

1. An analog electronic timepiece having an electric-optical display device, comprising:

a dial plate in which an opening is formed;

time-indicating hand means for pivotally moving hands on said dial plate to indicate the time;

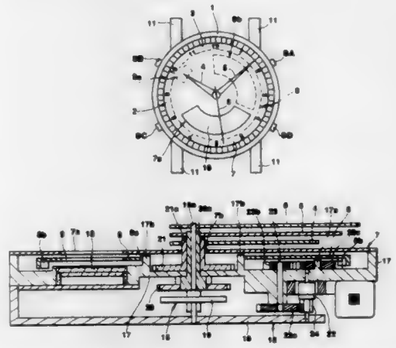
electric-optical display means arranged below the opening of said dial plate;

a shutter plate mounted between said dial plate and said electric-optical display means;

data generating means for generating at least two different types of data which require the different numbers of display digits to be used to display them on said electric-optical display means;

display control means for selectively displaying the two types of data generated by said data generating means on said electric-optical display means; and

shutter plate movement control means for moving said shutter plate to a first position, in which only one data is exposed through the opening of said dial plate, and stopping it at the first position when one of the two types of data is displayed on said electric-optical display means by said display control means, and



for moving said shutter plate to a second position, in which only the other data is exposed through the opening of said dial plate, and stopping it at the second position when the other type of data is displayed on said electric-optical display means.

5,202,859

TIME INFORMING CLOCK

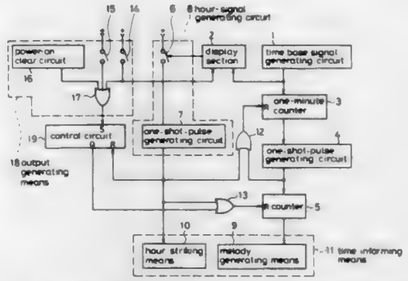
Yuji Gorai, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Feb. 5, 1991, Ser. No. 650,483

Claims priority, application Japan, Feb. 6, 1990, 2-10687[U]

Int. Cl.[5] **G04B** *21/00*

U.S. Cl. 368—274 **19 Claims**



1. A time informing clock comprising: display means for indicating time by means of clock hands, counter means for receiving a time base signal and counting the time, time informing means for informing at least on the half hour and on the hour on the basis of the time count of the counter means, hour-signal generating means for generating an hour signal and resetting the counter means each time the clock hands indicate the hour to make the time count of the counter means coincide with the time indication of the clock hands, output generating means for generating an output when electric power is applied to the clock or when the time count of the counter means and the time indication of the clock hands are different, the output generating means including switch means for generating an output to inhibit operation of the time informing means during time correction of the clock hands, and control means for inhibiting the time informing operation of the time informing means from when the output is generated from the output generating means to when the hour signal is generated.

5,202,860

MAGNETO-OPTIC REPRODUCING DEVICE USING RIGHT AND LEFT CIRCULARLY POLARIZED LIGHT

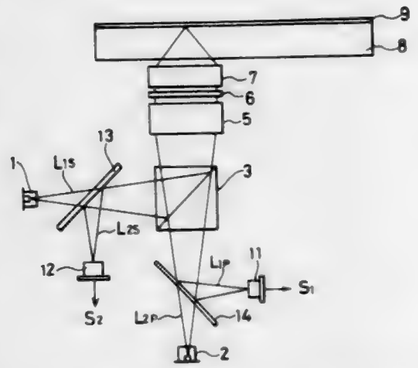
Akira Takahashi, Nara; Yoshiteru Murakami, Nishinomiya; Junsaku Nakayima, Yamatotakada, and Kenji Ohta, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1991, Ser. No. 664,183

Claims priority, application Japan, Mar. 5, 1990, 2-53978; Mar. 5, 1990, 2-53979

Int. Cl.[5] **G11B** *11/00, 5/127;* **G01J** *4/00*

U.S. Cl. 369—13 **31 Claims**



1. A reproducing optical device for a magneto-optical recording medium, comprising:

light source means for simultaneously emitting linearly polarized lights whose polarization directions are mutually orthogonal towards a magneto-optical recording medium, wherein the recording medium is comprised of a plurality of magnetized sections each magnetized in response to recorded information in either a first direction perpendicular to a surface of the recording medium or a second direction that is a reverse direction with respect to the first direction;

quarter wavelength plate means, disposed between the recording medium and the light source means, for converting one of the linearly polarized lights into a right circularly polarized light and the other of the linearly polarized lights into a left circularly polarized light;

means for directing said right circularly polarized light and said left circularly polarized light simultaneously onto one of said magnetized sections;

first photodetector means for generating a first reproduced signal that corresponds to a variation due to circular dichroism such that intensity of a first reflected light is strong corresponding to one of said magnetized sections magnetized in the first direction and is weak corresponding to one of said magnetized sections magnetized in the second direction, the first reflected light being a reflected light of the right circularly polarized light from the recording medium; and

second photodetector means for generating a second reproduced signal that corresponds to a variation, due to circular dichroism, between weak intensity of a second reflected light, corresponding to one of said magnetized sections magnetized in the first direction, and strong intensity of the second reflected light, corresponding to one of said magnetized sections magnetized in the second direction, the second reflected light being a reflected light of the left circularly polarized light from the recording medium.

5,202,861

MAGNETO-OPTICAL DISK DRIVE HAVING A MECHANISM FOR MOVING A BIAS MAGNETIC FIELD COIL

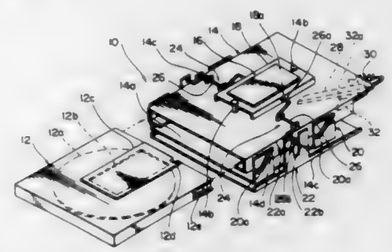
Teruo Yoshida, Gunma, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 800,130

Claims priority, application Japan, Nov. 29, 1990, 2-331513

Int. Cl.[5] **G11B** *13/04, 11/12, 11/10*

U.S. Cl. 369—13 **2 Claims**



1. A magneto-optical disk drive comprising:

a cassette holder for accommodating a cartridge having a magneto-optical disk therein;

a coil base mounted on said cassette holder;

a bias magnetic field coil affixed to said coil base;

body base supporting said cassette holder;

loading means interposed between said cassette holder and said body base and movable on said body base in a reciprocating motion for moving said cassette holder toward and away from said body base; and

coil elevating means interposed between said cassette holder and said coil base for moving said coil base away from said cassette holder in association with the movement of said cassette holder away from said body base;

wherein said coil elevating means comprises a connecting rod for moving said coil base away from said cassette holder in association with the movement of said cassette holder away from said body base, wherein said connecting rod presses, when said coil base contacts said cassette holder, said coil base against said cassette holder with an adequate degree of biasing force.

5,202,862

MAGNETO-OPTICAL RECORDING AND REPRODUCING DEVICE HAVING INTEGRALLY FORMED RECORDING AND REPRODUCING MAGNETIC HEADS

Kenji Ohta, Kitakatsuragi; Akira Takahashi, Nara; Tetsurou Muramatsu, Nara; Tatsushi Yamamoto, Nara, and Toshio Ishikawa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha

Filed Jun. 11, 1991, Ser. No. 713,742

Claims priority, application Japan, Jun. 13, 1990, 2-158072; Jun. 13, 1990, 2-158077; Jun. 20, 1990, 2-162098

Int. Cl.[5] **G11B** *13/04, 11/14*

U.S. Cl. 369—13 **9 Claims**

5. A magneto-optical recording and reproducing device comprising:

light converging means for converging a light beam of substantially constant intensity and irradiating the light beam as a light beam spot on a predetermined area of a magnetic film, the light converging means being disposed on a translucent-substrate side of a magneto-optical recording medium, the substrate having a guiding groove provided thereon and having the magnetic film formed thereon; and

a recording and reproducing magnetic head for recording information by applying a magnetic field on the area on the magneto-optical recording medium where the light beam is irradiate as the light beam spot by the light con-

verging means, the magnetic head comprising a coil

surface of the loaded magneto-optical disk in a floating

reading out an address of a track on the recording carrier

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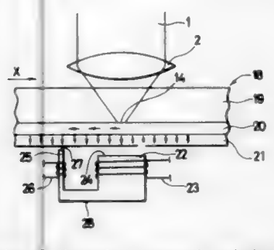
verging means, the magnetic head comprising a coil wound around a ring-shaped magnetic core with a gap portion, the magnetic field reversing in response to information to be recorded, as well as for reproducing the



information by detecting temporal variation of magnetic flux form the magnetic film, the recording and reproducing magnetic head being disposed on a magnetic-film side of the magneto-optical recording medium.

5,202,863

MAGNETO-OPTICAL DISK UNIT COMPATIBLE WITH DIFFERENT TWO TYPES OF MAGNETO-OPTICAL DISKS AND A MAGNETIC-FIELD GENERATOR SUITABLE THEREOF

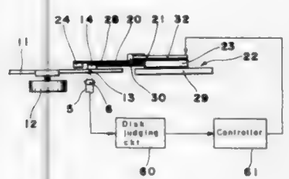
Norio Miyatake, Hyogo; Hidetsugu Kawabata, Osaka; Kiyoshi Uchida, Osaka; Yasumori Hino, Osaka; Teruyuki Takizawa, Osaka, and Tohru Nakamura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

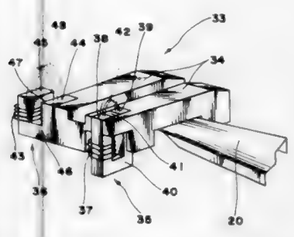
Filed Sep. 10, 1991, Ser. No. 757,461

Claims priority, application Japan, Sep. 11, 1990, 2-242107; Mar. 5, 1991, 3-038329

Int. Cl.[5] G11B *13/04, 11/12, 11/10*

U.S. Cl. 369—13 **13 Claims**





1. A magneto-optical disk unit for recording on a magneto-optical disk loaded therein, the magneto-optical disk being either one of a first type of magneto-optical disk that can be overwritten through modulation of a magnetic field and a second type of magneto-optical disk that requires an erase operation prior to undergoing a write operation, said magneto-optical disk unit comprising:

a first magneto-field generator for generating a first magnetic field corresponding to a frequency in a recording signal frequency band when a loaded magneto-optical disk is the first type of magneto-optical disc, said first magnetic-field generator having a slider part for sliding over a surface of the loaded magneto-optical disk in a floating manner using an aerodynamic effect;

a second magnetic-field generator for generating a second magnetic field having DC magnetic fields of both north-seeking and south-seeking poles when the loaded magneto-optical disk is the second type of magneto-optical disk, the second magnetic-field generator being spaced from the surface of the loaded second type of magneto-optical disk;

drive means for moving said first and second magnetic-field generators in a direction parallel to the surface of the loaded magneto-optical disk; and

up-down drive means for vertically moving said first magnetic-field generator to bring it into contact with the surface of the loaded magneto-optical disk when the loaded magneto-optical disc is the first type of magneto-optical disc.

5,202,864

SLIP-OFF PREVENTING TRACKING CONTROL APPARATUS

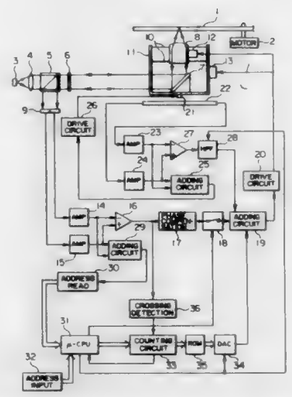
Mitsuro Moriya, Neyagawa; Hiroyuki Yamaguchi, and Masayoshi Shioya, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 337,156, Apr. 12, 1989, Pat. No. 5,109,366. This application Dec. 27, 1991, Ser. No. 813,930

Claims priority, application Japan, Apr. 14, 1988, 63-92023

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—32 **8 Claims**



1. A tracking control apparatus for performing a tracking control operation so as to position an irradiating optical beam on a track on a recording carrier to reproduce information therefrom, comprising:

track deviation detecting means for detecting a positional deviation of the optical beam from a track;

moving means for moving a movable member which causes the optical beam to move in a track width direction;

position detecting means for detecting a position of said movable member moved by said moving means;

a control circuit for driving said moving means in accordance with an output signal of said track deviation detecting means and for performing a control operation so as to always position the optical beam on the track; and

a processing circuit having a high-pass filter for preventing passage of a signal in a low-frequency region, said processing circuit processing an output signal of said position detecting means and generating a processed output signal to be supplied to said moving means in the tracking control operation, wherein said processing circuit includes an address read circuit, a register circuit and a slippage detecting circuit, said address read circuit continuously

reading out an address of a track on the recording carrier at which the optical beam is positioned, said register circuit registering a latest address number and an address number before the latest address number which are sent from said address read circuit, said slippage detecting circuit calculating an address number difference between the latest address number and the address number before the latest address number which are stored in said register circuit and detecting occurrence of slippage in the tracking control operation; and said processing circuit generates the processed output signal to be supplied to said moving means in accordance with an output signal of said slippage detecting circuit.

5,202,865

TRACK ACCESS CONTROL APPARATUS FOR OPTICAL DISK APPARATUS

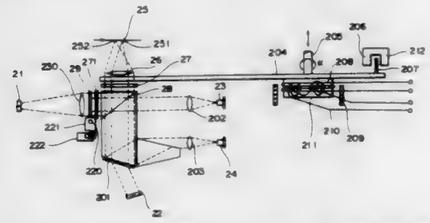
Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 5, 1990, Ser. No. 488,250

Claims priority, application Japan, Mar. 9, 1989, 1-56947; Mar. 20, 1989, 1-68682

Int. Cl.[5] G11B *7/085*

U.S. Cl. 369—32 **7 Claims**



1. A track access control apparatus for an optical disk apparatus including a rotatable optical disk having a center on which a plurality of guide grooves for defining tracks and guiding a beam spot projected thereon are spirally formed along a direction of rotation of the rotatable optical disk, and an optical head including a first light source for emitting a first beam of first light, a second light source for emitting a second beam of second light and an object lens for focusing the first and the second beams onto the rotatable optical disk, said track access control apparatus comprising:

first photodetector means for detecting a third light of the first beam reflected from said rotatable optical disk and producing a first output signal;

optical head access control means for moving said optical head to a target position where the first beam is positioned on one of the tracks having a target track address, said optical head access control means including means for obtaining a current track address from the first output signal, means for detecting a difference between the target track address and the current track address and means for moving said object lens to the target position across the tracks of said rotatable optical disk along a first line which is offset from a second line passing through the center of said rotatable optical disk and parallel to the second line;

first and second sensors detecting first and second positional information of said first and second beams, respectively;

means for obtaining relative positional information between the first and the second beams on said rotatable optical disk at said target track address responsive to the first and second positional information and a geometrical positional relationship formed between the first and second beams;

means for computing a driving amount required to move the second beam to a target track based on said relative positional information; and

means for moving a position of the second beam responsive to the driving amount on said rotatable optical disk.

5,202,866

DIGITAL AUDIO DISK PLAYER

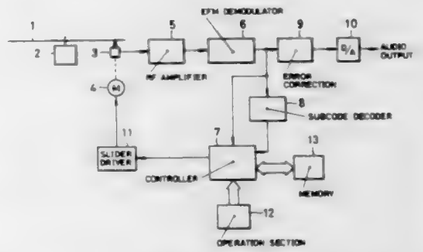
Hiroshi Otsubo, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 668,139

Claims priority, application Japan, Jan. 8, 1990, 2-150184

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—32 **10 Claims**



1. A method for detecting the peak levels of music recorded on a digital audio disk having a plurality of music pieces recorded thereon, the method comprising the steps of:

reading the digital audio disk for playback of each of selected music pieces recorded thereon;

producing an output signal from data read from said audio disk;

detecting a level of said output signal as each music piece is read from the audio disk;

determining a peak level of said output signal for each of said music pieces;

determining the address of each peak level for each of said music pieces; and

storing each peak value and the address for each peak value associated therewith for each of said music pieces.

5,202,867

CONDENSING OPTICAL SYSTEM WITH CORRECTED CHROMATIC ABERRATION, AND INFORMATION RECORDING/REPRODUCING APPARATUS USING THIS OPTICAL SYSTEM

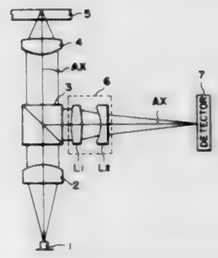
Hiroshi Matsui, and Osamu Koyama, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 149,090, Jan. 27, 1988, abandoned. This application May 15, 1991, Ser. No. 702,156

Claims priority, application Japan, Jan. 29, 1987, 62-020010

Int. Cl.[5] G11B *7/09*

U.S. Cl. 369—44.230 **13 Claims**



1. An optical information recording/reproducing apparatus comprising:

means for directing a radiation beam to a recording medium, wherein said directing means includes a collimator lens for forming a parallel beam, an objective lens for receiving the parallel beam to focus it on the recording medium and

a beam splitter disposed in a path of the parallel beam

5,202,870

in response to a focus search signal, and then focuses said

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a beam splitter disposed in a path of the parallel beam between said collimator lens and said objective lens; and means for detecting a beam from the recording medium, said means including a photodetector means and a condensing optical system for condensing the beam from the recording medium onto said photodetector means, and said condensing optical system is so arranged as to receive a beam reflected by the recording medium, and made generally parallel by said objective lens through said beam splitter said condensing optical system including a first lens group and a second lens group, said first lens group having a positive refracting power ψ_p, where $\psi_p = 1/(f_p/F) = F/f_p$ and f_p is a focal length of a first group positive lens, and being arranged at a side of the recording medium and said second lens group having a negative refracting power ψ_n, where $\psi_n = 1/(fn/F) = F/fn$ and fn is a focal length of a second group negative lens, and being arranged at a side of said photodetector means, wherein the following relation is met:

$$-0.15F < \frac{\psi_p}{\nu_p} + \left[\frac{\psi_p}{\nu_p}\right]\frac{\psi_n}{\nu_n} < 0$$

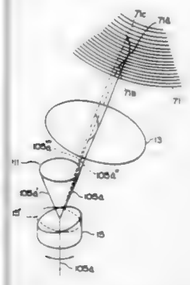
where F is a focal length of said condensing optical system, ν_p is Abbe's number of said first lens group and ν_n is Abbe's number of said second lens group.

5,202,868

METHOD OF DISPLACING A BEAM CONVERGING POSITION AND APPARATUS THEREOF

Masatoshi Terao; Takeshi Ikegami; Kazumi Saburi, and Hiroe Miyajima, all of Tokyo, Takashi Kato, Kawaguchi; Takashi Horinouchi, Kawasaki; Katsura Komiyama, Tokyo; all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed May 23, 1990, Ser. No. 530,017
Claims priority, application Japan, May 24, 1989, 1-128981
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.17 **23 Claims**



1. A beam spot controlling method for controlling the beam-converging position of a light beam projected on a recording track of a recording medium by an objective lens having an optical axis, comprising the steps of:

(a) rotating a tapered prism in a plane transverse to a light beam incident upon said tapered prism, said tapered prism having an inclination-imparting portion for imparting an inclination to a light beam incident on said tapered prism, said rotation changing the inclination of said light beam incident on said objective lens with respect to the optical axis of said objective lens thereby displacing the beam-converging position of said light beam;

(b) causing a light beam to enter said tapered prism; and

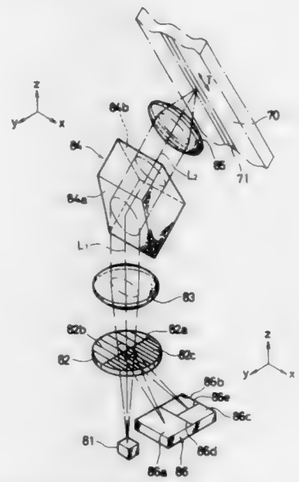
(c) causing said light beam exiting from said tapered prism to enter said objective lens, and directing said exiting light beam onto said recording track of said recording medium at a beam converging position displaced in accordance with the rotation of the prism.

5,202,869

OPTICAL HEAD DEVICE INCLUDING DIFFRACTION GRATING

Takahiro Miyake; Yoshio Yoshida, and Yukio Kurata, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 687,478, Apr. 18, 1991. This application May 28, 1991, Ser. No. 705,802
Claims priority, application Japan, Apr. 20, 1990, 2-105937; May 29, 1990, 2-138893
Int. Cl.[5] G11B *7/09*
U.S. Cl. 369—44.23 **18 Claims**



1. An optical head device comprising:

light generation means for generating light having intensity distribution showing a substantially elliptic shape in a cross section orthogonal to an optical axis, a major axis of the elliptic shape being parallel to a reference direction;

photodetecting means for generating detection signals so as to obtain a focus error signal, the photodetecting means including a plurality of photodetecting sections formed by a plurality of division lines dividing a light-receiving face thereof, the detection signals being released by the respective photodetecting sections according to the intensity of light entered thereto, at least one of the plurality of division lines being substantially parallel to the reference direction;

diffraction means including a plurality of diffracting regions formed by a plurality of division lines dividing a diffraction face, at least one of the plurality of division lines for dividing the diffraction face being parallel to the reference direction; and

optical means for converging the light emitted from the light generation means on a recording track formed on the recording medium and further directing reflected light from the recording track to the diffraction means so that the major axis of an elliptic bright portion formed on the diffracting face by the reflected light may be positioned on said one of the division lines in the diffraction means, the division line being parallel to the reference direction,

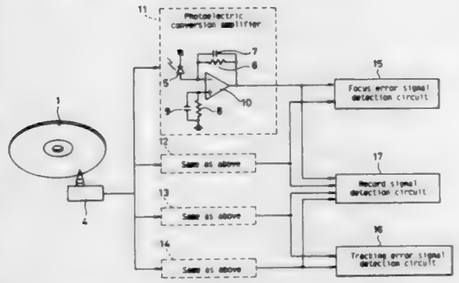
whereby a value of the focus error signal is zero when a part of the reflected light that has been diffracted by at least one of the diffracting regions of the diffraction means is converged on said one of the division lines in the photodetecting means, which is substantially parallel to the reference direction.

5,202,870

OPTICAL DISK RECORDING/REPRODUCING APPARATUS AND A PHOTOELECTRIC CONVERSION AMPLIFIER THEREFOR

Kazuhiro Aoki, Moriguchi; Yasuaki Edahiro, Hirakata, and Akira Kurahashi, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 6, 1991, Ser. No. 650,804
Claims priority, application Japan, Feb. 7, 1990, 2-27498
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.25 **10 Claims**



1. A photoelectric conversion amplifier comprising:

a differential amplifier;

a photo-diode, an anode of which is directly connected to an inverted input terminal of said differential amplifier, for converting a light signal into an electric signal;

a first resistor connected between said inverted input terminal and an output terminal of said differential amplifier;

a first capacitor connected in parallel with said first resistor;

a second resistor connected between a non-inverted input terminal of said differential amplifier and a reference voltage source terminal; and

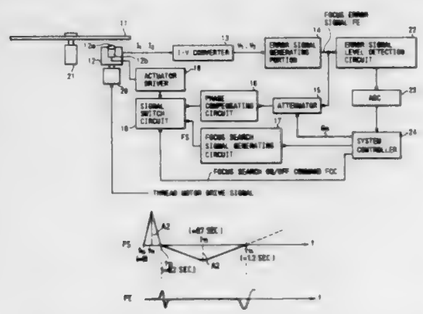
a second capacitor connected in parallel with said second resistor, wherein said second resistor and said second capacitor are the only elements connected to said non-inverted input terminal of said differential amplifier.

5,202,871

FOCUS SERVO CONTROL DEVICE

Hachiro Yokota, Iwaki, Japan, assignor to Alpine Electronics, Inc., Tokyo, Japan

Filed Sep. 25, 1991, Ser. No. 765,338
Claims priority, application Japan, Oct. 4, 1990, 2-266859
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.29 **4 Claims**



1. A focus servo control device which moves an object lens to a position where the focus servo control can be performed in response to a focus search signal, and then focuses said object lens on a reflecting surface of a disc in response to a focus error signal in accordance with the distance between said object lens and said disc reflecting surface, comprising:

a focus search signal generating portion for generating a focus search signal whose first half cycle is short and whose second half cycle is long;

a level detecting portion for detecting the level of a focus error signal when said object lens first passes near the focus point in response to the focus search signal;

a gain adjusting portion for adjusting the focus servo gain based on the detected focus signal level; and

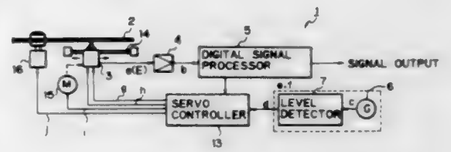
a signal switch circuit for outputting a focus error signal instead of the focus search signal when said object lens reaches the focus point or the adjacency of the focus point for a second time in response to the focus search signal.

5,202,872

OPTICAL DISC PLAYER WITH SERVO SYSTEM GAIN CONTROLLED WITH HYSTERESIS BY VIBRATION SENSOR CIRCUIT

Akira Shinada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,780
Claims priority, application Japan, Dec. 7, 1989, 1-318479
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.32 **4 Claims**



1. An optical disc apparatus comprising:

an optical pickup for reading recorded information on an optical disc and producing an information output signal corresponding thereto;

servo control means for performing tracking servo control and/or focus servo control of said optical pickup in response to said information output signal;

vibration sensor means for sensing a vibration of said apparatus and producing a vibration output signal having a level that varies in response to a sensed vibration level; and

control means for controlling a servo gain for the tracking servo and/or the focus servo of said optical pickup in response to said vibration output signal from said vibration sensor means and including a hysteresis comparator means receiving said vibration output signal for producing a control signal having a high level for increasing said servo gain when said vibration output signal is above a first predetermined threshold level and for producing said control signal having a low level for decreasing said servo gain when said vibration output signal is below a second predetermined threshold level, lower than said first threshold level.

5,202,873

nected to an output of said high pass filter; said comparator

aberration encountered by the substrate layers which

means to have an error based on the data to be recorded in

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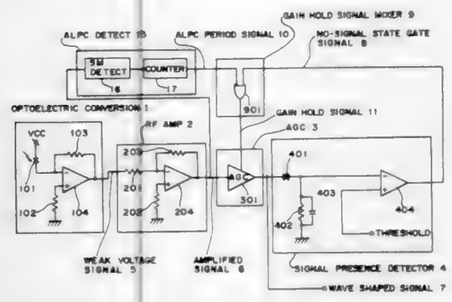
5,202,873

AGC CIRCUIT FOR OPTICAL DISK DATA REPRODUCING APPARATUS USING ALPC PERIOD DETECTOR

Motoshi Ito, Toyonaka; Kenzo Ishibashi, Moriguchi; Takashi Inoue, Osaka, and Shunji O'Hara, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1990, Ser. No. 634,553
Claims priority, application Japan, Jan. 12, 1990, 2-5888
Int. Cl.[5] G11B 7/125
U.S. Cl. 369—48 5 Claims



1. An optical disk data reproducing apparatus for reading and reproducing, from an optical disk, data having an address period, an ALPC (Automatic Laser Power Control) period and a data period, with said ALPC period containing a no-signal state at opposite ends, said apparatus comprising:

an optoelectric conversion means for optically reading data on said optical disk and for converting the read data to an electrical signal;

an automatic gain control means for receiving and changing the amplitude of said electrical signal, said automatic gain control means having an active state and suspended state such that during the active state the gain is automatically controlled relatively to the electrical signal applied thereto, and during the suspended state the gain is held to a gain as set immediately before the suspended state; and

an ALPC period detection means, operatively connected to said automatic gain control means, for detecting said ALPC period in said data and for producing an ALPC period signal indicative of the ALPC period, said automatic gain control means being set to said suspended state when said ALPC period signal is present and to said active state when said ALPC period signal is not present.

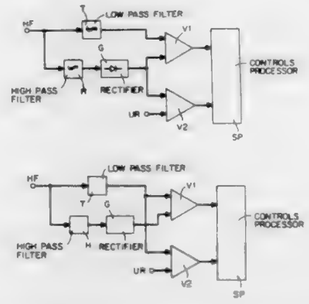
5,202,874

CIRCUIT ARRANGEMENT FOR IDENTIFYING THE TYPE OF AN OPTICAL RECORD CARRIER

Friedhelm Zucker, Mönchweiler, and Christian Büchler, Marbach, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP89/01390, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/05977, PCT Pub. Date May 31, 1990
PCT Filed Nov. 17, 1988, Ser. No. 688,957
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838859
Int. Cl.[5] G11B 7/00, 11/10, 19/12
U.S. Cl. 369—54 7 Claims

1. A circuit arrangement for detecting and recognizing a type of optical recording medium comprising: a high pass filter connected in series with a rectifier, said high pass filter receiving a data signal having information stored in said recording medium; a low pass filter having an input receiving also said data signal; and comparator having a first input connected to an output of said rectifier, said rectifier having an input connected to an output of said high pass filter; said comparator having a second input connected to an output of said low pass filter; and a controls processor connected to an output of said comparator; a second comparator with a first input connected to the output of said rectifier; said second comparator having a second input connected to a source of reference voltage; said second comparator having an output connected to said controls processor; said controls processor recognizing said recording medium to be a compact disk when said first input of said first comparator has a voltage level exceeding the voltage level at said second input of said first comparator and exceeding also said reference voltage; said controls processor recognizing said recording medium to be a combination optical and magneto-optical recording medium when the voltage level at



said first input of said first comparator exceeds the voltage level of the second input of said first comparator and the voltage level of said first input of said second comparator is below said reference voltage at the second input of said second comparator so that said first comparator has an output voltage exceeding the output voltage of said second comparator; said controls processor recognizing said recording medium to be a magneto-optical disk when the voltage level at the first input of both said first comparator and said second comparator is substantially zero and the second input of said first comparator has a voltage level exceeding the first input of said first comparator so that recognition of said magneto-optical disk of based only on the output voltage of said first comparator and independent of the output voltage of said second comparator.

5,202,875

MULTIPLE DATA SURFACE OPTICAL DATA STORAGE SYSTEM

Hal J. Rosen, Los Gatos; Kurt A. Rubin, Santa Clara; Glenn T. Sincerbox, San Jose; Timothy C. Strand, San Jose, and James M. Zavislan, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1991, Ser. No. 710,228
Int. Cl.[5] G11B 7/095
U.S. Cl. 369—94 20 Claims

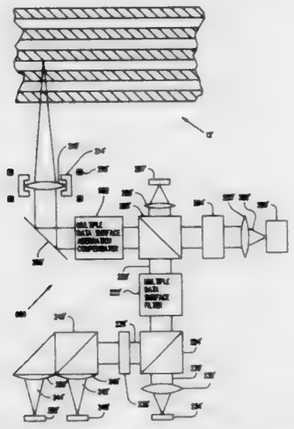
11. An optical data storage system comprising:

a laser for providing a laser beam;

an optical medium having at least three data surfaces, the data surfaces separated alternately by air spaces and substrate layers;

a lens for focussing the beam to one of the data surfaces;

an adjustable aberration compensator located between the laser and the medium for adjusting the spherical aberration of the laser beam in order to compensate for spherical aberration encountered by the substrate layers which alternately separate the data surfaces; and



an optical reception means for receiving a reflected beam from the optical medium and providing a data signal responsive thereto.

means to have an error based on the data to be recorded in said sector or data reproduced from said sector, and

a CPU for performing a substitution operation for substituting a substitution sector from said first substitution area of said optical disc for said defect sector in the event that the number of said defect sectors detected by said error detecting means out of a predetermined number of sectors is less than a given predetermined number,

for substituting said substitution sectors of said second substitution area of said optical disc for all the sectors of said predetermined number of sectors including said defect sectors in the event that the number of said defect sectors is greater than or equal to said given predetermined number, and

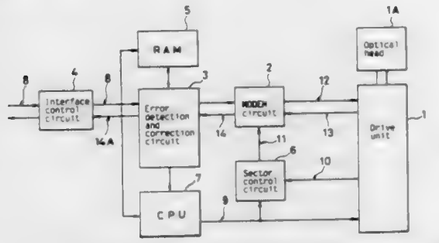
for recording addresses of said defect sectors and said substitution sectors in said map sector area of said optical disc.

5,202,876

OPTICAL DISC RECORDING-REPRODUCING APPARATUS IN WHICH SECTOR SUBSTITUTION OF DEFECTIVE SECTORS IS PERFORMED

Yuji Takagi, Hirakata; Isao Satoh, Neyagawa; Yoshihisa Fukushima, Osaka; Yasushi Azumatani, Neyagawa, and Hiroshi Hamasaka, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 15, 1991, Ser. No. 699,616
Claims priority, application Japan, May 17, 1990, 2-127155
Int. Cl.[5] G11B 7/00, 27/36, 5/09
U.S. Cl. 369—58 6 Claims



1. An optical disc recording-reproducing apparatus for use with an optical disc having a data area, first and second substitution areas respectively containing substitution sectors, and a map sector area containing map sectors, said apparatus comprising:

optical head means for recording data in a predetermined sector of a track of said optical disc or for reproducing data recorded in said sector of said track by applying a light beam having a predetermined intensity to said sector,

a MODEM circuit for modulating data to be recorded in said sector or for demodulating said data reproduced from said sector,

error detecting means for determining whether said sector of said optical disc is a defect sector, said defect sector being a sector of said optical disc found by said error detecting

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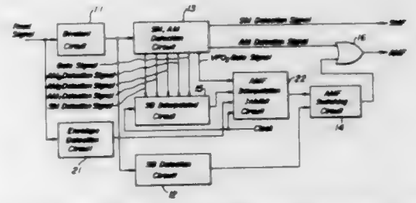
5,202,877

APPARATUS FOR DETECTING UNUSED SECTOR ON RECORD MEDIUM

Tsuneo Yanagida, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 619,918
Claims priority, application Japan, Nov. 30, 1989, 1-308979
Int. Cl.[5] G11B 3/90
U.S. Cl. 369—58 15 Claims



1. An apparatus for detecting unused sectors based on a read signal obtained from a record medium having thereon a plurality of sectors on which data are to be read and written, the apparatus comprising:

first mark detecting means for detecting in said read signal at least one predetermined mark prerecorded in an identification area of a sector to derive a first mark detection signal;

second mark detecting means for detecting in said read signal at least one predetermined mark in a data area of the sector to derive a second mark detection signal, said predetermined mark being recorded in the data area when data are recorded in the relevant data area;

interpolating means for generating an interpolated mark signal corresponding to said predetermined mark in the data area in accordance with said first mark signal;

envelope detecting means for detecting an envelope of a data signal in said read signal to derive an envelope detection signal; and

inhibiting means for inhibiting the generation of said interpolated mark signal from the interpolating means when said envelope detecting means does not produce the envelope detection signal.

5,202,878

and/or reproduced from said first information region

5,202,881

converter and digital-to-analog converter with appertaining

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5,202,878

OPTICAL RECORDING AND REPRODUCING METHOD AND APPARATUS FOR THE SAME

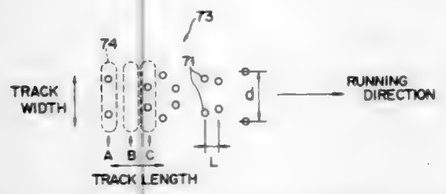
Jun Kanehira, and Naoyuki Ueno, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,413

Claims priority, application Japan, May 24, 1990, 2-134944; Apr. 18, 1991, 3-86770

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—100 **18 Claims**



1. An optical recording and reproducing method comprising:

a first recording process of irradiating a recording laser beam onto an optical recording medium at a certain interval in the track width direction of the optical recording medium to form a mark set which comprises plural marks on the track of the optical recording medium and recording a first information which has been coded corresponding to the interval between the plural marks in the mark set on the track of the optical recording medium;

a second recording process of irradiating the recording laser beam onto the optical recording medium in the track length direction thereof to form the plural mark sets on the track of the optical recording medium at a certain interval in the track length direction of the optical recording medium and recording a second information which has been coded corresponding to the interval between these mark sets on the optical recording medium;

a first reproducing process of scanning the track of the optical recording medium in the track width direction thereof with a reproducing laser beam and detecting a first diffraction beam which changes corresponding to the interval between the plural marks in the mark set to reproduce the first information from the track of the optical recording medium; and

a second reproducing process of scanning the track of the optical recording medium in the track length direction thereof with the reproducing laser beam and detecting a second diffraction beam which changes corresponding to the interval between the plural mark sets formed on the track of the recording medium in the track length direction thereof to reproduce the second information from the track of the optical recording medium.

5,202,879

INFORMATION RECORDING MEDIUM, AND INFORMATION RECORDING AND/OR REPRODUCING METHOD AND APPARATUS

Takahiro Oguchi, Atsugi; Kunihiro Sakai, Isehara; Hiroyasu Nose, Zama; Ryo Kuroda, Machida, and Akihiko Yamano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1991, Ser. No. 789,321

Claims priority, application Japan, Nov. 13, 1990, 2-307911

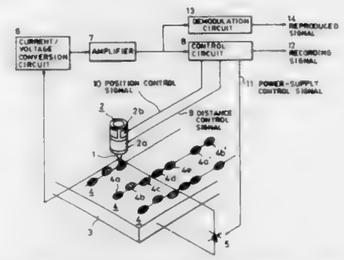
Int. Cl.[5] G11B *9/00*

U.S. Cl. 369—126 **30 Claims**

1. An information recording medium for effecting at least one of recording of information thereon and reproducing of information therefrom using a probe, said recording medium comprising:

a first information region, the information being recorded on and/or reproduced from said first information region using the probe; and

a second information region separated from said first information region, detection information for detecting an



abnormality of the probe being recorded in said second information region, and any abnormality of the probe being detected by detecting the information from said second information region by the probe.

5,202,880

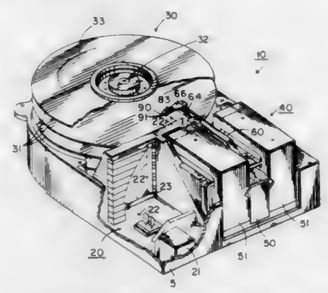
DOUBLE-SIDED MAGNETO-OPTICAL MEDIA FOR A MULTI-DISK STORAGE DEVICE

Neville K. Lee, Sherbourn, and Brian Tan, Westboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 6, 1992, Ser. No. 847,526

Int. Cl.[5] G11B *7/24*

U.S. Cl. 369—275.4 **24 Claims**



24. A thin-film, double sided, magneto-optical media for storing information by means of an air incident lightbeam comprising:

a substrate having two side surfaces, each of said side surfaces having a microscopic relief to provide a pre-formatted structure for storing information;

a thin-film reflective layer on each of said side surfaces to reflect an incident lightbeam used for reading and writing information;

an optional transparent thin-film dielectric layer on each of said reflective layers to isolate said reflective layers;

an optically sensitive thin-film recording layer applied on each of said dielectric layers, the composition of said recording layers including a rare-earth transition-metal to magnetically store information; and

a transparent thin-film protective layer on each of said recording layers to minimize corrosion of said recording layers.

5,202,881

INFORMATION STORAGE MEDIUM

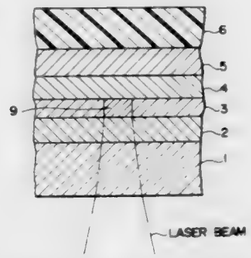
Katsumi Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 535,523, Jun. 11, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 825,817

Claims priority, application Japan, Jun. 30, 1989, 1-169610; Jun. 30, 1989, 1-169611; Jun. 30, 1989, 1-169612

Int. Cl.[5] G11B *3/84*

U.S. Cl. 369—284 **21 Claims**



1. An information storage medium comprising:

a substrate; and

a recording layer supported on said substrate and subjected to reversible and selective phase transformation between a crystalline phase and an amorphous phase, by changing the conditions under which a light beam is radiated,

said recording layer consisting essentially of an alloy represented by $(In_{100-x}Sb_x)_{100-y}Te_y$ where x and y are in atomic %, $45 \leqq x \leqq 50$, and $25 \leqq y \leqq 45$.

5,202,882

METHOD FOR CHECKING TRANSMISSION PROPERTIES OF A SUBSCRIBER LINE CIRCUIT

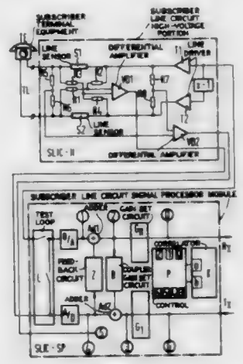
Hans-Werner Rudolf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1991, Ser. No. 683,689

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011985

Int. Cl.[5] H04J *3/14*; H04M *3/30*

U.S. Cl. 370—17 **2 Claims**



1. A method for checking transmission properties of a subscriber line circuit together with a subscriber line and subscriber terminal equipment connected thereto in a digital time-division multiplex telephone system, in which the subscriber line circuit comprises a high-voltage module including line drivers and elements for indicating the subscriber line state, and a signal processor module comprising an analog-to-digital converter and digital-to-analog converter with appertaining filtering, a two-wire-to-four-wire conversion connection, in which the realization of the two-wire impedance and the receiving signal amplification occur, the method comprising the steps of:

(a) accessing and sensing a plurality of operating signals at a plurality of circuit points of the transmitting and receiving branches of the signal processor module via a digital interface, including:

converting analog signals to digital signals,

converting digital signals to analog signals,

feeding back said transmitting branch to said receiving branch to set two-wire impedance,

coupling said receiving branch to said transmitting branch for two-to-four wire conversion, and

setting gain in said transmitting and receiving branches;

(b) forming correlation products from selected combinations of the voltage values of two sensed signals, wherein predetermined selected combinations are indicative of predetermined transmission properties; and

(c) evaluating the correlation products for providing an information concerning the quality of certain transmission properties.

5,202,883

DIGITAL KEY STYSTEM ARCHITECTURE

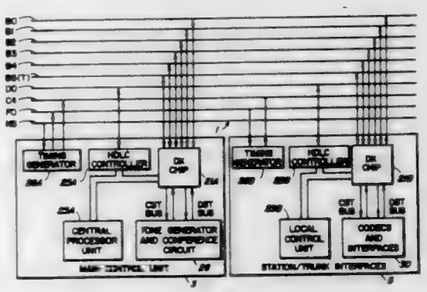
Richard A. Hatherill; Bernard J. Trudel, both of Ottawa; Mark R. Coomber, Kanata, and William C. Mitchell, Arnprior, all of Canada, assignors to Mitel Corporation, Ontario, Canada

Filed Jul. 31, 1989, Ser. No. 386,697

Claims priority, application Canada, Aug. 2, 1988, 573618

Int. Cl.[5] H04G *11/04*

U.S. Cl. 370—67 **11 Claims**



1. A digital communication system, comprised of:

(a) a universal backplane bus,

(b) plural interface circuits each including control means for generating and receiving message signals to and from said bus,

(c) one or more remote peripherals connected to predetermined ones of said interface circuits, for generating and receiving information signals,

(d) switching means included in each of said interface circuits for effecting distributed bidirectional switching of said information signals between said remote peripherals via said bus,

(e) communication controller means included in each of said interface circuits for exchanging said message signals between said control means via said bus in accordance with a bit oriented data link protocol, in response to which said control means supervises said bidirectional switching of said information signals, and

(f) one of said interface circuits including means for storing a memory map of available time slots within respective ones of said switching means and for generating and transmitting message signals to said switching means for controlling which time slots are to be used for interchange of said information signals via said bus, whereby said super-

data can be transmitted at a speed within a range suitable for existing carrier waves; and, in reception at the reception side,

accessible by one of said plurality of processing units previously had an irrecoverable failure based on said

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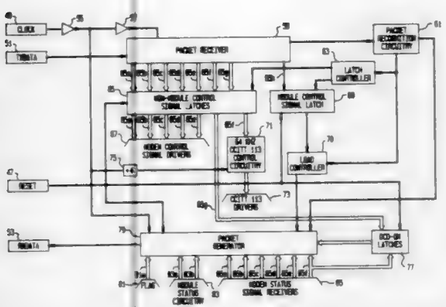
vision of said bidirectional switching of said information signals by said control means can be initiated, and a flexible data bus time slot assignment obtained.

5,202,884

MULTIPLEXING SCHEME FOR MODEM CONTROL SIGNALS

Ciaran B. Close, Dublin; Bryan T. Campbell, and Una M. Quinlan, both of Clonmel, all of Ireland, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1991, Ser. No. 722,686
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—94.1 **20 Claims**



14. A method for transmitting control and status signals between a line interface card and a remote distribution panel, the line interface card comprising a plurality of line interface units, the remote distribution panel including a plurality of serial ports, each of the serial ports adapted for coupling to a modem such that each of the line interface units selectively communicates with one of the plurality of serial ports, the signals being transmitted over a multiple wire cable, the method comprising:

generating a first time-division-multiplexed bit stream in the line interface card, the first bit stream comprising control information from the line interface units for corresponding ones of the serial ports;

communicating the first bit stream over a first preselected wire of the multiple wire cable;

receiving the first bit stream in the remote distribution panel;

demultiplexing the first bit stream in the remote distribution panel; and

transmitting the control information of the first bit stream to corresponding ones of the serial ports.

5,202,885

ATM EXCHANGE WITH COPYING CAPABILITY

Karl Schrodi, Heimsheim; Gert Eilenberger, Kirchheim; Bodo Pfeiffer, Schwieberdingen, and Bozo Cesar, Stuttgart, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 12, 1991, Ser. No. 668,160
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1990, 4008078
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 **4 Claims**

1. ATM (Asynchronous Transfer Mode) exchange with copying capability for switching cells each having path information included in a cell header, said exchange comprising a group switch comprising

a plurality of group switch inputs,

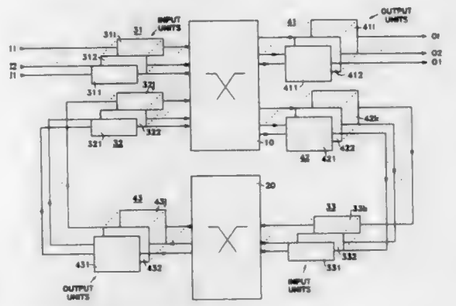
a plurality of group switch outputs,

a plurality of group switch switching elements arranged in several stages for providing a plurality of connections between each group switch input and each group switch output, each of said switching elements having a respective alterable connection table and being individually switchable, by information contained in the cell header, between a first addressing mode independent of said alterable connection table and a second addressing mode, in which point-to-multipoint path information in the cell header is evaluated with the aid of said alterable connection table to cause the cell to be copied and passed on over a plurality of paths,

a plurality of exchange outputs,

a plurality of output units, each between the group switch and a different respective exchange output, each of said output units including

a buffer into which all cells to be outputted via said output unit are written after leaving the group switch, and from which the cells are outputted in an order determined by a sequencing label contained in the cell header,



a plurality of exchange inputs, and

a copy switch having

a plurality of copy switch inputs, each said copy switch input accessible from each said exchange input,

a plurality of copy switch outputs, each connected to a respective one of a first group of said group switch inputs, and

means for making multiple copies of any of said cells appearing at any of said copy switch inputs and for outputting each of said multiple copies at respective different said copy switch outputs,

wherein at least some of said group switch inputs may be directly connected to respective exchange inputs such that at least some cells routed from an exchange input to one or more exchange outputs pass only through said group switch and do not pass through said copy switch.

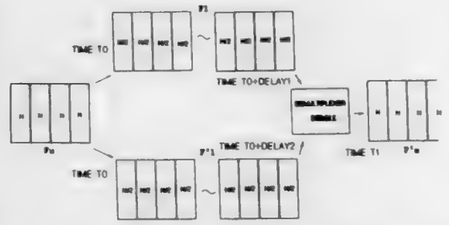
5,202,886

SYSTEM AND MULTIPLEXER/DEMULTIPLEXER FOR THE TRANSMISSION/RECEPTION OF DIGITAL TELEVISION INFORMATION

Alessandra Rossi, Vicenza, Italy, and Antonio Campos, Madrid, Spain, assignors to Alcatel Telettra S.p.A., Milan, Italy

Filed Oct. 30, 1990, Ser. No. 605,969
Claims priority, application Italy, Oct. 31, 1989, 22230 A/89
Int. Cl.[5] H04J *3/22*
U.S. Cl. 370—112 **8 Claims**

1. A system for transmitting data of TV, HDTV, audio and data signals that come from different sources, can have speeds different from one another and are fed to a multiplexer for transmission from a transmission side to a reception side, wherein, in transmission from the transmission side, the signals at different speeds are each accumulated into a respective buffer that forms a packet thereof and, when the packet is ready, sends to the multiplexer a signal enabling the transmission of said packet, the multiplexer transmitting the packets according to a prefixed priority order and adding to the packets a frame synchronization signal, the data in the packets being transmitted over at least two paths simultaneously so that the data can be transmitted at a speed within a range suitable for existing carrier waves; and, in reception at the reception side, said system distributes the packets to respective memories on



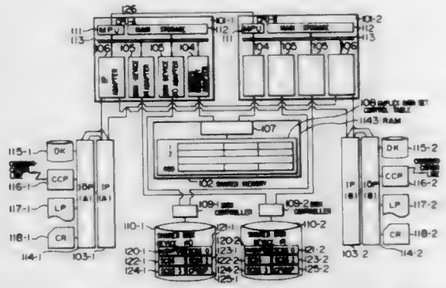
each of the two paths and then carries out an alignment of the data on the two paths on the basis of the synchronization signal.

5,202,887

ACCESS CONTROL METHOD FOR SHARED DUPLEX DIRECT ACCESS STORAGE DEVICE AND COMPUTER SYSTEM THEREFOR

Hitoshi Ueno, Zama; Masahiro Kitano, Hiratsuka, and Kenji Masuda, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of Japan

Filed Jun. 21, 1990, Ser. No. 541,749
Claims priority, application Japan, Jun. 21, 1989, 1-156805
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—10.1 **21 Claims**



1. A DASD access control method for use in a computer system comprising a plurality of processing units, a memory connected to said plurality of processing units and duplex direct access storage devices (hereinafter "DASD's") accessible by said plurality of processing units, said duplex DASD's comprising a first DASD for storing a plurality of data groups in addressable storage locations therein and a second DASD for storing a plurality of data groups in addressable storage locations therein, said first DASD and said second DASD including identical contents and one-to-one correspondence between the data groups stored in corresponding storage locations therein, wherein each one of said data groups of said first DASD and each corresponding one of said data groups of said second DASD form a data group set and are accessible as a logical unit by one of said plurality of processing units, said DASD access control method comprising the steps of:

(a) storing information in said memory device for identifying the invalidity of data groups in which an irrecoverable failure has occurred within said plurality of data groups stored in said first DASD and said second DASD;

(b) judging whether one data group of a data group set stored in said first DASD and said second DASD and accessible by one of said plurality of processing units previously had an irrecoverable failure based on said stored information in said memory, when said one data group is accessed;

(c) accessing said one data group of said data group set when said step (b) results in a determination that said one data group does not have an irrecoverable failure; and

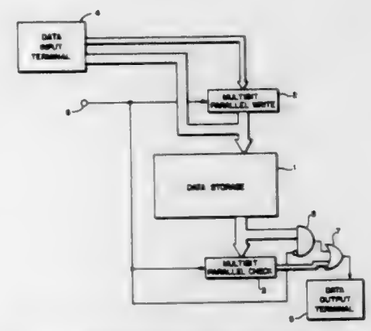
(d) stopping access to said one data group of said data group set when said step (b) results in a determination that said one data group has an irrecoverable failure.

5,202,888

SEMICONDUCTOR MEMORY DEVICE HAVING A MULTIBIT PARALLEL TEST FUNCTION AND A METHOD OF TESTING THE SAME

Kazuaki Ochiai, Tearl, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Mar. 28, 1990, Ser. No. 500,601
Claims priority, application Japan, Mar. 30, 1989, 1-80666
Int. Cl.[5] G11C *29/00*
U.S. Cl. 371—21.2 **3 Claims**



1. In a semiconductor memory device comprising a memory means, said semiconductor memory device further comprises:

a multibit parallel write means connected to said memory means;

a multibit parallel check means connected to said memory means;

an input means connected to said memory means, said write means, and said multibit parallel check means, for receiving a control signal and test data from outside, said control signal being indicative of the ON/OFF state of said multibit parallel write means and check means, said test data being supplied in parallel into said memory means when said multibit parallel write means is in the ON state;

switching means, connected to said memory means and said input means, for receiving said multibit test data and said control signal and for passing said multibit test data according to said control signal;

an output means, connected to said memory means via said switching means and said multibit parallel check means, for outputting said multibit test data from said memory means when said multibit parallel check means in in the OFF state,

said memory means, said multibit parallel write means, and said multibit parallel check means being formed within one semiconductor chip.

5,202,889

a detector means for receiving counted results of said count-

capacitor means for storing electrical energy;

is adjustable in a continuous manner, each of said means incor-

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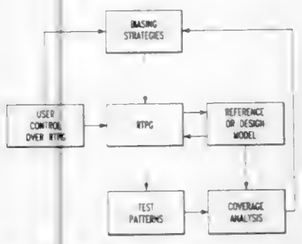
5,202,889

DYNAMIC PROCESS FOR THE GENERATION OF BIASED PSEUDO-RANDOM TEST PATTERNS FOR THE FUNCTIONAL VERIFICATION OF HARDWARE DESIGNS

Aharon Aharon, Doar Na Misgav; Ayal Bar-David, Haifa; Raanan Gewirtzman, Haifa; Emanuel Gofman, Haifa; Moshe Leibowitz, Haifa, and Victor Shwartzburd, Haifa, all of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1990, Ser. No. 612,349
Claims priority, application Israel, Apr. 18, 1990, 094115
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—27 **12 Claims**



1. Dynamic process for generating biased pseudo-random test patterns for the functional verification of an integrated circuit design, wherein the verification is performed in a sequence of steps defined by a user, and wherein each of the test patterns provides all data required to test the circuit design during at least one of said steps, said process comprising:

a) performing each of said steps in a first and a second stage, wherein facilities and parameters required for executing said step are defined and initialized in said first stage, and wherein said step is executed in said second stage;

b) repeating a) until the test pattern having the number of steps requested by the user is generated, and whereupon completion of said generation said test pattern comprises:

the initialized facilities that define an initial machine state;

the execution of the step that drives the simulation of said design; and

final values of said facilities that incorporate changes that occurred during the execution of said steps to include expected results of said test pattern.

5,202,890

BLOCK ERROR DETECTOR

Akira Iketani, Higashiosaka, and Hiromasa Mizuki, Tokushima, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 7, 1990, Ser. No. 534,276
Claims priority, application Japan, Jun. 9, 1989, 1-147890
Int. Cl.[5] G11B *20/18*
U.S. Cl. 371—40.3 **7 Claims**

1. A block error detector for detecting an error in data blocks, each block including sub-blocks consisting of an ID block and an information block carrying a plurality of information signals, said block error detector comprising:

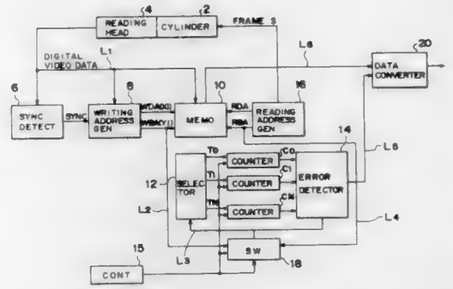
a memory means having a plurality of sections, each section having a plurality of segments for storing information signals for a plurality of data blocks;

a writing address generator means for generating a section writing address based on said ID block for designating a section in said memory means, and for generating a segment writing address for designating a segment in the designated section;

a plurality of counters provided correspondingly to said plurality of sections, respectively, and operated in response to said section writing address; and

a detector means for receiving counted results of said counters;

wherein said detector means includes a means for detecting



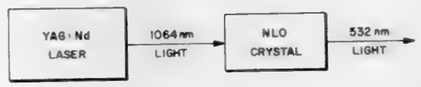
an error in said ID block when all of said plurality of counters, which are incremented by "1" when all the ID data has been properly detected, have not been incremented by "1".

5,202,891

NONLINEAR OPTICAL MATERIAL

Arthur W. Sleight, Philomath, and Jinfan Huang, Corvallis, both of Oreg., assignors to State of Oregon Acting by and through the State Board of Higher Education of behalf of Oregon State University, Eugene, Oreg.

Filed Dec. 23, 1991, Ser. No. 813,211
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—21 **34 Claims**



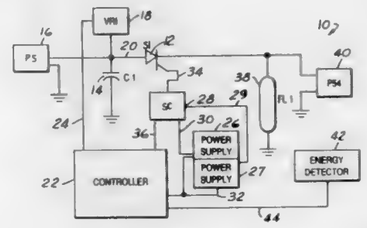
1. A compound of the formula $Ca_{1.40-X}M_XV_{0.98\pm0.05}O_{4.00\pm0.08}$ wherein X is 0.07 to 0.43 and M is selected from the group consisting of Bi, La, Ce, Y, Pm, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc, and mixtures thereof.

5,202,892

PULSE FORMING AND DELIVERY SYSTEM

John A. Harwick, Bluffton, S.C., assignor to Kigre, Inc., Hilton Head Island, S.C.

Filed Nov. 8, 1991, Ser. No. 792,318
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—30 **13 Claims**



1. A pulse forming and delivery system for use in combination with a flashlamp comprising:

capacitor means for storing electrical energy;

thyristor means having an input coupled to said capacitor for allowing said stored electrical energy to be transferred from said capacitor means to said flashlamp; and

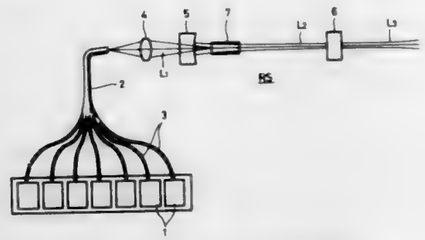
controller means coupled to said thyristor means for allowing said thyristor means to transfer said stored electrical energy to said flashlamp for a fixed period of time.

5,202,893

END PUMPED SOLID-STATE LASER

Shigeo Kubota, Tokyo, and Yushi Kaneda, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1991, Ser. No. 732,649
Claims priority, application Japan, Jul. 30, 1990, 2-202049
Int. Cl.[5] H01S *3/04*
U.S. Cl. 372—34 **14 Claims**



1. An end pumped solid-state laser comprising:

a resonator having a pair of mirrors and a laser rod disposed between said pair of mirrors, said laser rod having an optical axis, an end face, and a peak absorption wavelength;

a pumping light source means for generating a pumping light to excite said laser rod by the absorption of the pumping light, the pumping light source means comprising a plurality of laser light sources producing laser light at a plurality of output wavelengths, said plurality of output wavelengths falling within a wavelength band around the peak absorption wavelength of said laser rod;

an optical guide for guiding said pumping light from said exciting light source; and

a converging optical element means for converging said pumping light guided by said optical guide and for irradiating said converged pumping light on said end face of said laser rod so as to excite said laser rod, the converging optical element having a large wavelength dispersion such that said plurality of wavelengths of laser light produced by said plurality of laser light sources are focused at a plurality of points on said optical axis of said laser rod, thereby reducing a density of heat generated within said laser rod.

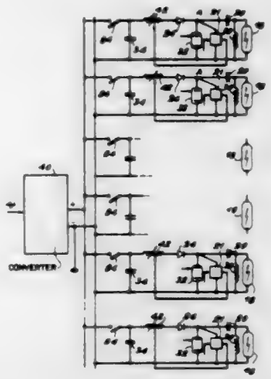
5,202,894

ELECTRIC SUPPLY DEVICE FOR ONE OR MORE METAL VAPOR LASERS USING AN ELECTRIC POWER CHARGING CIRCUIT WITH A VARIABLE INDUCTOR TO PROVIDE A VARIABLE CHARGING GRADIENT

Bernard Chaudanson, LaGarde Adhemar, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 652,677, Feb. 7, 1991, abandoned. This application Aug. 4, 1992, Ser. No. 925,812
Claims priority, application France, Feb. 8, 1990, 90 01455
Int. Cl.[5] H01S *3/0975*; H02M *9/06*
U.S. Cl. 372—38 **7 Claims**

1. Electric supply device for a plurality of metal vapour lasers, comprising a converter for converting an a.c. voltage into a fixed amplitude d.c. voltage, a plurality of means coupled to said convertor each of said means supplying, from said d.c. voltage, a pulse voltage, the maximum amplitude of which is adjustable in a continuous manner, each of said means incorporating a controllable switch; and



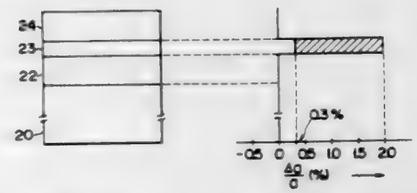
an electric power charging circuit coupled to said switch, said circuit having a variable charging gradient and able to discharge said power as a result of the closure of said controllable switch.

5,202,895

SEMICONDUCTOR DEVICE HAVING AN ACTIVE LAYER MADE OF INGAALP MATERIAL

Koichi Nitta, Kawasaki; Masayuki Ishikawa, Tokyo; Yukie Nishikawa, Narashino; Hideto Sugawara; Minoru Watanabe, both of Tokyo; Masaki Okajima, Kawasaki, and Genichi Hatakoshi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1991, Ser. No. 695,088
Claims priority, application Japan, May 7, 1990, 2-117346; Aug. 24, 1990, 2-221281; Jan. 9, 1991, 3-1082
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **11 Claims**



1. A semiconductor laser device comprising a compound semiconductor substrate, a double heterostructure which is formed on the compound semiconductor substrate said double heterostructure comprises an active layer comprising first and second surfaces, a first cladding layer formed on the first surface of the active layer and a second cladding layer formed on the second surface of the active layer and wherein the improvement comprises:

that the active layer comprises an $In_{1-y}(Ga_{1-x}Al_x)_yP$ material ($0 \leq x < 1$, $0 \leq y < 1$) having a lattice constant larger than the lattice constant of the substrate by at least 0.6%.

5,202,896

length of the cavity and at a low bias level is greater than with

5,202,899

5,202,900

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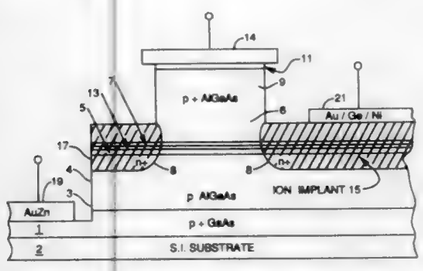
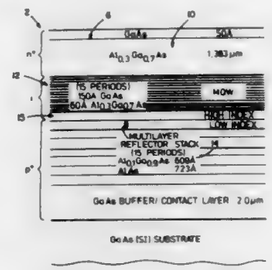
5,202,896
BIPOLAR INVERSION CHANNEL FIELD EFFECT TRANSISTOR LASER
Geofrey W. Taylor, Holmdel, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 16, 1991, Ser. No. 730,759
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **24 Claims**



1. A bipolar inversion channel field effect transistor laser comprising:
(a) an active layer of a quantum well body formed within a central portion of said laser;
(b) an upper cladding layer and a lower cladding layer positioned above and below the central portion of said laser respectively, for confining light vertically within the central portion of the laser;
(c) a gate/emitter contact electrically coupled to the upper cladding layer;
(d) a pair of n+ ion-implant wells, self-aligned with respect to the gate/emitter contact and intersecting the central portion of said laser for confining light laterally therein and configured to insure that said active layer is at no point exposed;
(e) first electrode means co-acting with said ion-implant wells for pumping electrons into the active layer laterally and symmetrically; and
(f) second electrode means including said gate/emitter contact and a collector contact electrically coupled to said lower cladding layer for pumping holes into the active region, thereby to produce lasing of said laser.

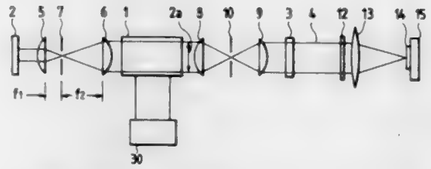
5,202,897
FABRY-PEROT MODULATOR
Mark Whitehead, Santa Barbara, Calif., assignor to British Telecommunications public limited company, London, United Kingdom
Filed May 24, 1991, Ser. No. 704,994
Claims priority, application United Kingdom, May 25, 1990, 9011813
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—92 **20 Claims**

1. A Fabry-Perot modulator comprising a resonant cavity defined by front and back reflective surfaces of different reflectivities and including within the cavity a multiple quantum well structure having a barrier width sufficient to prevent resonant coupling between wells in the structure, wherein absorption of the quantum well structure at a resonant wavelength of the cavity and at a low bias level is greater than with a higher bias level, whereby reflectivity of the Fabry-Perot



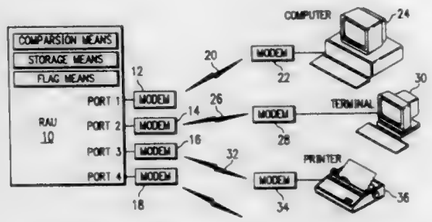
modulator at that wavelength increases with an increase in bias level.

5,202,898
LASER OSCILLATOR, LASER RESONATOR, AND APPARATUS FOR MANUFACTURING OF SEMICONDUCTOR
Hiroyuki Sugawara, Hitachi; Toshiharu Shirakura, Toukai; Takeshi Yamamura, and Hideki Yamai, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibataki, both of Japan
Filed Jul. 22, 1991, Ser. No. 733,646
Claims priority, application Japan, Sep. 19, 1990, 2-247587
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—92 **19 Claims**



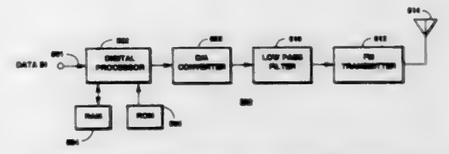
1. A laser oscillator comprising
a resonator having a whole reflecting mirror and an output mirror which are installed with an interval having a laser medium between, and
a means to excite the laser medium;
characterized in having
an optical system for selecting directivity of light from the resonator between said whole reflecting mirror and said laser medium.
19. An apparatus for semiconductor fabrication comprising
a laser oscillator, and
a means for irradiating of laser light from said laser oscillator to a mask;
characterized in having
a means for making said laser oscillator generate the laser light having almost constant directivity chronically and no interference.

5,202,899
APPARATUS FOR PROVIDING DYNAMIC SELECTION OF MODEM PROTOCOL TO SUPPORT MULTIPLE MODEM TYPES
James P. Walsh, Joliet, Ill., assignor to Rockwell International Corporation, Seal Beach, Calif.
Filed Aug. 16, 1991, Ser. No. 746,395
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—8 **2 Claims**



1. Apparatus for connection to any one of a plurality (N) of modem (modulator-demodulator) types incorporating means for recognizing the type connected, comprising in combination:
a plurality of output ports for connection to a plurality of modems;
storage means for maintaining a list of N types of modems that may be used with said apparatus:
multi-setting flag means, including control input means, for stepping through N flag types as set forth in the list of said storage means from first to last in response to input signals applied to said control input means;
signal transmission means, connected to said flag means, for generating and transmitting a set of initialization commands in accordance with the setting of said flag means, from a given output port for application to a modem where the response expected is unique for each of the flag settings;
signal reception means, connected to said flag means, for decoding any response received at said given output port;
comparison means, connected to said flag means and said signal reception means, for checking any received response against that expected from the setting of said flag means and for providing an output indicative of whether or not the comparison was positive;
flag changing means, connected to said comparison means and said multi-setting flag means, for
IF
the last received response was not as expected,
AND IF
said flag means is set to other than the N-2 modem type as set forth in said list contained in said storage means,
THEN
changing the setting of said multi-setting flag means to indicate a further type of modem as listed in said storage means and returning control to said signal transmission means to transmit a further set of initialization commands in accordance with said flag means,
OTHERWISE
changing the multi-setting flag in said storage means to indicate the final type modem as the only choice remaining; and
ENDIF
means for transmitting signals from said output port to a connected modem in accordance with the setting of said multi-setting flag means for establishing that a connected modem is in operational condition for communications.

5,202,900
SPECTRALLY EFFICIENT DIGITAL FM MODULATED TRANSMITTER
Clifford D. Leitch, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 390,317, Aug. 7, 1989, Pat. No. 5,068,874. This application Jul. 19, 1991, Ser. No. 732,967
Int. Cl.[5] H03C *1/06*
U.S. Cl. 375—51 **6 Claims**



1. A transmitter for transmitting digital information to a communication receiver employing a post detection low pass filter having a predetermined filter transfer function, said transmitter comprising:
means for storing a sequence of numerical values depicting an optimized electric pulse, the sequence of numerical values being derived by processing an electric pulse exhibiting minimum intersymbol interference characteristics with the reciprocal transfer function of the predetermined post detection low pass filter of the communication receiver;
means for receiving the digital information depicting a message;
means, responsive to the digital information received, for recovering the sequence of numerical values depicting the optimized electric pulse from said storing means, and therefrom generating a sequence of optimized electric pulses depicting the digital message; and
means for transmitting the sequence of optimized electric pulses.

5,202,901
DIGITAL DISCRIMINATOR FOR PULSE SHAPED π/4 SHIFTED DIFFERENTIALLY ENCODED QUADRATURE PHASE SHIFT KEYING
Sandeep Chennakeshu, Clifton Park, and Gary J. Saulnier, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed May 21, 1991, Ser. No. 703,517
Int. Cl.[5] H04L *27/22*
U.S. Cl. 375—84 **9 Claims**

1. In a receiver of a cellular telephone for receiving phase angles encoded in a received signal, a digital discriminator, said discriminator comprising:
a) a heterodyne circuit for converting said received signal to an intermediate frequency (IF) signal;
b) an analog to digital (A/D) converter circuit coupled to the heterodyne circuit for sampling said IF signal and for creating a digital output signal having a plurality of samples, each sample comprising a quadrature coefficient signal and an in-phase coefficient signal;
c) a sorter circuit coupled to receive the digital signal from the A/D converter and provide a predetermined number of samples for decoding;
d) means for producing an initial sample index;
e) a sample and phase adjustment (SPA) circuit coupled to the sorter circuit for receiving the samples of the sorter circuit, coupled to the means for producing an initial sample index for receiving an initial sample timing index, for receiving a sample timing index, for selecting samples for decoding based upon the sample timing index, for receiving a carrier phase adjustment, and creating a set of output samples based upon the selected samples and car-

rier phase adjustment, each SPA output sample compris-

racy to enable autonomous operation on this new crite-

5,202,904

5,202,905

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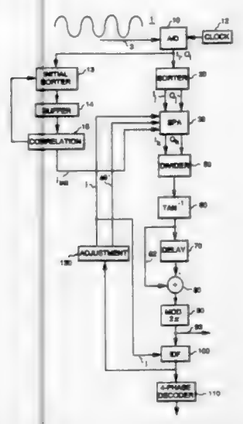
rier phase adjustment, each SPA output sample comprising a quadrature coefficient and an in-phase coefficient;

f) a means for providing a set of relative phase angle samples from the set of output samples from the SPA circuit, the relative phase angle providing means coupled to the SPA circuit;

g) a modulo-2π correction circuit coupled to the relative phase angle providing means for receiving the relative phase angle samples, for correcting for phase angles which wrap-around the real axis and for creating a set of corrected relative phase angle samples;

h) an integrate and dump filter (IDF) coupled to the modulo-2π correction circuit for receiving the corrected relative phase angle samples and sum them over each symbol period, then creating an output signal from the sums, each sum representing a decoded phase angle for the current symbol;



i) a four-phase decoder circuit coupled to the IDF circuit for receiving the decoded phase angle of the symbol and for decoding the angle into a pair of decoded bits; and

j) an adjustment circuit coupled to receive the signal sent to the four-phase decoder circuit for calculating a decoding error between the decoded phase angle for each symbol in a preamble and a respective one of a predetermined set of phase angles stored by the adjustment circuit, and for adjusting the sample timing and carrier phase adjustment to minimize the decoding error.

5,202,902

CARRIER RECOVERY METHOD FOR MODULATION HAVING A LARGE NUMBER OF STATES, AND APPARATUS FOR IMPLEMENTING THE METHOD

Marc Isard, St. Germain En Laye, and Christophe Mostkowy, Paris, both of France, assignors to Alcatel Transmission Par Faisceaux Hertziens, Levallois Perret Cedex, France

Filed Apr. 22, 1991, Ser. No. 688,396

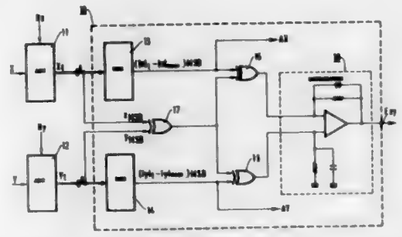
Claims priority, application France, Apr. 27, 1990, 90 05410

Int. Cl.[5] H04L *27/06*

U.S. Cl. 375—97 **5 Claims**

1. A method of recovering the carrier from a received signal, said received signal having a large number of modulation states represented by a received constellation having quadrants in a regeneration plane, said method comprising the steps of:

calculating a center of gravity of the received constellation in each quadrant of the regeneration plane in order to bring the demodulated constellation within the monotonic range of a conventional estimator, with sufficient accuracy to enable autonomous operation on this new criterion; and



generating a phase estimate in accordance with the calculated center of gravity.

5,202,903

NOISE-IMMUNE SPACE DIVERSITY RECEIVER

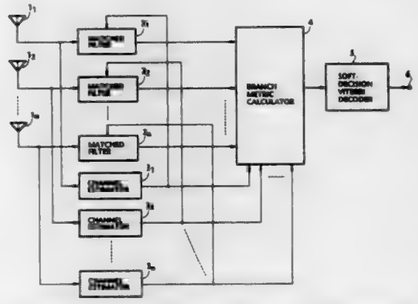
Kazuhiro Okanoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 1, 1991, Ser. No. 678,497

Claims priority, application Japan, Mar. 30, 1990, 2-83478; Mar. 30, 1990, 2-83479

Int. Cl.[5] H04B *7/10;* **H04L** *1/02*

U.S. Cl. 375—100 **12 Claims**



1. A diversity receiver having a plurality of diversity antennas for simultaneously receiving sequentially coded symbol sequences transmitted over distinct communications channels from a point of transmission to said antennas, comprising:

a plurality of channel estimators respectively coupled to said diversity antennas for deriving estimates of impulse responses of said communication channels respectively from coded symbol sequences received by said antennas;

a plurality of matched filters associated respectively with said channel estimators and said diversity antennas, each of said matched filters having a tapped delay line coupled to the associated antenna and a plurality of multipliers coupled respectively to successive taps of said tapped delay line for controlling tap weight coefficients of said multipliers in response to an output signal from the associated channel estimator and integrating weighted signals generated by said multipliers to produce a matched filter output;

a branch metric calculator for receiving the outputs of said matched filters and said estimates from said channel estimators for calculating a branch metric of the signals received by the antennas; and

a maximum likelihood sequence estimator coupled to said branch metric calculator.

5,202,904

PULSE STUFFING APPARATUS AND METHOD

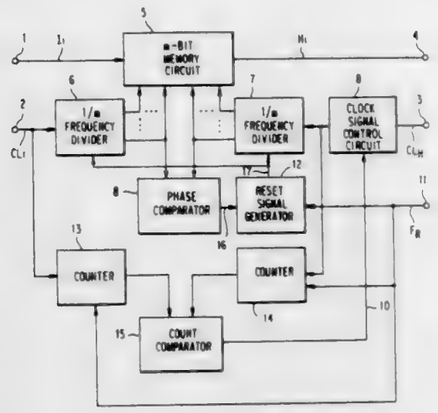
Yoshiki Kamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 16, 1992, Ser. No. 851,836

Claims priority, application Japan, Mar. 14, 1991, 3-075648

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—118 **7 Claims**



1. A pulse stuffing circuit for each channel of a pulse stuffing multiplexer apparatus wherein low order data signals for N channels (N: positive integer) are entered and, after stuffing bits are added to the low order data signals in order to synchronize the bit rate of the entered low order data signals with a higher bit rate, these data signals are multiplexed to be emitted, comprising:

a first divider for entering a low order clock signal synchronizing with the entered low order data signal for a single channel to divide the clock signal to 1/m (m: positive integer) in order to generate a writing clock signal;

a second divider for entering a high order clock signal having a bit rate not lower than that of the low order clock signal for any channel to divide the higher order clock signal to 1/m in order to generate a reading clock signal;

an m-bit memory circuit into which said low order data signal is written by the writing clock signal generated by said first divider and from wh.ich said low order data signal is read out by the reading clock signal generated by said second divider to be emitted as the high order data signal;

a clock signal control circuit for suppressing the high order clock signal entering said second divider when a clock signal is given to the clock signal control circuit;

first control means for comparing the position of said writing clock signal and the position of said reading clock signal at intervals of m-bits when the high order signal is read out from said memory circuit, and for resetting said first and second dividers at the head position of the next frame when the interval therebetween falls within predetermined k-bits (k≦m) to place said writing and reading clock signals in a predetermined positional relationship; and

second control means for comparing the count values of said low order clock signal and said suppressed high order clock signal at the time of the last bit of each frame to emit said clock control signal to said clock signal control circuit.

5,202,905

MODEN SIGNAL DETECTING SYSTEM FOR ADAPTIVE DIFFERENTIAL PCM CODEC

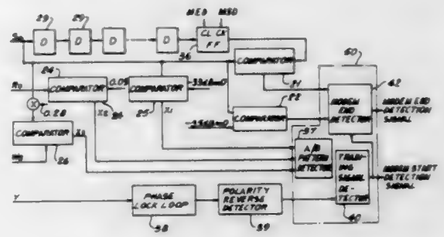
Keizo Sakamoto, Kanagawa; Yoshihiro Tomita, and Hironori Orihara, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 16, 1990, Ser. No. 614,197

Claims priority, application Japan, Nov. 16, 1989, 1-297830; Feb. 19, 1990, 2-36229; Apr. 6, 1990, 2-92610; Jun. 7, 1990, 2-149063

Int. Cl.[5] H04L *23/00*

U.S. Cl. 375—121 **12 Claims**



1. A modem signal detector for detecting a modem training signal for use in an adaptive differential coding system, comprising:

means for detecting and deciding a first signal pattern of a modem training signal;

means for detecting a second signal pattern inverting a phase of the first signal after detection of the first signal pattern of the modem training signal;

timer means for counting a time passage of a predetermined time period after detecting and deciding said first signal pattern; and

reset means for resetting said detecting and deciding means of said first signal pattern when said second signal pattern is not detected within the predetermined time period counted by said timer means after detection and decision of said first signal pattern.

5,202,906

FREQUENCY DIVIDER WHICH HAS A VARIABLE LENGTH FIRST CYCLE BY CHANGING A DIVISION RATIO AFTER THE FIRST CYCLE AND A FREQUENCY SYNTHESIZER USING SAME

Shigeki Saito, Yokohama; Hiroshi Suzuki, Yokosuka, and Yoshiaki Tarusawa, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Company, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,129

Claims priority, application Japan, Dec. 23, 1986, 61-305253; May 22, 1987, 62-123731

Int. Cl.[5] H03L *7/18;* **H03K** *21/36*

U.S. Cl. 331—14 **3 Claims**

1. A frequency synthesizer comprising:

a voltage controlled oscillator producing a frequency output which is responsive to an input control voltage;

variable frequency divider means, coupled to receive said frequency output from said voltage controlled oscillator for dividing said frequency output by a supply division ratio n;

a reference signal oscillator for producing reference signals;

phase comparator means for comparing a phase of an output signal of said variable frequency divider means with a phase of said reference signal and producing a signal indicative thereof;

a controllable switch circuit, coupled to receive said signal, for selectively conducting said signal therethrough based on a switch control signal, a closed loop being formed by a closing of said controllable switch circuit;

loop filter means, coupled to an output of said controllable

switch circuit, for smoothing and latching said output, and

5,202,909

METHOD AND APPARATUS FOR MEASURING

transition temperature at or below the normal operating

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switch circuit, for smoothing and latching said output, and coupling the smoothed output to said voltage controlled oscillator as said control voltage;

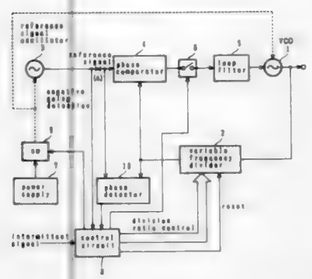
phase detector means for detecting a phase difference between said output signal from said variable frequency divider means and said reference signal and producing an output phase difference signal; and

control means for:

(1) initially setting n_1 as said division ratio n during a reset condition while maintaining said variable frequency divider means in a reset condition before closing the loop to initiate a first phase difference detection cycle;

(2) detecting an edge of said reference signal;

(3) releasing said reset condition of said variable frequency divider in response to said detecting to divide by said division ratio for a first cycle;



(4) setting N as a second division ratio after said first cycle;

(5) dividing by N during a second cycle;

(6) setting n_2 as a third division ratio based on said output phase difference signal;

(7) resetting said variable freqency divider means and repeating said functions (2), (3), (4), and (5) as a second phase difference detection cycle to repeat an operation similar to the first phase difference detection cycle using said division ratio n_2;

(8) repeating said function (7) using different division ratios until the phase difference between the output phase of said reference oscillator and the output phase form the variable frequency divider becomes smaller than the reference value; and

(9) commanding said switch circuit to close said loop.

5,202,907

SOLID-STATE IMAGE SENSOR OUTPUT MOSFET AMPLIFIER WITH MOSFET LOAD

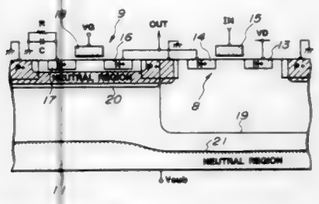
Kazuya Yonemoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1992, Ser. No. 892,930

Claims priority, application Japan, Jun. 4, 1991, 3-159601

Int. Cl.[5] G11C *19/28;* **H01L** *29/78;* **H03F** *3/16*

U.S. Cl. 377—60 **10 Claims**



1. A solid-state imager comprising:

a substrate layer of a first conductivity type in a semiconductor substrate;

first and second wells of a second conductivity type formed in said substrate layer, said first and second wells both extending into said substrate from a top surface of said substrate;

a pair of first drain and first source regions of the first conductivity type formed in the first well region;

a pair of second drain and second source regions of the first conductivity type formed in the second well region;

a first insulated gate electrode formed on said top surface of said substrate, said first gate electrode forming a drive side MOS transistor with said first drain and source regions; and

a second insulated gate electrode formed on said top surface of said substrate, said second gate electrode forming a load side MOS transistor with said second drain and source regions, said drive side MOS transistor and said load side MOS transistor being connected to form a floating diffusion type output amplifier of said solid-state imager;

wherein said first well is deeper from said top surface of said substrate than said second well.

5,202,908

SHIFT REGISTER

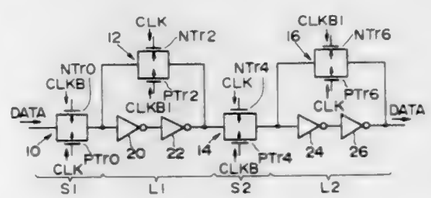
Akiyoshi Hatada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 797,214

Claims priority, application Japan, Dec. 10, 1990, 2-401133

Int. Cl.[5] H03K *3/284*

U.S. Cl. 377—64 **12 Claims**



1. A shift register comprising:

a cascade connection;

said cascade connection including a plurality of shifting sections each one of which alternating with ones of a plurality of latching sections;

each of said shift shifting sections including a CMOS transmission gate;

each of said latching sections including a series combination of two inverters;

each of said latching sections further including a CMOS transmission gate connected in parallel with its respective series combination;

wherein phases of clocks that drive said shifting and said latching sections are in a relationship such that said latching sections are driven earlier in time than said shifting sections; and

a resistance of said shifting section CMOS transmission gates during conduction is larger than a resistance of said latching section transmission gates during their conduction such that, in an event that said latching and shifting transmission gates conduct simultaneously, latched data, output by said series combinations of inverters, predominates over shifted data at the inputs of said series combinations of inverters due to the resistive voltage division principle whereby a race condition is prevented.

5,202,909

METHOD AND APPARATUS FOR MEASURING TRANSVERSE THICKNESS PROFILE OF A METAL STRIP

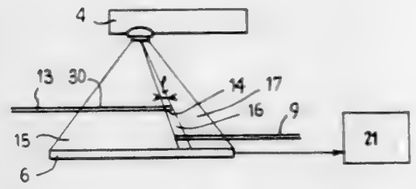
Pierre Gaujé, Evecquemont, France, assignor to Institute de Recherches de la Siderurgie Francaise (IRSID), Puteaux, France

Filed Aug. 29, 1991, Ser. No. 752,057

Claims priority, application France, Sep. 5, 1990, 90 11037

Int. Cl.[5] G01N *23/06*

U.S. Cl. 378—54 **15 Claims**



1. An apparatus for measuring a thickness profile of a metal strip by radiation absorption comprising:

a radiation emitting tube disposed on a side of a plane substantially defined by said strip;

a linear radiation detector disposed on a side of said plane opposite said tube for generating a signal profile representative of an amount of radiation incident thereon;

a mask interposed between said tube and said detector to partly occult the radiation emitted by said tube and mask a corresponding part of said detector;

determining means for receiving said signal profile and determining a first position at which said profile changes from a first level representing radiation occulted only by said strip to a second level representing radiation occulted by said strip and by said mask, and for determining a second position at which said signal profile changes from said second level to a third level representing radiation occulted only by said mask;

difference means for generating a signal indicative of a difference between said first and second positions; and

control means responsive to said difference signal for controlling a position of said mask to maintain said difference at a predetermined amount.

5,202,910

ANODE FOR ARC DISCHARGE DEVICES

Phillip K. Ausburn, Lawrenceville, and Loyce A. Turner, SE. Smyrna, both of Ga., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 574,620, Aug. 28, 1990. This application Jun. 23, 1992, Ser. No. 902,770

Int. Cl.[5] H01J *35/22*

U.S. Cl. 378—121 **14 Claims**

1. A device comprising:

a) a first electrode acting as a cathode; and

b) a second electrode acting as an anode exposed to high current arc discharges;

wherein the improvement comprises that the second electrode is made of a material which has a ductile-to-brittle transition temperature at or below the normal operating temperature of the device, whereby mechanical splintering damage to the second electrode, from sudden heating due to arcing, is reduced.

5,202,911

MARKERS FOR DENTAL X-RAY FILM AND PACKETS FOR SIMPLIFIED FILM MOUNTING

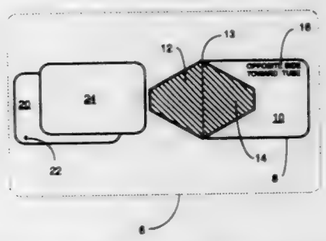
Carl E. Fabian, 577 NE. 96th St., Miami Shores, Fla. 33138

Continuation-in-part of Ser. No. 665,096, Mar. 6, 1991, which is a continuation-in-part of Ser. No. 572,264, Aug. 27, 1990, abandoned. This application Feb. 10, 1992, Ser. No. 833,059

The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—168 **15 Claims**



1. A radiographic film packet adapted to be placed in a patient's mouth for exposing a sheet of dental film to X-rays generated by an X-ray tube, comprising:

(a) a light-proof envelope having a first side and second side defining a pocket for receiving said film sheet;

(b) a sheet of lead disposed within said pocket adjacent said second side;

(c) a sheet of film disposed within said pocket between said lead sheet and said first side;

(d) an indicator affixed to said first side of said envelope, said indicator expressly designating the edge of said film packet appointed to be uppermost in said mouth during radiographic exposure; and

(e) a marker comprising a perforation in the periphery of said film sheet.

5,202,912

dimension in a first orientation in a first user position in the

d3) transmitting said message to said data processing

including a positive line and a negative line exhibiting a phone

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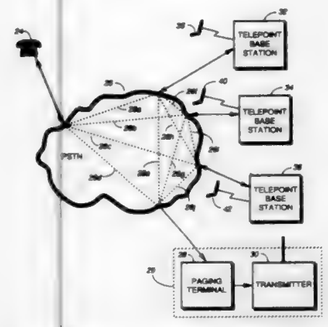
5,202,912

METHOD AND APPARATUS FOR PROVIDING TELEPOINT TO TELEPOINT CALLING BETWEEN PAGER EQUIPPED HANDSETS

Robert L. Breeden, Boca Raton; Prabhakar Muppidi, Boynton Beach, and Richard E. Bessom, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 9, 1991, Ser. No. 756,944
Int. Cl.[5] H04M *11/00*; G08B *5/22*
U.S. Cl. 379—57 22 Claims



1. In a communication system providing at least cordless radiotelephone operation and having a plurality of telepoint base stations geographically located therein for providing communication between a plurality of portable radiotelephone transceivers and a public switched telephone network, a method for providing communication between transceivers having paging receivers coupled thereto and operating within the communication system comprises the steps of:

transmitting a paging message from a paging system which is transmitted substantially throughout the communication system in response to a first transceiver registering with a first telepoint base station and requesting communication with a second transceiver, the paging message including at least access information identifying the first telepoint base station and access information identifying the first transceiver;

establishing a communication link with the first telepoint base station from a second telepoint base station registering with the second transceiver in response to the same receiving the paging message identifying the first telepoint base station; and

thereafter requesting registration of the first complete the communication link between the first and second transceivers in response to the first telepoint base station receiving the access information of the first transceiver.

5,202,913

COMMUNICATIONS UNIT FOR FITTING IN VEHICLES

Ulf Lang, Lödöse, and John-Gustaf Gudmundson, Trollhättan, both of Sweden, assignors to Saab Automobile Aktiebolag, Sweden

PCT No. PCT/SE89/00753, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991, PCT Pub. No. WO90/07833, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 29, 1989, Ser. No. 720,537
Claims priority, application Sweden, Dec. 30, 1988, 8804719
Int. Cl.[5] H04M *11/00, 1/00*
U.S. Cl. 379—58 17 Claims

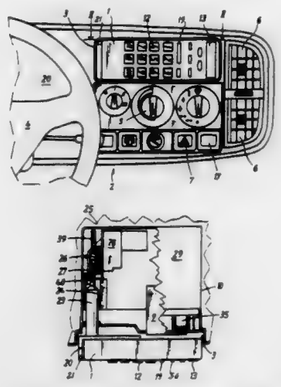
1. A communications unit for fitting into a recess in the instrument panel of a vehicle, the recess being so placed in the instrument panel and being so shaped as to open generally horizontally and in the transverse direction of the vehicle;

the communications unit comprising:

a base unit in the recess;

means holding an a telephone receiver having an elongated dimension in a first orientation in a first user position in the base unit and in the recess, the telephone receiver having one side which is held by the holding means essentially parallel to a first plane;

drive members in the base unit for ejecting the receiver out



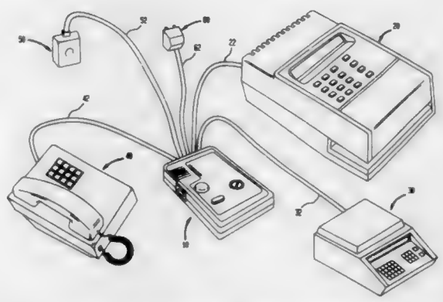
of the recess, the drive members further comprising guide means which guide the receiver to eject in a parallel displacement and in a turning movement and to move to a second user position, and the second user position is turned at an angle from the first user position and is generally parallel to the first user position.

5,202,914

SYSTEM FOR RESETTING A POSTAGE METER

Hyung-Kun (Paul) Kim, Wilton, and William V. Pickering, Jr., New Canaan, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 13, 1990, Ser. No. 582,576
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—97 19 Claims



1. Apparatus for recharging a postage meter, comprising:

a) first means for communicating with said postage meter;

b) memory means for storage and retrieval of data relating to recharging said postage meter;

c) second means for communicating with a remote data processing center; and

d) control means for:

d1) communicating through said first communicating means with said postage meter to obtain meter parameters;

d2) combining an access code with data previously stored in said memory means to form a message;

d3) transmitting said message to said data processing center through said second communicating means;

d4) receiving and storing a recharge code derived from said message from said data processing center;

d5) communicating with said postage meter through said first communicating means to transfer said recharge code to said meter, whereby said meter is recharged;

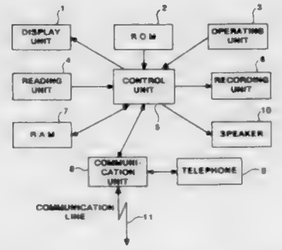
e) a physically separable memory module, said separable memory module storing a portion of the information comprising said message, said portion including an identification code for said meter, said recharge code being uniquely associated with said meter as a function of said identification code, whereby said separable memory module acts as a key, without which said apparatus cannot recharge said meter.

5,202,915

SINGLE LINE COMMUNICATION APPARATUS FOR SPEECH AND DATA AND METHOD THEREFOR

Teruyuki Nishii, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 715,720, Jun. 18, 1991, abandoned, which is a continuation of Ser. No. 372,622, Jun. 28, 1989, abandoned. This application Jul. 20, 1992, Ser. No. 915,890
Claims priority, application Japan, Jul. 1, 1988, 63-165651
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—100 14 Claims



1. A data communication apparatus, in which a remote telephone can be connected and a single communication line is selectively used for speech communication by the telephone and data communication by a data communication means, comprising:

detection mean for detecting a remote indication for starting data communication from the telephone remote from the data communication means;

switch-over means for switching over the communication line from the telephone to the data communication means in response to the remote indication;

control means for detecting reception of a signal related to data communication after the communication line has been switched over to the data communication means by the switch-over means, and for controlling a start of data communication in response to the signal reception detection; and

information means for informing an operator at the telephone by a sound that data communication has been started by said control means.

5,202,916

SIGNAL PROESSING CIRCUIT FOR USE IN TELEMETRY DEVICES

Stewart W. Oliver, Venice, Calif., assignor to Telegenics Inc., Los Angeles, Calif.

Filed Aug. 10, 1990, Ser. No. 565,947
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—106 8 Claims

1. A signal processing circuit for use with an inbound telemetry device which is couplable to a phone line, said phone line including a positive line and a negative line exhibiting a phone line voltage therebetween, at least one other communications device being couplable to said phone line, said processing circuit comprising:

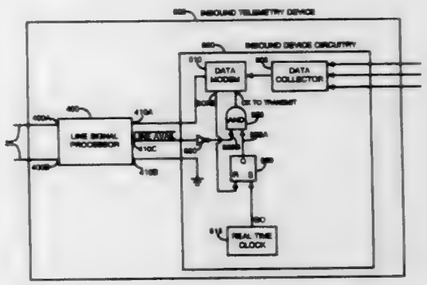
a first input for coupling to said positive line;

a second input for coupling to said negative line;

a positive supply path coupled to said first input;

a negative supply path coupled to said second input;

a transistor, coupled to said positive and negative supply paths, said transistor generating an output signal exhibiting a first state when said phone line voltage is greater than a predetermined threshold voltage to indicate that said phone line is available for use by said inbound telemetry device, said output signal assuming a second state



when said phone line voltage is less than said predetermined threshold voltage to indicate that said phone line is not available for use by said inbound telemetry device;

first isolating means coupled between said transistor and said positive supply path for preventing said transistor from drawing substantial current from said phone line;

second isolating means situated in said negative supply path for preventing said signal processing circuit from drawing substantial current from said phone line;

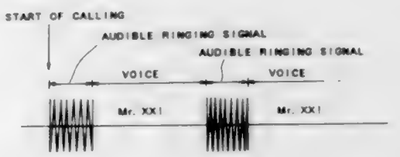
power supply means, coupled between said positive supply path and said negative supply path and including an output port, for deriving sufficient power from said phone line to supply operating power to said output port for use by an inbound telemetry device.

5,202,917

TELEPHONE CALLING METHOD AND TELEPHONE APPARATUS

Yoichi Wakai, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 774,862
Claims priority, application Japan, Nov. 15, 1990, 2-307099
Int. Cl.[5] H04M *1/72, 9/00*
U.S. Cl. 379—159 6 Claims



1. A telephone calling method for a telephone apparatus which includes a plurality of extension telephone sets capable of making an extension-to-extension telephone call, comprising the steps of developing an audible ringing signal which sounds intermittently after each predetermined silent period, and calling a called person by voice during each such silent period.

5,202,918

incoming tip and ring terminal DC to 300 Hz ("DC band")

means for generating a higher tip input impedance, an

5,202,921

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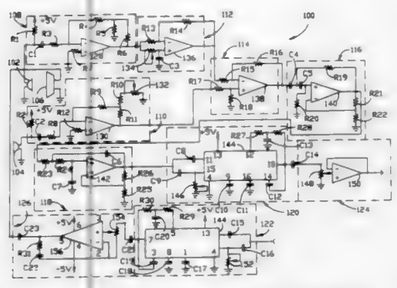
5,202,918
DUPLEX TRANSDUCER FOR SIMULTANEOUS VOICE BROADCAST AND RECEPTION

Donald R. White, Kansas City, Mo., assignor to Maxcom Electronics, Inc., Kansas City, Mo.

Continuation of Ser. No. 703,391, May 21, 1991, abandoned. This application Apr. 8, 1992, Ser. No. 865,205
Int. Cl.[5] H04M *1/60*
U.S. Cl. 379—390 **15 Claims**



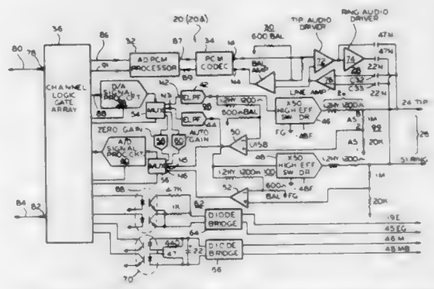
1. A duplex communications apparatus comprising:
speaker means for receiving and responding to incoming audio signals from a source thereof for producing corresponding speaker sounds;
first and second microphone means each operable for receiving and responding to said speaker sounds and to other sounds from outside said apparatus for producing respectively corresponding audio signals;
means for positioning said first and second microphone means so that the audio signals representative of said speaker sounds of said first microphone means relative to the audio signals representative of said speaker sounds of said second microphone means present a ratio;
amplifier means coupled with first and second microphone means for receiving and amplifying said audio signals according to respective first and second gains for producing respectively corresponding first amplified signals including first amplified speaker sounds signals and first amplified other sounds signals, and second amplified signals including second amplified speaker sounds signals and second amplified other sounds signals,
said amplifier means including means for providing said gains so that said second gain relative to said first gain presents said ratio so that said first and second amplified speaker sounds signals are substantially equal and thereby present a common speaker mode between said first and second amplified signals; and
means for receiving and responding to said first and second amplified signals for rejecting any common mode therebetween in order to produce output signals substantially free of said common speaker mode and thereby representative of said other sounds.

5,202,919
METALLIC CHANNEL UNIT NETWORK

Frederick J. Kiko, Carlsbad, Calif., assignor to Tollgrade Communications, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1990, Ser. No. 577,284
Int. Cl.[5] H04M *19/08*
U.S. Cl. 379—399 **18 Claims**

1. A metallic channel unit network for interconnecting a two-wire, bidirectional signal transmitting means and a four-wire digital signal transmitting means in a communication, said metallic channel unit network comprising:
a two-wire port having tip and ring terminals adapted for connection to said two-wire means;
a signal receive port adapted for connection to a first signal transmission path of said four-wire means for receiving incoming tip and ring terminal DC to 300 Hz ("DC band") frequency signals and incoming tip and ring terminal "300 Hz to 3.5 KHz ("voice band") frequency signals;
a signal transmit port adapted for connection to a second signal transmission path of said four-wire means for supplying outgoing tip and ring terminal DC to 300 Hz ("DC band") frequency signals and outgoing tip and ring 300 Hz to 3.5 KHz (voice band) frequency signals from said two-wire means;
first circuit means including CODEC means coupled to said four-wire means for supplying said incoming tip and ring terminal "voice band" frequency signals of said four-wire means at a first node connected to said CODEC means;
second circuit means including D/A signal processing means and A/D signal processing means coupled to said four-wire means for supplying said incoming tip and ring terminal "DC band" frequency signals of said four-wire means at a second and third nodes connected to said D/A signal processing means;
voice hybrid driver means being responsive to said incoming tip and ring terminal "voice band" frequency signals of said four-wire means at the first node from said CODEC means for applying to said respective tip and ring terminals corresponding outgoing tip and ring terminal "voice band" frequency signals;
said voice hybrid driver means including line amplifier means having its inputs coupled across said incoming differential "voice band" frequency signals from said two-wire means for generating an output voltage on its output;

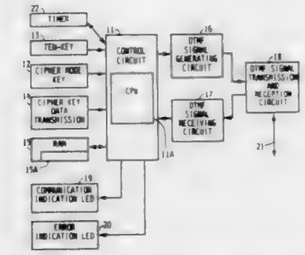


said CODEC means of said first circuit means being responsive to the output voltage of said line amplifier means at a first node for supplying said outgoing tip and ring terminal "voice band" frequency signals of said two-wire means for transmission over the second path of said four-wire means;
tip driver means having its input being responsive to said incoming tip terminal "DC band" frequency signals of said four-wire means arriving at the second node from said D/A signal processing means for applying to said tip terminal corresponding outgoing tip terminal "DC band" frequency signal and an output;
a first low output impedance coupled between the output of said tip driver means and said tip terminal so as to effect a low signalling capacitance;
ring driver means having its input being responsive to said incoming ring terminal "DC band" frequency signals of said four-wire means arriving at the third node from said D/A signal processing means for applying to said ring terminal corresponding outgoing ring terminal "DC band" frequency signal and an output;
a second low output impedance coupled between the output of said ring driver means and said ring terminal so as to effect a low signalling capacitance;
tip sensing amplifier having its non-inverting input coupled to the output of said tip driver means via said first low output impedance and being responsive to incoming tip terminal "DC band" frequency signals from said two-wire means for generating a higher tip input impedance, an inverting input, and an output;
ring sensing amplifier having its non-inverting input coupled to the output of said ring driver means via said second low output impedance and being responsive to incoming ring terminal "DC band" frequency signals from said two-wire means for generating a higher ring input impedance, an inverting input, and an output;
said A/D signal processing means being coupled to the output of said tip sensing amplifier at a fifth node for supplying said incoming tip terminal "DC band" frequency signals of said two-wire means for transmission over the second path of said four-wire means;
said A/D signal processing means being coupled to the output of said ring sensing amplifier at a sixth node for supplying said incoming ring terminal "DC band" frequency signals of said two-wire means for transmission over the second path of said four-wire means;
DC tip balance means coupled between the input of said tip driver means and the inverting input of said tip sensing amplifier for reducing an effective signalling capacitance; and
DC ring balance means coupled between the input of said ring driver means and the inverting input of said ring sensing amplifier for reducing the effective signalling capacitance.

5,202,920
FACSIMILE EQUIPMENT HAVING A SECURE COMMUNICATION FUNCTION

Hideaki Takahashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 29, 1991, Ser. No. 783,885
Claims priority, application Japan, Nov. 26, 1990, 2-323559
Int. Cl.[5] H04N *1/44*
U.S. Cl. 380—18 **18 Claims**

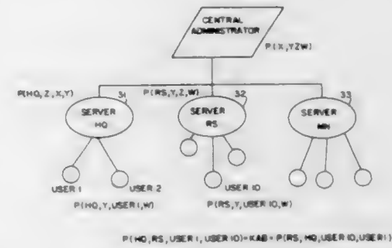


1. A facsimile apparatus having a secure communication function comprising:
input means for entering cipher key data used in the secure communication;
memory means for holding the cipher key data entered through said input means;
data transmission means for sending the cipher key data held in said memory means to a receiving unit;
data reception means for receiving the cipher key data sent from a sending unit;
cipher verification means for verifying whether the cipher key data sent from said sending unit is complete; and
means of generating a recurrent transfer request signal and sending it to a sending unit in the event of detection of defective cipher key data by said cipher verification means.

5,202,921
METHOD AND APPARATUS FOR AUTHENTICATING USERS OF A COMMUNICATION SYSTEM TO EACH OTHER

Amir Herzberg, Ramat-gan, Israel; Shay Kutten, Rockaway, N.J., and Marcel M. Yung, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1991, Ser. No. 678,474
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 **20 Claims**

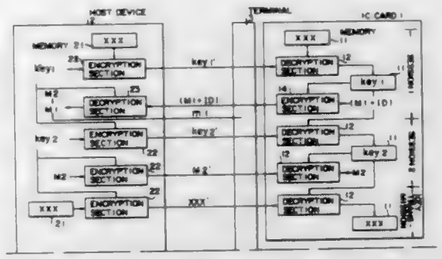


1. In a communication system having a plurality of parties, a method for each party to authenticate another party comprising:
generating a system function in at least two variables, said function two variables representing the identity of first and second parties;
transferring to each of the parties a projection of said function solved for a respective party's identity;
evaluating at said first party's location said projection with the identity of said second party to obtain a validation number, when said first party needs to authenticate said second party;
evaluating at said second party's location said second projection with the identity of said first party;
comparing at each party's location the evaluated projections, and determining based on said comparison the authenticity of each party.

5,202,922
DATA COMMUNICATION SYSTEM

Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1991, Ser. No. 798,757
Claims priority, application Japan, Nov. 30, 1990, 2-340428
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—45 **14 Claims**



1. A data communication system comprising:
first and second electronic apparatuses for transmitting data to each other during data exchange sessions;
said first electronic apparatus comprising:
first memory means for storing common key data;

session key data generating means for generating session

when said first checking means determines that the pro-

a high cut control circuit for providing a high cut control

frame interval via a correlation of phoneme symbols to

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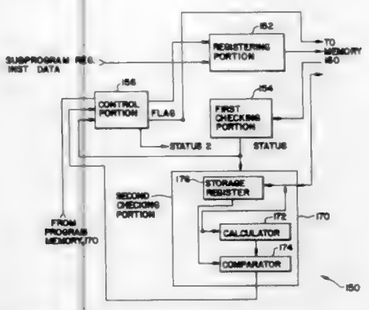
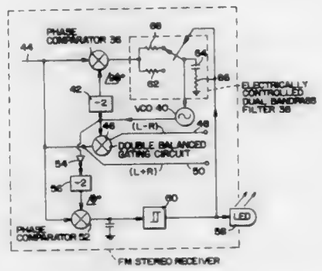
session key data generating means for generating session kay data for each of said data exchange sessions;
first encrypting means for encrypting said session key data using said common key data to generate first encrypted data;
first transmitting means for transmitting said first encrypted data encrypted by said first encrypting means to said second electronic apparatus; and
first decrypting means for decrypting a second encrypted data which is encrypted second data transmitted from said second electronic apparatus using said session kay data;
said second electronic apparatus, comprising:
second memory means for storing said common key data;
second decrypting means for decrypting first encrypted data received from said first electronic apparatus using said common key data to obtain session key data;
second encrypting means for encrypting said second data using said session key data to generate second encrypted data to be transmitted to said first electronic apparatus;
second transmitting means for transmitting said second encrypted data encrypted by said second encrypting means to said first electronic apparatus; and
first updating means for updating said common key data stored in said second memory means to said session key data decrypted by said second decrypting means; and
portions of said first and second electronic apparatuses together constituting second updating means for updating updated session key data stored in said second memory means by using said common key data stored in said first memory means after a predetermined data exchange session is completed;
said key data generated by said session key data generating means being transmitted to said second electronic apparatus every time one of said data exchange sessions is performed.

5,202,923
PORTABLE ELECTRONIC DEVICE CAPABLE OF REGISTERING SUBPROGRAMS
Ryouichi Kuriyama, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 27, 1990, Ser. No. 648,638
Claims priority, application Japan, Nov. 30, 1989, 1-311402; Nov. 30, 1989, 1-311403; Nov. 30, 1989, 1-311404; Dec. 4, 1989, 1-315106
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—50 21 Claims



4. A portable electronic device comprising:
memory means for storing an externally supplied program;
means for registering the program in said memory means;
first checking means for checking whether the program has been registered in said memory means;
second checking means for checking validity of the program when said first checking means determines that the program has been registered; and
enabling means for enabling registration of the program only when said second checking means determines that the program is invalid.

5,202,924
STEREO FM RADIO RECEIVER WITH VARIABLE BAND PASS STEREO DECODER
Oliver L. Richards, Jr., N. Grosvenor Dale, Conn., assignor to Allegro Microsystems, Inc., Worcester, Mass.
Filed Dec. 22, 1989, Ser. No. 455,050
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—13 5 Claims

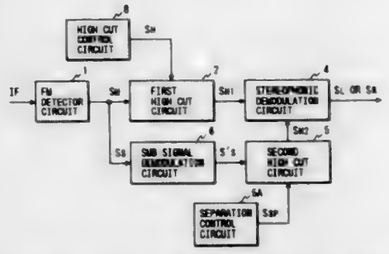


1. A stereo FM broadcast radio receiver including a variable bandwidth FM stereo decoder comprising:
(a) a composite-stereo-multiplex-signal input conductor;
(b) a phase-difference detector having one input connected to said composite-signal input conductor;
(c) an electrically controlled oscillator having a control-signal input connected to the output of said phase-difference detector and an output connected to the other input of said phase-difference detector to form a phase-locked loop;
(d) a dual-filter circuit means being connected in said loop, having a binary-signal input conductor, for establishing the bandpass of said loop to include frequencies of several hundred Hertz within audible range when a binary input signal at said binary-signal conductor is in one electrical state and for establishing the bandpass of said loop to include only frequencies below the audible range when the binary input signal at said binary-signal conductor is in the other state; and
(e) a binary signal generating means connected to said loop having an output connected to said binary-signal conductor for generating a binary output signal that is in said another state and in said one state respectively when said oscillator is locked and when it is not locked to a pilot frequency component of a signal at said composite-stereo-multiplex-signal input conductor.

5,202,925
FM STEREOPHONIC RECEIVER
Katsuaki Kawamura, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Mar. 27, 1991, Ser. No. 675,822
Claims priority, application Japan, Jun. 29, 1990, 2-68481[U]
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—13 1 Claim

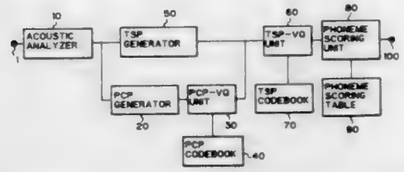
1. An FM stereophonic receiver comprising:
an FM detector circuit for detecting an intermediate frequency signal, and for providing a main signal and a sub signal in response to the detected intermediate frequency signal;
a first high cut circuit, connected to receive the main signal, for providing a first high cut signal;

a high cut control circuit for providing a high cut control signal in accordance with a received signal field strength level, said first high cut circuit controlling a frequency characteristic of the main signal in accordance with the high curt control signal;
a sub signal demodulation circuit, connected to receive the sub signal;
a second high cut circuit, connected to receive an output of said sub signal demodulation circuit, for providing a second high cut signal;



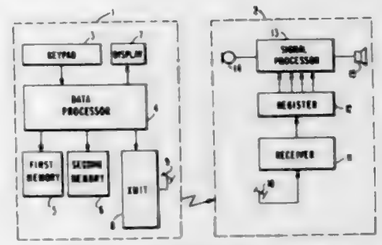
a separation control circuit for providing a separation control signal in accordance with the received signal field strength level, said second high cut circuit controlling a frequency characteristic of the sub signal in accordance with the separation control signal and providing the second high cut signal even if the received signal field strength level is relatively low; and
a stereophonic demodulation circuit, connected to receive the first and second high cut signals, for providing separated right and left channel signals.

5,202,926
PHONEME DISCRIMINATION METHOD
Kei Miki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1991, Ser. No. 757,964
Claims priority, application Japan, Sep. 13, 1990, 2-242897; Sep. 13, 1990, 2-242898
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—36 20 Claims



1. A phoneme discrimination method comprising the steps of:
analyzing the frequency of an inputted voice signal to compute, for predetermined time frame intervals, voice spectrum parameters and voice powers indicative of the intensity of the inputted voice;
combining the voice powers of adjacent frames to provide a power-change pattern (PCP) indicative of the time variance of the voice powers;
combining the spectrum parameters of neighboring frames to provide a time spectrum pattern (TSP) indicative of the time variance of the spectrum parameters;
vector-quantizing the PCP to determine power-change pattern codes (PCP codes);
vector-quantizing the TSP using a TSP codebook corresponding to the PCP-VQ codes in the respective frames to obtain TSP codes; and
determining the probable phoneme symbol of each time frame interval via a correlation of phoneme symbols to PCP code and TSP code.

5,202,927
REMOTE-CONTROLLABLE, PROGRAMMABLE, HEARING AID SYSTEM
Jan Topholm, Holte, Denmark, assignor to Topholm & Westermann ApS, Vaerloese, Denmark
PCT No. PCT/EP90/00031, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO90/08448, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 8, 1990, Ser. No. 688,510
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1989, 3900588
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68 7 Claims



1. A remote-controllable, programmable hearing air system, comprising an external control unit (1) and a hear air (2), said external control unit includes an input device (3), a display (7) for operator prompting and a transmitter for optional transmission of different groups of control parameters to said hearing air, said hearing aid having a receiving circuit and a signal processing circuit whose transmission characteristic can be optionally adjusted at any time by a set of said control parameters transmitted by said external control unit, wherein said remote control unit contains a first memory (5) for storing audiometric data, a second memory (6) for storing data characterizing different environmental situations, and a data processing device (4) for determination of a set of control parameters from the contents of said first and second memories.

5,202,928
SURFACE GENERATION METHOD FROM BOUNDARIES OF STEREO IMAGES
Fumiaki Tomita; Kazuhide Sugimoto, and Hironobu Takahashi, all of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Sanyo Electric Co., Osaka, both of Japan
Filed Jul. 21, 1989, Ser. No. 601,657
Claims priority, application Japan, Sep. 9, 1988, 63-226761
Int. Cl.[5] G06K *9/48*; G01C *3/14*; H04N *13/00*
U.S. Cl. 382—1 2 Claims

2. An image processing method for matching edges detected in images of the same objects present in a three-dimensional scene which are viewed simultaneously by two or more image pick-up devices located at different positions, and real planar surfaces of said objects surrounded by closed boundaries are estimated, comprising:
setting two boundary segments with opposite directions on each edge of an object,
classifying each segment on the boundary using positions of points of occlusion into apparently real segments on the surface which occludes an object or a background to the rear, apparently imaginary segments which are on the opposite side of the apparently real segments, or undefined segments which are not defined to be the apparently real segments or the apparently imaginary segments, and

digital signals in a file of reference digital signals for re- ticity of the to-be-verified signature, as criterion Cr3;

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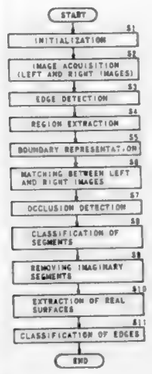
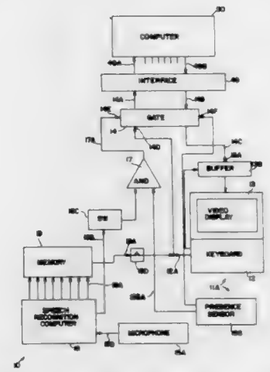
for each boundary
(a) finding a planar surface which has all apparently real segments and no apparently imaginary segment on it,
(b) in the case where there is only one surface which has no segment under it, determining said one surface to be an actually existing surface to be referred to as the real surface, and
(c) classifying the undefined segments to real segments which exit on the real surface or imaginary segments which exist above the real surface, and
for each edge



(a) in the case where both segments on the edge are the real segments, classifying said edge to be a ridge edge at which two surfaces intersect, and in the case where only one segment on the edge is the real segment, classifying said edge to be the occluding edge at which the front object occludes a rear object or the background, and
(b) further classifying each ridge edge into a convex edge, a concave edge, or a flat edge according to the angle between normals of the surface on both sides of the edge.

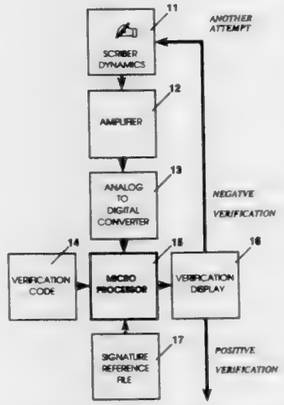
5,202,929
DATA SYSTEM AND METHOD
Jerome H. Lemelson, 868 Tyner Way, Call Box 14-286, Incline Village, Nev. 89450
Continuation of Ser. No. 192,460, Sep. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,167, Sep. 24, 1979, abandoned. This application Nov. 6, 1984, Ser. No. 633,305
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—2 **7 Claims**

1. A method of detecting fraud in the operation of a computer system, said method comprising:
a) identifying by means of information signals all the operators authorized to operate an electronic computer system having a plurality of data entry and display terminals, and
b) whenever data is entered into said system, generating a select information signal in the form of code identification signals which are unique to a person physically present at one of said data terminals for entering the data,
c) only upon determining said physically present person as one of said authorized operations, recording said code identification signal along with signals indicative of the information entered,
d) when it is desired to audit and determine the identification of the person entering specific information into the computer system, reproducing the signals indicative of the specific information to be audited along with code identification signals of the person entering said information, and
e) applying said code identification signals to activate a visual presentation means to cause the visual presentation means to present visually readable information indicating



the identity of the person associated with such code signals.

5,202,930
HIGH PRECISION ON-LINE SIGNATURE DYNAMIC VERIFICATION SYSTEM
Alexander Livshitz, and Ruth Shraiman, both of 1475 Folsom, Apt. 378, Boulder, Colo. 80303
Continuation-in-part of Ser. No. 402,875, Sep. 5, 1989, abandoned. This application Apr. 9, 1991, Ser. No. 683,533
Int. Cl.[5] G06K *9/00, 9/46, 9/66, 9/36*
U.S. Cl. 382—3 **13 Claims**

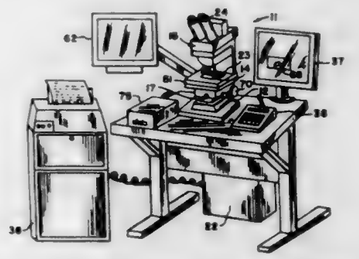


1. A machine method of on-line handwritten signature verification based on the dynamics of a reference signature and of a to-be-verified signature in accordance with one or more selected threshold value, including the steps of:
a. gathering a set of reference analog dynamic signals related to scriber movement for handwritten reference signatures during the process of reference signature making, such signals being selected from the group consisting of forces transmitted from the hand of the writer to the scriber, scriber acceleration, scriber velocity, and mixtures thereof, all as functions of time;
b. converting the reference analog dynamic signals from analog to digital form, and storing the resulting reference digital signals in a file of reference digital signals for retrieval therefrom;
c. gathering a set of to-be-verified analog dynamic signals related to scriber movement for a to-be-verified handwritten signature during the process of to-be-verified signature making, such signals to be selected from the group consisting of forces transmitted from the hand of the writer to the scriber, scriber acceleration, scriber velocity, and mixtures thereof, all as functions of time;
d. converting the to-be-verified analog dynamic signature signals from analog to digital form;
e. providing a pair of digital signals, said digital signal pair being composed of the to-be-verified digital signals and one of the reference digital signals taken from the reference signal file, with which it is to be compared;
f. processing the data pair of digital signals to eliminate time distortions between them utilizing the steps of:
i. using a sliding window to find phase shift locations, and thereby establishing the mapping between phase coincident areas of a reference digital signal and of the to-be-verified digital signals;
ii. eliminating phase shift distortions between the reference digital signal and of the to-be-verified digital signal by the use of the mapping procedure of step f. ii.;
g. determining the similarity of a pair of reference and to-be-verified signatures utilizing the steps of:
i. evaluating the cross-correlation matrix K_{rs} from step f. ii., with each element K_{ij} representing the maximum value of the corresponding cross-correlation function for each pair of x, y and z components of digital signal vector;

$$K_{rs} = \begin{bmatrix} K_{xx} & K_{xy} & K_{xz} \\ K_{yx} & K_{yy} & K_{yz} \\ K_{zx} & K_{zy} & K_{zz} \end{bmatrix}$$

ii. utilizing information in said matrix to produce a measure, said measure being determined using a method selected from the method of calculating a trace of the matrix and the method of calculating a norm of the matrix;
iii. using the measure as determined by step g.ii., and comparing it with an appropriate threshold in order to produce a non-rejection or rejection message of the authenticity of to-be-verified signature, as a criterion Cr_1;
iv. determining distribution of phase distortion for windows by constructing a histogram of the first order shift differences obtained from the application of the sliding window method in step f.i.;
v. utilizing the information of said first order shift differences histogram to produce a measure which characterizes the portion of the first order shift differences in the zero neighborhood;
vi. using the measure determined in step g.v. and comparing it with an appropriate threshold in order to produce a message of non-rejection or rejection of authenticity of the to-be-verified signature, as a criterion Cr_2;
vii. determining coincidence of phase distortion distributions for two of the different components of the signature signal vectors: X, Y and Z by constructing histogram of the shift differences, obtained from application of window method in step f.i., for each component by comparing their shift histograms;
viii. utilizing the information of said shift differences histogram to produce a measure which characterizes the portion of the shift differences for the two considered vector components of the signature signal which values are in the zero neighborhood;
ix. using the measure determined in step g. viii. and comparing it with an appropriate threshold in order to produce a signal of non-rejection or rejection of authenticity of the to-be-verified signature, as criterion Cr_3; and then
x. computing the verification result using criterion selected from the group consisting of Cr_1, Cr_2, and Cr_3, and combinations thereof;
xi. using the verification result of g.x. to produce a signal of approval or rejection of the authenticity of to-be-verified signature.

5,202,931
METHODS AND APPARATUS FOR THE QUANTITATION OF NUCLEAR PROTEIN
James W. Bacus, Hinsdale, Ill., assignor to Cell Analysis Systems, Inc., Lombard, Ill.
Continuation of Ser. No. 809,229, Dec. 17, 1991, abandoned, which is a continuation of Ser. No. 628,483, Dec. 14, 1990, abandoned, which is a division of Ser. No. 106,717, Oct. 6, 1987, Pat. No. 5,008,185. This application Jun. 23, 1992, Ser. No. 902,504
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—6 **25 Claims**



1. An apparatus for quantitation of nuclear antigen in a cell population which has been enhanced with an optical enhancement factor specific to a nuclear antigen such that the optical density of the optical enhancement factor relates to the location and nuclear antigen content of the cell population, and which cell population has been optically enhanced with a spectral stain material specific to the nuclear area which optically enhances the nuclear area of said cell population, said apparatus comprising:
means for digitizing an optical image of said cell population into a digital image having a plurality of pixels with grey scale values of intensity;
means for identifying from the digital image the nuclear area of the cell population at a first wavelength which allows identification of substantially all of the enhanced nuclear area;
means for identifying from the digital image the portions of said nuclear area optically enhanced specific to the nuclear antigen at second wavelength range which substantially excludes contribution from the spectral stain; and
means for measuring from said digital image the optical density of said identified portion of said nuclear area which has been optically enhanced by the optical enhancement factor specific for the nuclear antigen.

5,202,932
X-RAY GENERATING APPARATUS AND ASSOCIATED METHOD
James L. Cambier, Rome, and David Pasiak, Waterville, both of N.Y., assignors to Catawa Pty. Ltd., Australia
Continuation of Ser. No. 535,179, Jun. 8, 1990, abandoned. This application Aug. 20, 1991, Ser. No. 750,450
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—8 **16 Claims**

8. A method of inspecting an object comprising the steps of

generating an external signal in response to said object being

ing a region of said image containing text and line

color conversion means for altering at least one color attri-

each of said positions to detect a position at which the

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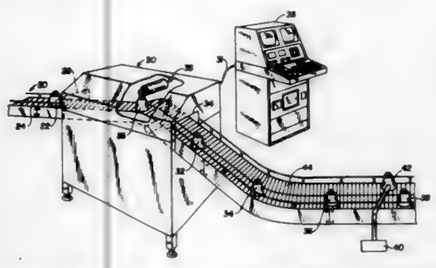
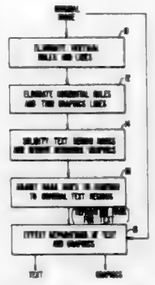
generating an external signal in response to said object being in a predetermined optimal position;
generating a high energy short x-ray pulse in response to said external signal and causing said x-ray pulse to impinge upon said object to create an x-ray image of said object;
converting said x-ray image into a digital output image;
convolving said output image with at least one mask;



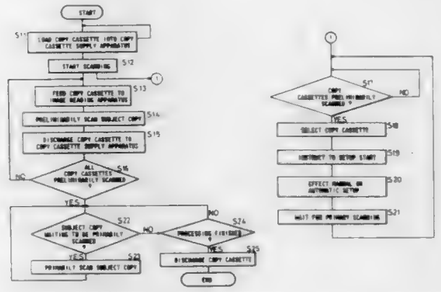
searching said output image to find an overall minimum pixel intensity value;
comparing said overall minimum pixel intensity value of said output image with a predetermined threshold value and generating a responsive signal when the comparison results in the conclusion that a departure from said predetermined threshold value has been sensed.

5,202,933
SEGMENTATION OF TEXT AND GRAPHICS
Dan S. Bloomberg, Palo Alto, Calif., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 8, 1989, Ser. No. 449,626
Int. Cl.[5] G06K *9/46*
U.S. Cl. 382—9 **79 Claims**



1. In a digital processing system, a method of identifying a line graphics region in an image containing at least text and line graphics, comprising the steps of:
a) converting OFF pixels adjacent text pixels to ON pixels using a structure element having a higher probability of having a hit in said text than said line graphics, at least a portion of said ON pixels connecting adjacent text pixels so as to produce coalesced regions of ON pixels; and
b) identifying at least a portion of said image having said coalesced regions of ON pixels, at least a portion of a remainder of said image comprising said line graphics region, said step of identifying comprising the steps of:
i) forming a mask, the mask comprising ON pixels in a region of text pixels, said step of forming a mask comprising the steps of substantially eliminating at least a portion of vertical lines from said image containing text and line graphics to produce a first intermediate image, and turning on additional pixels adjacent to remaining ON pixels in said first intermediate image; and
ii) forming a graphics image, said graphics image comprising a region of said image containing text and line graphics outside of said mask.

5,202,934
METHOD OF AND APPARATUS FOR READING IMAGE
Tadashi Miyakawa; Shinji Itoh, and Yukihisa Ozaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 11, 1991, Ser. No. 713,205
Claims priority, application Japan, Jun. 22, 1990, 2-165320
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—41 **6 Claims**

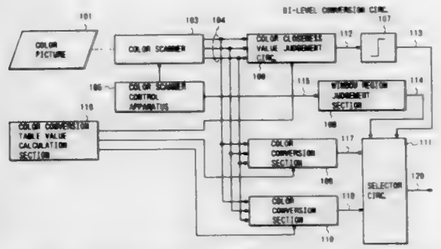


1. A method of reading an image from a subject copy, comprising the steps of:
providing an image reading apparatus for preliminarily scanning image information recorded on a first subject copy for determining a first set of image processing conditions;
establishing said first set of image processing conditions in said image reading apparatus;
causing said image reading apparatus to preliminarily scan image information recorded on a second subject copy for determining a second set of image processing conditions, at the same time that said first set of image processing conditions are being established in said image reading apparatus; and
reading said image information recorded on said first subject copy according to said first set of image processing conditions to obtain output image information to be reproduced.

5,202,935
COLOR CONVERSION APPARATUS FOR ALTERING COLOR VALUES WITHIN SELECTED REGIONS OF A REPRODUCED PICTURE
Katsuhiro Kanamori; Teruo Fumoto, and Hiroaki Kotera, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 779,816, Oct. 21, 1991, abandoned. This application Aug. 7, 1992, Ser. No. 926,188
Claims priority, application Japan, Oct. 19, 1990, 2-282091
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **11 Claims**

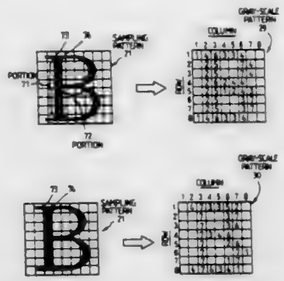
1. A color conversion apparatus comprising:
means for generating successive input color values respectively corresponding to picture elements of an original color picture;
first judgement means for judging, for each of said input color values, whether said input color value is within a predetermined range of closeness in color to a predetermined conversion origin color value;
second judgement means for judging, for each of said input color values, whether a picture element corresponding to said input color value is within a predetermined region of said color picture;

color conversion means for altering at least one color attribute of each of a plurality of said input color values to obtain respective color-converted color values, said plurality including all of said input color values which are within said predetermined range of closeness;
selector means coupled to receive said color-converted



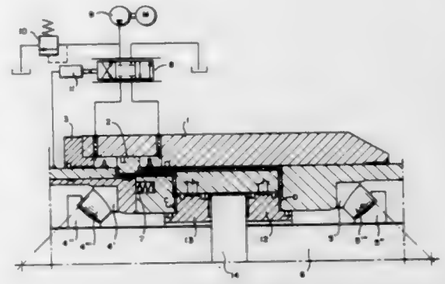
color values and responsive to judgement results obtained by said first and second judgement means for transferring to an output terminal thereof each of said color-converted color values which corresponds to an input color value that is within said predetermined region of the original color picture and which is within said predetermined degree of closeness to the conversion origin color value.

5,202,936
METHOD FOR GENERATING A GRAY-SCALE PATTERN
Yoshitaka Kobiyama, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 23, 1991, Ser. No. 734,655
Claims priority, application Japan, Jul. 25, 1990, 2-195101
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—54 **9 Claims**



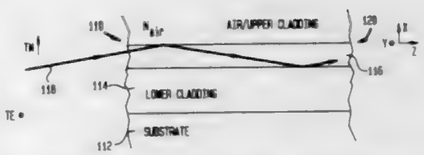
1. A method for generating a low-resolution gray-scale pattern representing a high-resolution original character image, said original character image comprising a two-dimensional array of foreground and background pels arranged in rows and columns, said method comprising the steps of:
generating a sampling pattern having plural sampling windows arranged in columns and rows, the number of columns and rows of the sampling pattern being determined by the resolution of said gray-scale pattern, each window of the sampling pattern overlying a matrix of pels of the original character image;
sequentially positioning said sampling pattern at plural positions separated by a predetermined distance along a column direction on said original character image to count, at each position, the total number of foreground pels of the original character image in predetermined portions of the rows of said sampling pattern;
comparing the total number of foreground pels counted in each of said positions to detect a position at which the largest number of foreground pels is detected;
positioning said sampling pattern at said detected position on said original character image; and
counting the number of foreground pels in each sampling window of said sampling pattern to assign a gray-scale value to the sampling window in accordance with the number of foreground pels counted.

5,202,937
ARRANGEMENT FOR AN AXIAL AND RADIAL BEARING UNIT
Thomas Arvidsson, Linkoping, Sweden, assignor to Hymac Ltd., Canada
Filed Mar. 27, 1992, Ser. No. 859,003
Int. Cl.[5] F16C *19/52*
U.S. Cl. 384—101 **3 Claims**



1. Arrangement for an axial and radial bearing unit comprising two halves (**4**, **5**), each consisting of an outer ring (**4'**, **5'**), an inner ring (**4''**, **5''**) and, where appropriate, sliding or rolling devices (**4'''**, **5'''**) arranged between them, whereby two hydrostatic bearings (**12**, **13**) acting axially in mutually opposing directions, each having at least one fluid pocket supplied with a fluid from a flow source (**9**), are applied against one or two flanges (**14**, **15**) connected to the shaft, characterized in that the hydrostatic bearings are so arranged, via their individual pressure chamber (C, D), as to absorb a loading which lies in a predetermined relationship to the external loading applied to the axial and radial bearing unit.

5,202,938
LAMINATED WAVEGUIDING POLARIZER UTILIZING POLYMERIC BIREFRINGENT CLADDING
Hong-Tai Man, Basking Ridge; Joseph Teja, Jr., Edison, and Kazutaka Oba, Jersey City, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.
Filed Nov. 25, 1991, Ser. No. 796,731
Int. Cl.[5] G02B *6/10, 1/08*
U.S. Cl. 385—11 **14 Claims**



1. A laminated waveguiding polarizer for emitting linearly polarized light upon irradiation with a light beam of arbitrary polarization comprising in combination a waveguide core

layer which is substantially optically transparent adjacent a birefringent polymer film cladding layer, the refractive indices

an optical receiver coupled to one of said optical output ports;

opposite to side main electrode and adjacent to said first

5,202,943

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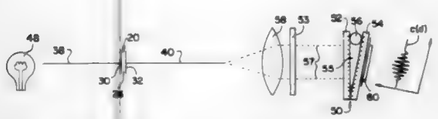
layer which is substantially optically transparent adjacent a birefringent polymer film cladding layer, the refractive indices of said core layer and said cladding layer being selected so that the layers of the polarizer will cooperate to selectively guide light of a predetermined linear polarization and extinguish polarization components orthagonal thereto wherein said core layer is formed of a polymer having sidechains with a dipole moment such that the core material changes its refractive properties upon poling in an electric field at the vicinity of the glass transition temperature of the polymer.

5,202,939

FABRY-PEROT OPTICAL SENSING DEVICE FOR MEASURING A PHYSICAL PARAMETER

Claude Belleville, Charlesbourg, and Gaétan Duplain, Québec, both of Canada, assignors to Institut National D'Optique, Sainte-Foy and Her Majesty the Queen in right of Canada, as represented by the Ministere des Transports, Quebec, both of Canada

Filed Jul. 21, 1992, Ser. No. 915,645
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—12 24 Claims



1. An optical sensing device for measuring a physical parameter, to be connected to a light source for generating a multiple frequency light signal having predetermined spectral characteristics, said device comprising:

a) a Fabry-Perot interferometer through which the light signal is passed, said Fabry-Perot interferometer including two semi-reflective mirrors substantially parallel to one another and spaced by a given distance so as to define a Fabry-Perot cavity having transmittance or reflectance properties which are affected by said physical parameter and which cause said spectral properties of the light signal to vary in response to said physical parameter, said Fabry-Perot interferometer being provided with at least one multimode optical fiber for transmitting the light signal into said Fabry-Perot cavity and for collecting at least a portion of the light signal outgoing thereof;

b) optical focusing means for focusing said at least a portion of the light signal; and

c) a Fizeau interferometer through which said focused light signal is passed, said Fizeau interferometer including optical wedge means forming a wedge-profiled Fizeau cavity from which exits a spatially-spread light signal indicative of said transmittance or reflectance properties of said Fabry-Perot interferometer;

whereby said physical parameter can be determined by means of said spatially-spread light signal.

5,202,940

MODULAR ELECTRO-OPTIC BUS COUPLER SYSTEM

Robert Betts, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 654,472, Feb. 13, 1991, Pat. No. 5,131,061. This application Feb. 6, 1992, Ser. No. 832,194
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—24 5 Claims

1. A coupler for connecting terminals to an electrical bus, said terminals being coupled by an optical bus, said coupler comprising:

optical input ports;

optical output ports;

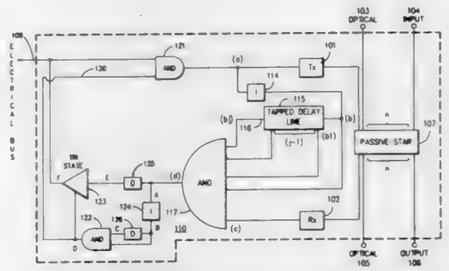
an optical transmitter coupled to one of said optical input ports;

an optical receiver coupled to one of said optical output ports;

an electrical input port;

an electrical output port;

logic control means coupling said optical transmitter, said optical receiver, said electrical output port and said electrical input port for preventing any electrical input signal



on said electrical input port from appearing at the electrical output port, but allowing an electrical input signal to be transmitted as an optical output signal and allowing an optical input signal to become an electrical output and an optical output; and

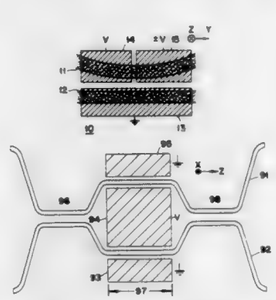
means physically configured for plugging into said electrical bus so as to couple said terminals to said electrical bus for optical-electrical bus-to-bus transmissions.

5,202,941

FOUR SECTION OPTICAL COUPLER

Per O. Granestrand, Tyresö , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 2, 1991, Ser. No. 801,483
Int. Cl.[5] G02B *6/10, 6/00;* G02F *1/00*
U.S. Cl. 385—41 20 Claims



1. A polarization independent directional optical coupler comprising:

a mono-crystalline wafer of electro-optic material;

at least two light waveguides at an upper surface of said wafer and forming an interaction region where said at least two waveguides are closely adjacent and substantially parallel to one another; and

electrodes positioned along said interaction region of said at least two waveguides wherein said electrodes include

a main electrode formed substantially parallel to said at least two waveguides on one side of said waveguides, said main electrode being grounded;

a first electrode formed on a side of said waveguides opposite to main electrode, said first electrode being connectable to a first voltage source, the output of which is changeable;

a second electrode formed on a side of said waveguides opposite to side main electrode and adjacent to said first electrode, said second electrode being connectable to a second voltage source, the output of which is changeable;

a third electrode formed on a side of said waveguides opposite to side main electrode and adjacent to said second electrode, said third electrode being connectable to a third voltage source, the output of which is changeable;

a fourth electrode formed on a side of said waveguides opposite to side main electrode and adjacent to said third electrode, said fourth electrode being connectable to a fourth voltage source, the output of which is changeable,

wherein when the outputs of said second and third voltage sources have equal value and like polarity and the outputs of said first and fourth voltage sources have equal value and like polarity the light travelling in one waveguide is barred from transferring to another waveguide, and,

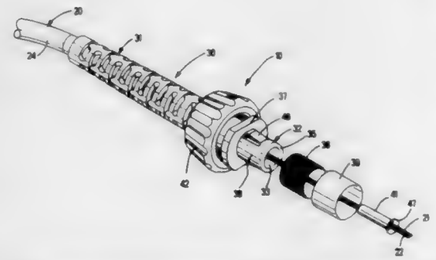
when the outputs of said second and third voltage sources have equal value and opposite polarity and the outputs of said first and fourth voltage sources have equal value and opposite polarity, the light travelling in one waveguide crosses to another waveguide.

5,202,942

CABLE TERMINATION MEMBER FOR FIBER OPTIC CONNECTORS HAVING IMPROVED STRAIN RELIEF

Daniel R. Collins, Camp Hill, and Thomas R. Fawcett, Jr., Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1992, Ser. No. 862,676
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—87 16 Claims



12. A cable termination assembly for terminating an optical fiber cable including an optical fiber member, a load bearing member around the optical fiber member, and an outer jacket surrounding the load bearing member, the cable assembly comprising:

a first outer crimp means having a bore adapted for receiving an end of the optical fiber cable therethrough and an outer surface surrounding said bore adapted so that the load bearing member extending through the bore can be folded back onto said outer surface;

a tubular-shaped, radially-rigid inner crimp member adapted to receive the end of the optical fiber member therethrough and further adapted to be positioned between the optical fiber member and the load bearing member within the first outer crimp means; and

a crimpable second outer crimp means adapted for surrounding the outer surface of the first outer crimp means and the folded back load bearing member and being further adapted to tightly engage the first outer crimp means when crimped,

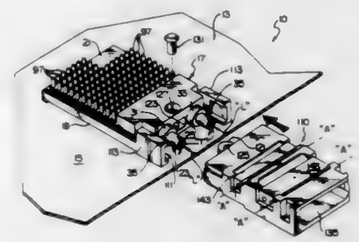
whereby when the cable termination assembly is assembled with the optical fiber cable and crimped thereto, the outer jacket is engaged by the first outer crimp member in cooperation with the inner crimp member and the folded back load bearing portion is tightly engaged between the first and second outer crimp means.

5,202,943

OPTOELECTRONIC ASSEMBLY WITH ALIGNMENT MEMBER

Gary R. Carden, Endwell, N.Y.; David H. Danovitch, Quebec, Canada; Eric M. Foster, Owego, and William W. Vetter, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1991, Ser. No. 771,904
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—92 23 Claims



1. In an optoelectronic assembly for providing bidirectional data transmission between fiber optic means including a connector housing having at least one optical fiber member therein and an electrical circuit member wherein said assembly includes a housing, a substrate member substantially positioned within said housing of said assembly and adapted for being electrically coupled to said electrical circuit member, at least one optoelectronic device substantially positioned within said housing and electrically coupled to said substrate member, the improvement wherein said optoelectronic device is initially substantially movably positioned within said housing, said assembly further including a separate alignment member for being secured to said housing in fixed alignment therewith and adapted for having said connector housing of said fiber optic means positioned therein, said alignment member adapted for engaging said substantially movably positioned optoelectronic device to securedly position said device with said housing of said assembly in fixed alignment with said alignment member such that said optical fiber member of said fiber optic means and said optoelectronic device are in precise alignment with said alignment member is secured to said housing of said assembly.

5,202,944

COMMUNICATION AND POWER CABLE

Mathew B. Riordan, Garden Grove, Calif., assignor to Westech Geophysical, Inc., Ventura, Calif.

Division of Ser. No. 540,573, Jun. 15, 1990, Pat. No. 5,140,319. This application May 31, 1991, Ser. No. 708,977
Int. Cl.[5] G02B *6/44*
U.S. Cl. 385—101 10 Claims

1. A communication and power cable comprising:

an optical fiber;

an inner layer of electrical conductors surrounding the optical fiber;

an outer layer of electrical conductors surrounding the inner layer of electrical conductors;

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an insulator disposed between the inner layer of electrical conductors and the outer layer of electrical conductors, thereby separating said layers; and

strength member strands disposed in one of said layers which are in electrical contact with the electrical conductors of said layer in which they are disposed, the strength member strands having a tensile strength substantially greater than the tensile strength of the electrical conductors of the layer in which they are disposed, but having an electrical conductivity substantially less than said electrical conductors.

5,202,945

OPTICAL CABLE AND METHOD FOR THE MANUFACTURE THEREOF

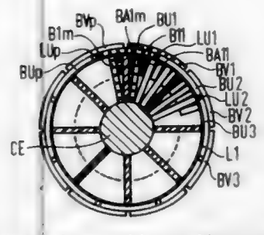
Johann Foertsch, Kronach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 17, 1991, Ser. No. 808,742

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1991, 4103587

Int. Cl.[5] **G02B** *6/44*

U.S. Cl. 385—105 **28 Claims**



1. In an optical cable comprising a cable core element and a plurality of bands, each band containing a plurality of individual light waveguides within a shared envelope, which envelope guarantees a cohesion of the individual light waveguides and each band having a long side, said bands being stranded on the core element with the long side of each band extending in a radial direction, each band having a uniformly curved shape around an innermost edge, which curved shape is applied during production of the band, and a light waveguide of each band lying on the radial outermost portion of the band having a longer length than the optical waveguides disposed radially inward therefrom due to said uniform curved shape.

5,202,946

HIGH COUNT TRANSMISSION MEDIA PLENUM CABLES WHICH INCLUDE NON-HALOGENATED PLASTIC MATERIALS

Tommy G. Hardin, Lilburn, Ga., and Behrooz A. Khorramian, New York, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 20, 1992, Ser. No. 839,196

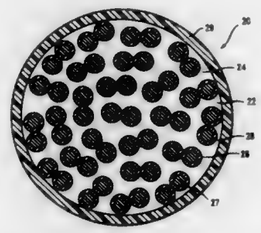
Int. Cl.[5] **G02B** *6/44*

U.S. Cl. 385—109 **8 Claims**

1. A communications cable, which is suitable for building plenum use, said cable comprising:

a core which comprises a relatively large number of communications transmission media, each communications transmission medium being enclosed with a plastic material which is selected from the group consisting of a polyetherimide, a silicone-polyimide copolymer, and compositions which include a polyetherimide and a silicone-polyimide copolymer; and

a jacket which encloses said core and which comprises a plastic material comprising a silicone-polyimide copolymer and a system comprising a composition which includes titanium dioxide and zinc borate that enhances the flame retardancy and smoke suppression characteristics of



said cable sufficiently to protect a relatively large number of transmission media.

5,202,947

OPTICAL FIBER COMPONENT OPTICAL COUPLER AND METHOD OF PRODUCING THEREOF

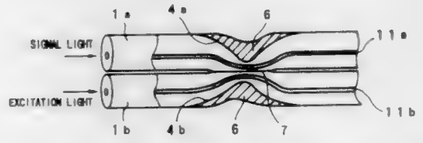
Sumio Hoshino; Masumi Ito; Masayuki Shigematsu; Hiroo Kanamori, all of Yokohama, and Hisasi Izumita, Mito, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Nippon Telegraph and Telephone Corporation, Tokyo, both of Japan

Filed Nov. 29, 1991, Ser. No. 798,913

Claims priority, application Japan, Nov. 29, 1990, 2-331535

Int. Cl.[5] **G02B** *6/26, 6/28*

U.S. Cl. 385—123 **17 Claims**



1. An optical fiber component including an optical fiber comprising:

a core portion formed of transparent material with a first refractive index;

a cladding portion formed of transparent material with a second refractive index smaller than said first refractive index and located adjacent to the core portion, having a thin portion, which has a thinner diameter than the cladding portion, in at least a part of the cladding portion in a longitudinal direction of the optical fiber; and

a light amplifying portion located at the thin portion, the light amplifying portion containing a sol which has active elements having a light amplification ability and a polyethylene glycol.

5,202,948

TRAVELING-WAVE TYPE LIGHT AMPLIFIER

Hajime Suhara, Yokohama, and Akira Tanioka, Kawaguchi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Nov. 7, 1991, Ser. No. 788,870

Claims priority, application Japan, Nov. 8, 1990, 2-303540

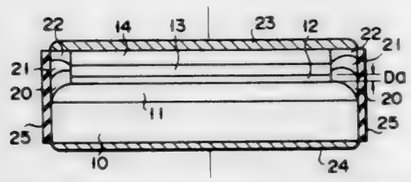
Int. Cl.[5] **G02B** *6/10*

U.S. Cl. 385—131 **8 Claims**

1. A traveling-wave type light amplifier comprising:

a semiconductor substrate formed by stacking a plurality of semiconductor layers;

a waveguide region formed on the semiconductor substrate in a strip shape, the waveguide region including end portions and having a length shorter than that of the semiconductor substrate, a plane shape of each end portion being narrowed to form a tip so that a width of the tip is equal to a thickness thereof; and



window regions formed on the semiconductor substrate, each window region contacting a corresponding end portion of the waveguide region.

5,202,949

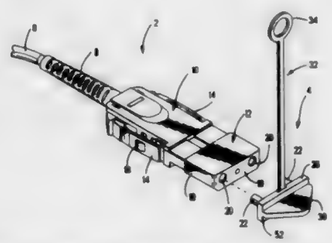
DUST COVER FOR FIBER OPTIC FERRULES OF OPTICAL FIBER CONNECTORS

Ronald A. Hileman, Camp Hill, and Wallace R. Savitsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 30, 1992, Ser. No. 876,674

Int. Cl.[5] **G02B** *6/00, 6/26*

U.S. Cl. 385—134 **17 Claims**



1. A dust cover for covering one or more fiber optic ferrules of an optical fiber connector, comprising:

a base portion; and

at least one protruding portion extending from said base portion, each of said at least one protruding portion having a cavity therein adapted for individually receiving one ferrule of said one or more ferrules to individually cover the one ferrule that corresponds to the cavity when said dust cover is mounted to said connector.

5,202,950

BACKLIGHTING SYSTEM WITH FACETED LIGHT PIPES

Douglas A. Arego, Spring, Tex.; Kevin J. Hathaway, Menlo Park, Calif.; Richard M. Knox, Jr., Houston, Tex., and Gaylon R. Kornfuehrer, Cypress, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 589,325, Sep. 27, 1990, Pat. No. 5,050,946. This application Sep. 23, 1991, Ser. No. 764,427

Int. Cl.[5] **G02B** *6/00*

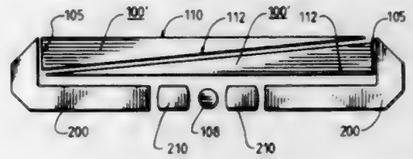
U.S. Cl. 385—146 **7 Claims**

1. A backlighting system for a liquid crystal display, said system having an illuminated front surface, comprising:

a first faceted light pipe proximal the illuminated front surface of the backlight having a generally planar front surface for providing light to said illuminated front surface, having a faceted back surface wherein said back surface includes a plurality of generally planar portions parallel to said front surface and a plurality of facets formed at an angle to said front surface and located connecting said back surface parallel portions, and having at least one end surface for receiving light to be transmitted through said front surface;

a first light source means located adjacent said end surface for receiving light of said first faceted light pipe for providing light to said first light pipe;

a second faceted light pipe proximal the back surface of the first faceted light pipe having a generally planar front surface situated such that light exiting said front surface



enters the back surface of the first faceted light pipe, having a faceted back surface wherein said back surface includes a plurality of generally planar portions parallel to said front surface and a plurality of facets formed at an angle to said front surface and located connecting said back surface parallel portions, and having at least one end surface for receiving light to be transmitted through said front surface; and,

a second light source means located adjacent said end surface for receiving light of said second faceted light pipe for providing light to said second light pipe.

5,202,951

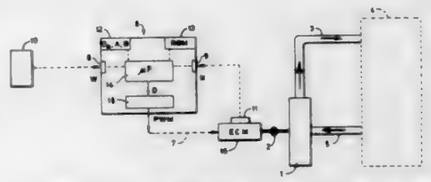
MASS FLOW RATE CONTROL SYSTEM AND METHOD

Edward F. Doyle, Dedham, Mass., assignor to Gas Research Institute, Chicago, Ill.

Filed Jun. 5, 1991, Ser. No. 710,709

Int. Cl.[5] **G05B** *5/00*

U.S. Cl. 388—811 **9 Claims**



1. A system for controlling the mass flow rate of a blower which is drivably connected to an electronically commutated motor (ECM), the system comprising:

means for generating a mass flow rate signal representing the desired mass flow rate of the blower,

means for generating a speed feedback signal representing the actual shaft speed of the ECM,

controller means for generating a motor control signal for supply to the ECM to control the torque output thereof,

said controller means including a first input terminal for receiving said mass flow rate signal and a second input terminal for receiving said speed feedback signal, and

said controller means operable to adjust said motor control signal as a function of said speed feedback signal and said mass flow rate signal to maintain the actual mass flow rate at a desired value which is represented by said mass flow rate signal.

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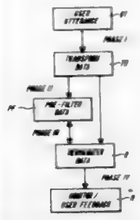
5,202,952

LARGE-VOCABULARY CONTINUOUS SPEECH PREFILTERING AND PROCESSING SYSTEM

Laurence S. Gillick, Newton, and Robert S. Roth, Newtonville, both of Mass., assignors to Dragon Systems, Inc., Newton, Mass.

Filed Jun. 22, 1990, Ser. No. 542,520
Int. Cl.[5] G10L 9/00
U.S. Cl. 395—2 27 Claims



22. A continuous speech processing method for processing speech including a succession of utterances comprising the steps of:

A. storing a plurality of M cluster data sets, $C_1, \ldots, C_M$, where M is an integer greater than 1, each of said cluster data sets including data representative of a plurality of word models;

B. generating a succession of w frame data sets $v_t, v_t+1, \ldots v_t+w-1$, beginning at a frame start time t during said succession of utterances, where w is an integer greater than 1, each of said frame data sets being representative of successive acoustic segments of utterances for a frame period, each of said frame data sets including k values representative of different frame parameters where $k \geq 1$;

C. reducing w of said frame data sets to generate s reduced frame data sets $Y_1, Y_2, \ldots, Y_3$, where $s < w$, each of said reduced frame data sets being related to an associated plurality of said frame data sets and including j related to the k values of said associated frame data sets, where $j \leq k$;

D. evaluating said reduced frame data sets with a succession of said cluster data sets to generate a cluster score S_Y for each of said cluster data sets;

E. identifying each of said word models having a cluster score bearing a predetermined relation to at least one threshold score T, said identified word models defining a word list;

F. determining said frame start times, t, where successive start times t are identified at arbitrarily selected intervals, said frame start times being independent of identification of an initial anchor; and

G. generating a signal representative of said candidate word list for selected ones of said frame start times determined in step F.

5,202,953

MULTI-PULSE TYPE CODING SYSTEM WITH CORRELATION CALCULATION BY BACKWARD-FILTERING OPERATION FOR MULTI-PULSE SEARCHING

Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 534,308, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 179,455, Apr. 18, 1988, abandoned. This application Jan. 21, 1992, Ser. No. 823,615
Claims priority, application Japan, Apr. 8, 1987, 62-87669
Int. Cl.[5] G10L 9/08
U.S. Cl. 395—2 5 Claims

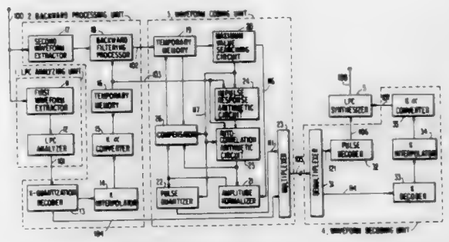
1. A multi-pulse type coding system for coding a speech signal into a plurality of pulse signals, comprising:

means for producing one set of parameters indicative of a spectral envelope of said speech signal for each search frame period;

means, coupled to said parameter producing means and responsive to a plurality of sets of parameters, each of said sets of parameters belonging to adjacent search frame periods, for producing a plurality of sets of interpolated parameters during each search frame period;

means for extracting a segmented speech signal from said speech signal and for delivering said segmented speech signal in backward time sequence, said segmented speech signal having a period corresponding to said each search frame period;

means for filtering said segmented speech signal in accordance with a filtering characteristic defined by said set of



parameters and said plurality of sets of interpolated parameters during said each search frame period and for directly producing a cross-correlation signal representative of a transition of cross-correlation between said segmented speech signal and an impulse response defined by said set of parameters and said sets of interpolated parameters during said each search frame period, said filtering characteristic being varied during said each search frame period in accordance with a backward time sequence of said set of parameters and said plurality of interpolated parameters, said segmented speech signal being received in backward time sequence; and

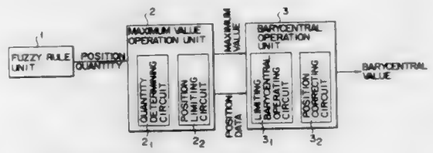
means for generating said plurality of pulse signals in response to said cross-correlation signal.

5,202,954

DIGITAL FUZZY APPARATUS HAVING SIMPLIFIED BARYCENTRAL OPERATION ARRANGEMENT

Azuma Miyazawa, Mitaka; Kozi Mizobuchi, and Takashi Suzuki, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 547,912, Jul. 3, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 790,125
Claims priority, application Japan, Jul. 14, 1989, 1-181743
Int. Cl.[5] G05B 11/00
U.S. Cl. 395—3 21 Claims



1. A digital fuzzy apparatus comprising:

fuzzy rule operating circuit for performing an operation on an input value in accordance with fuzzy rules constituted by membership functions and outputting address position data and fitness degree data in units of rules;

maximum value operating circuit for calculating a maximum value of the fitness degree data output from said fuzzy rule operating circuit at each address position corresponding to the fitness degree data;

address selecting circuit for selecting an effective range on the basis of an address position at which the maximum value of the fitness degree data output in units of address positions exceeds a predetermined value;

center of gravity position operating circuit for calculating a center of gravity position in accordance with the address positions of the effective range and the fitness degree data output from said maximum value operating circuit in correspondence with the address positions of the effective range; and

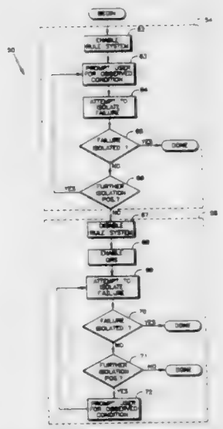
output circuit for obtaining a final center of gravity position and outputting the final center of gravity position as an inference result in accordance with the center of gravity position output from said center of gravity position operating circuit and the address positions selected by said address selecting circuit.

5,202,955

DYNAMIC ASSUMPTION ORDERING FOR QUALITATIVE PHYSICS

Thomas P. Hamilton, South Windsor, and Carol E. Jacobsen, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 549,590, Jul. 6, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 832,615
Int. Cl.[5] G06F 15/00
U.S. Cl. 395—10 1 Claim



1. A method of using a processor for analyzing machine signals to determine the presence of particular machine faults, comprising the steps of:

the processor receiving signals indicative of values of machine parameters;

the processor generating a plurality of pending hypotheses wherein each hypothesis has associated therewith a set of confluence describing operation of components of the machine which are assumed not to have failed, said confluence being provided by a model instance data element;

the processor propagating values indicative of said machine signals through said confluences to produce a set of predictions for values of confluencing variables;

the processor discarding hypotheses which produce an inconsistent set of predictions;

the processor saving hypotheses which produce a consistent set of predictions; and

the processor indicating the presence of one or more particular machine faults in response to there remaining a single hypothesis corresponding to failure of one or more particular machine components,

wherein a hypothesis is discarded by the steps of:

choosing a particular confluence variables which appears in an equation containing other variables which, if known, would allow the derivation of additional variables of said hypothesis or would allow said hypothesis to be deemed inconsistent;

a first assigning step, for temporarily assigning a constant value to said particular variable, said constant value being from a list of possible value for said variable;

propagating said constant value through equations of said hypothesis in order to determine consistency;

an interation step, for iteratively performing said first assigning step and said propagating step until a particular one of said constant values results in a consistent set of predictions or until all possible values or said variable have been temporarily assigned to said variable;

a second assigning step, for assigning a particular one of said constant values to said variable if said iteration step results in a consistent set of predictions when said particular one of said constant values is assigned to said variable; and

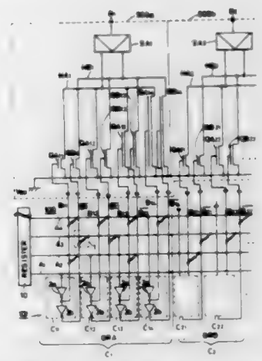
iteratively performing said choosing step, said first assigning step, said iteration step, and said second assigning step for all unknown variables of said hypothesis, and for backtracking to assign new values to previously assigned variables whenever said iteration step results in all possible values being assigned to a variable without resulting in a consistent set of predictions, wherein said hypothesis is discarded if there is no combination of values which can be temporarily assigned to unknown variables of said hypothesis which produces a consistent set of predictions for said hypothesis.

5,202,956

SEMICONDUCTOR NEURAL NETWORK AND OPERATING METHOD THEREOF

Koichiro Mashiko, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 605,717
Claims priority, application Japan, Dec. 16, 1989, 1-326258; Apr. 28, 1990, 2-113055
Int. Cl.[5] G06F 15/18; G06G 7/60
U.S. Cl. 395—24 15 Claims



1. A semiconductor neural network, comprising:

at least one input line for transmitting a data signal to be processed;

a plurality of internal output line groups, each group comprising a plurality of internal output lines provided in a direction intersecting said at least one input line and transmitting an internal output data signal;

movement data stored in said nonvolatile memory, and endpoint being represented respectively by

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a plurality of coupling elements provided at intersections of said at least one input line and said internal output lines, each element for coupling, with a specific coupling strength, an input line to a corresponding internal output line and transmitting signals between said at least one input line and said corresponding internal output line, said coupling strength being specific to each of said plurality of coupling elements being programmable; and

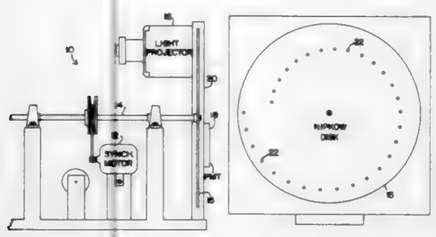
a plurality of weighting addition means corresponding, respectively, to said plurality of internal output line groups, each of said weighting addition means for loading predetermined weights to signals on the internal output lines of its corresponding group to provide weighted internal output data signal and adding together said weighted internal output data signals to form an output signal for its group.

5,202,957

FULL MOTION VIDEO TELEPHONE SYSTEM

Thomas M. Serrao, Bucksport, Me., assignor to Future Communications, Ellsworth, Me.

Filed Aug. 9, 1990, Ser. No. 565,579
Int. Cl.[5] H04N *7/12*
U.S. Cl. 379—53 **18 Claims**



1. A system for transmission and reception over bandwidth limited telephone lines of full motion video image information of an object in real time comprising:

a full motion video camera pickup comprising a first mechanical flying spot scanner means for causing light scanning of an object in picture frames with an image resolution in the range of approximately 30–90 scan lines per frame and full motion resolution in the range of approximately 15–30 frames per second, said mechanical flying spot scanner means comprising photomultiplier sensor means generating an analog serial scanning signal having an analog signal bandwidth within the analog frequency range of approximately 20–36 kHz kHz comprising full motion image information of the object in real time;

first clock means for generating a first clock signal at the camera pickup in synchronism with a selected reference clock standard;

first synchronous drive means operatively coupled to said first mechanical flying spot scanner means for driving said scanner means in synchronism with said first clock signal;

analog to digital (A/D) converter means converting said analog serial scanning signal to a digital signal for transmission of said digital signal;

a bandwidth limited telephone line and first modem coupling means at a first location coupling said digital signal to said telephone line for transmission over the bandwidth limited telephone line;

a digital to analog (D/A) converter means at a second location and second modem coupling means for coupling the digital signal transmitted over said bandwidth limited telephone line to the D/A converter means for digital to analog conversion, said D/A converter means substantially reproducing the analog serial scanning signal comprising full motion image information of the object in real time;

a full motion video camera receiver comprising a second mechanical flying spot scanner means for causing projection and mechanical scanning of light in picture frames in accordance with said analog serial scanning signal for reproducing full motion image information about the object in real time;

said camera receiver comprising an LED array light source having light output controlled by the reproduced analog serial scanning signal;

second clock means for providing a second clock signal at the camera receiver substantially in synchronism with the first clock signal;

and second synchronous drive means operatively coupled to said second mechanical flying spot scanner means for driving said scanner means in synchronism with the second clock signal to provide scan lines per frame and frames per second substantially in synchronism with said first mechanical flying spot scanner means thereby reproducing a full motion image of the object in real time;

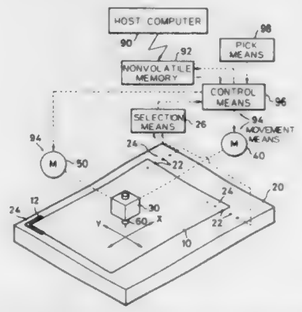
said camera pickup and camera receiver each comprising a mechanical scanning disk formed with scanning hole apertures arranged in a scanning configuration for light scanning in picture frame scan lines upon rotation of the scanning disc, with the number of scanning hole apertures being in the range of approximately 30–90, said first and second synchronous drive means being constructed to drive and rotate said respective scanning disks in revolutions per minute in the range of approximately 900–1800 RPM's.

5,202,958

PLOTTER WITH STORED IMAGE INFORMATION

Hisayuki Kobayashi, Ueda, Japan, assignor to Mimaki Engineering Co., Ltd., Nagano, Japan

Filed May 6, 1991, Ser. No. 696,165
Claims priority, application Japan, Jul. 31, 1990, 2-203154
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—102 **22 Claims**



1. In a plotter wherein, a writing utensil grasped by a pen carriage is brought into contact with a surface of a sheet placed on a recording surface, the pen carriage is moved in X-Y directions relative to the sheet in accordance with movement date items transferred from a host computer, to thereby depict figures, characters etc. on the sheet surface, the improvement comprising:

a nonvolatile memory capable of storing therein movement data for at least one stipulated pattern to be used in depicting the stipulated pattern on the sheet surface from among the movement data items capable of being transferred from said host computer to said plotter;

movement means for moving said pen carriage in the X-Y directions relative to the sheet in accordance with the movement data stored in said nonvolatile memory, wherein the movement data for each stipulated pattern stored in said nonvolatile memory includes movement data items for the stipulated pattern in a plurality of sizes;

discrimination means for discriminating a size of a sheet placed on said recording surface; and

selection means for selecting the movement data for the stipulated pattern in a size conforming to the sheet size discriminated by said discrimination means from among the movement data items for the stipulated pattern stored in said nonvolatile memory and for actuating said movement means in accordance with the selected movement data.

5,202,959

COLOR MEASUREMENT

Gordon L. P. Phillips, Cardiff, United Kingdom, assignor to Gordon Phillips Limited, Cardiff, England

PCT No. PCT/GB91/00204, § 371 Date Sep. 12, 1991, § 102(e) Date Sep. 12, 1991, PCT Pub. No. WO91/12500, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 8, 1991, Ser. No. 761,871
Claims priority, application United Kingdom, Feb. 9, 1990, 9002962
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—109 **7 Claims**

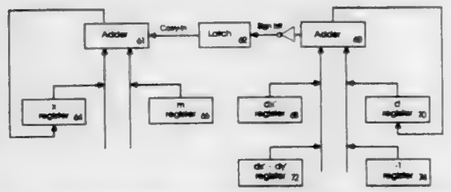
1. A colour referencing system whereby a process colour is first defined in terms of percentage levels of a number of base colours to create a standard reference in which there are a plurality of small printed process colour areas, each representing a different reference "tint" for use in the final colour printing, the said printed areas being arranged in identifiable groups, and all the printed areas in each group being printed by means of selected process colours, each at a uniform selected percentage density within the said group, and each printed area being individually identifiable, an ink mixture is experimentally defined for a flat colour which corresponds in appearance to the process colour, and the colour difference equation value is determined by conventional means for that matched colour.

5,202,960

METHOD AND APPARATUS FOR PLOTTING POLYGON EDGES ON A PIXELIZED GRID

Larry D. Seiler, Boylston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 2, 1988, Ser. No. 266,441
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—143 **16 Claims**



1. A method for illuminating a portion of a pixel grid to represent a portion of a polygon edge,

each pixel of said grid being definable by a unique point on a cartesian coordinate system in which distances may be measured in "units,"

each such point having a horizontal component in the x direction and a vertical component in the y direction,

said polygon edge having an initial point represented by a coordinate (x[a], y[a]) and having an endpoint represented by a coordinate (x[b], y[b]),

the horizontal and vertical distances between the initial point and endpoint being represented respectively by dx=x[b]−x[a] and dy=y[b]−y[a],

said method comprising the steps of:

(a) initializing the following variables to the following values:

dy'=|dy| if dy<0, else dy'=dy

dx'=dx zmod dy', where zmod is a modulus operator which renders dx' equal to a remainder of dx divided by dy';

m=dx zdiv |dy'|, where |dy'| is the absolute value of dy' and where zdiv is an operator which renders m equal to an integer result of dividing dx by |dy'|;

d=dx';

(b) illuminating an initial pixel (x,y) containing the initial point (x[a],y[a]);

(c) resetting the following variables to the following values: y=y+1 if dy≧0, else y=y−1 x=x+m;

(d) if d is nonpositive, then

(1) illuminating the pixel (x,y), and

(2) resetting the variable d=d+dx',

else

(i) illuminating the pixel (x+1, y), and

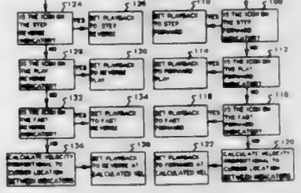
(ii) resetting the variable d=d+dx'−dy'.

5,202,961

SEQUENTIAL INFORMATION CONTROLLER

Michael Mills; Jonathan Cohen, both of San Francisco; Yin Y. Wong, Cupertino, all of Calif., and Ian S. Small, Toronto, Canada, assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 8, 1990, Ser. No. 536,913
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—159 **45 Claims**



1. A controller for use in combination with a display system and a user operable control device for producing control signals for regulating the flow direction and the flow velocity of sequential information, said control device including means for selecting and manipulating images on a display of said display system, the means for selecting and manipulating images including a button, the controller comprising:

an interactive slide indicator responsive to said control device for indicating an available range of selectable flow directions and selectable flow velocities for said sequential information, said slide indicator including means for generating a slide indicator image on said display corresponding to said available range;

an interactive control icon responsive to said control device for selecting a selected flow direction and a selected flow velocity for said sequential information from said available range, said control icon including means for generating a control icon image on said display over said slide indicator image, said control icon image being operative

to be moved by said control device to a selected position

a controller for controlling said first, second, third, and

the processor is responsive to a request for communication with a remote device for

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to be moved by said control device to a selected position along said slide indicator image corresponding to the selected flow direction and the selected flow velocity for said sequential information, the selected flow velocity and the selected flow direction being selected in a one of a tentative set mode and a fixed set mode, in the tentative set mode the selected flow velocity and the selected flow direction being continuously variable according to the selected position of the control icon image while the button is in a one of two button states, in the fixed set mode the selected flow velocity and the selected flow direction being independent of control icon image position, said tentative set mode an said fixed set mode being alternatively selectable through operation of said control device; and

means for detecting the presence of said control icon image at said selected position and for generating said control signals corresponding to said selected flow direction and said selected flow velocity for use in regulating the flow of said sequential information.

5,202,962

GRAPHIC PROCESSOR SUITABLE FOR GRAPHIC DATA TRANSFER AND CONVERSION PROCESSES

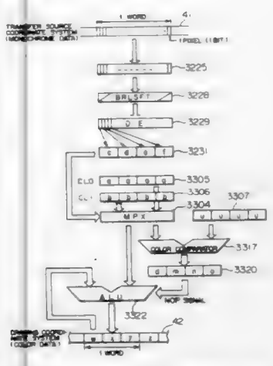
Shigeru Matsuo, Hitachi; Koyo Katsura, Hitachiota; Jun Sato, Musashino; Takashi Sone, Tokyo, and Masakatu Yokoyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of Japan

Division of Ser. No. 175,418, Mar. 30, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,503

Claims priority, application Japan, Mar. 31, 1987, 62-78195; May 15, 1987, 62-116870; Jul. 10, 1987, 62-171032

Int. Cl.[5] **G06F** *3/12*

U.S. Cl. 395—166 **4 Claims**



1. A graphic processor which controls reading, writing and transfer of graphic data for a display memory that stores graphic data comprising:

first means for storing first address information, to address said display memory and for storing first pixel address information pointing to a position, corresponding to a first pixel, in a word specified by the first address information;

second means for storing second address information, to address said display memory and for storing second pixel address information pointing to a position, corresponding to a second pixel, in a word specified by the second address information;

third means for shifting graphic data of multiple pixels included in two consecutive words to extract 1-word graphic data;

fourth means for implementing a drawing computation pixel-wise concurrently for one word depending on a number of pixel data included in a word; and

a controller for controlling said first, second, third, and fourth means;

said controller reading graphic data of two consecutive words out of said display memory in response to said first address information, supplying said two consecutive words to said third means, said third means extracting a 1-word graphic data by shifting said two consecutive words in accordance with the first and second pixel address information, said controller supplying said 1-word graphic data to said fourth means, said fourth means implementing a modification operation for graphic data read out by the second address information from said display memory using said 1-word graphic data extracted by said third means, and said controller writing a result of the modification operation into said display memory.

5,202,963

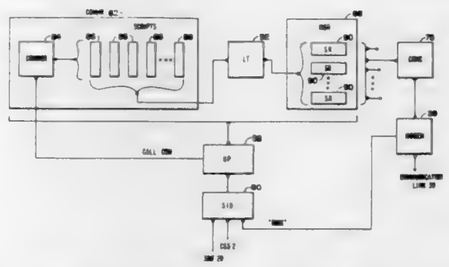
METHOD AND APPARATUS FOR ADAPTING A REMOTE COMMUNICATIONS CONTROLLER TO A VARIETY OF TYPES OF COMMUNICATIONS MODEMS

Richard C. Zelley, North Chelmsford, Mass., assignor to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 18, 1990, Ser. No. 629,745

Int. Cl.[5] **G06F** *3/00;* **H04M** *11/00*

U.S. Cl. 395—325 **16 Claims**



1. In a data processing system having a communication manager memory for storing communications manager programs for controlling communications between the data processing system and remote devices external to the data processing system, a processor connected to the communications manager memory and responsive to the communications manager programs for performing communications operations, at least one communications link connected to the remote devices, at least one modem connected to the communications links for performing communications operations with the remote devices through the communications links, a communications request means connected from the data processing system and the modem and to the processor and responsive to communications operations of the data processing system, including communications operations of the modem, for generating requests for communication by the data processing system with a remote device, and at least one controller connected to the modems for controlling the communications operations of the modems, a modem adaptor for adapting the controller to a plurality of types of modems, comprising:

a script memory connected from the processor for storing scripts for directing operations of a modem,

each script being comprised of a sequence of links and each link directing a corresponding operation related to control of a modem, and

a modem subroutine memory connected to the controller for storing a library of modem control subroutines, each subroutine corresponding to a link and controlling an operation related to operation of a modem, and

a link table memory connected from the processor and to the modem subroutine memory for storing a link table relating each link to the corresponding subroutine, wherein

the processor is responsive to a request for communication with a remote device for

selecting and executing a corresponding communication manager program for the requested operation, the communication manager program including a script for controlling the modem associated with the remote device for the requested operation,

the processor being responsive to the links of the selected script for reading the relationship between each link of the selected script and the corresponding modem control subroutine stored in the modem subroutine memory from the link table and selecting and reading the modem control subroutines corresponding to the links from the modem subroutine memory, and

the controller being connected from the modem subroutine memory for receiving the modem control subroutines from the modem subroutine memory and responsive to the modem control subroutines corresponding to the links and read from the modem subroutine memory by the processor for controlling the modem to perform the requested operation.

5,202,964

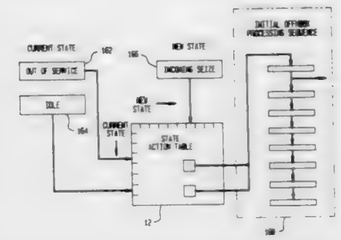
INTERFACE CONTROLLER INCLUDING MESSAGING SCANNER ACCESSING STATE ACTION TABLE

Richard W. Crouch, Gustine, Calif., assignor to Rolm Systems, Santa Clara, Calif.

Filed Oct. 26, 1990, Ser. No. 604,557

Int. Cl.[5] **G06F** *13/10*

U.S. Cl. 395—275 **12 Claims**



1. In a computerized system for controlling the interconnection of a plurality of peripheral devices, said system including a system bus, a central processing unit (CPU) connected to said bus, said CPU including storage of a plurality of program routines at given addresses, respectively, a plurality of state messaging cards operable by said CPU for connecting said plurality of peripheral devices to said bus, a state messaging scanner operable by said CPU, software table means included in said scanner for storing commands and program addresses necessary in different combinations for carrying out various functions for interconnecting and operating said peripheral devices, said logic cards each including status registers having a plurality of individual channels for connection to individual ones of said peripheral devices, respectively, said channels being indicative of the state of an associated one of said peripheral devices, the method comprising the steps of:

performing a primary scan routine for detecting, in a repetitive cyclic manner, whether any of said peripheral devices have changed state between successive cycles;

performing a secondary scan routine for extracting from said software table means the required combination of commands and program addresses for operating said CPU to execute program routines, and/or said logic cards into a designed configuration, to permit said peripheral devices of changed state to operate in their respective new states; and

maintaining the operation of said peripheral devices that have not changed state between cycles.

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ELECTRONIC SYSTEM WITH A PLURALITY OF REMOVABLE UNITS

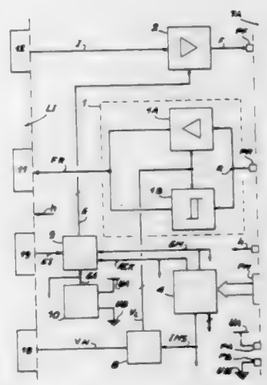
Claude Ahn, Saintry/Seine; Robert Chikli-Pariente, Courbevoie, and Rolland Marbot, Saint Remy les Chevreuses, all of France, assignors to Bull, S.A., Paris, France

Continuation of Ser. No. 444,941, Dec. 4, 1989, abandoned. This application Jul. 29, 1992, Ser. No. 919,383

Claims priority, application France, Dec. 9, 1988, 88 16194

Int. Cl.[5] **G06F** *13/00*

U.S. Cl. 395—325 **19 Claims**



1. An electronic system having at least one bus (B, B') to connect a plurality of units (U1, U2, U3, U4) of the system to one another for carrying signals therebetween, each of said plurality of units comprising at least one device selected from the group consisting of transmission devices and reception devices, at least one of said plurality of units having a reception device, each unit communicating with a maintenance device (SP), one or more of said units (U1) being removably connected to said bus, said system being characterized in that each of said removable units (U1) includes first means (4) controlled selectively by said maintenance device (SP) to assure the functional isolation of said removable unit (U1) and that said system includes second means (8) controlled by said maintenance device (SP) for causing the reception devices (1) of said units (U1, U2, U3, U4) to shift from a normal mode to an increased immunity mode for reception with an increased immunity to interference, and that upon disconnection or connection of any one of said removable units, said first means of that removable unit is activated by said maintenance device to assure the functional isolation of that removable unit and said second means causes the reception devices of the other of said removable units to shift into the increased immunity mode.

5,202,966

CENTRALIZED BUS ARBITRATION CIRCUIT

Alan D. Woodson, Mission Viejo, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 6, 1991, Ser. No. 755,951

Int. Cl.[5] **G06F** *13/362*

U.S. Cl. 395—325 **2 Claims**

1. A method for arbitrating access to a bus accessible by a plurality of processors, the method comprising the steps of:

(a) selecting a next processor;

(b) determining whether the processor is permitted to use the bus;

(c) if the processor is not permitted to use the bus, then returning to step (a);

(d) if the processor is permitted to use the bus, then interrogating the processor as to the mode of operation requested by the processor;

(e) if a first mode is requested, then:

in parallel with an instruction decoded in said first instruc-

with contents of the address and the level of the expansion

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METHOD FOR SHARING MEMORY IN A

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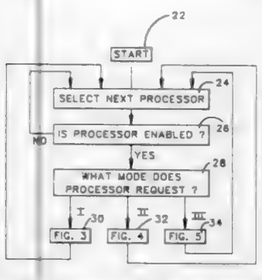
(e) if a first mode is requested, then:
(1) determining whether quick access is required;
(2) performing steps (a) through (g) if quick access is required and the processor does not use the bus immediately;
(3) setting a period to a predetermined number;
(4) allowing bus access to the processor if the period is greater than zero;
(5) decrementing the period by one;
(6) repeating the operation of the means described in (4) and (5) until the period equals zero, at which time steps (a) through (g) are performed;
(f) if a second mode is requested, then:
(1) setting a period to a predetermined maximum;
(2) determining iof the processor has released the bus;



(3) allowing the bus access to the processor if the processor has not released the bus and
(4) decrementing the period by one; and
(5) repeating steps (2) through (4) until the period equals zero or the processor released the bus, at which time steps (a) through (g) are performed; and
(g) if a third mode is requested, then:
(1) determining if the processor has released the bus;
(2) allowing the bus access to the processor if the processor has not released the bus;
(3) waiting one clock cycle; and
(4) repeating steps (2) and (3) until the processor releases the bus, at which time steps (a) through (g) are performed.

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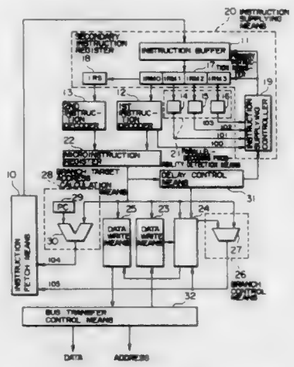
DATA PROCESSING APPARATUS FOR PERFORMING PARALLEL DECODING AND PARALLEL EXECUTION OF A VARIABLE WORD LENGTH INSTRUCTION

Toshimichi Matsuzaki, Minoo, and Takashi Sakao, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 389,692, Aug. 4, 1989, abandoned. This application Jul. 20, 1992, Ser. No. 916,804
Claims priority, application Japan, Aug. 9, 1988, 63-198226; Feb. 7, 1989, 1-28184
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—375 **3 Claims**

1. A data processing apparatus for decoding in parallel a plurality of instructions of a variable word length instruction system including at least one fixed length instruction, comprising:
instruction supplying means for providing a first instruction having a variable word length and a second instruction subsequent to said first instruction;
a first instruction decoder means for receiving and decoding said first instruction and providing a signal indicative of a boundary of the first instruction;
parallel decoding probability detection means for receiving said second instruction while the first instruction is currently being decoded by the first instruction decoder means, for decoding said second instruction and for detecting whether the second instruction is a parallel-decodable instruction which has a fixed length and is decodable in parallel with an instruction decoded in said first instruction decoder means;
at least one second instruction decoder means for decoding the parallel-decodable instruction detected as parallel-decodable by the parallel decoding probability detection means in parallel with an instruction decoded in said first instruction decoder; and
said instruction supplying means for selectively validating



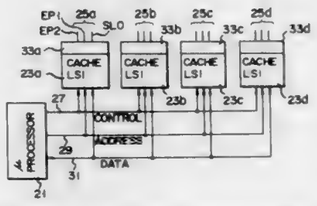
the parallel-decodable instruction detected by the parallel decoding probability detection means as a validated parallel-decodable instruction in accordance with the signal indicative of the boundary of the first instruction outputted by the first instruction decoder means, and for supplying the validated parallel-decodable instruction to the second instruction decoder means and an instruction subsequent to the validated parallel-decodable instruction to the first instruction decoder means.

5,202,968

EXPANSION SYSTEM

Kazuyuki Sato, Koganei, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 330,697, Mar. 30, 1989, abandoned. This application Sep. 10, 1991, Ser. No. 758,358
Claims priority, application Japan, Mar. 30, 1988, 63-76939
Int. Cl.[5] G06F *12/02*
U.S. Cl. 395—400 **5 Claims**



1. A LSI semiconductor device selecting system, comprising:
means for supplying an address to access a plurality of LSI semiconductor devices;
a plurality of LSI semiconductor devices, connected to said address supplying means, each including:
at least one expansion pin which is set to a predetermined static level, the expansion pin specifying the number of LSI semiconductor devices and LSI-selection-data in the address; and
means, connected to said address supplying means and said pins, for performing a logical operation in accordance with contents of the address and the level of the expansion pin;
means, connected to the performing means and the supplying means, for determining whether an LSI semiconductor device is selected in accordance with a result from said logical operation performing means.

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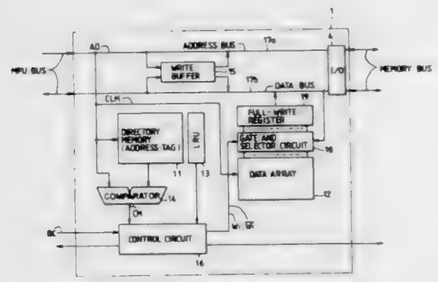
SINGLE-CHIP-CACHE-BUFFER FOR SELECTIVELY WRITING WRITE-BACK AND EXCLUSIVELY WRITING DATA-BLOCK PORTIONS TO MAIN-MEMORY BASED UPON INDICATION OF BITS AND BIT-STRINGS RESPECTIVELY

Katsuyuki Sato, Akishima; Tadahiko Nishimukai, Sagamihara; Kunio Uchiyama; Hirokazu Aoki, both of Hachioji; Susumu Hatano, Musashino; Kanji Oishi, Koganei; Hiroshi Fukuta, Kodaira; Takashi Kikuchi, Akishima, and Yasuhiko Saigou, Fuchuu, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering, Tokyo, Japan

Division of Ser. No. 426,781, Oct. 25, 1989, Pat. No. 5,146,573. This application Apr. 21, 1992, Ser. No. 871,906
Claims priority, application Japan, Nov. 1, 1988, 63-277624; Dec. 26, 1988, 63-330040
Int. Cl.[5] G06F *12/02*
U.S. Cl. 395—425 **20 Claims**



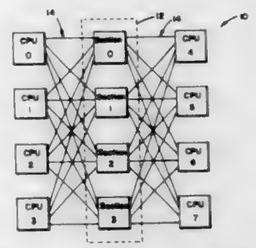
1. A single semiconductor chip cache buffer storage device for use with a microprocessor unit and a main memory, the single semiconductor cache buffer storage device comprising:
data memory means for storing data in a plurality of data blocks the data blocks being identified by address tags; and,
directory memory means for storing said address tags, said directory memory means having storage locations for at least:
a plurality of bits, each bit indicating whether a one of said plurality of said data blocks stored in said data memory means has been updated, and
a plurality of bit strings, each bit string indicating whether preselected portions of one of said plurality of said data blocks have been updated;
means for selectively writing write-back data from the data memory means to the main memory responsive to a microprocessor unit cache miss, the writing means including:
means for identifying a first data block in the data memory means to be copied to the main memory based upon said plurality of bits and a predetermined algorithm;
means for exclusively writing portions of said first data block to said main memory based on a first one of said bit strings corresponding to the first data block.

5,202,970

METHOD FOR SHARING MEMORY IN A MULTIPROCESSOR SYSTEM

Alan J. Schiffleger, Chippewa Falls, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Division of Ser. No. 682,876, Apr. 8, 1991, Pat. No. 5,142,638, which is a continuation of Ser. No. 307,882, Feb. 7, 1989, abandoned. This application Feb. 13, 1992, Ser. No. 834,867
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] G06F *13/18*
U.S. Cl. 395—425 **12 Claims**



1. A method of memory access for sharing a memory between a plurality of processors, each processor having a plurality of ports for generating memory references, said memory comprising a plurality of sections, each section connected to each processor by a memory path, each section including a plurality of subsections, each subsection including a plurality of banks, each bank including a plurality of individually addressable memory locations, said method comprising the steps of:
generating a plurality of memory references by said plurality of ports of said each processor attempting to access individually addressable memory locations of said banks within said subsections;
resolving subsection conflicts between said plurality of memory references generated by said plurality of ports of said each processor so that only one of the memory references from said each processor is allowed to proceed to attempt access to one of said plurality of subsections at a time;
resolving section conflicts between said plurality of memory references generated by said plurality of ports of said each processor and which are allowed to proceed to attempt access to said one of said plurality of subsections so that only one of the plurality of ports of said each processor connects via the memory path for said each processor to one of said plurality of sections at a time; and
resolving bank conflicts between particular memory references generated by said plurality of processors and which are allowed access to said one of said plurality of subsections in said one of said plurality of sections so that only one of said particular memory references accesses a particular bank in said one of said plurality of subsections at a time.

5,202,971

SYSTEM FOR FILE AND RECORD LOCKING BETWEEN NODES IN A DISTRIBUTED DATA PROCESSING ENVIRONMENT MAINTAINING ONE COPY OF EACH FILE LOCK

Larry W. Henson; Anal A. Shaheen-Gouda, and Todd A. Smith, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 14,891, Feb. 13, 1987, abandoned. This application Dec. 17, 1990, Ser. No. 629,073
Int. Cl.[5] G06F *12/14*
U.S. Cl. 395—425 **18 Claims**

1. A method for locking at least one range of a file residing

at a first node of a data processing system, said method com-

address is not currently represented in said L1 cache or

second responding memory before initiating a second

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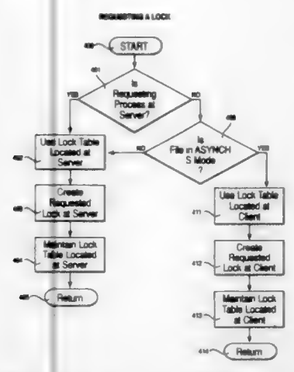
at a first node of a data processing system, said method comprising:

maintaining, in memory at said first node, information describing said at least one locked range of said file, said information used to service at least one locking request from at least one process located in at least one second node;



moving, from said first node, said information to reside in memory at one of said at least one second node when each of said at least one process resides at said one of said at least one second node; and

servicing, at said one of said at least one second node, a subsequent lock request, performed by any process residing at the one of said at least one second node, using said moved information.

5,202,972

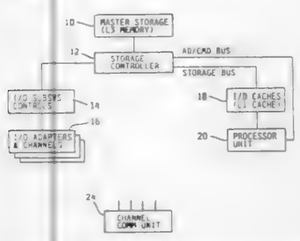
STORE BUFFER APPARATUS IN A MULTIPROCESSOR SYSTEM

Richard J. Gusefski, Endicott; Chon I. Lei, Endwell, and Alfonso Ramirez, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 291,805, Dec. 29, 1988, abandoned. This application Jul. 3, 1991, Ser. No. 725,919

Int. Cl.[5] G06F *13/00, 9/00, 15/16*

U.S. Cl. 395—425 **7 Claims**



1. A cache system for transferring data to and from a processor, said system comprising:

a level two (L2) storage unit;

a level one (L1) cache coupled to said processor and to said L2 storage unit;

first means for writing data from said L2 storage unit to said L1 cache, and writing said data from said L1 cache to said processor;

a level one (L1) storage unit coupled to said processor and said L2 storage unit;

second means, responsive to a write request by said processor, for writing data from said processor to said L1 storage unit without first requiring contents of said L2 storage unit from an address associated with said write request be stored in said L1 cache or said L1 storage unit if said address is not currently represented in said L1 cache or said L1 storage unit, and subsequently writing said data from said L1 storage unit to said L2 storage unit, said second mean also writing said data to said L1 cache if said address is currently represented in said L1 cache; and

status means, coupled t said L1 storage unit and responsive to a read request by said processor, for determining if said read request requires data that is stored in said L1 storage unit but has not yet been written from said L1 storage unit to said L2 storage unit, and

if so, delaying said read request until the second writing means writes said data from said L1 storage unit to said L2 storage unit, and then causing said processor to a access said at a from said L1 cache if written in said L1 cache by said second means, without writing said data from said L2 storage unit to said L1 cache,

if not, without said delay, causing said first means to write said data form said L1 cache to said processor if said data resides in said L1 cache or causing said first means to write said data from said L2 storage unit to said L1 cache and then from said L1 cache to said processor if said data did not reside in said L1 cache when said processor made said read request.

5,202,973

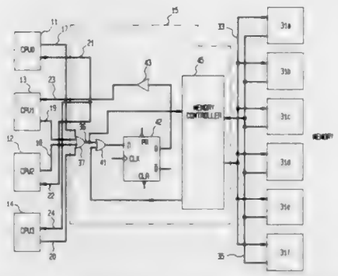
METHOD OF CONTROLLING A SHARED MEMORY BUS IN A MULTIPROCESSOR SYSTEM FOR PREVENTING BUS COLLISIONS AND FOR ENSURING A FULL BUS

Raj Ramanujan, Leominster; James B. Keller, Arlington, both of Mass.; Jay Stickney, Derry, N.H.; Steven Ho, Westford, and Paul Lemmon, West Townsend, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,548

Int. Cl.[5] G06F *13/00, 13/376*

U.S. Cl. 395—425 **7 Claims**



1. A method for controlling a shared memory bus used by at least two requesters so that the shared memory bus is full during each of a continuous string of cycle times, comprising the steps of:

(a) placing a first command N and address on the shared memory bus for requesting data from a first responding memory connected to the shared memory bus;

(b) waiting a first dynamically determined time period for data responding to a request at step (a) to return from the first responding memory before initiating a first additional command to the first responding memory;

(c) placing a second command N+1 and address on the shared memory bus after a second dynamically determined time period for requesting data from a second responding memory connected to the shared memory bus, with the second dynamically determined time period being shorter than the first dynamically determined time period;

(d) waiting a third dynamically determined time period for data responding to a request at step (c) to return from the second responding memory before initiating a second additional command to the second responding memory;

(e) placing a third command N+2 and address on the shared memory bus after the second dynamically determined time period for requesting data from a third responding memory connected to the shared memory bus;

(f) waiting a fourth dynamically determined time period for data responding to a request at step (e) to return from eh third responding memory;

(g) placing a command N+P and address on the shared memory bus for requesting data after an additional responding memory returns requested data responding to a command N+R and address, with P>2, R>=2, P>R;

(h) waiting a fifth dynamically determined time period for data responding to a request at step (g) to return from the additional responding memory; and

(i) repeating steps (g) and (h) for each additional command and address.

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Patent Not Issued For This Number

5,202,975

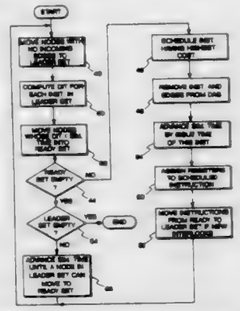
METHOD FOR OPTIMIZING INSTRUCTION SCHEDULING FOR A PROCESSOR HAVING MULTIPLE FUNCTIONAL RESOURCES

James C. Rasbold, Livermore, and Don A. Van Dyke, Pleasanton, both of Calif., assignors to Supercomputer Systems Limited Partnership, Eau Claire, Wis.

Continuation of Ser. No. 571,500, Aug. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 537,466, Jun. 11, 1990, Pat. No. 5,179,702. This application Jun. 10, 1992, Ser. No. 896,895

Int. Cl.[5] G06F *9/45, 9/455*

U.S. Cl. 395—500 **3 Claims**



1. In a computer that compiles or assembles a source code program to produce object code instructions, an improved method of scheduling instructions in a basic instruction block for execution, the method comprising the steps of:

identifying a leader set of instructions as being those instructions without resource dependencies from other instructions within the basic instruction block;

identifying a read set as those instructions in the leader set that would execute without interlock interruption if issued immediately based upon a simulation of the execution of those instructions in the leader set for all combinations of the available functional units in the target computer; and

issuing the instruction in the ready set with the highest cumulative pendency cost, wherein the cumulative pendency cost represents the cost of not issuing the instruction in terms of how many other instruction depend upon this instruction issuing.

5,202,976

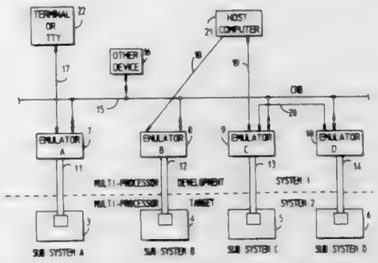
METHOD AND APPARATUS FOR COORDINATING MEASUREMENT ACTIVITY UPON A PLURALITY OF EMULATORS

John D. Hansen; Arnold S. Berger; Lewis S. Kootstra; Beth V. Jones; Stan W. Bowlin, and William Fleck, all of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 292,590, Dec. 30, 1988, Pat. No. 5,051,888. This application Jun. 21, 1991, Ser. No. 718,728

Int. Cl.[5] G06F *15/16, 9/00, 11/30*

U.S. Cl. 395—500 **1 Claim**



1. A method of simultaneously beginning the execution of user code upon a plurality of emulators, the method comprising the steps of:

(a) connecting a respective synchronization signal terminal on each emulator to a common conductor;

(b) coupling at least one pull-up resistance between the common conductor and a source of voltage V_f representing a logically true condition, such coupling being adequate, in the absence of any other coupling to a different voltage, to pull the common conductor up to V_f;

(c) executing a respective monitor program on each emulator;

(d) within each emulator as a response to its respective instance of step (c), connecting the synchronization terminal of that emulator to a source of voltage V_f representing a logically false condition, such connecting within any one of the emulators being sufficient to pull the voltage on the common conductor down to V_f from V_f;

(e) signalling each emulator to cause the respective monitor program to prepare but to not quite begin to run user code;

(f) within each emulator disconnecting the respective synchronization terminal thereof from the voltage V_f upon completion of that monitor's preparations began in response to step (e);

(g) detecting within each emulator that the voltage upon the common conductor has pulled up to V_f;

(h) responding within each emulator to step (g) by falling through a final portion of the respective monitor to begin execution of the respective user code.

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EDI TRANSLATION SYSTEM USING PLURALITY OF COMMUNICATION PROCESSES AND DE-ENVELOPING PROCEDURE CORRESPONDING TO TRANSMITTED COMMUNICATION PROCESS

Emmanuel K. Pasetes, Jr., Danville, and Lew Jenkins, Pleasant Hill, both of Calif., assignors to Premenos Corp., Concord, Calif.

Filed Jul. 13, 1990, Ser. No. 552,080

Int. Cl.[5] G06F *15/21, 15/24*

U.S. Cl. 395—500 **18 Claims**

1. A computer implemented method for translating electronic data in a computer system in a computer system from a first format to a second format, comprising the steps of:

(a) determining which one of a plurality of communication

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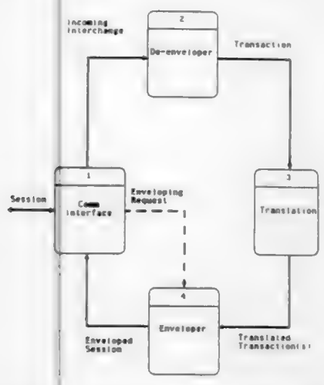
base of a first plurality of data elements stored in the data

protocols to utilize to receive data as a function of a communication process used to transmit the data to the computer system;

(b) receiving input data as a unit of work in a first format, the data comprises a plurality of data components;

(c) assigning a script name to the unit of work to identify a de-enveloping procedure that will be used to separate the plurality of data components of the received data into individual data components, the de-enveloping procedure identified being dependent on the communication process used to transmit the data to the computer system;



(d) dividing the received data into individual data components by executing the identified de-enveloping procedure;

(e) translating the individual data components from the first format into a second format which is chosen to be compatible with a desired destination for the data; and

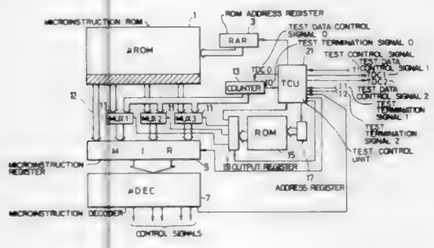
(f) arranging the individual data components into a package so that the package is available for transmission at any time by the computer system to the desired destination.

5,202,978

SELF-TEST CIRCUIT OF INFORMATION PROCESSOR

Yasuyuki Nozuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1989, Ser. No. 323,824
Claims priority, application Japan, Mar. 15, 1988, 63-59343
Int. Cl.[5] G06F *9/44*
U.S. Cl. 395—575 **9 Claims**



1. A self-test circuit of an information processor including a microprogram control system, the self-test circuit carrying out a self-test inside the information processor and comprising:

test data generating means for generating test data to be written in specific fields of each of primary test microinstructions; and

selection controlling means for receiving microinstructions including the primary test microinstructions as well as receiving the test data from said test data generating means, said selection control means masking the specific fields of each primary test microinstruction and supplying the test data from said test data generating means to the masked specific fields during the self-test to form a secondary test microinstruction, the number of the primary test microinstructions being minimized because the test data from said test data generating means are used as the data of the specific fields of the primary test microinstructions,

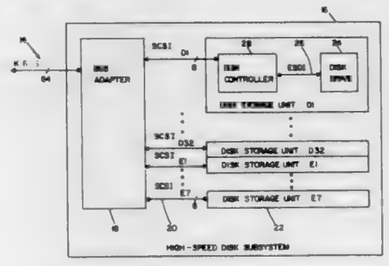
wherein said information processor and said self-test circuit form an integral operating unit.

5,202,979

STORAGE SYSTEM USING MULTIPLE INDEPENDENTLY MECHANICALLY-DRIVEN STORAGE UNITS

W. Daniel Hillis, Cambridge, and Clement K. Liu, Brighton, both of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Continuation of Ser. No. 703,580, May 20, 1991, abandoned, which is a continuation of Ser. No. 431,709, Nov. 2, 1989, abandoned, which is a continuation of Ser. No. 732,353, May 8, 1985, abandoned. This application Jun. 26, 1992, Ser. No. 906,006
Int. Cl.[5] G06F *7/22*
U.S. Cl. 395—575 **18 Claims**



1. A system for storing digital data words, each data word having a plurality of multi-bit data portions, and for delivering said data words in succession to a parallel data bus in response to a retrieval request, said system comprising:

A. a plurality of data storage units each having a mechanically driven medium, said media of said different storage units being driven independently of each other, said data storage units storing data words with each data storage unit storing in parallel a respective one of said multi-bit data portions for each data word;

B. at least one correction bit storage unit including a storage medium that is mechanically driven independently from the mechanically-driven media on which said data word is stored, for storing an error correction code associated with said data words, and

C. an adapter connected to said parallel data bus, said data storage units and said correction bit storage unit for, in response to a retrieval request, (i) enabling said data storage units to contemporaneously retrieve respective data portions of selected data words and said correction bit storage unit to the retrieve error correction codes associated with said selected data words contemporaneously with the retrievals by said data storage units, (ii) assembling said respective data portions into said selected data words and (iii) use the associated error correction codes to perform an error detection and correction operation with respect to each said selected data word to determine whether it is correct and if not to generate a respective corrected data word, and (iv) thereafter to transmit the selected data words over said parallel data bus.

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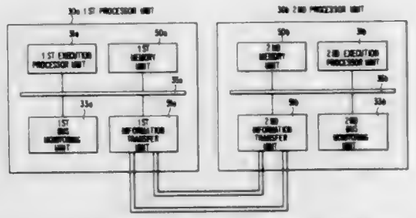
INFORMATION PROCESSING SYSTEM CAPABLE OF READILY TAKING OVER PROCESSING OF A FAULTY PROCESSOR

Nobuki Morita, Tokyo; Shinichi Nomiyama, Ehime; Kazuhito Koguchi, and Yoshiaki Sugiyama, both of Tokyo, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 547,005
Claims priority, application Japan, Jun. 30, 1989, 1-166924; Jul. 14, 1989, 1-180516; Nov. 30, 1989, 1-309272
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 **6 Claims**



1. An information processing system comprising first and second processor units each of which comprises a bus line, a memory unit coupled to said bus line for storing a control program processed in each processor unit and a main data signal renewed periodically in accordance with the control program read out of said memory unit, an execution processor unit coupled to said bus line for carrying out processing in accordance with said control program, and an information transfer unit coupled to said bus line for transferring said main data signal to the other processor unit and for transferring, to said memory unit, an additional data signal sent from the other processor unit, said memory unit having a control program area for storing said control program, a data area for storing said main data signal, and a saving area for saving the main data signal of each processor unit and said additional data signal, said main data signal being transferred from said data area to said saving area on the basis of said control program under control of said execution processor unit with said main data signal kept in said data area;

said information transfer unit comprising:

bus control means coupled to said bus line for receiving said main data signal from said memory unit through said bus line when said main data signal is transferred from said data area to said saving area;

processing control means coupled to said bus control means for carrying out transfer control of the main data signal sent from said bus control means and said additional data signal sent from the other processor unit;

output transfer control means coupled to said processing control means for transferring the main data signal to the other processor unit under control of said processing control means; and

input transfer control means coupled to said processing control means and supplied with said additional data signal for transferring said additional data signal to said saving area through said bus line under control of said processing control means.

5,202,981

PROCESS AND APPARATUS FOR MANIPULATING A BOUNDLESS DATA STREAM IN AN OBJECT ORIENTED PROGRAMMING SYSTEM

Floyd W. Shackelford, Buford, Ga., assignor to International Business Machines Corporation, Armonk, N.Y.

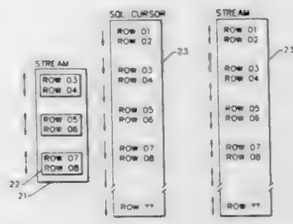
Filed Oct. 23, 1989, Ser. No. 425,813
Int. Cl.[5] G06F *15/40, 15/403*
U.S. Cl. 395—600 **50 Claims**

1. A method for bidirectionally accessing data in a database management system comprising a data storage device, a database of a first plurality of data elements stored in the data storage device, a data processor connected to the data storage device, said data processor executing a database manager for converting a plurality of unidirectional pointers into bidirectional pointers to manipulate said first plurality of data elements; said bidirectional access method comprising the steps of:

accepting a query request;

processing the accepted query request to obtain a second plurality of pointers to a second plurality of data elements selected from said first plurality of data elements as a result of said query;

creating a file in said data storage device for storing said second plurality of pointers therein in a predetermined sequence, from a first to a last pointer, said file allowing only unidirectional access to said second plurality of pointers, from said first to said last pointers;



accepting a request to manipulate said second plurality of data elements, including a selected one of said second plurality of data elements;

creating a data window in said data storage device, for storing therein a third plurality of pointers selected from said second plurality of pointers stored in said file allowing only unidirectional access to said second plurality of pointers;

storing the selected third plurality of pointers in said data window, the selected third plurality of pointers comprising a third plurality of sequential pointers from said second plurality of pointers stored in said file allowing only unidirectional access to said second plurality of pointers, including a pointer to said selected one of said second plurality of data elements; and

bidirectionally accessing said third plurality of pointers stored in said data window and selected from said second plurality of pointers stored in said file allowing only unidirectional access to said second plurality of pointers.

5,202,982

METHOD AND APPARATUS FOR THE NAMING OF DATABASE COMPONENT FILES TO AVOID DUPLICATION OF FILES

Wayne C. Gramlich, Sunnyvale, and Soren J. Tirfing, Palo Alto, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 27, 1990, Ser. No. 499,639
Int. Cl.[5] G06F *7/04*
U.S. Cl. 395—600 **18 Claims**

1. In a computer system comprising a CPU, input/output means and memory containing a file system, said file system comprising at least one source file comprising text, a process for generating a database comprising at least one database component file derived from the source files such that one database component file is generated for each unique source file regardless of the number of copies of the source file occurring in a file system, said process comprising the steps of:

generating a unique name for the database component file, said name generated by concatenating the source file name with a hash value computed according to the contents of the source file, whereby if the contents of the

source file changes, the hash value changes and a different

plified file name and a corresponding original file name

(D) file memory means for storing a file corresponding to the first table, said file including data items and first labels

said elements having at least one incoming port and at least one outgoing port;

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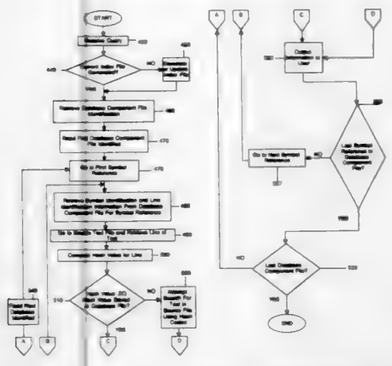
source file changes, the hash value changes and a different database component file name is generated;

searching the file system for a database component file having the same name as the generated database component file name;

if a database component file having the same name as the generated database component file does not exist in the file



system, generating a database component file for the source file comprising a listing of symbols and line numbers in the source file where the symbol occurs;

whereby if a database file having the same name as the generated database file exists, a database component file is not generated thereby eliminating the duplication of database component files and the system usage required to write the duplicate file.

5,202,983

FILE ACCESSING SYSTEM USING CODE NAME TO ACCESS SELECTED CONVERSION TABLE FOR CONVERTING SIMPLIFIED FILE NAME INTO ORIGINAL FILE NAME

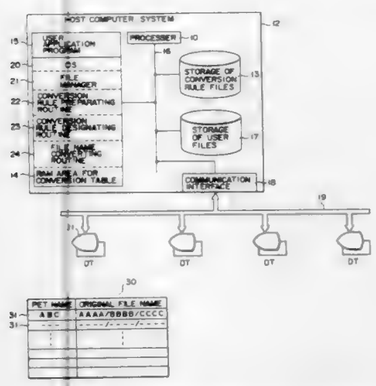
Yukio Orita, Fussa, and Keiichi Yasuda, Oome, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1989, Ser. No. 452,396

Claims priority, application Japan, Dec. 19, 1988, 63-319817

Int. Cl.[5] G06F *15/40, 5/00, 12/00*

U.S. Cl. 395—600 **10 Claims**



1. An information-processing system for permitting a file to be accessed with a simplified file name, said system comprising:

storing means for storing multiple conversion tables of conversion data, each said conversion data includes the simplified file name and a corresponding original file name different than the simplified file name, respectively, each said conversion table being accessed by a code name, said storing means including:

means for receiving the conversion data and preparing one of said multiple conversion tables including at least one piece of said conversion data; and

means for adding one code name to said one of said multiple conversion tables;

access means for accessing a specific one of said multiple conversion tables in said storing means responsive to said code name being entered, said access means including:

means for entering the code name which denotes the specific conversion table;

memory means for storing the specific conversion table loaded therein; and

conversion table-loading means for searching the storing means for the specific conversion table denoted by the entered code name and for loading the specific conversion table into the memory means;

designation means for designating a specific simplified file name; and

file name-converting means for receiving the simplified file name and converting the simplified file name into the original file name on the basis of the accessed conversion table in said memory means.

5,202,984

APPARATUS AND METHOD FOR UPDATING TRANSACTION FILE

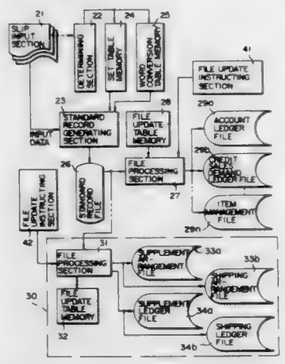
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 360,021, Jun. 1, 1989. This application Mar. 13, 1992, Ser. No. 851,233

Claims priority, application Japan, Jul. 14, 1988, 63-175404; Jul. 14, 1988, 63-175405; Jul. 14, 1988, 63-175406

Int. Cl.[5] G06F *7/10, 15/18*

U.S. Cl. 395—600 **3 Claims**



1. An apparatus for updating files, comprising:

(A) input table memory means for storing an input table including a plurality of third labels;

(B) first table memory means for storing a first table including a plurality of first labels and said third labels, said third labels being in one-to-one correspondence with the first labels;

(C) input data memory means having an input data memory corresponding to said input table, said input data memory storing data items and the third labels included in the input table, said third labels being in one-to-one correspondence with each of the data items;

(D) file memory means for storing a file corresponding to the first table, said file including data items and first labels included in the first table, said first labels being in one-to-one correspondence with each of the data items;

(E) data input means, coupled to said input table memory means and to said input data memory means, for inputting data items which are designated to have a one-to-one correspondence with one of the respective third labels included in the input table, and for storing the input data items along with the corresponding third labels in said input data memory;

(F) read out means, coupled to said input data memory means and to said first table memory means, for reading, from the input data memory, a data item corresponding to the third label which coincides with the third label included in the first table; and

(G) update means, coupled to said read out means, to said first table memory means, and to said file memory means, for updating, in the file, a data item corresponding to the third label included in the first table, in accordance with the readout data item.

5,202,985

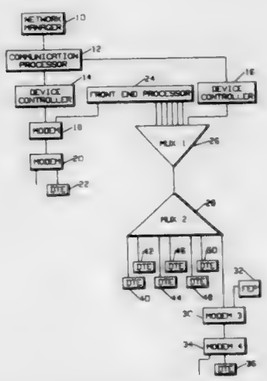
APPARATUS AND METHOD FOR DISPLAYING DATA COMMUNICATION NETWORK CONFIGURATION AFTER SEARCHING THE NETWORK

Praduemn K. Goyal, Ft. Lauderdale, Fla., assignor to Racal-Datacom, Inc., Sunrise, Fla.

Continuation of Ser. No. 181,538, Apr. 14, 1988, abandoned. This application Dec. 2, 1991, Ser. No. 801,320

Int. Cl.[5] G06F *15/40*

U.S. Cl. 395—600 **11 Claims**



1. A computer implemented method for providing a response to a query of a relational database having a plurality of entries describing a model of a communication network, said model of said communication network comprising a plurality of elements which are interconnected by a plurality communication links, said plurality of elements being located at a plurality of nodes in said communication network, said plurality of elements including at least two types of elements selected from a set of types of elements consisting of a modem element, a multiplexer element and Digital Service Unit element, said method comprising the steps of:

first, searching said database for said entries which satisfy a search criterion, said search criterion including the criterion of selection of only said entries representative of a predetermined one of said types of elements;

said first step of searching through said database including the further ordered steps of:

a) generating a token including said search criterion;

b) placing said token on an incoming port of first one of said elements having at least one incoming port and at least one outgoing port;

c) determining whether said first element has characteristics which satisfy said search criterion;

d) transforming said token to said outgoing port of said first element in accordance with a stored internal switch mapping which describes how said at least one incoming port of said first element is mapped to said at least one outgoing port of said first element;

e) moving said token to an externally connected second one of said elements using a stored external connection mapping which describes how said first element is interconnected with said second element; and

d) recording a list of the elements traversed as by the above steps which satisfy said search criterion;

second, ascertaining a structural interrelationship between said entries which satisfy said search criterion; and

third, generating a graphical representation of said structural interrelationship between said entries which satisfy said search criterion, whereby said graphical representation of said communication network includes only said predetermined one of said types of elements.

5,202,986

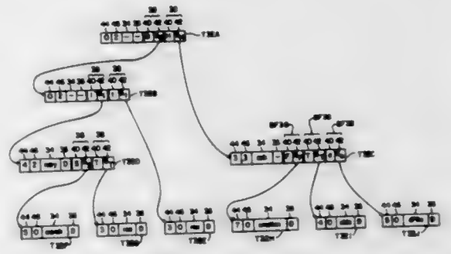
PREFIX SEARCH TREE PARTIAL KEY BRANCHING

Steven P. Nickel, Cherry Valley, Mass., assignor to Bull HN Information Systems Inc., Billerica, Mass.

Filed Sep. 28, 1989, Ser. No. 414,045

Int. Cl.[5] G06F *15/40*

U.S. Cl. 395—600 **1 Claim**



1. A computer-implemented method for searching an information tree of record keys with a search key to locate and retrieve one of a plurality of data records of a database held in the memory of a data processing system, wherein:

each of said record keys represents one of said data records and comprises a string of a plurality ("s") of characters, the number s of said characters differing for different ones of said record keys;

said search key comprises a string of a plurality ("k") of characters; and

said tree comprises a plurality of linked information nodes held in said memory, wherein each of at least some of said nodes comprises:

(i) a first field holding a string of the i-th through p-th successive characters common to the all of the record keys represented by all of at least one subtree of said each of at least some of said nodes;

(ii) a second field holding a pointer to a data record for which said i-th through p-th successive characters represent a final portion of the respective record key; and

(iii) a third field for each of said at least one subtree of said node and holding a (p+1)st record key character immediately following said pth character held in said first field, which (p+1)st record key character is common to all of the record keys represented by the respective one of said at least one subtree, said third field including a respective pointer to the root node of said respective

one of said at least one subtree; said method being char-

monitoring/detecting means, and to said processors for

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EXCLUSIVE CONTROL SYSTEM CAPABLE OF SIMPLY

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one of said at least one subtree; said method being characterized by:

∅ for each one of said nodes, comparing the string of the i-th through p-th successive characters of said search key with the record key character string held in the first field of said node, and

(1) if said search key string does not match said record key string, terminating said method, but

(2) if said search key string matches said record key string, then

(a) if k=p, retrieving from the memory a data record using the pointer held in the second field of said node, but

(b) if k>p, comparing the (p+1)st search key character with the (p+1)st record key character held in each of the third fields of said node, and

(i) if said (p+1)st search key character does not match any of said (p+1)st record key characters, terminating said method, but

(ii) if said (p+1)st search key character matches one of said (p+1)st record key characters, then retrieving from the memory the root node for the respective subtree using the pointer held in the respective third field of the node holding said (p+1)st record key character, and returning to step ∅ to continue said method for the root node so retrieved.

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HIGH FLOW-RATE SYNCHRONIZER/SCHEDULER APPARATUS AND METHOD FOR MULTIPROCESSORS

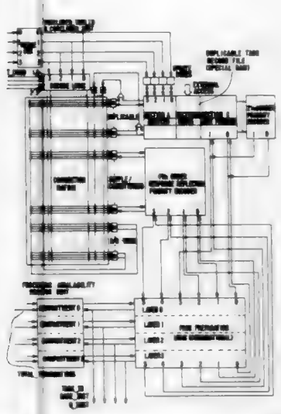
Nimrod Bayer, 7 Gordon Street, Givataim, and Ran Ginosar, Nofit 104 (near Tivon), both of Israel

Filed Jan. 15, 1991, Ser. No. 641,250

Claims priority, application Israel, Feb. 1, 1990, 093239

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—650 **10 Claims**



1. A hardware synchronization/scheduling apparatus for performing synchronization/scheduling in a multiprocessor system by controlling, during program run-time, a process of monitoring and detecting which computational tasks are allowed for execution and allocating computational tasks to processors, the tasks being represented by instructions and data accessible to the processors via instruction and data storage hardware, said synchronization/scheduling apparatus comprising:

means for monitoring and detecting which computational tasks are allowed for execution, said monitoring/detecting means containing a task map describing the precedence relations among the computational tasks of the program, and

communication/distribution means connected to said monitoring/detecting means, and to said processors for distributing, to the processors, information on computational tasks detected by said monitoring/detecting means to be allowed for execution in a processor and for forwarding, to said monitoring/detecting means, information on termination of execution of computational tasks at the processors, said communication/distribution means comprising a network of nodes possessing both the capability of decomposing information on a pack of allocated computational tasks into messages of finer partial packs of allocated computational tasks to be sent toward the processors and possessing the capability of unifying packs of information on termination of computational tasks into a more comprehensive pack, to be sent to said means for monitoring/detecting of allowed computational tasks.

5,202,988

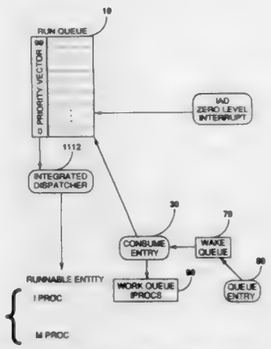
SYSTEM FOR COMMUNICATING AMONG PROCESSORS HAVING DIFFERENT SPEEDS

George A. Spix; Gregory G. Gaertner; Diane M. Wengelski, and Keith J. Thompson, all of Eau Claire, Wis., assignors to Supercomputer Systems Limited Partnership, Eau Claire, Wis.

Continuation-in-part of Ser. No. 537,466, Jun. 11, 1990. This application Aug. 23, 1990, Ser. No. 571,951

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—650 **6 Claims**



1. In a computing system having a plurality of shared data storage resources, a plurality of sources of service requests and a plurality of processors, each capable of performing tasks required by said service requests, apparatus for queuing service requests and processes for performing the required tasks comprising:

wake queue means in at least one of said shared data storage resources for storing service requests,

queue entry means coupled between the wake queue and the plurality of sources of service requests for entering in said wake queue means service requests and context used to respond to associated entered service requests,

access means controlled by one of said plurality of processors for processing wake queue entries,

consume entry means coupled to said wake queue means for retrieving a process identified by the said access means, and

run queue means coupled to said consume entry means for storing a retrieved process to be run when a processor becomes available to run the process identified by context entered in said wake queue means.

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CONTROL METHOD AND APPARATUS FOR COMPUTER NETWORK SYSTEM

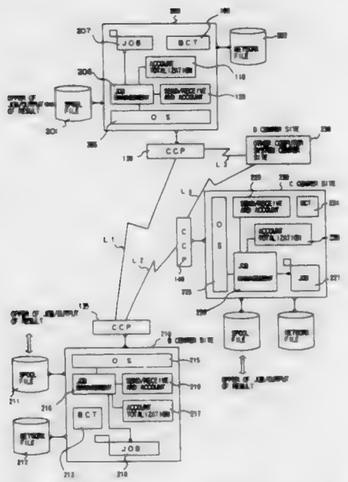
Toshio Hirosawa, Machida; Jun'ichi Kurihara, Takamatsu, and Ikuo Kimura, Yamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,750

Claims priority, application Japan, Jun. 23, 1989, 1-159520

Int. Cl.[5] G06F *15/21*

U.S. Cl. 395—650 **29 Claims**



1. A control method for a computer network system in which a plurality of computer systems managed by different managers are connected, and wherein a user requests that a job be executed by a computer system in the network system, said method comprising in each of said computer systems:

a first step of requesting an execution of a job by a first of the computer systems to a second of the computer systems in said computer network system, wherein a first storage means of the first computer system stores scheduled account information of jobs for which the second computer system is being requested to execute, a second storage means of the first computer system stores resulting account information of jobs received from the second computer system and executed by the first computer system, and third storage means stores user account information of users for computer systems in the network;

a second step of receiving from the second computer system resulting account information together with the execution of the job;

a third step of adding the resulting account information acquired in said second step to the scheduled account information in said first storage means and storing result of the adding into said first storage means and settling of accounts between the first and second computer systems on a basis of the added account information in said first storage means and the resulting account information in said second storage means; and

a fourth step of charging the user under contract with the first computer system on the basis of the resulting account information added to said first storage means and a cost standard of the first computer system for accounts, whereby the job of the user is charged as if executed by the first computer system even when executed by the second computer system in said computer network system.

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EXCLUSIVE CONTROL SYSTEM CAPABLE OF SIMPLY LOCKING EACH RESOURCE

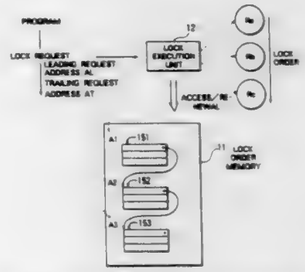
Kouki Saikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 648,483

Claims priority, application Japan, Jan. 30, 1990, 2-19944

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—650 **4 Claims**



1. A system for use in exclusively controlling a plurality of resources by selectively putting each of said resources into a locked state and an unlocked state in response to a lock request and a lock release request issued from a program, respectively, said system comprising:

lock order memory means for memorizing a lock order of the resources to be locked and a lock release order of the resources locked to produce a lock order signal representative of the lock order and a lock release order signal representative of the lock release order;

lock executing means responsive to said lock request and said lock order signal for successively putting the resources to be locked into the locked states in accordance with said lock order signal; and

lock releasing means responsive to said lock release request and said lock release order signal for successively putting the resources locked into the unlocked states in accordance with said lock release order signal.

5,202,991

REDUCING THE EFFECT PROCESSOR BLOCKING

Rodney N. Gamache, Merrimac; Stuart J. Farnham, Mason, and Michael S. Harvey, Nashua, all of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 540,886, Jun. 20, 1990, abandoned, which is a continuation of Ser. No. 181,637, Apr. 14, 1988, abandoned. This application Feb. 13, 1991, Ser. No. 655,180

Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—650 **7 Claims**

1. A method for determining alternative tasks which a processor may execute when its work on a task has been temporarily blocked by a conflict with another processor, comprising

assigning each task a priority level,

maintaining a current priority value for each processor indicating the lowest priority level of tasks which the processor is permitted to execute,

updating the current priority value of a processor from a previous priority value to a new priority value that corresponds with its execution of a new task, and

when the processor has been temporarily blocked from executing the new task because of a conflict with another processor, temporarily updating the current priority value of the blocked processor from the new priority value to a temporary priority value that is lower than the new prior-

ity value but no lower than the previous priority value,

formed, said fifth lens component having a relatively

improving execution speed in said pipelined processor for said plurality of instructions in said instruction block.

5,202,995

METHOD FOR REMOVING INVARIANT BRANCHES FROM INSTRUCTION LOOPS OF A COMPUTER

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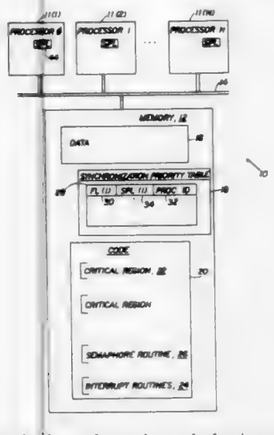
ity value but no lower than the previous priority value, whereby the processor, while the conflict exists, may



execute only those alternative tasks having priority levels which are no lower than the previous priority value.

5,202,992

ZOOM LENS APPARATUS

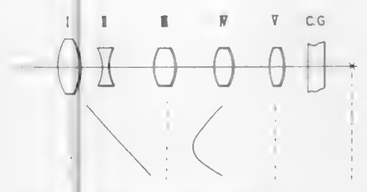
Makoto Banno; Nobuyuki Adachi; Hiroshi Miyamae, and Kiichirou Ueda, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 23, 1991, Ser. No. 689,559

Claims priority, application Japan, Apr. 27, 1990, 110504/1990; May 7, 1990, 115842/1990; May 7, 1990, 115843/1990; Jul. 23, 1990, 192932/1990

Int. Cl.[5] G02B *15/14, 9/60*

U.S. Cl. 359—676 **9 Claims**



1. A zoom lens apparatus comprising:

(a) a first lens component having a positive refractive power, said first lens component being provided at a fixed position at a side of the apparatus nearest to an object to be photographed;

(b) a second lens component having a negative refractive power, said second lens component being movable for variation of image magnification and being provided next to said first lens component;

(c) a third lens component having a positive refractive power, said third lens component being provided at a fixed position next to said second lens component;

(d) a fourth lens component having a positive refractive power for compensating a shift of focus resulting from the variation of the image magnification, said fourth lens component being provided next to said third lens component; and

(e) a fifth lens component, said fifth lens component being provided at a fixed position between said fourth lens component and a side of the apparatus nearest the image to be formed, said fifth lens component having a relatively weak refractive power; and further

wherein an aspheric element is included in at least one of said fourth lens component and said fifth lens component.

5,202,993

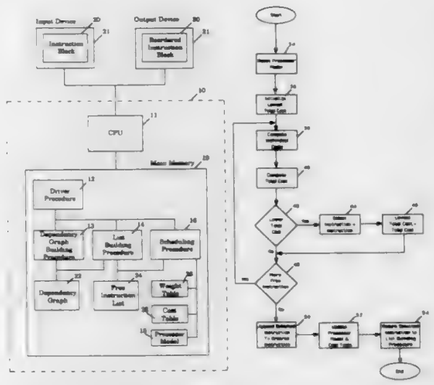
METHOD AND APPARATUS FOR COST-BASED HEURISTIC INSTRUCTION SCHEDULING

Gregory Tarsy, Scotts Valley, and Michael J. Woodard, Fremont, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Feb. 27, 1991, Ser. No. 661,674

Int. Cl.[5] G06F *9/45, 9/38*

U.S. Cl. 395—700 **34 Claims**



1. A method for cost-based heuristic instruction scheduling instructions for execution in a pipelined processor, said instructions comprising definitions, resources for use in said pipeline processor, or definitions and resources for use in said pipelined processor, said method comprising the steps of:

building an instruction dependency graph data structure for an instruction block, said instruction block comprising a plurality of instructions to be scheduled and said dependency graph data structure comprising said plurality of instructions arranged in a serial relationship such that a higher level instruction will precede a lower level instruction when definitions or use of a resource of said higher level instruction are necessary for said pipelined processor to execute said lower level instruction;

accessing free instructions in said instruction dependency graph data structure, said free instructions comprising instructions that do not have a higher preceding instruction;

building a free instruction list data structure comprising said free instructions;

providing a plurality of component modeling means for determining a plurality of cost heuristics for said pipelined processor;

simulating clock cycles and instruction execution in said pipelined processor for each of said free instructions so as to determine a plurality of cost heuristics by accessing said component modeling means for said plurality of cost heuristics;

computing a total cost for each free instruction by summing said plurality of cost heuristics;

building a cost table data structure comprising said total cost for each free instruction; and

scheduling for execution in said pipelined processor one of said free instructions based on a lowest total cost in said cost table data structure wherein execution time pipeline interlocks in said pipelined processor are reduced thereby improving execution speed in said pipelined processor for said plurality of instructions in said instruction block.

5,202,994

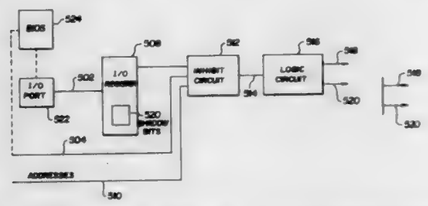
SYSTEM AND METHOD FOR SHADOWING AND RE-MAPPING RESERVED MEMORY IN A MICROCOMPUTER

Sridhar Begur, and Irvin R. Jones, Jr., both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1990, Ser. No. 472,057

Int. Cl.[5] G06F *12/16*

U.S. Cl. 395—700 **15 Claims**



1. A system for shadowing one or more selected portions from a plurality of portions of an original reserved memory in a microcomputer to a shadow memory, which system is adapted for use with a central processing unit, the system comprising:

(a) first means for determining whether the one or more selected portions of the original reserved memory are to be copied to the shadow memory;

(b) second means, responsive to said first means, for indicating whether each of the one or more selected portions is in a non-shadowed state or a shadowed state, said second means comprising:

a register having a shadow bits which are either active or not active, each of said shadow bits representing whether a corresponding one of said one or more selected portions of original reserved memory is in a non-shadowed state or shadowed state; and,

third means, responsive to said second means, for causing the central processing unit to read data from only the one or more selected portions of original reserved memory and to write said data to corresponding portions of the shadow memory when said second means indicates that said one or more selected portions are in a non-shadowed state;

wherein said third means includes means for causing the central processing unit to read from said corresponding portions of the shadow memory when said second means indicates that said one or more selected portions are in said shadowed state,

wherein said third means includes means for changing said shadow bits in said second means corresponding to said one or more selected portions after the CPU is caused to write said data to the shadow memory whereby the second means indicates that the one or more selected portions are in a shadowed state, and

wherein said third means incudes an inhibit circuit to write-protect said one or more selected portions of said original reserved memory and corresponding portions of shadow memory when said second means indicates that said one or more selected portions are in said shadowed state.

5,202,995

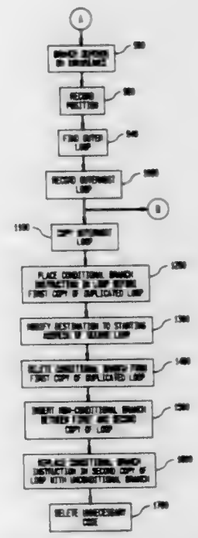
METHOD FOR REMOVING INVARIANT BRANCHES FROM INSTRUCTION LOOPS OF A COMPUTER PROGRAM

John K. P. O'Brien, South Salem, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 420,789, Oct. 12, 1989, abandoned. This application Sep. 3, 1992, Ser. No. 939,586

Int. Cl.[5] G06F *15/38*

U.S. Cl. 395—700 **10 Claims**



1. A computer implemented method of reducing the execution time of a computer program which includes at least one instruction loop having a first conditional branch instruction internal to the loop which has a condition part and a branch part including a target address, wherein the condition part is invariant with respect to the instruction loop, said computer implemented method comprising the steps of:

a) identifying said first conditional branch instruction;

b) copying said first conditional branch instruction to a location in the computer program immediately before the instruction loop to create a second copy of the conditional branch instruction;

c) copying the instruction loop to create a copy of the instruction loop, including a third copy of the conditional branch instruction, and inserting the copy of the instruction loop in a location in the computer program after the instruction loop, wherein said location is identified by a starting address;

d) modifying the branch part of the second copy of the conditional branch instruction to branch to the copy of the instruction loop;

e) inserting an unconditional branch instruction, to branch around the copy of the instruction loop, at a location in the computer program before the copy of the instruction loop; and

f) deleting the first conditional branch instruction; and

g) changing the third conditional branch instruction to an unconditional branch instruction, wherein said unconditional branch instruction includes a further target address and said further target address is said target address modified relative to said starting address such that the execution time of the computer program is reduced.

5,202,996

managing means, said software including a string of table

5,202,998

FAST, SIMULTANEOUS MULTI-PROCESSOR SYSTEM

token signal input and the token signal output of each one of the combinational logic blocks being coupled to a token

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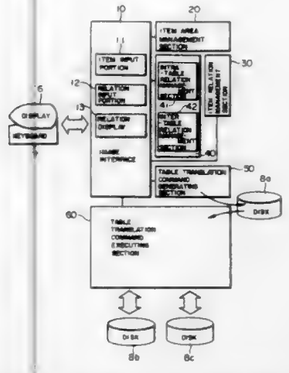
5,202,996

SOFTWARE STRUCTURING SYSTEM AND METHOD BY DATA TABLE TRANSLATION

Kazuhiro Sugino; Noboru Tsuchiya; Tadamasa Kamikubo, and Hisashi Onari, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 918,002, Oct. 14, 1986, abandoned. This application May 23, 1990, Ser. No. 527,715
Claims priority, application Japan, Oct. 11, 1985, 60-224705
Int. Cl.[5] G06F *15/60*
U.S. Cl. 395—700 **4 Claims**



1. A method developing software of a table translation type, said software being in the form of a string of commands for translating input tables into a desired output table, said software being developed by a processor, said method for developing software comprising the steps of:

registering, if not yet registered, items and definition information representing definitions of said items in a first managing means;

registering, if not yet registered, inter-item dependence relation information representing inter-item dependence relations of said registered items in a second managing means based on said definition information of said items registered in said first managing means;

registering, if not yet registered, inter-item derivation relation information representing inter-item derivation relations of said registered items in a third managing means, wherein each inter-item derivation relation information represents a relationship between first and second registered items;

fetching inter-item dependence relation information from said second managing means and fetching inter-item derivation relation information from said third managing means corresponding to desired items of a desired output table in response to an input from a designer;

deriving various combinations of one or more input tables each including one or more of said items, related to said desired items of said desired output table, based on said fetched inter-item dependence relation information and said fetched inter-item derivation relation information, displaying said various combinations of said one or more input tables on a display means connected to said processor and selecting a combination from said various combinations in response to an input from said designer;

registering in a fourth managing means said desired items of said desired output table and said items, related to said desired items of said desired output table, of each of said input tables of the selected combination;

registering a name of said desired output table and names of said input tables of the selected combination in a fifth managing means; and

generating software for translating said input tables of the selected combination into said desired output table based on information registered in said third, fourth and fifth managing means, said software including a string of table translation commands;

said generating step includes the steps of:

fetching said name of said desired output table and said names of said input tables of the selected combination from said fifth managing means,

selecting table translation commands from predetermined table translation commands based on a determination of whether said fetched name of said desired output table and said fetched means of said input tables are the same,

fetching said desired items of said desired output table and said items, related to said desired items of said desired output table, of said input tables of the selected combination from said fourth managing means, and

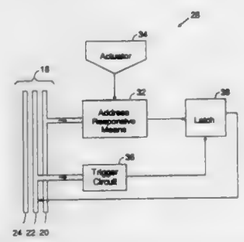
setting information in said selected table translation commands of said name of said desired output table, said names of said input tables of the selected combination, said desired items of said desired output table and said items, related to said desired items of said desired output table, of said input tables of the selected combination.

5,202,997

DEVICE FOR CONTROLLING ACCESS TO COMPUTER PERIPHERALS

G. Peter Arato, Etobicoke, Canada, assignor to Isolation Systems Limited, Etobicoke, Canada

Continuation of Ser. No. 915,226, Oct. 3, 1986, abandoned. This application Sep. 6, 1990, Ser. No. 578,561
Claims priority, application United Kingdom, Mar. 10, 1985, 8524455
Int. Cl.[5] G06F *13/12, 11/30*
U.S. Cl. 395—725 **9 Claims**



1. A device for preventing unauthorized access to computer peripherals attached to the input/output channel of a computer system in which a processing unit transmits an address signal along the input/output channel to the peripherals whenever a user selects any one of the peripherals for data transfer, said device comprising:

storage means for storing access information regarding a user's authority to access each of the peripherals;

address-responsive means for detecting the address signal transmitted along the input/output channel by the processing unit to the peripherals and for retrieving from the storage means in response to the detected address signal transmitted by the processing unit, the access information associated with the selected peripheral; and,

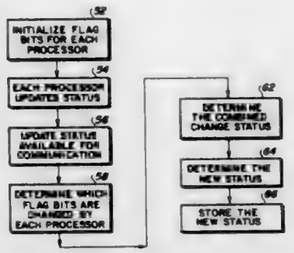
interruption means responsive to the retrieved access information for automatically applying a signal to the input-/output channel which prevents use of the selected peripheral whenever the retrieved access information indicates that access to the selected peripheral is restricted.

5,202,998

FAST, SIMULTANEOUS MULTI-PROCESSOR SYSTEM STATUS COMMUNICATION INTERFACE

Adalberto G. Yanes, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,740
Int. Cl.[5] G06F *13/00, 15/16*
U.S. Cl. 395—725 **21 Claims**



12. A method of updating system status information available to at least first and second processors through a communication interface having a first and second register, said first and second processors coupled to the communication interface, wherein said at least first and second processors may simultaneously change a plurality of system flag bits, the method comprising the steps of:

storing a first status and a second status in said first and second registers, respectively, the first and second statuses comprising the plurality of flag bits;

providing a first processor update from said first processor to said communication interface;

providing a second processor update from said second processor to said communication interface simultaneous with said providing a first processor update to said communication interface;

determining which flag bits are different between the first status and the first processor update, and generating a first change indication therefrom;

determining which flag bits are different between the second status and the second processor update, and generating a second change indication therefrom;

combining the first and second change indications;

determining a first new status from the combining step and the first status; and

storing the first new status in said first register so that the first status is replaced by the first new status.

5,202,999

ACCESS REQUEST PRIORITIZATION AND SUMMARY DEVICE

John M. Lenthall, Galway, Ireland; Neal A. Crook, Reading, England; Helen C. McGreal, Galway, Ireland, and Michael J. Seaman, San Jose, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 10, 1992, Ser. No. 819,186
Int. Cl.[5] G06F *13/37*
U.S. Cl. 395—725 **14 Claims**

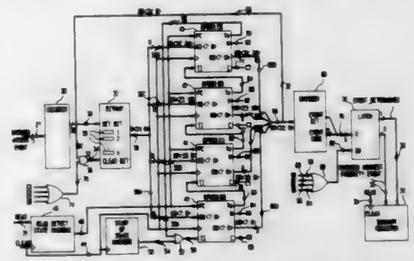
1. A device for determining a current highest priority among n entities, the device comprising:

a bitmap comprising n storage locations, each one of the n storage locations comprising a one bit storage location corresponding to one of the entities and storing a value representing when the corresponding entity is available for prioritization;

a plurality of combinational logic blocks coupled to the bitmap so that each one of the combinational logic blocks receives as an input preselected ones of the values stored in the n storage locations of the bitmap;

each one of the plurality of combinational logic blocks including a token signal input and a token signal output, the token signal input and the token signal output of each one of the combinational logic blocks being coupled to a token signal output of a previous one of the combinational logic blocks and to a token signal input of a succeeding one of the combinational logic blocks, respectively, to form a closed loop of token signal links between the combinational logic blocks;

each one of the combinational logic blocks generating a token signal for input to the token signal input of the respective succeeding combinational logic block upon



occurrence of preselected highest priority determination conditions within the combinational logic block;

each one of the combinational logic blocks being responsive to reception of a token signal at the respective token signal input from the respective previous combinational logic block, to determine a current highest priority among the values input to the respective one of the combinational logic blocks as a function of the token signal,

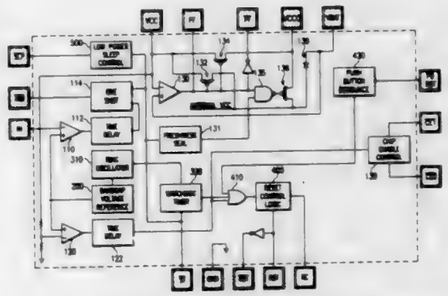
each one of the combinational logic blocks having an output for output of a signal representative of a current highest priority determination.

5,203,000

POWER-UP RESET CONDITIONED ON DIRECTION OF VOLTAGE CHANGE

Don Folkes, Coppell, and Wendell L. Little, Carrollton, both of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Continuation of Ser. No. 283,268, Dec. 9, 1988, abandoned. This application Nov. 15, 1990, Ser. No. 617,480
Int. Cl.[5] H01S *3/06*
U.S. Cl. 395—750 **20 Claims**



1. An integrated circuit, for providing power management functions to an associated integrated circuit, comprising:

a voltage comparison circuit, connected to monitor an input voltage with reference to a reference-voltage source, and to output an interrupt to the associated circuit if said comparison circuit indicates that said input voltage has declined from an input voltage target to a first voltage;

reset control logic, connected to operate selectably in either

decision means determines that the key address exists in

5,203,003

5,203,004

MULTI-BOARD SYSTEM HAVING ELECTRONIC

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reset control logic, connected to operate selectably in either a first mode or a second mode, wherein,

in said first mode, said reset control logic is permitted to output a reset signal to the associated circuit

IF said comparison circuit indicates that an external power supply voltage has strengthened to a second voltage after previously having declined from a target voltage to a third voltage,

but NOT IF said external power supply voltage has declined from said target voltage to a second voltage without having passed through said third voltage; and

in said second mode, said reset control logic is permitted to output said reset signal to the associated circuit WHENEVER said comparison circuit indicates that said power supply voltage is less extreme than said second voltage;

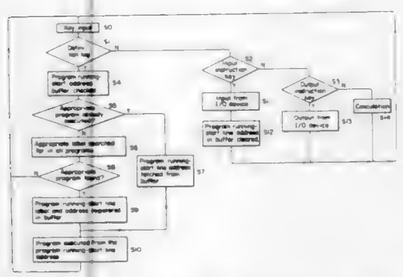
wherein said target voltage is more extreme than said first voltage, said target voltage is more extreme than said second voltage, and said second voltage is more extreme than said third voltage.

5,203,001

PORTABLE COMPUTER HAVING AN UPDATABLE TABLE OF STARTING ADDRESSES FOR ACCESSING THOSE STORED PROGRAMS HAVING BEEN PREVIOUSLY EXECUTED

Shigenobu Yanagiuchi, Tenri, and Yasuhiko Takano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 186,579, Apr. 27, 1988, abandoned.
This application Sep. 5, 1989, Ser. No. 403,020
Claims priority, application Japan, Apr. 27, 1987, 62-104975
Int. Cl.[5] G06F *15/02*
U.S. Cl. 395—800 **5 Claims**



2. A portable computer for storing a plurality of application programs in a program memory comprising:

key input means for generating a key address which designates program running-start lines for the plurality of application programs, each of said plurality of program running-start lines corresponding to a different one of said plurality of application programs;

memory means for storing addresses of said program running-start lines for each of the plurality of programs having been previously executed, said plurality of program running-start lines corresponding to a number less than said plurality of application programs stored in said program memory;

decision means, coupled to said key input means, said program memory, and said memory means, for determining whether the key address designated by said key input means exists in the program running-start lines stored in said memory means for a corresponding designated program from the plurality of application programs stored in the program memory;

first processing means, coupled to said decision means, for immediately executing said designated program when said decision means determines that the key address exists in said memory means; and

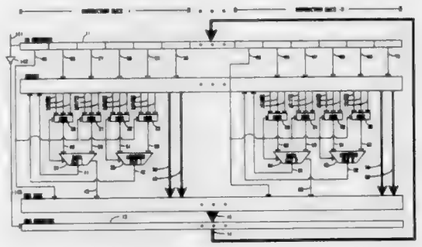
second processing means, coupled to said decision means, for searching said program memory for said key address designating one of said program running-start lines, storing said key address in said memory means, and executing said designated program, when said decision means determines that said key address fails to exist in said memory means.

5,203,002

SYSTEM WITH A MULTIPORT MEMORY AND N PROCESSING UNITS FOR CONCURRENTLY/INDIVIDUALLY EXECUTING 2N-MULTIINSTRUCTION-WORDS AT FIRST/SECOND TRANSITIONS OF A SINGLE CLOCK CYCLE

Glen F. Wetzel, 1682 El Cerrito Ct., San Luis Obispo, Calif.

Filed Dec. 27, 1989, Ser. No. 457,515
Int. Cl.[5] G06F *9/38, 9/30*
U.S. Cl. 395—800 **18 Claims**



1. A digital processor for concurrently processing a plurality of instructions in a single clock cycle having at least a first transition and a second transition comprising:

input register means for receiving and outputting a multiinstruction word having N individually and concurrently executable instructions at said first transition of said single clock cycle, N is an integer greater than 1;

multiport memory means, coupling to output of said input register means, for storing data and a plurality of said multiinstruction words;

N processing means, coupling to said multiport memory means, for processing corresponding data outputted from said multiport memory means in response to said multiinstruction word outputted from said input register means, each of said N processing means concurrently and individually calculating a multiport memory write address and generating multiport memory write data for a different one of said N instructions within said multiinstruction word;

multiplexing means, coupling to said multiport memory means and said N processing means, selectively outputting one of 2N multiinstruction words received from said multiport memory means based upon signals received from said N processing means wherein said multiport memory means outputting said 2N of said multiinstruction words to said multiplexing means in response to the output from said input register means and output from said N processing means; and,

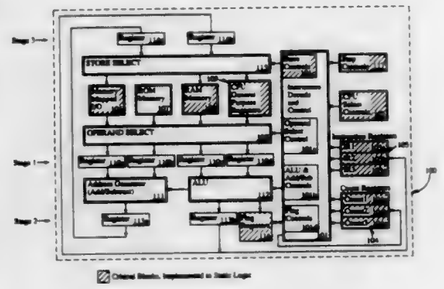
output register means, coupling to input of said input register means and output of said multiplexing means, for holding said outputted multiinstruction word at said second transition of said single clock cycle.

5,203,003

COMPUTER ARCHITECTURE FOR CONSERVING POWER BY USING SHARED RESOURCES AND METHOD FOR SUSPENDING PROCESSOR EXECUTION IN PIPELINE

Robert W. Donner, Scotts Valley, Calif., assignor to Echelon Corporation, Palo Alto, Calif.

Filed Mar. 28, 1991, Ser. No. 677,648
Int. Cl.[5] G06F *9/28, 9/38*
U.S. Cl. 395—800 **5 Claims**



1. A pipelined computer architecture capable of retaining data after a system clock has been halted thus conserving power, said architecture comprising a plurality of processing units coupled to shared resources, the architecture comprising:

a. first circuitry, the first circuitry comprising dynamic components including a compuer pipeline, arithmetic logic unit, instruction decoder, and address generator which is shared among and coupled to the plurality of processing units; and

b. second circuitry coupled to said first circuitry, the second circuitry comprising static components, including central processing unit registers, instruction counters, status registers, random access memory and computer stop controls, said computer stop controls including:

i. means for detecting the issuance of an execution suspend signal, said pipeline being in a first state including instructions which may not be complete,

ii. means responsive to said execution suspend signal detection means for preventing modification of said second processing circuitry:

iii. means responsive to said execution suspend signal detection means for advancing data in the pipeline all stages through the pipeline without modifying said second processing circuitry,

iv. means for stopping a computer system clock which provides a timing reference for said first processing circuitry responsive to the completion of said advancing pipeline means;

v. means for detecting the issuance of an execution resume signal;

vi. means responsive to the execution resume signal detection means for restarting said computer system clock;

vii. means responsive to the execution resume detection means for advancing the pipeline a first number of stages until said pipeline is restored to said first stage;

viii. means for allowing modification of said second processing circuitry responsive to the execution resume signal detection means; and

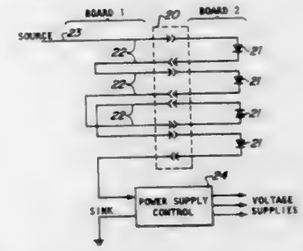
ix. means for resuming execution of instructions in said system responsive to the execution resume signal detection means.

5,203,004

MULTI-BOARD SYSTEM HAVING ELECTRONIC KEYING AND PREVENTING POWER TO IMPROPERLY CONNECTED PLUG-IN BOARD WITH IMPROPERLY CONFIGURED DIODE CONNECTIONS

William P. Bunton, New Braunfels; John M. Brown, Leander, and Patricia L. Whiteside, Austin, all of Tex., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jan. 8, 1990, Ser. No. 464,817
Int. Cl.[5] G06F *1/26, 15/08*
U.S. Cl. 395—800 **3 Claims**



1. A computer system having a first board and at least one module, said module having a plug-in assembly for connection to said first board, and an electrical keying circuit to prevent operation of said module unless properly-configured by said plug-in assembly, said keying circuit comprising:

a) a plurality of connector elements located upon said module to engage a like plurality of connector elements located upon said first board;

b) a plurality of uniquely-configured connections on said module separately engaging said plurality of connector elements to define a key configuration different from any other of said modules wherein each one of said uniquely-configured connections includes a diode connected between a pair of said plurality of connector elements for conduction in either a first or a second direction; and

c) an electrical circuit on at least one of said first board and said module for supplying enabling voltage to said module, said electrical circuit for said module engaging said plurality of connector elements on said first board in a unique pattern to prevent supplying said enabling voltage unless said module is connected and properly configured by said plug-in assembly to said first board; wherein said electrical circuit for said module includes said unique pattern to enable a series connection through said diodes in a manner such that all of the diodes for said module are connected in the same direction for conduction of current.

5,203,005

CELL STRUCTURE FOR LINEAR ARRAY WAFER SCALE INTEGRATION ARCHITECTURE WITH CAPABILITY TO OPEN BOUNDARY I/O BUS WITHOUT NEIGHBOR ACKNOWLEDGEMENT

Robert W. Horst, 2804 Robeson Park Dr., Champaign, Ill. 61821

Filed May 2, 1989, Ser. No. 346,203
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—800 **7 Claims**

1. A cell structure suitable for use in a cellular array, the cell being formed to have N boundaries, each boundary having an input bus means and an output bus means for respectively communicating signals into and out of the cell, each boundary being located between a first adjacent boundary and second adjacent boundary, the cell structure comprising:

a plurality of selection means each associated with a corresponding one of the N boundaries, each selection means having inputs coupled to receive the input bus means and the output bus means of the associated boundary and a selection output, the selection output associated with N-1

of the boundaries being coupled to the output bus means

generating a next microinstruction address by successively

5,203,008

5,203,009

RADIO TRANSCEIVER HAVING FIXED CALLING

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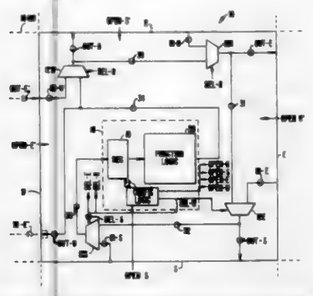
of the boundaries being coupled to the output bus means of the corresponding first adjacent boundary, the selection means being operable to select between the input bus means and the output bus means;

logic means coupled between an output of the remaining one of the N selection means and the output bus means of the corresponding first adjacent boundary, the logic means being configured and constructed to perform logic functions; and

control means operably coupled to each of plurality of the selection means for causing selection of the corresponding input bus means or the output bus means for communication to the selection output of the selection means, the



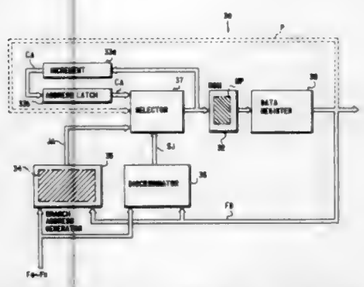
control means including first circuit means for asserting an OPEN signal for a first of the N boundaries, and second circuit means coupled to receive the OPEN signal and a neighbor OPEN signal from a neighbor cell structure across the first one of the N boundaries for causing the selection means associated with the first one of the N boundaries to select the corresponding input bus when the OPEN signal or the neighbor OPEN signal is asserted; whereby, communication may be established between the cell structure and the neighbor cell structure by the neighbor OPEN signal when the control means of the cell structure is itself unable to effect assertion of the OPEN signal.

5,203,006

SYSTEM FOR SELECTING NEXT INSTRUCTION ADDRESS BETWEEN UNIT INCREMENTED ADDRESS AND ADDRESS FROM TABLE SPECIFIED BY OPERATING CONDITION SIGNALS

Takayoshi Taniai, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 17, 1989, Ser. No. 338,823
Claims priority, application Japan, Apr. 22, 1988, 63-100636
Int. Cl.[5] G06F *9/26, 9/32*
U.S. Cl. 395—800 11 Claims



1. A microprogram branching method comprising the steps of:

generating a next microinstruction address by successively incrementing an address of current microinstruction;

generating a branched next microinstruction address from a branch address table based on predetermined operating condition signals, said branch address table prestoring a plurality of branch addresses in correspondence with operating condition signals;

discriminating whether or not a branch is to be made depending on the predetermined operating condition signals and obtaining a discrimination result;

selecting the next microinstruction address normally and selecting the branched next microinstruction address when the discrimination result indicates that the branch is to be made; and

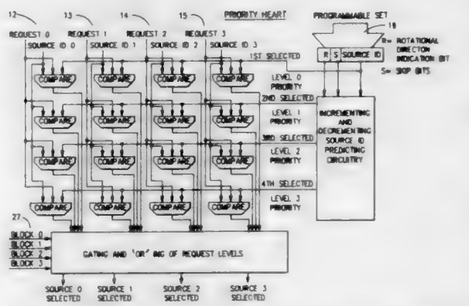
outputting data from an address location of a main memory depending on the selected address, said main memory prestoring microprograms.

5,203,007

OVERRIDING PROGRAMMABLE PRIORITY AND SELECTIVE BLOCKING IN A COMPUTER SYSTEM

Patrick W. Gallagher, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 292,297, Dec. 30, 1988. This application Oct. 3, 1991, Ser. No. 770,675
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—800 7 Claims



1. A computer-implemented method of resolving resource contention in a computer system, comprising the steps of:

a. directing a plurality of requests to use a multi-usable common resource having a plurality of separately and concurrently usable portions through a priority circuit;

b. selecting one of the requests to use one of said portions of the common resource;

c. attempting to use said portion of the common resource by the selected one request, said attempt determining whether there is any contention for the common resource which prevents the selected one request from using said portion of the common resource;

d. simultaneously with step (c), initially blocking the selected one request to prevent the selected one request from being reselected;

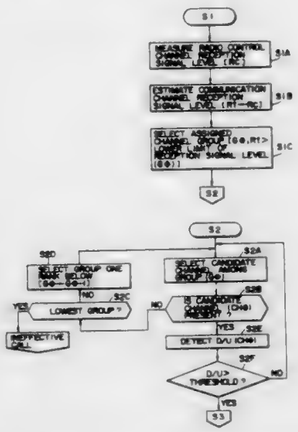
e. if contention for said common resource prevents use thereof by the selected one request, continuing to block said selected one request from being requested until any such contention is resolved, repeating steps (a) through (d) to attempt to use one of the same usable portion and another separately and concurrently usable portion of the common resource by another selected one request, eliminating the blocking of the selected one request, and redirecting the selected one request through the priority circuit.

5,203,008

METHOD OF ASSIGNING RADIO COMMUNICATION CHANNELS TO EACH OF A PLURALITY OF MOBILE STATIONS

Syuji Yasuda; Yoshiaki Nakajima, and Jun Tajima, all of Yokohama, Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,456
Claims priority, application Japan, Nov. 28, 1989, 1-306417
Int. Cl.[5] H04B *15/00;* H04Q *7/02*
U.S. Cl. 455—33.1 2 Claims



1. A method of assigning mobile radio communication channels to a plurality of mobile stations and a plurality of base stations arranged in a service area, said base stations constituting a radio zone where the base stations are connected to the mobile stations for communication, wherein each of said base stations includes a plurality of radio communication channels used for communication between the base station and the mobile station, said radio communication channels being divided into a plurality of channel groups, each channel group having a predetermined lower limit value of a reception electric field level of a reception signal, the predetermined lower limit value being necessary for communication between the mobile station and the base station, and a radio control channel used for transmission of control information before the communication time, said method comprising:

a first step of determining whether or not the reception electric field level of the reception signal for communication, which is found from the reception electric field level of the reception signal of said radio control channel between the mobile station issuing a communication connection demand and the base station within the radio zone, belongs to one of the channel groups which meets the predetermined lower limit value of the reception electric field level of the reception signal, thereby finding a radio communication channel to be assigned in response to the communication connection demand issued within the radio zone;

a second step of determining whether or not said radio communication channel belongs to the channel group which meets the predetermined lower limit value of the reception electric field level of the reception signal for communication, and satisfies a threshold of the ratio of desired wave power to interference wave power (D/U) when the communication connection demand is generated; and

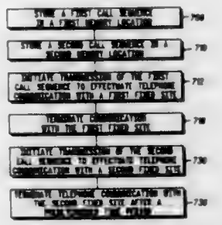
a third step of assigning the radio communication channel determined and selected in said first and second steps to the mobile station and the base station, the communication connection between which is requested.

5,203,009

RADIO TRANSCEIVER HAVING FIXED CALLING CAPACITY

Anthony J. Bogusz, Harwood Heights, Ill., and J. Robert Sroka, Sutton Scotney, England; Donald A. Dorsey, Arlington Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1991, Ser. No. 810,271
Int. Cl.[5] H04Q *7/02*
U.S. Cl. 455—33.1 18 Claims



1. In a cellular, communication system comprised of a plurality of base stations coupled to a wireline network having fixed sites connected thereto, a radio transceiver having transmitter circuitry operative to transmit a fixed number of call sequences to a base station of the cellular communication system to effectuate thereby telephonic communication between the radio transceiver and fixed sites of the wireline network associated with the call sequences transmitted by the transmitter circuitry, the combination with the transmitter circuitry of:

means forming a first memory location for storing a first call sequence therein;

means for initiating transmission by the transmitter circuitry of the first call sequence stored in the first memory location;

means forming a second memory location for storing a second call sequence therein; and

means for initiating transmission by the transmitter circuitry of the second call sequence stored in the second memory location only after effectuation of telephonic communication between the radio transceiver and the first fixed site and termination of telephonic communication therebetween.

5,203,010

RADIO TELEPHONE SYSTEM INCORPORATING MULTIPLE TIME PERIODS FOR COMMUNICATION TRANSFER

Kenneth A. Felix, Crystal Lake; Alton P. Werrosen; Thomas B. Hart, both of Palatine; Scott A. Hardman, Island Lake, and Thomas G. Hulsebosch, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 13, 1990, Ser. No. 612,292
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 455—33.2 40 Claims

1. A radiotelephone system having a mobile unit communicating to a source base-site, the mobile unit requiring a communication transfer from the source base-site to a selected one target base-site, the radiotelephone system comprising:

means, at the source base-site, for obtaining a first signal quality value of a signal when received by the source base-site;

means, at the source base-site, for providing a second signal quality value;

means, at the source base-site, for providing at least a first predetermined time period and a second predetermined time period;

means, the selected one target base-site, for obtaining a third signal quality value of said signal when received by the selected one target base-site;

means, at the selected one target base-site, for comparing

predetermined received signal quality characteristic

at a radio telephone:

the first predetermined signal sequence containing the first

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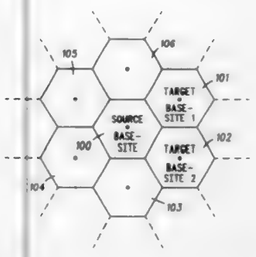
means, at the selected one target base-site, for comparing said first signal quality value to said third signal quality value during said first predetermined time period and for comparing said second signal quality value to said third signal quality value during said second predetermined time period; and



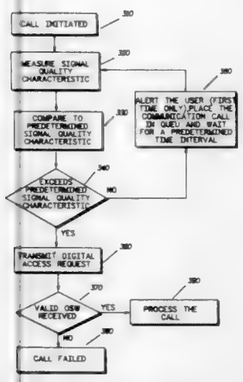
means, responsive to said means for comparing, for transferring communication from the source base-site to the selected one target base-site during at least either said first predetermined time period or said second predetermined time period.

5,203,011

METHOD AND APPARATUS FOR ESTABLISHING VOICE AND TONE SIGNALLING COMMUNICATION IN A TRUNKED SYSTEM

Ronald L. Bane, and Tanh Q. Van, both of Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1990, Ser. No. 577,176
Int. Cl.[5] H04Q *9/00*
U.S. Cl. 455—34.1 **8 Claims**



1. In a communication system including a communication resource controller capable of establishing analog communication and synchronous digital communication with at least one communication unit, wherein the likelihood of success for establishing digital communication is substantially greater than the likelihood of success for establishing analog communication, said analog communication being established after a digital access request message transmitted from said communication unit is received by said communication resource controller during an access time interval, a method for establishing an analog communication by said communication unit comprising the steps of:

(a) measuring a received signal quality characteristic from said communication resource controller;

(b) comparing said received signal quality characteristic to a predetermined received signal quality characteristic which is determined to make analog communication substantially likely;

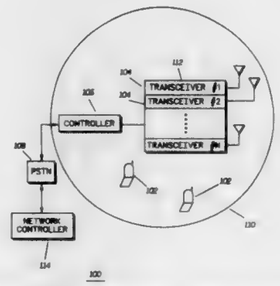
c) transmitting said digital access request message when analog communication with said communication resource controller is substantially likely.

5,203,012

METHOD AND APPARATUS FOR OPTIMUM CHANNEL ASSIGNMENT

Stelios J. Patsiokas, Plantation; Paul D. Marko, Ft. Lauderdale; Craig P. Wadin, Sunrise; Edward S. Kovach, Plantation, and Kenneth D. Alton, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 10, 1992, Ser. No. 833,281
Int. Cl.[5] H04Q *7/04*
U.S. Cl. 455—34.1 **8 Claims**



1. A method for selecting from a communication device a communication channel from among a plurality of communication channels available in a communication system for establishing a communication link comprising the steps of:

determining the receive signal strength level for each of the plurality of communication channels at the communication device;

determining if any of the plurality of communication channels have a receive signal strength level above a first threshold level;

selecting the communication channel which has the lowest receive signal strength level if it is determined that all of the plurality of communication channels have a receive signal strength level above the first threshold level;

determining which communication channels are adjacent to communication channels above a second threshold level when a communication channel was not previously selected; and

selecting a communication channel which is not adjacent to communication channels above the second threshold level.

5,203,013

RADIO TELEPHONE SYSTEM SUPPORTING BUSY AND OUT-OF-RANGE FUNCTION

Robert L. Breeden; Gary S. Lobel, both of Boynton Beach, and Thomas V. D'Amico, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 10, 1990, Ser. No. 579,646
Int. Cl.[5] H04B *17/00*
U.S. Cl. 455—34.2 **14 Claims**

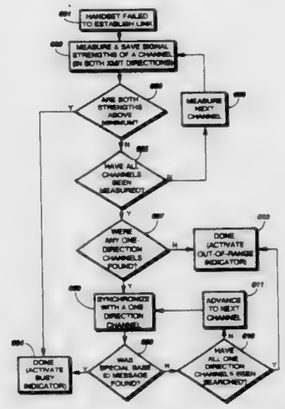
1. In a radio telephone communication system having:

a base station with at least one frequency agile transceiver capable of time division duplex operation on at least one radio frequency channel for facilitating communication with at least one radio telephone on the at least one radio frequency channel, a method of determining acquisition status of the at least one frequency agile transceiver in the base station comprising the steps of:

at a radio telephone:

providing an indication representing a base station busy status when one of:

requesting a communication link fails and bidirectional time division duplex communication exists on the at least one radio frequency channel; and



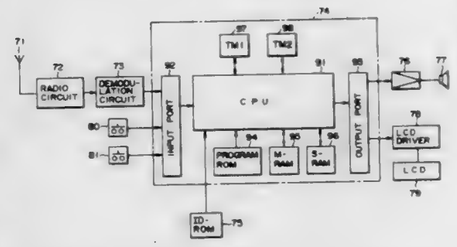
requesting a communication link fails and unidirectional time division duplex communication exists on the radio frequency channel and the unidirectional time division duplex communication originates from the base station.

5,203,014

RADIO TELECOMMUNICATION DEVICE WITH A DISPLAY FOR CHANGED INFORMATION IN RECEIVED SIGNALS

Kiyoshi Wagai; Tatsuaki Sekigawa, both of Hachioji, and Mitsuji Shiono, Oome, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1990, Ser. No. 493,462
Claims priority, application Japan, Mar. 15, 1989, 1-63321
Int. Cl.[5] H04B *7/00*
U.S. Cl. 455—38.2 **1 Claim**



1. A radio receiver comprising:

receiving means for receiving signals broadcast over a predetermined radio channel;

first signal detecting means coupled to said receiving means for detecting a first predetermined signal sequence containing a first ID code;

second signal detecting means coupled to said receiving means for detecting a second predetermined signal sequence containing a second ID code and an additional code, a new message signal sequence;

first alarming means coupled to said first signal detecting means for, when said first signal detecting means detects the first predetermined signal sequence containing the first ID code, alarming a user of the radio receiver;

determining means coupled to said second signal detecting means for determining whether or not the additional code detected by said second signal detecting means is an alarm instruction code;

amount-of-change detecting means for, comparing the new message signal sequence detected by said second signal detecting means with previously received message signal sequence and for detecting an amount of change between the new message signal sequence and the previously received message signal sequence, when said determining means determines that the additional code is not the alarm instruction code; and

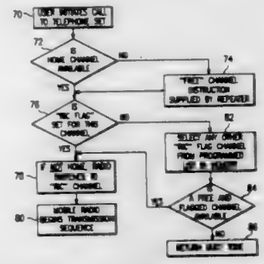
second alarming means for, alarming the user of the radio receiver and displaying the new message signal sequence, when said determining means determines that the additional code is the alarm instruction code and the amount of change detected by said amount-of-change detecting means exceeds a predetermined level.

5,203,015

AUTOMATIC CHANNEL SELECTION IN A MOBILE RADIO FOR TELEPHONE INTERCONNECT

David L. George, Colleyville, Tex., assignor to Uniden America Corporation, Fort Worth, Tex.

Continuation of Ser. No. 499,179, Mar. 26, 1990. This application Mar. 30, 1992, Ser. No. 861,355
Int. Cl.[5] H04Q *9/00*; **H04B** *1/00*
U.S. Cl. 455—34.1 **8 Claims**



1. In a mobile radio of the type adapted for operation with a multichannel repeater system that coordinates communications between plural mobile radios, and that coordinates communications with at least one different communication facility only on selected ones of said channels, the improvement in said mobile radio comprising:

a processor in said mobile radio;

a memory programmable with data for indicating the channels in said repeater system on which communications are available with said different communication facility;

said processor being programmed to determine if free channel designations transmitted to the mobile radio by said repeater system correspond with communication requests input into the mobile radio by a user to communicate with the communication facility, and

on an affirmative determination of a correspondence between a free channel designation and a communication request by the user, said processor causes a transmission to the repeater system on said corresponding free channel; and

on a determination of noncorrespondence between a free channel designation and a communication request by the user, said processor selects a channel indicated by the memory data as being available and on which communications can be established to the communication facility;

whereby said mobile radio automatically selects channels

that are both free and adapted for communicating with the communication facility.

tween the company representative and a certain individual another one of the plurality of customers;

a plurality of antennas equal in number to the number of identical bursts and associated on a one-to-one basis with

5,203,020

METHOD AND APPARATUS FOR REDUCING POWER

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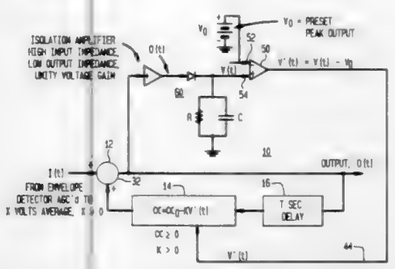
that are both free and adapted for communicating with the communication facility.

5,203,016

SIGNAL QUALITY-DEPENDENT ADAPTIVE RECURSIVE INTEGRATOR

Donald K. Belcher, W. Melbourne, and Darrell R. Gimlin, Melbourne Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 28, 1990, Ser. No. 545,299
Int. Cl.[5] H04B *7/02, 15/00*
U.S. Cl. 455—52.3 **9 Claims**



1. For use with a communication system in which an information signal transmitted from a transmitter site may be subjected to multipath propagation and received at a receiver site in the presence of noise, an apparatus for processing received multipath signals in order to identify said information signal comprising:

a recursive integrator which includes a summing device, said summing device having a first input to which the received signal is applied, an output and a second input, a controllable gain, feedback delay path coupled between said output and said second input, said controllable gain feedback delay path applying, to said second input of said summing device, a controlled gain, delayed version of a summation signal produced at the output of said summing device; and

a gain control circuit coupled between said output and said controllable gain feedback delay path, said gain control circuit controlling the gain of said controllable gain feedback delay path in accordance with said received signal.

5,203,017

METHOD AND APPARATUS FOR ESTABLISHING WIRELESS COMMUNICATION WITH MULTIPLE CUSTOMER STATIONS

Randall D. Brooks, Spring Valley, Calif., assignor to H. M. Electronics, Inc., San Diego, Calif.

Filed Oct. 19, 1990, Ser. No. 600,307
Int. Cl.[5] H04B *7/26*
U.S. Cl. 455—54.1 **5 Claims**

1. A drive through half duplex communication system for enabling a company representative to communicate selectively with a plurality of customers seated in vehicles positioned in different drive-up lanes, comprising:

a plurality of customer stations disposed at different ones of the drive-up lanes;

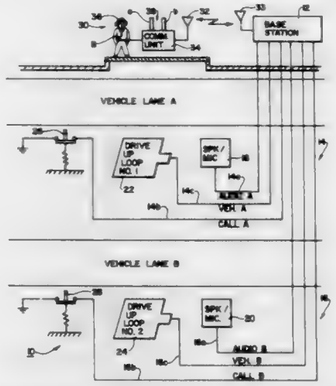
a company representative station for two-way communicating with said customer stations selectively;

said company representative station including at least one transceiver communication unit for communicating with individual ones of said plurality of customer stations selectively;

said unit including one manually operable dedicated device for controlling half duplex communications between the company representative and a certain individual one of the plurality of customers;

said unit including another manually operable dedicated device for controlling half duplex communications between the company representative and a certain individual another one of the plurality of customers;

said company representative station further including switching means responsive to one actuation sequence of the one manually operable dedicated device for establishing a half-duplex path between the communication unit and said certain individual one of the plurality of customers and responsive to another actuation sequence of the one manually operable dedicated device for terminating the established half-duplex path between the communication unit and said certain individual one of the plurality of customers; and



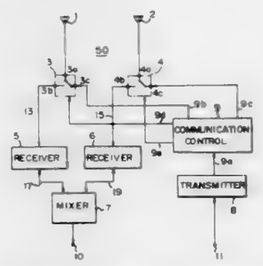
said switching means responsive to one actuation sequence of the another manually operable dedicated device for establishing a half-duplex path between the communication unit and said certain individual another one of the plurality of customers and responsive to another actuation sequence of the another manually operable dedicated device for terminating the established half duplex path between the communication unit and said certain individual another one of the plurality of customers.

5,203,018

SPACE DIVERSITY SYSTEM SWITCHING TRANSMISSION

Toshiyuki Hirose, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,514
Claims priority, application Japan, Jul. 6, 1989, 1-172973
Int. Cl.[5] H04B *7/06;* **H04L** *1/08*
U.S. Cl. 455—61 **11 Claims**



1. Fixed station radio equipment, comprising:

means, responsive to a signal, for producing a plural number of successive identical bursts, each burst consisting of a carrier modulated by said signal;

a plurality of antennas equal in number to the number of identical bursts and associated on a one-to-one basis with said identical bursts; and

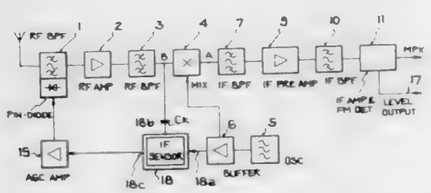
means, coupled to said producing means, for distributing said identical bursts to the associated antennas in sequence during respective nonoverlapping time intervals, said antennas transmitting the bursts in said time intervals as corresponding electromagnetico waves, said antennas being separated from each other by a predetermined distance selected so that the corresponding electromagnetic waves have substantially minimized correlation with respect to interferential fading.

5,203,019

RADIO RECEIVER WITH IMPROVED AUTOMATIC GAIN CONTROL

Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Dec. 13, 1990, Ser. No. 627,032
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942959
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—67.3 **36 Claims**



1. A radio receiver for use with an antenna, comprising:

a first mixer;

means for conveying a received signal to the first mixer along a signal path from the antenna to the first mixer, the means for conveying including agc means for controlling the amplitude of the received signal on the signal path in response to an agc control signal;

a local oscillator which generates an oscillator signal, the oscillator signal being supplied to the first mixer; and

sensor means, responsive to the received signal on the signal path and to the oscillator signal, for generating the agc control signal, the sensor means including

a second mixer, the second mixer receiving the oscillator signal,

first transmission channel means for conveying the received signal from the signal path to the second mixer, the first transmission channel means imposing a first degree of distortion,

second transmission channel means for simultaneously conveying the received signal in phase opposition from the signal path to the second mixer, the second transmission channel means imposing a second degree of distortion that is different from the first degree of distortion, and

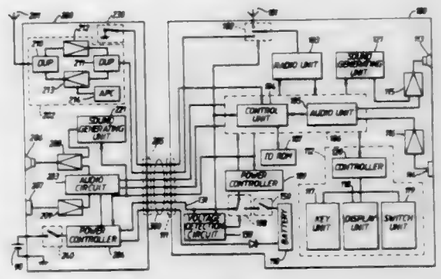
output means connected to the second mixer for generating the agc control signal.

5,203,020

METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN A RADIO TELECOMMUNICATION APPARATUS

Hiroshi Sato; Kita Katsuhiko, both of Tokyo, and Ishii Takaaki, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 707,225, May 24, 1991, abandoned, which is a continuation of Ser. No. 365,825, Jun. 14, 1989, abandoned. This application Oct. 2, 1991, Ser. No. 769,570
Claims priority, application Japan, Jun. 14, 1988, 63-146367; Jun. 14, 1988, 63-146369
Int. Cl.[5] H04B *1/38, 1/04*
U.S. Cl. 455—68 **11 Claims**



1. A radio communication apparatus for use in a radio communication system in which at least one base station broadcasts radio signals over a plurality of radio channels, the apparatus comprising a portable radio unit and an adaptor unit connectable to the portable radio unit, wherein:

the adaptor unit includes:

first power source for powering the portable radio unit when the portable radio unit is connected with the adaptor unit; and

the portable radio unit includes:

selecting means for selecting at least one radio channel from the plurality of radio channels;

receiving means responsive to the selecting means for receiving the radio signals broadcast from the base station over the selected radio channels;

first detecting means coupled to the receiving means for providing a positive detection when the selected radio channel is available for communication;

second detecting means for detecting information signals to be transmitted by the apparatus;

third detecting means for detecting whether the portable unit is connected with the adaptor unit;

transmitting means for transmitting radio signals including the information signals;

second power source whose power capacity is smaller than that of the first power source;

switching circuitry for selectively coupling the first power source and the second power source to the selecting means, the receiving means, the first detecting means, the second detecting means, and the third detecting means; and

control means for controlling the switching circuitry such that, in the event that the portable radio unit is not connected with the adaptor unit, the portable radio unit is intermittently supplied power from the second power source if the positive detection is provided by the first detecting means; and such that the receiving means and the transmitting means are continuously powered by the first or second power source in response to either the detection of information signals to be transmitted by the second detecting means or the detection of connection

between the portable radio unit and the adaptor unit by

a clamp for sliding over said opposed side portions to inter-

5,203,024

in a communication device including first and second antennas,

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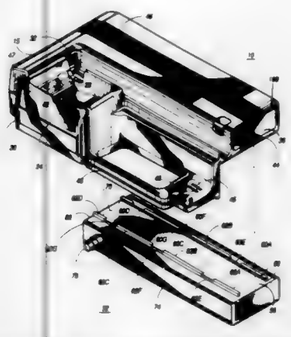
between the portable radio unit and the adaptor unit by the third detecting means.

5,203,021
TRANSPORTABLE SUPPORT ASSEMBLY FOR TRANSCEIVER

Daniel J. Repplinger, Lake Zurich, and Gary R. Weiss, Wheeling, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 22, 1990, Ser. No. 600,946
Int. Cl.[5] H04B *1/08, 1/38;* **H01R** *13/62*
U.S. Cl. 455—90 **19 Claims**



1. A transportable support assembly for releasably affixing a transceiver unit thereto, the transceiver unit having a bottom mounting surface extending in a first planar direction and at least one side surface extending in a second planar direction dissimilar with that of the first planar direction, the at least one side surface having an interface element positioned thereat, said transportable support assembly comprising:

a support surface for receiving the bottom mounting surface of the transceiver unit thereupon and for permitting sliding translation of the transceiver unit therealong to position the transceiver unit at a support position;

a latch member positioned upon the support surface and translatable thereupon into a latching position whereat the latch member latching engages the transceiver unit when the transceiver unit is translated into the support position to latch the transceiver unit in position thereat; and

an interface connector coupled to the latch member to be translatable in unison therewith, said interface connector for engaging with the interface element positioned at the side surface of the transceiver unit when the transceiver unit is positioned at the support position and for disengaging the interface element when the transceiver unit is positioned beyond the support position.

5,203,022
CLAMPING ASSEMBLY FOR INTERLOCKING A RADIO AND BATTERY HOUSING

Steven J. Finch, Sunrise; Faris S. Habbaba, Boca Raton; Jeffrey P. Marchuk, Ft. Lauderdale, and Steven M. Joss, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

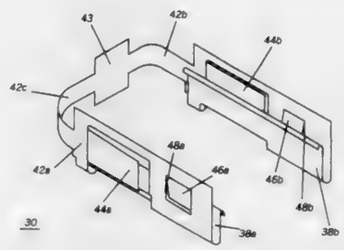
Filed Mar. 5, 1991, Ser. No. 665,204
Int. Cl.[5] H04B *1/03*
U.S. Cl. 455—127 **18 Claims**

1. A portable radio assembly, comprising:

a radio housing having opposed bottom side portions;

a battery housing having opposed top side portions;

a clamp for sliding over said opposed side portions to interconnect said housings; and

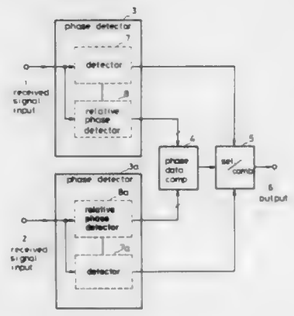


said opposed top side portions of said battery housing having means for retaining said clamp.

5,203,023
PHASE LIKELIHOOD COMPARISON DIVERSITY RECEIVER

Shigeki Saito, Yokohama, and Yasushi Yamao, Yokosuka, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

PCT No. PCT/JP90/00393, § 371 Date Jan. 11, 1991, § 102(e) Date Jan. 11, 1991, PCT Pub. No. WO90/11656, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 26, 1990, Ser. No. 613,704
Claims priority, application Japan, Mar. 28, 1989, 1-75918; Aug. 4, 1989, 1-202489; Aug. 14, 1989, 1-210461
Int. Cl.[5] H04B *7/08*
U.S. Cl. 455—133 **8 Claims**



1. A diversity receiver having plural receiver branches which respectively receive and detect phase modulated signals from the same transmitter to obtain plural detection data, and a selector/combiner means which either selects one of the plural detection data obtained by said plural receiver branches or combines them with weighting, the diversity receiver comprising:

plural detectors which generate a reference signal from the phase modulated signal and phase detect said modulated signal using said reference signal,

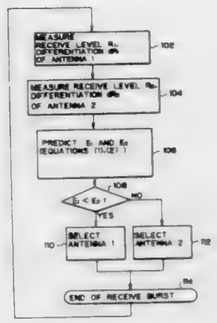
plural relative phase detectors, receiving the phase modulated signal and the reference signal from said detectors and which detect a phase difference between the phase modulated signal and the reference signal, and

a control means which compares said phase difference from each of said plural relative phase detectors to control said selector/combiner means to select a branch with a minimum phase difference or to combine the branches with weighting based on their phase difference.

5,203,024
ANTENNA SELECTION DIVERSITY RECEPTION SYSTEM

Yasushi Yamao, Kanagawa, Japan, assignor to Nippon Telegraph & Telephone Corp., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,295
Claims priority, application Japan, Apr. 27, 1990, 2-110517; Apr. 27, 1990, 2-114244; Apr. 27, 1990, 2-114245
Int. Cl.[5] H04B *17/02*
U.S. Cl. 455—133 **8 Claims**



1. An antenna selection diversity receiver system for a TDM receive signal comprising:

a plurality of antennas,

a selection switch for selecting one of said antennas,

a receiver/demodulator coupled with the selected antenna through said selection switch for providing a demodulated receive signal and a receive level,

a frame synchronization circuit coupled with output of said receiver/demodulator for effecting frame synchronization of said TDM signal,

an antenna selection circuit coupled with output of said receiver/demodulator for receiving said receive level, and coupled with said selection switch for controlling said selection switch,

said antenna selection circuit comprising;

a timing circuit coupled with said frame synchronization circuit for finding a beginning of an assigned time slot,

first storage means for storing said receive level of each antenna just before said assigned time slot,

slope means for providing a slope of said receive level of each antenna,

second storage means for storing output of said slope means,

prediction means for predicting receive signal quality of each antenna in said assigned time slot according to said receive level and said slope by using output of said first storage means and said second storage means, and

a switch control circuit coupled with said timing circuit and said prediction means for switching said selection switch just before a beginning of said assigned time slot for every assigned slot so that an antenna providing the best predicted receive signal quality in said assigned time slot is selected.

5,203,025
SELECTION CIRCUIT IN A SPACE DIVERSITY RECEPTION SYSTEM FOR A MOBILE RECEIVER

Kiomars Anvari, and Glyn Roberts, both of Calgary, Cansda, assignors to KovAtel Communications, Ltd., Alberta, Canada

Filed Nov. 9, 1990, Ser. No. 612,252
Int. Cl.[5] H04B *1/06*
U.S. Cl. 455—134 **9 Claims**

1. In a space diversity reception system for receiving signals in a communication device including first and second antennas, a first source coupled with said first antenna for supplying a first signal, a second source coupled with said second antenna for supplying a second signal, said first and second signals having respective magnitudes and phases, and a selection and combining system for providing downstream circuitry with a composite intermediate frequency signal, said received signals being subject to multi-path fading, said selection and combining system comprising:

A) means for generating a first magnitude signal indicative of the magnitude of said first signal;

B) means for generating a second magnitude signal indicative of the magnitude of said second signal;

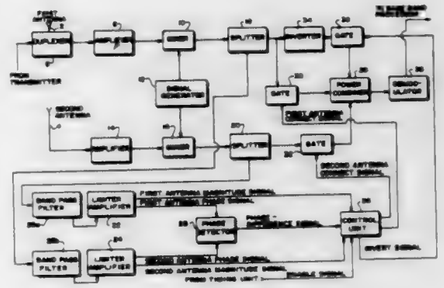
C) means for generating a first phase signal indicative of the phase of said first signal;

D) means for generating a second phase signal indicative of the phase of said second signal;

E) a phase detector responsive to said first and second phase signals for generating a phase difference signal indicative of the phase difference between said first and second signals, wherein the absolute value of the phase difference between said first and second signals can be greater than or less than ninety degrees;

F) linear combining means; and

G) means coupled with said first and second signal sources, said first- and second magnitude-signal-generating means,



and said phase detector, and responsive to said first and second magnitude signals and said phase difference signal, for

i) applying only said first signal to said combining means when (a) the ratio of the magnitudes of said first and second signals is equal to or greater than a preset magnitude level and (b) the magnitude of said first signal is greater than the magnitude of said second signal,

ii) applying only said second signal to said combining means when (a) the ratio between the magnitudes of said first and second signals is equal to or greater than the preset magnitude level and (b) the magnitude of said second signal is greater than the magnitude of said first signal, and

iii) applying said first signal and said second signal to said combining means when (a) the ratio of the magnitudes of said first and second signals is less than the preset magnitude level and (b) the absolute value of the phase difference between said first and second signals is less than ninety degrees; and

I) wherein said combining means generates said composite intermediate frequency signal from, without requiring co-phasing of, said first and second signals.

5,203,026

the data signal respectively distorted in the signal trans-

5,203,028

of a radio link and of the type in which a maximum power

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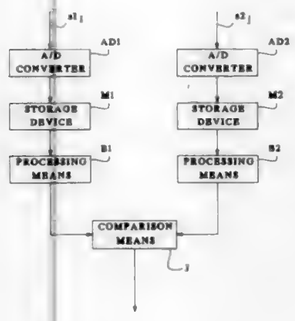
5,203,026

METHOD OF SELECTING THE MOST SUITABLE RECEIVER ANTENNA FROM TWO OR MORE RECEIVER ANTENNAS

Björn O. P. Ekeland, Lund, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 22, 1991, Ser. No. 673,304
Claims priority, application Sweden, Apr. 10, 1990, 9001311-1
Int. Cl.[5] H04B 17/02
U.S. Cl. 455—134 2 Claims



1. In a time-multiplexed radio communication system having a mobile radio station receiver, the system including an allocated time slot during which the receiver is intended to communicate, a method of selecting, from two or more antennas in the receiver, a most suitable antenna for communication during the allocated time slot, comprising the steps of:

for each of the antennas, making a plurality of signal strength measurements during a time interval in a time slot which precedes the allocated time slot, wherein the duration of the time interval is short in relation to the duration of the time slot;

for each of the antennas, linearly combining the plurality of signal strength measurement values to form a suitability measurement that is indicative of the antenna's suitability for use in the receiver during communication in the allocated time slot, wherein the step of linearly combining includes the step of multiplying each of the plurality of signal strength measurement values by a coefficient that is a function of a time derivative of the signal strength measurement values; and

selecting an antenna for use in the receiver during communication in the allocated time slot by choosing an antenna having a highest suitability measurement.

5,203,027

DIVERSITY RECEIVER FOR EQUALIZING A DATA SIGNAL DISTORTED IN A SIGNAL TRANSMISSION ROUTE

Katsuya Nounin; Katsumi Sakakibara, both of Kanagawa; Mutsumu Serizawa, Tokyo, and Koji Ogura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1990, Ser. No. 618,404
Int. Cl.[5] H04B 7/08
U.S. Cl. 455—134 8 Claims

1. A diversity receiver having a plurality of diversity branches for equalizing a data signal distorted in a signal transmission route thereof by utilizing a training signal transmitted prior to the data signal, each of the diversity branches comprising:

signal receiving means for receiving the training signal and the data signal respectively distorted in the signal transmission route;

sampling means for sampling the training signal received by the signal receiving means to output distorted code elements of the training signal;

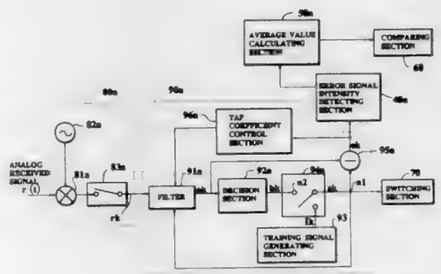
equalization means for equalizing the training signal sampled by the sampling means with tap coefficients, equalized code elements being generated by equalizing the distorted code elements of the training signal, and the tap coefficients being adjustable;

training signal generating means for generating undistorted code elements of the training signal, the training signal not distorted in the signal transmission route being stored in the training signal generating means in advance;

error signal generating means for generating an error signal indicating the difference between the equalized code elements generated by the equalization means and the undistorted code elements generated by the training signal generating means, the error signal being generated for each equalized code element;

tap coefficient control means for renewing the tap coefficients utilized by the equalization means so as to decrease the difference indicated by the error signal generated by the error signal generating means,

(i) the tap coefficients being renewed for each equalized code element,



(ii) a distorted code element E1, following a distorted code element E2, being equalized by the equalization means with the tap coefficients renewed by utilizing the distorted code element E2, and

(iii) the intensity of the error signal generated by the error signal generating means becoming stable after the tap coefficients are renewed a prescribed number of times;

intensity detecting means for detecting intensity of the error signal generated by the error signal generating means for each equalized code element; and

average value calculating means for calculating an average value of the intensity of the error signals detected by the intensity detecting means after the intensity of the error signal becomes stable, and the diversity receiver further including:

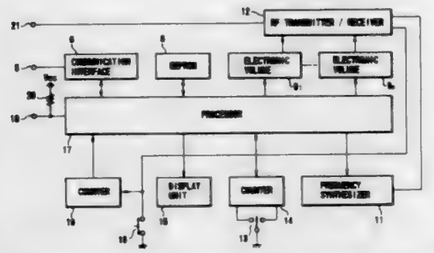
selecting means for selecting one of a plurality of diversity branches in which the smallest average value of the intensity of the error signals among a plurality of the average values calculated in the diversity branches is calculated by the average value calculating means, the data signal received by the signal receiving means being equalized with the renewed tap coefficients in the branch selected by the selecting means.

5,203,028

AUTOMATIC ADJUSTMENT RADIO APPARATUS

Mitsuo Shiraishi, Tokyo, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 591,066
Claims priority, application Japan, Oct. 5, 1989, 1-258890
Int. Cl.[5] H04B 17/02, 1/16
U.S. Cl. 455—154.1 2 Claims



1. An automatic adjustment radio apparatus which, in a first operating mode, performs channel selection by using a channel switch, and which, in a second operating mode, supplies predetermined data to a plurality of electronic volumes through a communication interface to adjust characteristics of said radio apparatus, and stores the data in a non-volatile memory for permitting, after disconnection of a power source, the restoration of the characteristics of the radio apparatus before the power source disconnection by supplying to the plurality of electronic volumes the data that is stored in the nonvolatile memory, said apparatus comprising:

transfer destination selecting means for selecting a transfer destination of the data, said data determined by said channel switch operating in said second operating mode; and

data transfer means for transferring the data to a specific electronic volume and a specific address of said non-volatile memory selected by said transfer destination selecting means,

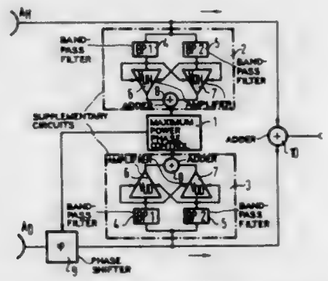
wherein the data is supplied to said electronic volume and stored in said non-volatile memory upon adjustment.

5,203,029

COMBINER CIRCUIT IN SPACE-DIVERSITY RECEPTION

Hermann Betzl, Penzberg, and Josef Noosek, Iffeldorf, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 23, 1991, Ser. No. 704,959
Claims priority, application European Pat. Off., May 31, 1990, 90110392.9
Int. Cl.[5] H04B 17/02
U.S. Cl. 455—137 8 Claims



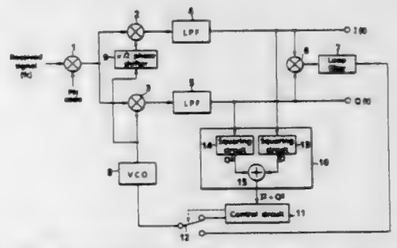
1. In a combiner circuit for first signals received from a main antenna and second signals received from a diversity antenna of a radio link and of the type in which a maximum power method is used, the improvement therein of a combination phase control circuit including a maximum power control circuit and comprising: an output adder connected to said main antenna and to said diversity antenna; a first signal supplementary circuit including first and second channels for varying the amplitudes of the first signals received from the main antenna and connected in parallel between the main antenna and the maximum power control circuit; a second signal supplementary circuit including third and fourth channels for varying the amplitudes of the signals received from the diversity antenna and connected between the diversity antenna and the maximum power control circuit; each of said first and third channels including identical first bandpass filters and each of said second and fourth channels including identical second bandpass filters by which the signal spectra are split into upper and lower spectrum halves; and means in each of said channels for measuring the power of sub-bands at the outputs of said bandpass filters and setting the power of the sub-bands to identical values or to a higher value for the weaker sub-band.

5,203,030

SATELLITE TRANSMISSION CAPTURING METHOD FOR GPS RECEIVER

Kenichiro Kawasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,800
Claims priority, application Japan, Feb. 13, 1990, 2-29488
Int. Cl.[5] H04B 1/06
U.S. Cl. 455—164.2 3 Claims



1. A satellite transmission capturing method for GPS receivers wherein a reference carrier is reproduced by a demodulator comprising a first multiplier for inverse diffusing said satellite transmission, a second multiplier for in-phase channel signal demodulation, a third multiplier for orthogonal channel signal demodulation, a first low-pass filter corresponding to said second multiplier, a second low-pass filter corresponding to said third multiplier, a fourth multiplier for detecting the phase difference of said satellite transmission and said reference carrier, a phase-locked loop (PLL) filter, a voltage controlled oscillator for generating said reference carrier, a demodulation intensity calculating circuit, a control circuit and a switch for switching to said PLL loop when said reference carrier is synchronized with said satellite transmission, said method comprising the steps of:

inverse diffusing said satellite transmission and applying the resulting received satellite transmission to said second and third multipliers;

generating the reference carrier;

demodulating said received satellite transmission by multiplying said received satellite transmission by an in-phase component of said reference carrier with said second multiplier and multiplying said received satellite transmission by an orthogonal component of the reference carrier with said third multiplier to obtain a demodulated in-phase channel signal I(t) and a demodulated orthogonal channel signal Q(t);

incrementing a frequency of said reference carrier within a

predetermined Doppler-shift frequency range beginning

selecting said untuned signal when said first signal is pro-

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predetermined Doppler-shift frequency range beginning at a starting frequency in frequency increments greater than a capture frequency range required for PLL operation to lock onto a captured transmission;

calculating a demodulation intensity based upon said in-phase channel signal I(t) and said orthogonal channel signal Q(t) corresponding to a particular frequency obtained following each frequency increment, said frequency increments being determined by a bandwidth corresponding to a predetermined threshold level of said demodulation intensity;

comparing said demodulation intensity obtained at each frequency increment to said threshold level;

reducing said frequency increments to correspond to said capture frequency range when said demodulation intensity of said particular frequency reaches said threshold level;

determining whether said particular frequency is located substantially at the peak of demodulation intensity corresponding to a received frequency of said received satellite transmission; and

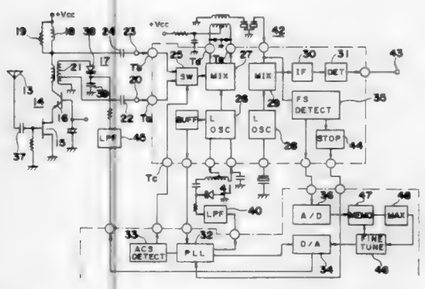
initiating said PLL operation when said particular frequency is located substantially at the peak of demodulation intensity corresponding to said received frequency of said received satellite transmission to phase synchronize said reference carrier with said received frequency.

5,203,031

AM RADIO RECEIVER WITH IMPROVED TRACKING

Sakae Sugayama, Ora, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 30, 1990, Ser. No. 605,837
Claims priority, application Japan, Oct. 31, 1989, 1-283903
Int. Cl.[5] H04B 1/16
U.S. Cl. 455—182.1 **6 Claims**



1. An AM radio receiver which receives a radio frequency signal comprising:

an automatic seeking circuit means for setting an automatic signal seeking mode and for producing a first signal indicative of automatic tuning thereof and a second signal indicative of a signal receiving mode;

radio frequency circuit means for producing in response to the received signal a tuned signal of a fixed frequency band and an untuned signal;

selector means for receiving said tuned signal and said untuned and responsive to the output of said signal seeking means for selecting said tuned signal when said second signal is produced from said automatic seeking circuit and selecting said untuned signal when said first signal is produced, and producing a selected signal; and

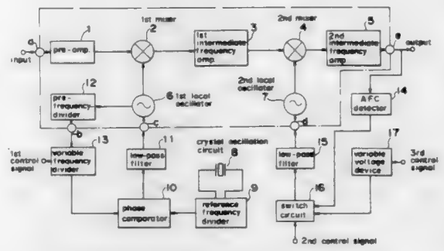
intermediate frequency signal generating means for producing an intermediate frequency signal based on the selected signal.

5,203,032

STATION SELECTING APPARATUS

Akira Usui, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 3, 1990, Ser. No. 547,152
Claims priority, application Japan, Jul. 5, 1989, 1-173400
Int. Cl.[5] H04B 1/16
U.S. Cl. 455—182.2 **3 Claims**



1. A tuner station selecting apparatus comprising;

a first mixer for converting the frequency of an input signal into a first intermediate frequency with a first local oscillator;

a second mixer for converting an output signal from said first mixer into a second intermediate frequency in with a second local oscillator;

said first mixer comprising:

a first frequency convertor for inputting both of an output signal from said first local oscillator and said input signal;

a prefix frequency divider for dividing said output signal from said first local oscillator;

a variable frequency divider connected to an output terminal of said prefix frequency divider to change the frequency dividing ratio in accordance with channel information input thereto;

a phase comparator for comparing in phase an output signal of said variable frequency divider and an output signal from a reference frequency divider, and

a low-pass filter for supplying an output signal from said phase comparator to said first local oscillator as an oscillation control voltage upon changing said output signal of said phase comparator to a direct current;

a wave detector for detecting an output signal from said second mixer to provide a control signal for said second local oscillator;

a variable voltage device adapted to output a variable output of direct current voltage step by step, and control signal from said wave detector and said output direct current voltage from said variable voltage device to output one of them to said second local oscillator;

wherein a minimum electrical potential width at the step of the output direct current voltage being set to a value such that the frequency electrical potential of said second local oscillator obtained by the minimum electrical potential difference is small than a frequency resolution of said first local oscillator.

DESIGN PATENTS

GRANTED Apr. 13, 1993

ERRATA

For CLASS	See PATENT NO.
D08-369	D,334,664
D06-469	D,334,722
D28-041	D,334,793

DESIGNS

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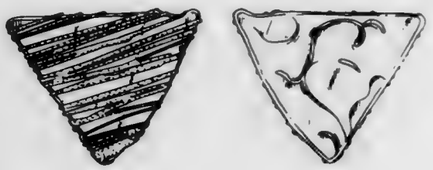
334,643
FOOD PRODUCT
Lisa G. Korslund, Edina; Donna J. Otto-Schoenauer, Maple Grove, and Eugene P. Buck, St. Paul, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jun. 17, 1991, Ser. No. 716,605
Term of patent 14 years
U.S. Cl. D1—113

334,644
FOOD PRODUCT
Lisa G. Korslund, Edina; Donna J. Otto-Schoenauer, Maple Grove, and Eugene P. Buck, St. Paul, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jun. 17, 1991, Ser. No. 716,607
Term of patent 14 years
U.S. Cl. D1—113

334,645
EDIBLE CANDY
Dorothy Kennedy, 5 New Forest, Longview, Tex. 75601
Filed Mar. 21, 1991, Ser. No. 673,107
Term of patent 14 years
U.S. Cl. D1—127



334,646
RIBBED BOOT COLLAR
Theodore F. Dissinger, Hummelstown, Pa., assignor to Richland Shoe Company, a division of H. H. Brown Shoe Company, Inc., Womelsdorf, Pa.
Filed Dec. 4, 1990, Ser. No. 621,904
Term of patent 14 years
U.S. Cl. D2—314

334,647
SURFACE OF AN EYELET STAY FOR A SHOE UPPER
Bruce E. Rogers, Portland, and Michael A. Aveni, Lake Oswego, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg. and Nike International, Ltd., Bermuda
Filed Jul. 3, 1991, Ser. No. 725,251
Term of patent 14 years
U.S. Cl. D2—314

334,648

334,651

334,653
SHOE SOLE

334,656
SHOE SOLE

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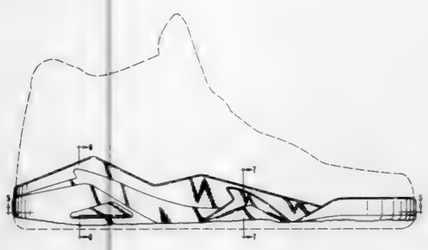
334,648
SURFACE OF AN EYELET STAY FOR A SHOE UPPER
Bruce E. Rogers, Portland, and Michael A. Aveni, Lake Oswego, both of Oreg., assignors to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed Jul. 3, 1991, Ser. No. 725,255
Term of patent 14 years
U.S. Cl. D2—314

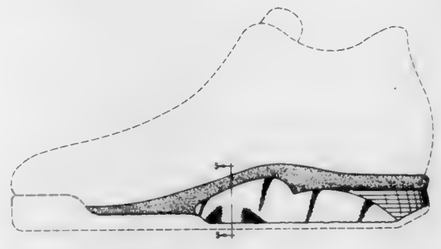
334,649
SHOE UPPER
Steven C. McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,714
Term of patent 14 years
U.S. Cl. D2—314

334,650
SHOE MIDSOLE PERIPHERY
Tracy Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,719
Term of patent 14 years
U.S. Cl. D2—314



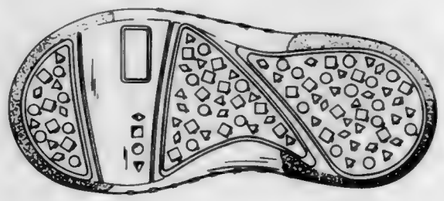
334,651
SHOE UPPER
Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 6, 1992, Ser. No. 879,227
Term of patent 14 years
U.S. Cl. D2—314

334,652
SHOE MIDSOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Sep. 24, 1991, Ser. No. 764,479
Term of patent 14 years
U.S. Cl. D2—318

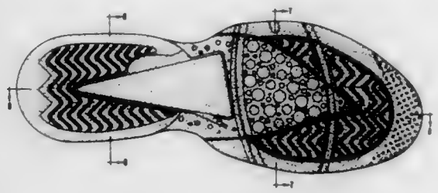


334,653
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asecs Corporation, Japan
Filed Feb. 20, 1991, Ser. No. 657,734
Term of patent 14 years
U.S. Cl. D2—320

334,654
SHOE SOLE DESIGN
Jennifer May, Boston, Mass., assignor to The Stride Rite Corporation, Cambridge, Mass.
Filed Nov. 1, 1991, Ser. No. 787,969
Term of patent 14 years
U.S. Cl. D2—320

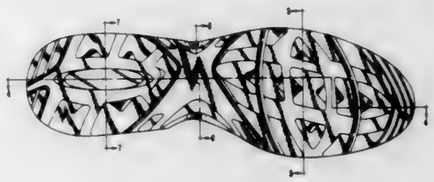


334,655
OUTSOLE OF A SHOE
Steven C. McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,418
Term of patent 14 years
U.S. Cl. D2—320

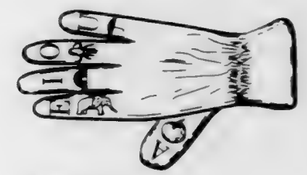


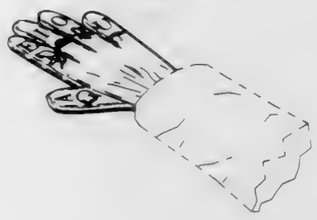
334,656
SHOE SOLE
William L. Bianchini, Elmwood, Mass., assignor to The Rockport Company Inc., Marlboro, Mass.
Filed Jan. 13, 1992, Ser. No. 820,064
Term of patent 14 years
U.S. Cl. D2—320

334,657
OUTSOLE
Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 6, 1992, Ser. No. 879,226
Term of patent 14 years
U.S. Cl. D2—320



334,658
GLOVE
Evelyn N. Ivie, Box 453, MacKay, Id. 83251
Filed Mar. 14, 1991, Ser. No. 669,225
Term of patent 14 years
U.S. Cl. D2—619





334,659
INFANT CARRIER

334,661
REMOVABLE POCKETBOOK LINER

334,664
DRAPERY BOW RING

334,667
MAKE-UP MIRROR

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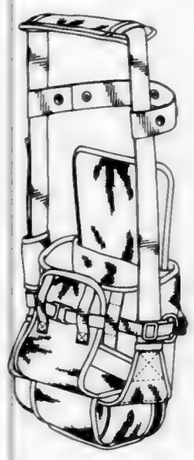
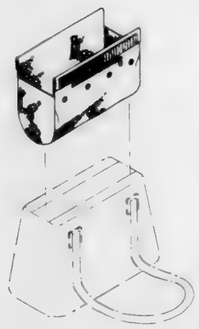
334,659
INFANT CARRIER
Takumichi Yamaguchi, 16-32-103 Sengen Uemachi, Fuji-shi, Shizuoka-ken; Naomi Hirata, 2-13-14 Yawatagaoka, Itsukaichimachi, Saeki-ku, Hiroshima-shi, Hiroshima-ken, and Keiko Hirasawa, 1221-1 Matsuoka, Fuji-shi, Shizuoka-ken, all of Japan
Filed Oct. 31, 1990, Ser. No. 607,078
Claims priority, application Japan, May 14, 1990, 2-15736
Term of patent 14 years
U.S. Cl. D3—31

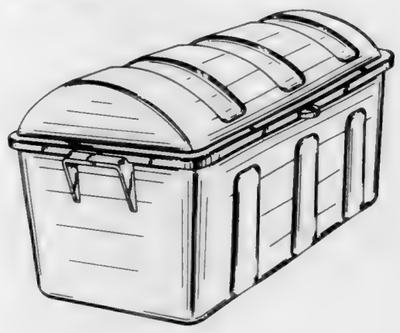


334,660
TRUCKER SHOWER ORGANIZER
Bozena Zagora, and Danuta Zagora, both of 5045 W. Newport, Chicago, Ill. 60641
Filed Feb. 5, 1991, Ser. No. 650,552
Term of patent 14 years
U.S. Cl. D3—42

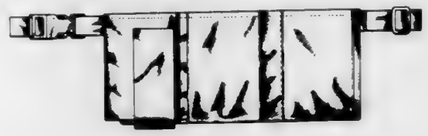
334,661
REMOVABLE POCKETBOOK LINER
Dorothy P. Kohn, Krewson La., Cheltenham, Pa. 19012
Filed Jan. 17, 1991, Ser. No. 642,382
Term of patent 14 years
U.S. Cl. D3—54



334,662
TREASURE CHEST
Joost van Berne, Breda, Netherlands, assignor to Curver Rubbermaid B.V., Goirle, Netherlands
Filed Jan. 11, 1991, Ser. No. 648,602
Claims priority, application Hague, Aug. 10, 1990, DM/017381
Term of patent 14 years
U.S. Cl. D3—70



334,663
BELT PACK
Neil A. Petrillo, 14592A Holt Ave., Tustin, Calif. 92680
Filed Oct. 24, 1991, Ser. No. 781,953
Term of patent 14 years
U.S. Cl. D3—106

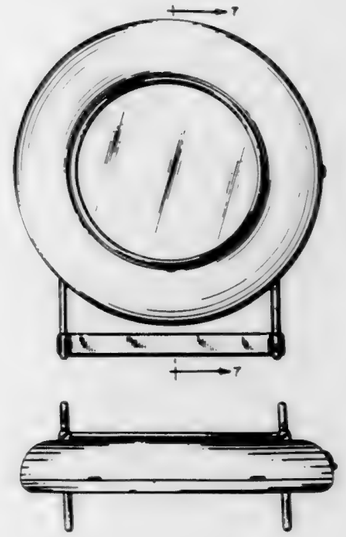


334,664
DRAPERY BOW RING
Stuart R. Fraker, Arlington; Michael R. Loupe, Fort Worth, and Kitty M. Milliorn, Arlington, all of Tex., assignors to Home Furnishings Discount Club of America, Inc., Arlington, Tex.
Filed Jul. 18, 1991, Ser. No. 734,317
Term of patent 14 years
U.S. Cl. D8—369

334,665
SOAP DISPENSING BRUSH
Carlos J. Johnson, P.O. Box 62343, Washington, D.C. 20019
Filed Oct. 17, 1990, Ser. No. 599,233
Term of patent 14 years
U.S. Cl. D4—114

334,666
HOT AIR STYLING BRUSH
Randall Bell, Oak Park; Paul Hurley, Chicago, both of Ill., and Leslie Szabo, El Paso, Tex., assignors to Helen of Troy Corp., Tex.
Filed Oct. 9, 1990, Ser. No. 594,198
Term of patent 14 years
U.S. Cl. D4—116

334,667
MAKE-UP MIRROR
John Loneczak, Newburgh, and Kin S. Yan, Brooklyn, both of N.Y., assignors to Clairol Incorporated, New York, N.Y.
Filed Dec. 29, 1989, Ser. No. 495,009
Term of patent 14 years
U.S. Cl. D6—308



334,668
HANGER FOR COAT OR GARMENT
Yoshihiro Miyahara, Osaka, Japan, assignor to Kabushiki Kaisha On Off International, Osaka, Japan
Filed May 20, 1991, Ser. No. 702,692
Claims priority, application Japan, Nov. 20, 1990, 2-39043
Term of patent 14 years
U.S. Cl. D6—317

334,669
TWO-PIECE CAR SEAT AND HEAD REST
Jeffrey Lee Hall, Lake Forest, Calif., assignor to Evenflo Company, Inc., Vandalia, Ohio
Filed Jan. 31, 1991, Ser. No. 648,603
Term of patent 14 years
U.S. Cl. D3—31

334,671
ROCKING CHAIR
Ronald Lee Hall, Lake Forest, Calif., assignor to Evenflo Company, Inc., Vandalia, Ohio
Filed Jan. 31, 1991, Ser. No. 648,604
Term of patent 14 years
U.S. Cl. D3—31

334,673
ADJUSTABLE LOUNGE CHAIR
Ronald Lee Hall, Lake Forest, Calif., assignor to Evenflo Company, Inc., Vandalia, Ohio
Filed Jan. 31, 1991, Ser. No. 648,605
Term of patent 14 years
U.S. Cl. D3—31

334,675
MAGAZINE FILE
Ronald Lee Hall, Lake Forest, Calif., assignor to Evenflo Company, Inc., Vandalia, Ohio
Filed Jan. 31, 1991, Ser. No. 648,606
Term of patent 14 years
U.S. Cl. D3—31

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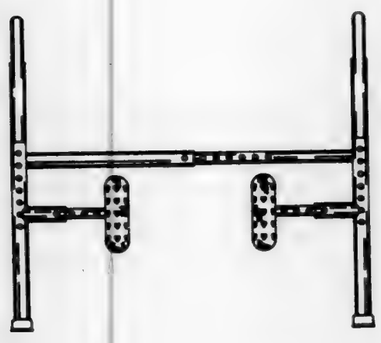
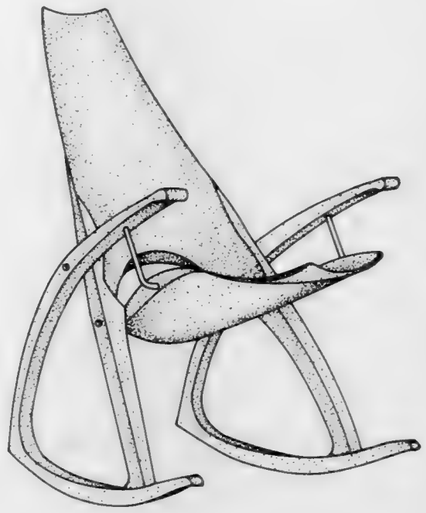
334,669
CHILDREN'S CAR SEAT AND HEAD REST
Ismael Gonzalez, 600 - 12th St., Mercedes, Tex. 78570
Filed Jul. 27, 1990, Ser. No. 558,391
Term of patent 14 years
U.S. Cl. D6—333

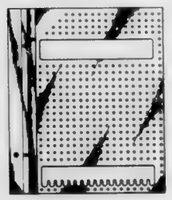


334,671
ROCKING CHAIR
Leon C. Meyer, 3221 Via Solona, Escondido, Calif. 92029
Filed Jan. 12, 1990, Ser. No. 463,966
Term of patent 14 years
U.S. Cl. D6—348

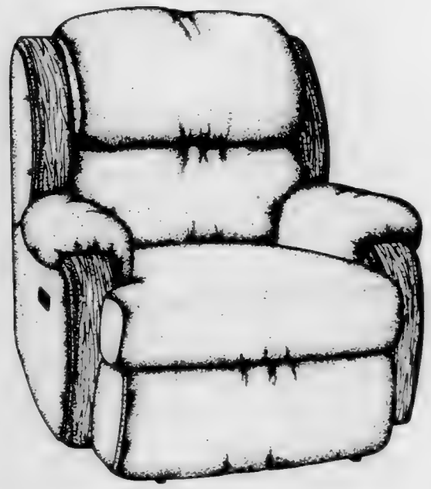


334,670
CLOTHING DISPLAY RACK
Steven Brunner, Atlanta, Ga., assignor to Liz Claiborne, Inc., New York, N.Y.
Division of Ser. No. 571,429, Aug. 23, 1990. This application May 1, 1992, Ser. No. 877,057
Term of patent 14 years
U.S. Cl. D6—415

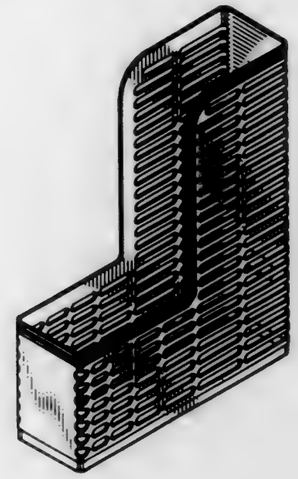
334,672
JEWELRY DISPLAY RACK
Peggy M. Bradwell, and Lyle R. G. Bradwell, both of RR 2, Site 6, Comp 29, Prince George, B.C., Canada V2N 2H9
Continuation-in-part of Ser. No. 151,265, Feb. 2, 1988. This application Jul. 23, 1991, Ser. No. 734,820
Term of patent 14 years
U.S. Cl. D6—469



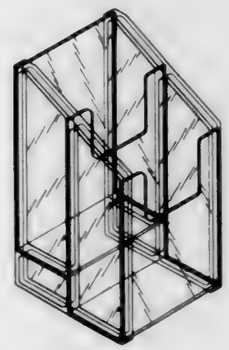
334,673
ADJUSTABLE LOUNGE CHAIR
Steve R. Robison, and Stephen M. Palumbo, both of Tupelo, Miss., assignors to The Lane Company, Inc., Alta Vista, Va.
Filed Jul. 17, 1990, Ser. No. 553,270
Term of patent 14 years
U.S. Cl. D6—367



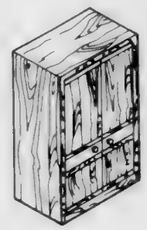
334,675
MAGAZINE FILE
Mel Evenson, San Pedro, Calif., assignor to Rubbermaid Office Products Group, Inc., Maryville, Tenn.
Filed Dec. 13, 1991, Ser. No. 806,459
Term of patent 14 years
U.S. Cl. D6—475



334,676
DISPLAY HOLDER FOR BROCHURES AND THE LIKE
Richard M. Liptak, Parma Heights, Ohio, assignor to Integral Design, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 369,908, Jun. 22, 1989, Pat. No. Des. 321,446. This application Sep. 19, 1990, Ser. No. 584,875
Term of patent 14 years
U.S. Cl. D6—476



334,674
WARDROBE
Carol B. Wheeless, and Harold Van Aubert, both of High Point, N.C., assignors to Ladd Furniture, Inc., High Point, N.C.
Filed Jan. 3, 1992, Ser. No. 816,931
Term of patent 14 years
U.S. Cl. D6—446



334,677

334,679

334,681

334,683

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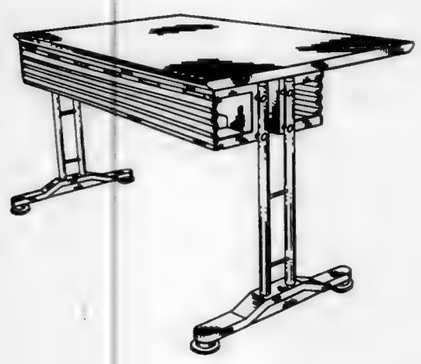
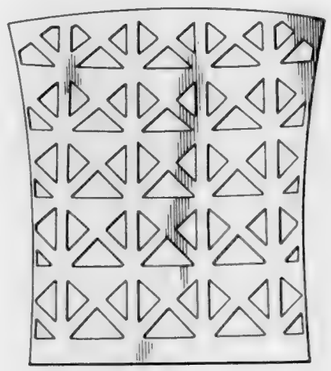
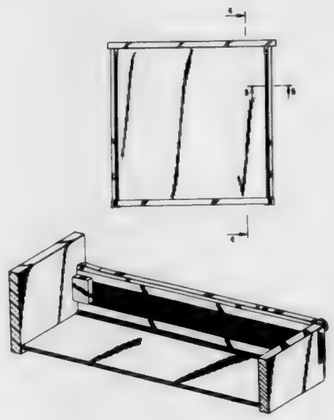
334,677
TABLE
Peter Hinden, Remigen, Switzerland, assignor to Embru-Werke, Mantel & Cie., Switzerland
Filed Nov. 30, 1989, Ser. No. 444,379
Claims priority, application Switzerland, May 30, 1989, 117.462
Term of patent 14 years
U.S. Cl. D6—484



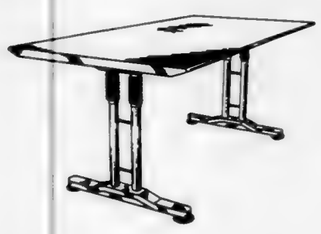
334,679
CHAIR BACK
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Arbent, France
Filed Oct. 31, 1990, Ser. No. 607,085
Claims priority, application Int'l Pat. Institute, May 15, 1990, DMA/110238
Term of patent 14 years
U.S. Cl. D6—502



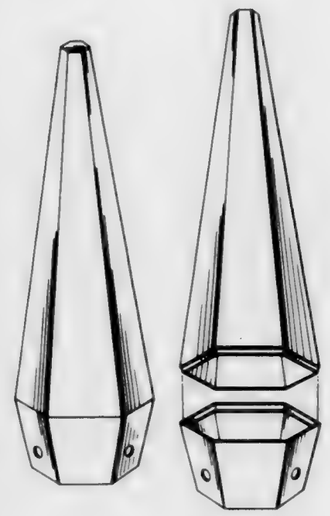
334,680
DRAWER
Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Continuation of Ser. No. 86,586, Aug. 18, 1987, abandoned. This application Apr. 22, 1991, Ser. No. 688,693
Term of patent 14 years
U.S. Cl. D6—510



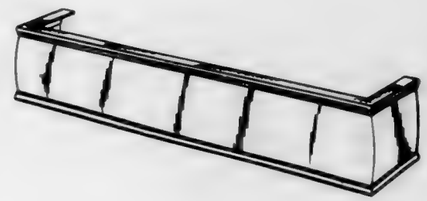
334,678
TABLE
Peter Hinden, Remigen, Switzerland, assignor to Embru-Werke, Mantel & Cie., Switzerland
Filed Nov. 30, 1989, Ser. No. 444,375
Claims priority, application Switzerland, May 30, 1989, 117.462
Term of patent 14 years
U.S. Cl. D6—487



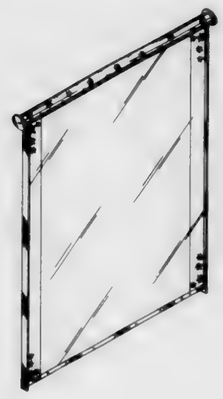
334,681
CONTAINER FOR A PLUNGER
Alden R. Callicutt, 1070 Travis La., Gaithersburg, Md. 20879
Filed Jul. 31, 1992, Ser. No. 922,965
Term of patent 14 years
U.S. Cl. D6—524



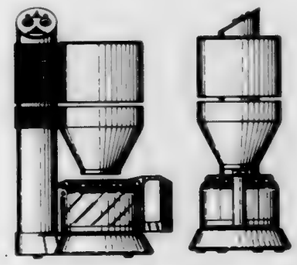
334,683
WINDOW VALANCE
Charles Byrne, Lot 28, Concession #2 RR. 1, Huntsville, Ontario, Canada
Filed Apr. 10, 1990, Ser. No. 507,051
Claims priority, application Canada, Nov. 14, 1989, 14-11-89-25
Term of patent 14 years
U.S. Cl. D6—579



334,682
ROLL UP SHOWER CURTAIN
Gregory Weeks, 4941 Carmichael Ave., Las Vegas, Nev. 89110-3529
Filed Jun. 26, 1990, Ser. No. 543,571
Term of patent 14 years
U.S. Cl. D6—575



334,684
AUTOMATIC COFFEE MAKER
Meinolf Hoffmann, Sundern/Sauerland, Fed. Rep. of Germany, assignor to A. Severin & Co. GmbH, Sundern/Sauerland, Fed. Rep. of Germany
Filed Dec. 12, 1990, Ser. No. 626,714
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1990, DM/016 929
Term of patent 14 years
U.S. Cl. D7—309



334,685

334,687

334,689
PORTABLE TUBULAR COOLER FOR CANNED

334,692
SPATULA

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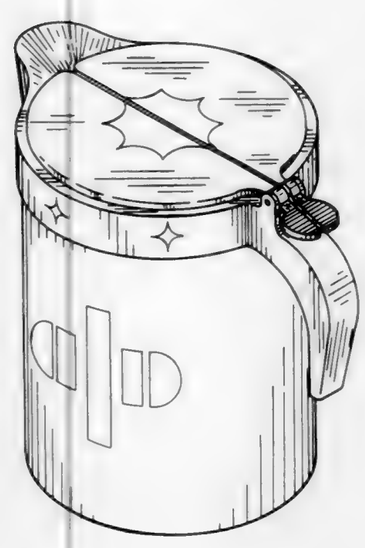
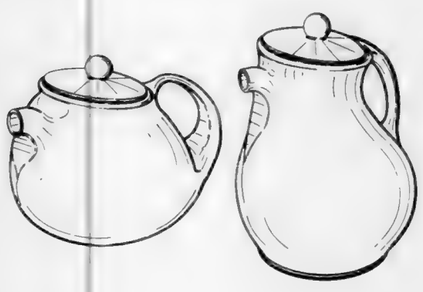
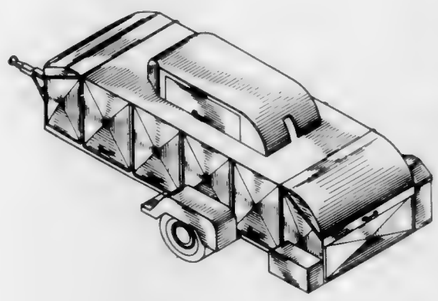
334,685
DUAL COFFEE DISPENSER
Carol Coulter, 36635 Acton, Mt. Clemens, Mich. 48043
Filed May 7, 1990, Ser. No. 519,662
Term of patent 14 years
U.S. Cl. D7—317



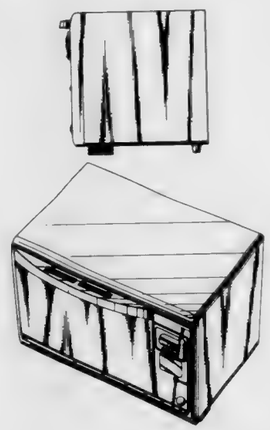
334,686
TEAPOT
Lee A. Wiley, 1185 Sunset Drive, Fenwick, Ontario, Canada L0S 1C0
Filed Jun. 12, 1990, Ser. No. 537,534
Term of patent 14 years
U.S. Cl. D7—321



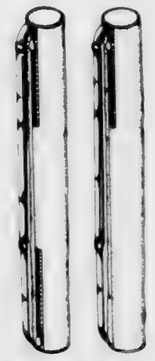
334,687
MOBILE FOOD COOKING TRAILER
Dean Gongwer, Wakarusa, Ind., assignor to Nelgo Manufacturing, Inc., Wakarusa, Ind.
Filed Oct. 15, 1990, Ser. No. 597,589
Term of patent 14 years
U.S. Cl. D7—334



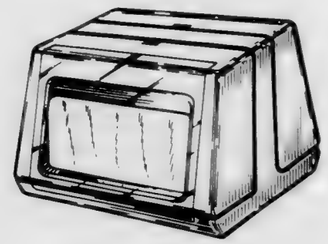
334,688
MICROWAVE OVEN
Isao Kitae, and Junichi Sakamoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 14, 1991, Ser. No. 792,066
Claims priority, application Japan, May 14, 1991, 3-14072
Term of patent 14 years
U.S. Cl. D7—351



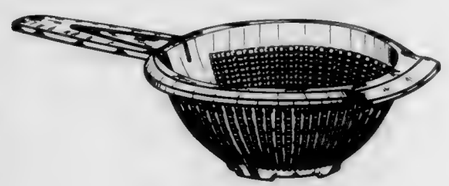
334,689
PORTABLE TUBULAR COOLER FOR CANNED BEVERAGES
Jeffrey V. Mason, Huntington, N.Y., assignor to Canvas & Leather Bag Co., Inc., Melville, N.Y.
Filed Nov. 16, 1990, Ser. No. 615,004
Term of patent 14 years
U.S. Cl. D7—605



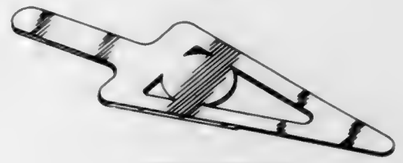
334,690
TWO-DOOR DISPENSER FOR PAPER NAPKINS
Christopher W. Chudek, and Bruce L. Renquist, both of Racine, Wis., assignors to Wisconsin Tissue Mills, Inc., Menasha, Wis.
Filed Apr. 30, 1991, Ser. No. 694,273
Term of patent 14 years
U.S. Cl. D7—631



334,691
STRAINER
David L. Feer, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 9, 1991, Ser. No. 804,163
Term of patent 14 years
U.S. Cl. D7—667



334,692
SPATULA
Lawrence P. Nussio, 2904 Hickory Grove Rd., Bloomfield Hills, Mich. 48331
Filed Jun. 10, 1991, Ser. No. 712,659
Term of patent 14 years
U.S. Cl. D7—688

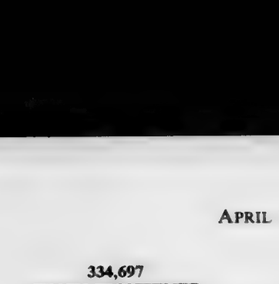


334,693
COMBINATION TOOL
Donald D. Burke, 9719 N. Flora, Kansas City, Mo. 64155
Filed Sep. 28, 1990, Ser. No. 590,284
Term of patent 14 years
U.S. Cl. D8—17

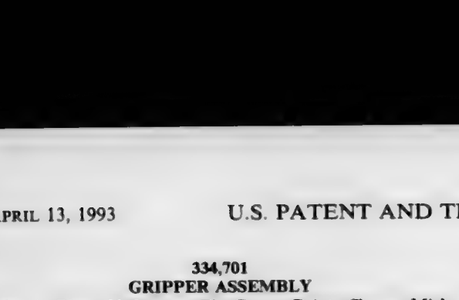
334,694
COMBINED LIGHT AND REMOTE VIEWING MIRROR
Winston G. McCoy, 3907 W. Grand Ave., Chicago, Ill. 60651
Filed Nov. 2, 1990, Ser. No. 608,319
Term of patent 14 years
U.S. Cl. D8—14

334,695
SOLDERING TOOL
Wintershoven, Alfred P. Oglesby, and John Arthur Waldherr, 201 Freeport Dr., Bloomingdale, Ill. 60108
Filed Jun. 10, 1991, Ser. No. 712,660
Term of patent 14 years
U.S. Cl. D8—17

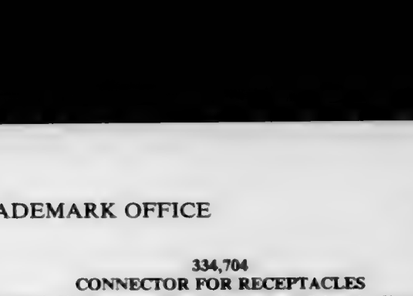
334,697
CINCH TIGHTENER
Filed Jun. 10, 1991, Ser. No. 712,660
Term of patent 14 years
U.S. Cl. D8—17



334,701
GRIPPER ASSEMBLY
John A. Blatt, 22 Stratton Pl., Grosse Pointe Shores, Mich. 48236
Filed Jun. 10, 1991, Ser. No. 712,661
Term of patent 14 years
U.S. Cl. D8—14



334,704
CONNECTOR FOR RECEPTACLES
Howard W. Andrews, Jr., Winchester; John A. Kowalski, Andover; and Robert J. Wentworth, Jr., Lowell, all of Mass., assignors to Wentworth Laboratories, Inc., Bedford, Mass.
Filed Jun. 10, 1991, Ser. No. 712,662
Term of patent 14 years
U.S. Cl. D13—6



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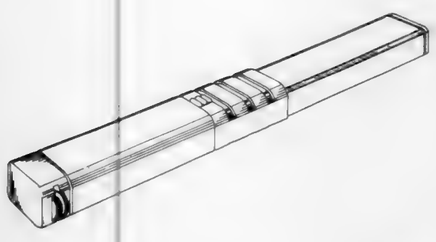
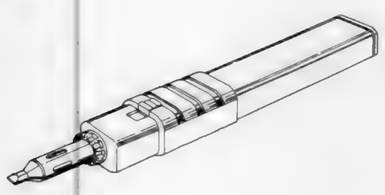
334,695
SOLDERING TOOL
John P. Watmore, Winterbourne; Alfred P. Oglesby, and John P. Oglesby, both of Carlow, all of Ireland, assignors to Oglesby & Butler Limited, Carlow, Ireland
Filed Apr. 25, 1991, Ser. No. 691,597
Claims priority, application Ireland, Oct. 26, 1990, 464/90; Oct. 26, 1990, 465/90
Term of patent 14 years
U.S. Cl. D8—30



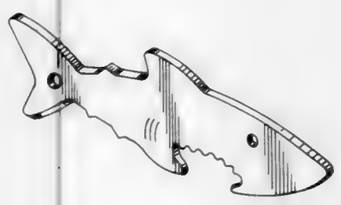


334,697
CINCH TIGHTENER
Arthur Waldherr, 201 Freeport Dr., Bloomingdale, Ill. 60108, and Victor R. Kurowski, 211 W. Central Ave., Lombard, Ill. 60148
Filed Nov. 26, 1990, Ser. No. 618,104
Term of patent 14 years
U.S. Cl. D8—51

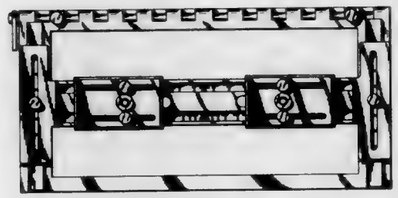
334,698
SABRE SANDER-FILER
Gayle K. Bane, R.R. 1 Box 86, Saybrook, Ill. 61770
Filed Apr. 9, 1991, Ser. No. 682,224
Term of patent 14 years
U.S. Cl. D8—62

D334,699
Patent Not Issued For This Number

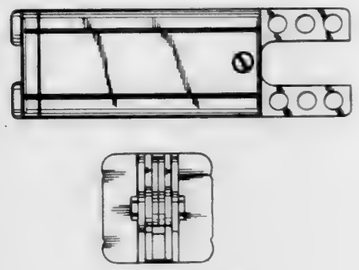
334,696
BOTTLE OPENER
Luke Makris, 7455 Ridge Blvd., Chicago, Ill. 60645
Filed Sep. 11, 1989, Ser. No. 405,677
Term of patent 14 years
U.S. Cl. D8—38



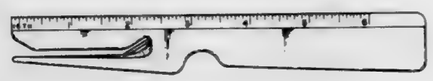
334,700
DRILL JIG
James Eller, Kennewick, Wash., assignor to Dean Kader, Yakima, Wash.
Filed Feb. 20, 1991, Ser. No. 658,631
Term of patent 14 years
U.S. Cl. D8—71



334,701
GRIPPER ASSEMBLY
John A. Blatt, 22 Stratton Pl., Grosse Pointe Shores, Mich. 48236, and David C. Tomlin, Mt. Clemens, Mich., assignors to John A. Blatt, Grosse Pointe Shores, Mich.
Filed Jan. 24, 1991, Ser. No. 645,275
Term of patent 14 years
U.S. Cl. D8—72

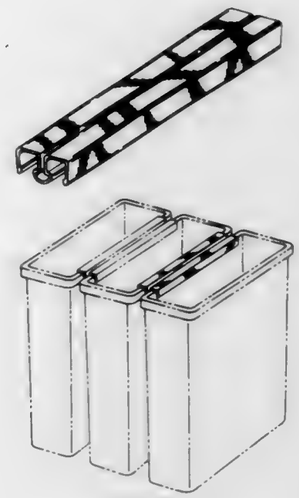


334,702
LETTER OPENER
Donald W. Godsey, 7807 Cove Ridge Rd., Hixson, Tenn. 37343
Filed Oct. 23, 1990, Ser. No. 602,199
Term of patent 14 years
U.S. Cl. D8—104



334,703
DEADBOLT KNOB AND DOORKNOB ENGAGING SECURITY UNIT
Jerry A. Murphy, 7361 E. Diamond, Scottsdale, Ariz. 85257
Filed Mar. 1, 1991, Ser. No. 662,895
Term of patent 14 years
U.S. Cl. D8—331

334,704
CONNECTOR FOR RECEPTACLES
Howard W. Andrews, Jr., Winchester; John A. Kowalski, Stephens City, and Friedrich G. Wahl, Boyce, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jun. 10, 1991, Ser. No. 712,647
Term of patent 14 years
U.S. Cl. D8—395



334,705
CONTAINER FOR A PUMP DISPENSER
Joseph Pereira, West Redding, and Kimberly Slavin, Norwalk, both of Conn., assignors to Clairol, Incorporated, New York, N.Y.
Filed Jun. 18, 1991, Ser. No. 718,157
Term of patent 14 years
U.S. Cl. D9—300

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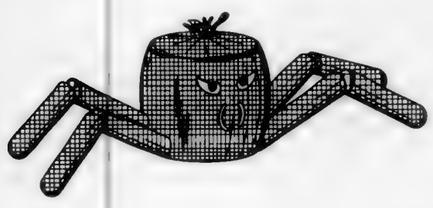
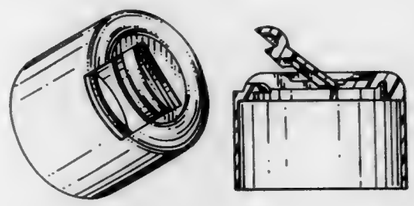
334,706
BAG
Michael C. Wotton, Plantsville; Katherine A. Reed, Riverside, and Nancy E. Mimoun, Stamford, all of Conn., assignors to Benson E. Zinbarg, Stamford, Conn.
Filed Aug. 23, 1991, Ser. No. 749,406
Term of patent 14 years
U.S. Cl. D9—307

334,707
MULTIPLE BAG UNIT
Katherine A. Reed, Riverside; Nancy E. Mimoun, and Norma J. Amlicke, both of Stamford, all of Conn., assignors to Benson E. Zinbarg, Stamford, Conn.
Filed Aug. 28, 1991, Ser. No. 749,409
Term of patent 14 years
U.S. Cl. D9—307

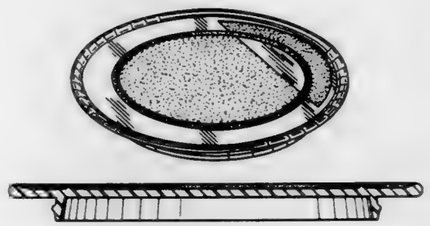
334,708
BAG
Benson E. Zinbarg, 320 Chestnut Hill Rd., Stamford, Conn. 06903; Nancy E. Mimoun, Stamford, Conn., and Katherine A. Reed, Riverside, Conn., assignors to Benson E. Zinbarg, Stamford, Conn.
Division of Ser. No. 664,023, Mar. 4, 1991. This application Aug. 23, 1991, Ser. No. 749,408
Term of patent 14 years
U.S. Cl. D9—316



334,709
CLOSURE
Gregory J. Fleming, Glen Rock, N.J.; Cheryl A. Bachelder, Winston-Salem, N.C.; Joseph F. Collerd, Winston-Salem, N.C., and Ronald W. Yonker, Winston-Salem, N.C., assignors to Nabisco, Inc., Parsippany, N.J.
Filed May 2, 1991, Ser. No. 695,033
Term of patent 14 years
U.S. Cl. D9—449

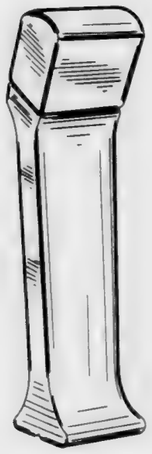


334,710
CONTAINER COVER
Augusto A. Picozza, Orlando, Fla., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 28, 1991, Ser. No. 677,274
Term of patent 14 years
U.S. Cl. D9—454



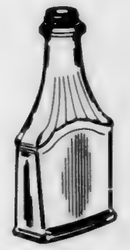
334,711
COMBINED BOTTLE AND CAP
Kenji Ekuan, Tokyo, Japan, assignor to Kikkoman Corporation, Chiba, Japan
Filed Apr. 12, 1991, Ser. No. 684,366
Term of patent 14 years
U.S. Cl. D9—503

334,712
COMBINED CONTAINER AND CAP
Mary B. Turner-Adams, Wheeling, Ill., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 28, 1990, Ser. No. 590,149
Term of patent 14 years
U.S. Cl. D9—526



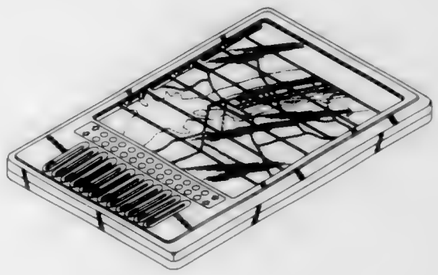
334,713
BOTTLE
Umberto I. D. Segati, Vincennes, France, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Dec. 16, 1991, Ser. No. 807,898
Term of patent 14 years
U.S. Cl. D9—543

334,714
BOTTLE
William S. Magianis, Jr., Fullerton, Calif., assignor to Hunt-Wesson, Inc., Fullerton, Calif.
Filed Apr. 10, 1990, Ser. No. 506,764
The portion of the term of this patent subsequent to Mar. 16, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—569



334,715
WRISTWATCH
Francis P. A. Besson, La Chaux-de-Fonds, Switzerland, assignor to Girard-Perregaux, S.A., La Chaux-de-Fonds, Switzerland
Filed Dec. 7, 1990, Ser. No. 624,050
Claims priority, application World Int. Prop. O., Jun. 8, 1990, DM/016-882
Term of patent 14 years
U.S. Cl. D10—39

334,716
SLIDE MAP
Fukuzo Kusaka, Osaka, Japan, assignor to Shozo Kusaka, Osaka, Japan
Filed Jun. 21, 1990, Ser. No. 541,341
Term of patent 14 years
U.S. Cl. D10—65



334,717

334,719

334,722

334,725

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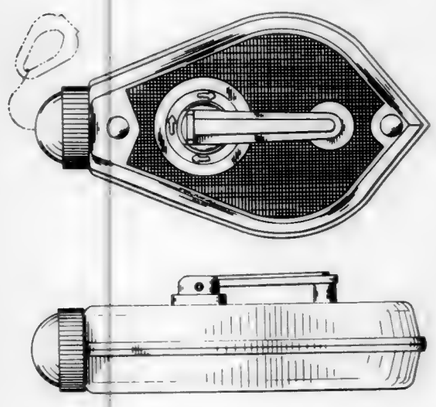
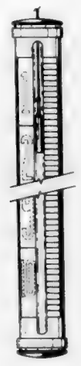
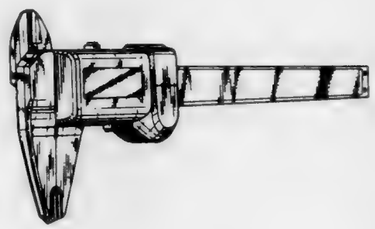
334,717
CHALK LINE MARKER
John J. Evans, Jr., Charleston, and David Morris, North Charleston, both of S.C., assignors to L. S. Starrett Company, Athol, Mass.
Filed Oct. 17, 1990, Ser. No. 599,248
Term of patent 14 years
U.S. Cl. D10—65



334,718
LIQUID STORAGE TANK GAUGE
Wayne Basden, 700 Gregg St.; Mike Skalicky, 2700 Apache, and Donnie Reagan, 4008 Vicky St., all of Big Spring, Tex. 79720
Filed May 31, 1991, Ser. No. 708,629
Term of patent 14 years
U.S. Cl. D10—101

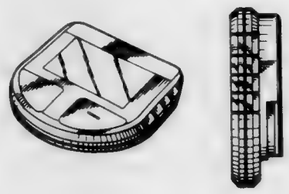


334,719
CALLIPER
Paul Yeo, Kewalram Hillview, Singapore, assignor to Asiasource Technology PTE Ltd., Singapore, Singapore
Filed Nov. 21, 1991, Ser. No. 795,616
Claims priority, application United Kingdom, May 22, 1991, 2014856
Term of patent 14 years
U.S. Cl. D10—73

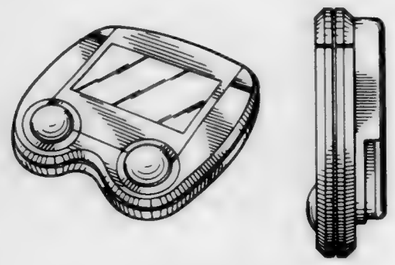


334,720
BICYCLE SPEEDOMETER
Takashi Ueda, Osaka, Japan, assignor to Cat Eye Co., Ltd., Osaka, Japan
Filed Mar. 27, 1990, Ser. No. 500,263
Claims priority, application Japan, Oct. 2, 1989, 1-35952
Term of patent 14 years
U.S. Cl. D10—98

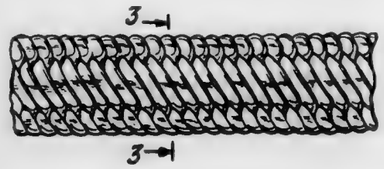
334,721
BICYCLE COMPUTER
Lee A. Katz, Evanston, Ill., assignor to Phoenix International Trading, Inc., Evanston, Ill.
Filed Feb. 5, 1991, Ser. No. 650,660
Term of patent 14 years
U.S. Cl. D10—98



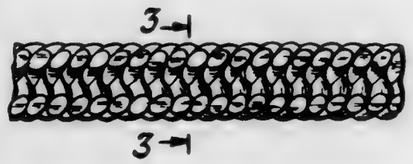
334,722
BICYCLE COMPUTER
Lee A. Katz, Evanston, Ill., assignor to Phoenix International Trading, Inc., Evanston, Ill.
Filed Feb. 5, 1991, Ser. No. 650,664
Term of patent 14 years
U.S. Cl. D10—98



334,723
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A., Italy
Filed Jun. 13, 1990, Ser. No. 537,526
Claims priority, application Italy, Dec. 19, 1989, 11776 B/89
Term of patent 14 years
U.S. Cl. D11—13

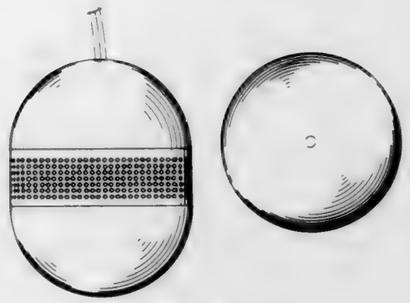


334,724
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A, Italy
Filed Jun. 13, 1990, Ser. No. 537,528
Claims priority, application Italy, Dec. 19, 1989, 11776 B/89
Term of patent 14 years
U.S. Cl. D11—13



334,725
CROSS
Lindsey White, 32 Shetland La., Willingboro, N.J. 08046
Filed Feb. 11, 1991, Ser. No. 653,117
Term of patent 14 years
U.S. Cl. D11—96

334,726
COMBINED HANGING ORNAMENT AND SIGN
Thomas R. Homsher, Glendale, Calif., assignor to Practical Devices, Inc., Glendale, Calif.
Filed Oct. 26, 1990, Ser. No. 604,595
Term of patent 14 years
U.S. Cl. D11—121



334,727
TABLETOP GOLF BALL NOVELTY
J. Thomas Goserud, 13818 Sutters Mill Rd., Midlothian, Va. 23112
Filed Apr. 24, 1991, Ser. No. 694,264
Term of patent 14 years
U.S. Cl. D11—131

334,733

334,736

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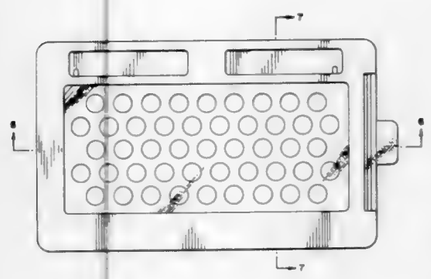
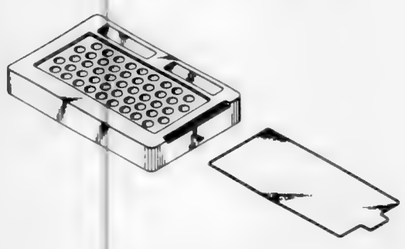
334,728
PORTABLE PLANTER FOR GROWING SMALL PLANTS
Shozo Ishiyama; Takeshi Kubodera, and Takako Inose, all of Tokyo, Japan, assignors to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan
Filed Jun. 14, 1990, Ser. No. 539,962
Claims priority, application Japan, Mar. 23, 1990, 2-9762
Term of patent 14 years
U.S. Cl. D11—155



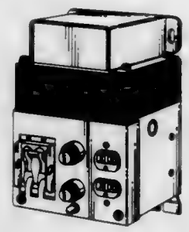


334,729
VEHICLE WINDOW UNIT EXTERIOR SURFACE
Patrick P. Treadway, Ontario, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.
Filed Feb. 5, 1991, Ser. No. 650,659
Term of patent 14 years
U.S. Cl. D12—183

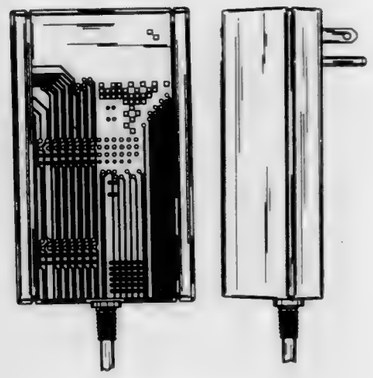
334,730
VEHICLE WHEEL FRONT FACE
Suny Chung, Anaheim, Calif., assignor to American Racing Equipment, Inc., Rancho Dominguez, Calif.
Filed Oct. 8, 1991, Ser. No. 773,083
Term of patent 14 years
U.S. Cl. D12—209

334,731
BOAT BOARDING LADDER
Robert T. McCarty, 4916 Lakeshore, Port Huron, Mich. 48060
Filed May 18, 1990, Ser. No. 525,741
Term of patent 14 years
U.S. Cl. D12—317

334,732
TRANSFORMER ASSEMBLY FOR POWER SUPPLY
Peter H. Burgher, Captiva, Fla.; Richard L. Holmes, Lansing, and John Boomer, Howell, both of Mich., assignors to Marelco Power Systems, Inc., Howell, Mich.
Filed May 18, 1989, Ser. No. 353,917
The portion of the term of this patent subsequent to Feb. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—110

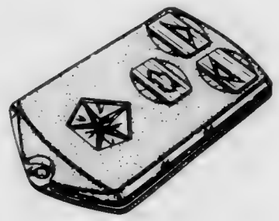


334,733
WALL MOUNTED POWER SUPPLY MODULE
Stuart K. Morgan, Westford, and Margaret L. Hetfield, Arlington, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 8, 1991, Ser. No. 683,370
Term of patent 14 years
U.S. Cl. D13—110

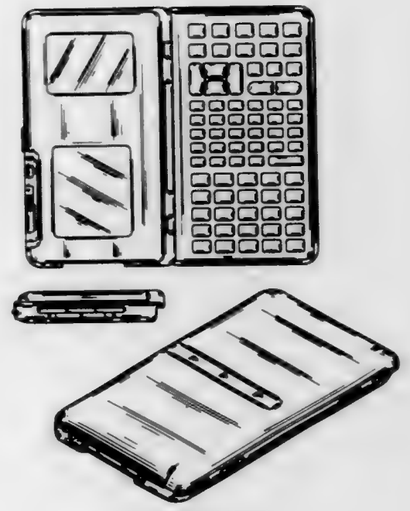


334,734
OPTICAL FIBER SPLICER
Robert Esert, Glen Ellyn, and Peter Ori, Chicago, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.
Filed Sep. 6, 1990, Ser. No. 579,446
Term of patent 14 years
U.S. Cl. D13—154

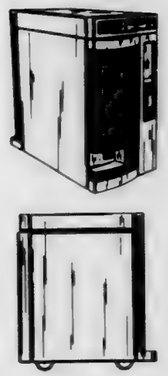
334,735
VEHICLE REMOTE KEYLESS ENTRY TRANSMITTER
Carl A. Cameron, 19320 Afton, Detroit, Mich. 48203; Edward D. Pinardi, 19370 Norwich, Livonia, Mich. 48152; Richard Megregian, 25019 Arden Park Dr., Farmington Hills, Mich. 48018, and Gary F. Kajdasz, 18361 W. 13 Mile Rd., #31, Southfield, Mich. 48076
Filed Feb. 11, 1991, Ser. No. 653,458
Term of patent 14 years
U.S. Cl. D13—168



334,736
DATA INPUT AND OUTPUT TERMINAL
Masaji Sawada, and Koji Nishida, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 15, 1990, Ser. No. 524,177
Claims priority, application Japan, Nov. 15, 1989, 1-41528
The portion of the term of this patent subsequent to Jun. 11, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100



334,737
COMPUTER ENCLOSURE
Christian C. Landry, Harvard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 18, 1991, Ser. No. 670,797
Term of patent 14 years
U.S. Cl. D14—102



334,738

334,740

334,742

334,745

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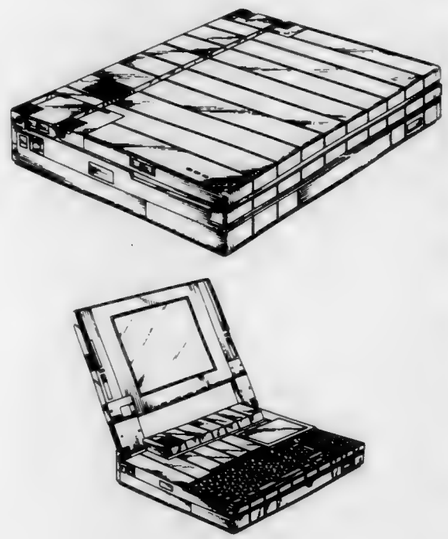
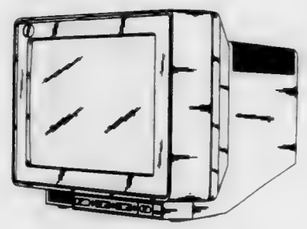
334,738
LAP TOP COMPUTER
Gyu C. Kim, Yongin-gun, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea
Filed Jul. 19, 1990, Ser. No. 554,847
Claims priority, application Rep. of Korea, Apr. 25, 1990, 90-5623
Term of patent 14 years
U.S. Cl. D14—106

334,739
NOTEBOOK COMPUTER
Chang-Ting Tsai, Nantou Hsien, Taiwan, assignor to Universal Scientific Industrial Co., Ltd., Taiwan
Filed Feb. 22, 1991, Ser. No. 659,139
Term of patent 14 years
U.S. Cl. D14—106

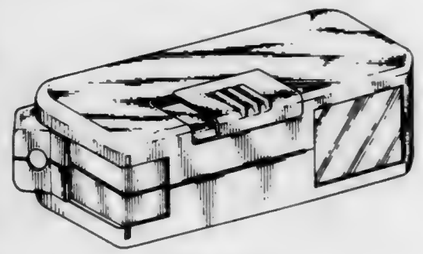
334,740
PERSONAL LAPTOP COMPUTER
Klaus-Diether Krause, Dietenhofen, and Florian Stolzenberger, Altenthann, both of Fed. Rep. of Germany, assignors to TA Triumph-Adler, Nuremberg, Fed. Rep. of Germany
Filed Apr. 8, 1991, Ser. No. 682,117
Claims priority, application World Int. Prop. O., Oct. 23, 1990, DM/017.910
Term of patent 14 years
U.S. Cl. D14—106



334,741
DISPLAY FOR COMPUTER
Thomas E. Pangburn, Lexington, Ky., and John A. Wiseman, Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 4, 1990, Ser. No. 505,945
Claims priority, application United Kingdom, Oct. 5, 1989, 2001488
Term of patent 14 years
U.S. Cl. D14—113

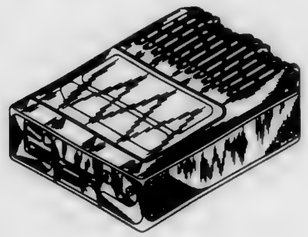


334,742
MINIATURE VIDEO DISPLAY
Gregory H. Hunter, Westwood, Mass.; Greydon A. Rhodes, Chester; Armand H. Plasencia, Hopatoong, both of N.J., and Benjamin A. Wells, Newton, Mass., assignors to Reflection Technology, Inc., Waltham, Mass.
Filed Oct. 3, 1990, Ser. No. 592,194
Term of patent 14 years
U.S. Cl. D14—113

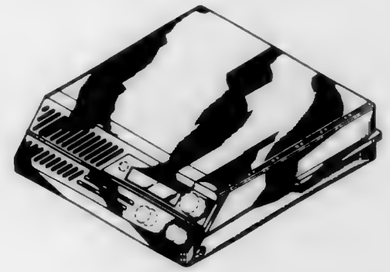


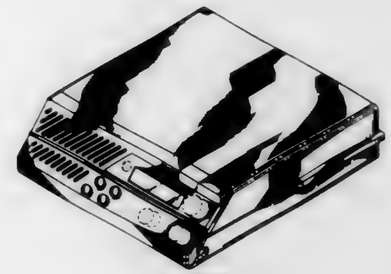
334,743
CLEANING CARTRIDGE FOR A VIDEO GAME
Klaus R. Zorn, 1832 Ross Rd., St. Paul, Minn. 55119
Filed Feb. 15, 1990, Ser. No. 480,504
Term of patent 14 years
U.S. Cl. D14—121

334,744
TWO-WAY RADIO
Masaru Tokiyama, Arlington; Thomas G. Beaumont, Bedford, both of Tex., and William H. Robertson, Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 20, 1990, Ser. No. 586,052
Term of patent 14 years
U.S. Cl. D14—137

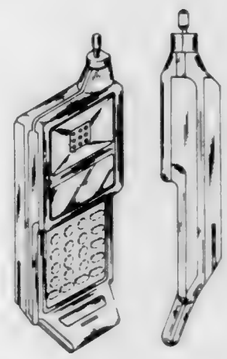


334,745
TWO-WAY MARINE RADIO
Phillip E. Lindeman, Roselle, and Terrance N. Taylor, Cary, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Dec. 14, 1990, Ser. No. 628,868
Term of patent 14 years
U.S. Cl. D14—137





334,746
PORTABLE RADIOTELEPHONE OR SIMILAR ARTICLE
Carl V. Novak, Pell Lake, Wis., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 30, 1991, Ser. No. 768,482
Term of patent 14 years
U.S. Cl. D14—138



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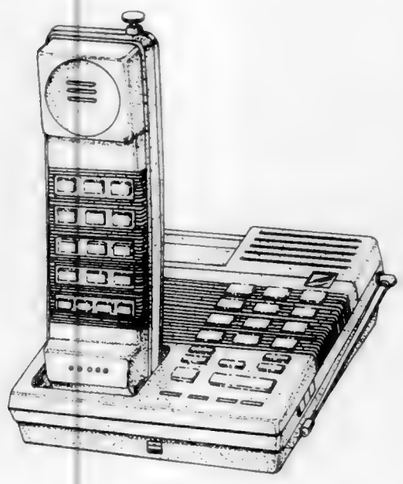
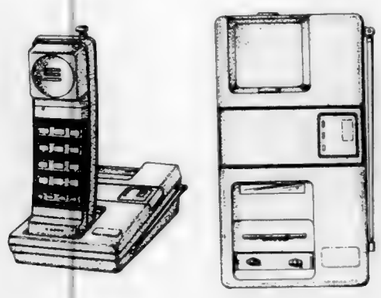
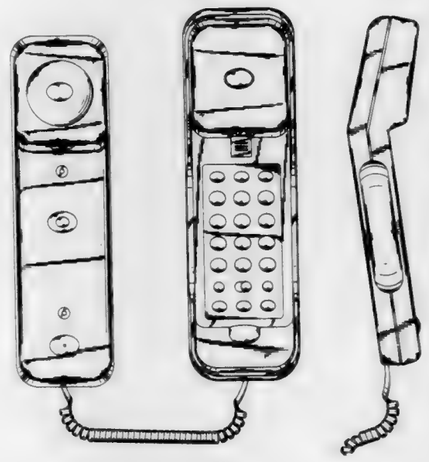
334,747
COMBINATION CORDLESS TELEPHONE HANDSET AND BASE
George P. Roegner, Vero Beach, Fla., assignor to North American Foreign Trading Corporation, New York, N.Y.
Filed Dec. 26, 1991, Ser. No. 813,425
Term of patent 14 years
U.S. Cl. D14—138



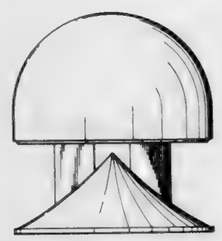
334,748
COMBINATION CORDLESS TELEPHONE HANDSET AND BASE
George P. Roegner, Vero Beach, Fla., assignor to North American Foreign Trading Corporation, New York, N.Y.
Filed Dec. 30, 1991, Ser. No. 814,683
Term of patent 14 years
U.S. Cl. D14—138



334,749
TELEPHONE SET
Him-Chi Yu, Hong Kong, Hong Kong, assignor to Picotronics Industries Limited, Kowloon, Hong Kong
Filed Jun. 5, 1991, Ser. No. 710,922
Claims priority, application United Kingdom, Dec. 7, 1990, 2011590
Term of patent 14 years
U.S. Cl. D14—151

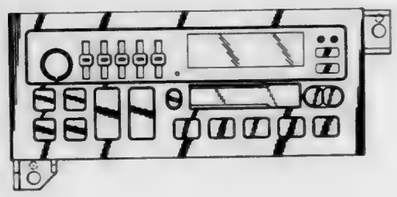


334,750
LOUDSPEAKER
Hirokazu Negishi, Guildford, England, and Allen Boothroyd, Little Shelford, United Kingdom, assignors to Canon Research Centre Europe Limited, Surrey, England
Filed Feb. 1, 1991, Ser. No. 649,826
Claims priority, application United Kingdom, Aug. 3, 1990, 2008719
Term of patent 14 years
U.S. Cl. D14—213

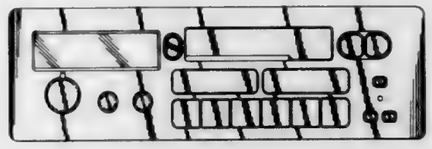


334,751
BASE TELEPHONE CASING
John Westwood, Victoria, Australia, assignor to Telecom Technologies Pty. Ltd., Victoria, Australia
Filed Jan. 11, 1991, Ser. No. 641,016
Claims priority, application Australia, Jul. 12, 1990, 2222/90; Jul. 12, 1990, 2223/90; Jul. 12, 1990, 2224/90; Jul. 12, 1990, 2225/90; Jul. 12, 1990, 2226/90
Term of patent 14 years
U.S. Cl. D14—241

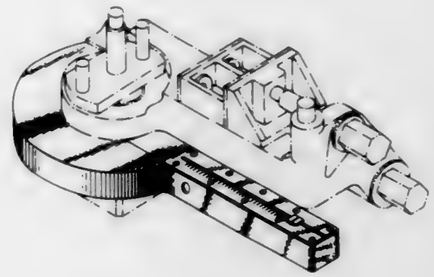
334,752
CONTROL PANEL FOR A COMBINED VEHICULAR RADIO RECEIVER, CASSETTE PLAYER, DIGITAL CLOCK AND GRAPHIC EQUALIZER
Lee M. Dziekan, 20826 Redmond, East Detroit, Mich. 48021; James P. Muccioli, 29222 Valley Bend Ct., Farmington Hills, Mich. 48331, and Gilbert L. McCauley, 21700 Stratford Cir., Oak Park, Mich. 48237
Filed Sep. 24, 1990, Ser. No. 587,377
Term of patent 14 years
U.S. Cl. D14—258



334,753
CONTROL PANEL FOR A COMBINED VEHICULAR RADIO RECEIVER, CASSETTE PLAYER AND DIGITAL CLOCK
Lee M. Dziekan, 20826 Redmond, East Detroit, Mich. 48021; James P. Muccioli, 29222 Valley Bend Ct., Farmington Hills, Mich. 48331, and Gilbert L. McCauley, 21700 Stratford Cir., Oak Park, Mich. 48237
Filed Sep. 24, 1990, Ser. No. 587,378
Term of patent 14 years
U.S. Cl. D14—258



334,754
TUBE BENDER READOUT INSTRUMENT
Richard A. Pearson, Ellicottville, N.Y., and Richard E. Potesta, Chesterland, Ohio, assignors to Stride Tool, Inc., Ellicottville, N.Y.
Filed Oct. 1, 1991, Ser. No. 773,398
Term of patent 14 years
U.S. Cl. D15—123



334,755
LOG SPLITTER
Mark E. Malanke, Arthur, and Kenneth I. Harriman, Ida Grove, both of Iowa, assignors to Marken Enterprises, Inc., Ida Grove, Iowa
Filed Dec. 5, 1991, Ser. No. 802,455
Term of patent 14 years
U.S. Cl. D15—127

334,756

334,759

334,761

334,764

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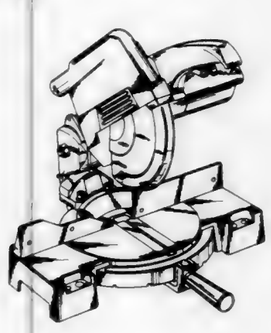
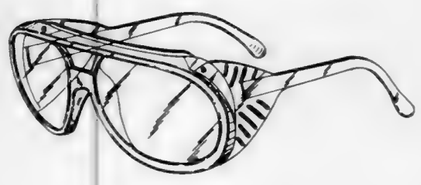
334,756
COMPOUND MITER SAW
Masakazu Sakamoto, and Toshiaki Saito, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 27, 1991, Ser. No. 798,798
Term of patent 14 years
U.S. Cl. D15—133



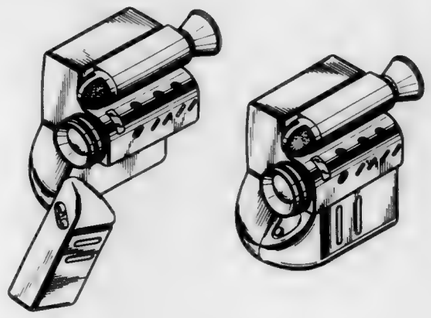
334,757
HIGH POWER SPECTACLE LENS
Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.
Filed Jun. 24, 1991, Ser. No. 719,609
Term of patent 14 years
U.S. Cl. D16—101

334,758
SAFETY GLASSES
Bernard Reymondet, Saint Claude, and Guy Magdeleine, Vaux-les-Saint-Claude, both of France, assignors to Christian Dalloz SA, Saint Claude, France
Filed Jul. 30, 1991, Ser. No. 738,737
Term of patent 14 years
U.S. Cl. D16—102

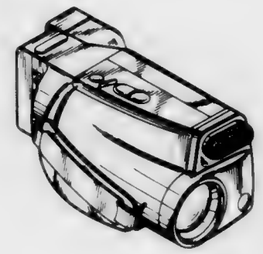


334,759
ILLUMINATED MAGNIFIER HEAD
Carl X. Meyer, Grantwood Village; Louis O. Vitt, St. Louis; David P. Burchell, Valley Park, and James A. Schmid, St. Louis, all of Mo., assignors to Dazor Manufacturing Corp., St. Louis, Mo.
Filed Oct. 12, 1990, Ser. No. 596,827
Term of patent 14 years
U.S. Cl. D16—135

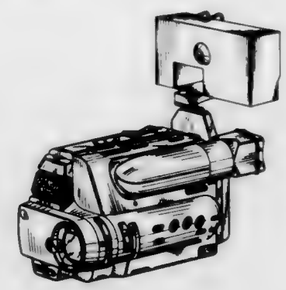
334,760
COMBINED VIDEO CAMERA AND TAPE RECORDER
Takao Ina; Hiroshi Fukuda, both of Kanagawa, and Hideo Miura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 28, 1991, Ser. No. 646,377
Claims priority, application Japan, Jul. 30, 1990, 2-25824
Term of patent 14 years
U.S. Cl. D16—202



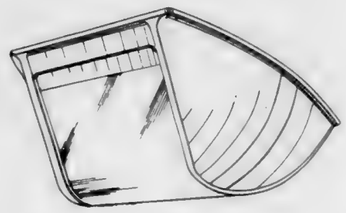
334,761
COMBINED VIDEO CAMERA AND TAPE RECORDER
Takao Ina, and Hiroshi Fukuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 28, 1991, Ser. No. 646,378
Claims priority, application Japan, Aug. 13, 1990, 02-27558
Term of patent 14 years
U.S. Cl. D16—202



334,762
COMBINED VIDEO CAMERA AND TAPE RECORDER
Takao Ina, and Hidemi Sasaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 26, 1991, Ser. No. 661,086
Claims priority, application Japan, Oct. 11, 1990, 2-34039
Term of patent 14 years
U.S. Cl. D16—202

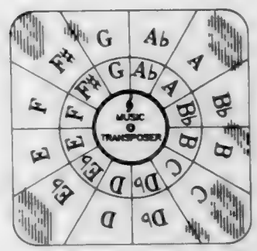


334,763
HOUSING FOR A TELEVISION MONITOR
Marty Sedighzadeh, Littleton, and Robert Bromley, Boulder, both of Colo., assignors to Marty Sedighzadeh, Littleton, Colo.
Division of Ser. No. 161,833, Feb. 29, 1988, Pat. No. Des. 320,028. This application Jun. 26, 1991, Ser. No. 723,511
Term of patent 14 years
U.S. Cl. D16—203



334,764
ELECTRIC GUITAR
Charles H. Fisher, IV, 410 Main St., P.O. Box 402, Coalport, Pa. 16627
Filed Oct. 17, 1990, Ser. No. 599,234
The portion of the term of this patent subsequent to Apr. 3, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D17—14

334,765
MUSIC TRANSPOSER
James M. Dunn, Jr., 1061 Boy Scout Rd., Hixson, Tenn. 37343, and Richard N. May, 1805 Sundancer La., Goose Creek, S.C. 29445
Filed May 4, 1990, Ser. No. 518,874
Term of patent 14 years
U.S. Cl. D17—99



334,766
CALCULATOR
Richard F. M. Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International, B.V., Roelofarendsveen, Netherlands
Filed Jan. 23, 1991, Ser. No. 644,378
Term of patent 14 years
U.S. Cl. D18—7

334,773

334,775

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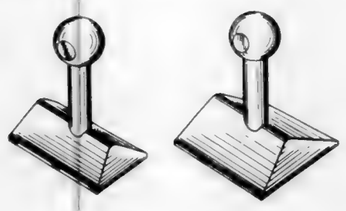
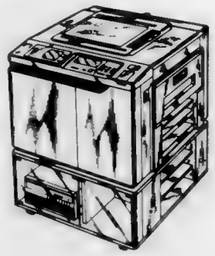
334,767
HAND STAMP
Werner Scholpp, Vaihingen, Fed. Rep. of Germany, assignor to Stempel-Schilder-Druck Maurer, Stuttgart, Fed. Rep. of Germany
Filed Aug. 31, 1990, Ser. No. 575,887
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, M9001663.7
Term of patent 14 years
U.S. Cl. D18—15



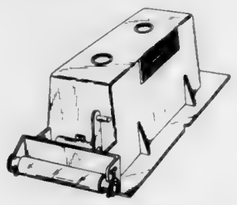
334,768
COPYING MACHINE
Yoshie Katada; Ryoichi Takahashi, both of Yokohama, and Mitsuru Sakurai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,120
Claims priority, application Japan, Apr. 4, 1991, 3-9682
Term of patent 14 years
U.S. Cl. D18—36

334,769
COPYING MACHINE
Ei Yamamoto, and Mitsuru Sakurai, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1991, Ser. No. 770,960
Claims priority, application Japan, Apr. 19, 1991, 3-11505
Term of patent 14 years
U.S. Cl. D18—36

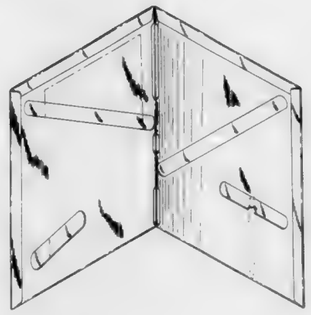
334,770
COPYING MACHINE
Masataka Isomoto, Kawasaki, and Nobuyuki Agata, Soka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1991, Ser. No. 791,637
Claims priority, application Japan, May 31, 1991, 3-15968
Term of patent 14 years
U.S. Cl. D18—39



334,771
TONER CARTRIDGE
Takefumi Adachi, Tokyo; Hiroshi Ishii, Yokohama, and Katsumi Masuda, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 11, 1990, Ser. No. 596,159
Claims priority, application Japan, Apr. 12, 1990, 2-012580
Term of patent 14 years
U.S. Cl. D18—43

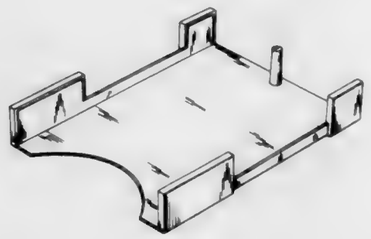


334,772
PORTFOLIO HAVING INTERNAL COMPARTMENTS
John R. Wyant, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 13, 1990, Ser. No. 612,892
Term of patent 14 years
U.S. Cl. D19—26



334,773
MODEL OF THE UNIVERSE WITH PLANETS AND STARS
Albert R. Simpson, 1690 E. 174th St., Apt. 3-G, Bronx, N.Y. 10472
Filed Apr. 11, 1991, Ser. No. 683,678
Term of patent 14 years
U.S. Cl. D19—62

334,774
LETTER TRAY
Kuno Prey, Via P.P. Rainer 5, 39038 S. Candido (Bolzano), Italy
Filed Aug. 8, 1991, Ser. No. 742,891
Claims priority, application Italy, Feb. 15, 1991, M1910000132
Term of patent 14 years
U.S. Cl. D19—92



334,775
COMBINED INFORMATION AND ADVERTISING COLUMN
Norman Foster, London, Great Britain, assignor to Street Equipment, Ltd., London, United Kingdom
Filed Jun. 19, 1991, Ser. No. 717,706
Claims priority, application France, Jan. 11, 1991, 910139
Term of patent 14 years
U.S. Cl. D20—10

334,776
DECAL
Susan C. Hacking, Edina; Janice B. Kiefer, Plymouth, and Cheryl A. Nobens, Fridley, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed May 28, 1991, Ser. No. 705,792
Term of patent 14 years
U.S. Cl. D20—11

334,777

334,783

334,786

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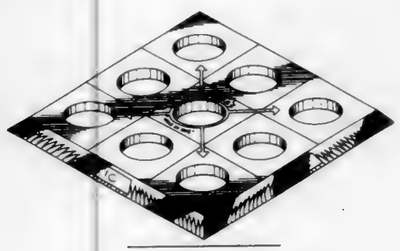
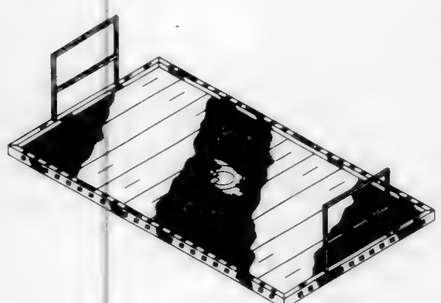
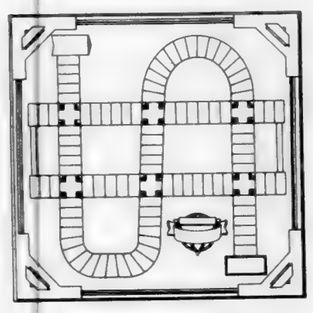
334,777
GOLF GAME
Jon Caravella, P.O. Box 706, Ladylake, Fla. 32159
Filed Oct. 31, 1990, Ser. No. 607,459
Term of patent 14 years
U.S. Cl. D21—5



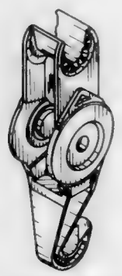
334,778
FOOTBALL GAME BOARD
Jeff Moening, 6853 Highbury Rd., Huber Heights, Ohio 45424
Filed Aug. 22, 1990, Ser. No. 570,683
Term of patent 14 years
U.S. Cl. D21—29



334,779
GAME BOARD
Stephen G. Guerin, Downsview, Canada, assignor to Ideas In Motion, Downsview, Canada
Filed Sep. 14, 1990, Ser. No. 588,951
Term of patent 14 years
U.S. Cl. D21—35

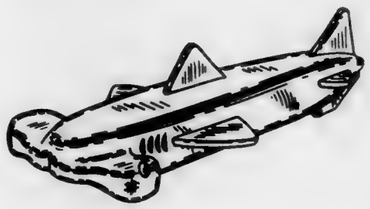


334,780
CRANE HOOK FOR A TOY BUILDING SET
Flemming H. Olsen, Espergæde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,104
Term of patent 14 years
U.S. Cl. D21—108



334,781
TOY ANIMAL FIGURE
Wayne Vetterlein, Eugene, Oreg., assignor to Hanging Out Inc., Seattle, Wash.
Filed Feb. 20, 1990, Ser. No. 482,407
Term of patent 14 years
U.S. Cl. D21—154

334,782
TOY HAMMERHEAD SHARK
Dennis Kupperman, Glenview, Ill., assignor to RB Toy Development Co., Skokie, Ill.
Filed Nov. 26, 1990, Ser. No. 617,852
Term of patent 14 years
U.S. Cl. D21—157

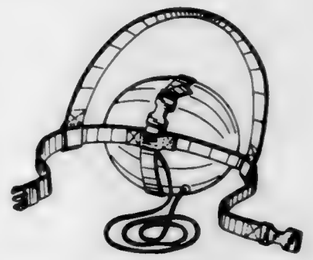


334,783
TOY BEAR
Ruth E. Saunders, 1014 S. Fourth St., De Kalb, Ill. 60115
Filed Nov. 29, 1990, Ser. No. 620,312
Term of patent 14 years
U.S. Cl. D21—159

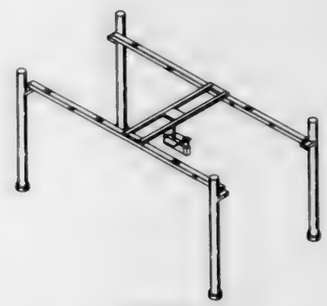
334,784
MARTIAL ARTS KICKING BAG
Julian DeZulueta, 1394 Dunlawton Ave. #407, Port Orange, Fla. 32109
Filed May 4, 1990, Ser. No. 518,854
Term of patent 14 years
U.S. Cl. D21—191

334,785
WATER SKI
James B. Quantrell, 44 Danien St., Glen Waverley, Victoria 3150, Australia
Filed Jul. 17, 1990, Ser. No. 553,273
Claims priority, application Australia, Oct. 10, 1988, 3378/88
Term of patent 14 years
U.S. Cl. D21—229

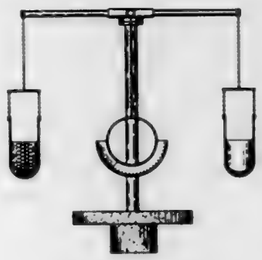
334,786
FLOAT
Mojmir Flisek, Naselje heroja Maroka 15, YU-68290 Sevnica, Yugoslavia
Filed Dec. 4, 1990, Ser. No. 624,275
Claims priority, application Yugoslavia, Jun. 4, 1990, M425/90
Term of patent 14 years
U.S. Cl. D21—237



334,787
GLIDER AMUSEMENT RIDE
Gary L. Bickford, 311 Hunter Blvd., Browns Mills, N.J. 08015
Filed Aug. 3, 1990, Ser. No. 563,962
Term of patent 14 years
U.S. Cl. D21—242



334,788
MERRY-GO-ROUND
Harvey C. Blankenagel, Box 840, Washington, Utah 84780
Continuation-in-part of Ser. No. 436,733, Nov. 15, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 719,588
Term of patent 14 years
U.S. Cl. D21—249



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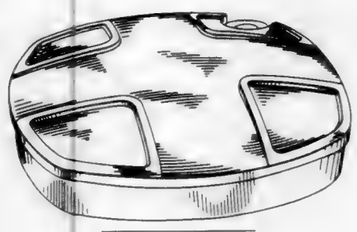
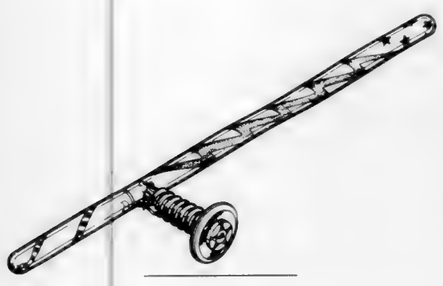
334,789
COVERED SANDBOX
Thomas E. Fish, Jr., Willoughby Hills, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jul. 31, 1990, Ser. No. 560,334
Term of patent 14 years
U.S. Cl. D21—252



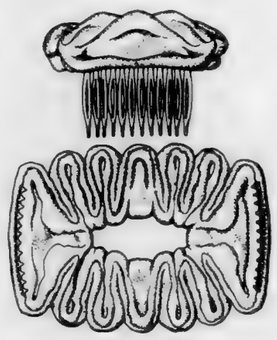
334,790
COMBINATION NIGHT STICK AND MACE DISPENSER
Steve W. Jaramillo, 152 Peyton Rd., Los Lunas, N. Mex. 87031
Filed Aug. 22, 1990, Ser. No. 570,707
Term of patent 14 years
U.S. Cl. D22—117



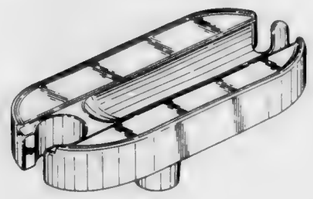
334,791
COMBINED KNIFE AND SHEATH
Walter W. Collins, North, S.C., assignor to Wenoka Sea Style, Div. of Schur, Inc., West Palm Beach, Fla.
Filed Feb. 15, 1991, Ser. No. 657,320
Term of patent 14 years
U.S. Cl. D22—118

334,792
ILLUMINATED FISHING BOBBER
Leonard N. Flemming, 326 Blitch St., Valdosta, Ga. 31601
Filed Jun. 17, 1991, Ser. No. 717,729
Term of patent 14 years
U.S. Cl. D22—146

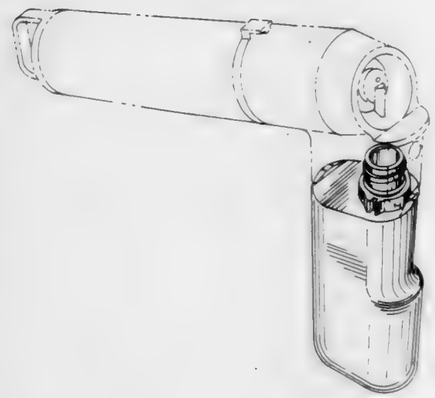
334,793
COMBINED ELASTIC HAIR ORNAMENT AND RETAINING COMBS
Melody L. Richardson, 43269 Newport Dr., Fremont, Calif. 94536
Filed Dec. 3, 1990, Ser. No. 620,917
Term of patent 14 years
U.S. Cl. D28—41



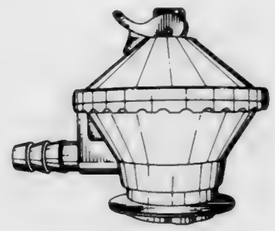
334,794
HOLDER FOR A SHOWER HEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 750,899
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1991, 9101317
Term of patent 14 years
U.S. Cl. D23—213



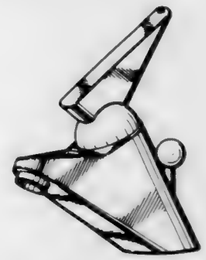
334,795
FLUID RESERVOIR FOR A SPRAY GUN
Scott W. Demarest, Caledonia, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 17, 1990, Ser. No. 600,347
Term of patent 14 years
U.S. Cl. D23—225



334,796
DISCHARGE REGULATOR FOR A LIQUEFIED GAS CONTAINER
Fritz P. U. Hansen, Rungsted Kyst, Denmark, assignor to Kosan Teknova A/S, Niva, Denmark
Filed Jan. 7, 1987, Ser. No. 1,503
Claims priority, application Denmark, Jul. 8, 1986, 675/86
The portion of the term of this patent subsequent to Apr. 13, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—235

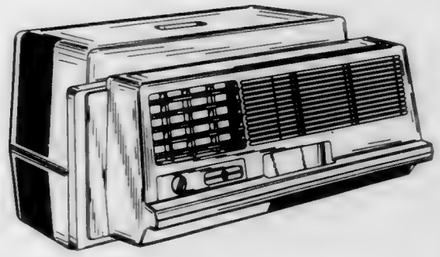


334,797
FAUCET
Philippe Caretien, Dietlikon, Switzerland, assignor to KWC AG, Unterkulm, Switzerland
Filed Oct. 9, 1990, Ser. No. 594,206
Claims priority, application Hague, Apr. 9, 1990, DM/016382
The portion of the term of this patent subsequent to Feb. 16, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—238



334,798
FILLER SPOUT
Robin H. Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Filed Oct. 16, 1990, Ser. No. 598,868
Term of patent 14 years
U.S. Cl. D23—255

334,799
WINDOW-MOUNTED ROOM AIR CONDITIONER
Robert W. Kennedy, Dublin, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed May 6, 1991, Ser. No. 695,758
Term of patent 14 years
U.S. Cl. D23—353



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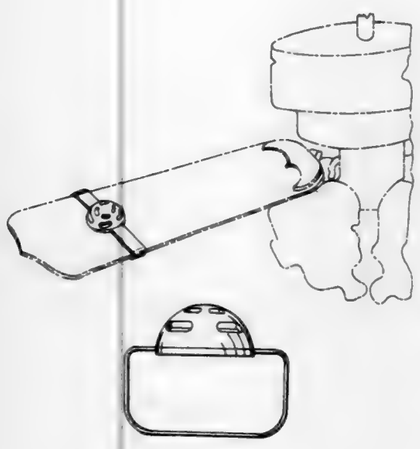
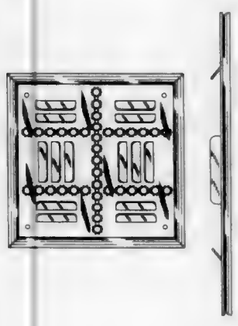
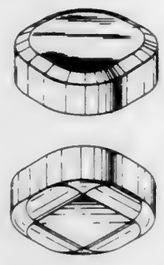
334,800
AIR FRESHENER FOR MOUNTING ON A BLADE OF A CEILING FAN
Leroy V. Portis, 6108 S. Kimbark Ave., Chicago, Ill. 60637
Filed Nov. 4, 1991, Ser. No. 786,953
The portion of the term of this patent subsequent to Mar. 24, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—366



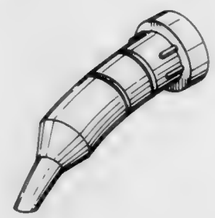
334,801
CEILING CLEAN AIR DEFLECTOR
Patrick McConnell, 609 Sponseller St., Las Vegas, Nev. 89110
Filed Sep. 19, 1990, Ser. No. 586,586
Term of patent 14 years
U.S. Cl. D23—387



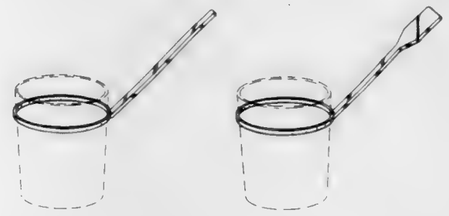
334,802
TABLET
Hugh J. Greer, Dartford, and Robert J. H. Hiscock, Crowborough, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Filed Feb. 19, 1991, Ser. No. 656,548
Claims priority, application United Kingdom, Aug. 20, 1990, 2009109
Term of patent 14 years
U.S. Cl. D24—101



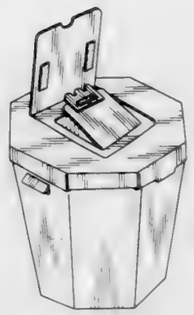
334,803
DENTAL SYRINGE TIP
John Discko, Jr., Hamden, Conn., assignor to Centrix, Inc., Shelton, Conn.
Filed Jul. 1, 1991, Ser. No. 723,539
Term of patent 14 years
U.S. Cl. D24—112



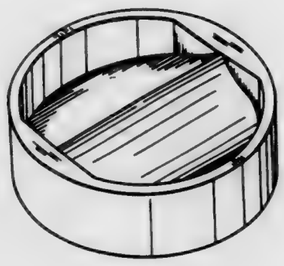
334,804
SPECIMEN CUP HOLDER
Timothy B. Jones, 200 15th St. - No. 134, Edmond, Okla. 73013; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Mar. 28, 1991, Ser. No. 676,725
Term of patent 14 years
U.S. Cl. D24—128



334,805
MEDICAL WASTE CONTAINER
Kenneth R. Ivey, P.O. Box 10577, Palm Desert, Calif. 92255-0577
Filed Feb. 12, 1991, Ser. No. 654,386
Term of patent 14 years
U.S. Cl. D24—131

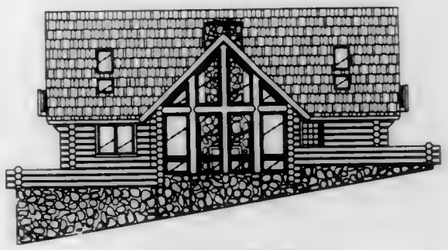


334,806
PROSTHETIC HEART VALVE
Thomas H. Reif, Milton, Fla., assignor to Republic Medical Products Inc., Port St. Lucie, Fla.
Filed Jun. 30, 1989, Ser. No. 375,300
Term of patent 14 years
U.S. Cl. D24—155



334,807
TEETHER
Ralph M. Nowak, Marblehead, Mass., assignor to Kiddie Products, Inc., Avon, Mass.
Filed Sep. 30, 1991, Ser. No. 770,949
Term of patent 14 years
U.S. Cl. D24—195

334,808
LOG HOME
Dana J. McBride, 2624 Leisure Dr., Fort Collins, Colo. 80525; Elizabeth A. Santangelo, and Luke R. Santangelo, both of 3424 McConnell Dr., LaPorte, Colo. 80535
Filed Jan. 24, 1990, Ser. No. 469,258
Term of patent 14 years
U.S. Cl. D25—17



334,809
PET DOOR LOCKING PLATE
George N. Daviantes, 21457 Iglesia Dr., Woodland Hills, Calif. 91364
Filed Feb. 22, 1991, Ser. No. 661,082
Term of patent 14 years
U.S. Cl. D25—48

334,810

334,812

334,815

334,818

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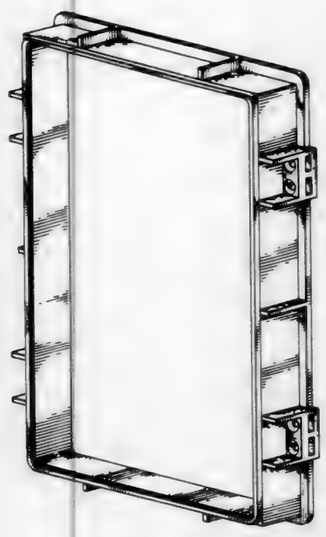
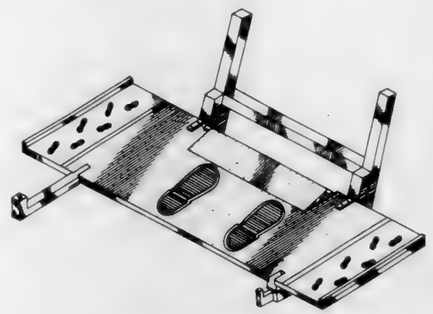
334,810
PET DOOR SPACER
George N. Davlantes, 21457 Iglesia Dr., Woodland Hills, Calif. 91364
Filed Feb. 22, 1991, Ser. No. 661,081
Term of patent 14 years
U.S. Cl. D25—60

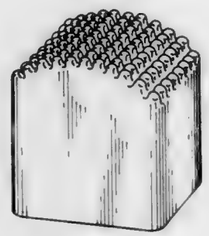


334,811
FOLDABLE SAWHORSE
Roby A. Parks, 2161 Huntleigh Rd., Springfield, Ill. 62714, and W. Allan Shears, 411 S. 3rd St., Divernon, Ill. 62530
Filed May 3, 1990, Ser. No. 518,646
Term of patent 14 years
U.S. Cl. D25—67

334,812
LADDER PLATFORM
Jeffrey L. Hart, and Denise Hart, both of 100-5th Ave., Elysburg, Pa. 17824
Filed Apr. 4, 1990, Ser. No. 504,991
Term of patent 14 years
U.S. Cl. D25—68

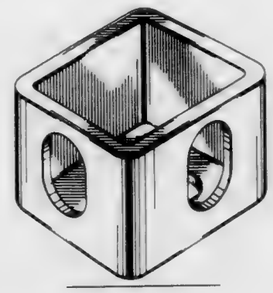


334,813
LADDER BUMPER
Steven J. Sheftel, Hingham, Mass., assignor to Crawford Products, Inc., West Hanover, Mass.
Filed Feb. 7, 1991, Ser. No. 652,266
Term of patent 14 years
U.S. Cl. D25—68

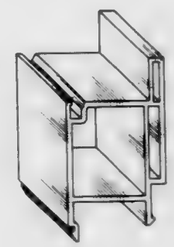


334,814
LADDER BUMPER
Steven J. Sheftel, Hingham, Mass., assignor to Crawford Products, Inc., West Hanover, Mass.
Filed Feb. 15, 1991, Ser. No. 661,446
Term of patent 14 years
U.S. Cl. D25—68

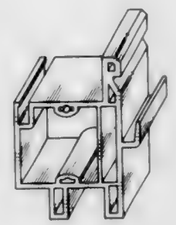
334,815
CORNER CONNECTOR FOR A MODULAR STORAGE CONTAINER
Ricahrd E. Bunger, 1834 W. 3rd St., Tempe, Ariz. 85281
Filed Sep. 24, 1990, Ser. No. 588,107
Term of patent 14 years
U.S. Cl. D25—113



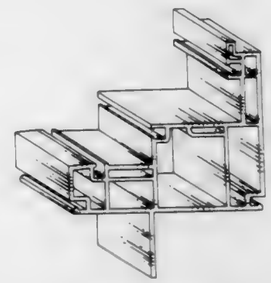
334,816
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 22, 1991, Ser. No. 674,021
Term of patent 14 years
U.S. Cl. D25—124



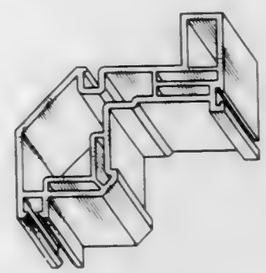
334,817
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,215
Term of patent 14 years
U.S. Cl. D25—124



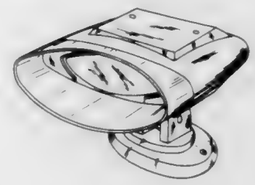
334,818
CASEMENT WINDOW FRAME BAR EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Apr. 18, 1991, Ser. No. 687,429
Term of patent 14 years
U.S. Cl. D25—124



334,819
CASEMENT WINDOW VENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed May 30, 1991, Ser. No. 707,401
Term of patent 14 years
U.S. Cl. D25—124



334,820
AUXILARY VEHICLE EMERGENCY LIGHT
Kyung C. Lee, 256-7, Seongsan-Dong, Mapo-Ku Seoul, Rep. of Korea
Filed Oct. 16, 1989, Ser. No. 421,732
Claims priority, application Rep. of Korea, Apr. 15, 1988, 4855
Term of patent 14 years
U.S. Cl. D26—28



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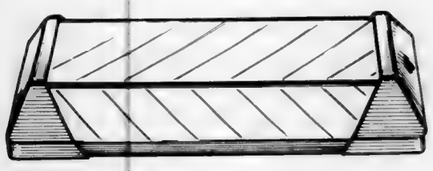
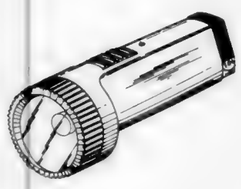
334,821
INTERIOR LAMP FOR A VEHICLE
David Morgan, London, England, assignor to Alexander Engineering Company, Ltd., Bucks, Great Britain
Filed Oct. 3, 1990, Ser. No. 592,496
Term of patent 14 years
U.S. Cl. D26—28

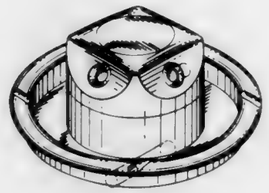


334,822
FLASHLIGHT
Luciano Antognazza, Venegono Superiore, Italy, assignor to VELAMP S.p.A., Venegono, Italy
Filed May 29, 1991, Ser. No. 707,006
Claims priority, application Int'l Pat. Institute, Jan. 3, 1991, DM/018492
Term of patent 14 years
U.S. Cl. D26—46



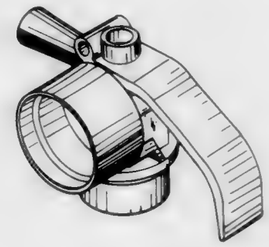
334,823
FLOOR LAMP
Leslie A. Meck, Blandon; N. Peter Pettersson, Bernville; John Lehn, Reading, and Michael J. Becker, Lansdale, all of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Jun. 4, 1991, Ser. No. 710,292
Term of patent 14 years
U.S. Cl. D26—110

334,824
ASHTRAY
Reginald W. Newsome, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 17, 1990, Ser. No. 627,966
Term of patent 14 years
U.S. Cl. D27—135

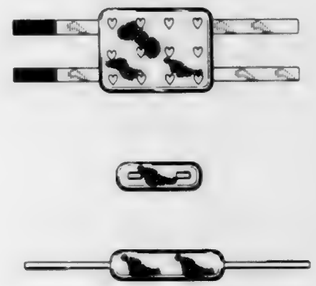


334,825
HAIR PIN
Young-soo Park, Tokyo, Japan, assignor to Goriki Kogyo Company Ltd., Higashi-Osakashi and K.K. Y.S. Park New York, Tokyo, both of Japan
Filed Jul. 20, 1990, Ser. No. 555,549
Term of patent 14 years
U.S. Cl. D28—39

334,826
INTEGRAL GAUGE AND FIRE EXTINGUISHER VALVE HOUSING
John J. McSheffrey, Hingham, and James M. Koloski, East Sandwich, both of Mass., assignors to Mija Industries, Inc., Plymouth, Mass.
Filed Jul. 18, 1991, Ser. No. 732,315
Term of patent 14 years
U.S. Cl. D29—5



334,827
KNEE PAD FOR BABY OR TODDLER
Melissa K. Brown, 1117 NW. 199th St., Edmond, Okla. 73034
Filed Mar. 29, 1990, Ser. No. 501,192
Term of patent 14 years
U.S. Cl. D29—10



LIST OF PATENTEES

TO WHOM

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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF APRIL, 1993

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A. Ahlstrom Corporation: *See*—
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A-DEC, Inc.: *See*—
Austin, George K., Jr.; Sturges, Paul D.; and Johannes, Sandor, 5,201,899, Cl. 433-98.000.

A.S. Incorporated: *See*—
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Abarca, John R.: *See*—
Berzin, Vel; and Abarca, John R., 5,201,369, Cl. 166-187.000.

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Abbott Laboratories: *See*—
Bryant, Peter L., 5,201,712, Cl. 604-164.000.
Ungemach, Frank S.; Nam, Daniel S.; and Meek, Oliver H., 5,202,270, Cl. 436-537.000.

Abe, Etsurou, to Isowa Industry Co., Ltd. Apparatus for conveying roll-shaped article. 5,201,400, Cl. 198-463.300.

Abe, Fumio; Mizuno, Hiroshige; Harada, Takashi; and Kondo, Tomoharu, to NGK Insulators, Ltd. Resistance adjusting type heater. 5,202,547, Cl. 219-552.000.

Abe, Fumio: *See*—
Kondo, Tomoharu; and Abe, Fumio, 5,202,548, Cl. 219-552.000.

Abe, Hiroyuki: *See*—
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Abe, Kimihiro: *See*—
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Abe, Masakazu: *See*—
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Abe, Masaki; Shiohara, Yukimitsu; and Sagiyama, Masaru, to NKK Corporation. Method for manufacturing zinciferous electroplated steel sheet excellent in press-formability. 5,202,012, Cl. 205-109.000.

Abe, Masao: *See*—
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Abe, Ryutaro; Takeuchi, Yoshiyuki; and Kitamura, Michihiro, to Toyoda Koki Kabushiki Kaisha. Vane pump with pressure chambers at the outlet to reduce noise. 5,201,878, Cl. 418-133.000.

Abe, Seizaburo: *See*—
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Abe, Yoshiyuki: *See*—
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Abel, Karl-Josef: *See*—
Grundmann, Ulrich; Abel, Karl-Josef; and Amann, Egon, 5,202,419, Cl. 530-350.000.

Abramowski, Zyta A.: *See*—
Towers, G. H. Neil; Bruening, Reimer C.; Balza, Felipe; Abramowski, Zyta A.; and Lopez-Bazzochi, Isabel, 5,202,348, Cl. 514-436.000.

Abrams, Suzanne R.; and Gusta, Lawrence V., to Canada, Her Majesty the Queen in right of Canada, as represented by the National Research Council of. Abscisic acid-related plant growth regulators - germination promoters. 5,201,931, Cl. 504-291.000.

Acutus Mold, Inc.: *See*—
Grove, John W.; and Kowalczyk, Frank J., 5,201,361, Cl. 164-459.000.

Adachi, Nobuyuki: *See*—
Banno, Makoto; Adachi, Nobuyuki; Miyamae, Hiroshi; and Ueda, Kiichirou, 5,202,992, Cl. 359-676.000.

Adinolfi, Raphael; and Larriuz-Moe, Axa. Nail saver extension keys. 5,201,594, Cl. 400-490.000.

Adschiri, Tadafumi: *See*—
Sakagami, Seigou; Kawase, Makoto; Wakamatsu, Satoshi; Iwata, Kouichi; and Adschiri, Tadafumi, 5,202,158, Cl. 427-185.000.

Advanced-Connectek Inc.: *See*—
Lin, Chao-Tsung, 5,201,669, Cl. 439-357.000.

Advent Medico, Inc.: *See*—
Artzer, Craig S., 5,201,430, Cl. 211-70.600.

Aetrium, Inc.: *See*—
Tessier, Robert R.; Jensen, Dennis H.; and Hertz, Jeffrey J., 5,201,875, Cl. 294-64.100.

Afshar, Mohammad R., to Hydrotech Chemical Corp. Insulated firebox for swimming pool or spa heaters for reduction of smoke or odor. 5,201,307, Cl. 126-344.000.

Agency of Industrial Science and Technology: *See*—
Tomita, Fumiaki; Sugimoto, Kazuhide; and Takahashi, Hironobu, 5,202,928, Cl. 382-1.000.

Agopian, Robert P.; and Tanaka, Shoji, to Agopian, Robert P. Train apparatus for removing blisters from a fiber conduit. 5,201,622, Cl. 409-299.000.

Aharon, Aharon; Bar-David, Ayal; Gewirtzman, Raanan; Gofman, Emanuel; Leibowitz, Moshe; and Shwartzburd, Victor, to International Business Machines Corporation. Dynamic process for the generation of biased pseudo-random test patterns for the functional verification of hardware designs. 5,202,889, Cl. 371-27.000.

Ahl, David K.; Swanson, Roger M.; Struczewski, Timothy G.; Fox, James C.; Lee, Roy; Terietzki, Michael; Skillman, Gary R.; and Schroll, Ross E., to Xerox Corporation. Electrical connector for an electrophotographic printing machine. 5,201,854, Cl. 439-247.000.

Ahm, Poul H., to Bentle Products AG. Method of hydroponical growing of plants and an apparatus and a system for use by the method. 5,201,141, Cl. 47-67.000.

Ahn, Claude; Chikli-Pariente, Robert; and Marbot, Rolland, to Bull, S.A. Electronic system with a plurality of removable units. 5,202,965, Cl. 395-325.000.

Ahn, Tae K., to Goldstar Electron Co., Ltd. Heat block of wire bonding machine. 5,201,450, Cl. 228-4.500.

AIL Corporation: *See*—
Kimberley, John A.; and Cavanaugh, John B., 5,201,295, Cl. 123-467.000.

Ail Systems, Inc.: *See*—
Brady, Matthew E., 5,202,644, Cl. 329-313.000.
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Air Products and Chemicals, Inc.: *See*—
Nicholas, David M.; Bushinsky, Joseph P.; Kumar, Ravi; and Kratz, Wilbur C., 5,202,057, Cl. 252-376.000.
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Aisan Kogyo Kabushiki Kaisha: *See*—
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Aishita, Hideki: *See*—
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Aisin AW Co., Ltd.: *See*—
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Aisin Keikinzoku Kabushiki Kaisha: *See*—
Terada, Haruhiko; Haneda, Shinichi; Ohashi, Masataka; Gyobu, Kiyohito; and Azuchi, Kazunari, 5,201,912, Cl. 293-120.000.

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Akins, Edward A. Flexible fencing system. 5,201,498, Cl. 256-26.000.

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Albrecht, Melvin J., to Babcock & Wilcox Company, The. Upflow/-downflow heated tube circulating system. 5,201,282, Cl. 122-406.100.

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Allen, Charles W. Back pressure flapper valve. 5,201,371, Cl. 166-325.000.

Allen, Eric E.; and Olson, Richard E., to Merck & Co., Inc.; and Du Pont de Nemours, E. I., and Company. Quinazolinone and pyridopyrimidine a-II antagonists. 5,202,322, Cl. 514-228.200.

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Allmon, Barry L.; and Tongeman, Kevin B., to General Electric Company. Low pressure drop radial inflow air-oil separating arrangement and separator employed therein. 5,201,845, Cl. 415-169.100.

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Study, Alan L., to Ford Motor Company. Accumulator for vehicle air conditioning system. 5,201,792, Cl. 62-503.000.

Stummer, Friedrich; Schwab, Wilfried; Schneider, Wolfgang; and Baldering, Heike, to Maschinenfabrik Muller-Weingarten AG; and Vereinigte Aluminium-Werke AG Berlin-Bonn. Die-casting machine. 5,201,358, Cl. 164-312.000.

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Stuth, William L. Secondary sewage treatment system. 5,202,027, Cl. 210-615.000.

Stypula, Richard J., to International Flavors & Fragrances Inc. Stable pizza food article, process for preparing same and coating composition used in same. 5,202,138, Cl. 426-94.000.

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Suemitsu, Yuji: *See*—
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Sugano, Mami; Furuya, Akira; Tanahashi, Toshiyuki; Kondo, Makoto; and Anayama, Chikashi, to Fujitsu Limited. Semiconductor laser having double heterostructure and method of producing same. 5,202,285, Cl. 437-129.000.

Sugawara, Hideto: *See*—
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Sugawara, Hiroyuki; Shirakura, Toshiharu; Yamamura, Takeshi; and Yamai, Hideki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Laser oscillator, laser resonator, and apparatus for manufacturing of semiconductor. 5,202,898, Cl. 372-92.000.

Sugawara, Shigeru; and Koshigoe, Shinpei, to Kabushiki Kaisha Toshiba. In-line electron gun for a colored cathode ray. 5,202,603, Cl. 313-414.000.

Sugayama, Sakae, to Sanyo Electric Co., Ltd. AM radio receiver with improved tracking. 5,203,031, Cl. 455-182.100.

Sugimoto, Kazuhide: *See*—
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Sugino, Kazuhiro; Tsuchiya, Noboru; Kamikubo, Tadamasa; and Onari, Hisashi, to Hitachi, Ltd. Software structuring system and method by data table translation, 5,202,996, Cl. 395-700.000.

Sugita, Ryuji: *See*—
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Sugiyama, Nobuo: *See*—
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Sugiyama, Yoshiaki: *See*—
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Suhadolnik, Joseph; Ravichandran, Ramanathan; Borzatta, Valerio; and Vignali, Graziano, to Ciba-Geigy Corporation. Polymer stabilizers containing both hindered amine and hydroxylamine moieties. 5,202,441, Cl. 546-223.000.

Suhara, Hajime; and Tanioka, Akira, to Kabushiki Kaisha Toshiba. Traveling-wave type light amplifier. 5,202,948, Cl. 385-131.000.

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Sulzer Brothers Limited: *See*—
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Zimmer, Oswald; Vollenberg, Werner; Seipp, Ulrich; Englberger, Werner; Haurand, Michael; Bosman, Brigitte J.; and Schneider, Johannes, to Gruenenthal GmbH. Substituted phenylacetylenes, pharmaceutical compositions containing these compounds and processes for the preparation of these compounds and compositions. 5,202,349, Cl. 514-438.000.

Zimmerman, Patrick G.; Babu, Gaddam N.; Nguyen, Lang N.; Blair, Ingrid E.; and Vesley, George F., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive. 5,202,361, Cl. 522-120.000.

Zimmermann, Clifton; Holl, Norbert; Lewin, Helmut; and Wippel, Juergen, to BASF Aktiengesellschaft. Arrangement for the dynamic compensation of eccentricities of solids of rotation. 5,201,586, Cl. 384-247.000.

Zimmermann, Dayton E. Apparatus for securing articles in an automatic dishwasher. 5,201,826, Cl. 211-41.000.

Zimmermann, Otto; and von Steht, Gunter, to Ingenieurburo H. Luthin AG; and Techno-Chemie Kessler & Co. GmbH. Extensible house for reducing pressure pulses. 5,201,343, Cl. 138-26.000.

Zmick, Paul G.: *See*—
Knox, Benjamin H.; Malone, Francis J., Jr.; Mikusovich, Gary D.; Overton, Frank H.; Steele, Ronald E.; and Zmick, Paul G., 5,202,182, Cl. 428-364.000.

Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., to Chevron Research and Technology Company. Zeolite SSZ-25. 5,202,014, Cl. 208-46.000.

Zucker, Friedhelm; and Buchler, Christian, to Deutsche Thomson-Brandt GmbH. Circuit arrangement for identifying the type of an optical record carrier. 5,202,874, Cl. 369-54.000.

Zushi, Shizuo: *See*—
Yoshikawa, Tomio; Kato, Takashi; Yamashita, Tetsuji; Murakami, Kyoshiro; and Zushi, Shizuo, 5,201,187, Cl. 62-126.000.

Zusi, F. Christopher; Marathe, Suresh; Somerville, William; and Tramposch, Kenneth M., to Bristol-Myers Squibb Co. Furanone anti-inflammatory agents. 5,202,350, Cl. 514-461.000.

Zvosec, Charles M.; and Mottet, Leon P., to Glaverbel; and Fosbel, Inc. Apparatus for ceramic repair. 5,202,090, Cl. 266-281.000.

Zwack, Robert R.: *See*—
Moriarity, Thomas C.; McCollum, Gregory J.; Zwack, Robert R.; Scott, Matthew S.; Zawacky, Steven R.; and Corrigan, Victor G., 5,202,383, Cl. 525-124.000.

3H Invent A/S: *See*—
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Bloch, Maurice. Pharmaceutical compositions comprising magnesium compounds. Re. 34,222, Cl. 514-26.000.
Bonaldo, Jean M., to Care Medical Devices, Inc. Catheter inserter. Re. 34,223, Cl. 604-164.000.
Care Medical Devices, Inc.: *See*—
Bonaldo, Jean M., Re. 34,223, Cl. 604-164.000.
Drori, Mordeki. Easily-cleanable filters. Re. 34,218, Cl. 210-108.000.
Edmark, John. Modular rack unit. Re. 34,217, Cl. 211-41.000.
Facial Alveodental Implant Rehabilitation, Inc.: *See*—
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Haris, Andras, to Facial Alveodental Implant Rehabilitation, Inc. Adjustable dentoalveolar implant system. Re. 34,221, Cl. 433-173.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, Re. 34,216, Cl. 123-339.000.
Hitachi, Ltd.: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, Re. 34,216, Cl. 123-339.000.
Itakura, Tomiya; and Kamifuji, Hiroshi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Method of and apparatus for controlling engine revolution speed. Re. 34,216, Cl. 123-339.000.
Jack Kennedy Metal Products and Buildings, Inc.: *See*—
Kennedy, William R.; and Kennedy, John M., Re. 34,220, Cl. 405-132.000.
Kamifuji, Hiroshi: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, Re. 34,216, Cl. 123-339.000.
Kennedy, John M.: *See*—
Kennedy, William R.; and Kennedy, John M., Re. 34,220, Cl. 405-132.000.
Kennedy, William R.; and Kennedy, John M., to Jack Kennedy Metal Products and Buildings, Inc. Contractible mine stopping and contractible block member for use therein. Re. 34,220, Cl. 405-132.000.
Lederer, Wayne A. Sound system. Re. 34,219, Cl. 381-90.000.

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Alexander Engineering Company, Ltd.: *See*—
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American Racing Equipment, Inc.: *See*—
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Andrews, Howard W., Jr.; Kowalski, John A.; and Wahl, Friedrich G., to Rubbermaid Commercial Products Inc. Connector for receptacles. 334,704, 4-13-93, Cl. D8-395.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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46 5,202,014
119 5,202,015

CLASS 209

144 5,201,422
273 5,201,423
534 5,201,424

CLASS 210

85 5,202,016
108 Re.34,218
143 5,202,017
159 5,202,019
169 5,202,020
232 5,202,021
293 5,202,022
321.8 5,202,023
360.1 5,202,024
500.35 5,202,025
512.1 5,202,026
615 5,202,027
634 5,202,028
656 5,202,029
695 5,202,030
703 5,202,031
718 5,202,032
747 5,202,033
770 5,202,034

CLASS 211

17 5,201,426
23 5,201,427
41 Re.34,217
5,201,826
50 5,201,428
59.2 5,201,429
70.6 5,201,430

CLASS 213

61 5,201,827

CLASS 215

100 R 5,201,431

CLASS 219

10.55 M 5,202,541
50 5,202,542
117.1 5,202,543
121.5 5,202,544
127 5,202,545
137 R 5,202,546
552 5,202,547
5,202,548

CLASS 220

1.5 5,201,432
241 5,201,433
315 5,201,434
403 5,201,868
415 5,201,435
458 5,201,436
601 5,201,437
666 5,201,438
735 5,201,439

CLASS 221

304 5,201,869

CLASS 222

153 5,201,440
368 5,201,441
610 5,201,442

CLASS 223

85 5,201,443

CLASS 224

183 5,201,444
197 5,201,445
205 5,201,446
243 5,201,447
253 5,201,448
321 5,201,911

CLASS 227

8 5,201,449

CLASS 228

2 5,201,894
4.5 5,201,450
5.5 5,201,451
II 5,201,452
110 5,201,453
5,201,454
119 5,201,455
122 5,201,456
144 5,201,457
199 5,201,458

CLASS 229

103.1 5,201,459
5,201,460
125.08 5,201,461
125.15 5,201,462
125.27 5,201,828
203 5,201,463
305 5,201,464

CLASS 232

35 5,201,465

CLASS 235

379 5,202,549
382 5,202,550
486 5,202,551
494 5,202,552

CLASS 238

8 5,201,467

CLASS 239

263 5,201,466
383 5,201,468

CLASS 241

5 5,201,469
13 5,201,470
21 5,201,471
22 5,201,472
36 5,201,473
100 5,201,474
236 5,201,475

CLASS 242

199 5,201,476
245 5,201,477
298 5,201,870

CLASS 244

2 5,201,478
3.16 5,201,895
49 5,201,479
75 R 5,201,829
110 R 5,201,480
118.1 5,201,481
118.5 5,201,830
119 5,201,831
145 5,201,482
158 R 5,201,832
165 5,201,833

CLASS 246

169 A 5,201,483
169 R 5,201,834

CLASS 248

68.1 5,201,484
118 5,201,485
206.5 5,201,486
278 5,201,896
298 5,201,487
354.5 5,201,488
638 5,201,489

CLASS 250

201.8 5,202,555
208.1 5,202,556
214 A 5,202,553
222.2 5,202,554
223 R 5,202,557
227.21 5,202,558
231.1 5,202,559
238 5,202,560
281 5,202,561
5,202,562
287 5,202,563
310 5,202,564
327.2 5,202,565
515.1 5,202,566
551 5,202,567
561 5,202,568
566 5,202,569
575 5,202,570

CLASS 251

120 5,201,490
122 5,201,491
172 5,201,872
315 5,201,493
331 5,201,492

CLASS 252

8.551 5,202,035
33.4 5,202,036
33.6 5,202,037
5,202,038
49.6 5,202,039
52 R 5,202,040
58 5,202,041
62.2 5,202,042
62.56 5,202,043
68 5,202,044
90 5,202,045
94 5,202,046
99.61 5,202,054
106 5,202,047
117 5,202,048
162 5,202,049
170 5,202,050
183.12 5,202,051
188.28 5,202,052
299.01 5,202,053
299.63 5,202,055
351 5,202,056
376 5,202,057
387 5,202,058
389.31 5,202,059
500 5,202,060
5,202,061
633 5,202,062

CLASS 254

8 B 5,201,494
134.3 FT 5,201,495
405 5,201,496

CLASS 256

12.5 5,201,497
26 5,201,498

CLASS 257

10 5,202,571
60 5,202,572
133 5,202,750
140 5,202,573
215 5,202,574
292 5,202,575
315 5,202,576
532 5,202,751
667 5,202,577
678 5,202,752
684 5,202,754
685 5,202,578
751 5,202,579
787 5,202,753

CLASS 264

4.6 5,202,063
23 5,202,064
5,202,065
5,202,066
40.1 5,202,068
40.5 5,202,067
51 5,202,069
103 5,202,070
137 5,202,071
177.13 5,202,072
210.6 5,202,073
241 5,202,074
245 5,202,075
255 5,202,076
504 5,202,077
527 5,202,078

CLASS 266

47 5,202,079
172 5,202,080
231 5,202,081
281 5,202,090

CLASS 267

64.27 5,201,499
140 5,201,500
155 5,201,897

CLASS 269

32 5,201,501
43 5,201,502

CLASS 270

53 5,201,503

CLASS 271

2 5,201,504
3 5,201,505
3.1 5,201,425
5 5,201,506
9 5,201,507
5,201,873
10 5,201,508
118 5,201,510
127 5,201,511
157 5,201,509
164 5,201,512
180 5,201,513
188 5,201,514
224 5,201,515
277 5,201,516
291 5,201,517
305 5,201,518

CLASS 273

54 B 5,201,874
56 5,201,519
88 5,201,520
176 K 5,201,521
232 5,201,522
233 5,201,523
248 5,201,524
293 5,201,525
342 5,201,526
402 5,201,527

CLASS 277

1 5,201,835
35 5,201,528
37 5,201,529
53 5,201,530
96.1 5,201,531
124 5,201,532
152 5,201,533
235 B 5,201,534

CLASS 280

30 5,201,535
5,201,536
5,201,898
281.1 5,201,537
288.1 5,201,538
426 5,201,836
479.2 5,201,539
646 5,201,540
731 5,201,541
736 5,201,542
750 5,201,543
751 5,201,544
777 5,201,545
789 5,201,546
834 5,201,547

CLASS 283

2 5,201,548
108 5,201,837

CLASS 285

39 5,201,549
109 5,201,550
119 5,201,551
137.1 5,201,552
177 5,201,553
321 5,201,554

CLASS 292

48 5,201,555
161 5,201,557
257 5,201,556

CLASS 293

120 5,201,912
133 5,201,558

CLASS 294

19.1 5,201,559
64.1 5,201,875
5,201,913
64.2 5,201,560
88 5,201,838

CLASS 296

37.5 5,201,561
39.2 5,201,562
97.4 5,201,563
97.9 5,201,564
136 5,201,565
192 5,201,566

CLASS 297

335 5,201,567
439 5,201,568

CLASS 299

86 5,201,569

CLASS 303

10 5,201,570
22.5 5,201,571
5,201,572
92 5,201,573

CLASS 305

35 EB 5,201,574

CLASS 307

10.3 5,202,580
10.8 5,202,581
39 5,202,582
102 5,202,583
105 5,202,584
116 5,202,585
296.2 5,202,587
5,202,588
350 5,202,589
352 5,202,586
362 5,202,590
450 5,202,591
465 5,202,592
475 5,202,593
5,202,594

CLASS 310

13 5,202,595
64 5,202,596
83 5,202,597
90.5 5,202,598
234 5,202,599
338 5,202,600

CLASS 312

323 5,201,575

CLASS 313

142 5,202,601
309 5,202,602
414 5,202,603
5,202,604
444 5,202,605
450 5,202,606
456 5,202,615

CLASS 315

58 5,202,607
86 5,202,608
366 5,202,609

CLASS 318

6 5,202,610
85 5,202,611
138 5,202,612
254 5,202,613
5,202,614
5,202,616

CLASS 320

2 5,202,617

CLASS 323

270 5,202,618
349 5,202,619
358 5,202,621

CLASS 324

158 F 5,202,622
5,202,623
158 MG 5,202,620
158 R 5,202,624
5,202,625
5,202,626
166 5,202,627
207.12 5,202,628
244.1 5,202,629
248 5,202,630
309 5,202,631
5,202,632
321 5,202,633
322 5,202,634
5,202,635
414 5,202,636
425 5,202,637
444 5,202,638
537 5,202,639
5,202,640
715 5,202,641

CLASS 328

014 5,202,642
119 5,202,678

CLASS 329

309 5,202,643
313 5,202,644

CLASS 330

253 5,202,645
271 5,202,646

CLASS 331

14 5,202,906
74 5,202,647

CLASS 333

16 5,202,648
33 5,202,649
034 5,202,650
170 5,202,651
174 5,202,656
193 5,202,652
202 5,202,653
206 5,202,654
215 5,202,655
238 5,202,657

CLASS 335

18 5,202,662
186 5,202,663
230 5,202,658

CLASS 336

5 5,202,664

CLASS 338

25 5,202,665

CLASS 340

332 5,202,660
522 5,202,661
524 5,202,673
573 5,202,666
605 5,202,667
705 5,202,668
721 5,202,669
728 5,202,670
747 5,202,671
5,202,672
781 5,202,674
782 5,202,675
784 5,202,676
786 5,202,677
825.160 5,202,679
853.1 5,202,680
856.4 5,202,681
870.19 5,202,682
906 5,202,683
961 5,202,684

CLASS 341

76 5,202,685
139 5,202,686
158 5,202,687

CLASS 342

1 5,202,688
10 5,202,689
26 5,202,690
90 5,202,691
179 5,202,692
357 5,202,693
5,202,694
359 5,202,695

CLASS 343

741 5,202,696
770 5,202,697
5,202,698
840 5,202,699
5,202,700
909 5,202,701

CLASS 346

1.1 5,202,659
5,202,702
140 R 5,202,703
5,202,704
159 5,202,705

CLASS 351

123 5,202,707
206 5,202,708
208 5,202,709
211 5,202,710
224 5,202,711

CLASS 354

81 5,202,712
212 5,202,713
219 5,202,714
246 5,202,715
319 5,202,716
400 5,202,717
407 5,202,718
413 5,202,719
415 5,202,720
441 5,202,721

CLASS 355

27 5,202,722
45 5,202,723
64 5,202,724
69 5,202,725
106 5,202,726
211 5,202,727
245 5,202,728
251 5,202,729
5,202,730
5,202,731
260 5,202,732
271 5,202,733
284 5,202,734
298 5,202,735
308 5,202,736
5,202,737
323 5,202,738
327 5,202,739

CLASS 356

4 5,202,740
5,202,741
5 5,202,742
5,202,743
73 5,202,744
73.1 5,202,745
5,202,746
5,202,747
350 5,202,748
360 5,202,749
376

CLASS 358

12 5,202,755
41 5,202,756
75 5,202,757
98 5,202,758
108 5,202,759
141 5,202,760
142 B1 4,977,455
149 5,202,761
163 5,202,762
166 5,202,763
167 5,202,764
183 5,202,765
198 5,202,766
209 5,202,767
247 5,202,768
300 5,202,769
426 5,202,770
5,202,771
459 5,202,772
461 5,202,773
488 5,202,774

CLASS 359

11 5,202,775
17 5,202,776
50 5,202,777
54 5,202,778
78 5,202,779
125 5,202,780
152 5,202,781
5,202,782
5,202,783
196 5,202,784
214 5,202,785
243 5,202,786
267 5,202,787
270 5,202,788
281 5,202,789
323 5,202,790
345 5,202,791
356 5,202,792
463 5,202,793
568 5,202,794
645 5,202,795
676 5,202,992
819 5,202,706
894 5,202,796

CLASS 360

15 5,202,797
35.1 5,202,798
48 5,202,799
62 5,202,800
70 5,202,801
77.05 5,202,802
97.02 5,202,803
106 5,202,804
108 5,202,805
120 5,202,806
122 5,202,807
130.21 5,202,808
132 5,202,809
135 5,202,810

CLASS 361

56 5,202,811
154 5,202,813
321 5,202,814
384 5,202,815
5,202,816
393 5,202,817
429 5,202,818
436 5,202,819
565 5,202,812

CLASS 362

3 5,201,576
101 5,201,577
104 5,201,578
368 5,201,579

CLASS 363

56 5,202,820

CLASS 364

162 5,202,821
187 5,202,822
405 5,202,825
5,202,826
408 5,202,827
419 5,202,828
424.02 5,202,832
424.05 5,202,830
5,202,831
424.1 5,202,833
449 5,202,829
457 5,202,835
464.02 5,202,834
468 5,202,836
476 5,202,837
480 5,202,838
488 5,202,839
490 5,202,840
491 5,202,841
508 5,202,824
571.01 5,202,842
578 5,202,843
709.11 5,202,844
713 5,202,845
721 5,202,846
725 5,202,847

CLASS 365

104 5,202,848
149 5,202,849
185 5,202,850
189.01 5,202,851
5,202,852
201 5,202,853
203 5,202,854
226 5,202,855
230.05 5,202,856
230.06 5,202,823
233 5,202,857

CLASS 366

4 5,201,839
159 5,201,580

CLASS 368

71 5,202,858
274 5,202,859

CLASS 369

13 5,202,860
5,202,861
5,202,862
5,202,863
32 5,202,864
5,202,865
5,202,866
44.17 5,202,868
44.23 5,202,869
44.230 5,202,867
44.25 5,202,870
44.29 5,202,871
44.32 5,202,872
48 5,202,873
54 5,202,874
58 5,202,876
5,202,877
94 5,202,875
100 5,202,878
126 5,202,879
275.4 5,202,880
284 5,202,881

CLASS 370

17 5,202,882
67 5,202,883
94.1 5,202,884
5,202,885
112 5,202,886

CLASS 371

10.1 5,202,887
21.2 5,202,888
27 5,202,889
40.3 5,202,890

CLASS 372

21 5,202,891
30 5,202,892
34 5,202,893
38 5,202,894
45 5,202,895
50 5,202,896
92 5,202,897
5,202,898

CLASS 374

5 5,201,841
36 5,201,581
45 5,201,582
145 5,201,840
176 5,201,583

CLASS 375

8 5,202,899
51 5,202,900
84 5,202,901
97 5,202,902
100 5,202,903
118 5,202,904
121 5,202,905

CLASS 376

260 5,202,082
299 5,202,083
433 5,202,084
435 5,202,085

CLASS 377

60 5,202,907
64 5,202,908

CLASS 378

54 5,202,909
121 5,202,910
168 5,202,911

CLASS 379

53 5,202,957
57 5,202,912
58 5,202,913
97 5,202,914
100 5,202,915
106 5,202,916
159 5,202,917
390 5,202,918
399 5,202,919

CLASS 380

18 5,202,920
23 5,202,921
45 5,202,922
80 5,202,923

CLASS 381

13 5,202,924
5,202,925
36 5,202,926
68 5,202,927
90 Re.34,219

CLASS 382

1 5,202,928
2 5,202,929
3 5,202,930
6 5,202,931
8 5,202,932
9 5,202,933
41 5,202,934
54 5,202,935
5,202,936

CLASS 384

49 5,201,584
99 5,201,585
101 5,202,937
247 5,201,586
620 5,201,587

CLASS 385

11 5,202,938
12 5,202,939
24 5,202,940
41 5,202,941
87 5,202,942
92 5,202,943
101 5,202,944
105 5,202,945
109 5,202,946
123 5,202,947
131 5,202,948
134 5,202,949
146 5,202,950

CLASS 388

811 5,202,951

CLASS 395

2 5,202,952
5,202,953
3 5,202,954
10 5,202,955
24 5,202,956
102 5,202,958
109 5,202,959
143 5,202,960
159 5,202,961
166 5,202,962
275 5,202,964
325 5,202,963
5,202,965
5,202,966
375 5,202,967
400 5,202,968
425 5,202,969
5,202,970
5,202,971
5,202,972
5,202,973
500 5,202,975
5,202,976
5,202,977
575 5,202,978
5,202,979
5,202,980
600 5,202,981
5,202,982
5,202,983
5,202,984
5,202,985
650 5,202,986
5,202,987
5,202,988
5,202,989
5,202,990
5,202,991
700 5,202,993
5,202,994
5,202,995
5,202,996
725 5,202,997
5,202,998
5,202,999
750 5,203,000
800 5,203,001
5,203,002
5,203,003
5,203,004
5,203,005
5,203,006
5,203,007

CLASS 400

120 5,201,588
134 5,201,589
150 5,201,590
166 5,201,591
5,201,876
194 5,201,592
214 5,201,593
480 5,201,594
618 5,201,595
718 5,201,596

CLASS 403

5 5,201,842
274 5,201,597
372 5,201,598

CLASS 404

6 5,201,599
25 5,201,600
35 5,201,601
41 5,201,602
5,201,843
84.1 5,201,603
110 5,201,604

CLASS 405

37 5,201,605
55 5,201,606
68 5,201,607
129 5,201,608
5,201,609
132 Re.34,220
172 5,201,610
193 5,201,611
264 5,201,612

CLASS 406

85 5,201,877

CLASS 407

36 5,201,613
41 5,201,614

CLASS 408

87 5,201,615
224 5,201,616

CLASS 409

131 5,201,617
132 5,201,618
5,201,619
232 5,201,620
233 5,201,621
399 5,201,622

CLASS 411

48 5,201,623
180 5,201,624
369 5,201,625
531 5,201,627

CLASS 414

388 5,201,626
538 5,201,628
632 5,201,629
744.5 5,201,630
786 5,201,631

CLASS 415

122.1 5,201,844
146 5,201,633
169.1 5,201,845
173.6 5,201,846
177 5,201,847
199.1 5,201,848

CLASS 416

95 5,201,849
96 R 5,201,634
190 5,201,850
228 5,201,635

CLASS 417

18 5,201,636
48.4 5,201,644
218 5,201,637
234 5,201,638
236 5,201,639
312 5,201,640
415 5,201,851
417 5,201,641
420 5,201,642
472 5,201,643

CLASS 418

14 5,201,645
55.5 5,201,646
102 5,201,647
133 5,201,878
201.2 5,201,648

CLASS 420

17 5,202,087
40 5,202,088
63 5,202,089

CLASS 422

52 5,202,091
62 5,202,092
102 5,202,093
5,202,094
186 5,202,095
190 5,202,096
218 5,202,097
300 5,202,098
310 5,202,099

CLASS 423

5 5,202,100
239 5,202,101
240 5,202,102
242.7 5,202,103
335 5,202,104
345 5,202,105
488 5,202,106
574 R 5,202,107
594 5,202,108

CLASS 424

1.1 5,202,109
45 5,202,110
49 5,202,111
52 5,202,112
54 5,202,113
61 5,202,114
66 5,202,115
85.1 5,202,116
5,202,117
85.2 5,202,118
88 5,202,119
93 U 5,202,120
94.64 5,202,121
195.1 5,202,122
401 5,202,123
405 5,202,124
449 5,202,125
450 5,202,126
469 5,202,128
489 5,202,129
617 5,202,130

CLASS 425

7 5,202,131
82 5,202,132
83.1 5,202,133
425 5,202,134
527 5,202,135

CLASS 426

2 5,202,136
89 5,202,137
94 5,202,138
242 5,202,139
268 5,202,140
5,202,141
330.3 5,202,142
402 5,202,143
574 5,202,144
580 5,202,145
613 5,202,146
633 5,202,147

CLASS 427

98 5,202,151

108 5,202,152
135 5,202,153
365 5,201,660

CLASS 455

274 5,202,329
5,202,330
387.3 5,202,421
5,202,422
941 5,202,508

D1— 113 334,643
334,644
475 334,675
476 334,676
307 334,706
334,707
102 334,737
106 334,738
36 334,768
334,769
353 334,799
366 334,800

108 5,202,152
125 5,202,153
5,202,154
127 5,202,155
135 5,202,156
142 5,202,157
185 5,202,158
213.31 5,202,159
231 5,202,160
237 5,202,161
282 5,202,162
314 5,202,163
356 5,202,164
534 5,202,149
595 5,202,150

CLASS 428

1 5,202,165
33 5,202,166
5,202,167
40 5,202,168
43 5,202,169
48 5,202,170
64 5,202,171
100 5,202,172
131 5,202,173
138 5,202,174
142 5,202,175
195 5,202,176
225 5,202,086
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Country	Instrument	Deposit of Instrument	Entry into Force[1]

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Patent Cooperation Treaty Update
Declaration of Continuation by Kazakhstan

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Kazakhstan on Feb. 16, 1993, deposited a declaration the effect of which is that the PCT is applied by Kazakhstan. Consequently, nationals and residents of Kazakhstan are entitled to file international applications under the PCT, and Kazakhstan may be designated and elected in international applications. Moreover, the extension to Kazakhstan of the effects of each international application filed on or after Dec. 25, 1991 (the date on which the Soviet Union ceased to exist) and no later than Apr. 16, 1993, may be requested by the applicant concerned. That request must be filed with, and the prescribed fee must be paid to, the International Bureau of WIPO within three months from the date of its notification informing the applicant that a request for extension may be made. An applicant may also extend to Kazakhstan the effect of an international application which was filed before Dec. 25, 1991, provided the application designated the Soviet Union and other conditions and procedures as prescribed by Kazakhstan are met.

Listing of PCT Member Countries

	Country	Instrument		Deposit of Instrument		Entry into Force[1]
(1)	Central African Republic[2]	Accession	15	September 1971	24	January 1978
(2)	Senegal[2]	Ratification	08	March 1972	24	January 1978
(3)	Madagascar	Ratification	27	March 1972	24	January 1978
(4)	Malawi	Accession	16	May 1972	24	January 1978
(5)	Cameroon[2]	Accession	15	March 1973	24	January 1978
(6)	Chad[2]	Accession	12	February 1974	24	January 1978
(7)	Togo[2]	Ratification	28	January 1975	24	January 1978
(8)	Gabon[2]	Accession	06	March 1975	24	January 1978
(9)	United States of America	Ratification	26	November 1975	24	January 1978
(10)	Germany, Federal Republic of[3]	Ratification	19	July 1976	24	January 1978
(11)	Congo[2]	Accession	08	August 1977	24	January 1978
(12)	Switzerland[3]	Ratification	14	September 1977	24	January 1978
(13)	United Kingdom[3]	Ratification	24	October 1977	24	January 1978
(14)	France[3]	Ratification	25	November 1977	25	February 1978
(15)	Russian Federation	Ratification	29	December 1977	29	March 1978
(16)	Brazil	Ratification	09	January 1978	09	April 1978
(17)	Luxembourg[3]	Ratification	31	January 1978	30	April 1978
(18)	Sweden[3]	Ratification	17	February 1978	17	May 1978
(19)	Japan	Ratification	01	July 1978	01	October 1978
(20)	Denmark[3]	Ratification	01	September 1978	01	December 1978
(21)	Austria[3]	Ratification	23	January 1979	23	April 1979
(22)	Monaco[3]	Ratification	22	March 1979	22	June 1979
(23)	Netherlands[3]	Ratification	10	April 1979	10	July 1979
(24)	Romania	Ratification	23	April 1979	23	July 1979
(25)	Norway	Ratification	01	October 1979	01	January 1980
(26)	Liechtenstein[3]	Accession	19	December 1979	19	March 1980
(27)	Australia	Accession	31	December 1979	31	March 1980
(28)	Hungary	Ratification	27	March 1980	27	June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08	April 1980	08	July 1980
(30)	Finland	Ratification	01	July 1980	01	October 1980
(31)	Belgium[3]	Ratification	14	September 1981	14	December 1981
(32)	Sri Lanka	Accession	26	November 1981	26	February 1982
(33)	Mauritania[2]	Accession	13	January 1983	13	April 1983
(34)	Sudan	Accession	16	January 1984	16	April 1984
(35)	Bulgaria	Accession	21	February 1984	21	May 1984
(36)	Republic of Korea (South Korea)	Accession	10	May 1984	10	August 1984
(37)	Mali[2]	Accession	19	July 1984	19	October 1984
(38)	Barbados	Accession	12	December 1984	12	March 1985
(39)	Italy[3]	Ratification	28	December 1984	28	March 1985
(40)	Benin[2]	Accession	26	November 1986	26	February 1987
(41)	Burkina Faso[2]	Accession	21	December 1988	21	March 1989
(42)	Spain[3]	Accession	16	August 1989	16	November 1989
(43)	Canada	Ratification	02	October 1989	02	January 1990
(44)	Greece[3]	Accession	09	July 1990	09	October 1990
(45)	Poland	Accession	25	September 1990	25	December 1990
(46)	Cote d'Ivoire[2]	Ratification	31	January 1991	30	April 1991
(47)	Guinea[2]	Accession	27	February 1991	27	May 1991
(48)	Mongolia	Accession	27	February 1991	27	May 1991
(49)	Czech Republic	Declaration[4]	18	December 1992	01	January 1993
(50)	Ireland[3]	Ratification	01	May 1992	01	August 1992
(51)	Portugal[3]	Accession	24	August 1992	24	November 1992
(52)	New Zealand	Accession	01	September 1992	01	December 1992
(53)	Ukraine	Declaration[4]	21	September 1992	24	August 1991
(54)	Viet Nam	Accession	10	December 1992	10	March 1993
(55)	Slovak Republic	Declaration[4]	30	December 1992	01	January 1993
(56)	Niger[2]	Accession	21	December 1992	21	March 1993
(57)	Kazakhstan	Declaration[4]	16	February 1993	25	December 1991

[1]Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2]Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

[3]Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium, Italy, Ireland and Greece for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

[4] Declaration of continued application.

Mar. 24, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

By a small entity (§ 1.9f)	$65.00
By other than a small entity	$130.00

Patent Number	Serial Number	Issue Date			
			4,497,515	06/479,641	2/05/85
			4,497,522	06/492,125	2/05/85

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 17, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,916,752 through 4,918,751
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 8, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,581,771 through 4,583,245
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 7, 1993
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,497,070	06/450,403	2/05/85
4,497,079	06/542,253	2/05/85
4,497,082	06/433,211	2/05/85
4,497,087	06/500,994	2/05/85
4,497,088	06/566,046	2/05/85
4,497,093	06/453,630	2/05/85
4,497,100	06/393,777	2/05/85
4,497,102	06/510,135	2/05/85
4,497,104	06/451,113	2/05/85
4,497,109	06/587,839	2/05/85
4,497,113	06/524,184	2/05/85
4,497,118	06/429,492	2/05/85
4,497,121	06/456,566	2/05/85
4,497,123	06/354,592	2/05/85
4,497,126	06/597,696	2/05/85
4,497,132	06/309,085	2/05/85
4,497,137	06/432,802	2/05/85
4,497,139	06/640,202	2/05/85
4,497,140	06/403,509	2/05/85
4,497,143	06/511,987	2/05/85
4,497,148	06/360,558	2/05/85
4,497,149	06/264,788	2/05/85
4,497,154	06/437,812	2/05/85
4,497,161	06/395,665	2/05/85
4,497,165	06/550,185	2/05/85
4,497,169	06/503,148	2/05/85
4,497,171	06/333,502	2/05/85
4,497,173	06/596,649	2/05/85
4,497,174	06/460,597	2/05/85
4,497,176	06/494,508	2/05/85
4,497,177	06/547,479	2/05/85
4,497,185	06/536,046	2/05/85
4,497,187	06/446,581	2/05/85
4,497,188	06/451,969	2/05/85
4,497,191	06/469,017	2/05/85
4,497,192	06/451,700	2/05/85
4,497,193	06/360,466	2/05/85
4.497.200	06/484,078	2/05/85
4,497,205	06/450,648	2/05/85
4,497,206	06/474,765	2/05/85
4,497,209	06/513,059	2/05/85
4,497,211	06/492,748	2/05/85
4,497,221	06/386,643	2/05/85
4,497,223	06/465,664	2/05/85
4,497,227	06/461,438	2/05/85
4,497,229	06/421,531	2/05/85
4,497,230	06/370,206	2/05/85
4,497,231	06/465,165	2/05/85

Patent Number	Serial Number	Issue Date
4,497,232	06/489,835	2/05/85
4,497,233	06/500,843	2/05/85
4,497,235	06/463,138	2/05/85
4,497,237	06/496,132	2/05/85
4,497,242	06/347,752	2/05/85
4,497,245	06/513,594	2/05/85
4,497,248	06/559,852	2/05/85
4,497,250	06/465,027	2/05/85
4,497,253	06/237,395	2/05/85
4,497,254	06/421,396	2/05/85
4,497,261	06/508,255	2/05/85
4,497,279	06/470,051	2/05/85
4,497,280	06/568,886	2/05/85
4,497,283	06/553,443	2/05/85
4,497,284	06/413,239	2/05/85
4,497,287	06/377,815	2/05/85
4,497,289	06/501,916	2/05/85
4,497,290	06/483,717	2/05/85
4,497,295	06/552,199	2/05/85
4,497,297	06/634,584	2/05/85
4,497,307	06/576,721	2/05/85
4,497,309	06/380,931	2/05/85
4,497,310	06/579,259	2/05/85
4,497,313	06/446,602	2/05/85
4,497,314	06/446,482	2/05/85
4,497,316	06/394,445	2/05/85
4,497,317	06/443,744	2/05/85
4,497,327	06/413,482	2/05/85
4,497,328	06/532,373	2/05/85
4,497,338	06/535,209	2/05/85
4,497,341	06/525,130	2/05/85
4,497,347	06/439,639	2/05/85
4,497,358	06/443,920	2/05/85
4,497,361	06/273,355	2/05/85
4,497,363	06/372,539	2/05/85
4,497,369	06/319,179	2/05/85
4,497,373	06/404,726	2/05/85
4,497,382	06/478,486	2/05/85
4,497,383	06/609,527	2/05/85
4,497,388	06/327,131	2/05/85
4,497,389	06/320,888	2/05/85
4,497,392	06/480,108	2/05/85
4,497,393	06/327,515	2/05/85
4,497,395	06/350,571	2/05/85
4,497,400	06/464,224	2/05/85
4,497,409	06/453,203	2/05/85
4,497,410	06/523,257	2/05/85
4,497,419	06/576,315	2/05/85
4,497,421	06/389,692	2/05/85
4,497,422	06/507,091	2/05/85
4,497,427	06/350,698	2/05/85
4,497,428	06/302,121	2/05/85
4,497,432	06/540,024	2/05/85
4,497,433	06/534,186	2/05/85
4,497,436	06/467,390	2/05/85
4,497,440	06/433,241	2/05/85
4,497,450	06/411,701	2/05/85
4,497,452	06/557,948	2/05/85
4,497,458	06/475,662	2/05/85
4,497,460	06/478,747	2/05/85
4,497,461	06/422,530	2/05/85
4,497,468	06/371,656	2/05/85
4,497,470	06/367,180	2/05/85
4,497,476	06/472,043	2/05/85
4,497,479	06/395,282	2/05/85
4,497,482	06/403,908	2/05/85
4,497,489	06/407,251	2/05/85
4,497,492	06/440,991	2/05/85
4,497,496	06/603,148	2/05/85
4,497,498	06/405,793	2/05/85
4,497,501	06/313,411	2/05/85
4,497,502	06/462,489	2/05/85
4,497,503	06/465,819	2/05/85
4,497,505	06/436,664	2/05/85
4,497,507	06/483,598	2/05/85
4,497,511	06/403,655	2/05/85
4,497,513	06/418,543	2/05/85
4,497,515	06/479,641	2/05/85
4,497,522	06/492,125	2/05/85
4,497,525	06/390,052	2/05/85
4,497,527	06/430,556	2/05/85
4,497,541	06/355,489	2/05/85
4,497,547	06/367,807	2/05/85
4,497,549	06/460,027	2/05/85
4,497,553	06/489,272	2/05/85
4,497,555	06/444,702	2/05/85
4,497,556	06/488,272	2/05/85
4,497,564	06/513,406	2/05/85
4,497,565	06/419,215	2/05/85
4,497,567	06/489,621	2/05/85
4,497,570	06/463,099	2/05/85
4,497,575	06/438,102	2/05/85
4,497,579	06/543,123	2/05/85
4,497,592	06/326,330	2/05/85
4,497,593	06/434,029	2/05/85
4,497,595	06/456,577	2/05/85
4,497,598	06/443,117	2/05/85
4,497,599	06/484,301	2/05/85
4,497,603	06/392,705	2/05/85
4,497,606	06/399,334	2/05/85
4,497,609	06/327,936	2/05/85
4,497,616	06/493,070	2/05/85
4,497,618	06/530,951	2/05/85
4,497,619	06/458,787	2/05/85
4,497,632	06/482,428	2/05/85
4,497,636	06/522,277	2/05/85
4,497,637	06/443,335	2/05/85
4,497,639	06/331,370	2/05/85
4,497,640	06/576,826	2/05/85
4,497,642	06/507,598	2/05/85
4,497,646	06/410,386	2/05/85
4,497,649	06/524,512	2/05/85
4,497,653	06/385,191	2/05/85
4,497,655	06/547,870	2/05/85
4,497,659	06/524,707	2/05/85
4,497,660	06/589,037	2/05/85
4,497,665	06/455,327	2/05/85
4,497,667	06/512,513	2/05/85
4,497,669	06/516,109	2/05/85
4,497,679	06/311,038	2/05/85
4,497,687	06/563,683	2/05/85
4,497,694	06/602,403	2/05/85
4,497,704	06/574,231	2/05/85
4,497,707	06/477,640	2/05/85
4,497,709	06/414,807	2/05/85
4,497,711	06/524,073	2/05/85
4,497,712	06/541,924	2/05/85
4,497,714	06/424,346	2/05/85
4,497,715	06/404,794	2/05/85
4,497,718	06/486,624	2/05/85
4,497,738	06/358,431	2/05/85
4,497,740	06/386,303	2/05/85
4,497,743	06/278,304	2/05/85
4,497,754	06/240,825	2/05/85
4,497,760	06/471,519	2/05/85
4,497,761	06/261,733	2/05/85
4,497,764	06/428,832	2/05/85
4,497,768	06/395,893	2/05/85
4,497,769	06/377,773	2/05/85
4,497,770	06/258,831	2/05/85
4,497,771	06/472,702	2/05/85
4,497,773	06/529,494	2/05/85
4,497,776	06/531,179	2/05/85
4,497,779	06/541,830	2/05/85
4,497,783	06/405,469	2/05/85
4,497,798	06/506,004	2/05/85
4,497,799	06/319,755	2/05/85
4,497,808	06/453,393	2/05/85
4,497,809	06/486,820	2/05/85
4,497,810	06/541,834	2/05/85
4,497,811	06/510,132	2/05/85
4,497,813	06/378,165	2/05/85
4,497,815	06/455,863	2/05/85
4,497,820	06/491,386	2/05/85
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4,498,139	06/309,938	2/05/85

Patent Number	Serial Number	Issue Date
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4,497,834	06/412,762	2/05/85
4,497,835	06/456,986	2/05/85
4,497,838	06/486,829	2/05/85
4,497,841	06/475,501	2/05/85
4,497,844	06/292,873	2/05/85
4,497,851	06/431,232	2/05/85
4,497,854	06/590,509	2/05/85
4,497,856	06/452,195	2/05/85
4,497,857	06/547,136	2/05/85
4,497,858	06/530,760	2/05/85
4,497,863	06/587,154	2/05/85
4,497,867	06/466,358	2/05/85
4,497,869	06/476,014	2/05/85
4,497,873	06/456,147	2/05/85
4,497,875	06/464,945	2/05/85
4,497,876	06/475,735	2/05/85
4,497,880	06/474,386	2/05/85
4,497,883	06/489,872	2/05/85
4,497,907	06/388,967	2/05/85
4,497,910	06/402,673	2/05/85
4,497,912	06/621,270	2/05/85
4,497,913	06/499,651	2/05/85
4,497,929	06/399,404	2/05/85
4,497,939	06/561,429	2/05/85
4,497,940	06/561,435	2/05/85
4,497,941	06/429,481	2/05/85
4,497,943	06/487,203	2/05/85
4,497,948	06/561,431	2/05/85
4,497,949	06/388,167	2/05/85
4,497,950	06/536,788	2/05/85
4,497,951	06/487,336	2/05/85
4,497,954	06/551,965	2/05/85
4,497,959	06/463,176	2/05/85
4,497,966	06/529,910	2/05/85
4,497,968	06/598,955	2/05/85
4,497,971	06/552,557	2/05/85
4,497,972	06/540,931	2/05/85
4,497,976	06/466,628	2/05/85
4,497,980	06/505,428	2/05/85
4,497,994	06/465,317	2/05/85
4,497,996	06/459,019	2/05/85
4,497,999	06/467,049	2/05/85
4,498,007	06/390,869	2/05/85
4,498,011	06/261,750	2/05/85
4,498,019	06/500,268	2/05/85
4,498,026	06/462,450	2/05/85
4,498,028	06/306,449	2/05/85
4,498,032	06/397,605	2/05/85
4,498,033	06/405,702	2/05/85
4,498,035	06/562,037	2/05/85
4,498,037	06/534,801	2/05/85
4,498,044	06/377,070	2/05/85
4,498,051	06/281,638	2/05/85
4,498,061	06/355,116	2/05/85
4,498,064	06/439,112	2/05/85
4,498,065	06/357,818	2/05/85
4,498,068	06/448,959	2/05/85
4,498,070	06/509,359	2/05/85
4,498,077	06/497,441	2/05/85
4,498,078	06/336,944	2/05/85
4,498,080	06/552,502	2/05/85
4,498,081	06/287,757	2/05/85
4,498,087	06/387,547	2/05/85
4,498,101	06/452,162	2/05/85
4,498,104	06/382,385	2/05/85
4,498,111	06/401,043	2/05/85
4,498,115	06/399,032	2/05/85
4,498,116	06/570,926	2/05/85
4,498,117	06/555,234	2/05/85
4,498,120	06/571,637	2/05/85
4,498,121	06/457,605	2/05/85
4,498,124	06/392,337	2/05/85
4,498,125	06/427,147	2/05/85
4,498,127	06/444,525	2/05/85
4,498,134	06/342,671	2/05/85
4,498,139	06/309,938	2/05/85
4,498,143	06/320,540	2/05/85
4,498,148	06/469,051	2/05/85
4,498,153	06/356,641	2/05/85
4,498,167	06/353,695	2/05/85
4,498,176	06/347,787	2/05/85
4,498,179	06/403,439	2/05/85
4,498,181	06/534,399	2/05/85
4,498,183	06/375,750	2/05/85
4,498,190	06/539,177	2/05/85
4,498,196	06/402,368	2/05/85
4,802,244	07/090,518	2/07/89
4,802,245	06/909,910	2/07/89
4,802,249	07/157,590	2/07/89
4,802,250	07/058,912	2/07/89
4,802,251	07/134,258	2/07/89
4,802,252	07/043,951	2/07/89
4,802,257	07/074,002	2/07/89
4,802,258	07/027,257	2/07/89
4,802,260	07/244,094	2/07/89
4,802,265	07/103,803	2/07/89
4,802,279	07/040,268	2/07/89
4,802,284	07/017,931	2/07/89
4,802,287	07/097,120	2/07/89
4,802,293	07/123,608	2/07/89
4,802,294	07/045,565	2/07/89
4,802,300	07/064,812	2/07/89
4,802,301	07/199,440	2/07/89
4,802,302	07/116,529	2/07/89
4,802,303	07/161,774	2/07/89
4,802,304	06/927,648	2/07/89
4,802,308	07/152,861	2/07/89
4,802,312	06/395,619	2/07/89
4,802,313	07/113,992	2/07/89
4,802,318	07/083,034	2/07/89
4,802,328	07/044,034	2/07/89
4,802,329	07/101,816	2/07/89
4,802,333	07/037,804	2/07/89
4,802,344	07/183,364	2/07/89
4,802,346	07/135,395	2/07/89
4,802,348	07/097,365	2/07/89
4,802,351	07/191,976	2/07/89
4,802,352	07/059,499	2/07/89
4,802,354	07/070,924	2/07/89
4,802,358	07/073,530	2/07/89
4,802,368	07/130,545	2/07/89
4,802,372	06/747,121	2/07/89
4,802,376	07/002,693	2/07/89
4,802,377	06/886,536	2/07/89
4,802,382	07/064,132	2/07/89
4,802,391	07/100,475	2/07/89
4,802,393	06/926,953	2/07/89
4,802,397	07/003,033	2/07/89
4,802,406	07/187,956	2/07/89
4,802,412	07/046,557	2/07/89
4,802,413	07/065,951	2/07/89
4,802,425	06/450,401	2/07/89
4,802,429	07/096,966	2/07/89
4,802,436	07/076,022	2/07/89
4,802,442	07/118,171	2/07/89
4,802,443	07/103,521	2/07/89
4,802,446	07/043,185	2/07/89
4,802,449	06/939,079	2/07/89
4,802,452	06/901,764	2/07/89
4,802,465	06/808,759	2/07/89
4,802,467	07/191,508	2/07/89
4,802,468	06/899,162	2/07/89
4,802,472	07/105,617	2/07/89
4,802,479	06/925,163	2/07/89
4,802,499	07/078,297	2/07/89
4,802,500	07/085,466	2/07/89
4,802,503	07/216,290	2/07/89
4,802,504	06/893,356	2/07/89
4,802,507	07/000,046	2/07/89
4,802,511	06/641,136	2/07/89
4,802,513	06/364,322	2/07/89
4,802,514	07/032,477	2/07/89
4,802,516	07/084,488	2/07/89

Patent Number	Serial Number	Issue Date
4,802,517	07/191,913	2/07/89
4,802,522	07/015,268	2/07/89
4,802,527	07/121,634	2/07/89
4,802,531	06/875,151	2/07/89
4,802,540	07/150,034	2/07/89
4,802,548	07/135,984	2/07/89
4,802,550	07/095,828	2/07/89
4,802,556	06/518,886	2/07/89
4,802,560	07/148,970	2/07/89
4,802,565	07/174,607	2/07/89
4,802,569	07/062,170	2/07/89
4,802,572	07/115,383	2/07/89
4,802,573	07/012,580	2/07/89
4,802,574	07/127,165	2/07/89
4,802,576	06/935,327	2/07/89
4,802,577	07/214,303	2/07/89
4,802,579	07/026,875	2/07/89
4,802,582	07/114,093	2/07/89
4,802,587	07/062,434	2/07/89
4,802,588	06/601,503	2/07/89
4,802,592	07/156,365	2/07/89
4,802,593	07/073,232	2/07/89
4,802,594	07/146,852	2/07/89
4,802,595	07/093,224	2/07/89
4,802,596	06/929,992	2/07/89
4,802,601	07/007,698	2/07/89
4,802,607	07/146,079	2/07/89
4,802,608	07/092,012	2/07/89
4,802,609	06/941,732	2/07/89
4,802,611	06/943,938	2/07/89
4,802,612	07/000,191	2/07/89
4,802,615	07/120,143	2/07/89
4,802,620	07/176,623	2/07/89
4,802,622	06/866,465	2/07/89
4,802,629	06/436,006	2/07/89
4,802,634	07/042,414	2/07/89
4,802,641	06/781,657	2/07/89
4,802,644	07/150,574	2/07/89
4,802,647	07/058,033	2/07/89
4,802,649	07/086,480	2/07/89
4,802,654	07/156,914	2/07/89
4,802,656	07/097,880	2/07/89
4,802,659	07/072,638	2/07/89
4,802,661	07/145,892	2/07/89
4,802,662	06/902,608	2/07/89
4,802,663	06/873,414	2/07/89
4,802,666	07/082,312	2/07/89
4,802,667	07/153,314	2/07/89
4,802,668	07/129,822	2/07/89
4,802,670	07/016,017	2/07/89
4,802,675	06/911,148	2/07/89
4,802,676	06/890,727	2/07/89
4,802,677	07/100,408	2/07/89
4,802,680	07/021,793	2/07/89
4,802,681	07/134,483	2/07/89
4,802,684	06/450,977	2/07/89
4,802,689	06/895,332	2/07/89
4,802,701	06/948,108	2/07/89
4,802,702	07/166,398	2/07/89
4,802,704	07/167,049	2/07/89
4,802,705	07/140,610	2/07/89
4,802,708	07/040,212	2/07/89
4,802,719	06/758,515	2/07/89
4,802,724	07/074,304	2/07/89
4,802,729	07/001,193	2/07/89
4,802,730	06/929,094	2/07/89
4,802,737	06/856,709	2/07/89
4,802,752	07/188,705	2/07/89
4,802,768	06/850,944	2/07/89
4,802,770	07/089,990	2/07/89
4,802,778	06/849,396	2/07/89
4,802,782	07/133,840	2/07/89
4,802,783	07/091,291	2/07/89
4,802,786	07/116,445	2/07/89
4,802,787	07/111,767	2/07/89
4,802,790	07/103,774	2/07/89
4,802,792	06/920,717	2/07/89
4,802,797	06/865,081	2/07/89
4,802,798	07/132,259	2/07/89
4,802,800	07/105,560	2/07/89
4,802,801	07/117,575	2/07/89
4,802,805	07/041,638	2/07/89
4,802,812	06/754,179	2/07/89
4,802,818	07/101,390	2/07/89
4,802,829	07/015,363	2/07/89
4,802,836	07/073,228	2/07/89
4,802,846	07/042,720	2/07/89
4,802,855	07/195,038	2/07/89
4,802,856	07/112,620	2/07/89
4,802,863	07/185,448	2/07/89
4,802,865	07/034,007	2/07/89
4,802,868	07/114,455	2/07/89
4,802,877	07/154,317	2/07/89
4,802,878	07/011,903	2/07/89
4,802,884	07/175,387	2/07/89
4,802,887	07/024,287	2/07/89
4,802,897	06/893,425	2/07/89
4,802,905	07/024,273	2/07/89
4,802,906	06/810,336	2/07/89
4,802,908	07/006,822	2/07/89
4,802,910	07/005,539	2/07/89
4,802,911	07/063,218	2/07/89
4,802,916	06/827,086	2/07/89
4,802,917	06/827,085	2/07/89
4,802,920	06/810,464	2/07/89
4,802,928	06/640,462	2/07/89
4,802,941	07/034,706	2/07/89
4,802,960	06/826,162	2/07/89
4,802,961	07/137,272	2/07/89
4,802,973	07/007,476	2/07/89
4,802,979	07/074,722	2/07/89
4,802,980	07/120,963	2/07/89
4,802,981	07/117,014	2/07/89
4,802,986	07/160,746	2/07/89
4,802,987	06/583,104	2/07/89
4,802,991	06/656,866	2/07/89
4,802,997	07/087,784	2/07/89
4,803,015	06/922,275	2/07/89
4,803,018	07/074,337	2/07/89
4,803,035	06/809,511	2/07/89
4,803,051	06/868,204	2/07/89
4,803,064	07/095,611	2/07/89
4,803,087	07/076,109	2/07/89
4,803,097	07/040,445	2/07/89
4,803,098	06/927,336	2/07/89
4,803,106	07/072,119	2/07/89
4,803,109	07/065,728	2/07/89
4,803,111	07/163,133	2/07/89
4,803,118	07/179,553	2/07/89
4,803,128	07/086,704	2/07/89
4,803,134	07/065,967	2/07/89
4,803,172	07/163,199	2/07/89
4,803,179	07/033,261	2/07/89
4,803,183	07/017,776	2/07/89
4,803,186	06/938,095	2/07/89
4,803,188	07/142,203	2/07/89
4,803,197	07/002,074	2/07/89
4,803,200	07/103,938	2/07/89
4,803,204	07/075,643	2/07/89
4,803,205	07/203,399	2/07/89
4,803,214	07/144,822	2/07/89
4,803,215	06/942,476	2/07/89
4,803,219	07/076,082	2/07/89
4,803,220	06/750,101	2/07/89
4,803,266	07/104,152	2/07/89
4,803,269	07/085,595	2/07/89
4,803,281	07/129,711	2/07/89
4,803,282	06/900,856	2/07/89
4,803,290	07/055,645	2/07/89
4,803,293	07/017,002	2/07/89
4,803,297	07/072,339	2/07/89
4,803,312	07/047,935	2/07/89
4,803,313	07/132,349	2/07/89
4,803,314	07/083,939	2/07/89
4,803,318	07/141,552	2/07/89
4,803,323	07/008,823	2/07/89

Patent Number	Serial Number	Issue Date
4,803,482	07/015,051	2/07/89
4,803,483	07/074,389	2/07/89

CONTAINING ETHER GROUPS, James T. Edmonds, Jr., et. al., Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.*

Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19

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Patent Number	Serial Number	Issue Date	4,803,482	07/015,051	2/07/89
			4,803,483	07/074,389	2/07/89
4,803,330	07/156,919	2/07/89	4,803,484	07/004,551	2/07/89
4,803,334	07/121,814	2/07/89	4,803,495	06/936,918	2/07/89
4,803,341	07/071,280	2/07/89	4,803,523	07/049,771	2/07/89
4,803,342	06/937,597	2/07/89	4,803,542	07/051,850	2/07/89
4,803,354	07/036,482	2/07/89	4,803,544	07/071,303	2/07/89
4,803,356	07/070,549	2/07/89	4,803,545	07/169,549	2/07/89
4,803,357	07/006,993	2/07/89	4,803,549	06/880,401	2/07/89
4,803,364	07/021,252	2/07/89	4,803,553	07/143,110	2/07/89
4,803,370	07/050,878	2/07/89	4,803,559	07/125,857	2/07/89
4,803,378	06/823,451	2/07/89	4,803,566	06/518,995	2/07/89
4,803,379	07/045,849	2/07/89	4,803,569	06/558,879	2/07/89
4,803,381	07/055,952	2/07/89	4,803,578	06/861,349	2/07/89
4,803,386	07/121,521	2/07/89	4,803,586	07/126,422	2/07/89
4,803,390	07/122,982	2/07/89	4,803,607	07/143,554	2/07/89
4,803,391	07/039,382	2/07/89	4,803,610	07/035,479	2/07/89
4,803,395	07/093,003	2/07/89	4,803,631	07/101,091	2/07/89
4,803,396	07/096,289	2/07/89	4,803,637	07/070,188	2/07/89
4,803,417	06/944,753	2/07/89	4,803,638	06/878,817	2/07/89
4,803,418	07/090,579	2/07/89	4,803,649	07/026,736	2/07/89
4,803,419	06/914,039	2/07/89	4,803,661	07/082,167	2/07/89
4,803,423	07/055,659	2/07/89	4,803,671	07/079,177	2/07/89
4,803,427	07/053,620	2/07/89	4,803,688	07/174,001	2/07/89
4,803,439	07/094,116	2/07/89	4,803,693	07/103,408	2/07/89
4,803,450	07/134,268	2/07/89	4,803,701	07/066,290	2/07/89
4,803,459	07/038,002	2/07/89	4,803,719	07/058,253	2/07/89
4,803,464	07/150,486	2/07/89	4,803,723	07/109,107	2/07/89
4,803,474	06/840,941	2/07/89	4,803,728	07/065,507	2/07/89
4,803,476	06/922,669	2/07/89	4,803,729	07/034,843	2/07/89

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
Re. 32,656	07/084,554	4/26/88	8/12/87	1/13/93
(4,626,118)	(06/712,536)	(3/18/85)	(12/02/86)	
4,421,003	06/324,848	12/20/83	11/25/81	2/17/93
4,422,278	06/270,891	12/27/83	6/05/81	2/17/93
4,422,976	06/364,894	12/27/83	4/02/82	2/17/93
4,448,638	06/426,973	5/15/84	9/29/82	5/20/92
4,486,287	06/577,016	12/04/84	2/06/84	2/26/93
4,530,862	06/489,790	7/23/85	4/29/83	3/02/93
4,619,610	06/754,944	10/28/86	7/15/85	1/13/93
4,626,742	06/593,578	12/02/86	3/26/84	2/10/93
4,631,715	06/731,049	12/23/86	5/06/85	1/13/93
4,637,731	06/700,701	1/20/87	1/16/85	1/28/93
4,658,917	06/775,106	4/21/87	9/09/85	1/13/93
4,662,006	06/772,381	5/05/87	9/05/85	1/15/93
4,687,362	06/902,422	8/18/87	8/29/86	1/13/93
4,705,175	07/015,147	11/10/87	2/17/87	2/11/93
4,711,161	06/318,683	12/08/87	11/05/81	2/11/93
4,712,629	06/903,279	12/15/87	9/03/86	2/17/93
4,715,922	06/846,601	12/29/87	3/31/86	2/24/93
4,741,434	07/061,723	5/03/88	6/15/87	1/13/93
4,776,339	07/022,200	10/11/88	3/05/87	2/17/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,303,748, Re. S.N. 07/888,378, Filed May 22, 1992, Cl. 429, ELECTROCHEMICAL GENERATORS FOR PRODUCING CURRENT AND NEW MATERIALS FOR THEIR MANUFACTURE, Michel B. Armand, Owner of Record: *Inventor*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 1107

4,457,393, Re. S.N. 07/819,962, Filed June 2, 1992, Cl. 180/227, SUSPENSION DEVICE FOR MOTORCYCLE, Donald G. Richardson, et. al., Owner of Record: *Donald G. Richardson Jackson, California*, Attorney or Agent: John E. Wagner, Ex. Gp.: 3106

4,645,591, Re. S.N. 08/000,181, Filed Jan. 4, 1993, Cl. 210/108.000, SELF-CLEANING FLUID FILTER, Benedict R. Gerulif, Owner of Record: *C. I. B., Inc., Minneapolis, Minn.*, Attorney or Agent: Lawrence M. Newrocki, Ex. Gp.: 1308

4,808,694, Re. S.N. 07/992,518, Filed Dec. 17, 1992, Cl. 528/125, POLY(ARYLENE SULFIDE SULFONE)POLYMER CONTAINING ETHER GROUPS, James T. Edmonds, Jr., et. al., Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.*, Attorney or Agent: John W. Miller, Ex. Gp.: 1503

4,821,440, Re. S.N. 08/018,928, Filed Feb. 9, 1993, Cl. 40/642, WEATHERIZED CONSTRUCTION SITE INSPECTION BOARD ASSEMBLY, Gary D. Dunn, Owner of Record: *Inventor*, Attorney or Agent: Ronald E. Smith, Ex. Gp.: 3507

4,895,496, Re. S.N. 07/996,382, Filed Dec. 23, 1992, Cl. 417/372, REFRIGERATION COMPRESSOR, John P. Elson, Owner of Record: *Copeland Corp., Sidney, Ohio*, Attorney or Agent: Richard L. Carlson, Ex. Gp.: 3403

4,959,812, Re. S.N. 07/951,125, Filed Sept. 25, 1992, Cl. 365/185, ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND CELL STRUCTURE, Masaki Momodomi, et. al., Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 2511

4,993,417, Re. S.N. 08/019,654, Filed Feb. 19, 1993, Cl. 128/661, METHOD AND SYSTEM FOR CONTROLLING ULTRASOUND SCANNING SEQUENCE, Yasutsugu Seo, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Scott C. Harris, Ex. Gp.: 3305

4,995,663, Re. S.N. 08/023,699, Filed Feb. 26, 1993, Cl. 296/100, SLIDABLE TRUCK COVER ASSEMBLY, Robert C. Weaver, et. al., Owner of Record: *Inventors, Port Matilda, Pa.*, Attorney or Agent: John F. A. Earley III, Ex. Gp.: 3102

4,995,940, Re. S.N. 08/022,548, Filed Feb. 25, 1993, Cl. 156/629, METHOD OF FARMING A GAS REMOVING DEVICE FOR AN INK JET SYSTEM, Nathan P. Hine, et. al., Owner of Record: *Spectra, Inc., Hanover, N.H.*, Attorney or Agent: Francis J. Hone., Ex. Gp.: 1304

4,998,581, Re. S.N. 08/022,307, Filed Feb. 25, 1993, Cl. 164/307, REINFORCED CERAMIC INVESTMENT CASTING SHELL MOLD AND METHOD OF MAKING SUCH MOLD, Jan M. Lane, et. al., Owner of Record: *Howmet Corp., Greenwich, Conn.*, Attorney or Agent: Kathleen G. Dussault, Ex. Gp.: 3205

5,014,361, Re. S.N. 08/015,994, Filed Feb. 10, 1992, Cl. 002/167, POLYURETHANE ELASTIC GLOVE HAVING IMPROVED PUNCTURE AND TEAR RESISTANCE, Norman Gray, Owner of Record: *Inventor*, Attorney or Agent: James R. Cannon, Ex. Gp.: 2407

5,045,215, Re. S.N. 08/015,448, Filed Feb. 9, 1993, Cl. 210/747, REMOVING HAZARDOUS CONTAINMENTS FROM WATER, Bruce L. Lamarre, Owner of Record: *North East Environmental Products, Inc., Lebanon, N. H.*, Attorney or Agent: Stephen L. Peterson, Ex. Gp.: 1308

5,051,034, Re. S.N. 08/027,658, Filed Mar. 8, 1993, Cl. 405/157, MAGNETICALLY DETECTABLE PLASTIC PIPE, William L. Goodman, Owner of Record: *Gas Research Institute, Chicago, Ill.*, Attorney or Agent: Neal J. Mosely, Ex. Gp.: 3501

5,096,912, Re. S.N. 07/995,463, Filed Dec. 22, 1992, Cl. 514/383, MICROBICIDAL HYDROXYETHLYL-CYCLOPROPYL-AZOLYL DERIVATIVES, Jurgen Scherkenbeck, et. al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: William C. Gerstenzang, Ex. Gp.: 1205

5,137,088, Re. S.N. 08/016,433, Filed Feb. 11, 1993. Cl. 166/319, TRAVELING DISC VALVE APPARATUS, David L. Farley, et. al., Owner of Record: *Completion Services Inc., Lafayette, La.*, Attorney or Agent: Gregory C. Smith, Ex. Gp.: 3506

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,140,022, Reexam. No. 90/002,982, Requested Mar. 3, 1993, Cl. 073/626, ACOUSTIC IMAGING APPARATUS, Samuel H. Maslak, Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.*, Attorney or Agent: Donald N. Timbie, Sr., Pennington, N.J., Ex. Gp.: 2605, Requester: Acuson Corp., Mountain View, Calif.

4,534,039, Reexam. No. 90/002,990, Requested Mar. 10, 1993, Cl. 375/036, DATASET POWERED BY CONTROL AND DATA SIGNALS FROM DATA TERMINAL, David E. Dobbs, et. al., Owner of Record: *Saskatchewan Economic Development Corp., Regina, Saskatchewan, Canada*, Attorney or Agent: Michael J. Berger, Amster, Rothstein & Ebenstein, New York, N.Y., Ex. Gp.: 2614, Requester: John P. Morgan, Cushman, Darby & Cushman, Washington, D.C.

4,571,365, Reexam. No. 90/002,985, Requested Mar. 15, 1993, Cl. 428/412, TRANSPARENT, ABRASION RESISTANT COATING COMPOSITIONS, Lysander T. Ashlock, et. al., Owner of Record: *Pilkington Aerospace, Inc., Garden Grove, Calif.*, Attorney or Agent: Lyon & Lyon, Los Angeles, Calif., Ex. Gp.: 1509, Requester: Paul J. Cook, Patent and Trademark Counsel, Manchester, Mass.

4,677,646, Reexam. No. 90/002,989, Requested Mar. 10, 1993, Cl. 375/036, DATASET POWERED BY CONTROL AND DATA SIGNALS FROM DATA TERMINAL, David E. Dobbs, et. al., Owner of Record: *Saskatchewan Economic Development Corp., Regina, Saskatchewan, Canada*, Attorney or Agent: Michael J. Berger, Amster, Rothstein & Berstein, New York, N.Y., Ex. Gp.: 2614, Requester: John P. Morgan, Cushman, Darby & Cushman, Washington, D.C.

4,702,773, Reexam. No. 90/002,986, Requested Mar. 15, 1993, Cl. 106/287.12, TRANSPARENT, ABRASION RESISTANT COATING COMPOSITIONS, Lysander T. Ashlock, et. al., Owner of Record: *Pilkington Aerospace, Inc., Garden Grove, Calif.*, Attorney or Agent: Lyon & Lyon, Los Angeles, Calif., Ex. Gp.: 1509, Requester: Paul J. Cook, Patent and Trademark Counsel, Manchester, Mass.

4,719,639, Reexam. No. 90/002,991, Requested Mar. 10, 1993, Cl. 372/066, CARBON DIOXIDE SLAB LASER, John Tulip, Owner of Record: *Boreal Laser, Inc., Edmonton, Alberta, Canada*, Attorney or Agent: Anthony R. Lambert, Thompson & Lambert, Edmonton, Alberta, Canada, Ex. Gp.: 2501, Requester: Coherent, Inc., Palo Alto, Calif.

4,934,233, Reexam. No. 90/002,992, Requested Feb. 23, 1993, Cl. 083/397, COMPOUND MITER SAW, Richard B. Brundage, et. al., Owner of Record: *Emerson Electric Co., St. Louis, Mo.*, Attorney or Agent: Polster, Polster & Luchessi, St. Louis, Mo., Ex. Gp.: 3204, Requester: Richard C. Turner, Shugrue, Mion, Zinn, MacPeak & Seas, Washington, D.C.

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registrion may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED MARCH 22, 1992	935,526	72/381,575	6/13/1972
	935,529	72/387,647	6/13/1972

Reg. Number	Serial Number	Reg. Date	935,817	72/370,994	6/13/1972
			935,819	72/376,260	6/13/1972

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TRADEMARK REGISTRATIONS WHICH EXPIRED
MARCH 22, 1992
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
38,451	70/038,451	6/17/1902
38,452	70/038,452	6/17/1902
87,001	71/031,154	6/18/1912
87,022	71/054,246	6/18/1912
294,940	71/323,279	6/14/1932
294,977	71/324,617	6/14/1932
294,984	71/324,019	6/14/1932
295,007	71/322,819	6/14/1932
295,015	71/323,276	6/14/1932
295,017	71/323,565	6/14/1932
295,019	71/315,389	6/14/1932
295,029	71/324,698	6/14/1932
295,030	71/324,646	6/14/1932
295,042	71/311,400	6/14/1932
295,049	71/309,115	6/14/1932
295,055	71/320,164	6/14/1932
295,063	71/321,704	6/14/1932
295,071	71/318,597	6/14/1932
560,043	71/535,737	6/17/1952
560,046	71/545,029	6/17/1952
560,050	71/553,804	6/17/1952
560,052	71/557,973	6/17/1952
560,054	71/559,391	6/17/1952
560,058	71/564,624	6/17/1952
560,059	71/565,147	6/17/1952
560,060	71/565,552	6/17/1952
560,062	71/567,533	6/17/1952
560,078	71/584,249	6/17/1952
560,079	71/586,069	6/17/1952
560,087	71/589,780	6/17/1952
560,090	71/590,627	6/17/1952
560,091	71/591,642	6/17/1952
560,097	71/595,168	6/17/1952
560,098	71/595,388	6/17/1952
560,110	71/599,440	6/17/1952
560,112	71/601,126	6/17/1952
560,126	71/604,980	6/17/1952
560,136	71/606,218	6/17/1952
560,138	71/606,592	6/17/1952
560,147	71/608,927	6/17/1952
560,156	71/610,503	6/17/1952
560,158	71/610,755	6/17/1952
560,170	71/612,170	6/17/1952
560,175	71/612,224	6/17/1952
560,177	71/612,354	6/17/1952
560,186	71/613,759	6/17/1952
560,193	71/614,592	6/17/1952
560,200	71/615,103	6/17/1952
560,202	71/615,152	6/17/1952
560,203	71/615,422	6/17/1952
560,206	71/615,500	6/17/1952
560,207	71/615,549	6/17/1952
560,217	71/616,284	6/17/1952
560,231	71/617,737	6/17/1952
560,234	71/617,964	6/17/1952
560,235	71/618,056	6/17/1952
560,245	71/620,622	6/17/1952
560,255	71/589,929	6/17/1952
560,257	71/595,284	6/17/1952
560,264	71/619,070	6/17/1952
560,272	71/557,575	6/17/1952
560,277	71/561,572	6/17/1952
560,282	71/569,748	6/17/1952
560,290	71/584,993	6/17/1952
560,299	71/588,954	6/17/1952
560,323	71/611,247	6/17/1952
560,327	71/612,747	6/17/1952
560,329	71/613,729	6/17/1952
560,330	71/613,937	6/17/1952
560,333	71/621,832	6/17/1952
560,334	71/628,206	6/17/1952
935,523	72/353,547	6/13/1972
935,525	72/378,297	6/13/1972
935,526	72/381,575	6/13/1972
935,529	72/387,647	6/13/1972
935,533	72/388,477	6/13/1972
935,537	72/364,709	6/13/1972
935,550	72/386,528	6/13/1972
935,553	72/380,307	6/13/1972
935,560	72/380,582	6/13/1972
935,561	72/387,646	6/13/1972
935,565	72/391,428	6/13/1972
935,570	72/392,147	6/13/1972
935,586	72/406,874	6/13/1972
935,589	72/407,232	6/13/1972
935,591	72/355,637	6/13/1972
935,597	72/372,316	6/13/1972
935,599	72/372,883	6/13/1972
935,602	72/382,582	6/13/1972
935,604	72/357,100	6/13/1972
935,608	72/363,423	6/13/1972
935,613	72/365,166	6/13/1972
935,616	72/366,671	6/13/1972
935,620	72/367,986	6/13/1972
935,624	72/375,735	6/13/1972
935,626	72/377,023	6/13/1972
935,638	72/388,103	6/13/1972
935,646	72/390,283	6/13/1972
935,648	72/391,169	6/13/1972
935,650	72/393,544	6/13/1972
935,652	72/398,263	6/13/1972
935,653	72/398,264	6/13/1972
935,654	72/286,832	6/13/1972
935,656	72/354,916	6/13/1972
935,657	72/354,918	6/13/1972
935,658	72/355,235	6/13/1972
935,659	72/361,664	6/13/1972
935,661	72/368,155	6/13/1972
935,669	72/389,566	6/13/1972
935,670	72/389,588	6/13/1972
935,671	72/396,513	6/13/1972
935,672	72/337,645	6/13/1972
935,673	72/343,639	6/13/1972
935,680	72/380,739	6/13/1972
935,683	72/384,186	6/13/1972
935,686	72/387,086	6/13/1972
935,687	72/394,271	6/13/1972
935,688	72/325,920	6/13/1972
935,690	72/396,651	6/13/1972
935,691	72/397,275	6/13/1972
935,692	72/397,394	6/13/1972
935,693	72/398,116	6/13/1972
935,696	72/346,824	6/13/1972
935,697	72/317,391	6/13/1972
935,700	72/329,292	6/13/1972
935,702	72/382,538	6/13/1972
935,706	72/395,017	6/13/1972
935,710	72/388,252	6/13/1972
935,711	72/388,261	6/13/1972
935,714	72/373,291	6/13/1972
935,717	72/378,792	6/13/1972
935,718	72/386,679	6/13/1972
935,725	72/303,300	6/13/1972
935,734	72/314,749	6/13/1972
935,745	72/388,356	6/13/1972
935,749	72/391,047	6/13/1972
935,752	72/394,137	6/13/1972
935,762	72/376,984	6/13/1972
935,763	72/379,947	6/13/1972
935,764	72/389,292	6/13/1972
935,770	72/366,483	6/13/1972
935,773	72/318,900	6/13/1972
935,776	72/390,102	6/13/1972
935,777	72/390,103	6/13/1972
935,781	72/375,714	6/13/1972
935,782	73/395,376	6/13/1972
935,791	72/338,158	6/13/1972
935,795	72/365,617	6/13/1972
935,801	72/393,097	6/13/1972
935,803	72/387,666	6/13/1972
935,808	72/349,991	6/13/1972
935,809	72/349,992	6/13/1972

Reg. Number	Serial Number	Reg. Date
935,810	72/349,993	6/13/1972
935,814	72/366,954	6/13/1972
935,815	72/387,180	6/13/1972
935,817	72/370,994	6/13/1972
935,819	72/376,260	6/13/1972
935,820	72/381,659	6/13/1972
935,823	72/352,514	6/13/1972
935,828	72/386,178	6/13/1972

PATENT NOTICES

Certificates of Correction For Week of April 20, 1993

5,075,134	5,078,007	5,081,713	5,086,030
5,075,258	5,078,076	5,081,752	5,086,429

SPECIAL BOXES FOR MAIL

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Certificates of Correction For Week of April 20, 1993

Re. 33,812	5,010,193	5,046,049	5,064,977
D. 316,815	5,010,400	5,046,195	5,064,978
D. 319,770	5,010,405	5,046,495	5,065,257
D. 322,955	5,010,888	5,047,449	5,065,295
4,455,297	5,010,900	5,048,061	5,065,330
4,595,880	5,011,508	5,048,095	5,064,446
4,718,947	5,011,748	5,048,745	5,065,526
4,742,000	5,011,879	5,048,769	5,065,529
4,775,625	5,012,291	5,049,133	5,065,581
4,798,745	5,012,455	5,049,231	5,065,583
4,816,443	5,012,973	5,049,340	5,065,606
4,830,907	5,013,388	5,049,349	5,065,708
4,838,958	5,013,742	5,049,931	5,065,745
4,839,702	5,015,549	5,050,007	5,065,769
4,840,216	5,016,652	5,050,117	5,065,795
4,847,241	5,017,293	5,050,232	5,065,904
4,858,202	5,017,416	5,050,348	5,065,995
4,861,738	5,017,434	5,050,845	5,066,334
4,861,833	5,018,006	5,050,972	5,066,340
4,897,444	5,018,987	5,051,156	5,066,480
4,898,968	5,021,018	5,051,487	5,066,729
4,905,470	5,021,969	5,051,974	5,066,752
4,906,691	5,023,080	5,052,835	5,067,160
4,910,296	5,023,660	5,053,384	5,067,254
4,915,027	5,023,728	5,054,272	5,067,391
4,926,177	5,023,864	5,055,264	5,067,631
4,936,059	5,024,640	5,055,269	5,067,789
4,936,359	5,024,656	5,055,498	5,067,980
4,939,141	5,024,694	5,056,435	5,068,071
4,939,933	5,025,448	5,056,523	5,068,137
4,943,545	5,025,475	5,056,629	5,068,160
4,944,992	5,026,496	5,057,706	5,068,240
4,945,122	5,026,902	5,058,054	5,068,285
4,949,407	5,027,147	5,058,059	5,068,313
4,953,717	5,028,318	5,058,077	5,068,341
4,958,357	5,029,017	5,058,746	5,068,503
4,960,321	5,029,802	5,058,823	5,068,528
4,962,448	5,029,870	5,058,851	5,068,674
4,963,638	5,029,995	5,059,037	5,068,726
4,967,245	5,030,187	5,059,044	5,069,107
4,968,318	5,032,687	5,059,123	5,069,222
4,970,771	5,032,901	5,059,234	5,069,378
4,971,528	5,033,868	5,059,261	5,069,422
4,974,551	5,034,152	5,059,303	5,069,515
4,975,874	5,034,336	5,059,368	5,069,553
4,977,372	5,034,470	5,059,395	5,069,575
4,978,385	5,034,890	5,059,762	5,069,780
4,978,555	5,035,510	5,059,962	5,069,964
4,978,972	5,036,089	5,060,118	5,070,110
4,981,619	5,036,192	5,060,167	5,070,173
4,981,640	5,037,286	5,060,236	5,070,501
4,982,229	5,038,075	5,060,338	5,070,505
4,982,352	5,038,390	5,060,420	5,070,647
4,982,408	5,039,309	5,060,713	5,070,741
4,982,827	5,039,310	5,060,831	5,070,826
4,985,421	5,040,031	5,060,954	5,071,010
4,988,933	5,040,194	5,061,027	5,071,081
4,989,284	5,040,604	5,061,303	5,071,225
4,989,532	5,040,881	5,061,327	5,071,721
4,990,560	5,041,207	5,061,611	5,071,849
4,991,476	5,041,344	5,061,849	5,071,864
4,991,559	5,041,416	5,062,214	5,071,877
4,991,589	5,041,877	5,062,385	5,072,069
4,991,787	5,042,559	5,062,458	5,072,308
4,992,425	5,043,058	5,062,622	5,072,408
4,994,118	5,043,263	5,062,709	5,072,749
4,994,687	5,043,324	5,062,957	5,072,771
4,995,391	5,043,371	5,063,110	5,073,057
4,996,686	5,043,620	5,063,116	5,073,122
4,999,083	5,043,651	5,063,164	5,073,817
5,000,980	5,043,707	5,063,261	5,073,835
5,003,423	5,044,375	5,063,411	5,073,866
5,004,691	5,044,542	5,063,576	5,073,883
5,006,781	5,045,124	5,063,756	5,074,017
5,007,483	5,045,214	5,064,014	5,074,227
5,007,806	5,045,304	5,064,228	5,074,432
5,009,472	5,045,539	5,064,589	5,074,771
5,075,134	5,078,007	5,081,713	5,086,030
5,075,258	5,078,076	5,081,753	5,086,429
5,075,313	5,078,089	5,081,763	5,086,699
5,075,420	5,078,239	5,082,271	5,087,262
5,075,521	5,078,445	5,082,515	5,087,550
5,075,802	5,078,505	5,082,585	5,087,635
5,075,865	5,078,579	5,082,595	5,087,752
5,076,302	5,078,630	5,082,656	5,087,769
5,076,339	5,078,846	5,082,657	5,087,848
5,076,539	5,079,028	5,082,699	5,087,915
5,076,711	5,079,088	5,082,786	5,088,160
5,076,814	5,079,260	5,082,806	5,088,237
5,076,817	5,079,367	5,082,840	5,088,307
5,076,862	5,079,674	5,082,951	5,088,332
5,076,895	5,079,997	5,083,475	5,088,709
5,076,935	5,080,364	5,083,485	5,088,948
5,076,988	5,080,573	5,083,611	5,088,985
5,077,033	5,080,798	5,083,624	5,089,147
5,077,074	5,080,872	5,083,691	5,089,490
5,077,195	5,080,894	5,083,869	5,098,400
5,077,206	5,081,195	5,083,915	5,126,529
5,077,220	5,081,256	5,084,371	5,128,145
5,077,330	5,081,290	5,084,533	5,131,623
5,077,356	5,081,418	5,084,843	5,132,454
5,077,483	5,081,467	5,084,896	5,160,231
5,077,493	5,081,500	5,084,915	5,163,193
5,077,576	5,081,582	5,085,056	
5,077,667	5,081,696	5,085,659	

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
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	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
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	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280

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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

REEXAMINATIONS

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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	4/25/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	7/23/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	6/05/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/05/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	9/19/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	10/01/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	9/14/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	12/19/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	4/03/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	9/07/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	12/02/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/29/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	6/23/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/19/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	6/26/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	3/03/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during March 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

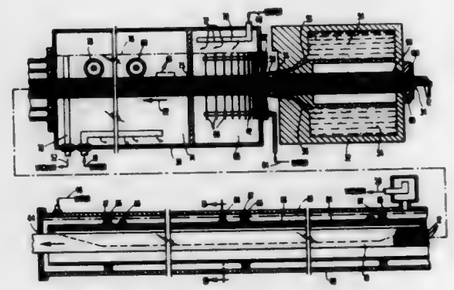
Patents ..... Numbers 3,940,801 to 3,947,895 inclusive
Plant Patents ..... 3,831 to 3,855

REEXAMINATIONS

APRIL 20, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,508,500 (1977th)
ELECTRICAL DUCT EXTRUSION APPARATUS
Terry M. French, Cressona, Pa., assignor to Tamaqua Cable Products Corporation, Schuylkill Haven, Pa.
Reexamination Request No. 90/002,617, Jan. 17, 1992.
Reexamination Certificate for Patent No. 4,508,500, issued Apr. 2, 1985, Ser. No. 548,503, Nov. 3, 1983.
Reexamination Certificate B0 4,508,500, issued Jan. 17, 1992.
Int. Cl.[5] B29C *47/02*
U.S. Cl. 425—388



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-2 is confirmed.

Claims 3-17 are cancelled.

New claims 18-33 are added and determined to be patentable.

18. A differential pressure calibrating tank for sizing and cooling just-extruded duct having cable extending therethrough comprising:

a duct inlet opening to the tank for receiving just-extruded duct from an adjacent extrusion die;

a calibrator head adjacent the inlet opening for sizing the just-extruded duct;

a cooling water inlet to the tank, the cooling water partially filling the tank and submersing the just-extruded duct;

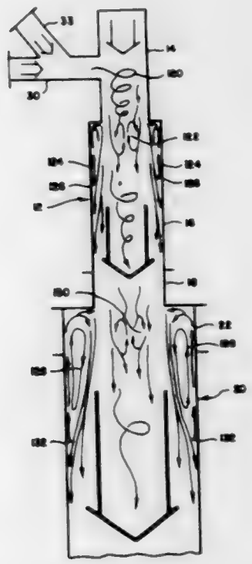
a vacuum source to the tank for creating a differential pressure across the walls of the duct;

a duct exit from the tank through which sized and cooled duct passes;

a means for restraining the duct submersed in the water as the duct travels from the duct inlet to the exit, said means for restraining said duct comprises at least one roller oriented to rotate about an axis transverse to the path of travel of said duct between the duct inlet and the duct exit, said roller being inflatable and deformable; and

a flexible conduit, having one end fixed relative to said extrusion die in a manner such as to permit extrusion of said duct about said conduit and a portion of said flexible conduit extending within the duct inlet opening of the tank, said flexible conduit being movable relative to said tank for precluding contact between the duct and the cable before the duct has cooled.

B1 4,654,077 (1978th)
METHOD FOR THE PYROMETTALLURGICAL TREATMENT OF FINELY DIVIDED MATERIALS
John F. Punsteri, Beaverton, Pa.; Thomas E. Kidd, Tallahoma, and Glen R. Lazalier, Hillsboro, both of Tenn., assignors to Manufacturers Hanover Trust Company
Reexamination Request No. 90/002,457, Oct. 1, 1991.
Reexamination Certificate for Patent No. 4,654,077, issued Mar. 31, 1987, Ser. No. 799,538, Nov. 19, 1985.
Int. Cl.[5] C22B *5/02*
U.S. Cl. 423—619



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 5-7, and 11 are determined to be patentable as amended.

Claims 2, 4 and 8-10, dependent on an amended claim, are determined to be patentable.

1. A process for pyrometallurgically treating finely divided ores, concentrates, residues, slags, and like metal-bearing materials, comprising the step of:

providing within a first vertically-extending chamber hot fuel-rich reaction gases;

passing said hot fuel-rich reaction gases by [dump] *ring vortex stabilized* flow into a second vertically-extending chamber;

introducing into said second chamber the finely divided materials to be treated; and

reacting said finely divided materials with said hot fuel-rich reaction gases.

B1 4,732,368 (1979th)

B1 4,894,562 (1980th)

B1 4,896,943 (1981st)
ENCAPSULATED LENS RETROREFLECTIVE

(b) a retaining element movably mounted to the frame;
(c) means for securing at least one electrode defining a plu-

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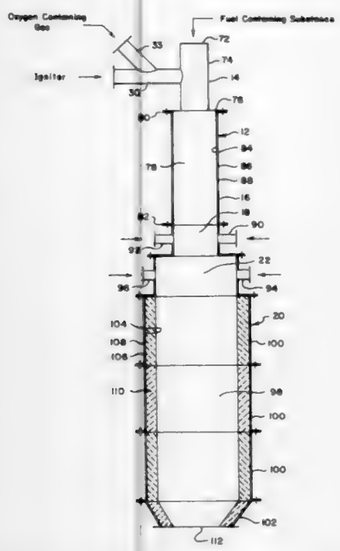
B1 4,732,368 (1979th)
APPARATUS FOR THE PYROMETALLURGICAL TREATMENT OF FINELY DIVIDED MATERIALS
John F. Pusateri, Palmerton, Pa., and Thomas E. Kidd, Tullahoma, Tenn., assignors to Horsehead Resource Development Co., Inc., Palmerton, Pa.
Reexamination Request No. 90/002,458, Oct. 1, 1991.
Reexamination Certificate for Patent No. 4,732,368, issued Mar. 22, 1988, Ser. No. 929,957, Nov. 12, 1986.
Division of Ser. No. 799,538, Nov. 19, 1985
Int. Cl.[5] C22B *1/10;* **C21B** *7/00*
U.S. Cl. 266—172



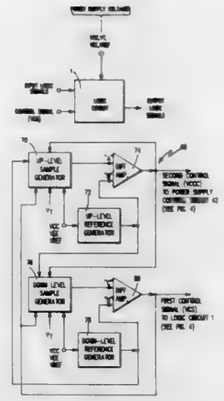
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–6**, dependent on an amended claim, are determined to be patentable.

1. Reactor apparatus for use in the pyrometallurgical treatment of finely divided material, said apparatus comprising:
a vertically-extending cylindrical structure having first and second stages in series *with a zone of sudden expansion therebetween*, said first stage having a turbulent mixing section feeding a dump section, the output from said dump section feeding said second stage, with the latter having an output for treated material, said first and second stages being dimensioned to create **[**dump flow therebetween**]** *a recirculation zone within said vertical, bounded sidewalls that is toroidal in shape and begins downstream of said sudden expansion zone at a point of gaseous reattachment to said sidewalls;*
means coupled to said first stage for introducing therein a fuel-containing substance and an oxidizing gas to produce substantially within said first stage a hot fuel-rich reaction mixture for treating said material; and
means for introducing said material to be treated into said second stage for reaction with said hot fuel-rich reaction mixture to yield treated material that exits from the output of said second stage.

B1 4,894,562 (1980th)
CURRENT SWITCH LOGIC CIRCUIT WITH CONTROLLED OUTPUT SIGNAL LEVELS
Joseph R. Cavaliere, Hopewell Junction, and George E. Smith, III, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Reexamination Request No. 90/002,580, Feb. 14, 1992.
Reexamination Certificate for Patent No. 4,894,562, issued Jan. 16, 1990, Ser. No. 252,489, Oct. 3, 1988.
Int. Cl.[5] H03K *19/086, 19/003, 17/14, 17/16*
U.S. Cl. 307—455



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4** and **10–17** is confirmed.

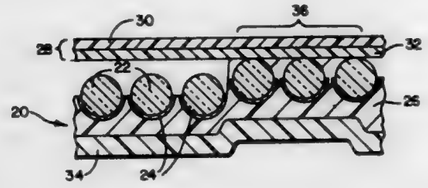
Claims **1–3** and **18–20** are cancelled.

Claims **5** and **7** are determined to be patentable as amended.

Claims **6**, **8** and **9**, dependent on an amended claim, are determined to be patentable.

[1. A logic circuit network for producing an adjustable first logic level and a different adjustable second logic level in response to at least one input signal, comprising:
a logic circuit having at least one input terminal, at least one output terminal, at least one power supply terminal for receiving power, circuit components having parameters and a first control terminal;
a control circuit coupled to the logic circuit and having a second control terminal;
means for independently generating a first control signal and a second control signal responsive to changes in the power supply, temperature and logic circuit component parameters; and
means for supplying the control signals to the first and second control terminals, respectively, so as to maintain the first and second logic levels at different predetermined reference levels despite changes in the power supply, temperature and logic circuit component parameters.**]**
4. The logic circuit network of claim **1**, in which the control circuit comprises:
a load resistor;
a controllable dynamic resistance connected across the resistor, comprising one or more transistors;
a controllable current source comprising one or more transistors, connected to the dynamic resistance; and
means for controlling the current source and the dynamic resistance by the second control signal.

B1 4,896,943 (1981st)
ENCAPSULATED-LENS RETROREFLECTIVE SHEETING HAVING IMPROVED COVER FILM
Howard R. Tolliver, Woodbury; Roger R. Kult, Maplewood; Terry R. Bailey, Woodbury, and Arthur D. Dickson, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Reexamination Request No. 90/002,727, May 21, 1992.
Reexamination Certificate for Patent No. 4,896,943, issued Jan. 30, 1990, Ser. No. 49,674, May 13, 1987.
Int. Cl.[5] G02B *5/128*
U.S. Cl. 359—540



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–25**, dependent on an amended claim, are determined to be patentable.

1. An encapsulated-lens retroreflective sheeting comprising a monolayer of lenses partially embedded in a binder layer, a specularly reflective layer underlying the lenses, and a cover film sealed to the binder layer along a network of interconnecting lines forming hermetically sealed cells within which the lenses are encapsulated and have an air interface, wherein:
the cover film comprises *low-density* polyethylene, or polypropylene; or a copolymer comprising a major portion by weight of at least one of ethylene or propylene and a minor portion by weight of at least one comonomer; blends of polyethylene, polypropylene, or copolymers.

B1 4,904,838 (1982nd)
ELECTRODE CHANGERS AND METHODS OF OPERATION FOR ELECTRICAL BONDING APPARATUS
Charles F. Szantho, Roselle Park; Allan Warner, Clark, and Edward D. Riordan, S. Somerville, all of N.J., assignors to Joyal Products, Inc., Linden, N.J.
Reexamination Request No. 90/002,777, Jul. 10, 1992.
Reexamination Certificate for Patent No. 4,904,838, issued Feb. 27, 1990, Ser. No. 164,122, Mar. 4, 1988.
Continuation-in-part of Ser. No. 908,566, Sep. 18, 1986, Pat. No. 4,766,282
Int. Cl.[5] B23K *11/30*
U.S. Cl. 219—86.8

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

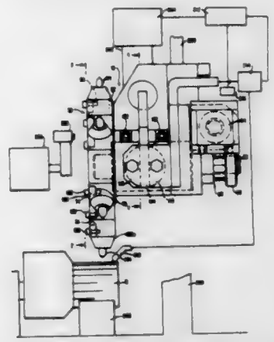
The patentability of claims **14–32** is confirmed.

Claims **1** and **10** are determined to be patentable as amended.

Claims **2–9** and **11–13**, dependent on an amended claim, are determined to be patentable.

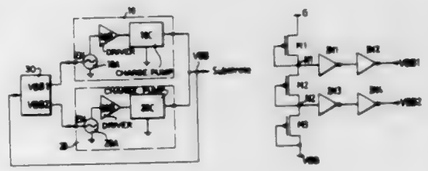
New claims **33–45** are added and determined to be patentable.

1. An electrode changer for electrical bonding apparatus comprising:
(a) a frame;
(b) a retaining element movably mounted to the frame;
(c) means for securing at least one electrode defining a plurality of contact regions to said retaining element;
(d) means for arresting movement of said retaining element relative to said frame so as to hold one of said contact regions in an operative position and intermittently moving said retaining element relative to said frame to bring a new one of said contact regions into said operative position;
(e) means for transmitting electrical current to said retaining



element, said electrical transmitting means including an electrical transmission element on said frame and an electrical transmission element on said retaining element, *said electrical transmission elements being separately constructed from said means for arresting movement of said retaining element;*
(f) means for biasing said electrical transmission elements into engagement with one another; and
(g) means for temporarily relieving said bias concomitantly with intermittent movement of said retaining element.

B1 5,034,625 (1983rd)
SEMICONDUCTOR SUBSTRATE BIAS CIRCUIT
Dong-sun Min, Seoul, and Hoon Choi, Taegu, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Reexamination Request No. 90/002,594, Feb. 14, 1992.
Reexamination Certificate for Patent No. 5,034,625, issued Jul. 23, 1991, Ser. No. 417,314, Oct. 5, 1989.
Claims priority, application Rep. of Korea, Dec. 19, 1988, 88-16959
Int. Cl.[5] H03K *3/354;* **H01L** *27/04, 29/94*
U.S. Cl. 307—296.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–16** are cancelled.

[1. A semiconductor substrate bias circuit comprising:
first and second substrate biasing means, connected in parallel between a substrate and a ground node, for biasing said substrate with a substrate bias voltage; and
detecting means for selectively enabling said first and second substrate biasing means in accordance with the substrate bias voltage.**]**

REISSUES

APRIL 20, 1993

Matter printed in italics **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,224

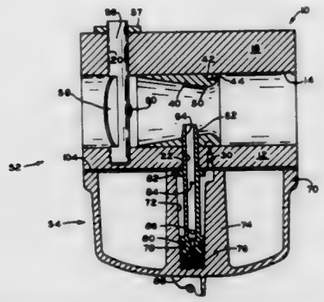
METHOD OF MAKING A CARBURETOR

Thomas G. Guntly, Hartford; Mark E. Federspiel, and Michael J. Kurth, both of West Bend, all of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Original No. 4,864,705, dated Sep. 12, 1989, Ser. No. 267,037, Nov. 4, 1988. Application for reissue Oct. 16, 1990, Ser. No. 598,358

Int. Cl.[5] B23P *15/00*

U.S. Cl. 29—888.01 17 Claims



1. A method of making a carburetor comprising:

forming an extrusion *having a generally axial throughbore therein;*

cutting a carburetor body of a predetermined length from said extrusion;

forming a nozzle bore in said body;

providing a venturi member, said venturi member including a nozzle aperture;

inserting said venturi member axially into the throughbore of said body;

aligning said nozzle aperture with said nozzle bore;

providing a fuel bowl, *said fuel bowl having a well portion positioned generally centrally of said fuel bowl;*

inserting a resilient spring into said well portion;

inserting a nozzle into said well portion through said nozzle bore and said nozzle aperture;

securing said fuel bowl to said body; and

forming fluid passages in said body.

Re. 34,225

MODULAR SICKLE BAR SECTIONS

David S. Majkrzak, West Fargo, N. Dak., assignor to Crary Company, West Fargo, N. Dak.

Original No. 4,805,390, dated Feb. 21, 1989, Ser. No. 50,147, May 14, 1987. Application for reissue Feb. 20, 1991, Ser. No. 658,063

Int. Cl.[5] A01D *34/14*

U.S. Cl. 56—300 12 Claims

8. A modular sickle knife assembly comprising at least first and second sickle modules, each sickle module comprising a knifeback portion having a longitudinal length and a plurality of knife sections mounted on each of the sickle modules, and said sickle modules each having splice forming means on at least one end thereof for splicing adjacent sickle modules together, said splice forming means comprising complemental splice plates integral with each of the knifeback portions and having a radiused surface formed where the splice plate joins the respective knifeback portion and a shoulder surface generally perpendicular to the splice plate being formed at the junction with the respective knifeback portions and joining the radiused surface, said splice plates overlapping each other at the splice in direction of the longitudinal length, said splice plates having aligning openings when positioned overlapped to form a sickle knife assembly and each splice plate having an end spaced in longitudinal direction from the shoulder surface of other knifeback portion when the openings in the splice plates are aligned, a splice knife section providing a plurality of openings aligning with at least two aligning openings of the overlapping splice plates, said openings in the splice knife section including separate openings in each end of the splice knife section means, aligning with openings through a separate one of the separate knifeback portions of the adjacent sickle modules other than openings in the splice plates and fastening means in each of the openings of the splice knife section means to fasten the splice knife section means to the knifeback portions and splice plates of the two modules being joined.

Re. 34,226

CYLINDER HEAD COOLING FOR MULTIPLE VALVE ENGINE

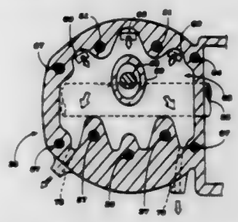
Isao Morishita, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Original No. 4,972,807, dated Nov. 27, 1990, Ser. No. 357,473, May 26, 1989. Application for reissue Jun. 10, 1991, Ser. No. 713,405

Claims priority, application Japan, May 30, 1988, 63-134053

Int. Cl.[5] F02F *1/36*

U.S. Cl. 123—41.82 R 35 Claims



21. A cylinder head for a liquid cooled internal combustion engine, said cylinder head being defined by a lower surface having a recessed portion forming at least in part a combustion chamber and a surrounding planer portion for sealing cooperation with an associated cylinder block, at least two first ports extending through one side of said cylinder head and terminating in a pair of spaced apart first valve seats on one side of said recess, at least two second ports extending through the other side of said cylinder head and terminating a pair of spaced apart second valve seats formed on the other side of said recess, and a cooling jacket formed internally of said cylinder head and extending substantially between said sides for receiving a liquid coolant, said cooling jacket being defined in part by internal spaced apart first and second walls defining said first ports so that said cooling jacket extends substantially from said one side of said cylinder head and between said two first ports, said cooling jacket being further defined by a third wall extending from the other side of said cylinder head and which defines both of said second ports and which extends back to the other side of said

cylinder head so that said cooling jacket does not extend in any substantial extent between said second ports

Re. 34,228

ALKALINE BENZYLIC ETHER PHENOLIC RESIN

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cylinder head so that said cooling jacket does not extend in any substantial extent between said second ports.

Re. 34,227

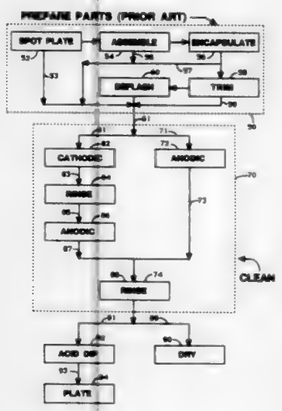
NON-CYANIDE ELECTRODE CLEANING PROCESS

Reginald K. Asher; Duane W. Endicott, both of Scottsdale, Ariz., and Beng L. Lim, Malacca, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 4,968,397, dated Nov. 6, 1990, Ser. No. 441,595, Nov. 27, 1989. Application for reissue Jun. 6, 1991, Ser. No. 710,853

Int. Cl.[5] **C25F** *1/00, 5/00*

U.S. Cl. 204—141.5 **47 Claims**



20. A method of removing non-metal material from metal surfaces comprising the steps of:

providing a metal surface having thereon non-metal material to be removed; and

immersing said metal surface in a solution comprising lactic acid and a metal hydroxide and applying an electrical potential between said metal surface and a reference electrode contacting said solution to remove said non-metal material at a rate faster than the removal rate of the metal.

Re. 34,228

ALKALINE BENZYLIC ETHER PHENOLIC RESIN BINDERS

David R. Armbruster, Forest Park, and Merlyn C. Pasion, Chicago, both of Ill., assignors to Acme Resin Corp., Westchester, Ill.

Original No. 5,021,539, dated Jun. 4, 1991, Ser. No. 328,438, Mar. 24, 1989. Application for reissue Mar. 2, 1992, Ser. No. 844,782

Int. Cl.[5] **C08G** *8/04;* **C08L** *61/00;* **B22C** *1/22, 9/00*

U.S. Cl. 528—129 **26 Claims**

15. A binder composition which comprises an aqueous alkaline solution of a phenolic resole resin, said aqueous solution having a solids content of from about 40% to about 75% by weight, said phenolic resole having an aldehyde:phenol molar ratio of from about 1.2:1 to about 2.6:1 and an alkali:phenol molar ratio of from about 0.2:1 to about 1.2:1, wherein the phenolic resole resin is the modified benzylic ether resole resin [of claim 8] *obtained by a process comprising the steps of:*

(a) first reacting a phenol with a molar excess of an aldehyde in the presence of a divalent metal ion catalyst at a pH below 7 until from about 20% to about 90% by weight of the aldehyde has combined with the phenol;

(b) then adding sufficient basic catalyst to the mixture of step(a) to raise the pH to at least about 8; and

(c) heating the mixture obtained in step (b) until the free aldehyde in the mixture is less than about 5% by weight of the mixture.

Re. 34,229

CYLINDRICAL PERMANENT MAGNET AND METHOD OF MANUFACTURING

Motoharu Shimizu, Kumayaga; Noriyuki Noda, and Yoshihiro Noguchi, both of Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Original No. 4,547,758, dated Oct. 15, 1985, Ser. No. 446,322, Dec. 2, 1982. Application for reissue Oct. 6, 1989, Ser. No. 426,569

Int. Cl.[5] **H01F** *7/02*

U.S. Cl. 335—302 **5 Claims**

1. A cylindrical permanent magnet, comprising:

a sintered material having a composition expressed by $MO.nFe_2O_3$, where M represents Ba, Sr, Pb or a mixture thereof, and n is a value of 5 to 6,

the magnet being characterized by a surface multipolar anisotropy of more than eight poles imparted to the cylindrical portion of the magnet, and

the magnet being further characterized by having an inside diameter D_1 and an outside diameter D_2 of the cylindrical portion which satisfy the condition:

$$D_1/D_2 = 1 - K_1\pi/P$$

where P is the number of poles imparted to the cylindrical portion of the magnet, and K_1 is a constant defined by [1.5] $\propto 1.76 \leqq K_1 \leqq 2.5$.

PLANT PATENTS

GRANTED APRIL 20, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,205

STRAWBERRY PLANT NAMED 'PSI-.118'

Steven D. Nelson; Michael D. Nelson, both of Watsonville, and Daniel T. Schmida, Aptos, all of Calif., assignors to Plant Sciences, Inc., Watsonville, Calif.

Filed Dec. 27, 1990, Ser. No. 635,220

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. A new distinct strawberry variety, as herein described and illustrated.

8,206

AFRICAN VIOLET PLANT NAMED TAMA

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,503

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—69.1 **1 Claim**

1. A new and distinct cultivar of African violet named Tama, as described and illustrated, and particularly characterized by its single violet-shaped, pearl color flowers with light pink center; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, oval leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

8,207

CHRYSANTHEMUM PLANT NAMED POWER

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 9, 1991, Ser. No. 756,838

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Power, as described and illustrated.

8,208

CHRYSANTHEMUM PLANT NAMED DARK YELLOW BOALDI

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 21, 1991, Ser. No. 719,179

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Dark Yellow Boaldi, as described and illustrated.

8,209

CHRYSANTHEMUM PLANT NAMED DARK FALMA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 9, 1991, Ser. No. 756,839

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct Chrysanthemum plant named Dark Falma, as described and illustrated.

8,210

CHRYSANTHEMUM PLANT NAMED LEXUS

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 9, 1991, Ser. No. 756,840

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named Lexus, as described and illustrated.

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PATENTS

GRANTED APRIL 20, 1993

GENERAL AND MECHANICAL

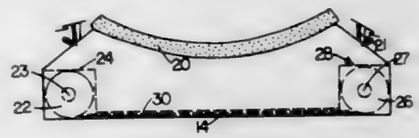
5,203,033
CAMOUFLAGED GARMENT
David L. Sheppard, Sr., 7 Pine Lake Dr.; David L. Sheppard, Jr., 1708 Wansley Rd., and Christopher Sheppard, 7 Pine Lake Dr., all of Laurel, Miss. 39440
Filed Jul. 25, 1991, Ser. No. 735,745
Int. Cl.[5] A41D *27/08*
U.S. Cl. 2—69 **3 Claims**

1. A clothing garment adaptable for camouflage effect comprising:
a) a garment material conformed to fit the human body;
b) a plurality of elongated deformable connectors secured at respective ends to said garment so as to define flexible and twistable connector loops extending outwardly of said garment material, and
c) at least one pair of simulated leaves attached to one of said connector loops, each pair having an axially extending common stem, such that a simulated leaf extends from each end of said stem, said stem likewise being flexible and deformable the attachment of said pair to said connector loop being in the form of a stem loop extensible through said flexible and twistable connector loop with said pair of leaves being drawn together and pulled through said stem loop for double looping and binding non-slip attachment to the flexible connector loop.

5,203,034
OPERATING DEVICE FOR PROTECTIVE HELMETS
Artur Foehl, Auf der Halde 28, D-7060 Schorndorf, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 472,952, Jan. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 194,993, Jun. 22, 1988, abandoned. This application Dec. 4, 1991, Ser. No. 803,476
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628493
Int. Cl.[5] A42B *7/00*
U.S. Cl. 2—421 **12 Claims**

1. A control device for actuating a locking device placed inside a shell of a helmet for changing a locking condition of a chin strap of the helmet, comprising:
a control part having a surface which is accessible from outside the helmet shell, wherein the control part is integrated with the helmet shell in an area of a neck ring of the helmet shell such that in a neutral position of the control device, the surface of the control part is continuous with an outer surface of the helmet shell, forming at most a minor interruption of the outer surface of the helmet shell; and,
guide means in the neck ring area of the helmet shell for guiding the control part into the helmet shell upon application of a vertical force, wherein said guide means includes a guide part for guiding the control part, the guide part being provided in a cut-out at an edge of the helmet shell, the cut-out being dimensioned to accommodate the control device.

5,203,035
VISION CLEARING DEVICE
James F. Lawlor, 4475 Mission Blvd., #233, San Diego, Calif. 92109
Filed Aug. 17, 1992, Ser. No. 931,204
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—438 **6 Claims**



1. A disposable vision clearing device for painting or the like comprising:
a card stock paper housing having a planar front wall panel with a cutout window portion that defines a top frame portion, a bottom frame portion, a left side frame portion and a right side frame portion, said front wall panel having a predetermined width (W1), a predetermined height (H1), a front surface and a rear surface;
said front wall panel having a top edge that defines a fold line that is connected to a top wall;
said front wall panel having a bottom edge that defines a fold line that is connected to a bottom wall;
said front wall panel having a left edge that defines a first fold line that is connected to a left side primary wall portion;
said front wall having a right edge that defines a first fold line that is connected to a right side primary wall portion;
a card stock paper interior assembly having a planar rear wall panel with a cutout portion that defines a top frame section, a bottom frame section, a left side frame section, and a right side frame section, said rear wall panel having a predetermined width (W2) a predetermined height (H2), a front surface and a rear surface;
said rear wall panel having a top edge that defines a fold line that is connected to a top edge tab member;
said rear wall panel having a bottom edge that defines a fold line that is connected to a bottom edge tab member;
an elongated transparent sheet of film having its one end mounted on a supply roll and its other end mounted on a take-up reel, said sheet having a predetermined height H3;
said sheet of film being stretched across the rear surface of said front wall panel and its cutout window portion with said supply roll positioned adjacent said left side frame

portion and said take-up reel positioned adjacent said right side frame portion;

closet bowl for rotating said ratchet through a predetermined angle;

5,203,038
WATER LEVEL SENSING APPARATUS FOR A

5,203,039
ADJUSTABLE CROSS BAR FOR BED RAILS
Irving Friedman, University City, Mo., assignor to Friedman

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portion and said take-up reel positioned adjacent said right side frame portion;

said rear wall panel having its front surface positioned on said sheet of film so that its cutout window portion aligns with the cutout window portion of said front wall panel;

means securing the top edge tab member of said rear wall panel to the rear surface of the top wall of said front wall panel to form a top track between said front and rear wall panels along which the top edge of said sheet of film can travel as it advances across said aligned cutout window portions;

means securing the bottom edge tab member of said rear wall panel to the rear surface of the bottom wall of said front wall panel to form a bottom track between said front and rear wall panels along which the bottom edge of said sheet of film can travel as it advances across said aligned said cutout window portion;

said rear wall panel having a left edge that defines a first fold line that is connected to means for forming the right side wall portion and rear wall portion of a sealed enclosure for said supply roll, the other two side walls of said enclosure being the left side primary wall portion and the left side frame portion of said front wall panel; and

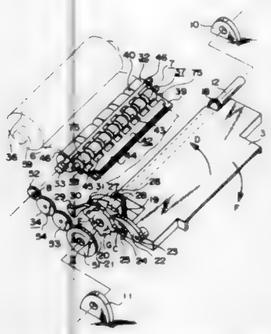
said rear wall panel having a right edge that defines a first fold line that is connected to means for forming the left side wall portion and rear wall portion of a sealed enclosure for said take-up reel, the other two side walls of said enclosure being the right side primary wall portion and the right side frame portion of said front wall panel.

5,203,036

APPARATUS FOR DELIVERING LAYING PAPER FOR CLOSET SEAT

Hiroyuki Juushi, Saitama, Japan, assignor to Nihon-Isued Co., Ltd., Saitama, Japan

Filed Jun. 25, 1991, Ser. No. 722,557
Claims priority, application Japan, Sep. 28, 1990, 2-259840
Int. Cl.[5] A47K *13/20*
U.S. Cl. 4—243.3 **1 Claim**



1. An apparatus for delivering paper for a water closet seat, comprising:

a lid member having a rear end portion;

a box member adapted to be secured to an upper rear side of a closet bowl and means for rotatably supporting said rear end portion in said box member;

a closet seat for the closet bowl, said closet seat being engaged with an under side of said lid member and having a rear end portion means for rotatably and vertically movably supporting the rear end portion of said closet seat in said box member, and spring means urging said closet seat toward said lid member;

a ratchet driving portion including a ratchet and means rotatably supporting said ratchet on said box member and a pawl provided on said lid member and engagable with said ratchet upon raising of said lid member from the closet bowl for rotating said ratchet through a predetermined angle;

a paper delivery roller portion positioned within said box member including means connecting a driving roller to said ratchet whereby said driving roller is rotatable by the rotation of said ratchet, and a pressure roller disposed in parallel with said driving roller and rotatable by the rotation of said driving roller for gripping paper stored in said box member between said driving roller and said pressure roller and pulling the paper out of said box member upon rotation of said driving roller and pressure roller and delivering a predetermined length of paper along a paper path to between said lid member and said closet seat; means for rotatably supporting said rollers in the box member and

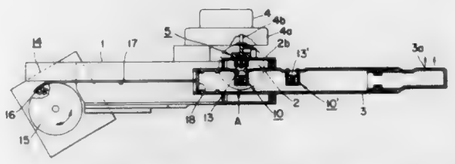
a cutter portion disposed proximate a delivery side of said paper delivery roller portion and having a stationary lower blade disposed below the paper path and a movable upper blade vertically movably disposed above the paper path, said movable upper blade being operatively associated with the rear end portion of said closet seat for being pushed downwardly by the downward movement of said closet seat to thereby cut off the paper between the movable upper blade and the stationary lower blade.

5,203,037

WASHING DEVICE FOR A HUMAN BODY

Se-Hee Kang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 12, 1991, Ser. No. 805,951
Claims priority, application Rep. of Korea, Dec. 14, 1990, 90-20668
Int. Cl.[5] A47K *3/20*
U.S. Cl. 4—420.4 **7 Claims**



1. A bidet-type washing device for attachment to a toilet bowl for washing an anal area or genital area of a human body, comprising:

a frame for attachment to said toilet bowl, said frame having a motor-driven valve actuator;

a nozzle pipe mounted in said frame for movement between first and second positions corresponding to anal and genital positions, respectively, said nozzle pipe having a water outlet including a plurality of nozzle openings;

power-driven displacing means for displacing said nozzle pipe between said first and second positions;

first and second valve means mounted on said nozzle pipe and arranged to be selectively positioned for actuation by said actuator, when said nozzle pipe is in said first and second positions, respectively; and

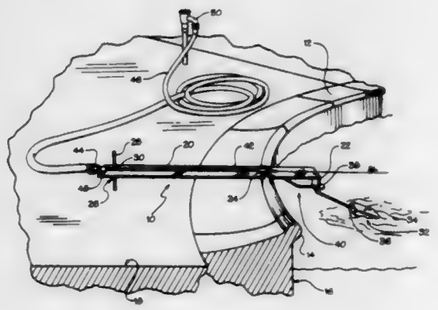
water-supplying means for supplying pressurized water to said valve actuator so that when either of said first and second valve means is opened by said actuator, water is ejected through said first or said second valve means and then through said nozzle openings.

5,203,038

WATER LEVEL SENSING APPARATUS FOR A SWIMMING POOL

Michael Gibbs, 4101 E. La Cadena, Tucson, Ariz. 85718

Filed Jul. 12, 1991, Ser. No. 729,230
Int. Cl.[5] E04H *4/14*
U.S. Cl. 4—508 **3 Claims**



1. An apparatus for sensing the level of fluid in a swimming pool, comprising:

means forming a main body, the main body having an end portion, and means for supporting the main body in free-standing disposition on a surface extending from an edge of the swimming pool with the end portion projecting in cantilever disposition over the edge of the swimming pool;

the supporting means including a first support portion for resting in free-standing disposition on the surface of the swimming pool to support the main body thereat, and a second support portion for resting in free-standing disposition on the swimming pool surface to support the main body thereat, the second support portion being at a spacing from the swimming pool edge greater than the spacing of the first support portion from the swimming pool edge as measured from the intersection of the swimming pool edge and a line passing through the first and second support portions, the first support portion and the second support portion each supporting the main body at respective predetermined heights above the swimming pool surface, the predetermined heights at which the main body is supported above the surface by the first and second support portions being selected such that the spacing between the end portion and the level of fluid decreases in correspondence with decreases in the spacing between the second support portion and the intersection of the line passing through the first and second support portions and the swimming pool edge; and

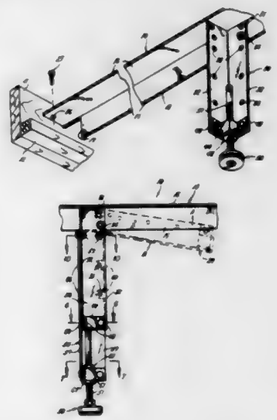
a swimming pool fluid surface following device including a floatation portion and means for movably securing the floatation portion to the end portion of the main body, the floatation portion extending from the end portion of the main body to a swimming pool fluid surface to be buoyantly supported thereat in an initial position relative to the end portion of the main body and the movably securing means permitting movement of the floatation portion such that, as the height of the main body above the swimming pool fluid surface changes due to increases and decreases in the level of fluid in the swimming pool, the position of the floatation portion relative to the end portion of the main body changes as the floatation portion rises and falls due to its buoyant support on the swimming pool fluid surface.

5,203,039

ADJUSTABLE CROSS BAR FOR BED RAILS

Irving Fredman, University City, Mo., assignor to Fredman Brothers Furniture Company, Inc., Peoria, Ill.

Filed Sep. 15, 1992, Ser. No. 945,824
Int. Cl.[5] A47C *19/04, 19/02*
U.S. Cl. 5—203 **13 Claims**



1. A universal cross bar adjustable in height for interconnecting the side rails of a queen size bed wherein the side rails are wood and have opposed horizontal flanges on which the cross bar resides comprising:

a) an "L" angle cross bar having horizontal and vertical webs with notches cut out of the vertical web at the ends whereby the horizontal web lies flat on the side rail horizontal flanges,

b) an "L" angle leg having flanges and being pivotally connected to the vertical web intermediate its ends and movable into a nested position with the cross bar from an extended operating position perpendicular to the cross bar,

c) means for securing the leg in operating position,

d) a "W" bracket positioned inside the "L" angle leg at the free end thereof and defining therewith a square opening,

e) a plastic insert positionable in the opening defined by the bracket and the leg, said insert having

1) a body member adapted to fit in the opening,

2) a flange larger than the opening at one end of the body, and

3) a threaded throughbore through the flange and the body member, and

f) a foot having a threaded stem extending therefrom and adapted to engage the threaded throughbore to provide an adjustable leg in which the distance from the foot to the bar can be adjusted by threading the stem through the threaded throughbore.

5,203,040

SOFT-SIDED FLOTATION MATTRESS FRAME

Arthur A. Hochschild, III, 7274 Lampson Ave., Garden Grove, Calif. 92641

Filed Oct. 16, 1992, Ser. No. 962,328
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—400 **18 Claims**

1. A soft-sided frame for a flotation mattress comprising a flat horizontal rectilinear platform with top and bottom surfaces and side and end edges, anchor plates secured to the top surface of the platform about the side and end portions thereof; elongate wall sections of soft flexible and resilient material overlying the side and end portions of the platform to project

upwardly therefrom and extend about the outer perimeter thereof; and interengaged coupling parts on the anchor plates positioned over and in contiguous communication with the box spring member, and wherein the apparatus comprises

the accompanying member (4) and to exert a pressing force on the permeable flat article (3);

from the pulp within the vessel through the screens and extraction arms;

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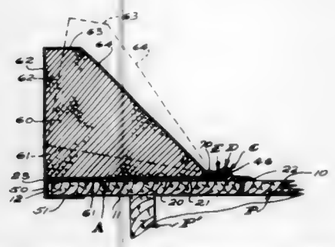
upwardly therefrom and extend about the outer perimeter thereof; and, interengaged coupling parts on the anchor plates and the wall sections releasably securing the wall sections to



the platform, the platform and wall sections defining an upwardly opening frame structure to receive and support the bottom and sides of a slack-filled waterbed flotation mattress.

5,203,041

CHILD'S REST MAT

Frank Alonso, 29458 Blue Water, Malibu, Calif. 90265

Filed Apr. 20, 1992, Ser. No. 871,555
Int. Cl.[5] A47G *9/06*; A47C *27/14*
U.S. Cl. 5—420 **10 Claims**

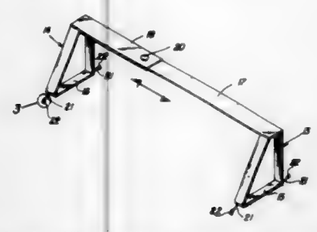
1. A child's rest may comprising a suitably sized, generally planar foam pad capable of folding on itself along longitudinally spaced fold lines, a removable fabric cover sewn along its edges to the dimensions of the pad and enclosing said pad, said cover having at one end a return portion sewn in said cover at said fabric edges to define an interior pocket for said pad, and means securing the covered pad for carrying, said securing means comprising a pair of longitudinally spaced interlocking tabs fastened to one face of said pad cover at opposed ones of said fold lines for maintaining said covered pad in folded condition.

5,203,042

BED COVER LIFT APPARATUS

Arthur L. Mason, 369 E. 33rd St., Paterson, N.J. 07504

Filed Jun. 29, 1992, Ser. No. 905,328
Int. Cl.[5] A47C *21/00*
U.S. Cl. 5—504.1 **3 Claims**



1. A bed cover lift apparatus arranged for mounting onto a bed assembly, wherein the bed assembly includes a mattress member and a box spring member, with the mattress member positioned over and in contiguous communication with the box spring member, and wherein the apparatus comprises,

a first support member spaced from and parallel to a second support member in a coextensive relationship, the first support member having a first base leg, the second support member having a second base leg, wherein the first base leg and the second base leg are arranged in a coplanar coextensive relationship, and

a longitudinally aligned support plate fixedly and orthogonally mounted to the first support member parallel to the first base leg, and the second support member having a support sleeve fixedly and orthogonally mounted to the second support member parallel to the second base leg, wherein the support sleeve slidably receives the support plate, and

wherein the support plate is mounted to an upper distal end of the first support member, and the support sleeve is mounted to an upper distal end of the second support member, and a lock rod is threadedly and orthogonally directed through the support sleeve, wherein the lock rod includes a lower end arranged for engagement with the support plate, wherein the lower end is positioned within the support sleeve, and the lock rod including an upper end, wherein the upper end includes a lock rod handle permitting ease of manual manipulation of the lock rod, and

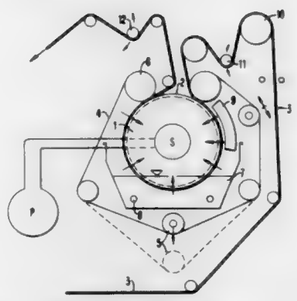
the first base leg and the second base leg each include a plurality of elastomeric straps extending from the respective first base leg and second base leg, and each elastomeric strap includes a clip member arranged for securement to the mattress member.

5,203,043

METHOD FOR CONTINUOUSLY INTENSIVELY WETTING A FLAT ARTICLE, ESPECIALLY A TEXTILE STRIP

Dieter Riedel, Porta Westfalica, Fed. Rep. of Germany, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG, Viersen, Fed. Rep. of Germany

Filed Sep. 5, 1991, Ser. No. 755,434
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1990, 4031063
Int. Cl.[5] D06B *5/08*
U.S. Cl. 8—149.1 **7 Claims**



1. Process for continuous intensive wetting of a permeable flat article, comprising the steps of:

a) wetting a flat permeable article (3) with a wetting liquid by contacting two continuously running permeable accompanying members (2,4) on both sides of the permeable flat article (3), said two continuously running permeable accompanying members being loaded with the wetting liquid;

b) tensioning one of the accompanying members (4) contacting on the permeable flat article (3) to provide a tension in the accompanying member (4) and to exert a pressing force on the permeable flat article (3);

c) controlling the tension in the accompanying member (4) exerting the pressing force on the permeable flat article (3) to prevent the flat article from swelling; and

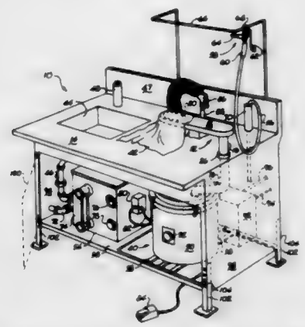
d) subjecting the permeable flat article (3) and both of the accompanying members (2,4) to a suction pressure in a suction treatment to draw moisture and air through the flat article (3) and both of the accompanying members (2,4).

5,203,044

SPOT CLEANING SYSTEM AND METHOD

Herbert C. Jung, Jr., Spartanburg, S.C., assignor to Cherokee Products, Inc., Gaffney, S.C.

Filed Sep. 6, 1991, Ser. No. 755,637
Int. Cl.[5] D06F *43/00*; D06B *5/24*
U.S. Cl. 8—149.1 **37 Claims**



30. A method of commercially spot cleaning soiled garments without the use of chlorinated solvents, said method comprising:

pretreating spots on the soiled garment to be cleaned by the application of nonchlorinated cleaners thereto; and

applying a relatively high vacuum force to the pretreated spots so as to flush both soil and pretreatment cleaner therefrom and for drying the garment being cleaned.

34. A system for commercially spot cleaning soiled garments without the use of chlorinated solvents, said system comprising:

a user workstation;

means for pretreating spots on the soiled garment to be cleaned by the application of nonchlorinated cleaners thereto; and

vacuum means for selectively applying a relatively high vacuum force to the pretreated spots, so as to flush both soil and pretreatment cleaner therefrom as such garment is drying with said vacuum force.

5,203,045

NOZZLE MOUNTING IN ATMOSPHERIC DIFFUSERS

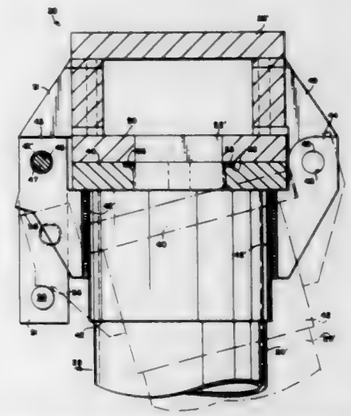
Stefan Golston, Bellevue, Wash., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Oct. 15, 1991, Ser. No. 775,499
Int. Cl.[5] D06B *1/02*
U.S. Cl. 8—156 **27 Claims**

20. A method of treating paper pulp in an upright vessel having a vertical axis, a plurality of annular screens mounted on extraction arms and concentric with the vertical axis, and a plurality of treatment arms having treatment fluid introducing nozzles connected thereto by connections and disposed between the annular screens; said method comprising the steps of:

(a) introducing paper pulp so that it flows vertically in the vessel past the annular screens, liquid being withdrawn from the pulp within the vessel through the screens and extraction arms;

(b) rotating the treatment arms and attached nozzles so that the nozzles move through the pulp in a first direction of rotation, while introducing treatment fluid into the pulp through the nozzles, the treatment fluid flowing through the treatment arms into the nozzles, a drag force naturally being applied to the nozzles as they move through the pulp in the first direction of rotation;



(c) reciprocating the extraction arms, and attached screens, up and down; and

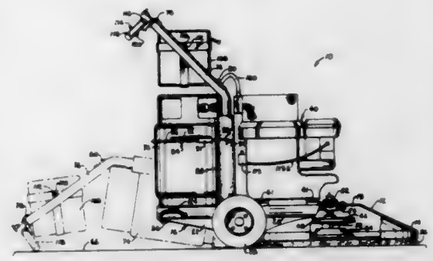
(d) should the drag force on a nozzle become greater than a high predetermined value, but less than the amount of drag force that would break the nozzle, providing breaking of the connection between the nozzle and the treatment arm so that treatment fluid flows into the pulp directly from the treatment arm, rather than through the nozzle, the treatment fluid diluting the pulp at the area of breakage so as to reduce the drag force at that point.

5,203,046

FLOOR BUFFING MACHINE

Patrick A. Shaw, 4359 Victory Dr., Kansas City, Kans. 66102

Filed Jul. 22, 1991, Ser. No. 734,143
Int. Cl.[5] A47L *11/14*
U.S. Cl. 15—98 **19 Claims**



1. A floor buffing machine comprising:

a body having a truncated conical shield constructed of sheet material and a channel section integrally joined to and extending in a rearwardly direction from said shield, said channel section having a generally horizontal deck partially overlying said shield and opposite side panels;

an engine mounted on said deck, said engine driving an output shaft;

a fuel tank mounted on said deck behind the engine and

5,203,048

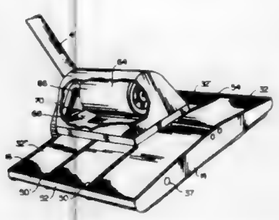
GOLF CLUB HEAD BRUSH

a first washer nozzle on said wiper arm for spraying a wash-

a wiper blade slidingly coupled to said frame means for longitudinal displacement across a surface of said mirror;

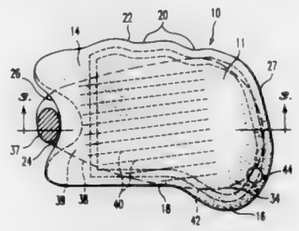
a fuel tank mounted on said deck behind the engine and holding fuel for combustion in the engine;
releasable means for retaining said fuel tank on the deck;
a battery for supplying electrical power;
means for mounting said battery at a location above the fuel tank in a manner permitting the battery to pivot about a substantially horizontal pivot axis to maintain the battery in a generally level orientation;
a buffing disk supported beneath said shield for rotation about a rotational axis substantially coinciding with the major cone axis of said shield;
wheels supporting said body for rolling movement at an elevation to maintain said buffing disk against the floor;
handlebar means connected with said body and located to be grasped by an operator of the machine; and
a drive linkage coupling said output shaft with the buffing disk to effect rotation of the disk when the engine operates.

5,203,047
CLEANING APPARATUS WITH ROTATABLE ENDLESS BELT
William R. Lynn, 38 Prospect St., Dover, N.H. 03820
Filed Jul. 16, 1991, Ser. No. 730,641
Int. Cl.[5] A47L *11/282, 11/292*
U.S. Cl. 15—99 **6 Claims**



1. An improved cleaning apparatus for cleaning a surface, comprising in combination:
a surface cleaning had having a frame supporting a plurality of rotatable means for one of applying liquid to a surface to be cleaned and absorbing liquid and contaminants form the surface to be cleaned, said plurality of continuous rotatable absorbent means each having means for removing liquid and contaminants therefrom which has been absorbed form the surface to be cleaned, and means, associated with said removing means, for storing the liquid and contaminants removed form said plurality of continuous rotatable absorbent means;
means for rotating said plurality of continuous rotatable absorbent means;
a handle member defining a longitudinal axis; and
connection means for connecting one end of said handle member to said surface cleaning head whereby said handle member can be used to operate said surface cleaning head in a direction along said longitudinal axis;
wherein said plurality of continuous rotatable absorbent means are rotatable in directions substantially transverse to the longitudinal operational direction defined by said handle member with at least one rotatable absorbent means rotating in a first direction and at least a second rotatable absorbent means rotating in a second opposite direction.

5,203,048
GOLF CLUB HEAD BRUSH
Chandler K. Bynum, 361 London Blvd., Portsmouth, Va. 23704
Filed Feb. 7, 1992, Ser. No. 832,589
Int. Cl.[5] A46B *5/02*
U.S. Cl. 15—160 **3 Claims**

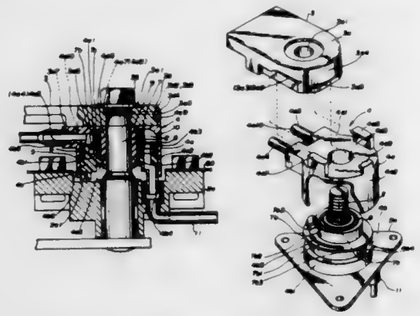


1. A brush for cleaning golf club heads comprising a relatively flat, generally rectangular handle having opposite brush and non-brush sides, said handle defining shaft, thumb, head and finger edges bounding said brush and non-brush sides in this order in a counter-clockwise direction when viewed from the non-brush side, said brush further including brush bristles mounted on said brush side to be directed outwardly away from said handle, said brush and non-brush sides having said generally rectangular shape and being approximately of a size of a golf-club-head face, but of an approximate contoured non-symmetrical shape of said golf-club-head face, said shape including a thumb protrusion at an end of the thumb edge near the head edge, said thumb and finger edges being opposite one another whereby said brush handle can be easily gripped by a thumb on the thumb protrusion and by other fingers of a same hand on the finger edge, a shaft slot formed in said shaft edge;
wherein said shaft edge of said handle defines an outwardly flaring shaft slot of a size and shape for receiving a club shaft; and
wherein said shaft edge tapers outwardly from said brush side to said non-brush side of said handle at an apex of said shaft slot to permit the entire face of the club to be cleaned.

5,203,049
WIPER APPARATUS WITH MECHANISM FOR SWITCHING SPRAYING DIRECTION OF WASHING FLUID
Katsuhiko Nogawa, Yokohama, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama, Japan
Filed May 19, 1992, Ser. No. 885,360
Claims priority, application Japan, May 20, 1991, 3-035511[U]; May 20, 1991, 3-035518[U]
Int. Cl.[5] B60S *1/46, 1/34*
U.S. Cl. 15—250.02 **2 Claims**

1. A windshield wiping apparatus for a vehicle with a windshield, a washer pump and a reservoir containing washing fluid to be sprayed onto the windshield by the washer pump, said apparatus comprising:
a pivot holder fixed on the vehicle, said pivot holder having a reservoir duct receiving port communicating with the reservoir through a feed pipe;
a pivot shaft supported rotatably by said pivot holder;
a wiper arm having an end base secured to said pivot shaft for swinging reciprocatively over the windshield of the vehicle, the end base of said wiper arm having an end face with an elongated end groove therein and opposite side faces with a elongated side groove in each side face, said grooves being disposed orthogonally to an axis of said pivot shaft;
a wiper blade attached to said wiper arm for wiping the windshield of the vehicle between a lower turning position and an upper turning position thereof;

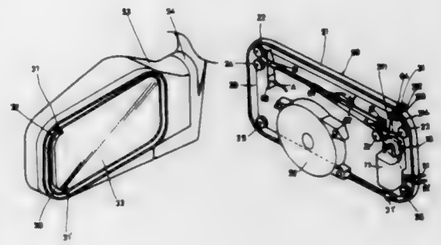
a first washer nozzle on said wiper arm for spraying a washing fluid stored in the reservoir toward the windshield of the vehicle on a leading side of said wiper blade during movement in a first direction;
a second washer nozzle on said wiper arm for spraying said washing fluid stored in the reservoir of the vehicle toward the windshield on a leading side of said wiper blade during movement in a second direction opposite to said first direction; and
a fluid switching mechanism for alternatively supplying the washing fluid stored in the reservoir of the vehicle to one of said first and second washer nozzles, which is on the leading side of said wiper arm, in accordance with the reciprocative movement of the wiper arm;
a base member detachably attached to said pivot holder coaxially with the pivot shaft and provided with a reservoir duct communicating with said reservoir duct receiving port of said pivot holder;
a casing member including an upper wall having a cylindrical support with a pivot hole through which said pivot



shaft extends and a side wall having a first duct and second duct in communication with said first washer nozzle and said second washer nozzle respectively, the upper wall having a pair of side projections engaged with the side grooves of said end base of said wiper arm and an end projection engaged with the end groove in the end base of said wiper arm, whereby said casing member is slidably and detachably engaged with said wiper arm, said casing member being coupled rotatably with said base member to form a valve chest communicating with the first duct, the second duct and the reservoir duct of said base member; and
a valve means disposed in said valve chest composed of said base member and said casing member and having a first valve blocking the first duct while the wiper blade is moving in said first direction toward a lower turning position from an upper turning position and a second valve blocking the second duct while the wiper blade is moving in said second direction toward the upper turning position from the lower turning position.

5,203,050
WIPER DEVICE FOR A MOTOR VEHICLE REAR VIEW MIRROR
Ivan Hau, No. 57-30, Ming Yi Road, Sec. 1, 34th Lin, Wu Ku Hsiang, Taipei, Taiwan
Filed Oct. 15, 1991, Ser. No. 775,910
Int. Cl.[5] B60S *1/20, 1/46, 1/56*
U.S. Cl. 15—250.003 **6 Claims**

1. A wiper device for cleaning a motor vehicle rear view mirror, comprising:
frame means coupled to a motor vehicle mirror for angular displacement therewith, said frame means having a top and bottom edge and a left and right side;
a wiper blade slidingly coupled to said frame means for longitudinal displacement across a surface of said mirror;
driving means fixedly coupled to said frame means for displacement of said wiper blade, said driving means including (1) a motor having a worm fixedly coupled to an output shaft thereof, (2) a worm gear meshingly engaged with said worm, (3) an output gear meshingly engaged with said worm gear, (4) an output pulley rotatably coupled to said output gear, and (5) means for resiliently engaging said output gear to said output pulley, said resilient engaging means including a liner member having opposing sides in contact with a respective surface of said output gear and said output pulley, said resilient engaging means further including a spring clamp member coupled between said output gear and said output pulley for applying a bias force to said liner member;
means for displacing said wiper blade coupled to said output pulley, said displacing means including (1) a pull wire having opposing ends coupled to said output pulley, (2) a first pair of first pulley wheels disposed on opposing sides of said frame means adjacent the top edge thereof for displaceably supporting a first portion of said pull wire, (3) a second pair of first pulley wheels disposed on opposing sides of said frame means adjacent the bottom edge thereof for displaceably supporting a second portion of said pull wire, and (4) a pair of second pulley wheels



disposed between opposing sides of said frame means and between said first and second pairs of first pulley wheels, said pulley mounted pull wire extending in a cross-over manner between said pair of second pulley wheels, whereby said first and second portions of said pull wire are displaceable in the same direction responsive to a rotational displacement of said output pulley;
a first slide member slidingly coupled to said top edge of said frame means, said first slide member being fixedly coupled to said first portion of said pull wire for displacement therewith;
a second slide member slidingly coupled to said bottom edge of said frame means, said second slide member being fixedly coupled to said second portion of said pull wire for displacement therewith, each of said first and second slide members being coupled to a respective opposing end of said wiper blade for said longitudinal displacement thereof; and,
a pair of switches disposed on opposing sides of said frame means for interrupting an electrical current path through said motor in a first direction without interrupting a current path through said motor in a second direction responsive to a predetermined displacement of said first slide member, wherein a rotational direction of said motor can be reversed by passing an electrical current in said second direction therethrough.

5,203,051

through an air inlet opening in said first housing and into said

depending from said upper housing portion for defining a

adapted for frictionally engaging said marginal edge por-

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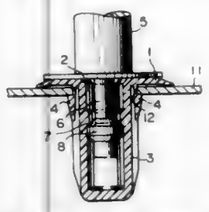
5,203,051

GROMMET AND METHOD OF INSERTING GROMMET

Sunao Tonami, Aichi; Naoto Horiguchi, Sasebo; Sotoaki Yamamoto, Kariya; Hiroshi Kazino; Masaaki Ide, both of Komaki; Hideki Kakamu, Gifu, and Tomiyasu Kakeno, Konan, all of Japan, assignors to K.K. Aoyama Seisakusho, Nagoya, Japan

Filed Dec. 6, 1991, Ser. No. 802,864
Int. Cl.[5] B16L 5/00
U.S. Cl. 16—2 8 Claims



1. A grommet for automatic insertion into a mounting hole in a panel, by a robot arm, comprising:

a member having a head portion and a bottom portion integrally attached to said head portion at one side of said head portion and at least one locking claw attached to said member,

said member having a longitudinal bore extending through said head portion and at least a major portion of said bottom portion,

said head portion having an outer periphery larger than the inner circumference of the mounting hole,

said bottom portion having an outer periphery smaller than the inner circumference of the mounting hole and having a stepped portion located within said longitudinal bore,

said outer periphery of said bottom portion surrounding said stepped portion being spaced from the inner circumference of the mounting hole so as to allow said bottom portion to expand when the robot arm is retracted,

said stepped portion having an inside diameter smaller than that of said longitudinal bore for engaging the robot arm,

said at least one locking claw having a free end extending outwardly from said member with said free end of said at least one locking claw being spaced from said member,

each of said at least one locking claw being resiliently deflectable relative to the longitudinal axis of said member such that when said member is inserted in the mounting hole and after said free end of said at least one locking claw clears the mounting hole said free end of said at least one locking claw is released to spring snap into engagement with the side of the panel opposite from said head portion such that the force required to deflect said stepped portion and expand said bottom portion and thereby retract the robot arm is less than the force required to remove said grommet from the mounting hole after said at least one locking claw has snapped into engagement with the opposite side of the panel.

5,203,052

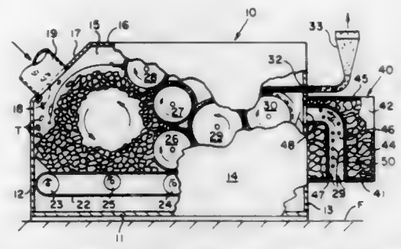
NOISE SUPPRESSION BOX FOR FIBER PROCESSING MACHINERY

William M. Hardy, Victor, and Michael A. Ruffalo, Newark, both of N.Y., assignors to Phoenix Associates, Victor, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,298
Int. Cl.[5] D01B 3/00; G10K 11/04
U.S. Cl. 19—205 9 Claims

1. In a fiber processing machine including a first housing having adjacent one end thereof an inlet for receiving a supply of fiber tufts, adjacent an opposite end thereof a fiber outlet connected to a suction source, and intermediate the ends thereof a plurality of toothed rolls for opening fiber tufts, means exterior of said first housing for directing a stream of air through an air inlet opening in said first housing and into said fiber outlet, comprising

an air inlet duct at the exterior of the first housing secured at one end over said air inlet opening in said first housing and communicating at an opposite end thereof with ambient air at the exterior of said housing,



a second housing surrounding said air inlet duct in spaced relation to the outer surface of said air inlet duct, and

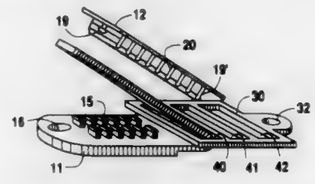
sound absorbing means interposed in a space between said second housing and the outer surface of said air inlet duct.

5,203,053

SHOE FASTENING DEVICE

Lawrence S. Rudd, San Antonio, Tex., assignor to I. J. Associates, Inc., San Antonio, Tex.

Filed Sep. 23, 1992, Ser. No. 949,566
Int. Cl.[5] A43C 11/00
U.S. Cl. 24—306 11 Claims



1. A shoe lace replacing and fastening apparatus comprising:

a clasp for mounting on one side of a shoe;

an elongated flexible strip for mounting on an opposite side of a shoe and having a plurality of hook elements at one end and a plurality of openings at the opposite end of the strip; and

a strip insert having a plurality of hook elements for releasably inserting into the plurality of openings and for releasably mating and connecting with the hook elements on the elongated strip when pressed together to secure a shoe onto a foot.

5,203,054

RETAINER FOR TRUNK LID TORSION BARS

Delbert L. Arnold, St. Clair, Mich., assignor to Emhart Inc., Newark, Del.

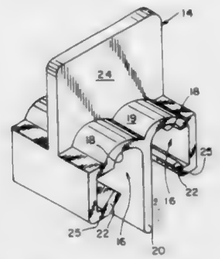
Filed Sep. 28, 1992, Ser. No. 951,916
Int. Cl.[5] F16B 7/04
U.S. Cl. 24—336 3 Claims

1. A retainer for retaining a pair of vehicular trunk torsion bars which are in non-parallel overlying relation comprising housing means for receiving and resiliently nesting the torsion bars including

an elongated upper housing portion,

an elongated separator depending from said housing portion for preventing contact between the clamped torsion bars, opposed locking fingers spaced from said separator and depending from said upper housing portion for defining a pair of nesting channels in which said torsion bars can be nested,

said separator depending downwardly beyond said locking fingers a distance selected so that said separator can be located between the torsion bars proximate the location where the torsion bars overly, and



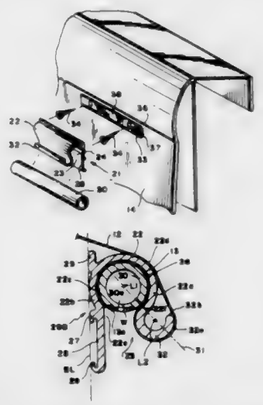
a tongue projecting upwardly from said upper housing portion and extending perpendicularly to said separator and located centrally on said upper housing portion so that an installer can grip said tongue between adjacent fingers, slide said separator between the torsion bars into engagement therewith at the location where the torsion bars overly and pull said housing against the torsion bars to nest the torsion bars in said nesting channels.

5,203,055

SNAP ASSEMBLY FOR SECURING FLEXIBLE COVERINGS

Thomas D. Broadwater, Sr., 1300 Winyah Dr., Columbia, S.C. 29203

Filed Jan. 22, 1992, Ser. No. 823,467
Int. Cl.[5] B60P 7/00; A47H 13/00
U.S. Cl. 24—462 18 Claims



1. A cover gripping assembly for securing a marginal edge portion of a flexible cover to a side member of a frame, said assembly comprising:

an elongated channel member comprising an inward arcuate sector having a transverse configuration generally in the form of an inwardly facing C and defining a cavity, said inward sector comprising inner and outer segments in opposing relation to define an open and longitudinally extending throat providing access to said cavity, at least a portion of said outer segment being resilient, and at least a portion of an inner surface of said inward sector being adapted for frictionally engaging said marginal edge portion of the cover;

attachment means connected to said inner segment of the inward sector for securing said channel member to said side member of the frame;

grip-enhancing means integral with said outer segment of the inward sector for increasing said frictionally engagement in response to an increase in tension on said cover, said grip-enhancing means causing a body portion of said cover adjacent to said marginal edge portion to be folded back through an angle of at least about 180°, and comprising an outward arcuate sector having a transverse configuration generally in the form of an outwardly facing C, said inward and outward sectors being integrally formed with a transverse configuration substantially in the shape of an S; and,

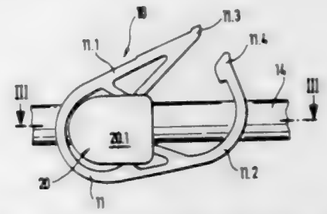
at least one elongated snap-in member having an outer surface generally congruent with said inner surface of the inward sector, at least a portion of said outer surface being adapted for frictionally engaging said marginal edge portion of the cover, and said snap-in member having a transverse dimension relative to a transverse dimension of said cavity such that insertion of said snap-in member transversely into said cavity causes said inner surface portion and said outer surface portion to be pressed into frictionally engagement with the marginal edge portion of said cover, said open throat having a width less than said transverse dimension of the snap-in member by an amount sufficient to cause said snap member to pass through said throat with a snap action for restraining said snap-in member in said cavity.

5,203,056

HOSE CLAMP FOR MEDICAL APPLICATION

Gerald Funk, Bisingen, and Tomas Hartig, Hechingen, both of Fed. Rep. of Germany, assignors to Joka Katbetertechnik GmbH, Hechingen, Fed. Rep. of Germany

Filed May 7, 1992, Ser. No. 879,341
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1991, 4118732
Int. Cl.[5] A44B 21/00; F16L 55/00
U.S. Cl. 24—543 6 Claims



1. A hose clamp for medical application comprising a bracket-shaped clamp body having bracket ends arrestable with one another to form a closed ring, and provided with openings for a hose which passes through a throughgoing passage extending in a bracket plane, said clamp body having bracket legs; inwardly directed wedge-shaped clamping jaws provided on said bracket legs; and side walls located at both sides of said throughgoing passage parallel to the bracket plane so as to prevent bending out of a hose from the bracket plane; an insert member for said clamp body, said insert member being U-shaped and having legs which form said side walls and a base provided with a hose throughgoing opening which has an opening axis extending parallel to said side walls.

5,203,057

member being flexible and biased into a locking position; said

5,203,060

APPARATUS FOR MAKING INSERT MOLDED

plurality of second sliders, respectively, and each of said first sliders is paired with its counterpart in said second

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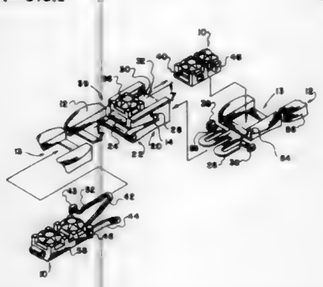
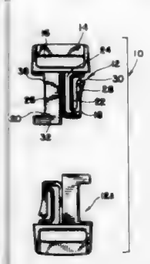
5,203,057
PIGGY BACK JEWELRY CATCH
Donna M. Runnels, 1010 S. Veal, P.O. Box 546, Sundown, Tex. 79372
Filed Mar. 5, 1992, Ser. No. 847,574
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—573.1 **26 Claims**



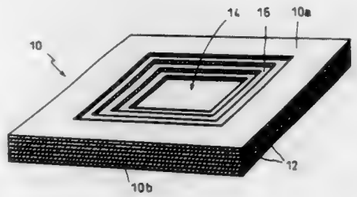
1. Structure for combining at least two ornamental bands into a combination loop comprising:
a. a catch body;
b. the catch body having a bracelet end, a guard end, a top, a bottom, a latch side and a button side;
c. a female guard tongue receiver located at the guard end and within said body;
d. a female bracelet tongue catch receiver located at the bracelet end and within said body;
e. each tongue receiver within said body being matable to a male tongue;
f. a guard-catch connector at the bracelet end of said body for attaching the body to a band;
g. a catch knob recess in the body on the latch side of the body;
h. the recess being deeper near the bracelet end and shallower near the guard end;
j. a catch knob located in the recess at the shallower portion of said recess; and
k. said catch knob being matable with a safety latch.

5,203,058
TWIN BUCKLE FOR FASTENING STRAPS AND THE LIKE
Mark Krauss, E. Greenwich, R.I., assignor to American Cord & Webbing Co., Inc., Woonsocket, R.I.
Filed May 1, 1992, Ser. No. 877,084
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—575 **9 Claims**



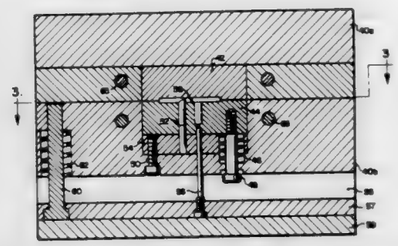
1. A snap fastener comprising two identical pieces having respective male and female members positioned adjacent each other and adapted to engage in a male female relationship by the axial insertion of one in the other, a said male member comprising an axially extending latching member having a combined locking portion and a guide portion somewhat centrally positioned with the guide portion comprising a flat surface positioned adjacent the female member, said latching member being flexible and biased into a locking position; said female member comprising a U-shaped sleeve including a cut out to receive the locking portion of the latching member to lock the two pieces together when the latching member is fully inserted therein, said latching member includes a portion which extends beyond the sleeve when in the latched position, and wherein said pieces are joined together by axially sliding the respective flat sides together to a point that the latching member locks in the cut out and the separation of the pieces is implemented by a squeezing force placed upon the respective portions of the latching members which extend beyond the sleeve.

5,203,059
METHOD OF MAKING A FIBER PREFORM OF VARYING THICKNESS
Pierre Olry, Bordeaux, and Philippe Dupont, Le Bouscat, both of France, assignors to Societe Europeenne de Propulsion, Suresness, France
Filed Dec. 2, 1991, Ser. No. 801,541
Claims priority, application France, Dec. 3, 1990, 90 15125
Int. Cl.[5] D04H *1/46, 3/10;* **B32B** *5/06;* **B29C** *67/14*
U.S. Cl. 28—107 **7 Claims**



1. A method of making a fiber preform of varying thickness to manufacture a part made of composite material, the method comprising superposing layers of fiber fabric and needling the layers together as they are superposed, and within the, or each, portion of the preform to be made in which the thickness of the preform is to be reduced so as to form a recess the steps of:
interposing a mask between two adjacent layers, forming the mask from a thin film of a material suitable for allowing the needles to pass therethrough during needling while preventing significant quantities of fibers caught by the needles from passing therethrough; and
cutting out each layer after needling along a line corresponding to the outline of the recess in the preform at the level at which the layer is situated within the preform;
situating the mask between two cutout layers occupying an area that is not less than the area extending between the cutout lines of the two layers, such that the portions of the layers delimited by the cutout lines are not securely connected to the remainder of the preform by the needling and so that the recess can be formed, after all of the layers have been needled, by removing the cutout portions of the layers and by peeling off the masks.

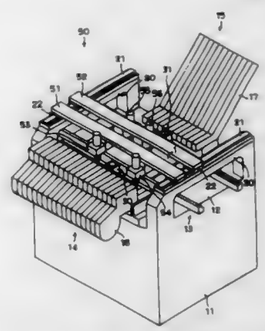
5,203,060
APPARATUS FOR MAKING INSERT MOLDED CIRCUITRY
James E. Mraz, 409 Redrock Dr., Lindenhurst, Ill. 60046; Martin T. Schwartz, 2145 McArthur Dr., Glenview, Ill. 60025; James M. Kemp, 1120 Pine Tree La., Libertyville, Ill. 60048; Joel M. Schotanus, 32930 Thornapple, Wildwood, Ill. 60030, and Donald P. Schwarz, 1093 Valley Stream Dr., Wheeling, Ill. 60090
Continuation of Ser. No. 700,043, May 7, 1991, abandoned, which is a continuation of Ser. No. 519,277, May 4, 1990, abandoned, which is a division of Ser. No. 354,458, May 22, 1989, Pat. No. 4,965,933. This application Jan. 15, 1992, Ser. No. 823,013
Int. Cl.[5] H01R *43/16*
U.S. Cl. 29—33 M **6 Claims**



1. A mold for use in an insert molding apparatus for making an insert molded electrical circuit from a lace curtain including a plurality of electrical connectors joined by at least one interconnect joint, the apparatus including a press and means for injecting an insulating material, the mold comprising:
a cavity configured to receive the lace curtain, the mold including an aperture leading from exterior of the mold to the cavity,
means for operatively connecting the aperture to the means for injecting the insulating material; and
a punch and means for connecting the punch to the press, the punch having a severing position, the punch arranged to sever at least one of the interconnect joints while the lace curtain is in the cavity and the punch is in the severing position.

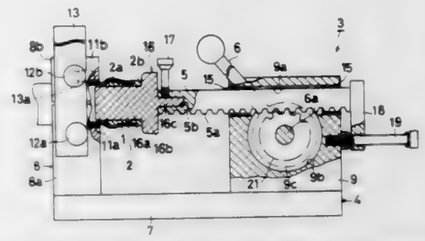
5,203,061
WORKING APPARATUS HAVING WORKING HEAD MOVABLE IN X-Y DIRECTIONS
Shozi Hamada, Kakogawa, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Feb. 13, 1992, Ser. No. 834,826
Claims priority, application Japan, Feb. 14, 1991, 3-020990
Int. Cl.[5] H01R *43/00;* **B21F** *27/00*
U.S. Cl. 29—33 M **7 Claims**

1. A working apparatus, comprising:
a base;
a pair of supports provided on said base;
first and second linear servo-motor means provided on said supports in parallel to each other, said first and second linear servo-motor means including slider means, respectively;
beam means both end of which are coupled to said slider means of said first and second linear servo-motor means;
third linear servo motor means mounted on said beam means and including a plurality of sliders;
a plurality of working head means each coupled to one of said plurality of sliders on said beam means;
driving means for moving said working head means in said longitudinal direction; and
control means for controlling said first and second linear servo-motor means so that said beam is moved in parallel motion by said sliders wherein said first and second linear servo-motor means include a plurality of first sliders and a plurality of second sliders, respectively, and each of said first sliders is paired with its counterpart in said second sliders so as to constitute a plurality of slider pairs, and



said beam means includes a plurality of beams each of which is coupled to one of said slider pairs, and said control means controls said slider pairs independently.

5,203,062
INSERTION APPARATUS FOR PRESSING A RING INTO A PIPE
Kiyoshi Nishio, Osaka, Japan, assignor to Nippon Pillar Packing Co., Ltd., Osaka, Japan
Filed Sep. 11, 1991, Ser. No. 757,582
Int. Cl.[5] B23P *19/02*
U.S. Cl. 29—237 **4 Claims**



1. Apparatus for pressing with strong force an oversized inner ring into a receiving pipe having an internal diameter less than the largest diameter of said inner ring, comprising:
a clamp base for fixedly holding said pipe;
pressing means, comprising a ring holder adapted to hold said inner ring on one end thereof and including a rack, said rack extending horizontally and along the axis of said pipe and having downwardly extending teeth; and,
a means for moving said rack, said means for moving said rack including a pinion to be engaged with said rack, so that said ring is inserted into said pipe when said rack is moved toward the end of said pipe,
said pinion being mounted in an enclosed housing which supports two bearings in which said rack may slide.

5,203,063

and a valve stem slidably directed through the valve stem

horizontally fixed beneath said fixed horizontal boom, aluminized and resin-coated to create a coated surface, the

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5,203,063

DEVICE FOR MOUNTING AND DISMOUNTING SHAFT FURNACE TYMPS

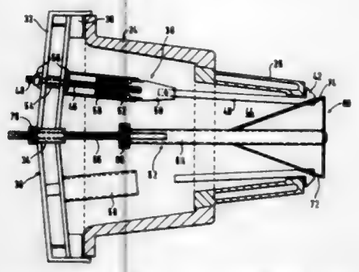
Nicolas Bouzat, Schifflange; Edmond Mainz, Bettembourg; Edouard Sand, Esch/Alzette; Ernest Sand, Dudelange; Nicolas Wistersdorf, Esch/Alzette; Michel Lax, Leudelange; Francis Gross, Esch/Alzette; Victor Hutmacher, Niedercorn; Patrick Peiffer, Rumelange, and Pierre Maillet, Howald, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Jun. 17, 1991, Ser. No. 716,728

Claims priority, application Luxembourg, Jun. 29, 1990, 87758

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—258 20 Claims



1. A device for mounting and dismounting shaft furnace tymps which, when mounted in an operative position, are wedged into an inner circular seat of a tuyere arch in a wall of the furnace, comprising:

gripper means, having a plurality of retractable claws, each of said retractable claws including engaging means for engaging the tymp, said engaging means extending radially outwardly with respect to the longitudinal axis of the tymp;

control means for alternatively spreading or retracting the claws of the gripper means radially with respect to the longitudinal axis of the tymp;

yoke means for mounting the gripper means and the control means thereon and for engaging an outer edge of the tuyere arch; and

means for operatively associating the device with an explosive-actuated pneumatic tool for exerting a tractive force on the claws.

5,203,064

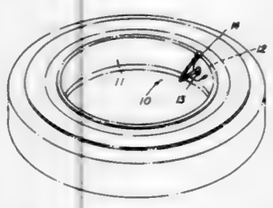
VALVE STEM ALIGNMENT TOOL

Gary L. Johnson, 509 Washington Ave. N. #29, Kent, Wash. 98032

Filed Apr. 13, 1992, Ser. No. 867,500

Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—271 3 Claims



1. A valve stem alignment tool arranged for mounting to a vehicular tire rim having a peripheral annular flange, with the vehicular tire rim including a valve stem receiving bore directed therethrough spaced from the peripheral annular flange, and a valve stem slidably directed through the valve stem receiving bore, wherein the tool comprises,

a plurality of chain links, and

the chain links including adjustment means mounted between adjacent chain links of said chain links for adjusting effective length of said chain links, and

said chain links including a clamp chain link mounted at a first distal end of said chain links, and

a cap member chain link mounted at a second distal end of said chain links, and

said clamp chain link mounted to a "V" shaped rim clamp and said cap member chain link mounted to a cap member, with the cap member including a valve stem receiving bore for receiving a free distal end of said stem therewithin, and

the rim clamp includes a first plate fixedly mounted to a second plate at an intersection defining an acute angle between the first plate and the second plate, and

the first plate includes a matrix of first plate teeth canted towards the intersection, and the second plate includes a matrix of second teeth canted towards the intersection, and

the first plate includes a first plate rear distal end, the first plate rear distal end including a first swivel yoke, the first swivel yoke including a first yoke cylindrical socket and a first cylindrical plate rotatably mounted within the first cylindrical socket captured therewithin, and a first connector rod fixedly and coaxially mounted to the first cylindrical plate extending exteriorly of the first swivel yoke, the first connector rod fixedly mounted to a first link plate, said first link plate mounted to one of said chain links at said first distal end.

5,203,065

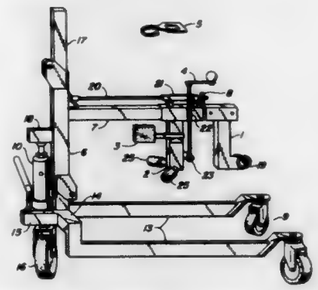
TOILET FIXTURE INSTALLATION APPARATUS

Morris P. Peters, 2525 Sage St., Santa Rosa, Calif. 95405

Filed Dec. 16, 1991, Ser. No. 807,718

Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—281.4 2 Claims



1. A toilet fixture installation apparatus for the support, movement, and alignment of a toilet bowl fixture during its installation, said toilet bowl fixture having a front rim and a rear rim, said toilet fixture installation apparatus comprising:

a three-wheeled base structure having a pair of generally parallel lower frame members connected by a crossmember and defining a base plane;

a fixed vertical mast portion perpendicular to and connected to the center of said crossmember and carrying a sliding mast elevated by a jack member;

a fixed horizontal boom portion having an end extending perpendicularly from said sliding mast in the direction of said lower frame members;

an L-shaped fixed shoe assembly beneath and at said end of said fixed horizontal boom, said fixed shoe assembly bearing an outwardly-extending toilet bowl rear rim gripping member comprising curved gripping fingers;

an L-shaped adjustable shoe assembly slidably mounted on

and selectively fixed beneath said fixed horizontal boom between said sliding mast and said fixed shoe assembly, said adjustable shoe assembly bearing a toilet bowl front rim gripping member comprising curved gripping fingers extending in the opposite direction from said fixed shoe assembly toilet bowl gripping member, said adjustable relative to said fixed shoe assembly to adjust the horizontal plane of said toilet bowl fixture.

5,203,066

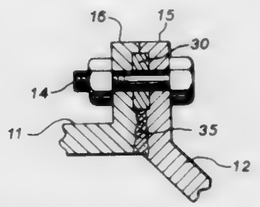
METHOD OF REPAIRING LARGE ROTATING MACHINES IN WHICH PARTS ARE BOLTED TOGETHER THROUGH RADIALLY EXTENDING FLANGES

Daniel McDonald, Beaconsfield, Canada, assignor to Svedala, Inc., Milwaukee, Wis.

Filed Oct. 18, 1991, Ser. No. 779,522

Int. Cl.[5] B23P *6/00*

U.S. Cl. 29—402.11 3 Claims



1. A method of repairing a large rotary device made up of sections having adjacent radially extending flanges forced together by a bolt extending through aligned bores in said flanges which force surfaces of said flanges into an abutting and sealing force transmitting relationship, the method of comprising the steps of:

(a) removing said bolts and separating said adjacent flanges;

(b) counterboring each surface surrounding said aligned bores to a depth less than the width of its respective flange, thereby forming a counterbore in each surface;

(c) inserting an annular spacer of material having similar thrust transmitting capability to the material of said flanges into the counterbores, the inner diameter of said spacer being at least the equal to the diameter of said bores, the outer diameter of said spacer being less than the diameter of the counterbores, and the thickness of said spacer being equal to the combined depths of the counterbores;

(d) bolting said flanges together, thereby forming a seal and thrust transmitting drive between the abutting surfaces of said flanges and between said flanges and said spacer.

5,203,067

REUSE OF PLASTIC

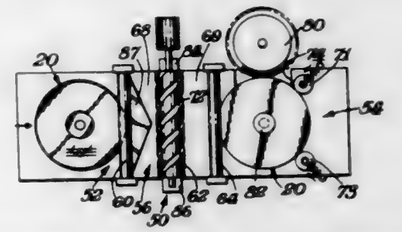
August DeFazio, 33 Forman La., Englishtown, N.J. 07726

Filed May 22, 1991, Ser. No. 704,210

Int. Cl.[5] B23P *19/04*; H01B *15/00*; B24B *7/00*

U.S. Cl. 29—403.3 6 Claims

1. In the process of salvaging compact discs that have been aluminized and resin-coated to create a coated surface, the improvement being in removing the aluminized and resin-



coated surface by shaving the surface, with a rotating surface mill.

5,203,068

METHOD OF CONNECTING A VEHICLE BRAKE CABLE EQUALIZER

Andrew J. Siring, 2640 Seymour Lake Rd., Ortonville, Mich. 48462

Filed Aug. 7, 1992, Ser. No. 925,827

Int. Cl.[5] B21D *39/00*; B60T *1/00*; F16C *1/10*

U.S. Cl. 29—452 2 Claims

1. The method of connecting a vehicle brake cable equalizer to a main actuator cable extending from a forward section of a vehicle and a pair of brake actuator cables extending from a pair of rear wheel brakes of the vehicle wherein the main actuator cable and brake cable equalizer are positioned on the upper side of a floor of the vehicle and the brake actuator cables are positioned on the lower side of the vehicle floor, comprising the steps of:

a. providing a brake cable equalizer having first slot means for attaching the main actuator cable and second and third slot means for attaching the pair of brake actuator cables, the brake cable equalizer having a ramp in which the second and third slot means are located;

b. providing a pair of spaced apart openings in the vehicle floor for insertion of an end of each of the pair of brake actuator cables from the lower side of the vehicle floor to the upper side thereof;

c. providing an enlarged head on the end of each brake actuator cable;

d. providing an enlarged opening at an terminus of each of the second and third slot means;

e. providing fastener means on the brake cable equalizer including a pair of arms insertable through the openings in the vehicle floor for engagement with the vehicle floor;

f. attaching the main actuator cable in the first slot means of the brake cable equalizer on the upper of the vehicle floor and securing the brake cable equalizer to the upper side of the vehicle floor by means of the fastener arms;

g. applying brake tension to the main actuator cable from the upper side of the vehicle floor;

h. inserting the enlarged head of each brake cable actuator from the lower side of the vehicle floor through one of the openings in the vehicle floor;

i. attaching the brake cable actuators to the brake cable

equalizer by sliding the enlarged heads of each brake cable

zones are selected to permit stretching of said continuous

bending said connecting portion at two places so that said two rectangular portions are in opposed parallel relation-

leaving a space thereunder through which said motorcar body can be conveyed;

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equalizer by sliding the enlarged heads of each brake cable actuator up the ramp from the lower side of the vehicle floor using the second and third slot means as guides until the enlarged heads thereof pass through the enlarged openings at the terminus of the second and third slot means; and

j. freeing the arms of the fastener means from the lower side of the vehicle floor from engagement with the vehicle floor to thereby detach the brake cable equalize from the vehicle floor.

5,203,069

METHOD OF PRODUCING A TELESCOPIC COVER WITH ROUNDED CORNERS

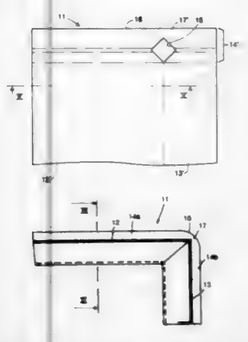
Kurt Hennig, Munich, Fed. Rep. of Germany, assignor to Gebr. Hennig GmbH, Ismaning, Fed. Rep. of Germany

Filed Oct. 15, 1990, Ser. No. 598,851

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1989, 3936213

Int. Cl.[5] B23P *13/04*

U.S. Cl. 29—557 3 Claims



1. A method of producing a cover element for a telescopic cover for covering machine tools, the telescopic cover comprising a plurality of said cover elements movable in a longitudinal direction into and out of one another, said cover element including a top wall connecting opposed side walls and an end region extending at a right angle to the longitudinal direction, the end region being formed at least once in a U-shaped cross-section and projecting outwardly from the top wall and the side walls, the method comprising the steps of:

providing a flat sheet material blank for ultimately producing said top wall, side walls, and said end region of said cover element;

forming diamond-shaped cut-outs in said flat sheet material blank at corner zones which are disposed to ultimately form corners between said top wall and said side walls in said end region, said diamond-shaped cut-outs formed as respective closed perimeter openings and separated from an outer edge of said sheet material blank by corresponding continuous material zones;

forming a T-shaped cut in said flat sheet material blank bordering on said continuous material zones so that the arm of said T-shaped cut extends at a right angle to said outer edge where said end region is formed and the cross-piece of said T-shaped cut extends parallel to said edge;

bending said flat sheet material blank near said outer edge into said U-shaped cross-section to thereby form said end region which projects outwardly from said flat sheet material; and

bending said flat sheet material blank along fold lines which substantially bisect said diamond-shaped cut-outs and extend perpendicularly with respect to said outer edge to thereby form said corners, said side walls, and said top wall;

wherein the width and thickness of said continuous material zones are selected to permit stretching of said continuous material zones without cracking while said sheet material blank is bent.

5,203,070

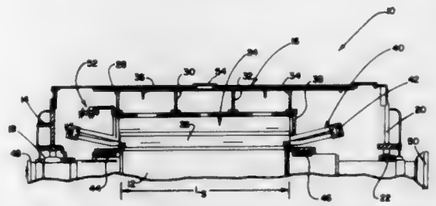
METHOD OF MANUFACTURING A MODULAR ELECTRICAL GENERATOR

Lon W. Montgomery, Winter Springs; Glenn D. Cooper, Orlando, and William R. McCown, Winter Springs, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1992, Ser. No. 867,994

Int. Cl.[5] H02K *15/14*

U.S. Cl. 29—596 20 Claims



1. A method of designing an electrical generator having an intended power output rating which uses many standardized, modular components, comprising:

(a) selecting a standardized set of diameters for each of the rotor and stator of the generator, said standardized set of diameters being used for the design of other generators having different power outputs than the generator being designed as well; and

(b) selecting the length of the stator core based on the intended power rating of the generator, whereby standardized generator components which are specific to the selected set of diameters may be used during assembly of the generator instead of components which are unique to a generator having a specific power rating, such standardization resulting in reduced design and manufacturing costs per generator.

5,203,071

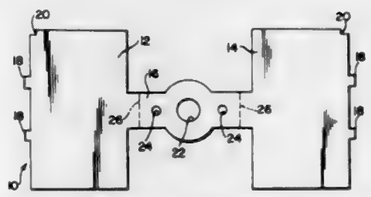
METHOD OF MOTOR CONSTRUCTION

Paul W. Niemela, Pickens, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.

Division of Ser. No. 608,805, Nov. 5, 1990, Pat. No. 5,160,867. This application Sep. 25, 1991, Ser. No. 765,249

Int. Cl.[5] H02K *15/14*

U.S. Cl. 29—596 9 Claims



1. A method for constructing an electric motor including a motor armature assembly, the method comprising the steps of:

providing a motor armature assembly;

providing a flat sheet of magneto-conductive material;

forming from said sheet a blank having two equal size rectangular portions joined by an elongated connecting portion;

rolling said rectangular portions about an axis parallel to said connecting portion, thereby forming each of said rectangular portions into a semi-cylindrical configuration;

bending said connecting portion at two places so that said two rectangular portions are in opposed parallel relationship, thereby forming a cylindrical motor housing shell which encloses the motor armature assembly, the housing shell having two diametrically opposed seams, said connecting portion forming a motor housing end wall;

providing N annular permanent magnet segments, where N is an even number equal to the number of poles of the motor, each of said segments subtending an arc less than 360°/N; and

mounting said segments to the interior of said shell in spaced equiangular relation with a central portion of each segment of a pair of diametrically opposed segments spanning a respective seam.

5,203,072

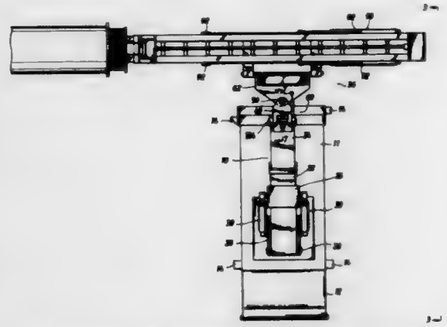
DETACHABLE CRANE- OR BOOM-OPERATED HEAT EXCHANGER TUBE BUNDLE EXTRACTOR

Thomas B. Boisture, Baytown, Tex., assignor to Ohmstede Mechanical Services, Inc., Baytown, Tex.

Division of Ser. No. 642,658, Jan. 17, 1991. This application Nov. 12, 1991, Ser. No. 791,096

Int. Cl.[5] B23P *15/26*

U.S. Cl. 29—726.5 4 Claims



1. A versatile heat exchanger tube bundle extractor suspended from a crane with a plurality of slings comprising:

a tube bundle extractor;

first means for releasably suspending said tube bundle extractor from the slings connected to the crane, said first means attached to said tube bundle extractor; and

second means for releasably connecting said tube bundle extractor to the rigid, telescoping boom.

5,203,073

APPARATUS FOR ASSEMBLING EXTERIOR PARTS OF A MOTORCAR

Katuo Kotake; Michihiro Kitahama; Keizaburo Otaki; Akira Miyazaki; Masayuki Abe; Shoji Okahara; Manabu Tuchida; Yukihiro Yaguchi; Hiroyuki Furuya, and Takeshi Nakamura, all of Sayama, Japan, assignors to Honda Engineering Kabushiki Kaisha, Sayama, Japan

Division of Ser. No. 628,880, Dec. 18, 1990, Pat. No. 5,150,506. This application Jun. 15, 1992, Ser. No. 900,710

Claims priority, application Japan, Dec. 20, 1989, 1-328397; Feb. 22, 1990, 2-39753; Mar. 5, 1990, 2-51796; Mar. 15, 1990, 2-64771; Mar. 17, 1990, 2-67764; Mar. 26, 1990, 2-75932

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—784 5 Claims

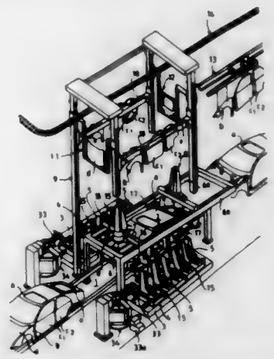
1. An apparatus for assembling exterior parts of a motorcar comprising:

assembling robots for assembling exterior side parts to a motorcar body, said assembling robots being disposed on sides of an assembling station in which said motorcar body is stationarily placed;

an overhead frame provided in said assembling station while leaving a space thereunder through which said motorcar body can be conveyed;

an additional assembling robot for assembling lid-like exterior parts, said additional assembling robot being mounted on said overhead frame;

hanger conveyor means for conveying said exterior side parts and said lid-like exterior parts to a position above said overhead frame;



an apparatus frame for drop lifters, said apparatus frame being provided in said assembling station such that it extends upwards above said overhead frame;

drop lifters for said exterior side parts and drop lifters for said lid-like exterior parts, said drop lifters being vertically movably provided on said apparatus frame for respectively transferring said exterior side parts and said lid-like exterior parts from said hanger conveyor means to respective assembling jigs mounted on each of said assembling robots.

5,203,074

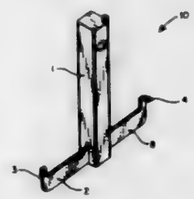
SIMM EXTRACTION TOOL

Alan W. Lam, Fremont, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 24, 1991, Ser. No. 813,347

Int. Cl.[5] H05K *13/04*

U.S. Cl. 29—829 18 Claims



1. An extraction tool for removing a single in-line memory module (SIMM) from a connector, said SIMM having a pair of vertical edges and a pair of holes, one of said holes offset from each of said vertical edges in accordance with a published specification for said SIMM, comprising:

an elongated handle member having a first end and a second end;

an L-shaped first arm for coupling to said holes and removing said SIMM from said connector, said first arm comprising;

an elongated first portion coupled to said first end of said handle member and projecting perpendicularly from said handle member; and

a second portion projecting perpendicularly from said

5,203,076

VACUUM INFILTRATION OF UNDERFILL MATERIAL

ing the solder on said pads to adhere to said tabs and said lead wire ends wrapped around said tabs.

cable, said connector having an elongated signal pin surrounded in part by an insulating jacket and an elongated shield

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a second portion projecting perpendicularly from said first portion toward said second end of said handle member such that said first portion is parallel to said handle member, said second portion of said first arm having a length substantially equal the distance each of said holes in said SIMM are offset from said vertical edges of said SIMM;

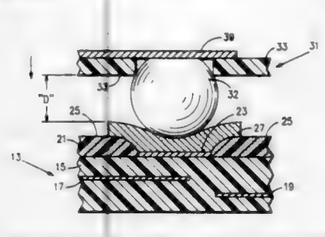
said extraction tool further comprising an L-shaped second arm for coupling to said holes and removing said SIMM from said connector.

5,203,075

METHOD OF BONDING FLEXIBLE CIRCUIT TO CICUITIZED SUBSTRATE TO PROVIDE ELECTRICAL CONNECTION THEREBETWEEN USING DIFFERENT SOLDERS

Christopher G. Angulas, Endicott; Patrick T. Flynn, Owego; Joseph Funari, Vestal; Thomas E. Kindl, Endwell, and Randy L. Orr, Vesal, all of N.Y., assignors to Inernational Business Machines, Armonk, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,970
Int. Cl.[5] H05K 3/36
U.S. Cl. 29—830 9 Claims



1. A method of bonding first and second circuitized substrates to provide electrical interconnection therebetween, said method comprising:

providing at least one conductive pad on a first substrate comprised of an organic dielectric material;

providing a quantity of organic dewetting material of a predetermined configuration substantially adjacent said conductive pad;

applying a quantity of solder paste holding a first melting point over said conductive paid and at least part of said organic dewetting material;

providing a second substrate including a dielectric material having an aperture therein and at least one conductor located within and/or bridging said aperture, said second substrate being flexible in nature;

securing a solder member having a second melting point greater than said first melting point to said conductor;

stretching said second substrate across a frame and thereafter aligning said second substrate having said solder member secured to said conductor substantially parallel to said first substrate such that said solder member engages said solder paste;

heating said first and second substrates to a temperature substantially equal to or above said first melting point but less than said second melting point sufficient to cause said solder paste to dewet from said organic dewetting material and form substantially about said solder member; and

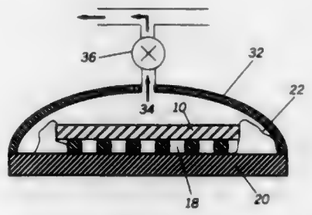
thereafter cooling said formed solder to form an electrical interconnection and bond between said first and second substrates.

5,203,076

VACUUM INFILTRATION OF UNDERFILL MATERIAL FOR FLIP-CHIP DEVICES

Kingshuk Banerji, Plantation; Francisco D. Alves, Boca Raton, and Robert F. Darveaux, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1991, Ser. No. 812,332
Int. Cl.[5] H05K 3/34
U.S. Cl. 29—840 10 Claims



1. A method of attaching a semiconductor device to a substrate not having a through-hole, comprising the steps of:

electrically interconnecting the semiconductor device on the substrate;

providing a bead of underfill material on the substrate about the periphery of the semiconductor device;

applying at least a partial vacuum to the semiconductor device and the substrate to substantially evacuate entrapped air in the underchip area between the semiconductor device and the substrate by bubbling the entrapped air through the underfill material;

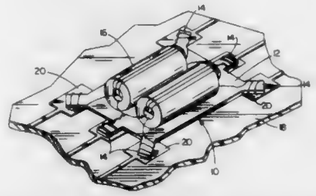
releasing the vacuum by applying fluid pressure to the semiconductor device and the substrate to force at least a portion of the underfill material into the underchip area between the semiconductor device and the substrate.

5,203,077

METHOD FOR MOUNTING LARGE DISCRETE ELECTRONIC COMPONENTS

Prabhakara Reddy, 7 Sheep Meadow Pl., The Woodlands, Tex. 77381

Filed Sep. 11, 1991, Ser. No. 758,900
Int. Cl.[5] H05K 3/34
U.S. Cl. 29—840 5 Claims



1. The method of mounting a large discrete component on a printed circuit board, which method comprises the steps of:

forming an auxiliary board member large enough to receive and secure thereon the discrete component to be mounted;

forming a plurality of tabs to project from said auxiliary board;

fixing the component to the auxiliary board with lead wires extending outwardly from the component;

stripping insulation from of said lead wires and wrapping the stripped wire ends about respective ones of said tabs;

forming a main printed circuit board and a plurality of solder-containing contact pads on said main board in positions coinciding with said tab locations; and

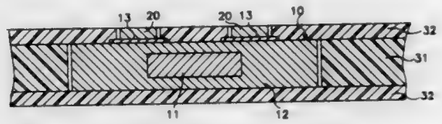
soldering the ends of aid lead wires by placing said auxiliary board tabs in alignment with said contact pads and flowing the solder on said pads to adhere to said tabs and said lead wire ends wrapped around said tabs.

5,203,078

PRINTED WIRING BOARD FOR IC CARDS

Chiaki Nakanishi; Atsushi Hiroi, and Yoji Yanagawa, all of Ogaki, Japan, assignors to Ibiden Co., Ltd., Ogaki,

Division of Ser. No. 554,086, Jul. 17, 1990, abandoned, which is a continuation of Ser. No. 26,670, May 26, 1987, abandoned.
This application May 30, 1991, Ser. No. 707,627
Claims priority, application Japan, Jul. 17, 1985, 60-159192; Nov. 11, 1985, 60-253324
Int. Cl.[5] H01R 9/06
U.S. Cl. 29—843 9 Claims



1. A method for producing a printed wiring board for an IC card, wherein said printed wiring board has a substrate of a non-conductive material, a printed wiring pattern on said substrate, and bumps on said printed wiring pattern, comprising:

forming a plating mask on said printed wiring pattern and said substrate, said plating mask having windows, each window corresponding to the size and location of each said bump which is to be plated to a predetermined part of said printed wiring pattern;

plating an electroconductive material to said printed wiring pattern exposed by each said window of said plating mask to form platings having a top surface;

with the plating mash in place over said printed wiring pattern and said substrate, surface treating only the top surface of the platings in order to form said bumps;

removing said plating mask to expose said bumps; and

surrounding said bumps and covering said printed wiring pattern and said substrate with an over sheet of a non-conductive material.

5,203,079

METHOD OF TERMINATING MINIATURE COAXIAL ELECTRICAL CONNECTOR

Donald J. Brinkman, Woodridge; Frank A. Harwath, Downers Grove; Glean A. Landgraf, Naperville; Hasmukh Shah, Wheaton, and Eric Stenstrom, Warrenville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 13, 1991, Ser. No. 792,537
Int. Cl.[5] H01R 43/02
U.S. Cl. 29—860 17 Claims

1. A method of terminating a coaxial connector to a coaxial cable, said connector having an elongated signal pin surrounded in part by an insulating jacket and an elongated shield member surrounding the insulating jacket, said cable having a signal wire surrounded by an inner insulating member, ground means surrounding said insulating member and an outer insulating sheath surrounding said ground means, comprising the steps of:

providing an elongated conductive shield member having a front portion and a rear portion;

securing the front portion of the shield member onto the insulating jacket surrounding the signal pin whereby a portion of said signal pin is positioned within said rear portion;

electrically and mechanically bonding with heat and pressure the ground means to the rear portion of the shield member without substantial deformation of the shield member;

electrically and mechanically bonding with heat and pressure the signal wire to an exposed portion of the signal pin within said rear portion of the shield member while the insulating jacket is secured by the shield member and without substantial deformation of the signal pin; and

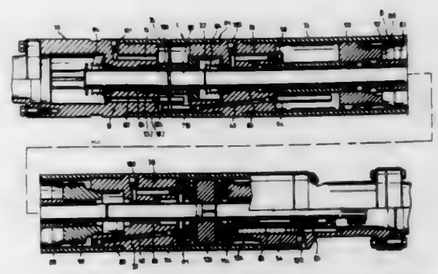
closing the rear portion of the shield member around the bonded portions of the signal wire and the ground means.

5,203,080

METHOD OF MAKING MODULAR PROTECTOR ASSEMBLIES FOR OIL-FILLED SUBMERGIBLE ELECTRIC MOTORS

Russell J. Bookout, P.O. Box 1181, Bartlesville, Okla. 74005

Division of Ser. No. 442,633, Nov. 29, 1989, Pat. No. 4,992,689.
This application Jul. 27, 1990, Ser. No. 558,590
Int. Cl.[5] H02K 15/14; B23P 19/02
U.S. Cl. 29—888.02 12 Claims



1. A method of manufacturing protector assemblies for use with oil-filled submergible electric motors of the type employed to drive submergible pumps, each protector assembly having at least one protector chamber, each said protector chamber having a body, comprising the steps of:

providing a plurality of protector chambers adapted to be interconnected physically and hydraulically to form different protector assemblies, said plurality of protector chambers including protector chambers of different types, each said protector chamber including a pressure equalization system, each said type of protector chamber having communication passages for facilitating fluid communication;

providing a plurality of identical bodies for coupling at least one of said protector chambers to another component, each of said bodies having a plurality of passages, said passages arranged and oriented to operatively communicate with said communication passages of each of said types of protector chambers;

selectively opening or closing at least one of said passages in at least one of said bodies to cause said passage to provide a selected opened or closed path of fluid communication

with said protector chamber when said body is opera-

forming an insert opening in said plastic pipe, lateral with

5,203,084

handle generally along said first spring and formed with a

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with said protector chamber when said body is operatively coupled to said protector chamber; and

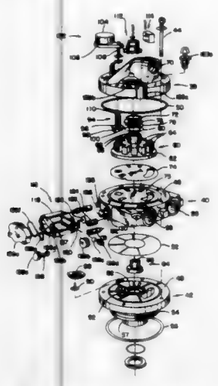
operatively coupling said at least one body to at least one of said protector chambers to form a protector assembly.

5,203,081

METHOD OF ASSEMBLING A WATER CONDITIONER ROTARY VALUE

Theodore E. Dahlen, West Bend; John M. Gagas, Milwaukee, and Nick W. Buettner, Waterford, all of Wis., assignors to Erie Manufacturing Company, Milwaukee, Wis.

Division of Ser. No. 606,508, Oct. 31, 1990, Pat. No. 5,174,337.
This application Aug. 25, 1992, Ser. No. 934,940
Int. Cl.[5] F16K *11/02*
U.S. Cl. 29—890.124 **1 Claim**



1. A method of assembling a water conditioner valve adapted for connection to a tank having a mineral bed, comprising the steps of:

providing a valve upper portion including a plurality of flow passages and a rotor member for providing intake water to selected flow passages during movement of the rotor member;

assembling a brine injector valve to the valve upper portion for drawing brine from a brine source when the rotor member is in a predetermined position and for supplying brine to a passage formed in the valve upper portion;

providing a first lower valve portion having a plurality of passages formed therein for communicating with the valve upper portion to provide downflow of brine through the tank;

providing a second lower valve portion having a plurality of passages formed therein for communicating with the valve upper portion and with a standpipe located in the tank to provide upflow of brine through the tank; and

assembling one of the first or second valve lower portions to the valve upper portion, to provide either downflow or upflow of brine through the tank.

5,203,082

PIPE INSERT AND METHOD OF INSTALLATION

Thomas A. Bontems, Tempe, Ariz., assignor to Arizona Mist Outdoor Cooling Systems, Inc., South Los Feliz, Ariz.

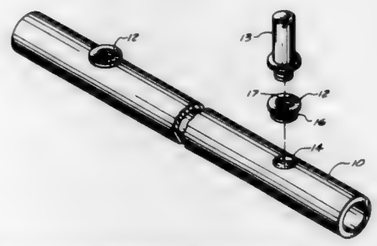
Filed Aug. 26, 1991, Ser. No. 750,183
Int. Cl.[5] B21D *53/00*
U.S. Cl. 29—890.141 **5 Claims**

1. A method of installing a metal insert in a plastic pipe comprising the steps of:

providing a plastic pipe having a longitudinal axis;

forming an insert opening in said plastic pipe, lateral with respect to said longitudinal axis;

providing a metal insert; and



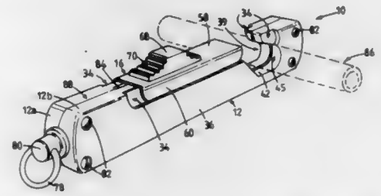
installing said insert in said insert opening of said plastic pipe so as to cause the plastic of said plastic pipe to bond to said insert.

5,203,083

CUTTING DEVICE

Dean D. Domonoske, 16A/66 Great Eastern Highway, Rivervale, Western Australia, Australia 6103

Filed Feb. 5, 1992, Ser. No. 831,777
Claims priority, application Australia, Feb. 21, 1991, PK 4712
Int. Cl.[5] B23D *21/06*
U.S. Cl. 30—92 **13 Claims**



1. A cutting device for cutting a tubular member comprising:

a casing;

blade means in said casing, said blade means having a cutting edge and being movable between first and second blade positions;

a movable member having blade guide means engaging said blade means and movable between first and second positions to move said blade means between said first and second blade positions;

resilient means in said casing to bias said blade means toward said first blade position; and

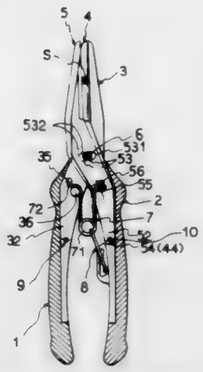
said casing provided with cut-out means to accommodate said tubular member to be cut, said cut-out means having a curved surface for supporting said tubular member transversely with respect to the direction of the movement of said blade means, whereby said tubular member may be placed in said cut-out means when said blade means is in said second blade position, and said tubular member is cut when said blade means is in said first blade position such that said cutting edge of said blade means passes through said cut-out means as it moves from said second blade position to said first blade position and said tubular member is cut substantially transversely to its longitudinal axis.

5,203,084

STRUCTURE FOR SCISSORS WITH PINCER-CLIP

Long-Far Kuo, Taipei, Taiwan, assignor to Pei-Ken Lui and Chi-Chang Yang, both of Taiwan

Filed Mar. 20, 1992, Ser. No. 854,575
Int. Cl.[5] B26B *13/14*
U.S. Cl. 30—135 **7 Claims**



1. A pair of scissors with a pincer-clip comprising:

a pair of blades;

a pair of handles having grooves formed therein, one of said handles having a wedge formed at one end thereof, said pair of blades mounted in said grooves of said pair of handles, said pair of blades and said one of said handles having a common axle for pivoting thereabout, each of said pair of blades having a cutting blade at one end and a handle member at another end, said handles receiving said handle members, said common axle positioned between said cutting blade and said handle member;

a clipboard having a handle portion at one end and a gripping surface at the other end, said handle portion received by said another of said handles, said clipboard having an extended axle hole pivotable about said common axle; and

a spring having one end connected to one of said pair of blades, said spring having the other end connected to said clipboard, said spring for urging said pair of handles apart, one of said pair of blades having a peg affixed thereto, said peg for receiving one end of said springs.

5,203,085

KNIFE

Marald Berns, Wuppertal, Fed. Rep. of Germany, assignor to Martor-Argentax E.H. Beermann KG, Solingen, Fed. Rep. of Germany

Filed Apr. 30, 1992, Ser. No. 876,235
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1992, 4200018
Int. Cl.[5] B26B *3/06*
U.S. Cl. 30—163 **14 Claims**

1. A knife, comprising:

an elongated hollow handle having an opening at one end;

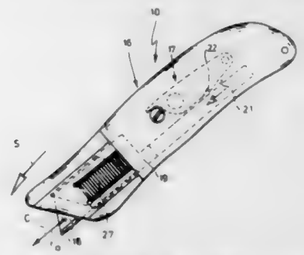
a blade holder longitudinally shiftable in said handle, adapted to receive a blade, and displaceable between an operative position wherein said blade extends from said opening and a retracted position wherein said blade is withdrawn through said opening into an interior of said handle;

a first longitudinally extending coil tension spring generally parallel to a direction of displacement of said holder within said handle and connected to said holder for retracting said holder from said operative position to said retracted position;

an extension on said holder projecting rearwardly in said handle generally along said first spring and formed with a locking tooth;

a locking pawl swingably mounted in said handle for pivotal movement about a pivot axis therein and formed with a detent recess receiving said tooth and having a substantially planar blocking surface substantially tangential to a pivot circle of said surface centered on said axis for engagement by said tooth in said operative position of said holder, thereby retaining said holder in said operative position, said pawl being swingable about said axis away from said tooth to release said tooth from said surface and permit said first spring to retract said holder to said retracted position, said tooth being shaped so as to engage said surface only at an apex of said tooth; and

a second longitudinally extending coil tension spring in said handle connected to said pawl and biasing said pawl toward said extension.

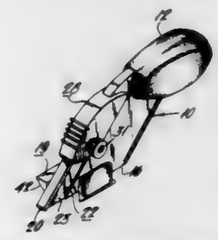


5,203,086

CUTTING APPARATUS

Michael Dann, Philadelphia, Pa., assignor to Hunt Holdings, Inc., Wilmington, Del.

Filed Mar. 18, 1992, Ser. No. 853,446
Int. Cl.[5] B26B *1/08*
U.S. Cl. 30—293 **3 Claims**



1. Apparatus for making narrow, slitlike cuts extending along a cutting path in a material, comprising:

a blade-holding body having a grip portion adapted to be held in a hand of a user to enable drawing of said body along a predetermined cutting direction parallel to said cutting path;

a blade holder mounted on said body;

an adjustable cutting blade having a cutting edge and held in said blade holder for adjustable extension of said cutting edge into a cutting position in which it protrudes outward beyond an edge of said body and for retraction into a stored position in which it is entirely within the border of said body, the plane of said cutting blade and the plane of said cutting edge extending along said predetermined cutting direction;

said body having a planar guide surface at said edge thereof for holding said body at a fixed elevational angle with respect to the surface of said material adjacent thereto as said body is moved along said surface of said material to

effect cutting of said material along said cutting path by

5,203,088

a third bogie (30) mounted to the vehicle between said first

tion of at least a portion of the piece of siding, and wherein

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effect cutting of said material along said cutting path by said cutting edge of said blade;

said blade being mounted on an outer side of said body parallel to said cutting path so that it is readily visible to a viewer, another cutting blade having a cutting edge and held in said blade holder for adjustable extension and retraction of its cutting edge with respect to said edge of said body, said another blade being held for sliding motion parallel to and on the opposite side of said body from said first-named blade, whereby both blades may make simultaneous cuts,

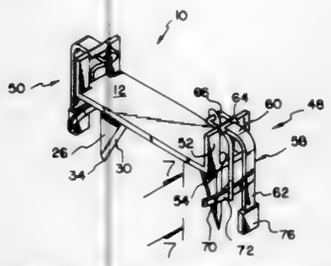
wherein said another blade and said first-named blade are spaced apart by the thickness of said body, and said body has a nose portion extending between said blades and having an inclined-plane configuration, whereby after said cuts are made, said body portion can be moved along between said cuts to plow out the material between said cuts.

5,203,087

CAN TOP OPENER AND SEALER

Walco J. Richard, 9005 Vicksburg, Texas City, Tex. 77591

Filed Jun. 9, 1992, Ser. No. 895,647
Int. Cl.[5] B67B *7/46*
U.S. Cl. 30—411 **5 Claims**



5. A new and improved opener for a container having a sealed end comprising:

a plate member having a longitudinal dimension at least as large as the longitudinal dimension of said container's sealed end,

a pair of blade members adapted to pierce said sealed end and form corresponding openings therein, said blade members being fixed to said plate member at locations wherein the distance between said blade members is less than the longitudinal dimension of said plate member,

wherein said plate member has a pair of opposed ends defining the limits of said longitudinal dimension, clamping means supported on at least one of said opposed ends to clamp said plate member to said container with said blade members being seated within the openings formed thereby in said sealed end of said container, and

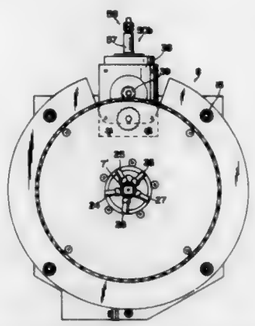
wherein said clamping means comprises a support member on said one opposed end, said support member defining an axle about which a clamping arm may be rotated, said axle located intermediately opposed ends of said clamping arm, jaw means attached to one end of said clamping arm whereby rotation of the other end of said clamping arm about said axle is effective to cause said jaw means to engage a side of said container when said plate member is positioned on said container sealed end with said blade members received in said openings formed thereby.

5,203,088

METHOD AND MACHINE FOR THE ENGRAVING OF ARTICLES

Andersson Morgan, AB Antoengraving, Kougsta Gård, Higgenäs, S-830 30 Lit, Sweden

PCT No. PCT/SE90/00331, § 371 Date Dec. 13, 1991, § 102(e) Date Dec. 13, 1991, PCT Pub. No. WO90/15723, PCT Pub. Date Dec. 27, 1990
PCT Filed May 17, 1990, Ser. No. 781,199
Claims priority, application Sweden, Jun. 15, 1989, 8902158
Int. Cl.[5] B43L *9/00*
U.S. Cl. 33—21.1 **10 Claims**



1. An engraving machine for engraving an article having a curved surface, said machine being controlled by computer-generated control signals and comprising:

frame means;

a substantially planar member rotatably supported on said frame means for rotation within the plane of said planar member and about an axis;

attachment means secured to said planar member for rotatably holding said article for rotating said curved surface about said axis;

rotation means secured to said frame means and operatively connected to said planar member for rotating said planar member with its plane and about said axis in response to said computer-generated control signals;

an engraving member operatively connected to said frame means for moving axially and radially with respect to the curved surface of an article mounted within said planar member in response to said computer-generated control signals;

means secured to said frame means for moving said engraving member axially and radially; and

a computer for generating and coordinating said computer-generated control signals for engraving said article.

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RAILROAD VEHICLE FOR MEASURING THE GEOMETRICAL PARAMETERS OF RAILROAD TRACK

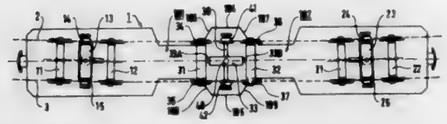
Jean-Francois Trefouel, Gentilly, and Marc Centil, Chateaubriand, both of France, assignors to Cegelec, Levallois-Perret and Ateliers Bretons de Realisations Ferroviaires, Chateaubriand, both of France

Filed Jun. 10, 1991, Ser. No. 712,273
Claims priority, application France, Jun. 12, 1990, 90 07276
Int. Cl.[5] B61K *9/00*; G01B *11/24*
U.S. Cl. 33—338 **6 Claims**

1. In a railroad vehicle for measuring by optical means the geometrical parameters of a track comprising a first rail and a second rail, the vehicle moving on said track and including a first bogie (**10**) and a second bogie (**20**) each of said bogies having two main axles, the improvement wherein each of the first and second bogies includes a third axle (**13, 23**) with independent wheels, and said vehicle further includes:

a third bogie (**30**) mounted to the vehicle between said first and second bogies and comprising two main axles (**31** and **36**), capable of moving relative to each other about an axis passing through their centers, and a third, central axle (**39**) with independent wheels, placed between said two main axles of said third bogie;

three pairs (**51** and **53**; **62** and **63**; **72** and **73**) of optical proximity meters disposed on respective ones of the three independent-wheel axles (**13**, **23** and **29**), each proximity meter including an emitter and a receiver placed so as to look at the inside faces of the first rail (**2**) and the second rail (**3**) respectively;



first and second pairs of optical distance gauges whose receivers (**81** and **82**; **81A** and **82A**) are disposed head-to-tail in pairs at the ends of the central axle (**39**) of the third bogie (**30**) and whose emitters (**91** and **92**; **91A** and **92A**) are disposed at the ends of the independent-wheel axles (**13** and **23**) respectively of the first (**10**) and second (**20**) bogies; and

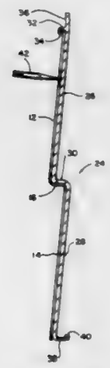
a third pair of distance gauges whose receivers (**93** and **93A**) are placed at the ends of one (**31**) of the main axles of the third bogie (**30**) and whose emitters (**94** and **94A**) are disposed at the ends of the other (**36**) axle of the third bogie (**30**).

5,203,090

SIDING LAYOUT TOOL AND METHOD

Bill R. Bouska, 105 Fourth Street, SE., West Union, Iowa 52175, and Douglas L. Sevey, 635 Burbank Ave., Waterloo, Iowa 50702

Filed Dec. 26, 1991, Ser. No. 813,658
Int. Cl.[5] G01B *3/30*
U.S. Cl. 33—481 **8 Claims**



1. A method of making a longitudinal mark or cut on a piece of siding having an upper panel, a lower panel, a longitudinal ridge between the upper and lower panels, and a lip located toward the upper end of the upper panel, comprising the steps of:

providing a tool defining a substantially planar plate portion and a step oriented at an angle to the plate portion, the plate portion having one or more openings extending therethrough, each opening being located at a predetermined distance from the step, wherein the tool defines a cross-section substantially corresponding to the cross-section of at least a portion of the piece of siding, and wherein the plate portion includes an upper planar plate portion extending upwardly from the step and terminating in an upper end, and a lower planar plate portion extending downwardly from the step, the upper and lower plate portions each having one or more openings therethrough located at predetermined distances from the step;

placing the tool on the piece of siding by engaging the step with the longitudinal ridge disposed between the siding upper panel and the lower panel and placing the upper end of the upper planar plate portion between the lip and the upper panel to maintain the tool in position on the piece of siding, wherein the upper plate portion of the tool is disposed against the upper panel and the lower plate portion of the tool is disposed against the lower panel;

placing a marking or cutting instrument through a selected one of the openings in the plate portion; and

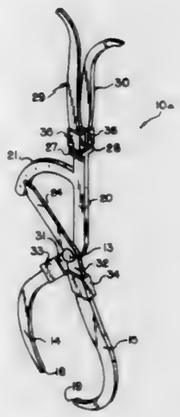
simultaneously moving the tool and the marking or cutting instrument longitudinally along the piece of siding while maintaining the step in engagement with the longitudinal ridge of the piece of siding and while maintaining the upper end of the upper planar plate portion between the lip and the upper panel.

5,203,091

CALIPER APPARATUS

Salah M. Al-Farsy, c/o Oman Aviation Services Co. P.O. Box 1034, Seeb Central Post, Muscat, Sultanate of Oman,

Filed May 11, 1992, Ser. No. 881,200
Int. Cl.[5] G01B *3/16*
U.S. Cl. 33—558.3 **3 Claims**



1. A caliper apparatus, comprising,

a first leg member pivotally mounted relative to a second leg member in a scissor-like orientation, with the first leg member and the second leg member including a pivot axle orthogonally directed through the first leg member and the second leg member pivotally mounting the first leg member relative to the second leg member, and

the first leg member including a C-shaped first arcuate lower leg, with the second leg member including a C-shaped second arcuate lower leg, the C-shaped first arcuate lower leg includes a first concave side wall in confronting relationship relative to a second concave side wall of the C-shaped second arcuate lower leg, the first lower leg includes a first leg lower distal end radially spaced from the pivot axle a predetermined spacing , with the C-shaped second arcuate lower leg including a second leg

distal end spaced from the pivot axle said predetermined

for calculating said set value and controlling the burning

base portion and a distribution portion extending from the

ing member and said first member, said separation termi-

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distal end spaced from the pivot axle said predetermined spacing, and

the first leg member further including a first leg extension leg extending above the pivot axle, with the first leg extension leg including an extension leg arcuate plate mounted laterally of the first leg extension leg concentric about the pivot axle, with the extension leg arcuate plate including an arcuate plate top surface, the arcuate plate top surface including gradations imparted thereon, and

the second leg member includes a second leg indicator leg integrally formed relative to the second arcuate lower leg, with the second leg indicator leg spaced above the pivot axle, with the second leg indicator leg including a pointed free end positioned above the arcuate plate top surface, and

the first leg extension leg includes a bifurcated head extending above the extension leg arcuate plate, the bifurcated head includes a first flange parallel to a second flange, and the first leg member includes a first leg stub plate, the second leg member includes a second leg stub plate, with the first leg stub plate and the second leg stub plate oriented below the pivot axle, and the C-shaped first arcuate lower leg includes a first leg sleeve at an upper distal end of the C-shaped first leg arcuate lower leg spaced from the first leg lower distal end, and the C-shaped second arcuate leg includes a second leg sleeve formed to an upper distal end of the C-shaped arcuate lower leg spaced from the second leg lower distal end, with the first leg sleeve arranged for receiving the first leg stub plate, the second leg sleeve arranged for receiving the second leg stub plate.

5,203,092

DRYING APPARATUS AND ITS CONTROL DEVICE FOR ROTARY PRINTING PRESS

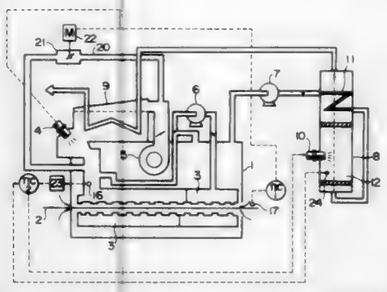
Hiroaki Kuno; Kazutoshi Yokoo, both of Hiroshima; Kuniaki Tanouchi; Chie Kuwada, both of Tokyo, and Minoru Yoshida, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1991, Ser. No. 801,461

Claims priority, application Japan, Dec. 3, 1990, 2-400261; Dec. 27, 1990, 2-408230

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—48 **8 Claims**



1. A drying apparatus for a rotary printing press wherein hot air is blown onto paper printed in ink to dry the printed paper by evaporating solvent in the ink and the hot air is reheated by using exhaust gas from a direct fired deodorizing apparatus, said drying apparatus comprising:

a hot air temperature control device for correcting a set value for a deodorizing apparatus furnace temperature on the basis of a value detected by a temperature sensor of hot air blowing from nozzles;

a paper temperature control device for correcting the set value for the deodorizing apparatus furnace temperature on the basis of a value detected by a temperature sensor of printed paper;

a deodorizing apparatus furnace temperature sensor; and

a deodorizing apparatus furnace temperature control device for calculating said set value and controlling the burning amount of a burner for deodorization of a direct fired deodorizing apparatus on the basis of said set value in response to the value from one of said hot air temperature control device and said paper temperature control device and also on the basis of the value detected by said deodorizing apparatus furnace temperature sensor.

5,203,093

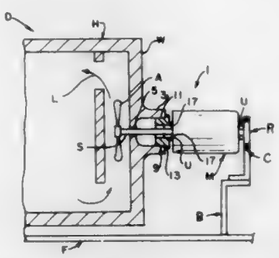
PLUG-IN HUB RING

Gerald N. Baker, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 13, 1991, Ser. No. 699,258

Int. Cl.[5] F26B *11/02*

U.S. Cl. 34—133 F **15 Claims**



1. In a household appliance having a housing in which a fan is located for circulating air through the housing, a motor located outside the housing for driving the fan and having a shaft to which the fan is attached extending through an opening in a sidewall of the housing the improvement which comprises means for mounting the motor to the housing, said means including a motor hub ring attachable to the housing sidewall adjacent the opening, and means formed on the ring for interlocking the motor with the hub ring, the housing including a projection extending outwardly of the housing, said projection having an axial groove in it, and said hub ring being received in said projection, and said hub ring including an annular flange fitting over the outer face of the projection.

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TEXTILE DRYING MACHINE HAVING PASS-THROUGH INTAKE CONDUIT FOR ONE DRYING FLUID DISTRIBUTION MEANS

Helge Freiberg, Mönchengladbach, and Manfred Pabst, Cologne, both of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Aug. 19, 1991, Ser. No. 746,877

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 4026107

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—158 **8 Claims**

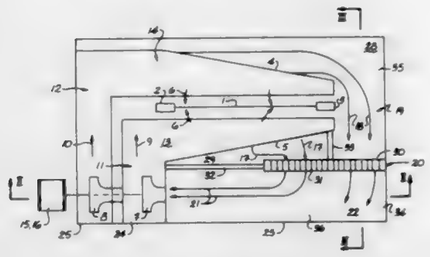
1. A textile drying machine for applying a drying fluid to a traveling web of textile material, comprising:

means for advancing a web of textile material along a generally planar travel path;

lower side treatment means including lower side jet nozzle means for jetting drying fluid onto the web from a lower side thereof relative to a transverse axis transverse to the plane of the travel path and a lower side housing, the lower side housing having a base portion and a distribution portion extending from the base portion in which the lower side jet nozzle means is mounted;

upper side treatment means including upper side jet nozzle means for jetting drying fluid onto the web from the upper side of the web opposite to the lower side thereof and an upper side housing, the upper side housing including a base portion and a distribution portion extending from the base portion in which the upper side jet nozzle means is mounted, the base portion of the upper side housing extending from the upper side of the web to the lower side of the web on one lateral side of the web relative to a lateral direction transverse to the travel path and being laterally outward of the base portion of the lower side housing and the base portions of the lower side housing and the upper side housing being substantially coextensive with one another relative to the travel path;

a lower side exhaust outlet formed in the lower side housing for passage therethrough of exhaust drying fluid being drawn away from the web;



an upper side exhaust outlet formed in the upper side housing for passage therethrough of exhaust drying fluid being drawn away from the web;

first intake means for the intake of exhaust drying fluid, the first intake means including a first intake conduit extending into the base portion of the lower side treatment means and suction means for drawing exhaust drying fluid into the first intake conduit; and

second intake means for the intake of exhaust drying fluid, the second intake means including a second intake conduit extending laterally completely through the base portion of the lower side housing and into the base portion of the upper side housing and suction means for drawing drying fluid into the second intake conduit.

5,203,095

ORTHOPEDIC STABILIZER ATTACHMENT AND SHOE

Don T. Allen, 4406 Oxford Way, Norman, Okla. 73072

Continuation-in-part of Ser. No. 743,890, Aug. 12, 1991, Pat. No. 5,159,767, which is a continuation-in-part of Ser. No. 535,604, Jun. 11, 1990, abandoned. This application Jun. 18, 1992, Ser. No. 900,470

Int. Cl.[5] A43B *21/30, 21/32*

U.S. Cl. 36—27 **32 Claims**

1. An orthopedic apparatus for use on a shoe having a sole portion said orthopedic apparatus comprising, a region corresponding to the heel of a human foot, a region corresponding to the arch of a human foot, and a region corresponding to the ball of a human foot said apparatus, comprising:

a substantially rigid first member extending from the arch region backward toward the heel region;

a substantially flexible supporting member extending from the arch region backward toward the heel region;

a fastener located in said arch region and fastening said first member and said supporting member together;

a wedge, for maintaining a separation between said supporting member and said first member, said separation terminating at an apex;

a substantially rigid wedge-shaped reinforcing member extending from the arch region forward to the ball region and reinforcing the sole portion of the shoe, said reinforcing member disposed in front of said apex;

whereby said first member, said supporting member and said reinforcing member cooperate to distribute weight forward toward said ball region and rearward toward said heel region and said supporting member flexes toward said first member to thereby cushion s id heel region.

5,203,096

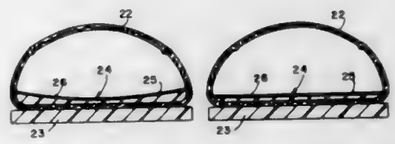
INSOLE ASSEMBLIES FOR SHOE GIRTH ADJUSTMENT

Henri E. Rosen, 229 Coolidge Ave., Watertown, Mass. 02172

Continuation-in-part of Ser. No. 337,381, Apr. 13, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 621,330

Int. Cl.[5] A43B *13/38*

U.S. Cl. 36—43 **12 Claims**



1. A girth adjustment shoe system for providing a shoe in which the girth may be varied to better fit a foot therein, comprising a shoe having a ball region and having an upper attached to a bottom forming a shoe cavity and a means for incrementally adjusting the girth of the shoe over a range of different girths in at least the ball region of the shoe, and girth adjustment means comprising at least two interchangeable and removable insole assemblies having substantially equal thicknesses generally along their longitudinal center, each insole assembly having a different transverse surface contour and thickness along its side portions when compared to the other insole assembly, each insole assembly comprising a substantially firm member that does not compress under the weight of a wearer's foot and being dimensioned so that there is no substantial change in elevation of the foot relative to the bottom surface of the shoe regardless of the girth adjustments effected by the insole assembly, said at least two insole assemblies being available for use separately within the shoe cavity so as to provide different girths for the same shoe without deformation of the bottom.

5,203,097

ATHLETIC SHOE OUTER SOLE FOR IMPROVED TRACTION

Roy D. Blair, 124 Cypress St., Watertown, Mass. 02172

Filed Aug. 21, 1990, Ser. No. 570,202

Int. Cl.[5] A43D *23/28*

U.S. Cl. 36—59 C **14 Claims**

1. In an athletic shoe for use on a hard playing surface, a shoe outer sole having within the periphery of said sole a toe area and a ball area, a plurality of adjacent grooves in the surface of the sole in said toe and ball areas thereof, said adjacent grooves defining a rib therebetween, thereby providing a plurality of adjacent ribs that correspond to said adjacent grooves, said ribs having rib faces that form said surface of said sole, the improvement comprising:

(a) each groove is defined by two evenly spaced apart walls and the groove bottom, said walls being transverse to said sole surface and said groove bottom,

(b) groups of said grooves are substantially parallel to the nearest part of said sole periphery,

(c) for each groove in a group, the wall thereof nearest said

free distal end thereof and including an open mouth por-

sion arm side of the elbow, the double drive sprocket in

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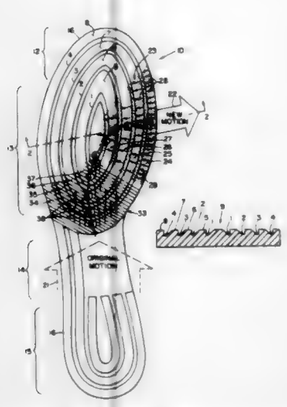
part of said sole periphery is perpendicular to said sole surface and

(d) the other wall of said groove is at least partially tapered toward said perpendicular wall,

(e) said perpendicular wall of a groove forms one wall of a rib and said tapered wall of the adjacent groove forms the other wall of said rib,



(f) whereby said groups of grooves form corresponding groups of said ribs and said ribs, when moving across said playing surface with said perpendicular wall thereof leading said motion makes relatively high friction contact therewith.

5,203,098

ALPINE SKI BOOT WITH SIDE LATCHING APPARATUS

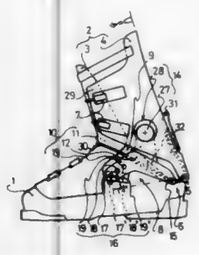
Claude Perrissoud, Saint-Jorioz, and Serge Lagier, Rumilly, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jan. 25, 1991, Ser. No. 645,656

Claims priority, application France, Jan. 26, 1990, 90 01102

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—117 **14 Claims**



1. A ski boot comprising:

a shell base having a heel portion and a pair of side portions;

an upper comprising a rear collar;

a pivot journal connecting said rear collar for pivoting at said heel portion of said shell base between a rearward position and a forward latched position;

a closure system for closing the upper on the lower leg of a skier;

a latching apparatus for latching said upper with respect to said shell base in said forward latched position and for unlatching said upper with respect to said shell base to allow movement of said rear collar toward said rearward position, and wherein:

said latching apparatus comprises an apparatus distinct from said shell base and said upper;

said latching apparatus is located in a zone of the malleoli of the skier;

said latching apparatus is connected to said shell base at an area of said shell base forward of the malleoli of said skier;

said latching apparatus is connected to said rear collar at said upper at an area of said rear collar above the malleoli of said skier in said forward latching position of said rear collar;

said latching apparatus comprises a rigidifying element on each of said pair of side portions of said shell base, each of said rigidifying elements comprising:

at least one fixed linkage device fixedly linking each of said rigidifying elements to said shell base at a predeterminate location; and

a further linkage device for linking said rigidifying element to said rear collar in said forward latched position;

said rear collar comprises a pair of wings, each of said wings having an opening therein;

each of said further linkage devices comprises a projection located for nesting within a respective one of said openings in said wings of said rear collar in said forward latched position of said rear collar;

at least one of said at least one fixed linkage device comprises a removable linkage element; and

each of said rigidifying elements further comprises an adjustable linkage device for fixedly linking a respective one of said rigidifying elements at a selected one of a plurality of different positions with respect to said shell base by means of said removable linkage element.

5,203,099

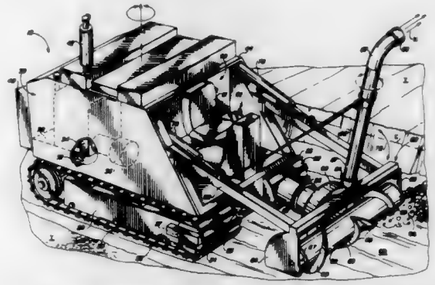
SELF-POWERED, SUBMERSIBLE DREDGE APPARATUS

Javier Naranjo, and Pierre G. Mansur, both of Miami, Fla., assignors to Commodities, Inc., Miami, Fla.

Filed Apr. 3, 1992, Ser. No. 863,584

Int. Cl.[5] E02F *5/28*

U.S. Cl. 37—329 **8 Claims**



1. A dredge apparatus for removing accumulated bottom sediment from the bottom surface of a body of water, said apparatus comprising:

a drive unit including drive means thereon structured and disposed to drivingly engage the bottom surface of the body of water,

a housing movable attached to an upper portion of said drive unit and including an interior compartment and an exterior operator control portion including an operator's seat and operating controls,

a dredge unit movably attached to an end of said housing and extending therefrom, said dredge unit being movable between a raised position and a lowered, operable position,

said dredge unit including a dredge assembly attached to a free distal end thereof and including an open mouth portion structured and disposed to be at least partially submerged below a water surface level of the body of water such that when said dredge unit is in said lowered, operable position, the bottom sediment is force fed into said open mouth as said drive unit moves the apparatus and attached dredge unit along the bottom surface in a forward direction in relation to the position of said housing and attached dredge unit,

pump means attached to said dredge unit including an intake disposed in fluid communication with said open mouth structured and disposed to intake a mixture of the bottom sediment and water being force fed into said open mouth, and an output structured and disposed to subsequently discharge said mixture forcefully therefrom,

a discharge chute rotatably attached to and extending upwardly from said output of said pump means and terminating at an upper free distal end in spaced relation above said drive unit, said distal end of said discharge chute being structured and disposed to evenly disperse and distribute the discharge of said mixture throughout a range of at least 30 feet in radius,

power means within said compartment of said housing, structured to operatively engage said drive means and said dredge unit for operation thereof,

control means at said control portion for operatively controlling said power means, thereby facilitating operative control of said drive means and said dredge unit,

rotation means interconnected between said drive unit and said housing and structured for controlled, adjusted rotation of said housing and said dredge unit about an arc of 360° relative to said drive unit, and

vertical adjustment means interconnected between said drive unit and said housing and structured to facilitate controlled vertical adjustment of said housing relative to said drive unit throughout a predetermined range of height.

5,203,100

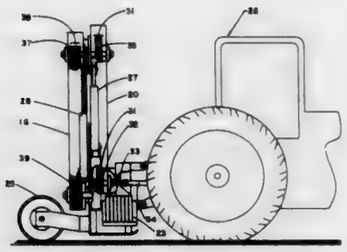
OFFSET DITCHER WITH CHAIN DRIVE

Paul M. Snyder, and John L. Snyder, both of 119 Ramsey Rd., Vincennes, Ind. 47591

Filed Aug. 7, 1991, Ser. No. 741,666

Int. Cl.[5] E02F *5/08*

U.S. Cl. 37—92 **4 Claims**



1. A folding boom side ditcher adapted to be driven by the power take off and the hydraulic drive system of a farm tractor, and to be attached to a three-point hitch on the back of the tractor, comprising:

a support frame adapted to be attached to a tractor;

a hydraulically operated, counterweighted, folding boom pivotally mounted on said support frame, said boom comprising a main arm pivotally connected at its inner end to the support frame, an extension arm pivotally connected at its inner end to the outer end of the main arm and at its outer end to the digger head, and a pivoting elbow connecting the main arm and the extension arm, said pivoting elbow including an outer double drive sprocket and a double drive chain in the main arm side of the elbow, a triple drive sprocket and a triple drive chain in the extension arm side of the elbow, the double drive sprocket in the elbow having a larger diameter than the diameter of the triple drive sprocket in the elbow to decrease the rpms and increase the driving force transmitted to the digger head.

5,203,101

DIGGING CHAIN VIBRATORY SYSTEM

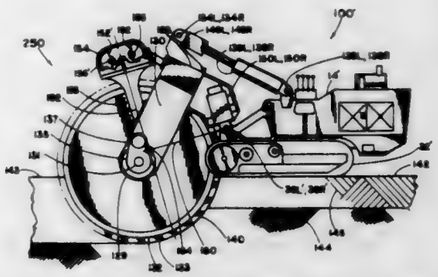
John F. Bryan, 4250 W. Lovers La., Dallas, Tex. 75209

Continuation-in-part of Ser. No. 444,402, Dec. 1, 1989, Pat. No. 5,056,244. This application Jul. 15, 1991, Ser. No. 729,945

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[5] E02F *5/08*

U.S. Cl. 37—189 **22 Claims**



1. A boom type continuous excavating machine comprising:

a main frame;

an undercarriage supporting said main frame for forward and reverse movement along the ground;

a support boom having upper and lower ends;

digging means in rotatable assembly with said support boom for engaging the ground, said digging means including peripheral cutting means for continuously cutting and excavating ground material;

drive means for powering continuous rotation of said digging means;

connecting means adjacent said boom upper end connecting said support boom to said main frame for pivotal movement from a first position in which said digging means engages the ground along a cutting surface to a second position in which said digging means is raised above the ground, the assembly of said support boom and said digging means having a center of percussion spaced from said connecting means;

actuating means connecting said main frame to said support boom at a position adjacent said upper end for pivoting said boom assembly between said first and second positions; and

directionally oriented vibration exciting means having direction of vibration, substantially perpendicular to a radial line formed by said center of percussion and said pivotal connecting means, and substantially aligned with said center of percussion.

5,203,102

DEVICE ON ROTARY SNOW PLOUGH

Paul Mötteli, Ackersteinstrasse 111, 8049 Zürich, Switzerland

Filed Nov. 26, 1991, Ser. No. 797,958

Claims priority, application Switzerland, Dec. 6, 1990, 03863/90

Int. Cl.[5] E01H *5/09*

U.S. Cl. 37—248 **5 Claims**

1. A device on rotary snow plough comprising:

a ploughing drum, a running gear and a motor drive connected to each other,

holding-down means, connected to the running gear and

5,203,104

the hook retained by the neck portion in a generally rear-

5,203,107

FISHING LINE LIMIT ASSEMBLY

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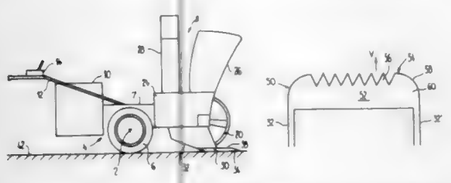
holding-down means, connected to the running gear and being arranged in front of the ploughing drum, for holding down said rotary snow plough due to the weight of snow on top of said holding-down means,

said holding-down means having an upwardly directed holding-back surface, the upwardly directed holding-back surface having a free surface area forward of a working area of the ploughing drum, said holding down means being curved inward in front of the ploughing drum and

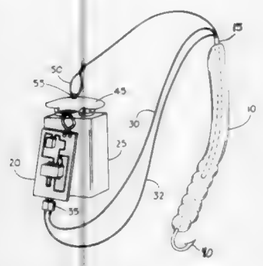


having a blade member which extends over the longitudinal length of the ploughing drum such that a portion of the blade member is directly forward of the working area of the ploughing drum, said blade member having forwardly directed teeth,

said ploughing drum having only one axis,

said holding-down means being rigidly fastened to a housing of said rotary snow plough by at least one connection piece.

5,203,103
ACTION FISHING LURE
James M. Hawley, 4272 Queen Ave. S., Minneapolis, Minn. 55410
Filed Sep. 2, 1992, Ser. No. 939,307
Int. Cl.[5] A01R *79/02*
U.S. Cl. 43—17.1 **7 Claims**



1. A fishing lure comprising:

a temperature sensitive actuator, the actuator including:

a first end,

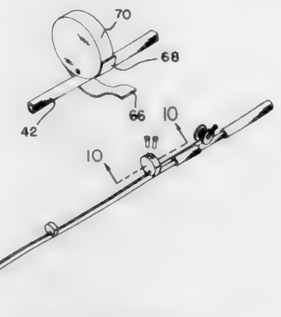
a second end, and

an electrically resistive actuator body extending there between the body of the actuator characterized by a first configuration at a first temperature and a second configuration at a second temperature greater than the first temperature;

a pulsed electrical source electrically connected to the first and second ends of the actuator and providing a periodical electrical current through the actuator body, the periodical electrical current causes a temperature fluctuation of the actuator body between the first temperature and the second temperature, said temperature fluctuation causes said actuator body to move between the first configuration and the second configuration;

a pliant fish attractive body mechanically connected to the actuator and changing shape in response to the configuration changes of the actuator.

5,203,104
NONSUBMERSIBLE FISHING ROD AND REEL
Aaaron A. Brauer, P.O. Box 232, Stockton, Mo. 65785
Filed Apr. 24, 1992, Ser. No. 874,130
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—23 **14 Claims**



1. An article of manufacture comprising:

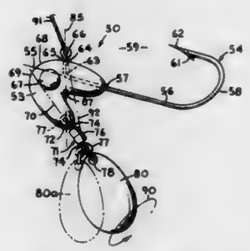
a fishing rod having a handle at one end thereof, and

floatation means associated with said handle to render said fishing rod nonsubmersible in water, said floatation means comprising a filler member of buoyant material in at least a portion of said handle,

reel means having fishing line thereon provided on said fishing rod near said handle, and

wherein said fishing rod further comprises at least one floatation collar mounted therein, said floatation collar serving as eyelet guide means for the fishing line contained on said reel means.

5,203,105
HORSE HEAD FISHING LURE
A. Melvin Bond, and Jerry M. Bond, both of Denver, Iowa, assignors to Do-It Corporation, Denver, Iowa
Filed Aug. 27, 1992, Ser. No. 936,897
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.39 **11 Claims**



1. A horse head fishing lure comprising:

a weight in the shape of an elongate neck portion with a front and rear, and an elongate head portion with upper and lower ends, the head portion extending with its upper end from the front of the neck portion downward at an acute included angle between the elongate neck and head portions;

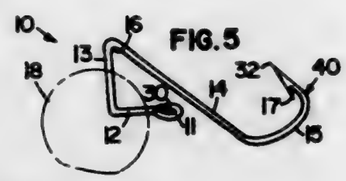
a hook having a shank and a hook portion, the hook portion curved back on the shank and forming a gap with the shank, the gap being disposed in a plane substantially bisecting the weight and coincident with longitudinal axes through the elongate neck and head portions, the shank extending partially within the neck portion of the weight,

the hook retained by the neck portion in a generally rearward orientation and extending from the rear of the neck portion and having the hook portion disposed away from the weight;

means for suspending the fishing lure, the suspending means mounted in the neck portion and extending from a top surface of the front of the neck portion above a centroid of the fishing lure when the hook is disposed in the generally rearward direction; and

a swivel attached to the lower end of the head portion, the swivel including a swivel link extending generally downward away from the front of the neck portion and from the lower end of the head portion, the swivel link including means for attaching a spinner blade thereto, and disposed on the bisecting plane through the weight and rearward with respect to the centroid of the lure such that a line of action between the suspending means and the swivel link is disposed rearward of the centroid of the lure.

5,203,106
FISHING LURE
Mikel R. Huppert, Route 1, Box 72A, Ellsworth, Wis. 54011
Filed May 16, 1991, Ser. No. 701,227
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.39 **12 Claims**



1. A fish lure, comprising:

(a) a first end;

(b) a second end;

(c) a generally straight first segment cooperatively connected to said first end;

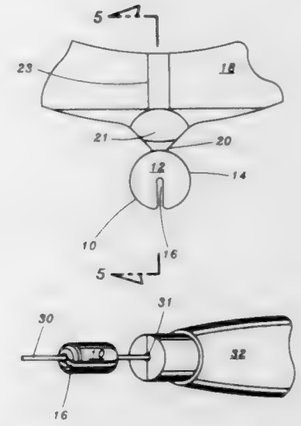
(d) a generally straight second segment cooperatively connected to said first segment;

(e) a generally straight third segment cooperatively connected to said second segment;

(f) an arcuate fourth segment having an arcuate path cooperatively connected to said second end and said third segment, wherein the arcuate path is greatest between said second end and said third segment, said arcuate path gradually decreasing in radius as it approaches said second end and said third segment and wherein said arcuate fourth segment defines a projected area bounded on one side by said third segment; and

(g) a head member cooperatively connected to said first and second segment, wherein when the lure is balanced at the intersection between said second and third segments, then said head member tends to hang directly below said intersection thereby orienting said third segment generally horizontal and wherein said head member is arranged and configured to lie entirely outside of said projected area, whereby the fish lure has an optimized hook gap, wherein hook gap is defined as the gap between said head member and said second end.

5,203,107
FISHING LINE LIMIT ASSEMBLY
James R. O'Brien, 4355 Pilgrim Hollow Ct., Brookfield, Wis. 53005, and Robert E. Luce, N169 W19820 Chestnut Ct., Apt. 11, Jackson, Wis. 53037
Filed Apr. 1, 1991, Ser. No. 678,112
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—44.9 **8 Claims**



7. A kit for securing a bobber to a fishing line that comprises:

(a) a bobber having an eyehole through which a fishing line is strung;

(b) a fishing line limit assembly that includes first and second fishing line limits that attach to the fishing line, the first fishing line limit being attachable at a preselected location forward of the bobber to restrain movement of the fishing line forward of the bobber through the inside diameter of the eyehole and the second fishing line limit being attachable at a preselected location rearward of the bobber to restrain movement of the fishing line rearward of the bobber through the inside diameter of the eyehole of the bobber, each of the fishing line limits comprising a body having an outer margin that is sized to project from the outside diameter of the fishing line by a dimension that exceeds the dimension of the inside diameter of the eyehole, the fishing line limits each having a notch that extends inward from the outer margin and that is sized to a dimension less than the relaxed outside diameter of the fishing line such that the fishing line may be inserted into the notch and the respective fishing line limit remains fixed at its preselected location by frictional engagement of the notch against the outside diameter of the fishing line; and

(c) a support structure to which the bodies are attached prior to attachment of the bodies to a fishing line, the bodies being capable of being detached from the support structure and the support structure being discardable after the bodies are broken off, and wherein the main bodies of the fishing line limits are each mounted on the support structure by an interconnection and wherein the support structure has an indentation corresponding to each one of the bodies, the indentations each being shaped to mate with the outer margin of one of the bodies, the bodies each being manipulable such that the interconnection may be bent and the outer margins of the bodies may be individually received within one of the indentations in order that the fishing line limit be steadied for insertion of the fishing line into the notch of the body.

5,203,108

rows partial cell-forming sidewall portions joined at lower

said transmitter and continuously received by said receiver to

electric motor, and latch plate actuating means operati-

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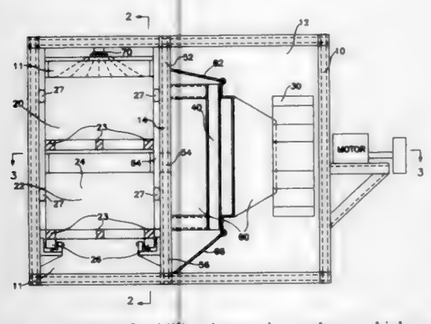
5,203,108

METHOD AND DEVICE FOR HEAT KILLING INSECTS IN BULK PRODUCE CONTAINERS

Martin W. Washburn, Jr., R.R. 1, Box 313A, Morgan Hill, Calif. 95037

Filed May 31, 1991, Ser. No. 708,358
Int. Cl.[5] A01M 19/00
U.S. Cl. 43—130 28 Claims



1. An apparatus for killing insects in produce, which comprises:
an outer container;
means for dividing a space enclosed by said outer container into first and second internal chambers;
first and second air passage means for allowing passage of air between said first internal chamber and said second internal chamber;
means for circulating air from said second internal chamber successively through one of said air passage means, said first internal chamber, the other of said air passage means, and back into said second internal chamber;
means for heating said circulating air while maintaining relative humidity in said first internal chamber below 75%; and
means for supporting at least one bulk produce bin in said first internal chamber so that sides of said bin contact surfaces of said first internal chamber or surfaces of additional bins in said chamber, wherein contacting surfaces and bin sides block passage of air through said first internal chamber expect for passage through said bin or bins in said first internal chamber.

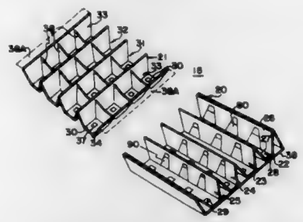
5,203,109

APPARATUS FOR TRANSPLANT PROPAGATION

Edward J. Simon, 1015A Greenwood Rd., Elk, Calif. 95432, and Anthony Visser, s-Gravendeel, Netherlands, assignors to Edward John Simon, Elk, Calif.

Continuation-in-part of Ser. No. 803,685, Dec. 3, 1991, abandoned, which is a continuation of Ser. No. 549,454, Jul. 6, 1990, abandoned, and a continuation-in-part of Ser. No. 104,661, Oct. 5, 1987, Pat. No. Des. 312,577. This application Dec. 27, 1991, Ser. No. 815,288
Int. Cl.[5] A01G 9/10
U.S. Cl. 47—75 28 Claims

1. Apparatus for transplant propagation comprising a unitary lower tray member and a separate unitary upper tray member carried on said lower tray member and cooperatively forming a regular two dimensional array of transplant plug cells arranged as separate but interconnected rows and columns adapted to receive a transplant medium for growing of seedling in each of said transplant plugs thereby formed in said transplant plug cells, said upper tray member being removable from said lower tray to carry simultaneously all of said rows and columns of transplant plugs out of said two dimensional array of cells and said upper tray member consisting of parallel rows partial cell-forming sidewall portions joined at lower edges by bottom wall portions such that each of said transplant



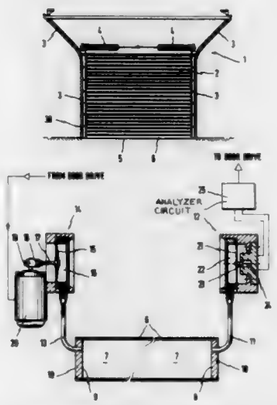
plugs is supported by said upper tray member solely on two of its opposing sides and bottom.

5,203,110

SAFETY DEVICE FOR THE CLOSING EDGE OF A DOOR LEAF

Michael Hörmann, Marienfeld, Fed. Rep. of Germany, assignor to Marantec Antriebs- und Steuerungstechnik GmbH & Co. Produktions oHG, Marienfeld, Fed. Rep. of Germany

PCT No. PCT/DE90/00496, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO91/00406, PCT Pub. Date Jan. 10, 1991
PCT Filed Jul. 2, 1990, Ser. No. 663,905
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921641
Int. Cl.[5] E05F 15/02
U.S. Cl. 49—28 18 Claims



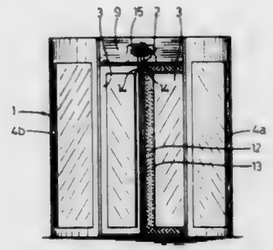
1. A safety arrangement for a motor driven door or gate to close building entrances or doorways, comprising: a vertical movable overhead door of at least one part; a closing edge at a terminal end of said door; an elastically deformable hollow rubber section at said closing edge and having an interior hollow space with first and second ends; an air pressure-wave receiver signal transformer connected to said first end of said gollow space through a first tubular member; an air pressure-wave transmitter connected to said second end of said hollow space through a second tubular member; said transmitter generating a continuous air pressure oscillation having a first pulse duration and a first pulse frequency when said closing edge is freely movable through the entire path of motion of said door, said continuous oscillation having a second pulse duration differing from said first pulse duration and a second pulse frequency differing from said first pulse frequency when said closing edge abuts an object positioned in said path of motion of said door, said oscillation being continuously generated by said transmitter and continuously received by said receiver to monitor continuously said closing edge and detect when said closing edge abuts said object for stopping thereupon movement of said door.

5,203,111

REVOLVING DOOR FOR THE PROTECTION OF THE ACCESS TO AND/OR EXIT FROM A ROOM

Jacob R. A. Huber, Edam, and Erik J. Huber, Purmer, both of Netherlands, assignors to Boon Edam B.V., Edam, Netherlands

Filed Mar. 13, 1992, Ser. No. 853,223
Claims priority, application Netherlands, Mar. 26, 1991, 9100527
Int. Cl.[5] E05D 15/02
U.S. Cl. 49—42 5 Claims



1. Revolving door for the protection of the access to and/or exit from a room, comprising a revolving shaft with a number of door wings spaced evenly around it, a pair of panels at opposite ends bordering on the path followed by the door wings and forming a partly closed zone with a first and second opening, a drive motor for the shaft and a control unit for the drive motor, including a monitor unit with a detection aerial, which aerial generates a detection field, such that when a person carrying an authorization card enters the detection field the monitor unit sends an enable signal to the control unit to turn the shaft through a predetermined angle in the direction of passage to allow the person concerned to proceed from the one opening to the other, wherein each door wing comprises a detection aerial, means being provided for switching on and off each aerial in turn, such that when the revolving door is not rotating only the detection aerial of that particular door wing is activated, which, seen in the direction of passage, is in front of the person who wishes either to enter or leave the protected room.

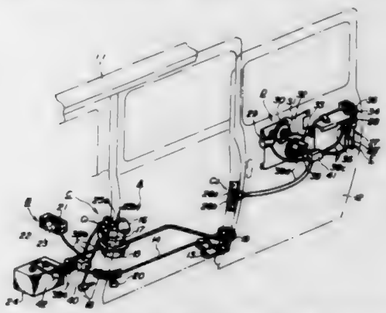
5,203,112

AUTOMATIC DOOR OPERATING SYSTEM

Jun Yamagishi, and Kouichi Shiota, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Nov. 29, 1990, Ser. No. 620,404
Claims priority, application Japan, Nov. 30, 1989, 1-138044[U]
The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.
Int. Cl.[5] G05F 15/00
U.S. Cl. 49—280 8 Claims

1. An automatic door operating system for use in a motor vehicle having a vehicle body and a sliding door, comprising:
a door lock device mounted on said door and including a latch plate having a releasing condition, a half-latch condition and a full-latch condition, said releasing condition being a condition in which said door is released from the vehicle body, said half-latch condition being a condition wherein said door is incompletely latched by said vehicle body and said full-latch condition being a condition wherein said door is fully latched by said vehicle body;
a door closing device mounted on said door and including an electric motor, and latch plate actuating means operatively connected to said motor, for enforcedly turning said latch plate in a direction toward said full-latch condition when said electric motor is energized to run in a first direction and for allowing said latch plate to be returned in another direction toward said releasing condition when said motor is energized to run in a second direction such that said latch plate actuating means moves toward a rest position;
a latch plate position detecting switch which detects both the half-latch condition and the full-latch condition of said latch plate;
a return recognition switch which detects whether said latch plate actuating means of said door closing device is returned to said rest position;
a control device which, when said latch plate position detecting switch detects the half-latch condition of said latch



plate, energizes said motor to run in said first direction, and which, when said latch plate position detecting switch detects the full-latch condition of said latch plate, energizes said motor to run in said second direction, and which, when said return recognition switch detects the latch plate actuating means having returned to said rest position, stops the rotation of said motor in said second direction, said control device starting its control operation when electrically energized;
a manually operated switch having an ON position and an OFF position for selectively energizing and deenergizing said control device, respectively; and
control means for energizing said motor to run in said second direction for a predetermined time when said manually operated switch is successively moved into OFF and ON positions such that said latch plate is returned to said releasing condition.

5,203,113

WINDOW OPENER

Mikiya Yagi, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Mar. 13, 1992, Ser. No. 851,547
Claims priority, application Japan, Sep. 25, 1991, 3-246188
Int. Cl.[5] E05F 11/00
U.S. Cl. 49—324 4 Claims

1. A window opener for opening or closing a window including a window frame and a window pane rotatably set in said window frame, the window opener comprising a motor having an output shaft and contained within a casing, a damper for vibration isolation interposed between said motor and said casing, a worm concentrically connected to said output shaft of said motor, a worm wheel engaging said worm, a pinion concentrically projecting from said worm wheel, an output gear engaged with said pinion, an output gear shaft projecting from an upper surface of said output gear, and a link mechanism connected to said output gear shaft for transforming a rotational force of said output gear shaft in one direction into

portion, and a downwardly extending post at each of two

set of endless belt-type sanding units in the workpiece

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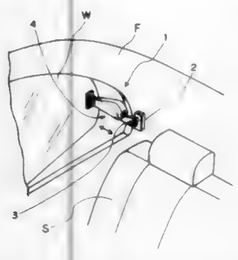
an opening force and for transforming said rotational force of said output gear shaft in another direction into a closing force



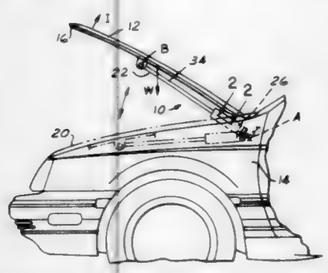
of said window; said worm, said worm wheel and said output gear arranged relative to each other so as to be superposed.

5,203,114

SUPPORT DEVICE FOR A HINGED PANEL

James A. Orlando, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 7, 1991, Ser. No. 772,743
Int. Cl.[5] E05F *1/10*
U.S. Cl. 49—386 **19 Claims**



1. A support device for a hinged panel mounted on a vehicle, the hinged panel being angularly displaceable between an opened position and a closed position, the support device comprising:

an elongate connecting member pivotally connected to the hinged panel, said elongate connecting member including a shaft portion and a helical mating surface disposed thereupon; and

a support arm pivotally connecting to the vehicle, said support arm telescopingly receiving said elongate connecting member and being provided with a helical mating surface which is adapted to cooperate with said helical mating surface of said elongate connecting member,

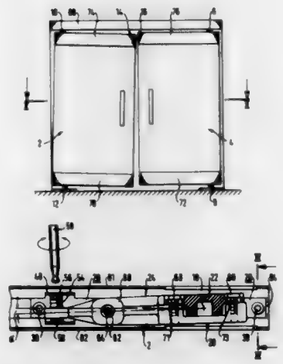
said helical mating surfaces being aligned about a common axis, one of said helical mating surfaces being rotatable relative to the other about said axis, whereby as the hinged panel is raised or lowered, either the elongate connecting member or the support arm may be stationary in relation to said axis.

5,203,115

DOOR ALIGNING DEVICE

Mario Marinoni, Magenta, Italy, assignor to Societa Italiana Progetti S.r.l., Milan, Italy

Filed Mar. 6, 1992, Ser. No. 845,935
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1991, 4107327
Int. Cl.[5] F05D *7/08*
U.S. Cl. 49—388 **8 Claims**



1. A door comprising:

at least one wing;

a lower door rail being connected to said wing and having a lower bearing device, wherein said lower bearing device has a lower hinge axis about which said wing can be swivelled relative to a door closer in an upper tubular door frame;

an upper hinge having an upper hinge axis about which said wing can be swivelled relative to said door closer;

an upper door rail being connected to said wing, and having an upper bearing device;

wherein, said upper bearing device includes

A) an adjustable first hinge part which is capable 1) of swivelling on an outside surface of said upper wing frame section in a limited fashion about an essentially vertical alignment axis and 2) of being fixed in place, and

B) a second hinge part which is connected to said first hinge part and which is essentially horizontally displaceable

1) in a limited fashion relative to said first hinge part, and

2) essentially parallel to a top surface of said wing, and which is capable of being fixed in place, and

wherein said upper hinge is positively disposed between said first and second hinge parts such that the location of said upper hinge axis is changed when said second hinge part is displaced horizontally relative to said first hinge part.

5,203,116

RAIL ASSEMBLY FOR SLIDING DOOR

Hong Jen Chen, #313, 14 Chia, 12 Lin, Da Chih Village Ming Hsiung Hsiang, Chi Yi Hsien, Taiwan

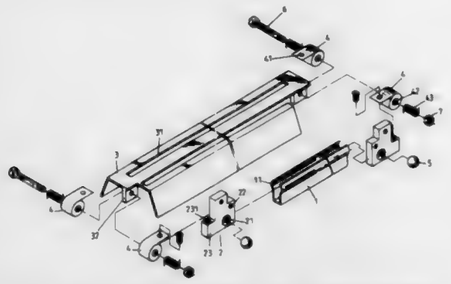
Filed May 7, 1992, Ser. No. 879,283
Int. Cl.[5] E05D *15/06*
U.S. Cl. 49—404 **4 Claims**

1. A rail assembly for a sliding door or window comprising:

a) a pair of rails, each rail including a pair of upwardly extending wall sections provided with longitudinal recesses therein for defining a ball seat;

b) a rail cover including a flat top portion, a pair of parallel longitudinal troughs formed along the length of the top portion, and a downwardly extending post at each of two spaced ends of the cover;

c) a pair of guide blocks for attachment to the bottom of a door or window extending upwardly through each longitudinal trough for sliding movement therealong, a ball carried by each guide block disposed in sliding engagement within the ball seat of a rail;



d) a pair of paper rolls secured to each post of the rail cover, each roll including a free end secured to a guide block and a restoring spring for rewinding the roll; and

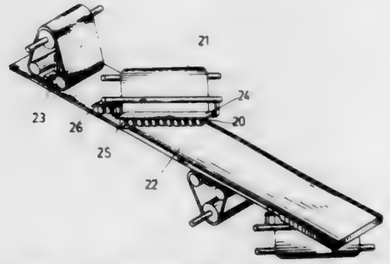
e) whereby sliding of a door or window attached to each pair of guide blocks along a rail causes the paper rolls to wind or rewind, thereby covering the rail and preventing debris from accumulating therein.

5,203,117

BELT SANDER SANDING MECHANISM

Chih-Lang Jen, No. 19, Alley 8, Lane 548, Chungshan Rd., Shen Kang Hsiang, Taichung Hsien, Taiwan

Filed Oct. 8, 1991, Ser. No. 772,958
Int. Cl.[5] B24B *21/00*
U.S. Cl. 51—135 R **2 Claims**



1. A sanding mechanism for simultaneously sanding opposing faces of a workpiece comprising:

a first set of endless belt-type sanding units adapted to sand one face of a longitudinally fed workpiece, said first set of endless belt-type sanding units including a primary sanding unit disposed at an angle of 30° to 60° relative to a workpiece feeding direction and a finishing sanding unit, located downstream of said primary sanding unit in the workpiece feeding direction, arranged in parallel with the workpiece feeding direction;

a second set of endless belt-type sanding units adapted to sand an opposing face of the longitudinally fed workpiece, said second set of endless belt-type sanding units including a primary sanding unit disposed at an angle of 30° to 60° relative to the workpiece feeding direction and a finishing sanding unit, located downstream of said primary sanding unit of said second set of endless belt-type sanding units in the workpiece feeding direction, arranged in parallel with the workpiece feeding direction, said second set of endless belt-type sanding units being located upstream of said first set of endless belt-type sanding units in the workpiece feeding direction;

first and second spaced supporting frames secured to each of said primary sanding units of said first and second sets of endless belt-type sanding units; and

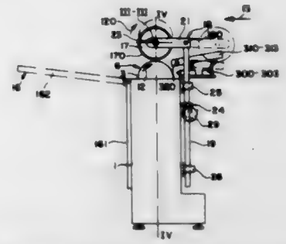
a plurality of guide rollers carried by each of said supporting frames for guiding a workpiece between said first and second sets of endless belt-type sanding units in the workpiece feeding direction.

5,203,118

SKI GRINDING MACHINE

Jean-Pierre Bocquet, La Motte Servolex, France, assignor to SKID, Société anonyme, La Motte Servolex, France

Filed Feb. 28, 1992, Ser. No. 843,625
Claims priority, application France, Mar. 8, 1991, 91 02993
Int. Cl.[5] B24B *21/12, 21/20*
U.S. Cl. 51—139 **14 Claims**



1. Ski grinding machine for grinding a surface of a ski having a width comprising:

a frame standing on a floor,

a support drum mounted rotatably around a first horizontal axis, forming an accessible support area to accommodate the surface of the ski to be ground,

a return drum mounted rotatably around a second horizontal axis,

an abrasive belt stretched between the support drum and the return drum,

tensioning means to pull at least one of the drums away from the other drum and to tension the abrasive belt,

driving means to rotate the support drum and the abrasive belt,

water circulation means to spray water onto the area of the abrasive belt around the support drum and to collect water that flows on the abrasive belt,

the support drum comprises at least one first longitudinal section, which includes a circumferential surface of the drum, and one second longitudinal section, which includes a circumferential surface of the drum, side-by-side with and extending longitudinally away from the first section, the first and second sections each longer than the width of an said alpine ski and having different surface hardnesses, the first section with an elastic surface having a peripheral area comprising an elastic material for performing a first grinding operation on the surface of the ski and the second section with a rigid surface having a peripheral area comprising a rigid material aluminum for performing a second grinding operation on the surface of the ski,

the abrasive belt simultaneously covers all sections of the support drum,

driving means positioned in order to rotate the support drum at least two different appropriate speeds corresponding, respectively, to a first initial machining or flattening process where the surface of the ski is ground at a high belt speed and a second finishing process where the surface of the ski is ground at a low belt speed, and

the return drum having means of centering the abrasive belt

5,203,122

METHOD OF GRINDING TITANIUM

5,203,124

WIRE MESH CONVEYOR ABRASIVE MACHINE AND

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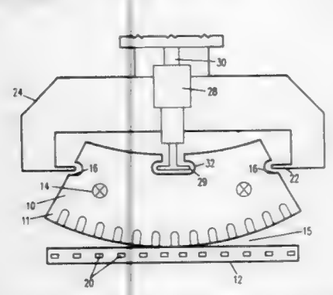
to guide said abrasive belt and hold it close to a position that is essentially centrally aligned with the return drum and the support drum.

5,203,119

AUTOMATED SYSTEM FOR LAPPING AIR BEARING SURFACE OF MAGNETIC HEADS

Robert A. Cole, Newark, Calif., assignor to Read-Rite Corporation, Milpitas, Calif.

Filed Mar. 22, 1991, Ser. No. 673,651
Int. Cl.[5] B24B 49/16
U.S. Cl. 51—165.77 12 Claims



1. An automated system for laping thin film magnetic heads disposed in a row on a ceramic bar comprising:
an adjustable transfer tool to which said bar is mounted, said transfer tool having recesses or apertures;
a lapping assembly including a rotary lapping plate;
means for securing said bar in apposition to said lapping plate, said securing means comprising a bow yoke element having means for engaging said transfer tool including fingers for engaging said recesses or apertures;
means coupled to said heads for generating data signals representing throat height during the lapping process;
a data processor coupled to said signal generating means for producing command signals in response to said data signals; and
means coupled to said data processor for automatically varying the pressure applied to said ceramic bar relative to said lapping plate in response to a command signal from said processor.

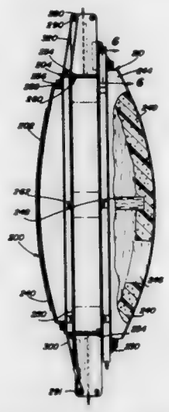
5,203,120

METAL SKIN BUFFING FIXTURE AND STRUCTURE

Don F. Carlson, Bloomfield Hills, and Richard Koch, Mt. Clemens, both of Mich., assignors to Acme Manufacturing Company, Madison Heights, Mich.

Filed Mar. 29, 1991, Ser. No. 677,457
Int. Cl.[5] B24B 41/06
U.S. Cl. 51—216 R 7 Claims

1. A buffing fixture for removably supporting substantially an entire side of a large and thin metal skin having a contoured three dimensional shape, comprising:
a frame having at least one brace extending outwardly from said frame;
form shell means mounted to said frame such that an interior surface of said form shell is in contact with said brace, said form shell having a shape which follows the contoured three dimensional shape of said skin;
strap means for removably securing and registering the position of said metal skin along an exterior surface of said form shell; and



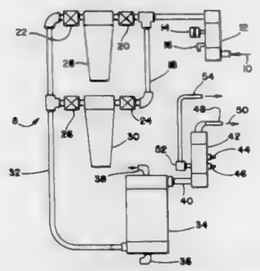
foam means disposed along substantially the entire interior surface of said form shell for supporting said form shell.

5,203,121

METHOD FOR FILTERING AND COOLING SURFACE FINISHING COMPOUNDS

George L. Metzger, 323 Eighth St., Downers Grove, Ill. 60515

Filed May 9, 1991, Ser. No. 697,399
Int. Cl.[5] B24C 9/00
U.S. Cl. 51—322 9 Claims



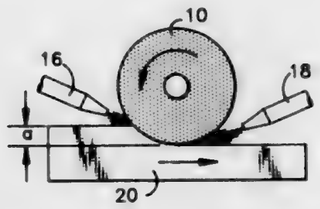
1. A method for recycling spent finishing compounds used in surface machine finishing processes, comprising the steps of:
a. collecting the spent finishing compound used in a surface machine finishing process;
b. filtering the spent finishing compound to remove particles of a predetermined size ranging from about 0.1 to 100 microns;
c. transferring the spent finishing compound through an in-line, constant flow intercooler having a chamber for receiving and maintaining the finishing compound in a spiral circulation and having cooling tubes;
d. circulating fluid having a preset temperature from a temperature control unit to the cooling tubes of the intercooler about which the finishing compound circulates to change the temperature of the finishing compound to a predetermined level; and
e. returning the finishing compound to the surface machine finishing process.

5,203,122

METHOD OF GRINDING TITANIUM

James D. Campbell, Cromwell, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 5, 1992, Ser. No. 894,404
Int. Cl.[5] B24B 1/00
U.S. Cl. 51—322 2 Claims



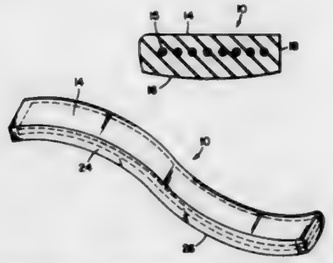
1. Method of grinding a titanium workpiece including the steps of:
a. using an electroplated single layer grinding wheel;
b. rotating the electroplated grinding wheel to produce a surface speed of 38–66 m per second;
c. causing the wheel to interact with the workpiece to cause a depth of cut of at least 0.05 mm;
d. causing relative velocity between the grinding wheel and the workpiece of at least 0.5 mm per second with the combination of wheel surface speed, depth of cut and relative velocity between the wheel and workpiece resulting in an amount of material removed per pass;
e. coordinating grinding condition such that the depth of cut and relative workpiece velocity fall within an area bounded by line $Y \leqq -0.1875 \times +3.28$;
f. providing a lubricant/coolant selected from a group consisting of hydrotreated petroleum containing chlorinated paraffin and synthetic soluble oil-water emulsions.

5,203,123

DEFORMABLE SANDING BLOCK

Michael L. Travis, Creek Rd., Pleasant Valley, N.Y. 12569

Filed Mar. 28, 1990, Ser. No. 500,137
Int. Cl.[5] B24D 17/00
U.S. Cl. 51—358 7 Claims



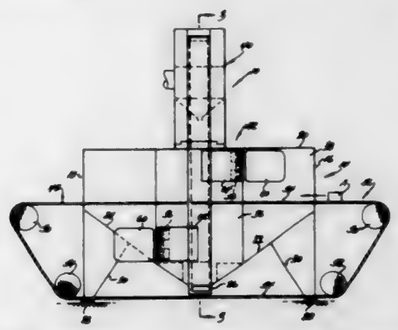
1. A sanding block comprising:
a unitary body of elastomeric, non-abrasive material capable of flexion and providing a sufficient coefficient of friction at an outer surface thereof to allow for the securement of an abrasive cover for sanding;
a deformable, shape retaining metal core completely enclosed within said body whereby the block may be bent so that a portion of the block conforms to a workpiece and another portion provides a grasping means for a user; and
a piece of sandpaper removably wrapped about at least a portion of said outer surface of said unitary body wherein said unitary body functions as a sanding block.

5,203,124

WIRE MESH CONVEYOR ABRASIVE MACHINE AND ABRASIVE RETURN SYSTEM THEREFOR

James H. Carpenter, Hagerstown, Md., assignor to Pangborn Corporation, Hagerstown, Md.

Filed May 3, 1991, Ser. No. 695,392
Int. Cl.[5] B24C 3/00
U.S. Cl. 51—410 10 Claims



1. An abrasive cleaning machine comprising a conveyor in the form of an endless conveyor belt of an open construction through which abrasive particles may freely pass, said conveyor belt having a generally horizontal longitudinal upper run for supporting articles to be cleaned, at least one blast wheel for directing abrasive particles moving along said run, a transverse trough extending below said run for collecting spent abrasive particles, and return means for returning spent abrasive particles to said blast wheel, said return means including a second belt having exterior carrying buckets, and said second belt being of an open construction wherein abrasive particles may freely pass therethrough, said conveyor belt being of an open wire mesh construction, said second belt having a lower run presenting said buckets to said trough for collecting abrasives collected in said trough, said second belt in longitudinal cross section and transversely of said machine presenting series of interlocking loops, and each bucket being secured to said second belt by a longitudinally extending bar extending transversely of said second belt seated in said loops, and each bucket being secured to a respective bar, each bucket being supported by two of said base with each bucket being rigidly secured to one bar and resiliently secured to the other bar to permit said second belt to flex around roller type supports.

5,203,125

OPENABLE ROOF

Kenichi Sugizaki, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 567,134, Aug. 14, 1990, abandoned.
This application Apr. 8, 1992, Ser. No. 865,700
Claims priority, application Japan, Aug. 16, 1989, 1-211175
Int. Cl.[5] E04B 1/346
U.S. Cl. 52—66 13 Claims

1. An openable roof for selectively covering a given area, and having a generally sectorial plan shape forming a central angel, the roof comprising:
an inner arcuate support member and an outer arcuate support member, said inner and outer arcuate support members being concentrically disposed relative to each other about a common axis;
a plurality of moveable roof members, each of the roof members having a generally sectorial plan shape forming a central angle smaller than the central angle of the openable roof, and including
i) an outer edge portion supported on the outer arcuate support member for movement therealong, and

ii) an inner edge portion supported on the inner arcuate assembly being adjacent to a surface on which the structure

of said first stringer element to an opposite second end that cover being adapted to permit said insulator core to flex as

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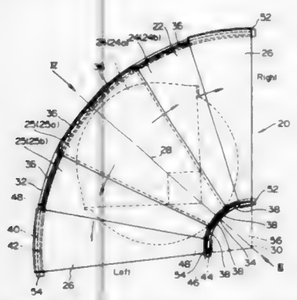
ii) an inner edge portion supported on the inner arcuate support member for movement therealong,

each of the movable roof members being supported by the inner and outer arcuate support members independent of the others of the movable roof members,

wherein the moveable roof members are moveable over the inner and outer support members between a closed position, in which the roof members extend over and cover the given area, and an open position in which the moveable roof members form a sectorial shaped opening between the support members and over said given area; and



first and second fixed roof members permanently mounted on the inner and outer arcuate support members in fixed positions relative thereto, and

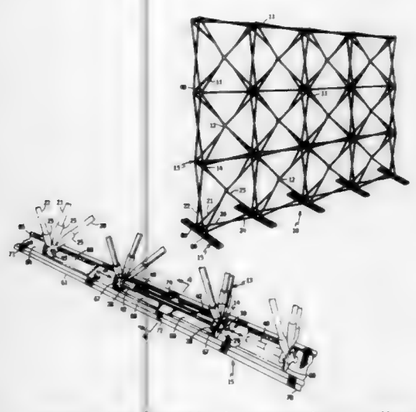
wherein the first and second fixed roof members are separated from each other, and each of the first and second fixed roof members has a sectorial plan shape and extends between the inner and outer arcuate support members on a respective radius of the sectorial plan shape of the openable roof.

5,203,126

SLIDABLE FOOT ASSEMBLY FOR COLLAPSIBLE DISPLAY

Gary R. Sorenson, Apple Valley, and Philip C. Berberding, Hopkins, both of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.

Filed Jun. 21, 1991, Ser. No. 718,593
Int. Cl.[5] E04B *1/68*
U.S. Cl. 52—109 **19 Claims**



1. A slidable foot assembly for supporting a collapsible display structure having a network of support rods which form a skeletal frame for the structure and which are pivotally joined together by hub assemblies, at least one lower hub assembly being adjacent to a surface on which the structure stands, the structure having erected and collapsed forms, the slidable foot assembly comprising:

a) elongate means connected to the structure adjacent the lower hub assembly for supporting the structure by engagement with the surface, the elongate means being disposed at a substantial angle to a plane of the erected form of the structure to stabilize the structure on the surface and being in generally parallel relationship with the collapsed form of the structure to maintain the compactness of the collapsed form, and

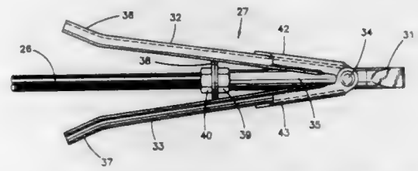
b) slidable engagement means between the elongate means and the structure for slidably fixing the elongate means relative to the structure whereby the erected form of structure is stabilized and the elongate means remains on both the erected and collapsed forms of the structure.

5,203,127

EARTH ANCHOR

John R. Olthoff, 740 Eastridge, N.E., Grand Rapids, Mich. 49506; Wayne L. Nichols, Jr., 5960 Myers Lake Rd., Belmont, Mich. 49306; Rick A. Harmon, 623 N. 11th St., Canton, Ill. 61520, and Charles L. Duncan, 619 S. Chestnut, Lewistown, Ill. 61542

Filed Jun. 28, 1991, Ser. No. 722,833
Int. Cl.[5] E04G *23/02*; E02D *5/74*
U.S. Cl. 52—161 **10 Claims**



1. An earth anchor including an internally threaded member having an axis and at least one arm pivotally connected to said internally threaded member for movement from a first position substantially parallel to said axis to a second position extending laterally from said axis, stop means operative to establish said second position, and an externally threaded member in engagement with said internally threaded member and extending to a remote position for transfer of linear forces, wherein the improvement comprises:

abutment means disposed at an intermediate point on said externally threaded member; and

cam means axially fixed with respect to said abutment means, and operative to engage said arm on relative axial movement of said cam means toward said internally threaded member on relative rotation in a selected direction between said members to induce movement of said arm from said first position toward said second position.

5,203,128

PRECAST STAIR SYSTEM HAVING IMPROVED RELEASABLY CONNECTED STEPS

Eldon R. Bennett, 550 Canal Rd., Apt. B, Sarasota, Fla. 34242

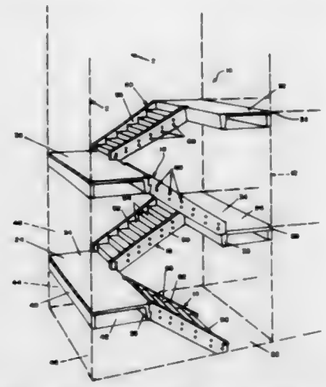
Filed May 6, 1991, Ser. No. 695,728
The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.[5] E04F *19/10*
U.S. Cl. 52—189 **13 Claims**

1. A precast stair system having releasably mounted steps comprising:

first and second elongate, generally parallel stringer elements having respective inner surfaces that face each other;

a plurality of individually precast steps, each step extending side to side from a first end that engages the inner surface of said first stringer element to an opposite second end that engages the inner surface of said second stringer element, said steps being juxtaposed in an ascending pattern along said stringer elements; and

means for releasably fastening each said step to each said



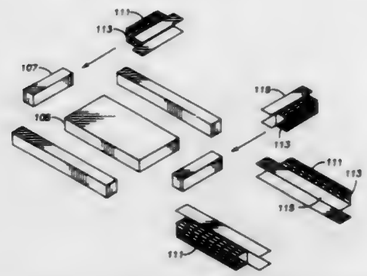
stringer element including first releasable connector means formed through said inner surface of said first stringer element and through said first end of said step and second releasable connector means formed through said inner surface of said second stringer element and through said second end of said step.

5,203,129

WINDOW INSULATOR

Brenis E. Johnson, P.O. Box 741516, Houston, Tex. 77274-1514

Filed May 31, 1991, Ser. No. 708,732
Int. Cl.[5] E06B *3/26*
U.S. Cl. 52—202 **29 Claims**



1. A sunlight blocking window insulator for placement within a window enclosure, comprising:

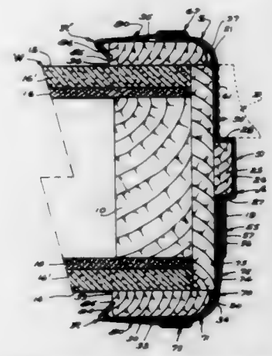
an opaque insulator core composed of a substantially solid inner core portion of a lightweight rigid acoustic and thermal insulating material and a plurality of flexible, resilient acoustic and thermal insulating material members affixed to the peripheral edges of said inner core portion, said insulator core being sized so as to be slightly larger than the window enclosure, said flexible, resilient insulating material members of said insulator core forming an environmrntal seal against the window enclosure when installed therewithin, said insulator core comprising means serving as an effective acoustic and thermal insulator, as well as a means of substantially blocking entry of light through the enclosed window; and a closely fitted, flexible cover for removably enclosing the insulator core for placement as a unit within the window enclosure, said cover being adapted to permit said insulator core to flex as necessary to frictionally engage said window enclosure, and for protecting and enhancing the appearance of said window insulator when installed.

5,203,130

DOOR FRAME SHIELD

James W. Freelove, 13903 Roseton Ave., Norwalk, Calif. 90650

Filed Nov. 26, 1991, Ser. No. 799,424
Int. Cl.[5] E04B *1/04*
U.S. Cl. 52—211 **9 Claims**



9. A door frame shield engageable about the inside surface and the front and rear edges of a related standard door frame jamb, the inside surface and front and rear edges of a related standard door stop projecting inward from the inside surface of the jamb between the front and rear edges thereof and outwardly about the front and rear surfaces and the inside and outside edges of front and rear casings extending outward from the front and rear edges of the jamb; the shield includes an inside assembly comprising an elongate front section with a longitudinally extending outwardly opening channel part with an inside wall and front and rear walls to engage the inside surface and the front and rear edges of the door stop, a thin flexible rear web part extending rearwardly from the rear wall of the channel part adjacent the inside surface of the jamb and thence outwardly to the rear surface of the rear casing, a rear gripper part with a longitudinally extending rearwardly opening slot with at least one longitudinally serrated surface on the web and adjacent the rear surface of the rear casing and an inner gripper part projecting forward from the front wall of the channel part and adjacent the inside surface of the jamb and having a forwardly opening longitudinally extending slot with at least one longitudinally serrated surface; an elongate front section with a longitudinally extending inner tongue part with at least one longitudinally serrated surface and entered into the slot in the inner gripper part and projecting forwardly therefrom adjacent the front surface of the jamb and a flexible front web part projecting forwardly and outwardly from the inner tongue part to the front surface of the front casing and a front gripper part with an outwardly opening longitudinal slot with at least one longitudinally serrated surface on the front web part and adjacent the front surface of the front casing; a front retainer with a longitudinally extending tongue with at least one longitudinally serrated surface engaged in and projecting outward from the slot in the front gripper part and a rearwardly projecting cleat at an outer edge of the front tongue overlying and in stopped engagement with the outside edge of the front gripper part; and a rear retainer with an elongate tongue part with at least one longitudinally serrated surface engaged in and projecting outwardly from the slot in the rear gripper part and a forwardly projecting cleat at the outer edge of the rear tongue overlying and in stopped engagement with

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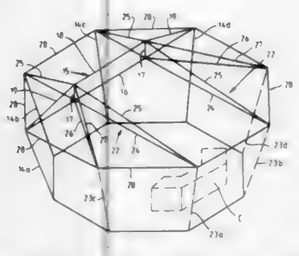
the outside edge of the rear casing; the longitudinal serrations on the surfaces of the tongue parts and in the gripper parts allow movement of the tongue parts into the gripper parts and interengage to stop movement of the tongue parts from engagement in the gripper parts.

5,203,131
STRUCTURES

Francis C. Adlam, Bury, England, assignor to Alifabs Limited, Surrey, United Kingdom

Filed Apr. 29, 1991, Ser. No. 693,458
Int. Cl.[5] E04B *1/34*
U.S. Cl. 52—236.1 **15 Claims**



1. A structure for a visual control room, comprising:

a plurality of peripheral sidewalls defining a periphery of an interior space having a polygonal shape in horizontal cross section, a corner being defined between each mutually adjacent pair of said peripheral sidewalls, each of said plurality of peripheral sidewalls comprising at least one planar panel;

a plurality of mullions mounted at a plurality of said corners, said plurality of corners at which said mullions are mounted being spaced along a continuous portion of said periphery which constitutes not more than half of said periphery of said interior space such that said periphery includes a continuous portion with mullions and a continuous portion without mullions, each mutually adjacent pair of said planar panels disposed in said portion of said periphery without mullions being mounted side edge to side edge;

a roof mounted atop said peripheral sidewalls such that said roof is supported on said mullions along said portion of said periphery with mullions, said roof extending in cantilever fashion over said portion of said periphery without mullions; and

wherein at least said planar panels along said portion of said periphery without mullions are transparent panels.

5,203,132
WALL ASSEMBLY

Robert A. Smolik, 670 W. 7th St., St. Paul, Minn. 55102

Filed Sep. 17, 1991, Ser. No. 761,713
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—241 **23 Claims**

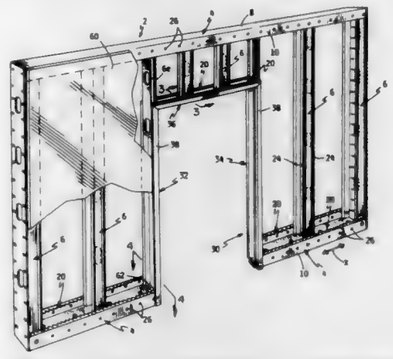
1. A wall assembly, which comprises:

(a) a framework formed of a plurality of elongated wall studs, wherein each wall stud has a pre-determined cross-sectional length extending between two opposed transverse sides of the wall stud;

(b) a first support channel for receiving at least one end of each wall stud, the support channel being elongated along a longitudinal axis and being formed from a base wall with two spaced side walls extended perpendicularly from the base wall for forming a U-shaped cross-sectional configuration for the channel having a width between the side walls of the channel corresponding generally to the cross-sectional length of the wall stud;

(c) wherein said wall studs are suited to be disposed in perpendicular relationship to the support channel with the one end of each wall stud being received in the channel and extending transversely across the channel; and

(d) means carried on the support channel and the wall studs for forming a ratchet engagement therebetween which



ratchet engagement is configured to releasably hold the wall studs in place in the channel but which can be overcome to allow the wall studs to be pushed or bumped into a new location in the channel.

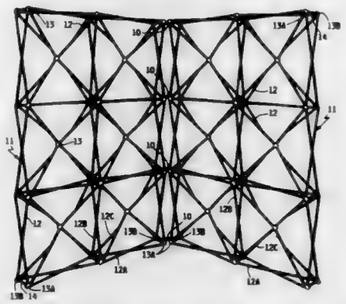
5,203,133

Patent Not Issued For This Number

5,203,134
PIVOTAL FRAME CONNECTOR

Gary R. Sorenson, Lakeville, and Philip C. Gerberding, Hopkins, both of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.

Continuation of Ser. No. 758,751, Sep. 12, 1991. This application Aug. 26, 1992, Ser. No. 935,649
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—646 **11 Claims**



1. The combination of at least one pivotal frame connector with a pair of collapsible display structures for swingably joining the collapsible display structures, the combination comprising:

a) at least the pair of collapsible display structures, each of the structures comprising:

1) a skeletal frame comprising a network of support rods, each of the rods comprising a a pair of ends; and

2) a plurality of hub assemblies for coupling to the support rods and for providing for articulation therebetween, each of the hub assemblies comprising:

i) a hub body having a plurality of regularly-arranged recesses about a circumference for receiving support rod ends; and

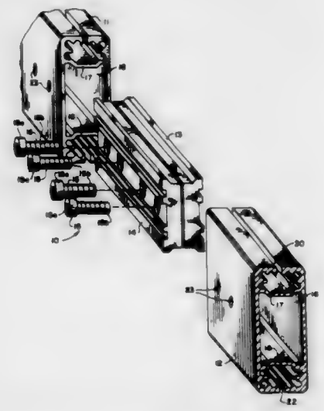
ii) engagement means connectable to the hub body for pivotally engaging the ends of the support rods in respective recesses and including means for fixing the support rods relative to each other; and

b) said at least one pivotal frame connector extending between one of the hub assemblies of each of the collapsible display structures, the pivotal frame connector comprising a pair of ends for engaging the engagement means of one of the hub assemblies of each of the display structures, the ends of the pivotal frame connector received in respective ones of said recesses in said hub body; the at least one frame connector being pivotal independently of the support rods whereby the display structures are swingable relative to each other even when the support rods are fixed relative to each other.

5,203,135
CONNECTION FOR HOLLOW STRUCTURAL MEMBERS

John M. Bastian, Manitowoc, Wis., assignor to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Mar. 5, 1991, Ser. No. 665,327
Int. Cl.[5] E04C *3/32*
U.S. Cl. 52—726.1 **10 Claims**

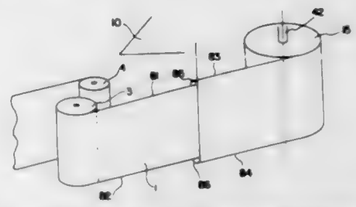


1. In combination with a pair of structural members disposed in end-to-end relation, a bridging member having an irregular surface portion, a second bridging member, said second bridging member combining with the bridging member to substantially fill the portions of the structural member bores over which they extend, and securing means for securing the bridging member to the two structural members, each structural member defining a bore with a complementary irregular surface portion which mates with the irregular surface of the bridging member, the securing means placing the irregular surface of the bridging member in abutting relation with the complementary surfaces of the structural members without deforming the bridging member, a portion of the bridging member and the second bridging member extending into the bore of one structural member, and the remaining portion of the bridging member and the second bridging member extending into the bore of the other structural member.

5,203,136
FILM UNWINDING CARRIGAE FOR A PACKAGING MACHINE

Jacques Thimon, St Louis, Mo., and Jack Morantz, Westmount, Canada, assignors to Newtec International (Societe Anonyme), Aix-Les-Bains, France

Division of Ser. No. 702,890, May 20, 1991, Pat. No. 5,125,209, which is a division of Ser. No. 576,698, Aug. 31, 1990, Pat. No. 5,016,427. This application May 1, 1992, Ser. No. 877,130
Claims priority, application France, Sep. 6, 1989, 89 11638
Int. Cl.[5] B65B *11/04, 61/00*
U.S. Cl. 53—399 **4 Claims**



1. A process using a carriage for unwinding packaging film, said carriage including a stand, a supporting shaft for a film reel to allow the pivoting of said reel and said unwinding of said film, and a device with rollers, said carriage being intended to be incorporated in a packaging machine for wrapping a load; said process having

an initial phase for associating said film reel with supporting shaft;

a subsequent phase for positioning the web of said packaging film in said roller device;

a phase of unwinding said film for the packaging of said load; said process applicable to said unwinding phase and comprising the steps of: providing a stretchable plastic film having two longitudinal edges and said web therebetween, a prestretching roller device and a creasing member for substantially reducing the breadth of the film; making at least one longitudinal crease on the edge of said film upstream of said prestretching roller device and said creasing member by bringing a member into contact with one of said edges, said member folding over said edge and superposing said edge over said web, said longitudinal crease forming at least one of said two longitudinal edges of said film web whereby tearing of said film web is prevented.

5,203,137
ANNULAR ARTICLE-WRAPPING MEMBER AND METHOD OF MAKING SAME

Masamitsu Tsukada; Kiyoshi Murata; Yasushi Ota, and Yoshihiko Watanabe, all of Tokyo, Japan, assignors to Heisei Polymer Co., Ltd., Tokyo, Japan

Division of Ser. No. 488,825, Mar. 6, 1990. This application Nov. 27, 1991, Ser. No. 799,191
Claims priority, application Japan, Mar. 8, 1989, 1-55580; Jul. 18, 1989, 1-185202
Int. Cl.[5] B65B *25/24*
U.S. Cl. 53—409 **26 Claims**

1. An annular article-wrapping method, comprising the steps of:

providing a pair of rolls of heat sealable wrapping material, wherein said annular article is disposed to have an axis of rotation parallel to an axis of each of said pair of rolls of said heat sealable wrapping material;

winding said heat sealable wrapping material on an outer circumferential periphery of said annular article to be wrapped, thereby forming overlapped portions of said heat sealable wrapping material, said overlapped portions of said heat sealable wrapping material traversing said

annular article in a direction normal to the circumference

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closing the open-topped container (10), thereby closing the

ing streams nested in and upstream of the cavities in the

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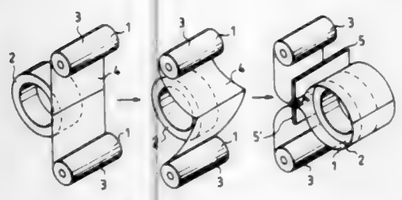
annular article in a direction normal to the circumference of said annular article;
joining said overlapped portions of said wrapping material together;
forming said wrapping material to provide an intermediate wrapped member having sleeve openings having a diameter smaller than an inner diameter of said annular article; and
joining circumferential edges of the wrapping material of said intermediate wrapped member together in a ring-shape along an inner periphery of said annular article,
wherein said step of forming said wrapping material comprises heating said wrapping material in its entirety.

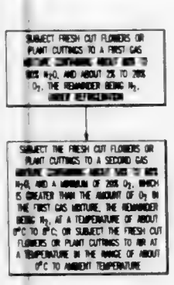


5,203,138

METHOD FOR PRESERVING FRESH CUT FLOWERS OR PLANT CUTTINGS

Pascal Schvester, and Nathalie Savich, both of Chicago, Ill., assignors to American Air Liquide, Inc., Countryside, Ill.

Filed Dec. 12, 1990, Ser. No. 632,091
Int. Cl.[5] B65B *55/00, 31/02*
U.S. Cl. 53—428 **19 Claims**



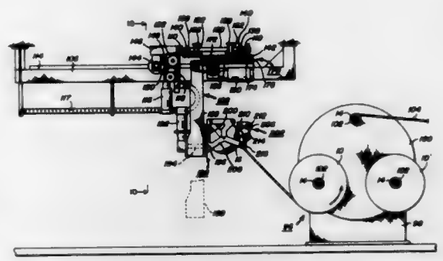
1. A process for preserving fresh cut flowers or plant cuttings, which comprises:
a) subjecting said fresh cut flowers or plant cuttings to a first gas mixture comprising about 80 to 98% N_2O, and about 2 to 20% O_2, with the remainder being N_2, under refrigeration, and
b) subjecting said fresh cut flowers or plant cuttings to a second gas mixture comprising about 50 to 80% N_2O, and a minimum of 20% O_2, which amount of O_2 is greater than the amount of O_2 in said first gas mixture, with the remainder being N_2, at a temperature in the range of about 0° to 8° C.

5,203,139

APPARATUS AND METHOD FOR WINDING AND WRAPPING ROLLS OF WEB MATERIAL

Frederic S. Salsburg, Victor, and William E. Roberts, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1991, Ser. No. 722,780
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—430 **15 Claims**



1. Apparatus for winding and stretch wrapping rolls of web material, comprising:
a rotatable turret assembly;
a plurality of first means, mounted at circumferentially spaced locations on said turret assembly, for independently supporting and rotating at each of said locations a core on which said web material is to be, is being or has already been wound;
second means, positioned in proximity to said turret assembly, for applying a stretch wrap to a first roll while said first roll is supported and rotated by one of said first means; and
third means, operatively connected to said turret assembly and said first and second means, for causing said first roll to be wound by one of said first means, for thereafter rotating said turret assembly to position said first roll at said second means and to position a core for winding of a second roll at another of said first means, and for thereafter (a) actuating said one of said first means and said second means to rotate and wrap said first roll and (b) actuating said another of said first means to wind said second roll while said first roll is being rotated by said one of said first means and wrapped by said second means.

5,203,140

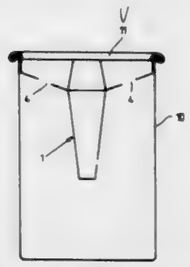
BEVERAGE CONTAINER AND METHOD OF FILLING IT

James G. Jamieson, Mauldon, England, assignor to Whitbread PLC, London, United Kingdom and Heineken Technisch Beheer B.V., Amsterdam, Netherlands

PCT No. PCT/GB90/01017, § 371 Date Mar. 6, 1992, § 102(e) Date Mar. 6, 1992, PCT Pub. No. WO91/00825, PCT Pub. Date Jan. 24, 1991
PCT Filed Jul. 2, 1990, Ser. No. 781,127
Claims priority, application United Kingdom, Jul. 6, 1989, 8915532
Int. Cl.[5] B65B *3/04, 31/00, 25/02*
U.S. Cl. 53—432 **13 Claims**

1. A method of packaging a beverage container (**10**), comprising:
placing an open-topped secondary chamber (**1**) having a wall with an orifice (**6**) into an open container (**10**) one of before and after the container (**10**) is filled with a beverage;
displacing substantially all oxygen from the open-topped container (**10**) and the open-topped secondary chamber (**1**); and

closing the open-topped container (**10**), thereby closing the open-top of the secondary chamber (**1**) so that the orifice



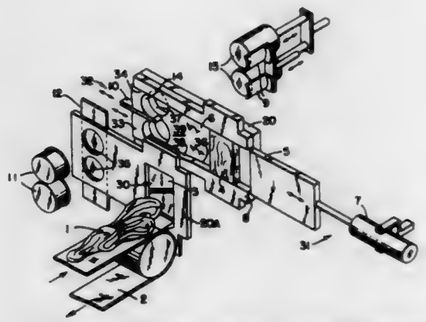
(**6**) provides the only communication between the secondary chamber (**1**) and the inside of the container (**10**).

5,203,141

APPARATUS AND METHOD FOR FILLING A CANNING CONTAINER WITH A SHAPED FOODSTUFF PRODUCT, SUCH AS TUNA FISH

Stefano Berciga, Fontanellato; Dino Bertani, and Luigi Salati, both of Parma, all of Italy, assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 7, 1992, Ser. No. 864,698
Claims priority, application Italy, Apr. 19, 1991, MI91 A001078
Int. Cl.[5] B65B *63/02, 37/20*
U.S. Cl. 53—435 **7 Claims**



1. An apparatus for filling a canning container with a shaped foodstuff product, such as tuna tish, comprising a rectangular shaped channel for receiving sliced pieces of tuna, a plunger for compacting the pieces in the channel into a mass of a predetermined density, a shaping end wall having a pair of semi-cylindrical cavities for forming a pair of scallop-like semi-cylindrical ends in the mass, a cutter for separating the scallop-like semi-cylindrical ends in half, a pair of shaping dies for cutting the scallop-like cylindrical ends into two cylindrical cakes, and a pair of pistons for ejecting the cakes into two canning containers; wherein,
the shaping end wall (**33**) is slidably mounted in the channel (**6**) for controlling the density of the mass (**4**) by changing the volume of the channel; and wherein,
the channel is provided with a flared portion (**39**) for expanding the mass and releasing excessive compression adjacent the semi-cylindrical cavities (**14**) in the shaping end wall; characterized in that:
the cutter (**10**) is slidably mounted between the cavities in the shaping end wall for moving into the flated mass in the flared portion of the channel and starting two streams for easily compacting into the cavities in the shaping end wall concomitant with the shaping dies (**9**) cutting two preceding streams nested in and upstream of the cavities in the shaping end wall into the two cylindrical cakes (**40**).

5,203,142

METHOD AND APPARATUS FOR THE MECHANICAL PACKING OF A TUBULAR SEGMENT SHIRRED ONTO A SHIRRING TUBE

Günter Kolross, Am Wallerstädter Weg 20, D-6080 Gross Gerau-Dornheim, Fed. Rep. of Germany

Filed Apr. 6, 1992, Ser. No. 864,230
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1991, 4111623
Int. Cl.[5] B65B *9/18*
U.S. Cl. 53—436 **22 Claims**

1. A method of mechanically packing a tubular casing segment comprising the step of:
shirring the tubular casing segment on a shirring tube to form a tubular shirred formation;
providing a supply of tubular shaped covering material in a shirred condition with one end closed;
axially thrusting a front end of the shirred formation against the closed end of the covering material and introducing the remainder of the shirred formation into the covering material while the shirred formation is seated on the shirring tube to form a covered formation;
gripping the covered formation about a periphery thereof;
withdrawing the shirring tube from a rear end of the shirred formation as the covered formation is gripped and from a region between the covered formation and the supply of the covering material;
radially crimping a trailing portion of the covering material in the region;
sealing off of the trailing protion of the covering material in the region; and
cutting through the trailing portion of the covering material in the region to form a rear end for the covered formation and a new closed end for the supply of the tubular shaped covering material.

5,203,143

MULTIPLE AND SPLIT PRESSURE SENSITIVE ADHESIVE STRATUMS FOR CARRIER TAPE PACKAGING SYSTEM

Charles Gutentag, Los Angeles, Calif., assignor to Tempo G, Los Angeles, Calif.

Filed Mar. 28, 1992, Ser. No. 856,655
Int. Cl.[5] B65B *15/04*
U.S. Cl. 53—452 **2 Claims**

1. A method of adjusting a tape-to-component binding strength for use in an automated packaging and releasing process for retaining small components, the method comprising the steps of:
a. preparing a longitudinally elongated carrier tape having a lower side and an upper side and comprising a plurality of hexahedron shaped aperture cavities for accommodating said small components respectively;
b. providing a pair of pressure sensitive adhesive tapes each having an adhesive surface;
c. aligning said pair of pressure sensitive adhesive tapes longitudinally in parallel with a lateral gap therebetween

drive means including (1) a common closing means connected

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LAWN MOWER ACTIVATION SWITCH

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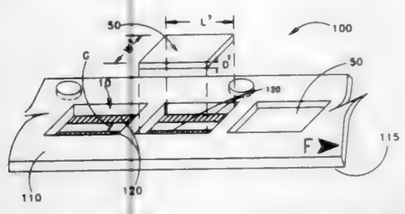
and having their said adhesive surfaces facing said lower side of said carrier tape;

d. adjusting said gap between said pair of pressure sensitive adhesive tapes;

e. affixing said adhesive surfaces of said pair of pressure sensitive adhesive tapes to said lower side of said carrier tape and having each one of said plurality of aperture cavities partially overlapped by said pair parallel pressure sensitive adhesive tapes; and



f. placing said small components into said plurality of aperture cavities respectively and causing said small components to be partially bound to said pair of parallel pressure sensitive adhesive tapes;

g. whereby when said small components are retained within said plurality of aperture cavities respectively, said tape-to-component binding strength is determined by said adjusted gap, independent of the adhesiveness of said adhesive surfaces of said pair of pressure sensitive adhesive tapes.

5,203,144

MACHINES FOR PACKAGING ARTICLES WITH HEAT-SHRINKING MATERIAL

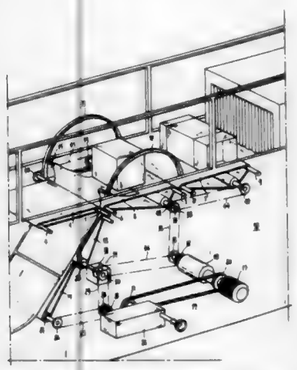
Mario Gambetti, Crevalcore, Italy, assignor to Baumer S.r.l., Castelfranco Emilia, Italy

Filed Feb. 12, 1992, Ser. No. 835,134

Claims priority, application Italy, Apr. 3, 1991, B091 A/000104

Int. Cl.[5] **B65B** *11/06, 49/00, 41/02*

U.S. Cl. 53—465 **4 Claims**



4. A method of operating a wrapping machine comprising the steps of:

(a) continuously advancing a plurality of spaced apart articles along a delivering endless conveyor at a transport speed;

(b) advancing each of said articles at said transport speed toward a wrapping endless conveyor spaced from said delivering conveyor;

(c) simultaneously with step (b) supplying respective segments of wrapping paper along a first transporter movable at a constant speed and a second transporter downstream of said first transporter movable at said transport speed for interposing a leading end of the segment between a bottom of the article and the wrapping conveyor, said constant speed of the first transporter being higher than said transport speed;

(d) thereafter displacing a guiding bar at a wrapper speed higher than said transport speed along a closed path for carrying a trailing end of the segment of paper over the article while advancing the article with the leading end of the segment along said wrapping transporter;

(e) simultaneously with step (d) increasing a speed of said second transporter from said transport speed to said wrapper speed, thereby bringing said trailing end of the segment beneath the bottom of the article;

(f) thereafter joining said trailing and leading ends together;

(g) simultaneously with step (e) reducing said wrapping speed of the second conveyor to said transport speed; and

(h) repeating steps (b) through (f).

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STRIPPER MECHANISM FOR A TUBULAR BAG PACKAGING MACHINE

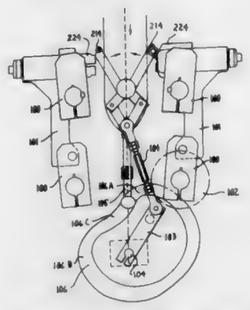
Roman Kammler, Worms; Dirk Wenzel, Simtshausen, and Werner Schneider, Hohenahr-Erda, all of Fed. Rep. of Germany, assignors to Rovema Verpackungsmaschinen GmbH, Fernwald-Annerod, Fed. Rep. of Germany

Filed Dec. 4, 1991, Ser. No. 803,280

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1990, 9016520[U]

Int. Cl.[5] **B65B** *51/30, 9/20*

U.S. Cl. 53—552 **25 Claims**



1. A stripper mechanism for a tubular bag packaging machine, comprising means thereon for forming a foil strip into a tube, defining a path of movement for the tube and introducing product to be packaged into a central region of the tube, longitudinal sealing jaw means for sealing a longitudinally extending seam on the tube, cross-sealing jaw means for forming the tube into a bag by sequentially effecting first and second spaced seams extending cross-wise to a longitudinal axis of the path of movement for the tube, the product being entrapped between said first and second seams, a stripper means for urging the product toward said first cross-wise extending seam prior to a closing of said second cross-wise extending seam to free an area at which said second seam will be located of product, said stripper means including at least two stripper rods arranged on opposite sides of said path of movement for the tube said stripper means including drive means for effecting a movement of said at least two stripper rods simultaneously along an outer side of the tube parallel to the longitudinal axis of the path of movement for the tube as well as toward and away from each other, said stripper rods each being mounted adjacent one end of each of a pair of elongated support arms pivotally connected together by a common pivot axle located midlength of each thereof to form a scissors linkage, said stripper rods being each oriented on one side of said pivot axle, said

drive means including (1) a common closing means connected to each said support arm adjacent an end thereof located on an opposite side of said pivot axle from said support rods for effecting a relative movement of said support rods toward and away from each other and (2) a longitudinal drive means for effecting a movement of said support rods along the outer side of the tube parallel to the longitudinal axis of the path of movement for the tube.

5,203,146

MACHINE FOR THE PACKAGING OF ARTICLES OF ANY SIZE IN SHEETS OF, IN PARTICULAR, A HEAT-SHRINKING MATERIAL

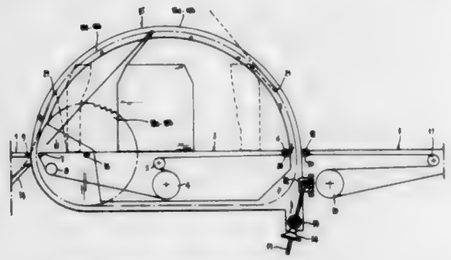
Mario Gambetti, Crevalcore, Italy, assignor to Baumer S.r.l., Modena, Italy

Filed Feb. 12, 1992, Ser. No. 835,135

Claims priority, application Italy, Jul. 29, 1991, 000287 A/91

Int. Cl.[5] **B65B** *11/10, 49/10, 53/02*

U.S. Cl. 53—557 **7 Claims**



1. A wrapping machine comprising:

a frame;

conveyor means on said frame including at least one endless transport conveyor for advancing a plurality of successive articles to be wrapped along a transport path, said conveyor being formed with an upper stretch having a length defined between upstream and downstream ends of said conveyor;

transport means on said frame for supplying a succession of sheets of wrapping material on said conveyor, each of said sheets having respective leading and trailing ends;

a pair of spaced apart support annular guides flanking said conveyor and mounted pivotally on said frame about a common axis, each of said supports being formed with a respective inner surface eccentric with respect to said axis;

a pair of endless belts each mounted on the respective inner surface of said supports;

a wrapping bar mounted on said pair of belts and movable therewith along a closed wrapping path having an arcuate downstream directed segment extending over said upper stretch for moving the bar downstream and bringing the trailing end of the respective sheet around the respective article while advancing the latter along said transport path;

adjusting means for pivoting said guides about said axis in order to vary a clearance between said upper stretch of said conveyor and said arcuate segment and for changing an effective length of said arcuate segment of said wrapping path according to a size of the respective article; and

engaging means formed on said downstream end of said conveyor and being in contact with said inner surfaces of said guides for changing said length of said upper stretch upon varying said clearance.

5,203,147

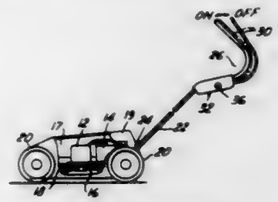
LAWN MOWER ACTIVATION SWITCH

Charles K. Long, Seneca, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.

Filed Jan. 22, 1992, Ser. No. 824,185

Int. Cl.[5] **A01D** *75/00*

U.S. Cl. 56—10.1 **16 Claims**



1. An electric lawn mower comprising:

an electric motor for driving a cutting blade;

a mower deck having a plurality of wheels for movably supporting said cutting blade relative to a lawn to be cut;

a handle having a first end affixed to said mower deck and a second end adapted to cooperate with an operator using said mower;

a bail bar shiftable with respect to said handle between an ON position and an OFF position;

an activator button movable with respect to said handle in a first degree of freedom between an ACTIVE position and a STOP position, said activator button movable with respect to said handle when said activator button is in said ACTIVE position for movement in a second degree of freedom between a READY orientation and a RUN orientation in response to movement of said bail bar from said OFF position to said ON position;

biasing means cooperating with said handle and said activator button for biasing said activator button toward said READY orientation and for biasing said activator button toward said STOP position;

a normally open electrical switch for activating said electric motor, said switch being closeable only when said activator button is moved to said RUN orientation and said bail bar is shifted to said ON position; and

a detent cooperating with said switch and said activator button when said activator button is in said RUN orientation to prevent said biasing means from biasing said activator button to said STOP position.

5,203,148

COTTON HARVESTER ROW UNIT WITH ROW FINDER

Joel M. Schreiner, Ankeny, and Jeffrey S. Wigdahl, Ames, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 16, 1992, Ser. No. 822,007

Int. Cl.[5] **A01D** *75/14*

U.S. Cl. 56—10.2 **8 Claims**

1. In an agricultural implement row unit with a plant passage having a generally upright crop-receiving throat with first and second sidewalls located on opposite sides of the passage, and a guidance system with a row following probe including a pair of feelers connected for movement together relative to the sidewalls on opposite sides of the row adjacent the throat, the feelers movable generally transversely over a range of positions between the sidewalls, the improvement comprising:

an extension located on the forward end of one of the feelers and extending outwardly therefrom, and a receiving area

located in the first sidewall for receiving the feeler exten-

5,203,150

ground engagement, to support the frame with the cutting line at a desired cutting height above ground, wherein the roll

(d) a pair of wheels one each of which is mounted to either of said lever plates; and

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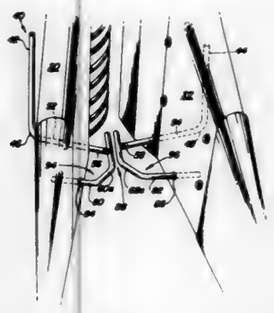
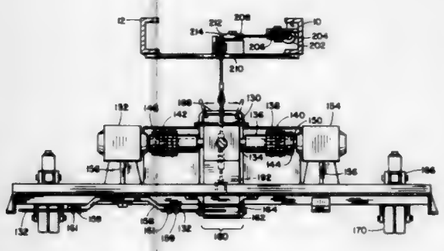
located in the first sidewall for receiving the feeler extension therethrough, wherein the extension remains in the



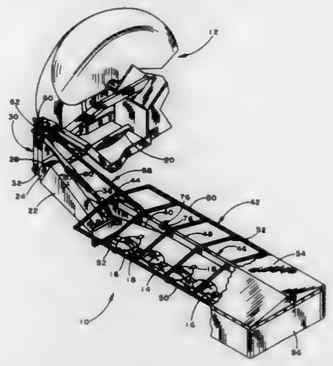
receiving area as the feelers move over the range of positions.

5,203,149
SLOPE MOWER
Norman R. Youngberg, and Cyril A. Malinski, both of Ottawa County, Okla., assignors to N-R Industries, Inc., Miami, Okla.
Division of Ser. No. 644,850, Jan. 23, 1991, Pat. No. 5,129,218. This application Jul. 13, 1992, Ser. No. 912,309
Int. Cl.[5] A01D *34/76*
U.S. Cl. 56—14.9 2 Claims



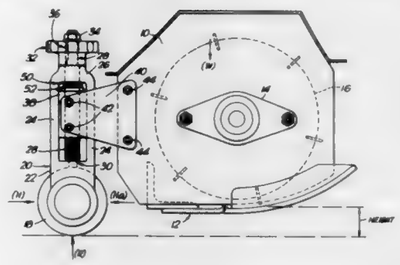
1. A gear driven mower, comprising:
a main drive gearbox having a power means input and a first shaft extending out from the main drive gearbox;
a first coupling hub attached to said first shaft;
a first sprocket attached to said first coupling hub;
a second sprocket coupled to said first sprocket by a double linked chain belt;
a second hub attached to said second sprocket;
a second shaft extending out from said second hub;
a shear pin connected to said second shaft, coupling said second shaft with said second hub;
a mower blade shaft;
a right angle drive connecting said second shaft with said mower blade shaft; and
a mower blade connected to said mower blade shaft.

5,203,150
HINGED SHIELD FOR CROP CUTTING APPARATUS
Jim D. Rykes, New Sharon, and Louis J. Norton, Pella, both of Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa
Filed Jan. 6, 1992, Ser. No. 817,131
Int. Cl.[5] A01D *34/66, 34/82*
U.S. Cl. 56—16.3 12 Claims



1. A crop cutting apparatus having a frame for attachment to a tractor, said mower comprising:
(a) a transversely extended cutter bar pivotal between a lower, operating position and a raised, transport position;
(b) a safety shield operatively associated with the frame for pivotal movement relative thereto;
(c) means for pivoting said cutter bar between said lower position and said upper position; and
(d) means for releasably interconnecting said safety shield and said cutter bar to raise and selectively lower said safety shield with said cutter bar.

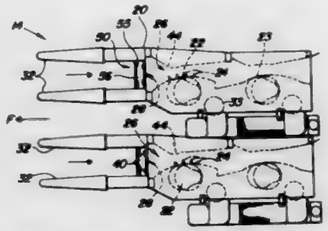
5,203,151
GRASS CUTTING UNIT WITH HEIGHT OF CUT ADJUSTMENT
John Mills, Suffolk, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England
PCT No. PCT/GB90/01185, § 371 Date May 13, 1992, § 102(e) Date May 13, 1992, PCT Pub. No. WO91/03927, PCT Pub. Date Apr. 4, 1991
PCT Filed Jul. 31, 1990, Ser. No. 838,270
Claims priority, application United Kingdom, Sep. 15, 1989, 8920953
Int. Cl.[5] A01D *34/54*
U.S. Cl. 56—17.2 10 Claims



1. A grass cutting unit comprising a frame; a cutting reel rotatably mounted in the frame to define therewith a horizontal cutting line; a ground roll and roll support means connected between the roll and the frame and serving, with the roll in

ground engagement, to support the frame with the cutting line at a desired cutting height above ground, wherein the roll support means comprises first and second screw-thread inter-engaging adjustment members operatively connected with the ground roll and the frame respectively, such that relative rotation of said adjustment members about a screw-thread axis thereof serves to adjust the cutting height, characterised in that there is provided a reaction member having a surface adapted for interlocking engagement with a surface of the first adjustment member to inhibit said relative rotation of the adjustment members and in that, to permit said adjustment of the cutting height, the first adjustment member is moveable away from the reaction member against the action of at least a substantial proportion of the weight of the frame and the cutting reel.

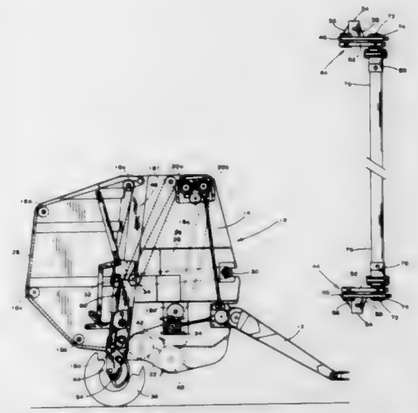
5,203,152
DEFLECTOR FOR A COTTON HARVESTER ROW UNIT
Timothy A. Deutsch, Newton, and Russell D. Copley, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Dec. 20, 1991, Ser. No. 811,498
Int. Cl.[5] A01D *46/16*
U.S. Cl. 56—36 16 Claims



1. In a cotton harvester including a row unit with a housing defining a plant passage with a forward opening of preselected width, the forward opening having an upper boundary and adapted to receive a row of cotton plants including cotton plants which extend above the upper boundary, and an upright picker drum supported in the housing rearwardly of the opening, a deflector comprising:
a crop contacting portion including a forward curved portion with radius of curvature equal to or greater than about one inch and width equal to at least approximately the preselected width, and
means for supporting the crop contacting portion from the housing with the curved portion located forwardly of and below the upper boundary to deflect cotton plants downwardly below the upper boundary and thereby reduce the amount of cotton picked by the uppermost portion of the drum.

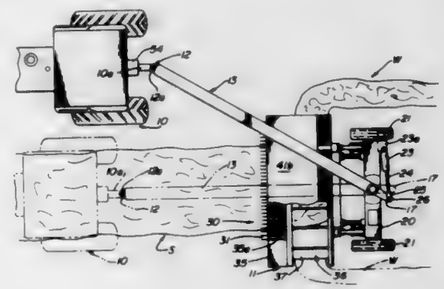
5,203,153
LIFT APPARATUS FOR A GROUND VEHICLE
Daryl W. Van Zee, and Scott A. Rempe, both of Pella, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa
Filed May 28, 1991, Ser. No. 706,405
Int. Cl.[5] A01D *39/00*
U.S. Cl. 56—341 14 Claims

12. A lift apparatus for a baler, comprising:
(a) a pair of transversely opposite vertical frame members interconnected at lower end portions thereof by a transversely extended crank axle;
(b) a pair of radially extended crank arms, one each of which is secured to one of the end portions of said crank axle;
(c) a pair of lever plates, one each of which is pivotally connected by an upper link to an associated one of said vertical frame members and to an associated one of said crank arms;
(d) a pair of wheels one each of which is mounted to either of said lever plates; and



(e) extensible and retractable means interconnecting each of said vertical frame members and the associated one of said lever plates wherein the baler is raised upon extension of said means and is lowered upon retraction of said means.

5,203,154
HAY RAKE AND MERGER
Glenn A. Lesher, R.D. #1, Box 302, Bernville, Pa. 19506, and Lee A. Schlappich, R.D. #2 Box 436, Mohrsville, Pa. 19541
Filed Sep. 18, 1991, Ser. No. 762,544
Int. Cl.[5] A01D *78/00, 78/10*
U.S. Cl. 56—366 18 Claims



1. A mobile forage crop harvester adapted to be towed behind a prime mover in a laterally offset position relative to the path of travel of the prime mover comprising:
elongated conveyor means extended transversely of the path of travel of said harvester;
ground support means for maintaining said conveyor means in an elevated position with respect to the ground;
crop pick-up means extended along one side of said conveyor means and adapted to pick-up crop and deposit it on said conveyor means;
said conveyor means having end discharge means and means for moving crop picked up by said pick-up means to said end discharge means where it is deposited in a windrow adjacent thereto;
the crop pick-up means and the conveyor means being in an advance position in relation to the harvester ground support means;

prime mover connector means including a towing boom,

5,203,156
PROCESS FOR PRODUCING AN ANGORA RABBIT

ning unit for subjecting two slivers to spinning which comprises drafting apparatus common to both slivers,

roller chain being held by said cradle and said second reciprocating means.

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prime mover connector means including a towing boom, said towing boom having a first pivot means for pivotal connection of the harvester to the prime mover about a first vertical axis and a second pivotal means rearwardly positioned on the towing boom with respect to the first pivot means for pivotal connection of the towing beam to the ground engaging means about a second vertical axis located relatively rearwardly of the crop pick-up means and the conveyor means; and

steerable means interconnecting said boom and said ground engaging means for selectively maintaining said harvester in a path of travel offset from the path of travel of the prime mover.

5,203,155

TUBE-SENSING DEVICE FOR DOFFING AND DONNING APPARATUS

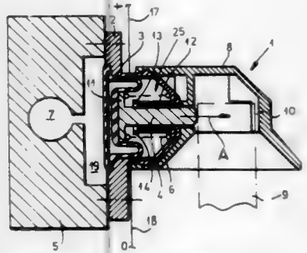
Franz J. Wiese, Gradisca D'Isonzo, Italy, and Martin Maeser, Albershausen, Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Nov. 25, 1991, Ser. No. 799,820

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1990, 4037312

Int. Cl.[5] D01H *9/04*

U.S. Cl. 57—264 **9 Claims**



1. In a doffing apparatus for removing a row of yarn tubes from a row of upright spindles, the apparatus comprising:

a support;

a row of grabs mounted on the support, each engageable with a respective tube of a respective spindle, and movable for lifting the tubes off the spindles, each grab including

an abutment element,

a pusher element displaceable toward and away from the abutment element, and

means including an actuator for pushing the pusher element toward the abutment element and clamping the respective tube between the elements; and

control means including respective switches each connected directly to one of the elements of the respective grab and directly operable by movement of the respective one element for detecting the presence of tubes in the respective grabs and for generating individual outputs respectively corresponding to the absence of tubes in the respective grabs.

5,203,156

PROCESS FOR PRODUCING AN ANGORA RABBIT HAIR YARN

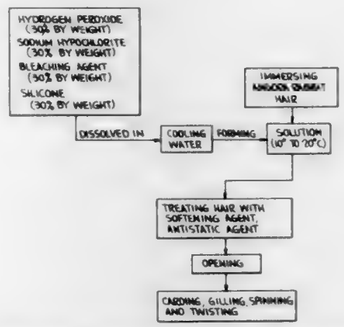
Kiyong Yun, Kyungki, Rep. of Korea, assignor to Hanol Angora Fabric Co. Ltd., Seoul, Rep. of Korea

Filed Aug. 23, 1991, Ser. No. 748,832

Claims priority, application Rep. of Korea, Aug. 24, 1990, 90-13144

Int. Cl.[5] D01H *7/52, 13/30*

U.S. Cl. 57—295 **7 Claims**



1. A process for producing an angora rabbit hair yarn, comprising the steps of dissolving a mixture of 30% by weight of hydrogen peroxide, 30% by weight of sodium hypochlorite, 30% by weight of bleaching agent and 10% by weight of silicone into cooling water to form a solution having a temperature of 10° to 12° C., immersing an angora rabbit hair into said solution for 50 min., treating the angora rabbit hair with a softening agent and an antistatic agent, opening the angora rabbit hair after completing the above steps, carding, gilling, spinning the twisting the treated angora rabbit hair, wherein the carding is carried out using a worsted type carding machine having one cylinder with a needle density of 12 to 18 needles/in.^{2} and a gap between the cylinder and a worker of 0.3 to 0.4 mm, wherein the gilling is carried out in four steps using a gilling machine having a pin density of 14 pins/in.^{2}, 16 pins/in.^{2}, 18 pins/in.^{2} and 23 pins/in.^{2}, in order, and the diameters of a nip roller and a front bottom roller is 20 mm and 40 mm, respectively, wherein the spinning is carried out using a ring spinning machine having four rows of rollers of which the gaps from the back roller to the front roller are 60 mm, 55 mm and 45 mm, respectively, and the diameter of the bottom roller is 25 mm, and wherein the twisting is carred out by opposing the direction of a second twist to that of a first twist and making the number of twists of the second twist to be 0.59 through 0.70 times that of the first twist.

5,203,157

SPINNING MACHINE FOR PNEUMATIC FALSE-TWIST SPINNING

Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of Fed. Rep. of Germany

Filed Jun. 21, 1991, Ser. No. 719,013

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1990, 4022969

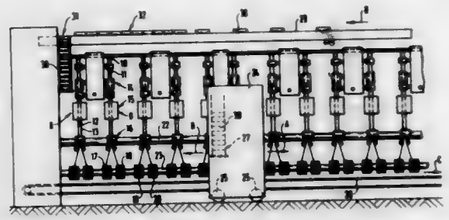
Int. Cl.[5] D01H *5/28, 7/46;* **B65H** *54/02*

U.S. Cl. 57—313 **17 Claims**

1. A spinning textile machine system including a plurality of spinning units, each of said spinning units comprising drafting apparatus for drafting fed slivers, pneumatic false-twisting apparatus for false twisting the drafted slivers, withdrawal apparatus for withdrawing the false-twisted yarn, and winding apparatus for winding the yarn onto spool packages,

wherein each spinning unit is constructed as a double spinning unit for subjecting two slivers to spinning which comprises drafting apparatus common to both slivers, respective separate pneumatic false-twisting apparatus, and respective separate winding apparatus for winding the yarns onto a pair of narrow intermediate spool packages arranged on a common winding axis, said drafting apparatus common to both slivers including a single pressure roller engaged with both slivers during operation, and

a spooling machine arranged in an automatic interconnection with the spinning units which rewinds the yarns of the intermediate packages to normal-sized spool packages of approximately twice the axial length of the intermediate packages.



5,203,158

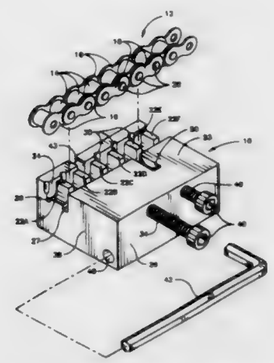
ROLLER CHAIN ASSEMBLING AND DISASSEMBLING DEVICE

Charles E. Bowers, 576 E. 152nd St., Cleveland, Ohio 44110

Filed Oct. 29, 1991, Ser. No. 783,985

Int. Cl.[5] B21L *21/00*

U.S. Cl. 59—7 **10 Claims**



1. A device for removing pins from a roller chain, comprising:

a block;

a cradle formed in said block for holding a roller chain during operation of the device;

a first bore extending from an exterior surface of said block to said cradle;

a first reciprocating means carried in said first bore operable for positively forcing a pin from a roller chain being held by said cradle;

a second bore extending from the exterior surface of said block to said cradle;

a second reciprocating means carried in said second bore operable for positively forcing a pin into a roller chain being held by said cradle;

a first opening in said block to facilitate removal of a pin being forced from a roller chain being held by said cradle; and

a second opening in said block to interpose a pin between a roller chain being held by said cradle and said second reciprocating means.

5,203,159

PRESSURIZED FLUIDIZED BED COMBUSTION COMBINED CYCLE POWER PLANT AND METHOD OF OPERATING THE SAME

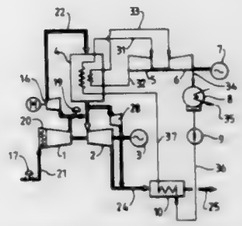
Naoto Koizumi, Hitachi; Asao Takashi, Juoo; Shinichi Hoizumi, Hitachi; Yoshiki Noguchi, Hitachi, and Toshihiko Sasaki, Hitachi, all of Japan, assignors to Hitachi Ltd., Chiyoda and Hitachi Engineering Co., Ltd., Hitachi, both of Japan

Filed Mar. 12, 1991, Ser. No. 668,203

Claims priority, application Japan, Mar. 12, 1990, 2-57950; Aug. 29, 1990, 2-225078

Int. Cl.[5] F02C *3/26, 6/18*

U.S. Cl. 60—39.02 **19 Claims**



1. A pressurized fluidized bed combustion combined cycle power plant comprising:

a pressurized fluidized bed combustion boiler means for burning coal and producing steam by combustion heat and including a combustion chamber in which said coal is burned;

a gas turbine unit including a gas turbine driven by combustion gas from burning of said coal in said boiler means, a spindle rotated at a constant speed by said turbine, an electrical generator driven at a constant speed by said spindle, a compressor means on said spindle for supplying compressed combustion air to said boiler means for burning the coal;

control means for controlling, in dependence upon an operating load of said boiler means, at least one of a flow rate of said combustion air into said boiler means, and an operating pressure in said combustion chamber of said boiler means and wherein said control means controls at least one of said combustion air flow rate and said operating pressure by adjustment of at least two adjusting means, and wherein each of said at least two adjusting means is adapted to adjust at least one of said combustion air flow rate and said operating pressure.

5,203,160

COMBINED GENERATING PLANT AND ITS START-UP CONTROL DEVICE AND START-UP CONTROL METHOD

Jiro Ozono, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 18, 1991, Ser. No. 779,093

Claims priority, application Japan, Oct. 18, 1990, 2-280244

Int. Cl.[5] F02C *6/00*

U.S. Cl. 60—39.02 **19 Claims**

1. A method for effecting start-up of a combined generating plant when in a cold start condition, said plant having a gas turbine, a steam turbine and a generator coupled to a single shaft, said steam turbine having a low-pressure steam turbine and a high-pressure steam turbine driven by introducing high-pressure steam from a high-pressure drum and low-pressure steam from a low-pressure drum thereto, respectively, an

auxiliary steam system for supplying auxiliary low-pressure steam to said low-pressure turbine, and high- and low-pressure

first temperature of no greater than about 55° F. and at a relative humidity such that the moisture content of the air

an annular nacelle and a casing and at least one support mem-

duct also having an outlet downstream from the aft end of

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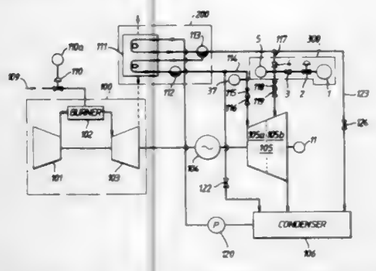
auxiliary steam system for supplying auxiliary low-pressure steam to said low-pressure turbine, and high- and low-pressure steam regulating valves for regulating flow rates of the high- and low-pressure steam, respectively, using said low-pressure turbine, comprising the following steps:

determining whether said combined generating plant is in a cold start condition;

actuating said auxiliary steam system when the cold start condition is recognized;

controlling a speed of rotation of said low-pressure steam turbine to coincide with a set value of start-up speed of said low-pressure steam turbine, whose speed of rotation is set beforehand, by regulating a degree of opening of said low-pressure steam regulating valve;



compensating for a change of rotational speed of said low-pressure steam turbine corresponding to an amount of rotational torque applied to said low-pressure steam turbine by said gas turbine when fuel is introduced into said gas turbine, by further regulating said degree of opening of said low-pressure steam regulating valve;

supplying to said low-pressure steam turbine a predetermined minimum flow rate of steam of said low-pressure steam when the rotational speed of said low-pressure turbine reaches a predetermined value; and

fully opening said low-pressure steam regulating valve when start-up of said combined generating plant is completed.

5,203,161

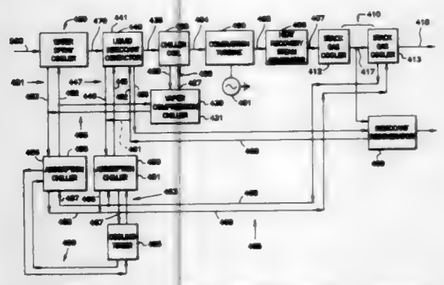
METHOD AND ARRANGEMENT FOR COOLING AIR TO GAS TURBINE INLET

John M. Lehto, Rte. 2, Box 119B, Cokato, Minn. 55321

Filed Oct. 30, 1990, Ser. No. 605,743

Int. Cl.[5] F02C *7/04*

U.S. Cl. 60—39.53 **10 Claims**



1. A method for providing relatively efficient operation of an air compressor arrangement; said method including the steps of:

(a) providing an ambient air flow stream from ambient air having as temperature of at least 70° F. and a relative humidity of at least 60%; and

(b) conditioning the ambient air flow stream to provide an air flow stream to the air compressor arrangement at a first temperature of no greater than about 55° F. and at a relative humidity such that the moisture content of the air in the air flow stream is no greater than an amount corresponding to saturation at a temperature of 5° F. lower than the first temperature.

5,203,162

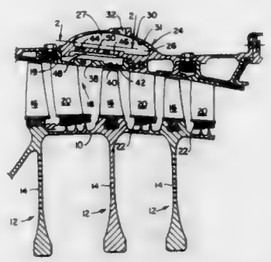
COMPRESSOR BLEED MANIFOLD FOR A GAS TURBINE ENGINE

Joseph C. Burge, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 581,230, Sep. 12, 1990, abandoned. This application Jun. 9, 1992, Ser. No. 895,966

Int. Cl.[5] F02C *6/18*

U.S. Cl. 60—39.07 **10 Claims**



1. Means for protecting the bleed manifold formed from the outer case of a gas turbine engine, said engine having a compressor section including a drum rotor defining an inner boundary for the engine's gas path and for supporting a plurality of compressor stages each of which comprises a row of circumferentially spaced axial flow blades, stator means including wall means defining an inner case radially spaced and coaxially disposed relative to said drum rotor defining an outer boundary for said gas path, means for defining the bleed manifold consisting essentially of a bowed wall formed from a portion of the outer case of said gas turbine engine radially spaced and coaxially disposed relative to said inner case of said drum rotor, and an inner annular wall portion and said bowed wall both being concentrically disposed relative to said outer boundary defining an annular cavity, said inner annular wall portion creating a heat sink and being spaced from said inner case, means for leading a portion of said gas path out of said gas turbine engine through said annular cavity including a first opening in said inner case for flowing a continuous stream of fluid susceptible of including incendiary particles entrained therein, a second opening in said inner annular wall portion parallelly disposed relative to said first opening for leading said stream of fluid into said annular cavity, and a bleed port in said bowed wall, said first opening and said second opening being laterally spaced relative to each other so that said stream of fluid and said incendiary particles entrained therein ingested in said first opening impinges on said inner annular wall portion prior to being ingested into said annular cavity so that heat is dissipated from said incendiary particles by said inner wall for protecting said outer case.

5,203,163

HEAT EXCHANGE ARRANGEMENT IN A GAS TURBINE ENGINE FAN DUCT FOR COOLING HOT BLEED AIR

Franklin D. Parsons, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 561,139, Aug. 1, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 865,731

Int. Cl.[5] F02C *6/18*

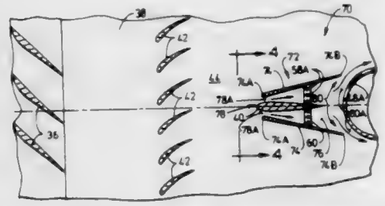
U.S. Cl. 60—226.1 **14 Claims**

1. In an annular fan duct of a gas turbine engine defined by an annular nacelle and a casing and at least one support member extending radially between and interconnecting said nacelle and casing, said fan duct providing a main air flow for producing thrust, a heat exchange arrangement comprising:

(a) a conduit connected in flow communication with a bleed flow at a temperature higher than that of the fan duct air flow, said conduit having a section extending to and from said fan duct;

(b) a heat exchanger disposed within said fan duct and extending between said nacelle and casing, said heat exchanger being interposed in said conduit section such that said conduit passes the bleed air flow to the interior of said heat exchanger; and

(c) means disposed within said fan duct for separating said heat exchanger from the main air flow through said fan duct and for temporarily diverting a small fractional portion of the fan duct main air flow from said main air flow to pass said fractional air flow portion over the exterior of said heat exchanger in heat transfer relationship with the bleed air flow passing through the interior of said heat exchanger and thereafter to return said fractional air flow portion to the main air flow through said fan duct where



it is used to produce engine thrust after cooling the bleed air flow carried by said conduit;

(d) said separating and diverting means including at least one partition member extending radially between said nacelle and casing, said partition member being oriented transversely to said heat exchanger and disposed adjacent to said heat exchanger and said support member so as to define therewith a radially and axially extending air diffusion passage through which said fractional air flow portion is diverted to pass over the exterior of said heat exchanger, said diffusion passage having an inlet and an outlet communicating with said main air flow, said inlet being spaced from one side of said heat exchanger and said outlet being spaced from an opposite side thereof, said diffusion passage being larger in cross-sectional size at the location of said heat exchanger than at said inlet and outlet of said passage and being provided with reversely tapering longitudinal configurations at said inlet and outlet of said passage such that said fractional air flow portion decreases in velocity after entering said passage through said inlet and before reaching said heat exchanger and then increases in velocity after leaving said heat exchanger and approaching said outlet.

5,203,164

METHOD AND APPARATUS FOR QUIETING A TURBOJET ENGINE

Allen E. Paulson, P.O. Box 2206, Savannah, Ga. 31402

Continuation-in-part of Ser. No. 534,525, Jun. 6, 1990, abandoned. This application Feb. 13, 1991, Ser. No. 654,584

Int. Cl.[5] F02K *3/02*; F01N *1/14*

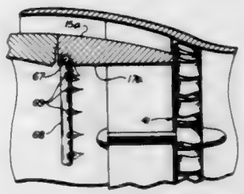
U.S. Cl. 60—226.1 **11 Claims**

1. Apparatus for reducing the noise emitted by the exhaust from the outlet at the aft end of a jet propulsion engine, comprising:

a housing configured for location at the outlet of the engine and having a portion spaced outwardly from the engine adjacent the aft end to define a duct having an air inlet, the duct also having an outlet downstream from the aft end of the engine;

a free turbine mounted for rotation within the housing and driven by the exhaust from the engine outlet so as to rotate independently of rotating elements in the jet engine;

a fan within the air inlet of the duct and driven by rotation of the free turbine to create an air flow through the duct,



such that the air flow substantially surrounds the jet exhaust and thereby reduces the noise of the jet exhaust flowing from the outlet of the duct; and

means for introducing fuel into the exhaust immediately upstream from the free turbine so that the fuel combusts and produces exhaust gas which increases the power available to drive the turbine, thereby driving the fan to produce more thrust for the engine.

5,203,165

METHOD FOR THE LAMBDA CONTROL OF AN INTERNAL COMBUSTION ENGINE HAVING A CATALYZER

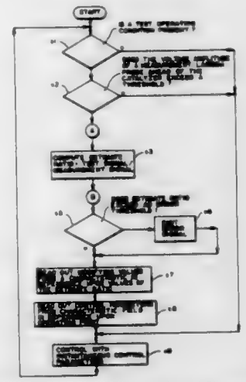
Ernst Wild, Oberriexingen; Günther Plapp, Filderstadt; Lothar Raff, Remseck; Michael Westerdorf, Moeglingen, and Eberhard Schnaibel, Hemmingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 31, 1991, Ser. No. 738,360

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024210

Int. Cl.[5] F01N *3/20*

U.S. Cl. 60—274 **8 Claims**



1. A method for lambda control of an internal combustion engine having a catalyzer and a measuring probe arrangement in front of the catalyzer for emitting a measuring signal which is utilized for regulating the air/fuel ratio applied to the engine and a testing probe arrangement behind the catalyzer for emitting a test signal, the lambda control including a lambda control loop utilizing a plurality of control parameters, said lambda control loop imparting a control oscillation having an amplitude, the method comprising the steps of:

displacement hydraulic pump in a closed circuit, and a

a generator driven by the Stirling engine;

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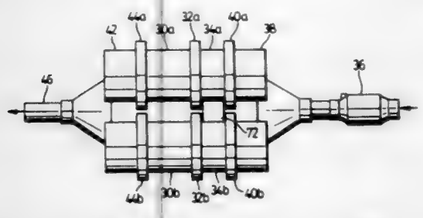
forming a ratio of a value based on the measuring signal and another value based on the test signal when one or more pregiven engine operating conditions are met, said ratio having an instantaneous value;
evaluating said ratio as an estimating quantity for a conversion rate of the catalyzer; and,
modifying said control parameters in the lambda control loop in a pregiven controlled manner on the basis of the instantaneous values of said ratio thereby reducing said amplitude of said control oscillation in the control loop with decreased conversion rate of the catalyzer.

5,203,166

METHOD AND APPARATUS FOR TREATING DIESEL EXHAUST GAS TO REMOVE FINE PARTICULATE MATTER

John W. Miller, 580 Eyer drive, Unit 24, Pickering, Ont., Canada L1W 3B7

Filed Feb. 22, 1991, Ser. No. 658,874
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—274 **5 Claims**



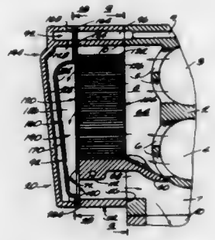
1. A method for regenerating a first ceramic filter and a second ceramic filer both loaded with particulates from exhaust gases of a diesel engine, said filters being in joint communication with the exhaust from a diesel engine and each being provided at the intake end thereof with first and second switchable heaters, respectively, operable when turned on to uniformly heat a stream of exhaust gas passing therethrough to a temperature sufficient to sustain combustion of particulate on said filters, comprising the steps of:
(a) turning on said first heater for a selected period of time, such that a portion of the particulates held by said first ceramic filter is burned off during passage of heated exhaust gases therethrough and the flow rate of exhaust gases through said fist ceramic filter becomes substantially greater than the flow rate of exhaust gases through said second ceramic filter;
(b) turning off said first heater and turning on said second heater for a selected period of time, such that the initially lower flow of heated exhaust gas through said second filer regenerates it essentially completely and the flow rate of exhaust gases through said second filter becomes greater than through the partially regenerated first filter;
(c) turning off said second heater and turning on said first heater for a selected period of time, such that the initially lower flow of heated exhaust gas through the partially regenerated first filter regenerates it essentially completely; and
(d) turning off said first heater and turning on said second heater for a selected period of time to ensure complete regeneration of said second filter,
wherein the exhaust from the diesel engine is passed through a catalytic purifier before passing through said first and second heaters.

5,203,167

MARINE PROPULSION DEVICE INTERNAL COMBUSTION ENGINE AND METHOD FOR MAKING THE SAME

George G. Lassanske, Nashota, and Lee A. Woodward, Racine, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 25, 1991, Ser. No. 782,427
Int. Cl.[5] F01N *3/24*
U.S. Cl. 60—298 **26 Claims**



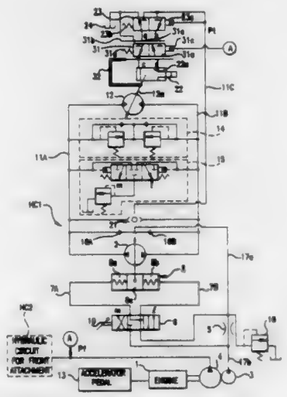
5. An internal combustion engine comprising a cylinder block defining a cylinder having an exhaust port, an exhaust outlet, and an exhaust passage between said exhaust port and said exhaust outlet, an exhaust catalyst apparatus mounted on said cylinder block, said apparatus including a tongue extending into said cylinder block exhaust passage and dividing said cylinder block exhaust passage into an upstream portion communicating with said exhaust port and a downstream portion communicating with said exhaust outlet, and said apparatus including an exhaust passage communicating between said upstream portion and said downstream portion, and a catalyst located in said apparatus exhaust passage.

5,203,168

HYDRAULIC DRIVING CIRCUIT WITH MOTOR DISPLACEMENT LIMITATION CONTROL

Morio Oshina, Ibaragi; Takashi Kanai, Kashiwa, and Mitsuo Sonoda, Ibaragi, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Chiyoda, Japan

Filed Jul. 1, 1991, Ser. No. 724,183
Claims priority, application Japan, Jul. 4, 1990, 2-177150
Int. Cl.[5] F16D *31/02, 39/00*
U.S. Cl. 60—426 **15 Claims**



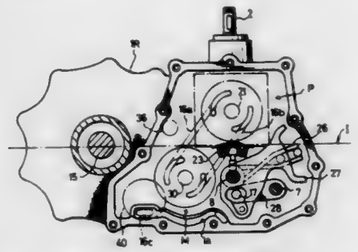
1. A hydraulic driving circuit comprising:
a first hydraulic circuit having a variable displacement hydraulic pump driven by a prime mover, a variable displacement hydraulic motor connected to said variable displacement hydraulic pump in a closed circuit, and a motor displacement control means for controlling a displacement of said variable displacement hydraulic motor; and
a second hydraulic circuit for driving a loader attachment, said second hydraulic circuit including at least a hydraulic pump which is driven by said prime mover and is adopted to deliver hydraulic fluid having a load pressure which depends on a load of said loader attachment, wherein said hydraulic driving circuit comprises a motor displacement limitation means for limiting a maximum value of the displacement of said variable displacement hydraulic motor in accordance with said load pressure in said second hydraulic circuit.

5,203,169

AXLE DRIVE APPARATUS

Norihiro Ishii; Hiroaki Shimizu; Toru Inoue, and Takashi Yokoyama, all of Amagasaki, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Dec. 19, 1991, Ser. No. 810,070
Claims priority, application Japan, Dec. 25, 1990, 2-404895[U]
Int. Cl.[5] F16D *39/00*
U.S. Cl. 60—487 **4 Claims**



1. An axle drive apparatus comprising:
a transmission case;
an axle disposed within said transmission case;
a hydraulic pump disposed within said transmission case, having a shaft adapted to be driven by an engine;
a hydraulic motor disposed within said transmission case, having a shaft for driving said axle;
wherein said pump shaft, said motor shaft and said axle are arranged within said transmission case with their axes of rotation disposed in parallel to one another;
wherein said pump shaft and said motor shaft are oppositely disposed relative to an imaginary horizontal line passing through the axis of said axle so that said pump shaft is positioned above said horizontal line and said motor shaft is positioned below said horizontal line, such that said pump shaft and said motor shaft are held in a longitudinally staggered relation within said transmission case; and
wherein said pump and said motor are both disposed on one side of a plane perpendicular to said imaginary horizontal line and said axle is disposed on a side of said plane opposite to said one side.

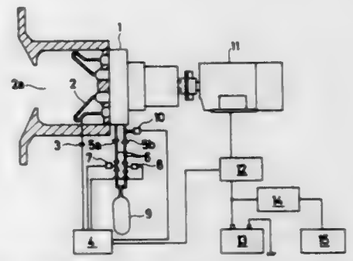
5,203,170

STIRLING ENGINE GENERATING SYSTEM

Yoshihiro Naito, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 17, 1992, Ser. No. 853,089
Claims priority, application Japan, Mar. 27, 1991, 3-85811
Int. Cl.[5] F02G *1/06*
U.S. Cl. 60—524 **4 Claims**

1. Stirling engine generating system comprising;
a Stirling engine driven by solar heat which is used as a heat input source of the engine;
a generator driven by the Stirling engine;
a temperature sensor for detecting the temperature of an operational gas enclosed in an operational space of the engine;
a pressure sensor for detecting an operational gas pressure in the operational space;
an operational gas tank in communication with the operational space via a pair of conduits;
a one way valve interposed in each of the conduits so as to invert the flow direction of the operational gas in each conduit;
an opening and closing valve interposed in both conduits between the one way valve and the operational gas tank;



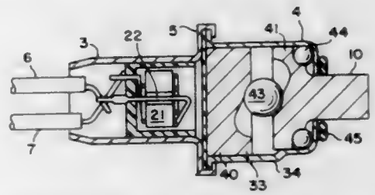
a field magnet control device for adjusting the rotational speed of the generator; and
a temperature regulation device for controlling the opening and closing action of the opening and closing valves to vary the operational gas pressure in the operational space in response to a detected signal of the temperature sensor and for controlling the field magnet control device to vary the field current of the generator when the operational gas pressure in the operational space is at a determined pressure and the operational gas temperature in the operational space exceeds a predetermined optimum temperature.

5,203,171

ROTARY ELECTROTHERMAL ACTUATOR

Bradford W. Petot, Cleveland Hts., and Douglas Herndon, Ashtabula, both of Ohio, assignors to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Sep. 30, 1991, Ser. No. 767,630
Int. Cl.[5] F03G *7/06*
U.S. Cl. 60—531 **17 Claims**



1. An electrothermal actuator for converting electrical energy to rotational mechanical motion comprising:
a housing;
a flexible diaphragm disposed in the housing and defining a boiler chamber within the housing;
a working fluid disposed within the boiler chamber, changing phase in response to heating and thereby displacing the diaphragm;
heating means disposed within the boiler chamber for heating the working fluid in response to an electrical current flowing through the heating means; and

a rotatable shaft assembly partially disposed within the hous-

comprising a coil member and a fixedly and centrally

(i) the conveyor tube (3) being connected at a lower clo-

for conducting the entire output of liquid fuel from said

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a rotatable shaft assembly partially disposed within the housing and including a rotatable shaft extending outside the housing and rotating between a return position and a rotated position, a cam driver slidingly disposed within the housing, a cam rotatably disposed within the housing and attached to the shaft, first and second recesses of variable depth respectively disposed in the cam driver and the cam, the respective recesses being disposed opposite each other, a spherical member disposed in the first and second recesses contacting the cam driver and the cam for rotating the cam about an axis in response to sliding of the cam driver, whereby the shaft and the cam rotate from the return position toward the rotated position in response to heating of the working fluid.

5,203,172

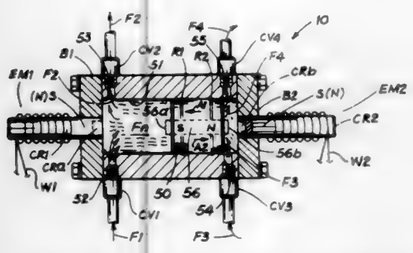
ELECTROMAGNETICALLY POWERED HYDRAULIC ENGINE

Alvin B. Simpson, 437 W. Scott, Clovis, Calif. 93612, and Charley W. Bisel, 286 E. 12th Ave., Broomfield, Colo. 80501

Continuation-in-part of Ser. No. 740,091, Aug. 5, 1991, which is a continuation-in-part of Ser. No. 524,189, May 17, 1990, Pat. No. 5,036,930. This application Feb. 18, 1992, Ser. No. 836,523

Int. Cl.[5] **F15B** *7/00*; **H02K** *33/00*; **F04B** *17/04*

U.S. Cl. 60—545 **13 Claims**



1. A hydraulic engine apparatus, said apparatus comprising:

an electrical energy source means for powering said apparatus;

a hydraulic motor having an output drive shaft to effect conversion of electrical energy from said electrical energy source to work;

at least one electromagnet means electrically coupled and responsive to said energy source means for producing controlled magnetic fields, said electromagnet means comprising a coil member and a fixedly and centrally located magnetic core member with respect to said coil member; and

at least one piston-permanent magnet means disposed within a cylinder in a magnetically coupling relationship with said core member, said cylinder having suitably disposed input and output ports at each end of said cylinder for alternately receiving and delivering a fluid under pressure, said output ports being in a hydraulically coupled relationship with said hydraulic motor,

said core member having a central bore portion, and said at least one piston-permanent magnet means further comprising an end-connected shaft member for magnetically coacting with said central bore portion and producing increased magnetic pull.

11. A method of producing propulsion using hydraulic means, said method comprising the steps of:

(a) providing an engine apparatus, said engine apparatus comprising:

an electrical energy source means for powering said apparatus,

a hydraulic motor having an output drive shaft,

at least one electromagnet means electrically coupled and responsive to said energy source means for producing controlled magnetic fields, said electromagnet means comprising a coil member and a fixedly and centrally located magnetic core member with respect to said coil member, and

at least one piston-permanent magnet means disposed within a cylinder in a magnetically coupling relationship with said core member, said cylinder having suitably disposed input and output ports at each end of said cylinder for alternately receiving and delivering a fluid under pressure, said output ports being in a hydraulically coupled relationship with said hydraulic motor, said core member having a central bore portion, and said at least one piston-permanent magnet means further comprising an end-connected shaft member for magnetically coacting with said central bore portion and producing increased magnetic pull;

(b) providing a fluid source, said fluid source being hydraulically coupled to said input ports of said cylinder;

(c) coupling said output driveshaft to a drivetrain of a vehicle;

(d) synchronously energizing and de-energizing said coil member from said energy source means and producing power states that result in producing alternating polarity magnetic fields;

(e) repelling said piston-permanent magnet means during a first polarity state;

(f) receiving fluid from said fluid source through one of said input ports into a vacant chamber portion of said cylinder and concurrently pumping fluid from a previously filled chamber portion of said cylinder through one of said output ports during said repelling step;

(g) attracting said piston-permanent magnet means to said core member during a second polarity state;

(h) increasing the magnetic influence of said at least one electromagnet means on said piston-permanent magnet means by further attracting said end-connected shaft member into said central bore portion to produce enhanced fluid pressures;

(i) receiving fluid from said fluid source through another one of said input port into a step (f) vacated chamber portion and pumping fluid from a step (f) filled chamber portion through another one of said output ports during said attracting steps g and h;

(j) repeating said steps (e), (f), (g), (h) and (i) and producing reciprocating action of said piston-permanent magnet means and corresponding repeated pumping of said fluid; and

(k) hydraulically driving said hydraulic motor and turning said output drive shaft coupled to said drivetrain to produce propulsion of said vehicle.

5,203,173

DEVICE FOR UTILIZATION OF GEOTHERMAL ENERGY

Diego Horton, Tobas 196, C.P. 5153 Costa Azul, Villa Carlos Paz, Argentina

PCT No. PCT/DE91/00406, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/18205, PCT Pub. Date Nov. 28, 1991

PCT Filed May 16, 1991, Ser. No. 809,518

Claims priority, application Argentina, May 18, 1990, 316883; Japan, May 18, 1990, 316884; Sep. 26, 1990, 317951

Int. Cl.[5] **F03G** *07/04*

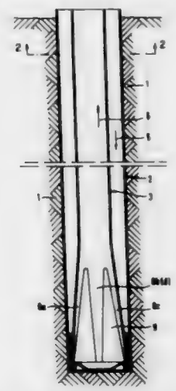
U.S. Cl. 60—641.2 **13 Claims**

1. A device for utilization of geothermal energy, wherein a conveyor tube is sunk into the earth's crust for the purpose of raising a medium located therein that is heated by geothermal energy, and possibly transported in vapor form; said device being characterized by:

(a) a second, outer tube (2), which surrounds the conveyor tube (3), for conveying the medium to the bottom, and a closure piece (4) that closes off the outer tube in pressure-tight fashion against the surrounding rock or the like;

(i) the conveyor tube (3) being connected at a lower closure region thereof, with the outer tube (3);

(ii) the closure piece (4) being provided at its outer circumference with a perpendicular rim (7), through which is produced the connection of the conveyor tube (3) with the outer tube (2) and the closure piece (4) for supporting the lower end of the conveyor tube (3), with the conveyor tube (3) being divided, in its lower closure



region, into at least four sections (8*a*, 8*b*, 8c and 8*d*), which among them enclose a greater cross sectional area than the cross sectional area in the rest of the conveyor tube (3), with end zones of these end sections (8*a*, 8*b*, 8*c*, 8*d*) resting in at least one depression in the closure piece (4), which is constructed between the perpendicular rim (7) and one of the raised regions of the closure piece (4) formed toward the rim, adjacent to a middle of the closure piece (4).

5,203,174

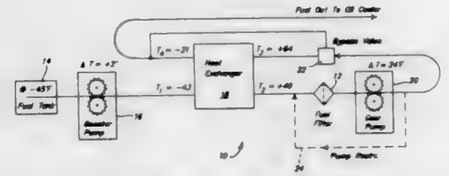
REFLEXIVE FUEL HEATING SYSTEM

Robert H. Meyer, West Bloomfield, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Jul. 5, 1991, Ser. No. 726,371

Int. Cl.[5] **F02C** *7/224*

U.S. Cl. 60—736 **2 Claims**



1. A reflexive fuel heating system for an engine comprising a fuel tank,

a heat exchanger having a cold side inlet for liquid fuel, a cold side outlet for liquid fuel, a hot side inlet for liquid fuel and a hot side outlet for liquid fuel, the cold side liquid fuel inlet being in liquid fuel flow communication with said fuel tank,

a fuel filter having an inlet in liquid fuel flow communication with the cold side outlet of said heat exchanger and an outlet for liquid fuel,

a gear type fuel pump having an inlet in liquid fuel flow communication with said outlet of said fuel filter and a single outlet in liquid fuel flow communication with the hot side inlet of said heat exchanger, and

means connecting the hot side outlet of said heat exchanger for conducting the entire output of liquid fuel from said pump to said engine whereby heat generated in liquid fuel passing through said fuel pump is transferred in said heat exchanger to fuel upstream of said fuel filter.

5,203,175

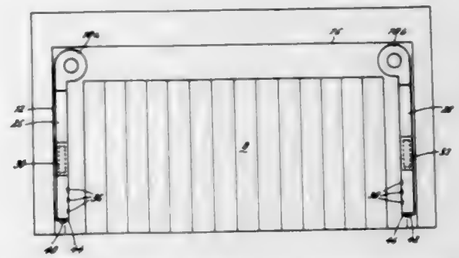
FROST CONTROL SYSTEM

Nancy L. Farrey; William W. Hoerner, both of Dubuque; David P. Leppert, Zwingle, all of Iowa, and Glenn A. Nicol, Dickeyville, Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Apr. 20, 1992, Ser. No. 870,952

Int. Cl.[5] **F25D** *21/12*

U.S. Cl. 62—82 **25 Claims**



1. A frost control system for removing from and preventing the formation of vapor condensation and/or frost upon a cold storage locker door having a top, a base, first and second side edges, a cold-side surface and a warm-side surface, said system comprising:

air intake means for drawing air into the frost control system;

heater means for warming said air;

transfer means coupled with said air intake means and said heater means for transporting said air from said intake means to said heater means; and

air discharge means disposed adjacent to said first side edge of the door for receiving a volume of warm air from said heater means and discharging said volume of warm air across said warm-side surface in a direction having a horizontal component.

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METHODS AND DEVICE FOR PREPARING ICE

Marinus C. De Weered, Haaksbergen, Netherlands, assignor to S.S.P. Lichtenvoorde B.V., Lichtenvoorde, Netherlands

Filed Jun. 20, 1991, Ser. No. 718,182

Claims priority, application Netherlands, Jun. 21, 1990, 9001429

Int. Cl.[5] **F25C** *1/12*

U.S. Cl. 62—138 **8 Claims**

1. A device for making ice, comprising:

a refrigerating circuit (1) adapted to contain a refrigerant with at least one compressor (2) at least one condenser (5) connected to the delivery side of the compressor (2) by a first conduit (3) having therein a first controllable valve (4) at least one expansion valve (7) connected to the condenser (5) by a second conduit (6) at least one evaporator (11, 12) connected to the expansion valve (7) by a third conduit (8) having therein a first check valve (9, 10), a return line (13) connecting the evaporator (11, 12) to the suction side of the compressor (2) and having therein a second controllable valve (14, 15), a defrosting conduit (16) connecting the delivery side of the compressor (2) to the evaporator (11, 12) and having therein a third controllable valve (17, 18), and means (19) for controlling the valves;

means (20, 21) for guiding a liquid (22) for freezing over the

means for indicating absence of liquid refrigerant within

ing the superheat at said second predefined level while

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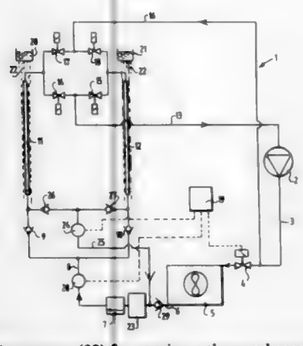
means (20, 21) for guiding a liquid (22) for freezing over the evaporator (11, 12);
means for collecting ice formed on the evaporator (11, 12); and



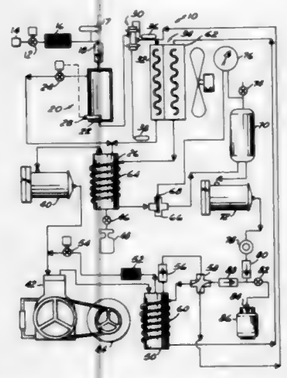
a condition sensor (28) for sensing a thermodynamic parameter of the refrigerant arranged in the third conduit (8) and connected for signal transmission to the valve control means (19).

5,203,177

REFRIGERANT HANDLING SYSTEM WITH INLET REFRIGERANT LIQUID/VAPOR FLOW CONTROL

Kenneth W. Manz, Paulding; Christopher M. Powers, and Gregg E. Laukhuf, both of Bryan, all of Ohio, assignors to SPX Corporation, Muskegon, Mich.

Filed Nov. 25, 1991, Ser. No. 797,360
Int. Cl.[5] F25D *21/00*
U.S. Cl. 62—149 **26 Claims**



1. A refrigerant handling system that includes a compressor having an inlet and an outlet, means coupled to said compressor inlet for evaporating refrigerant passing therethrough, input means for connecting said evaporating means to a source of refrigerant, means coupled to said input means for determining presence of liquid refrigerant at said input means, and means connected between said input means and said compressor inlet in parallel with said evaporating means for bypassing refrigerant from said evaporating means to said compressor inlet when liquid refrigerant is absent at said input means,

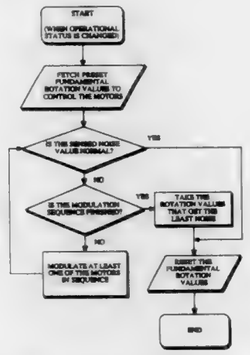
said means for determining presence of liquid refrigerant at said input means comprising refrigerant accumulation means connected between said input means and said evaporating means having an open internal volume, means coupled to said volume for detecting level of liquid refrigerant therein, and means responsive to said level-detecting means for indicating absence of liquid refrigerant within said volume.

5,203,178

NOISE CONTROL OF AIR CONDITIONER

Jia-Ming Shyu, Hsinchu, Taiwan, assignor to Norm Pacific Automation Corp., Hsinchu, Taiwan

Continuation-in-part of Ser. No. 605,419, Oct. 30, 1990, abandoned. This application May 7, 1991, Ser. No. 696,506
Int. Cl.[5] F25D *17/00*; **F04B** *49/00*
U.S. Cl. 62—180 **12 Claims**



1. In an air conditioning apparatus having a condenser fan, an evaporator fan, a compressor, and at least two motors for driving the fans and the compressor, the improvement comprising means, responsive to vibration of the apparatus, for controlling a speed of each of said motors to reduce the vibration; wherein said controlling means performs a test to determine optimum speeds of said motors to minimize the vibration, said controlling means including

a microcomputer means operative during the test to change the speed of at least one of said motors to each of a plurality of speed values within a predetermined speed range, and

at least one detector for detecting values of the vibration, said controlling means controlling said at least one of said motors, at a termination of the test, to operate at a speed value at which the vibration is minimized.

5,203,179

CONTROL SYSTEM FOR AN AIR CONDITIONING/REFRIGERATION SYSTEM

James W. Powell, Guilford, Conn., assignor to Ecoair Corporation, New Haven, Conn.

Filed Mar. 4, 1992, Ser. No. 845,675
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—180 **4 Claims**

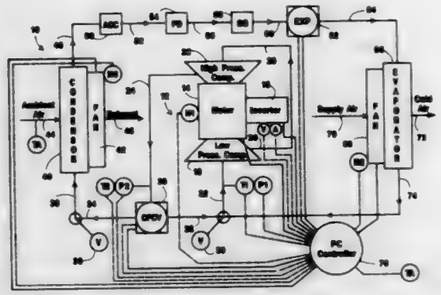
1. A method of controlling a refrigeration system having a working fluid and, in sequence, an evaporator, a variable speed centrifugal compressor, a condenser and an expansion valve, comprising:

a) operating said compressor at a constant speed;

b) maintaining said working fluid a first predefined level of superheat between said evaporator and said compressor while said compressor is operating at constant speed;

c) accelerating rotation of said compressor;

d) increasing the superheat of said working fluid between said evaporator and said compressor to a second predefined level above said first predefined level and maintaining the superheat at said second predefined level while said compressor is accelerating; and



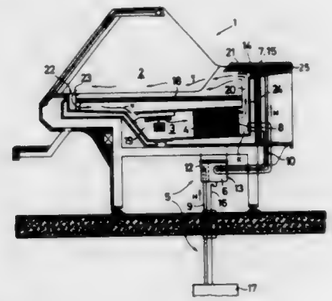
e) decreasing the superheat of said working fluid to said first predefined level when said compressor returns to a constant operating speed.

5,203,180

REFRIGERATOR COUNTER

Fred R. Weisbrich, Frankfurt am Main, Fed. Rep. of Germany, assignor to Nax GmbH & Co. Ladenbau OHG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 23, 1991, Ser. No. 811,933
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1991, 4128148
Int. Cl.[5] A47F *3/04*
U.S. Cl. 62—247 **14 Claims**



1. A refrigerator counter comprising:

a goods receiving chamber;

a counter bed;

means for circulating an air current through said goods receiving chamber and therefrom into said counter bed;

means for cooling said air current prior to introduction thereof into said goods receiving chamber, thus forming a cooled air current;

means for branching a portion of said cooled air current and for introducing said portion into a mixed air chamber;

means for introducing hot sterilized physically pure steam into said mixed air chamber and therein swirling with said portion of said cooled air current, thereby forming moistened mixed air;

at least one steam outlet nozzle; and

means for supplying said moistened mixed air from said mixed air chamber through said at least one steam outlet nozzle into said goods receiving chamber.

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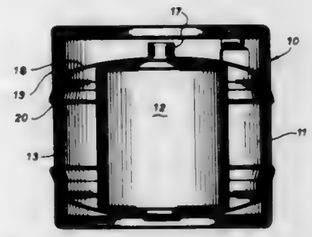
CONTAINER-COOLER

Charles E. Brossia, Valley Park, Md.; Philip S. Desmond, Waukesha, and Eckhard F. Rahn, Colgate, both of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 800,390, Nov. 27, 1991. This application Jun. 5, 1992, Ser. No. 893,640
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—372 **2 Claims**



1. A container-cooler for beer, said container-cooler comprising:

(a) a conventional keg-shaped rigid outer shell;

(b) a rigid inner vessel for beer having top and bottom walls having a diameter and a circumferential side wall extending between the top and bottom walls, said vessel having a neck for closure by a conventional keg closure and disposed therein being centrally positioned within said outer shell with the top of said neck below the neck of said shell;

(c) an annular space for ice between the outer wall of the inner vessel and the inner wall of the shell; and

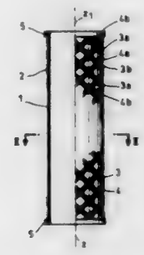
(d) retaining means for retaining the inner vessel in the shell and maintaining said space, said retaining means being a collar which fits around the neck of the vessel and over said top wall and which has a plurality of spaced-apart arms which extend out from the neck to and are secured to the shell, said arms forming a plurality of horizontally elongated apertures providing areas to the annular space through which ice can be introduced.

5,203,182

ARTICLES OF JEWELRY AND PROCESS FOR MANUFACTURING SAME

Bauhs Wirath, Paris, France, assignor to OR-EST S.A., Erstein, France

Filed Aug. 26, 1991, Ser. No. 749,916
Int. Cl.[5] A44C *25/00*
U.S. Cl. 63—2 **9 Claims**



1. In an article of jewelry, the improvements comprising a rigid body and a tubular sheath longitudinally about said rigid body, said sheath being a braid formed by interwoven metal filaments that defines spaces therebetween and having longitudinally opposite ends fixed to said rigid body to maintain an

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amount of tension in said braid effective to press said braid

der axis and an outer skirt, said needle cylinder being

loop positioned inside the outermost wale by at least one wale, the overlapped stitch loop defining at least one

bottom wall and a portion of said one side wall, whereby to form upper and lower shell segments, said segments each

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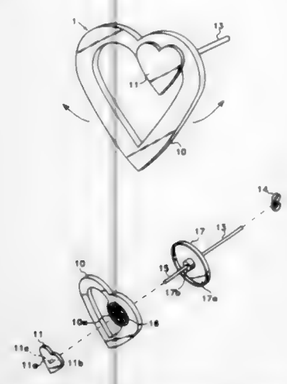
amount of tension in said braid effective to press said braid radially against said rigid body, said spaces making portions of said rigid body visible through said braid all along and about said rigid body between said longitudinally opposite ends of said sheath.

5,203,183
ROTATABLE EARRING AND METHOD FOR MAKING THE SAME

Robert U. Salerno, 21-69 W. 9th St., Brooklyn, N.Y. 11223

Filed Jan. 16, 1992, Ser. No. 822,058
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—12 **11 Claims**



1. An earring of unitary construction having a rotatable element, said earring comprising:

(a) a first ornamental portion having rotation means fixedly attached to said first ornamental portion, said rotation means comprising ball bearing rotation means including a central annular bearing retainer having a central opening formed therein, an outer annular bearing retainer, and a plurality of ball bearings disposed between said central bearing retainer and said outer bearing retainer, said outer bearing retainer being fixedly attached to said first ornamental portion, said rotation means axle extending through the central opening of said central bearing retainer, said first ornamental portion including a bearing seat and said outer bearing retainer being formed having an annular shoulder, said annular shoulder being disposed in said bearing seat, said outer bearing retainer being fixedly attached to said bearing seat by cutting and bending displaced portions of said bearing seat over said outer bearing retainer.

5,203,184
SINGLE-CYLINDER CIRCULAR MACHINE WITH IMPROVED PLATEN ACTUATION, IN PARTICULAR FOR MANUFACTURING SOCKS, STOCKINGS AND THE LIKE

Francesco Lonati; Ettore Lonati; Fausto Lonati, and Tiberio Lonati, all of Brescia, Italy, assignors to S.F.I.M. S.r.L., Brescia, Italy

Filed Nov. 12, 1991, Ser. No. 790,622
Claims priority, application Italy, Nov. 15, 1990, 22063 A/90
Int. Cl.[5] D04B *9/06*
U.S. Cl. 66—95 **16 Claims**

1. Single-cylinder circular machine with improved platen actuation, particularly for manufacturing socks and stockings, comprising;

a supporting structure;

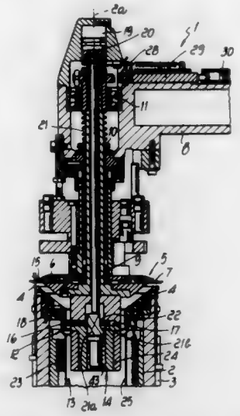
a substantially vertical needle cylinder having a needle cylinder axis and an outer skirt, said needle cylinder being rotatable about said needle cylinder axis;

axial grooves defined in said outer skirt of said needle cylinder;

a plurality of needles arranged in said axial grooves and being individually movable along directions parallel to said needle cylinder axis;

a platen arranged coaxially above said needle cylinder, said platen being supported by said supporting structure and rotatable about said needle cylinder axis;

said machine further comprising;



first connecting means controllably activatable and disactivatable for rigidly rotationally associating said platen with said needle cylinder about said needle cylinder axis;

a wing connected to said platen and extending inside said needle cylinder;

an inner surface defined by said needle cylinder and having a portion facing said wing;

second connecting means arrange don said wing and on said portion of said inner surface of said needle cylinder facing said wing, said second connecting means interacting magnetically with one another, whereby to transmit rotary motion of said needle cylinder to said platen.

5,203,185
FABRIC CONNECTING METHOD AND FABRIC HAVING CONNECTIONS

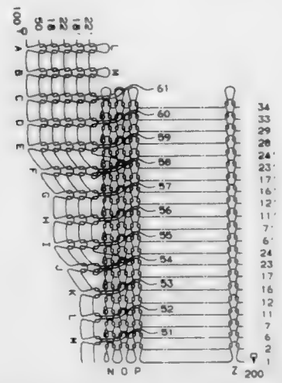
Masao Okuno, Wakayama, Japan, assignor to Shima Seiki Mfg. Ltd., Wakayama, Japan

Filed Jun. 3, 1991, Ser. No. 709,493
Claims priority, application Japan, Jun. 5, 1990, 2-147559
Int. Cl.[5] D04B *7/30*
U.S. Cl. 66—171 **9 Claims**

1. A fabric, comprising:

first and second knitted parts formed separately on respective first and second opposedly arranged beds of a flat knitting machine, the first knitted part defining an outermost portion, the second knitted part defining at least first and second wales, the first wale defining an outermost wale, and

a connecting line connecting the first and second knitted parts, the connecting line including an overlapped stitch loop positioned inside the outermost wale by at least one wale, the overlapped stitch loop defining at least one

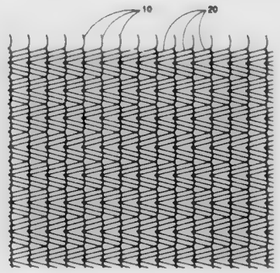


stitch loop from the first part overlapped with at least one stitch loop from the second wale.

5,203,186
STITCH-STABILIZED NONWOVEN FABRIC

Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 406,576, Sep. 13, 1989, abandoned. This application Sep. 18, 1990, Ser. No. 584,161
Int. Cl.[5] D04B *23/08*
U.S. Cl. 66—192 **14 Claims**



1. A stitchbonded nonwoven fabric made with two multi-needle stitched thread systems, the first thread system being a bulkable thread and the second thread system being a substantially inextensible thread, the fabric comprising a nonwoven fibrous layer reinforced in a first direction with the bulkable thread forming spaced-apart rows of stitches in the fibrous layer and reinforced in a second direction with the substantially inextensible thread forming spaced-apart rows of stitches in the fibrous layer, the second direction being at an angle of at least 50 degrees with the first direction.

5,203,187
PORTABLE DOOR LOCK CLOSURE

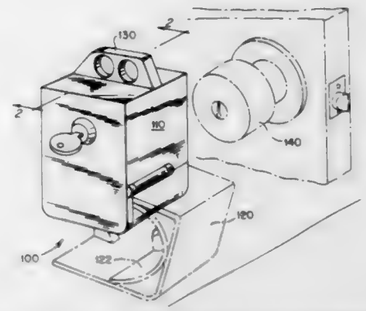
James T. Kane, 1601 Dona Bay Dr., Nacomis, Fla. 34275

Filed Jun. 22, 1992, Ser. No. 902,341
Int. Cl.[5] E05B *17/18, 13/00*
U.S. Cl. 70—455 **1 Claim**

1. In a portable clamshell doorknob closure of box configuration, wherein the closure defines opposed front and rear walls, top, bottom and divisible side walls and wherein one side wall bears a hinge, located intermediate its ends to connect the bottom wall and a portion of said one side wall, whereby to form upper and lower shell segments, said segments each defining opposed doorknob enveloping cavities:

a) a spring-loaded latch pivoted to the interior of said side wall; and

b) a lockable latch lever with a locking means, the lever being pivoted to the interior of the front wall of the upper segment, in operative juxtaposition to the spring-loaded latch;



c) a latch cam and seat fixed to the interior of said other side wall;

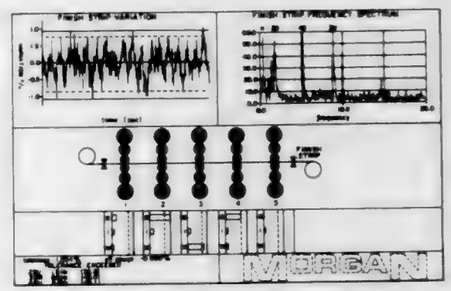
d) a cam slide fixed to the upper shell segment rear wall, in latch contacting disposition relative to the latch cam;

whereby as the lower segment is closed against the upper segment, the latch cam and seat may trip the latch, locking the segments together and as the latch lever is sequentially activated, the lower shell segment will release from the upper segment to open the closure.

5,203,188
SYSTEM AND METHOD FOR MONITORING A ROLLING MILL

Peter N. Osgood, Upton, and Thomas E. Simmons, Westborough, both of Mass., assignors to Morgan Construction Company, Worceter, Mass.

Filed Sep. 16, 1991, Ser. No. 760,600
Int. Cl.[5] B21C *51/00;* **G06G** *7/19*
U.S. Cl. 72—11 **58 Claims**



1. A rolling mill monitoring system for use in a rolling mill to identify specific contributions to out of tolerance finish product, said rolling mill having a plurality of roll stands which support a plurality of rolls for rolling an entering product into a finish product, said system comprising:

means for establishing a data acquisition time period;

means for calculating roll frequency data corresponding to nominal roll frequencies of each of said rolls;

means for acquiring data corresponding to measured separating forces at each roll stand while rolling said product,

said measured separating forces data being acquired over

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VERSATILE AUTOMATIC METAL STRIP WORKING

(b) fulcrum means mounted to the top plate of the casing;

(c) bending means capable of angular displacement about the

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said measured separating forces data being acquired over said acquisition time period;

means for acquiring data corresponding to measured gauge of said finish product after being rolled by said roll stands, said measured finish product gauge data being acquired over said data acquisition time period;

means for transforming said measured separating forces data and said measured finish product gauge data into the frequency domain so as to obtain frequency amplitude data corresponding to each of said measured separating forces and finish product gauge;

means for correlating said frequency amplitude data corresponding to said measured separating forces, said measured finish product gauge, and said nominal roll frequency data of each roll in order to derive matched frequency amplitude data which corresponds to each roll; and

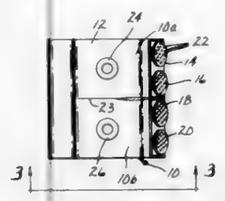
means for determining, in accordance with said matched frequency amplitude data, which of the rolls are contributing to the out of tolerance finish product.

5,203,189

HIGH-INTENSITY ROTO PEEN FLAPS, METHOD OF MAKING SAME, WHEELS INCORPORATING SAME, AND METHODS OF USING WHEELS INCORPORATING SAME

Michael W. Lovejoy, Prescott, Wis.; Jennifer L. Trice, Eagan, Minn.; Richard C. Kerr, Rutherfordton, N.C.; John R. Damewood; Jill R. Menzel, both of Spartanburg, S.C.; Eddie L. Jarvis, Charlotte, N.C., and Bert A. Ross, Conyngham, Pa., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1991, Ser. No. 788,550
Int. Cl.[5] B21J *5/00*
U.S. Cl. 72—53 **63 Claims**



1. An improved high-intensity peening flap of the type in which an elongate strap of fabric having a coating thereon has at least one peening particle support base fastened thereto, the support base having a plurality of peening particles joined to an exposed face of the support base, wherein the improvement comprises said coating comprising a plurality of coating layers, at least one of the layers being comprised of a linear polyurethane elastomer.

5,203,190

METHOD AND APPARATUS FOR MAKING A HYDROCYCLONE SEPARATION CHAMBER

Roy W. Kramer; Robert B. Sivyer; Michael J. Thurmond, and Daniel P. Lane, all of Houston, Tex., assignors to Sivco, Inc., Houston, Tex.

Filed May 30, 1990, Ser. No. 530,787
Int. Cl.[5] B21D *39/20*
U.S. Cl. 72—62 **9 Claims**

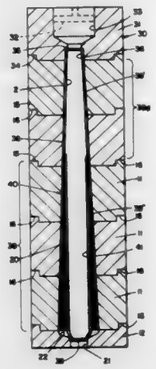
1. A method of forming a frusto-conical tubular member to obtain a seamless, smooth frusto-conical interior wall surface, said tubular member being formed from an elongated tube member of metal material of known ductility and yield strength and having a pair of ends and a cylindrically shaped wall of specific wall thickness configured about a central longitudinal axis,

said method including:

disposing one end of the tube member into a female die member having a pair of die ends and a frusto-conical interior wall surface which extends between said die ends to form a large opening at one of said die ends and a smaller opening at the other die end, said frusto-conical wall surface being configured about a central cone axis which is in substantially coaxial alignment with the central longitudinal axis of the tube member and said frusto-conical wall surface of said female die member being disposed at a taper angle relative to said cone axis;

applying hydraulic pressure to the interior of said tube member while said tube member is disposed in said female die member at a level of hydraulic pressure which is greater than the yield strength of the tube member to obtain an outward radial expansion of the wall of the tube member to conform to the interior wall surface of the die member;

during the step of applying hydraulic pressure, restricting the radial expansion of the wall of said tube member along a first predetermined length of said interior wall surface of the die member where said first predetermined length is measured from said large opening in the die member so as to allow radial expansion of the wall of said tube member into a conforming frusto-conical relationship with respect to the remaining length of the frusto-conical interior wall surface of said female die member to thereby form a first frusto-conical length segment of a tubular member,



said first predetermined length being selected with respect to the taper angle of said frusto-conical wall surface of said die member and the ductility and wall thickness of said tube member so that the tensile strength of the tube member is not exceeded during the radial expansion, said step of restricting radial expansion of the wall of said tube member along said first predetermined length of the die member being controlled by disposition of a die sleeve of greater tensile strength than said tube member between said tube member and said die member in sleeved relation with the length segment of the tube member which throughout its segment length is axially coincident with said first predetermined length of the die member,

thereafter annealing said tubular member;

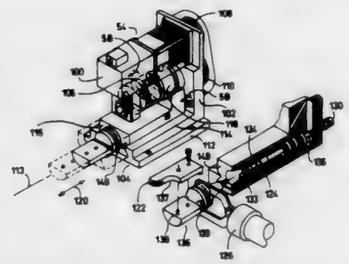
sequentially repeating each of the aforementioned process steps to form one or more additional frusto-conical length segments of said tube member by successively expanding contiguous length segments of the tube member after each annealing step and in each step of restricting radial expansion of the wall of said tube member along each predetermined length of die member using a different die sleeve over the length segment of the tube member which is axially coincident with the selected predetermined length of the die member for providing a tubular member with a seamless, smooth frusto-conical interior wall surface.

5,203,191

VERSATILE AUTOMATIC METAL STRIP WORKING MACHINE

Luigi Maggi, Lecco, Italy, assignor to North America OMCG, Inc., Bridgeport, Conn.

Filed May 2, 1990, Ser. No. 518,074
Int. Cl.[5] B21F *3/02*
U.S. Cl. 72—140 **18 Claims**



1. A replaceable tool actuator for use on a wire working machine, comprising:

a support removably-mountable to a machine;

a slide movable mounted to the support for sliding motion along an axis;

means for moving the slide;

a tool holder;

means on the slide for releasably holding the tool holder; said tool holder having a first part extending therefrom;

a wire former having a second part extending therefrom;

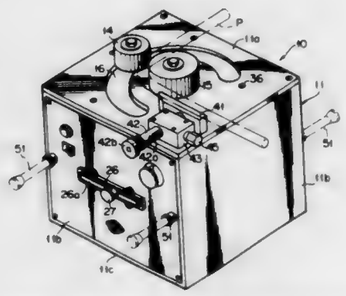
said first and second parts each having a reference element and being sized and shaped to interfit in lateral and longitudinal interlocking relationship with each other with the respective reference elements of the first and second parts in fixed abutting relationship so as to provide a referenced position for the wire former that is maintained throughout high force operation of the tool actuator, and means for releasably mounting the first and second parts to each other.

5,203,192

PORTABLE, LIGHTWEIGHT MACHINE FOR BENDING REINFORCING STEEL RODS OR THE LIKE

Kiyoshi Kimura, Fujisawa, Japan, assignor to Kabushiki Kaisha Ogura, Kanagawa, Japan

Filed Feb. 11, 1992, Ser. No. 833,671
Claims priority, application Japan, Feb. 15, 1991, 3-42790
Int. Cl.[5] B21D *7/02, 9/05*
U.S. Cl. 72—217 **20 Claims**



1. A machine for bending elongate workpieces such as reinforcing steel rods, comprising:

(a) a casing having a top plate;

(b) fulcrum means mounted to the top plate of the casing;

(c) bending means capable of angular displacement about the fulcrum means for bending a workpiece;

(d) abutment means mounted to the top plate of the casing for bearing against the workpiece being bent by the bending means about the fulcrum means, said abutment means comprising:

(1) an abutment;

(2) a fixture immovably mounted to the top plate of the casing, the fixture having a first hole extending therethrough and a second hole extending at right angles with the first hole;

(3) a support rod slidably extending through the first hole in the fixture and carrying the abutment on one end thereof;

(4) a thrust member slidably received in the second hole in the fixture, the thrust member having a slanting surface extending at an angle to the longitudinal direction of the support rod;

(5) a wedge member disposed between the support rod and the slanting surface of the thrust member for preventing the movement of the support rod in a direction from the one to another end thereof by wedging action; and

(6) a threaded member threadedly engaged in the second hole in the fixture for pushing the thrust member against the support rod via the wedge member;

(e) a support structure disposed within the casing and mounted solely to the top plate of the casing; and

(f) drive means mounted to the support structure for revolving the bending means about the fulcrum means;

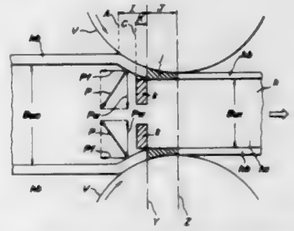
(g) whereby all but the top plate of the casing can be of relatively lightweight construction as the fulcrum means, the bending means, the abutment means and the drive means are all mounted, either directly or via the support structure, to the top plate of the casing.

5,203,193

METHOD OF ROLLING H-BEAMS

Takaaki Iguchi, and Hiroyuki Hayashi, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Nov. 4, 1991, Ser. No. 787,126
Claims priority, application Japan, Nov. 5, 1990, 2-297163; Nov. 30, 1990, 2-330621
Int. Cl.[5] B21B *1/08*
U.S. Cl. 72—225 **6 Claims**



1. A method of producing an H-beam by finishing rolling a steel billet rolled in rough rolling and having a web and flanges by a universal finishing mill having a pair of vertical rolls embracing the flanges of the billet on both sides and a pair of horizontal rolls having widths less than an inner web width of the steel billet rolled in the rough rolling and embracing the web on upper and lower sides to reduce web width and thicknesses of the flanges of the billet and to correct inclination of the flanges, thereby reducing and adjusting an inner web width of the H-beam, wherein the billet is rolled by the universal finishing mill in a state such that axes of the pair of vertical rolls are shifted downstream of axes of the pair of horizontal rolls into a position within a range where reduction of the web

width and the thicknesses of the flanges are simultaneously

5,203,195

BENDING MACHINE FOR BENDING BAR-SHAPED

each of said interchangeable disks having a central aperture sized to conform to the diameter of said existing dent

pied to said first end of all of said elongated members such that as said driving member is moved along an annular

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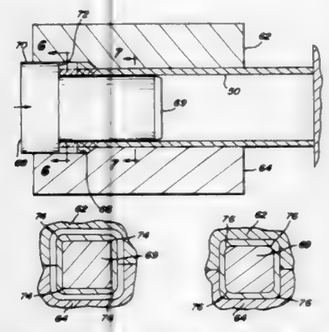
width and the thicknesses of the flanges are simultaneously effected.

5,203,194
METHOD OF FORMING A TRAILER HITCH RECEIVER TUBE

Herman Marquardt, Pinckney, Mich., assignor to Great Lakes Tool and Machine, Milford, Mich.

Filed Dec. 5, 1991, Ser. No. 802,497
Int. Cl.[5] B21D *41/02, 53/88*
U.S. Cl. 72—316 3 Claims

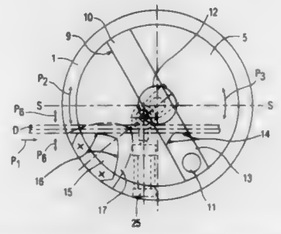


1. A method of forming an elongated receiver tube for a motor vehicle trailer hitch assembly of the type wherein said receiver tube has a hollow interior passage which receives a hitch bar having a rectangular cross section, comprising the steps of:
providing an elongated rectangular cross-section hollow tube having a substantially uniform wall thickness,
providing die means having a forming surface for defining an enlarged bead end for said receiver tube, said forming surface including a stop separating the enlarged bead end from a tube receiving portion of the die means,
providing a single punch having a post fitting with a rectangular cross section for engagement within said rectangular tube hollow interior passage and said punch having a radial forming surface engageable with an end of said tube, said rectangular post defined by small radius corners adjacent said radial forming surface and more rounded corners at a leading end of the post,
loading said tube into said die means with said end positioned within said bead forming surface and extending a desired distance from said stop,
placing said punch with said post in said tube interior passage with said radial forming surface engaging said end of said tube,
forcibly displacing said punch against said tube end causing said end to be deformed to conform to said die and post forming surfaces thereby providing a bead around said tube end having an increased wall thickness thereby strengthening said tube end and forming sharper corners in the interior of the bead and more round corners in the tube interior contacting the post; and
forming an elongated receiver tube for a motor vehicle trailer hitch assembly.

5,203,195
BENDING MACHINE FOR BENDING BAR-SHAPED MATERIAL

Klaus Ritter; Gerhard Ritter, and Gerhard Schmidt, all of Graz, Austria, assignors to EVG Entwicklungs- u.Vertwertungs-Gesellschaft mbH, Graz, Austria

PCT No. PCT/AT91/00001, § 371 Date Sep. 4, 1991, § 102(e) Date Sep. 4, 1991, PCT Pub. No. WO91/10519, PCT Pub. Date Jul. 25, 1991
PCT Filed Jan. 2, 1991, Ser. No. 761,824
Claims priority, application Austria, Jan. 12, 1990, 61/90
Int. Cl.[5] B21D *7/02*
U.S. Cl. 72—387 18 Claims



1. A bending machine for bending bar-shaped material in two directions, having
a stationary frame (**4**);
a single bending disc (**5**) rotatable about a fixed central axis (x—x);
a central bending mandrel (**12**) on the disc (**5**);
an eccentrically located bending tool (**13**, **29**) on the disc;
a housing (**1**) rotatably supported for rotation in two opposite directions about the axis (x—x) on the stationary frame (**4**);
an adjustable steadying element (**15**, **17**, **26**) secured to the housing, for holding the material to be bent against the disk (**5**);
wherein the bending disc (**5**) is located coaxially with the housing;
the bending mandrel is coaxial with respect to said axis (x—x);
a rotary drive mechanism (**18**) is provided, mounted on the housing (**1**) and drivingly coupled to the bending disc (**5**); and
wherein the steadying element (**15**, **17**, **26**) is eccentrically located on the housing, rotation of the housing by said rotary drive mechanism resulting in engagement of the material to be bent against said steadying element.

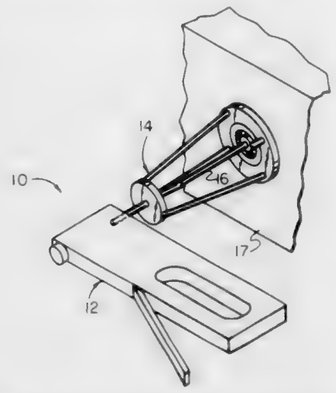
5,203,196
DENT PULLER

Fremont T. Jenkins, 70235 Beach Dr., Edwardsburg, Mich. 49112

Filed Oct. 7, 1991, Ser. No. 772,573
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—391.2 2 Claims

1. A new and improved dent puller comprising:
attachment rod means fixedly securable to an existing dent in the vehicle's body;
cone-shaped support means through which said attachment rod means is slidably positionable;
and
pulling tool means for applying a pulling force to said attachment rod means thereby to remove said existing dent,
wherein said rod attachment means is adhesively attached by a heat activated adhesive to said existing dent, said cone-shaped support means includes first and second parallel aligned disks, said first disk having a guide aperture for said attachment rod means and said second disk having an aperture for receiving a series of interchangeable disks,

each of said interchangeable disks having a central aperture sized to conform to the diameter of said existing dent respectively and adapted to be snap fitted within said

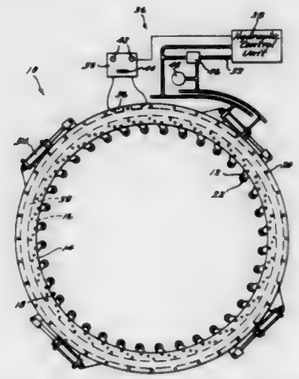


aperture in said second disk so that said attachment rod means is slidably positionable through the aperture in said first disk and the central aperture in each said respective insert snap fitted in said second disk.

5,203,197
CLAMP ASSEMBLY

Warren B. Depperman, Camden, S.C., assignor to Cogsdill Tool Products, Inc., Camden, S.C.

Filed Aug. 19, 1991, Ser. No. 746,863
Int. Cl.[5] B21D *41/00*
U.S. Cl. 72—402 25 Claims

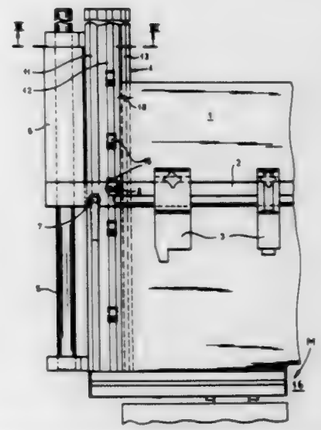


1. An improved clamping assembly for reforming an out-of-round, relatively thin walled workpiece, said improvement comprising:
(a) frame means for providing a relatively stationary base, said frame means defining at least one generally circular edge portion;
(b) a plurality of force applying assemblies, each having a rigid elongated member which has first and second end portions, each elongated member coupled to said frame means by a pivotal coupling disposed between said end portions, closer to said second end portion than said first end portion, such that said force applying assemblies are located at equal radial distances from a central axis of said at least one generally circular edge portion; and
(c) a rigid one piece annular driving member pivotally coupled to said first end of all of said elongated members such that as said driving member is moved along an annular path, said elongated members pivot about said pivotal coupling, thereby causing said second ends of said elongated members to simultaneously pivot into and out of engagement with said workpiece to reform said workpiece.

5,203,198
WORKPIECE-POSITIONING APPARATUS

Bernd Stursberg, Emepetal, Fed. Rep. of Germany, assignor to Rolf Peddinghaus, Emepetal, Fed. Rep. of Germany

Filed Mar. 17, 1992, Ser. No. 852,634
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1991, 4109028
Int. Cl.[5] B21D *11/22*
U.S. Cl. 72—461 6 Claims



1. In combination with a workpiece-treating machine having a table with a pair of longitudinal edges and a working station between the edges,
an apparatus for positioning a workpiece in the station, the apparatus comprising:
a generally square section metal tube extending along one edge of the table and formed with
a longitudinally extending inner T-slot to which the one edge of the table is secured,
a pair of transversely spaced but longitudinally extending and upwardly open outer T-slots, and
a pair of outwardly open and longitudinally extending outer T-slots;
a longitudinally extending guide rod at the one table edge;
supports and T-fasteners fixing the guide rod on the table in the outwardly open T-slots at the one edge in a position extending parallel to the longitudinal edges;
a carriage longitudinally displaceable along the guide rod;
an elongated traverse extending transverse to the longitudinal edges and having one end fixed in the carriage and another end at the other table edge;
a stepless-adjustment clamp on the carriage having a T-fastener engaged in one of the upwardly open T-slots for clamping the carriage on the tube at any position therealong; and
a toothed retaining element on the carriage engaged in the other upwardly open T-slot for arresting the carriage at any of a plurality of longitudinally offset positions therealong.

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be tested and a supporting bracket for supporting said

wrapped around the outside of said pliable conductive mate-

pattern means and said application means to align each of them relative to the bearing surface; and

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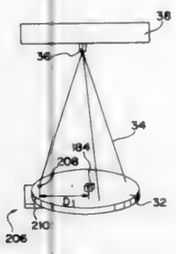
5,203,199

CONTROLLED ACCELERATION PLATFORM

Frederick H. Henderson; Arthur R. Thorne, and Hardin Joyce, Jr., all of Huntsville, Ala., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 12, 1990, Ser. No. 597,716
Int. Cl.[5] G01P *21/00*
U.S. Cl. 73—1 D **22 Claims**



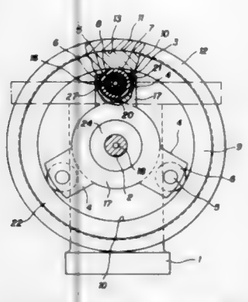
1. A method for testing a device on an acceleration platform assembly which comprises a pendulous assembly and pivot means for pivotably supporting said pendulous assembly, said pendulous assembly including a primary platform and suspending means for suspending said primary platform from said pivot means, said method comprising:
- disposing a device under test at a known location with respect to the center of percussion of said pendulous assembly;
- adjusting a secondary pendulous assembly, which is supported by said primary platform and is free to move relative to said primary platform, such that said secondary pendulous assembly causes said primary platform to move in response to the adjusting of said secondary pendulous assembly; and
- monitoring an output signal produced by the device under test to determine accuracy of the device under test.

5,203,200

MACHINE FOR TESTING CENTRIFUGAL LOAD OF BEARING

Hiroshi Inoue, Chigasaki, and Takehiko Hara, Yokohama, both of Japan, assignors to Nippon Thompson Co., Ltd., Tokyo

Filed May 13, 1991, Ser. No. 698,850
Claims priority, application Japan, May 18, 1990, 2-128917
Int. Cl.[5] G01N *3/56*
U.S. Cl. 73—7 **2 Claims**



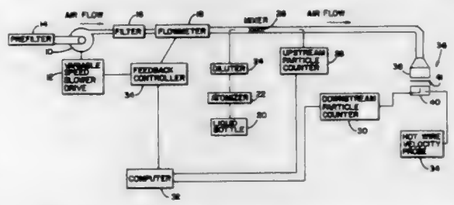
1. A machine for testing a centrifugal load of a bearing including an outer race member, comprising:
- a supporting frame including a sun ring, and
- a rotational main shaft including mounting portions for mounting bearings to be tested, said mounting portions each including a mounting shaft for mounting a bearing to be tested and a supporting bracket for supporting said mounting shaft,
- said mounting portions being fixedly projected integrally from an outer peripheral portion of said rotational main shaft at equal intervals in a circumferential direction,
- each said mounting shaft being arranged in its respective said supporting bracket in parallel with the rotational main shaft in such a manner that a pat of an outer peripheral surface of said outer race member is projected radially outwardly from said supporting bracket,
- said sun ring being concentrical with said rotational main shaft and surrounding said mounting portions,
- an inner peripheral surface of said sun ring being used as a track to be rolled with the outer race members of the bearings to be tested.

5,203,201

ON-LINE WEB FILTRATION EFFICIENCY TEST METHOD

Mark A. Gogins, Roseville, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Dec. 20, 1991, Ser. No. 810,836
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—38 **15 Claims**



1. Apparatus for monitoring the filtration efficiency of an air permeable moving web comprising:
- a sampling head having first and second members disposed on opposite sides of the moving web, each spaced apart from the web and defining a path through which the web travels without contacting said first and second members;
- means for introducing particle laden air into said first member, said first member distributing the particle laden air through the web while the web is moving, said second member collecting the particle laden air passing through the moving web;
- means for determining the efficiency of the removal of particles from the air by the air permeable web.

5,203,202

APPARATUS FOR DETECTING LEAKS IN CIRCUITS

Mark Spencer, Phoenix, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 25, 1992, Ser. No. 841,135
Int. Cl.[5] G01M *3/04, 3/14*
U.S. Cl. 73—40.5 R **3 Claims**

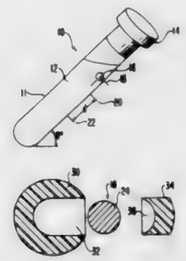
1. A fluid carrying conduit equipped for leak detection, which comprises a conduit surrounded around its circumference with a pliable fluid permeable conductive material, and which has a series of parallel insulated electrical conductors disposed generally longitudinally along the conduit and wrapped around the outside of said pliable conductive material, said insulated electrical conductors having bare conductor elements exposed at adjacent areas of insulated conductor material on the side of the insulated conductor material that is adjacent the pliable conductive material wherein the conductive material is adapted to be expanded by the pressure of leaking fluid and thereby contact the conductor elements at adjacent exposed areas.

5,203,203

VISCOMETER FOR IN SITU MONITORING

William L. Bryan, 6806 N. Aycliffe Dr., Peoria, Ill. 61614, and James M. Bryan, 630 S. Hermitage, Apt. 802, Chicago, Ill. 60612

Filed Oct. 10, 1990, Ser. No. 594,950
Int. Cl.[5] G01N *11/12*
U.S. Cl. 73—54.19 **16 Claims**



1. An apparatus for measuring the viscosity of a fluid in situ comprising:
- (a) a sealed, frangible container for holding said fluid including an inlet portion and a base portion; and
- (b) a composite ball having a known diameter and density enclosed within said container, said composite ball including an outer shell portion and an interior core portion enclosed by said outer shell portion, one of said outer shell portion or interior core portion being formed of a first material and the remaining shell portion or interior core portion being formed of a second material which differs from said first material, said first material having a substantially different density than said second material, said second material operating to diametrically increase the size of said composite ball.

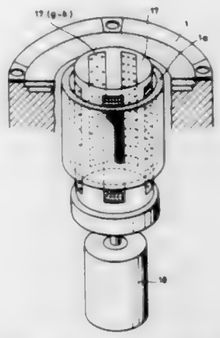
5,203,204

FLOW REGULATING APPARATUS AND FLOW MEASURING APPARATUS FOR POROUS HYDROSTATIC BEARING

Takatomi Miyazaki, Tsuchiura, and Satoshi Osaki, Ushiku, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1991, Ser. No. 769,215
Claims priority, application Japan, Oct. 4, 1990, 2-265083; Oct. 4, 1990, 2-265084; Oct. 4, 1990, 2-265085
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 **12 Claims**

1. A flow regulating apparatus for a porous hydrostatic bearing, said apparatus comprising:
- measuring means for measuring a flow of injected gas through a bearing surface of the hydrostatic bearing to be regulated;
- pattern means having a plurality of application pattern portions of different opening ratios, each application pattern portion having a plurality of small holes formed therethrough in a dispersed manner;
- application means for applying solvent onto the bearing surface through said pattern means;
- positioning means for moving said measuring means, said pattern means and said application means to align each of them relative to the bearing surface; and
- control means for selecting a proper pattern portion of said plurality of pattern portions based on a flow measured by said measuring means and controlling said positioning means so as to align said proper pattern portion and said application means relative to a portion of the bearing surface to which the solvent is to be applied.

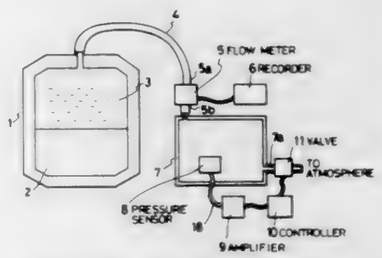


5,203,205

FREEZING AGENT CONSUMPTION MEASUREMENT SYSTEM

Osamu Ookubo, and Tsugio Watanabe, both of Akou, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,713
Claims priority, application Japan, Aug. 22, 1990, 2-221851
Int. Cl.[5] G01F *15/02*
U.S. Cl. 73—199 **5 Claims**



1. A freezing agent consumption measurement system for measuring the consumption of a freezing agent in a low-temperature container, said consumption being due to evaporation of the freezing agent, comprising:
- gas flow path means communicating with said low-temperature container for conducting the evaporated gas from the container to the atmosphere;
- measuring means provided in the gas flow path means to measure the flow of the evaporated gas from the freezing agent;
- a tank provided in the gas flow path means at a position downstream of said measuring means;
- pressure measuring means for measuring the pressure within the tank; and
- means, disposed downstream of said tank and responsive to said pressure measuring means, for maintaining the pressure in the tank at a predetermined value;
- whereby the flow of the gas as measured by the gas flow measuring means corresponds to the consumption of the freezing agent.

5,203,206

predetermined angle relative to the plate so that the elastic

5,203,209

MOTION MEASUREMENT OF ACOUSTICALLY LEVITATED OBJECT

upper and lower mounting members positioned on opposite sides of the proof mass assembly from one another; and fastening means for holding the mounting members together

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5,203,206

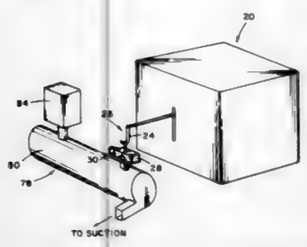
APPARATUS AND METHODS FOR TESTING TENSION-ELONGATION OR CROSS-SECTIONAL PROPERTIES OF SINGLE FIBERS AND MULTIPLE FIBER BUNDLES

Fred M. Shofner; Youe-T Chu; Christopher K. Shofner; Mark G. Townes; Joseph C. Baldwin, and David B. Patelke, all of Knoxville, Tenn., assignors to Zellweger Uster, Inc., Knoxville, Tenn.

Division of Ser. No. 722,604, Jun. 27, 1991, Pat. No. 5,167,150, which is a continuation-in-part of Ser. No. 460,292, Jan. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 293,258, Jan. 4, 1989, abandoned. This application Sep. 23, 1992, Ser. No. 949,706

Int. Cl.[5] G01L *5/06, 5/10;* **G01N** *3/08*

U.S. Cl. 73—160 **6 Claims**



1. An apparatus for testing a single bundle of fibers, comprising:
- a hook for engaging the midregion of the bundle of fibers so that the ends of the bundle hang over opposite sides of the hook;
- a clamp for clamping the two ends of the bundle that hang over opposite sides of the hook;
- means for producing a vacuum disposed to one side of said clamp opposite from said hook so that said vacuum producing means draws the fiber into proper position for being engaged by the clamp;
- translator means for providing relative movement between said hook and said clamp to tension the bundle between said hook and clamp; and
- monitoring means for monitoring at least one characteristic of the fiber as it is tensioned.

5,203,207

RAINDROP SENSOR

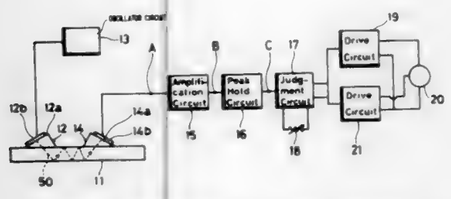
Masanori Sugiyama, Nishio, Japan, assignor to Aisin Seiki K.K., Kariya, Japan

Filed Oct. 26, 1990, Ser. No. 603,497

Claims priority, application Japan, Oct. 26, 1989, 1-279375; May 1, 1990, 2-115417; Sep. 21, 1990, 2-253058

Int. Cl.[5] G01N *1/14;* **G08B** *21/00*

U.S. Cl. 73—170.17 **9 Claims**



1. A raindrop sensor provided on a plate, comprising:
- wave transmitting means associated with a plate to radiate elastic waves thereinto;
- holding means for holding the wave transmitting means at a predetermined angle relative to the plate so that the elastic waves are transmitted while being repeatedly reflected in the plate; and
- wave receiving means associated with the plate to detect amplitude of the elastic waves transmitted in the plate;
- wherein the holding means is a coupler interposed between the plate and the wave transmitting means, the coupler holding the wave transmitting means relative to the plate so that the wave transmitting means has a predetermined incident angle in relation to a normal of the plate; and
- wherein the holding means is made of a material selected from the group consisting of lead, synthetic resin, zinc and brass.

5,203,208

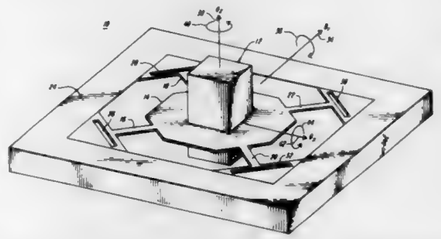
SYMMETRICAL MICROMECHANICAL GYROSCOPE

Jonathan J. Bernstein, Medfield, Mass., assignor to The Charles Stark Draper Laboratory, Cambridge, Mass.

Filed Apr. 29, 1991, Ser. No. 693,326

Int. Cl.[5] G01P *9/04*

U.S. Cl. 73—505 **10 Claims**



1. A symmetrical, micromechanical gyroscope, for detecting rotational movement about an input axis, comprising:
- a gyroscope support frame including a cavity above which is suspended an inertial mass;
- first and second pairs of flexures suspending said mass above said cavity;
- said first pair of flexures including first and second flexible elements, each of said flexible elements including a first end coupled to a first side of said mass, and a second end coupled to a first portion of said support frame, each of said first and second flexible elements oriented generally at a 45° angle from a sense axis;
- said second pair of flexures including third and forth flexible elements, each of said flexible elements including a first end coupled to a second side of said mass diametrically opposed from said first side of the mass, and a second end coupled to a second portion of said support frame, diametrically opposed from the first portion of said support frame, said third and forth flexible elements oriented generally at a 45° angle from said sense axis;
- a drive axis, about which said inertial mass is induced to vibrate in response to an applied drive signal, said drive axis coplanar with and orthogonal to said sense axis;
- means for driving said hydroscope about said drive axis;
- means for sensing rotation of said inertial mass about said sense axis; and
- wherein each flexible element of said first and second pair of flexures is oriented generally at a 45° angle from said drive axis, for providing a micromechanical gyroscope with flexures coupling said inertial mass which are symmetrically oriented about both said drive and sense axes.

5,203,209

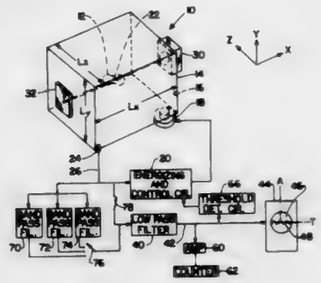
MOTION MEASUREMENT OF ACOUSTICALLY LEVITATED OBJECT

John L. Watkins, Pasadena, and Martin B. Barmatz, Glendale, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 25, 1991, Ser. No. 660,380

Int. Cl.[5] G01P *13/04*

U.S. Cl. 73—505 **3 Claims**



1. A method for determining a frequency of motion of an object that is acoustically positioned in a chamber by an acoustic standing wave field in the chamber, comprising:
- sensing amplitude modulation of said acoustic standing wave field in said chamber, determining one frequency component of said amplitude modulation which is of a frequency less than the frequency of acoustic energy of said standing wave field, and indicating a frequency of object motion to be the frequency of said one frequency component of said amplitude modulation.

5,203,210

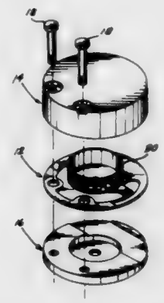
ACCELEROMETER WITH FASTENER ISOLATION

Thomas E. Terry, Vashon, and Damon R. Stoddard, Seattle, both of Wash., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 11, 1991, Ser. No. 713,752

Int. Cl.[5] G01P *15/02, 15/13*

U.S. Cl. 73—517 B **10 Claims**



3. An accelerometer for measuring acceleration along a sensing axis, the accelerometer comprising:
- a proof mass assembly including a paddle, a support, and suspension means for suspending the paddle from the support such that the paddle can move along the sensing axis in response to acceleration along the sensing axis;
- sensing means for detecting movement of the paddle away from a null position;
- upper and lower mounting members positioned on opposite sides of the proof mass assembly from one another; and
- fastening means for holding the mounting members together such that the mounting members clamp the support between them, the fastening means including at least one fastening member extending between the upper and lower mounting members through the proof mass assembly;
- the support being shaped so as to form an opening through which the fastening member passes such that the support isolates the fastening member from the paddle, wherein the support comprises a support ring extending around the paddle, said support ring having a clamped portion clamped between the mounting members and an unclamped portion and a bulge formed in the clamped portion comprising a section in which the support ring is radially thicker than in adjacent sections of the support ring, and wherein the suspension means comprises a flexure extending between the unclamped portion of the support ring and the paddle, the flexure permitting the paddle to rotate with respect to the support ring about a hinge axis normal to the sensing axis, wherein said opening extends through the bulge in the clamped portion formed in the support ring.

5,203,211

MULTI-PHASE FLOW MEASUREMENT

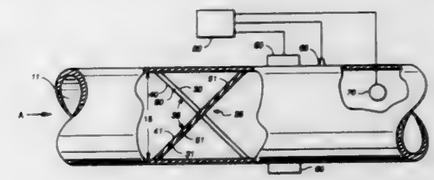
Douglas B. Jung, 3209 Franz Valley Rd., Santa Rosa, Calif. 95404

Continuation-in-part of Ser. No. 285,735, Dec. 19, 1988, Pat. No. 5,007,293. This application Apr. 16, 1991, Ser. No. 686,246

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] G01F *1/74, 15/08*

U.S. Cl. 73—861.04 **12 Claims**



1. A flow meter for the measurement of a multi-phase flow within a conduit, said conduit having an inside surface, said flow meter comprising:
- a spin generating element within said conduit, said spin generating element comprising a pair of blades presenting opposing planar surfaces to said flow mixture, said spin generating element conditioned to separate said multi-phase flow into denser components and less dense components, and urge said denser components against said inside surface of said conduit in the form of an annulus, and to urge said less dense components to flow through said annulus;
- first measurement means for measurement of said less dense component's annular rate;
- second measurement means for measurement of said denser components flowing against said conduit inner surface; and
- third measurement means for measurement of the bulk flowing components.

5,203,212

METHOD FOR DETERMINING THE COMPOSITION OF

a fixed member;

a take-up element rotatably supported on said fixed member;

5,203,215

MECHANICAL COMPONENT ATTACHMENT SAFETY

direction thereof by rotation of said pinion to axially shift a tie rod connected to said rack shaft,

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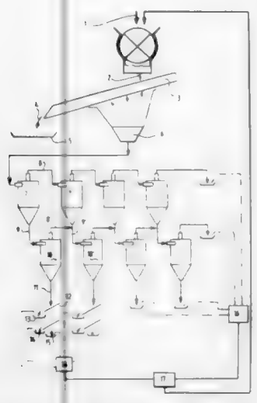
5,203,212

METHOD FOR DETERMINING THE COMPOSITION OF A SAMPLE

Jan Bovendeur, Renkum, and Barend J. Visser, Ar Veen, both of Netherlands, assignors to Serasea B.V., Waalwijk, Netherlands

Filed Feb. 12, 1991, Ser. No. 654,310
Claims priority, application Netherlands, Feb. 13, 1990, 9000341
Int. Cl.[5] G01L 5/24
U.S. Cl. 73—863.21 17 Claims



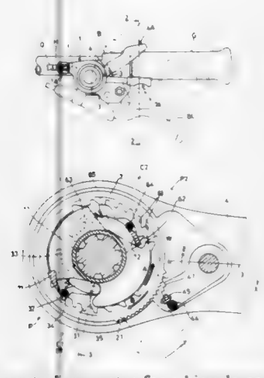
1. A method for determining the composition of a sample by separating the sample into fractions, subsequently analyzing said sample geophysically and/or physical-chemically and by further characterizing the fractions, characterized in that the composition is determined by separating the sample in accordance with a first selected pattern of weight criteria; wherein said sample is of dredging sludge.

5,203,213

BICYCLE SPEED CONTROL APPARATUS

Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Nov. 12, 1991, Ser. No. 789,876
Claims priority, application Japan, Nov. 14, 1990, 2-309557
Int. Cl.[5] B62M 25/04; B62K 11/14, 23/06
U.S. Cl. 74—475 10 Claims



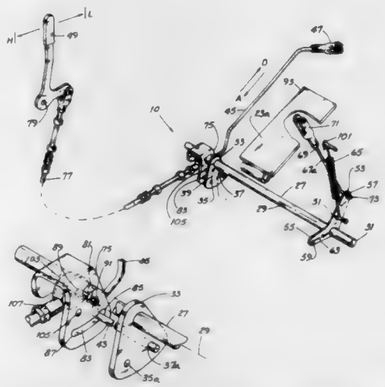
1. A speed control apparatus for a bicycle comprising:
a fixed member;
a take-up element rotatably supported on said fixed member for rotating in a wire winding direction to wind a change speed wire, said take-up element being urged in a wire unwinding direction;
a first control member for rotating said take-up element, through a one way transmission means, in said wire winding direction by operation of said first control member in said wire winding direction, said first control member being returned to its home position after a change speed operation;
a position retaining means switchable between a operative state for retaining said take-up element at a change speed position selected by said first control member, and an inoperative state for allowing rotation of said take-up element in said wire unwinding direction;
a second control member for switching said position retaining means to said inoperative state by operation of said second control member in said wire unwinding direction, said second control member being returned to its home position after a change speed operation, and said position retaining means being switched to said operative state upon return of said second control member to its home position.

5,203,214

ENGINE THROTTLE LINKAGE WITH MOTION-REVERSING FEATURE

Claude M. Frisbee, Schofield, and Allen O. Erickson, Rothschild, both of Wis., assignors to Case Corporation, Racine, Wis.

Filed Apr. 6, 1992, Ser. No. 864,234
Int. Cl.[5] G05G 1/14, 11/00
U.S. Cl. 74—482 16 Claims



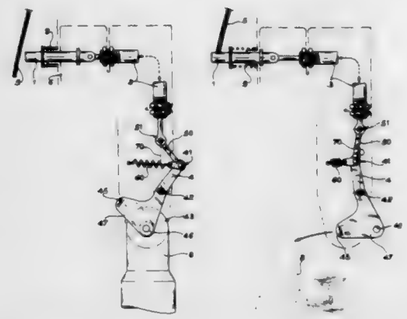
1. In an engine throttle linkage having a throttle rod, a shaft pivot-mounted for rod movement in first and second directions for engine acceleration and deceleration, respectively, and a conventional pedal depressed for pivoting the shaft, the improvement wherein the linkage has a motion-reversing mechanism comprising:
a lever-like member connected to the shaft and having first and second attachment points spaced from the shaft along separate radii;
a pedal coupled to the member by a linking stem extending therebetween, pedal depression pivoting the shaft in a first or second rotation direction when the pedal is coupled to the first point or the second point, respectively,
whereby pedal depression causes engine acceleration or deceleration.

5,203,215

MECHANICAL COMPONENT ATTACHMENT SAFETY SYSTEM

Pierre A. M. Baudu, Angerville L'Orcher; Jean-Marc D. L. Marescot, Le Havre; Guy B. Vauchel, Le Havre, and Pascal-Marie P. M. Soulier, Le Havre, all of France, assignors to Hispano-Suiza, Saint Cloud, France

Filed Oct. 9, 1991, Ser. No. 773,423
Claims priority, application France, Oct. 10, 1990, 90 12478
Int. Cl.[5] G05G 5/08
U.S. Cl. 74—483 R 8 Claims



1. A mechanical safety system to prevent closing of a cover panel for a mechanical component unless the mechanical component is properly located on a frame comprising:
a) a blocking rod movable between a first position wherein the blocking rod permits the closing of the cover panel and a second position wherein it prevents closing of the cover panel;
b) over-center lever means having a plurality of pivot attachment means located in a plane and a joint, the lever means movable between a first position wherein the joint is located on one side of the plane and a second position wherein the joint is located on an opposite side of the plane;
c) motion transmitting means operatively connecting the blocking rod to the over-center lever means such that when the over center lever means is in its first position the blocking rod is in its first position and when the over-center lever means is in its second position the blocking rod is in its second position;
d) biasing means operatively associated with the over-center lever means to bias the over-center lever means toward its second position; and,
e) means to connect the over-center lever means to the mechanical component such that the over-center lever means is retained in its first position when connected to the mechanical component.

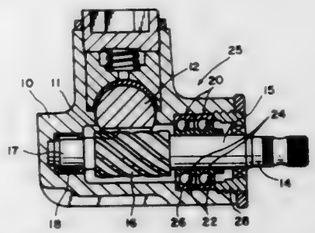
5,203,216

SUPPORTING APPARATUS FOR SUPPORTING PINION SHAFT IN RACK-PINION POWER TRANSMITTING SYSTEM

Kiyoshi Hasegawa, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,087
Claims priority, application Japan, Mar. 28, 1990, 2-30940[U]
Int. Cl.[5] B62D 3/12; F16H 19/04
U.S. Cl. 74—498 4 Claims

1. A rack-pinion mechanism for a vehicle, comprising:
a housing,
a pinion shaft having housed within said housing a pinion and first and second supporting portions respectively disposed to opposite sides of said pinion, and
a rack shaft having a rack meshed with said pinion within said housing, said rack shaft being shiftable in an axial direction thereof by rotation of said pinion to axially shift a tie rod connected to said rack shaft,
wherein said second supporting portion is supported within said housing by a corresponding bearing means, and
wherein said first supporting portion of said pinion shaft is supported within said housing by a pair of angular rolling bearings having respective inner races fixed to said first



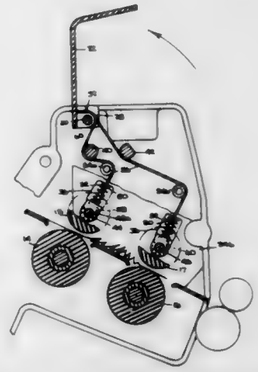
supporting portion and respective outer races abutted with one another, said outer races being held with a predetermined pre-load between a stepped portion of said housing in abutment with one of said outer races and a nut threaded to said housing and pressing against the other of said outer races but not pressing against either of said inner races.

5,203,217

PIVOTING COVER TO SEPARATE PAIR OF ROLLERS

Franklin J. Buckley, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 18, 1992, Ser. No. 883,993
Int. Cl.[5] F16C 1/10; B65H 7/00
U.S. Cl. 74—500.5 7 Claims



1. Apparatus for separating a pair of contiguous rollers from each other located beneath a cover, comprising:
a pair of opposed, side frames;
a lower roller fixedly mounted to said side frames;
an upper roller adjustably mounted to said side frames;
means for biasing said upper roller against said lower roller;
a cover for said upper and lower roller pivotably mounted to said side frames; and
a cable connected to said cover and to said upper roller, whereby when said cover is pivoted from its closed position to its open position, said cable is caused to move said upper roller away from said lower roller.

5,203,218

crank pin moves in a circular path about the axis of rotation of

plied to control said gimbal system, said error signal in-

direction of rotation of said feed member so that a speed of

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5,203,218

SYSTEM FOR UNLOADING A MEMORY CARTRIDGE

Masaaki Orimoto; Toshikatsu Harase, and Masahiko Mizuno, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

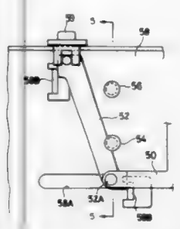
Continuation of Ser. No. 715,891, Jun. 19, 1991, Pat. No. 5,179,871, which is a continuation of Ser. No. 314,744, Feb. 24, 1989, abandoned. This application Apr. 22, 1992, Ser. No. 872,176

Claims priority, application Japan, Feb. 29, 1988, 63-047052

The portion of the term of this patent subsequent to Jan. 19, 2010, has been disclaimed.

Int. Cl.[5] G05G *1/04*; G11B *5/008*

U.S. Cl. 74—516 3 Claims



1. An apparatus in combination with a memory cartridge and having a main body defining therein a path of travel of said memory cartridge in at least an insertion direction and a discharge direction, said apparatus further including a device for unloading said memory cartridge, said device for unloading said memory cartridge comprising:

a cartridge engagement member arranged within said main body of the apparatus and operative to move in said insertion direction and said discharge direction of said memory cartridge, said cartridge engagement member including an engagement portion operative to engage said memory cartridge at least when said cartridge engagement member is moved in said cartridge discharge direction;

a single lever including one end portion serving as a point of action thereof operative to engage with said cartridge engagement member and an other end portion serving as a point of force thereof on which a force is applied;

a first fulcrum disposed at a position where a first leverage is obtained, and serving as a fulcrum of rotation of said single lever while said single lever is present within a range of rotation where said memory cartridge is initially pulled out; and

a second fulcrum disposed at a position wherein a second, smaller leverage than said first leverage is obtained, and serving as a fulcrum of rotation of said single lever when said single lever is further rotated beyond said range of rotation.

5,203,219

SPEED REDUCER FOR A WIPER MECHANISM, HAVING A HOUSING CLOSED BY A COVER

Pierre Blanchet, Lencloitre, France, assignor to Valeo Systemes d'Essuyage, Montigny-le-Bretonneux, France

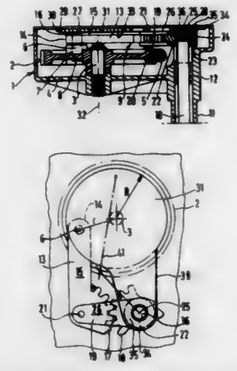
Filed Oct. 3, 1991, Ser. No. 770,589

Claims priority, application France, Oct. 5, 1990, 90 12284

Int. Cl.[5] F16H *21/40*

U.S. Cl. 74—42 12 Claims

1. A speed reducer comprising a hollow casing and, in said casing, a toothed wheel, means defining an axis of rotation and mounting the toothed wheel for rotation about said axis, a crank pin carried by the toothed wheel for free rotation and axial movement, the crank pin extending axially and being eccentric with respect to said axis of rotation, an output shaft rotatable in the casing, and a crank and connecting rod system coupling the crank pin to the output shaft such that the crank for converting continuous rotary motion of the toothed wheel to alternating rotary motion of the output shaft such that the crank pin moves in a circular path about the axis of rotation of the toothed wheel, the speed reducer further including a cover closing said casing and having an inner face directed into the casing, the cover having at least one flat thickened portion



arranged on its said inner face and being of a material having a low coefficient of friction, said thickened portion extending over the whole circular path of the crank pin about said axis of rotation of the toothed wheel.

5,203,220

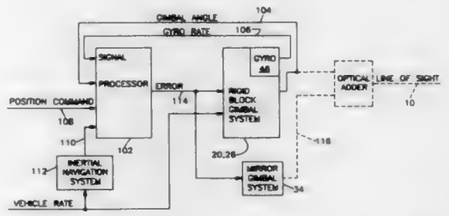
OPTICAL TRACKING AND STABILIZING SYSTEM WITH A GIMBAL MOUNTED MIRROR FOR ESTABLISHING A LINE OF SIGHT

Harold Lerman, Paramus, N.J., assignor to GEC-Marconi Electronic Systems Corp., Wayne, N.J.

Filed May 26, 1992, Ser. No. 887,860

Int. Cl.[5] G01C *19/00*, *21/00*

U.S. Cl. 74—5.22 2 Claims



1. An optical tracking and stabilizing system for establishing and maintaining a line of sight in response to a position command signal, comprising:

a two-axis gimbal system controllable independently about each of its axes;

a rigid block mounted to said gimbal system;

a mirror mounted to said rigid block;

gyroscope means mounted to said rigid block for providing a gyro rate signal about each of the axes of said gimbal system;

means for providing a gimbal angle signal corresponding to the angular position of said rigid block about each of the axes of said gimbal system;

means for receiving an input line of sight position command signal which defines a desired line of sight position to be attained by said mirror; and

for each of said gimbal axes, means responsive to said gyro rate signal, said gimbal angle signal and said position command signal for generating an error signal to be applied to control said gimbal system, said error signal including first and second components, said first component passing through a high pass filter and corresponding to an inertial stable platform error signal based on said gyro rate signal, and said second component passing through a first low pass filter and corresponding to a position servo error signal based on said gimbal angle signal and said position command signal, wherein said high pass filter and said first low pass filter are mutually complementary.

5,203,221

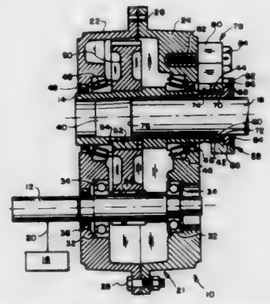
SHAFT MOUNTABLE GEAR DRIVE

Michael A. Logsdon, Dousman, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Oct. 15, 1991, Ser. No. 776,198

Int. Cl.[5] F16H *1/12*

U.S. Cl. 74—421 R 15 Claims



1. A shaft mountable gear drive for transferring power between a power source and an accessory shaft to be driven, comprising:

gear means drivingly interconnected between the power source and the accessory shaft;

a coupling axially movable along the accessory shaft and interposed between the gear means and the accessory shaft for establishing a driving connection therebetween in response to movement of the gear means;

retaining means operatively associated with the gear means for moving the coupling into driving engagement with the accessory shaft and the gear means when the gear means are moved relative to the retaining means; and

locking means for preventing the retaining means from moving when the gear means are moved.

5,203,222

MOTION CONVERTING MECHANISM

Masanori Hirai, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Jul. 19, 1991, Ser. No. 733,128

Claims priority, application Japan, Jul. 31, 1990, 2-204307

Int. Cl.[5] F16H *25/20*

U.S. Cl. 74—424.8 B 11 Claims

1. A motion converting mechanism comprising:

a feed member provided with a screwed portion;

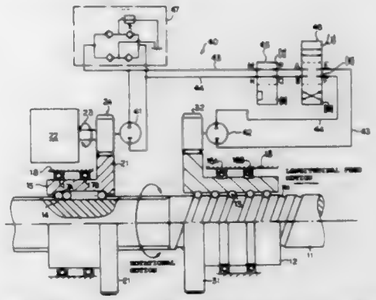
a screw nut member engaging with said screwed portion of said feed member;

a support member rotatably supporting said feed member and said screw nut member;

drive means for imparting a rotational motion to said feed member in a direction of rotation, the rotational motion of said feed member being converted into a linear motion through said screw nut member; and

speed control means provided between said drive means and said screw nut member and constructed such that it rotates said screw nut member in the same direction as that of said feed member and in a direction opposite to the direction of rotation of said feed member so that a speed of said linear motion is invariably controlled;

said speed control means comprising a first fluid pump/motor coacting with said drive means, a second fluid pump/motor coacting said screw nut member and held in fluid communication with said first fluid pump/motor through fluid paths, a first control valve provided on said fluid paths having a first position in which said first fluid pump/motor and said second fluid pump/motor are connected with each other and a second position in which said drive



means and said first fluid pump/motor are allowed to rotate with a condition that said second fluid pump/motor is held in a stopped state, and a second control valve connected to said first control valve through said fluid paths and having a first position in which said second fluid pump/motor is rotated in said same direction, a second position in which said first fluid pump/motor and said second fluid pump/motor are both stopped and a third position in which said second fluid pump/motor is rotated in the opposite direction.

5,203,223

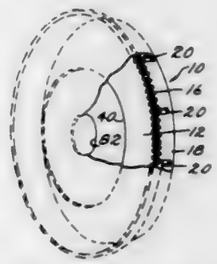
COLD-FORMING OF TOOTHED WHEELS FROM SHEET STEEL

Helge Himmeroeder, Barrie, Canada, assignor to Tesma International Inc., Markham, Canada

Division of Ser. No. 837,399, Feb. 19, 1992, Pat. No. 5,152,061. This application Aug. 7, 1992, Ser. No. 925,775

Int. Cl.[5] F16H *55/12*

U.S. Cl. 74—449 2 Claims



1. A toothed wheel cold-formed from a circular piece of sheet steel of predetermined thickness comprising

a central wall generally of said predetermined thickness and an outer annular section extending annularly around an outer periphery of said central wall having a series of teeth therein,

said outer annular section having

smooth opposite side surfaces spaced apart a predetermined distance greater than said predetermined thickness provided by steel from the circular piece having an interior

grain configuration cold-formed by generally axially out- said selector rod; characterized by the fact that it also com-

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peripheral surface of said aperture and the outer periph-

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grain configuration cold-formed by generally axially outward contact with cold-forming surfaces,

an exterior peripheral surface in tooth formation provided by steel from the circular piece having an interior grain configuration cold-formed by rollingly meshing engagement with tooth-forming surfaces of a rotary tooth-forming tool unit, and

generally radially inwardly facing transitional surface means extending generally axially from the outer periphery of said central wall provided by steel from the circular piece having an interior grain configuration cold-formed by generally radially inward pressure contact with control surface means of a rotary preform holding unit.

5,203,224

GEAR FOR USE IN VACUUM SPACE

Toshio Honda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1992, Ser. No. 828,166

Claims priority, application Japan, Jan. 30, 1991, 3-9706

Int. Cl.[5] **F16H** *55/06, 57/04*

U.S. Cl. 74—468 **10 Claims**

1. A gear for use in vacuum space, comprising:

a gear body made of alloy tool steel and having teeth;

a manganese phosphate layer formed on the surface of said gear body; and

a solid lubricating film formed on the manganesephosphate-treated layer.

5,203,225

VEHICLE TRANSMISSION GEARSHIFT FOR PREVENTING ACCIDENTAL ENGAGEMENT

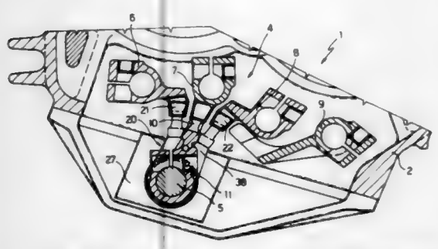
Giuseppe Giusti, Casinalbo, Italy, assignor to Ferrari S.P.A., Modena, Italy

Filed Feb. 24, 1992, Ser. No. 840,261

Claims priority, application Italy, Feb. 28, 1991, TO91 A 000141

Int. Cl.[5] **G05G** *9/00*

U.S. Cl. 74—473 R **4 Claims**



1. A vehicle transmission gearshift, comprising a gear selector rod supported in rotary and axially sliding manner on the transmission casing; a number of shifting forks sliding parallel to and arranged at different angles about the selector rod; and a drive dog projecting radially from and angularly and axially integral with said selector rod, for selectively engaging said forks one at a time and rendering them axially integral with said selector rod; characterized by the fact that it also comprises an axially fixed element in relation to which said selector rod is permitted to move axially; said axially fixed element being connected angularly integral with and rotated integral with said selector rod, and supporting two radially projecting dogs offset angularly on opposite sides of said drive dog, for selectively engaging the adjacent forks on either side of that engaged by the drive dog, and so preventing accidental engagement of other than the selected gears; and said axially fixed element is mounted between two opposite axial shoulders of the casing, said axially fixed element includes at least one member which extends outwardly from said drive dog along an axis of said selector rod and abuts one of the two opposite axial shoulders of said casing.

5,203,226

STEERING WHEEL PROVIDED WITH LUMINOUS DISPLAY DEVICE

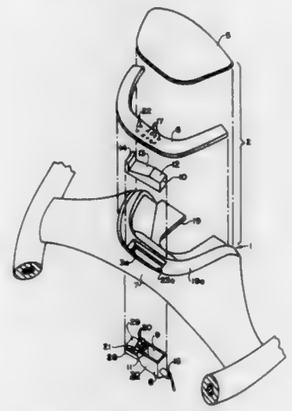
Suzuaki Hongou, Ichinomiya; Hitoshi Oshima, and Mitsuhiro Kikuta, both of Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 11, 1991, Ser. No. 683,812

Claims priority, application Japan, Apr. 17, 1990, 2-101086; Apr. 18, 1990, 2-104147

Int. Cl.[5] **B62D** *1/04;* **G05G** *1/10;* **B60Q** *1/00*

U.S. Cl. 74—552 **6 Claims**



1. A steering wheel comprising:

a pad portion;

a ring portion;

spokes joining said ring portion and said pad portion;

a display device including a display portion mounted on said pad portion, said display device further including:

a reflection chamber having an opening at one side thereof;

a main light-emitting element mounted within said reflection chamber;

a reflection surface provided in said reflection chamber for reflecting light emitted from said main light-emitting member through said opening toward an exterior of said reflection chamber;

a dissipating plate mounted in said opening for dissipating light passing therethrough, said dissipating plate having a thickness that becomes progressively smaller as distance from said main light-emitting member increases;

a character plate mounted above said dissipation plate so as to transmit the light through character portions thereof; and

a sub light-emitting element mounted below said character plate and disposed proximate said reflection chamber.

5,203,227

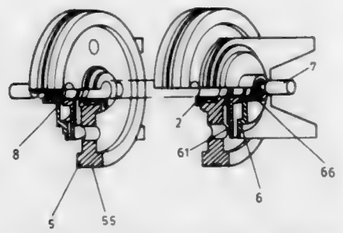
DISC-TYPED FLYWHEEL STRUCTURE FOR A PRESS

Han M. Li, P.O. Box 82-144, Taipei, Taiwan

Filed Jan. 13, 1992, Ser. No. 821,443

Int. Cl.[5] **G05G** *1/00;* **F16D** *55/18*

U.S. Cl. 74—572 **1 Claim**



1. A disc-typed flywheel structure for a press comprising:

a sleeve put onto a driving shaft of said press and fixedly mounted on said press:

a bearing enclosing said sleeve;

a flywheel mounted on said bearing;

a controlling base mounted on an outer side of said flywheel; and

a controlling disc mounted on said driving shaft and drivingly connected with a pneumatic cylinder, said pneumatic cylinder being fixedly mounted on said driving shaft.

5,203,228

JOINT STRUCTURE BETWEEN CRANKSHAFT AND CONNECTING ROD

Nobuyuki Miyawaki, and Fukumitsu Kitauchi, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

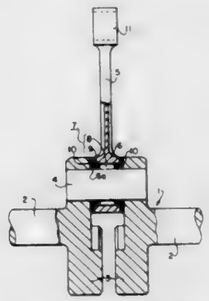
PCT No. PCT/JP89/00604, § 371 Date Jan. 29, 1991, § 102(e) Date Jan. 29, 1991, PCT Pub. No. WO89/12760, PCT Pub. Date Dec. 28, 1989

Continuation of Ser. No. 623,402, Jan. 29, 1991, abandoned. This PCT application Jun. 16, 1989, Ser. No. 946,144

Claims priority, application Japan, Jun. 17, 1988, 63-80966

Int. Cl.[5] **G05G** *1/00;* **F16C** *33/34*

U.S. Cl. 74—579 R **4 Claims**



1. A two-stroke internal combustion engine comprising:

a cylinder;

a piston reciprocatable within said cylinder;

a crankcase;

a crankshaft rotatable within said crankcase, said crankshaft having a crank pin extending therefrom;

a connecting rod having a first end connected to said piston and a second end opposite said first end, said second end having an aperture therethrough, said crank pin being inserted in said aperture; and

a bearing positioned in said aperture between the inner peripheral surface of said aperture and the outer peripheral surface of said crank pin, said bearing including a plurality of needle rollers and a retainer for holding and retaining said needle rollers evenly spaced around the periphery of said retainer, and said needle rollers being made of a sintered ceramic comprising silicon nitride as the main ingredient, and yttria and aluminum oxide in a total amount of less than 10% by weight as sintering additives.

5,203,229

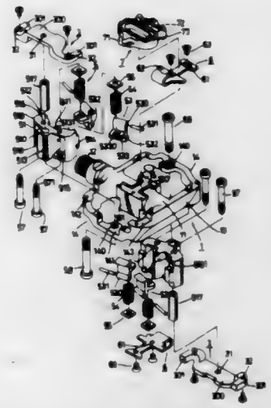
QUICK-RELEASE CLIPLESS PEDAL WITH TWO CLEAT ENGAGING SIDES

Chung-I Chen, No. 3, Kung-Chi Rd., Yu-Shih Industry Dist., Ta-Chia Chen, Taichung Hsien, Taiwan

Filed Apr. 28, 1992, Ser. No. 875,033

Int. Cl.[5] **B62M** *3/08;* **G05G** *1/14*

U.S. Cl. 74—594.6 **5 Claims**



1. A quick-release clipless pedal including a cleat to be secured to a shoe sole and a pedal body to be mounted on a pedal shaft and releasably retaining said cleat, wherein the improvement comprises:

said cleat having first and second engaging parts respectively formed on front and rear ends thereof;

said pedal body including a frame portion and a tubular portion which partitions said frame portion in a transverse direction, said tubular portion receiving one end of the pedal shaft, said frame portion having front and rear ends respectively formed with an opening;

said pedal body further including a pair of cleat engaging members respectively provided on upper and lower sides of said tubular portion and respectively having a claw portion to receive releasably said first engaging part of said cleat, and a pair of retaining units revertably engaging said second engaging part of said cleat, each of said retaining units including: a base member having a central wall mounted uprightly in said opening of a respective one of said front and rear ends of said frame portion and a pair of end walls connected to and disposed on opposite sides of said central wall, said end walls cooperating with said central wall so as to define a pair of side openings; a pair of hook units, each of said hook units having one end pivotably mounted to said base member in one of said side openings, an opposite hook end and a rearward plate projection which extends into the respective one of said side openings; and a pair of spring members, each of said spring members being disposed in a respective one of said side openings and urging one of said plate projections

upward to bias said hook end of one of said hook units to

said gearbox, said hollow output shaft being arranged so

shafts being coupled together with gaps formed therebetween

plurality of main speed stages through which drive force is transmitted during running of the vehicle, and auxiliary

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upward to bias said hook end of one of said hook units to engage said second engaging part of said cleat;

said cleat being rotatable relative to said pedal body so as to disengage said first engaging part from said claw portion, rotation of said cleat causing said cleat to push said hook units rearward, thereby causing said hook units to pivot and compress said spring members in order to allow a lateral disengagement of said cleat from said pedal body.

5,203,230

CRANKSHAFT FOR AN INTERNAL-COMBUSTION ENGINE

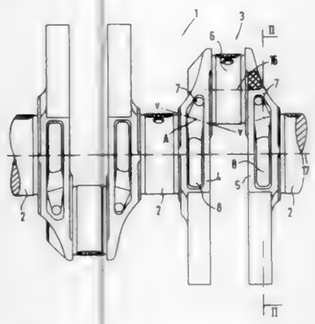
Winfried Distelrath, Stuttgart, Fed. Rep. of Germany, assignor to Ing. h. c. F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 29, 1991, Ser. No. 783,691

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1990, 4034384

Int. Cl.[5] F16C *3/04*

U.S. Cl. 74—595 **9 Claims**



1. A crankshaft for an internal-combustion engine, comprising:

a plurality of journals and a plurality of crank pins bound by crankshaft webs;

wherein said crankshaft webs contain recesses therein extending with a predetermined depth in a direction transversely to one of said journals and crank pins;

said recesses ending openly in a circumferential surface of the crankshaft webs and, with respect to a longitudinal direction of the crankshaft, are bounded on both sides by remaining crankshaft web material which in this manner forms side legs having a U-profile;

wherein each of the crankshaft webs has four of the recesses, two recesses, respectively, being disposed symmetrically opposite one another with respect to a plane containing the axes of one of the journals and crank pins which bound the crankshaft webs; and

a reinforcing rib is arranged in an overlapping area of the crank pin and the journal between the two recesses, which are each situated on the same side of the plane.

5,203,231

MOTOR-EQUIPPED ORTHOGONAL GEAR DEVICE

Kiyoji Minegishi, Aichi; Isao Kohno, Nagoya; Tetsushi Isozaki, and Katsumi Taki, both of Ohbu, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 828,438

Claims priority, application Japan, Jan. 31, 1991, 3-31983

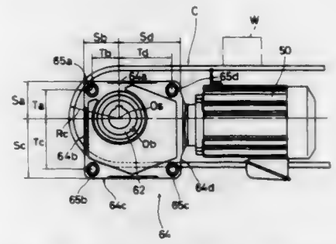
Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R **10 Claims**

1. A motor-equipped orthogonal gear device provided with a motor and a gearbox, said motor having a motor shaft, said gearbox being mounted to a mating machine, comprising,

a hollow output shaft of said gearbox which passes through said gearbox, said hollow output shaft being arranged so that it is orthogonal to said motor shaft,

holes for mounting which are arranged in four vertex positions of a square, said square being such that a position of said hollow output shaft is on a diagonal of said square and said position is, at the same time, displaced from a center



of said square, and said holes for mounting also pass through said gearbox, and

two mountable faces through which said output shaft and said holes for mounting pass, said gearbox being mounted to said mating machine through one of the mountable faces.

5,203,232

ROTATION TRANSMITTING DEVICE

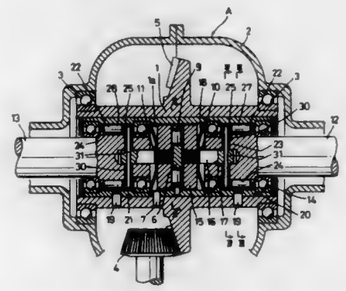
Kenichiro Ito; Hiromi Nojiri, and Kenro Adachi, all of Iwata, Japan, assignors to NTN Corporation, Osaka, Japan

Filed Feb. 14, 1992, Ser. No. 834,955

Claims priority, application Japan, Feb. 18, 1991, 3-23278; Mar. 28, 1991, 3-64788; Aug. 29, 1991, 3-218707

Int. Cl.[5] F16M *35/04*

U.S. Cl. 74—650 **1 Claim**



1. A rotation transmitting device comprising an outer ring having a bore, a holder fixedly mounted in said bore, rolling elements mounted in said holder so as to be rollable as said outer ring rotates, a pair of input shafts provided coaxially with an axis of rotation of said outer ring each input shaft has a disk means for sandwiching said rolling elements from both sides thereof a pair of, output shafts rotatably mounted in said bore, each output shaft being located at one end of a corresponding said input shaft, cages rotatably mounted between one of said output shafts and said outer ring and formed with pockets, engaging elements mounted in said pockets and adapted to be engageable between opposite surfaces of said outer ring and said output shafts with relative rotation between said cages and said output shafts in either direction, and elastic members mounted in said pockets for keeping said engaging elements in a position where they are not engaged, said cages and said output shafts being coupled to said respective input shafts so that a driving force can be transmitted between said input shafts and said output shafts, said input shafts and said output

shafts being coupled together with gaps formed therebetween in the direction of rotation.

5,203,233

HYDRAULIC CONTROL APPARATUS FOR BELT-AND-PULLEY TYPE CONTINUOUSLY VARIABLE TRANSMISSION, INCORPORATING MEANS FOR OPTIMIZING BELT TENSIONING PRESSURE

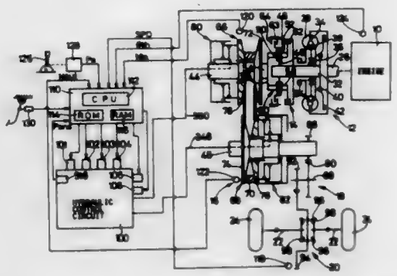
Yuji Hattori; Yoshinobu Soga; Masami Sugaya, and Nobuyuki Kato, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 11, 1991, Ser. No. 805,058

Claims priority, application Japan, Dec. 28, 1990, 2-416144

Int. Cl.[5] B60K *41/14*

U.S. Cl. 74—865 **10 Claims**



1. A hydraulic control apparatus for controlling a hydraulically operated continuously variable transmission of a motor vehicle having an engine, said transmission including a first and a second shaft, a pair of variable-diameter pulleys provided on said first and second shafts, respectively, a transmission belt connecting the pair of pulleys, and a pair of hydraulic actuators for changing effective diameters of said pulleys for continuously variably changing a speed ratio of the transmission, one of said pair of hydraulic actuators receiving a belt tensioning pressure for controlling a tension of said transmission belt; said hydraulic control apparatus comprising;

an engine-output detecting valve for generating an engine output fluid pressure indicative of a currently required output of said engine in response to a member which is displaced with said currently required output;

a solenoid-operated valve including a solenoid coil receiving said engine output fluid pressure and regulating said engine output fluid pressure to a modified engine output fluid pressure at an output of the solenoid operated valve based on said engine output fluid pressure generated by said engine-output detecting valve by controlled energization of said solenoid coil, said modified engine output fluid pressure being obtained so that said belt tensioning pressure is controlled to an optimum level; and

a pressure regulating valve for regulating said belt tensioning pressure based on at least said modified engine output fluid pressure.

5,203,234

AUTOMATIC TRANSMISSION

Toshiyuki Asada, Susono; Yasuo Hojo, and Hideo Tomomatsu, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 13, 1990, Ser. No. 611,924

Claims priority, application Japan, Nov. 13, 1989, 1-295823; Nov. 30, 1989, 1-309028; Jan. 19, 1990, 2-10110

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **21 Claims**

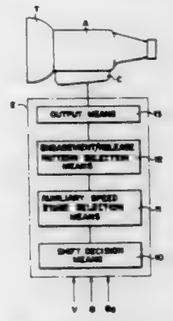
1. An automatic transmission for a vehicle, comprising:

a gear train comprising a plurality of planetary gear sets each having rotary members;

a plurality of frictional engagement means for setting a plurality of main speed stages through which drive force is transmitted during running of the vehicle, and auxiliary speed stages having a gear ratio of an intermediate value between those of said main speed stages, which are not selected based on the engine load, by connecting or stopping the rotary members of said planetary gear sets to change the transmission path of the drive force through said gear train;

hydraulic control means for changing the engagement-/release statuses of said frictional engagement means;

shift decision means for deciding a shift from one of said main speed stages to another main speed stage;



auxiliary speed stage selection means for selecting at least one auxiliary speed stage between said main speed stages; and

output means for outputting an instruction signal to said hydraulic control means as to shift from said one main speed stage to said another main speed stage and so as to set said at least one auxiliary speed stage temporarily at the time of the shift between said main speed stages, wherein said at least one auxiliary speed stage is selected such that the revolving, direction of the rotary members of said planetary gear sets is not reversed during the shift between said main speed stages.

5,203,235

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

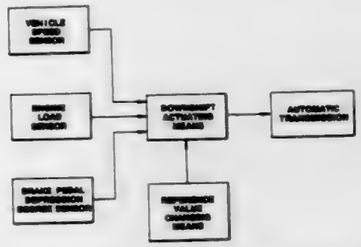
Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Fuji, Japan

Filed Mar. 12, 1992, Ser. No. 850,283

Claims priority, application Japan, Mar. 27, 1991, 3-87586

Int. Cl.[5] B60K *41/26*

U.S. Cl. 74—866 **8 Claims**



1. A control system for controlling an automatic transmission on a motor vehicle, said control system comprising:

a vehicle speed sensor for detecting the speed at which the vehicle moves;

an engine load sensor for detecting the engine load;

segment which meshes with teeth of said toothed rack

improved blade being adapted for cutting through both soft

5,203,240

CASTELLATED VALVE WRENCH

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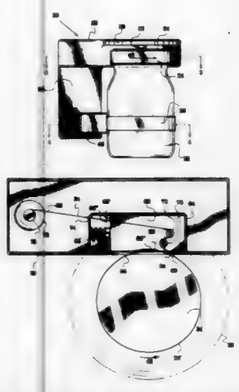
an engine load sensor for detecting the engine load;
a brake pedal depression degree sensor for detecting the degree by which the brake pedal is depressed;
a downshift control means for forcing said transmission to carry out a downshift when the vehicle speed is lower than a predetermined speed, the engine load is lower than a predetermined load and the brake pedal depression degree is greater than a predetermined depression degree; and
changing means for varying said predetermined depression degree in accordance with a select range which the transmission assumes.

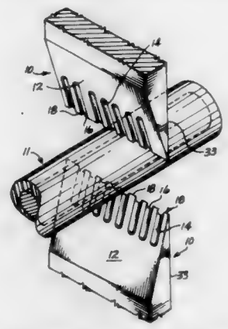
5,203,236
LID STARTING APPARATUS AND METHOD
Scott M. Anderson, 9627 Highland Gorge, Beverly Hills, Calif. 90210
Filed Aug. 28, 1992, Ser. No. 936,947
Int. Cl.[5] B67B *7/18*
U.S. Cl. 81—3.2 **18 Claims**



1. Apparatus for starting a lid from a container, comprising:
a base member;
a lid belt arranged in a loop to receive said lid;
a resistive biasing member coupled between said base member and a first end of said lid belt and arranged to apply a resistive biasing force to said first end;
a pulling mechanism coupled between said housing and the second end of said lid belt to apply a pulling force thereto having a magnitude greater than said resistive biasing force; and
a container belt coupled to said base member and arranged about said container for rotational restraint thereof relative to said base member.

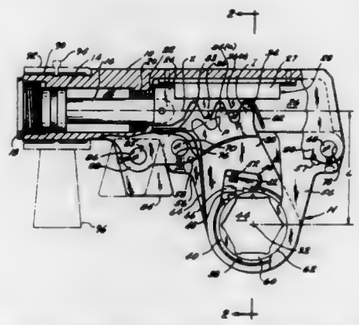
5,203,237
NOTCHED BLADE FOR ROTARY WIRE STRIPPER
Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 446,181, Dec. 5, 1989, abandoned. This application Feb. 8, 1991, Ser. No. 654,400
Int. Cl.[5] H02G *1/12*
U.S. Cl. 81—9.51 **4 Claims**

1. In a mechanized rotary wire stripper characterized in that, when in operation, the stripper has at least one pair of diametrically opposed blades driven by a motor in a manner so that their cutting edges repetitively circle about the end of an insulated wire to be stripped, and simultaneously move in a symmetrical, generally radially inward fashion until their cutting edges contact and cut around the wire's insulation, to permit stripping the same from the wire's center conductor, an improved blade for use in connection with said stripper, said improved blade being adapted for cutting through both soft and hard forms of insulation, comprising:
a blade having a cutting edge, with at least a portion of said edge having at least one chipping point, said chipping point being defined by a substantially unsharpened notch in said cutting edge, said notch being positioned adjacent a sharpened, straight section of said edge, in a manner so that said sharpened section and said notch define a corner



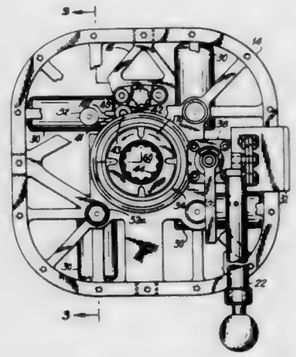
at one side of said notch shaped to chip through said insulation, the distance across said notch being substantially less than the outer diameter of the center conductor of said wire to be stripped, but sufficiently great so that at least a portion of the curvature of said insulation surrounding said center conductor is normally received within said notch during stripping of said wire, so that said corner chips through said insulation as said edge moves radially inward into contact with and circles said wire.

5,203,238
LOW PROFILE RACK AND PINION WRENCH
John H. Ferguson, Rocky Hill, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.
Filed Oct. 27, 1989, Ser. No. 428,298
Int. Cl.[5] B25B *13/06*
U.S. Cl. 81—57.39 **28 Claims**



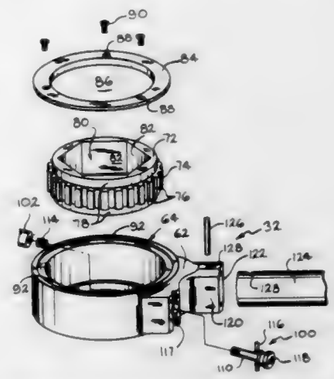
1. A wrench for applying torque to a fastener element, including:
a housing;
toothed rack means in said housing for transmitting an actuating force, said toothed rack means having a pitch line X;
actuating means in said housing for delivering an actuating force to said toothed rack means;
lever arm means for delivering an output from said wrench to a fastener, said lever arm means having a toothed gear segment which meshes with teeth of said toothed rack means, said toothed gear segment having a pitch line P;
output ratchet means carried by said lever arm means at a location spaced form said gear segment; said output ratchet means having an axis of rotation about which said lever arm moves;
said lever arm means having an effectively constant lever arm length L extending substantially along a line from said axis of rotation to said pitch line X substantially at the point of tangency of said pitch line X and said pitch line P and being at substantially an angle of 90° to the said pitch line X, whereby the actuating force is delivered to said lever arm means at substantially 90° to said line; and
reaction means connected to said housing for providing a reaction member for the wrench.

5,203,239
TORQUE WRENCH
Anthony J. Sergan, Farmington, and George L. Castle, Perryville, both of Conn., assignors to Barnes Group Inc., Bristol, Conn.
Continuation-in-part of Ser. No. 526,927, May 22, 1990, Pat. No. 5,056,384. This application Oct. 11, 1991, Ser. No. 774,678
The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.
Int. Cl.[5] B25B *13/40*
U.S. Cl. 81—57.39 **20 Claims**



1. A torque wrench for applying torque to an article, comprising:
a frame defining a central aperture concentric with a central vertical axis;
drive means for converting linear force applied to said drive means to angular force and for engaging such article, said drive means to angular force and for engaging such article, said drive means being supported by the frame in said central aperture for rotation about the central vertical axis;
means for applying at least two pairs of equal and diametrically opposed linear forces to said drive means, said force-applying means comprising at least four fluid power cylinders disposed on the frame in opposed pairs acting through parallel lines spaced perpendicularly apart across the central aperture, said cylinders each having a piston rod pivotably linked to said drive means and applying equal, diametrically opposed linear forces thereto, said fluid power cylinders being disposed on the frame for rotation around pivot points; and
selector means for selectively rotating said cylinders around said pivot points to provide for alternate rotation of the drive means in a clockwise direction and a counter-clockwise direction.

5,203,240
CASTELLATED VALVE WRENCH
James L. Sorter, 9760 Lime Lake Rd., Hudson, Mich. 49247
Continuation of Ser. No. 478,554, Feb. 12, 1990, abandoned. This application Dec. 11, 1990, Ser. No. 626,396
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63.2 **16 Claims**



1. A torque applying apparatus for handwheels comprising, in combination,
a drive member having an open face and a sidewall defining an interior for receiving a portion of a handwheel and a plurality of slots opening in the direction of said face, said slots having a narrow throat region defined by a pair of opposed projections communicating with an enlarged region adjacent said projections, a stanchion extending from said drive member along an axis, said stanchion including engageable means for receiving rotational force, and an aperture for receiving a valve stem extending along said axis and through said stanchion,
a ratchet drive means for selectively, bi-directionally rotating said drive member, said ratchet drive means including a drive collar having complementary means for engaging said engageable means of said drive member and ratchet teeth disposed about its periphery, a ratchet member engaging said ratchet teeth of said drive collar and a housing for receiving said collar and said ratchet member and an elongate member extending from said housing and
means for retaining said stanchion of said drive member in said ratchet drive means.

5,203,241
FLEXIBLE LINK PLIERS
James F. Mattis, 44200 Galway Dr., Northville, Mich. 48167
Filed Feb. 14, 1992, Ser. No. 835,839
Int. Cl.[5] B25B *7/04*
U.S. Cl. 81—424 **8 Claims**

1. Flexible link pliers comprising:
a plier body with a pair of elongated members extending therefrom, each including a jaw;
said plier body including a pair of handles connected through a pivot axis about which the handles pivot;

said elongated members including adjustable link means

5,203,244
DEVICE FOR CUTTING UP A COMPONENT OF A

moved to its operational position, the improvement comprising:

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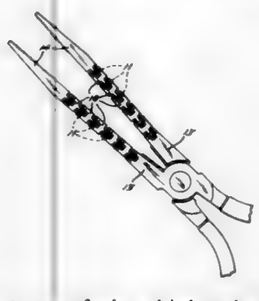
said elongated members including adjustable link means between said body and a respective said jaw for enabling



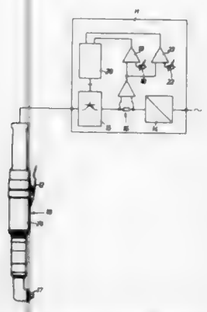
said jaws to move freely and independently about axes orthogonal to said pivot axis.

5,203,242

POWER TOOL FOR TWO-STEP TIGHTENING OF SCREW JOINTS

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco-Tools AB, Stockholm, Sweden

Filed Dec. 18, 1991, Ser. No. 809,961
Int. Cl.[5] B25B *25/151*
U.S. Cl. 81—469 **4 Claims**



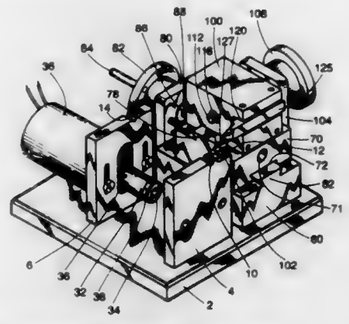
1. A power tool for two-step tightening of screw joints, the two steps comprising a first high speed tightening step for tightening a screw joint to a predetermined torque snug level (T_1), and a second low speed tightening step for tightening the screw joint to a desired final torque level (T_2), said power tool comprising:
a housing (**28**);
a rotation motor in said housing;
an output shaft (**17**);
a mechanical power transmission coupling said rotation motor to said output shaft (**17**);
power supply means (**11**) coupled to said rotation motor;
signal producing means (**16**) for delivering a signal reflective of the output torque of the power tool (**10**); and
means (**19, 23**) for comparing said torque reflective signal with predetermined limit values corresponding to said torque snug level (T_1) and to said final torque level (T_2), and for delivering power shut-off initiating signals as said torque reflective signal attains said predetermined limit values;
said mechanical power transmission including:
a planetary reduction gear (**32**) including a ring gear;
a torque and speed responsive override clutch (**30**) which comprises said ring gear (**37**) of said planetary reduction gear (**32**), said ring gear (**37**) being rotatably supported in said housing (**28**) and exposed to a reaction torque as said reduction gear (**32**) transfers torque;
a yieldable cam means (**39, 40**) for transferring to said housing (**28**) said reaction torque from said ring gear (**37**) up to a level corresponding to a safety torque level (T_s) substantially below said final torque level (T_2);
a speed responsive lock means (**45**) arranged to release said ring gear (**37**) for rotation relative to said housing during said first high speed tightening step and to positively lock said ring gear (**37**) against rotation relative to said housing (**28**) during said second low speed tightening step;
said lock means comprises an activation means (**48, 49**) for locking and releasing said ring gear (**37**); and
a lock ring (**45**) shiftable by said activation means (**48, 49**) from a ring gear (**37**) locking position to a ring gear (**37**) releasing position.

5,203,243

COMMUTATOR TRUING LATHE

Mike Walker, 657 E. Arrow Hwy., Ste. H, Glendora, Calif. 91740

Filed Nov. 21, 1990, Ser. No. 617,117
Int. Cl.[5] B23B *5/00*
U.S. Cl. 82—115 **6 Claims**



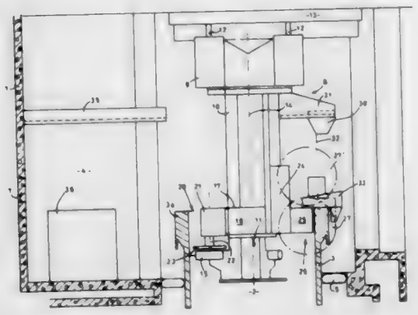
1. A commutator truing lathe comprising:
a base;
cradle means mounted on said base for mounting a workpiece to be trued or machined;
said cradle means comprises:
a pair of spaced apart upright mounts mounted parallel with each other on said base;
each said mount having a V-shaped depression and aligned with each other for holding a variety of sizes of workpieces while they are being rotated and machined;
motor drive means having a pulley at its power send for providing means for rotating the workpiece about a longitudinal spinning axis on said cradle means;
mounting means for mounting said motor means on said cradle means; cutting bit means for truing and machining the workpiece;
means for moving said cutting bit parallel to said longitudinal spinning axis of the workpiece;
means for moving said cutting bit radially relative to said spinning axis of the workpiece; and
elastic belt means interconnecting said pulley on said motor drive means with said body of the workpiece for rotating the workpiece when said drive means is energized.

5,203,244

DEVICE FOR CUTING UP A COMPONENT OF A NUCLEAR REACTOR

Jean-Paul Guigon, Hameau de Varanges, and Paul Jacquier, Tassin-la-Demi-Lune, both of France, assignors to Framatome, Courbevoie, France

Filed Feb. 6, 1992, Ser. No. 832,054
Claims priority, application France, Feb. 6, 1991, 91 01336
Int. Cl.[5] E04G *23/08;* **B26D** *1/18, 7/18*
U.S. Cl. 83—153 **6 Claims**



1. Device for cutting up a component (**3**) of a nuclear reactor which has a wall of tubular overall shape and is arranged with its axis vertical in a part of the structure (**1**) of the nuclear reactor which is being dismantled, characterised in that it comprises:
a support (**9**) provided with means (**12**) for its demountable fastening to the reactor structure (**1**) above and vertically in line with the component (**3**),
a turret (**10**) arranged vertically, resting on the support (**9**) by means of its upper part and mounted rotatably on the support (**9**) about its vertical axis (**14**),
a device for taking up forces (**11**), on which the lower end of the turret (**10**) is mounted rotatably,
an arm (**18**) mounted movably on the turret (**10**) in a radial direction,
a first cutting unit (**20**) comprising a circular saw arranged horizontally and mounted on the movable arm (**18**),
a trolley (**25**) mounted movably on the turret in the vertical direction,
a second cutting unit (**26**) comprising a circular saw (**27**) arranged vertically and mounted on the trolley (**25**) and a means for handling (**30**) fragments of the component (**3**) which are obtained by cutting up the wall, comprising a hoist (**30**) fastened to the turret (**10**) and having a lifting cable (**32**) at the end of which is suspended a means for grasping (**33**) fragments of the component (**3**).

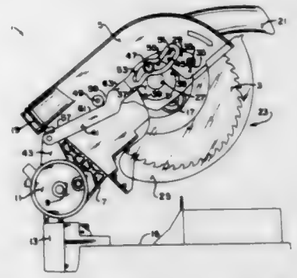
5,203,245

SWINGING BLADE GUARD ASSEMBLY

Daniel A. Terpstra, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 811,227, Dec. 20, 1991. This application Oct. 19, 1992, Ser. No. 962,868
Int. Cl.[5] B23D *45/14;* **B27B** *5/18*
U.S. Cl. 83—397 **10 Claims**

1. In a motor driven saw blade including a supporting arm pivotally mounted at one end to a frame support with a rotatably mounted motor driven saw blade at an opposite end of said supporting arm, said motor driven saw blade being movable about the pivotal mounting of the supporting arm from an upper at rest to a lower operational position, an upper blade guard fixed to said supporting arm for encasing upper areas of said saw blade, and a lower swinging blade guard pivotally mounted to said upper blade guard for fully covering the blade when in its rest position and for exposing the saw blade when moved to its operational position, the improvement comprising:
a swinging blade guard assembly including an elongated link pivotally attached at one end to said frame support and having a pre-configured slot at an opposite end which receives a slidable pin that is attached to the lower swinging blade guard adjacent the pivotal mounting of the lower swinging blade guard to the upper blade guard, and



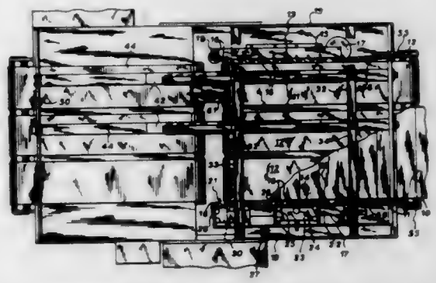
a bearing element attached to the upper blade guard in laterally spaced relationship to said pin for engaging an upper surface of the elongated link, whereby movement of the saw blade from an upper at rest to a lower operational position causes the bearing to press against an upper surface of the link while also causing edge surface areas surrounding the pre-configured slot in the link to press against the pin to rotate the lower swinging blade guard for exposure of said saw blade.

5,203,246

SYSTEM TO ALIGN AND SQUARE BOXES

Dean W. Smitterberg, Timothy C. Prochnow, and William R. Nachtrab, Jr., all of Phillips, Wis., assignors to Marquip, Inc., Phillips, Wis.

Filed Apr. 24, 1992, Ser. No. 873,380
Int. Cl.[5] B65H *9/00*
U.S. Cl. 83—420 **10 Claims**



7. An apparatus for aligning and squaring a line of knocked down boxes being moved in a linear path on a moving conveyor, said boxes having edges, opposite edges and upper surfaces, said apparatus comprising:
a plurality of fixed alignment wheels positioned along one lateral edge of the conveyor and having outer peripheral surface portions commonly tangent to a fixed vertical plane parallel to the direction of conveyor movement, said surface portions adapted to engage the edges of the boxes on a lateral edge of the line of boxes;
a plurality of primary adjustable alignment wheels positioned along and above the conveyor and adjacent an opposite lateral edge of the line of boxes, said primary adjustable alignment wheels having outer peripheral sur-

face portions commonly tangent to an angularly variable vertical plane including a plane defining said other lateral

disposed to said one side of said back portion and substantially in the plane in which said horizontal axis lies, one of

ing each of said mandrels toward said braid ring assembly for braiding; and

means and within the piston means opening as the first and second structures shift relative to each other;

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face portions commonly tangent to an angularly variable vertical plane including a plane defining said other lateral edge of the boxes;

a rigid pivot arm carrying said primary adjustable alignment wheels, said pivot arm having a generally central pivot defining an upstream set of adjustable alignment wheels and a downstream set of adjustable alignment wheels;

a carriage plate mounted above the conveyor and to which said pivot arm is attached by the central pivot for pivotal movement on a vertical axis between an initial non-aligned position with the upstream wheel set generally out of the path of movement of the boxes the downstream wheel set generally in the path of movement of the boxes, and an aligned position with both the upstream and downstream wheel sets tangent to a vertical plane parallel to the path of box movement;

said carriage plate mounted for reciprocal movement perpendicular to the path of box movement;

means for biasing said pivot arm to the non-aligned position;

means for applying a first biasing force to said carriage plate to move said primary adjustable alignment wheels into the path of box movement;

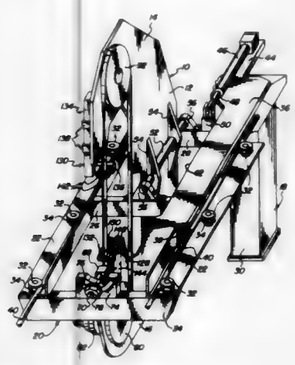
means responsive to pivotal movement of said pivot arm to the aligned position for applying a second biasing force to said carriage plate sufficient to cause said adjustable alignment wheels to move the edges of the boxes into engagement with said fixed alignment wheels.

5,203,247

VERTICAL MITERING BAND SAW

John W. D'Arcy, 20 Austin St., Suffield, Conn. 06078

Filed Mar. 27, 1992, Ser. No. 858,636
Int. Cl.[5] B23D *53/04*
U.S. Cl. 83—794 **22 Claims**



1. A mitering band saw machine,

a table;

a generally C-shaped column comprising an elongate back portion with opposite ends, and upper and lower support portions extending forwardly from said opposite ends of said back portion in spaced, aligned relationship with one another, at least one of said support portions being integrally formed, as a single piece, with said back portion, said back portion having opposite sides and being substantially greater in width, from front-to-rear, than it is in thickness;

means for mounting said column on said table for pivotable movement about a horizontal axis extending along one side of said back portion and between said support portions of said column;

means operatively connected to said column for affixing it in each of a range of orientations pivoted about said horizontal axis;

a pair of pulleys for mounting a band saw blade in a position disposed to said one side of said back portion and substantially in the plane in which said horizontal axis lies, one of said pulleys being rotatably mounted on each of said support portions of said column; and

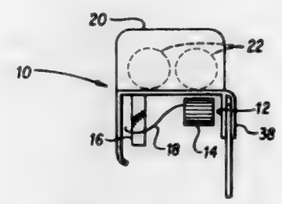
drive means mounted on one of said support portions and operatively connected to either pulley of said pair of pulleys.

5,203,248

PORTABLE PAGE TURNER FOR MUSIC SHEETS

Douglas J. Carr, 24226 Ambassador Pl., Harbor City, Calif. 90710, and Lincoln Lucero, 2333 W. 246th Pl., Lomita, Calif. 90717

Filed Feb. 25, 1992, Ser. No. 841,061
Int. Cl.[5] G10G *7/00*
U.S. Cl. 84—487 **6 Claims**



1. A page turning device for turning the pages of a music score, said device comprising:

An L-shaped chassis which supports a drive train which includes an electric motor, a power source, an. endless belt, a drive post, an idler post, a left stop, a right stop, a plurality of torpedo tabs mounted on said endless belt between said left and right stops said torpedo tabs having an opening which is in frictional engagement with said endless belt, said motor being reversible to drive said torpedo tabs in either a left or right direction between said left and right stops, a leash attached to each of said torpedo tabs, each of said leashes including a clip for attachment to a music page, two gates mounted on a left side of said chassis for controlling the movement of said torpedo tabs in a first direction, two gates mounted on a right side of said chassis for controlling the movement of said torpedo tabs in a second direction, a programmable means controlling the opening and closing of all said gates, and actuator means for causing said programmable means to open and close of said gates to allow backward or forward movement of one or more of said pages.

5,203,249

MULTIPLE MANDREL/BRAIDING RING BRAIDER

Kenneth M. Adams, Sandy Hook, and Richard J. Simkulak, Meriden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1991, Ser. No. 753,288
Int. Cl.[5] D04C *3/48*
U.S. Cl. 87—34 **7 Claims**

1. A composite braiding apparatus for depositing composite filaments on a mandrel comprising:

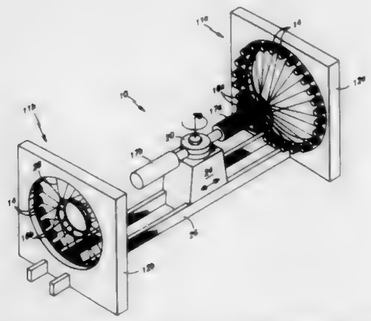
a braid ring assembly equipped with a braiding ring, a braider guide ring, and a plurality of cops wound with composite filaments, for depositing a plurality of said composite filaments on a mandrel;

a mandrel support assembly for holding said a mandrel in position to receive braided filaments; and

means for effecting reciprocation of said mandrel support relative to said braid ring assembly, characterized by:

said mandrel support assembly including means for mounting a plurality of mandrels in angularly spaced relation to one another and means for rotating and selectively orienting each of said mandrels toward said braid ring assembly for braiding; and

an other said braid ring assembly, the two of said braid ring assemblies being spaced from one another and including said mandrel support assembly positioned therebetween,



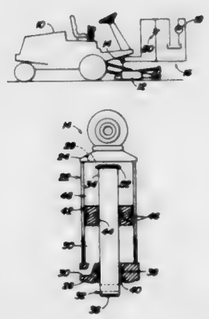
said braider guide ring of one of said braid ring assemblies facing a braider guide ring of the other of said braid ring assemblies for allowing said mandrel to be rotated to align with either of said braid ring assemblies for depositing said composite filaments.

5,203,250

FLUID CYLINDER MECHANISM

John D. Sundberg, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 632,282, Dec. 21, 1990, abandoned. This application Jul. 29, 1992, Ser. No. 922,643
Int. Cl.[5] F15B *13/02;* **F01B** *9/00;* **F16J** *1/10*
U.S. Cl. 91—51 **16 Claims**



1. A fluid cylinder mechanism couplable between a first and second structures, comprising:

a cylinder means having a base end couplable to the first structure, and having a rod end opposite the base end;

a piston means slidably received within said cylinder means, said piston means having an opening defined therein, a base end chamber being formed between the piston means and the base end of the cylinder means, and a rod end chamber being formed between the piston means and the rod end of the cylinder means;

a rod means slidably received by the rod end of the cylinder means and the piston means opening, said rod end of the cylinder means and said piston means being positioned between first and second end portions of the rod means, said second end portion being operatively couplable to the second structure, and said rod means being shiftable along its longitudinal axis within the rod end of the cylinder means and within the piston means opening as the first and second structures shift relative to each other;

said piston means being shaftable along the rod means to a position substantially adjacent the rod end of the cylinder means regardless of the position of the rod means within the cylinder means;

a fluid circuit means is communication with the rod end chamber for selectively forcing fluid into the rod end chamber to selectively urge the piston means toward the base end, said fluid circuit means also being in communication with the base end chamber;

abutment means formed between the piston means and first end portion of the rod means for urging the rod means toward the base end as the piston is urged toward the base end, thereby urging the first and second structures toward each other, and

said first end portion of the rod means and the abutment means each have effective diameter's substantially smaller than the diameter of the piston such that the first end portion of the rod means and abutment means displace less fluid as the rod means shifts relative to the piston means than the piston means and rod means displace when shifting together,

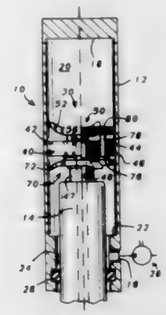
restrictor means coupled with the fluid circuit means downstream of the base end chamber and upstream of the rod end chamber during normal operation for maintaining a slightly higher fluid pressure in the base end chamber than the rod end chamber for thereby biasing the piston means to the rod end of the cylinder means during normal operation.

5,203,251

MOTOR WITH SPRING ELEMENTS FORMED ON VALVE ASSEMBLY

Leif Karlberg, Älta, Sweden, assignor to Alentec Orion Aktiebolag, Sweden

Filed Oct. 22, 1991, Ser. No. 781,113
Claims priority, application Sweden, Oct. 31, 1990, 9003472
Int. Cl.[5] F01L *15/12;* **F15B** *15/17*
U.S. Cl. 91—224 **5 Claims**



1. A valve assembly (30) mounted on a piston unit (40) of an air motor (10) which is arranged for reciprocating movement in a housing (12), said valve assembly (30) providing the piston unit (40) with means to provide differential means surface areas such that an equalized pressure on both sides of the piston will cause movement of the piston unit (40) and comprising a first valve unit (50) which is mounted on one side of said piston unit (40) and a second valve unit (70) which is mounted on the other side of said piston unit (40), wherein said second valve unit (70) is connected with the first valve unit (50) through the medium of said piston unit (40) for common movement with said first valve unit (50) in relation to said piston unit (40) when the valve assembly (30) is switched mechanically at one of the reversing positions of the motor, to effect the reversing of the

motor (10), characterized in that, each of the valve units (50 and 70 respectively) is produced from an elastomeric material

lates from the air stream that circulates within the air duct assembly, the separator means providing a thermal mass

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5,203,255

extending vertically in said chamber adjacent to one another and occupying a major portion of said chamber;

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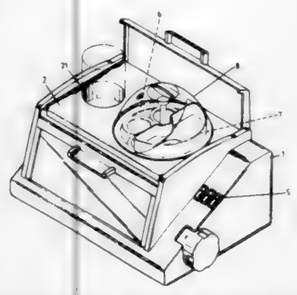
motor (10), characterized in that, each of the valve units (50 and 70 respectively) is produced from an elastomeric material and is formed integrally with discrete spring elements (52 and 72 respectively) which are adapted to strike against fixed abutments (18, 22) in the housing (12) to effect the mechanical switching of the valve assembly (30).

5,203,252

TOASTER WITH MULTI-FUNCTION

Tung-Chiang Hsieh, #6, Lane 210, Chung Cheng S. Rd., Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Sep. 25, 1992, Ser. No. 950,714
Int. Cl.[5] **A47J** *29/00, 29/02*
U.S. Cl. 99—339 **1 Claim**



1. A toaster with multi-function having a casing of a general outline comprising a heat plate at top portion, two cords surrounding said heating plate, a set of switches adapted to control each function, an egg broiler seated on top of said heating plate, a steam pot resting on top of said egg broiler and a cap and characterized in that said heating plate having two recesses each being surrounded by one of said cords and one of which being sized to receive a cup therein while the other recess being sized to receive said egg broiler therein;

said egg broiler being integrally formed having a plurality of holes adapted to receive an egg thereon, a plurality of stands at bottom portion adapted to support said egg broiler to stand on said recess, and a handle extending from the center portion thereof;

said steam pot including two half-rounded plates each having a recess at center portion adapted to receive an egg yellow while the flat portion surrounding hereat being to receive egg white, and a protuberance at opposite site of said recess adapted to be inserted into one of said holes of said egg broiler;

said cap having a dome shaped body with the diameter of the open end slightly larger than the diameter of said steam pot and smaller than the diameter of said recess of said heating plate.

5,203,253

AUTOMATIC AIR COOKING SYSTEM FOR VENDING MACHINES

Wayne L. Covington, Boise, Id., and Glen R. Green, St. George, Utah, assignors to Ore-Ida Foods, Inc., Boise, Id.

Continuation-in-part of Ser. No. 594,382, Oct. 9, 1990, Pat. No. 5,097,754. This application Mar. 24, 1992, Ser. No. 855,927
Int. Cl.[5] **A47J** *37/04*
U.S. Cl. 99—357 **14 Claims**

1. A closed-loop air cooking system for cooking frozen foods comprising:

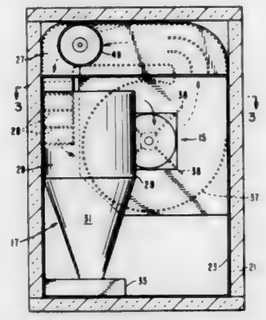
a closed-loop air duct assembly;

a cooking basket means mounted for rotation within the air duct assembly;

fan means for forcing air through the air duct assembly;

heating means for heating air that circulates within the air duct assembly; and

a separator means mounted for removing entrained particulates from the air stream that circulates within the air duct assembly, the separator means providing a thermal mass



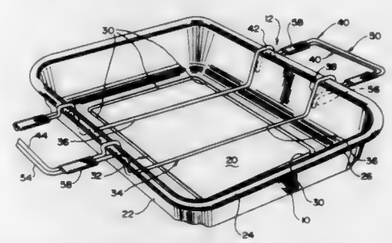
that can absorb heat from, and can provide heat to, the circulating air stream.

5,203,254

COMBINATION COOKING RACK AND PAN ASSEMBLY

Carl R. Fletcher, Kildeer, Ill., assignor to Ensar Corporation, Wheeling, Ill.

Filed Sep. 21, 1992, Ser. No. 947,465
Int. Cl.[5] **A47J** *37/04, 43/00, 43/18*
U.S. Cl. 99—426 **18 Claims**



1. A combination cooking rack and pan assembly, and wherein said cooking rack supports an item to be cooked thereon during cooking and suspends said pan by its rim,

said pan comprising a base, a side wall extending upwardly from the base and a peripheral rim extending outwardly from the side wall,

said cooking rack comprising

a plurality of wire segments overlying said pan base and together defining a generally planar array for directly supporting an item to be cooked thereon,

a pair of handle means, each secured to said planar array at opposite sides of said array,

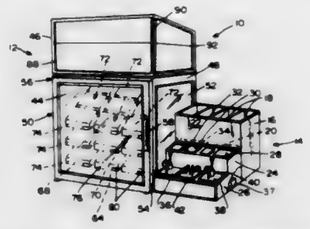
each said handle means comprising a hand grip portion and a clamping portion movable relative to said hand grip portion between a first position in which said hand grip portion and said clamping portion grip said pan rim at said opposite sides, and a second position in which said pan rim is readily assembleable to said cooking rack.

5,203,255

HOT COUNTERTOP SELF-SERVICE FOOD STATION

Cindie M. Wells, McFarland; Scott A. Halverson, Poynette, and John A. Jonovic, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 25, 1991, Ser. No. 691,255
Int. Cl.[5] **A21B** *1/00;* **A23L** *1/00;* **A47B** *77/08;* **A47F** *3/14*
U.S. Cl. 99—468 **6 Claims**



1. A hot food countertop self-service display station comprising: a countertop display oven including an oven body defining a generally rectangular heated oven compartment having a reclosable, side-opening, hinged front door panel for covering a generally rectangular front opening and an upright, vertical elongate forced air flow control tube disposed in a corner location in said oven compartment opposite said front door panel, said flow control tube including means for directing air flow in said oven compartment, means for supplying a flow of heated forced air into said flow control tube and throughout said oven compartment, means for thermostatically controlling air temperature connected to said hot air supply for maintaining the temperature of said oven compartment at a generally constant range of temperatures and rack means adapted to be placed in said oven compartment and effective to sub-divide said compartment into a gravity feed, self-facing array of columns and rows of product packages disposed at said front opening, said rack means including stop means adjacent said front opening for each package position in said array and positioned to prevent packages placed in said rack from sliding forwardly out of said array of columns and rows at said front opening, each said stop means being located in such manner that heated rack surfaces are recessed from said front opening, away from the center of each package presented in the array, thereby permitting a person to grab a package in the center and remove the package from a column or row of said array at the front opening generally without being burned.

5,203,256

CONTINUOUS FERMENTING CHAMBER FOR DOUGH PRODUCTS

Gerhard Mueller, Asperg, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 10, 1992, Ser. No. 896,303
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1991, 4121587
Int. Cl.[5] **A21C** *13/02;* **A21D** *4/00*
U.S. Cl. 99—475 **15 Claims**

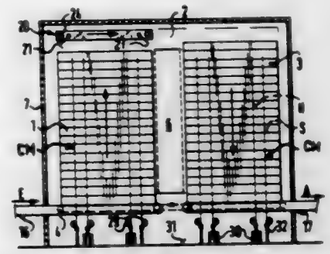
1. Apparatus for fermenting dough products comprising:

a casing defining a fermenting chamber having an inlet for carriers on which dough products are supported and an outlet for the carriers after the dough products have passed through and have been fermented in said chamber, said chamber having a lower region including a front portion at which said inlet is located and a rear portion at which said outlet is located, a lifting station at which the carriers are lifted in said chamber from said lower region to an upper region of the chamber and a lowering station at which the carriers are lowered from said upper region to said lower region, said lifting and lowering stations extending vertically in said chamber adjacent to one another and occupying a major portion of said chamber;

first vertical conveyor means at said lifting station for lifting said carriers stepwise from said lower region to said upper region;

horizontal conveyor means in said upper region of the chamber for transporting said carriers from the lifting station to the lowering station;

second vertical conveyor means at said lowering station for lowering said carriers stepwise from said upper region to said lower region;



each of said first and second vertical conveyor means comprising a plurality of pairs of first and second columns, respectively including projections thereon in an arrangement to support the carriers respectively and individually by the first and second columns;

means for selectively rotating the first and second columns between respective operative positions in which the projections on said columns support the carriers and inoperative positions in which the projections are withdrawn from the carriers; and

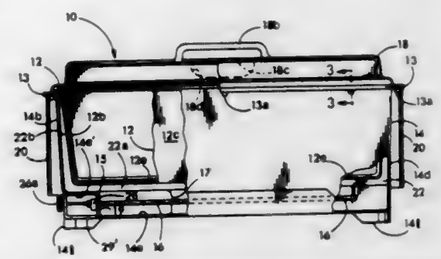
means for raising and lowering one of said columns of said pairs.

5,203,257

FOOD WARMING VESSEL FOR CAFETERIAS, RESTAURANTS AND THE LIKE

Eugine W. Goad, 12711 Cedarwood Ct., Dayton, Minn. 55327

Filed Apr. 29, 1991, Ser. No. 693,459
Int. Cl.[5] **F24B** *9/00*
U.S. Cl. 99—483 **5 Claims**



1. A food warming apparatus for restaurants, cafeterias and the like, comprising:

1) a food containment vessel having sides, bottom and an upper open wide mouth positioned to open upwardly at the top of the vessel for holding food that is to be heated;

2) a hollow sump vessel formed from a rigid heat insulating molded plastic resinous material and having side walls and a bottom wall and having an upper open wide mouth,

a) said mouth terminating in a lip for supporting the food containment vessel,

b) said lip being integral with the walls of the sump vessel

and being formed from the same rigid molded plastic

(c) thermostatically controlled fluid vapor generating

5,203,261

driven shaft, the sprocket on said second driven shaft and

and being formed from the same rigid molded plastic resinous heat insulating material,

3) means supporting the food containment vessel within the rigid sump vessel,

4) said sump vessel being adapted to hold water or other heat transfer liquid therewithin,

5) said sump vessel being constructed and arranged to have its side and bottom walls spaced apart from the larger than the food containment vessel so as to provide a sump chamber within the sump vessel with capacity for containing the heat transfer liquid such that an outer surface of the food containment vessel is exposed directly to the heat transfer liquid,

6) the insulating qualities of the sump vessel improving heating efficiency whereby the sump vessel walls provide a three-way function of:

A) supporting the food containment vessel,

b) providing a thermal barrier for directing the flow of heat from within the sump vessel inwardly through the food containment vessel to food therein, and

c) containing heated heat transfer liquid and hot, boiled-off vapor in contact with the outer surface of the food containment vessel,

7) an electrical heating element in the sump vessel between the walls of the containment vessel and the walls of the sump vessel such that the outer surface of the containment vessel faces the heating element for heating the heat transfer liquid;

8) an indentation in one side wall of the sump vessel to provide the bottom wall of the sump with two horizontal portions at different elevations, including a shallow bottom wall portion and a relatively deep bottom wall portion joined by an upright wall for supporting the electric heating element,

a) the electric heating element being mounted in the upright wall and extending therefrom into the sump chamber between the bottom of the containment vessel and the bottom of the sump vessel for heating the heat transfer liquid to produce hot vapor for directly contacting the sides and bottom of the food containment vessel,

9) a cover member secured to the sump vessel for enclosing said indentation in the sump vessel so as to define a junction box containing electrical connections for said electric heating element, said junction box having side, top and bottom walls formed by portions of the sump vessel and the cover.

5,203,258

APPARATUS FOR HEATING FOOD ARTICLES

Vincent P. Tippmann, 8605 N. River Rd., New Haven, Ind. 46774, and Joseph R. Tippmann, HRC-33, Box 8419, Rapid City, S. Dak. 57701

Continuation of Ser. No. 581,548, Sep. 12, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 833,607

Int. Cl.[5] A23L *1/00*; **A47F** *10/06*

U.S. Cl. 99—483 **3 Claims**

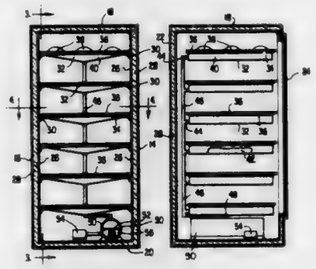
1. An apparatus for transferring heat to food articles contained on trays within a chamber comprising:

(a) a chamber having a plurality of vertically upstanding spaced-apart side walls and adjoining top and bottom walls, and at least one closure member permitting access of said trays to said chamber,

(b) a plurality of vertically spaced-apart support means between said side walls, each of said support means having a flat upper surface member for receiving one of said tray adjacent thereto, a front side member, a rear side member adjacent one of said side walls, said rear side member having an outlet formed therein, and a lower surface member tapered toward said outlet in said rear side member, said upper and lower surface members and said side members forming a fluid tight enclosure,

(c) thermostatically controlled fluid vapor generating means, and

(d) conduit means extending between said rear side members and being adjacent one of said side walls for interconnecting the outlet of each of said support means to said fluid vapor generating means, said generating means supplying fluid vapor through said conduit means to said enclosure



of each of said support means for heating said food articles, said conduit means serving to both transmit said fluid vapor to each of said support means and return condensate fluid back to said fluid vapor generating means; said support means, said conduit means and said fluid vapor generating means being sealed to the atmosphere to prevent dissipation of said condensate fluid.

5,203,259

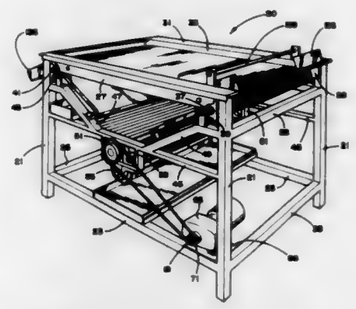
BLUEBERRY DESTEMMER

A. Dale Miedema, Zeeland, Mich., assignor to Lakewood Manufacturing Company, Holland, Mich.

Filed Oct. 1, 1990, Ser. No. 590,803

Int. Cl.[5] A23N *15/02*

U.S. Cl. 99—640 **20 Claims**



1. A self-aligning fruit destemmer comprising:

a substantially rectangular supporting frame;

a first and a second driven shaft rotatably mounted on said supporting frame with one shaft mounted near each end of said frame;

a sprocket on opposite ends of each of said first and second driven shafts;

a wheel on opposite ends of said first and second driven shafts with said wheels and sprockets being oppositely mounted on each driven shaft;

a driving shaft mounted below said driven shafts;

a pair of spaced sprockets mounted on said driving shaft;

a first endless chain connecting the sprocket on said first driven shaft, the wheel on said second driven shaft and the sprocket on said driving shaft;

a second endless chain connecting the wheel on said first driven shaft, the sprocket on said second driven shaft and a sprocket on said driving shaft;

a plurality of rotatable rollers mounted between said first and second endless chains forming an endless belt for carrying fruit to be destemmed;

said wheels on said first and second driven shafts enable said first and second endless chains to slide on the surface of said wheels, maintaining the alignment of said rollers, if either of said first and second endless chains attempts to come out of alignment due to the presence of an object in the path of the chain.

5,203,260

BINDING APPARATUS FOR BINDING A BUNDLE OF LABLES OR THE LIKE

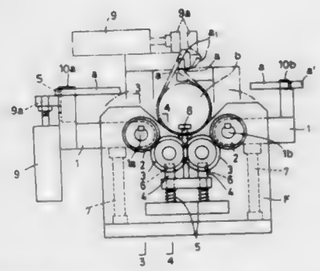
Michio Fukuda, Nishinomiya, and Hiroshi Kagei, Kuwana, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Oct. 18, 1991, Ser. No. 779,271

Claims priority, application Japan, Nov. 2, 1990, 2-298361

Int. Cl.[5] B65B *13/02*

U.S. Cl. 100—9 **2 Claims**



1. A binding apparatus comprising:

a frame;

first and second arms each having a first end which is pivotally mounted at a pivot point on said frame so as to be pivotal about first and second axes respectively, a respective moment about said first and second axes of each of said arms due to the weight thereof tending to move second ends of said arms, which are opposite said first ends, away from each other when said arms are in a closed position at which said second ends of said arms are proximate each other;

a gear mechanism operatively coupled to said arms so as to interlock said arms with each other so that said arms pivot in opposite directions at the same speed;

first and second hooks respectively provided on each of said second ends of said arms between which a rubber band, having a mushroom-shaped latch attached thereto, is spanned, a linear length of said rubber band being shorter than a circumference of a bundle of cable to be bound, a first distance between said first hook and said first pivotal axis being longer than a second distance between said second hook and said second pivotal axis;

a cylinder, provided on said first arm and having a rod slidably mounted therein, when said arms pivot into said closed position said cylinder moves said rod so as to cause a push member, which is mounted on an end of said rod, to push a portion of said rubber band so that said portion of said rubber band hooked by said first hook is moved toward said second hook;

a maintaining device coupled to said gear mechanism so as to keep said arms in an open position wherein said second ends are remote from one another; and

a releasing device coupled to said maintaining device so as to release said maintaining device.

5,203,261

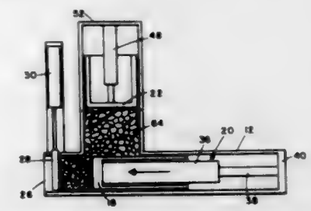
CAN BALING MACHINE AND METHOD

Robert M. Davis, Bonita, Calif., assignor to CP Manufacturing, Inc., National City, Calif.

Filed Nov. 5, 1991, Ser. No. 788,331

Int. Cl.[5] B30B *9/32, 7/04*

U.S. Cl. 100—42 **7 Claims**



6. A method of forming cans into a compressed bale of predetermined size and weight, comprising the steps of:

feeding cans into a can receiving cavity at the intersection of a main baling chamber with an auxiliary baling chamber such that the cans extend from the auxiliary baling chamber into the main baling chamber;

actuating a reciprocating, auxiliary piston in the auxiliary baling chamber to compress the cans in the cavity at the intersection until a compacted mass of cans at a predetermined first compression pressure is reached;

actuating a main piston in the main baling chamber to shear off the portion of the mass of cans in the main baling chamber from the portion in the auxiliary chamber at the intersection between the chambers and to compress cans in the main baling chamber towards a discharge end of the chamber until a predetermined second compression pressure greater than the first compression pressure is reached, the portion of the main baling chamber between the main piston and discharge end of the chamber being of predetermined dimensions such that when the cans at said first compression pressure filling said portion are compressed to said second compression pressure, they form a bale of predetermined size and density; and

opening a discharge door at the discharge end of the main baling chamber and ejecting the bale from the baling chamber.

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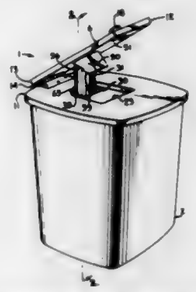
CAN CRUSHING APPARATUS

James W. Menard, 515 SE. Sixth St., Abilene, Kans. 67410, and Ronnie L. Zachago, 2622 Plantation, Salina, Kans. 67401

Filed Feb. 3, 1992, Ser. No. 829,984

Int. Cl.[5] B30B *1/04*

U.S. Cl. 100—233 **20 Claims**



1. An apparatus for crushing cans comprising:

(a) a base having a disposal opening extending therethrough;

(b) a lever arm pivotally connected at a pivot end of said

lever arm to said base and pivotally movable between a

5,203,264

on the rail member at inclinations of the rail member from

section extending oppositely in the transverse direction a short length toward the corresponding upper ends of the

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lever arm to said base and pivotally movable between a closed position wherein said lever arm extends across said disposal opening and an open position wherein said lever arm is angled relative to said base;

(c) support means attached to said base for positioning and supporting a can to be crushed on said base when said lever arm is in said open position such that the center of gravity of the can is vertically positioned over said support means so that the can is supported by said support means; and

(d) a can engaging surface mounted on said lever arm such that said can engaging surface travels along an arcuate path as said lever arm is advanced between said open position and said closed position; said lever arm being advanceable from said open position to a can engaging position wherein said can engaging surface is adapted to engage the can such that as said lever arm is subsequently advanced towards said closed position; the traveling of said can engaging surface along an arcuate path causes the can to be crushed in such a manner that the center of gravity of the can after crushing is positioned over said disposal opening.

5,203,263

DEVICE FOR TRIGGERING A POSTAGE METER MACHINE

Erwin Berger, Thörishaus, and Rudolf Grünig, Köniz, both of Switzerland, assignors to Ascom Autelca AG, Bern, Switzerland

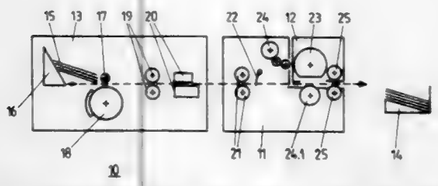
PCT No. PCT/CH91/00041, § 371 Date Nov. 4, 1991, § 102(e) Date Nov. 4, 1991, PCT Pub. No. WO91/14238, PCT Pub. Date Sep. 19, 1991

PCT Filed Feb. 19, 1991, Ser. No. 793,440

Claims priority, application Switzerland, Mar. 14, 1990, 00835/90

Int. Cl.[5] B41J *45/00*

U.S. Cl. 101—76 **8 Claims**



1. Apparatus for triggering of a postage meter machine (**10**), comprising

an infeed roller pair (**21**), where infeed rollers (**21.1**, **21.2**) of the infeed roller pair (**21**) are spring-loadedly held together, and wherein the rollers (**21.1** and **21.2**) form a passage for mail pieces (**15**) of variable thickness, a release trigger (**122**) actuatable, in each case, by a mail piece (**15**) for initiating in each case one single rotation of a print rotor (**23**), and

an adjustment device for a fine adjustment of a release position of the release trigger (**122**), characterized by a support (**62**), which supports the release trigger (**122**) and which is displaceable parallel to a passage path (**28**) of the mail pieces (**15**), and

a power connection (**50**), which connects the infeed roller pair (**21**) and a support (**62**) such that the release position of the release trigger (**122**) is shifted in motion direction of the mail piece (**15**), if a mutual distance of the infeed rollers (**21.1**, **21.2**) is increased, and where the release position of the release trigger (**122**) is shifted opposite to said motion direction, if the recited distance is decreased.

5,203,264

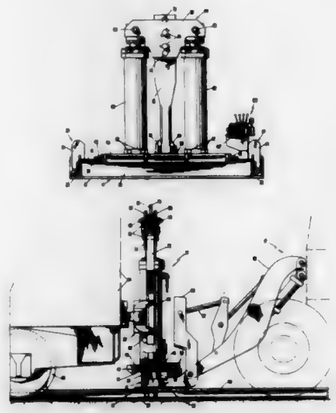
RE-RAILING UNIT FOR DERAILED RAIL CAR

George Sodder, Jr., 51 Maple St., Falls View, W. Va.

Filed Oct. 18, 1991, Ser. No. 779,336

Int. Cl.[5] B61F *9/00*

U.S. Cl. 104—263 **5 Claims**



1. A re-railing unit for re-railing a de-railed rail car, comprising:

a base having longitudinally spaced ends and connecting arm means releasably connectible to a vehicle;

hydraulic ground support members carried adjacent respective ends of said base and including vertically adjustable means;

a support plate mounted on said base for longitudinal sliding movement thereon;

bearing means, including a plurality of rolling elements disposed between said support plate and said base;

a pair of upright hydraulic lifting rams extending upwardly from said support plate;

a lifting arm suspended at its upper end from said lifting rams and disposed between said lifting rams, a lower end of said lifting arm carrying hook means for engaging a drawhead of the de-railed rail car, said lifting arm and drawhead being raisable in response to extension of said lifting rams;

power actuated means connected between said base and said support plate for sliding said support plate longitudinally across said base to reposition wheels of the raised rail car over the track from which it has become de-railed so that the wheels can be lowered by said lifting rams.

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SELF-PROPELLING, MULTI-ROUTE TRANSPORT FOR MOVEMENT ALONG BOTH HORIZONTAL AND VERTICAL SECTIONS OF TRACK

Koichi P. Nii, 1376 E. 27 St., Oakland, Calif. 94606, and Shizuo Harada, Nerima-ku Minami Tanaka 5-7-16, Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 691,861

Int. Cl.[5] B61C *11/02*

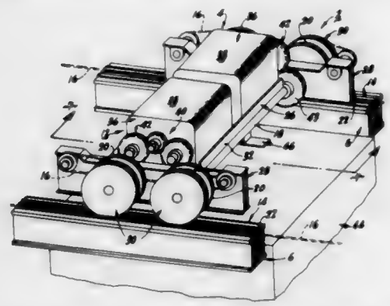
U.S. Cl. 105—29.1 **20 Claims**

1. A self-propelling transport comprising: a track unit having two spaced rail members with a continuous drive chain retained on at least one of the rail members;

a vehicle unit having a carriage with wheels with means for maintaining the vehicle unit on the track unit at inclinations of the carriage from horizontal to vertical, wherein at least one of the wheels is a chain engagement wheel having sprocket teeth engaging the continuous drive chain;

active retention means for actively retaining the drive chain on the rail member at inclinations of the rail member from horizontal to vertical;

release means for selectively releasing a segment of chain from the rail member proximate the chain engagement when by deactivating the retention means, wherein the



chain segment is wrapped in part around the chain engagement wheel; and,

propulsion means on the carriage operably connected to the chain engagement wheel for moving the vehicle unit along the track unit.

5,203,266

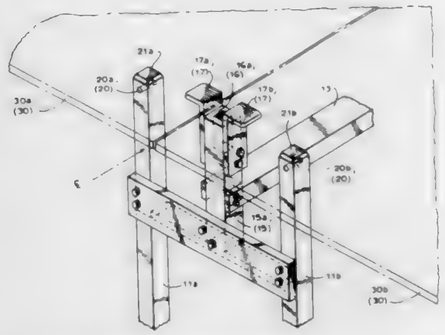
FOLDABLE TABLE HAVING CENTERLINE FOLDING LEAVES

Kenneth V. Stevens, Brooklyn, N.Y., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Sep. 29, 1989, Ser. No. 414,483

Int. Cl.[5] A47B *3/00*

U.S. Cl. 108—112 **12 Claims**



1. A foldable table assembly comprising:

(a) a base frame including first and second lower base pieces spaced apart in a longitudinal direction and extending in parallel with each other in a transverse direction perpendicular to the longitudinal direction, a first pair and a second pair of upright pieces, each pair of upright pieces having their lower ends fixed to a respective one of the base pieces and being spaced apart by a given width in the transverse direction and extending vertically in parallel, said upright pieces having pivot mounts provided respectively on their upper ends, and at least one longitudinal stretcher having its opposite ends fixed to the upright pieces to provide said base frame with structural rigidity;

(b) first and second end sections each respectively disposed at a midpoint of the given width between the spaced-apart upright pieces of said first and second pairs and each having a pair of leaf stops fixed on an upper end of the end section extending oppositely in the transverse direction a short length toward the corresponding upper ends of the upright pieces, wherein said first and second end sections define a centerline of the assembly between the upright pieces with the upper ends of the upright pieces being disposed on respective transverse sides of said centerline; and

(c) first and second table leaves each extending a given length in the longitudinal direction and having a width in the transverse direction that is substantially greater than one-half the given width between the pairs of upright pieces, wherein each table leaf has a pair of pivot sections including pivot pins fixed to a lower surface thereof and spaced apart in the longitudinal direction for pivotably mounting each table leaf to respective pivot mounts on the upper ends of the upright pieces on each transverse side of the centerline of the assembly, and has a pair of cutout portions which are formed at an inner longitudinal edge of the table leaf spaced apart in the longitudinal direction for fitting around the respective end sections and abutting with the leaf stops to hold the table leaf in a horizontal position in conjunction with the pivot mounts on the upper ends of the upright pieces, said table leaves thereby each being independently pivotable on the respective pivot mounts between a horizontal position for use and a vertical position in which the inner longitudinal edges are released from the leaf stops and the table leaves are pivoted upright in parallel with each other between the upright pieces for storage.

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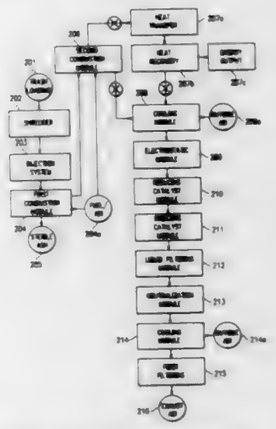
METHOD AND APPARATUS FOR DISPOSING OF WASTE MATERIAL

Ralph F. Greene, Richardson, and Patrick C. Malone, The Colony, both of Tex., assignors to New Clear Energy, Inc., Carrollton, Tex.

Continuation of Ser. No. 643,419, Jan. 22, 1991, abandoned. This application Dec. 6, 1991, Ser. No. 804,474

Int. Cl.[5] F23B *5/00*; **F23J** *15/00*

U.S. Cl. 110—212 **18 Claims**



1. A waste disposal apparatus comprising:

a first combustion chamber for incinerating waste material in an oxygen rich atmosphere to produce ash and exhaust containing gasses and particulate matter;

an injector for blowing air into said first combustion chamber in excess of the amount required for normal combustion;

a second combustion chamber for firing said exhaust con-

taining gasses and particulate matter in an oxygen starved

a sewing machine having a needle mounted for vertical

determined distance from the sewing needles to create a watertight structural hull comprising a bottom portion and

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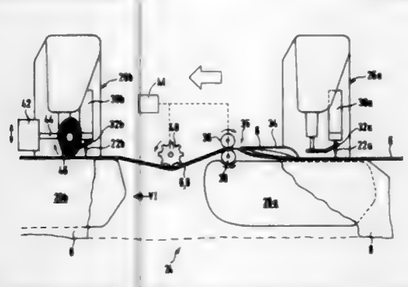
taining gasses and particulate matter in an oxygen starved atmosphere;
a damper for restricting air flow into said second combustion chamber to an amount less than that required for normal combustion; and
a liquid filter for capturing said particulate matter contained in said fired exhaust and for chemically treating said fired exhaust gasses to reduce the quantity of CO, NO and SO contained in said fired exhaust.

5,203,268

APPARATUS FOR SEWING ELASTIC HEMS ON FABRIC PIECES

Helmut Schips, St. Gallen, Switzerland, assignor to Schips AG Nahautomation, Tubach, Switzerland

Filed Nov. 13, 1990, Ser. No. 611,521
Claims priority, application European Pat. Off., Nov. 13, 1989, 89121012.2
Int. Cl.[5] D05B *35/02, 35/10, 27/10*
U.S. Cl. 112—121.27 **11 Claims**



1. An apparatus for sewing a curved elastic hem on a fabric piece, said apparatus comprising:
a first sewing machine for fixing an elastic band along an edge portion of the fabric piece;
folding means for folding the fabric piece, at a folding portion, about a longitudinal edge of the elastic band while said fabric piece and said elastic band are being conveyed, and for thereby forming a triple-ply structure formed of the folding portion, the elastic band, and the edge portion of the fabric piece; and
a second sewing machine for finishing the triply-ply structure; and
wherein said folding means includes a baffle plate for rotating the triple-ply structure by approximately 180°, said baffle plate being located immediately downstream of said first sewing machine, and said baffle plate having an exit end ; and
wherein said apparatus further includes conveying rollers for withdrawing the triple-ply structure from said exit end of said baffle plate; and
wherein said apparatus further includes a deflection roller for deflecting said triple-ply structure from a horizontal path of movement, said deflection roller being located between said conveying rollers and said second sewing machine.

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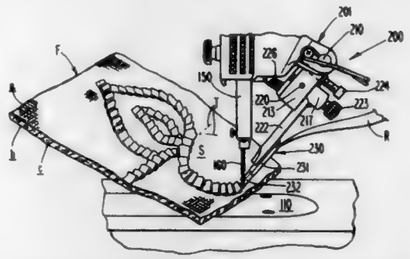
TEXTILE GUIDE APPARATUS

Douglas J. Glenn, Wallburg, N.C., assignor to Sewing Center Supply Co., Inc., Portland, Oreg.

Division of Ser. No. 489,878, Mar. 6, 1990, Pat. No. 5,031,554, which is a continuation of Ser. No. 343,842, Apr. 26, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 651,149
Int. Cl.[5] D05B *35/00*
U.S. Cl. 112—147 **7 Claims**

1. An apparatus for sewing a narrow fabric onto a substrate to form a textile article therefrom comprising:
a sewing machine having a needle mounted for vertical reciprocation with respect to a needle plate;
narrow fabric guide means pivotally mounted on said sewing machine above said needle plate and adjacent said needle, and comprising a feed folder; means pivotally mounting said narrow fabric feed folder to said sewing machine adjacent said needle and including means biasing said narrow fabric feed folder toward said needle and into a first position relative to the path of reciprocation of the



needle for positioning a narrow fabric in the path of said needle at a predetermined height above said needle plate for being pierced, transported downwardly and sewn to the substrate in a transversely folded configuration by said needle during its downward stroke, and said narrow fabric feed folder being movable to a second position outwardly sway from said needle in response to the downward stroke of the needle towards said needle plate, and back to the first position upon reciprocation of the needle.

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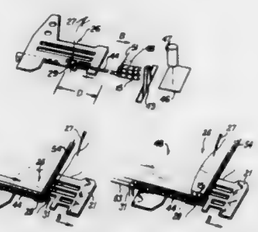
SEWING MACHINE WITH LATCH BACK DEVICE

Elvin C. Price, Dacula, and Preston B. Dasher, Lawrenceville, both of Ga., assignors to Atlanta Attachment Company, Lawrenceville, Ga.

Filed Dec. 20, 1990, Ser. No. 630,841
The portion of the term of this patent subsequent to Nov. 3, 2009, has been disclaimed.
Int. Cl.[5] D05B *65/00*
U.S. Cl. 112—269.1 **29 Claims**



25. A method of sewing excess thread chain extending from the sewing needles of a sewing machine to a work piece for eliminating a knot or thread chain protruding from the leading edge of the work piece, comprising the steps of:
a. forming an overlock stitch or the like about a chaining tongue and into a series of work pieces with the operation of sewing needles as the work pieces move along a sewing path beneath the sewing needles of the sewing machine;
b. sewing off a first one of the work prices to form a thread chain extending from a trailing edge of the first work piece to the sewing needles;
c. drawing taut the thread chain extending from the trailing edge of the first work piece to the sewing needles;
d. cutting the taut thread chain extending between the sewing needles and the previously sewn work piece at a predetermined distance from the sewing needles to create a predetermined length of leading thread chain extending from the sewing needles as the thread chain continues to be formed;
e. simultaneously with the step of cutting the taut thread chain inducing a stream of air into the chaining tongue to draw off the free end of the leading thread chain extending from the sewing needles into the chaining tongue to cause the free end of the leading thread chain to extend along the sewing path;
f. continuing the sewing action of the sewing needles and advancing a second work piece along the sewing path to the sewing machine while retaining the free end of the leading thread chain in the hollow chaining tongue until the second work piece is engaged in the sewing needles; and
g. sewing the second work piece with the sewing needles while progressively pulling with the second work piece the free end of the leading thread chain from the chaining tongue and incorporating the leading thread chain into the chain stitch formed in the second work piece.

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SHALLOW DRAFT BARGE

Malcolm G. Chapman, P.O. Box 834, Middletown, Conn. 06457

Filed May 22, 1991, Ser. No. 704,089
Int. Cl.[5] B63B *1/12*
U.S. Cl. 114—26 **4 Claims**

1. A barge apparatus which comprises:
first and second elongated pontoons each including a unitary mass of buoyant foamed plastic material, each of said pontoons having an upper surface;
decking bridging said pontoons with said pontoons disposed in spaced relationship;
each of said pontoons including first and second elongated longitudinally extending members that extend substantially the entire length of the pontoon member proximate to the upper surface thereof;
each of said pontoons including first and second lower corner angles disposed in nested relationship to the lower extremities of said buoyant foam plastic material;
a plurality of straps disposed at axially spaced intervals along each of said elongated longitudinally extending members, each of said straps extending around said buoyant foam plastic material and said first and second lower corner angles, said first and second elongated longitudinally extending members being angle members, said first and second elongated longitudinally extending members being rectangular tubing, said apparatus including a support member extending intermediate said pontoons in spaced relation to said decking, and a helm carried on said decking, said helm being constructed to permit folding downwardly, each of said members being a steel member.

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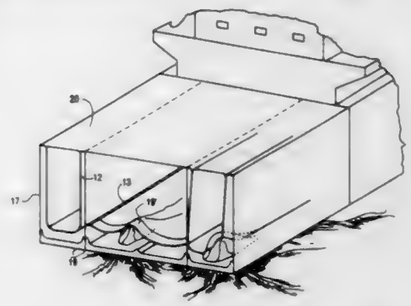
FLEXIBLE DOUBLE HULL FOR LIQUID CARGO VESSELS

Rudolph Kassinger, 94 Barchester Way, Westfield, N.J. 07090, and Panos Zachariadis, 235 W. 48th St., New York, N.Y. 10036

Filed Aug. 12, 1991, Ser. No. 744,451
Int. Cl.[5] B63B *25/12*
U.S. Cl. 114—74 R **32 Claims**

1. In a liquid cargo vessel having an outer, substantially watertight structural hull comprising a bottom portion and upstanding side wall portions and one or more horizontally disposed decks defining, in combination, a maximum closed liquid cargo space, said vessel further having a plurality of interior bulkheads, at least some of which are fastened at extreme ends to said hull, and a plurality of vertical walls which are spaced away from said hull side walls and intersect said bulkheads; said hull side walls, portions of said bottom portion and said bulkheads and selected ones of said vertical walls forming exterior compartments and said other portions of said bottom portion and said bulkheads and said vertical walls forming interior compartments within said cargo space, apparatus for preventing the discharge of liquid cargo from said cargo compartments when said vessel is subjected to puncture below the cargo line by a foreign object comprising:



a flexible, free-hanging composite liner impermeable to a desired liquid cargo material having an area extending across at least one of said compartments at least in the vicinity of the portion of the hull forming said at least one compartment; and
means for fastening said liner within said compartment in a sagging manner retain said liquid cargo therein and to provide cargo-free space between said hull and said liner, the minimum distance between said hull and said liner when said liner contains cargo being selected and the location within said compartment of said means for fastening being selected such that said cargo is retained within said liner despite puncture and entry into said hull by a foreign object to a distance greater than said minimum distance.

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OIL SPILL RAPID RESPONSE, CONTAINMENT AND STOPPAGE METHOD AND APPARATUS

Michael I. Sandlofer, Bronx, N.Y., assignor to North Wind Undersea Institute, Inc., Bronx, N.Y.

Filed May 23, 1991, Ser. No. 704,327
Int. Cl.[5] B63B *43/16*
U.S. Cl. 114—229 **19 Claims**

1. An oil spill rapid response, containment and stoppage apparatus, comprising: a skin comprising an outer material and a dehydrated material, a means for securing the skin to a ship and a deployment means for the skin wherein said skin is of sufficient size to cover at least a portion of the hull of the ship below the water line.

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AMPHIBIOUS VEHICLE

to be attached directly to the underside portion of said cavita-

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5,203,277

WINDSHIELD AND QUICK-RELEASE HINGE DEVICE

said bore and longitudinally between said plunger head

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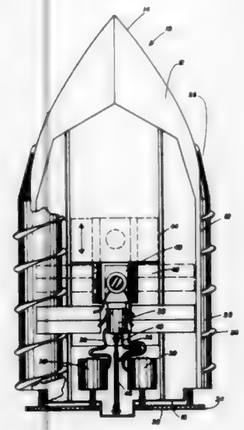
AMPHIBIOUS VEHICLE

Douglas S. Hart, Kenai; Larry D. Beller, Soldotna, and Robert L. White, Kenai, all of Ak., assignors to Crude Tool Works, Homer, Ak.

Filed Apr. 19, 1990, Ser. No. 510,971
Int. Cl.[5] B63H 1/26
U.S. Cl. 114—270 3 Claims



1. An amphibious vehicle comprising:
a buoyant hull having a bottom and generally upright sides;
said sides being formed to merge with said bottom in concave cylindrical transition recess surfaces; and
a pair of augers rotatable mounted along the sides of said hull closely nested in said recess surfaces;
each said auger being of elongated generally cylindrical configuration and having a continuous, helical screw extending around it from front to rear;
the screws of said augers being of opposite threads;
the upper inboard quadrants of said augers being contained within said recess surfaces and the lower outboard and inboard quadrants thereof depending below said bottom of the hull whereby when said vehicle is afloat in water the auger will propel the vehicle through the water and when the vehicle is on land or other firm surfaces, the auger will move the vehicle by traction.

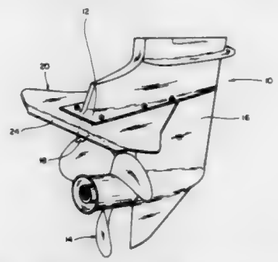
5,203,275

MEANS ATTACHABLE TO AN OUTBOARD MOTOR OR STERN DRIVE UNIT FOR FACILITATING ON-PLANE OPERATION OF A WATERCRAFT

Joseph J. Brauner, 16957 Manchester Rd., and John C. Covert, 2531 Estherton Rd., both of Grover, Mo. 63040

Filed Mar. 18, 1992, Ser. No. 853,098
Int. Cl.[5] B63B 1/24
U.S. Cl. 114—274 17 Claims

1. Means removably attachable to the underside portion of a cavitation plate located on the lower drive unit of an outboard motor or stern drive unit for facilitating the on-plane operation of a watercraft, said removably attachable means comprising a relatively thin plate member having front, side and rear portions, a tab portion extending from the rear portion of said plate member, said tab portion being angularly related to the plane of said plate member, means adjacent the front portion of said plate member for positioning and locating said front portion with that portion of the lower drive unit located immediately adjacent to and extending below the cavitation plate, said means enabling the front portion of said plate member to be compatible with the shape of said lower drive unit portion when positioned and located in abutting relationship thereagainst, and attachment means for enabling said plate member to be attached directly to the underside portion of said cavitation plate in flush abutting relationship thereto, said plate



member being in substantial overlap with the underside portion of said cavitation plate when attached in operative position thereto.

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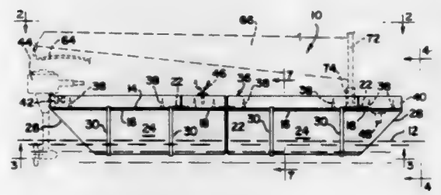
SUITCASE BOAT

Robert W. Methven, 984 S. Victor Way, Aurora, Colo. 80012

Filed Mar. 19, 1992, Ser. No. 853,908
Int. Cl.[5] B63H 9/04
U.S. Cl. 114—354 13 Claims



1. A suitcase boat, comprising:
platform means for supporting a person(s) and/or object(s) while said boat is on the water, said platform means comprising a plurality of sections hingedly interconnected and relatively foldable to form a hollow rectangular enclosure similar to the form of a suitcase;
said sections being hingedly interconnected along parallel axes transversely of a longitudinal axis of said boat and providing pairs of opposite walls of said suitcase when said sections are folded at right angles to one another;
a first pair of said sections comprising opposite side walls of said suitcase and a second pair of said sections comprising top and bottom walls of said suitcase;
a plurality of floatation elements adapted to support said platform means on the water while said sections are unfolded and dimensioned to be contained within said hollow enclosure when said sections are folded into suitcase form; and
attachment means for securing said floatation elements to said platform means in position for providing floatation support for said boat and for retaining said sections of said platform means in said folded up form of a suitcase for containing said floatation elements in said hollow enclosure.

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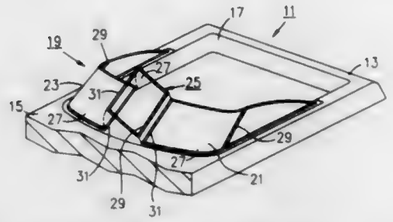
WINDSHIELD AND QUICK-RELEASE HINGE DEVICE

L. C. Norman, Maitland, Fla., assignor to Water Bonnete Manufacturing, Inc., Casselberry, Fla.

Filed Feb. 3, 1992, Ser. No. 829,718
Int. Cl.[5] B67B 17/00
U.S. Cl. 114—361 11 Claims



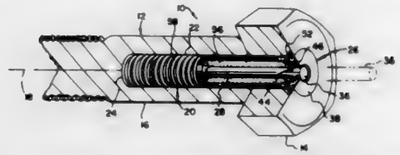
1. A windshield for use on a boat comprising:
a pair of spaced part stationary windshield sections mounted to a part of the boat, one of said stationary windshield sections including a stationary hinge pin;
another windshield section removably mounted between said stationary windshield sections, said another windshield section including a set of open hinge means for pivotal association with said stationary hinge pin; and
a plurality of sets of cam means relatively movable on said another windshield section and associated with said open hinge means for releasable engagement with said stationary hinge pin to releasibly retain said open hinge means against displacement from their pivotal associations with said stationary hinge pins, respectively.

5,203,278

TEMPERATURE WARNING DEVICE

Richard J. Kinney, Alexandria, Va., assignor to Commonwealth Technology Inc., Alexandria, Va.

Filed Dec. 31, 1991, Ser. No. 814,792
Int. Cl.[5] G01K 1/14, 11/06
U.S. Cl. 116—218 16 Claims



1. A temperature warning device which indicates when a threshold temperature has been exceeded comprising:
a threaded bolt having a bolt head and a bolt body extending along a longitudinal axis from said bolt head, said bolt head and bolt body having a longitudinal bore defined by a surrounding surface provided along said longitudinal axis with said bore having a closed end and an open end at said bolt head;
a plunger in said bore having a plunger head and a plunger body of smaller longitudinal cross section than said plunger head, said plunger body extending from said plunger head and terminating at the open end of said bore;
a retaining cap secured in said bore of said bolt head having a cap hole through which said plunger body freely extends;
a sleeve of a fusible material contained in said bore which melts at the threshold temperature, said sleeve before melting substantially filling a volume of said bore radially between said plunger body and the surrounding surface of said bore and longitudinally between said plunger head and said cap so as to be confined in this volume; and
a spring located in said bore and compressed before melting of said sleeve between said closed end and said plunger head so as to exert a force on said plunger head and hence a compressive force on said sleeve and such that if the threshold temperature is exceeded, said fusible sleeve melts and said spring moves said plunger longitudinally so that said plunger body extends beyond said retaining cap and said bolt head and is easily visible.

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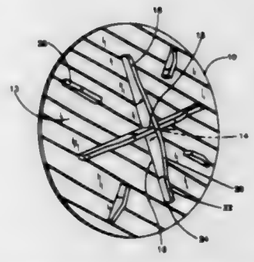
PUPPY TRAINING DEVICE

Martin Eversdyk, 29150 Harvard Rd., Cleveland, Ohio 44122

Continuation of Ser. No. 637,292, Jan. 3, 1991, abandoned. This application Dec. 11, 1991, Ser. No. 807,962
Int. Cl.[5] A01K 15/00
U.S. Cl. 119—29 7 Claims



1. A puppy training device for improving balance, coordination and animal disposition comprising:
a) a deck having a generally flat upper surface and an opposed bottom surface;
b) a base connected to the deck and including a plurality of rocking members depending from the bottom surface, each of the rocking members having a convex rocking underside surface spaced from the bottom surface, the convex rocking surfaces being adapted to support the device on a flat surface for professional movement;
c) each member extending generally radially from a central axis to ends spaced inwardly from the perimeter of the deck thereby allowing rocking of the members about the central axis and precessional rotation of the device around the axis; and,
d) stopping means depending from the deck bottom surface, the stopping means including a plurality of circumferentially spaced stop elements, each having a base surface spaced from the bottom surface, the stop elements and the rocking members each being spaced inwardly from the perimeter of the deck and from the bottom surface sufficiently to restrict the range of precessional motion of the device when in use to maintain the perimeter of the bottom surface in spaced relationship with a device supporting surface and prevent substantial injury to a puppy's paws and tail by pinching between such device supporting surface and any one of the perimeter of the bottom surface, the stop element base surfaces and the rocking members.

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RAPID EXIT HERRINGBONE STALL

William S. Nelson, Sun Prairie, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Dec. 23, 1991, Ser. No. 813,102
Int. Cl.[5] A01K 1/12
U.S. Cl. 119—14.03 7 Claims

1. A milking parlor entry/exit system for use in a parlor having a herringbone configuration in which the cows are

by means of a separable wrapping member, which releases said

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UNIFORM DISTRIBUTION HEAT TRANSFER PIPE

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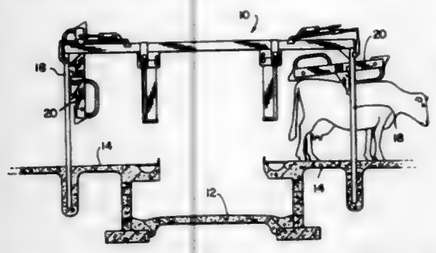
angularly disposed in stalls defined by a herringbone rump rail and cow restraining framework in which the milking is done from the side of the cow's legs, said system comprising:

an elongated rotating gate disposed on the framework and movable in a rotational manner and having elongated rails disposed at opposite ends of the gate,

motive means for moving said gate from a first substantially vertical position to a first substantially horizontal position in which said rails do not obstruct the cow and the cow is allowed to exit from the milking stall,

said motive means also rotating said gate from said substantially horizontal position to a second substantially vertical position so that one of said elongated rails engages the rump of the cow and urges the cow to exit the stall, with said rotational movement between said first substantially vertical position and said second substantially vertical position being substantially continuous with a hesitation in the movement at said first substantially horizontal position, and

means for reversing the movement of said gate so that said gate returns to a third position short of vertical and one of said elongated rails engages the cow and urges said cow rearwardly toward said rump rail.



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COLLAPSIBLE FEEDER AND PROTECTIVE ENCLOSURE

Mary B. Harwich, P.O Box 533, Glencoe, Ill. 60022

Filed May 6, 1992, Ser. No. 879,025

Int. Cl.[5] A01K *5/00*

U.S. Cl. 119—57.9 22 Claims

1. A collapsible protective enclosure and feeder for butterflies and the like, comprising:

a generally cylindrical sidewall including at least two circumferential ribs having therebetween a mesh material having members sufficiently spaced from each other by a distance to have said mesh material allow the ingress and egress of butterflies and the like while excluding larger animals, each of said circumferential ribs generally defining an end of the protective enclosure and feeder;

a peripheral flange having an attachment end pivotally mounted to one of said circumferential ribs, said peripheral flange further having a free end generally opposed to said attachment end, said peripheral flange being movable inwardly to close or outwardly to open one of said ends of the protective enclosure and feeder;

a feeding plate suspended within said protective enclosure and feeder;

suspension means for supporting said feeding plate; and,

hanging means for hanging said protective enclosure and feeder from an overhang support.

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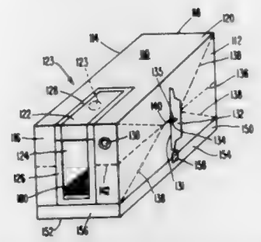
DISPOSABLE LITTER CONTAINER

Aaron S. Hasiuk, 1310 Frost Hallow Rd., Levittown, Pa. 19101

Continuation-in-part of Ser. No. 657,524, Feb. 20, 1991. This application Nov. 18, 1991, Ser. No. 793,209

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—168 5 Claims



1. An extensible disposable litter container for receiving the waste of household pets, the container being extensible from a closed position to an open position, the container comprising:

a rectangular tray having a floor and opposing sides and ends for containing litter material;

a unitary cover member having a top and generally rectangular opposing collapsible sides and opposing collapsible ends, each of the opposing collapsible sides having an extension means affixed thereto, the cover member being releasably attached to the tray when the container is in the closed position, the cover member having at least one vent communicating with the atmosphere; one end of the cover member having a door formed therein for entry and egrees of household pets; the walls and ends of the cover member being folded when the container is in the closed position, the folded walls and ends of the cover member providing an extensive force so as to at least partially extend the cover member away from the tray when the cover member is released from the tray and the container assumes the open position, the folded walls and ends of the cover member being joined at respective edges thereof when the cover member is in the closed position, the cover member consequently not requiring assembly when extended from the closed position to the open position.

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METHOD AND APPARATUS FOR RAISING RUMINANTS

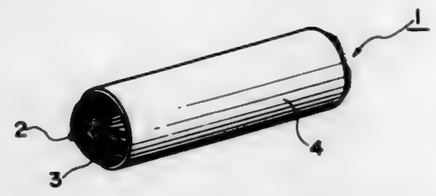
Syotaro Nagamori, Kyota, and Yasuyuki Takada, Tokyo, both of Japan, assignors to Meiwa Sangyo Co., Ltd., Kyoto, Japan

Filed Oct. 15, 1991, Ser. No. 776,629

Int. Cl.[5] A01K *1/00, 3/00*

U.S. Cl. 119—174 6 Claims

3. An apparatus for raising ruminants and stimulating the rumen thereof, comprising a gastric resident object having a body member and a plurality of elastic stimulus members which are secured at and between the ends along the length of said body member so as to extend radially outward from said body member along the length thereof, said plurality of elastic stimulus members being initially wrapped to a small diameter by means of a separable wrapping member, which releases said plurality of elastic stimulus members in the stomach of the ruminant so as to allow said plurality of stimulus members to be expanded to a larger diameter along the length of said resident object.



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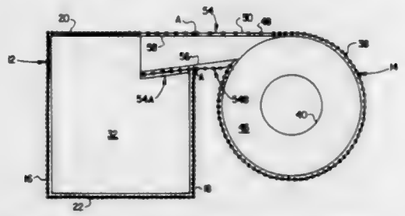
FLUIDIZED BED COMBUSTION SYSTEM UTILIZING IMPROVED CONNECTION BETWEEN THE REACTOR AND SEPARATOR

David H. Dietz, Hampton, N.J., assignor to Foster Wheeler Development Corporation, Livingston, N.J.

Filed Mar. 2, 1992, Ser. No. 844,073

Int. Cl.[5] B09B *3/00;* F22B *1/00*

U.S. Cl. 122—4 D 25 Claims



1. A fluidized bed combustion system comprising:

(a) a reactor having a furnace section;

(b) means for introducing fuel particles into said furnace section;

(c) means for combusting said fuel particles to form gaseous and solid products of combustion;

(d) means for fluidizing said furnace section with a fluidizing gas so that said fluidizing gas combines with said gaseous products of combustion to form flue gases which entrain portions of said fuel particles and said solid products of combustion;

(e) a separator for receiving and separating said flue gases and said entrained material; and

(f) a duct connecting said reactor to said separator for passing said flue gases and said entrained material from said furnace section to said separator, at least a portion of said duct extending within said furnace section, said duct having an inlet for receiving said flue gases and entrained material from said furnace section and an outlet for passing said flue gases and entrained material to said separator, and said duct being wedge shaped so that said inlet has a greater width than said outlet.

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UNIFORM DISTRIBUTION HEAT-TRANSFER PIPE UNIT FOR DOUBLE-LAYER FLUIDS

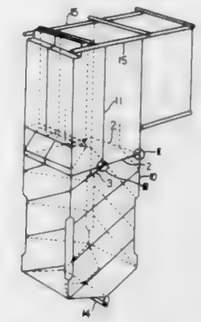
Takashi Tsukino, and Tadashi Gengo, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 716,981

Claims priority, application Japan, Jun. 18, 1990, 2-63571[U]

Int. Cl.[5] F28F *7/00*

U.S. Cl. 122—6 A 2 Claims



1. In a spiral wound type of boiler having a furnace wall, pipes extending spirally around a lower part of the furnace wall, and pipes extending vertically along an upper part of the furnace wall, the improvement wherein a horizontal pipe extends entirely around the periphery of the furnace wall in a horizontal plane, said horizontal pipe being interposed between and opening into the spirally extending and the vertically extending pipes.

5,203,286

APPARATUS FOR HEATING AND DEGASSING WATER

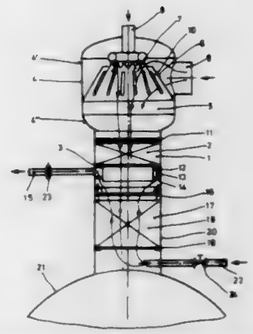
Mustafa Youssef, Zurich, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 10, 1991, Ser. No. 712,703

Claims priority, application Switzerland, Jun. 11, 1990, 1949/90-1

Int. Cl.[5] F16T *1/00;* F22B *37/26*

U.S. Cl. 122—488 5 Claims



1. An apparatus for heating and degassing water by means of steam, essentially consisting of a column array accommodated in a housing and having a water feed line, leading above the column array into the housing, for the water which is to be heated and degassed, and having one steam feed line, leading into the housing, for the heating steam and one deaeration line for the gas/steam mixture which is to be extracted, wherein

the steam feed line is also arranged above the column array

directions to rotate the crankshaft by means of the engage-

5,203,289

receiving bore formed in said rocker arm, a hydraulically

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the steam feed line is also arranged above the column array in the housing and leads into a mixing chamber in which spray means for the water are provided,

a first column charged in co-current is arranged below the mixing chamber,

a second column is provided below the first column, as viewed in the direction of water flow,

a flushing steam feed line leads into the housing below the second column, so that the second column is charged in counter-current,

and the deaeration line leads between the two columns into the housing.

5,203,287

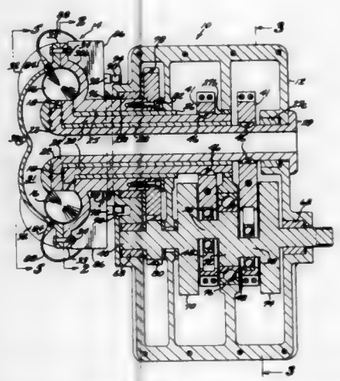
OSCILLATING PISTON ENGINE

Bruce C. Wiley, Grover City, Calif., assignor to Tommy Hasbun, Arroyo Grande, Calif., a part interest

Filed Aug. 7, 1992, Ser. No. 927,131

Int. Cl.[5] F02B *53/00*

U.S. Cl. 123—18 A 20 Claims



1. An internal combustion engine, of the type having a rotating annular cylinder containing a plurality of mutually oscillating pairs of pistons, first means for oscillating the pistons so as to move the pistons in each pair toward and away from each other in accordance with the strokes of the operational cycle of the engine, a crankshaft having at least two crank throws, second means coupled to the crank throws for converting the oscillation of the pistons during the power stroke of the cycle into rotation of the crankshaft, and third means for rotating the cylinder in response to the rotation of the crankshaft, wherein the engine includes an improvement in the second means, comprising:

first and second concentric tubes aligned coaxially with the axis of rotation of the cylinder and journaled for rotation along said axis, each of the tubes having a proximal portion extending into the cylinder, and a distal portion spaced from the cylinder, one piston of each pair of pistons being rigidly fixed to the proximal portion of the first tube, and the other piston of each pair of pistons being rigidly fixed to the proximal portion of the second tube;

a first rigid arm having a first end fixed to the distal portion of the first tube, and a second rigid arm having a first end fixed to the distal portion of the second tube, the first and second arms each having a substantially elliptical aperture spaced from its first end; and

fourth means for journaling each of the crank throws in the elliptical aperture of one of the arms so as to operatively engage each of the arms with one of the crank throws;

whereby the oscillation of the pistons axially rotates the first and second tubes in mutually opposite directions, thereby oscillating the first and second arms in mutually opposite directions to rotate the crankshaft by means of the engagement between the crank throws and the arms.

5,203,288

TWO-STROKE INTERNAL COMBUSTION ENGINES WITH A COMPRESSION-IGNITION OF DIESEL TYPE

Jean Melchior; Thierry Andre, both of Paris, and Henri B. Edelmann, Sevres, all of France, assignors to S.N.C. Melchior Technologie, Paris, France

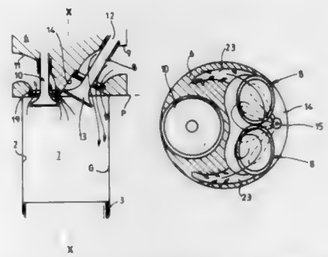
PCT No. PCT/FR91/00056, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO91/12419, PCT Pub. Date Aug. 22, 1991

PCT Filed Jan. 30, 1991, Ser. No. 768,213

Claims priority, application France, Feb. 13, 1990, 90 01683

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—65 VD 7 Claims



1. Two-stroke internal combustion engine with a compression-ignition of Diesel type, which comprises at least one cylinder devoid of lateral ports and at least one piston undergoing a reciprocating motion in this cylinder and delimiting with the cylinder and with a cylinder head a variable-volume combustion chamber, said cylinder head carrying at least one inlet valve and at least one exhaust valve respectively adapted to an air inlet pipe and to an exhaust pipe for exhaust gas, a longitudinal axis of the or each inlet valve making with a longitudinal axis of the cylinder an angle approximately between 30° and 60° so that a stem of this inlet valve is at a greater distance from the axis of the cylinder than an inlet valve head of the inlet valve, this inlet valve head being placed at an inner end of an at least partly cylindrical recess of the cylinder head into which recess a fuel injector discharges and where a depth of said recess increases in a regular manner from the periphery toward the center of the combustion chamber without constituting a constriction toward the combustion chamber so that, when this inlet valve is open, the inlet valve allows flow only on about one half of a periphery thereof in directing the air toward the piston, during the scavenging, along and in the vicinity of the generatrix of the cylinder most remote from the exhaust valve or valves, the engine being equipped with means for starting the engine up and operating the engine at low power, wherein:

the exhaust valve or valves are so arranged as to allow flow on at least the major part of the periphery thereof;

the piston cooperates with a ceiling of the cylinder head so as to leave, in the vicinity of top dead center, only the required operational clearance between the piston and the part of the ceiling of the cylinder head in which the exhaust valve or valves is or are placed; and

said recess is arranged to constitute practically alone the combustion chamber when the piston is in the vicinity of top dead center.

5,203,289

VARIABLE TIMING MECHANISM

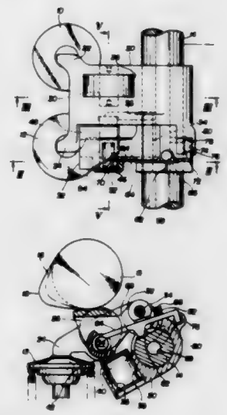
Seinosuke Hara; Shoji Morita, and Yoshihiko Yamada, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Sep. 23, 1991, Ser. No. 763,908

Claims priority, application Japan, Sep. 21, 1990, 2-252703; Sep. 27, 1990, 2-257750; Sep. 27, 1990, 2-257751; Nov. 27, 1990, 2-325083

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.16 35 Claims



1. An apparatus comprising:

a rocker shaft;

a first cam;

a second cam;

a rocker arm pivotally mounted on said rocker shaft, said rocker arm including a first cam follower arranged to engage said first cam,

said rocker arm including a second cam follower, said second cam follower being arranged to engage said second cam;

means for connecting said second cam follower to said rocker arm for a unitary motion, said connecting means having a positive motion state wherein said rocker arm moves with said second cam follower as a unit as said second cam follower follows said second cam and a lost motion state wherein said rocker arm fails to move as a unit with said second cam follower, said connecting means being shiftable between said positive motion state and said lost motion state;

wherein said connecting means includes a first bore formed in said rocker arm, a second bore formed in said second cam follower, a hydraulically operated locking bolt received in said first bore to define therein a hydraulic chamber, said locking bolt movable between an unlocking position wherein said locking bolt is disengaged from said second bore and a locking position wherein said locking bolt is inserted into said bore, and means for resiliently biasing said locking bolt toward said unlocking position;

means for mechanically restraining said connecting means at least against shifting out of said lost motion state toward said positive motion state; and

wherein said mechanically restraining means includes a groove formed in said rocker shaft and having a bottom wall, a timing lever mounted on said rocker arm and having a follower portion in engagement with said bottom wall, a spring arrangement for biasing said timing lever in a first direction to maintain said follower portion of said timing lever in engagement with said bottom wall and biasing said timing lever in a second direction, a piston receiving bore formed in said rocker arm, a hydraulically operated piston received in said piston receiving bore and defining therein a second hydraulic chamber, said hydraulically operated piston being arranged to engage said timing lever and subject to a bias of said spring arrangement in said second direction.

5,203,290

INTAKE AND/OR EXHAUST-VALVE TIMING CONTROL SYTEM FOR INTERNAL COMBUSTION ENGINE

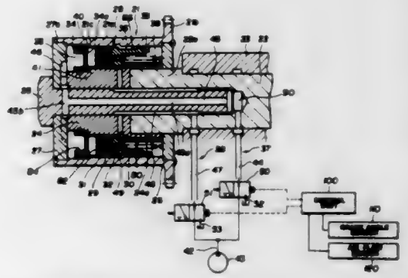
Seiji Tsuruta; Tamotsu Todo, and Hideaki Onishi, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Atsugi, Japan

Filed Aug. 14, 1992, Ser. No. 929,434

Claims priority, application Japan, Aug. 23, 1991, 3-066972[U]

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 6 Claims



1. A valve timing control system for an internal combustion engine comprising:

a rotary member rotatably connected to a crankshaft of the engine;

a camshaft assembly connected to said rotary member rotatably in synchronism with the crankshaft;

piston means disposed between said rotary member and said camshaft assembly, said piston means being displaceable over a range of first, second, and third piston positions, the first piston position being to establish a first phase angle relation between said rotary member and said camshaft assembly, the second piston position being to establish a second phase angle relation where a phase angle between said rotary member and said camshaft assembly is shifted by a first degree from the first phase angle relation, the third piston position being to establish a third phase angle relation where a phase angle between said rotary member and said camshaft assembly is shifted by a second degree greater than the first degree from the first phase angle relation;

sensor means for detecting a preselected engine operating parameter to provide a sensor signal indicative of an engine load level;

a fluid power source for providing fluid pressure for valve timing control;

first pressure chamber means fluidly communicating with said fluid power source through a first pressure line, said first pressure chamber means for exerting fluid pressure on said piston means to be displaced from the first piston position to the second piston position;

second pressure chamber means fluidly communicating with said fluid power source through a second pressure line, said second pressure chamber means for exerting hydraulic pressure on said piston means to be displaced from the second piston position to the third piston position;

a movable member slidably disposed in said first pressure chamber means, said movable member being responsive to elevation in fluid pressure in said first pressure chamber

engine and is low in a substantially transverse direction to that

and allowing free wheeling of the input shaft during re-

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means to be urged to move said piston means from the first piston position to the second piston position; and

control means responsive to the sensor signal from said sensor means indicating a low engine load level for reducing fluid pressures in said first and second pressure chambers below a preselected level to position said piston means at the first piston position, said control means being responsive to the sensor signal indicating an intermediate engine load level for elevating fluid pressure in said first pressure chamber above the preselected level to urge said movable member to move said piston means to the second piston position from the first piston position, said control means being further responsive to the sensor signal indicating a high engine load level for elevating fluid pressure in said second pressure chamber above the preselected level while maintaining the fluid pressure in said first pressure chamber above the preselected level to move said piston means from the second piston position to the third piston position.

5,203,291

VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

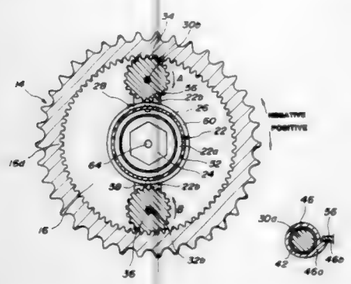
Seiji Suga; Hideaki Onishi, and Akio Akasaka, all of Atsugi, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Jun. 26, 1991, Ser. No. 721,131

Claims priority, application Japan, Jun. 28, 1990, 2-171019; Jun. 28, 1990, 2-171020; Aug. 31, 1990, 2-231205

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **14 Claims**



1. A valve timing control system for an internal combustion engine, comprising:

a hollow rotary housing driven by an engine output and rotatably supported on a camshaft, said rotary housing having an internal toothed circumference;

a rotary member housed within said rotary housing and rigidly connected to said camshaft for rotation therewith, said rotary member having a pair of radially extending portions;

a pair of gears rotatably supported on said radially extending portions, and engaging said internal toothed circumference to be rotatable in accordance with rotation of said rotary housing for causing relative angular displacement of said rotary member to said rotary housing;

regulating means for regulating relative angular displacement of said rotary member to said rotary housing within a predetermined maximum range;

clutch means for restricting rotation of said gears so as to be associated with said regulating means for restricting relative angular displacement of said rotary member to said rotary housing; and

control means for controlling said clutch means in accordance with current engine running condition.

5,203,292

WIRING ARRANGEMENT FOR ELECTRIC PARTS OF AN OUTBOARD MOTOR

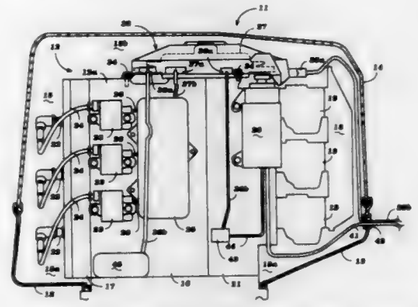
Hitoshi Motose, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 19, 1992, Ser. No. 901,390

Claims priority, application Japan, Jul. 2, 1991, 3-188020

Int. Cl.[5] B63H *21/36*; **F02B** *77/00*

U.S. Cl. 123—143 C **4 Claims**



1. A wiring assembly for an outboard motor including an engine, a cowling defining an engine compartment in which the engine is contained and a cover member disposed in an upper section of the engine compartment, said wiring assembly comprising a printed circuit board contained within the cover and having a plurality of outwardly extending projecting portions, said wiring assembly further comprising a plurality of connectors, one for connection to each of said plurality of projecting portions, and a plurality of branch wires, one attached to each of said connectors, extend from their respective connectors.

5,203,293

AUXILIARY MECHANISM MOUNTING STRUCTURE FOR AN ENGINE

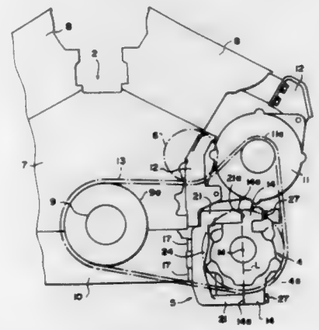
Hidetoshi Shintani; Shouhei Kumano; Kenichi Morizane; Yukio Masuda; Sadashichi Yoshioka, and Toshihiko Osumi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 26, 1991, Ser. No. 721,713

Claims priority, application Japan, Jun. 29, 1990, 2-171884; Aug. 10, 1990, 2-85170[U]; Aug. 10, 1990, 2-213449

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 A **9 Claims**



1. An auxiliary mechanism mounting structure for mounting an auxiliary mechanism on an engine comprising an auxiliary mechanism mounting portion whose bearing rigidity is high in a direction substantially parallel to an axis of a crankshaft of the engine and is low in a substantially transverse direction to that of the axis of the crankshaft of the engine so that the auxiliary mechanism is easy to vibrate in a direction which is substantially transverse to the direction of the axis of the crankshaft of the engine; and

a damping means for damping vibration of said auxiliary mechanism;

wherein said auxiliary mechanism is driven by a driving belt which is passed around a crank pulley connected to the crankshaft of the engine and a pulley connected to said auxiliary mechanism, and said damping means comprises at least another driving belt which is passed around a pulley connected to said auxiliary mechanism and a pulley connected to another auxiliary mechanism.

5,203,294

HORIZONTAL CYLINDER ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

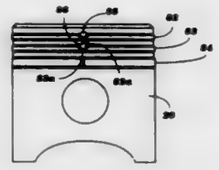
Takao Takemura; Yoshikazu Yamaoka, and Takahide Watanabe, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 25, 1992, Ser. No. 857,371

Claims priority, application Japan, Mar. 26, 1991, 3-84511

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 HC **9 Claims**



1. A cylinder arrangement for a four-cycle internal combustion engine comprising a generally horizontal cylinder bore having no side ports formed therein, a piston positioned for reciprocation within said cylinder bore and formed with a groove around the outer periphery of said piston, a ring having a gap and fitted in said groove, and a pin associated with said ring for positioning and maintaining the gap of said ring in the upper 340° of the outer periphery of said piston.

5,203,295

INTERNAL COMBUSTION ENGINE

Donnie W. Alexander, Nueces County, Tex., assignor to Spiralex Corp., Corpus Christi, Tex.

Filed Aug. 27, 1992, Ser. No. 937,062

Int. Cl.[5] F02B *75/22*

U.S. Cl. 123—197.5 **14 Claims**

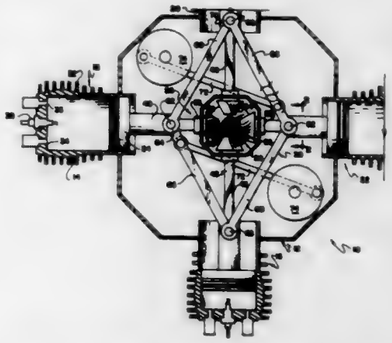
1. An internal combustion engine comprising

a piston-cylinder arrangement including a cylinder having a piston reciprocating therein and a piston rod, the piston moving in a cycle including intake and power strokes;

a power output including an input shaft and an output;

a motion converter connecting the piston rod to the input shaft and comprising a helical groove on the input shaft and a ball carried by the piston rod and riding in the groove for rotating the input shaft upon movement of the piston in the power stroke, and a one-way clutch operating on the input shaft for driving the output during advance of the piston in a first direction in the power stroke and allowing free wheeling of the input shaft during retraction of the piston in a second direction;

means for limiting the stroke of the piston; and



means for moving the piston at the end of the power stroke in the second direction.

5,203,296

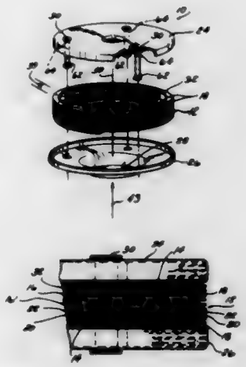
FLAME ARRESTER HAVING HELICAL FLAME ARRESTING MEMBER

James P. Hart, Grosse Point, Mich., assignor to Barbron Corporation, Detroit, Mich.

Filed Apr. 9, 1992, Ser. No. 865,490

Int. Cl.[5] F23D *14/82*

U.S. Cl. 123—198 D **21 Claims**



1. A flame arrester, comprising:

a continuous flame arresting member in the form of a helix having offset interstices between adjacent turns of the helix; and

means for housing the flame arresting member;

wherein, upon installation of the flame arrester on a source of flammable gases, any flame passing through the flame arrester will be extinguished.

5,203,297

ROTARY ENGINE

Dennis D. Iversen, 1600 Cedar St., Sturgis, S. Dak. 57785

Filed Jan. 27, 1992, Ser. No. 826,385

Int. Cl.[5] F02B *53/00*

U.S. Cl. 123—248 **4 Claims**

1. An internal combustion engine including a plurality of pistons unidirectionally and constantly advancing in a circular

intake passage system extending from said intake opening to each of said intake ports for delivering a charge to said intake

capsule includes a face-end (36) including a face-end bottom (31), and the guide socket (33), includes an annular stop (35)

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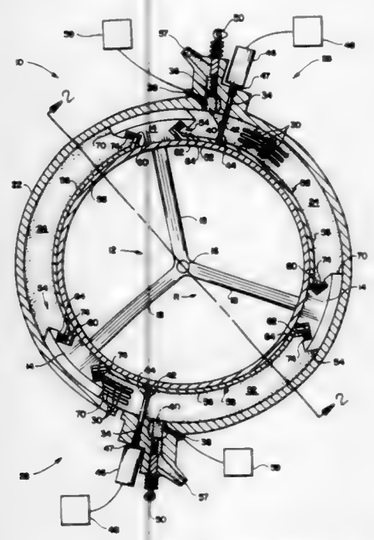
path in a chamber, said circular path defining an axis of rotation, each of said pistons having a forward and a rearward face, all of said pistons being rigidly connected to one another at a common hub means by connecting rod means, said engine also having a central shaft being coaxial with said hub means and connected thereto, said central shaft providing means enabling rotatable drive of engine support functions and of a driven load,

ignition means rotatably driven from said central shaft, camshaft means rotatably driven from said central shaft,

intake valve means operated from said camshaft means,

exhaust port means defining openings in said chamber through which exhaust gases pass upon advancement of each of said pistons past said openings following combustion,

reciprocating valves periodically projecting into and withdrawing from said chamber, said valves comprising plates configured to cooperate with a cross sectional configuration of said chamber, thereby sealing said chamber and defining segments of said chamber, said segments extending between said reciprocating valves and a trailing face

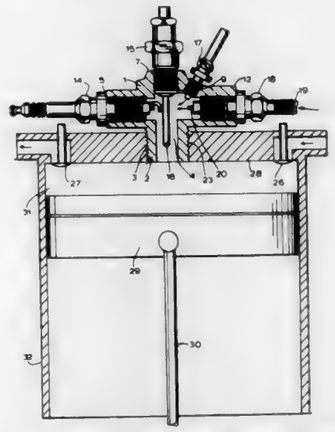


of a passing piston, said segments including said ignition means and serving as combustion chambers, said reciprocating valves normally projecting into said chamber, withdrawing to allow passage thereby of each of said pistons, and returning to their previous positions to projecting positions immediately following said passage,

means to actuate said reciprocating valves,

means to vary effective piston displacement comprising a radially movable wall of said combustion chamber, said radially movable wall approaching and moving away from an opposing radially spaced wall of said combustion chamber, said radially spaced wall being located outwardly of said movable wall relative to said axis of rotation, said movable wall being slidably connected to a rearward face of one of said pistons, and slidably connected to a forward face of an adjacent trailing piston, whereby said movable wall moves radially outwardly and inwardly, relative to said axis of rotation, to the same extent at both said forward piston face and at said rearward piston face, thus varying effective piston displacement.

5,203,298
PRE-COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE
John Manolis, P.O. Box 380, New York, N.Y. 10028
Filed May 29, 1992, Ser. No. 890,243
Int. Cl.[5] F02M *19/00*; F02B *19/00*
U.S. Cl. 123—275 **5 Claims**

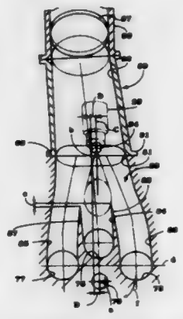


1. A pre-combustion chamber for internal combustion engine comprising:

(i) a cylindrical base portion having threads providing means for threadable engagement with a combustion chamber of an internal combustion engine; and

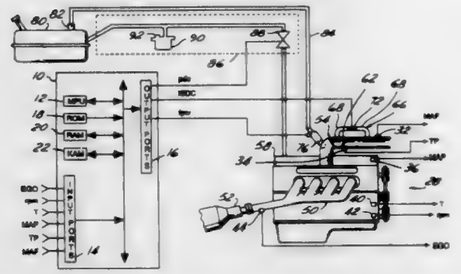
(ii) a plurality of cylindrical inlet ports having threads providing means for threadable engagement with a spark plug, a glow plug, a fuel injector and an air injector.

5,203,299
AIR INTAKE SYSTEM FOR A FUEL INJECTION TYPE FOUR CYCLE ENGINE
Hideaki Ueda, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Feb. 12, 1992, Ser. No. 834,474
Claims priority, application Japan, Feb. 22, 1991, 3-050409
Int. Cl.[5] F02B *31/00*
U.S. Cl. 123—308 **20 Claims**



1. An internal combustion engine having a combustion chamber, at least three intake ports serving said combustion chamber in side by side fashion comprising a center intake port and a pair of side intake ports, a common intake opening formed in an external surface of said engine, a Siamese type intake passage system extending from said intake opening to each of said intake ports for delivering a charge to said intake ports, said common intake opening being offset from the center of said center intake port toward one of said side intake ports, and a fuel injector for spraying fuel into said intake passages from a point offset from the center of said intake opening toward the center of said center intake port.

5,203,300
IDLE SPEED CONTROL SYSTEM
Daniel V. Orzel, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 28, 1992, Ser. No. 967,884
Int. Cl.[5] F02M *3/00*
U.S. Cl. 123—339 **10 Claims**



1. A method for controlling idling speed of an engine by controlling a bypass throttle connected in parallel to a primary engine throttle and also controlling purge flow through a vapor recovery system into an air/fuel intake of the engine, comprising the steps of:

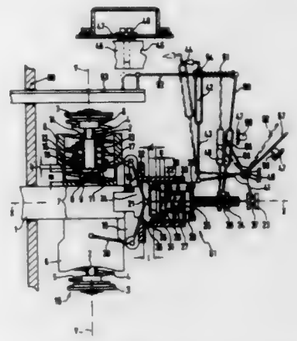
positioning the bypass throttle to decrease any difference between a desired engine idle speed and actual engine idle speed;

adjusting the purge flow to maintain said bypass throttle position within a preselected range; predetermined mass per unit of time; and

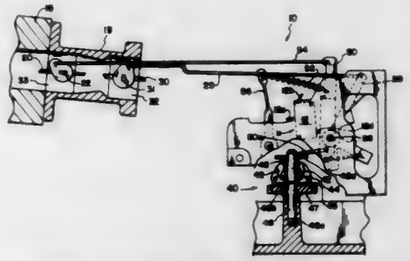
decreasing rate of vapor purge in a preprogramed manner in response to said detection step.

5,203,301
CONTROL CAPSULE FOR A CENTRIFUGAL SPEED GOVERNOR
Sieghart Maier, Gerlingen, and Guenther Koch, Zweibruecken, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed May 8, 1992, Ser. No. 880,270
Claims priority, application Fed. Rep. of Germany, May 10, 1991, 4115301
Int. Cl.[5] F02D *31/00*
U.S. Cl. 123—373 **2 Claims**

1. A control capsule for a centrifugal speed governor, which is disposed axially adjustably in a guide socket (**33**) and includes a governor sleeve (**24**) which includes one end (**28**) supported on said control capsule, and an adaptation sleeve (**23**) positioned relative to said governor sleeve, said control capsule includes a first support part (**25**) and a second support part (**26**) which are movable relative to each other within said capsule (**29**) and which are supported against one another by means of a helical spring (**27**) and an adaptation sleeve connecting part (**22**), said adaptation sleeve connecting part (**22**) includes one portion which extends through the control capsule (**29**) and a portion which extends through the governor sleeve (**24**) one end of said adaptation sleeve connecting part is pivotably connected to flyweights (**6**) of the centrifugal speed governor with the opposite end which passes through the governor sleeve connected to the adaptation sleeve (**23**), said control capsule includes a face-end (**36**) including a face-end bottom (**31**), and the guide socket (**33**), includes an annular stop (**35**) located axially adjacent the face-end (**36**) of the control capsule (**29**), the face-end bottom (**31**) of the control capsule (**29**) is provided with a stp (**32**) that protrudes radially from the annular stop (**35**); the face-end bottom (**31**) has a constant thickness (d); and the position of the face-end (**36**) of the face-end bottom (**31**) that comes to rest on the annular stop (**35**) is variable within a thickness range (d), depending on the height of the step (**32**).



5,203,302
OVERLOAD WARNING APPARATUS FOR INTERNAL COMBUSTION ENGINES
William A. Parnitzke, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jan. 27, 1992, Ser. No. 826,023
Int. Cl.[5] F02D *31/00*
U.S. Cl. 123—376 **10 Claims**



1. An internal combustion engine, comprising:

a carburetor including a fuel-air mixture conduit having an outlet opening;

a throttle plate in said conduit for controlling the flow of the fuel-air mixture through said outlet opening, said throttle plate being movable between a closed position and wide open position which permits a predetermined flow of fuel-air mixture through said outlet opening;

governor means mounted on the engine and driven thereby and responsive to engine speed, said governor means being operatively connected to the throttle for adjusting the throttle in accordance with engine speed;

a switch that is mechanically actuated by engagement of said throttle plate into said wide open position, wherein actuation of said switch produces an electrical signal; and

means energized by said electrical signal for indicating to an operator that said throttle plate is in said wide open position.

5,203,303

connection elements (**121**, **122**) which protrude axially from

tive fuel injector control signal to the first and second alternative fuel injectors

vapor pump including means for pumping fuel vapor from

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5,203,303

FUEL PUMPING APPARATUS

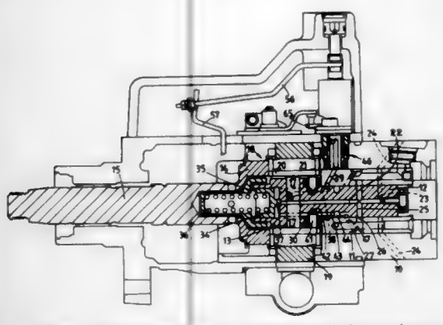
Peter A. G. Collingbora; Kenenth M. Harris, and Derek W. Tomsett, all of Kent, England, assignors to Lucas Industries, West Midlands, England

Filed Jan. 2, 1991, Ser. No. 636,727

Claims priority, application United Kingdom, Jan. 25, 1990, 9001736

Int. Cl.[5] F02M *41/00*

U.S. Cl. 123—450 7 Claims



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a rotary distributor member journalled in a pump body and driven in use in timed relationship with the engine, a pumping plunger mounted in a bore in the distributor member, cam means for imparting inward movement to the pumping plunger, a delivery passage communicating with the bore, and the delivery passage registering in turn with a plurality of outlets in the pump body during successive inward movements of the pumping plunger, a spill valve operable to allow fuel to spill from the bore, a fluid pressure operable piston for actuating the spill valve, an auxiliary plunger carried by the distributor member and operated at the same time as the pumping plunger to deliver actuating fluid, and a control valve including a fluid pressure operable component movable by the fluid delivered by the auxiliary plunger, said control valve controlling the application of fluid under pressure to said piston,

wherein at a predetermined position in the movement of said component the control valve opens to apply fluid under pressure delivered by said auxiliary plunger to the piston, and said control valve further including an adjustable member operable to vary said predetermined position, thereby allowing the quantity of fuel delivered by the apparatus to be varied.

5,203,304

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Udo Hafner, Ludwigsburg, and Ferdinand Reiter, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE91/00015, § 371 Date Aug. 19, 1991, § 102(e) Date Aug. 19, 1991, PCT Pub. No. WO91/11608, PCT Pub. Date Aug. 8, 1991

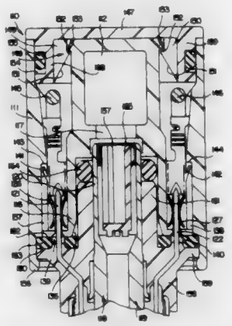
PCT Filed Jan. 10, 1991, Ser. No. 752,433

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002393

Int. Cl.[5] F02M *55/02, 39/00*

U.S. Cl. 123—456 24 Claims

1. A fuel injection system for internal combustion engines, having a plurality of electromagnetically operable fuel injection valves of the top-feed type in combination with a fuel distributor which has a distributor housing duct formed along a length of the fuel distributor housing, comprising a valve housing with a supply connection (120) having an end-face fuel supply opening and, for valve control, two electrical plug connection elements (121, 122) which protrude axially from the valve housing and extend at a parallel distance from one another on diametrical sides of the supply connection (120), said fuel distributor housing begins with a fuel supply and ends with a fuel drain and includes a number of connecting branches (116) which correspond to the plurality of fuel injection valves, said connecting branches (116) are integral with the fuel distributor housing and connected via outlet openings with the distributor duct, said valve housings are inserted into said connecting branches in a fluid-tight manner with the supply connections (120) of the fuel injection valves in alignment with said outlet openings, said electrical plug jacks (126, 127) are integrated with the fuel distributor housing and de-



signed for corresponding acceptance of the electrical plug connection elements (121, 122) and, in each case, two of the plug jacks (126, 127) are allocated to a connecting branch (116) in the fuel distributor housing in such a way that when the supply connection (120) is pushed into an insertion opening (136) of the connecting branch (116), the electrical plug connection elements (121, 122) also penetrate into the associated plug jacks (126, 127), and in which each connecting branch (116) includes two separate pockets (137, 138) located near the insertion opening (136) for the supply connections (120) of the fuel injection valves (118) in which the plug jacks (126, 127) each of which is connected to a connecting conductor (145, 146) is accommodated.

5,203,305

APPARATUS AND METHODS FOR CONVERTING CONVENTIONALLY FUELED ENGINES TO OPERATE ON AN ALTERNATIVE FUEL

Fred C. Porter, 447 E. Elmwood, and Garth J. Schultz, 2111 Lovington Ave., Apt. #106, both of Troy, Mich. 48083

Continuation-in-part of Ser. No. 758,894, Sep. 11, 1991, Pat. No. 5,150,685. This application Jun. 25, 1992, Ser. No. 903,920

Int. Cl.[5] F02D *41/04;* F02M *21/02*

U.S. Cl. 123—478 16 Claims

1. A method of operating an internal combustion engine with an alternative fuel, the method comprising the steps of:

providing first and second alternative fuel injectors in fluid communication with the alternative fuel;

measuring the temperature of the alternative fuel;

generating an intermediate alternative fuel injector control signal in response to the temperature of the alternative fuel and the energy content differential of conventional fuel and the alternative fuel;

adjusting the intermediate alternative fuel injector control signal to a final alternative fuel injector control signal in accordance with the flow and operating characteristics of the alternative fuel injector; and

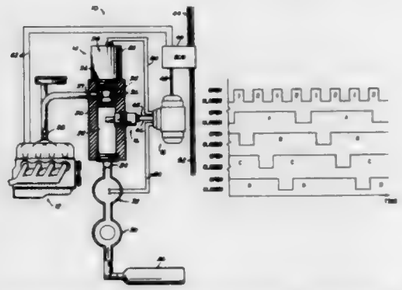
transmitting the final alternative fuel injector control signal to the first alternative fuel injector until the load on the engine increases past the capacity of the first alternative fuel injector, and thereafter transmitting the final alternative fuel injector control signal to the first and second alternative fuel injectors.

16. A method of converting a conventionally fueled internal combustion engine to operate with an alternative fuel, the engine having an electronic control module which generates a control signal to a conventional fuel injector, the method comprising the steps of:

providing an alternative fuel injector in fluid communication with the alternative fuel;

measuring the temperature of the alternative fuel;

generating an intermediate alternative fuel injector control



signal in response to the temperature of the alternative fuel and the energy content differential of conventional fuel and the alternative fuel;

adjusting the intermediate alternative fuel injector control signal to a final alternative fuel injector control signal in accordance with the flow and operating characteristics of the alternative fuel injector;

varying the timing of the start of the final alternative fuel injector control signal as a function of the fuel flow rate demanded by the engine; and

transmitting the final alternative fuel injector control signal to the alternative fuel injector.

5,203,306

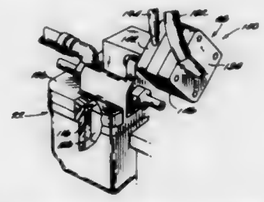
FUEL FEED SYSTEM

Henry C. Billingsley, Kenosha, Wis.; David J. Hartke, and Glenn R. Belec, both of Gurnee, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 489,279, Mar. 2, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,769

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—518 13 Claims



1. A fuel feed system for an internal combustion engine, said system comprising

a vapor separator including a fuel chamber having an inlet and an outlet and being adapted to contain a supply of fuel, said vapor separator including means for venting fuel vapor from said chamber when said supply of fuel is below a predetermined level,

a fuel pump communicating with said vapor separator for supplying fuel to the internal combustion engine, and

a vapor pump which is independent of said fuel pump and which is communicable with said means for venting fuel vapor and a source of cyclically varying pressure, said vapor pump including means for pumping fuel vapor from said vapor separator and to a location remote from the source of alternating pressure.

5,203,307

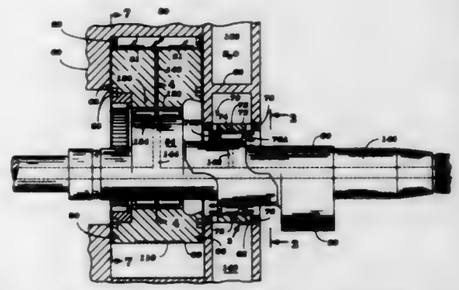
ROTARY WANKEL TYPE ENGINE

Wilson A. Bartis, 5011 Harvard Ave., Westminster, Calif. 92683

Continuation-in-part of Ser. No. 373,231, Jun. 29, 1989, abandoned. This application Aug. 1, 1990, Ser. No. 561,924

Int. Cl.[5] F02B *53/00*

U.S. Cl. 123—242 20 Claims



1. A rotary engine system comprising a crankshaft characterized by at least two spaced crankshaft lobes separated by a center bearing portion; at least two rotors, each one coupled on a corresponding one of said lobes of said crankshaft, each said rotor characterized by a plurality of rotor apexes and first and second opposing rotor side surfaces; engine housing defining a pair of trochoidal chambers separated by a center wall; a crankshaft center main roller bearing for supporting said center bearing portion of said crankshaft between said spaced lobes, said roller bearing comprising a one piece bearing outer race secured to the engine housing center wall, said bearing outer race characterized by an inner diameter large enough that said outer race can be slipped over one of said crankshaft lobes during assembly of said engine system, said roller bearing further comprising a plurality of roller bearing members journalled in said race and journalling said crankshaft center bearing portion, and retainer means for retaining said roller bearings within said outer race; apex sealing means for sealing between the rotor apexes and the engine housing; and side sealing means for sealing the interface between the rotor side surfaces and the engine housing.

5,203,308

DEVICE FOR INJECTING A FUEL-GAS MIXTURE

Uwe Liskow, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE91/00151, § 371 Date Nov. 20, 1991, § 102(e) Date Nov. 20, 1991, PCT Pub. No. WO91/14865, PCT Pub. Date Oct. 3, 1991

PCT Filed Feb. 23, 1991, Ser. No. 775,982

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009320

Int. Cl.[5] F02M *67/00, 69/08, 69/50*

U.S. Cl. 123—531 19 Claims

1. A device for injecting a fuel-gas mixture into an intake tube or directly into cylinders of an internal combustion engine, which comprises a fuel injection valve including a valve closing body actuatable as a function of an opening state for delivery of fuel to a number of equally spaced injection ports (15) in an injection end (3) of a valve housing (4), a valve cap (7) is disposed at least in an axial direction between the valve housing (4) and a distributor housing (10), said valve cap (7) includes transport conduits (17) in alignment with said injection ports (15), said injection ports (15) and said transport conduits (17) correspond in number to the number of cylinders,

said distributor housing (10) includes an axially aligned gas

charger for permitting an intake air flow therein to bypass the supercharger; and

of said intermittent closing means at each cycle during an

fluidly connecting an intake air passageway and an ex-

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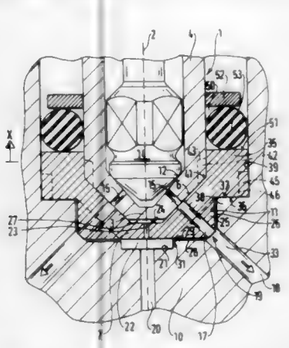
said distributor housing (10) includes an axially aligned gas delivery opening (20) that extends concentrically with a longitudinal valve axis as well as including distributor lines (18) that include distributor openings (19) which are disposed concentrically with the injection ports (15) and transport conduits (17), said injection ports (15) are aimed toward said transport conduits, each of which discharge into one of the distributor open-



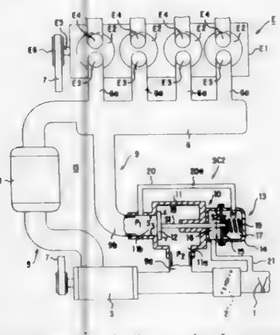
ings (19) which is surrounded at least partially by a gas gap (28), said gas gap (28) extends from the gas delivery opening which surrounds and communicates with the distributor openings (19) and discharges gas at a fast rate which is aimed at the transport conduits (17) and the distributor openings (19), which gas surrounds the fuel discharged into each one of the distributor openings (19) from each of the transport conduits (17).

5,203,309

INTAKE SYSTEM WITH SUPERCHARGER FOR INTERNAL COMBUSTION ENGINE

Tsuyoshi Goto, and Kouichi Hatamura, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 25, 1991, Ser. No. 645,927
Claims priority, application Japan, Jan. 25, 1990, 2-15737
Int. Cl.[5] F02B *33/00*
U.S. Cl. 123—564 **10 Claims**



1. An intake system including an intake passage provided with a throttle valve and a supercharger, in order, from an upstream side of the intake passage, for delivering intake air having a supercharged pressure created by the supercharger into cylinders of an internal combustion engine, said intake system comprising:

a bypass passage branching off from the intake passage between the throttle valve and the supercharger and connected to the intake passage downstream of the supercharger for permitting an intake air flow therein to bypass the supercharger; and

pressure controlled valve means disposed in said bypass passage for causing and shutting off said intake air flow in said bypass passage, said pressure controlled valve means including a pressure operated actuator having a first pressure chamber, a second pressure chamber, and a communication pipe connecting a portion of said bypass passage downstream of said pressure controlled valve means with said second pressure chamber, said pressure controlled valve means including a valve receiving, in one direction, the supercharged pressure in said intake passage downstream of the supercharger from said portion of said bypass passage downstream of said pressure controlled valve means and a negative pressure created by the intake air flow in the intake passage between the throttle valve and the supercharger from a portion of said bypass passage upstream of said pressure controlled valve means so as to allow said intake air flow and, in another direction opposite to said one direction, a pressure from said communication pipe and said second pressure chamber which is substantially equal to the supercharged pressure so as to shut down said intake air flow, thereby regulating the amount of intake air flowing in said bypass passage, depending upon said negative pressure, so as to control the supercharged intake air pressure,

said pressure controlled valve means further including a valve housing forming therein a pressure chamber and supporting said valve in said pressure chamber for linear movement, which valve housing has an inlet port for introducing said negative pressure into said pressure chamber so as to apply it to said valve and an outlet port for introducing said supercharged pressure so as to apply it to said valve, said pressure operated actuator introducing said pressure which is substantially equal to the supercharged pressure to the valve in the other direction and including an actuator housing secured to said valve housing and forming therein said second pressure chamber, and diaphragm means disposed in said actuator housing and operationally coupled to said valve for receiving and applying said pressure from said communication pipe to said valve in the other direction,

said diaphragm means comprising a restorable diaphragm connection to said valve and urging means for deflecting said restorable diaphragm in the other direction,

said restorable diaphragm forming said first pressure chamber and said second pressure chamber so that they are air-tightly isolated from each other, the second pressure chamber being in communication with said outlet port, the first pressure chamber being in communication with said intake passage upstream of said throttle valve, said urging means being disposed in at least one of said first pressure chamber and said second pressure chamber.

5,203,310

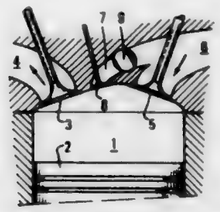
PROCESS FOR REDUCING THE HARMFUL COMPONENTS IN EXHAUST GAS AND ENGINE IMPLEMENTING THE PROCESS

Bertrand Gatellier, Boulogne, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 29, 1991, Ser. No. 783,780
Claims priority, application France, Oct. 30, 1990, 90 13602
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—568 **21 Claims**

1. A four-stroke internal combustion engine comprising at least one cylinder provided with at least one intake valve connected with a fresh gas intake pipe during intake phases and at least one exhaust valve connected with a waste exhaust pipe during exhaust phases, an auxiliary pipe communicating at a first end with said intake pipe and at a second end with the exhaust pipe directly out of said exhaust valve, an intermittent closing means for controlling reinjection of waste gas through said auxiliary pipe, and control means for controlling opening

of said intermittent closing means at each cycle during an opening window of at least one of a duration and phasing of said intermittent closing means in dependence upon load con-



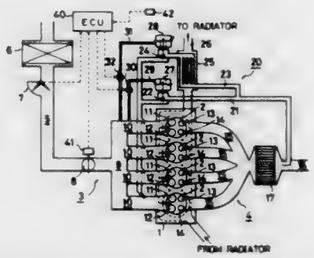
ditions of the engine, thereby allowing reinjection of waste gas during a selected part of each intake phase where waste gas is the richest in harmful discharges.

5,203,311

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Mitsuo Hitomi; Toshihiko Hattori; Kenji Kashiyama; Juneou Sasaki; Kazuaki Umezawa; Tadayoshi Kaide; Noriyuki Iwata; Naoyuki Yamagata, and Kazumasa Nomura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 5, 1991, Ser. No. 788,128
Claims priority, application Japan, Nov. 6, 1990, 2-298918; Nov. 6, 1990, 2-298919; Nov. 6, 1990, 2-298920
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—570 **28 Claims**



1. An exhaust gas recirculation system for an internal combustion engine having an outside exhaust gas recirculation duct connected to an exhaust system of the internal combustion engine and an intake system thereof for recirculating a portion of exhaust gases into the intake system, wherein:

said outside exhaust gas recirculating duct is provided with an exhaust gas recirculation cooler, said internal combustion engine is an engine having a high compression ratio and a supercharger disposed in the intake system and wherein said supercharger is of a mechanical type drivable by output of the engine.

5,203,312

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshiya Sato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

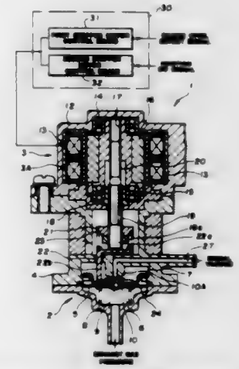
Filed May 6, 1992, Ser. No. 879,834
Claims priority, application Japan, May 14, 1991, 3-138425
Int. Cl.[5] F02M *25/06*
U.S. Cl. 123—571 **8 Claims**

1. An exhaust gas recirculation system for an internal combustion engine, comprising:

means defining an exhaust gas recirculation passage for fluidly connecting an intake air passageway and an exhaust gas passageway of the engine;

an exhaust gas recirculation control valve disposed in said exhaust gas recirculation passage, said exhaust gas recirculation control valve including a diaphragm defining a vacuum chamber into which a signal vacuum is supplied, and means for controlling an amount of exhaust gas flowing through the exhaust gas recirculation passage in response to said signal vacuum;

a vacuum control valve including a diaphragm defining an atmospheric chamber and an exhaust pressure chamber respectively on the opposite sides of said diaphragm, said exhaust pressure chamber being supplied with an exhaust gas pressure prevailing in said exhaust gas recirculation passage downstream of said exhaust gas recirculation control valve, means defining an atmospheric air introduction port which is opened to said atmospheric chamber and communicated with said vacuum chamber of said



exhaust gas recirculation control valve, a valve member secured on said diaphragm and located facing said atmospheric air introduction port, said valve member being capable of closing and opening said atmospheric air introduction port so as to modify said signal vacuum, spring means for biasing said diaphragm in a direction of movement relative to said atmospheric air introduction port, and a stepper motor for changing a biasing force of said spring means;

means for controlling the stepper motor in accordance with an engine operating condition, said controlling means including first control means for controlling the stepper motor in a first manner to regulate an amount of exhaust gas passing through the exhaust gas recirculation passage, and second control means for controlling said stepper motor in a second manner to maintain said valve member at a position remote from said atmospheric air introduction port during stopping of the engine.

5,203,313

EGR VENTURI COUPLER

Timothy F. Rotarius, New Baltimore, Mich., assignor to Bundy Corporation, Warren, Mich.

Filed Jun. 19, 1992, Ser. No. 901,491
Int. Cl.[5] F02M *25/06*
U.S. Cl. 123—571 **15 Claims**

1. An exhaust gas recirculation system for an internal combustion engine comprising:

a conduit with an exhaust inlet and an exhaust outlet;

a venturi located within said conduit through which exhaust gases flow;

pressure taps located on each side of said venturi for indicating the pressure on each side thereof;

a transducer connected to said pressure taps for sensing the

at least one baffle that delays the escape of hot gases from

mounted thereto, said control valve being adapted to be

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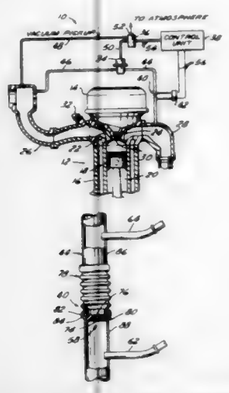
pressure differential across said venturi and producing an electric output signal indicative thereof;

a valve disposed in said conduit and operable to closed, open and partially open positions to control the rate of flow of exhaust gases through said conduit from said inlet through said outlet for recirculating the exhasut gases through an internal combustion engine; and



an electronic control unit operably connected to said transducer for receiving the output signal thereform and to said valve for varying the extent to which said valve is open to control the rate of flow of recirculating exhaust gases in response to varying engine operating conditions, whereby said valve is controlled by said control unit as a function of the pressure differential across said venturi such that said valve controls recirculating exhasut gas flow through the engine.

5,203,314

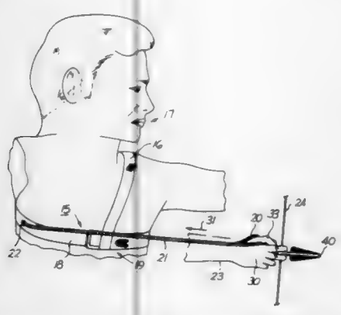
ARCHER'S AID FOR DRAWING BOWSTRING

William H. Green, 527 Clarks Run Rd., La Plata, Md. 20646

Filed Dec. 6, 1991, Ser. No. 803,064

Int. Cl.[5] F41B *5/18*

U.S. Cl. 124—35.2 **6 Claims**



1. Apparatus for assisting an archer to draw a bowstring, comprising in combination, a harness constructed with means for supporting it upon the upper torso of an archer, an elastic cord affixed to the harness with one end disposed for grasping and stretching by a hand of the archer when attempting to draw the bowstring, the cord being adapted for elastically extending away from the harness to a position alongside a drawing arm in response to manual force of the archer's arm reaching for a bowstring, thereby to store energy in the cord in a vectorial direction for exerting a drawing force on the bowstring, thereby to aid the archer by supplementing the manual energy of the arm for breaking the bow and drawing the bowstring, an archer's glove, and mating fittings on the glove and elastic cord for attaching the cord to the glove.

4. The method of drawing a bowstring comprising the steps of stretching an elastic member anchored to an archer's body with an archer's arm reaching for the bowstring to draw it thereby to store a force on a forward stroke of the arm for supplementing manual force supplied by the archer's arm during a return stroke to draw the bowstring, and drawing the bowstring with the dual force of the stretched elastic member and the manual force in the arm coupled to the bowstring.

5,203,315

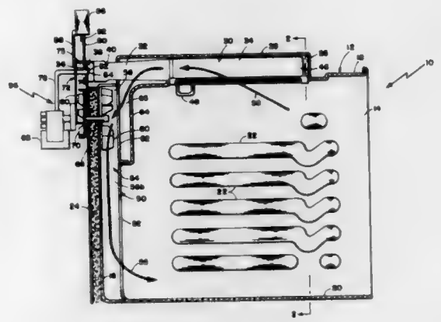
GAS CONVECTION OVEN WITH DUAL FUNCTION BURNER

Lawrence G. Clawson, Dover, and Edward R. Cook, Northborough, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 18, 1992, Ser. No. 931,750

Int. Cl.[5] A21B *1/00*

U.S. Cl. 126—21 A **16 Claims**



1. A gas oven comprising:

a cooking chamber;

a burner operatively coupled to said cooking chamber, said burner having a downwardly facing outer screen; and

means for operating said burner in alternate first and second modes wherein, in said first mode, said screen is heated to a predetermined temperature to produce radiant energy of a predetermined magnitude and, in said second mode, said screen serves as a flame holder to produce hot gases with said screen being at a temperature substantially below said predetermined temperature.

5,203,316

PORTABLE CAMP STOVE

Wayne Pritchett, 4075 Lasalle Ave., Culver City, Calif. 90230

Continuation of Ser. No. 487,727, Mar. 6, 1990, abandoned, which is a continuation of Ser. No. 194,951, May 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 839,158, Mar. 13, 1986, Pat. No. 4,744,381. This application Nov. 18, 1991, Ser. No. 794,675

Int. Cl.[5] F24B *3/00*

U.S. Cl. 126—29 **18 Claims**

1. A portable camp stove comprising:

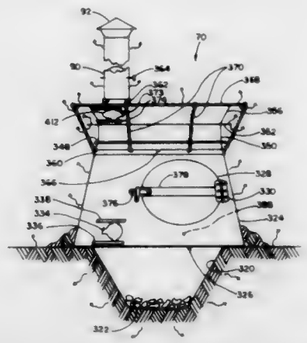
a generally frusto-conical main body defining a main combustion chamber;

an open bottom which allows for the placement of the stove over a fire in a pit in the earth;

means including at least one cylindrical section above said frusto-conical main body, forming a spiral flue chamber having an inlet in communication with said combustion chamber and an outlet, said spiral flue chamber containing

at least one baffle that delays the escape of hot gases from said inlet to said outlet;

a corrugated metal divider, located at the bottom of said frusto-conical main body, which together with said frusto-



conical main body forms a preheating chamber in which air traverses from an opening means in said frusto-conical main body and is preheated before the air enters the main combustion chamber through an opening means in said corrugated metal divider.

5,203,317

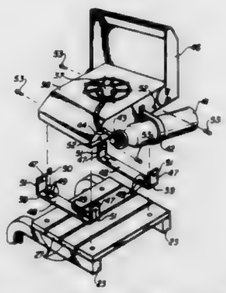
AUXILIARY BURNER

Charles W. James, Columbus, Ga., assignor to W. C. Bradley Company, Columbus, Ga.

Filed Aug. 10, 1990, Ser. No. 565,464

Int. Cl.[5] F24C *3/00*

U.S. Cl. 126—41 R **18 Claims**



1. For use with a barbecue grill cart assembly having a plurality of generally vertical leg members having side shelf members extending laterally therefrom and laterally from the sides of the cart, wherein each of the side shelves includes a supporting surface formed of an array of slats,

an auxiliary burner assembly comprising one or more support members adapted to be mounted on the slats of one of the side shelves, and comprising:

a burner unit,

a housing for said burner unit, means for preventing heat transfer from said burner unit to the slats comprising means for mounting said housing on the slats of one of the shelves in spaced relation to the slats, said means including said one or more support members,

means for mounting a source of burner fuel on one side of said housing,

a fuel conduit mounted to said housing and having first and second ends, the first end of said fuel conduit being connected to said burner unit for supplying fuel thereto, and the second end of said fuel conduit having a control valve mounted thereto, said control valve being adapted to be mounted to the source of burner fuel for controlling the amount of fuel flowing therefrom through said fuel conduit to said burner.

5,203,318

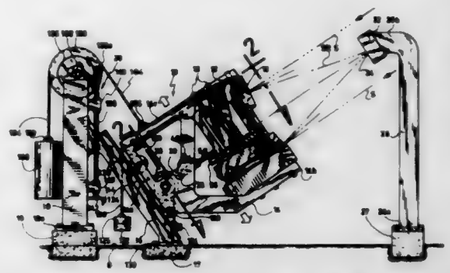
SUN TRACKING SOLAR CONCENTRATOR

Maxime Chauvet, P.O.B. 941 Station "M", Halifax (n.S.) B3J 2Y9, Canada

Filed Aug. 6, 1992, Ser. No. 925,165

Int. Cl.[5] F24J *2/38*

U.S. Cl. 126—606 **8 Claims**



1. A sun tracking solar concentrator for collecting and storing infra-red heat from sun-rays sun-rays, comprising:

a first, ground-embedded frame having an upper portion;

collection means, fixedly mounted to said first frame upper portion, for sunray absorption and heat retention;

a second, ground-embedded frame located at a selected distance from said first frame, said second frame including an inclined ramp in spaced facing register with said collector means, the latter inclined ramp to extend about a plane substantially parallel to this Earth's axis of rotation;

carriage means, movably mounted to said second frame inclined

ramp, for slopewise displacement thereover;

mirror means, carried by said carriage means for reflecting incident sunrays toward said collector means;

power means, for continuously pivoting said mirror means relative to said carriage means during daylight about pivotal axes to be parallel to the Earth's axis of rotation, from a dawn, sun-facing position, to a dusk, sun-facing position, so as to continuously track the sun during a single daylight period, whereby the reflected sunrays continuously converge toward said collector means daylong; and

actuator means for incrementally displacing said carriage means and associated mirror means, once each day, slopewisely of said second frame inclined ramp, so as to continuously track the sun yearlong.

5,203,319

FLUID CONTROLLED BIASED BENDING NECK

Dominick Danna; Allan I. Krauter, both of Syracuse, and Raymond A. Lia, Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Division of Ser. No. 539,232, Jun. 18, 1990, Pat. No. 5,018,506. This application Feb. 8, 1991, Ser. No. 652,660

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 **7 Claims**

1. A tubular, fluid controlled bending neck that comprises a plurality of elastomeric bladders, a tubular braid disposed over said bladders and confining the same; proximal and distal fittings sealing the proximal and distal ends of the bladders and mechanically attaching to the proximal and distal ends of the braid, means for selectively communicating fluid pressure from a controlled fluid pressure source to the interiors of said blad-

engaging the front of the epiglottis and seating over the

place same vertically on a pivot connection to thereby apply a

outlet opening in the end cap, said tubular band sized to sealingly fit over the outlet end of the expansion chamber;

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ders for controllably inflating selected ones thereof, and an elastically bendable but substantially axially incompressible spine centrally disposed within said braid and with said bladders being distributed about the spine, said spine being connected mechanically to said proximal and distal fittings, such

that when fluid pressure is applied to a selected one of the bladders, the braid expands laterally and shortens axially on the side adjacent the inflated bladder, thereby bending the spine and the neck a controlled amount that depends on the fluid pressure applied.

5,203,320

TRACHEAL INTUBATION GUIDE

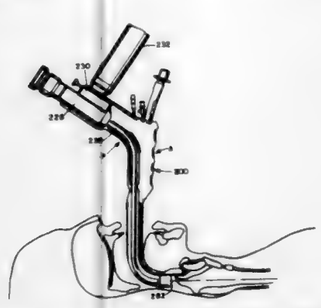
Scott D. Augustine, Blue Springs, Mo., assignor to Augustine Medical, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 356,295, May 22, 1989, Pat. No. 5,042,469, which is a continuation-in-part of Ser. No. 126,567, Nov. 30, 1987, Pat. No. 4,832,020, which is a continuation-in-part of Ser. No. 30,697, Mar. 24, 1987, abandoned. This application Jul. 12, 1991, Ser. No. 730,266

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.[5] **A61B** *1/26;* **A61M** *16/00*

U.S. Cl. 128—10 **20 Claims**



1. A tracheal intubation guide for inserting a tube into the trachea of a patient, comprising:

a single, unitary guide member having a proximal and a distal end, a proximal section including said proximal end, a distal section including said distal end, said distal section including a curvature conforming to the curvature of the rear end of a patient's tongue, and an intermediate section extending between said proximal section and said distal section;

a leading edge formed in said guide member at said distal end;

means formed in said guide member at said leading edge for engaging the front of the epiglottis and seating over the hyo-epiglottic ligament;

a centerline extending substantially midway through said leading edge and said means for engaging;

means for supporting an endoscope in said guide member for viewing along said centerline; and

means formed in said guide member for supporting an endotracheal tube adjacent said centerline.

5,203,321

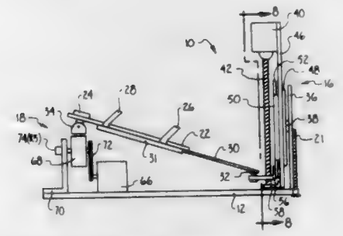
PASSIVE ANATOMIC ANKLE-FOOT EXERCISER

Thomas L. Donovan, Lompoc, and R. J. Allemandi, Sunnyvale, both of Calif., assignors to Sutter Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 625,430, Dec. 11, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 763,636

Int. Cl.[5] **A63B** *23/08, 23/10*

U.S. Cl. 128—25 B **20 Claims**



9. An ankle-foot exerciser comprising:

a base;

foot holding means mounted to the base and including a foot platform for a patient's foot with a heel portion and a toe portion;

drive means including a drive motor and a drive auger adjustably mounted on the base and pivotally and slidably attached to the toe portion of the foot platform for moving the foot platform alternately in an up and down or in and out motion in order to alternately generate plantarflexion and dorsiflexion or to alternately generate abduction and adduction of the patient's foot with the drive means adjustable to generate pure plantarflexion and dorsiflexion motion or pure abduction and adduction motion or a combination of both;

foot tilting means pivotally attached to the heel portion of the foot platform for continuously tilting the foot platform through a range of motion responsive to the motion of the drive means to generate inversion and eversion of the patient's foot; and

control means for controlling and coordinating the drive means and the foot tilting means.

5,203,322

SUPPORT MECHANISM FOR TREATMENT DEVICE

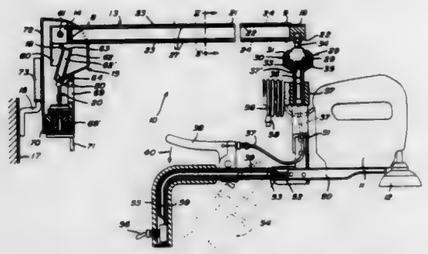
Pierre Isabelle, 5360 Bégin St., St-Hubert, Quebec, Canada J3Y 2P9; Marc A. Archambault, 8774 Rene-Labelle St., Montreal, Quebec, Canada H2M 2L7, and Mario Goulet, 40 Terrasse Barbeau, Lavaltrie, Quebec, Canada J0K 1H0

Filed Sep. 3, 1991, Ser. No. 753,847

Int. Cl.[5] **A61H** *23/00, 31/02*

U.S. Cl. 128—55 **13 Claims**

1. An adjustable support mechanism for supporting a treatment device having a treatment head for locating said head at a desired position of a person's body, said support mechanism comprising an extendable boom pivotally secured at an attachment end to an adjustable pivoting housing securable to a stationary object, said pivoting housing permitting vertical and horizontal angular displacement of said boom and having adjustable pressure biasing means acting on said boom to displace same vertically on a pivot connection to thereby apply a vertical moment on said treatment device, an articulated connecting joint having a connecting arm secured to a support bracket to which said treatment device is removably secured, said connecting joint interconnecting said treatment device to a free end of said boom said connecting joint having a disconnectible brake means to position said treatment device at a desired angle relative to said free end of said boom, a handle connected to said support bracket to position said treatment head to said desired position, and means to disconnect and



reconnect said brake means to adjust the angular position of said treatment device relative to said boom free end, said means to disconnect and reconnect said brake means is a pivoting lever secured to said handle said pivoting lever applies a pulling force on a spring biased brake clamp, said brake clamp being held in a lower section of a two-section ball joint housing, said connecting arm being connected to said lower section of said two-section ball joint housing so that said connecting arm and support bracket and device may be connected at a desired angle relative to said boom free end.

5,203,323

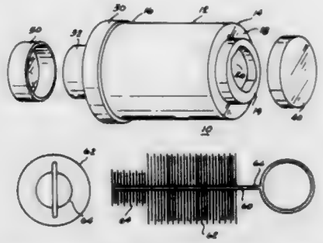
METERED DOSE INHALER SPACER DEVICE AND ASSOCIATED CLEANING BRUSH

Paul E. Tritle, 1460 S. Olympia, Westport, Wash. 98595

Continuation-in-part of Ser. No. 724,761, Jul. 2, 1991, abandoned. This application Apr. 20, 1992, Ser. No. 870,902

Int. Cl.[5] **A61M** *11/00, 15/00, 16/10*

U.S. Cl. 128—200.23 **5 Claims**



1. A constant-volume, sealed inhaler expansion chamber with unrestricted fluid flow therethrough for use in combination with a metered-dosage inhaler for delivering medicament to a user's lungs, comprising

a tubular member having a partially closed inlet end sized to sealingly interfit with said metered-dosage inhaler and further having an open outlet end;

a transverse wall member extending radially inwardly from, and formed integral with, the tubular member at its inlet end with an inlet opening in the transverse wall member forming the partially closed inlet end;

an outlet end cap having a transverse wall portion extending radially inwardly from a tubular band and having an outlet opening in the end cap, said tubular band sized to sealingly fit over the outlet end of the expansion chamber;

a mouthpiece with a mouthpiece aperture therethrough through which a fluid mist can pass out of the expansion chamber, the mouthpiece being adapted to sealingly fit integrally with the outlet opening in the end cap and sized such that a user's lips can easily form a sealed connection therewith, and the ratio of chamber volume to mouthpiece aperture diameter is approximately 7 to 1 so that withdrawal from the chamber is regulated such that over a single short, quick inhalation from a user, such as in typical from a user suffering from asthma or chronic bronchitis, the concentrated medicament mist is substantially withdrawn evenly form the chamber through the mouthpiece and into the users lungs an bronchi and bronchiole.

5,203,324

CONTOURED ANATOMICAL MOUTHPIECE

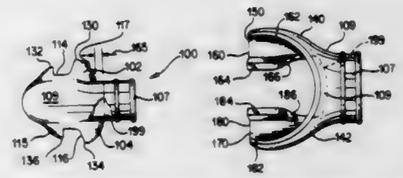
Donald J. Kinkade, Greeley, Colo., assignor to Kinkade Family Partnership, Greeley, Colo.

Continuation-in-part of Ser. No. 449,560, Dec. 12, 1989, Pat. No. 5,062,422, which is a continuation-in-part of Ser. No. 283,611, Dec. 13, 1988, abandoned. This application Apr. 2, 1991, Ser. No. 679,517

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[5] **B63C** *11/16;* **A61M** *16/00;* **A62B** *9/06;* **A61C** *5/14*

U.S. Cl. 128—201.11 **13 Claims**



1. A mouthpiece oriented for an overbite comprising:

U shaped body member having first and second ends and upper and lower portions;

the first end formed in a generally oval shape and having an orifice formed therein;

the second end extending away from the orifice and formed into two leg members, each having an outer end;

a internal wing member formed on each leg member near the outer end thereof;

the lower portion of the U shaped member extending outwardly toward the leg members more than the upper portion of the U shaped member to form an offset which reaches to the lower level of the internal wing members;

the internal wing members having first and second ends;

said wing members have a taper such that the first end farther from the orifice is smaller than the second end nearer the orifice;

said wing members having a laterally extending surface bounded on either side thereof by substantially vertical curved walls for contacting the lateral surfaces of the user's cuspids and bicuspids.

5,203,325

SELF CONTAINED APPARATUS FOR INDEFINITE RESPIRATION IN NON-AIR ENVIRONMENTS

Jonathan A. Carr, 1418 Hopkins St. NW., Washington, D.C. 20036

Filed Mar. 26, 1992, Ser. No. 857,991

Int. Cl.[5] **B63C** *11/20*

U.S. Cl. 128—202.26 **6 Claims**

1. A self contained apparatus for indefinite respiration in non-air environments which comprises:

a vest pack having a front section, a pair of flexible shoulder

bars having a top and a back section which is worn by a

in electrical contact with preselected nerve fibers within the patient's nervous system

5,203,328

said skin, a common minimum detection depth greater than a thickness of epidermis as a portion of said skin,

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bars having a top and a back section which is worn by a diver;

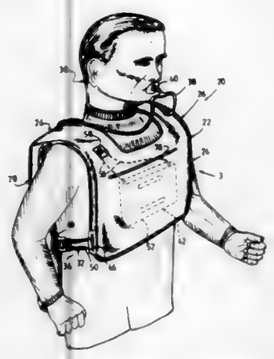
means for securing the front section and the back section of said vest pack about the waist of the diver, said securing means including a first pair of elongated eyelets, each positioned at a lower corner of the front section of said vest pack, a second pair of elongated eyelets, each positioned at one side of the back section in alignment with one of said first pair of elongated eyelets, and a pair of belts, each extending between one of said first pair of elongated eyelets and said second pair of elongated eyelets at the waist of the diver;

water stored in the back section of said vest pack;

an air hose extending from the top of the flexible shoulder bars of said vest pack;

a mouthpiece connected to said air hose;

means within said vest pack, for electrolyzing the water in



the back section so as to release the oxygen and allow the diver to breath the oxygen through said mouthpiece, said electrolyzing means including a battery carried in the front section of said vest pack, an electrolyzer member carried in the back section of said vest pack within the stored water, a pair of wires extending from said battery to said electrolyzer member so that said electrolyzer member can be charged by said battery to electrolyze the water and release the oxygen therefrom, a waterproof switch carried on one of the flexible shoulder bars and electrically connected to said wires so that said switch can be manually operated by the diver to turn the current to said electrolyzer member on and off;

a plurality of one way valves at the bottom of the back section of said vest pack to allow more water to enter when the diver breaths the oxygen out of the back section and to prevent the oxygen from escaping when the diver is diving deeper.

5,203,326

ANTIARRHYTHMIA PACER USING ANTIARRHYTHMIA PACING AND AUTONOMIC NERVE STIMULATION THERAPY

Kenneth A. Collins, Neutral Bay, Australia, assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Dec. 18, 1991, Ser. No. 809,978

Int. Cl.[5] A61N *1/362*

U.S. Cl. 128—419 PG **30 Claims**

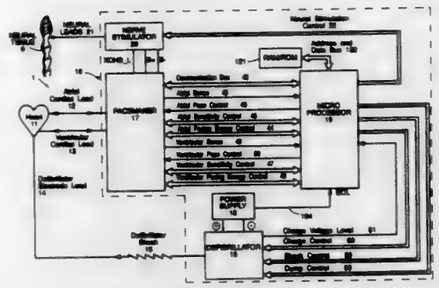
1. An antiarrhythmia pacemaker for detecting and treating arrhythmia episodes in a patient's heart, comprising:

means for detecting an occurrence of an abnormal condition of the heart,

heart stimulating means for generating and delivering, electrical stimulation to the heart,

at least one nerve stimulation electrode adapted to be placed in electrical contact with preselected nerve fibers within the patient's nervous system,

nerve fiber pulse stimulating means electrically coupled to said nerve stimulation electrode for generating and delivering stimulating pulses to the preselected nerve fibers, and



arrhythmia therapy control means responsive to said detecting means for controlling said heart stimulating means and said nerve fiber pulse stimulating means to direct performance of a combined heart and nerve stimulation therapy.

5,203,327

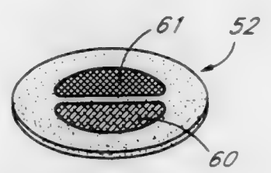
METHOD AND APPARATUS FOR DETERMINATION OF CHEMICAL SPECIES IN BODY FLUID

Donald W. Schoendorfer, and William R. Miller, both of Santa Ana, Calif., assignors to Sudor Partners, Santa Ana, Calif.

Continuation-in-part of Ser. No. 241,707, Sep. 8, 1988, Pat. No. 4,957,108. This application Aug. 15, 1990, Ser. No. 569,007

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—632 **30 Claims**



1. A dermal concentration patch for determining the presence of an analyte in a subject mammal's perspiration, comprising:

a water permeable support layer having a first and a second side;

at least one first and at least one second reagent immobilized in the support layer; and

means for removably securing the first side of the support layer in fluid communication with the subject's skin, wherein said patch is water permeable so that water vapor is permitted to escape through the support layer and outside of the concentration patch, and wherein the first reagent comprises a specific binding partner for the analyte to be determined, and the second reagent comprises a specific binding partner for a reference substituent in the perspiration.

5,203,328

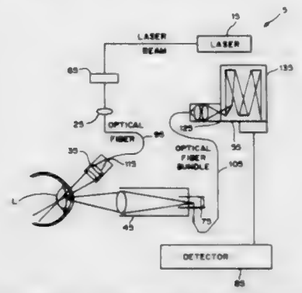
APPARATUS AND METHODS FOR QUANTITATIVELY MEASURING MOLECULAR CHANGES IN THE OCULAR LENS

Mark A. Samuels, Duluth; Scott W. Patterson, Lawrenceville; Jonathan A. Eppstein, Atlanta, all of Ga.; Nai T. Yu, Kowlon, Hong Kong, and Sven-Erik Bursell, Newton, Mass., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jul. 17, 1991, Ser. No. 731,533

Int. Cl.[5] A61B *5/00, 3/10*

U.S. Cl. 128—633 **16 Claims**



1. An apparatus for measuring molecular changes in a patient having an ocular lens that, when illuminated, is capable of backscattering radiation including fluorescent and Rayleigh components of determinable intensities, comprising:

a. means for illuminating the ocular lens with light having a wavelength between approximately 400–430 nm, thereby causing the ocular lens to backscatter radiation in response to the illumination;

b. means, responsive to the backscattered radiation, for collecting the backscattered radiation;

c. means, connected to the collecting means, for separating the backscattered radiation into its fluorescent and Rayleigh components; and

d. means, connected to the separating means, for (i) detecting the intensity of each of the separated fluorescent and Rayleigh components and (ii) forming the ratio of the detected intensities, thereby producing a measurement of molecular changes in the ocular lens.

5,203,329

NONINVASIVE REFLECTANCE OXIMETER SENSOR PROVIDING CONTROLLED MINIMUM OPTICAL DETECTION DEPTH

Setsuo Takatani, Houston; Jonathan P. Jaeb; Ronald L. Branstetter, both of San Antonio, all of Tex., and Hiroshi Sakai, Komaki, Japan, assignors to Colin Electronics Co., Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 417,321, Oct. 5, 1989. This application Dec. 11, 1991, Ser. No. 805,003

Int. Cl.[5] G01N *33/49;* **A61B** *5/00*

U.S. Cl. 128—633 **9 Claims**

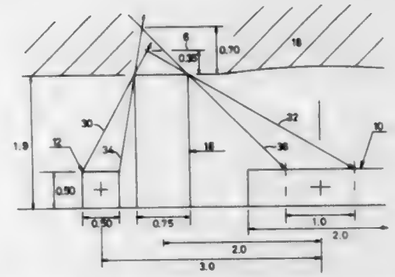
1. A reflectance oximeter sensor for achieving a controlled minimum detection depth in the skin of a living subject, the reflectance oximeter sensor comprising:

a plurality of light source means for producing lights of different wavelengths at different times, respectively, toward the skin of a subject;

a single optical detector means for detecting the lights reflected from said subject,

optical barrier means disposed between said plurality of light source means and said optical detector means, for preventing the detector means from being illuminated by the lights reflected by an external surface of said skin; and

each of said plurality of light source means, a corresponding portion of said optical barrier means, and said optical detector means cooperating with each other to define, in said skin, a common minimum detection depth greater than a thickness of epidermis as a portion of said skin, wherein said common minimum detection depth is not less



than 0.50 mm, said optical detector means detecting the lights reflected from a deeper portion of said skin under said minimum detection depth.

5,203,330

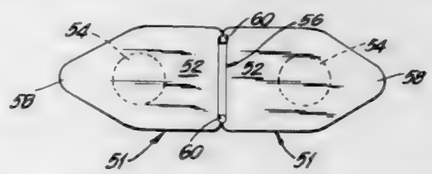
DISPOSABLE ELECTRODES FOR ELECTROMYOGRAPHY (EMG) AND NERVE CONDUCTION VELOCITY (NCV) AND KIT CONTAINING SAME

Alan J. Schaefer, Spring Valley; Arthur Blumenfeld, Brewster, both of N.Y.; Finn Pedersen, Stenlose, and Carsten Stabell, Bronshoj, both of Denmark, assignors to Vickers PLC, London, England

Filed Feb. 26, 1991, Ser. No. 661,476

Int. Cl.[5] A61B *5/04, 5/0492*

U.S. Cl. 128—640 **8 Claims**



1. A disposable disc electrode for use in electromyograph (EMG) and/or nerve conduction velocity (NCV) testing, said electrode comprising first and second identical disc electrode comprising first and second connection to a cable connector and being laminated of a plurality of layers including first and second outer layers, said first outer layer being a backing member with exposable adhesive thereon, a hydrogen layer intermediate said outer layers, and a conductive foil layer between said hydrogel layer and said second outer layer; wherein said eletrode elements are separably joined to each other by a central portion and the tab of each said electrode element is remote from said central portion.

5,203,331

APPLANATION TONOMETER

Jörg Draeger, Hamburg, Fed. Rep. of Germany, assignor to Haag-Streit AG, Switzerland

Filed Jul. 13, 1990, Ser. No. 552,579

Claims priority, application Switzerland, Jul. 17, 1989, 02668/89

Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—652 **10 Claims**

1. An applanation tonometer, comprising:

a) a housing;

b) a measuring body for engagement with an eye whose

intraocular pressure is to be measured, the measuring

said second radiation during the delay period a final detection

said reflector and said diaphragm comprising a volume filled with water, a pair of electrodes in said reflector and having

tized and delayed representations of the N echo signals; and

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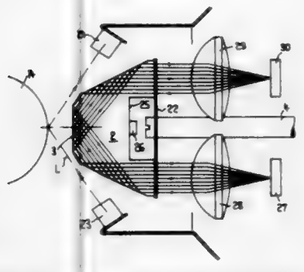
intraocular pressure is to be measured, the measuring body being movably mounted to the housing;
c) an adjustable support for the housing;
d) means for adjusting the housing relative to the support to position the measuring body at a predetermined distance from the eye;
e) means for automatically detecting when the predetermined distance has been achieved;



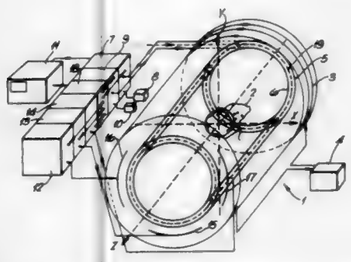
f) means for automatically locking the support when the predetermined distance has been achieved;
g) means for moving the measuring body to cause the measuring body to apply force to the eye to applanate the eye;
h) means for measuring the amount of applanation;
i) means for measuring the force applied to the eye; and
j) means responsive to means h) and i) for determining the intraocular pressure of the eye.

5,203,332

MAGNETIC RESONANCE IMAGING

Ib Leunbach, Dragör, Denmark, assignor to Nycomed Imaging As, Oslo, Norway

Division of Ser. No. 295,031, Dec. 23, 1988, Pat. No. 4,984,573. This application Oct. 25, 1990, Ser. No. 603,314
Claims priority, application United Kingdom, Jun. 23, 1987, 8714615; Jun. 24, 1987, 8714804
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **8 Claims**



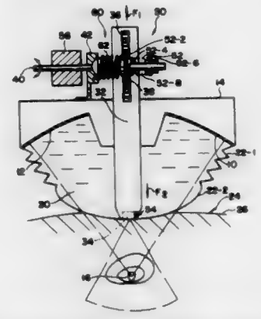
1. A magnetic resonance image genrating apparatus comprising a first radiation source means for emitting pulse sequences of a first radiation of a frequency selected to excite nuclear spin transitions in selected nuclei in a sample being imaged, a second radiation source means for emitting a second radiation of a frequency selectd to excite elecron spin transitions coupled to the nuclear spin transitions of at least some of said selected nuclei, a primary magnet means for generating a substantially uniform nagnetic field, magnetic field gradient generating means for imposing a gradient on the magnetic field experienced by said sample during gradient imposition periods within said sequences, means for detecting free induction decay signals from said selected nuclei during detection periods within said sequences, and means for transforming said detected free induction decay signals into a magnetic resonance image of at least part of said sample, said second source means for emitting said second radiation during the delay period a final detection period of one of said sequences and an initial pulse of said first radiation in a subsequent sequence.

5,203,333

ACOUSTIC WAVE THERAPY APPARATUS

Satoshi Nomura, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 745,951, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 522,322, May 11, 1990, abandoned. This application Aug. 21, 1992, Ser. No. 931,497
Claims priority, application Japan, May 15, 1989, 1-121207
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—660.03 **16 Claims**



1. An acoustic wave therapy apparatus comprising:
a holder having a central portion, a one side portion and another portion, said one side portion including a concave surface and said central portion including a through-hole;
acoustic wave generating means, provided on said one side portion of said holder, for generating acoustic waves for medical treatment;
a bag member arranged on said one side portion of the holder and adapted to be put in contact with a surface of a subject, and containing an acoustic wave propagation medium;
a rod member having an end portion inserted into said through-hole of the holder and arranged to be vertically movable in said bag member, and adapted to be placed in contact with the surface of the subject through said bag member;
an ultrasonic probe for ultrasonic wave tomographic imaging, arranged on the end portion of the rod member;
a drive mechanism arranged on the other portion of the holder, for vertically moving the rod member within the through-hole relative to the holder; and
a torque limiter provided on said drive mechanism for limiting to a predetermined value the pressing force with which the rod member is pressed on the subject.

5,203,334

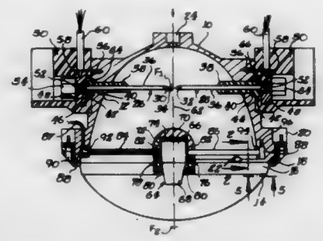
TRANSDUCER MOUNTING IN LITHOTRIPTER

A. Glen Brisson, Kildeer; Exequiel D. Cruz, Arlington Heights, and Dianne L. Vickers, Cary, all of Ill., assignors to B&L Technologies, Inc., Cary, Ill.

Filed Mar. 23, 1992, Ser. No. 856,374
Int. Cl.[5] A61B *8/00, 17/22*
U.S. Cl. 128—660.03 **12 Claims**

1. In an extracorporeal lithotripter comprising a truncated ellipsoidal reflector open at one end, a rubber diaphragm closing said open end, said reflector having a first focus point within said reflector and a second focus point outside said reflector and beyond said diaphragm, said reflector having an axis of rotation which passes through both of said focus points,

said reflector and said diaphragm comprising a volume filled with water, a pair of electrodes in said reflector and having ends in spaced relation providing a spark gap at said first focus point, an electrical spark between said electrodes across said gap producing a shockwave focused by said reflector on said second focus point, the improvement comprising an ultrasound transducer within said reflector and aimed toward said second focus point, and mounting means for said transducer adapted



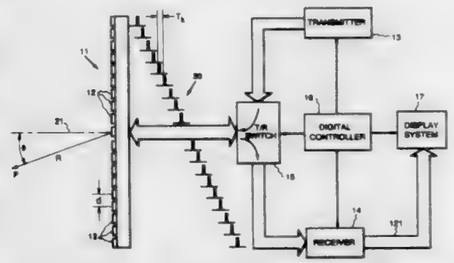
for quick and simple mounting of said transducer, said mounting means comprising a housing open toward said second focus point, said transducer being mounted in said housing, a plurality of arms extending substantially radially from said housing, each arm having an outer end, a plurality of anchor members respectively mounted on said arm outer ends, and a plurality of sockets in said reflector adjacent said open end and respectively receiving said anchor members to mount said transducer substantially at said reflector open end.

5,203,335

PHASED ARRAY ULTRASONIC BEAM FORMING USING OVERSAMPLED A/D CONVERTERS

Shurbel E. Noujaim, Clifton Park; Steven L. Garverick, Schenectady, both of N.Y., and Matthew O'Donnell, Ann Arbor, Mich., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,031
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—661.01 **12 Claims**



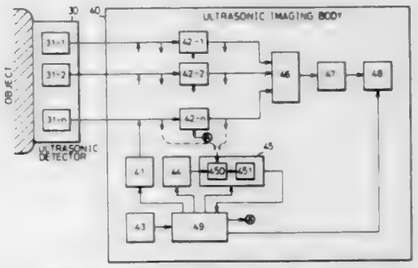
1. In a vibratory energy imaging system which includes a vibratory energy transducer having a set of N elements that produce N separate echo signals, a beam former for separately delaying and summing the N echo signals to produce a digital beam signal, comprising:
a set of N oversampled analog-to-digital converters, each one of said converters being coupled to receive a respective one of the N echo signals and each being operable to produce a digitized representation of its respective echo signal at a sample rate in excess of the sample rate required to meet the Nyquist criterion;
delay means for separately delaying each digitized representation of an echo signal in increments corresponding to said sample rate;
summing means for arithmetically adding together the digitized and delayed representations of the N echo signals; and
decimator means for reducing the sample rate of said digitized representation of said N echo signals to the rate required to meet the Nyquist criterion.

5,203,336

ULTRASONIC IMAGING APPARATUS

Atsuo Iida, and Takuya Noda, both of Kawasaki, Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Mar. 6, 1992, Ser. No. 846,334
Claims priority, application Japan, Mar. 8, 1991, 3-42134
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—660.06 **4 Claims**



1. An ultrasonic imaging apparatus for obtaining a tomogram image of an object having a surface to be diagnosed on a monitor, comprising:
electroacoustic transducers emitting ultrasonic waves in a line along the surface of the object, and for detecting the ultrasonic waves reflected from the object as reflected waves, and for converting the reflected waves into electric signals as detection signals having a phase and a detection frequency;
phasing means operatively connected to the electroacoustic transducers for receiving the detection signals, for delaying the detection signals for a delay period as delayed detection signals responsive to a distance between the electroacoustic transducers and the object, and for phasing the delayed detection signals for a phase period to match the phase of the detection signals as phased detection signals having a phased frequency;
phase detection means operatively connected to the electroacoustic transducers and the phasing means for detecting an error of phase between a reference signal and one of the detection signals output from the electroacoustic transducers and the phased detection signals output from the phasing means, and for correcting the delay period previously set in the phasing means responsive to the error;
reference signal generating means operatively connected to the phase detection means for generating the reference signal having a reference frequency the same as one of the detection and phased frequencies; and
adding means operatively connected to the phasing means for adding the phased detection signals phased by the phasing means as an added detection signal; and
the phase detection means comprising a calculation unit for calculating a mutual-relation value between the one of the detection and phased detection signals and the reference signal, and an error detection unit for detecting the error responsive to the mutual-relation value.

5,203,337

CORONARY ARTERY IMAGING SYSTEM

5,203,339

METHOD AND APPARATUS FOR IMAGING A

a second pressure communication means for exposure to and communication of a reference pressure;

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PERIPHERAL BLOOD CIRCULATION STATE

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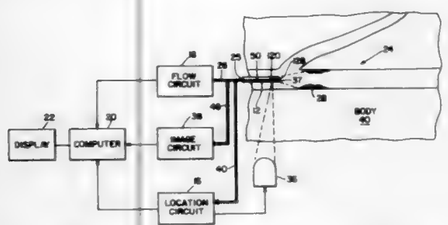
5,203,337

CORONARY ARTERY IMAGING SYSTEM

Charles L. Feldman, Framingham, Mass., assignor to Brigham and Women's Hospital, Inc., Boston, Mass.

Filed May 8, 1991, Ser. No. 697,251
Int. Cl.[5] A61B 8/12
U.S. Cl. 128—662.06 30 Claims



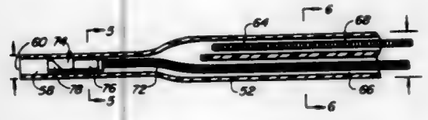
1. A method of determining flow in a blood vessel having a wall comprising the steps of:
(a) measuring the geometry of said wall at a location in a segment of said blood vessel that may have an obstruction;
(b) measuring the volumetric flow rate at the location without interfering with the flow in said segment;
(c) determining the local fluid flow conditions at points within cross sections of said vessel at the location from the volumetric flow and geometric measurements.

5,203,338

VASCULAR CATHETER HAVING LOW-PROFILE DISTAL END

Yue-Teh Jang, Fremont, Calif., assignor to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 629,500, Dec. 17, 1990, abandoned.
This application Aug. 14, 1992, Ser. No. 930,977
Int. Cl.[5] A61B 8/14
U.S. Cl. 128—662.06 23 Claims



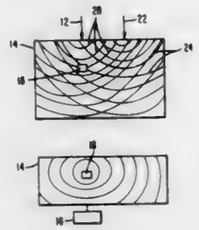
1. A vascular catheter comprising:
a catheter body having a proximal end and a distal end, wherein the catheter body includes a proximal region having at least two lumens and a distal region having a single lumen which is connected to and in communication with both of the lumens in the proximal region and having a cross-sectional area which is less than the combined cross-sectional area of the two lumens of the proximal region;
a drive shaft having a distal end and a proximal end and being reciprocatably disposed in one of the lumens in the proximal region of the catheter body; and
a work element secured to the distal end of the driven shaft, whereby the work element may be extended into the single lumen in the distal region or retracted into the lumen in the proximal region by selectively reciprocating the drive cable.

5,203,339

METHOD AND APPARATUS FOR IMAGING A PHYSICAL PARAMETER IN TURBID MEDIA USING DIFFUSE WAVES

Alexander Knüttel, Kensington, and Jay R. Knutson, Silver Spring, both of Md., assignors to The Government of the United States of America as represented by the Secretary of the Department Health and Human Services, Washington, D.C.

Filed Jun. 28, 1991, Ser. No. 722,823
Int. Cl.[5] A61B 5/05
U.S. Cl. 128—665 21 Claims



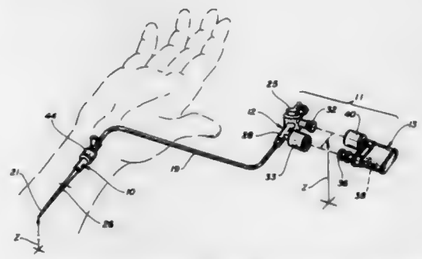
1. A method for imaging an object comprising the steps of:
applying modulated optical rays to the object, the rays each having an amplitude and a phase which are modulated at respective modulating frequencies and relative phase-shifts;
selecting the relative phaseshifts of the modulated rays to cause constructive interference among the modulated rays at a predetermined voxel thereby selecting said predetermined voxel for imaging;
diffusively propagating the modulated rays through the object; and
detecting an amplitude and phase of a light ray resulting from the constructive interference at the selected voxel for imaging a characteristic thereof.

5,203,340

APPARATUS FOR REZEROING AN IN VIVO PRESSURE SENSOR AND METHOD FOR REZEROING

Gary E. Gustafson, Sandy; Wallace H. Ring; Timothy J. Erskine, both of Salt Lake City; Kim L. Richardson, Herriman, and Steven C. Kimble, Draper, all of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 578,712, Sep. 7, 1990, Pat. No. 5,133,358. This application Mar. 16, 1992, Ser. No. 851,712
Int. Cl.[5] A61B 5/02; A61M 25/00
U.S. Cl. 128—675 12 Claims



1. A device for re-zeroing a pressure sensing apparatus for measuring physiological pressure, said device comprising:
a first pressure communication means for exposure to and communication of an in-vivo pressure;

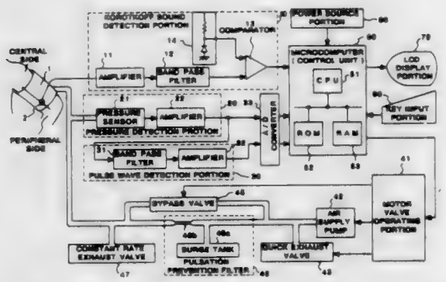
a second pressure communication means for exposure to and communication of a reference pressure;
a pressure responsive sensor for measuring in-vivo physiological pressure, said sensor comprising a first side for exposure to the in-vivo pressure and a second side in pressure communication with the second pressure communication means;
pressure resetting means for selectively applying the in-vivo pressure to the second side by selectively linking the first pressure communication means to the second pressure communication means, thereby making the reference pressure substantially equal to the in-vivo pressure,
wherein the pressure resetting means comprises pressure interface means for communicating the in-vivo pressure between the first pressure communication means and the second side via the second pressure communication means such that the in-vivo pressure is applied to the second side and such that fluid does not flow across the pressure interface means.

5,203,341

ELECTRONIC SPHYGMOMANOMETER

Tsutomu Shinomiya, and Takahiro Souma, both of Nakai, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 591,410, Oct. 1, 1990, Pat. No. 5,013,830.
This application Nov. 27, 1991, Ser. No. 799,348
Claims priority, application Japan, Oct. 5, 1989, 1-258797; Oct. 5, 1989, 1-258798; Oct. 9, 1989, 1-262189
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—680 2 Claims



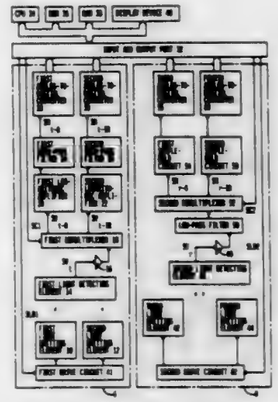
1. An electronic sphygmomanometer for measuring blood pressure by pressing a portion of a living body by means of a cuff, comprising:
Korotkoff sound detection means for detecting Korotkoff sounds by means of a sound sensor coupled to the cuff;
oscillating pulse wave detection means for detecting oscillating pulse waves by means of a pressure sensor which senses a pressure of the cuff;
point detection means for detecting a point of a systolic blood pressure and a point of a diastolic blood pressure in accordance with an appearance of a disappearance of Korotkoff sound as detected by said sound detection means;
determining means for determining a validity of points detected by said point detection means, in accordance with a height of an oscillating pulse wave, detected by said oscillating pulse wave detection means, at a detected point and in accordance with a change in height of said oscillating pulse waves in a vicinity of the detected point; and
display means for displaying the blood pressure at said points so as to enable discrimination of a result of said determination made by said determining means.

5,203,342

PERIPHERAL BLOOD CIRCULATION STATE DETECTING APPARATUS

Hiroshi Sakai, Komaki, Japan, assignor to Colin Electronics Co., Ltd., Aichi, Japan

Filed May 16, 1991, Ser. No. 701,058
Claims priority, application Japan, Jun. 29, 1990, 2-173975
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—691 15 Claims



1. An apparatus for detecting a state of peripheral blood circulation of a subject, comprising:
transmission type blood oxygen saturation measuring means for emitting a plurality of lights, each light having a different wavelength, toward said subject, producing a photoelectric pulse wave signal indicative of intensity of each of the lights transmitted through said subject, and determining a first blood oxygen saturation by using the pulse wave signals corresponding to the transmitted lights;
reflection type blood oxygen saturation measuring means for emitting a plurality of lights, each light having a different wavelength toward said subject, producing a photoelectric pulse wave signal indicative of intensity of each of the lights reflected from said subject, and determining a second blood oxygen saturation by using the pulse wave signals corresponding tot he reflected lights; and
peripheral blood circulation determining means for determining a state of peripheral blood circulation of said subject by utilizing a difference between said first and second blood oxygen saturations.

5,203,343

METHOD AND APPARATUS FOR CONTROLLING SLEEP DISORDER BREATHING

John R. Axe; Khosrow Behbehani, both of Arlington; John R. Burk, Aledo; Edgar A. Lucas, Fort Worth, and Fu-Chung Yen, Arlington, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 14, 1991, Ser. No. 715,374
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—725 7 Claims

1. A method for controlling sleep disorder breathing of a person, comprising:
connecting an interface from a source of air pressure to the person's nostril passages;
supplying air pressure from the source through the interface to the person's nostril passages;
monitoring the air pressure in the interface to detect an onset of sleep disorder breathing; then
increasing the air pressure if the onset of sleep disorder breathing is detected while continuing to monitor the air

pressure in the interface for the onset of sleep disorder

third and fourth electrodes by the bioelectrical impedance

a 3-D analysis means to yield 3-D information of the

5,203,348

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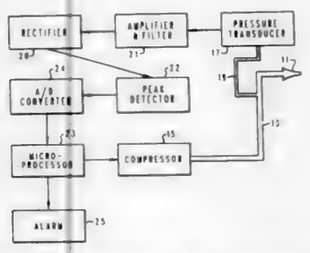
pressure in the interface for the onset of sleep disorder breathing; and wherein the step of monitoring the air pressure in the interface comprises:

sensing pressure waveforms resulting from the person's breathing;

filtering the sensed waveforms to pass only frequencies of a selected range;

determining a present energy level of each of the filtered waveforms;



comparing the present energy level determined to an average energy level of previously filtered waveforms by the same person; and if the present energy level determined falls within a selected range based on the average energy level,

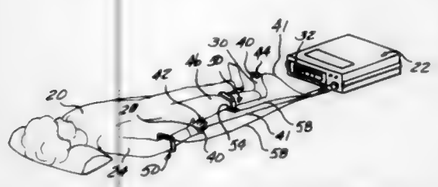
counting the number of waveforms that fall within the range within a selected time period, and if the number is within a selected amount, then providing a signal to increase the air pressure.

5,203,344

METHOD AND APPARATUS FOR TAKING BIOELECTRICAL IMPEDANCE MEASUREMENTS USING PROXIMALLY POSITIONED ELECTRODES

Marc R. Scheltinga, and Douglas W. Wilmore, both of Brookline, Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Filed Jan. 31, 1991, Ser. No. 648,226
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—734 **7 Claims**



1. A method for measuring bioelectrical impedance of a subject's body comprising the steps of:

attaching first and second electrodes to one hand and one foot of the subject's body, respectively;

attaching third and fourth electrodes to the body of the subject in proximity with the elbow and the knee joint of the subject's body, respectivley, the third electrode positioned about one centimeter from the elbow of the subject, the fourth electrode positioned about one centimeter from the knee joint of the subject;

electrically connecting the first, second, third and fourth electrodes to a bioelectrical impedance measuring device;

generating an electrical current signal from the bioelectrical impedance measuring device;

introducing the electrical signal into the subject's body by the first and second electrodes; and

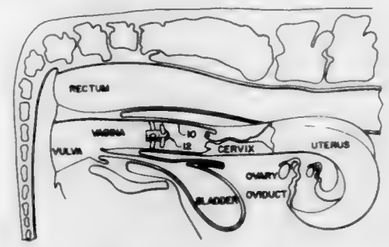
measuring the impedance in the subject's body between the third and fourth electrodes by the bioelectrical impedance measuring device.

5,203,345

METHOD OF USING A SUPPORT ANCHOR FOR THE VAGINA OF A MAMMALIAN FEMALE

Alma D. Kennedy; Kimberly D. Redden, and Tracy L. Gilson, all of Manitoba, Canada, assignors to University of Manitoba, Winnipeg, Canada

Filed Oct. 31, 1991, Ser. No. 784,210
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—736 **12 Claims**



1. A method for supporting an element within the vagina of a mammalian female, the method comprising providing a body portion in the form of a sleeve having a first end and a second end and a peripheral wall surrounding a longitudinal axis of the sleeve and having an opening at the first end of the sleeve receiving the element supported within the sleeve so as to be wholly confined therein and a plurality of flexible fingers projecting outwardly from the body portion, arranging the fingers in a first set and a second set, the sets being axially spaced from the ends of the sleeve and from each other, arranging the fingers of each set at angularly spaced positions around the axis of the body portion, the fingers each being substantially straight so as to define a longitudinal axis of each finger arranged to extending substantially radially outwardly from the axis of the sleeve and so as to define an end surface of each finger facing outwardly along the longitudinal axis of the finger engaging the vagina wall, the end surface of each finger having a contact area which is sufficiently large to engage the vagina wall without irritation, the fingers being spaced and arranged so as to hold the body portion at a position spaced from the vagina wall and to allow material to pass longitudinally out of the vagina past the body portion between the fingers.

5,203,346

NON-INVASIVE METHOD FOR DETERMINING KINEMATIC MOVEMENT OF THE CERVICAL SPINE

Arlan W. Fuhr, Scottsdale, Ariz.; Jack Winters, Takoma Park, Md., and Paul J. Osterbauer, Phoenix, Ariz., assignors to Whiplash Analysis, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 503,050, Mar. 30, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,913
Int. Cl.[5] A61B *5/11*
U.S. Cl. 128—781 **2 Claims**

1. A non-invasive 3-D method for determining the kinematic function of the cervical spine of a human patient, comprising the steps of:

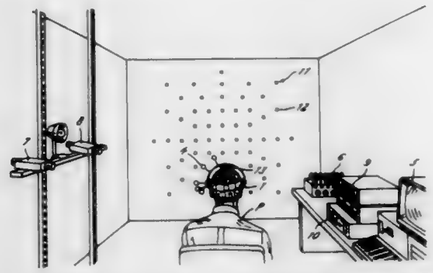
a. positioning recordable, detectable marker means onto the head of the patient;

b. using a target or instructional means to guide the patient through spatial head movements;

c. recording the positions of said marker means as the patient moves his head in response to said target or instructional means;

d. processing the recorded positions of the marker means by a 3-D analysis means to yield 3-D information of the marker means;

e. processing the 3-D information of the marker means by a mathematical rigid body analysis means to derive screw axis parameters of the patient's head which define a 3-D instantaneous rotation of the patient's head and, optionally, a finite axis of rotation of the patient's head;



f. using the axis of rotation of said patient's head as a measure of cervical kinematic function during head movements; and

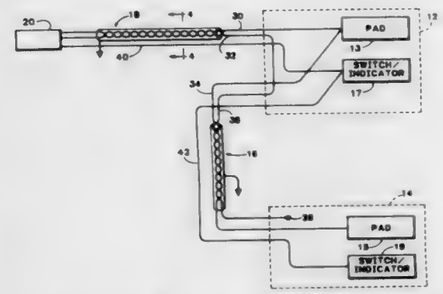
g. comparing the derived head axis of rotation for said patient either with a head axis of rotation for predetermined, standardized data to ascertain any discrepancy or with a previously derived head axis of rotation for said patient to identify changes.

5,203,347

UNI-CABLE DEFIBRILLATOR PADDLES

David B. Cameron, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1990, Ser. No. 626,651
Int. Cl.[5] A61N *1/04*
U.S. Cl. 128—783 **6 Claims**



1. A uni-cable paddle system for a defibrillator, comprising:

(a) first and second paddle means, each having a contact surface, for establishing an electrical connection with a patient;

(b) a main cable having a first and second high-voltage wires, said main cable having a first end for connection to the defibrillator and having a second end connected to said first paddle means, wherein said first high-voltage wire is connected to said contact surface of said first paddle means;

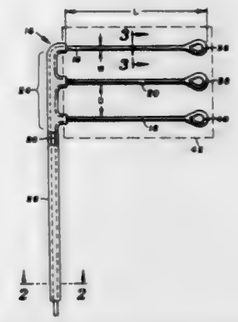
(c) an inter-paddle cable having a third high-voltage wire, said third high-voltage wire having a first end connected to said second high voltage wire of said main cable and having a second end connected to said contact surface of said second paddle means.

5,203,348

SUBCUTANEOUS DEFIBRILLATION ELECTRODES

Roger W. Dahl, Andover; David K. Swanson; Stephen J. Hahn, both of Roseville; Douglas J. Lang, Arden Hills, and John E. Heil, St. Paul, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jun. 6, 1990, Ser. No. 533,886
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—784 **17 Claims**



1. A body implantable tissue stimulating electrode assembly, including:

an elongate, electrically conductive lead having a proximal end region and a distal end region; and

an electrode including a plurality of compliant, electrically conductive electrode segments, each of said segments having a nominal width of at most five millimeters and a length exceeding the nominal width, said electrode segments having respective and opposite first and second ends and being coupled to the distal end region of the lead for substantially simultaneous reception of tissue stimulating electrical pulses from a pulse generating means at the proximal end region of the lead, said electrode segments being arranged in spaced apart and side-by-side relation such that each of the electrode segments, over most of its length, is spaced apart from each one of the other electrode segments by a distance of at least 1.5 cm, each of the electrode segments being free of electrically insulative material at and along its periphery substantially over its entire length to provide an exposed reactive surface over substantially the entire length and periphery of the electrode segment, each of said electrode segments including at least one electrically conductive cable having a highly conductive metal core within in a conductive metal tube, said electrode segments when receiving the tissue stimulating pulses cooperating to define an effective electrode area incorporating all of the electrode segments.

5,203,349

ELECTRICAL PULSE GENERATING DEVICE FOR THERAPEUTIC USES

Henry Kogan, Paris, France, assignor to Anatomia International S.A., Paris, France

Filed Dec. 30, 1991, Ser. No. 814,573
Int. Cl.[5] A61N *1/32*
U.S. Cl. 128—800 **11 Claims**

1. An electrical pulse generating device for therapeutic uses, comprising a body containing a piezoelectric type generator and a head having at least two electrodes respectively connected to terminals of said piezoelectric type generator, an actuating trigger for operating said piezoelectric type generator, motor means for controlling said actuating trigger, said

motor means being operatively connected to said actuating

tending forwardly from said body, said container comprising a

section, said tail section having a room temperature recov-

the cylindrical dryer such that it forms a coherent recon-

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motor means being operatively connected to said actuating trigger and having a settable operating rhythm, whereby

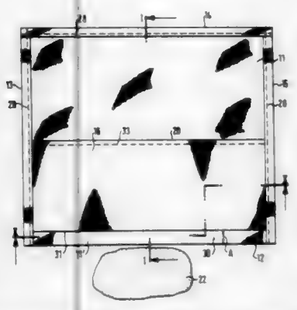
pulses are delivered across said at least two electrodes with a frequency which varies as a function of said operating rhythm.

5,203,350

MEDICAL SURGICAL COVER SHEET

John A. Duncan, Glenrothes; Suresh R. Patel, Dalgety Bay, both of Scotland, and Günter Wiedner, Seeshaupt, Fed. Rep. of Germany, assignors to Rotecno AG, Zürich, Switzerland

Filed Sep. 24, 1991, Ser. No. 764,671
Int. Cl.[5] A61B *19/08*; B32B *5/26*
U.S. Cl. 128—849 **28 Claims**



1. A medical surgical cover sheet for covering at least part of a patient during an operation comprising:
- a hydrophobic textile construction comprised of fibers made of a synthetic material and having a plurality of edges, said edges including a surgical edge for placement proximate to a site on a patient where the operation is to take place and a side edge;
- a hydrophilic textile fabric comprised of fibers made of a synthetic material arranged on the hydrophobic construction in a vicinity of the surgical edge; and
- a surgical strip formed by a turned-over section of the hydrophobic construction at the surgical edge, said section being turned over towards an outside surface of the hydrophobic construction;
- the hydrophilic fabric being sewn to the turned over strip forming a seam.

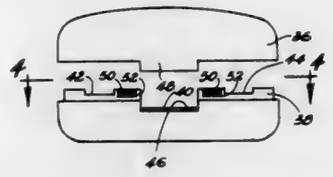
5,203,351

MOUTHGUARD AND CONTAINER THEREFOR

Loren S. Adell, 200 Adell Blvd., Sunnyvale, Tex. 75182, assignor to Loren S. Adell and Michael Adell, Sunnyvale, Tex.

Filed Mar. 16, 1992, Ser. No. 851,921
Int. Cl.[5] A61C *5/14*
U.S. Cl. 128—859 **10 Claims**

1. A container in combination with a mouthguard which has a U-shaped body and an elongate flexible attaching strap extending forwardly from said body, said container comprising a first enclosing part and a second enclosing part that are selectively openable for enabling the container to receive said mouthguard body and closeable for enabling the container to enclose said mouthguard body, characterized in that said parts are selectively operable to two discrete positions of closing defined by two respective locator means, one of said locator means defining a first position of closing wherein said parts define a frontal opening that is slightly larger than a transverse cross section of said attaching strap so as to allow said attaching strap to pass outwardly from said container when said mouthguard body is disposed within said container, and the



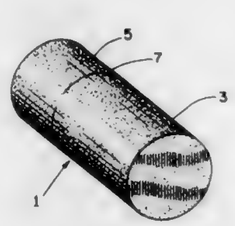
other of said locator means defining a second position of closing wherein said frontal opening is reduced to less than such transverse cross section of said attaching strap so as to preclude such outward passage of said attaching strap from said container, said container having a size and shape that allows said attaching strap from said container, said container having a size and shape that allows said attaching strap to be flexed into said container prior to closing and to be enclosed within said container along with said mouthguard body so as to allow said parts to be operated to said second position of closing with both said mouthguard body and said attaching strap enclosed within said container.

5,203,352

POLYMERIC FOAM EARPLUG

Ross Gardner, Jr., Indianapolis, Ind., assignor to Cabot Safety Corporation, Southbridge, Mass.

Filed Oct. 16, 1990, Ser. No. 598,268
Int. Cl.[5] A61F *11/00*
U.S. Cl. 128—864 **23 Claims**



1. A roll-down type earplug construction comprising a resilient polymeric foam body the cellular volume of said foam body being gas-filled, said body comprising a nose section and, coextensive therewith, a tail section,

said nose section being composed of a slow recovery, viscoelastic, polymeric foam and being of a size and shape adapted to be compressed, inserted into the human ear canal and there allowed to expand and obturate the ear canal, said nose section having a room temperature recovery time from 60 percent compression to 40 percent compression thereof at least 1 second and an equilibrium pressure at 40 percent compression thereof of from 0.2 to 1.3 p.s.i.,

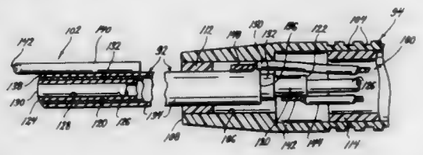
said tail section being composed of a relatively faster recover, more elastic, polymeric foam than that of said nose section, said tail section having a room temperature recovery time from 60 percent compression to 40 percent compression thereof of no greater than 50 percent of the recovery time of said nose section and no greater than 5 seconds.

5,203,353

METHOD OF PENETRATING AND WORKING IN THE VITREOUS HUMOR OF THE EYE

James C. Easley, St. Charles; Kurt W. Gampp, Jr., Ellisville, and Gregg D. Scheller, Ballwin, all of Mo., assignors to Surgical Technologies, Inc., Chesterfield, Mo.

Division of Ser. No. 425,936, Oct. 24, 1989, Pat. No. 5,078,712. This application Jan. 3, 1992, Ser. No. 816,802
Int. Cl.[5] A61B *17/36*
U.S. Cl. 128—898 **2 Claims**



1. A method of penetrating and working in the vitreous humor of the eye comprising:

gripping a finger grip member of a surgical instrument, the grip member having first and second ends, and a conduit extending through the grip member;

inserting the tip end of a needle into the vitreous humor of the eye, the needle having first and second ends, the first needle end being insertable into the vitreous humor, and the second needle end being securely attached to the first end of the grip member;

illuminating the area of the vitreous humor adjacent the first needle end by light directed through a fiber optic member extending from a source of illumination through the conduit and the needle, the fiber optic member being co-axial with the needle;

working in the vitreous humor with a pic secured to the first needle end, the pic being parallel to, but spaced apart from, a longitudinal axis of the fiber optic member and needle; and,

applying an electrical current to the area adjacent the tip end of the needle to coagulate any blood occurring thereat, said electrical current being applied through a first conducting member which is a tubular member coaxial with and immediately surrounding the fiber optic member, and

a second conducting member which is a tubular member coaxial with and outside of said first conducting member, said first and second conducting members being spacially separated by an electrically insulating member located between the two conducting members.

5,203,354

RESTRUCTURED TOBACCO DRYER

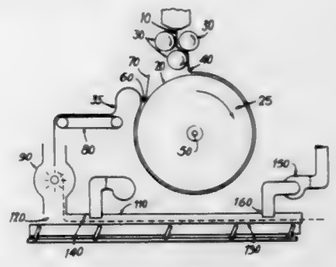
John N. Hickle, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 28, 1991, Ser. No. 723,164
Int. Cl.[5] A24B *3/14*
U.S. Cl. 131—296 **11 Claims**

1. A method of making reconstituted tobacco sheet comprising the steps of:

metering a tobacco-containing slurry onto the outer surface of a cylindrical dryer;

drying the tobacco-containing slurry on the outer surface of the cylindrical dryer such that it forms a coherent reconstituted sheet; and



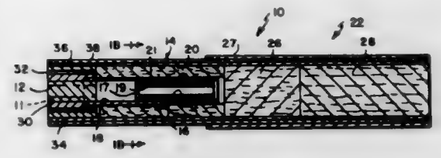
removing the reconstituted sheet from the outer surface of the cylindrical dryer at a doctoring point.

5,203,355

CIGARETTE WITH CELLULOSIC SUBSTRATE

Jack F. Clearman, Blakely, Ga.; Billy T. Conner, Winston-Salem, and Ronnie G. Huff, Kernersville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 14, 1991, Ser. No. 655,706
Int. Cl.[5] A24B *15/00*
U.S. Cl. 131—359 **16 Claims**



1. A smoking article comprising:

(a) a combustible fuel element less than bout 30 mm in length prior to smoking; and

(b) a physically separate aerosol generating means disposed longitudinally behind the fuel element comprising a low mass, paper-like cellulosic substrate material having a controlled evaporative surface area, and at least one aerosol forming material; and

(c) wherein the controlled evaporative surface area ranges from about 5 mm^2 to about 30 mm^2.

5,203,356

CIGARETTES

Myeong K. Yun, 223-3, Bukuri, Wooljinkun, Kyeongsangbukdo, Rep. of Korea

Filed Jun. 10, 1991, Ser. No. 711,526
Int. Cl.[5] A24D *3/00*
U.S. Cl. 131—361 **2 Claims**

1. A cigarette having a filter at one end connected to the cigarette by an outer tubular paper wrapper wherein the wrapper has an extension portion projecting beyond the filter to provide a tubular receptacle, a spirally wound strip of filter paper in said receptacle having an outer end adhered to the extension portion of said wrapper and a free inner end, and said strip of filter paper having a first edge between said inner and outer ends formed with a unitary projecting tongue at said

inner end of the strip of filter paper, said tongue projecting

ting device including enclosing space surrounding said rinsed hair followed thereafter by vacuuming of said hair

ing a quantity of liquid medium for wetting said charge of said solid material in a floating mass adjacent an upper

located adjacent said sequence of said loading station, said cleaning station and unloading station, for sequentially

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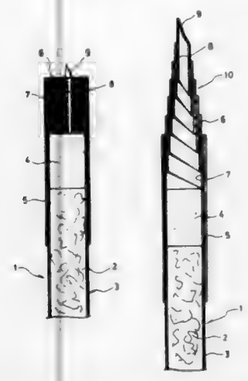
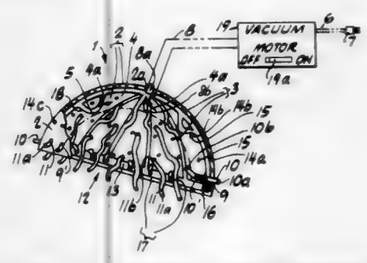
inner end of the strip of filter paper, said tongue projecting beyond the extension portion of the wrapper enabling a user to



grip the inner end of the filter paper and extend same from said receptacle into a helical tubular mouthpiece.

5,203,357
PERMING METHOD AND DEVICE
James A. Vigliotti, 273 Morris St., Stirling, N.J. 07980
Filed Oct. 4, 1991, Ser. No. 770,880
Int. Cl.[5] A45D *7/00*
U.S. Cl. 132—210 **20 Claims**



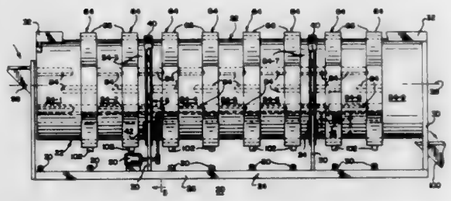
1. A method of perming hair consisting essentially of, in combination:
applying water to hair to be permed sufficiently to obtain dampened hair; thereafter wrapping the dampened hair on perm rods; thereafter applying perm solution to the hair sufficiently to obtain perm-treated hair; thereafter water-rinsing residual perm solution from the perm-treated hair to obtain rinsed hair; thereafter employing a perm-setting device, said perm-setting device consisting essentially of a first vacuuming means for substantially enclosing and maintaining free-space surrounding substantially all of a person's upper head having perm-mounted rinsed hair rinsed substantially free from residual perm solution and for applying vacuuming to an enclosed and maintained free-space substantially surrounding all of said perm rod mounted hair of said person's upper head, said method further comprising the step of vacuuming moisture from the rinsed hair mounted on perm-rods; thereafter applying a neutralizing water-solution perm-neutralizer to obtain neutralized hair; thereafter applying sufficient rinsing water to the hair to rinse residual water-solution perm-neutralizer from the hair in its neutralized state to obtain rinsed hair; thereafter removing residual rinsing water from the rinsed hair to obtain dried hair; and taking down the set hair from the perm rods subsequent to applying said neutralizer solution, said employing of the perm-setting device including enclosing space surrounding said rinsed hair followed thereafter by vacuuming of said hair by channeling a flow of ambient, room-temperature air to scalp-located ends of said hair such that channeled air is vacuum-drawn from said scalp-located ends through wet hair mounted on the perm rods thereby enhancing and facilitating rapid removal of moisture by said vacuuming, said vacuuming consisting of channeling said ambient room-temperature air concurrently to a plurality of spaced-apart locations of perm-treated rod-mounted rinsed hair.

5,203,358
HAIR RINSING HOOD
Larry Eytcheson, 1900 Old State Rd. 67 West, Martinsville, Ind. 46151
Filed Feb. 25, 1992, Ser. No. 841,369
Int. Cl.[5] A45D *7/02*
U.S. Cl. 132—212 **12 Claims**

1. A flexible hood for use in washing hair and retaining heat during a permanent inducing process comprising:
a flexible scalp covering including;
a pliable upper scalp covering portion having a first expanded state to permit access to the scalp and collapsible to a second state tightly about the scalp to form a heat retaining barrier;
a pliable lower liquid directing portion, sealingly connected to said upper scalp covering portion, and having a lower end;
a front port for the application of a liquid and having front access control means for opening and closing said front port;
a rear port located at said lower end of said lower liquid directing portion said rear port having rear access control means for opening and closing said rear port; and
sealing means for sealingly securing said flexible scalp covering about the head.

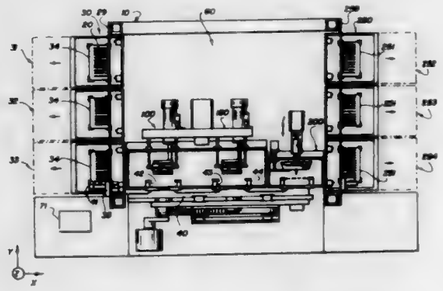
5,203,359
UNITARY SYSTEM FOR RECYCLING USED CONTAMINATED MATERIAL FOR RE-USE
Robert H. Feamire, Barrington, Ill.; Earl Spengler, Chino, Calif.; George F. Sekera, Jr., Willowbrook, and Helmut Mueller, Rolling Meadows, both of Ill., assignors to Ellis Corporation, Itasca, Ill.
Filed Nov. 4, 1991, Ser. No. 787,685
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—61 **12 Claims**

1. Unitary apparatus for removing contaminants from a charge of solid chip-like material, comprising:
container means having an outer wall and adapted for holding a quantity of liquid medium for wetting said charge of said solid material in a floating mass adjacent an upper surface of said liquid medium to facilitate removal of contaminants from surfaces of said material;
agitator means in said container means supported to rotate about an axis spaced above said liquid medium, said agitator means including a plurality of elements having surfaces extending generally radially and spaced outwardly of said axis and spaced inwardly away from said outer wall adapted to downwardly strike the upper surface of



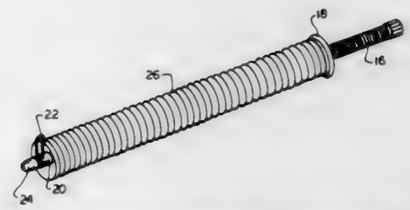
said liquid medium and thereafter pass downwardly through said mass of solid chip-like material floating in said liquid medium for forcing said material downwardly toward greater depths in said liquid medium below an upper surface of said liquid medium for washing at least some of said contaminants away from said surfaces of said solid chip-like material for collection into said liquid medium as said agitator means rotates, and
means for removing said contaminants from said liquid medium after some of said contaminants are washed away from said surfaces of said solid material.

5,203,360
DISC WASHING SYSTEM
Quy C. Nguyen, Milpitas; Sushil Shah, Pleasanton; William Jacobs, San Jose; Steven A. Shifman, San Ramon; William Kuhns, Pleasanton, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Filed Dec. 17, 1990, Ser. No. 628,710
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—78 **43 Claims**



1. An automated disc washing apparatus, comprising:
in sequence, loading means including a loading station for loading a disc into said disc washing machine;
at least one cleaning station for cleaning a disc; and
unloading means including an unloading station for unloading said cleaned from said disc washing machine;
said disc washing apparatus further comprising:
disc transfer means, including transfer arm means capable of pivoting between a first position for receiving said disc and a second position for unloading said disc, and being located adjacent said sequence of said loading station, said cleaning station and unloading station, for sequentially transferring a first disc from said loading station to said cleaning station and simultaneously transferring a second disc from said cleaning station to said unloading station in a first transfer cycle and for transferring said first disc from said cleaning station to said unloading station and simultaneously transferring a third disc from said loading station to said cleaning station in a second transfer cycle, each full cycle of said disc transfer means accomplishing one of each of said station to station transfer cycles, for sequentially and linearly transferring said discs from said loading means through said cleaning station and to said unloading means.

5,203,361
RECREATIONAL VEHICLE HOLDING TANK HOSE CLEANING
David P. Tickle, Summerfield, N.C., assignor to Camco Manufacturing, Inc., Greensboro, N.C.
Filed Oct. 7, 1991, Ser. No. 772,267
Int. Cl.[5] B08B *9/02*
U.S. Cl. 134—167 C **17 Claims**



1. A cleaning and storage implement for cleaning and storing sewer hoses used to discharge the contents of holding tanks of recreational vehicles comprising
an elongated plastic tube having a length and first and second ends, with a water supply conduit fitting on said first end and a nozzle that sprays in a conical spray pattern on said second end,
an adjustably positionable stop on said tube near said first end if the form of a disk having a hole sized so as to receive said tube in an adjustable friction fit,
a hand grip on said tube between said fitting and said stop, and
a retainer hook on said tube near said second end,
whereby a compressible hose may be cleaned and stored by
connecting a cleaning water supply conduit to said first end of said tube,
supplying water through said tube from the supply while passing said second end of said tube into a first end of a hose to be cleaned to clean the hose by a spray of water from said water outlet,
compressing the hose against said stop, and
upon compressing the hose to length comparable to the distance between said stop and said retainer, retaining the second end of the hose with said retainer hook.

5,203,362
ULTRASONIC OSCILLATING DEVICE AND

said support frame structure in a generally vertical position; and

first and second top rails;
a cover connected to said top rails; and

5,203,366
APPARATUS AND METHOD FOR MIXING AND

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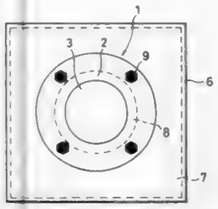
5,203,362
ULTRASONIC OSCILLATING DEVICE AND ULTRASONIC WASHING APPARATUS USING THE SAME

Hajime Shibata, Tokyo, Japan, assignor to Kaijo Denki Co., Ltd., Japan

Division of Ser. No. 477,725, Feb. 9, 1990, Pat. No. 5,114,840, which is a division of Ser. No. 35,179, Apr. 7, 1987, abandoned. This application Dec. 20, 1991, Ser. No. 811,317
Claims priority, application Japan, Apr. 7, 1987, 61-51645; Apr. 7, 1987, 61-51647
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—184 **4 Claims**



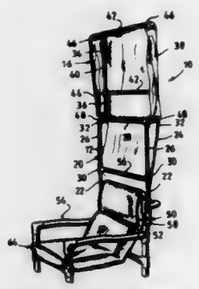
1. An ultrasonic washing apparatus, comprising:
a tank for containing cleaning liquid, the tank comprising an opening in a bottom wall thereof;
an ultrasonic oscillating device for emitting an ultrasonic wave into the cleaning liquid of the tank, said ultrasonic oscillating device being sealingly mounted in said bottom opening; and
an ultrasonic oscillator for outputting a drive oscillating signal to the ultrasonic oscillating device,
wherein the ultrasonic oscillator is a multifrequency oscillator constituting means for outputting a drive oscillating signal having a fundamental frequency, and an odd number multiple of the fundamental frequency, and
wherein the ultrasonic oscillating device comprises a base plate and an ultrasonic transducer attached to the base plate, the base plate having a thickness which is an integer multiple of approximately a half-wavelength of a resonance frequency of the base plate oscillating in the direction of the thickness thereof, and
in which the base plate is substantially in the shape of a circle with a length of a diameter of the circle being at least a quarter-wavelength of the resonance frequency of the base plate.

5,203,363
PORTABLE CANOPY ATTACHMENT

William Kidwell, 1062 Iris Pl., Westbury, N.Y. 11753, and MaryAnn Levinson, 10 Tredwell Ave., Syosset, N.Y. 11791

Filed May 13, 1991, Ser. No. 713,957
Int. Cl.[5] E04H *15/04*
U.S. Cl. 135—90 **6 Claims**

1. A portable canopy attachment comprises:
A) a support member having an upper portion and a lower portion wherein said lower portion can be inserted in the ground; said support member further includes
a) a support frame structure includes corners, a pair of spaced apart side rails, a pair of spaced apart upper and lower cross bars connected to said side rails, and
a pair of tee fittings wherein each of said tee fittings connects one of said legs, one of said lower cross bar and one of said side rails together, and
a pair of ell fittings wherein each of said ell fittings connects said upper cross bar and one of said side rails together;
b) a pair of legs, each of said legs connected in alignment to one of said corner in a spaced apart relationship, wherein said legs can be inserted in the ground to hold said support frame structure in a generally vertical position; and
c) a first flexible covering affixed to said support frame structure to block out the sunrays;
B) a canopy member attached to said upper portion wherein said canopy member can extend outwardly form said support member in a generally horizontal position to cover and protect a person from the sunrays; said canopy member further includes
a) a canopy frame structure having corners, a pair of sapaced apart side rails, a pair of spaced apart inner and outer cross bars connected to said side rails, and
a pair of tee fittings, each of said tee fittings connects one of said arms, said inner cross bar and one of said side rails together, and
a pair of ell fittings, each of said ell fittings connects said outer cross bar and one of said side rails together;



b) a pair of arms, each of said arms connected in alignment to one of said corners of said canopy frame structure in a spaced apart relationship, so that when said arms are attached to said upper portion of said support frame structure, said canopy frame structure will extend outwardly from said support frame structure in a generally horizontal position; and
c) a second flexible covering affixed to said canopy frame structure and said arms to block out sunrays;
d) a pair of hinge members, each of said hinge members connected between a distal end of one of said arms of said canopy member and one of said ell fittings on said support frame structure of said support member so that said canopy member can swing back out of the horizontal position for storage.

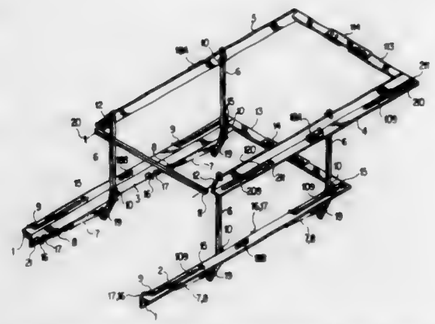
5,203,364
CANOPY JACK ASSEMBLY AND METHOD OF OPERATION

Arie Koole, 316 N. Meadow, Grangeville, Id. 83530

Filed Mar. 20, 1992, Ser. No. 855,854
Int. Cl.[5] B60P *3/34*
U.S. Cl. 135—111 **16 Claims**

1. An apparatus for retractably mounting a canopy on a support, which comprises:
first and second bed rails respectively mounted on the support;
first and second bottom rails respectively slidably mounted on said bed rails;

first and second top rails;
a cover connected to said top rails; and

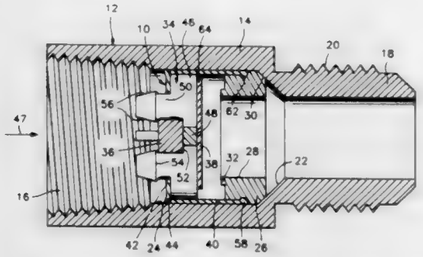


means interconnecting said top rails and bottom rails for raising said top rails and canopy with respect to said bottom rails.

5,203,365
EXCESS FLOW CHECK VALVE CAPSULE

Wallace W. Velie, Alta Loma, Calif., assignor to Mallard Products, Inc., Rancho Cucamonga, Calif.

Filed Oct. 8, 1992, Ser. No. 958,092
Int. Cl.[5] F16K *17/28*
U.S. Cl. 137—454.2 **17 Claims**

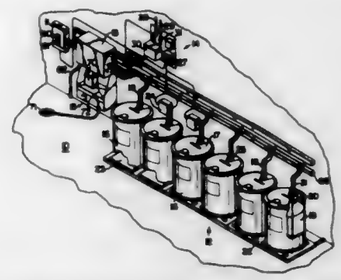


1. A self contained magnetically operated flow valve capsule for insertion into a flow duct comprising a permanent magnet retaining body means, a valve seat body means spaced from said retaining body means, a permanent magnet means mounted in said retaining body means, a valve plate means moveable between said retaining body means and said valve seat body means to control flow through said flow duct, said magnet retaining body means including webs for retaining and centrally positioning the magnet means, a retaining ring means mounted on said webs to retain the capsule in the flow duct, and means on said retaining body means for engaging, indexing, positioning and sealing the retaining body means with respect to the seat body means and accommodating the plate means.

5,203,366
APPARATUS AND METHOD FOR MIXING AND DISPENSING CHEMICAL CONCENTRATES AT POINT OF USE

Stephen J. Czeck, Shoreview; Douglas S. Hoerning, Crystal; Richard J. Mehus, Minneapolis; Timothy A. Gutzmann, Eagan, and Richard O. Ruhr, Buffalo, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Feb. 5, 1992, Ser. No. 831,564
Int. Cl.[5] B67D *5/60*
U.S. Cl. 137—3 **18 Claims**



1. A method for forming chemical compositions, the method comprising:
(a) selecting a composition to be produced using a microprocessor controller;
(b) delivering a plurality of liquid components by energizing a plurality of liquid component supply valves while energizing a positive displacement pump to sequentially draw the liquid components through the manifold;
(c) directing predetermined quantities of the liquid components into a container at a filling station to form the chemical composition;
(d) directing excess quantities of the liquid components away from the container;
(e) measuring the flow of the liquid components delivered;
(f) measuring the delivery time of the liquid components; and
(g) reporting the liquid component flow and time measurements to the microprocessor controller.

5,203,367
APPARATUS FOR SUPPLYING LIQUID UNDER CONSTANT PRESSURE

Tadao Akai, and Hiromichi Nishino, both of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed May 28, 1992, Ser. No. 889,333
Claims priority, application Japan, May 29, 1991, 3-38628[U]
Int. Cl.[5] B67D *5/00*
U.S. Cl. 137—101.25 **4 Claims**

1. An apparatus for supplying a liquid under a constant pressure comprising:
a supply tank disposed at a higher level than articles to be supplied with the liquid,
an overflow plate partitioning the interior of the supply tank into a main tank compartment and an auxiliary tank compartment,
a supply pipe having an upper end connected to the main tank compartment and a lower end positioned to oppose the article,
replenishing means for supplying a replenishment of the liquid to the main tank compartment at a rate in excess of the rate of supply by the supply pipe per unit time,
means for transferring the liquid from the auxiliary tank compartment to the main tank compartment at a rate in excess of the rate of supply, and
control means for operating the replenishing means and stopping the transferring means upon the liquid level in

the auxiliary tank compartment reaching a predetermined low level and for stopping the replenishing means and

and for communicating pressure from said pneumatic means for to selected ones of said valving locations.

stem portion outboard of said secondary sealing means, said tertiary sealing means including a seal member coop-

lating base in the upper chamber, said second regulating base having a threaded hole, a pin hole behind the

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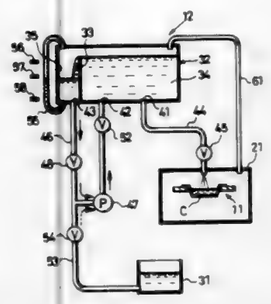
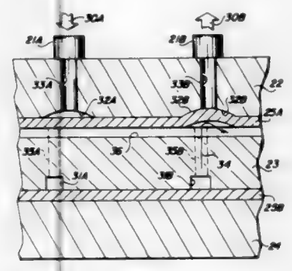
the auxiliary tank compartment reaching a predetermined low level and for stopping the replenishing means and



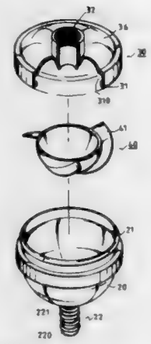
operating the transferring means upon the liquid level reaching a predetermined high level.

5,203,368
MATRIX OF VALVES
Leon E. Barstow; Anthony R. Ford; Terry D. Long, and Glen D. Ward, all of Tucson, Ariz., assignors to Protein Technologies Inc., Tucson, Ariz.
Filed Jul. 29, 1992, Ser. No. 922,036
Int. Cl.[5] F16K *11/22, 31/126*
U.S. Cl. 137—240 **29 Claims**



1. A valving system comprising:
a) a pneumatic means for providing a suction force and a pressure force;
b) a valve block having,
1) a first layer having a substantially flat first surface,
2) a second layer having at least two supply channels and at least two delivery channels, said second layer also having at least four valving locations for communicating flowing material from each of said supply channels to each of said delivery channels, said second layer disposed over said first surface of said first layer,
3) a third layer having valving holes and cavities disposed over each of said at least four valving locations of said second layer, and,
4) a pliable layer sandwiched between said second layer and said third layer, said pliable layer being flexibly responsive to suction, thereby pulling a portion of said pliable layer into an associated cavity and permitting flow through said valving location from one of said supply channel to said delivery channel, said pliable layer further being responsive to pressure to force the portion of said pliable layer against said valving location of said second layer such that flow from said supply channel to said delivery channel is prevented; and,
c) control means for communicating suction from said pneumatic means for to selected ones of said valving locations and for communicating pressure from said pneumatic means for to selected ones of said valving locations.

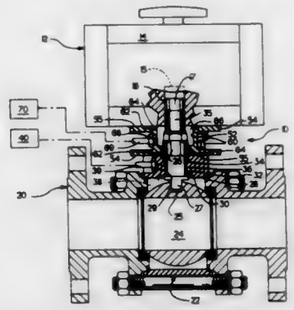
5,203,369
SINK-TRAP
Jin-Chyuan Hwang, No. 149 (Room 9, 10/F.) Lin Sen Road, Sec. 1, Tainan, Taiwan
Filed Oct. 15, 1992, Ser. No. 961,416
Int. Cl.[5] F16K *13/10*
U.S. Cl. 137—247.39 **2 Claims**



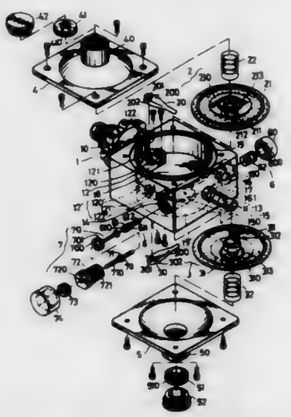
1. A sink-trap comprising:
a semi-global outer chamber defining an inner space and having a laterally-extending rim on an upper end and an outlet pipe attached to a lower end, said outlet pipe defining a first passageway communicating the inner space; a water chamber adapted to be located in the inner space of the outer chamber;
a plurality of baffle members spirally disposed on an outer circumference of the water chamber to support the water chamber within the outer chamber in an inwardly spaced relation and define a plurality of volute passageways between the outer and water chambers to communicate the the first passageway in the outlet pipe;
a cap member secured to the upper end of the outer chamber and having an annular groove for receiving the rim of the outer chamber; and
an inlet pipe extending downwardly through the cap member into the water chamber.

5,203,370
MOUNTING APPARATUS WITH FUGITIVE EMISSION COLLECTION MEANS FOR DIRECTLY COUPLING A ROTARY VALVE TO AN ACTUATOR HAVING ROTARY DRIVE MEANS
Gary C. Block, 325 Thomas St., Carnegie, Pa. 15106, and Gary W. Friedline, R.D. #3, Box 42a, New Alexandria, Pa. 15670
Filed Nov. 26, 1991, Ser. No. 800,350
Int. Cl.[5] G01M *3/04;* **F16K** *43/00*
U.S. Cl. 137—312 **9 Claims**

1. In the combination of a rotary valve having a valve housing and an actuator therefor having a housing and a rotary drive means, said rotary valve having primary and secondary sealing means surrounding a first valve stem portion and defining a first fluid collection chamber, the improvement comprising:
a mounting member disposed between said actuator and said valve housing and adapted to engage said actuator to allow a second valve stem portion extending beyond said mounting member to directly engage said rotary drive means of said actuator while maintaining a driving alignment therebetween; and
spaced tertiary sealing means surrounding said first valve stem portion outboard of said secondary sealing means, said tertiary sealing means including a seal member cooperating with said mounting member and said valve housing where they engage one another and another seal member cooperating with said mounting member and said actuator housing where they engage one another to define a second fluid collection chamber therebetween to collect any fluid that leaks from said first collection chamber past said secondary sealing means.



5,203,371
GAS REGULATOR WITH SEVERAL STAGE ADJUSTMENT
Jaw-Shiunn Teay, No. 40, Niu-Chou Tzu, Ling-Nan Village, Dung-Shan Hsian, Tainan Hsieu, Taiwan
Filed Nov. 5, 1992, Ser. No. 972,298
Int. Cl.[5] G05D *16/06;* **F16K** *17/28*
U.S. Cl. 137—460 **1 Claim**



1. A gas regulator with several stage adjustments comprises:
a main body connected with a gas inlet tube combined with a rotatable disc at its left side and with a gas outlet tube at its right side, having its inner cavity opened to the top and the bottom, a first regulating base near the inlet tube in the cavity, a first passageway vertically communicating with the outlet tube, a threaded nut hole abutting a second passageway communicating the first passageway, a notch in a lower in a lower portion of the second passageway to communicating with the inner cavity, a connecting tube of two different sizes extending rearward from the first passageway, an annular groove around the connecting tube, a separating plate dividing the inner cavity into an upper chamber and a lower chamber, a second regulating base the lower chamber in opposite direction of the first regulating base in the upper chamber, said second regulating base having a threaded hole, a pin hole behind the threaded hole, and a through hole behind the pin hole to communicate with both the upper and the lower chamber;
two pressure regulators respectively mounted on the top and the bottom of the first and the second regulating base, consisting of two resulating plates, two regulating diaphragms and two springs, said regulating plates shaped to slope from the rear to the front as a pointed cone and having a recess at its bottom, a filler filling in the recess and a sidewise pin extending from the rear, said diaphragms respectively having a carrying member and a pulling block fixed with a nut on the top surface and a bottom surface, said pulling blocks having a connecting opening, said carrying members having a spring groove for a spring to sit therein:
two regulator caps being secured on the top and under the bottom of said main body, respectively having a cap post on the top and under the bottom, each said cap post provided with a female thread to screw with an adjusting block and a rotatable cap, each said adjusting block having a lower projection for a spring to fit around;
a restoring unit combined in the rear of the main body, having a push cap extending out the main body, a push rod being in connected with the push cap and extending in the connecting tube and in the first passageway and having a push head at one end attached with an anti-leak ring for blocking the connecting tube to stop gas supply, and a male thread at the other end to screw with a female thread in the push cap, a spring fitting around the lower portion of the push rod, said push cap fitting in the annular groove around the connecting tube;
a micro adjusting unit being mounted in the front of the main body, having a connecting rod, a sustaining rod, a nut, a rotatable button and a protective cap, said nut having a central through threaded hole and a male thread in a lower portion, said connecting rod extending in the second passageway in the main body and having a stopper attached with an anti-leak ring for blocking an opening of the first passageway, said sustaining rod abutting the connecting rod and having a male thread in one end portion screwing with the central threaded hole in the nut to extend a little in the second passageway and a stop block in an intermediate portion, said rotatable button centrally screwing with the thread of the sustaining rod, and said protecting cap covering the rotatable button and fitting around the nut; and
said first pressure regulator adjusting pressure difference caused between the upper chamber and a gas tank when the gas in the gas tank is made to flow in the upper chamber through the inlet tube, and letting gas flow in the lower chamber to balance pressure, said second regulator and said micro adjusting unit controlling the volume of the gas flowing in and out of this regulator in a stably balanced pressure, preventing instant stoppage or unbalanced volume of gas going out of this regulator, said adjusting blocks in the regulator caps being possible to change their positions in the cap posts by rotating them, said springs fitting around the projections of said adjusting blocks being changed their resilience by changing position of the adjusting blocks so that the inner pressure of the upper and the lower chamber can be adjusted to cope with different stoves, said connecting rod in the micro adjusting unit being pushed up to let its stopper block the opening of the first passageway to perform a safety measure of automatic cutting of gas supply, said push cap of the restoring unit being pressed to push down the connected rod to let its stopper leave off the opening of the first passageway for restoring ordinary supply of gas, said rotatable button of the micro adjusting unit being rotated to raise up or lower the stopper of the connected rod in adjusting the distance between the stopper and the opening of the first passageway so as to adjust sensibility of this regulator in cutting gas supply, said protective cap of the

micro adjusting unit preventing the rotatable button from being touched carelessly.

5,203,374
PRESSURE BALANCED HYDRAULIC COUPLING WITH

predetermined pressure level to be vented as said stream of over-pressurized fluid by passing through said cylindri-

a flow chamber adjacent said valve seat for communication with the pneumatic shock absorption system,

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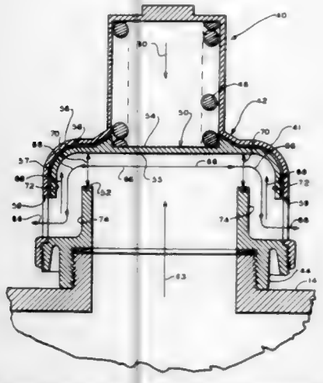
micro adjusting unit preventing the rotatable button from being touched carelessly.

5,203,372
JET-FLOW PRESSURE RELIEF VENT

John L. Freiler, New Brunswick, N.J., assignor to Girard Equipment Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 789,593, Nov. 8, 1991, abandoned. This application May 21, 1992, Ser. No. 886,363
Int. Cl.[5] F16K *17/196*
U.S. Cl. 137—469 **1 Claim**



1. A pressure relief vent for allowing pressurized fluid pressurized over a predetermined pressure level to be vented from a pressure vessel as a stream of over-pressurized fluid, comprising:

housing means for being mounted to said pressure vessel around an opening formed therein, said housing means including a generally centrally disposed outwardly extending cylindrical member provided with an internal cylindrical passageway which is circular in transverse cross-section and which has a circular transverse cross-sectional area, said cylindrical passageway for being placed in fluid communication with said opening formed in said pressure vessel, said cylindrical member including a top portion provided with a valve seat, and said housing means provided with at least one vent opening for venting said stream of over-pressurized fluid;

a poppet and a compression spring mounted in said housing, said poppet including a central portion for overlying said cylindrical passageway provided in said cylindrical member and said spring for normally forcing said central portion of said poppet into sealing engagement with said valve seat to prevent venting of pressurized fluid contained in said pressure vessel pressurized below said predetermined pressure level, said poppet further including an outer peripheral portion including a cylindrical portion extending outwardly generally at a right angle with respect to said central portion and an outwardly rounded smooth curved intermediate portion interconnecting said central portion and said cylindrical portion of said poppet, said cylindrical portion of said peripheral portion of said poppet generally surrounding said cylindrical member and being spaced outwardly from said cylindrical member to provide therebetween an annular passageway upon said poppet being lifted off of said valve seat, said annular passageway being annular in transverse cross-section and having an annular transverse cross-sectional area;

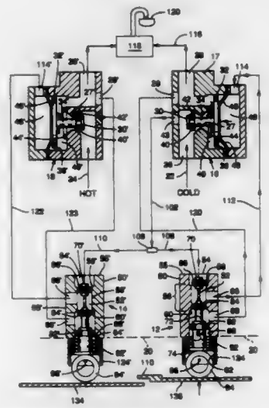
upon pressurized fluid contained in said pressure vessel being pressurized above said predetermined pressure level, said pressurized fluid acting against said central portion of said poppet to lift said poppet off of said valve seat to permit said pressurized fluid pressurized above said predetermined pressure level to be vented as said stream of over-pressurized fluid by passing through said cylindrical passageway provided in said cylindrical member, through said annular passageway formed between said cylindrical portion of said peripheral portion of said poppet and said cylindrical member and out of said housing through said vent opening; and

upon said poppet being lifted off of said valve seat, said cylindrical portion of said peripheral portion of said poppet and said cylindrical member providing said annular passageway with a substantially constant annular transverse cross-sectional area, and said circular transverse cross-sectional area of said cylindrical passageway provided in said cylindrical member and said annular transverse cross-sectional area of said annular passageway provided between said cylindrical portion of said peripheral portion of said poppet and said cylindrical member being substantially equal, and said substantially constant transverse cross-sectional area of said annular passageway and said substantially equal transverse cross-sectional areas of said cylindrical and annular passageways cooperating to form said stream of overpressurized fluid into a jet-stream acting against the underside of said outwardly rounded smooth curved intermediate portion of said peripheral portion of said poppet to provide reaction force which assists said pressurized fluid pressurized above said predetermined pressure level in lifting said central portion of said poppet off of said valve seat.

5,203,373
FOOT-ACTUATED VALVES

George K. Austin, Jr., Newberg, and Larry D. Lietz, Dundee, both of Oreg., assignors to A-Dec, Inc., Newberg, Oreg.

Filed Jun. 1, 1992, Ser. No. 892,532
Int. Cl.[5] F16K *11/22*
U.S. Cl. 137—606 **7 Claims**



1. A valve assembly, comprising:

a normally closed first on-off valve connected to a first fluid source;

a normally closed second on-off valve connected to a second fluid source;

a first actuator valve for opening the first on-off valve;

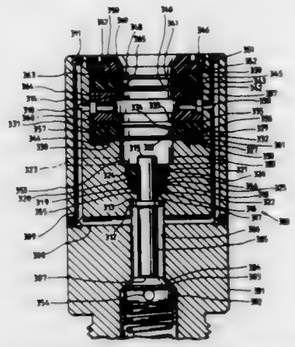
a second actuator valve for opening the second on-off valve; and

a kick plate comprising a first actuator plate configured for actuating solely the first actuator valve, and a second actuator plate configured for simultaneously actuating the first and second actuator valves.

5,203,374
PRESSURE BALANCED HYDRAULIC COUPLING WITH METAL SEALS

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

Continuation of Ser. No. 640,063, Jan. 11, 1991, Pat. No. 5,099,882. This application Oct. 16, 1991, Ser. No. 777,071
Int. Cl.[5] F16L *37/08*
U.S. Cl. 137—614.04 **11 Claims**



1. An apparatus for sealing a fluid flow port between a male member and a female member in an undersea hydraulic coupling, comprising:

(a) a cylindrical sleeve having a first end, a second end, an outer circumferential surface and a longitudinal bore extending therethrough; the outer circumferential surface having a first pair of shoulders adjacent the first and second ends, and the longitudinal bore having a second pair of shoulders adjacent the first and second ends;

(b) a first pair of hollow annular metal seals positionable on the first pair of shoulders for sealing between the longitudinal bore and the male member;

(c) a second pair of hollow annular metal seals positionable on the second pair of shoulders for sealing between the outer circumferential surface and the female member;

(d) a fluid flow port in the cylindrical sleeve for fluid passage between the female member and the male member.

5,203,375
LEVELING VALVE

Roland Blanz, Heiligkreuzsteinach, Fed. Rep. of Germany, assignor to Grau GmbH, Heidelberg, Fed. Rep. of Germany

Filed Feb. 19, 1991, Ser. No. 657,655
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1990, 4007828
Int. Cl.[5] F16K *31/52*
U.S. Cl. 137—627.5 **2 Claims**

1. A leveling valve for stabilizing the chassis height of a motor vehicle having a pneumatic shock absorption system wherein said valve comprises:

a unitary housing including a first end, an intermediate portion, and a second end.

a first bore hole extending between said first end and said second end through said unitary housing, said first bore hole including a first cross section having a first cross sectional dimension in said intermediate portion of said unitary housing and including a plurality of discrete longitudinal sections successively extending from said intermediate portion toward said first end and another plurality of discrete longitudinal sections successively extending toward said second end, said sections having a greater cross sectional dimension than the preceding section,

a valve seat formed in said first bore hole,

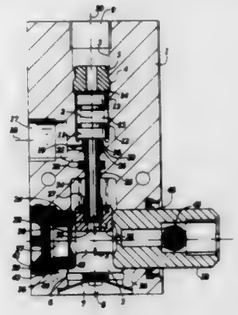
a flow chamber adjacent said valve seat for communication with the pneumatic shock absorption system,

a double valve body within said first bore hole in a section adjacent said valve seat,

a spring means biasing said double valve body toward closed relationship with said valve seat,

a valve plunger defining an exhaust passage therethrough and positioned within said first bore hole in said first section and axially movable with respect to said unitary housing through said flow chamber and said valve seat, and

means extending transversely of said housing for moving said valve plunger axially of said first bore hole through said flow chamber and valve seat and into and out of engagement with said double valve body to close alternately the exhaust passage of said plunger and urge said double valve body away from said valve seat to permit passage of fluid about said double valve body to said flow



chamber or to retract said valve plunger from said double valve body and open the exhaust passage,

whereby said double valve body and said valve plunger are insertable into said first bore hole within said unitary housing of the leveling valve from above and below said unitary housing so that no disassembly of said unitary housing is required for assembling the parts of the leveling valve,

wherein said means for moving said valve plunger is insertable in said unitary housing through a continuous second bore hole having a first side and a second side extending transversely within said unitary housing and through a section of said first bore hole and having a plurality of discrete transversely extending sections successively from said first bore hole toward said first side and toward said second side, each successive end of said transversely extending sections having a greater cross sectional dimension than the adjacent preceding section.

5,203,376
SELF-SHUTTING EGRESS VALVE

Sheen Chung-Shan, No. 34, Hehping Road, Huwei Chen, Yunlin Hsuan, Taiwan

Filed Mar. 23, 1992, Ser. No. 855,786
Int. Cl.[5] F16K *21/16*
U.S. Cl. 137—801 **15 Claims**

1. In a fluid tap, a self-shutting egress valve comprising:

a hollow valve body having an orifice of predetermined diameter on an upper portion thereof and at least one inlet aperture on a peripheral lower portion thereof;

a generally annular valve seat provided in a lower portion of said valve body below said at least one inlet aperture;

a valve piston movably positioned within said valve body having an axial bore, the lower portion of said valve piston being abuttable against said valve seat to prevent the efflux of fluid from said self-shutting egress valve;

an elongate push rod depending from said valve piston, the upper end of said push rod being slidingly retained within

gether with said repair material into the conduit to be repaired so that said repair material overlies a zone of said conduit to be

outer tubular member in sealing engagement with said

means for bending said coil having a distal end portion substantially fixed to a distal end portion of said coil; and

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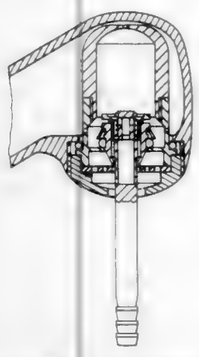
an elongate push rod depending from said valve piston, the upper end of said push rod being slidingly retained within said bore, said push rod having at least one conduit provided therein through which said bore is in communication with an exterior space surrounding said push rod, said at least one aperture being in communication with an egress space defined between said push rod and said valve body when said valve piston is spaced from said valve seat;

a flow controlling means disposed around a peripheral portion of said valve piston for enabling the flow of fluid from an interior portion of said valve body above said flow controlling means to an interior portion of said main body below said flow controlling means upon an upward displacement of said valve piston while inhibiting backflow



of fluid from the interior portion of said valve body below said flow controlling means to the interior portion of said valve body above said flow controlling means upon a downward displacement of said valve piston, said orifice being in communication with the interior portion of said valve body above said valve piston;

valve means provided in an upper portion of said valve piston for enabling the flow of fluid from the interior portion of said valve body above said flow controlling means to said at least one conduit of said push rod via said bore of said valve piston in communication therewith, said valve means being opened by an upward displacement of said push rod;

wherein, said self-shutting egress valve is disposed within the opening of a spout of said fluid tap.

5,203,377

METHOD OF REPAIRING A PIPELINE AND APPARATUS FOR USE IN SUCH A METHOD

David R. Harrington, Upper Beaconsfield, Australia, assignor to Barry Bros. Specialised Services Pty. Ltd., Mount Waverley, Australia

PCT No. PCT/AU90/00137, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/12243, PCT Pub. Date Oct. 18, 1990

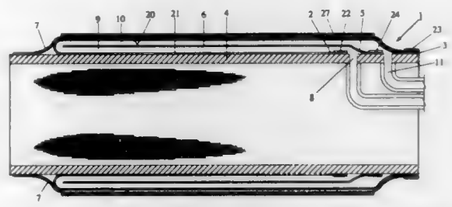
PCT Filed Apr. 9, 1990, Ser. No. 602,335

Claims priority, application Australia, Apr. 7, 1989, PJ3570

Int. Cl.[5] **F16L** *55/16*

U.S. Cl. 138—97 **15 Claims**

1. A method of repairing a conduit comprising providing a core member with a radially expandable device located outwardly of said core member, said radially expandable device extending axially along said core member, and at least partly circumferentially around said core member, said radially expandable device having an outer surface portion connected to said core member only at or adjacent one axial end of said outer surface portion of the radially expandable device, locating a repair material over said outer surface portion of the radially expandable device, positioning the core member together with said repair material into the conduit to be repaired so that said repair material overlies a zone of said conduit to be repaired, expanding said radially expandable device so as to press the repair material including a settable substance against the zone of the conduit to be repaired, holding the expanded condition of said radially expandable device for a length of



time sufficient for said repair material to remain adhered to said conduit to be repaired, and contracting said radially expandable device and withdrawing said core member from said conduit in a manner whereby the outer surface portion of the radially expandable member is peeled from said repair material by at least partial eversion.

5,203,378

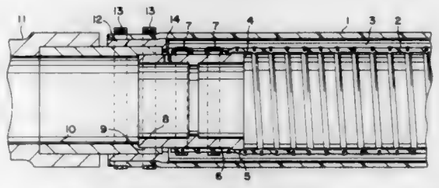
HIGH-FLEXIBILITY, NONCOLLAPSING LIGHTWEIGHT HOSE

David A. Williams, Pittsburgh, Pa., assignor to United States Department of Energy, Washington, D.C.

Filed Feb. 1, 1991, Ser. No. 648,931

Int. Cl.[5] **F16L** *55/00*

U.S. Cl. 138—109 **4 Claims**



1. A large, lightweight, non-collapsing fluid-conducting hose comprising:

an outer highly flexible and collapsible tubular member;

an inner flexible, lightweight, and non-collapsing tubular member disposed within said outer tubular member so that the combination forms a flexible non-collapsing hose wherein said inner and outer tubular members are in radially spaced relationship to provide an annular space between said inner and outer tubular members;

vent means for communicating said annular space with the inside of said inner tubular member to maintain substantially equal pressure on the inner and outer surfaces of said inner tubular member;

at least one end fitting; and

a coupling means for connecting said end fitting to the ends of said inner and outer tubular members substantially concentrically in a sealing relationship, and for connecting said hose to a fluid-handling system;

wherein said coupling means comprises:

a tubular spacer inserted into the end of said outer tubular member;

an outer coupling sleeve inserted partially into said tubular spacer and partially into said end fitting, sealed with said end fitting and said tubular spacer;

at least one hose clamp around the outer surface of said outer tubular member for clamping said end of said outer tubular member in sealing engagement with said tubular spacer and said outer coupling sleeve;

an inner coupling sleeve inserted partially into said outer coupling sleeve and partially into said inner tubular member and having a middle part exposed to said annular space; and

at least one hose clamp around said inner tubular member for clamping said inner tubular member in sealing engagement with said inner coupling sleeve.

5,203,379

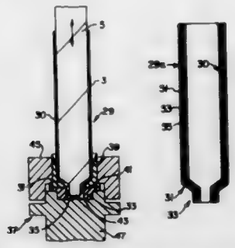
HEADED THERMOPLASTIC TUBE

George H. Holoubek, and John J. Rhoades, both of Muscatine, Iowa, assignors to Courtaulds Packaging Inc., Muscatine, Iowa

Division of Ser. No. 581,460, Sep. 12, 1990, Pat. No. 5,069,856. This application Aug. 13, 1991, Ser. No. 744,247

Int. Cl.[5] **B65B** *3/16*

U.S. Cl. 138—109 **9 Claims**



1. A headed thermoplastic tube formed solely from a thermoplastic extruded, stretched, cylinder, said cylinder stretched in the direction of the longitudinal axis, said tube having a body portion, having a uniform wall thickness within a variance of only about 10 percent thickness, shoulder portion and neck portion, all of which are comprised of the thermoplastic material from which said thermoplastic extruded, stretched, cylinder was formed, with no seams or joints present throughout said body portion, shoulder portion and neck portion.

5,203,380

BENDING DEVICE

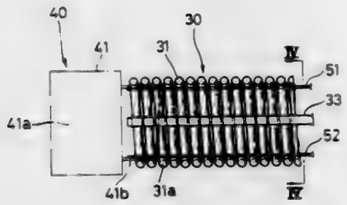
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,118

Claims priority, application Japan, Oct. 13, 1989, 1-264960; Oct. 13, 1989, 1-264961

Int. Cl.[5] **F16L** *11/12*

U.S. Cl. 138—118 **5 Claims**



1. A bending device comprising:

(a) a coil having an internal space therein, and comprising a number of turn portions juxtaposed in a direction of an axis of said coil;

(b) means for bending said coil comprising an operating wire, said means for bending said coil having a proximal end portion adapted to receive an operating force, said means for bending said coil having a distal end portion substantially fixed to a distal end portion of said coil; and

(c) at least one pair of limitation members extending in an axial direction of said coil and mounted respectively on diametrically-opposite portions of said coil, said limitation members engaging said turn portions of said coil to keep said turn portions at substantially constant intervals, and said coil being bendable in a direction perpendicular to a plane in which said pair of limitation members are disposed.

5,203,381

SPRING TENSION RELIEVING DEVICE FOR NEGATIVE DOBBY

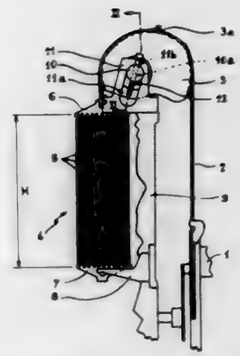
Jean-Paul Froment, and André Fumex, both of Faverges, France, assignors to S.A. des Etablissements Staubli, Faverges, France

Filed Jan. 23, 1992, Ser. No. 824,398

Claims priority, application France, Jan. 25, 1991, 9101065

Int. Cl.[5] **D03C** *1/14*

U.S. Cl. 139—84 **9 Claims**



1. In a weaving machine including a drawing device for actuation of heddle frames of weaving mechanisms of the negative type which includes for each frame at least one control cable which extends from the frame over a lever mounted to oscillate on a support shaft carried by fixed structures of the weaving mechanism to a spring system which is normally under tension, the improvement comprising, the support shaft being guided inside spaced guide slots, adjustment means extending into said guide slots, said support shaft being displaceable along said guide slots by said adjustment means to thereby release tension on the spring systems.

5,203,382

COMBINATION PIN STRAIGHTENER AND PIN SPREADING DEVICE

Robert T. Barnhart, 1329 N. Columbus Ave. #C, Glendale, Calif. 91202, and Kent S. McFann, Los Angeles, Calif., assignors to Robert T. Barnhart, Hollywood, Calif.

Filed Jan. 9, 1992, Ser. No. 818,604

Int. Cl.[5] **B21F** *1/02*

U.S. Cl. 140—123 **6 Claims**

1. A tool for straightening and splitting stage pin connectors, wherein a handle incorporating two holes, one at each end,

with one end of the handle being tapered, is perpendicular and

an automatic dispensing means for automatically dispensing a predetermined amount of a solvent into said container,

positioned therebelow, second pump means for pumping the paint ingredients from said second storage means to

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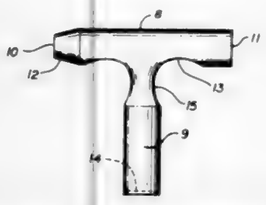
with one end of the handle being tapered, is perpendicular and attached to one end of a tube, leaving the other end of the tube



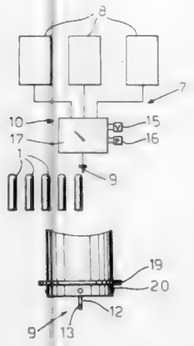
open to form a mouth, which embodies a blade (at the bottom which is) recessed within the said mouth of (said) the tube.

5,203,383

SYSTEM FOR USING AEROSOLS AND AEROSOL PACKAGES

Pentti Turunen, Vähänummentie 5, SF-04440 Järvenpää, Finland

Filed Mar. 29, 1991, Ser. No. 677,664
Claims priority, application Finland, Jan. 15, 1991, 910201
Int. Cl.[5] B65B *3/04*
U.S. Cl. 141—20 **3 Claims**



1. In combination, an aerosol package having an outer pressure resistant shell, said shell having an opening therein, a resilient container disposed within the shell and having an inlet sealed within said opening, a valve disposed in said opening, a propellant gas disposed in the space between the shell and the container, a filling apparatus for introducing a liquid into the container, said filling apparatus including a reservoir of liquid and a nozzle communicating with said reservoir and disposed to be inserted in said valve to open said valve, and force means for applying a force to said liquid in the reservoir to thereby transfer the liquid from the reservoir through said nozzle to said container.

5,203,384

COMBINATION CASTING FOR A BLENDING DISPENSER

Robert E. Hansen, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 659,196, Feb. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 568,431, Aug. 15, 1990, abandoned. This application Jun. 1, 1992, Ser. No. 892,625
Int. Cl.[5] B67D *5/56*
U.S. Cl. 141—59 **6 Claims**

1. A casting member for use with a blending dispenser having vapor recovery, comprising:

at least first and second product inlets, a mixing chamber, a product outlet, an annular vapor recovery inlet, and at least one vapor recovery outlet; wherein

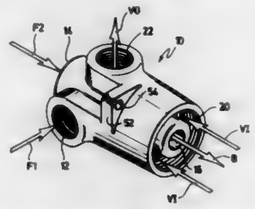
said casting member being a single-pieced article that can be formed in a single casting process;

said mixing chamber is formed by the intersection of said first and second product inlets;

said product outlet and said annular vapor recovery inlet are adapted for connection to a coaxial hose;

said annular vapor recovery inlet is an annular opening surrounding said product outlet;

said first and second product inlets and said at least one vapor recovery outlet are substantially at one end of said



casting while said product outlet and said annular vapor recovery inlet are at the other end of said casting;

said product outlet includes a pair of spaced o-ring seals;

each of said first and second product inlets and said at least one vapor recovery outlet are threaded so as to receive a threaded tube fitting;

said annular vapor recovery inlet is threaded so as to receive a threaded coaxial hose connector; and

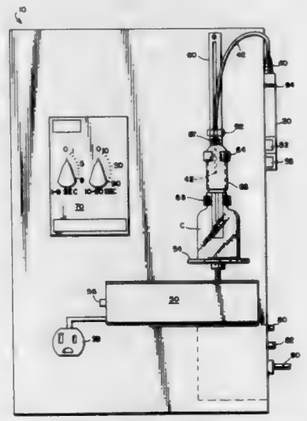
said first product inlet and said at least one vapor recovery outlet are oriented perpendicular to said second product inlet, said product outlet, and said annular vapor recovery inlet.

5,203,385

APPARATUS AND PROCESS FOR AUTOMATICALLY RECONSTITUTING DRY MATERIALS, ESPECIALLY PHARMACEUTICALS

Donald Waber, 1155 Fort St. Mall, Suite 132, Honolulu, Hi. 96813-2706

Filed Mar. 31, 1992, Ser. No. 861,321
Int. Cl.[5] B65B *3/30*
U.S. Cl. 141—69 **11 Claims**



1. An apparatus for reconstituting a dry material that has been stored in a storage container without removing said dry material from said container, comprising:

an automatic dispensing means for automatically dispensing a predetermined amount of a solvent into said container, wherein said dispensing means dispenses said solvent at a flow rate of at least approximately 1 milliliter per second; and

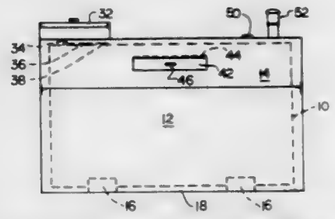
an agitator means for agitating said solvent and said dry material in said container adjacent to said dispensing means.

5,203,386

SECONDARY CONTAINMENT OF ABOVE-GROUND TANKS FOR FLAMMABLE MATERIALS

Robert W. Harp, Pilot Mountain, N.C., assignor to Industrial Environmental Supply, Inc., Greensboro, N.C.

Continuation of Ser. No. 516,291, Apr. 30, 1990. This application Nov. 20, 1991, Ser. No. 794,951
Int. Cl.[5] B65B *1/04*
U.S. Cl. 141—86 **24 Claims**



1. An above-ground secondary containment system comprising:

a) a closed tank suitable for holding liquid and having an input port and a dike surrounding said tank;

b) a hood over said dike for preventing ambient precipitation and trash from entering said dike; and

c) a closable tank port access means in said hood for permitting access to said tank input port when desired but closable to maintain said hood's property of preventing ambient precipitation and trash from entering said dike at other times and communicating with said dike so that spilled liquid adjacent said tank input port may be directed to said dike.

5,203,387

PROCESS AND APPARATUS FOR DISPENSING LIQUID COLORANTS INTO A PAINT CAN, AND QUALITY CONTROL THEREFOR

Philip Howlett, Wheaton; Larry Frederickson, Glendale Heights, both of Ill.; Kenneth N. Edwards, Glendale, and Edward D. Edwards, Healdsburg, both of Calif., assignors to Dunn Edwards Corp. & Fluid Management Ltd. Part., Los Angeles, Calif.

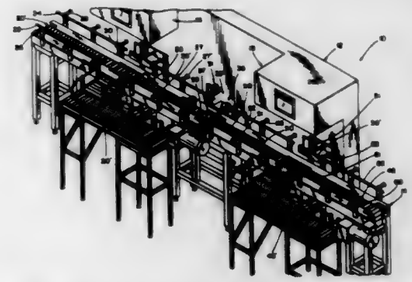
Division of Ser. No. 795,008, Nov. 14, 1991, which is a division of Ser. No. 432,991, Nov. 6, 1989, Pat. No. 5,083,591. This application May 13, 1992, Ser. No. 882,503
Int. Cl.[5] B01F *11/00*
U.S. Cl. 141—103 **25 Claims**

1. A paint batching apparatus, comprising:

a first tint-dispensing station comprising first storage means for storing the paint ingredients for dispensing into a paint can, first nozzle means for dispensing the paint ingredients directly into the paint can positioned therebelow, first pump means for pumping the paint ingredients from said first storage means to said first nozzle means, and first control means for controlling the operations of said first nozzle means and said first pump means for dispensing desired ones of paint ingredients; and

a second base-dispensing station comprising second storage means for storing the liquid base paint ingredients for dispensing into a paint can, second nozzle means for dispensing the paint ingredients directly into the paint can positioned therebelow, second pump means for pumping the paint ingredients from said second storage means to said second nozzle means, and second control means for controlling the operations of said second nozzle means and said second pump means for dispensing desired ones of paint ingredients;

said first storage means comprising a plurality of first supply-containers for storing therein a respective liquid-colorant paint ingredient, and said first nozzle means comprising a plurality of first dispensing nozzles; said first pump means



comprising a plurality of first conduit means for fluidly connecting each of said first supply-containers to a respective and unique one of said first dispensing nozzles, and a plurality of valves operatively associated with said plurality of first conduit means, one said valve for one said first conduit means, for controlling the flow through said first conduit means;

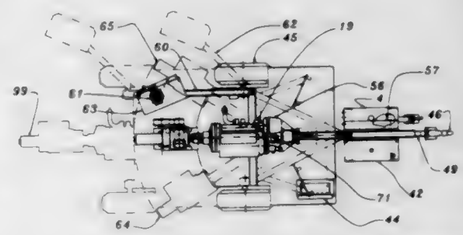
said first nozzle means further comprising at least one supplemental dispensing nozzle for dispensing liquid base paint ingredient at said first tint-dispensing station.

5,203,388

STUMP CUTTER

John M. Bowling, 9376 Lincoln Way East, Orrville, Ohio 44667

Filed Apr. 28, 1992, Ser. No. 876,066
Int. Cl.[5] A01G *23/06*
U.S. Cl. 144—2 N **24 Claims**



1. An improved stump cutting apparatus of the type having a wheel supported frame, said frame having at least a first and a second frame member intersecting in an essentially "T" configuration, said first frame member having a forwardly projecting tongue for towing, a rotating cutting wheel having a plurality of radially extending cutting teeth circumferentially secured about the periphery of said cutting wheel, said cutting wheel mounted on a cutting boom having a first and second end and positioned rearwardly of said frame, a power drive means for powering said cutting wheel and having at least a hydraulic pump and motor wherein the improvement comprises:

said cutting boom having a single longitudinal axis, said cutting boom being non-jointed and pivotally attached at said first end to said frame, said cutting wheel suspend-

ingly mounted directly from said second end of said cut-

end lap joints, dowel joints, spline joints, tongue and

along the spindle to form, with the spindle, a portion of a first air passageway that extends between the inboard and outboard

output shaft, wherein said brake releasing means further comprises temperature sensitive means for operating said

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ingly mounted directly from said second end of said cutting boom;

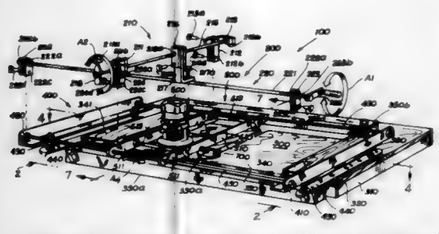
a rotational engine means operatively connected to said power drive means and having a longitudinal axis, said engine means being mounted along said cutting boom such that the longitudinal axis of said engine means is essentially coaxial to the longitudinal axis of said cutting boom.

5,203,389

PRECISION WOOD-JOINT MAKING FIXTURE APPARATUS AND METHOD OF USE WITH A ROUTER

Edward J. Goodwin, 1655 W. Ajo #681, Tucson, Ariz. 85713

Filed Nov. 6, 1992, Ser. No. 972,767
Int. Cl.[5] B27B *1/00*; **B23C** *1/20, 5/10*
U.S. Cl. 144—356 **18 Claims**



1. A method of making a wood-joint, said method comprising the steps of:

(a) providing a fixture apparatus for use with a router, said apparatus comprising:

a table structure having a plurality of clamp means for clamping a plurality of workpieces to said table structure, said plurality of clamp means facilitating clamping said plurality of workpieces in appropriate directions with respect to each other for making a selected one of a plurality of wood-joints,

a first frame member having first opposing ends mounted to said table structure and also having second opposing ends suspended above said table structure,

said first opposing ends having a plurality of jack means for elevation said second opposing ends an equidistance from a work surface of said table structure and also having a plurality of corner adjustment means for maintaining said first and second opposing ends in orthogonal relationship with each other, and

a second frame member transversely and movably mounted to said second opposing ends for being maneuvered over said work surface, said second frame member comprising a carriage means for supporting and carrying said router, said second opposing ends and said carriage means having respective stop members for being selectively attached thereto said second opposing ends and to said carriage means for selectively limiting travel of said

(b) squaring said first frame member with respect to said work surface using said plurality of jack means and said plurality of corner adjustment means and facilitating unimpeded back and fourth movement of said second frame member on said second opposing ends;

(c) installing said router to a carriage plate member of said carriage means and further installing said carriage plate member onto opposing carriage supports members of said carriage means and facilitating unimpeded back and fourth movement of said plate member on said opposing carriage support members;

(d) selecting a type of wood-joint to be made, said wood-joint type being selected from a group of commonly used wood-joints comprising: dovetail joints, box joints, dado joints, dovetail-dado joints, rabbet joints, combination rabbet and dado joints, mortise and tenon joints, mortise and mortise joints, biscuit joints, lap joints, cross lap joints, end lap joints, dowel joints, spline joints, tongue and groove joints, and stile and rail joints;

(e) selecting and installing a router bit onto said router, said router bit being selected from a group of provided router bits and being suitable for making said selected type of wood-joint;

(f) clamping a plurality of wood workpiece to said table structure for making said selected type of wood-joint;

(g) positioning said installed router over said clamped workpieces and maneuvering said router for performing a cutting operation on said workpieces that will make said selected wood-joint; and

(h) removing said cut workpieces and repeating said steps (d) through (g) to make other types of wood-joints.

5,203,390

COVER FOR PROTECTING GOLF CLUB HANDLES AND THE LIKE

David L. Eckstein, Cary, N.C., assignor to Kilf Designs, Inc., Cary, N.C.

Filed Aug. 8, 1991, Ser. No. 742,755
Int. Cl.[5] A63B *53/14, 57/00*
U.S. Cl. 150—160 **8 Claims**

1. A cover for protecting golf, club handles comprising an elongate tubular member having a closed end and an opposing open end, the tubular member being dimensioned to form a sleeve adapted to fit over the handle, and wherein the sleeve includes an outer shell formed of a substantially waterproof material, and an inner terry cloth fabric covering a substantial majority of the inside surface of the shell, and wherein the edge portion of the open end is folded upon itself to form a drawstring channel and two channel openings, a drawstring positioned within the channel and having drawstring ends emerging from the openings, and means for locking the drawstring when the drawstring is pulled so that the grip cover remains in secure engagement to the handle of a golf club when inserted thereon.

5,203,391

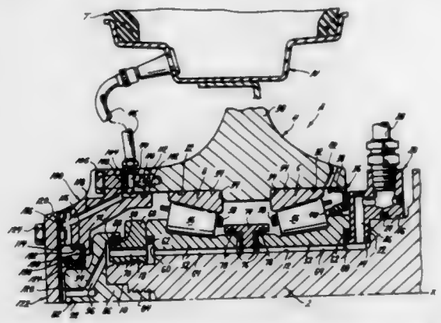
WHEEL MOUNTING FOR TIRE PRESSURE ADJUSTMENT SYSTEM

Gerald P. Fox, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Mar. 15, 1991, Ser. No. 670,344
Int. Cl.[5] B60C *23/00*
U.S. Cl. 152—416 **24 Claims**

1. A mounting for a wheel having a pneumatic tire, said mounting comprising: a nonrotating spindle having inboard and outboard ends; a hub located around the spindle and having the wheel attached to it; bearings interposed between the hub and the spindle to enable the hub to rotate on the spindle about an axis of rotation, the bearings having inner and outer races located around the spindle and within the hub, respectively, and opposed raceways on the races, the bearings further having rolling elements located between and contacting opposed raceways of the inner and outer racer; the inner race of each bearing having an axially directed channel which lies

along the spindle to form, with the spindle, a portion of a first air passageway that extends between the inboard and outboard ends of the spindle, the inner races being spaced axially from each other; connecting means at the inner races of the bearings for connecting the channels in the inner races so that they are in communication and for preventing air from escaping from the first passageway into the region between the races, the connecting means including a separator ring located around the spindle and between the inner races and means for establishing a fluid tight barrier between the separator ring and the inner races, the first passageway extending through the separator ring; a closure attached to the hub and extending across the outboard end of the spindle to close one end of a chamber that lies at least in part beyond the outboard end of the spindle and into which the first passageway opens at the outboard end of the spindle; sealing means for establishing a fluid barrier generally between the hub and the spindle to thereby close the other end of the chamber, the sealing means further being located between the outboard end of the first passageway and the rolling elements of the bearings so that the rolling elements of the bearings are isolated from the chamber; and means for providing a second passageway between the chamber and the interior of the tire.



5,203,392

MECHANISM FOR CONTROLLING THE RAISING AND LOWERING OF A DOOR

Tsung-Wen Shea, Taipei, Taiwan, assignor to Anchuan Corporation, Taipei, Taiwan

Filed Mar. 30, 1992, Ser. No. 859,833
Int. Cl.[5] E05F *15/20*
U.S. Cl. 160—7 **48 Claims**

1. A mechanism for controlling the raising and lowering of a slatted retractable door comprising:

a speed reduction means for reducing a rotational speed;

a high speed input shaft connected to said speed reduction means and being connectable to a means for rotating said input shaft;

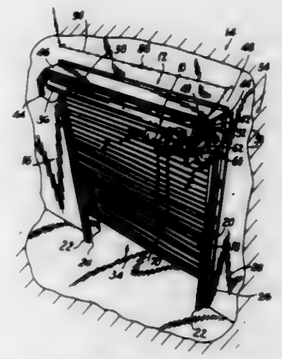
a low speed output shaft connected to said speed reduction means;

a governor mounted on said input shaft for limiting the rotational speed thereof, whereby to also regulate the rotational speed of said output shaft;

means for operatively connecting said output shaft to the slatted retractable door;

a brake for preventing rotation of said output shaft; and

means for releasing said brake to permit rotation of said output shaft, wherein said brake releasing means further comprises temperature sensitive means for operating said brake releasing means upon the ambient temperature reaching a predetermined value.

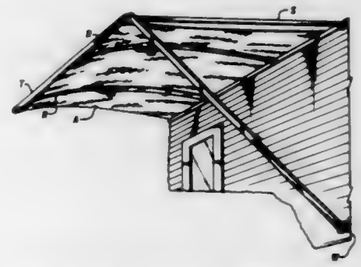


5,203,393

AWNING SUPPORT RIBS

Timothy D. Blevins, and Donald E. Blevins, both of P.O. Box 1088, Rockwell, Tex. 75087

Continuation-in-part of Ser. No. 690,263, Apr. 24, 1991, abandoned. This application Jun. 5, 1992, Ser. No. 894,636
Int. Cl.[5] E04F *10/06*
U.S. Cl. 160—67 **10 Claims**



1. An awning support apparatus comprising:

an awning formed of supple sheet material connected to a wall and to a tube disposed parallel to said wall;

a pair of side frames connected to and extending from said wall respectively along each side of said awning, and connected at an apex opposite to said wall to a respective end of said tube;

said tube when connected to said pair of side frames being disposed a predetermined distance from said wall measured along said each side of said awning;

at least one flexible, adjustable rib means located between said sides of said awning and extending between said wall and said tube, said at least one flexible, adjustable rib means being longer than said predetermined distance; and

holding means engageable with said at least one flexible, adjustable rib means to hold said at least one flexible, adjustable rib means in an outwardly bowed condition in substantial contact with said awning material to thereby provide additional support for the awning material;

said at least one flexible, adjustable rib means comprising an elongated slide bar having a rectangular cross section and a plurality of holes at one end and a first end cap provided at an opposite end, an elongated clamp bar having a rect-

angular cross section and a clamp mounted at one end and a second end cap provided at an opposite end, said clamp

top edge portion to said shade panel bottom portion exclusive of said width adjustable portion, and

line being located along said second internal port means whereby the same is formed in each of said valve body components, so that separating said valve body exposes a

5,203,399

HEAT TRANSFER APPARATUS

Hisao Koizumi, Zushi, Japan, assignor to Kabushiki Kaisha

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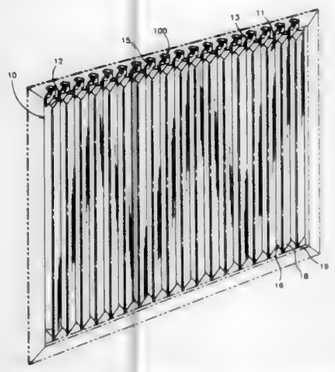
angular cross section and a clamp mounted at one end and a second end cap provided at an opposite end, said clamp including a collar with an opening for receiving said one end of said slide bar, and a spring biased locking bolt engageable with one of said plurality of holes in said one end of said slide bar; whereby the length of said at least one flexible adjustable rib means may be changed to accommodate differently sized awnings, and sagging and flapping of the awning is substantially reduced particularly during inclement and windy weather conditions.

5,203,394
LOUVER SYSTEM
Anderson Hailey, 4525 Texas St., Apt. #8, San Diego, Calif. 92116
Filed Jan. 22, 1991, Ser. No. 644,433
Int. Cl.[5] E06B *7/084, 3/04*
U.S. Cl. 160—166.1 **5 Claims**



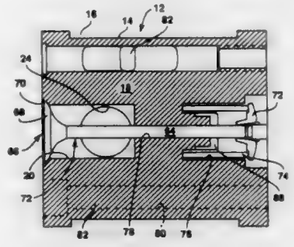
1. A louver system in combination with a vertical louver support system comprising:
a. a plurality of parallel tubular triangular elongate louvers rotatably attached to the support system at one end of each louver and depending vertically therefrom;
b. a first side and a second side of each triangular louver being made of a material that will allow light to pass through, and the first side and second side being connected to each other forming adjacent sides of each triangular louver; and
c. a third side of each triangular louver being made of an opaque material, and being opposite of an angle formed by the joining of the first side and second side, and having a rotation restriction and alignment tab depending thereon.

5,203,395
ADJUSTABLE RUFFLE WINDOW SHADE
Barbara J. Koller, Lake Wylie, S.C., and Jerome Ohnstad, Charlotte, N.C., assignors to CHF Industries, Charlotte, N.C.
Filed Mar. 19, 1992, Ser. No. 853,906
Int. Cl.[5] A47G *5/02*
U.S. Cl. 160—263 **13 Claims**

1. An adjustable width window shade comprising an adjustable roller assembly,
a shade panel having top and bottom portions and a pair of side portions, at least one of said side portions having a plurality of lines of weakness therein defining strips of the shade panel side portion which may be selectively torn away to provide a width adjustable portion,
means for affixing the top portion of said shade panel exclusive of said width adjustable portion to a portion of said roller assembly,
a decorative member having a top edge portion,
means for affixing a first length of said decorative member top edge portion to said shade panel bottom portion exclusive of said width adjustable portion, and
means for removably attaching the remaining length of said decorative member top edge portion to said width adjustable portion of said shade panel bottom portion,

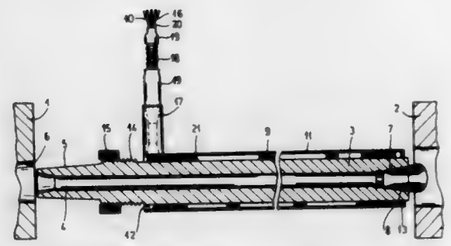
whereby the remaining length of said decorative member can be detached and adjusted to match the adjusted width of the shade panel and then reattached to said shade panel.

5,203,396
VACUUM VALVE FOR DIE CASTING
Russell J. VanRens, Milwaukee, Wis.; James M. Rumford, Waukegan, Ill., and Thornton E. Schultz, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Apr. 27, 1992, Ser. No. 874,629
Int. Cl.[5] B22D *17/14, 17/20*
U.S. Cl. 164—305 **32 Claims**



1. A vacuum valve apparatus for use in a die casting means, the die casting means being of the type which utilizes a source of vacuum pressure and a die body having internal surfaces which define an internal die cavity for making a casting, said apparatus comprising:
a valve body adapted to be at least partially located in the die body, said valve body having at least one face that is generally coextensive with an internal surface of the die body, said valve body having a first internal port means adapted to receive a valve means, a second internal port means communicating said first port means with a trap means and the source of vacuum pressure, said first port means terminating at said one face and being in communication with said die cavity;
an openable and closeable valve means housed in said first internal port means of said valve body and communicating said first port means with the die cavity when said valve means is open and isolating the first port means from the die cavity when said valve means is closed;
a trap means operatively connected to said valve body and having a closed chamber with an inlet thereto, said chamber being adapted to receive and contain casting material that may enter the inlet thereof, said inlet communicating said chamber with said second internal port means, said trap means having a vacuum port means for communicating the chamber with the source of vacuum pressure;
said valve body having at least two body components that are separable from one another along a split line, said split line being located along said second internal port means whereby the same is formed in each of said valve body components, so that separating said valve body exposes a substantial portion of at least said second internal port means to enable any casting material to be removed therefrom.

5,203,397
HEATING ASSEMBLY FOR A DIE-CASTING MACHINE
Srekumar Bandyopadhyay, Battle Creek, Mich., assignor to Hotset Corporation, Battle Creek, Mich.
Filed Apr. 2, 1992, Ser. No. 862,491
Int. Cl.[5] B22D *17/02*
U.S. Cl. 164—309 **9 Claims**

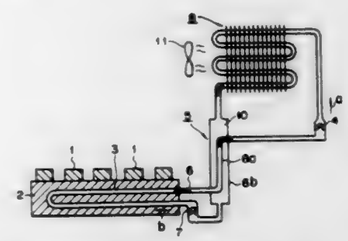


1. A die-casting apparatus, comprising:
a die caster for producing a material stream of a molten metal selected from the group which consists of zinc and magnesium, said die caster having an internally conical seat;
a tubular nozzle body formed with a passage for conducting said material stream, an externally conical end receivable in and adapted to be wedged into said seat, and an internally conical recess at an opposite axial end of said body;
a die having a sprue and formed with a mouthpiece engaging in said recess and receiving said stream;
an electrical heating element in a form of a strip wrapped around an outer surface of said nozzle body in a multiplicity of turns in a single layer;
a thin-wall protective tube slid axially over said layer and defining an axially extending gap with said tubular nozzle body, said turns being secured between said protective tube and said nozzle body; and
respective annular members closing opposite axial ends of said gap and bonded to both an inner wall of said tube and said nozzle body, said strip having a greater number of turns per unit length at each end of said protective tube than between said ends of said protective tube.

5,203,398
LOW TEMPERATURE PROCESS FOR EVAPORATIVE PATTERN CASTING
Jay Easwaran, Portage, Mich., assignor to The Board of Trustees of Western Michigan University, Kalamazoo, Mich.
Filed Jan. 31, 1992, Ser. No. 830,177
Int. Cl.[5] B22C *9/04*
U.S. Cl. 164—516 **13 Claims**

1. A method of producing a cast metal part comprising the steps of forming a pattern of the metal part out of a heat-vaporizable material; forming a ceramic shell around said pattern; forming a bed of a particulate medium heated to a temperature of from 700° to 1000° F. around said ceramic shell; vaporizing the pattern to form a mold; introducing molten metal into said mold; solidifying said molten metal; and removing said solidified molten metal from said mold to form a cast metal part.

5,203,399
HEAT TRANSFER APPARATUS
Hisao Koizumi, Zushi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 15, 1991, Ser. No. 700,257
Claims priority, application Japan, May 16, 1990, 2-124084
Int. Cl.[5] F28D *15/02;* **H01L** *23/427*
U.S. Cl. 165—104.33 **5 Claims**



1. A heat transfer apparatus comprising:
closing loop pipe line means enclosing a predetermined amount of liquid heating medium inside;
a heat receiving section receiving heat from an object to be cooled wherein said object to be cooled includes an electronic part, and transferring heat to said heating medium in said closing loop pipe means;
a radiating section taking heat away from said heating medium in said closing loop pipe means;
a first check valve formed to move said heating medium in a first direction toward said radiating section by a volume expansion generated when at least one part of said heating medium evaporates in said heat receiving section;
a second check valve formed to move said heating medium in only the same direction as said first direction by a volume contraction generated when said heating medium evaporated in said radiating section is cooled;
wherein a diameter of the pipe of said closing loop pipe line means close to said heat receiving section is set to be adjusted to a piston type flow state when said heating medium receives heat and evaporates, and changes to a two phase flow of vapor-liquid; and
wherein when the pipe of said closing loop pipe line close to said heat receiving section is horizontally arranged, an inner diameter d (mm) of said pipe is set as follows:

$$d < 150\,[x]\sqrt{\sigma/\rho}$$

where σ: surface tension of the heating medium (N/m), and ρ: density of the heating medium (g/cm^3).

5,203,400
AIR CONDITIONER
Shoji Tsunekawa, Gunma; Koji Mori, Ashikaga; Fujio Suzaki, Ohta, and Yoshiki Ikari, Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Dec. 27, 1990, Ser. No. 634,760
Claims priority, application Japan, Dec. 29, 1989, 1-340074
Int. Cl.[5] F24F *7/00*
U.S. Cl. 165—59 **2 Claims**

1. An air conditioner having an interior divided into two chambers by a partitioning plate, one chamber housing therein a heat exchanger, a centrifugal type fan having a given diameter and given thickness, and a fan scroll for said fan, the other chamber having a motor arranged therein, said fan being rotatably supported on a shaft of said motor which extends through said partitioning plate such that an adjacent side of the fan is spaced a given distance from the heat exchanger, wherein
the fan scroll has a scroll portion and a nose portion integral with said scroll portion, said scroll further defining a front portion having a vent opening nd an upper portion having

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a discharge opening, said openings merging to form a

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in spaced relation along a first direction, each hole being

and an exterior and having at least one first shell opening

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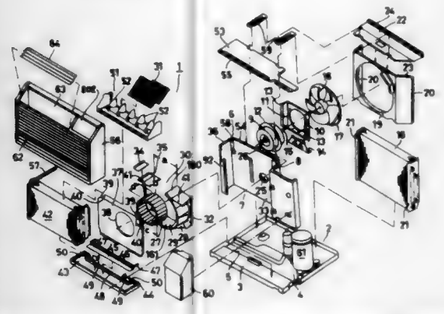
a discharge opening, said openings merging to form a single continuous opening to said front and upper portions of said scroll,

said scroll having a back portion opposite said front portion which is mounted on said partitioning plate,

said vent opening and said discharge opening being larger than the diameter of said fan,

the heat exchanger being spaced from the scroll a distance greater than the distance the motor shaft projects from the partitioning plate,



the shaft projecting beyond said partitioning plate a distance less than the spacing between the adjacent side of the fan and the heat exchanger,

a mounting plate having an intake hole mounted on the front portion of the scroll so that the intake hole registers with the vent opening, and

a plate for covering a gap between the mounting plate and heat exchanger so as to bridge over an upper member of the heat exchanger and an upper portion of the mounting plate.

5,203,401

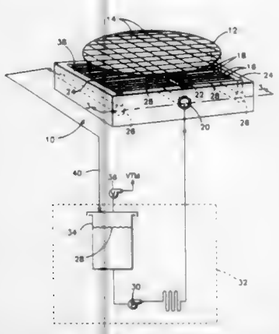
WET MICRO-CHANNEL WAFER CHUCK AND COOLING METHOD

William R. Hamburgen, Menlo Park, and John S. Fitch, Newark, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 722,891, Jun. 28, 1991, Pat. No. 5,115,858. This application May 22, 1992, Ser. No. 888,040

Int. Cl.[5] H01L *23/473*

U.S. Cl. 165—80.4 **9 Claims**



1. A chuck for cooling a planar electronic substrate which comprises a body having a planar upper surface, a plurality of micro-channels extending into said body from said planar upper surface, said plurality of micro-channels being separated from one another by individual ones of a plurality of cooling fins, a liquid coolant circulation system including at least one liquid coolant supply manifold positioned in said body to supply liquid coolant to said plurality of micro-channels and at least one liquid coolant exit manifold positioned in said body to remove liquid coolant from said plurality of micro-channels, and a source of a vacuum connected to said liquid coolant circulation system.

5,203,402

HEAT EXCHANGER

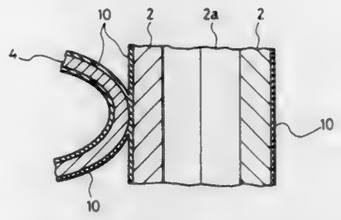
Kunihiko Nishishita, Konan; Amane Watanabe, Higashi-Matsuyama; Isamu Kurosawa, Konan, and Yokichi Sato, Tokyo, all of Japan, assignors to Zexel Corporation and Nihon Parkerizing Co., Ltd., both of Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 836,127

Claims priority, application Japan, Feb. 18, 1991, 3-45770

Int. Cl.[5] F28F *13/18*

U.S. Cl. 165—133 **3 Claims**



1. In a heat exchanger including a plurality of tube elements, each of said tube elements having a refrigerant-evaporating passage formed therethrough, and corrugated fins associated with said tube elements, wherein said tube elements and said corrugated fins have outer surfaces thereof coated with a hydrophilic coating layer,

the improvement wherein said hydrophilic coating layer comprises a colloidal silica having silanol groups, the colloidal silica being made cationic by combining aluminum nitrate with an acrylic-modified resin of polyamide-epichlorohydrin having hydroxyl groups, part of the silanol groups of said colloidal silica being chemically combined with part of the hydroxy groups of said acrylic-modified resin of polyamide-epichlorohydrin.

5,203,403

FIN-TUBE HEAT EXCHANGER

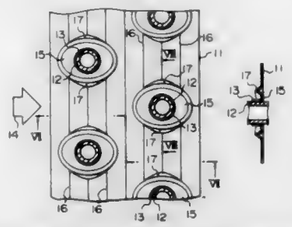
Shoichi Yokoyama, Otsu; Hitoshi Motegi, Kusatsu, and Toshiaki Andoh, Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 14, 1992, Ser. No. 835,686

Claims priority, application Japan, Feb. 21, 1991, 3-026596

Int. Cl.[5] F28F *1/32*

U.S. Cl. 165—151 **4 Claims**



1. A plate fin heat exchanger comprising a plurality of plate-like fins disposed in parallel at predetermined intervals and a group of tubes upon which said fins are mounted, each said fin comprising:

a plurality of rows of holes for receiving said tubes disposed

in spaced relation along a first direction, each hole being defined by a collar, each collar being surrounded by a substantially planar seat, all the seats lying substantially in a common plane and being shaped so as to define a long axis parallel to said first direction and a short axis, each seat being surrounded by a first ridge portion protruding from said common plane in a direction parallel to said tubes, and longitudinal ridges extending transverse to said first direction and having a height substantially the same as the highest protrusion of said ridge portions relative to said common plane.

5,203,404

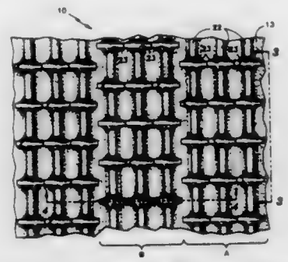
HEAT EXCHANGER TUBE

Robert H. L. Chiang, Liverpool; Daniel Gaffaney, Chittenango, and Albert J. Kalifelz, Camillus, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,051

Int. Cl.[5] F28F *1/26*

U.S. Cl. 165—133 **3 Claims**



1. A heat exchanger tube (10) having an improved external surface configuration in which the improvement comprises:

at least one fin convolution (22), the ratio of the height of said fin convolution to the outer diameter of said tube being between 0.025 and 0.075, disposed helically about the external surface of said tube so that there are 20 to 30 fins per cm (5) to 75 fins per inch); and

notches (23) extending radially into, to a depth of between 0.2 and 0.8 of said fin convolution height, and generally axially across said fin convolution at intervals about the circumference of said tube.

5,203,405

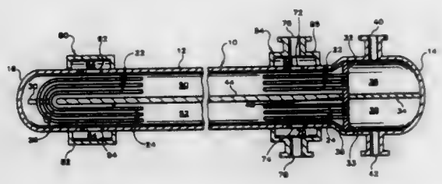
TWO PASS SHELL AND TUBE HEAT EXCHANGER WITH RETURN ANNULAR DISTRIBUTOR

Cecil C. Gentry, and Irvin M. Atkins, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 3, 1992, Ser. No. 829,191

Int. Cl.[5] F28D *7/06*

U.S. Cl. 165—160 **10 Claims**



1. A shell unit for use in a two pass shell and tube heat exchanger, comprising:

a shell having a first end and a second end and an interior and an exterior and having at least one first shell opening between said first end and said second end and at least one second shell opening between said first end and said second end and wherein said at least one second shell opening is completely separate and distinct from said at least one first shell opening;

a longitudinal baffle sealingly engaged to the interior of said shell, wherein said longitudinal baffle divides at least a portion of the interior of said shell into a top half and a bottom half wherein said first shell openings are in communication with said top half and said second shell openings are in communication with said bottom half; and

return distributor means for providing direct fluid flow communication between said at least one first shell opening and said at least one second shell opening through said exterior of said shell.

5,203,406

PLATE EVAPORATOR

Ralf Blomgren, Skanör, Sweden, and Niels-Erik Clausen, Stealöse, Denmark, assignors to Alfa-Laval Desalt A/S, Hvidovre, Denmark

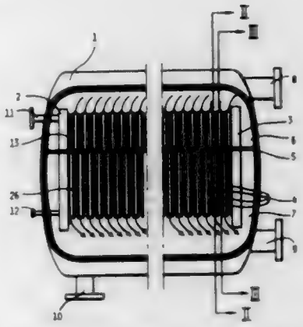
PCT No. PCT/SE90/00703, § 371 Date May 1, 1992, § 102(e) Date May 1, 1992, PCT Pub. No. WO91/06818, PCT Pub. Date May 16, 1991

PCT Filed Oct. 30, 1990, Ser. No. 849,054

Claims priority, application Sweden, Nov. 2, 1989, 8903671

Int. Cl.[5] F28F *3/10*; **B01D** *1/22*

U.S. Cl. 165—167 **5 Claims**



1. Plate evaporator comprising a package of substantially vertically arranged heat transferring plates (4) with plate interspaces, every second one of which forms an evaporation space (28) for at least partial evaporation of a liquid and the other plate interspaces forming condensation spaces (30) for at least partial condensation of a heat emitting vapour, and further comprising first sealing means (13, 14) which in an upper part of the plate interspaces forming evaporation spaces (28) delimit distribution chambers (27), each of which has several separate connections with at least one evaporation space (28), the heat transferring plates (4) having through openings (16) forming an inlet channel for evaporation liquid, which extends through the plate package and communicates with the distribution chambers (27), wherein

at least two second sealing means (25) are arranged in an upper part of each condensation space (30), horizontally spaced from each other along the heat transferring plates (4), each of said second sealing means delimiting between the heat transferring plates (4) a transferring chamber (29) that is closed from connection with other parts of the condensation space (30),

the condensation spaces (30) communicate with the surrounding of the plate package through the gaps formed between said second sealing means (25) for receiving heat emitting vapour from above, and

the heat transferring plates (4) have through holes (17, 18)

5,203,408

5,203,409

GEOTHERMAL WELL APPARATUS AND ECCENTRIC

the upward flow of well fluids after closure of the flapper means to a location remote from the wellhead; and

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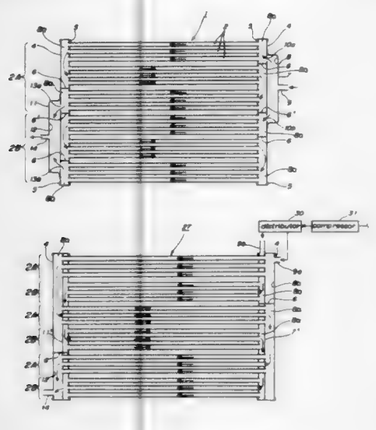
the heat transferring plates (4) have through holes (17, 18) communicating with the transferring chambers, for each transferring chamber (29) at least one first hole (17) connecting the transferring chamber (29) with a distribution chamber (27) and at least one second hole (18) connecting the transferring chamber (29) with an evaporation space (28).

5,203,407

VEHICLE-LOADED PARALLEL FLOW TYPE HEAT EXCHANGER

Yoshikiyo Nagasaka, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Nov. 7, 1991, Ser. No. 788,837
Claims priority, application Japan, Nov. 7, 1990, 2-301404
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—174 **9 Claims**



1. A heat exchanger comprising:
a pair of header tanks placed in parallel to each other in a plane;
a row of parallel tubes placed in said plane and connected at opposite ends to said header tanks;
a plurality of partitions provided in said header tanks to divide each header tank into a plurality of compartment along the length of said header tank thereby forming a plurality of refrigerant passages each consisting of a plurality of multitube paths each having a plurality of said parallel tubes; and
a pair of additional tanks each attached to each of said header tanks to form a chamber which communicates with said refrigerant passages through ports formed on said header tank whereby refrigerant is distributed into said plurality of refrigerant passages to provide reduced flow resistance.

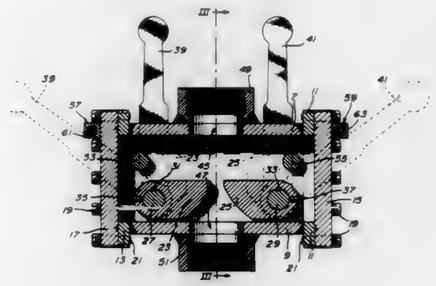
7. A heat exchanger comprising:
a pair of header tanks placed in parallel to each other in a plane;
a row of parallel tubes placed in said plane and connected at opposite ends to said header tanks;
a plurality of partitions provided within said header tanks to divide each header tank into a plurality of compartments along the length of said header tank thereby forming a plurality of refrigerant passages each consisting of a plurality of multitube paths each having a plurality of said parallel tubes; and
a plurality of inlet pipes each connected at one end to some of said refrigerant passages and at the other end to a distributor whereby refrigerant is distributed into said plurality of refrigerant passages to provide reduced flow resistance.

5,203,408

TOOL SAVER

Robert Boscher, Drayton Valley, Canada, assignor to Frontier Oilfield Sales Ltd., Alberta, Canada

Filed Dec. 2, 1991, Ser. No. 801,442
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—70 **5 Claims**



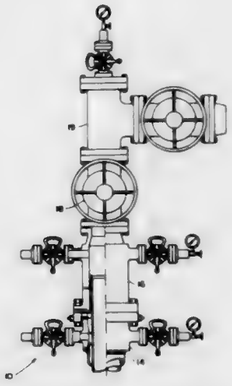
1. A tool saver for mounting over a well bore, comprising:
a housing having at least a top wall and a spaced parallel bottom wall;
aligned openings in said top and bottom walls defining a path through said housing;
said housing being mountable over said well bore so that said openings are aligned with said well bore such that tools may be lowered into and withdrawn out of said well through said aligned openings by a wire line;
a pair of pivoting blocks mounted in said housing, said blocks being pivotable from a closed position, wherein said blocks extend across said path to partially block said path, to an open position wherein the blocks are removed from said path to open said path;
each said block being mounted on a separate shaft for pivoting therewith;
a respective handle being fixedly connected to each said shaft, each handle having one end connected to its respective shaft and a free end;
whereby pivoting said handles will cause said blocks to pivot;
and further including spring means, said spring means having a first end and a second end, said first end of said spring means being connected to the free end of one of said handles and said second end being connected to the free end of the other one of said handles whereby said spring means biases said handles towards each other into said closed position;
adjacent ends of said blocks being spaced from each other to permit the passage of said wire line therethrough even when said blocks are in said closed position;
wherein, when a tool is withdrawn from said well with said blocks being in said closed position, the force of the upward motion of said tool will force apart said blocks, against the bias of said spring, so that said tool can be moved upwardly along said path; and
after the tool has passed the blocks in the upper movement thereof, said blocks will automatically be returned to said closed position by the biasing action of said spring means;
whereby, when a tool has been pulled above said pivoting blocks, the pivoting blocks in the closed position will prevent the tool from falling back into said well.

5,203,409

GEOTHERMAL WELL APPARATUS AND ECCENTRIC HANGER SPOOL THEREFOR

G. Ray Seid, Houston; Joe E. Wilson, Missouri City, and John B. Williams, Jr., Houston, all of Tex., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 27, 1992, Ser. No. 826,087
Int. Cl.[5] E21B *33/03*
U.S. Cl. 166—86 **9 Claims**



1. A geothermal well apparatus comprising
a casing head mounted on the upper end of a casing string,
a hanger spool having an internal flow passage with a landing pocket positioned in a eccentric position within said internal flow passage in said spool,
a master valve,
means for securing said hanger spool to and above said casing head and to and below said master valve,
said landing pocket having means for supporting a tubing hanger therein with a tubing string depending therefrom, and
means for delivering a fluid from the exterior of said hanger spool into a tubing string supported in said hanger spool landing pocket,
said hanger spool internal flow passage having substantially the same flow area as the master valve and the casing head.

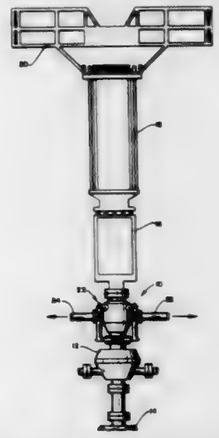
5,203,410

BLOWOUT SAFETY SYSTEM FOR SNUBBING EQUIPMENT

Charles C. Cobb, Frisco, and Tibor Laky, Dallas, both of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Dec. 18, 1991, Ser. No. 809,934
Int. Cl.[5] E21B *33/03*
U.S. Cl. 166—95 **11 Claims**

1. A blowout safety system adapted to provide emergency protection at the wellhead of oil and gas wells, the system comprising:
flapper valve means biased toward a closed positions, said flapper valve means being adapted to move to the closed position and thereby block and upward flow of well fluids through the wellhead immediately following a blowout;
means disposed below the flapper valve means for diverting the upward flow of well fluids after closure of the flapper means to a location remote from the wellhead; and



means for selectively overriding the bias on the flapper valve means.

5,203,411

OIL RECOVERY PROCESS USING MOBILITY CONTROL FLUID COMPRISING ALKYLATED DIPHENYLOXIDE SULFONATES AND FOAM FORMING AMPHOTERIC SURFACTANTS

Robert D. Dawe, Sarnia; Thomas Oswald, Fort Saskatchewan, and Ian A. Robson, Bright's Grove, all of Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1992, Ser. No. 849,270
Int. Cl.[5] E21B *43/22*
U.S. Cl. 166—274 **19 Claims**

1. A method for recovering hydrocarbons from a subterranean formation which comprises injecting, sequentially or simultaneously, into the subterranean formation containing hydrocarbons,
(1) a drive fluid selected from the group consisting of
(a) a gas to drive the hydrocarbons,
(b) a gas/aqueous fluid mixture to drive the hydrocarbons,
(c) a miscible fluid to thin or solubilize and carry the hydrocarbons, and
(d) a miscible fluid/aqueous fluid mixture to thin or solubilize and carry the hydrocarbons,
from the formation to a producing well; and
(2) a mobility control fluid of a surfactant/aqueous fluid mixture comprising a mixture of one or more alkylated diphenyl sulfonate surfactants and one or more foam forming amphoteric surfactants
under conditions such that the hydrocarbon is recovered from the subterranean formation.

5,203,412

WELL COMPLETION TOOL

Glenn Doggett, P.O. Box 712, Water Valley, Tex. 76958

Continuation-in-part of Ser. No. 557,614, Jul. 24, 1990, abandoned. This application Jun. 6, 1991, Ser. No. 711,458
Int. Cl.[5] E21B *23/04*
U.S. Cl. 166—186 **22 Claims**

1. A completion tool for insertion into a borehole for isolating a formation of interest traversed by the borehole, comprising:
first and second hollow packer mandrels having first and second elongated cylindrical slots respectively formed in the exterior thereof,

first and second elongated cylindrical packers located in said

tion, the treatment fluid comprising an active fluid and at

chamber via said orifice in response to the movement of

second member in engagement with said valve member prior to disassembly of said unit and moving relative to

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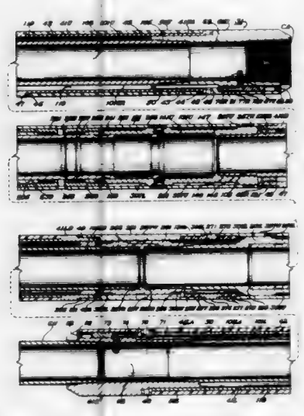
first and second elongated cylindrical packers located in said first and second elongated cylindrical slots respectively,

each packer having opposite ends bonded to the ends of the cylindrical slot in which it is located and an unbounded intermediate portion which can be expanded outward by the injection of fluid under pressure between said intermediate portion and said cylindrical slot,

hollow intermediate structural means coupled between said first and second packer mandrels such that said first and second packer mandrels have upper and lower ends and said first and second cylindrical packers have upper and lower ends respectively,

said hollow intermediate structural means and said first and second packer mandrels providing a central fluid flow path between said upper and lower ends of said first and second hollow packer mandrels,



a hollow piston slidably located in said hollow intermediate structural means for movement between closed and open positions,

outer and inner ports formed through the walls of said hollow intermediate structural means and said hollow piston respectively at positions such that said outer and inner ports are in fluid communication with each other when said piston is in said open position and closed to each other when said piston is in said closed position,

an outer by-pass fluid flow path extending through said tool beyond said upper and lower ends of said first and second packer mandrels and radially outward and separate from said central fluid flow path, and

means for injecting fluid under pressure between said intermediate portions of said packers and said cylindrical slots for expanding said first and second packers outward.

5,203,413

PRODUCT AND PROCESS FOR ACID DIVERSION IN THE TREATMENT OF SUBTERRANEAN FORMATIONS

Mohamed Zerhboub, Saint Etienne, France, assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Sep. 10, 1991, Ser. No. 757,363

Claims priority, application France, Sep. 12, 1990, 90 11362

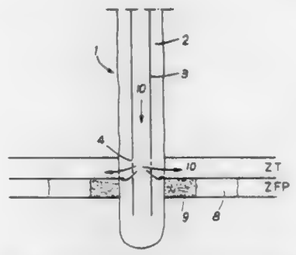
Int. Cl.[5] E21B *33/138, 43/27*

U.S. Cl. 166—281 **7 Claims**

1. A process for treating a relatively low permeability first zone of a subterranean formation having at least one adjacent second zone of relatively higher permeability penetrated by a well to the subterranean formation comprising steps of:

(a) injecting a foam comprising an inert fluid, a gas and at least one surfactant into the subterranean formation followed by the step of

(b) injecting a treatment fluid into the subterranean formation, the treatment fluid comprising an active fluid and at least one surfactant contained in the foam and



(c) repeating said sequential foam and treatment fluid injecting steps (a) and (b) using an increasing volume of foam in each subsequent foam injecting step whereby the treatment fluid is diverted toward the first zone.

5,203,414

METHOD OF ANCHORING A DEVICE IN A WELLBORE INCLUDING OPENING AN ORIFICE BETWEEN TWO CHAMBERS IN RESPONSE TO AN ELECTRICAL SIGNAL AND MOVING A PISTON IN RESPONSE TO HYDROSTATIC PRESSURE WHEN THE ORIFICE IS OPENED

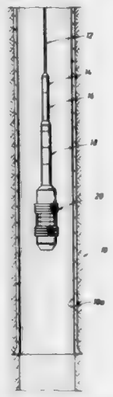
Joe C. Hromas, Sugar Land; A. Glen Edwards, Hockley, and Klaus B. Huber, Sugar Land, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 670,554, Mar. 15, 1991, Pat. No. 5,146,983.

This application Apr. 22, 1992, Ser. No. 872,273

Int. Cl.[5] E21B *23/04*

U.S. Cl. 166—382 **10 Claims**



1. A method of anchoring a device in a wellbore, comprising the steps of:

transmitting an electrical signal thereby opening an orifice between a first chamber and a second chamber;

flowing an annulus fluid at hydrostatic pressure into a port of a housing and imposing the hydrostatic pressure of the annulus fluid on a surface of a mandrel;

when the orifice opens in response to the electrical signal, moving the mandrel in response to the hydrostatic pressure of the annulus fluid;

moving a piston in response to the movement of the mandrel;

transferring a fluid from said first chamber to said second chamber via said orifice in response to the movement of said piston; and

anchoring said device during the transfer of said fluid from said first chamber to said second chamber.

5,203,415

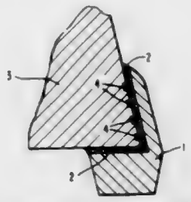
PROCESS FOR BONDING TO THE SIDEWALL OF A HORSE'S HOOF

Allan B. Schaffer, 4751 Del Moreno Dr., Woodland Hills, Calif. 91364

Filed Mar. 20, 1992, Ser. No. 855,852

Int. Cl.[5] A01L *3/02, 5/00*

U.S. Cl. 168—4 **4 Claims**



1. A process for bonding to the sidewall of a horse's hoof a non-metallic part capable of being reversibly preheated to approximately 275° F., wherein prior to bonding with a paste-type urethane adhesive having a hardness in excess of about 50 Shore D, said part is preheated to approximately 275° F. and the area of said hoof sidewall that is to receive adhesive is covered with a plurality of grooves and preheated to a temperature of approximately 220° F.

5,203,416

SPRINKLER HEAD

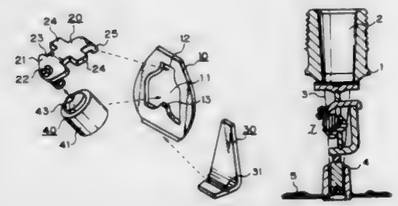
Takashi Takeuchi, Kanagawa, and Teturo Kikuchi, Iwate, both of Japan, assignors to Senju Sprinkler Company Limited, Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,352

Claims priority, application Japan, Sep. 4, 1990, 2-92450[U]

Int. Cl.[5] A62C *37/11*

U.S. Cl. 169—39 **5 Claims**



3. A sprinkler head for dispensing fire extinguishant including a frame with a bore through which the fire extinguishant may flow, a movable valve member for blocking the bore to control flow of the fire extinguishant, a boss located opposite said valve member and fixed to said frame by arm means, and a unit positioned between said valve member and said boss for holding said valve member in a closed position to block flow of fire extinguishant prior to disassembly of said unit and for releasing said valve member and for falling clearly away from said sprinkler head to permit flow of fire extinguishant upon disassembly of said unit in response to fire heat, said unit comprising:

a first member having a first portion abutting said boss and a second portion extending away from said boss;

a second member having a first portion abutting said first portion of said first member and a second portion abutting said valve member to hold said valve member closed prior to disassembly of said unit, said first member holding said second member in engagement with said valve member prior to disassembly of said unit and moving relative to said second member upon disassembly of said unit to release said second member from holding said valve member, said second member having surface means which define an opening;

a third member extending through the opening in said second member, said third member having outwardly extending portions positioned on either side of said second member for retaining said third member with the second member upon disassembly of said unit to ensure that the third member falls clearly away from said sprinkler head, said third member having first and second portions located on either side of said second member and being pivotable relative to said second member, said first portion of said third member engaging said second portion of said first member to prevent movement of said first member relative to said second member when said third member is in a first pivot position; and

a fourth member extending between said second portion of said third member and said surface means of said second member which define the opening to hold said third member in the first pivot position, said fourth member including means for pivoting said third member away from the first pivot position relative to said second member upon heating of the fourth member by a fire to permit said first member to move relative to said second member to cause disassembly of said unit.

5,203,417

HANDHELD IMPACT POWER TOOL

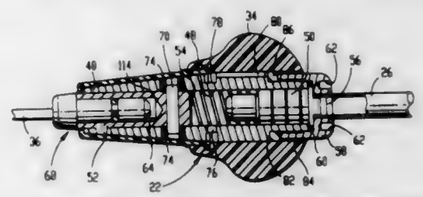
Donald J. Glaser, Emporia, Kans., assignor to Glendo Corporation, Emporia, Kans.

Filed Jan. 14, 1991, Ser. No. 641,658

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] B25D *9/14*

U.S. Cl. 173—200 **16 Claims**



1. An impact power tool for use in supporting a tool tip for hand-working operations, the tool comprising:

a body presenting a bore and having first and second ends, the bore having a central longitudinal axis;

a piston received within the bore and being shiftable relative to the body along the longitudinal axis;

an anvil received within the bore at the first end of the body and being shiftable relative to the body along the longitudinal axis of the bore, the anvil including a recess extending in a direction substantially parallel with the central longitudinal axis of the bore so as to define a receptacle in the anvil adjacent the first end of the bore;

a tool carrier block shaped for receipt in the recess of the anvil and including tip attachment means for permitting attachment of the carrier block to a tool tip to be supported on the impact power tool;

support means for providing friction-fit engagement between the carrier block and the anvil sufficient to retain the carrier block in the receptacle and to permit manual removal of the carrier block; and

positioning means for fixing the axial position of the anvil relative to the bore, the positioning means including a transverse member interposed between the anvil and the body, first support means for rigidly supporting the trans-

verse member on one of the anvil and the body, and second support means for resiliently supporting the trans-

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5,203,419

POSTAL SCALE HAVING EXTENDABLE WEIGHT

DISPLAY FOR WEIGHING OVERSIZE PACKAGES

angular position signal indicating an angular displacement of the steering wheel from said neutral position;

a controller comprising means for determining a working

ratio gear mechanism and a speed increasing gear mechanism connected in series and disposed in a steering transmission for

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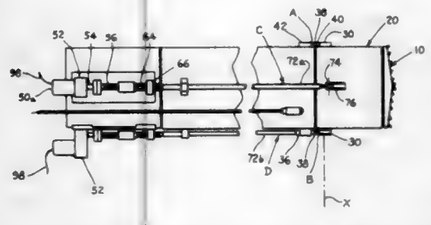
verse member on one of the anvil and the body, and second support means for resiliently supporting the transverse member for limited axial movement relative to the other of the anvil and the body.

5,203,418

APPARATUS FOR GUIDING AND STEERING EARTH BORING CASING

Paul N. Gibson, Saluda, S.C., and Leo J. Barbera, St. Augustine, Fla., assignors to Leg Steering Systems, Rocky Mt., N.C.

Continuation of Ser. No. 656,855, Feb. 19, 1991, Pat. No. 5,099,927, which is a continuation-in-part of Ser. No. 646,852, Jan. 28, 1991. This application Mar. 25, 1992, Ser. No. 857,163
Int. Cl.[5] E21B *7/08, 47/024*
U.S. Cl. 175—45 **21 Claims**



1. Earth boring apparatus for boring and laying pipe casings underground beginning at a boring station pit to form a cased bore which includes means for forming a bore and pushing the pipe casings through the bore as it is formed, said apparatus comprising:
- a plurality of pipe casings joined together having a forward casing at a forward end of said casings;
- a steering head carried by said forward casing;
- a cutting head carried by said steering head for forming said bore;
- hinge means connecting said forward casing and steering head for rotation about a first axis and a second axis disposed at an angle to said first axis; and
- actuation means connected to said steering head for imparting an actuation force to rotate said steering head through said hinge means about said first and second axes to steer said steering head.

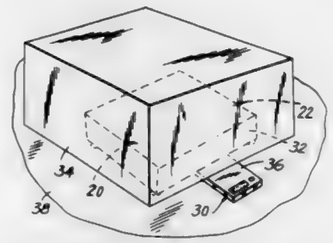
16. Earth boring apparatus for boring and laying pipe casings underground to form a cased bore from a boring pit, and includes means for forming a bore and pushing the pipe casings through the bore as it is formed, said apparatus comprising:
- a plurality of pipe casings joined together having a forward casing at a lead end of said casings;
- a steering head carried by said forward casing;
- a cutting head carried by said steering head for forming said bore;
- hinge means connecting said steering head and said forward casing so that said steering head rotates relative to said forward casing about at least a first axis;
- actuator means connected to said steering head for imparting an actuation force to rotate said steering head through said hinge means to steer said steering head in a desired direction; and
- said hinge means including a bearing mount carried by said steering head, bearing means carried about said bearing mount constructed from a low friction material, and a bearing hinge carried by said forward casing which surrounds said bearing means so that said bearing means is sandwiched between said bearing mount and said bearing hinge.

5,203,419

POSTAL SCALE HAVING EXTENDABLE WEIGHT DISPLAY FOR WEIGHING OVERSIZE PACKAGES

Alec Douglas, St. Johnsbury, Vt., assignor to Fairbanks, Inc., Kansas City, Kans.

Filed Nov. 5, 1991, Ser. No. 788,091
Int. Cl.[5] G01G *21/28*
U.S. Cl. 177—244 **28 Claims**



1. A postal type scale capable of weighing a plurality of different size packages, said scale comprising a weighing mechanism; a platform for supporting a package thereon in a weighing relationship with said weighing mechanism when said platform is supported on a horizontal mounting surface, said platform having a periphery and a predetermined size defined by an edge surrounding said periphery of said platform and being capable of supporting said different size packages thereon in said weighing relationship, said platform being capable of supporting a package having a predetermined size greater than said predetermined size of said platform whereby said supported package has an edge which extends beyond said platform edge; and a movable weight display means for displaying a weight associated with said package supported on said platform in said weighing relationship, said weight display means being slidably mounted to said platform and longitudinally extendable therefrom along said horizontal mounting surface when said platform is supported on said horizontal mounting surface, said weight display means comprising a horizontal weight display and being variably extendable beyond said platform edge along said horizontal mounting surface from a display rest position to a plurality of different longitudinal positions beyond said platform edge within a predetermined longitudinal range for enabling said weight display to be longitudinally moved along said horizontal mounting surface to a variable position for enabling said horizontal weight display to a readable from above said supported package, said longitudinal range being dependent on a predetermined range of package sizes weighable on said platform scale; whereby said horizontal weight display may be readable from above said platform when the size of the package supported thereon is within said predetermined range of package sizes weighable on said scale.

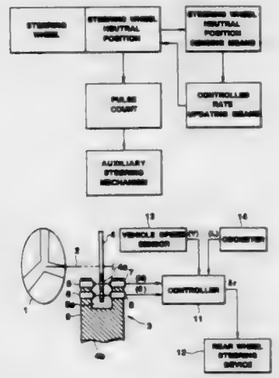
5,203,420

AUXILIARY STEERING MECHANISM FOR AUTOMOTIVE VEHICLES

Yasuhiro Shiraishi, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 492,052, Mar. 12, 1990, abandoned. This application Oct. 9, 1991, Ser. No. 772,124
Claims priority, application Japan, Apr. 25, 1989, 1-103456
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **8 Claims**

1. An auxiliary steering control system for an automotive vehicle comprising:
- sensing means for sensing rotational motion of a steering wheel of a vehicle and producing a neutral position signal indicating a neutral position of the steering wheel and an angular position signal indicating an angular displacement of the steering wheel from said neutral position;
- a controller comprising means for determining a working neutral position value, mean for determining a steering wheel angle from the angular position signal with respect to the working neutral position value, means for determining an actual neutral position value in response to the neutral position signal, means for changing the working neutral position value in a stepwise manner toward the actual neutral position value by fixed increments at regular time intervals, means for determining an auxiliary steer angle in accordance with the steering wheel angle, and means for producing a control signal indicating the auxiliary steer angle; and
- an auxiliary steering device for steering a wheel of the vehicle in response to the control signal.

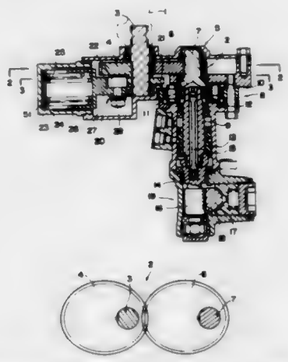


5,203,421

FAST REACTION STEERING MECHANISM

Katsumi Ueno, Okazaki; Takayuki Suganuma, Obu, and Hiroyuki Masuda, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 582,140, Sep. 11, 1990, abandoned, which is a continuation of Ser. No. 342,286, Apr. 24, 1989, abandoned. This application Apr. 27, 1992, Ser. No. 875,540
Claims priority, application Japan, Apr. 27, 1988, 63-55845[U]; Feb. 17, 1989, 1-37426; Feb. 17, 1989, 1-37427; Feb. 17, 1989, 1-37428; Feb. 17, 1989, 1-37429
Int. Cl.[5] B62D *5/02, 5/06*
U.S. Cl. 180—132 **8 Claims**



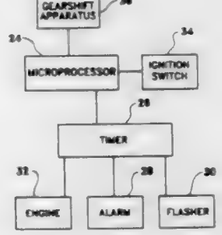
1. A small-angle steering apparatus comprising a variable ratio gear mechanism and a speed increasing gear mechanism connected in series and disposed in a steering transmission for mechanically connecting a steering wheel and a steering gear box to transmit rotation of said steering wheel to said steering gear box;
- said variable ratio gear mechanism comprising a first gear having an elliptical shape with an eccentric axis connected to said steering wheel having an effective radius gradually increasing with an increasing steering angle of said steering wheel and a second gear having an elliptical shape with an eccentric axis connected to said speed increasing gear mechanism having an effective radius gradually decreasing with an increasing steering angle of said steering wheel, and, when said steering wheel is at its central position, having a smallest-radius portion of said first gear engaging with a largest-radius portion of said second gear;
- further comprising a power steering control valve disposed between said speed increasing gear mechanism and an input shaft of said steering gear box, and said speed increasing gear mechanism being disposed between an output shaft of said variable ratio gear mechanism and an input shaft of a power steering control valve, maximum rotational angles of said first and second gears corresponding to a maximum rotation of said control valve input shaft of not more than 180°.

5,203,422

ONE-WAY TRAFFIC MONITOR

William E. Estep, P.O. Box 314, Powellton, W. Va. 25161, and Robert J. Stephens, P.O. Box 36, Charlton Heights, W. Va. 25040

Filed Jun. 26, 1992, Ser. No. 904,458
Int. Cl.[5] B60T *7/12*
U.S. Cl. 180—169 **3 Claims**



1. A vehicle disablement system for detecting and stopping a vehicle traveling in an undesired direction, the vehicle having an engine, a gearshift apparatus movable to a reverse position, and an ignition switch selectively movable to an on and an off position, said disablement system comprising:
- at least one reflector having encoding means, said reflector being mounted adjacent a road surface and being directed towards a vehicle traveling in an undesired direction,
- transmitting means for transmitting energy from said vehicle to said at least one reflector,
- receiving means for receiving energy reflected back to the vehicle from said at least one reflector,
- microprocessor means for recognizing said encoding means of said at least one reflector and for producing a recognition signal output in response thereto,

disablement means for disabling the ignition system of the

selectively collapsing and extending said first vertical bar about its length;

the drive shaft, a primary chain coupling the output shaft and

support member for decelerating a person prior to alighting on the ground,

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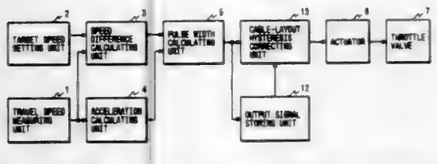
disablement means for disabling the ignition system of the vehicle,
timer means, activated in response to said recognition signal from said microprocessor, for activating said disablement means only after a predetermined interval of time has elapsed,
reset means operably connected to said ignition switch for deactivating said disablement means in response to the ignition switch being moved to the off position and then to the start position,
override means operably connected to the gearshift apparatus for preventing reactivation of said disablement means when the gearshift apparatus is shifted into a reverse gear position within said predetermined time interval, and
alarm means activated in response to said recognition signal from said microprocessor.

5,203,423

VEHICLE CONSTANT-SPEED CRUISING DEVICE

Yasuhiro Fujiwara, and Kazuyori Katayama, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 857,663
Claims priority, application Japan, Mar. 27, 1991, 3-062263
Int. Cl.[5] B60K *31/00*
U.S. Cl. 180—179 **7 Claims**



1. A vehicle constant-speed cruising device, comprising:
travel speed measuring means for measuring a travel speed of a vehicle;
target speed setting means for setting a target speed of said vehicle;
speed difference calculating means for calculating a speed difference between said target speed and said travel speed;
acceleration calculating means for calculating an acceleration of said vehicle in response to said travel speed signal;
pulse width calculating means for calculating a pulse width of a pulse signal having a predetermined period in response to said speed difference and said acceleration;
an actuator for operating an engine throttle valve in response to said pulse width thus calculated;
output signal storing means for receiving an output from said pulse width calculating means, to store acceleration and deceleration signals output during a predetermined past period of time; and
cable-layout hysteresis correcting means for receiving outputs of said pulse width calculating means and said output signal storing means, to subject the output of said pulse width calculating means to cable-layout hysteresis correction.

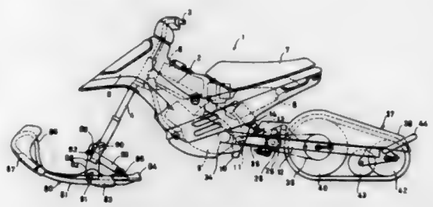
5,203,424

CHAIN ADJUSTING DEVICE FOR VEHICLES

Kazuhiko Gogo, Saitama, and Kenji Uehara, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisa, Tokyo, Japan

Filed Jun. 14, 1991, Ser. No. 716,733
Claims priority, application Japan, Jun. 16, 1990, 2-158374
Int. Cl.[5] B62M *27/02*
U.S. Cl. 180—190 **6 Claims**

1. A chain adjusting device for a vehicle having a main vehicle frame, a rear fork pivotally mounted thereto, an engine having an output shaft, a drive shaft rotatably mounted on the rear fork, an intermediate shaft between the output shaft and the drive shaft, a primary chain coupling the output shaft and the intermediate shaft and a secondary chain coupling the intermediate shaft and the drive shaft, comprising
a shaft mounting including a bearing receiving the intermediate shaft and an arm;



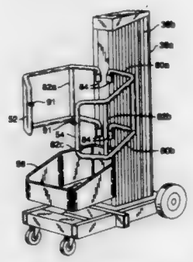
a bracket on the rear fork adjustably engaging said arm to mount said bearing to the rear fork, the rear fork including two mutually displaced structural cross members, said bracket extending between said cross members.

5,203,425

PERSONNEL LIFT DEVICES

Donald T. Wehmeyer, 5522 218th Ave. E., Sumner, Wash. 98390

Filed Mar. 13, 1991, Ser. No. 668,961
Int. Cl.[5] E04G *5/00*
U.S. Cl. 182—19 **6 Claims**



1. A personnel lift device capable of safely and securely elevating an operator to a desired height above a deployment surface, the lift comprising:
an operator platform;
a cage assembly operably connected to the platform, allowing the operator access to the platform when the cage assembly is in an open configuration and safely and securely enclosing the operator within the cage assembly when the cage assembly is in a closed configuration; and
interlocking means capable of permitting the cage assembly to be elevated only when the cage assembly is in a closed configuration and not permitting the cage assembly to assume an open configuration when elevated.

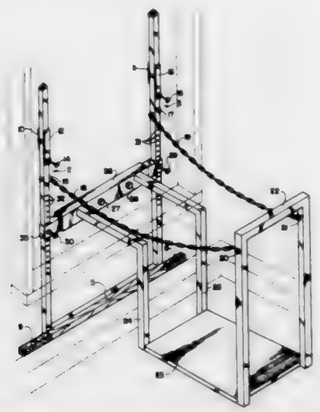
5,203,426

PORTABLE WINDOW PERCH ASSEMBLY

Eugene E. Sydnor, 3508 Legere Ct., Woodbridge, Va.

Filed Feb. 11, 1992, Ser. No. 833,663
Int. Cl.[5] A47L *3/00*
U.S. Cl. 182—57 **9 Claims**

1. An improved portable window perch assembly usable with a window which may be opened to allow access from the inside of a building structure to the outside of said building structure comprising:
a first vertical bar having a predetermined vertical length;
a first hinge located in the middle of said first vertical bar for selectively collapsing and extending said first vertical bar about its length;
a second vertical bar having a vertical length equivalent to said predetermined vertical length, said second vertical bar being located a predetermined horizontal distance from said first vertical bar;
a second hinge located in the middle of said second vertical bar for selectively collapsing and extending said second vertical bar about its length;
an upper horizontal bar extending from the top of said first vertical bar to the top of said second vertical bar;
a lower horizontal bar extending from the bottom of said first vertical bar to the bottom of said second vertical bar;
a horizontal cross member;



means for attaching said horizontal cross member at one end thereof to said first vertical bar and at the other end thereof to said second vertical bar; and
a perch for allowing a user to stand thereon, and including means for attaching said perch to said horizontal cross member,
wherein, during operation of said window perch assembly, both said first and second vertical bars are extended and said lower horizontal bar contacts the floor and lower portion of the inside wall of said building structure below said window while said upper horizontal bar contacts the inside wall of said building structure above said window, in such a way that said first and second vertical bars are displaced from said inside wall thereby preventing contact between said perch assembly and said window.

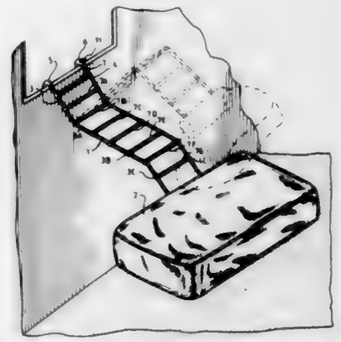
5,203,427

FIRE ESCAPE LADDER WITH INTEGRAL AIR CUSHION

Anthony E. Williams, Sr., and Alonda O. Williams, both of 6 Belmont Ct., Holbrook, N.Y. 11741

Filed May 15, 1992, Ser. No. 883,677
Int. Cl.[5] E06C *1/36*
U.S. Cl. 182—129 **9 Claims**

1. A safety escape ladder for permitting persons to escape from burning buildings and the like to the ground comprising a ladder having an upper window sill engaging portion, a plurality of frame members interconnected with rungs and a lower second end portion, an inflatable support means for maintaining said lower second end portion adjacent the ground; a propellant source member disposed to said inflatable support means, said propellant source connected to a trigger, said propellant source operable of producing a flow of gas to said inflatable support means to accelerate inflation of said inflatable support means; an outlet located at an outlet point along said ladder, said outlet disposed to said inflatable support means, for directing a flow of said propellant to said inflatable support member for decelerating a person prior to alighting on the ground,
said support means and said ladder being integrally connected, and



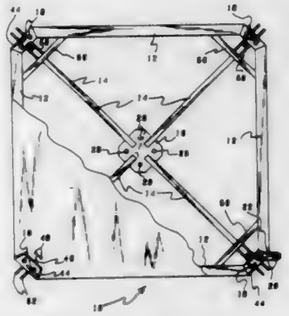
said trigger attached to said upper window sill engaging portion for permitting said propellant to be propelled into said inflatable support means.

5,203,428

MODULAR SCAFFOLDING PLATFORM AND TRUSS FRAME COMPONENTS THEREFOR

Gregory L. Beeche, Rexford, N.Y., assignor to Garox Corporation, Prior Lake, Minn.

Continuation of Ser. No. 349,713, May 10, 1989, abandoned, which is a continuation of Ser. No. 48,108, May 7, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 442,414
Int. Cl.[5] E04G *5/00*
U.S. Cl. 182—222 **30 Claims**



1. A truss frame for a modular scaffolding platform, comprising:
at least three tubular top rails, said rails being joined together so as to define a substantially planar surface;
means by which at least one top rail of the truss frame may be readily detachably connected to at least one top rail of an adjoining truss frame when two or more of said truss frames are connected together to form a platform, said rail-connecting means being disposed so that, when said truss frames are connected together in said platform, the top rails of said connected truss frames form a continuous top cord in a direction parallel to that spanned by said connected truss frames, and so that said connected truss frames exhibit high torsional rigidity;
a plurality of bracing members attached to and depending from said top rails, said members being disposed so that all

of said members are connected together to form a bottom connection which has a predetermined location with

slots, said slots not extending to edges of said layer to allow current induced upon said layer to extend around

flat primary element and a flat secondary element, one of said primary or said secondary element being hung by a plurality of

said cavity means of said locking bar means to selectively lock said hub and said drive wheel in a stationary position.

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of said members are connected together to form a bottom connection which has a predetermined location with respect to said top rails, said predetermined location being chosen so that said bracing members form truss-like braces for said top rails; and

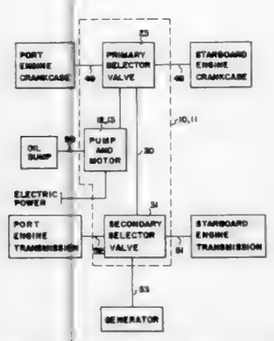
means by which the bottom connection of said truss frame may be connected to the bottom connection of an adjoining one of said truss frames when two or more of said truss frames are connected together to form a platform, said bottom connection including means for readily detachably receiving bottom connection joining means such that said joining means may be connected to and detached from said bottom connection without requiring disconnection of the top rails of adjoining truss frames, said joining means being disposed so that, when said bottom connections are joined together, a bottom chord is formed which extends in a direction parallel to that spanned by said connected truss frames.

5,203,429

MOTORIZED OIL CHANGING SYSTEM

Raymond Zager, Ponte Vedra Beach, Fla., assignor to Ray Zager & Company, Ponte Vedra Beach, Fla.

Filed Apr. 3, 1992, Ser. No. 862,724
Int. Cl.[5] F16N *33/00*
U.S. Cl. 184—1.5 **12 Claims**



1. In a system for draining and refilling the oil from a plurality of engines wherein the system includes a reversible pump driven by an electric motor to an "off" position, a "forward" pumping direction, and a "reverse" pumping direction; the flow of oil being selectively directed through a first selector valve and then selectively through conduits therefrom to and from any of three locations wherein two of said three locations being crankcase a crankcase, a first engine and second engine; the improvement wherein the third location comprises a second selector valve, another conduit connected between said first and second selector valve said second selector valve and additional conduits directing oil flow selectively to and from any of three additional location being a first engine transmission, a second engine transmission, and a generator.

5,203,430

ELEVATOR FLAT LINEAR MOTOR SECONDARY

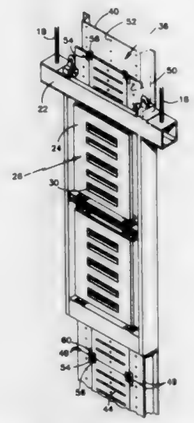
Timothy J. Grinaski, East Hartford, and Robin M. Miller, Ellington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Oct. 17, 1991, Ser. No. 778,026
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—17 **2 Claims**

1. An elevator linear motor secondary, said secondary comprising:

a support plate,

a conductive, non-magnetic layer disposed upon said support plate, said layer having a plurality of spaced-apart slots, said slots not extending to edges of said layer to allow current induced upon said layer to extend around



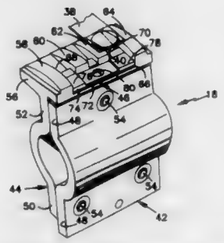
ends of said slots, said slots allowing said layer to expand and contract in plane.

5,203,431

ELEVATOR ROTARY LOST DOOR INTERLOCK

Michael P. Donohoe, Simsbury; Richard E. Kulak, Bristol, both of Conn., and Christian G. Tonna, Sao Paulo, Brazil, assignors to Otis Elevator Company, Farmington, Conn.

Filed Feb. 25, 1992, Ser. No. 841,143
Int. Cl.[5] B66B *1/00*
U.S. Cl. 187—31 **7 Claims**



1. An elevator door interlock which bridges a lead of an electrical circuit to indicate that the elevator door is locked, said interlock comprising:

a rotatable camming surface,

a bridge disposed upon said surface, and

means for rotating said camming surface, said means rotating to maintain said lead in contact with said camming surface if said door is not locked, said means rotating said camming surface to move said lead into contact with said bridge if said door is locked, said means rotating said lead out of contact with said camming surface if the door is missing.

5,203,432

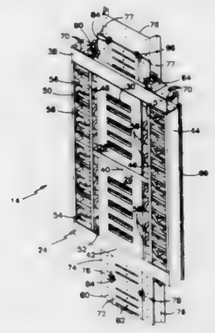
FLAT LINEAR MOTOR DRIVEN ELEVATOR

Timothy J. Grinaski, East Hartford, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Nov. 15, 1991, Ser. No. 793,056
Int. Cl.[5] B66B *17/12*
U.S. Cl. 187—94 **3 Claims**

1. A flat, single-sided linear motor for driving an elevator, said motor having a single air gap defining a plane between a flat primary element and a flat secondary element, one of said primary or said secondary element being hung by a plurality of ropes, wherein said motor is further characterized by:

means for coinciding centers of thrust and gravity of said one of said primary or secondary elements in said plane of



said air gap to minimize any moments about said plane, and

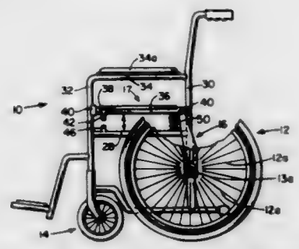
said ropes being distributed in or about said plane of said air gap to minimize any moments of said one of said primary or secondary elements about said plane.

5,203,433

AUTOMATIC BRAKING WHEELCHAIR

Grady A. Dugas, P.O. Box 37, Taylor St., Marion, La. 71260

Filed Dec. 16, 1991, Ser. No. 807,518
Int. Cl.[5] B60T *1/00*
U.S. Cl. 188—2 F **18 Claims**



1. An automatic braking assembly for a wheelchair having two large drive wheels which automatically locks one of the large drive wheels of the wheelchair when a patient attempts to rise from the wheelchair, each of the drive wheels of the wheelchair having a hub which rotates about an axle, comprising:

a. movable seat means on which the patient sits,

b. support member means for supporting said movable seat means, said support member means having two axles connected thereto, each of said axles having a rotatable hub connected thereto, each of said hubs having a drive wheel rigidly connected thereto, said movable seat means being slidably connected to said support member means,

c. spring means connected to said support member means and to said movable seat means for moving said movable seat means upwardly when the patient is not sitting in said movable seat means,

d. locking bar means connected to said movable seat means, said locking bar means having cavity means therein for receipt of said axle, and

e. locking member means rigidly connected to at least one of said hubs, said locking member means being received in said cavity means of said locking bar means to selectively lock said hub and said drive wheel in a stationary position.

5,203,434

MOUNTING STRUCTURE FOR CONE BRAKE

Timothy L. Teeter, Lucas, Ohio, and James E. Hall, Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 21, 1991, Ser. No. 721,846
Int. Cl.[5] F16D *63/00*
U.S. Cl. 188—70 R **17 Claims**

16. A brake assembly comprising:

a shaft received in a housing for rotation about an axis;

a brake drum fixed to rotate with said shaft, said brake drum having a conically-tapered inner peripheral friction surface;

a brake shoe mounted for limited axial movement relative to said shaft and said brake drum, said brake shoe having a conically-tapered outer peripheral friction surface which is selectably engaged with said friction surface on said brake drum to prevent rotation of said shaft;

a lever having a cam face in contact with a cam face on said brake shoe, said lever being rotatable to move said brake shoe from a removed non-braking position where said friction surface of said brake drum is not contacted by said friction surface of said brake shoe, to an engaged braking position at which said friction surface of said brake drum does engage said friction surface of said brake shoe; and

said brake drum having a tubular sleeve at a position radially inwardly from said inner peripheral surface, said brake shoe being slidably received on said sleeve, said lever being rotatably received on said sleeve and rotatable about said axis, and a spring being positioned between said brake drum and abutting a face of said brake shoe to bias said brake shoe away from said brake drum into contact with said lever, said lever being adapted to cause said brake shoe to overcome the biased force of said spring and move towards said brake drum.

5,203,435

COMPOSITE PASSIVE DAMPING STRUTS FOR LARGE PRECISION STRUCTURES

Benjamin P. Dolgin, Northridge, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1990, Ser. No. 575,697
Int. Cl.[5] F16F *1/14*
U.S. Cl. 188—322.5 **11 Claims**

5. An energy absorbing apparatus, comprising:

(a) a first layer including a composite ply having a first orientation;

(b) a second layer including a composite ply having a second orientation opposing said first orientation such that said

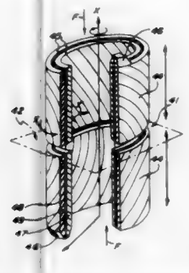
first and second layers experience interlaminar shear when

at a right angle to a longitudinal direction along the length

5,203,439

of the first drive only when the first signal is present, optional

first and second layers experience interlaminar shear when a load is applied to the apparatus; and



(c) a viscoelastic layer disposed between said first and second layers such that stress is borne by said viscoelastic layer when a load is applied to the apparatus.

5,203,436

REINFORCED TUBULAR DOOR SUPPORT

Enno Wieting, Ratingen, and Joachim Fischer, Mülheim, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 2, 1991, Ser. No. 725,006

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1990, 4021235

Int. Cl.[5] F16F *7/12*; **B60J** *5/00*

U.S. Cl. 188—377 **5 Claims**

1. A deformable, reinforced tubular door member mounted in a vehicle door for reinforcing the vehicle door and for absorbing energy occasioned by an impact force exerted thereupon, comprising:

a deformable tube having an inner wall surface;

a spiralled stiffening element positioned within said deformable tube and having a plurality of surface elements which are arranged so as to rest against said inner wall surface such that when the impact force is exerted upon the tubular door member, said surface elements exert a resisting force against said deformable tube, said spiralled stiffening element comprising a strip having peripheral edges and a lengthwise axis, said strip being twisted along said lengthwise axis, wherein said surface elements comprise said peripheral edges, and wherein said surface elements have a repeating double helical geometry.

5,203,437

TROLLEY BRUSH

Uwe Bormann, Ruemmingen, Fed. Rep. of Germany, assignor to Wampfler GmbH, Weil am Rhein-Maerkt, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 680,516

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 9004828[U]

Int. Cl.[5] B60L *5/30*

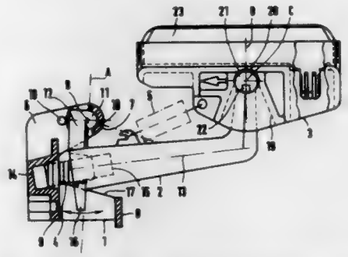
U.S. Cl. 191—58 **14 Claims**

1. A trolley brush for a sliding contact line comprising:

a base having a slot-like recess with a limiting first wall and a calotte on the inside of said first wall,

an arm attached to said base having a cambered projection engaging in said calotte, whereby when said trolley brush is in operation, said projection can pivot said arm around the center of said calotte about a first axis which is almost at a right angle to a longitudinal direction along the length of said arm and in said recess about a second axis which is a right angle to said first axis,

a spring being provided between said base and said arm, said spring acting upon said arm at a distance from said projection, holding said projection and said calotte engaged and



turning said arm about said second axis in a direction of said sliging contact line,

and a sliding contact support attached to said arm which can be turned about a third axis which runs parallel to said second axis and to a limited degree about a fourth axis which extends at a right angle to said third axis and which runs parallel to said first axis.

5,203,438

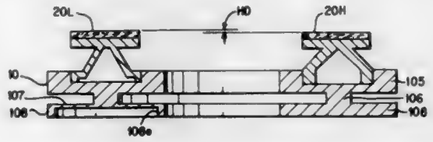
BEAM MOUNTED FRICTION PADS FOR USE IN FRICTION BRAKES AND CLUTCHES

Russell D. Ide, P.O. Box 744, 641 Arnold Rd., Coventry, R.I. 02816

Filed Mar. 12, 1991, Ser. No. 668,216

Int. Cl.[5] F16D *13/68*

U.S. Cl. 192—107 C **42 Claims**



1. A modular friction element for use in a friction engagement device in which the friction element is adapted to engage a relatively moving surface, the friction element comprising:

a one-piece carrier member, the carrier member having a plurality of recesses formed therein, each of the recesses having a sidewall and a bottom surface, the recesses being spaced about a predetermined axis;

a plurality of friction pads, one friction pad secured in each of the recesses of the carrier, each of the friction pads comprising a pad portion having a pad surface made of high friction material and a support portion the support portion having one end extending into a recess in contact with both the side wall and the bottom wall of the recess and another end extending out of the recess and supporting the pad portion away from and out of contact with the carrier,

and the support portion of each of the friction pads being designed such that, under load, the friction pads deflect with respect to the surface to be engaged.

5,203,439

ADJUSTABLE VISCOUS SHEAR COUPLING

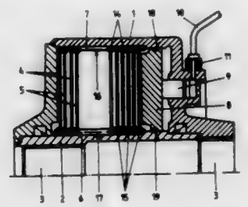
Othmar Peier, Pöllau, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 27, 1992, Ser. No. 842,718

Claims priority, application Austria, Mar. 8, 1991, 498/91

Int. Cl.[5] F16D *35/00*

U.S. Cl. 192—58 C **6 Claims**



1. An adjustable viscous shear coupling, comprising

a housing containing a viscous fluid therein,

an inner part extending into said housing,

a set of outer disks non-rotatably and axially movably connected to said housing,

a set of inner disks non-rotatably and axially movably connected to said inner part, said inner disks being interleaved with said outer disks so that they are separated by a gap between adjacent inner and outer disks,

an axillary movable piston acting on said inner and outer disks to adjust the width of said gap, and

axially movable means for forming sealing intervals between said outer disks and said inner part and between said inner disks and said housing to greatly inhibit overflow of said viscous fluid from one gap to another.

5,203,440

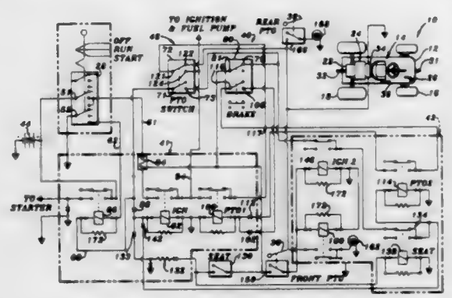
INTERLOCK CIRCUIT FOR A VEHICLE WITH AN OPTICAL SECOND DRIVE

Rudolph A. Peterson, Jr., and James J. Cinnamon, both of Horicon, Wis., assignors to Deere & Company, Moline, Ill.

Filed Jun. 24, 1992, Ser. No. 903,420

Int. Cl.[5] B60K *41/28, 28/00*

U.S. Cl. 192—0.094 **12 Claims**



1. In a vehicle having a frame supported for movement over the ground by drive wheels connected through a transmission to an engine, an operator station, a first drive for providing power to a first driven device, an electrically engageable clutch connected between the engine and the first drive, and an operator presence interlock including an operator presence switch providing a first signal when the operator is present at the station and a second signal when the operator is absent from the station, the interlock normally permitting operation of the first drive only when the first signal is present, optional drive and interlock circuit structure comprising:

a second drive connected to the clutch;

a drive selector for selectively engaging the first or second drive; and

means responsive to the selection of the second drive for overriding the operator presence interlock under preselected vehicle conditions when the operator is absent from the station.

5,203,441

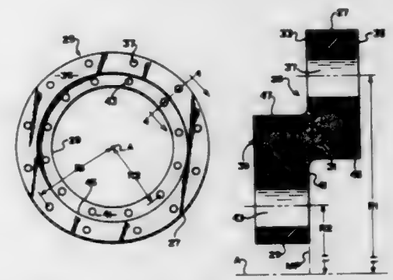
ADAPTOR FOR USE IN A FLYWHEEL AND TRANSMISSION ASSEMBLY

Daniel A. Monette, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 1, 1992, Ser. No. 891,024

Int. Cl.[5] F16D *13/58*

U.S. Cl. 192—112 **10 Claims**



1. An adaptor for use with a transmission clutch housing whereby said housing may be attached, selectively, to one flywheel housing which defines a first bolt circle pattern, or to another flywheel housing which defines a second bolt circle pattern, said first bolt circle pattern having a substantially larger diameter than said second bolt circle pattern; said transmission clutch housing defining said second bolt circle pattern; said adaptor including a first portion defining forward and rearward axially spaced apart surfaces, said forward surface defining an imaginary transverse mounting plane and adapted to be disposed in engagement with a mounting surface defined by said one flywheel housing, said first portion defining a plurality of bolt holes defining said first bolt circle pattern, and adapted to be connected to said one flywheel housing; said adaptor further comprising a second portion defining forward and rearward axially spaced apart surfaces, and means interconnecting said first and second portions; said adaptor being configured such that said second portion thereof is adapted to be disposed within said one flywheel housing, and said rearward surface of said second portion of said adaptor coincides with said imaginary transverse mounting plane; said second portion defining a plurality of bolt holes defining said second bolt circle pattern, and adapted to be connected to said transmission clutch housing, whereby the relative axial position of said transmission clutch housing and said one flywheel housing is adapted to be substantially identical to the relative axial position of said transmission clutch housing and said another flywheel housing.

5,203,442

CANTILEVER CONVEYING TECHNIQUES

Robert F. Oury, Gilberts, and A. Steven Ledger, Addison, both of Ill., assignors to Rotec Industries, Inc., Elmhurst, Ill.

Filed Apr. 29, 1991, Ser. No. 693,914

Int. Cl.[5] B65G *15/26*

U.S. Cl. 198—313 **30 Claims**

1. Apparatus for conveying concrete and the like comprising in combination:

self-propelled vehicle means having a first wheel-supporting

least two of said plurality of conveyors provided for each of

respectively form with said conveying direction of said conveyor means at a beginning and end of said portion of

for transporting dishes and trays along a conveyor slider bed; said single and continuous conveyor belt extending above the

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self-propelled vehicle means having a first wheel-supporting axle defining a first axle center line and a second wheel-supporting axle defining a second axle center line, said first and second axle center lines defining a first reference plane;

conveyor means for transporting concrete in a predetermined first path direction defining a second reference plane perpendicular to the first reference plane;

turntable means supported for rotation on said vehicle means, said turntable means defining an axis of rotation perpendicular to said first reference plane and defining a third reference plane perpendicular to the second reference plane and collinear with the axis of rotation;

truss means for supporting the conveyor means, said truss means having a supported end portion and a cantilevered end portion;

drive means for extending the truss means and conveyor means in the first path direction and retracting the truss means and conveyor means in a second path direction opposite the first path direction;

transfer means for transferring concrete to the conveyor means;

elevating means supported on a first segment of the turntable means located on a first side of the third reference plane for rotating the truss means around a pivot axis;

cab means carried by the turntable means and located on one side of the second reference plane for enabling an operator to control the vehicle means and conveyor means, said cab means having a top surface that defines a fourth reference plane parallel to the first reference plane;

counterbalance means defining a center of gravity located on a second side of the third reference plane opposite the first side for counterbalancing the weight of the truss means and conveyor means; and

force balancing means for supporting the truss means and the counterbalance means on the turntable means such that the second reference plane passes through the turntable means and the counterbalance means and for positioning the pivot axis above the fourth reference plane, perpendicular to the second reference plane and on the first side of the third reference plane, whereby concrete can be transferred from the transfer means to the conveyor means while the turntable means is rotating around the axis of rotation and whereby an operator can view the operation of the conveyor means.

5,203,443

CONVEYING APPARATUS USED IN ASSEMBLING SEMICONDUTORS

Kiyoshi Toriumi, and Kazumasa Kimura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

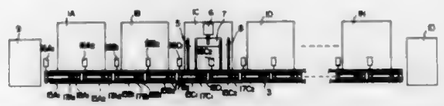
Continuation of Ser. No. 611,918, Nov. 9, 1990, abandoned. This application Feb. 26, 1992, Ser. No. 841,857

Claims priority, application Japan, Nov. 13, 1989, 1-292435

Int. Cl.[5] **B65G** *43/00*

U.S. Cl. 198—341 **3 Claims**

1. A conveying apparatus for use in conveying and processing semiconductors comprising a plurality of devices which each perform same semiconductor processing operations arranged in a row and a single conveying line provided so as to be used commonly by said plurality of devices that supplies and discharges semiconductors processed by said devices, said apparatus being characterized in that said single conveying line comprises a plurality of conveyors provided in series, with at least two of said plurality of conveyors provided for each of said plurality of processing devices, a control means is provided for individually controlling each of said plurality of conveyors such that semiconductors are independently supplied and discharged upon independent demand of each of said plurality of devices, and sensors coupled to said control means which detect said semiconductors are installed for each of said conveyors.



5,203,444

CONTAINER GROUPING APPARATUS

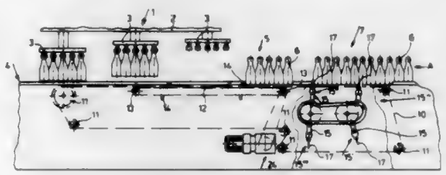
Karl Münch, Heppenheim, Fed. Rep. of Germany, assignor to Seitz Enzinger Noll Maschinenbau AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 15, 1991, Ser. No. 794,737

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1990, 4036341

Int. Cl.[5] **B65G** *47/26*

U.S. Cl. 198—418.7 **14 Claims**



1. A grouping apparatus for providing groups of containers, with each of said groups having a prescribed length and being formed by separating from a stream of containers that is being fed by a conveyor means a number of containers that corresponds to said group length, comprising:

at least two continuously rotating belt or chain type drive means, each of which forms a loop;

grouping mechanisms having dividing means or grouping fingers that form a plurality of abutment and retaining surfaces for said containers, with said grouping mechanisms being provided on said drive means, and said abutment and retaining surfaces thereof being moved in a direction of rotation of said drive means along a continuous path of rotation, wherein along a portion of said path of rotation that proceeds in a conveying direction of said conveyor means, said surfaces of said grouping mechanism extend into a path of movement of said containers on said conveyor means, while along the remainder of said path of rotation said surfaces of said grouping mechanisms are outside said path of movement of said containers, with said grouping mechanisms being mounted on said drive means equidistantly from one another in such a way as to be pivotable about a pivot axis that extends perpendicular to said direction of rotation of said drive means, wherein said surfaces of said grouping mechanisms are radially spaced from said pivot axis;

a control member that is pivotably mounted on said grouping apparatus for adjusting the position of said control member relative to said drive means for adjusting said group length by adjusting the spacing between successive ones of said surfaces of said grouping mechanisms along said portion of said path of rotation by altering the angular position which said dividing means or grouping fingers

respectively form with said conveying direction of said conveyor means at a beginning and end of said portion of said path of rotation, with a pivot axis of said control member extending perpendicular to a plane in which said loops formed by said drive means is disposed, and with said control member having at least one continuous control curve means, which is disposed in a plane that extends parallel to said plane of said loop of said drive means; and

guide arms, each one of which is rigidly connected to a respective grouping mechanism and extends radially relative to said pivot axis of said grouping mechanism, with each of said guide arms engaging said control curve means of said control member via at least one guide means, which follows said pivot axis of the pertaining grouping mechanism when viewed in said direction of rotation of said drive means, and wherein a center line of said control curve means is intersected at least two times, and preferably four times, by a projection of said loop of said drive means onto said plane of said control curve means, and in particular in conformity with at least one of the following: two times in the region of a container inlet of said grouping apparatus and two times in the region of a container outlet of said grouping apparatus.

5,203,445

CARRIER CONVEYING APPARATUS

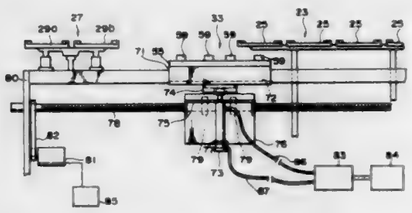
Hirotsugu Shiraiwa, Tokyo, Japan, assignor to Tokyo Electron Sagami Limited, Kanagawa, Japan

Filed Jul. 26, 1991, Ser. No. 736,647

Claims priority, application Japan, Mar. 17, 1990, 2-216910

Int. Cl.[5] **B65G** *43/08*

U.S. Cl. 198—464.3 **27 Claims**



1. A carrier conveying apparatus, comprising:

a first carrier rest on which carriers are placed, said first carrier rest being square in configuration;

a second carrier rest;

a carrier holding member for holding carriers from beneath the carrier, said carrier holding member having a plurality of projection rods projected from a main rod with a spacing defined between the adjacent projection rods to allow the carrier rest to pass through the spacing; and

carrier holding member driving means for lifting the carrier holding member from beneath the first carrier rest and, by doing so, lifting the carriers which are placed on the first carrier rest with the carriers held by the carrier holding member, moving the carrier holding member in a horizontal direction and placing the carriers on the second carrier rest after the carrier holding member has been lowered toward the second carrier rest.

5,203,446

SINGLE AND CONTINUOUS FLEXIBLE BELT CONVEYOR

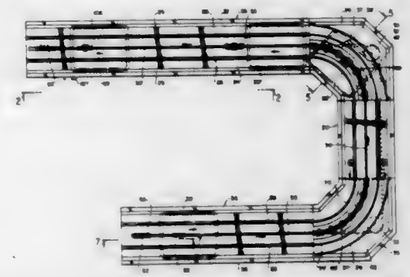
Jared Ufland, National Conveyor Corp. 6905 Beck Ave., North Hollywood, Calif. 91605

Filed Sep. 23, 1991, Ser. No. 764,283

Int. Cl.[5] **B65G** *25/00*

U.S. Cl. 198—465.2 **1 Claim**

1. In combination with a power supply including a drive means for pulling a continuous belt rounded in cross-section for transporting dishes and trays along a conveyor slider bed; said single and continuous conveyor belt extending above the slider bed and constructed and arranged for engaging and supporting the trays and dishes; auxiliary parallel balancing support means along opposite sides of and spaced from the belt for stabilizing the trays for insuring the balanced supporting of the weight of the trays on and along the top of the single conveyor belt; said belt has a frictional engagement with the trays, said trays having bottoms frictionally engaging and



supported on and along said belt; means for changing the direction of the slider bed and belt; means are additionally provided for guiding the belt around corners, comprising roller means and self-lubricating guide block means which confine the belt in its longitudinal movement on both sides and at the bottom but not at the top, the parts being so adjusted and arranged that the top portion of the belt defines an arc of less than 180 degrees, extending above all surrounding structures for exposure to and supporting engagement with the bottoms of the trays.

5,203,447

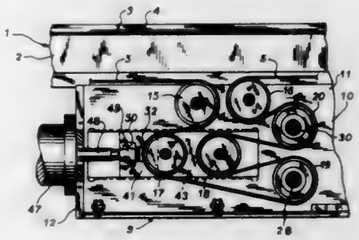
DRIVE MECHANISM FOR A CONVEYOR

Terry S. Ewert, Sussex, Wis., assignor to Dorner Mfg. Corp., Hartland, Wis.

Filed Apr. 9, 1992, Ser. No. 866,146

Int. Cl.[5] **B65G** *39/16*

U.S. Cl. 198—807 **17 Claims**



1. A drive unit for a conveyor, comprising a frame, an endless conveying member supported for travel on the frame, a drive unit carried by the frame and including a supporting structure and a power source having an output shaft, a pair of drive spindles journaled on the supporting structure and disposed in operative engagement with said conveying member, a drive member connecting said drive shaft with said pair of drive spindles, tensioning means including a pair of tensioning spindles each mounted for movement relative to said support structure and engaged with said conveying member, and operating means operably connected to said tensioning spindles for moving said tensioning spindles to thereby tension said conveying member.

5,203,448

PUSH BUTTON KEY SWITCH

tions thereof in said first position; and deployment means operably associated with said securement means for interaction

and a second actuation position, said actuating bar having a downwardly extending protuberance; and

and includes a front, back, bottom, a first side and a second side, said upright compartment adapted to vertically re-

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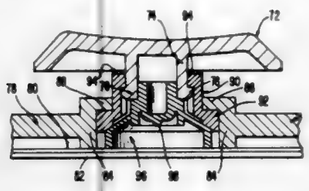
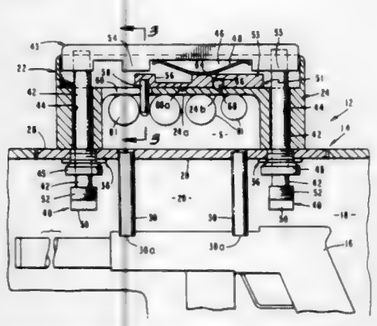
5,203,448
PUSH BUTTON KEY SWITCH
Masamitsu Osada, Kawasaki, and Nobuyuki Takahashi, Yokohama, both of Japan, assignors to Minebea Co., Ltd., Nagano, Japan
Filed Feb. 11, 1992, Ser. No. 832,929
Claims priority, application Japan, Feb. 12, 1991, 3-012080[U]
Int. Cl.[5] H01H *3/12*
U.S. Cl. 200—517 **5 Claims**



1. A push button key switch comprising:
a base having a fixed guide cylinder formed therein;
an intermediate guide cylinder slidable lengthwise inside said fixed guide cylinder;
a keytop having a neck extending therefrom, said neck being slidable lengthwise inside said intermediate guide cylinder, said keytop and said neck having a prescribed keystroke distance;
an elastic body positioned below and contacting one end of said neck whereby said elastic body normally biases said keytop and said neck to an uppermost position; and
an electric contact mechanism positioned below said elastic body whereby when said keytop is pushed downwardly said prescribed keystroke distance, said one end of said neck and an end of said intermediate guide cylinder contact said elastic body to cause said elastic body to collapse and contact said electric contact mechanism to thereby activate said electric contact mechanism.

5,203,449
RAPID DEPLOYMENT APPARATUS
G. Fonda Bonardi, 2075 Linda Flora Dr., Los Angeles, Calif. 90077
Filed Dec. 26, 1991, Ser. No. 813,485
Int. Cl.[5] B65D *25/28, 55/02*
U.S. Cl. 206—1.5 **14 Claims**



1. An improved rapid deployment apparatus for concealing and then rapidly deploying for use a utilitarian object, said apparatus being of a character having an enclosure for enclosing the utilitarian object, including operably associated first and second portions movable between a first position defining an internal chamber for concealing the object and a second position deploying the object for use, said enclosure having a hollow handle; securement means interconnected with said enclosure for releasably maintaining said first and second portions thereof in said first position; and deployment means operably associated with said securement means for interaction with said securement means upon actuation of said deployment means to move said first and second portions of said enclosure from said first closed to said second open position; the improvement comprising safing means for preventing accidental actuation of the deployment means, said safing means comprising:
(a) a slider bar disposed within said hollow handle, said slider bar being movable from a first position blocking actuation of said deployment means to a second position permitting actuation of said deployment means; and
(b) finger engaging means for moving said slider bar from said first to said second position, said finger engaging means comprising a downwardly extending member connected to said slider bar.

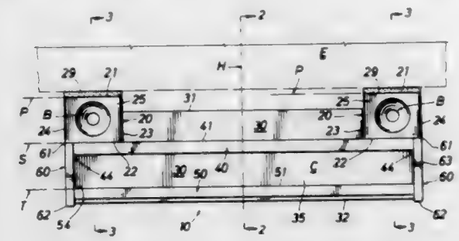
5. A rapid deployment apparatus for concealing and then exposing an utilitarian object, comprising:
(a) an enclosure for enclosing the utilitarian object, including:
(i) a first portion;
(ii) a second portion hingeably connected to said first position, said first and second portions being movable between a first position defining an internal chamber for concealing the utilitarian object and a second portion exposing the utilitarian object; and
(iii) a hollow handle connected to one of said first and second portions, said handle having a cavity;
(b) securement means connected to said enclosure for maintaining said first and second portions thereof in said first position;
(c) deployment means connected to said enclosure and operably associated with said securement means for interaction with said securement means upon actuation of said deployment means to permit said first and second portions of said enclosure to move toward said second position, and said deployment means comprising an actuating bar mounted within said cavity of said handle for movement between a first normal position and a second actuation position, and
(d) safety means for preventing accidental actuation of said deployment means, said safety means comprising:
(i) a slider bar disposed within said cavity of said handle, said slider bar being movable from a first position blocking actuation of said deployment means to a second position permitting actuation of said deployment means; and
(ii) finger engaging means for moving said slider bar from said first to said second position, said finger engaging means comprising a downwardly extending pin connected to said slider bar.

9. An improved rapid deployment apparatus for concealing and then exposing an utilitarian object, comprising:
(a) an enclosure for enclosing the utilitarian object, including:
(i) a first portion,
(ii) a second portion hingeably connected to said first portion, said first and second portions being movable between a first position defining an internal chamber for concealing the utilitarian object and a second position exposing the utilitarian object; and
(iii) a handle connected to one of said first and second portions, said handle having a cavity;
(b) securement means connected to said enclosure for maintaining said first and second portions thereof in said first position; and
(c) deployment means connected to said enclosure and operably associated with said securement means for interaction with said securement means to permit said first and second portions of said enclosure to move toward said second position, and said deployment means including:
(i) an actuating bar mounted within said cavity of said handle for movement between a first normal position and a second actuation position, said actuating bar having a downwardly extending protuberance; and
(ii) biasing means for yieldably resisting movement of said actuating bar toward said second actuating position;
(d) Safety means for preventing accidental actuation of said deployment means, said safety means comprising:
(i) a slider bar disposed within said cavity of said handle, said slider bar having access for receiving said protuberances of said actuating bar and being movable from a first position blocking actuation of said deployment means to a second position permitting actuation of said deployment means; and
(ii) finger engaging means for moving said slider bar from said first to said second position, said finger engaging means comprising a downwardly extending pin connected to said slider bar.

5,203,450
COMBINATION DISPLAY AND PACKAGING CONTAINER FOR DENTAL MATERIAL
Vincent M. Benetti, Vacaville, Calif., assignor to Aalba Dent, Inc., Cordelia, Calif.
Filed Feb. 12, 1992, Ser. No. 834,485
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—63.5 **6 Claims**

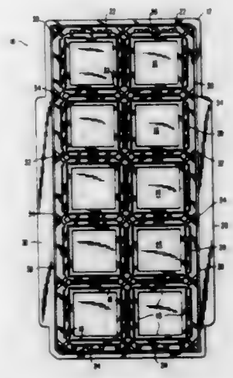
1. A system for holding ingots of dental material, comprising:
a container having an open top including a rim;
within said container at least one generally flat holding member having a plurality of spaced-apart depressions therein each of said depressions configured to contain one ingot, and each of said depressions including means for retaining said ingot therein;
a first cover secured in said container below said rim portion for retaining said holding member in said container; and
a second cover secured on said container over said first cover and forming a storage space between said first and second covers.

5,203,451
STATIONARY HOLDER FOR WORK-SITE ENVIRONMENT
Don L. Short, II, 706 Leawood Dr., Omaha, Nebr. 68154
Filed Feb. 14, 1992, Ser. No. 836,098
Int. Cl.[5] A45C *11/34*
U.S. Cl. 206—214 **2 Claims**



1. A stationary holder for compact, upright storage of a writing instrument and a pad of writing material, comprising:
a substantially upright compartment which is open at the top and includes a front, back, bottom, a first side and a second side, said upright compartment adapted to vertically receive a pad of writing material;
a first upright member attached to said upright compartment, said first upright member having a substantially vertical tubular opening adapted to vertically receive a first writing instrument;
means for attaching the stationery holder to a vertical surface; and
a second upright member attached to said upright compartment, said second upright member having a substantially vertical tubular opening adapted to vertically receive a second writing instrument,
wherein said first and second upright members are attached to said back of said compartment substantially adjacent to said first and second side respectively and said first and second upright members include a rear vertical surface and said attaching means includes an adhesive layer on said rear vertical surface permitting the stationery holder to be securely attached and supported to a vertical surface.

5,203,452
SHIPPING TRAY
Edith M. Small, New Lenox, and Kenneth R. Steinhart, Frankfort, both of Ill., assignors to Illinois Tool Works, Inc., Glenview, Ill.
Continuation-in-part of Ser. No. 850,880, Mar. 13, 1992. This application Aug. 13, 1992, Ser. No. 929,730
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—329 **8 Claims**



1. A shipping tray for shipping electronic components, said tray comprising:
an open latticework integral tray defining a plurality of pockets, each of said pockets being bordered by a plurality of sides, each of said sides having a raised lip which cooperates with lips of other sides of said pocket in defining a rim within which a component may be seated;
a member for joining at least one side of one pocket with at least one side of an adjacent pocket, said joining member having a narrowed portion therein to facilitate the severing thereof; and
means on a side of one pocket for interlocking said shipping tray with another shipping tray in a stacked relationship, so that said shipping tray may be used as covering lid for another shipping tray.

5,203,453
GOLF STANCE DEVICE

5,203,456
CURLING IRON TRAVEL CASE

a container having wall elements defining a cavity;
said container having an upper portion and a lower por-

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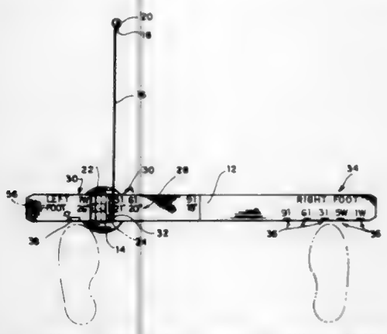
5,203,453

GOLF STANCE DEVICE

Anthony R. Dirito, 1604 Sherman St., Alameda, Calif. 94501

Filed Apr. 16, 1992, Ser. No. 868,849
Int. Cl.[5] A63B *55/00, 69/36*
U.S. Cl. 206—315.3 11 Claims



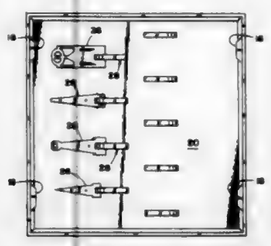
1. A golf stance device for properly locating the feet of a golfer on the ground with respect to a golf ball comprising:
a linear member adapted to rest upon the ground, and adapted to receive indicia to guide the location of the golfer's feet;
a housing; means for slidably connecting said housing to said linear member; and,
a rolled-up extensible tape in said housing, said tape adapted to be drawn in a direction outward from said housing and substantially normal to said linear member, said tape having markings thereon for determining the extent to which said tape may be drawn from said housing; and a flexible disk joined to said housing, said flexible disk having a plurality of slots therein for slidably engaging said housing with said linear member so that slidable engagement is accomplished by inserting said linear member through said slots.

5,203,454

METHOD AND APPARATUS FOR TRANSPORTING SENSITIVE ELECTRONIC COMPONENTS

Leslie G. Strong, 240 Mississippi Dr., Monticello, Minn. 55362

Continuation-in-part of Ser. No. 701,101, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 603,456, Oct. 25, 1990, abandoned. This application Oct. 22, 1991, Ser. No. 781,105
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—328 20 Claims



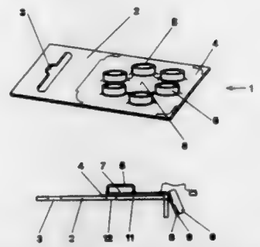
1. A combination of at leastone suspension assembly and a container for packaging a plurality of suspension assemblies during transport and handling, said combination comprising:
at least one suspension assembly having a base plate and suspension arm;
a tray having an outer wall and an inside surface which at least partially defines a protected space therien, said inside surface including a bottom surface;
a removable retention bar separate from said tray, said retention bar having two ends; and
retention means located on each of said two ends of said removable retention bar and integral with said retention bar, said retention means for retaining said removable retention bar within said tray to capture said base plate of said at least one suspension assembly between said removable retention bar and said bottom surface, whereby said suspension arm of said at least one suspension assembly is suspended in said protected space.
14. A container for packaging a pluraltiy of suspension assemblies during transport and handling,e ach suspension assembly having a base plate and suspension arm, and each suspension assembly being packaged by capture of its base plate, said container comprising:
a tray having an outer wall with an inside surface which at least partially defines a protected space therein, said inside surface further comprising a bottom surface, said tray further comprising a plurality of serrated portions formed in said inside surface;
a removable elongated retention bar having two ends; and
retention means located on each of said two ends of said removable retention bar, said retention means for retaining said removable retention bar within said tray to capture base plates between said removable retention bar and said bottom surface, said retention means further comprising a serrated portion on each end of said retention bar, said serrated portion adapted to cooperate with one of said plurality of serrated portions in said tray, whereby suspension arms of suspension assemblies are suspended in said protected space.

5,203,455

PACKAGE FOR ZINC-AIR BATTERIES

Helmut Hewelt, and German Schulz, both of Ellwangen, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Jun. 30, 1992, Ser. No. 906,520
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1991, 4128248
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—333 6 Claims



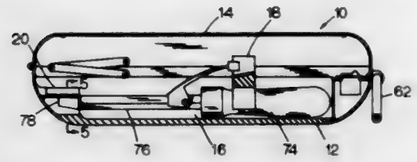
1. A package for zinc-air batteries each having a base and air supply holes formed in the base, the package comprising a clear plastic cover having cup-shaped recesses which substantially conform to the shape of each battery, a rupturable support fastened to the cover so that the batteries can be pushed through the support to rupture said support, and a foil fastened between the support and the cover and extending to regions of the support through which the batteries can be pushed, wherein the foil includes an adhesive coating for adhering the base of each battery to said foil and for sealing the air supply holes, and wherein the foil remains associated with the support after the batteries have been pushed through and removed.

5,203,456

CURLING IRON TRAVEL CASE

Rudy Boswell, 4316 Pickfair, Springfield, Ill. 62703

Filed Jul. 31, 1991, Ser. No. 738,457
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—349 13 Claims



1. A curling iron travel case comprising: a base structure, the base structure having a bottom, back, left side, right side, front and open top;
a cover structure pivotally hinged to the back of the base structure, the cover structure having a top, back, left side, right side, front and open bottom;
a support member installed within the base structure;
a hold down clamp and stand attachable to the support member;
a heat-resistant sleeve contained on the support member near the back of the base structure; and
the hold down clamp and stand further comprises a soft compressible a material contained within the hold down clamp and stand for securing a curling iron to the support member when the hold down clamp and stand is attached to the support member, and an arched area for holding a curling iron when the curling iron is in use.
13. A curling iron travel case comprising:
a base structure, the base structure having a bottom, back, left side, right side, front and open top, further containing a power block within the base structure near the front, the power block having multiple receptacles, a power cord and a power switch;
a cover structure pivotally hinged to the back of the base structure, the cover structure having a top, back, left side, right side, front and open bottom;
a support member installed within the base structure, the support member having multiple elongated troughs for receiving multiple curling irons and a clamping means along the troughs for attaching the hold down clamp and stand;
a hold down clamp and stand attachable to the support member, the hold down clamp and stand having a soft compressible material contained within the hold down clamp and stand for securing a curling iron to the support member when the hold down clamp and stand is attached to the support member, and an arched area for holding a curling iron when the curling iron is in use; and
a heat resistant sleeve contained on the support member near the back of the base, the heat resistant sleeve having a hollow area for receiving a tip of a curling iron on one side of the support member and an arched area for holding a tip of a curling iron when the curling iron is in use.

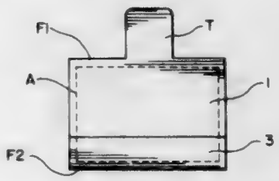
5,203,457

DEVICE FOR DISPENSING PLANAR ARTICLES AND WRAPPER FOR EACH ARTICLE

Nancy C. Garcia, Acorn Export P.O. Box 6221, Laguna Niguel, Calif. 92677-6221

Filed Apr. 13, 1992, Ser. No. 867,337
Int. Cl.[5] B65D *85/62*
U.S. Cl. 206—499 3 Claims

1. A device for dispensing planar articles comprising:
a plurality of planar articles:
a plurality of wrappers each of said wrappers enclosing one of said planar articles to define a plurality of packets
a container having wall elements defining a cavity;
said container having an upper portion and a lower portion and a dispensing port located proximate said lower portion:
said plurality packets stacked atop one another in said cavity;
whereby said packets may be removed from said container by manually pulling said packets from said dispensing port;
each of said wrappers comprising:
a generally rectangular sheet of foldable material having a first axis and a second axis normal to one another;
said sheet being folded along a plurality of fold lines parallel to said first axis and defining at least three panels on associated sides of said fold lines; and
a tab element cut from one of said panels and integrally joined to an associated panel along a hinge line coincident with one of said fold lines; wherein
said panels and fold lines comprise:



a first panel, a second panel, and a third panel,
said first panel joined to said second panel along a first fold line,
said second panel joined to said third panel along a second fold line.
said second and third panels being substantially rectangular and about the same size.
said first panel being substantially rectangular and about one half the size of said second and third panels,
said tab element being located on said third panel and formed from a cut line, whereby said planar article is placed atop said second panel.
said third panel being positioned atop said planar article by rotating about said second fold line,
said first panel being positioned atop said third panel by rotating about said first fold line and,
said tab element being rotated about said second fold line until it rests against said second panel.

5,203,458

CRYPTOPLATE DISPOSABLE SURGICAL GARMENT CONTAINER

James T. Cornwell, Cleveland, Tenn., assignor to Quality Containers International, Inc., Cleveland, Tenn.

Filed Mar. 2, 1992, Ser. No. 844,177
Int. Cl.[5] B65D *81/70, 33/29*
U.S. Cl. 206—524.8 11 Claims

1. A container for infectious medical waste comprising:
a container body having an elongated slit therein for receiving infectious medical waste into an interior of the body;
a one-way valve secured to the body near the slit for applying a vacuum to the interior of the container body to remove air from the interior of the container body;
an elongated closure tape for engagement over the slit to close the slit after the container body is filled to a selected level with infectious medical waste and after which air in

the container body is removed through the one-way valve; and

water within the two respective compartments upon reciprocating motion of a piston within a cylinder;

A'. retaining structure comprised of multiple, spaced grooves:

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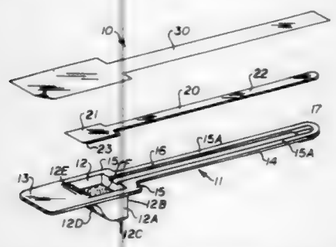
the container body is removed through the one-way valve; and

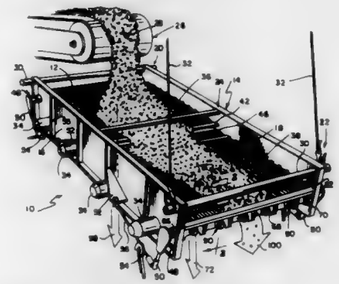
a reinforcing strip extending along the slit for reinforcing the slit and extending around the valve for helping secure the valve to the container body.

5,203,459
PREPACKAGED ORAL MEDICATION SERVING APPARATUS AND METHOD
Leslie C. Wade, 19415 Enchanted Oaks Dr., Spring, Tex. 77388
Filed May 14, 1991, Ser. No. 699,502
Int. Cl.[5] B65D *69/00;* **A21D** *10/02;* **A47J** *43/28*
U.S. Cl. 206—572 **10 Claims**



1. An oral serving container apparatus for administering medicants to persons who have little or no control over the muscles of their mouth or have difficulty in swallowing pills comprising;
a generally rectangular serving container having a flat generally rectangular serving surface at a forward end, an open top recessed polygonal chamber adjoining said serving surface containing a measured amount of consumable food substance, and an integral rectangular handle portion extending longitudinally rearward therefrom and said chamber and handle portion having top surfaces shaped to receive a spatula member and a cover member,
a flat generally rectangular spatula having a flat head portion and an integral flat handle portion extending longitudinally therefrom and sized to be removably received on said serving container with its handle portion engaged along said serving container handle portion and its head portion substantially covering the food substance contained in said chamber, and
a removable thin flexible cover member peelably attached to the top surfaces of said serving container handle portion, said chamber, said serving surface, and said spatula and having outer peripheral portions extending beyond the top surfaces of said serving container, whereby
said cover member may be peeled away from said serving container to gain access to said serving surface, said spatula, and the food substance contained in said chamber, and said spatula may be removed therefrom to be placed head down in the food substance and pushed forward to transfer the food substance from said chamber onto said serving surface, and thereafter
said serving surface with said food substance thereon is placed in a recipient's mouth and said food substance is wiped off on the inside of the recipient's cheek or onto their tongue.

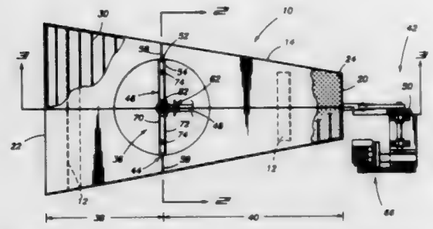
5,203,460
TENSION CONTROL APPARATUS FOR VIBRATING SCREENS
E. Mark Deister, Fort Wayne, and Dale A. Loshe, New Haven, both of Ind., assignors to Deister Machine Co., Inc., Fort Wayne, Ind.
Filed Apr. 1, 1992, Ser. No. 861,641
Int. Cl.[5] B07B *1/49*
U.S. Cl. 209—402 **24 Claims**



1. A vibrating screen apparatus comprising:
a frame;
a screen including a first end, a second end, and a width dimension;
an anchor beam rigidly coupled to the frame;
means for coupling the first end of the screen to the anchor beam;
means for tensioning the screen to substantially a predetermined tension, the tensioning means being rotatably coupled to the frame and spaced apart from the anchor beam to change the tension of the screen upon rotation of the tensioning means relative to the frame;
means for coupling the second end of the screen to the tensioning means; and
means for selectively and incrementally adjusting the relative rigidity of the tensioning means at predetermined intervals along the width dimension of the second end of the screen to compensate for nonuniform tension of the screen.

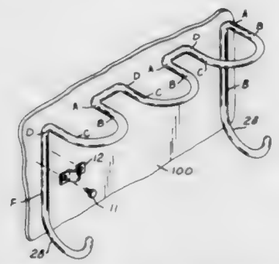
5,203,461
MINERAL JIG APPARATUS
Raymond A. Hanson, and Wayne F. Crockett, both of Spokane, Wash., assignors to R. A. Hanson Company, Inc., Spokane, Wash.
Filed Oct. 4, 1991, Ser. No. 771,621
Int. Cl.[5] B03B *5/56*
U.S. Cl. 209—455 **20 Claims**

1. A mineral jig apparatus comprising:
a supporting framework;
at least one jig tank which retains water and material being concentrated, the jig tank having a lower portion and an upper portion, the upper portion having a screen atop which ore to be processed is fed to the jig, the lower portion having a drain for discharging concentrated ore from the tank, the jig tank being substantially separated into at least two compartments;
a piston and cylinder assembly mounted within the tank, the piston and cylinder assembly defining an interface between the two compartments to reciprocatingly pulsate water within the two respective compartments upon reciprocating motion of a piston within a cylinder;
drive means for imparting reciprocating action to the piston; and



the piston and cylinder assembly including a piston rod for driving the piston, the piston rod being supported for reciprocating motion by at least two leaf springs.

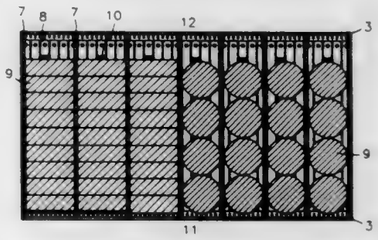
5,203,462
SPORTS EQUIPMENT RACK
Cary W. Brooks, 20360 Oneida Dr., Mt. Clemens, Mich. 48044
Filed Jul. 31, 1991, Ser. No. 738,261
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—14 **6 Claims**



1. A combination comprising: a sports equipment rack comprising at least a first and second adjacently positioned U-shaped hollow ball holders each for supporting a basketball and each comprising an arcuate shaped leg and first and second substantially straight balancing legs each having one end extending from an associated end of the arcuate shaped leg; said arcuate shaped leg and said balancing legs of both the first and second ball holder all being in substantially the same plane; said rack being secured to a wall by a securing means so that each ball holder formed by said arcuate shaped leg and said balancing legs is angled slightly less than ninety degrees with respect to a wall to which the rack is to be secure to, and a ball supported and balanced by said balancing legs of one of said ball holders and resting against the wall.

5,203,463
ADJUSTABLE PRODUCT DISPLAY AND DISPENSING UNIT
Steven K. Gold, 237 Doyle Ave., Providence, R.I. 02906
Filed Dec. 9, 1991, Ser. No. 773,033
Int. Cl.[5] A47F *1/04*
U.S. Cl. 211—59.3 **4 Claims**

1. An adjustable assembly for the storage, display, and dispensing of units of containerized products comprising:
A. a generally rectangular base portion having top and bottom facings, front side, rear side, and opposed lateral sides;
A'. retaining structure comprised of multiple, spaced grooves:
A". one or more selectively positionable and replaceable product repositioning mechanisms, each comprising resilient means for supplying force for product repositioning:
A"'. one or more selectively positionable and replaceable row dividers, said assembly being further characterized by:
B. said retaining structure being capable of receiving and retaining said row dividers and said product repositioning mechanisms, such that said row dividers occupy some said grooves of said retaining structure while said product repositioning mechanisms occupy other said grooves of said retaining structure:
C. each row divider extending approximately from said front side to said rear side of said base portion and being selectively movable and positionable in parallel with other said row dividers to thereby define a selectively adjustable number of product spaces of adjustably variable width between adjacent said row dividers;



D. said assembly base portion including an upstanding rim at said top facing front and rear side edges to maintain said product within said product spaces, and having no said rim at said top facing opposed lateral side edges to thereby permit side-to-side connection of two said assemblies to provide a said product space which may span and exist partly in each of two said connected assemblies:
E. each said assembly product repositioning mechanism residing substantially entirely within said assembly base portion and product space, and having said mechanism resilient means reside substantially entirely within said base portion such that said resilient means resides below any said units of containerized product positioned within said product space, and;
F. each said product repositioning mechanisms being capable of automatically repositioning said product towards said assembly front side without requiring said assembly to be supported in an inclined position.

5,203,464
STORAGE RACK SYSTEMS
Donald R. Allen, Frenchtown, N.J., assignor to Frazier Industrial Company, Long Valley, N.J.
Filed Nov. 5, 1990, Ser. No. 609,152
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—151 **8 Claims**

1. In a storage rack system for storing pallet loads multiple pallets deep having a framework providing a plurality of storage bays each of which is defined by a plurality of vertical uprights and horizontals shelf beams, each of said storage bays comprising:
a pair of track means extending from front to back along the depth of said storage bay and being spaced apart across the width of said storage bay,
each track means including at least one track for supporting the wheels of a cart,
an interlocked cart assembly movable along said track means and including
a first cart including a frame providing support for a pallet

load, front and rear wheel assemblies on each side of said

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disk portion having a seating portion which is flexible in a direction opposite to a valve closing direction when said

surface and said cover for engaging said cover in a closed position such that said seal is sufficiently compressed to

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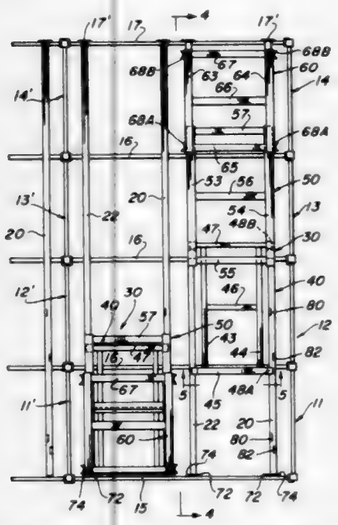
load, front and rear wheel assemblies on each side of said first cart frame, and means for supporting each of said first cart wheel assemblies to make rolling contact with said one track of each track means as said first cart moves along the depth of the storage bay between a forward and a back position, and

a second cart including a frame providing support for a loaded pallet, front and rear wheel assemblies on each side of said second cart frame, and means for supporting each of said second cart wheel assemblies to make rolling contact with said one track of each track means as said second cart moves along the depth of the storage bay between a forward and a back position,

said first and second carts being interlocked by having said first wheel assemblies of said second cart being positioned to ride on said one track of each track means between the front and rear wheel assemblies of said first cart,

the forward position of said second cart overlying the forward position of said first cart and the back position of said second cart being located a pallet depth rearwardly of the back position of said first cart,



said track means being mounted on said storage bay framework so as to be inclined toward the entry end of said storage bay, with said one tracks being constructed and arranged so that said carts of said interlocked cart assembly are supported so that they tend to roll along said one tracks toward the entry end of said storage bay,

each of said track means comprising a channel construction wherein each of said one tracks is provided by an inwardly facing flange on which said wheel assemblies ride,

said first cart frame including a pair of support members extending along the depth thereof and forming the sides thereof, said first cart support members being inwardly of said support means for said second cart front wheel assemblies to provide clearance for the relative movement between said second cart and said first cart along said track means,

and including a pair of support plates mounted on each side of said frame of said first cart at locations to permit said carts to move along said one tracks between said forward and back positions thereof and extending above said track means to prevent said first cart from falling between said track means.

5,203,465

LID WITH A VALVE-CONTAINING KNOB FOR A COOKING UTENSIL

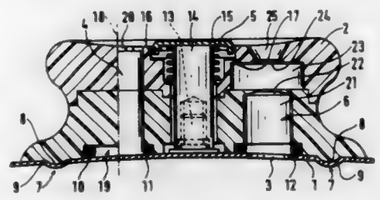
Gerd D. Baumgarten, Wilnsdorf-Wilden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile, Neunkirchen, Fed. Rep. of Germany

Filed Feb. 13, 1992, Ser. No. 835,621

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 9101708

Int. Cl.[5] B65D *51/16*

U.S. Cl. 220—206 **2 Claims**



1. A lid for a cooking utensil, comprising: a valve-containing knob rotatably supported on the lid, said lid having a hole therein, and said valve-containing knob being provided with a venting opening selectively connectable to said hole in said lid, said valve-containing knob being supported on a central support element fastened to said lid and initially urged toward and against said lid by means of an initial tensioning element, said valve-containing knob having a whistle opening adapted to be selectively arranged in alignment with said hole in said lid, wherein said support element includes a cylindrical sleeve secured to said lid by a threaded bolt which is fastened on said lid on the same side of said lid on which said knob is located, and a holding plate connected to said sleeve, wherein said valve-containing knob and said lid each have releasable locking elements for fixing said valve-containing knob in one of a venting position, a whistle position and a closed position, wherein said locking elements include at least one raised elevation on an underside of said valve-containing knob facing said lid, and a conforming indentation in said lid therefor, wherein said holding plate has at least one pawl facing said valve-containing knob, wherein said valve-containing knob has at least one locking recess into which is selectively received said locking pawl upon a lifting of said valve-containing knob, and wherein said locking recess and said locking pawl are spaced apart a distance greater than a distance that said valve-containing knob is lifted away from said lid when said locking elements are released from one another in response to said valve-containing knob and said lid being rotated with respect to one another.

5,203,466

FUEL CAP

Joji Kasugai, and Norikazu Hosokawa, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 26, 1992, Ser. No. 903,944

Claims priority, application Japan, Jun. 27, 1991, 3-182991

Int. Cl.[5] B65D *51/16*

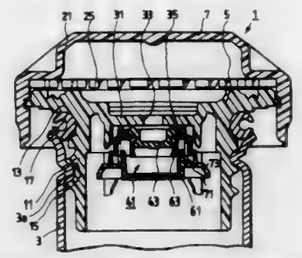
U.S. Cl. 220—209 **5 Claims**

1. A fuel cap comprising a cap body adapted to be connected to a filler hole of a fuel tank, said cap body having a flow path bore defined therein and a seat surface defined around said flow path bore; and a pressure control valve mounted in the cap body so as to open and close said flow path bore, said pressure control valve including:

a valve member to be seated on said seat surface around said flow path bore in the cap body, to close said flow path bore, said valve member including as support portion supported by a valve member holder and a disk portion formed on an outer periphery of said support portion, said disk portion having a seating portion which is flexible in a direction opposite to a valve closing direction when said valve member is subject to a pressure higher than a predetermined pressure;

spring means for urging said valve member via said valve member holder in said closing direction; and

inner and outer annular lips which are disposed in substantially concentric relation to each other formed on said seating portion;



said outer lip having a substantially triangular cross-section and having an apex, and said inner lip having a substantially triangular cross-section, an apex, and having a height less than that of said outer lip so that when the pressure in the valve closing direction exceeds said predetermined pressure, said inner lip can be seated on said seat surface as a result of he flexing of said disk portion in said opposite direction.

5,203,467

PROTECTIVE CAP WITH SEAL FOR BEVERAGE CONTAINER

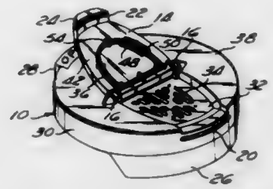
Terence Tucker, P.O. Box 1420, San Juan Capistrano, Calif. 92693

Continuation-in-part of Ser. No. 598,175, Oct. 15, 1990, Pat. No. 5,054,640. This application May 23, 1991, Ser. No. 704,944

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] B65D *51/18*

U.S. Cl. 220—254 **13 Claims**



1. A protective cap for preventing insects, airborne debris, and the like from entering a beverage container, for preventing spillage, and for sealing carbonation within the container, the cap comprising:

(a) a generally planar surface having a peripheral portion formed thereabout, said generally planar surface having an opening formed therein, said generally planar surface removably attachable to a beverage can such that a gas-tight seal is provided at the periphery of said cap between said cap an said can;

(b) a cover hingeably attached to said cap such that said cover can be rotated between an opened position and a closed position of said opening;

(c) a compressible seal disposed intermediate said cover and said generally planar surface when said cover is disposed in a closed position;

(d) a detent means formed upon one of said generally planar surface and said cover for engaging said cover in a closed position such that said seal is sufficiently compressed to provide gas-tight closure, said detent means comprising a first detent formed upon a distal portion of said cover and a second detent formed upon the periphery of said generally planar surface.

5,203,468

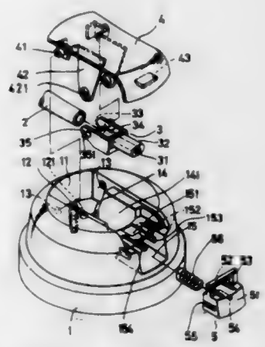
WATER CONTAINER CAP

Chun-Feng Hsu, No. 31-13, Nung 55, Lane 274, Chung-Cheng South Road, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Jul. 1, 1992, Ser. No. 907,067

Int. Cl.[5] B65D *51/18*

U.S. Cl. 220—254 **2 Claims**



1. A cap for coupling to a water container, comprising:

a cap body having a recessed chamber disposed therein, said cap body having a pair of first recess openings formed in opposing side walls of said recessed chamber;

fluid coupling means extending through a bottom wall of said recessed chamber of said cap body for providing fluid communication with a fluid disposed within said water container;

vent means extending through said bottom wall of said recessed chamber of said cap body for providing an inlet for air as fluid is displaced from said water container;

nipple means fluidly coupled to said fluid coupling means for withdrawing fluid from said water container therethrough, said nipple means includes (1) a nipple support member having a substantially U-shaped contour, and (2) a nipple member extending through a central portion of said nipple support member and having a longitudinally directed bore hole extending therethrough, said nipple member having opposing first and second ends, said second end being coupled to one end of a flexible conduit, said flexible conduit having an opposing end coupled to said fluid coupling means;

closure means pivotedly coupled to said cap body for providing access to said nipple member, said closure means including a longitudinally extended cap member having a pair of opposing transversely directed first projections being disposed at one end thereof, each of said pair of first projections being disposed in a respective one of said pair of first recess openings for pivotally coupling said cap member to said cap body, whereby said cap member is rotatably displaceable from a first position to a second position, said cap member forming a closure for said recessed chamber in said first position, said closure means further including a pair of arm members extending from a bottom surface of said cap member in spaced parallel relation, said nipple support member being pivotally coupled to said pair of arm members for displacing said nipple member from a position within said recessed chamber of said cap body responsive to said cap member being dis-

placed to said second position, whereby said first end of said nipple member is accessible to a user for withdrawing

first aperture and at least two additional apertures therein; and

5,203,472

TIMER CONTROLLED CIGARETTE DISPENSER

predetermined spacing, with a lid securable to an upper terminal end of the housing, and

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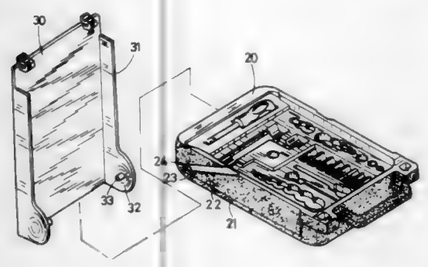
placed to said second position, whereby said first end of said nipple member is accessible to a user for withdrawing fluid from said water container therethrough; and,

a push button member slidingly coupled within an opening formed opposite said recessed chamber of said cap body, said push button member having an inverted U-shaped rod defining a through opening on an upper portion thereof for reversibly capturing a lug extending from an end portion of said cap member and in spaced parallel relation with said bottom surface thereof, thereby maintaining said cap member in said first position when said lug is captured by said push button member, said cap being free to be displaced to said second position responsive to said push button member being slidingly displaced into said opening sufficiently to disengage said lug from said through opening formed in said push button member.

5,203,469
TOOL BOX
Roger Chang, and John Lynn, both of 58, Ma Yuan West St., Taichung, Taiwan
Filed Jun. 1, 1992, Ser. No. 890,726
Int. Cl.[5] B65D *43/12*
U.S. Cl. 220—331 **2 Claims**



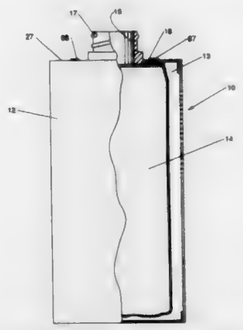
1. A tool box comprising a body including a plurality of recesses formed therein for accommodating tools and including two side surfaces each having a first end and a second end, a depression formed in said first end of each of said side surfaces of said body, a slot inclined from said depression to a middle and upper portion of each of said side surface of said body, and a cover including a pair of flanges extended downward from two side portions thereof respectively, each of said flanges including a stub formed integral on one end thereof for engagement with said depressions of said body such that said cover is rotatable about said stubs, each of said side surfaces of said body including a groove formed therein and extended vertically from said depression toward a bottom portion of said body, whereby, said cover is engageable in said bottom portion of said body when said studs are engaged in said depressions via said grooves, and said studs are slidable along said slots in order to move said cover along a direction from said depressions toward said second ends of said side surfaces of said body.

5,203,470
SEPARABLE BAG-IN-BOX COMPOSITE CONTAINER
Michael T. Brown, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 5, 1992, Ser. No. 878,941
Int. Cl.[5] B65D *5/56, 5/74*
U.S. Cl. 220—462 **19 Claims**

1. A bag-in-box composite container comprising:

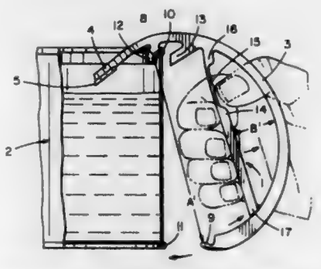
(a) a rigid one-piece outer box being constructed from a unitary blank having a continuous side wall, a top end panel and a bottom end panel, said top end panel and said bottom end panel being joined to said side wall so as to define a hollow box cavity, said top end panel having a first aperture and at least two additional apertures therein; and

(b) an inner bag being located within said hollow box cavity of said outer box, said inner bag having a pouring spout, said pouring spout having an outer surface and an annular flange, said pouring spout extending through said first aperture in said top end panel of said outer box, said annular flange of said pouring spout including an attachment



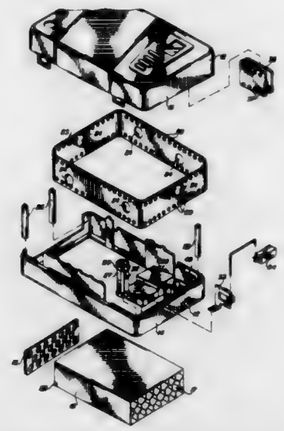
means for preventing relative rotation between said pouring spout and said outer box and permitting easy separation of said inner bag from said outer box, said attachment means including at least two attachment members extending from said annular flange, said attachment members extending through said two additional apertures in said top end panel of said outer box and being adapted to temporarily secure said inner bag to said outer box.

5,203,471
DETACHABLE HANDLE FOR CONTAINERS
Bruno Widman, 534 E. Lincoln Hwy., Dekalb, Ill. 60115
Filed Oct. 6, 1992, Ser. No. 956,965
Int. Cl.[5] B65D *23/10*
U.S. Cl. 220—755 **9 Claims**



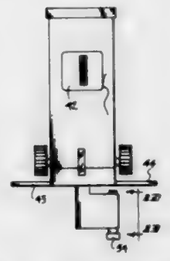
1. A detachable handle adapted to engage a container formed with a continuous sidewall which terminates in a pair of peripheral edges separated one from the other by the sidewall, comprising a generally curved bendable body adapted for manual holding and with the curved body defining an interior generally concave surface, a pair of edge engaging means fixed to the interior surface of the curved body with each such means separated from the other, and an elongated camming lever having a first end pivotally attached to the interior surface of the curved body and having an opposite end loosely positioned adjacent a different interior surface of the curved body whereby the application of a manual gripping force between the camming lever and the curving body separates the edge engaging fingers one from the other to release thereby any container to which the detachable handle is attached.

5,203,472
TIMER CONTROLLED CIGARETTE DISPENSER
Warren G. Levenbaum, Phoenix, Ariz., and David Anderson, Salt Lake City, Utah, assignors to Longevity Products Corporation, Phoenix, Ariz.
Filed Aug. 29, 1991, Ser. No. 752,024
Int. Cl.[5] B65B *59/00*
U.S. Cl. 221—15 **9 Claims**



1. Cigarette dispensing apparatus comprising a case, a multi-compartment cartridge in said case for storing cigarettes therein, the compartments in said cartridge being arranged in multiple rows, said case having opening means therein permitting cigarettes to be removed from said case through the opening means, and a belt in said case having a run thereof passing between said cartridge and the opening means in said case, said belt having openings therein which are advanced along the rows of compartments in said cartridge to permit removal of cigarettes one at a time, the spacing of the openings in said belt being such that all of the compartments in said cartridge are sequentially exposed one at a time with equal incremental unidirectional advancements of said belt.

5,203,473
TOOTHPASTE DISPENSER APPARATUS
Carlton B. Willey, P.O. Box 3471 3C02/203U, Corcoran, Calif. 93213-8310
Filed Oct. 18, 1991, Ser. No. 779,327
Int. Cl.[5] B65D *35/34*
U.S. Cl. 222—94 **1 Claim**



1. A toothpaste dispenser apparatus, comprising,

a housing of a parellelepiped construction, including a front wall spaced from a rear wall, with a first side wall spaced from and parallel to a second side wall spaced apart a predetermined spacing, with a lid securable to an upper terminal end of the housing, and

the housing defining a lower end, and

a bottom end cap securable to the lower end, wherein the bottom end cap includes a cap floor, the cap floor including a floor opening directed medially of the cap floor to receive a toothpaste tube nozzle therethrough, and

an adapter boss is securable to the toothpaste tube nozzle exteriorly of the housing, the adapter boss is securable to a toothpaste tube directed through the cap floor, with the adapter boss including an adapter boss conduit directed through the adapter boss, with a conduit end cap securable to a lower terminal end of the adapter boss conduit spaced from the floor, and

the bottom end cap includes a first slide spaced from a second slide spaced apart the predetermined spacing, and wherein the first slide includes a first slide groove and the second slide includes a second slide groove, wherein the first slide and second slide are slidably mounted to the first side wall and the second side wall respectively, wherein the first side wall includes a first pin slidably received within the first slide groove, and the second side wall includes a second pin slidably received within the second groove, wherein the first pin and second pin are coaxially aligned relative to one another, and at least one lock leg mounted to the bottom end cap, wherein the at least one lock leg includes at least one lock leg opening directed through the housing to receive the lock leg for securement of the bottom end cap to the housing lower end, and

the first side wall and the second side wall include respective first side wall slot and second side wall slot respectively, wherein the first side wall slot and the second side wall slot are arranged in a coextensive parallel relationship relative to one another, and wherein the first side wall slot is positioned medially of the first side wall and the second side wall slot is positioned medially of the second side wall, and an axle member defined by a predetermined length substantially equal to or greater than the predetermined spacing received within the first side wall slot and the second side wall slot, wherein the axle member includes an axle member slot to receive the toothpaste tube therethrough, and

the first side wall slot includes a first tooth rack coextensive with the first side wall slot and the second side wall slot includes a second tooth rack coextensive with the second side wall slot, and the axle member includes a first rotary array of gear teeth spaced from a second rotary array of gear teeth the predetermined spacing, and wherein the first rotary array of gear teeth are engaged with the first tooth rack and the second rotary array of gear teeth are engaged with the second tooth rack and upon rotation of the axle member effects projection of the axle member downwardly along the first side wall slot and the second side wall slot, and the axle member includes a first boss and a second boss mounted to a respective first and second distal end of the axle member spaced exteriorly of the housing adjacent the respective first side wall and the second side wall, and

the adapter boss includes a fluid reservoir, and further includes a fluid reservoir outlet in fluid communication with the adapter boss conduit, the reservoir outlet including a porous mesh wick to meter fluid from the fluid reservoir into the conduit.

5,203,474
BEVERAGE DISPENSING NOZZLE
Joel E. Haynes, Tarzana, Calif., assignor to Alco Standard Corporation, Valley Forge, Pa.
Filed Jun. 19, 1990, Ser. No. 540,243
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—129.1 **5 Claims**

1. A nozzle for a beverage dispenser for dispensing a beverage comprising a first liquid and a second liquid comprising:

separating means for separating the first liquid into a first

and

to be movable between an actuated and a deactuated position

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FISH STRINGER HANDLE

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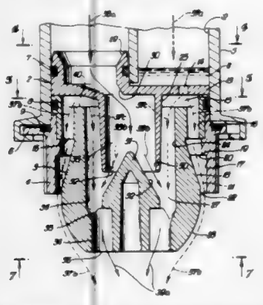
separating means for separating the first liquid into a first portion and a second portion;
first mixing means for forming a mixture of the second liquid and the first portion of the first liquid;
second mixing means for mixing said mixture and the second portion of the first liquid; and



inlet conduit means for the second liquid having an inlet and an outlet and a diverter provided therein having an apex at its top and a base at its bottom with its apex being directed to the outlet of the inlet conduit means.

5,203,475

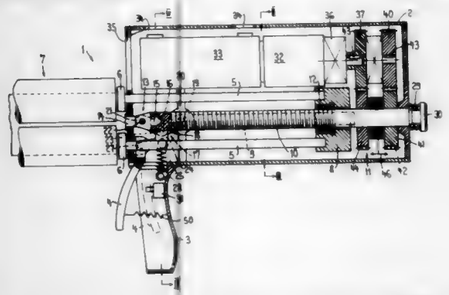
Patent Not Issued For This Number

5,203,476

ELECTRICALLY OPERATED DISPENSING APPLIANCE INCLUDING MECHANICAL MEANS FOR PREVENTING AFTERFLOW OF THE DISPENSED PRODUCT

Wilhelm A. Keller, Obstgartenweg 9, CH - 6402 Merlischachen, Switzerland

Filed Jun. 21, 1991, Ser. No. 719,235
Claims priority, application Switzerland, Jun. 22, 1990, 02090/90
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—136 **13 Claims**



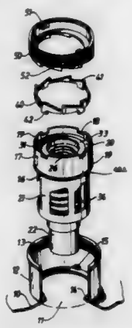
1. An electrically operated dispensing appliance including at least one cartridge containing a composition to be dispensed, comprising:
a housing;
a driving spindle, having first and second ends, movable in an axial direction in the housing;
at least one thrust rod movable along and driven by said driving spindle;
electric drive means disposed in the housing for driving said driving spindle and thrust rod, the electric drive means including an operating switch;
mechanical means associated with said driving spindle for retracting said driving spindle and said at least one thrust rod, the mechanical means including a plurality of levers; and
a trigger lever connected to said mechanical means, wherein when said trigger lever is released said mechanical means axially retracts said at least one thrust rod and said driving spindle, and said operating switch is actuated by said trigger lever to stop the electric drive means, to immediately suppress any afterflow of the dispensed composition.

5,203,477

CLOSURE UNIT FOR KEGS

Sin W. Lo, Selangor Darul Ehsan, Malaysia, assignor to Yin Seng Lim, Selangor Darul Ehsan, Malaysia

Filed Jul. 1, 1991, Ser. No. 721,343
Claims priority, application Malaysia, Jun. 30, 1990, PI 9001116
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **7 Claims**



1. A closure unit for a container, the container having an upstanding neck fixedly attached to the perimeter of an opening in the container and the neck being internally threaded at the upper end, the closure unit comprising:
a bush for receipt in and support by the neck, the bush forming a valve seat which seats two concentric valves which are retained by spring means against the valve seat, and wherein the concentric valves are delineated by an annular element, the annular element having an outwardly radiused flanged end with spaced apertures in said flanged end, and resilient material enveloping said flanged end and passing through said apertures to form a continuous mass, with said resilient means sealing the outer one of said concentric valves against the valve seat;
a deformable ring mounting atop said bush;
a locking sleeve having external threading and when in use, said locking sleeve is tightened against said deformable ring when screwed into said neck of the container but on unscrewing will fracture said ring so as to allow release of pressuring gas within the container through the wall between said neck and said bush and said fractured ring such that most of the gas would have escaped before said locking sleeve is free of said neck.

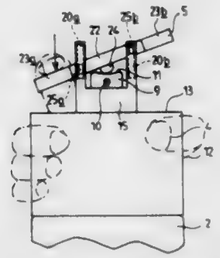
5,203,478

DISPENSER ASSEMBLY FOR A FLUID PRODUCT COMPRISING A DEVICE HAVING A TWIN LEVER ARM IN ORDER TO ACTUATE A DISPENSING MEANS

Vincent de Laforcade, Clamart, and Gilles Baudin, Clichy, both of France, assignors to L'Oreal, Paris, France

Filed Oct. 3, 1991, Ser. No. 770,405
Claims priority, application France, Oct. 15, 1990, 90 12689
Int. Cl.[5] B65D *83/18*
U.S. Cl. 222—402.13 **12 Claims**

1. A dispenser assembly for a fluid product housed in a container having a longitudinal axis and of the type having a dispensing means including a movable member disposed along the longitudinal axis of the container and a push button having a dispensing orifice and mounted on the movable member so as to be movable between an actuated and a deactuated position to, respectively, dispense the product through the dispensing orifice and to cease dispensing of the product, said dispenser assembly comprising a stationary part for mounting on the container and a part movably mounted on said stationary part to move the push button from the deactuated to the actuated position, said stationary part including an opening for slidably receiving the push button, guide means on said stationary part



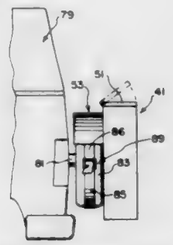
for guiding the movement of said movably mounted part, said guide means having four channels disposed symmetrically relative to the longitudinal axis of the container when the stationary part is mounted on the container, said movably mounted part comprising a lever arm having a longitudinal axis and opposite ends, said lever arm having four catch elements each slidably received in one of said channels, said lever arm further including a projection member for engaging the push button.

5,203,479

STORAGE CARRIER FOR VEHICLE EXTERIOR

Adelmer B. Lucas, 107 Westview Rd., Erie, Colo. 80516

Filed Mar. 2, 1992, Ser. No. 847,607
Int. Cl.[5] B62D *43/00*; **B60R** *5/00*
U.S. Cl. 224—42.13 **23 Claims**



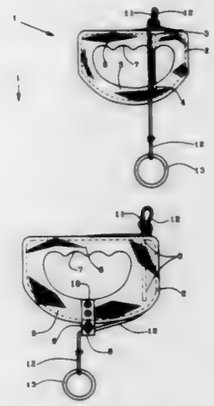
1. Carrier mount for attachment to an exteriorally mounted spare wheel of a vehicle, said spare wheel including a rubber tire and held in upright position adjacent to, and spaced from an exterior wall of said vehicle, said carrier mount including:
a) a saddle cap having a front wall and a rear wall spaced from said front wall, and an intermediate wall adjoining said front and rear wall, said intermediate wall having spaced-apart first and second lower edges and providing a concave interior surface, said cap walls defining a downwardly facing cavity adapted to be received over an upper segment of said wheel, the rear wall of said cap adapted to support a means for holding articles; and
b) adjustable strap means attached to said cap intermediate wall and adapted to extend downwardly from said lower edges, and whereby when said cap is received over said spare wheel said strap means is adapted to adjustably embrace a periphery of said tire.

5,203,480

FISH STRINGER HANDLE

Charles R. Day, 2712 Bronco Trail, Duluth, Ga. 30136, and G. Wayne Perrin, 714 W. 20th, Ada, Okla. 74820

Filed Feb. 4, 1992, Ser. No. 830,700
Int. Cl.[5] A01K *65/00*
U.S. Cl. 224—103 **17 Claims**



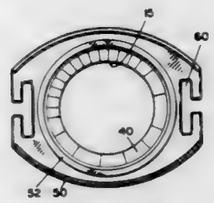
1. A fish-stringer handle having:
a D-shaped handle sized and shaped to be held with a hand at a leg of a D-shape of the D-shaped handle;
a channel around an outside periphery of the D-shape sized to contain a select plurality of windings of fish-stringer string; and
a needle orifice in a bottom of the channel sized and shaped to contain a fish-stringer needle at a select position in the D-shaped handle with a select portion of the fish-stringer needle projecting into and through the channel.

5,203,481

SQUEEZE BOTTLE CADDY

Ronald E. Dobbins, 10241 Jeanrich Ave., Garden Grove, Calif. 92643, and William D. Pulliam, 15710 Rosalita Dr., La Mirada, Calif. 90638

Filed Nov. 19, 1991, Ser. No. 794,041
Int. Cl.[5] A45F *3/14*
U.S. Cl. 224—148 **10 Claims**



1. A collar for a container comprising
a relatively thin planar body having a generally elliptical configuration,
a relatively large aperture through the central portion of said planar body and adapted to receive a neck of a container,
strap retaining apertures formed in said planar body on opposite sides of said aperture,
said strap retaining apertures are disposed at the ends of the longer axis of said planar body,
at least one of said strap retaining apertures formed by a discontinuous portion of said planar body which is adapted to be deformed under prescribed load conditions.

5,203,482

plurality of slats extending generally longitudinally of the

accommodating the frame tube, said jaw being movable relative to said abutment member in said clamp to adjust the size of

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5,203,486

CRANK DRIVE FOR A MATERIAL FEEDER

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5,203,482
SHOULDER STRAP
Rosanne Puff, P.O. Box 2352, Santa Barbara, Calif. 93120
Filed Nov. 18, 1991, Ser. No. 793,785
Int. Cl.[5] A45F *3/14*
U.S. Cl. 224—257 1 Claim

1. A shoulder strap assembly adapted for attachment to an object for carrying a load, said shoulder strap assembly comprising:

first and second end sections of narrow strap material, wherein each of said end sections having a length, a width, a first end and a second end whereby each of said first ends of said end sections includes a fastener assembly adapted for securing said end section to said object, and each end section having an adjustment device positioned intermediate said first and second ends for adjusting the length of said end section; and

an elongated middle section of thin pliable material having a longitudinal axis, an intermediate section and a pair of free ends wherein one of said free ends is secured to said second end of said first end section and the other of said free ends is secured to said second end of said second end section, said middle section having a width such that it is folded along its longitudinal axis to form in cross section an open seamed tube having a plurality of pleats extending along the longitudinal axis, said folded free ends of said middle section being secured to said end sections such that said middle section has a folded width approximately equal to the width of the end sections, said intermediate section having a folded position and an unfolded position such that said end sections and said middle section form a conventional shoulder strap when said intermediate section is in said folded position, said intermediate section can be unfolded to said unfolded position such that said intermediate section expands to the full width of the middle section whereby the intermediate section can be positioned over a shoulder of a user such that said intermediate section is adapted to distribute the load of the object over the entire shoulder of the user, and said middle section being folded such that said free ends can be pulled taut by the user to return the intermediate section from the unfolded position to the folded position.

5,203,483
VEHICLE ARTICLE CARRIER
John S. Cucheran, Lake Orion, Mich., assignor to John A. Bott, Grosse Pointe Farms, Mich.
Continuation of Ser. No. 609,825, Nov. 6, 1990, abandoned. This application Jun. 5, 1992, Ser. No. 895,147
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—321 19 Claims

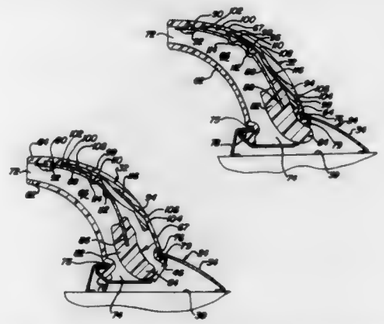
1. An article carrier for a vehicle comprising:

a plurality of slats fixedly secured on a generally horizontally extending exterior automobile body surface, said plurality of slats extending generally longitudinally of the vehicle;

a pair of brackets disposed upon certain of said plurality of slats and a restraining bar extending laterally between and secured adjacent its opposite ends to said pair of brackets;

said certain of said plurality of slats including means defining a channel for permitting sliding movement of at least one of said brackets along the length thereof, and means defining one or more apertures located within said channel;

at least a single one of said pair of brackets including locking means cooperable with said one or more apertures of one



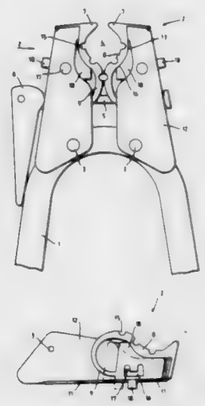
of said certain of said slats and slidably movable between engaged and disengaged positions for detachably securing and allowing longitudinal adjustment of said restraining bar and said pair of brackets at predetermined positions along said certain of said slats; and

at least a single bracket of one of said pair of brackets including a spring member coupled to said locking means;

actuating means movable slidably relative to said bracket member and into contact with said spring member for causing said spring member to controllably move into locking means into said engaged and disengaged positions relative to said one aperture.

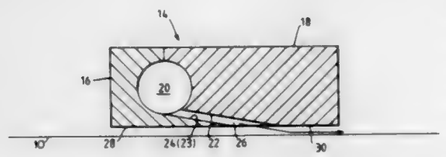
5,203,484
BRACKET FOR TRANSPORTING A CYCLE
Curt Englander, Hillerstorp, Sweden, assignor to Industri AB Thule, Hillerstorp, Sweden
PCT No. PCT/SE89/00400, § 371 Date Mar. 13, 1991, § 102(e) Date Mar. 13, 1991, PCT Pub. No. WO90/02669, PCT Pub. Date Mar. 22, 1990
PCT Filed Jul. 10, 1989, Ser. No. 669,394
Claims priority, application Sweden, Sep. 13, 1988, 8803224
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—324 16 Claims

1. A holder for transportation of a bicycle on a vehicle comprising an anchorage device connected to the vehicle and having two clamps adjustable relative to one another, said clamps having gripping members provided for gripping a frame tube of the bicycle when tightening said clamps, the shape of said gripping members being adaptable to the frame tube, said gripping members comprising one abutment member and one jaw provided on each clamp, said abutment member and said jaw defining a portion of an accommodation space for accommodating the frame tube, said jaw being movable relative to said abutment member in said clamp to adjust the size of



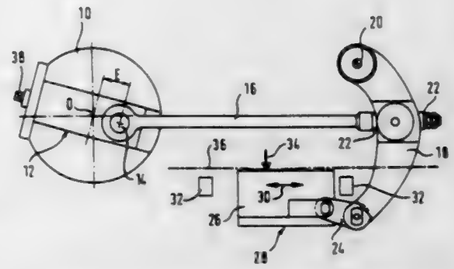
the accommodation space, said jaw having a concave surface facing an opposite one of the clamps.

5,203,485
PNEUMATIC WEB FEEDING
Michael J. Cahill, and Kevin R. Fincham, both of Coventry, England, assignors to Molins PLC
Filed Oct. 10, 1989, Ser. No. 418,526
Claims priority, application United Kingdom, Oct. 11, 1988, 8823815
Int. Cl.[5] B65H *20/14*
U.S. Cl. 226—97 19 Claims



1. An article conveyance device in the form of an air mover for producing a stream of air moving along a guide surface for the purpose of conveying web or other sheet material longitudinally along a path which follows the guide surface, comprising a body having first and second parts, and having means for conveying pressurized air; adjacent first faces of said first and second parts comprising said guide surface, each of said parts having a second face which adjoins said first face, said second faces having complementary portions which are sealingly in engagement with each other, at least one of said second faces having a recess which defines with the other of said second faces a slot, said slot extending from said pressurized air conveying means to said guide surface, so that pressurized air is supplied via said slot to said guide surface for applying pressure to move a web or other sheet material longitudinally along a path which follows said guide surface.

5,203,486
CRANK DRIVE FOR A MATERIAL FEEDER
Otto Bihler, Halblech/Füssen, Fed. Rep. of Germany, and Edsard Brüller, Trimbach, Switzerland, assignors to Otto Bihler Maschinenfabrik GmbH & Co. KG, Halblech/Fussen, Fed. Rep. of Germany
Filed Jun. 28, 1990, Ser. No. 545,917
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921998
Int. Cl.[5] B65H *20/00*
U.S. Cl. 226—142 14 Claims



1. A crank drive mechanism for a material feeding device (26,34) on a material processing machine, said crank drive mechanism comprising a crank rotor (50,10) revolving at a substantially constant speed around a crank rotor axis (10), said crank rotor (50,10) being rotatably mounted in a stationary bearing arrangement (52,54), a main slide element (46) being guided on said crank rotor (50,10) in a direction (X) substantially radial to said crank rotor axis (0) and defined by main slide element guide means (48), a secondary slide element (84) being guided on said main slide element (46) by secondary slide element guide means (82) substantially parallel to said main slide element guide means (48), said secondary slide element (84) carrying a crank pin (14) for common movement therewith, cam track means (58,60) being arranged in a stationary position with respect to said stationary bearing arrangement (52,54) around said crank rotor axis (0), a cam follower carrier unit (64) being guided on said crank rotor (50,10) in a direction (Y) substantially radial with respect to said crank rotor axis (0) and defined by carrier unit guide means (62), said direction (Y) defined by said carrier unit guide means (62) being oblique with respect to said direction (X) defined by said main slide element guide means (48), said cam follower carrier unit (64) being provided with cam follower means (66,68) engaging said cam track means (58,60), a linear motion transmission unit (76,74) being provided between said cam follower carrier unit (64) and said main slide element (46), said cam follower carrier unit (64) being subjected to a to and fro linear motion along said direction (Y) defined by said carrier unit guide means (62) in response to said cam follower means (66,68) following said cam track means (58,60) in circumferential direction, said main slide element (46) being subject to a to and fro linear motion along said direction (X) defined by said main slide element guide means (48), said to and fro linear motion of said main slide element (46) being derived from said to and fro linear motion of said cam follower carrier unit (64) through said linear motion transmission unit (76,74) having a variable transmission ratio, the transmission ratio of said linear motion transmission unit (76,74) being variable by transmission ratio setting means (88,86), said secondary slide element (84) with said crank pin (14) being settable with respect to said main slide element (46) along said secondary slide element guide means (82) by a basic eccentricity setting device (38).

5,203,487
REFLOW SOLDERING METHOD AND SYSTEM

reaction of said molten parent metal with said permeable mass to form at least one boron-containing compound; (iv)

member relative to said main, hollow receptacle-portion, whereby said hand-gripping member may be rotated to a

5,203,492
PACKING CONTAINER

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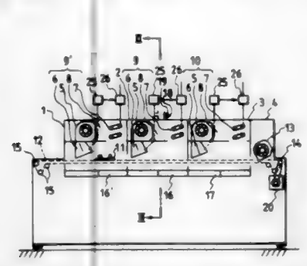
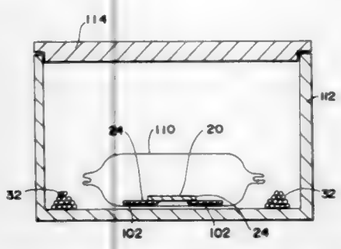
5,203,487
REFLOW SOLDERING METHOD AND SYSTEM THEREFOR
Haruo Mishina, Ushiku; Masato Itagaki, Kashiwa, and Masahumi Wada, Nagareyama, all of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan
Filed Mar. 25, 1992, Ser. No. 857,334
Claims priority, application Japan, Mar. 26, 1991, 3-61453
Int. Cl.[5] B23K *1/00, 1/012*
U.S. Cl. 228—102 8 Claims



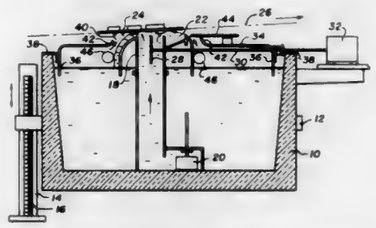
1. A reflow soldering method for successively heating objects to be treated in which electronic parts are placed on a circuit substrate coated with solder while being carried into a preheating chamber and a reflow chamber adjacent thereto to melt said solder so as to solder said electronic parts on said circuit substrate,
wherein a temperature for heating the objects to be treated in said preheating chamber is adjusted at least by introducing a low temperature gas into the preheating chamber in accordance with a heat capacity of the electronic parts on said circuit substrate and to a high temperature hot gas leaking from said reflow chamber into said preheating chamber.

5,203,488
METHOD FOR JOINING CERAMIC COMPOSITE BODIES AND ARTICLES FORMED THEREBY
James C. Wang, and Terry D. Claar, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.
Continuation of Ser. No. 589,634, Sep. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 551,749, Jul. 12, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 803,702
Int. Cl.[5] B22D *19/14*; B23K *31/00*
U.S. Cl. 228—122 17 Claims



1. A method for producing a self-supporting body, comprising:
providing at least one self-supporting body which is made by a process comprising (i) heating a parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal; (ii) contacting said body of molten parent metal with a permeable mass which is to be reactively infiltrated; (iii) maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said permeable mass which is to be reactively infiltrated and to permit reaction of said molten parent metal with said permeable mass to form at least one boron-containing compound; (iv) continuing said infiltration reaction for a time sufficient to produce said at least one first self-supporting body;
providing a brazing material on at least a portion of a surface of said at least one first self-supporting body;
contacting said brazing material with at least a portion of a surface of at least one second self-supporting body;
heating said at least one first self-supporting body, said brazing material and said at least one second self-supporting body to a temperature which permits said brazing material to bond said at least one first self-supporting body and said at least one second self-supporting body together.

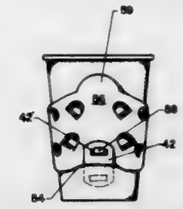
5,203,489
GAS SHROUDED WAVE SOLDERING
John H. Gileta, Chateauguay; Raymond J. Chartrand, Kirkland, and Derek E. Sellen, St. Hubert, all of Canada, assignors to Electrovert Ltd., La Prairie, Canada
Continuation-in-part of Ser. No. 804,904, Dec. 6, 1991, abandoned. This application Mar. 30, 1992, Ser. No. 860,316
Int. Cl.[5] B23K *1/00, 3/08*
U.S. Cl. 228—219 49 Claims



1. An apparatus for wave soldering an element comprising:
a solder reservoir adapted to contain molten solder, and having at least one solder wave nozzle projecting therefrom;
pump means for forming a solder wave from the nozzle;
cover means for covering at least a portion of the reservoir having at least one longitudinal slot for the solder wave to pass therethrough;
supply means for supplying pressurized gas to the underside of the cover means in the form of gas discharge pipes extending on both sides of the solder wave beneath the longitudinal slot in the cover means, the gas permitted to pass upwards through the slot on both sides of the solder wave and provided a gas blanket over the solder wave, and
conveyor means for moving the element in a predetermined path over the cover means ensuring at least a portion of the element passes through the solder wave.

5,203,490
HOT CUP WITH HEAT-INSULATING HAND-GRIP
Mark E. Roe, 3558 SE. Morrison St., Portland, Oreg. 97214
Filed Jun. 25, 1992, Ser. No. 904,264
Int. Cl.[5] B65D *3/00*
U.S. Cl. 229—1.5 B 20 Claims

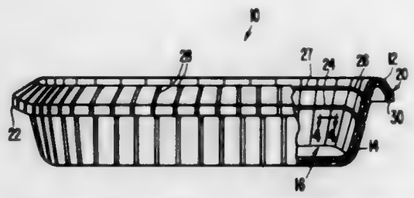
1. In a cup for holding liquid comprising a main, hollow receptacle-portion having an interior surface and an exterior surface, and a handle-section, wherein the improvement comprises:
said handle-section comprising an arcuate, hand-gripping member spanning about a circumferential portion of said main, hollow receptacle-portion, and a mounting means for connecting said hand-gripping member to portions of said main, hollow receptacle-portion;
said mounting means rotatably mounting said hand-gripping member relative to said main, hollow receptacle-portion, whereby said hand-gripping member may be rotated to a position spaced from the exterior surface of said main, hollow receptacle-portion;
said mounting means comprising a plurality of tabs, each said tab having a first section connected to a respective portion of said exterior surface of said main, hollow receptacle-portion, and a second section having a first end connected to said first section, and a second end connected to a respective portion of said hand-gripping member; said second section of each of said plurality of tabs being pivotal with respect to the respective said first section, whereby said hand-gripping member may be rotated relative to said main, hollow receptacle-portion and be spaced therefrom, in order to provide a thermal-insulating, air-space barrier;
each said tab being punched out from a respective portion of said hand-gripping member, said hand-gripping member having a plurality of cut-outs formed when said tabs were punched out.



5,203,492
PACKING CONTAINER
Walter Scheilenberg, Diepoldsau, Switzerland, assignor to Rundpack AG, Diepoldsau, Switzerland
Filed Sep. 12, 1991, Ser. No. 758,765
Claims priority, application Switzerland, Sep. 12, 1990, 02954/90
Int. Cl.[5] B65D *3/28*
U.S. Cl. 229—4.5 22 Claims

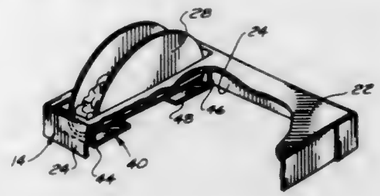
1. A packing container with a container body, which is closed at one end (4) by a bottom diaphragm (3) and at its other end (6) by a lid diaphragm (5), the container body (2) having an inner coating (9) of a material which is of a different type from that of an outer coating (14) and is of the same type as the material of the bottom diaphragm (3) and said inner coating (9) extending helically with overlapping edges (16,17; 16',17'; 16'',17'') on the container body (2), the bottom diaphragm (3) having a rim which is connected to a strip of the inner coating (9) and the overlapping edges of said strip are superimposed in a contact-free manner at least in an outer marginal area (21,21',21''), the bottom diaphragm (3) carrying a grip, so that upon tearing out the bottom diaphragm (3) the strip of the inner coating is detached from the outer coating for separate waste disposal.

5,203,491
BAKE-IN PRESS-FORMED CONTAINER
Ronald P. Marx, Appleton, Wis., and Richard R. Hartman, Kalamazoo, Mich., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Oct. 17, 1991, Ser. No. 778,366
Int. Cl.[5] B65D *1/34*
U.S. Cl. 229—2.5 R 23 Claims



1. A container useful for baking a food product contained therein at elevated temperatures which includes a bottom wall and an upturned side wall extending peripherally about the bottom wall to substantially cradle the food product on an inside surface, said container comprising an ovenable paperboard base layer and an inner layer of food compatible parchment paper forming the inside surface of said container wherein said container is capable of being heated while cradling the food product without causing substantial deterioration of said container.

5,203,493
CONVERTIBLE TACO PACKAGE AND HOLDER
Donald C. Moody, 2138 E. Pierce, Phoenix, Ariz. 85006
Filed Apr. 6, 1992, Ser. No. 863,769
Int. Cl.[5] B65D *5/06*
U.S. Cl. 229—103 7 Claims



1. A convertible taco package comprising:
a first portion;
a second portion receivable within said first portion having;
a planar member,
parallel perforations in a said planar member defining at least one strip,
a medial perforation extending across a medial portion of said at least one strip perpendicular to said parallel perforations and dividing said at least one strip into two tabs,
a slot extending through said planar member, corresponding to said at least one strip when said strip is disen-

gaged from said planar member at said parallel perforations and said medial perforations.

5,203,495
SALES AND DISPENSER BOX FOR PASTILS AND THE

viding a fluid flow path between said flow control valve means and said outlet;

the thermostat and for requesting display of thermostat data;

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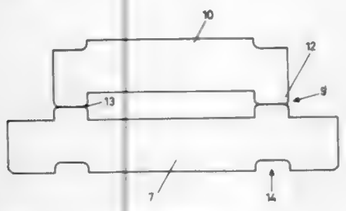
gaged from said planar member at said parallel perforations and said medial perforations.

5,203,494
STACKABLE PACKAGE

Gregory T. Blomfield, Auckland, New Zealand, assignor to PrintPac-Ueb Limited, Penrose, New Zealand

Filed Feb. 20, 1992, Ser. No. 838,096
Claims priority, application New Zealand, Feb. 20, 1991, 237169
Int. Cl.[5] B65D *5/04*
U.S. Cl. 229—148 **14 Claims**

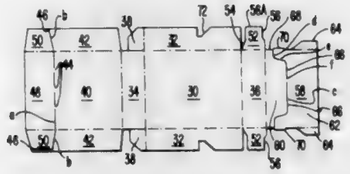


1. A stackable container comprising:
a carton formed from a single blank of a sheet material having,
a substantially rectangular base,
first and second end walls extending upwardly from said base,
two side walls extending upwardly from said base, and
two top flaps, each top flap being hinged from the top of one of said side walls to substantially close the carton in a closed position and each top flap being selectively engageable against the outer face of the respective side wall in an open position;
a first end wall reinforcing element engaging against said first end wall;
a second end wall reinforcing element engaging against said second end wall;
each end wall reinforcing element comprising a paper board of at least one corrugated ply having flutes and having at least a pair of outer plies and being formed from a blank having a first elongate region, a second elongate region shorter in length than said first elongate region so that each reinforcing element has end portions of one ply for minimizing the thickness of said end portions and maximizing the space within said container, at least two bridging regions connecting said elongate regions, and a cut out portion between said bridging regions, said blank being folded transversely through said bridging regions along fold lines substantially parallel to the elongate axis of said elongate regions to define at least two projections extending above said end walls, the flutes of the corrugations of said at least one corrugated ply extending substantially perpendicular to said base;
openings in said base adjacent each end wall reinforcing element and aligned with said at least two projections so that each opening indexes over a projection of an end wall reinforcing element of an adjacent carton in a stack of like stackable cartons; and
at least one aperture in each top flap corresponding to each of said at least two projections for receiving a respective one of said at least two projections upon closing of each top flap over each end wall reinforcing element;
so that said containers are stackable with said at least two projections of each end wall reinforcing element of one container engageable in said openings in said base of an adjacent container, and engageable in said at least one aperture in said top flaps in said open and closed positions, and said top flaps strengthen the stack against racking when said containers are closed.

5,203,495
SALES AND DISPENSER BOX FOR PASTILS AND THE LIKE

Frode Jörgensen-Beck, and Heinrich W. Lambach, both of Horsens, Denmark, assignors to Schur Engineering A/S, Horsens, Denmark

PCT No. PCT/DK90/00128, § 371 Date Jan. 22, 1992, § 102(e) Date Jan. 22, 1992, PCT Pub. No. WO90/14278, PCT Pub. Date Nov. 29, 1990
PCT Filed May 22, 1990, Ser. No. 768,987
Claims priority, application Denmark, May 22, 1989, 2476/89
Int. Cl.[5] B65D *5/66*
U.S. Cl. 229—225 **3 Claims**



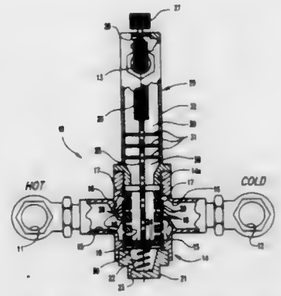
1. A dispenser box of a hinged lid type including:
box panel portions to form said dispenser box;
a hood shaped lid hinged to a rear edge of a box mouth of said dispenser box, said hood shaped lid having a lid panel and skirt portions covering a portion of the box panel portions adjacent to the box mouth at a front side of said dispenser box and at lateral sides of said dispenser box, the skirt portions having exterior layers detachably connected to said dispenser box by a perforation line with additional exterior portions of the front side and the lateral sides of the dispenser box; and
interior neck plate portions projecting beyond the perforation line to be covered by the skirt portions of the hood shaped lid; and wherein
an interior neck plate portion of said interior neck plate portions at the front side is formed from a prolongation of an interior layer of a front skirt portion of the skirt portions, the interior layer being formed from a prolongation of the lid panel and having a free edge spaced between the perforation line and a bottom line of a box front panel of the box panel portion for sealing said dispenser box by holding said hood shaped lid between a free end portion of the interior layer and an interior of an exterior front panel portion of the additional exterior portions, said interior layer having a transverse perforation line formed spaced from the perforation line and spaced from the lid panel of the closed hood shaped lid, an exterior front skirt layer of said exterior layers not being sealed to the portion of said interior layer between the two perforation lines.

5,203,496
THERMOSTATIC CONTROL VALVE WITH FLUID MIXING

Kevin B. Kline, Indianapolis, Ind., assignor to Lawler Manufacturing Co., Inc., Indianapolis, Ind.

Filed Mar. 4, 1991, Ser. No. 664,356
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.2 **10 Claims**

1. A thermostatic control valve assembly for mixing a hot fluid and a cold fluid for discharge at a controlled temperature, the valve assembly comprising:
a cold fluid inlet;
a hot fluid inlet;
flow control valve means for controllably mixing hot and cold fluid received through said hot fluid inlet and said cold fluid inlet, respectively;
a housing defining a fluid outlet and a mixing chamber providing a fluid flow path between said flow control valve means and said outlet;
means for turning the fluid flow through the mixing chamber including a plurality of baffles sequentially arranged in said flow path and integrally formed in said housing;
each of said plurality of baffles being a disc having an elongated opening therethrough and including a first baffle, a second baffle and a third baffle;
said elongated opening of each of said first, second, and thrid baffles defining a major axis of symmetry; and

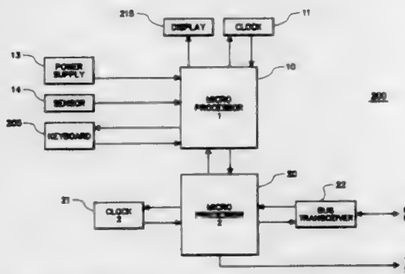


said major axis of said first baffle and said major axis of said third baffle being angularly displaced from said major axis of said second baffle; and
a thermostat disposed within said mixing chamber between said means for turning the fluid flow and said fluid outlet and operably connected to said flow control valve means to control said flow control valve means in response to the temperature of fluid flowing through said mixing chamber.

5,203,497
COMMUNICATING THERMOSTAT

James W. Ratz, Bloomington, and Robert J. Schnell, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1991, Ser. No. 811,765
Int. Cl.[5] G05D *23/00*
U.S. Cl. 236—46 R **5 Claims**

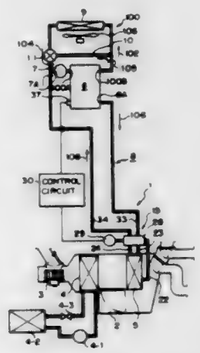


1. A thermostat for control of an HVAC system, comprising:
a temperature sensor for producing a temperature signal indicative of a local temperature;
data entry means for entering time and temperature data into the thermostat;
a clock, for producing a real time signal indicative of real time;
data entry means for entering time and temperature data into the thermostat and for requesting display of thermostat data;
a display means, connected to said data entry means, said temperature sensor and said clock, for displaying said time and temperature data, said real time and said local temperature, said data entry means being capable of modifying said display means;
a first microprocessor connected to said temperature sensor, said data entry means, said clock, and said display means, said first microprocessor receiving data, said temperature signal and said real time signal and controlling said display means;
a second microprocessor connected to said first microprocessor, said second microprocessor controlling the operation of the HVAC system in accordance with prestored instructions and user entered time and temperature data entered through said data entry means, said first microprocessor sending to said second microprocessor said temperature signal and said time and temperature data, said second microprocessor sending to said first microprocessor a HVAC system status, said thermostat being divided into a thermostat housing in a subbase, said thermostat carrying said data entry means, said temperature sensor, and said display means.

5,203,498
HOT WATER TYPE HEAT EXCHANGE DEVICE

Yoshiharu Kajikawa, Hekinan, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 22, 1992, Ser. No. 917,188
Claims priority, application Japan, Aug. 7, 1991, 3-197830
Int. Cl.[5] G05D *23/00*
U.S. Cl. 237—2 A **8 Claims**



1. A hot water type heat exchange device connected to an internal combustion engine having a cooling water recirculating system provided with a water pump for a recirculation of a cooling water, comprising:
a first tank;
a second tank;
a plurality of tubes for allowing a passage of hot water therethrough, each having first and second ends; said first ends of the tubes being connected to the first tank, and the second ends of the tubes being connected to the second tank;
flow direction control means for switching between a first cooling water flow circuit wherein the cooling water from the recirculating system is introduced into the first tank and then into the second tank via a group of the tubes, then reintroduced into the first tank via a different group of tubes, and finally returned to flow circuit wherein the cooling water from the recirculating system is introduced into the first tank, then into the second tank via

all of the tubes, and then returned to said recirculating

and connectd at siad upper fitting thereo, said return tue

chair and rail fixing means for fixing said metal chair (2) to said metal base (1) and for fixing said rail to said metal

opening, and a flow-reducer path between said two chambers;

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all of the tubes, and then returned to said recirculating system;

means for detecting information related to an amount of engine cooling water flowing from the water pump, and;

means, responsive to the obtained information related to the amount of the engine cooling water, for executing a switching by said flow direction control means between the first cooling water flow circuit and the second cooling water flow circuit.

5,203,499

PROCESS AND APPARATUS FOR CONTROLLING AN INTERIOR SPACE TEMPERATURE OF A MOTOR VEHICLE

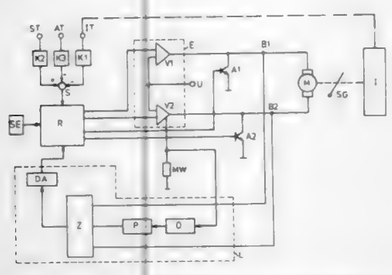
Otto Knittel, Soest, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 602,141

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935593

Int. Cl.[5] G05D *23/00*

U.S. Cl. 237—2 A **13 Claims**



1. In a process for controlling interior-space temperature of a motor vehicle of a type in which a nominal temperature is preset and an interior space temperature is measured from which a difference value is formed and fed to a controller from which a regulation value is formed and fed to an output stage for cyclically and directionally driving a dc motor which adjusts the position of an adjustable member to influence an amount of heat fed to an interior space of the motor vehicle, with a position-signal of the adjustable member being measured and fed into a control loop, the improvement wherein:

the position signal is formed by measurement and analysis of partial movements of the dc motor through predetermined angles for activation and further rotation of the dc motor;

wherein said measurement and analysis of partial movements is accomplished by measurement and analysis of a motor current for each activation and each further rotation of the dc motor.

5,203,500

APPARATUS AND METHOD FOR CONVERTING AN ELECTRIC WATER HEATER TO USE GAS

Frank L. Horne, Sr., Charlotte, N.C., assignor to Gas-Fired Products, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 409,143, Sep. 19, 1989, Pat. No. 5,020,721. This application May 31, 1991, Ser. No. 708,750

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] F24D *3/08*

U.S. Cl. 237—19 **45 Claims**

20. An apparatus for providing a hot water supply for a building, said apparatus comprsing:

a generally cylindrical hot water storage tank positioned within the building, said tank having an upper fitting of the type typically used for receiving an electrical heating element therein;

a return tube posiionted within siad hot water storage tank and connectd at siad upper fitting thereo, said return tue being substantially L-shaped to direct water flowing into said tank to mix with the relatively hot water in the upper regions of siad hot water stoage tank;

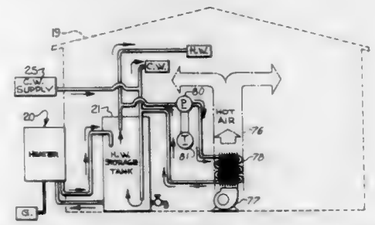
a thermostat positioned in siad hot water storage tank;

a housing mounted outside of teh building;

a gas-fueled burner positioned within siad housing and including means for controlling gas flow thereto;

a heat exchanger positioned within siad ousing and including means for controlling gas flow thereto;

a heat exchanger positioned adjacent siad burner and positoiend within siad ousng, siad heat exchanger having an inlet in fluid communication with loer regions of siad hot



water storage tank so as to permit drawing off of rleatively cool water therefrom, said heat exchanger having an outlet in fulid communication with the upper regions of siad tank through siad return tube;

a pump in fluid communication with siad heat exchagner for circulating water from said hot water storage tank through siad heat exchanger and back into said storage tank; and

heater control mnas opratively connected to said thermostat, said pump and siad gas flow control means for actvating siad pump and said burner so that water flows through and is heated in siad heat exchanger when the temperature of the water in siad hot water storage tank falls below a predetermined temperature.

5,203,501

DEVICE FOR FIXING A RAIL ONTO A SLAB OF CONCRETE

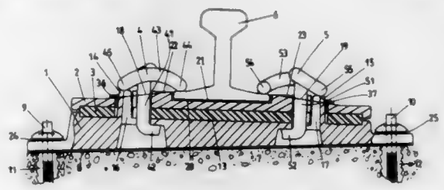
Gerard Vanotti, St-Paul De Varax, France, assignor to Etablissements Vape, Saint-Martin-Du-Fresne, France

Filed Jan. 21, 1992, Ser. No. 823,675

Claims priority, application France, Feb. 4, 1991, 01220.

Int. Cl.[5] E01B *9/38, 9/68, 19/00*

U.S. Cl. 238—265 **3 Claims**



1. A device for fixing a rail having a rail flange onto a slab of concrete (7) without ballast, said device comprising;

a metal base (1) resting on said slab of concrete and having pillars (14, 15) integral with said metal base;

a resilient sole (3) resting on said metal base (1);

a metal chair (2) presenting a facing arranged and constructed to receive said rail (6) and resting on said resilient sole (3), with said pillars (14, 15) passing through said resilient sole (3) and said metal chair (2);

base fixing means (9, 10) for fixing said metal base (1) to said concrete slab (7);

chair and rail fixing means for fixing said metal chair (2) to said metal base (1) and for fixing said rail to said metal chair (2), said chair and rail fixing means including clamps (4, 5);

each said clamp having a rod with a vertical rectilinear part, a heel attached to said rectilinear part and engaging said metal base (1) and an undulating curved part attached to the vertical rectilinear part, said curved part forming a spring with spring end, said spring end being arranged to grip said rail flange;

said undulating curved part having an intermediate bearing point (45, 55) substantially opposite to said spring end and bearing on one of said pillars.

5,203,502

RIBBED ELASTOMERIC RAIL PAD

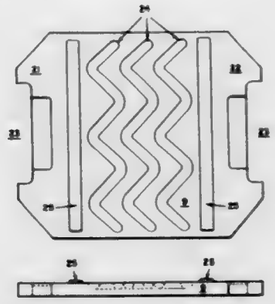
Hartley F. Young, Melton, Australia, assignor to McKay Australia Limited, Maidstone, Australia

Continuation of Ser. No. 534,937, Jun. 8, 1990, abandoned. This application May 29, 1992, Ser. No. 891,687

Claims priority, application Australia, Jun. 9, 1989, PJ4636

Int. Cl.[5] E01B *9/68*

U.S. Cl. 238—283 **11 Claims**



1. In a rail seat of the kind in which a rail having a flange, a field edge and a gauge edge is fastened to a rail tie by a pair of rail clamps which bear down on the flange of said rail and on rail clamp supports secured to said rail tie on either side of said rail such that a portion of said rail clamps eat in said rail clamp support, and wherein a wear resistant rail pad lies between the rail tie and the rail and said pad abuts said rail to electrically and dynamically insulate said rail tie from said rail, the improvement comprising said water resistant rail pad incorporating a rib extending longitudinally of said rail, said rib comprising a long raised structure upstanding from said rail pad surface and having a width relatively narrow in relation to the length thereof and said rib being provided on a surface of the field edge portion of the rail pad to reduce intensity of pressure on the pad under the region of the field edge of the rail to reduce the tendency of the rail to cut into the rail pad.

5,203,503

DRIP IRRIGATION LINES

Amir Cohen, Yuvalim, Israel, assignor to Agroteam Consultants Ltd., Migdal Ha'emek, Israel

Filed Jan. 29, 1991, Ser. No. 647,099

Claims priority, application Israel, Feb. 2, 1990, 93255

Int. Cl.[5] B05B *15/00*

U.S. Cl. 239—1 **17 Claims**

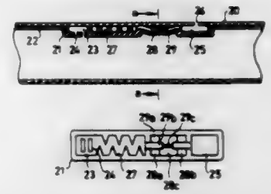
1. A drip irrigation line, comprising:

a continuous tube having a plurality of flow-reducer elements spaced longitudinally of the tube;

each of said flow-reducer elements comprising a strip formed with an inlet chamber of a predetermined depth at one end having an inlet opening, an outlet chamber of said predetermined depth at the opposite end having an outlet opening, and a flow-reducer path between said two chambers;

said strip of each flow-reducer element being further formed with a connecting passageway, of a depth less than said predetermined depth, between, and axially spaced from, said flow-reducer path and said outlet chamber;

said connecting passageway including a wide groove of a depth from the inner face of the tube less than that of said predetermined depth, and a narrow groove, of a depth



from the inner face of the tube greater than that of said wide groove but less than that of said predetermined depth, extending through a part of said wide groove;

at least the portion of the strip forming said connecting passageway being of elastomeric material.

17. The method of making a flow-reducer element by injection-moulding, characterized in that a plurality of different materials are injection-moulded during separate shots in a single mould, at least one of which materials is an elastomeric material to effect regulation of the dripper during its operation.

5,203,504

PREPARING MIXED LIQUIDS

Andrew R. Frost, Stevington, and John A. Marchant, Bedford, both of England, assignors to British Technology Group Limited, London, England

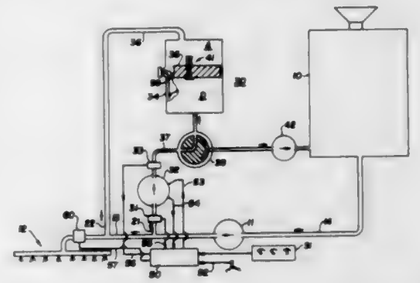
PCT No. PCT/GB89/00287, § 371 Date Sep. 13, 1990, § 102(e) Date Sep. 13, 1990, PCT Pub. No. WO89/08390, PCT Pub. Date Sep. 21, 1989

Continuation of Ser. No. 573,149, Sep. 13, 1990, abandoned. This PCT application Mar. 17, 1989, Ser. No. 801,594

Claims priority, application United Kingdom, Mar. 17, 1988, 8806352

Int. Cl.[5] A01M *7/00;* **A01C** *23/04;* **B05B** *7/32*

U.S. Cl. 239—10 **20 Claims**



1. A method of preparing a mixture of a carrier liquid and an active liquid in required proportion including:

providing a flow of carrier liquid,

providing a forced liquid flow of a proportion of said carrier liquid flow,

providing a control member in a flow path of said proportional liquid flow,

making pressure difference measurements of the forced proportional liquid flow at an inlet and outlet of said

control member, an inlet pressure of said control member

annular discs being located at the larger-diameter end of

extend axially symmetrically within said mozzle and said

vortex flow in said flow passageway downstream of

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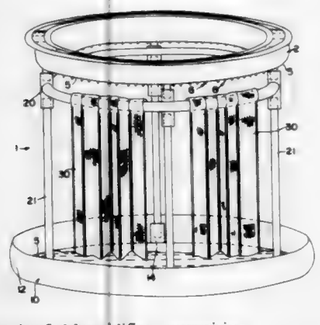
control member, an inlet pressure of said control member being independent of an outlet pressure thereof,
controlling said proportional liquid flow to a selected required proportional of said carrier liquid flow from said pressure difference measurements,
displacing active liquid with said proportional liquid flow without liquid contact,
conveying said displaced active liquid freely to said carrier liquid flow,
including said displaced active liquid in said carrier liquid flow,
thereby producing a liquid mixture in said required proportion without a flow meter for said carrier or said active liquid.

5,203,505

GRAVITY FED HUMIDIFIER

Pil M. Yum, 4701 Americana Dr., #302, Annandale, Va. 22003

Filed May 19, 1992, Ser. No. 885,539
Int. Cl.[5] B01F *3/04*
U.S. Cl. 239—43 **4 Claims**



1. A gravity fed humidifier, comprising:
a reservoir for containing a liquid to be evaporated, the reservoir having a plurality of openings extending through a bottom wall of the reservoir through which the liquid passes, the reservoir having an annular configuration with two side walls extending upwardly from the bottom wall;
at least one support leg for supporting the reservoir;
an absorbent material for absorbing the liquid passing from the reservoir; and
a circular support member, attached to the support leg, for supporting the absorbent material beneath the openings in the bottom of the reservoir.

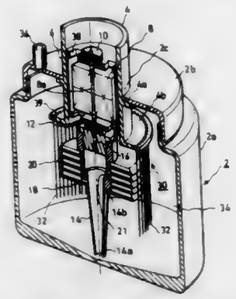
5,203,506

LIQUID PUMP AND NEBULIZER CONSTRUCTED THEREWITH

Joseph Gross, Moshav Mazor, and Shlomo Zucker, Mihmoret, both of Israel, assignors to Product Development (Z.G.S.) Ltd., Petah Jikja, Israel

Filed Dec. 16, 1991, Ser. No. 808,345
Int. Cl.[5] B05B *3/02*
U.S. Cl. 239—224 **14 Claims**

1. A liquid pumping device, comprising:
a receptacle for receiving a quantity of a liquid to be pumped;
a hollow conical tube having a small-diameter end located to be immersed in the liquid to be pumped, and a larger-diameter end located above the liquid to be pumped, said larger-diameter end being formed with a plurality of radially-extending passages through which the liquid is pumped by centrifugal force when the hollow conical tube is rotated;
a plurality of annular discs secured to the outer surface of said hollow conical tube to rotate therewith, each of said annular discs being located at the larger-diameter end of the hollow conical tube under one of said passages so as to receive the liquid flowing therethrough and to eject it outwardly in atomized form by centrifugal force;
each of said annular discs being formed with an annular rib around the outer periphery of its upper surface;
each of said annular ribs being formed with a sharpened



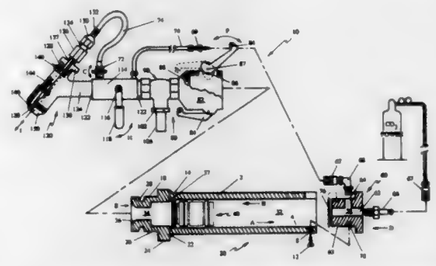
outer edge having a cross-sectional area decreasing toward the under face of the overlying disc and closely spaced thereto to define a very small annular passage between the rib of one disc and the overlying disc;
and a drive for rotating said hollow conical tube about its longitudinal axis to pump by centrifugal force liquid therethrough from its small-diameter end to its larger-diameter end.

5,203,507

AIR POWERED SPRAYER FOR DISPENSING MATERIAL SLURRIES

Richard H. Matthews, 254 Arlington Cir., Woodland, Calif. 95695

Filed Dec. 11, 1990, Ser. No. 625,466
Int. Cl.[5] B05B *7/06*
U.S. Cl. 239—373 **9 Claims**



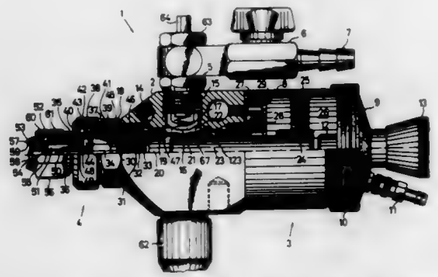
6. A sprayer for dispensing slurries, comprising, in combination:
a nozzle,
a source of air,
a canister operatively interposed between said nozzle and said air source whereby said air source indirectly acts on said slurry through said canister,
means for admitting the slurry into said canister to charge said canister,
a valve means interposed between said canister and said nozzle to regulate the through passage of the slurry therebeyond,
and direct means at said nozzle whereby said source of air directly affects the slurry at said nozzle,
wherein said direct means includes an air tube oriented to extend axially symmetrically within said mozzle and said slurry is adapted to circumscribe said air tube, whereupon broadcasting of the slurry can be modified by adjusting the relationship of said air tube with respect to said nozzle.

5,203,508

DOSING GUN, IN PARTICULAR HIGH-PRESSURE DOSING GUN

Walter Westenberger, Bischof-Ketteler-Strasse 11, D-6052 Mühlheim, Fed. Rep. of Germany

PCT No. PCT/EP89/00286, § 371 Date Sep. 12, 1990, § 102(e) Date Sep. 12, 1990, PCT Pub. No. WO89/08505, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 17, 1989, Ser. No. 572,964
Int. Cl.[5] B05B *1/28, 1/30*
U.S. Cl. 239—290 **31 Claims**



1. In a dosing gun for spraying a medium such as polishing paste comprising a housing, a cartridge element held in said housing, a valve body, a valve seat, a spring element, means defining a first working chamber between said valve seat and said valve body, said valve body and said valve seat being movable relative to one another against the force of said spring element if an adequate pressure is generated by said medium in said first working chamber between said valve seat and said valve body, and a nozzle;
the improvement comprising a first casing, said valve body being mounted detachably on said first casing, said first casing extending from one of said cartridge element and said housing, means defining a hollow cylinder movable relative to said first casing, said valve seat being formed in the frontal part of said hollow cylinder, and a second casing operatively connected to said means defining a hollow cylinder and movable against said spring element.

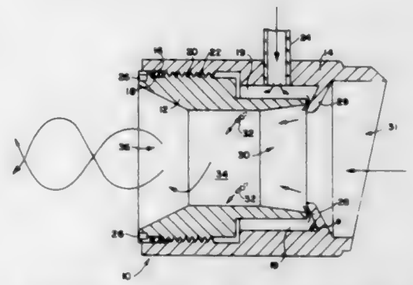
5,203,509

VORTEX NOZZLE FOR SEGMENTING AND TRANSPORTING METAL CHIPS FROM TURNING OPERATIONS

Lothar F. Bieg, Louisville, Colo., assignor to The United State of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 3, 1992, Ser. No. 862,885
Int. Cl.[5] B02C *23/26, 19/06;* **B05B** *1/34*
U.S. Cl. 239—405 **4 Claims**

1. A compressed gas driven vortex nozzle comprising:
(a) an annular inner assembly defining:
i. a continuous flow passageway having a converging inlet portion with an inlet end, a uniform throat portion and a diverging exhaust portion in continuous fluid communication; and
ii. a plurality of vortex holes for discharging compressed gas into said uniform throat portion of said flow passageway, said vortex holes being angled to impart a spiral flow path to said compressed gas discharged therefrom whereby said gas has both circumferential and downstream flow components so as to produce vortex flow in said flow passageway downstream of said vortex holes;
(b) an annular outer assembly concentrically surrounding said inner assembly, said inner and outer assemblies defining:
i. an annular chamber for receiving compressed gas, said annular chamber being in fluid communication with said vortex holes for providing compressed gas to be discharged through said holes, and



ii. an annular discharge passageway surrounding the inlet end of said converging inlet portion of said flow passageway, said annular discharge passageway being in fluid communication with said annular chamber and positioned to discharge compressed gas into said inlet portion wherein said compressed gas has both radial and downstream flow components so as to induce flow of ambient air into said inlet portion.

5,203,510

DUAL ROTARY IMPELLER BROADCAST SPREADERS

Steve P. Courtney, Westerville, and James D. Amerine, Marysville, both of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Continuation-in-part of Ser. No. 635,214, Dec. 28, 1990, abandoned. This application May 14, 1992, Ser. No. 884,053
Int. Cl.[5] A01C *17/00*
U.S. Cl. 239—667 **27 Claims**

1. A spreader for broadcasting particulate materials in a controlled distribution pattern onto a selected target area comprising:
a housing;
means for driving said housing in a forwardly advancing direction;
first and second impellers mounted on said housing in adjacent alignment for rotary motion about their respective central axes, said impellers rotating in rotational correspondence toward one another as said housing is driven in said forwardly advancing direction;
said housing having means for storing said particulate materials and for depositing said materials onto at least one

material drop position located on a top surface of each of

5,203,512

projections therebetween and the pockets being of a size two comminuting member rings rotatable relative to each

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material drop position located on a top surface of each of said impellers along a circular path lying a radial distance of between about 1 to about 2 inches from said central axis of each of said impellers;

said impellers being structured and positioned in a manner such that said rotation thereof in said rotational correspondence as said housing is driven in said forwardly advancing direction causes said particulate materials deposited thereon to be broadcast therefrom in a controlled distribution pattern generally in the direction of spreader advancement as said spreader is driven in a forwardly advancing direction and in a manner such that an additive spreading effect is achieved from the two rotating impellers providing an even coverage of said target area.

5,203,511

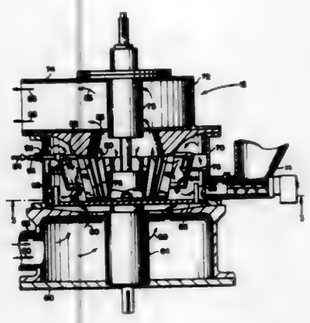
METHOD FOR FINE GRINDING

Andrew P. Ondush, Catasauqua; Richard D. Ritter, Bath, and Arthur H. Andersos, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 297,222, Jan. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 125,638, Nov. 25, 1987, abandoned. This application Mar. 8, 1990, Ser. No. 490,175

Int. Cl.[5] B02C *23/06, 23/24*

U.S. Cl. 241—5 **5 Claims**



1. A method for utilizing a fluid classification impact grinding mill, of the type containing a generally flat disc having a plurality of equally spaced hammers or comminuting devices disposed equally around the peripheral edge of said disc, for fine grinding plastic and elastomeric materials normally difficult to grind at ambient temperature comprising the steps of:

pre-cooling the material to be ground to a temperature below its embrittlement temperature;

injecting said pre-cooled material into said mill while simultaneously injecting a liquid cryogen into said mill said liquid cryogen injected through a plurality of inlets disposed in a circular pattern and placed inside said hammers whereby said cryogen is distributed uniformly throughout inner parts of said mill and wherein said liquid cryogen vaporizes;

using said vaporized cryogen to classify material inside and convey material through said mill;

recovering material ground by said mill and cryogen vaporized in said mill;

separating said vaporized cryogen from said ground material and recycling said vaporized cryogen to said mill as a classifying medium.

5,203,512

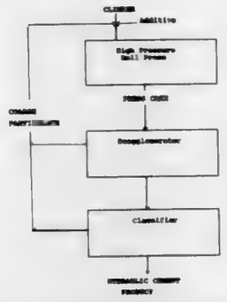
PROCESSING ADDITIVE FOR HIGH-PRESSURE ROLL PRESS PROCESS OF FORMING FINISH GRIND CEMENT

Chiara F. Ferraris, Columbia; Ellis M. Gartner, Silver Spring, and David F. Myers, Columbia, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Feb. 7, 1992, Ser. No. 832,512

Int. Cl.[5] C04B *7/14*; B02C *23/00*

U.S. Cl. 241—16 **8 Claims**



1. In a process for forming hydraulic cement powder product from clinker raw material by subjecting clinker raw material to a high pressure roll press, pulverizing the clinker raw material within the roll press to form a press cake, disintegrating the press cake and removing the coarse particulate, the improvement comprising applying to the clinker raw material an aqueous solution having from 5 to 95 weight percent of an organic hydroxyl or methoxy containing additive therein selected from phenol, propylene glycol, lignin or mixtures thereof at a rate of from about 25 to 2500 gram of additive per metric ton of clinker raw material.

5,203,513

WEAR-RESISTANT SURFACE ARMORING FOR THE ROLLERS OF ROLLER MACHINES, PARTICULARLY HIGH-PRESSURE ROLLER PRESSES

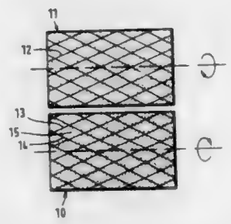
Guenter Keller, Bergisch Gladbach; Jakob Ansen, and Albrecht Wolter, both of Cologne, all, Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 20, 1991, Ser. No. 657,992

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005553; Nov. 13, 1990, 4036040

Int. Cl.[5] B02C *4/30*

U.S. Cl. 241—30 **21 Claims**



1. A high pressure roller press capable of product bed comminution of pulverulent material comprising in combination:

a cylindrical press roller for mounting in opposition to a coacting roller for forming a high pressure product bed comminution nip therebetween;

and pockets on the outer surface of the press roller with rigid projections therebetween and the pockets being of a size to be filled with pulverulent materials being compressed into the pockets;

said pockets capable of retaining the pulverulent material in the pockets for full rotation of the roller so that the compressed pulverulent material in the pockets coacting with the projections comprise means for performing interparticle crushing in the nip, the width of the pockets between projections being less than 40 mm and the depth of the pockets being in excess of 5 mm.

5,203,514

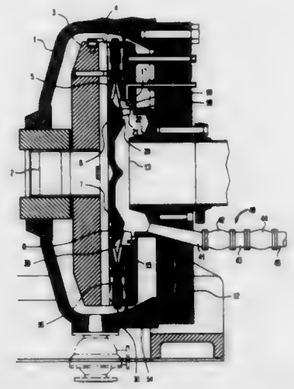
REFINER WITH MEANS TO PROTECT THE REFINING DISCS FROM PREMATURE WEAR

Anders Mokvist, Snellville, Ga., and Thor Johansen, Minneapolis, Minn., assignors to Sunds Defibrator Industries Aktiebolag, Sweden

Continuation of Ser. No. 759,477, Sep. 13, 1991, abandoned. This application Sep. 9, 1992, Ser. No. 942,371

Int. Cl.[5] B02C *7/12*

U.S. Cl. 241—81 **21 Claims**



1. A fiber refiner comprising a first and a second opposed refining disc, said first and said second opposed refining discs being separated from one another and, at the periphery thereof, defining a refining zone having an entranceway and an exit, at least one of said first and second refining discs having an inlet and at least one of said first and second refining discs being rotatable about its axis to thereby cause material to move outwardly from said inlet to said entranceway of said refining zone and, interposed between said inlet and said entranceway, and into a means for receiving material deflected in a direction away from said entranceway by said guard means such that said deflected material is removed from the flow of the remaining material outwardly from said inlet to said entranceway of said refining zone so as to prevent said deflected material from entering said refining zone.

5,203,515

APPARATUS FOR THE CONTINUOUS KINEMATIC HIGH FREQUENCY TREATMENT OF A SUBSTANCE AND METHOD FOR THE MANUFACTURE OF SAID DEVICE

Wolfram Stoerzbach, Luzern, Switzerland, assignor to Kinematica AG, Littau, Switzerland

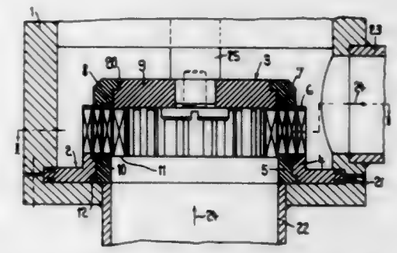
Filed Dec. 28, 1990, Ser. No. 635,223

Claims priority, application European Pat. Off., Jan. 5, 1990, 90810012.6

Int. Cl.[5] B02C *19/00*

U.S. Cl. 241—89.3 **15 Claims**

1. An apparatus for the continuous kinematic high frequency treatment of a substance having cylindrically arranged at least two comminuting member rings rotatable relative to each other which enclose each other and are fitted on holders, wherein at least one of said comminuting member rings of each



holder is provided with slots which are closed at both ends of said rings, and wherein said slots of at least one of said communicating member rings have a width of less than 1 mm.

5,203,516

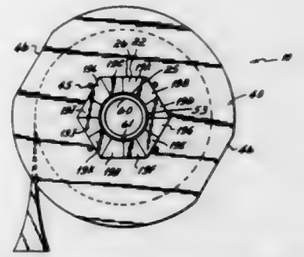
HEAVY DUTY SPOOL

Charles D. Donaldson, Loveland, Ohio, assignor to Dymest Limited, Canada

Filed Jul. 16, 1991, Ser. No. 730,436

Int. Cl.[5] B65H *75/14, 75/18*

U.S. Cl. 242—71.8 **15 Claims**



1. A heavy duty spool suitable for receiving a product, such as at least about 375 lbs. of product or at least about 2,800 unfilled plastic or paper bags sized to hold disposable diapers, said spool comprises:

a pair of flange plates having respective inner and outer surfaces, said flange plates being connected to one another in a mutually parallel spaced relationship by a hollow outer core bridging said inner surfaces of said plates along an axis perpendicular to each of said plates, each said flange plate having a central opening and a plurality of alternating long and short anchoring slots intersecting said central opening and extending radially outwardly therefrom;

said hollow outer core including a plurality of interlocks, each said interlock comprising three panels including a center panel and a pair of end panels, each said end panel being hinged to said center panel about a side fold line orientated parallel to said axis and including a locking arm extending from each end of each said end panel, each said locking arm being hinged to one said end of each said end panel about a first fold line orientated transverse to said axis, each said locking arm including a second fold line orientated transverse to said axis to form an L-shape, each said L-shaped locking arm including an integral flap lying between said first and second fold lines and a holding tab hinged to said integral flap along said second fold line;

each said long anchoring slot having two said locking arms of different ones of said interlocks inserted therethrough

said belt drive surface being smooth and nontextured and having a frictional characteristic relative to said tape

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in a direction orientated away from said hollow outer core, each said short anchoring slot having two holding tabs of a same one of said interlocks inserted therethrough in a direction orientated toward said hollow outer core, each said locking arm of each said same interlock being folded at the said first fold line toward one another, said holding tabs of each same said interlock being folded at said second fold lines and inserted through one of said short anchoring slots in a direction orientated toward said hollow outer core, said integral flaps lying adjacent said outer surfaces of said flange plates; and

a hollow inner core having an exterior surface, said hollow inner core being received within said hollow outer core and said central openings, said end panels and said holding tabs forming ribs extending radially inwardly of said hollow outer core for leading support to said hollow outer core, each of said ribs having a rib edge which abuts the exterior surface of said hollow inner core so that said hollow inner core lends support to said hollow outer core through said ribs.

5,203,517

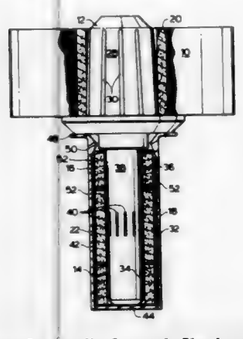
STRETCH-WRAP FILM DISPENSER WITH CYLINDRICAL BEARINGS

John C. Parry, 616 Cape McKinsey Dr., and Daniel J. Parry, 553 Center Dr., both of Severna Park, Md. 21146

Continuation of Ser. No. 635,825, Jan. 3, 1991, abandoned. This application Jul. 28, 1992, Ser. No. 920,523

Int. Cl.[5] **B65H** *23/08, 75/02*

U.S. Cl. 242—96 **14 Claims**



1. A dispenser for a roll of stretch film having a core, said dispenser comprising

a spindle having a substantially cylindrical shaft and an integral hub at one of the shaft, said hub being adapted for insertion into the core of the film roll and having means thereon for preventing relative rotation between the core and the hub,

a first sleeve bearing mounted coaxially upon the shaft adjacent said hub, and freely rotatable upon the shaft,

a brake drum mounted coaxially upon the shaft with one end longitudinally adjacent the first sleeve bearing,

means constraining the brake drum to rotate in unison with said shaft,

a second sleeve bearing mounted coaxially upon the shaft longitudinally adjacent the other end of said brake drum, said second sleeve bearing being freely rotatable upon the shaft, and

a single flexible hand grip having a tubular portion surrounding both of said sleeve bearings and said brake drum, said grip, when relaxed, being out of contact with said brake drum, but coming into contact with the brake drum, to resist rotation of the spindle, when finger pressure is applied to the grip against the brake drum, but not when finger pressure is applied to the grip only against the sleeve bearings.

5,203,518

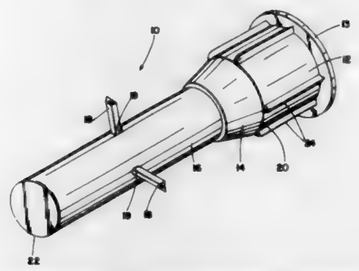
CREEL ADAPTER

Arthur C. Morgan, P.O. Box 3187, Cumberland, Md. 21502

Filed Aug. 9, 1991, Ser. No. 743,450

Int. Cl.[5] **B65H** *49/06, 49/36*

U.S. Cl. 242—130 **1 Claim**



1. A creel adapter of a character for use to fix yarn spooled on either cylindrical or tapered type tubes, comprising, a base plate large enough to create a flange, a rear hub connected to said base plate and extending longitudinally therefrom, portion connected next to the front end of said rear hub, a protruding terminal end tube disposed adjacent to said conical portion and extending longitudinally co-axially with said base plate, rear hub, and conical portion and means for fixedly engaging and retaining either a cylindrical tube or a tapered tube thereon wherein said last mentioned means includes a plurality of portions along said rear hub which are equipped with a plurality of longitudinally disposed radially extending ribs, all of which ribs have rounded heads remotely disposed relative to said base plate for the passage thereover of a cylindrical type tube end, all of said ribs having sharp edges peripherally disposed along their lengths for providing for firmly fixing of a cylindrical type tube thereon, said last mentioned means further including a plurality of outwardly extending sharp ended whiskers which tend to cut into the inner peripheral surface of either a tapered type tube or a cylindrical type tube as may selectively be positioned thereon to prevent either type tube from creeping forward.

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TAPE CARTRIDGE DRIVE BELT HAVING A LOW RATIO OF STATIC TO DYNAMIC FRICTION

Gerhard Rotter, Mission Viejo, Calif., assignor to Athana Incorporated, Torrance, Calif.

Filed Mar. 1, 1991, Ser. No. 662,755

Int. Cl.[5] **B65H** *20/06*

U.S. Cl. 242—192 **8 Claims**

1. A tape cartridge comprising:

a first reel mounted for rotation around its axis;

a second reel mounted for rotation around its axis;

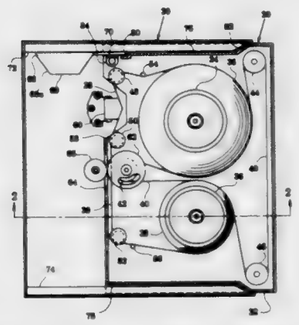
a flat elongate magnetic tape extending between said reels having at least one end of said tape convolutely wound on one of said reels;

tape guide means for bidirectionally moving said tape along a defined path from one of said reels to the other of said reels;

a closed loop elongate drive belt having a drive surface;

belt guide means supporting said drive belt for movement along a defined path maintaining an elongate portion of said drive surface in contact with an elongate portion of a surface of said tape;

said belt drive surface being smooth and nontextured and having a frictional characteristic relative to said tape



surface such that the ratio of static to dynamic coefficients of friction between said surfaces is less than 2.

5,203,520

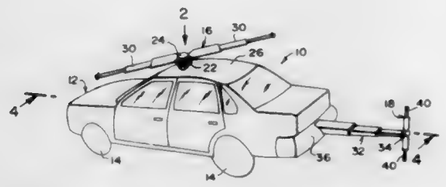
HELICAR

Jozef Przygodzki, 202 Huron St. #3-L, Brooklyn, N.Y. 11222, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Oct. 28, 1991, Ser. No. 783,574

Int. Cl.[5] **B64C** *37/00*

U.S. Cl. 244—2 **4 Claims**



1. A helicar which comprises:

a) a body with a longitudinal axis in the shape of an automobile;

b) a plurality of wheels on an axle rotating on a second axis perpendicular to the first said axis depending from said body for supporting said body on the ground;

c) a top rotor assembly operatively secured to said body about a third axis perpendicular to the first two said axes;

d) a rear rotor assembly operatively secured to said body;

e) means for operating said top rotor assembly and said rear rotor assembly in a helicopter mode for travel through the air and for operating said wheels in an automobile mode for travel on the ground; said means comprising a drive shaft parallel to said longitudinal axis, said top rotor assembly includes:

f) a vertical rotor shaft having a first end extending upwardly through the roof of said body and a second end connected to said operating means; and

g) a par of main rotor blades operatively connected to the first end of said vertical rotor shaft, so that said main rotor blades can collapse towards said vertical rotor shaft when said helicar goes into the automobile mode and said main rotor blades can extend away from said vertical rotor shaft when said helicar goes into the helicopter mode.

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ANNULAR BODY AIRCRAFT

Terence R. Day, 9 Wolfram Court, Anula, Northern Territory, Australia 0812

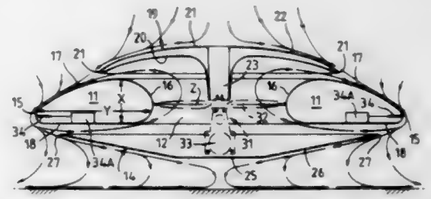
PCT No. PCT/AU90/00193, § 371 Date Nov. 8, 1991, § 102(e) Date Nov. 8, 1991, PCT Pub. No. WO90/13478, PCT Pub. Date Nov. 15, 1990

PCT Filed May 11, 1990, Ser. No. 773,568

Claims priority, application Australia, May 12, 1989, PJ4143; Jun. 16, 1989, PJ4760

Int. Cl.[5] **B64C** *15/00*

U.S. Cl. 244—12.2 **14 Claims**



1. An annular recirculating fluid apparatus comprising:

an annular body having a passageway, the body having an upper stationary, non-adjustable airfoil surface and being further configured to facilitate circulation of fluid around said body and through the passageway,

a fluid drive to accelerate fluid through said passageway,

a deflector disposed above said passageway and at least partially overlying said upper airfoil surface to direct accelerated fluid from said passageway outwardly across said upper airfoil surface of said annular body, and

a collector disposed below said passageway, said collector having a peripheral edge terminating short of the outermost periphery of said annular body, for directing a portion of fluid circulating around and under said annular body to said fluid drive, and directing another portion of fluid circulating around and under said annular body downwardly away from said annular body.

5,203,522

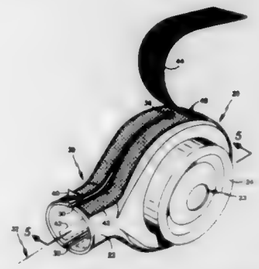
RESEALABLE PROTECTIVE BOOT

Kevin A. White, Shelton, and Robert F. Bohm, Bridgeport, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1991, Ser. No. 725,140

Int. Cl.[5] **B64C** *27/00*

U.S. Cl. 244—17.11 **4 Claims**



1. A flexible protective boot of the type used in rotorcraft for application over operating mechanisms or other sensitive elements including a bearing in combination with an upper control rod attachment bolt to fasten a control rod shaft to a rotor blade pitch horn, for the purpose of excluding foreign objects

from the sensitive elements, said boot further having a tubular

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sively between the threaded shank portion and the abut-

a) a member having upper and lower sections, where said

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from the sensitive elements, said boot further having a tubular neck portion adapted to cover the shaft, a disk-like portion adapted to cover the bearing with openings through which the upper control rod attachment bolt may extend, and opposite surfaces defined as including opposite sides of a circumference of said disk-like portion and extending continuously therefrom into said neck portion, characterized by:

two slits extending through opposite surfaces of the boot, each said slit beginning at the outermost end of the neck portion and extending longitudinally inward completely through the neck portion and extending partially through the disk portion; and

fastening means attached to the boot for selectively opening and re-sealing each said slit, said fastening means comprising a resealable hook and loop fastening arrangement including:

a hook portion; and

a loop portion, wherein one of said portions is disposed in a fixed manner on each side of a respective said slit, and the other of said portions is disposed in a removable manner over said fixed portion for covering the respective said slit.

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Patent Not Issued For This Number

5,203,524

VIBRATION DAMPING ARRANGEMENT FOR AIRCRAFT

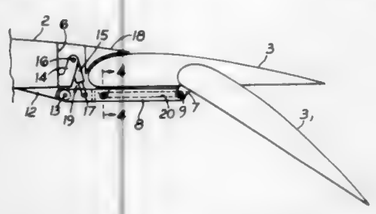
Maurice A. Laceby, and Cyril R. Fletcher, both of Bristol, England, assignors to British Aerospace Public Limited Company, London, England

Filed Aug. 1, 1991, Ser. No. 739,057

Claims priority, application United Kingdom, Aug. 2, 1990, 9017012

Int. Cl.[5] B64C *13/16*

U.S. Cl. 244—75 A **5 Claims**



1. A method of damping induced fundamental vibrations in an aircraft high-lift device comprising the steps of:

providing a damping device operatively associated with the high-lift device, said damping device including a damper strut being pivotly connected to a track beam, said track beam interconnecting an aircraft wing and said high-lift device, said track beam being pivotably connected to said aircraft wing, said track beam including a trackway for sliding interconnection with said high-lift device;

including a reactive force in said damping device in response to said fundamental vibrations; and

applying said reactive force to said high-lift device to substantially nullify said fundamental vibrations.

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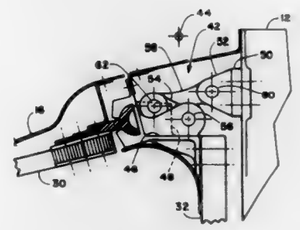
HINGE WITH OFFSET PIVOT LINE

Jihad I. Remlaoui, Oceanside, Calif., assignor to Rohr, Inc., Chula Vista, Calif.

Filed Oct. 23, 1991, Ser. No. 780,957

Int. Cl.[5] B64C *1/14*; **E05D** *15/00*

U.S. Cl. 244—129.4 **16 Claims**



1. In a hinge system for pivoting a first structure relative to a second structure where the contact line between said structures is non-linear, said system having at least two first hinges each having brackets secured to said first and second structures, at least one finger extending from each of said brackets and a hinge pin extending through the distal ends of said fingers, said hinge pins arranged in a substantially straight line substantially parallel to a non-linear line of contact between said structures and at least one second hinge assembly offset from said straight line, the improvement wherein:

said second hinge assembly each comprises first and second brackets mounted on said first and second structures, respectively, adjacent to said non-linear line of contact, at least one first link pivotally secured to said first bracket, at least one second link pivotally connected to the distal end of said first link and to said second bracket, the hinge line of said assembly lying outside said assembly and substantially along said straight line; and

spherical bearings connecting said at least one second link to said second bracket and to said at least one first link for allowing thermal expansion of said second structure relative to said first structure along said hinge line.

5,203,526

HOSE GUIDE APPARATUS

Robert E. Green, 5401 Rodgers Ave., Harrisburg, Pa. 17112, and Ronald C. Green, P.O. Box 232, Pine Grove, Pa. 17963

Filed Dec. 16, 1991, Ser. No. 808,474

Int. Cl.[5] B05B *15/00*

U.S. Cl. 248—87 **5 Claims**

1. A hose guide apparatus, comprising,

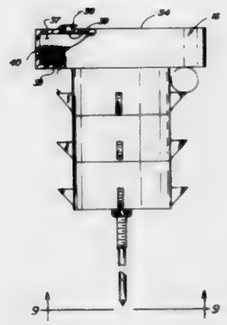
a support post, the support post including an abutment bar fixedly and orthogonally mounted to an upper distal end of the support post, a lower distal end of the support post terminating in a lower pointed end, and

a threaded shank portion formed about the abutment bar spaced from the lower pointed end, and

a smooth cylindrical bearing surface extending coextensively between the threaded shank portion and the abutment bar, and

an abutment disc mounted to the bearing surface receiving the abutment bar therewithin, and

a plurality of roller guide discs mounted between the abutment disc and the threaded shank portion, and



the roller guide discs and the abutment disc are arranged coextensively along the bearing surfaces, and

the abutment disc includes an abutment disc top surface, the abutment disc top surface includes a groove formed diametrically therewithin, and the groove receives the abutment bar in a complementary relationship.

5,203,527

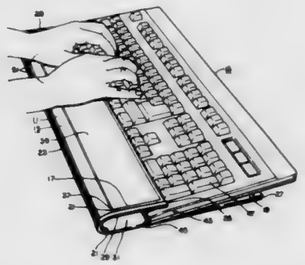
WRIST SUPPORT DEVICE FOR KEYBOARDS

Ulyss R. Rubey, Graham, Tex., assignor to Media Recovery, Inc., Graham, Tex.

Filed Mar. 4, 1992, Ser. No. 845,697

Int. Cl.[5] A47F *5/00*

U.S. Cl. 248—118 **19 Claims**



1. A wrist support apparatus for a keyboard comprising:

a) a member having upper and lower sections, where said upper and lower sections form a gap in said member which gap is adapted to receive said keyboard and said upper section being adapted to support a keyboard operator's wrists for comfortable operation of said keyboard;

b) resilient connecting means for connecting the upper and lower sections of said member together, each of said upper and lower sections having respective first and second ends, said connecting means being coupled to said respective first ends of the upper and lower sections of said member, said gap forming an opening at said respective second ends of said upper and lower sections, which opening communicates with said gap and is structured and arranged to receive said keyboard, said connecting means for clamping the upper and lower sections onto said keyboard when said keyboard is inserted into said gap between said respective second ends.

5,203,528

FURNITURE LEG WITH HIDDEN GLIDE

George V. Oke, 5645 B. General Washington Dr., Alexandria, Va. 22312

Filed Feb. 12, 1992, Ser. No. 834,385

Int. Cl.[5] F16M *11/24*

U.S. Cl. 248—188.4 **7 Claims**

1. A furniture leg assembly for supporting a chair seat or table, said assembly comprising:

a) a leg portion formed of one-piece construction;

b) said leg portion having a top end forming a substantially horizontally extending support surface;

c) said leg portion having an intermediate section extending accurately downwardly and laterally from said support surface;

d) said leg portion including a laterally extending foot;

e) said foot having a first portion having a first perimeter and a second portion having a second perimeter wherein said first portion is elevated above said second portion and said first perimeter is larger than said second perimeter; and,

f) said foot includes a tubular downwardly opening recess for receiving a circular glide.

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connected to said stud of said bracket plate at one side

parallel first and second base members (2, 2*a*);

held in sealing engagement against a neck plug placed within

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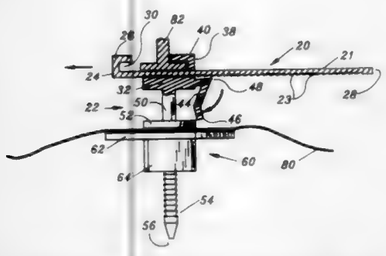
DEVICE TO SUSPEND POLYETHYLENE OR OTHER SHEETING AND COMPONENTS OF SUCH DEVICE

David T. Penniman, Roaring Brook Rd., Prospect, Conn. 06712

Continuation-in-part of Ser. No. 471,529, Jan. 29, 1990, abandoned. This application Dec. 14, 1990, Ser. No. 628,935
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—228 2 Claims



1. A device to suspend sheeting from a building component said device having an upper member for being removably affixed to said building component and lower member for suspending sheeting, said lower member having a suspension member and a releasable clamping member, said suspension member having a shank with a plurality of circular ratchet teeth, a sharp piercing free end, and a fixed upper clamping surface, said ratchet teeth spaced between said fixed upper clamping surface and said sharp piercing free end; said releasable clamping member having a clamping surface and an axis and an axial opening for insertion of said shank, said releasable clamping surface being formed by an external flange, an annular boss extending from said external flange, said axial opening extending from end to end of said annular boss and said external flange, said axial opening interrupted by a pair of confronting jaws for releasably capturing said shank when inserted therethrough by engaging said ratchet teeth, said jaws having a gap therebetween which is enlargeable by applying manual squeezing pressure to said boss thereby enlarging said gap to release said jaws from engagement with said ratchet teeth, said sheeting being supported between said fixed upper clamping member and said removable clamping surface.

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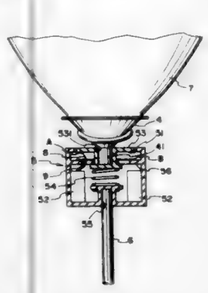
BALLOON HOLDER

Kuang-Pu Liu, No. 31, Cheng-Chao St., Kaohsiung City, Taiwan

Filed Feb. 19, 1992, Ser. No. 836,916
Int. Cl.[5] G10F *1/00*; A63H *5/00*
U.S. Cl. 248—309.1 1 Claim



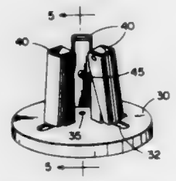
1. A balloon holder comprising:
a bracket plate having two notches for positioning a mouth of a balloon and a stud extending from a side thereof;
a hollow casing made of an insulative material and having an electronic music producing device, a spring member and a swinging plate mounted therein, said swinging plate being connected to said stud of said bracket plate at one side thereof and to said spring member at the other side thereof, said spring member being connected to a bottom of said casing at one end thereof and to said other side of said swinging plate at the other end thereof so that said swinging plate can swing within said casing, an annular flange extending inwardly from an internal wall of said casing between said swing plate and said electronic music producing device, said swinging plate having a first electrically conductive ring connected thereto and said annular flange having a second electronically conductive ring connected thereto, said first and second electrically conductive rings being respectively and electrically connected to said electronic music producing device, said electronic music producing device being actuated to produce music when said swinging plate is swung to allow said first and second electrically conductive rings to contact; and
a shank having one end connected to said casing.

5,203,531

PAPER CUP STACK HOLDER

Edward Gracon, 7 Francis St., Derby, Conn. 06418

Filed Feb. 28, 1992, Ser. No. 843,759
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.3 8 Claims



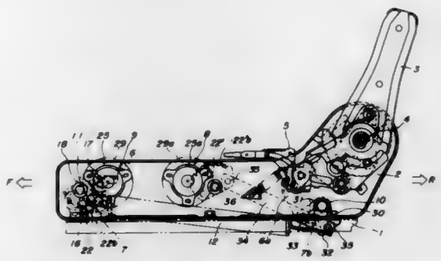
1. A paper cup stack holder and dispenser comprising:
a) a base unit;
b) a prong unit means for adjusting to the size of the cups adjustably connected to said base unit; and
c) a prong unit sleeve means for adjusting to the shape of said paper cup.

5,203,532

SEAT ADJUSTER

Hiroshi Matsuura, Shizuoka, Japan, assignor to Fuji Kiko Co., Ltd., Japan

Filed Sep. 17, 1991, Ser. No. 760,971
Claims priority, application Japan, Sep. 18, 1990, 2-97691[U]; Sep. 18, 1990, 2-97692[U]; Sep. 18, 1990, 2-248202
Int. Cl.[5] A45D *19/04*
U.S. Cl. 248—394 15 Claims



1. A seat adjuster for adjusting the position of a seat having a seat pan, comprising:

parallel first and second base members (2, 2*a*);
spaced first and second rod members (11, 10), each being rotatably supported by said base members;
first and second link mechanisms (7, 7*a*) respectively connected to spaced portions of said first rod member and mounting thereon a first part of said seat pan, said first and second link mechanisms raising said first part of the seat pan when said first rod member is rotated about its axis in a given direction;
third and fourth link mechanisms (7*b*, 7*c*) respectively connected to spaced portions of said second rod member and mounting thereon a second part of said seat pan, said third and fourth link mechanisms raising said second part of the seat pan when said second rod member is rotated about its axis in a given direction;
first and second drive mechanisms (9, 8) mounted to spaced portions of said first base plate for rotating said first and second rod members respectively, each drive mechanism having a one-way clutch function which locks parts of said drive mechanism when a torque is applied thereto from the associated rod member; and
a first sector gear (22) secured to said first rod member for synchronous rotation therewith, said first sector gear having teeth (22*b*) directed toward said first drive mechanism (9) and operatively engaged with the same, and
wherein said first drive mechanism (9) is disposed between said sector gear (22) and said second drive mechanism (8).

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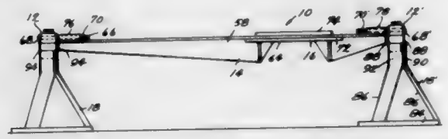
VEHICLE LIFTING AND SUPPORTING SYSTEM

H. Peter Karen, P.O. Box 9142, La Jolla, Calif. 92038

Filed Oct. 31, 1991, Ser. No. 785,764
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—676 24 Claims



1. A vehicle lifting and supporting system for use with a vehicle lifting jack, said system comprising:
a plurality of first means for positioning at predetermined locations beneath and in contacting relationship with said vehicle;
bar means, defining a vehicle lifting jack receiving portion, for positioning beneath said vehicle and in removably directly engaging relationship with predetermined of said first means; and
a plurality of support means for removable engagement with and beneath said predetermined first means for independently supporting said vehicle in cooperation with said predetermined first means while enabling removal of said jack from said jack receiving portion and removal of said bar means from engagement with said predetermined first means.

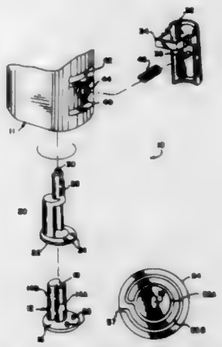
5,203,534

FLUID CONTROL VALVE

Scott W. Demarest, Caledonia; James E. Buhler, Waterford, and Allen D. Miller, Mt. Pleasant, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 18, 1990, Ser. No. 629,517
Int. Cl.[5] F16K *7/04*, *24/04*
U.S. Cl. 251—7 3 Claims

1. In a fluid control valve of the type designed to allow fluid to be transferred from a fluid reservoir to a dispensing nozzle, the fluid control valve having a top portion containing a fluid passageway and a base portion through which the fluid passageway extends, the base portion being designed to fit and be held in sealing engagement against a neck plug placed within the neck of the fluid reservoir, the fluid reservoir having a neck portion and a body portion,
an air inlet channel in the base portion of the fluid control valve, the air inlet channel being designed to allow air to enter the neck plug of the fluid reservoir and thus equalized the pressure between the atmosphere and the interior of the fluid reservoir when fluid is drawn from the fluid



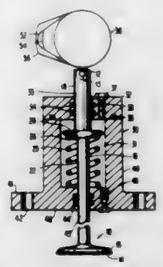
reservoir into the fluid control valve, while preventing fluid from leaking from the fluid reservoir should the fluid reservoir be placed on its side, the air inlet channel having an inner circular channel portion designed to overlie and be in open communication with an air vent opening in the neck plug of the fluid reservoir, and a tortuous path air channel portion leading from the inner circular air channel portion to the periphery of the base portion of the fluid control valve.

5,203,535

CAM ACTUATED VALVE ASSEMBLY WITH HYDRAULIC SPRING

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 13, 1991, Ser. No. 715,069
Int. Cl.[5] F01L *1/04*; F16F *5/00*; F16K *31/52*
U.S. Cl. 251—48 6 Claims



1. Valve assembly for a cylinder in an internal combustion engine of the type having at least one cylinder with at least one valve seat and a cam which is rotated to reciprocate a valve to and from said seat, said assembly comprising
a valve having a first end acted upon by said cam, an opposed second end brought to bear against said seat, and a stem extending between said ends, said stem having a first diameter which is uniform over a first section toward said first end and a second diameter which is uniform over a second section between said first section and said second

end, said first diameter being larger than said second

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surface, said rotating seal constructed to abut said inside

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end, said first diameter being larger than said second diameter,

a housing having a closed chamber having a fixed volume defined by fixed rigid walls with opposed first and second coaxial bores which receive said stem therethrough so that said first and second ends are located externally of said chamber, said first bore closely receiving said first section, said second bore closely receiving said second section, said first and second diameters having a difference which is only sufficient to effect compression of a hydraulic fluid in said closed chamber during a complete rotation of said cam, whereby

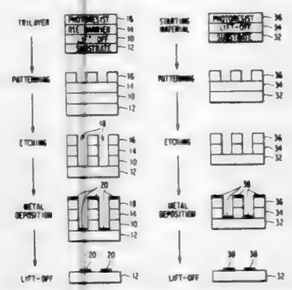
upon rotating said cam to move said first end toward said first bore and to lift said second end off said valve seat, the amount of said first section in said chamber increases while the amount of the second section in said chamber decreases, thereby decreasing the volume in said chamber not occupied by said valve stem by an amount sufficient to compress a hydraulic fluid in said chamber.

5,203,536

COMPACT ENGINE SHUTDOWN VALVE

Joseph Krepela, Edmonton, Canada, assignor to Barber Industries Ltd., Calgary, Canada

Filed Mar. 5, 1992, Ser. No. 846,630
Claims priority, application Canada, Jan. 20, 1992, 2059696
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—74 **10 Claims**



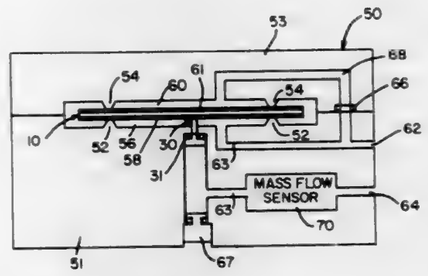
1. An engine shutdown valve comprising a housing, a gate within said housing and being pivotable about an axis, an air flow passage extending through said housing and having a longitudinal axis parallel to said axis of said gate, a first spring acting between said gate and said housing to bias and move said gate from a first position wherein said air passage is substantially unobstructed to a second position wherein said passage is closed, a drive operably connected to said gate, and a piston assembly having a piston acting on said drive, said piston having a first retaining position in said drive to retain said gate when said gate is in said first position and a second position out of engagement with said drive when said gate is in said second position so as to release said gate from said first position, said housing being made from two assemblies, said assemblies being joined together in a plane which is transverse to the plane of movement of said gate.

5,203,537

PIEZOCERAMIC VALVE ACTUATOR SANDWICH ASSEMBLY AND VALVE INCORPORATING SUCH AN ASSEMBLY

David C. Jacobs, Hampton, and Joseph A. Hochadel, Yorktown, both of Va., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 9, 1992, Ser. No. 848,393
Int. Cl.[5] F16K *31/02*; H01L *41/08*
U.S. Cl. 251—129.06 **17 Claims**



1. A valve comprising:

a valve actuator sandwich assembly comprising;

a piezoceramic bending element having a first side and a second side and including means for electrically activating the piezoceramic bending element;

first and second metal sheets flexibly bonded to the first and second sides of the piezoceramic bending element, respectively;

first and second flexible elastomeric sheets bonded to outer surfaces of the first and second metal sheets, respectively;

a first supporting member which sealingly engages an outer surface of the first elastomeric sheet in a continuous line around a periphery of a central portion of the first elastomeric sheet to flexibly support a first side of the valve actuator sandwich assembly and to create a first valve chamber between the central portion of the elastomeric sheet and the first supporting member;

a second supporting member which sealingly engages an outer surface of the second elastomeric sheet in a continuous line around a periphery of a central portion of the second elastomeric sheet to flexibly support a second side of the valve actuator sandwich assembly;

a valve inlet communicable with the first chamber;

a valve outlet communicable with the first chamber; and

at least one of the valve inlet and the valve outlet including a valve seat having an orifice therethrough sealingly engageable with the central portion of the first elastomeric sheet to prevent a stream of flow through the valve seat, first chamber, valve inlet and valve outlet, the valve seat being disengageable from the first elastomeric sheet to allow the stream of flow through the valve seat, first chamber, valve inlet and valve outlet;

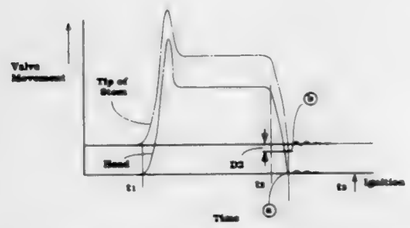
wherein the flexible supporting of the valve actuator sandwich assembly by the first and second supporting members allows deflection of the valve actuator sandwich assembly when the piezoceramic bending element is actuated; and the sealing engagement of the first and second supporting members with the first and second elastomeric sheets, respectively, also causes a sealing engagement between the first and second elastomeric sheets and the first and second metal sheets, respectively, and thereby isolates the piezoceramic bending element from the flow stream.

5,203,538

SOLENOID VALVE DEVICE

Nobuhiko Matsunaga, and Yoshihiko Moriya, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 29, 1991, Ser. No. 783,830
Claims priority, application Japan, Oct. 31, 1990, 2-296686
Int. Cl.[5] F16K *31/06*; B05B *1/30*
U.S. Cl. 251—129.19 **21 Claims**



1. An injection valve for a fuel injection system comprising an injection valve element comprised of a head portion adapted to selectively engage and close a valve seat and move away from said valve seat to an open position for permitting flow therethrough and a stem portion, biasing means for urging said valve to its closed position, an inertial mass supported for movement along said stem portion in opposite directions along an axis of said stem portion, a pair of spaced apart abutment means fixed relative to said stem portion and engagable with said inertial mass for limiting the movement of said inertial mass relative to said injection valve element in both directions, and actuating means for moving said valve element against the action of said biasing means to its opened position and for effecting engagement of said inertial mass with one of said abutment means, said inertial mass being movable along said stem portion when said biasing means urges said head portion into engagement with said seat for engaging one of said abutment means for precluding said head portion from bouncing away from said valve seat.

5,203,539

PIPELINE VALVE APPARATUS

Gary M. Stary, 636 Thorn Hollow Dr., Coraopolis, Pa. 15108

Division of Ser. No. 809,720, Dec. 17, 1991, Pat. No. 5,160,118.
This application Aug. 3, 1992, Ser. No. 924,098
Int. Cl.[5] F16K *1/22*
U.S. Cl. 251—308 **4 Claims**

1. Apparatus for attaching a valve member including a disk having a perimetrical surface and first and second opposing surfaces to a control shaft within the bore of a valve body having a control shaft bore therethrough, comprising:

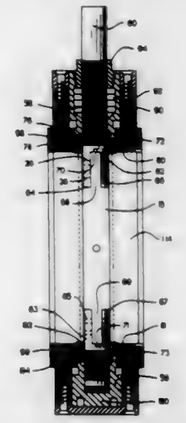
a tongue member partially along said perimetrical surface of the valve member;

two coupling pads recessed in said opposing surfaces of the valve member, adjacent said tongue member;

a pair of leg members, integral to the control shaft, said leg members defining an aperture, said aperture adapted to receive said coupling pads, the control shaft further having a groove constructed to receive said tongue;

a bushing adapted to be rotatably received by the control shaft bore having a bore therethrough adapted to receive the control shaft, an outer groove adapted to receive the perimetrical surface of the valve member and an inner groove within said outer grove adapted to receive said tongue; and

a circular rotating seal having a bore adapted to receive said bushing, an outer groove adapted to receive said perimetrical surface and an inner groove adapted to receive said tongue, the bore of the valve body defining an inside surface, said rotating seal constructed to abut said inside surface of the valve body about said control shaft bore



such that the valve member may be rotated by the control shaft between an open and closed position.

5,203,540

HYDRAULIC LIFTING DEVICE

Chia-Chang Lee, No. 15, Lane 42, Te-Ming Rd., Chiayi City, Taiwan

Filed May 13, 1992, Ser. No. 882,413
Int. Cl.[5] B60P *1/48*
U.S. Cl. 254—8 B **7 Claims**

1. An hydraulic lifting for lifting an object, comprising:

a mobile base;

an upright prop extending upwardly from said mobile base and having a top end provided with a stationary pivot seat;

a connecting bar for supporting the object thereon;

a driving crank arm having one end hinged to a first hinge point on said pivot seat and the other end hinged to a first hinge point on said connecting bar, said driving crank being a tubular member and having a first part which has a distal end hinged to said first hinge point and a second part extending from one end of said first part and cooperating with said first part so as to define a substantially L-shaped first bent portion, wherein said first part extends upwardly when said driving crank arm is in an unfolded position, said first bent portion of said driving crank arm being formed with an opening to access said second part;

a support rod telescopically extending into said second part;

a chained hook provided on a distal end of said support rod for hanging an object thereon;

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GUARDRAIL SUPPORT BRACKET

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VEHICLE SUSPENSION MEMBER DESIGNED TO

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a driven crank arm having one end hinged to a second hinge point on said pivot seat and the other end hinged to a second hinge point on said connecting bar, the distance between said first and second hinge points on said pivot seat being equal to that between said first and second hinge points on said connecting bar, the distance between said first hinge points being equal to that between said second hinge points; said pivot seat, said driving crank arm, said driven crank arm and said connecting bar cooperatively forming a parallel crank four-bar linkage; and

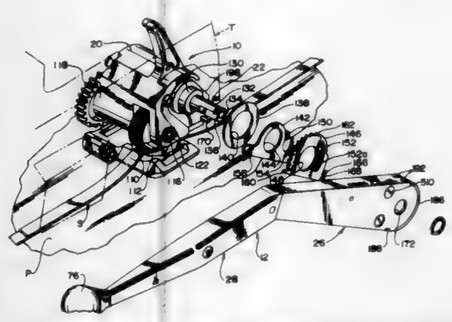
an hydraulic cylinder means having one end pivoted to said upright prop and another end pivoted to said driving crank arm, said hydraulic cylinder means being operated so as to pivot said driving crank arm toward or away from said upright prop in order to adjust the height of said connecting bar, pivoting action of said driving crank arm causing said driven crank arm to pivot at a similar angular speed to prevent angular deviation of said connecting bar.

5,203,541

TENSIONING MECHANISM FOR STRAPPING TOOL

Robert J. Nix, Algonquin, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Apr. 23, 1991, Ser. No. 689,496
Int. Cl.[5] B25B *25/00*
U.S. Cl. 254—218 **10 Claims**



1. A tensioning mechanism for a strapping tool, the tensioning mechanism comprising a housing structure, a shaft mounted rotatably to the housing structure, a handle coupled to the shaft, and means for coupling the handle to the shaft so as to cause the shaft to be rotatably driven in a tensioning direction when the handle is pivoted about the shaft in one pivotal direction, the coupling means enabling the handle to be oppositely pivoted about the shaft without rotating the shaft, the handle being articulate and including a mounting member, a gripping member, and a reaction member, the mounting member being coupled to the shaft by the coupling means, the gripping member being mounted to the mounting member so as to permit pivotal movement of the gripping member relative to the mounting member between a normal position and a displaced position, the reaction member being movable conjointly with the gripping member between the normal and displaced positions, the handle including means coacting with the mounting and reaction members for biasing the gripping and reaction members toward the normal position, the biasing means permitting the gripping and reaction members to be forcibly displaced toward the displaced position, the tensioning mechanism comprising means coacting with the shaft for controlling pivotal movement of the mounting member about the shaft, the controlling means permitting pivotal movement of the mounting member about the shaft in the tensioning direction with the gripping and reaction members in the normal position and preventing further movement of the mounting member about the shaft in the tensioning direction upon displacement of the gripping and reaction members from the normal position into the displaced position, the biasing means comprising

(a) an adjusting screw having a head and a shank and defining an axis, the adjusting screw being mounted to the mounting member so as to permit rotational adjustment of the adjusting screw relative to the mounting member without axial movement of the adjusting screw relative to the mounting member,

(b) a follower coacting with the adjusting screw shank and with the mounting member so as to permit axial movement of the follower along the adjusting screw shank without rotational movement of the follower relative to the mounting member upon rotational adjustment of the adjusting screw relative to the mounting member,

(c) a spring coacting with the reaction member and with the follower for biasing the gripping and reaction members toward the normal position, the spring being compressible and being arranged so as to be more compressed upon rotational adjustment of the adjusting screw in a first rotational direction and so as to be less compressed upon rotational adjustment of the adjusting screw in a second rotational direction opposite to the first rotational direction, and

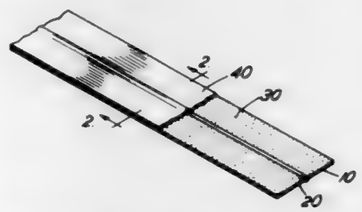
(d) means for limiting rotational adjustment of the adjusting screw in either of the first and second rotational directions to a limited range, the limiting means being adjustable to adjust the limited range.

5,203,542

APPARATUS FOR AN IMPROVED ELECTRIC FENCE WIRE CONSTRUCTION FOR USE WITH INTENSIVE GRAZING

James W. Coley; John P. Crichton, both of Cary, N.C., and Marshall H. Eubanks, Millersport, Ohio, assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed Feb. 26, 1991, Ser. No. 661,391
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—10 **6 Claims**



1. An improved electric fence wire construction comprising, in combination:

a first metal foil strip having a longitudinal dimension;

a second metal foil strip substantially identical to the first strip;

at least one wire core of electrically conductive wire having a longitudinal dimension; and

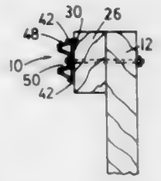
means for laminating the first strip, the core, and the second strip together with the longitudinal dimensions being generally coincident and with the first strip underlaying the second strip and the strips conductively connected to and enveloping the wire, said two metal foil strips enveloping the conductive wire core to provide a total conductive assembly.

5,203,543

GUARDRAIL SUPPORT BRACKET

Henri-Paul Fleury, Drummond, Canada, assignor to Les Entreprises Gifab Ltee, Drummond, Canada

Filed May 7, 1992, Ser. No. 879,306
Claims priority, application Canada, May 3, 1991, 2043584
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—13.1 **10 Claims**



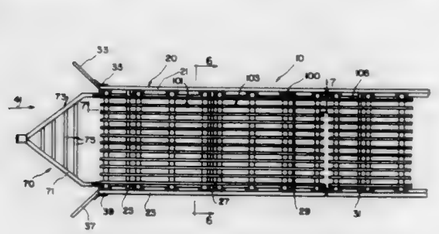
1. A bracket for mounting a roadway guardrail to a wooden post adjacent a roadway comprising: a generally rectangular backing member having opposed upper and lower edges and opposed side edges; inwardly extending end flanges, one such flange extending along each of said upper and lower edges, each flange being adapted for retaining abutment against a corresponding longitudinal edge of a guardrail; elongated aperture means therethrough adapted for cooperation with bolt-receiving aperture means in the guardrail normally used for mounting the guardrail to a post; and at least one pointed tab extending rearwardly of the backing member for anchoring the bracket to a wooden post.

5,203,544

CATTLE GUARD

A. LeVan Webb, Rte. 2, Box 1760, Lakeside, Ariz. 85929

Filed Jul. 9, 1991, Ser. No. 727,433
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—17 **6 Claims**



1. An improved cattle guard comprising:

a) a base buried underground in a pit having a floor and including:

i) a pair of elongated spaced runners supported on said floor;

ii) a plurality of cross members, each of said cross members being interconnected between said runners and being suspended above said floor to allow free flow of fluid through said base;

iii) each of said runners having an angled extension attached at each end thereof with adjacent angled extensions of said spaced runners diverging from one another in a direction away from said runners to provide a funnel-like shape to funnel fluid between said runners; and

b) a grill structure removably placed on said base.

5,203,545

VEHICLE SUSPENSION MEMBER DESIGNED TO DIVERT CRACK PROPAGATION

Richard F. Pierman, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 666,968, Mar. 11, 1991, Pat. No. 5,144,734.
This application May 11, 1992, Ser. No. 880,779
Int. Cl.[5] B60G *11/02*; F16F *1/18*
U.S. Cl. 267—47 **3 Claims**

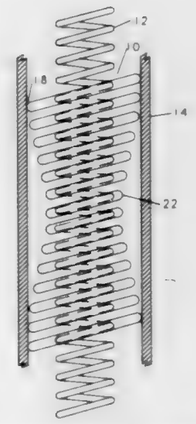
1. A vehicle suspension member having a longitudinal axis extending therealong between opposite ends thereof and having respective discontinuities extending along opposite edges thereof in a direction generally parallel to the longitudinal axis and effective to divert crack propagation in a direction generally parallel thereto and are formed by compressing an unfolded member having opposite side walls that are configured substantially concave in cross section so that the side walls are compressed together in a manner effective to form the respective discontinuities extending along opposite edges of the suspension member.

5,203,546

WINDOW SPRING DAMPING APPARATUS

Alfred Amadore, 113 Ferraro Dr., Bristol, Conn. 06010

Filed Aug. 6, 1990, Ser. No. 564,283
Int. Cl.[5] F16F *1/06*
U.S. Cl. 267—168 **7 Claims**



5. A device for attenuating noise associated with a window balance spring rattling against the inside of an associated rigid spring cover, said device comprising:

a helical spring of lesser overall length than said balance spring and having a plurality of turns varying in diameter from a first diameter corresponding to the inside diameter of said spring cover and a second diameter wherein said coils will at least partially detent between the coils of said balance spring in an extended condition, said helical spring contacting both said cover and balance spring so as

to dampen out any relative oscillations therebetween, said helical spring having at least one of said first diameter

5,203,550

SORTER WITH ROTATABLE TRAYS SUPPORTED ON

ing sheets fed from said first feeder along said lower paper path;

therefrom, the board being flexible along a longitudinal line which extends fully through both the chopping area and the

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to dampen out any relative oscillations therebetween, said helical spring having at least one of said first diameter coils at least at each end thereof.

5,203,547

VACUUM ATTRACTION TYPE SUBSTRATE HOLDING DEVICE

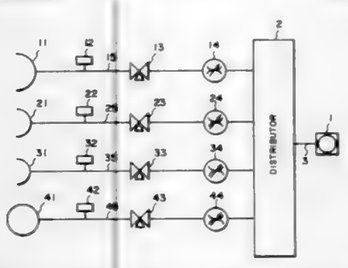
Mitsuji Marumo, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,812

Claims priority, application Japan, Nov. 29, 1990, 2-326002; May 8, 1991, 3-131618

Int. Cl.[5] B25B *11/00*

U.S. Cl. 269—21 **21 Claims**



1. A vacuum attraction type substrate holding system, comprising:

a vacuum source;

a distributor for distributing a vacuum from said vacuum source into a plurality of vacuum lines;

a plurality of vacuum attraction type substrate holding portions corresponding to said vacuum lines, respectively, each of said substrate holding portions including a three-way valve for control of a supply of one of a vacuum and an ambience pressure to the corresponding substrate holding portions, wherein the control of each valve is influential to control attraction of a substrate to and release of a substrate from a corresponding substrate holding portion; and

a plurality of restriction valves each being disposed between said distributor and a corresponding one of said three-way valves, for resisting gas flowing from the corresponding three-way valve.

5,203,548

CHOPPING BOARDS

Mark A. Sanders, 16, Green Lane, Windsor, Berkshire, United Kingdom

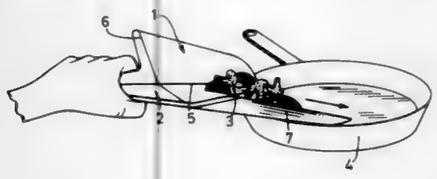
PCT No. PCT/GB90/00896, § 371 Date Dec. 6, 1991, § 102(e) Date Dec. 6, 1991, PCT Pub. No. WO90/14785, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 8, 1990, Ser. No. 777,391

Claims priority, application United Kingdom, Jun. 8, 1989, 8913225

Int. Cl.[5] A47J *43/00*

U.S. Cl. 269—302.1 **8 Claims**



1. A chopping board having a large planar top surface defining a chopping area and a narrower handle area extending therefrom, the board being flexible along a longitudinal line which extends fully through both the chopping area and the handle area along the length of the board, the board also incorporating a hinge positioned near to the handle area of the board along a lateral line which extends fully across the board from one side to the other, so as to intersect said longitudinal line.

5,203,549

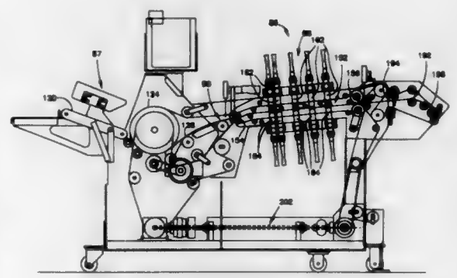
COLLATOR WITH PRINTER HAVING INCLINED PRINTING PATH AND DISPLACEABLE CONVEYOR BELTS TO EXPOSE PRINTING SURFACE

Robert A. Bryson, Sr., Huber Hts.; David F. Christofferson, Englewood; John Hobbs, Troy, and Al Baglyos, Huber Hts., all of Ohio, assignors to AM International Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 403,127, Sep. 5, 1989. This application Dec. 10, 1991, Ser. No. 805,119

Int. Cl.[5] B41F *13/54*

U.S. Cl. 270—1 **38 Claims**



1. An apparatus for feeding sheet material to a first sheet material feed means at a pickup location and from which the sheet material is fed to a longitudinally extending collating conveyor, said apparatus comprising sheet material holder means for holding sheet material, second sheet material feed means for engaging a leading end portion of sheet material which is at least partially held by said holder means and for feeding the sheet material from said holder means, conveyor means for receiving sheet material from said second sheet material feed means and for moving the sheet material to the pickup location to enable the first sheet material feed means to engage the leading end portion of the sheet material at the pickup location, and printer means for printing on the sheet material while the sheet material is being moved by said conveyor means along a path segment which slopes upwardly at an acute angle to a horizontal plane during movement of the sheet material from said second sheet material feed means to the first sheet material feed means, said printer means including a plurality of ink jet nozzles for directing ink toward the sheet material along flow paths which extend at an acute angle to a vertical plane and which extend perpendicular to the upwardly sloping path segment along which the sheet material is moved through said printer means by said conveyor means.

5,203,550

SORTER WITH ROTATABLE TRAYS SUPPORTED ON GUIDE MEMBERS

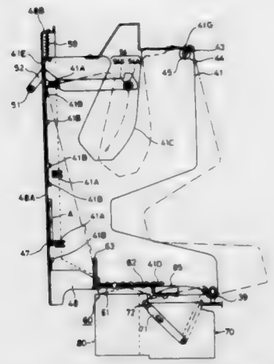
Minoru Kawano; Kazunobu Miura, and Kohji Yoshie, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 30, 1991, Ser. No. 815,923

Claims priority, application Japan, Jan. 8, 1991, 3-000658; Feb. 26, 1991, 3-031034; Apr. 10, 1991, 3-077764

Int. Cl.[5] B42B *2/00*; **B65H** *39/02*

U.S. Cl. 270—53 **25 Claims**



1. A sorting and stapling apparatus, comprising:

a plurality of plate-shaped bins;

a plurality of guide members provided for said plurality of bins so that each of said plurality of bins is respectively slidable on a respective one of said plurality of guide members, between a first position and a second position;

each of said plurality of bins receiving and stacking sheets at said first position;

stapling means positioned at said second position of said plurality of bins for stapling the thus stacked sheets;

moving means for respectively moving each of said plurality of bins from said first position to said second position; and

a plurality of spring members provided for said plurality of bins, each spring member returning a respective one of said plurality of bins from said second position to said first position.

5,203,551

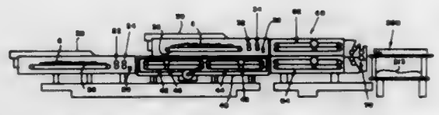
SYSTEM AND METHOD FOR IN-LINE FEEDING FROM TWO CUT SHEET FEEDERS

Kenneth W. Lowell, Farmington; Karen P. Synnett, Seymour, and Karel J. Janatka, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 816,441

Int. Cl.[5] B65H *43/00*

U.S. Cl. 270—59 **8 Claims**



1. A system for in-line feeding from two cut sheet feeders, comprising:

a first feeder for feeding cut sheets seriatim along a lower paper path originating at said first feeder;

first transport means adjacent said first feeder for transporting sheets fed from said first feeder along said lower paper path;

a second feeder mounted above said first transport means for feeding cut sheets seriatim along an upper paper path originating at said second feeder;

means for merging said upper and said lower paper paths into a main paper path whereby sheets fed from said first and second feeders are merged into said main paper path for further processing, wherein said first and second feeders each include means for reading control information printed on the sheets fed from the respective feeder, said control information being used to control said first and second feeders, said first transport means and said merging means.

5,203,552

SHEET FEEDING APPARATUS

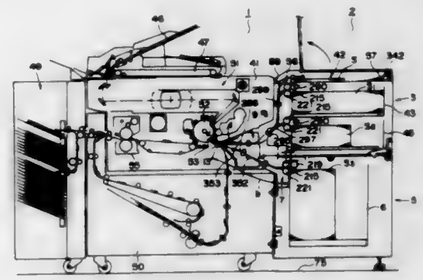
Akimitsu Hoshi, Kawasaki; Masaaki Sato, Yokohama; Takaji Yonemori, Kawasaki, and Hideki Goto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,890

Claims priority, application Japan, Dec. 11, 1989, 1-321649

Int. Cl.[5] B65H *3/44*

U.S. Cl. 271—9 **52 Claims**



1. A sheet feeding apparatus for feeding a sheet to a sheet processing means, comprising:

a first unit having stacking means for stacking sheets;

a first feeding means for feeding a sheet from said stacking means of said first unit;

a first sheet passage for guiding the sheet from said first feeding means to the processing means;

a second unit having stacking means for stacking sheets;

a second feeding means for feeding the sheet from said stacking means of said second unit;

a second sheet passage for guiding the sheet from said second feeding means to the processing means; and

supporting means for supporting said first unit to said second unit for movement between a first position wherein said first sheet passage guides the sheet from said first feeding means and a second position wherein at least one of said first sheet passage and said second sheet passage are exposed.

5,203,553

AUTOMATIC DOCUMENT FEEDER

Ming-Tong Chiang, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 19, 1992, Ser. No. 853,822

Int. Cl.[5] B65H *5/00, 3/06*

U.S. Cl. 271—10 **1 Claim**

1. An automatic document feeder of a fax machine, for transporting document sheets from a document tray to an outlet tray, during which the graphical data on the document sheets is scanned and transmitted, comprising:

a frame;

a feeding roller, disposed on said frame downstream the

document tray, for urging the document sheets down-

5,203,554

a flat spring mounted at one end to a shaft extending along

ing across substantially the full width of said flexible prod-

UMI

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document tray, for urging the document sheets downstream;

a dividing roller, disposed on said frame downstream said feeding roller, for urging one of the document sheets downstream, said dividing roller having a first outer periphery;

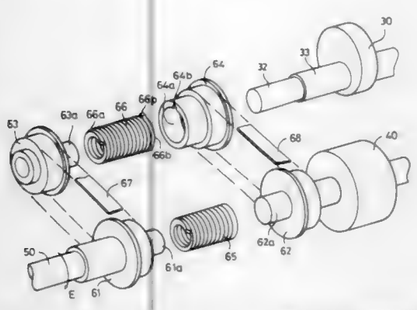
a driving shaft, coaxially disposed with said dividing roller on said frame;

a scanning roller, disposed on said frame downstream said dividing roller, for urging said one of the document sheets downstream, while said one of the document sheets being scanned, said scanning roller having a second outer periphery;

an outlet roller, disposed on said frame downstream said scanning roller and upstream the outlet tray, for transporting said one of the document sheets to the outlet tray;

means for urging said driving shaft and said scanning roller and said outlet roller, so that the tangential speed of said second outer periphery of said scanning roller is greater than the tangential speed of said first outer periphery of said dividing roller; and

a clutch, connecting said driving shaft and said feeding roller and said dividing roller, for controlling the rotation of said feeding roller and said dividing roller, said clutch comprising a first pulley, a second pulley, a third pulley, a fourth pulley, a first coil spring, a second coil spring, a first belt and a second belt,



said first pulley being mounted on said driving shaft, said second pulley being mounted on said dividing roller, said first coil spring being wound in the opposite direction of the rotational direction of said driving shaft, one end of said first coil spring being sleeved on and slightly close fitted to said first pulley and the other end being sleeved on and slightly close fitted to said second pulley, said third pulley being rotatably mounted on said feeding roller, said fourth pulley being rotatable mounted on said feeding roller, said fourth pulley having an enlarged hole at one end of said fourth pulley, said enlarged hole of said fourth pulley having a periphery and a slot which extends axially along said periphery of said enlarged hole of said fourth pulley, said second coil spring having two ends and a protrusion at one of said two ends of said second coil spring, said second coil spring being wound in the opposite direction of the rotating direction of said third pulley, said one end of said second coil spring being received in said enlarged hole of said fourth pulley and being simultaneously sleeved on and slightly close fitted to said driving roller, said protrusion of said second coil spring being received in said slot of said fourth pulley and the other end of said second coil spring being sleeved on and slightly close fitted to said third pulley, said first belt being mounted on said first pulley and said third pulley, said second belt being mounted on said second pulley and said fourth pulley.

5,203,554

PLURALITY DOCUMENT FEEDING APPARATUS AND METHOD FOR COPYING MACHINES

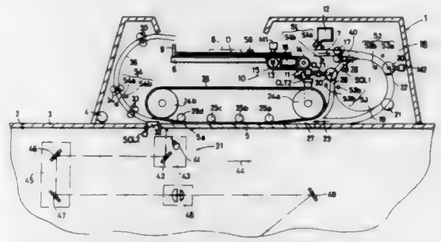
Kaoru Suzuki, and Toru Morooka, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1991, Ser. No. 755,624

Claims priority, application Japan, Sep. 7, 1990, 2-237837; Sep. 7, 1990, 2-237838; Sep. 14, 1990, 2-245241

Int. Cl.[5] B65H *39/10, 7/02*

U.S. Cl. 271—10 **8 Claims**



4. A document feeding apparatus comprising:

a document loading tray for holding a plurality of document sheets;

document feeding means for feeding the document sheets one by one from the document loading tray;

a first transport path along which the document sheets fed from the document feeding means are transported;

a second transport path continuously from the first transport path, there being a joint portion between the first and second transport paths;

a third transport path diverging from the joint portion at a branching point between the first and second transport paths and extending into a document scanning area facing an optical scanning means; and

means for transporting a preceding first document from the first transport path to the second transport path for inversion of the transporting direction thereof, the first document then being guided into the third transport path; stopping the transportation of the inverted first document when the trailing edge thereof has passed the branching point of the third transport path, while at the same time inverting the transporting direction of a succeeding second document; and transporting direction of a succeeding second document; and transporting the first and second documents together at the same speed when the leading edge of the inverted second document comes to a predetermined distance from the trailing edge of the stationary first document.

5,203,555

ADJUSTABLE DAMPENING DEVICE IN AN APPARATUS FOR DETECTING DOUBLE FED SHEETS

Joseph A. Cannaverde, New Milford; Joseph H. Marzullo, Brookfield, and Ming Xiao, Terryville, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 4, 1992, Ser. No. 941,274

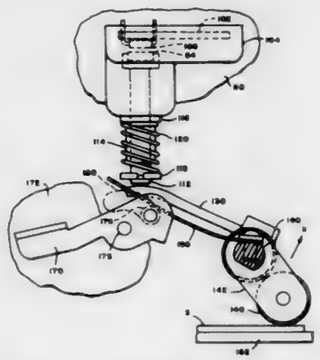
Int. Cl.[5] B65H *7/02*

U.S. Cl. 271—263 **4 Claims**

1. In a mechanism for detecting double sheets fed from a feeder, including an actuator arm operatively coupled at one end to a magnet and at the other end to a paper follower, wherein said paper follower follows the profile of each sheet or group of sheets being conveyed between said paper follower and a fixed transport deck below thereto, said paper follower causing said actuator arm to pivot about a first axis to raise and lower the magnet with respect to a stationary electromagnetic sensor, an improvement comprising:

a flat spring mounted at one end to a shaft extending along the first axis;

a lever, having a pin for supporting an other end of said flat spring, said lever being pivotally mounted along a second axis for pivoting said pin between at least a first and second position wherein said flat spring provides a first dampening load to the paper follower and the actuator arm when said lever is in said first position and provides a second dampening load to said actuator arm when said lever is in said second position.



5,203,556

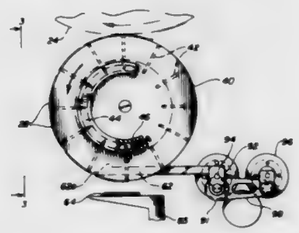
METHOD AND APPARATUS FOR THE SEQUENTIAL HANDLING AND DELIVERY OF FLEXIBLE PRODUCTS

David A. Smith, Midland, and Robert J. Nestle, Essexville, both of Mich., assignors to Dowbrands L.P., Indianapolis, Ind.

Continuation of Ser. No. 606,217, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 286,205, Dec. 19, 1988, Pat. No. 5,014,978. This application Oct. 5, 1992, Ser. No. 956,571

Int. Cl.[5] B65H *29/54, 29/32*

U.S. Cl. 271—308 **28 Claims**



1. An apparatus for the sequential handling and delivery of individual flexible products comprising:

means for delivering a series of closely spaced individual flexible products to a transfer point:

means positioned at said transfer point for transferring said flexible products to a delivery point while maintaining substantially the same spacing between said products, said means including a vacuum transfer drum having a plurality of annular grooves about the periphery thereof, and means for rotating said drum;

a shaft mounted adjacent said transfer drum for orbital movement, including drive means for orbiting said shaft; and

a plurality of fingers secured to said shaft and extending into said annular grooves for removing said flexible products sequentially from said transfer drum and delivering them to said delivery point, said fingers extending and contacting across substantially the full width of said flexible products as said products are removed from said transfer drum.

5,203,557

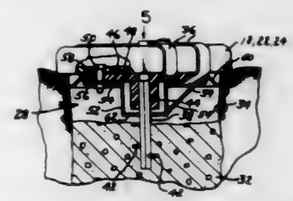
BASEBALL BASE AND ANCHOR

Charles E. Studebaker, 5753 Greendale Dr., Galloway, Ohio 43119, and William Weigl, 1805 Conwood Dr., Troy, Ohio 45373

Filed Jan. 21, 1992, Ser. No. 822,684

Int. Cl.[5] A63B *71/00*

U.S. Cl. 273—25 **18 Claims**



1. A permanent anchor for a portable baseball base having an anchor plate fastened to its underside with a central female receptacle extending downwardly from said anchor plate and vertical edge surfaces encompassing said female receptacle, said anchor being firmly positionable in earth along a basepath of a baseball diamond and being entirely below grade of the basepath when so positioned so as not to obstruct performance of dragging equipment used to level the top surface of the basepath when the base is removed, said anchor comprising:

a central, upwardly-extending male stake having an upper end for entering said female receptacle to comprise a first vertical male/female connection when said base and anchor plate are placed over said stake, said female receptacle and male stake overlapping vertically and each being provided with means for essentially restraining the base against relative rotation when the receptacle and stake are engaged;

a vertically-extending housing attached to and surrounding said stake and having a central opening, said housing being open-ended at its upper edge and said upper edge terminating approximately in the same horizontal plane as said upper end of said stake; and

said housing having vertical restraining edge surfaces encompassing its upper open end, said restraining surfaces mating with and closely interfitting said vertical edge surfaces of said anchor plate when said receptacle and stake are engaged so as to comprise a second vertical male/female connection located radially outward of said central stake and receptacle.

5,203,558

UNIDIRECTIONAL FLEXIBLE SPINNER

Benjamin J. An, 2520 Bunker Hill, Ann Arbor, Mich. 48105

Filed Aug. 27, 1990, Ser. No. 572,771

Int. Cl.[5] A63B *61/00*

U.S. Cl. 273—29 A **4 Claims**

1. A ball-hitting practice device which is adapted to redirect motion of a hit ball to a rhythmic motion in a uniplanar predetermined direction, comprising:

supporting means for supporting said practice device on a practice surface;

an elongated flexible section joined at one end to said supporting means and projecting therefrom, said flexible section being formed by two elongated cylindrical springs, said springs having first and second ends, said springs further being aligned in side-by-side relationship and defining a plane, means attaching said springs to each

other at said first and second ends thereof, said first ends

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PRODUCTION OF A SOUND-PRODUCING PU-BALL

a viscous fluid interiorly situated within said tubular member, and

5,203,563

SHAKER CONTROL DEVICE

Milton H. Loper, III, Mountain View, Calif., assignor to Atari

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other at said first and second ends thereof, said first ends of said springs being joined to said supporting means;

a ball defining an axis which extends along a diameter thereof; and

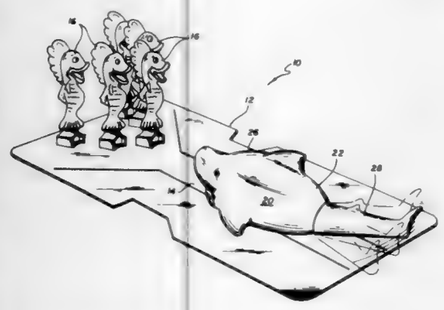
attachment means attaching said ball at said axis to said second ends of said springs, opposite of said supporting means, and means attaching said first end of said springs to said support means, so that said ball tends to move in a direction generally transverse to said plane when hit by a batter.

5,203,559

BOWLING APPARATUS HAVING SPRING DRIVEN WIND-UP STRIKER

Adolph E. Goldfarb, 1432 S. Eastwind Cir., Westlake Village, Calif. 91361

Filed Feb. 7, 1992, Ser. No. 832,733
Int. Cl.[5] A63D *3/00*
U.S. Cl. 273—37 **6 Claims**



1. A bowling game apparatus comprising:

1) at least one playpiece for standing upright on a supporting surface, and

2) a self-powered striker which is movable forwardly along the supporting surface toward the playpieces, the gam objective being for the striker to engage and knock over the playpieces,

the striker having motor means for causing the forward movement of the striker toward the playpieces,

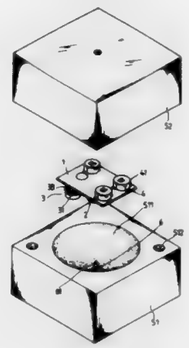
the striker also having a main portion with opposed sides and a transversely movable portion connected to the main portion, the movable portion being transversely movable relative to the striker main portion to a position beyond at least one of said sides while the strike moves forwardly, for engaging the playpieces as the striker moves past the playpieces.

5,203,560

PRODUCTION OF A SOUND-PRODUCING PU-BALL

Shyr-Yuh Wang, No. 44-3, Street Hwa-Fu, Chung-Ho, Taipei Hsien, Taiwan

Filed Jan. 28, 1992, Ser. No. 826,871
Int. Cl.[5] A63B *45/00*
U.S. Cl. 273—58 E **2 Claims**



1. A method of making a sound producing polyurethane ball in a mold comprising the steps of:

a) extending a rod member from the mold into a mold cavity,

b) removably supporting a sound generator on the rod member such that the sound generator is out of contact with the mold, said sound generator having a music integrated circuit, a speaker, a spring, and a battery set mounted thereon,

c) placing a foamable polyurethane material into the mold cavity and causing the polyurethane material to undergo a foaming process such that the polyurethane material encloses the sound generator; and,

d) removing the ball from the mold and withdrawing the rod member from the ball so as to leave a passage extending through the ball to the sound generator.

5,203,561

VIBRATION DAMPENING HANDLE HAVING METAL PARTICLES AND A VISCUS FLUID

Paul A. Lanctot, 520 Sand Hill Rd., Scotts Valley, Calif. 95062

Filed Apr. 8, 1992, Ser. No. 865,176
Int. Cl.[5] A63B *53/14*
U.S. Cl. 273—81 R **17 Claims**

1. A golf club comprising:

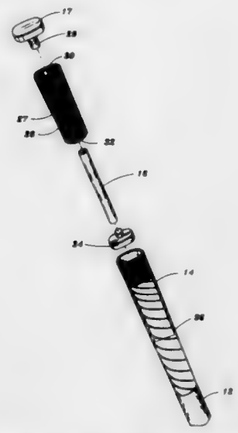
a clubhead, a shaft, and a grip,

a tubular member inserted into said shaft of said golf club, having a first end and a second end, said first end having an opening therein,

a hollow spine member secured within said tubular member,

a plurality of particles interiorly disposed within said tubular member,

a viscous fluid interiorly situated within said tubular member, and



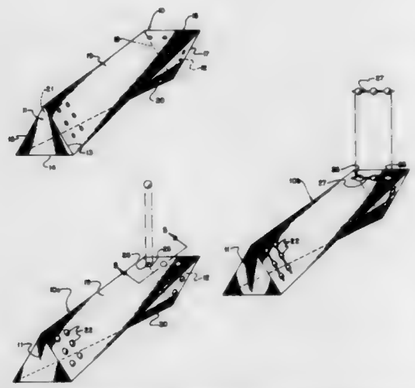
means for sealing said opening in said first end of said tubular member.

5,203,562

DICE CONSTRUCTION

Mark V. Smith, 417 W. Milwaukee, Apt. 3, Janesville, Wis. 53545

Filed Jun. 19, 1992, Ser. No. 900,653
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 **7 Claims**



1. A dice construction, comprising,

a first end wall configured as a first equilateral triangle, and a second end wall configured as a second equilateral triangle, wherein the first end wall includes a first end wall first side, a first end wall second side, and a first end wall third side, and wherein the second end wall includes a second end wall first side, second end wall second side, and a second end wall third side, wherein each side is of an equal predetermined length, and

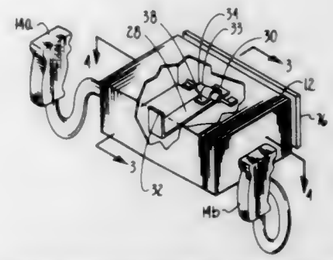
a plurality of arcuate side walls interconnecting the first end wall relative to the second end wall.

5,203,563

SHAKER CONTROL DEVICE

Milton H. Loper, III, Mountain View, Calif., assignor to Atari Games Corporation, Milpitas, Calif.

Filed Mar. 21, 1991, Ser. No. 674,076
Int. Cl.[5] A63B *71/04*
U.S. Cl. 273—148 B **11 Claims**



1. A device for generating simulated environmentally caused vibrations in a steering wheel, which comprises:

a steering wheel;

a frame attached to the steering wheel;

an electric motor mounted on said frame, said motor having a rotor;

an electrical circuit for driving the motor when the vibration is to be simulated;

a first shaft connected to said rotor so as to be rotationally driven by said motor; and

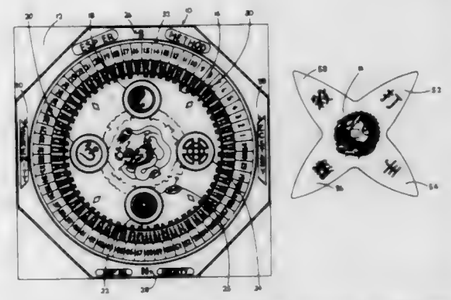
a first weight disposed on said first shaft in a radially asymmetric configuration with respect to the longitudinal axis of the shaft so that the asymmetric weight configuration vibrates the shaft when the shaft is rotationally driven by the motor to thereby simulate environmentally caused vibrations in said steering wheel.

5,203,564

METHODOLOGY BOARD FOR SELECTING GAMING NUMBERS

Carl J. Bruzas, Enumclaw, and Bryant V. Rutherford, Maple Valley, both of Wash., assignors to Carl J. Bruzas, Enumclaw, Wash.

Filed Jun. 6, 1991, Ser. No. 711,159
Int. Cl.[5] A63B *9/00*
U.S. Cl. 273—161 **12 Claims**



1. A methodology device for use in selecting gaming numbers, comprising:

a surface bearing a plurality of individual numbers arranged in a first circular field;

a plurality of four mandala designs positioned on said surface inside said circular field, one of said mandala designs being positioned northerly with respect to the others, and a

second one of said mandala designs being positioned

predetermined sized distance of said circular intermediate

an open concave surface defining an opening through providing the golfer with feedback indicative of body part

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second one of said mandala designs being positioned southerly with respect to the others, and a third one of said mandala designs being positioned westerly with respect to the others, and the fourth mandala being positioned easterly with respect to the others; and

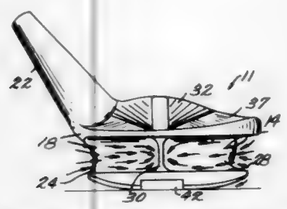
a shirikin device adapted to be laid flatly on said surface within said circular field, said shirikin device having a plurality of pointers for directing a user's attention to certain numbers of said field.

5,203,565

GOLF CLUB HEAD

Tom R. Murray, 1914 Carriage La., Crete, Ill. 60417, and Jack J. Murray, 9800 Olcott Ave., St. John, Ind. 46375

Filed Jan. 22, 1992, Ser. No. 824,223
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—164.1 **15 Claims**



11. A golf club head for striking a golf ball, comprising:

a top part defining a crown, said crown defining a crown area having a slightly V-shaped tapering wedge with a high point near said crown adjacent said top part and extending generally rearwardly away from said front face to substantially zero taper;

a bottom part defining a sole, said sole defining a sole area substantially equal to said crown area;

a front face connecting said crown to said sole;

a hosel extending from said crown and for interfitting said golf club head to a golf club shaft;

a heel defining an area near said hosel and adjacent said front face, said heel connecting said crown to said sole;

a toe defining an area opposite said heel and adjacent said front face, said toe connecting said crown to said sole;

a rear area opposite said front face and between said toe and said heel, said rear area connecting said crown to said sole;

a pair of channels, said first channel extending from said front face through said area defined by said heel, said second channel extending from said front face through said area defined by said toe, said channels ending in said rear area and forming means for aligning said golf club head, said pair of channels causing air to flow substantially unobstructed during movement of said golf club head towards striking the golf ball, and said aligning means during movement of said golf club head toward striking the golf ball nearly eliminating rotational movement of said golf club head by forcing the air passing through said pair of channels to grip said aligning means.

5,203,566

SIMULATED GOLF COURSE

William Ricigliano, 212 Willowick Dr., Naples, Fla. 33942

Filed Nov. 15, 1991, Ser. No. 792,636
Int, Cl.[5] A63B *67/02*
U.S. Cl. 273—176 E **2 Claims**

1. A miniature simulated golf course comprising:

a plurality of fairways with tees and holes for golf balls,

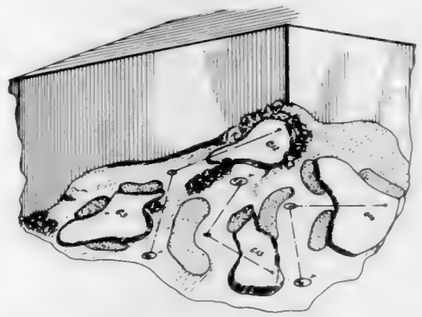
each fairway having a tee-area and a hole, each fairway having at least one circular intermediate target area spaced between each said tee area and each said hole at a substantial distance from each other;

each said circular intermediate target area having a predetermined ratio of a sized diameter directly proportional to a predetermined sized distance of said circular intermediate target area from the tee of its respective said fairway, said ratio of said sized diameter of each said circular intermediate target areas to the respective said distance of said circular intermediate target area from its tee being identical to each ratio for each other of said sized diameters of each other circular intermediate target areas to each other of their respective said distances of said circular intermediate target areas from each other of their respective said tees;

said fairways having greens made of a dense pile fabric material with tufts of short height,

said fairways being made of a pile fabric of intermediate density with tufts of taller height,

said fairways surrounded by interspersed simulated water, sand and rough hazard areas,



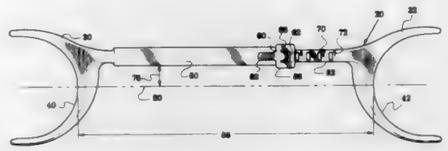
each said simulated water, sand and rough hazard areas comprising a retention means adapted to slow down and capture one of said golf balls, said retention means including a plurality of taller strands of loosely packed pile fabric tufts capable of meshing and converging together upon the application of pressure from the lateral forward movement of said golf ball against said plurality of taller strands of loosely packed pile fabric tufts; each said fairway having a first axial direction from its respective said tee to its respective said circular intermediate target zone and a second axial direction from its respective circular intermediate target zone toward a hole, said first and second axial directions being angled with respect to each other.

5,203,567

GOLF PUTTING TRAINER

Michael D. Erlinger, Lawndale, and Michael F. Abram, Palos Verdes Estates, both of Calif., assignors to Connection Golf Corp., Redondo Bch, Calif.

Filed May 20, 1992, Ser. No. 886,763
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187.2 **14 Claims**



1. A golf putting trainer encouraging active participation of a user thereof, comprising:

a pair of members, each defining, along a first plane thereof, an open concave surface defining an opening through which a user's arm can be received; and

means for supporting said members with each concave surface and the opening thereto facing away from the other in a coplanar spaced relationship with said supporting means spaced from a second plane normal to each first plane and bisecting each concave surface;

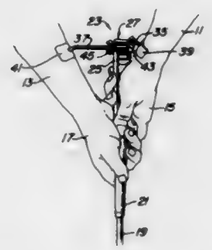
each concave surface thus arranged to receive a different one of a user's arms to hold said putting trainer therebetween for active participation of the user in practicing a putting stroke with said supporting means spaced from the user's chest to avoid interference therewith.

5,203,568

GOLF TRAINING DEVICE

Jose C. Vasquez, 2608 Torrey Pines, Ft. Worth, Tex. 76109

Filed Apr. 3, 1992, Ser. No. 862,880
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187.2 **11 Claims**



1. A golf instructional device for use with a conventional golf club and grip to teach and reinforce the touch and feel of strokes that establish accurate paths of golf balls around the greens, comprising:

a support member adapted to be held against and parallel to the grip of the club for use by a practicing golfer;

a coupler secured to the support member;

a first link with one end connected to the coupler and the other end extending from the coupler a selected distance transversely from support member;

a first arm pad secured to the first link to position one of the golfer's lower arms relative to the grip and club in an unalterable position;

a second link with one end connected to the coupler and the other end extending from the coupler a selected distance transversely from support member and opposite the first link;

a second arm pad secured to the second link to position the other of the golfer's arms relative to the grip and club in an unalterable position.

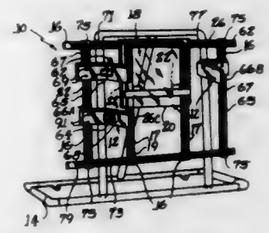
5,203,569

GOLF STANCE TRAINER

John F. Rilling, Roswell, Ga., assignor to Golf research Technology Corporation, Norcross, Ga.

Filed Jan. 16, 1992, Ser. No. 822,185
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187.2 **16 Claims**

1. A golf stance trainer for monitoring a golfer's stance during a golf swing comprising: a superstructure including a stationary support; at least one of means for monitoring buttock positioning, means for monitoring hip positioning, and means for monitoring leg positioning during a golf swing mounted on said support; the means for monitoring comprising an actuation member mounted by a pivot on the support; the actuation member being pivotable by contact with at least one of a buttock, a hip, and a leg of the golfer; a sensor module for providing the golfer with feedback indicative of body part movement when actuated; and the sensor module being responsive to pivoting of the actuation member a predetermined distance with respect to said stationary support.

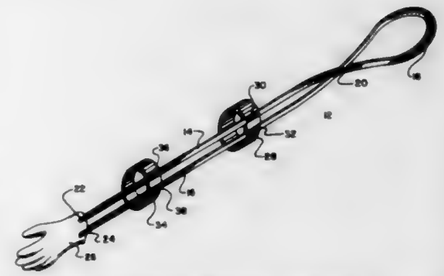


5,203,570

GOLF SWING TRAINING APPARATUS

John Graham, 210 5th St., Queensbury, N.Y. 12804

Filed Jul. 10, 1992, Ser. No. 911,509
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187.2 **12 Claims**



1. A golf swing training apparatus comprising:

a band of elastomeric material having a pair of opposed ends, an intermediate portion between said opposed ends, said intermediate portion having a pair of opposed end points, and a pair of end portions between said intermediate portion and said opposed ends;

wherein said intermediate portion of said elastomeric band is joined at said end points to define an enlarged loop which is dimensioned to fit under an upper portion of a leading arm at an arm pit and over an adjacent shoulder of a golfer;

wherein said pair of end portions are arranged as a pair of substantially parallel legs and extend outwardly from said enlarged loop and terminate at said opposed ends of said band;

trailing hand receiving means attached to said opposed ends of said legs and said band; and

a pair of trailing arm receiving means positioned between said enlarged loop and said trailing hand receiving means, each of said trailing arm receiving means being attached to said parallel legs at longitudinally spaced positions therealong;

so that, in a mounted position on a golfer, said enlarged loop fits under said leading arm at said arm pit, over an adjacent shoulder and partially across the golfer's back, a portion of said legs lies against said back while a remaining portion of said legs lies against a back surface of said trailing arm, and said trailing arm and hand are captured in said pair of trailing arm receiving means and said trailing hand receiving means, respectively.

5,203,571

GAME BOARD

provided with a pair of oppositely disposed strap retaining

a seal clamp including wedging means for forcing said seal-

adjacent to said port mouths and axially between said

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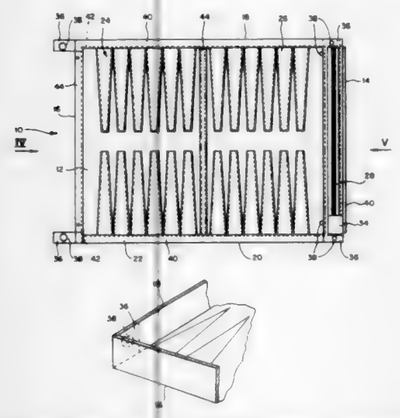
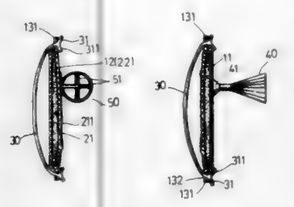
5,203,571
GAME BOARD
Roland Fischer, Aldringenstrasse 11, D 8000 Munich 19, Fed. Rep. of Germany
Filed Jun. 8, 1992, Ser. No. 895,329
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1991, 9107064
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—286 10 Claims



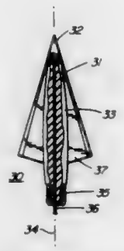
1. A game board made of a flexible material, comprising a first pocket (**28**) for receiving pieces (**30**) is arranged on a first edge (**14**) of the game board (**10**), a plurality of second pockets arranged on the remaining edges (**16**, **18**, **20**) of said game board, said second pockets having openings (**42**) for receiving reinforcing bars (**44**), and a plurality of closing elements and a plurality of corresponding locking elements arranged at the respective ends of the edges (**14**, **16**, **18**, **20**), wherein when said game board is laid out on a flat horizontal surface and when said closing elements engage with their corresponding locking elements the edges and their said respective reinforcing bars are vertically displaced relative to the game board (**10**).

5,203,572
TARGET FOR SUCTION CUP AND HOOK-AND-LOOP PROJECTILES
Poh-Weei Lirn, No. 32, Alley 37, Lane 267, Sec. 2 Tien-Hsin Rd., Feng-Yuan City, Taichung Hsien, Taiwan
Filed Oct. 29, 1991, Ser. No. 784,373
Int. Cl.[5] A63B *67/00*
U.S. Cl. 273—344 3 Claims



1. A target for catching a first projectile having a suction cup on one end and a second projectile having VELCRO hook and loop fastening material provided thereon, comprising:
a pan member confining a receiving space and having a closed side provided with a flat suction surface to which said suction cup of said first projectile can releasably adhere and an opposite open side to access said receiving space, said pan member further having a peripheral wall provided with a pair of oppositely disposed strap retaining means;
an elastic foam layer provided in said receiving space;
an adhesion surface including a textile sheet having a periphery sealed to said peripheral wall of said pan member so as to cover said open side of said pan member, and a hairy outer surface to which said VELCRO hook and loop fastening material of said second projectile can releasably adhere; and
a flexible strap having two ends, each being provided with an anchor means to releasably engage said strap retaining means of said pan member.

5,203,573
BALLISTIC ARROW TIP
Larry D. Brailean, Regina, Canada, assignor to Michael M. Sakovich, Ottawa, Canada
Filed May 18, 1992, Ser. No. 884,944
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—422 21 Claims

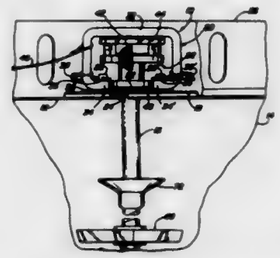


1. A ballistic arrow with radio locating means, comprising:
a shaft having a leading end, a body portion adapted to retainably mount a radio frequency transmitter, a fletched trailing end terminated in a nock, and a first antenna element operably connectable to the transmitter; and
a composite arrowhead adapted to retainably engage the leading end of the shaft, the arrowhead comprising the combination of a dielectric portion of low density and an electrically conductive coating of small mass deposited on at least a part of the dielectric portion and being operably connectable to the transmitter as a second antenna element for effectively radiating a signal therefrom, whereby the combination imparts durability to the arrowhead and effects an overall weight reduction to achieve a flatter trajectory and increased flight range for the arrow.

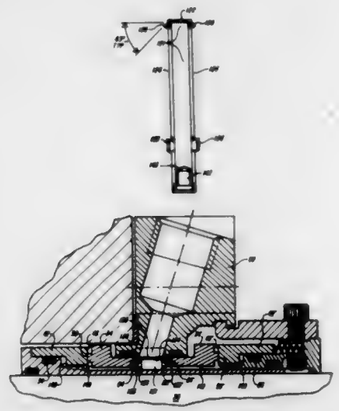
5,203,574
LIQUID TRANSPORTING AND MIXING CONTAINER
George P. Stolzenfeld, 9465 Deerpark Ct., Fenton, Mich. 48430
Continuation of Ser. No. 666,346, Mar. 8, 1991, Pat. No. 5,102,151. This application Feb. 14, 1992, Ser. No. 837,371
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] F16J *15/06*; B01F *7/00*
U.S. Cl. 277—6 4 Claims

1. Apparatus for preventing liquid leakage around a rotatable shaft extending into a container of liquid, said apparatus comprising:
a rotatable shaft extending through a wall of said container, said wall having a first sealing surface on the outside thereof,
a collar mounted on said shaft for rotation therewith outside said wall and having a second sealing surface for engaging said first sealing surface,

a seal clamp including wedging means for forcing said sealing surfaces together when said wedging means is tightened and for allowing axial movement of said shaft when said wedging means is disengaged.

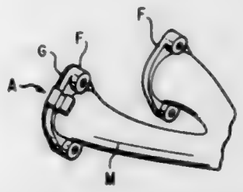


5,203,575
BALANCED MECHANICAL SEAL ASSEMBLY AND FLOW RING THEREFOR
Henri V. Azibert, Windham; Margaret B. Willbrant, Derry, both of N.H., and Ann T. Attenasio, Revere, Mass., assignors to AWChesterton Company, Stoneham, Mass.
Continuation-in-part of Ser. No. 619,207, Nov. 28, 1990. This application Oct. 18, 1991, Ser. No. 779,104
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—59 25 Claims



1. A double mechanical seal assembly having a gland for fixed attachment to the housing of equipment having a rotary shaft means, the shaft means comprising a shaft which is subject to endplay and fluid-flow acceleration vanes associated with said shaft, said gland having an interior surface for non-rotatably receiving a pair of annular primary seal members having seal faces which mate with a respective seal face of a second pair of annular primary seal members which are non-rotatably mounted to said shaft means, said primary seal members forming two pairs of mated seal faces defining a sealed barrier-fluid environment, a first pair of said mated seal faces sealing process fluid along said shaft means in a process-fluid environment, said gland having a pair of ports extending radially therethrough and each port having a mouth located for opening into said barrier-fluid environment adjacent to said vanes for providing barrier-fluid flow thereat in the direction of rotation of said shaft means when said gland is mounted to said equipment concentrically to said shaft, the seal comprising
an axially floating, annular flow ring having an outer circumferential surface for mounting to said gland interior adjacent to said port mouths and axially between said primary seal members associated with said gland, the interior of said floating ring comprising an obstructed flow channel,
said floating ring having sidewalls extending radially inwardly to the inner diameter of said floating ring, said flow channel defined along an inner circumferential surface of said floating ring axially located between said sidewalls,
said floating ring further comprising a pair of passages extending radially through said outer and inner circumferential surfaces, said ring interior further including a dam located between said passages, said dam blocking fluid flow between said passages in a first rotational direction in said flow channel, said passages floatingly communicating with ones of said gland port mouths to facilitate flow of barrier fluid through said ports, passages, and flow channel, in a second rotational direction, and
mounting means for non-rotatably mounting said floating ring and said primary seal members associated with said gland to said gland, said mounting means permitting axial travel of said gland-mounted primary members and said floating ring to accommodate axial shifting of said shaft means while sealing barrier fluid flow in said barrier-fluid environment, whereby said axial travel of said floating ring maintains said flow channel located adjacent to said vanes regardless of shaft endplay while said mated seal faces remain mated.

5,203,576
CLIP FOR A GASKET
Yoshio Miyaoh; Yoshio Yamada, and Susumu Inamura, all of Tokyo, Japan, assignors to Ishikawa Gasket Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 775,529, Oct. 15, 1991. This application Dec. 2, 1991, Ser. No. 801,348
Claims priority, application Japan, Dec. 13, 1990, 2-400547[U]
Int. Cl.[5] F16J *15/10*
U.S. Cl. 277—235 B 11 Claims



1. A clip adapted to attach a gasket with an edge portion to a gasket attaching portion of an engine part, comprising:
an elongated body having a first end portion and a second end portion located away from the first end portion, said body having a width and a resiliency,
a projection integrally formed with the body at the first end portion of the body, said projection extending substantially perpendicularly to the body and having a width substantially the same as in the elongated body, and
an engaging portion integrally formed with the body at the second end portion and having a width substantially the same as in the elongated body, said engaging portion extending in the same direction as in the projection so that when the gasket is attached to the gasket attaching portion, the projection engages a part of the edge of the gasket and the engaging portion engages the gasket attaching portion to thereby hold the gasket to the gasket attaching portion.

5,203,577

the cart, and at least one rack carried by the frame, the

a pair of wheels, one of said pair of wheels being perpendicu-

support wheels for selectively actuating one of three modes, the suspension means including a generally verti-

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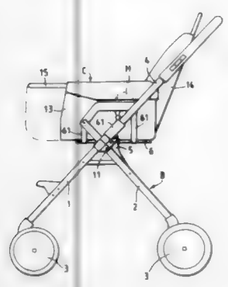
5,203,577

MECHANISM FOR HOLDING SEATING UNIT OF BABY CARRIAGE ENGAGEMENT

Hitoshi Kato, and Yuuichi Arai, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 732,291
Claims priority, application Japan, Jul. 20, 1990, 2-76605[U]
Int. Cl.[5] B62B 7/14
U.S. Cl. 280—30 15 Claims



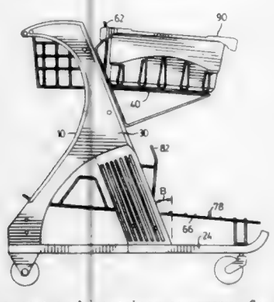
1. A baby carriage comprising:
a seating unit for holding a baby;
a body portion for supporting said seating unit, said body portion including a plurality of wheels; and
engagement means, coupled to said seating unit and said body portion, for releasably coupling said seating unit to said body portion, said engagement means comprising a body having a fitting notch for receiving an engagement jut, an engagement/disengagement lever pivotally coupled to said body, and a stopper movably attached to a side of said body, said stopper movable along the fitting notch, and to a position which prevents pivotal motion of said engagement/disengagement lever in a first direction.

5,203,578

SHOPPING CART AND CONTAINER APPARATUS

Michael B. Davidson; Joseph P. Jackman; Cameron G. Whitworth, and Harold Braul, all of Toronto, Canada, assignors to In-Store Products Limited, Ontario, Canada

Filed Nov. 12, 1991, Ser. No. 790,056
Int. Cl.[5] B62D 39/00
U.S. Cl. 280—33.991 26 Claims



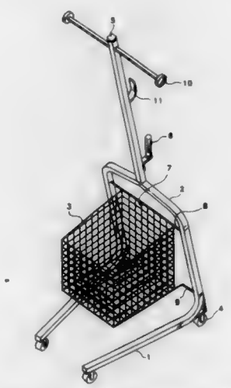
1. Shopping cart and container apparatus for transporting merchandise within and to and from a store, comprising:
(a) a plurality of containers dimensioned for containing merchandise, wherein the containers comprise a bottom, two paris of opposed walls extending upwardly form the bottom to provide an open top, and a lip extending from the upper edges of the walls,
(b) cart means for transporting the containers, comprising an elongated wheeled base, a frame extending upwardly form the base, handle means coupled to the frame for handling the cart, and at least one rack carried by the frame, the rack including shelving means extending laterally outwardly from the frame for supporting at least one of the containers at the bottom thereof,
(c) securing means associated with the rack and containers for releasably securing the containers to the shelving means, wherein the securing means comprises at least one pin extending generally upwardly from the rack, and
(d) wherein the securing means comprises at least one aperture in the lip of the container dimensioned to mate with the at least one pin.

5,203,579

SHOP E Z CART

Sarah Lipschitz, 2021 84 St., Apt. 5D, Brooklyn, N.Y. 11214

Filed Oct. 3, 1991, Ser. No. 770,363
Int. Cl.[5] B62B 3/00
U.S. Cl. 280—33.991 3 Claims



1. A shopping cart for the temporary storing of clothing comprising: base portion of substantially U shaped construction having two ends and a curved central portion connecting said ends, said U shape laying along two planes, said ends lying in a first plane and said curved portion lying in a second plane perpendicular to said first plane, said ends having roller means for movement, storage compartment in connection with said curved portion, said storage compartment having bottom wall, back and front walls and two side walls, said back wall located below said second portion of said U shape and about co-planar with said second plane, said back wall capable of pivoting upward so as to allow a plurality of said carts to nest alongside one another, said ends being slightly angled so as to facilitate nesting with other said carts, said cart having a handle portion in connection with said curved portion at about near the center of said curved portion, said handle having a T-shaped portion near said top end.

5,203,580

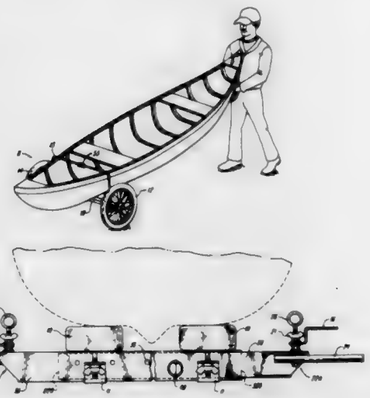
CANOE TOTER WITH WHEEL STABILIZERS

Brian J. Cunningham, 60 Summer Sr., Hanover, Mass. 02339

Filed Aug. 14, 1991, Ser. No. 745,010
Int. Cl.[5] B62B 1/00, 5/00
U.S. Cl. 280—47.331 17 Claims

1. An apparatus for manually transporting a marine craft having a width and a bottom surface, said apparatus comprising:
an axle, having a length, a longitudinal axis, a first and second end and a top surface against which said marine craft rests;
means for adjusting said axle length to accommodate said marine craft width;

a pair of wheels, one of said pair of wheels being perpendicularly and rotatably mounted on said first axle end and the other of said pair of wheels being perpendicularly and rotatably mounted on said second axle end;
stabilizing means, coupled to said axle, for preventing the rotation of at least one of said pair of wheels about the respective axle end to which said one wheel is mounted, said stabilizing means comprising a tongue rotatably



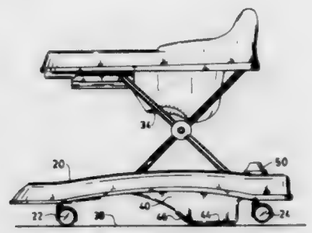
mounted on a pivot, said pivot being located on said axle axis and extending perpendicularly thereto, fastener means for frictionally holding said tongue in selective engagement with said at least one wheel whereby when said fastening means is loosened, said tongue is allowed to rotate about said pivot and disengage from said at least one wheel; and
securing means, coupled to said axle, for receiving and securing said marine craft adjacent said axle top surface.

5,203,581

BABY WALKER

Mark D. Jankowski, Cleveland, Ohio, assignor to Fisher-Price, Inc., East Aurora, N.Y.

Filed Aug. 6, 1991, Ser. No. 741,111
Int. Cl.[5] F62B 7/00
U.S. Cl. 280—87.051 6 Claims



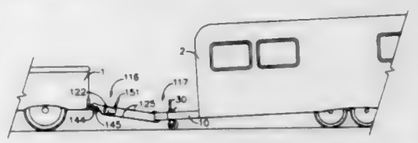
1. A baby walker comprising:
seat means for surrounding a child in a standing position for causing the walker to move with the child, and for supporting the child in a seated position;
friction pad means on the walker for selectively engaging a surface upon which the walker is supported for inhibiting translation of the walker;
a plurality of support wheels on the walker for supporting the walker for rolling translation on the supporting surface;
adjustable suspension means coupled to one or more of the support wheels for selectively actuating one of three modes, the suspension means including a generally vertical stem connected to the wheel for allowing the wheel to move vertically;
a housing surrounding the stem;
spring means on the stem for resiliently biasing the stem to an extended position relative to the housing; and
control means having cooperating surfaces for engaging an end of the stem opposite the wheel for selectively limiting the motion of the stem to actuate one of three modes;
a first mode in which the friction pad means engage the surface substantially continuously for inhibiting translation of the walker;
a second mode in which the walker is movably supported on the wheels when the child is in the standing position and is supported on the friction pad means for inhibiting translation when the child is in the seated position; and
a third mode in which the walker is continuously supported on the wheels for rolling translation over the surface.

5,203,582

SEPARABLE IMPROVED TRAILER TONGUE DEVICES

George M. Smyly, Sr., 1903-B Carlton St., North Charleston, S.C. 29405

Filed Oct. 1, 1991, Ser. No. 767,515
Int. Cl.[5] B60D 1/38
U.S. Cl. 280—477 27 Claims



1. An improved separable trailer tongue of the type having first and second assemblies which are united by a winch means having a cable connected thereto for drawing said assemblies together and means for assuring that said assemblies remain united, said first assembly including a first assembly housing integral with a coupler means for coupling the forward end of said housing to a towing vehicle, said second assembly including second assembly bifurcated bars which are received into said housing by entering an opening at the rear end of said housing, said bars forking internal components of said housing when said bars are within said housing, wherein the improvement comprises:
(a) a prop combined with and fixedly attached within said housing, said prop having said cable also connected thereto;
(b) a brace means for supporting said housing such that said housing is supported slanting downward from said vehicle; said housing being coupled to said vehicle;
(c) an appendage combined with and interposed between said second assembly bars;
(d) a carriage disposed through an aperture of said appendage such that said carriage will slide within said appendage;
(e) a stop means for limiting forward displacement of said carriage within said appendage, said carriage being displaced to a forward position within said appendage; and
(f) a cable receiver means for receiving said cable through the forward end of said carriage, said cable extending from said prop and through the forward end of said carriage and onward to said winch means.

5,203,583

SKI EQUIPPED WITH FRONT MASSES OF INERTIA

a predetermined value changing means for changing a pre-

extension at an angle defined between a line passing through the ends of the beam and a line passing through

tioning the annular filter relatively loosely around the outside of the combustion cup; and,

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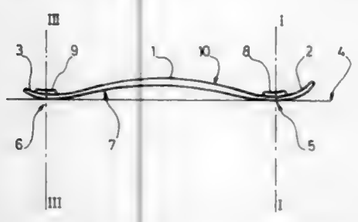
5,203,583

SKI FURNISHED WITH FRONT MASSES OF INERTIA

Maurice LeGrand, and Francois Guers, both of Annecy, France, assignors to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 431,868, Nov. 6, 1989, abandoned. This application Feb. 5, 1992, Ser. No. 829,562
Claims priority, application France, Nov. 7, 1988, 88 15724
Int. Cl.[5] A63C 5/075
U.S. Cl. 280—602 16 Claims



1. A ski having a longitudinal axis, said ski comprising:
a) an upper and lower surface;
b) a front end which is turned upwardly;
c) said lower surface including a contact surface for contacting the ground which is connected to said front end at a front transverse line of contact, the front transverse line of contact being defined at the position at which the unloaded ski contacts a sliding surface, said front transverse line of contact being transverse to said longitudinal axis;
d) said ski having an average density, a discrete front additional mass of inertia being substantially centered about said front transverse line of contact, so that said front additional mass of inertia is distributed on both sides of a vertical plane including said front transverse line of contact, said front additional mass of inertia being non-viscous and having a greater density than said average density of said ski; and
e) said front additional mass of inertia comprising two half-masses, said two half-masses being positioned, respectively, on both sides of a plane passing through said longitudinal axis;
whereby the moment of inertia of the ski is affected by said front additional mass of inertia, both about a vertical axis and a horizontal axis, which is perpendicular to said longitudinal axis.

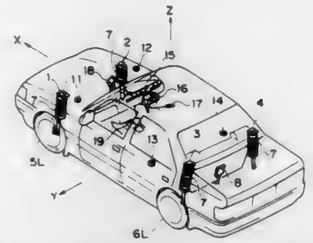
5,203,584

SUSPENSION SYSTEM FOR A VEHICLE

Tetsuro Butsuen; Hiroshi Uchida; Tohru Yoshioka; Yasunori Yamamoto, and Shinichiro Yamashita, all of Hiroshima, Japan, assignors to Mazada Motor Croporation, Japan

Filed Apr. 17, 1991, Ser. No. 686,794
Claims priority, application Japan, Apr. 17, 1990, 2-101082; Apr. 24, 1990, 2-109452
Int. Cl.[5] B60G 11/26
U.S. Cl. 280---707 8 Claims

1. A suspension system for a vehicle comprising:
a shock absorber, having a variable damping force characteristic, provided between a sprung member and an unsprung member;
a judging means for judging in which direction damping force of said shock absorber is acting with respect to vertical oscillation of said sprung member, either in oscillation-stimulating direction or in oscillation-restraining direction and for judging size of the damping force;
a control means for controlling the damping force characteristic in such a way that if a judging function is more than a predetermined value, the damping force characteristic is set higher and if the judging function is less than the predetermined value, the damping force characteristic is set lower;
a predetermined value changing means for changing a predetermined value according to road surface;
an absolute speed detecting means for detecting absolute speed of either said sprung member or said unsprung member;
a relative speed detecting means for detecting relative speed between said sprung member and said unsprung member; and



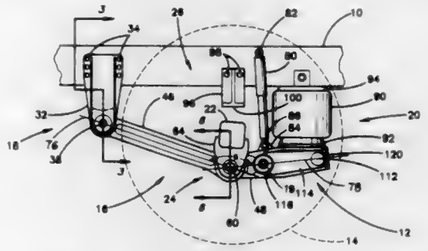
said judging means receives signals from said absolute speed detecting means and said relative speed detecting means and calculates a product which is the absolute speed of either said sprung member or of said unsprung member, multiplied by the relative speed between the sprung member and the unsprung member in order to judge in which direction the damping force of said shock absorber is acting, either in oscillation-stimulating direction or in oscillation-restraining direction, and to judge size of the damping force.

5,203,585

SPLIT-BEAM SUSPENSION SYSTEM

William C. Pierce, Muskegon, Mich., assignor to Neway Corp., Muskegon, Mich.

Filed Jul. 12, 1991, Ser. No. 729,498
Int. Cl.[5] B60G 7/00
U.S. Cl. 280—713 38 Claims



1. A trailing arm for a vehicle trailing arm suspension, said suspension being adapted to support an axle carrying ground-engaging wheels, and having a bracket mounted to a vehicle frame and an air spring suspended from the vehicle frame rearwardly of the bracket, the trailing arm comprising:
a beam and a beam extension;
an axle bracket mounted to the beam for supporting the axle;
said beam having a first end and a second end, the first end being adapted to be pivotably connected to the bracket, the second end having a first connection surface;
said beam extension being elongated and having an inner end and an outer end, the outer end being adapted to support the air spring, the inner end having a second connection surface rigidly attached to the first connection surface in a position wherein the outer end extends generally rearwardly of the inner end when the trailing arm is mounted to a vehicle and the beam is disposed relative to the beam

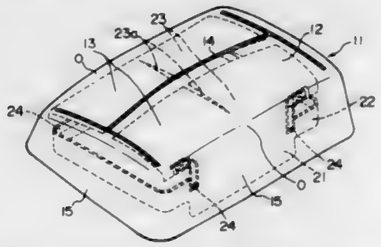
extension at an angle defined between a line passing through the ends of the beam and a line passing through the ends of the beam extension,
one of said first connection surface and said second connection surface being shaped to interface with the other of said first connection surface and said second connection surface in a number of different relative angular relationships while maintaining the outer end generally rearwardly of the inner end whereby the angle is preselected from a range of angles for different vehicles, each vehicle requiring a different angle so that the beam and the beam extension can be rigidly attached to each other to form a trailing arm for any one of said different vehicles.

5,203,586

PAD FOR AIR BAG DEVICE

Minoru Niwa; Shinichi Goto, and Kimio Muramatsu, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 5, 1991, Ser. No. 740,628
Claims priority, application Japan, Aug. 9, 1990, 2-212483
Int. Cl.[5] B60R 21/04
U.S. Cl. 280—728 5 Claims



1. A pad for an air bag device comprising:
an upper wall portion having an openable portion which, upon expansion of an air bag, is separated from a side wall portion of said pad, leaving a hinge portion, and is angularly movable about said hinge portion so as to be opened;
said openable portion including a net insert and a covering layer of a soft material covering said net insert;
said net insert having a free edge remote from said hinge portion; and
a slit formed in said net insert to extend from said free edge toward said hinge portion substantially perpendicularly with respect to said free edge and along at least about one half of a distance from said free edge to said hinge portion thereby to define first and second net insert portions within said openable portion.

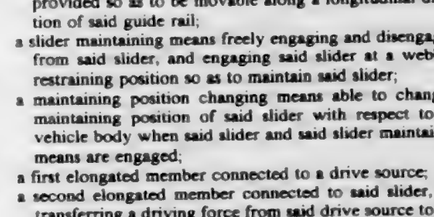
5,203,587

METHOD OF ASSEMBLY OF A COMBUSTION CUP, FILTER, AND DIFFUSER CUP FOR A VEHICLE OCCUPANT RESTRAINT INFLATOR

Conrad M. Novak, and John P. O'Loughlin, both of Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Dec. 18, 1990, Ser. No. 629,218
Int. Cl.[5] B60R 21/26
U.S. Cl. 280—740 10 Claims

1. A method of assembling an inflator for use in inflating a vehicle occupant restraint, said method comprising the steps of:
positioning an annular filter relatively loosely around the outside of a combustion cup;
gripping the combustion cup with the filter by axially compressing the filter to radially contract a surface of the filter so that the filter grips relatively tightly around the outside of the combustion cup after performing said step of positioning the annular filter relatively loosely around the outside of the combustion cup; and,



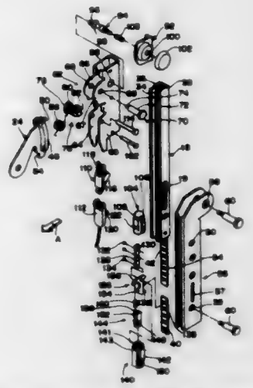
thereafter, positioning the combustion cup and said filter as a unit in a diffuser cup with the filter between the combustion cup and the diffuser cup.

5,203,588

AUTOMATIC SEAT BELT APPARATUS

Yasutaka Watanabe, and Yasuho Kitazawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jun. 3, 1992, Ser. No. 893,088
Claims priority, application Japan, Jun. 14, 1991, 3-044891[U]; Mar. 19, 1992, 4-014811[U]
Int. Cl.[5] B60R 22/06
U.S. Cl. 280—804 21 Claims



1. An automatic seat belt apparatus comprising:
a guide rail mounted on a vehicle body;
a slider to which one end of a webbing is fixed, and which is provided so as to be movable along a longitudinal direction of said guide rail;
a slider maintaining means freely engaging and disengaging from said slider, and engaging said slider at a webbing restraining position so as to maintain said slider;
a maintaining position changing means able to change a maintaining position of said slider with respect to the vehicle body when said slider and said slider maintaining means are engaged;
a first elongated member connected to a drive source;
a second elongated member connected to said slider, and transferring a driving force from said drive source to said slider via said first elongated member;
connecting means for connecting said first elongated member and said second elongated member, said connecting means having a first member, said first member being displaceable between a connected position, at which said first and second elongated members are connected, and a

separated position, at which said first and second elongated members are separated;
aligned with the handle base axis and each of said ears includes an ear lug directed into one of said bores, and

portions of said pages of said stack being positioned in said
a bottom portion, said inner peripheral surface and said bottom portion defining a hollow in which said coupling

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separated position, at which said first and second elongated members are separated;

connecting means maintaining means movable between a first position, at which said first member of said connecting means is maintained at said connected position by said connecting means maintaining means, and a second position, at which said connecting means is movable to said separated position;

urging means for urging said first member of said connecting means in a direction of being displaced to said separated position, and for urging said connecting means maintaining means such that said connecting means maintaining means is positioned at said first position; and

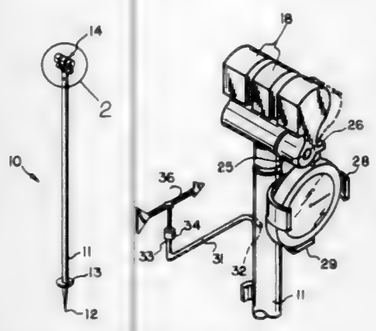
operating means provided in a vicinity of said webbing restraining position, for moving said connecting means maintaining means to said second position against an urging force of said urging means by movement of said slider to said webbing restraining position.

5,203,589

SKI POLE ARRANGEMENT

Richard C. Tio, 87-25 Clover Pl., Jamaica Estates, N.Y. 11423

Filed Apr. 27, 1992, Ser. No. 874,435
Int. Cl.[5] A63C *11/22*
U.S. Cl. 280—816 **2 Claims**



1. A ski pole arrangement, comprising,

a ski pole shaft, the ski pole shaft including a lower conical tip formed at a lower distal end of the shaft, and

an upper distal end of the shaft including a support sphere member coaxially aligned with the shaft, and

a T-shaped handle assembly pivotally mounted to the support sphere, the T-shaped handle assembly including a handle socket receiving the support sphere therewithin, the handle socket orthogonally and medially intersecting a support cylindrical handle base, and

the handle base includes a handle base axis directed through the handle base, with the handle base axis orthogonally oriented relative to the handle socket, and a plurality of spaced grasping lugs integrally mounted to the handle base, with a plurality of the grasping lugs longitudinally aligned about a lug axis, with the lug axis arranged parallel relative to the handle base axis, and

the grasping lugs include spaced parallel slots positioned between adjacent grasping lugs, and

each grasping lug includes a semi-cylindrical rear wall and a planar forward wall, and an arcuate recess is directed into the T-shaped handle between the planar forward wall of each grasping lug and the handle base, and

a cover hood, the cover hood including a cover hood cavity for receiving the T-shaped handle therewithin, and the cover hood including spaced parallel resilient ears projecting below the cover hood, the handle base including handle bores at each distal end of the handle base coaxially aligned with the handle base axis and each of said ears includes an ear lug directed into one of said bores, and

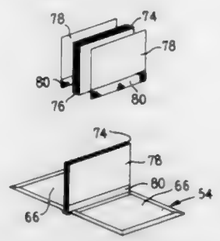
an outermost one of said grasping lugs is pivotally mounted about the handle base axis, and said outermost grasping lug includes an actuator leg fixedly mounted relative to said handle base axis diametrically aligned relative to said handle base axis, and a stop watch mounted to said shaft below said handle, said stop watch including an actuator button, the actuator button arranged adjacent the actuator leg for selective actuation of the actuator button upon pivoting of said outermost grasping lug.

5,203,590

BOUND BOOK WITH REINFORCED FABRIC STRIPS

Rodger Ranson, Winchester, Ill., assignor to Hertzberg-New Method, Inc., Jacksonville, Ill.

Continuation of Ser. No. 606,441, Oct. 31, 1990, abandoned.
This application Mar. 12, 1992, Ser. No. 850,223
Int. Cl.[5] B42C *9/00, 11/00*
U.S. Cl. 281—21.1 **1 Claim**



1. A bound book comprising in combination:

(a) a book cover comprising:

(1) a generally rectangular cover sheet having opposed inner and outer faces and having inwardly foldable flap members defined along perimeter edge portions thereof;

(2) a foldable spine strip with opposed longitudinal sides that is centrally located adjacent said inner face and extends transversely thereacross;

(3) a pair of support boards each located adjacent said inner face and positioned in spaced, adjacent relationship to a different one of said longitudinal sides of said spine strip;

(4) said flap members being folded over adjacent peripheral portions of said spine strip and of each one of said support boards; and

(5) adhesive means bonding said cover sheet and said flaps to said spine strip and to said support boards; so that, in the resulting book cover, said spine strip and adjacent bonded portions of said cover sheet are together definable into a generally U-shaped channel;

(b) a stack comprised of a plurality of adjacent pages, said stack having

(1) a pair of opposed faces,

(2) a straight side at which respective edge portions of each page are generally aligned,

(3) a pair of end sheets, each one being adjacent a different one of said opposed faces and having respective edge portions that extend generally along said side, and each one of said end sheets secured to an adjacent reinforcing fabric strip, each one of said fabric strips extending in alignment along said side and overlapping laterally upon adjacent edge portions of said end sheets, and

(4) stitching means securing together all of said pages, said end sheets and said fabric strips at said respective edge portions in laterally spaced adjacent relationship to said side, said stitching means extending transversely through said pages, said fabric strips and optionally said end sheets;

(c) said side of said stack and said respective adjacent edge portions of said pages of said stack being positioned in said U-shaped channel so that the interrelationship between said channel and said stack is such that said channel extends around said side and said respective adjacent edge portions and over said stitching;

(d) each one of said end sheets and said adjacent said fabric strip being outwardly folded into adjacent relationship with a different one of each of said support boards; and

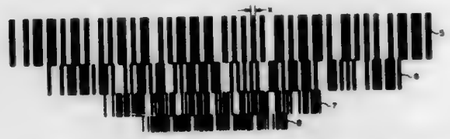
(e) adhesive means bonding each of said end sheets and said adjacent fabric strips to its adjacent said support board, thereby bind said stack to said book cover.

5,203,591

MULTICODE BARCODE LABEL

Douglas H. Treat, Concord, N.H., assignor to Compatype, Inc., St. Paul, Minn.

Filed Sep. 28, 1992, Ser. No. 952,052
Int. Cl.[5] B42D *15/10*
U.S. Cl. 283—81 **7 Claims**



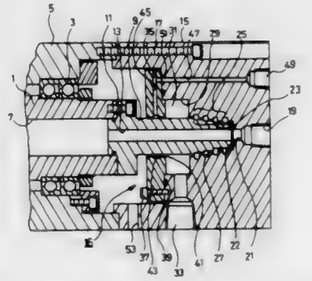
1. A barcode label comprising a carrier surface displaying thereon a single barcode repeated in at least three different densities, said barcodes being arranged vertically adjacent one another wherein each barcode has an overall length and width different from said adjacent barcode thereby providing an optimum reading distance that is different from said adjacent barcode.

5,203,592

FLUID COUPLING DEVICE

Toru Takada, Bisai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 24, 1991, Ser. No. 764,904
Claims priority, application Japan, Nov. 29, 1990, 2-335981
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—14 **13 Claims**



1. A fluid coupling device to be mounted on an apparatus having a rotary shaft, the rotary shaft rotatably mounted in the apparatus, in order to lead a fluid into said rotary shaft, comprising:

a coupling shaft;

means for attaching said coupling shaft to said rotary shaft, said coupling shaft supported through the attachment means by only said rotary shaft and rotated together with said rotary shaft and said coupling shaft formed with a fluid passage extending in an axial direction thereof, said fluid passage opened at both ends of said coupling shaft;

a coupling main body having an inner peripheral surface and a bottom portion, said inner peripheral surface and said bottom portion defining a hollow in which said coupling shaft is inserted in a non-contact state;

said bottom portion of said coupling main body formed with a highly pressurized fluid supply port, said highly pressurized fluid supply port opposing said fluid passage opened at one end of said coupling shaft;

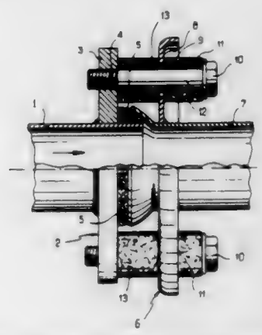
an outer peripheral surface of said coupling shaft and said inner peripheral surface of said coupling main body defining a pressure reduction passage extending from said one end of said coupling shaft toward said rotary shaft, said inner peripheral surface of said coupling main body formed with a pressure reduction chamber communicated with said pressure reduction passage, said coupling main body formed with a drain hole communicated with said pressure reduction chamber and opened at an outer surface of said coupling main body, said outer peripheral surface of said coupling shaft and said inner peripheral surface of said coupling main body defining a minute space positioned on a side of said pressure reduction chamber away from said one end of said coupling shaft, and said coupling main body formed with a compressed air supply passage communicated with said minute space and opened at said outer surface of said coupling main body.

5,203,593

FLEXIBLE EXHAUST COUPLING WITH GASKET CRUSH REDUCING RESILIENT MEMBERS

Louis Brandener, Poissy, France, assignor to Societe Jacques Dubois, Barentin, France

Filed May 22, 1990, Ser. No. 526,707
Claims priority, application France, May 26, 1989, 89 06941
Int. Cl.[5] F16L *55/04*
U.S. Cl. 285—49 **4 Claims**



1. A flexible exhaust coupling comprising a first length of tubing having one end on which is mounted a resilient annular gasket having a convex spherical bearing portion, a first assembly flange associated with the first length of tubing, a second length of tubing terminated by a concave spherical bearing portion facing the convex spherical portion of the resilient annular gasket, a second assembly flange associated with the second length of tubing, and a clamping means, including a first resilient member, disposed to urge the assembly flanges towards each other and to tighten the gasket and resilient means compressibly disposed between the assembly flanges for generating a force opposite to and less than a force generated by the first resilient member so as to reduce the force on the flanges when the clamping means is tightened and avoid crushing of the annular gasket while maintaining the sealing of the coupling.

5,203,594

from said planar first surface at an angle with respect to

said tubular members being of hollow material, having substan-

and a second actuator arm pivotally mounted relative to the control head, and

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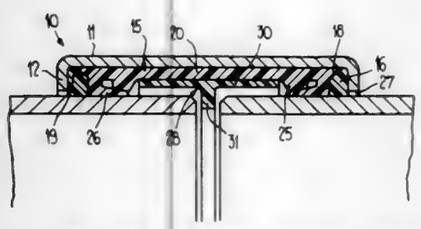
5,203,594

PIPE COUPLING

Immanuel Straub, Wangs, Switzerland, assignor to Straub Federnfabrik, Wangs, Switzerland

Filed Jun. 17, 1991, Ser. No. 716,625
Claims priority, application Switzerland, Jun. 18, 1990, 02025/90
Int. Cl.[5] F16L *17/035*
U.S. Cl. 285—112 21 Claims



1. In a pipe coupling of the type comprising an elastomer sealing sleeve which is approximately C-shaped in cross-section and defines sealing lips which extend toward each other and are each supported on a sleeve web, and annular beads interposed between said lips and said web; a housing which surrounds the sleeve and which defines radial end walls and an axially extending longitudinal gap; a closure comprising tensioning bolts operative to constrict the housing; and an insert sheet which is inserted between the sleeve and the housing and bridges the longitudinal gap; wherein the sealing lips of the sleeve define first, larger dimensions before the housing is constricted and wherein it is possible for said sealing lips to be compressed in the circumferential direction and to be pressed snugly onto a pipe wall due to compression of the annular beads as the housing is constricted; the improvement comprising;

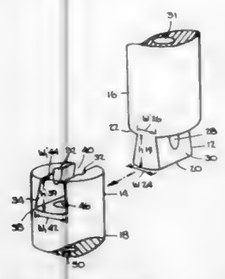
an annular insert which is elastically flexible and constrictable in a circumferential direction as the tensioning bolts constrict the housing but substantially rigid in the axial direction and which in an unconstricted state of the housing is supported with a base part against the sleeve web essentially over the full surface of the sleeve web.

5,203,595

DOVETAIL-TYPE COUPLING DEVICE AND METHOD

Rocco R. Borzone, Emerson; Jay Bichet, Aberdeen, and Thomas F. McCarthy, Neshanic Station, all of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Feb. 2, 1990, Ser. No. 474,421
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—325 13 Claims



12. A coupling device comprising:

(a) a first part having a protrusion extending therefrom, wherein said protrusion is in the form of a dovetail and has a planar first surface and a pair of wall surfaces extending from said planar first surface at an angle with respect to said planar first surface;

(b) a second part having a recess into which recess said protrusion can mate, wherein said recess is in the form of a dovetail recess having a planar second surface and a pair of wall surfaces extending from said planar second surface at an angle with respect to said planar second surface; and

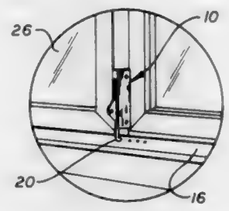
(c) a wedging portion formed from flexible material and situated in a fixed position within said recess such that said wedging portion extends laterally beyond a portion of a wall surface of said protrusion and said recess such that said wedging portion provides an interference between said first part and said second part when said first part and said second part mate together, thus preventing said first part from readily separating from said second part in a lateral direction and thus tightening said first part with respect to said second part in a lateral direction until dissociation is desired.

5,203,596

LOCK ASSEMBLY FOR A SLIDING WINDOW, OR THE LIKE

Larry Stevens, 1400 E. Palm Canyon,, Palm Springs, Calif. 92264

Filed Oct. 1, 1992, Ser. No. 956,689
Int. Cl.[5] E05C *3/04*
U.S. Cl. 292—204 5 Claims



1. In combination a window, which has at least one sliding panel with an inner end and an outer end, and which also has a frame forming a lower track in which the sliding panel may be moved back and forth, said frame having at least one hole therein adjacent to said lower track, said panel being removable from said frame by moving said panel upwardly and out of said track, and a lock assembly for preventing said panel from being moved back and fourth in said frame and for preventing said panel from being moved upwardly out of said track, said lock assembly including: a housing; means for mounted said housing on the inner end of said sliding panel; a lever member pivotally mounted in said housing having an elongated intermediate section extending beyond the confines of the housing and a further having a bent-over end section to be received in said hole in said frame when said panel is moved along said track to a predetermined position in said frame, said lever member being moved angularly between a first position in which said first end section is displaced from said frame and a second position in which said first end section of said lever is received in said hole in the frame to prevent the panel from being moved back and forth in said frame or upwardly out of said track.

5,203,597

UNIVERSAL LOCK

Karl E. Wheelock, 113 Netural Ct., Syracuse, N.Y. 13208

Filed Jun. 25, 1991, Ser. No. 720,958
Int. Cl.[5] E05B *65/52*
U.S. Cl. 292—258 11 Claims

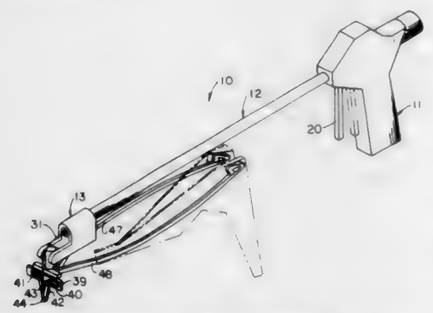
1. A safety attachment for preventing inadvertent opening of the handles of household devices for placing around such devices comprising: first and second tubular members, each of said tubular members being of hollow material, having substantially smooth surfaces, and being bent at about a 90 degree angle to form a side portion and a front portion, said members of dissimilar diameter for telescoping movement, said member of larger diameter having a threaded screw in movable connection with said member of smaller diameter for holding said members tightly together, said threaded screw attached to the front portion of said member of larger diameter, each of said side portions having a strip of frictional material for engaging with the sides of said devices.

5,203,598

WASTE SCOOPER APPARATUS

Karl W. Lindlbauer, P.O. Box 574, Stratton, Vt. 05155

Filed Mar. 9, 1992, Ser. No. 848,074
Int. Cl.[5] A01K *29/00*; E01H *1/12*
U.S. Cl. 294—1.4 4 Claims



1. A waste scooper apparatus, comprising,

an elongate support tube, the support tube including a support tube first end and a support tube second end, the support tube first end including a handle fixedly mounted to the support tube first end at an oblique included angle therebetween, wherein the handle includes a handle chamber, and the handle chamber includes a trigger lever, the trigger lever including a trigger lever pivot axle positioned within the handle chamber at an upper distal end of the trigger lever, and

the support tube including an elongate support tube cylindrical cavity directed coextensively through the support tube, with a slide cylinder slidably received within the cylindrical cavity, the slide cylinder including a slide cylinder rear wall, the slide cylinder rear wall including a trigger cable mounted to the slide cylinder rear wall, and wherein the trigger cable extends interiorly of the handle chamber, and

linkage means mounted to the trigger lever and to the trigger cable to effect retraction of the slide cylinder within the support tube towards the handle upon displacement of the trigger lever towards the handle, and

a control head mounted at the second end of the support tube, with the control head including a first actuator arm and a second actuator arm pivotally mounted relative to the control head, and

a unitary support frame mounted to the first actuator arm and the second actuator arm, and

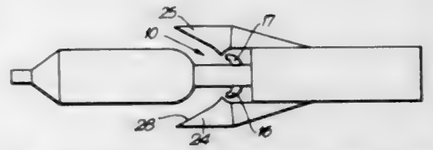
a bag member mounted to the support frame.

5,203,599

GRAPNEL FOR UNDERWATER CABLE

Martin Lewis; Paul Davis, and Mark V. Batten, all of Hants, England, assignors to British Telecommunications public limited company, London, England

Filed Jul. 8, 1991, Ser. No. 725,811
Claims priority, application United Kingdom, Apr. 17, 1991, 9108240
Int. Cl.[5] B63G *7/20*
U.S. Cl. 294—66.1 10 Claims



10. A grapnel for recovering cables from the sea bed by towing the grapnel along the sea bed, said grapnel comprising:

a rotor cable of acquiring and winding a portion of an encountered cable thereon, said rotor being pre-settable prior to a recovery operation to rotate either clockwise or counter-clockwise upon encountering a cable to be recovered; and

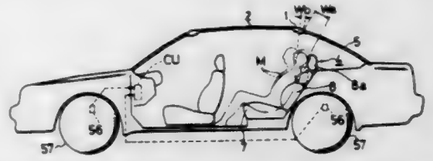
a cable cutting station disposed on each of two opposite sides of said rotor at positions where one said cutting station will engage and cut an acquired cable when the rotor is set for clockwise rotation and the other of said cutting stations will engage and cut an acquired cable when the rotor is set for counter-clockwise rotation.

5,203,600

APPARATUS FOR PROTECTING A REAR PASSENGER FOR AN AUTOMOTIVE VEHICLE

Yasukazu Watanabe; Hidemi Aoki; Masatoshi Takayama; Tadashi Ioka; Katsumi Sakane; Noritaka Sakiyama; Yasunari Hirotani; Naomi Mitani, and Kazuhiro Ushijima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 1, 1991, Ser. No. 723,904
Claims priority, application Japan, Jun. 29, 1990, 2-173262; Jun. 29, 1990, 2-173824; Sep. 27, 1990, 2-258703; Sep. 27, 1990, 2-258704
Int. Cl.[5] B60N *2/22*
U.S. Cl. 296—68.1 12 Claims



1. An apparatus for protecting a passenger seated on a rear seat of an automotive vehicle, said apparatus comprising:

moving means for moving an upper end portion of a seat back section of the rear seat in a forward direction with respect to the automotive vehicle;

detecting means for detecting movement of the automotive vehicle having a vertical component; and

control means for controlling said moving means in accor-

form of at least one bearing for a spindle, said bearing being

tween the left front and rear support members; and a right

of the roof opening on lateral guide rails disposed in a traverse

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control means for controlling said moving means in accordance with said detecting means such that the upper end portion of the seat back is moved forward when movement of the automotive vehicle having a vertical component is detected by the detecting means;

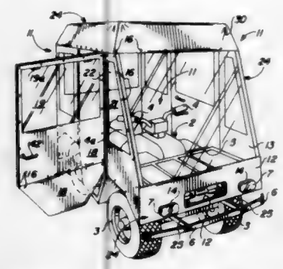
wherein said moving means comprises seat back inclination adjusting means for adjusting an angle of inclination of the seat back, said inclination adjusting means comprising of a first electric motor; and wherein said control means controls the inclination adjusting means such that the angle of inclination of the seat back is made smaller when movement of the automotive vehicle having a vertical component is detected by the detecting means.

5,203,601

FRAME AND COVER FOR WHEELED VEHICLE

Wilmer E. Guillot, Rte. 1, Box 68C, Gilbert, La. 71336

Filed Mar. 26, 1992, Ser. No. 858,035
Int. Cl.[5] B60J *1/04*
U.S. Cl. 296—77.1 **25 Claims**



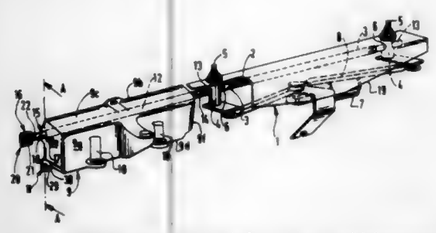
1. In a wheeled vehicle having operating controls and a vehicle frame, the improvement comprising a vehicle top characterized by a bottom frame member rigidly carried by the vehicle frame; floorboard means positioned between front and rear wheels of the vehicle and carried by said bottom frame member; a plurality of upright supports having one end attached to said bottom frame member and the opposite end of each of said upright supports terminating above the vehicle frame; a top frame member carried by said opposite end of said upright supports and flexible cover means extending substantially around said bottom frame member, said upright supports and said top frame member to substantially enclose the wheeled vehicle.

5,203,602

BASE UNIT FOR A WINDSHIELD WIPER ASSEMBLY

Jean-Pierre Eustache, Antony, France, assignor to Valeo Systemes D'Essuyage, Montigny-Le-Bretonneux, France

Filed Jan. 15, 1992, Ser. No. 821,427
Claims priority, application France, Jan. 17, 1991, 91 00500
Int. Cl.[5] B60S *1/26*
U.S. Cl. 296—96.15 **21 Claims**



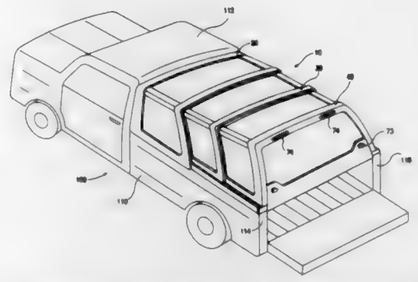
1. A windshield wiper base unit for a motor vehicle comprising a support structure which includes support means in the form of at least one bearing for a spindle, said bearing being carried by at least one bar and at least one liquid receptacle carried by said support structure and means for mounting said unit to a body portion of a vehicle.

5,203,603

TELESCOPIC CAMPER CAP

William E. Hertzberg, Santa Barbara; Michael J. Botich, Ventura, and Mark Murphy, Thousand Oaks, all of Calif., assignors to Zipper Project Incorporation, Santa Barbara, Calif.

Filed Oct. 24, 1988, Ser. No. 261,366
Int. Cl.[5] B60P *7/02*
U.S. Cl. 296—100 **6 Claims**



1. A telescopic cover assembly for a vehicle having a cab section and a load bed section, said load bed section extending rearwardly from the cab section of the vehicle and comprising a front disposed near the cab section and a rear disposed distally from the cab section, a generally rectangular bed, and left and right walls upstanding along left and right sides, respectively, of the bed, as viewed looking from the rear of the load bed section toward the cab section, said cover assembly comprising a fixed cover member which is fixedly mounted atop said walls, at least one movable cover member which is slidably mounted atop said walls, and left and right track assemblies mounted upon said left and right walls, respectively, and into which said at least one movable cover member is slidably engaged, wherein each of said at least one movable cover member comprises:

a frame member having left and right base members disposed opposite each other, each base member having a front end disposed toward the cab section of the vehicle and a rear end disposed toward the rear of the load bed section, said left base member being disposed leftward of said right base member as viewed looking from the rear of the load bed section toward the cab section, left and right front support members extending upwards from the front ends of the left and right base members, respectively, left and right rear support members extending upwards from the rear ends of the left and right base members, respectively, each of the front and rear support members having a top end extending a vertical height above the base members, said vertical height being substantially the same for each support member of the movable cover member, a front roll bar having a left end and right end, the left end of the front roll bar being connected to the top end of the left front support member and the right end of the front roll bar being connected to the top end of the right front support member, and a rear roll bar having a left end and a right end, the left end of the rear roll bar being connected to the top end of the left rear support member and the right end of the rear roll bar being connected to the top end of the right rear support member; a top panel member disposed in a substantially horizontal plane between the front and rear roll bars, said to panel member having a front edge connected to said front roll bar and a rear edge connected to said rear roll bar; a left side panel members disposed in a substantially vertical plane between the left front and rear support members; and a right side panel member disposed in a substantially vertical plane between the right front and rear support members; each of said left and right side panels members a forward edge connected to the left and right front support members, respectively, and each of said left and right side panel members having a rearward edge connected to the left and right rear support members, respectively, the front and rear roll bars each having an outer surface facing upwardly and lying substantially in a horizontal plane, said top panel member having an outer surface facing upwardly and being depressed inwardly from the outer surface of said front and rear roll bars, said front and rear support members each having an outer surface lying substantially in a vertical plane, and each of said left and right side panel members having an outer surface which is depressed inwardly from the outer surface of the front and rear support members to which it is attached;

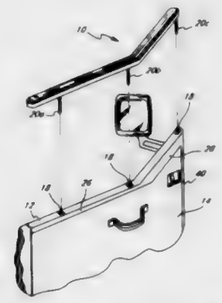
whereby scratching of the top panel member and the left and right side panel members is minimized as each said movable cover member is moved in telescoping relation to other cover members.

5,203,604

CONVERTIBLE AUTOMOBILE REMOVABLE ARMREST

Joseph R. Emley, Jr., 31520 Egan, South Laguna, Calif. 92677

Filed May 6, 1992, Ser. No. 879,970
Int. Cl.[5] B60J *9/00*
U.S. Cl. 296—153 **22 Claims**



1. A removable armrest for use along the upper edge of doors of vehicles having a removable top and having engaging holes along the upper edge of the door, said armrest comprising:

a first substantially horizontal portion;

a second upwardly inclined portion extending longitudinally from said first horizontal portion; and

a plurality of substantially rigid armrest engaging pins extending from a bottom side of the armrest, said engaging pins spaced to fit within the engaging holes along the upper edge of the vehicle door.

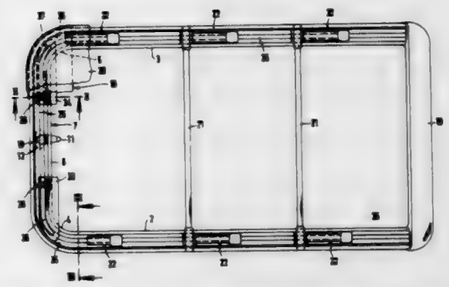
5,203,605

FOLDING ROOF FOR AN AUTOMOBILE

Rainer Grimm, Wetzlar, and Horst Böhm, Frankfurt, both of Fed. Rep. of Germany, assignors to Rockwell Golde GmbH, Fed. Rep. of Germany and Rockwell Golde GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1991, Ser. No. 808,505
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1990, 4042020
Int. Cl.[5] B60J *7/06*
U.S. Cl. 296—219 **4 Claims**

1. A folding roof for an automobile for the optional closure or partial exposure of a roof opening formed in a fixed vehicle roof, comprising a front hood bar, slidably guided at both sides of the roof opening on lateral guide rails disposed in a traverse direction from one another and movable by a drive device, a fixed, rear hood bar and a foldable hood extending between the hood bars, which foldable hood is tightened by the front hood bar on closure, the front hood bar, when the roof is closed, being pressed with its front edge sealed onto the fixed automobile roof, wherein the lateral guide rails are adjoined at the front by curved transitions, which are continued parallel to the front edge of the roof opening and are provided with an upwardly open guide channel, continuous at least partly also along the lateral guide rails, in which guide channel, at each side, an upwardly projecting entraining element having a lower end which is slidably guided and synchronously movable by drive cables, the entraining elements are each force-



transmittingly connected with the front hood bar by a control plate guided slidably in a transverse direction on the front hood bar, upper ends of the entraining elements each engaging longitudinally slidably but axially immovably into a control slit formed in each control plate, which slit, starting from a section, parallel to the front edge of the roof opening, continues into a rearwardly curved section, of which a radius of curvature defined by said slit is larger than a radius of curvature defined by said curved transitions of the guide channel, the control slits are arranged so as to define an upwardly ascending portion extending from said curved section to said section which extends parallel to the front edges of the roof opening, and the control plates bear slidably with their outer ends against wall surfaces of the guide rails corresponding to the curved transitions.

5,203,606

TWO SECTION-BICYCLE SADDLE WITH MOVABLE FRONT SECTION

Artemio Granzotto, Schlieren, Switzerland, assignor to Michele A. Chiarella, Lugano, Switzerland and Giuseppe Bigolin, Rossano Veneto, Italy

Filed Dec. 17, 1990, Ser. No. 628,713
Claims priority, application Switzerland, Jun. 6, 1990, 1894/90
Int. Cl.[5] B60N *2/02*
U.S. Cl. 297—201 **4 Claims**

1. A bicycle saddle, comprising:

(a) a broad rear section with a forward projecting extension having a slot therein;

(b) a front section with a guide arm angled downward and forward; said guide arm slidably engaged in said slot in said extension;

(c) a slide plane at the forward face of said rear section;

(d) a pre-loading means positioned between said front section and said extension for upwardly pre-lading said front

347-149 O.G.-93-8

mate the center of each of said air-filled cells to ventilate

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5,203,609

a first base member constantly engaging the floor;

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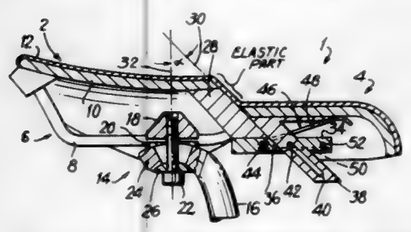
section a position even with said rear section to whereby pressure exerted on said front section causes said guide arm to slide downwardly and forwardly along said slide plane.

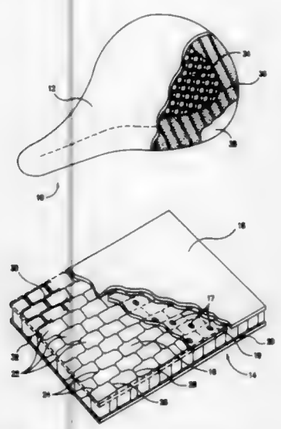


5,203,607

BICYCLE SEAT

Curtis L. Landi, Mountain View, Calif., assignor to Supracor Systems, Inc., Sunnyvale, Calif.

Filed Dec. 11, 1990, Ser. No. 625,501
Int. Cl.[5] B62J *1/18*
U.S. Cl. 297—214 2 Claims



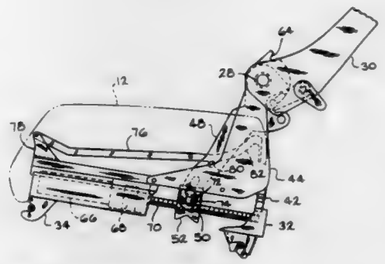
1. An improved bicycle seat comprising:
a rigid shell having means for affixing the shell to a bicycle, said shell having a rear portion and a front portion, said rear portion being wider than said front portion;
a layer of resilient foam disposed atop said rigid shell and having an outline substantially similar to that of said rigid shell;
a honeycomb pad affixed to said resilient foam having a core made from strips of material bonded together to form the walls of a honeycomb-like network of generally hexagonally shaped cells, the walls of said cells each having upper edges and lower edges;
a first sheet of resilient facing material thermal compression bonded to one surface of said core formed by said upper and lower edges, to form a body of singly faced core material;
a second sheet of resilient facing material thermal compression bonded to the unfaced surface of said core to form a body of doubly faced core material wherein air is encapsulated within each of said cells; and
wherein one of said sheets of facing material has a plurality of holes formed therein, said holes being disposed proximate the center of each of said air-filled cells to ventilate said padding.

5,203,608

SEAT ASSEMBLY WITH ARTICULATING CUSHION AND SEAT BACK RECLINER

Omar D. Tame, West Bloomfield, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Feb. 28, 1991, Ser. No. 662,485
Int. Cl.[5] B60N *2/00*
U.S. Cl. 297—320 4 Claims



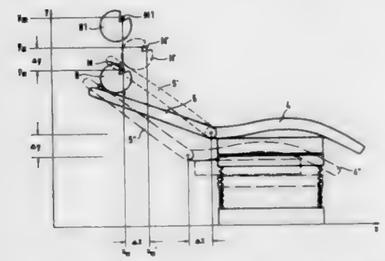
1. A seat assembly comprising:
a support frame;
a seat part having a forward end and a rearward end, said seat part being pivotally mounted to said frame for rotation about a first transverse axis fixed in position relative to said seat part forwardly of said rearward end;
a seat back extending upwardly at the rearward end of said seat part and pivotally mounted to said frame for rotation about a second transverse axis for movement between an upright position and a rearwardly rotated reclined position;
means operatively associated with said seat back and said seat part for rotating said set back between said upright position and said reclined position and for rotating said seat part about said first axis to raise the rearward end of said seat part when said seat back is rotated rearwardly;
said means for rotating including a recliner arm mounted to said support frame for rotation about said second axis and coupled to said seat back for rotation therewith, said recliner arm extending generally downwardly from second axis when said seat back is in said upright position;
drive means mounted to said support frame and coupled to said recliner arm for selectively rotating said recliner arm and for retaining said recliner arm in a selected rotational position whereby said seat back is rotated and retained in said reclined position;
a cam pin extending from said recliner arm with the rearward end of said seat part rearward of said first axis resting upon said cam pin and being supported thereon whereby as said seat back is rotated rearwardly to said reclined position, said cam pin moves in an arcuate path about said second axis from a rear-lower position corresponding to said seat back upright position to forward-raised position corresponding to said seat back reclined position and raises the rearward end of said seat part supported thereon; and
said seat part including a convex cam surface across which said cam pin moves as said recliner arm is rotated, said convex cam surface having a rearward end.

5,203,609

DENTAL PATIENT CHAIR WITH CHANGING PATIENT POSITION WHILE MAINTAINING MOUTH POSITION

Klaus Stoeckl, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 17, 1991, Ser. No. 808,728
Claims priority, application European Pat. Off., Dec. 19, 1990, 90124831.0
Int. Cl.[5] A47C *1/02, 1/06, 1/12*
U.S. Cl. 297—344 18 Claims



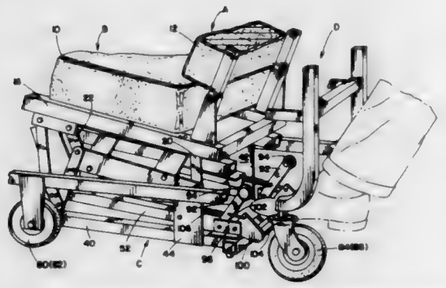
1. A dental patient chair comprising a base part, upper chair parts consisting of a seat, backrest and headrest part, adjustable means for mounting the upper chair parts on the base part and including controllable drive means for varying at least the height adjustment and longitudinal displacement of the upper chair parts relative to the base part, additional adjustment means for adjusting at least the headrest part and the backrest relative to the seat, sensor means for determining the respective actual position of the respective upper chair parts, means for inputting and storing target values corresponding to predetermined positions for a reference point facing toward the headrest part and control means for calculating the amount of change of the actual position of the headrest part from a targeted position and creating drive signals for the adjustment means to obtain the necessary height and longitudinal displacement of the upper seat parts relative to the base part for the purpose of keeping the actual value constant for the input target value of the reference point.

5,203,610

RECLINING LIFT CHAIR HAVING WHEELS FOR TRANSPORT

Robert E. Miller, Deltona, Fla., assignor to Invacare Corporation, Elyria, Ohio

Filed Nov. 14, 1990, Ser. No. 612,793
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—345 11 Claims



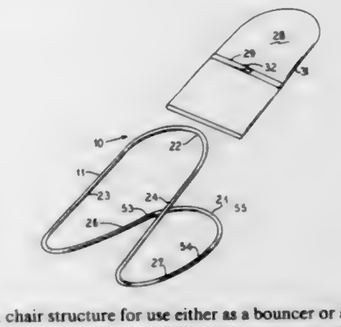
1. A lift chair for raising and lowering an occupant above a floor, the lift chair comprising:
a seat having a seat back and a seat portion;
a first base member constantly engaging the floor;
means for selectively moving the seat relative to the first base member between raised and lowered positions;
a second base member operatively associated with the seat and a portion of the second base member in at least partial engagement with the floor in a seat lowered position; and
manual means for selectively actuating the second base member into full contact with the floor, the actuation of the manual means providing for redistributed and shared support of the seat between the first and second base members, the manual actuating means including a lever operatively associated with the first base member and extending outwardly therefrom for selective engagement with the seat, and the lever being pivotable about a pin for selective retraction away from engagement with the seat.

5,203,611

INFANT BOUNCE AND ROCKING CHAIR

Mark H. Greenwood, Arlington Hts., Ill., assignor to Children On The Go, Inc., Wheeling, Ill.

Filed Oct. 21, 1991, Ser. No. 779,717
Int. Cl.[5] A47C *7/02, 13/10*
U.S. Cl. 297—457 22 Claims



1. A chair structure for use either as a bouncer or as a rocker upon a support surface, said chair structure comprising:
(a) a continuously extending frame member that generally defines the perimeter of said chair structure, said frame member having a pair of transversely spaced, longitudinally extending, generally U-configured side portions, each one of said U-configured side portions including a pair of interconnected arms, the corresponding arms of each one of said arm pairs being in opposed, transversely spaced relationship relative to the other so as to provide first and second pairs of corresponding arms;
said frame member further having a pair of generally transversely extending end portions, each one of said end portions being in opposed, spaced relationship relative to the other, each one of said end portions being interconnected to a terminal region of a different one of said corresponding arms of said first and second arm pairs; and
(b) a seat member comprised of flexible sheet material which is engageable with either one of said first and second arm pairs;
the corresponding arms of said first arm pair having a vertically outwardly curved profile so that, when said first arm pair is engaged with said support surface, said chair structure is rockable; and
the corresponding arms of said second arm pair having a profile such that each one of said corresponding arms includes at least two longitudinally spaced locations that are simultaneously engageable with said support surface when said second arm pair is engaged with said support surface so that, when so engaged, said chair structure is vertically oscillatable.

5,203,615

FULL SIDE SHIFT SYSTEM FOR DETACHABLE

a sump;
an operator driven pump for supplying pressurized fluid in

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5,203,612

CHILD SEATING RESTRAINT SYSTEM

Annette L. Pokrzywinski, 4020 N. 135th St., Brookfield, Wis. 53005

Filed May 21, 1992, Ser. No. 887,214
Int. Cl.[5] A47D *1/10*
U.S. Cl. 297—466 4 Claims

1. A system for restraining a seated child, comprising:
(a) a base member having two elongated curved depressions each being suitable for partially surrounding at least a segment of an horizontally forward extending thigh of a child seated on the base member;
(b) a top member suitable for placement atop the base member and having:
(1) a substantially vertical wall disposed to restrain and support the waist and abdomen area of the seated child; and
(2) two parallel elongated curved vaults extending forward from the wall and disposed, when the top member is properly atop the base member, to align with the curved depressions of the base member in order to form two passageways each of which completely surrounds at least a segment of a thigh of the seated child;
(c) whereby when the top member is properly atop the bottom member they form a pants-like enclosure for the thighs of the seated child and a support for the waist and lower abdomen of the seated child.

5,203,613

RESTRAINING DEVICES COMBINED WITH SUPPORT AND METHOD OF SECUREMENT ADJACENT A CROTCH POST

Susan P. Ward, RR#3 Box 409, 2550 River Rd., Manotick, Ontario, Canada K0A 2N0

Continuation-in-part of Ser. No. 482,759, Feb. 21, 1990, abandoned. This application May 3, 1991, Ser. No. 696,998
Int. Cl.[5] A47D *15/00*
U.S. Cl. 297—485 20 Claims

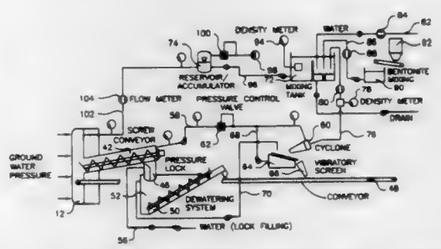
1. A shopping cart having a seating compartment for an infant, said seating compartment formed by a seat, a seat back, opposite sides and a front, said front comprising a horizontal member extending between said sides and a crotch member extending between said seat and a middle of said horizontal member, said crotch member, horizontal member, seat and sides defining openings either side of said crotch member for the legs of an infant seated in the seating compartment, and a pair of shoulder straps attached by their respective first ends to one of said seat back and said horizontal member, said shoulder straps having sufficient length to extend over the shoulders of an infant seated in said seating compartment and attach at their respective other ends to the other said seat back and said horizontal member, crossing at least once, said other ends of said shoulder straps having releasable fastening means for attachment to said other of said seat back and said front horizontal member, said seat, seat back, sides, horizontal member, crotch member, and shoulder straps cooperating, in use, to retain the infant in said seating compartment, said seat, sides, front and seat back preventing egress of the infant in any direction other than upwards, and said shoulder straps preventing egress upwards.

5,203,614

TUNNELING MACHINE HAVING LIQUID BALANCE LOW FLOW SLURRY SYSTEM

Richard J. Robbins; David T. Cass, both of Seattle, and Peter B. Dowden, Kirkland, all of Wash., assignors to The Robbins Company, Kent, Wash.

Filed Jun. 17, 1991, Ser. No. 716,847
Int. Cl.[5] E21D *9/08*
U.S. Cl. 299—33 21 Claims



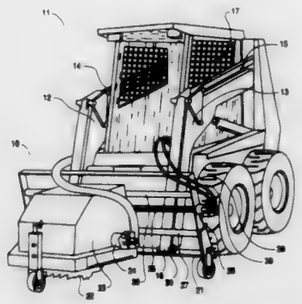
1. In a slurry type tunneling machine having a full face rotary cutterhead with a plurality of cutter units and muck openings therein and a pressurized cutterhead chamber with a removable bulkhead in which slurry is to be maintained by a pressure maintenance system at a pressure sufficient to support the tunnel workface during the tunneling operation, the improvement wherein the pressure maintenance system comprises:
inlet means for delivering makeup slurry to said pressurized cutterhead chamber;
pressurized conveyor means for receiving and withdrawing tunneled material and slurry from said pressurized cutterhead chamber;
pressure lock means receiving the tunneled material and slurry from said pressurized conveyor means and discharging same at substantially atmospheric pressure;
means connected to said pressure lock means for processing the tunneled material and slurry discharged from said pressure lock means and acting to seperate and discharge most of the tunneled material solids to conveyor means for removal from the tunnel;
means including reservoir-accumulator means for recycling essentially all of the liquid discharged from said means for processing tunneled material and slurry to the pressurized cutterhead chamber, with slurry makeup as necessary, in a manner maintaining the pressure in said chamber, and consequently the pressure at the tunnel workface, sufficient to support the workface; and
second conveyor means adapted to be inserted into the cutterhead chamber upon removal of the bulkhead, said second conveyor means being adapted to transport material tunneled from the tunnel work face at substantially atmospheric pressure when the tunnel workface is self-supporting.

5,203,615

FULL SIDE SHIFT SYSTEM FOR DETACHABLE ROTARY APPARATUS

C. Christopher Zanetis, and William J. Bethards, both of Brownsburg, Ind., assignors to Alitec Corporation, Brownsburg, Ind.

Filed Dec. 30, 1991, Ser. No. 815,804
Int. Cl.[5] E01C *23/09*
U.S. Cl. 299—39 16 Claims



1. A rotary apparatus detachably mountable to a self-propelled vehicle, the vehicle comprising a pair of opposing lift arms each outwardly adjacent to one of a pair of opposite sides of the vehicle, said lift arms being swingable up and down in unison and projecting forward to have front ends in front of a front end of the vehicle, and each of the lift arms comprising attachment means providing for removable mounting of the apparatus to the arms, the apparatus comprising:
a frame comprising a horizontal member and first and second vertical side frame members;
means located on the frame for attaching the apparatus to the lift arms;
the vertical side frame members each having a front edge and an inner side edge;
an axially rotatably work implement having front and rear peripheries and left side and right side peripheries;
a housing having an opened bottom partially enclosing the axially rotatable work implement;
means supporting the work implement from the first and second vertical side frame members such that the front, rear, left, and right peripheries may extend beyond the front edges of the vertical side frame members;
at least one ground engaging member extending from the apparatus for controlling the cutting depth of the work implement; and
means for shifting the position of the work implement with respect to the frame members in a direction parallel to a line between the first and second vertical side frame members,
such that one of the side peripheries of the work implement may extend beyond the side edge of the first vertical side frame member.

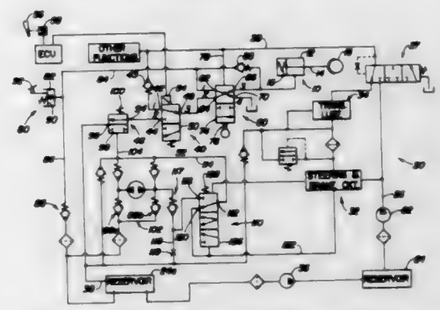
5,203,616

ELECTROHYDRAULIC PARKING BRAKE CONTROL SYSTEM

Douglas R. Johnson, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 21, 1992, Ser. No. 822,766
Int. Cl.[5] B60T *13/16*; F16D *65/24*
U.S. Cl. 303—10 13 Claims

1. In a brake system having a spring-applied, pressure-released parking brake having a release chamber, a control system for controlling operation of the parking brake, the control system comprising:
an engine driven pump for supplying pressurized fluid;
a sump;
an operator driven pump for supplying pressurized fluid in response to manual operation thereof; and
valve means for controlling communication between the engine driven pump, the sump, the operator driven pump and the release chamber so that the parking brake can be released and applied during normal operation of the engine driven pump and so that the parking brake can be released by operation of the operator driven pump when the engine driven pump is not operating;
the valve means comprising:



a parking brake control valve for normally communicating fluid from the engine driven pump to the release chamber and for communicating the release chamber with the sump in response to an operator produced signal;
a tow control valve for selectively permitting and preventing the operator driven pump supplying pressurized fluid to the release chamber, and for controlling communication between the release chamber and the engine driven pump; and
a transport valve for preventing engagement of the parking brake when the vehicle is in motion.

5,203,617

ELECTROMAGNETICALLY-ACTUATED 2/2-WAY VALVE, FOR HYDRAULIC MOTOR VEHICLE BRAKE SYSTEMS HAVING AN ANTI-SKID AND TRACTION CONTROL APPARATUS

Werner Wilde, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1991, Ser. No. 789,555
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1991, 4102626
Int. Cl.[5] F15B *13/44*; B60T *8/36*; F16K *31/06*; B60K *28/16*
U.S. Cl. 303—116.2 2 Claims

1. An electromagnetically-actuated multiposition 2/2-way shutoff valve (**15**), for hydraulic motor vehicle brake systems having an anti-skid and traction control apparatus, having a housing (**33**), a longitudinal bore (**35**) in said housing (**33**), an armature (**36**) and a first-closing body (**46**) carried by said armature and movable toward a first valve seat (**59**), a second closing body (**47**), said second closing body having said first valve seat (**59**) thereon for receiving said first closing body thereon, said armature moves said first closing body toward said first valve seat (**59**) counter to the force of a restoring first spring (**43**), a wall (**42**) juxtaposed said first closing body firmly attached within the longitudinal bore (**35**) to the housing (**33**), the wall having a through bore (**54**) through which a portion of said second closing body extends, said through bore like the longitudinal bore (**35**) communicates with a fluid flow connection upstream of said wall (**42**) and a flow connection downstream of said wall (**42**), the wall (**42**), on a side remote from the first closing body (**46**) includes a second valve seat (**55**) through which the through bore (**54**) discharges;

said second valve seat (**55**) is engaged by said second closing body (**47**) which includes an axially extending conduit (**58**)

said storage unit and affixed to said continuous cable on

tilt means connected to said light mast for pivoting said light mast in relation to said platform;

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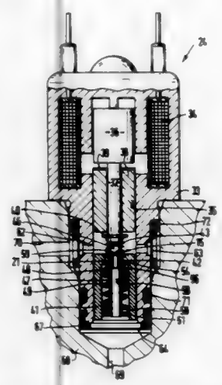
said second valve seat (55) is engaged by said second closing body (47) which includes an axially extending conduit (58) which extends from said first valve seat (59),



the second closing body (47) is supported on the second valve seat (55) under the influence of a bearing force of a restoring second spring (49), and the biasing force of said second spring is greater than a force produced by the armature (36) to close said first closing body.

5,203,618

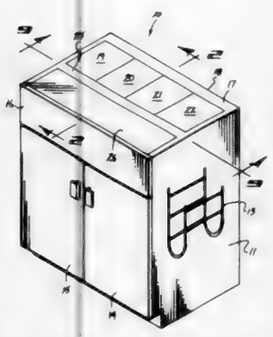
RECYCLING ORGANIZER APPARATUS

William H. Oshall, R.D. 1, Box 51, Fallentimber, Pa. 16639

Filed Jun. 24, 1991, Ser. No. 719,611

Int. Cl.[5] **A47B** *81/00*

U.S. Cl. 312—290 **7 Claims**



1. A recycling organizer apparatus, comprising,

a housing, the housing including a right side wall spaced from and parallel a left side wall, a rear wall, a top wall, a floor, and a front wall defining the housing, the front wall including a respective right and left door pivotally mounted relative to the respective right and left side walls, and

an upper, door plate pivotally mounted to the housing, with the upper door plate extending coextensively between the right side wall and left side wall orthogonally oriented relative to the right side wall and the left side wall, and

a top wall pivot plate pivotally mounted to the top wall, with the top wall pivot plate including a pivot axle directed medially and longitudinally thereof, with the pivot axle oriented orthogonally relative to the right side wall and left side wall and parallel relative to the upper door plate permitting pivoting of the top wall pivot plate relative to the top wall, the top wall pivot plate including a top surface and a bottom surface, the bottom surface including can processing means mounted to the top wall pivot plate bottom surface for permitting the selective grinding and crushing of can members, and

the upper door plate pivotally mounted from a first position coplanar with the front wall extending from the right door and the left door to the top wall, and the upper door plate pivotally displaceable to a second position orthogonally oriented relative to the front wall to permit pivoting of the top wall pivot plate relative to the top wall, and

the top wall further includes a row of pivoting door plates, each pivoting door plate pivotally mounted relative to the top wall, with the top wall including a rear edge defined by an intersection of the rear wall and the top wall, and the row of pivoting door plates hingedly mounted relative to the top wall adjacent the top wall rear edge, and a plurality of bag members, wherein a bag member of said bag members is positioned below a respective pivoting door plate of said pivoting door plates.

5,203,619

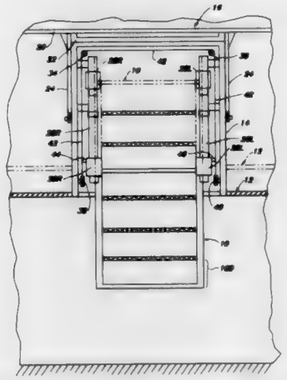
STORAGE SYSTEM INCLUDING A VERTICALLY RETRACTABLE STORAGE UNIT

John H. Welsch, Moscow, and Thomas E. Meacham, Mountaintop, both of Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Nov. 7, 1990, Ser. No. 610,115

Int. Cl.[5] **A47B** *67/02*

U.S. Cl. 312—247 **10 Claims**



1. A storage system for selectably providing access to the space between a suspended ceiling and a support structure thereabove and for storing articles therein, said system comprising:

a frame disposed substantially above said suspended ceiling and secured in position between said suspended ceiling and said support structure;

a storage unit; and

a vertical lifting mechanism disposed substantially above said ceiling and cooperating with said frame rigidly and stably to support said storage unit and to translate said storage unit between a retracted storage position and a lowered access position; said vertical lifting mechanism comprising vertical guide means, vertical guide follower means, lifting means, a plurality of pulleys and a continuous cable reeved about said plurality of pulleys; and vertical guide means being fixed to said frame, said vertical guide follower means being fixed to an upper portion of said storage unit; said lifting means including a pair of lifting pins, and said pulleys guiding said reeved continuous cable in an inverted generally U-shape configuration above said storage unit; said lifting pins being coupled to said storage unit and affixed to said continuous cable on opposite legs of said inverted U-shape, such that reciprocal traveling of said continuous cable about said pulleys causes said lifting means simultaneously and reciprocally to translate in the vertical direction and to translate said storage unit in the vertical direction while maintaining said storage unit in a stable attitude relative to a horizontal plane.

5,203,620

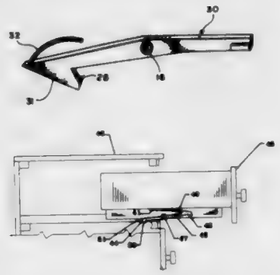
DRAWER GUIDE AND LATCH COMBINATION

Bruce H. McLennan, 933 Hawthorne Dr. NE., Lenoir, N.C. 28645

Continuation-in-part of Ser. No. 737,781, Jul. 30, 1991, abandoned. This application Mar. 25, 1992, Ser. No. 857,480

Int. Cl.[5] **A47B** *88/00*

U.S. Cl. 312—334.46 **15 Claims**



1. A drawer latch for a cabinet comprising: a pawl, said pawl having an elongated body with a front and a rear end, said body defining an axle opening therein, a catch, said catch positioned on the rear end of said pawl, a finger rest, said rest positioned on the front end of said pawl, said rest extending laterally from said pawl for application of manual pressure thereto, said catch comprising a front face and a biased rear face, a resilient member, said resilient member affixed to said elongated body, whereby said pawl will grasp the cabinet as the drawer is opened to prevent accidental complete withdrawal and after selected drawer removal by applying manual pressure to said finger rest, will allow said drawer to be easily reinserted.

5,203,621

ROOF-MOUNTED FLOOD LIGHT ASSEMBLY

Roger Weinmeister, Ft. Collins, and Donald Weinmeister, Windsor, both of Colo., assignors to Super Vacuum Manfacturing Co., Inc., Loveland, Colo.

Filed Apr. 10, 1992, Ser. No. 867,747

Int. Cl.[5] **B60Q** *1/06*

U.S. Cl. 362—66 **2 Claims**

1. A flood light assembly, comprising:

a base adapted for mounting on the top of a vehicle;

a platform;

parallelogram lift means connecting said platform to said base in such a manner that said platform is movable through an arc toward and away from said base while maintaining a constant attitude in relation to said base;

an elongated light mast having a proximal end and a distal end, said proximal end of said mast being mounted on said platform in such a manner that it is both rotatable and pivotal in relation to said platform;

tilt means connected to said light mast for pivoting said light mast in relation to said platform;

rotation actuator means in said platform and connected to said tilt means for rotating said tilt means and mast in relation to said platform; and

a light set mounted on the distal end of said light mast.

5,203,622

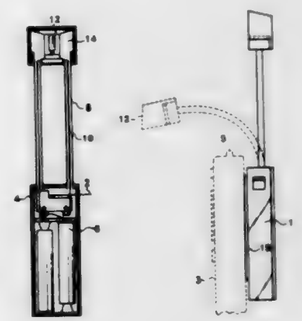
REMOTE CONTROL LIGHTING UNIT

Keith Sottile, 2031 Marina Bay Ct., Las Vegas, Nev. 89117

Filed Mar. 23, 1992, Ser. No. 855,590

Int. Cl.[5] **F21V** *33/00*

U.S. Cl. 362—109 **4 Claims**



1. An illuminated remote control unit comprising: a flat, planar support base having a top surface, an undersurface, a front edge, a back edge and a centerline starting at said front edge and running to said back edge, a bendable support arm in connection with said front edge and extending above said top surface, said arm offset to one side of said centerline, an infrared (IR) emitting device in connection with said top surface and having a front portion having an IR emitter located about near a center of said front portion and in line with said centerline, illuminating means in connection with said support arm for illuminating said IR emitting device, battery-powered electrical source in connection with said illumination means.

5,203,623

SUPPRESSOR FOR MOTOR VEHICLES

an elongated metallic, electrically conductive housing having two ends and an internal chamber;

trance opening and adapted to engage said filter mounting

with said lamp directed to issue light from said opening;

and

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5,203,623

SUN VISOR FOR MOTOR VEHICLES

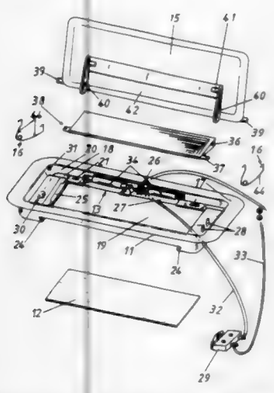
Lothar Viertel, Altforweiler, Fed. Rep. of Germany, and Patrick Welter, La Chambre, France, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1992, Ser. No. 921,309

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1991, 4125185

Int. Cl.[5] **B60Q** *3/02*

U.S. Cl. 362—135 **14 Claims**



1. A sun visor for motor vehicles, comprising:
a sun visor body having a broad side, and a recess formed in the broad side for receiving a mirror assembly;
a mirror assembly installed in the sun visor body recess, the mirror assembly comprising:
a part defining a trough;
a mirror supported on the trough to be viewed from the broad side of the visor body, the mirror having a side edge;
an electrically operated illuminating device above the side edge of the mirror;
a light transmissive light panel which is movable to a covering position where the light panel covers over the illuminating device, such that the light from the illuminating device is transmitted through the light panel;
a swing cover, means at the trough supporting the swing cover to swing into an open position exposing the mirror and the light panel and a closed position
covering and hiding the mirror and the light panel;
the light panel having one location thereon swingably supported on the cover and having another location swingably supported on the trough, such that with the swing cover closed, the light panel is covered by the swing cover and is moved by the swing cover to an uncovering position below the illuminating device, and with the swing cover swung open, the light panel is moved by the swing cover into the covering position to cover over the illuminating device for preventing direct view of the illuminating device while light from the illuminating device is transmitted through the light panel.

5,203,624

HAZARD WARNING DEVICE

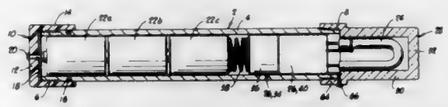
J. Alan Schier, Tujunga, Calif.; Karl G. Thompson, Willowdale, Canada, and Gregg F. Thompson, Dallas, Tex., assignors to G.A. Thompson Company, Inc., Dallas, Tex.

Filed May 7, 1992, Ser. No. 880,055

Int. Cl.[5] **F21L** *7/00*

U.S. Cl. 362—158 **21 Claims**

1. A portable electric warning light, comprising:
an elongated metallic, electrically conductive housing having two ends and an internal chamber;
a plurality of batteries disposed linearly in electrical series within said internal chamber so that a first terminal of said batteries is at one end of said housing and a second terminal of said batteries is intermediate the two ends of said housing;
closure means for fluid tightly closing said one end of said housing and for activating said warning light, said closure means including:
an end cap connected to said housing at said one end thereof so that said end cap is movable between first and second positions relative to said housing;
seal means for providing a fluid tight seal between said end cap and said housing when said end cap is connected to said housing at said second position; and



connecting means for electrically connecting said first terminal of said batteries to said housing when said end cap is connected to said housing at said second position;
a gas discharge flash tube connected to the other end of said housing;
a cover overlying said gas discharge flash tube and connected to said housing at said other end thereof, said cover having a side wall and an end wall both of material which permits passage of visible light therethrough; and
electronic means, connected to said gas discharge flash tube and said housing, for causing said gas discharge flash tube to emit flashes of light visible through said cover when said end cap is connected to said housing at said second position so that said connecting means connects said first terminal of said batteries to said housing, wherein said electronic means includes a flash capacitor disposed in said housing between said batteries and said gas discharge flash tube.

5,203,625

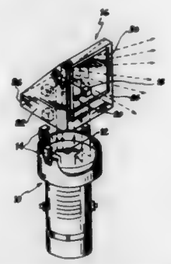
DIFFUSION SYSTEM

Daniel Naum, 1430 Willamette St., Ste. 18, Eugene, Oreg. 97401

Filed Jan. 6, 1992, Ser. No. 817,094

Int. Cl.[5] **F21L** *7/00*

U.S. Cl. 362—202 **1 Claim**



1. Add-on diffuser module attachment for a high-intensity HMI lamp having a light source within a light casing and having spaced filter mounting supports extending from said casing, said diffuser module attachment comprising:
(a) a housing having a light entrance opening and a light exit opening approximately 90° from said entrance opening and spaced screw mounts position about said light entrance opening and adapted to engage said filter mounting supports to mount said housing to the casing of a high-intensity lamp;
(b) said housing defining a primary reflecting surface at an angle of on the order of 45° between said light entrance opening and said light exit opening; and
(c) substantially the complete interior surface of said enclosure including all of said primary reflective surface having a coating of highly diffusive material comprising on the order of 95% barium sulfate thereon such that light form a high-intensity lamp to which said housing is mounted will be diffused and integrated and exit through said opening as high-intensity lambertian light.

5,203,626

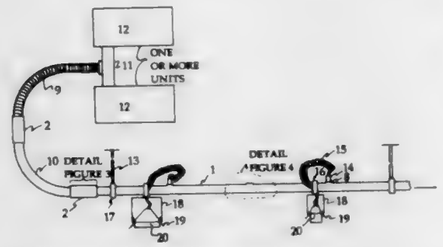
LOW VOLTAGE POWER DISTRIBUTION AND LIGHTING SYSTEM

Wade Clement, 460 Brannan, San Francisco, Calif. 94107

Filed Jun. 4, 1991, Ser. No. 710,066

Int. Cl.[5] **F21V** *21/14*

U.S. Cl. 362—250 **20 Claims**



1. A distributed lighting system, including;
at least one tubular support member;
conductor means secured within said at least one tubular member and connected to an electrical power source;
a plurality of power connector receptacles secured in said at least one tubular member and opening outwardly therefrom, said plurality of power connector receptacles being connected to said conductor means, said plurality of power connector receptacles being spaced apart along said at least one tubular member;
a plurality of lamp holder fixtures, each including an electrical lamp;
each of said lamp holder fixtures including clamping means for removably securing the respective lamp holder fixture to said at least one tubular member at any location therealong; said clamping means being securable to said at least one tubular member at any rotational angle with respect to the tubular axis of said at least one tubular member;
each of said lamp holder fixtures including extendible cable means for connecting the respective lamp holder fixture to one of said power connector receptacles.

5,203,627

GARDEN LAMP HOUSING

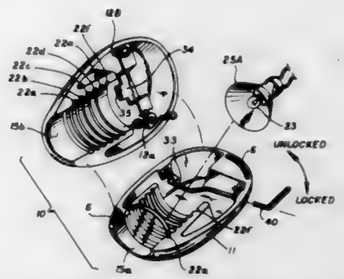
Hiroshi Kira, Westlake Village, Calif., assignor to Lumiere Design & Manufacturing, Inc., Westlake Village, Calif.

Filed May 4, 1992, Ser. No. 877,976

Int. Cl.[5] **F21V** *21/00*

U.S. Cl. 362—374 **12 Claims**

1. A lighting fixture comprising a pair of mating ceramic parts defining an exterior housing, said housing parts including integral lamp and lens holders, and means defining an opening;
means for securing the housing parts together with said integral lamp and lens holders supporting a lamp and lens with said lamp directed to issue light from said opening; and



an additional opening in one of said housing parts for allowing the passage of power leads from the exterior of said housing into the lamp.

5,203,628

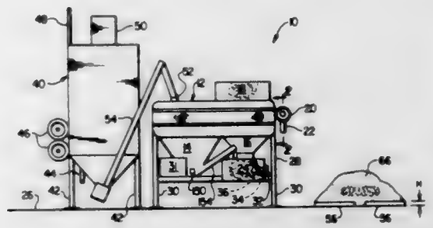
PORTABLE BATCH MIXING APPARATUS FOR CEMENTITIOUS CONSTRUCTION MATERIALS

Alton B. Hamm, Fort Worth, Tex., assignor to Hamm Family Partnership, Ft. Worth, Tex.

Continuation-in-part of Ser. No. 252,379, Sep. 30, 1988, abandoned. This application Jun. 13, 1990, Ser. No. 537,475

Int. Cl.[5] **B01F** *13/10*

U.S. Cl. 366—2 **26 Claims**



9. A method of economically and accurately producing selectively variably sized individual batches of cementitious material at a construction site, said method comprising the steps of:
utilizing a road vehicle to transport a cementitious material mixing machine to the construction site, said mixing machine having:
batch mixer means for receiving cement, sand and water constituents, mixing the received constituents, and discharging the resulting mixture batch for use,
cement hopper means for storing on the machine a dispensable supply of cement,
sand hopper means for storing on the machine a dispensable supply of sand,
control means operative to select a total, selectively variable volume of the cementitious material batch to be mixed and then automatically cause the proportional amounts of cement and sand necessary to form the batch to be mixed to be respectively dispensed into said batch mixer means from said cement hopper means and said sand hopper means;
utilizing the road vehicle to transport a bulk cement storage silo to the construction site, said bulk cement storage silo being sized to hold at least one commercial delivery truckload of cement;
operatively positioning said bulk cement storage silo adja-

cent said mixing machine; depositing an initial quantity of

zone which subtends a sector of about 100° between radial lines

means for continuously chopping said electrical signals between each generated pulse during said M revolutions

top panel are attached at points equidistant from the seams connecting the side panels to the elongate panel; and

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cent said mixing machine; depositing an initial quantity of cement in said bulk cement storage silo;
interconnecting conveyor means between said bulk cement storage silo and said cement hopper means, said conveyor means being selectively operable to transfer cement from said bulk cement storage silo into said cement hopper means;
respectively depositing initial dispensable quantities of cement and sand into said cement hopper means and said sand hopper means;
operating said control means and said batch mixer means to produce and discharge separate batches of cementitious material;
periodically operating said conveyor means to replenish the dispensable supply of cement within said cement hopper means; and
periodically deposit full commercial delivery truckloads of cement into said bulk cement storage silo to replenish its stored supply of cement.

5,203,629

METHOD FOR MODIFYING CONCRETE PROPERTIES

Stephen A. Valle, Bradford; John E. Sorenson, North Reading, both of Mass.; Robert C. Hegger, Oak Park, and Walter W. Wydra, Itasca, both of Ill., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 563,580, Aug. 7, 1990. This application Apr. 10, 1991, Ser. No. 683,214
Int. Cl.[5] B01F *17/00*
U.S. Cl. 366—2 **11 Claims**

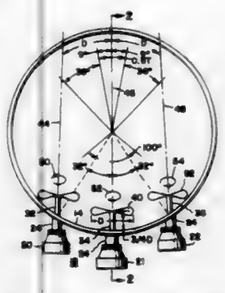
1. A method for modifying the properties of concrete, comprising the steps of:
placing one or more closed non-water-soluble paper packages into a fresh concrete, said packages containing a solid admixture including air-entraining admixtures, air detrainer admixture, accelerating admixture, alkali-reactivity reducer, superplasticizer, pumping aids, water-reducing admixture, corrosion inhibitor, permeability reducer, or mixtures thereof; and
agitating the fresh concrete to cause the packaging material to disintegrate and distribute the admixture relatively uniformly throughout the fresh concrete.

5,203,630

SIDE ENTRY FLUID MIXING

Richard A. Howk, Rochester, N.Y., assignor to General Signal Corp., Rochester, N.Y.

Filed Feb. 6, 1992, Ser. No. 832,144
Int. Cl.[5] B01F *7/06;* **B28C** *5/08*
U.S. Cl. 366—292 **15 Claims**



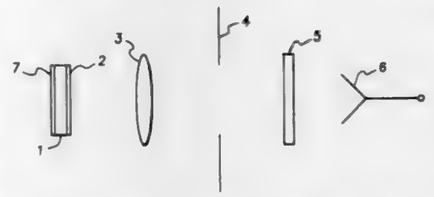
1. A mixing system for circulating and suspending particles in a suspension having at least two phases in a tank having a bottom and a side wall about a center and having first and second interior regions which face each other, which system comprises a cluster comprising a plurality of mixers entering said tank through said side wall in said second region and disposed along said side wall in side-by-side relationship in a zone which subtends a sector of about 100° between radial lines to the center and are symmetrically disposed about a radial line to the center, a first and second of said plurality of mixers being disposed at opposite ends of said cluster and being separated by more than 60° defined between radial lines from said center to said side wall and said second region, said mixers having axial flow impellers and shafts which drive said suspension from said second to said first region, thereby establishing in the tank a circulating flow along the bottom, upwardly along the said wall and said first region and downwardly along said side wall in said second region, and said mixers being in spatial and orientational relationships such that the axes of said impellers do not intersect within the tank and said flow from each of said mixers is in substantially non-interfering relationship along the bottom of said tank between said first and second regions.

5,203,631

NARROW SPECTRAL BAND PYROMETRY

Michelangelo Delfino, Los Altos, and David T. Hodul, Oakland, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 18, 1991, Ser. No. 779,444
Int. Cl.[5] G01J *5/00, 5/58*
U.S. Cl. 374—123 **14 Claims**



1. A pyrometric system for measuring the temperature within a selected temperature range of a thermally radiating object comprising:
(a) a coating placed on said object, said coating being composed of material having an absorption band for attenuating electromagnetic radiation emitted from said object, said material having known emissivity over said temperature range,
(b) focusing means for collecting and focusing electromagnetic radiation emitted by said coated object,
(c) a narrow passband filter in the field of said collected and focused radiation, wherein the passband of said filter lies within said absorption band, and,
(d) a radiation detector for measuring the amount of radiation passing through said filter.

5,203,632

GAS TURBINE PYROMETER FILTERING SYSTEM

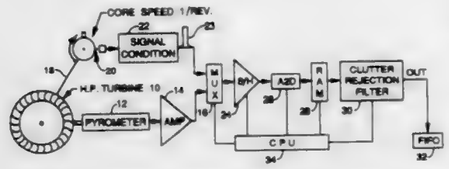
Edward A. Fisher, Cincinnati, and Keith L. Gehring, West Chester, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1992, Ser. No. 874,323
Int. Cl.[5] G01K *13/08;* **G01J** *5/62, 5/08, 5/10*
U.S. Cl. 374—144 **7 Claims**

1. In a system for measuring the temperature of the rotating blades of a turbine in a gas turbine engine, said system including a pyrometer for generating analog electrical signals proportional to the temperature detected at said rotating turbine, said electrical signals containing both desired signals and undesired noise, a system for filtering positively biased undesired noise from said electrical signals, said filtering system comprising:
means for generating a pulse for each of M revolutions of said turbine;

means for continuously chopping said electrical signals between each generated pulse during said M revolutions of said turbine into a plurality of samples;
means for aligning the samples of each of said M revolutions with the samples of the other revolutions;
means for selecting the minimum value from each of said aligned samples; and
means for serially storing said selected samples, said stored samples representing a profile of the temperature of said turbine blades during said M revolutions.

4. A method for measuring the temperature of the rotating blades in a gas turbine engine in the presence of positively biased noise, the steps comprising:



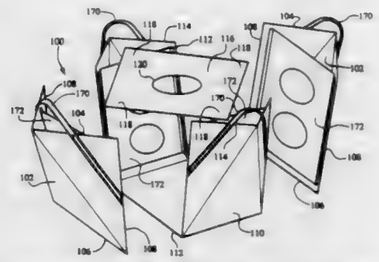
generating electrical signals which are a measure of the temperature of said rotating blades and said positively biased noise;
generating a pulse for each of M revolutions of said gas turbine engine;
continuously chopping said electrical signals between each generated pulse during said M revolutions of said gas turbine engine into a plurality of samples;
aligning the samples of each of said M revolutions with the samples of the other revolutions;
selecting the minimum sample from each of said aligned samples; and
serially storing said selected samples, said stored samples representing a profile of the temperature of said turbine blades during said M revolutions.

5,203,633

SPREAD STRAP FLEXIBLE BULK CONTAINER

Norwin C. Derby, Dallas, Tex., assignor to Super Sack Manufacturing Corporation, Dallas, Tex.

Division of Ser. No. 616,217, Nov. 20, 1990, Pat. No. 5,076,710. This application Sep. 25, 1991, Ser. No. 765,206
Int. Cl.[5] B65D *30/10, 33/06*
U.S. Cl. 383—17 **18 Claims**



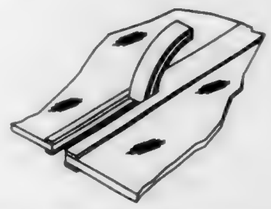
1. A flexible container for receiving, transporting, and storing flowable materials comprising:
two side panels each having four edges;
one elongate panel having a pair of opposed elongate edges and a pair of opposed shorter edges and seamed along the length of said elongate edges to three sides of each of the side panels to form an upwardly open container;
a top panel having four corners and seamed to the remaining edge of each of the side panels and to the opposed shorter edges of the elongate panel such that the corners of the top panel are attached at points equidistant from the seams connecting the side panels to the elongate panel; and
at least one strap having two opposed ends with said opposed ends of the strap attached to the container at adjacent seams connecting a side panel to the elongate panel with a center portion of the strap extending above the top panel to form a loop.

5,203,634

DOUBLE GUIDE STRIP OPENING DEVICE

Myun H. Kim, 42-16 80th St., Apt. 6b, Elmhurst, N.Y. 11373

Continuation of Ser. No. 763,928, Sep. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 538,129, Jun. 14, 1990, Pat. No. 5,054,618, and a continuation-in-part of Ser. No. 543,461, Jun. 25, 1990, Pat. No. 5,050,741, and a continuation-in-part of Ser. No. 695,205, May 3, 1991, abandoned. This application Oct. 9, 1992, Ser. No. 959,168
Int. Cl.[5] B65D *33/00, 27/34*
U.S. Cl. 383—205 **10 Claims**



1. A double guide strip opening device for a container wall, which comprises
(a) said container wall having at least one structure comprised of inner and outer elongated guide strips mounted respectively on internal and external surfaces of said container wall, in generally opposed, at least partially overlapping relation to each other, and extending along a line to be torn,
(b) each of said guide strips having opposite side edges and formed to be relatively non-tearable in the width direction and relatively more tearable in the longitudinal direction,
(c) each of said guide strips forming one or more longitudinally extending tear lines intermediate its side edges,
(d) tear lines of the inner and outer guide strips of said at least one structure being generally aligned in opposed relation in spaced-apart locations to define a tear strip section which is removable along said tear lines,
(e) said tear strip section, when pulled outward with respect to said container wall, being severed from said guide strips along with a section of said container wall,
(f) the remaining portions of said at least one structure, after severing of said tear strip section, forming spaced-apart guide strip edges.

5,203,635

LIGHTWEIGHT STENOGRAPHIC MACHINE WITH SEPARATE AND ADDITIONAL NUMBER KEYS

Kenneth Freedman, 246 Seventh Ave., Brooklyn, N.Y. 11215

Filed Jun. 17, 1991, Ser. No. 716,094
Int. Cl.[5] B41J *3/26*
U.S. Cl. 400—91 **6 Claims**

1. A stenographic machine including a keyboard having a first area containing keys designated for at least some of numerals "1", "2", "3", "4", "5", "6", "7", "8" and "9", a second area containing keys designated for consonant letters, a third

area containing, in order from left to right, keys designated for

when said error detecting means detects an error initially

being axially aligned with the longitudinal axis of the elongated body, 12;

gated groove therein of a constant width and constantly varying depth and with portions of said side face disposed on oppo-

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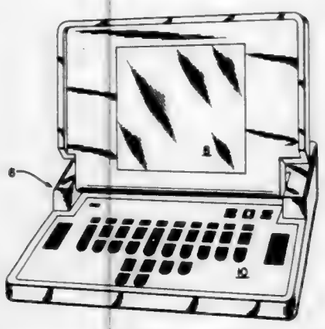
area containing, in order from left to right, keys designated for vowel letters "A", "0", "E" and "U", and a fourth area containing a first additional key designated for numeral "5" and a second additional key designated for numeral "0".



5,203,636

PRINTING APPARATUS CAPABLE OF DISTINGUISHING FUNCTIONING ABNORMALITIES

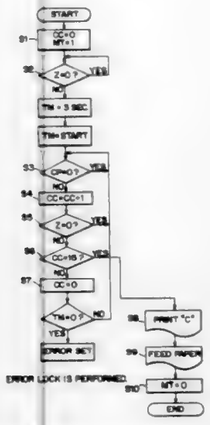
Hiroshi Nishikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 622,277, Dec. 6, 1990, abandoned, which is a continuation of Ser. No. 436,131, Nov. 14, 1989, abandoned, which is a continuation of Ser. No. 165,397, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 85,246, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 791,398, Oct. 25, 1985, abandoned. This application Feb. 27, 1992, Ser. No. 841,199

Claims priority, application Japan, Dec. 11, 1984, 59-236822; Dec. 11, 1984, 59-236823

Int. Cl.[5] B41J *29/38*

U.S. Cl. 400—54 30 Claims



1. A printer for recording on a recording medium, comprising:

recording means for recording on a recording medium;

error detecting means for detecting an erroneous drive of said printer;

a voltage source;

storing means for storing a predetermined time period; and

operating means for operating said error detecting means such that an error lock operation in accordance with error detection is prohibited for the predetermined time period when said error detecting means detects an error initially after turning on said voltage source, and for releasing the prohibition of the operation in accordance with the error detection when the operation of said error detecting means is normal in operation.

5,203,637

CAP FOR WRITING IMPLEMENT WITH AIR VENT AND GUIDE

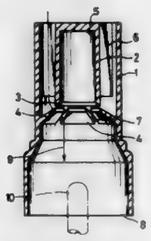
Kazuya Nishimura, and Masayuki Hasegawa, both of Nagoya, Japan, assignors to Shachihata Industrial Co., Ltd., Japan

Filed Jan. 28, 1992, Ser. No. 826,853

Claims priority, application Japan, Jan. 31, 1991, 3-9583[U]; Jan. 31, 1991, 3-9584[U]

Int. Cl.[5] B43K *9/00*

U.S. Cl. 401—202 2 Claims



1. A cap for a writing implement having a writing tip, comprising:

an outer cap having open top and bottom ends and an inner surface;

an inner cap having at its top a closed end and at its bottom an open end;

a plurality of ribs extending radially extending from said inner cap and coaxially connecting said inner cap to said outer cap, said ribs defining therebetween a plurality of openings between said inner and outer caps; and

guide means for preventing the writing tip of the writing implement from entering said openings and for guiding the writing tip toward said inner cap, said guide means comprising a plurality of flange elements disposed below corresponding ones of said openings, said flange elements having inner edges, said flange elements extending obliquely upwardly from said inner surface of said outer cap toward a position below said open end of said inner cap to define an annular space between said open end of said inner cap and said inner edges of said flange elements, and said flange elements being circumferentially spaced apart from one another to define a plurality of slits in alignment with said ribs, said slits defining with said annular space and said openings an air passage from the interior of said inner cap to the exterior of said outer cap.

5,203,638

WRITING INSTRUMENT FOR ALTERNATELY WRITING IN FLUORESCENT TRANSPARENT AND NONTRANSPARENT INK

Robert F. Redmond, Jr., 3900 W. Franklin St., Richmond, Va. 23221

Filed Nov. 29, 1991, Ser. No. 800,013

Int. Cl.[5] B43K *27/08*

U.S. Cl. 401—17 2 Claims

1. A writing instrument, **10**, for forming continuous lines capable of writing alternately in fluorescent transparent and nontransparent ink comprising:

i) a first elongated body, **12**, having a first nib, **16**, and a second nib, **14**, at one end of the elongated body;

ii) the first nib, **16**, being retractably mounted in the end and being axially aligned with the longitudinal axis of the elongated body, **12**;

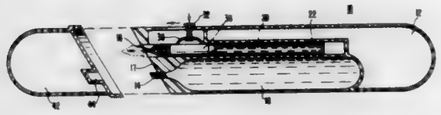
iii) the second nib, **14**, being fixed in the same end and spaced from the longitudinal axis of the elongated body, **12** and extending a length which is different from the extended position of the retractable nib, **16**;

iv) the first retractable nib, **16**, consisting of a substantially rigid nib in fluid communication with a reservoir on nontransparent ink, **20**, which reservoir is held in a barrel, **22**, attached to the retractable nib which barrel extends and retracts with the retractable nib;

v) the second nonretractable nib, **14**, consisting of a porous nib in fluid communication with a reservoir of fluorescent transparent ink, **18**;

vi) a slidable locking mechanism, **24**, for extending and retracting the nib, **16**, with a simple finger motion without requiring the user to alter the writing angle or causing the user to rotate the instrument in the hand comprising:

i) a slidable sleeve, **36**, containing the barrel, **22**, of the retractable nib, **16**, which sleeve is attached to a flattened archy, **38**;



ii) an arch, **38**, rising from the sleeve, **36**, which is flattened at it apogee and contains, at its apogee a hole capable of accepting the perpendicular shaft of the locking button, **32**, when the shaft is depressed;

iii) a perpendicular shaft, **32**, that has, at one end an oval locking button which protrudes from the outer perimeter of the elongated body, **12**, of the instrument and at the opposite end is seated slightly above the hole at the apogee of the flattened arch, **38**, which end is capable of being depressed through the hole when pressure is exerted on the oval locking button, located on said oval locking button adjacent said perpendicular shaft are locking protrusions;

iv) a spring, **40**, surrounding the perpendicular shaft, **32**, which spring is seated, at one end, on the flattened portion of the arch, **38**, and on the opposite end, on the locking protrusions of the oval locking button, **32**, which spring is capable of exerting upward pressure on the oval locking button and the perpendicular shaft, **32**, but will compress when the oval locking button is depressed.

5,203,639

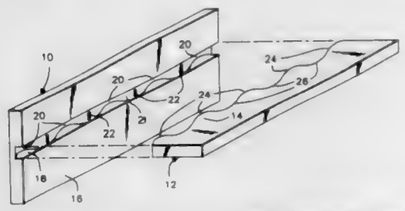
SINUOSE DADO JOINT

Loren G. Femrite, Rte. 2, Box 20, Dawson, Minn. 56232

Filed May 6, 1991, Ser. No. 696,057

Int. Cl.[5] F16B *12/02*

U.S. Cl. 403—382 8 Claims



1. A sinuose tongue and groove dado joint between first and second members to be joined together by said joint, said first member having a side face provided with at least one elongated groove therein of a constant width and constantly varying depth and with portions of said side face disposed on opposite sides of said groove, said groove including a bottom surface in the form of a shallow, smoothly curving sine wave defining alternating deeper and shallower portions of said groove, the second member including a marginal edge tongue of constant thickness for mating with and snug reception within said groove between the opposite sides thereof, said tongue including a sine wave edge opposing and conforming to said shallow sine wave bottom surface and being seated and secured in said groove.

5,203,640

PROFILED CORNER STRIP

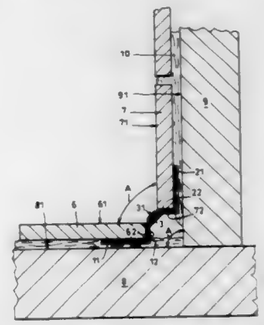
Jean-Jacques Pourtau, and Eric T. Pourtau, both of Croissy-sur-Seine, France, assignors to Tomecanic, France

Filed Mar. 18, 1991, Ser. No. 672,697

Claims priority, application France, Mar. 30, 1990, 90 04116

Int. Cl.[5] E04G *17/06*

U.S. Cl. 403—403 11 Claims



1. A profiled corner strip to be bonded by mortar to two surface coverings disposed at substantially a 90 degree angle, said profiled corner strip comprising:

a) first mounting means for securing and positioning the profiled strip, said first mounting means including a striated sole plate, and an integral extension formed perpendicular to the sole plate and extending along a longitudinal edge of said first mounting means;

b) second mounting means for securing and positioning the profiled strip, said second mounting means including a striated sole plate, and an integral extension formed perpendicular to the sole plate and extending along a longitudinal edge of said second mounting means;

c) a plurality of spaced apart apertures between an inner surface and an outer surface of the sole plates of said first mounting means and said second mounting means wherein each said aperture is shaped as two trapezia, each trapezoid having a large base defined by one of two parallel longitudinal sides of said aperture and a common small base defined by a line between two inwardly angled sides connecting the longitudinal sides;

d) a flexible bridge for sealably engaging both the extension of said first mounting means and the extension of said second mounting means, said bridge having an isoscel trapezoidal configuration in cross section, whereby said bridge forms a sealed joint between the two surface coverings when said first mounting means is bonded to the first surface covering and said second mounting means is bonded to the second surface covering.

5,203,641

FLUTING TOOL APPARATUS

screed unit, said extension unit including a front plate and a sole plate;

an outer containment building;

an inner containment building, within said outer contain-

angularly movable without breaking the seal of said housing;

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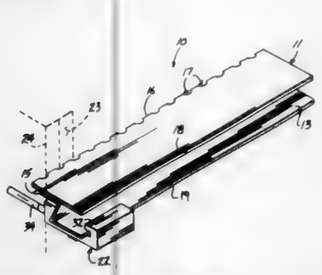
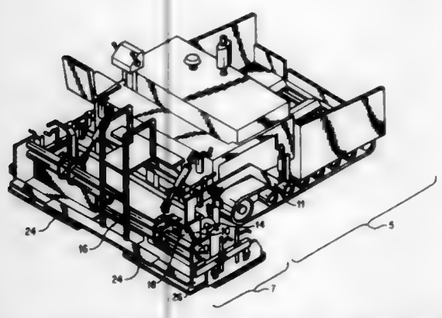
5,203,641
FLUTING TOOL APPARATUS
Lyle D. Kranich, 8575 E. Harney La., Lodi, Calif. 95204
Filed Oct. 4, 1991, Ser. No. 771,112
Int. Cl.[5] E01C *23/16, 19/22*
U.S. Cl. 404—93 6 Claims



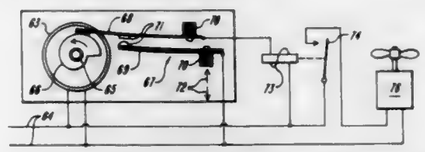
1.A fluting tool apparatus comprising,
a scribing tool, said scribing tool including a first plate, said first plate including a first plate forward edge spaced from and parallel to a first plate rear edge, said first plate forward edge including a series of spaced recesses directed into the first plate from the first plate forward edge,
wherein said scribing tool further includes a second plate spaced below the first plate in a parallel coextensive relationship, wherein the first plate is defined by a first width and the second plate is defined by a second width that is less than the first width,
said second plate includes a second plate rear edge, wherein the first plate rear edge and the second plate rear edge are arranged in a single plane relative to each other wherein said single plane is orthogonally orientated relative to the first plate and the second plate,
a connecting web is fixedly mounted between the first and the second plate wherein the connecting web is mounted to a forward edge of the second plate and defines a predetermined acute angle between the connecting web and the second plate, and wherein the connecting web is mounted to a bottom surface of the first plate substantially medially of said bottom surface of the first plate.

5,203,642
EXTENDABLE SCREED FOR AN ASPHALT PAVER
John W. Heller, Plano; Andrew W. Green, Geneva, and James H. Bassett, Sycamore, all of Ill., assignors to Barber-Greene Company, DeKalb, Ill.
Filed Apr. 3, 1991, Ser. No. 679,611
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—118 4 Claims



1. A screed assembly for a floating screed asphalt paving machine comprising:
(a) a main screed unit, including a front plate and a sole plate;
(b) a screed extension unit for at least one end of said main screed unit, said extension unit including a front plate and a sole plate;
(c) first means mounting said screed extension unit to the main screed unit for permitting said extension unit to be adjusted inwardly and outwardly of the main screed unit substantially transverse to the direction of movement of the paving machine;
(d) second means mounting each extension unit to the main screed unit for permitting said extension unit to be pivotably adjusted relative to main screed about a horizontal axis substantially longitudinal in the direction of movement of the paving machine;
(e) said first and second mounting means mounting said screed extension unit rearwardly of said main screed unit;
(f) said second mounting means including, for each extension unit and the adjacent main screed, pivot means pivoting about said horizontal, longitudinal axis, said pivot means including fastening means capable of being tightened, said pivot means in its tightened condition creating a state of zero clearance between the main screed and the extension unit in a longitudinal direction at least in the area of said second mounting means; and
(g) means for effecting the pivoting of the extension unit with respect to the main screed about said horizontal, longitudinal axis by overcoming friction at the zero clearance joint.

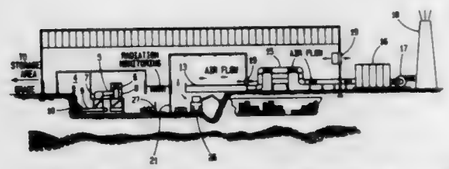
5,203,643
METHOD AND APPARATUS FOR ADAPTIVE ICE CONTROL
Raymond P. Mork, HC69 Sewall Rd., Wolfeboro, N.H. 03894
Filed May 11, 1992, Ser. No. 881,144
Int. Cl.[5] E02B *15/02*
U.S. Cl. 405—61 24 Claims



1. A method for operating the power switch of a submerged energy transducer adapted to produce water movements to reduce surface ice formations, comprising the steps of
sensing an ambient condition affecting ice formation and generating an ambient signal having a characteristic representing increases in amplitude with changes in said condition that increasingly produce ice formations,
generating a ramp signal having a periodic characteristic representing progressively increasing amplitudes between a minimum value and a maximum value,
comparing the amplitudes represented by the ramp and ambient signals, and
changing the position of the power switch upon a change in the sign of the difference between said amplitudes.

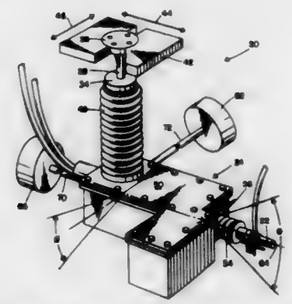
5,203,644
SYSTEM TO CONTROL CONTAMINATION DURING RETRIEVAL OF BURIED TRU WASTE
Daniel E. Menkhaus; Guy G. Loomis; Carlan K. Mullen; Donald W. Scott; Edgar M. Feldman, and Leroy C. Meyer, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 29, 1991, Ser. No. 751,900
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—128 11 Claims
1. A system for contamination control of transuranic waste, comprising:

an outer containment building;
an inner containment building, within said outer containment building;
means for electrostatic radioactive particle recovery connected to and in communication with said inner and outer containment buildings, and including a sweep hood con-



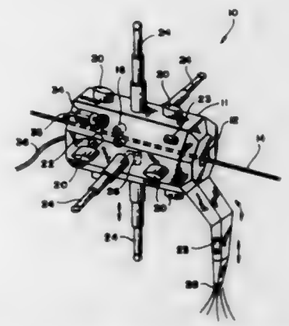
nected to said inner containment building for drawing exhaust gases from an excavation area in said inner containment building; and
a moisture control subsystem having the ability to monitor and control surface and airborne contaminate conditions in said inner and outer containment buildings.

5,203,645
UNDERWATER MANIPULATOR
Phillip B. Schrum, Clairton, and George H. Cohen, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 10, 1992, Ser. No. 819,244
Int. Cl.[5] B63C *11/52*
U.S. Cl. 405—191 9 Claims



1. A remotely operable, sealed manipulator apparatus whereby an attached instrument is positioned in a hostile environment, including submerged, and angularly oriented about two rotation axes which are not parallel, such that said instrument is accurately positioned and accurately angularly oriented in said hostile environment proximate to but not mechanically attached to a target object, said manipulator comprising:
a platform attached to a means of positioning said platform;
a means for positioning said platform to a position in close proximity to an object in a hostile environment, such as submerged;
a rigid strut attached to said platform at one end and attached to the second movable member of a sealed housing at the other end;
a sealed housing having two movable members projecting from said housing, both movable without breaking the seal, with the second movable member being rigidly attached to said rigid strut attached to said platform;
said first movable member projecting from said housing, said member being angularly movable with respect to said housing in a first plane and about an axis of rotation transverse to the housing, said first movable member being angularly movable without breaking the seal of said housing;
a means of rigidly attaching to said first movable member at the end of said first movable member external to the housing a device for measuring or directing emanations at a target object;
a first driver means attached to said first movable member within said housing for causing said member and said means of rigidly attaching an external device to the external end thereof to move angularly within a first plane;
said second movable member projecting from said sealed housing and rigidly attached to the rigid strut attached to said platform, said second movable member being angularly movable with respect to a frame of reference embedded in said sealed housing in a second plane of rotation with respect to said housing which second plane or rotation is not parallel to the plane of rotation of the first movable member, said second movable member being movable without breaking the seal of said housing and in such a manner that when the second movable member rotates with respect to said sealed housing the said sealed housing rotates with respect to the frame of reference of said platform; and
a second driver within said sealed housing attached to the proximate end of the second movable member in such a manner that the second driver rotates the said sealed housing with respect to said attached rigid strut, such that the housing rotates the first movable member and said means of rigidly attaching an external device to the first movable member, said rotation being about an axis of said sealed housing not parallel to the axis of rotation of the first movable member, such that when the sealed housing and the means of rigidly attaching an external device have been moved angularly by the second driver, the said external device traces an arc, thereby allowing the said external device to be moved in a second plane not parallel to its first plane of rotation.

5,203,646
CABLE CRAWLING UNDERWATER INSPECTION AND CLEANING ROBOT
Samuel E. Landsberger, Ithaca, N.Y.; Raj Sundra, Bedford, Mass.; David B. Short, Fair Oaks, Calif., and Benjamin F. Martin, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Feb. 6, 1992, Ser. No. 831,878
Int. Cl.[5] B08B *9/04*
U.S. Cl. 405—191 15 Claims



1. A robot for cleaning and/or inspecting interiors of fluid containing hollow objects comprising:
a robot housing for carrying cleaning and/or inspection tools;
drive means in said housing for engaging and advancing said

robot along a cable disposed within a fluid containing

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further equipped with a plurality of stabilizer pads at

5,203,651
TAPPING ATTACHMENTS

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robot along a cable disposed within a fluid containing hollow object to be cleaned and/or inspected; and,

guidance means to guide said robot through a hollow object to be inspected and/or cleaned as said robot advances along a cable to which it is engaged, said guidance means comprising a plurality of adjustable fins spaced on an outer surface of said robot housing for steering said robot through fluid contained within the hollow object.

5,203,647

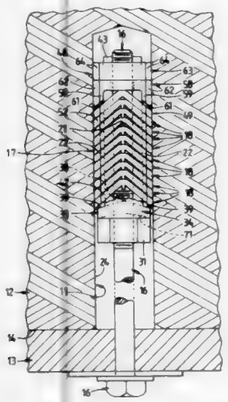
ROOF BOLT ANCHOR

Russell Blackwell, 2109 Arcadia Rd., Birmingham, Ala. 35214

Continuation-in-part of Ser. No. 807,716, Dec. 16, 1991. This application Jun. 29, 1992, Ser. No. 905,431

Int. Cl.[5] E21D *21/00*

U.S. Cl. 405—259.1 **20 Claims**



1. An improvement in roof bolt anchors for securing a mine roof bolt within a hole preformed within a rock strata, said improvement comprising:

(a) a stacked plurality of plastic leaves each having a central aperture therethrough in which said roof bolt is received and each being bent transversely proximal to said central aperture to form a pair of inclined portions connected at and forming a common crest and defining two opposing curved edges adjacent a defining face of said hole;

(b) support means connected to said bolt below said stacked plurality of leaves for supporting said plurality of leaves and maintaining a minimal inclination of said inclined portions;

(c) a compression nut having a horizontal member slidably connected to said bolt and supported thereon by said plurality of plastic leaves, wherein said horizontal member has a pair of opposing flanges integrally connected to opposing margins thereof and extending downwardly therefrom in substantially normal relation thereto, wherein said compression nut further includes an upper portion threadably connected to said bolt superjacent said horizontal member, such that rotation of said bolt in a selected direction will urge said upper portion downwardly against said horizontal member to compress said plurality of plastic leaves against said support means to reduce the inclination of said inclined portions and thereby urge said curved edges from said roof bolt and against said defining face of said hole.

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INDEXABLE INSERT FOR THREAD CUTTING AND SLOTTING

Richard D. Bohannan, Box 203, and Reinar Schmidt, Box 149, both of S-771 01 Ludvika, Sweden

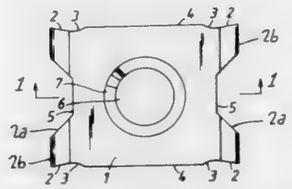
PCT No. PCT/SE90/00378, § 371 Date Nov. 26, 1991, § 102(e) Date Nov. 26, 1991, PCT Pub. No. WO90/14930, PCT Pub. Date Dec. 13, 1990

PCT Filed May 31, 1990, Ser. No. 777,327

Claims priority, application Sweden, May 31, 1989, 8901967

Int. Cl.[5] B23B *27/04, 27/16*

U.S. Cl. 407—113 **2 Claims**



1. An indexable insert for thread cutting and slotting which is adapted to be vertically mounted on a holder, said indexable insert being made of hard metal and substantially square, defining opposite faces which are substantially flat and parallel, first and second pairs of opposite sides, and a center hole which extends through said indexable insert from one face to the other, the first pair of opposite sides being substantially flat and parallel and each side of the second pair of opposite sides forming two cutting edges separated by a plane contact surface which is perpendicular to each of the first pair of opposite sides, each cutting edge defining a flank, and a bevel surface extending from each flank to an adjacent plane contact surface, said indexable insert being reversible and usable for right-or left-hand threading.

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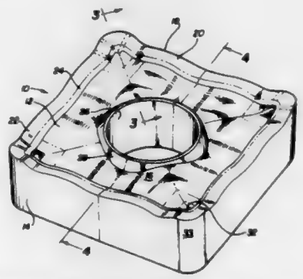
HIGH PRODUCTIVITY, HIGH METAL REMOVAL RATE INSERT

Karl Katbi, Troy; Thomas J. Bernadic, Madison Heights; Tony M. Lowe, Royal Oak, and Brendon L. Brockett, Dearborn Heights, all of Mich., assignors to GTE Valentine Corporation, Troy, Mich.

Filed Oct. 7, 1991, Ser. No. 772,501

Int. Cl.[5] B23B *27/22*

U.S. Cl. 407—114 **10 Claims**



1. An indexable cutting insert, comprising:

an upper surface which is a rake face, a lower surface adapted to be seated in a tool holder, and a side wall extending substantially unbroken therebetween to define a body, said upper surface defining an arcuate concave, convex cutting edge along its periphery, and further defining a land rearward of said cutting edge, said cutting edge

further equipped with a plurality of stabilizer pads at regular intervals to improve the strength of said cutting edge, said stabilizer pads formed by joining of different angular surfaces formed in the cutting edge; a chip straining surface and at least one directional chip breaker surface formed in the upper surface, said chip breaker surface having an arcuate concave convex configuration corresponding to said cutting edge and descending therefrom toward a center and depth of cut line; a central aperture extending at least partially through said insert, said aperture surrounded by a raised angular chip deflecting island to aid chip breaking and to protect a fastener means from chip flow damage, whereby said arcuate concave convex cutting edge reduces localized stress concentration at a depth of cut and imparts improved force distribution across the rake face of the insert, which reduces localized stress concentrations at said depth of cut to yield reduced tendency to form notches in the insert during cutting operations.

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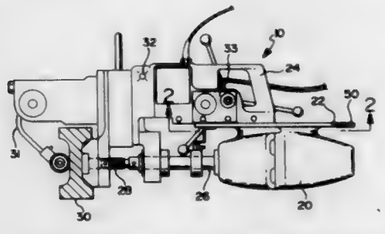
METHOD AND APPARATUS FOR DRILLING HOLES

Dennis C. McCourtney, Davison, Mich., assignor to Everett D. Hougen, Flint, Mich.

Filed Jan. 9, 1992, Ser. No. 819,313

Int. Cl.[5] B23B *35/00*

U.S. Cl. 408—1 R **9 Claims**



3. A method for adjusting a power tool to traverse a predetermined distance said method comprising the steps of:

a) providing a power tool having a reciprocating means adapted to reciprocate between raised and lowered positions for cutting an object;

b) providing an adjustable limit switch in the path of said reciprocating means operable to deactivate said reciprocating means when said reciprocating means is at said predetermined distance and adjacent said limit switch;

c) providing indicating means to visually indicate when said limit switch is properly adjusted to deactivate said reciprocating means at said predetermined distance;

d) activating and lowering said reciprocating means said predetermined distance;

e) activating said indicating means;

f) manually deactivating said reciprocating means after said reciprocating means has traversed said predetermined distance;

g) adjusting said limit switch until said indicating means is deactivated;

h) re-activating and lowering said reciprocating means, said limit switch automatically deactivating said reciprocating means when said predetermined distance has been traversed by said reciprocating means.

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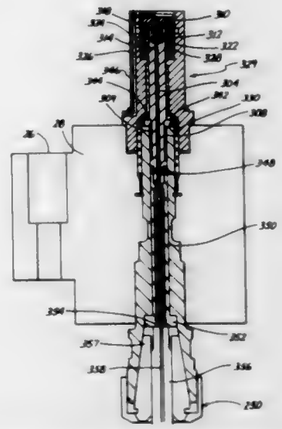
TAPPING ATTACHMENTS

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 330,752, Mar. 30, 1989, abandoned. This application Jun. 14, 1991, Ser. No. 715,343

Int. Cl.[5] B23G *3/00*

U.S. Cl. 408—59 **14 Claims**



5. In a tapping attachment for transmitting drive to a tap having, in combination, a first rotating member connectable to a source of rotational drive, a second rotating member axially aligned with said first rotating member, said members being relatively movable axially, means for transmitting rotary drive from one member to the other, said second member comprising a spindle member having means for carrying a tap having a bore for circulating a coolant to the tap, said bores being positionable and alignable for said purpose, means to accommodate relative movement between said spindle member and said first rotating member, said means to accommodate relative movement between said spindle member and said first rotating member including a flexible tubular member forming part of said bore in said spindle member whereby the first rotating member is movable relatively to the tap and providing for continuous transmission of coolant to the tap, and further including a rigid conduit member disposed within said flexible tubular member.

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SELF-ALIGNING TAP AND DIE WRENCH AND UNIVERSAL THREADING TOOL

Adrian C. Woods, 14401 Boone Rd., Columbia Station, Ohio 44028

Filed Jul. 29, 1991, Ser. No. 737,255

Int. Cl.[5] B23G *1/26*

U.S. Cl. 408—112 **20 Claims**

1. A tap and die wrench for retaining a tap for tapping rods or other round stock as well as flat workpieces, and for retaining various dies for threading workpieces, comprising:

a body member and a base movably mounted upon a pair of parallel alignment rods by a means for mounting on each of the ends of said parallel rods, said body member and base adapted for slidable movement toward and away from each other upon said rods;

a means for retaining said tap associated with said body member;

a means for self-aligning associated with said alignment rods and positioned between said body member and said base;

a means for locking said body member in position along the

threaded segment and having a cross sectional area less

a first non-flexing washer;

first camming means, on said nut and said first washer, for

having a large curvature at a terminal end near said large diameter part and a gentle curvature with a diameter gradually

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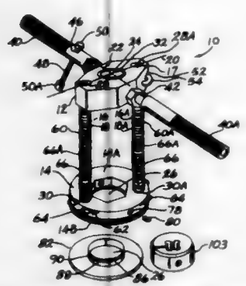
a means for locking said body member in position along the length of said alignment rods; and,



a means for repositioning said base along the length of said alignment rods.

5,203,653

REAMER FOR SHAPING BONE SOCKETS

John W. Kudla, Colonia, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Dec. 30, 1991, Ser. No. 814,137

Int. Cl.[5] A61B *17/32, 17/18*

U.S. Cl. 408—207 **8 Claims**

1. A reamer for shaping a socket comprising:

a cutting head comprising a hemispherical portion having a hemispherical exterior surface and containing a hollow chamber;

at least three elongate helical slots each extending along a single plane oriented at a predetermined angle between 20° and 50° to the polar axis of said hemispherical portion between said hemispherical exterior surface and said chamber, said slots converging toward the center point of said hemispherical exterior surface but being unconnected to each other at said point; and

a cutting edge on the trailing portion of each of said slots and raised slightly above said hemispherical exterior surface of said hemispherical portion for moving material from said socket into said chamber during the rotation of said reamer.

5,203,654

REPLACEABLE TANG AND TOOL COMBINATION

Jerry N. Henderson, 1456 McKinley St., Eugene, Oreg. 97402

Filed Mar. 30, 1992, Ser. No. 859,830

Int. Cl.[5] B23B *51/02*

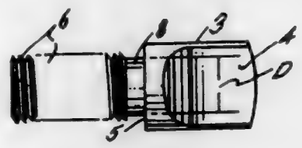
U.S. Cl. 408—226 **2 Claims**

1. A tang for a machine powered tool having a tapered shank defining an internally threaded bore, said tang comprising,

a threaded segment for installation in said bore,

an end segment having a distal end, a pair of torque receiving flats on said end segments terminating at the distal end of the end segment, a shoulder for abutment with said shank, and,

an additional segment intermediate said shoulder and aid threaded segment and having a cross sectional area less than the cross sectional area of said threaded segment to



provide a fracture zone susceptible to fracture prior to fracture of the tool during tool use.

5,203,655

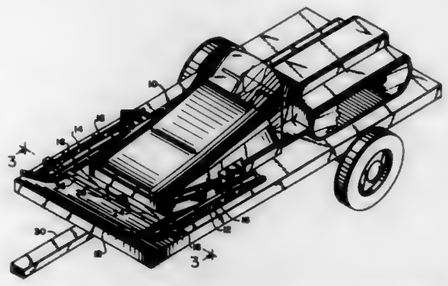
LOCKING BAR FOR SNOWMOBILE ON TRAILER

David Persau, 59 Moshier St., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 796,810, Nov. 22, 1991, abandoned. This application Aug. 20, 1992, Ser. No. 932,899

Int. Cl.[5] B60P *7/00*

U.S. Cl. 410—3 **9 Claims**



1. A hold-down locking device for holding a snowmobile on a trailer, said trailer having a floor and having a first hole drilled through the forward end of said floor, said snowmobile provided with a pair of apertured skis resting on said floor of said trailer, the device comprising: an elongated locking bar passing through an aperture in both skis, said locking bar having a second hole located substantially centrally in said locking bar, an elongated threaded bolt with two ends, a crank handle attached to one of said ends of the bolt, said bolt being inserted through the aligned second and first holes in the locking bar and the trailer floor respectively, a tapped member connected to the other of said ends of said threaded bolt, whereby when said crank handle is rotated said threaded bolt travels with respect to said tapped member to firmly engage the underside of said trailer floor, and thereby securely holding the snowmobile on said trailer, and locking means including an adjustable pivotable member attached to said locking bar and provided with a third hole and a padlock shackle is passed through said third hole for locking said crank handle to said locking bar.

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SELF-CENTERING, SELF-TIGHTENING FASTENER

Alistair N. McKinlay, Marina Del Ray, Calif., assignor to Hong Kong Disc Lock Company, Limited, Hong Kong, Hong Kong

Filed Sep. 19, 1991, Ser. No. 762,395

Int. Cl.[5] F16B *39/24*

U.S. Cl. 411—149 **21 Claims**

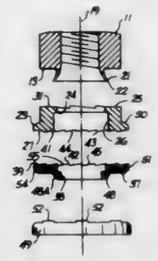
1. A self-centering, self-tightening fastener for coacting with a threaded stud or bolt to apply tightening force to a workpiece, comprising:

a threaded nut for applying tensile stress to said stud or bolt when tightened thereon;

a first non-flexing washer;

first camming means, on said nut and said first washer, for driving both said nut and said first washer when said nut is tightened on said stud or bolt and for locking said nut or said stud or bolt when said nut alone is loosened on said stud or bolt;

a second non-flexing washer having a smooth, workpiece-contacting surface including an annular crown adapted to seat in a mating recess of said workpiece; and



second camming means, on said first washer and said second washer, for adding tensile stress to said bolt or stud in addition to the tensile stress imposed by said threaded nut, thereby increasing the tensioning effect of said nut on said stud or bolt, and for allowing said first washer to slide over said second washer when said second washer comes into contact with said workpiece, whereby the smooth workpiece contacting surface of the second washer in combination with the lack of movement of the second washer on the workpiece tends to prevent galling of the workpiece.

5,203,657

SELF-TAPPING SCREW

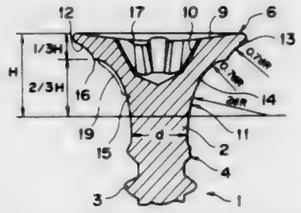
Eiichi Nagoshi, Chigasaki; Osami Iwasaki, and Tetuya Akashi, both of Hatano, all of Japan, assignors to Topura Co., Ltd., Osaka, Japan

Filed Apr. 29, 1992, Ser. No. 876,436

Claims priority, application Japan, May 29, 1991, 3-152284

Int. Cl.[5] F16B *23/00, 35/06*

U.S. Cl. 411—399 **4 Claims**



1. A screw comprising a screw shaft part, a drill part with a sharp end at an extreme end of the screw shaft part and a head part arranged at a rear end of said screw shaft part having an inverse truncated cone shape with an outer circumference of a curved concave surface and an upper surface with an engaging groove in which a screw driver tool is adapted to be installed, said upper surface of the head part including an edge part around said engaging groove formed with a spherical concave surface, said head part including a large diameter part extending from an outer circumferential edge of the upper surface to a lower end, and a small diameter part concentrically and integrally connected to the lower end of the large diameter part and extending to said screw shaft part, an outer circumference of said small diameter part constituting a second seat surface forming a part of the curved concave surface and having a large curvature at a terminal end near said large diameter part and a gentle curvature with a diameter gradually decreasing toward said screw shaft part, an outer circumference of said large diameter part constituting a first seat surface forming a part of the curved concave surface and having a diameter gradually decreasing toward the terminal end of said second seat surface with a curvature approximately equal to that near the terminal end of said second seat surface so as to form two-stage curved concave surfaces and an annular projecting edge at a connection part between said first seat surface and said second seat surface.

5,203,658

BALE FEEDER

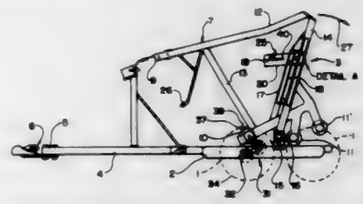
Allan W. Henderson, Invercargill, New Zealand, assignor to Marlene Ruth Henderson, New Zealand, a part interest

Filed May 17, 1991, Ser. No. 702,613

Claims priority, application New Zealand, May 18, 1990, 233727

Int. Cl.[5] A01D *90/14*

U.S. Cl. 414—24.6 **8 Claims**



1. A forage material feed out machine, the machine comprising: a cradle; a series of transverse rollers extending across the cradle, the transverse rollers forming a base for a bale; the cradle being mounted on a chassis and wheels such that the cradle is pivotable backward to contact a bale to be loaded into the cradle, the bale being retained relative to the cradle by transverse pins positioned at the centre of each side of the bale, the pins retaining the bale relative to the cradle during material feed out, the cradle being pivoted forward by hand to load the bale onto the chassis; at least one of the transverse rollers being ground driven to remove forage material from the periphery of the bale during feed out.

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DIE PRESENTATION SYSTEM FOR DIE BONDER

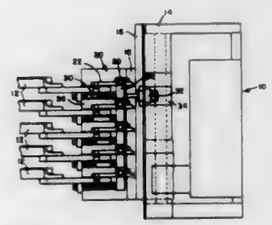
Karl Schweitzer, Mitte, and Gerhard Zeindl, Munster, both of Austria, assignors to Emhart Inc., Newark, Del.

Continuation of Ser. No. 661,915, Feb. 27, 1991, abandoned. This application Jun. 2, 1992, Ser. No. 896,495

Claims priority, application United Kingdom, Mar. 16, 1990, 9006036

Int. Cl.[5] B25J *9/04*

U.S. Cl. 414—226 **3 Claims**



1. A die presentation system comprising a plurality of die presentation packages,

a magazine including means for horizontally supporting said

remains at said at least one power carrier when transfer-

members and push the pellet against said guide member;

response to the horizontal movement of the vehicle away

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a magazine including means for horizontally supporting said packages vertically one above the other,
means for guiding said magazine for vertical displacement to locate any one of said supported packages at a pick up/-deposit location,
means for picking up/depositing a package at said pick up/deposit location including
means for horizontally mounting one of said packages,
said mounting means being rotatable about a vertical axis,
means for rotatably displacing said mounting means to said pick up/deposit location,
said mounting means including a clamping element movable vertically from a remote position where said mounting means can be horizontally, rotatably displaced to said pick up/deposit location to pick up a package supported at said pick up/deposit location, to an operative position for clamping a package, and
said supporting means including a clamping element for each of said supported packages movable vertically from a remote position where said mounting means can rotatably, horizontally displace a clamped package to said pick up/deposit location, to an operative position for clamping a package located at said pick up/deposit location.

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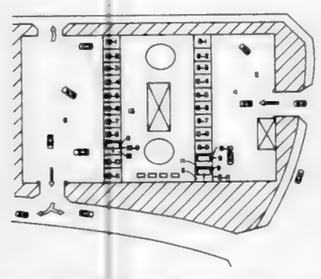
MULTISTORY PARKING SPACE

Tsubota Takahiro, Hyogo, Japan, assignor to Takenaka Corporation, Osaka, Japan, a part interest

Continuation of Ser. No. 561,712, Aug. 1, 1990, abandoned. This application Aug. 24, 1992, Ser. No. 933,895
Int. Cl.[5] E04H *6/00*
U.S. Cl. 414—257 **3 Claims**



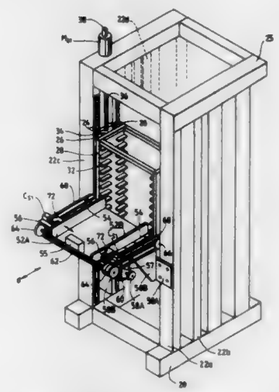
1. A multistory parking space comprising:
an entrance and exit floor adapted to allow vehicles to enter and exit from said multistory parking space;
at least one parking floor further comprising a plurality of stationary parking pallets having lower surfaces and at least one power carrier, wherein said power carrier and each of said plurality of parking pallets is adapted to receive at least one vehicle thereon, and wherein said at least one power carrier has a motor and wheels attached thereto, said motor and wheels being operatively coupled, said parking floor further having rail means for engaging said power carrier wheels whereby said at least one power carrier is capable of being driven along said rail means by said motor and said wheels coupled to said motor to positions adjacent said plurality of pallets;
at least one elevator means extending between said entrance and exit floor and said at least one parking floor for moving vehicles between said floors, said elevator means being adapted to receive at least one vehicle thereon, and wherein said entrance and exit floor has at least one entrance and exit area adjacent to said at least one elevator means;
vehicle transfer means provided on said at least one power carrier for transferring a vehicle, by direct contact therewith, disposed on said carrier to a parking pallet by shifting motion and to said elevator means, and wherein said vehicle transfer means at said at least one power carrier remains at said at least one power carrier when transferring a vehicle;
vehicle transfer means provided on each of said plurality of parking pallets for transferring vehicles, by direct contact therewith, disposed on said pallets to said at least one power carrier, and wherein said vehicle transfer means on each of said plurality of parking pallets remains on each of said plurality of parking pallets when transferring a vehicle; and
vehicle transfer means provided on said elevator means for transferring a vehicle, by direct contact therewith, disposed on said elevator means to said entrance and exit area and to said at least one power carrier, and wherein said vehicle transfer means on said elevator means remains on said elevator means when transferring a vehicle; and
vehicle transfer means provided at said entrance and exit area for transferring a vehicle, by direct contact therewith, disposed at said area to said elevator means, and wherein said vehicle transfer means at said entrance and exit area remains at said entrance and exit area when transferring a vehicle.

5,203,661

HANDLING DEVICE FOR ARTICLES OR CONTAINERS

Takeo Tanita; Masateru Yasuhara; Shozo Kasai, all of Kawasaki; Yusaku Azuma; Toshihiro Yamamoto, both of Yokohama; Norio Nikaido, Tsuchiura, and Toshio Tsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 225,175, Jul. 28, 1988, abandoned. This application Oct. 16, 1990, Ser. No. 598,746
Claims priority, application Japan, Aug. 5, 1987, 62-119245[U]; Aug. 5, 1987, 62-119246[U]; Jan. 30, 1988, 63-20799
Int. Cl.[5] B65G *1/02*
U.S. Cl. 414—331 **7 Claims**



6. A pallet driving device, comprising:
means for storing a pallet containing items, including:
a storing portion for storing the pallet;
an extraction table for supporting the pallet extracted from said storing portion;
a pallet stop member provided on an end of said extraction table;
a guide member provided on a side of said extraction table;
means for extracting the pallet from said storing portion onto said extraction table, said mans including first and second engaging members for engaging each side of the pallet, and first and second pushing force generating means for generating a pushing force against said first and second engaging members so as to generate a difference in pushing force between said first and second engaging members and push the pallet against said guide member; and
means for moving said engaging members to extract the pallet from the storing portion as the pallet is being forced against said guide member by said first and second pushing force generating means.

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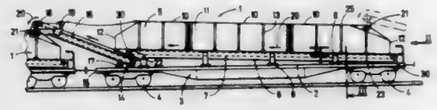
TRACK-BOUND FREIGHT CAR FOR BULK MATERIAL

Josef Theurer, Vienna; Friedrich Oellerer, Linz, and Manfred Brunninger, Altenberg, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 620,368, Jan. 28, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 857,091
Claims priority, application, European Pat. Off., Dec. 1, 1989, 89122171
Int. Cl.[5] B65G *67/10*
U.S. Cl. 414—339 **7 Claims**



1. A track-bound flat-bed freight car comprising
(a) a loading platform,
(b) a box for storing bulk material, the box having a bottom portion and comprising
(1) a longitudinally extending conveyor in the bottom portion of the box,
(2) a carrier frame bearing the conveyor, and
(3) the box carrier frame having a length not exceeding that of the loading platform,
(c) supports of different lengths projecting downwardly from the carrier frame for supporting the carrier frame and conveyor on the loading platform in a longitudinally extending plane extending obliquely with respect to the loading platform from a higher discharge end to a lower end, both conveyor ends being in the bottom portion of the box and the higher discharge end being vertically spaced from the loading platform a distance not exceeding half the height of the box, and
(d) a delivery conveyor band projecting beyond an end of the loading platform and ascending from a receiving end immediately above the loading platform end and immediately below the higher discharge end of the longitudinally extending conveyor to an upper end.

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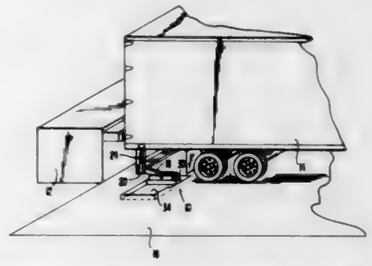
VEHICLE RESTRAINING MECHANISM

Michael J. Ruppe, Hawthorn Woods, Ill., assignor to Dock Leveler Manufacturing, Inc., Malvern, Ark.

Filed May 23, 1991, Ser. No. 705,069
Int. Cl.[5] B65G *69/00*
U.S. Cl. 414—401 **20 Claims**

5. A restraint for preventing horizontal movement of a vehicle away from a loading dock, the restraint comprising:
a base;
a restraint arm having a locking end and an opposed cam end, the restraint arm being connected to the base for selective movement between a raised position wherein the locking end is disposed to engage the vehicle and a lowered position;
means for selectively resiliently biasing the restraint arm to the raised position; and
cam means connecting the cam end to the base for preventing movement of the restraint arm in the raised position in response to the horizontal movement of the vehicle away from the loading dock, while permitting movement of the restraint arm in the raised position against the biasing means in response to vertical movement of the vehicle or horizontal movement of the vehicle toward the loading dock.

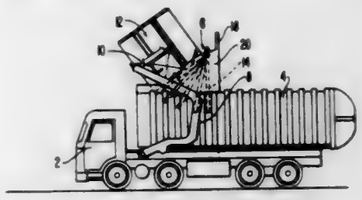


5,203,664

WASTE CONTAINER FOR HANDLING WITH FRONT LOADING MEANS

Torben B. Jensen, Aalborg, Denmark, assignor to Vecto Hydraulic A/S, Aalborg, Denmark

PCT No. PCT/DK89/00148, § 371 Date Dec. 20, 1990, § 102(e) Date Dec. 20, 1990, PCT Pub. No. WO89/12591, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 19, 1989, Ser. No. 623,991
Claims priority, application Denmark, Jun. 20, 1988, 3369/88
Int. Cl.[5] B65F *3/04*
U.S. Cl. 414—407 **4 Claims**



1. A waste container for transporting and emptying waste by being lifted and swung upwards and rearwards to a collecting receptacle of a vehicle, the waste container comprising a container body; a cover plate member; insertion means for accepting lifting forks of the vehicle; and engagement and pivot means for pivotally connecting said cover plate member with said container body,
wherein the cover plate member, when the waste container is placed in an upright position, is transversely slid and pivoted from the container body to open the top side thereof so that the waste is placed in the waste container, and
wherein the waste container further comprises restriction means pivotally connected between the container body and the cover plate member to restrict the pivoting of the cover plate member with respect to the container body and to force the cover plate member to be transversely slid and pivoted over a rearside of the container body, when the waste container is pivoted to an upside-down position automatically pivot open the cover plate member from the container, and wherein the cover plate member, when the waste container is swung to the upright position, automatically is transversely slid and pivoted closed with respect to the container body by gravitational pull.

5,203,665

said tray unloading station comprising, means for accommo-

movement between said pallet body and said lift frame;

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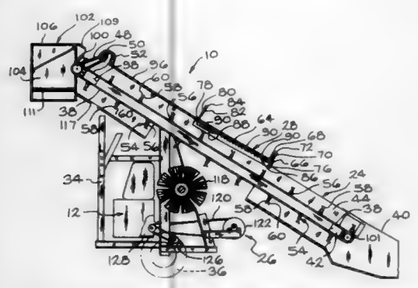
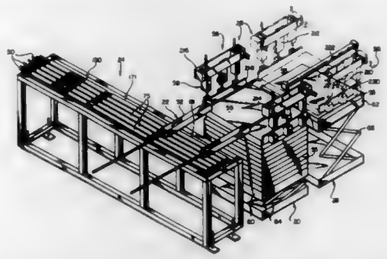
5,203,665
APPARATUS FOR REMOVING COMPOST FROM PLASTIC BAGS
Lars Lande, 11615 N. Shore Rd., Whitmore Lake, Mich. 48189
Filed Oct. 11, 1991, Ser. No. 775,003
Int. Cl.[5] B02C *23/02*
U.S. Cl. 414—412 13 Claims



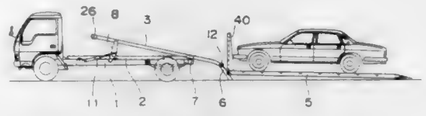
1. An apparatus for removing materials from bags comprising:
a conveyor including a frame and having first and second ends, said conveyor also including a belt being operable for rotation in a direction about said first and second ends, said belt including a plurality of retaining tines being positioned at spaced apart intervals thereon, said retaining tines receiving said bags thereon and carrying said bags along said conveyor as said belt rotates, at least some of said retaining tines being angularly oriented generally toward and in the direction of rotation of said belt;
a cutting element mounted to said frame of said conveyor and being positioned relative to said belt so as to cuttingly engage said bags during rotation of said belt thereby opening said bags;
spreading means for substantially laterally spreading open said bags to expose said materials therein after said basg have been longitudinally cut open by said cutting element; and
a receiving bin positioned adjacent to said second end, said materials being emptied into said receiving bin from said bags as said bags are carried about said second end, said receiving bin including a discharge portion and means for forcibly discharging said materials from said receiving bin through said discharge portion.

5,203,666
AUTOMATIC TRAY LOADING, UNLOADING AND STORAGE SYSTEM
Wallace W. Mojden; Andrew Mojden, both of Hinsdale, and Robert E. Darr, Chicago, all of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.
Division of Ser. No. 866,113, Apr. 7, 1992, Pat. No. 5,158,424, which is a continuation of Ser. No. 544,683, Jun. 27, 1990, abandoned, which is a division of Ser. No. 449,304, Dec. 5, 1989, Pat. No. 4,979,870, which is a continuation of Ser. No. 195,220, May 18, 1988, abandoned. This application Sep. 4, 1992, Ser. No. 940,534
Int. Cl.[5] B65G *57/24*
U.S. Cl. 414—416 4 Claims

1. An article handling system for unloading articles, supplied from a first location in trays such that said system may be used for balancing a supply of articles between said first location and a second location wherein the articles are being further processed, said system comprising; a tray unloading station; a plurality of outfeed lanes disposed adjacent said tray unloading station for receiving articles unloaded therefrom and delivering the same to said second location; a plurality of trays, each having multiple channels and being adapted to have a quantity of articles disposed therein in nested face-wise engagement; said tray unloading station comprising, means for accommodating a plurality of article-filled ones of said trays, and for disposing one of said article-filled trays in position for unloading said articles therefrom; unloading means comprising a plurality of generally parallel disposed pick-and-place devices each adapted to engage and thereafter discharge a stack of nested articles; operational means for said pick-and-place devices for moving said devices between a position overlying said one of said article filled trays and a position overlying said outfeed lanes, and control means for operating said pick-and-place devices individually to place stacks of nested articles into said outfeed lanes, and for operating all of said pick-and-place devices in unison to acquire stacks of nested articles from said one of said article-filled trays simultaneously.

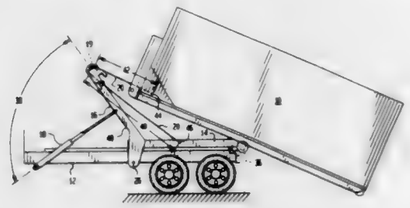


5,203,667
CARGO TRUCK WHICH CAN LOWER THE BODY TO THE GROUND IN A LEVEL POSITION
Takashi Yoneda, and Takashi Asakura, both of Nishinomiya, Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Hyogo, Japan
Filed Mar. 27, 1991, Ser. No. 675,254
Claims priority, application Japan, Mar. 28, 1990, 2-79559; Oct. 30, 1990, 2-294605; Oct. 30, 1990, 2-294606; Oct. 30, 1990, 2-294608
Int. Cl.[5] B60P *1/64, 3/12*
U.S. Cl. 414—477 10 Claims



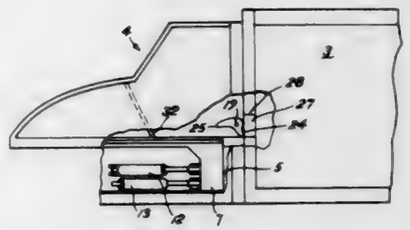
1. A cargo truck, comprising:
a truck chassis;
a lift frame mounted on said chassis of said truck so as to be tiltable and slidable on said chassis, said lift frame including, at a rear end thereof, a curved member curving downwardly;
a lift frame drive means for tilting said lift frame relative to said chassis and sliding said lift frame relative to said chassis;
a pallet body slidably mounted on said lift frame; and
a pallet body drive means for sliding said pallet body on said lift frame, including said curved member curving downwardly, between a raised position wherein said pallet body is on said lift frame and a lowered position wherein said pallet body has been lowered to the ground and is substantially parallel to the ground;
wherein said pallet body drive means comprises a motor, a sprocket connected to said motor so as to be rotated thereby, and a chain extending from one end of said lift frame to the other, said sprocket engaging said chain such that rotation of said sprocket by said motor causes relative movement between said pallet body and said lift frame; and
wherein said motor is mounted on said pallet body, said chain has one end thereof fixed to a forward end of said lift frame and an opposite end fixed to a rear end of said lift frame.

5,203,668
APPARATUS FOR LOADING AND UNLOADING OF A CONTAINER STRUCTURE OR OTHER LOADS WITH RESPECT TO A TRUCK BODY OR TRAILER
Lazar Marmur, 6608 Raveas Crest Dr., Plainsboro, N.J. 08536, assignor to E. Fisher; L. Marmur; F. Fisher and W. Kimble
Filed Jun. 6, 1991, Ser. No. 710,878
Int. Cl.[5] B60P *1/28*
U.S. Cl. 414—500 19 Claims



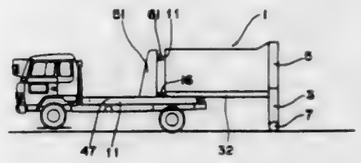
1. An improved apparatus for loading and unloading of a container with respect to a vehicle body which comprises:
a) a lower frame means positioned on a vehicle body adapted to receive a container positioned thereon;
b) an upper frame means pivotally attached to said lower frame means;
c) a frame pivot means attached to said lower frame means and said upper frame means to allow relative pivotal movement therebetween;
d) an upper frame roller means rotatably mounted on said upper frame means, said upper frame roller means being pivotally movable along with said upper frame means with respect to said lower frame means;
e) an extensible arm means pivotally attached adjacent one end thereof to a vehicle body and being pivotally attached adjacent the other end thereof to said upper frame means, said extensible arm means being longitudinally extensible to selectively urge pivotal movement of said upper frame means with respect to the lower frame means as required for loading and unloading of a container with respect to a vehicle body, said upper frame means being movable between a raised position ready to receive a container and a lowered position adapted to retain a container thereon; and
f) a flexible cable means fixedly attached at one end thereof to said lower frame means and extending around said upper frame roller means, said flexible cable means being fixedly attached adjacent the other end thereof to a container to facilitate loading thereof with respect to a vehicle body responsive to movement of said upper frame means from said raised position to said lowered position by retracting of said extensible arm means, said flexible cable means being fixedly attached adjacent the other end thereof to a container to further facilitate unloading thereof with respect to a vehicle body responsive to movement of said upper frame means from said lowered position to said upper position by extending of said extensible arm means.

5,203,669
GARBAGE TRUCK
Johannes Klossek, and Johannes Kirchhoff, both of Iserlohn, Fed. Rep. of Germany, assignors to Waste Management of North America, Inc., Oak Brook, Ill.
Continuation of Ser. No. 691,535, Apr. 25, 1991, abandoned. This application Sep. 1, 1992, Ser. No. 939,404
Int. Cl.[5] B65F *3/14*
U.S. Cl. 414—525.2 6 Claims



1. A garbage truck comprising:
a garbage inlet opening leading into a tipping section having side walls, an upper section, and an open push-out side;
means for pressing in a reciprocally moveable motion in the tipping section, said pressing means having an upper edge and being guided along the side walls and propelling discharged garbage through a receptacle inlet opening into a removable receptacle;
at least one lateral member reinforcing the side walls of the tipping section and being arranged above the press means;
a shaft pivotally mounted in the upper section of the tipping section in close proximity to both the receptacle inlet opening and the upper edge of the press means, said shaft having a claw means for pressing down and freeing objects seized by the press means;
means for pivoting said shaft and activating said claw means when objects are seized by the press means;
a sensing element integrally associated with the shaft, the sensing element generating a signal when there is an obstruction, said signal stopping the reciprocal movement of the press means.

5,203,670
CONTAINER CARRIER
Takashi Yoneda, and Takashi Asakura, both of Nishinomiya, Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Nishinomiya, Japan
Division of Ser. No. 623,440, Dec. 13, 1990, Pat. No. 5,169,194. This application Jun. 30, 1992, Ser. No. 907,101
Claims priority, application Japan, Jul. 12, 1989, 1-180766; Aug. 23, 1989, 1-217135
Int. Cl.[5] B60P *1/02*
U.S. Cl. 414—589 8 Claims



1. In combination:
a container carrier for a container having:
a carrier body extending in a forward and rearward direction;
a vertically oriented column device movable forward and backward on said carrier body;
a carrier top connecting member movable upward and

and downward on said column device and including

placing any bundles in the storing means on a shipping

tached to said upper turbine blade attachment means and the lower ends being attached to said lower turbine blade

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COMPACT DIFFUSER, PARTICULARLY SUITABLE FOR

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and downward on said column device and including coupling and uncoupling means for coupling and uncoupling with a container top connecting member;

a carrier top connecting member drive means for driving said carrier top connecting member upward and downward;

a carrier bottom connecting member movable upward and downward on said column device and including coupling and uncoupling means for coupling and uncoupling with a container bottom connecting member; and

a carrier bottom connecting member drive means for driving said carrier bottom connecting member upward and downward; and

a container for mounting on said container carrier and having:

a container body having a front and a back;

a support member mounted on said back of said container body for free ascending and descending movement relative to said container body;

a container top connecting member fixed to said front of said container body for being coupled with said carrier top connecting member;

a container bottom connecting member for being coupled to said carrier bottom connecting member and movably mounted on said front of said container body for ascending and descending movement relative to said container body between a position close to said container top connecting member and a position remote from said container top connecting member; and

a force transmitting means connected between said container bottom connecting member and said support member for, when said column device has been moved to a rear end of said carrier body and the carrier top and bottom connecting members have been coupled to the container top and bottom connecting members, the container top connecting member is raised by upward movement of said carrier top connecting member for raising the front of said container body and said container bottom member is held fixed by said carrier bottom connecting member to thereby relatively move said container bottom connecting member to said position remote from said container top connecting member, transmitting force to said support member for moving said support member in descending movement as said container body is raised for raising said back of said container body at the same time as said front of said container body is raised, whereby the container can be kept level as it is raised for being positioned on said carrier body by forces exerted only on said container top and bottom connecting members by said carrier top and bottom connecting members.

5,203,671

APPARATUS FOR PALLETIZING BUNDLES OF PAPER

W. D. Cawley, Port Neches; Joe C. Beavers, Sour Lake, and David Hayes, Lumberton, all of Tex., assignors to C&D Robotics, Beaumont, Tex.

Filed Jul. 9, 1991, Ser. No. 727,200

Int. Cl.[5] B65G *57/22*

U.S. Cl. 414—791.6 **5 Claims**

2. An apparatus for automating the placement of paper bundles onto a shipping pallet in substantially level layers comprising:

a bundle conveyor;

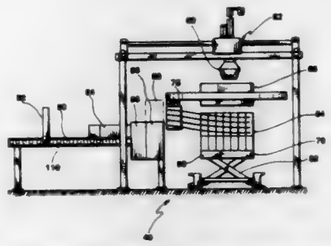
means for measuring bundle height as the bundles travel on said bundle conveyor;

means downstream from the bundle conveyor for accumulating the bundles delivered by conveyor;

means downstream from the accumulating means for temporarily storing bundles received from said accumulating means;

a robot downstream from the temporarily storing means for placing any bundles in the storing means on a shipping pallet;

a computer system comprising a computer programmed to receive bundle height signals from said measuring means, control the number of bundles accumulated in said accumulating means based on height, control the movement of the accumulated bundles to said storing means, and instruct said robot to remove any bundles from said storing



means and place the bundles onto pallet locations wherein the bundles are stacked so as to achieve a substantially level predetermined layer height; wherein the means for storing the bundles comprises:

a rectangular container having an open top adapted for receiving said robot; and

a shuttle elevator for pushing any bundles stored in said container up and into said robot.

5,203,672

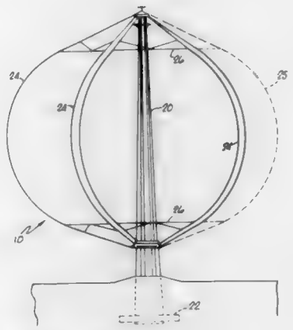
WIND TURBINE WITH STATIONARY VERTICAL SUPPORT TOWER AND AIRFLOW-DIRECTING SHELL

Randolph J. Wolf, Monument, Colo., assignor to Mariah Electric Corporation, Monument, Colo.

Filed Jul. 22, 1991, Ser. No. 733,039

Int. Cl.[5] F01B *15/06*

U.S. Cl. 415—2.1 **22 Claims**



1. A wind turbine, comprising

(a) a substantially stationary vertical tower;

(b) upper turbine blade attachment means mounted on an upper portion of said tower for rotatably attaching the upper end of a plurality of turbine blades to said upper portion of said tower;

(c) lower turbine blade attachment means mounted on a lower portion of said tower for rotatably attaching the lower end of a plurality of turbine blades to said lower portion of said tower, the wind turbine not including any rotation rigid vertical tower that connects the upper blade attachment means to the lower blade attachment means; and

(d) a plurality of turbine blades, the upper end being attached to said upper turbine blade attachment means and the lower ends being attached to said lower turbine blade attachment means, each of said turbine blades being curved over its length so that the middle of the turbine blades rotate about the tower spaced apart from the tower.

5,203,673

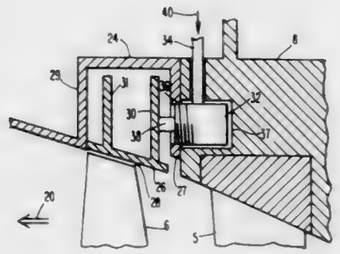
TIP CLEARANCE CONTROL APPARATUS FOR A TURBO-MACHINE BLADE

David H. Evans, Lake Mary, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1992, Ser. No. 823,532

Int. Cl.[5] F01D *5/20*

U.S. Cl. 415—173.2 **19 Claims**



12. A turbo-machine, comprising:

a) a centrally disposed rotor having a row of rotating blades extending radially therefrom, each of said blades having an approximately conical tip portion;

b) a stationary cylinder enclosing said rotor;

c) a blade ring having an approximately conical surface encircling said blade tips and forming a blade tip clearance therebetween;

d) means for mounting said blade ring in said cylinder so that said blade ring is capable of axial displacement relative to said cylinder, said mounting means including:

(i) an approximately radially extending rib attached to said conical blade ring and having a plurality of holes formed therein, and

(ii) a plurality of approximately axially oriented support members attached to said cylinder, a respective one of said support members disposed in each of said holes; and

e) means for continuously adjusting said tip clearance by axially displacing said blade ring during operation of said turbo-machine, thereby maintaining said tip clearance within a predetermined range, said tip clearance continuous adjusting means including:

(i) a plurality of springs for generating an axial force biasing said blade ring in a first axial direction, and

(ii) a piston cylinder supplied with pressurized fluid for applying an axial force in a second axial direction opposing said springs, whereby said tip clearance is adjusted by balancing said piston cylinder and spring forces.

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COMPACT DIFFUSER, PARTICULARLY SUITABLE FOR HIGH-POWER GAS TURBINES

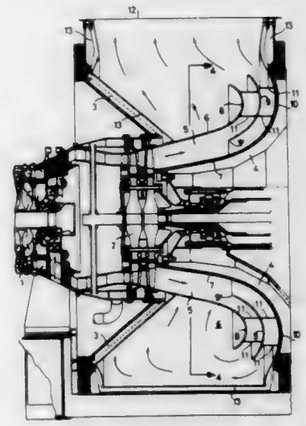
Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Continuation of Ser. No. 602,797, Oct. 24, 1990, abandoned, which is a continuation of Ser. No. 818,250, Jan. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 551,005, Nov. 14, 1983, abandoned. This application Nov. 21, 1991, Ser. No. 795,789

Claims priority, application Italy, Nov. 23, 1982, 24370 A/82

Int. Cl.[5] F01D *1/02*

U.S. Cl. 415—211.2 **6 Claims**



1. A compact diffuser for high-power gas turbines, comprising a first diffusion section free of ribs and/or intermediate walls, wherein said first diffusion section is of substantially axial path, and is defined by two prevalently conical coaxial walls inclined at an angle to the horizontal axis of the turbines, and a double curved diffuser section with three walls following said first diffusion section, wherein the intermediate curved wall of said double curved diffuser section immediately follows said first diffuser section and is cantilever-supported by a twin set of airfoil shaped ribs, said ribs being linear along their length and uniformly spaced about the circumference of the double curved diffuser section, having their generating lines parallel to the horizontal axis of the turbine and are situated near the end of said double curved diffuser to provide substantially uniform outlet velocity from the diffuser.

5,203,675

VARIABLE-PITCH PROPELLER HAVING FEATHERING BLADES

Fernando Marini, Cassano Magnago, Italy, assignor to Santa Caterina di Brena ADA & C. S.a.S., Italy

Filed Sep. 6, 1991, Ser. No. 757,655

Claims priority, application Italy, Sep. 19, 1990, 21513 A/90

Int. Cl.[5] B63H *3/02*

U.S. Cl. 416—140 **10 Claims**

1. A variable pitch-propeller having feathering blades, in particular for sail boats, comprising:

a hub fitted on a drive shaft of a propulsory means;

a shell embracing rotatably the hub,

propeller blades mounted rotatably about their own axes within said shell;

a bevel toothing provided on the hub and meshing with bevel pinions carried by each of said propeller blades;

an adjusting element rotatably engaged on the hub;

a first circular sector connected to and projecting outwardly from the hub;

a second circular sector projecting inwardly from the adjust-

tor, comprising a flow control valve having a supply passage communicating with said hydraulic fluid supply source, a load

and the blade in each section defining a pitch and a chord

the resonator space comprises two resonator chambers of different depths.

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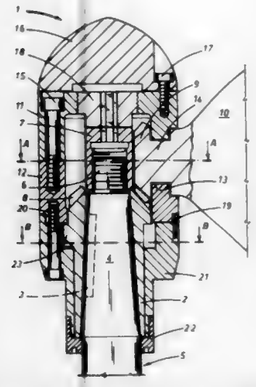
a second circular sector projecting inwardly from the adjusting element and designed to engage the first circular sector to transmit a rotatory motion from the hub to the shell;

a gear coupling having mating toothings carried respectively by one end of the shell and the adjusting element and meshing together to lock rotation between the shell and the adjusting element;



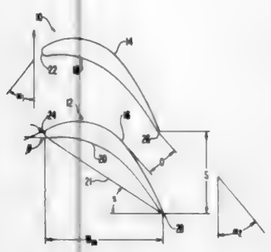
axial securing screws housed in slots of circular outline formed in said adjusting element and engaging said shell one end by threaded portions in said shell one end, and said axial screws may be loosened to allow reciprocal disengagement of the mating toothings and rotation of the adjusting element with respect to the shell.

5,203,676

RUGGEDIZED TAPERED TWISTED INTEGRAL SHROUD BLADE

Jurek Ferleger, Longwood, and Shun Chen, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1992, Ser. No. 846,103
Int. Cl.[5] F01D *5/14, 5/16*
U.S. Cl. 416—223 A **5 Claims**



1. A tapered twisted rotating blade comprising:

a straight side-entry root portion;

a platform portion;

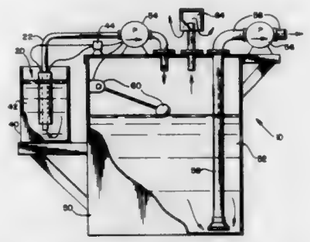
an airfoil portion integrally formed with the platform and root portions and having a base section disposed at the platform portion, thus constituting a proximal; end of the airfoil portion, and a tip section constituting an opposite, distal end of the airfoil portion, and a shroud segment integrally formed on the airfoil portion at the tip section, the airfoil portion of the blade being divided into five basic sections including the base section and the tip section, a quarter section, a mean section and a three quarter section, and the blade in each section defining a pitch and a chord with a pitch to chord ratio that increases linearly with length of the blade.

5,203,677

SYSTEM AND METHOD FOR ANALYZING GRAVITY OF USED MOTOR OIL

Terry J. Lix, 3506 Willowlake La., Enid, Okla. 73703, and Michael W. McCarty, 3610 Faulkner Dr., Rowlett, Tex. 75088

Filed Jan. 17, 1990, Ser. No. 822,587
Int. Cl.[5] F04B *49/06, 49/04*
U.S. Cl. 417—12 **17 Claims**



1. A system comprising:

a. means for determining whether a fluid in a receptacle has a specific gravity falling within a predetermined range;

a holding tank;

c. a conduit providing communication between the receptacle and holding tank;

d. a pump adapted to transfer fluid through the conduit; and

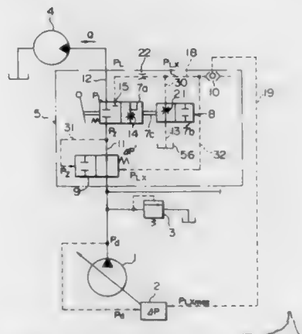
e. means for selectively activating the pump for a predetermined interval to transfer the fluid exhibiting a specific gravity within the predetermined range from the receptacle into the holding tank.

5,203,678

VALVE APPARATUS AND HYDRAULIC DRIVE SYSTEM

Genroku Sugiyama, Ibaraki; Toichi Hirata, Ushiku, and Yusuke Kajita, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01407, § 371 Date Feb. 28, 1991, § 102(e) Date Feb. 28, 1991, PCT Pub. No. WO91/10833, PCT Pub. Date Jul. 25, 1991
PCT Filed Nov. 1, 1990, Ser. No. 655,368
Claims priority, application Japan, Jan. 11, 1990, 2-2539
Int. Cl.[5] F04B *1/26*
U.S. Cl. 417—218 **15 Claims**



1. A valve apparatus for controlling a flow of a hydraulic fluid supplied from a hydraulic fluid supply source to an actuator, comprising a flow control valve having a supply passage communicating with said hydraulic fluid supply source, a load passage; communicating with said actuator, and a first meter-in variable restrictor disposed between said supply passage and said load passage and opened dependent on an operation amount thereof; a first signal passage located downstream of said first variable restrictor and having a passage section for detecting load pressure of said actuator; a tank passage communicating with a reservoir tank; a discharge passage for communicating said first signal passage with said tank passage; and a second variable restrictor provided in said discharge passage and having its opening variable dependent on the operation amount of said flow control valve to produce in said first signal passage a control pressure different from said load pressure, the control pressure in said first signal passage being led to said hydraulic fluid supply source through a second signal passage, wherein:

said valve apparatus further comprises auxiliary restrictor means disposed in said first signal passage for reducing the load pressure detected in said passage section of said first signal passage so that a pressure lower than the detected load pressure is produced in said first signal passage as said control pressure.

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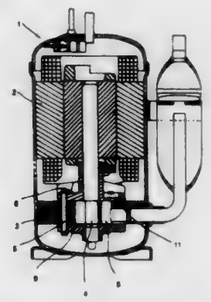
RESONATOR FOR HERMETIC ROTARY COMPRESSOR

Kyungwoo Yun, Hilliard, Ohio, and Insoo Whang, Kwangju, Rep. of Korea, assignors to Daewoo Carrier Corporation, Kwangju, Rep. of Korea

Filed Oct. 22, 1991, Ser. No. 780,583
Claims priority, application Rep. of Korea, Oct. 22, 1990, 90-16862
Int. Cl.[5] F04B *39/00;* **F01N** *1/02*
U.S. Cl. 417—312 **1 Claim**



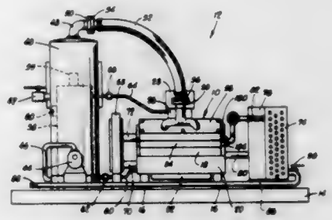
1. An hermetic rotary compressor comprising an electric motor fixedly mounted in said compressor, a cylinder located below said motor and provided with an eccentric shaft extending into said cylinder, said shaft being connected to a shaft of said motor, a piston fitting over the eccentric shaft and disposed in the cylinder such that a space is defined between the inner surface of the cylinder and the outer surface of the piston, a sliding vane slidably mounted in the cylinder and adapted to divide said space into a suction chamber and a compression chamber, upper and lower bearing flanges bolted to vertical ends of the cylinder, respectively, a vertical discharge port formed at the upper flange and adapted to discharge compressed gas in said compression chamber into the interior of said compressor; and a resonator space provided at a lower surface of said upper flange to communicate with said discharge port by means of an entrance channel extending horizontally between the resonator space and the discharge port, said compressor being characterized in that said entrance channel has a tapered surface diverging toward the resonator space, so as to form a narrow inlet connected to the discharge port and a wide outlet connected to the resonator space, wherein the resonator space comprises two resonator chambers of different depths.

5,203,680

INTEGRAL GAS COMPRESSOR AND INTERNAL COMBUSTION ENGINE

James L. Waldrop, Woodward, Okla., assignor to Gas Jack, Inc., Oklahoma City, Okla.

Division of Ser. No. 541,777, Jun. 21, 1990, which is a division of Ser. No. 427,576, Oct. 27, 1989, Pat. No. 4,961,691. This application Jul. 3, 1991, Ser. No. 725,830
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—364 **4 Claims**



1. A method of constructing a gas compressor and transferring natural gas therewith, said method comprising the steps of:

removing an engine head and associated engine valves from a cylinder block of an internal combustion engine;

installing a compressor head assembly on said cylinder block;

manifolding a plurality of inlet flow paths in said compressor head assembly;

supplying natural gas to an inlet side of said compressor head assembly;

energizing said internal combustion engine and compressing natural gas in a cylinder bore aligned with said compressor head assembly;

discharging compressed gas from said compressor head assembly to a downstream location; and

sensing viscosity of oil in a crankcase of said engine and sending a signal for de-energizing said engine when said viscosity drops below a predetermined level.

5,203,681

SUBMERISBLE MOLTEN METAL PUMP

Paul V. Cooper, 8389 Sherman Rd., Chesterland, Ohio 44026

Filed Aug. 21, 1991, Ser. No. 748,145
Int. Cl.[5] F04B *17/00, 35/04*
U.S. Cl. 417—424.1 **27 Claims**

1. A submersible molten metal pump comprising:

a pump casing having a cylindrical non-volute pump chamber defined therein, at least one inlet opening, and a tangential discharge opening;

a rotor in said chamber sized to fit through said at least one inlet opening;

a rotor shaft attached to said rotor and extending upwardly therefrom,

at least one support post attached to said casing and extending upwardly therefrom in parallel with said rotor shaft, and

superstructure positioned above said casing and including a mounting plate,

means on said plate engaging said at least one support post,

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SCREW TYPE PUMP

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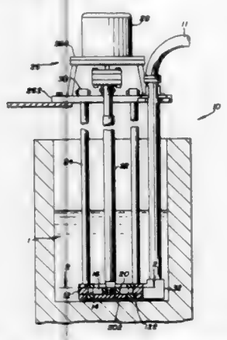
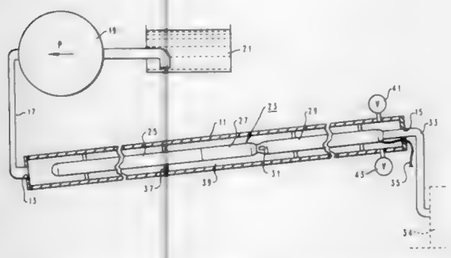
means on said plate engaging said at least one support post,
a motor mount attached to said plate,
a motor on said motor mount, and



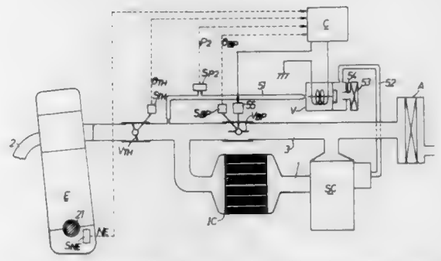
coupling means for operatively connecting said motor to said rotor shaft.

5,203,682
INCLINED PRESSURE BOOST PUMP
Bobby A. Inklebarger, Claremore, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Sep. 4, 1991, Ser. No. 755,034
Int. Cl.[5] F04B *39/12*
U.S. Cl. 417—435 **19 Claims**



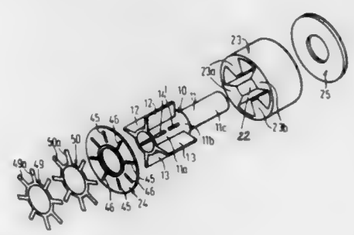
1. An apparatus for supporting an electrical submersible pump assembly for boosting pressure of liquid delivered under feed pressure from a feed source, the submersible pump assembly comprising an electrical motor and a centrifugal pump having an intake, the apparatus comprising in combination:
a tubular jacket capable of containing the feed pressure, the jacket having an inlet on one end adapted to be connected to the feed source, the jacket having a discharge end opposite the inlet;
motor mounting means for mounting the electrical motor and intake of the centrifugal pump within the jacket, with the discharge end of the jacket being upstream of the intake of the pump;
gas accumulation means for accumulating gas contained in the liquid supplied from the feed source during operation of the pump in the jacket upstream of the intake of the pump at the discharge end of the jacket; and
bleed off means at the discharge end of the jacket for bleeding off any accumulation of gases.

5,203,683
SCREW TYPE PUMP
Mamoru Yoshikawa, and Taketoshi Satoh, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 6, 1991, Ser. No. 788,334
Claims priority, application Japan, Nov. 6, 1990, 2-300228
Int. Cl.[5] F04B *41/00*
U.S. Cl. 417—440 **14 Claims**



1. A screw type pump having a pair of screw rotors meshed with each other and rotatably supported in a housing, comprising
a piston which is provided on a side of the housing having an intake port provided at one axial end for movement between a high-compression position inwardly in a moving direction perpendicular to an axis of the screw rotors and a low-compression position outwardly in the moving direction, said piston defining a discharge port in cooperation with a lead-out section provided at the other axial end of the housing, that portion of said piston which faces into the housing being formed so that a discharge starting position of the discharge port at the time when said piston is in said low-compression position is closer to the intake port than a discharge starting position of the discharge port at the time when said piston is in said high-compression position, and
a back pressure chamber which a back of the piston faces, and a communication hole provided in the piston for permitting communication of the back pressure chamber with the discharge port.

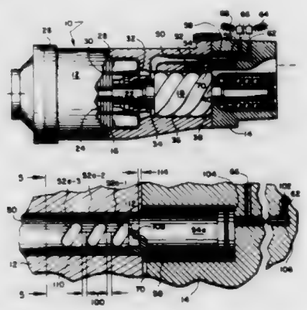
5,203,684
OSCILLATING PISTON PUMP OR SIMILAR MACHINE
Leif D. Henriksen, Porsgrunn, Norway, assignor to 3H Invent A/S, Skien, Norway
PCT No. PCT/NO90/00022, § 371 Date Aug. 28, 1991, § 102(e) Date Aug. 28, 1991, PCT Pub. No. WO90/08902, PCT Pub. Date Aug. 9, 1990
PCT Filed Feb. 1, 1990, Ser. No. 721,583
Claims priority, application Norway, Feb. 3, 1989, 890436
Int. Cl.[5] F04C *21/00*
U.S. Cl. 417—484 **5 Claims**



1. In combination

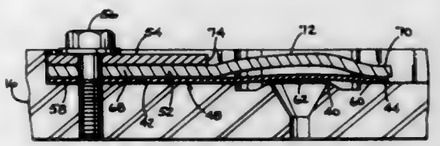
a first housing component having a plurality of radially inwardly directed partition walls;
a first pair of mutually opposite end members, each end member being disposed at a respective end of said first housing component to define a first hollow space therewith;
a second housing component;
a second pair of mutually opposite end members, each said end member of said second pair being disposed at a respective end of said second housing component to define a second hollow space therewith;
a one-piece rocker piston member slidably mounted in and extending within each said housing component, said piston member having a plurality of radically directed wings disposed in alternating relation with said partition walls and a cylindrical surface in said second hollow space;
a crank arm mechanism in said second hollow space coupled to said cylindrical surface of said piston member for oscillating said piston member;
a sealing ring sealingly engaging about said piston member and located in sealing contact with at least one of said end members of said housing components to seal said hollow spaces from each other along said piston member;
a cover member on a side of said first housing component opposite said second housing component; and
connecting means removably connecting said cover member to said second housing component.

5,203,685
PISTON UNLOADER ARRANGEMENT FOR SCREW COMPRESSORS
Garry E. Andersen, and Peter J. Linnert, both of La Crosse, Wis., assignors to American Standard Inc., New York, N.Y.
Filed Jun. 23, 1992, Ser. No. 903,045
Int. Cl.[5] F01C *1/16*
U.S. Cl. 418—1 **16 Claims**



1. A screw compressor comprising:
a housing defining a working chamber, a bore remote from said working chamber and a plurality of ports communicating therebetween said ports being spaced apart so that no portion of any one of them overlaps a adjacent port along said bore; and
means, disposed for axial movement within said bore, for unloading said compressor in a continuous manner by providing an uninterrupted unloading path from said working chamber to said bore through said ports.

5,203,686
ROTARY COMPRESSOR WITH SPAN TYPE DISCHARGE VALVE
Owen H. Scheldorf; Gary O. Scheldorf, and James F. Gordon, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Continuation of Ser. No. 787,102, Nov. 4, 1991, abandoned. This application Oct. 23, 1992, Ser. No. 965,542
Int. Cl.[5] F01C *1/02*
U.S. Cl. 418—63 **7 Claims**



1. A rotary compressor comprising:
a cylindrical side wall and a pair of end plates defining a compression chamber having a low pressure and a high pressure side;
a single high pressure discharge passage extending from said high pressure side of said chamber through a first of said plates;
a valve seat provided in the outer surface of said first plate around said passage;
first and second pads formed on said outer surface of said first plate on opposite sides of said valve seat;
a single elongated valve member having first and second distal end portions supported from said first and second pads respectively and an intermediate portion overlying said valve seat, said intermediate portion normally sealing against said valve seat and moving away from said valve seat upon a predetermined high pressure existing in said high pressure side of said chamber;
a spring backer overlying said valve member and including first and second end portions engaging said first and second end portions respectively of said valve member; and
means fixedly securing said first end portion of each of said valve member and said spring backer to the corresponding pad, the second end portion of said spring backer permitting said end portion of said valve member to move longitudinally of said second pad as said intermediate portion of said valve member moves away from said seat while biasing said second end portion of said valve member against movement away from said second pad.

5,203,687
CONTROL SYSTEM FOR BURNER
Yukihiro Oguchi, Aichi, Japan, assignor to Toyotomi Co., Ltd., Aichi, Japan
Filed Mar. 14, 1991, Ser. No. 669,686
Claims priority, application Japan, Aug. 27, 1990, 2-226267
Int. Cl.[5] F23N *5/00, 5/26*
U.S. Cl. 431—14 **20 Claims**

1. A control system for a burner having at least one of an alarm and a combustion reducing device which is actuated in response to an abnormality detecting signal indicating an abnormal oxygen concentration, said control system comprising:
an oxygen sensor adapted to react with oxygen gas to generate an electric signal depending upon an oxygen concentration in a room in which the burner is placed;
oxygen concentration detecting means responsive to the electric signal supplied from said oxygen sensor for generating a detected oxygen concentration value;
first comparing means or comparing said detected oxygen concentration value with an oxygen concentration reference value;
reference value storing means for storing an initial reference value and said detected oxygen concentration value and

inputting the oxygen concentration reference value to said

gas burning appliance and a pilot outlet adapted for con-

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COMBUSTION APPARATUS

incoming passage means so as to extend in a direction

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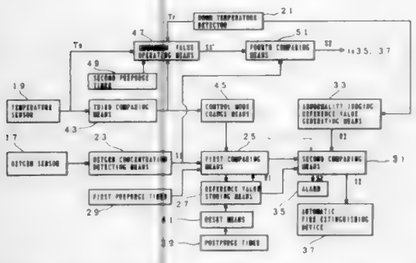
inputting the oxygen concentration reference value to said first comparing means, said reference value storing means including means to initially input said initial reference value as the oxygen concentration reference value inputted to said first comparing means, and means to thereafter input said detected oxygen concentration value as the oxygen concentration reference value inputted to said first comparing means when said first comparing means detects that said detected oxygen concentration value is larger than the oxygen concentration reference value previously inputted to said first comparing means; and,



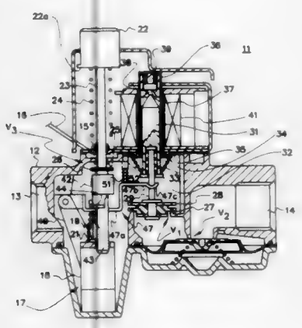
second comparing means for comparing a deviation between said detected oxygen concentration value and the oxygen concentration reference value with an abnormality judging reference value, and for generating said abnormality detecting signal when said deviation is larger than said abnormality judging reference value and said first comparing means detects that said detected oxygen concentration value is smaller than the oxygen concentration reference value.

5,203,688

SAFE GAS CONTROL VALVE FOR USE WITH STANDING PILOT

Paul Dietiker, Redondo Beach, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 4, 1992, Ser. No. 831,116
Int. Cl.[5] F23D *14/72*
U.S. Cl. 431—51 **15 Claims**



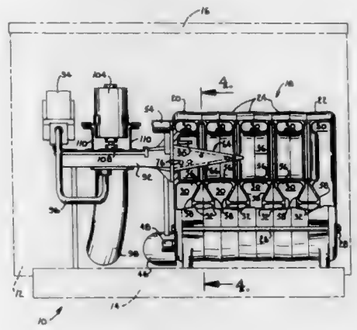
1. A gas valve for a gas burning appliance, comprising:
housing means defining an inlet adapted for connection to a source of gas, a main outlet adapted for connection to a gas burning appliance and a pilot outlet adapted for connection to a pilot burner on the appliance;
pilot valve means disposed between the inlet and pilot outlet for controlling the flow of gas therebetween;
main valve means disposed between the inlet and main outlet for controlling the flow of gas therebetween;
first control means for opening and closing the main valve means in response to a control signal;
manually operated control means operatively connected to the pilot valve means and movable between a first position in which the pilot valve means is closed and a second position in which the pilot valve means is opened, said manually operated control means being biased to the first position;
second control means operatively connected to the manually operated control means for retaining the manually operated control means in the second position when a pilot flame has been established at said pilot burner and for releasing said manually operated control means for return to the first position in the absence of a pilot flame; and
overriding control means operatively connected to the second control means and said main valve means for closing the main valve means in overriding relation to the first control means when said pilot valve means is closed.

5,203,689

PREMIX BOILER CONSTRUCTION

Robert B. Duggan; James V. Goins, both of Michigan City; Donald E. Holloway, LaPorte, all of Ind., and Ronald Moulder, Newark, Ohio, assignors to The Marley Company, Mission Woods, Kans.

Division of Ser. No. 597,065, Oct. 15, 1990, Pat. No. 5,109,806. This application Nov. 15, 1991, Ser. No. 792,679
Int. Cl.[5] F23D *11/40*
U.S. Cl. 431—114 **5 Claims**



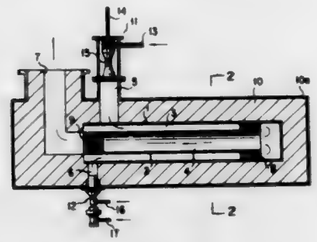
1. A burner for gaseous fuel, comprising:
a burner element having a substantially conical wall tapering from a base end to a pointed tip end, said base end providing an inlet for admitting the gaseous fuel into the burner element; and
a plurality of ports in said wall for passing the fuel therethrough, said ports being arranged in a plurality of separate clusters each separated from other clusters and each including a plurality of individual ports arranged in a pattern defining a hexagon having a port at each vertex and another port at the geometric center of the hexagon.

5,203,690

COMBUSTION APPARATUS

Saburo Maruko, Yamato, Japan, assignor to Nippon Chemical Plant Consultant Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 697,742, May 6, 1991, abandoned, which is a continuation of Ser. No. 577,834, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 376,098, Jul. 6, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 814,226
Claims priority, application Japan, Jul. 8, 1988, 63-170429; Jul. 8, 1988, 63-170430
Int. Cl.[5] F23D *11/44*
U.S. Cl. 431—236 **10 Claims**



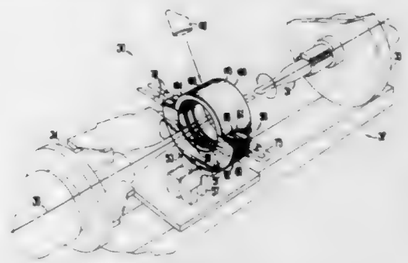
1. A combustion apparatus comprising:
(a) an incoming passage means for flowing a combustion gas in a predetermined direction, said incoming passage means being defined by heat insulating material, disposed in a substantially central portion of an outer casing, said incoming passage means being closed at one end portion located in a downstream end of said incoming passage means;
(b) an outgoing passage means for flowing, in a direction counter to said predetermined direction, said combustion gas having passed through said incoming passage means, said outgoing passage means being open at opposite end portions thereof and disposed in said incoming passage means so as to communicate with said incoming passage means at one end portion of said outgoing passage means located in a downstream side of said incoming passage means;
(c) a mixture gas main incoming means for supplying a mixture gas consisting of an oxygen-containing gas and fuel, said mixture gas main incoming means being in communication with an upstream end portion of said incoming passage means;
(d) an oxygen-containing gas/fuel mixing unit for mixing a preheated oxygen-containing gas with fuel at a predetermined ratio to prepare said mixture gas, said oxygen-containing gas/fuel mixing unit being connected to said mixture gas main incoming means to supply said mixture gas to said mixture gas main incoming means under a predetermined pressure;
(e) a combustion-gas auxiliary incoming means for supplying another combustion gas to said incoming passage means, said another combustion gas being produced by burning fuel with an oxygen-containing gas through a pilot burner, said combustion-gas auxiliary incoming means being connected to an upstream end portion of said incoming passage means so as to be in communication with the same at a position oppositely disposed diametrically from a position of said mixture gas main incoming means; and
(f) a combustion-gas outlet means defined in a side portion of said outer casing and said heat-insulating material so as to be connected to a downstream side outlet portion of said outgoing passage means,
wherein a downstream side outlet portion of said incoming passage means is in communication with an inlet portion of said outgoing passage means through a space defined between the upstream end and the closed end portion said incoming passage means, and
wherein at least one baffle plate member is disposed in said incoming passage means so as to extend in a direction perpendicular to a longitudinal direction of said incoming passage means.

5,203,691

TORCH ASSEMBLY FOR HEATING GLASSY TUBES

William D. OBrien, Jr., Lilburn, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 537,201, Jun. 12, 1990, Pat. No. 5,090,978, which is a continuation of Ser. No. 238,373, Aug. 30, 1988, abandoned. This application Feb. 18, 1992, Ser. No. 837,506
Int. Cl.[5] C03B *37/00*; F23Q *9/00*
U.S. Cl. 431—278 **2 Claims**



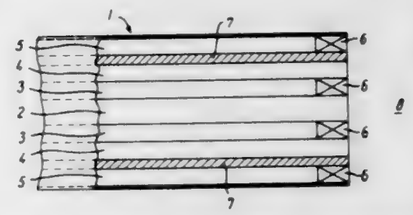
1. A torch assembly comprising:
a gas outlet plate;
first and second outer members arranged such that said gas outlet plate is captured therebetween;
each outer member having a cavity therein which opens toward said gas outlet plate which isolates said cavities;
inlet means for directing gas into each cavity;
said gas outlet plate having a plurality of slots on each major surface thereof, arranged in an interleaved relationship, the slots extending from the respective cavities in the outer members to an inner arcuately shaped surface of said gas outlet plate to form a plurality of gas outlets; and
the inner arcuately shaped portion of said gas outlet plate having a radius which is greater than that of adjacent inner arcuately shaped surfaces of said outer members thereby controllably narrowing the width of a gas path created by gas being directed out of the torch assembly.

5,203,692

BURNER FOR SOLID AND LIQUID OR GASEOUS FUEL

Mads Wexoe, Valby, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Jan. 29, 1991, Ser. No. 647,535
Claims priority, application Denmark, Jan. 29, 1990, 0232/90
Int. Cl.[5] F23D *17/00*; F23K *5/02*
U.S. Cl. 431—284 **6 Claims**



1. Burner for feeding solid and liquid or gaseous fuel into a burning zone of a kiln, for instance a rotary kiln, the burner comprising an outer casing inside which is mounted a central fuel feed channel for liquid and/or gaseous fuel, a first concen-

tric channel for feeding combustion air in the form of primary

U-shaped in plan, the tooth positioner having a trough sized and shaped to receive a row of teeth arranged in an

elongated member, at a proximal end thereof, attached to said mounting plate and extending from said distal end of

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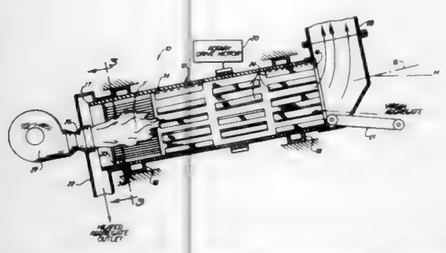
tric channel for feeding combustion air in the form of primary air into the burning zone and surrounding the central tube, a second concentric channel surrounding the first concentric channel and adapted for feeding pneumatically a solid fuel into the burning zone, and mounted outside of and surrounding the second concentric channel a plurality of annularly spaced ducts for feeding an amount of combustion air into the burning zone, characterized in that said plurality of annularly spaced ducts also form a heat exchanger for heating the combustion air being transported through said plurality of ducts by heat exchange with heat generated in that part of the kiln into which the burner extends, and in that the plurality of ducts is separated from the second concentric channel by a heat insulating ceramic layer or layer of light fibre material.

5,203,693

ROTARY DRUM DRYER HAVING INTERNAL FLIGHTS

Malcolm L. Swanson, Chickamauga, Ga., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Oct. 1, 1991, Ser. No. 769,963
Int. Cl.[5] F27B *7/14*
U.S. Cl. 432—110 **12 Claims**



1. A rotary drum dryer adapted for heating and drying stone aggregate useful in the production of asphalt paving composition or the like, and comprising

an elongate hollow drum having a cylindrical wall which defines a central axis,

means mounting said drum for rotation about said central axis and with said central axis being inclined with respect to the horizontal so as to define an upper end and a lower end of said drum,

aggregate inlet means positioned adjacent said upper end of said drum for introducing aggregate into the interior of said drum, and aggregate outlet means positioned adjacent said lower end of said drum for withdrawing the aggregate from the interior of said drum, and so as to define a downstream direction from the inlet means toward the outlet means and an opposite upstream direction,

means for rotating said drum about said central axis so as to cause the aggregate which is introduced at said inlet means to move through the interior of said drum in the downstream direction to said outlet means,

heating means comprising a burner positioned adjacent one of said ends of said drum for introducing air and a high temperature flame into the interior of said drum, and so as to define a combustion zone in said drum which surrounds said flame,

exhaust duct means positioned adjacent the other of said ends of said drum for exhausting the heated gas therefrom and so that the heated gas flows through said drum,

a dam coaxially encircling the inside surface of said wall of said drum and located adjacent the downstream end of said combustion zone, with said dam defining an inside circumferential edge which is spaced from said wall of said drum,

a plurality of longitudinally extending flights mounted to the inside surface of said wall of said drum and extending upstream from said dam along at least a substantial portion of the length of said combustion zone, with each of said flights, when viewed in transverse cross section, comprising a medial portion which is generally parallel to the adjacent portion of said inside circumferential edge of said dam, and a trailing edge portion which is inclined away from the wall of said drum,

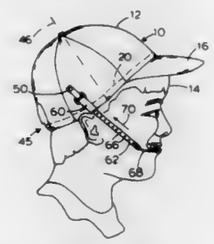
whereby the dam is adapted to retain and raise the level of the aggregate flowing through the combustion zone of the rotating drum so that the flights pass through the aggregate in the bottom of the drum, and the flights collect a portion of the aggregate on their top surfaces and carry the collected aggregate to an elevated discharge point.

5,203,694

ANATOMICAL HEAD-WORN DEVICE FOR APPLYING ORTHODONTIC FORCE

Paul E. Klein, 928 Lake Shore Rd., Lake Oswego, Oreg. 97034

Filed Feb. 20, 1992, Ser. No. 839,630
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—5 **23 Claims**



1. An anatomical head-worn device for application of an orthodontic tension force, comprising:

a bill cap with a dome for covering the top of the head and a bill extending outwardly from the dome along a portion of its perimeter, the cap being sized to fit snugly against the head to inhibit rotational slippage relative to the head,

an elongate load-bearing strap joined to said cap on the inside of said dome, said strap being shorter in length than the length of the adjacent inside surface of said dome and extending in a run between its ends which is spaced from said surface, and

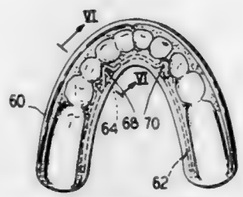
an orthodontic tension-device anchor on said cap for accommodating the attachment thereto of an orthodontic tension-applying device in a manner which causes the orthodontic force applied to be reacted against the head via said cap and said strap.

5,203,695

ORTHODONTIC DEVICE FOR EXPANSION OF ARCHES WITH IMBEDDED WIRE

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Dec. 20, 1991, Ser. No. 811,575
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—6 **15 Claims**



1. An orthodontic appliance, comprising:

(a) a tooth positioner, the tooth positioner being generally U-shaped in plan, the tooth positioner having a trough sized and shaped to receive a row of teeth arranged in an arch, the trough being defined by lingual and labial-buccal flanges joined together by an isthmus, the tooth positioner being made of molded plastic; and

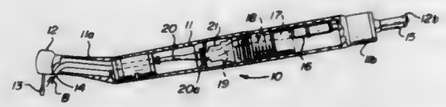
(b) deformable means embedded in the positioner for deforming the arch defined by the row of teeth, the deformable means providing forces for one of constriction and expansion of the arch, the deformable means also comprising means for pressuring an individual tooth to move distally as the arch is deformed, the deformable means comprising at least one wire, said at least one wire being bendable after the appliance is made to provide additional force beyond that which originally is available and which has been made for a given arch width, said at least one wire being positioned in the lingual flange, the positioner including a plurality of ribs that generally follow the outline of the junctures of the teeth and gingival tissue to provide means for holding the positioner in place in a patient's mouth without the need for auxiliary fastening devices, the positioner including a plurality of sockets in which the teeth are snugly embraced, said at least one wire including at least one sharp and jutting bend which engages between ends of preselected teeth to place pressure on the individual tooth which is to move distally as the arch is deformed.

5,203,696

FIBER-OPTIC PROTECTANT FOR HEAT STERILIZABLE INSTRUMENTS

Donald I. Gonser, Lancaster, Pa., assignor to Den-Tal-Ez, Inc., Valley Forge, Pa.

Filed Jul. 29, 1991, Ser. No. 737,176
Int. Cl.[5] A61C *1/00, 3/00*
U.S. Cl. 433—29 **18 Claims**



1. In a medical/dental instrument subjected to periodic sterilization cycles involving heat and moisture, the instrument having a glass fiber-optic assembly mounted therein for transmitting light into and from surfaces which are located at opposite ends of the assembly and which are optically ground and polished, the improvement comprising a thin coating of a substantially transparent, heat-resistant, hydrophobic compound applied on both of said surfaces, whereby the instrument can be subjected to repeated sterilization cycles with minimal degradation in the light transmission into and out of the fiber-optic assembly.

5,203,697

DENTAL IRRIGATING AND ASPIRATION SYSTEM

Oscar Malmin, 3621 Federal Way, Boise, Id. 83705

Filed May 23, 1991, Ser. No. 705,714
Int. Cl.[5] A61G *1/10*
U.S. Cl. 433—81 **18 Claims**

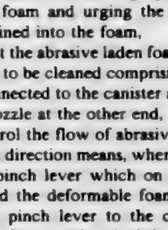
1. A dental irrigating and aspirating instrument for use with a source of irrigating fluid and vacuum comprising:

engagement means for attaching the irrigating and aspirating instrument to the source of irrigating fluid and vacuum in non-rotatable relationship therewith;

a cannula, a proximal end thereof being fixedly attached to said engagement means, for conducting said irrigating and aspirated fluid;

an elongated member extending beyond a distal end of said cannula;

a mounting plate slidingly disposed within said cannula, said elongated member, at a proximal end thereof, attached to said mounting plate and extending from said distal end of said cannula, said mounting plate retained by means disposed at said cannula distal end; and



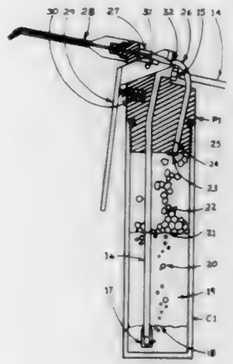
bias means disposed within said cannula for exerting a force against said mounting plate urging said elongated member longitudinally outwardly from said cannula distal end.

5,203,698

WET FOAM SANDBLASTER

Thomas S. Blake, 115-A Railroad Ave., and Mark Fernwood, 1341 Camino Tassajara, both of Danville, Calif. 94526

Filed Apr. 25, 1991, Ser. No. 691,351
Int. Cl.[5] A61C *3/02, 1/10, 1/12, 15/00*
U.S. Cl. 433—88 **10 Claims**



1. An apparatus for cleaning and etching teeth and other surfaces comprising:

a canister capable of being sealed and pressurized and holding a pre-determined mixture of liquids, abrasive particles, and wetting agent, said canister also having a means for dispersing a stream of pressurized gas through the mixture of liquid, particles, and wetting agent causing thereby a formation of foam and urging the abrasive particles to become entrained into the foam,

a means to direct the abrasive laden foam exiting the cansiter to the surface to be cleaned comprising a deformable tube integrally connected to the canister at one end and a rigid exit orifice nozzle at the other end,

a means to control the flow of abrasive laden foam integral with the foam direction means, wherein the control means comprises a pinch lever which on one end contact and pinches closed the deformable foam tube, a pivot point attaching the pinch lever to the canister and a spring which applies force to the pinch lever to urge the pinch lever to deform the tube to a degree sufficient to stop the flow of foam.

347-149 O.G.-93-9

5,203,699

said interior walls and filling said grooves, said gasket

wall, a bottom wall spaced from the top wall, a plurality of least one full-sized swallowable particulate construct, said

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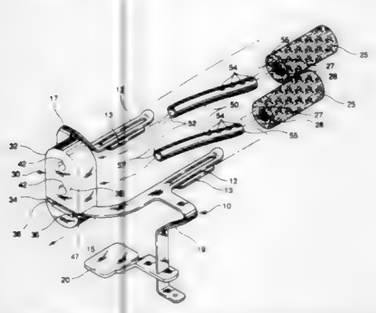
5,203,699

SUCTION ADAPTER FOR USE WITH ABSORBENT ROLL HOLDER

Jimmie L. McGuire, 2938 Ramble Rd. West, Bloomington, Ind. 47408

Filed Jul. 22, 1991, Ser. No. 733,441
Int. Cl.[5] A61C *17/06, 17/14*
U.S. Cl. 433—93 13 Claims



1. A suction adapter for use with a dental instrument having a pair of roll-retaining members for supporting a number of absorbent rolls and a frame for supporting the roll-retaining members within the mouth of a patient, each absorbent roll having a central bore therethrough for engagement with a suction tube, the suction adapter comprising:

a body having a suction face and an attachment face;

engagement means in said body for removably engaging the frame of the dental instrument between the pair of roll-retaining members with said suction face oriented toward the mouth of the patient, whereby said body is supported by the frame when the dental instrument is in use and removable therefrom when the instrument is not in use;

a number of passages extending through said body, one end of each of said number of passages opening in a suction orifice at said suction face of said body, wherein said suction orifice of said number of passages is exposed for fluid connection to a suction source; and

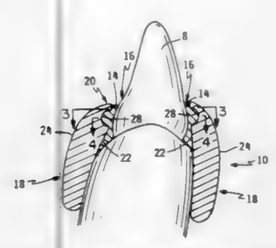
means at another end of each of said number of passages for sealingly engaging a suction tube.

5,203,700

PHYSICAL LOCK OF GASKETS SURROUNDING NATURAL TEETH

James M. Chmel, 3050 Riverview Dr., Eau Claire, Wis. 54703

Filed Dec. 2, 1991, Ser. No. 800,959
Int. Cl.[5] A61C *13/12, 13/225*
U.S. Cl. 433—169 11 Claims



1. An improved prosthetic denture apparatus adapted for engagement to natural teeth, said denture apparatus having an interior and a plurality of apertures comprising:

a) interior walls for each aperture;

b) a continuous groove located in each of said interior walls about said aperture; and

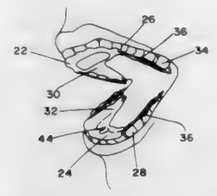
c) a gasket liner affixed to said interior of said denture and said interior walls and filling said grooves, said gasket liner forming a reduced size opening for engagement to said natural teeth.

5,203,701

APPLIANCE FOR TEMPOROMANDIBULAR JOINT DYSFUNCTION

David A. Burtch, 182 Coleman Court, Penticton, British Columbia, Canada V2A 7A9

Filed May 18, 1992, Ser. No. 885,341
Int. Cl.[5] A61C *5/00*
U.S. Cl. 433—215 7 Claims



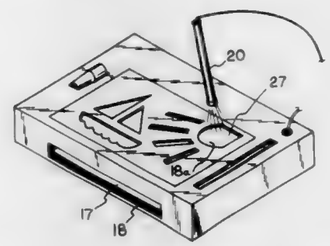
1. An intraoral appliance which is wearable over an extended period of time by a person having a maxilla with a maxillary arch, a mandible with a mandibular arch, and temporomandibular joints which provide for motion of the mandible relative to the maxilla arch, the appliance comprising an upper member and a separate lower member, the upper member being removable mountable on the maxillary arch, the lower member being removably mountable on the mandibular arch, one of the upper and lower members having an anteriorly located smooth surface facing towards the other of the upper and lower members, the other member having an anteriorly located projection to extend towards the smooth surface of said one member, whereby gliding contact of the projection from said other member against the smooth surface of said one member maintains vertical clearance between the maxillary arch and the mandibular arch, the smooth surface of said one member being formed of wear resistant material and the projection from said other member being formed of a material suitable to provide low friction gliding contact against the smooth surface to ensure relatively free horizontal movement of the mandible throughout horizontal border movement of the mandible.

5,203,702

WRITING BOARD KIT HAVING LIGHT-SENSITIVE SELF-ILLUMINATING DRAWING SURFACE

Robert T. Wilson, 1514 Carlisle Ct., Oklahoma City, Okla. 73120

Filed May 11, 1992, Ser. No. 881,162
Int. Cl.[5] G09B *11/00*
U.S. Cl. 434—85 1 Claim



1. A writing board kit, comprising,

a support container, the support container including a top

wall, a bottom wall spaced from the top wall, a plurality of spaced end walls, and

a forward side wall, the foward side wall including a forward side wall opening, and

the support container having a housing storage cavity positioned below the top wall, with the forward side wall opening directed into the storage container in communication therewith, and

a plurality of template plates, each template plate of a predetermined peripheral configuration and each of said template plates having a plurality of template plate openings directed therethrough, and

the top wall including a top wall opening, the top wall opening defined by said predetermined configuration to complementarily receive one of said template plates therewithin, and

the support container including a light-sensitive self-illuminating web mounted to the support container below the top wall opening a predetermined height, and

including a flashlight tube, the flashlight tube having a predetermined first diameter, and including an illuminated forward end, and a tether line mounted to a rear distal end of the flashlight tube, the tether line secured to the support container, and the top wall including a top wall recess to complementarily receive the flashlight tube therewithin, and a light alignment tube having an entrance opening of said predetermined first diameter to complementarily receive the illuminated forward end of the flashlight tube therewithin, and the light alignment tube including a conical alignment tube forward end having a forward end opening of a second diameter less than the first diameter, with the forward end opening coaxially aligned with the light alignment tube to concentrate illumination from the flashlight tube illuminated forward end onto the light-sensitive self-illuminating web, and

including a lid plate having a lid plate opening, the lid plate including a lid plate rear edge and a lid plate forward edge, the plate rear edge including a lid plate hinge, the lid plate hinge secured to the support container for pivotment of the lid plate relative to the support container, the lid plate forward edge including a lid plate latch, and the support container forward side wall including a forward side wall latch fixedly mounted to the forward side wall below the forward side wall opening, whereupon securement of the lid plate latch to the forward side wall latch effects securement of said plurality of template plates within the housing storage cavity and simultaneously secures one of said template plates within the support container below the top wall, and

wherein each template of said plurality of template plates includes a template plate bottom surface and a template plate top surface, each template bottom surface includes at least one continuous compressible resilient seal arranged in surrounding relationship relative to at least one template plate opening, and the continuous compressible resilient seal and template plate define a further height greater than the predetermined height to extend above the top wall when one of said template plates is mounted within the top wall opening in a first position and upon securement of the lid plate forward side wall latch effects compression of the seal to a second position equal to the predetermined height to effect sealing engagement of said seal with the light-sensitive self-illuminating web.

5,203,703

DEGLUTITION TRAINING METHOD AND APPARATUS

Marc J. Schneiderman, 135 Claridge Dr., Coraopolis, Pa. 15108

Filed Aug. 27, 1991, Ser. No. 750,456
Int. Cl.[5] G09B *19/00;* B65D *83/04*
U.S. Cl. 434—127 12 Claims

1. A success-oriented positive reinforcement method for teaching pill-swallowing, to enable a person to swallow a predetermined full-sized pill or capsule utilizing a set of incrementally increasing swallowable particulate constructs and at least one full-sized swallowable particulate construct, said method comprising the steps of, in sequence,

a) administering a first swallowable particulate construct to a person for whom deglutition training is desired;

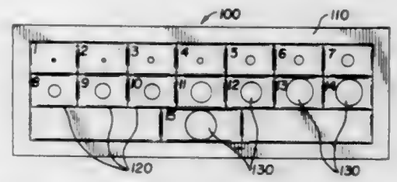
b) motivating said person to swallow said first swallowable particulate construct without chewing it;

c) positively reinforcing the success of the swallowing of step b);

d) administering to said person a second swallowable particulate construct of the same size as the first swallowable particulate construct and on the same day as the first swallowable particulate construct was administered;

e) motivating said person to swallow said second swallowable particulate construct without chewing it;

f) positively reinforcing the success of the swallowing of step e); and



g) repeating steps a)-f) between 3 and 40 times at a periodicity between every other day and every day, wherein each repetition of steps a)-f) further comprises the administration of a first and second swallowable particulate construct each having the same size as the other and each further having a size larger than the first and second swallowable particulate constructs administered in a previous sequence of steps a)–f); and

h) administering at least one full-sized swallowable particulate construct to said person for whom deglutition training is desired, said at least one full-sized swallowable particulate construct representing a full-sized pill or capsule;

i) motivating said person to swallow said at least one full-sized swallowable particulate construct without chewing it; and

j) positively reinforcing the success of the swallowing of step i).

5,203,704

METHOD OF COMMUNICATION USING POINTING VECTOR GESTURES AND MNEMONIC DEVICES TO ASSIST IN LEARNING POINT VECTOR GESTURES

Seth R. McCloud, 16201 Jordan Rd., Arlington, Wash. 98223

Filed Dec. 21, 1990, Ser. No. 632,325
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—156 17 Claims

1. A method of communication in a language by sender and a receiver, comprising:

a. selecting a set of pointing gestures by said sender and said receiver, said set of pointing gestures including a plurality

5. A system to aid in the teaching of language skills compris-

training compartment and with a burner control connection to the burner, and having a ventilation system;

formed therein for engagement with a center electrode of said

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of unique pointing gestures, each said pointing gesture including one primary indicator capable of selecting one vector pattern in a field having a plurality of said vector patterns and capable of delineating one vector within said selected vector pattern, said vector capable of being detected by said receiver, and a plurality of ancillary indicators, each said ancillary indicator capable of being disposed together with said primary indicator into one of a plurality of configurations, each said configuration capable of being detected by said receiver;

b. associating one communication code used in said language with each said pointing gesture from said set of pointing gestures by said sender;

c. performing a plurality of said pointing gestures by said sender to communicate a message to said receiver, each said pointing gesture being performed by delineating one said vector in said field with said primary indicator and then disposing said ancillary indicators together with said primary indicator into one said configuration;

d. identifying by said receiver said pointing gestures performed by said sender, and;

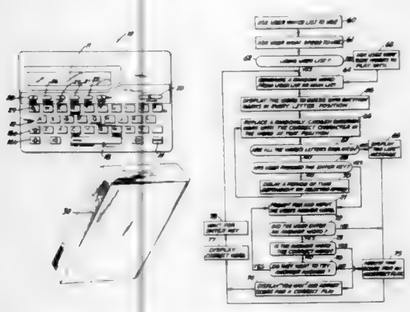
e. associating by said receiver each said pointing gesture identified with said associated communication codes so that said message is communicated from said sender to said receiver.

5,203,705

WORD SPELLING AND DEFINITION EDUCATIONAL DEVICE

George P. Hardy, Pelham Manor, N.Y.; David McWherter, Bensalem, Pa., and Gregory J. Winsky, Medford, N.J., assignors to Franklin Electronic Publishers, Incorporated, Mt. Holly, N.J.

Filed Nov. 29, 1989, Ser. No. 443,114
Int. Cl.[5] G09G *19/00*
U.S. Cl. 434—169 **18 Claims**



1. An electronic language skills teaching aid machine comprising:

user list memory means,

entry means to permit a user to enter user selected terms into said user list memory means to provide a user determined list of terms,

at least one predetermined user controlled function means for operating on terms selected from said user list of terms,

selection means to select one of said terms from said user list of terms for use with said user controlled function means,

error memory means to record user error for each of said terms in said user list when selected by said selection means and processed by said user controlled function means, and

bias means to bias said selection means as a function of the frequency with which terms are incorrectly processed by the user controlled function as indicated by said error memory means.

5. A system to aid in the teaching of language skills comprising:

an electronic spelling corrector means having a main list of terms in memory to compare an entered term against said list in memory and to provide an indication that the entered term is a validly spelled term and, if the entered term is not a validly spelled term, to provide a set of terms from said main list which may correspond to the entered term, and user list memory means,

entry means to permit a user to enter user selected terms into said user list memory means to provide a user determined list of terms,

at least one predetermined user controlled function means for operating on terms selected from said main list of terms or said user list of terms,

user controlled pre-selection means to permit the user to select either said main list of terms or said user list of terms for use with said user controlled function means, and

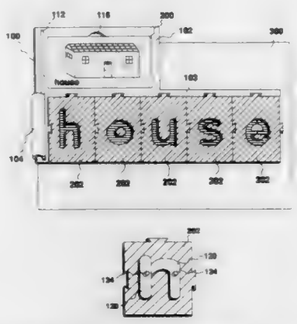
selection means to select one of said terms in the one of said list of terms selected by said pre-selection means for use with said user-controlled function means.

5,203,706

EDUCATIONAL DEVICE

Amos Zamir, 3 Hasavoraim Street, Neve Avivim, 69 207 Tel Aviv, Israel

Filed Jan. 21, 1992, Ser. No. 822,814
Int. Cl.[5] G09B *1/16, 1/40*
U.S. Cl. 434—172 **15 Claims**



1. An educational apparatus, comprising:

(a) a plurality of cards, each of said cards featuring information;

(b) a plurality of symbol blocks, each of said symbol blocks featuring a hollowed-out region representing a symbol;

(c) a frame for holding one of said cards and a plurality of said symbol blocks; and

(d) a plurality of symbol segments capable of being inserted into said hollowed-out regions in said symbol blocks.

5,203,707

MODULAR FIRE TRAINER

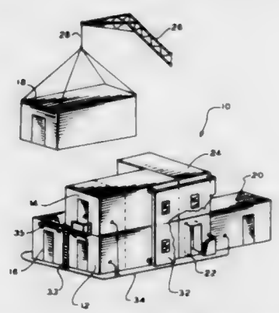
Dominick J. Musto, 50 Louis Ave., Middlesex, N.J. 08846; William Rogers, 46 Elba Ave., Hopatcong, N.J. 07843, and James J. Ernst, 20 Sherbrooke Pkwy., Livingston, N.J. 07039

Filed Jan. 6, 1992, Ser. No. 817,435
Int. Cl.[5] G09B *9/00*
U.S. Cl. 434—226 **7 Claims**

1. A modular fire fighter trainer comprising:

a prefabricated first training compartment subassembly having a training compartment with at least one simulated burnable item with a burner; and with extinguishing agent detectors and safety monitors; and also having an equipment room with a smoke generator outputting into the training compartment and with a burner control connection to the burner, and having a ventilation system;

a prefabricated second control subassembly having a control room with a control unit for connection to the burner control enclosures and the smoke generators for operation by an instructor



a prefabricated third interconnect subassembly having a hallway connecting to the training room and having an exterior doorway and having an interior stairway; and

a prefabricated additional subassembly disposed above the prefabricated third interconnect subassembly and having access to said interior stairway.

5,203,708

CREATRESS IMAGE

Nancy A. Bird, 304 W. 91st St., New York, N.Y. 10024

Filed Apr. 5, 1991, Ser. No. 681,117
Int. Cl.[5] G09B *23/28*
U.S. Cl. 434—267 **12 Claims**

12. A creatress image comprising a soft figure of a human-like female form comprising a head and an expandable torso, and further comprising a cavity within the torso with an opening thereto at the lower portion of the torso; and soft forms of the elements of creation comprising an edible plant, wherein each of said elements is sized to fit through the opening, and all of said elements together fit into the cavity, expanding the torso.

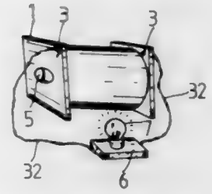
5,203,709

DEVICE FOR COUPLING A BATTERY TO AN ELECTRIC APPLIANCE

Ming-Chuan Huang, 58, Ma Yuan West St., Taichung, Taiwan

Filed May 18, 1992, Ser. No. 884,437
Int. Cl.[5] H01R *11/30*
U.S. Cl. 439—38 **3 Claims**

1. A device for coupling at least one battery to an electric appliance comprising a first magnetic plate having an opening formed therein for engagement with a center electrode of said battery, means for electrically coupling said first magnetic plate to said electric appliance, a second magnetic plate attractable to an electrode of said battery, and means for electrically coupling said second magnetic plate to said electric appliance



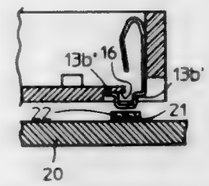
in order to energize said electric appliance, said means for electrically coupling said magnetic plates to said electric appliance including electric wires, each having a first end connected to said electric appliance and having a second end connected to a respective said magnetic plate by a screw.

5,203,710

SURFACE MOUNT ELECTRICAL CONNECTOR

Shuichi Miyazawa, Tokyo, Japan, assignor to Kel Corporation, Tokyo, Japan

Filed Jan. 16, 1992, Ser. No. 821,738
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—71 **8 Claims**



1. A surface mount connector for connection to a circuit board by a reflow soldering technique comprising an insulating housing having an upper mating face and a lower board mounting face, a housing wall extending away form the board mounting face and a base portion having upper and lower faces attached to the housing wall and located adjacent and spaced from a portion of the housing wall adjacent the board mounting face defining an aperture therebetween, a series of one-piece strip-form contacts having, respectively, contact portions for connection to a complementary connector received in the housing through the mating face, and board connecting leg portions, joined respectively to anchoring portions, the board connecting leg portions having respectively, free ends remote from the anchoring portions and soldering portions formed between the anchoring portions and the free ends, for soldered connection to respective solder pads on a circuit board, by a surface mount technique the contacts being permanently mountable in the housing by insertion thereof with a single straight action through a housing face with the anchoring portions extending along the wall towards the mating face anchoring the contacts in the wall and with the board connecting leg portions extending from the wall, across the aperture so that the soldering portions are aligned with the aperture exposed for unimpeded inspection through the aperture form the mating face and the free ends are in engagement with a face of the base portion thereby locating the soldering portions in substantially coplanar, board contacting relation at the board mounting face.

5,203,711

one outlet receptacle port adapted to receive a first outlet

power block contact and above said second power block

said latching assistor member being slidingly engaged

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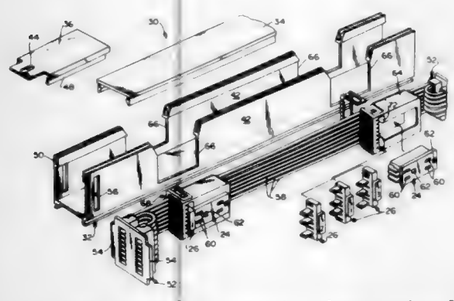
5,203,711
MODULAR INTERCHANGEABLE POWER DISTRIBUTION SYSTEM

Steven B. Bogiel, Schaumburg, Ill., assignor to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 771,029, Oct. 1, 1991, Pat. No. 5,131,860. This application Jun. 16, 1992, Ser. No. 899,195
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—215 **6 Claims**

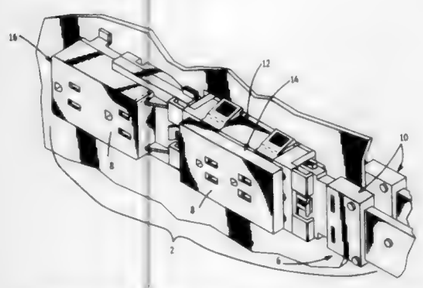


1. In a wire raceway to be mounted to a lower portion of a modular wall panel including:
an elongated U-shaped member, within which pass electrical wires, having a longitudinal axis and two upstanding sidewalls with free edges,
cover means attached to an open portion of said U-shaped member, and
an electrical receptacle, having an outwardly facing surface, to be mounted to either of the side walls of said U-shaped member and adapted to be electrically connected to the wires,
the improvement comprising:
one slot on each of opposite sides of said receptacle located at a preset distance from the outwardly facing surface, and
an opening in one of the sidewalls of the U-shaped channel having at least two sides parallel to each other and adapted to slidably mate with said slots,
whereby said slots slide over the two sides of the openings to mount the receptacle to the U-shaped member.

5,203,712
CIRCUIT WIRING DEVICE

Jerry B. Kilpatrick, Greensboro; Mitchell E. Miller, Clemmons, and Victor E. Slack, Lewisville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 17, 1992, Ser. No. 822,246
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—215 **13 Claims**

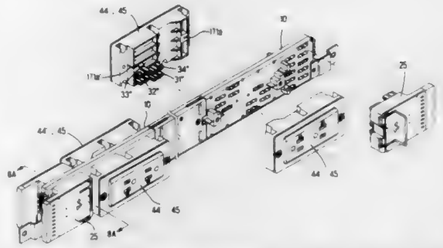


1. A power distribution system for a raceway, comprising:
a junction box adapted to be connected to an input wiring cable, comprising, an insulative housing providing at least one outlet receptacle port adapted to receive a first outlet receptacle, multiple output wiring ports, first electrical terminals in said outlet receptacle port and second electrical terminals in each of said output wiring ports electrically connected, respectively, to the first electrical terminals in said outlet receptacle port;
multiple conductors of an input wiring cable electrically connected, respectively, with the first electrical terminals, whereby the input wring cable is electrically connected to the first electrical terminals of the outlet receptacle port;
multiple conductors of at least one output wiring cable electrically connected, respectively, to the second electrical terminals in a selected one of the output wiring ports, whereby the output wiring cable is electrically connected to the first electrical terminals in said outlet receptacle port;
a wiring device comprising, an insulative housing providing at least a second outlet receptacle and electrical contacts in the housing connected to said second outlet receptacle;
and said electrical contacts being mateably engaged with said second electrical terminals in a second one of the output wiring ports whereby the second outlet receptacle is electrically connected to the first electrical terminals in said outlet receptacle port.

5,203,713
POWER DISTRIBUTION SYSTEM FOR MODULAR FURNITURE UNIT

Jay L. French, Middletown; John L. Himes, Jr., Hummelstown; James S. Hower, Harrisburg; Douglas J. Pirc, Mechanicsburg; Ronald M. Weber, Lebanon, and James H. Wise, Palmyra, all of Pa., assignors to AMP Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 714,318, Jun. 10, 1991, Pat. No. 5,092,787, which is a continuation of Ser. No. 539,284, Jun. 15, 1990, abandoned, which is a continuation of Ser. No. 394,775, Aug. 16, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 791,054
Int. Cl.[5] H01R *25/00*
U.S. Cl. 439—215 **23 Claims**

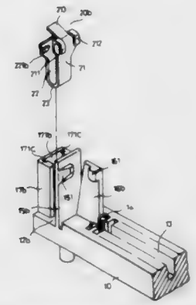


1. A multicircuit electrical system for office furniture units and the like of the type having a utility raceway associated therewith, comprising:
a plurality of electrical conductors extending between opposite ends of the utility raceway, and including at least a first conductor associated with a first power circuit, at least a second conductor associated with a second power circuit, and a common conductor associated with both of said first and second power circuits;
a power block adapted for mounting in the utility raceway, and including a first power block contact electrically connected with said first conductor, a second power block contact electrically connected with said second connector, and third and fourth power block contacts electrically connected with said common conductor; said third and fourth power block contacts being horizontally aligned on said power block along a line disposed below said first power block contact and above said second power block contact in a spaced arrangement which minimizes the overall height of said power block;
a removable power outlet adapted for selectively tapping power from said electrical system, and including means for detachably connecting the same with said power block in first and second orientations disposed generally 180 degrees apart; said power outlet including at least first and second outlet contacts arranged such that in said first orientation of said power outlet on said power block, said first and second outlet contacts electrically connect with said first and third power block contacts respectively to tap power from said first circuit, and in said second orientation of said power outlet on said power block, said first and second outlet contacts electrically connect with said second and fourth power block contacts to tap power from said second circuit.

5,203,714
ELECTRICAL CONNECTOR FOR A PRINTED CIRCUIT BOARD

Kenny Tuan, 5F, No. 30, Lane 423, Yuan Shan Rd., Chung Heh City, Taipei County, Taiwan

Filed Jun. 18, 1992, Ser. No. 900,147
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—326 **12 Claims**

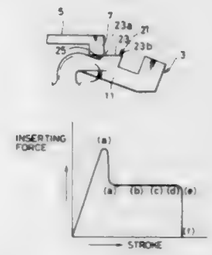


1. An electrical connector for a printed circuit board comprising:
an insulative housing having opposing end portions and an insertion face having a trough-like recess extending therealong between said end portions for receiving said printed circuit board;
an integral, resilient latching plate on each said end portion extending away therefrom, each said plate having an abutment protruding from a first side thereof for engagement with a corresponding first side portion of said printed circuit board adjacent an edge thereof;
an integral positioning post on each said end portion extending away therefrom disposed at a predetermined position opposite from the first side of an associated said plate, each said post having a pin protruding therefrom that is substantially parallel directed with respect to the first side of associated said plate for engaging a corresponding cooperating aperture in said printed circuit board, with said post being adjacent a second side of said printed circuit board;
an integral anchor bar on each said end portion extending away therefrom disposed opposite a second side of an associated said plate, each said bar having an axial groove formed thereon of reentrant section facing the second side of an associated said plate;
a generally U-shaped resilient, latching assistor member having two legs adjoined by a bight, disposed over each said end portion between said bar and said plate thereof with the bight of each said latching assistor member being in proximity with the base of said plate, a first leg of each said latching assistor member being slidingly engaged within the groove of an associated said bar in a tongue and groove-like fashion;
retaining means for securing the first leg of each said latching assistor member in an associated said bar;
at least one generally hook-shaped grapnel element on the terminal end of the second leg of each said latching assistor member engaged with a terminal end portion of an associated said plate opposite from the base thereof; and
an inclinate tab on a terminal end portion of the second leg of each said latching assistor member directed away from an associated said end portion and towards said bar thereof;
whereby, said printed circuit board can be secured in a functional position in said recess by applying force to said tab, in each said end portion, so as to effect the flexure of said latching assistor member wherein the second leg is flexed toward the first leg and said plate carried thereby is flexed towards said bar, inserting a connecting edge portion of said printed circuit board into said recess at an acute angle with respect to said insertion face wherein said printed circuit board is spaced from each said post, rotating said printed circuit board so as to engage each cooperating aperture thereon with a corresponding said pin, and allowing said latching assistor member and said plate to recover so as to engage said abutment thereon with the corresponding first side portion of said printed circuit board.

5,203,715
CONNECTOR

Takayuki Yamamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Mar. 13, 1992, Ser. No. 850,844
Claims priority, application Japan, Mar. 13, 1991, 3-14425[U]
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—354 **3 Claims**



1. A connector comprising;
a first housing;
a second housing fitted to said first housing;
an engaging portion disposed in said first housing;
an elastic lock arm having a front end of which in an inserting direction is integrally connected to said second housing, said elastic lock arm extending in the inserting direction, a rear end of which in the inserting direction forms a free end; and
a lock projection integrally formed on said lock arm, engaging said engaging portion to be depressed by said engaging portion when fitting said second housing to said first housing, having a first sliding face sliding on said engaging portion when depressed by said engaging portion, said first sliding face formed such that an inclination angle of said first sliding face is substantially the same as a maximum bending angle of said elastic lock arm relative to the inserting direction; said lock projection having a second sliding face disposed on a front side of said first sliding face.

5,203,716

Filed Jan. 17, 1992, Ser. No. 822,246
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—215 **13 Claims**

1. A power distribution system for a raceway, comprising:
a junction box adapted to be connected to an input wiring cable, comprising, an insulative housing providing at least one outlet receptacle port adapted to receive a first outlet receptacle, multiple output wiring ports, first electrical terminals in said outlet receptacle port and second electrical terminals in each of said output wiring ports electrically connected, respectively, to the first electrical terminals in said outlet receptacle port;
multiple conductors of an input wiring cable electrically connected, respectively, with the first electrical terminals, whereby the input wring cable is electrically connected to the first electrical terminals of the outlet receptacle port;
multiple conductors of at least one output wiring cable electrically connected, respectively, to the second electrical terminals in a selected one of the output wiring ports, whereby the output wiring cable is electrically connected to the first electrical terminals in said outlet receptacle port;
a wiring device comprising, an insulative housing providing at least a second outlet receptacle and electrical contacts in the housing connected to said second outlet receptacle;
and said electrical contacts being mateably engaged with said second electrical terminals in a second one of the output wiring ports whereby the second outlet receptacle is electrically connected to the first electrical terminals in said outlet receptacle port.

5,203,717

Filed Jan. 17, 1992, Ser. No. 822,246
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—215 **13 Claims**

1. A power distribution system for a raceway, comprising:
a junction box adapted to be connected to an input wiring cable, comprising, an insulative housing providing at least one outlet receptacle port adapted to receive a first outlet receptacle, multiple output wiring ports, first electrical terminals in said outlet receptacle port and second electrical terminals in each of said output wiring ports electrically connected, respectively, to the first electrical terminals in said outlet receptacle port;
multiple conductors of an input wiring cable electrically connected, respectively, with the first electrical terminals, whereby the input wring cable is electrically connected to the first electrical terminals of the outlet receptacle port;
multiple conductors of at least one output wiring cable electrically connected, respectively, to the second electrical terminals in a selected one of the output wiring ports, whereby the output wiring cable is electrically connected to the first electrical terminals in said outlet receptacle port;
a wiring device comprising, an insulative housing providing at least a second outlet receptacle and electrical contacts in the housing connected to said second outlet receptacle;
and said electrical contacts being mateably engaged with said second electrical terminals in a second one of the output wiring ports whereby the second outlet receptacle is electrically connected to the first electrical terminals in said outlet receptacle port.

5,203,719
LOCK ASSURANCE MECHANISM FOR CONNECTOR

insulating sheath and being interconnected by at least one longitudinal continuous web made of the same material as that

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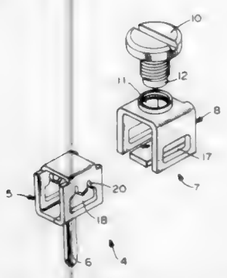
5,203,716

TERMINAL BLOCK FOR PRINTED CIRCUIT BOARDS

Roberto Martucci, and Mario Previato, both of Padua, Italy, assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 11, 1992, Ser. No. 896,937
Claims priority, application European Pat. Off., Jun. 14, 1991, 91109788; May 8, 1992, 92107809
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—411 7 Claims



1. A terminal block for establishing a connection between one or more conductors and a printed circuit board having a housing (2) of insulating material and screw-operated insulation displacement terminals (3) received in cavities (22) of the housing, the improvement in said terminal block comprising:

Each of said terminals (3) includes a first contact member (4) having an upper portion (5) containing a transverse opening (18) to accommodate one or more conductors, the first contact member (4) further having a lower portion (6) forming a downwardly extending pin, each terminal (3) further including a second contact member (7) forming a cage (8) which has on a top thereof a threaded bore (10) adapted to accept a screw (10), and a transverse opening (17), the upper portion (5) of the first contact member (4) being slidably mounted in the cage (8) of the second contact member (7) with the transverse openings (17, 18) of the first and second contact members (4, 7) being aligned, the pin (6) of the first contact member (4) extending through a base portion (14) of the housing (2) and being adapted for insertion into a plated-through hole of a printed circuit board, one of the transverse openings (17, 18) of the first and the second contact members (4, 7) having at least one insulation displacement slot (20), and the screw (10) resting with its end (12) on the upper portion (5) of the first contact member (4) and when rotated forcing the transverse openings (17, 18) of the first and second contact members (4, 7) out of alignment such that the conductors are forced into the insulation displacement slots (20).

5,203,717

COAX CONNECTOR ASSEMBLY

Herbert C. Beck, Simpsonville; Sam S. Shasteen, Greenville, and Clifford L. DeYoung, Woodruff, all of S.C., assignors to Woven Electronics Corporation, Greenville, S.C.

Continuation of Ser. No. 706,161, May 28, 1991, abandoned.
This application Apr. 21, 1992, Ser. No. 873,342
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—460 20 Claims

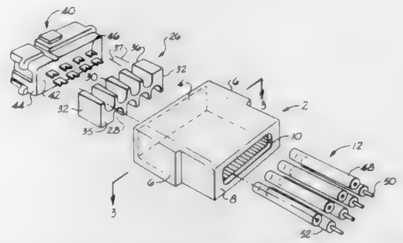
1. A connector assembly comprising:

a non-conductive housing which includes a multi-position connector and a back shell;

said back shell having a hollow interior with a forward opening which receives a contact portion of said connector and a rearward opening through which insulated wires extend;

a multi-wire retention comb having a plurality of slots fittingly received within said hollow interior, said slots are adapted to each receive one of said wires substantially adjacent an end thereof and to hold said wire ends in fixed relationship;

said slots are tapered inwardly longitudinally along their length from a first end toward a second end to form an inwardly tapered and protruding portion so that when



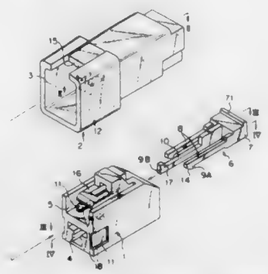
said wires are positioned within said slots to extend substantially longitudinally thereof and said comb is positioned within said back shell, said protruding portion of each of said slots bites into said insulation of said respective wire to provide positive retention of said wires in said fixed relationship.

5,203,718

CONNECTOR

Masamitsu Chishima, Mie, Japan, assignor to Sumitomo Wiring Systems Ltd., Mie, Japan

Filed Oct. 8, 1991, Ser. No. 773,003
Claims priority, application Japan, Oct. 8, 1990, 2-106178[U]; Nov. 5, 1990, 2-300434; Nov. 13, 1990, 2-118624[U]
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 10 Claims



1. A connector assembly in which the portions of a pair of connector housings each accommodating a terminal are coupled with each other and are locked together by means of a pair of first locking devices, said connector comprising:

a detecting spacer which is locked and removably connected to one of said pair of connector housings by a second locking device; and

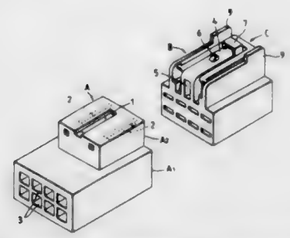
a lock-releasing device provided on the other connector housing, said lock releasing device being configured so as to release a locked condition of said detecting spacer to said one connector housing when said other connector housing is properly coupled with said one connector housing.

5,203,719

LOCK ASSURANCE MECHANISM FOR CONNECTOR

Seiji Kozono, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Dec. 3, 1991, Ser. No. 801,925
Claims priority, application Japan, Dec. 14, 1990, 2-410617
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—489 4 Claims



1. A lock assurance mechanism for a connector including a first housing with at least one terminal therein, a second housing adapted to be fitted to the first housing with at least one terminal mounted therein adapted to mate with the terminal of the first housing, a lock arm formed on an outer wall of said first housing through a fulcrum and displaceable about said fulcrum, and a lock retaining portion provided on said second housing for engagement with said lock arm, said first and second housings being locked together through said lock arm and said lock retaining portion upon fitting of said two housing relative to each other so that the terminals of the respective housings are in mating engagement, comprising:

a lock assurance member attached to said first housing and movable back and forth relative to said first housing, said lock assurance member having a flexible retaining lever which extends along said lock arm and has a retaining pin at a free end thereof;

a guide wall formed upright on said first housing and having a guide holder for supporting said retaining pin on the underside thereof; and

a back-and-forth movement limitation piece provided on said second housing for limiting back and forth movement of said retaining pin; wherein

when said first and second housings are fitted together to engage said lock arm with said lock retaining portion, said retaining pin which is abutted against said back-and-forth movement limitation piece is subsequently disengaged from said guide holder to allow the displacement of said flexible retaining lever; and

subsequently by moving said lock assurance member forward, said retaining pin is brought into engagement with a rear surface of said back-and-forth movement limitation piece, thereby completely retaining said flexible retaining lever relative to said first housing.

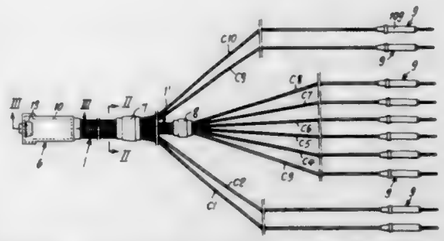
5,203,720

MULTIPLE-CORE, MULTIPLE-SCREEN STRAP-TYPE CONNECTING CABLE, PARTICULARLY FOR ELECTROCARDIOGRAPHS OR FOR OTHER MEASURING INSTRUMENTS

Roberto Zini, Lugo di Ravenna, Italy, assignor to Mortara Rangoni Europe S.r.l., Italy

Filed Oct. 8, 1991, Ser. No. 772,925
Claims priority, application Italy, Oct. 10, 1990, 15161/90[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—502 9 Claims

1. A connecting cable for electrical instruments comprising a multiple-core strap formed by a plurality of single-core leads which are flexible and have substantially identical characteristics, each said leads being provided with a screen, and being disposed in a common plane adjacent to each other, in substantially mutual contact, said leads further being provided with an insulating sheath and being interconnected by at least one longitudinal continuous web made of the same material as that forming the external insulating sheath of the leads, said strap including, at one end thereof, a terminal with a connector for removable connection to a corresponding socket of an electrical instrument, said connector having incorporated therein protective means for providing protection for the electrical instrument, said strap including at first and second intermediate points therealong separate leads which branch off to form



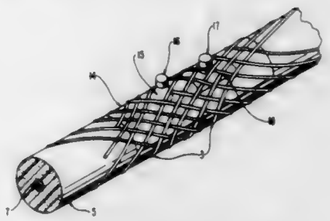
peripheral branches and precordial branches, and said strap further including at said first and second intermediate points first and second corresponding flat clamps which ensure that sections of said strap on the side of the said clamps closest to the electrical instrument remain in a fixed combined state, individual separate leads branching off from the clamps being cut to a required length and being connected with the free ends thereof to a corresponding connection means for providing rapid and removable connection to the measuring electrodes.

5,203,721

MOLDED PLASTIC COAXIAL CABLE SIDE TAP CONNECTOR

Steven K. Buck, Buda, Tex., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Sep. 1, 1992, Ser. No. 939,287
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—581 6 Claims



1. A coaxial cable side tap assembly comprising:

(a) an electric cable comprising an electrically conductive center conductor surrounded by insulation, said insulation having a short section removed from around said center conductor;

(b) a cylindrically curved plastic cap of the same curvature as said insulation fitted over said cable at the point of removal of said short section of insulation;

(c) said cap having imbedded therein and penetrating it perpendicularly a first electric contact pin, the inside end of which pin is notched to fit over said center conductor, and which notch is soldered to said center conductor;

(d) said cap having a plastic hump molded about said first contact pin on the outside surface of said cap to aid in holding said pin in place in said cap and to aid in deflecting strands of conductive braid wire around and out of electrical contact with said first pin;

(e) said cap having affixed to its outer surface a second

terminal bolt, and a top cover and a bottom cover of

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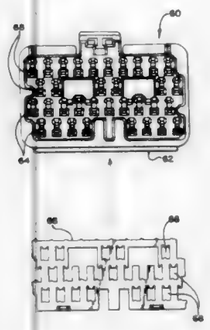
(e) said cap having affixed to its outer surface a second electrical contact pin for electrically contacting a conductive braided sheath surrounding said insulation and said cap and optionally an area of conductive metal plating on the outside surface of said cap surrounding said second pin;
(f) insulation comprising the same or different insulation to that of the insulation surrounding said conductor filling the removed section of insulation surrounding said center conductor and surrounding said first pin soldered to said center conductor;
(g) a conductive braided sheath surrounding said insulation and said cap; and
(h) an optional protective polymer Jacket surrounding said conductive braid.

5,203,722

DOUBLE-LOCK ELECTRICAL CONNECTOR

Yoshiji Kinoshita, Isehara, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 758,042, Sep. 12, 1991, abandoned. This application Sep. 17, 1992, Ser. No. 946,241
Claims priority, application Japan, Sep. 28, 1990, 2-257519
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 **4 Claims**



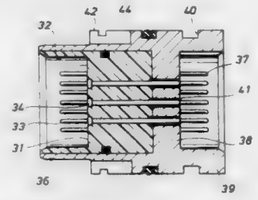
1. An electrical connector housing, comprising:
a dielectric housing member having at least one row of contact-receiving chambers extending from a contact-receiving end to a front end for receiving electrical contacts terminated to wires therein, said housing member positioned inwardly approximately midway between said insertion end and said front end and intersecting said contact-receiving chambers;
first latching surfaces provided by said contact-receiving chambers adjacent the opening in said wall;
second latching surfaces provided by said contact-receiving chambers adjacent the opening in said wall;
a dielectric locking member profiled to fit within said opening and having holes including edge surfaces therethrough;
first latching means on said locking member engagable with said first latching surfaces when said locking member is inserted within said opening to maintain said locking member at a first position thereby aligning said holes of said locking member with said contact-receiving chambers so that electrical contacts can be inserted within the contact-receiving chambers; and
second latching means on said locking member engagable with said second latching surfaces when said locking member is moved further into said opening to maintain said locking member at a second position so that edge surfaces of said holes of said locking member engage the electrical contacts positioned in the contact-receiving chambers at a point removed from the point of wire termination to prevent backing out of the contacts therefrom due to wire strain.

5,203,723

LOW COST PLASTIC HERMETIC ELECTRICAL CONNECTORS FOR HIGH PRESSURE APPLICATION

Thomas E. Ritter, Katy, Tex., assignor to Halliburton Logging Services Inc., Houston, Tex.

Filed Feb. 27, 1992, Ser. No. 842,702
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—589 **12 Claims**



1. A high pressure hermetically sealed connector comprising:
(a) plural elongate conductive pins wherein each of said pins has two ends and a central elongate portion wherein the central portion includes an irregular surface means;
(b) a polymeric body surrounding the central elongate portion of said pins to thereby position the respective ends of said pins exposed for connections in a circuit, and wherein said body secures said pins parallel to each other and said pin ends terminate as two sets of exposed pin ends for connection on opposing sides of said body;
(c) wherein said body and said pins are bonded at the irregular surface means to prevent leakage along said pins;
(d) wherein said body has openings therethrough to encircle and fit about and in a surrounding relationship to said pins and said body has an external sealing surface therearound;
(e) a surrounding housing which contacts against and seals with the external sealing surface of said body wherein said housing is formed of metal and supports a metal wall transverse thereacross and abutting said polymeric body, and said wall enables said body to be registered there against and held in a sealing relationship;
(f) plural aligned holes in said wall to align each of said pins to enable said pins to extend through said wall so that said pins position one set of ends on one side of said wall and another set of pin ends on the opposite side of said wall;
a separate insulative sleeve having sufficient length positioned around each of said pins to enable said pins to be electrically insulated from said wall to avoid electrical grounding thereto;
(h) an O-ring registration shoulder cooperative with an O-ring to permit interconnection in a hermetically sealing fashion between said body and said metal housing; and
(i) wherein said pins provide individual electrically insulated connections through said hermetically sealed housing.

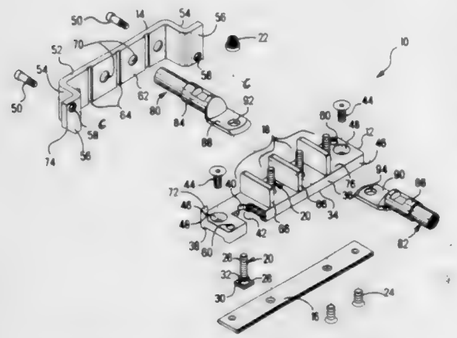
5,203,724

FIREWALL TERMINAL BLOCK

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1991, Ser. No. 788,323
Int. Cl.[5] H01R *11/03, 13/52*
U.S. Cl. 439—792 **10 Claims**

1. An electrical connector for the interconnection of pairs of terminated power cables having terminals including ring-tongue contact sections, comprising:
a dielectric body member, at least one terminal bolt, a threaded clamping member associated with each said terminal bolt, and a top cover and a bottom cover of dielectric material;
each said terminal bolt including a threaded shank of known length and diameter extending to a leading end from a body portion having a planar head;
said dielectric body member including a transverse body portion having at least one connection site therealong defined by a bolt-receiving aperture extending from a mounting face to a termination face, each bolt-receiving aperture including a recess along said mounting face for receipt thereinto of a respective said bolt head, and said transverse body portion further including a cover-receiving channel extending thereacross intersecting each said recess for receipt thereinto of said bottom cover for retaining each said at least one terminal bolt in said body member and covering said bolt head thereof;
said body portion of each said terminal bolt having a diameter larger than said shank diameter and defining a forwardly facing annular compression shoulder, and each said bolt head having a dimension larger than said diameter of said body portion, said diameter of a corresponding said bolt-receiving aperture having a diameter corresponding to said body portion diameter;
said bolt head having a thickness corresponding to a selected depth of a respective said recess and having a selected



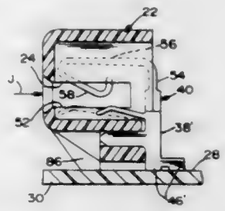
cross-sectional shape and dimension, each said recess having a cross-sectional shape and dimension corresponding closely to said selected dimension and shape of a respective said bolt head and said selected shape being at least asymmetric whereby said bolt head is secured against rotation when disposed within a said recess upon assembly;
said body portion further having an axial dimension approximately equal to said said selected axial length of said bolt-receiving aperture, whereby when said terminal bolt is assembled to said body member with said bolt head disposed in a respective said recess, said annular stop shoulder is disposed approximately flush with said termination face of said body member,
whereby when a pair of contact sections of terminals terminating a pair of cables are placed onto a respective said threaded shank of a said terminal bolt and said clamping member is threaded onto said threaded shank and requisite substantial torque is applied to establish an assured electrical connection therebetween when pressed against said termination face of said body member, a bottom one of said contact sections engages and is compressed against said compression shoulder of said terminal bolt with no more than minimal compressive force being received by said termination face of said body member.

5,203,725

BIASED EDGE CARD CONNECTOR

David L. Brunker, Naperville; Frank A. Harwath, Downers Grove, and Kent E. Regnier, Lombard, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 16, 1992, Ser. No. 852,441
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—636 **18 Claims**



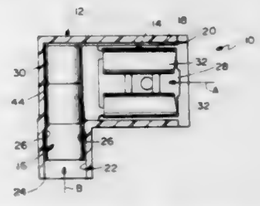
1. In an edge connector for receiving a printed circuit board having a mating edge and a plurality of contact pads adjacent the edge, said connector including an elongated dielectric housing having a board-receiving slot means for receiving the mating edge of the printed circuit board, and a plurality of spring contact elements mounted in the housing along at least one side of the slot means and having first spring contact portions extending into the slot means for contacting respective ones of the contact pads on one side of the printed circuit board, surface means on the housing at said one side of the slot means defining a datum plane beyond which the first spring contact portion of the spring contact elements extends into the slot means, and biasing means for biasing the printed circuit board against the surface means, thereby deflecting the first spring contact portion of said spring contact elements a predetermined amount, the improvement comprising:
said biasing means being a second spring contact portion extending into said slot means for contacting the printed circuit board on a side opposite said one side of the board and biasing said one side of the board against said datum plane and said first spring contact portions, each said spring contact element being a monolithic structure including said first and second spring contact portions.

5,203,726

INSULATED ELECTRICAL TERMINAL AND METHOD OF FABRICATING SAME

Robert L. Quinn, St. Petersburg, Fla., assignor to Molex Incorporated, Lisle, Ill.

Filed Feb. 11, 1992, Ser. No. 834,019
Int. Cl.[5] H01R *4/20*
U.S. Cl. 439—867 **11 Claims**



1. In an insulated terminal for connection to an end of an insulated electrical wire having an exposed conductor core projecting from the insulation, said terminal including:
an angled insulating housing having a through passage defined by a first passage portion communicating with and at an angle to a second passage portion, the first passage portion including a first open end through which a complementary mating terminal is received and the second

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TILTING SYSTEM FOR OUTBOARD DRIVE UNIT

d) providing at least one access hole to help facilitate the removal of material underneath the cusp, and

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passage portion including a second open end for receiving the insulated electrical wire;

a terminal portion positionable into the first passage portion through the first open end, the terminal portion including an outward contact section for direct connection to the mating terminal and an inward crimp section for crimping directly onto the conductor core of the insulated electrical wire inserted into the second passage portion; and

an open-ended cylindrical crimp ferrule having one end adjacent the inward crimp section of the terminal portion and the other end adjacent said second open end, said crimp ferrule adapted to receive the insulated electrical wire therethrough such that said exposed conductor core is positionable within said inward crimp section and an insulated portion of the wire adjacent the exposed conductor core is positionable within the crimp ferrule adjacent said second open end, said housing being deformable whereby the inward crimp section of the terminal portion is adapted to be crimped directly about said exposed conductor core and the crimp ferrule is adapted to be crimped directly about said insulated portion of the wire by applying a crimping force to said housing;

wherein the improvement comprises:

said crimp ferrule being separate from said terminal portion and being receivable through said second open end of the second passage portion of the housing, and

said housing substantially enclosing said terminal and said crimp ferrule except at said first and second open ends.

5,203,727

CONTROL APPARATUS FOR AN OUTBOARD MARINE ENGINE WITH IMPROVED CRUISING PERFORMANCE

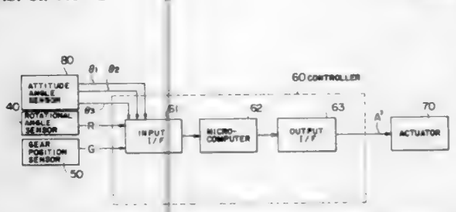
Wataru Fukui, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1992, Ser. No. 872,117

Claims priority, application Japan, Apr. 26, 1991, 3-96475

Int. Cl.[5] B63H *21/26*

U.S. Cl. 440—1 **5 Claims**



1. A control apparatus for an outboard marine engine in which the outboard engine is mounted on the hull of a boat for pivotal movements around an athwart pivot axis and a vertical pivot axis, said apparatus comprising:

sensor means for sensing various operating conditions of the engine and generating corresponding output signals;

an attitude angle sensor for sensing a three-dimensional attitude of the engine and generating corresponding attitude angle signals;

a controller operatively connected to receive the output signals from said sensor means and said attitude angle sensor for continuously generating a basic drive signal for controlling operating parameters of the engine based on the output signals received directly from said sensor means, said controller including modification means for continuously modifying the basic drive signal based on the attitude angle signals from said attitude angle sensor for optimal engine control; and

actuator means operatively connected to receive the modified output drive signal from said controller and for controlling the engine in accordance therewith to optimally control the operation of the engine while at the same time preventing an overturn of the boat due to centrifugal force.

5,203,728

WATERCRAFT WITH A COUPLE OF WATER JET PROPULSION UNITS

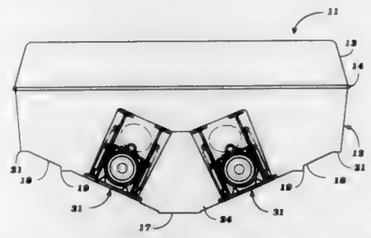
Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 27, 1990, Ser. No. 544,404

Claims priority, application Japan, Jul. 11, 1989, 1-180047

Int. Cl.[5] B63H *16/08*

U.S. Cl. 440—38 **31 Claims**



1. A watercraft having a hull with a transom, tunnel means at the rear of said hull and a V-bottom and a pair of separate jet propulsion units each mounted in said tunnel means in generally parallel relationship to each other each on a respective side of said V-bottom, each of said jet propulsion units having its own normally downwardly facing inlet for receiving water on a respective side of said V-bottom from a body of water in which said watercraft in operating, an impeller section and a discharge nozzle for discharging water rearwardly through said transom on a respective side of said V-bottom for propelling said hull.

5,203,729

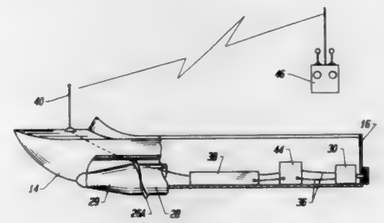
AUGER-DRIVEN AMPHIBIOUS TOY

Larry D. Beller, P.O. Box 444, Homer, Ak. 99603; Douglas S. Hart, and Robert L. White, both of P.O. Box 1775, Kenai, Ak. 99611

Continuation-in-part of Ser. No. 510,971, Apr. 19, 1990. This application Jan. 9, 1992, Ser. No. 819,091

Int. Cl.[5] B60F *3/00*

U.S. Cl. 440—48 **2 Claims**



1. An amphibious toy vehicle comprising:

a central vessel including a buoyant hull and generally upright sides;

a pair of augers with oppositely wound threads rotatably mounted along said sides of said hull, each of said augers extending below said hull;

means for propelling said augers;

remote control means for sending a control signal;

signal receiving means mounted in said vessel for receiving said control signal; and

signal processing means coupled to signal receiving means for utilizing said control signal for operating said propelling means.

5,203,730

TILTING SYSTEM FOR OUTBOARD DRIVE UNIT

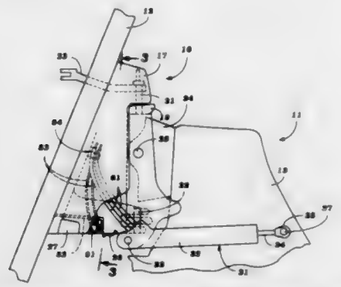
Naoyoshi Kuragaki, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 22, 1992, Ser. No. 887,781

Claims priority, application Japan, Jun. 7, 1991, 3-163751

Int. Cl.[5] B63H *5/12*

U.S. Cl. 440—61 **6 Claims**



1. A hydraulic tilting system for an outboard drive unit pivotally attached to a support structure that is mounted on a transom of a marine vessel, comprising at least one fluid motor connected to said drive unit and said support structure, a pressure source inboard of said marine vessel for delivering hydraulic fluid to said fluid motor, a first connecting member mounted on said support structure, a first plurality of conduits in communication with said pressure source and extending from inboard of said marine vessel to said first connecting member, a second connecting member mounted on said support structure at a position higher than said first connecting member but lower than the point of pivotal attachment of the outboard drive unit to the support structure, a second plurality of conduits extending from said first connecting member to said second connecting member, and a third plurality of conduits outboard of said marine vessel and extending from said second connecting member to said fluid motor.

5,203,731

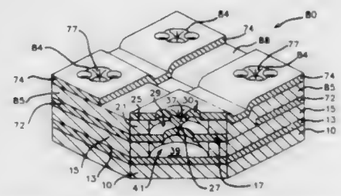
PROCESS AND STRUCTURE OF AN INTEGRATED VACUUM MICROELECTRONIC DEVICE

Steven M. Zimmerman, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 555,214, Jul. 18, 1990, abandoned. This application Mar. 5, 1992, Ser. No. 847,153

Int. Cl.[5] H01J *9/12*

U.S. Cl. 445—24 **49 Claims**



1. A process of making at least one integrated vacuum microelectronic device comprising the steps of:

a) providing at least one hole in a substrate having at least one electrically conductive material,

b) filling at least a portion of said hole with at least one material sufficiently to form a cusp,

c) depositing at least one layer of a material which is capable of emitting electrons under the influence of an electrical field, and filling at least a portion of said cusp to form a tip,

d) providing at least one access hole to help facilitate the removal of material underneath the cusp, and

e) removing the material underneath said cusp to expose at least a portion of said tip of said electron-emitting material and at least a portion of said electrically conductive material in said substrate, thereby forming said at least one integrated vacuum microelectronic device.

5,203,732

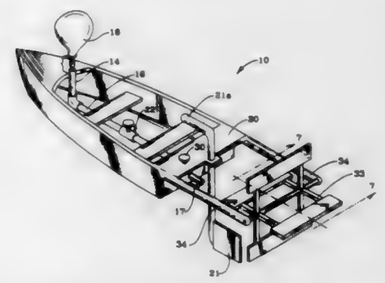
BALLOON POWERED TOY BOAT

René J. Cusson, 4 Burling St., Winooski, Vt. 05404

Filed Dec. 13, 1991, Ser. No. 806,201

Int. Cl.[5] A63H *23/06*

U.S. Cl. 446—163 **1 Claim**



1. A balloon powered toy boat, comprising,

a boat hull, the boat hull including a bow positioned medially of and forwardly of a stern plate, and

a boat floor extending coextensively between the boat hull and the stern plate, with spaced side walls extending upwardly relative to the boat floor, and

a first conduit pipe mounted to the boat hull, including an upper distal end projecting above the spaced side walls, and

the first conduit pipe in pneumatic communication with a second conduit pipe, the second conduit pipe including a second conduit pipe rear distal end projecting rearwardly of the stern plate and exteriorly of the boat hull, with the second conduit pipe rear distal end positioned below the stern plate, and

a pneumatic balloon mounted to the upper distal end of the first conduit pipe for directing pressurized air through the first conduit pipe and through the second conduit pipe and exiting the second conduit pipe through the second conduit pipe rear distal end, and

a stern flange fixedly mounted in an orthogonal relationship relative to the stern plate, wherein the stern flange extends rearwardly of the stern plate and rearwardly of the side walls of the boat hull, and the stern flange includes a rudder shaft orthogonally projecting through the stern flange, wherein the rudder shaft includes a rudder mounted to a lower distal end of the rudder shaft positioned below the boat floor, and a rudder handle lever mounted at an upper distal end of the rudder shaft, and

a second conduit valve mounted within the second conduit pipe to effect pneumatic closure through the second conduit pipe, and

the second conduit valve includes a threaded valve rod directed through the second conduit valve and coaxially aligned with a valve rod receiving boss within the second conduit, and the threaded valve rod includes a lower conical end, and the lower conical end coaxially aligned with a conical cavity formed within the receiving boss, and a seal member mounted about the lower conical end to effect sealing of the lower conical end relative to the receiving boss, and

a fluid reservoir mounted within the hull adjacent the stern plate, with the fluid reservoir including a fill plug directed

through a top wall of the fluid reservoir, and a fluid con-

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casing extension, said deformable sleeve having a leading edge

opening extending generally perpendicularly to each

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through a top wall of the fluid reservoir, and a fluid contained within the reservoir, and the fluid reservoir including a reservoir floor, the reservoir floor spaced above the boat floor, and an outlet pipe directed through the reservoir floor and through the stern plate, with the outlet pipe arranged adjacent to and above the second conduit pipe rear distal end, and

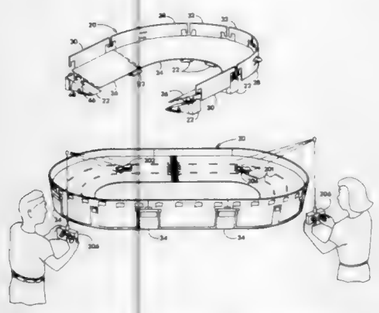
a plurality of parallel support legs fixedly mounted to the stern plate projecting rearwardly thereof, and a paddle wheel rotatably mounted to the support legs, wherein the paddle wheel has a paddle wheel axis parallel to the stern plate.

5,203,733

TOY CAR RACETRACK ASSEMBLED FROM MULTIPLE PAPERBOARD BLANKS

Bryce L. Patch, 2704 Highcrest Rd., and Francis W. Patch, 728 N. Hill Rd., both of Beloit, Wis. 53511

Filed Nov. 13, 1991, Ser. No. 791,904
Int. Cl.[5] A63H *18/06*
U.S. Cl. 446—444 **13 Claims**



1. A kit for the construction of a toy racetrack for radio controlled cars, comprising:

a) a plurality of first blanks having portions defining a curved roadway having an inner edge and an outer edge, and portions of each first blank defining radial slits which extend from the inner edge to the outer edge, the radial slits facilitating the bending of the first blank to form a curved, banked roadway section, the first blanks being joinable to form a continuous roadway for the travel of radio controlled toy cars thereon, wherein the first blanks are adapted to being erected on a support surface such that the roadway inner edge engages said support surface and the roadway outer edge is elevated above the support surface; and

b) a plurality of second blanks which are foldable to engage the outer edge of the first blanks and which are adapted to form a continuous barrier which extends above and is separate from the roadway for the retention of toy cars on the roadway, wherein each blank is formed of corrugated material having a first planar layer, a second planar layer, and an intermediate undulating layer attached between the first and second layers.

5,203,734

FOOD CASINGS WITH IMPROVED TUBULAR TAB ENDS

Mark L. Fox, Pleasant Valley, Mo., and Thomas R. Stanley, Georgetown, Ill., assignors to Teepak, Inc., Westchester, Ill.

Continuation-in-part of Ser. No. 573,953, Aug. 28, 1990, Pat. No. 5,127,873. This application Jul. 2, 1992, Ser. No. 908,094
Int. Cl.[5] A22C *13/00*
U.S. Cl. 452—32 **18 Claims**

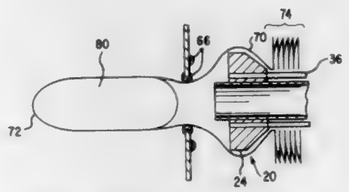
1. A food casing comprising a flattened tubular casing in combination with a deformable semi-rigid sleeve, separate from but attached to one end of said casing in the form of a casing extension, said deformable sleeve having a leading edge opposite the end attached to said food casing defining an opening for said casing-sleeve combination, the leading edge of said deformable sleeve having a generally circular configuration when said sleeve is expanded into a tubular shape.

5,203,735

VACUUMIZED INTERNAL SIZING RING ASSEMBLY AND METHOD OF USE

Thomas G. Stanek, Roswell, Ga., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Dec. 12, 1991, Ser. No. 806,974
Int. Cl.[5] A22C *11/02*
U.S. Cl. 452—38 **18 Claims**



1. A vacuumized internal sizing ring assembly for use on a stuffing machine to extract air from a tube-like casing having a closed end, wherein the stuffing machine includes a stuffing horn with an outer surface adapted to support the casing inserted thereon and a discharge end against which the closed end is positioned in preparation for stuffing operation, the sizing ring assembly comprising:

a sizing ring having an inner mounting surface adapted to conform to the outer surface of the stuffing horn for mounting said sizing ring proximate the discharge end with the casing displaced thereover, a peripheral casing-expanding surface to expand the casing into an open configuration as the casing is withdrawn from the stuffing horn during the stuffing operation, a front surface extending radially from the mounting surface to the casing-expanding surface with the front surface adapted to be positioned toward the discharge end, and a back surface located opposite the front surface; and

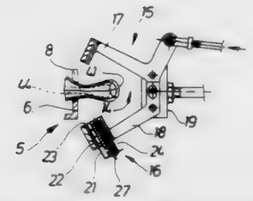
vacuum means associated with said sizing ring for extracting air trapped within the casing between the closed end and said sizing ring.

5,203,736

METHOD FOR DEBONING POULTRY LEGS AND APPARATUS FOR PERFORMING THE METHOD

Josef Schulte, Hamberge, and Günther Wodrich, Klempau, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lubeck, Fed. Rep. of Germany

Filed Mar. 17, 1992, Ser. No. 852,814
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1991, 4109699
Int. Cl.[5] A22B *25/16*
U.S. Cl. 452—135 **10 Claims**



1. A method for processing poultry legs in the form of at least one of whole legs and drumsticks comprising at least one bone, a splint bone (fibula), tendons and ligaments, and meat, and defining a distal and a proximal end, for the purpose of gaining the meat therefrom, the method comprising the steps of

a) severing the tendons and ligaments extending along the drumstick bone at said distal end area thereof and

b) subsequently stripping off the meat by a relative movement between said bone and said meat, which relative movement is directed towards said proximal end of said drumstick bone,

wherein

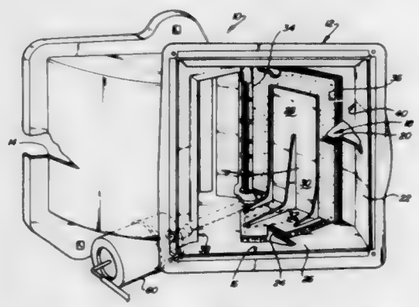
said severing step is performed without severing a tendon which forms a continuation of said splint bone in the direction, towards said distal end.

5,203,737

MULTIPLE ENTRY AIR PASSAGE

Thomas J. Joseph, Milford; Dennis A. Vermette, Westland, and Suzanne T. Bertolino, Royal Oak, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 17, 1992, Ser. No. 870,081
Int. Cl.[5] B60H *1/26*
U.S. Cl. 454—139 **18 Claims**



1. An air intake passage for a heating and air conditioning system comprising:

a housing having a first inlet for receiving fresh air, and an outlet for conveying air to a heating and air conditioning unit, said housing also having second inlets for receiving recirculation air from a vehicle occupant compartment, said second inlets having a main opening and an auxiliary opening extending generally perpendicularly to each other;

an L-shaped damper door pivotally mounted on said housing for movement between fresh air and recirculation air positions, said damper door having a main portion for opening said first inlet and closing said main opening when said damper door is in said fresh air position and for closing said first inlet and opening said second inlet when said damper door is in said recirculation air position, said damper door also having an auxiliary portion for opening said auxiliary opening when said damper door is in said recirculation air position and for closing said auxiliary opening when said damper door is in said fresh air position, said auxiliary damper door element contiguous to, and generally perpendicular to said main damper door element;

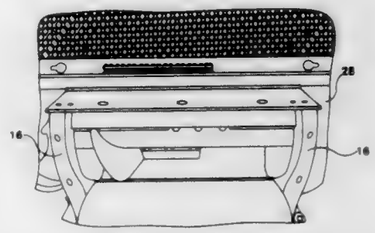
said housing also having camming means for camming said L-shaped damper door away from said auxiliary opening while said damper door is in intermediate, pivoting movement between said fresh air position and said recirculation air position.

5,203,738

COMBINE FOR RAPID HEAD CHANGE

Steven R. Busse, Moorhead, Minn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1991, Ser. No. 738,821
Int. Cl.[5] A01D *47/00;* **A01F** *12/10*
U.S. Cl. 460—16 **20 Claims**



1. In a combine of the type for harvesting crops and including a head mounted to a feeder housing and non-removable therefrom when said feeder housing is mounted on said combine, the improvement comprising:

an assembly for removably mounting said head to said feeder housing when said feeder housing is mounted on said combine,

said assembly comprising upper mounting members carried by one of said head and said feeder housing, and corresponding upper mounting openings for receiving said upper mounting members in said other of said head and said feeder housing,

said assembly further comprising at least a first lower attachment element mounted to said feeder housing, at least a second lower attachment element mounted to said head, and a connector element disposed between said first and said second lower attachment elements for removably coupling together the lower portion of said head and the lower portion of said feeder housing,

said assembly for removably mounting said head to said feeder housing enabling exchange of one of said heads for another without removing said feeder housing from said combine.

5,203,739

5,203,742

5,203,743

ORNAMENTAL CAROUSEL ASSEMBLY

distance which is substantially equal to one third of the

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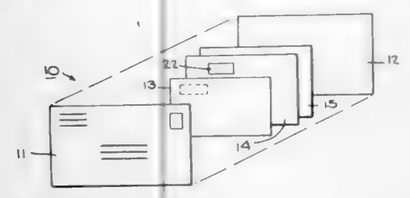
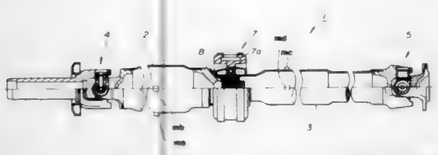
5,203,739
MAILER FORM HAVING A PROTECTED IMAGE TRANSFER MEDIUM
Frank Neubauer, Mount Kisco, N.Y., assignor to Transkrit Corporation, Brewster, N.Y.
Filed Mar. 23, 1992, Ser. No. 855,265
Int. Cl.[5] B41L *1/20*
U.S. Cl. 462—6 **14 Claims**



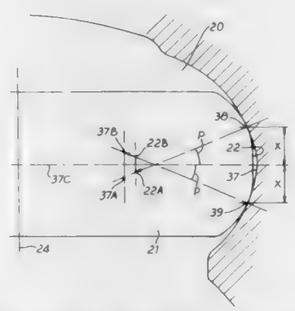
1. A mailer form comprising
a front ply having a front face for impacting of an imaging means thereon and a rear face;
a back ply secured to said front ply to define a pocket therewith;
at least one insert ply disposed in said pocket between said front ply and said back ply;
an image transfer medium on said rear face of said front ply for transferring an image imposed on said front ply under an impact force of an imaging means onto said insert ply; and
an overcoat over at least a part of said transfer medium to reduce transfer of an image imposed on said front ply under a transversely applied force onto said insert ply while transferring an image imposed on said front ply under an impact force onto said insert ply.

5,203,740
DRIVE SHAFT ASSEMBLY
Hiroshi Okuzumi, Ithaca, N.Y., and Yoshinori Hirano, Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Jan. 28, 1991, Ser. No. 646,542
Claims priority, application Japan, Jan. 29, 1990, 2-18184
Int. Cl.[5] F16D *3/76;* **F16C** *3/02*
U.S. Cl. 464—89 **14 Claims**



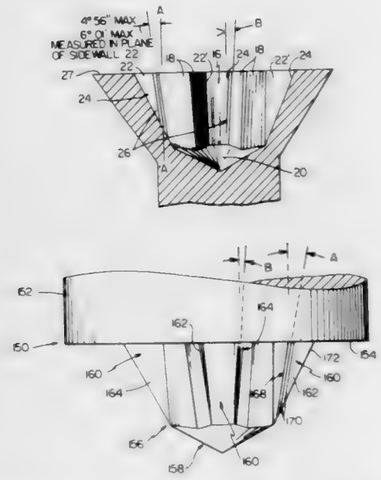
1. A drive shaft assembly comprising first and second shafts each of which has first and second ends;
a connecting means for resiliently connecting said first ends of said first and second shafts with each other so that power can be transmitted from one of said first and second shaft to the other;
a first unbalancing means fixed to said first shaft, said first unbalancing means being located at a first unbalance position of said first shaft, said first unbalance position being radially spaced from a center axis of said first shaft, said first unbalance position being separated from said first end of said first shaft by a distance which is substantially equal to one third of the length of said first shaft; and
a second unbalancing means fixed to said second shaft, said second unbalancing means being located at a second unbalance position of said second shaft, said second unbalance position being radially spaced from a center axis of said second shaft, said second unbalance position being separated from said first end of said second shaft by a distance which is substantially equal to one third of the length of said second shaft,
wherein said first unbalancing means is fixed to said first shaft so as to make a principal axis of inertia of said first shaft approximate an inclined straight line which intersects said center axis of said first shaft at said second end of said first shaft and which is apart from said center axis of said first shaft at said first end of said first shaft, and said second unbalancing means is fixed to said second shaft so as to make a principal axis of inertia of said second shaft approximate an inclined straight line which intersects said center axis of said second shaft at said second end of said second shaft and which is apart from said center axis of said second shaft at said first end of said second shaft.

5,203,741
CONSTANT VELOCITY RATIO UNIVERSAL JOINT WITH GOTHIC ARCH SHAPED ROLLERS AND GUIDE GROOVES
Turner, Colin F. S., and Colin A. Bird, both of Sutton Coldfield, England, assignors to Hardy Spicer Limited, England
PCT No. PCT/GB89/01385, § 371 Date May 15, 1991, § 102(e) Date May 15, 1991, PCT Pub. No. WO90/06451, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 21, 1989, Ser. No. 689,778
Claims priority, application United Kingdom, Nov. 26, 1988, 8827655
Int. Cl.[5] F16D *3/205*
U.S. Cl. 464—111 **13 Claims**



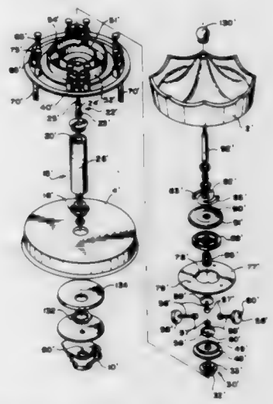
1. A constant velocity ratio universal joint of the tripod type comprising an outer joint member (**10**) having a rotational axis (**17**) and three guide grooves (**20**) extending parallel to its rotational axis and equally circumferentially spaced thereabout, each guide groove having opposed side portions; and inner joint member (**12**) disposed inside the outer member (**10**), having a rotational axis (**18**) and three arms (**13**) equally spaced about this rotational axis extending radially into the guide grooves (**20**) of the outer joint member; each arm carrying a roller (**21**) having an external surface (**22**) which engages said opposed side portions of the guide groove (**20**) into which the arm extends so that the roller is constrained to roll therealong; each roller being able to rotate about, move lengthwise of, and tilt relative to the arm (**13**) by which it is carried; wherein the cross-sectional shape of said external surface of each roller is of a truncated gothic arch shape, and the cross-sectional shape of each guide groove side portion is of a gothic arch shape different from said truncated gothic arch shape of the roller external surface, said roller external surface and each guide groove side portion having angular contact engagement with one another at two spaced points which lie in said roller external surface and guide groove side portion which are parts of said gothic arch shapes.

5,203,742
PUNCH FOR MAKING SUCH SCREW HEADS WITH SLANT RIB
John H. Grady, Wayland, Mass., assignor to Phillips Screw Company, Burlington, Mass.
Continuation-in-part of Ser. No. 736,094, Jul. 26, 1991, Pat. No. 5,120,173. This application Jan. 14, 1992, Ser. No. 820,355
Int. Cl.[5] B21K *1/46*
U.S. Cl. 470—63 **5 Claims**



1. In an impact tool for forming drive-engageable surfaces at an end of a rotatable fastener comprising:
a body portion having an axis and having an end region lying along said axis, the end region having primary surfaces constituting side walls which define a primary geometrical shape substantially corresponding to those of the primary drive-engageable surfaces to be formed; and
means forming at least one elongate groove of relatively small cross-sectional dimensions in at least one of said primary surfaces of said end region, said groove extending generally longitudinally of said axis, whereby when the end region of said tool is impacted into the material of the rotatable fastener, the primary surfaces of the end region will form said geometrically shaped primary driver-engageable surfaces and said elongate groove will cause metal flow in a predetermined direction to form a projection of relatively small cross-sectional dimension extending from said at least one primary driver-engageable surface;
the improvement wherein the elongate groove has a triangular cross-section, the apex of the triangle forming a rib edge which is engageable by the edge of the driver, the groove being tilted upwardly and outwardly from the punch axis in the direction of metal flow by an angle A (the rib angle) with respect to a plane parallel to the punch axis, said angle A being between about 1° and 10°, the associated side wall of the punch being slanted outwardly from the punch axis by a small vertical wing angle B between 1° and 10°, said groove having an apex angle sufficiently large that a vertical section through said formed rib will provide a base angle D for the rib surface which is equal to or less than the vertical wing angle B, said apex angle being measured in a plane normal to the groove.

5,203,743
ORNAMENTAL CAROUSEL ASSEMBLY
Jack Hou, and I-Pin Feng, both of Taipei, Taiwan, assignors to Giftec, Ltd., Alexandria, Va.
Continuation-in-part of Ser. No. 714,729, Jun. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 577,773, Sep. 5, 1990, Pat. No. 5,078,386. This application Jul. 21, 1992, Ser. No. 915,756
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.[5] A63H *13/20*
U.S. Cl. 472—7 **27 Claims**



1. An ornamental carousel assembly of the type wherein a plurality of ornaments are mounted on a rotating ceiling plate comprising:
(a) a base;
(b) a wind-up type drive and music box mechanism secured to said base and including an output shaft;
(c) a tubular support assembly extending upright from and supported by said base;
(d) bearing means having an inner sleeve member non-rotatably secured to an upper portion of said tubular support assembly and an outer rotary bearing member;
(e) a ceiling plate attached to said outer rotary bearing member, said ceiling plate having means to support a plurality of ornaments; and,
(f) drive transmitting means interconnected between said output shaft and said ceiling plate for rotating said ceiling plate on said bearing means relative to said tubular support assembly.

5,203,744
DEVICE FOR VERTICALLY OSCILLATING PARTICIPANTS
Stanley J. Checketts, P.O. Box 55, Providence, Utah 84332
Filed Aug. 30, 1991, Ser. No. 753,335
Int. Cl.[5] A63J *5/12*
U.S. Cl. 472—131 **20 Claims**

1. A device for vertically oscillating participants, which comprises:
an elevating means for bringing participants from the surface of the earth to a desired height;
a means for horizontal movement, which is attached to the top of said elevating means, for moving participants horizontally outward from said elevating means;
a means for jumping, which is connected to the outward end of said means for horizontal movement, to enable the participants to be accelerated downward by the force of gravity;
a means for decelerating the participants' descent and pro-

ducing dampened vertical oscillations, which is connected

ping ends, said roller means providing roller axes transverse to

the internal gears to engage a greater or lesser portion of the respective laterally-constrained external gears such that the

diameter portion and said internal diameter portion of said output shaft; and

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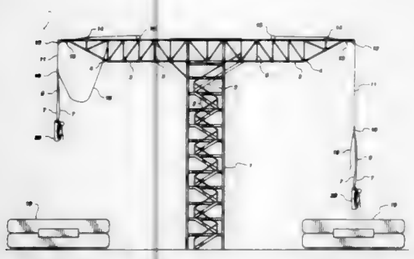
ducing dampened vertical oscillations, which is connected to each participant; and

a means for lowering the participants to the surface of the earth and restoring the decelerating and oscillating means to its original elevated position, which lowering and restoring means is connected to both the mean for horizontal movement and the decelerating and oscillating means.

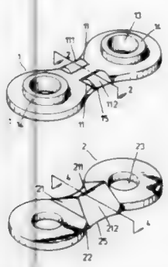


5,203,745

INNER AND OUTER CHAIN PLATES FOR BICYCLE HAVING MULTIPLE WHEELS

Wen B. Wang, #67 Kong Ko, Kong Nang Village, An Ding Hsiang, Tainan Hsien, Taiwan

Filed May 8, 1992, Ser. No. 880,599
Int. Cl.[5] F16G *1/24*
U.S. Cl. 474—206 3 Claims



1. Inner and outer plates for bicycle having multiple wheels comprising essentially a plurality of inner plates and outer plates; each of said inner plates have two triangular protuberances extending on respective edges of a reduced portion at one side thereof, and having formed thereon two guiding surfaces from the top marginal edges to the outer marginal edges of said protuberances; said outer plates have also a pyramidal protuberance extending upwardly from a reduced portion at one side thereof and are defined as guiding surfaces; each said bottom marginal edge of said outer plate being extending a portion out of the bottom edge of said plate.

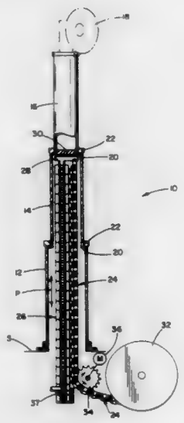
5,203,746

TELESCOPING MAST ASSEMBLY

Heidi E. Lehnert, Doylestown, Ohio, assignor to The Will-Burt Company, Orrville, Ohio

Division of Ser. No. 717,895, Jun. 19, 1991. This application May 7, 1992, Ser. No. 879,293
Int. Cl.[5] F16G *1/24*
U.S. Cl. 474—206 20 Claims

1. A chain assembly comprising a plurality of inner and outer link plates, each said inner and outer link plate having opposite ends and spaced apart opposite edges between said ends, said inner and outer link plates being in alternating laterally spaced pairs with the ends of adjacent pairs of inner and outer link plates overlapping and pivotally interconnected by roller means laterally between said inner link plates at said overlapping ends, said roller means providing roller axes transverse to said inner and outer link plates about which adjacent pairs of said inner and outer link plates are pivotal in opposite directions, said inner and outer link plates each having a mounting flange on a corresponding one of said opposite edges and extending axially outwardly from said one edge with respect to said roller axes, and means mounted on said mounting flanges of adjacent pairs of said inner and outer link plates to maintain said roller axes generally coplanar and preclude pivotal displacement of said adjacent pairs of inner and outer link plates about said roller axes in at least one of said opposite directions.

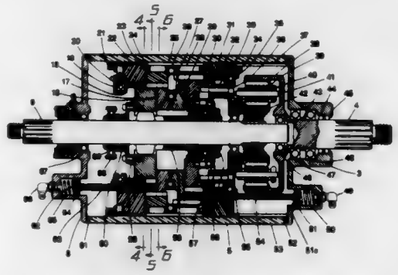


5,203,747

INTEGRATED HYDRO-MECHANICAL TRANSMISSION

Walter S. Warren, 14 Chapman Road, Winnipeg Manitoba, Canada R2Y 1J8

Filed Oct. 10, 1991, Ser. No. 774,555
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—72 8 Claims



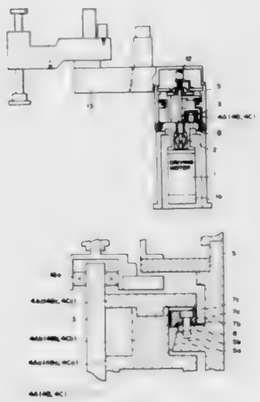
1. A hydrostatic transmission incorporating gear-type hydraulic pump and motor elements; the hydraulic pump and motor each being of the internal gear type, wherein said hydraulic pump and motor each have an internal gear, an external gear and a crescent that separates the respective internal gear and external gear; the internal gears being capped off by means of laterally constrained and rotatably supported internal gear plugs, and the external gears being capped off by means of external gear plugs sandwiched between the two internal gears creating respective pump and motor working chambers; the internal gears and associated external gear plugs being laterally moveable by means of a concentrically-spanned control shaft which is positionally displaceable in an axial direction causing the internal gears to engage a greater or lesser portion of the respective laterally-constrained external gears such that the volumetric capacity of both pump and motor working chambers are made inversely variable to one another; the internal gear of the pump portion of said hydrostatic transmission being spline-coupled and driven via a support input shaft, said support input shaft also being spline coupled to a sun gear of a sun and planetary gear set; the internal gear of the motor portion of said hydrostatic transmission being spline coupled to a planet carrier of said sun and planetary gear set; the motor element of said hydrostatic transmission being coupled hydraulically to the pump element such that it rotates in the same direction as the pump but at a generally slower speed; gear ratios of said sun and planetary gear set being chosen in conjunction with the relative volumetric capacities of said hydraulic pump and motor elements such as to achieve a continuously variable, through zero output; and an output shaft being integral with a ring gear of the sun and planetary gear set.

5,203,748

ROTARY DRIVING SYSTEM AND ROBOT OPERATING THEREON

Yasuhiro Sawada, Chofu; Yusaku Azuma; Takeo Tanita, both of Yokohama; Yasuo Karube, Inashiki, and Teiji Ohsaka, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1991, Ser. No. 695,995
Claims priority, application Japan, May 9, 1990, 2-117646; May 9, 1990, 2-117647; May 9, 1990, 2-117648; May 9, 1990, 2-117649; May 10, 1990, 2-118679; Jun. 22, 1990, 2-162867; Jul. 16, 1990, 2-185281
Int. Cl.[5] G05G *11/00*
U.S. Cl. 475—183 9 Claims



1. A rotary driving system, comprising:

a fitting base;

a motor having a rotating shaft and fixed to said base;

a sun roller coupled to said rotating shaft;

a plurality of planetary rollers disposed around said sun roller at substantially regular intervals, and supported pivotably by said shaft fixed to said fitting base,

said planetary roller comprising:

a first diameter portion for applying a pressing force against said sun roller; and

a second diameter portion for adjusting the pressing force against said sun roller;

an output shaft pressing said first diameter portion of said planetary rollers and receiving a transferred force;

a ring member interposed between said second diameter portion of said planetary roller and an internal diameter portion of said output shaft and having a tapered portion on a surface for connecting either one of said second diameter portion and said internal diameter portion of said output shaft; and

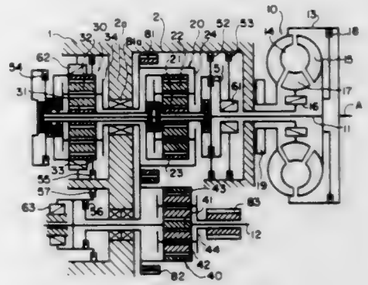
an auxiliary roller mounted over said second diameter portion of said planetary roller for pressing against said sun roller, said auxiliary roller having a diameter greater than said second diameter portion and being detachably attached to said planetary roller.

5,203,749

AUTOMATIC TRANSMISSION

Koki Ito, Higashi-Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 21, 1992, Ser. No. 822,696
Claims priority, application Japan, Jan. 21, 1991, 3-22796; Jan. 21, 1991, 3-22797
Int. Cl.[5] F16H *3/62*
U.S. Cl. 475—204 7 Claims



1. An automatic transmission comprising:

a casing;

an input shaft;

an output shaft provided parallel to the input shaft;

a pair of planetary gear mechanisms;

an output gear supported on casing;

two input elements operably connected to the pair of planetary gear mechanisms;

wherein the two input elements are spaced apart in the direction of the shaft to form a space; and

wherein in the space between the two input elements, each planetary gear mechanism is disposed on one side of the output gear with the output gear in the middle.

5,203,750

ANGLED VEHICLE AXLE ASSEMBLY

Terry L. Oster, and Kraig J. Schlosser, both of Auburn, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 18, 1991, Ser. No. 779,385
Int. Cl.[5] F16H *1/38*
U.S. Cl. 475—230 16 Claims

1. A vehicle axle assembly comprising:

a pair of output shafts having a first rotational axis;

an input shaft having a second rotational axis oriented at an oblique first angle of approximately twenty-seven degrees to said first rotational axis of said pair of output shafts; and

an intermediate shaft having a third rotational axis oriented at a second angle of approximately sixty-three degrees to

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5,203,752

HORIZONTAL LADDER FOR PLAYGROUNDS

a pliable hand grip, said hand grip being circumjacent said

element to said fifth ring element and for passing said first cord upwardly through said third and first ring elements

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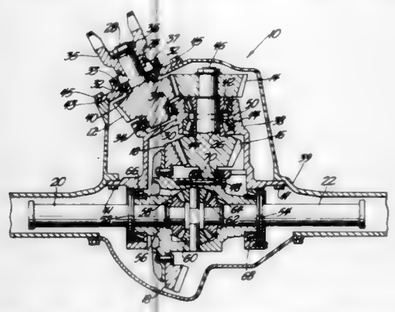
an intermediate shaft having a third rotational axis oriented at a second angle of approximately sixty-three degrees to



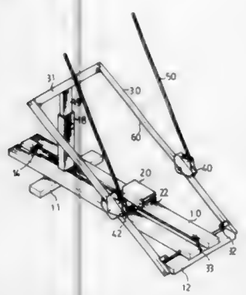
one of said pair of output shafts which is perpendicular to said first rotational axis of said pair of output shafts.

5,203,751

EXERCISE MECHANISM

Chester Chang, No. 1-5, Chun Ting Lane, Ya Tan Road, Ta Ya Hsiang, Taichung Hsien, Taiwan

Filed Jul. 15, 1991, Ser. No. 729,060
Int. Cl.[5] A63B *22/00*
U.S. Cl. 482—70 **2 Claims**



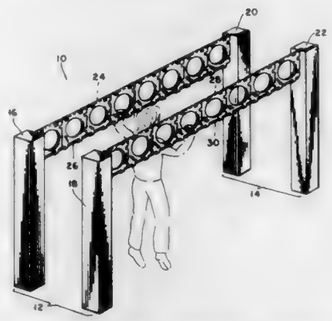
1. An exercise mechanism comprising a pair of tracks disposed in parallel on a base; a gear rotatably disposed between a front end of said tracks; a belt engaged on said gear and including two end portions; a bracket slidably disposed on each of said tracks; a pair of rails having a lower end pivotally coupled to said base and having an upper end pivotally coupled together by a beam; a post vertically fixed on said tracks, said beam being disposed on a top of said post; a slide slidably disposed on each of said rails; a handle having a lower end pivotally coupled to each of said slides; a first pulley disposed on each end of each of said rails; a second pulley disposed on a rear end of each of said tracks; and a cable threaded through said first pulleys and said second pulleys and including two end portions coupled to said end portions of said belt so that said cable and said belt form a closed loop; said brackets being coupled to said end portions of said cable, and said slides being coupled to said cable such that said brackets and said slides are coupled together and such that said brackets and said slides move in concert.

5,203,752

HORIZONTAL LADDER FOR PLAYGROUNDS

Arie Frankel, Melville, N.Y., assignor to American Playtime Systems, Inc., Melville, N.Y.

Filed Sep. 23, 1991, Ser. No. 764,351
Int. Cl.[5] A63B *9/00*
U.S. Cl. 482—36 **13 Claims**



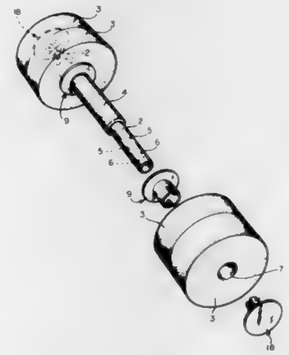
1. A horizontal ladder for a playground comprising:
a first and a second end structure;
four cables secured between said first and second ends, said four cables including first and second upper cables, and first and second lower cables disposed substantially below said first and second upper cables, respectively; and
a first set and a second set of cells arrange and constructed to form handholds for traversing from said first to said second end structure, each cell of said first set being mounted between said first upper and said first lower cable, and each cell of said second set being mounted between said second upper and said second lower cable.

5,203,753

PADDED BARBELL FLOAT

Dianne Rothhammer, Arroyo Grande, Calif., assignor to Rothhammer International, Inc.

Filed Apr. 28, 1992, Ser. No. 874,692
Int. Cl.[5] A63B *21/08*
U.S. Cl. 482—111 **7 Claims**



1. A bar bell float for exercise performed in water comprising:
a lift bar of selected length, said lift bar being made from a light weight water impervious material, said lift bar having at least two pairs of apertures located at each end of said lift bar,

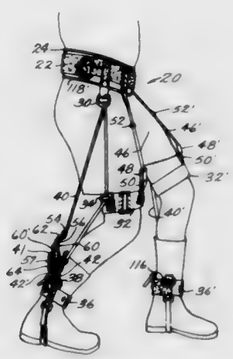
a pliable hand grip, said hand grip being circumjacent said lift bar and positioned equidistant from the ends of said bar,
at least one float located at each end of said lift bar said floats being made from closed cell, expanded polymer material so that said float is buoyant in water, said float also having a central aperture so as to allow said float to be axially movable on said bar,
at least one float retaining collar located at each end of said lift bar for limiting the axial movement of said float in towards the middle of said bar, said float retaining collar being made from a light weight, water impervious material,
at least one end cap located at each end of said lift bar for limiting the axial movement of said float out towards the ends of the bar, said end cap being made from a light weight, water impervious material,
means for positioning and attaching each float retaining collar to said lift bar, said means comprising two diametrically opposed, generally cylindrical buttons located on each of said float retaining collars and two diametrically opposed apertures located near each end of said lift bar, and
means for positioning and attaching each end cap to said lift bar, said means comprising two diametrically opposed, generally cylindrical buttons located on each of said end caps and two diametrically opposed apertures located nearer the end of said lift bar outside of said float retaining collar apertures.

5,203,754

VARIABLE RESISTANCE LEG HARNESS EXERCISE APPARATUS

Colin R. Maclean, 3229 Stone Eagle Ct., Abingdon, Md. 21009

Filed May 18, 1992, Ser. No. 884,945
Int. Cl.[5] A63B *21/02*
U.S. Cl. 482—124 **18 Claims**



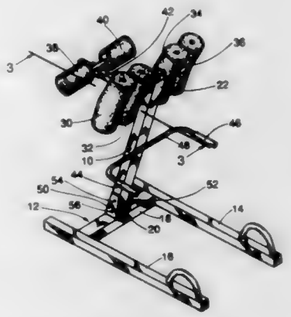
1. Exercise apparatus, comprising:
belt means for adjustable and removable attachment about the waist or mid-section of a human user of said apparatus;
first and second ring elements attached to said belt means;
first and second strap means for adjustable and removable attachment about the legs and above the knees of said user;
third and fourth ring elements attached to said first and second strap means, respectively;
first and second foot attachment means for removable attachment to the feet of said user;
fifth and sixth ring elements attached to said first and second foot attachments, respectively;
a first stretchable cord of predetermined normal length and first and second connecting elements attached to said first cord for removable attachment of said first connecting element to said fifth ring element and for passing said first cord upwardly through said third and first ring elements to be stretched and removably reattached by said second connecting element to said fifth ring element; and
a second stretchable cord of predetermined normal length and third and fourth connecting elements attached to said second cord for removable attachment of said third connecting element to said sixth ring element and for passing said second cord upwardly through said fourth and second ring elements to be stretched and removably reattached by said fourth connecting element to said sixth ring element.

5,203,755

EXERCISE APPARATUS FOR INVERTING A HUMAN BODY

William D. Kaiser, P.O. Box 849, Santa Margarita, Calif. 93453

Filed Jan. 30, 1992, Ser. No. 828,210
Int. Cl.[5] A63B *26/00*
U.S. Cl. 482—144 **7 Claims**



1. An exercise apparatus for inverting a human body comprising in combination:
a base having a front portion and a rear portion;
a single post having a lower end connected to the rear portion of said base, said single post extending upwardly and forwardly above said base and having an upper end;
a pivotable assembly including a pelvic cushion, a knee cushion, and an arm holding said knee cushion in a constant spaced relationship to said pelvic cushion; and,
means for mounting said pivotable assembly to the upper end of said single post for limited pivotal motion about a horizontal axis.

5,203,756

LAMINATOR

Hiroshi Taguchi, Tokyo; Yoji Washizaki, Saitama; Akira Igarashi, Tokyo, and Hiroyoshi Nakano, Saitama, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Continuation of Ser. No. 650,374, Jan. 30, 1991, abandoned. This application Feb. 21, 1992, Ser. No. 839,675
Claims priority, application Japan, May 15, 1990, 2-125959
Int. Cl.[5] B21B *13/02*
U.S. Cl. 492—16 **7 Claims**

1. A pressurized roller for bonding a film to a panel by application of substantially uniform heat and pressure to the film and panel, comprising:
a roller outer shell;
a pair of flanges at opposite ends, respectively, of said roller outer shell;
a roller shaft, to which an angular moment of force is applied, passing through said flanges and said roller outer shell and extending axially from both ends thereof;
bearings located between said shaft and an inner diameter of

said flanges to transfer said angular moment of force to

5,203,758

METHOD FOR MANUFACTURING A SACK OR BAG

flat surface for receipt of a free end of casing from a roll of casing;

bar for slidable movement toward and away from the center line;

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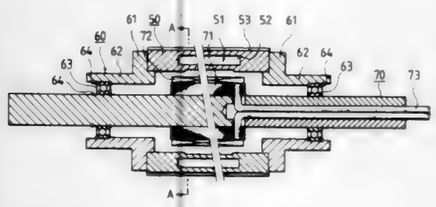
said flanges to transfer said angular moment of force to said flanges and thereby to said roller outer shell;



a shell heater located within said shell circumscribing said shaft; and

a rubberized layer covering said roller outer shell.

5,203,757

METHOD AND APPARATUS FOR PRODUCING TOBACCO SMOKE FILTER RODS

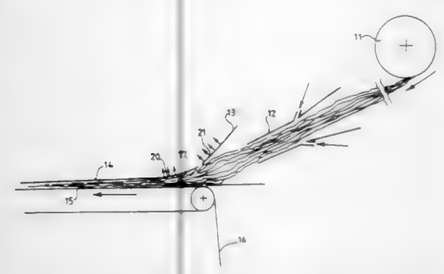
Walter Kampen, Freiburg, Fed. Rep. of Germany, assignor to Rhone Poulenc Rhodia AG, Freiburg, Fed. Rep. of Germany

Division of Ser. No. 614,985, Nov. 15, 1990, Pat. No. 5,106,357, which is a continuation of Ser. No. 120,819, Nov. 16, 1987, abandoned. This application Jan. 27, 1992, Ser. No. 826,391

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640883

Int. Cl.[5] **B65H** *51/00, 55/00, 57/00*

U.S. Cl. 493—44 **5 Claims**



1. A method for producing tobacco smoke filter rods having improved drawing resistance and an improved coefficient of variation from a filter tow of crimped spun fibers and/or filaments, the method comprising spreading, loosening, stretching, and relaxing the filter tow in a preparation zone, then passing the filter tow to a processing zone for gathering together the filter tow in an intake zone, the intake zone having an intake finger means, treating the filter tow with a gas or vapor under elevated pressure in the direction of movement of the filter tow at an angle of less than 90° to the axis of the filter tow with the aid of an intake nozzle for conveying the filter tow preceding the intake finger means, forming a continuous tobacco smoke filter rod, and cutting the continuous filter rod into individual tobacco smoke filter rods,

characterized in that the filter tow is treated a second time, after passing through the intake nozzle, in the intake finger means with a gas or vapor under elevated pressure in the direction of movement of the filter tow at an angle of less than 90° to the axis of the filter tow, and the gas or vapor is permitted to escape from a sidewall of the intake finger means thereafter;

wherein the drawing resistance of the filter rods is substantially uniform and the coefficient of variation thereof is low.

5,203,758

METHOD FOR MANUFACTURING A SACK OR BAG WITH A BOTTOM BEING RECTANGULAR IN THE FILLED STATE AND WITH A HANDLE, AND A SACK OR BAG MANUFACTURED IN ACCORDANCE WITH SAID METHOD

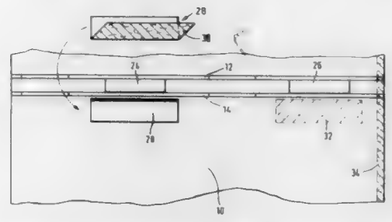
Fritz Achelpohl, and Werner Jürgens, both of Lengerich, Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 16, 1992, Ser. No. 852,006

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1991, 4109568; Apr. 19, 1991, 4112900

Int. Cl.[5] **B31B** *37/14, 33/26, 33/62, 37/86*

U.S. Cl. 493—195 **5 Claims**



1. Method for manufacturing a sack or bag with a bottom being rectangular in the filled state and with a handle, consisting of the following steps:

a) onto a continuously advanced flat web (**10**) two strips (**12,14**) of reactivatable adhesive or sealing-wax and extending in parallel to each other and vertically to the lateral edges are applied at distances of one bag length, respectively,

b) at the corresponding location of the back side of the flat web (**10**) four short strips (**16, 18, 20, 22**) of reactivatable adhesive or sealing-wax are applied,

c) between the strips (**12,14**) of reactivatable adhesive or sealing-wax two reinforcements (**24, 26**) are glued thereon with their whole surface,

d) below and onto the first reinforcement a folded sheet (**28**) with a leg is glued, whereas the other leg (**30**) is folded back thereon,

e) below the second reinforcement (**26**) an area (**32**) is provided with glue which in size corresponds to the leg (**30**),

f) on one side of the flat web (**10**) an adhesive strip (**34**) is applied,

g) the web (**10**) is folded to a tube by forming lateral folds (**36, 38**) such that the free leg (**30**) is arranged on the glued area (**32**) and that simultaneously the two reinforcements (**24,26**) are arranged on top of each other,

h) the reactivatable adhesive strips or sealing-wax strips (**12,14;16,18,20,22**) are activated,

i) fold edges (**40,42,44,46**) are pregrooved,

j) in the section of the reinforcements (**24,26**) lying on top of each other a griphole (**45**) is cut in by punching.

5,203,759

APPARATUS FOR APPLYING A FIRST TIE TO CASING MATERIAL

David O. Torres; Johnny T. Stanley, both of Raleigh, and Brian W. Roberts, Apex, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed May 15, 1992, Ser. No. 884,511

Int. Cl.[5] **B31B** *1/90*

U.S. Cl. 493—214 **5 Claims**

1. Apparatus for application of a first tie to a hollow casing material, said first tie comprising a U-shaped metal clip formed about gathered casing material, said apparatus comprising, in combination:

(a) a support frame;

(b) a carriage on the frame defining a generally horizontal flat surface for receipt of a free end of casing from a roll of casing;

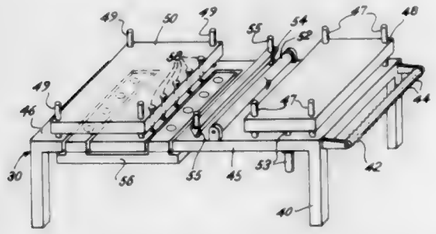
(c) first and second spaced platens positioned on the frame over the flat surface, the platens each movable simultaneously into and out of contact with the flat surface to thereby grip casing or to release casing;

(d) a casing drive roll on the frame between the platens and in opposed reaction to the carriage surface for engaging and driving the casing intermittently over the flat surface;

(e) a shear on the frame in opposed relation to the carriage surface intermediate the drive roll and the second platen;

(f) means on the frame for driving the shear to cut the casing when the casing is not in motion in response to the drive roll;

(g) means on the frame for intermittently driving an incremental length of the casing over the flat surface beneath the first to the second platen;



(h) casing punch means in one of the platens for cutting apertures in the casing when the casing is not in motion;

(i) means adjacent said carriage for gathering the casing and applying a U-shaped metal clip to the gathered casing;

(j) a casing transfer assembly slidably mounted on the frame and movable transversely to the direction of casing movement through the carriage including means for directing the incremental length of casing into said means for gathering the casing and applying a U-shaped metal clip to the gathered casing, whereby incremental units of the casing are advanced over the flat surface by the driven drive roll, the casing is then secured against the surface, said shear subsequently an incremental length of casing from the roll, and said transfer assembly subsequently positioning the casing incremental unit in a clipper for attachment of a clip.

5,203,760

APPARATUS FOR ADJUSTMENT OF THE SPACING OF FILM DRIVE ASSEMBLIES IN A TUBULAR FILM FORMING DEVICE

Kuo-Raid G. Chen, Cary; Raymond H. Misner, Raleigh; Elbert P. Windham, Fuquay-Varina, and Bernard D. Richardson, Apex, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed May 15, 1992, Ser. No. 884,736

Int. Cl.[5] **B65B** *9/06;* **B31B** *23/10*

U.S. Cl. 493—302 **5 Claims**

1. In apparatus for forming a sheet of flexible material into a cylindrical shape, said apparatus including a generally cylindrical tube as a form for the sheet and further including spaced, generally parallel transport assemblies positioned on opposite sides of the tube, the improvement of a mounting and adjustment mechanism for controlling the movement and spacing of the spaced transport assemblies from a center line between the parallel assemblies, said center line generally coincident with the center line of the tube, said improvement comprising, in combination:

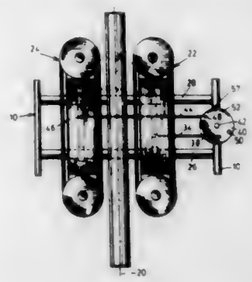
at least one assembly support bar mounted generally transversely to the center line and extending over the range of desired travel of the assemblies;

means for slidably mounting each assembly on the support bar for slidable movement toward and away from the center line;

a spacing adjustment plate pivotally mounted adjacent the assemblies for pivot movement about an axis;

a first arm pivotally connected to one assembly and extending generally parallel to the support bar to pivotally attached to the spacing adjustment plate at a first position which is a first fixed radial distance from the axis thereof;

a second arm pivotally connected to the other assembly and



extending generally parallel to the support bar to pivotally attach to the spacing adjustment plate at a second position which is a second fixed radial distance from the axis thereof, said first and second positions of attachment to the plate being on opposite sides of the plate axis whereby pivotal movement of the plate about its axis will simultaneously move the first and second arms in opposite directions and simultaneously in part opposite sliding movement of the assemblies on the support bar toward or away from the center line.

5,203,761

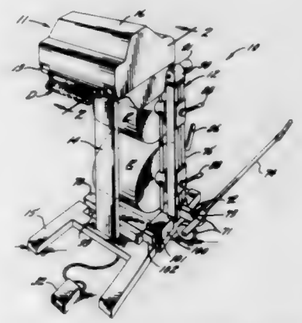
APPARATUS FOR FABRICATING DUNNAGE MATERIAL FROM CONTINUOUS WEB MATERIAL

A. N. Reichental, Southbury, and Alexander Shafir, Watertown, both of Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Jun. 17, 1991, Ser. No. 716,634

Int. Cl.[5] **B31F** *1/07, 1/26, 5/02*

U.S. Cl. 493—346 **28 Claims**



1. An apparatus for fabricating discrete segments of joined multiple ply cushioned web material in desired lengths for use as dunnage in packaging or the like, comprising:

a mobile supply cart for retrieving, transporting and storing web material rolled onto a hollow core, said cart having at least one cantilevered support arm extending in a substantially horizontal orientation for receiving a hollow roll core;

a rugation device comprising;

drive means;

a plurality of feed rollers on said rugation device for

at a variable voltage and frequency, and (d) a common bus connecting the first controller means to the second controller

having an average hydroxyl equivalent weight greater

secure a selected patient skeletal process alignment simply

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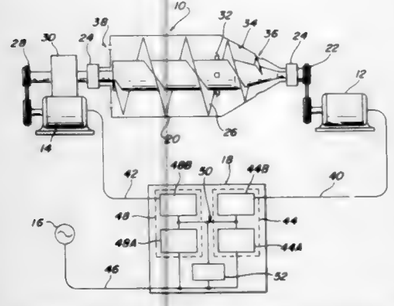
drive means;
- a plurality of feed rollers on said rugation device for collecting multiple plies of untextured web material from the roll on said mobile supply cart and for directing the collected web material in overlying, contacting relationship along a single predetermined path of travel through said rugation device;
- a pair of driven interdigitized texturing rolls downstream of said feed rollers, one said texturing roll disposed on each side of said single path of travel for embossing a raised pattern on the overlying, contacting plies of web material and for advancing the web material along said path of travel;
- a plurality of separating rollers downstream from said texturing rolls for separating the overlying textured plies of web material and directing each ply in divergent paths of travel;
- driven combining rolls downstream of said separating rollers for recombining the separated plies of textured web material into overlying, contacting relationship, said combining rolls being positioned such that each said path of travel of each separated ply of embossed web material from said texturing rolls, over said separating rollers and to said combining rolls has a length different from the length of the path of travel of the ply adjacent thereto, whereby when the plies are recombined the embossed areas of each ply do not directly overlie each other but are offset, creating void areas between the adjacent plies to form a multiple ply cushioned web material;
- a driven cutter located downstream of said combining rolls for precisely and cleanly severing the recombined offset embossed plies into discrete segments, said cutter having a rotating disc blade with a peripheral edge which moves transverse to the longitudinal length of the plies; and
- driven exit rollers for conveying the cut segments of cushioned web material from said rugation device; and

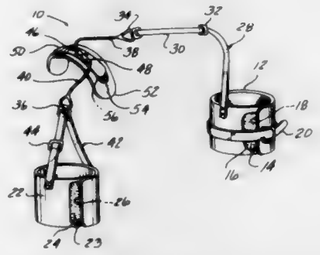
means for interconnecting said rugation device and said mobile supply cart such that the plies of untextured web material supplied by said cart to said feed rollers are laterally aligned with said feed rollers.

5,203,762
VARIABLE FREQUENCY CENTRIFUGE CONTROL
Joseph L. Cooperstein, Philadelphia, Pa., assignor to Alfa-Laval Separation, Inc., Warminster, Pa.
Filed Dec. 20, 1990, Ser. No. 630,655
Int. Cl.[5] B04B *9/10*
U.S. Cl. 494—7 **9 Claims**



4. A controller for a centrifuge including two drive motors comprising: (a) means for receiving an AC power source, (b) first controller means for converting the input AC power for supply to one centrifuge motor at a variable voltage and frequency, (c) second controller means for converting power from the first controller means for supply to the second motor at a variable voltage and frequency, and (d) a common bus connecting the first controller means to the second controller means, the second controller means capable of converting power generated from the second centrifuge motor during operation of the centrifuge for input to the first controller means for use by the first centrifuge motor.

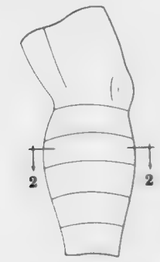
5,203,763
DYNAMIC SLING
Renée Lajiness-O'Neill, 4061 W. 5580 S., Kearns, Utah 84118-4444
Filed Feb. 4, 1992, Ser. No. 830,653
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—4 **19 Claims**



1. A dynamic sling for providing a patient with therapeutic movement including joint approximation and proprioceptive input for an affected shoulder joint, the dynamic sling comprising:
- first cuff means for attachment to a non-affected humeral extremity of said patient adjacent a non-affected shoulder joint;
- second cuff means for attachment to an affected humeral extremity of said patient adjacent an affected shoulder joint; and
- elongated attachment means for connecting said first and second cuff means to one another and for transferring movement from said non-affected humeral extremity to said affected humeral extremity during normal movement of the non-affected humeral extremity of said patient, said attachment means connected to said first cuff means at one end and passing over an affected shoulder of said patient before connected to said second cuff means at an opposite end, and a guide means supported by a shoulder adjacent the affected shoulder joint and opposite from said first cuff means.

5,203,764
FOAM PADS USEFUL IN WOUND MANAGEMENT
Christopher J. Libbey, St. Joseph, Wis.; Lawrence R. Bramlage, Lexington, Ky., and Timothy C. Sandvig, Woodville, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 674,565, Mar. 25, 1991, which is a continuation of Ser. No. 93,408, Sep. 4, 1987, Pat. No. 5,002,047, which is a continuation-in-part of Ser. No. 903,281, Sep. 3, 1986, Pat. No. 4,968,542, and a continuation-in-part of Ser. No. 15,972, Feb. 18, 1987, Pat. No. 4,964,726, which is a continuation-in-part of Ser. No. 784,345, Oct. 4, 1985, Pat. No. 4,683,877. This application Nov. 27, 1991, Ser. No. 800,571
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—5 **6 Claims**

6. A kit for preparing a wound dressing to be placed in fluid contact with a wound comprising
- a. a foam blank comprising an open-celled foam impregnated with a resin system, said resin system comprising a water curable prepolymer resin comprising an isocyanate component and a polyol component, said polyol component having an average hydroxyl equivalent weight greater than about 400 grams of polyol per hydroxyl group, and a catalyst capable of setting and curing said prepolymer resin upon exposure to water,

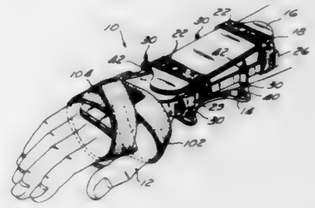


- b. a non-adherent wound contact interface material for use between said wound and a foam pad prepared from said foam blank, and
- c. overwrap means for retaining said cured foam blank in fluid contact with said wound.

5,203,765
ADJUSTABLE HALO SYSTEM ORTHOPEDIC APPLIANCE AND METHOD
Frank E. Friddle, Jr., Honea Path, S.C., assignor to Friddle Orthopedic Appliances, Inc., Honea Path, S.C.
Filed May 31, 1991, Ser. No. 708,490
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—18 **28 Claims**

8. An orthopedic appliance to be worn by a patient, comprising:
- a patient vest with poster mounting means supported thereon;
- a patient halo ring with a plurality of threaded holes formed in the periphery thereof and a plurality of skull pin screws received respectively in selected of said holes;
- a pair of clamps and corresponding clamp screws, said clamps respectively defining a poster receipt therein, ally opposite lateral sides of said patient halo ring by receipt of the corresponding clamp screw in selected of said patient halo ring threaded holes, and each of said camps respectively defining a poster receipt therein, which channel is tightened by its respective clamp screw; and
- a pair of halo ring support posters, each such poster being supported at a lower end thereof by said poster mounting means and generally at an upper end thereof slidably supported in said poster receipt channel of a respective one of said clamps, so that tightening of a clamp screw simultaneously fixes the selected slidably adjusted position of a support poster relative its corresponding clamp and fixes the selected rotatably adjusted position of such clamp relative said halo ring, so as to readily adjust and secure a selected patient skeletal process alignment simply by tightening of said respective clamp screws.

5,203,766
WRIST BRACE
Peter R. Carter, Dallas, Tex.; John C. Gates, Fountain Valley, and Edward L. Castillo, Laguna Hills, both of Calif., assignors to Innovation Sports, Inc., Irvine, Calif.
Filed Jun. 3, 1991, Ser. No. 710,359
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—21 **20 Claims**



1. A wrist brace comprising:
- an anterior forearm plate abutted against the anterior aspect of a user's forearm;
- a lateral strut attached to said anterior forearm plate so as to be positioned adjacent the lateral aspect of the forearm;
- a medial strut attached to said anterior forearm plate so as to be positioned adjacent the medial aspect of the forearm;
- a hand brace pivotally connected to the proximal ends of said lateral strut and said medial strut, said hand brace being abutted against the posterior aspect of a user's hand and adapted to selectively apply downward pressure to the second and third metacarpal bones of the user's hand, said hand brace comprising:
  - a lateral member having a lateral extension formed thereon which includes a first pair of arcuate slots disposed therein; and
  - a medial member slidably connected to said lateral member and having a medial extension formed thereon which includes a second pair of arcuate slots disposed therein, the slidable connection being operable to allow the distance separating said lateral extension and said medial extension to be selectively adjusted;
- a posterior forearm plate releasably attachable to said lateral strut and said medial strut, said posterior forearm plate being abutted against the posterior aspect of the user's forearm when attached to said lateral and medial struts;
- a means associated with said lateral and medial struts for adjusting the distance separating said lateral strut from said medial strut and the distance separating said struts from said anterior forearm plate, said adjusting means being operable to properly align the struts relative the lateral and medial aspects of the forearm and cause the hand brace to be abutted against and apply downward pressure to the posterior aspect of the user's hand;
- a third pair of arcuate slots disposed within the proximal end of said lateral strut and a fourth pair of arcuate slots disposed within the proximal end of said medial strut, said third and fourth pairs of slots being oriented such that when said hand brace is pivotally connected to said struts, said first and third pairs of slots and said second and fourth pairs of slots are in general alignment;
- a first pivot pin connecting said lateral extension to the proximal end of said lateral strut and a second pivot pin connecting said medial extension to the proximal end of said medial strut, said wrist brace being attached to the arm of the user such that said pivot pins are disposed laterally on opposite sides of the capacitate bone of the user's wrist along a single axis;

wherein the pivotal connection of said hand brace to said

struts is adapted to permit controlled pivotal movement

within an electric field generated by electrically connect-

5,203,770
METHOD AND APPARATUS FOR CATHETERIZATION

attach to an intravascular (IV) fluid administration system;

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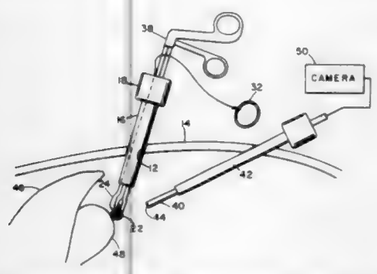
struts is adapted to permit controlled pivotal movement of a user's wrist about said single axis.

5,203,767

LAPAROSCOPIC SURGICAL GAUZE AND THE LIKE

David W. Cloyd, 2540 Royal Crest, Escondido, Calif. 92025

Filed Jan. 8, 1991, Ser. No. 638,799
Int. Cl.[5] A61F *13/20*
U.S. Cl. 604—11 20 Claims



1. A surgical tool for use in laparoscopic surgery comprising:
a surgical gauze formed of a unitary body of a size to fit through a trocar for use in laparoscopic surgical procedures;
an elongated flexible tether connected at one end to said body; and
an article of a size to prevent its passage through a trocar connected to the other end of said tether.

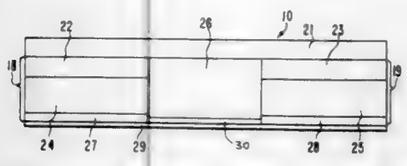
15. A method of use of surgical gauzes during laparoscopy surgery in a body cavity comprising the steps of:
selecting and inserting a trocar through an opening into an abdominal body cavity for providing access therethrough to a surgical site within said body cavity;
selecting a surgical gauze of a size to pass through said trocar;
providing said gauze with an elongated flexible radiopaque tether of a length to extend through said trocar and be manipulated within said body cavity;
providing an outer end of said tether with an anchoring device for preventing its passing through the trocar;
selecting grasping means sized to fit through said trocar for grasping said gauze; and
grasping said surgical gauze with said grasping means and extending said gauze through said trocar into said body cavity.

5,203,768

TRANSDERMAL DELIVERY DEVICE

Ronald P. Haak, San Jose; Felix Theeuwes, Los Altos, and J. Richard Gyory, San Jose, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Jul. 24, 1991, Ser. No. 735,126
Int. Cl.[5] A61N *1/30*
U.S. Cl. 604—20 28 Claims



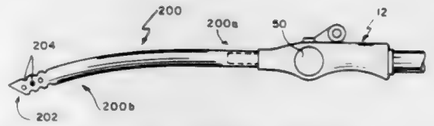
1. A transdermal agent delivery device, comprising a unitary device having:
an active agent reservoir adapted to be placed in active agent transmitting relation with a body surface and positioned within an electric field generated by electrically connecting the active agent reservoir to a source of electrical power; and
a passive agent reservoir adapted to be placed in passive agent transmitting relation to a body surface, the passive agent being able to passively diffuse through the passive agent reservoir, the passive agent reservoir being electrically insualted from the electrical field generated by the power source.

5,203,769

MEDICAL DEVICE VALVING MECHANISM

Thomas P. Clement, and David P. Weber, both of Bloomington, Ind., assignors to Mectra Labs, Inc., Bloomfield, Ind.

Continuation-in-part of Ser. No. 432,084, Nov. 6, 1989, Pat. No. 5,019,054. This application Feb. 22, 1991, Ser. No. 660,356
The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—32 14 Claims



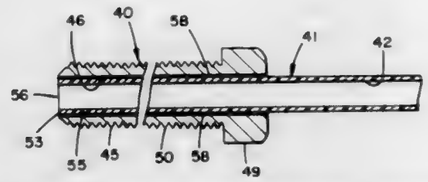
1. A hand-held lavage mechanism comprising
an elongated valve body configured to have a longitudinally extending body shaped to be gripped and securely held in either hand while leaving the hand's thumb free for valve operational movement, said body providing at least one fluid passageway extending longitudinally therethrough from one end of the body to another end, said body also providing a cylindrical opening extending transversely therethrough and intercepting said at least one passageway, a cylindrical molded plastic, one-piece rotor having smooth cylindrical sides inserted into said cylindrical opening for snug slidable and rotational contact with sides of said cylindrical opening to block said at least one passageway, said rotor being rotatable between valve opening and valve closing positions, said rotor having at least one transaxial passageway therethrough which opens said at least one fluid passageway through said valve body when said rotor is in said valve opening position and which closes said at least one fluid passageway when said rotor is in said valve closing position, and thumb-actuated means for rotating said rotor, said actuated means being attached to said rotor and disposed above said valve body and said rotor for convenient thumb movement of said rotor while the valve body is gripped and held by the hand, and
a conduit piece attached to the valve body in fluid communication said fluid passageway extending longitudinally through the valve body, said conduit piece having a proximal end attached to said valve body and a distal end projecting outward from said valve body for patient contact, and wherein rotation of said rotor controls introduction of fluid into the conduit piece.

5,203,770

METHOD AND APPARATUS FOR CATHETERIZATION

Bruce D. Wigness, and Frank D. Dorman, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 511,562, Apr. 20, 1990, Pat. No. 5,120,312.
This application Apr. 2, 1992, Ser. No. 862,402
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—51 6 Claims



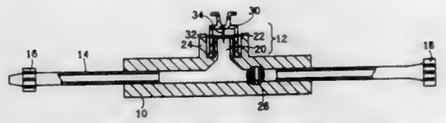
1. A method of delivering therapeutic material to an internal joint cavity of an animal, the joint cavity being defined at least in part by bone material and including fluid therein retained by a retaining membrane; the joint cavity further defining a connective point for at least two bones of which at least one is movable relative to the other; said method comprising the steps of:
(a) providing an access channel through a bone having a surface in association with the cavity, the access channel being provided in fluid flow communication with the cavity; said step of providing an access channel being conducted without a piercing of the retaining membrane;
(b) securing a tap arrangement within the access channel and completely internally of the animal, the tap arrangement having an internal flow channel provided in fluid flow communication with the joint cavity; the tap arrangement having a head portion and a shank portion, the shank portion having the internal flow channel extending completely therethrough;
(c) providing a cannula arrangement in fluid flow communication with the internal flow channel of the tap arrangement; said step of providing a cannula arrangement comprising providing an extension of flexible, biologically compatible material, which is resistant to bone overgrowth, in extension completely through the tap arrangement internal flow channel; and,
(d) injecting a therapeutic material through the cannula arrangement and into the joint cavity.

5,203,771

ARTERIAL/VENOUS FLUID TRANSFER SYSTEM

Richard J. Melker, and Gary J. Miller, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 371,378, Jun. 26, 1989, Pat. No. 5,135,492. This application May 18, 1992, Ser. No. 821,769
Int. Cl.[5] A61M *31/00;* A61B *5/00*
U.S. Cl. 604—53 9 Claims



1. A system for transferring fluids to and from a patient's circulatory system through a vascular catheter comprising:
(a) a channel member comprising:
(i) a duct extending therethrough, the duct having first and second ends, the first end being adapted to attach to a vascular catheter, the second end being adapted to attach to an intravascular (IV) fluid administration system;
(ii) an access port in flow communication with the duct, the access port being provided with a self-sealing cap and being recessed within a first mounting member;
(b) an adapter, comprising:
(i) a second mounting member for removably mounting the adapter to the access port, wherein the second mounting member is adapted to mate with the first mounting member;
(ii) a housing connected to the second mounting member; and
(iii) a needle assembly comprising a first needle cannula, recessed and enclosed within the second mounting member sufficiently to shield the needle from a user, a first end of the first needle cannula being in flow communication with the housing, whereby when the adapter is mounted to the access port of the channel member, a second end of the first needle cannula pierces the cap of the access port and is placed in flow communication with the access port; and
(c) an integral, manually closable two-way valve disposed within the duct at a location upstream of the access port with reference to the direction of flow of IV fluid through the channel member, and having an open position permitting flow of IV fluid from the IV fluid administration system from the second end to the first end of the duct, and a closed position preventing flow of IV fluid from the IV fluid administration system through the duct;
wherein fluids may be injected into the duct through the access port, and, when the integral valve is closed, fluid may be withdrawn from the duct through the access port without further influx of fluid from upstream of the valve.

5,203,772

STEERABLE MEDICAL DEVICE

Gary R. Hammerslag, Dana Point, and Julius G. Hammerslag, San Juan Capistrano, both of Calif., assignors to Pilot Cardiovascular Systems, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 583,819, Sep. 17, 1990, Pat. No. 5,108,368, which is a continuation-in-part of Ser. No. 461,049, Jan. 4, 1990, Pat. No. 4,998,916, which is a continuation-in-part of Ser. No. 295,124, Jan. 9, 1989, Pat. No. 4,921,482. This application Apr. 8, 1992, Ser. No. 865,357
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—95 14 Claims

1. A steerable device for percutaneous transluminal insertion into the coronary or peripheral vascular system and controlled negotiation of branches and turns therein, said device comprising:
an elongate support structure having a proximal and a distal end for transmitting axial force from the proximal end of the support structure to the distal end thereof;
a steering element extending distally from the distal end of the support structure;
a fulcrum at the intersection of the support structure and the steering element; and
a core wire extending generally parallel to the support structure and secured to the steering element at a point of attachment which is distal from the fulcrum;
wherein axial movement of the core wire in a proximal direction relative to the support structure causes a lateral deflecting of the steering element distally of the fulcrum.

5,203,773

TISSUE GRIPPING APPARATUS FOR USE WITH A

5,203,775

NEEDLELESS CONNECTOR SAMPLE SITE

said profiled portion comprising, in order from said shaft

the container by contacting the blood with a lipophilic discriminating means, that discriminates between essen-

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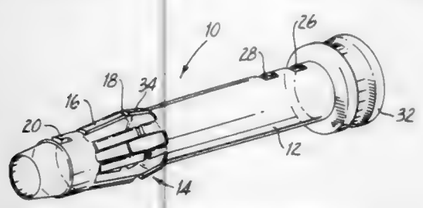
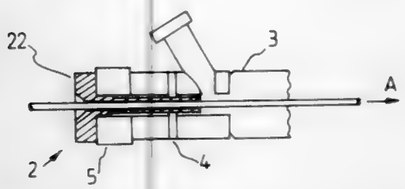
5,203,773
TISSUE GRIPPING APPARATUS FOR USE WITH A CANNULA OR TROCAR ASSEMBLY
David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 18, 1991, Ser. No. 781,063
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—104 33 Claims



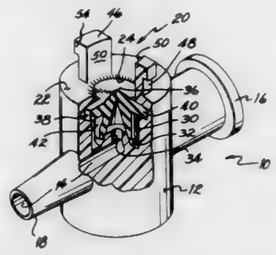
1. A tissue gripping apparatus which comprises:
an outer sleeve concentrically positioned about an inner sleeve;
a plurality of articulated arm members integral with said outer sleeve and positioned adjacent a distal end thereof;
at least one hinge being positioned proximal a midpoint of each of said articulated arm members, said hinge defining a proximal arm portion which is shorter than a distal arm portion;
wherein said articulated arm members are manipulable between an at rest position and a deployed position.

5,203,774
DEVICE FOR USE WITH A CATHETER
James P. Gilson, County Galway, Ireland, and Anthony F. Rickards, London, England, assignors to C. R. Bard Ireland Limited, Galway, Ireland
Filed Jan. 29, 1991, Ser. No. 647,267
Claims priority, application Ireland, Jan. 30, 1990, 330/90
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—165 6 Claims



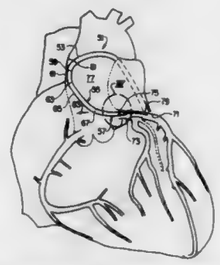
1. A holding system for catheters of predetermined external diameters, said system including a connector with proximal and distal ends adapted to receive freely a catheter therethrough introduced through said proximal end, seal means within said connector for engaging a received catheter and providing a seal between said connector and the received catheter; the improvement comprising a sleeve received through said proximal end of said connector in surrounding relation to a received catheter and between the received catheter and said connector, said sleeve having an internal diameter greater than and complementary with the external diameter of the received catheter to define a space about the received catheter within and along the length of said sleeve sufficient to allow backbleed of blood therethrough in a controlled manner, said seal means engaging with said sleeve and providing a seal between said connector and said sleeve, said sleeve precluding engagement of said seal means with the received catheter and being of sufficient rigidity to maintain said defined space for a controlled amount of backbleed of blood therethrough.

5,203,775
NEEDLELESS CONNECTOR SAMPLE SITE
Thomas P. Frank, Dublin, and Charles R. Patzer, Columbus, both of Ohio, assignors to Medex, Inc., Dublin, Ohio
Continuation of Ser. No. 584,286, Sep. 18, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 855,147
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—256 34 Claims



1. A sample site adapted to connect to a blunt cannula comprising:
a housing;
a liquid path extending into the housing;
an actuator member fixedly positioned within the housing and having a lumen therethrough in fluid communication with the liquid path;
an apertured exterior wall on the housing through which the blunt cannula can enter the housing to make fluid connection to the lumen;
seal means adjacent the exterior wall aperture and presenting an outer surface generally flush with an in adjacent contact with the housing exterior wall for normally sealing the aperture against fluid communication with the lumen, the seal means being movable into the actuator member under pressure of the blunt cannula passing into the aperture so as to open a channel in the seal means and expose the lumen therethrough to the blunt cannula, the seal means channel being resealed and the exterior wall and seal means outer surface being substantially unobstructed with the blunt cannula removed.

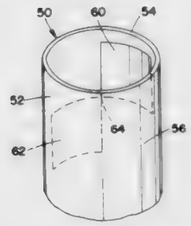
5,203,776
CATHETER
Paul J. Durfee, 3408 Mapleleaf La., Dallas, Tex. 75233
Filed Oct. 9, 1992, Ser. No. 959,295
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—264 5 Claims



1. A catheter for insertion through an aorta into a coronary artery, said catheter comprising:
a tubular member comprising a shaft, an integral profiled portion, and an integral, substantially straight tip portion;
said tip portion being adapted to axially engage said coronary artery;

said profiled portion comprising, in order from said shaft portion to said tip portion, a first bend, a first substantially straight leg, a second bend, a second substantially straight leg, and a third bend;
said shaft and said second leg being disposed relative to each other at an angle between about 100 to about 120 degrees;
said first leg being about 1 cm in length;
said second leg being about 2 cm in length; and
said profiled portion being about 4 to about 5 cm in length, including said bends;
whereby when said tip portion is engaged with said coronary artery, said first leg will be approximately parallel to an engaged with an opposing inner wall of the aorta to resist forces tending to displace said tip portion from said coronary artery.

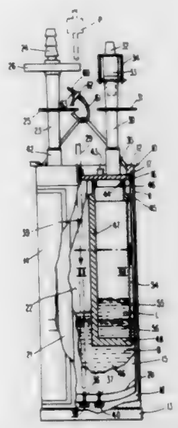
5,203,777
RADIOPAQUE MARKER SYSTEM FOR A TUBULAR DEVICE
Peter Y. Lee, 5118 Beechgrove NE., Canton, Ohio 44705
Filed Mar. 19, 1992, Ser. No. 853,921
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—280 24 Claims



1. A medical device comprising:
a body having an outer circumference and a distal end portion;
a first radiopaque marker located on said body adjacent said distal end portion; and,
a second radiopaque marker located on said body adjacent said distal end portion, and spaced from said first radiopaque marker, wherein each of said first and second radiopaque markers extends no more than 90 degrees around said circumference of said body wherein said first and second markers are so located in relationship to each other that they will present different images as the body is rotated around its longitudinal axis such that a rotational orientation of the device can be determined.

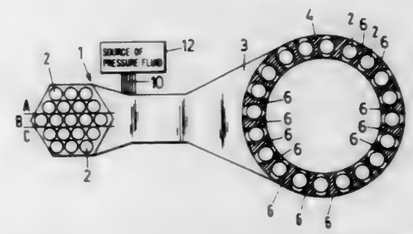
5,203,778
PROCESS AND APPARATUS FOR REMOVAL OF INSOLUBLE FAT FROM BLOOD OF A PATIENT
John R. Boehringer, Wynnewood, and John Karpowicz, Glenmoore, both of Pa., assignors to Boehringer Laboratories, Norristown, Pa.
Continuation-in-part of Ser. No. 626,895, Dec. 13, 1990, which is a continuation-in-part of Ser. No. 406,820, Sep. 13, 1989, abandoned, which is a continuation of Ser. No. 264,444, Oct. 28, 1988, abandoned, which is a continuation of Ser. No. 906,750, Sep. 12, 1986, Pat. No. 4,781,707, which is a continuation-in-part of Ser. No. 830,533, Feb. 18, 1986, Pat. No. 4,769,159. This application Oct. 17, 1991, Ser. No. 778,583
Int. Cl.[5] A61M *1/00, 37/00, 1/14;* B01D *61/00*
U.S. Cl. 604—317 9 Claims

1. A method of treating blood of a patient for re-use, comprising the steps of:
(a) providing a container for receiving blood from a body of the patient;
(b) delivering the patient's blood to the container; and
(c) removing essentially insoluble lipids from the blood in the container by contacting the blood with a lipophilic discriminating means, that discriminates between essentially insoluble lipids in the blood and essentially aqueous components of the blood that includes soluble lipids, and



accumulating the essentially insoluble lipids separately from the essentially aqueous components of the blood that include soluble lipids by discriminating between said essentially insoluble lipids and said essentially aqueous components of the blood that include soluble lipids.

5,203,779
CATHETER SYSTEM FOR VESSEL RECANALIZATION IN THE HUMAN BODY
Gerhard Müller; Hasan Kar; Klaus Dörschel, all of Berlin, and Karl-Heinz Schönborn, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 494,743, Mar. 19, 1990, Pat. No. 5,066,292. This application Nov. 6, 1991, Ser. No. 788,385
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 8903333[U]
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—7 7 Claims



1. A catheter system having a proximal end and a distal light emitting end for the transmission of laser radiation for treatment purposes, comprising an array of lightguides comprised of optical fibers arranged in the catheter wall structure each light guide having proximal ends and distal light emitting ends, means for coupling a laser light source to the proximal ends of the lightguides, the light guides being arranged as a ring of lightguides of an initial circumference at the distal light-emitting end of the catheter with the light guides being connected to one another by elastically extendable material for allowing

enlargement of the circumference of the distal end, the enlargement in circumference being selectively accomplished by

face of said hollow needle portion for providing a substan-

degree bend formed therein where it extends through said first opening;

netic retainer means movably arranged for retaining ferro-

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enlargement of the circumference of the distal end, the enlargement in circumference being selectively accomplished by increasing the spacing between the individual light guides of the ring and between specific peripheral groups of light guides of the ring.

5,203,780

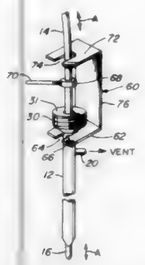
VENTED SURGICAL PROBE AND METHOD OF USE

William A. Liebler, 2 Village La., Bronxville, N.Y. 10708

Filed Sep. 5, 1990, Ser. No. 577,989

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—14 **8 Claims**



1. A surgical needle probe for the administration of laser beam energy to treat a body part, comprising:

an elongated hollow needle portion having an inner surface;

an elongated optical fiber which passes through said hollow needle portion, said optical fiber having an outer surface, and said optical fiber being movable relative to said hollow needle portion in the longitudinal direction of said hollow need portion, and wherein said hollow needle portion has one end which is insertable into a body tissue whereby an end of said optical fiber is placed adjacent to a body portion that is to be treated by a laser beam passing through said optical fiber;

said optical fiber having a distal end portion at which said laser beam is emitted, said distal end portion of said optical fiber extending beyond said one end of said hollow needle portion during treatment of the body portion so as to be directly adjacent the body portion to be treated;

a channel-like space provided between said outer surface of said elongated optical fiber and said inner surface of said hollow needle portion and extending along at least a substantial portion of the length of said hollow needle portion, and said channel-like space substantially surrounding said optical fiber within said hollow needle portion and extending to said one end of said hollow needle portion which is insertable into the body tissue, thereby providing a ring-like opening at said one end of said hollow needle portion;

evacuating means coupled to said hollow needle portion at a location remote from said one end of said hollow needle portion, and said evacuating means communicating with said channel-like space for evacuating any resulting hazardous smoke plume, produced by treating said body portion with said laser beam, from said channel-like space via said ring-like opening;

a vent side arm coupled to a wall of said hollow needle portion and in communication with said channel-like space between said hollow needle portion and said optical fiber;

said evacuating means including a suction device coupled to said vent side arm;

said vent side arm being connected between said hollow needle portion and said suction device, whereby a smoke plume resulting from the laser treatment is suctioned up said channel-like space and into said vent side arm and then into said suction device;

sealing means in said channel-like space between said outer surface of said elongated optical fiber and said inner surface of said hollow needle portion for providing a substantially air-tight seal therebetween, said sealing means being located above said vent side arm relative to said one end of said hollow needle portion; and

movement limiting means coupled to said hollow needle portion and to said optical fiber for limiting relative movement therebetween;

said movement limiting means comprising an abutment member on said optical fiber, and a generally U-shaped clip member coupled to said hollow needle portion, said U-shaped clip member having at least one movement limiting surface thereon which is abuttable by said abutment member on said optical fiber to limit movement of said optical fiber, relative to said hollow needle portion.

5,203,781

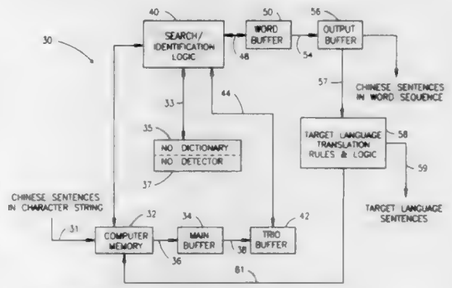
LUMBAR ARTHROSCOPIC LASER SHEATH

Alfred O. Bonati, New Port Richey, and Philip Ware, Spring Hill, both of Fla., assignors to Meditron Devices, Inc., Hackensack, N.J.

Filed Dec. 19, 1991, Ser. No. 814,185

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—15 **3 Claims**



1. A lumbar arthroscopic sheath, comprising:

an elongate, hollow, linear-in-configuration tube having a distal end and a proximal end;

a lock means positioned at said proximal end of said hollow tube;

said lock means including a cylindrical lock member for slideably receiving a complementary formed part of an arthroscope;

said lock means further including a radially disposed set screw that screw threadedly engages said cylindrical lock member and that, when advanced, engages said complementary formed part of said arthroscope and holds it within said cylindrical lock member;

a first opening formed in said hollow tube near said proximal end;

a hollow, disc-shaped base member mounted about said hollow tube in communication with said first opening so that the hollow interior of said hollow tube and the hollow interior of said base member are in open fluid communication with one another;

an irrigation control valve mounted to said base member;

said irrigation control valve having an irrigation port positioned within the hollow interior of said base member and having an inlet means positioned external to said hollow interior of said base member, said inlet means being in fluid communication with a source of irrigation fluid under positive pressure;

an elongate flexible needle having a proximal end secured to said irrigation port and a distal end substantially contiguous with the distal end of said linear-in-configuration tube;

said elongate flexible needle extending through said first opening formed in said hollow tube and having a ninety degree bend formed therein where it extends through said first opening;

a suction control valve mounted to said base member in diametrically opposed relation to said irrigation control valve;

said suction control valve having a suction port positioned within the hollow interior of said base member and having an inlet means positioned external to said hollow interior, said inlet means being in fluid communication with a source of negative pressure;

a second opening being formed in said hollow tube, said second opening being formed distally of said first opening and proximal to a free end of said hollow tube; and

a laser tube having a proximal end and a distal end, said laser tube distal end being disposed in open communication with the hollow interior of said linear-in-configuration hollow tube at said second opening and said laser tube proximal end for connection to a source of coherent light external to said sheath.

5,203,782

METHOD AND APPARATUS FOR TREATING MALIGNANT TUMORS BY LOCAL HYPERPYREXIA

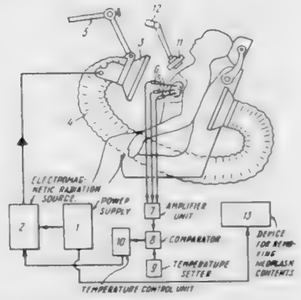
Vasily F. Gudov, ulitsa Kachalova, 16, kv. 1, Moscow; Nikolai E. Yakhontov, ulitsa Osharskaya, 52a, kv. 2, Gorky; Vladimir P. Kharchenko, ulitsa akademika Piljugina, 8, kv. 484, Moscow; Boris K. Dolotov, ulitsa Proletarskaya, 5, kv. 301; Evgeny L. Belousov, ulitsa Semashko, 2, kv. 49, both of Gorky; Valery B. Vinitsky, Leningradskoe shosse, 78, kv. 20, Moscow; Alexandr M. Kozlov, ulitsa Lesnaya, 10, kv. 162, Moskovskaya oblast, Reutov; Mikhail G. Akhalaya, ulitsa Lenina, 24, kv. 7, Sukhumi; Alexandr Kovenshnikov, ulitsa Kirovogradskaya, 44, korpus 8, kv. 160, Moscow, and Valery F. Pugachev, prospekt Tsiolkovskogo, 30, kv. 43, Gorkovskaya oblast, Dzerzhinsk, all of U.S.S.R.

Division of Ser. No. 503,529, Apr. 2, 1990, Pat. No. 5,067,952.

This application Mar. 26, 1991, Ser. No. 675,295

Int. Cl.[5] A61B *17/36*; **A61N** *2/10*

U.S. Cl. 606—31 **4 Claims**



1. An apparatus for treating a malignant tumor by local hyperpyrexia, comprising:

a power supply having an output; a source of electromagnetic radiation having a first input connected to the power supply output, a second control input and an output; at least one electromagnetic radiation emitter connected to the radiation source output, means for positioning the at least one emitter close to any desired portion of a patient's body; a temperature pickup adapted to be introduced directly into the malignant tumor, the temperature pickup having an output; a comparison circuit having a first input, connected to the output of the temperature pickup, a second input and an output; a temperature setter, connected to the second input of the comparison circuit; a temperature control unit having an input connected to the output of the comparison circuit and an output connected to the second control input of the radiation source; magnetic retainer means movably arranged for retaining ferromagnetic particles within the boundaries of the malignant tumor; removal means for removing the contents of said tumor and comprising: a needle made of a magnetically soft material having a pointed end, adapted for introduction into the tumor and a blunt end, the needle having an axially extending cavity and at least one through hole close to the pointed end thereof, the diameter of the at least one through hole and the axially extending cavity being greater than the diameter of the ferromagnetic particles, the at least one through hole being in communication with the axially extending cavity; the needle having an outlet port for the axially extending cavity, adjacent to the blunt end of the needle; a source of a pulsed magnetic field magnetically coupled to the needle; a receiver-collector having an inlet port and another port; a conduit having a first end in communication with the inlet port of the receiver-collector and a second end in communication with the outlet port of the needle cavity; a vacuum source connected to the another part of the receiver-collector.

5,203,783

OSTEOSYNTHETIC FIXATION AND FORCE TRANSMITTING APPARATUS

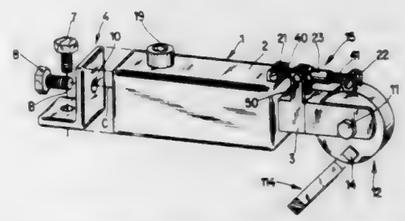
Anton Härle, Drechslerweg 40, W-4400 Münster-Roxel, Fed. Rep. of Germany

Filed May 8, 1991, Ser. No. 697,323

Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4014973

Int. Cl.[5] A61B *17/60*

U.S. Cl. 606—53 **22 Claims**



1. An osteosynthetic fixation and force transmitting apparatus, comprising first and second force transmitting members having a common axis; means for moving said members relative to each other in a predetermined direction along said common axis; means for at least indirectly connecting said members to at least one bone, comprising a first connecting component mounted on one of said members for pivotal movement between a plurality of different positions; a fulcrum pivotally connecting said first connecting component to said one member, said fulcrum defining a predetermined axis which is substantially normal to said common axis; means for releasably locking said first connecting component in a selected position relative to said one member, said connecting means further comprising a second connecting component mounted on the other of said members for angular movement about a second axis which is normal to said direction and to said predetermined axis; and means for releasably locking said second connecting component in a selected angular position relative to said other member.

5,203,784

BIOABSORBABLE TACK FOR JOINING BODILY

coupled to and transverse said outer tube, and an actuating

5,203,787

SUTURE RETAINING ARRANGEMENT

whereby when the lens apparatus is implanted into an eye and the control signal is generated outside the eye and

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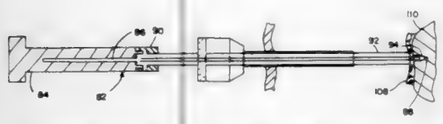
5,203,784

BIOABSORBABLE TACK FOR JOINING BODILY TISSUE AND APPARATUS FOR DEPLOYING SAME

Randall D. Ross, Largo, Fla.; Stephen J. Snyder, Tarzana, Calif., and Sam R. Marchand, Dunedin, Fla., assignors to Linvatec Corporation, Largo, Fla.

Division of Ser. No. 404,378, Sep. 8, 1989, Pat. No. 5,129,906.
This application Sep. 3, 1991, Ser. No. 753,843
Int. Cl.[5] A61F *1/04, 2/08*
U.S. Cl. 606—104 18 Claims



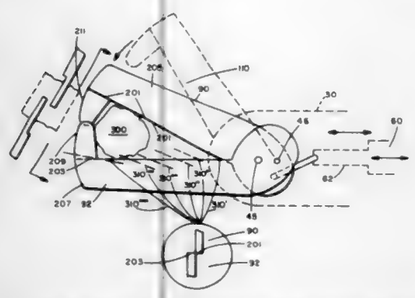
1. A surgical system for attaching bodily tissue in vivo to bone at an attachment site, said system comprising:
a trocar wire having a sharp distal end;
inserter means for inserting the distal end of the trocar wire through the tissue and into the bone at the attachment site to maintain the tissue adjacent the attachment site;
a bioabsorbable tack having a proximal end and a distal end and a bore extending longitudinally therethrough of sufficiently large cross-section to receive said trocar wire therein;
impactor means having a proximal end and a distal end and a longitudinal passage extending therethrough of sufficiently large cross-section to receive said trocar wire therein;
securing means for removably securing said tack to said distal end of said impactor means with said trocar wire extending through said longitudinal passage and said longitudinal bore, whereby said impactor and said tack are movable along said trocar wire to position the distal end of said tack adjacent said tissue at the attachment site;
wherein said impactor means includes means for inserting said tack through the tissue and into the bore to engage the bone and retain the tissue against the bone;
whereby upon disengaging the impactor from the tack, the impactor and the trocar wire may be retracted from the tissue without removing the tack.

5,203,785

LAPAROSCOPIC HOOK SCISSORS

Charles R. Slater, Fort Lauderdale, Fla., assignor to Symbrosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 521,766, May 10, 1990, and a continuation-in-part of Ser. No. 680,392, Apr. 4, 1991. This application Oct. 21, 1991, Ser. No. 780,013
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—205 16 Claims



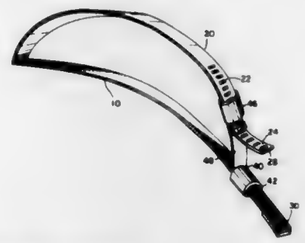
1. In a surgical hook scissors suitable for insertion through a trocar tube and having an outer tube having a longitudinal axis, first and second end effector scissor blade means, pivot means coupled to and transverse said outer tube, and an actuating means extending through said outer tube and coupled to at least said said first end effector scissor blade means, an improvement comprising:
a) said first and second end effector scissor blade means laterally offset from each other, said first and second end effector scissor blade means having respective first and second elongate straight blade members having respective first and second inside cutting edges with respective proximal and distal ends, said first blade member having a through-hole in a proximal portion of said first blade member for pivotally engaging said pivot means, wherein, when said pivotally engaging first blade member pivots towards a closing position, said inside cutting edge of said first straight elongate straight blade member engages said inside cutting edge of said second elongate straight blade member in a bearing contact starting at a point proximal said distal ends of said inside cutting edges and moving distally therefrom to effect a cutting action;
b) a first hook element integral with said first blade member at a distal portion of said first blade member, said first hook element laterally offset relative to and indented from said first cutting edge of said first blade member and extending away from said first blade member and toward said second blade member;
c) a second hook element integral with said second blade member at a distal portion of said second blade member, said second hook element laterally offset relative to and indented from said second cutting edge of said second blade member and extending away from said second blade member and toward said first blade member, wherein a narrow recess is provided between said first and second hook members upon closing of said first and second blade members.

5,203,786

HEPATIC RESECTION CLAMP

Jerome J. Vernick, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Jun. 19, 1991, Ser. No. 717,801
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—151 10 Claims



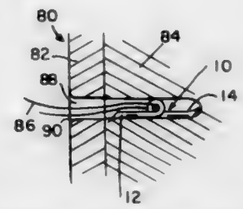
1. A clamp comprising:
an upper flexible band and a lower base, each having proximal and distal ends, said band and base being attached to each other at their distal ends; and
clamp adjusting means attached to said upper flexible band slidably mounted on said lower base such that the portion of said lower base between the distal end of said lower base and the clamp adjusting means may be varied, said clamp adjusting means having engaging and retracting means for gradually engaging and retracting the proximal end of said upper band past or through said engaging and retracting means, whereby the portion of said upper band between the distal end of said upper band and the engaging and retracting means may be varied.

5,203,787

SUTURE RETAINING ARRANGEMENT

Niles Noblitt, Mountain Lakes, N.J., and Kevin Stone, Warsaw, Ind., assignors to Biomet, Inc., Warsaw, Ind.

Filed Nov. 19, 1990, Ser. No. 615,353
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—232 29 Claims



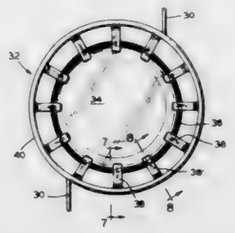
1. A device for attaching an object such as a suture to a bone, comprising:
a relatively rigid, elongate body having first and second ends, a central portion between said ends, and a longitudinal axis extending through said ends; and
means for attaching a suture substantially midway between the first and second ends of the body at a point which is offset from the longitudinal axis so that, when the device is placed in a hole in the bone and a force having a component acting in a direction which is parallel to the longitudinal axis of the device is applied to the suture, the device will rotate causing the ends to engage the bone and prevent removal of the device and suture from the hole;
wherein at least one of said first and second ends is formed as a sharp point and wherein said sharp point is offset from the longitudinal axis, and faces away from said axis and the central portion of the elongate body.

5,203,788

MICROMOTOR ACTUATED ADJUSTABLE FOCUS LENS

Robert G. Wiley, 4545 Brookside Rd., Toledo, Ohio 43615

Filed Mar. 14, 1991, Ser. No. 669,499
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 7 Claims



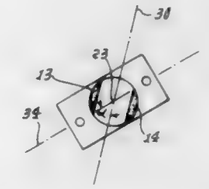
1. An adjustable focus intraocular lens apparatus, for implantation into an eye, comprising:
a transparent lens body having a periphery which includes an expandable and contractible inner ring;
a mounting ring positioned adjacent to said periphery of said lens body, said mounting ring including an outer ring being substantially rigid with respect to the inner ring of said lens body; and
micrometer means coupling the outer ring of said mounting ring to the inner ring of said lens body, said micromotor means being responsive to an externally generated control signal for selectively changing at least one of the shape and the position of the inner ring of said lens body whereby when the lens apparatus is implanted into an eye and the control signal is generated outside the eye and transmitted to said micromotor means, said micromotor means responds to adjust the focus of the lens for power and astigmatism correction respectively.

5,203,789

FOLDABLE PLASTIC OPTICAL LENS WITH REDUCED THICKNESS LIGHT BLOCKING SEGMENTS

Henry H. McDonald, 65 N. Madison, Suite 810, Pasadena, Calif. 91101, assignor to Henry H. McDonald and William W. Haefliger, both of Pasadena, Calif., a part interest

Filed Nov. 12, 1991, Ser. No. 791,002
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 13 Claims



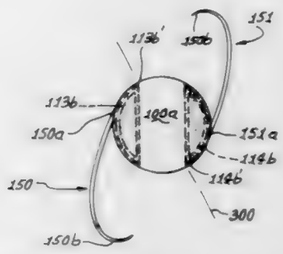
1. A foldable plastic lens insertable into the eye lens zone from which a natural lens has been removed, comprising
a) the plastic lens having a light passing intermediate optical portion, and two oppositely extending haptics,
b) the lens also having two opposed peripheral segments characterized as light blocking,
c) said segments having substantially reduced thickness relative to the thickness or thicknesses of said intermediate optical portion,
d) said haptics being in the form of flat, foldable plastic elements that extend directionally longitudinally oppositely, said segments each elongated in skewed relation to said longitudinal direction.

5,203,790

FOLDABLE PLASTIC OPTICAL LENS WITH REDUCED THICKNESS LIGHT BLOCKING SEGMENTS, AND ANCHORING MEANS

Henry H. McDonald, 65 N. Madison, #810, Pasadena, Calif. 91101, assignor to Henry H. McDonald and William W. Haefliger, both of Pasadena, Calif.

Continuation-in-part of Ser. No. 791,002, Nov. 12, 1991. This application Dec. 16, 1991, Ser. No. 807,204
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 19 Claims



1. A foldable lens insertible into the eye lens zone from which a natural lens has been removed, comprising
a) the lens having a light passing intermediate optical portion, consisting of plastic,

b) the lens also having opposed peripheral segments characterized as substantially light blocking,

said shoe upper having an inside surface and an outside surface;

substantially isolating said chamber from said atmosphere, whereby when said physical barrier is removed and a portion

a threaded fastener, extending through said perforated cover plate and said sealing gasket, attached to said wedging

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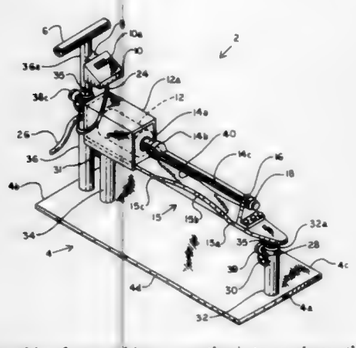
b) the lens also having opposed peripheral segments characterized as substantially light blocking,
c) and anchoring means for anchoring said segments to the intermediate optical portion,
d) said anchoring means extending along outer peripheries of said segments.

5,203,791

DEVICE FOR ATTACHING A PROSTHESIS

J. Wayne Blanchard, 60320 Lafourche St., Plaquemine, La. 70764

Filed Jun. 4, 1992, Ser. No. 893,797
Int. Cl.[5] A61F *2/48*
U.S. Cl. 623—24 **17 Claims**



1. A machine for attaching a prosthesis to an above-the knee amputee, comprising:
(a) a frame including a horizontal base;
(b) a motor mounted on the frame;
(c_1) means for switching the motor on and off, and
(c_2) means for varying the vertical distance from the motor to the base of the frame;
(d) a rigid, elongated, horizontal member having first and second ends, the first end of the elongated member being rotatably connected to the motor; and
(e) means for holding a tubular stocking in contact with the elongated member, the stocking having first and second ends, the first end of the stocking being held in contact with the elongated member, the elongated member and the holding means being so constructed and arranged that, as the elongated member is turned by the motor, the tubular stocking is wrapped around the elongated member, thereby drawing the second end of the stocking toward the elongated member.

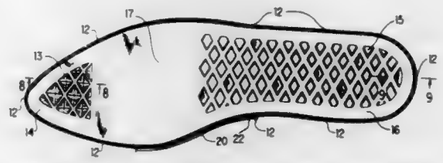
5,203,792

SHOE CONSTRUCTION AND METHOD OF MAKING THE SAME

Emilio Kaiser, Florence, Italy, assignor to What's What, Inc., Edison, N.J.

Division of Ser. No. 451,084, Dec. 15, 1989, abandoned. This application Aug. 21, 1990, Ser. No. 570,530
Int. Cl.[5] A43B *9/08, 9/00*
U.S. Cl. 12—142 C **7 Claims**

1. A method of making a shoe comprising the steps of:
providing a shoe sole of polymeric material, having a top surface, a bottom surface and an exposed side surface, with a lip extending around the perimeter of the top surface, said lip being integrally formed with said sole as a one-piece construction, said lip having a first surface and a second surface, said lip extending upwardly from said top surface of said sole with said second surface being contiguous to and coplanar with said exposed side surface;
providing a shoe upper having a lower edge generally configured to conform with the configuration of the said lip, said shoe upper having an inside surface and an outside surface;
fitting the shoe upper inside out about the sole with the sole upside down such that the outside surface of the upper is brought flush with the lip of the sole while the lip is in the upward extending disposition;
securing the shoe upper to said lip while said lip is in the upward extending disposition;
said sole top having imperforate band extending entirely around said sole top adjacent said lip, said band being coplanar with the upper most portion of said sole top;



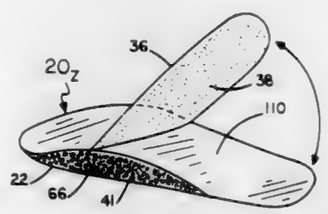
attaching the first surface of the lip to the top surface of the sole by applying adhesive to one of said first surface and said band;
pulling said upper over the sole so that said outside surface of said upper faces outwardly and all of the upper is above said top surface of the sole, said sole being sufficiently flexible to permit said pulling step; and
said providing steps, said fitting step, said securing step, and said pulling step are being accomplished while maintaining the dimensional integrity of said sole bottom and said exposed side surface, without changing the relative position of said exposed side surface with respect to said sole bottom.

5,203,793

CONFORMABLE CUSHIONING AND STABILITY DEVICE FOR ARTICLES OF FOOTWEAR

Robert M. Lyden, 16384 SW. Estuary Dr., Apt #203, Beaverton, Oreg. 97006

Continuation-in-part of Ser. No. 714,971, Jun. 13, 1991, Pat. No. 5,101,580, which is a continuation of Ser. No. 410,074, Sep. 20, 1989, abandoned. This application Dec. 11, 1991, Ser. No. 805,596
Int. Cl.[5] A43B *13/18;* **A61F** *5/14*
U.S. Cl. 36—88 **24 Claims**



1. A conformable device for use in an article of footwear and conforming to and supporting a portion of a wearer's anatomy comprising a chamber having inner volume, said chamber comprising at least in part a pliable casing, said pliable casing at least partially comprising a selectively permeable material to gases including water vapor, a conformable material substantially comprising liquid matter substantially comprising an aqueous silicone emulsion which can comprise a resilient material substantially comprising solid matter after a working time when water in the form of gaseous water vapor evaporates from said conformable material into the atmosphere, said conformable material contained within said chamber and displacing at least a portion of said inner volume, a physical barrier

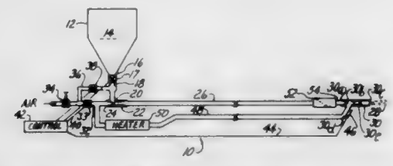
substantially isolating said chamber from said atmosphere, whereby when said physical barrier is removed and a portion of said wearer's anatomy is positioned in functional relation to said conformable device causing a force application to be made thereupon and causing at least a portion of said conformable device to be formed in substantial conformance with said portion of said wearer's anatomy, said conformable device substantially retains the shape imparted by said portion of said wearer's anatomy when said conformable material substantially comprises said resilient material after a working time.

5,203,794

ICE BLASTING APPARATUS

Scott M. Stratford, Alta Loma; Philip Spivak, Toluca Lake; Oleg Zadorozhny, North Hollywood, and Alan E. Opel, Monrovia, all of Calif., assignors to Alpheus Cleaning Technologies Corp., Rancho Cucamonga, Calif.

Filed Jun. 14, 1991, Ser. No. 715,790
Int. Cl.[5] B24C *3/00*
U.S. Cl. 51—410 **10 Claims**



1. Apparatus for treatment of a workpiece by blasting same with sublimable particles (**14**), comprising:
(a) a source (**12**) of the particles, the particles having an incoming first average volume per particle;
(b) a nozzle unit (**30**) spaced from the source and having a gas inlet (**30***d*) for receiving a high pressure gas, and a particulate inlet (**30***a*) for receiving the particles, the particulate inlet being in fluid communication with a material outlet (**30***b*), a nozzle outlet (**30***c*) in fluid communication with the gas inlet being located downstream of the material outlet;
(c) transport means (**22**) for transporting the particles from the source to the particulate inlet of the nozzle unit;
(d) divider means (**52**) proximate the particulate inlet of the nozzle unit for splitting at least a portion of the particles, whereby the average volume of the particles is reduced from the incoming first average volume per particle to a second average volume per particle, the second average volume being less than approximately the first average volume; and
(e) accelerator means (**30***e*) in the nozzle unit for accelerating the particles to high velocity in response to the high pressure gas.

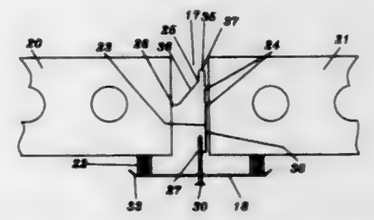
5,203,795

WEEPHOLE VENTILATOR AND INSECT GUARD

Jay W. Balamut, 3628 Leathertop, Plano, Tex. 75075, and Christopher McCrate, 3601 Racquet Ct., Plano, Tex. 75023

Filed Oct. 17, 1991, Ser. No. 778,249
Int. Cl.[5] E04B *1/70*
U.S. Cl. 52—303 **8 Claims**

1. A weephole device for the ventilation of cavities between exterior masonry, brick, and brick veneer wall structures, and an interior wall structure, comprising:
a perforated cover plate wherein said perforations provide a ventilating means;
a sealing gasket filling surface imperfections between the perforated cover plate and an exterior wall surface;
a "V" shaped wedging anchor providing a solid base from within a weephole cavity for mounting the perforated cover plate and the sealing gasket to an exterior wall surface; and
a threaded fastener, extending through said perforated cover plate and said sealing gasket, attached to said wedging anchor, securing and sealing the perforated cover plate with said sealing gasket against the exterior wall surface.

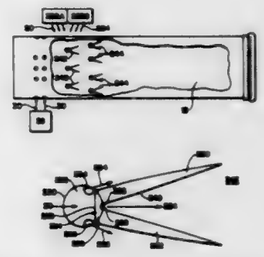


5,203,796

TWO STAGE V-GUTTER FUEL INJECTION MIXER

Roy M. Washam; Lewis B. Davis, and Charles E. Steber, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,727
Int. Cl.[5] F02C *1/00;* **F02G** *3/00*
U.S. Cl. 60—737 **52 Claims**



1. In a gas turbine combustor for mixing and combusting fuel and an oxidant comprising:
an enclosure for the introduction and mixing of the fuel and oxidant in an upstream end region thereof, and for combustion of the mixture of said fuel and oxidant in a downstream end region thereof;
two or more rows of convex-shaped members in the upstream end of said enclosure extending transverse to the mixture flow from the upstream end to the downstream end regions, each row having a plurality of spaced convex-shaped members;
said convex-shaped members each including an apex connecting a pair of trailing edges;
the apex of each of said convex-shaped members being pointed toward the upstream end of said enclosure, and said trailing edges of said convex-shaped members extending outwardly from said apex toward the downstream end of said enclosure;
means to inject the oxidant into said upstream end region to cause an oxidant flow toward the downstream combustion end region; and
means to inject said fuel into said upstream end region for mixing with said oxidant flow;
said convex-shaped members being interposed in, and extending transverse to, the path of said mixture flow;
a first row of said convex-shaped members located to assist in said mixing of said fuel and said oxidant, and a second row of said convex-shaped members located downstream of said first row of said convex-shaped members to assist in separating an area of mixing from said combustion end region, and wherein the apexes of at least some of said

second downstream row of convex-shaped members are

the tank, wherein the tank has a cross-section greater than the

endless belt laterally from its edges within the area adapted for exercise;

from a front wall of the loading machine to a working position in which it is located close to said front wall; and

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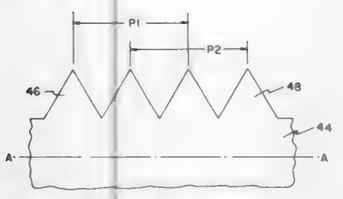
second downstream row of convex-shaped members are positioned axially behind and pointing toward openings between adjacent trailing edges of said first row of convex-shaped members.

5,203,797

RAPID JAW ADJUSTMENT FOR TOOLS AND THE LIKE

Ralph Petersen, DeWitt, Nebr., assignor to Petersen Manufacturing Co., Inc., DeWitt, Nebr.

Continuation of Ser. No. 392,707, Aug. 11, 1989, abandoned.
This application Nov. 8, 1990, Ser. No. 613,945
Int. Cl.[5] B25B *7/12*
U.S. Cl. 81—367 **20 Claims**



1. A locking hand tool, comprising

a fixed handle having front and rear portions, a fixed jaw connected to said front portion and a receiving part located at said rear portion;

a movable jaw pivotally connected to said front portion of said fixed handle for cooperation with said fixed jaw, and a movable handle connected to said movable jaw;

adjusting means for cooperation with said movable jaw, movable handle and for adjusting the position of the movable jaw relative to said fixed jaw, said adjusting means comprising a threaded opening in said receiving part of said fixed handle, and a screw member having a first end configured for hand rotation thereof, said screw member having a plurality of permanent first multiple individual threads with the same diameter and pitch throughout the entire length thereof;

said threaded opening having a plurality of permanent multiple second individual threads with the same diameter and pitch throughout the entire length thereof;

said plurality of first and second individual threads being of the same type and having identical pitches;

said plurality of said permanent second threads being engaged with said plurality of permanent first threads,

whereby a substantially increased rate of advancement of said screw member in an axial direction resulting from rotational engagement of said plurality of first threads of the screw member with the plurality of second threads of the threaded opening, and the cooperation of said adjusting means with said movable handle and movable jaw produces a substantial increase in the rate of adjustment of said movable jaw relative to said stationary jaw.

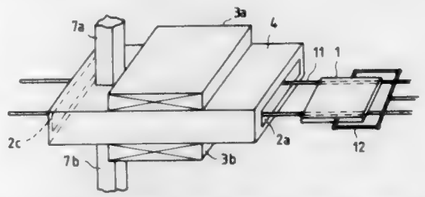
5,203,798

CLEANING APPARATUS FOR SUBSTRATE

Masahiro Watanabe; Mitsuyoshi Otake, and Megumi Hamano, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 720,001
Claims priority, application Japan, Jun. 25, 1990, 2-164072
Int. Cl.[5] B08B *9/10*
U.S. Cl. 134—184 **16 Claims**

9. A cleaning apparatus for cleaning a material, comprising a tank for containing a cleaning liquid and including an opening portion for insertion of the material to be cleaned, means including a pump for feeding the cleaning liquid under pressure through a piping and to the tank so as to apply the cleaning liquid under pressure to at least one surface of the material to be cleaned, and at least one ultrasonic transducer attached to the tank, wherein the tank has a cross-section greater than the cross-section of the material to be cleaned and the piping has a cross-section greater than the difference between the cross-sec-



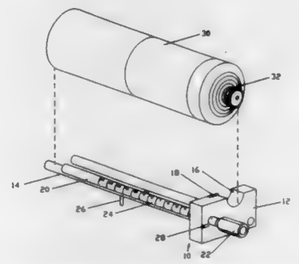
tion of the tank and the cross-section of the material to be cleaned so as to enable an increased flow velocity of the cleaning liquid in the proximity of the material to be cleaned and an improved cleaning thereof.

5,203,799

SCALE TO DETERMINE LIQUIFIED GAS AMOUNT IN SMALL CONTAINERS

Neal B. Wineman, P.O. Box 8112, Sisters, Oreg. 97759

Filed Apr. 25, 1991, Ser. No. 692,453
Int. Cl.[5] G01G *1/18, 21/22*
U.S. Cl. 177—246 **3 Claims**



1. A weight indicating scale for determining the liquid content of small propane containers comprising:

a cradle block;

at least two support dowels fixed to said cradle block for support of a small propane container;

a fulcrum extending downwardly from each of said support dowels; and

a sliding dowel with indicia is slidably positionable within said cradle block with a fixed weight attached to one end of said sliding dowel where said sliding dowel and said weight can be slidably positioned such that said weight indicating scale will rest on said fulcrums and said cradle block indicating the weight of said liquid contents of said small propane container.

5,203,800

TREADMILL WITH PERIPHERAL BELT SUPPORT

Jeffrey O. Meredith, 3859 E. 8th St., Long Beach, Calif. 90804

Filed Oct. 11, 1991, Ser. No. 775,105
Int. Cl.[5] A63B *22/02*
U.S. Cl. 482—54 **8 Claims**

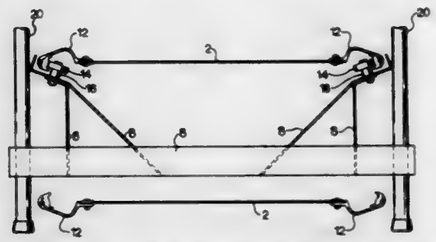
1. A treadmill, comprising:

(a) an endless belt, with its uppermost surface exposed to form a flat exercise surface;

(b) a longitudinal support means located within the endless belt at each end of the exercise surface to suspend the endless belt and allow it to be moved longitudinally;

(c) a lateral support means located on either side of the uppermost surface of the endless belt for suspending the endless belt laterally from its edges within the area adapted for exercise;

(d) a connecting means along the edges of the endless belt for engaging the lateral support means as the endless belt moves relative to the lateral support means, wherein the connecting means include a plurality of guide brackets;



(e) a clamping means on the guide brackets for attaching the edge of the endless belt to the brackets, wherein the clamping means includes a washer means and an overlapping portion of the brackets, the overlapping portion including a gripping surface; and

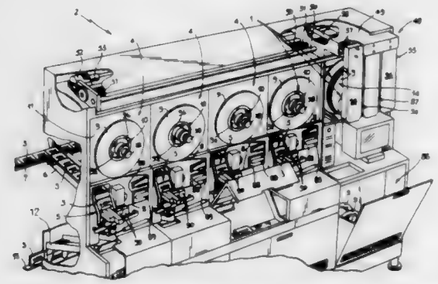
(f) a frame for maintaining the longitudinal and lateral support means in fixed positions relative to each other, the endless belt, and the ground on which the treadmill sits.

5,203,801

APPARATUS FOR SUPPLYING TAPE LOADING MACHINES WITH REELS OF TAPE

Luciano Perego, Mezzago, Italy, assignor to Tapematic U.S.A., Inc., Orlando, Fla.

Filed Sep. 20, 1990, Ser. No. 585,710
Claims priority, application Italy, Aug. 6, 1990, 21223A/90
Int. Cl.[5] B65H *19/30, 75/24*
U.S. Cl. 242—58.6 **15 Claims**



1. An automated apparatus for supplying magnetic tape reels for cassette loading machines, comprising:

at least one rotatable support hub capable of engaging a magnetic tape reel comprising:

a core rotatable by a motor; and

at least three locking levers circumferentially distributed about the core axis capable of exerting a force to fix the position of a reel on said support hub;

a storage unit capable of storing, on a central support shaft having a free end, a plurality of reels of magnetic tape for mounting on said support hub, wherein said storage unit comprises means for biasing said plurality of reels toward said free end of said central support shaft;

a main carriage slidably movable in relation to a loading machine and said storage unit, wherein said main carriage has at least on support arm extending therefrom, and wherein said support arm is movable relative to said support hub from a rest position in which it is spaced apart from a front wall of the loading machine to a working position in which it is located close to said front wall; and

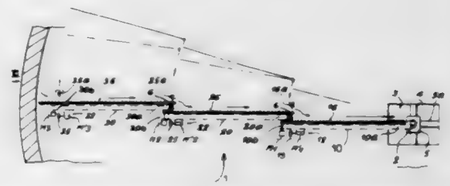
at least one grasping and release member connected to said support arm capable of engaging said support hub and said storage unit in order to remove an empty tape reel from said support hub, pick up a new tape reel from said storage unit and fit said new tape reel on said support hub in place of the empty reel.

5,203,802

DEVICE FORMING AN EMPTYING SCREW FOR RESIDUAL PRODUCT STORED IN A SILO

Pierre Denis, Broa, France, assignor to Etablissements DENIS, Broa, France

Filed Aug. 1, 1991, Ser. No. 739,174
Claims priority, application France, Aug. 3, 1990, 90 09950
Int. Cl.[5] B65G *69/08*
U.S. Cl. 414—320 **22 Claims**



1. A device for emptying a silo, which has a substantially flat base and at least one discharge opening in said base, of residual granular or pulverulent product stored in the silo; said device comprising:

(a) a series of generally longitudinally aligned beams situated above the base of the silo and extending parallel to it;

(b) a pivot structure situated above said discharge opening;

(c) each beam of the series of beams

(i) having a first end and a second end and

(ii) rotatably supporting a respective endless screw extending along that beam between said first and second ends thereof;

(d) one of said beams, constituting the first beam of the series, being articulated at said first end thereof to said pivot structure for pivotal movement of said first beam over said base of said silo;

(e) each beam of the series subsequent to said first beam being articulated at its first end to the second end of the next preceding beam of the series for relative pivotal movement between each subsequent beam and the respective next preceding beam;

(f) a plurality of drive systems, one for each beam and each situated toward said second end of its associated beam, each said drive system including a wheel in rolling contact with and via which said associated beam bears on said base of said silo; and

(g) a plurality of motor assemblies, one for each beam and each situated toward said second end of its associated beam, each said motor assembly including

(i) a first motor operatively connected with and driving said endless screw of said associated beam, and

(ii) a second motor operatively connected with and driving said wheel of said drive system of said associated beam.

5,203,803

REVERSE OSMOSIS WATER PURIFIER BOOSTER

in said chamber for moving in said first and second dielec-

is greater than the fluid pressure in said housing outlet;

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articulating surface that articulates against one of said

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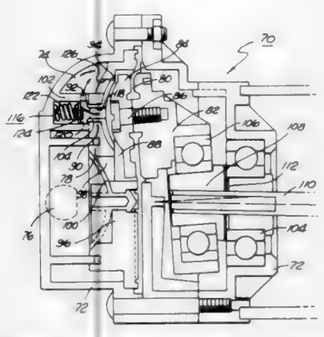
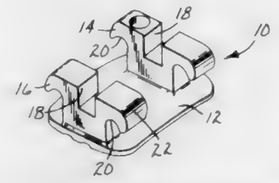
5,203,803
REVERSE OSMOSIS WATER PURIFIER BOOSTER PUMP SYSTEM
Ivar Schoenmeyr, Mission Viejo, Calif., assignor to Aquatec Water Systems, Inc., Anaheim, Calif.
Continuation-in-part of Ser. No. 679,791, Apr. 3, 1991, abandoned. This application Sep. 5, 1991, Ser. No. 755,165
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—38 **17 Claims**



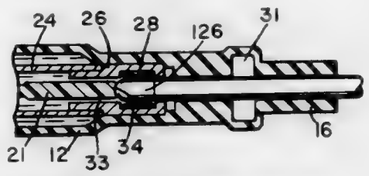
1. A reverse osmosis water purification system that can purify water from a water source, comprising:
a filter having an inlet and an outlet, said filter further having an osmotic membrane that filters water at a flow rate and operates at a water pressure that does not exceed a maximum pressure;
a pump operatively connected to the water source and said filter inlet to pump water from the water source to said filter, said pump including;
a housing having an inlet and an outlet;
a diaphragm mounted within said housing;
a piston having a piston head attached to said diaphragm;
a wobble plate operatively connected to said piston, said wobble plate having a cam surface with a predetermined cam angle;
a bearing operatively connected to said housing such that said bearing can rotate relative to said housing surface, said bearing having a first surface that operatively engages said cam surface;
a valve plate mounted inside said housing, said valve plate having a first and second valve portion constructed such that said valve portions, said piston and said diaphragm form a chamber, said first valve portion further has an inlet opening to allow fluid communication between said housing inlet and said chamber, said second valve portion has an outlet opening to allow fluid communication between said chamber and said housing outlet, said first valve portion and said housing defining a valve chamber that is in fluid communication with said housing inlet;
a motor output shaft attached to said wobble plate to rotate said wobble plate such that said piston is moved relative to said valve plate to expand and contract said chamber in accordance with said cam engagement with said bearing;
a first valve operatively connected to said first valve portion adapted to allow one way fluid communication from said housing inlet to said chamber through said inlet opening when the fluid pressure in said housing inlet is greater than the fluid pressure in said chamber, said first valve having a first valve opening that can provide fluid communication between said chamber and said valve chamber;
a second valve operatively connected to said second valve portion adapted to allow one way fluid communication from said chamber to said housing outlet through said outlet opening when the fluid pressure in said chamber is greater than the fluid pressure in said housing outlet; and
a by-pass valve being located within said valve chamber and adapted to control the flow of fluid through said first valve opening such that said pump outlet water pressure does not exceed the maximum pressure of said filter;
a motor operatively connected to said pump, said motor being adapted to drive said pump so that said pump provides a water flow rate that is approximately equal to the flow rate of said filter;
a storage tank connected to said filter outlet; and,
logic means operatively connected to said storage tank and said motor for starting said motor when the water within said storage tank reaches a first level and stopping said motor when the water within said storage tank reaches a second level that is greater than said first level, wherein said by-pass valve opens to allow said motor and said pump to run continuously while the water within said storage tank rises from said first level to said second level.

5,203,804
COATED DENTAL ARTICLE
Enrique A. Nikutowski, Monrovia; Randall E. Adam, Temple City, both of Calif., and David G. O'Neill, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 18, 1991, Ser. No. 732,117
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—8 **38 Claims**



1. A dental article having a hard carbon coating, wherein said article comprises an orthondontic bracket.

5,203,805
UNDERWATER ELECTRICAL CONNECTOR
James L. Cairns, 2348 Kentucky Ave., Mims, Fla. 32754
Continuation of Ser. No. 487,584, Mar. 2, 1990, abandoned. This application Aug. 29, 1991, Ser. No. 754,355
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—199 **4 Claims**



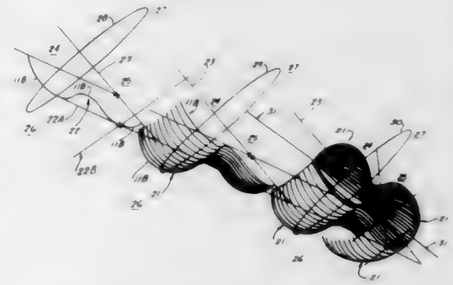
1. An underwater electrical socket, comprising:
a flexible chamber for enclosing an electrical receptacle in dielectric fluid and having a sealable opening at one end;
said flexible chamber having first and second, fluid interconnecting dielectric bath chambers with an inner wiper positioned therebetween;
a dielectric stopper in said chamber for exposing the electrical receptacle to electrical contact being slidably disposed in said chamber for moving in said first and second dielectric bath chambers and being wiped by said inner wiper,
said inner wiper having a cylindrical passageway,
said dielectric stopper having along its length a first portion with a first diameter and a second portion with a second, smaller diameter; and
said first diameter portion being normally positioned in said sealable opening and said second smaller diameter portion being positioned in said inner wiper passageway and partially in said first and second dielectric bath chambers, providing fluid interconnection between said first and second bath chambers.

5,203,806
ABSORBENT PAD FOR MEDICAL USE
Marna Broida, P.O. Box 1558, North Kingstown, R.I.
Continuation of Ser. No. 388,607, Aug. 2, 1989, Pat. No. 5,013,307. This application Feb. 21, 1991, Ser. No. 658,531
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—338 **8 Claims**

1. An absorbent pad for use with an ostomy appliance of the type having an enclosed bag portion and an adhesive flange which are connected together around an aperture adapted for receiving a stoma, to absorb fluid leakage from around the flange of said ostomy appliance, said absorbent pad comprising:
a flexible laminate formed with an inner layer of material permeable to and capable of absorbing fluid disposed on one side adapted to face toward a patient's skin and an outer layer of material impermeable to fluid disposed to cover said inner layer on an opposite side adapted to face away from the patient's skin, said layer being sealed together, and
an opening formed through said laminate substantially in the center of said laminate being adapted for fitting securely around the connection between the ostomy appliance bag and flange enabling a peripheral edge of the ostomy appliance flange to terminate in a region that is surrounded by said inner layer.

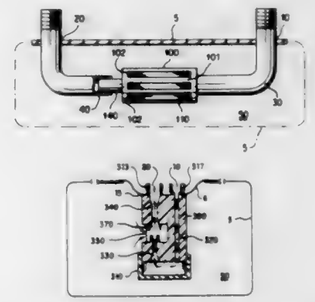
5,203,807
KNEE JOINT PROSTHESIS ARTICULAR SURFACE
David L. Evans, Bartlett, and Mark S. Gosney, Memphis, both of Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.
Filed Jul. 10, 1991, Ser. No. 727,971
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 **10 Claims**

1. A prosthesis for surgical implantation for replacement of a patient's knee having two spaced apart condylar portions, or for replacement of a portion thereof comprising:
a) a tibial component that includes one or more concave tibial condylar articulating surfaces;
b) a femoral component that includes one or more distal femoral condyles, each with a convex femoral condylar articulating surface that articulates against one of said tibial condylar articulating surfaces of the tibial component;
c) the concave tibial and convex femoral condylar articulating surfaces being correspondingly shaped to define during at least the first few degrees of flexion from a beginning position a flexion axis with an inclination of from about ten degrees (10°) to about fifty degrees (50°) with



respect to a transverse plane tangent to distal femoral condyles; and
d) the concave tibial and convex femoral condylar articulating surfaces being correspondingly shaped and conforming articular surfaces through the first few degrees of flexion from a beginning fully extending position, with substantial congruent surface area contact between said components.

5,203,808
WATER BED WITH COMPACT BUILT-IN DRAIN PUMP
Russell D. Ide, 122 Ridge Dr., Exeter, R.I. 02822
Continuation-in-part of Ser. No. 818,264, Jan. 8, 1992, Pat. No. 5,136,739. This application May 11, 1992, Ser. No. 881,506
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—451 **19 Claims**



1. A water bed having a built-in drain pump, the water bed comprising:
a water tight bladder having a sealed interior;
an insert, the insert having an outer periphery connected to the bladder and an opening into the interior of the bladder;
a pump extending into the water tight bladder through the opening, the pump including: a pump body having an inlet port formed in the pump body to allow fluid to pass into the interior of the water tight bladder,
an outlet port formed in the pump body to allow fluid to flow out of the water tight bladder,

an inlet pipe extending from the inlet port into the interior of

5,203,812
METHOD OF CONNECTING TWO COMPONENTS
Gerd-Jurgen Eckold, Silbergutte 11, D-3424 St. Andreasberg,

comprising the steps of molding a rigid thermoplastic liner,

moving the hooked second end of said wire from said second notch to said third notch; and

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an inlet pipe extending from the inlet port into the interior of the water-tight bladder;

an outlet pipe extending from the outlet port into the interior of the water tight bladder;

a jet nozzle formed in the pump body, the jet nozzle having an inlet opening and a discharge opening, the inlet opening being in fluid communication with the inlet pipe so that fluid passing through the inlet pipe is directed into the inlet opening of the jet nozzle, the inlet opening being larger than the discharge opening such that the velocity of fluid passing through the nozzle is increased; and

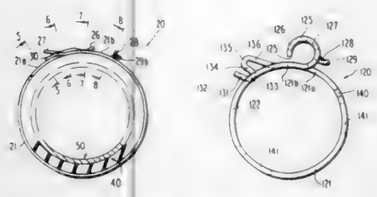
a diffuser formed in the pump body, the diffuser having an inlet opening and an outlet opening, the inlet opening of the diffuser being larger than the outlet opening of the jet nozzle and the outlet opening being connected to the outlet pipe, the discharge end of the jet nozzle being coaxially aligned with the inlet end of the diffuser and spaced therefrom whereby when fluid is caused to flow through the jet nozzle, a suction pressure is created.

5,203,809

SELF-TIGHTENING CLAMP

Hans Oetiker, Oberdorfstrasse 21, CH-8812 Horgen, Switzerland

Filed Dec. 6, 1991, Ser. No. 803,220
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—20 R **49 Claims**



1. A self-tightening clamp operable to assume a reduced diametric dimension as a result of its inherent springiness and adapted to be expanded in its diametric dimension to enable installation over a hose, comprising clamping band means made from spring steel and normally defining a substantially circular configuration, said clamping band means having overlapping end portions, one clamping band end portion having a tongue-like configuration of a width less than the width of the clamping band means, the other clamping band end portion being provided with an elongated slot of such width as to permit the tongue-like inner band end portion to extend through same, detent means in said one band end portion, said detent means being located to be within the area of said slot when the clamp is in its reduced diametric dimension corresponding to its clamping position, said outer band portion being provided with locking means to lock the clamp in its expanded diametric dimension corresponding to the open clamp position by engagement with said detent means, and further means to minimize the danger of injury by the free ends of any inner and outer band end portions which are so constructed that the free end of any inner and outer band portion extends at most only a limited distance in a direction radially outwardly from the outer surface of the clamping band means.

5,203,810

METHOD OF MAKING A PLASTIC LINED CONCRETE STRUCTURE

Michael Davidian, Oak Brook, Ill., assignor to Wilbert, Inc., Broadview, Ill.

Division of Ser. No. 668,770, Mar. 13, 1991, Pat. No. 5,157,817. This application Aug. 11, 1992, Ser. No. 927,930
Int. Cl.[5] A61G *17/00*
U.S. Cl. 27—35 **6 Claims**

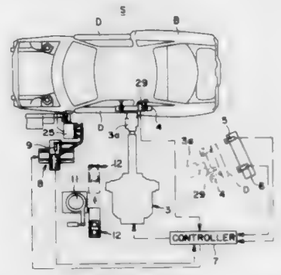
1. A method of producing a plastic lined concrete structure, comprising the steps of molding a rigid thermoplastic liner, applying a thermosetting resin adhesive to a surface of said liner, said adhesive comprising an epoxy resin system, a solvent compatible with said epoxy resin system and capable of solubilizing the outer surface of said liner, and a surfactant capable of emulsifying said epoxy resin system and said solvent, applying wet flowable concrete to said adhesive layer, and curing said adhesive and said concrete to provide a composite structure in which the concrete is firmly bonded to the liner, said surfactant acting to reduce the hydrophobic characteristics of said adhesive to provide an improved bond between said concrete and said liner.

5,203,811

METHOD OF POSITIONING A DOOR IN AN AUTOMOBILE BODY STRUCTURE

Kazunori Hirotani, and Toshisumi Tokunaga, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 18, 1991, Ser. No. 716,975
Claims priority, application Japan, Jun. 21, 1990, 2-163762; Jun. 21, 1990, 2-163764
Int. Cl.[5] B23Q *17/00*
U.S. Cl. 29—407 **9 Claims**



1. A method of accurately positioning an automobile door with respect to an automobile body structure preparatory to fixedly mounting said door to said body structure, said method comprising:

placing said door in a location opposed to a door opening in said body structure;

determining a vertical position of said door by detecting by an image-processing operation a vertical position of a reference point on said door;

determining the existence of any errors of said detected vertical position of said reference point due to a relative opened position of said door at said location by detecting at least one parameter of an area of said reference point at said location of said door and a distance in a direction longitudinally of said body structure between a center of said reference point at said location of said door and said center of said reference point at a closed position of said door;

determining a corrected vertical position of said reference point based on the thus detected said at least one parameter; and

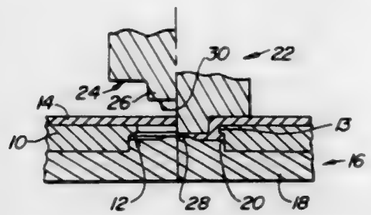
moving said door relative to said body structure from said location by a distance based on the thus determined said corrected vertical position.

5,203,812

METHOD OF CONNECTING TWO COMPONENTS

Gerd-Jurgen Eckold, Silbergutte 11, D-3424 St. Andreasberg, and Hans Maass, Germelmannstr. 12, D-3422 Bad Lauterberg, both of Fed. Rep. of Germany

Filed Oct. 16, 1990, Ser. No. 598,504
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934743
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—522.1 **3 Claims**



1. A method of connecting a first workpiece having a connection area with a first thickness to a second workpiece having a connection area with a second thickness smaller than said first thickness, said first workpiece having a preformed hole therethrough with a first, smaller section adjacent said second workpiece and a second, larger section remote from said second workpiece, said sections being separated by a step, said method comprising pressing a punch against the connection area of said second workpiece causing deformation of material from the second workpiece into said hole with a single press stroke and without cutting through said second workpiece, whereby material of the second workpiece is extruded through the small section and into the large section of said hole, positioning said first workpiece by means of a support member having a section shape complementary to said second hole section and extending into said hole to an extent such that said step is left unimpeded and said deformed material is extruded beyond said step but not beyond the second section of the hole.

5,203,813

LOW ENTRY FORCE CONNECTOR SOCKET METHOD OF MANUFACTURE

Peter Fitzsimmons, Allen, Tex.; Mark S. Glasmeire, Moorpack, Calif.; John L. Grant, Sherborn, Mass.; Jean L. Meek, Lindale, Tex.; William J. Merritt, Moorpack, Calif., and John B. Moetteli, Dallas, Tex., assignors to Airborn, Inc., Addison, Tex.

Filed Aug. 6, 1991, Ser. No. 740,927
Int. Cl.[5] H01R *43/20*
U.S. Cl. 29—876 **9 Claims**

1. A method of making a connector socket of the kind comprising a generally cylindrical inner cage, at least one contact wire positioned within said cage, said contact wire being rotationally offset by a selected angle from one end of said cage to the other, and enclosing means for enclosingly engaging said cage, said method comprising:

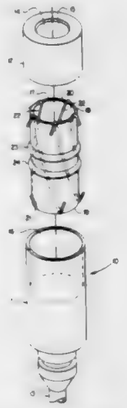
providing wire seating notches on the rims of each end of said cage, each said wire having three seating notches associated therewith, a first notch on a first cage end rim, a second notch on a second cage end rim and rotationally offset from said first notch by an angle smaller than said selected angle, and a third notch on said second cage end rim and rotationally offset from said first notch by said selected angle;

feeding at least one wire into said cage in a path of movement substantially parallel to the axis of said cage;

hooking a first end of said wire on said first notch;

hooking a second end of said wire on said second notch;

moving the hooked second end of said wire from said second notch to said third notch; and



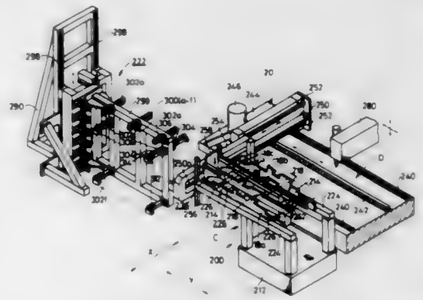
enclosing said cage with said at least one wire hooked thereto in said enclosing means.

5,203,814

METHOD OF MANUFACTURING AN AUTOMOBILE ROOF UNIT

Ken Kushizaki; Keizaburo Otaki, and Chitoshi Kato, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1991, Ser. No. 652,645
Claims priority, application Japan, Feb. 13, 1990, 2-033024; Feb. 16, 1990, 2-035584; Apr. 24, 1990, 2-107781
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—897.2 **2 Claims**



1. A method of manufacturing a roof unit for an automobile, wherein the assembled roof unit is maintained in a predetermined orientation which is the same orientation as the orientation of the roof unit shall be when assembled onto an automobile body, comprising the steps of:

setting at least one stiffener on a jig in a position for receiving a roof panel thereon;

feeding said at least one stiffener on said jig to a sealing station;

coating said at least one stiffener with an sealant in said sealing station;

feeding the coated stiffener to a working station;

unloading a stack of roof panels from an unloading station, and feeding the stack of roof panels from an unloading station, and feeding the stack of roof panels to a standby station;

holding and elevating an uppermost one of the roof panels in said standby station, positioning the elevated roof panel in

5,203,816

ELECTRIC FLEA TRAP

sponding to the post cross-section, wherein the fence post may be inserted into the bracket through the remaining

5,203,819

APPARATUS FOR ATTACHING A FITMENT TO A WEB

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holding and elevating an uppermost one of the roof panels in said standby station, positioning the elevated roof panel in a desired position, and releasing said roof panel at said desired position;

feeding the positioned roof panel to said working station, while maintaining said roof panel in said predetermined orientation;

assembling said roof panel and said at least one stiffener into a roof unit in said working station; and

feeding said assembled roof unit from said working station while maintaining the assembled roof unit in the same orientation in which the roof unit shall be assembled onto said automobile body.

5,203,815

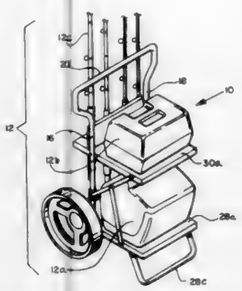
APPARATUS FOR CARRYING FISHING EQUIPMENT

Richard A. Miller, 5134 Valley Stream Rd., Charlotte, N.C. 28209

Continuation-in-part of Ser. No. 572,025, Aug. 24, 1990, Pat. No. D. 323,413. This application Jan. 24, 1992, Ser. No. 825,555

Int. Cl.[5] **B62B** *1/26*

U.S. Cl. 43—21.2 **11 Claims**



7. Apparatus for carrying fishing equipment, comprising:

(a) a support member;

(b) a first load bearing member rotatably mounted on the support member;

(c) a second load bearing member rotatably mounted on the support member above the first load bearing member;

(d) means connecting the first load bearing member and the second load bearing member for concurrently collapsing and opening the first and second load bearing members relative to the support member, the collapsing means including:

(1) a first connector having two ends;

(2) a second connector having two ends; and

(3) a slidable joint slidably connected to the support member;

(4) one end of the first connector being pivotally connected to the front end of the first load bearing member and the other end of the first connector being pivotally connected to the midsection of the second connector;

(5) one end of the second connector being pivotally connected to the front end of the second load bearing member and the other end of the second connector being pivotally connected to the slidable joint;

(6) the slidable joint being positioned on and slidably engageable with the support member between the first load bearing member and the second load bearing member; and

(7) means for releasably engaging the slidable joint with the support member;

(e) means for receiving fishing rods on the apparatus; and

(f) means connected to the first load bearing member for moving the apparatus.

5,203,816

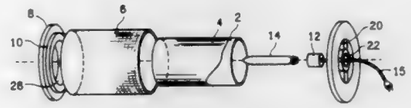
ELECTRIC FLEA TRAP

Daniel M. Townsend, P.O. Box 230943, San Diego, Calif. 92023-0943

Filed Mar. 2, 1992, Ser. No. 845,225

Int. Cl.[5] **A01M** *1/14*

U.S. Cl. 43—114 **11 Claims**



1. A trap for catching insects, comprising:

(a) an elongated, translucent, open-ended tubular member having a sticky coating on the outer surface thereof;

(b) a protective screen sleeve made of mesh for permitting ingress of some insects but to exclude appendages of children and pets, disposed concentrically about said tubular member;

(c) two end-pieces, each end-piece having an infacing surface removably engaging said tubular member and said screen sleeve, one of said end-pieces having an electrical connection means connectible to a source of electricity; and

(d) a light source means connected to said source of electricity by said electrical connection means and held by at least one end-piece, said light source axially disposed within said tubular member between said two-end pieces.

5,203,817

FENCE POST BRACKET

Joe Klumpjan, 1334 Sunset Dr., Rte. 3, Campbellsport, Wis. 53010

Filed Jan. 27, 1992, Ser. No. 826,544

Int. Cl.[5] **E02D** *27/42*

U.S. Cl. 52—298 **5 Claims**

1. A fence post assembly for rigidly securing an elongated wooden fence post having a perimeter of rectangular cross-section, a top end and a bottom end in a fixed position with the bottom end of the post spaced upwardly from a post hole in the ground, the assembly comprising:

a. a substantially vertical support bracket adapted for receiving the fence post adjacent its bottom end and for circumscribing three sides of the perimeter of the fence post, the support bracket including three vertical walls intersecting at right angles to form three sides of a rectangle corresponding to the post cross-section, wherein the fence post may be inserted into the bracket through the remaining open side;

b. each of said vertical walls including opposite ends, wherein corners are defined by abutting ends of the walls, and wherein a leg depends from each of the corners and each of the free outer ends to define open spaces bounded by adjacent pairs of legs and a lower edge of the wall interconnecting each respective leg pair;

c. means for releasably securing the fence post to the support bracket with the bottom end of post substantially above the legs; and

d. a cylindrical concrete base into which the ends of said legs depending from the support bracket are embedded leaving upper portions of said spaces open and for holding the fence post in a substantially vertical position, whereby the bottom end of the fence post is free of contact with any portion of the concrete base to provide for drainage of the fence post and the open side of said bracket and the upper portions of said open spaces provide open circulation to the post bottom from all directions.

5,203,818

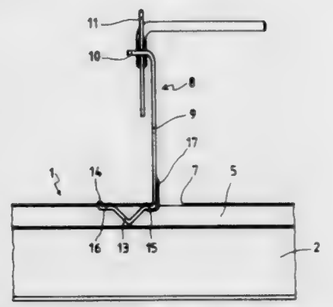
SUSPENSION HOOK

Karel Kuiper, Stationslaan 52, 8071 CN Nunspeet, Netherlands

Filed Nov. 4, 1991, Ser. No. 787,625

Int. Cl.[5] **E04B** *9/12, 9/18*

U.S. Cl. 52—484 **6 Claims**



1. A suspension hook for suspending a plurality of sectional bars forming a grid upon which ceiling panels are supported, each of said sectional bars comprising a vertical web portion having an upper end and there being a hollow tubular portion on said upper end, said hollow tubular portion having a top wall and there being a pair of apertures therein spaced along a length of said sectional bar, said suspension hook comprising a flat strip having a top end and a bottom end, said bottom end comprising a portion bent at substantially a right angle to said flat strip to define a hook portion having a flat bearing surface and a free end, there being an upwardly directed lip at said free end, said flat bearing an upwardly having a central portion with a V-shaped depression therein to define a downwardly projecting nose the height of which corresponds to the height of said hollow tubular portion of a said sectional bar, said hook being mounted to a said sectional bar when said hook portion is inserted downwardly through a said aperture such that said lip extends upwardly through said second aperture whereby the bearing surface on either side of said nose abuts the inner upper surface of said tubular portion and the tip of said nose abuts the inner bottom surface of said tubular portion.

5,203,819

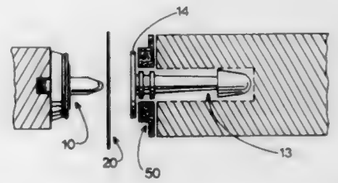
APPARATUS FOR ATTACHING A FITMENT TO A WEB OF FILM

Byron Gleason, Algonquin, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 520,148, May 7, 1990, abandoned, which is a continuation of Ser. No. 443,056, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 819,648, Jan. 17, 1986, abandoned. This application Jul. 30, 1992, Ser. No. 924,418

Int. Cl.[5] **B65B** *61/00, 51/14*

U.S. Cl. 53—133.2 **20 Claims**



1. An apparatus for piercing and sealing a web of film to a fitment having a flange comprising:

an abutment member including a heated face having a generally flat lower portion and a generally flat raised portion, both the generally flat lower portion and the generally flat raised portion adapted to contact the web of film during sealing, the generally flat raised portion sized to contact the web against a portion of the flange adjacent the fitment; and

a heat seal tip extending from the raised portion of the heated face.

5,203,820

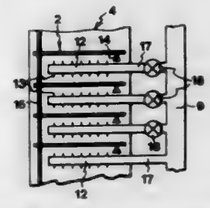
FOOD FREEZING APPARATUS

Richard J. Dibbs, Huron, Ohio, assignor to Frigoscandia Food Process Systems AB, Helsingborg, Sweden

Filed Mar. 6, 1992, Ser. No. 847,409

Int. Cl.[5] **F25D** *125/02*

U.S. Cl. 62—381 **6 Claims**



1. An apparatus for freezing of food products, comprising:

an insulated housing;

an endless, foraminous conveyor belt following a helical path for forming a belt pile having several tiers in said housing;

helical rail means for supporting the conveyor belt at one side thereof along the helical path;

cooling means;

air flow means for circulating an air flow through said cooling means and said belt pile in series;

duct means positioned between the tiers of said belt pile and extending from a beginning of said helical path along at least a part of said helical path, said duct means having a top wall, a bottom wall and side walls, said top wall and said bottom wall having a plurality of nozzles therein;

a chamber connected to said duct means along that side of the belt pile where said helical rail means supports the

conveyor belt and having an opening towards said cooling

5,203,822

a second transmission signal which has a wave form comprising smoothly curved portions;

tainer, said tubular retainer having a length much less than the length of the borehole; and

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conveyor belt and having an opening towards said cooling means for receiving cooled air therefrom; and

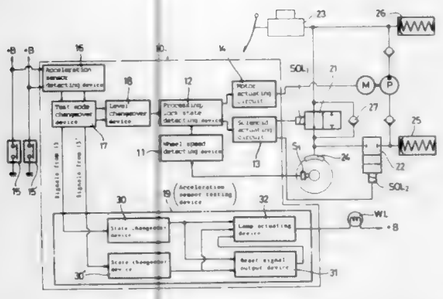
impeller means for drawing the cooled air into said chamber and increasing the air pressure in said chamber and in said duct means such that a plurality of air jets are ejected from said plurality of nozzles in said duct means for impinging upon both a top side and a bottom side of food products carried by the conveyor belt past said duct means.

5,203,821

MALFUNCTION DETECTOR FOR ACCELERATION SENSOR

Hirohisa Tanaka, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 583,642, Sep. 17, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 813,760
Claims priority, application Japan, Aug. 21, 1989, 1-245843
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—1 D **1 Claim**



1. An apparatus for detecting a malfunction of any of a plurality of acceleration sensors used in an antilock control system, each of the acceleration sensors normally operative to output a first signal when a deceleration exceeding a predetermined threshold is present and a second signal when a deceleration of less than the predetermined threshold is present, the antilock control system including locking state processing circuitry for detecting a locking state of vehicle wheels and for outputting brake pressure control commands, said apparatus comprising:

a test means for testing the acceleration sensors;

a changeover means for selectively applying output signals from the acceleration sensors to one of said test means and the locking state processing circuitry; and,

a lamp operatively coupled to said test means,

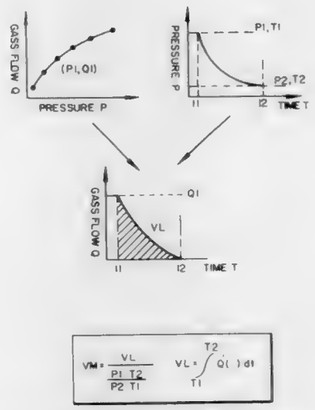
wherein said test means includes (1) means for receiving the output signals from the acceleration sensors via said changeover means, (2) a plurality of state changeover means corresponding to said respective acceleration sensors for changing their outputs from 0 to 1 if the outputs of said respective acceleration sensors change from low deceleration state to high deceleration states and from 1 to 0 if the outputs of said respective acceleration sensors change from high to low deceleration states, (3) a reset signal output means for producing a reset signal if the outputs of all of said state changeover means are 1 and if said outputs of all of said state changeover means change from 1 to 0 thereafter, and (4) a lamp actuating means for turning said lamp on if the output of at least one of said state changeover means is 1 and turning said lamp off if there is a reset signal from said reset signal output means.

5,203,822

PROCESS AND DEVICE TO MEASURE VOLUME IN ORDER TO DETERMINE THE COMPRESSION RATIO OF AN INTERNAL COMBUSTION ENGINE

Gunter Gürich, Aachen; Eugen Schäfer, Bereborn; Norbert Adolph, Aachen, and Thomas Schladt, Eitensheim, all of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Apr. 9, 1991, Ser. No. 682,380
Int. Cl.[5] G01F *17/00*
U.S. Cl. 73—149 **9 Claims**



$$VM = \frac{VL}{\frac{P1}{P2}\frac{T2}{T1}} \qquad VL = \int_{T1}^{T2} Q(\,)\,dt$$

1. A process to measure the compression volume of a cylinder of an internal combustion engine in which a volume to be measured is supplied with a first gas pressure p1, subsequently the pressure p1 is changed to a pressure p2 which is different from p1 and the compression volume is computed from the change over time of the gas pressure values, wherein

the changes of a gas flow led into or sucked out of a leaking combustion chamber are measured as a function of the pressure in the chamber,

the pressure and the temperature in the measured volume are measured as a function of time during the change in pressure,

a gas flow is assigned to each gas pressure value during the change in pressure,

a volume change is obtained by integrating the gas flow as a function of the pressure over time, and

the volume to be measured in consideration of the first pressure and the second pressure and the temperature at the start and end of the pressure change is determined with the aid of the gas equation $p \cdot V = m \cdot R \cdot T$,

where the gas flow is measured as a function of the pressure during steady states in the measured volume.

5,203,823

DETECTING APPARATUS

Shusou Wadaka; Koichiro Misu; Tsutomu Nagatsuka, and Mitsuhiro Koike, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 27, 1990, Ser. No. 486,006
Claims priority, application Japan, Feb. 28, 1989, 1-45316; Apr. 5, 1989, 1-86383; Aug. 8, 1989, 1-203909
Int. Cl.[5] G01N *29/10*
U.S. Cl. 73—602 **47 Claims**

1. A detecting apparatus characterized by comprising:

a first transmission signal generating means for generating a first transmission signal which has a wave form comprising smoothly curved portions;

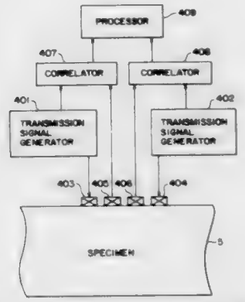
a second transmission signal generating means for generating a second transmission signal which has a wave form comprising smoothly curved portions;

a first transmitting means for transmitting waves to an object by said first transmission signal;

a second transmitting means for transmitting waves to said object by said second transmission signal;

a first receiving means for receiving a first echo corresponding to said first transmission signal;

a second receiving means for receiving a second echo corresponding to said second transmission signal;



a first correlation operation means for performing a first correlation operation with respect to said first echo;

a second correlation operation means for performing a second correlation operation with respect to said second echo; and

a processing means for processing results of said first and second correlation operations, whereby a signal which has substantially zero range sidelobes is obtained.

5,203,824

METHOD AND APPARATUS FOR PREPARING THE SURFACE OF A REGION OF SOIL FOR FURTHER TESTING

Robert Henke, and Wanda K. Henke, both of 7 Wyndam Ct., Lutherville, Md. 21093

Filed Sep. 23, 1991, Ser. No. 763,826
Int. Cl.[5] G01N *1/08;* **E21B** *7/28;* **E21C** *7/08*
U.S. Cl. 73—864.43 **8 Claims**

1. A soil removal device adapted for removing soil from a region adjacent the bottom of a borehole, comprising:

means for trimming soil from a bottom region of an initial borehole, said trimming means including a tubular retainer, said tubular retainer having a length much less than the length of the borehole; and

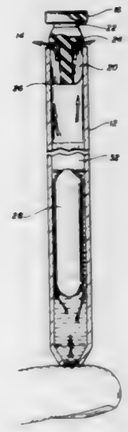
means for advancing said trimming means and said tubular retainer below said borehole, to remove soil from below said borehole, said tubular retainer being detachably connected to said advancing means so that said tubular retainer may be left below said borehole when said advancing and trimming means are removed.

5,203,825

CAPILLARY TUBE ASSEMBLY INCLUDING A VENTED CAP

John L. Haynes, Chapel Hill, N.C.; Stephen C. Wardlaw, Old Saybrook, Conn., and Edward Williamson, Dover, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 7, 1991, Ser. No. 711,844
Int. Cl.[5] B01L *3/02*
U.S. Cl. 73—864.02 **15 Claims**



1. A vented cap and capillary tube assembly comprising:

a capillary tube having an axis and a pair of open ends;

an elastomeric cap having a hydrophobic external surface and slidably mounted to one of the ends of said capillary tube, said cap including an enlarged head portion and a substantially cylindrical plug extending from said enlarged head portion, said plug extending within one of the ends of said capillary tube;

means for removably positioning said cap at a predetermined first axial position with respect to the axis of said capilliary tube; and

a vent groove defined within the outer surface of said plug, said vent groove being positioned on said plug such that

(i) air within said capillary tube is passed through said vent groove to atmosphere when said cap is in the first axial position, and

(ii) said vent groove is sealed by a surface of said capillary tube when said cap is slidably moved along the axis of said capillary tube from the first axial position to a second axial position, thereby preventing the flow of air through said vent groove.

5,203,826

pedaling surface, each clamp comprising a pair of clamp

waist strap engages said second intermediate portion of

from the combustion chamber into the exhaust port, the appa-

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5,203,826

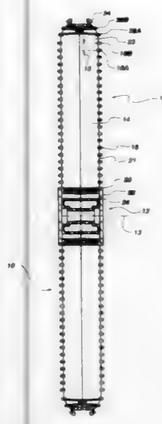
ENCLOSED FLYWHEEL

William T. Dalebout, Logan, Utah, assignor to Proform Fitness Products, Inc., Logan, Utah

Continuation of Ser. No. 776,723, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 481,352, Feb. 16, 1990. This application Jun. 10, 1992, Ser. No. 896,894

Int. Cl.[5] G05G *1/00*; F16H *55/36*; B63H *1/00*

U.S. Cl. 74—572 14 Claims



1. A flywheel comprising:

a hub having an axis of rotation;

a plurality of blades each having outer edges positioned opposite one another in a lateral direction, a proximal end and a distal end, said proximal end being secured to said hub and said distal end being positioned radially away from said hub;

enclosure means secured to said blades for passing air to said blades and preventing contact between said blades and foreign objects; and

a collar secured proximate said distal ends of said blades.

5,203,827

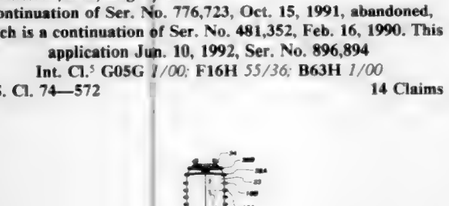
COUNTER WEIGHTED PEDAL

Thomas C. Nestrud, Barrington, Ill., assignor to Excel International Group, Inc., Rockford, Ill.

Filed Jul. 24, 1991, Ser. No. 734,906

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.5 8 Claims



1. A pedal comprising

(a) a top pedaling surface,

(b) means for rotatably attaching the pedal to a crank arm, and

(c) means counterweighting the pedal to retain the pedaling surface substantially in a horizontal orientation, said counterweighting means being located beneath said means for rotatably attaching and comprising

(i) a pair of spaced clamps secured to the pedal beneath the pedaling surface, each clamp comprising a pair of clamp arms,

(ii) an elongated, generally cylindrical counterweighting body circumferentially retained in said clamps, and

(iii) means formed in said counterweighting body and in at least one of said clamps for preventing axial shifting of said counterweighting body in said clamps, said means for preventing shifting comprising a groove in said one clamp forming a gap in each clamp arm of said one clamp and a circumferential flange on said counterweighting body intersecting said gaps.

5,203,828

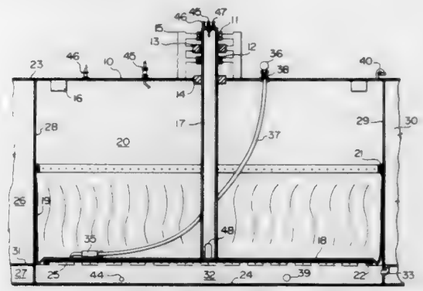
GUIDE AND CONTROL MEANS FOR DIAPHRAGM

Patrick J. Strain, 27 Tanglewood Dr., Nepean, Ontario, Canada K2H 6P5

Filed May 29, 1991, Ser. No. 706,855

Int. Cl.[5] B63B *25/12*

U.S. Cl. 114—74 R 7 Claims



1. In a diaphragm tank having walls and an impervious diaphragm vertically movable between upper and lower positions within the tank, the diaphragm comprising a diaphragm partition having edges to which are secured an edge of a diaphragm membrane, another edge of the diaphragm membrane being secured to the walls of the tank, so as to prevent cross contamination of cargos within the tank from one side of the diaphragm to the other, the improvement comprising diaphragm guide cylinder means secured to an upper surface of the diaphragm and extending upwardly beyond the tank through guide and brake means located externally of the tank, and through gland means at the top of the tank circumscribing the guide cylinder means below the guide and brake means to prevent escape of fluid stored in the tank.

5,203,829

SAFETY HARNESS WITH ADJUSTABLE FRONT D-RING

Brian K. Fisk, Portland, Oreg., and Scott C. Casebolt, North St. Paul, Minn., assignors to D B Industries, Inc., Red Wing, Minn.

Filed Oct. 25, 1991, Ser. No. 782,575

Int. Cl.[5] A62B *35/00*; B64D *17/30*

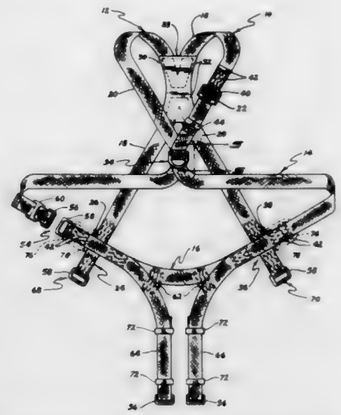
U.S. Cl. 119—96 33 Claims

1. A safety harness, comprising: a shoulder strap having a first end region and a second end region; a waist strap having a first end region and a second end region;

a front slide assembly, through which pass said shoulder strap and said waist strap;

a rear suspension assembly, engaging intersecting intermediate portions of said shoulder strap; and

an adjustable seat strap having first and second end regions and first and second intermediate portions, whereby said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said waist strap is releasably attached to said first intermediate portion of said seat strap, said first end region of said seat strap, respectively, said second end region of said waist strap engages said second intermediate portion of said seat strap, said first end region of said shoulder strap is releasably attached to said first end region of said seat strap, said second end region of said shoulder strap is releasably attached to said second end region of said seat strap, and said rear suspension assembly is maintained in a fixed position relative to said seat strap.



5,203,830

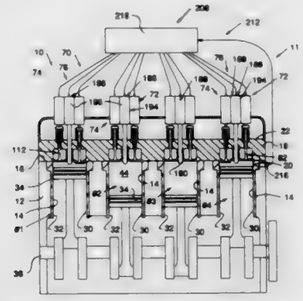
METHOD AND APPARATUS TO REDUCE ENGINE COMBUSTION NOISE UTILIZING UNIT VALVE ACTUATION

James J. Faletti, Spring Valley, and Yung T. Bui, Peoria Heights, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 1, 1992, Ser. No. 891,613

Int. Cl.[5] F02M *25/07*

U.S. Cl. 123—568 20 Claims



1. An apparatus adapted for use with an engine to reduce combustion noise, the engine including a plurality of combustion chambers, an intake port, an exhaust port, and a piston being reciprocally movable in each of the combustion chambers between a top dead center position and a bottom dead center position forming an intake stroke during which air is introduced from the intake port into the combustion chamber, movable between the bottom dead center position and the top dead center position forming a compression stroke during which the air in the combustion chamber is compressed to an established temperature range and fuel is introduced at or before top dead center during which a desired ignition delay period occurs prior to combustion, and movable between the bottom dead center position and the top dead center position forming an exhaust stroke during which exhaust gas is expelled from the combustion chamber into the exhaust port, the apparatus comprising:

flow control means including intake means for selectively passing intake air into the combustion chambers during their intake stroke, and exhaust means for selectively passing exhaust gas away from the combustion chambers during their exhaust stroke;

means for actuating each of the intake means and the exhaust means independently in response to a control signal;

exhaust gas conducting means operatively connected to the combustion chambers for directing exhaust gas; and

electronic control means for introducing a controlled volume of exhaust gas into any selected combustion chamber from the exhaust gas conducting means by initiation of the exhaust means for the selected combustion chamber during its exhaust stroke into a selected one of the combustion chambers during its intake stroke following initiation of the intake stroke and terminating prior to completion of the intake stroke effectively elevating the temperature of the air in the selected one of the combustion chambers.

5,203,831

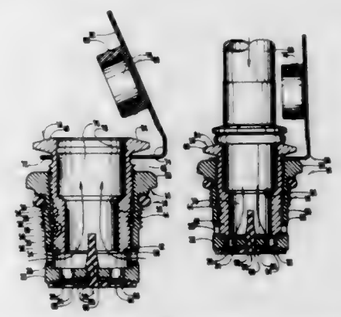
TOPPING AND DUMPING VALVE FOR INFLATABLE STRUCTURES

John R. Lind, Burnsville, and Robert L. Swanson, Ham Lake, both of Minn., assignors to Survival Engineering, Inc., Burnsville, Minn.

Filed Oct. 5, 1992, Ser. No. 956,407

Int. Cl.[5] F16K *15/20*

U.S. Cl. 137—1 20 Claims



14. A method of inflating and deflating an inflatable device using a valve comprising a first body extending into the inflatable device and having inflation and deflation ports therein providing selective communication with a buoyancy chamber of the device, a second body movably mounted in the first body, and seal means normally biased for sealing the inflation port, the method comprising:

moving the second body to a first position in the first body wherein the deflation port is sealed from communication with the atmosphere,

forcing gas from a gas source through a passageway in the second body and then through the inflation port to move the seal means out of normal sealing engagement with the inflation port so as to inflate the device, and

terminating the force of gas through the second body and inflation port such that the seal means returns to sealing engagement with the inflation ports thereby preventing outward flow of air through the inflation port.

5,203,832

a) a housing having a compartment for the placement of the

said second member being connected to the converter

a surface and turret bearing means on the top of said

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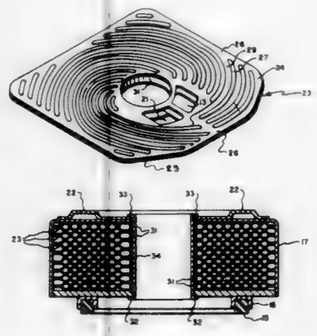
5,203,832

CIRCUMFERENTIAL FLOW HEAT EXCHANGER

Paul K. Beatenbough, Medina; Kris J. Meekins, Bemus Point, and Clark E. Stohl, Lakewood, all of N.Y., assignors to Long Manufacturing Ltd., Oakville, Canada

Filed Nov. 17, 1989, Ser. No. 437,680
Int. Cl.[5] F28F *3/04, 3/12, 3/08*
U.S. Cl. 165—41 23 Claims



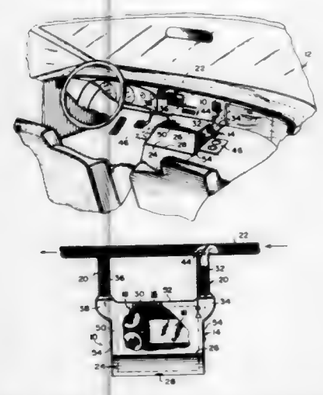
1. An improved energy exchange structure, comprising first and second generally parallel opposing plates joined to define a hollow passageway and further defining a generally overall circular flow path of fluid from an inlet to an outlet, each of said opposing plates undulating in cross-section to define a plurality of opposing valleys extending into the hollow passageway, at least some of the valleys of each said plate being disposed at an oblique angle to the circular flow path, the oblique angle being higher near the center of the circular flow path than at the outer periphery thereof, with apexes of valleys of the first plate arranged to cross apexes of valleys of the second plate such that the area between opposing valleys defines crossing passages.

5,203,833

FOOD STORAGE CONTAINER HEATED AND COOLED BY CONDITIONED AIR IN A MOTOR VEHICLE

David S. Howell, 1734 Lakeview Blvd., N. Ft. Myers, Fla. 33903

Filed Mar. 16, 1992, Ser. No. 851,314
Int. Cl.[5] F25D *17/08, 1/00*
U.S. Cl. 165—41 11 Claims



1. A food storage container heated and cooled by conditioned air from a motor vehicle thermal conditioning system, which comprises:

a) a housing having a compartment for the placement of the food therein; and

b) means connected between said compartment of said housing and a conduit line of said vehicle thermal conditioning system carrying the conditioned air therethrough, for diverting the conditioned air into said compartment of said housing for heating and cooling the food, said diverting means includes an inlet pipe connected between a first rear corner of said housing and the conduit line, and an outlet pipe connected between a second rear corner of said housing and the conduit line of said vehicle thermal conditioning system.

5,203,834

FOAMED GELS HAVING SELECTIVE PERMEABILITY

Richard D. Hutchins, Placentia; Burton B. Sandiford, Balboa Island, and Hoai T. Dovan, Yorba Linda, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 631,863, Dec. 21, 1990, Pat. No. 5,145,012. This application Feb. 28, 1992, Ser. No. 843,954
Int. Cl.[5] E21B *33/138, 43/22*
U.S. Cl. 166—270 25 Claims

1. A method for selectively reducing the flow of an aqueous fluid with respect to the flow of a nonaqueous fluid in a subterranean formation, the method comprising, in any order, the steps of:

(a) injecting into at least a portion of a subterranean formation a composition comprising (i) one or more ingredients capable of reacting to form a gel and (ii) a delayed gel degrading agent;

(b) injecting into at least a portion of the subterranean formation one or more surfactants capable of foaming the composition; and

(c) injecting a gas for foaming the composition into at least a portion of the subterranean formation.

20. A recovery system comprising:

(a) a subterranean formation;

(b) a well penetrating at least a portion of the subterranean formation; and

(c) a composition containing (i) one or more ingredients capable of reacting to form a gel, (ii) a surfactant, and (iii) a delayed gel degrading agent located in at least a portion of the well, the concentration of the delayed gel degrading agent in the composition being sufficient to cause syneresis but less than the concentration required to virtually degrade the entire gel.

5,203,835

LOCK-UP TORQUE CONVERTER FOR AUTOMATIC TRANSMISSION

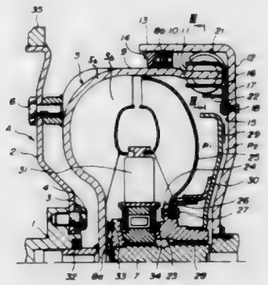
Satoshi Kohno, and Hirofumi Ara, both of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Japan

Filed May 27, 1992, Ser. No. 888,650
Claims priority, application Japan, May 29, 1991, 3-124161
Int. Cl.[5] F16D *33/00*
U.S. Cl. 192—3.29 6 Claims

1. A lock-up torque converter for an automatic transmission, which transmits torque generated by an internal combustion engine to a converter output shaft through which the engine torque is transmitted to an automatic transmission, said lock-up torque converter comprising:

a first member fixedly connected to a crankshaft of the internal combustion engine, said first member including a pump;

a second member sealingly contacted with said first member, said second member being connected to the converter output shaft during a lock-up condition; and



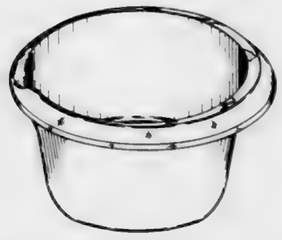
a shock absorbing member elastically operatively connecting said first and second members for rotation.

5,203,836

NESTABLE MIXING BOWL WITH INTEGRAL HANDLE

William E. Brazis, and David L. Feer, both of Medina, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jan. 10, 1992, Ser. No. 819,055
Int. Cl.[5] B65D *21/00*
U.S. Cl. 206—507 16 Claims



1. A bowl of the type having a bottom surface, a radiused sidewall extending upward from said bottom surface to a top bowl rim, and a pourspout formed in said top rim at a forward side of the bowl, the improvement comprising:

said bowl having a downturned rim flange at said top bowl rim, said rim flange extending continuously about said top bowl rim in dependence therefrom and terminating at a lower edge, said lower edge having a constant spacing from said top bowl rim about the perimeter of said bowl, and said rim flange defining with upper portions of the bowl sidewall a channel extending along said bowl rim, said channel having a relatively narrow width dimension at the forward side of the bowl, and a relatively large width dimension at a rearward side of the bowl, whereby a rearward portion of said rim flange forming a handle at the rearward side of the bowl.

5,203,837

BALANCED LIFTING CRANE

Bosko Madic, 25 Maybelle Ave., Apt. 811, Etobicoke, Ontario, M9A 4Y1, Canada, and Vojislav Terzic, 4700 Ruth Ann Street, Harrisburg, Pa. 17109

Filed Oct. 25, 1991, Ser. No. 782,590
Int. Cl.[5] B66C *23/72, 23/76, 23/04*
U.S. Cl. 212—195 8 Claims

1. A balanced lifting crane comprising:

a. a vertical column having a base to support said column on a surface and turret bearing means on the top of said column;

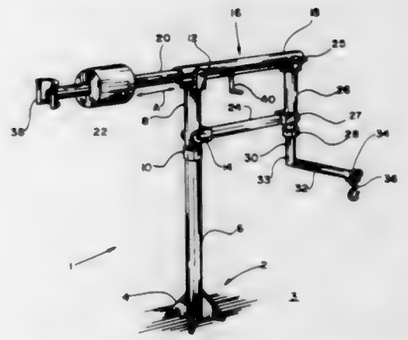
b. a turret mounted on said turret bearing means such that said turret is free to rotate through 360 degrees with respect to said column;

c. a main boom centrally pivotally mounted atop said turret, thus to define first and second boom arms to either side of the center of said main boom;

d. a vertical support arm having an upper end and a lower end, the support arm upper end being pivotally attached to the free end of said first boom arm;

e. a stabilizer bar having a first outer end pivotally attached to said turret mesially thereof and a second outer end attached to said vertical load support arm mesially thereof, such that said stabilizer arm is parallel to said first boom arm, said first boom arm, stabilizer bar, turret and vertical load support arm define a parallelogram arm system and thus confine said vertical load support arm to substantially vertical movement only;

f. a load supporting swing arm depending from said vertical load support arm, there being a swing arm bearing assembly means disposed between said vertical load support arm and said swing arm for free rotation of said swing arm about said vertical load support arm through 360 degrees in a horizontal plane, said swing arm further comprising a short length arm below said swing arm bearing means, a



projecting load support arm extended outwardly from said short length arm and an elbow interconnecting said short length arm and said projecting load support arm, said projecting load support arm, stabilizer bar and first boom arm being dimensioned and configured such that said projecting load support may be rotated through a full 360 degree arc without interference with said column or turret;

g. counterweight means disposed on said second boom for counterbalancing a load carried by said horizontal load support arm;

h. means operable for adjusting the distance of said counterweight from said column and turret and being affixed to one of said first boom arm and said counterweight; and

i. said second boom arm is slidably, telescopically received within said first boom arm, said counterweight is fixed to said second boom arm near an end thereof remote from said first boom arm, and said means for adjusting the distance of said counterweight with respect to said column and turret is affixed to said first boom arm and comprises handle means, externally of said first boom arm and journalled therethrough, and gear means internally of said first boom arm in operative engagement with the telescopically received portion of said second boom arm, whereby rotation of said handle means imparts axial movement of said second boom arm with respect to said first boom arm.

5,203,838

ASSEMBLY COMPRISING AN OPENING CAPSULE AND

be manipulated and powered while held by an operator com-

one inner body inserted in said main body, wherein said inner body is received in said main body with a pressing

ber so that said key member and said keyhole portion can form an interlocking impeding means for said push lid and

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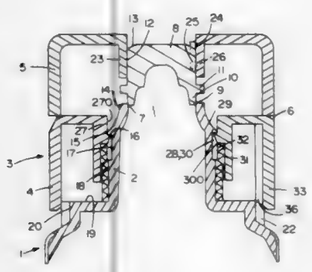
5,203,838

ASSEMBLY COMPRISING AN OPENING CAPSULE AND A RECEPTACLE WITH A TAMPERPROOF COVER

Bernard Schneider, Sainte Menehould, France, assignor to Cebal, Clichy, France

Filed Aug. 14, 1991, Ser. No. 745,235
Claims priority, application France, Aug. 14, 1990, 90 10605
Int. Cl.[5] B65D *41/02*
U.S. Cl. 215—253 12 Claims



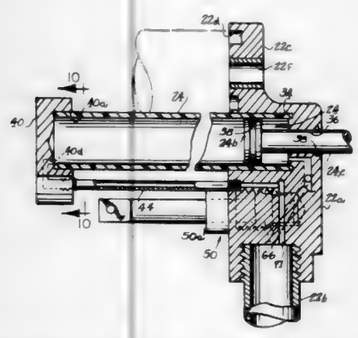
1. An assembly comprising
(a) an opening capsule, consisting of an opening part (**5**) and of a base (**4**), and a receptacle (**1**) having a neck (**2**) of plastic material surmounted by a tamperproof cover (**8**) which is connected to said neck (**2**) by a tearable zone (**9**);
(b) said opening part carrying means (**25**) for axially force-fitting said cover (**8**) into said opening part;
(c) said base (**4**) and said neck (**2**) having thereon complementary snap-on projections (**28** and **15**) so situated that, when said capsule (**3**) is pushed onto said neck (**2**), one of said complementary projections engages around the other of said complementary projections only after force-fitting of said cover by said axially force-fitting means (**25**) has attained maximum force;
(d) said base and said neck comprising below said snap-on projections (**28** and **15**), complementary screw threading (**32** and **18**), whereby downward screwing of said capsule results in rupture of said cover (**8**) by shearing said tearable zone (**9**) and then pushing said cover (**8**) into said neck (**2**).

5,203,839

APPARATUS FOR DISPENSING ADHESIVE MATERIALS

Kenneth R. Skaggs, 27881 Flynn Creek, Barrington, Ill. 60010

Filed Jun. 14, 1991, Ser. No. 715,408
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—137 23 Claims



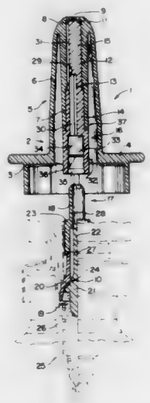
1. A portable hand-held adhesive dispensing gun which may be manipulated and powered while held by an operator comprising
(a) a pair of elongated cylindrical disposable cartridges containing adhesive materials to be mixed together, said cartridges each having a discharge end and an operating end with a displaceable end wall to which force is applied to discharge simultaneously the contents of each cartridge for mixing together,
(b) an elongated frame including a portion extending horizontally for receiving the disposable cartridges and for supporting the cartridges side-by-side,
(c) a hydraulic cylinder means supported by said frame and having a power piston means within said cylinder with a piston rod means connected to said power piston means and extending from said cylinder,
(d) a pair of elongated plungers mounted on said frame for axial slidable movement into said adhesive containing cartridges to discharge the contents thereof, said plungers being disposed parallel to said piston rod means, said plungers and piston rod means being coupled together to move in unison,
(e) a manually operated hydraulic pump supported by said frame and connected to supply fluid from a reservoir to said hydraulic cylinder means to drive said power piston means and said plungers to discharge the contents of said cartridges,
(f) a gun handle depending from the horizontal frame and including a handgrip portion and pump operating lever supported by said frame and extending laterally with respect to said hydraulic cylinder means, said pump operating lever being mounted adjacent said handgrip portion for limited movement toward and away from said handgrip portion to drive said pump to supply fluid to said hydraulic cylinder means.

5,203,840

FLUID DISPENSING APPARATUS

Lothar Graf, Rielasingen/Worblingen; Peter Pfeiffer, Gaienhofen, and Ernst Buhr, Radolfzell, all of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 15, 1991, Ser. No. 656,765
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005529
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—321 26 Claims



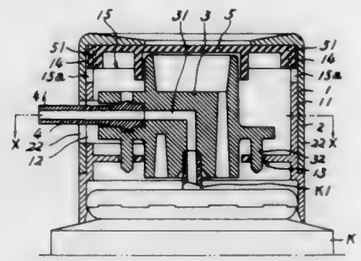
26. A discharge head for media comprising:
at least one main body having at least one discharge duct;
at least one connecting member for connecting said main body to a counterpart of a discharge apparatus and at least one inner body inserted in said main body, wherein said inner body is received in said main body with a pressing action providing a radial pressure of a maximum operating pressure in said discharge duct.

5,203,841

DISPENSING HEAD HAVING A CAP GUARD

Seiichi Kitabayashi, 919-12, Oaza-Koshikiya, Ageo-shi, Saitama 362, Japan

PCT No. PCT/JP87/00267, § 371 Date Jun. 8, 1990, § 102(e) Date Jun. 8, 1990, PCT Pub. No. WO87/06503, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 25, 1987, Ser. No. 169,198
Claims priority, application Japan, Apr. 25, 1986, 61-61864; Oct. 3, 1986, 61-151456; Jan. 21, 1987, 62-7100
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—402.11 8 Claims



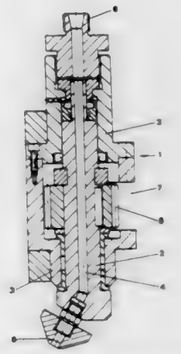
1. A dispensing head having a guard cap which comprises:
a non-rotary member, a rotary member, a nozzle tube, and a push lid, each hereunder; said non-rotary member having a cylindrical wall provided with a wide notch portion and supported coaxially with and non-rotatably by a dispensing container containing, under pressure, an object for dispensing, and said non-rotary member having a push button hereunder; said rotary member having a cylindrical wall coaxial with said cylindrical wall of said non-rotary member, said cylindrical wall of said rotary member being provided with a window bore of a size comparable with the diameter of said nozzle tube and supported, by said dispensing container, rotatably and in external contact with said cylindrical wall of said non-rotary member, and said rotary member having a range of rotation which extends from an operative position in which said window bore is located at a location in front of said push button within an angular range of said notch portion of said cylindrical wall of said non-rotary member to a non-operative position in which said window bore is located at a location within an angular range of the solid portion of said cylindrical wall of said non-rotary member; said push button being provided with a dispensing passage connected to the axial bore of a valve stem projecting from the top portion of said dispensing container coaxially therewith and movable in a vertical direction to control a discharge valve provided in said dispensing container, and said push button being mounted fixedly on said valve stem and supported non-rotatably by said dispensing container; said nozzle tube being a solid and straight tube, the base portion of which is pivoted to the front portion of said push button and connected to said dispensing passage of said push button, and said nozzle tube having a nozzle length, as measured from the center of said push button, longer than the radius of said rotary member cylindrical wall; said push lid covering and closing substantially the top portion of said cylindrical wall of said rotary member and being supported movable in a vertical direction to be interlockable with said push button at least in said operative position; one of said non-rotary member or said rotary member being provided with a key member and the other one forming a keyhole portion adapted to said key member so that said key member and said keyhole portion can form an interlocking impeding means for said push lid and said push button in said non-operative position.

5,203,842

NOZZLE DEVICE FOR A HIGH-PRESSURE LIQUID JET

Edi Mark, Wäseliweg, CH-9475 Sevelen, and Hartmut Brenner, Staad, both of Switzerland, assignors to Edi Mark, Sevelen, Switzerland

PCT No. PCT/CH90/00061, § 371 Date Nov. 9, 1990, § 102(e) Date Nov. 9, 1990, PCT Pub. No. WO90/11134, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 12, 1990, Ser. No. 598,649
Claims priority, application Switzerland, Mar. 17, 1989, 991/89
Int. Cl.[5] B05B *3/02*
U.S. Cl. 239—227 16 Claims



1. A nozzle arrangement for a high pressure liquid jet for use in a device for treating surfaces by removing material from, roughening or cleaning said surfaces; said arrangement comprising: a nozzle including a nozzle head and an elongated nozzle body said nozzle being rotatably mounted about the longitudinal axis of said elongated nozzle body;
said nozzle head inclined at an angle of approximately 30° to said longitudinal axis of said longitudinal nozzle body and communicating with the interior of said longitudinal nozzle body;
means for maintaining said nozzle head at a substantially constant distance from a planar surface to be treated;
means for generating a high pressure liquid jet to issue from said nozzle head; and means for reciprocating said elongated nozzle body in partial rotations about said longitudinal axis of said elongated nozzle body to cause the high pressure liquid jet issuing from said nozzle head to strike the surface to be treated with a recurring arc-shaped pattern.

5,203,843

LIQUID SPRAY APPLICATION OF COATINGS WITH SUPERCRITICAL FLUIDS AS DILUENTS AND SPRAYING FROM AN ORIFICE

Kenneth L. Hoy, St. Albans; Kenneth A. Nielsen, and Chinsoo Lee, both of Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 218,910, Jul. 14, 1988, Pat. No. 5,108,799.
This application Sep. 10, 1991, Ser. No. 757,484
Int. Cl.[5] B05B *7/16, 7/26*
U.S. Cl. 239—135 9 Claims

1. An apparatus for the liquid spray application of a coating to a substrate wherein the use of environmentally undesirable

organic solvent is diminished, said apparatus comprised of, in

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5,203,845

COMPUTER MOUSE SUPPORT

nip therebetween for accommodating an article positioned in said feed nip; and

television game console, and a means for electrically connecting said game cartridge read only memory unit and said televi-

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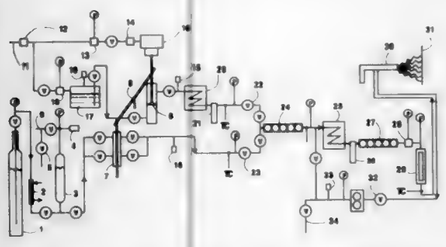
organic solvent is diminished, said apparatus comprised of, in combination:

(1) a source of supercritical fluid,

(2) means for supplying at least one polymeric compound capable of forming a continuous adherent coating:

(3) means for supplying at least one active organic solvent;

(4) means for supplying supercritical fluid from said source;



(5) means for forming a liquid mixture of components supplied from the means for supplying the at least one polymeric compound, the means for supplying the at least one active organic solvent and the means for supplying the supercrictical fluid;

(6) means for spraying said liquid mixture onto a substrate by passing the mixture under pressure through an orifice to form a liquid spray containing droplets having an average diameter of 1 micron or greater.

5,203,844

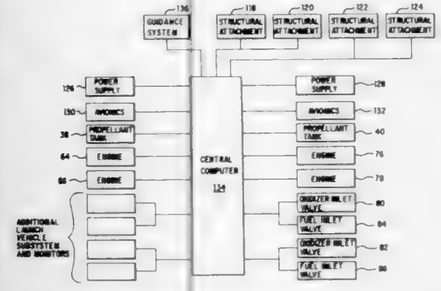
MULTIPLE PAYLOAD/FAILURE MODE LAUNCH VEHICLES

Byron P. Leonard, 13700 Tahiti Way, Marina Del Rey, Calif. 90292

Continuation-in-part of Ser. No. 472,096, Jan. 30, 1990, Pat. No. 5,143,328, which is a continuation-in-part of Ser. No. 417,278, Oct. 5, 1989, Pat. No. 5,129,602, and a continuation-in-part of Ser. No. 417,736, Oct. 5, 1989, Pat. No. 5,141,181. This application Mar. 27, 1991, Ser. No. 675,644

Int. Cl.[5] B64G *1/00*

U.S. Cl. 244—158 R **41 Claims**



1. A launch vehicle, comprising:

a payload having a plurality of discrete separable subpayloads;

a plurality of thruster engines, said plurality of thruster engines having a combined thrust and propellant capacity to lift said payload into orbit for a nominal launch; and

means for jettisoning one of said plurality of subpayloads in response to a detected non-nominal condition in the form of a benign failure in one of said thruster engines.

5,203,845

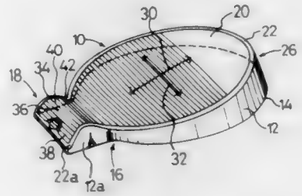
COMPUTER MOUSE SUPPORT

Edward Moore, L'Acadie, Canada, assignor to 2749394 Canada Inc., Montreal, Canada

Filed Dec. 5, 1991, Ser. No. 802,524

Int. Cl.[5] B68G *5/00*

U.S. Cl. 248—118 **12 Claims**



1. A device having a working surface for a computer mouse, comprising:

a top surface and a bottom surface and sides connecting said top and bottom surfaces, said sides increasing in height from a forward end to a rearward end in a longitudinal direction;

said top surface comprising an inclined planar working surface extending upwardly and rearwardly from said forward end to said rearward end, and adapted to receive a mouse, and a wrist support surface integral with and extending forwardly and continuously from said forward end of said planar working surface, said wrist support surface extending upwardly and forward towards said forward end, and then downwardly and forwardly towards said forward end in a convex curve, said wrist support surface being in a fixed spatial relationship with said working surface; and

wherein one of said sides has a greater height than the other of said sides whereby said top working surface is upwardly inclined from one of said sides to the other of said sides in a transverse direction.

5,203,846

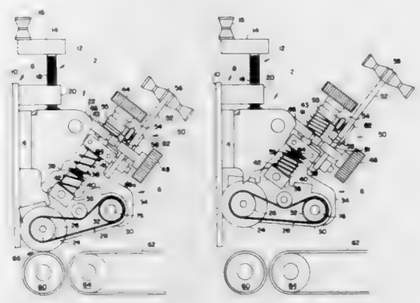
MEDIA FEED ROLL APPARATUS AND METHOD FOR ITS USE

Richard J. Kuhns, and Neil A. Polit, both of Crystal Lake, Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Nov. 12, 1991, Ser. No. 791,036

Int. Cl.[5] B65H *3/52*

U.S. Cl. 271—125 **23 Claims**



23. A media feed roll apparatus comprising:

a drive roller assembly with at least one upper roller mounted on a frame for moveable engagement with a lift assembly, at least one lower roller mounted on said frame facing each said upper roller, said at least one upper roller and said at least one lower roller forming an article feed nip therebetween for accommodating an article positioned in said feed nip; and

the lift assembly including a first toggle arm connected to a lift lever, said first toggle arm being mounted for connection through a toggle arm connector to a second toggle arm, the lift assembly being positioned relative to the at least one upper roller in a manner such that movement of said lift lever causes said at least one upper roller to move from a raised position to a lowered article engagement position to engage the article with an adjustable preset pressure, said drive roller assembly being releasably clampable at said raised or lowered position by a clamping means that is operable independent of the lift assembly to set separation of the upper and lower rollers to handle a range of article thicknesses.

5,203,847

MULTIPLE LAYER MAGNETIC PUZZLE

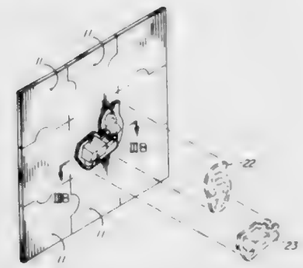
Sandra L. Butt, North Vancouver, Canada, assignor to Magnaplay Inc., North Vancouver, Canada

Continuation of Ser. No. 440,681, Nov. 22, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 646,446

Claims priority, application Canada, Sep. 29, 1989, 614797

Int. Cl.[5] A63F *9/10*

U.S. Cl. 273—157 R **2 Claims**



1. A puzzle comprising a first set of pieces, each having a graphics side and a magnetic side for attachment to a metallic surface, said pieces having mating formations for assembly of the pieces in abutting relationship into an assembled form for forming a graphic representation in a first plane; and a second set of pieces, each having a graphics side which is provided with a graphic representation of a complete object thereon and a magnetic side for attachment to the graphics side of one or more of the first set of pieces in said assembled form in a second plane located above said first plane.

5,203,848

TELEVISION GAME CONSOLE AND ELECTRONIC CONTROL DEVICE FOR CONTROLLING THE ALLOWABLE PLAYING TIME OF THE TELEVISION GAME CONSOLE

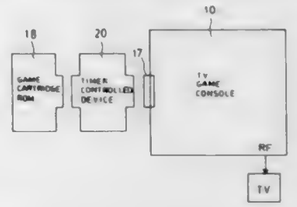
Jack Y. Wang, Paipei, Taiwan, assignor to Myson Technology, Inc., Cupertino, Calif. and Myson Technology, Inc., Taipei, Taiwan

Filed Jan. 16, 1992, Ser. No. 821,701

Int. Cl.[5] A63F *9/22*

U.S. Cl. 273—435 **6 Claims**

1. An electronic control device for controlling the allowable playing time of a television game console, said electronic control device comprising a timer control device for interfacing said television game console with a game cartridge read only memory unit, said timer control device including a means for generating a current time clock output, a means for receiving a presettable allowable playing time range input from said television game console, and a means for electrically connecting said game cartridge read only memory unit and said televi-



sion game console only when said current time output is within said allowable playing time range input.

5,203,849

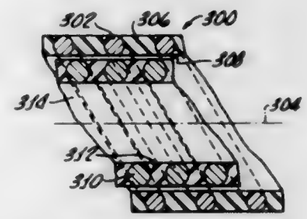
CANTED COIL SPRING IN LENGTH FILLED WITH AN ELASTOMER

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 496,329, Mar. 20, 1990. This application Aug. 27, 1990, Ser. No. 572,242

Int. Cl.[5] F16J *15/12*

U.S. Cl. 277—163 **6 Claims**



1. A spring assembly comprising:

a first plurality of coil means, interconnected with one another in a spaced-apart relationship, for causing the spring assembly to exert a generally constant force in a loading direction approximately normal to a tangent to a centerline of said plurality of coil means in response to deflection of the spring assembly along said loading direction;

a second plurality of coil means, interconnected with one another in a spaced-apart relationship and disposed within said first plurality of coil means, and in a cooperating relationship therewith, for causing the spring assembly to exert a generally constant force in a loading direction approximately normal to a tangent to a centerline of said second plurality of coil means in response to deflection of the spring assembly along said loading direction; and

elastic material means, disposed around and between said first and second plurality of coil means, and partially adhering to the coil means for modifying the force exerted by the spring assembly in response to deflection of the spring assembly along said loading direction, said elastic material means comprising an outer portion disposed around the first plurality of coil means and an inner portion disposed around said second plurality of coil means, said outer and inner portions being separate and unattached to one another.

5,203,850

AIR ISOLATED FIFTH WHEEL SYSTEM

predetermined distance from said first perforated line thereby forming a second label portion;

c. a connecting element, said connecting element including a first part linked to said rotatable member, and a second

holes; said portion of said body forming said second semi-circular supporting surface, whereby each of said first and second

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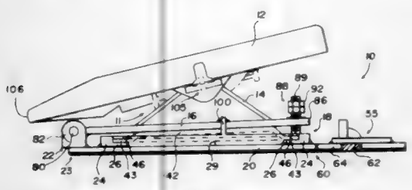
5,203,850

AIR ISOLATED FIFTH WHEEL SYSTEM

David O. Harrold, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Jun. 10, 1991, Ser. No. 713,175
Int. Cl.[5] B62D *53/06*; F16F *9/04*
U.S. Cl. 280—438.1 18 Claims



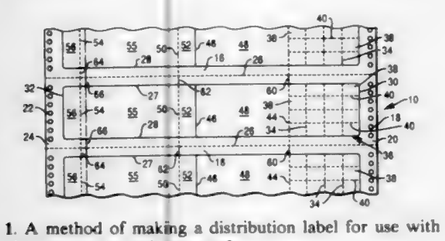
1. An air isolated fifth wheel system comprising:
a base plate which is slidably received within side channels members mounted to the top side of the frame rails of a vehicle frame, said base plate including means for releasably fixing same to said side channel members at various positions therealong;
a secondary plate secured to the upper side of said base plate, said secondary plate being radially inwardly downwardly stepped from a periphery thereof, a first step forming a continuous flange and a second step terminating upon an upper surface of said base plate;
a diaphragm member sized and configured to extend across and seat upon said continuous flange in a manner forming a chamber therebeneath;
a clamp ring sized and configured to engage over said diaphragm in the area where said diaphragm seats over said continuous flange, said clamping ring securing said diaphragm to said flange in an airtight manner;
a top plate hingedly fixed to said base plate at one end thereof, a lower surface of said top plate seating across said diaphragm;
a fifth wheel assembly pivotably mounted on said top plate; and means for providing pressurized air to the chamber formed between said diaphragm and said base plate.

5,203,851

DISTRIBUTION LABEL

Jovona C. Browning, Miamisburg, Ohio, and Vernon B. Harvey, Florence, S.C., assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 637,844, Jan. 7, 1991, Pat. No. 5,147,699.
This application Jun. 1, 1992, Ser. No. 891,242
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 17 Claims



1. A method of making a distribution label for use with a package comprising the steps of:
providing a sheet of facestock material having adhesive on the back side thereof;
adhering said back side of said facestock material to a sheet of liner material such that said liner material underlies the entire surface of said facestock material;
perforating a first line in said facestock material spaced a predetermined distance from one edge thereof thereby forming a first label portion;
slitting a second line in said facestock material spaced a predetermined distance from said first perforated line thereby forming a second label portion;
perforating a third line in said facestock material adjacent and spaced from said first perforated line to allow the release of a portion of said facestock material from said liner material thereby forming a first edge portion of said facestock material for adhering to the package;
perforating a fourth line in said facestock material space a predetermined distance from said third perforated line thereby forming a third label portion;
slitting a fifth line in said liner material adjacent and spaced from said fourth perforated line thereby forming a second edge portion of said facestock material for adhering to the package;
removing a first portion of said liner material underlying said second edge portion along said fifth slit line to expose said second edge portion for adhering to the package;
folding said first label portion along said first perforated line under said second label portion;
folding said second label portion along said third perforated line under said third label portion;
removing a second portion of said liner material between said second slit line and said third perforated line to expose said first edge portion for adhering to the package; and
securing said distribution label to the package by pressing said first edge portion and said second edge portion against the package such that removal of said third label portion along said third perforated line and said fourth perforated line permits retrieval of said first label portion and sand second label portion while leaving said first edge portion and said second edge portion adhered to the package.

5,203,852

CARPET TUCKING DEVICE

Keith A. Downing, 1708 Regent Ave., Redding, Calif. 96001, and Michael Downing, 2421 Celestial St., Redding, Calif. 96002

Filed Jan. 17, 1992, Ser. No. 822,105
Int. Cl.[5] A47G *27/04*; B25B *27/02*
U.S. Cl. 294—8.6 10 Claims

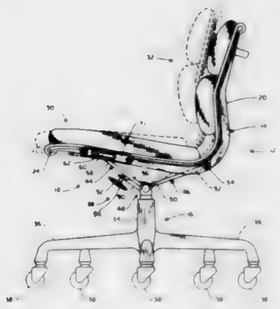
1. A carpet tucking device; comprising:
a. a rotatable member including a core and a cover for said core forming an outer surface of said rotatable member, said cover including a first portion and a second portion, said cover first portion including a flange extending further outwardly from said core than said cover, said cover first and second portions being capable of contacting the carpet;
b. a handle; and
c. a connecting element, said connecting element including a first part linked to said rotatable member, and a second part linked to said first part at an obtuse angle and further linked to said handle, said rotatable member being rotatable relative to said connecting element.

5,203,853

LOCKING CHAIR TILT MECHANISM WITH TORSION BAR

Jerome Caruso, Lake Forest, Ill., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Sep. 18, 1991, Ser. No. 763,654
Int. Cl.[5] A47C *3/00*
U.S. Cl. 297—303 24 Claims



1. In a chair comprising:
a base;
a chair frame for supporting a seat and a backrest;
an elongated opening in said frame near the front edge of a seat portion thereof; and
a tilt mechanism mounted between said base and said chair frame for tilting movement of the seat and backrest relative to the base, said tilt mechanism including means to bias the chair frame to an upright position, at least one front support arm which is fixedly mounted at a lower end to the base and at an upper end is both slidably and pivotably mounted in said elongated opening in the frame, and a back support arm having a lower end pivotally mounted to the base and an upper end pivotally mounted to the frame; and
a locking mechanism between said front support arm and the chair frame to selectively lock said chair frame in one of several tilted positions.

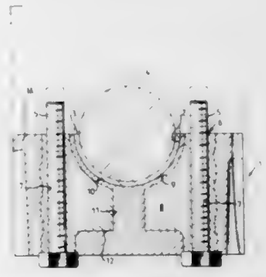
5,203,854

MAIN BEARING CAP FOR INTERNAL COMBUSTION ENGINES

Lars Nilsson, Torslanda, and Kjell Berntson, Mölndal, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Feb. 6, 1991, Ser. No. 651,629
Int. Cl.[5] F16C *35/02, 9/00*; F02F *7/00*
U.S. Cl. 384—433 4 Claims

1. In an engine comprising an engine block formed of an aluminum alloy, an a bearing cap attached to said engine block; said engine block including a first semi-circular surface; said bearing cap including a second semi-circular surface; said first and second semi-circular surfaces together forming a circular supporting surface for supporting a bearing shell; said bearing cap comprising a body formed of an aluminum alloy, and a core formed of an iron alloy disposed within said body; said core including holes for receiving bolts to attach said bearing cap to said engine block; a portion of said body and a portion of said core being situated in a region disposed between said holes; said portion of said body forming said second semi-circular supporting surface, whereby each of said first and second



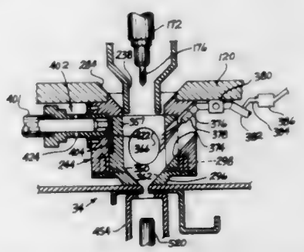
semi-circular supporting surfaces is formed of an aluminum alloy.

5,203,855

METHOD OF MIST LUBRICATION, CHIP VACUUM AND COIL COOLING

Gregory C. Givler, and Gregory L. Clark, both of Issaquah, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 632,445, Dec. 21, 1990. This application Mar. 27, 1992, Ser. No. 812,514
Int. Cl.[5] B23B *35/00*
U.S. Cl. 408—1 R 4 Claims



1. A method of mist lubrication of a drill, and vacuum removal of drilling chips created when drilling a workpiece with the drill, while avoiding substantial contact of the lubricant or the drill chips with the workpiece, comprising:
aligning a drill cavity in a slidable shuttle with a drill spindle, said cavity having top and bottom openings;
pressing an apertured pressure foot attached beneath said shuttle and positioned with said aperture in said pressure foot aligned with said bottom opening in said cavity, against a workpiece to be drilled to hold said workpiece stationary with respect to the axis of said drill;
applying rotational power to said spindle to rotate said spindle and an attached drill bit;
blowing air and mist lubricant into said cavity through a blowing port in the side of said cavity while plunging said drill bit through said top and bottom openings in said cavity and into a workpiece positioned beneath said shuttle to drill a hole in said workpiece;
suctioning said cavity through a suction port in the side of said cavity to suck the drilling chips made by said drill as it drilled the hole and before said chips can contact the surface of said workpiece.

5,203,856

TOOL FOR FINISHING AND CHAMFERING A HOLE

valve means therein adapted to open said discharge passage means to said discharge chamber means for pressurized gas on

shaft, each mechanism employing for its respective piston, a

5,203,860

WATER MATTRESS AND ANCHOR APPARATUS

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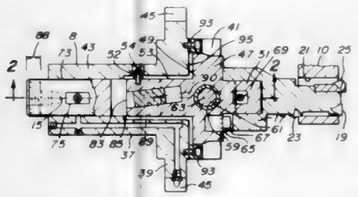
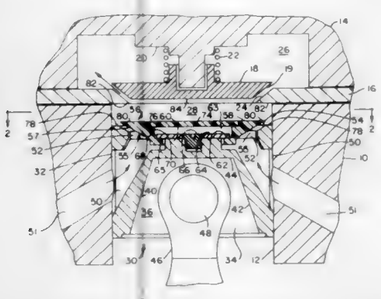
5,203,856
TOOL FOR FINISHING AND CHAMFERING A HOLE
Raymond Stephens, Sterling Heights, Mich., assignor to GTE Valenite Corporation, Troy, Mich.
Filed Mar. 23, 1992, Ser. No. 855,964
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—159 17 Claims



1. A mechanism for finishing a circular hole in a workpiece in a chamfer at each end of the hole; said mechanism having a longitudinal operating axis; a cutter support member swivably mounted on said tool body for pivotable motion around a second axis that intersects said longitudinal axis, said axis being transverse to said longitudinal axis; an actuator slidably mounted on said tool body for axial motion along the tool body longitudinal axis; and a cam connection comprising a slider element pivotally connected to said actuator for swinging motion around a third axis that is parallel to said second axis, said cam connection between said actuator and said cutter support member, said cutter support member having a mating slideway member; said slideway member being acutely angled to the movement axis of the actuator; said slider element being slidably engaged with the slideway whereby motion of the actuator along the tool body longitudinal axis causes the cutter support member to be pivotally adjusted around said second axis, whereby axial motion of the actuator is translated into pivotable motion of the cutter support member.

5,203,857
GAS COMPRESSOR HEAD AND DISCHARGE VALVE CONSTRUCTION
Gerald L. Terwilliger, Abington; Robert D. Douglas, Bristol, both of Va.; Prasanta K. Roy, Bristol, Tenn., and Milton M. Kosfeld, Bristol, Va., assignors to Bristol Compressors, Inc., Bristol, Va.
Division of Ser. No. 532,204, Jun. 1, 1990, Pat. No. 5,080,130. This application Oct. 15, 1991, Ser. No. 775,866
Int. Cl.[5] F04B *21/04*
U.S. Cl. 417—552 6 Claims

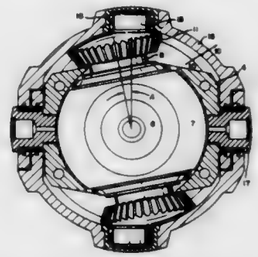


1. A gas compressor having block means with cylinder means formed therein, piston means mounted for reciprocation in said cylinder means, cylinder head means mounted on said block means over the end of said cylinder means to provide discharge chamber means, gas discharge valve means intermediate said head and cylinder means defining compression chamber means and providing discharge passage means and valve means therein adapted to open said discharge passage means to said discharge chamber means for pressurized gas on the compression stroke of said piston means and to close said discharge passage means on the suction stroke of said piston means, first suction gas inlet means through the wall of said cylinder means at a position remote from said cylinder head means, second suction gas inlet passage means in said piston means extending through the outer wall thereof and into communication with said first passage means over at least a substantial portion of the travel of said piston means, suction gas port means in the top of said piston means in communication with said second passage means, said port means comprising suction port means defining an aperture through the top of said piston means, wherein said suction port seat means comprises two radially spaced and substantially concentric seat lands between which the suction gas flows into the compression chamber during the suction stroke, and suction valve disc means mounted in the upper portion of said piston means for limited axial, floating movement and having disc seat means adapted to bear against said suction port seat means on the compression stroke of said piston means to close off said second passage means from said compression chamber, said floating movement being sufficient for movement of said disc seat means away from said suction port seat means to provide said suction gas port means with suitable open dimensions to allow adequate low-pressure refrigerant gas flow into said compression chamber during the suction stroke of said piston means,

said cylinder head means comprising body means having wall means formed to provide said discharge chamber means, discharge outlet means through said wall means, the outer peripheral portions of said cavity means being bordered by substantially continuous, substantially planar mounting surface means on said wall means, discharge valve stanchion means integral with said wall means projecting axially outwardly therefrom within said cavity means in a direction substantially normal to the plane of said mounting surface means, said discharge valve means comprising discharge valve disc means having a discharge side and an inlet side, discharge valve disc seat means on the inlet side of said disc means, said discharge side of said discharge valve disc means having axially oriented bearing means thereon adapted to slidably engage axially oriented bearing means on said stanchion means for guided movement of said discharge valve disc means axially of said stanchion means, said discharge valve means further comprising discharge valve plate means having an inlet side and a discharge side and attached to said compressor intermediate said mounting surface means of said body means and said block means to provide closure means for said discharge chamber means, discharge port means formed through said plate means and comprising discharge port seat means in axial alignment with said discharge valve disc seat means, said discharge port means adapted to be closed by contact of said discharge port seat means with said discharge valve disc seat means, and compression spring means interposed between said discharge valve disc means and said body means and resiliently urging said disc means toward said discharge port means.

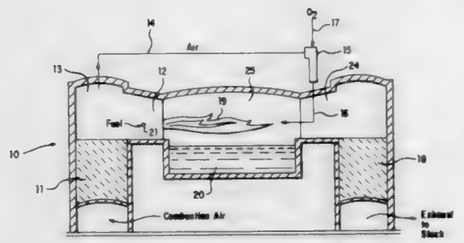
5,203,858
ALTERNATING VELOCITY ROTARY ENGINE EMPLOYING A GEAR CONTROL MECHANISM
Hugh A. Seymour-Chalk, 93 Canfield Gardens, London, United Kingdom NW6 3EA
Filed Jan. 27, 1992, Ser. No. 825,935
Int. Cl.[5] F01C *1/077*
U.S. Cl. 418—36 5 Claims

1. An alternating velocity rotary engine comprising a central mainshaft, a toroidal channel disposed about said mainshaft, a pair of pistons located in said channel, and two alternating velocity mechanisms located on opposite sides respectively of the channel, each connecting a respective piston to the mainshaft, each mechanism employing for its respective piston, a stationary gear disposed about said mainshaft, a pair of rotary drive gears which rotate on an axis extending radially from the mainshaft and which both cooperate with the stationary gear, an eccentrically mounted drive element on each rotary drive



gear and a pair of connecting arms drivingly connecting the piston to the drive elements, each of the connecting arms being rotatably connected to a respective drive element and extends to, and is rotatably connected to, the piston, each connecting arm of each mechanism and the connecting arms of the two mechanisms being of substantially the same dimensions.

5,203,859
OXYGEN-ENRICHED COMBUSTION METHOD
Mark J. Khinkis, Morton Grove, and Hamid A. Abbasi, Darien, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.
Filed Apr. 22, 1992, Ser. No. 872,288
Int. Cl.[5] F24H *7/00*
U.S. Cl. 432—30 8 Claims



1. A process for oxygen-enriched combustion of a fuel in an industrial furnace comprising:

preheating a primary oxidant required for combustion of a fuel in a heat exchanger;

introducing said fuel and at least a portion of said preheated primary oxidant into said industrial furnace, producing a fuel/oxidant mixture and forming a primary combustion zone, said primary oxidant comprising between about 85% and about 115% of the total amount of oxygen required for complete combustion of said fuel;

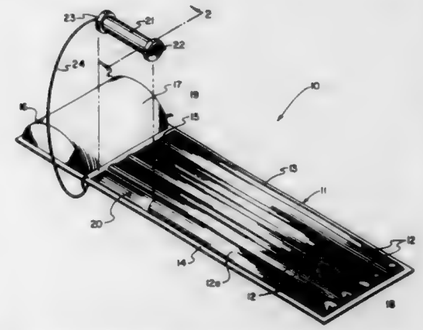
igniting said fuel/oxidant mixture producing a flame;

removing heat from said primary combustion zone;

introducing a secondary oxidant into said industrial furnace forming a secondary combustion zone downstream of said primary combustion zone producing products of combustion, said secondary oxidant having an oxygen concentration greater than the oxygen concentration in air; and

exhausting said products of combustion.

5,203,860
WATER MATTRESS AND ANCHOR APPARATUS
Patrick J. Bollant, 57 Knutson Dr., Madison, Wis. 53704
Filed Apr. 7, 1992, Ser. No. 864,560
Int. Cl.[5] B63B *21/00*
U.S. Cl. 441—40 8 Claims



1. A water mattress and anchor apparatus, comprising,

a pneumatic air mattress, the pneumatic air mattress having a first side spaced from a second side, and

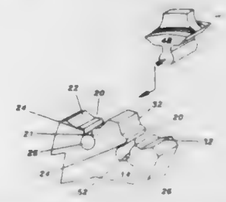
a first inner end spaced from a first outer end having a pneumatic cushion mounted between the first inner end and the first outer end, and

a plurality of first pneumatic chambers extending from the first side, with the first pneumatic chambers arranged in a parallel relationship relative to one another, and

the second side having a second pneumatic chamber extending along the second side from a lower distal end of the second side in a spaced relationship relative to the first inner end, wherein the first pneumatic chambers extend from a lower distal end of the air mattress beyond the second pneumatic chamber to the first inner end, and

a cavity extending from the second pneumatic chamber to the first inner end, and an anchor removably mounted within the cavity.

5,203,861
PLASTIC SPROCKET WHEEL WITH REPLACEABLE TEETH
Guy L. Irwin, 512 Oreland Mill Rd., Oreland, Pa. 19075, and Andre Robin, 8630 Farley Way, Fair Oaks, Calif. 95628
Filed Dec. 18, 1991, Ser. No. 809,869
Int. Cl.[5] F16H *55/12*
U.S. Cl. 474—161 27 Claims



1. A sprocket wheel with removable/replaceable teeth, said sprocket wheel comprising

a sprocket body having opposite side faces and a circumferential edge surface extending between said side faces, there being a plurality of recesses extending radially inwardly from openings spaced around said edge surface, with each recess opening at at least one of said side faces, each recess having a part narrowed circumferentially

relative to its edge surface opening and located radially

said first clutch selectively connecting said axial exten-

bers extending axially therethrough where each said chamber is spaced equally radially from said axis of rota-

5,203,866
STILETTED NEEDLES

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relative to its edge surface opening and located radially inwardly of the body edge surface,

a corresponding plurality of tooth elements associated one with each respective recess, each tooth element including a tooth piece and a base piece, the base piece being receivable in its associated recess with the tooth element extending radially beyond the sprocket body edge surface, said base piece being configured complementally to the recess wherein received, the base piece having an envelope size larger than an envelope size of its associated recess, the sprocket body being made of a resilient material so that when said base piece is slidably removably inserted into its associated recess through the opening at the at least one body side face, body structure defining said recess is caused to elastically yield to admit said base piece in recess conformable occupancy and in tight frictional base piece external surface-to-recess surface interference fit, and

means associated with each base piece and recess for maintaining the base piece when inserted in the recess, registered therein with an end surface of the base piece aligned flush with said sprocket body one side face.

5,203,862

AUTOMATIC TRANSMISSION WITH HYDRAULIC OPERATOR HAVING NESTED DRUMS

Masaaki Nishida; Chihiro Hosono, and Yoichi Hayakawa, all of Aichi, Japan, assignors to Aisin Aw Co., Ltd., Japan

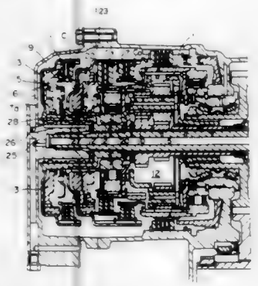
PCT No. PCT/JP90/01481, § 371 Date Sep. 6, 1991, § 102(e) Date Sep. 6, 1991, PCT Pub. No. WO91/07609, PCT Pub. Date May 30, 1991

PCT Filed Nov. 15, 1990, Ser. No. 752,535

Claims priority, application Japan, Nov. 15, 1989, 1-297168

Int. Cl.[5] F16H *3/66*

U.S. Cl. 475—282 **3 Claims**



1. An automatic transmission comprising:

a planetary gear unit having a plurality of rotary components and a reaction member;

an input shaft connected to at least a first of said rotary components;

an output shaft connected to a second of said rotary components;

a brake for selectively braking said reaction member;

a first clutch system comprising:

a first drum;

a first hub member fixed to said first drum slidably mounted on and rotating with said input shaft;

a first clutch mounted within said first drum;

a first piston slidably mounted in said first drum for selectively engaging said first clutch; and

a second clutch system comprising:

a second drum;

a second hub member fixed to said second drum and rotatably mounted on said first hub member;

a radially extending portion connecting said second drum with said second hub;

an axial extension fixed to said radially extending portion, said first clutch selectively connecting said axial extension with said first drum;

a second clutch for selectively connecting said second drum with one of said rotary components; and

a second piston slidably mounted in said second drum for selectively engaging said second clutch.

5,203,863

INSTRUMENT FOR THE LIGATION OF HEMORRHOIDS OR THE LIKE

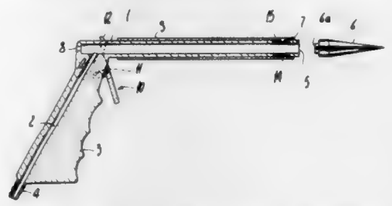
Gianfranco Bidoia, Via Bressanone, 3/A, 35100 Padova, Italy

Filed Mar. 2, 1992, Ser. No. 844,329

Claims priority, application Italy, Mar. 6, 1991, 000047 A/91

Int. Cl.[5] A61M *1/00*; **A61B** *19/00*

U.S. Cl. 606—140 **6 Claims**



1. Ligation instrument, particularly for hemorrhoids, comprising:

a substantially cylindrical container having an open end about which an elastic dilated ligature element is circumferentially and externally positionable, and a passage extending inside said container from said open end;

a grip handle for an operator's palm to which is rigidly connected said cylindrical container in such a manner that said grip handle and said cylindrical container form a pistol-like assembly;

a coupling duct which extends inside said handle portion and which is in communication at a first end thereof with said passage of said cylindrical container, said coupling duct having a second end to which is connectable an air aspirator means;

an aspiration hole which is in communication with said passage of said cylindrical container and which is arranged so as to be easily blocked by a user's thumb during use;

pusher element means slidably arranged on said cylindrical container for engaging and pushing said dilated ligature element off said open end of said cylindrical container; and

trigger lever means pivotally connected to said grip handle and actuatable by a user's fingers during use for actuating said pusher element means.

5,203,864

SURGICAL FASTENER SYSTEM

Edward H. Phillips, 712 N. Roxbury Dr., Beverly Hills, Calif. 90210

Filed Apr. 5, 1991, Ser. No. 681,685

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—151 **17 Claims**

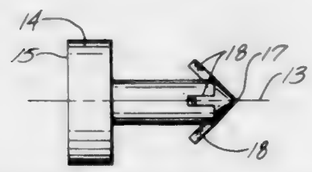
1. A fixation tool for inserting a fastener into body tissue comprising:

(a) a housing having a longitudinal axis and a proximate and distal end;

(b) an axially extending drive rod carried by said housing where said housing is so constructed and adapted to permit rotation of said drive rod relative to said housing;

(c) a cartridge having an axis of rotation and mounted in fixed relationship to the distal end of said drive rod, said cartridge extending axially from said distal end of said housing and having a plurality of radially spaced chambers extending axially therethrough where each said chamber is spaced equally radially from said axis of rotation and so dimensioned and proportioned to captively hold a fastener within said chamber;

(d) a plunger having a distal engagement end slideably carried by said housing in fixed space relationship to said axis of rotation for axial displacement relative to said axis of rotation where said plunger is so positioned and adapted



that upon sufficient axial displacement of said plunger said distal engagement end will extend at least in part through said chamber to eject said fastener therefrom; and

(e) rotation means carried by said housing for rotating said drive rod such that each said chamber may be rotated into axial alignment with said distal engagement end of said plunger whereby upon axial displacement of said distal engagement end at least in part through said chamber, said fastener may be ejected therefrom.

5,203,866

STILETTED NEEDLES

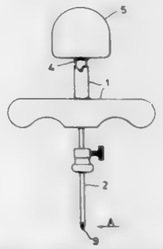
Abul B. M. A. Islam, 651 Elm St., Apt. 9A, Buffalo, N.Y. 14203

Filed May 8, 1991, Ser. No. 697,079

Claims priority, application United Kingdom, May 9, 1990, 9010427

Int. Cl.[5] A61M *5/178*

U.S. Cl. 606—186 **4 Claims**



1. A stiletted needle comprising a body member, a needle extending from the body member, with a bore of the body member co-axial with a bore of the needle, a stilette extending from a hand grip for the stilette, and being removably extendable through said needle bore, there being pin means on the hand grip to engage slot means in the end of the body member, said slot means having at least one side wall forming a cam surface for engagement and rotation of the pin means and stylette as the stylette is moved in the bore of the needle, the hand grip of the stilette being of semi-circular cross-section.

5,203,865

SURGICAL KNIVES FOR USE IN OPHTHALMIC SURGERY

Steven B. Siepser, 866 Downington Pike, West Chester, Pa. 19380

Filed Aug. 23, 1990, Ser. No. 572,173

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—166 **11 Claims**

1. A surgical blade for use in ophthalmic surgery, comprising:

a first shaft;

a second shaft, connected to the first shaft at a predetermined first angle and extending a distance from said first shaft thereby forming a distal end; and

a tip, connected to the distal end of said second shaft, and extending a distance along a central axis, said tip comprising first and second side portions substantially symmetrical about said central axis, each of said first and second side portions comprises a cutting edge oriented at a second angle with respect to said central axis, a tapered surface extending away from said cutting edge and a side edge which is generally rounded wherein said cutting edge extends to the leading end of said side edge and wherein that portion of the taper farthest from said cutting edge extends to the trailing end of said side edge.

5,203,867

METHOD FOR GENERATING POWER-UP PULSE

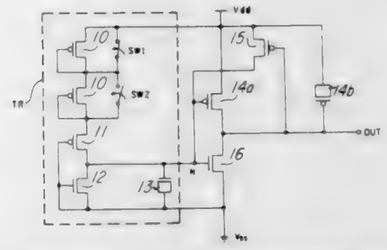
Andrew M. Love, Stafford, Tex., and Roger D. Norwood, Sunnyvale, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 415,944, Oct. 2, 1989, Pat. No. 5,030,845. This application Jun. 18, 1991, Ser. No. 717,139

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] H03K *17/22*

U.S. Cl. 307—272.2 **19 Claims**



1. A method for generating a power-up pulse using a circuit with a detector field-effect device having ON and OFF states, said detector field-effect device conducting a subthreshold current while in said OFF state, said method comprising:

using said subthreshold current of said detector field-effect device while in said OFF state to cause an output of said circuit to be at a first voltage level,

using said detector field-effect device while in said ON state to cause said output of said circuit to be at a second voltage level.

5,203,868

fitting contact between said at least one longitudinal edge

5,203,871

TRIPOD WITH HORIZONTAL AND VERTICAL

ture providing fluid communication between said up-

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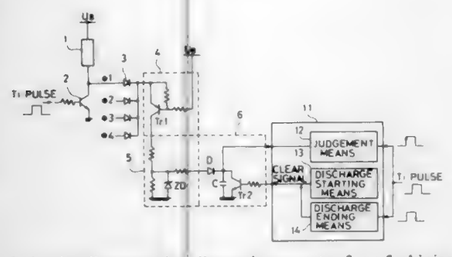
5,203,868

WIRE DISCONNECTION DIAGNOSIS APPARATUS OF FUEL INJECTOR DRIVE CIRCUIT

Fujio Ono, Iseaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Oct. 15, 1991, Ser. No. 774,973
Claims priority, application Japan, Oct. 15, 1990, 2-273281
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—119 A 3 Claims



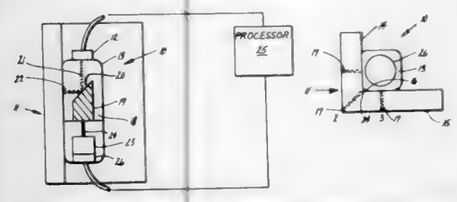
1. A wire disconnection diagnosis apparatus for a fuel injector drive circuit, comprising:
- a fuel injector drive circuit for driving a solenoid in a fuel injector via a first transistor turned on by a drive pulse signal;
- a charge/discharge circuit charged by the counter electromotive voltage of said solenoid for turning off said first transistor during a fall of said drive pulse signal, said charge/discharge circuit being discharged upon the reception of a clear signal;
- a determining means for determining the charge potential of said charge/discharge circuit during the rise of said drive pulse signal and for detecting a wire disconnection when said potential is lower than a predetermined value;
- a discharge starting means for starting an output of said clear signal to said charge/discharge circuit immediately after the determination by said determining means; and
- a discharge ending means for ending said output of said clear signal during the fall of said drive pulse signal.

5,203,869

ULTRASONIC FLANGE RADII INSPECTION TRANSDUCER DEVICE

Manohar Bashyam, Mason, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 26, 1991, Ser. No. 800,909
Int. Cl.[5] G01N *29/06, 29/24*
U.S. Cl. 73—640 9 Claims



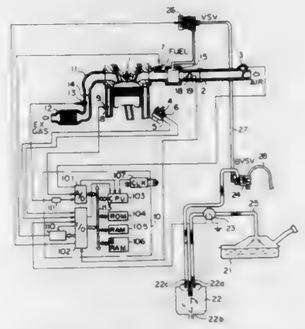
1. An improved ultrasonic transducer holder for ultrasonic inspection of internal flaws in a material in a predetermined small radius of curvature surface at the intersection of a pair of surfaces comprising in combination
- (a) a generally rectangular block member of a synthetic resin material,
- (b) at least one continuous longitudinal edge of said block member having a radius of curvature matching the predetermined small radius of curvature surface for precise fitting contact between said at least one longitudinal edge and said small radius of curvature surface,
- (c) an ultrasonic sound transducer positioned at one end of said block member and adapted to provide an ultrasonic sound beam in said block member,
- (d) mirror means in said block member to reflect said beam 90° from said beam's original direction through said material of said at least one longitudinal edge and into said small radius of curvature surface,
- (e) electric motor drive means to rotate said mirror means to cause said reflected beam to traverse an arc path of 360° while being projected perpendicularly into said small radius of curvature surface.

5,203,870

METHOD AND APPARATUS FOR DETECTING ABNORMAL STATE OF EVAPORATIVE EMISSION-CONTROL SYSTEM

Nobuaki Kayanuma, Gotenba; Kenichi Uchida, and Takayuki Otsuka, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 26, 1991, Ser. No. 721,687
Claims priority, application Japan, Jun. 28, 1990, 2-168522; Jun. 29, 1990, 2-170225; Oct. 15, 1990, 2-275609
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—198 D 24 Claims



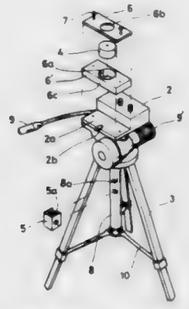
1. A method of detecting an abnormal state of an evaporative emission-control system in which a fuel-vapor evaporated from the fuel tank is temporarily trapped in a canister when an internal combustion engine is stopped or in an idle state, the trapped fuel-vapor is purged from the canister by a vacuum in a air-intake passage of the engine, and the purged fuel-vapor is mixed with an air-fuel mixture to be burned in a combustion chamber when a vehicle is running in a predetermined driving condition, comprising the steps of:
- detecting an amount of fuel-vapor trapped in the canister, wherein the detection of the amount of fuel-vapor trapped in the canister is carried out by counting the time period for which fuel-vapor flows into the canister;
- purging the fuel-vapor trapped in the canister and mixing the purged fuel-vapor with the air-fuel mixture in an air-intake passage;
- detecting a concentration of a vapor-laden air from the canister when the purging is executed; and
- determining the occurrence of an abnormal state of the evaporate emission-control system when the amount of fuel-vapor trapped in the canister is more than a predetermined amount, purging of the fuel-vapor trapped in the canister is executed, and a change of the concentration of the vapor-laden air from the canister before and after the purging is less than a predetermined value.

5,203,871

TRIPOD WITH HORIZONTAL AND VERTICAL SENSING MEANS FOR A CAMCORDER

Yoon T. Seo, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 5, 1991, Ser. No. 802,662
Claims priority, application Rep. of Korea, Dec. 7, 1990, 90-19281
Int. Cl.[5] G03B *17/56;* F16M *13/00*
U.S. Cl. 248—542 3 Claims



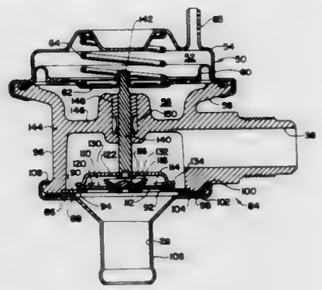
1. A tripod for a camcorder, comprising:
- a) a head part with an adjustment handle for holding said camcorder and a housing mount portion formed in one side of said head part;
- b) a horizontal sensing means mounted on one side of said head part, said horizontal sensing means including upper and lower housings mounted in said mount portion, said upper and lower housings each having an opening, a level for sensing the horizontal position of the camcorder and mounted in said upper and lower housing openings;
- c) a leg part for supporting said head part; and
- d) a vertical sensing means mounted on a head fixing central shaft extended from a bottom of said head part for sensing the vertical position of said camcorder.

5,203,872

SECONDARY AIR CONTROL AND CHECK VALVES

Lee A. Naffziger, Sterling, Ill., assignor to Borg-Warner Automotive Electronic & Mechanical Systems Corporation, Sterling Heights, Mich.

Continuation of Ser. No. 673,777, Mar. 21, 1991, abandoned.
This application Apr. 23, 1992, Ser. No. 873,499
Int. Cl.[5] F16K *15/14*
U.S. Cl. 251—82 19 Claims



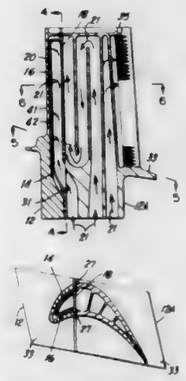
1. A valve comprising:
- a. an inlet port;
- b. an outlet port;
- c. a seat having an upstream side in fluid communication with said inlet port and a downstream side in fluid communication with said outlet port, said seat defining an aperture providing fluid communication between said upstream side and said downstream side;
- d. a first valve element comprising a flap having obverse first and second sides and deformable between an open position for permitting fluid communication through said aperture, wherein the first side of said flap is unseated from said seat, and a closed position for preventing such communication, wherein the first side of said flap is substantially seated on said seat and substantially blocks said aperture; and
- e. a second valve element being positioned between said first valve element and said outlet port, translation of said second valve element being independent of said deformability of said flap of said first valve element, said second valve element selectively operatively engagable with said flap for maintaining said flap in said closed position and preventing said deforming of said flap.

5,203,873

TURBINE BLADE IMPINGEMENT BAFFLE

Robert J. Corsmeier, and Harvey M. MacLin, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 29, 1991, Ser. No. 752,141
Int. Cl.[5] F01D *5/08*
U.S. Cl. 416—96 A 14 Claims



4. An impingement baffle for use in a gas turbine engine blade, said baffle comprising a tubular body having a perforated airfoil-shaped front portion and a substantially planar support plate extending transversely to opposite sides of said front portion and integrally connected to an aft portion of each of said opposite sides of said front portion, wherein said substantially planar support plate forms a radially extending boundary of said tubular body, said substantially planar support plate comprising connecting means projecting transversely from said opposite sides of said front portion for connecting said baffle to said turbine engine blade.

5,203,874

DEVICE FOR SECURING DIES ON THREADING MACHINES

Manuel Azkona-Ollacarizqueta, Abadiano, Spain, assignor to Super-Ego Tools, S.A., Spain

Filed Mar. 24, 1992, Ser. No. 856,451
Int. Cl.[5] B21H *3/02*
U.S. Cl. 470—82 5 Claims

1. A device for securing a threaded die to an adapter of a threading machine wherein the adapter has a polygonal bore and said die has a polygonally shaped mandrel such that the

polygonal bore of said adapter mates with the polygonally

pression springs and tension springs biased to maintain said cover in said closed position, said spring means being

CHEMICAL

5,203,875

DYEING COMPOSITION FOR KERATINOUS FIBERS, CONTAINING OXIDATION DYE PRECURSORS AND

radicals indicated above denote a group having 1 to 4 carbon atoms or mixtures thereof.

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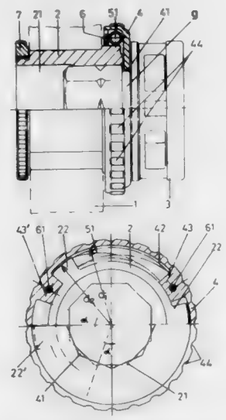
polygonal bore of said adapter mates with the polygonally shaped mandrel of said die, said die having a throat which has a diameter smaller than the diameter of the mandrel, said device comprising:

(a) a rotatable diaphragm cover coaxially mounted at one end of said adapter, said diaphragm cover having a polygonal bore therein, said polygonal bore being coaxial with said polygonal bore of said adapter, said polygonal bore of said cover having dimensions substantially identical to said polygonal bore of said adapter, said cover being rotatable between a closed position wherein said polygonal bore of said cover is engaged in the said throat of the die whereby said die is held in said adapter, and an open position wherein said polygonal bore of said cover is not engaged in the said throat of the die whereby said mandrel of said die can be inserted into or removed from said adapter; and

(b) spring means selected from the group consisting of compression springs and tension springs biased to maintain said cover in said closed position, said spring means being



connected at one end to said adapter and at the other end to said cover.

5,203,875

DYEING COMPOSITION FOR KERATINOUS FIBERS, CONTAINING OXIDATION DYE PRECURSORS AND HYDROXYBENZOFURANE USED AS COUPLERS, AND DYEING PROCESS USING THESE COMPOSITIONS

Remy Tuloup, Miniac-sous-Bécherel; Christian Blaise, Sevran, and Alex Junino, Livry-Gargan, all of France, assignors to L'Oreal, Paris, France

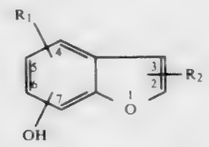
Filed Mar. 30, 1992, Ser. No. 860,543

Claims priority, application France, Mar. 28, 1991, 91 03806

Int. Cl.[5] A61K *7/13*

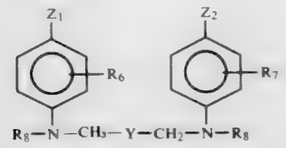
U.S. Cl. 8—405 **18 Claims**

1. A dyeing composition for dyeing keratinous fibers and in particular human hair, which comprises, as coupler in an aqueous or dilute alcoholic vehicle, one or more hydroxybenzofurans of formula (I):



(I)

in which R_1 and R_2, which are identical or different, represent a hydrogen atom or a C_1–C_6 alkyl radical, R_1 and R_2 can occupy any position on the benzofuran ring provided that when R_1 and R_2 both denote an alkyl radical, they do not occupy the positions 2 and 3 at the same time, the concentration of the hydroxybenzofurans of formula (I) being 0.05 to 3.5% by weight of the total weight of the composition, in combination with one or more oxidation dye precursors selected form the group consisting of a para-phenylenediamine, a para-aminophenol, 2,5-diaminopyridine, 2-hydroxy-5-aminopyridine, tetraaminopyrimidine, 1-amino-2-hydroxybenzene, 6-methyl-1-hydroxy-2-aminobenzene, 4-methyl-1-amino-2-hydroxybenzene, an ortho-phenylenediamine and a bis-phenylenealkylenediamine of formula (III) and their addition salts with acids:



(III)

in which:

Z_1 and Z_2, which are identical or different, represent a hydroxyl or NHR_9 groups, where R_9 denotes a hydrogen atom or a lower alkyl radical;

R_6 and R_7, which are identical or different, represent a hydrogen atom, a halogen atom or an alkyl group;

R_8 represents a hydrogen atom, an alkyl or hydroxyalkyl group, or an aminoalkyl group which amino residue is unsubstituted or substituted by one or two alkyl groups;

Y represents a radical selected from the group of radicals consisting of:

$$-(CH_2)_n-,\ (CH_2)_m-O-(CH_2)_m,$$

$$-(CH_2)_m-CHOH-(CH_2)_m,\ \text{and}$$

$$-(CH_2)_m-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{N}}-(CH_2)_m,$$

in which n is an integer between 0 and 8 and m is an integer between 0 and 4, and in which the alkyl or alkoxy radicals indicated above denote a group having 1 to 4 carbon atoms or mixtures thereof.

5,203,876

PROCESS FOR DYEING PAPER

Adolf Käser, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

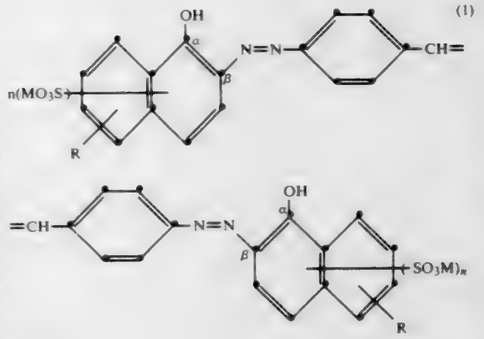
Continuation of Ser. No. 382,134, Jul. 19, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 660,227

Claims priority, application Switzerland, Jul. 22, 1988, 2807/88

Int. Cl.[5] C09B *67/00*

U.S. Cl. 8—527 **10 Claims**

1. A process for dyeing paper, which comprises contacting paper with a solid or liquid aqueous dye, wherein said liquid dye is substantially undissolved in the dyeing liquor, said dye being of the formula



(1)

wherein

R is hydrogen, —OH, —OR^1, —NH_2, —NHR^1, —NH-COR^1, —$NHSO_2R^1$, —$NHCONH_2$ or —$NHCONHR^1$, in which R^1 is unsubstituted or substituted alkyl or aryl, M is hydrogen or the equivalent of a colourless cation, and n is 1 or 2,

and the —OH group in the α-position and the azo group in the β-position of the naphthalene nucleus are mutually interchangeable.

5,203,877

PROCESS FOR PRODUCING SODIUM PERBORATE MONOHYDRATE AGGLOMERATE

Werner Doetsch, Bad Hoenningen; Richard Roesler, Rheinbrohl, and Hans-Ludwig Pfeifer, Bad Hoenningen, all of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 2, 1991, Ser. No. 739,501

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025856

Int. Cl.[5] C01B *15/12*; **C22B** *1/16*

U.S. Cl. 23—313 R **7 Claims**

1. A process for producing sodium perborate monohydrate granules comprising the steps of:

compacting primary particles prepared by dehydration of sodium perborate tetrahydrate by dry pressing-agglomeration at a temperature in the range from 20° to 50° C. and at a pressure of at least 0.2 tons per cm of roller length without addition of agglomeration agents using an at least lightly textured roller press to form compressed strips, and

comminuting the resulting compressed strips of sodium perborate monohydrate to a granular material having a desired average grain diameter within the range from 0.3 to 3 mm.

5,203,878

FUEL OIL ADDITIVES

5,203,880

METHOD AND APPARATUS FOR MAKING ABRASIVE

tive to enhance bonding of the silica to the surface of alumi-

the side wall flanges, and the molding member top surface

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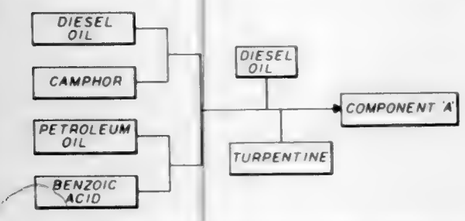
5,203,878

FUEL OIL ADDITIVES

Benjamin E. Woomer, 1597 E. 30th St., Cleveland, Ohio 44114; Lin H. Yen, and Chu K. Sing, both of 42-44 Ko Shing Street, Hong Kong, Hong Kong

Filed Apr. 27, 1992, Ser. No. 875,084
Int. Cl.[5] C10L *1/18*
U.S. Cl. 44—369 14 Claims



1. An additive for liquid hydrocarbon fuels produced by the process of:

forming a first component by blending a composition (a) of diesel oil and camphor with a composition (b) of petroleum oil and an aromatic acid, combining said blend with additional diesel oil and with turpentine,

forming a second component by combining Turkey red oil and water, and

thereafter combining said first and second components to form said adhesive.

5,203,879

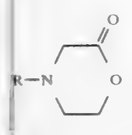
FUEL COMPOSITION

Wei-Yang Su, Austin, Tex.; Sheldon Herbstman, New City; Joseph M. Russo, Poughkeepsie, both of N.Y.; Robert L. Zimmerman, and Michael Cuscurida, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 1, 1992, Ser. No. 938,806
Int. Cl.[5] C10L *1/18, 1/22*
U.S. Cl. 44—419 11 Claims

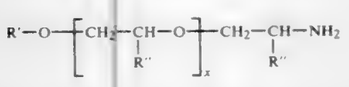
1. An amido alkanolamine composition obtained by reacting, at a temperature of 10° C.–200° C.:

(a) a 4-alkyl-2-morpholinone represented by the formula:



in which R represents a monovalent aliphatic radical having from 1 to 10 carbon atoms, and

(b) a hydrocarbyl oxypolyoxyalkylene amine represented by the formula:



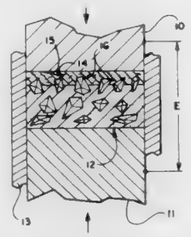
in which R′ represents an alkyl or an alicyclic radical having from 8 to 30 carbon atoms, x has a value from 5 to 50, and R″ represents a methyl radical or a mixture of hydrogen and methyl radicals.

5,203,880

METHOD AND APPARATUS FOR MAKING ABRASIVE TOOLS

Naum N. Tselesin, P.O. Box 52606, Atlanta, Ga. 30355

Filed Jul. 24, 1992, Ser. No. 919,040
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 15 Claims



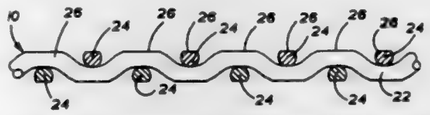
1. In the method for making a body of abrasive material wherein a plurality of hard particles is embedded in a matrix material for retaining said hard particles during use, said method including the steps of placing said matrix material in a mold means, providing said plurality of hard particles adjacent to at least one surface of said body, exerting compacting forces against said body with said mold means, and raising the temperature of said body to a sintering temperature during the said step of exerting compacting forces against said body, the improvement comprising the step of placing a separator between said mold and said body prior to the said step of exerting compacting forces against said body.

5,203,881

ABRASIVE SHEET AND METHOD

Ronald C. Wiand, 1494 Heatherwood, Troy, Mich. 48098

Continuation-in-part of Ser. No. 474,373, Feb. 2, 1990, Pat. No. 5,131,924. This application Aug. 29, 1991, Ser. No. 751,339
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 9 Claims



1. A method of manufacture of an abrasive sheet comprising the steps of:

(a) providing a metal sheet substrate having a plurality of spaced apertures therethrough;

(b) coating said sheet substrate with a mixture of a braze and a temporary binder;

(c) applying a layer of grit particles onto the coating of step (b); and

(d) heating the product of step (c) to drive off the binder and attach said grit particles to said metallic layer of said sheet substrate.

5,203,882

BONDING ADJUVANTS FOR VITREOUS BOND FORMULATIONS AND PROCESS FOR BONDING WITH

Lee A. Carman, Worcester, and Xiaoming Li, Shrewsbury, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Jan. 27, 1992, Ser. No. 826,543
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 14 Claims

1. A bonding adjuvant for vitreous bonds which comprises a silica sol, abrasive material and an organic binding agent effective to enhance bonding of the silica to the surface of aluminous abrasive grits, and an additive selective from the group consisting of boron oxide and malic acid; in proportions to provide a solids content of from about 10 to about 30 weight % of silica and from about 30 to about 50 weight % of organic binding agent and from about 10–20 weight percent of additive, all proportions being based on the solids content of adjuvant.

5,203,883

HONING MEDIA

Winfield B. Perry, Lexington, Mass., assignor to Dynetics Corp., Woburn, Mass.

Filed Aug. 12, 1991, Ser. No. 743,880
Int. Cl.[5] B24D *17/00*
U.S. Cl. 51—293 18 Claims

1. A method of abrading or polishing or honing or deburring a surface comprising flowing under pressure and at a high velocity through a restricted passage onto a surface to be abraded, polished, honed or deburred, an abrasive composition comprising:

a mixture of a boron-dialkyl silicon-oxygen polymer;

a metallic soap of a fatty carboxylic acid having 8 to 22 carbon atoms and a polybutene; and having

abrasive grit particles dispersed in said mixture said high velocity being achieved by pressure drop across said restricted passage.

5,203,884

ABRASIVE ARTICLE HAVING VANADIUM OXIDE INCORPORATED THEREIN

Scott J. Buchanan, Minneapolis; Eric D. Morrison, West St. Paul; David R. Boston, Woodbury; Steven T. Hedrick; William L. Kausch, both of Cottage Grove, and Wayne K. Larson, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 4, 1992, Ser. No. 893,491
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—295 32 Claims

1. A coated abrasive article comprising:

(a) a backing having a front surface;

(b) an abrasive layer bonded to said front surface of said backing to provide a coated abrasive article, said abrasive layer comprising abrasive grain and a cured bond system; and

(c) vanadium oxide incorporated into said coated abrasive article, wherein said vanadium oxide is present in an amount sufficient to reduce the accumulation of static electric charge during the abrading of a workpiece with said coated abrasive article.

5,203,885

MOLDING FINISHING TOOL AND METHOD OF MAKING

Scott J. Pastre, and Michele L. Pastre, both of Surdan Mt. Rd., Sharon, Conn. 06069

Filed Jan. 8, 1992, Ser. No. 818,250
Int. Cl.[5] B24D *18/00*
U.S. Cl. 51—298 4 Claims

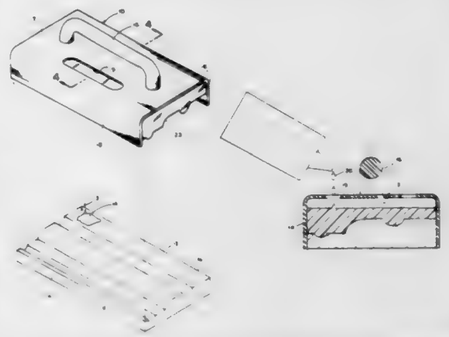
1. A method of making a finishing tool to include an abrasive surface complementary to a molding member top surface, wherein the molding member includes spaced side walls spaced apart a predetermined spacing, wherein the method of forming the tool comprises,

providing a "U" shaped support, including a support top wall with a handle mounted to the top wall,

parallel side wall flanges, and

the top wall including a top wall opening, and

positioning the "U" shaped support over the molding member, directing a hardening compound through the top wall opening, and thereby creating a mirror image mold configuration of the molding member between the top wall, the side wall flanges, and the molding member top surface wherein "U" shaped support and the mirror image mold



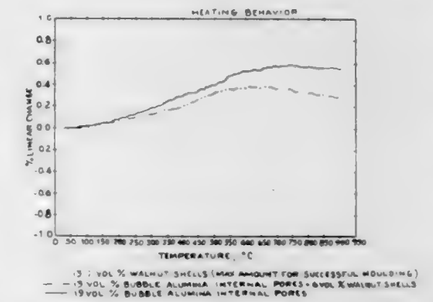
configuration are secured together when the hardening compound cures.

5,203,886

HIGH POROSITY VITRIFIED BONDED GRINDING WHEELS

David A. Sheldon, Worcester; Carole J. Markhoff-Matheny, Leicester, and Renato Terragni, Holden, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 12, 1991, Ser. No. 743,952
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—309 16 Claims



1. A bonded abrasive body prepared from a combination of (i) sol-gel sintered aluminous abrasive grit particles, (ii) a vitreous bond, (iii) from about 5 to about 30% of the volume of the combination, of bubbled alumina and (iv) from about 1 to about 12% by volume of the combination, of a sacrificial organic material which completely decomposes at a temperature at least 100° C. below the maturing temperature of the bond.

5,203,887

ADSORBENT BEDS FOR PRESSURE SWING ADSORPTION OPERATIONS

Lee J. Toussaint, Lockport, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Dec. 11, 1991, Ser. No. 804,752
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—25 18 Claims

1. In a vacuum pressure swing adsorption system for the recovery of oxygen or nitrogen from air, said system being adapted to operate between a superatmospheric or atmospheric higher adsorption pressure and a subatmospheric lower desorption pressure on a cycle basis, said system containing

5,203,890

body for receiving a secondary gas flow separated from

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one or more adsorbent bed, each bed being capable of selectively adsorbing nitrogen as the more readily adsorbable component of feed air, the improvement comprising incorporating, as each said adsorbent bed, a composite bed comprising special adsorbent material at the feed end of the bed and conventional non-ion-exchanged zeolite X adsorbent material at the opposite, product end thereof, said special adsorbent material extending from said feed end comprising from about 25% to about 95% of the overall adsorbent bed, said special adsorbent material comprising the lithium cation form of zeolite X in which the Si/Al_2 molar ratio is from about 2.0 to about 3.0 and in which at least about 88% of the AlO_2-tetrahedral units are associated with lithium cations, whereby the product costs are desirably reduced, without any appreciable increase in power requirements, compared to an all-special adsorbent system.

5,203,888

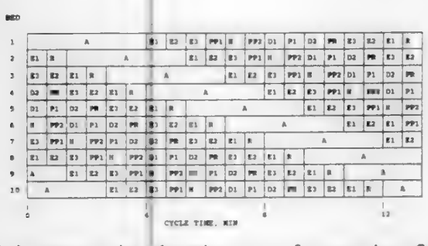
PRESSURE SWING ADSORPTION PROCESS WITH MULTIPLE DESORPTION STEPS

Richard T. Maurer, Nanuet, N.Y., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 618,337, Nov. 23, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 839,846

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—26 **31 Claims**



1. A pressure swing adsorption process for separating a first component from a feedstream comprising said first component and at least one other component, wherein a plurality of adsorber beds are employed and each of said adsorber beds is subjected to a repetitive cycle comprising the steps of;

(a) passing the feedstream to a first adsorber bed containing adsorbent having adsorptive capacity for said other component at effective adsorption conditions including an adsorption pressure and temperature, and withdrawing a product stream enriched in said first component relative to the feedstream from the first adsorber bed;

(b) cocurrently depressurizing the first adsorber bed to an equalization pressure that is lower than the adsorption pressure and passing the effluent therefrom to a second adsorber bed being repressurized;

(c) countercurrently depressurizing the first adsorber bed to a first desorption pressure that is above atmospheric pressure and lower than the equalization pressure and effective to desorb said other component and withdrawing a first desorption effluent comprising said other component;

(d) countercurrently purging the first adsorber bed with a purge feed at about the adsorption temperature and withdrawing a purge effluent comprising said other component;

(e) either simultaneously with or subsequently to said countercurrently purging further countercurrently depressurizing the first adsorber bed to a second desorption pressure that is lower than the first desorption pressure and effective to further desorb said other component and withdrawing a second desorption effluent stream comprising said other component; and

(f) repressurizing the first adsorber bed to the adsorption pressure.

5,203,889

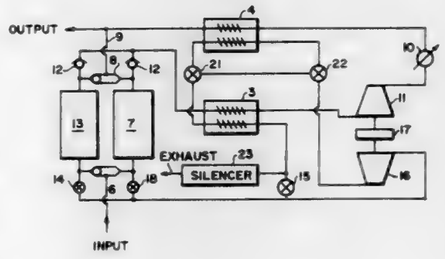
PROCESS AND SYSTEM FOR FRACTIONATING GASEOUS MIXTURES

Jeffrey M. Brown, Windham, Me., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 5, 1992, Ser. No. 846,802

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—163 **24 Claims**



1. A system for separating a gaseous mixture by means of pressure swing adsorption fractionation which comprises:

a. means for directing a source stream of gaseous mixture to a first adsorption unit wherein said gaseous mixture is fractionated such that waste gases are adsorbed and product gases are passed through said first adsorption unit;

b. means of dividing said product gases into a product stream and a purge stream;

c. means for directing said purge stream to a pre-heater means wherein said purge stream is heated to a desirable temperature;

d. means for directing the preheated purge stream to a pressure powered motor wherein rotational mechanical energy is produced and/or stored, said purge stream is cooled, and the pressure of said purge stream is reduced;

e. means for directing said purge stream from said pressure powered motor to a second adsorption unit wherein the waste gases in said second adsorption unit are desorbed and wherein said purge stream becomes enriched with said waste gases;

f. means for directing the waste gas enriched purge stream to a compressor means wherein said enriched purge stream is compressed to near atmospheric pressure, said compressor means being powered by said rotational mechanical energy produced by and/or stored within said pressure powered motor and wherein said enriched purge stream is heated by virtue of the work done upon it by said compressor means; whereby said compressor means creates a subatmospheric pressure in said second adsorption unit to enhance said desorption;

g. means for directing said heated purge stream to said preheater means wherein the heat of compression is recovered;

h. means for venting said heated purge stream of said preheater means from said system;

i. means for controlling said system wherein the functions of said first adsorption unit and said second adsorption unit are periodically reversed to enable the regeneration of each adsorption unit; and

j. means for storing rotational mechanical energy produced by said pressure powered motor when said system is reversed and wherein said mechanical energy is recovered by said compressor means after the reversing of said system is complete.

5,203,890

DEAERATOR FOR REMOVING DISSOLVED OXYGEN IN WATER

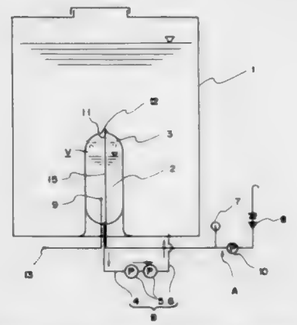
Okabe Tatsuo, 10-5 Minami-Honcho, Funabashi-shi Chiba-ken, Japan

Filed Aug. 6, 1990, Ser. No. 562,760

Claims priority, application Japan, Aug. 7, 1989, 1-92193

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—164 **3 Claims**



3. A deaerator for removing dissolved oxygen gas from water in a water storage tank, comprised of:

(a) a deaerating tank contained within the water storage tank or located outside of the storage tank, said deaerating tank having a top cone for collecting oxygen gas;

(b) a water supply system comprised of a pipe ad at least one water supply nozzle for removing water from the storage tank and downwardly introducing water into the deaerating tank through the at least one nozzle;

(c) an exhaust system for exhausting oxygen gas collected in the deaerating tank to the atmosphere, comprised of a vacuum pump, an exhaust pipe connected to the deaerating tank and having an inlet end located in the top cone of the deaerating tank, and a check valve for controlling flow through said exhaust pipe;

(d) a circulating system for returning deaerated water to the water storage tank, comprised of a pump and a recycling pipe; and

(e) a water level sensor and activator for determining the water level within the deaerating tank and activating the water supply system to introduce water from the water storage tank into the deaerating tank.

5,203,891

GAS/LIQUID SEPARATOR

Luis E. Lema, North Attleboro, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1992, Ser. No. 862,709

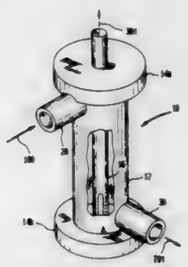
Int. Cl.[5] B01D *45/16;* **B04C** *5/13*

U.S. Cl. 55—205 **20 Claims**

1. A gas/liquid separator comprising:

a hollow cylindrical separator body having: 1) an inlet port in a top sidewall thereof for receiving a tangential inflow of a gas/liquid mixture, and 2) an outlet port in a bottom sidewall thereof for allowing liquid separated from the mixture to tangentially exit said cylindrical separator body, wherein said inlet port and outlet port are located 90° apart; and

a hollow cylindrical vortex finder positioned concentrically within said cylindrical separator body, said vortex finder having: 1) first gas entrance ports aligned with said inlet port of said separator body for receiving a primary gas flow separated from the mixture, and 2) second gas entrance ports aligned with said outlet port of said separator body for receiving a secondary gas flow separated from the mixture, wherein said cylindrical vortex finder is



further provided with means to allow the primary and secondary gas flows to exit same.

5,203,892

COKE FILTER

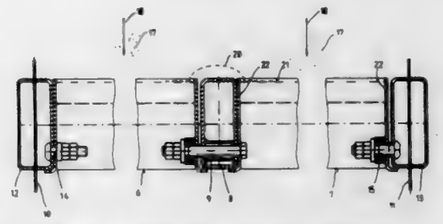
Ludger Brentrup, Oelde, and Heinz-Herbert Schmits, Rheda-Wiedenbruck, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Jul. 21, 1992, Ser. No. 916,274

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1991, 9110285[U]

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—274 **11 Claims**



1. Coke filter for cleansing a gas stream, comprising

a) a filter housing with at least one filter chamber (1*a*, 1*b*, 1*c*, 1*d*) which serves to receive a granular mass of coke (17) and is defined by chamber walls in which inlet openings and outlet openings (5) are provided for the gas stream to be cleansed,

b) and a temperature measuring arrangement for determining the temperatures prevailing at predetermined locations in the filter chamber,

characterised in that

c) the temperature measuring arrangement contains a photoconductor (20) which is supplied with pulsed laser light and is passed in a loop through the filter chamber near the outlet openings (5).

5,203,893

OZONE FILTER UNIT FOR AN ELECTROPHOTOGRAPHIC APPARATUS

Yoshiharu Horii, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1992, Ser. No. 827,169

Claims priority, application Japan, Jan. 29, 1991, 3-8060

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—385.1 **3 Claims**

1. An ozone filter unit for an electrophotographic apparatus, comprising:

a housing having an upwardly facing opening for defining an upper space in the housing, said housing containing an image forming unit disposed in the housing;

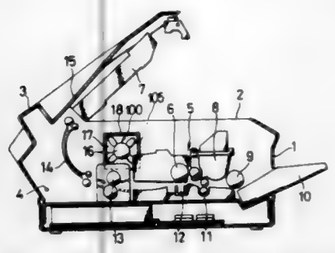
a cover pivotally supported on the housing for covering the

parallel to its associated sheet edge; and said second legs

the core with an active energy ray curable composition

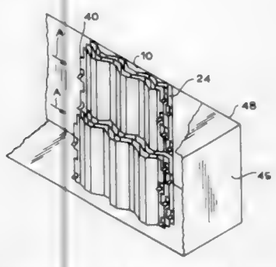
5,203,898

a cover pivotally supported on the housing for covering the opening;
a filter case having an open end facing an air exit formed in the housing and an opposite open end;
an exhaust blower positioned in the filter case for drawing in air through said air exit;
a filter element for removing ozone from air drawn through the air exit by said exhaust blower which contains ozone produced by said image forming unit; and
a filter element holding frame having an upper opening for receiving said filter element therethrough, said holding



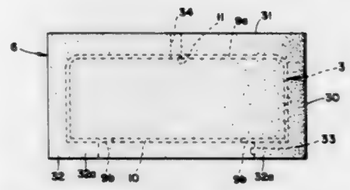
frame being pivotally connected to a lower portion of the open end of the filter case for permitting the pivoting of said holding frame about a substantially horizontal axis, wherein said holding frame with said filter element disposed therein is pivotable from a closed position in which said frame is fitted in said open end of the filter case for removing ozone from the air, and an opened position for permitting the insertion of said filter element through the open upper space of the housing and into the frame, and the removal of the filter element from the frame and through the open upper space of the housing.

5,203,894
MIST ELIMINATOR BLADE SPACER
James M. Chowaniec, Cape Coral, Fla., assignor to Munters Corporation, Fort Myers, Fla.
Filed Apr. 3, 1992, Ser. No. 863,245
Int. Cl.[5] B01D *45/08*
U.S. Cl. 55—440 **13 Claims**



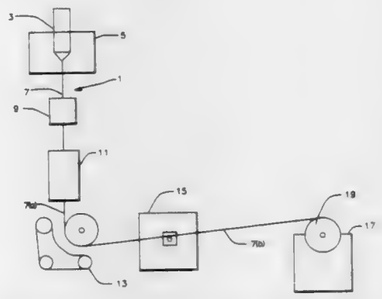
1. A mist eliminator pack for removing liquid components from a gas stream comprising:
a plurality of mist eliminator sheets having first and second opposed and generally parallel edges and a non-planar configuration between said edges, said sheets being in substantially parallel alignment with each other;
at least said first edge of each sheet having a plurality of offset tabs integrally formed therein positioned and dimensioned to engage an adjacent sheet on one side thereof; said tabs on each sheet being longitudinally offset from the tabs on sheets adjacent thereto, said offset tabs being generally L-shaped, each tab having a first leg extending generally perpendicularly to its associated edge and a second leg extending at right angles to the first leg and parallel to its associated sheet edge; and said second legs of said tabs being secured to the first edge of the adjacent sheet on said one side thereof thereby to define an integral pack of evenly spaced sheets to define uniform flow paths between the sheets.

5,203,895
AIR FILTER ASSEMBLY
Joseph J. Berto, P.O. Box 8775, Truckee, Calif. 95737
Continuation of Ser. No. 588,019, Sep. 25, 1990, Pat. No. 5,100,443. This application Mar. 19, 1992, Ser. No. 854,349
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—522 **4 Claims**



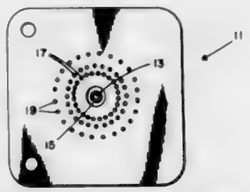
1. A filter useful for cleaning air for an engine such as an engine of a chainsaw, the filter comprising:
a foam element having opposed first and second spaced-apart endwalls and a sidewall extending therebetween, the first endwall of the filter including a hole extending therethrough and the second endwall including a flow passage extending therethrough for providing fluid communication with an air outlet in a cage for supporting the foam element, the first endwall having a thickness sufficient for sealing the foam element around a bolt passing through the hole therein and the second endwall having an inwardly extending section with a thickness sufficient for sealing the outer periphery of the flow passage.

5,203,896
PROCESS FOR PRODUCING HARD PLASTIC CLAD OPTICAL FIBER WITH IMPROVED ULTRAVIOLET TRANSMISSION
Wolfgang Neuberger, Monchen-Gladbach, Fed. Rep. of Germany, assignor to CeramOptec, Inc., Enfield, Conn.
Filed Apr. 2, 1992, Ser. No. 862,446
Int. Cl.[5] G02B *6/02*
U.S. Cl. 65—3.11 **20 Claims**



1. A process for producing hard clad optical fibers with improved ultraviolet transmission which comprises:
(a) drawing an optical fiber core through a draw process and, as it is being drawn from the draw process, coating the core with an active energy ray curable composition having no photo initiators therein, which when cured, serves as a cladding such that the cladding meets the core at a core/cladding interface; and,
(b) introducing the coated fiber core to high energy ionizing radiation rays such that ≧40% of the coated fiber core cross-sectional area receives ≦1 Mrad of radiation dose while curing the cladding.

5,203,897
METHOD FOR MAKING A PREFORM DOPED WITH A METAL OXIDE
Dale R. Powers, Painted Post, N.Y.; Kenneth H. Sandhage, Randolph, Mass., and Michael J. Stalker, Clifton Park, N.Y., assignors to Corning Incorporated, Corning, N.Y.
Continuation of Ser. No. 435,966, Nov. 13, 1989, abandoned. This application Mar. 24, 1992, Ser. No. 856,454
Int. Cl.[5] C03B *37/018*
U.S. Cl. 65—3.12 **11 Claims**

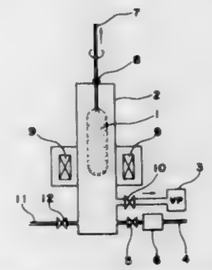


1. A vapor deposition process for creating a porous silica based preform for a graded index multimode optical waveguide fiber having a core which includes GeO_2 and having a cladding, wherein
a burner is used to react oxygen with a fuel in the presence of a reactant stream which includes a precursor of said GeO_2 to form soot, said oxygen, said fuel and said reactant stream being provided to and flowing from said burner, and
said burner has at least one fuel passageway formed therein through which fuel leaves the burner, and at least one outlet structure inboard of said at least one fuel passageway,
including the steps of
a) supplying oxygen to the burner in said at least one fuel passageway and inboard of this passageway, and in the case of more than one fuel passageway, in the burner's outermost fuel passageway and inboard of this passageway,
b) controlling the oxygen provided in said supplying step in the location specified in said supplying step during the creation of at least the part of the preform which forms the center of the fiber's core to an amount per unit time that is greater than the amount of oxygen stoichiometrically required per unit time to fully oxidize the fuel leaving the burner per unit time, and
c) depositing said soot formed in said burner reaction to build up said porous silica based preform by the outside vapor deposition soot laydown technique in which at least a part of the porous glass preform is reheated as subsequent parts are deposited,
wherein the providing of oxygen decreases the amount of GeO which is generated during the creation of the porous glass preform and which tends to migrate along the length of the preform.

5,203,898
METHOD OF MAKING FLUORINE/BORON DOPED SILICA TUBES
Norman W. Carpenter, Woodhull; Alan J. Morrow, Elmira, and Donald R. Young, Jr., Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Dec. 16, 1991, Ser. No. 809,697
Int. Cl.[5] C03B *37/10, 37/023*
U.S. Cl. 65—3.12 **14 Claims**

1. A method of forming a glass article comprising the steps of
forming a B_2O_3-doped porous glass preform having interconnective pores,
heating said preform,
flowing through said pores at least two different fluorine-containing gases, one of said gases being a source of fluorine for doping said porous preform and a second of said gases being a sufficient amount of BF_3 to prevent fluorine from reacting with the B_2O_3 in said porous preform and forming a B_2O_3-depleted region therein, and
consolidating said porous preform to form a dense glass article doped with fluorine and B_2O_3.

5,203,899
METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER
Michihisa Kyoto; Yoichi Ishiguro; Akira Urano, and Hideo Kakuzen, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Division of Ser. No. 640,556, Jan. 14, 1991, which is a division of Ser. No. 221,432, Jul. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 839,336, Mar. 13, 1986, abandoned. This application Feb. 7, 1992, Ser. No. 832,330
Claims priority, application Japan, Mar. 18, 1985, 60-52180; Oct. 3, 1985, 60-219090
Int. Cl.[5] C03B *37/027*
U.S. Cl. 65—3.11 **3 Claims**



1. A method for producing a glass preform for use in the fabrication of an optical fiber, which comprises the steps of:
a) forming a porous silica glass soot body from a glass-forming raw material,
b) heating the silica glass soot body at pressure of 50 to 10^{-3}

torr, in a furnace, at a temperature at which the silica glass

including a step of mixing with additives to provide said

5,203,904

of said fabric and deflecting said fabric to produce said

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torr, in a furnace, at a temperature at which the silica glass soot body is not vitrified, to remove any trapped gas or water that is present in the pores of the silica glass soot body formed in step a),

c) introducing a gas containing SiF, from an inlet to the furnace to fill the pores of the silica glass soot body formed in step b) with fluorine,

d) vitrifying the fluorine-added silica glass soot body formed in step c) into a transparent glass body,

e) boring the transparent glass body formed in step d) to form a bore therein, and

f) inserting a pure quartz rod which extends throughout the length of the body into the bore and fusing the rod and the body to form a glass preform.

5,203,900

METHOD OF PRODUCING DISCONTINUOUS COATED GLASS FIBERS

Christian Guillard, Vincennes; Bernard Gicquel, Saint Brice Sous Foret, and Guy Berthier, Clermont, all of France, assignors to Isover Saint-Gobain. "Les Miroirs" , Courbevoie, France

Continuation of Ser. No. 622,902, Dec. 6, 1990, abandoned. This application Aug. 10, 1992, Ser. No. 927,787

Claims priority, application France, Dec. 6, 1989, 89 16093

Int. Cl.[5] C03C *25/02*; C03B *37/04*

U.S. Cl. 65—3.44 **10 Claims**

1. A method of producing discontinuous fibers from a glass material having an elevated melting point comprising

feeding molten glass material into a centrifugal chamber, said chamber comprising a plurality of orifices wherein said molten glass material is forced therethrough forming a plurality of molten glass jets,

directing hot streams of gas at said molten glass jets to form glass fibers therefrom,

spraying said glass fibers with a sizing agent, said sizing agent comprising an emulsion or suspension in water, or an aqueous solution having no more than three active substances including a lubricating agent and an antistatic agent wherein the quantity of aid active substances deposited on said glass fibers after evaporation of said water in said aqueous solution is between 1 and 5 percent by weight relative to the weight of said glass fibers.

5,203,901

METHOD FOR CONVERTING WASTE TO CRYSTALLIZED GLASS

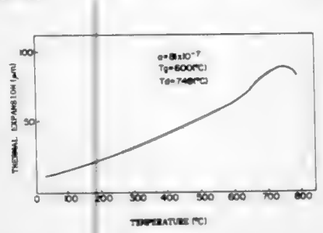
Shigeru Suzuki; Keiichiro Miyano; Takumi Kaneko, and Yoshikazu Nagayoshi, all of Tokyo, Japan, assignors to Tsukishima Kikai Co., Ltd. and Tokyo Metropolitan Government, Japan

Filed Dec. 18, 1991, Ser. No. 809,883

Claims priority, application Japan, Dec. 25, 1990, 2-413772

Int. Cl.[5] C03C *10/00*

U.S. Cl. 65—33 **13 Claims**



1. A process for converting a waste material ash of a specific composition into a crystallized glass containing at least one phase of anorthite and β-wollastnite crystal phases, said process comprising the steps of:

(a) preparing said waste material to produce a feed material, including a step of mixing with additives to provide said specific composition;

(b) melting said feed material in a furnace to produce a melt at temperatures between 1300 to 1500° C.;

(c) cooling said melt rapidly to produce a glassy charge; and

(d) heat treating said glassy charge to produce a crystallized glass containing at least one phase of anorthite and β-wollastnite phases infiltrated with a vitreous material.

5,203,902

GLASS COMPOSITION FOR USE IN GLAZES OR ENAMELS

Johannes J. W. Murkens, Eijsden, Netherlands, assignor to Johnson Matthey Public Limited Company, United Kingdom

Division of Ser. No. 431,888, Nov. 6, 1989, Pat. No. 5,093,285. This application Nov. 25, 1991, Ser. No. 796,834

Claims priority, application United Kingdom, Nov. 19, 1988, 8827096; Sep. 15, 1989, 8920941

Int. Cl.[5] C03C *17/02*

U.S. Cl. 65—60.53 **17 Claims**

1. In a method of forming a glaze or enamel coated article, the improvement comprising the step of applying a composition comprising 70–90% by weight of a component consisting essentially of, by weight, 45–65% Bi_2O_3, 25–36% SiO_2, 4–6% B_2O_3, 3–6% TiO_2, 1–3% Na_2O, 0.5–2% K_2O, 2–6% L_2O 0–3% Al_2O_3, 0–1% ZrO_2, 0–1% BaO, 0–1% CaO, 0–1% MgO, 0–1% ZnO, 0–3% PbO, and 0–0.5% CdO and 10–30% by weight of pigment to the article and then firing the composition.

5,203,903

METHOD OF COATING GLASS

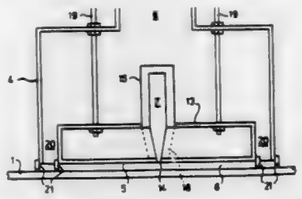
Robert Terneu, Thiméon, and Michel Hannotiau, Jodoigne, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Aug. 19, 1991, Ser. No. 746,728

Claims priority, application United Kingdom, Aug. 31, 1990, 9019069

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—60.2 **22 Claims**



1. A method of forming a coating comprising a pyrolytically formed oxide layer on a travelling hot glass substrate by contacting the travelling hot glass substrate with coating precursor material in the presence of oxygen, the method comprising:

pyrolytically forming an undercoating layer which is an oxide substratum of said coating and is in an incompletely oxidized state by contacting a surface of the travelling hot glass substrate in an undercoating chamber with an undercoating precursor material in the presence of molecular oxygen in insufficient quantity for full oxidation of the undercoating precursor material on the substrate; and

overcoating the undercoating layer formed on the surface of the hot glass substrate with an upper coating layer while the undercoating layer is still in an incompletely oxidized state and while the travelling hot glass substrate is still hot to thereby preserve the undercoating layer in an incompletely oxidized state.

5,203,904

PROCESS FOR THE PRODUCTION OF BENT GLASS PLATES WITH MORE MARKEDLY BENT AREAS

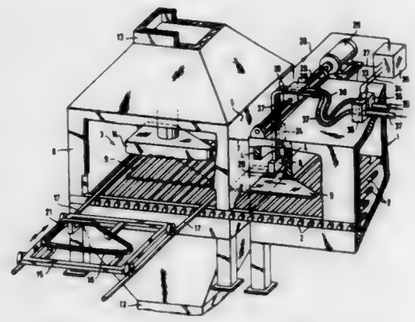
Luc Vanachen, Eupen, Belgium; Hans-Werner Kuster, Aachen, Fed. Rep. of Germany; Hubert Havenith, Wurselen, Fed. Rep. of Germany, and Wilfried Korsten, Heinsberg, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Aug. 16, 1991, Ser. No. 745,713

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 4026094

Int. Cl.[5] C03B *23/03*

U.S. Cl. 65—106 **6 Claims**



1. Process for the production of bent glass plates with areas of more pronounced bending, comprising the steps of:

homogeneously heating the glass plates in a continuous furnace to the bending temperature;

locally additionally heating the glass plates after leaving the continuous furnace by applying gas flames produced by acetylene fuel in the areas intended to have more pronounced bending; and

bending the locally additionally heated glass plates in a bending station, wherein the additional heating step is performed in a transition zone between the continuous furnace and the bending station.

5,203,905

HOLDING DEVICE AND METHOD FOR COUNTERBENDING GLAZING PANES

Hans-Werner Kuster, Aachen; Werner Diederen, and Werner Kahlen, both of Herzogenrath, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Oct. 31, 1991, Ser. No. 785,811

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1990, 4034600

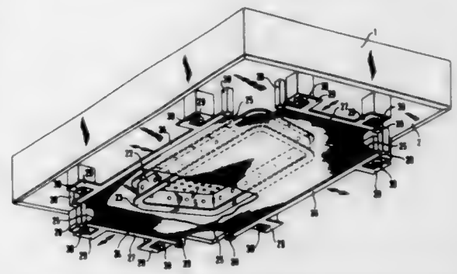
Int. Cl.[5] C03B *23/025*

U.S. Cl. 65—107 **7 Claims**

1. A method for producing a counter-bend in a glazing pane comprising the steps of:

mounting a woven or knitted fabric over a frame having a larger dimensional area than the glazing pane so as to tension said fabric over the frame, said frame being positioned on a bottom plate of a casing; and

applying a vacuum within an area defined by said casing so as to create a differential pressure between a lower surface and an upper surface of the glazing pane for raising the glazing pane against a downwardly facing contact surface of said fabric and deflecting said fabric to produce said counter bend of the glazing pane, wherein the counter-



bend of said glazing pane is proportional to the amount of deflection of said fabric.

5,203,906

ANTI-CLUMPING PRODUCTS, COMPOSITIONS AND TREATMENTS FOR SALTS, SIMPLE AND COMPLEX FERTILIZERS

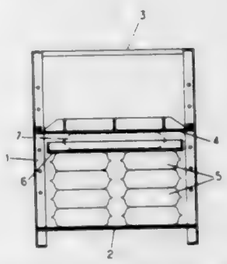
Joseph Schapira, Paris; Jean-Claude Cheminaud, Herblay; Pascal Petitbon, Gennevilliers, and Daniel Chaillou, Sannois, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers Cedex, France

Continuation of Ser. No. 334,437, Apr. 7, 1989, abandoned. This application Nov. 26, 1991, Ser. No. 797,153

Claims priority, application France, Apr. 7, 1988, 88 04614

Int. Cl.[5] C05G *3/10*

U.S. Cl. 71—64.12 **19 Claims**



18. A method for treating products essentially used as simple or complex fertilizers in order to prevent the clumping of said products, comprising the steps of:

a) preparing a product for use essentially as a fertilizer including discharging the product from a preparation zone after the product has substantially acquired its final mechanical properties, and

b) substantially at the moment of discharge, incorporating into the product a composition comprising at least one amine salt of an alkylaryl-sulfonic acid and at least one amine salt of an acid phosphate ester

and wherein the incorporating step is effected by spraying on the product an amount of the composition of 0.03 to 0.4% by weight with respect to the product and wherein the composition comprises:

a) from 5 to 35% by weight of a combination of 15 to 85% of at least one amine salt of an alkylaryl-sulfonic acid and of 85 to 15% of at least one amine salt of an acid phosphate ester, wherein the alkylaryl-sulfonic acid is selected from the group consisting of mono-, di- or trisulfonic acids in which the alkylaryl portion is selected from the group consisting of mono- or polyalkyl-substituted benzene and naphthalene and wherein the acid phosphates esters corre-

spond to a formula selected from the group consisting of

the lance over the slag covered surface above the tap hole

lower end of said conveying conduit in a molten metal

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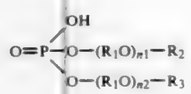
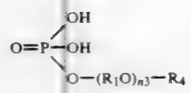
spond to a formula selected from the group consisting of



(I)

and



(II)

in which

R_1 represents an alkylene group having from 2 to 4 carbon atoms,

R_2, R_3 and R_4 represent an alkyl group having from 8 to 20 carbon atoms or an alkylaryl group of which the alkylated portion has from 8 to 12 carbon atoms, and

n_1, n_2 and n_3 represent a number from 0 to 15;

b) from 0 to 10% of a fatty acid or of one of its salts;

c) from 20 to 90% by weight of a mineral oil; and

d) from 0 to 50% by weight of macrocrystalline wax.

5,203,907

ISOXAZOLE- AND ISOTHIAZOLE-5-CARBOXAMIDES

Volker Maywald, Ludwigshafen; Peter Muenster, Neulussheim; Hartmann Koenig, Limburgerhof; Gerhard Hamprecht, Weinheim; Thomas Kuekenhoehner, Boehl-Iggelheim; Helmut Walter, Obrigheim; Karl-Otto Westphalen, Speyer, and Matthias Gerber, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

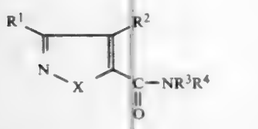
Filed Mar. 11, 1992, Ser. No. 849,256

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1991, 4108181

Int. Cl.[5] A01N *43/26*; C07D *26/06, 275/02*

U.S. Cl. 504—191 **7 Claims**

1. An isoxazole- or isothiazole-5-carboxamide of the formula I



I

where

X is oxygen or sulfur;

R^1 is halogen,

C_1–C_4-alkylaminocarbonyl, di-C_1–C_3-alkylaminocarbonyl or cyclopropylaminocarbonyl;

R^2 is $COOR^5$, where

R^5 is hydrogen; C_1–C_6-alkyl which can carry 1 to 5 halogens and/or up to three hydroxyl and/or C_1–C_4-alkoxy groups;

R^3 is hydrogen or

C_1–C_6-alkyl;

R^4 is hydrogen;

C_1–C_8-alkyl which can carry one to three of the following: halogen, cyano, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-alkylthio, di-C_1–C_4-alkylamino, C_3–C_8-cycloalkyl or phenyl, it being possible for the latter in turn to carry one to three of the following: halogen, cyano, nitro, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, partially or completely halogenated C_1–C_4-alkoxy or C_1–C_4-alkylthio;

C_3–C_8-cycloalkyl which can carry one to three of the following: halogen, nitro, cyano, C_1–C_8-alkyl, partially or completely halogenated C_1–C_6-alkyl, C_1–C_4-alkoxy or partially or completely halogenated C_1–C_4-alkoxy;

C_3–C_6-alkenyl or C_3–C_6-alkynyl, each of which can be substituted one to three times by halogen and/or once by phenyl which in turn can carry one to three of the following groups: C_1–C_4-alkyl;

phenyl which can carry one to four of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, halogen, nitro, cyano, formyl, C_2–C_4-alkanyl, C_2–C_4-haloalkanoyl or C_1–C_4-alkoxycarbonyl;

and the environmentally compatible salts of the compound I.

5,203,908

PROCESS FOR RECOVERY OF FREE ALUMINUM FROM ALUMINUM DROSS OR ALUMINUM SCRAP USING PLASMA ENERGY AT HIGH ENTHALPY

Richard D. Lindsay, and Terry L. Moore, both of Brentwood, Tenn., assignors to Plasma Processing Corporation, Millwood, W. Va.

Filed Mar. 2, 1992, Ser. No. 844,443

Int. Cl.[5] C22B *21/00*

U.S. Cl. 75—10.35 **12 Claims**

1. A process of recovering free aluminum from aluminum dross or aluminum scrap comprising charging aluminum dross or aluminum scrap to a furnace equipped with a plasma arc torch for heating said charge; heating said charge by providing plasma energy to said charge generated by air plasma at an enthalpy of at least about 4,200 BTU/#arc gas; continuing said heating until said molten, and removing free aluminum in the molten state from said furnace.

5,203,909

METHOD AND APPARATUS FOR SLAG FREE CASTING

Robert G. Petrushka, Brecksville, and Franklin E. Rote, Bay Village, both of Ohio, assignors to LTV Steel Company, Inc., Cleveland, Ohio

Filed Oct. 15, 1991, Ser. No. 776,981

Int. Cl.[5] B22D *41/58*

U.S. Cl. 75—375 **28 Claims**

1. In an apparatus for promoting the slag-free tapping of molten metal through a tap hole, the tap hole being located in a metallurgical vessel carried by a support structure, by directing a stream of gas onto a slag covered surface of molten metal, above the tap hole, to substantially clear the surface of slag, thereby impeding the slag from being entrained in the molten metal stream as it is tapped from the vessel, the improvement comprising:

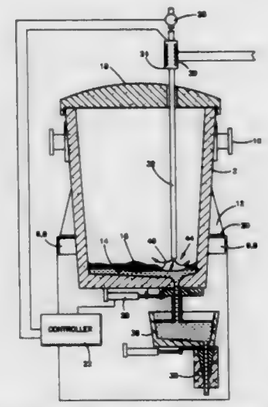
a. a lance feeder means connected to the support structure for positioning a lance in the metallurgical vessel;

b. the lance being drivingly connected to said feeder means for insertion into the metallurgical vessel;

c. connecting means for connecting a substantially non-reactive gas source to the lance;

d. sensor means connected to the vessel to monitor the physical conditions of the vessel and its contents and emit vessel signals representative of said physical conditions; and

e. control means interfaced with the sensor means the lance feeder means to control the positioning of a distal end of the lance over the slag covered surface above the tap hole and to control the flow of the non-reactive gas through the lance to force slag away from the surface of the metal



near the tap hole whereby slag entrainment in the molten metal stream is minimized during tapping of the molten metal from the vessel.

5,203,910

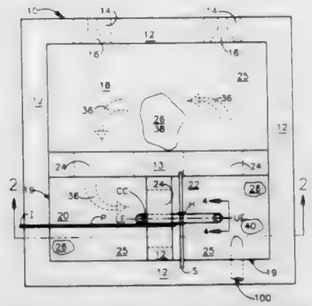
MOLTEN METAL CONVEYING MEANS AND METHOD OF CONVEYING MOLTEN METAL FROM ONE PLACE TO ANOTHER IN A METAL-MELTING FURNACE

Larry D. Areaux, Nathrop, Colo., and Brian Klenoski, Vicksburg, Mich., assignors to Premelt Pump, Inc., Kalamazoo, Mich.

Filed Nov. 27, 1991, Ser. No. 799,114

Int. Cl.[5] C21C *7/00*

U.S. Cl. 75—708 **56 Claims**



1. A method for the conveyance of molten metal from one place to another in a molten metal pool or mass in a metal-melting furnace or out of said molten metal pool, comprising the steps of:

providing an elongated conveying conduit having a lower end and an upper end, at least a portion of said conduit being inclined upwardly from the horizontal,

providing a gas feed means having a gas inlet port and a gas exit port,

positioning the exit port of said gas feed means with respect to the lower end of said conveying conduit so as to enable release of gas from said exit port into said conveying conduit at or adjacent its lower end,

submerging the exit port of said gas feed means and the lower end of said conveying conduit in a molten metal mass or pool,

introducing inert gas into said gas feed means through the gas inlet port thereof and causing said gas to emerge from the exit port thereof into said conveying conduit at or adjacent its lower end and to rise up the incline therein, and

inducing concomitant flow of molten metal in said conveying conduit by means of said gas exiting from the exit port of said gas feed means and into said conveying conduit at or adjacent its lower end and rising up the incline therein.

5,203,911

CONTROLLED ELECTROLESS PLATING

Prasit Sricharoenchaikit, Millis; Gary S. Calabrese, North Andover, and Michael Gulla, Millis, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Jun. 24, 1991, Ser. No. 719,979

Int. Cl.[5] C23C *18/34, 18/40*

U.S. Cl. 106—1.26 **16 Claims**

1. An aqueous electroless metal plating solution comprising a source of metal ions, a complexing agent for said metal ions, a reducing agent capable of reducing said metal ions to metallic form in the presence of a catalytic surface and a pH adjustor, said metal ions being present in a concentration ranging between about 0.001 and 0.01 moles per liter and said remaining solution components being present in solution in a concentration whereby the rate at which metal plates from solution does not exceed 100 Angstroms per minute.

5,203,912

ANIONIC DYE

David Greenwood; Nigel Hughes, both of Oldham; Ronald W. Kenyon, Manchester, all of England, and Suraj L. Hindagolla, Corvallis, Oreg., assignors to Imperial Chemical Industries PLC, London, England

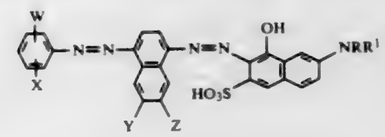
Division of Ser. No. 398,369, Aug. 24, 1989, Pat. No. 5,053,495. This application Jun. 24, 1991, Ser. No. 719,342

Claims priority, application United Kingdom, Aug. 24, 1988, 8820117; Jun. 12, 1989, 8913460

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 K **25 Claims**

1. An ink comprising an effective amount of a dye to color said ink of Formula I, or a salt thereof, and an aqueous medium, said Formula I being the following:



I

wherein

W is COOH

X is selected from the group consisting of H, COOH, SO_3H, halo, nitro, cyano, C_{1-6}-alkyl, C_{1-6}-acylamino;

Y is H, COOH or SO_3H;

Z is H, COOH or SO_3H;

R is H or C_{1-6}-alkyl; and

R^1 is H or C_{1-6}-alkyl;

as a collar to metal oxide varistor valve block cylindrical

(b) intermixing with said slurry from about 10 to 20% of

applicator including first means for applying a first coating composition directly onto a first web;

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R^1 is H or C_{1-6}-alkyl;
provided that there are at least two COOH groups and that the number of COOH groups is equal to or greater than the number of SO_3H groups.

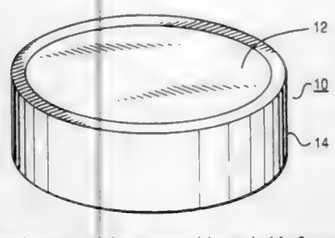
5,203,913
ERASABLE AQUEOUS INK COMPOSITION
Hiroyoshi Yamamoto, Kobe, and Shingo Uzukawa, Kashiwara, both of Japan, assignors to Sakura Color Products Corporation, Japan
Filed Oct. 11, 1991, Ser. No. 768,214
Claims priority, application Japan, Feb. 13, 1990, 2-33406
Int. Cl.[5] C09D *11/16*
U.S. Cl. 106—22 B 4 Claims

1. An erasable aqueous ink composition comprising, based on the total weight of the ink composition, 3 to 50% of a resin having a minimum film-forming temperature of not lower than 40° C., 0.01 to 10% of a water-insoluble dyes, 0.5 to 50% of a water-soluble organic solvent and 20 to 60% of water.

5,203,914
DENTAL COMPOSITION FOR IMPRESSION-TAKING
Shunichi Futami, Nagareyama, and Hiroshi Kamohara, Tokyo, both of Japan, assignors to GC Corporation, Tokyo, Japan
Filed Jun. 10, 1991, Ser. No. 712,425
Claims priority, application Japan, Jun. 11, 1990, 2-149888
Int. Cl.[5] C09K *3/00*
U.S. Cl. 106—35 9 Claims

1. A dental impression composition which contains
4 to 40% by weight of an acetoacetylated polyvinyl alcohol having an acetoacetylation degree of 0.5 to 15 mol % and a polymerization degree of 100 to 1,500,
1 to 20% by weight of a gelling agent comprising one or more members selected from the group consisting of aldehyde, hydrazides and amines and
20 to 85% by weight of fillers comprising one or more members selected from the group consisting of titanium oxide, silica, alumina and basic aluminum sulfate, all having a mean particle size of 1 mμ to 5 μm and a pH value of 7.0 or less.

5,203,915
PASSIVATING COATING FOR METAL OXIDE VARISTORS
Mohammed A. Alim, Medina, Ohio, assignor to Hubbell Incorporated, Orange, Conn.
Continuation-in-part of Ser. No. 704,216, May 22, 1991, abandoned. This application Mar. 23, 1992, Ser. No. 855,678
Int. Cl.[5] C04B *14/10, 12/02*
U.S. Cl. 106—286.2 9 Claims



1. A passivating coating composition suitable for application as a collar to metal oxide varistor valve block cylindrical surfaces comprising a mixture by dry weight of 55–85% mullite and 15–45% kaolinite, from 0.03 to 15% by weight of the coating composition of one of the following additive compounds: Y_2O_3; ZrO_2; ZnO; $2ZnO{\cdot}3B_2O_3{\cdot}7H_2O$; $3ZnO{\cdot}2B_2O_3{\cdot}5H_2O$; or Si_3N_4, and sufficient deionized water to form a sprayable slurry.

5. A passivating coating composition suitable for application as a collar to metal oxide varistor valve block cylindrical surfaces comprising a mixture by dry weight of 55–85% mullite and 15–45% kaolinite, from, 0.15 to 15% by weight of the coating composition including wafer of TiO_2 in addition to the amount of TiO_2 that may be inherently present in the kaolinite as an impurity and sufficient deionized water to form a sprayable slurry.

5,203,916
TITANIUM DIOXIDE PIGMENT AND METHOD OF PREPARATION
Kelly A. Green, Edmond, and Thomas I. Brownbridge, Oklahoma City, both of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.
Filed Apr. 10, 1992, Ser. No. 866,705
Int. Cl.[5] C04B *1/00*
U.S. Cl. 106—438 36 Claims

23. A method of preparing a pigmentary composite consisting essentially of the steps of:
(a) dispersing a particulate titanium dioxide base in water to form an aqueous titanium dioxide slurry;
(b) adding a water soluble zirconium compound to said slurry which is hydrolyzable to form a hydrous zirconium oxide precipitate;
(c) forming a layer consisting essentially of hydrous zirconium oxide on said titanium dioxide base by allowing said hydrous zirconium oxide precipitate to deposit on said titanium dioxide base while maintaining the pH of said slurry in the range of from about 7 to about 9;
(d) after step (c), adding a water soluble aluminum compound to said slurry which is hydrolyzable to form a hydrous alumina precipitate;
(e) forming a layer consisting essentially of hydrous alumina on said layer of hydrous zirconium oxide by allowing said hydrous alumina precipitate to deposit on said layer of hydrous zirconium oxide;
(f) during steps (d) and (e), maintaining the pH of said slurry in the range of from about 7 to about 9 and the temperature of said slurry in the range of from about 115° F. to about 122° F.; and
(g) recovering said pigmentary composite from said slurry.

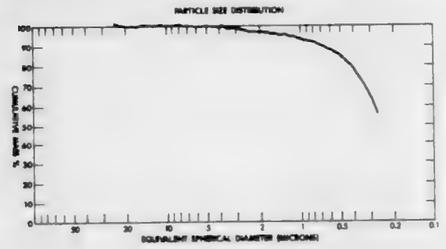
5,203,917
BISMUTH VANADATE PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE
Friedrich Schwochow, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany
Filed Dec. 9, 1991, Ser. No. 803,573
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1990, 4040849
Int. Cl.[5] C04B *14/00*
U.S. Cl. 106—479 4 Claims

1. Bismuth vanadate pigments in the form of the tetragonal crystal structure of Scheelite, containing from 0.1 to 0.3 mol of ZrO_x, per mol of $BiVO_4$.

5,203,918
METHOD FOR FORMING AGGREGATED KAOLIN PIGMENT
C. Arlyn Rice, Sandersville, Ga., assignor to ECC America Inc., Atlanta, Ga.
Continuation of Ser. No. 534,123, Jun. 4, 1990, abandoned. This application Aug. 7, 1992, Ser. No. 927,235
Int. Cl.[5] C08B *14/04*
U.S. Cl. 106—486 7 Claims

1. A method for forming an aggregated kaolin clay pigment, consisting essentially of:
(a) preparing an aqueous 6–30% solids slurry of a fine particle size feed kaolin;

(b) intermixing with said slurry from about 10 to 20% of alum, by weight of the dry kaolin;
(c) adding to the mix of step (b) from about 15 to 30% of sodium silicate, by weight of the dry kaolin;
(d) mixing the reactants of step (c); and



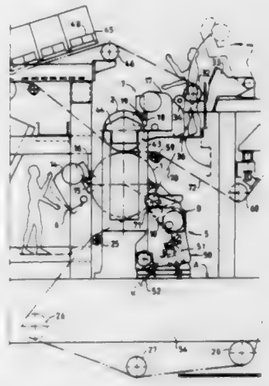
(e) filtering and drying the slurry to recover aggregates of adherent kaolin platelets;
the steps (b), (c) and (d) being carried out at a pH in the range of from about 3.5 to 5.0.

5,203,919
METHOD AND COMPOSITIONS FOR STABILIZING CONCRETE RESIDUES
Gregory S. Bobrowski, Chagrin Falls, and Robert J. Ryan, Maple Heights, both of Ohio, assignors to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 507,704, Apr. 10, 1990, abandoned, which is a continuation of Ser. No. 408,638, Sep. 18, 1989, abandoned, which is a continuation of Ser. No. 144,886, Jan. 14, 1988, abandoned. This application Mar. 27, 1992, Ser. No. 861,152
Int. Cl.[5] C04B *16/00, 24/00*
U.S. Cl. 106—802 17 Claims

1. A method for stabilizing concrete residue in a ready-mix truck drum consisting essentially of the steps of:
1) adding water to the ready-mix truck drum to form a slurry with the concrete residue therein;
2) adding from 32 to 96 fluid ounces of a stabilizing agent to stabilize the concrete slurry for a period of time; the stabilizing agent being selected from the group consisting of a phosphonic acid derivative; a hydroxycarboxylic acid or salt thereof; a polycarboxylic acid or salt thereof; ascorbic acid, isoascorbic acid; a sulphonic acid-acrylic acid copolymer; a polyhydroxysilane; a polyacrylamide; a carbohydrate; a lignosulfonate; and mixtures thereof;
3) mixing the stabilizing agent and drum contents to form a stabilized concrete slurry; and
4) thereafter adding fresh concrete to the stabilized concrete slurry.

5,203,920
DEVICE FOR APPLYING A COATING COMPOSITION TO TRAVELING WEBS OF MATERIAL ON TWO WEB PATHS
Anton Plomer, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany
Filed May 1, 1991, Ser. No. 694,133
Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014647
Int. Cl.[5] B05C *1/12, 3/132*
U.S. Cl. 118—206 13 Claims

1. A device for applying coating composition to a web which passes through the device on a selected one of two different web paths, the device comprising:
a lower rotatable counter roll having a first periphery for support of a web thereon and being rotatable between spaced apart first and second sides;
a first applicator at the first side of the counter roll, the first applicator including first means for applying a first coating composition directly onto a first web;
first web guide means for guiding the first web along the first one of the web paths around the counter roll past the first applicator;
a second applicator at the second side of the counter roll, the second applicator including second means for applying a second coating composition to the counter roll at the second side;
a rotatable upper press roll located above the counter roll at a distance therefrom as to form a nip with the counter roll at the top of the counter roll; the press roll having a respective second periphery and being rotatable between respective spaced apart third and fourth sides, the nip being formed between the first and second sides of the counter roll and the third and fourth sides of the press roll;
a third applicator at the third side of the press roll, the third



applicator including third means for applying a third coating composition to the press roll at the third side;
second web guide means for guiding a second web along the second web path through the nip between the counter roll and the press roll and not past the first applicator;
the second web guide means being so positioned and the counter roll and the press roll being so rotatable that the second path of the second web is through the nip from the first to the second sides of the counter roll;
first web guide means including first guide rollers being positioned for directing the first web up to the counter roll from below such that the first web approaches the counter roll from below and from the second side of the counter roll; and
respective first and second means for mounting the counter roll and the press roll for rotation, and at least one of the mounting means being movable for adjusting the width of the nip between the rolls.

5,203,921
APPARATUS FOR PAINTING SHEAR CAULKED PART OF BRAKE BOOSTER
Shinichi Yamashita, and Hidefumi Inoue, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan
Filed Jan. 18, 1991, Ser. No. 643,447
Claims priority, application Japan, Feb. 14, 1990, 2-33177
Int. Cl.[5] B05D *1/02;* B05B *13/00*
U.S. Cl. 118—320 3 Claims

1. In an apparatus for painting a shear caulked portion of a brake booster, said brake booster being comprised of a pair of members disposed in opposing relationship to each other and connected together by shear caulked portions at a peripheral portion of both members which are disposed in abutment

against each other, the improvement comprising a support

5,203,923
APPARATUS FOR PAINTING HIGHWAY MARKINGS

5,203,924
flow controller, the gas inlet being connected with the

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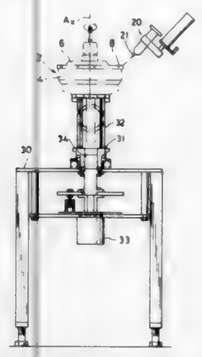
against each other, the improvement comprising a support means for supporting the shell for rotation about axis thereof;

a paint applicator means disposed in opposing relation to an outer periphery of the shell and aligned with the shear caulked portions for projecting a paint only to the shear caulked portions; and



drive means for intermittently rotating the shell about the axis thereof and through a first angle so that each of the shear caulked portions is successively oriented opposite to the paint applicator so that the paint applicator means can apply a paint only to the shear caulked portions.

5,203,922

APPLICATION DEVICE

Norio Shibata; Yasuhito Hiraki, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

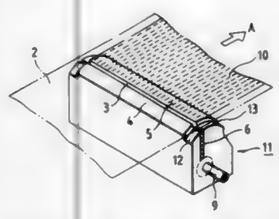
Division of Ser. No. 666,461, Mar. 5, 1991, Pat. No. 5,099,786, which is a continuation of Ser. No. 390,808, Aug. 8, 1989, abandoned. This application Oct. 21, 1991, Ser. No. 779,903

Claims priority, application Japan, Aug. 15, 1988, 63-201996

The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.

Int. Cl.[5] B05C *3/18*

U.S. Cl. 118—410 **2 Claims**



1. In an application device for applying a liquid to a surface of a moving web comprising an application head disposed below said web and pushed against said web, said application head having a rear portion and a doctor portion with a slot being formed between said rear portion and said doctor portion for application of said liquid to said web, said slot directing a flow of said liquid therethrough upward to said web, the improvement wherein said slot has a length less than a width of said web so as to leave liquid-free edge portions on said web, and steps are formed in both side portions of said rear portion and said doctor portion of said application head at ends of said slot below said web in regions corresponding to liquid-free edge portions of said web outward of said webs of said slot, said steps extending to and being contiguous with respective ends of said slots through which said liquid is applied.

5,203,923

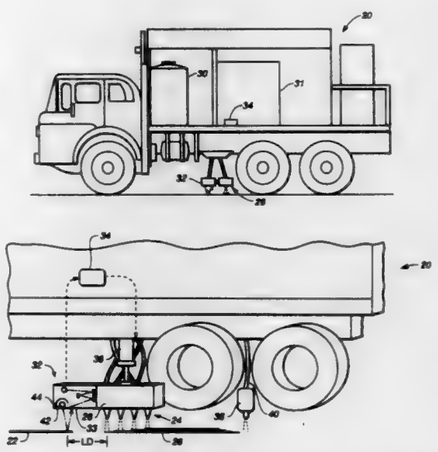
APPARATUS FOR PAINTING HIGHWAY MARKINGS

William H. Hartman, Sacramento, Calif., assignor to Research Derivatives, Inc., Sacramento, Calif.

Filed Nov. 27, 1990, Ser. No. 618,674

Int. Cl.[5] B05C *5/00*; E01C *23/16*

U.S. Cl. 118—669 **15 Claims**



1. In a traffic paint pavement marking system adapted for installation on a vehicle including a paint supply and paint gun means for applying paint onto the pavement, a control apparatus for repainting old paint markings, said apparatus comprising:

illuminating means capable of stimulating a return spectrum of fluorescent emissions from the pavement;

focusing means for forming a real image of an area of the pavement at a principal focus plane;

spectroscope means having an optical path through said principal focus plane and an entrance slit located at said principal focus plane, and having dividing means for separating the spectral components of said return emissions;

masking means for masking all but a desired one or more wavelengths emitted by a specific chemical contained in said old paint markings, thereby selecting only one or more desired spectral components from the total spectrum being received from the pavement;

photodetector means responsive to said selected spectral components and having an electrical signal output proportional to the intensity of said spectral components;

threshold setting means for establishing a minimum detection level;

means for producing an output voltage above said detection level that is a measure of the presence of said specific chemical in said old paint markings on the surface of the pavement area in view;

a valve drive amplifier controlled by said output voltage, said amplifier having an output signal when said output voltage above said detection level exceeds said minimum detection level; and

an electrical gun valve means on said paint gun means and connected to said valve drive amplifier, to cause said paint gun means to dispense paint in response to said valve drive amplifier output signal and apply new paint material to the pavement when the output voltage for a selected specific chemical is reached.

5,203,924

METHOD OF AND APPARATUS FOR SYNTHESIZING DIAMONDLIKE THIN FILM

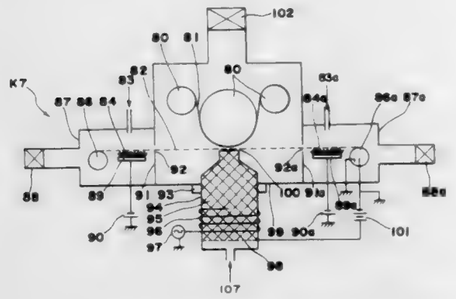
Tsutomu Mitani, Akashi; Hirokazu Nakaue, Higashiosaka, and Hideo Kurokawa, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 26, 1990, Ser. No. 558,241

Claims priority, application Japan, Jul. 31, 1989, 1-198986; Nov. 17, 1989, 1-300503

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—719 **4 Claims**



1. An apparatus for synthesizing a diamondlike thin film on a substrate, comprising:

a first vacuum vessel which has an inflow portion and an outflow portion for gas containing hydrocarbon gas;

a plasma generating means for converting the gas into plasma in said first vacuum vessel;

a second vacuum vessel which is coupled with said first vacuum vessel so as to allow the gas to flow between said outflow portion of said first vacuum vessel and said second vacuum vessel and has a pressure lower than that of said first vacuum vessel;

said substrate being provided in said second vacuum vessel;

a mesh type electrode which is provided upstream of said substrate in a flow path of the gas between said first vacuum vessel and said second vacuum vessel;

a voltage applying means for applying a voltage to said mesh type electrode; and

a supply means for continuously supplying a clean portion of said mesh type electrode to a front of said substrate.

5,203,925

APPARATUS FOR PRODUCING A THIN FILM OF TANTALUM OXIDE

Munehiro Shibuya, Katano; Masatoshi Kitagawa, Hirakata; Takeshi Kamada, Ikeda; Takashi Hirao, Moriguchi, and Hiroshi Nishizato, Narita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 19, 1992, Ser. No. 901,555

Claims priority, application Japan, Jun. 20, 1991, 3-148594; Jun. 20, 1991, 3-148595

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—724 **4 Claims**

1. An apparatus for producing a thin film of tantalum oxide comprising:

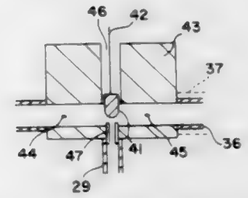
a vacuum chamber having a heater for heating the inside thereof;

an ampule of an organic tantalum compound;

a container of a carrier gas;

a container of an oxygen-containing gas; and

a valve having a liquid inlet, a gas inlet and an outlet, the liquid inlet being connected with the ampule via a liquid flow controller, the gas inlet being connected with the container of a carrier gas and the container of an oxygen-



containing gas, and the outlet being connected with the vacuum chamber.

5,203,926

CLEANSER AND DESENSITIZER FOR PRINTING EQUIPMENT

Louis E. Bondurant, P.O. Box 2074, Middleburg, Va. 22117

Filed Mar. 6, 1992, Ser. No. 847,328

Int. Cl.[5] B41F *35/04*; C09D *5/20*; C11D *7/20, 7/50*

U.S. Cl. 134—42 **7 Claims**

1. A cleanser for use with printing plates and chrome rollers comprising:

2% to 25% by weight of an alcohol selected from the group consisting of isopropyl alcohol, ethyl alcohol and n-propyl alcohol;

0.5% to 5% by weight of a buffer comprising a mono basic alkali metal phosphate selected from the group consisting of monopotassium phosphate, monoammonium phosphate and monosodium phosphate;

1.5% to 25% by weight of a polyhydric alcohol humectant selected from the group consisting of ethylene glycol, glycerin and propylene glycol;

0.5% to 28% by weight of ethylene glycol monobutyl ether;

0.2% to 7.5% by weight of finely powdered anhydrous aluminum silicate;

0.2 to 5% by weight of gum arabic;

0.2% to 12% mineral spirits; and

the balance being water.

7. A method for cleaning a printing plate to thereby increase its effectiveness of printing quality comprising the step of wiping the printing plate with a cloth having been wetted with a solution having

2% to 25% by weight of an alcohol selected from the group consisting of isopropyl alcohol, ethyl alcohol and n-propyl alcohol;

0.5% to 5% by weight of a buffer comprising a mono basic alkali metal phosphate selected from the group consisting of monopotassium phosphate, monoammonium phosphate and monosodium phosphate;

1.5% to 25% by weight of a polyhydric alcohol humectant selected from the group consisting of ethylene glycol, glycerin and propylene glycol;

5% to 28% by weight of ethylene glycol monobutyl ether;

0.2% to 7.5% by weight of powdered anhydrous aluminum silicate;

0.2 to 5% by weight of gum arabic;

0.2% to 12% mineral spirits; and

the balance being water.

5,203,932

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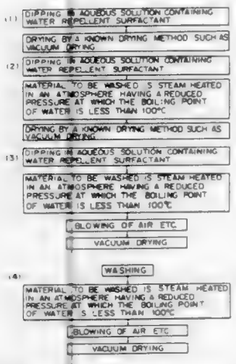
5,203,927

WASHING/DRYING METHOD WITH AN AQUEOUS SOLUTION CONTAINING SURFACTANT

Ichiro Yoshida; Hiroshi Iida; Shuzo Kawashima, all of Nagano; Fukuji Kuroiwa, Shimotakai; Isamu Ito, Suzaka; Satoru Asanome, and Toshiji Fujimori, both of Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1991, Ser. No. 691,915
Claims priority, application Japan, May 1, 1990, 2-116439
Int. Cl.[5] B08B *3/00, 5/04*
U.S. Cl. 134—21 6 Claims



1. A washing/drying method, comprising:

dipping material to be washed into an aqueous solution containing at least one surfactant having a water repellency selected from the group consisting of hydrocarbon surfactants having a C_{12}–C_{18} hydrophobic alkyl group, fluorine surfactants having a C_6–C_{12} fluorinated alkyl group, and hydrophobic silicon surfactants so that at least one molecular layer of the water repellent surfactant is attached to the surface of the material to be washed, and then

drying the material by at least one of vacuum drying, shaking off, blowing gas thereon, and heating.

5,203,928

METHOD OF PRODUCING LOW IRON LOSS GRAIN ORIENTED SILICON STEEL THIN SHEETS HAVING EXCELLENT SURFACE PROPERTIES

Yukio Inokuti, and Yoh Ito, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 540,293, Jun. 19, 1990, abandoned, which is a continuation of Ser. No. 117,154, Sep. 10, 1987, abandoned. This application Oct. 11, 1991, Ser. No. 774,384
Int. Cl.[5] H01F *1/18*
U.S. Cl. 148—111 9 Claims

4. A method of producing from a steel slab a low iron loss, high magnetic flux density grain oriented silicon steel thin sheet having recrystallized grains in a (110)<001> orientation and having excellent surface properties, which comprises incorporating into the steel slab molybdenum, silicon and aluminum as an inhibitor, wherein the amounts of molybdenum, silicon and aluminum are

Si: 3.1~4.5 wt %,

Mo: 0.003~0.1 wt %,

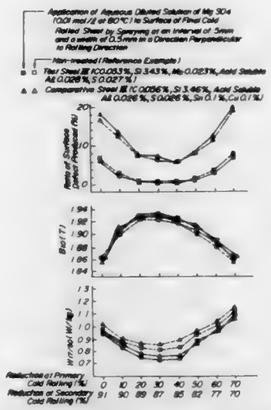
acid soluble Al: 0.005~0.06 wt %, and

at least one of S and Se is present in an amount of 0.005~0.1 wt % in total;

subjecting said steel slab to hot rolling in the presence of said molybdenum and preventing oxidation of the grain boundary to form a hot rolled steel sheet;

subjecting the hot rolled steel sheet to primary cold rolling at a

reduction of 10~60% and an intermediate annealing and a secondary cold rolling at a reduction of 75~90% to obtain a cold rolled thin sheet having a final gauge of 0.1~0.25 mm; subjecting the cold rolled thin sheet to decarburization and primary recrystallization annealing in a wet hydrogen atmosphere; before or after said decarburization and primary recrystallization annealing step subjecting the cold rolled thin sheet to a treatment for the formation of surface modified heterogeneous microareas onto the surface of the thin sheet; and subjecting the thin sheet to high-temperature finish annealing.

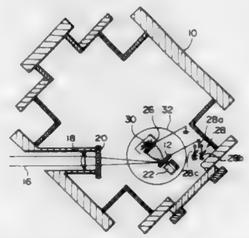


5,203,929

METHOD OF PRODUCING AMORPHOUS MAGNETIC FILM

Noboru Takayanagi, and Kazuhiro Akihama, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 26, 1991, Ser. No. 721,320
Claims priority, application Japan, Jul. 24, 1990, 2-196929; Feb. 13, 1991, 3-20199
Int. Cl.[5] H01F *41/22*
U.S. Cl. 148—121 4 Claims



1. A method of producing an amorphous magnetic film, comprising:

(a) disposing a target consisting of a magnetic metal and a substrate in a confronting manner in a high vacuum chamber;

(b) heating said substrate to a temperature below a crystallization temperature of a film to be produced;

(c) irradiating a laser beam to said target so as to evaporate a target material; and

(c) depositing the evaporated target material on said heated substrate so as to produce a thin film on said substrate.

5,203,930

PROCESS OF FORMING PHOSPHATE COATINGS ON METAL SURFACES

Georg Blümlhuber, Oberasbach; Horst Gehmecker, Hofheim; Dieter Hauffe, Frankfurt am Main; Lothar Kaul, Karben; Thomas Nitschke, Flörsheim; Werner Rausch, Oberursel, and Hardy Wietzoreck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,350
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927613
Int. Cl.[5] C23C *22/12*
U.S. Cl. 148—262 18 Claims

1. A process for forming a phosphate coating on a metal surface, comprising contacting said metal surface with an Fe(II) containing phosphating solution comprising

from 0.4 to 30 g/l Zn;

from 4 to 30 g/l P_2O_5;

from 5 to 50 g/l NO_3;

from greater than 0 to 10 g/l Fe(II);

from greater than 0 to 0.3 g/l Fe(III);

wherein the weight ratio of free P_2O_5 to total P_2O_5 is (0.04 to 0.50) : 1, and replenishing said phosphating solution with Zn, NO_3 and P_2O_5 in a weight ratio of, Zn : NO_3 : P_2O_5 = (0.80 to 0.30) : (0.17 to 0.4) : 1; wherein the Fe(II) content is adjusted by an oxidation with nitrate or nitrite derived from nitrate, optionally employed with an oxygen-containing gas, H_2O_2 and/or nitrous gases, then rinsing said metal surface by a cascade of at least two aqueous rinsing baths in the opposite direction of travel of said metal surface wherein water having a low salt content or being salt-free an derived from the phosphating bath is fed to the last rinsing bath and the overflowing water from said rinsing bath is fed to the next preceding rinsing bath and ultimately to the phosphating bath, respectively, and the low-salt content or salt-free rinse water derived from the phosphating bath is withdrawn therefrom at a rate effective to permit the addition of phosphate-enriched rinsing water from the cascade of rinsing water to the phosphating bath while maintaining a desired species concentration in said phosphating bath.

5,203,931

ELECTRODEPOSITION OF INDIUM-THALLIUM SHAPE MEMORY ALLOYS

Thomas J. O'Keefe, Columbia, Mo., assignor to University of Missouri, Columbia, Mo.

Filed Sep. 20, 1991, Ser. No. 763,343
Int. Cl.[5] C25D *3/56, 5/18*
U.S. Cl. 148—518 14 Claims

1. A process for preparing an indium-thallium alloy which exhibits shape memory transformation at a temperature greater than that temperature at which shape memory transformation would occur for a thermally prepared alloy of the same composition, the process comprising:

providing an article for use as a cathode;

providing an electrolyte by dissolving indium sulfate and thallium sulfate in an acidic solution;

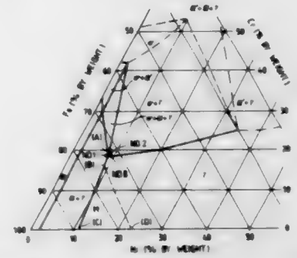
electrodepositing the indium-thallium alloy onto the article, the indium-thallium alloy comprising between about 21 and about 35 atomic percent thallium.

5,203,932

FE-BASE AUSTENITIC STEEL HAVING SINGLE CRYSTALLINE AUSTENITIC PHASE, METHOD FOR PRODUCING OF SAME AND USAGE OF SAME

Takahiko Kato; Akira Yoshinari, both of Katsuta; Shinzoo Ikeda, Toukai; Michiyoshi Yamamoto, Hitachi; Hideyo Kodama, Katsuta; Hisashi Sato, Hitachi; Masakiyo Izumiya, Mito, and Yasuhisa Aono, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,380
Claims priority, application Japan, Mar. 14, 1990, 2-61008
Int. Cl.[5] C22C *38/08, 38/18, 38/40*
U.S. Cl. 148—562 13 Claims



8. Method for producing an austenitic steel which has superior characteristics in resistance against stress corrosion cracking and which has a composition consisting essentially of

Ni of 9–30%, Cr of 16–18.5%, and balance Fe of at least 45% by weight, said method comprising the steps of

forming molten metal of the austenitic steel which has whole austenitic structure in the equilibrium diagram at 700° C.;

casting the molten austenitic steel into a mold heated at a temperature between 1500° C. and 1650° C.;

keeping the molten metal in the mold in a vacuum lower than 3×10^{-3} Torr or in an inert gas atmosphere for a predetermined time;

forming an initial solidified part having crystals which are oriented in one direction by cooling one end of the mold so as to solidify the steel in one direction;

forming a further solidified part which is composed of an austenitic single crystal by solidifying the molten metal from the initial solidified part in a selector of the mold to form an austenitic single crystal and progressively cooling the mold in said one direction from said one end to another end to progressively solidify the melt and grow said austenitic single crystal at a rate of 1–50 cm/h;

performing cutting work on the casting; and

performing of solution treatment to homogenize an alloy composition of the austenitic single crystalline casting by heating the casting at least once at a temperature between 1,000° C. and 1,300° C. after completion of solidification.

5,203,933

TIRES FOR MOTOR VEHICLES

Kouichi Nagahisa, 2-37, Ekinan 4-chome, Takaoka-shi, Toyama-ken 933, Japan

Filed Dec. 11, 1990, Ser. No. 625,966
Int. Cl.[5] B60C *11/11*
U.S. Cl. 152—209 R 11 Claims

1. A tire for a motor vehicle, said tire having a ground-contacting tread having a tread pattern comprising a plurality of large-size convex portions, a plurality of middle-size convex portions, a plurality of small-size convex portions and a plurality of concave, suction portions surrounded by said large-size, said middle-size and said small-size convex portions, said convex portions having outermost ground-contacting tread surfaces, the heights of said large-size convex portions being greater than the heights of said middle-size convex portions and the heights of said middle-size convex portions being

greater than the heights of said small-size convex portions, the

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5,203,938

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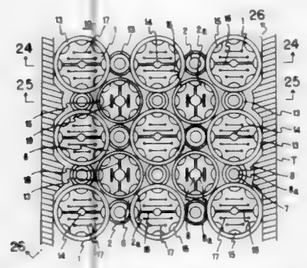
greater than the heights of said small-size convex portions, the areas of said large-size convex portions being greater than the areas of said middle-size convex portions at the outermost



ground-contacting tread surfaces thereof, and the areas of said middle-size convex portions being greater than the areas of said small-size convex portions at the outermost ground-contacting tread surfaces thereof.

5,203,934

PNEUMATIC RADIAL TIRE WITH HIGH DURABLE BEAD PORTIONS

Hiroyuki Iida, and Hiroyuki Koseki, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 382,594, Jul. 21, 1989. This application Jul. 8, 1991, Ser. No. 726,674

Claims priority, application Japan, Jul. 21, 1988, 63-180292

Int. Cl.[5] B60C *3/00, 9/02*

U.S. Cl. 152—454 **5 Claims**

1. A pneumatic radial tire with high durable bead portions, comprising; a pair of bead portions each having a bead core, a pair of sidewalls and a tread extending between the sidewalls, a carcass extending between the bead portions and consisting of plies with cords radially arranged, at least one ply being turned up about said bead cores of the bead portions from inside to outside of the tire in a turn-up construction, wherein a carcass pass line in radial section of the tire in its self-holding position filled with 5% of a normal inner pressure under no-load condition comprises curvatures changing areas (v) in a carcass pass line curved toward the turned-up portions in the proximities of positions corresponding to a height (h) of turn-up ends of the ply from a bead base line to cause compressive stresses in the bead portions near the turn-up ends of the ply by deformations of the carcass when the tire is filled to normal inner pressure, each of said curvature changing areas (v) of the carcass pass line is smoothly continuous with a zone (w') on a side remote from the bead core through an inflation point of the carcass pass line and is within a carcass pass line area extending a radial distance corresponding to 8% of a maximum radial height (H) of the carcass pass line measured from the bead base line on radially inward and outward side of the turn-up ends of the ply, and curvature changing areas (v) of said pass line have large curvatures with two circumferentially spaced tangential points on said pass line having a difference in angles of said tangents greater than 5°, and said zone (w') is located in a portion of the carcass pass line between two points (P) and (Q) radially spaced from said height (h) by a radial distance (i) corresponding to 24% of said maximum radial height (H), and a radial distance (j) corresponding to 12% of said maximum radial height (H) and said carcass pass line in zone w' having a center of curvature located outside of the tire.

5,203,935

METHOD OF PRODUCING PACKAGING MATERIAL HAVING A TEAR TAPE

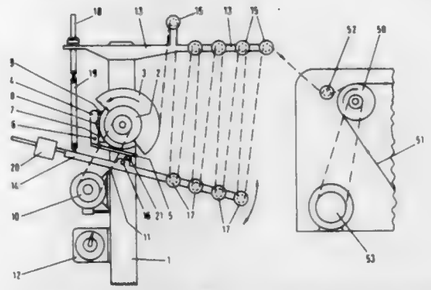
Geoffrey B. May; Brian F. Davis, and Wladyslaw L. Nowak, all of Nottingham, United Kingdom, assignors to Payne Packaging Limited, Giltway, United Kingdom

Continuation of Ser. No. 294,749, Jan. 9, 1989, abandoned, which is a division of Ser. No. 595,311, Mar. 30, 1984, Pat. No. 4,844,962. This application Jul. 19, 1991, Ser. No. 733,365

Claims priority, application United Kingdom, Mar. 31, 1983, 8308932

Int. Cl.[5] B32B *31/08;* **B65B** *61/18*

U.S. Cl. 156—64 **6 Claims**



1. A method of producing filmic packaging material having a tear tape adhered thereto which method comprises:

(a) providing a reel of tear tape comprising an oriented thermoplastic material base film coated with a pressure sensitive adhesive composition;

(b) adhering an end portion of the tear tape to a portion of the packaging material by means of the pressure sensitive adhesive composition;

(c) moving the packaging material by means of a drive mechanism so as to move the tear tape along a path in a manner such that successive portions of the tear tape are drawn into contact with successive portions of the packaging material and become adhered thereto; and

(d) controlling the speed of feed of the tear tape relative to the speed of movement of the packaging material, so as to minimize tension imbalance between the tear tape and the packaging material, by:

braking the reel of tear tape so as to reduce the speed of rotation of the reel in response to a reduction in tension of the tear tape passing along said path, and

directly driving the reel of tear tape while decreasing braking thereof, so as to increase the speed of rotation of the reel, in response to an increase in tension of the tear tape passing along said path;

wherein the reel of tear tape is driven by a separate drive mechanism from that which moves the packaging material.

5,203,936

CLEAN BURNING GREEN CERAMIC TAPE CAST SYSTEM USING POLYISOBUTYLENE BINDER

Leonard E. Dolhert, Clarksville, Md., and James D. Idol, Jr., Worthington, Ohio, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Dec. 16, 1991, Ser. No. 808,138

Int. Cl.[5] C03B *29/00;* **C04B** *33/34*

U.S. Cl. 156—89 **12 Claims**

1. A method of forming a dense ceramic article, said method comprising:

a) forming a slip consisting essentially of ceramic particles, a dispersant, a plasticizer, a solvent, and a polyisobutylene binder,

b) casting said slip onto a sheet to form a tape,

c) recovering said tape from said sheet, and

d) heating said tape in a reducing atmosphere to remove said binder and densify said ceramic.

5,203,937

MANUFACTURE OF A REINFORCED TUBULAR ARTICLE

Anthony G. Goodfellow, Liverpool, United Kingdom, assignor to Bridgestone/Firestone Inc., Akron, Ohio

PCT No. PCT/GB89/00260, § 371 Date Aug. 22, 1990, § 102(e) Date Aug. 22, 1990, PCT Pub. No. WO89/08546, PCT Pub. Date Sep. 21, 1989

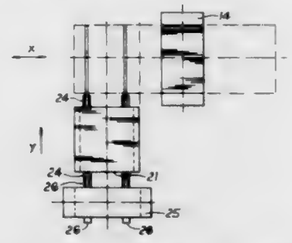
PCT Filed Mar. 13, 1989, Ser. No. 566,397

Claims priority, application United Kingdom, Mar. 12, 1988, 8805924

The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.[5] B29D *30/30;* **B29C** *53/42*

U.S. Cl. 156—133 **15 Claims**



1. A method for the manufacture of a reinforced tubular article, comprising forming at a first work station a flexible tubular reinforcement structure comprising a layer of polymeric material having at least partially embedded therein at least one reinforcing element, cutting said flexible tubular reinforcement structure transversely between the axial ends of the structure when at the first work station to provide a pair of transverse edges, feeding said flexible reinforcement structure onto a carrier at the first work station for transport thereon to a second work station, transporting the flexible reinforcement structure from the first to the second work station whilst supported by the carrier and maintained in an accurate stationary location relative to the surface of the carrier and winding the flexible reinforcement structure at a second work station into a substantially tubular form in which said transverse edges extend substantially in the circumferential direction.

5,203,938

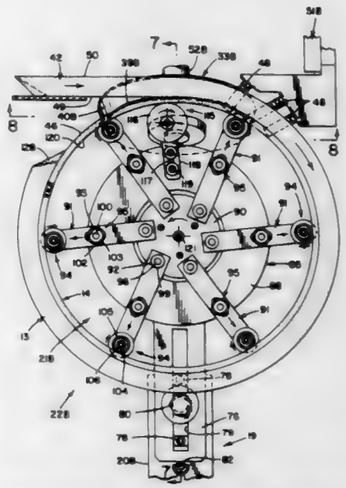
METHOD AND APPARATUS FOR FORMING AN APEX FILLER AND/OR APPLYING AN APEX FILLER TO A BEAD RING SUB-ASSEMBLY

Dale R. Moody, Dana Point, and Robert A. Cronin, Irvine, both of Calif., assignors to Heico Aluminum Products, Inc., Akron, Ohio

Division of Ser. No. 648,898, Jan. 31, 1991, Pat. No. 5,100,497. This application Nov. 12, 1991, Ser. No. 791,043

Int. Cl.[5] B29D *30/50*

U.S. Cl. 156—136 **4 Claims**



1. A method of forming an apex filler and also applying the apex filler onto a ring sub-assembly, said method comprising:

mounting a ring sub-assembly on a roller chuck, the ring sub-assembly having a substantially annular inner periphery adapted to be contacted by roller members on the chuck, a substantially annular outer periphery and a pair of laterally spaced sidewalls joining the inner and outer surfaces;

extruding a substantially linear elastomeric strip having an apex, a base and a pair of sidewalls converging between the base and the apex such that the elastomeric strip is narrower at the apex than at the base;

engaging the sidewalls of the ring sub-assembly and the sidewalls of the elastomeric strip with a pair of opposed, driven frusto-conical rollers, the base of the elastomeric strip being forced into contact with the outer periphery of the ring sub-assembly to effect at least temporary tacking therebetween;

pressing the elastomeric strip between the frusto-conical rollers while causing rotation of the ring sub-assembly and the base of the elastomeric strip at a first linear speed, the apex at a second, and greater, linear speed and the sidewall of the elastomeric strip at a linear speed substantially proportional to the distance from the base to the apex,

thereby elongating the elastomeric strip in a radially differential manner as determined by the frusto-conical rollers to form an annulus circumferentially about the ring sub-assembly with the base of the elastomeric strip having a linear dimension equal to the circumference of the outer, substantially annular periphery of the ring sub-assembly and the apex of the elastomeric strip having a linear dimension sufficient to form a substantially stress-free annulus; and,

splicing the ends of the elastomeric strip to close the annulus.

the decorative coating thereof facing toward the extruded

the second nip from the releasable layer as the substrate

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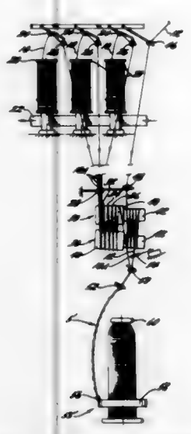
5,203,939

PROCESS FOR PRODUCTION OF INTERNALLY BONDED SEWING THREADS

Philip E. Sperling, Charlotte, N.C.; Robert M. Gailey, Paisley; Leslie A. Bathie, Glasgow, both of Scotland, and A. Edwin Suttle, Marion, N.C., assignors to Coats Viyella, PLC, Manchester, England

Filed Aug. 5, 1991, Ser. No. 741,053
Int. Cl.[5] D02G 3/40
U.S. Cl. 156—148 22 Claims



1. A process for the preparation of internally bonded sewing thread comprising:

providing a plied thread having three multifilament yarns wrapped helically about a low melting point core yarn;

winding said plied thread onto a heating drum at a uniform tension in the range of between about 50 and about 500 grams;

heating said drum comprising said wound plied thread in a closed autoclave with superheated steam at a temperature above the melting point of said core yarn and for a time sufficient to soften said core yarn throughout the length of the plied thread wound on said drum to thereby provide said internally bonded sewing thread; and

thereafter wet processing said internally bonded sewing thread at a temperature above the melting point of said low melting point core yarn.

5,203,940

METHOD AND APPARATUS FOR THERMOFORMING PLASTIC SHEETS

James R. Krone, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1991, Ser. No. 796,498
Int. Cl.[5] B32B 31/04
U.S. Cl. 156—196 7 Claims

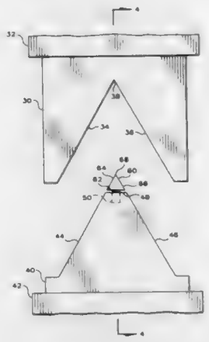
1. Thermoforming apparatus comprising:

a first and second platen;

a mold cavity attached to said first platen wherein said mold cavity comprises a first mold cavity wall and second mold cavity wall, wherein said first mold cavity wall converges toward said second mold cavity wall and said first and second mold cavity walls mutually intersect along a recessed wedge-shaped mold cavity edge;

a mold plug attached to said second platen wherein said mold plug comprises a first mold plug wall and a second mold plug wall, wherein said first mold plug wall converges toward said second mold plug wall, and a mold plug end mutually interconnecting said first mold plug wall and said second mold plug wall of said first and said second mold plug walls' closest convergence;

a mold plug insert comprising a mold plug insert end of equivalent dimensions to said mold plug end, wherein said mold plug insert end is disposed adjacent to said mold plug end, a first mold plug insert wall and a second mold plug insert wall adjacent to said mold plug insert end wherein said first mold plug insert wall converges toward



said second mold plug insert wall and said first and second mold plug insert walls mutually intersect along a protuberant wedge-shaped edge; and

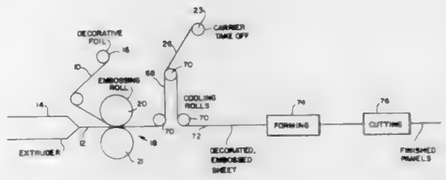
pressure-exerting means disposed between said mold plug and said mold plug insert for urging said mold plug insert outwardly from said mold plug.

5,203,941

PROCESS FOR MANUFACTURING PLASTIC SIDING PANELS WITH OUTDOOR WEATHERABLE EMBOSSED SURFACES

Patrick L. Spain, Lowell, and Keith L. Truog, Crown Point, both of Ind., assignors to Avery Dennison Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 424,130, Oct. 19, 1989, abandoned. This application Oct. 17, 1990, Ser. No. 599,034
Int. Cl.[5] B32B 31/08, 31/22
U.S. Cl. 156—209 53 Claims



1. A process for making plastic panels with an embossed low gloss decorative surface transfer-laminated to an extruded plastic sheet, comprising:

forming a matte release layer on a continuous, thin, flexible, heat-resistant carrier sheet, the matte release layer containing a resinous material hardened at an elevated temperature to form a continuous heat-resistant resinous film permanently bonded to the carrier sheet and having a micro-roughness on a release-coated outer surface thereof;

forming a decorative coating on the micro-roughened, release-coated outer surface of the hardened matte release layer to thereby form a thin, flexible transfer laminate;

extruding a plastic sheet at an elevated temperature through an extruder die exit opening, the extruded sheet having a heat of extrusion adjacent the extruder die exit opening;

overlaying the transfer laminate on the extruded sheet with the decorative coating thereof facing toward the extruded sheet;

applying pressure to the transfer laminate and to the extruded sheet from an embossing roll on the side of the transfer laminate opposite from the extruded sheet, said embossing being directed through the matte release-coated carrier sheet and toward the extruded sheet while the temperature of the extruded sheet is maintained near its heat of extrusion, thereby transferring heat to the decorative coating while the mate release layer remains in its heat-resistant condition under the heat from the extrusion to provide a continuous heat transfer barrier between the carrier sheet and the extruded sheet, to thereby continuously transfer the decorative coating from the matte release layer and bond the decorative coating to the extruded sheet under the applied pressure, the transferred decorative coating being maintained in a pliable condition under the heat transferred thereto while the micro-roughness of the hardened matte release layer transfers a low gloss outer surface to the decorative coating, the embossing roll continuously embossing three-dimensional impressions through the matte release-coated carrier sheet and into the outer surface of the pliable decorative coating; and

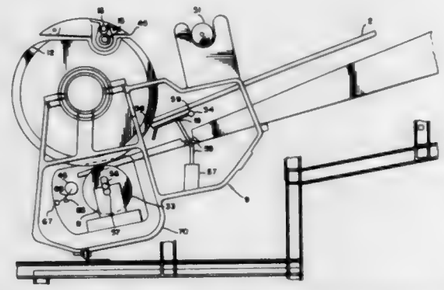
thereafter releasing the carrier sheet and its hardened resinous film from the embossed low gloss decorative coating after the embossed impressions have set permanently through a temperature reduction to thereby form a panel having said embossed low gloss surface.

5,203,942

DELAMINATOR APPARATUS AND METHOD

Bradley C. DeCook, Rochester, and Kevin S. Reitter, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1991, Ser. No. 749,009
Int. Cl.[5] B44C 1/165
U.S. Cl. 156—230 3 Claims



1. A method for delaminating a composite material comprising:

a. heating and applying pressure to a prelaminate having a releasable layer and a substrate layer,

b. moving the releasable layer adjacent to and with a material to be laminated, while conveying the material to be laminated and the prelaminate in a first nip formed by a heated drum carrying and retaining the material to be laminated and a heated fuser roller,

c. directing a leading edge of the prelaminate into a second nip formed by the heated fuser roller and a delamination roller,

d. engaging the leading edge of the prelaminate in the second nip,

e. pulling the leading edge of the prelaminate through the second nip, and

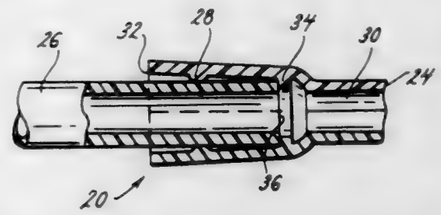
f. ripping the substrate layer of the prelaminate by pulling of the second nip from the releasable layer as the substrate exits the first nip.

5,203,943

METHOD OF FORMING INTERNAL STRICTURES IN A TUBULAR MEMBER AND A BONDING CONNECTION WITH AN INSERTED TUBE

Jon M. Nornberg, Woodbury; Raymond L. Ferguson, St. Paul, and David M. Stoen, Mahtomed, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 13, 1990, Ser. No. 626,826
Int. Cl.[5] F16L 13/02; B32B 31/00
U.S. Cl. 156—245 21 Claims



1. A method of making a connection between the ends of first and second generally tubular members, the method comprising:

forming at least one continuous annular stricture in the lumen of the first tubular member by inserting a mandril, having at least one circumferential annular groove, into the end of the lumen of the first tubular member; heating the portion of the first tubular member surrounding the mandril to form an annular projection in the groove in the mandril; and removing the mandril from the lumen leaving an annular stricture in the lumen of the first tubular member;

inserting the end of the second tubular member into the end of the first tubular member, beyond the stricture, and

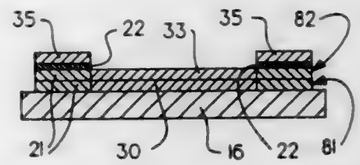
bonding the first and second tubular members together.

5,203,944

METHOD FOR FABRICATION OF THREE-DIMENSIONAL ARTICLES BY THERMAL SPRAY DEPOSITION USING MASKS AS SUPPORT STRUCTURES

Fritz B. Prinz, 5801 Northumberland St.; Lee R. Weiss, 6558 Darlington Rd., both of, Pittsburgh, Pa. 15217, and Duane A. Adams, 2325 N. Richmond St., Arlington, Va. 22207

Filed Oct. 10, 1991, Ser. No. 774,610
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—247 14 Claims



1. A method for the fabrication of a three dimensional article comprising the steps of

a) creating a set of masks, each mask comprised of a support layer and a removable liner thereon, having a cut-away portion through the support layer and liner, each mask corresponding to at least a portion of a cross section through the article such that there is at least one mask for every parallel cross section through the article normal to

5,203,946

METHOD OF AND APPARATUS FOR

reciprocatingly radially movable toward and away from the main shaft to adjust the diameter of the drum and having

an inner position respectively with respect to said spacing, said head being fastened to an end of at least one rod;

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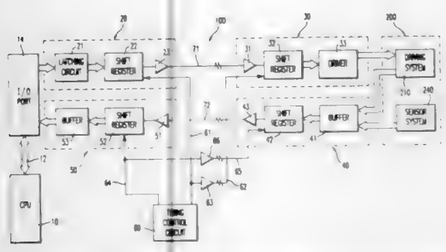
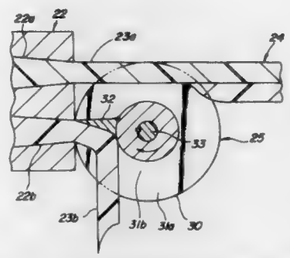
every parallel cross section through the article normal to a centerline through the article;
b) placing on a work surface at least one mask;
c) applying deposition material over the mask to form a layer of deposition material having a first layer portion within the cut-away area and adjacent the support layer of the mask and a second layer portion on the liner;
d) removing the liner and deposition material thereon after applying the deposition material thereby leaving the support layer and the first layer portion;
e) placing another mask selected from the set of masks on the support layer;
f) applying deposition material over the another mask;
g) removing the liner portion of the another mask and any deposition material thereon;
h) repeating steps e) through g) until the article has been formed and;
i) removing the support layers from the article.

5,203,945
PLASMA PROCESSING APPARATUS HAVING DRIVING CONTROL SECTION
Isahiro Hasegawa, Zushi, and Takashi Yokota, Yokohama, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan
Filed Nov. 29, 1991, Ser. No. 800,025
Claims priority, application Japan, Nov. 30, 1990, 2-339786
Int. Cl.[5] B44C *1/22*
U.S. Cl. 156—345 **15 Claims**



1. A plasma processing apparatus having a driving control section comprising:
a plasma processing section, having a driving system, for performing plasma processing; and
a control section for controlling an operation of the driving system of said plasma processing section,
said control section having
control means, arranged to be separated from said plasma processing section, for outputting a digital control signal to the driving system of said plasma processing section,
first converting means, arranged on a side of said control means, for converting a parallel signal from said control means into a serial signal,
second converting means, arranged on a side of said processing section, for converting the serial signal from said first converting means into a parallel signal and outputting the parallel signal to said processing section,
transmitting means for transmitting a serial signal between said first converting means and said second converting means, and
a timing control circuit for controlling timings of transmission/reception signals for said first and second converting means.

5,203,946
METHOD OF, AND APPARATUS FOR MANUFACTURING ELONGATE PLASTIC ARTICLES
Tatsuya Tamura, and Tetsuo Hotta, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Japan
Division of Ser. No. 411,887, Sep. 25, 1989, Pat. No. 5,061,335.
This application Jul. 12, 1991, Ser. No. 729,344
Int. Cl.[5] B29C *47/00*
U.S. Cl. 156—350 **4 Claims**

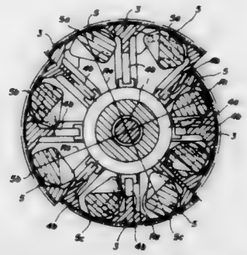


1. An apparatus for manufacturing elongate articles including a plurality of segments which are connected with each other in the longitudinal direction of the article, each segment having a common cross-sectional portion which is common to all the segments, at least one segment further having at least one additional cross-sectional portion, said apparatus comprising:
a single extrusion die head formed with a common orifice of a cross-section which corresponds to that of said common cross-sectional portion of a segment, said die head also formed with at least one additional orifice of a cross-section corresponding to that of said additional cross-sectional portion of said at least one segment;
means for detecting a parameter representing the length of the synthetic resin material extruded from said common orifice;
means for selecting and controlling first and second operational modes of the apparatus in accordance with said detected length such that, in said first operational mode of the apparatus, synthetic resin material is extruded from both said common orifice and said at least one additional orifice of said die head and the extrudant from said at least one additional orifice is diverted away from the extrudant of said common orifice to form a first extruded body corresponding to a first segment and, in said second operational mode of the apparatus, synthetic resin materials are extruded from both said common orifice and said at least one additional orifice of said die head and caused to adhere with each other while they are still sufficiently hot to achieve an adhesion, to form a second extruded body corresponding to a second segment;
a guide means for moving between a first position for forming said first segment, and a second position for forming said second segment and a cutter means for cutting said synthetic resin material extruded from said additional orifice when effecting a change from said first operational mode to said second operational mode, and vice versa.

5,203,947
RADIALLY EXPANDABLE TIRE FORMING DRUM
Pat A. Boeker, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Aug. 27, 1992, Ser. No. 936,206
Claims priority, application Japan, Oct. 7, 1991, 3-259247
Int. Cl.[5] B29D *30/24*
U.S. Cl. 156—417 **4 Claims**

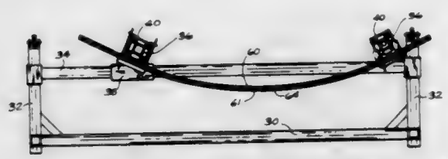
1. A tire forming drum including a plurality of movable main segments arranged around a main shaft of the drum and rotatable together with the main shaft, said movable main segments

reciprocatingly radially movable toward and away from the main shaft to adjust the diameter of the drum and having circular arc surfaces, respectively, on which a tire constituent member is wrapped, wherein said tire forming drum comprises



subsegments arranged between the movable main segments so as to fill clearances occurring between the adjacent main segments in response to the movements of the main segments, and said subsegments having plural circular arc surfaces, respectively, to conform to change in diameter of the drum.

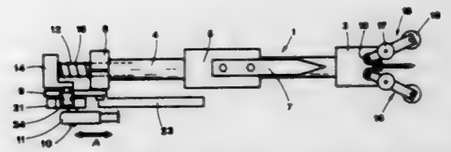
5,203,948
APPARATUS AND METHOD FOR PRODUCING A BENT LAMINATE
Alex Suska, 2404 Pinewood Drive, SE., Calgary, Albera, Canada T2B 1S4
Filed Sep. 16, 1991, Ser. No. 760,735
Int. Cl.[5] B27H *1/00*
U.S. Cl. 156—443 **21 Claims**



19. A method of producing a bent laminate having at least two continuous flexible laminations comprising the steps of:
clamping together the laminations at spaced apart clamping locations and at a clamping force permitting mutual sliding movement of the laminations;
bending the layers between the clamping locations to a radius of curvature larger than a desired radius of curvature;
increasing the clamping force at the clamping locations to prevent the mutual sliding movement; and
further bending the layers to the desired radius of curvature so that the laminations are forced against each other at an even pressure along the curvature, the laminations being of sufficient strength to withstand the pressure created.

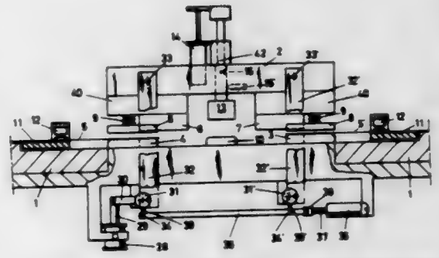
5,203,949
DEVICE FOR TAPING CONTAINERS WITH STRIPES OF ADHESIVE TAPE
Domenico Pattarozzi, S. Lazzaro Di Savena, Italy, assignor to PRB Packaging Systems S.R.L., Bologna, Italy
Filed Jan. 22, 1991, Ser. No. 643,733
Claims priority, application Italy, Jan. 26, 1990, 3317A/90
Int. Cl.[5] B31F *5/00*
U.S. Cl. 156—468 **3 Claims**

1. A unit at a taping station for taping containers with a strip of adhesive tape disposed along a line for conveying containers spaced from one another by a spacing, said taping unit comprising:
an operating head movable alternatively in a direction transverse to said conveying line between an outer position and an inner position respectively with respect to said spacing, said head being fastened to an end of at least one rod;
a support body integral with a frame to slidably guide said at least one rod;
a rear head carrying an articulated arm for driving said operating head between its outer and inner positions, said rear head being driven in reciprocating motion by motive means;
a pair of articulated rocker means on said operating head to intercept a strip of adhesive tape extending from a longitudinal wall of a container downstream of said taping station, said pair of rocker means being biased to diverge outwardly when inserted into said spacing to act by pressure on front and rear faces of containers disposed downstream and upstream respectively of said taping station;



a stem slidable within said rod and having at the end of said operating head a cutting means to cut said strip of adhesive tape held by said rocker means;
means for driving said stem in relation to the insertion of said operating head in said inner position into said spacing at the taping station, means for biasing said driving means to keep said cutting means retracted toward said operating head when said operating head is in said outer position;
wedge means fastened to a support body for insertion between said rocker means when said operating head is in the outer position to actuate a closing of said pair of rocker means.

5,203,950
DEVICE FOR CUTTING ACCORDING TO A SAW TOOTH PATTERN THE EXTREMITIES OF VENEER TAPES BETWEEN TWO PAIRS OF UPPER AND UNDER KNIVES
Lady Spoelders, Hombekerkouter 100, 2930 Mechelen (Hombeek), Belgium
Continuation of Ser. No. 425,753, Oct. 23, 1989, abandoned.
This application Feb. 21, 1992, Ser. No. 841,225
Int. Cl.[5] B31F *5/00*
U.S. Cl. 156—506 **8 Claims**



1. A device for cutting, according to a saw tooth pattern, the extremities of veneer tapes between two pairs of upper and under knives and for gluing those extremities under pressure by using a sledge which pulls an adhesive tape transversely with respect to the extremities of the veneer tapes, a pressure beam over which the extremities of the veneer tapes and the adhesive layers are disposed and on which the necessary pressure is applied by a hammer of an oscillable press and which,

for that purpose, is beared in a vertically displaceable bridge,

between said flange portions being substantially the same

like magazine and are extracted therefrom for being trans-

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for that purpose, is beared in a vertically displaceable bridge, which is movable with respect to a fixed ground plate by the action of two pairs of arms which are kinematically connected to each other, one of the said arms being driven by a pneumatic cylinder, characterized in that the device comprises the following elements:

(a) a means for locking the hammer of said press with respect to said bridge in such a manner that by a downward movement of the bridge the hammer comes into contact with the extremities of the veneer tapes and the adhesive tape resting on the pressure beam;

(b) under and upper knives, the upper knives being attached to the vertically displaceable bridge wherein one of the upper knives extends below the bridge to a greater extent than the other upper knife such that the upper knives cut the veneer tapes at slightly different times, and wherein the upper knives are adjusted at different heights so that they do not come into contact with the under knives when said hammer pushes on the veneer tapes to be glued;

(c) means for bringing said hammer to its resting position when it is unlocked with respect to said bridge;

(d) a hydraulic cylinder for pulling down said bridge;

(e) means for overcoming the pressure exerted by springs on the under knives.

5,203,951

TAPE ALIGNMENT MECHANISM

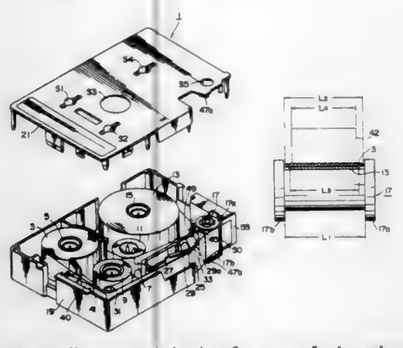
Shigenori Hattori, Ama, and Atsuhiro Kobayashi, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 422,113, Oct. 16, 1989. This application Mar. 2, 1992, Ser. No. 844,742

Claims priority, application Japan, Oct. 19, 1988, 63-136362

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—554 9 Claims



1. A tape alignment mechanism for a tape feed mechanism, said tape feed mechanism being used to feed a film tape and a double-sided adhesive tape provided with an exfoliative sheet in an overlapped state, each of said tapes respectively being arranged to be attachably and detachably mounted on said tape feed mechanism, said tape alignment mechanism comprising:

a first feed member comprising a first feed roller for feeding one of said two tapes, said first feed roller being formed of an elastic material which, when engaged by a second feed roller to drive said tapes, expands in a direction parallel to a width of said one of said two tapes;

a second feed member comprising a second feed roller adapted to be brought into and out of engagement with said first feed roller for feeding the other of said tapes to a position overlapping said one tape in accordance with an operation of said first feed member;

an adjust member comprising a pair of flange portions for adjusting the position of the overlapped tapes in a width direction thereof, said adjust member comprising a pair of flange portions of said second feed roller, the spacing between said flange portions being substantially the same as the width of said film tape wherein the width of said first feed roller prior to expansion is less that the width of the double sided adhesive tape and when expanded is less than the spacing between said pair of flange portions and substantially the same as the width of the double sided adhesive tape.

5,203,952

CHECK STRIP ATTACHMENT AND REMOVAL APPARATUS

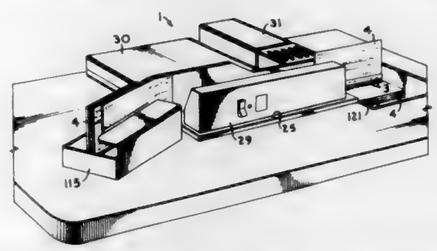
Jack G. Clark, Jr., and Joseph W. Schouster, both of Houston, Tex., assignors to BancTec, Inc., Dallas, Tex.

Continuation of Ser. No. 352,555, May 16, 1989, Pat. No. 4,966,644. This application Jun. 6, 1990, Ser. No. 534,519

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—554 3 Claims



1. Apparatus for both attaching strips of encodable material to and removing strips of encodable material from checks and other documents, comprising:

(a) a document transit passageway extending between an entrance document feet station and an exit station,

(b) document transport means for advancing, along the same said document transit passageway between said document feed station and said exit station, first type documents to which strips of encodable material are already respectively attached as well as second type documents to which strips of encodable material are to be respectively attached,

(c) attachment means disposed adjacent said document transit passageway for attaching respective strips of encodable material to said second type documents, and

(d) removal means disposed adjacent said document transit passageway, said removal means, when engaged, removing respective strips of encodable material from said first type documents,

(e) said removal means being movable between engaging and non-engaging conditions.

5,203,953

PROCESS AND APPARATUS FOR CONVEYING LABELS TO BE TRANSFERRED TO A (CIGARETTE) PACK

Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Feb. 26, 1991, Ser. No. 660,827

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4006021; Aug. 29, 1990, 4027247

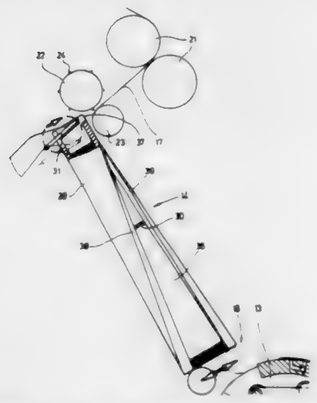
Int. Cl.[5] B65C *9/00*

U.S. Cl. 156—566 10 Claims

1. A process for conveying blanks to be transferred to packs, said blanks being successively severed from a continuous web of material and being conveyed into a position ready for being received by the packs, characterized in that:

the blanks (10), after being severed from the web of material (17), are individually conveyed in succession into a chute-like magazine and are extracted therefrom for being transferred to the packs (11); and

the blanks (10), severed from the web of material (17) and fed into the magazine (14) transverse to their longitudinal



extensions, are turned during a downward movement in the magazine (14), such that each blank (10) is extractable at a bottom side of the magazine (14) with its longitudinal extension pointing in the conveying direction.

5,203,954

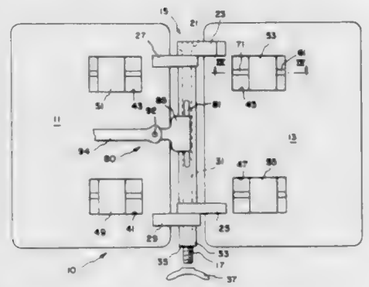
ADJUSTABLE CORNER BEAD DRYWALL ROLLER

David R. Moore, 3195 Lundquist La., Moscow, Id. 83843

Filed Jan. 29, 1992, Ser. No. 827,768

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—574 8 Claims



1. An adjustable roller device, comprising:

a) a first plate and a second plate, said plates being connected together by a hinge mechanism having a hinge pin, said hinge mechanism permitting adjustment of an angular relationship between said plates;

b) each plate including:

i) an opening;

ii) a roller carried in said opening by axle means;

iii) said axle means being adjustable to facilitate adjustment of a position of said roller in said opening; and

c) a manipulating handle.

5,203,955

METHOD FOR ETCHING AN ORGANIC POLYMERIC MATERIAL

Aldred Viehbeck, Stormville; Stephen L. Buchwalter, Wappingers Falls; John J. Gleaning, Vestal; Martin J. Goldberg, Mahopac, all of N.Y.; Caroline A. Kovac, Ridgefield, Conn.; Linda C. Matthew, Peekskill, N.Y.; Walter P. Pawlowski, Endicott, N.Y., and Stephen L. Tisdale, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 290,486, Dec. 23, 1988. This application May 24, 1991, Ser. No. 705,648

Int. Cl.[5] C25F *3/00*

U.S. Cl. 156—628 18 Claims

1. A method for etching an organic polymeric material that is capable of accepting and donating electrons and ions in a reversible manner which comprises supplying electrons to redox sites of said polymeric material and then dissolving said polymeric material in an aprotic solvent.

5,203,956

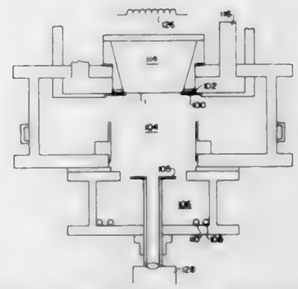
METHOD FOR PERFORMING IN-SITU ETCH OF A CVD CHAMBER

Keith J. Hansen, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 591,587, Oct. 2, 1990, abandoned, which is a division of Ser. No. 461,959, Jan. 8, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 794,780

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—643 4 Claims



1. A method of performing an in-situ etch of a CVD chamber in a cold-wall type processing system for cleaning said chamber comprising the steps of:

heating walls of said chamber in said cold-wall type processing system to a temperature of between approximately 65° C. and approximately 90° C.;

injecting fluorine-based etching gas into said chamber; and

supplying RF power to energize said etching gas to etch said walls of said chamber.

5,203,957

CONTACT SIDEWALL TAPERING WITH ARGON SPUTTERING

Chue-San Yoo, Taipei; Ting-Hwang Lin, and Sui-Hei Kuo, both of Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor manufacturing Company, Hsinchu, Taiwan

Filed Jun. 12, 1991, Ser. No. 713,508

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—643 20 Claims

1. A method for making a contact opening for an integrated circuit in a horizontal plane having a feature size of about one micrometer or less comprising:

providing an integrated circuit structure having device elements within a semiconductor substrate and multilayer insulating layers thereover;

forming a resist masking layer over the said multilayer insu-

lating layer having openings therein in the areas where the

5,203,959

introducing a gaseous medium into the chamber,

to promote dissolving of the membrane by the solvent on

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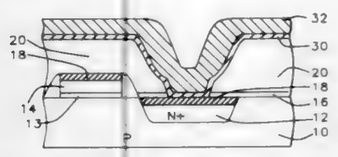
lating layer having openings therein in the areas where the said contact openings are desired; isotropic etching through a thickness portion of said multilayer insulating layer;

anisotropic etching through the remaining thickness of said multilayer insulating layer to the semiconductor substrate to form said contact opening;

removing the said resist layer; and



subjecting the structure to an Argon sputter etching ambient that is influenced by a magnetic field that causes preferential etching along a direction that is approximately 45 degrees to the horizontal plane to smooth the sharp corners at the upper surface of said multilayer layer and the point where the said isotropic etching ended and the anisotropic etching began.

5,203,958

PROCESSING METHOD AND APPARATUS

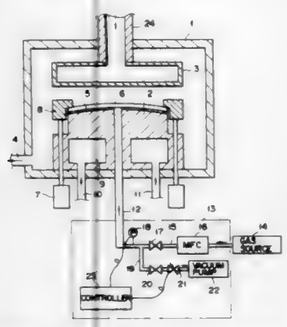
Izumi Arai, Yokohama, and Yoshifumi Tahara, Yamato, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jul. 24, 1991, Ser. No. 735,277

Claims priority, application Japan, Jul. 31, 1990, 2-203155; Jul. 31, 1990, 2-203156

Int. Cl.[5] **H01L** *21/306;* **B44C** *1/22;* **B29C** *37/00;* **C23C** *14/00*

U.S. Cl. 156—643 **24 Claims**



1. A processing method, comprising the steps of:

evacuating a hermetic container;

placing an object to be processed on a susceptor arranged in said hermetic container;

preliminarily introducing a small amount of heat transfer medium gas into a gap between the object to be processed and said susceptor;

measuring a pressure of the heat transfer medium gas in the gap;

automatically controlling further introduction of the heat transfer medium gas into the gap depending on the measured pressure of the heat transfer medium gas so that the pressure of the heat transfer medium gas reaches a predetermined value; and

processing the object to be processed.

5,203,959

MICROWAVE PLASMA ETCHING AND DEPOSITION METHOD EMPLOYING FIRST AND SECOND MAGNETIC FIELDS

Naoki Hirose; Takashi Inujima, and Toru Takayama, all of Atsugi, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

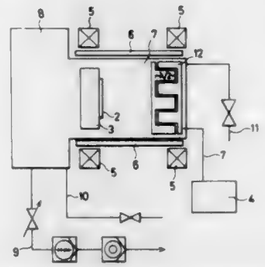
Continuation of Ser. No. 461,938, Jan. 8, 1990, abandoned, which is a division of Ser. No. 186,219, Apr. 26, 1988, Pat. No. 4,926,791. This application Sep. 27, 1991, Ser. No. 766,283

Claims priority, application Japan, Apr. 27, 1987, 62-104024; Apr. 27, 1987, 62-104025

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] **B05D** *3/06*

U.S. Cl. 156—643 **15 Claims**



10. A cyclotron resonance plasma processing method comprising:

placing a substrate in a reaction chamber;

introducing a reactive gas into said reaction chamber;

emitting microwaves into said reaction chamber;

establishing a first magnetic field in said reaction chamber by virtue of an electromagnetic coil surrounding said reaction chamber where the direction of the magnetic field is substantially parallel to the direction of propagation of the microwaves;

establishing a cyclotron resonance by virtue of said microwaves and said first magnetic field, thereby converting said reactive gas into a plasma;

establishing a second magnetic field by virtue of ioffe bars placed around said reaction chamber where the direction of said second magnetic field is perpendicular to said first magnetic field in order to confine said plasma inside the reaction chamber; and

carrying out a plasma processing including etching or deposition with said plasma gas on said substrate,

wherein said substrate is placed in said reaction chamber so that a surface of the substrate is substantially perpendicular to the direction of the first magnetic field and substantially parallel to the direction of the second magnetic field.

5,203,960

METHOD OF OPERATION OF ELECTRON CYCLOTRON RESONANCE PLASMA SOURCE

Raphael A. Dandl, San Marcos, Calif., assignor to Applied Microwave Plasma Concepts, Inc., San Marcos, Calif.

Division of Ser. No. 320,947, Mar. 9, 1989. This application Apr. 29, 1992, Ser. No. 875,750

Int. Cl.[5] **H01L** *21/00*

U.S. Cl. 156—643 **17 Claims**

1. A method of generating plasma by electron cyclotron resonant (ECR) heating to treat specimens by processes including chemical vapor deposition and etching, comprising the steps of

forming a cylindrical chamber which is symmetrical about its longitudinal axis,

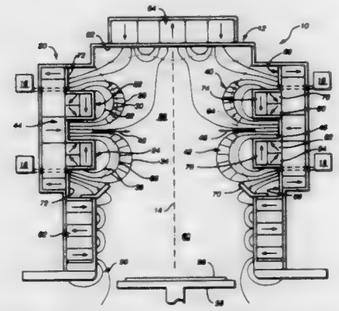
supporting one of the specimens adjacent one axial end of the cylindrical chamber,

introducing a gaseous medium into the chamber,

generating a circumferentially continuous and symmetrical magnetic field having lines of force forming continuous annular lobes also circumferentially extending about the chamber and continuous resonant interaction regions encircling the longitudinal axis of the chamber adjacent an opposite axial end thereof,

developing a substantially field free region adjacent the one axial end of the chamber while minimizing the extension of magnetic field force lines into the magnetic field free region and toward the specimen,

uniformly radiating electromagnetic radiation from a microwave power injector arranged between the magnet assemblies and having multiple injection axes extending radially



inwardly toward the longitudinal axis of the chamber toward the resonant interaction region about the entire periphery of the chamber so that plasma electrons made energetic by interaction with the electromagnetic radiation are not permitted line of sight communication to the specimen along magnetic field force lines in the magnetic field free region, and

maintaining low gas pressure in the chamber whereby a plasma stream flows through the magnetic field free region toward the specimen with characteristics of high plasma density, uniformity over transverse dimensions larger than the specimen, low plasma temperature and absence of energetic particles resulting from plasma instabilities even with operating gas pressures as low as 10^{-5} Torr.

5,203,961

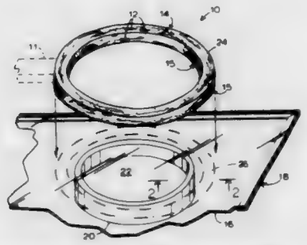
WET DIE CUTTER ASSEMBLY AND METHOD

Yung-Tsai Yen, 196 Tuscaloosa Ave., Atherton, Calif. 94025

Filed Sep. 20, 1991, Ser. No. 763,422

Int. Cl.[5] **B44C** *1/22;* **B79C** *37/00*

U.S. Cl. 156—645 **12 Claims**



11. A method for making a wet die cut through a membrane that is soluble in a solvent comprising:

utilizing an expanse having been configured in a desired shape;

pooling a volume of such a solvent on the expanse; and

advancing the solvent-wetted expanse toward the membrane to promote dissolving of the membrane by the solvent on the expanse and, thereby making a wet die cut through the membrane.

5,203,962

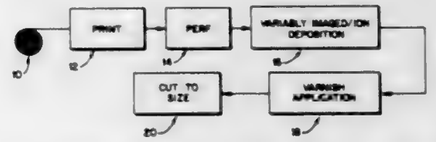
METHOD OF MANUFACTURING AND UTILIZING CELLULOSIC FIBER IDENTIFICATION TAGS FOR WOODEN ARTICLES

George A. Renquist, Edmonds, Wash., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jun. 1, 1989, Ser. No. 360,073

Int. Cl.[5] **D21C** *19/66;* **D21B** *1/32;* **G09F** *3/00*

U.S. Cl. 162—4 **17 Claims**



1. A method of manufacturing and utilizing cellulosic fiber based identification tags for wooden articles, comprising the steps of:

(a) printing a web of cellulosic fiber based paper with non-variable information, if any;

(b) forming perforations in the web to define at least two distinct areas, each area separated by a perforation, for each tag to be formed;

(c) variably imaging variable information on the web, the variable information provided on each area of each tag to be formed;

(d) applying a varnish to the web to cover the printed non-variable, if any, and variable information; and

(e) cutting the web into discrete identification tags, each tag having at least two of said distinct areas.

5,203,963

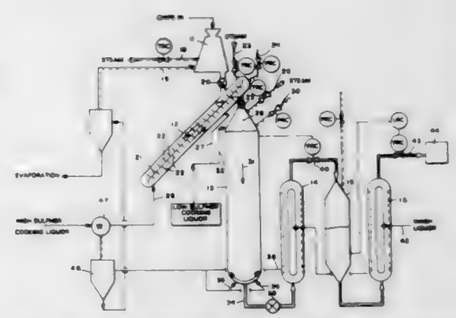
CONTINUOUS TREATMENT OF SMALL CHIPS

Kaj Henricson, Kotka, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Oct. 21, 1991, Ser. No. 779,809

Int. Cl.[5] **D21C** *3/26*

U.S. Cl. 162—19 **16 Claims**



12. A method of producing paper pulp from small chips of cellulosic fibrous material not int eh form of sawdust, comprising the steps of continuously and sequentially:

(a) steaming the chips;

(b) impregnating the chips with sulphur containing liquor under superatmospheric pressure by circulating the chips within and under the liquid level in a first vessel containing sulphur containing liquor to impregnate the chips;

(c) heating the chips to digesting temperature;

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METHOD AND APPARATUS FOR CONDITIONING

stock is ejected, a twin wire former for forming the stock into a web, said twin wire former comprising: a top loop of wire

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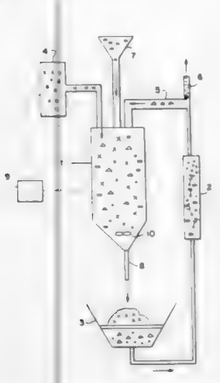
(c) heating the chips to digesting temperature;
(d) transferring the impregnated chips, under superatmospheric pressure, to a second pressurized vessel;
(e) digesting the chips in a slurry with sulphur containing liquor by passing the chips downwardly in a column at digesting temperature and pressure which is above the pressure of the first vessel in the presence of the sulphur containing liquor, in the absence of circulatory loops of treatment liquors from the column;
(f) effecting a first washing of the digested chips;
(g) without substantial pressure reduction, subjecting the washed chips to hot alkali extraction; and
(h) without substantial pressure reduction, effecting a second washing of the chips.

5,203,964

PROCESS FOR PRODUCING CELLULOSE FROM LIGNIN CONTAINING RAW MATERIALS USING AN ENZYME OR MICROORGANISM WHILE MONITORING AND MAINTAINING THE REDOX POTENTIAL

Hans-Peter Call, Heinsberger Strasse 14A, D-5132 Uhach-Palenberg, Fed. Rep. of Germany

Continuation of Ser. No. 701,574, May 14, 1991, abandoned, which is a continuation of Ser. No. 364,422, May 25, 1989, abandoned. This application Dec. 31, 1991, Ser. No. 815,896
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636208
Int. Cl.[5] D21C *3/20, 7/12*
U.S. Cl. 162—49 **18 Claims**



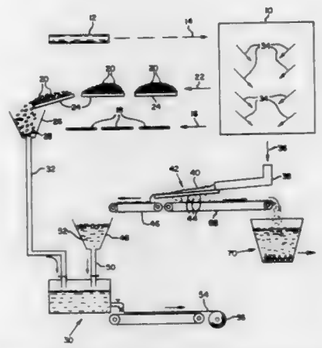
1. A process for degrading lignin in lignocellulosic raw material, comprising the steps of:
supplying an aqueous solution of lignocellulosic raw material containing lignin to a reaction vessel; adjusting the aqueous solution to an acidic pH; setting a redox potential at a range of about between 200 and 500 mV by adding redox chemical agents comprising at least one oxidizing agent, at least one reducing agent, at least one salt, at least one phenolic compound and at least one organic acid; adding to the reaction vessel a lignin degradation reaction agent selected from the group consisting of enzymes and microorganisms; and reacting the ingredients in the reaction vessel while stirring to degrade the lignin in the lignocellulosic material, continuously monitoring and maintaining the redox potential within said range by adding further amounts of said redox chemical agents, and maintaining substantially constant the pH and temperature of the reaction.

5,203,965

UTILIZATION OF SAWDUST FOR PULP PRODUCTION

James L. McCowan, Eugene, Oreg., assignor to Pope & Talbot, Inc., Portland, Oreg.

Continuation of Ser. No. 213,631, Jun. 30, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 657,358
Int. Cl.[5] D21H *11/00, 15/00;* **B07B** *1/50, 1/54*
U.S. Cl. 162—55 **5 Claims**



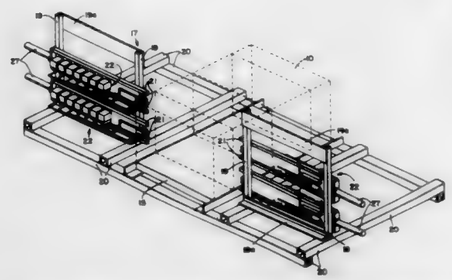
1. A method for utilizing sawdust from lumber mills as pulp for paper production comprising;
collecting sawdust from lumber processing operations in a lumber mill wherein the sawdust is a mixture of wet sawdust particles of varying size from about number 3 screen size and smaller which particles stick together to resist separation by screening,
establishing a discriminate size for the sawdust particles that delineate between sawdust particles of a larger size that produces strength enhancing fiber for pulp and smaller size sawdust particles that lack strength enhancing utility,
providing a screen conveyor including a first screen having screen openings smaller than said discriminate size, said screen conveyor defining a receiving position and a removing position spaced from said receiving position, and the material of said screen being non-corrosive to moisture and substantially friction free,
continuously depositing the wet sawdust mixture on the screen at the receiving position and conveying said mixture on said screen to said removing position,
providing a grid-like structure under the first screen that includes numerous side-by-side enclosed chambers encompassing the under surface of the screen, said chambers enclosed at the top by said first screen, at the bottom by a lower screen having screen openings substantially larger than the first screen of said screen conveyor, and side walls enclosing the sides of said chambers,
entrapping elastic balls in said chambers, agitating the structure to force bouncing of the balls within the chambers, and deflecting the bouncing balls to randomly impact the bottom of the first screen substantially over the entire overlying surface of the screen to produce a jarring motion and thereby jarring the wet sawdust mixture on the screen whereby particles adhered together due to the moistened condition thereof are jarred apart so as to be individually exposed to the screen openings for screening out the small particles,
collecting the larger particles of the sawdust mixture conveyed to the removing position,
producing sawdust pulp from the collected larger sized particles of sawdust and the smaller sized particles excluded from said sawdust pulp, and
incorporating said sawdust pulp of larger sized particles as an ingredient in the production of paper.

5,203,966

METHOD AND APPARATUS FOR CONDITIONING BALED WASTEPAPER IN RECYCLING OPERATIONS

Willard E. Carlson, Hilton Head Island, S.C., and Ivar H. Steckel, Naples, Fla., assignors to Recycle Processes Inc., Naples, Fla.

Division of Ser. No. 521,361, May 10, 1990, Pat. No. 5,147,502. This application Feb. 13, 1992, Ser. No. 834,860
Int. Cl.[5] D21B *1/32*
U.S. Cl. 162—252 **12 Claims**



1. In a wastepaper recycling installation having pulping and sorting means for defibrating and recovering cellulosic fibers from wastepaper contained in bales of waste material, linear non-agitating conveying means moving the waste material bales along a transit path for deposit into said pulping means from an exit end of said transit path and soaking means associated with said transit path for saturating the wastepaper in the bales with a cellulosic fiber softening and swell-inducing liquid prior to reaching said transit path exit end and deposit into said pulping means, the improvement wherein said soaking means comprises:
jet stream nozzle means having a plurality of discharge orifices,
means supporting said nozzle means establishing said discharge orifices in a position substantially in contact with an exterior surface of each waste material bale moved along said transit path,
a source of said liquid,
conduit means interconnecting said liquid source and said discharge orifices,
valve means associated with said conduit means operable between open and closed positions for respectively connecting and disconnecting said liquid source and said discharge orifices,
pump means having an established discharge rate operably connected to said liquid source,
and flow control means operably establishing said valve means at said open and closed positions during a selected time period while ones of said orifices are substantially in contact with each waste material bale exterior surface,
each said discharge orifice having a cross sectional dimension such that with said valve means in said open position liquid from said liquid source is discharged from said orifice as a jet stream of sufficiently high velocity as penetrates a substantial distance into the interior of said waste material bale.

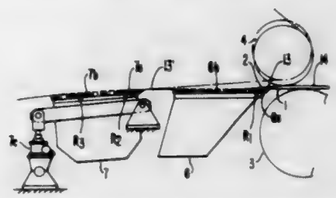
5,203,967

TWIN-WIRE FORMER IN A PAPER MACHINE

Takashi Bando; Kazuhide Sakamoto; Hiromu Masuda, and Hiroyuki Fuchioka, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1991, Ser. No. 809,133
Claims priority, application Japan, Dec. 19, 1990, 2-403649
Int. Cl.[5] D21F *1/00*
U.S. Cl. 162—301 **4 Claims**

1. In a paper machine having a head box from which paper stock is ejected, a twin wire former for forming the stock into a web, said twin wire former comprising: a top loop of wire having an approximately horizontally extending run; a bottom loop of wire having an approximately horizontally extending run coacting with said run of the top loop of wire; a forming roll at an upstream end of the approximately horizontally extending run of said top loop of wire and over which said top loop travels and is guided, said forming roll being adjustably mounted in the twin wire so as to be movable in up and down directions toward and away from the bottom loop of wire; a forming board disposed within said bottom loop of wire and confronting the approximately horizontally extending run thereof, said forming board including a first blade defining a tip of the forming board at the upstream side thereof with respect to the direction of travel of the runs of the wires, and a plurality of successive blades disposed downstream of said first blade in said direction of travel, said first blade having an upper



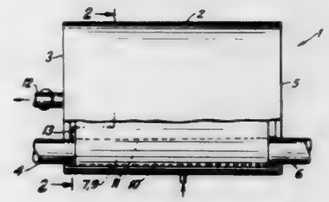
convex surface and a width as taken in said direction of travel greater than that of each of said successive blades, and said successive blades of the forming board having respective flat upper surfaces lying in a common plane; and a forming shoe disposed within said bottom loop of wire downstream of said forming board with respect to said direction of travel and also confronting the approximately horizontally extending run of said bottom loop, said shoe including a first blade defining a tip of the shoe at the upstream side thereof with respect to said direction of travel, and a plurality of successive blades disposed downstream of the first blade of the shoe in said direction of travel, the first blade of said shoe having an upper convex surface and a width in said direction of travel that is greater than that of each of said successive blades of the show, said successive blades of the shoe having upper convex surfaces lying in an arc having a radius of curvature that is greater than the radius of curvature of the upper surface of the first blade of said shoe.

5,203,968

APPARATUS FOR TREATING FIBER SUSPENSIONS HAVING ROTATABLE LIQUID PERMEABLE TREATMENT DUCTS

Kaj Henricson, Kotka, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 336,712, Apr. 12, 1989. This application Oct. 25, 1991, Ser. No. 782,499
Claims priority, application Finland, Apr. 13, 1988, 881725
Int. Cl.[5] D21C *9/02, 9/06*
U.S. Cl. 162—380 **24 Claims**



1. An apparatus for treating a fiber suspension comprising: a casing having a liquid inlet and a liquid outlet port;

said water phase I also a retentate as water III is generated

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COMPOSITE CELL BOTTOM FOR ALUMINUM

5,203,973

METHOD OF ROUGHENING SURFACES

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a plurality of elongated treatment ducts disposed within said casing for rotation about an axis of rotation, said plurality of treatment ducts each having an entrance end and a discharge end and being annularly arranged around said axis and circumferentially defined by at least one liquid permeable wall;

a feed conduit disposed for registration and axial alignment with the entrance end of at least one of said treatment ducts for feeding untreated fiber suspension into said at least one registered treatment duct;

a discharge conduit disposed for registration and axial alignment with the discharge end of said at least one treatment duct for permitting the discharge of treated fiber suspension therefrom;

means for rotating said treatment ducts around said axis of rotation to another registration position so that said entrance end and said discharge end of another one of said plurality of treatment ducts, having been subject to the treatment process and containing treated fiber suspension, is axially aligned with said feed conduit and discharge conduit, the apparatus is structured so that the feeding of the untreated fiber suspension from the feed conduit into said at least one registered treatment duct displaces the treated fiber suspension discharged into said discharge conduit.

5,203,969

METHOD OF SEPARATING AND RECOVERING COMPONENTS OF MIXTURES VIA PERVAPORIZATION

Axel Wenzlaff, Escheburg; Dieter Behling, Hamburg, and Karl W. Böddeker, Beitenfelde, all of Fed. Rep. of Germany, assignors to GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

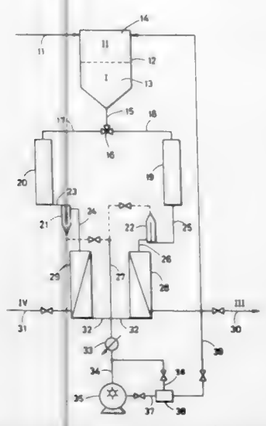
Continuation of Ser. No. 484,076, Feb. 23, 1990, Pat. No. 5,108,549. This application Oct. 7, 1991, Ser. No. 772,932

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905924

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.[5] B01D *3/10, 3/42, 61/36, 71/06*

U.S. Cl. 203—1 **16 Claims**



1. A method of separating and recovering components of a mixture of organic compounds and water in a pervaporization process with the aid of membranes, said method in operating sequence including the steps of:

first separating said mixture into an organically loaded water phase I and a water-saturated organic phase II;

subsequently separately subjecting said water phase I and said organic phase II to parallel, different pervaporization processes, whereby permeates result, and whereby from said water phase I also a retentate as water III is generated and from said organic phase II also a retentate as organic liquid IV is generated;

condensing said permeates and combining said permeates, wherein the order in which said steps of condensing and combining are performed can be selected as desired; and

subsequently returning said permeates to said mixture that is to be separated.

5,203,970

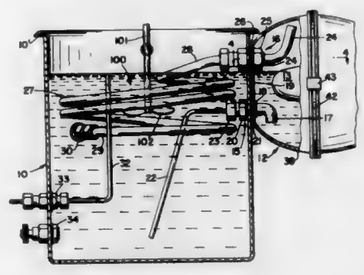
METHOD FOR WATER DEGASIFICATION AND DISTILLATION

John C. Ellis, Jr., 1084 Palmer Ave., Larchmont, N.Y. 10538

Filed Feb. 28, 1990, Ser. No. 486,228

Int. Cl.[5] B01D *3/02, 19/02;* **C02F** *1/04*

U.S. Cl. 203—10 **2 Claims**



1. A method for producing a distilled water product that is at least partially aerated which comprises providing a distillation apparatus including a water reservoir container having a water inlet and outlet thereto connected so as to create a reservoir of water therein and a boiler smaller than the reservoir container with an open connection between container and boiler for water flow to or from the boiler, a steam line overhead of the water level in the boiler leading to a condenser immersed in the reservoir and an outlet from said condenser for discharge of condensate, the distillation apparatus further including a filter at the outlet of said condenser for filtering the condensate and for sterilizing and filtering any air entering said filter through reverse flow, and a mechanically operated stirrer in the reservoir to cause swirling in the reservoir water and generation of steam bubbles therein; maintaining a predetermined level of reservoir water by introducing feed water into and removing water from said container at a flow rate which maintains a temperature in the range of about 180°–190° F. in the reservoir and heating the water in said boiler to generate steam, the steam passing into said condenser to be condensed therein by heat exchange against the reservoir water whereby the reservoir water becomes heated while at the same time mechanically stirring the water of said reservoir so as to cause generation of steam bubbles in the reservoir water whereby the heated reservoir water becomes devolatilized and deaerated prior to entering said boiler, and passing air into said filter whereby devolatilized water converted into steam in said boiler and thereafter condensed in said condenser to become the distilled water product absorbs filtered and sterilized air during passage through the condenser and through the filter.

5,203,971

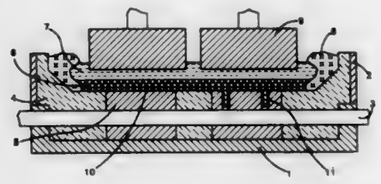
COMPOSITE CELL BOTTOM FOR ALUMINUM ELECTROWINNING

Vittorio de Nora, Nassau, The Bahamas; Jean-Jacques Duruz, Geneva, and Brian Cronin, Gland, both of Switzerland, assignors to Moltech Invent S.A., Luxembourg

Continuation of Ser. No. 466,366, Mar. 15, 1990, Pat. No. 5,135,621. This application Nov. 7, 1991, Ser. No. 788,919

Int. Cl.[5] C25C *3/08*

U.S. Cl. 204—67 **31 Claims**



15. A method of renovating a used cell bottom of an aluminum production cell which cell bottom is made up of rows of blocks of carbon connected to current supplying means, which method comprises replacing some of the used blocks of carbon with new blocks of carbon, and replacing the other used blocks of carbon with at least one mass of non-conductive, refractory material extending throughout the thickness of the cell bottom and juxtaposed with the carbon blocks to make up a composite cell bottom composed of adjacent areas of current-conducting carbon and non-conducting refractory material, positioning the upper surfaces of the carbon blocks lower than the upper surfaces of said juxtaposed, non-conductive refractory material, supplying sufficient to said carbon blocks to provide a total upwardly facing surface area of the carbon blocks in the cell bottom that is smaller than the horizontal surface area of the overlying anodes, and passing current from said carbon blocks of smaller surface area.

5,203,972

METHOD FOR ELECTROLYTIC OZONE GENERATION AND APPARATUS THEREFOR

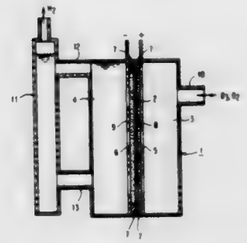
Takayuki Shimamune, Tokyo; Isao Sawamoto, and Yoshinori Nishiki, both of Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Nov. 26, 1991, Ser. No. 798,645

Claims priority, application Japan, Nov. 27, 1990, 2-323471

Int. Cl.[5] C25B *1/10*

U.S. Cl. 204—129 **9 Claims**



1. A method for electrolytic ozone generation which comprises feeding raw water to an ozone-generating electrolytic cell partitioned into an anode chamber and a cathode chamber by means of a solid electrolyte, said feeding of raw water being only to the cathode chamber, and conducting electrolysis to thereby produce ozone in the anode chamber.

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METHOD OF ROUGHENING SURFACES

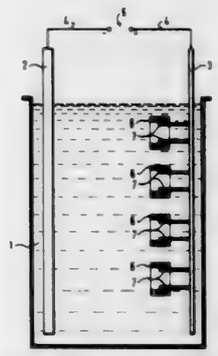
Heribert Reith, Stuttgart, and Hans Lander, Pleidelsheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 806,477, Dec. 13, 1991. This application Apr. 27, 1992, Ser. No. 875,546

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041577; Oct. 18, 1991, 4134463

Int. Cl.[5] C25F *3/02*

U.S. Cl. 204—129.75 **17 Claims**



1. A method for surface treatment of a pressed graphite body formed with a binder and a metal additive, comprising immersing said pressed body in an alkali metal containing solution, wherein said alkali metal is selected from the group consisting of sodium and potassium, said solution having a pH greater than 12, and

applying an electric current to a surface of said pressed body, acting as an anode, to electrochemically treat the same.

5,203,974

PROCESS FOR PRODUCING THIN FILMS

Hiroshi Kokado; Katsuyoshi Hoshino; Tetsuo Saji, all of Tokyo, and Seiichiro Yokoyama, Chiba, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

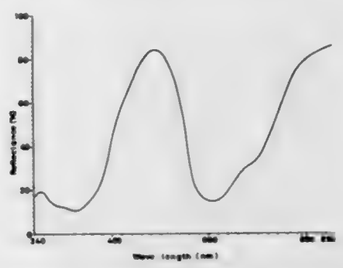
Continuation of Ser. No. 444,817, Dec. 1, 1989, Pat. No. 5,122,247. This application Jan. 24, 1992, Ser. No. 826,905

Claims priority, application Japan, Dec. 17, 1988, 63-317626; Dec. 17, 1988, 63-317627; May 12, 1989, 1-117481

The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.

Int. Cl.[5] C25B *3/12;* **C25D** *13/00*

U.S. Cl. 204—180.2 **18 Claims**



1. A process for producing a thin film comprising electrotreating a dispersion or a solution obtained by dispersing or dissolving a hydrophobic substance powder with a

surfactant having a HLB value of 10.0 to 20.0 under con-

fluid channel communicating with a first fluid transfer mani-

Z is —I, —Br, —Cl, —F, —OR or —NR_1R_2;

clamping bolt being mounted and secured in a contact bushing

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surfactant having a HLB value of 10.0 to 20.0 under conditions for forming a thin film of said hydrophobic substance on a cathode with a potential on the cathode of −0.03 to −10.0 V.

5,203,975

PROCESS FOR CATHODIC ELECTRODEPOSITION OF A CLEAR COATING OVER A CONDUCTIVE PAINT LAYER

Eugene Richardson, Pennsauken, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1991, Ser. No. 784,241

The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.

Int. Cl.[5] **C25D** *13/12*

U.S. Cl. 204—181.1 **10 Claims**

1. An improved electrocoating process which comprises

a. cathodically electrocoating onto a conductive substrate a layer of an electrically conductive cathodic electrocoating composition containing film forming binder and electrically conductive pigment in a pigment to binder weight ratio of about 1:100 to 100:100 and curing the layer to form a conductive layer;

b. applying an intermediate conductive layer of an electrically conductive coating composition containing electrically conductive pigment and film forming binder and curing the intermediate layer and

c. cathodically electrocoating onto the intermediate layer a layer of a clear cathodic electrocoating composition and curing the layer of clear composition to form a clear layer on the substrate;

wherein the electrically conductive pigment used in the conductive cathodic electrocoating composition comprises

silica which is either amorphous silica or a silica containing material, the silica is in association with a two-dimensional network of antimony-containing tin oxide crystallites in which the antimony content ranges from about 1–30% by weight of the tin oxides and provides the cured conductive layer with a resistance of less than 10×10^{15} ohms.

5,203,976

INTRODUCING AND REMOVING ION-EXCHANGE AND OTHER PARTICULATES FROM AN ASSEMBLED ELECTRODEIONIZATION STACK

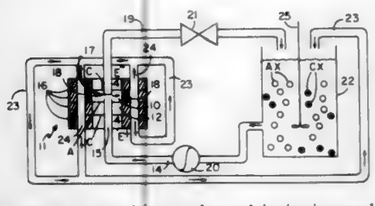
Edgardo J. Parsi, Lexington; Keith J. Sims, Framingham; Irving D. Elyanow, Somerville, and Thomas A. Prato, Cambridge, all of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Division of Ser. No. 743,068, Aug. 9, 1991, Pat. No. 5,120,416, which is a division of Ser. No. 495,513, Mar. 19, 1990, Pat. No. 5,066,375. This application Apr. 6, 1992, Ser. No. 866,782

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] **C02F** *1/46*; **C25B** *1/00*

U.S. Cl. 204—182.4 **9 Claims**



1. Apparatus comprising an electrodeionization stack, which stack comprises first and second sets of parallel chambers, the chambers of said first set alternating with chambers of said second set and separated therefrom by ion exchange membranes, the chambers of each said set comprising at least one flow path defined by an intermembrane spacer, each said at least one flow path in each set of chambers having at least one fluid channel communicating with a first fluid transfer manifold within said stack, each said at least one second channel spaced from said at least one first channel, said at least one second channel communicating with a second fluid transfer manifold within said stack, each of said at least one flow path in each set of chambers further having at least one-third channel communicating with a third fluid transfer manifold within said stack, said at least one-third channel positioned between said at least one first channel and said at least one second channel, said first, second and third manifolds adapted to transfer fluid solely into or out of said at least one flow path solely in one set of chambers, said at least one flow path in said one set of chambers adapted to be substantially filled with particulates comprising ion exchange particles if a suspension of particulates is flowed into said at least one flow path through at least one of said first and third manifolds, said at least one of first and second channels characterized by retaining at least some particulates if a suspension of particulates is flowed into said at least one flow path through at least one of said first and third manifolds.

5,203,977

MAGNETRON SPUTTERED BORON FILMS AND TI/B MULTILAYER STRUCTURES

Daniel M. Makowiecki, and Alan F. Jankowski, both of Livermore, Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Mar. 11, 1991, Ser. No. 666,971

Int. Cl.[5] **C23C** *14/35*

U.S. Cl. 204—192.15 **8 Claims**

1. A method for forming thin amorphous boron films which have no morphological growth features; comprising:

subjecting a boron target having a density near theoretical density to an rf magnetron sputtering process; and

depositing a thin amorphous film of sputtered boron on a substrate material.

5,203,978

MEMBRANE-ELECTRODE STRUCTURE FOR ELECTROCHEMICAL CELLS

Yu-Min Tsou; James W. McMichael, both of Lake Jackson, Tex.; Richard N. Beauver, deceased, late of Angleton, Tex. by Wanda G. Beaver, Legal Representative , and Thomas J. Pisklak, Brazoria, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 14, 1991, Ser. No. 792,339

Int. Cl.[5] **C25B** *9/00, 11/04, 11/20, 13/08*

U.S. Cl. 204—252 **15 Claims**

1. A membrane-electrode structure for use in an electrochemical cell which comprises an ion exchange membrane with a cathode layer, and a retardation layer between said membrane and said cathode layer, said retardation layer comprising a blend of about 5 to 80% by weight of inorganic solid particles with about 20 to 95% by weight of a thermoplastic ionic conductive polymer binder having a melting point of about 230° F. to 540° F., said inorganic solid particles comprising at least one of the borides, carbides, and nitrides of metals of Groups IIIB, IVA, IVB, VB, and VIB of the Periodic Table, said binder consisting of a copolymer of a monomer of the general formula:

$$CF_2{=}CZZ' \qquad (I)$$

wherein Z and Z′ are independently selected from the group consisting of —H, —Cl, —F, or $—CF_3$, and

at least one monomer selected from compounds represented by the general formula:

$$Y{-}(CF_2)_a{-}(CFR_f)_b{-}(CFR_f)_c{-}O{-}[CF(CF_2X{-})-CF_2-O]_n-CF{=}CF_2 \qquad (II)$$

wherein Y is $—SO_2Z$

Z is —I, —Br, —Cl, —F, —OR or $—NR_1R_2$;

wherein R is a branched or linear alkyl radical having from 1 to about 10 carbon atoms or an aryl radical;

R_1 and R_2 are independently selected from the group consisting of —H, a branched or linear alkyl radical having from 1 to about 10 carbon atoms or an aryl radical;

wherein:

a is 0–6;

b is 0–7;

c is 0 or 1;

provided a+b+c is not equal to 0;

X is —Cl, —Br, —F, or mixtures thereof when n>1; n is 0 to 6; and R_f and R_f are independently selected from the group consisting of —F, —Cl, perfluoroalkyl radicals having from 1 to about 10 carbon atoms and fluorochloroalkyl radicals having from 1 to about 10 carbon atoms.

13. In an electrochemical cell having an electrode-membrane structure, the improvement wherein said membrane-electrode structure comprises the structure of claim 1.

5,203,979

SILVER RECOVERY DEVICE

Gerhard Üffinger, Weinstadt-Grossheppach, and Franz-Joseph Hüttemeister, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

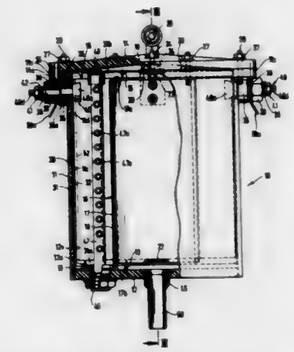
PCT No. PCT/EP91/00354, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO91/14022, PCT Pub. Date Sep. 19, 1991

PCT Filed Feb. 26, 1991, Ser. No. 776,233

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007906

Int. Cl.[5] **C25C** *7/00, 1/20, 7/02*; **C25D** *17/00*

U.S. Cl. 204—272 **23 Claims**



1. Device for the electrolytic recovery of silver from a photographic processing liquid, said device comprising a cylindrical electrolysis tank having at its bottom a liquid inlet and a liquid outlet as well as a hollow-cylindrical anode, which is arranged concentrically within the cylindrical tank, and an expendable cathode, which is formed into a hollow cylinder, rests against the inner surface of the tank wall and comprises a sheet carrier which is provided with an electrically conductive layer on a surface facing the anode, and also having electrical contacts for the cathode and the anode, characterized in that holding means (**12***a*, **14***a*; **13**, **15**) provided within the electrolysis tank (**10**) serve to engage and hold the lower and upper circumferential rims of the cathode (**30**) resting against the inner surface (**11***c*) of tank wall (**11**) and in that at least one clamping bolt (**40**) of an electrically nonconductive material is provided which is passed through a circular hole (**32***a*) disposed in the electrically conductive layer (**32**) and through another circular hole (**31***h*) which is associated with hole (**32***a*) and disposed in the carrier sheet (**31**) of cathode (**30**), said clamping bolt being mounted and secured in a contact bushing (**36**) arranged in tank wall (**11**) and connected with an electrical lead, and in that clamping bolt (**40**) both connects the electrically conductive layer (**32**) of cathode (**30**) with the current-carrying contact bushing (**36**) and secures the cathode (**30**) against displacement along the inner surface (**11***c*) of tank wall.

5,203,980

LARGE SURFACE CATHODE ARRANGEMENT OF UNIFORM CONSUMPTION

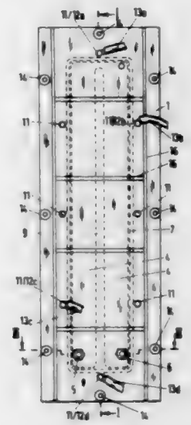
Dieter Cremer, Overath, and Hans-Gerhard Dedericha, Cologne, both of Fed. Rep. of Germany, assignors to Multi-Arc Oberflächentechnik GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Oct. 25, 1991, Ser. No. 782,151

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 9014857[U]

Int. Cl.[5] **C23C** *14/34*

U.S. Cl. 204—298.08 **21 Claims**



1. A cathode arrangement with a large surface area, comprising:

a base plate;

a consumable cathode plate;

an intermediate plate with high electrical and thermal conductivity, arranged between said base plate and said cathode plate;

cooling channels arranged in a space between said base plate and said cathode plate; and

means for uniformly distributing electrical current densities and electrical potentials within said cathode plate.

5,203,981

VACUUM-TREATMENT APPARATUS

Moriaki Akazawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 835,331

Claims priority, application Japan, Jun. 5, 1991, 3-133905

Int. Cl.[5] **C23C** *14/34*

U.S. Cl. 204—298.15 **6 Claims**

1. A vacuum-treatment apparatus comprising:

a vacuum container;

a specimen table, positioned in said vacuum chamber, for supporting a specimen;

a clamp ring including an embedded permanent magnet for pressing a specimen disposed on said specimen table; and

an electromagnet for generating a magnetic field for selec-

output characteristic of a step change portion changing

prising: means for sampling consecutively information directly

sheet excellent in spot weldability, which comprises the steps

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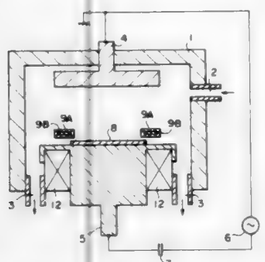
an electromagnet for generating a magnetic field for selectively lifting said clamp ring perpendicularly from said



specimen table and urging said clamp ring against a specimen disposed on said specimen table.

5,203,982

CATION EXCHANGE MEMBRANES

Russell J. MacDonald, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation of Ser. No. 639,852, Nov. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 422,212, Oct. 16, 1989, abandoned. This application Jan. 16, 1992, Ser. No. 821,675

Int. Cl.[5] B01D *61/42*; **C08J** *5/20*

U.S. Cl. 204—301 **10 Claims**

1. A cation exchange membrane prepared by polymerizing a homogeneous solution of a mixture of polymerizable monomers, said mixture comprising one or more water soluble, monomeric, styrene sulfonate ammonium salts and divinyl benzene, said mixture in one or more mutual solvents for said one or more styrene sulfonate ammonium salts and divinyl benzene, said one or more mutual solvents comprising from about 20 to about 60 percent by volume of said solution and characterized by substantially swelling the polymerized mixture of said polymerizable monomers, said one or more mutual solvents selected from the group consisting of solvents having boiling points in the commercially pure state of not less than about 100° C. at standard atmospheric pressure, low frequency dielectric constants in excess of about 10 and Hildebrand solubility parameters greater than about 10 $cal^{0.5}\ cm^{-1.5}$, said solvents further characterized by being soluble in water in all proportions, said mixture of polymerizable monomers comprising at least 0.17 mols of available crosslinks per mol of said one or more styrene solfonate ammonium salts, said membrane characterized by having a cation exchange capacity of at least about 1 milligram-equivalent per gram of dry cation exchange resin in the sodium form.

5,203,983

AIR-FUEL RATIO SENSOR FOR AN INTERNAL COMBUSTION ENGINE AND AN AIR-FUEL RATIO CONTROL APPARATUS USING THE SAME

Yoshishige Ohyama, and Minoru Ohsuga, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 508,464, Apr. 13, 1990, which is a continuation of Ser. No. 251,878, Sep. 30, 1988. This application Oct. 30, 1990, Ser. No. 605,440

Claims priority, application Japan, Oct. 5, 1987, 62-249827

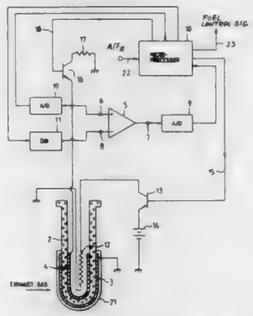
Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—427 **12 Claims**

1. An air-fuel ratio sensor for sensing an air-fuel ratio of air-fuel mixture supplied to an internal combustion engine, said air-fuel ratio sensor comprising:

a sensing portion, exposed to exhaust gas from the engine, for producing an output voltage in response to the concentration of remaining oxygen included in the exhaust gas, said sensing portion having a temperature dependent output characteristic of a step change portion changing stepwise in the vicinity of stoichiometric air-fuel ratio of a mixture and a portion changing linearly with respect to an air-fuel ratio of a mixture on either side of said stoichiometric air-fuel ratio;

a differential amplifier having two input terminals, one of which being provided with an output voltage of said sensing portion and the other input terminal being provided with a reference voltage, said differential amplifier produces an output signal indicative of a deviation be-



tween said output voltage and said reference voltage, said reference voltage being related to a temperature of said sensing portion; and

a microprocessor circuit, which has stored therein a table of reference voltage versus temperature of said sensing portion, for detecting a temperature of said sensing portion, determining said reference voltage by retrieving said table on the basis of said detected temperature, inputting said output signal of said differential amplifier, and identifying an actual air-fuel ratio on the basis of said output signal.

5,203,984

MONITORING SYSTEM FOR PLANT OPERATION CONDITION AND ITS IN-SITU ELECTROCHEMICAL ELECTRODE

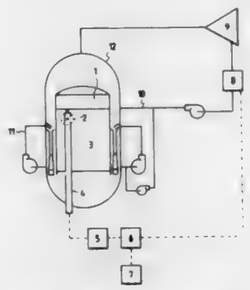
Masanori Sakai; Katsumi Mabuchi, both of Hitachi; Toshiaki Arato, Katsuta; Takuya Takahashi, Hitachi; Masakiyo Izumiya, Mito; Isao Masaoka, Hitachi; Yoshitaka Kojima, Hitachi; Masahisa Inagaki, Hitachi; Katsumi Ohsumi, Hitachi; Makoto Hayashi, Hitachi; Fumio Sato, Hitachi; Masateru Suwa, Tohkai, and Kimihiko Akahori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,780

Claims priority, application Japan, Sep. 11, 1989, 1-232824

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—435 **16 Claims**



1. A monitoring system for plant operating conditions comprising: means for sampling consecutively information directly relating to high temperature water quality in an objective monitoring section of the plant for a certain period with an electrochemical water quality sensor disposed in said objective monitoring section; means for evaluating the water quality based on the sampled information; means for comparing the obtained results of the water quality evaluation with a predetermined reference value for the plant operation and manipulation; and means for displaying or recording necessary portions of said comparison result; wherein, said electrochemical water quality sensor is an electrochemical cell comprising a reference electrode member provided with an electrolyte layer containing ions of the reference electrode material, a porous layer which is made of ceramic or resin in contact with and surrounding the electrolyte layer and which is non-liquid-permeable but ion-permeable, a counter electrode member disposed in electrochemical relation with said electrolyte layer, said porous layer being in contact with and surrounding said reference electrode and said electrolyte so that said high temperature water does not directly contact said electrode and electrolyte, whereby dissolution of said reference electrode material into said high temperature water is substantially suppressed but said reference electrode is in electrochemical communication with said water, and terminals electrically contacting with said electrode members.

5,203,985

PROCESS FOR MANUFACTURING GALVANIZED STEEL SHEET BY NICKEL PRE-COATING METHOD

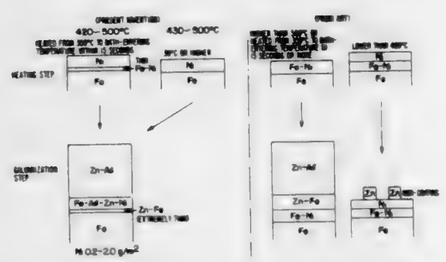
Kazumi Nishimura; Hisao Odashima; Tetsuya Ohara; Ryohei Mizoguchi, and Shigeto Fujii, all of Hyogo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 15, 1991, Ser. No. 700,457

Claims priority, application Japan, Oct. 9, 1990, 2-271957

Int. Cl.[5] C25D *5/00*

U.S. Cl. 205—193 **1 Claim**



1. A process for manufacturing a galvanized steel sheet, comprising steps of coating a steel sheet with nickel in an amount of from 0.2 to 2 g/m^2, rapidly heating the steel sheet thus coated at a heating rate of not less than 30° C./s to a temperature within the range of from 430° C. to 500° C. in a non-oxidative atmosphere, and dipping the nickel coated steel sheet into a molten zinc bath containing aluminum at a content of from 0.1 to 1% without contact with air.

5,203,986

METHOD FOR MANUFACTURING ELECTROGALVANIZED STEEL SHEET EXCELLENT IN SPOT WELDABILITY

Yukimitsu Shiohara, and Masaki Abe, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 657,665

Claims priority, application Japan, Mar. 8, 1990, 2-57689; Mar. 13, 1990, 2-61961

Int. Cl.[5] C25D *3/22*

U.S. Cl. 205—305 **13 Claims**

1. In a method for manufacturing an electrogalvanized steel sheet excellent in spot weldability, which comprises the steps of:

electrogalvanizing a steel sheet in an acidic electrogalvanizing solution containing an oxidizer to form, on at least one surface of said steel sheet, a galvanizing layer comprising zinc oxide or a zinc hydroxide;

the improvement wherein:

said acidic electrogalvanizing solution further contains a complexing agent, which has a degree of stability of a complex with zinc of at least 1.0 in the acidic electroplating solution having a pH value of 6, in an amount within a range of from 0.001 to 10 moles per liter of said electrogalvanizing solution, thereby preventing a pH value of said acidic electrogalvanizing solution on an interface with a cathode from decreasing to 5.6 or under and increasing to over 12.

5,203,987

METHOD OF UPGRADING RESIDUA

Emiliano de la Fuente, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 5, 1991, Ser. No. 694,225

Int. Cl.[5] C01G *65/00, 65/14, 45/00, 59/06*

U.S. Cl. 208—59 **27 Claims**

17. A method for upgrading a hydrocracked residua comprising:

separating a hydrocracked residua into a first fraction containing no more than 20 vol.% aromatic components and a second fraction containing at least 50 vol.% aromatic components;

catalytically hydrotreating the first fraction to produce a hydrotreated product;

distilling the second fraction under vacuum, to produce a third fraction containing between 25 and 50 wt.% aromatic components and a residua fraction;

catalytically hydroprocessing the third fraction in the presence of a cracking catalyst for the production of midbarrel products boiling between 150° C. and 355° C. (302° F. and 671° F.) to produce a hydroprocessed product; and

combining said hydrotreated product with said hydroprocessed product to produce a product of which is distillable into a fuel product boiling between 175° C. and 260° C. (347° F. and 500° F.), the fuel product containing no more than 20 vol.% aroamtic components and b) a naphtha fraction containing no more than 1 ppmw sulfur-containing components and 1 ppmw nitrogen containing components.

5,203,988

MULTISTAGE REFORMING WITH ULTRA-LOW

first ultraviolet light means for killing microorganisms in the

cylindrical tubes, and pipe means, said adapter means defining an opening axially therethrough and serving to connect said

derive chromatograms corresponding to selectable values of the optimization parameter; and

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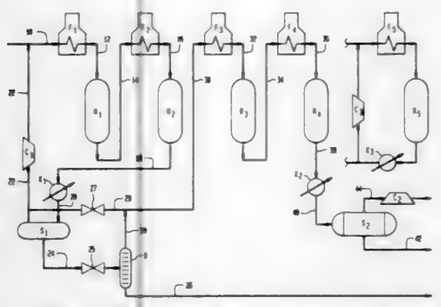
5,203,988

MULTISTAGE REFORMING WITH ULTRA-LOW PRESSURE CYCLIC SECOND STAGE

George A. Swan, III, Baton Rouge, La.; James P. Bailor, Kenvil, N.J.; David W. Staubs, and Eduardo Mon, both of Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Aug. 19, 1991, Ser. No. 747,897
Int. Cl.[5] C10G 35/04
U.S. Cl. 208—65 27 Claims



1. A process for catalytically reforming a gasoline boiling range hydrocarbonaceous feedstock in the presence of hydrogen in a reforming process unit comprised of a plurality of serially connected reactors, wherein each of the reactores contains a supported noble metal-containing reforming catalyst composition, the process comprising:

(a) conducting the reforming in two or more stages comprised of one or more reactors;

(b) separating aromatics possessing nine carbon atoms or more from at least a portion of the reaction stream at each stage thereby resulting in a stream rich in C_9+ aromatics and a stream rich in lighter aromatics and paraffins;

(c) passing at least a portion of the stream rich in lighter aromatics and paraffins to the next downstream stage, in the substantial absence of non-reformed feed; and

(d) wherein the reforming of one or more of the downstream stages is conducted such that at least one of the reactors contains a reforming catalyst selected from (i) a supported mono-metallic or multi-metallic catalyst wherein at least one of the metals is a noble metal, and the support is alumina, and wherein at least one reactor of a downstream stage is operated in the substantial absence of steam, and at a pressure which is at least 25 psig lower than that of the first stage.

5,203,989

POTABLE AIR-WATER GENERATOR

James J. Reidy, 1260 Main St., Holden, Mass. 01520

Continuation-in-part of Ser. No. 648,541, Jan. 30, 1991, Pat. No. 5,149,446, and a continuation-in-part of Ser. No. 749,932, Aug. 16, 1991, Pat. No. 5,106,512. This application Jan. 30, 1992, Ser. No. 828,190
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] B01D 21/30; C02F 1/00; F25D 17/06
U.S. Cl. 210—137 31 Claims

1. A water generating device for obtaining potable water from ambient air, comprising:

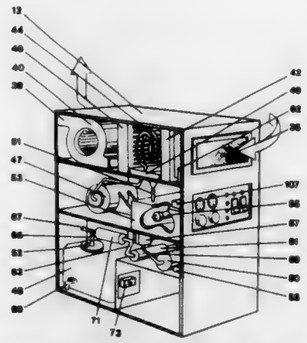
means for bringing a supply of inside or outside ambient air to the device and for returning the air back outside the device after it has been processed;

air filtering means for filtering the air;

condenser means for extracting water vapor from the filtered air;

first ultraviolet light means for killing microorganisms in the extracted water;

a temporary holding reservoir for holding the freshly extracted water;



pump means for moving the water from the temporary holding reservoir to a subsequent location within the device, or to a subsequent location exterior to the device;

water filter means downstream of said pump means for filtering the water; and

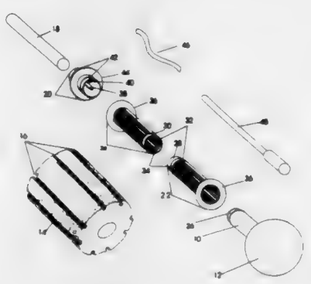
outlet means for allowing filtered water to exit the device.

5,203,990

INSIDE MULTI-FUNCTIONAL AQUARIUM SPONGE FILTER

Joseph C. Gargiulo, P.O. Box 33623, Decatur, Ga. 30033

Filed May 21, 1992, Ser. No. 888,349
Int. Cl.[5] A01K 63/04
U.S. Cl. 210—169 6 Claims



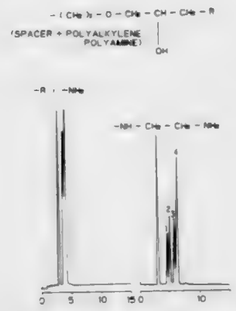
1. An aquarium filter comprising a pair of cylindrical tubes, a first tube of said pair of cylindrical tubes including a flange on a first end thereof and a male connector on the second end thereof, a second tube of said pair of cylindrical tubes including a flange on a first end thereof and a female connector on the second end thereof, said male and said female connectors being selectively fit together for defining a clear water chamber within said pair of cylindrical tubes, said first tube and said second tube defining a plurality of slits extending generally from said first end to said second end for allowing the entrance of water into said clear water chamber, a sponge filter medium defining an opening therethrough, said opening being sized to snugly receive said pair of cylindrical tubes, said sponge filter being sized to be received between said flange on said first tube and said flange on said second tube when said male and female connectors are fixed together, plug means selectively receivable in said first end of said cylindrical tubes, said plug means acting to prevent fluid flow into said clear water chamber, adapter means selectively receivable in said first end of said cylindrical tubes, and pipe means, said adapter means defining an opening axially therethrough and serving to connect said clear water chamber to said pipe means.

5,203,991

PACKING MATERIAL FOR LIQUID CHROMATOGRAPHY

Hiroshi Kutsuna; Yoshihiro Shiojima; Tsuneo Suhara; Hiroshi Fukui; Yutaka Ohtsu, and Michihiro Yamaguchi, all of Yokohama, Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan

Filed Oct. 17, 1991, Ser. No. 778,357
Claims priority, application Japan, Oct. 31, 1990, 2-291695
Int. Cl.[5] B01D 15/08
U.S. Cl. 210—198.2 9 Claims



1. A packing material for liquid chromatography comprising a moiety derived from a porous silica gel coated with a silicone polymer containing a SiH group, a spacer moiety having two ends and a polyalkylene polyamine portion having an amino group capable of bonding to the spacer moiety, said packing material wherein:

A. the silicon atom derived from a SiH group of the aforesaid silica gel moiety is silicon-carbon covalently bonded to one end of the spacer moiety, and the other end of the spacer moiety is carbon-nitrogen or sulfur-nitrogen covalently bonded to the amino group of the polyalkylene polyamine; and

B. the spacer constituting portion between said both bonds is a group having 3 to 15 constituent atoms of a main chain, and comprises a substituted or unsubstituted hydrocarbon chain which is or is not interrupted with at least one oxygen atom, sulfur atom or nitrogen atom.

5,203,992

APPARATUS FOR OPTIMIZING THE LIQUID CHROMATOGRAPHIC SEPARATION OF A SAMPLE

Antonius Drouen, Waldbronn, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 507,606, Apr. 10, 1990, abandoned.
This application Mar. 2, 1992, Ser. No. 844,901
Claims priority, application European Pat. Off., Jun. 23, 1989, 89111420.9
Int. Cl.[5] B01D 15/08
U.S. Cl. 210—198.2 13 Claims

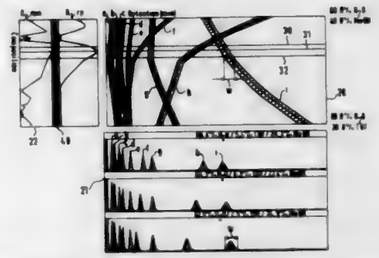
1. An apparatus for optimizing the liquid chromatographic separation of a sample comprising a plurality of components with respect to an optimization parameter, comprising:

means for performing liquid chromatographic separations at selected values of the optimization parameter;

data processing means programmed to:

derive retention behavior of each component as a function of the optimization parameter; and

derive chromatograms corresponding to selectable values of the optimization parameter; and



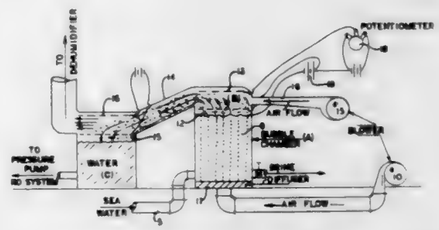
display means for displaying the derived retention behavior as a function of the optimization parameter and for displaying the derived chromatograms.

5,203,993

METHOD AND APPARATUS FOR REMOVING SALT FROM SEA WATER

Dominic S. Arbisi, Minnetonka, Minn., assignor to Electrostat Technologies, Inc., Minnetonka, Minn.

Filed Oct. 29, 1991, Ser. No. 783,926
Int. Cl.[5] C02F 1/48
U.S. Cl. 210—221.1 10 Claims



1. A water desalination method comprising

providing a supply tank with salt water contained therein,

discharging bubbles of air upwardly through the salt water in the tank whereby the film surrounding each bubble will rupture as it passes through the top surface of the liquid in the supply tank to produce low salt content water droplets having an electrical charge inherently formed thereon,

providing an electrostatic field above the surface of the salt water in the tank through which the droplets may pass,

imposing a potential gradient above the surface of the liquid in the tank to move the droplets upwardly away from the surface of the supply water,

providing a collection tank,

imposing a crossflow of air supplied by a blower on the droplets discharged above the grid to transport said droplets into the collection tank.

5,203,994

FUEL FILTER RETENTION SYSTEM

Leon P. Janik, Suffield, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

Filed Aug. 16, 1991, Ser. No. 746,693
Int. Cl.[5] B01D 27/00
U.S. Cl. 210—232 22 Claims

1. A fuel filter assembly comprising:

base means comprising a receptacle and ramp means for defining a first spiral ramp at the exterior of said enclosure

and a stop angularly spaced from said first ramp and defining a slot therebetween;

mm, said ilmenite particles being in the form of grains having sharp edges and irregular sized faces;

a source of fluid under pressure; and

tie rods and inner sides of the inner tie rods and forming an

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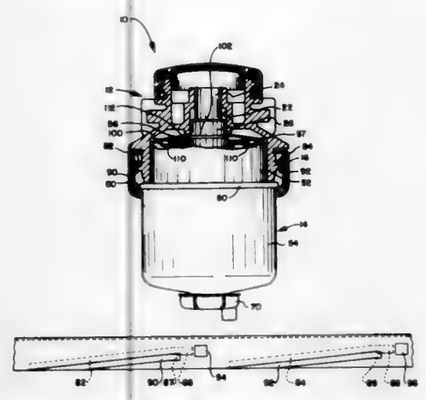
and a stop angularly spaced from said first ramp and defining a slot therebetween;

disposable cartridge means mountable to said base means, at least a portion of said cartridge means being receivable in said receptacle, said cartridge means housing a filter element and comprising a peripheral engagement shoulder;

biasing means for generally axially biasing said cartridge means away from said base means receptacle;



retainer collar means comprising a retainer portion engageable against said shoulder and follower means comprising a catch at one end thereof, said follower means being engageable with said ramp means so that as said collar means is angularly rotated, said follower means rides said ramp means and said catch moves into said slot under the bias of said biasing means for capture thereby to lock said cartridge means to said base means.

5,203,995

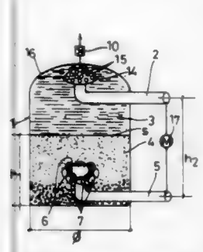
FILTER FOR MACHINE TOOL

Martinez M. Fernando, Larrasoloeta, 5, 48200 Durango, Spain

Continuation of Ser. No. 644,578, Jan. 23, 1991, abandoned. This application Jul. 23, 1992, Ser. No. 919,084

Int. Cl.[5] B01D *24/14*

U.S. Cl. 210—274 **10 Claims**



1. A filter for use with a machine tool, operative to filter at least one of steel, brass, and copper from a liquid agent, the filter consisting of:

a cylindrical container having a closed top end and a closed bottom end;

an upper duct positioned near the top end of the container;

a lower duct positioned near the bottom end of the container and having a lower diffuser fluidly connected thereto;

a filtering element surrounding said lower diffuser, the filtering element having a diameter ϕ, the filtering element having a first surface adjacent said top end and a second surface adjacent said bottom end, the filtering element consisting essentially of ilmenite particles having a density (d) of about 6 g/cm^3 and a size (t) ranging between a smallest size of about 0.2 mm and a largest size of about 1.0 mm, said ilmenite particles being in the form of grains having sharp edges and irregular sized faces;

the distance (h_2) between the said upper and lower ducts being at least 1.2 times the height (h_1) of the filtering element; and

the upper duct having an upwardly directed diffuser of hemispherical shape facing said top end of the container, the upwardly directed diffuser having outlet holes therein and being situated at said distance (h_2) from said lower duct and being at least one-sixth of the distance (h_2) from said second surface of the said filtering element.

5,203,996

APPARATUS FOR PRESSING, DEWATERING OR FILTERING

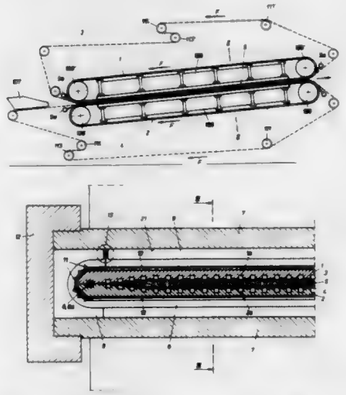
Peter Scheucher, Kumberg; Dag Berglöff, Graz; Reinhart Pinter, Graz, and Rupert Syrowatka, Graz, all of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Continuation of Ser. No. 385,765, Jul. 26, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 803,674

Claims priority, application Austria, Aug. 11, 1988, 2018/88

Int. Cl.[5] B30B *9/24*

U.S. Cl. 210—386 **37 Claims**



1. An apparatus for the treatment of sludges, fibrous material suspensions or cellulosic material suspensions by pressing and dewatering or filtering, comprising:

two circulating filter belts, each belt having a side thereof facing the other belt, between which the material to be treated is made to pass;

two circulating pressure belts for supporting the sides of the filter belts which face away from the material to be treated, the pressure belts and filter belts forming a belt package wherein the filter belts are disposed between the pressure belts with the material to be treated passing between the filter belts;

means for circulating said pressure belts and filter belts in a moving direction,

means for supporting the belt package, which includes enclosing walls forming a tunnel through which the belt package is disposed, said tunnel having an inlet end and an outlet end, and said belt package moving through the tunnel in said moving direction from the inlet end to the outlet end;

a plurality of sealing members attached to the walls of the tunnel and extending completely around the belt package transverse to said moving direction of the belt package, said members providing a seal between the tunnel walls and the belt package;

a source of fluid under pressure; and

means for introducing fluid from said source into the tunnel between adjacent sealing members to form compression zones along the belt package whereby fluid pressure may be applied to said belt package to compress the material to be treated.

5,203,997

HYDROPHILIC POROUS MEMBRANE, METHOD OF MANUFACTURING THE SAME AND LIQUID FILTER USING THE SAME

Noriyuki Koyama, Fuji; Shinsuke Yokomati, Fujinomiya; Yasushi Nemoto, and Makoto Ohnishi, both of Fuji, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1989, Ser. No. 345,244

Claims priority, application Japan, May 2, 1988, 63-109777; Sep. 6, 1988, 63-222871

Int. Cl.[5] B01D *71/34*

U.S. Cl. 210—490 **7 Claims**

1. A hydrophilic porous membrane comprising a porous membrane substrate based on fluorine having innumerable pores, surfaces of said porous membrane substrate and inner pore surfaces being covered by a non-ionic surface active agent based on fluorine, wherein the hydrophilic porous membrane contains 7.5 to 12.5% by weight of said non-ionic surface active agent based on fluorine with respect to the weight of said porous membrane substrate based on fluorine.

5,203,998

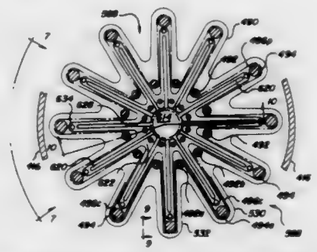
PERMANENT BACKWASHABLE FILTER STRUCTURE

Robert Benian, West Bloomfield, Mich., assignor to Benian Filter Company, Inc., West Bloomfield, Mich.

Filed Jun. 17, 1992, Ser. No. 900,003

Int. Cl.[5] B01D *27/06*

U.S. Cl. 210—493.5 **25 Claims**



1. A pressurizable filter cartridge apparatus having a central axis and a sheet of permanent mesh filter bed material arranged in a star configuration for increasing the ratio of surface-area-to-unit-volume of the cartridge apparatus, comprising:

a top cartridge plate provided with at least four elongated openings arranged in a star configuration;

a bottom cartridge plate having at least four elongated finger sections arranged in star configuration;

a plurality of outer tie rods for interconnecting the top and bottom cartridge plates, the outer tie rods being arranged concentrically about the central axis, with each outer tie rod being coupled to the bottom cartridge plate at an outer end portion of an elongated finger section thereof, cartridge plate and coupled to a portion of the top cartridge plate adjacent a respective one of the elongated slots at and outer end thereof;

a plurality of inner tie rods for interconnecting the top and bottom cartridge plates, with each such tie rod being connected to the bottom cartridge plate at a respective interfinger web section thereof and to the top cartridge plate at an inside web between two adjacent openings;

a sheet of permanent filter bed material arranged in a star configuration so as to have a number of pleated sections, the pleated sections passing on the outer sides of the outer tie rods and inner sides of the inner tie rods and forming an enclosed inner volume extending between the top and bottom filter cartridge plates; and

top sealing means, for closing leakage paths between a top edge of the sheet of filter bed material and the top cartridge plate; and

bottom sealing means for closing leakage paths between the bottom cartridge plate and a lower edge of the sheet of filter bed material,

the cartridge plates, tie rods, sheet of permanent bed material, and sealing means all being arranged, sized and interconnected in a manner which enables the filter bed material to be backwashed by liquid flowing from the enclosed inner volume through the sheet of filter bed material.

5,203,999

CENTRIFUGAL OIL FILTER WITH PARTICLE COLLECTOR

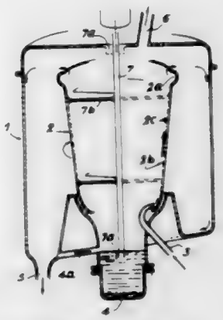
Michel G. Hugues, Bois le Roi, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jan. 24, 1992, Ser. No. 825,576

Claims priority, application France, Jan. 30, 1991, 91 01021

Int. Cl.[5] B04B *5/04*

U.S. Cl. 210—512.3 **6 Claims**



1. A centrifugal oil filter, comprising:

a rotatable bowl,

means for mounting said bowl for rotation about a substantially vertical axis,

oil inlet means opening into the lower portion of said bowl,

means for permitting an overflow of oil from an upper portion of said bowl when said bowl is rotating, and

a fixed particle collector situated beneath said bowl, said bowl having an open bottom portion, an inner wall, particle trapping means located on said inner wall, and an annular recess forming an oil reservoir situated above said particle trapping means wherein said particle trapping means comprises a plurality of grooves formed on said inner wall such that particles are trapped in said grooves due to centrifugal force when said bowl is rotating and fall due to a force of gravity into said particle collector when said blow stops rotating.

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oxidizable material comprising a solids-containing mixture of

5,204,002

molecules of said solute exhibit repulsive or weakly attractive

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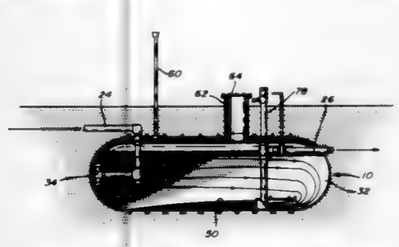
5,204,000

TANK FOR SEPARATING WATER AND HYDROCARBON FUELS FROM CONTAMINATED WATER

Gary E. Steadman, Sherwood Park, and Richard R. Scragg, Edmonton, both of Canada, assignors to ZCL Mfg Canada Inc., Edmonton, Canada

Filed Jan. 31, 1992, Ser. No. 829,755
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—519 **5 Claims**



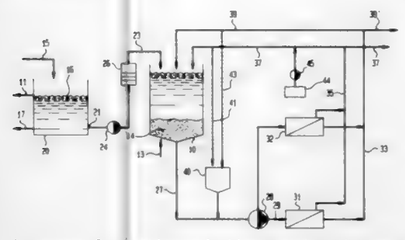
1. A tank for separating water and hydrocarbon fuels from contaminated water comprising:
an elongated vessel having opposite ends;
inlet means adjacent a first or said ends for delivering contaminated water to said vessel;
distribution baffle means mounted at said first end and connected to said inlet means for directing, in said vessel, said contaminated water in multiple streams thereby altering an incoming turbulent flow of said contaminated water from said inlet means into a laminar flow whereby light hydrocarbon fuel droplets are allowed to rise and be collected on the surface of water in said vessel; and
outlet means adjacent a second of said ends for discharging water free of hydrocarbon fuels from said vessel,
further comprising sludge baffle means on a bottom wall of said vessel adjacent said second end,
said sludge baffle means include a vertical wall connected to a bottom of said vessel to provide a barrier for the accumulation of sludge therebehind and a horizontal wall extending downstream of said vertical wall to direct water flow to said second end of said vessel,
said outlet means comprises a piping having an inlet end in said vessel disposed below said horizontal wall of said sludge baffle means thereby providing a channel for the reverse flow of water from said second end of said vessel towards said inlet end of said piping.

5,204,001

MEMBRANE BIOREACTOR SYSTEM FOR TREATING SYNTHETIC METAL-WORKING FLUIDS AND OIL-BASED PRODUCTS

Fernando A. Tonelli, Dundas, and R. Philip Canning, Waterdown, both of Canada, assignors to Zenon Environmental Inc., Burlington, Canada

Filed Oct. 9, 1991, Ser. No. 773,226
Int. Cl.[5] C02F *3/12*
U.S. Cl. 210—608 **15 Claims**



1. A process for continuously biodegrading biochemically oxidizable material comprising a solids-containing mixture of easy- and difficult-to-degrade waste fluids in a wastewater stream from a metal-working plant, said process comprising,
(a) providing a pretreatment zone for said wastewater, said zone having a volume sufficiently large to equalize variations in the flow rate of said wastewater to said pretreatment zone which is adapted for removal of settlable solids and skimmable free oil, and removing skimmed wastewater from said zone;
(b) removing finely divided solids injurious to membranes, from said skimmed wastewater to provide a solids-depleted wastewater feed;
(c) feeding said solids-depleted wastewater feed at an essentially constant rate of flow to a bioreaction zone maintained with an essentially constant volume of liquid therein, and, with a hydraulic retention time of at least 24 hr;
(d) aerating said biochemically oxidizable material in the presence of live microorganisms adapted to degrade said materials which are held in suspension within said reactor with a solids retention time (SRT) of at least 30 days;
(e) flowing said suspension through a membranous filtration zone at a velocity and pressure sufficient to maintain a predetermined membrane flux in said filtration zone at which flux essentially no solids are retained on the surface of membrane in said filtration zone, said membranous zone having a membrane area sufficiently large to provide a flow rate of permeate greater than said essentially constant rate of flow of said solids-depleted wastewater feed;
(f) separating permeate from a concentrate containing said solids;
(g) flowing said concentrate from said membranous filtration zone into said bioreaction zone as a concentrate recycle;
(h) removing an effluent of acceptable quality;
(i) flowing excess permeate over that removed as effluent, back to said bioreaction zone; and,
(j) periodically removing a minor proportion by volume of said concentrate recycle to modulate the solids content in said bioreaction zone.

15. A wastewater treatment system operatively connected between a source of wastewater containing waste fluids from a metal-working plant and an outlet for treated effluent, comprising,
(a) a vessel large enough to hold said wastewater delivered at a variable rate of flow and to equalize the rates of flow to a predetermined essentially constant rate removed from said vessel;
(b) means to remove free oil from said wastewater to provide a skimmed wastewater;
(c) filtration means having a mesh size small enough to remove finely divided solids injurious to membrane means and provide a solids-depleted feed;
(d) a bioreactor means in which is confined an essentially constant volume of a reaction mass with means for aerating skimmed and solids-depleted feed, and for contacting said feed with waste-degrading microorganisms mixed therein;
(e) pump means for withdrawing a suspension of biomass from said bioreactor at an essentially constant rate of flow, and impelling said suspension at elevated pressure;
(f) membrane filtration means in direct, open flow-receiving communication with said pump means, said membrane filtration means including plural membrane elements adapted to separate said suspended solids in a concentrate stream, from water permeate which is essentially free of solids, and means to duct said permeate away from said system;
(g) means to return said concentrate bioreactor means; and,
(h) means to return a minor portion of said permeate to said bioreactor means.

5,204,002

CURVED CHANNEL MEMBRANE FILTRATION

Georges Belfort, Slingerlands, N.Y.; Mary E. Brewster, Longmont, Colo., and Kun-Yong Chung, Troy, N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Jun. 24, 1992, Ser. No. 903,990
Int. Cl.[5] B01D *61/18, 63/10*
U.S. Cl. 210—634 **15 Claims**

1. A filtration apparatus for separating at least one substance of a fluid, from another substance of the fluid, comprising:
an inner wall which is curved around an axis of curvature;
an outer wall which is curved around the axis of curvature, at least one of the inner and outer wall being of material that is porous to the one substance, the outer wall being spaced outwardly of the inner wall by a gap defining a curved channel having a fluid inlet for receiving a flow of the fluid and a fluid outlet for discharging the flow of fluid, the gap of the channel being narrow compared to a width of the channel along the axis; and
means for creating and maintaining Dean vortices in the channel including a curvature and gap which is defined by the curvature of said inner and outer walls.

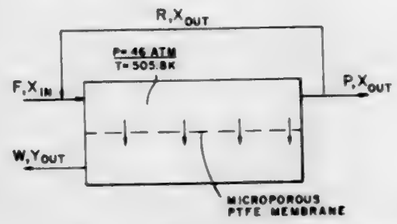
10. A filtration method for separating at least one substance of a fluid from another substance of the fluid, comprising:
passing the fluid at a fluid flow rate through a curved channel having inner and outer walls, at least one of which being porous to the one substance;
the channel having an axis of curvature and having a narrow radial gap with respect to the axis and as compared to an axial width of the channel along the axis; and
providing means for creating and maintaining Dean vortices within the flow of fluid in the channel by providing a preselected curvature in the channel.

5,204,003

SEPARATION PROCESSES USING EXPULSION FROM DILUTE SUPERCRITICAL SOLUTIONS

Henry D. Cochran, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 8, 1991, Ser. No. 697,031
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—651 **12 Claims**



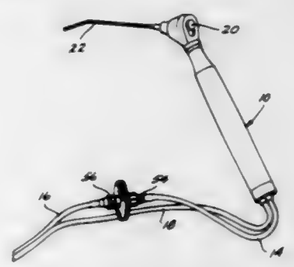
1. In a solution comprising a solute and a solvent wherein molecules of said solute exhibit repulsive or weakly attractive behavior relative to molecules of said solvent as the critical point of said solvent is approached, a process for separating said solute from said solvent comprising:
bringing a dilute solution of said solute and said solvent to a temperature and pressure approaching the critical point of said solvent thus effecting a maximization of solute fugacity;
separating said solute from said solvent by contacting said solution with a medium, said medium having the capacity to admit solvent and its negligible insolubility in said solution.

5,204,004

METHOD AND APPARATUS FOR PREVENTING BACTERIOLOGICAL CONTAMINATION BY A DENTAL TOOL WATER LINE

Simon E. Johnston; Anna M. Johnston, both of 9039 Juanita Dr. NE., Kirkland, Wash. 98033, and Jeffrey F. Williams, 5690 W. Columbia Rd., Mason, Mich. 48854

Filed May 29, 1992, Ser. No. 891,440
Int. Cl.[5] A61G *17/02*
U.S. Cl. 210—651 **20 Claims**



1. Apparatus for use in connection with dental tools that employ a water line for conveying water to a patient's mouth, said apparatus protecting a patient from bacteriological contamination that may be present in the water line, comprising:
(a) a housing in which are formed an inlet port and an outlet port, said outlet port being in a sterile condition prior to use and installation of the apparatus in a water line;
(b) a quick-connect inlet fitting formed on the inlet port;
(c) a quick-connect outlet fitting formed on the outlet port;
(d) means for bacteriological sterilization of water flow through the housing, including a microporous membrane having a porosity selected to block a predefined size of particulate matter, including bacteria, without substantially restricting water flow through the membrane, said membrane being disposed within the housing between the inlet port and the outlet port and sealingly extending between an internal periphery of the housing so that all water flowing in the inlet port passes through the membrane before flowing out the outlet port; and
(e) a sterile cap sized to fit over the outlet port to protect it from being contaminated by exposure to a non-sterile environment when the housing is handled during installation in a water line, said apparatus being thus installable in a water line that has an internal surface capable of supporting a bacterial growth, so that bacteria within the water entering the inlet port are substantially blocked and prevented from reaching a patient's mouth through a dental tool used therein, said apparatus thereby protecting a patient from exposure to potentially harmful bacteria that might cause illness.

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(a) introducing a pH adjusting compound to said stream of

metal or an alkaline earth metal or formed in situ from hydro- ylated higher alkyl amines, ethoxylated higher alkyl amine/-

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5,204,005

REVERSED PHASE CHROMATOGRAPHIC PROCESS

Narciso O. Doran, III, Bridgeton; Thomas J. Dunn, Cedar Hill; Mills T. Kneller, University City; Youlin Lin, Chesterfield; David H. White, Florissant, and David Ming-Lee Wong, Chesterfield, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 484,261, Feb. 26, 1990, abandoned. This application Jan. 28, 1991, Ser. No. 646,836

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—656 34 Claims

1. A process for the reversed phase chromatographic decolorization, separation, and purification of water-soluble, nonionic contrast media compounds from solutions containing nonionic compound impurities, said solutions having been treated for removal of ionic impurities; comprising the steps of:

(a) packing a chromatographic column with a chromatographic packing material;

(b) passing through said column a solution containing a water-soluble, nonionic contrast media compound and nonionic compounds as impurities at a loading ratio between approximately 10 to 1 and 1.5 to 1 wt. packing material/total wt. nonionic compounds; and

(c) eluting said column to produce an eluate containing substantially pure, water-soluble, nonionic contrast media compound.

5,204,006

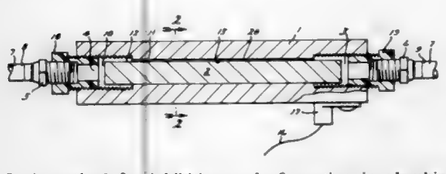
IN-LINE STATIC WATER CONDITIONER AND METHOD FOR INHIBITING SCALE FORMATION

Joseph P. Santoli, 2031 Discovery Circle, Pompano Beach, Fla. 33064

Continuation of Ser. No. 567,594, Aug. 15, 1990, abandoned. This application Feb. 18, 1992, Ser. No. 839,029

Int. Cl.[5] C23F *13/00*

U.S. Cl. 210—696 14 Claims



9. A method for inhibiting scale formation in plumbing comprising contacting water containing scale forming ions with a surface having a composition comprising copper having a weight fraction greater than 0.8, tin and nickel having a weight fraction between 0.07 and 0.04, zinc having a weight fraction between 0.04 and 0.01 and lead having a weight fraction between 0 and 0.005 by flowing said water across said surface before feeding said water to said plumbing.

5,204,007

METHOD OF CLARIFICATION OF WASTE WATER FOR PRODUCTION OF ANIMAL FEEDS

Kenneth L. Mosley, 100 Roundabout Dr., Trussville, Ala. 35173, and Hans E. Lundgren, 7939 Titian Way, Salt Lake City, Utah 84121, assignors to Kenneth L. Mosley, Trussville, Ala. and Hans E. Lundgren, Salt Lake City, Utah

Continuation-in-part of Ser. No. 753,827, Sep. 3, 1991, abandoned. This application Dec. 30, 1991, Ser. No. 814,574

Int. Cl.[5] C02F *1/24*

U.S. Cl. 210—705 4 Claims

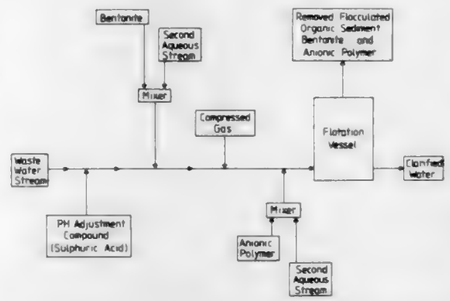
1. A method for removing solids from a stream of food processing waste water containing fatty acids and peroxide compounds from a chicken processing plant without the use of a metal salt such that said solids may be subsequently rendered as an animal food stuff, comprising the steps of:

(a) introducing a pH adjusting compound to said stream of waste water to maintain the pH thereof at about 3.5 to 9.0;

(b) creating an activated bentonite slurry by introducing bentonite into a first aqueous stream at ratios of about 1% to 10% by weight wherein said bentonite and stream undergo mixing for a sufficient period to activate said slurry;

(c) introducing said bentonite slurry into said stream of waste water at rates ranging from about 200 to 600 milligrams of bentonite per liter of waste water;

(d) introducing an anionic polymer into a second aqueous stream at ratios of about 0.01% to 5.0% by weight anionic polymer to water;



(e) mixing said second aqueous stream with said stream of waste water, thus initiating flocculation of said bentonite, anionic polymer, and solids;

(f) transferring said stream of waste water to a flotation vessel and forming a float blanket containing flocculate bentonite, anionic polymer, and solids and clarified waste water;

(g) removing said float blanket from said clarified waste water for subsequent rendering into an animal food product; and,

(h) discharging said clarified waste water from said vessel.

5,204,008

PROCESS FOR THE DETOXIFICATION OF AQUEOUS SOLUTIONS CONTAINING CYANOHYDRINS AND/OR NITRILES

Manfred Diehl, Frankfurt; Joachim Fischer, Rodenbach, and Hubert Wolf, Hammersbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1992, Ser. No. 858,001

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1991, 4110056

Int. Cl.[5] C02F *1/72*

U.S. Cl. 210—759 9 Claims

1. A process for the detoxification of an aqueous solution which contains a cyano compound which is a cyanohydrin or a nitrile and mixtures thereof each of said cyanohydrin and nitrile having 2 to 5 carbon atoms, whereby said cyanohydrin and nitrile is converted into the corresponding non-toxic hydroxycarboxylic acid or carboxylic acid, and which in addition contains a manganese compound, comprising carrying out a perhydrolysis reaction of 5° to 80° and a pH value of from 8 to 12, wherein said peroxide compound used for perhydrolysis is one or more peroxide compounds selected from the group consisting of alkali metal percarbonates and perborates of alkali metals and alkaline earth metals and alkaline earth metal peroxides, the said peroxide compound being added in solid form or dissolved or suspended in water to the solution to be detoxified or formed in situ in the said solution from hydrogen peroxide and a source of a metaborate and a source of an alkali metal or an alkaline earth metal or formed in situ from hydrogen peroxide and a source of an alkaline earth metal.

5,204,009

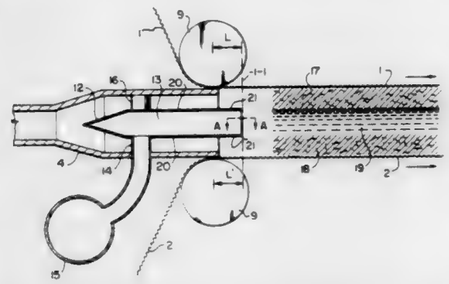
SLURRY RISING APPARATUS AND METHOD THEREFOR

Steve Rowland, Ste. Thérèse, Canada, assignor to Kvaerner Hymac Inc., Canada

Filed Aug. 14, 1991, Ser. No. 745,007

Int. Cl.[5] B01D *33/60*

U.S. Cl. 210—772 5 Claims



1. A method of rinsing a slurry contained between a pair of converging mesh belts in a twin wire press comprising the steps of:

(a) feeding said slurry through slurry inlet means disposed between and positioned at an upstream end of a pair of converging mesh belts in a twin wire press, said pair of belts converging toward a point of convergence of said belts positioned downstream of said slurry inlet means;

(b) providing slurry stream splitter means in said slurry inlet means, said slurry stream splitter means splitting the slurry into two stream, each stream being adjacent one of the converging mesh belts, said slurry stream splitter means having a closed upstream end having converging side walls to split said slurry into said two streams, a downstream end having substantially parallel upper and lower walls, an inlet means for a rinsing fluid, and an outlet means for said rinsing fluid at said downstream end of said splitter;

(c) introducing a stream of rinsing fluid into said inlet of said slurry stream splitter means to form an upper slurry stream portion, a lower slurry stream portion, and a layer of rinsing fluid intermediate said two slurry stream layers, and

(d) creating compressive forces within the pair of mesh belts.

5,204,010

CATIONIC/ANIONIC SURFACTANT COMPLEX ANTISTATIC AND FABRIC SOFTENING EMULSION FOR WASH CYCLE LAUNDRY APPLICATIONS

Dean G. Klewsaat, Watchung, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Division of Ser. No. 916,067, Oct. 6, 1986, Pat. No. 4,888,119. This application Nov. 1, 1989, Ser. No. 430,217

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] D06M *13/26, 13/38, 13/46, 13/48*

U.S. Cl. 252—8.75 7 Claims

1. An aqueous antistatic and fabric softening emulsion of a complex of a cationic surfactant and an anionic surfactant, which comprises a complex produced by heating with stirring said cationic and anionic surfactants to form a melt complex and then cooling to solidify said complex in which the proportion of cationic and anionic moieties thereof is in the range of about 1:1 to 1:1.5, and which said softening emulsion comprises 10 parts by weight of said complex, 0.5 to 10 parts of emulsifying agent, which is selected from the group consisting of ethoxylated higher alkyl amines, ethoxylated higher alkyl amine/higher fatty acid complexes, mixtures of ethoxylated higher alkyl amines and ethoxylated higher alkyl amine/higher fatty acid complexes, mixtures of ethoxylated higher alkyl amine and ethoxylated higher alcohols, and mixtures of ethoxylated higher alkyl amine/higher fatty acid complexes and ethoxylated higher alcohols, and 15 to 100 parts of aqueous medium.

5,204,011

LUBRICANTS CONTAINING ARYL ARENESULFONATES AS LUBRICITY ADDITIVES

Bassam S. Nader, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1992, Ser. No. 894,490

Int. Cl.[5] C10M *135/10, 135/08*

U.S. Cl. 252—48.4 40 Claims

1. A lubricating composition which comprises a lubricating fluid and an aryl arenesulfonate in an amount sufficient to increase the lubricity of the lubricating fluid, wherein the aryl arenesulfonate is of the formula ASO_3A, ASO_3BSO_3A, or $(ASO_3)_3B$ wherein A is independently in each occurrence phenyl or substituted phenyl, wherein when A is substituted phenyl the phenyl can be substituted by halo, keto, alkyl of up to 10 carbons, polyhaloalkyl, alkoxy, polyhaloalkoxy, aryl, polyhaloaryl, aryloxy, polyhaloaryloxy, polyhaloalkylaryl, or polyhaloaryloxy, and wherein B is benzene or two benzene rings connected by a divalent bridging group selected from the group consisting of $C(CH_3)_2$, O, OCH_2, OCH_2CH_2, OCH_2CH_2O, $C(CF_3)_2$, S, SO_2, CO, and 9,9'-fluorene.

5,204,012

SUPPLEMENTAL RUST INHIBITORS AND RUST INHIBITION IN INTERNAL COMBUSTION ENGINES

John G. Schaffhausen, Naperville, Ill., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 31, 1989, Ser. No. 304,765

Int. Cl.[5] C10M *129/70*

U.S. Cl. 252—52 A 18 Claims

1. A lubricating oil composition comprising a major amount of a hydrocarbon oil of lubricating viscosity, a minor amount of a dispersant, a minor amount of a primary rust inhibitor, and from about 0.03% to about 1 wt. %, based on the weight of the oil composition, of an esterification product having a total acid number (TAN) that is in the range of about 10 to about 40 and being prepared by reacting in the presence of a catalyst and at a temperature in the range of about 25° C. (77° F.) to about 111° C. (232° F.) ethylene oxide/propylene oxide block copolymer with a long-chain monocarboxylic acid having an alkyl radical with sufficient carbon atoms to provide solubility of said product in said composition.

5,204,013

POLARIZED PRODUCTS

Jerry I. Scheinbeim, Somerset, and Brian A. Newman, Highland Park, both of N.J., assignors to Rutgers, The State Unversity of New Jersey, New Brunswick, N.J.

Continuation-in-part of Ser. No. 62,014, Jun. 25, 1987, Pat. No. 4,863,648, which is a continuation-in-part of Ser. No. 881,828, Jul. 3, 1986, Pat. No. 4,830,795. This application Jun. 2, 1989, Ser. No. 360,788

Int. Cl.[5] C04B *35/00*

U.S. Cl. 252—62.9 28 Claims

1. A polarized material which is characterized as follows

1) is free or substantially free of mechanically-induced molecular orientation;

2) has polarization which is essentially stable to about the crystal melting temperature range of the polar crystals of the material or to about the softening temperature range or glass transition temperature range of the material if it is non-crystalline; and

3) has mechanical and electromechanical properties iso-

tropic or substantially isotropic in a plane perpendicular to

5,204,015

SURFACTIN MUTANTS

H_2—CH=CH—, —CH=CH—CH_2O— or —OCH_2—CH=CH—; R^1 and R^2 each independently denote halogen, cyano,

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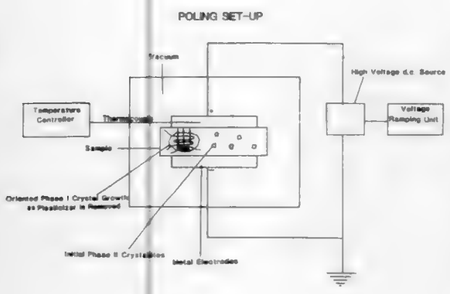
tropic or substantially isotropic in a plane perpendicular to the poling field direction;



said polarized material being a composition comprising essentially all or all of said polarized material.

5,204,014

LOW PH MILD PERSONAL CLEANSING BAR WITH LATHERING MILD SYNTHETIC SURFACTANT AND MAGNESIUM SOAP

Bruce L. Redd; Eddie C. Walker, both of Cincinnati; Robert E. Hare, Winchester; Donald A. Niederbaumer, Cincinnati; James C. Dunbar, Cincinnati, and Theresa A. Bakken, Cincinnati, all of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 668,578, Mar. 13, 1991, abandoned. This application May 18, 1992, Ser. No. 887,570

Int. Cl.[5] C11D *9/18, 9/48, 10/04, 13/18*

U.S. Cl. 252—117 **22 Claims**

1. Process for preparing a mild personal cleansing bar comprising the steps of:

I. preparing a flake composition comprising:

(A) from about 20% to about 50% lathering mild synthetic surfactant and from about 10% to about 50% of magnesium fatty acid soap; wherein the ratio of said lathering mild synthetic surfactant to said soap is from about 5:1 to about 0.4:1; wherein said lathering mild synthetic surfactant consists essentially of C_{12} to C_{14} alkyl chains;

(B) from about 5% to about 40% non-soil-load diluent synthetic surfactant wherein said non-soil-load diluent synthetic surfactant consists essentially of C_{16} to C_{22} alkyl chains; and

(C) from about 5% to about 20% of a wax;

wherein said fatty acid soap is made from fatty acid having a titer of 40–75 and an Iodine Value of from zero to 15; and wherein said bar contains no more than about 1.4% of residual sodium soap; and

II. forming said bar by plodding said flake composition and stamping cut plugs of said plodded composition into said personal cleansing bars.

5,204,015

SUBTILISIN MUTANTS

Robert M. Caldwell, San Carlos; David A. Estell, San Mateo, and Thomas P. Graycar, Pacifica, all of Calif., assignors to Genencor International, Inc., So. San Francisco, Calif.

Division of Ser. No. 600,430, Oct. 19, 1990, which is a continuation-in-part of Ser. No. 429,882, Oct. 31, 1989, abandoned, Ser. No. 84,589, Aug. 12, 1987, abandoned, Ser. No. 294,340, Jan. 6, 1989, Pat. No. 5,155,033, Ser. No. 86,869, Aug. 21, 1987, abandoned, and Ser. No. 92,976, Sep. 3, 1987, abandoned, said Ser. No. 294,340, is a continuation-in-part of Ser. No. 35,652, Apr. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 858,594, Apr. 30, 1986, abandoned, which is a continuation of Ser. No. 614,612, May 29, 1984, Pat. No. 5,081,616, Ser. No. 614,615, May 29, 1984, abandoned, Ser. No. 614,617, May 29, 1984, abandoned, and Ser. No. 614,491, May 29, 1984, abandoned. This application Oct. 9, 1992, Ser. No. 958,885

Int. Cl.[5] C11D *10/00*

U.S. Cl. 252—174.12 **4 Claims**

1. An enzymatic cleaning composition capable of degrading proteins comprising:

a) a surfactant end; and

b) a subtilisin mutant having an amino acid sequence not found in nature which is derived from a precursor subtilisin by substituting a different amino acid for the amino acid residue at a position in said precursor equivalent to +123 or +274 in *Bacillus amyloliquefaciens* subtilisin.

5,204,016

NON-CAUSTIC OVEN CLEANER, METHOD FOR MAKING AND METHOD OF USE

C. R. Hamilton, Arvada, Colo., and Dennis R. Sampson, Maplewood, Mo., assignors to Golden Technologies Company, Inc., Golden, Colo.

Filed Jun. 16, 1989, Ser. No. 367,022

Int. Cl.[5] C09D *9/00;* **C11D** *7/50*

U.S. Cl. 252—162 **14 Claims**

1. A method for producing an oven cleaner, comprising:

(a) premixing components miscible in oil to form an oil phase, said components comprising a terpene, a mineral seal oil surfactant miscible in oil, and a chemical stabilizer;

(b) premixing components miscible in water to form a water phase, said water phase comprising a foaming agent, a viscosity agent, and a surfactant miscible in water;

(c) mixing said oil phase into said water phase while agitating said water phase, wherein an "oil-out" emulsion composition is produced that inverts to a "water-out" emulsion upon application to a soiled surface.

5,204,017

DIFLUOROBENZONITRILES AND LIQUID-CRYSTALLINE MEDIUM

Volker Reiffenrath, Rossdorf; Hans-Adolf Kurmeier, and Bernhard Scheuble, both of Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Merck Patent GmbH, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP90/01412, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO91/03468, PCT Pub. Date Mar. 21, 1991

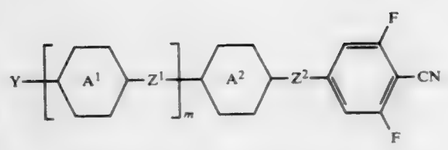
PCT Filed Aug. 24, 1990, Ser. No. 623,387

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1989, 3929762; Jan. 30, 1990, 4002609

Int. Cl.[5] C09K *19/34, 19/30;* **C07D** *239/02, 213/84*

U.S. Cl. 252—299.61 **14 Claims**

1. A difluorobenzonitrile compound of formula I

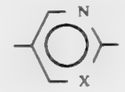


I

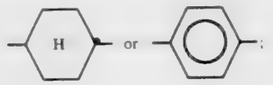
wherein

Y is alkyl, alkenyl, alkoxy, oxaalkyl or alkenyloxy, in each case containing 1–12 carbon atoms;

one of A^1 and A^2 which is present in the compound is



and the other of A^1 and A^2 is



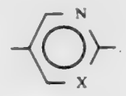
x is CH or N;

Z^2 is a single bond;

Z^1 is $—CH_2CH_2—$ or a single bond; and

m is 0 or 1,

with the proviso that if m is 1, Z^1 is a single bond, one of the radicals A^1 and A^2 is 2,5-pyrimidinediyl and the other of A^1 and A^2 is 1,4-phenylene, then A^1 is 2,5-pyrimidinediyl and A^2 is 1,4-phenylene; if m is 0, then A^2 is



5,204,018

LIQUID CRYSTALS

Stephen Kelly, Möhlin, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

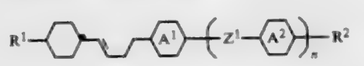
Filed Jan. 22, 1991, Ser. No. 643,965

Claims priority, application Switzerland, Feb. 1, 1990, 326/90

Int. Cl.[5] C09K *19/30, 19/34, 19/54;* **C07D** *239/02*

U.S. Cl. 252—299.63 **10 Claims**

1. Compounds of the formula



I

wherein n stands for the number 0 or 1; ring A^1 is 1,4-phenylene which may be unsubstituted or substituted with one or more of halogen, cyano or methyl, or ring A^1 is pyridin-2,5-diyl, pyrimidin-2,5-diyl, pyrazin-2,5-diyl, or pyridazin-3,6-diyl, ring A^2 represents 1,4-phenylene which may be unsubstituted or substituted with one or more of halogen, cyano and methyl, or ring A^2 is pyridin-2,5-diyl, pyrimidin-2,5-diyl, pyrazin-2,5-diyl, pyradizin-3,6-diyl, or ring A^2 is trans-1,4-cyclohexylene, trans-1,3-dioxane-2,5-diyl, 1-cyano-trans-1,4-cyclohexylene, bicyclo[2.2.2]octane-1,4-diyl, naphthalene-2,6-diyl, tetralin-2,5-diyl or trans-decalin-2,6-diyl; Z^1 signifies a single covalent bond, —COO—, —OOC—, CH_2O—, —OCH_2—, —CH_2CH_2—, —C≡C—, —$(CH_2)_3O$—, —$O(CH_2)_3$—, —$(CH_2)_4$— or the trans form of —CH=CH—CH_2CH_2—, —CH_2C-H_2—CH=CH—, —CH=CH—CH_2O— or —OCH_2—CH=CH—; R^1 and R^2 each independently denote halogen, cyano, $—CF_3$, $—OCF_3$ or an alkyl or alkenyl of up to 18 carbon atoms in which optionally one methylene group or two non-adjacent methylene groups may be replaced by —O—, —COO— and/or —OOC— and/or optionally one methylene group is replaced by —CHX—; and X signifies halogen, or methyl.

5,204,019

2,3-DIFLUOROBIPHENYLS

Volker Reiffenrath, Rossdorf; Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Georg Weber, Erzhausen; Ulrich Finkenzeller, Plankstadt, all of Fed. Rep. of Germany; David Coates, Wimborne, Great Britain; Ian C. Sage, Broadstone, Great Britain; Simon Greenfield, Poole, Great Britain; George W. Gray, Cottingham, Great Britain; Michael Hird, Hull, Great Britain; David Lacey, Hull, Great Britain, and Kenneth J. Toyne, Hull, Great Britain, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00180, § 371 Date May 15, 1989, § 102(e) Date May 15, 1989, PCT Pub. No. WO89/08687, PCT Pub. Date Sep. 21, 1989

PCT Filed Feb. 27, 1989, Ser. No. 362,470

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807861

The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.

Int. Cl.[5] C09K *19/12, 19/20, 19/34, 19/30*

U.S. Cl. 252—299.66 **11 Claims**

1. A 4—Q^1—4'—Q^2—2,3-difluorobiphenyl compound wherein

Q^1 and Q^2 independently of one another are each R or R—A^1—A^2—Z in which

R is alkyl having 1–15 C atoms or alkenyl having 3–15 C atoms each of which is unsubstituted or monosubstituted by cyano or at least monosubstituted by fluorine or chlorine, and in which in each case one or two non-adjacent CH_2 groups can also be replaced by —O—, —CO—, —O—CO—, —CO—O— or —O—COO—;

Z is —COO—, —O—CO—, $—CH_2O$—, —O—CH_2—, or $—CH_2CH_2$—; and

A^1 and A^2 independently of one another are each 1,4-phenylene which is unsubstituted or substituted by one or two fluorine atoms, and in which one or two CH groups can also be replaced by N, or trans-1,4-cyclohexylene wherein one or two non-adjacent CH_2 groups can also be replaced by —O—, and one of the two groups A^1 and A^2 can also be a single bond.

5,204,020

LIQUID CRYSTAL COMPOUNDS

Yoshiichi Suzuki; Hiroyuki Mogamiya, and Ichiro Kawamura, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

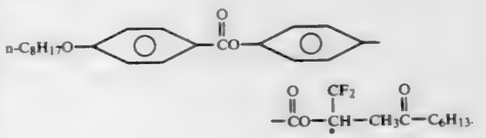
Continuation of Ser. No. 305,127, Feb. 2, 1989, abandoned. This application Apr. 29, 1992, Ser. No. 875,609

Claims priority, application Japan, Feb. 2, 1988, 63-21159; Feb. 2, 1988, 63-21160

Int. Cl.[5] C09K *19/20, 19/54;* **C07C** *69/76*

U.S. Cl. 252—299.67 **1 Claim**

1. A liquid crystal compound which has the following formula:



5,204,023

amine, characterized in that a polyvinyl pyrrolidone and/or a having at least two weld tips disposed in spaced relationship

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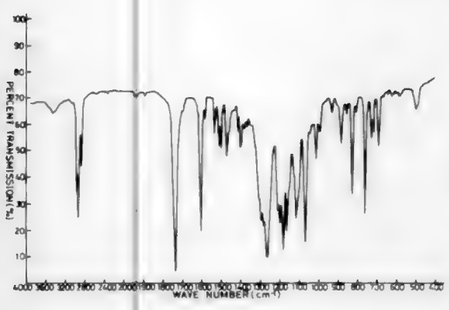


5,204,021

LANTHANIDE OXIDE FLUORIDE PHOSPHOR HAVING CERIUM LUMINESCENCE

Stephen L. Dole, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1992, Ser. No. 817,036
Int. Cl.[5] C09K *11/86*
U.S. Cl. 252—301.4 H 6 Claims

1. A phosphor comprising:

about 0.01 to 10 mol percent cerium, and the balance substantially a lanthanide oxide fluoride compound having the formula $LO_{1-x}F_{1+2x}$ wherein $0.1 \leqq x \leqq 0.3$, and where L is at least one lanthanide from the group lutetium and yttrium, the compound having substantially a tetragonal crystal form, said phosphor exhibiting cerium luminescence.

4. A phosphor comprising:

about 0.01 to 10 mol percent cerium, and the balance substantially a lanthanide oxide fluoride compound having the formula LO_xF_{3-2x} wherein $0.75 \leqq x \leqq 0.83$, and where L is gadolinium, the compound having substantially a tetragonal crystal form, said phosphor exhibiting cerium luminescence.

5,204,022

SOLID-FORM ADDITIVE SYSTEMS DISPERSIBLE IN AQUEOUS MEDIA

Mahendra K. Sharma, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,759
Int. Cl.[5] B01F *3/00, 17/00;* C09K *3/00*
U.S. Cl. 252—363.5 47 Claims

1. A method for rendering one or more meltable polymer additives and, optionally, one or more higher melting polymer additives, dispersible in aqueous media, said method comprising:

a) heating said additives to a temperature sufficient to produce a melt phase,

b) combining the resulting melt phase, at a temperature sufficient to maintain a melt phase, with at least one surfactant having a low hydrophobic-lipophobic balance value of less than about 9 and at least one surfactant having a high hydrophobic-lipophobic balance value of greater than about 9, wherein said combining is carried out under sufficient agitation to provide a homogeneous mixed melt, and

c) allowing the resulting blend obtained from step (b) to cool so as to obtain a water dispersible solid material.

5,204,023

MALODORS REDUCTION

John M. Behan, Kennington, and Keith D. Perring, Ashford, both of Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 507,833, Apr. 12, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 782,796
Claims priority, application United Kingdom, Apr. 12, 1989, 8908199
Int. Cl.[5] C11D *13/00;* C11B *1/00;* A23D *9/00*
U.S. Cl. 252—367 3 Claims

1. A method of reducing the organoleptic effect of undesirable aldehydic components in triglycerides or derivatives thereof by chemically trapping the aldehydic component with a reaction product of an organoleptically acceptable aldehyde and an amine chosen from

i) Aminoalkanes of general formula:

$R\,NH_2$ Where R is C_1 to C_{16} alkyl, aryl or aralkyl,

ii) Diaminoalkanes of general formula:

$H_2N(C_nH_{2n})NH_2$ Where (C_nH_{2n}) includes linear and branched chains and n is a maximum of 10,

Alkanolamines of general formula:
(NH_2) (C_nH_{2n}) (OH), where n is a maximum of 10, and their alkyl and (poly)oxyethylene ether derivatives,
Phosphatidylethanolamines of the type:

R', R'' are each fatty acid alkyl residues containing at least 12 carbon atoms,

iv) Alpha-amino acid esters of the type:

$H_2NCH(R'')CO_2R'$

R' is CH_3, Ph, $PhCH_2$, C_2 to C_4 straight and branched alkyl groups,
R'' is H, CH_3CH_2, CH_3 $CH_2CH(CH_3)$, $(CH_3)_2CHCH_2$, H_2NCO, $HSCH_2$, $RO_2CCH_2CH_2$, $CH_3SCH_2CH_2$, $HOCH_2$, $(CH_3)_2CH$, $PhCH_2$, p-hydroxphenylmethyl,

v) Beta-, or gamma-amino acid esters of general formula:

$H_2N(CH_2)_nCO_2R$ n is 2 or 3, R is CH_3, Ph, $PhCH_2$, C_2 to C_4 straight and branched alkyl groups.

5,204,024

METHOD FOR PREVENTING AGGLOMERATION OF POWDER

Tadao Onaka, Shinnanyo, and Hiroshi Fukuda, Tokuyama, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 729,689, Jul. 15, 1991, abandoned. This application May 22, 1992, Ser. No. 888,379
Claims priority, application Japan, Jul. 16, 1990, 2-185255
Int. Cl.[5] C09D *139/06*
U.S. Cl. 252—384 7 Claims

1. A method for preventing the agglomeration of hygroscopic and sublimable powders of piperazine or triethylenediamine, characterized in that a polyvinyl pyrrolidone and/or a vinyl pyrrolidone-vinyl ester copolymer is incorporated as an anti-agglomeration agent to the powder.

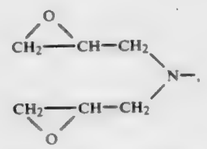
5,204,025

CONDUCTIVE PASTE COMPOSITION

Kimiko Yamada; Katuyosi Yada; Hiromu Inoue, and Yousui Nemoto, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 681,899
Int. Cl.[5] H01B *1/22;* C08L *63/00*
U.S. Cl. 252—500 3 Claims

1. A conductive paste composition comprising an epoxy resin having a diglycidylamino group represented by the formula:



a resol phenol curing agent, and copper powder, with said epoxy resin being present in a proportion of at least 80% by weight based on the total epoxy resins, said resol phenol curing agent being a resol phenol containing an amino group which is obtained by condensation of phenol and formaldehyde in the presence of ammonia, hexamethylenetetramine or a tertiary amine and being present at an equivalent ratio of from 0.5 to 1.5 to the total epoxy resins and said copper powder being present in an amount of from 100 to 800% by weight of the total amount of the total epoxy resins and the resol phenol curing agent.

5,204,026

SOLVENT WITH ALICYCLIC CARBONATE AND ETHYLENE DIPROPIONATE

Patrisha A. Doscher-Good, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 605,630, Oct. 30, 1990, Pat. No. 5,098,594, which is a continuation-in-part of Ser. No. 354,529, May 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 196,903, May 20, 1988, Pat. No. 5,007,969. This application Jan. 23, 1992, Ser. No. 823,937
Int. Cl.[5] C11D *7/26, 7/32, 7/50;* C23G *5/036*
U.S. Cl. 252—542 9 Claims

1. A solvent having extended shelf life comprising a mixture of an one volume of ethylene carbonate, about the same volume of propylene carbonate, and about two volumes of ethylene dipropionate, further comprising about 5–10 vol % triethanolamine wherein the volume % triethanolamine is based on the combined volumes of the two carbonates and the dipropionate.

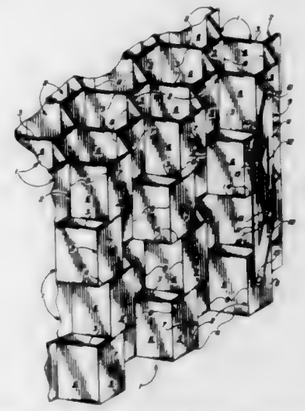
5,204,027

FLUID CONTACT PANELS

Charles M. Armstrong, Rte. 3, Box 70, Timpson, Tex. 75975, and Llewellyn C. Watson, Jr., Rte. 7, Box 27, Jacksonville, Tex. 75766

Filed Feb. 4, 1992, Ser. No. 830,863
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—112.2 16 Claims

1. Fluid contact panels comprising an array of corrugated waffled members having a repetitive half polygon pattern, said corrugated waffled members joined and stacked in staggered relationship to define discreet layers of said array and a plurality of vertical connectors, each of said vertical connectors having at least two weld tips disposed in spaced relationship for engaging selected ones of said corrugated, waffled members in said layers and joining said layers of said array in said staggered relationship.

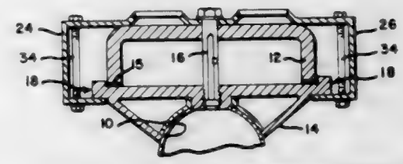


5,204,028

CLAMP FOR AERATION DOME

George H. Ruston, Boxford, Mass., assignor to Aeration Engineering Resources Corporation, Worcester, Mass.

Filed Aug. 25, 1992, Ser. No. 935,093
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—122.1 6 Claims



1. A clamp for use with a circular ceramic aeration dome mounted on an annular seat integral with a molded plastic saddle supported over an air supply pipe that extends in a line along the bottom in a liquid aeration tank, said clamp comprising an elongated body portion extending over and being spaced above said dome, said body having a length longer than the diameter of said circular dome, said body being shaped to have integral C shaped ends, said ends each being adapted to engage said plastic saddle underneath said annular seat at diametrically opposite points, said body being disposed at approximately a right angle to the direction of the line along which said supply pipe extends, and means to forcibly engage said C shaped ends against the underside of said plastic saddle to hold said dome firmly sealed in said seat of the saddle.

5,204,029

METHODS OF ENCAPSULATING LIQUIDS IN FATTY MATRICES, AND PRODUCTS THEREOF

Robert Morgan, and Peter A. Blagdon, both of Paris, Ill., assignors to Morgan Food Products, Inc., Paris, Ill.

Filed Sep. 25, 1989, Ser. No. 412,300
Int. Cl.[5] B01J *13/02*
U.S. Cl. 264—4.4 5 Claims

1. A process for making edible microcapsules containing a multiplicity of liquid cores, comprising the steps of:

a. heating an edible shell material selected from the group consisting of edible fats, edible waxes, edible resins and

mixtures thereof to a temperature sufficient to liquify said

the discharged pitch fiber to give an extremely fine fiber

5,204,033

5,204,035

METHOD FOR PRODUCING INDIVIDUAL POLYMER

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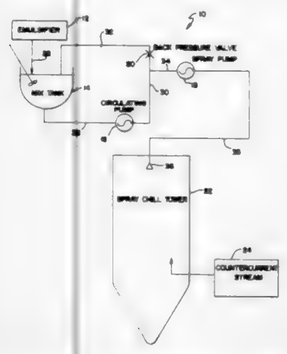
mixtures thereof to a temperature sufficient to liquify said shell material;

b. forming an emulsion of said liquified shell material with an edible liquid core material, said edible liquid core material being immiscible with said shell material and having a boiling point, at ambient atmospheric pressure, above the temperature sufficient to liquify said shell material, whereby said shell material is in continuous phase and said liquid core material is in discontinuous phase;

c. transporting said emulsion in turbulent flow conditions thereby maintaining said shell material and said liquid core material in the emulsified state, to a low temperature zone, said zone formed by flowing a gas at a temperature maintained below the temperature sufficient to liquify said shell



material and above the temperature at which said liquid core material solidifies;

d. delivering said emulsion into said low temperature zone by flowing said emulsion through a spray nozzle and spraying said emulsion into said low temperature zone and maintaining said emulsion so delivered in said low temperature zone for a time sufficient to cool said shell material into form-retaining condition and to form microcapsules containing a multiplicity of liquid cores made from said liquid core material, as the discontinuous phase, surrounded by said shell material, as the continuous phase, and whereby said multiplicity of liquid cores comprise from about 1% to about 35% by weight of the microcapsule; and

e. Recovering the microcapsules formed from step d.

5,204,030

METHOD FOR PRODUCING PITCH-TYPE CARBON FIBER

Eiji Kitajima, Izumi; Takashi Oyama, Izumi-Otsu; Makoto Kitai, Osaka-Sayama; Haruki Yamasaki, Isehara, and Susumu Shimizu, Chuo, all of Japan, assignors to Kon Oil Company, Limited and Tanaka Kikinzoku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 18, 1991, Ser. No. 793,461

Claims priority, application Japan, Nov. 16, 1990, 2-310597

Int. Cl.[5] D01F *9/12, 11/10*

U.S. Cl. 264—29.2 **2 Claims**

1. A method for producing pitch-type carbon fiber, comprising the steps of:

discharging, from a spinning nozzle, a spinning pitch comprising an optically isotropic pitch and/or optically anistropic pitch, maintained at such a temperature that the spinning pitch can have a viscosity of 20 poises or less, to form pitch fiber, while jetting a gas preheated to a temperature of 100° C. lower than the temperature at which the spinning pitch can have a viscosity of 20 poises or less, or higher from the periphery of he spinning nozzle at a jetting rate of 100 m/sec or more in the same direction as the discharging direction of the spinning pitch and parallel to the discharged pitch fiber to give an extremely fine fiber having an average diameter of 5 μm or less, and

subjecting the thus spun fine fiber to infusibilization and carbonization.

5,204,031

POWDER OF OXIDE FOR DIELECTRIC CERAMICS AND A PROCESS FOR PRODUCING DIELECTRIC CERAMICS

Munetoshi Watanabe, Takatsuki; Yasuhiro Shimizu, Osaka, and Hiroyuki Hata, Kobe, all of Japan, assignors to Osaka Titanium Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 589,118, Sep. 27, 1990, abandoned. This application Jan. 30, 1992, Ser. No. 827,537

Claims priority, application Japan, Sep. 30, 1989, 1-256556

Int. Cl.[5] C04B *35/46*

U.S. Cl. 264—63 **6 Claims**

1. A process for producing dielectric ceramics, comprising the steps of:

producing a lead containing perovskite compound, represented by the formula ABO_3, A and B representing metal elements, and O representing oxygen, powder compound of fine particles containing lead by hydrothermal reaction;

heating said powder, at a temperature of between 500° C. and 1000° C., said powder attaining a specific surface area of at most 20 m^2/g;

mixing binder with said powder;

compressing, molding and debinding said powder mixed with said binder so as to obtain a compact having at least 50% of theoretical density; and

sintering said compact at a temperature of less than 1300° C. compact, said compact attaining a shrinkage ratio of at most 20% to thereby obtain a homogeneous composition and few or no crack.

5,204,032

PROCESS FOR SUBSTANTIALLY ELIMINATING SURFACE MELT FRACTURE DURING EXTRUSION OF THERMOPLASTIC POLYMERS

Arakalgud V. Ramamurthy, East Windsor, and Mahmoud R. Rifi, Kendall Park, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 15, 1989, Ser. No. 366,477

Int. Cl.[5] B29C *47/00*

U.S. Cl. 264—85 **9 Claims**

1. A process for substantially eliminating surface melt fracture during extrusion of narrow molecular weight distribution, linear ethylene copolymer under conditions of flow rate and melt temperature which would otherwise produce such melt fracture which comprises incorporating into said ethylene copolymer a wood rosin or a wood rosin derivative and thereafter extruding said ethylene copolymer containing said rosin or wood rosin derivative, said rosin or wood rosin derivative being employed in an amount sufficient to substantially eliminate surface melt fracture during extrusion of said ethylene copolymer.

5,204,033

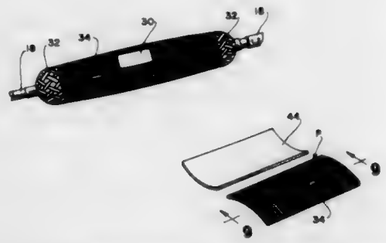
METHOD OF FABRICATING A PREFORM IN A RESIN TRANSFER MOLDING PROCESS

Robert G. Pearce, and Samuel J. Osten, both of Lincoln, Nebr., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 21, 1991, Ser. No. 780,008

Int. Cl.[5] B29C *45/14, 53/60*

U.S. Cl. 264—136 **37 Claims**



1. A method of fabricating a preform for use in a resin transfer molding process, comprising the steps of:

locating a transport means on a mandrel;

filament winding a dry fiber layer about the mandrel over the transport means;

applying a tackifier to the dry fiber layer at least in the area of the transport means;

cutting the filament wound dry fiber layer about the transport means to provide a preform thereon;

transporting the preform to a resin transfer mold by means of the transport means; and

resin transfer molding the preform in the mold.

5,204,034

METHOD OF PRODUCING A CLEANING BLADE WITH A LUBRICANT SURFACE

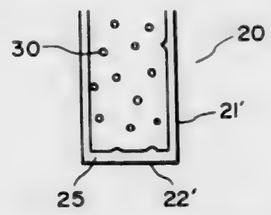
Hiroshi Sasame; Takeo Shoji, both of Yokohama; Hiroyuki Adachi, Tokyo; Shinichi Tsukida, Okegawa; Masahiro Watabe, and Moriyuki Yanai, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1991, Ser. No. 672,909

Claims priority, application Japan, Mar. 24, 1990, 2-74208

Int. Cl.[5] B29C *37/02*

U.S. Cl. 264—138 **14 Claims**



1. A method for producing a cleaning blade, comprising:

a first step for dispersing resin powder in a liquidous rubber material;

a second step for molding said rubber material; and

a third step for vulcanizing the molded rubber at a temperature higher than the softening point of said resin powder.

5,204,035

METHOD FOR PRODUCING INDIVIDUAL POLYMER PROFILES BY EXTRUDING INTERCONNECTED POLYMER PROFILES AND SEPARATING THEM

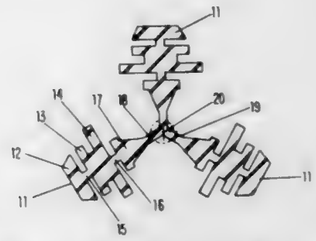
Carsten Boltze, 3765 Ramsey Dr., Uniontown, Ohio 44685; Klaus Kleinhoff, Suntalstr. 42, 3054 Rodenberg, and Hendrik Stevens, Hanover, both of Fed. Rep. of Germany, assignors to Klaus Kleinhoff, Rodenberg, Fed. Rep. of Germany and Carsten Boltze, Uniontown, Ohio

Filed Jan. 17, 1992, Ser. No. 822,541

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1991, 4101187

Int. Cl.[5] B29C *69/00*

U.S. Cl. 264—146 **15 Claims**



1. A method for producing polymer profiles, having a varying thickness over a width of said polymer profiles and with only one longitudinal side tapering off to form a thin edge, said method comprising the steps of:

extruding simultaneously a plurality of said polymer profiles through a common die such that said thin edge of each one of said polymer profiles is connected to said thin edge of at least a neighboring one of said polymer profiles to form an interconnected extrudate;

providing in a cross-section of said interconnected extrudate an angle between angle bisectors of said interconnected neighboring thin edge of between 45° and 135°; and

separating said polymer profiles from one another after said step of extrusion.

5,204,036

METHOD OF MOLDING TIRES

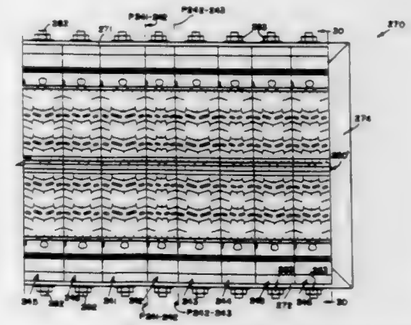
Kenneth T. MacMillan, 115 Oxford Sq., Carrollton, Ga. 30117

Division of Ser. No. 459,399, Dec. 29, 1989, Pat. No. 5,120,209. This application Mar. 18, 1992, Ser. No. 853,382

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] B29C *35/04;* **B29D** *30/56*

U.S. Cl. 264—152 **18 Claims**



1. A method of molding tires of different diameters comprising the steps of providing a plurality of pitches collectively

defining a generally annular cavity of a first tire diameter when

position, the composition comprising polypropylene and at

ing an inlet and an outlet and defining a flow path, and a man-

5,204,040

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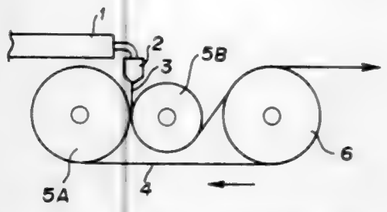
defining a generally annular cavity of a first tire diameter when the pitches are in generally radially abutting face-to-face relationship in a closed position with at least one group of the pitches being defined by several pitches of different circumferential lengths, closing the pitches about a tire by effecting radial inward and circumferential contracting movement to bring the pitches into radially abutting face-to-face relationship to form a closed mold, molding the tire in the closed mold by imparting a mold configuration thereto corresponding to the annular cavity as defined by the mold configuration of the individual pitches thereof which mate circumferentially across the radially abutting faces including mating across mold portions at angles to the circumference of the tire irrespective of the location of said pitches relative to each other and irrespective of the number of said pitches, opening the mold by effecting radial outward and circumferential expanding movement to move at least selected pitches out of radially abutting face-to-face relationship, removing the molded tire from the open mold, changing at least one pitch of the plurality of pitches with another pitch of different circumferential length but with generally the same mold configuration which mates circumferentially across the radially abutting faces of adjoining pitches including mating across mold portions at angles to the circumference of the tire to thereby change the mold to a second tire mold diameter different than the first tire mold diameter when the pitches are again in generally radially abutting face-to-face relationship, closing the changed mold about a tire by effecting radial inward and circumferential contracting movement to bring said last-mentioned plurality of pitches and another pitch into radially abutting face-to-face relationship, molding the last-mentioned tire in the changed closed mold to the second tire mold diameter by imparting thereto the generally same mold configuration which mates circumferentially across the radially abutting faces of the another and adjoining pitches including mating across mold portions at angles to the circumference of the tire irrespective of the location of said pitches relative to each other and irrespective of the number of said pitches, opening the changed mold by effecting radial outward and circumferential expanding movement to move the last-mentioned plurality of pitches and another pitch out of radially abutting face-to-face relationship, and removing the last-mentioned molded tire from the open mold.

5,204,037

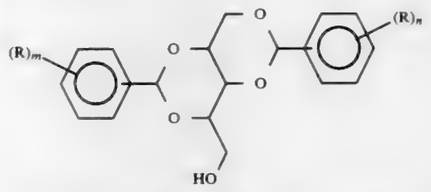
PROCESS FOR PRODUCTION OF POLYPROPYLENE SHEETS OR FILMS

Atsushi Fujii, Himeji, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1991, Ser. No. 816,349
Claims priority, application Japan, Jan. 25, 1991, 3-023779
Int. Cl.[5] B29C *47/90*
U.S. Cl. 264—171 **26 Claims**



1. A process for producing a polypropylene sheet or film which comprises:
(a) providing two opposing cooling rolls which are maintained at a temperature of 10° to 50° C.;
(b) passing a metallic endless belt having a surface roughness of not more than 1.5 μm under tension, between said opposing cooling rolls;
(c) producing a molten sheet or film of a polypropylene composition, the composition comprising polypropylene and at least one additive selected from the group consisting of
(i) a nucleating agent being at least one member selected from the group consisting of talc, organic carboxylic acid salts; organic phosphoric acid metal salts; polyvinyl cycloalkane and at least one dibenzylidene sorbitol compound of the formula



wherein R is an alkyl group having 1 to 8 carbon atoms, a halogen atom or an alkoxy group having 1 to 4 carbon atoms, and m and n are each 0 to 3,
(ii) a finely powdered high melting point polymer having a melting point of more than 200° C.,
(iii) a petroleum resin,
(iv) a terpene resin,
(v) an organic peroxide, and
(vi) a crystalline propylene-based copolymer, and
(d) subjecting the produced sheet or film to a specular finishing treatment by passing the sheet or film between said metallic endless belt and one of said cooling rolls and conveying the sheet or film on said metallic endless belt over a surface portion of at least one of said cooling rolls; and
(e) separating said sheet or film from said metallic endless belt after said specular finishing treatment.

5,204,038

PROCESS FOR FORMING POLYMERS

Alan J. Heeger, and Paul Smith, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 27, 1990, Ser. No. 635,455
Int. Cl.[5] B29C *47/00;* **D01D** *5/06;* **D01F** *6/00*
U.S. Cl. 264—184 **11 Claims**

1. A process for forming an oriented conjugated polymer-containing shaped article comprising the steps of
(a) providing a carrier solution comprising (i) carrier solvent, (ii) nonconjugated flexible-chain carrier polymer and (iii) conjugated polymer or conjugated polymer precursor;
(b) gelling and forming said carrier solution and removing solvent therefrom thereby yielding a body having a first shape; and
(c) anisotropically distorting the first shape of the body to yield the oriented conjugated polymer-containing shaped article characterized by having both nonconjugated flexible chain polymer and conjugated polymer is oriented form and by exhibiting anisotropic absorption and photoluminescence.

5,204,039

EXTRUSION METHOD AND EXTRUDER USED FOR OBTAINING PHENOLIC RESIN PIPE

Takeshi Miyasaka, and Kunio Hanaue, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

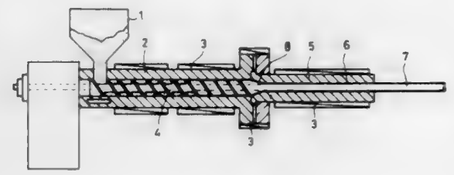
Filed Nov. 25, 1991, Ser. No. 797,056
Claims priority, application Japan, Nov. 27, 1990, 2-321190
Int. Cl.[5] B29C *47/24*
U.S. Cl. 264—209.2 **7 Claims**

1. An extrusion method for preparing a phenolic resin pipe with an extruder comprising a screw, a cylinder, a die comprising an inlet and an outlet and defining a flow path, and a mandrel, the mandrel being inserted into a through-hole formed in the screw along the screw axis and protruding into the die along the screw axis so as to be able to more forward and backward and being fitted to the screw so as to be able to freely rotate independently from the screw or the mandrel being firmly fitted to the front end of the screw so as to be able to rotate synchronously with the screw, the die satisfying the following formulas

$$R_1/R_2=0.25\sim1.0$$

$$S_1/S_2=0.1\sim2.5$$

where R_1 is an outside diameter of the die flow path at the die outlet, S_1 is a cross-sectional area of the die flow path at the die outlet, R_2 is an outside diameter of the die flow path at the die inlet, and S_2 is a cross-sectional area of the die flow path at the die inlet, wherein the die further comprises a uniform flow path portion having the same cross section as the die outlet and a length of 1D to 300D where D is the inside diameter of the die, said uniform flow path portion being spaced from the die inlet and wherein an outer periphery of the die flow path is inclined from the die inlet to the uniform flow path portion with the inclination not greater than 35° with respect to the axis of the screw, which method comprises shaping and extruding a phenolic resin material whereby the material after extrusion is cured so as to be able to retain its shape, by controlling



the temperature of a heating zone of the cylinder communicating with the die inlet.

7. An extruder for preparing a phenolic resin pipe, comprising a screw having a feed zone, a compression zone and a metering zone, a cylinder having heating means corresponding to the feed zone, the compression zone and the metering zone, a die fitted to the front end of the cylinder, having a heating means, and a mandrel inserted into a through-hole formed in the screw along the screw axis and protruding into the die along the screw axis, or firmly fitted to the front end of the screw, the die satisfying the following formulas

$$R_1/R_2=0.25\sim1.0$$

$$S_1/S_1=0.1\sim2.5$$

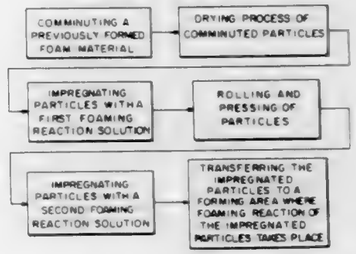
where R_1 is an outside diameter of the die flow path at the die outlet, S_1 is a cross-sectional area of the die flow path at the die outlet, R_2 is an outside diameter of the die flow path at the die inlet, and S_2 is a cross-sectional area of the die flow path at the die inlet, wherein the die further comprises a uniform flow path portion having the same cross section as the die outlet and a length of 1D to 300D where D is the inside diameter of the die, said uniform flow path portion being spaced from the die inlet and wherein an outer periphery of the die flow path is inclined from the die inlet to the uniform flow path portion with the inclination not greater than 35° with respect to the axis of the screw.

5,204,040

METHOD OF MAKING FOAM MATERIAL

Kun-Huang Chang, No. 10-3, Changshu, Changshu Village, Tanglo Shiang, Miao Li Hsien, Taiwan

Filed Feb. 14, 1992, Ser. No. 834,951
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—51 **2 Claims**



1. A method of making foam material comprising steps of:
(a) comminuting a previously formed foam material into particles;
(b) drying said particles to obtain dried particles;
(c) impregnating said dried particles with a first foaming reaction solution made up of polyol, catalyst and additives so as to obtain first impregnated particles and at the same time rolling and pressing said first impregnated particles so as to obtain rolled particles;
(d) mixing said rolled particles with a second foaming reaction solution containing a predetermined quantity of diisocyanate so as to obtain second impregnated particles; and
(e) transferring said second impregnated particles to a forming area provided with steam and using steam to facilitate foaming of said second impregnated particles.

5,204,041

METHOD OF MAKING ULTRA-FINE POLYESTER FIBERS

Mikio Tashiro; Tsukasa Kobayashi, both of Matsuyama, and Ryuji Uemura, Moriguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP89/01111, § 371 Date Jun. 22, 1990, § 102(e) Date Jun. 22, 1990, PCT Pub. No. WO90/04666, PCT Pub. Date May 3, 1990
PCT Filed Oct. 27, 1989, Ser. No. 499,451
Claims priority, application Japan, Oct. 28, 1988, 63-271024; Jan. 20, 1989, 1-9822
Int. Cl.[5] D01D *5/12;* **D02J** *1/22*
U.S. Cl. 264—210.8 **4 Claims**

1. A method of producing ultra-fine polyester fibers, consisting essentially of: obtaining undrawn fibers by melt-spinning a co-polyester having an intrinsic viscosity of from 0.35 to 0.50, and having repeating units composed mainly of ethyleneterephthalate that contains from 0.5 mol % to 7.0 mol % of 5-sodium-sulfoisophthalic acid and from 0.5 mol % to 10 mol % of isophthalic acid; and flow-drawing the undrawn fibers at a draw ratio of more than 5 times.

5,204,045

b) providing and injecting flowing heated wax into the mold

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5,204,042

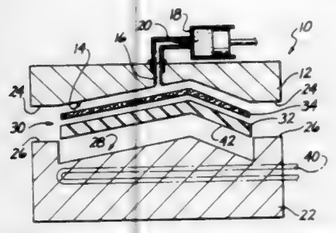
METHOD OF MAKING COMPOSITE LAMINATE PARTS COMBINING RESIN TRANSFER MOLDING AND A TRAPPED EXPANSION MEMBER

Darryl G. James, Camarillo; Aubrey G. Jackson, Jr., Huntington Beach, both of Calif., and Stephen M. Novak, Maple Valley, Wash., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 3, 1990, Ser. No. 562,547

Int. Cl.[5] B28B *7/30*

U.S. Cl. 264—257 **18 Claims**



1. A resin transfer process for forming a composite part from dry reinforcing fibers and resin comprising:
selecting a mold having a mold cavity, said mold having a resin passageway into said cavity, said cavity including a part definition surface for defining the shape of a composite part to be formed;
selecting an expansion member made of a solid, thermally expandable elastomeric material capable of expanding to a larger volume in response to being heated;
locating said expansion member in said mold cavity;
locating reinforcing fibers in said mold cavity in association with said expansion member;
closing said mold cavity;
injecting resin into said closed mold cavity through said resin passageway to saturate said fibers;
heating said expansion member to expand said expansion member an amount sufficient to consolidate said resin and said reinforcing fibers between said expansion member and said part definition surface to shape said fibers and said resin into a component part mimicking the shape of said part definition surface;
curing said resin within said mold for a time sufficient for said consolidated fibers and resin to maintain the shape of said part definition surface; and
cooling said mold, part, and said expansion member and removing said expansion member from said part and said part from said mold.

5,204,043

METHOD OF MANUFACTURING STEERING WHEEL

Toru Abiko; Katunobu Sakane; Mitsuru Harata, and Hiroshi Yasuda, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishigasugai, Japan and Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

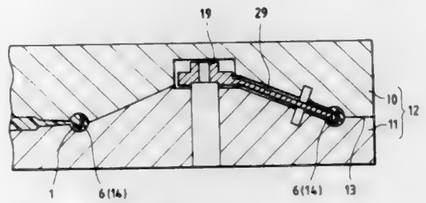
Continuation of Ser. No. 639,658, Jan. 11, 1991, abandoned. This application Feb. 6, 1992, Ser. No. 831,667

Claims priority, application Japan, Jan. 13, 1990, 2-4959

Int. Cl.[5] B29C *45/14, 33/12*

U.S. Cl. 264—267 **6 Claims**

1. A method of manufacturing a steering wheel, said steering wheel including a center boss portion, a core member having an annular portion located around said boss portion, and at least one spoke coupling said boss portion to said annular portion of the core member, said steering wheel also including a coating layer on said annular portion, said annular portion having an inner circumferential wall and an outer circumferential wall radially disposed opposite one another and connected by a bottom wall so that said annular portion has a substantially U-shaped cross section, wherein one of said inner and outer circumferential walls has a notched portion provided thereon, said method comprising the steps of:
opening an upper molding die and a lower molding die, said upper and lower molding dies having a gate and a molding cavity formed therein;
positioning said annular portion in said molding cavity so that said gate is across from the notched portion and is directed toward one of said inner and outer circumferential walls positioned beyond the notched portion and said



annular portion is positioned such that an open side of said substantially U-shaped cross section is directed upward;
closing said upper and lower molding dies;
injecting a synthetic resin into said cavity through said gate so as to form said coating layer on said annular portion of the core member, said injecting step including filling the U-shaped cavity to avoid the formation of voids; and
opening said upper and lower molding dies so that the finished steering wheel may be removed.

5,204,044

METHOD OF ASEMBLING A DC SOLENOID WITH A THERMISTOR

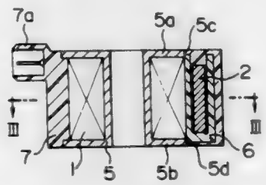
Kazuhiro Yoneshige, Nagoya, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Ohbu, Japan

Division of Ser. No. 488,662, Feb. 28, 1990, abandoned. This application Feb. 28, 1991, Ser. No. 662,998

Claims priority, application Japan, Mar. 28, 1989, 1-036226[U]

Int. Cl.[5] B29C *0/0*

U.S. Cl. 264—272.15 **4 Claims**



1. Method of assembling a DC solenoid with a thermistor, the steps comprising:
connecting a thermistor having positive temperature coefficient in series with a coil;
housing the thermistor in a case that is sufficiently resistant to pressure to substantially prevent damage to the thermistor on encapsulation of the case by injection molding material thereabout; and
injection-molding a synthetic resin material to encapsulate and seal the case and the coil integrally while substantially preventing damage to the thermistor by the injection molding process.

5,204,045

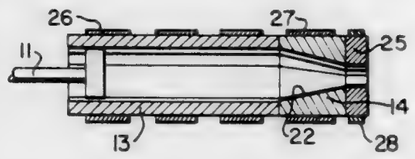
PROCESS FOR EXTRUDING POLYMER SHAPES WITH SMOOTH, UNBROKEN SURFACE

Gregory J. Courval, Napanee; Dermot R. M. Thomas, and Steven G. Allen, both of Kingston, all of Canada, assignors to Symplastics Limited, Ontario, Canada

Continuation-in-part of Ser. No. 539,076, Jun. 15, 1990, abandoned, and a continuation-in-part of Ser. No. 538,889, Jun. 15, 1990, abandoned. This application Jun. 14, 1991, Ser. No. 715,459

Int. Cl.[5] B29C *47/82*

U.S. Cl. 264—323 **15 Claims**



1. A solid state extrusion process in which a semi-crystalline polymer billet in a pressure chamber is forced through a die to form an oriented polymer profile, comprising the steps of:
preheating the pressure chamber to a temperature below the melting point of the polymer billet;
preheating the die to a temperature at least as high as the temperature of the pressure chamber;
extruding the polymer billet through the pressure chamber and die to form an oriented polymer profile oriented in the longitudinal direction; and
controlling the temperature of the die so that a thin surface layer of the oriented polymer profile being extruded is melted to form a thin, smooth surface layer on the oriented polymer profile of reduced orientation in the longitudinal direction and increase toughness.

5,204,046

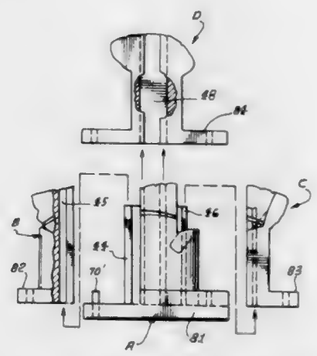
WAX PATTERN MOLDING PROCESS

Glenn Schmidt, Malibu, Calif., assignor to Callaway Golf Company, Carlsbad, Calif.

Filed Oct. 15, 1991, Ser. No. 775,852

Int. Cl.[5] B28B *7/02, 7/30;* **B29C** *39/04*

U.S. Cl. 264—328.1 **6 Claims**



1. In a wax pattern molding process, employing a mold having a cavity and a core means in the mold cavity, the core means comprising multiple core pieces, the steps that include
a) closing the mold with the core means positioned in the mold cavity,
b) providing and injecting flowing heated wax into the mold to flow about the core,
c) allowing the injected wax to cool and solidify to form the wax pattern,
d) removing the core means from the solidified wax pattern, by removing said core pieces one-by one in a removal direction, and while the mold holds the pattern in position in the mold, the core pieces having integral flanges located outside the cavity and said removing being accomplished by manipulation externally of said mold,
e) and thereafter opening the mold and removing the wax pattern from the mold,
f) the method including preliminarily positioning the core in the mold cavity, in wax pattern forming position, with metal-to-metal locating of the core relative to the mold,
g) said positioning step including providing a stop shoulder on the mold, and wedging the flanges against the stop shoulder during said a) step,
h) the method including removing the core pieces from the pattern in the mold, so that the pattern becomes a hollow shell supported in and by the mold, said core pieces having slidable interconnections, and said removing of the core pieces being carried out in said removal direction as accommodated by relative sliding of said interconnecting, there being at least four A, B, C, and D of said core pieces, and they are removed one-by-one in said direction, piece A removed first thereby forming a cavity and pieces B, C and D removed after movement thereof toward the cavity formed by removal of A.

5,204,047

METHOD OF USING A MOLD CLOSING APPARATUS FOR AN INJECTION MOLDING MACHINE

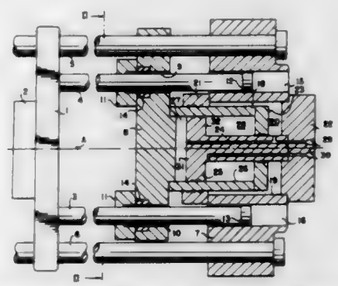
Walter Wohlrab, Weissenburg, Fed. Rep. of Germany, assignor to Krauss Maffei Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 421,307, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 115,053, Oct. 30, 1987, abandoned. This application Jul. 8, 1991, Ser. No. 727,351

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637175

Int. Cl.[5] B29C *45/68*

U.S. Cl. 264—328.1 **11 Claims**



1. A method of closing a mold with an apparatus comprising:
a stationary mold platen fixedly connected by guide columns to a support,
a mobile mold platen supported on said guide columns and further comprising support columns attached to said mobile mold platen, said support columns each having a stop rim located on at least one end;
a lock plate defining passages configured to allow the sop rims of said support columns to pass through the passages;
stop rim securing elements located on said lock plate so that when said mobile mold platen is displaced by displacement forces, said stop rims are displaced and are thereafter secured by said stop rim securing elements;
at least one closing cylinder for displacing said mobile mold platen toward and against said stationary mold platen to

tire being preheated, prior to being located into a curing unit,

of a mold cavity defined by walls to completely fill the

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close a mold in said mold platen and for displacing said mobile mold platen away from said stationary mold platen to open said mold, said closing cylinder at least comprising:

an immobile piston cylinder attached to a second support,

a displaceable double-acting differential piston at least partially within and guided by said immobile piston cylinder during displacement and acting against said lock plate,

an immobile differential piston within said double-acting differential piston and attached to said second support;

wherein said immobile differential piston divides interior space within said double-acting differential piston into a mold-opening cavity exhibiting mold-opening pressure surfaces and a first mold-closing chamber defined in part by interior surfaces of the double-acting differential piston and exhibiting mold-closing pressure surfaces, said pressure surfaces are configured so said mobile mold platen is displaced when pressure is applied to said pressure surfaces; and rapid-acting hydraulic cylinders acting on said mobile mold platen independently of said at least one closing cylinder;

said method comprising the steps of:

applying pressure rapidly to said mobile mold platen and rapidly moving said mobile mold platen toward said stationary mold platen;

securing said stop rims on said support columns by said stop rim securing elements;

applying pressure to said first mold-closing chamber pressure surfaces and to pressure surfaces of a second mold-closing chamber defined in part by an exterior portion of said double-acting differential piston of said at least one closing cylinder for displacing said mobile mold platen toward said stationary mold platen;

maintaining said mobile mold platen against said stationary mold platen for a predetermined time period; and

applying pressure to said mold-opening pressure surfaces of said at least one closing cylinder for displacing said mobile mold platen away from said stationary mold platen.

5,204,048

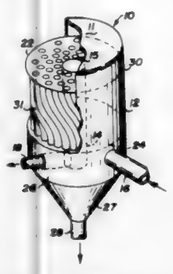
METHOD FOR MAKING A BUNDLE OF HELICAL TUBES AND APPARATUS FOR SEPARATING IMPURITIES FROM A POLLUTED LIQUID

Allison L. Rider, 313 Hames Rd., Watsonville, Calif. 95076, and Robert S. Smith, San Jose, Calif., assignors to Allison L. Rider, Watsonville, Calif.

Continuation-in-part of Ser. No. 399,844, Aug. 29, 1989, Pat. No. 5,013,435. This application May 2, 1991, Ser. No. 694,826

Int. Cl.[5] B29C *53/08;* **B01D** *21/02*

U.S. Cl. 264—339 **13 Claims**



1. A method for making a bundle of helical tubes from rigid tubing each tube having a common length and cross-sectional dimensions, a common helical axis and each tube having an open top end lying on a common top plane and a common bottom end lying on a common bottom plane, and each helical tube having a common slope B, said method comprising:

a) forming a mold surface wherein the equation of the surface of the mold is given by a relation between polar coordinates $Z=r\,\phi(\tan B)$, where r, Z, and ϕ are polar coordinates that define the location of a point on the surface, r is the radial coordinate, ϕ is the angular coordinate, and z is the coordinate along a direction orthogonal to the r and ϕ coordinates, tan B is the slope of the surface in a direction on the surface defined by a constant value of r, said resulting mold surface having helical grooves defined by said constant value of r;

b) softening each said tube;

c) laying said softening tube in one of said grooves to conform to a helical shape;

d) hardening said tubes to retain said helical shape;

e) arranging said helically shaped tubes to form said bundle; and

f) securing said tubes together.

7. A clarifying apparatus for separating impurities from a polluted liquid comprising in operative combination:

a) a tank having a generally cylindrical upper section for housing a settling tube bundle, and a lower conical section having a sludge outlet port therein;

b) a settling tube bundle assembly having a central standpipe forming a reaction zone surrounded by a plurality of settling tubes secured thereto;

c) each of said settling tubes having a common length, a common cross-sectional dimension, a top and a bottom end, and each formed into a continuous helix having a common slope;

d) said settling tube bundle supporting said standpipe generally axially centrally of said tank in said upper cylindrical section and providing a quiescent settling zone below the bottom end of said tubes;

e) means for supporting said tank with said standpipe in a generally vertical orientation;

f) means for introduction of said polluted liquid into the top end of said standpipe into said reaction zone;

g) a circumferential weir disposed radially outward of said tube bundle and including an outlet therefrom for removal of clarified liquid.

5,204,049

METHOD FOR PREHEATING, CURING AND STABILIZING VEHICLE TIRES

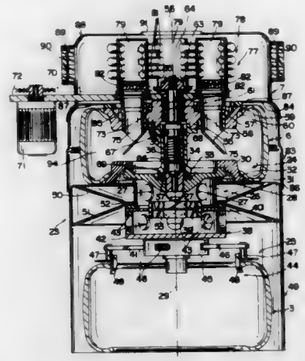
Karl J. Siegenthaler, Ostia, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 3, 1991, Ser. No. 725,852

Claims priority, application Italy, Jul. 27, 1990, 67594 A/90

Int. Cl.[5] B29C *35/02, 35/16*

U.S. Cl. 264—502 **7 Claims**



1. A method of preheating, curing and stabilizing vehicle tires, comprising the step of preheating a first green tire, and a simultaneous step of stabilizing a second cured tire; said first tire being preheated, prior to being located into a curing unit, by exchanging heat with said second tire as it is being stabilized by positioning said first and second tires adjacent to each other, said second tire being positioned in a stabilizing unit; inflating said second tire to a given pressure by means of a first pressurized fluid; cooling said second tire by circulating a stream of a second fluid in contact externally with said second tire; and preheating said first tire simultaneously by directing said stream of said second fluid over same.

5,204,050

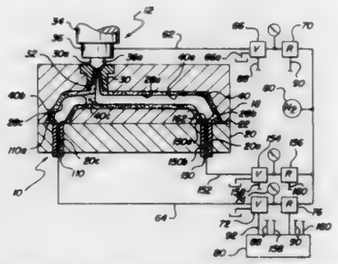
GAS ASSISTED INJECTION MOLDING

Norman S. Loren, 24874 Chalk Farm Rd., Warren, Mich. 48091

Filed Oct. 9, 1991, Ser. No. 773,707

Int. Cl.[5] B29C *45/00, 45/20, 45/34*

U.S. Cl. 264—504 **20 Claims**



1. A method of providing gas assistance to a resin injection molding process in which hot resin is injected into a mold, gas is injected into the resin to fill out the mold cavity, the resin cools, the gas is vented, and the mold is opened to remove the molded part, characterized in that the gas is injected into the resin at a first location to form a gas hollow within the resin and completely fill out the mold cavity with resin and is thereafter injected into the resin at a second location spaced from the first location to form a second hollow within the resin.

5,204,051

PROCESS FOR THE INJECTION MOLDING OF FLUID-FILLED PLASTIC BODIES

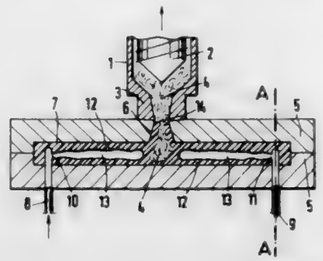
Christoph Jaroschek, Herbolzheim, Fed. Rep. of Germany, assignor to Klockner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Apr. 20, 1990, Ser. No. 511,764

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913109

Int. Cl.[5] B29C *45/00, 45/34;* **B29D** *22/00*

U.S. Cl. 264—572 **20 Claims**



1. A process for the injection molding of fluid filled plastic bodies, comprising the steps of:

injecting a pressurized, flowable plastic melt into an interior of a mold cavity defined by walls to completely fill the mold cavity;

cooling part of the plastic melt along the walls, thereby providing an interior of flowable, plastic melt; then

providing at least one side cavity in communication with the mold cavity;

injecting a pressurized fluid into the interior of flowable, plastic melt formed by cooling part of the plastic melt along the walls;

expelling the interior of flowable, plastic melt into the at least one side cavity via the injected pressurized fluid; and

separating the flowable, plastic melt expelled into the at least one side cavity from the fluid filled plastic body in the mold cavity.

5,204,052

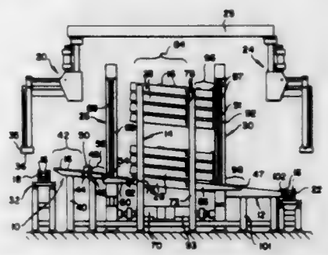
NUCLEAR FUEL ROD ACCUMULATION MACHINE

Edward S. Walker, Wilmington, and Wilbur L. Croom, Hampstead, both of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 5, 1991, Ser. No. 755,413

Int. Cl.[5] G21C *21/00*

U.S. Cl. 376—261 **19 Claims**



1. A nuclear fuel rod accumulation machine for concurrently accumulating fuel rods of various rod types from a succession of rod trays in a succession of bundle trays, said machine comprising, in combination:

A. an input table on which fuel rods are uploaded from rod trays for procession from an input queue to an output queue through a reading station;

B. a serial number reader for reading a unique serial number from each fuel rod while detained at said reading station;

C. an accumulation rack having a plurality of vertically spaced shelves;

D. an input elevator for picking up plural fuel rods from said output queue and distributing the fuel rods to said shelves;

E. an output table; and

F. an output elevator for picking up all of the fuel rods from each of said shelves and depositing the fuel rods on said output table in separate fuel bundle groups for downloading into separate bundle trays.

5,204,053

BI-LEVEL FUEL MANAGEMENT METHOD FOR BOILING-WATER NUCLEAR REACTOR

Larry E. Fennern, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 533,073, Jul. 10, 1990, Pat. No. 5,116,567. This application Dec. 9, 1991, Ser. No. 804,301

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—267 **5 Claims**

1. A method for managing fuel in a boiling-water reactor, said method comprising the steps of:

arranging fuel bundles into an upper matrix and a lower matrix so that during reactor operation water flows from said lower matrix toward said upper matrix; and

during a refueling operation, moving at least some fuel bundles from one of said matrices to the other of said matrices.

5,204,054

between the partial pressure p and the total pressure P_t

5,204,055

5,204,059

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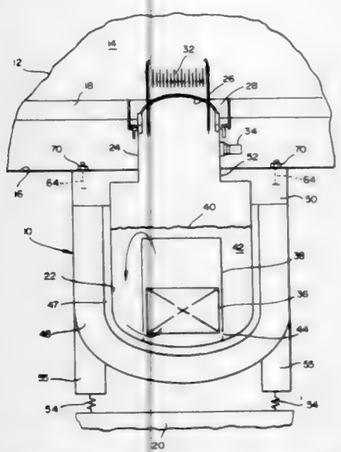
5,204,054
NUCLEAR REACTOR PRESSURE VESSEL
Harold E. Townsend, Campbell; Perng-Fei Gou, Saratoga, and Giancarlo Barbanti, Cupertino, all of Calif., assignors to General Electric Company, San Jose, Calif.
Filed Jul. 6, 1990, Ser. No. 549,328
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—296 **23 Claims**



1. In a nuclear reactor system including structure defining a containment space, said structure including a structure floor at a topographical grade level, and a nuclear reactor core, a pressure vessel for housing said reactor core therein, said pressure vessel comprising,

a metallic structured inner liner part, said inner liner part having a top region of reduced width relative to that of an inner liner lower major body part, said top region demarked in upward termination thereof by an inner liner part head, said inner liner part having an encircling compass and defining a fully enclosed space, said reactor core being situate in said enclosed space at a lower region therein adjacent a bottom boundary of said inner liner part,

a pre-stressed concrete outer vessel part encasing said inner liner part in following contour therewith from the bottom boundary thereof upwardly to a location proximal merger of the inner liner part reduced width region with its relatively widened remainder structure,

a concrete cover received on top of said outer vessel part, said cover having a central opening for upward pass through of the inner liner part reduced width top region but with a surface of the cover defining the opening in abutment with an external surface of said top region, the cover, the concrete outer vessel and the inner liner lower body major part being disposed below the grade level in an earth fill, and

a circulation shroud in the pressure vessel located about the reactor core spaced therefrom and extending upwardly therefrom to a location proximal but below a normal level of a steam generating pool of water present in the vessel, the reactor core being squat comparative to a height of the pool whereby natural circulation of heated water in the pool is promoted in a convective flow path defined by the space between the shroud and the reactor core, upwardly towards a surface of the pool and then downwardly at the exterior side of the shroud to a shroud space reentry location defined by shroud openings adjacent a lower reach of the reactor core.

5,204,055
THREE-DIMENSIONAL PRINTING TECHNIQUES
Emanuel M. Sachs, Somerville; John S. Haggerty, Lincoln; Michael J. Cima, Lexington, and Paul A. Williams, Concord, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Dec. 8, 1989, Ser. No. 447,677
Int. Cl.[5] B22F *7/02;* **B29C** *35/02, 67/02;* **C04B** *35/64*
U.S. Cl. 419—2 **42 Claims**

5. A process for making a component comprising the steps of

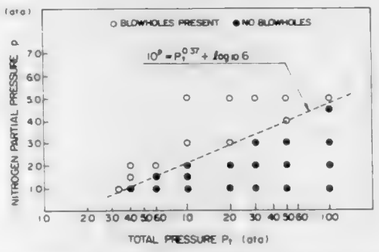
(1) depositing in a confined region a layer of a fluent porous material having interconnected porosity;

(2) applying to one or more selected regions of said layer of fluent porous material a further material which will cause said layer of fluent porous material to become bonded at said one or more selected regions;

(3) repeating steps (1) and (2) a selected number of times to produce a selected number of successive layers, said further material causing said successive layers to become bonded to each other;

(4) removing fluent porous material which is not at said one or more selected regions to provide the component.

5,204,056
METHOD OF PRODUCTION OF HIGH-NITROGEN FERRITIC HEAT-RESISTING STEEL
Yasushi Hasegawa, Kanagawaken, Japan; Peter Ernst, Niederglatt, Switzerland, and Fujimitsu Masuyama, Nagasakiken, Japan, assignors to Nippon Steel Corporation and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 655,584, Feb. 15, 1991, Pat. No. 5,158,745. This application Jul. 31, 1992, Ser. No. 923,214
Claims priority, application Japan, Feb. 19, 1990, 2-37895
Int. Cl.[5] C21D *10/00*
U.S. Cl. 420—71 **4 Claims**



1. A method of producing a high-nitrogen ferritic heat-resistant steel comprising, in weight percent

0.01–0.30% C,
0.02–0.80% Si,
0.20–1.00% Mn,
8.00–13.00% Cr,
0.005–1.00% Mo,
0.50–3.00% W,
0.05–0.50% V,
0.02–0.12% Nb, and
0.10–0.50% N,

and being controlled to include

not more than 0.050% P,
not more than 0.010% S, and
not more than 0.020% O,

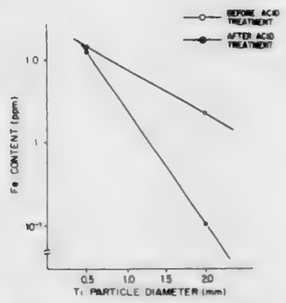
the remainder being Fe and unavoidable impurities,

which process comprises melting and equilibrating the steel in an atmosphere of a mixed gas of a prescribed nitrogen partial pressure or nitrogen gas, and thereafter casting or solidifying the steel in an atmosphere controlled to have a nitrogen partial pressure of not less than 1.0 ata and a total pressure of not less than 4.0 ata, with the relationship between the partial pressure p and the total pressure P_t being

$$10^9 < P_t^{0.37} + \log_{10} 6$$

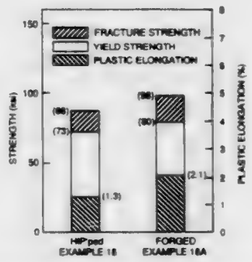
thereby obtaining sound ingot free of blowholes.

5,204,057
HIGHLY PURIFIED TITANIUM MATERIAL AND ITS NAMED ARTICLE, A SPUTTERING TARGET
Takashi Ishigami; Mituo Kawai, and Noriaki Yagi, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 550,682, Jul. 10, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 924,770
Claims priority, application Japan, Jul. 14, 1989, 1-181877
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—417 **5 Claims**



1. A highly purified Ti material comprising:
an oxygen content of not more than 350 ppm;
Fe, Ni and Cr contents of not more than 15 ppm each;
Na and K contents of not more than 0.5 ppm each;
a reduction of area of not less than 70%; and
a thermal conductivity of not less than 16 W/mK.

5,204,058
THERMOMECHANICALLY PROCESSED STRUCTURAL ELEMENTS OF TITANIUM ALUMINIDES CONTAINING CHROMIUM, NIOBIUM, AND BORON
Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 21, 1990, Ser. No. 631,989
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—418 **4 Claims**



1. A structural element, said element having the following approximate composition:

$Ti_{42.8-53.5}Al_{43-48}Cr_{1-3}Nb_{2-4}B_{0.5-2.0}C_{0.05-0.2}$ and have been thermomechanically processed.

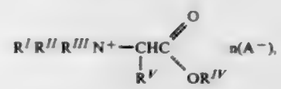
5,204,059
NI BASE ALLOY FOR SPARK PLUG ELECTRODES OF INTERNAL COMBUSTION ENGINES
Kensho Sahira, Yono; Hideo Kitamura, Omiya; Akira Mimura, Konosu, and Nobuyoshi Kuranchi, Kitamoto, all of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan
Continuation of Ser. No. 464,573, Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 346,989, May 3, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 804,486
Claims priority, application Japan, Jul. 25, 1988, 63-185291; Jul. 25, 1988, 63-185292; Jul. 25, 1988, 63-185293
Int. Cl.[5] C22C *19/03, 19/05*
U.S. Cl. 420—445 **2 Claims**

1. A Ni base alloy which is forged and drawn to form a spark plug wire electrode for an internal combustion engine, which consists essentially of, on weight percent basis, from 0.5 to 0.9% Si, from 0.45 to 0.65% Mn, from 3.9 to 4.3% Al, and the remainder Ni and incidental impurities.

5,204,060
METHOD FOR DISINFECTION
Stig Allenmark, Kullavik; Magnus Lindstedt, and Lars Edebo, both of Göteborg, all of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden
Continuation of Ser. No. 212,993, Jun. 29, 1988, Pat. No. 5,080,902, which is a continuation-in-part of Ser. No. 948,261, Dec. 31, 1986, Pat. No. 4,790,978. This application Oct. 11, 1991, Ser. No. 775,096
Claims priority, application Sweden, Jan. 7, 1986, 8600046; Jun. 29, 1987, 8702674
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[5] A61L *2/18;* **A61K** *31/14*
U.S. Cl. 422—28 **7 Claims**

1. The process of disinfecting at least one of food, human beings, animals, and products to be brought in contact with one of food, human beings, and animals to combat microorganisms, comprising:

providing a microbicidal composition comprised of an effective amount of at least one microbicide, which at least one microbicide is hydrolyzable at a pH-value ranging from about 6 to about 8.5 and is a long-chain alkyl ester compound having the general formula;



I

wherein R^I, R^{II} AND R^{III} are hydrogen or lower alkyl groups having 1 to 4 carbon atoms, R^{IV} is a long-chain alkyl group having 10 to 18 carbon atoms, R^V is hydrogen or a group having the formula $R^{VI}N^+H_3$, wherein R^{VI} is an alkylene group having 3 to 4 carbon atoms, A is a monovalent counter ion, and n is a number of cationic groups in the long-chain alkyl ester compound;

exposing microorganisms to the microbicidal composition to inactivate the microorganisms; and

detoxicating the long-chain alkyl ester compound of the microbicidal composition by exposing the long-chain alkyl ester compound to a medium having a pH-value ranging from about 6 to about 8.5 to hydrolyze the ester bond of the long-chain alkyl ester compound and reduce the content of the long-chain alkyl ester compound to innocuous levels.

5,204,061

at least one of said layers provided with an aperture to

reaction distillation zone thereby increasing the density of a reaction material in said distillation reaction zone above

mating together with said pressure release disk therebe-

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5,204,061

DEPOSITING A BINDER ON A SOLID SUPPORT

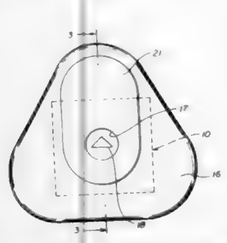
Gloria J. Covington, Arnold, and Timothy G. Bloomster, Reisterstown, both of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 549,670, Jul. 6, 1990, Pat. No. 5,073,340, which is a continuation of Ser. No. 106,075, Oct. 8, 1987, abandoned. This application Aug. 26, 1991, Ser. No. 749,734

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—56 14 Claims



1. A test device for use in an assay for detecting the presence of an analyte, comprising:

a solid support comprising an upper surface and a lower surface;

a test area on the upper surface of said support;

a binder for the analyte attached to said test area and;

a detectable marker attached with said binder which is related to the presence or absence of the binder, and does not interfere with said assay; and

a background area on the upper surface of said support without binder and detectable marker; wherein:

the detectable marker causes the binder to be distinguishable from said support so that, before the device is used in said assay the device is examined to confirm that binder is present in said test area.

5,204,062

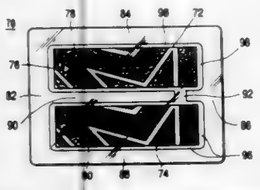
BOWIE-DICK TEST DEVICE

Steven T. Buglino, Apex; Pareshbhai J. Patel, Cary, and Bahram B. Rahimzadeh, Durham, all of N.C., assignors to Surgicot Incorporated, Research Triangle Park, N.C.

Filed Sep. 5, 1989, Ser. No. 402,379

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—56 7 Claims



1. A permanent record test device for testing the efficiency with which a steam sterilizer apparatus creates a vacuum satisfying the Bowie-Dick test procedure comprising:

a sheet comprising a porous material with a steam sensitive indicator ink printed thereon in a predetermined pattern extending from a first point on said sheet to a second point, said sheet serving as a passageway for the passage of steam or air from one of said first point or said second point to the other; and

a layer of steam and air impermeable material laminated on each side and around the edges of said sheet to substantially totally occlude said sheet from ambient atmosphere, at least one of said layers provided with an aperture to expose said first point to ambient atmosphere.

5,204,063

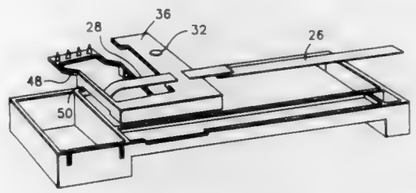
ELUENT RELEASE SYSTEM AND AUTOMATED ASSAY DEVICE

Michael P. Allen, Sunnyvale, Calif., assignor to Chemtrak, Inc., Sunnyvale, Calif.

Filed Dec. 12, 1991, Ser. No. 806,579

Int. Cl.[5] G01N *21/79, 31/22*

U.S. Cl. 422—58 7 Claims



1. In a self-contained analyte measuring device, comprising:

a housing comprising a well, a flow path, two bibulous spaced apart strips wherein said path holds said strips in position and defines a space between said strips, the end of one of said strips extending into said well, and a structure for receiving a slide proximal to one end of said housing;

an orifice for receiving a sample displaced from and substantially aligned with the space between said two bibulous strips;

a slide element in said structure comprising: a sample receiving element positioned under said orifice when said slide element is in an initial position, and positioned in said space when said slide is in a final position; and scoring means for releasing a liquid into said well when said slide is moved from its initial position to its final position; and,

a scorable container enclosing said liquid in a compartment located above said wall, where upon scoring of said container, said liquid can be released into said well;

the improvement which comprises:

means for overcoming resistance of said liquid from flowing into said well by initiating flow of said liquid resulting from movement of said slide, said overcoming resistance means operating in connection with said scoring means, said means for overcoming resistance including at least one of shocking means and wicking means.

5,204,064

APPARATUS FOR CONDUTING A CATALYTIC DISTILLATION PROCESS

Lawrence A. Smith, Jr., Bellaire, Tex., assignor to Chemical Research & Licensing Company, Pasadena, Tex.

Continuation of Ser. No. 328,487, Mar. 23, 1989, abandoned. This application Aug. 7, 1991, Ser. No. 742,582

Int. Cl.[5] B01J *8/02, 8/04*

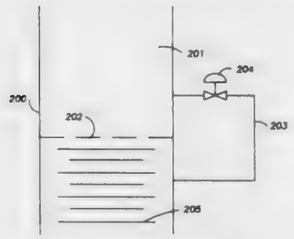
U.S. Cl. 422—106 6 Claims

1. An apparatus for conducting a catalytic distillation process, comprising:

(a) a distillation column reactor containing conventional inert distillation structure defining a distillation zone, and a packing of catalytic distillation structure comprising a catalyst component intimately associated with or surrounded by a resilient component having at least 70 volume per cent open space above said distillation zone defining a reaction distillation zone; and

(b) liquid flow restriction means between said distillation zone and said reaction zone to maintain liquid within said

reaction distillation zone thereby increasing the density of a reaction material in said distillation reaction zone above



the density of the reaction material in a distillation column reactor without said liquid flow restriction means.

5,204,065

HIGH PRESSURE AND HIGH TEMPERATURE DIGESTION VESSEL

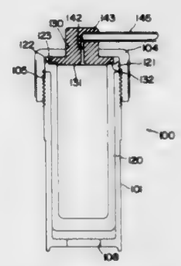
Terry Floyd, 4527 Island Fork Rd., Lake Wylie, S.C. 29710

Continuation-in-part of Ser. No. 317,461, Mar. 1, 1989, Pat. No. 4,904,450. This application Feb. 6, 1990, Ser. No. 475,970

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] B01L *3/00*

U.S. Cl. 422—113 15 Claims



1. A high temperature, high pressure chemical digestion vessel comprising:

(a) a microwave transparent inner container having a bottom and integrally-formed cylindrical sidewalls, the upper edge of which sidewalls defines a cylindrical mouth for receiving material to be chemically digested under high pressure and high temperature;

(b) an enlarged-diameter flange integrally-formed with the cylindrical mouth of said inner container;

(c) a seal cap having a pressure vent therethrough and an annular seat for being positioned and seated on the flange of said inner container without mechanical attachment;

wherein said flange includes a raised rim integrally formed around the periphery of said flange and defining an interior, lower shoulder for receiving a pressure release disk, said seal cap including:

(1) a centrally-disposed bottom surface for being received into the mouth of said inner container and supporting said pressure release disk in the mouth of said inner container;

(2) an integrally-formed peripheral shoulder of reduced thickness for being positioned on and being supported on the lower shoulder of said inner container with said pressure release disk positioned therebetween; and

(3) wherein the peripheral shoulder of said seal cap defines an annular groove for mating with the lower shoulder of said flange in sealing relation thereto, said annular groove having a bearing edge for sealingly bearing against said pressure release disk around its entire periphery; said annular groove and the lower shoulder of said flange mating together with said pressure release disk therebetween to provide a sealing surface;

(d) a microwave transparent outer casement comprising a bottom and integrally-formed cylindrical sidewalls, the upper edge of which outer casement defines a cylindrical mouth for supporting said enlarged flange of said inner container, said sidewalls of said outer casement being of a diameter to receive said inner container therein, and a casement cap being attachable to the upper edge of said cylindrical sidewalls of said outer casement and tightened into pressure-resisting relation with said inner container;

(e) the replaceable, rupturable pressure release disk formed of a flat sheet material having a predetermined rupture pressure;

said pressure release disk and said seal cap cooperating to seal the inner container and thereby enclose a substance to be digested in said inner container, said pressure release disk adapted to rupture and release pressure within said inner container if pressure within said inner container reaches said predetermined rupture pressure.

5,204,066

METHOD OF OPERATING CATALYTIC CONVERTER

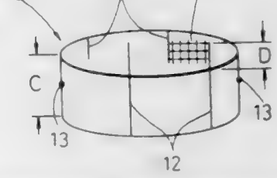
Abe Fumio, Handa; Takashi Harada, Nagoya, and Hiroshige Mizuno, Tajimi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 14, 1990, Ser. No. 581,984

Claims priority, application Japan, Jul. 4, 1990, 2-176943

Int. Cl.[5] F01N *3/10*; B01D *53/36*; H05B *3/10*

U.S. Cl. 422—174 3 Claims



1. A method of operating a catalytic converter for purifying an exhaust gas from a vehicle, said converter having a monolithic honeycomb heater incorporated therein, comprising the steps of:

heating a monolithic honeycomb heater having a plurality of passages which are defined by partition walls and having a catalyst carried on said partition walls by directly energizing said monolithic honeycomb heater at a power level of 1.5 KW or above per unit amount m^3 of exhaust gas substantially concurrently with initial operation of an engine;

introducing an oxidizing gas into said monolithic honeycomb heater substantially concurrently with said initial operation of said engine;

reducing the power level when the temperature of said monolithic honeycomb heater exceeds 300° C. or greater;

suspending energization within sixty seconds after exhaust gas is introduced into said catalytic converter; and

suspending supply of said oxidizing gas within sixty seconds after exhaust gas is introduced into said catalytic converter.

5,204,067

5,204,069

5,204,070

REACTOR FOR PROCESSING A CATALYST MATERIAL

plurality of combustion nozzles connected thereto, each

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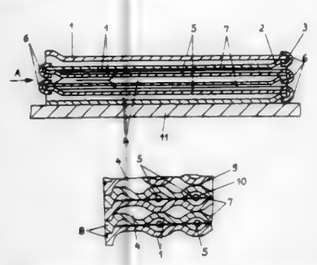
5,204,067
FILTER

Hans A. Haerle, Bopfingen, Fed. Rep. of Germany, assignor to Schwaebische Huettenwerke GmbH, Fed. Rep. of Germany

Filed Jul. 11, 1991, Ser. No. 728,560
Int. Cl.[5] B01D *39/14, 46/10, 46/48;* **B01J** *35/04;* **F01N** *3/24, 3/02*
U.S. Cl. 422—177 **13 Claims**



1. A filter, suitable for the separation of impurities from the exhaust gases of an internal combustion engine, including a filter body comprising a plurality of compression-moulded and sintered filter plates made from powdered metal, metal filings, metal fibers or a mixture thereof, which are disposed against one another and separated by spacers to form a plurality of flow ducts therebetween, with the flow ducts being alternately open on one end and closed on the other end so as to form alternating adjacent inlet and outlet ducts with the walls of the filter plates lying between the inlet and outlet ducts providing filter surfaces and the outlet ducts containing catalytic inserts which are made of catalytic materials or which are coated with catalytic materials, said inserts comprising plates extending parallel to said flow ducts and generally extending over the entire length and width of said outlet ducts.

5,204,068
FILTER

John P. O'Loughlin; Eldron L. Boehmer, and Timothy A. Swann, all of Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio

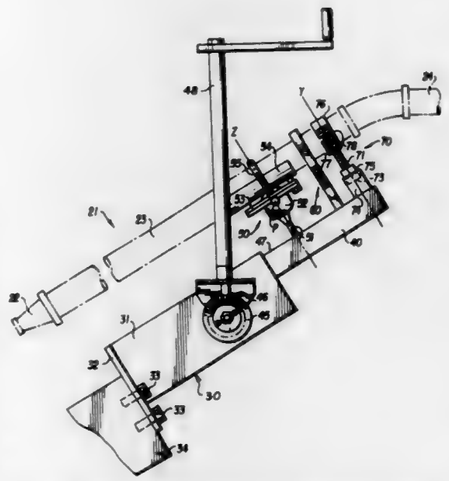
Filed May 1, 1991, Ser. No. 694,003
Int. Cl.[5] B01D *53/34, 50/00;* **B60R** *21/26*
U.S. Cl. 422—180 **17 Claims**

1. A filter for filtering the exhaust gas of an air bag inflator, in which said exhaust gas comprises an alkali metal oxide, comprising:
- a fibrous mat comprising a plurality of strands defining a plurality of tortuous passageways for the flow of an exhaust gas comprising an alkali metal oxide; and
- a coating on said strands;
- said coating comprising particles of a silicon compound adhered to the strands of said mat, said silicon compound being reactive with an alkali metal oxide to form particles of an alkali metal silicate;
- said coating being present in an effective amount to constrict said passageways to small enough diameters to entrap said particles of alkali metal silicate.

5,204,069
RECOVERY BOILER SMELT SHATTERING SPRAY

Wendell L. Paxton, and Gary W. Waddell, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 7, 1991, Ser. No. 772,155
Int. Cl.[5] D21C *11/00*
U.S. Cl. 422—185 **14 Claims**

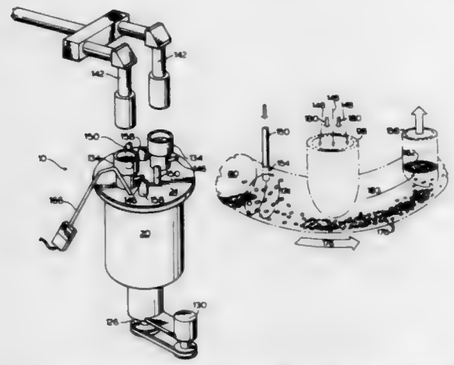


1. An appliance for mounting a smelt shattering spray conduit on support structure associated with a chemical recovery boiler having a furnace bed and dissolving tank, said furnace bed being drained of accumulated liquid smelt through perimeter spouts which channel a liquid smelt flow stream into a free fall space above said dissolving tank, said appliance for mounting said conduit comprising:
- unitizing frame means for securing said appliance to said support structure in the proximity of said smelt free fall flow space, said frame means including platform guide means secured thereto;
- a fixture platform confined by said platform guide means to linear translational movement relative to said frame means in a directional line projected through the space normally occupied by said free falling smelt flow stream;
- drive means respective to said fixture platform for controllably displacing and securing a stationary position for said fixture platform along said platform guide means;
- a first anchor fixture secured to said fixture platform for rigidly holding a smelt shattering spray conduit at a position displaced from said fixture platform said first anchor fixture having at least two pivot axes between said platform and said conduit, a first of said two pivot axes being substantially parallel with said platform translation direction line and a second of said two pivot axes being substantially normal to said first pivot axis; and,
- a second anchor fixture secured to said fixture platform at a position displaced from said first anchor fixture along a line substantially parallel with said translation direction line, said second anchor fixture having means to rigidly hold said smelt shattering spray conduit at a selectively adjustable position displaced from said fixture platform along a line substantially normal to said first and second pivot axes and pivotable about a third axis coinciding with said conduit position displacement line.

5,204,070
REACTOR FOR PROCESSING A CATALYST MATERIAL

Michael F. Wilson, Ottawa; Thomas M. Steel, Waterloo, and Walter W. Duley, King City, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources Canada, Ottawa, Canada

Filed Oct. 3, 1991, Ser. No. 770,858
Claims priority, application Canada, May 16, 1991, 2042801
Int. Cl.[5] B01J *19/08, 37/34*
U.S. Cl. 422—186 **16 Claims**



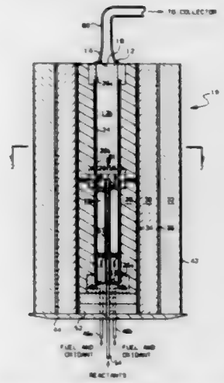
1. A reactor for processing a catalyst material comprising:
- a reaction chamber including support means for the catalyst material;
- at least one laser radiation entry means in communication with said reaction chamber to permit laser radiation to enter said reaction chamber at a first zone thereof and impinge on said support means;
- at least one gas inlet in communication with said reaction chamber and permitting entry of an oxidizing gas into said reaction chamber;
- at least one exhaust outlet in communication with said reaction chamber at a second zone thereof different from said first zone and permitting removal of an exhaust gas from said reaction chamber; and
- drive means connected to said support means and operable to provide relative movement between said support means and the laser radiation entry means to allow said support means to be positioned in one of said zones.

5,204,071
METHOD AND APPARATUS FOR PRODUCING CARBIDE PRODUCTS

Michael C. Carter, and Bruce W. Gerhold, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 504,450, Apr. 4, 1990. This application Dec. 3, 1990, Ser. No. 620,810
Int. Cl.[5] B01J *10/00;* **C01B** *31/30, 31/32, 31/34*
U.S. Cl. 422—194 **13 Claims**

1. An apparatus comprising:
- a reactor having an elongated chamber defined therein which has a longitudinal axis and longitudinally separated upstream and downstream ends, wherein the chamber comprises a combustion zone and a reaction zone such that the combustion zone longitudinally extends from said upstream end to a surface boundary between the zones intermediate said ends and such that the reaction zone longitudinally extends from said surface boundary to said downstream end;
- means for injecting a combustible mixture of fuel and oxidant into said combustion zone which comprises a source of the fuel and oxidant and which further comprises a plurality of combustion nozzles connected thereto, each combustion nozzle having a corresponding outlet which communicates with the combustion zone and which releases the combustible mixture into the combustion zone in a direction generally toward the reaction zone and generally parallel to said longitudinal axis; and
- means for injecting at least one reactant into the chamber which comprises a source of said at least one reactant and which further comprises at least one reactant nozzle connected thereto and having a least one outlet which communicates with said chamber at said surface boundary and which releases said at least one reactant into the reaction zone in a direction generally parallel to said longitudinal axis, wherein said at least one reactant reacts in said chamber to form a carbide product, and further wherein said plurality of combustion nozzle outlets define at least one linear boundary whose projection in a direction generally parallel to said longitudinal axis and onto said surface boundary generally surrounds said at least one reactant nozzle outlet.



5,204,072
PRODUCTION OF SELENIUM-72 AND ARSENIC-72

Dennis R. Phillips, Los Alamos, N. Mex., assignor to University of California, Alameda, Calif.

Filed Sep. 6, 1991, Ser. No. 756,022
Int. Cl.[5] C01G *57/00, 28/00*
U.S. Cl. 423—2 **3 Claims**

1. A method of separating arsenic-72 from selenium-72 comprising:
- a. dissolving a mixture comprised of selenium-72 and arsenic-72 formed by radioactive decay of selenium-72 by contacting said mixture with a heated solution of hydrogen peroxide and hydrochloric acid to form a selenium-72/arsenic-72 solution;
- b. destroying residual hydrogen peroxide in said selenium-72/arsenic-72 solution;
- c. adding hydrazine dihydrochloride to said selenium-72/arsenic-72 solution and heating to a temperature of from about 60 to about the boiling point of 6M HCl from about 10 to about 35 minutes;
- d. cooling said selenium-72/arsenic-72 solution with said additive; and
- e. separating selenium in solid form from said cooled solution which contains arsenic-72.

5,204,073

with an aqueous solution (C) and back-extracting said gallium

than about 1 vpm of oxygen, and not more than about 1 vpm water.

5,204,074
METHOD FOR PRODUCING FLUORINE MICA

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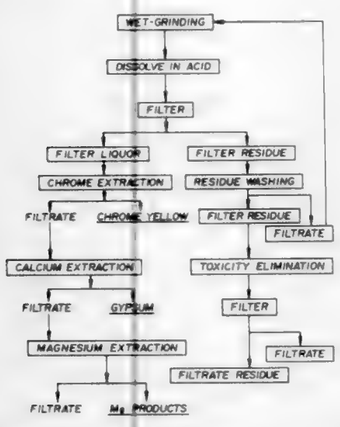
5,204,073

TOXICITY ELIMINATION AND COMPREHENSIVE UTILIZATION OF CHROME RESIDUES

Gang Z. Zhong; Cheng Xiang Li; Xian Ke Zeng; Jin H. Lin, and Wei C. Hou, all of Guangzhou, China, assignors to Guangzhou Zhufeng Institute, Guangzhou, China

Filed Sep. 6, 1991, Ser. No. 755,785
Claims priority, application China, Apr. 29, 1991, 91-1-02667.3
Int. Cl.[5] C01G *37/14*; C01F *5/00, 5/40, 11/46*
U.S. Cl. 423—58 12 Claims



1. A method for toxicity elimination of chrome residues including calcium and magnesium comprising adding water to said chrome residues and wet-grinding the same, reacting the ground residues with hydrochloric acid having a concentration of 15.1–18% HCl, and said reaction being controlled, such that a reaction temperature of between 30°–49.5° C. and a pH of between 6.6 and 7.5 is maintained for between 5–9.5 minutes, whereby a solution is obtained having dissolved therein ions of chrome, including Cr^+ and ions of magnesium and calcium, and further whereby a residue is obtained and separating the solution from the residue, whereby a filter liquor including the chrome ions in the solution and a residue is provided; adding a barium-containing additive selected from the group consisting of barium chloride and barium hydroxide to the filter liquor, to form a sediment of barium chromate.

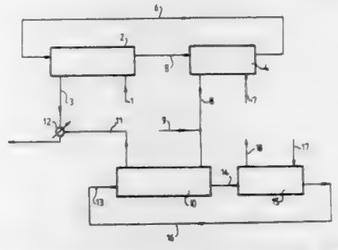
5,204,074

RECOVERY OF GALLIUM VALUES FROM BASIC AQUEOUS SOLUTIONS THEREOF

Yvette Pescher, Bagneux, and Jean-Louis Sabot, Maisons Laffitte, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Nov. 15, 1990, Ser. No. 613,064
Claims priority, application France, Nov. 15, 1989, 89 14985
Int. Cl.[5] C01G *15/00*; C22B *58/00*
U.S. Cl. 423—112 26 Claims

1. A process for the recovery of gallium values from a basic aqueous solution (A) thereof, comprising (i) contacting such basic aqueous solution (A) with a medium (I) containing a gallium extractant, whereby said gallium values are transferred to said medium (I), (ii) contacting said gallium-enriched medium (I) with a basic aqueous solution (B) and back-extracting said gallium values to said basic aqueous solution (B), (iii) contacting said gallium-enriched basic aqueous solution (B) with a second medium (II) containing a gallium extractant, whereby said gallium values are transferred to said medium (II), and (iv) contacting said gallium-enriched medium (II) with an aqueous solution (C) and back-extracting said gallium values into said aqueous solution (C), wherein said basic aqueous solution (B) is diluted prior to contact with said second medium (II).

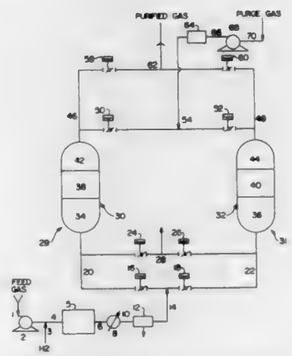


5,204,075

PROCESS FOR THE PURIFICATION OF THE INERT GASES

Ravi Jain, Piscataway; Satish S. Tamhankar, Scotch Plains, and Alberto I. LaCava, South Plainfield, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed May 30, 1991, Ser. No. 710,190
Int. Cl.[5] C01B *13/00*
U.S. Cl. 423—219 18 Claims



1. A process for the removal of oxygen from a gas stream containing water vapor and up to about 3 vol % oxygen comprising:

a) introducing hydrogen into the gas stream to the extent necessary to ensure that the gas stream contains at least sufficient hydrogen to enable all of the oxygen in the gas stream to be converted to water;

b) contacting the gas stream with an oxidation catalyst in a first catalysis zone, thereby combining a substantial amount of the oxygen in the stream with hydrogen to form water, and producing a gaseous effluent containing not greater than about 500 vpm oxygen;

c) cooling the gaseous effluent from said first catalysis zone;

d) contacting the cooled gaseous effluent with an solid adsorbent in a first adsorption zone, thereby removing substantially all of the water and any oxidation catalyst poisons contained in the cooled gaseous effluent;

e) contacting the substantially anhydrous effluent from said first adsorption zone with an oxidation catalyst in a second catalysis zone, thereby combining substantially all of the oxygen in said substantially anhydrous effluent with hydrogen to produce water; and

f) contacting the gaseous effluent from said second catalysis zone with an adsorbent in a second adsorption zone, thereby producing a gaseous stream containing not more than about 1 vpm of oxygen, and not more than about 1 vpm water.

5,204,076

ZEOLITES DERIVATIZED WITH SULFONIC ACIDS

Maria D. Farnos, Wilmington, Del., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 16, 1991, Ser. No. 732,841
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—700 10 Claims

1. A process for forming a sulfonated derivative of a microporous crystalline material produced by reacting an oxide of sulfur with a crystalline porous material having silanol groups wherein said crystalline porous material can exhibit a Constraint Index of 10 or less comprising

providing a crystalline porous material, wherein the crystalline porous material has an ordered crystalline structure and comprises oxygen atoms, silicon atoms, and at least one framework element therein, wherein said framework element is selected from the group consisting of aluminum, boron, and gallium, and

wherein said crystalline porous material can exhibit a Constraint Index of 10 or less.

subjecting said crystalline porous material to acid conditions effective to remove at least a portion of said at least one framework element, to form a product depleted in said framework element which retains said ordered crystalline structure and to generate silanol groups therein;

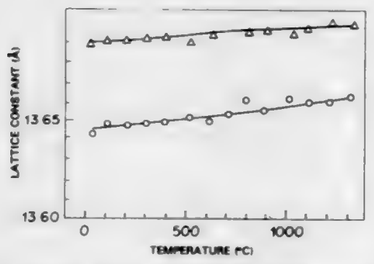
reacting said silanol group-containing product with an oxide of sulfur to form a sulfonic acid derivative of said product.

5,204,077

POLLUCITE CRYSTALLINE POWDERS WITH LOW THERMAL EXPANSION COEFFICIENTS AND METHODS FOR THEIR PREPARATION

Toshiyuki Mori, Tsuchiura; Hiroshi Yamamura, Tsukuba; Takashi Mitamura, Urawa, and Hidehiko Kobayashi, Saitama, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Sep. 16, 1991, Ser. No. 760,136
Claims priority, application Japan, Dec. 19, 1990, 2-411713; Aug. 9, 1991, 3-223561
Int. Cl.[5] C01B *33/34, 33/32*; C01F *7/00*
U.S. Cl. 423—328.2 1 Claim



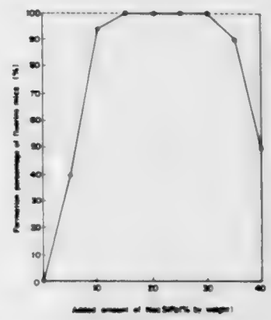
1. A pollucite powder consisting essentially of a pollucite crystal structure and having an Al_2O_3/SiO_2 molar ratio of from 0.21 to 0.25, a $(Cs_2O+Li_2O)/SiO_2$ molar ratio of from 0.19 to 0.22 and a Li_2O/Cs_2O molar ratio of from 2/98 to 10/90.

5,204,078

METHOD FOR PRODUCING FLUORINE MICA

Hiroshi Tateyama; Kiase Tomematsu; Kunio Kimura; Hidehara Hirotsu; Kazuhiko Jinnai, all of Tosu, and Takashi Furusawa, Tagami, all of Japan, assignors to Co-Op Chemical Co., Ltd. and The Agency of Industrial Science and Technology, both of Tokyo, Japan

Continuation of Ser. No. 297,190, Jan. 13, 1989, abandoned. This application Sep. 25, 1991, Ser. No. 766,960
Claims priority, application Japan, Jan. 21, 1988, 63-12345; Aug. 2, 1988, 63-193796
Int. Cl.[5] C01B *7/00*; B22B *15/16*
U.S. Cl. 423—331 15 Claims



1. A method for producing fluorine mica represented by the formula:

$$\alpha MF \cdot \beta(aMgF_2 \cdot bMgO) \cdot \gamma SiO_2$$

wherein M represents at least one alkali metal selected from the group consisting of sodium atom and potassium atom, α, β, γ, a and b each represent a coefficient satisfying the relationships of $0.1 \leqq \alpha \leqq 2$, $2 \leqq \beta \leqq 3$, $3 \leqq \gamma \leqq 4$ and $a+b=1$, which comprises heating a fine powdery mixture comprising 10 to 35% by weight of an alkali silicofluoride represented by the formula:

$$M_2SiF_6$$

and the balance being talc to a temperature of 700° to 1000° C.

5,204,079

HCN BY CATALYTIC AMMOXIDATION OF CRUDE ACETONITRILE

Dev D. Suresh, Hudson, Ohio; Mark C. Cosa, South Euclid, Ohio; Tai C. Yang, Maple Heights, Ohio; Robert K. Grasselli, Chadds Ford, Pa.; Mark R. Bruce, Seven Hills, Ohio; Michael J. Seely, Twinsburg, Ohio; Maria S. Friedrich, Lyndhurst, Ohio, and Robert A. Dubbert, Solon, Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Feb. 15, 1991, Ser. No. 656,543
Int. Cl.[5] C01C *3/02*
U.S. Cl. 423—376 17 Claims

1. A process for the production of hydrogen cyanide directly from crude acetonitrile containing hydrocyanic acid is an impurity comprising contacting in the vapor state crude acetonitrile at an elevated temperature with an ammoxidation catalyst in the presence of oxygen containing gas and ammonia to produce hydrogen cyanide.

5,204,080

ment by reaction of a mixture of a titanium halide and an

first end of the column, the venturi having an inlet and an

(c) separating a zinc bearing leach liquor from the leach

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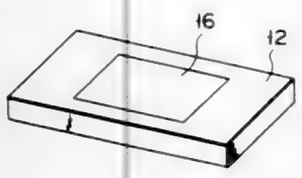
5,204,080

METHOD OF MANUFACTURING AN ALUMINUM NITRIDE STRUCTURE

Mitsuo Kasori; Akihiro Horiguchi, both of Kawasaki; Yoshiko Goto, Tokyo, and Fumio Ueno, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 29, 1990, Ser. No. 545,691
Claims priority, application Japan, Jun. 30, 1989, 1-166875
Int. Cl.[5] B29B *17/00*; C01B *21/072*
U.S. Cl. 423—412 5 Claims



1. A method of manufacturing an aluminum nitride structure, comprising the steps of:

forming at least one solid layer of an oxygen-trapping substance on at least one up to a plurality of positions on an aluminum nitride substrate having a first concentration of solution oxygen; and

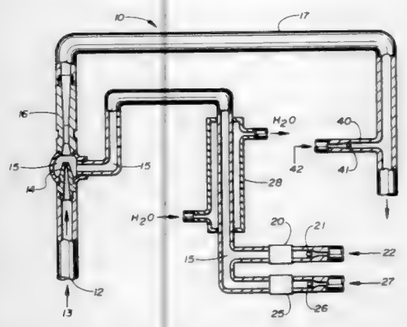
heating the resultant structure in a non-oxidizing atmosphere to locally reduce said first concentration of solution oxygen of said aluminum nitride substrate under said oxygen-trapping substance(s) to a second concentration of solution oxygen by trapping the solution oxygen in said oxygen-trapping substance, so as to form an aluminum nitride structure in which at least one up to a plurality of regions of the aluminum nitride structure corresponding to the position(s) of said oxygen-trapping substance, which position(s) has said second oxygen concentration, is integrally formed with aluminum nitride regions having said first solution oxygen concentration.

5,204,081

PROCESS FOR THE GENERATION OF CHLORINE DIOXIDE

John Y. Mason, Plymouth, Calif.; Edward J. Bechberger, Etobicoke, Canada; Dorman N. Matchim, Citrus Heights, and Dick L. Hilliard, Orangevale, both of Calif., assignors to Rio Linda Chemical Co., Ltd., Sacramento, Calif.

Filed May 3, 1991, Ser. No. 695,217
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—478 13 Claims



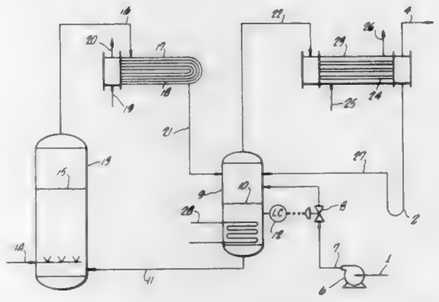
13. A process for the rapid preparation of chlorine dioxide under reduced pressure, consisting essentially of the steps of providing an aqueous chlorate solution, a gaseous stream of substantially anhydrous hydrogen chloride, a column having a first end and a second end, a venturi being disposed near the first end of the column, the venturi having an inlet and an outlet, a reaction chamber being connected to the column adjacent to the venturi, the reaction chamber being in direct fluid communication with the inlet of the venturi; introducing a driving medium into the inlet of the venturi thereby creating a suction effect; introducing the aqueous chlorate solution into the reaction chamber, introducing the gaseous stream of substantially anhydrous hydrogen chloride into the reaction chamber concurrently with introduction of the chlorate solution wherein chlorine dioxide and chlorine are produced within the reaction chamber with a retention time of less than one one-hundredth of a second, the chlorine dioxide and chlorine being drawn by the suction effect into the column at the inlet of the venturi nozzle such that mixture of the driving medium, the chlorine dioxide and the chlorine takes place in the column at the inlet of the venturi nozzle, and introducing a chlorite solution in the column near the second end of the column wherein the co-produced chlorine is substantially reacted with the chlorite solution.

5,204,082

SULFUR DIOXIDE GENERATION BY SUBMERGED COMBUSTION AND REDUCED THERMAL CYCLING BY USE OF A HOT RECYCLE OF SULFUR

Ronald L. Schendel, Manhattan Beac`, Calif., assignor to C.F. Braun Inc., Alhambra, Calif.

Filed Jul. 18, 1991, Ser. No. 732,110
Int. Cl.[5] C01B *17/48*
U.S. Cl. 423—539 8 Claims



1. A method for the production of sulfur dioxide, comprising:

combusting boiling sulfur with an oxygen-containing gas within a first liquid sulfur pool to produce a sulfur dioxide;

continuously removing sulfur laden vapor effluent from the first liquid sulfur pool;

passing the vapor effluent to an indirect cooling zone, wherein the vapor effluent is cooled to not below 600° F. while forming condensed sulfur having a temperature above 600° F.;

producing a sulfur depleted vapor by separating said condensed sulfur from the vapor in said cooled effluent; and

recycling said condensed sulfur at a temperature not below 600° F. to the first liquid sulfur pool for conversion to sulfur dioxide or vaporization.

5,204,083

PROCESS FOR PREPARING TITANIUM DIOXIDE

John C. Magyar, Ackerman; R. Gerald McDill, Amory, and Eugene R. Adams, Caledonia, all of Miss., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 23, 1988, Ser. No. 197,212
Int. Cl.[5] C01G *23/04*
U.S. Cl. 423—613 7 Claims

1. In a method for preparing a rutile titanium dioxide pigment by reaction of a mixture of a titanium halide and an oxidizing gas in a vapor phase in a reaction zone of a vapor phase oxidation reactor at a temperature of at least 800° C. in the presence of an added metal ion containing compound wherein the metal is selected from the group consisting of Groups IA, IIA and the Lanthanide Series of metals of the Periodic Table of the Elements, said metal ion containing compound being present in a total amount of from about 100 to about 1000 parts per million, based upon the weight of the titanium dioxide pigments being produced, the improvements which comprise:

introducing said metal ion containing compound into said reaction mixture of titanium halide and

oxidizing gas in said reaction zone in separate and discrete increments comprising a first increment and at least one additional increment, wherein said first increment is introduced into said reaction at a point therein prior to onset of reaction between said titanium halide and said oxidizing gas within said reaction zone and wherein said at least one additional increment is introduced into said reaction zone at a point therein subsequent to the reaction of at least about 20 weight percent of said titanium halide with said oxidizing gas; and

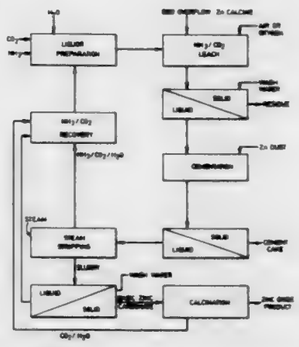
recovering the titanium dioxide pigment substantially as produced.

5,204,084

HYDROMETALLURGICAL PRODUCTION OF ZINC OXIDE FROM ROASTED ZINC CONCENTRATES

Murry C. Robinson, Don Mills, and Donald H. Eberts, Scarborough, both of Canada, assignors to Materials-Concepts-Research Limited, Don Mills, Canada

Continuation-in-part of Ser. No. 480,374, Feb. 14, 1990, Pat. No. 5,028,410. This application Jul. 1, 1991, Ser. No. 721,329
The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
Int. Cl.[5] C01G *9/02*
U.S. Cl. 423—622 3 Claims



1. A process for the production of zinc oxide comprising the steps of:

(a) roasting zinc sulphide bearing concentrates containing arsenic, sulfur and cadmium compounds in a fluid bed roaster wherein both dust carry over calcine and bed overflow calcine are produced; selecting the bed overflow calcine which contains lesser amount of arsenic, sulfur and cadmium compounds than a normal calcine of combined dust carry over calcine and bed overflow calcine for further processing;

(b) slurrying a roasted zinc sulphide concentrate consisting only of bed overflow calcine in an aqueous solution of ammoniacal ammonium carbonate solution to dissolve zinc contained therein without washing;

(c) separating a zinc bearing leach liquor from the leach slurry;

(d) purifying the zinc bearing leach liquor by cementation to remove at least one of the metals of copper and cadmium, prior to the step of steam stripping the purified zinc bearing leach liquor.

(e) steam stripping the purified zinc bearing leach liquor to remove ammonia and to precipitate basic zinc carbonate; and

(f) separating the precipitated basic zinc carbonate and calcining the basic zinc carbonate to produce zinc oxide at a temperature in the range of 275° C. to 1,000° C.

5,204,085

METHOD FOR ENHANCING THE SAFETY OF METAL-LIGAND CHELATES AS X-RAY CONTRAST AGENTS

Donald R. VanDeripe, Lake St. Louis, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 383,056, Jun. 22, 1989, Pat. No. 5,082,649, which is a continuation of Ser. No. 68,588, Jun. 30, 1987, abandoned, which is a continuation of Ser. No. 905,765, Sep. 9, 1986, abandoned, which is a continuation of Ser. No. 692,514, Jan. 8, 1985, abandoned. This application Nov. 18, 1991, Ser. No. 793,527
Int. Cl.[5] A61K *49/04*, *31/28*
U.S. Cl. 424—4 13 Claims

1. In a method for enhancing safety in the in vivo use of metal-ligand chelate complexes as X-ray contrast agents comprising administering to a mammal a diagnostically effective amount of a metal-ligand complex, the improvement comprising:

adding calcium ions to a charge-balanced metal-ligand complex formed from the anion of a complexing acid and a central ion of an element with an atomic number of 57 to 83, said calcium ions being added in substantially less than stoichiometric amounted to the metal-ligand complex, said calcium ions being provided from a member of the group consisting of inorganic calcium salts, organic calcium salts and mixtures thereof without excess ligand being added.

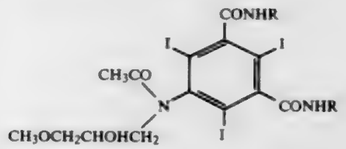
5,204,086

X-RAY CONTRAST AGENT

Knut Wille, Osterås, Norway, assignor to Nycomed Imaging AS, Oslo, Norway

Continuation of Ser. No. 119,346, Nov. 10, 1987, abandoned, which is a continuation of Ser. No. 917,025, Oct. 9, 1986, abandoned, which is a continuation of Ser. No. 537,836, Sep. 30, 1983, abandoned. This application Jun. 25, 1992, Ser. No. 902,810
Claims priority, application United Kingdom, Oct. 1, 1982, 8228067
Int. Cl.[5] C07C *237/46*
U.S. Cl. 424—5 8 Claims

1. A compound of the formula:



(I)

wherein R represents $—CH(CH_2OH)_2$ or $—CH_2CH(OH)CH_2OH$; including the stereoisomeric forms thereof separately or in combination.

5,204,087

WATERPROOF HIGH-SPF SUNSCREEN

5,204,090

WATERPROOF HIGH-SPF SUNSCREEN

R_1 represents hydrogen or a member selected from the group consisting of

5,204,094

TREATMENT OF PNEUMOTHORAX

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5,204,087

COMPOSITION FOR FOAMING PREPARATION

Masami Moroi, Yachiyo; Kimie Ominato, Higata; Toshio Yokoyama, Tokyo, and Akira Iwasa, Yotsukaido, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 569,963, Aug. 20, 1990, abandoned.
This application Dec. 12, 1991, Ser. No. 806,791
Claims priority, application Japan, Aug. 31, 1989, 1-226216; Feb. 2, 1990, 2-24008
Int. Cl.[5] A61L 9/04; A61K 33/10, 31/70, 31/715
U.S. Cl. 424—44 10 Claims

1. A foaming preparation composition comprising (a) 0.5 to 50% by weight of crystals of an organic acid of which the crystal surface is coated with a compound selected from the group consisting of monosaccharides, disaccharides, polysaccharides and sugar alcohols and (b) 0.5 to 50% by weight of a carbonate.

5,204,088

HYDROPHOBIC SILICA COATING

Roger D. Noebel, Irvine, and Lane Elliott, Laguna Hills, both of Calif., assignors to Globe Technology Corporation, Irvine, Calif.

Continuation of Ser. No. 423,084, Oct. 18, 1989, abandoned, which is a continuation of Ser. No. 339,775, Apr. 18, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 749,486
Int. Cl.[5] A61K 7/32, 9/12
U.S. Cl. 424—47 1 Claim

1. A system for at least one of repelling water and enhancing friction on a surface comprising,

an applicator comprising an aerosol dispenser, wherein the aerosol dispenser includes a container, a pressurized propellant therein, and a nozzle communicating with the interior of the container, and

a colloidal suspension of hydrophobic silica particles within the container consisting of hydrophobic silica particles suspended in a C1 to C4 alcohol, wherein the hydrophobic silica particles have a mean diameter of between about 5 to 40 nm, a substantial proportion of which particles are aggregated into conglomerates of greater than about 1μ in diameter, and which particles have been rendered hydrophobic by treatment with an organosilane having hydrocarbon chains of between 4 to 30 carbon atoms, said suspension being ejectable by said propellant through said nozzle as an aerosol to a surface to provide a coating of silica particles agglomerated into conglomerates of submicron sizes.

5,204,089

METHOD OF PREVENTING THE FORMATION OR AGGREVATION OF DENTAL PLAQUE AND METHOD FOR REDUCING CARIOGENESIS

Yukihiko Hara, Fujieda, and Masao Hattori, Toyama, both of Japan, assignors to Mitsui Norin Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 547,639, Jul. 2, 1990, abandoned. This application Feb. 13, 1992, Ser. No. 836,158
Claims priority, application Japan, Aug. 30, 1989, 1-221816
Int. Cl.[5] A61K 7/16, 7/26, 35/78
U.S. Cl. 424—58 8 Claims

1. A method of preventing the formation or aggravation of dental plaque consisting essentially of the step of contacting a tooth surface of a patient with at least one tea polyphenol selected from the group consisting of epicatechin gallate, gallocatechin gallate, epigallocatechin gallate, free theaflavin, theaflavin monogallate A, theaflavin monogallante B and theaflavin digallate, said tea polyphenol being in a concentration effective to inhibit the formation and adherence on said tooth surface, of a water insoluble glucan formed by *Streptococcus mutans* glucosyltransferase.

5,204,090

WATERPROOF HIGH-SPF SUNSCREEN COMPOSITIONS

Sie-Ta R. Han, Williamsville, N.Y., assignor to Bristol Myers Squibb, New York, N.Y.

Filed May 30, 1991, Ser. No. 707,473
Int. Cl.[5] A61K 7/42, 7/44, 7/48, 9/12
U.S. Cl. 424—59 15 Claims

1. A waterproof high-SPF Sunscreen composition comprising:

(a) from about 1 weight % to about 10 weight % based on the total weight of the composition, of a water insoluble carboxylated acrylic copolymer selected from the group consisting of acrylate/t-octylpropenamide, octylacrylamide/acrylate/-butylaminoethyl methacrylate copolymer, sand octylacrylamide/acrylates copolymer;

(b) from about 1 weight % to about 60 weight % of polyoxypropylene (15) stearyl ether;

(c) from about 1 weight % to about 30 weight % of a sunscreen component containing at least one UVB sunscreen and/or at least one UVA sunscreen.

5,204,091

METHOD FOR COMBATTING FOOT ODORS

Lawrence E. Barrett, 46198 First Avenue, Chilliwack, British Columbia, Canada V2P 1W3

Filed Dec. 6, 1991, Ser. No. 803,425
Int. Cl.[5] A61K 7/32, 33/26
U.S. Cl. 424—65 10 Claims

1. A method of combatting foot odors comprising the step of soaking the feet in a soaking solution comprising, as active ingredient, ferric ferrocyanide in an aqueous oxalic acid solution.

5,204,092

COSMETIC COMPOSITIONS FOR THE TREATMENT OF THE HAIR AND SKIN CONTAIN POLYMER CONSTITUTED ESSENTIALLY BY REPEATING UNITS OF THE BETA-ALANINE TYPE

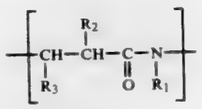
Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, both of France, assignors to Societe Anonyme dite: L'oreal, Paris, France

Filed Jun. 30, 1982, Ser. No. 393,699
Claims priority, application France, Jul. 3, 1981, 81 13131
Int. Cl.[5] A61K 7/02, 7/06, 7/42, 9/10
U.S. Cl. 424—70 7 Claims

1. A shampoo composition comprising a solution of, in water or a hydroalcoholic solution wherein the alcohol is ethanol or isopropanol,

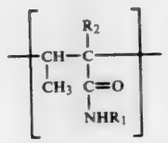
(a) at least one polymer having 50 to 100% of repeating units of the β-alanine type having the formula:

(I)



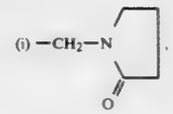
and 0 to 50% of repeating units of the acrylamide type having the formula

(II)



wherein

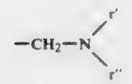
R_1 represents hydrogen or a member selected from the group consisting of



(ii) $-CH_2OH$,

(iii) $-(CH_2)_n-CH_3$ wherein n is 0 or a whole number ranging from 1 to 11,

(iv)

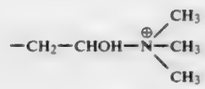


wherein r' and r'' each independently represent hydrogen or alkyl containing 1–3 carbon atoms,

(v) $-CHOH-COOH$,

(vi) $-CH_2-SO_3Na$,

(vii)



$Cl^{\ominus}$ and

(viii) $-(CH_2-CH_2-O)_mH$ wherein m ranges from 1 to 10 and

R_2 and R_3 represent hydrogen or methyl,

said polymer being present in an amount ranging from 0.1 to 4 weight percent based on the total weight of said composition, and

(b) at least one cationic, nonionic, anionic or amphoteric detergent, or a mixture thereof, said detergent being present in an amount ranging from 3 to 50 weight percent based on the total weight of said composition.

5,204,093

SHAVING CREAM COMPOSITION FOR THE TREATMENT OF ACNE VULGARIS AND PSEUDOFOLLICULITIS BARBAE AND METHOD OF PRODUCING AND USING SAME

Steven A. Victor, 301 E. 79th St., New York, N.Y. 10021

Continuation of Ser. No. 334,700, Apr. 6, 1989, abandoned. This application Jul. 2, 1991, Ser. No. 728,031
Int. Cl.[5] A61K 7/15, 31/19
U.S. Cl. 424—73 31 Claims

1. A method of treating acne vulgaris or pseudofolliculitis barbae in humans, comprising the steps of:

applying to the skin a brushless, or non-lathering shaving cream containing in stable admixture therewith a therapeutically effective amount of benzoyl peroxide; and

removing the brushless, or non-lathering shaving cream by shaving with a straight-edge razor.

5,204,094

TREATMENT OF PNEUMOTHORAX

Maud Brandely, Paris, and Christian Boutin, Marseille, both of France, assignors to Roussel Uclaf, France

Filed Jan. 16, 1992, Ser. No. 822,180
Int. Cl.[5] A61K 37/02
U.S. Cl. 424—85.2 8 Claims

1. A method of treating pneumothoraxes in warm-blooded animals comprising administering to warm-blooded animals an amount of a polypeptide having interleukin-2 activity sufficient to treat the symptoms of pneumothoraxes.

5,204,095

MONOCLONAL ANTIBODIES AGAINST HEPATITIS B VIRUS

Alison H. Goodall, Buntingford; George Janossy, Harrow, and Howard C. Thomas, London, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 873,289, Jun. 5, 1986, abandoned, which is a continuation of Ser. No. 293,243, Aug. 17, 1981, abandoned, which is a continuation of Ser. No. 252,069, Apr. 8, 1981, abandoned. This application Jul. 17, 1990, Ser. No. 554,985
Claims priority, application United Kingdom, Apr. 9, 1980, 8011697; Jun. 26, 1981, 8119762
Int. Cl.[5] A61K 39/42, 39/44
U.S. Cl. 424—86 24 Claims

1. A monoclonal antibody to hepatitis B surface antigen which is secreted by hybridoma cell line RF-HBs-1.

5,204,096

PRE-S GENE CODED PEPTIDE HEPATITIS B IMMUNOGENS, VACCINES, DIAGNOSTICS, AND SYNTHETIC LIPID VESICLE CARRIERS

Alexander R. Neurath, New York, N.Y., and Stephen B. H. Kent, Pasadena, Calif., assignors to New York Blood Center, Inc., New York, N.Y. and California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 698,499, Feb. 5, 1985, Pat. No. 4,847,080, which is a continuation-in-part of Ser. No. 587,090, Mar. 7, 1984, abandoned. This application Apr. 14, 1989, Ser. No. 338,028
Int. Cl.[5] A61K 39/12, 37/02
U.S. Cl. 424—89 52 Claims

1. A process for raising antibodies to the hepatitis B virus which comprises administering to an animal a protective amount of a peptide containing an amino acid chain of at least six consecutive amino acids within the pre-S gene coded region of the envelope of hepatitis B virus, said peptide not comprising a naturally occurring envelope protein of hepatitis B virus.

5,204,097

applying to skin an effective moisturizing amount of an amino

5,204,103

USE OF POLYSACCHARIDES IN PREPARATION FOR

the group consisting of vitamin A, vitamin C, a selenium

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5,204,097

SHIGA TOXIN B CHAIN POLYPEPTIDES AND VACCINE THERETO

Ruth Arnon, Rehovot; Ilana Harari, Kfar Aviv, both of Israel; Gerald T. Keusch, Lexington, and Arthur Donohue-Rolfe, Sudbury, both of Mass., assignors to Yeda Research and Development Company Limited, Rehovot, Israel

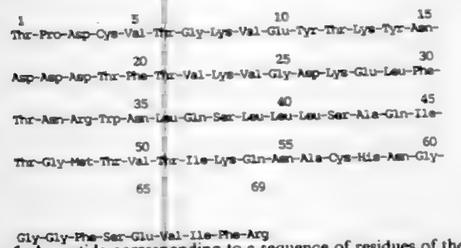
Continuation of Ser. No. 70,243, Jul. 6, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 364,506

Claims priority, application Israel, Jul. 6, 1986, 79346

The portion of the term of this patent subsequent to Jun. 20, 2008, has been disclaimed.

Int. Cl.[5] A61K *39/02*; C07K *7/00*; C08H *1/00*

U.S. Cl. 424—92 8 Claims



1. A peptide corresponding to a sequence of residues of the Shiga toxin B chain, the sequence consisting essentially of residues 5 to 18, 7 to 26, 13 to 26 or 19 to 29 of the Shiga toxin B chain, conjugated to suitable carrier.

5,204,098

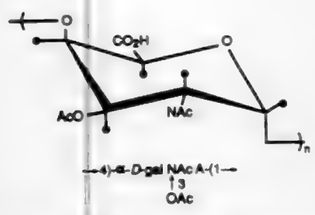
POLYSACCHARIDE-PROTEIN CONJUGATES

Shousun C. Szu; Rachel Schneerson, both of Bethesda, and John B. Robbins, Chevy Chase, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 16, 1988, Ser. No. 155,799

Int. Cl.[5] A61K *39/112, 39/385*; C07K *17/10*

U.S. Cl. 424—92 18 Claims



1. A method for conjugating capsular polysaccharide having carboxyl groups to a protein comprising:

(a) forming a thiol derivative of the carboxyl groups of the polysaccharide; and

(b) binding said thiol derivative to a protein using a heterobifunctional crosslinking agent.

5,204,099

COSMETIC COMPOSITION CONTAINING AMINO ACID COPOLYMERS WHICH IS USEFUL AS A MOISTURIZER

Alain Barbier, Saint Clement la Riviere; Joseph Millan, Juvignac, and Michel Sabadie, Bernay, all of France, assignors to Sanofi, Paris, France

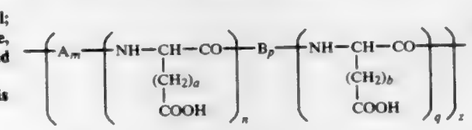
Filed Feb. 12, 1991, Ser. No. 654,187

Claims priority, application France, Feb. 12, 1990, 90 01618

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—401 10 Claims

1. A method of moisturizing skin, comprising the step of applying to skin an effective moisturizing amount of an amino acid copolymer of the statistical formula



(I)

in which:

a and b are each independently 1 or 2;

A and B are similar or different and each is an amino acid selected from the group consisting of arginine, serine, proline, glycine, histidine, alanine, lysine, ornithine, citrulline, urocanic acid, asparagine and tyrosine;

m, n, p and q are integers such that the ratio $(n+q)/(m+p)$ is between 0.5 and 4; and

z is an integer such that the average molecular weight is between 1000 and 100,000; or a slat thereof.

5,204,100

BACIULLUS THURINGIENSIS STRAINS ACTIVE AGAINST COLEOPTERAN INSECTS

Nadine B. Carozzi, Raleigh; Vance C. Kramer, Hillsborough; Gregory W. Warren, and Michael G. Koziel, both of Cary, all of N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 650,792, Feb. 1, 1991, abandoned. This application May 21, 1991, Ser. No. 703,421

Int. Cl.[5] A01N *63/00*; C12N *1/20*

U.S. Cl. 424—93 L 6 Claims

6. A method of controlling insect pests belonging to the order of Coleoptera which comprises contacting said insect pests with an insect-controlling effective amount of a *Bacillus thuringiensis* strain selected from the group consisting of CGB 14-4, CGB 14-5, CGB 14-8 and CGB 14-10.

5,204,101

METHOD AND COMPOSITION FOR TREATING ACQUIRED IMMUNODEFICIENCY SYNDROME

Thomas W. Stubblefield, 1723 Eagle Dr., Hixson, Tenn. 37343, and Betty J. Cothran, 1309 Swope Dr., Chattanooga, Tenn. 37412

Filed Oct. 15, 1991, Ser. No. 775,596

Int. Cl.[5] A61K *35/78, 9/48*

U.S. Cl. 424—195.1 3 Claims

1. A method of increasing the T4 lymphocyte counts of patients testing positive for human immunodeficiency virus consisting essentially of administering to the patients about 1 to 40 milligrams of a composition consisting of approximately equal amounts of dried powdered *Phytolocca americana, Rumex acetosella* and *Citrus liminonia*, on a daily basis.

5,204,102

ANIMAL FEEDSTUFF

Richard G. Coles, and Ian J. Broadfoot, both of Toowoomba, Australia, assignors to Grainco Queensland Co-Operative Association Limited, Queensland, Australia

Filed Sep. 3, 1991, Ser. No. 753,905

Claims priority, application Australia, Jan. 14, 1991, PK4194

Int. Cl.[5] A61K *35/78*; A23L *1/20*

U.S. Cl. 424—195.1 22 Claims

1. An animal feedstuff comprising fluffy cotton seed coated with a binder and a filler.

5,204,103

USE OF POLYSACCHARIDES IN PREPARATION FOR WOUND TREATMENT

Wiete Westerhof, Landsmeer, and Jacob Verschoor, Teteringen, both of Netherlands, assignors to Pharmalett International B.V., Teteringen, Netherlands

Filed Aug. 29, 1991, Ser. No. 751,336

Claims priority, application Netherlands, Sep. 7, 1990, 9001980

Int. Cl.[5] A61K *35/78, 37/54, 9/70*

U.S. Cl. 424—195 10 Claims

1. Process for wound treatment which comprises applying to the wound of an affected patient a vegetable fiber material originating from *Plantago ovata.*

5,204,104

PHYSICAL THERAPY MASSAGE STICK AND PROCESS

Robert W. Bolinger, Escondido, and Don C. Atkins, Jr., Los Alamitos, both of Calif., assignors to Pre Pak Products, Carlsbad, Calif.

Filed Oct. 7, 1991, Ser. No. 772,438

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—401 5 Claims

1. A massage stick for use by physical therapists in conducting tisue mobilization, myofacial and deep tissue massage therapy on patients, comprising

a solid stick of ingredients which remains essentially solid at and below the temperature of the human body and which upon contact with and at the temperature of the human body provides a massaging surface exhibiting a degree of lubricity, a degree of tackiness and a solid firmness facilitating deep penetrating massaging action,

said stick comprising a composition of ingredients including a major porportion by weight of a first polyethylene glycol having a relatively high viscosity and a melting temperature above the temperature of the human body, a lower porportion by weight of a second polyethylene glycol having a melting temperature less than the temperature of the human body, and a minor porportion by weight of a third polyethylene glycol exhibiting emolliency,

said first polyethylene glycol having an average molecular weight of from about 3,000 to about 3,700 and comprising about 54% by weight of said stick, said second polyethylene glycol having an average molecular weight of from about 570 to about 630 and comprising about 41% by weight of said stick, and said third polyethylene glycol comprising an ethoxylated lanolin having in the order of about 75 moles of ethylene oxide and comprising about 5% by weight of said stick.

5,204,105

COSMETIC COMPOSITION

Jack Mausner, New York, N.Y., assignor to Chanel, Inc., New York, N.Y.

Filed Apr. 10, 1990, Ser. No. 508,070

Int. Cl.[5] A61K *7/032*

U.S. Cl. 424—401 3 Claims

2. An emulsified cosmetic composition for treatment of skin under the eyes comprising:

water, and emulsified and dispersed in the water:

(a) means for reducing puffiness of the skin under the yes and for reducing sensations of irritation and inflammation of the skin under the eyes including a mixture consisting of plant and yeast extracts;

(b) means for enhancing firmness and elasticity of the skin under the eyes and for minimizing dark circles under the eyes comprising between about 3.4% to about 4.6% of a complex of methylsilanol elastinate and methylsilanol aspartate hydroxyprolinate;

(c) means for retarding the effects of free radical activity on the firmness of the skin under the eyes selected from the group consisting of vitamin A, vitamin C, a selenium metal compound, and beta carotene;

(d) a preservative for preventing microbial growth in the composition;

(e) a thickener to increase the viscosity of the composition;

(f) an anti-oxidant; and

(g) means for emulsification.

5,204,106

PROCESS FOR RESTORING AN OSSEOUS DEFECT OR DEFICIENCY BY FILLING WITH OSSEOUS TISSUE

Evert Schepers, Leuven, Belgium; Paul Ducheyne, Bryn Mawr, Pa., and Raymond Kempeneers, Mol, Belgium, assignors to FBFC International S.A., Brussels, Belgium

Filed Apr. 19, 1990, Ser. No. 511,303

Claims priority, application France, Apr. 20, 1989, 89 05504

Int. Cl.[5] A61F *2/28*

U.S. Cl. 424—423 8 Claims

1. Process for the formation of osseous tissue for filling an osseous defect or deficiency, comprising introducing particles consisting essentially of an inorganic, non-fluorinated, bioreactive granular material having sharp edges, an irregular profile and surface defects or microcracks into said osseous defect or deficiency in order to cause osteogenesis by osteostimulation, said particles being progressively dissolved internally, by way of said surface defects or microcracks to create a central cavity in which mesenchymal precursor cells are differentiated into osteoblasts, followed by progressive replacement of said particles by osseous tissue,

said particles consisting essentially of, by weight:

SiO_2 between 40 and 55%;

Na_2O between 10 and 32%;

P_2O_5 between 0 and 12%; and

CaO between 10 and 32%;

and having a grain size distribution such that at least 95% of the particles are between 280 and 425 μm.

5,204,107

SLOW-RELEASING COMPOSITION OF PLATINUM-CONTAINING ANTICANCER AGENT

Ryoichi Tsurutani; Koji Kifune, and Yuriko Nakamura, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Nov. 20, 1991, Ser. No. 794,909

Claims priority, application Japan, Nov. 20, 1990, 2-316409

Int. Cl.[5] A61K *9/00, 9/16, 31/73, 47/00*

U.S. Cl. 424—426 13 Claims

1. A pharmaceutical composition consisting essentially of a platinum-containing anticancer agent bound to deacetylated chitin and a pharmaceutically acceptable carrier, wherein the composition has a slow-release property over a duration of at least four months.

5,204,108

TRANSMUCOSAL FORMULATIONS OF LOW MOLECULAR WEIGHT PEPTIDE DRUGS

Lisbeth Illum, Nottingham, United Kingdom, assignor to Danbiosyst UK Ltd., Nottingham, United Kingdom

PCT No. PCT/GB88/00836, § 371 Date Apr. 9, 1990, § 102(e) Date Apr. 9, 1990

PCT Filed Oct. 10, 1988, Ser. No. 469,443

Claims priority, application United Kingdom, Oct. 10, 1987, 8723846

Int. Cl.[5] A61K *9/14, 9/16, 9/50, 31/075*

U.S. Cl. 424—434 13 Claims

1. A drug delivery composition which is suitable for transmucosal delivery and which comprises a plurality of microspheres adapted to gel in contact with the mucosal surface and active drug associated with each microsphere, the composition

being substantially free of an enhancer, characterised in that

(a) from about 0% to about 90% by weight polyhydric

5,204,112

INDUCTION OF ASYMMETRY IN VESICLES

5,204,116

DOSAGE FORM PROVIDING IMMEDIATE THERAPY

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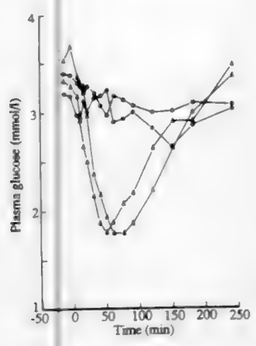
being substantially free of an enhancer, characterised in that the drug is for systemic delivery and is a peptide having a



maximum molecular weight of 6000, and the microspheres comprise starch, gelatin, collagen or dextran.

5,204,109

PERCUTANEOUS GEL PREPARATION

Hitoshi Akemi; Saburo Otsuka; Takashi Kinoshita; Yoshifumi Hosaka, and Yoshihisa Nakano, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka and Toa Eiyo Ltd., Tokyo, both of Japan

Continuation of Ser. No. 635,024, Dec. 28, 1990, abandoned. This application Mar. 23, 1992, Ser. No. 855,493

Claims priority, application Japan, Dec. 28, 1989, 7-344639; Sep. 6, 1990, 2-237384

Int. Cl.[5] **A61K** *9/70, 31/34;* **A61L** *15/16*

U.S. Cl. 424—443 **10 Claims**

1. A percutaneous gel preparation comprising a substrate having on one surface thereof a crosslinked gel layer formed by crosslinking a composition comprising the following ingredients (a) to (c), the weight ratio of said ingredient (b) to said ingredient (c) being from 1.0/0.25 to 1.0/2.0:

(a) isosorbide dinitrate;

(b) an acrylate polymer obtained by polymerizing alkyl (meth)acrylates used in the production of adhesives; and

(c) a non-aqueous liquid ingredient compatible with said ingredient (b), wherein said ingredient (c) is selected from the group consisting of phthalic acid esters, isopropyl myristate, isotridecyl myristate, and octyl palmitate.

5,204,110

HIGH ABSORBENCY HYDROGEL WOUND DRESSING

James V. Cartmell, Xenia; Wayne R. Sturtevant, Centerville; Michael L. Wolf, West Milton, and Michael J. Allaire, Cincinnati, all of Ohio, assignors to NDM Acquisition Corp., Minneapolis, Minn.

Continuation-in-part of Ser. No. 517,837, Apr. 2, 1990, Pat. No. 5,115,801. This application Feb. 19, 1992, Ser. No. 838,464

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] **A61F** *13/00*

U.S. Cl. 424—443 **19 Claims**

1. A hydrogel composition for use in a wound dressing formed form a mixture comprising:

(a) from about 0% to about 90% by weight polyhydric alcohol;

(b) from about 6% to about 60% by weight isophoronediisocyanate terminated prepolymer;

(c) from about 4% to about 40% by weight polyethylene oxide based polyamine;

(d) 0% to about 2% by weight sodium chloride; and

(e) the balance water.

5,204,111

PROCESS FOR THE PREPARATION OF ALGINATE CAPSULES, APPARATUS FOR PRODUCING SAID CAPSULES AND COSMETIC COMPOSITIONS CONTAINING SAID CAPSULES

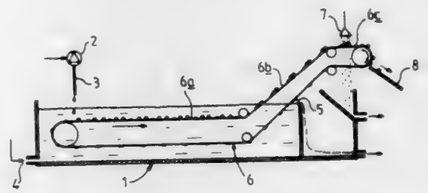
Rose-Marie Handjani, Paris; Myriam Kauffmann, Lyons, and Frédéric Huguenin, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 505,687, Apr. 9, 1990, Pat. No. 5,139,783. This application Jan. 28, 1992, Ser. No. 826,610

Claims priority, application France, Apr. 7, 1989, 89 04598

Int. Cl.[5] **A61K** *7/00, 9/48, 31/725*

U.S. Cl. 424—451 **1 Claim**



1. A cosmetic composition comprising, in a cosmetically acceptable external phase suitable for application to the skin, alginate capsules easily crushed on the skin under the action of a massage without leaving a residue on the skin and having sufficient rigidity so that the structure of said capsules is not modified during storage or on introduction into said cosmetic composition, said alginate capsules being prepared by slowly introducing through at least one nozzle an aqueous solution of at least one alginate into an aqueous solution of at least one polyvalent metal salt, said metal being selected from the group consisting of iron, silver, strontium, aluminum, manganese, selenium, calcium and zinc, removing the resulting alginate capsules, forming by gelification, so as to separate said capsules from the aqueous solution of polyvalent metal and finally, optionally, washing and drying said capsules, wherein at least one alginae has mannuronic units (M) and guluronic units (G) in a M/G molar ratio between 0.4 and 1.9, the amount of blocks (G) being greater than 50 percent, the said alginate being a sodium alginate having a viscosity in a 0.5 weight % aqueous solution lower than 20 mP.s measured with a TV Contraves viscosimeter provided with No. 1 measurement body in the presence of a calcium chelating agent, the weight concentration of said alginate in the aqueous solution introduced through said nozzle being between 0.2 and 2 percent, the molar concentration of the polyvalent metallic cation of the crosslinking aqueous solution of said polyvalent metal salt being between 3.4×10^{-3} M and 6.8×10^{-2} M, the surface tension of the aqueous solution of polyvalent metal salt being reduced to a value lower than 70 dynes/cm, by the addition of a surface active agent, and the contact time between the drops of alginate solution and the aqueous solution of polyvalent metal salt ranging from 10 seconds to 20 minutes.

5,204,112

INDUCTION OF ASYMMETRY IN VESICLES

Michael J. Hope, and Pieter R. Cullis, both of Vancouver, Canada, assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 874,575, Jun. 16, 1986, abandoned. This application Jun. 12, 1987, Ser. No. 61,837

Int. Cl.[5] **A61K** *9/133;* **A61R** *9/127;* **B01J** *13/06*

U.S. Cl. 124—450 **28 Claims**

1. An asymmetric liposome having an outer bilayer which comprises an ionizable lipid or an ionizable protein wherein the outer bilayer has an asymmetric distribution of the ionizable lipid or ionizable protein within the two monolayers which comprise the outer bilayer, said asymmetric distribution induced by a transmembrane concentration gradient wherein the gradient is a pH gradient.

5,204,113

PHARMACEUTICAL COMPOSITIONS CONTAINING PENTAMIDINE

Philip S. Hartley, Crich, England, and John Stevens, Scarborough, Canada, assignors to Fisons plc, England

PCT No. PCT/GB88/00277, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/07855, PCT Pub. Date Oct. 20, 1988

Continuation of Ser. No. 275,054, Nov. 14, 1988, abandoned. This PCT application Apr. 8, 1988, Ser. No. 657,335

Claims priority, application United Kingdom, Apr. 9, 1987, 87/08527

Int. Cl.[5] **A61K** *9/14, 9/48, 9/72*

U.S. Cl. 424—45 **5 Claims**

1. A sealed capsule loosely filled with a nonpressurized dry powder pharmaceutical composition for the prophylactic or remedial treatment of pneumono-cystis carinii pneumonia by oral or nasal inhalation, said composition containing as active ingredient, finely divided pentamidine or a pharmaceutically acceptable salt thereof with a mass median diameter of 0.01 to 10 microns.

5,204,114

METHODS OF MANUFACTURING HIGH DOSAGE GLUTATHIONE THE TABLETS AND CAPSULES PRODUCED THEREBY

Harry B. Demopoulos, Scarsdale, and Joel Ross, Ardsley, both of N.Y., assignors to Health Maintenance Programs, Inc., Elmsford, N.Y.

Filed Mar. 30, 1992, Ser. No. 859,892

Int. Cl.[5] **A61K** *9/20, 9/48*

U.S. Cl. 424—465 **20 Claims**

1. An oral dosage form consisting essentially of glutathione and an amount of crystalline ascorbic acid effective to neutralize the electrostatic charge of said glutathione.

5,204,115

DIRECTLY COMPRESSIBLE XYLITOL AND METHOD

Philip M. Olinger, Schaumburg, Ill., and Auli Karhunen, Jokioinen, Finland, assignors to Suomen Xyrofin Oy, Kotka, Finland

Filed Dec. 12, 1990, Ser. No. 626,495

Int. Cl.[5] **A61K** *9/16, 9/28*

U.S. Cl. 424—470 **37 Claims**

1. A directly compressible, non-cariogenic free flowing xylitol granulate having an average particle size of up to about 500 microns in which the sensorial properties of xylitol are not noticeably diminished which consists of xylitol and a physiologically acceptable, non-cariogenic binder in the range of about 0.1% to about 5% by weight taken from the group consisting of polymerized reducing sugars, alkali carboxymethylcellulose and hydrogenated starch hydrolysate.

5,204,116

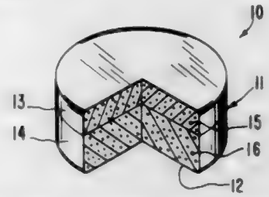
DOSAGE FORM PROVIDING IMMEDIATE THERAPY FOLLOWED BY PROLONGED THERAPY

David E. Edgren, El Granada; Gurdish K. Bhatti, Fremont, and Judy A. Magruder, Mountain View, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed May 1, 1991, Ser. No. 694,173

Int. Cl.[5] **A61K** *9/24*

U.S. Cl. 428—473 **4 Claims**



1. An improvement in a method for administering a drug to patient in need of therapy, wherein the method comprises:

(a) admitting orally into the patient a dosage form comprising:

(1) a first layer comprising 0.10 ng to 500 mg of stereoisomer drug and from 1 wt % to 99 wt % of a hydroxypropylmethylcellulose;

(2) a second layer comprising 1 mg to 650 mg of a racemic drug and 1 wt % to 99 wt % of a different hydroxypropylmethylcellulose; and wherein the improvement comprises:

(b) releasing the stereoisomer drug over a period of instant release up to 1 hour from the first layer to provide instant stereoisomeric drug therapy to the patient; and,

(c) releasing the racemic drug over a prolonged period up to 24 hours from the second layer to provide prolonged racemic drug therapy to the patient.

5,204,117

Patent Not Issued For This Number

5,204,118

PHARMACEUTICAL COMPOSITIONS AND METHODS FOR TREATING THE SYMPTOMS OF OVERINDULGENCE

William J. Goldman, Ambler, and Thomas N. Gates, Doylestown, both of Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 430,837, Nov. 2, 1989, abandoned. This application Apr. 29, 1992, Ser. No. 876,824

Int. Cl.[5] **A61K** *9/08, 9/10, 9/14*

U.S. Cl. 424—489 **14 Claims**

1. A pharmaceutical composition for treating the symptoms of overindulgence due to the excessive or inappropriate intake of food and/or alcoholic beverages comprising a therapeutically effective amount of an analgesic and a gastric acid inhibiting effective amount of a proton pump inhibitor wherein the therapeutically effective amount of the analgesic is selected from the group consisting of acetaminophen from 500 to 1000 mg per dose, ibuprofen from 200 to 400 mg per dose, naproxen from 200 to 500 mg per dose, fenoprofen from 200 to 600 mg per dose, ketoprofen from 50 to 300 mg per dose, meclofenamate from 50 to 400 mg per dose, mefenamic acid from 250 to 500 mg per dose, piroxicam from 10 to 20 mg per dose, indomethacin from 25 to 200 mg per dose, sulindac from 150 to 400 mg per dose, tolmetin from 200 to 1200 mg per dose and their pharmaceutically acceptable salts; in combination with an effective amount of the proton pump inhibitor omeprazole of from 60 to 500 mg per dose and its pharmaceutically acceptable salts.

5,204,119

PROCESS FOR THE PREPARATION OF 1-(2-HYDROXY-3-ALKYLAMINOPROPYL)-1,2,3,4-TETRAHYDROQUINOLINE-2-CARBOXAMIDE DERIVATIVES

Jean-Pierre Bonin, Paris, and Jean-Claude Lacoste, Le Plessis Robinson, both of France, assignors to Synthelabo, Paris, France

Filed Jan. 28, 1992, Ser. No. 826,611

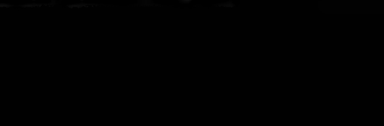
Claims priority, application France, Jan. 31, 1991, 91 01107

Int. Cl.[5] **C07D** *215/38*

U.S. Cl. 546—167 **5 Claims**

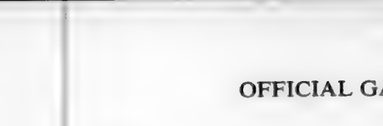
1. A process for the preparation of a compound of formula (I):

wherein R represents a linear or branched alkyl group containing 1 to 4 carbon atoms, and its addition salts with a pharmaceutically acceptable acid, which process comprises reacting a compound of formula (II):



wherein R is as defined above, with a compound of formula (III):

wherein Y represents a leaving group, to obtain a compound of formula (IV):



wherein R is as defined above, and then reacting the compound of formula (IV) with ammonia.

5,204,120

PROCESS FOR PRODUCING A RESIN MOLDED ARTICLE

Yoshiaki Kobayashi, Kawasaki, and Yoshiaki Kawamura, Yokohama, both of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,966

Claims priority, application Japan, Feb. 2, 1990, 2-23000

Int. Cl.[5] **B29C** *45/14*

U.S. Cl. 264—272.17 **3 Claims**

(a3) sodium laurylsulphate as a wetting agent, and

pot, to extrude molten resin from the pot into said cavity

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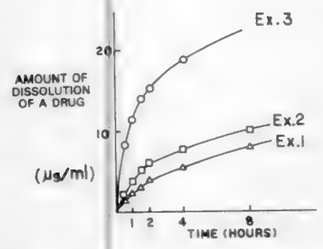
5,204,119

EXTERNAL PREPARATION COMPRISING CALCIUM SILICATE

Takao Shiobara, 20-18, Keyaki 1-chome; Jun Nonaka, 15-4, Midori 1-chome, both of Honjo-shi, Saitama; Masayoshi Kasai, 156, Tsutsujigaoka 5-chome, Kakamigahara-shi, Gifu, and Takeshi Konita, 2-2, Fukiagemachihoncho 3-chome, Kitaadachi-gun, Saitama, all of Japan

Filed Aug. 20, 1991, Ser. No. 748,208
Claims priority, application Japan, Aug. 29, 1990, 2-228669
Int. Cl.[5] A61K *9/14*
U.S. Cl. 424—489 **7 Claims**



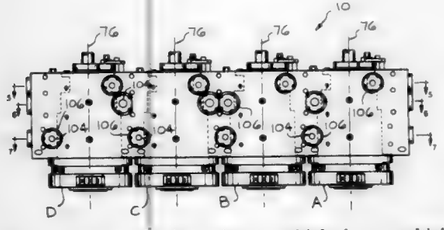
1. An external preparation comprising calcium silicate in the form of a porous powder and a drug adsorbed thereon, said calcium silicate having a gyrolite crystal structure having the formula $2CaO{\cdot}3SiO_2{\cdot}mSiO_2{\cdot}nH_2O$, with $1<m<2$ and $2<n<3$ and is contained in the preparation in an amount of from 1 to 120 percent by weight based on the weight of the drug.

5,204,120

INTERMITTENT MULTI-LAYER MULTI-PARISON EXTRUSION HEAD

Michael Hirschberger, Sylvania, Ohio, assignor to Hoover Universal, Inc., Plymouth, Mich.

Continuation-in-part of Ser. No. 849,827, Mar. 11, 1992, which is a continuation of Ser. No. 429,403, Oct. 31, 1989, abandoned.
This application Jun. 17, 1992, Ser. No. 900,195
Int. Cl.[5] B29C *47/06, 47/22*
U.S. Cl. 425—132 **17 Claims**



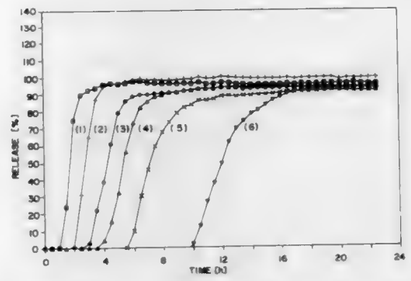
1. An apparatus for intermittent multiple layer multiple parison extrusion comprising:
an extrusion head;
means forming multiple extrusion stations within said extrusion head each having a lengthwise axis with the axes of said multiple stations being arranged coplanar and parallel with one another forming a longitudinal array of said extrusion stations within said head, said stations each extruding parisons of multiple concentric layers of thermoplastic resins; and
passage means within said extrusion head for feeding resins to said stations, said passage means being configured to produce substantially equal ratios of resin volume for one resin layer to another resin layer for each station while the resin volume in said passage means for each layer is not equal for all stations.

5,204,121

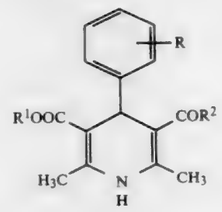
MEDICAMENTS HAVING CONTROLLED RELEASE OF THE ACTIVE COMPOUND

Manfred Bücheler, Overath; Andreas Ohm, Neuss; Roland Rupp, Leichlingen; Josef Schmoll, Wermelskirchen, and Axel Wollenschläger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

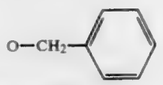
Filed Jan. 30, 1990, Ser. No. 472,681
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1989, 3904093
Int. Cl.[5] A61K *9/14, 9/58, 9/62*
U.S. Cl. 424—495 **9 Claims**



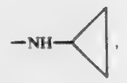
1. Pellets of a medicament having controlled release of the active compound and comprising
(a) a core which contains
(a1) an active compound of the formula



in which
R represents nitro or the group

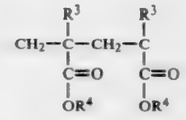


in the ortho- or meta-position,
R^1 represents alkyl having 1–4 C atoms, which is optionally interrupted by an oxygen in the chain, and
R^2 represents alkoxy having 1–4 C atoms, or represents the radical

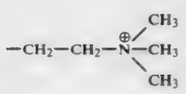


or a compound from the group consisting of 3-(4-fluorophenylsulphonamido)-1,2,3,4-tetrahydro-9-carbazole propanoic acid and 2-[4-(2-pyrimidinyl)-1-piperazinyl] butyl]-1,2-benzisothiazol-3(2H)-one, 1,1-dioxide, and
(a2) an intensive disintegrating agent from the group comprising crosslinked sodium carboxymethylcellulose or sodium starch glycolate, and

(a3) sodium laurylsulphate as a wetting agent, and
(a4) PVP as a binder, and
b) a double layer which controls the release, consisting of
b1) an outer undigestible water-permeable lacquer layer which essentially consists of an acrylic resin based on a poly(meth)acrylic acid ester having a neutral character or having a low content of quaternary ammonium groups, consisting of a copoly(meth)acrylic acid ester having the structural element



wherein
R^3 represents H or CH_3 and
R^4 represents CH_3 or C_2H_5,
and having an average molecular weight of about 800,000, and
the said ester having the low content of quaternary ammonium groups differing in that the R^4, in a molar ratio of 1:20 to 1:40, represents the group



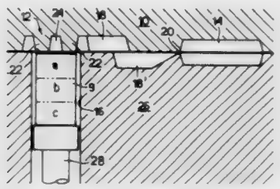
and it has an average molecular weight of about 150,000, or consists essentially of ethylcellulose, optionally contains antiadhesive agents, and
b2) an inner jacket which controls the migration of the water in the direction of the core and consists essentially of about 10 to 40% of hydroxypropylcellulose and about 60 to 90% of a hydrophobic additive selected from the group consisting of calcium stearate and hydrogenated castor oil.

5,204,122

MOLD FOR USE IN RESIN ENCAPSULATION MOLDING

Akira Konishi, Kyoto, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kyoto, Japan

Filed Jan. 23, 1992, Ser. No. 824,646
Int. Cl.[5] B29C *45/02, 45/18*
U.S. Cl. 425—116 **11 Claims**



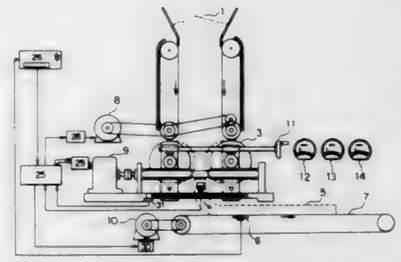
1. Apparatus for resin encapsulation molding of small elements, comprising:
a male mold and a cooperating female mold, defining a cavity wherein small elements to be resin encapsulated with a synthetic resin are placed for encapsulation;
at least one pot for receiving a quantity of synthetic resin material and heat for melting said resin material therein;
a cull formed in the male mold, said cull communicating with said at least one pot to receive melted resin therefrom;
a plunger disposed to be movable in an axial direction of the pot, to extrude molten resin from the pot into said cavity to encapsulate said elements placed therein,
wherein an inner bottom portion of said cull, facing an opening of said pot from which said molten resin is extruded into said cull, is provided with a continuous groove passage defined by projections providing surfaces by which heat received by thermal conduction between the molds is applied to the molten resin to ensure its fluidity as the molten resin flows through the groove in the cull into the cavity to surround and encapsulate the small elements placed therein.

5,204,123

APPARATUS FOR MANUFACTURING CONTINUOUS SHEETS OF BREAD DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Division of Ser. No. 686,091, Apr. 16, 1991, Pat. No. 5,091,202.
This application Oct. 1, 1991, Ser. No. 770,072
Claims priority, application Japan, Apr. 17, 1990, 2-101078
Int. Cl.[5] A21C *3/04*
U.S. Cl. 425—141 **1 Claim**



1. An apparatus for producing a continuous belt-like sheet of bread dough, comprising
a dough hopper having a top, a bottom and four sides, an inlet provided at the top, vertical conveyors provided on two opposing ones of the four sides, and a dough outlet provided at the bottom of the hopper, and
a pair of discharging rolls that constitute a part of the dough outlet, facing each other and separated by a distance, and rotated so as to pass downwardly the bread dough passing therebetween,
means for adjusting the distance between the discharging rolls,
means for adjusting a peripheral speed b of the discharging rolls,
means for adjusting a downward speed a of the vertical conveyor, and
means for controlling the distance, the peripheral speed and the downward speed such that the following equation is realized;

$$D\times a/F\times b=k$$

wherein
D is a sectional area defined by the vertical conveyors.
F is a sectional area defined by the discharging rolls. and
k is a constant.

5,204,124

pensed said viscous liquid preventing premature curing of

5,204,126

urging said movable portion away from said stationary

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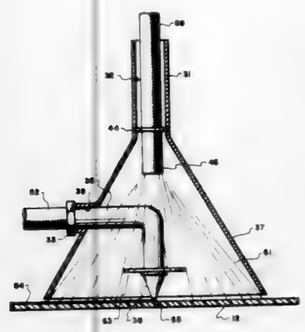
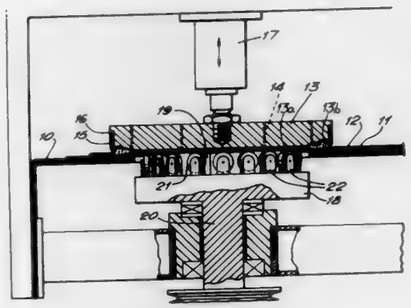
5,204,124
CONTINUOUS EXTRUDED BEAD OBJECT FABRICATION APPARATUS
Stanley Secretan, 9211 Elizabeth Lake Rd., Leona Valley, Calif. 93551, and Earl T. Bayless, 28051 Wildwind Rd., Canyon Country, Calif. 91351
Continuation-in-part of Ser. No. 594,046, Oct. 9, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 789,977
Int. Cl.[5] B29C *35/08*
U.S. Cl. 425—145 **9 Claims**



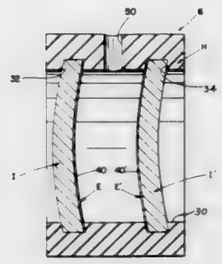
5. An apparatus for producing a prototype comprising:
a prototype support platform upon which a prototype is to be created;
a liquid source terminating in a nozzle through which a viscous liquid is to be dispensed, said nozzle being located directly adjacent said prototype support platform and viscous liquid from said liquid source is capable of being deposited directly on said prototype support platform, the viscous liquid being curable into a solid when subjected to light energy, horizontal relative movement to occur between said prototye support platform and said nozzle, the depositing of the viscous liquid being continuous in the form of a narrow bead during said horizontal relative movement, vertical relative movement to occur between said prototype support platform and said nozzle with said vertical relative movement comprising an incremental series of short distances in a direction away from said prototype support platform, said horizontal movement normally occurring between a directly adjacent sequence of said series of short distances of said vertical movement;
programmable means to produce said relative movement, said programmable means being preprogrammed according to the size and shape of said prototype, said programmable means directing said relative movement along with the dispensing of the viscous liquid to produce said prototype;
a source of light for producing light energy for curing said viscous liquid, light direction means located directly adjacent to said nozzle, said light direction means for beaming the light energy toward said nozzle, the light energy from said source of light being transmitted to said light direction means prior to being applied to said prototype, said light direction means emits said light energy in a three hundred sixty degree pattern about said nozzle;
a light shield, said light shield being mounted directly adjacent said nozzle, said light shield comprising a washer shaped structure shadowing said nozzle, said light shield to prevent light from contacting the immediately dispensed said viscous liquid preventing premature curing of said viscous liquid; and
a cone-shaped light observing window, said nozzle and said light direction means being fixedly mounted on said light observing window, said light observing window surrounding said nozzle, said light observing window permitting observing said light energy in the area of said nozzle by a human being without causing injury to the eyes of the human being.

5,204,125
MACHINE FOR FORMING A DOUGH PRODUCT
Hans K. Larsen, Aestorp, Sweden, assignor to Nestec S.A., Vevey, Switzerland
Filed May 17, 1991, Ser. No. 702,247
Claims priority, application European Pat. Off., Jun. 29, 1990, 90112430.5
Int. Cl.[5] A21C *11/10*
U.S. Cl. 425—298 **8 Claims**



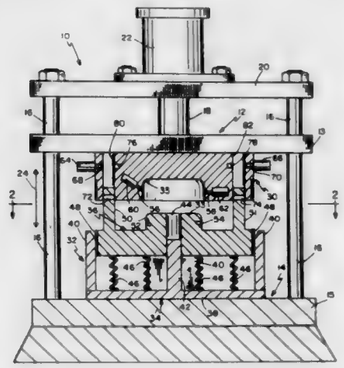
1. A machine for forming a dough-based product comprising:
a conveyor positioned to have an upper run having a surface for transporting a dough product;
at least one set of rollers positioned beneath the upper run transport surface and arranged on a rotatable disc so that the at least one set of rollers forms a spiral configuration; and
a reciprocable punch die and a cutter fitted to the die, wherein the die has a centrally disposed die surface portion which extends to a peripheral die surface channel portion which is positioned adjacent the cutter, the die and cutter being positioned for reciprocating to and from the upper run transport surface and the rollers so that when the die reciprocates towards a dough product transported on the transport surface, the dough product is pressed, formed and cut by the punch die and cutter, in cooperation with the rollers, into a piece having a rim having a thickness greater than a centrally disposed portion of the cut piece.

5,204,126
MOLD SURFACES WITH ULTRA THIN RELEASE FILMS
Brij P. Singh, North Royalton, and Raj Subramaniam, Parma, both of Ohio, assignors to NanoFilm Corporation, Valley View, Ohio
Continuation-in-part of Ser. No. 475,777, Feb. 6, 1990, Pat. No. 5,078,791. This application Oct. 10, 1991, Ser. No. 774,451
Int. Cl.[5] B29C *33/00, 33/60, 39/02*
U.S. Cl. 425—412 **17 Claims**



1. A mold for casting articles, said mold having inner surfaces coated with a release coating consisting essentially of polymerized amphiphilic molecules that are capable of self-assembly and that are self-assembled on said surfaces.

5,204,127
COMPRESSION MOLDING APPARATUS
Thomas J. Prusha, Winona, Minn., assignor to Composite Products, Inc., Winona, Minn.
Filed May 10, 1991, Ser. No. 698,044
Int. Cl.[5] B29C *43/34*
U.S. Cl. 425—544 **23 Claims**



1. A compression molding tool for production of a molded article, said tool comprising:
first and second tool halves relatively movable with respect to each other, and first and second mold sections configured to define a mold cavity supported on said first and second tool halves, respectively, in facing relation to each other, said second mold section including a stationary portion and a movable portion, said first mold section and said movable portion of said second mold section being relatively movable towards each other to an engaged position to form therebetween said mold cavity; and
biasing means engaging said movable portion and normally urging said movable portion away from said stationary portion of said second mold section, and said first mold section and said movable portion of said second mold section being jointly movable in said engaged position against the resistance of said biasing means towards said stationary portion of said second mold section in a molding stroke during which molding material is compressed and forced into said mold cavity; and
means for creating an aperture in the molded article, said means being actuable to an aperture forming position between said first mold section and said movable portion of said second mold section when said first mold section and said movable portion of said second mold section are moved to said engaged position.

5,204,128
METHOD OF TREATING MINT OILS TO REDUCE PULEGONE AND MENTHOFURAN CONTENTS
Sonya S. Johnson, Brookfield, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.
Filed Nov. 20, 1991, Ser. No. 796,090
Int. Cl.[5] A23L *1/222;* **A23G** *3/30*
U.S. Cl. 426—3 **20 Claims**

1. A method of reducing the pulegone and menthofuran contents of mint oil, comprising:
(a) mixing mint oil containing pulegone and menthofuran with a Lewis acid, to form a reaction mixture;
(b) maintaining the reaction mixture at a temperature below 100° C. for at least one half hour, thereby permitting the reaction mixture to form Diels-Alder adducts of pulegone and menthofuran, and to reduce the pulegone and menthofuran contents in the reaction mixture;
(c) neutralizing the reaction mixture after at least one half hour of reaction; and
(d) separating mint oil having reduced pulegone and menthofuran contents from the Diels-Alder adducts of pulegone and menthofuran.

5,204,129
METHOD FOR PREPARING PULVERIZED POLYDEXTROSE WHICH IS SUBSTANTIALLY FREE OF ACIDS AND COMPOSITIONS CONTAINING SAME
Subraman R. Cherukuri, Towaco; Kirshna P. Raman, Randolph, both of N.J.; Lucy L. Wong, Jackson Heights; Gul Mansukhani, Staten Island, both of N.Y., and Angel Orama, Stanhope, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Division of Ser. No. 354,650, May 19, 1989, Pat. No. 5,066,511. This application Jun. 10, 1991, Ser. No. 712,854
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 **11 Claims**

1. A sugarless chewing gum composition which comprises:
(A) a gum base;
(B) a major amount of a pulversized Polydextrose composition, which is substantially free of low molecular weight organic acids and which has a particle size of under about 125 microns in diameter; and
(C) a softening agent;
(D) a sweetening agent; and
(E) a flavoring agent.

5,204,130

similar to that of home baked cookies comprising the steps of:

5,204,134
HYPOALLERGENIC MILK PRODUCTS FROM

leaving said primary extraction cell bank as a primary extract through said outlet thereof;

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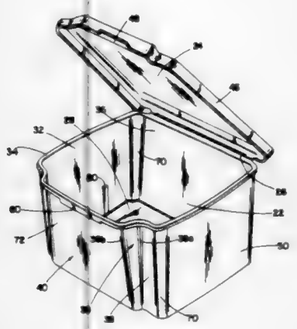
5,204,130

RECLOSABLE CONTAINER FOR SLICED FOOD PRODUCTS

John F. McDevitt, Evanston; David J. Johnson, Beach Park, and Denis H. Nelson, Wheaton, all of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Jul. 11, 1991, Ser. No. 728,708
Int. Cl.[5] B65D *43/00, 85/00*
U.S. Cl. 426—115 8 Claims

1. A reclosable container in combination with a plurality of sliced food products stacked within said container comprising:
a container body comprising a base wall; a pair of opposite side walls, a front wall, and a rear wall extending upward from the base wall; and a lip extending outwardly about the upper periphery of said container body along said front, rear and side walls;
a lid; and
a hinge supporting said lid on said container body for pivotal movement between an open position and a closed position, said hinge being connected to said lip along said rear wall;



said food products being oriented horizontally and having forward edges disposed adjacent said front wall;
said front wall having a protrusion defining an access space between said forward edges of said food products and said protrusion so as to maintain a distance of at least about ¼ in. between said food products and said protrusion, said protrusion having a width of at least about 1 in.

5,204,131

PROCESS FOR PREPARING COOKIES AND COOKIES RESULTING FROM SUCH PROCESS

Dean J. Frattinger, Saskatoon, and Tim Frattinger, Hague, both of Canada, assignors to Archer Foods Ltd., Saskatchewan, Canada

Filed Feb. 5, 1991, Ser. No. 650,581
Claims priority, application Canada, May 28, 1990, 2017611
Int. Cl.[5] A21D *15/06*
U.S. Cl. 426—243 6 Claims

1. A method of making a cookie having a soft chewy texture similar to that of home baked cookies comprising the steps of:
1) creaming butter or shortening with sugars and a stabilizing agent for a time which is sufficient to provide a smooth texture indicative of adequate mixing;
2) adding liquid ingredients including water in the range of from 3% to 8% to provide a selected moisture content;
3) adding blended dry ingredients including high gluten flour having a protein level of 13 to 19% and blending to make a stretchy dough to allow the cookie to rise quickly when microwaved and yet still trap the water within the dough;
4) freezing the dough;
5) baking the frozen dough in a microwave oven to form said cookie.

5,204,132

Patent Not Issued For This Number

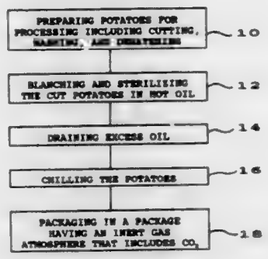
5,204,133

PROCESS FOR PREPARING SLICED POTATO PRODUCTS

Robert A. Hibbs, and Wayne B. Durfey, both of Boise, Id., assignors to Refrigerated Foods Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 691,527, Apr. 25, 1991, abandoned. This application Jan. 16, 1992, Ser. No. 823,583
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—393 13 Claims

1. A method of preparing the packaging cut, washed, and dewatered potatoes consisting of the steps of:
blanching and sterilizing the potatoes in hot oil at about 360° F. for about 1.5 to 3 minutes;



chilling the potatoes; and then
packaging the potatoes in a package having an inert gas atmosphere containing CO_2 thereby reducing bacterial growth on the potato surfaces by the formation of carbonic acid on the potato surfaces.

5,204,134

HYPOALLERGENIC MILK PRODUCTS FROM NATURAL AND/OR SYNTHETIC COMPONENTS AND PROCESS OF MAKING

Leonard S. Girsh, South Palm Beach, Fla., assignor to Immuno Path Profile, Inc., Melrose Park, Pa.

Continuation-in-part of Ser. No. 562,777, Aug. 3, 1990, Pat. No. 5,064,674, which is a continuation-in-part of Ser. No. 297,451, Jan. 13, 1989, Pat. No. 4,954,361. This application Sep. 4, 1991, Ser. No. 754,872
The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.
Int. Cl.[5] A23C *9/142, 9/20*
U.S. Cl. 426—580 165 Claims

1. A palatable hypoallergenic milk product comprising:
(a) a mineral salt component substantially free of allergenic protein, said mineral salt component comprising a mixture of mineral salts having approximately the mineral content of natural milk;
(b) a carbohydrate component substantially free of allergenic protein, said carbohydrate component comprising one or more carbohydrates; and
(c) a hypoallergenic protein component having a molecular weight of not more than 5 kDa, said hypoallergenic protein component being selected from the group consisting of hypoallergenic protein, amino acids, polypeptides and combinations thereof.

5,204,135

SAUCES FOR RETORTABLE FOOD PRODUCTS

Victor T. Huang, Moundsview; Laurie E. Kerschner, Minnetonka, and Lorri D. Cullen, Minneapolis, all of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed Jan. 16, 1992, Ser. No. 821,208
Int. Cl.[5] A23L *1/39*
U.S. Cl. 426—589 22 Claims

1. A method of preparing a retorted food product having a sauce component and starch-containing and/or vegetable food component of preserved textural qualities comprising the steps of:
a) preparing said sauce component wherein about 0.1 to about 24% by weight of the sauce component is comprised of polysaccharides of MW_w between about 3600 and 250,000, said sauce having a A_w of greater than 0.92;
b) mixing said sauce and said vegetable and/or said starch-containing food in ratios suitable for the food product;
c) thermally treating said mixture at a temperature greater than 212° F. under pressure for a period of time adequate to sterilize said mixture;
d) cooling said mixture.

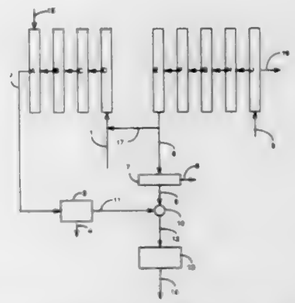
5,204,136

PROCESS FOR EXTRACTING COFFEE

Adrianus C. M. Hellemons, Montfoort, Netherlands, assignor to Douwe Egbets Koninklijke Tabaksfa-Briek-Koffiebranderij-en-Theehandel N.V., Urecht, Netherlands

Continuation of Ser. No. 379,048, Jul. 13, 1989, abandoned. This application Apr. 25, 1991, Ser. No. 690,393
Claims priority, application Netherlands, Jul. 13, 1988, 8801775; Feb. 6, 1989, 8900285
Int. Cl.[5] A23F *5/24*
U.S. Cl. 426—594 17 Claims

1. A process for preparing an extract from ground, roasted coffee beans, comprising:
(a) providing a primary extraction cell bank having an inlet for extraction liquid and an outlet for primary extract, said primary extraction cell bank including at least one extraction cell, each extraction cell of said primary extraction cell bank being effectively connected between said inlet and said outlet so that extraction liquid introduced to said primary extraction cell bank will course through each extraction cell of said primary extraction cell bank before leaving said primary extraction cell bank as a primary extract through said outlet thereof;
(b) providing a secondary extraction cell bank having an inlet for extraction liquid and an outlet for secondary extract, said secondary extraction cell bank including at least one extraction cell, each extraction cell of said secondary extraction cell bank being effectively connected between said inlet of said secondary extraction cell bank and said outlet of said secondary extraction cell bank so that extraction liquid introduced to said secondary extraction cell bank will course through each extraction cell of said secondary extraction cell bank before leaving said secondary extraction cell bank as a secondary extract through said outlet thereof;
(c) charging each extraction cell in said primary extraction cell bank with ground, roasted coffee beans;
(d) providing each extraction cell in said secondary extraction cell bank with a charge of ground, roasted coffee beans which have already been subjected to primary extraction in said primary extraction cell bank;
(e) conducting a primary extraction of said ground, roasted coffee beans charged in said primary extraction cell bank, including introducing a stream of primary extraction liquid, devoid of said secondary extract, into said primary extraction cell bank through said inlet thereof and withdrawing a stream of primary extract from said primary extraction cell bank through said outlet thereof, said primary extraction being carried out at a temperature which



is maximally equal to the boiling point of water at atmospheric pressure and in the absence of said secondary extract, in order to progressively remove from the ground, roasted coffee beans in said primary extraction cell bank only such components as are directly soluble in water;
(f) conducting a secondary extraction of said ground, roasted coffee beans provided as a charge in said secondary extraction cell bank, including introducing a stream of secondary extraction liquid into said secondary extraction cell bank through said inlet thereof and withdrawing a stream of secondary extract from said secondary extraction cell bank through said outlet thereof, said secondary extraction being carried out at a temperature which is above that used in conducting said primary extraction and such that a portion of solids in said ground, roasted coffee beans that was insoluble under conditions prevailing during said primary extraction, is hydrolysed to form soluble components which are extracted in said secondary extraction;
(g) periodically removing from said primary extraction cell bank an extraction cell effectively closest to said inlet of said primary extraction cell bank upon achievement of substantially complete exhaustion of the charge of ground, roasted coffee beans therein insofar as extractability of coffee solubles therefrom by said primary extraction is concerned, and adding this cell, still containing its charge of primary extracted ground, roasted coffee beans and its

filling of extraction liquid, to said secondary extraction cell bank so as to be effectively closest to said outlet of

chamber a mixture essentially consisting of a silane, a perfluorosilane and nitrogen and applying electromagnetic radia-

includes external surfaces and shielded surfaces which are at least partially shielded by other portions of said sub-

forming a plurality of first slits on an edge portion of said paperboard at a predetermined angle relative to the edge;

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filling of extraction liquid, to said secondary extraction cell bank so as to be effectively closest to said outlet of said secondary extraction cell bank;

(h) correspondingly periodically removing from said secondary extraction cell bank an extraction cell effectively closest to said inlet of said secondary extraction cell bank, emptying this cell of its charge of secondary extracted ground, roasted coffee beans, adding this cell to said primary extraction cell bank as an extraction cell effectively closest to said outlet of said primary extraction cell bank, and conducting step (c) in regard to this cell;

(i) each time step (g) of conducted, withdrawing approximately so much of said filling of extraction liquid from the cell which has just been removed from the primary extraction cell bank and added to the secondary extraction cell bank as will drain therefrom, including at least 75 percent of said filling of extraction liquid contained in this cell when this cell was removed from the primary extraction cell bank but substantially no secondary extraction liquid introduced into this cell as a result of initiation of step (f) in regard thereto after this cell has been added to the secondary extraction cell bank, and adding the extraction liquid thereby withdrawn from this cell, to said stream of primary extraction liquid being introduced to said primary extraction cell bank in step (e), thereafter reverting to conducting steps (e) and (f), respectively, in regard to the primary extraction cell bank and secondary extraction cell bank;

(j) concentrating said primary extract obtained from said primary extraction cell bank through said outlet thereof, to provide a concentrated primary extract;

(k) concentrating said secondary extract obtained from said secondary extraction cell bank through said outlet thereof, minus said extract or liquid withdrawn from each respective said cell in step (i), and thereby removing both water vapor and at least some undesirable aroma constituents from said secondary extract, to provide a concentrated secondary extract; and

(l) mixing said concentrated primary extract and said concentrated secondary extract to provide a concentrated coffee extract product.

5,204,137

PROCESSES FOR PRODUCTS FROM SWEET POTATO

Karen M. Slimak, P.O. Box 2444, Springfield, Va. 22152

Continuation-in-part of Ser. No. 825,656, Jan. 31, 1986, Pat. No. 4,925,697, and a continuation-in-part of Ser. No. 294,690, Aug. 1, 1988. This application May 14, 1990, Ser. No. 522,820

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] A23L *1/214*

U.S. Cl. 426—637 **15 Claims**

2. A non-grain edible flour possessing the ability to maintain a risen structure in the absence of grain flour, legume flour, or added fiber; said non-grain edible flour consisting essentially of the comminuted particles of tubers of family Convolvulaceae, including substantially all of the flesh and fiber of said tubers, comminuted to a size such that substantially all of said particles pass through a screen opening of 0.015 inch, wherein said flour has a moisture content of less than 20% by weight.

5,204,138

PLASMA ENHANCED CVD PROCESS FOR FLUORINATED SILICON NITRIDE FILMS

Son V. Nguyen, Williston; David M. Dobuzinsky, Essex Junction, both of Vt.; Douglas J. Dopp, Hopewell Junction, N.Y., and David L. Harmon, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1991, Ser. No. 814,973

Int. Cl.[5] B05D *3/06*; C23C *16/00*

U.S. Cl. 427—578 **12 Claims**

1. A process for producing a fluorinated silicon nitride film on a substrate comprising introducing into a film forming chamber a mixture essentially consisting of a silane, a perfluorosilane and nitrogen and applying electromagnetic radiation to said mixture to produce a plasma whereby said silicon nitride film is formed on said substrate; said mixture having a volume-to-volume ratio of said silane to said perfluorosilane from about 0.05 to about 3.

5,204,139

METHOD FOR COATING THERMIONIC EMISSION MATERIAL FOR A THERMIONIC EMISSION FILAMENT

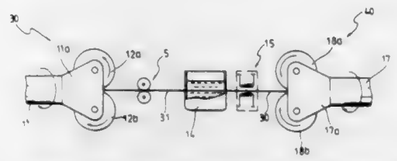
Kyeong-seok Choi, Ulsan, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Oct. 30, 1991, Ser. No. 785,108

Claims priority, application Rep. of Korea, Nov. 2, 1990, 90-17769

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—77 **3 Claims**



1. A method for coating a thermionic emission material on a thermionic emission filament wherein tungsten wire is conveyed in a conveyance direction and passed through a storage tank containing a dryable thermionic emission material and then the thermionic emission material is dried after being coated onto the tungsten wire, said tungsten wire being made to rotate around a central axis of a conveyance direction to uniformly coat the thermionic emission material onto the surface of the tungsten wire.

5,204,140

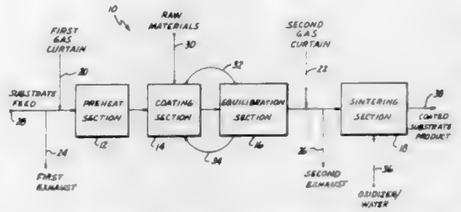
PROCESS FOR COATING A SUBSTRATE WITH TIN OXIDE

Victor L. Grosvenor, Topanga; Naum Pinsky, Thousand Oaks, and Thomas J. Clough, Santa Monica, all of Calif., assignors to ENSCI, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 348,789, May 8, 1989, Pat. No. 5,167,820, Ser. No. 348,788, May 8, 1989, Pat. No. 5,039,845, Ser. No. 348,787, May 8, 1989, abandoned, and Ser. No. 348,786, May 8, 1989, each is a continuation-in-part of Ser. No. 272,517, Nov. 17, 1988, abandoned, and Ser. No. 272,539, Nov. 17, 1988, abandoned, each is a continuation-in-part of Ser. No. 82,277, Aug. 6, 1987, Pat. No. 4,787,125, which is a division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,713,306. This application Dec. 3, 1990, Ser. No. 621,660

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—126.3 **74 Claims**



1. A process for coating an inorganic three dimensional substrate with doped tin oxide comprising:

contacting an inorganic three dimensional substrate which includes external surfaces and shielded surfaces which are at least partially shielded by other portions of said substrate with a composition comprising a tin chloride-forming compound at conditions effective to form a tin chloride-forming compound containing coating on at least a portion of said substrate;

forming a liquidus tin chloride forming compound containing coating on at least a portion of the three dimensions of said substrate including the shielded surface of said substrate,

contacting said substrate with at least one fluorine component at conditions effective to form a fluorine component-containing coating on at least a portion of said substrate including at least a portion of the three dimensions of said substrate including the shielded surfaces of said substrate; and

contacting said substrate having said tin chloride-forming compound containing coating and said fluorine component-containing coating thereon with an oxidizing agent at conditions effective to convert tin chloride forming compound to tin oxide and form a fluorine doped tin oxide coating on at least a portion of said three dimensions of said substrate including the shielded surfaces of said substrate.

5,204,141

DEPOSITION OF SILICON DIOXIDE FILMS AT TEMPERATURES AS LOW AS 100 DEGREE C. BY LPCVD USING ORGANODISILANE SOURCES

David A. Roberts, Carlsbad, and Arthur K. Hochberg, Solana Beach, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 18, 1991, Ser. No. 762,101

Int. Cl.[5] C23C *16/00*

U.S. Cl. 427—255.3 **22 Claims**

1. A low temperature chemical vapor deposition process comprising the steps of:

heating a substrate to a temperature of from about 95° C. to about 380° C. in a vacuum;

introducing into the vacuum a silicon-containing feed and an oxygen containing feed, said silicon containing feed consisting essentially of an organodisilane having the general formula

$$H_3Si—CH(R)—[CH(R')]y—CH(R'')—SiH_3$$

wherein

y is 0, 1, 2, 3, 4, 5, 6 and

R, R', and R'' are independently selected from the group consisting essentially of H and C_1–C_3 hydrocarbon; and

maintaining said temperature and vacuum condition thereby causing a film of silicon dioxide to deposit on said substrate.

5,204,142

METHOD FOR INTEGRALLY FORMING A CUTTER ON A CARTON BLANK

Eitaro Okumura, Kyoto, Japan, assignor to Ayako Okumura, Kyoto, Japan

Filed Jan. 22, 1991, Ser. No. 643,286

Claims priority, application Japan, Jan. 22, 1990, 2-4473; Mar. 1, 1990, 2-50775[U]

Int. Cl.[5] B05D *3/12, 5/00*

U.S. Cl. 427—285 **5 Claims**

1. A method of integrally forming a cutter on a carton blank in which a paperboard is shaped into a profile substantially the same as that of the carton blank, the paperboard is integrally formed with saw-teeth on an edge portion thereof, and the teeth are hardened by application of a quick drying adhesive including α-cyanoacrylate, thereby producing a carton blank for a carton having an integral cutter, comprising:

forming a plurality of first slits on an edge portion of said paperboard at a predetermined angle relative to the edge;

forming a plurality of second slits on said edge portion of the paperboard at a predetermined angle relative to the first slits in such a manner that saw-teeth are formed on the edge; and

hardening the teeth by application of said quick drying adhesive.

5,204,143

PROCESS FOR TREATING METAL SURFACE

Nobuyuki Nishimiya, and Toshiyuki Sekiya, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 3, 1990, Ser. No. 503,751

Claims priority, application Japan, Apr. 3, 1989, 1-84193

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 **14 Claims**

1. A process for treating a metal surface comprising providing a liquid composition comprising an inorganic polymer produced by hydrolyzing and then polycondensing an organometallic compound having an organic functional group and a group capable of being hydrolyzed and then polycondensed in an organic solvent under conditions such that said organic functional group is kept unreacted and applying said liquid composition under conditions such that said inorganic polymer is adhered to the metal surface and said organic functional group is kept unreacted and remains on the metal surface.

5,204,144

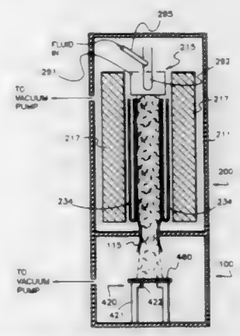
METHOD FOR PLASMA DEPOSITION ON APERTURED SUBSTRATES

Gordon L. Cann; Cecil B. Shephard, Jr., both of Laguna Beach, and Frank X. McKevitt, Anaheim Hills, all of Calif., assignors to Celestech, Inc., Irvine, Calif.

Filed May 10, 1991, Ser. No. 698,446

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—569 **34 Claims**



1. A method for depositing a substance comprising the steps of:

producing a plasma beam containing the constituents of said substance;

providing a substance having a surface in the path of said beam, said substrate having at least one aperture through said surface, such that said beam deposits said substance on said surface and a portion of the beam passes through said at least one aperture.

5,204,145

separating said diamond layer from said substrate to form

least partially bonded to each other via said thermally

longitudinal direction beyond a non-extension end of the

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5,204,145

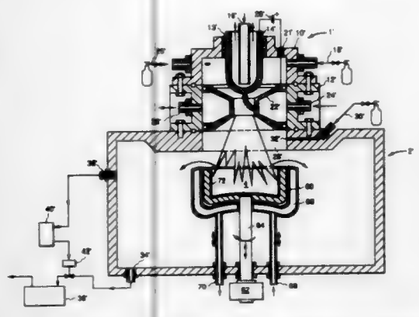
APPARATUS FOR PRODUCING DIAMONDS BY CHEMICAL VAPOR DEPOSITION AND ARTICLES PRODUCED THEREFROM

Steven M. Gasworth, Glenville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 664,153, Mar. 4, 1991, abandoned. This application Sep. 21, 1992, Ser. No. 948,077

Int. Cl.[5] **C23C** *16/48*

U.S. Cl. 427—577 **22 Claims**



1. Apparatus for producing diamond articles by chemical vapor deposition, comprising:

a closed reaction chamber, formed by chamber walls and having at least one throat and at least one exhaust means, said chamber having means to maintain said chamber at a desired pressure;

at least one jet producing plasma torch connected to said throat of said chamber;

a chemical vapor deposition zone formed by zone walls separate from said chamber walls, said zone walls being confined within said chamber walls, and at least one of said walls of said zone being a substrate capable of rotation;

said torch having its jet discharge end aligned to trap a jet produced by said torch within said zone, and said zone being enclosed on all sides except the side facing said torch;

drive means to rotate said substrate;

cooling means to cool said substrate to a set temperature;

a gas feeding system for feeding gas into said plasma torch; and

nozzle means for introducing a carbon compound into said zone near said throat of said chamber or through said gas feeding system of said torch.

13. A method of producing diamond articles by chemical vapor deposition comprising:

effecting an arc discharge while feeding hydrogen or a mixture of hydrogen and an inert gas between an anode and a cathode of a DC arc discharge plasma torch to a produce a plasma jet within a closed reaction chamber formed by chamber walls and maintained at a desired pressure;

feeding a gaseous carbon compound into said jet;

radicalizing hydrogen and said gaseous carbon compound in said plasma jet;

directing said plasma jet to a partially enclosed chemical vapor deposition zone formed by zone walls that are separate from said chamber walls confined within said chamber;

trapping said plasma jet into said zone formed by said zone walls wherein at least one of said zone walls is a rotating substrate;

cooling said substrate to a set temperature;

quenching said plasma jet by allowing said jet to impinge on said cooled substrate to form diamond layer on said substrate; and

separating said diamond layer from said substrate to form said article.

5,204,146

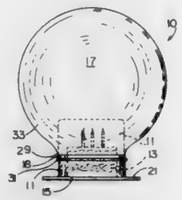
DECORATIVE CONTAINER AND METHOD FOR PREPARING SAME

Sally M. Heinze, and Leda M. Borghese, both of 7227 Cascade Rd., Grand Rapids, Mich. 49546

Filed Feb. 15, 1991, Ser. No. 656,955

Int. Cl.[5] **B65D** *85/36*

U.S. Cl. 428—7 **9 Claims**



1. A decorative container comprising:

a housing for removably covering a shaped article; and

an elastic balloon on said housing, said balloon enclosing a portion of said housing, said housing closing an aperture in said balloon when said balloon is inflated enabling said housing and inflated balloon to be removed from said article.

5,204,147

ROLLER SHUTTER ROD OF STABLE SHAPE AND METHOD FOR ITS MANUFACTURE

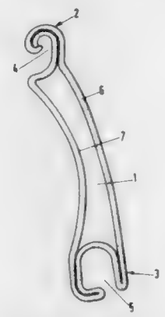
Helmuth Schneider, Grevenbroich, Fed. Rep. of Germany, assignor to Vereinigte Aluminiumwerke AG, Bonn, Fed. Rep. of Germany

Filed Mar. 1, 1991, Ser. No. 662,932

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1990, 4007777; Nov. 15, 1990, 4036410

Int. Cl.[5] **E06B** *9/11;* **B32B** *1/04*

U.S. Cl. 428—35.8 **11 Claims**



1. A roller shutter rod of stable shape, comprising

an aluminum strip forming an outer periphery of said rod, said outer periphery defining a generally rod-shaped structure with a hollow section, said aluminum strip having a plastic coating along one of its sides which faces said hollow section, said outer periphery further defining upper and lower connecting areas wherein said aluminum strip is arranged in a double layer with a thermally consolidated double layer of plastic coating between individual layers of said double layer of aluminum strip, said individual layers of said double layer of aluminum strip in at least one of said upper and lower connecting areas being at least partially bonded to each other via said thermally consolidated double layer of plastic coating.

5,204,148

LAMINATE COVER AND METHOD FOR SEALING A ROOFING MEMBRANE

Brian S. Alexander, Westfield, and Daniel L. Barksdale, Brownsburg, both of Ind., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Feb. 18, 1992, Ser. No. 837,266

Int. Cl.[5] **A61F** *13/02*

U.S. Cl. 428—40 **11 Claims**

1. A flexible laminate cover for sealing a roofing membrane including:

a) a release coated carrier having a peripheral border;

b) a layer of uncured elastomeric sealing material located within the peripheral border of the carrier adapted to be positioned in contact with an area of a roofing membrane to be sealed thereby after removal of the carrier from said layer of sealing material;

c) a first sheet of a dimensionally stable tacky elastomeric material mounted on the carrier and having an exposed pressure sensitive peripheral border extending beyond the layer of sealing material in order to adhere to the roofing membrane after the release coated carrier has been removed form the first sheet and sealing material, and to trap said layer of sealing material within the peripheral border of said first sheet after said first sheet and sealing material have been placed in contact with the roofing membrane; and

d) a second flexible sheet of a weather resistant material permanently secured to the first sheet to provide physical protection to said first sheet and to said layer of sealing material after said first sheet and said sealing member have been placed in contact with the roofing membrane.

5,204,149

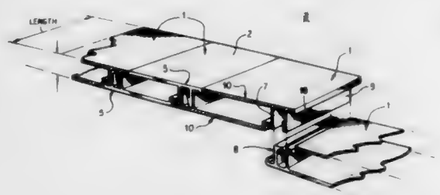
METHOD AND APPARATUS FOR MAKING DOUBLE WALL CONTAINERS

Ronald W. Phenicie, and Peter E. Dahlquist, both of Warrenton, Va., assignors to Case Designers Corporation, Warrenton, Va.

Filed Jan. 4, 1991, Ser. No. 637,542

Int. Cl.[5] **B32B** *3/00*

U.S. Cl. 428—57 **36 Claims**



36. An end-to-end interlockable panel for assembling a container wall comprising:

a pair of first and second parallel sidewalls, the sidewalls being staggered in a longitudinal direction so that an extension end section of each sidewall extends in the longitudinal direction beyond a non-extension end of the other sidewall wall;

a pair of parallel connecting walls, each connecting wall joining the non-extension end of a sidewall to the other sidewall;

a receiving flange wall extending from the extension end section of the first sidewall so as to define an open flange receiving cavity between the connecting wall nearest to the receiving flange wall, said extension end section and the receiving flange wall; and

a projection flange extending from the extension end of said second sidewall, said projection flange displaced from a connecting wall to accommodate said receiving flange wall, said projection flange defining a base wall being co-planar with the second sidewall and, which is not attached to said second sidewall, said base wall and said nearest connecting wall defining a gap therebetween which is of a size that it could snugly receive a receiving flange wall of another identical panel; said flange receiving cavity and said projection flange being of dimensions and being adapted such that the flange receiving cavity could completely receive the projection flange of another identical panel so as to make wall to wall contact with the flange.

5,204,150

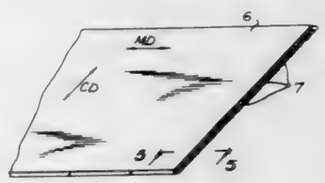
LOOP FORMATION IN ON-MACHINE-SEAMED PRESS FABRICS USING YARNS COMPRISING MXD6 POLYAMIDE RESIN MATERIAL

Francis L. Davenport, Ballston Lake, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Aug. 17, 1989, Ser. No. 395,363

Int. Cl.[5] **B32B** *3/00, 5/02, 27/08;* **D02G** *3/00*

U.S. Cl. 428—58 **7 Claims**



1. An open-ended press fabric, for use on the press section of a papermaking or similar machine, and designed for pin-seam closure, comprising:

a system of machine-direction (MD) yarns interwoven with a system of cross-machine direction (CD) yarns to form a woven base fabric, wherein said machine-direction (MD) yarns are composite yarns whose strands are extruded from MXD6 polyamide resin so that a coating will form on said machine-direction (MD) yarns when said woven base fabric is heat-set, forming a monofilament-like strand;

a first end and a second end, said first end and said second end being joined to each other when said press fabric is installed on said papermaking or similar machine; and

a plurality of loops, formed by said machine-direction (MD) yarns during the production of said open-ended press fabric, at said first end and said second end, to facilitate the joining of said first end to said second end by a pin seam.

5,204,151

5,204,153

5,204,155

5,204,157

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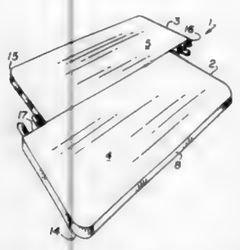
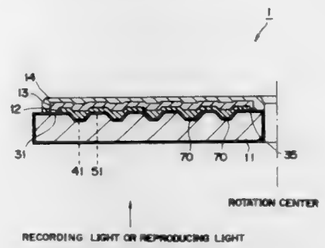
5,204,151
MARTIAL ARTS BOARD
Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 09173
Continuation-in-part of Ser. No. 775,018, Oct. 11, 1991. This application Aug. 21, 1992, Ser. No. 933,120
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—60 5 Claims



1. A reusable martial arts board which comprises:
two symmetrical half-portions, each half-portion comprising:
a planar quadrangular slab having substantially flat top and bottom surfaces;
along a connecting edge, a plurality of alternating and parallel male and female interconnecting elements wherein each of said male interconnecting elements is shaped and dimensioned to intimately nest into one of said female interconnecting elements;
each of said female elements comprising a circular, tubular cavity having a slot opening into said bottom surface;
each of said male elements comprising a cylindrical projection having a solid core and a radial groove opening into an underside section of said projection;
wherein the periphery of said tubular cavity is tangential to said bottom surface; and
said slots comprise rounded edges.

5,204,153
WRITE ONCE READ MANY TYPE OPTICAL DISC
Fumio Matsui; Makoto Okano; Tatsuro Sakai; Satoru Tanaka, and Shuichi Yanagisawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 2, 1992, Ser. No. 862,312
Claims priority, application Japan, Aug. 13, 1991, 3-202949
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 7 Claims

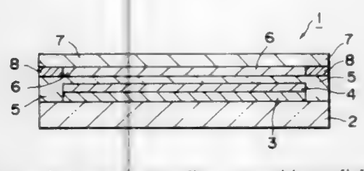


1. A write once read many type optical disc, comprising a light transmissive substrate having a tracking groove formed therein, a light absorbing layer disposed on a surface of the substrate on which the tracking groove is formed, and a light reflection layer disposed on the light absorbing layer,
wherein an RMI value defined by the following formula is in the range of 0.22 to 0.50:

$$RMI\ value=(I_l-I_g)/I_o$$

wherein I_l denotes an electric potential at a land portion, I_g denotes an electric potential at a groove portion, and I_o denotes an electric potential at a mirror surface portion.

5,204,152
OPTICAL RECORDING MEDIUM
Atsushi Yoshizawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 2, 1992, Ser. No. 862,311
Claims priority, application Japan, Aug. 20, 1991, 3-208005
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 18 Claims

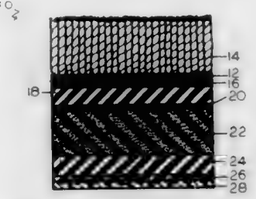


1. An optical recording medium, comprising: a light transparent substrate, a light absorbing layer disposed on the light transparent substrate a light reflection layer disposed on the light absorbing layer, and a protection layer disposed on the light reflection layer,
wherein a cushion material layer is disposed at least above the light reflection layer by the medium of the protection layer, and a protection plate is disposed on the cushion material layer.

5,204,154
FLOWABLE, PRESSURE-COMPENSATING MATERIAL AND PROCESS FOR PRODUCING SAME
Terrence M. Drew; Chris A. Hanson, and Alden B. Hanson, all of Boulder, Colo., assignors to Alden Laboratories, Inc., Boulder, Colo.
Continuation-in-part of Ser. No. 410,610, Sep. 21, 1989, Pat. No. 5,100,712, and a continuation-in-part of Ser. No. 573,452, Aug. 27, 1990, Pat. No. 5,093,138. This application Mar. 2, 1992, Ser. No. 844,518
Int. Cl.[5] B32B *1/00*; C09K *21/00*; A61L *2/00*
U.S. Cl. 428—68 63 Claims

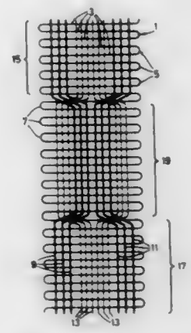
37. A padding device comprising a flexible enclosure and a flowable, pressure-compensating composition substantially filling said enclosure, said flowable, pressure-compensating composition comprising:
a) a liquid;
b) an organic viscosity-increasing material selected from the group consisting of guar, agar, carboxymethylcellulose, hydroxypropylcellulose, hydroxyethylcellulose, polyethyleneoxide, and mixtures thereof, in an amount from about 0.5 weight percent to about 10 weight percent based on the total composition weight; and
c) a flame retardant selected from the group consisting of boric oxide, borax, boric acid, bicarbonate of soda, epsom salt and mixtures thereof, wherein said flame retardant is present in an amount from about 5 weight percent to about 30 weight percent based on the total composition weight.

5,204,155
RESILIENT FOAM-BACKED CARPET AND METHOD OF PREPARATION
Peter W. Bell, Troon, Scotland, and Johannes A. H. Claessen, Leusden, Netherlands, assignors to Interface, Inc., La Grange, Ga.
Filed Nov. 12, 1991, Ser. No. 790,370
Int. Cl.[5] B32B *3/02, 3/26, 5/20, 31/00*
U.S. Cl. 428—95 29 Claims



1. A floor covering which comprises:
a) a primary backing layer having a fibrous face wear surface and a back surface;
b) a first solid thermoplastic backing layer;
c) a second solid thermoplastic backing layer; and
d) a polymeric foam layer characterized by high compression set and a substantially closed-cell structure, the foam layer positioned and secured between the first and second thermoplastic backing layers, the thermoplastic backing layer being of sufficient thickness, to disperse the mechanical force on the foam layer and to protect the polymeric foam layer from substantial cellular breakdown in use, and the polymeric foam layer of sufficient thickness to provide a lightweight, cushioning floor covering.

5,204,157
CARRIER AND METHOD
James Matsumiya, Bucks, England, assignor to Schlegel (UK) Holding United, Seacroft, United Kingdom
Filed Apr. 19, 1990, Ser. No. 511,076
Claims priority, application United Kingdom, Apr. 21, 1989, 8909076; Jan. 29, 1990, 9001998
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] B32B *5/12*
U.S. Cl. 428—105 39 Claims



1. An elongate carrier comprising a plurality of longitudinally separated transversely extending metal strip members and means extending lengthwise of the carrier to control the spacing of said members, wherein the transverse location in said carrier of said means is varied along the length of said carrier, the variation of the transverse location and the actual transverse location at any longitudinal position in the carrier of said means being selected to provide at least one region of increased longitudinal flexibility.

5,204,156
WINDPROOF AND WATER RESISTANT COMPOSITE FABRIC WITH BARRIER LAYER
Douglas Lumb, Methuen, and Moshe Rock, Andover, both of Mass., assignors to Malden Mills Industries, Inc., Lawrence, Mass.
Continuation-in-part of Ser. No. 468,027, Jan. 22, 1990, Pat. No. 5,126,182, which is a continuation-in-part of Ser. No. 422,850, Oct. 17, 1989. This application Nov. 7, 1991, Ser. No. 788,913
Int. Cl.[5] B32B *5/04, 5/18*
U.S. Cl. 428—96 39 Claims

1. A stretchable, drapable, water vapor permeable, windproof and water resistant composite fabric for use in a garment comprising:
an outer layer of fabric;
an inner layer of fabric;
barrier means for providing resistance to wind and liquid water while providing for water vapor transport through absorption-diffusion-desorption including a hydrophilic barrier layer disposed on and adhered to at least one of said inner or outer layers of fabric by transfer coating from a carrier without a separate adhesive; and
said other of said inner or outer layers of fabric being disposed on and adhered to said barrier layer.

5,204,158
IRREGULAR PATTERNED ENTANGLED NONWOVEN FABRICS AND THEIR PRODUCTION
Robert L. Phillips, Kendall Park; Connie B. Taylor, Middlesex, both of N.J., and Lauren Jackson, San Clemente, Calif., assignors to Chicopee, New Brunswick, N.J.
Filed May 30, 1991, Ser. No. 707,521
Int. Cl.[5] B32B *3/10*; D04H *1/46*
U.S. Cl. 428—134 8 Claims

1. A nonwoven fabric comprising a plurality of substantially uniformly spaced apart continuous strands of entangled staple fibers interconnected at randomly spaced junctures by nonentangled bands of substantially coextensive fibers to define an irregular pattern of irregular sized apertures.

5,204,159
plurality of successive inwardly extending superplasti-

5,204,164
boride, a glass and an organic vehicle which contains at least

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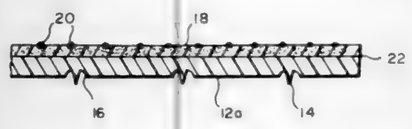
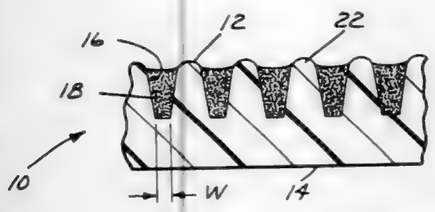
5,204,159
DEFORMABLE, SLIP-FREE, ANTI-SKID PADS FOR SNOW AND ICE
Domingo K. L. Tan, 6028 Bitternut Dr., Alexandria, Va. 22310
Filed Mar. 29, 1991, Ser. No. 677,431
Int. Cl.[5] E01C *11/24, 15/00;* B32B *3/30*
U.S. Cl. 428—143 10 Claims



1. A deformable pad for placement on slippery snow and icy surfaces to form a slip-free walking spot when walkers step thereon, comprising:
a) an anti-skid bottom surface having a plurality of spikes slightly extending vertically from hemispherically recessed areas of said bottom surface; and
b) an anti-slip top surface comprising a resilient material having embedded therein particles of abrasive materials held in spaced-apart relationship, and wherein said abrasive materials extend partially out of and above an uppermost area of said top surface.

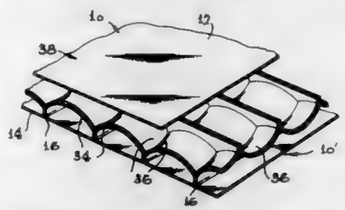
5,204,160
LIGHT-COLLIMATING FILM
Forrest J. Rouser, San Rafael, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation of Ser. No. 539,376, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 229,827, Aug. 8, 1988, abandoned. This application May 28, 1991, Ser. No. 707,413
Int. Cl.[5] B32B *3/28*
U.S. Cl. 428—167 16 Claims



1. A light control film comprising a transparent plastic film having first and second major surfaces, said first major surface having a plurality of grooves, the interiors of said grooves being rendered light absorbing, said film further comprising cylindrical lenses between adjacent grooves.

5,204,161
FABRICATION OF PANEL STRUCTURE
Richard G. Pettit, La Habra, and Ken K. Yasui, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jun. 3, 1991, Ser. No. 709,695
Int. Cl.[5] B32B *3/12;* F04C *2/34*
U.S. Cl. 428—174 9 Claims

1. A panel structure comprising
a first core panel comprised of superplastic material, said superplastic material being a metal or a metal alloy having superplasticity characteristics, and including a plurality of successive inwardly extending superplastically formed substantially similar first bulges, and
at least one other core panel comprised of said superplastic material adjacent said first core panel, and including a plurality of successive inwardly extending superplastically formed substantially similar second bulges orthogonally disposed to and extending toward said first bulges,



said second bulges being formed around and contacting said first bulges, and said first and said second bulges being diffusion bonded at the contacting areas.

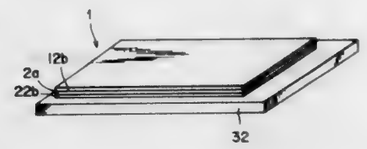
5,204,162
NON-SPHERICAL BODIES
Thomas D. Ketcham, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Oct. 3, 1991, Ser. No. 770,369
Int. Cl.[5] B32B *15/02*
U.S. Cl. 428—192 9 Claims

1. A non-spherical, inorganic body deformed from a spherical shape to have a shape selected from the group consisting of a cylindrical rod and a barrel-shape, the body having a uniform circular cross-section and rounded, smooth ends, each of which approximates a section of a sphere, the diameter of the circular cross-section being at least 0.5 microns, but less than 200 microns, and the length of the body being greater than the diameter of the circular cross-section.

5,204,163
SHEET FOR FORMATION OF BURNED PATTERN AND BURNING LABEL
Hiroshi Nakatsuka; Kazuhiro Tajiri; Takafumi Sakuramoto, and Yozo Oishi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan
Filed Apr. 26, 1990, Ser. No. 514,806
Claims priority, application Japan, Apr. 26, 1989, 1-106814
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—195 6 Claims

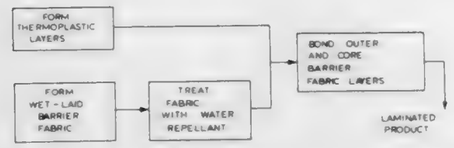
1. A fixing label comprising a sheet for formation of a fixed pattern comprising a shape retaining layer comprising an organic binder and glass powder which is retained in a sheet form by said organic binder, said shape retaining layer further comprising mica powder covered with an oxide ceramic or a compound capable of being converted into an oxide ceramic by oxidation, wherein said sheet is provided with a pattern.

5,204,164
IMAGE TRANSFERRED MATERIAL
Kazuo Sangyoji; Takemi Yamamoto, both of Nagoya, and Shunichi Higashiyama, Yotsukaichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Feb. 27, 1991, Ser. No. 661,232
Claims priority, application Japan, Mar. 2, 1990, 2-52543; Mar. 29, 1990, 2-85171; Apr. 3, 1990, 2-88472
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 8 Claims



1. An image transferred material comprising an interlayer on a surface of a desired medium and an image layer formed on said interlayer, said image layer and said interlayer being thermally transferred onto said desired medium, said interlayer comprising at least a metallic component and an adhesive component.

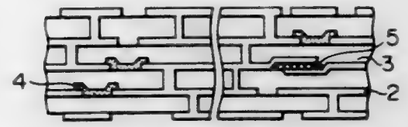
5,204,165
NONWOVEN LAMINATE WITH WET-LAID BARRIER FABRIC AND RELATED METHOD
Walter E. Schortmann, Cumberland, R.I., assignor to International Paper Company, Purchase, N.Y.
Filed Aug. 21, 1991, Ser. No. 748,298
Int. Cl.[5] B32B *27/14*
U.S. Cl. 428—198 30 Claims



1. A nonwoven laminate having a barrier property comprising:
at least one fiber layer made of thermoplastic fibers; and
a wet-laid fabric core layer made of a uniform distribution of cellulose fibers and polymeric fibers;
wherein a water-repellent finish is applied to said wet-laid fabric layer, and wherein said at least one thermoplastic fiber layer and said wet-laid fabric layer are bonded together at a plurality of discrete bonding points.

5,204,166
THICK FILM RESISTOR COMPOSITION, HYBRID IC USING THE COMPOSITION, AND PROCESS FOR PRODUCING THE HYBRID IC
Osamu Ito, Hitachi; Tadamichi Asai, Ibaraki; Toshio Ogawa, Katsuta; Noritaka Kamimura, Hitachi; Yoshishige Endou, Tsuchiura; Takao Kobayashi, Hitachi; Hiromi Isomae, Nakaminato; Masaki Kamiakutsu, Katsuta; Michio Otani, Chiba, and Katsuo Ebisawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan
Filed Feb. 25, 1991, Ser. No. 659,682
Claims priority, application Japan, Feb. 23, 1990, 2-043688
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 23 Claims

1. A thick film resistor composition comprising a metal boride, a glass and an organic vehicle which contains at least one of metallic cobalt and a cobalt oxide in an amount of 0.1–10



parts by weight in terms of cobalt per 100 parts by weight of the mixture of the metal boride and the glass.

5,204,167
DIAMOND-COATED SINTERED BODY EXCELLENT IN ADHESION AND PROCESS FOR PREPARING THE SAME
Kosuke Saijo; Masaru Yagi; Kunio Shibuki; Takeshi Sadahiro, all of Kawasaki, and Mika Niwa, Yokohama, all of Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan
Continuation of Ser. No. 458,521, Dec. 28, 1989, abandoned.
This application Nov. 29, 1991, Ser. No. 798,972
Claims priority, application Japan, Feb. 23, 1989, 1-44891; Apr. 21, 1989, 1-102168; Apr. 28, 1989, 1-110992
Int. Cl.[5] C04B *41/06;* C23C *11/00*
U.S. Cl. 428—212 8 Claims

1. A diamond-coated sintered body having excellent adhesion strength, comprising a film of diamond and/or diamond-like carbon deposited on a surface of a substrate, wherein:
said substrate comprises a sintered body of a hard-phase composed mainly of tungsten carbide, and
said surface of said substrate comprises recrystallized tungsten carbide in the surface layer to at most 10 microns toward the inner portion from the surface of said substrate in which the average grain size of the recrystallized tungsten carbide in the surface layer is finer than the average grain size of the tungsten carbide in the inner portion of the substrate excluding the surface layer.

5,204,168
METAL LAMINATES, IN PARTICULAR FLEXIBLE METAL LAMINATES PRE-COATED WITH POWDER-BASE PAINTS AND CAPABLE OF BEING PLASTICALLY DEFORMED
Roberto Rota, and Gavino Mura, both of Grassobbio, Italy, assignors to Otefal S.p.A., Grassobbio BG, Italy
Filed May 30, 1991, Ser. No. 707,649
Int. Cl.[5] B32B *7/02, 15/04, 15/20*
U.S. Cl. 428—216 10 Claims

3. A metal laminate pre-coated with a layer of 30 to 95 μm obtained by applying a powder-base paint and capable of being plastically deformed without any loss of continuity of the paint layer, the paint layer comprising:
at least one additive selected from the group consisting of a filler, a pigment, and the mixtures thereof; wherein said filler and said pigment are at least partially constituted by one or more products selected from the group consisting of natural and synthetic oxides, hydroxides, silicates and mixtures thereof having a structure selected from the group consisting of lamellar and acicular and mixtures thereof;
the total amount of said products being comprised within the range of from 1% to 40% by weight relative to the total weight of said paint layer, and within the range of from 2.5% to 100% by weight, relative to the total weight of the filiers and pigments contained in said paint layer;
said products being constituted by particles of such dimensions that the value of their average equivalent sphere diameter is comprised within the range of from 0.2 to 4

μm, and the value of their average length is less than or

filaments extending transverse to the direction of advance

5,204,174
FINE FIBER WEBS WITH IMPROVED PHYSICAL

5,204,177
PROCESS FOR PREPARING CONDUCTIVE FINE

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μm, and the value of their average length is less than or equal to 6 μm, and in which the ratio of the largest dimension to the smallest dimension is comprised within the range of from 3 to 50.

5,204,169

POLYSTYRENE FOAMS CONTAINING 1,1-DEFLUOROETHANE

Robert O. York, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 702,285, May 20, 1991, Pat. No. 5,147,896. This application Aug. 3, 1992, Ser. No. 923,592

Int. Cl.[5] C08J *9/14*

U.S. Cl. 428—220 **2 Claims**

1. A closed-cell polymer foam prepared from a foam-forming composition consisting essentially of polystyrene and up to about 20 weight percent, based on the total weight of the composition, of 1,1-difluoroethane, said foam having a thickness from about 0.04 to about 4 inches and containing 2–30 parts per million of 1,1-difluoroethane.

5,204,170

HIGH DENSITY STRUCTURAL REACTION INJECTION MOLDED COMPOSITE CONTAINING A FABRIC OF NONWOVEN SPUNBONDED FIBERS MADE OF A POLYESTER CORE SHEATHED IN A POLYAMIDE SKIN EMBEDDED IN A POLYURETHANE MATRIX

Gregg S. Kuyzin, Ypsilanti, Mich., assignor to BASF Corporation, Parsippany, N.J.

Filed Aug. 1, 1991, Ser. No. 738,773

Int. Cl.[5] D03D *3/00*

U.S. Cl. 428—244 **24 Claims**

1. An essentially noncellular structural reaction injection molded composite having a density of about 1.0 g/cm^3 or greater and a flexural modulus of about 500,000 p.s.i. or greater, comprising a fabric embedded in a polyurethane matrix, said fabric comprised of a nonwoven spunbonded fibers having a polyester core sheathed in a polyamide skin, and said polyurethane matrix having a viscosity from about 10 to about 2,000 cps., at 25° C., upon injection into a mold.

5,204,171

PRESS FELT

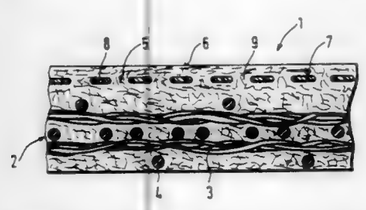
Sylvester Eschmann, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Thomas Josef Heimbach GmbH, Duren, Fed. Rep. of Germany

Continuation of Ser. No. 648,166, Jan. 31, 1991, abandoned. This application Jun. 4, 1992, Ser. No. 893,883

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1990, 4002761

Int. Cl.[5] B32B *5/02*

U.S. Cl. 428—234 **13 Claims**



1. A press felt for a papermaking machine, comprising:
a. a lower fabric layer comprised of a plurality of interlaced longitudinal and cross filaments; and
b. an upper fabric overlaid on said lower fabric layer and having an upper paper contacting surface, said upper fabric includes a blocking layer intermediate said lower fabric layer and said paper contacting surface and said blocking layer comprising a plurality of mutually spaced filaments extending transverse to the direction of advance of the felt and a substantially continuous passage is disposed between adjacent filaments of said blocking layer for permitting water to flow therethrough to said lower fabric layer while preventing water from flowing therethrough to said upper fabric and said blocking layer disposed parallel to said paper contacting surface.

5,204,172

FLEXIBLE FABRIC THERMAL INSULATORS

Roy J. Gidley, Lancaster, United Kingdom, assignor to Courtaulds plc, United Kingdom

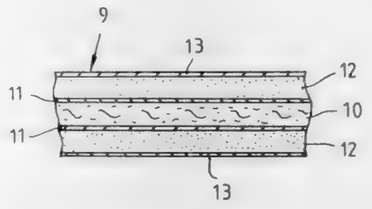
PCT No. PCT/GB90/00262, § 371 Date Aug. 16, 1991, § 102(e) Date Aug. 16, 1991, PCT Pub. No. WO90/09281, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 16, 1990, Ser. No. 743,400

Claims priority, application United Kingdom, Feb. 17, 1989, 8903641

Int. Cl.[5] B32B *17/02, 5/22;* B27N *9/50*

U.S. Cl. 428—251 **10 Claims**



1. A flexible laminated fabric comprising a first layer (**10**) of knitted glass fabric, a second layer (**11**) of heat reflecting foil, a third layer (**12**) comprising a woven glass fabric and a fourth layer (**13**) comprising an abrasion resistant material.

5,204,173

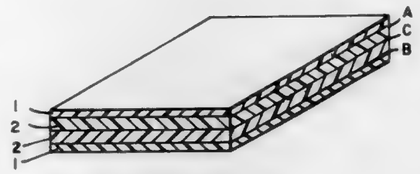
PAPERBOARD PRODUCT AND PROCESS

Stephen A. Canary, Westfield, Mass., assignor to DVSG Holding GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 29, 1990, Ser. No. 621,083

Int. Cl.[5] A43B *13/38;* D03D *25/00;* D21F *13/00*

U.S. Cl. 428—284 **21 Claims**



1. A paperboard product comprising:
a first wet laid layer formed from a slurried mixture of polyolefin fibers and long fiber softwood pulp, the quantity of polyolefin fiber being less than the quantity of wood pulp fiber in the mixture, and
a second wet laid layer formed from a slurried mixture of a polyolefin fiber and a long fiber softwood pulp, the quantity of polyolefin fiber being greater than the quantity of wood pulp;
said wet laid layers being superimposed on one another and being bonded together by melting the polyolefin of one layer into the polyolefin and the fiber matrix in the adjacent layer.

5,204,174

FINE FIBER WEBS WITH IMPROVED PHYSICAL PROPERTIES

Diego H. Daponte, Woodstock; Susan E. Shawver, Alpharetta; Sharon L. Watkins, Roswell, all of Ga., and Hugo P. Watts, Larkfield, England, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 4, 1990, Ser. No. 518,904

Int. Cl.[5] D04H *3/03, 3/05, 3/16*

U.S. Cl. 428—286 **40 Claims**

1. A nonwoven web comprising at least one layer consisting of highly drawn and unoriented thermoplastic fibers formed from a blend comprising propylene polymers selected from the group consisting of homopolymers and copolymers of propylene and butylene polymers selected from the group of copolymers of butylene, wherein the blend by weight is from 90% to 50% propylene polymer and from 10% to 50% butylene polymer.

5,204,175

WATER ABSORPTIVE FABRIC, AND PROCESS OF PRODUCING THE SAME

Masanari Umeda; Yukio Sakuraba, both of Kasugai, and Hiroshi Baba, Yokohama, all of Japan, assignors to Tokai Rubber Industries, Ltd. and Sumitomo Electric Industries, Ltd., Japan

Filed Jun. 7, 1991, Ser. No. 711,888

Int. Cl.[5] B32B *27/04, 27/18, 33/00;* G02B *6/44;* H02G *3/14*

U.S. Cl. 428—288 **12 Claims**

1. A water absorptive fabric having sufficient flexibility to be formed about a communication cable which includes a layer of a water absorptive polymeric material formed by the in situ reaction of a metal salt of acrylic acid, a cross-linking agent and a water soluble resin.

5,204,176

STRUCTURAL SIDING COMPOSITION

Randolph H. Seiss, and Robert J. Cleereman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1992, Ser. No. 845,104

Int. Cl.[5] B32B *3/26, 27/08*

U.S. Cl. 428—304.4 **22 Claims**

1. A structural siding composition for use in the building industry comprising
(a) a siding layer prepared from an impregnated cellulosic material with an amount of essentially uncatalyzed polyisocyanate from about 8 to 20 percent by weight of polyisocyanate to cellulosic material, which has been heated at a temperature from about 105° to about 245° C. (221° to 473° F.) for a time not exceeding about 5 minutes and at a pressure from about 2700 to about 8300 kPa (390 to 1200 psi) sufficiently to cure the polyisocyanate, and
(b) an insulating layer.

5,204,177

PROCESS FOR PREPARING CONDUCTIVE FINE PARTICLES AND CONDUCTIVE COATING MATERIALS CONTAINING SAID PARTICLES

Goro Sato; Michio Komatsu; Tsuguo Koyanagi; Masayuki Matsuda; Hiroo Yoshidome; Akira Nakashima, and Kazuaki Inoue, all of Fukuoka, Japan, assignors to Catalysts & Chemicals Industries, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 501,248, Mar. 29, 1990, abandoned, which is a division of Ser. No. 346,295, May 1, 1989, Pat. No. 4,937,148, Continuation-in-part of Ser. No. 21,482, Mar. 4, 1987, abandoned. This application Aug. 27, 1991, Ser. No. 754,208

Claims priority, application Japan, Mar. 6, 1986, 61-50233; Jul. 30, 1986, 61-179607; Dec. 22, 1986, 61-305906

Int. Cl.[5] B32B *5/16;* C08K *3/10*

U.S. Cl. 428—328 **10 Claims**

1. A conductive coating material consisting of solution or dispersion in a solvent of
(a) conductive fine particles obtained by pulverizing calcined particles having a specific surface area of less than 50 m^2/g prepared by hydrolyzing a hydrolyzable tin containing or indium containing compound in an aqueous solution while controlling the pH of said solution substantially constant within the range of 8–12, so that an aqueous sol containing colloidal particles may be formed, followed by separation, drying and calcination of the colloidal particles, and
(b) a binder resin.

5,204,178

(METH)ACRYLATE COPOLYMERS AND THEIR USE IN NONLINEAR OPTICS AND FOR THE PRODUCTION OF LANGMUIR-BLODGETT

Ulrike Licht, Mannheim; Harald Fuchs, Carlsberg; Dirk Funhoff; Wolfgang Schrepp, both of Heidelberg, and Hans Schupp, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

PCT No. PCT/EP90/00866, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO90/15087, PCT Pub. Date Dec. 13, 1990

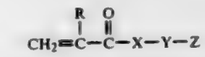
PCT Filed May 30, 1990, Ser. No. 784,427

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918016

Int. Cl.[5] B32B *27/30*

U.S. Cl. 428—333 **8 Claims**

1. A (meth)acrylate copolymer which contains, as polymerized units,
A) one or more (meth)acrylates or (meth)acrylamides having second order nonlinear optical properties and the formula



(I)

where R s hydrogen or methyl, X is a flexible spacer, which may or may not be present, Y is a divalent group having electron donor activity capable of donating electrons to the easily polarizable conjugated π-electron system of Z and Z is a noncentrosymmetic radical containing an easily polarizible conjugated π-electron system and one or more nitro, trifluoromethyl, cyano, or fulven-6-yl groups as electron acceptor groups capable of accepting electrons directly from -YZ, and
B) one or more (meth) acrylates of alkanols where the alkyl radical is of 10 to 30 carbon atoms, the molar ratio of A to B being from 1:0.5 to 1:5.

7. A nonlinear optical arrangement which has at least one substrate and at least one film comprising the (meth)acrylate copolymer as claimed in claim 1.

5,204,179

MULTILAYERED POLYOLEFIN STRUCTURE

ing a thermoplastic polyester as a main component, said heat-

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5,204,183

COMPOSITION COMPRISING POLYMER

casein with a first melamine-formaldehyde pre-conden-
sate;

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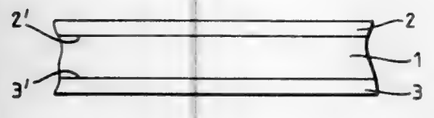
5,204,179
MULTILAYERED POLYOLEFIN STRUCTURE
Philip S. Baker, Fairport, and Daniel L. Donk, Phelps, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Mar. 29, 1991, Ser. No. 678,880
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—336 40 Claims

1. A thermoplastic multilayer structure comprising: a first extruded sheet capable of thermoforming into end products which comprises a first polyolefin and an inert, inorganic filler material; and
at least a film comprising a polymer selected from the group consisting of oriented polyolefins and oriented polyesters, joined to said first sheet, whereby sagging is prevented upon thermoforming.

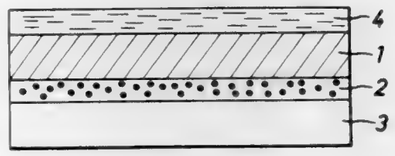
5,204,180
MULTIPLE-LAYER POLYOLEFIN FILMS
Charles R. Nelson, Cheshire, and Robert E. Slater, Welwyn, both of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Jan. 31, 1992, Ser. No. 828,442
Claims priority, application United Kingdom, Jan. 31, 1991, 9102122
Int. Cl.[5] C09J *7/02*
U.S. Cl. 428—349 9 Claims



1. A multiple-layer film comprising a substrate layer of a polyolefin and, on at least one surface thereof, a polymeric heat-sealable layer characterised in that:
a) the substrate, having opposed first and second surfaces, comprises a layer of an oriented propylene polymer, having
b) associated with the first surface of the substrate, a layer of a first vinylidene halide copolymer having a glass transition temperature (Tg) of up to 25° C. and a molecular weight (weight average) not exceeding 135,000 and
c) associated with the second surface of the substrate, a layer of a second vinylidene halide copolymer having a glass transition temperature (Tg) greater than that of the first copolymer.

5,204,181
HEAT-SEALED CLOSURE FOR POLYESTER CONTAINER AND CONTAINER HAVING SAID CLOSURE
Kouji Suzuki, Yokohama; Tsuneo Imatani; Hideo Kurashima, both of Yokosuka, and Kazuo Taira, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Jun. 12, 1990, Ser. No. 476,497
Claims priority, application Japan, Oct. 12, 1988, 63-132333; Mar. 17, 1989, 1-63815
Int. Cl.[5] B32B *7/12, 15/04*
U.S. Cl. 428—349 10 Claims

1. A closure for heat-sealing a container, at least a part of a portion to be heat-sealed of which is formed of a resin containing a thermoplastic polyester as a main component, said heat-sealable closure comprising a laminate of
(1) a heat-sealable layer containing as a main component a copolymerized polyester resin having a softening temperature of at least 120° C. and a glass transition temperature of 30° to 85° C.,
(2) a metal substrate, and
(3) an epoxy-phenol resin primer layer interposed between



the heat-sealable layer (1) and the metal substrate (2) with the weight ratio of the epoxy resin to the phenolic resin ranging from 35:65 to 95:5,
wherein said laminate is prepared by coating the metal substrate with said epoxy-phenol resin primer drying the coated primer layer so as to be tack-free, applying the copolymerized polyester on the surface of the coated primer layer and melting the copolymerized polyester and simultaneously curing the coated primer layer.

5,204,182
POLYOLEFIN FILM
Michael J. Packham, Shefford, and Bernard C. Bushnell, Essex, both of England, assignors to Imperial Chemical Indusries PLC, London, England
Division of Ser. No. 695,021, May 6, 1991, Pat. No. 5,116,926.
This application Mar. 25, 1992, Ser. No. 857,445
Claims priority, application United Kingdom, May 4, 1990, 9010092
Int. Cl.[5] C09J *7/02*
U.S. Cl. 428—349 3 Claims

1. A film comprising a biaxially oriented substrate layer of a propylene polymer, characterised in that the film has an X-ray scattering phi (ϕ) scan full width half maximum (FWHM) value, of greater than 16.0° and a polymeric heat-sealable layer on at least one surface of the propylene polymer substrate layer.

5,204,183
COMPOSITION COMPRISING POLYMER ENCAPSULANT FOR SEALING LAYER ENCAPSULATED SUBSTRATE
Lee A. McDougall, Houston; John C. Newlove, Kingwood, both of Tex.; Pacifico V. Manalastas, Edison, and Evelyn N. Drake, Bernardsville, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Division of Ser. No. 637,391, Jan. 4, 1991, Pat. No. 5,102,559, and a continuation-in-part of Ser. No. 446,572, Dec. 4, 1989, abandoned, and a continuation-in-part of Ser. No. 446,573, Dec. 4, 1989, abandoned, and a continuation-in-part of Ser. No. 446,736, Dec. 6, 1989, abandoned. This application Jan. 3, 1992, Ser. No. 816,915
The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.
Int. Cl.[5] B32B *27/06, 27/00*
U.S. Cl. 428—402.24 7 Claims

1. An encapsulated particulate composition comprising:
(a) a solid particulate substrate;
(b) a water soluble sealing layer having a thickness of at least about 1 micron deposited onto the surface of particles of said substrate and encapsulating said substrate;
(c) a coating substantially free of pinholes comprising a neutralized sulfonated elastomeric polymer having a thickness of at least about 1 micron deposited on the sealing layer surface of particles of said substrate, wherein said neutralized sulfonated polymer encapsulates and is permeable to said substrate under conditions of use; and
(d) a layer of thermoplastic polymer overcoating said coating.

5,204,184
MICROENCAPSULATION USING TERTIARY ALIPHATIC ISOCYANATE CAPSULE WALL MATERIAL
Richard L. Shields, Dayton, and Michael Seitz, Miamisburg, both of Ohio, assignors to The Standard Register Company, Dayton, Ohio
Filed Sep. 10, 1990, Ser. No. 579,950
Int. Cl.[5] B01J *13/16;* B41M *5/165*
U.S. Cl. 428—402.21 12 Claims

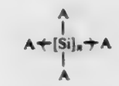
1. A process for the production of microcapsules containing a core material comprising the steps of:
providing a polar solvent, adding thereto a) a dispersion of a tertiary aliphatic isocyanate and a core material in an oleophilic liquid, said tertiary aliphatic isocyanate comprising an adduct of m-tetramethylxylene diisocyanate and trimethylolpropane, and b) an amine-containing composition having at least three primary amine groups to form a mixture, said amine-containing composition being selected from the group consisting of (tris)amino-1,6 hexamethylene biuret adduct, polyoxypropyleneamine, and N,N'-di(6-aminohexyl)-(6-aminohexylamino) succinamide; and
reacting said tertiary aliphatic isocyanate with said amine-containing composition to form microcapsules containing said core material.

5,204,185
MICROENCAPSULATION PROCESS USING MELAMINE-FORMALDEHYDE AND MICROCAPSULES PRODUCED THEREBY
Michael E. Seitz, Miamisburg, Ohio, assignor to The Standard Register Company, Dayton, Ohio
Filed Dec. 11, 1990, Ser. No. 625,435
Int. Cl.[5] B01J *13/18;* B41M *5/165*
U.S. Cl. 428—402.21 14 Claims

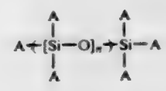
1. A process for producing melamine-formaldehyde microcapsules, comprising the steps of:
(a) preparing a reactive protective colloid by reactively coupling a surface active polymer selected from the group consisting of casein, casein salts, and partially hydrolyzed casein with a first melamine-formaldehyde pre-condensate;
(b) preparing an aqueous solution comprising said reactive protective colloid and a second melamine-formaldehyde pre-condensate;
(c) dispersing a discontinuous phase of substance to be encapsulated as droplets into said aqueous solution, said reactive protective colloid surrounding said droplets of said substance to be encapsulated to form an emulsion and;
(d) causing said second melamine-formaldehyde pre-condensate and said reactive protective colloid to self-condense, said second melamine-formaldehyde pre-condensate co-condense, with said reactive protective colloid to form capsule walls around said droplets of said substance to be encapsulated thereby forming melamine-formaldehyde microcapsules.

5,204,186
METHOD FOR REDUCING THE COMBUSTIBILITY OF COMBUSTIBLE MATERIALS
Dean E. Brunken, Edmond, and Arnulf P. Hagen, Norman, both of Okla., assignors to Advanced Chemical Technologies Co., Oklahoma City, Okla.
Continuation of Ser. No. 610,862, Nov. 8, 1990, Pat. No. 5,120,581, which is a continuation-in-part of Ser. No. 421,176, Oct. 13, 1989, abandoned. This application Mar. 18, 1992, Ser. No. 853,461
The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—447 110 Claims

56. A fire retardant article, comprising:
a compatible combustible material treated with an effective amount of a fire retardant agent comprising silane or a siloxane or a combination thereof,
wherein the silane has the general formula:



wherein the siloxane has the general formula:



wherein Si is silicon; O is oxygen; n is a positive integer; and
A is selected from the group consisting essentially of H, R, X, or Y wherein
H is a hydrogen atom;
R is selected from the group consisting essentially of an alkyl group containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, an arylalkyl group, an arylalkenyl group, or any substituted group thereof, wherein the cyclo substituent contains from about 4 to about 8 carbon atoms, the alkyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms;
X is selected from a group consisting essentially of a halogen, hydroxyl group, RO group wherein O is oxygen, RNR or RNH wherein N is nitrogen, or carboxylic group; and
Y is selected from a group consisting essentially of an alkyl group containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, an arylalkyl group, an arylalkenyl group, or any substituted group thereof, wherein the cyclo substituent contains from about 4 to

about 8 carbon atoms, the alkyl substituent contains up

from the group consisting of curing such organic coating

base paper substrate having thereon a layer of a coating com-

5,204,192
MAGNETIC RECORDING MEMBER

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about 8 carbon atoms, the alkyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms,

wherein Y is substituted with at least one bromine atom or at least one iodine atom,

with the proviso that at least one A is X, and at least one A is Y in the composition, wherein the Y group is connected to a silicon atom in the silane or the siloxane formula by a carbon atom.

wherein the silicon fire retardant composition containing moiety is substantially chemically bonded to the compatible combustible material and the Y group is substantially chemically bonded to the silicon moiety whereby the Y group substantially cannot be removed from the silicon moiety by water washing.

5,204,187

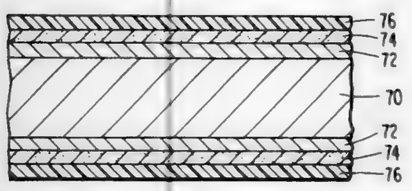
COMPOSITE-COATED FLAT-ROLLED SHEET METAL PRODUCT

William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corp., Weirton, W. Va.

Division of Ser. No. 318,677, Mar. 3, 1989, Pat. No. 5,084,358, which is a continuation-in-part of Ser. No. 855,694, Apr. 25, 1986, Pat. No. 4,812,365. This application Dec. 20, 1991, Ser. No. 812,567

Int. Cl.[5] B32B *9/02*

U.S. Cl. 428—473 **1 Claim**



1. A one-piece draw-processed can body which is symmetrically disposed in relation to a centrally located axis and having

a closed endwall,

a unitary side wall joined to such closed endwall by a transition zone which is curvilinear in a cross-sectional plane which includes such centrally located axis, and

flange metal, formed during such draw processing, located at such open end of the can body defined by such side wall,

such flange metal being oriented in a plane which is substantially perpendicularly transverse to such centrally located axis; with

such can body being fabricated from composite-coated flat-rolled steel substrate capable of being fabricated directly into sheet metal articles, without damage to such coating or substrate, manufactured by

selecting base metal from the group consisting of double-reduced flat-rolled steel in the range of about 55 to 90 #/bb and single-reduced flat-rolled steel in the range of about 55 to 110 #/bb,

preparing both surfaces of such base metal for plating,

applying about 0.05 #/bb of tin to such base metal,

alloying such tin with such base metal to present external tin-iron alloy surfaces,

chemically treating such tin-iron alloy surfaces to passivate such tin-iron alloy and enhance adhesion properties for organic coating so as to enable fabrication of such articles without damage to organic coating or base metal,

applying organic to each such chemically treated surface to provide an organic coating weight in the range of about 3 to about 15 milligrams/in^2 on each surface, and

treating such coated substrate to carry out a step selected from the group consisting of curing such organic coating and drying an adhesive for such organic coating.

5,204,188

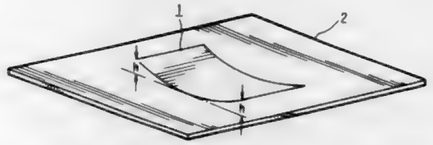
COATED RESIN FILM HAVING EXCELLENT OFFSET PRINTABILITY

Katsukuni Nitta, Tokyo, and Nobuyuki Yamaguchi, Shizuoka, both of Japan, assignors to Oji Yuka Goseishi Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1991, Ser. No. 744,351

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—476.3 **4 Claims**



1. A coated resin film having excellent offset printability, comprising a polyolefin resin film base material layer, solvent permeation preventing layers, for preventing the permeation of a solvent in offset printing ink compositions, formed on both surfaces of the base material layer, and a pigmented coating agent layer further formed on one or both of the solvent permeation preventing layers.

5,204,189

HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM

Seiji Ueyama, Hirakata, and Hiroyasu Onoe, Ikoma, both of Japan, assignors to General Company Limited, Osaka, Japan

Continuation of Ser. No. 271,406, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 112,965, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 759,858, Jul. 29, 1985, abandoned. This application Sep. 18, 1989, Ser. No. 408,951

Claims priority, application Japan, Mar. 12, 1985, 60-47400

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—484 **5 Claims**

1. A heat-sensitive transferring recording medium, comprising:

a substrate;

a solid coating film on said substrate, said solid coating film comprising:

a wax;

a resin; and

a coloring agent, the resin providing 39.1–69.2% of the solid content of the solid coating film;

the solid coating film having been formed by application of an aqueous dispersion including the wax, resin and coloring agent to the substrate, followed by drying.

5,204,190

METHOD FOR PREPARING AQUEOUS DISPERSION OF DEVELOPER AND PRESSURE-SENSITIVE RECORDING PAPER

Toranosuke Saito; Shigeru Oda, both of Osaka; Tomoharu Shiozaki, and Masato Tanaka, both of Hyogo, all of Japan, assignors to Sanko Kaihatsu Kagaku Kenyusho, Osaka and Kanzaki Paper Manufacturing Co., Ltd., Tokyo, both of Japan

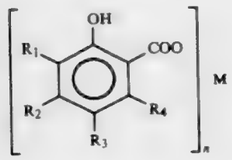
Division of Ser. No. 616,788, Nov. 21, 1990, Pat. No. 5,164,001. This application Jun. 29, 1992, Ser. No. 905,834

Claims priority, application Japan, Nov. 22, 1989, 1-301820; Mar. 30, 1990, 2-81239

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—531 **6 Claims**

1. Pressure sensitive recording paper, which comprises; a base paper substrate having thereon a layer of a coating composition containing a dispersion of an aqueous developer which comprises a nuclear-substituted salicylic acid salt represented by the formula (I):



(I)

Wherein R_1, R_2, R_3 and R_4 may be the same or different and each represents a hydrogen atom, a halogen atom, an alkyl group having not more than 15 carbon atoms, a cycloalkyl group, a phenyl group, a nuclear-substituted phenyl group, an aralkyl group or a nuclear-substituted arakyl group, or two adjacent groups selected from R_1 to R_4, may be bonded together to form a ring; n is an integer of not less than 1; and M represents magnesium, calcium, zinc, aluminum, iron, cobalt, nickel or a basic ion thereof; emulsified and dispered in an aqueous solution of an acrylamice copolymer having a degree of polymerization of not less than 100 obtained by copolymerizing 96 to 70 mole % of acrylamide with 4 to 30 mole % of an alkyl or alkoxyalkyl, having not more than 4 carbon atoms, ester of acrylic acid, methacrylic axcid, itaconic acid or maleic acid; then distilled to remove the organic solvent and finely wet-pulverized to an extent that reduction in the average particle size of the developer dispersed in the dispersion does not exceed 10%.

5,204,192

MAGNETIC RECORDING MEMBER

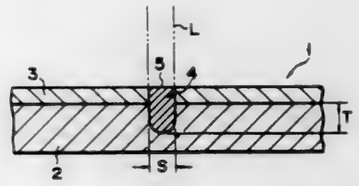
Ei Nakamura, Yokosuka; Mitsuo Sasaki, Yokohama, and Hiromi Nakamura, Zama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Machine Co., Ltd., Tokyo, both of Japan

Division of Ser. No. 804,694, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 320,621, Mar. 8, 1989, Pat. No. 5,100,692. This application Apr. 1, 1992, Ser. No. 863,680

Claims priority, application Japan, Mar. 9, 1988, 63-55366

Int. Cl.[5] H01F *10/02*

U.S. Cl. 428—694 **4 Claims**



1. A magnetic recording member comprising:

a recording member which consists of a plurality of layers having different compositions and has a modified portion formable region; and

a magnetic modified portion which is formed by radiating a high-energy beam onto said member so as to fuse a least two layers in a portion including the modified portion-formable region, and has higher permeability than a non-fused region of the modified portion-formable region, data being read by detecting magnetism of said modified portion.

5,204,191

COATING MATERIALS FOR METAL ALLOYS AND METALS AND METHOD

Jean-Marie Dubois, Pompey, and Pierre Weinland, Houdemont, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Continuation-in-part of Ser. No. 474,747, Apr. 3, 1990, abandoned. This application Jan. 6, 1992, Ser. No. 816,559

Claims priority, application France, Aug. 4, 1988, 88 10559

Int. Cl.[5] B32B *15/20*; **C22C** *21/00*

U.S. Cl. 428—650 **23 Claims**

1. An aluminium alloy coating material comprising a composition

(a) having the general formula $Al_aCu_bFe_cX_dI_e$ wherein X represents one or more elements chosen from V, Mo, Ti, Zr, Nb, Cr, Mn, Ru, Rh, Ni, Mg, W, Si and the rare earths, I represents the inevitable manufacturing impurities, $e \leqq 2$, $14 \leqq b \leqq 30$, $7 \leqq c \leqq 20$, $0 \leqq d \leqq 10$, with $c+d \geqq 10$ and $a+b+c+d+e=100\%$ of the number of atoms; and

(b) containing at least 40% by mass of a quasi-crystalline phase,

wherein the mean grain size of the crystallites in the crystalline phase is greater than 1000 nm.

5,204,193

RECORDING MAGNETOOPTICAL RECORDING MEDIUM

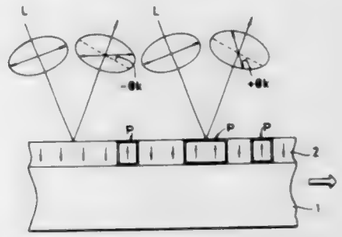
Masatoshi Sato, Tokyo, and Hideki Akasaka, Kanagawa, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 246,015, Sep. 14, 1988, abandoned, which is a continuation of Ser. No. 14,126, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 907,167, Sep. 15, 1986, abandoned, which is a continuation of Ser. No. 703,947, Feb. 21, 1985, abandoned. This application Jul. 25, 1991, Ser. No. 734,119

Claims priority, application Japan, Feb. 22, 1984, 59-31903

Int. Cl.[5] G11B *5/66*

U.S. Cl. 428—694 **12 Claims**



1. A magnetooptical recording medium having a perpendicular magnetic layer comprised of a first layer and a second layer, wherein

the first layer consists essentially of RE-Fe-Co, said RE representing at least one rare earth metal selected from the group consisting of Dy and Tb, said first layer having a predetermined Curie point and a predetermined coercivity; and

the second layer consists essentially of Gd-Fe-Co, disposed

in contact with said first layer defining an interface, said second layer having a predetermined Curie point higher

about 5.0% by weight thereof of conductive fibres chosen from the group consisting of carbon fibres, graphite fibres

nents thermally bonded together, said first component occupying a surface layer, said second component occupying a core

group consisting of a hydrazone compound, a pyrazoline compound, an oxazole compound, an oxadiazole com-

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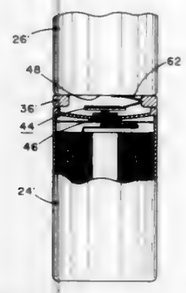
in contact with said first layer defining an interface, said second layer having a predetermined Curie point higher than the predetermined Curie point of said first layer, and a predetermined coercivity lower than the predetermined coercivity of said first layer, said interface having a wall energy density greater than or equal to 1.6 erg/cm^2 and less than or equal to 1.87 erg/cm^2.

5,204,194

MULTICELL BATTERY HAVING A TAB-FUSE FOR OVERCURRENT INTERRUPTION

Ted J. Miller; Dean P. Stanley, and Kent A. Snyder, all of Fort Wayne, Ind., assignors to Magnavox Electronic Systems Company, Fort Wayne, Ind.

Filed May 21, 1992, Ser. No. 886,205
Int. Cl.^{5} H01M *2/00*
U.S. Cl. 429—7 **5 Claims**



1. A multicell battery, comprising:
(a) at least first and second battery cells disposed in end-to-end relationship; and
(b) a tab-fuse for connecting said first and second battery cells, said tab-fuse comprising:
(i) a metallic member having a base portion for attachment to the positive end of one of said first and second battery cells and a tab portion which is bendable for attachment of the distal end thereof to the negative end of the other of said first and second battery cells; and
(ii) said base portion and the proximal end of said tab portion being joined by a relatively narrow portion of selected width, such that said narrow portion serves as a fusible link for overcurrent protection.

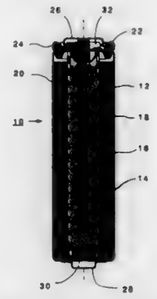
5,204,195

MANGANESE DIOXIDE CATHODE FOR A RECHARGEABLE ALKALINE CELL, AND CELL CONTAINING THE SAME

Klaus Tomantschger, and Christopher Michalowski, both of Mississauga, Canada, assignors to Battery Technologies Inc., Richmond Hill, Canada

Division of Ser. No. 497,908, Mar. 23, 1990, Pat. No. 5,108,852. This application Jan. 22, 1992, Ser. No. 824,208
Int. Cl.^{5} H01M *10/34*
U.S. Cl. 429—59 **23 Claims**

1. A rechargeable alkaline electrochemical cell having a container, internal components comprising an anode, a separator, a manganese dioxide cathode, an alkaline electrolyte, and a closure member;
wherein said closure member is placed over said anode, separator, cathode, and electrolyte, within said container, so as to seal said internal components within said container;
wherein said cathode contains from about 4% to about 8% by weight thereof of said alkaline electrolyte, and optionally from about 5% to about 15% by weight thereof of graphite, and optionally from about 0.1% to about 10.0% by weight thereof of conductive carbon; and
wherein said cathode further contains from about 0.1% to about 5.0% by weight thereof of conductive fibres chosen from the group consisting of carbon fibres, graphite fibres, carbon fibres plated with nickel, carbon fibres plated with



silver, graphite fibres plated with nickel, graphite fibres plated with silver, copper fibres plated with nickel, and copper fibres plated with silver.

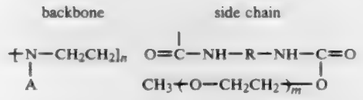
5,204,196

SOLID STATE AND CONDUCTIVE POLYMER COMPOSITION

Yasunori Yokomichi, Osaka; Shinichi Tada, Ikoma; Hitoshi Nishino, Kawachinagano, and Kenji Seki, Higashiosaka, all of Japan, assignors to Osaka Gas Company Limited, Japan

Filed Feb. 25, 1992, Ser. No. 841,055
Claims priority, application Japan, Feb. 25, 1991, 3-115700
Int. Cl.^{5} H01M *6/18, 4/36, 10/36*
U.S. Cl. 429—192 **1 Claim**

1. A solid state and conductive polymer composition comprising a host copolymer shown in the general formula:



wherein n is an integer in the range of 3 to 1×10^7, m is an integer in the range of 3 to 100, R is $-C_6H_3(CH_3)-$ or $-(CH_2)_1-$(1 is an integer in the range of 1 to 10), A is hydrogen atom or side chain and wherein said copolymer contains side chains providing a mole fraction of PEO units in the host copolymer of not less than 5% and a supporting electrolyte containing at least one of salts consisting of alkali metal salt, alkaline earth metal salt, ammonium salt, transition metal salt and a solid acid, a supporting electrolyte being admixed in an amount in the range of 0.1 to 400 parts by weight per 100 parts by weight of the host copolymer.

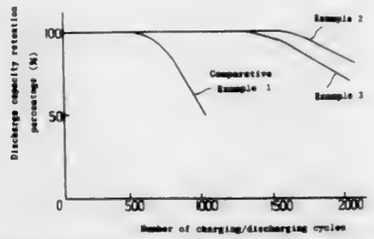
5,204,197

SEPARATOR MATERIAL FOR STORAGE BATTERIES AND METHOD FOR MAKING THE SAME

Yousuke Takai, Hyogo; Toyohiko Sano, Himeji, and Isao Ikkanzaka, Amagasaki, all of Japan, assignors to Daiwabo Create Co., Ltd., Osaka and Kanai Juyo Kogyo Co., Ltd., Itami, both of Japan

Filed Mar. 25, 1991, Ser. No. 673,910
Claims priority, application Japan, Mar. 26, 1990, 2-78274; Jan. 12, 1991, 3-13741
Int. Cl.^{5} C08F *228/06, 226/06*
U.S. Cl. 429—249 **7 Claims**

1. A separator material for storage batteries comprising a fabric sheet made of fibers, said fibers comprising sulfonated conjugate fibers comprising at least first and second components thermally bonded together, said first component occupying a surface layer, said second component occupying a core portion, said first component comprising an olefinic random



copolymer containing at least a unit represented as $-CH_2-C(SO_3H)(COOH)-$, and said second component comprising a nonsulfonated polyolefin having a melting point no higher than 250° C.

5,204,198

PHOTOELECTROGRAPHIC ELEMENTS UTILIZING NONIONIC SULFONIC ACID PHOTOGENERATORS

Douglas E. Bugner; Jeanne E. Kaeding, and Michel F. Molaire, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1991, Ser. No. 783,590
Int. Cl.^{5} G03G *13/16, 13/22*
U.S. Cl. 430—49 **22 Claims**

1. A photoelectrographic element for electrostatic imaging which is capable of producing multiple prints from a single exposure and exhibiting consistent performance at variable relative humidities, said element comprising:
a conductive layer in electrical contact with an acid photogenerating layer which is free of photopolymerizable materials and comprises an electrically insulating binder and a nonionic sulfonic acid photogenerator.

5,204,199

ELECTROPHOTOGRAPHIC RECEPTOR HAVING EXCELLENT CHARGING CHARACTERISTIC, PHOTOSENSITIVITY, AND RESIDUAL POTENTIAL

Masami Sugiuchi, Yokohama, and Hideyuki Nishizawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1990, Ser. No. 586,308
Claims priority, application Japan, Sep. 22, 1989, 1-244964
Int. Cl.^{5} G03G *5/047*
U.S. Cl. 430—58 **16 Claims**

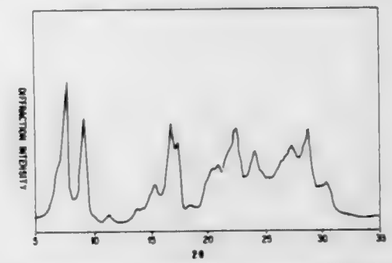
1. An electrophotographic receptor comprising:
a conductive support; and
a photoconductive layer formed on said conductive support comprising a charge generating layer containing a charge generating substance and a charge transporting layer containing a charge transporting substance,
wherein a minimum electric field strength required for a waveform, which indicates a change in photocurrent generated when a voltage is applied to and a light pulse is radiated on said photoconductive layer with respect to a time, to have a single peak and an upwardly projecting shape, is not more than 200 kV/cm,
said charge generating substance is selected from the group consisting of an inorganic photoconductor, a phthalocyanine pigment, an azo-based dye, a perylene-based pigment, an indigoid dye, a quinacridon pigment, a polycyclic quinone, a cyanine dye, a xanthene dye, a charge-transfer complex consisting of an electron donor substance and an electron acceptor substance, and an eutectic complex consisting of pyrylium salt dye and a polycarbonate resin, and
said charge transporting substance is selected from the group consisting of a hydrazone compound, a pyrazoline compound, an oxazole compound, an oxadiazole compound, a thiazole compound, an amino compound, a ketazine compound, an enamine compound, an amidine compound, a stilbene compound, a butadiene compound, and a carbazole compound.

5,204,200

LAMINATED ORGANIC PHOTOSENSITIVE MATERIAL COMPRISING AN X-TYPE NONMETAL PHTHALOCYANINE IN THE CHARGE GENERATING LAYER

Tomokazu Kobata, and Yosuke Matsui, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Feb. 7, 1991, Ser. No. 651,444
Claims priority, application Japan, Feb. 7, 1990, 2-27958
Int. Cl.^{5} G03G *5/10*
U.S. Cl. 430—58 **11 Claims**



1. A laminated organic photosensitive material which comprises an electroconductive support, an undercoat formed on the electroconductive support, a charge producing layer provided on the undercoat and a charge transporting layer provided on the charge producing layer wherein the undercoat comprises an alcohol soluble polyamide resin and wherein the charge producing layer comprises (a) an X-type nonmetal phthalocyanine, as a charge producing substance, and (b) a mixture of a vinyl chloride-ethylene copolymer, in an amount of 40–95% by weight, based on the mixture, and a vinyl chloride-vinyl acetate-maleic acid copolymer, in an amount of 5–60% by weight, based on the mixture, as a binder resin for the charge producing layer.

5,204,201

POLYMERIC SYSTEMS FOR OVERCOATING ORGANIC PHOTORECEPTORS USED IN LIQUID DEVELOPMENT XEROGRAPHIC APPLICATIONS

Richard L. Schank, Pittsford, and John A. Bergfjord, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1991, Ser. No. 809,116
Int. Cl.^{5} G03G *5/147, 5/047*
U.S. Cl. 430—59 **11 Claims**

1. A coated photoreceptor element comprising a charge generation layer and a charge transport layer, wherein said charge transport layer comprises an aromatic amine transport molecule, wherein said transport layer is coated with a layer of a transport and conductive emulsion polymer that is unaffected by hydrocarbon solvents and that suppresses leaching of said transport molecule from said transport layer.

5,204,202

PHOTOCONDUCTIVE PHOTOSENSITIVE

5,204,204

CARRIER FOR DEVELOPING ELECTROSTATIC

styrenic monomer component in the styrene-acrylic copolymers of which the outermost surface is formed, 40° in terms of the L*a*b* color space, and said quinacridone-type pigment has the property that when a color produced by

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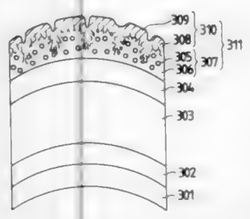
5,204,202
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE ELEMENT COMPRISING A PROTECTIVE LAYER WITH A POROUS SURFACE IMPREGNATED WITH LUBRICANT

Fuminori Ishikawa, Hitachiohta; Kunihiro Tamahashi, Mito; Shigeharu Onuma; Masatoshi Wakagi, both of Hitachi; Masanobu Hanazono, Mito; Mitsuyoshi Shoji, Ibaraki; Takayuki Nakakawaji, Hitachi; Yutaka Ito, Takahagi; Shigeki Komatsuzaki, Mito, and Chiaki Yamabishi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,527
Claims priority, application Japan, Mar. 18, 1989, 1-66777
Int. Cl.[5] G03G *5/082, 5/14*
U.S. Cl. 430—66 **23 Claims**



1. An electrophotographic photosensitive element comprising a substrate and provided thereon at least a photoconductive layer and a protective and lubricating layer, with said protective and lubricating layer providing an outermost surface of the element, said protective and lubricating layer comprising a solid film having a number of fine pores and a water-repellent lubricant having perfluoropolyoxyalkyl groups or perfluoropolyoxyalkylene groups impregnated into said pores and covering a surface of said solid film, said water-repellent lubricant being a liquid film that exudes from the pores to the outermost surface; the thickness of the protective and lubricating layer being not greater than 1 micron and greater than the depth of the pores.

5,204,203
ELECTROPHOTOGRAPHIC ELEMENT WITH BLOCKED ISOCYANATE BINDER

Yoshimasa Ito, Tokyo; Sohji Tsuchiya, Kanagawa; Mutsuaki Murakami, Tokyo, and Atsushi Omote, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 20, 1991, Ser. No. 795,131
Claims priority, application Japan, Nov. 28, 1990, 2-332390
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—96 **4 Claims**

1. A photosensitive material for electrophotography, comprising a support and, provided on the support, an organic photoconductive layer of single-layer structure comprising a mixture of a metal-free phthalocyanine and a binder organic compound; said binder organic compound consisting essentially of an isocyanate in which the isocyanate terminal has been blocked with a blocking agent selected from the group consisting of an oxime compound, a lactam compound and an ester compound.

5,204,204
CARRIER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Yuji Shintani; Etsuaki Urano; Osamu Doi, all of Toyokawa; Shinobu Nakasawa, Toyohashi; Ichiro Demizu, Toyonaka; Miyoko Ito, Nagoya; Kazuhiro Itadaki, Amagasaki; Nobutaka Torii, Amagasaki; Yukio Tanigami, Amagasaki; Toshio Honjo; Yuji Sato, both of Kashiwa, and Toshiyuki Fukumoto, Matsudo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka and Powdertech Co., Ltd., Kashiwa, both of Japan

Filed Nov. 27, 1991, Ser. No. 799,129
Claims priority, application Japan, Nov. 30, 1990, 2-337543; Nov. 30, 1990, 2-337544; Apr. 9, 1991, 3-076031; Apr. 9, 1991, 3-076032; Jun. 5, 1991, 3-134124
Int. Cl.[5] G03G *9/10*
U.S. Cl. 430—108 **18 Claims**

1. A carrier for developing electrostatic latent images comprising;

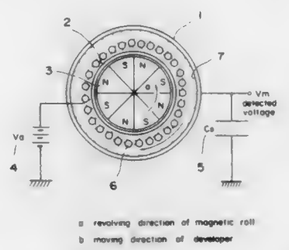
carrier core particles having a mean particle size of 40 to 60 μm and a bulk density of 2.45 to 2.65 g/cm^3, and

resin-coating layers the amount of which is 2.7 to 3.5% by weight on the basis of the carrier core particles.

5,204,205
THREE LAYERED TONER FOR ELECTROPHOTOGRAPHY

Masahiro Anno; Kazuo Ota; Junji Machida; Eiichi Sano, and Makoto Kobayashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 515,449, Apr. 27, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 770,730
Claims priority, application Japan, Apr. 28, 1989, 1-109941; Apr. 28, 1989, 1-109942; Apr. 28, 1989, 1-109943; Apr. 28, 1989, 1-109944
Int. Cl.[5] G03G *9/093*
U.S. Cl. 430—109 **25 Claims**



1. Toner for the development of electrostatic latent images comprising

a core particle comprising at least styrene-acrylic copolymer,

an intermediate layer coating the core particle and comprising at least styrene-acrylic copolymers, and

an outermost surface layer coating the intermediate layer and comprising at least styrene-acrylic copolymers,

an absolute value (%) of the difference between S_0(%) and S_1 (%) represented by the formula ($|S_0-S_1|$)

in which S_0 is a content (%) of styrenic monomer component in the styrene-acrylic copolymers of which the core particle is formed, and S_1 is a content (%) of styrenic monomer component in the styrene-acrylic copolymers of which the intermediate layer is formed,

being 10% or more, and

an absolute value (%) of the difference between S_1 (%) and S_2 (%) represented by the formula ($|S_1-S_2|$)

in which S_1 is a content (%) of styrenic monomer component in the styrene-acrylic copolymers of which the intermediate layer is formed and S_2 is a content (%) of styrenic monomer component in the styrene-acrylic copolymers of which the outermost surface is formed, being 5% or more, and

the relationship among S_0, S_1 and S_2 satisfies the following formula;

$S_0>S_1>S_2$ or $S_0<S_1<S_2$.

5,204,206
PROCESS FOR PRODUCING DISPLAY ELEMENT, PATTERN SHEET THEREFOR, AND PROCESS FOR PRODUCING PATTERN SHEET

Teruhiko Iwase; Takeshi Imai; Toshio Koura; Yutaka Yamamura, and Tsuneyuki Amano, all of Aichi, Japan, assignors to Nitto Denko Corporation, Osaka and Nippondenso Co., Ltd., Aichi, both of Japan

Filed Jun. 11, 1990, Ser. No. 535,620
Claims priority, application Japan, Jun. 10, 1989, 1-147564; May 24, 1990, 2-134766
Int. Cl.[5] G03C *1/68;* **G03F** *7/00, 9/00*
U.S. Cl. 430—253 **10 Claims**

1. A process for producing a patterned display element which comprises the steps of:

adhering a peel-off developable pattern-forming sheet comprising a transparent flexible substrate having thereon a photopolymerizable color image-forming material layer onto an adherend through said color image-forming material layer;

exposing said pattern-forming sheet to light through a photomask having a light transmitting pattern; and

peeling off said pattern-forming sheet while leaving and fixing a color pattern comprising the thus photocured color image-forming material layer on said adhered, wherein the photopolymerizable color image-forming material layer contains a colorant having weather resistant properties and is capable of endowing a photocured product of the color image forming material layer with a hiding power of 2.5 or more as measured by a transmission densitometer.

5,204,207
MAGENTA COLOR LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Masahide Yamashita, Numazu, and Akihiko Gotoh, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 716,990
Claims priority, application Japan, Jun. 18, 1990, 2-157547
Int. Cl.[5] G03G *9/12*
U.S. Cl. 430—114 **9 Claims**

1. A magneta color liquid developer for use in electrophotography comprising a carrier liquid and toner particles dispersed in said carrier liquid, which toner particles comprise a resin and at least two pigments, one being a water-insoluble azo pigment and the other being a quinacridone-type pigment, wherein said water-insoluble azo pigment has the property that when a color produced by a liquid developer comprising as a pigment component said water-soluble azo pigment only, the metric hue-angle of said produced color is in the range of 0° to 40° in terms of the L*a*b* color space, and said quinacridone-type pigment has the property that when a color produced by a liquid developer comprising as a pigment component said quinacridone-type pigment only, the metric hue-angle of said produced color is in the range of 330° to 360° in terms of the L*a*b* color space.

5,204,208
PROCESSES FOR CUSTOM COLOR ENCAPSULATED TONER COMPOSITIONS

Anthony J. Paine, Mississauga; Trevor I. Martin, Burlington; Lurdes M. Martins, Mississauga; Karen A. Moffat, Brantford, and Walter Mychajlowskij, Georgetown, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1991, Ser. No. 772,307
Int. Cl.[5] G03G *9/093*
U.S. Cl. 430—137 **32 Claims**

1. A process for obtaining custom color toner compositions which comprises admixing at least two encapsulated toners wherein each toner is comprised of a core comprised of a polymer binder, pigment, dye, or mixtures thereof, and a polymeric shell prepared by interfacial polycondensation polymerization; and wherein the pigment, dye or mixtures thereof is different for each toner, thereby resulting in a custom color toner with a color different than each of said encapsulated toners, and containing an effective proportion of intact polymeric shells which results in the triboelectric charge on the custom color toner being substantially equal to the triboelectric charge on the encapsulated toners.

5,204,209

Patent Not Issued For This Number

5,204,210
METHOD FOR THE DIRECT PATTERNING OF DIAMOND FILMS

Frank Jansen, and Mary A. Machonkin, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1990, Ser. No. 624,031
Int. Cl.[5] G03C *11/00;* **B05D** *3/02*
U.S. Cl. 430—198 **23 Claims**

1. A method of forming a patterned, poly-crystalline diamond film on a substrate, comprising:

applying to a substrate a photoresist layer;

applying to said photoresist layer a diamond powder layer, said diamond powder layer including diamond particles;

exposing said photoresist layer and said diamond powder layer to electromagnetic radiation through a mask;

developing said photoresist layer sufficiently to form a developed photoresist layer;

heating the substrate, developed photoresist layer, and diamond powder layer in a processing apparatus, said heating step causing said developed photoresist layer to carbonize;

introducing a mixture of gases into said apparatus, said mixture of gases including carbon-containing and hydrogen-containing gases; and

decomposing said mixture of gases in said apparatus, whereby hydrogen in said hydrogen-containing gases remove said carbonized photoresist layer, and whereby carbon in said carbon-containing gases combines with said diamond particles forming diamond structures on said substrate.

23. A method of forming a patterned, poly-crystalline diamond film on a substrate, comprising:

applying a photoresist layer to a silicon substrate;

applying to said photoresist layer a diamond powder layer, said diamond powder layer formed from diamond particles;

5,204,214
SILVER HALIDE PHOTOGRAPHIC MATERIAL

ing element using an aqueous alkaline processing liquid comprising a silver halide solvent, 3-(N,N-diethylamino)propane-

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applying to said photoresist layer a diamond powder layer, said diamond powder layer formed from diamond particles having an average diameter of 0.1 microns;
exposing said photoresist layer and diamond powder layer to Ultra-Violet light through a mask;
developing said photoresist layer sufficiently to form a developed photoresist layer;
heating the substrate, developed photoresist layer, and diamond powder layer in a deposition chamber, said heating step causing said developed photoresist layer to carbonize;
introducing a mixture of gases into said chamber, said mixture of gases including a diatomic hydrogen gas and a hydrocarbon gas; and
decomposing said mixture of gases in said chamber, whereby hydrogen removes said carbonized photoresist layer, and whereby carbon in said hydrocarbon gas combines with said diamond particles forming diamond structures on said substrate.

5,204,211

IMAGE RECEIVER ELEMENT FOR USE IN SILVER SALT DIFFUSION TRANSFER

Ikutaro Horie, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1991, Ser. No. 744,736
Claims priority, application Japan, Aug. 16, 1990, 2-216390
Int. Cl.[5] G03C *5/54, 1/38*
U.S. Cl. 430—232 **5 Claims**

1. An image receiving element containing silver deposition nuclei for use in a peel-apart type silver salt diffusion transfer process comprising:
(a) a support having a front side and a back side;
(b) at least one layer which is a cellulose ester layer or a regenerated cellulose layer coated on the front side of the support;
(c) an aliphatic acid ester of glycerol contained in at least one of the cellulose ester layer or the regenerated cellulose layer; and
(d) a gelatin-containing layer coated on the back side of the support; wherein the aliphatic acid ester of glycerol is selected from the group of compounds represented by general formula (I):

(I)

wherein R^1, R^2 and R^3, which may be the same or different, each represents a linear or branched chain alkyl group having 1 to 7 carbon atoms.

5,204,212

PROCESSING LIQUID FOR THE SILVER SALT DIFFUSION TRANSFER PROCESS CONTAINING 3-(N,N-DIETHYLAMINO)PROPANE-1,2-DIOL

Jean-Pierre D. Tahon, Louvain, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 27, 1991, Ser. No. 813,660
Claims priority, application European Pat. Off., Jan. 21, 1991, 91200111.2
Int. Cl.[5] G03C *5/54, 5/30, 5/38*
U.S. Cl. 430—249 **10 Claims**

7. A method for obtaining an image comprising information-wise exposing a photographic material containing a silver halide emulsion layer and developing said information-wise exposed photographic material according to the silver complex diffusion transfer reversal process while in contact with an image receiving layer containing physical development nuclei wherein complex silver ions are transferred to an image receiving element using an aqueous alkaline processing liquid comprising a silver halide solvent, 3-(N,N-diethylamino)propane-1,2-diol, at least one developing agent of the p-hydroxybenzene type and phosphate ions from 0.0 mol/l to 0.03 mol/l.

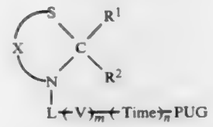
5,204,213

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okada, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1991, Ser. No. 655,574
Claims priority, application Japan, Feb. 14, 1990, 2-32770; Feb. 15, 1990, 2-34736
Int. Cl.[5] G03C *5/54, 1/34, 1/06, 7/26*
U.S. Cl. 430—264 **10 Claims**

1. A silver halide photographic material comprising at least one silver halide emulsion layer on a support, characterized in that the emulsion layer and/or another hydrophilic colloid layer contains a compound represented by general formula (I):



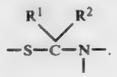
(I)

$L \leftarrow V \rightarrow_m \leftarrow Time \rightarrow_n PUG$

wherein R^1 and R^2 each represents a hydrogen atom, aliphatic group, aromatic group or heterocyclic group, with the proviso that R^1 and R^2 may be connected to each other to form a ring; L represents a divalent linking group; V represents a carbonyl group,

group, sulfonyl group, sulfoxy group,

group (in which R_0 represents an alkoxy group or aryloxy group), iminomethylene group or thiocarbonyl group; Time represents divalent linking group; m represents an integer 0 or 1; n represents an integer 0 or 1; PUG represents a fog inhibitor, development inhibitor, development accelerator, fogging agent, coupler, coupler-releasing coupler, diffusive dye, non-diffusive dye, desilvering accelerator, desilvering inhibitor, silver halide solvent, competitive compound, developing agent, auxiliary developing agent, fixing accelerator, fixing inhibitor, image stabilizer, toner, processing dependency improver, dot improver, dye stabilizer, photographic dye, surface active agent, film hardener, ultraviolet absorbent, fluorescent brightening agent, desensitizer, contrast improver, chelating agent or DIR hydroquinone; and X represents an atomic group required to form a 5- or 6-membered ring with



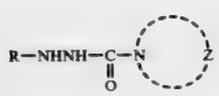
5,204,214

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okamura; Hiroshi Kawamoto; Kazuhiko Matsumoto, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 511,135, Apr. 19, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,397
Claims priority, application Japan, Apr. 21, 1989, 1-102393
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—264 **14 Claims**

1. A silver halide photographic material comprising a silver halide emulsion and a compound represented by formula (I):



(I)

wherein R represents an aliphatic group, an aromatic group, or a heterocyclic group; and Z represents an atomic group necessary to form a nitrogen-containing heterocyclic aromatic group, said heterocyclic ring being selected from the group consisting of pyrrole, imidazole, pyrazole, 1,2,3-triazole, 1,2,4-triazole, tetrazole, 2-thioxathiazoline, 2-oxathiazoline, 2-thioxaoxazoline, 2-oxazoline-5-thione, 1,2-thiazoline-5-thione, 1,2-oxazoline-5-one, 1,2-thiozoline-5-one, 5-thioxatetrazoline, 2-thioxa-1,3,4-thiadiazoline, 2-oxa-1,3,4-thiadiazoline, 2-thioxa-1,3,4-oxadiazoline, 2-oxa-1,3,4-oxadiazoline, 3-thioxa-1,2,4-triazoline, 2-thioxadihydropyridine, 2-oxadihydropyridine, isoindole, indole, indazole, benzimidazole, 2-thioxabenzimidazole, 2-oxabenzimidazole, benzoxazoline-2-thione, benzooxazoline-2one, benzothiazoline-2-thione, benzothiazoline-2-one, purine, pyrazolopyridines, and pyrazolopyrimidines, and wherein R contains a ballast group or a group which is capable of accelerating adsorption of the compound onto silver halide.

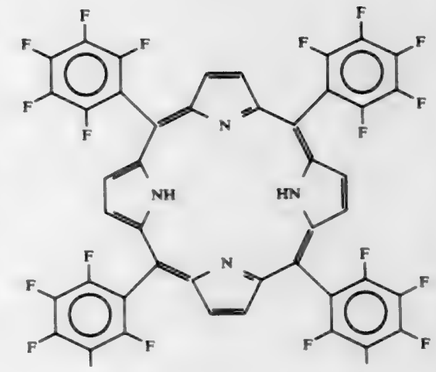
5,204,215

WAVELENGTH MULTIPLEXED OPTICAL RECORDING MATERIAL

Noriyuki Kishii; Shinichiro Tamura; Nobutoshi Asai; Koichi Kawasumi, and Jenetsu Seto, all of Kanagawa, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 500,239, Mar. 26, 1990, Pat. No. 5,153,099, which is a continuation of Ser. No. 199,266, May 26, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 669,671
Claims priority, application Japan, May 27, 1987, 62-128350; May 27, 1987, 62-128351
Int. Cl.[5] G11B *7/24*
U.S. Cl. 430—270 **2 Claims**

1. A recording member for use with a laser beam optical recording apparatus having a recording layer consisting of material comprising:
a dispersing agent and tetra(pentafluorophenyl) porphine exhibiting persistent photochemical hole-burning having the following formula;



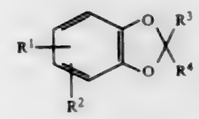
5,204,216

RADIATION-SENSITIVE MIXTURE

Son N. Kim, Hemsbach, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

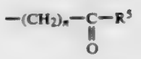
Filed Jan. 30, 1991, Ser. No. 648,533
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005212
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—270 **10 Claims**

1. A radiation-sensitive mixture, consisting essentially of effective amounts of
(a) a binder or binder mixture which is insoluble in water but soluble in aqueous alkaline solutions,
(b) a compound which forms a strong acid on exposure to radiation and
(c) one or more organic compounds which suppress the solubility of (a) in aqueous alkaline solutions, compound (c) is a compound of the general formula (I)



(I)

where R^1 and R^2 are identical or different and are each hydrogen, alkyl, alkoxy, aryl or aralkyl, R^3 and R^4 are identical or different and are each alkyl, cycloalkyl, aralkyl, unsubstituted or alkyl- or halogen-substituted aryl or a radical



where n is from 1 to 5 and Rs is alkyl, alkoxy, aryl or aralkyl or R^3 together with R^4 forms a five-membered to seven-membered ring via $-(CH_2)_m-$ in which m is from 4 to 6.

5,204,217

PHOTOSENSITIVE COMPOSITION

5,204,219

PHOTOGRAPHIC ELEMENT WITH NOVEL SUBBING

5,204,221

PHOTOSENSITIVE RESIN COMPOSITION

initiating polymerization of compound b) under the action of actinic radiation.

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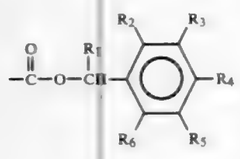
5,204,217
PHOTOSENSITIVE COMPOSITION
Toshiaki Aoai, and Mitsunori Ono, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 16, 1991, Ser. No. 641,834
Claims priority, application Japan, Jan. 16, 1990, 2-6806; Jan. 16, 1990, 2-6807
Int. Cl.[5] G03F *7/039, 7/004*
U.S. Cl. 430—270 **5 Claims**

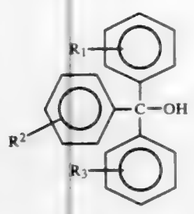
1. A photosensitive composition containing (a) a compound having a group represented by formula (I), said group, when irradiated with actinic radiation, forming a carboxylic acid:


(I)

wherein
R_1 represents hydrogen; and
R_2 to R_6 may be the same or different and each represents hydrogen, a halogen, an alkoxyl group, an aryloxyl group, cyano group, or an alkyl group, provided that at least one or R_2 and R_3 represents an alkoxyl or aryloxyl group, and two of R_2 to R_6 may link to form a ring provided that R_2 and R_3 do not link to form a ring and (b) a resin which is insoluble in water but soluble in an aqueous solution of an alkali.

5,204,218
PHOTOSENSITIVE RESIN COMPOSITION
Teruhiko Kumada; Youko Tanaka; Hideo Horibe; Shigeru Kubota, and Hiroshi Kozuka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 17, 1991, Ser. No. 717,281
Claims priority, application Japan, Jun. 19, 1990, 2-160630; Jun. 4, 1991, 3-132472
Int. Cl.[5] G03C *1/492, 1/725;* **C08F** *2/46;* **G03F** *7/025*
U.S. Cl. 430—270 **23 Claims**

1. A photosensitive resin composition containing:
a photobase generator expressed in the following general formula (I):


(I)

where R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen, halogen, alkyl groups, alkenyl groups, alkinyl groups, phenyl groups and alkoxy groups; and
a base-catalytic reaction compound which reacts under basic conditions.

5,204,219
PHOTOGRAPHIC ELEMENT WITH NOVEL SUBBING LAYER
Wim J. Van Ooij, Golden, Colo.; David R. Boston, and Edward J. Woo, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 693,780, Apr. 26, 1991, abandoned, which is a continuation of Ser. No. 79,687, Jul. 30, 1987, abandoned. This application Jan. 21, 1992, Ser. No. 824,903
Int. Cl.[5] G03C *1/492*
U.S. Cl. 430—272 **15 Claims**

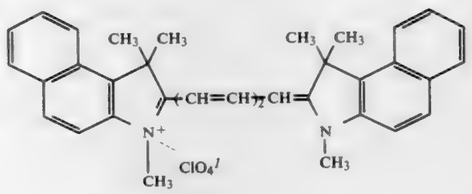
1. A polymeric film having adhered to at least one surface thereof a layer comprising a continuous gelled network of inorganic particles containing from 0.1 to 20% by weight of solids content of said layer of an ambifunctional silane represented by the formula

$$(Q)_n\text{—R—Si(OR}^1)_3$$

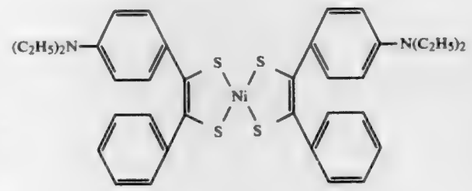
wherein
R^1 is alkyl or aryl,
R is the organic group of up to 10 carbon atoms having n+1 external valences,
n is 1, or 2, and
Q is an amino or epoxy moiety reactive with gelatin hardeners or gelatin.

5,204,220
OPTICAL RECORDING MEDIUM
Shuichi Yanagisawa; Tatsuro Sakai; Takashi Chuman; Yasushi Araki, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 24, 1991, Ser. No. 690,474
Claims priority, application Japan, Oct. 9, 1990, 2-270709
Int. Cl.[5] G03C *1/72;* **B41M** *5/24*
U.S. Cl. 430—275 **3 Claims**

1. An optical recording medium which can be applied to a compact disc comprising:
a light transmissive substrate having a thickness of 1.0 to 1.5 mm;
a light absorption layer provided on the light transmissive substrate and having a thickness of 20 to 2000 nm;
a light reflecting layer provided on the light absorption layer and having a thickness of 0.02 to 2.0 μm;
a protective layer provided on the light reflecting layer and having a thickness of 0.1 to 100 μm; and
said light absorption layer containing a cyanine dye:



and a quencher:



5,204,221
PHOTOSENSITIVE RESIN COMPOSITION
Hisaichi Muramoto, Hirakata; Yusuke Ninomiya, Nishinomiya; Keizou Ishii, Ashiya, and Shinichi Ishikura, Tsuzuki, all of Japan, assignors to Nippon Paint Co., Ltd., Japan
Filed Jan. 31, 1991, Ser. No. 648,881
Claims priority, application Japan, Feb. 1, 1990, 2-22946
Int. Cl.[5] G03C *1/73*
U.S. Cl. 430—281 **16 Claims**

1. A photosensitive resin composition consisting essentially of:
30 to 90 parts by weight, based on 100 parts by weight of the components (I), (II) and (III), of crosslinked resin particles having a particle size of less than several mm prepared by dispersing in an aqueous medium the following four components:
(a) 60 to 90% by weight, based on the total amount of the components (a), (b) and (c), of a base resin having a glass transition temperature (Tg) of 0° C. or less and a polymerizable double bond,
(b) 0.9 to 30% by weight, of based on the total amount of the components (a), (b) and (c), of a monomer which, when polymerized, provides a resin in which Tg is 20° C. higher than that of said base resin, or a resin in which Tg is 20 ° C. higher than that of said base resin,
(c) 0.1 to 10% by weight, based on the total amount of the components (a), (b) and (c) of a polyvinyl compound, and
(d) 0.1 to 3 parts by weight, based on 100 parts by weight of the total weight of the components (a), (b) and (c), of a polymerization initiator, components (a), (b), (c) and (d) having been heated to crosslink,
(II) 5 to 70 parts by weight, based on 100 parts by weight of the components (I), (II) and (III), of a photopolymerizable unsaturated monomer, and
(III) 0.01 to 10 parts by weight, based on 100 parts by weight of the components (I), (II) and (III), of a photopolymerization initiator.

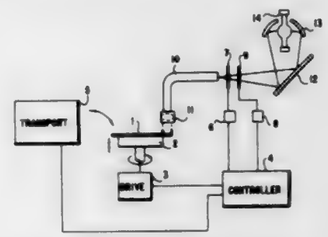
5,204,222
PHOTOCURABLE ELASTOMERIC MIXTURE AND RECORDING MATERIAL, OBTAINED THEREFROM, FOR THE PRODUCTION OF RELIEF PRINTING PLATES
Joachim Gersdorf, Wiesbaden; Matthias Kroggel, Liederbach, and Karl-Josef Rauterkus, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 379,946, Jul. 14, 1989, abandoned. This application Aug. 6, 1991, Ser. No. 742,732
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824146
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Int. Cl.[5] G03F *7/038*
U.S. Cl. 430—281 **14 Claims**

1. A photocurable elastomeric mixture consisting essentially of:
a) an elastomeric graft polymer binder which comprises
i) a graft base, consisting essentially of a polyurethane having at least 2 urethane groups formed by reaction between a diol and a diisocyanate, and
ii) a plurality of components comprising carboxylic acid vinyl ester units having 3 to 20 carbon atoms, or saponification products thereof, grafted to said graft base,
said graft polymer being soluble or dispersible in water or aqueous solution,
(b) a compound comprising at least one terminal ethylenically unsaturated group and having a boiling point at normal pressure of above 100° C., which is polymerizable by free radical polymerization, and
(c) a compound or combination of compounds capable of initiating polymerization of compound b) under the action of actinic radiation.

5,204,223
PHOTOSENSITIVE RESIN COMPOSITION
Yuji Taguchi, and Toshiaki Fujimura, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan
Filed Aug. 8, 1991, Ser. No. 742,046
Claims priority, application Japan, Aug. 9, 1990, 2-212117; Jul. 3, 1991, 3-190544; Jul. 16, 1991, 3-175141
Int. Cl.[5] C08F *2/50;* **G03F** *7/031, 7/035*
U.S. Cl. 430—281 **3 Claims**

1. A photosensitive resin composition comprising a soluble synthetic polymer, a photopolymerizable unsaturated compound, and a photopolymerization initiator; wherein said soluble synthetic polymer comprises an addition polymer obtained by the reaction between diamine compounds having amino groups selected from primary and secondary amino groups and having no amide bonds in their molecules and a diisocyanate compound; wherein said addition polymer contains a polyoxyalkylene glycol component and said diamine compounds are a combination of at least one hydrophilic diamine and at least one hydrophobic diamine.

5,204,224
METHOD OF EXPOSING A PERIPHERAL PART OF A WAFER
Shinji Sazaki, Kawasaki, Japan, assignor to Ushio Denki, Tokyo, Japan
Continuation of Ser. No. 617,243, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 360,699, Jun. 2, 1989, abandoned. This application Jul. 22, 1991, Ser. No. 734,077
Claims priority, application Japan, Sep. 26, 1988, 63-238894
Int. Cl.[5] G03F *7/20*
U.S. Cl. 430—315 **3 Claims**



1. A method of exposing a peripheral part of a wafer on which a photoresist is coated comprising the steps of:
exposing said peripheral part of said wafer to light guided by single optical fiber light guide at a first illumination intensity while turning said wafer, said first illumination is a low level so that gases are generated in said photoresist and are emitted outside the photoresist without forming bubbles therein;
exposing a same area of said wafer to light guided by said single optical fiber light guide at a second illumination intensity which is higher than the first illumination intensity, so that gases are generated in said photoresist and are emitted outside the photoresist without forming bubbles therein, while again continuously turning said wafer, wherein any small portion of small peripheral part of said wafer is twice exposed in a time interval; and
developing said photoresist on said peripheral part of said wafer.

5,204,225
PROCESS FOR PRODUCING NEGATIVE IMAGES

5,204,226
PHOTOSENSITIZERS FOR POLYSILANES

ferric complex salts of compounds represented by the following formula A or B:

5,204,229
REPLENISHING SOLUTION UNIT FOR PREPARING A

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5,204,225
PROCESS FOR PRODUCING NEGATIVE IMAGES
Wayne E. Feely, Rydal, Pa., assignor to Rohm and Haas Company, Phila., Pa.
Division of Ser. No. 48,998, May 8, 1987, Pat. No. 5,034,304. This application Apr. 23, 1991, Ser. No. 690,195
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—325 **5 Claims**

1. A process for preparing a negative image on a substrate comprising

a) depositing on a substrate surface a short wavelength actinic radiation sensitive negative photoresist comprising as its essential ingredients which together total 100 percent: from about 99.9 to about 50 weight percent of an acid-hardening resin system selected from the group consisting of a combination of an aminoplast resin and at least one reactive hydrogen containing compound, where said reactive hydrogen containing compound is selected from the group consisting of novolak, polyvinylphenol, polyglutarimide, poly(meth) acrylic acid copolymers, alkali soluble polyacrylic amide and polymethacrylic amide copolymers, copolymers containing 2-hydroxyethyl (meth)acrylate, polyvinyl alcohol; alkali soluble styrene-allyl alcohol copolymers and mixtures thereof, or

a phenoplast resin and at least one formaldehyde generating compound, and

from about 0.1 to about 50 weight percent of a photoacid generating compound, where the photoacid generating compound is selected from the group of halogenated organic compounds which

(i) absorb short wavelength actinic radiation having a wavelength less than about 299 nanometers selected from deep ultraviolet, x-ray and electron beam radiation;

(ii) are compatible with the acid-hardening resins system in solvents wherein said acid-hardening resin system is soluble;

(iii) generate a halogen acid when the photoresist is exposed to said short wavelength actinic radiation;

(iv) permits the unexposed photoresist to be developed using an aqueous base; and

(v) permits the crosslinking of said acid-hardening resin system in the exposed photoresist when said exposed photoresist is heated to elevated temperatures to form a thermally stable negative image,

b) soft baking the deposited photosensitive solution at a temperature of about 90° C. for about 30 minutes to form a coating,

c) exposing portions of the coating to a source of actinic radiation in the deep ultraviolet spectra, x-ray or e-beam;

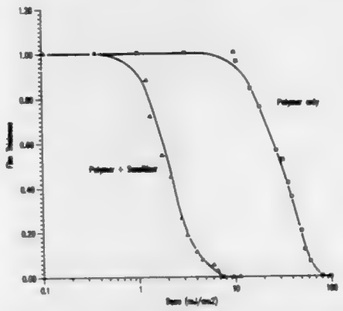
d) developing the unexposed portions of the coating with an aqueous base developer, and

e) heating the exposed coating to an elevated temperature to form a negative image that is thermally stable to temperatures in excess of 200° C.

wherein the concentration of said photoacid generating compound in said photoresist is at least 0.1 weight percent when deep ultraviolet radiation having a dosage of less than 10 ml/Cm^2 is used to expose the photoresist having a thickness less than about 2 microns and wherein the concentration of said photoacid generating compound in said photoresist is at least 10 weight percent when x-ray radiation having a dosage of less than about 130 ml/Cm^2 is used to expose the photoresist; and

wherein the amount of aminoplast or phenoplast in said photoresist is from about 3 to about 50 weight percent and the amount of reactive hydrogen generating compound or formaldehyde generating compound is from about 40 to about 90 weight percent.

5,204,226
PHOTOSENSITIZERS FOR POLYSILANES
Mark E. Baier, Sonora; Robert D. Miller, San Jose, and Gregory M. Wallraff, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 4, 1991, Ser. No. 664,260
Int. Cl.[5] G03F *7/30*
U.S. Cl. 430—326 **2 Claims**



1. A process for generating a positive tone resist image in a film comprising the steps of (a) forming a film comprising polyphenysilane and sulfosuccinimide; (b) imagewise exposing the film to radiation and (c) developing the image in the film.

5,204,227
METHOD OF DEVELOPING PHOTOPOLYMERIZABLE PRINTING PLATES AND COMPOSITION THEREFOR
Victor L. Larimer, Middletown Township, Bucks County, Pa., assignor to 3D Agency, Inc., Benton Harbor, Mich.
Continuation-in-part of Ser. No. 521,897, May 10, 1990, abandoned. This application Mar. 1, 1991, Ser. No. 664,055
Int. Cl.[5] G03F *7/32*
U.S. Cl. 430—331 **17 Claims**

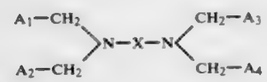
1. A devloper composition consisting essentially of from 10 to 60 wt. % of a monoterpene, from 10 to 50 wt. % of N-methylpyrrolidone, from 1 to 35 wt. % of an aromatic alcohol and from 5 to 12 wt. % of a nonionic surfactant, said wt. % being based on the total weight of the developer composition and the weight ratio of N-methylpyrrolidone/aromatic alcohol being from about 4:1 to about 1:1.

15. The developer composition consisting essentially of from 10 to 60 wt. % of a monoterpene, from 10 to 50 wt. % of N-methylpyrrolidone, from 5 to 12 wt. % of a nonionic surfactant, from 10 to 60 wt. % of an organic solvent having an ether-ester functionality and from 0 to 35 wt. % of an aromatic alcohol, said wt. % being based on the total weight of the developer composition and, when the aromatic alcohol is present, the weight ratio of N-methylpyrrolidone/aromatic alcohol being from about 4:1 to about 1:1.

5,204,228
METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS
Hiroshi Yoshimoto, Tokyo, and Shigeharu Koboshi, Sagamihara, both of Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,701
Claims priority, application Japan, Jun. 29, 1990, 2-172374
Int. Cl.[5] G03C *7/42*
U.S. Cl. 430—393 **8 Claims**

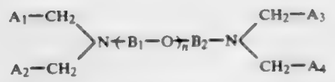
1. A method of processing a silver halide color photographic light-sensitive material having a silver halide emulsion layer containing silver halide grains having a silver chloride content of not less than 80 mol %, wherein said silver halide color photographic material is color-developed and then processed with a bleaching solution (BL-1) comprising at least one of

ferric complex salts of compounds represented by the following formula A or B:



Formula A

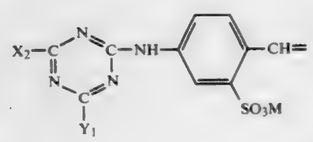
wherein A_1 through A_4, which may be the same or different from each other, each represent $-CH_2OH$, $-COOM$ or $-PO_3M_1M_2$; M, M_1 and M_2 each represent a hydrogen atom, an alkali metal atom or an ammonium group and X represents a substituted or unsubstituted alkylene group having three to six carbon atoms, and



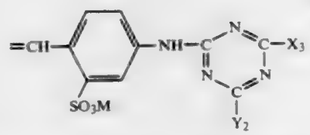
Formula B

wherein A_1 through A_4 are the same as those defined for Formula A; n represents an integer of 1 to 8; and B_1 and B_2, which may be the same or different from each other, each represent substituted or unsubstituted alkylene group having two to five carbon atoms;

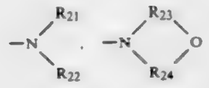
a replenishing volume of said bleaching solution (BL-1) is not more than 50 ml per m^2 of said silver halide color photographic material; and the processing time with said bleaching solution is not longer than 40 seconds, and wherein said silver halide color photographic material is developed with a color developer containing a compound represented by the following Formula E,



Formula E



wherein X_2, X_3, Y_1 and Y_2 each represent a hydroxy group, halogen atom, alkyl group, aryl group,



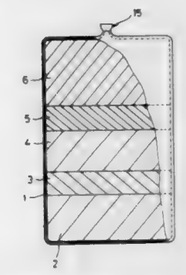
or $-OR_{25}$, wherein R_{21} and R_{22} each represent a hydrogen atom, alkyl group or aryl group; R_{23} *and* R_{24} each represent an alkylene group; R_{25} represents a hydrogen atom, alkyl group or aryl group; and M represents a cation.

5,204,229
REPLENISHING SOLUTION UNIT FOR PREPARING A COLOR DEVELOPING SOLUTION AND METHOD FOR PROCESSING A COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL THEREWITH
Koichi Nakamura, and Masato Taniguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 21, 1991, Ser. No. 795,728
Claims priority, application Japan, Nov. 21, 1990, 2-314104
Int. Cl.[5] G03C *5/30, 5/31, 7/44*
U.S. Cl. 430—399 **12 Claims**

1. A replenishing solution unit for color-developing a color photographic light-sensitive material, comprising at least (1) a replenishing solution containing an aromatic primary amine color developing agent and a sulfinic acid or a salt thereof and the pH of said replenishing solution is 2 to 6 and (2) a replenishing solution containing a replenishing solution component other than the color developing agent.

9. A method for processing a color photographic light-sensitive material in color development comprising using a replenishing solution unit comprising at least (1) a replenishing solution containing an aromatic primary amine color developing agent and a sulfinic acid or a salt thereof wherein the pH of said solution is 2 to 6 and (2) a replenishing solution containing a replenishing solution component other than the developing agent, and the method comprises adding the replenishing solution containing the developing agent to a color developing solution separately from the replenishing solution containing a replenishing solution component other than the developing agent or by mixing such with a third replenishing solution.

5,204,230
VACUUM PACKAGED PHOTOGRAPHIC PROCESSING COMPOSITION
Katsumi Hayashi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 29, 1991, Ser. No. 706,693
Claims priority, application Japan, May 29, 1990, 2-138858
Int. Cl.[5] G03C *5/18, 5/26*
U.S. Cl. 430—450 **46 Claims**



1. A vacuum packaged photographic processing composition consisting of a plurality of photographic processing components which are received in a container and vacuum sealed, said plurality of components are contained in separate solid state layers, wherein at least one of said plurality of components includes a normally liquid component which is converted into a solid adduct for containment.

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5,204,236
SILVER HALIDE PHOTOGRAPHIC MATERIALS

(h) GCTGAAGAACTTCCTATTCGTGGTGGT-GAGC;

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5,204,231

WHITE SAFELIGHT HANDLEABLE PHOTOGRAPHIC FILM CONTAINING A FILTER DYE LAYER

Elfriede Stockel, Queens Village, and Thomas R. Smith, Selden, both of N.Y., assignors to Konica Imaging, U.S.A., Inc., Glen Cove, N.Y.

Filed Mar. 31, 1992, Ser. No. 861,123
Int. Cl.[5] G03C 1/46
U.S. Cl. 430—507 28 Claims

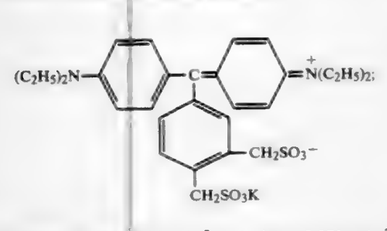
1. A film containing a filter dye layer coated over a light-sensitive silver halide emulsion layer on the side opposite the emulsion support, comprising:

A. a support selected from the group consisting of paper, polymer coated paper, and polymeric film;

B. a silver halide emulsion layer coated on one side of said support in a quantity sufficient to provide a final silver deposition of between 0.5 and 5.0 grams per square meter; and

C. a filter dye layer on top of said silver halide emulsion layer on the side opposite said support, said filter dye layer comprising:

a. between about 0.0065 g/m^2 and about 0.204 g/m^2 of a green dye having absorbance maxima at 628–632 nm and 430 nm, with the following structure



b. between about 0.014 g/m^2 and about 0.271 g/m^2 of a yellow dye with an absorbance maximum between 375 and 550 nm; and

c. between about 0.430 g/m^2 and about 1.399 g/m^2 of a binder.

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PHOTOGRAPHIC MATERIAL WITH FLUORESCENCE COMPOUND RELEASER

Hirokazu Sato; Shigeo Tanaka, and Satoru Ikesu, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 666,914
Claims priority, application Japan, Mar. 15, 1990, 2-65830
Int. Cl.[5] G03C 7/26, 7/32, 7/18
U.S. Cl. 430—512 9 Claims

1. A light-sensitive silver halide photographic material having at least one silver halide emulsion layer on a support, characterized in that at least one layer of the above silver halide emulsion layers contains a compound represented by the following formula (I):

(I)

wherein n represents 0 or 1; A represents a compound residue which cleaves a bonding to Time in the case of n=1 or a compound residue which cleaves one of bondings to FL in the case of n=0; Time represents a timing group which cleaves a bonding to FL after cleavage from A; and FL represents a compound residue which, as a function of development, emits fluorescence by cleavage of a bonding to Time in the case of n=1 and a compound residue which, as a function of development, emits fluorescence by cleavage of one of bondings to A in the case of n=0.

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PHOTOGRAPHIC SILVER HALIDE ELEMENT HAVING COATED PARTICLES

Akira Ogasawara, and Takeo Arai, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 772,230
Claims priority, application Japan, Oct. 9, 1990, 2-270704; Feb. 13, 1991, 2-19977
Int. Cl.[5] G03C 1/76
U.S. Cl. 430—523 3 Claims

1. A silver halide photographic light-sensitive material comprising a support and provided thereon, a silver halide emulsion layer and a hydrophilic colloidal layer comprising particles with an average particles size of 0.5 to 20 μ coated with a silane coupling agent in that order, wherein said particles are composed of amorphous silica or polymethylmethacrylate and contained in an amount of 1 to 150 mg/m^2.

5,204,234

SILVER HALIDE PHOTOGRAPHIC MATERIAL WHICH CONTAINS AN IRON DOPANT AND SUBSTANTIALLY NO SILVER IODIDE

Masahiro Asami, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 10, 1990, Ser. No. 595,290
Claims priority, application Japan, Oct. 18, 1989, 1-271081
Int. Cl.[5] G03C 1/08, 1/005
U.S. Cl. 430—567 11 Claims

1. A silver halide photographic material comprising a base and on said base at least one photosensitive emulsion layer containing silver halide emulsion of a surface latent image type that contains silver halide grains of silver chloride or silver chlorobromide made up of 90 mol % or more of silver chloride substantially free from silver chloride, said silver halide grains containing iron ions in an amount of 10^{-7} to 10^{-3} mol per mol of the silver halide wherein said silver halide grains comprise a core and a surface layer that amounts to 50% or less of the grain volume and the iron ions are supplied together with a supply of an aqueous silver salt solution and an aqueous halide solution for forming the surface layer so that the concentration of iron ions in the surface layer is then times or more the concentration of iron ions in the core.

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METHOD FOR MANUFACTURING SILVER HALIDE EMULSION IN WHICH THE RIPENING TEMPERATURE IS LESS THAN THE NUCLEATION TEMPERATURE

Shin-ichi Yamamoto, Hachioji, and Toshihiko Yagi, Shiroyama, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 19, 1991, Ser. No. 810,164
Claims priority, application Japan, Dec. 27, 1990, 2-408178
Int. Cl.[5] G03C 1/015
U.S. Cl. 430—569 23 Claims

1. A method for manufacturing a silver halide emulsion, which mainly comprises twin silver halide grains, comprising steps of

forming a precipitation nuclei of silver halide grains by adding a water-soluble silver slat and a water soluble halide salt to a protective colloid solution,

applying Ostwald ripening to aid precipitation nuclei aty a temperature lower than the temperature at which said silver halide nuclei are formed in the presence of a bromide and ammonia, to form silver halide seed grains which mainly comprises twin grains having an average grain size of less than 0.25 μm, and less than 50% of a surface area of each of said seed grains is occupied with {100} surface, and

growing said seed grains by adding a component of silver halide to a liquid containing said seed grains.

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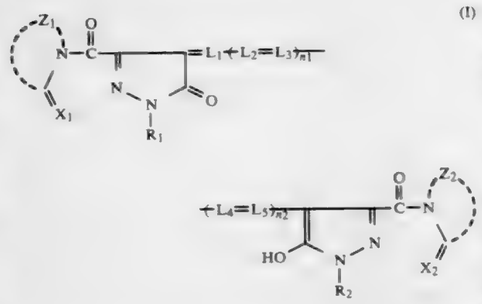
SILVER HALIDE PHOTOGRAPHIC MATERIALS

Yasuhiko Kawashima, and Reiko Yamauchi, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 842,481
Claims priority, application Japan, Mar. 26, 1991, 3-61931
Int. Cl.[5] G03C 1/825
U.S. Cl. 430—579 3 Claims

1. A silver halide photographic material which comprises a compound of the general formula (I):



(I)

wherein R_1 and R_2 each represents a hydrogen atom, an alkyl group, an aryl group, an alkenyl group or a heterocyclic group; Z_1 and Z_2 each represents a non-metallic atomic group necessary for forming a 5- to 7-membered ring; X_1 and X_2 each represents an oxygen atom, a sulfur atom or =N-R_3; R_3 is a hydrogen atom, an alkyl group, an aryl group, an alkenyl group, a heterocyclic group or —OR_4; R_4 represents a hydrogen atom, an alkyl group, an aryl group, an alkenyl group or a heterocyclic group; L_1 to L_5 each represents a methine group; and n_1 and n_2 each represents an integer of 0, 1 or 2.

5,204,237

UNIVERSAL AND SPECIFIC PROBES FOR *BACILLUS THURINGIENSIS* ENDOTOXIN GENES

Frank H. Gaertner, San Diego; August J. Sick, Oceanside, and George E. Schwab, La Jolla, all of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation of Ser. No. 427,068, Oct. 25, 1989, abandoned.
This application Jul. 26, 1991, Ser. No. 737,569
Int. Cl.[5] C12Q 1/68; G01N 33/566, 33/48; C07H 15/12
U.S. Cl. 435—6 36 Claims

1. A gene probe for identifying *Bacillus thuringiensis* DNA encoding insecticidally-active protein endotoxins consisting essentially of a nucleotide sequence selected from the group consisting of

(a) GGACCAGGATTTACAGGAGGAGAT;
(b) ATGATTCATGCGGCAGATA;
(c) GGTGATTTTACACAAGGGGTAATGGGGGTGGCATG;
(d) AAAGCTCTTGCAGAGTTACAGGG;
(e) GAATTATACTTGGTTCAGGCCC;
(f) GTCCAATCGGAAAATGTGCCC;
(g) CCAATTCACTTCCCATCGAC;
(h) GCTGAAGAACTTCCTATTCGTGGTGGTGAGC;
(i) CGTTATGGAGAGCAGCGCA;
(j) GTTAGCGCATCAACAGTCCAAACGGG;
(k) CATGTTTATACTAACCATTGTGTGGATACG;
(l) CGTAGCAGCAGAAATCGGCTTGGGC;
(m) GGGAGGAACAAATATGAATCCTTATC;
(n) CAGGCTATCCGTTAGCGAATGACTTACAAGGG;
(o) AATGTTGGCGCGGTCAGCTGGG; and
(p) TACAATGGCTATTTAGGTGCACAG.

5,204,238

PROCESS FOR THE REDUCTION OF STAR ACTIVITIES

Frank Laue, Pühl; Waltraud Ankenbauer, Penzberg, and Gudrun Schmitz, Bernried, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 14, 1991, Ser. No. 669,562
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1990, 4009663
Int. Cl.[5] C12Q 1/68; C12N 9/24
U.S. Cl. 435—6 9 Claims

1. Process for the reduction of nonspecific star activities during the specific cleavage of deoxyribonucleic acids comprising incubation with a restriction endonuclease in an appropriate buffer, wherein an antibiotic which binds to the DNA on or near the star sequences of the enzyme but not within the specific recognition sequence of the restriction endonuclease is added to the incubation batch.

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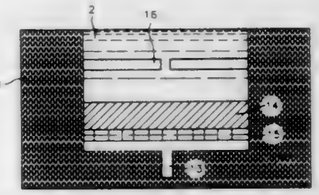
BIOSENSORS INCLUDING LIPID BILAYER DOPED WITH ION CHANNELS ANCHORED TO A RECORDING ELECTRODE BY BRIDGING MOLECULES

Carlos Gitler, and Itzhak Yuli, both of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Jan. 9, 1991, Ser. No. 638,488
Claims priority, application Israel, Jan. 9, 1990, 93020
Int. Cl.[5] C12Q 1/00; G01N 33/53, 33/566; C12M 1/40
U.S. Cl. 435—7.1 10 Claims



1. A biosensor for qualitative and quantitative analysis of an anylate comprising a containment chamber having at least one wall comprised of apolar material exposed to the containment chamber; bulk aqueous electrolyte medium contained in said containment chamber; a reference electrode located in an upper part of the containment chamber immersed in said electrolyte medium; a recording electrode located at the bottom of said containment chamber; a liquid crystalline membrane comprised of a lipid bilayer doped with ion channels wherein said liquid crystalline membrane is immersed in the electrolyte medium between the reference electrode and the recording electrode; and bridging anchoring molecules attached to the recording electrode on one side and to the lipid bilayer on the other side to anchor the lipid bilayer to the recording electrode in a spaced relationship so that the lipid bilayer is in continuous contact with the bulk aqueous electrolyte medium on both the upper and lower surfaces of the lipid bilayer with the boundaries of the lipid bilayer being

sealed by apolar contact with the apolar material of the at least

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EXTRACTION OF THYMIDINE AND OTHER

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PROCESS FOR PREPARING

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sealed by apolar contact with the apolar material of the at least one wall.

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METHOD AND A KIT CONTAINING MEANS FOR THE KINETIC DETERMINATION OF FACTOR XIII

Werner Stüber, Lahntal, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

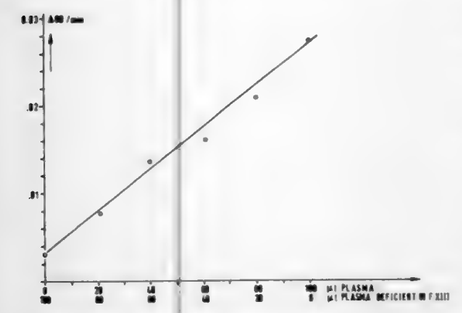
Filed Apr. 5, 1989, Ser. No. 333,371

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811647

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] C12Q *1/56*; G01N *33/86*; C07K *7/06*

U.S. Cl. 435—13 **12 Claims**



1. A method for the determination of Factor XIII in a Factor XIII-containing sample in which the sample is activated with thrombin in the presence of a fibrin-aggregation inhibitor and incubated with a substrate for Factor XIII, with a primary amine and with a buffer substance in solution, and the ammonia which is formed is determined using NADH, glutamic dehydrogenase and ketoglutarate, wherein the substrate for Factor XIII is

X-Gly-Pro-Gly-Gln-Ser-Lys-Val-Y-Gly-amide

wherein X is selected from the group consisting of H, at least one naturally occurring amino acid, the D-form of at least one naturally occurring amino acid, and a dipeptide formed by any of these amino acids; and

wherein Y is selected from the group consisting of Ile and Leu.

5,204,241

GLUTATHIONE-S-TRANSFERASE MU AS A MEASURE OF DRUG RESISTANCE

Ronald W. Pero, New York, N.Y., assignor to Oxi-Gene Inc., New York, N.Y.

Filed Oct. 22, 1990, Ser. No. 601,266

Int. Cl.[5] C12Q *1/48*; C12N *9/00*

U.S. Cl. 435—15 **13 Claims**

1. A method of determining the resistance of a human individual to a nitrosourcea which comprises determining the GST mu activity of the individual, to establish a measured value of the individual's GST mu activity, and comparing said measured value with a predetermined value, the presence of a GST mu activity above said predetermined value indicting that the individual is resistant to the nitrosourcea.

5,204,242

SUBSTITUTED PHENOLS

Martina Junius-Comer, Iffeldorf; Bernd Vogt, Tutzing, and Rupert Herrmann, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

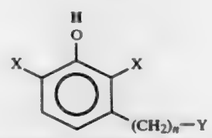
Filed Sep. 17, 1991, Ser. No. 761,335

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1990, 4029709

Int. Cl.[5] G03C *1/06, 1/40*; C07C *79/32*

U.S. Cl. 435—28 **39 Claims**

1. Compounds of the formula:



(I)

wherein X is bromine or chlorine, n is 1, 2 or 3, Y is COOR, CONRR', SO_3R, SO_2NRR' or OR and R and R', independently of one another, are hydrogen or C_1–C_3-alkyl.

5,204,243

RECOMBINANT POXVIRUS INTERNAL CORES

Enzo Paoletti, Albany, N.Y., assignor to Health Research Incorporated, Albany, N.Y.

Filed Feb. 14, 1990, Ser. No. 480,097

Int. Cl.[5] C12P *21/00*; C12N *7/01, 7/04*; A61K *39/00*

U.S. Cl. 435—69.1 **17 Claims**

1. A substantially purified recombinant poxvirus core devoid of viral envelope by in vitro modification, said core containing therein exogenous DNA in a nonessential region of the poxvirus genome; the core being capable of expression of the exogenous DNA when inoculated into a host, without production of infectious progeny.

16. A method for expressing a gene product in a cell cultured in vitro, which method comprises introducing into the cell a substantially purified recombinant poxvirus core devoid of viral envelope by in vitro modification, said core containing therein exogenous DNA in a nonessential region of the poxvirus genome; the core being capable of expression of the exogenous DNA when introduced into the cell, without production of infectious progeny.

5,204,244

PRODUCTION OF CHIMERIC ANTIBODIES BY HOMOLOGOUS RECOMBINATION

H. Perry Fell, Redmond, and Kim R. Folger Bruce, Seattle, both of Wash., assignors to Oncogen, Seattle, Wash.

Continuation-in-part of Ser. No. 113,800, Oct. 27, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 243,873

Int. Cl.[5] C12N *15/00, 5/00*

U.S. Cl. 435—69.6 **21 Claims**

1. A method for the production of a cell line expressing a modified antibody molecule comprising:

(a) transfecting an antibody producing lymphoid cell line with a target vector comprising:

(i) a replacement gene to modify a portion of the genomic sequence of the immunoglobulin genes of the lymphoid cell line, and

(ii) a target sequence homologous to a second DNA sequence adjacent to the immunoglobulin sequence to be converted,

so that the replacement gene modifies the immunoglobulin sequence via site specific homologous recombination with genomic chromosomal DNA in vivo; and

(b) selecting a transfectant which produces the modified antibody molecule.

5,204,245

EXTRACTION OF THYMIDINE AND OTHER NUCLEOSIDES

James A. Doncheck, Manitowoc; James R. Millis, Kohler, both of Wis., and Paul E. Swanson, Midland, Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1991, Ser. No. 700,659

Int. Cl.[5] C12P *19/38, 19/40, 19/30*

U.S. Cl. 435—87 **8 Claims**

1. An enzymatic process comprising grinding barley malt sprouts to finer than about 60 mesh, suspending the ground sprouts in water to a solids content of 3 to 15 weight percent, adding 1.0 to 10 mM magnesium salt, 1.0 to 10 mM calcium salt, 0.1 to 1 mM zinc salt, to the dispersion, holding the dispersion at 40° to 60° C. for 12 to 70 hours, and recovering at least one of thymidine, cytidine, uridine, guanosine or deoxy-guanosine from the product.

5,204,246

DNA ISOLATION METHOD

Anil K. Jhingan, Polk County, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Dec. 26, 1990, Ser. No. 634,256

Int. Cl.[5] C12N *1/08, 1/06*; C12P *19/34*

U.S. Cl. 435—270 **7 Claims**

1. A method for disrupting cell walls in a DNA extraction process, comprising the steps of contacting the cells with an aqueous solution comprising a compound or compounds that form xanthate reaction products with cell wall polysaccharides and isolating DNA from the cells.

5,204,247

LACTOBACILLUS SP. KPB-167 AND METHOD OF MANUFACTURING VISCOSE POLYSACCHARIDES EMPLOYING THE SAME

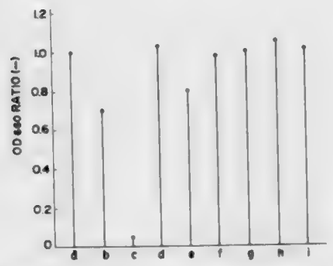
Susumu Adachi; Takahiro Toba; Takao Mukai, all of Sendai; Takashi Watanabe, Kamakura, and Haruhiko Yokoi, Hiratsuka, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 376,686, Jul. 7, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 785,176

Claims priority, application Japan, Jul. 13, 1988, 63-175637

Int. Cl.[5] C12P *19/04*

U.S. Cl. 435—101 **5 Claims**



1. A process of manufacturing Kefiran comprising the steps of: culturing Lactobacillus sp. KPB-167 on a medium containing milk whey and casamino acid; and separating and collecting the Kefiran produced.

5,204,248

PROCESS FOR PREPARING 2-HALOGENO-3-HYDROXY-3-PHENYL-PROPIONIC ACID ESTER COMPOUNDS

Takeji Shibatani, Kobe; Takao Nishida, Amagasaki, and Hiroaki Matsumae, Kobe, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

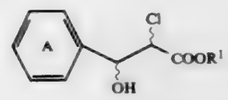
Filed Mar. 22, 1991, Ser. No. 673,553

Claims priority, application Japan, Mar. 22, 1990, 2-69570

Int. Cl.[5] C12P *17/18, 17/14, 17/02*; C07D *281/10*

U.S. Cl. 435—119 **25 Claims**

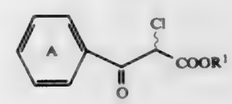
1. A process for preparing a 3R or 3S-2-chloro-3-hydroxy-3-phenyl-propionic acid ester compound represented by the formula (I):



(I)

wherein Ring A is a phenyl group which may be substituted and R^1 is an ester residue,

which comprises permitting an enzyme having the ability of enantioselectively reducing an oxo group to a hydroxy group to act on a 2-chloro-3-oxo-3-phenylpropionic acid ester compound represented by the formula (II):



(II)

wherein Ring A and R^1 have the same meanings as defined above.

5,204,249

PROCESS FOR THE PREPARATION OF CAREBASTINE AND SIMILAR MATERIALS

Harry Schwartz, Hofheim-Diedenbergen, and Henning Böttcher, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraakter Haftung, Fed. Rep. of Germany

Filed Oct. 25, 1991, Ser. No. 783,024

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1990, 4034218

Int. Cl.[5] C12P *17/12*; C12N *1/14*; C07D *211/46*

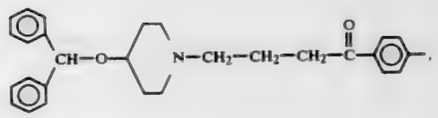
U.S. Cl. 435—122 **4 Claims**

1. A process for the preparation of carebastine and similar materials comprising microbiologically oxidizing compounds of formula I:

(I)

wherein

R =



or

-continued

5,204,252

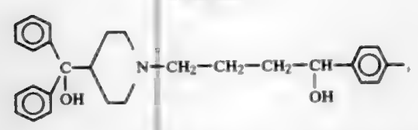
CANDIDA TROPICALIS TRANSFORMATION SYSTEM

sheet being a resilient membrane fixedly secured at its edges against movement,

5,204,255

HYBRID TISSUE PLASMINOGEN

-continued



wherein any or all of the phenyl groups and/or piperidinyl groups is/are substituted by alkyl, alkoxy or halo and wherein alkyl portion has 1–6 carbon atoms; with a *Cunninghamella blakesleeana* or *Cunninghamella elegans* and recovering the oxidized product.

5,204,250

PROCESS FOR PRODUCTION OF ARACHIDONIC ACID

Yoshifumi Shinmen; Hideaki Yamada, and Sakayu Shimizu, all of Kyoto, Japan, assignors to Suntory Limited, Osaka, Japan

Continuation of Ser. No. 22,820, Mar. 6, 1987, abandoned. This application Sep. 26, 1990, Ser. No. 588,473

Claims priority, application Japan, Mar. 31, 1986, 61-71270; Jan. 28, 1987, 62-15920

Int. Cl.[5] C12P *7/64, 1/02;* C12N *1/38*

U.S. Cl. 435—134 **1 Claim**

1. A process for producing arachidonic acid or a lipid comprising arachidonic acid, comprising culturing a microorganism selected from the group consisting of *Mortierella elongata* IFO 8570, *Mortierella elongata* SAM 0219 (FERM BP-1239), *Mortierella exigua* IFO 8571, and *Mortierella hygrophila* IFO 5941 wherein culturing is effected in a medium comprising an additive selected from the group consisting of n-hexadecane, n-octadecane, a salt of oleic acid, a salt of linolenic acid, a salt of linoleic acid, olive oil, corn oil, coconut oil, soybean oil and linseed oil, to produce arachidonic acid or a lipid comprising arachidonic acid, and recovering said arachidonic acid or lipid comprising arachidonic acid.

5,204,251

PROCESS OF ENZYMATIC INTERESTERIFICATION MAINTAINING A WATER CONTENT OF 30–300 PPM USING RHIZOPUS

Susumu Kyotani; Isao Tsujimura, and Hideki Fukuda, all of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo & Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 192,029, May 9, 1988, abandoned. This application Jun. 19, 1991, Ser. No. 717,864

Claims priority, application Japan, May 11, 1987, 62-115475; Oct. 5, 1987, 62-250953

Int. Cl.[5] C12P *7/64;* C12N *11/14*

U.S. Cl. 435—134 **1 Claim**

1. A process of interesterification which comprises:

subjecting a reaction liquid containing:

(a) a fat or oil; and

(b) a member selected from the group consisting of

(i) a fat or oil differing from component (a)

(ii) a fatty acid ester of a lower alcohol; and

(iii) a fatty acid;

to the action of a lipase contained in dry microbial cells or immobilized dry microbial cells said cells having a water content of 0.1 to 20% by weight, and belonging to Rhizopus species while adjusting water concentration by adding water to the reaction mixture so as to maintain a water concentration of the reaction mixture ranging from 30 to 300 ppm.

5,204,252

***CANDIDA TROPICALIS* TRANSFORMATION SYSTEM**

James M. Cregg; Martin A. Gleeson, both of San Diego, Calif.; Lisa Haas, New York, N.Y., and Stephen Picataggio, Santa Rosa, Calif., assignors to Henkel Research Corporation, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 308,481, Feb. 8, 1989, abandoned. This application Jul. 27, 1989, Ser. No. 386,837

Int. Cl.[5] C12N *15/52, 15/63, 15/81, 1/19*

U.S. Cl. 435—255 **9 Claims**

1. A method for transforming *Candida tropicalis* comprising:

(1) providing an auxotrophic host which requires uracil for growth due to a lack of orotidine-5'-phosphate decarboxylase as the result of mutations in the URA3A and RUA3B genes; (2) enzymatically treating the cell wall of said auxotrophic host; (3) adding to the resulting spheroplasts a DNA construct comprising the *C. tropicalis* URA3A or URA3B genes and which functionally compliments the auxotrophic mutation in said host; (4) fusing said DNA construct with said auxotrophic host to form transformed cells; (5) selecting said transformed cells by their ability to grow in a selective medium lacking uracil.

5,204,253

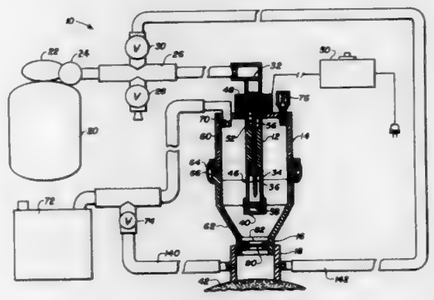
METHOD AND APPARATUS FOR INTRODUCING BIOLOGICAL SUBSTANCES INTO LIVING CELLS

John C. Sanford; Michael J. DeVit, both of Geneva, N.Y.; Ronald F. Bruner, Sewell, N.J., and Stephen A. Johnston, Durham, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1990, Ser. No. 529,989

Int. Cl.[5] C12N *15/00, 15/89;* C12M *1/00*

U.S. Cl. 435—172.3 **35 Claims**



1. A method of introducing particles carrying biological materials into a target of cells, said method comprising the steps of:

providing a planar carrier sheet having a target side, said sheet being a resilient membrane fixedly secured at its edges against movement,

providing a target of cells,

positioning particles carrying biological materials on the target side of the planar carrier sheet, and

exposing said sheet to the force of an instantaneous cold gas shock wave so as to accelerate the particles free of the carrier sheet and to cause them to penetrate the surface of the cells and become incorporated into the interior of the cells without killing the cells, said cold gas shock wave causing distension but not rupture of the membrane, thereby protecting the target from the shock wave.

22. Apparatus for introducing particles carrying biological materials into a target of cells and/or tissue comprising:

a closed housing capable of sustaining a vacuum, the housing having a first port for applying a vacuum thereto, a major axis, and second and third ports lying on the axis, the third port defining a throat portion where particles are accelerated and the third port located on the target side of the housing,

a high pressure chamber positioned in the second port and having a portion positioned toward the throat portion, the pressure chamber constructed so as to release gas stored therein to provide a gas shock wave directed toward the throat portion,

means for positioning the particles in the throat portion for their acceleration by the force of the shock wave provided by the high pressure chamber through the third port toward the target, and an interface secured to the throat portion for coupling the throat portion to the target, the portion of the pressure chamber toward the throat portion being sealed by a rupturable membrane.

5,204,255

HYBRID TISSUE PLASMINOGEN ACTIVATOR/UROKINASE POLYPEPTIDES

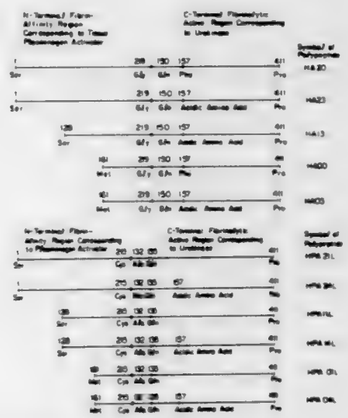
Michito Tagawa; Masakatsu Wada; Masayuki Yamada; Midori Yokoyama, and Naganori Numao, all of Sagamihara, Japan, assignors to Seqami Chemical Research Center, Tokyo; Central Glass Company, Limited, Ube; Hodogaya Chemical Co., Ltd., Tokyo; Nippon Soda Company, Limited, Tokyo; Nissan Chemical Industries, Limited, Tokyo and Toyo Soda Manufacturing Co., Ltd., Shinnanyo, all of Japan

Continuation of Ser. No. 7,865, Jan. 28, 1987, abandoned. This application Jul. 3, 1991, Ser. No. 726,129

Claims priority, application Japan, Jan. 31, 1986, 61-017734

Int. Cl.[5] C12N *9/48, 9/64, 9/72*

U.S. Cl. 435—215 **5 Claims**



1. The hybrid polypeptide HA20.
2. The hybrid polypeptide HA23.
3. The hybrid polypeptide HA13.
4. The hybrid polypeptide HPA21L.
5. The hybrid polypeptide HPA24L.

5,204,254

MALTOPENTAOSE PRODUCING AMYLASES

Gerhard Schmid; Anton Caduusio, both of Munich, and August Bock, Kaltenberg, all of Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed May 29, 1991, Ser. No. 706,699

Claims priority, application Fed. Rep. of Germany, May 31, 1990, 4017595

Int. Cl.[5] C12N *9/28*

U.S. Cl. 435—202 **2 Claims**

1. An isolated and purified maltopentaose producing A-180 amylase protein, which protein has the following properties:

(a) a molecular weight of 180,000 daltons as measured by SDS polyacrylamide gel electrophoresis;

(b) a pI of 4.65 as measured by isoelectric focusing;

(c) is able to hydrolyze a starch solution to produce a product composition comprising greater than 80% maltopentaose;

(d) is unable to hydrolyze γ-cyclodextrin;

(e) is thermostable up to 50° C. and;

(f) is stable within the pH range 5.5–11.0.

5,204,256

PROCESS FOR THE PURIFICATION OF PLASMINOGEN ACTIVATOR INHIBITOR 2 (PAI-2)

Klaus-Peter Radtke, La Jolla, Calif.; Norbert Heimburger, Marburg, and Karlheinz Wenz, Weimar, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 719,078, Jun. 19, 1991, abandoned, which is a continuation of Ser. No. 577,632, Sep. 4, 1990, abandoned. This application Jun. 2, 1992, Ser. No. 892,634

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929504

Int. Cl.[5] C12N *9/50, 9/64*

U.S. Cl. 435—226 **12 Claims**

1. A process for the purification of plasminogen activator inhibitor 2 (PAI-2), which comprises the steps:

(a) preincubating a PAI-2-containing solution with a compound which cleaves disulfide linkages;

(b) mixing said solution with a water-soluble acridine or quinoline base to precipitate impurities in the solution; and

(c) separating the precipitated impurities to obtain PAI-1 in purified form.

5,204,257

tration of liquid ethanol in a fermentation broth over the range

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5,204,260

5,204,264

METHOD FOR VALIDATION OF CALIBRATION

VOL 1149 ISS 3 AP 20 1993 UMI

5,204,257
METHOD OF RECOVERING BACTERIOPHAGE
David A. DeBonville, Beverly, and Kelley A. Logan, Somerville, both of Mass., assignors to Autogen Instruments, Inc., Beverly, Mass.
Filed Apr. 29, 1991, Ser. No. 693,133
Int. Cl.[5] C12N 7/02; C07K 3/12
U.S. Cl. 435—239 17 Claims

17. A method of recovering bacteriophage from liquid broth medium, comprising:
mixing a liquid medium containing bacteriophage with a 0.5 to 2.0M inorganic chloride salt or acetic salt solution/hydroxylated silica mixture to bind the bacteriophage;
incubating the mixture;
centrifuging the incubated mixture to pellet the bound bacteriophage; and
separating the pellet from the liquid.

5,204,258
GENE EXPRESSING VPT PROTEIN AND VECTORS EXPRESSING THIS PROTEIN
William A. Haseltine, Cambridge, and Eric Cohen, Brighton, both of Mass., assignors to Dana Farber Cancer Institute, Boston, Mass.
Filed Jun. 2, 1989, Ser. No. 360,847
Int. Cl.[5] C12N 1/00, 1/21, 15/00, 15/49
U.S. Cl. 530—403 7 Claims

1. A DNA segment containing a functional vpt gene but not the entire HIV genome, wherein the DNA segment will not express functional tat protein having the ability to trans-activate.

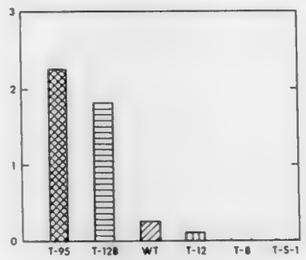
5,204,259
METHODS AND SYSTEMS FOR PRODUCING HIV ANTIGENS
Torsten B. Helting, La Jolla, Calif.; Hakan Drevin, Uppsala, Sweden, and Michael F. Nunn, Solana Beach, Calif., assignors to Pharmacia Genetic Engineering, Inc., La Jolla, Calif.
Continuation-in-part of Ser. No. 191,229, May 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 206,499, Jun. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 258,016, Oct. 14, 1988, abandoned.
U.S. Cl. 435—252.3 12 Claims

1. A DNA segment comprising a first nucleotide base sequence operatively linked at its 3' terminus to the 5' terminus of a second nucleotide base sequence, said first sequence having a nucleotide base sequence represented by the formula:

AGGAGGGTTTTTCAT,

and said second sequence having a nucleotide base sequence encoding amino acid residues of a recombinant HIV p24 protein as shown in FIG. 1A, from amino acid residue 1 through amino acid residue 232, or as shown in FIG. 1B, from amino acid residue 1 through amino acid residue 225.

5,204,260
METHOD FOR MAKING BIOCONTROL AGENTS RHIZOSPHERE-COMPETENT
Syed J. Ahmad, Tahir Ahmadiyya Muslim High School, Mansakonko (L.R.D) The Gambia, South Africa, and Ralph Baker, 1216 Southridge, Ft. Collins, Colo. 80521
Continuation of Ser. No. 72,343, Jul. 10, 1987, abandoned. This application Apr. 30, 1990, Ser. No. 516,325
The portion of the term of this patent subsequent to Mar. 9, 2010, has been disclaimed.
Int. Cl.[5] C12N 1/14, 15/00; A01N 63/00; A01C 1/06
U.S. Cl. 435—254 1 Claim

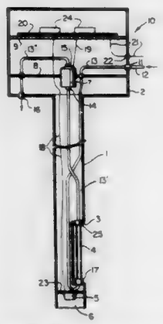


1. A rhizosphere competent bicontrol agent, said biocontrol agent comprising *Trichoderma harzianum* ATCC 20835.

5,204,261
CATALASE-NEGATIVE *PICHIA PASTORIS*
William D. Prevatt, and George T. Sperl, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 24, 1991, Ser. No. 690,433
Int. Cl.[5] C12N 1/16
U.S. Cl. 435—255 1 Claim

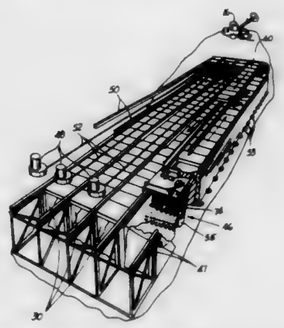
1. A biologically pure culture of *Pichia pastoris* strain NRRL Y-18584.

5,204,262
ETHANOL SENSOR FOR COMPUTERIZED FERMENTATION CONTROL
Anton G. Meiering, 25 Hales Crescent, Guelph, Ontario N1G 1P4, and Ronald E. Subden, 160 Maples Street, Guelph, Ontario N1G 2G7, both of Canada
Filed Mar. 1, 1991, Ser. No. 662,291
Claims priority, application Canada, Mar. 1, 1990, 2001297
Int. Cl.[5] C12M 1/34, 1/04; G01N 25/18
U.S. Cl. 435—291 13 Claims



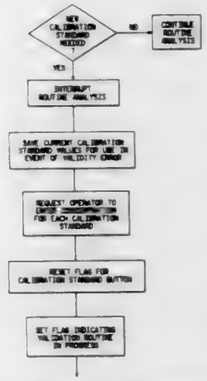
1. A probe for continuously measuring the precise concentration of liquid ethanol in a fermentation broth over the range of feasible fermentation temperatures, said probe comprising:
a. a thermal sensor;
b. a gas permeable membrane leading to a vapor channel;
c. an ethanol vapor sensor in a vapor sensing chamber;
d. a microcomputer, said microcomputer being loaded with a first set of data defining the initial concentration of fermentation broth, acid and cellulosic components and microbial concentration, and density, and a second set of data defining the ethanol diffusion rate through said gas permeable membrane as a function of the temperature of said fermentation broth;
e. inlet means for a flushing gas and outlet means for said flushing gas and tubular interconnections for said flushing gas, said tubular interconnections being provided for leading said flushing gas through said vapor channel, through said vapor sensing chamber, past said ethanol vapor sensor, and out through said outlet means;
f. electrical lines leading from said thermal sensor to said microcomputer, said electrical lines being constructed to carry an output signal which is proportional to the temperature of said fermentation broth;
g. electrical lines leading from said ethanol vapor sensor to said microcomputer, said electrical lines being constructed to carry an output signal which is proportional to the concentration of ethanol vapor; and
h. evaluating software loaded into said microcomputer to correlate said output signal proportional to said fermentation broth temperature, said output signal proportional to said ethanol vapor concentration and said second set of data defining said ethanol diffusion rate through said gas permeable membrane as a function of temperature and to provide a single output consisting of the actual concentration of liquid ethanol in said fermentation broth.

5,204,263
CHANNEL COVER
Larry J. Finn, Gladewater, Tex., assignor to Bedminster Bioconversion Corporation, Cherry Hill, N.J.
Filed Sep. 27, 1991, Ser. No. 766,829
Int. Cl.[5] C12M 1/06, 1/02
U.S. Cl. 435—315 18 Claims



1. In a composting system, comprised of a channel storing compost to be cured, said channel being of generally U-shaped, cross-sectional configuration and having a floor, sidewalls and an upwardly presented open face, the improvement comprising: a temperature-insulating cover overlying and closing the open face of the channel, turning means for periodically turning compost stored within the channel; and means for moving said temperature-insulating cover in advance of said turning means as it moves along the channel.

5,204,264
METHOD FOR VALIDATION OF CALIBRATION STANDARDS IN AN AUTOMATIC CHEMICAL ANALYZER
Jon J. Kaminer, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 14, 1991, Ser. No. 669,654
Int. Cl.[5] G01N 31/00, 35/00; G01C 17/38
U.S. Cl. 436—8 1 Claim



1. In a method for analyzing the concentration of a sample using an automatic analyzer wherein the possibility of human operator faults in entry of calibration standard concentrations or mislabeled standards exists that includes the steps of generating a calibration curve by means of said automated analyzer based on the concentrations of one or more calibration standards coupled to said automated analyzer and storing said curve in said analyzer, each of said calibration standards having a different known concentration, detecting a change in response caused by the concentration of said sample and comparing said change to said calibration curve to determine if said concentration of said sample is within a predetermined range of said calibration curve, the improvement being validating the concentration of a replacement calibration standard to be used in place of an expended calibration standard in said analyzer, said improvement comprising: using a portion of said replacement calibration standard as a sample, comparing said concentration of said portion to said calibration curve and signaling if said concentration of said portion is not within said predetermined range.

5,204,265
METHOD OF STABILIZING A CARBON DIOXIDE SENSOR
Alan Nelson, San Diego; Henry K. Hui, Laguna Niguel; Monte Bennett, Escondido; Soonkap Hahn, Poway, and Charles S. Bankert, Oceanside, all of Calif., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.
Continuation of Ser. No. 597,816, Oct. 15, 1990, abandoned. This application Aug. 21, 1992, Ser. No. 933,884
Int. Cl.[5] G01N 31/00; G01C 17/38; A61B 5/05
U.S. Cl. 436—8 6 Claims

1. A method of stabilizing non-specific drift of an optical fiber carbon dioxide sensor adapted for measurement of the concentration of carbon dioxide in a fluid, comprising the steps of:
exposing the sensor to a first aqueous solution infused with a concentration of carbon dioxide which is higher than a normal physiologically significant blood level of carbon dioxide for at least one hour; and
exposing the sensor for at least one day to a second aqueous solution infused with a gas consisting essentially of from 2

weight percent to 15 weight percent of carbon dioxide,

separating said solvent from said solid;

motion being timed for interaction with an element when an element is in the target location and for interaction with a cell

introduced gas, and mixing the introduced gas and the entrained resultant gases, oxidizing the entrained resultant gases

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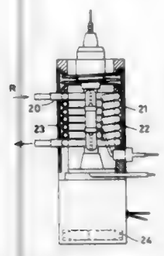
weight percent to 15 weight percent of carbon dioxide, with the balance of the gas being inert.

5,204,266

METHOD AND APPARATUS FOR LIQUID PHASE CALIBRATION OF OXYGEN AND CARBON DIOXIDE PARTIAL PRESSURE

Claudio Calzi, Milan, Italy, assignor to Instrumentation Laboratory SpA, Milan, Italy

Filed Jul. 24, 1989, Ser. No. 383,645
Claims priority, application Italy, Aug. 10, 1988, 21689 A/88
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.[5] G01N *31/00, 33/50*
U.S. Cl. 436—11 **11 Claims**



1. A method of preparing a substance in the liquid phase having a pre-determined partial O_2 and CO_2 pressure, useful for calibrating analytical instruments of the type used to measure blood gases, which method comprises:

a) providing a solution of reagents adapted to generate CO_2,

b) affecting in a pre-determined manner the concentration of O_2 in the solution,

c) conveying the reagent solution to a reaction vessel to conduct a reaction with a pre-determined amount of CO_2 being generated, wherein the reagent solution is conveyed to the reaction vessel through a pressure equalizer exposed to the atmosphere, to equilibrate the pO_2 of the reagent solution,

d) measuring the pressure and temperature in the reaction vessel, and

e) conveying the reacted solution from the reaction vessel to an analytical apparatus for calibration of the analytical apparatus based upon the partial O_2 and CO_2 pressures of the reacted solution.

5,204,267

METHOD OF GLUCOSE STABILIZATION AND ANALYSIS IN DRIED BLOOD SPOT SAMPLES

Jangbir S. Sangha, Overland Park; Linda R. Pflatzgraff, Osawatomie, and Melinda L. Van Hercke, Olathe, all of Kans., assignors to Osborn Laboratories, Inc., Olathe, Kans.

Filed Dec. 17, 1991, Ser. No. 812,066
Int. Cl.[5] G01N *31/00, 33/00*
U.S. Cl. 436—14 **22 Claims**

1. A method of preparing a blood sample and determining the glucose concentration thereof, said method comprising the steps of:

contacting a sorbent with a solution of a means for inhibiting glycolysis;

evaporating said solution to present a sorbent having said means for inhibiting glycolysis thereon;

applying a fluid blood sample to said sorbent;

drying said blood sample on said sorbent to present a dried blood sample;

dissolving a glucose-containing portion of said dried blood sample in a solvent such that a blood protein portion of said dried blood sample substantially remains as a solid;

separating said solvent from said solid;

reacting said glucose-containing solvent with glucose oxidase enzyme and peroxidase enzyme in the presence of a peroxidase enzyme substrate molecule to produce an oxidized substrate molecule; and

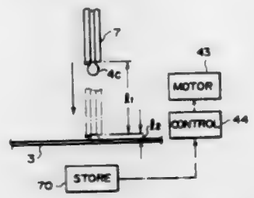
measuring the absorbance of said oxidized substrate molecule to proportionally determine the glucose concentration in the original blood spot.

5,204,268

METHOD AND APPARATUS FOR APPLYING LIQUID SAMPLES

Masaki Matsumoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 360,636, Jun. 2, 1989, abandoned. This application Jan. 28, 1992, Ser. No. 825,843
Claims priority, application Japan, Jun. 2, 1988, 63-136002
Int. Cl.[5] G01N *35/00, 21/01*
U.S. Cl. 436—44 **3 Claims**



1. In a method for applying liquid samples in which a liquid sample accommodated in a sample applying nozzle is delivered therefrom until a droplet of the liquid sample forms at the leading edge of the sample applying nozzle, the sample applying nozzle is then moved down to a sample applying position slightly above a test film, which contains a reagent which will react with the liquid sample and give rise to a change in optical density, so that the droplet comes into contact with the test film and is applied thereto,

wherein the improvement comprises the steps of:

moving said sample applying nozzle with a test film sensor down prior to the formation and application of the droplet of said liquid sample,

sensing said test film with said test film sensor,

measuring said distance by which said sample applying nozzle has been moved down;

stopping said moving of said sample applying nozzle when said test film sensor detects said test film,

storing the distance by which said sample applying nozzle was moved down, and

at the time said liquid sample is applied to said test film, adjusting the distance by which said sample applying nozzle is moved down in accordance with said stored distance so that said sample applying nozzle is moved down to a sample applying position spaced a predetermined distance from said test film.

5,204,269

SAMPLE HANDLING FOR CHEMISTRY ANALYZERS

Stephen F. Barker, Pomona; Samuel G. Ricchio, Fullerton; Glenn A. Benton, Hespertia, and Delbert D. Jackson, Placentia, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 322,814, Mar. 13, 1989, abandoned. This application Apr. 2, 1992, Ser. No. 863,135
Int. Cl.[5] G01N *35/06*
U.S. Cl. 436—47 **18 Claims**

1. A sample handling apparatus comprising discrete elements located in a row on a body, motive means for selectively moving the elements towards and from a target location, a probe at the target location for reciprocal vertical motion, the motion being timed for interaction with an element when an element is in the target location and for interaction with a cell located below the elements when the elements are removed from the target location, wherein the elements are sample containers and the interaction with each of the sample containers is insertion of the probe into each of the sample containers for removal of fluid from selected of the sample containers, and wherein the probe is restrained to vertical motion without transverse movement and wherein the motive means are a first motive means for periodically moving the sample containers relative to the probe in both a lateral and transverse direction, and a second motive means for vertical movement of the probe

for periodically removing samples from a sample container and injecting samples into the cell.

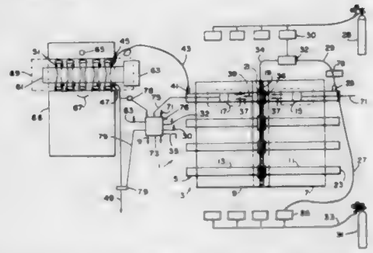
16. A sample handling method comprising selectively moving discrete elements located along a line in a row on a body towards and from a target location, reciprocally vertically moving a probe at the target location, the motion being timed for interaction with an element when an element in the line is in the target location and moving the probe for interaction with a cell located below the elements when the line of elements are removed from the target location, and wherein the line of elements is movable in both a lateral and transverse direction relative to the probe.

5,204,270

MULTIPLE SAMPLE CHARACTERIZATION OF COALS AND OTHER SUBSTANCES BY CONTROLLED-ATMOSPHERE PROGRAMMED TEMPERATURE OXIDATION

Robert B. LaCount, 403 Arbor Ct., Waynesburg, Pa. 15370

Filed Apr. 29, 1991, Ser. No. 692,981
Int. Cl.[5] G01N *25/24, 31/12, 1/10;* **G01J** *3/08*
U.S. Cl. 436—157 **23 Claims**



15. A method of quantitatively analyzing multiple samples, comprising providing plural sample tubes, packing samples in plural first sample tube sections, packing catalyst in plural second catalyst tube sections, connecting each of the sample tube sections with a catalyst tube section, placing the connected sample and catalyst tube sections in horizontal communicating alignment in a furnace having a first hot zone which receives the first tube sections, and a second hot zone which receives the second tube sections, heating the first hot zone to uniformly increasing temperatures, and heating the second hot zone to a constant elevated temperature, introducing gas into an inlet of each sample tube, the gas containing at least 50% oxygen, entraining heated resultant gases from the samples within the sample tube sections and partially oxidizing with the introduced gas, and mixing the introduced gas and the entrained resultant gases, oxidizing the entrained resultant gases in the heated catalyst within the catalyst tube sections, and completing oxidization of the entrained resultant gases and forming oxidation gases, flowing all of the gases out of outlets of the catalyst tube sections and into inlets in plural gas cells connected separately to the outlets of the second catalyst-holding tube sections, flowing all of the gases through the gas cells and releasing the gases from the gas cells under pressure regulation, selectively moving the gas cells into alignment with an infrared beam and detecting influence on the infrared beam by gas within the cells with an electronic detector, increasing temperature within the first hot zone at a slow rate of increase, and sequentially positioning the cells within the infrared light beam and detector during the increase in temperature in the first hot zone for determining gases released from the samples and entrained and oxidized, and thereby determining content of the sample.

5,204,271

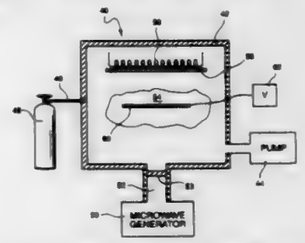
Patent Not Issued For This Number

5,204,272

SEMICONDUCTOR DEVICE AND MICROWAVE PROCESS FOR ITS MANUFACTURE

Subhendu Guha, Troy; Arindam Banerjee, Madison Heights, and Chi C. Yang, Troy, all of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Dec. 13, 1991, Ser. No. 808,209
Int. Cl.[5] H01L *31/18, 21/205*
U.S. Cl. 437—4 **16 Claims**



11. A method of making an improved photovoltaic device of the type comprising a layer of intrinsic semiconductor material disposed between oppositely doped layers of semiconductor material, said method including the steps of:

providing a deposition chamber, said chamber having a plasma region defined therein;

disposing a bias wire in the plasma region;

disposing a source of microwave energy, so as to introduce microwave energy into the plasma region of the deposition chamber;

disposing a substrate having a first, doped semiconductor layer of a first conductivity type disposed upon at least a portion thereof in said plasma region;

introducing an intrinsic semiconductor precursor gas into said chamber;

introducing microwave energy into said chamber so as to energize said intrinsic semiconductor precursor gas so as to create a plasma therefrom which decomposes said intrinsic precursor gas and deposits a layer of intrinsic semiconductor material onto said first doped semiconductor layer;

energizing said bias wire with voltage of at least +50 volts during a first portion of the time the microwaves are energizing the intrinsic semiconductor precursor gas and with a bias of less than +50 volts during a second portion

of the time the microwaves are energizing the intrinsic semiconductor precursor gas;

conductor substrate of a first conduction type, the well region being of a second conduction type;

films (11, 12) which extends at a side of the emitter lead-out electrode (9, 117) in each of the NPN transistor and

dation-resistant insulation film, a first conductor film containing an impurity of a second conductivity type and a

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of the time the microwaves are energizing the intrinsic semiconductor precursor gas;

depositing a second doped semiconductor layer atop said layer of intrinsic semiconductor material, said second doped semiconductor layer being of opposite conductivity type to said first doped semiconductor layer.

5,204,273

METHOD FOR THE MANUFACTURING OF A THYRISTOR WITH DEFINED LATERAL RESISTOR

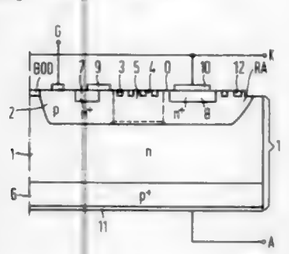
Reinhold Kuhnert; Heinz Mitlehner, both of Munich; Hans-Joachim Schulze, Ottobrunn, and Frank Pfirsch, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 723,800

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1990, 4026318

Int. Cl.[5] **H01L** *21/332*

U.S. Cl. 437—6 **7 Claims**



1. A method for manufacturing a thyristor with integrated lateral resistor comprising the steps of: generating in a semiconductor body of a first conductivity type a deposition layer of a second conductivity type with a predetermined doping concentration starting from a surface of the semiconductor body; introducing within an area for the resistor of the semiconductor body regularly arranged recesses in the deposition layer thereby leaving respective ribs between the recesses; adjusting the resistance value of a lateral resistor as defined by a width ratio of the recesses and the ribs within given tolerances; driving, by heating the semiconductor body, the deposition layer of the second conductivity type that has a predetermined doping concentration into the semiconductor body; generating thereby a further layer of the second conductivity type with a doping concentration that is lower than the predetermined doping concentration of the deposition layer; in the area for the resistor and due to the recesses, generating a defined lower doping concentration than in the further layer outside the area for the resistor; and due to the defined lower doping concentration in the area for the resistor, generating the lateral resistor having a defined resistance value within given tolerances.

5,204,274

METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Akihiro Kanda; Yoshiro Fujita, both of Osaka; Takehiro Hirai, Kyoto; Mitsuo Tanaka, and Hideya Esaki, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 431,581, Nov. 3, 1989, abandoned. This application Aug. 29, 1991, Ser. No. 750,856

Claims priority, application Japan, Nov. 4, 1988, 63-278700

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—31 **10 Claims**

1. A method of fabricating a semiconductor device including an NPN transistor and a PNP transistor, comprising the steps of:

forming a well region in a predetermined region in a semiconductor substrate of a first conduction type, the well region being of a second conduction type;

forming a base diffusion layer of the first conduction type in the well region;

forming a base diffusion layer of the second conduction type in a predetermined region in the semiconductor substrate;

forming a first polycrystalline silicon film (**115**) on the semiconductor substrate;

introducing impurity corresponding to a first conduction type into a portion of the first polycrystalline silicon film (**115**) which extends above an NPN-transistor-forming region;

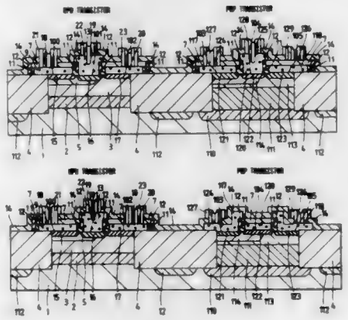
introducing impurity corresponding to a second conduction type into a portion of the first polycrystalline silicon film (**115**) which extends above a PNP-transistor-forming region;

forming a first insulating film (**7**) on the first polycrystalline silicon film;

etching the first insulating film and the first polycrystalline silicon film, and simultaneously forming emitter lead-out electrodes (**9, 117**) and collector lead-out electrodes (**10, 118**) in regions above emitter-contact-forming regions and collector-contact-forming regions of the NPN transistor and the PNP transistor;

forming second insulating films (**11, 12**) at sides of the emitter and collector lead-out electrodes;

simultaneously forming base contacts (**101, 104**) of the NPN transistor and the PNP transistor;



forming a second polycrystalline silicon film (**119**) on the semiconductor substrate;

introducing impurity corresponding to the second conduction type into a portion of the second polycrystalline silicon film (**119**) which extends above the NPN-transistor-forming region;

introducing impurity corresponding to the first conduction type into a portion of the second polycrystalline silicon film (**119**) which extends above the PNP-transistor-forming region;

etching the second polycrystalline silicon film to form a base lead-out electrode (**13**) of the NPN transistor and a base lead-out electrode (**120**) of the PNP transistor, wherein the base lead-out electrode of the NPN transistor includes impurity corresponding to the second conduction type, and wherein the base lead-out electrode of the PNP transistor includes impurity corresponding to the first conduction type;

diffusing the impurity from the emitter lead-out electrode, the collector lead-out electrode, and the base lead-out electrode to form emitter diffusion layers (**15, 121**), collector contact diffusion layers (**17, 123**), and base contact diffusion layers (**16, 122**) of the NPN transistor and the PNP transistor;

locating an end of the emitter diffusion layer (**15, 121**) and a first end of the base contact diffusion layer (**16, 122**) at positions directly below a portion of the second insulating

films (**11, 12**) which extends at a side of the emitter lead-out electrode (**9, 117**) in each of the NPN transistor and the PNP transistor; and

locating a second end of the base contact diffusion layer (**16, 122**) and an end of the collector contact diffusion layer (**17, 123**) at positions directly below a portion of the second insulating films (**11, 12**) which extends at a side of the collector lead-out electrode (**10, 118**) in each of the NPN transistor and the PNP transistor.

5,204,275

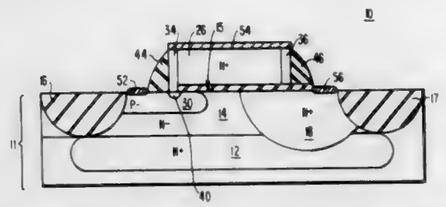
METHOD FOR FABRICATING COMPACT BIPOLAR TRANSISTOR

Richard H. Lane, Hillsboro, Oreg., assignor to North American Philips Corp., New York, N.Y.

Filed Dec. 26, 1990, Ser. No. 633,906

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—31 **15 Claims**



1. A method for fabricating a bipolar transistor comprising the steps of:

a) forming a collector region in a substrate that comprises an active monocrystalline semiconductor portion having an upper surface, said collector region comprising a collector contact region adjoining said surface and situated at least partly in said active portion;

b) forming an insulating layer along said upper surface of said active portion;

c) forming an island of non-insulating material over a part of said insulating layer;

d) subsequently performing an operation (a) to form a base region adjoining said upper surface in a part of said active portion laterally contiguous with said collector contact region or laterally separated from said collector contact region substantially fully b monocrystalline semiconductor material of said active portion and (b) to remove an exposed part of said insulating layer extending over the location for said base region;

e) forming a first ribbon of non-insulating material along a first sidewall of said island such that said first ribbon contacts said active portion along said base region; and

f) forming an emitter region adjoining said upper surface in a part of said base region beneath said first ribbon.

5,204,276

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Hiroomi Nakajima, Yokohama; Nobuyuki Itoh, Tokyo; Hiroyuki Nihira, Ayase; Eiryo Tsukioka, Tokorozawa; Kenji Hirakawa, Yokohama; Shin-ichi Taka, Yokosuka; Hideki Takada, Yokohama; Yasuhiro Katsumata, Chigasaki, and Toshio Yamaguchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 445,741, Dec. 4, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 645,313

Claims priority, application Japan, Dec. 6, 1988, 63-306900

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—31 **8 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of:

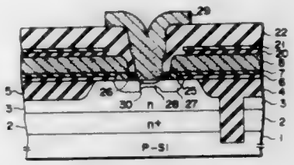
successively laminating a first buffer insulation film, an oxidation-resistant insulation film, a first conductor film containing an impurity of a second conductivity type and a second buffer insulation film on a semiconductor layer having a collector region of a first conductivity type;

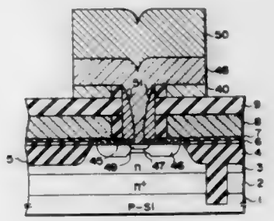
forming a first protective insulation film by a deposition method on the second buffer insulation film, said first protective insulation film consisting of a laminate structure consisting of a silicon nitride film and a thick silicon oxide film which are deposited successively;

forming an opening portion below which an emitter diffusion region is later formed and exposing the oxidation-resistant insulation film by selectively etching the first protective insulation film, the second buffer insulation film and the first conductor film, only the silicon nitride film of the first protective film being overetched to retreat an end thereof from the opening portion, thereby forming a first bore below the thick silicon oxide film;

forming a second protective insulation film to cover the surface of the first conductor film exposed at a side wall of the opening portion;

etching the oxidation-resistant insulation film exposed at the bottom of the opening portion using the first and second protective insulation films as an etching mask so as to





expose the first buffer insulation film, a predetermined size of a second bore being formed by side etching below the conductor film;

etching the exposed first buffer insulation film to expose a surface of the collector region of the semiconductor layer;

burying in the second bore a second conductor film capable of an insulation film formation by surface oxidation and also capable of an impurity diffusion;

applying a heat treatment under an oxidative atmosphere to form a thermal oxide film covering the exposed surface of the collector region and the surface of the second conductor film buried in the second bore and to diffuse the impurity of the second conductivity type contained in the first conductor film into the collector region through the second conductor film so as to form an outer base region of the second conductivity type;

doping the collector region with an impurity of the second conductivity type through the opening portion so as to form an inner base region of the second conductivity type; and

doping the inner base region with an impurity of the first conductivity type so as to form an emitter region of the first conductivity type and to form an emitter electrode in ohmic contact with the emitter region.

5,204,277

METHOD OF FORMING BIPOLAR TRANSISTOR

5,204,278

METHOD OF MAKING MES FIELD EFFECT

shared contact region covering the exposed underlying

trench composed of layers of said first and second plural-

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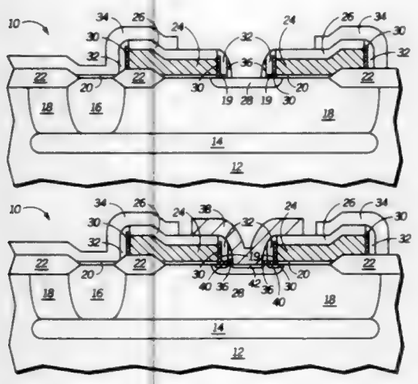
5,204,277

METHOD OF FORMING BIPOLAR TRANSISTOR HAVING SUBSTRATE TO POLYSILICON EXTRINSIC BASE CONTACT

Bradley M. Somero, and James D. Hayden, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1992, Ser. No. 829,669
Int. Cl.[5] H01L *21/265, 29/70*
U.S. Cl. 437—31 **14 Claims**



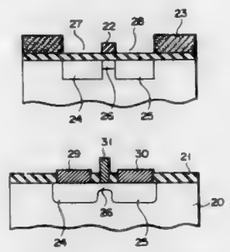
1. A process for forming a bipolar transistor comprising the steps of:
providing a substrate having a surface;
forming a doped collector region having a first conductivity type, the doped collector region being formed within the substrate;
forming a first dielectric layer overlying the substrate;
forming a first conductive layer overlying the first dielectric layer;
forming a second dielectric layer overlying the first conductive layer;
removing a portion of the first and second dielectric layers and a portion of the first conductive layer, the removing forming an exposed portion of the substrate which contains the doped collector region and forming a first conductive layer sidewall;
forming a doped base region having a second conductivity type within the exposed portion of the substrate and overlying the doped collector region, the doped base region being exposed at said surface of the substrate;
forming a conductive region laterally adjacent the first conductive layer sidewall and overlying the surface of the substrate;
forming a first sidewall spacer laterally adjacent the conductive region that is laterally adjacent the first conductive layer;
removing a portion of the conductive region which overlies the surface of the substrate, the removing of the portion of the conductive region forming a sidewall of the conductive region;
forming a second sidewall spacer laterally adjacent the sidewall of the conductive region; and
forming a second conductive layer having the first conductivity type and overlying each of the substrate, the first and second sidewall spacers, and the second dielectric layer, the second conductive layer making physical contact to the substrate and at least partially forming a doped emitter region.

5,204,278

METHOD OF MAKING MES FIELD EFFECT TRANSISTOR USING III-V COMPOUND SEMICONDUCTOR

Souichi Imamura, and Toru Suga, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 560,209, Jul. 31, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 853,859
Claims priority, application Japan, Aug. 11, 1989, 1-208507
Int. Cl.[5] H01L *21/338*
U.S. Cl. 437—40 **9 Claims**



1. A method of making a MES field effect transistor comprising the steps of:
depositing a first insulating film on a surface of a compound semiconductor substrate;
depositing a second insulating film on said first insulating film, said second insulating film being comprised of a silicon dioxide film having a thickness of about 1000 A;
selectively removing said second insulating film by means of lithography techniques except a portion corresponding to a channel region;
coating said first insulating film with a resist layer;
patterning said resist layer so as to define intended source and drain regions with both the residual resist layer and said selectively removed second insulating film;
subjecting said semiconductor substrate to an ion implantation using different acceleration voltages in the presence of both said first and second insulating films to provide source and drain regions and said channel region;
subjecting said semiconductor substrate to a heat-treatment to activate said ion-implanted regions;
successively removing said second insulating film and said first insulating film formed on said channel region;
forming a Schottky gate electrode on said channel region;
selectively removing said first insulating film from the substrate surface of said source and drain regions; and
forming an electrode on said source and drain regions.

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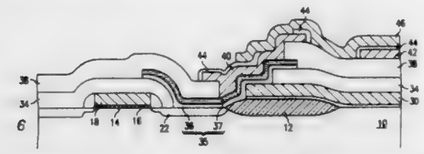
METHOD OF MAKING SRAM CELL AND STRUCTURE WITH POLYCRYSTALLINE P-CHANNEL LOAD DEVICES

Tsiu C. Chan, Carrollton; Frank R. Bryant, Denton, and Lisa K. Jorgenson, Colleyville, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 3, 1991, Ser. No. 709,354
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—47 **18 Claims**

7. A method of producing a semiconductor device structure with polycrystalline P-channel load devices of an integrated circuit comprising:
forming a first insulating layer over a substrate;
patterning and etching the first insulating layer to expose an underlying conductive structure;
forming an interconnect layer containing both a doped polysilicon layer and a barrier layer over the integrated circuit;
patterning and etching the interconnect layer to define a shared contact region covering the exposed underlying conductive structure;
forming a first conductive layer over a portion of the interconnect layer;
patterning and etching the first conductive layer to define a firs gate electrode of a first P-channel field effect device;
forming a gate oxide layer over a portion of the first gate electrode of the first P-channel device;



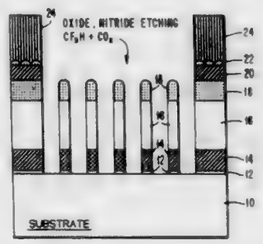
forming a second conductive layer over a portion of the first P-channel device; and,
patterning and etching the second conductive layer to define a source/drain and channel region over the first gate electrode of the first P-channel device and covering the interconnect layer.

5,204,280

PROCESS FOR FABRICATING MULTIPLE PILLARS INSIDE A DRAM TRENCH FOR INCREASED CAPACITOR SURFACE

Sang H. Dhong, Mahopac, and John C. Malinowski, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 9, 1992, Ser. No. 865,505
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **6 Claims**



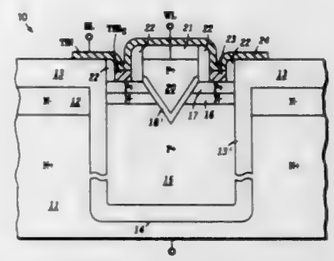
1. A method of fabricating semiconductor memory devices with trench capacitors having increased surface areas comprising the steps of:
step 1) forming a first plurality of stacked layers of material on a substrate surface;
step 2) forming a second plurality of stacked layers of material on said first plurality of stacked layers wherein the uppermost layer of said second plurality of layers has an irregular surface;
step 3) etching a selected region of said uppermost layer of said second plurality of stacked layers and partially etching said next to uppermost layer of said second plurality of stacked layers to form a trench wherein the irregular surface of said uppermost layer is replicated in the etched surface of said partially etched next to uppermost layer;
step 4) directionally etching said next to uppermost layer with a selective etchant that etches said uppermost layer faster than said next to uppermost layer to remove said next to uppermost layer and form spaced pillars of polysilicon from said first uppermost layer;
step 5) using said spaced pillars of said uppermost layer as a mask, etching said second plurality of stacked layers to form pillars on the surface of said substrate within said trench composed of layers of said first and second plurality of said stacked layers.

5,204,281

METHOD OF MAKING DYNAMIC RANDOM ACCESS MEMORY CELL HAVING A TRENCH CAPACITOR

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1990, Ser. No. 576,872
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **15 Claims**



1. A method of forming a dynamic random access memory cell in a substrate of a first conductivity comprising the steps of:
growing an epitaxial layer of said first conductivity on a surface of said substrate;
forming a first trench through said epitaxial layer and into said substrate;
lining said first trench with a first dielectric layer;
depositing a first silicon layer having a second conductivity type in said trench;
depositing a second silicon layer having said first conductivity type
on said first silicon layer in said trench;
depositing a third silicon layer having said second conductivity type
on said second silicon layer in said trench;
etching through said third and second and into said first silicon layers, leaving a peripheral portion of said third and second layers to form a second trench;
lining said second trench with a second dielectric layer; and
depositing a gate polysilicon layer having said second conductivity type in said second trench.

5,204,282

SEMICONDUCTOR CIRCUIT STRUCTURE AND METHOD FOR MAKING THE SAME

Kazuhiro Tsuruta, Nishio; Seizi Huzino, Anjyo; Mitutaka Katada, Nishio; Tadashi Hattori, Okazaki, and Masami Yamaoka, Anjyo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 415,132, Sep. 29, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 545,617
Claims priority, application Japan, Sep. 30, 1988, 63-248737
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—62 **13 Claims**

1. A method of producing a semiconductor circuit structure, comprising the steps of:
providing a first semiconductor substrate layer and a second semiconductor substrate layer, each having a main surface;
forming a concave portion on a main surface of one of said first and said second semiconductor substrate layers;
forming a groove extending into either said first semiconductor substrate layer at a position near an edge portion of said concave portion or said second semiconductor substrate layer to be stacked on the other semiconductor

substrate layer at a position opposite to a place near the

bromine and fluorine and the substrate is subjected to a heat treatment so as to reduce halogen density inside the substrate,

ing a thin film deposition of an etching product on sidewalls of said mask layer;

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INTEGRATED CIRCUIT DEVICE HAVING IMPROVED

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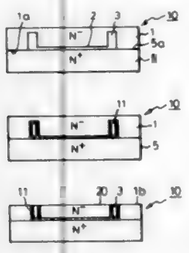
substrate layer at a position opposite to a place near the edge portion of said concave portion when it is placed in contact with the first semiconductor substrate, said groove having an opening on a side wall of said semiconductor substrate layer for introducing oxygen gas thereinto;

forming a semiconductor substrate portion by said placing in contact said main surfaces of said first and second semiconductor substrate layer with each other, thereby forming a vacant portion at least between the bottom surface of said concave portion on either of the semiconductor sub-



strate layers and the main surface of said other semiconductor substrate layer being communicated with said groove;

filling at least said vacant portion with an oxidized material to form a buried layer serving as an insulating layer and forming an oxide film at least on the inside wall of said groove, and

removing a part of the semiconductor substrate layer in which said groove is provided, from a free end surface thereof, so that at least a part of said groove is uncovered to form a region insulatedly isolated from other regions and surrounded by said buried layer.

5,204,283

METHOD OF GROWTH II-VI SEMICONDUCTING COMPOUNDS

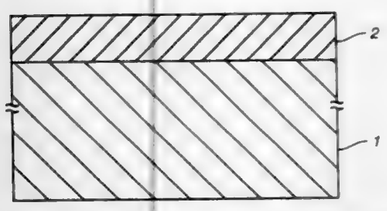
Masahiko Kitagawa, and Yoshitaka Tomomura, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 423,486, Oct. 12, 1989, abandoned, which is a continuation of Ser. No. 183,407, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 130,948, Dec. 10, 1987, abandoned. This application Aug. 20, 1991, Ser. No. 750,432

Claims priority, application Japan, Dec. 12, 1986, 61-297025

Int. Cl.[5] H01L *21/205*

U.S. Cl. 437—105 **4 Claims**



1. A method of expitaxially growing a single crystal film of a II-VI semiconducting compound on a substrate characterized in that a single crystal of a II-VI semiconducting compound grown by a chemical transport method with a halogen as the transport medium is used as said substrate wherein the halogen is selected from the group consisting of chlorine, bromine and fluorine and the substrate is subjected to a heat treatment so as to reduce halogen density inside the substrate.

5,204,284

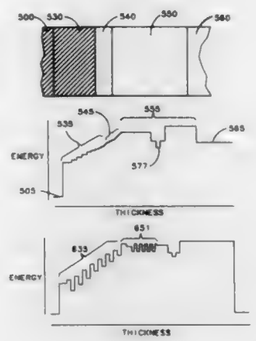
METHOD OF MAKING A HIGH BAND-GAP OPTO-ELECTRONIC DEVICE

Chih-Ping Kuo, Milpitas; Robert M. Fletcher, and Timothy D. Osentowski, both of San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 300,003, Jan. 19, 1989, Pat. No. 5,060,028. This application Aug. 13, 1991, Ser. No. 744,569

Int. Cl.[5] H01L *21/20, 21/203*

U.S. Cl. 437—127 **9 Claims**



1. A method of providing an electro-optical device, comprising the steps of:

providing a first substrate layer formed of gallium arsenide;

growing a second graded layer composed of aluminum gallium indium phosphide which is one of adjacent to and on top of said first substrate layer by periodically substituting aluminum atoms for gallium atoms of said gallium arsenide so as to maintain lattice matching between said first substrate layer and said second graded layer; and

growing an active section composed of aluminum gallium indium phosphide on said second graded layer so as to form a boundary therewith, said active section being substantially lattice matched with said first substrate layer and said second graded layer and having higher energy band gaps than said first substrate layer,

whereby said second graded layer has a varying energy band gap such that an energy band gap of said second graded layer at said boundary substantially equals that of the active section of the boundary and decreases to a lesser energy band gap away from said boundary.

5,204,285

METHOD FOR PATTERNING A METAL LAYER

Takao Kakiuchi, Takarazuka, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 616,865, Nov. 21, 1990, abandoned. This application Mar. 19, 1992, Ser. No. 855,459

Claims priority, application Japan, Dec. 1, 1989, 1-313626

Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—187 **2 Claims**

1. A method for patterning a metallization layer comprising aluminum, said method comprising:

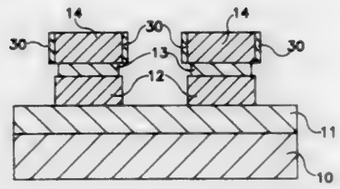
depositing said metallization layer on an oxide covered silicon substrate;

depositing a barrier layer on said metallization layer;

forming a mask layer on selected portions of said barrier layer;

a first etching step wherein said barrier layer and said metallization layer are etched, said first etching step also causing a thin film deposition of an etching product on sidewalls of said mask layer;

a second etching step wherein said etched sidewall of said



barrier layer is selectively further etched to the extent that this sidewall is separated from said thin film of said etching product on said sidewalls of said mask layer; and

removing said mask layer.

5,204,286

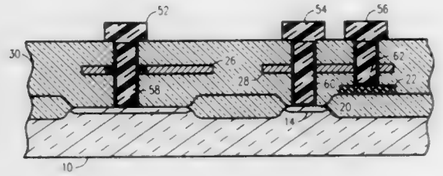
METHOD OF MAKING SELF-ALIGNED CONTACTS AND VERTICAL INTERCONNECTS TO INTEGRATED CIRCUITS

Trung T. Doan, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 15, 1991, Ser. No. 775,744

Int. Cl.[5] H01L *21/44*

U.S. Cl. 437—195 **3 Claims**



1. A process for manufacturing multi-level conductor type integrated circuits which includes the steps of:

a. providing a semiconductor substrate having active or passive devices therein to which electrical connections must be made,

b. forming a dielectric layer on said substrate having certain strips of conductor therein which must be connected to said devices and certain strips of conductor therein which must be maintained electrically isolated from said devices,

c. opening first vias in said dielectric layer above conductive strips to be electrically isolated and exposing edges of said conductive strips,

d. insulating said edges of said strips exposed by said vias,

e. continuing to etch said first vias on through to reach said semiconductor substrate, while also

f. opening second vias through said conductive strips which are to be connected to said substrate, and then

g. forming vertical electrical interconnects in said first and second vias whereby said active and passive devices in said semiconductor substrate may be both electrically connected to and isolated from said conductive strips within said dielectric layer and may be further interconnected to a surface layer of conductor on the surface of said dielectric layer.

5,204,287

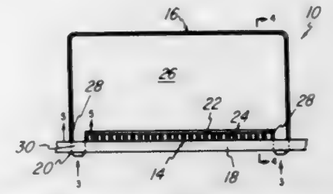
INTEGRATED CIRCUIT DEVICE HAVING IMPROVED POST FOR SURFACE-MOUNT PACKAGE

Robert N. McLellan, Garland, and Anthony M. Chiu, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1991, Ser. No. 723,108

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—217 **2 Claims**



1. A method of manufacturing an integrated circuit device or the like, the method comprising the steps of:

forming a package encapsulating a semiconductor die, said package including a plurality of posts integral therewith and extending from at least one edge of said package, said package presenting a lengthwise molding plane; and

connecting a plurality of lead fingers to said die, said lead fingers extending from at least one edge of said package, at least one of said posts only on one side of said lengthwise molding plane so as to fit into holes in a printed circuit board for mechanically positioning and supporting said package when said lead fingers are affixed to the printed circuit board.

5,204,288

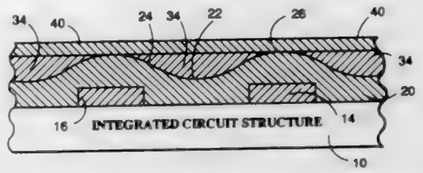
METHOD FOR PLANARIZING AN INTEGRATED CIRCUIT STRUCTURE USING LOW MELTING INORGANIC MATERIAL

Jeffrey Marks, Sunnyvale; Kam S. Law, Union City; David N. Wang, Saratoga, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 644,415, Jan. 22, 1991, abandoned, which is a continuation of Ser. No. 478,186, Feb. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 269,508, Nov. 10, 1988, abandoned. This application Mar. 4, 1992, Ser. No. 845,544

Int. Cl.[5] H01L *21/465*

U.S. Cl. 437—228 **24 Claims**



1. A process for planarizing an integrated circuit structure in a vacuum apparatus which comprises:

(a) depositing a first layer of an insulating material over an integrated circuit structure in a chemical vapor deposition zone in said apparatus;

(b) depositing over said insulating layer a low melting inorganic planarizing layer having a flow temperature of not greater than 500° C. in a chemical vapor deposition zone in said apparatus at a deposition temperature within a range of from about 300° C. to about 500° C. and sufficiently high within said range to permit said low melting inorganic planarizing material to flow as it is deposited;

(c) dry etching said inorganic planarizing layer in an etching

-continued

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PRECURSORS FOR BORON NITRIDE COATINGS

from 85:15 to 99:1 percent by mole and the addition composi-

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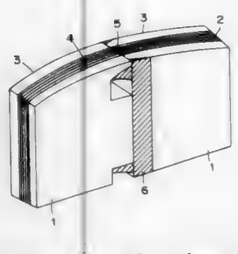
(c) dry etching said inorganic planarizing layer in an etching zone in said apparatus to remove at least a portion of said inorganic planarizing layer to planarize said structure; and
(d) depositing a second layer of insulating material over said structure in a chemical vapor deposition zone in said apparatus to encapsulate remaining portions of said planarizing layer.

5,204,289
GLASS-BASED AND GLASS-CERAMIC-BASED COMPOSITES
Kyung H. Moh, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 18, 1991, Ser. No. 779,016
Int. Cl.[5] C03C *4/16, 3/089, 10/06*
U.S. Cl. 501—5 **38 Claims**

1. A composite ceramic article comprising a plurality of crystalline mullite bubbles dispersed in a matrix selected from the group consisting of a borosilicate-based glass matrix and an aluminosilicate-based glass-ceramic matrix.

5,204,290
CRYSTALLIZED GLASS
Yasuo Mizuno, and Masaki Ikeda, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 18, 1991, Ser. No. 809,750
Claims priority, application Japan, Dec. 18, 1990, 2-403074
Int. Cl.[5] C03C *8/10, 10/00*
U.S. Cl. 501—14 **5 Claims**



1. A crystallized glass comprising at least as ingredients, in % by weight,
11–17% of SiO_2, 7–10% of B_2O_3, 30–55% of PbO, 1–3% of CdO, 5–10% of A_2O where A is an alkali metal, 7–35% of ZnO and 0–10% of ZrO_2 wherein the sum of the amounts of ZnO and ZrO_2 do not exceed 35%.

5,204,291
TRANSPARENT LEAD-FREE GLAZES
Jaroslava M. Nigrin, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Apr. 17, 1992, Ser. No. 870,677
Int. Cl.[5] C03C *8/02, 3/093*
U.S. Cl. 501—21 **4 Claims**

1. A glass frit composition essentially free from lead and cadmium exhibiting a linear coefficient of thermal expansion (25°–300° C.) of about $70–85\times10^{-7}$/°C., good flow at temperatures between 900°–1000° C., a softening point of about 650°–740° C., and excellent resistance to attack by acetic acid and detergent consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	51–59	CaO	0–7
Li_2O	0–2	SrO	0–12
Na_2O	3.5–7	BaO	0–9
K_2O	6–8.5	ZnO	0–10
$Li_2O + Na_2O + K_2O$	10–15	CaO + SrO + BaO + ZnO	8–18
B_2O_3	9–12	Al_2O_3	4.5–7

with the proviso that the mole ratio $(Li_2O+Na_2O+K_2O)$:-$(CaO+SrO+BaO+ZnO)$ is greater than 1.0 and ranges up to about 1.4.

5,204,292
OPTICAL GLASS FOR A PRESS LENS
Tooru Michimata, Nagaoka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Apr. 1, 1991, Ser. No. 678,788
Claims priority, application Japan, Apr. 19, 1990, 2-103831
Int. Cl.[5] C03C *3/064, 3/108*
U.S. Cl. 501—61 **1 Claim**

1. An optical glass for a press lens having a composition of 25 to 41 mol % of SiO_2, 10 to 30 mol % of B_2O_3, 18 to 40 mol %, of PbO, 1 to 10 mol % of Na_2O, 1 to 15 mol % of K_2O, 16 to 20 mol %, of Li_2O, 0.3 to 3 mol %, of Al_2O_3, and 0.1 to 3 mol % of Sb_2O_3.

5,204,293
BURGUNDY COLORED GLASSWARE
W. Duane Amundson, Jr., Corning, and Robert M. Morena, Lindley, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Aug. 23, 1991, Ser. No. 749,121
Int. Cl.[5] C03C *3/078, 3/087*
U.S. Cl. 501—72 **17 Claims**

1. A transparent glass exhibiting a burgundy color, the glass consisting essentially of 0.3 to 2.2% by weight of manganese oxide, calculated as MnO_2, in a soda lime silicate base glass, exhibiting chromaticity coordinates (Illuminant C) falling within the ranges
x=0.3200 to 0.3700
y=0.3300 to 0.3080
Cap Y=25 to 72
and having impurity levels for NiO and Fe_2O_3 not exceeding 100 ppm and 500 ppm, respectively.

5,204,294
SILICON CARBIDE CERAMICS CONTAINING A DISPERSED HIGH METAL CONTENT SILICIDE PHASE
Roger L. K. Matsumoto, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Oct. 21, 1991, Ser. No. 779,652
Int. Cl.[5] C04B *35/56, 35/58*
U.S. Cl. 501—92 **12 Claims**

1. A sintered ceramic product consisting essentially of (1) from about 20% to about 98% of alpha-phase, beta-phase or a mixture of alpha- and beta-phase silicon carbide, (2) from about 1% to about 80% of a nonagglomerated, uniformly dispersed, high metal content silicide selected from the group consisting of Mo_5Si_3, Fe_2Si, Co_2Si, Ni_2Si and Fe_3Si, and (3) from 0.02% to about 20% of at least one oxide, nitride or silicate of an element selected from UIPAC Groups 2, 3, 4, 13, or the lanthanide series, all percentages being by weight based on the total weight of the composition.

5,204,295
PRECURSORS FOR BORON NITRIDE COATINGS
Robert T. Paine, Jr., Albuquerque, N. Mex.; Chaitanya K. Narula, Ann Arbor, Mich.; Riley O. Schaeffer, Boulder, Colo.; David A. Lindquist, and Theodore T. Borek, III, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.
Continuation of Ser. No. 312,956, Feb. 17, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 725,933
Int. Cl.[5] C04B *35/56*
U.S. Cl. 501—96 **31 Claims**

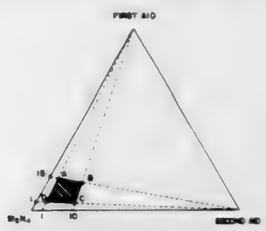
1. A process for the pyrolytic conversion of a polymeric precursor composition to boron nitride comprising the following steps:
(a) obtaining a borazine compound having a general formula selected from the group consisting of tris-dialkylamino borazines $(R_2NBNH)_3$; tris-alkylsulfide borazines $(RSBNH)_3$; B-trichloroborazine $(ClBNH)_3$; and 1-B-dialkylamino,3,5-B dichloroborazine $(R_2NB)(BCl)_2(NH)_3$; wherein R is an alkyl group and wherein boron atoms are not bonded to hydrogen atoms;
(b) dissolving the borazine compound in a solvent in the presence of a cross-linking agent to from an insoluble, solid polymer wherein boron atoms are not bonded to hydrogen atoms and wherein there are no direct N(ring)-B(ring) bonds;
(c) removing substantially all the solvent from the insoluble solid polymer;
(d) applying the insoluble, solid polymer as a dry coating to an article; and
(e) converting the polymer to boron nitride by pyrolysis.

5,204,296
PROCESS FOR INJECTION MOLDING CERAMICS
Robert J. Walter, Thousand Oaks, and Michael J. Robinson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Sep. 26, 1989, Ser. No. 412,957
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 **22 Claims**

1. A process for fabricating ceramic bodies which comprises
providing a particulate silicon nitride material,
providing an aqueous solution of the water soluble plastic binder,
adjusting the pH of said aqueous solution to a range of from about 7.8 to about 11,
dispersing said particulate silicon nitride material in said aqueous solution,
drying the resulting dispersion to form a mixture of said particulate silicon nitride material and said plastic binder poly(2-ethyl-2-oxazoline),
injection molding said mixture, and
stripping said plastic binder from the resulting injection molded mixture.

5,204,297
SILICON NITRIDE SINTERED BODY AND PROCESS FOR PRODUCING THE SAME
Takehisa Yamamoto; Takao Nishioka; Kenji Matsunuma; Akira Yamakawa, and Masaya Miyake, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd.
Filed Jan. 27, 1992, Ser. No. 825,989
Claims priority, application Japan, May 22, 1991, 3-117315; Sep. 2, 1991, 3-221603
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 **5 Claims**

1. A silicon nitride sintered body consisting of a composition falling within a range surrounded by the lines joining the points A, B, C and D in the ternary composition diagram of Si_3N_4-first aid-second aid shown in FIG. 1, the first aid consisting of a combination of two oxides of Y_2O_3 and MgO, the second aid consisting of one or both of Al_2O_3 and AlN wherein the addition composition ratio of Si_3N_4 to the first aid is in the range of from 85:15 to 99:1 percent by mole and the addition composition ratio of Si_3N_4 to the second aid is in the range of from 90:10 to 99:1 percent by mole, said sintered body comprising crystal phases containing both an α-Si_3N_4 crystal phase and a



β'-sailon crystal phase, the relative density of the sintered body being 98% or more, the precipitation ratio of the α-Si_3N_4 crystal phase to the β'-sialon crystal phase in the sintered body being more than 0 but not more than 30 in terms of the peak intensity in X-ray diffraction.

5,204,298
BASIC MONOLITHIC REFRACTORIES
Hideo Yaoi, Aichi; Toshihiro Isobe, Hyogo, and Yukihiro Suekawa, Fukuoka, all of Japan, assignors to Harima Ceramic Co., Ltd., Hyogo; Krosaki Corporation, Fukuoka and Nippon Steel Corporation, Tokyo, all of Japan
Filed Nov. 21, 1991, Ser. No. 795,950
Claims priority, application Japan, Nov. 28, 1990, 20328435
Int. Cl.[5] C04B *35/04*
U.S. Cl. 501—108 **2 Claims**

2. Basic monolithic refractories consisting essentially of (1) magnesia clinker with a chemical composition comprising, in oxide equivalence, 65–96% by weight of MgO, 2.6–20% by weight of ZrO_2, 1.3–10% by weight of SiO_2, 2% or less by weight of CaO, 0.5% or less by weight of Fe_2O_3 and 1% or less by weight of Al_2O_3, and with a mineral composition containing periclase as the main component and cubic zirconia and forsterite as sub-components, and with apparent porosity of 7% or less and bulk density of 3.2 g/cm^3 or more, and (2) at least one refractory material selected from the group consisting of calcined aluminous shale, calcined bauxite, sintered bauxite, sillimanite, synthetic mullite, fused alumina, sintered alumina, calcined alumina, sintered magnesia, electrofused magnesia, electrofused magnesia alumina spinel clinker, sintered magnesia alumina spinel clinker, zircon, zirconia and dolomite clinker.

5,204,299
MODIFIED CERAMIC STRUCTURES
Ratnesh K. Dwivedi, Wilmington, and Christopher R. Kennedy, Newark, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.
Continuation of Ser. No. 547,405, Jul. 2, 1990, Pat. No. 5,063,185, which is a continuation of Ser. No. 272,514, Nov. 16, 1988, abandoned, which is a continuation of Ser. No. 908,458, Sep. 17, 1986, Pat. No. 4,806,508. This application Nov. 4, 1991, Ser. No. 787,808
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] C04B *35/65*
U.S. Cl. 501—127 **2 Claims**

1. A shaped self-supporting ceramic matrix composite body comprising a ceramic matrix incorporating at least one preform, said preform comprising a shaped body of filler material which is capable of supporting its own weight and maintaining dimensional fidelity and interconnected porosity without any means of support located external to any surface of said preform, said ceramic matrix being disposed within at least a portion of said interconnected porosity so as to embed the filler

material and said ceramic matrix consisting essentially of about

nucleation and growth, said transformed compound

5,204,303
PREPARATION AND USE OF A NEW ZIEGLER-NATTA

wherein X^2 is halogen, R^3 is hydrocarbyl having 1 to

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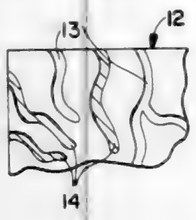
material and said ceramic matrix consisting essentially of about 60–99 percent by weight of an essentially single phase polycrystalline oxidation reaction product consisting essentially of a material selected from the group consisting of alumina, aluminum nitride and silicon nitride, and the remainder of said ceramic matrix consisting essentially of at least one metallic



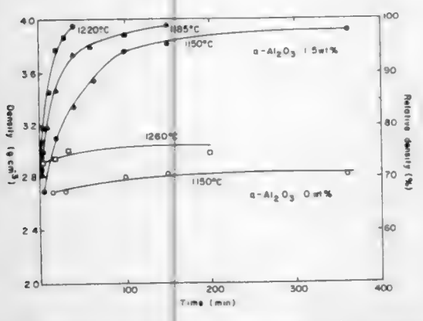
constituent and interconnected porosity, wherein a second ceramic component selected from the group consisting of chromia and silica is disposed in at least a portion of said porosity, said self-supporting ceramic matrix composite body corresponding substantially in shape to the configuration of said at least one preform.

5,204,300

METHODS OF SEEDING SINTERED OBJECTS

Masato Kumagai, Chiba, Japan, and Gary Messing, State College, Pa., assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 178,760, Apr. 4, 1988, abandoned, which is a continuation of Ser. No. 754,818, Jul. 12, 1985, abandoned. This application Jun. 12, 1989, Ser. No. 366,260
Claims priority, application Japan, Jul. 18, 1984, 59-148877
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 **7 Claims**



2. A method for solid-state transformation of a metastable aluminum oxide compound from one crystalline form to another, said compound having a high activation energy and being confronted with a high activation nucleation energy barrier to such transformation, comprising:

(a) preparing an aqueous colloidal dispersion of a multiplicity of solid particles of said oxide compound by adjusting the pH thereof;

(b) preparing an aqueous colloidal dispersion of 0.1% up to 10% of a multiplicity of solid-state alumina nucleation particles, based on the number of particles of said oxide, said nucleation particles having crystallographically similar structure to act as nuclei for the transformation;

(c) intimately contacting and mixing said dispersions into a homogeneous mixture;

(d) causing said mixture to gel by dehydration; and

(e) sintering the gelled and dried mixture in the solid-state, between about 1050° C. and about 1150° C. to transform at least about 95% of said compound from one crystalline form to another at about 1025° C. by initiation of grain nucleation and growth, said transformed compound reaching between about 65 and 97% of theoretical density and said transformation being effected independently of growth of the nucleation particles, said transformed compound having submicron sized grains and a substantially evenly distributed pore phase.

5,204,301

NON-REDUCTION TYPE DIELECTRIC CERAMIC COMPOSITION

Shinichi Ohkubo; Yoshiaki Mori; Yoshihiro Yoshimoto, and Harufumi Mandai, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 30, 1992, Ser. No. 906,534
Claims priority, application Japan, Jan. 31, 1992, 4-16500
Int. Cl.[5] C04B *35/49*
U.S. Cl. 501—136 **4 Claims**

1. A non-reduction dielectric ceramic composition, which is characterized by containing 100 parts by weight of $(Ca_{1-x}Sr_x)_m(Zr_{1-y}Ti_y)O_3$-$zMnO_2$-$wSiO_2$ serving as a main component and 2 to 30 parts by weight of an additive,

said x, y and m satisfying the following relationships in terms of a molar ratio:

$0 \leqq x \leqq 1.0$

$0 \leqq y \leqq 0.2$

$0.9 \leqq m \leqq 1.1$

said z and w being in the following ranges when the amount of $(Ca_{1-x}Sr_x)_m(Zr_{1-y}Ti_y)O_3$ is 100% by weight in said main component:

$0.1 \leqq z \leqq 5\%$ by weight

$0.3 \leqq w \leqq 8\%$ by weight

said additive being $a(LiO_{\frac{1}{2}}$-RO)-$(1-a)(BO_{3/2}$-$SiO_2)$, where RO is at least one of SrO, BaO and CaO, and a is not less than 0.01 nor more than 0.8 in terms of a molar ratio.

5,204,302

CATALYST COMPOSITION AND A METHOD FOR ITS PREPARATION

Igor V. Gorynin; Boris V. Farmakovsky; Alexander P. Khinsky; Karina V. Kalogina, all of Leningrad, U.S.S.R.; Alfredo R. V., Caracas, Venezuela; Julian Szekely, Weston, and Navtej S. Saluja, Cambridge, both of Mass., assignors to Technalum Research, Inc., Cambridge, Mass.

Filed Sep. 5, 1991, Ser. No. 755,076
Int. Cl.[5] B01J *35/00, 37/34*
U.S. Cl. 502—2 **59 Claims**

2. A multilayered article having catalytic activity that is highly resistant to thermal and mechanical shock useful for the conversion of waste gases from an internal combustion engine comprising:

a metallic substrate;

an adhesive sublayer comprising aluminum diffusion bonded onto said substrate;

a catalytically active layer deposited on said sublayer comprising active alumina and constituent species of said sublayer, said catalytically active layer characterized by a smooth compositional gradient of active alumina from substantially 0.0 wt % at said sublayer/catalytically active layer interface to substantially 100 wt % at an outermost portion of said catalytically active layer, the balance of the catalytically active layer comprising constituent species of said sublayer; and

a porous layer deposited on said catalytically active layer, said porous layer having a large surface area and comprising active alumina and metal oxides.

5,204,303

PREPARATION AND USE OF A NEW ZIEGLER-NATTA CATAYST COMPONENT

Inkeri T. Korvenoja, Helsinki; Arja-Liisa Kostiainen, Porvoo; Fero I. Iiskola, Porvoo; Pekka J. E. Sormunen, Porvoo; Bill B. B. Gustafsson, Porvoo; Hilkka R. Knuuttila, Porvoo, all of Finland, and Ulf Palmqvist, Stenungsund, Sweden, assignors to Neste Oy, Kulloo, Finland

Continuation of Ser. No. 457,006, Dec. 22, 1989, abandoned. This application Sep. 16, 1991, Ser. No. 759,809
Claims priority, application Finland, Dec. 30, 1988, 886056
Int. Cl.[5] B01J *35/08*
U.S. Cl. 502—9 **16 Claims**

1. A method for the preparation of a supported procatalyst useful in the polymerization of olefins comprising:

(a) forming particles of magnesium dihalide and alcohol,

(b) reacting the particles with an organometal compound selected from the group consisting of compounds of the formula RM, wherein R is alkyl or aryl and M is lithium, sodium or potassium; R_2M', wherein R is alkyl or aryl and M' is zinc or cadmium; $R_{2-l}MgX_l$, wherein R is alkyl or aryl, X is a halogen atom and l is 0 or 1; $MAlR_4$, wherein M is lithium, sodium or potassium and R is alkyl or aryl; $R'_{3-m}AlX_m$, wherein R' is hydrogen, alkyl or aryl, X is a halogen atom and M is 0 or a positive number lower than 3; $R'_{3-n}Al(OR)_n$, wherein R' is hydrogen, alkyl or aryl, R is alkyl or aryl and n is a positive number greater than 0 but smaller than 3; and RAl(OR)X, wherein R is alkyl or aryl and X is a halogen atom,

(c) reacting the particle product of stage (b) with a titanium and/or vanadium compound and optionally and electron donor, and

(d) optionally prepolymerizing the particle product of step (c),

wherein said particles of magnesium dihalide and alcohol are formed by spray crystallizing a mixture of magnesium dihalide and alcohol to form crystallized complex particles.

5,204,304

VANADIUM-CONTAINING POLYMERIZATION CATALYST

Chi-I Kuo, Humble, Tex., and Michael W. Lynch, Schaumburg, Ill., assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Jun. 4, 1991, Ser. No. 710,263
Int. Cl.[5] C08F *4/68*
U.S. Cl. 502—116 **41 Claims**

1. A catalyst comprising the product obtained by admixing:

(a) a solid inorganic oxide, inorganic phosphate, or mixtures thereof;

(b) a zinc-containing composition selected from the group consisting of a zinc compound having the formula

$$ZnR_2$$

wherein R is a hydrocarbyl having 1 to about 12 carbon atoms, a zinc complex having the formula

$$ZnX_2.2AlR_3^1$$

wherein X is halogen and R^1 is hydrocarbyl having 1 to about 12 carbon atoms, and mixtures thereof; and

(c) a vanadium-containing composition selected from the group consisting of compounds having the formula

$$VX_b^1(OR^2)_{a-b}$$

wherein X^1 is a halogen, R^2 is hydrocarbyl having 1 to about 18 carbon atoms, a is the valence of vanadium and is 3 or 4, and b is 0 or an integer from 1 to a,

$$VOX^2{}_c(OR^3)_{3-c}$$

wherein X^2 is halogen, R^3 is hydrocarbyl having 1 to about 18 carbon atoms, and c is 0 or an integer from 1 to 3, and mixtures thereof, wherein said product does not contain titanium.

2. The catalyst of claim 1 wherein said product obtained further comprises in admixture with components (a), (b) and (c):

(d) an auxiliary composition selected from the group consisting of compounds having the formula

$$M(R^4)_dX_{3-d}^3$$

wherein M is Al or B, X^3 is halogen, R^4 is hydrocarbyl having to about 12 carbon atoms, and d is 0 or an integer from 1 to 3,

$$Al_2(R^5)_3(X^4)_3$$

wherein R^5 is hydrocarbyl having 1 to about 12 carbon atoms and X^4 is halogen,

$$MgR_e^6Y_{2-e}$$

wherein R^6 is hydrocarbyl having 1 to about 12 carbon atoms, Y is halogen, has the formula OR^7 where R^7 is hydrocarbyl having 2 to about 12 carbon atoms, or is a silyl amide having the formula $N(SiR_3^8)_2$ where R^8 is hydrocarbyl having 2 to about 12 carbon atoms, and e is 0, 1 or 2, and mixtures thereof.

5,204,305

COCATALYTIC COMPOSITION WHICH IS USABLE FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Paul Fiasse, Brussels, and Hervé Collette, Namur, both of Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Aug. 30, 1991, Ser. No. 751,936
Claims priority, application Belgium, Aug. 30, 1990, 09000839
Int. Cl.[5] C08F *4/649*
U.S. Cl. 502—124 **21 Claims**

1. A cocatalytic composition capable of being stored, resulting from bringing an organoaluminium halide (A) into contact with an electron-donating organic compound (ED) selected from carboxylic acid esters, amides and ketones, the organoaluminium halide (A) having an atomic ratio halogen (X)/aluminium (Al) of greater than 1 and less than 1.3, and the halide (A) and the compound (ED) having a mole ratio halide (A)/compound (ED) of greater than about 20.

5,204,306

CAUSTIC FREE CATALYST FOR USE IN A LIQUID/LIQUID PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION

Robert R. Frame, Glenview; Jeffery C. Bricker, Buffalo Grove; Laurence O. Stine, Western Springs, and Thomas A. Verachtert, Wheeling, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 572,824, Aug. 27, 1990, Pat. No. 5,093,296. This application Nov. 29, 1991, Ser. No. 799,795
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.
Int. Cl.[5] B01J *31/12*
U.S. Cl. 502—155 **6 Claims**

1. A catalyst effective in oxidizing mercaptans contained in a sour hydrocarbon fraction to disulfides consisting of ammonium hydroxide, a metal chelate and an onium compound in an aqueous solution, the onium compound selected from the group consisting of quaternary ammonium, phosphonium, arsonium, stibonium, oxonium and sulfonium compounds having the formula,

$$[R'R''R_3M]^+X^-$$

where R is a hydrocarbon group containing up to about 20 carbon atoms and selected from the group consisting of alkyl,

cycloalkyl, aryl, alkaryl, and aralkyl, R' is a straight chain alkyl

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5,204,312

AZO DYES FOR THERMAL TRANSFER PRINTING

thermally converting the thin film precursor to the superconductive thin film

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cycloalkyl, aryl, alkaryl, and aralkyl, R' is a straight chain alkyl group containing from about 5 to about 20 carbon atoms, R'' is a hydrocarbon group selected from the group consisting of aryl, alkaryl and aralkyl, M is nitrogen, phosphorus, arsenic, antimony, oxygen or sulfur, X is an anion selected from the group consisting of halide, nitrate, sulfate, phosphate, acetate, citrate and tartrate, and y is 1 when M is oxygen or sulfur and y is 2 when M is phosphorus, arsenic, antimony or nitrogen.

5,204,307

PROCESS FOR ALKYLATION OF AROMATIC DIAMINES

Kryn G. Ihrman, Baton Rouge, La.; Olan W. Mitchell, Glen Carbon, Ill., and R. Woodrow Wilson, Jr., Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 601,516, Oct. 23, 1990, Pat. No. 5,103,059. This application Jan. 13, 1992, Ser. No. 820,191

Int. Cl.[5] B01S *31/14*

U.S. Cl. 502—155 **2 Claims**

1. A catalyst formed by reacting triethylaluminum with an aromatic diamine and a chloride ion source in a molar ratio of triethylaluminum to chloride ion source from about 1.0:0.9 to about 0.9:0.01.

5,204,308

ANIONICALY STABILIZED LITHIUM CATALYSTS AND A METHOD FOR STABILIZING THE LITHIUM CATALYST

Anthony L. Lee, Glen Ellyn; Erek J. Erekson, La Grange; James T. Semrau, Chicago; S. Peter Barone, Hoffman Estates, and Irving J. Solomon, Highland Park, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Apr. 8, 1991, Ser. No. 681,958

Int. Cl.[5] B01J *21/02, 21/06, 23/04, 27/18*

U.S. Cl. 502—208 **6 Claims**

1. An anionically stabilized lithium catalyst comprising lithium stabilized with an anion selected from the group consisting of phosphate, aluminate, silicate and mixtures thereof, said stabilized lithium supported on a metal oxide support selected from the group consisting of magnesium oxide, titanium oxide, zinc oxide, calcium oxide, barium oxide, strontium oxide, zirconium oxide, hafnium oxide, yttrium oxide, lanthanum oxide, samarium oxide and mixtures thereof.

5,204,309

CATALYSTS FOR NEUTRALIZING AIR AND GASEOUS EXHAUSTS

Vladimir N. Vorob'iev, and Tatjana B. Molodogenjuk, both of Uzbekistan, U.S.S.R., assignors to TPCT Chemicals, Inc., Seattle, Wash.

Filed Dec. 30, 1991, Ser. No. 814,933

Int. Cl.[5] B01J *21/04, 21/06, 23/26, 23/78*

U.S. Cl. 502—306 **13 Claims**

1. A composition comprising:

A. from about 0.1% to about 15% by weight of a material selected from the group consisting of CuO, Cr_2O_3, NiO, CoO, and mixtures of those compounds;

B. from about 5% to about 25% by weight of a material selected from the group consisting of $CuCr_2O_4$, $NiCr_2O_4$, $CoCr_2O_4$, and mixtures of those compounds;

C. from about 3% to about 25% by weight TiO_2; and

D. from about 60% to about 90% by weight of a material selected from the group consisting of Al_2O_3, $MgAl_2O_4$, and mixtures of those compounds;

wherein said TiO_2 and said material selected from the group consisting of Al_2O_3, $MgAl_2O_4$, and mixtures of those compound are provided in the form of a particulate carrier, and wherein said $CuCr_2O_4$ and said material selected from the group consisting of CuO, Cr_2O_3, and mixtures of those compounds are provided substantially on the surface of said particulate carrier.

5,204,310

HIGH ACTIVITY, HIGH DENSITY ACTIVATED CARBON

Edward D. Tolles; Mitchell S. Dimitri, both of Charleston, and Charles C. Matthews, Moncks Corner, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 21, 1992, Ser. No. 839,597

Int. Cl.[5] C01B *31/08, 31/12;* **B01J** *20/20;* **B01D** *53/04*

U.S. Cl. 502—416 **15 Claims**

1. A high activity, high density, lignocellulose-based activated carbon particulate characterized by a butane activity of from about 50 to about 80 g/100 g, a butane working capacity of from above 15 to about 25 g/100 cm^3, an apparent density of from about 0.25 to about 0.40 g/cm^3, greater than about 50% of total carbon particle volume comprising pores of a width from about 1.8 to about 50 nm, and less than about 20% of total carbon particle volume comprising pores of a width greater than about 50 nm.

5,204,311

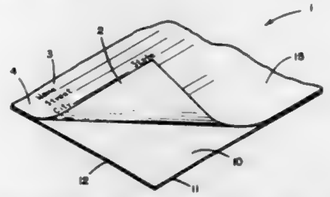
ETHANEDIIMIDIC ACID BIS[(ARYLALKYLIDENE)HYDRAZIDE] COLOR-FORMERS

Nusrallah Jubran, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

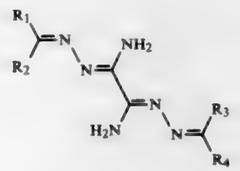
Filed Aug. 23, 1991, Ser. No. 749,173

Int. Cl.[5] B41M *5/132, 5/165*

U.S. Cl. 503—201 **19 Claims**



1. A composition capable of forming colored complexes with transition metal salts, said composition comprising an ethanediimidic acid bis[(arylalkylidene)hydrazide] compound carried in an organic cosolvent vehicle, said compound having the formula:



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wherein R_1 is selected from the group consisting of aryl group and alkoxyacetl group; and R_2, R_3, and R_4, are substituents independently selected from the group of substituents consisting of hydrogen, alkyl group, aryl group and alkoxyacetyl wherein an N-(monosubstituted)dithiooxamide, an N,N'-(disubstituted)dithiooxamide, or a mixture thereof, is also contained in the organic cosolvent.

5,204,312

AZO DYES FOR THERMAL TRANSFER PRINTING

Ruediger Sens, Mannheim; Gunther Lamm, Hassloch, and Karl-Heinz Etzbach, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ladwigshafen, Fed. Rep. of Germany

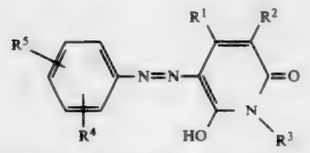
Filed Jun. 12, 1991, Ser. No. 714,021

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1990, 4019419

Int. Cl.[5] B41M *5/035, 5/38*

U.S. Cl. 503—227 **4 Claims**

1. In a process for thermal transfer printing, the improvement comprising transferring an azo dye of formula I



in which the substituents have the following meanings:

R^1 is hydrogen, amino, hydroxyl or C_1–C_3-alkyl,

R^2 is hydrogen, acetyl, carbamoyl or cyano,

R^3 is ω-phenoxy-, ω-tolyloxy-, ω-benzyloxy- or ω-cyclohexyloxy-C_1–C_{12}-alkyl whose carbon chain may be interrupted by one or two of the following nonadjacent members:

—O—, —CO—, —O—CO— or —CO—O—

and which may carry one or two of the following substituents: halogen, hydroxyl, C_1–C_2-alkyl, phenyl or cyclohexyl,

R^4 and R^5 are each hydrogen, halogen, cyano, nitro, trihalomethyl or a radical of the formula —CO—H, —CO—R^6, —O—CO—R^6, —CO—OR^6, —SO—OR^6, —O—SO—OR^6, —CO—NR^7R^8, —O—CO—NR^7R^8, —SO_2—NR^7R^8 or —O—SO_2—NR^7R^8 where

R^6 is C_1–C_{12}-alkyl or ω-phenoxy-, ω-tolyloxy-, ω-benzyloxy- or ω-cyclohexyloxy-C_1–C_{12}-alkyl, in each of which the carbon chain may be interrupted by one or two oxygen atoms in ether function,

R^7 is C_1–C_{12}-alkyl, and

R^8 is hydrogen or has one of the meanings of R^7; by diffusion from a transfer source to a substrate utilizing a heat source.

5,204,313

PROCESS OF FORMING A HIGH TEMPERATURE SUPERCONDUCTOR ON A METAL SUBSTRATE SURFACE

Mark Lelental, and Henry J. Romanofsky, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 623,639, Dec. 7, 1990, abandoned. This application Oct. 10, 1999, Ser. No. 773,830

Int. Cl.[5] B05D *5/12, 3/02*

U.S. Cl. 505—1 **11 Claims**

1. A process of forming on a surface of a substrate a superconductive crystalline mixed metal oxide thin film exhibiting superconductivity at a temperature in excess of 85° K. and containing a crystalline superconductive phase exhibiting a 37 Å crystal cell c-axis by the steps of

forming a precursor of the superconductive thin film on the substrate surface containing bismuth, lead, copper and a combination of the alkaline earths A and calcium, where A is strontium and 0 to 10 percent barium, based on strontium and barium combined in the proportions required to form the 37 Å crystal cell c-axis superconductive phase and

thermally converting the thin film precursor to the superconductive thin film,

characterized in that

the substrate surface is comprised of at least one of silver, gold or a platinum group metal,

at least 0.7 atom of lead for each four atoms of the alkaline earths is in the thin film precursor to enhance formation of the 37 Å crystal cell c-axis superconductive phase on the substrate support surface, and

at least two atoms of bismuth are maintained in the thin film precursor for each four atoms of the alkaline earths.

5,204,314

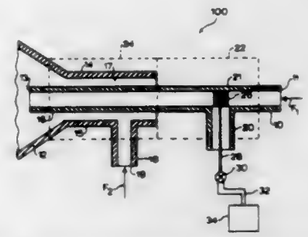
METHOD FOR DELIVERING AN INVOLATILE REAGENT IN VAPOR FORM TO A CVD REACTOR

Peter S. Kirlin, Brookfield; Robin L. Binder, Bethlehem, and Robin A. Gardiner, Bethel, all of, assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Continuation of Ser. No. 549,389, Jul. 6, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 807,807

Int. Cl.[5] C23C *16/00;* **B05D** *5/12*

U.S. Cl. 505—1 **25 Claims**



1. A process for delivering an involatile solid source reagent material having a vapor pressure of less than about 0.1 torr at 25° C. and 1 atmosphere conditions, and which is thermally unstable at its vaporization temperature, as a source regent material vapor into a CVD reactor, said process comprising:

providing a supply vessel containing a reagent source liquid formed by dissolving the involatile solid source reagent material in a non-azotropic organic solvent, wherein the reagent source liquid is contained in the supply vessel in a non-heated state, at or below room temperature;

arranging a flash vaporization structure comprising a foraminous element having a surface-to-volume ratio of at least 4, in liquid flow communication with the supply vessel containing the reagent source liquid;

heating the foraminous element to a flash vaporization temperature for the involatile solid source reagent material; and

flowing the reagent source liquid from the supply vessel to the heated foraminous element, with the reagent source liquid in a non-atomized state directly issuing a liquid stream of the reagent source liquid onto the heated foraminous element, and flash vaporizing the involatile solid source material from the reagent source liquid to form the source reagent material vapor.

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SUPERCONDUCTOR WIRE AND PROCESS FOR

duce said superconductive phase in said sintered body, said $CaCuO_2$ and cupric oxide in said mixture being

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PROCESS FOR MAKING HIGH CRITICAL CURRENT

10~10000 three-dimensionally and uniformly dispersed in a matrix of at least one calcium phosphate compound, and at

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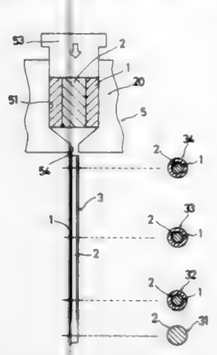
5,204,315

SUPERCONDUCTOR WIRE AND PROCESS FOR PRODUCTION THEREOF

Yoshitaka Ito, Kariya; Masami Ishii, Toyota; Tetsuo Oka, Obu; Takeo Nakagawa, and Lihong Zhang, both of Kawasaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 20, 1992, Ser. No. 837,918
Claims priority, application Japan, Feb. 27, 1991, 3-55901
Int. Cl.[5] H01B *12/00;* **B22F** *1/00*
U.S. Cl. 505—1 **3 Claims**



1. A process for production of superconductor wire having multiple rings, comprising the steps of:

preparing a silver mixture comprising a silver powder or silver-gold alloy powder mixed with an organic bonding agent, and superconductor mixture comprising a superconductor powder with an organic bonding agent;

arranging both the silver mixture and the superconductor mixture in an extrusion die;

extruding a wire having a core selected from either the superconductor mixture or the silver mixture such that when said wire has the superconductor mixture core said wire has at least one radial ring of said silver mixture and when said wire has the silver mixture core said wire has at least one radial ring of said superconductor mixture;

heating said wire at a temperature sufficient to sinter said superconductor mixture and said silver mixture such that the bonding agent is removed from said wire.

5,204,316

PREPARATION OF TAPE OF SILVER COVERED BI-PB-CA-SR-CU-O ORIENTED POLYCRYSTAL SUPERCONDUCTOR

Ronald H. Arendt, Schenectady, and Mary F. Garbauskas, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1990, Ser. No. 502,712
The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.
Int. Cl.[5] H01L *39/24*
U.S. Cl. 505—1 **6 Claims**

1. A process for producing a final tape comprised of a continuous elongated solid sintered body with its longitudinal surface enveloped with elemental silver leaving no significant portion of said longitudinal surface exposed, said sintered body containing oriented superconductive crystalline $Bi_{2-y}Pb_yCa_2Sr_2Cu_3O_{10\pm z}$ phase where y ranges from 0.1 to 0.5 and z ranges from zero to less than 1 in an amount of at least 90% by weight of said body, which comprises the following steps:

(a) forming a particulate mixture of reactants comprised of $Bi_2CaSr_2Cu_2O_{8\pm x}$ where x ranges from 0 to 0.5, Ca_2CuO_3, cupric oxide, and lead oxide, said mixture of reactants being formulated to produce said superconductive phase and to provide an excess amount of said Ca_2CuO_3 and cupric oxide sufficient to drive the reaction to produce said superconductive phase in said sintered body, said Ca_2CuO_3 and cupric oxide in said mixture being present in substantially mole equivalents to each other, said $Bi_2CaSr_2Cu_2O_{8\pm x}$ being comprised of substantially monodispersed crystals, said particulate mixture being a sinterable mixture;

(b) providing a hollow tube open at one end comprised of elemental silver, said tube having dimensions sufficient to produce said tape;

(c) packing said particulate mixture into said silver tube to produce a packed particulate mixture therein having a density ranging from 40% to 60% of its theoretical density;

(d) closing the open end of the resulting packed tube with elemental silver producing a closed tube comprised of said packed mixture and silver;

(e) applying physical force to the resulting packed tube in the radial direction to increase the density of said packed mixture to at least 65% of its theoretical density producing a deformed tube,

(f) drawing said deformed tube to produce a wire, said wire having dimensions sufficient to produce said tape;

(g) applying uniaxial pressure to said wire in the radial direction to orient said $Bi_2CaSr_2Cu_2O_{8\pm x}$ crystals with their c-axis substantially parallel to each other producing an initial tape with two major opposed surfaces to which said c-axis of said $Bi_2CaSr_2Cu_2O_{8\pm x}$ crystals are substantially perpendicular;

(h) firing said initial tape in an oxidizing atmosphere at a reaction temperature ranging from 820° C. to 860° C. converting a sufficient amount of said $Bi_2CaSr_2Cu_2O_{8\pm x}$ crystals to said superconductive crystalline $Bi_{2-y}Pb_yCa_2Sr_2Cu_3O_{10\pm z}$ phase to produce a first intermediate tape containing a significantly dilated intermediate partly reacted sintered product wherein said $Bi_{2-y}Pb_yCa_2Sr_2Cu_3O_{1-\pm z}$ phase comprises less than 50% by weight of said intermediate product;

(i) cooling the first intermediate tape in an oxidizing atmosphere producing a first intermediate tape containing intermediate solid sintered product;

(j) applying uniaxial pressure to a major surface of the resulting first intermediate tape to at least remove the dilation produced in step (h);

(k) firing the resulting first pressed intermediate tape in an oxidizing atmosphere at a reaction temperature ranging from 820° C. to 860° C. converting a sufficient amount of said $Bi_2CaSr_2Cu_2O_{8\pm x}$ crystals to said superconductive crystalline $Bi_{2-y}Pb_yCa_2Sr_2Cu_3O_{10\pm z}$ phase to produce a second intermediate tape containing a significantly dilated intermediate partly reacted sintered product wherein said $Bi_{2-y}Pb_yCa_2Sr_2Cu_3O_{10\pm z}$ phase comprises less than 90% by weight of said intermediate product;

(l) cooling the second intermediate tape in an oxidizing atmosphere producing a second intermediate tape containing intermediate solid sintered product;

(m) applying uniaxial pressure to a major surface of the resulting second intermediate tape to at least remove the dilation produced in step (k);

(n) firing the resulting pressed intermediate tape containing pressed intermediate product in an oxidizing atmosphere at a reaction temperature ranging from 820° C. to 860° C. to produce a tape containing finally sintered reaction product wherein said superconductive phase comprises at least 90% by weight of said reaction product, said reaction temperature being below the temperature at which sufficient liquid forms to prevent production of said sintered products, said pressed intermediate product undergoing no significant dilation in said final firing; and

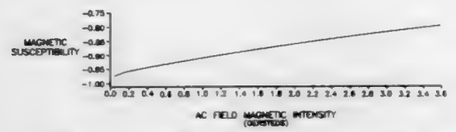
(o) cooling the resulting tape in an oxidizing atmosphere producing said final tape wherein said solid sintered body has an open porosity ranging from 5% to 20% by volume of the body, said steps (h) to (m) being carried out sufficiently to produce said tape containing said finally sintered reaction product in step (n).

5,204,317

PROCESS FOR MAKING HIGH CRITICAL CURRENT DENSITY $Bi_2CASR_2CU_2O_8$ SUPERCONDUCTOR

Francis S. Galasso, Manchester, and David A. Condit, Avon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 29, 1991, Ser. No. 737,296
Int. Cl.[5] C01F *11/02;* **C01G** *3/02, 29/00*
U.S. Cl. 505—1 **5 Claims**



1. A method for making a high critical current density $Bi_2CaSr_2Cu_2O_8$ high T_c superconductor, consisting essentially of sequentially:

(a) mixing suitable solid state reactants in amounts sufficient to create a reactant mixture having a ratio of approximately 4 Bi atoms:3 Ca atoms:3 Sr atoms:4 Cu atoms and oxygen;

(b) loosely compacting the reactant mixture so the reactant mixture is sufficiently porous to permit oxygen to infiltrate to the interior of the reaction mixture;

(c) heating the reactant mixture to a temperature between about 840° C. and about 870° C. in an oxygen-containing atmosphere; and

(d) maintaining the reactant mixture at a temperature between about 840° C. and about 870° C. for at least about 2 days in the oxygen-containing atmosphere to sinter the reactant mixture and form a $Bi_2CaSr_2Cu_2O_8$ superconductor;

wherein the superconductor has a high critical current density.

5,204,318

PREPARATION OF SUPERCONDUCTING OXIDES AND OXIDE-METAL COMPOSITES

Gregory J. Yurek, Wellesley, and John B. VanderSande, Newbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 31,407, Mar. 27, 1987, Pat. No. 4,826,808. This application Jun. 10, 1987, Ser. No. 61,233
Int. Cl.[5] B05D *5/12;* **C23C** *8/10*
U.S. Cl. 505—1 **1 Claim**

1. A method of preparing a superconducting ceramic oxide comprising the steps of:

1) combining metallic element ABC in a substantially stoichiometric proportion needed to form said superconducting oxide to form an alloy wherein A is La or Y, B is Ba or Sr and C is Cu.

2) shaping said alloy to a predetermined geometry.

3) oxidizing said shaped alloy to form said superconducting oxide.

5,204,319

FIBER REINFORCED CERAMICS OF CALCIUM PHOSPHATE SERIES COMPOUNDS

Ryo Enomoto; Yoshimi Matsuno, and Masato Yokoi, all of Ogaki, Japan, assignors to Ibiden Co., Ltd., Gifu, Japan

Division of Ser. No. 415,310, Sep. 27, 1989, Pat. No. 5,091,344. This application Jul. 31, 1991, Ser. No. 738,307
Claims priority, application Japan, Jan. 30, 1988, 63-18567; Apr. 27, 1988, 63-102655
Int. Cl.[5] C04B *35/02*
U.S. Cl. 501—1 **7 Claims**

1. A porous fiber reinforced composite ceramic of at least one calcium phosphate compound comprising about 1–45 vol. % of heat-resistant inorganic short fibers having an average length of not more than 10 mm and an average aspect ratio of 10~10000 three-dimensionally and uniformly dispersed in a matrix of at least one calcium phosphate compound, and at least part of the matrix is composed of at least one calcium phosphate compound produced in a heat treatment of at least one calcium phosphate compound precursor and pores existing in said ceramic being filled with biological glass.

5,204,320

DRILLING MUD ADDITIVE COMPRISING FERROUS SULFATE AND POLY(N-VINYL-2-PYRROLIDONE/SODIUM 2-ACRYLAMIDO-2-METHYLPROPANE SULFONATE)

Bharat B. Patel, and George G. Dixon, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 7, 1991, Ser. No. 789,208
Int. Cl.[5] C09K *7/02*
U.S. Cl. 507—121 **16 Claims**

5. A water based drilling fluid composition comprising poly(N-vinyl-2-pyrrolidone/sodium 2-acrylamido-2-methylpropane sulfonate) and an amount of ferrous sulfate sufficient to reduce drilling fluid viscosity as compared to a drilling fluid comprising poly(N-vinyl-2-pyrrolidone/sodium 2-acrylamido-2-methylpropane sulfonate) without said ferrous sulfate.

5,204,321

HEPARIN NEUTRALIZATION WITH PLATELET FACTOR 4

Jacquelynn J. Cook, Lansdale; Stefan Niewarowski, Narbeth, both of Pa., and Theodore E. Malone, Wakefield, Mass., assignors to Repligen Corporation, Cambridge, Mass.

Continuation of Ser. No. 480,873, Feb. 16, 1990, abandoned. This application Jun. 23, 1992, Ser. No. 902,509
Int. Cl.[5] A61K *37/02, 31/725;* **C07K** *7/10*
U.S. Cl. 514—2 **19 Claims**

1. A method for completely preventing heparin inhibition of coagulation in a mammal having an undesirably high level of circulating heparin following administration of heparin in connection with a medical procedure, said method comprising administering to said mammal a heparin neutralizing amount of purified PF4 or purified recombinant PF4.

9. A method of restoring a normal coagulation status in a human patient after administration of heparin, without substantial depletion of platelets or leukocytes, comprising administering purified PF4 or purified recombinant PF4 to said patient to form a complex of said heparin with said PF4.

10. A method of treating a human patient to temporarily prevent blood coagulation during a medical procedure, comprising:

administering to said patient a therapeutically effective amount of heparin to inhibit coagulation, and thereafter

administering to said patient a therapeutically effective amount of purified PF4 or purified recombinant PF4 to neutralize said heparin.

5,204,322

NITRILE AND ALDOXIME INDANE COMPOUNDS AND COMPOSITIONS

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Dec. 31, 1991, Ser. No. 816,141
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—6 **17 Claims**

1. A compound of the formula [I]

5,204,325

VISCOELASTIC SOLUTION

5,204,327

TREATMENT OF CEREBRAL EDEMA WITH ANP

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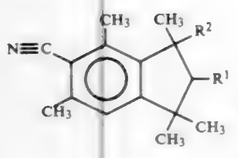


[I]

wherein
R^1 is H, CH_3, and CH_2CH_3, and
R^2 is CH_3, and CH_2CH_3.

10. A fragrance composition comprising a compound of claim **1** in combination with at least one of a carrier and additional perfumery material.

5,204,323
HEPARIN AND HIRUDIN ANTIDOTAL COMPOSITIONS AND METHODS

Valerie S. Findlay; Roger Kerry, both of Horsham; Graham F. Pay, Patcham; Robert B. Wallis, Leechponds Hills, and Keith D. Butler, Soreham-by-Sea, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 416,882, Oct. 4, 1989, abandoned. This application Sep. 20, 1991, Ser. No. 763,477
Claims priority, application United Kingdom, Oct. 6, 1988, 8823480
Int. Cl.[5] A61K *37/02, 31/725*
U.S. Cl. 514—2 **10 Claims**

1. A method of at least partially reversing the anticoagulation activity of a blood anticoagulant in a mammal comprising administering to said mammal a therapeutically effective amount of Factor VIII or fragments of Factor VIII which retain its activity or a substance which increases its concentration in blood, wherein the blood anticoagulant is selected from the group consisting of heparin, anticoagulantly active heparin fragments, low molecular weight heparins, fragmin, thrombin inhibitors, hirudin, synthetic hirudin variants, hirudin derivatives, hirudin fragments, desulphatohirudin variants, (2R, 4R)-4-methyl-1-[N^2-(3-(RS)-methyl-1,2,3,4-tetrahydro-8-quinolinyl-sulphonyl)-(S)-arginyl]-2-piperidine carboxylic acid, D-phenyl-alanyl-L-prolyl-L-arginine aldehyde sulphate, and Nα-(2-naphthalene-sulphonyl-glycyl)-4-amido-phenylalaninepiperidine.

5,204,324
BIOLOGICALLY COMPETENT, VIRUS INACTIVATED ALBUMIN

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 321,522, Mar. 9, 1989, abandoned, and a continuation-in-part of Ser. No. 290,161, Dec. 28, 1988, Pat. No. 4,891,221, and a continuation-in-part of Ser. No. 276,113, Nov. 23, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 433,605
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—2 **20 Claims**

1. A therapeutic composition of matter consisting essentially of non-pasteurized biologically competent human albumin substantially separated from plasma and other blood components, substantially free of stabilizers and free of active virus and suitable for human therapy, containing one or more glycyrrhizic triterpenoid compounds.

5,204,325
VISCOELASTIC SOLUTION

Richard L. Lindstrom, 1741 Archer Ct., Plymouth, Minn. 55447, and Debra Skelnik, P.O. Box 758 Rte. 1, Cambridge, Minn. 55008

Division of Ser. No. 284,533, Dec. 15, 1988. This application May 3, 1991, Ser. No. 695,332
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[5] A61K *37/00, 37/26, 37/36*
U.S. Cl. 514—4 **6 Claims**

1. A viscoelastic composition comprising:
a. a buffered balanced salt solution;
b. hydroxypropyl methyl cellulose; and,
c. a glycosaminoglycan which is dermatin sulfate, heparin sulfate, heparan sulfate, keratin sulfate or hyaluronic acid;
the composition having a pH of 6.0–8.0 and an osmolality of 200–400 mOsmol/L.

5,204,326
POLYPEPTIDE DERIVATIVES AND CALCIUM METABOLISM IMPROVING AGENT

Setsuro Fujii, deceased, late of Kyoto; by Keiko Fujii, successor, Kyoto; by Shinichiro Fujii, successor, Uji; by Kaoruko Takada, successor, Ehime; Yoshihito Yamamoto; Fumio Shimizu, both of Otsu; Masatoshi Inai, Tokushima; Naosumi Kinoshita, Otsu; Shizuo Nakamura, Naruto; Mitsuru Hirohashi; Takashi Sakamoto, both of Otsu; Kazuhiko Tsutsumi, Tokushima, and Tetsuhiko Shirasaka, Otsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo and Otsuka Pharmaceutical Factory, Inc., Tokushima, both of Japan

Filed Mar. 14, 1990, Ser. No. 493,359
Claims priority, application Japan, Mar. 16, 1989, 1-065446; Jul. 12, 1989, 1-180908; Aug. 3, 1989, 1-201869
The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.
Int. Cl.[5] A61K *37/02;* **C07K** *5/12, 7/36*
U.S. Cl. 514—11 **17 Claims**

1. Polypeptide derivatives, acid-addition salts thereof and complexes thereof represented by the general formula (1)

(1)

(A)—(B)—(D)
CO—(Ser)$_l$—Asn—Leu—Ser—Thr—NH—CH—CO—(E)—Leu—Gly—Lys—Leu—Ser—Gln—Glu—Leu—(F)—Lys—(Leu)$_m$—Gln—Thr—(Tyr)$_n$—Pro—(G)—Thr—Asn—Thr—Gly—Ser—Gly—Thr—Pro—NH_2

wherein (A) is a lower alkylene group; (B) is —NHCO—, —S— or an oxyphenylene group; (D) is a lower alkylene group; (E) is a valine residue, a glycine residue or an isoleucine residue; (F) is a histidine residue, an asparagine residue, a glycine residue, an alanine residue, a serine residue, a leucine residue or a glutamine residue; and (G) is an arginine residue or a glutamine residue, respectively; l, m and n are each 0 or 1; provided that when l is 0 and (A) is a methylene group, then (D) is a methylene group or an ethylene group; or represented by the general formula (2)

(2)

(A′)—(B′)—(D′)
CO—Ala—Ser—Leu—Ser—Thr—NH—CH—CO—Val—Leu—Gly—Lys—Leu—Ser—Gln—Glu—Leu—(G′)—Lys—(Leu)$_p$—Gln—Thr—(Tyr)$_q$—Pro—(H′)—Thr—Asp—Val—Gly—Ala—Gly—Thr—Pro—NH_2

wherein (A′) is a lower alkylene group; (B′) is —NHCO—; (D′) is a lower alkylene group; (G′) is a histidine residue, a asparagine residue or a glycine o residue; and (H′) is an arginine residue or a glutamine residue, respectively; and p and q are each 0 or 1.

5,204,327
TREATMENT OF CEREBRAL EDEMA WITH ANP PHARMACEUTICAL COMPOSITIONS

Takao Kiyota; Shuichi Sugawara, and Hiroshi Hayashi, all of Shizuoka, Japan, assignors to Ashi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Nov. 13, 1989, Ser. No. 435,659
Claims priority, application Japan, Nov. 18, 1988, 63-290173
Int. Cl.[5] A61K *37/02;* **C07K** *7/10*
U.S. Cl. 514—12 **7 Claims**

1. A method for treating cerebral edema, which comprises administering toa patient having cerebral edema an effective anti-cerebral edema amount of at least one peptide represented by formula (I):

(I)

H—Ser—Leu—Arg—Arg—Ser—Ser—Cys—Phe—Gly—Gly—
Arg—X—Asp—Arg—Ile—Gly—Ala—Gln—Ser—Gly—Leu—
Gly—Cys—Asn—Ser—Phe—Arg—Tyr—OH

wherein X is an isoleucine residue or a methionine residue.

5,204,328
PEPTIDES HAVING ATRIAL NATRIURETIC FACTOR ACTIVITY

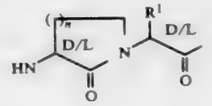
Ruth F. Nutt, Green Lane; Stephen F. Brady, Philadelphia; Daniel F. Veber, Ambler, and Theresa M. Williams, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 543,621, Jun. 26, 1990, abandoned. This application Nov. 5, 1991, Ser. No. 789,378
Int. Cl.[5] A61K *37/02;* **C07K** *7/10*
U.S. Cl. 514—13 **13 Claims**

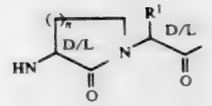
1. A peptide having the amino acid sequence:

R—Cys—A—B—C—D—N—O—E
Ile
Cys—J—Leu—I—Ser—H—G—F
K—L—M—P—Q

wherein
R is H, Ac, Ser, Ser-Ser, Arg-Ser-Ser, Arg-Arg-Ser-Ser, or Ser-Leu-Arg-Arg-Ser-Ser;
A is Phe or N-MePhe;
B is Gly, D/L-Ala or D/L-Pro;
C is Gly, L-Ala or D/L-Pro; or
B-C is



where
n=1 or 2, and
R^1 is H or methyl;
D is Arg, N-MeArg or D/L-Pro;
E is Arg, N-MeArg or Pro;
F is Gly, D/L-Ala or D/L-Pro;
G is Ala, N-MeAla or D/L-Pro, or
F-G is



wherein
n=1 or 2, and
R^1 is H or methyl;
H is Gln or D/L-Pro;
I is Gly, D/L-Ala or D/L-Pro;
J is Gly, D/L-Ala or D/L-Pro;
K is D/L-Asn, D/L-Pro or D/L-N-MeAla;
L is D/L-Ser, D/L-Pro or D/L-N-MeAla;
M is D/L-Phe, D/L-N-MePhe or D/L-Pro;
N is Met, Ile, Leu or Nle
O is Asp or Glu;
P is D/L-Arg, NH_2 or is absent;
Q is D/L-Tyr, NH_2 or is absent;
with the proviso that one residue of said peptide shall be N-methylated, said N-methylated residue taken from the group consisting of N-MePhe at position A, N-MeArg at position D, N-MeArg at position E, N-MeAla at position G, D/L-N-MeAla at position K, D/L-N-MeAla at position L and D/L-N-MePhe at position M;
with the additional proviso that, when all other residue positions are identical to native ANP, M is not N-MePhe, K is not Pro or C is not Pro.

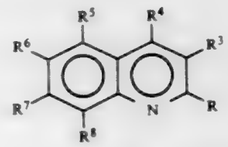
5,204,329
TREATMENT OF ORGAN TRANSPLANTATION REJECTION

Neil R. Ackerman, Greenville, and Bruce D. Jaffee, Wilmington, both of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Jun. 11, 1990, Ser. No. 535,672
Int. Cl.[5] A61K *31/47, 37/00*
U.S. Cl. 514—15 **31 Claims**

1. A method of treating organ transplantation rejection in a mammal comprising administering to the mammal a synergistically effective amount of a combination of at least one immunosuppressive agent, selected from the group consisting of cyclosporin A, azathioprine, FK506, mycophenolic acid or the morpholinethylester thereof, or rapamycin, and (b) at least one compound of the formula:

(I)



or a pharmaceutically acceptable salt thereof, wherein:
R is

R^1 is

5,204,331
COMPOSITION FOR DEBRIDEMENT OF RETAINED

one hydroxy,
one cyano,

C_1–C_4 alkoxy groups, CF_3, CN, NO_2, di(C_1–C_4 alkyl-)amino or C_1–C_4 alkanoylamino

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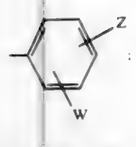
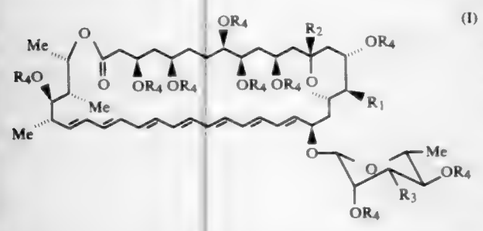


R^3 is H, alkoxy of 1 to 3 carbon atoms, alkyl of 1 to 2 carbon atoms, or hydroxy;
R^4 is CO_2H;
R^5, R^6, R^7 and R^8 are independently H, F, Cl, Br, I, CH_3, CF_3, or alkyl of 1 to 3 carbon atoms, at least two of R^5, R^6, R^7 and R^8 being H;
W, Y and Z are independently H, F, Cl, Br, alkyl of 1 to 5 carbon atoms, NO_2, OH, CF_3 or OCH_3;
(1) R^5, R^6 and R^7 cannot all be H; and
(4) when R^6 is CH_3, then R^7 cannot be Cl.

5,204,330
ANTIFUNGAL COMPOUNDS
Michael J. Driver, Slough; Alexander R. Greenlees, and David T. MacPherson, both of Epsom, all of England, assignors to Beecham Group p.l.c., Brentford, England
Filed Dec. 6, 1990, Ser. No. 624,709
Claims priority, application United Kingdom, Dec. 8, 1989, 8927848; Jun. 18, 1990, 9013574
Int. Cl.[5] A61K *31/70*; C07H *17/08*
U.S. Cl. 514—31 7 Claims

1. A compound of formula (I) or a pharmaceutically acceptably salt thereof:



(I)

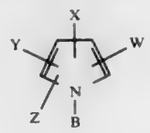
wherein R_1 is selected from the group consisting of a group $—CH_2—X$ where X is hydrogen, halogen, —CN, $—N_3$, $—OC(O)R_5$, $—S(O)_nR_5$, $—SH_n$ $—OC(O)NHR_5$, $—NHCONHR_5$ or $—NR_6R_7$, where R_5 is hydrogen, C_{1-8} alkyl, phenyl, naphthyl, heteroaryl, aryl-C_{1-4} alkyl or heteroaryl-C_{1-4} alkyl in each of which the aromatic moiety is optionally substituted with the proviso that when X is $—S(O)_nR_5$, R_5 does not represent hydrogen, R_6 and R_7 are independently hydrogen or C_{1-6} alkyl, or one of R_6 and R_7 is hydrogen and the other is -formyl, C_{2-8} alkanoyl, dialkoxyphosphoryl, aroyl, heteroaroyl, aryl-C_{1-4} alkanoyl, heteroaryl-C_{1-4} alkanoyl, C_{1-8} alkylsulphonyl, arylsulphonyl, heteroarylsulphonyl, aryl-C_{1-4} alkylsulphonyl or heteroaryl-C_{1-4} alkylsulphonyl, where n is 0, 1 or 2 and any R_5 C_{1-8} alkyl and R_5, R_6 or R_7 aryl or heteroaryl moieties are optionally mono-, di-, or tri-substituted by any function selected from the group consisting of carboxy, nitro, alkoxycarbonyl, OH, C_{1-6} alkyl, C_{1-6} alkoxy, halogen and NR_6R_7; R_2 is hydroxy or C_{1-8} alkoxy; R_3 is an amino group or an acyl derivatives thereof, selected from the group consisting of N-D-lysyl, N-D-ornithyl, guanidine and N-glycosyl; and each R_4 is hydrogen.

5,204,331
COMPOSITION FOR DEBRIDEMENT OF RETAINED LENS MATERIALS
Okihiro Nishi, and Kayo Nishi, both of Osaka, Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan
Filed Jun. 28, 1991, Ser. No. 723,072
Claims priority, application Japan, Jun. 29, 1990, 2-172914
Int. Cl.[5] A61K *31/715, 31/19*
U.S. Cl. 514—54 9 Claims

1. A composition for debridement of retained lens materials, comprising an effective amount of ethylenediaminetetraacetic acid (EDTA) or salts thereof and a viscoelastic material in an amount sufficient to prevent leakage of said EDTA or salts thereof from a lens capsule, both dissolved in a physiologically acceptable solution.

5,204,332
PYRROLE CARBONITRILE AND NITROPYRROLE INSECTICIDAL AND ACARICIDAL AND MOLLUSCICIDAL AGENTS
Dale G. Brown, Hopewell, N.J.; Robert E. Diehl, Yardley, Pa.; Gregory T. Lowen, Durham, N.C.; Donald P. Wright, Jr., Pennington; Christine F. Kukel, Neshanic Station, both of N.J.; Rod A. Herman, Indianapolis, Ind., and Roger W. Addor, Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 776,967, Oct. 15, 1991, Pat. No. 5,162,308, which is a continuation of Ser. No. 430,601, Nov. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 279,909, Dec. 5, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 795,407
Claims priority, application European Pat. Off., Nov. 13, 1989, 89120995.9; Israel, Nov. 14, 1989, 92311; India, Nov. 17, 1989, 955/CAL/89; New Zealand, Nov. 29, 1989, 231568; Switzerland, Nov. 30, 1989, 89108999.3; Canada, Dec. 1, 1989, 2004388-1; Australia, Dec. 4, 1989, 45866/89; Czechoslovakia, Dec. 4, 1989, PV6825-89; Denmark, Dec. 4, 1989, 6095/89; Fed. Rep. of Germany, Dec. 4, 1989, 3351578; Finland, Dec. 4, 1989, 895786; Ireland, Dec. 4, 1989, 3864/89; Japan, Dec. 4, 1989, 313561/89; Rep. of Korea, Dec. 4, 1989, 18035/1989; South Africa, Dec. 4, 1989, 89/9252; Thailand, Dec. 4, 1989, 9845; Turkey, Dec. 4, 1989, 54605; U.S.S.R., Dec. 4, 1989, 4742607/15; Brazil, Dec. 5, 1989, PI8906202; Egypt, Dec. 5, 1989, 597/89; Hungary, Dec. 5, 1989, 6431/89; Philippines, Dec. 8, 1989, 39646; Taiwan, Dec. 20, 1989, 78109883
Int. Cl.[5] A01N *43/46*; C07D *207/34, 207/42*
U.S. Cl. 514—63 19 Claims

1. A pyrrole carbonitrile or nitropyrrole compound having the structure:



wherein
W is CN or NO_2;
X is CN, Cl, Br, I or CF_3;
Y is Cl, Br, I or CF_3;
Z is Cl, Br or I; and
B is

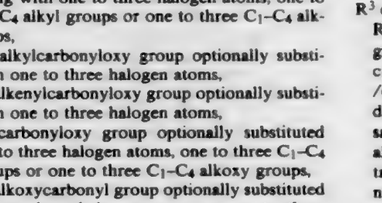
hydrogen,
C_1–C_6 alkyl optionally substituted with one to three halogen atoms,
one tri(C_1–C_4alkyl)silyl,

one hydroxy,
one cyano,
one or two C_1–C_4 alkoxy groups optionally substituted with one to three halogen atoms,
one C_1–C_4 alkylthio,
one phenyl optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one phenoxy group optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one benzyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one C_1–C_6 alkylcarbonyloxy group optionally substituted with one to three halogen atoms,
one C_2–C_6 alkenylcarbonyloxy group optionally substituted with one to three halogen atoms,
one phenylcarbonyloxy group optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups, or one to three C_1–C_4 alkoxy groups,
one C_1–C_6 alkoxycarbonyl group optionally substituted with one to three halogen atoms or one to three C_1–C_4 alkoxy groups, or
one benzyloxycarbonyl group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
C_3–C_6 alkenyl optionally substituted with one to three chlorine or bromine atoms or one phenyl group,
C_3–C_6 alkynyl optionally substituted with one to three chlorine or bromine atoms or one phenyl group or cyano;
R is C_1–C_6 alkyl optionally substituted with one to three halogen atoms,
one hydroxy,
one cyano,
one or two C_1–C_4 alkoxy groups optionally substituted with one to three halogen atoms,
one C_1–C_4 alkylthio,
one phenyl optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one phenoxy group optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one benzyloxy group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one C_1–C_6 alkylcarbonyloxy group optionally substituted with one to three halogen atoms,
one C_2–C_6 alkenylcarbonyloxy group optionally substituted with one to three halogen atoms,
one phenylcarbonyloxy group optionally substituted with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
one C_1–C_6 alkoxycarbonyl group optionally substituted with one to three halogen atoms or one to three C_1–C_4 alkoxy groups, or
one benzyloxycarbonyl group optionally substituted on the phenyl ring with one to three halogen atoms, one to three C_1–C_4 alkyl groups or one to three C_1–C_4 alkoxy groups,
C_3–C_6 alkenyl optionally substituted with one to three halogen atoms or one phenyl group,
C_3–C_6 alkynyl optionally substituted with one to three halogen atoms or one phenyl group,
phenyl optionally substituted with one to three halogen atoms, one or two C_1–C_4 alkyl groups, one or two C_1–C_4 alkoxy groups, CF_3, CN, NO_2, di(C_1–C_4 alkyl-)amino or C_1–C_4 alkanoylamino,
phenoxy optionally substituted with one to three halogen atoms, one or two C_1–C_4 alkyl groups, one or two C_1–C_4 alkoxy groups, CF_3, CN, NO_2, di(C_1–C_4 alkyl-)amino or C_1–C_4 alkanoylamino,
C_1–C_6 alkoxy optionally substituted with one to three halogen atoms,
C_2–C_6 alkenyloxy optionally substituted with one to three halogen atoms,
di(C_1–C_4 alkyl)amino,
N-(C_1–C_4 alkyl)-N-phenylamino or N-(C_1–C_4 alkyl)-N-halophenylamino, or
C_3–C_6 polymethyleneimino;
provided that when W is NO_2 and B is hydrogen, then X and Y cannot be chlorine, bromine or iodine; and when W and X are CN, and Y is chlorine, bromine or iodine, then B cannot be hydrogen or unsubstituted C_1–C_6 alkyl.

19. A composition for protecting agronomic crops from attack by insects, acarids and mollusks which comprises an edible nutritive substance, a carbohydrate source and a pesticidally effective amount of a pyrrole carbonitrile or nitropyrrole compound as described in claim 1.

5,204,333
PESTICIDAL COMPOUNDS
John P. Larkin; John B. Westoe; Ian H. Smith, all of The Wellcome Foundation Limited, Berkhamsted, Hertfordshire; Christopher J. Palmer, 37, Clapgate Lane, Ipswich, Suffolk, all of England, and John E. Casida, 1570 La Vereda Rd., Berkeley, Calif. 94708
Continuation of Ser. No. 469,013, Jan. 23, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 839,685
Claims priority, application United Kingdom, Jan. 24, 1989, 8901490; Jan. 24, 1989, 8901491
Int. Cl.[5] C07D *493/08*; A01N *43/90*
U.S. Cl. 514—63 12 Claims

1. A compound of the formula:



wherein
R is a phenyl group substituted by fluorine in the meta, para, both meta and para or ortho, meta and para positions;
R^1 and R^2may be the same or different, and each is hydrogen, halo, or a C_{1-3} aliphatic group optionally substituted by halo, cyano, C_{2-5} carbalkoxy, C_{1-4} alkoxy, or a group $S(O)_m R^{11}$ wherein m is 0, 1 or 2 and R^{11} is C_{1-4} alkyl, cyano, gem dimethyl, or C_{2-5} carbalkoxy;
R^3 contains between 3 and 18 carbon atoms and is a group R^{12} wherein R^{12} is a C_{1-13} non-aromatic hydrocarbyl group, optionally substituted by a C_{2-4} carbalkoxy or cyano group and/or by one or two hydroxy groups and-/or by one to five halo atoms which are the same or different and/or by one to three groups R^{13} which are the same or different and each include alkyloxy, alkenyloxy, alkynyloxy, alkoxyalkoxy, acyloxy, alkynyloximino, trialkylsilyl, haloalkyloxy, haloalkenyloxy, haloalkynyloxy, alkiyoximino, alkoxycarbonyloxy and mono or di-substituted alkylamino groups, or a group $—(O)_sS(O)_r(O)_wR^{19}$ wherein R^{19} is a C_{1-4} aliphatic group optionally substituted by halo, n is 0 or 1, r is 0, 1 or 2 and w is 0 or 1, the sum of n, r and w is between 0 and 3, or $_qR^3$ is phenyl or phenyl substituted by cyano and/or by one to five halo atoms and/or by one to three C_{1-4} haloalkyl groups and/or by a group —C≡CH, C≡C-halo or —C≡C—R^{12} wherein R^{12} is as hereinbefore defined or —C≡C—R^{14} wherein R^{14} is a group $S(O)_qR^{15}$ wherein R^{15} is methyl, ethyl or trifluoromethyl and q is 0, 1 or 2, or R^{14} is $SiR^{16}R^{17}R^{18}$ wherein R^{16} and R^{17} are the same or different and are each C_{1-4} aliphatic groups and R^{18} is a C_{1-4} aliphatic group or phenyl provided that R^{16} and R^{17} and R^{18} do not contain more than 10 carbon atoms in total; and
Y, Y^1 and Y^2 are oxygen.

5,204,334

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5,204,338

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5,204,334

BENZOHETEROCYCLYLALKYLAMINOALKANEDIPHOSPHONIC ACIDS, COMPOSITIONS THEREOF, AND USE THEREOF IN THE TREATMENT OF CALCIUM METABOLISM DISORDERS

Wolfgang Fröstl, and Knut A. Jaeggi, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

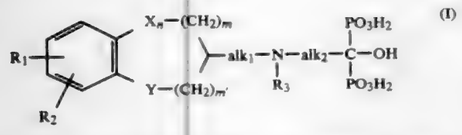
Filed Sep. 25, 1991, Ser. No. 765,360

Claims priority, application Switzerland, Oct. 18, 1990, 3332/90

Int. Cl.[5] **A61K** *31/67;* **C07F** *9/38*

U.S. Cl. 514—96 **20 Claims**

1. A benzoheterocyclylalkylaminoalkanediphosphonic acid of formula I



(I)

wherein R_1 and R_2, independently of one another, are hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl, R_3 is hydrogen or lower alkyl, X and Y, independently of one another, are oxy or thio, alk_1 and alk_2 are identical or different lower alkylene radicals, n is 0 or 1 and m and m', independently of one another, are 0, 1 or 2, the sum of n, m and m' being 1, 2 or 3, or a salt thereof.

5,204,335

IFOSFAMIDE LYOPHILISATE AND PROCESS FOR ITS PREPARATION

Dieter Sauerbier, Werther; Uwe-Peter Dammann, Detmold, and Otto Isaac, Hanau, all of Fed. Rep. of Germany, assignors to Asta Pharma Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 418,089, Oct. 5, 1989, abandoned, which is a continuation of Ser. No. 113,154, Oct. 27, 1987, abandoned. This application May 21, 1991, Ser. No. 703,703

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637089

Int. Cl.[5] **C07F** *9/547, 9/576;* **A61K** *31/675*

U.S. Cl. 514—105 **11 Claims**

1. A lyophilized preparation comprising ifosfamide and 0.1 to 17 parts by weight of a hexitol selected from the group consisting of mannitol, dulcitol and sorbitol for each part by weight of ifosfamide.

5,204,336

NAPHTHYL-,TETRAHYDRONAPHTHYL-, AND INDANYL-SUBSTITUTED G-EM-DIPHOSPHONATES AND PROCESS OF USE TO TREAT HYPERLIPIDEMIA

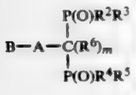
Lawrence I. Kruse, Malvern, Pa., and Virendra P. Shah, Welwyn, England, assignors to Symphar S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 703,237, May 20, 1991, abandoned, which is a continuation of Ser. No. 581,959, Sep. 13, 1990, abandoned. This application May 6, 1992, Ser. No. 879,675

Int. Cl.[5] **A61K** *31/66;* **C07F** *9/40*

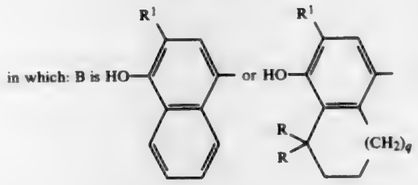
U.S. Cl. 514—107 **43 Claims**

1. A compound of structure (I) :



(I)

-continued



where

R is hydrogen or C_{1-4}alkyl and q is 0 or 1;

R^1 is hydrogen or C_{1-8}alkyl;

R^2, R^3, R^4 and R^5 are the same or different and are OR^7 in which R^7 is hydrogen or C_{1-8}alkyl; or R^2 and R^3 together and R^4 and R^5 together form a C_{2-8}alkylene dioxy ring;

R^6 is hydrogen or C_{1-4}alkyl;

m is 0 or 1, and

A is S, $S(CH_2)_n$, $CH{=}CHCH_2$, $(CH_2)_n$ or $(CH{=}CH)_p(CH_2)_tCH{=}$ in which n is 1 to 7, p is 0 or 1 and t is 0 to 4, with the proviso that m is 0 only when A is $(CH{=}CH)_p(CH_2)_tCH{=}$.

5,204,337

ESTROGEN NUCLEUS DERIVATIVES FOR USE IN INHIBITION OF SEX STEROID ACTIVITY

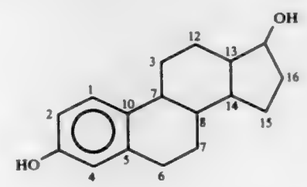
Fernand Labrie, and Yves Mérand, both of Ste-Foy, Canada, assignors to Endorecherche Inc., Canada

Continuation of Ser. No. 377,010, Jul. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 322,154, Mar. 10, 1989, which is a continuation-in-part of Ser. No. 265,716, Nov. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 265,150, Oct. 31, 1988, abandoned. This application Jul. 21, 1992, Ser. No. 917,915

Int. Cl.[5] **C07J** *41/00;* **A61K** *31/56*

U.S. Cl. 514—182 **10 Claims**

1. A sex steroid activity inhibiting compound having, as part of its molecular structure, a substituted or unsubstituted estrogenic nucleus of the structure:



wherein said compound includes as another part of its molecular structure a 7α-N-n-butyl-N-methyl undecanamide side chain substitution; and

wherein said estrogenic nucleus further includes at least one substitution selected from the group consisting of 15-chloro, 16-chloro, 15-iodo and 16-iodo.

5,204,338

OXALYLAMINO ACID DERIVATIVES AND THEIR USE AS MEDICAMENTS FOR INHIBITING PROLINE HYDROXYLASE

Ekkehard Baader, Königstein; Harald Burghard, Schmitten, and Volkmar Günzler-Pukall, Marburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

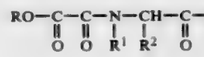
Filed May 10, 1991, Ser. No. 698,097

Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015255

Int. Cl.[5] **A61K** *31/395*

U.S. Cl. 514—183 **12 Claims**

1. A method for influencing the metabolism of collagen and collagen-like substances comprising administering an effective amount of an oxalylamino acid compound or a physiologically tolerable salt thereof, of the formula I



in which

R and R' are identical or different and are C_1–C_6alkyl or hydrogen,

R^1 is hydrogen or C_1–C_4-alkyl,

R^2 is hydrogen, C_1–C_6-alkyl, C_1–C_3-alkoxy, carboxyl, C_1–C_6-alkoxycarbonyl, aryl, SH, NH_2 or halogen, where the alkyl radicals are unsubstituted or substituted by aryl, OH, SH or NH_2

or

R^1 and R^2 together are a C_2–C_4-alkylene chain.

5,204,339

PENETRATION ENHANCERS FOR TRANSDERMAL DELIVERY OF SYSTEMIC AGENTS

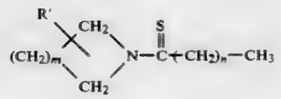
Gevork Minaskanian, Irvine; James V. Peck, Costa Mesa, and Vithal J. Rajadhyaksha, Mission Viejo, all of Calif., assignors to Whitby Research, Inc., Richmond, Va.

Continuation of Ser. No. 932,783, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 825,041, Jan. 31, 1986, abandoned. This application Aug. 6, 1990, Ser. No. 563,863

Int. Cl.[5] **A61K** *31/56, 31/445, 31/44, 31/415, 31/40, 31/34, 31/195, 31/135, 31/04*

U.S. Cl. 514—182 **8 Claims**

1. In a method for topically administering systemically active agents through the skin or mucosal membranes of humans and animals in a transdermal device or formulation, the improvement comprising the topical administration of an effective amount of a membrane penetration enhancer having the structural formula:



wherein R' is hydrogen or a lower alkyl group having 1–4 carbon atoms; m is 2–6; and n is 0–17.

5,204,340

TETRAHYDROBENZ(C,D)INDOLE SEROTONIN AGONISTS

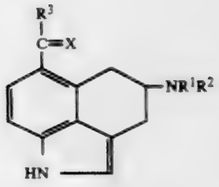
Michael E. Flaugh, and Mark M. Foreman, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 336,409, Apr. 11, 1989, abandoned. This application Feb. 26, 1990, Ser. No. 482,811

Int. Cl.[5] **C07D** *209/90, 295/192;* **A61K** *31/40, 31/535*

U.S. Cl. 514—210 **21 Claims**

1. A compound of the Formula (I)



(I)

wherein:

R^1 is hydrogen, C_1–C_4 alkyl, allyl or

R^2 is hydrogen, C_1–C_4 alkyl or allyl;

R^3 is hydrogen, C_1–C_4 alkoxy, $-NR^5R^6$ or C_1–C_4 alkylthio;

R^4 is hydrogen, methyl, ethyl or vinyl;

$R^5$and R^6 are independently a C_1–C_4 alkyl substituted with phenyl group, or a phenyl group or R^5 and R^6 together form a C_3–C_5 saturated heterocyclic ring;

R^5 is additionally hydrogen;

X is O or S; or

a pharmaceutically acceptable salt thereof.

5,204,341

1-ARYLSULPHONYL-2-PYRROLIDONE DERIVATIVES, THEIR PREPARATION PROCESS AND THE NEW INTERMEDIATES OBTAINED, THEIR USE AS MEDICAMENTS AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Emilio Toja, Milan; Carla Bonetti, Fontanella; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

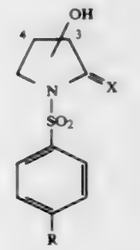
Filed Dec. 11, 1991, Ser. No. 805,694

Claims priority, application Italy, Dec. 13, 1990, 22371 A/90

Int. Cl.[5] **A61K** *31/55, 31/535, 31/495, 31/40;* **C07D** *403/00, 413/00, 207/00*

U.S. Cl. 514—212 **14 Claims**

1. A compound of formula (I):



(I)

in which

the OH radical is in the 3 or 4 position,

X represents oxygen or sulphur,

R represents a radical

R_1 and R_2 are identical or different from each other, and each represents a saturated or unsaturated alkyl radical containing up to 8 carbon atoms or form together with the

nitrogen atom to which they are linked a heterocyclic

5,204,344

R^{22} is hydrogen, halogen, lower alkyl, lower alkoxy, lower

(7) a phenoxycarbonyl which may be substituted with a C_{1-6}

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nitrogen atom to which they are linked a heterocyclic radical selected from the group consisting of piperidyl, piperazinyl, hexahydro azepinyl, morpholinyl and pyrrolidinyl;

or a compound of formula (I) having a functional derivative of the hydroxyl in the 3 or 4 position which is metabolized in vivo into the corresponding hydroxylated derivative.

13. A method for treating a patient suffering fom muscle spasms, comprising administering a pharmaceutically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

5,204,342

SATURATED TETRACYCLIC NITROGEN HETEROCYCLES

Wolfgang Frösti, Basel; Cesare Mondadori, Aesch; Dietrich Strub, Birsfelden, and Armin Züst, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

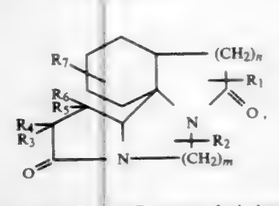
Division of Ser. No. 621,484, Dec. 3, 1990, Pat. No. 5,135,930. This application Mar. 31, 1992, Ser. No. 860,949

Claims priority, application Switzerland, Dec. 8, 1989, 4412/89

Int. Cl.[5] C07D *471/16, 487/16;* **A61K** *31/55, 31/495*

U.S. Cl. 514—219 **4 Claims**

1. A compound of the formula



(I)

in which R_1,R_2,R_3,R_5 and R_7 are each, independently of the others, hydrogen or lower alkyl, m is 3 and n is 2, and either R_4 and R_6 are each hydrogen or R_4 and R_6 together form an additional bond, in free form or in form of a salt.

5,204,343

5H-BENZODIAZEPIN DERIVATIVE

Ferenc Andrási; Péter Botka; Katalin Goldschmidt née Horváth; Tamás Hámori; Gyula Horváth; Jenó Kórösi; Imre Moravcsik; Márta Rusz née Pátfalusi; Éva Tomori née Joszt, and Gábor Zólyomi, all of Budapest, Hungary, assignors to Egis Gyógyszergyár, Budapest, Hungary

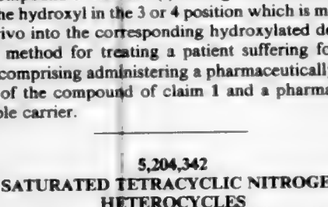
Filed Oct. 17, 1991, Ser. No. 776,771

Claims priority, application Hungary, Oct. 17, 1990, 6469/90

Int. Cl.[5] C07D *243/00;* **A61K** *31/55*

U.S. Cl. 514—221 **3 Claims**

1. The new 1-(3-chlorophenyl)-4-hydroxymethyl-7,8-dimethoxy-5H-2,3-benzodiazepine or formula (I)



(I)

and pharmaceutically acceptable acid addition salts thereof.

3. A method of anxiolytic, antiaggressive and/or antidepressant treatment, which comprises administering to a patient in need thereof an effective amount of a compound of formula (I) as claimed in claim 1 or a pharmaceutically acceptable salt thereof.

5,204,344

(QUINOLIN-2-YLMETHOXY)INDOLES AS INHIBITORS OF THE BIOSYNTHESIS OF LEUKOTRIENES

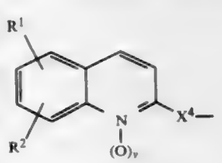
Petpiboon Prasit, Kirkland; Rejean Fortin; John H. Hutchinson, both of Montreal; Michel L. Belley, St. Laurent; Serge Léger, Dollard-des-Ormeaux; John Gillard, Baie D'Urfe, and Richard Frenette, Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Montreal, Canada

Continuation-in-part of Ser. No. 552,300, Jul. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 397,144, Aug. 22, 1989, abandoned. This application Feb. 5, 1991, Ser. No. 650,825

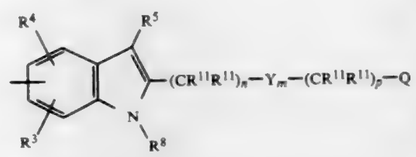
Int. Cl.[5] A01N *43/42;* **C07D** *215/04, 401/00*

U.S. Cl. 514—227.8 **22 Claims**

1. A compound of the formula I:



(I)



wherein:

R^1, R^2, R^3, R^4 and R^{10} are independently hydrogen, halogen, lower alkyl, lower alkenyl, lower alkynyl, $—CF_3$, —CN, $—NO_2$, $—N_3$, $—C(OH)R^{11}R^{11}$, $—CO_2R^{12}$, $—SR^{14}$, $—S(O)R^{14}$, $—S(O)_2R^{14}$, $—S(O)_2NR^{15}R^{15}$, $—OR^{15}$, $—NR^{15}R^{15}$, $—C(O)R^{16}$ or $—(CH_2)_tR^{21}$;

R^5 is hydrogen, $—CH_3$, $—CF_3$, —C(O)H, $X^1—R^6$ or $X^2—R^7$;

R^6 and R^9 are independently: alkyl, $—(CH_2)_uPh(R^{10})_2$ or $—(CH_2)_uTh(R^{10})_2$;

R^7 is $—CF_3$ or R^6;

R^8 is hydrogen or $X^3—R^9$;

each R^{11} is independently hydrogen or lower alkyl, or two R^{11}'s on same carbon atom are joined to form a cycloalkyl ring of 3 to 6 carbon atoms;

R^{12} is hydrogen, lower alkyl or $—CH_2R^{21}$;

R^{13} is lower alkyl or $—(CH_2)_rR^{21}$;

R^{14} is $—CF_3$ or R^{13};

R^{15} is hydrogen, —C(O)R^{16}, R^{13}, or two R^{15}'s on the same nitrogen may be joined to form pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine or N-methylpiperazine 2,5 dioxo-1-pyrrolidinyl, (3-pyridinylcarbonyl-)amino, 1,3-dihydro-1,3-dioxo-2H-isoindol-2-yl, 1,3-dihydro-2H-isoindol-2-yl, 2,4-imidazolinedion-1-yl, 2,6-piperidinedion-1-yl, 2-imidazolyl, 2-oxo-1,3-dioxolen-4-yl, piperindin-1-yl, morpholin-1-yl or piperazin-1-yl;

R^{16} is hydrogen, $—CF_3$, lower alkyl, lower alkenyl, lower alkynyl or $—(CH_2)_rR^{21}$;

R^{17} is $—(CH_2)_s—C(R^{18}R^{18})—(CH_2)_s—R^{19}$ or $—CH_2$-C(O)$NR^{15}R^{15}$;

R^{18} is hydrogen or lower alkyl;

R^{19} is a) pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine or N-methylpiperazine 2,5 dioxo-1-pyrrolidinyl,(3-pyridinylcarbonyl)amino,1,3-dihydro-1,3-dioxo-2H-isoindol-2-yl,1,3-dihydro-2H-isoindol-2-yl,2,4-imidazolinedion-1-yl,2,6-piperidinedion-1-yl,2-imidazolyl,2-oxo-1,3-dioxolen-4-yl,piperindin-1-yl,morpholin-1-yl or piperazin-1-yl, or b) the radical W-R^{20};

R^{20} is alkyl or C(O)R^{23};

R^{21} is phenyl substituted with 1 or 2 R^{22} groups;

R^{22} is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylcarbonyl, $—CF_3$, —CN, $—NO_2$ or $—N_3$;

R^{23} is alkyl, cycloalkyl, monocyclic tetrahydrofuran, tetrahydrothiophene, pyrrolidine, piperidine or tetrahydropyran;

R^{24} is the residual structure of a standard amino acid, or R^{18} and R^{24} attached to the same N can cyclize to form a proline residue;

m is 0 to 1;

n is 0 to 3;

p is 1 to 3 when m is 1;

p is 0 to 3 when m is 0;

r is 0 to 2;

s is 0 to 3;

t is 0 to 2;

u is 0 to 3;

v is 0 or 1;

W is 0, S or NR^{15};

X^1 is O, or NR^{15};

X^2 is C(O), $CR^{11}R^{11}$, S, S(O) or $S(O)_2$;

X^3 is C(O), $CR^{11}R^{11}$, $S(O)_2$ or a bond;

X^4 is CH=CH, $CH_2—Y^1$ or $Y^1—CH_2$;

Y is X^1 or X^2;

Y^1 is O, S, $S(O)_2$ or CH_2;

Q is $—CO_2R^{12}$, $—C(O)NHS(O)_2R^{14}$, $—NHS(O)_2R^{14}$, $—S(O)_2NHR^{15}$ $—C(O)NR^{15}R^{15}$, $—CO_2R^{17}$, —C(O)$NR^{18}R^{24}$, $—CH_2OH$, or 1H- or 2H-tetrazol-5-yl;

and the pharmaceutically acceptable salts thereof.

5,204,345

6-EPIFUMAGILLOLS AND THE PHARMACEUTICAL USE THEREOF

Shoji Kishimoto, and Takeshi Fujita, both of Takarazuka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

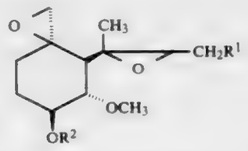
Filed Mar. 6, 1990, Ser. No. 489,010

Claims priority, application Japan, Mar. 6, 1989, 1-053536

Int. Cl.[5] A61K *31/535, 31/335;* **C07D** *413/14, 303/02*

U.S. Cl. 514—231.5 **8 Claims**

1. A compound of the formula:



wherein R^1 is 2-methyl-1-propenyl group or isobutyl group;

R^2 is

(1) hydrogen atom;

(2) a C_{1-20} alkanoyl which may be substituted with an amino, hydroxyl, halogen or carboxyl;

(3) a benzoyl or naphthoyl which may be substituted with a C_{2-6} alkyl, amino, halogen, hydroxyl, C_{1-6} alkoxy, cyano, carbamoyl or carboxyl;

(4) a 2-furoyl, 2-thienoyl, nicotinoyl, isonicotinoyl, or imidazole-1-carbonyl group which may be substituted with a C_{2-6} alkyl, amino, halogen, hydroxyl, C_{1-6} alkoxy, cyano, carbamoyl or carboxyl;

(5) a carbamoyl which may be substituted with a C_{1-6} alkyl, C_{1-6} alkanoyl, chloroacetyl, dichloroacetyl, trichloroacetyl, C_{1-6} alkoxycarbonylmethyl, carboxymethyl, phenyl, naphthyl or benzoyl, or form a cyclic amino group together with the adjacent nitrogen atom selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino or 4-phenylpiperazino;

(6) a C_{1-6} alkoxycarbonyl which may be substituted with an amino, hydroxyl, halogen or carboxyl;

(7) a phenoxycarbonyl which may be substituted with a C_{1-6} alkyl or halogen;

(8) a benzenesulfonyl which may be substituted with one to three substituents selected from a C_{1-6} alkyl and halogen;

(9) a C_{1-6} alkylsulfonyl which may be substituted with an amino, hydroxyl, halogen or carboxyl; or

(10) a sulfamoyl which may be substituted with a C_{1-6} alkyl or phenyl, or a salt thereof.

5,204,346

PYRAZOLOPYRIDINE COMPOUNDS

Youichi Shiokawa, Osaka; Atsushi Akahane, Hyogo; Hirohito Katayama, Hyogo, and Takafumi Mitsunaga, Hyogo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 15, 1991, Ser. No. 729,688

Claims priority, application United Kingdom, Jul. 18, 1990, 9015764

Int. Cl.[5] C07D *471/04;* **A61K** *31/435*

U.S. Cl. 514—234.5 **5 Claims**

1. A pyrazolopyridine compound of the formula:

wherein R^1 is phenyl, and

R^2 is amino(lower) alkyl; lower alkylamino(lower) alkyl; di(lower)alkylamino(lower)alkyl; carboxy(lower)alkylamino(lower)alkyl; protected carboxy(lower)alkylamino(lower)alkyl; lower alkylamino(lower)alkyl substituted by hydroxy and naphthyloxy; protected amino(lower)alkyl; cyano(lower)alkyl; cyano(higher)alkyl; heterocyclic substituted (lower)alkyl wherein heterocyclic is a substituted or unsubstituted heterocyclic group selected from the group consisting of pyridyl, tetrazolyl, piperidyl, piperazinyl, morpholinyl, oxazolidinyl and tetrahydropyranyl, in which said substituent(s) are 1 to 3 substituents independently selected from the group consisting of hydroxy(lower)alkyl, phenyl, (lower)alkoxyphenyl, and oxo; tetrazolyl(higher)alkyl; substituted tetrazolyl(higher-)alkyl wherein the substituent is selected from the group consisting of hydroxy(lower)alkyl, oxo, phenyl, and (lower)alkoxyphenyl; phenyl(lower)alkyl; lower alkenyl; or dihydrochromenyl which is unsubstituted or substituted by 1 to 4 substituent(s) independently selected from the group consisting of lower alkyl, hydroxy and cyano, and wherein (lower)alkyl has 1 to 6 carbon atoms and (higher)alkyl has 7 to 20 carbon atoms.

5,204,347

METHODS FOR USING (2-IMIDAZOLIN-2-YLAMINO) TETRAHYDROQUINOXALINES

Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 420,817, Oct. 12, 1989, Pat. No. 5,077,292. This application Sep. 12, 1991, Ser. No. 758,696

Int. Cl.[5] A61K *31/495, 31/50*

U.S. Cl. 514—249 **16 Claims**

1. A method of providing a therapeutic effect in a mammal comprising administering to a mammal an effective amount to provide a desired therapeutic effect in said mammal of a compound selected from the group consisting of those having the formula

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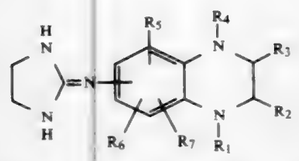


pharmaceutically acceptable acid addition salts thereof and mixtures thereof, wherein R_1 and R_4 are independently selected from the group consisting of H and alkyl radicals having 1 to 4 carbon atoms, R_2 and R_3 are independently selected from the group consisting of H, oxo, and alkyl radicals having 1 to 4 carbon atoms, the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8-positions of the quinoxaline nucleus, and R_5, R_6 and R_7 each is located in one of the remaining 5-, 6-, 7- or 8-positions of the quinoxaline nucleus and is selected from the group consisting of Cl, Br, H and alkyl radicals having 1 to 3 carbon atoms, said desired therapeutic effect being a decrease in the rate of fluid transport in the gastrointestinal tract of said mammal.

5,204,348

HETEROCYCLIC COMPOUNDS AND ANTICANCER-DRUG POTENTIATERS CONAINING THEM AS EFFECTIVE COMPONENTS

Nobuyuki Fukazawa; Makoto Odate, and Tsuneji Suzuki, all of Yokohama, Kengo Otsuka; Kamakura; Takashi Tsuruo, Tokyo, Wakao Sato, Tokyo; all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

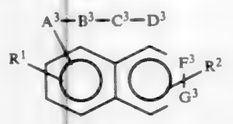
Division of Ser. No. 417,780, Oct. 6, 1989, Pat. No. 5,112,817. This application Dec. 3, 1991, Ser. No. 780,472

Claims priority, application Japan, Oct. 6, 1988, 63-250897; Jun. 22, 1989, 1-158315

Int. Cl.[5] A61K *31/495, 31/55, 31/47;* C07D *411/00, 243/08, 401/00, 271/10, 277/62*

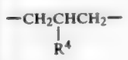
U.S. Cl. 514—253 9 Claims

1. A compound of the formula [I]

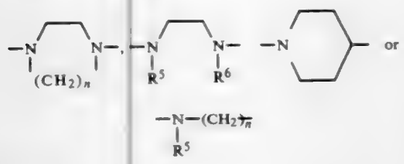


[I]

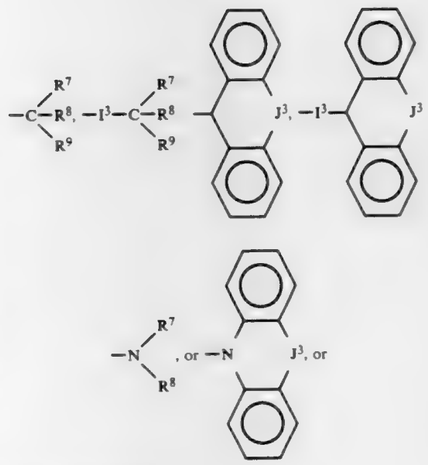
in which A^3 represents an oxygen or sulfur atom or an amino or NR^3 group, which is bound to any available position on the condensed ring; B^3 represents $—(CH_2)_n—$,



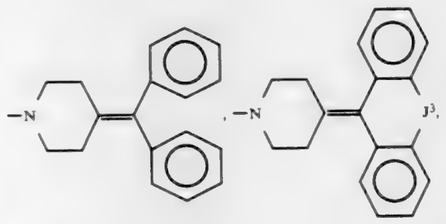
or $—CO(CH_2)_n—$; C^3 represents

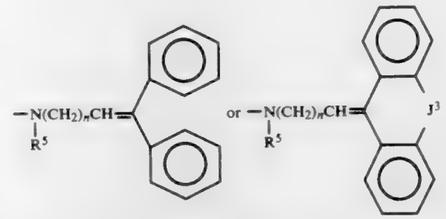


D^3 represents



C^3 and D^3 together form

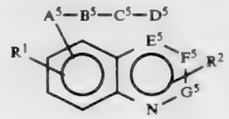




F^3 is a carbon atom, G^3 is a nitrogen atom, R^1 and R^2 each independently represent a hydrogen or halogen atom, a lower alkyl group, amino group, lower alkyl amino group, lower dialkyl amino group, a lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, cyano, nitro, amide or hydroxy group, wherein R^1 and R^2 may be on any position available on the condensed ring or one each on each of the rings or both on the same ring of which the condensed ring is formed; R^3 represents a hydrogen atom or a lower alkyl, lower alkanoyl or benzoyl group; R^4 represents a hydroxyl, lower alkylamino, lower alkoxyl or lower acyloxy group; R^5 and R^6 each independently represent a hydrogen atom or a lower alkyl or hydroxyalkyl group; R^7, R^8 and R^9 each independently represent a hydrogen atom or a hydroxy, phenyl, pyridyl, halogenophenyl, alkylphenyl, alkoxyphenyl, aminophenyl, alkylaminophenyl, acylaminophenyl, or hydroxyphenyl group; I^3 represents an oxygen atom,

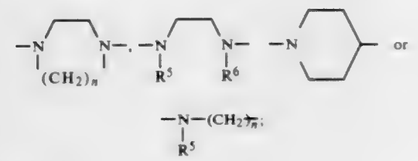
or a nitrogen atom; J^3 represents $—(CH_2)_m—$, $—CH=CH—$, $OCH_2—$ or an oxygen atom, n is 1, 2, 3, 4 or 5 and m is 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

2. A compound of the formula [II]

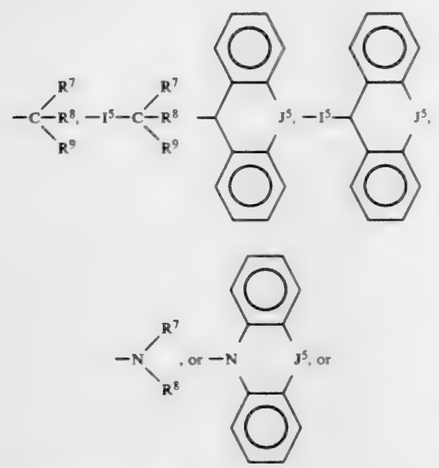


[II]

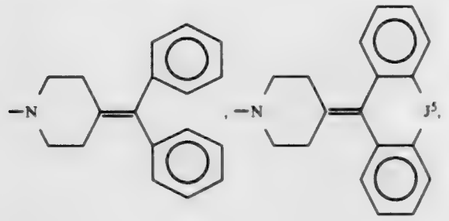
in which A^5 represents an oxygen or sulfur atom or an amino or NR^3 group, which is bound to any available position on the condensed ring; B^5 represents $—CO(CH_2)_n—$; C^5 represents



D^5 represents



C^5 and D^5 together form



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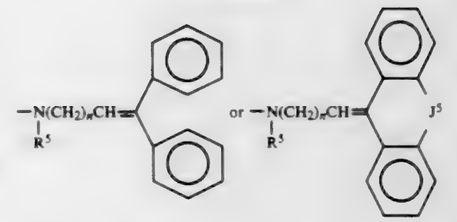
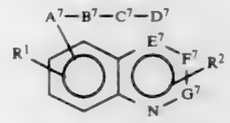


E^5, F^5, G^5 each represent a carbon atom, R^1 and R^2 each independently represent a hydrogen or halogen atom, a lower alkyl group, amino group, lower alkyl amino group, lower dialkyl amino group, a lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, cyano, nitro, amide or hydroxy group, wherein R^1 and R^2 may be on any position available on the condensed ring or one each on each of the rings or both on the same ring of which the condensed ring is formed; R^3 represents a hydrogen atom or a lower alkyl, lower alkanoyl or benzoyl group; R^5 and R^6 each independently represent a hydrogen atom, or a lower alkyl or hydroxyalkyl group; R^7, R^8 and R^9 each independently represent a hydrogen atom or a hydroxy, phenyl, pyridyl, halogenophenyl, alkylphenyl, alkoxyphenyl, aminophenyl, alkylaminophenyl, acylaminophenyl, or hydroxyphenyl group, I^5, represents an oxygen atom

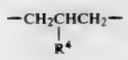
or a nitrogen atom; J^5 represents $—(CH_2)_m—$, $—CH=CH—$, $OCH_2—$ or an oxygen atom, n is 1, 2, 3, 4 or 5 and m is 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

3. A compound of the formula [III]

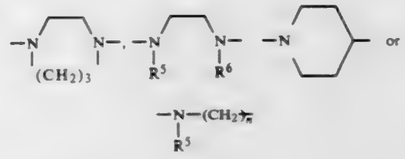


[III]

in which A^7 represents an oxygen or sulfur atom or an amino or NR^3 group, which is bound to any available position on the condensed ring; B^7 represents $—(CH_2)_n—$,



or C^7 represents



D^7 represents

$OCH_2—$ or an oxygen atom, n is 1, 2, 3, 4 or 5 and m is 0, 1 or

bonylalkylsulfonylamine, amino, aminocarbonyl, ami-

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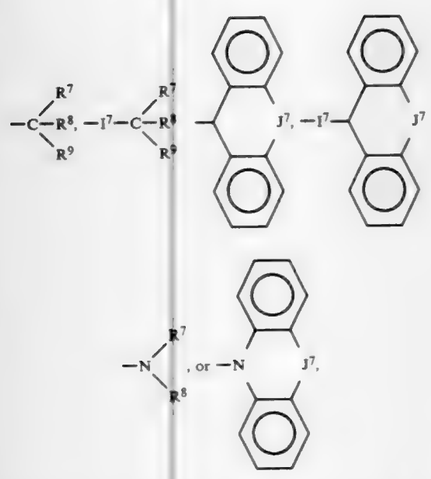
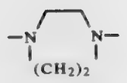
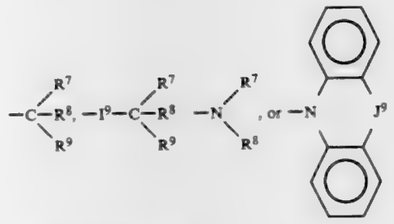
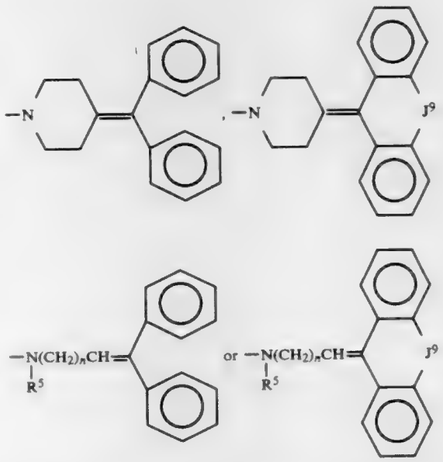




D⁹ represents



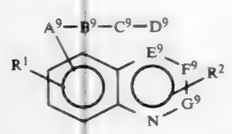
C⁹ and D⁹ can together form



E^7, F^7, G^7 each represent a carbon atom, R^1 and R^2 each independently represent a hydrogen or halogen atom, a lower alkyl group, amino group, lower alkyl amino group, a lower dialkyl amino group, a lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, cyano, nitro, amide or hydroxy group, wherein R^1 and R^2 may be on any position available on the condensed ring or one each on each of the rings or both on the same ring of which the condensed ring is formed; R^3 represents a hydrogen atom or a lower alkyl, lower alkanoyl or benzoyl group; R^4 represents a hydroxyl, lower alkylamino, lower alkoxyl or lower acyloxy group; R^5 and R^6 each independently represent a hydrogen atom or a lower alkyl or hydroxyalkyl group; R^7, R^8 and R^9 each independently represent a hydrogen atom or a hydroxy, phenyl, pyridyl, halogenophenyl, alkylphenyl, alkoxyphenyl, aminophenyl, alkylaminophenyl, acylaminophenyl, or hydroxyphenyl group, I^7 represents an oxygen atom,

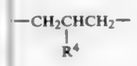
or a nitrogen atom; J^7 represents $-(CH_2)_m-$, $-CH=CH-$, OCH_2- or an oxygen atom, n is 1, 2, 3, 4 or 5 and m is 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

4. A compound of the formula [IV]



[IV]

in which A^9 represents an oxygen or sulfur atom or an amino or NR^3 group, which is bound to any available position on the condensed ring; B^3 represents $-(CH_2)_n-$,



or C^9 represents

E^9, F^9, G^9 each represent a carbon atom, R^1 and R^2 each independently represent a hydrogen or halogen atom, a lower alkyl group, amino group, lower alkyl amino group, lower dialkyl amino group, a lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, cyano, nitro, amide or hydroxy group, wherein R^1 and R^2 may be on any position available on the condensed ring or one each on each of the rings or both on the same ring of which the condensed ring is formed; R^3 represents a hydrogen atom or a lower alkyl, lower alkanoyl or benzoyl group; R^4 represents a hydroxyl, lower alkylamino, lower alkoxyl or lower acyloxy group; R^5 and R^6 each independently represent a hydrogen atom or a lower alkyl or hydroxyalkyl group; R^7 and R^8 each independently represent a hydrogen atom or a hydroxy, phenyl, pyridyl, halogenophenyl, alkylphenyl, alkoxyphenyl, aminophenyl, alkylaminophenyl, acylaminophenyl, or hydroxyphenyl; group R^9 represents a pyridyl group; I^9 represents an oxygen atom,

or a nitrogen atom; J^9 represents $-(CH_2)_m-$, $-CH=CH-$,

OCH_2- or an oxygen atom, n is 1, 2, 3, 4 or 5 and m is 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

5,204,349

AMIDE-SUBSTITUTED DERIVATIVES OF SPIROINDANYLCAMPHORSULFONYL OXYTOCIN ANTAGONISTS

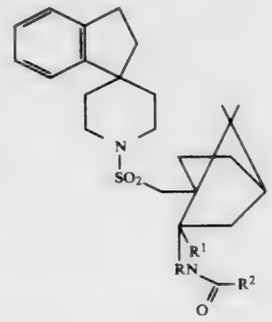
Mark G. Bock, Hatfield; Ben E. Evans; Roger M. Freidinger, both of Lansdale; Kevin Gilbert, Bechtelsville; Doug W. Hobbs, Lansdale; James B. Hoffman, King of Prussia; George F. Landell, Blue Bell, and Douglas J. Pettibone, Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 16, 1991, Ser. No. 760,284

Int. Cl.[5] **A61K** *31/495*; **C07D** *471/00, 401/12*

U.S. Cl. 514—253 **6 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein

R is H or C_{2-5} alkylsulfonylalkyl,

R^1 is hydrogen,

R^2 is one of N-$(R^3)_2$, Het-R^4 or Alk-R^5, wherein

R^3 is independently one or more of hydrogen, cycloalkyl, pyrrolidinyl substituted by oxo, carboxyalkyl or alkoxycarbonyalkyl, alkyl substituted by alkylamino, alkylcarbamate, alkylcarbonyl, alkylsulfonyl, alkylthio, alkoxycarbonyl, amino, aminocarbonyl, carboxyl, dialkylamino, dialkylaminoaryl, hydroxyl, sulfhydryl, or substituted or unsubstituted 5 or 6 membered heterocyclic rings having 1 or 2 heteroatoms where said heteroatom is N and said ring substituent is aralkoxycarbonyl;

Het is a 5 or 6 membered heterocyclic ring having 1 or 2 heteroatom wherein said heteroatom is N,

R^4 is alkylsulfonyl, alkylsulfonylamino, alkylsulfonyloxy, alkylaminocarbonyl, alkylcarbamatealkylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aminocarbonylalkyl, aminoalkylcarbonyl, aralkoxycarbonyl, carbonyl, dialkylaminocarbonyl, dialkylaminoalkylcarbonyl, diaminoalkylcarbonyl, halogenalkyl, halogenalkylcarbonyl, halogenalkoxycarbonyl, hydroxy, hydroxyalkyl, hydroxyalkylcarbonyl, imidazolylalkylcarbonyl imidizinylalkylcarbonyl, or phthalimidinylalkyl; with the proviso for Het-R4 that Het cannot be mono-substituted by any one of the alkoxycarbonyl, alkoxycarbonylalkyl, aralkoxycarbonyl or hydroxy;

Alk is alkyl,

R^5 is independently one or more of R^6, or Het-R^7 wherein R^6 is independently one or more of alkylcarbamate, alkylcarbonylamino substituted by substituted imidazolyl or pyrrolidinyl rings where said ring substituent is alkyl or alkoxycarbonylalky, alkylcarbamatecycloalkyl, alkylcarbonylaminoalkylsulfonyl, alkylimidazolylthio, alkylimidizinylthio, alkylimidazolylalkylthio, alkylimidizinylalkylthio, alkylpyrrolidinylthio, alkylpyrrolidinylalkylthio, alkylsulfonyl, alkylsulfonylamino, alkylsulfonylalkylamino, alkoxycarbonyl, alkoxycarbonylalkylamine, alkoxycarbonylalkylcarbonylamine, alkoxycarbonylalkylsulfonylamine, amino, aminocarbonyl, aminoalkylcarbonylamino, aminocarbonylalkylsulfonyl, aminocarbonylalkylecarbonylamino, aralkoxy, aralkoxycarbonyl, aralkylcarbamate, arylcarbamate, arylcarbamatecarbonylamino, arylcarbamatealkylcarbonylamino, carboxyalkylamino, carboxyalkylcarbonylamino, carboxyalkylsulfonylamino, cyano, cyanoalkylcarbonylamino, dialkylaminoalkylcarbonylamino or oxo, with the proviso for R^6 that R^6 cannot be mono-substituted by any one of alkoxycarbonyl, alkylcarbamate, alkylsulfonyl, aralkylcarbamate, aralkoxy, amino, aminocarbonyl, or oxo;

Het is as defined before;

R^7 is one or more of alkyl, imidazolinylalkylcarbonyl, imidazolinylalkylcarbonylamino, oxo, pyrrolidinylalkylcarbonyl, pyrrolidinylalkylcarbonylamino or alkylamino substituted by one or more of alkylcarbamate, alkylcarbamatealkylcarbonyl, alkylsulfonylalkyl, amino, aralkoxyalkyl or oxo with the proviso for Het-R^7 that Het cannot be mono-substituted by alkyl alkylamino, dialkylamino or oxo.

5,204,350

METHOD OF INHIBITING OSTEOCLAST-MEDIATED BONE RESORPTION BY ADMINISTRATION OF N-HETEROCYCLICALKYL-SUBSTITUTED PHENYL DERIVATIVES

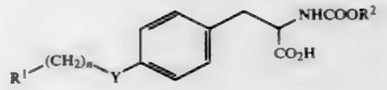
Melissa S. Egbertson, Ambler; George D. Hartman, Lansdale, and Robert J. Gould, Green Lane, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 9, 1991, Ser. No. 742,970

Int. Cl.[5] **A61N** *31/495, 31/40*

U.S. Cl. 514—255 **3 Claims**

1. A method of inhibiting the bone resorption activity of mammalian osteoclasts comprising the step of administering a pharmacologically effective amount of a compound of the formula



wherein

n is an integer of from 1 to 4;

Y is 0;

R^1 is unsubstituted or substituted 5 or 6-membered saturated heterocyclic rings having 1 or 2 heteroatoms where said heteroatoms is N and said substituent is alkyl; and

R^2 is alkyl of 1 to 4 carbon atoms or benzyl.

5,204,351

6-FLUORO-3,5-DIHYDROXY CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Gerhard Beck, Frankfurt am Main; Wilhelm Bartmann, Bad Soden am Taunus; Günther Wess, Erlensee, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,809

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826814

Int. Cl.[5] **A61K** *31/495*; **C07D** *239/26, 403/06*

U.S. Cl. 514—256 **3 Claims**

1. (3R,5S,6E)-6-Fluoro-3,5-dihydroxy-hept-6-enoic acids and the derivatives thereof of formula I

imidazolium ring wherein the compounds are selected from the

administrable, antiepileptically effective amount of a com-

5,204,354

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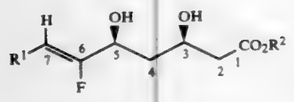
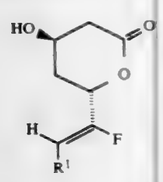
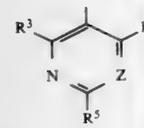


and the corresponding (4R,6S)-6-(1-fluoro-vinyl)-4-hydroxytetrahydro-pyran-2-ones of formula II



where, in formulas I and II, R^1 denotes the group of substituted 6-membered ring heteroaromatics



in which

Z denotes a nitrogen atom, and

R^3, R^4 and R^5 independently denote hydrogen, a straight chain or branched alkyl or alkenyl radical, each of which has up to 6 carbon atoms and which can optionally be substituted on the terminal carbon by a cycloalkyl or cycloalkenyl radical, each of which has 3–6 carbon atoms, or denote a cyclic hydrocarbon radical which is saturated or up to doubly saturated and has 3–7 carbon atoms, or an aromatic radical selected from the group consisting of phenyl, furyl, thienyl and pyridinyl, which can optionally carry in the nucleus 1–3 identical or different substituents from the following group: halogen, trifluoromethyl, alkyl or alkenyl, each of which has up to 6 carbon atoms, hydroxyl, alkoxy having 1–6 carbon atoms, carboxyl or carbalkoxy having 1–6 carbon atoms in the alkoxy moiety.

5,204,352

COMPOUNDS EXHIBITING ANTI-PARASITIC ACTIVITY AND A METHOD FOR THEIR USE

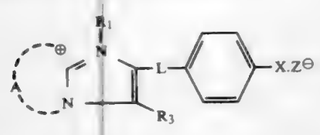
Richard J. Sundberg, Charlottesville, Va.; Daniel J. Dahlhausen, Columbus, Ohio; Govindarajan Manikumar, Raleigh, N.C.; Babu J. Mavunkel, Baltimore; Hikmat A. Musallam, Damascus, both of Md.; Atanu Biswas, Cleveland, and Srinivasan Varadarajan, Stow, both of Ohio, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1987, Ser. No. 102,445

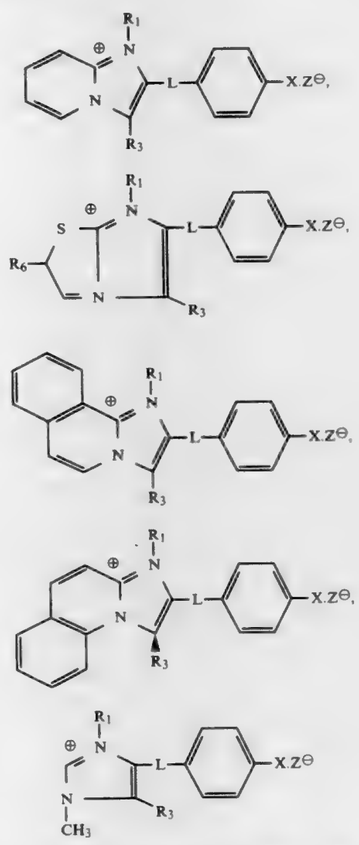
Int. Cl.[5] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—258 **20 Claims**

1. A compound having the general formula:



wherein A represents an optional heterocyclic ring fused to the imidazolium ring wherein the compounds are selected from the group consisting of



wherein R_1 is a straight or branched aliphatic group having from one to ten carbon atoms; R_3 represents CH_3, Br, hydrogen or NO_2;

Z represents I, Br, TsO or Cl;

L represents $—CH_2O—$, —CH=CH or a single bond; and

X represents substituted guanylhydrazone or unsubstituted guanylhydrazone and

$Z\ominus$ represents an anion which forms a physiologically acceptable salt with the rest of the compound.

5,204,353

3-BENZYL-3H-1,2,3-TRIAZOLO[4,5-D]PYRIMIDINES, COMPOSITIONS THEREOF, AND METHOD OF TREATING EPILEPSY THEREWITH

René Meier, Buus, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 622,304, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 376,793, Jul. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 173,840, Mar. 28, 1988, abandoned. This application Dec. 20, 1991, Ser. No. 814,216

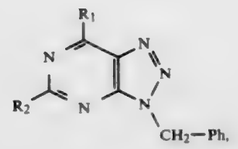
Claims priority, application Switzerland, Apr. 7, 1987, 1333/87

Int. Cl.[5] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—258 **2 Claims**

1. A pharmaceutical preparation containing an internally

administrable, antiepileptically effective amount of a compound of formula



(I)

selected from the group existing of:

(a) in which Ph represents a phenyl radical that is substituted by at least one of halogen, lower alkyl, trifluoromethyl and cyano;

R_1 represents amino, N-mono- or N,N-di-lower alkylamino, N-(lower alkoxy-lower alkyl)amino, N-(hydroxy-lower alkyl)amino, N-(hydroxy-lower alkyl)-N-lower alkylamino, N-mono- or N,N-di-cycloalkylamino, N-cycloalkyl-N-lower alkylamino, N-mono- or N,N-di-(cycloalkyl-lower alkyl)amino, N-(cycloalkyl-lower alkyl)-N-lower alkylamino, N-lower alkanoylamino, N-lower alkanoyl-N-lower alkylamino; and

R_2 represents amino, N-mono- or N,N-di-lower alkylamino, N-(lower alkoxy-lower alkyl)amino, N-(hydroxy-lower alkyl)amino, N-(hydroxy-lower alkyl)-N-lower alkylamino, N-mono- or N,N-di-cycloalkylamino, N-cycloalkyl-N-lower alkylamino, N-mono- or N,N-di-(cycloalkyl-lower alkyl)amino, N-(cycloalkyl-lower alkyl)-N-lower alkylamino, N-lower alkanoylamino or N-lower alkanoyl-N-lower alkylamino;

(b) in which Ph represents a phenyl radical that is substituted by at least one of halogen, lower alkyl, trifluoromethyl and cyano;

R_1 represents amino, N-mono- or N,N-di-lower alkylamino, N-(lower alkoxy-lower alkyl)amino, N-(hydroxy-lower alkyl)amino, N-(hydroxy-lower alkyl)-N-lower alkylamino, N-mono- or N,N-di-cycloalkylamino, N-cycloalkyl-N-lower alkylamino, N-mono- or N,N-di-(cycloalkyl-lower alkyl)amino, N-(cycloalkyl-lower alkyl)-N-lower alkylamino, N-lower alkanoylamino, N-lower alkanoyl-N-lower alkylamino; and

R_2 represents hydrogen or lower alkyl; in free form or in form of a pharmaceutically acceptable salt;

with the proviso that, in a compound of formula I in free form, wherein R_1 represents N,N-di-C_1–C_6-alkylamino in which the two N-C_1–C_6-alkyl groups may be the same or different, N-mono-C_1–C_6-alkyl-amino or amino, R_2 is other than hydrogen and other than C_1–C_6-alkyl, if Ph represents a phenyl radical which is monosubstituted by halogen or by trifluoromethyl;

(c) a compound of formula I in free form, wherein Ph is o-fluorophenyl; R_1 is N-mono-methylamino or amino; and R_2 is hydrogen or methyl;

(d) a compound of formula I in free from, wherein Ph is o-fluorophenyl, o-chlorophenyl or m-trifluoromethylphenyl; R_1 is N,N-di-methylamino; and R_2 is hydrogen; and

(e) a compound of formula I in free form, wherein Ph is m-fluorophenyl, p-fluorophenyl, o-chlorophenyl, o-trifluoromethylphenyl, m-trifluoromethylphenyl or p-trifluoromehtylphenyl; R_1 is N-mono-methylamino; and R_2 is hydrogen;

or a pharmaceutically acceptable salt thereof and optionally at least one pharmaceutically acceptable adjunct.

5,204,354

SUBSTITUTED QUINAZOLINONES AS NEUROTENSIN ANTAGONISTS USEFUL IN THE TREATMENT OF CNS DISORDERS

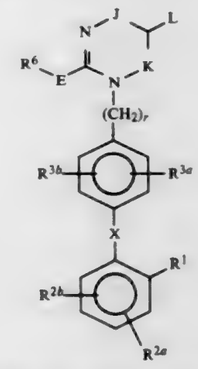
Prasun K. Chakravarty, Edison; E. M. Naylor, Scotch Plains, both of N.J., and Richard W. Ransom, New Britain, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 14, 1992, Ser. No. 826,726

Int. Cl.[5] C07D *239/91;* **A61K** *31/505*

U.S. Cl. 514—259 **14 Claims**

1. A method of treating central nervous system disorders which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound of structural formula:



(I)

or a pharmaceutically acceptable salt thereof, wherein:

L is connected with J or K to form an aromatic ring as defined below;

J is —C(=M)— or J and L are connected together to form a 6 carbon aromatic ring substituted with R^{7a}, R^{7b}, R^{8a} and R^{8b};

K is —C(=M)— or K and L are connected together to form a 6 carbon aromatic ring substituted with R^{7a}, R^{7b}, R^{8a} and R^{8b}, provided that only one of J and K is —C(=M)—;

M is O or NR^{22};

R^1 is

(a) $—NHSO_2R^{23}$,
(b) $—NHSO_2NHCOR^{23}$,
(c) $—NHCONHSO_2R^{23}$,
(d) $—SO_2NHR^{23}$,
(e) $—SO_2NHCOR^{23}$,
(f) $—SO_2NHCONR^4R^{23}$,
(g) $—SO_2NHCOOR^{23}$,
(h) $—SO_2NHOR^{23}$,
(i) $—CH_2SO_2NHCOR^{23}$,
(j) $—CH_2SO_2NHCONHR^{23}$,
(k) $—CO_2H$, or
(l) —1H-tetrazol-5-yl;

R^{2a} and R^{2b} are each independently

(a) H,
(b) Cl, Br, I, F,
(c) CF_3,
(d) C_1–C_6-alkyl,
(e) C_1–C_6-alkoxy,
(f) C_1–C_6-alkyl-S—,
(g) C_2–C_6-alkenyl,
(h) C_2–C_6-alkynyl,
(i) C_3–C_7-cycloalkyl,
(j) aryl, or
(k) aryl-C_1–C_6-alkyl;

R^{3a} is

(a) H,
(b) Cl, Br, I, F,
(c) C_1–C_6-alkyl,

(d) C_1–C_6-alkoxy, or

(q) $—NR^4SO_2R^{23}$,

(c) C_1–C_6-alkyl unsubstituted or substituted with a substituent selected from the group consisting of aryl, hetero-

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15-NITRO-2β, 3β-DIHYDRO- AND

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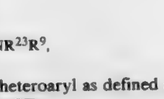
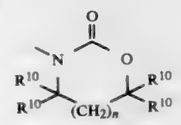
(d) C_1–C_6-alkoxy, or
(e) C_1–C_6-alkoxyalkyl;
R^{3b} is
(a) H,
(b) Cl, Br, I, F,
(c) C_1–C_6-alkyl,
(d) C_3–C_7-cycloalkyl,
(e) C_1–C_6-alkoxy,
(f) CF_3,
(g) C_2–C_6-alkenyl, or
(h) C_2–C_6-alkynyl;
R^4 is
(a) H,
(b) C_1–C_6-alkyl,
(c) aryl, wherein aryl is phenyl or naphthyl, either unsubstituted or substituted with one or two substituents selected from the group consisting of halogen, $N(R^4)_2$, CO_2R^4, C_1–C_4-alkyl, C_1–C_4-alkoxy, NO_2, CF_3, C_1–C_4-alkylthio, and OH;
(d) aryl-C_1–C_6 alkyl, or
(e) heteroaryl, wherein heteroaryl is an unsubstituted, monosubstituted or disubstituted five or six membered aromatic ring selected from thiazole, imidazole, pyrazole, oxazole, pyridine, thiazine, pyrazine, pyrimidine wherein the substituents are members selected from the group consisting of —OH, —SH, —C_1–C_4-alkyl, —C_1–C_4-alkoxy, —CF_3, Cl, Br, F, I, —NO_2, —CO_2H, —CO_2—(C_1–C_4-alkyl), —NH_2, —NH(C_1–C_4-alkyl) and —N(C_1–C_4-alkyl)$_2$;
E is a single bond, —$NR^{13}(CH_2)_s$—, —$S(O)_x(CH_2)_s$—where x is 0 to 2 and s is 0 to 5, —CH(OH)—, —O—, or —CO—;
R^6 is
(a) H,
(b) aryl,
(c) C_1–C_6-alkyl, C_2–C_5-alkenyl or C_2–C_5-alkynyl each of which is unsubstituted or substituted with a substituent selected from the group consisting of aryl, Cl, Br, I, F, C_3–C_7-cycloalkyl, —NH_2, —NH(C_1–C_4-alkyl), —OR^4, —N(C_1–C_4-alkyl)$_2$, —NH—SO_2R^4, —$COOR^4$, and —SO_2NHR^9; or
(d) heteroaryl, or
(e) C_3–C_7-cycloalkyl;
R^{7a} and R^{7b} are independently
(a) H,
(b) C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl,
(c) Cl, Br, I, F,
(d) CF_3,
(e) when R^{7a} and R^{7b} are bonded to adjacent carbon atoms, they joined to form a phenyl ring, or
(f) aryl;
R^{8a} and R^{8b} are independently
(a) H,
(b) C_1–C_6-alkyl, unsubstituted or substituted with a substituent selected from the group consisting of —OH, -guanidino, C_1–C_4-alkoxy, —$N(R^4)_2$, $COOR^4$, —$CON(R^4)_2$, —O—COR^4, -aryl, -heteroaryl, —$S(O)_x$—R^{23}, -tetrazol-5-yl, —$CONHSO_2R^{23}$, —SO_2NH-heteroaryl, —SO_2NHCOR^{23}, —$PO(OR^4)_2$, —$PO(OR^4)R^9$, —SO_2NH-CN, —$NR^{10}COOR^{23}$, morpholino, N—(C_1–C_6-alkyl)piperazine, and —COR^4,
(c) —CO-aryl,
(d) —C_3–C_7-cycloalkyl,
(e) Cl, Br, I, F,
(f) —OH,
(g) —OR^{23},
(h) —C_1–C_4-perfluoroalkyl,
(i) —$S(O)_x$—R^{23},
(j) —$COOR^4$,
(k) —SO_3H,
(l) —NR^4R^{23},
(m) —NR^4COR^{23},
(n) —NR^4COOR^{23},
(o) —$SO_2NR^9R^{10}$,
(p) —NO_2,
(q) —$NR^4SO_2R^{23}$,
(r) —$NR^4CONR^4R^{23}$,



(s) —$OCNR^{23}R^9$,

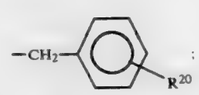
(t) -aryl or -heteroaryl as defined above,
(u) —$NHSO_2CF_3$,
(v) —SO_2NH-heteroaryl,
(w) —SO_2NHCOR^{23},
(x) —$CONHSO_2R^{23}$,
(y) —$PO(OR^4)_2$,
(z) —$PO(OR^4)R^9$,
(aa) -tetrazol-5-yl,
(bb) —CONH(tetrazol-5-yl),
(cc) —COR^4,
(dd) —SO_2NHCN,

(ee)

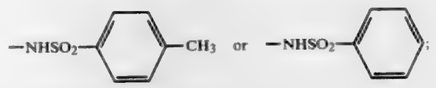


where n = 0 or 1,

(ff) —CO-heteroaryl,
(gg) —$NR^4SO_2NR^{23}R^9$,
(hh) —$N[CH_2CH_2]_2NR^{24}$, wherein R^{24} is C_1–C_6-alkyl, —C_3–C_7-cycloalkyl, —$CONR^9R^{10}$, -heteroaryl, -phenyl, —CO—C_3–C_7-cycloalkyl, —CO—C_1–C_6-alkyl, —SO_2—C_1–C_6-alkyl, or —SO_2—C_3–C_7-cycloalkyl, or
(ii) —$N[CH_2CH_2]_2O$;
R^9 is H, C_1–C_5-alkyl, aryl or arylmethyl;
R^{10} is H, C_1–C_4-alkyl;
R^{11} is H, C_1–C_6-alkyl, C_1–C_4-alkenyl, C_1–C_4-alkoxy alkyl, or



R^{12} is —CN, —NO_2, —CF_3 or —CO_2R^4;
R^{13} is H, (C_1–C_4-alkyl)CO—, C_1–C_6-alkyl, allyl, C_3–C_6-cycloalkyl, aryl or arylmethyl;
R^{14} is H, C_1–C_8-alkyl, C_1–C_8-perfluoroalkyl, C_3–C_6-cycloalkyl, aryl or arylmethyl;
R^{15} is H, C_1–C_6-alkyl;
R^{16} is H, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, aryl or arylmethyl;
R^{17} is —NR^9R^{10}, —OR^{10}, —$NHCONH_2$, —$NHCSNH_2$,



R^{18} and R^{19} are independently C_1–C_4-alkyl or taken together are —$(CH_2)_q$—where q is 2 or 3;
R^{20} is H, —NO_2, —NH_2, —OH or —OCH_3;
R^{21} is H, aryl, or C_1–C_4-alkyl optionally substituted with aryl, —NH_2, —NH(C_1–C_4-alkyl), —N(C_1–C_4-alkyl)$_2$, —CO_2R^4, —OH, —SO_3H, or —SO_2NH_2;
R^{22} is
(a) aryl,
(b) heteroaryl,

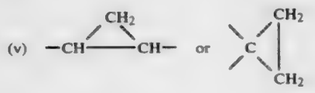
(c) C_1–C_6-alkyl unsubstituted or substituted with a substituent selected from the group consisting of aryl, heteroaryl, —OH, —NH_2, —NH(C_1–C_4-alkyl), —N(C_1–C_4-alkyl)$_2$, —CO_2R^4, Cl, Br, F, I, and —CF_3, or
(d) perfluoro-C_1–C_4-alkyl;
R^{23} is
(a) aryl,
(b) heteroaryl,
(c) C_3–C_7-cycloalkyl,
(d) C_1–C_8-alkyl wherein alkyl is unsubstituted or substituted with one or two substituents selected from the group consisting of aryl, heteroaryl, —OH, —SH, C_1–C_4-alkyl, —O(C_1–C_4-alkyl), —S(C_1–C_4-alkyl), —CF_3, Cl, Br, F, I, —NO_2, —CO_2H, —CO_2—C_1–C_4-alkyl, —NH_2, —$NR^4CO_2R^{22}$, —NH(C_1–C_4-alkyl), —N(C_1–C_4-alkyl)$_2$, —PO_3H_2, —PO(OH)(O—C_1–C_4-alkyl), —$PO(OR^4)R^9$, —NR^4COR^{22}, —$CONR^4R^{22}$, —$OCONR^4R^{22}$, —$SO_2NR^4R^{22}$, or —$NR^4SO_2R_{22}$, or
(e) perfluoro-C_1–C_4-alkyl;
X is
(a) a carbon-carbon single bond,
(b) —CO—,
(c) —O—,
(d) —S—,

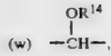
(e) —N(R^{13})—,

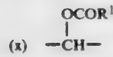
(f) —CON(R^{15})—,

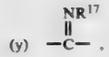
(g) —NCO(R^{15})—,

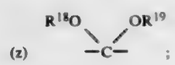
(h) —OCH_2—,
(i) —CH_2O—
(j) —SCH_2—,
(k) —CH_2S—,
(l) —$NHC(R^9)(R^{10})$,
(m) —NR^9SO_2—,
(n) —SO_2NR^9—,
(o) —$C(R^9)(R^{10})NH$—,
(p) —CH=CH—,
(q) —CF=CF—,
(r) —CH=CF—,
(s) —CF=CH—,
(t) —CH_2CH_2—,
(u) —CF_2CF_2—,

(v) 

(w) 

(x) 

(y) 

(z) 

r is 1 or 2.

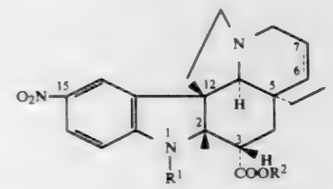
5,204,355
15-NITRO-2β, 3β-DIHYDRO- AND 15-NITRO-2β,3β,6,7-TETRAHYDROTABERSONINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PROCESS FOR PREPARING SAME

Béla Zsadon; Margit Barta née Bukovecz; Mária Szilasi; Tibor Keve; János Galambos; Viktória Bolya née Kassay; Sándor Szabó; Emília Répási, née Balogh; László Szporny; Béla Kiss; Egon Kárpáti; Éva Pálosi; Zsolt Szombathelyi; Ádám Sarkadi; Erzsébet Lapis; Anikó Gere; Mihály Bodó; Katalin Csomor; Judit Laszy, and Zsolt Szentirmay, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Filed Dec. 12, 1991, Ser. No. 806,975
Claims priority, application Hungary, Dec. 18, 1990, 8313/90
Int. Cl.[5] **C07D** *471/16*; **A61K** *31/475*
U.S. Cl. 514—283 **8 Claims**

1. A compound of the formula (I),

(I)



wherein
R^1 stands for hydrogen;
R^2 stands for hydrogen or a C_{1-6}alkyl group; and the symbol ⎓ represents a single or double bond or a salt thereof.

7. A pharmaceutical composition reducing or inhibiting the cerebral edema, which comprises as active ingredient a therapeutically effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof in admixture with additives or auxiliaries commonly used in pharmaceuticals.

5,204,356
TREATMENT OF ANXIETY

Michael B. Tyers, Welwyn, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 530,301, May 30, 1990, abandoned, which is a division of Ser. No. 419,728, Oct. 11, 1989, Pat. No. 4,975,436, which is a division of Ser. No. 259,719, Oct. 19, 1988, Pat. No. 4,883,803, which is a continuation of Ser. No. 888,467, Jul. 23, 1986, abandoned. This application Jan. 29, 1992, Ser. No. 827,511
Claims priority, application United Kingdom, Jul. 24, 1985, 8518658
Int. Cl.[5] **A61K** *31/44, 31/415*
U.S. Cl. 514—304 **5 Claims**

1. A method for the treatment of anxiety in a human or animal subject suffering from or susceptible to anxiety which comprises administering to the human or animal subject an effective amount for the treatment of anxiety in said subject of an azabicyclo derivative which acts as an antagonist of 5-hydroxytryptamine (5-HT) at 5-HT "M" receptors, wherein said azabicyclo derivative is a conjugate formed from an indole derivative connected by an amide group to a tropyl group; or a physiologically acceptable salt or solvate thereof.

5,204,357

—(C=O)R^3, —C(OH)R^3R^3, —CN, —N_3, substituted or

VOL 1149 ISS 3 AP 20 1993 UMI

5,204,357

RENIN-INHIBITING AMINO ACID DERIVATIVES

Rainer Henning, Hattersheim am Main; Hansjörg Urbach; Dieter Ruppert, both of Kronberg/Taunus, and Bernward Schölkens, Kelkheim (Taunus), all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

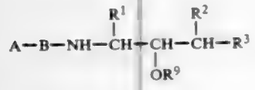
Filed Feb. 14, 1989, Ser. No. 310,183

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804793

Int. Cl.[5] **A61K** *31/44, 31/47;* **C07D** *401/04, 401/06, 211/82, 211/84, 211/86*

U.S. Cl. 514—307 **7 Claims**

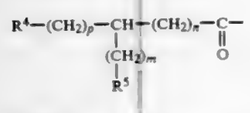
1. A compound of the formula I:



(I)

wherein:

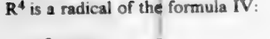
A is a radical of the formula II:



(II)

in which

R^4 is a radical of the formula IV:



(IV)

wherein

R^7 is (C_1–C_{10})-alkyl which is unsubstituted or substituted by one or more functional groups selected from the group consisting of oxo, hydroxyl, (C_1–C_6)-alkoxy and phenyloxy; (C_1–C_6)-alkanoyloxy; halogen; hydroxysulfonyloxy; carboxyl; (C_1–C_4)-alkoxycarbonyl; carbamoyl, mono-(C_1–C_4)-alkylcarbamoyl or di-(C_1–C_4)-alkyl-carbamoyl; cyano; amino; mono-(C_1–C_4)-alkylamino or di-(C_1–C_4)-alkylamino; acylamino or substituted amino in which the amino group is part of a pyridyl group; (C_2–C_8)-alkenyl which is unsubstituted or substituted by one or more functional groups selected from the group consisting of oxo, hydroxyl, (C_1–C_6)-alkoxy and phenyloxy or (C_2–C_8)-alkynyl which is optionally substituted by one or more functional groups selected from the group consisting of oxo, hydroxyl, (C_1–C_6)-alkoxy and phenyloxy; hydroxyl; (C_1–C_6)-alkoxy; (C_3–C_8)-cycloalkyl; (C_5–C_{10})-bicycloalkyl; (C_8–C_{10})-tricycloalkyl; (C_3–C_8)-cycloalkyl-(C_1–C_{10})-alkyl; (C_6–C_{14})-aryl, (C_6–C_{14})-aryloxy or (C_6–C_{14})-aryl-(C_1–C_{10})-alkyl, which are optionally substituted in the aryl moiety by one or two identical or different radicals selected from the group consisting of F, Cl, Br, hydroxyl, (C_1–C_7)-alkoxy, (C_1–C_7)-alkyl, (C_1–C_7)-alkoxycarbonyl, amino and trifluoromethyl; pyridyl; or amino, mono-(C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino, acylamino or substituted amino in which the amino is part of a pyridyl group; and

t is 2;

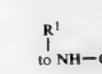
R^5 is phenyl; 2-, 3- or 4-pyridyl; or 1- or 2-naphthyl; each of which is optionally substituted by a radical selected from the group consisting of hydroxyl, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, Cl, F, Br, nitro, amino, acetamino, and trifluoromethyl or by a methylenedioxy radical;

m is 1;

n is 0 or 1;

p is 0, 1 or 2;

B is a radical, which is linked N-terminal to A and C-terminal



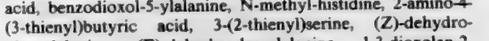
to NH—CH,

of an amino acid selected from the group consisting of phenylalanine, histidine, tyrosine, tryptophan, methionine, leucine, isoleucine, asparagine, aspartic acid, β-2-thienylalanine, β-3-thienylalanine, β-2-furylalanine, β-3-furylalanine, lysine, ornithine, valine, alanine, 2,4-diaminobutyric acid, arginine, 4-chlorophenylalanine, methionine sulfone, methionine sulfoxide, 2-pyridylalanine, 3-pyridylalanine, cyclohexylalanine, cyclohexylglycine, im-methylhistidine, O-methyltyrosine, O-benzyltyrosine, O-tertbutyltyrosine, phenylglycine, 1-naphthylalanine, 2-naphthylalanine, 4-nitrophenylalanine, norvaline, β-2-benzo[b]thienylalanine, β-3-benzo[b]thienylalanine, 2-fluorophenylalanine, 3-fluorophenylalanine, 4-fluorophenylalanine, norleucine, cysteine, S-methylcysteine, 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid, homophenylalanine, DOPA, O-dimethyl-DOPA, 2-amino-4-(2-thienyl)butyric acid, benzodioxol-5-ylalanine, N-methyl-histidine, 2-amino-4-(3-thienyl)butyric acid, 3-(2-thienyl)serine, (Z)-dehydrophenylalanine, (E)-dehydrophenylalanine, 1,3-dioxolan-2-ylalanine, N-pyrrolylalanine, and 1-, 3- or 4-pyrazolylalanine;

R^1 is hydrogen, (C_1–C_{10})-alkyl, (C_4–C_7)-cycloalkyl, (C_4–C_7)-cycloalkyl-(C_1–C_4)-alkyl, (C_6–C_{14})-aryl, (C_6–C_{14})-aryl-(C_1–C_4)-alkyl or 1,3-dithiolan-2-yl-(C_1–C_4)-alkyl;

R^2 is hydrogen;

R^3 is a radical of the formula III:



(III)

in which

R^6 is pyridyl; and

q and s is each, independently of one another, 0, 1 or 2; and

R^9 is hydrogen;

and physiologically tolerated salts thereof.

5,204,358

HETARYL STYRYL QUINOLINES AS LEUKOTRIENE INHIBITORS

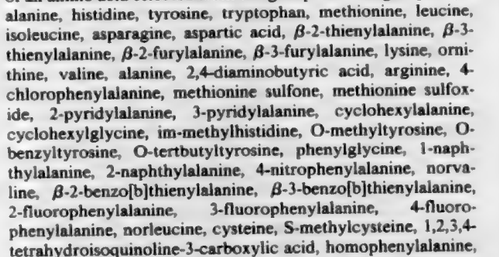
Robert N. Young, Senneville; Robert Zamboni, Pointe-Claire; Jacques-Yves Gauthier, Laval Des Rapides Laval, and Michel L. Belley, St.-Laurent, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Division of Ser. No. 527,236, May 22, 1990, Pat. No. 5,104,882, which is a continuation-in-part of Ser. No. 356,478, May 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 275,160, Nov. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 125,050, Nov. 25, 1987, abandoned. This application Jan. 9, 1992, Ser. No. 818,598

Int. Cl.[5] **C07D** *215/18*

U.S. Cl. 514—314 **8 Claims**

1. A compound of the formula:



I

wherein:

R^1 is H, halogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $-CF_3$, $-SR^2$, $-S(O)R^2$, $-S(O)_2R^2$, $-OR^3$, $-COOR^3$,

$-(C{=}O)R^3$, $-C(OH)R^3R^3$, $-CN$, $-N_3$, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, substituted or unsubstituted 2-phenethyl, or substituted or unsubstituted pyridyl;

R^2 is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $-CF_3$, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, or substituted or unsubstituted 2-phenethyl;

R^3 is H or R^2;

R^4 is H, halogen, $-NO_2$, $-CN$, $-OR^3$, $-SR^3$, NR^3R^3, or C_1–C_8 alkyl;

R^5 is H, halogen, $-N_3$, $-CN$, $-SR^2$, $-NR^3R^3$, $-OR^3$, C_1–C_8 alkyl, $-(C{=}O)R^3$;

R^6 is $-CH_2CONR^{12}R^{12}$;

R^7 is H or C_1–C_4 alkyl;

R^{10} is $-SR^{11}$, $-OR^{12}$, or $-NR^{12}R^{12}$;

R^{11} is C_1–C_6 alkyl, $-(C{=}O)R^{14}$, unsubstituted phenyl, or unsubstituted benzyl;

R^{12} is H or R^{11};

R^{13} is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $-CF_3$, or unsubstituted phenyl, benzyl, or 2-phenethyl;

R^{14} is H or R^{13};

R^{15} is R^3 or halogen;

R^{16} is H, C_1–C_4 alkyl, or OH;

R^{17} is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, or substituted or unsubstituted phenyl, benzyl, or 2-phenethyl;

R^{18} is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $-CF_3$, or substituted or unsubstituted phenyl, benzyl, or 2-phenethyl;

R^{19} is C_4–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, $-CF_3$, or unsubstituted phenyl, benzyl, or 2-phenethyl;

m and m′ are independently 0–8;

n and n′ are independently 0 or 1 but not both 0;

p and p′ are independently 0–8;

m+n+p is 1–10 when X^2 is O, S, S(O), or $S(O)_2$;

m+n+p is 0–10 when X^2 is CR^3R^{16};

m′+n′+p′ is 1–10 when X^3 is O, S, S(O), or $S(O)_2$;

m′+n′+p′ is 0–10 when X^3 is CR^3R^{16};

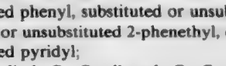
r is 0 or 1 when Z^1 is HET ($-R^3$, $-R^5$);

r is 1 when Z^1 is $-CONR^3$;

r′ is 0 or 1 when Z^2 is HET($-R^3$, $-R^5$);

r′ is 1 when Z^2 is $CONR^3$;

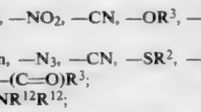
Q^1 and Q^2 are independently $-COOR^3$, tetrazole, $-COOR^6$, $-CONHS(O)_2R^{13}$, $-CN$, $-CONR^{12}R^{12}$, $-CHO$, $-CH_2OH$, $-COCH_2OH$, $-NHS(O)_2R^{13}$, $-C(O)R^{19}$, $-NR^{17}C(O)OR^{17}$, $-NR^{12}C(O)NR^{12}R^{12}$, $-NHC(O)R^{18}$, $-OC(O)NHR^{12}$, $-S(O)_2R^{18}$, $-S(O)R^{18}$, $-S(O)_2NR^{12}R^{12}$, $-NO_2$,



X^1 is O, S, $-S(O)-$, $-S(O)_2-$, $-NR^3$, or $-CR^3R^3-$;

X^2 and X^3 are independently O, S, S(O), $S(O)_2$, or CR^3R^{16};

Y is $-CR^3{=}CR^3-$, $-C{\equiv}C-$, $-CR^3R^3-X^1-$, $-X^1-CR^3R^3-$, $-CR^3R^3-X^1-CR^3R^3$,



Z^1 and Z^2 are independently $-CONR^3-$ or $-HET(-R^3, -R^5)-$, provided that at least one of them is $-HET(-R^3, -R^5)-$;

HET is

substituted phenyl, benzyl, or 2-phenethyl mean 1 or 2 substituents on the aromatic ring selected from C_1–C_6 alkyl, R^{10}, NO_2, SCF_3, halogen, $-COR^7$, $-COR^{10}$, CN, and CF_3;

and the pharmaceutically acceptable salts thereof.

5,204,359

INSECTICIDALLY ACTIVE NITRO COMPOUNDS

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo; Ikuro Honda, Tokyo, and Katsuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

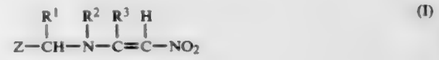
Division of Ser. No. 478,862, Feb. 12, 1990, Pat. No. 5,084,467. This application Sep. 11, 1991, Ser. No. 757,864

Claims priority, application Japan, Feb. 13, 1989, 1-31145

Int. Cl.[5] **A01M** *1/20;* **A01N** *43/40, 43/60, 43/54*

U.S. Cl. 514—332 **9 Claims**

1. A nitro compound of the formula



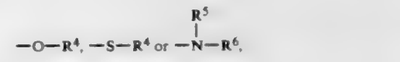
(I)

wherein

R^1 is cyano or C_{1-4} alkyl,

R^2 is hydrogen, C_{1-6} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl, C_{3-8} cycloalkyl optionally substituted by C_{1-2} alkyl, phenyl optionally substituted by halogen, benzyl optionally substituted by halogen, C_{1-4} alkoxy or $-(CH_2)_n-Z$, in which n is 1 or 2,

R^3 is



in which

R^4 is C_{1-6} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl, C_{3-8} cycloalkyl, phenyl optionally substituted by halogen, benzyl optionally substituted by halogen, or $-(CH_2)_n-Z$,

R^5 and R^6 are the same or different and stand for hydrogen, C_{1-9} alkyl optionally substituted by at least one substituent selected from the group consisting of mercapto, C_{1-2} alkoxy, C_{3-6} cycloalkyl, amino, C_{1-2} mono-alkylamino, C_{2-4} (in total) dialkylamino, C_{1-2} alkoxy-carbonyl and cyano; or

R^5 and R^6 are the same or different and stand for C_{3-4} alkenyl optionally substituted by halogen, C_{3-4} alkynyl, phenyl, benzyl, C_{1-4} alkoxy, hydroxy, formyl, C_{1-4} alkylamino, C_{2-4} (in total) dialkylamino, amino, acetyl, benzoyl, 6-chloronicotinoyl, pyridyl optionally substituted by chlorine or methyl, or $-CH_2-Z$, or

R^5 and R^6 may form, together with the adjacent nitrogen atom, a pyrrolidino, piperidino, 2-methylpiperidino, morpholino, piperazino or 1-isoxazolyl group, each optionally substituted by C_{1-2} alkyl,

and

Z is a pyridyl, thiazolyl, isoxazolyl, thiadiazolyl, pyrazolyl, oxazolyl, pyrimidinyl or pyrazinyl group, each optionally substituted by halogen or C_{1-4}-alkyl,

with the exception of the case were R^1 is C_{1-4} alkyl, R^2 is hydrogen or C_{1-4}-alkyl, R^3 is $-S-R^4$ or

an alkoxycarbonyl group which may be substituted by a

5,204,361

METHOD FOR TREATING LAMINITIS IN EQUINE

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in which R^4 is C_{1-4} alkyl, R^5 and R^6 are hydrogen or C_{1-4} alkyl, and Z is a 5- or 6-membered heterocyclic group having at least one nitrogen atom which may be substituted by halogen or C_{1-4} alkyl.

5,204,360

HETEROCYCLIC COMPOUNDS

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

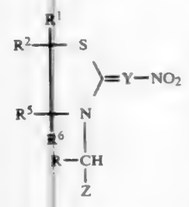
Division of Ser. No. 347,836, May 4, 1989, Pat. No. 5,001,138, which is a division of Ser. No. 68,991, Jul. 1, 1987, Pat. No. 4,845,106, which is a division of Ser. No. 821,621, Jan. 21, 1986, Pat. No. 4,742,060. This application Jul. 24, 1990, Ser. No. 557,292

Claims priority, application Japan, Feb. 4, 1985, 60-18627; Feb. 4, 1985, 60-18628; Feb. 12, 1985, 60-23683; May 21, 1985, 60-106853; May 21, 1985, 60-106854; Oct. 3, 1985, 60-219082

Int. Cl.[5] C07D *417/06*; A01N *43/78*

U.S. Cl. 514—342 **12 Claims**

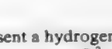
1. A compound of the formula



in which

R^1, R^2, R^5 and R^6 independently represent a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R^3 and R^4 independently represent a hydrogen atom, a hydroxy group or an alkyl group having 1 to 4 carbon atoms,

Y represents a nitrogen atom or



R^9 represents a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, a hydroxy group, an alkoxy group having 1 to 4 carbon atoms, a benzyloxy group, an alkyl group having 1 to 4 carbon atoms which may be substituted by at least one member selected from the class consisting of a fluorine atom, a chlorine atom, a hydroxy group, an alkoxy group having 1 to 2 carbon atoms, alkylthio groups having 1 to 2 carbon atoms, a cyano group, a dimethylamino group, alkylcarbonyl groups having an alkyl with 1 to 2 carbon atoms and alkoxycarbonyl groups having an alkyl with 1 to 2 carbon atoms,

an alkenyl group having 2 to 3 carbon atoms, a phenyl group,

an alkylcarbonyl group having an alkyl with 1 to 4 carbon atoms which may be substituted by at least one member selected from the class consisting of a methoxy group, a chlorine atom and a fluorine atom,

an alkenylcarbonyl group having an alkenyl with 2 to 3 carbon atoms,

a benzoyl group which may be substituted by at least one member selected from the class consisting of a fluorine atom, a chlorine atom, a bromine atom,

a methoxy group and a methyl group,

an alkoxycarbonyl group which may be substituted by a fluorine atom and/or a chlorine atom,

an alkylthiocarbonyl group having an alkyl with 1 to 4 carbon atoms,

a phenoxycarbonyl group which may be substituted by at least one member selected from the class consisting of a fluorine atom, a chlorine atom, a bromine atom, a methyl group, a methoxy group and a nitro group,

a phenylthiocarbonyl group, a benzyloxycarbonyl group,

a benzoylaminocarbonyl group which may be substituted by at least one member selected from the class consisting of a methyl group, a fluorine atom,

a chlorine atom and a bromine atom,

a phenylsulfonylaminocarbonyl group which may be substituted by at least one member selected from the class consisting of a methyl group, a fluorine atom,

a chlorine atom and a bromine atom,

an alkylsulfonylaminocarbonyl group having an alkyl with 1 to 4 carbon atoms,

an alkylthio group having 1 to 4 carbon atoms,

an alkylsulfonyl group which may be substituted by a fluorine atom and/or a chlorine atom,

a phentylthio group which may be substituted by at least one member selected from the class consisting of a methyl group, a fluorine atom, a chlorine atom and a bromine atom, or

a phenylsulfonyl group which may be substituted by at least one member selected from the class consisting of a methyl group, a fluorine atom, a chlorine atom and a bromine atom,

in addition, R^9 may form a bis-form of the formula (I), via a methylene group,

R represents a hydrogen atom or a methyl group, and

Z represents a 5 to 6 membered heterocyclic group, containing one to three hetero atoms selected from the class consisting of an oxygen atom, a sulfur atom and a nitrogen atom, at least one of which is a nitrogen atom, which may be substituted by at least one member selected from the class consisting of a fluorine atom, a chlorine atom, a bromine atom, alkyl groups having 1 to 4 carbon atoms which may be substituted by a fluorine atom and/or a chlorine atom,

a nitro group, a cyano group,

alkylsulfinyl groups having 1 to 4 carbon atoms,

alkylsulfonyl groups having 1 to 4 carbon atoms,

alkoxy groups having 1 to 4 carbon atoms which may be substituted by a fluorine atom and/or a chlorine atom,

alkylthio groups having 1 to 4 carbon atoms which may be substituted by a fluorine atom and/or a chlorine atom;

alkenyl groups having 2 to 3 carbon atoms which may be substituted by a chlorine atom,

an acetamide group which may be substituted by a fluorine atom and/or a chlorine atom,

alkoxycarbonyl groups having an alkyl with 1 to 4 carbon atoms, a thiocyanato group,

alkynyl groups having 2 to 4 carbon atoms,

an amino group, a methylamino group,

a dimethylamino group, an acetyl group,

a formyl group, a carboxy group, a hydroxy group,

a mercapto group, cycloalkyl groups having 3 to 7 carbon atoms, an oxo group, a thioxo group,

alkenylthio groups substituted by a fluorine atom, a chlorine atom and/or a bromine atom, alkoxyalkyl groups having 2 to 4 carbon atoms in total,

alkylaminocarbonyl groups having an alkyl with 1 to 2 carbon atoms,

dialkylaminocarbonyl groups having an alkyl with 1 to 2 carbon atoms,

a phenyl group, a phenoxy group and a benzyl group.

5,204,361

METHOD FOR TREATING LAMINITIS IN EQUINE LIVESTOCK

James B. Rowe, Lot 14 Amherst Ave., Darlington, Western Australia 6070, Australia

Filed Mar. 30, 1989, Ser. No. 331,581

Claims priority, application Australia, Mar. 30, 1988, PI7526; Nov. 1, 1988, PJ1239; Jan. 9, 1989, PJ2218

Int. Cl.[5] A61K *31/42, 37/00*

U.S. Cl. 514—375 **15 Claims**

1. A method of treating laminitis in equine livestock which comprises dosing said equine with a pharmaceutically effective quantity of an agent comprising virginiamycin, virginiamycin M or virginiamycin S wherein said agent acts to treat laminitis in the equine livestock.

5,204,362

FUNGICIDAL AZOLYLETHANE DERIVATIVES

Rainer Seele, Fussgoenheim; Norbert Goetz, Worms; Wolfgang Brox, Heidelberg; Reiner Kober, Fussgoenheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

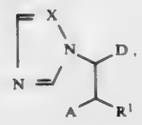
Filed Mar. 26, 1991, Ser. No. 675,170

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1990, 4009594

Int. Cl.[5] A01N *43/653*; C07D *405/06, 409/06*

U.S. Cl. 514—383 **6 Claims**

1. A compound of the formula I



where

A and R^1 are identical or different and are each C_1–C_8-alkyl, phenyl, biphenyl, naphthyl, benzyl, C_3–C_6-cycloalkyl, C_1–C_8-alkoxy, C_1–C_8-alkylthio, phenoxy, benzyloxy, phenylthio, methoxycarbonylethyl, furyl or thienyl, and these radicals may be monosubstituted to trisubstituted by halogen, nitro, phenoxy, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl,

with the proviso that at least one of the substituents A and R^1 is furyl or thienyl, each of which is unsubstituted or mono- to trisubstituted by halogen, nitro, phenoxy, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl,

D is halogen, and

X is N,

or its plant-tolerated acid addition salts or metal complex compounds.

5,204,363

HETEROCYCLIC COMPOUNDS

Balasubramanyan Sugavanam; Paul A. Worthington, both of Berkshire, and John M. Clough, Buckinghamshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 298,835, Jan. 18, 1989, Pat. No. 5,004,494, which is a continuation of Ser. No. 007,352, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 353,941, Mar. 2, 1982, abandoned. This application Jan. 18, 1991, Ser. No. 642,835

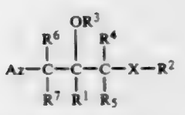
Claims priority, application United Kingdom, Mar. 18, 1981, 8108412; Oct. 16, 1981, 8131301; Oct. 29, 1981, 8132682

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 514—383 **2 Claims**

1. A triazole compound having the formula (I):



wherein R^1 is halophenyl and R^2 is hydrogen, C_1–C_6 alkyl or phenyl substituted with halogen; R^3 is hydrogen; R^4 and R^5, which may be the same or different, are hydrogen or C_1–C_6 alkyl; R^6 and R^7 are hydrogen; X is SO or SO_2; and Az is a 1,2,4- or 1,3,4-triazole ring; and isomers, acid addition salts and metal complexes thereof.

5,204,364

N-IMIDAZOLYL- AND N-IMIDAZOLYLMETHYL-DERIVATIVES OF SUBSTITUTED BICYCLIC COMPOUNDS

Germano Carganico; Paolo Cozzi; Antonio Pillan, all of Milan; Patricia Salvati, Arese, and Corrado Ferti, Barlassina, all of Italy, assignors to Farmitalia Carlo Erba, S.r.l., Milan, Italy

PCT No. PCT/EP89/01159, § 371 Date Jun. 27, 1990, § 102(e) Date Jun. 27, 1990, PCT Pub. No. WO90/03970, PCT Pub. Date Apr. 19, 1990

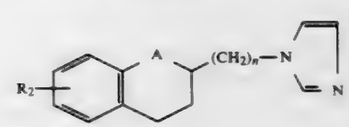
PCT Filed Oct. 3, 1989, Ser. No. 499,390

Claims priority, application United Kingdom, Oct. 6, 1988, 8823488; Jan. 18, 1989, 8901095; Jul. 27, 1989, 8917201

Int. Cl.[5] A61K *31/415*; C07D *233/56*

U.S. Cl. 514—399 **8 Claims**

1. A compound of formula (I)



wherein

A is a $\geqq CR_3$ or $>CHR_3$ group in which R_3 is C_1–C_4 alkyl;

n is zero or 1; and

R_2 is a $—CONH_2$ or $—COOR^1$ group in which R^1 is hydrogen or C_1–C_4 alkyl;

or a pharmaceutically acceptable salt thereof.

5,204,365

SUBSTITUTED DIPHENYLMETHANE DERIVATIVES AS ANALGESIC OR ANTI-INFLAMMATORY AGENTS

Romeo A. Rovati; Ernesto F. Felip; Ricardo C. Mestres, and Eduardo C. Bau, all of Barcelona, Spain, assignors to Sociedad Espanola de Especialidades Farmaco-Terapeuticas S.A., Spain

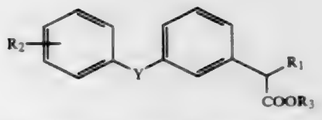
Filed May 24, 1991, Ser. No. 705,400

Claims priority, application Spain, May 25, 1990, 9001460; Jul. 25, 1990, 9001999

Int. Cl.[5] A61K *31/415*; C07D *233/56*

U.S. Cl. 514—399 **8 Claims**

1. A compound of the following formula:



or a pharmaceutically acceptable salt thereof, where:

$—R_1$ is hydrogen or methyl;

—Y— is >CH—A or its vinylogous group $>C=CH—CH_2—A$, wherein —A is 1(1H)-imidazolyl optionally mono- or bi-substituted by a group selected from C_1–C_4-alkyl or ben-

zyl; $—R_2$ is hydrogen or a radical C_1–C_4-alkyl, C_1–C_4-

animal an effective leukemia cell-inhibiting amount of a com-

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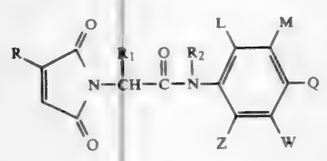
zyl; —R_2 is hydrogen or a radical C_1–C_4-alkyl, C_1–C_4-alkoxy, di(C_1–C_4-alkyl)amino, nitro or halogen, said radical being attached at the 2, 3 or 4 substitution positions of the phenyl ring;
—R_3 is hydrogen, phenyl, C_1–C_{10}-alkyl, a C_3–C_{10}-alkenyl or alkynyl group with the double or triple bond non-adjacent to the O—C bond, $(CH_2CH_1O)_n$—H with n=1, 2 or 3, —$CHOH)_m$—H with m=2, 3 or 4.

5,204,366
2,5-DIOXO-3-PYRROLINE-1-ACETANILIDE FUNGICIDAL AGENTS, COMPOSITIONS AND METHOD FOR USE THEREOF

Jerome M. Lavanish, Yardley, and Bomi Patel, Philadelphia, both of Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 10, 1991, Ser. No. 713,179
Int. Cl.[5] C07D *207/452;* **A01N** *37/32*
U.S. Cl. 514—424 **19 Claims**

9. A method for the protection of plants from the effects of plant pathogenic fungi which comprises applying to the locus of the plant or the fungi a fungicidally effective amount of a compound having the structural formula



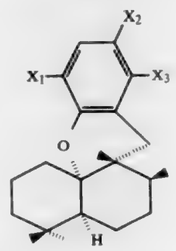
wherein
R is hydrogen, halogen, or C_1–C_4 alkyl optionally substituted with halogen;
R_1 is hydrogen, C_1–C_{10} alkyl optionally substituted with C_1–C_9 alkoxy or halogen, C_3–C_6 cycloalkyl, C_2–C_{10} alkylthioalkyl, C_4–C_{10} cycloalkylalkyl, or phenyl or $C_7 \geq C_{10}$ phenylalkyl optionally substituted with one to three halogen atoms, C_{-C4} alkoxy groups, nitro groups, cyano groups, or C_1–C_4 alkyl groups optionally substituted with halogen;
R_2 is hydrogen, or C_1–C_6 alkyly optionally substituted with C_1–C_5 alkoxy;
L, M, Q, W and Z are each independently hydrogen, C_1–C_6 alkyl optionally substituted with C_1–C_4 alkoxy or halogen, C_1–C_4 alkoxy, C_3–C_6 cycloalkyl, C_2–C_6 alkenyl, C_5–C_6 cycloalkenyl, C_2–C_6 alkynyl, halogen, nitro, cyano, CO_2R_3, or phenyl or phenoxy optionally substituted with one to three C_1–C_4 alkoxy groups, halogen atoms, nitro groups, cyano groups, or C_1–C_4 alkyl groups optionally substituted with halogen, with the proviso that at most only one of L, M, Q, W or Z may be phenyl or phenoxy;
R_3 is C_1–C_4 alkyl; and when R_1 is a substituent other than hydrogen, the optical isomers thereof.

5,204,367
ANTIVIRAL AND ANTI-LEUKEMIA TERPENE HYDROQUINONES AND METHODS OF USE

Amy E. Wright; Sue S. Cross, both of Fort Pierce; Neal S. Burres, Highland Park, and Frank Koehn, Fort Pierce, all of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Division of Ser. No. 548,784, Jul. 6, 1990, Pat. No. 5,091,412, which is a continuation-in-part of Ser. No. 480,996, Feb. 16, 1990, Pat. No. 5,051,519. This application Dec. 5, 1991, Ser. No. 803,255
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—453 **8 Claims**

1. A process for treating a human or animal hosting leukemia cells, said process comprising administering to said human or animal an effective leukemia cell-inhibiting amount of a compound having the following structure



wherein X_1, X_2, or X_3may be either OR or H, wherein R may be H, Ac, p-bromobenzoyl, tosyl, mesyl, or lower alkyl (C_1 to C_5).

5,204,368
BACTERIOSTATIC AND BACTERIOCIDAL METHOD USING FULVIC ACID DERIVATIVES

Izak J. Cronje, Verwoerdburg; Thomas E. Cloete, Pretoria; Johannes Dekker, Pretoria, and Hendrik Swart, Pretoria, all of South Africa, assignors to National Energy Council, Transvaal, South Africa

Filed May 7, 1991, Ser. No. 696,710
Claims priority, application South Africa, May 25, 1990, 90/4033
Int. Cl.[5] A01N *43/16*
U.S. Cl. 514—455 **9 Claims**

1. A method of reducing the bacterial activity of a locus comprising administering to the locus an effective amount of a composition having bactericidal and bacteriostatic activity comprising an agent selected from the group consisting of coal-derived fulvic acid, salts and derivatives thereof, and a suitable carrier.

5,204,369
METHOD FOR THE INHIBITION OF ALDH-I USEFUL IN THE TREATMENT OF ALCOHOL DEPENDENCE OR ALCOHOL ABUSE

Bert L. Vallee, Brookline, and Wing M. Keung, Wayland, both of Mass., assignors to The Endowment For Research In Human Biology, Boston, Mass.

Filed Jul. 1, 1991, Ser. No. 723,404
Int. Cl.[5] A01N *43/16;* **A61K** *31/35*
U.S. Cl. 514—456 **2 Claims**

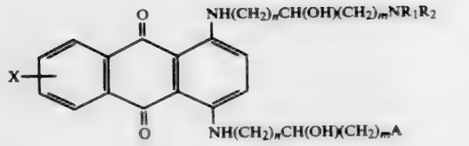
1. A method for inhibiting ALDH-I in a human comprising contacting the ALDH-I with an inhibiting amount of diadzin.

5,204,370
BIS-(HYDROXYALKYLAMINO)-ANTHRAQUINONE INHIBITORS OF PROTEIN KINASE C

Jack B. Jiang, Chapel Hill, and Mary G. Johnson, Carrboro, both of N.C., assignors to Sphinx Pharmaceuticals Corporation, Durham, N.C.

Filed Nov. 5, 1990, Ser. No. 609,252
Int. Cl.[5] A01N *43/70;* **C07C** *225/34, 225/36;* **C07D** *303/32*
U.S. Cl. 514—475 **6 Claims**

1. A substituted anthraquinone having the formula



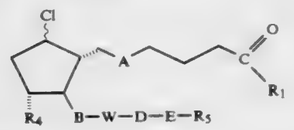
wherein
R_1 and R_2 are independently H, C_1–C_{10} alkyl, aryl, arylalkyl, alkylaryl;
n and m are independently 1, 2, or 3;
A is Halogen, OH, alkoxy, $OCO(NR_3R_4)$, $S—C(NH_2)=NR_5$, or when m=1, comprises an oxirane ring with the adjacent oxygen atom;
R_3, R_4, and R_5 are independently H, alkyl, or aryl;
X is H, OH, NR_6R_7, Cl, Br, I, F, alkyl, aryl, alkoxy, aryloxy, $COOR_8$, or $CONR_9R_{10}$; and
R_6, R_7, R_8, R_9, and R_{10} are independently H, lower alkyl, or aryl.

5,204,371
PHARMACEUTICALLY ACTIVE 9-CHLOROPROSTAGLANDINS

Werner Skuballa; Bernd Raduechel; Helmut Vorbrueggen; Walter Elger; Olaf Loge, and Ekkehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 96,232, Sep. 8, 1987, Pat. No. 5,079,259, which is a continuation of Ser. No. 754,702, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 581,741, Feb. 16, 1984, abandoned, which is a division of Ser. No. 387,140, Jun. 10, 1982, Pat. No. 4,444,788, which is a continuation-in-part of Ser. No. 215,762, Dec. 10, 1980, abandoned. This application Nov. 15, 1991, Ser. No. 792,574
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1979, 2950027
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.[5] C07C *177/00;* **A61K** *31/557*
U.S. Cl. 514—530 **18 Claims**

1. A 9-chloroprostane of the formula



wherein
the 9-chlorine atom can be in the α- or β-position,
R_1 is OR_2 wherein,
R_2 is H; $C_{1\text{-}10}$-alkyl; $C_{1\text{-}10}$-alkyl substituted by halogen, $C_{1\text{-}4}$-alkoxy, $C_{6\text{-}10}$-aryl or -aroyl, $C_{6\text{-}10}$-aryl or -aroyl substituted by the substituents defined below for the R_2 aryl groups, di-$C_{1\text{-}4}$-alkylamino, or tri-$C_{1\text{-}4}$-alkylammonium; $C_{4\text{-}10}$-cycloalkyl; $C_{4\text{-}10}$-cycloalkyl-substituted by $C_{1\text{-}4}$-alkyl; $C_{6\text{-}10}$-aryl; $C_{6\text{-}10}$-aryl substituted by 1–3 halogen atoms, phenyl, 1–3 $C_{1\text{-}4}$-alkyl groups, or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or $C_{1\text{-}4}$-alkoxy group; or an aromatic heterocycle of 5- or 6-total ring atoms and 1–2 hetero N, O or S atoms, the remainder being carbon atoms;
A is cis—CH=CH—,
B is $—CH_2—CH_2—$, trans—CH=CH— or —C≡C—,
W is hydroxymethylene or

wherein the OH-group in each case can be in the α- or β-position, and can be etherified or esterified by tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl, acetyl, propionyl, butyryl or benzoyl;
D and E together represent a direct bond or
D is a straight-chain or branched alkylene group of 1–10 carbon atoms, optionally substituted by fluorine, and
E is a direct bond, and
R_4 is hydroxy or hydroxy etherified or esterified as defined for W above;
R_5 is a $C_{1\text{-}10}$-hydrocarbon aliphatic group substituted by halogen;
or a physiologically acceptable salt thereof with a base when R_1 is OH.

5,204,372
USE OF KETONE, ALCOHOL AND SCHIFF BASE-CONTAINING COMPOSITIONS FOR REPELLING BLOOD FEEDING ARTHROPODS AND APPARATUS FOR DETERMINING REPELLENCY AND ATTRACTANCY OF SEMIOCHEMICALS AGAINST AND FOR BLOOD FEEDING ARTHROPODS

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel, both of N.J.; Jerry F. Butler, Gainesville, Fla.; Eleanor Fox, New York, and Vincent F. Kuczinski, Staten Island, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Division of Ser. No. 643,206, Jan. 18, 1991, Pat. No. 5,126,369. This application Nov. 8, 1991, Ser. No. 789,693
Int. Cl.[5] A01N *35/02, 31/02*
U.S. Cl. 514—675 **3 Claims**

1. A method of repelling at least one of the insect species:
(a) *Musca Domestica L.* (*Diptera:Muscidae*);
(b) *Aedes aegypti;*
(c) *Aedes albopictus;*
(d) *Anopheles spp.;*
(e) *Coquillettidia perturbans;*
(f) *Culiseta spp.;*
(g) *Culex spp.;*
(h) *Psorophora spp.;*
(i) *Culicoides spp.; and/or*
(j) *Lutzomyia spp.*
for a finite period of time from a three dimensional space inhabitable by said insect species comprising the step of exposing said three dimensional space to an effective:
(a) *Musca Domestica L.* (*Diptera:Muscidae*);
(b) *Aedes aegypti;*
(c) *Aedes albopictus;*
(d) *Anopheles spp.;*
(e) *Coquillettidia perturbans;*
(f) *Culiseta spp.;*
(g) *Culex spp.;*
(h) *Psorophora spp.;*
(i) *Culicoides spp.*; and/or
(j) *Lutzomyia spp.*

repelling concentration and quantity of an insect repellent

5,204,374
CYCLOALKANO(B)DIHYDROINDOLES AND

isoxazolyl, imidazolyl, thiazolyl or isothiazolyl,

5,204,377
POROUS, CRYSTALLIZED, AROMATIC

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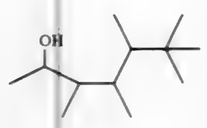
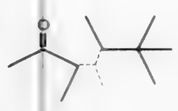
repelling concentration and quantity of an insect repellent composition of matter selected from the group consisting of:

(a) The secondary C_{12} branched alcohol defined according to the structure:



and

(b) The C_{12} unsaturated ketone mixture consisting of a mixture of compounds defined according to the generic structure:



wherein in each of the compounds of the mixture, one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond.

5,204,373

FARNESYLATED TETRAHYDRO-NAPHTHALENOLS AS HYPOLIPIDEMIC AGENTS

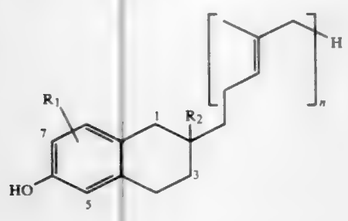
Bradley C. Pearce, East Hampton, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Aug. 26, 1991, Ser. No. 749,778

Int. Cl.[5] A61K *31/08;* **C07C** *43/21, 43/23*

U.S. Cl. 514—720 **9 Claims**

1. The compound having the structural formula



wherein

R_1 represents hydrogen, C_1–C_{10} alkyl, halogen, or OMe;

R_2 represents hydrogen, C_1–C_{10} alkyl; and n is 1–3,

or pharmaceutically acceptable acid additional salts, metal salts, or solvates thereof.

5,204,374

CYCLOALKANO(B)DIHYDROINDOLES AND -INDOLESULPHONAMIDES SUBSTITUTED BY HETEROCYCLES

Ulrich E. Müller; Ulrich Rosentreter, both of Wuppertal; Ulrich Niewöhner, Wermelskirchen; Elisabeth Perzborn, Wuppertal; Erwin Bischoff, Wuppertal; Hans-Georg Dellweg, Wuppertal, all of Fed. Rep. of Germany; Peter Norman, Slough, United Kingdom; Nigel J. Cuthbert, Great Missenden, United Kingdom, and Hilary P. Francis, Woodley, United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

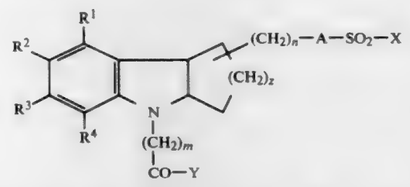
Filed Apr. 3, 1991, Ser. No. 679,710

Claims priority, application United Kingdom, Apr. 10, 1990, 9008108

Int. Cl.[5] C07D *215/36, 209/82;* **A01N** *43/54, 43/38*

U.S. Cl. 514—209 **14 Claims**

1. A heterocyclyl substituted cycloalkano[b]dihydroindole or -indolesulphonamide of the formula



(I)

in which R^1, R^2, R^3 and R^4 are identical or different and represent hydrogen, nitro, cyano, halogen, trifluoromethyl, carboxyl, hydroxyl or trifluoromethoxy, or represent a group of the formula $—S(O)_wR^5$, in which

R^5 denotes straight-chain or branched alkyl having up to 8 carbon atoms or aryl having 6 to 10 carbon atoms, which is optionally substituted by halogen, nitro, cyano or trifluoromethyl,

w denotes the number 0, 1 or 2, or

represents straight-chain or branched alkoxy or alkoxycarbonyl in each case having up to 10 carbon atoms, or benzyloxy, or

represents a group of the formula $—NR^6R^7$, in which

R^6 and R^7 are identical or different and

denote hydrogen, straight-chain or branched alkyl or acyl in each case having up to 8 carbon atoms or

denote aryl having 6 to 10 carbon atoms, or

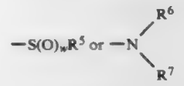
denote a group of the formula $—S(O)_wR^5$, in which

R^5 and w have the abovementioned meaning,

represent cycloalkyl having 3 to 8 carbon atoms or

represent aryl having 6 to 10 carbon atoms, or

represent straight-chain or branched alkyl or alkenyl in each case having up to 10 carbon atoms, which are optionally substituted by halogen, hydroxyl, carboxyl, cyano, aryl having 6 to 10 carbon atoms, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms or by a group of the formula



in which w, R^5, R^6 and R^7 have the abovementioned meaning,

m represents the number 1, 2, 3 or 4,

n represents the number 0, 1 or 2,

z represents the number 1, 2, 3 or 4,

A represents a bond or the —NH group,

X represents pyridyl, pyrimidyl, pyridazyl, quinolyl, morpholinyl, piperidinyl, thienyl, pyrryl, oxazolyl,

isoxazolyl, imidazolyl, thiazolyl or isothiazolyl, which are optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, trifluoromethoxy, hydroxyl or straight-chain or branched alkyl having up to 6 carbon atoms,

Y represents hydroxyl, alkoxy having up to 8 carbon atoms, phenoxy or a group of the formula $—NR^6R^7$, in which

R^6 and R^7 have the abovementioned meaning, an isomeric form thereof, or a salt thereof.

5,204,375

BETAINE SURFACE ACTIVE AGENT HAVING AN ESTOLIDE HYDROPHOBIC GROUP

Susumu Kusakawa, Hazuyama; Yoshiyuki Itoh, Hinaganishi, and Yuka Saigusa, Tamanoi, all of Japan, assignors to Itoh Seiyu Kabushiki Kaisha, Mie, Japan

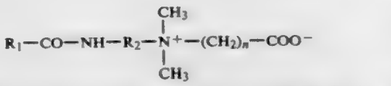
Filed Jan. 14, 1992, Ser. No. 820,036

Claims priority, application Japan, Jan. 16, 1991, 17102/1991

Int. Cl.[5] A61K *9/107;* **C07C** *215/40, 229/26, 233/47*

U.S. Cl. 514—784 **9 Claims**

1. A lipophilic amphoteric surface active betaine compound of the formula



wherein R_1—CO is an acyl radical of an estolide, R_2 is an alkylene group having 1 to 3 carbon atoms and n is an integer from 1 to 3.

5. A water-in-oil emulsion containing a non-polar substance, water and an emulsifying effective amount of the betaine compound of claim 5.

5,204,376

ANION EXCHANGER AND A METHOD FOR TREATING A FLUID

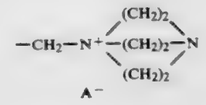
Masahiro Henmi, Otsu; Ken Noyorio, Moriyama, and Toshio Yoshioka, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 594,101, Sep. 25, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 861,341

Int. Cl.[5] B01J *41/04;* **C08J** *5/20*

U.S. Cl. 521—32 **5 Claims**

1. A crosslinked vinyl aromatic polymer or phenolic resin-based anion exchanger having an anion exchanging group of the formula:



in which the exchanging group is bound to the aromatic nucleus of a side chain of said aromatic polymer or said phenolic resin via the methylene group, wherein the anion exchanger has at least 0.1 mol of the anion exchanging group per mol of said aromatic nucleus and wherein A^- is a counter ion.

5,204,377

POROUS, CRYSTALLIZED, AROMATIC POLYCARBONATE PREPOLYMER, A POROUS, CRYSTALLIZED AROMATIC POLYCARBONATE, AND PRODUCTION METHODS

Isaburo Fukawa, Fuji; Shinsuke Fukuoka, Kurashiki; Kyosuke Komiya, Kurashiki, and Yoro Sasaki, Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP89/00994, § 371 Date Oct. 17, 1989, § 102(e) Date Oct. 17, 1989

PCT Filed Sep. 29, 1989, Ser. No. 442,353

Claims priority, application Japan, Dec. 27, 1988, 63-327678; Mar. 28, 1989, 1-74048; Jul. 4, 1989, 1-171084; Jul. 14, 1989, 1-180434; Jul. 27, 1989, 1-192670

Int. Cl.[5] C08J *9/28*

U.S. Cl. 521—60 **23 Claims**

1. A porous, crystallized, aromatic polycarbonate prepolymer comprising recurring aromatic carbonate units and terminal hydroxyl and aryl carbonate groups, wherein the molar ratio of the terminal hydroxyl groups to the terminal aryl carbonate groups is from 5/95 to 95/5, and having a number average molecular weight of from 1,000 to 15,000, a specific surface area of at least 0.2 m^2/g and a crystallinity of at least 5%.

5,204,378

FLUORINE-CONTAINING EPOXY(METH)ACRYLATE RESIN ADHESIVE CURED IN PRESENCE OF PHOTOINITIATOR

Tohru Maruno; Shigeki Ishibashi, both of Tokorozawa, and Kouzaburou Nakamura, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

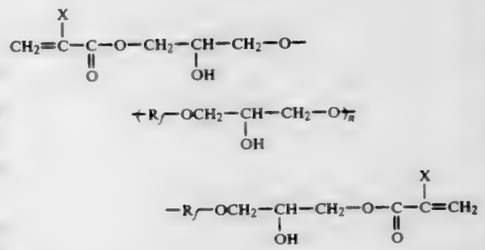
Continuation of Ser. No. 332,381, Apr. 3, 1989, Pat. No. 5,068,261, which is a continuation of Ser. No. 29,644, Mar. 24, 1987, abandoned. This application Mar. 18, 1991, Ser. No. 672,022

Claims priority, application Japan, Mar. 24, 1986, 61-64000; May 13, 1986, 61-107675; Oct. 7, 1986, 61-237004; Oct. 17, 1986, 61-246849

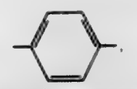
Int. Cl.[5] C08F *2/50;* **C08G** *20/06*

U.S. Cl. 522—39 **2 Claims**

1. An adhesive composition comprising a fluorine-containing epoxy(meth)acrylate resin of the formula:



wherein R_f is a member selected from the group consisting of $—\phi—C(CF_3)_2—\phi—$, in which ϕ represents



and $—CH_2(CF_2)_6CH_2—$; n is zero or a positive integer up to a value which results in a cured adhesive product which has a refractive index Np^{20} ranging from 1.434 to 1.532; and X is hydrogen or methyl, and from 2 to 10% by weight, based on the amount of said fluorine-containing epoxy(meth)acrylate resin, of a photopolymerization initiator which is a member

selected from the group consisting of benzoin butyl ether, including a ceramic matrix present in a pharmaceutically ac-

5,204,384

ONE-PART CURABLE ORGANOSILOXANE

merized insoluble acrylic elastomer which has a plurality of hydroxyl functionality; and

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selected from the group consisting of benzoin butyl ether, benzyl dimethyl ketal, benzoin ethyl ether, benzophenone and Michler's ketone.

5,204,379

PHOTOCURABLE ADHESIVE AND PRODUCTION OF LAMINATED ARTICLES USING THE SAME

Tsutomu Kubota, Mishima, and Tomoyoshi Shinoda, Ibaraki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 598,412
Claims priority, application Japan, Oct. 18, 1989, 1-272259
Int. Cl.[5] C08F *2/50; C08G 18/76, 18/32, 18/48*
U.S. Cl. 522—96 **9 Claims**

1. A photocurable adhesive which comprises:

(a) a polyurethane poly(meth)acrylate having a polyurethane structure which contains α, α, α', α'-tetramethylxylylenediisocyanate as a main polyisocyanate component and having (meth)acryloyl groups in the molecule; and

(b) an adhesive coupling agent in an amount of 0.05–10 parts by weight in relation to 100 parts by weight of the polyurethane poly(meth)acrylate.

5,204,380

PREPARATION OF SILICON CARBIDE CERAMICS FROM THE MODIFICATION OF AN SI-H CONTAINING POLYSILANE

Dietmar Seyferth, Lexington, Mass.; Henry J. Tracy, Bath, Me., and Jennifer L. Robison, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 29, 1991, Ser. No. 751,190
Int. Cl.[5] C08J *3/28*
U.S. Cl. 522—148 **56 Claims**

1. A modified preceramic polymer material prepared by a method comprising:

(a) mixing one or more organosilicon polymers each having a plurality of Si—H functional groups with

(b) a catalytically effective amount of a metallocene compound sufficient to cause a dehydrogenative crosslinking reaction; and

(c) allowing the mixture to undergo the dehydrogenative reaction to form the modified polymer material.

5,204,381

HYBRID SOL-GEL OPTICAL MATERIALS

John M. Zeigler, Albuquerque, N. Mex., assignor to The United States of America as Represented by he United States Department of Energy, Washington, D.C.

Division of Ser. No. 479,136, Feb. 13, 1990, Pat. No. 5,130,397. This application Apr. 20, 1992, Ser. No. 870,857
Int. Cl.[5] C08J *3/28*
U.S. Cl. 522—148 **7 Claims**

1. A hybrid sol-gel comprising an orthosilicate ester network cross-linked with siloxane linkages, said hybrid sol-gel having been generated by exposure of polysilane bearing sol-gel hybrid material to actinic radiation.

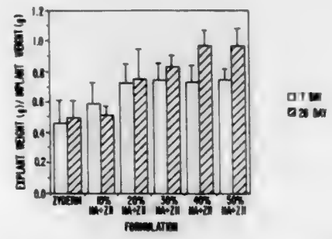
5,204,382

INJECTABLE CERAMIC COMPOSITIONS AND METHODS FOR THEIR PREPARATION AND USE

Donald G. Wallace, Menlo Park; Hugh McMullin, Pacifica, and George Chu, Cupertino, all of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 843,646, Feb. 28, 1992. This application Jul. 27, 1992, Ser. No. 920,412
Int. Cl.[5] A61F *2/00;* **C08K** *3/32*
U.S. Cl. 523—115 **16 Claims**

1. A method for augmenting tissue in a living mammal, said method comprising subcutaneously injecting a composition including a ceramic matrix present in a pharmaceutically acceptable fluid carrier to a tissue site, wherein the ceramic



matrix comprises particles having a size distribution in the range from 50 μm to 250 μm.

5,204,383

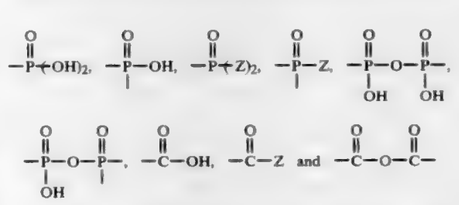
DENTAL ADHESIVES

Atsufumi Manabe; Kazuo Itoh; Sadao Wakumoto, all of Tokyo; Tokuji Hasegawa, Yokohama, and Toshie Koike, Kawasaki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Mitsui Petrochemical Industries, Ltd., Tokyo, both of Japan

Continuation of Ser. No. 590,814, Oct. 1, 1990. This application May 29, 1992, Ser. No. 892,725
Claims priority, application Japan, Mar. 28, 1990, 2-81768; Mar. 28, 1990, 2-81769
Int. Cl.[5] A61K *6/02, 6/08*
U.S. Cl. 523—118 **4 Claims**

1. A dental adhesive comprising glyceryl mono(meth)acrylate and a polymerizable monomer having at least one olefinic double bond and capable of copolymerizing with said glyceryl mono(meth)acrylate,

wherein the polymerizable monomer is a polymerizable acid monomer having at least one olefinic double bond and at least one acid group selected from the group consisting of



-continued

in which Z represents halogen, and further the above-mentioned groups do not link to hydroxyl, halogen or

and said

group links to an organic group having at least 8 carbon atoms.

5,204,384

ONE-PART CURABLE ORGANOSILOXANE COMPOSITION

Takao Matsushita, and Toshio Saruyama, both of Chiba, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,788
Int. Cl.[5] C08K *9/10*
U.S. Cl. 523—211 **5 Claims**

1. In a curable organosiloxane composition consisting essentially of:

(A) an organopolysiloxane containing at least 2 silicon-bonded alkenyl radicals in each molecule and represented by the average formula $R_aSiO_{(4-a)/2}$, where R represents a substituted or unsubstituted monovalent hydrocarbon radical and a represents an umber with a value of from 1.8 to 2.3, inclusive,

(B) an organohydrogenpolysiloxane containing at least 2 silicon-bonded hydrogen atoms in each molecule, and

(C) a particulate material exhibiting an average particle size of from 0.01 to 500 micrometers and consisting essentially of a hydrosilylation catalyst and a resin selected from the group consisting of silicone resins and polysilane resins, where said resins exhibit a softening point or glass transition temperature of from 40 to 200 degrees Centigrade and prevent contact between said catalyst and the other ingredients of said composition,

the improvement comprising the presence in said composition of

(D) an additive selected from the group consisting of the carboxylates, silanolates and beta-diketonates of metallic elements exclusive of those in groups IA and IIA of the Periodic Table, where the concentration of said additive is equivalent to from 0.0005 to 0.1 weight parts of the metallic element per 100 parts of said organopolysiloxane.

5,204,385

WATER REDUCIBLE EPOXY RESIN CURING AGENT

Bryan A. Naderhoff, Pensacola, Fla., assignor to Reichhold Chemicals, Inc., Durham, N.C.

Filed Nov. 27, 1990, Ser. No. 618,489
Int. Cl.[5] C08L *63/00, 63/02, 63/04*
U.S. Cl. 523—417 **23 Claims**

1. A particulate water reducible curing agent for a water dispersible epoxy resin composition having an average particle size of about 0.05 to about 5 microns, and consisting essentially of the adduct reaction product of a polyamine with the unreacted epoxy groups of an intermediate; wherein said intermediate comprises the reaction product of a chemical excess of a polyfunctional epoxide compound with a quaternary ammonium salt in the ratio of about 0.05:1 to about 0.8:1 equivalents, respectively, so that the intermediate reaction product contains unreacted epoxy groups, and wherein said quaternary ammonium salt is the reaction product of a tertiary amine and a monocarboxylic acid having 1 to 3 carbon atoms.

5,204,386

ACRYLIC-MODIFIED EPOXY RESIN ADHESIVE COMPOSITIONS WITH IMPROVED RHEOLOGICAL CONTROL

Yasemin Ersan-Hallsby; Dwight K. Hoffman, both of Midland; Gerald C. Kolb, Bay City, and Gene D. Rose, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 611,806, Nov. 13, 1990, abandoned. This application Jun. 9, 1992, Ser. No. 896,730
Int. Cl.[5] C08L *63/00;* **C08F** *283/00*
U.S. Cl. 523—443 **12 Claims**

1. A thixotropic adhesive composition exhibiting good sag resistance comprising a mixture of:

a. a dispersion which comprises an uncured epoxy resin as a continuous phase having dispersed therein an in situ polymerized insoluble acrylic elastomer which has a plurality of hydroxyl functionality; and

b. an effective amount of a rheological control agent which has a plurality of pendent hydroxyl groups.

5,204,387

EPOXY POWDER COATING COMPOSITION FOR USE IN ELECTROSTATIC COATING

Kunimitsu Matsuzaki, Yono; Seitaro Iwamoto; Takeshi Watanabe, both of Soka; Kazuya Ono, Tokyo, and Katsuji Kitagawa, Kasukabe, all of Japan, assignors to Somar Corporation, Japan

Filed Dec. 20, 1991, Ser. No. 811,137
Claims priority, application Japan, Dec. 28, 1990, 2-416980; Jan. 30, 1991, 3-32072; Mar. 29, 1991, 3-93447
Int. Cl.[5] C08L *63/00;* **C09D** *5/46, 163/100*
U.S. Cl. 523—443 **8 Claims**

1. A powder coating composition comprising:

a first particulate material consisting of first particles having a particle size in the range of 3–180 μm and a volume resistivity of at least 10^7 ohm.cm and each containing a first epoxy resin and a first curing agent for the first epoxy resin;

a second particulate material consisting of second particles having a particle size in the range of 3–180 μm and a volume resistivity of at least 10^7 ohm.cm and each containing a second epoxy resin and a second curing agent for the second epoxy resin;

a first, particulate, charge controlling agent deposited on surfaces of said first particulate material; and

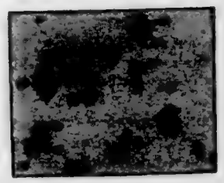
a second, particulate, charge controlling agent deposited on surfaces of said second particulate material, said first and second charge controlling agent differing in static characteristics from each other.

5,204,388

AQUEOUS SURFACE COATING MATERIAL PREPARED BY EMULSION POLYMERIZATION

Christopher J. Tonge, Darwen; John P. Tomlinson, Hoddlesden, and Thomas Graham, Clitheroe, all of England, assignors to Crown Decorative Products Limited, Derby, England

Continuation of Ser. No. 657,255, Feb. 19, 1991, abandoned, which is a continuation of Ser. No. 334,870, Apr. 7, 1989, abandoned. This application Mar. 30, 1992, Ser. No. 860,575
Claims priority, application United Kingdom, Apr. 13, 1988, 8808755
Int. Cl.[5] C08L *1/00, 3/00;* **C08K** *5/00, 9/00*
U.S. Cl. 524—30 **13 Claims**



1. An aqueous surface coating material containing opacifying units prepared in an emulsion polymerisation process in the presence of high refractive index opacifying pigment particles dispersed in a water phase before monomer is added, the units being characterised in that substantially all of the opacifying pigment particles in the units are disjuncted from one another and have non-enveloping appendant polymer particles to give a nodular outline.

5,204,389

SEALED CONTAINERS AND SEALING COMPOSITIONS

the polyolefin is from about 20 percent to about 50 percent

5,204,396

LONG FIBER-REINFORCED POLYAMIDE RESIN

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5,204,389
SEALED CONTAINERS AND SEALING COMPOSITIONS FOR THEM
Robert H. Hofeldt, Littleton, Mass., and Stephen A. C. White, Ivinghoe, Nr. Leighton, England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Division of Ser. No. 694,158, May 1, 1991, Pat. No. 5,075,362, which is a continuation of Ser. No. 307,670, Feb. 7, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 761,118
Claims priority, application United Kingdom, Feb. 10, 1988, 8803062
Int. Cl.[5] C08K *5/13, 5/15, 5/09;* B32B *3/12*
U.S. Cl. 524—72 17 Claims

1. A closure gasket composition comprising a polymeric matrix in a liquid or molten form and an isoascorbiate oxygen scavenger.

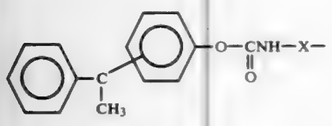
5,204,390
HOT MELT ADHESIVE RESISTANT TO ULTRAVIOLET LIGHT-INDUCED DEGRADATION AND TO PLASTICIZER MIGRATION
James P. Szymanski, Arden Hills; Eugene R. Simmons, Maplewood, and Jeffrey S. Lindquist, St. Paul Park, all of Minn., assignors to H.B. Fuller Company, Arden Hills, Minn.
Continuation of Ser. No. 404,656, Sep. 8, 1989, abandoned. This application Jul. 16, 1992, Ser. No. 915,049
Int. Cl.[5] C08L *23/26, 53/02*
U.S. Cl. 524—91 19 Claims

1. A hot melt pressure-sensitive adhesive PSA composition comprising:
(a) about 1–75 wt-% of a substantially saturated thermoplastic resin having a molecular weight of up to about 200,000;
(b) about 1–75 wt-% of a hydrocarbon resin; and
(c) about 10–50 wt-% of a plasticizer comprising an end-capped reaction product of a polybutene polymer having a molecular weight of up to about 5,000 and terminal ethylenic unsaturation, and a compound that can react with an ethylenically unsaturated group;
wherein the plasticizer, thermoplastic resin and hydrocarbon resin cooperate to significantly stabilize the adhesive against UV radiation and the adhesive exhibits stable adhesive properties upon exposure to UV radiation and is resistant to migration of plasticizer, when adhered to a surface.

5,204,391
BLOCKED POLYISOCYANURATE AND POLYVINYL CHLORIDE PLASTISOL COMPOSITION CONTAINING THE SAME
Yoshihiro Nakata, Takatsuki, and Hirohide Tomoyasu, Ohtsu, both of Japan, assignors to Sunstar Engineering, Inc., Osaka, Japan
Continuation of Ser. No. 602,685, Oct. 24, 1990, abandoned. This application Jul. 23, 1992, Ser. No. 917,739
Claims priority, application Japan, Oct. 26, 1989, 1-279328
Int. Cl.[5] C08J *5/34*
U.S. Cl. 524—100 6 Claims

1. A polyvinyl chloride plastisol composition comprising a polyvinyl chloride resin, a plasticizer, a blocked polyisocyanurate as an adhesiveness providing agent represented by the following general formula (1)

(1)



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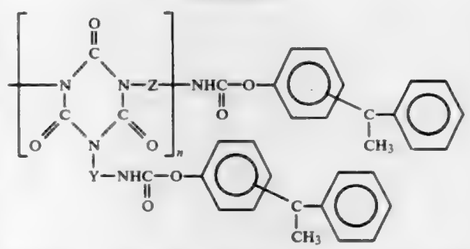


wherein X, Y and Z each independently represents a residue derived by elimination of the isocyanate groups of an aliphatic diisocyanate or an alicyclic diisocyanate, and n represents an integer of 1 to 10, and at least one catalyst that accelerates dissociation of the adhesiveness providing agent and is selected from the group consisting of dibutyltin diacetate, zinc octoate, stannous octoate, dibutyltin dimaleate and triethylenediamine.

5,204,392
TWO-COMPONENT INTUMESCENT FLAME RETARDANT
Raymond W. Nalepa, Coventry, and Daniel J. Scharf, East Greenwich, both of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Filed Sep. 5, 1991, Ser. No. 755,269
Int. Cl.[5] C08J *5/10;* C08K *5/34;* C08L *23/00*
U.S. Cl. 524—101 13 Claims

1. A flame retardant polyolefin wherein the flame retarding portion of the polyolefin comprises ammonium polyphosphate, tris(2-hydroxyethyl) isocyanurate and a selected silica, wherein:
a) the ammonium polyphosphate is a compound of formula $(NH_4PO_3)_n$ in which n is an integer from about 200 to about 1000 and has a particle size less that 45 microns;
b) the total amount of ammonium polyphosphate and tris(2-hydroxyethyl) isocyanurate in the polyolefin is from about 20 percent to about 50 percent by weight;
c) the ratio of ammonium polyphosphate to tris(2-hydroxyethyl) isocyanurate is from about 2:1 to about 6:1; and
d) said selected silica is added in an amount of from 0.5 percent by weight to an amount equal to one-half the amount by weight of said tris(2-hydroxyethyl) isocyanurate and wherein said selected silica has a surface area of at least 450 m^2/gram, a particle size less than or equal to 4.5 microns, a tapped density of less than or equal to 80 grams/liter and a dibutyl phthalate absorption value of at least 330 percent.

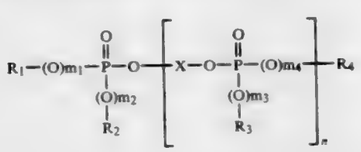
5,204,393
THREE-COMPONENT INTUMESCENT FLAME RETARDANT
Raymond W. Nalepa, Coventry, and Daniel J. Scharf, East Greenwich, both of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Filed Sep. 5, 1991, Ser. No. 755,271
Int. Cl.[5] C08J *5/10;* C08K *5/34;* C08L *23/00*
U.S. Cl. 524—101 13 Claims

1. A flame retardant polyolefin wherein the flame retarding portion of the polyolefin comprises ammonium polyphosphate, tris(2-hydroxyethyl) isocyanurate, melamine cyanurate, and a selected silica, wherein:
a) the ammonium polyphosphate is a compound of formula $(NH_4PO_3)_n$ in which n is an integer from about 200 to about 1000 and has a particle size less that 45 microns;
b) the total amount of ammonium polyphosphate, tris(2-hydroxyethyl) isocyanurate, and melamine cyanurate in the polyolefin is from about 20 percent to about 50 percent by weight;
c) the ratio of ammonium polyphosphate to tris(2-hydroxyethyl) isocyanurate to melamine cyanurate is from about 2:1:1 to about 7:1:1; and
d) said selected silica is added in an amount of from 0.5 percent by weight to an amount equal to one-half the amount by weight of said tris(2-hydroxyethyl) isocyanurate and wherein said selected silica has a surface area of at least 450 m^2/gram, a particle size less than or equal to 4.5 microns, a tapped density of less than or equal to 80 grams/liter and a dibutyl phthalate absorption value of at least 330 percent.

5,204,394
POLYMER MIXTURE HAVING AROMATIC POLYCARBONATE, STYRENE I CONTAINING COPOLYMER AND/OR GRAFT POLYMER AND A FLAME-RETARDANT, ARTICLES FORMED THEREFROM
Johannes C. Gosens, Roosendaal, Netherlands; Charles F. Pratt, Brasschaat, Belgium; Herman B. Savenije, LW Bergen op Zoom, and Christianus A. A. Claesen, CA Bergen op Zoom, both of Netherlands, assignors to General Electric Company, Pittsfield, Mass.
Continuation of Ser. No. 750,703, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 411,751, Sep. 20, 1989, abandoned. This application May 20, 1992, Ser. No. 887,580
Claims priority, application Netherlands, Sep. 22, 1988, 8802346
Int. Cl.[5] C08K *5/523, 5/5357*
U.S. Cl. 524—125 14 Claims

1. A polymer mixture which comprises an aromatic polycarbonate (A), a styrene-containing copolymer and/or styrene-containing graft copolymer (B) and a phosphate based flame-retardant (C), characterized in that the polymer mixture comprises as flame-retardant an oligomeric phosphate or a blend of oligomeric phosphates with the following formula I:

(1)



wherein R_1, R_2, R_3, and R_4, each represent an aryl or an alkaryl group chosen independently of each other with the proviso that none of R_1, R_2, R_3 and R_4 are xylyl and wherein X is an arylene group, m_1, m_2, m_3, and m_4, each independently of each other are 0 or 1 and wherein n=1,2,3,4 or 5 or wherein, in case of a blend of phosphates, n has an average value of 1 to 5.

5,204,395
FLAME RETARDANT POLYPHENYLENE ETHER COMPOSITIONS
John H. Lupinski, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 11, 1991, Ser. No. 805,159
Int. Cl.[5] C08K *9/06*
U.S. Cl. 524—265 5 Claims

1. A flame retardant polyphenylene ether composition comprising from about 70% to about 99% by weight of polyphenylene ether and from about 1% to about 30% by weight of a polydiorganosiloxane fluid-filler blend which is incorporated into the polyphenylene ether as a free-flowing powder which provides from about 0.25% to about 4% by weight of the polydiorganosiloxane fluid based on the weight of polyphenylene ether composition.

5,204,396
LONG FIBER-REINFORCED POLYAMIDE RESIN COMPOSITION AND MOLDED ARTICLES THEREFROM
Haruji Murakami; Kazuhito Kobayashi; Masaru Miura, and Mitsuru Yokouchi, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan
Filed Jun. 12, 1992, Ser. No. 897,672
Claims priority, application Japan, Jun. 14, 1991, 3-143252; Jul. 3, 1991, 3-162699
Int. Cl.[5] C08K *7/14;* C08J *5/08*
U.S. Cl. 524—394 11 Claims

1. A long fiber-reinforced normally solid polyamide resin composition comprising, based on the total composition weight:
(A) a polyamide base resin;
(B) between 5 to 80% by weight of reinforcing fibers having a length of at least 3 mm; and
(C) between 0.01 to 3% by weight of a processing aid which is at least one selected from (C-1) a lithium salt of a fatty acid, and (C-2) a metal salt of a fatty acid having 22 to 32 carbon atoms.

5,204,397
METHOD FOR IMPROVING THE ELECTRIC CONDUCTIVITY OF RESIN
Hirohisa Maki, Shiga; Takeshi Fujita; Katsuaki Matsuo, both of Kyoto; Kenji Motogami, Osaka, and Shigeo Mori, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan
Filed Sep. 3, 1991, Ser. No. 753,762
Claims priority, application Japan, Sep. 14, 1990, 2-244661
Int. Cl.[5] C08K *3/00;* C08L *75/08*
U.S. Cl. 524—401 7 Claims

1. A method of producing a resin of improved electric conductivity which comprises compounding into a matrix resin (A) a macromolecular compound obtained by crosslinking a polyether polyol and (B) a soluble electrolyte salt.

5,204,398
COMPOSITE DENTAL CEMENT COMPOSITION CONTAINING A LANTHANIDE SERIES COMPOUND
Brett I. Cohen, Nanuet, and Douglas M. Achan, Glendale, both of N.Y., assignors to Essential Dental Systems, Inc., South Hackensack, N.J.
Filed Mar. 17, 1992, Ser. No. 852,695
Int. Cl.[5] C08K *3/10*
U.S. Cl. 524—403 43 Claims

1. A composite dental cement composition comprising:
a polymer matrix in an amount between about 15 and 50 weight percent;
a filler in an amount between about 35 and 80 weight percent; and
a lanthanide series compound which is not modified selected from the group consisting of an oxide and a carbonate in an amount between about 1 and 20 weight percent and being a powder having a particle size of between about 5 and 10 microns.

5,204,399
THERMOPLASTIC FILM DIE ATTACH ADHESIVES
Robert Edelman, Staten Island, N.Y., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.
Continuation-in-part of Ser. No. 610,805, Nov. 8, 1990, abandoned, which is a division of Ser. No. 7,321,472, Mar. 9, 1989, Pat. No. 4,994,207. This application Aug. 9, 1991, Ser. No. 742,981
Int. Cl.[5] C08K *3/38*
U.S. Cl. 524—404 16 Claims

1. A thermally conducting, thermoplastic melt die-attach

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adhesive film, which softens at 200° C. but is firm at 175° C. to

amount up to about 15% of the theoretical equivalents of excess anhydride functionality; and

5,204,402
MULTIPURPOSE ADDITIVE SYSTEM FOR

aqueous carrier and has a pH of about 7–10; wherein the binder consist essentially of about

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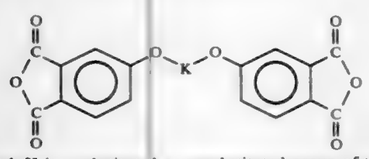
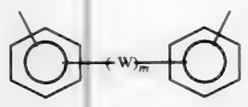
adhesive film, which softens at 200° C. but is firm at 175° C. to maintain adhesion, comprising:

(A) a normally solid thermoplastic polyimide polymeric binder having a weight average molecular weight of about 100,000 to 150,000 and synthesized from:

(1) an aromatic dietherdianhydride having the structure:



in which K is a substituted or unsubstituted group of the formula:

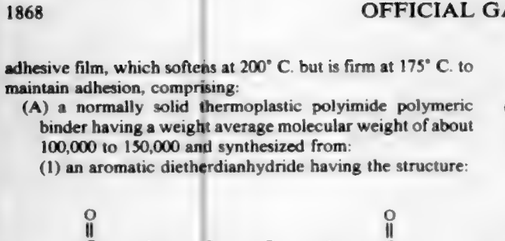


in which W is —O—, —S—, $—SO_2$, linear or branched alkylene or alkenylene having 1 to 8 carbon atoms or —(R)C(L)—, in which R and L can be the same or different lower alkyls having 1 to 8 carbons or aryl groups having 6 to 24 carbon atoms, and m is 0 or 1; and

(2) a meta-substituted benzenediamine having the structure:

in which Y is a divalent unsubstituted meat-phenylene radical or a meta-phenylene radical substituted with at least one lower alkyl group containing 1 to 8 carbon atoms; T is selected from the group consisting of —O—, —S—, —SO—, $—SO_2$, —CO— and lower alkylene having 1 to about 6 carbon atoms; the benzenediamine present in an amount of about 20 to about 50 mole percent of the total diamine content of the polyimide polymeric binder; and

(3) a polysiloxanediamine having the structure:



in which Q is a meta-substituted arylene; Z is a divalent oxygen, sulfide, sulfone, sulfoxide or carboxylic ester or amide group; D is a hydrocarbylene group; R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different alkyls having 1 to 8 carbons; and x, y and z are integers having values of 0 to 100; the polysiloxane diamine present in an amount of about 80 to about 50 mole percent of the total diamine content of the polyimide polymeric binder; the dianhydride content and total diamine content present in an unequal molar ratio of diamine to dianhydride of 0.95–0.97:1; and

(4) p-aminophenol present as an end-capping agent in an amount up to about 15% of the theoretical equivalents of excess anhydride functionality; and

(B) thermally conductive material present in an effective amount up to 85% by weight of the die-attach adhesive film to provide a conducting medium.

5,204,400

POLY(BIPHENYL ETHER SULFONE)COMPOSITIONS

W. E. Kelly, Neshanic Station; S. R. Patel, Branchburg, and M. Matzner, Edison, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 22, 1990, Ser. No. 542,744

Int. Cl.[5] C08K *3/38;* **C08L** *27/12, 81/06*

U.S. Cl. 524—405 **25 Claims**

1. A thermoplastic composition comprising:

a) a polyarylether comprising at least one poly(biphenyl ether sulfone)

b) at least 2.0 parts by weight of anhydrous zinc borate per 100 parts by weight of polyarylether; and

c) about 1.0 to about 8.0 parts weight of nonfibrillating fluorocarbon polymer per 100 parts by weight of polyarylether.

5,204,401

METALLIC WATER BORNE BASE COAT COMPOSITION BASED ON ACRYLIC LATEX RESINS USING ACRYLIC RESINS DERIVED FROM VINYL MONOMERS HAVING NONIONIC AND URETHANE FUNCTIONALITY FOR ALUMINUM STORAGE AND A TREATED HECTORIE CLAY FOR RHEOLOGY CONTROL - WATER BASE 9

James L. Anderson, Jr., Grand Rapids; Horst J. Finkenauer, Waterville; David L. Newton, and Jeff P. Jones, both of Toledo, all of Ohio, assignors to BASF Corporation, Parsippany, N.J.

Filed Jul. 13, 1990, Ser. No. 553,067

Int. Cl.[5] C08J *3/00;* **C08K** *3/08;* **C08L** *33/00;* **C08F** *8/30*

U.S. Cl. 524—441 **2 Claims**

1. A method of forming a water-borne metallic base coat kit composition consisting essentially of mixing:

A. an aluminum base consisting essentially of:

(1) a water reducible solvent borne acrylic resin having nonionic, urethane and acid functionality consisting essentially of:

(a) at least one monomer having acid functionality

(b) at least one monomer having urethane and nonionic functionality prepared by the reaction of: a capped polyether having a single active hydrogen functionality with a polyisocyanate compound to produce a partially capped isocyanate intermediate which is further reacted with a first ethylenically unsaturated compound having at least one active hydrogen group to produce a second ethylenically unsaturated compound having urethane and nonionic functionality

(c) one or more additional ethylenically unsaturated compounds

(2) a solvent borne aluminum flake at a level of 4–30% by weight,

(3) 25–55% total solids by weight,

(4) 35–50% total water miscible organic solvent by weight,

(5) 5–35% total binder by weight.

B. an aqueous pigmented base consisting essentially of an acrylic latex resin and,

C. an aqueous reducer base consisting essentially of a pregelled sodium lithium magnesium silicate hectorite clay rheology control agent.

5,204,402

MULTIPURPOSE ADDITIVE SYSTEM FOR THERMOPLASTIC RESINS

George N. Foster, Bloomsbury, N.J., and Anthony J. Gioffre, Ridgefield, Conn., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 11, 1990, Ser. No. 625,546

Int. Cl.[5] C08K *3/34*

U.S. Cl. 524—450 **17 Claims**

1. A multipurpose additive system comprising

(a) an alkali metal zeolite, an alkaline earth metal zeolite, zinc zeolite, or mixtures thereof;

(b) a dispersant, said dispersant being

(i) a saturated aliphatic compound containing at least six carbon atoms substituted with one or more polar functional groups sufficient to provide a polar group frequency factor of at least about 0.01; or

(ii) a polydimethylsiloxane compound containing from 4 to about 500 siloxane units, substituted with one or more polar functional groups sufficient to provide a polar group frequency factor of at least about 0.01, said polydimethylsiloxane compound having the following end groups:

R_3SiO

and/or

$R'R_2SiO$

wherein R is methyl or ethyl and

R' is a linear, branched, or cyclic alkyl having 3 to 100 carbon atoms; or

(iii) mixtures thereof in any proportions; and (c) optionally, zinc oxide.

5,204,403

MOISTURE PERMEABLE AND WATERPROOF COATED FABRIC AND METHOD FOR MANUFACTURING SAME

Tsunekatsu Furuta, Ohtsu; Ken'ichi Kamemaru, and Kiyoshi Nakagawa, both of Uji, all of Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Jul. 6, 1992, Ser. No. 909,157

Claims priority, application Japan, Jul. 15, 1991, 3-201310; Sep. 11, 1991, 3-260971; Feb. 6, 1992, 4-056899

Int. Cl.[5] C08L *75/04*

U.S. Cl. 324—493 **9 Claims**

1. A water-vapor permeable, waterproof coated fabric having a fibrous base fabric and a porous film formed by coating on one side of the base fabric, said porous film comprising:

a synthetic polymer composed mainly of a polyurethane resin, and a substantially non-porous, inorganic fine powder material having a mean particle diameter of not more than 0.1 μm which is contained in the synthetic polymer in a proportion of more than 1% by weight in terms of dry weight, said porous film having a resistance to water pressure of more than 0.6 kg/cm^2 and a water vapor transmission of more than 6000 g/m^2/24 hours.

5,204,404

WATERBASED ACRYLIC SILANE AND POLYURETHANE CONTAINING COATING COMPOSITION

Ervin R. Werner, Jr., Levittown, Pa., and Eileen E. Konsza, Swedesboro, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 326,724, Mar. 21, 1989, abandoned. This application Aug. 16, 1990, Ser. No. 568,488

Int. Cl.[5] C08K *3/20*

U.S. Cl. 524—501 **21 Claims**

1. A waterbased coating composition comprising about 10–30% by weight of film forming binder dispersed in an aqueous carrier and has a pH of about 7–10; wherein the binder consist essentially of about

a. 60–90% by weight, based on the weight of the binder, of an acrylic silane polymer consisting essentially of polymerized monomers of alkyl methacrylate, alkyl acrylate or mixtures thereof, 1–10% by weight based on the weight of the acrylic silane polymer, of silane containing alkyl acrylate or methacrylate, sufficient monoethylenically unsaturated acid to provide the polymer with an acid number of 2–100 and sufficient hydroxy alkyl acrylate or hydroxy alkyl methacrylate to provide the polymer with a hydroxyl number of about 5–100, a glass transition temperature of −40° to +25° C. and a weight average molecular weight of 500,000 to 3,000,000 and the acid groups of the polymer are reacted with ammonia or an amine;

b. 10–40% by weight, based on the weight of the binder, of the dispersed polyurethane selected from the group consisting of polyester urethane, polyether urethane or polyacrylourethane.

5,204,405

THERMOPLASTIC RESIN COMPOSITION AND METHOD FOR PREPARING THE SAME

Yuichi Orikasa, Yokohama, and Soehiro Sakazume, Fujisawa, both of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Nippon Oil & Fats Co., Ltd., Japan

Continuation of Ser. No. 432,925, Nov. 7, 1989. This application Apr. 11, 1991, Ser. No. 684,140

Claims priority, application Japan, Nov. 9, 1988, 63-283091

Int. Cl.[5] C08G *63/91;* **C08L** *81/04*

U.S. Cl. 525—64 **8 Claims**

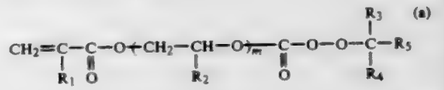
1. A thermoplastic resin composition prepared by blending

(I) 50 to 1% by weight based on the weight of components I and II of a polypropylene,

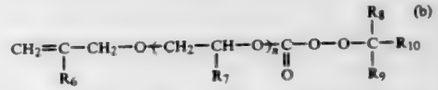
(II) 50 to 99% by weight based on the weight of components I and II of a polyarylene sulfide,

(III) 0.1 to 100 parts by weight, based on 100 parts by weight of the aforesaid components (I)+(II), of a compatibilizing agent which is a graft copolymer comprising 5 to 95% by weight of an olefin polymer or copolymer component selected from the group consisting of polypropylene, ethylene-glycidyl methacrylate copolymer and ethylene-ethylacrylate copolymer and 95 to 5% by weight of a vinyl polymer or copolymer component, different from said olefin polymer or copolymer component, obtained by polymerizing at least one vinyl monomer selected from the group consisting of vinyl aromatic monomers, vinyl ester monomers, and (meth)acrylonitrile monomer, one of said components being in the state of a dispersion phase having a particle diameter of 0.001 to 10 μm in the other of said components,

said graft copolymer prepared by melting a graft polymerization precursor obtained by copolymerizing at least one said vinyl monomer with at least one radical polymerizable organic peroxide represented by the following general formula (a) and (b)



(a)



(b)

wherein R_1 is a hydrogen atom or an alkyl group having 1 or 2 carbon atoms, each of R_2 and R_7 is a hydrogen atom or a methyl group, R_6 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, each of R_3, R_4, R_8, and R_9 is an alkyl group having 1 to 4 carbon atoms, each of

R_5 and R_{10} is an alkyl group having 1 to 12 carbon atoms,

5,204,407

PNEUMATIC TIRES

5,204,412

PHOTODEGRADABLE POLYMER COMPOSITION

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R_5 and R_{10} is an alkyl group having 1 to 12 carbon atoms, a phenyl group, an alkyl-substituted phenyl group or a cycloalkyl group having 3 to 12 carbon atoms, m is 0, 1 or 2, and n is 0, 1 or 2, in particles of said olefin polymer or copolymer selected from the group consisting of polypropylene, acrylate copolymer, and

(IV) 0 to 150 parts of inorganic filler based on 100 parts by weight of said components (I)+(II)+(III).

5,204,406

IMPACT-RESISTANT THERMOPLASTIC RESIN COMPOSITION

Seizo Fujii, and Yutaka Toyooka, both of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 553,026

Claims priority, application Japan, Jul. 3, 1989, 1-169832

Int. Cl.[5] C08L *25/12, 33/48, 33/20, 33/24*

U.S. Cl. 525—73 **7 Claims**

1. An impact-resistant thermoplastic resin composition comprising (a) a graft copolymer (II) prepared by polymerizing 10 to 1,000 parts by weight of a monomer or monomer mixture composed of 50 to 100% by weight of a monomer selected from the group consisting of methyl methacrylate and styrene and 50 to 0% by weight of a monofunctional or polyfunctional monomer copolymerizable therewith in the presence of 100 parts by weight (as solids) of a latex of an agglomerated rubber copolymer (I'), and (b) a heat-resistant rigid thermoplastic resin (III) comprising a member selected from the group consisting of a copolymer derived from 10 to 40% by weight of acrylonitrile, 90 to 60% by weight of α-methylstyrene, and 30 to 0% by weight of another monomer copolymerizable therewith and a copolymer derived from 5 to 40% by weight of a maleimide compound, 10 to 40% by weight of acrylonitrile, 85 to 30% by weight of at least one monomer selected from the group consisting of styrene and α-methylstyrene, and 30 to 0% by weight of another monomer copolymerizable therewith; the proportion of the graft copolymer (II) to the rigid thermoplastic resin (III) being such that the amount of the agglomerated rubber copolymer (I') is 1 to 70% by weight based on the total weight of the impact-resistant thermoplastic resin composition;

said agglomerated rubber copolymer (I') being prepared by the steps of:

emulsion-polymerizing a monomer mixture comprised of 51 to 99% by weight of an alkyl acrylate having 2 to 8 carbon atoms in the alkyl group, 49 to 1% by weight of 1,3-butadiene, and 10 to 0% by weight of at least one copolymerizable monomer selected from the group consisting of monofunctional monomers and polyfunctional monomers, to prepare a latex of a rubbery copolymer (I), and

agglomerating the rubbery copolymer (I) to an extent such that the average particle diameter of the agglomerated rubbery copolymer is 0.12 to 0.4 μm, by adding 0.1 to 5 parts by weight of an agglomerating agent to 100 parts by weight as solids of the latex of the rubbery copolymer (I); said agglomerating agent being selected from the group consisting of (A) an acid group-containing copolymer in a polymer latex formed by emulsion-polymerizing a monomer mixture comprised of 3 to 40% by weight of at least one unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, maleic acid, fumaric acid, cinnamic acid, sorbic acid and p-styrenesulfonic acid, 97 to 35% by weight of at least one alkyl acrylate having 1 to 12 carbon atoms in the alkyl group and 0 to 40% by weight of other monomer copolymerizable therewith.

5,204,407

PNEUMATIC TIRES

Mitsuru Araki, Hachioji, and Yoshiyuki Morimoto, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 10, 1991, Ser. No. 712,815

Claims priority, application Japan, Jun. 11, 1990, 2-149830; Jun. 11, 1990, 2-149831

Int. Cl.[5] C08F *4/08, 297/04;* **C08L** *9/00, 53/02*

U.S. Cl. 525—99 **11 Claims**

1. A pneumatic tire having a tread comprising a rubber composition,

wherein said rubber composition is produced by blending a rubber component with a styrene based thermoplastic elastomer,

said rubber component is composed essentially of a diene based rubber, and

said elastomer is internally crosslinked so that tensile stress at 100% elongation is increased to 10 to 1,000% of the styrene based thermoplastic elastomer which is not internally crosslinked.

5,204,408

MODIFIED SILICONE VULCANIZATION ACTIVATOR

Hiroki Konno, Annaka; Yasushi Yamamoto, Takasaki; Motoo Fukushima, Kawasaki, and Hironao Fujiki, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 497,680, Mar. 23, 1990, abandoned.

This application Oct. 25, 1991, Ser. No. 782,640

Claims priority, application Japan, Mar. 28, 1989, 1-77719

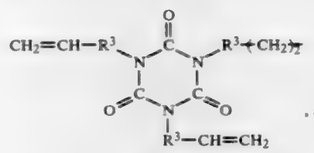
Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—105 **8 Claims**

1. A method of vulcanizing a rubber component with an organic peroxide in the presence of a vulcanization activator, wherein the rubber component contains a fluororubber, a mixture of a fluororubber and a silicone rubber, or a mixture of a fluororubber and a fluorosilicone rubber, the method comprising:

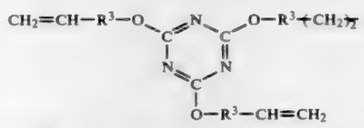
heating a mixture of the rubber component, the organic peroxide and the vulcanization activator in the presence of air to a temperature of 150° C. to 200° C. for about 10 to 30 minutes,

wherein the vulcanization activator is an organopolysiloxane comprising units selected from $[R^1{}_2SiO_{2/2}]$ or $[R^1{}_3SiO_4]$ wherein R^1 is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group having 1 to 21 carbon atoms, and wherein at least two R^1 substituents per molecule are replaced by an isocyanurate or a cyanurate substituent selected from the group consisting of:



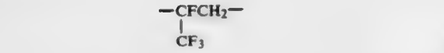
(1)

, and



(4)

wherein R^3 is a $—CH_2—$ group,



group, a $—(CF_2)_5—OCH_2—$ group, or a mixture thereof.

5,204,409

CROSSLINKING AGENTS FOR POLYMERIC ADHESIVES

Günter Arend, Dormagen; Otto Ganster, Odenthal; Rudolf Hombach, Leverkusen; Horst Müller-Albrecht, Cologne, and Knut Panskus, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 7, 1992, Ser. No. 832,262

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 4104436

Int. Cl.[5] C08L *75/04*

U.S. Cl. 525—123 **8 Claims**

1. A crosslinking agent for polymeric adhesives comprising a mixture of

A) 4,4',4''-triisocyanatotriphenyl methane and

B) trimerization products of 2,4-tolylene diisocyanate containing at least 50% by weight triisocyanatomonoisocyanurate and less than 1% by weight free tolylene diisocyanate.

5,204,410

METHOD FOR REMOVING VOLATILE SUBSTANCES FROM POLYPHENYLENE ETHER OR POLYPHENYLENE ETHER/STYRENE RESIN COMPOSITIONS

John P. Banevicius, Slingerlands; Alexandros Hasson, Delmar, and William E. Pecak, Cohoes, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

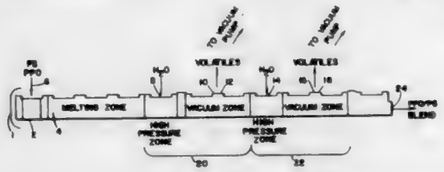
Division of Ser. No. 291,534, Dec. 29, 1988, Pat. No. 4,992,222.

This application Oct. 31, 1990, Ser. No. 606,415

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] C08L *71/12*

U.S. Cl. 525—132 **7 Claims**



1. A low odor polyphenylene ether or polyphenylene ether/polystyrene pellet which contains less than about 5 parts per million of 2,4,6-trimethylanisole, produced by a process which comprises extruding a composition which itself comprises:

a) a polyphenylene ether resin having sources of odoriferous amine content of greater than about 10,000 parts per million based on said resin; alone, or in combination with

b) a styrene resin;

said extrusion being carried out at a temperature above the melting point of the composition, in one pass in at least two stages, each stage comprising water injection followed by vacuum venting, the total amount of water being divided between said stages and comprising up to about 15% by weight of said composition;

and then shaping the low odor composition into a pellet.

5,204,411

Patent Not Issued For This Number

5,204,412

PHOTODEGRADABLE POLYMER COMPOSITION

Neil S. Davidson, Stirling, Scotland; Geoffrey Harrison, Hertfordshire, England, and Kenneth Wilkinson, Perthshire, Scotland, assignors to BP Chemicals Limited, London, England

Filed Oct. 31, 1990, Ser. No. 614,630

Claims priority, application United Kingdom, Apr. 13, 1989, 8908342

Int. Cl.[5] C08G *67/02*

U.S. Cl. 525—185 **6 Claims**

1. A photodegradable polymer composition comprising 50 to 99 weight percent based on the total weight of photodegradable polymer composition of a thermoplastic addition polymer and 1 to 50 weight percent based on the total weight of the photodegradable polymer composition of a photodegrading agent, said photodegrading agent being a polyketone which is a linear copolymer consisting of units of $—CO(C_2H_4)—$ and units $—CO(B')—$ where B' is derived from olefinically unsaturated hydrocarbon selected from the group consisting of $CHR_4{=}CHR_5$ (I) and $CH_2{=}C(R_6)(CHR_7R_8)$ (II), wherein R_4 is a hydrocarbyl group, R_5 is hydrogen or a hydrocarbyl group, R_6 is a hydrocarbyl group, and R_7 and R_8 are individually hydrogen or hydrocarbyl groups.

5,204,413

PROCESS FRO PRODUCING RESIN FOR A TONER

Ryo Funato, Nagoya; Syuji Takahiro, Kasugai; Keiji Yoshida, Nagoya; Shinji Kubo, Nagoya, and Motoshi Inagaki, Nagoya, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Division of Ser. No. 384,799, Jul. 25, 1989, Pat. No. 5,071,918.

This application Mar. 27, 1991, Ser. No. 676,072

Claims priority, application Japan, Aug. 10, 1988, 63-199319

Int. Cl.[5] C08F *4/36, 257/02, 265/06;* **G03G** *9/08*

U.S. Cl. 525—273 **6 Claims**

1. A resin for dry type toner, consisting essentially of a high molecular weight polymer having a weight average molecular weight of greater than about 350,000 and obtained from at least one monomer having a polymerizable vinyl group using a compound having at least three t-butyl peroxy groups per molecule as initiator, and a low molecular weight polymer prepared in the presence of said high molecular weight polymer, and having a softening temperature (Ts) of about 110° C. to 170° C. and a glass transition point (Tg) of about 40° C. to 63.5° C.

5,204,414

SALTS OF POLYALKYL VINYL ETHER MALEIC ANHYDRIDE AND DENTAL PROSTHESIS ADHESIVE PRODUCED THEREFROM

Zvi Pelah, Savyon, Israel; Ernst Urmann, Ludwigshafen, and Werner Kopp, Harthausen, both of Fed. Rep. of Germany, assignors to Giulini Chemie GmbH, Ludwigshafen, Fed. Rep. of Germany

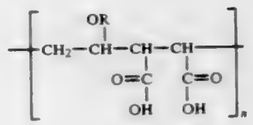
Filed Jul. 5, 1990, Ser. No. 548,376

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922170

Int. Cl.[5] C08F *8/44, 20/08, 20/66, 222/02*

U.S. Cl. 525—327.8 **8 Claims**

1. In a dental prosthesis adhesive the improvement comprising a mixed partially neutralized salt of alkyl vinyl ether/-maleic anhydride copolymers including the following structural unit



where R represents an alkyl radical having 1 to 4 carbon

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polymer (b) comprising recurring moieties derived from (i) diphenol, (ii) at least one nonvicinal benzene dicarboxylate

bonded to each other via a lower alkylene group, Me represents zirconium, $k \geq 1$, and $k+l+m+n=4$,

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where R represents an alkyl radical having 1 to 4 carbon atoms, 30 to 95% of the carboxyl groups are neutralized with aluminum, and at least one of calcium and sodium, the pH of the salts is between about 6.5 and 7.5 and n is an integer greater than zero, and n is selected so that the specific viscosity of the corresponding anhydride is between about 2.6 and 3.5 and the Al:Ca ratio is between about 1:1 and 1:4.

5,204,415

POLYMERS PREPARED FROM DIPROPARGYL ETHER OF ALPHA, ALPHA'-BIS (4-HYDROXYPHENYL)-PARA-DIISOPROPYLBENZENE

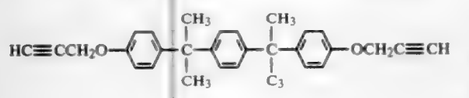
Anthony M. Pigneri, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 606,416, Oct. 31, 1990, Pat. No. 5,096,987, which is a division of Ser. No. 386,079, Jul. 28, 1989, Pat. No. 4,987,272. This application Nov. 26, 1991, Ser. No. 797,839

Int. Cl.[5] C08F *38/00*

U.S. Cl. 525—328.1 **8 Claims**

1. A polymeric composition which is the product of catalytic addition polymerization of a monomer of the formula



5,204,416

CROSSLINKED FLUORINATED POLY(ARYLENE ETHER)

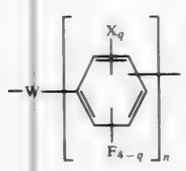
Frank W. Mercer, Belmont, and Richard C. Sovish, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 583,899, Sep. 17, 1990, Pat. No. 5,115,082, which is a continuation-in-part of Ser. No. 510,386, Apr. 17, 1990, abandoned, and a continuation-in-part of Ser. No. 510,353, Apr. 17, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 864,804

Int. Cl.[5] C08G *65/48*

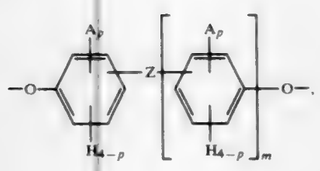
U.S. Cl. 525—390 **6 Claims**

1. A crosslinked, fluorinated poly(arylene ether) produced by heating in air at a temperature between about 300° and about 400° C. a fluorinated poly(arylene ether) comprising a repeat unit of the structure



wherein

—W— is



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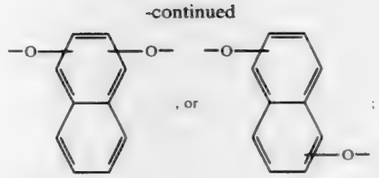
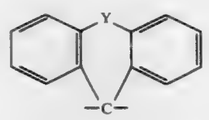


wherein independently each —A is $—CH_2CH=CH_2$ or —A is —F, —Cl, —Br, $—CF_3$, $—CH_3$, or $—C_6H_5$; p is 0, 1, or 2; —Z— is $—C(CH_3)_2—$, $—C(CF_3)_2—$, —O—, —S—, $—SO_2—$, —CO—, $—P(C_6H_5)—$, $C(CH_3)(C_6H_5)$, $—C(C_6H_5)_2—$, $—(CF_2)_{1-6}—$, or



wherein —Y— is —O— or —Y— is a direct bond; and m is 0, 1, or 2;

independently each —X is $—CH_2CH=CH_2$ or X is —H, —Cl, —Br, $—CF_3$, $—CH_3$, or $—C_6H_5$; q is 0, 1, or 2; and n is 1 or 2; provided that when —Z— is $—C(CH_3)_2—$, —S—, or $—SO_2—$ and m is 1, then p and q are not both 0.

5,204,417

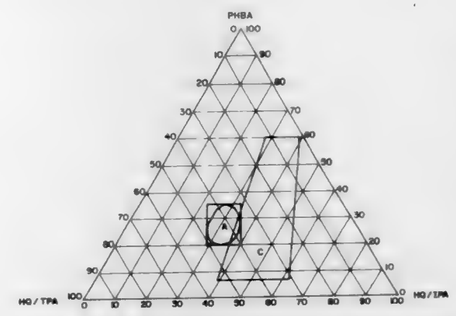
HIGH STRENGTH POLYMERS AND BLENDS OF HYDROQUINONE POLY(ISO-TEREPHTHALATES) CONTAINING RESIDUES OF P-HYDROXYBENZOIC ACID

Brian A. Stern, Evans, Ga.; Markus Matzner, Edison, N.J.; Richard Layton, Augusta, Ga.; Paul J. Huspeni, North Augusta, S.C.; Paul D. Frayer, Martinez, Ga., and James W. Cleary, Neenah, Wis., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 499,483, Jun. 4, 1990, Pat. No. 5,147,967, which is a continuation-in-part of Ser. No. 255,670, Oct. 11, 1988, abandoned, and a continuation-in-part of Ser. No. 255,632, Oct. 11, 1988, abandoned. This application Aug. 13, 1992, Ser. No. 929,667

Int. Cl.[5] C08G *63/02, 63/00*

U.S. Cl. 525—444 **9 Claims**



1. A Fully aromatic polyester blend comprising 1 to 19 parts by weight of a polyester polymer (a) consisting essentially of recurring moieties derived from (i) hydroquinone, (ii) at least one nonvicinal benzene dicarboxylate selected from the group consisting of isophthalic acid and terephthalic acid, and (iii) parahydroxybenzoic acid; to 1 part by weight of a polyester

polymer (b) comprising recurring moieties derived from (i) diphenol, (ii) at least one nonvicinal benzene dicarboxylate selected from the group consisting of isophthalic acid and terephthalic acid and (iii) parahydroxybenzoic acid; said polyester polymer (a) having a melting point in the range of about 250° to about 360° C., a heat distortion temperature of about 240° C. under a load of 264 psi and wherein the molar amounts of said recurring moities in polyester polymer (a) are such that the composition of said polyester (a) falls approximately within area C of the triangular diagram of FIG. 1.

5,204,418

LIGHT-WEIGHT POLYESTER FILM AND PROCESS FOR ITS PRODUCTION

Kenji Yasue; Eiji Y. Yamamoto; Katsuyuki Tona; Minoru Kishida, and Yoshiaki Kozuka, all of Uji, Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Jan. 30, 1992, Ser. No. 828,146

Claims priority, application Japan, Jan. 31, 1991, 3-032238

Int. Cl.[5] C08F *20/00*

U.S. Cl. 525—445 **10 Claims**

1. A light-weight polyester film which comprises (A) from 50 to 95% by weight of a crystalline polyester resin and (B) from 5 to 50% by weight of a maleimide copolymer, said maleimide copolymer being dispersed in the film in the form of particles having diameters of from 0.1 to 20 μm and fine voids being present in the film, and which has an apparent specific gravity of from 0.3 to 1.1, wherein said maleimide copolymer comprises from 30 to 50 mol % of a maleimide monomer group, from 30 to 70 mol % of an aromatic vinyl monomer group, from 0 to 40 mol % of an unsaturated dicarboxylic anhydride monomer group and from 0 to 50 mol % of other copolymerizable monomer group, and said maleimide copolymer has a glass transition temperature higher by at least 10° C. than the crystalline polyester resin.

5,204,419

PROCESS FOR POLYMERIZING OLEFINS

Toshiyuki Tsutsui, Ohtake; Akinori Toyota, and Norio Kashiwa, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00898, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/03932, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 19, 1987, Ser. No. 231,854

Claims priority, application Japan, Nov. 20, 1986, 61-275191

Int. Cl.[5] C08F *4/642, 10/00*

U.S. Cl. 526—153 **18 Claims**

1. A process for polymerizing olefins comprising polymerizing or copolymerizing olefins in the presence of a catalyst composed of

(A) a compound of a transition metal of the formula

$$R^1_kR_lR^3_mR^4_nMe$$

wherein R^1 represents a cycloalkadienyl groups, R^2, R^3 and R^4 are identical or different and each represents a cycloalkadienyl group, an aryl group, an alkyl group, an aralkyl group, a halogen atom or a hydrogen atom or a compound of the above formula wherein R^1 and one of R^2, R^3 or R^4 are indenyl, substituted indenyl or partially hydrogenated indenyl in which said indenyl groups are bonded to each other via a lower alkylene group, Me represents zirconium, $k \geq 1$, and $k+l+m+n=4$,

(B) an aluminoxane produced from trimethylaluminum, and

(C) an aluminoxane wherein at least on e hydrocarbon group other than n-alkyl groups is bonded to an aluminum atom, said hydrocarbon group being selected from the class consisting of branched alkyl groups, cycloalkyl groups and aryl groups.

5,204,420

GRIGNARD REAGENT AS ACTIVATOR FOR POLYMERIZATION OF DICYCLOPENTADIENE

Tim J. Coffy, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 23, 1991, Ser. No. 814,987

Int. Cl.[5] C08F *4/50*; C08G *61/08*

U.S. Cl. 526—162 **5 Claims**

1. In a process for polymerizing a polycyclic cycloolefin wherein a plurality of liquid streams, at least one of which contains a polycyclic cycloolefin and a metathesis polymerization catalyst and at least one of which contains a metathesis polymerization catalyst activator are brought together and immediately injected into a mold where polymerization and molding take place simultaneously, the improvement comprising using as the activator a Grignard reagent having the formula RMgX where R is a cycloalkyl or cycloalkenyl group and X is Cl, Br or I.

5,204,421

PROCESS FOR PREPARING VINYL CHLORIDE POLYMER IMPROVED IN PLASTICIZER TAKE-UP BY TWO-STAGE ADDITION OF DISPERSION STABILIZERS

Tadashi Amano, Kawasaki, and Shigehiro Hoshida, Kamisu, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,825

Claims priority, application Japan, Aug. 1, 1989, 1-199844

Int. Cl.[5] C08F *2/20*

U.S. Cl. 526—200 **3 Claims**

1. A process for preparing a vinyl chloride polymer, which comprises the steps of initiating suspension polymerization by suspending a monomer comprising vinyl chloride monomer and an oil-soluble polymerization initiator in the presence of a first dispersion stabilizer in an aqueous medium, and adding a second dispersion stabilizer in the polymerization system after initiation of the suspension polymerization, wherein said first dispersion stabilizer comprises (A) a partially saponified polyvinyl alcohol with an average polymerization degree of 1,500 to 2,700 and a saponification degree of 75 to 85 mol% and (B) a hydroxylpropylmethyl cellulose with a methoxy substitution degree of 26 to 30% by weight, a hydroxypropoxy substitution degree of 4 to 15% by weight and a viscosity in 2% aqueous solution at 20° C. of 5 to 4,000 cP, and said second dispersion stabilizer comprises (C) a partially saponified polyvinyl alcohol with an average polymerization degree of 150 to 600 and a saponification degree of 20 to 55 mol%, said second dispersion stabilizer being added into the polymerization system after initiation of polymerization at the time when the polymerization conversion has reached 5% to 50%, wherein the partially saponified polyvinyl alcohol (A) is added in an amount of 0.02 to 0.08 part by weight per 100 parts by weight of the charged monomer, wherein the hydroxypropyl methylcellulose (B) is added in an amount of 0.02 to 0.08 parts by weight per 100 parts by weight of the charged monomer, and wherein the partially saponified polyvinyl alcohol (C) is added in an amount of 0.01 to 1 part by weight per 100 parts by weight of the charged monomer.

5,204,422

bamoyl, alkylcarbamoyl of 2 to 13 carbon atoms, cy-

5,204,424

least 2, said acid containing on average one phosphonic acid

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5,204,422

PEROXIDE FREE RADICAL INITIATORS CONTAINING HINDERED AMINE MOIETIES WITH LOW BASICITY

Raymond Seltzer, New City; Roland A. E. Winter, Armonk, both of N.Y., and Peter J. Schirmann, Fairfield, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

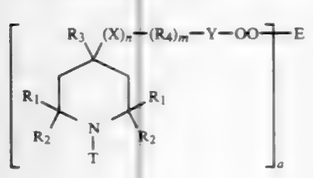
Division of Ser. No. 731,588, Jul. 17, 1991, Pat. No. 5,140,081, which is a division of Ser. No. 479,910, Feb. 14, 1990, Pat. No. 5,051,511, which is a continuation-in-part of Ser. No. 326,353, Mar. 21, 1989, abandoned. This application Apr. 6, 1992, Ser. No. 863,618

Int. Cl.[5] C08F *25/00*

U.S. Cl. 526—204 8 Claims

1. A process of preparing a homo- or copolymer containing a hindered amine light stabilizer moiety chemically bonded to the backbone of said polymer which process comprises

polymerizing one or more ethylenically unsaturated monomers capable of being polymerized by free radicals in the presence of an effective initiating amount of a compound which is a free radical initiator which also contains a hindered amine light stabilizing moiety having low basicity, which compound has formula I



(I)

a is 1 or 2,

n and m are independently 0 and 1,

R_1 and R_2 are independently alkyl of 1 to 4 carbon atoms, or R_1 and R_2 together are pentamethylene,

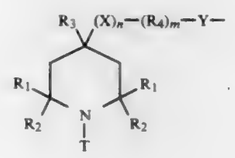
R_3 is hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, alkoxy of 1 to 8 carbon atoms, alkoxycarbonyl of 2 to 7 carbon atoms, aryl of 6 to 10 carbon atoms, aralkyl of 7 to 15 carbon atoms, alkanoyl of 1 to 8 carbon atoms, aroyl of 7 to 16 carbon atoms, alkanoyloxy of 1 to 7 carbon atoms, or aroyloxy of 6 to 10 carbon atoms, or R_3 together with R_4 form a cyclic structure of 5 to 7 atoms,

X is —O—, —S—, —NG—, —CO—, —SO—, —SO_2—, —OCO—, —OSO—, —OSO_2—, —NG—CO—, —NHCONH— or —OCO—O— where G is hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, alkanoyl of 1 to 8 carbon atoms or G and R_4 together form a cyclic structure of 5 to 7 carbon atoms,

R_4 is a diradical which is alkylene of 1 to 20 carbon atoms, arylene of 6 to 10 carbon atoms, cycloalkylene of 3 to 10 carbon atoms, aralkylene of 7 to 20 carbon atoms, alkynylene of 2 to 10 carbon atoms, alkadiynylene of 4 to 10 carbon atoms, alkenylene of 3 to 11 carbon atoms, alkadienylene of 5 to 11 carbon atoms, or said diradical interrupted by one or more oxygen, sulfur or nitrogen atoms,

Y is —CO—, —SO_2—, —CR_5R_6—, —OCOE—, —NG—CO—E— or —OCO—CO, where R_5 and R_6 are independently alkyl of 1 to 10 carbon atoms, aryl of 6 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, alkenyl of 2 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms, or R_5 and R_6 together are alkylene of 4 to 9 carbon atoms, and when E is tert-alkyl, tert-cycloalkyl or tert-aralkyl, R_6 is also —O—O—E,

E, when a is 1, is hydrogen, alkanoyl of 2 to 20 carbon atoms, aroyl of 7 to 20 carbon atoms, tert-alkyl of 4 to 12 carbon atoms, tert-cycloalkyl of 4 to 12 carbon atoms, tert-aralkyl of 9 to 15 carbon atoms, alkoxycarbonyl of 2 to 20 carbon atoms, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2 to 13 carbon atoms, cycloalkylcarbamoyl of 4 to 13 carbon atoms, alpha-hydroxyalkyl of 2 to 10 carbon atoms, alpha-hydroxycycloalkyl of 3 to 10 carbon atoms, alkylsulfonyl of 4 to 20 carbon atoms, cycloalkylsulfonyl of 3 to 12 carbon atoms, tert-alkoxyalkyl of 4 to 20 carbon atoms, tert-alkoxycycloalkyl of 4 to 20 carbon atoms, monovalent organometal, or the radical of formula II



(II)

E, when a is 2, is di-tert-alkylene of 7 to 15 carbon atoms, di-tert-alkenylene of 8 to 16 carbon atoms, di-tert-alkynylene of 8 to 16 carbon atoms, di-tert-aralkylene of 12 to 20 carbon atoms, alkanedioyl of 3 to 12 carbon atoms, aryldicarbonyl of 8 to 16 carbon atoms or aralkyldicarbonyl of 9 to 18 carbon atoms, and

T is formyl, —O—T_1 or —OCO—T_2, where

T_1 is alkyl of 1 to 36 carbon atoms, alkenyl of 2 to 18 carbon atoms, alkynyl of 2 to 18 carbon atoms, aralkyl of 7 to 15 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, a radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms, or aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl, and

T_2 is alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, phenyl or said phenyl substituted by hydroxy, alkyl or alkoxy; or amino or said amino mono- or disubstituted by alkyl or phenyl.

5,204,423

PROCESS FOR THE PREPARATION OF POLYTHIOPHENES BY USE OF FERRIC SALTS AND ALKYL HALIDES

Claude Franquinet, Brussels; Etienne Hannecart, Tervuren, and Elise Destryker, Sint-Pieters-Leeuw, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 364,227, Jun. 12, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 718,966

Claims priority, application France, Jun. 13, 1988, 88 07976

Int. Cl.[5] C08F *128/06*

U.S. Cl. 526—256 8 Claims

1. A process for the preparation of a polymer which is electrically conductive and which is based on polythiophene, the process comprising:

polymerizing thiophene in a reaction medium comprised of: thiophene,

from 2.5 to 20 moles of an anhydrous ferric salt per mole of thiophene,

from 0.04 to 1 liter of an alkyl halide per gram of thiophene, and

from 0.1 to 5% by weight of water introduced into the reaction medium based on the amount of alkyl halide.

5,204,424

CONDUCTIVE POLYMERS DERIVED FROM AROMATIC HETEROCYCLIC COMPOUNDS SUBSTITUTED BY AN ETHER-TYPE GROUP

Jean Roncali, Les Lilas; Robert Garreau, Sarcelles; Didier Delabouglise, Rouen; Marc Lemaire, Nanterre; Francis Garnier, Champigny, all of France, and Etienne Hannecart, Tervueren, Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Dec. 6, 1988, Ser. No. 280,411

Claims priority, application France, Dec. 7, 1987, 87 17117; Sep. 1, 1988, 88 11572

Int. Cl.[5] C08F *128/06*

U.S. Cl. 526—256 2 Claims

1. An electrically conductive polymer containing repeat units derived from 3-(3',6'-dioxaheptyl) thiophene prepared by electrochemical polymerization by an anodic oxidation in a polar solvent in the presence of an electrolyte.

5,204,425

POLYALICYCLIC POLYACRYLIC ACID ESTER DERIVATIVES

Kenichi Sekimoto, Machido; Noriaki Oshima, Ebina; Yousuke Takahashi, and Toru Seita, both of Atsugi, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

PCT No. PCT/JP89/01048, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/03987, PCT Pub. Date Apr. 19, 1990

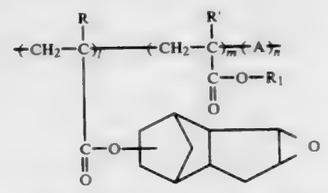
PCT Filed Oct. 12, 1989, Ser. No. 460,114

Claims priority, application Japan, Oct. 12, 1988, 63-254858; Mar. 15, 1989, 1-60693; Jul. 5, 1989, 1-171877

Int. Cl.[5] C08F *24/00*

U.S. Cl. 526—268 10 Claims

1. A polyacrylic acid ester derivative having repeating units represented by the formula:



wherein R and R' independently represent a hydrogen atom or a methyl group, R_1 represents a C_1–C_4 linear or branched alkyl group, A represents a structural unit derived from a group copolymerizable with an acrylic acid ester, and l, m and n are, respectively, from 0.04 to 1.0, from 0 to 0.9and from to 0.5 in this order, provided that their sum is 1, and when m is not higher than 0.2, n is a number of not higher than 0.01 and having a molecular weight of from about 5,000 to about 1,000,000.

5,204,426

COMMAND-CURABLE COMPOSITION

John Ellis, East Molesey, and Alan D. Wilson, Liphook, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 510,221, Apr. 18, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 784,083

Claims priority, application United Kingdom, Apr. 27, 1989, 8909614

Int. Cl.[5] C08F *30/02*; C08L *43/02*

U.S. Cl. 526—278 13 Claims

1. A command-curable composition, comprising an unsaturated phosphonate ester, being equivalent to the reaction product between an unsaturated phosphonic acid and a polyhydric alcohol in the mole ratio of (0.2–2.0) phosphonic acid groups: 1 hydroxyl groups, an initiator, and a cross-linkable polymeric acid capable of being gelled by cations with a valency of at least 2, said acid containing on average one phosphonic acid group per one to three backbone carbon atoms.

5,204,427

METHOD OF MAKING RING-OPENED POLYNORBORNENE POLYMERS USING POT LIFE EXTENDING AGENTS

Masao Torii, Kurashiki; Tomoo Sugawara, Kawasaki; Kin-ichi Okumura, Kamakura, and Motoyuki Yamato, Kanagawa, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

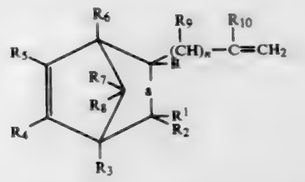
Continuation-in-part of Ser. No. 606,810, Oct. 31, 1990, abandoned. This application May 24, 1991, Ser. No. 708,079

Claims priority, application Japan, Nov. 1, 1989, 1-285555; Nov. 1, 1989, 1-285556

Int. Cl.[5] C08G *61/08*

U.S. Cl. 526—282 45 Claims

1. A method for extending the pot life of a bulk polymerizable reaction solution comprising adding an effective amount of a pot life adjusting agent of the formula:



wherein R, R_1, and R_2 independently represent hydrogen, C_1 to C_6 alkyl and the monomethyl, monochloro and dichloro substituents thereof, C_2 to C_6 alkenyl and the monomethyl, monochloro and dichloro substituents thereof; R_3, R_4, R_5, R_6, R_7 and R_8 independently represent hydrogen, a methyl group or a halogen atom; R_9 and R_{10} independently represent hydrogen or C_1 to C_6 alkyl; n is 0 to 4; and "a" represents a single or double bond with the proviso that when "a" is a double bond, R and R_1 are not present; to a reactive solution comprising at least one norbornene monomer having 3 or more rings in its backbone, tricylcopentadiene, a molybdenum metathesis catalyst and a cocatalyst.

5,204,428

COPOLYMER AND METHOD OF PRODUCING THE SAME

Shiro Kobayashi, 1-302 Kawauchi Zyutaku Daiichi Chiku, Kawauchi, Aoba-ku, Sendai-shi, Miyagi-ken; Yoshihiro Taguchi, Miyagi, and Hiroshi Uyama, Tagazyou, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo and Shiro Kobayashi, Miyagi, both of Japan

Continuation of Ser. No. 551,964, Jul. 12, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 809,224

Claims priority, application Japan, Aug. 17, 1989, 1-211689

Int. Cl.[5] C08F *220/50*, *220/36*, *216/14*

U.S. Cl. 526—298 14 Claims

1. A binary copolymer produced by free radical polymerization of a vinyl ether monomer having a first electron-accepting group and an acrylate monomer having a second electron group wherein

one of said first and second electron-accepting groups is selected from the group consisting of cyanoalkyl and cyanoalkyloxyalkyl groups,

while the other of said first and second electron-accepting groups is selected form the group consisting of cyanoalkyl, cyanoalkyloxyalkyl and haloalkyl groups.

5,204,429

PROCESS FOR THE PREPARATION OF AN OLEFIN

5,204,432

SILICONE RESIN FINE POWDER CONTAINING QUATERNARY AMMONIUM GROUP

R^3 is a divalent alkylene group with 2 to 11 carbon atoms,

z is 0 or 1

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5,204,429

PROCESS FOR THE PREPARATION OF AN OLEFIN POLYMER

Walter Kaminsky, Pinneberg, and Regina Spiehl, Hamburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,543

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726325

Int. Cl.[5] C08F 32/04, 4/642

U.S. Cl. 526—308 4 Claims

1. A homopolymer or copolymer containing 80 to 100 mol-% repeating cyclic units derived from a cycloolefin monomer, the balance of up to 20 mol-% of the repeating units, in the case of a copolymer, being derived from at least one linear monomer selected from the group consisting a C_2—to C_{28}—1—olefin and a C_4—to C_{28}—diolefin, said copolymer having a polydispersity, M_w/M_n ranging in value from 2.9 to 6.0.

5,204,430

LIQUID POLYMERIZABLE COMPOSITION FOR THE PRODUCTION OF HIGH REFRACTIVE INDEX OPTICAL ARTICLES

Fiorenzo Renzi, Gorgonzola; Franco Rivetti, Schio; Ugo Romano, Vimercate; Claudio Gagliardi, San Donato Milanese, and Umberto Sgambato, Milan, all of Italy, assignors to Enichem Synthesis, S.p.A., Polermo, Italy

Continuation of Ser. No. 416,069, Oct. 2, 1989, abandoned, which is a continuation of Ser. No. 168,162, Mar. 15, 1988, abandoned. This application May 14, 1991, Ser. No. 702,153

Claims priority, application Italy, Mar. 16, 1987, 19713 A/87

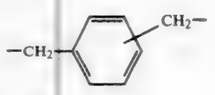
Int. Cl.[5] C08F 18/24

U.S. Cl. 526—314 11 Claims

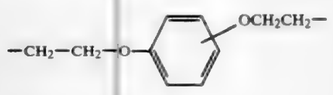
1. A liquid, polymerizable composition for the production of optical articles having a high refractive index consisting of:

(A) 30 to 65% by weight and in at least essentially monomeric form of either:

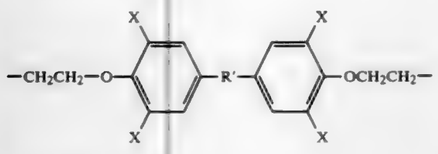
(i) the product of transesterification of diallyl-carbonate with an aromatic diol containing aromatic groups selected from the group consisting of:



either meta or para, and



either meta or para,



with R' being a radical selected from the group consisting of $-CH_2-$,

and —O—; with X being selected from the group consisting of H, Cl, and Br, in a mutual molar ratio of 12/1 or

(ii) a diallyl ester of a halogenated bicarboxy aromatic acid selected from the group consisting of diallyl-tetra-chlorophthalate and diallyl-tetrabromo-phthalate;

(B) 15 to 65% by weight and in at least essentially monomeric form of a reactive and non-halogenated monomer selected from the group consisting of diallyl orthophthalate, diallyl isophthalate, diallyl terephthalate, triallyl cyanurate, and triallyl isocyanurated; and

(C) 5 to 40% by weight and in at least a trimer or higher oligomeric form of the product of transesterification of diallyl carbonate with diethylene glycol in a molar ratio of 2/1.

5,204,431

POLYCARBOSILANES CONTAINING A HETERO ELEMENT

Peter Sartori, Rheinberg; Wolfgang Habel, Duesseldorf; Christopher Nover, Gladbeck; Baudouin van Aefferden, Duisburg; Lutz Mayer, Duisburg, and Thomas Adrian, Duisburg, all of Fed. Rep. of Germany, assignors to Solvay Deutschland, GmbH, Hanover, Fed. Rep. of Germany

Filed Jan. 21, 1992, Ser. No. 822,730

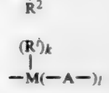
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102315

Int. Cl.[5] C08G 79/08

U.S. Cl. 528—4 19 Claims

1. A polycarbosilane containing a hetero element and composed of structural units corresponding to the formulas I and II

(I)



(II)

wherein

R^1 represents hydrogen, alkyl, cycloalkyl, arylalkyl or aryl, whereby R^1 may have different meanings in various units of the same polycarbosilane;

R^2 represents alkyl, cycloalkyl, arylalkyl or aryl, whereby R^2 may have different meanings in various units of the same polycarbosilane;

A represents a straight-chain or branched alkylene group or an arylene group, whereby A may have different meanings in various units of the same polycarbosilane;

M represents a hetero element having a formal valence m =2, 3, 4 or 5 selected from the group consisting of B, Al, Ga, Ge, Sn, Pb, P, As, Sb, Se, Te, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Ni, Pd and Pt;

(R^f) represents identical or different groups selected from the group consisting of alkyl, phenyl, cyclopentadienyl and cyclooctadienyl;

k represents a number 0, 1, 2 or 3; and

l represents the number of groups A having the above meaning bonded to the hetero element M in the structural unit of the formula II, and has the value 1, 2, 3 or 4;

with the proviso that m=k+l+1.

5,204,432

SILICONE RESIN FINE POWDER CONTAINING QUATERNARY AMMONIUM GROUP

Kenji Saito, and Hiroshi Kimura, both of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

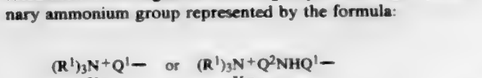
Filed Apr. 19, 1989, Ser. No. 340,354

Claims priority, application Japan, Apr. 19, 1988, 63-94547

Int. Cl.[5] C08G 77/26

U.S. Cl. 528—10 4 Claims

1. A silicone resin fine powder comprising units represented by $RSiO_{3/2}$, wherein from 1 to 50 mole % of the groups represented by R in the molecule of said silicone resin are a substituted monvalent organofunctional group containing a quaternary ammonium group represented by the formula:



wherein R^1 represents an alkyl group, Q^1 represent an alkylene group having 3 to 6 carbon atoms, Q^2 represents an alkylene group having 2 to 4 carbon atoms, and X— represents anion and the remainder of the groups represented by R in the molecule of said silicone resin are methyl.

5,204,433

USE OF EPOXYPOLYSILOXANES MODIFIED WITH OXYALKYLENE ETHER GROUPS AS A CURABLE COATING AGENT

Dieter Wewers, Bottrop; Christian Weitemeyer, Essen, and Jürgen Jachmann, Herne, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jul. 15, 1991, Ser. No. 730,279

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023247

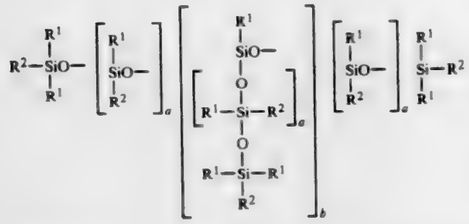
Int. Cl.[5] C08G 77/06

U.S. Cl. 528—12 7 Claims

1. A curable preparation comprising

(a) between about 90.00 to 99.99% by weight of a curable organopolysiloxane with epoxy groups and

(b) between about 0.01 to 10% by weight of a curing agent capable of curing epoxy groups, wherein the organopolysiloxane has the average formula



wherein

R^1 is the same or different in the molecule and represents an alkyl group with 1 to 4 carbon atoms, with the proviso that at least 90% of the R^1 groups are methyl groups

R^2 is selected from

(a) an alkyl group with 1 to 20 carbon atoms, an aryl group or aralkyl group,

(b) an epoxy group linked by way of an Si—C bond to a silicon atom of the organopolysiloxane, or

(c) a group of the formula

$$(-O-((C_nH_{2n}O-)_x)_y)_z)R^3-O-((C_nH_{2n}O-)_x)_yH$$

wherein

R^3 is a divalent alkylene group with 2 to 11 carbon atoms,

z is 0 or 1

y is 0 or 1

z+y is 1 or 2

n has an average value of 2 to 3 in the average molecule, the absolute value of n being 2, 3 or 4 and

x has a value of 1 to 200,

a has a value of 1 to 1,000 and

b has a value of 0 to 10,

with the proviso that at least one R^2 group is selected from b) and at least one R^2 is selected from c) in the average organopolysiloxane molecule.

5,204,434

POLYCARBOSILANES AND PROCESS FOR PREPARING THEM

Peter Sartori, Rheinberg; Wolfgang Habel, Duesseldorf, and Heinz-Peter Judenau, Krefeld, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

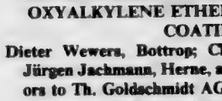
Filed Jun. 4, 1991, Ser. No. 709,571

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 4018374

Int. Cl.[5] C08G 77/106

U.S. Cl. 528—14 18 Claims

1. A polycarbosilane composed of structural units corresponding to the formula I:



(I)

wherein

R^1 represents hydrogen, alkyl, cycloalkyl, aryl, arylalkyl or halogen, whereby R^1 may have different meanings in various units of one and the same polycarbosilane;

R^2 represents alkyl, cycloalkyl, aryl, arylalkyl, or halogen, whereby R^2 may have different meanings in various units of one and the same polycarbosilane;

R^3 represents fluorine or phenyl, whereby R^3 may have different meanings in various units of one and the same polycarbosilane;

R^4 represents hydrogen, fluorine, or phenyl, whereby R^4 may have different meanings in various units of one and the same polycarbosilane,

n represents the numeral 1 if R^3 and/or R^4 represents phenyl, and n represents an integer from 1 to 6 if R^3 represents fluorine and R^4 represents hydrogen or fluorine, whereby n may have different meanings in various units of one and the same polycarbosilane, and

p represents an integer from n to 2n − 1, whereby p may have different meanings in various units of one and the same polycarbosilane.

5,204,435

OPTICAL FIBERS AND CORE-FORMING COMPOSITIONS

Shohei Kozakai, Annaka; Yoshinori Hida, Kawasaki; Hideki Asano, Mito, and Tomiya Abe, Hitachi, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Oct. 29, 1990, Ser. No. 604,526

Claims priority, application Japan, Oct. 30, 1989, 1-282751; Oct. 30, 1989, 1-282752

Int. Cl.[5] C08G 77/06

U.S. Cl. 528—15 26 Claims

1. A composition for forming an optical fiber core in which light is transmitted, comprising

(a) an organopolysiloxane having a unit of the formula:

$$RSiO_{3/2} \quad (I)$$

5,204,438

SILICONE MACROMERS AND THERMOPLASTIC

(ii) 50 to 95 equivalent percent, based on the total equiva-

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POLYETHER POLYMERS DERIVED FROM

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wherein R is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 10 carbon atoms in the molecule thereof and having at least 0.05 alkenyl groups each directly attached to a silicon atom per silicon atom, in a proportion of 30 to 80 mol %,

(b) an organopolysiloxane having at least 2 hydrogen atoms each directly attached to a silicon atom per molecule, and

(c) a platinum catalyst,

said composition having the capability of being cured into a cured product having a hardness of at least 30 in Shore D hardness scale.

5,204,436

CURABLE SILICONE COMPOSITION AND ITS CURED PRODUCT

Hirofumi Kishita, Annaka; Kouichi Yamaguchi, Takasaki; Kouji Takano, Annaka, and Shuji Suganuma, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,857

Claims priority, application Japan, Aug. 3, 1990, 2-206529

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **11 Claims**

1. A curable silicone composition comprising:

(A) An alkenyl group-containing organopolysiloxane containing at least two silicon-bonded alkenyl groups and at least one silicon-bonded fluorine-containing substituent having the general formula (1):

Rf—O—Y— (1)

wherein Rf is a perfluoroalkenyl group having 5 to 10 carbon atoms, and Y represents a divalent organic group selected from the group consisting of alkylene groups, arylene groups and alkylene-arylene groups, the total amount of said fluorine-containing substituent being 0.5 mol % or more based on all of the organic groups bonded to silicon atoms,

(B) an organohydrogenpolysiloxane containing at least two silicon-bonded hydrogen atoms, and

(C) a catalyst for addition reaction between silicon-bonded alkenyl groups and silicon-bonded hydrogen atoms, the molar ratio of the silicon-bonded hydrogen atoms of said component (B) to the silicon-bonded alkenyl groups of said component (A) being 0.5 or more.

5,204,437

ORGANOPOLYSILOXANE COMPOSITION AND ITS GEL CURED PRODUCT

Masayuki Ikeno, Annaka, and Hironao Fujiki, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1991, Ser. No. 738,442

Claims priority, application Japan, Aug. 1, 1990, 2-204075

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **7 Claims**

1. An organopolysiloxane composition, comprising

(A) an organopolysiloxane having 0.1 to 2 alkenyl groups bonded to silicon atoms on average in the molecule,

(B) an organohydrogenpolysiloxane having two or more hydrogen atoms bonded to silicon atoms in the molecule, and

(C) an addition reaction catalyst, wherein each of said organopolysiloxane (A) and said organohydrogenpolysiloxane (B) has at least two alkoxy groups having 4 or less carbon atoms or at least one epoxy group in the molecule, and said organohydrogenpolysiloxane (B) is blended in such an amount that the number of the hydrogen atoms bonded to the silicon atoms of the organohydrdogen polysiloxane (B) is 0.5 to 2 per alkenyl group bonded to the silicon atoms of the organopolysiloxane (A).

5,204,438

SILICONE MACROMERS AND THERMOPLASTIC FLAME RETARDANT SILICONE-POLYPHENYLENE ETHER GRAFT COPOLYMERS OBTAINED THEREFROM

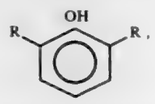
Kevin M. Snow, Clifton Park; James E. Pickett, Schenectady, and Larry N. Lewis, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 455,122, Dec. 22, 1989, abandoned. This application Jan. 15, 1992, Ser. No. 820,823

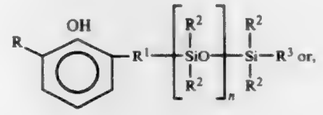
Int. Cl.[5] C08G *77/46*

U.S. Cl. 528—25 **6 Claims**

1. A method for making a thermoplastic silicone-polyphenylene ether graft copolymer comprising oxidatively coupling a 2,6-disubstituted phenol of the formula,



with a phenol-siloxane macromer selected from,



where R is selected from a halogen radical, or the same or different $C_{(1-13)}$ monovalent organic radicals, R^1 is a $C_{(2-20)}$ divalent organic radical, R^2 is selected from the same or different $C_{(1-13)}$ monovalent organic radicals, R^3 is a $C_{(1-13)}$ monovalent organic radical and n is an integer equal to 1 to 100 inclusive.

5,204,439

TWO-COMPONENT POLYURETHANE ADHESIVE

Jeffrey F. Dormish, Pittsburgh, Pa.; Peter W. Boerner, Massillon, Ohio, and Randall C. Rains, Pittsburgh, Pa., assignors to Miles Inc., Pittsburgh, Pa.

Division of Ser. No. 465,715, Jan. 16, 1990, Pat. No. 5,164,473. This application Aug. 19, 1992, Ser. No. 932,173

Int. Cl.[5] C08G *18/32*

U.S. Cl. 528—44 **18 Claims**

1. A low-viscosity two component filled polyurethane adhesive having a urethane content of from 7 to 20 percent by weight, based on the weight of nonfilled polyurethane polymer, consisting essentially of

(a) a low-viscosity isocyanate component in a quantity sufficient to provide an isocyanate index of about 100 to about 150 comprising an organic polyisocyanate wherein up to 10 equivalent percent of the isocyanate groups of said organic polyisocyanate have been modified by reaction with one or more isocyanate-reactive compounds; and

(b) a low-viscosity curative component comprising

(i) 5 to 50 equivalent percent, based on the total equivalents of amino and hydroxyl groups of components (b)(i) and (b)(ii) of an isocyanate-reactive polyether selected from the group consisting of a polyether polyol, a polyether terminated by aromatic amino groups and a mixture thereof, having an equivalent weight greater than 500,

(ii) 50 to 95 equivalent percent, based on the total equivalents of the amino and hydroxyl groups of components (b)(i) and (b)(ii), of one or more chain extenders and/or crosslinkers having molecular weight in the range of 32 to 399, wherein b(ii) is characterized in that it contains at least one diol chain extender which comprises from 50 to 100 percent of the isocyanate-reactive equivalents of component (b)(ii), and

(iii) one or more isocyanate-reactive diamines or triamines having a molecular weight in the range of 62 to 400 in a quantity sufficient to produce adequate resistance to flow when components (a) and (b) are mixed;

wherein at least one of components (a) or (b) contains at least one filler in a quantity of from about 10 to about 40 percent by weight based on the total quantity of the filled polyurethane adhesive.

5,204,440

POLYURETHANE RIM ELASTOMERS OBTAINED WITH HYDROXYL-CONTAINING HETEROCYCLIC ORGANOTIN CATALYSTS

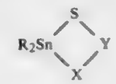
John E. Dewhurst, Macungie, and James D. Nichols, Fogelsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 12, 1990, Ser. No. 627,087

Int. Cl.[5] C08G *18/24*; B01J *23/14, 31/12*

U.S. Cl. 528—58 **8 Claims**

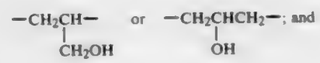
1. A reaction injection molded elastomer made by reacting in a closed mold a composition comprising polyether polyols greater than 500 average molecular weight, an aromatic diamine chain extender, an aromatic polyisocyanate and an organotin catalyst of the following general formula:



where

R is a C_1–C_8 alkyl or an aryl group,

Y is



—CH_2CH(—CH_2OH)— or —CH_2CHCH_2(—OH)—; and

X is —S— or —O—.

5,204,441

POLYFLUORINATED, BRANCHED-CHAIN DIOLS AND DIISOCYANANTES AND FLUORINATED POLYURETHANES PREPARED THEREFROM

Kurt Baum, Pasadena; Thomas G. Archibald, Los Angeles, and Aslam A. Malik, San Dimas, all of Calif., assignors to Fluorochem Inc., Azusa, Calif.

Filed Mar. 12, 1990, Ser. No. 491,972

Int. Cl.[5] C08G *18/28, 18/32*

U.S. Cl. 528—70 **5 Claims**

1. A new composition of matter selected from the group consisting of I—CH_2CH_2—R—CH_2CH_2—I, which is an ethylene-inserted diiodide adduct of an α,ω-diiodoperfluoroalkane having the formula $I(CF_2)_nI$, wherein n is a whole number of from 2 to 12, inclusive, and $CF_2{=}CF(CF_2)_nF$, wherein n is a whole number of from 1 to 10, inclusive, R being a branched-chain perfluoroalkyl radical; HO—CH_2CH_2—R—CH_2CH_2—OH; H_2N—CH_2CH_2—R—CH_2CH_2—NH_2; and OCN—CH_2CH_2—R—CH_2CH_2—NCO, wherein R, each instance, is the same as defined above.

5,204,442

POLYETHER POLYMERS DERIVED FROM 4,4''-DIHYDROXY-M-TERPHENYLS

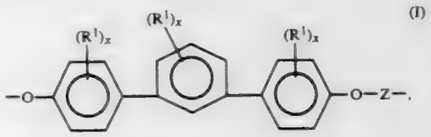
Susan A. Nye, Feura Bush, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 6, 1991, Ser. No. 651,171

Int. Cl.[5] C08G *8/02, 14/00, 65/38, 75/23*

U.S. Cl. 528—125 **19 Claims**

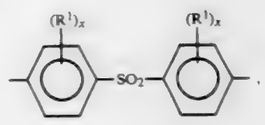
1. A polymer comprising structural units of the formula



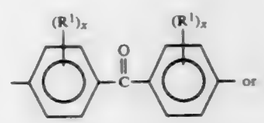
(I)

wherein:

Z is



(II)



(III)

(IV)

each R^1 is independently a substituent which is inert under conditions of reactive contact with alkyl or aryl halides;

each of R^2 and R^3 is hydrogen, C_{1-4} primary or secondary alkyl or phenyl; and

each x is independently 0–4.

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MELT PROCESSABLE POLY(ESTER-AMIDE) CAPABLE OF FORMING AN ANISOTROPIC MELT CONTAINING AN AROMATIC MOIETY CAPABLE OF FORMING AN AMIDE LINKAGE

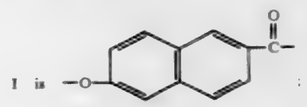
Cherylyn Lee, Basking Ridge, and Larry F. Charbonneau, Mendham, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

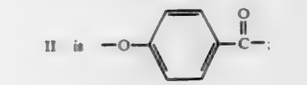
Filed Apr. 19, 1991, Ser. No. 687,801

Int. Cl.[5] C08G *63/00, 63/02, 63/18*

U.S. Cl. 528—184 **22 Claims**

1. A melt processable poly(ester-amide) capable of forming an anisotropic melt phase at a temperature below about 400° C. consisting of recurring moieties I, II, III, IV and V wherein:

I is 

II is 

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5,204,445

PEPTIDES AND ANTIBODIES THAT INHIBIT

5,204,448

CHELATING AGENTS FOR ATTACHING METAL IONS

5,204,450

CARCINOMA OROSOMUCOID-RELATED ANTIGEN, A MONOCLONAL ANTIBODY THERETO, AND THEIR

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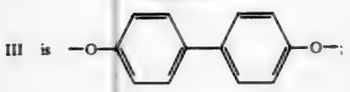
III is 

IV is —[Y—Ar—Z]—

wherein Ar is a divalent moiety containing at least one aromatic ring, Y and Z are divalent radicals and are the same or different and include at least one member selected from the group consisting of NH or NR where R is a 1–6 carbon containing alkyl moiety or an aryl moiety; and V is the residue of an aromatic dioyl precursor; and wherein said poly(esteramide) consists of from about 1 to about 15 mole percent of moiety I, from about 20 to about 70 mole percent of moiety II, from about 5 to about 40 mole percent of moiety III, from about 1 to about 6.5 mole percent of moiety IV, and from about 5 to about 40 mole percent of moiety V.

5,204,444

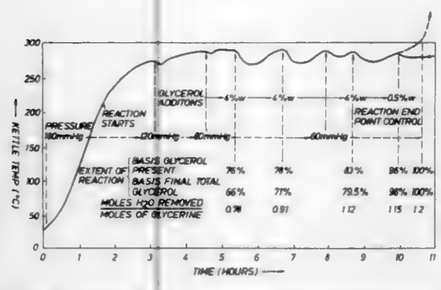
POLYCONDENSATION OF EPOXY ALCOHOLS WITH POLYHDRIC ALCOHOLS AND THERMAL CONDENSATION TO FORM POLYETHERCYCLICPOLYOLS

Harry Frank; George C. Blytas, and Anne H. Zuzich, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 672,203, Mar. 19, 1991, abandoned. This application Apr. 14, 1992, Ser. No. 869,091

Int. Cl.[5] C08G *65/04, 65/02*

U.S. Cl. 528—421 **31 Claims**



1. A method for preparing polyethercyclicpolyol by copolymerization and thermal condensation, comprising:

(a) heating a reaction mixture comprising a reactant selected from the group consisting of (1) a polyol having at least three hydroxyl groups of which at least two of the hydroxyl groups are vicinal, (2) precursors of the polyol, (3) cyclic derivatives of the polyol, and (4) mixtures thereof, said heating initiating the thermal condensation;

(b) removing water formed during the thermal condensation;

(c) continuing the thermal condensation until at least 1.05 moles of water per mole of reactant are removed, wherein the condensation goes to completion without incurring substantial undesirable degeneration; and

(d) prior to the condensation going to completion, admixing an epoxy alcohol with the reaction mixture.

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PEPTIDES AND ANTIBODIES THAT INHIBIT INTEGRIN-LIGAND BINDING

Edward F. Plow; Stanley E. D'Souza, and Mark H. Ginsberg, all of San Diego, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 252,674, Oct. 3, 1988. This application Oct. 2, 1989, Ser. No. 415,025

The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.

Int. Cl.[5] C07K *13/00, 15/00, 15/28*; C07H *21/04*

U.S. Cl. 530—326 **5 Claims**

1. A polypeptide of no more than 90 amino acid residues in length having a sequence that includes an amino acid residue sequence selected from the group consisting of:

-DDSKNFSIQVRQVEDYPV-,

-EDYPVDIYYLM-,

-LMDLSYSMKDDL-,

-DDLWSIQNLGTKL-,

-TKLATQMRKLTS-,

-LTSNLRIGFGAFVD-,

-AFVDKPVSPYMYIS-, and

-YISPPEALENPCYD-.

5,204,446

POLYPEPTIDE HAVING IMMUNOREACTIVITY WITH ANTIBODY SPECIFIC TO HEPATITIS B VIRUS

Toshiaki Kumazawa, and Masatoshi Osanai, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1990, Ser. No. 503,239

Claims priority, application Japan, Apr. 14, 1989, 1-95015

Int. Cl.[5] A61K *37/00, 37/02*; C07K *5/00, 7/00*

U.S. Cl. 530—325 **9 Claims**

1. A peptide having immunoreactivity with an antibody specific to hepatitis B virus, said peptide consisting essentially of at least six consecutive amino acids of the following amino acid sequence:

Asp-Cys-Val-Phe-Lys-Asp-Trp-Glu-Glu-Leu-Gly-Glu-Glu-Ile-Arg-Leu-Lys-Val-Phe-Val-Leu-Gly-Gly-Cys,

said peptide not including the entire amino acid sequence of Protein X.

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PURIFICATION OF FACTOR XIII

Paul D. Bishop, Fall City, and Gerald W. Lasser, Lynnwood, both of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Filed Nov. 14, 1988, Ser. No. 270,714

Int. Cl.[5] C07K *3/22, 3/24, 3/28, 15/00*

U.S. Cl. 530—381 **19 Claims**

1. A method for purifying factor XIII from a biological fluid, comprising:

precipitating the factor XIII by adjusting the pH of the biological fluid to 5.5 to 6.5; and

recovering the precipitated factor XIII.

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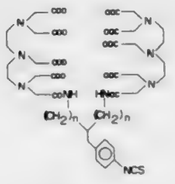
CHELATING AGENTS FOR ATTACHING METAL IONS TO PROTEINS

Ramaswamy Subramanian, Frederick, Md., assignor to Akzo N.V., Arnhem, Netherlands

Filed May 26, 1989, Ser. No. 358,917

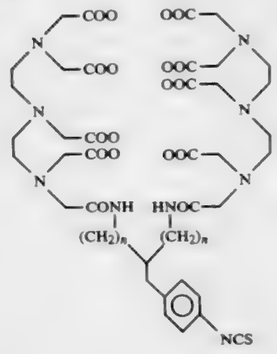
Int. Cl.[5] C07K *17/02*; A61K *49/02*

U.S. Cl. 530—391.5 **6 Claims**



n=1, "a" LiLo1
n=2, "b" LiLo2

4. A complex comprising a polypeptide bound to the chelating agent LiLo:



5,204,449

ANTIGEN ANTIBODY CONJUGATE FOR MAJOR HISTOCOMPATIBILITY COMPLEX (MHC) CLASS I OR II ANTIGENS

Nirdosh K. Puri, Bayswater, Australia, assignor to Bunge (Australia) Pty. Ltd., Melbourne, Australia

Filed Jan. 11, 1989, Ser. No. 296,229

Claims priority, application Australia, Jan. 12, 1988, PI6256; Mar. 28, 1988, PI7470

Int. Cl.[5] C07K *7/00, 15/28*

U.S. Cl. 530—391.7 **3 Claims**

1. An antigen-antibody conjugate including:

(a) at least one antigen selected from the group consisting of luteinizing hormone releasing hormone, follicle stimulating hormone, luteinizing hormone and somatostatin, analogues thereof, fragments thereof, mixtures thereof;

(b) at least one monoclonal antibody having a specificity for major histocompatibility complex (MHC) class I or class II antigens;

(c) at least one monoclonal antibody having a specificity for the CD4 or CD8 molecules of a given species; and,

(d) each antibody being conjugated to the at last one antigen.

5,204,450

CARCINOMA OROSOMUCOID-RELATED ANTIGEN, A MONOCLONAL ANTIBODY THERETO, AND THEIR USES

Carol A. Toth, Westwood, and Peter Thomas, Pembroke, both of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Division of Ser. No. 164,071, Mar. 4, 1988, Pat. No. 4,914,021. This application Jan. 9, 1990, Ser. No. 441,368

Int. Cl.[5] C07K *15/14*

U.S. Cl. 530—395 **8 Claims**

1. Essentially purified and isolated carcinoma orosomucoid-related antigen, a glycoprotein having a binding affinity for carcinoembryonic antigen, said glycoprotein having:

(a) a molecular weight of about 46,000–50,000 daltons;

(b) an isoelectric point of about 3.0–3.5;

(c) a carbohydrate content of about 25–35% by weight;

(d) reactivity with a monoclonal antibody ND5 raised thereto;

(e) no cross-reactivity with antisera raised to nonspecific cross-reacting antigen; and

(f) no cross-reactivity with antisera raised to carcinoembryonic antigen.

5,204,451

ACTIVATING HYDROXYL GROUPS OF POLYMERIC CARRIERS USING 4-FLUOROBENZENESULFONYL CHLORIDE FOR BINDING BIOLOGICALLY ACTIVE LIGANDS

Yu-An Chang, Costa Mesa, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Aug. 13, 1990, Ser. No. 567,481

Int. Cl.[5] C07K *17/00*; C12N *11/12, 11/10*; G01N *33/544*

U.S. Cl. 530—413 **13 Claims**

1. A method for binding biologically active organic ligand to a polymeric carrier having at least one hydroxyl group, comprising the steps of

(a) first contacting said carrier with 4-fluorobenzenesulfonyl chloride to form an activated carrier,

(b) next contacting said activated carrier with said ligand, and then

(c) binding said ligand to said activated carrier.

5,204,452

N-HALOCHITOSANS, THEIR PREPARATION AND USES

Edward C. Dingilian, Newark, Del., and George E. Heinsohn, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1990, Ser. No. 613,602

Int. Cl.[5] C02F *1/56*

U.S. Cl. 530—420 **3 Claims**

1. A process for flocculation, comprising the steps of: mixing an aqueous solution of a chitosan salt with a material to be flocculated and then adding a halogenating agent.

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PROCESS FOR THE PREPARATION OF 1:2 METAL

trifluoromethane and m is 1 to 4, with at least one polyether

wherein R^6, R^7 and R^8, which may be the same or different, are hydrogen, methyl, ethyl or methoxy,

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5,204,453

PROCESS FOR THE PREPARATION OF 1:2 METAL COMPLEX AZO COMPOUNDS BY CARRYING OUT DIAZOTIZATION AND COUPLING IN THE PRESENCE OF A METAL DONOR

Bernard Chambon, Michelbach Le Haut, France; Horst H. Jäger, Bettingen, Switzerland; Rüdiger Oxenius, Rheinfelden, Fed. Rep. of Germany, and Alois Püntener, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 617,486, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 25,469, Mar. 13, 1987, abandoned. This application Dec. 30, 1991, Ser. No. 815,839

Claims priority, application Switzerland, Mar. 18, 1986, 1087/86; Jul. 30, 1986, 3061/86

Int. Cl.[5] **C09B** *41/00, 45/01*

U.S. Cl. 534—602 **19 Claims**

1. A process for the preparation of 1:2 chromium, 1:2 cobalt, 1:2 nickel or 1:2 iron complex azo dye by diazotization, coupling and metalizing without isolation of the coupling product, which process comprises diazotising at least one amine of the benzene or naphthalene series in aqueous solution and coupling diazonium compound so obtained at a temperature in the range of 55° to 85° C. least one coupling component of the benzene or naphthalene series or of the heterocyclic series, such that the azo dye obtained as intermediate contains groups suitable for metal complex formation, and carrying out the diazotization or coupling in the presence of a chromium, cobalt, nickel or iron donor, and wherein the molar ratio of the sum of the amines and the molar ratio of the sum of the coupling components to the metallizing agent is 1.6:1.0 to 2:1.

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PREPOLYMERIC POLYOLS CONTAINING MESOGENIC UNITS

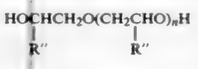
Randall A. Rodenhouse, Pittsburgh, Pa.; Dittmar K. Nerger, Krefeld, Fed. Rep. of Germany, and Douglas A. Wicks, Mt. Lebanon, Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Jul. 19, 1991, Ser. No. 732,566

Int. Cl.[5] **C07C** *245/06, 69/76, 229/00*

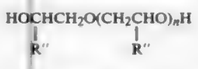
U.S. Cl. 534—805 **7 Claims**

1. A prepolymer conforming structurally to

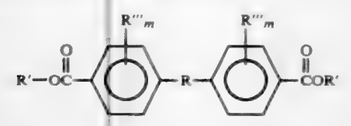


where x is an integer of 1 to 8, R is, $-CH_2CH_2-$, $-CH=CH-$, $-C\equiv C-$, $-OCH_2-$, $-CO_2-$, $-CH=N-$, $-N=N-$ and n is 0 to 45, R''' denotes hydrogen, alkyl, alkyl aryl, alkyl ether, aryl ether, halogen, trialkyl silyl or trifluoromethane R'' denotes at least one of —H and $-CH_3$ and m is 1 to 4.

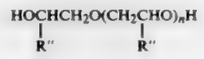
7. A process for preparing a prepolymer conforming structurally to



wherein x is 1 to 8 comprising reacting a mesogenic diacid or the corresponding diester conforming to



where R is, $-CH_2-CH_2$, $-CH=CH-$, $-C\equiv C-$, $-OCH_2-$, $-CO_2-$, $-CH=N-$, $-N=N-$ and where R' is —H, $-CH_3$, $-CH_2CH_3$, R''' denotes halogen, alkyl, alkyl aryl, aryl, alkyl ether, aryl ether, halogen, trialkyl silyl or trifluoromethane and m is 1 to 4, with at least one polyether polyol conforming to



where R'' is at least one of hydrogen and CH_3 group, and n is 0 to 45 in the presence of dibutyltin dilaurate as a catalyst.

5,204,455

MONOMETHOXYTRITYL PROTECTED OLIGONUCLEOTIDES BOUND TO A SOLID SUPPORT

Brian C. Froehler, 2310 Monserat Ave., Belmont, Calif. 94002; Kenneth M. Kent, 1725 Wright Ave. 63, Mt. View, Calif. 94043, and Sylvia Wu, 6050 Mount Rushmore Cir., Castro Valley, Calif. 94552

Continuation of Ser. No. 366,849, Jun. 15, 1989, Pat. No. 5,164,491. This application Feb. 10, 1992, Ser. No. 833,242

Int. Cl.[5] **C07H** *17/00*

U.S. Cl. 536—22.1 **10 Claims**

1. An oligonucleotide H-phosphonate, each internucleotide linkage of which contains an H-phosphonate moiety, which olionucleotide has a 5'-hydroxyl end and a 3'-hydroxyl end, one of which ends is bound to a solid support while the remaining end is blocked by a monomethoxytrityl protecting group.

5,204,456

DERIVATIVES OF NUCLEOSIDES AND THEIR USE FOR THE SYNTHESIS OF OLIGONUCLEOTIDES

Didier Molko, Tullins; Jean-Claude Schulhof, Saint Ismier, and Robert Teoule, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

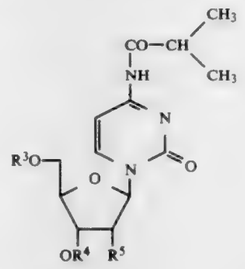
Continuation of Ser. No. 31,781, Mar. 30, 1987, Pat. No. 4,980,460. This application Sep. 20, 1990, Ser. No. 585,507

Claims priority, application France, Apr. 8, 1986, 86 04990

Int. Cl.[5] **C07H** *19/067, 19/073*

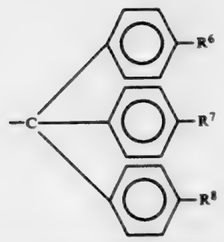
U.S. Cl. 536—25.33 **10 Claims**

1. A nucleoside having the formula:

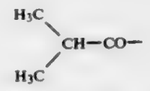


wherein

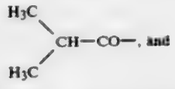
R^3 is selected from the group consisting of hydrogen, 9-phenylxanthenyl, trityl of the formula



wherein R^6, R^7, and R^8 which may the same or different, are hydrogen, methyl, ethyl or methoxy, and the group of formula:



R^4 is hydrogen, a phosphorylated group selected from the group consisting of phosphate, H-phosphonate and phosphoramidite, and the group

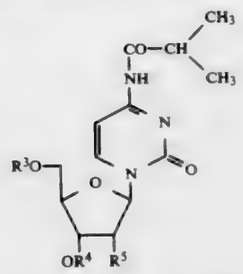


, and

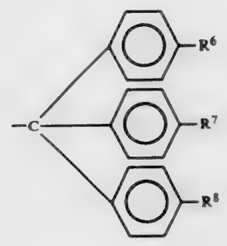
R^5 is hydrogen, OH or a protected OH group.

10. In a process for the synthesis of oligonucleotides, by condensing a protected nucleoside on a nucleoside or an oligonucleotide, wherein the improvement comprises the steps of:

1) condensing a nucleoside of the formula:



on a nucleoside or an oligonucleotide, wherein R^3 is selected from the group consisting of 9-phenylxanthenyl, trityl of the formula

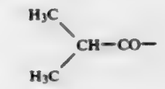


wherein R^6, R^7 and R^8, which may be the same or different, are hydrogen, methyl, ethyl or methoxy,

R^4 is a phosphorylated group selected from the group consisting of phosphate, H-phosphonate and phosphoramidite; and

R^5 is a hydrogen atom; and

2) hydrolytically removing the group of formula:



5,204,457

ORGANIC MAGNETIC COMPLEX

Shigeo Maruno, 134, Sakuragaoka 4-chome, Kasi-shi, Gifu 509-02, and Masakatsu Hasegawa, Nagoya, both of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Nagoya and Shigeo Maruno, Kasi, both of Japan

PCT No. PCT/JP90/01346, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991, PCT Pub. No. WO91/05807, PCT Pub. Date May 2, 1991

PCT Filed Oct. 19, 1990, Ser. No. 720,504

Claims priority, application Japan, Oct. 20, 1989, 1-271784

Int. Cl.[5] **C08B** *11/12*

U.S. Cl. 536—101 **20 Claims**

1. A complex of a carboxyalkyl ether of a polysaccharide having an intrinsic viscosity of about 0.02 to about 0.05 dl/g at 25° C. with a magnetic metal oxide.

5,204,458

PROCESS FOR PREPARING CEPHEM DERIVATIVES

Sigeru Torii, Akaiwa; Hideo Tanaka, Oakayama; Masatoshi Taniguchi, Osaka; Michio Sasaoka, Tokushima; Takashi Shirai, Tokushima, and Yutaka Kameyama, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

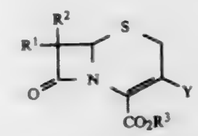
Filed Mar. 10, 1992, Ser. No. 849,160

Claims priority, application Japan, Mar. 11, 1991, 3-72450

Int. Cl.[5] **C07D** *501/02*

U.S. Cl. 540—222 **1 Claim**

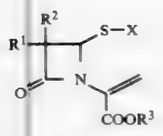
1. A process for preparing a cephem compound of the formula



wherein R^1 is amino or protected amino; R^2 is hydrogen or lower alkoxyl; R^3 is hydrogen or a carboxylic acid protecting group; and Y is halogen, hydroxyl, azido, cyano or isocyano; or $-OR^7$, $-OCOR^7$, $-SCSOR^7$, $-SCSN(R^7)_2$, $-NHR^7$, $-N(R^7)_2$ or $-SO_2R^7$, wherein R^7 is lower alkyl, phenyl or naphthyl; or $-SR^8$, wherein R^8 is lower alkyl, phenyl, naphthyl, piperidino, morpholino, 1-piperazinyl, 1-pyrrolidinyl, 1-imidazolidinyl, 1-pyrazolidinyl, 2-pyrrolin-1-yl, 2-imidazolin-1-yl, 3-pyrazolin-1-yl, 1-indolinyl, 2-indolinyl, 1-pyrrolyl, 1-indolyl, 2-isoindolyl, 1-imidazolyl, 1-pyrazolyl, 1-benzimidazolyl, 1H-1-indazolyl, 1-triazolyl or 1-tetrazolyl; optionally substituted by halogen, hydroxyl, nitro, cyano, aryl, lower alkyl, amino, mono lower alkylamio, di lower alkylamino, mercapto, lower alkyl alkylthio, arylthio, formyl or formyloxy; R^6COO-, R^6CO-, R^6O- or R^6OCO-, wherein R^6 is lower alkyl phenyl or naphthyl, which comprises reacting an allenyl β-lactam of the formula

wherein Z has the same meaning as defined above and Y is a hydrogen atom or a carboxyl group,

-continued



wherein R^1, R^2 and R^3 are as defined above; and X is $-SO_2R^4$ or $-SR^4$, wherein R^4 represents phenyl, naphthyl, thiazol-2-yl, thiadiazol-2-yl, benzothiazol-2-yl, oxazol-2-yl, benzoxazol-2-yl, imidazol-2-yl, benzoimidazol-2-yl, pyrimidinyl or pyridyl, optionally substituted by halogen, hydroxyl, nitro, cyano, aryl, lower alkyl, amino, mono lower alkylamio, di lower alkylamino, mercapto, lower alkyl alkylthio, arylthio, formyl or formyloxy; or R^6COO-, R^6CO-, R^6O- or R^6O-CO-, wherein R^6 is lower alkyl, phenyl or naphthyl; with H—Y.

5,204,459

PROCESS FOR PREPARING CARBAPENEM COMPOUNDS

Shigeo Nozoe, and Tomihisa Ohta, both of Sendai, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 661,246, Feb. 27, 1991, Pat. No. 5,118,831, which is a division of Ser. No. 360,534, Jun. 2, 1989, Pat. No. 5,028,718, which is a division of Ser. No. 95,445, Sep. 11, 1987, Pat. No. 4,876,383. This application Mar. 17, 1992, Ser. No. 853,069

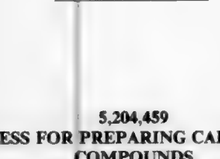
Claims priority, application Japan, Sep. 12, 1986, 61-215093

Int. Cl.[5] **C07D** *487/04*

U.S. Cl. 540—302 **5 Claims**

1. A process comprising

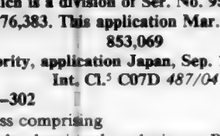
(i) selectively cleaving the substituent R^5 from a compound of the formula (II)



(II)

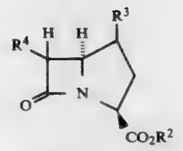
wherein R^2 is hydrogen or a carboxylic-protecting group, R^5 is a carboxylic-protecting group, R^3 is hydrogen, alkyl, hydroxyl, methoxy or acetoxy, R^4 is methyl, ethyl, i-propyl, benzyl or a $CH_3CR^6(OR^7)$-group in which R^6 is hydrogen or methyl and R^7 is hydrogen or a hydroxyl-protecting group and having, respectively 2(S) and 5(R) configurations in the 2 and 5 positions thereof;

to give a compound of the formula (V)



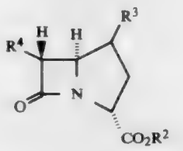
(V)

(ii) β-lactam cyclizing the compound of the formula (V) to produce a compound of the formula (VI);



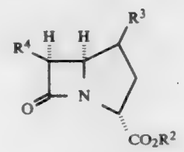
(VI)

(iii) treating the compound of the formula (VI) with lithium diisopropylamide at about −78° C. and quenching said treated compound with acetic acid/methanol at about 0° C. to give predominantly the (3R, 5R, 6R) carbapenem compound (VII)



(VII)

or quenching the compound of the formula (VI) at about −78° C. to give predominantly the (3R, 5R, 6S) carbapenam compound (IX)



(IX)

5,204,460

RUTHENIUM CATALYZED PROCESS FOR PREPARING 4-ACETOXYAZETIDINONES

Takao Saito, Yokohama, and Hidenori Kumobayashi, Chigasaki, both of Japan, assignors to Takasago International Corporation, Tokyo, Japan

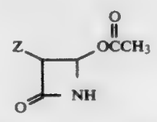
Continuation-in-part of Ser. No. 442,588, Nov. 29, 1989, Pat. No. 5,081,239. This application Oct. 10, 1991, Ser. No. 774,348

Claims priority, application Japan, Nov. 29, 1988, 63-301706

Int. Cl.[5] **C07D** *205/08;* **C07F** *41/12*

U.S. Cl. 540—357 **2 Claims**

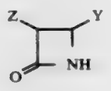
1. A process for preparing 4-acetoxyazetidinones of the following formula (I):



(I)

wherein Z is a hydrogen atom, a lower alkyl group or a hydroxyethyl group which may or may not be protected, which comprises reacting the following three components (a), (b) and (c):

(a) azetidinones of formula (II):



(II)

wherein Z has the same meaning as defined above and Y is a hydrogen atom or a carboxyl group,

(b) acetic acid, and

(c) oxidizing agent,

in the presence of a ruthenium compound as a catalyst represented by $[Ru(B)_2(L)]_m$ wherein:

B is Cl, Br or I;

m is a positive integer, and

L is 1,5-cyclooctadiene, norbornadiene, cycloheptatrien, cyclooctatetraene or benzene which may or may not have a lower alkyl group as a substituent.

5,204,461

PROCESS FOR PREPARING (1'R,3S)-3-(1'-HYDROXYETHYL)-AZETIDIN-2-ONE AND DERIVATIVES THEREOF

Toshiyuki Murayama; Takashi Miura, and Toyohiko Kobayashi, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

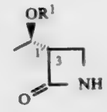
Filed Nov. 8, 1991, Ser. No. 789,604

Claims priority, application Japan, Nov. 8, 1990, 2-301016

Int. Cl.[5] **C07D** *205/08;* **C07B** *43/06*

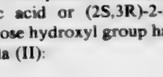
U.S. Cl. 540—362 **4 Claims**

1. A process for preparing (1'R,3S)-3-(1'-hydroxyethyl)-azetidin-2-one or (1'R,3S)-3-(1'-hydroxyethyl)-azetidin-2-one whose hydroxyl group has been protected represented by formula (I):



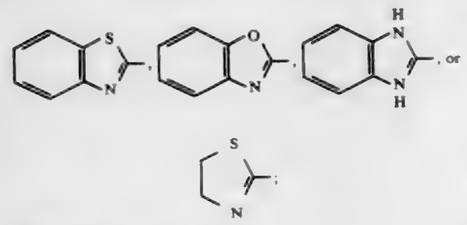
(I)

wherein R^1 represents a hydrogen atom or a hydroxyl-protective group, which comprises reacting (2S,3R)-2-aminomethyl-3-hydroxybutyric acid or (2S,3R)-2-aminomethyl-3-hydroxybutyric acid whose hydroxyl group has been protected represented by formula (II):

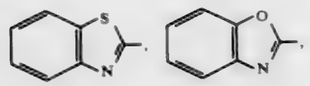


(II)

wherein R^1 is as defined above, with a sulfenamide represented by formula (III):



wherein R^2 represents



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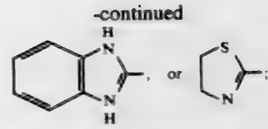


and R^3 and R^4 each represent a hydrogen atom or a cyclic or acyclic hydrocarbon group, provided that they do not simultaneously represent a hydrogen atom, or R^3 and R^4 are taken together with the adjacent nitrogen atom to form a 4-morpholinyl group, a 1-piperidinyl group or a 1-pyrrolidinyl group, and triphenylphosphine.

5,204,462

4H-3,1-BENZOXAZIN-4-ONE DERIVATIVE

Koji Kobayashi; Koichi Ozawa; Masashi Sasabuchi, and Itsuo Uchida, all of Yokohama, Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

PCT No. PCT/JP91/00386, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/15487, PCT Pub. Date Oct. 17, 1991

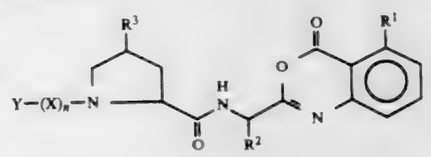
PCT Filed Mar. 26, 1991, Ser. No. 776,372

Claims priority, application Japan, Mar. 30, 1990, 2-80674

Int. Cl.[5] **C07D** *265/12, 207/08, 207/46, 5/02*

U.S. Cl. 544—92 **2 Claims**

1. 4H-3,1-benzoxazin-4-one derivatives represented by formula (I), below:



(I)

wherein R^1 represents a lower alkyl group, R^2 represents a lower alkyl group, a lower akylthioalkyl group, or a lower alkanesulfinylalkyl group, R^3 represents a hydrogen atom, a hydroxyl group, a lower alkoxy group, or a lower acyloxy group, X represents an amino acid residue selected from the group consisting of alanine, valine, and phenylalanine, n represents an integer of 0, 1, or 2, and Y represents a substituent selected from the group consisting of an alkanoyl group having 2 to 6 carbon atoms which may be substituted by a phenyl group, a benzyloxycarbonyl group, a lower alkoxycarbonyl group, a cinnamoyl group, and a methoxysuccinyl group.

5,204,463

SUBSTITUTED METHOXYPHENYL-4,5 DIHYDRO-3(2H)-PRIDAZINONES HAVING CARDIOTONIC AND BETA BLOCKING ACTIVITIES

Thomas N. Wheeler, Raleigh; Terrence P. Kenakin, Durham, and Joel E. Shaffer, Chapel Hill, all of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.

Division of Ser. No. 556,230, Jul. 20, 1991, Pat. No. 5,096,904, which is a continuation-in-part of Ser. No. 402,179, Sep. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 392,233, Aug. 10, 1989, abandoned. This application Sep. 4, 1991, Ser. No. 754,835

Int. Cl.[5] **C07D** *237/14*

U.S. Cl. 544—114 **8 Claims**

1. A pyridazinone of the following formula (I):

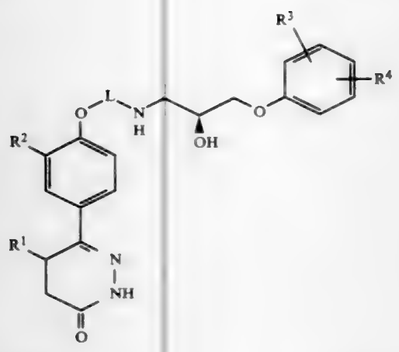
5,204,465

PROCESS FOR THE PRODUCTION OF

protecting group with silylated cytosine in the presence of $SnCl_4$

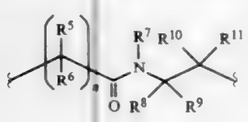
are joined to form a six-membered substituted or unsubstituted aromatic ring.

VOL 1149 ISS 3 AP 20 1993 UMI

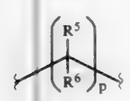


(I)

wherein:
R^1 represents hydrogen or lower alkyl;
R^2 represents hydrogen, halogen, trifluoromethyl, cyano, lower alkyl, or lower alkyloxy;
L represents a linking-moiety of the formula (II) or (III):



(II)



(III)

in which:
R^5–R^{11} represent, independently, hydrogen or lower alkyl; n represents the integer 1, 2 or 3; p represents the integer 2, 3, 4, 5, or 6; R^3 represent morpholino and R^4 represents hydrogen;
wherein:
said lower alkyl is of 1 to about 3 carbons,
or a pharmaceutically acceptable acid-addition salt thereof.

5,204,464

HIGH BULK DENSITY, CRYSTALLINE 3-CYANO-2-MORPHOLINO-5-PYRID-4-YL)-PYRIDINE

Volker Hagen; Günter Reck; Brigitte Gentsch, all of Berlin; Hans-Joachim Heidrich, Dresden; Hans-Joachim Jänsch, Radebeul; Ingrid Wielop, Radebeul, and Dieter Lohmann, Radebeul, all of Fed. Rep. of Germany, assignors to Arzneimittelwerk Dresden GmbH, Radebeul, Fed. Rep. of Germany

Filed Mar. 7, 1991, Ser. No. 665,681
Claims priority, application German Democratic Rep., Mar. 9, 1990, 338544
Int. Cl.[5] C07D *413/14*
U.S. Cl. 544—124 **3 Claims**

1. A crystalline 3-cyano-2-morpholino-5-(pyrid-4-yl)-pyridine of having a bulk density of from about 220 to about 360 g/l.

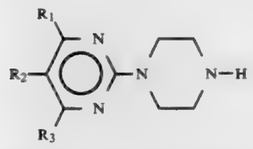
5,204,465

PROCESS FOR THE PRODUCTION OF PIPERAZINYLPYRIMIDINE DERIVATIVES

David L. Kuo, Brig, and Robert Voeffray, Basel, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

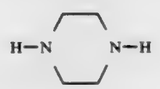
Filed Dec. 6, 1991, Ser. No. 803,067
Claims priority, application Switzerland, Dec. 18, 1990, 4015/90; Mar. 4, 1991, 639/91
The portion of the term of this patent subsequent to Apr. 6, 2010, has been disclaimed.
Int. Cl.[5] C07D *403/04*
U.S. Cl. 544—295 **19 Claims**

1. Process for the production of a piperazinylpyrimidine compound of the formula:



I

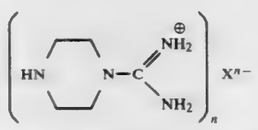
wherein R_1, R_2 and R_3 are the same or different and each is a hydrogen atom or a C_1–C_4 alkyl group, branched or unbranched, characterized in that, in a first stage, piperazine of the formula:



II

or its hydrate is acid-reacted with cyanamide to an amidine salt of the formula:

III



wherein X is an anion which forms said amidine salt and n corresponds to the valence of said anion which forms said amidine salt, the amidine salt of formula III is optionally isolated, and then, in a second stage, the amidine salt of formula III is reacted with a CH-acidic compound to said piperazinylpyrimidine compound of formula I.

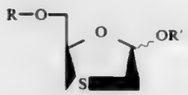
5,204,466

METHOD AND COMPOSITIONS FOR THE SYNTHESIS OF BCH-189 AND RELATED COMPOUNDS

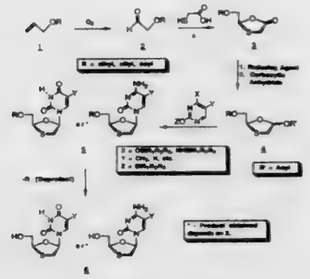
Dennis C. Liotta, Stone Mountain, and Woo-Baeg Choi, Atlanta, both of Ga., assignors to Emory University, Atlanta, Ga.

Filed Feb. 1, 1990, Ser. No. 473,318
Int. Cl.[5] C07D *411/04, 473/00*; C07F *5/02*
U.S. Cl. 544—317 **11 Claims**

1. A method of preparing a composition comprising predominantly the β-isomer of a 1,3-oxathiolane of the structure:



wherein R′ is an acyl group, and wherein R is an oxygen-protecting group with silylated cytosine in the presence of $SnCl_4$.



5,204,467

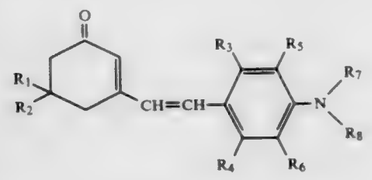
VISIBLE PHOTOSENSITIZERS FOR PHOTOPOLYMERIZABLE COMPOSITIONS

William K. Smothers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1991, Ser. No. 810,997
Int. Cl.[5] C07D *215/14, 277/64, 263/56, 231/56*
U.S. Cl. 546—94 **5 Claims**

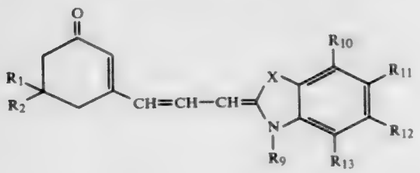
1. A compound suitable for use as a sensitizer in photopolymerizable compositions, said compound selected from the group consisting of:

A



wherein:
R_1 and R_2 are independently alkyl from 1 to 4 carbon atoms;
R_3 and R_4 are independently hydrogen, alkyl of 1 to 6 carbon atoms, or alkyoxyl of 1 to 6 carbon atoms;
(R_5+R_7) are —$(CH_2)_2$— or —$(CH_2)_3$—;
R_6 is hydrogen or methyl and R_8 is alkyl from 1 to 6 carbon atoms, or (R_6+R_8) are —$(CH_2)_2$— or —$(CH_2)_3$—, with the proviso that (R_5+R_7) and (R_6+R_8) may not be —$(CH_2)_2$— at the same time; and

B



wherein:
R_1 and R_2 are independently alkyl from 1 to 4 carbon atoms;
X is O, S, NR_{14}, or $CR_{15}R_{16}$, where R_{14}, R_{15}, and R_{16} are each an alkyl group of 1 to 6 carbon atoms or substituted or unsubstituted phenyl;
R_9 is a substituted or unsubstituted alkyl group of 1 to 7 carbon atoms or substituted or unsubstituted phenyl;
R_{10}, R_{11}, R_{12}, and R_{13} are each independently hydrogen, substituted or unsubstituted alkyl and alkyoxyl of 1 to 6 carbon atoms, halogen, or substituted or unsubstituted phenyl; or (R_{10} and R_{11}), (R_{11} and R_{12}), or (R_{12} and R_{13}) are joined to form a six-membered substituted or unsubstituted aromatic ring.

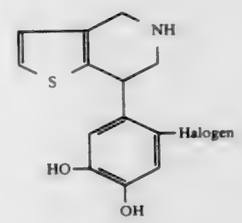
5,204,468

SUBSTITUTED 4,5,6,7-TETRAHYDROTHIENS[2,3-C]PYRIDINE COMPOUNDS

Akihiro Tanaka, Tokyo; Takashi Fujikura, Saitama; Ryuji Tsuzuki, Tokyo; Masaki Yokota, Saitama, and Takeyuki Yatsu, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 569,279, Aug. 21, 1990, abandoned, which is a continuation of Ser. No. 440,086, Nov. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 320,975, Mar. 9, 1989, abandoned, which is a division of Ser. No. 173,276, Mar. 25, 1988, Pat. No. 4,876,261. This application Jul. 25, 1991, Ser. No. 737,883
Claims priority, application Japan, Mar. 27, 1987, 62-75439; May 25, 1987, 62-129368; Aug. 10, 1987, 62-200562; Aug. 10, 1987, 62-200563; Sep. 10, 1987, 62-226184; Sep. 10, 1987, 62-227398; Sep. 29, 1987, 62-247590; Oct. 7, 1987, 62-254012
Int. Cl.[5] C07D *409/02*
U.S. Cl. 546—114 **1 Claim**

1. An optical isomer of the compound of the formula:



5,204,469

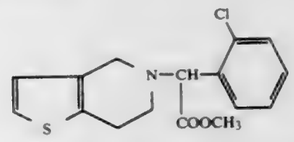
PROCESS FOR THE PREPARATION OF AN N-PHENYLACETIC DERIVATIVE OF TETRAHYDROTHIENO(3,2-C)PYRIDINE AND ITS CHEMICAL INTERMEDIATE

Marcel Descamps, Lhum, and Joël Radisson, Toulouse, both of France, assignors to Sanofi, Paris, France

Filed Jul. 3, 1991, Ser. No. 725,650
Claims priority, application France, Jul. 10, 1990, 90 08749
Int. Cl.[5] C07D *513/04, 333/20*
U.S. Cl. 546—114 **7 Claims**

1. A process for the preparation of the dextrorotatory isomer of the compound of

I



wherein a formylating agent chosen from formaldehyde, its hydrate or its polymer forms, the compound of formula XCH_2Y in which X is a halogen atom, a C_1–C_4 alkoxy group, a C_1–C_4 alkylthio group or an amino group, and Y is a C_1–C_4 alkoxy group, a C_1–C_4 alkylthio group, amino or a C_2–C_5 alkoxycarbonyl or phenoxycarbonyl group and a heterocyclic compound of formula

5,204,471

α-TRIFLUOROMETHYL-SUBSTITUTED, SATURATED

5,204,472

QUINOLINE AND ISOQUINOLINE INTERMEDIATES

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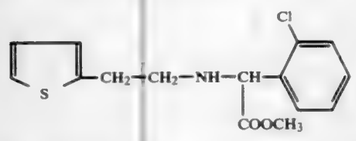
in which Z is O, NH or S is reacted with the dextrorotatory isomer of the compound of formula



and the compound formed is cyclised in the presence of an acid.

5,204,470

AZABICYCLIC DERIVATIVES

Ian A. Cliffe, Slough, England, assignor to John Wyeth & Brother, Limited, Maidenhead, England

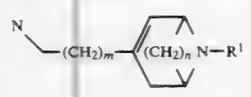
Filed Sep. 9, 1991, Ser. No. 756,648

Claims priority, application United Kingdom, Sep. 12, 1990, 9019973

Int. Cl.[5] **C07D** *451/02*

U.S. Cl. 546—126 **8 Claims**

1. An azabicyclic compound of formula



(I)

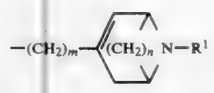
or a pharmaceutically acceptable acid addition salt thereof, wherein

represents an N-heteroaryl group containing 5 to 12 ring atoms and 0–2 other heteroatoms selected from the group consisting of N, O and S, optionally substituted by one or more C_{1-4}alkyl, C_{1-4}alkoxy, amino, C_{1-4}alkylamino, di(C_{1-4}-alkyl)amino, halogen, trifluoromethyl, phenyl, halophenyl, C_{1-4}-alkylphenyl, C_{1-4}-alkoxyphenyl, carboxy, carb oxamido, nitro, thiol, C_{1-4}-alkylthio or C_{1-4}-alkoxycarbonyl substituents;

n represents 2, 3 or 4;

m represents 1 or 2;

R^1 is hydrogen, C_{1-6}-alkyl, C_{3-5}-alkenyl, C_{3-6}-cycloalkyl, C_{3-6}-cycloalkyl-C_{1-2}alkyl or aryl- or heteroaryl-C_{1-2}-alkyl, where the aryl group is a phenyl or napthyl radical optionally substituted by one or more halogen, C_{1-4}-alkoxy or C_{1-4}-alkyl groups and the heteroaryl group is a mono- or bicyclic heteroaryl radical containing 5 to 12 ring atoms and one or two hetero atoms selected from oxygen, nitrogen and sulphur, and



moiety is ortho to the hetero atom X.

5,204,471

α-TRIFLUOROMETHYL-SUBSTITUTED, SATURATED BICYCLIC AMINES

Michael Negele, Cologne; Dieter Hübich, Wuppertal; Christian Laue, Langenfeld, and Heinz Ziemann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

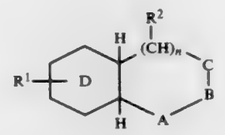
Filed Jul. 24, 1992, Ser. No. 920,217

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1991, 4126482

Int. Cl.[5] **C07D** *209/10, 215/12, 217/14*

U.S. Cl. 546—144 **2 Claims**

1. α-Trifluoromethyl-substituted, saturated bicyclic amines of the formula (I)



(I)

in which

R^1 represents hydrogen, C_1- to C_8-alkyl or C_1- to C_8-alkoxy,

R^2 represents hydrogen or C_1- to C_4-alkyl,

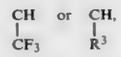
n represents zero or 1,

A represents

B represents NH or

and

C represents



in which A, B and C are either each different from one another or C represents

and one of A and B represents NH and the other represents

and R^3 denotes hydrogen or C_1- to C_4-alkyl and the ring D is saturated.

5,204,472

QUINOLINE AND ISOQUINOLINE INTERMEDIATES

Jürgen Stoltefuss; Horst Böshagen, both of Haan; Siegfried Goldmann, Wuppertal; Alexander Straub, Wuppertal; Rainer Gross, Wuppertal; Joachim Hütter, Leverkusen; Siegbert Hebisch, and Martin Bechem, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 677,718, Mar. 29, 1991, Pat. No. 5,100,900.

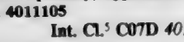
This application Dec. 13, 1991, Ser. No. 807,523

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011105

Int. Cl.[5] **C07D** *401/04, 219/02, 215/12*

U.S. Cl. 546—168 **4 Claims**

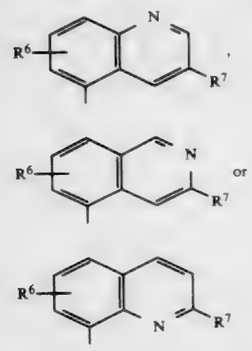
1. An aldehyde of the formula



(II)

in which

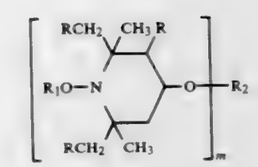
R^3 represents a radical of the formula



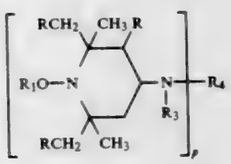
in which

R^6-denotes hydrogen, halogen or straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms,

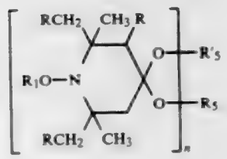
R^7-denotes aryl having 6 to 10 carbon atoms, which is optionally monosubstituted or disubstituted by identical or different substituents from the group consisting of halogen, nitro, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms and carboxyl, or denotes thienyl or pyridyl, which are optionally monosubstituted by halogen.



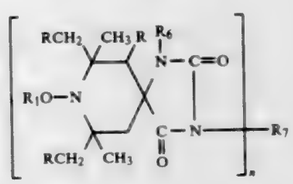
(A)



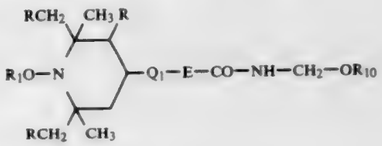
(B)



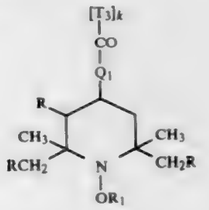
(C)



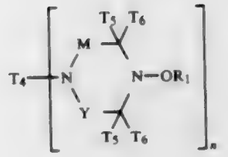
(D)



(E)



(F)



(G)

5,204,473

O-SUBSTITUTED N-HYDROXY HINDERED AMINE STABILIZERS

Roland A. E. Winter, Armonk; James P. Galbo, Hartsdale, and Raymond Seltzer, New City, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 749,470, Aug. 15, 1991, abandoned, which is a continuation of Ser. No. 614,569, Nov. 14, 1990, abandoned, which is a continuation of Ser. No. 259,950, Oct. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 99,414, Sep. 21, 1987, abandoned. This application May 12, 1992, Ser. No. 883,812

Int. Cl.[5] **C07D** *211/36, 211/38, 211/22*

U.S. Cl. 546—188 **36 Claims**

1. A compound corresponding to the formulae

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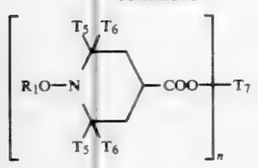
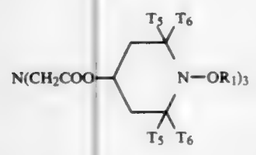
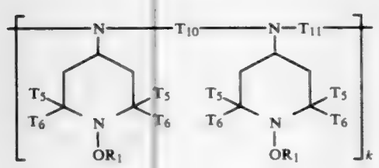
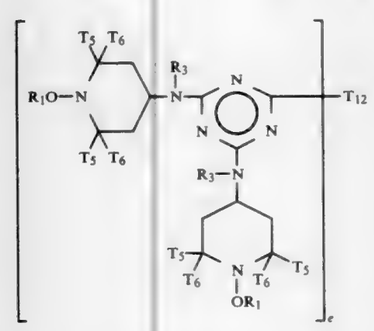
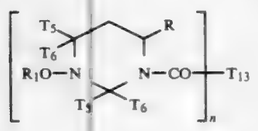
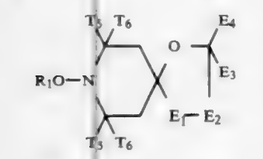


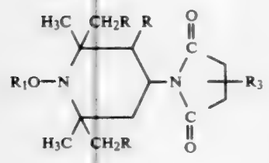




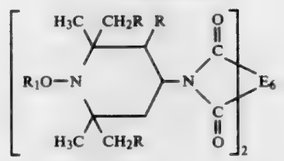








(H)



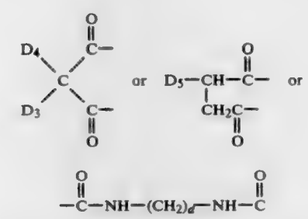
(I) R_1 is independently C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkynyl, C_5–C_8 cycloalkenyl, C_5–C_{12} cycloalkyl, C_6–C_{10} bicycloalkyl, C_6–C_{10} aryl, C_7–C_9 aralkyl, or C_7–C_9 aralkyl substituted by alkyl or C_6–C_{10} aryl;

m is 2–4,

when m is 2,

(J) R_2 is C_1–C_{12} alkylene, C_4–C_{12} alkenylene, xylylene, a divalent acyl radical of an aliphatic, cycloaliphatic, araliphatic or aromatic carboxylic acid, or of a dicarbamic acid,

(K)



wherein D_3 and D_4 are independently hydrogen, an alkyl radical containing up to 8 carbon atoms, an C_6–C_{10} aryl or an C_7–C_9 aralkyl or 3,5-di-tert-butyl-4-hydroxybenzyl radical, D_5 is hydrogen, or an alkyl or alkenyl radical containing up to 18 carbon atoms, and d is 0–20;

when m is 4, R_2 is a trivalent acyl radical of an aliphatic, unsaturated aliphatic, cycloaliphatic, or aromatic tricarboxylic acid;

(L) when m is 4, R_2 is a tetravalent acyl radical of a saturated or unsaturated aliphatic or aromatic tetracarboxylic acid,

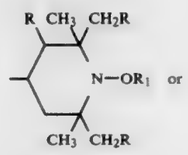
p is 1, 2 or 3,

R_3 is hydrogen, C_1–C_{12} alkyl, C_5C_7 cycloalkyl, C_7–C_8 aralkyl, C_2–C_{18} alkanoyl, C_3–C_5 alkenoyl or benzoyl;

when p is 1,

(M) R_4 is hydrogen, C_1–C_{18} alkyl C_5C_7 cycloalkyl, C_2–C_8 alkenyl unsubstituted or substituted by a cyano, carbonyl or carbamide group, C_6–C_{10} aryl, C_7–C_9 aralkyl, glycidyl, a group of the formula $—CH_2—CH(OH)—Z$ or of the formula —CO—Z— or —CONH—Z wherein Z is hydrogen, methyl or phenyl; or a group of the formulae

(N)



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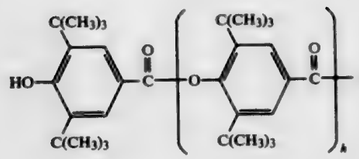
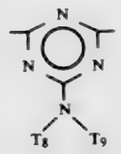


or R_3 and R_4 together when p is 1 can be alkylene of 4 to 6 carbon atoms or 2-oxapolyalkylene or the cyclic acyl radical of an aliphatic or aromatic 1,2- or 1,3-dicarboxylic acid,

when p is 2,

R_4 is a direct bond or is C_1–C_{12} alkylene, C_6–C_{12} arylene, xylylene, a $—CH_2CH(OH)—CH_2$ group, or a group $—CH_2—CH(OH)—CH_2—O—X—O—CH_2—CH(OH)—CH_2—$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene; or, provided that R_3 is not alkanoyl, alkenoyl or benzoyl, R_4 can also be a divalent acyl radical of an aliphatic, cycloaliphatic or aromatic dicarboxylic acid or of a dicarbamic acid, or can be the group —CO—; or

R_4 is



where T_8 and T_9 are independently hydrogen, alkyl of 1 to 18 carbon atoms, or T_8 and T_9 together are alkylene of 4 to 6 carbon atoms or 3-oxapentamethylene,

when p is 3,

R_4 is 2,4,6-triazinyl,

n is 1 or 2,

when n is 1,

R_5 and R'_5 are independently C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_7–C_{12} aralkyl, or R_5 is also hydrogen, or R_5 and R'_5 together are C_2–C_8 alkylene or C_2–C_8 hydroxyalkylene or C_4–C_{22} acyloxyalkylene;

when n is 2,

R_5 R'_5 together are $(—CH_2)_2C(CH_2—)_2$;

R_6 is hydrogen, C_1–C_{12} alkyl, allyl, benzyl, glycidyl or C_2–C_6 alkoxyalkyl;

when n is 1,

R_7 is hydrogen, C_1–C_{12} alkyl, C_3–C_5 alkenyl, C_7–C_9 aralkyl, C_5–C_7 cycloalkyl, C_2–C_4 hydroxyalkyl, C_2–C_4 alkoxyalkyl, C_6–C_{10} aryl, glycidyl, a group of the formula $—(CH_2)_t—COO—Q$ or of the formula $—(CH_2)_t—OC—O—Q$ wherein t is 1 or 2, and Q is C_1–C_4 alkyl or phenyl; or

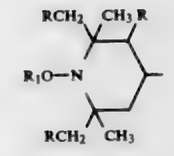
when n is 2,

R_7 is C_2–C_{12} alkylene, C_6–C_{12} arylene, a group $—CH_2CH(OH)—CH_2—O—X—O—CH_2—CH(OH)—CH_2—$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene, or a group $—CH_2CH(OZ')CH_2—(OCH_2—CH(OZ')CH_2)_2—$ wherein Z' is hydrogen, C_1–C_{18} alkyl, allyl, benzyl, C_2–C_{12} alkanoyl or benzoyl;

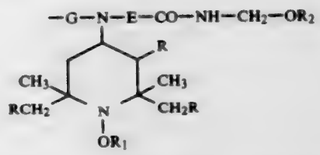
Q_1 is $—N(R_8)—$ or —O—;

E is C_1–C_3 alkylene, the group $—CH_2—CH(R_9)—O—$ wherein R_9 is hydrogen, methyl or phenyl, the group $—(CH_2)_3—NH—$ or a direct bond;

R_{10} is hydrogen or C_1–C_{18} alkyl, R_8 is hydrogen, C_1–C_{18} alkyl, C_5–C_7 cycloalkyl, C_7–C_{12} aralkyl, cyanoethyl, C_6–C_{10} aryl, the group $—CH_2—CH(R_9)—OH$ wherein R_9 has the meaning defined above; a group of the formula



or a group of the formula



wherein G is C_2–C_6 alkylene or C_6–C_{12} arylene; or R_8 is a group —E—CO—NH—CH_2—OR_{10};

T_3 is ethylene or 1,2-propylene, or is the repeating structural unit derived from an alpha-olefin copolymer with an alkyl acrylate or methacrylate;

k is 2 to 100;

T_4 has the same meaning as R_4 when p is 1 or 2,

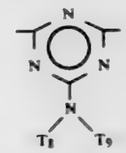
T_5 is methyl,

T_6 is methyl or ethyl, or T_5 and T_6 together are tetramethylene or pentamethylene,

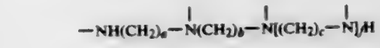
M and Y are independently methylene or carbonyl;

T_7 is the same as R_7,

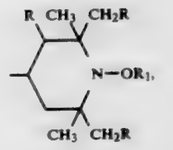
T_{10} and T_{11} are independently alkylene of 2 to 12 carbon atoms, or T_{11} is



T_{12} is piperazinyl, $—NR_{11}—(CH_2)_d—NR_{11}—$ or



where R_{11} is the same as R_3 and is also



a, b and c are independently 2 or 3, and f is 0 or 1,

e is 2, 3 or 4;

T_{13} is the same as R_2 with the proviso that T_{13} cannot be hydrogen when n is 1;

E_1 and E_2, being different, each are —CO— or $—N(E_5)$ where E_5 is hydrogen, C_1–C_{12} alkyl or alkoxycarbonylalkyl of 4 to 22 carbon atoms;

E_3 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl, said phenyl or said naphthyl substituted by chlorine or by alkyl of 1 to 4 carbon atoms, or phenylalkyl of 7 to

12 carbon atoms, or said phenylalkyl substituted by alkyl

atoms, —OH, $—OCH_3$, —CN, $—CF_3$, $—NO_2$, —F, —Cl,

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12 carbon atoms, or said phenylalkyl substituted by alkyl of 1 to 4 carbon atoms,

E_4 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl or phenylalkyl of 7 to 12 carbon atoms, or

E_3 and E_4 together are polymethylene of 4 to 17 carbon atoms, or said polymethylene substituted by up to four alkyl groups of 1 to 4 carbon atoms, and

E_6 is an aliphatic or aromatic tetravalent radical, and with the proviso that in formula B when R_1 is alkyl, R_3 is not hydrogen.

5,204,474

2,6-DIARYLPIPERIDIN-1-YL SUBSTITUTED 2-BUTENE STABILIZERS

Glen T. Cunkle, Stamford, Conn., and Joseph E. Babiarz, Amawalk, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1991, Ser. No. 709,688

Int. Cl.[5] **C07D** *401/06, 498/10, 513/10, 515/10*

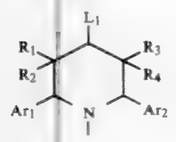
U.S. Cl. 546—193 **6 Claims**

1. A compound of formula I

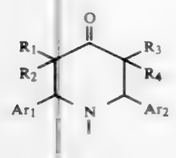
$$T—CH_2—CH=CH—CH_2—T \quad (I)$$

wherein

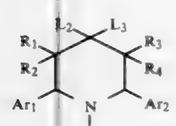
T is a group of formula III, IV, V or VI



(III)



(IV)



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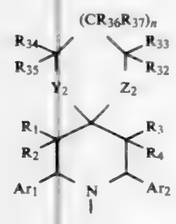


(VI)

where Ar_1 and Ar_2 are independently carbocyclic aryl of 6 to 10 carbon atoms; or said aryl substituted by one to three substituents selected from the group consisting of alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, $—COOG_1$ where G_1 is hydrogen or alkyl of 1 to 20 carbon atoms, $—COG_2$ where G_2 is alkyl of 1 to 20 carbon atoms, $—NR_5R_6$ where R_5 and R_6 are independently hydrogen or alkyl of 1 to 20 carbon atoms, $—SG_3$ where G_3 is carbocyclic aryl of 6 to 10 carbon atoms or alkyl of 1 to 20 carbon atoms, —OH, $—OCH_3$, —CN, $—CF_3$, $—NO_2$, —F, —Cl, —Br or —I;

R_1, R_2, R_3 and R_4 are independently hydrogen; a linear or branched alkyl of 1 to 30 carbon atoms; said alkyl terminated with $—OR_7$, $—NR_8R_9$, $—SR_{10}$, $—COOR_{11}$ or $—CONR_{12}R_{13}$, where R_7, R_8, R_9, R_{10} and R_{11} are independently hydrogen, alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 18 carbon atoms, and R_{12} and R_{13} are independently hydrogen or the same meaning as R_{11}; or said alkyl interrupted by one or two —O—, —S—, —SO—, $—SO_2—$, —CO—, —COO—, —OCO—, $—CONR_{14}—$, $—NR_{14}CO—$ or $—NR_{15}—$ where R_{14} and R_{15} have the same meaning as R_{12}; alkenyl of 3 to 20 carbon atoms; or carbocyclic aryl of 6 to 10 carbon atoms;

L_1 is hydrogen, $—OR_{25}$ where R_{25} is hydrogen or alkyl of 1 to 30 carbon atoms, $—NR_{26}R_{27}$, $—OCOR_{28}$, $—NCOR_{29}$ where R_{26}, R_{27}, R_{28} and R_{29} have the same meaning as R_{25};

L_2 and L_3 are independently $—Y_1—R_{30}$ or $—Z_1—R_{31}$ where Y_1 and Z_1 are independently —O—, —S— or $—NR_{26}—$, and R_{30} and R_{31} are hydrogen or alkyl of 1 to 30 carbon atoms; and

n is 0 or 1, Y_2 and Z_2 are independently —O—, —S— or $—NR_{26}—$, and R_{32}, R_{33}, R_{34}, R_{35}, R_{36} and R_{37} are independently hydrogen or alkyl of 1 to 30 carbon atoms.

5,204,475

SUBSTITUTED 3-AMINOSYDNONE IMINES AND SALTS THEREOF

Karl Schönafinger, Alzenau; Rudi Beyerle, Frankfurt; Helmut Bohn, Schöneck, and Melitta Just, Langen, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 16, 1991, Ser. No. 730,996

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1990, 4028679

Int. Cl.[5] **C07D** *413/04;* **A61K** *31/445*

U.S. Cl. 546—210 **8 Claims**

1. Substituted 3-aminosydnone imines of the formula I

(I)

in which n denotes 0 or 1, or their pharmacologically acceptable salts or acid addition salts.

5,204,476

FLUOROPHENYLPYRIDINES

Andreas Wächtler, Griesheim; Elke Poetsch, Mühltal; Thomas Geelhaar, Mainz; Reinhard Hittich, Modautal; Volker Reiffenrath, Rossdorf, and Hans-Michael Kompter, Riedstadt-Erfelden, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankger Haftung, Fed. Rep. of Germany

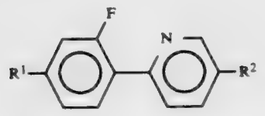
Filed Dec. 18, 1990, Ser. No. 628,887

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1989, 3941761; Jun. 20, 1990, 4019595

Int. Cl.[5] **C07D** *213/65, 213/26, 213/55, 213/80*

U.S. Cl. 546—290 **4 Claims**

1. A fluorophenylpyridine of the formula I:



where

R^1 and R^2 are, in each case independently of each other, linear C_{1-18}-alkyl or linear C_{2-5}-alkenyl radicals, wherein in each case one or more CH_2 groups may optionally be replaced by —O—, —CO—O—, —O—CO—or —C≡C—, two oxygen atoms not being adjacent.

5,204,477

PYRIDINE DERIVATIVES IN LIQUID CRYSTALLINE MEDIUM USEFUL FOR ELECTROOPTICAL DISPLAY ELEMENTS

Volker Reiffenrath, Rossdorf; Eike Poetsch, Mühltal; Volker Meyer, Gross-Zimmern, and Herbert Plach, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

PCT No. PCT/EP90/01535, § 371 Date Nov. 29, 1990, § 102(e) Date Nov. 29, 1990, PCT Pub. No. WO91/04249, PCT Pub. Date Apr. 4, 1991

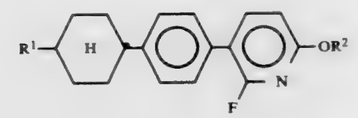
PCT Filed Sep. 12, 1990, Ser. No. 623,394

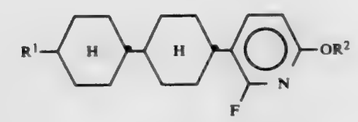
Claims priority, application United Kingdom, Sep. 22, 1989, 8921519

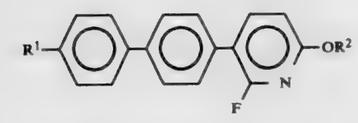
Int. Cl.[5] **C07D** *213/62, 213/63, 213/64*

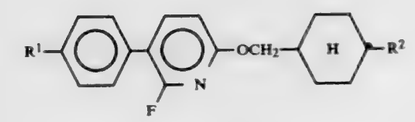
U.S. Cl. 546—303 **2 Claims**

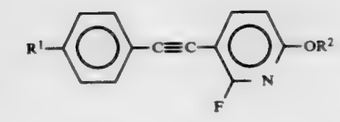
1. A pyridine derivative of the Formulae Ia-Ir:

Ia 

Ib 

Ic 

Id 

Ie 

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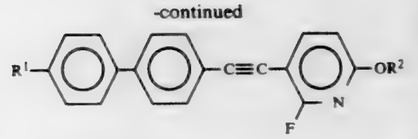
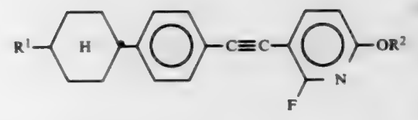
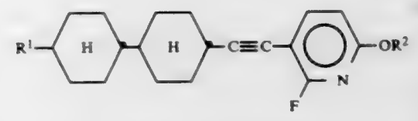
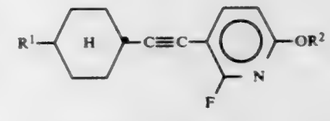
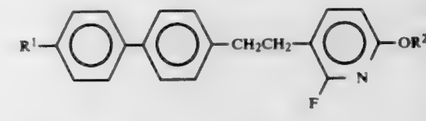
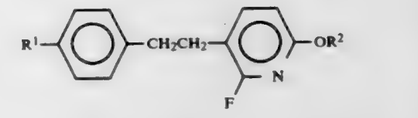
If 

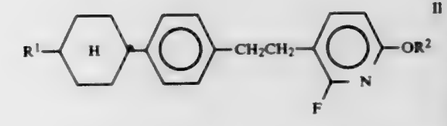
Ig 

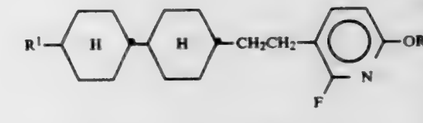
Ih 

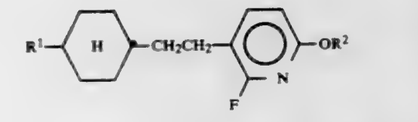
Ii 

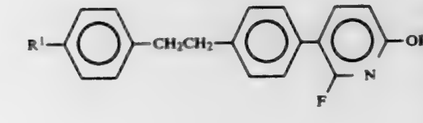
Ij 

Ik 

Il 

Im 

In 

Io 

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5,204,479

DERIVATIVES OF

5,204,481

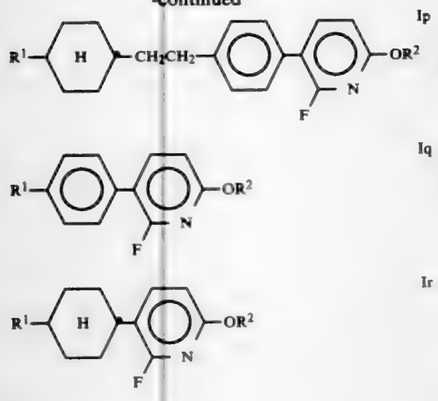
PROCESS FOR PREPARING BENZOTHIAZOLE

5,204,482

COMPOUNDS FOR TREATING AND PREVENTING

VOL 1149 ISS 3 AP 20 1993 UMI

-continued



wherein

R^1 is a straight-chain alkyl, alkoxy, alkenyl, or oxaalykyl group with up to 15 C atoms in the alkyl residue, and

R^2 is alkyl, alkenyl, oxaalykyl, or alkylcarbonyl with up to 15 C atoms in the alkyl residue.

5,204,478

PROCESS FOR THE SYNTHESIS OF 2,6-DICHLORO-5-FLUORONICOTINIC ACID AND 2,6-DICHLORO-5-FLUORONICOTINOYL CHLORIDE

Rex A. Jennings, Holland, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 20, 1992, Ser. No. 932,452

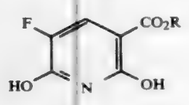
Int. Cl.[5] C07D *213/55*

U.S. Cl. 546—315 **27 Claims**

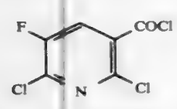
1. A process for the preparation of the compound of Formula I

which comprises:

Step (a) heating a compound of Formula III



wherein R is lower alkyl or benzyl with $POCl_3$ in the presence of a lithium reagent and subsequently diluting with a solvent, filtering and distilling to afford the compound of Formula II; and



Step (b) reacting the compound of Formula II in water with a base, extracting the resulting solution with a solvent, and neutralizing with an acid to afford the compound of Formula I.

5,204,479

DERIVATIVES OF 1,2,5,6-TETRAHYDROPYRIDIN-3-CARBOXALDEHYDE OXIME

Emilio Toja, Milan; Carla Bonetti, Fontanella; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

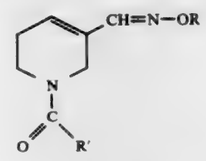
Filed May 15, 1991, Ser. No. 699,631

Claims priority, application Italy, May 15, 1990, 20311 A/90

Int. Cl.[5] C07D *211/70*

U.S. Cl. 546—328 **5 Claims**

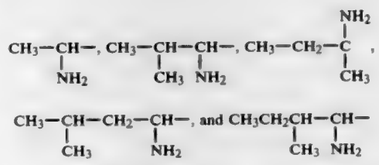
1. A compound of formula (I):



in which:

R represents hydrogen, alkyl, alkenyl, alkynyl or aralkyl containing up to 8 carbon atoms, and

R′ represents a member selected from the group consisting of



or a pharmaceutically acceptable addition salt thereof.

5,204,480

5-(1-HYDROXYLCYCLOALKYL)-2-METHOXY PYRIDINE COMPOUNDS

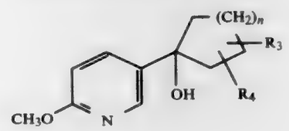
Richard C. Effland, Bridgewater, N.J., and David M. Fink, Doylestown, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 710,472, Jun. 5, 1991, Pat. No. 5,112,981, which is a division of Ser. No. 594,496, Oct. 9, 1990, Pat. No. 5,039,809, which is a division of Ser. No. 394,448, Aug. 16, 1989, Pat. No. 4,978,663. This application Feb. 21, 1992, Ser. No. 838,983

Int. Cl.[5] C07D *213/64*

U.S. Cl. 546—344 **5 Claims**

1. A compound having the formula,



where

n is 1, 2 or 3;

R_3 is hydrogen or loweralkyl; and

R_4 is hydrogen or loweralkyl.

5,204,481

PROCESS FOR PREPARING BENZOTHIAZOLE SULFENIMIDES USING AN ALIPHATIC HYDROCARBON SOLVENT

Sharen B. Carroll, Akron; Horng-Jau Lin, Wadsworth, and Roger K. Rains, Richfield, all of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 8, 1992, Ser. No. 894,965

Int. Cl.[5] C07C *277/62, 277/68, 277/76*

U.S. Cl. 548—157 **9 Claims**

1. In the process of producing N-alkyl- or N-cycloalkyl-2-benzothiazole sulfenimides by the reaction of the corresponding N-alkyl- or N-cycloalkyl-2-benzothiazole sulfenamide with an acid having an ionization constant, K_a, which is greater than 0.001 at 25° C., the improvement wherein the reaction is performed in a reaction medium consisting essentially of aliphatic hydrocarbons, in which reaction medium neither the starting sulfenamide material nor the sulfenimide product is more than slightly soluble.

5,204,482

COMPOUNDS FOR TREATING AND PREVENTING COGNITIVE DISEASES AND DEPRESSION AND METHODS OF MAKING SAME

Walter Gassner, Bottmingen; René Imbof, Gipf-Oberfrick; Emilo Kyburz, Reinach, all of Switzerland, assignors to Hoffman-LaRoche Inc., Nutley, N.J.

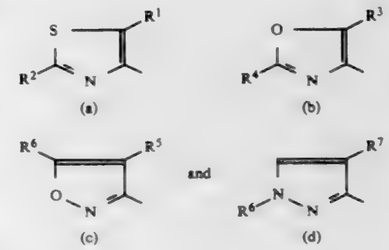
Division of Ser. No. 383,777, Jul. 21, 1989, Pat. No. 5,011,849. This application Feb. 4, 1991, Ser. No. 650,320

Claims priority, application Switzerland, Jul. 28, 1988, 2871/88

Int. Cl.[5] C07D *277/56, 263/34, 261/18, 231/14*

U.S. Cl. 548—200 **3 Claims**

1. A compound of formula R—CO—Y wherein R is one of the groups



and

Y is a group —NH—CH_2—CH_2—R^{14}; in which R^1 is phenyl, monohalophenyl, monolower-alkylphenyl, monocyanophenyl, monoaryl-lower-alkoxyphenyl, dihalophenyl, furyl, thienyl or monohalothienyl;

$R^2$is hydrogen, halogen or amino;

R^3, R^5 and R^7 each independently are phenyl, monohalophenyl dihalophenyl, thienyl, furyl or monohalofuryl;

R^4 and R^6 each are hydrogen or amino;

R^8 is hydrogen or lower-alkyl; and

R^{14} is a leaving group selected from the group consisting of halogen, arylsulfonyloxy and alylsulfonyloxy.

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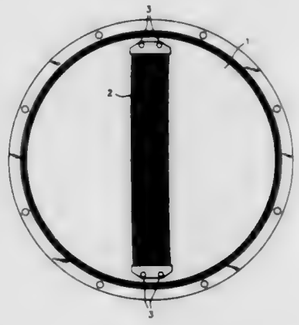
5,204,483
GUN BARREL CLEANING DEVICE
Albert F. Tellechea, Centray Plaza, 135 W. Central Blvd., Suite 850, Orlando, Fla. 32801
Filed Apr. 2, 1992, Ser. No. 862,213
Int. Cl.[5] F41C *31/00*
U.S. Cl. 42—95 24 Claims

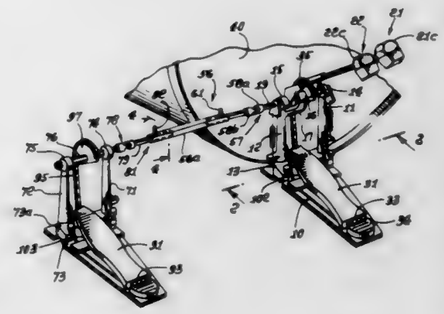
14. A device for cleaning the barrel of a gun in combination with a gun barrel cleaning mechanism, comprising:
a) a first shaft insertable within a gun barrel having a first end, a second end, and an exterior surface;
b) said first end having means for attaching said first shaft to said gun barrel cleaning mechanism; and
c) a first bushing mounted on said exterior surface of said first shaft for maintaining the spacing of said first shaft from the internal surface of said gun barrel.

5,204,484
SHARE ARRANGEMENT IN A PERCUSSION INSTRUMENT ATTACHED TO DRUM HEAD
Arthur W. Netto, Sao Paulo, Brazil, assignor to Weril Instrumentos Musicais Ltda., Sao Paulo, Brazil
Continuation of Ser. No. 670,937, Mar. 18, 1991, abandoned.
This application Jun. 16, 1992, Ser. No. 899,033
Claims priority, application Brazil, Jul. 4, 1990, MU7001165
Int. Cl.[5] G10D *13/02*
U.S. Cl. 84—415 4 Claims



2. A percussion instrument according to claim 1, wherein the snare is attached to the head internally of the instrument.

5,204,485
MULTI-AXLE DRUM BEATER AND PEDAL APPARATUS
Donald G. Lombardi, 2118 E. Hillcrest Dr., Thousand Oaks, Calif. 91360
Filed Oct. 28, 1991, Ser. No. 783,864
Int. Cl.[5] G10D *13/00*
U.S. Cl. 84—422.1 12 Claims



1. In a drum beating assembly, the combination comprising
a) a first frame including first pedestal means,
b) first, second and third bearings carried by the first pedestal means, in spaced coaxial relation, said third bearing including two axially spaced bearing elements, and a housing for said elements,
c) a primary axle carried by the first and third bearings, and a primary drum beater carried by the said primary axle,
d) a secondary axle carried by the second and third bearings, and a secondary drum beater carried by said secondary axle,
e) said primary and secondary axles being independently rotatable, there being a first pedal operatively connected to the primary axle to rotate the primary axle and primary drum beater in response to pedal pivoting, the secondary axle and secondary drum beater being rotatable by auxiliary means, adjustably positioned relative to the first frame,
f) and a first base plate integrally supporting said first pedestal means, the first plate also supporting the first pedal for pivoting relative thereto,
g) said pedestal means including primary and secondary upright pedestals respectively carrying said first and second bearings, said housing for said two axially spaced bearing elements being located between and spaced from said first and second bearings, there being an arm having one end connected to the secondary upright pedestal below the second bearing, the arm extending sidewardly from said secondary pedestal above the level of said pedal and then upwardly to said housing which is mounted on said arm,
h) the primary axle extending to and supported by said first bearing and one of said two axially spaced bearing elements, and the secondary axle supported by the second bearing and the other of said two axially spaced bearing elements.

5,204,486
KEYBOARD DEVICE OF AN ELECTRONIC KEYBOARD

tric transducer element in contact with the first face, and

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b) optical coupler means for connecting the optical energy to an optical fiber for transmission therethrough;

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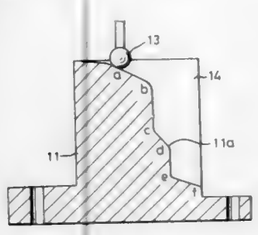
5,204,486

KEYBOARD DEVICE OF AN ELECTRONIC KEYBOARD INSTRUMENT

Myung H. Kim; Woo H. Kim, both of Seoul, and Byung J. Choi, Kyungki-do, all of Rep. of Korea, assignors to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 23, 1991, Ser. No. 689,972
Claims priority, application Rep. of Korea, Apr. 30, 1990, 6287/1990; Jun. 30, 1990, 9865/1990; Aug. 31, 1990, 13658/1990; Dec. 29, 1990, 22437/1990
Int. Cl.[5] G10C *3/12*
U.S. Cl. 84—439 13 Claims



1. A keyboard device of an electronic keyboard instrument generating a sound upon actuation of a switch arranged at a main plate by a pushing operation of a keyboard, comprising a guide bar protruding from an underside of a key of the keyboard, and a guide member having a stepped friction surface which contacts the guide bar as it moves along the guide member in a stepwise path.

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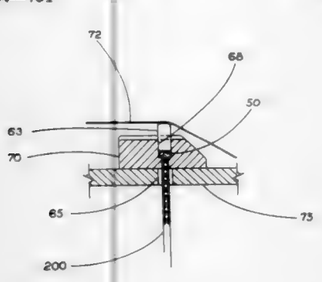
HIGH OUTPUT FILM PIEZOELECTRIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

Robert A. Turner, 209 Bassett St., Petaluma, Calif. 94952

Continuation-in-part of Ser. No. 681,116, Apr. 5, 1991. This application Sep. 17, 1991, Ser. No. 762,569
Int. Cl.[5] G10H *3/18;* H04R *17/00*
U.S. Cl. 84—731 29 Claims



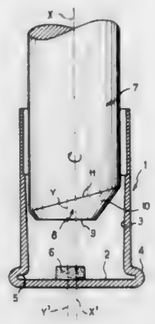
1. An electro-mechanical pickup for a musical instrument having a plurality of strings, comprising:
an elongated multi-faced core having a first face opposite a second face,
a first piezoelectric transducer element connected in parallel with a second piezoelectric transducer element,
each piezoelectric transducer element comprising:
a piezoelectric film having a first surface and a second
a piezoelectric film having a first surface and a second surface,
a first electrode on the first surface, and
a second electrode on the second surface,
each piezoelectric transducer element being responsive to more than one string,
the first piezoelectric transducer element being stacked on the core with the second electrode of the first piezoelectric transducer element in contact with the first face, and
the second piezoelectric transducer element being stacked on the first piezoelectric transducer element with the first electrode of the second transducer element in contact with the first electrode of the first piezoelectric transducer element, and
an output lead attached to the core, the output lead having a first conductor and a second conductor,
the first conductor electrically contracting the first electrode of the first piezoelectric transducer element and the first electrode of the second piezoelectric transducer element, and
the second conductor electrically contacting the second electrode of the first piezoelectric transducer element and the second electrode of the second piezoelectric transducer element.

5,204,488

PROCESS AND APPARATUS FOR PRIMING AMMUNITION CASINGS THAT ARE FIRED BY PERCUSSION ON AN ANNULAR FLANGE OF THE CASINGS

Gratien Cimolino, Othis; Michel Pitavy, Vaucresson, and Roger Dolbet, Clermont, all of France, assignors to N.C.S. Pyrotechnie et Technologies, Survilliers, France

Filed Feb. 20, 1992, Ser. No. 838,161
Claims priority, application France, Feb. 20, 1991, 91 02011
Int. Cl.[5] F42B *33/24*
U.S. Cl. 86—32 16 Claims



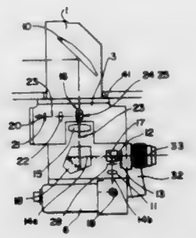
1. In a process for priming ammunition casings (1) comprising a bottom (2) connected to a cylindrical side wall (3) by an annular flange (4) defining within the casing an annular throat (5) adapted to receive a pyrotechnic priming composition (6), the process comprising depositing on the bottom of the casing said composition (6), then introducing said composition (6) into said throat (5); the improvement comprising introducing said composition into said throat (5) by subjecting the composition (6) disposed on the bottom (2) of the casing to a progressive compression in an oblique direction (D) relative to the axis (X–X') of the casing and directed toward the throat (5), this progressive oblique compression being created by means of a surface (8), without a sharp angle and which is eccentric relative to said axis (X–X') of the casing, which is caused to turn about said axis (X–X').

5,204,489

MODULAR AND RECONFIGURABLE EPISCOPIC SIGHT

Jean-François R. Pellarin, Saint Cyr l'Ecole, and Gilles M. Colin, Meudon, both of France, assignors to GIAT Industries, France

Filed Dec. 17, 1990, Ser. No. 628,012
Claims priority, application France, Dec. 20, 1989, 89 16888
Int. Cl.[5] F41G *1/40, 3/22*
U.S. Cl. 89—41.19 10 Claims



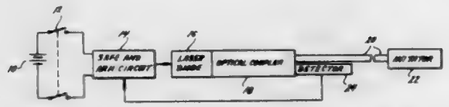
1. A modular episcopic sight for day and night observation and firing of a gun for a vehicle, said gun defining a firing axis, comprising:
a head module containing a head mirror adapted for rigid connection to said vehicle;
a module of separation adapted for rigid attachment to said vehicle for receiving an image from said head mirror, wherein said module of separation includes a sight reticule and means for generation of an image of said sight reticule; and
a detachable day module and a detachable night module cooperable with said module of separation such that said image of said sight reticule is projected into said day and night modules, wherein said means for generation of an image of said sight reticule comprises:
(a) a projection collimator defined by a diode for illuminating said sight reticule; and
(b) a rhombohedron to project said image of said sight reticule into said day and night modules, wherein said rhombohedron comprises a first face opposite said night module and a second face opposite said day module, said first face treated to reflect a portion of radiation emitted by said diode toward said second face and to transmit another portion of radiation to said night module, said second face treated to reflect said portion of radiation to said day module.

5,204,490

LASER DIODE APPARATUS FOR INITIATION OF EXPLOSIVE DEVICES

Barbara A. Soltz, Spring Valley, N.Y.; Charles R. Chubb, St. Peters, Mo.; John M. Haake, St. Charles, Mo.; Richard G. Podgornik, St. Louis, Mo., and Dale F. Waldo, St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 21, 1991, Ser. No. 719,038
Int. Cl.[5] F42C *19/00*
U.S. Cl. 102—201 5 Claims



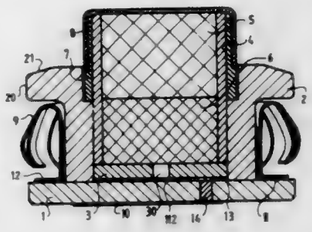
1. Apparatus for laser ignition of explosives, comprising:
a) light means for producing optical energy;
b) optical coupler means for connecting the optical energy to an optical fiber for transmission therethrough;
c) ignition means connected to the optical fiber for receiving the optical energy wherein the ignition means is disposed to ignite an explosive charge at a predetermined optical energy level;
d) electrical control means connected to the light means for generating optical energy at a low threshold power level wherein optical energy is reflected from the ignition means into the optical fiber;
e) detector means connected to the optical coupler means for receiving the reflected optical energy wherein the detector means supplies an input to the electrical control means indicating the status of continuity in the optical circuit;
f) the electrical control means further comprising firing circuits for generating a high threshold power level to ignite the ignition means; and
g) polarizing means included in the optical coupler means having piezoelectric means for blocking the optical energy in response to the electrical control means.

5,204,491

PYROTECHNIC DETONATOR USING COAXIAL CONNECTIONS

Thierry Auréal, Poitiers; Joël Bassard, Marcilly en Villette; Gérard Humily, and Christophe Rivière, both of Orleans, all of France, assignors to Thomson — Brandt Armements, Boulogne Billancourt, France

Filed Nov. 15, 1991, Ser. No. 792,422
Claims priority, application France, Nov. 27, 1990, 90 14785
Int. Cl.[5] F42B *3/12*
U.S. Cl. 102—202.14 17 Claims



1. A pyrotechnic detonator with coaxial connections comprising
electrical projected-layer control means including a barrel, a first cylindrical element forming an anvil, which has a bottom and an opposite surface with a circular edge and an assembly including a fusible bridge with two ends and a thin layer of a material disposed on said bridge, said assembly being located between said anvil and said barrel;
electrical supply means for said control means, including at least one conducting surface situated on the bottom of the anvil and hermetic electrical crossing means for connecting said conducting surface to one end of said fusible bridge through said anvil;
pyrotechnic means when initiated by said electrical projected-layer control means;
a second non-conducting cylindrical element formed as a hollow plug having a cylindrical body, and having a first end and a second end, said first end being pressed against said anvil and said second end having a guide shoulder;
a cylindrical flexible contact part being fitted around said plug between said shoulder and the circular edge of the anvil;
assembling means for hermetically sealing said plug to said anvil; and
hermetic closing means for hermetically sealing said detonator, said closing means being fixed at said second end of

said plug and holding the pyrotechnic means inside said

groove spacing in an adjacent second one of said form-locking zone regions.

of the inert insertion (1), a cone or truncated cone (5), respec-

defining an edge of the opening, a corresponding side wall each of the U-shaped members comprising spaced apart

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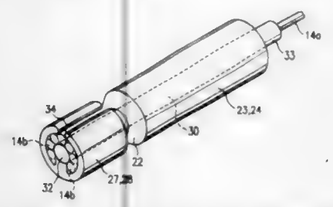
said plug and holding the pyrotechnic means inside said plug against said barrel.

5,204,492

LOW NOISE, LOW SHRAPNEL DETONATOR ASSEMBLY FOR INITIATING SIGNAL TRANSMISSION LINES

Merritt Jacob, Ayrshire, Scotland; Peter F. Reiss, Sugarloaf, and Samual G. Stednitz, St. Clair, both of Pa., assignors to ICI Explosives USA Inc., Wilmington, Del.

Filed Oct. 30, 1991, Ser. No. 784,780
Int. Cl.[5] C06C *5/04*; F42B *3/103*
U.S. Cl. 102—275.12 **17 Claims**



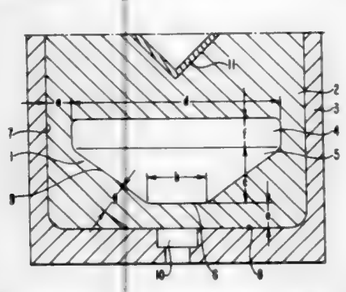
1. A low noise, low shrapnel detonator assembly for initiating signal transmission lines, comprising:
(a) a low strength detonator with a closed end and between about 75 to about 150 mg of explosives contained in said closed end;
(b) a high confinement connection block with a first and a second end which houses said low strength detonator;
(i) said first end comprising a retention block which holds said low strength detonator with said closed end exposed;
(ii) said second end comprising a confining wall extended from said retention block that surrounds said closed end of said low strength detonator, said confining wall having a gap through which one to a plurality of signal transmission lines can be inserted and operatively confined adjacent said closed end between said confining wall and said closed end.

5,204,493

INERT INSERTION FOR EXPLOSIVE WAVE GUIDANCE IN SHAPED CHARGES

Wolfgang Christmann, Rotdornbusch 44, 5070 Berg. Gladbach, Paffrath; Gerhard Lindner, Schillerstr. 4a, 5064 Rösrath, and Paul Lingens, Kursiefener Str. 22, 5068 Odenthal, all of Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 102,262
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852359
Int. Cl.[5] F42B *1/02*
U.S. Cl. 102—307 **1 Claim**



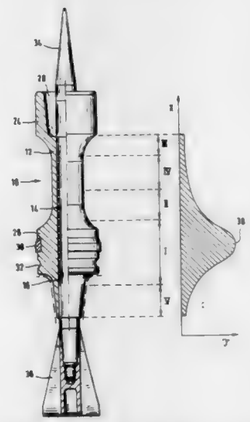
1. Inert insertion for the explosive wave guidance in shaped charges featuring a cylindrical part and which is inserted into an explosive, characterized in that, on the cylindrical part (4) of the inert insertion (1), a cone or truncated cone (5), respectively, is continuously connected and whose tip or surface (6), respectively, is facing the ignition-side end (8) of the explosive (2) and in which with a diameter d of the cylindrical part (4)
the diameter b of surface (6) of truncated cone (5) is ¾ to 0 d,
the height c of the cone or truncated cone (5), respectively, is ¼ to 1/10 d,
the height f of cylindrical part (4) is ¼ to 1/10 d,
the distance a of cylindrical part (4) from the envelope surface (7) of explosive (2) amounts to at least 1/25 d, and
the thickness e of the explosive layer between the inert insertion (1) and the bottom surface (8) of the explosive (2) amounts to at least 1/25 d, and
the minimum distance g of the cone or truncated cone surface (9), respectively, from the outer surface (8) of explosive (2) is at least as great as distance a.

5,204,494

SUBCALIBER PROJECTILE WITH SABOT

Jürgen Meyer, Cologne; Achim Sippel; Heinz-Josef Kruse, both of Ratingen; Siegfried Kessler; Horst Kantner, both of Düsseldorf, and Ulrich Theis, Mülheim, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 12, 1991, Ser. No. 683,959
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012154
Int. Cl.[5] F42B *14/06*
U.S. Cl. 102—521 **13 Claims**



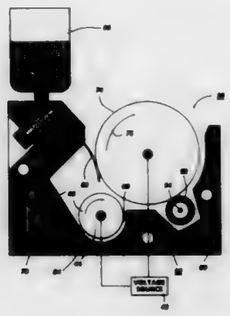
1. In a projectile arrangement including a subcalibar projectile having a projectile body, a segmented discardable propelling cage sabot which surrounds at least a partial region of the length of said projectile body, and form locking means, disposed in a common form-locking zone extending along at least a portion of said region of said projectile body, for transferring acceleration forces from said propelling cage sabot to said projectile body, with said form-locking means including corresponding annular grooves on an exterior surface of said projectile body and on an interior surface of said propelling cage sabot; the improvement wherein: said common form-locking zone is subdivided into at least two form-locking zone regions; said annular grooves in said at least two form-locking zone regions each have a respectively different groove spacing which is related to the locally occurring shear stresses such that a minimum groove spacing is associated with a region of maximum shear stress; and, said groove spacing in a first of said form-locking zone regions is at least 1.5 times as large as said groove spacing in an adjacent second one of said form-locking zone regions.

5,204,495

DEVELOPER UNIT DISTURBING BRUSH

Lawrence Floyd, Jr., Rochester; John F. Knapp, Fairport; Robert E. Trott, Webster, and Norman W. Czabaj, Jr., Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1992, Ser. No. 891,064
Int. Cl.[5] G03G *15/08*
U.S. Cl. 118—654 **14 Claims**



1. An apparatus for developing a latent image recorded on an image receiving member, including:
a housing defining a chamber storing a supply of developer material therein;
means, disposed at least partially in the chamber of said housing, for transporting a metered layer of developer material; and
means for disturbing the metered layer of developer material on said transporting means to prevent accumulation of developer material agglomerates on said transporting means creating a substantially stable, uniform layer of developer material thereon for developing the latent image recorded on the receiving member therewith, said disturbing means includes a brush having a multiplicity of fibers extending outwardly therefrom in contact with the metered layer of developer material on said transporting means, said brush being adapted to rotate and translate so as to disturb the metered layer of developer material by gently brushing thereagainst.

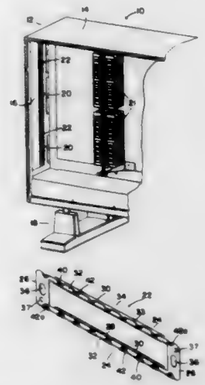
5,204,496

EMI SHIELDING GASKET

Steven G. Boulay, Schrewsbury, Mass.; Michael L. Joseph, Nashua, N.H., and Henry A. Rettstadt, Princeton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1992, Ser. No. 862,007
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 GC **6 Claims**

1. An EMI shielding gasket for use at an opening in an enclosure housing electronic components that radiate high frequency electromagnetic emissions during operation comprising:
a pair of generally parallel laterally spaced apart U-shaped channel members made of springy electrically conductive material, each of the pair of U-shaped channel members including a longitudinal bottom wall and two side walls extending from the bottom wall in a direction generally opposite and away from the other U-shaped member to terminate at a longitudinal channel entrance opening facing away from the other U-shaped member, the bottom and side walls being spaced and dimensioned to received in mounting relationship an edge portion of the enclosure defining an edge of the opening, a corresponding side wall each of the U-shaped members comprising spaced apart wall segments, the free side of each of such wall segments at the longitudinal channel entrance having turned out corners each forming a resilient electrical contact when the gasket is in EMI shielding use; and



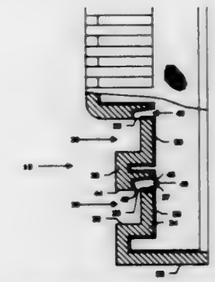
a pair of parallel spaced apart springy electrically conductive connecting portions oriented transversely of the U-shaped channel members and joined thereto at their end regions, such connecting portions being resiliently deformable to allow the U-shaped channel members to be moved more closely together to facilitate mounting the U-shaped channel members on opposite edges of the enclosure opening.

5,204,497

COMPUTER FRONT PANEL WITH OFFSET AIRFLOW LOUVERS

Gregory E. Herrick, Minneapolis, Minn., assignor to Zeos International, Inc., New Brighton, Minn.

Filed May 30, 1990, Ser. No. 544,116
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 R **7 Claims**



1. Panel for a personal computer comprising:
a. a panel member constructed to be resistant to RF transmission;
b. a plurality of louvers in said front panel; and,
c. an offset means in each of said louvers for blocking the path of RF transmission.

5,204,498

5,204,500

ERGONOMETRIC STETHOSCOPE CHESTPIECE

wherein each resonance means is composed of a rigid conductive hood, an annular air pressure compensation cham-

rotary and linear contact elements disposed between said carrier element and said stationary contacts;

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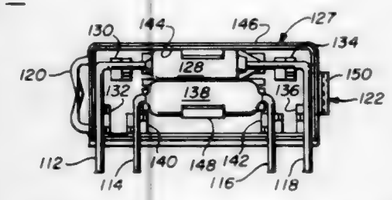
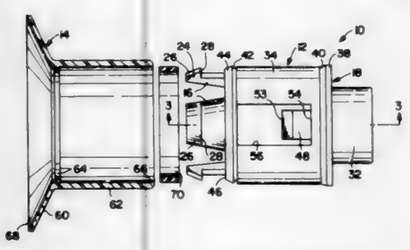
5,204,498
PACKAGING ASSEMBLY
Larry L. Russell, Lexington, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed Dec. 30, 1991, Ser. No. 811,701
Int. Cl.[5] H05K 5/00
U.S. Cl. 174—52.1 10 Claims



1. A packaging unit for an electrical assembly having projecting leads therefrom comprising:
first and second halves of a box-like housing for containing the electrical assembly whose leads project therefrom;
symmetrical mating means integrally formed on each of the first and second halves for snapping the halves securely together to form an enclosed housing for the electrical assembly; and
passageways within and formed by the housing halves for supporting the projecting leads.

5,204,499
SNAP-IN CONNECTOR WITH INTEGRAL SPRING
Mark L. Favalora, Niantic, Conn., assignor to Hubbell Incorporated, Orange, Conn.
Filed May 3, 1991, Ser. No. 695,696
Int. Cl.[5] H02G 3/22
U.S. Cl. 174—65 R 25 Claims



1. A connector for coupling an electrical conduit to a support having an aperture, the combination comprising:
a tubular body member having a longitudinal axis and first and second ends and including
a plurality of resilient legs extending outwardly from said first end and being adapted to deflect to pass through the aperture, said legs having locking tongues extending radially outwardly therefrom and
retaining means, adjacent said second end, for retaining the conduit therein; and
spring means for biasing said body member away fom the support, said spring means being rigidly coupled to said body member between said first and second ends and flaring outwardly from a second edge to a first edge, said first edge engaging the support and said second edge being immediately adjacent said legs,
whereby said locking tongues and spring means engage opposed sides of the support adjacent the aperture.

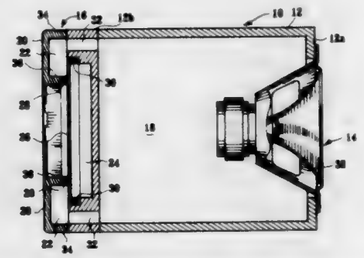
5,204,500
ERGONOMETRIC STETHOSCOPE CHESTPIECE
Joel R. Dufresne, St. Paul; Alan P. Dieken, St. Paul, and Curt Hostager, deceased, late of St. Paul, all of Minn. by Ray S. Hostager legal representative , assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 20, 1991, Ser. No. 658,099
Int. Cl.[5] A61B 7/02; H04R 25/00
U.S. Cl. 181—131 13 Claims

1. An ergonometric chestpiece for a stethoscope adapted to receive ausculatory sounds from a body and adapted to be coupled to an earpiece assembly for a user, said chestpiece adapted to grasped by a thumb and at least one finger of said user, comprising:
said chestpiece having a bottom surface which is generally planar adapted to be placed near said body for receiving said ausculatory sounds;
said chestpiece having an upper portion opposite said bottom surface;
said upper portion having a raised center portion defining left and right gripping surfaces forming recesses defined by said left and right gripping surfaces and by a surface generally parallel to but opposite said bottom surface, said recesses of said left and right gripping surfaces adapted to receive said thumb and said at least one finger of said user, respectively;
said raised center portion forming a physical stop for said thumb and said at least one finger from contacting said body when said thumb and said at least one finger grasp said raised center of said upper portion;
said gripping surfaces being defined by left and right walls, each having a concave surface arcuate about an axis generally normal to said bottom surface.

5,204,501
SYNCHRONOUS COMMON POLAR RESONANT WALL TYPE SPEAKER CABINET
Ye-Ming Tsao, 6F-4, No. 188, Sec. 3 Ting-Chou Rd., Taipei, Taiwan
Filed Feb. 20, 1992, Ser. No. 838,343
Int. Cl.[5] H05K 5/00
U.S. Cl. 181—156 2 Claims

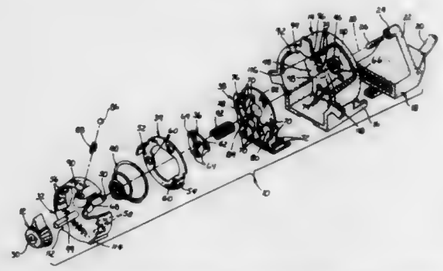
1. A synchronous common polar resonant wall type speaker cabinet comprising
a cabinet composed of a plurality of resonance wall boards including a front board and at least a resonance means, forming a main resonance cavity inside the cabinet; and
a front board and at least a speaker installed on the front board;

wherein each resonance means is composed of a rigid conductive hood, an annular air pressure compensation chamber surrounded by the rigid conductive hood and the resonance wall boards, at least a passage hole to connect the main resonance cavity to the annular air pressure compensation chamber, an enclosed compensation resonance cavity isolated from the main resonance cavity and the annular air pressure compensation chamber, a resonance plate having an outer edge between the air pressure compensation chamber and the compensation resonance



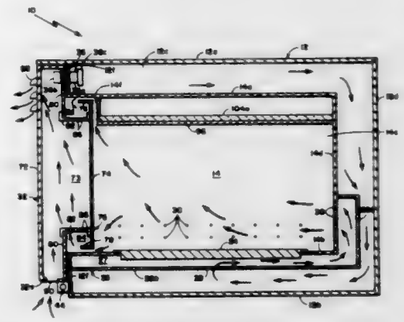
chamber, a first soft expansion gasket located between the resonance plate and the rigid conductive hood, and a second soft expansion gasket between the resonance plate and the wall board and maintained an appropriate distance from the first soft expansion gasket;
whereby a compensation air flow between the air pressure compensation chamber and the main resonance cavity can provide a kinetic energy to drive the resonance means for a synchronous and common polar oscillation synchronous with the speaker.

5,204,502
DUAL FUNCTION SWITCHING APPARATUS
Glenn E. Ferris, Fishers; Mark Z. Rada, and Frederick T. Yager, both of Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Filed Oct. 28, 1991, Ser. No. 783,597
Int. Cl.[5] H01H 9/00
U.S. Cl. 200—4 10 Claims



1. Dual function switching apparatus for an instrument panel, comprising:
a housing fastened to said panel to form a closed cavity defined in part by said panel and a rear face of said housing;
a set of stationary contacts formed in said cavity on the rear face of said housing;
a carrier element disposed within said cavity and supported on a shaft having a longitudinal axis, said shaft being supported within said cavity to permit rotation and axial displacement of said carrier element;
rotary and linear contact elements disposed between said carrier element and said stationary contacts;
means for coupling said rotary contact element to said carrier element for rotation therewith, and for biasing said rotary contact element into engagement with said set of stationary contacts, thereby defining a rotary switch assembly actuated by rotation of said carrier element; and
means for biasing said linear contact element into engagement with said carrier element, thereby defining a linear travel switch assembly actuated by axial displacement of said carrier element.

5,204,503
MICROWAVE OVEN HAVING CONVECTION AND GRIDDLE FEATURES
Joseph C. Maiellano, Jr., Chelmsford, and John S. Sklenak, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 17, 1991, Ser. No. 809,456
Int. Cl.[5] H05B 6/76
U.S. Cl. 219—10.55 B 14 Claims



1. A microwave oven comprising:
an outer housing;
a cooking cavity disposed within said outer housing, said cooking cavity comprising a top wall, a bottom wall, and side walls;
means for energizing said cooking cavity with microwave energy;
an electric griddle mounted to said bottom wall of said cooking cavity; and
means for directing a flow of air along the underside of said electric griddle and into said cooking cavity to provide convective heating within said cooking cavity.

5,204,504
HIGH-FREQUENCY HEATING APPARATUS INCLUDING RINGING EFFECT SUPPRESSOR FOR SWITCHING ELEMENT
Teruya Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 25, 1989, Ser. No. 398,506
Claims priority, application Japan, Aug. 26, 1988, 63-212043
Int. Cl.[5] H05B 6/68, 6/08
U.S. Cl. 219—10.55 B 19 Claims

1. A high frequency heating apparatus comprising:
DC (direct current)-to-AC (alternating current) inverter means, having an insulated gate bipolar transistor, for inverting DC power into high frequency AC power utilizing a resonant phenomenon by switching the insulated gate bipolar transistor at a predetermined high frequency, the AC power heating an article using electromagnetic induction;
driver means for driving a gate electrode of the insulated gate bipolar transistor for the switching;

removing means, interposed between the driver means and

5,204,506
PLASMA PINCH SURFACE TREATING APPARATUS

5,204,507
WORK ROTATING DEVICE FOR LASER BEAM

wardly along a path of travel from a casting station, and comprising the steps of

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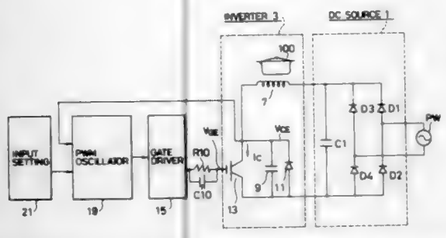
removing means, interposed between the driver means and the gate electrode of the insulated gate bipolar transistor, for removing an electron remaining between the gate electrode of the insulated gate bipolar transistor and an emitter thereof when the insulated gate bipolar transistor is turned OFF; and,



suppressing means, connected in parallel to the removing means, for suppressing vibrations of a gate voltage of the insulated gate bipolar transistor when the insulated gate bipolar transistor is turned OFF.

5,204,505

PROCESS AND APPARATUS FOR THE CONTINUOUS WELDING OF STRIPS GUIDED IN ABUTMENT BY A LASER BEAM

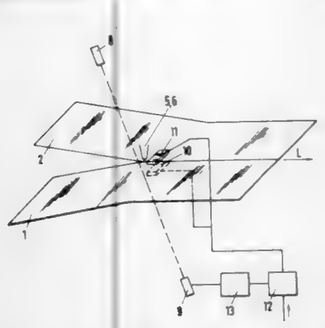
Wilfried Prange, Dinslaken; Joseph Sturm, Duisburg; Hans Schachheim, Hünxe; Heinrich Schmitz, Dinslaken, and Manfred Zeimes, Hilden, all of Fed. Rep. of Germany, assignors to Thyssen Stahl Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Mar. 13, 1991, Ser. No. 668,556

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010077

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **15 Claims**



1. A process for the continuous welding of strips (sheets) (1, 2) guided in abutment without filler by means of a laser beam (6), characterized in that the strips (1, 2) are cooled in the zone of the weld immediately downstream of the welding focus in the direction (L) in which the strip runs, the cooling intensity being so controlled, in dependence on the width of the gap formed by the joint edges of the strips (1, 2) immediately upstream of the welding focus, referred to the direction (L), that its width remains within given tolerance values.

5,204,506

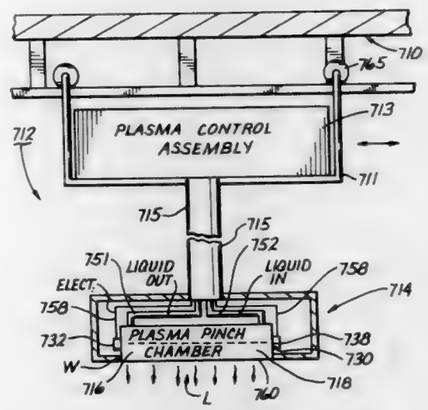
PLASMA PINCH SURFACE TREATING APPARATUS AND METHOD OF USING SAME

John F. Asmus, LaJolla, and Ralph H. Lovberg, San Diego, both of Calif., assignors to The Regents of the University of California, Alameda, Calif.

Continuation-in-part of Ser. No. 129,152, Dec. 7, 1987, Pat. No. 4,889,605, and a continuation-in-part of Ser. No. 223,025, Jul. 21, 1988, Pat. No. 4,994,715, and a continuation-in-part of Ser. No. 347,422, May 4, 1989, Pat. No. 5,079,187, and a continuation-in-part of Ser. No. 347,423, May 4, 1989, Pat. No. 5,048,163. This application Oct. 24, 1989, Ser. No. 425,865

Int. Cl.[5] B23K *9/00*; **G01N** *23/20*

U.S. Cl. 219—121.37 **11 Claims**



1. An apparatus for treating a surface comprising:

a pair of spaced apart combination liquid emitter and electrode means, and combination liquid receptor and electrode means;

means for flowing between said pair of electrode means a fine stream of liquid under sufficient pressure in a substantially narrow, straight and focused configuration, to cause the formation thereabout of a tenuous liquid vapor preconditioning cloud surrounding the flowing fine stream of liquid;

discharge means for establishing an electrical voltage potential difference between said electrode means of a sufficient high voltage to cause electrical current to flow through said liquid vapor cloud for establishing initially a low density plasma thereamong sufficient to emanate energy therefrom to said flowing liquid stream to heat it sufficiently to cause it to become ionized and to be converted into a high density plasma in response to said low density plasma;

a plasma pinch assembly for containing said high density plasma, said plasma pinch assembly including vacuum chamber means for confining said plasma wherein said combination liquid emitter, and electrode means and combination liquid receptor and electrode means are mounted within said vacuum chamber means;

a plasma control assembly for supplying the electrical voltage and the liquid to said plasma pinch assembly;

a flexible cable for coupling said plasma control assembly to said plasma pinch assembly;

means for mounting movably said plasma pinch assembly relative to said plasma control assembly; and

means for mounting movably said plasma control assembly relative to the surface to be treated.

5,204,507

WORK ROTATING DEVICE FOR LASER BEAM MACHINE TOOL

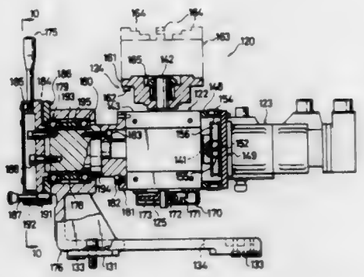
Koichi Saeda, Higashiosaka; Shunji Sakura, Kyoto; Hiroshi Kawanaka, Moriyama; Tatsuya Hirai, Itami; Hisakazu Sakamoto, Ashiya; Hisaharu Terashima, Toyonaki; Takashi Makino, Akashi, and Masayuki Tamura, Kakogawa, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Aug. 14, 1991, Ser. No. 746,034

Claims priority, application Japan, Aug. 14, 1990, 2-213645

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.82 **23 Claims**



6. A work rotating device for a laser beam machine tool comprising a frame having a surface adapted to be placed on the table of a laser beam machine tool; a manually rotatable shaft rotatably supported on said frame; a speed reducer in a housing and connected to said manually rotatable shaft, said speed reducer having an input shaft and an output shaft; motor means integrally mounted on the housing of said speed reducer for rotating said input shaft of the speed reducer; and a work-supporting bed connected to said output shaft of the speed reducer; wherein the axes of rotation of said manually rotatable shaft and said output shaft of the speed reducer are arranged in intersecting relationship to each other.

5,204,508

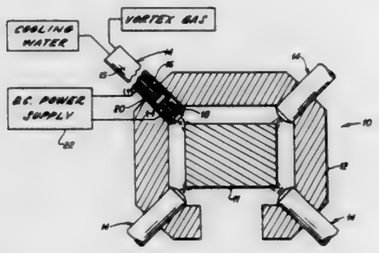
METHOD AND APPARATUS FOR ENHANCING THE QUALITY OF CAST BILLETS

Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Jul. 31, 1990, Ser. No. 560,373

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.59 **8 Claims**



1. A method of enhancing the quality of a continuously cast metal billet having a plurality of corner edges along the length of the billet and while the billet continuously advances forwardly along a path of travel from a casting station, and comprising the steps of

providing a framework which is mounted for selective movement in rearward and forward directions along said path of travel, and with said framework mounting at least one plasma arc torch thereon,

advancing the framework rearwardly along the path of travel from an initial position to a rearward position and while operating said plasma arc torch so that the heated plasma directly engages one of the corner edges of the advancing metal billet, and while coordinating the speed of the rearwardly advancing framework with the forward speed of the advancing billet so that the heated plasma heats such corner edge to a temperature sufficiently hot to melt and fuse together any cracks adjacent such corner edge, and then

returning the framework forwardly along the path of travel from said rearward position to said initial position while the plasma torch is non-operative, and with the return being at a speed at least equal to the advancing speed of the billet, and

repeating the above recited advancing and returning steps so that all longitudinal portions of the advancing billet are treated.

5,204,509

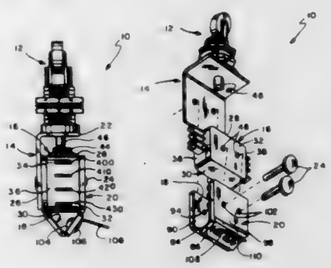
SELF REGULATING HEATED SWITCH ASSEMBLY

Harry N. Etters, Downers Grove, and Michael Kaczmarek, Park Ridge, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed May 31, 1991, Ser. No. 708,235

Int. Cl.[5] H05B *1/00*

U.S. Cl. 219—201 **16 Claims**



1. A self-regulating heated switch assembly, comprising:

a switch housing having top, bottom, front, rear, and end walls;

an insulative cover member comprising opposed front and rear panels, said front and rear panels being disposed in a spaced apart relationship with respect to said corresponding front and rear walls of said switch housing; and

a PTC heater device comprising a first heating section sandwiched between said front wall of said switch housing and said front panel of said cover member, and a second heating section of said PTC heater device sandwiched between said rear wall of said switch housing and said rear panel of said cover member so as to transmit heat into the interior of said switch housing.

5,204,510

RADIANT ELECTRIC HEATERS

ized in that at least one compound key is associated with at least two switches (14,16) and has a compound key head (28)

and also between each of the at least two card connectors and each of the first and second terminal connectors, and also between each of the at least two card connectors and

less of whether said head is relatively moved in a forward or reverse direction, said ID portion being formed by sequentially arranging a first ID mark representing the

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5,204,510

RADIANT ELECTRIC HEATERS

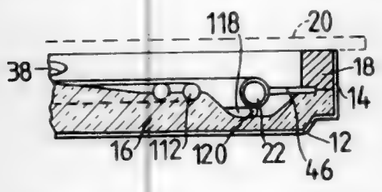
Kevin R. McWilliams, Stratford-Upon-Avon, and George A. Higgins, Hagley, both of England, assignors to Ceramaspeed Limited, Droitwich, United Kingdom

Continuation of Ser. No. 358,328, May 26, 1989, Pat. No. 5,051,561. This application Jul. 3, 1991, Ser. No. 725,150

Claims priority, application United Kingdom, May 27, 1988, 8812600; Sep. 20, 1988, 8822119; Dec. 23, 1988, 8830118; Jan. 13, 1989, 8800777

Int. Cl.[5] H05B 3/74

U.S. Cl. 219—464 24 Claims



1. A radiant electric heater for cooking or heating appliances comprising:

a container;

a layer of electrical and thermal insulating material disposed in the container; and

at least one infra-red source means having an envelope having ends and which is transmissive of infra-red radiation, said source means being supported against shock-induced displacement in said container at least in part by at least one elongate protrusion extending from said envelope intermediate the ends of said envelope, said elongate protrusion being supported by said thermal insulating material.

5,204,511

ALPHANUMERIC KEYBOARD

Günter Baitz, Berlin, and Joachim Burchart, Schlangen, both of Fed. Rep. of Germany, assignors to Siemans Nixdorf Informationssysteme AG, Paderborn, Fed. Rep. of Germany

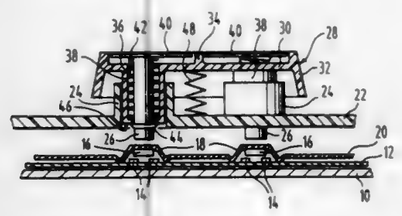
PCT No. PCT/EP89/01274, § 371 Date Jun. 10, 1991, § 102(e) Date Jun. 10, 1991, PCT Pub. No. WO90/05372, PCT Pub. Date May 17, 1990

PCT Filed Oct. 25, 1989, Ser. No. 688,934

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 3838362

Int. Cl.[5] G06C 7/02; H01H 9/26

U.S. Cl. 235—145 R 11 Claims



1. An alphanumeric keyboard including a plurality of switches (**14,16**) operable by keys and a cover frame (**22**) overlying the switches (**14,16**) with guide bosses (**24**) for key rams (**26**) carried by a key head (**28**) overlying the guide bosses (**24**), each of said guide bosses having a generally vertically extending bore, and means restricting said key head to translational movement relative to said cover frame in a keying direction extending parallel to the bores of said guide bosses characterized in that at least one compound key is associated with at least two switches (**14,16**) and has a compound key head (**28**) overlying at least two guide bosses, and that at least one of the rams (**26**) carried by said compound key head (**28**) is supported on said compound key head (**28**) for adjustment relative to said compound key head parallel to said keying direction.

5,204,512

DEVICE FOR CONTROLLING COMMUNICATION BETWEEN ELECTRONIC INFORMATION CARDS AND HOST COMPUTER TO BE KEPT IN SECRET

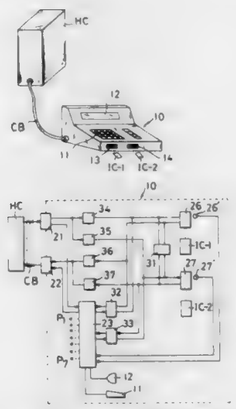
Toshiharu Ieki, Yokosuka; Takafumi Kobayashi, Yokohama; Norio Shimamura; Niichi Kobayashi, both of Yokosuka, and Takeshi Watanabe, Yokohama, all of Japan, assignors to NTT Data Communications System Corporation, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,559

Claims priority, application Japan, Oct. 31, 1989, 1-285397

Int. Cl.[5] G06K 5/00

U.S. Cl. 235—382 5 Claims



1. A system for controlling communication between an electronic information card including contacts and a host computer for reading and writing data to and from the electronic information card via a communication cable, said system comprising;

a first terminal connector, connected to the communication cable for receiving information including data and signals transmitted from the host computer;

a second terminal connection, connected to the communication cable for transmitting information including data and signals on the electronic information card to the host computer;

at least two card connectors, each having contacts corresponding to the contacts of the electronic information card and each having a card detector for generating signals representing a presence and absence of a card therein, wherein

one of the card connectors receives a card storing at least one fixed communication algorithm, and the other receives the electronic information card such that data stored in the electronic information card is enciphered and deciphered according to the at least one fixed communication algorithm by passing the data through the card storing the at least one fixed communication algorithm;

means for controlling the communication in response to the signals from the at least two card connectors so as to connect and disconnect circuits between the first and second terminal connectors and the at least two card connectors and between the means for controlling and the at least two card connectors; and

switching means, between the at least two card connectors, and also between each of the at least two card connectors and each of the first and second terminal connectors, and also between each of the at least two card connectors and the means for controlling, so that the means for controlling turns predetermined switches ON and OFF in response to a signal from each of the at least two card connectors and the host computer.

5,204,513

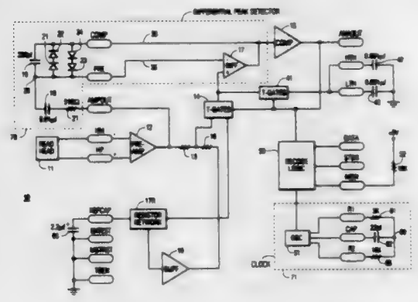
DECODER FOR MAGNETIC STRIPE RECORDING

George R. Steele, Long Beach, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed Oct. 2, 1990, Ser. No. 591,739

Int. Cl.[5] G06K 7/08, 19/06

U.S. Cl. 235—449 4 Claims



1. A decoder for flux reversal indicia on a magnetic material, said decoder including circuit means responsive to each of said indicia for generating a signal representative thereof, said circuit means including an amplitude differentiator for disabling said circuit responsive to flux reversal indicia on said magnetic material which produce signals which have amplitudes of less than a preset amplitude which is a function of the signal being read, wherein said magnetic material is a magnetic stripe having a sequence of indicia recorded thereon at a density of from about 65 bits per inch to about 430 bits per inch, said indicia comprising positive and negative flux reversals, said decoder also including means responsive to successive indicia pairs of said sequence of said indicia for determining the distance to the next successive flux reversal of opposite polarity, and means for setting positive and negative pulse amplitude threshold levels for discriminating against positive and negative low amplitude pulse levels respectively.

5,204,514

INFORMATION RECORDING/REPRODUCING METHOD CAPABLE OF FAST-ACCESSING

Toshio Horiguchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 660,713

Int. Cl.[5] G06K 7/10

U.S. Cl. 235—454 5 Claims

1. A method for accessing a desired track of a plurality of recording/reproducing tracks, which are formed on a recording medium to be parallel to each other, so as to record/reproduce information of the track, while reading address information recorded on an ID portion formed on only an end portion of one side of each of the tracks by relatively moving a recording/reproducing head with respect to the recording medium, the ID portion having address information of each track recorded thereon, said method comprising:

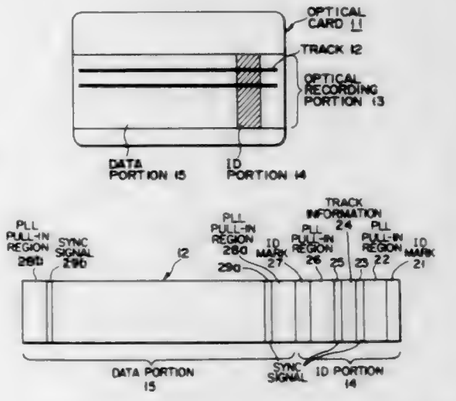
preparing address information on the ID portion of the recording medium, which can enable read access regardless of whether said head is relatively moved in a forward or reverse direction, said ID portion being formed by sequentially arranging a first ID mark representing the start of the ID portion in a forward read operation, a first phase-locked loop (PLL) pull-in region as a data separator in a forward read operation, a first sync signal representing the start of track information in a forward read operation, the address information, a second sync signal representing the start of track information in a reverse read operation, a second PLL pull-in region as a data separator in a reverse read operation, and a second ID mark representing the start of the ID portion in a reverse read operation;

determining a position at which said head is located on an end portion on a side opposite to an end portion on a side where the ID portion on the recording medium is formed;

calculating a track difference between the desired track to be accessed and a current track;

relatively moving said head with respect to the recording medium in accordance with the track difference in a direction in which the position to which said head is directed crosses the tracks on the recording medium;

relatively moving said head with respect to the recording medium, after the position to which said head is directed is shifted in a direction to cross the tracks on the recording medium, in a direction in which the position to which said



head is directed is shifted along a forming direction of the tracks toward the end portion on the side where the ID portion on the recording medium is formed;

reading the second ID mark, the second PLL pull-in region, the second sync signal and the address information, of a corresponding track, recorded on the ID portion in the reverse direction to which said head in the process of shifting the position to which said head is directed along the forming direction of the tracks toward the end portion on the side where the ID portion on the recording medium is formed;

demodulating the address information in accordance with the second ID mark, the second PLL pull-in region and the second sync signal read in the reverse direction by a reverse procedure opposite to that required when a read operation is performed in the forward direction, thereby performing reconstruction of the address information; and

determining whether the address of a track, to which said head is moved in accordance with the reconstructed address information, coincides with the address of the desired track, and accessing the desired track if it is determined that the addresses coincide with each other.

5,204,515

METHOD OF READING IDENTIFICATION CODE

for directing said radiation in the form of a scanning beam onto the surface, characterized in that the input grating is config-

5,204,518

BACKGROUND LIGHT COMPENSATION FOR SENSOR

cluding an electric charge in response to light incident

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5,204,515

METHOD OF READING IDENTIFICATION CODE SHEETS USING BORDERS TO DETERMINE SCAN ANGLE

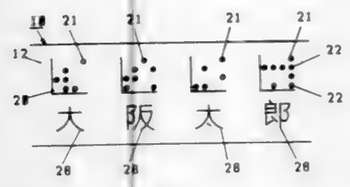
Hirokazu Yoshida, Osaka, Japan, assignor to Teiryo Sangyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 217,843, Jul. 11, 1988, abandoned. This application Oct. 15, 1991, Ser. No. 774,146

Claims priority, application Japan, Jul. 11, 1987, 62-173352; Sep. 17, 1987, 62-232983

Int. Cl.[5] G06K *7/10, 19/06*

U.S. Cl. 235—456 **6 Claims**



1. A method for reading and processing an identification code, comprising the steps of:

a) providing a representation area on an object including,

a computer readable orientation border, positioned within said representation area on at least two sides,

a plurality of sub-areas in which encoded indicia are located,

orthogonal rows and columns of separation marks, separating said plurality of sub-areas, and

a nonsymmetric auxiliary representation mark, provided within said representation area such that said representation area is defined by an area enclosed by said computer readable orientation border and said nonsymmetric auxiliary representation mark,

b) reading said plurality of sub-areas in which the encoded indicia are located and said orthogonal rows and columns of separation marks, with a reading apparatus, and generating data signals representative of the encoded indicia;

c) detecting said computer readable orientation border and said nonsymmetric auxiliary representation mark, determining a scanning direction and an angle of orientation of said identification code with respect to the reading apparatus, and generating a scanning direction signal and an angle of orientation signal;

d) correcting the data signals generated in step (b) depending on the scanning direction signal and angle of orientation signal generated in step (c), in order to produce corrected signals; and

e) translating the corrected data signals into character information, represented by the encoded indicia.

5,204,516

PLANAR OPTICAL SCANNING HEAD HAVING DEFICIENCY-CORRECTING GRATING

Willem G. Opheij, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

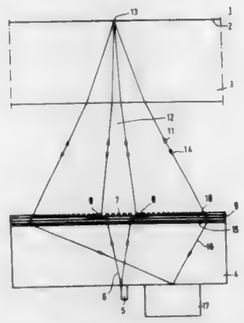
Filed Jul. 11, 1991, Ser. No. 728,440

Claims priority, application European Pat. Off., Apr. 23, 1991, 91200972

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.5 **17 Claims**

1. An optical head for scanning a surface, which head is provided with a source supplying a radiation beam, an input grating having a periodic grating structure for coupling the radiation beam as a deflected beam into a waveguide, and an output grating for coupling radiation out of the waveguide and for directing said radiation in the form of a scanning beam onto the surface, characterized in that the input grating is configured to provide at least one correction for a deficiency of the radiation beam.



5,204,517

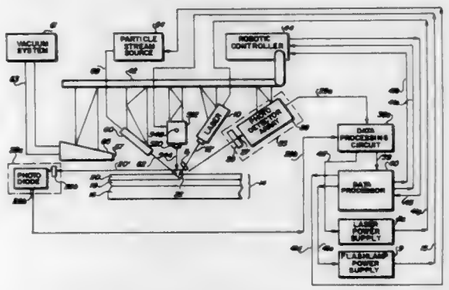
METHOD AND SYSTEM FOR CONTROL OF A MATERIAL REMOVAL PROCESS USING SPECTRAL EMISSION DISCRIMINATION

Michael C. Cates, Solana Beach; Richard R. Hamm, and John D. Hoogerwerf, both of San Diego, all of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Dec. 24, 1991, Ser. No. 813,865

Int. Cl.[5] G01J *1/32*

U.S. Cl. 250—205 **44 Claims**



1. A method for removing material from a structure, comprising the steps of:

(1) generating a light beam;

(2) irradiating the surface material of a structure with said light beam having an intensity sufficient to ablate said surface material and to cause said surface material to generate spectral emission signals;

(3) scanning said structure with said light beam at a scan speed;

(4) monitoring said spectral emissions to detect a selected one of said spectral emission signals having an intensity and a selected wavelength and generating an electronic output signal representative of the intensity of a selected one of said spectral emission signals in response to detecting said selected one of said spectral emission signals;

(5) determining an updated scan speed functionally related to said electronic output signal; and

(6) directing said scan speed to be equal to said updated scan speed.

5,204,518

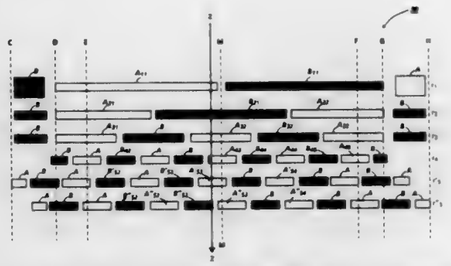
BACKGROUND LIGHT COMPENSATION FOR SENSOR ARRAY

Shi-Tron Lin, Irvine, and Steven A. Buhler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1991, Ser. No. 812,985

Int. Cl.[5] G01J *40/14*

U.S. Cl. 250—206.1 **2 Claims**



1. An apparatus for detecting the position of a scanning beam comprising:

a plurality of rows of spaced apart sensors;

each of said rows of sensors having a plurality of logic zero sensors and a plurality of logic one sensors being arranged in alternating logic order;

a scanning region;

an additional region on each side of said scanning region;

each of said rows being within said scanning region and extending beyond said scanning region into said additional region;

the total area of said logic one sensors and the total area of said logic zero sensors of each of said plurality of rows being equal; and

said plurality of rows being arranged such that each row is symmetrical about its center with those areas of logic zero sensors on each side of the center which are equal distances away from the center being equal and those areas of logic one sensors on each side of the center which are equal distances away from the center being equal to substantially cancel out any background light effects on the sensors of each row.

5,204,519

CLOSE-CONTACT IMAGE SENSING DEVICE HAVING A RESET SWITCH

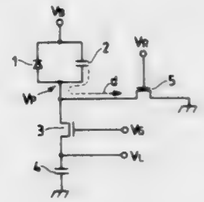
Yoshio Nishihara, Kanagawa; Hiroyuki Miyake, Ebina, and Mamoru Nobue, Tochigi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,613

Claims priority, application Japan, Apr. 5, 1989, 1-86471

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **8 Claims**



1. A close-contact image sensing circuit, comprising:

a photo sensing element for producing an image signal including an electric charge in response to light incident thereon, said photo sensing element having an equivalent capacitor for storing said charge;

a signal line connected to said photo sensing element for transferring said charge from said photo sensing element;

a photo sensing element select switch interposed between said signal line and said photo sensing element for selectively electrically connecting and disconnecting said photo sensing element from said signal line, said photo sensing element select switch being activated in accordance with a control signal;

a storage capacitor connected to said signal line for storing said charge stored on said equivalent capacitor upon the activation of said photo sensing element select switch; and

a reset switch, connected at one end between said photo sensing element and said photo sensing element select switch and connected at another end to a ground point, for discharging said charge stored on said equivalent capacitor upon being activated by a reset signal after said charge stored in said equivalent capacitor has been stored on said storage capacitor and read therefrom.

5,204,520

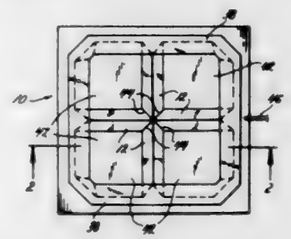
AVALANCHE PHOTODIODE ARRAY INTEGRATED WITH ETCHED SILICON DIVIDER

Samuel I. Green, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 23, 1991, Ser. No. 811,749

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214.1 **7 Claims**



1. An avalanche photodiode array, comprising:

a) a body of light-sensitive semiconductor material having a light entry surface and a plurality of spaced-apart elements therein, each element including a semiconductor junction therein, thereby forming a plurality of photosensitive regions about said elements;

b) a plurality of wedge-shaped regions having a light-reflective coating overlaying the surfaces thereof and positioned between the spaced-apart elements for reflecting light incident thereon into a photosensitive region of the body;

c) a back reflector region having a light-reflective coating overlaying the surfaces thereof and positioned about the periphery of the light entry surface for reflecting light incident thereon into a photosensitive region of the body; and

d) an antireflection coating placed upon the plurality of spaced-apart photosensitive elements.

5,204,521

[illegible] BASED OPTOELECTRONIC NEURONS

of the micro-channel plate is maintained at a reference potential; and

member and a second member having a main scale and an index scale, respectively which are opposed to each other, and

interpose between said light source and a light detector in said analytical instrument; and

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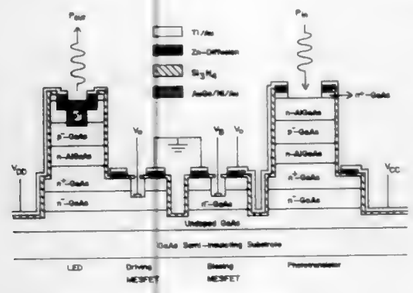
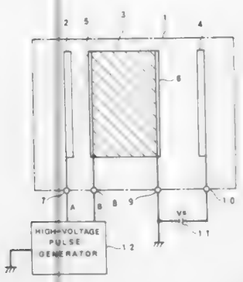
5,204,521
GAAS-BASED OPTOELECTRONIC NEURONS
Steven H. Lin, Temple City, Calif.; Jae H. Kim, Bellevue, Wash., and Demetri Psaltis, Pasadena, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 3, 1992, Ser. No. 845,283
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—214 LS **16 Claims**



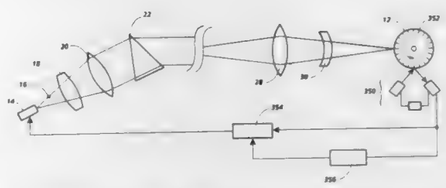
1. An optoelectronic neuron comprising:
a light detector;
a first transistor in series connection with said light detector and having an output responsive to the detection of light by said detector;
a second transistor connected to said output of said first transistor for switching on and off responsive to the voltage at said output; and
a light source connected in series with said second transistor, said light source generating light whenever said second transistor is switched on.

5,204,522
METHOD FOR DRIVING A PHOTOELECTRIC DEVICE AND A METHOD FOR DRIVING AN IMAGE INTENSIFIER USING THE PHOTOCATHODE DEVICE
Akira Takahashi, and Mitsunori Nishizawa, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamtsu, Japan
Filed May 2, 1991, Ser. No. 694,783
Claims priority, application Japan, May 8, 1990, 2-117905
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—214 VT **4 Claims**



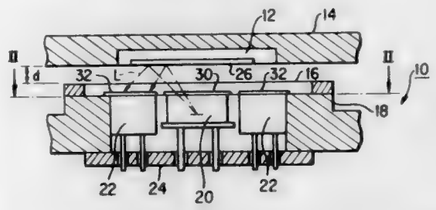
1. A method of driving a photoelectric device wherein the photoelectric device includes a photocathode, a micro-channel plate for multiplying electrons emitted from the photocathode and control means for controlling electrons emitted from the photocathode, the method comprising the steps of:
applying a first negative voltage to an electron input electrode of the micro-channel plate, while another electrode of the micro-channel plate is maintained at a reference potential; and
applying a second negative voltage which is lower than the first negative voltage to the photocathode at substantially the same time as the application of the first negative voltage to thereby perform an opening of a gate in the photocathode and in the micro-channel plate.

5,204,523
METHOD FOR SPOT POSITION CONTROL IN AN OPTICAL OUTPUT DEVICE EMPLOYING A VARIABLE WAVELENGTH LIGHT SOURCE AND AN OPTICAL BEAM DEFLECTING ELEMENT
James J. Appel, Brighton, N.Y., and Thomas L. Paoli, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 19, 1991, Ser. No. 747,889
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—236 **7 Claims**



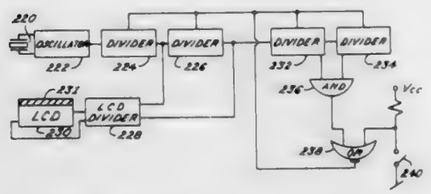
1. A method of controlling the slow scan direction position at which at least one beam of light is focussed to a spot upon an image plane in an optical output system, comprising the steps of:
generating at least one beam of light;
deflecting the at least one beam of light by way of an optical beam deflecting element such that the optical beam deflecting element deflects the path of the at least one beam of light by an amount that is determined by the wavelength of the light beam; and
varying the wavelength of at least one of the at least one beams of light such that the amount that the at least one beam of light is deflected by the optical beam deflecting element is varied to achieve control of the position of the spot at which the at least one beam of light is incident on the image plane in the slow scan direction.

5,204,524
TWO-DIMENSIONAL OPTICAL ENCODER WITH THREE GRATINGS IN EACH DIMENSION
Souji Ichikawa; Mikio Suzuki; Wataru Ishibashi, and Shingo Kuroki, all of Kanagawa, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan
Filed Mar. 9, 1992, Ser. No. 848,116
Claims priority, application Japan, Mar. 22, 1991, 3-25416[U]; May 13, 1991, 3-43266[U]; Oct. 14, 1991, 3-92225[U]
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—237 G **11 Claims**



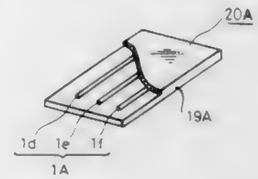
1. A two-dimensional optical encoder comprising a first member and a second member having a main scale and an index scale, respectively which are opposed to each other, and detecting a relative displacement between the first member and the second member in directions of an X-axis and a Y-axis, said optical encoder comprising:
a first grating formed on the main scale and including two sub-gratings having grating lines arranged in the directions of the X- and Y-axis, respectively;
a second grating formed on a central area of the index scale, and including a sub-grating extending along the X-axis and having grating lines arranged in the direction of the X-axis, and a sub-grating extending along the Y-axis and having grating lines arranged in the direction of the Y-axis;
a third grating formed on the index scale, and having two sub-gratings formed outside the corresponding sub-grating of the second grating and having grating lines arranged in the direction of the X-axis with a phase difference between the two sub-gratings, and two sub-gratings formed outside the corresponding sub-grating of the second grating and having grating lines arranged in the direction of the Y-axis with a phase difference between the two sub-gratings;
a light source fixed to the second member;
a plurality of photodetectors fixed to the second member and arranged corresponding to the respective sub-gratings of the third grating, for receiving light emitted from the light source, transmitted through the second grating, reflected by the first grating, and transmitted through the third grating; and
a computing circuit for producing signals indicating relative displacements in the directions of the X- and Y-axis by processing output signals of the plurality of photodetectors.

5,204,525
CAPILLARY FLOW DEVICE
Robert S. Hillman, Cupertino; Michael E. Cobb, Sunnyvale; Jimmy D. Allen, Los Altos; Ian Gibbons, Menlo Park; Vladimir E. Ostoich, San Jose, and Laura J. Winfrey, Belmont, all of Calif., assignors to Biotrack, Mountain View, Calif.
Continuation of Ser. No. 651,283, Feb. 5, 1991, which is a continuation of Ser. No. 472,130, Jan. 30, 1990, which is a division of Ser. No. 177,625, Apr. 5, 1988, Pat. No. 4,948,961, which is a division of Ser. No. 880,793, Jul. 1, 1986, Pat. No. 4,756,884, which is a continuation of Ser. No. 762,748, Aug. 5, 1985, abandoned. This application Jul. 19, 1991, Ser. No. 732,689
Int. Cl.[5] G01N *21/49*
U.S. Cl. 250—252.1 **3 Claims**



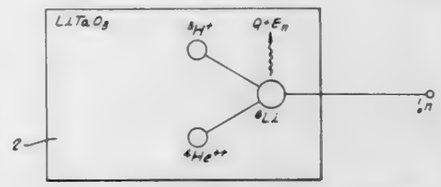
1. A quality control device for use in an analytical instrument which utilizes an analysis cartridge containing an internal chamber in which said analysis occurs, said analysis cartridge being insertable into a location in said instrument so that light generated in said instrument passes through said chamber and is detected by a light detector in said instrument, which comprises:
a control cartridge, wherein said control cartridge is insertable in said location;
a liquid crystal cell located in said control cartridge so as to interpose between said light source and a light detector in said analytical instrument; and
a polarizing filter located between said said light source and said light detector so as to allow passage or block passage of light between said light source and said light detector when voltage applied to said liquid crystal is modulated.

5,204,526
MAGNETIC MARKER AND READING AND IDENTIFYING APPARATUS THEREFOR
Mitsuo Yamashita, Kawasaki; Kaneo Mohri, Nagoya, and Osamu Saito, Kawasaki, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Continuation of Ser. No. 307,257, Feb. 7, 1989, abandoned. This application Feb. 18, 1992, Ser. No. 837,092
Claims priority, application Japan, Feb. 8, 1988, 63-27202; Oct. 25, 1988, 63-269023; Oct. 26, 1988, 63-270410; Jan. 11, 1989, 1-4173
Int. Cl.[5] G06K *19/10;* **H01F** *1/04;* **G08B** *13/24*
U.S. Cl. 235—493 **16 Claims**



1. A magnetic marker adapted to be applied on an object to be detected passing through an a.c. magnetic field, comprising: a plurality of long and narrow magnetic fine wires which are disposed in a longitudinal direction, said magnetic fine wires being produced by drawing amorphous magnetic material and by heat treating the drawn amorphous magnetic material under tension, each of said magnetic fine wires having a layered stress structure which includes an outer surface layer in which compressive stress exists and a core in which tensile stress exists, said outer surface layer being concentric to said core, said magnetic fine wires having square magnetic hysteresis characteristics and magnetic flux jumping characteristics and also at least having magnetic coercive forces which are different from each other, said magnetic fine wires being arranged in a direction orthogonal to the longitudinal direction thereof at predetermined intervals.

5,204,527
NEUTRON PARTICLE ENERGY DETECTOR
Ronnie J. Buchanan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Mar. 12, 1991, Ser. No. 667,927
Int. Cl.[5] G01T *3/00;* **G01V** *5/04*
U.S. Cl. 250—390.07 **32 Claims**



1. A method of measuring neutron energy, comprising:
placing a lithium tantalate crystal in a field of neutrons to be measured so that the crystal is polarized in response to

each nuclear reaction between a neutron from the field compensated density of a fluid in a borehole traversing an

first means for collecting said ions.

(d) applying the set of calibration constants associated with

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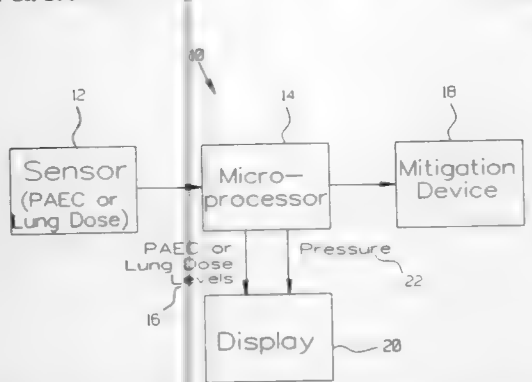
each nuclear reaction between a neutron from the field and a lithium atom in the crystal;
flowing an electrical current having a magntiude responsive to the polarization of the crystal; and
determining in response to the electrical current the energy of the neutron from the field reacting with the lithium atom in the crystal, including generating a neutron energy spectrum.

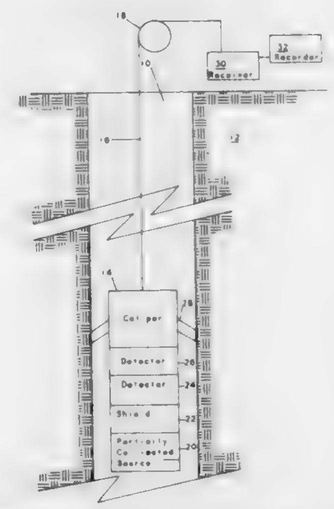
5,204,528
SYSTEM FOR DETERMINING HEALTH RISK DUE TO RADON PROGENY AND USES THEREOF
George S. Hurst; Harvel A. Wright, both of Knoxville, Tenn., and Philip K. Hopke, Potsdam, N.Y., assignors to Consultec Scientific, Inc., Knoxville, Tenn.
Continuation-in-part of Ser. No. 364,209, Jun. 9, 1989, Pat. No. 5,026,986. This application Mar. 11, 1991, Ser. No. 667,434
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.^{5} G01T *1/00*
U.S. Cl. 250—255 **8 Claims**



1. A system for the realtime determination of quantities related to health risk due to the level of radon in air within an environment, which comprises:
a filter element having selected collection characteristics to remove particulate material of selected sizes from said air, said particulate material containing daughter atoms from a decay of said radon, said filter element having a first portion with collection characteristics to retain particulates in a manner simulating collection of particulates in a human nasal cavity, and a second portion with collection characteristics to retain particulates in a manner simulating collection of particulates in a human lung;
means for drawing at least a selected portion of said air through said filter element at a selected constant flow rate;
electrical detector means positioned proximate said filter element for measuring energy spectra of radioactive decay of said daughter atoms on said filter element, said electrical detector means producing signals according to selected energy ranges of said daughter atoms; and
means for acquiring said signals from said electrical detector means, and for processing said signals to convert alpha particle counts in said selected energy ranges to said quantities related to lung dose of said health risk.

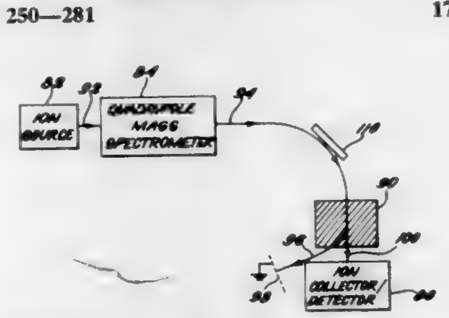
5,204,529
METHOD AND APPARATUS FOR MEASURING BOREHOLE FLUID DENSITY, FORMATION DENSITY AND/OR BOREHOLE DIAMETER USING BACK-SCATTERED GAMMA RADIATION
Victor Diatschenko, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.
Filed Jan. 18, 1991, Ser. No. 642,933
Int. Cl.^{5} G01V *5/12*
U.S. Cl. 250—268 **10 Claims**

1. A well logging system which measures the formation compensated density of a fluid in a borehole traversing an earthen formation, comprising:
sonde means including:
source means for partially collimated emitting gamma rays into the borehole fluid;
at least two detector means for detecting gamma rays from the borehole fluid and providing a count rate signal corresponding to a count rate of the detected gamma rays;
means continually measuring borehole diameter and means for providing caliper signals;



shield means fixed within said sonde between said source means and said at least two detector means preventing direct detection of gamma rays from said source means by said at least two detector means;
cable means connected to the at least two detector means for conveying the count rate signal to the surface, and
surface electronics including:
processing means connected to the cable means for processing the count rate signals and the caliper signals to provide a density signal corresponding to the density of the fluid in the borehole.

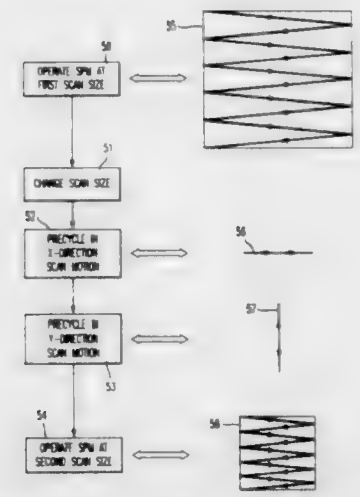
5,204,530
NOISE REDUCTION IN NEGATIVE-ION QUADRUPOLE MASS SPECTROMETRY
Philippe Chastagner, 3134 Natalie Cir., Augusta, Ga. 30909-2748
Filed Dec. 27, 1991, Ser. No. 813,730
Int. Cl.^{5} H01J *49/20*
U.S. Cl. 250—281 **17 Claims**



1. A mass spectrometer for isotopic analysis of a sample, said spectrometer comprising:
means for ionizing said sample to produce an ion beam, said beam containing electrons having a random energy distribution;
means for directing said beam along a path;
means for deflecting said electrons away from said path, whereby said electrons are substantially removed from said beam; and

first means for collecting said ions.

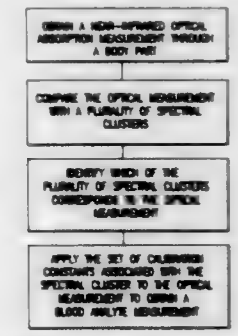
5,204,531
METHOD OF ADJUSTING THE SIZE OF THE AREA SCANNED BY A SCANNING PROBE
Virgil B. Elings, and John A. Gurley, both of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Santa Barbara, Calif.
Filed Feb. 14, 1992, Ser. No. 835,577
Int. Cl.^{5} H01J *37/00*
U.S. Cl. 250—306 **27 Claims**



1. A method for changing the scan size from a first to a second scan size of an instrument having piezoelectric scanners for scanning a probe over a surface with x-direction and y-direction scan motions, comprising:
operating said instrument at a first scan size;
precycling said instrument by scanning said probe in said x and y directions at a scan length related to said second scan size for a number of scan lines but less than a number of scan lines in a full scan; and
operating said instrument at said second scan size.

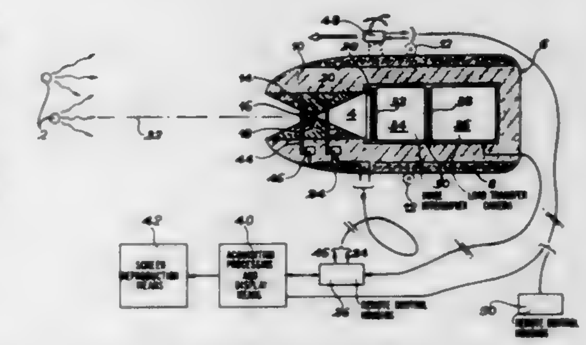
5,204,532
METHOD FOR PROVIDING GENERAL CALIBRATION FOR NEAR INFRARED INSTRUMENTS FOR MEASUREMENT OF BLOOD GLUCOSE
Robert D. Rosenthal, Gaithersburg, Md., assignor to Futrex, Inc., Gaithersburg, Md.
Continuation-in-part of Ser. No. 682,249, Apr. 9, 1991, Pat. No. 5,068,536, which is a continuation-in-part of Ser. No. 565,302, Aug. 10, 1990, Pat. No. 5,077,476, which is a continuation-in-part of Ser. No. 544,580, Jun. 27, 1990, Pat. No. 5,086,229, which is a continuation-in-part of Ser. No. 298,904, Jan. 19, 1989, Pat. No. 5,028,787. This application Jun. 18, 1991, Ser. No. 717,198
Int. Cl.^{5} G01N *21/59*
U.S. Cl. 250—341 **4 Claims**

1. A method for calibrating a near-infrared analysis instrument for the measurement of a blood analyte, said method comprising:
(a) obtaining a near-infrared optical absorption measurement through a body part of an individual;
(b) comparing said optical absorption measurement with each spectral cluster of a plurality of spectral clusters, each of said spectral clusters having a set of calibration constants associated therewith;
(c) identifying which of said plurality of spectral clusters corresponds to said optical absorption measurement; and
(d) applying the set of calibration constants associated with the identified spectral cluster to said near-infrared optical



absorption measurements to obtain a measurement of said blood analyte.

5,204,533
DEVICE FOR LOCALIZING RADIATION SOURCES IN REAL TIME
Geneviève Simonet, 33 Avenue du Président Kennedy, 91300 Massy, France
Filed Oct. 10, 1990, Ser. No. 594,959
Claims priority, application France, Oct. 11, 1989, 89 13281
Int. Cl.^{5} G01T *1/29*
U.S. Cl. 250—361 R **14 Claims**



1. Device for the localization of radiation sources (2) liable to be found in a given area, said device comprising a pinhole chamber (4) whose walls from a shield against the radiation emanating from said sources, and means (20) for shuttering said pinhole chamber, said shuttering means being transparent to radiation from said sources, said device comprising, furthermore, in said pinhole chamber and opposite a pinhole (16), a luminescent screen (28) which is transparent in a luminous range and which is capable of converting said radiation from said sources into luminous radiation, said shuttering means being, in addition, capable of preventing light from said area from reaching said screen, said device also comprising a camera (30) connected optically to said screen and capable of providing, in the form of electric signals, an image of said sources by means of luminous radiation which said camera receives from said screen, and an image of said area by means of said light which said camera receives from said area through said screen when said shuttering means are open, sensitivity of said camera being sufficient to ensure that an acceptable image of said sources will be obtained for a given radiation-detection efficiency of said screen, said image of said area and said image of said sources being capable of superposition and being visible through use of means (40) for processing and display of said electric signals.

5,204,534

detection means for detecting, through said projection opti-

a light source disposed adjacent said first end of said leaf

5,204,539

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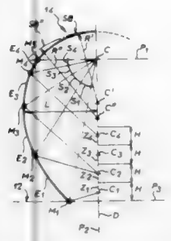
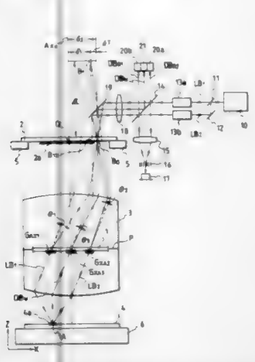
5,204,534
ULTRAVIOLET RADIATION DRYING OVEN AND DRYING ENCLOSURE THEREOF
Jean-Louis Dubuit, 63 Rue du Chemin Vert, 75011 Paris, France
Filed Nov. 7, 1991, Ser. No. 788,939
Claims priority, application France, Nov. 7, 1990, 90 13810; Nov. 16, 1990, 90 14281
Int. Cl.[5] G02B *5/10*; F21V *7/04*
U.S. Cl. 250—492.1 **8 Claims**



1. Ultraviolet radiation drying enclosure comprising a generally cylindrical wall containing said ultraviolet radiation lamp in a radiation plane parallel to the generatrices of said cylindrical wall and perpendicular to the longitudinal plane of symmetry wherein the profile of the transverse cross-section of said cylindrical wall is at least in part formed by elliptical arcs which have a common first focus on the axis along which said radiation plane intersects said longitudinal plane of symmetry and respective second foci staggered heightwise perpendicularly to said radiation plane.

5,204,535
ALIGNMENT DEVICE HAVING IRRADIATION AND DETECTION LIGHT CORRECTING OPTICAL ELEMENTS
Hideo Mizutani, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed May 27, 1992, Ser. No. 888,828
Claims priority, application Japan, May 31, 1991, 3-129563
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 **53 Claims**



1. An alignment device adapted for use in an exposure apparatus equipped with a projection optical system for transferring a predetermined pattern, formed on a reticle, onto a substrate with an exposure light, and adapted for detecting the position of an alignment mark formed on said substrate, comprising:

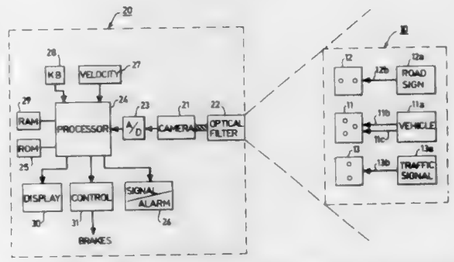
light irradiation means for irradiating said alignment mark, through said projection optical system, with alignment light of a wavelength different from that of said exposure light;

detection means for detecting, through said projection optical system, light from said alignment mark;

an irradiation light correcting optical element provided between said reticle and said substrate and adapted for deflecting the irradiation optical path so as to correct, by predetermined amounts, the longitudinal chromatic aberration and the chromatic aberration of magnification of the projection optical system for the irradiation light; and

a detection light correcting optical element provided between said reticle and said substrate and adapted for deflecting the detection optical path toward the peripheral part of an exposure area of said reticle, so as to correct, by a predetermined amount, the chromatic aberration of magnification of the projection optical system for the detection light.

5,204,536
ELECTRO-OPTICAL MONITORING SYSTEM UTILIZING OPTICAL SIGNAL TRANSMITTERS IN PREDETERMINED GEOMETRICAL PATTERNS
Shlomo Vardi, 6/8 Anilevitch Street, 70400 Nes Ziona, Israel
Filed Jun. 8, 1992, Ser. No. 895,075
Claims priority, application Israel, Jun. 14, 1991, 98498
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 **20 Claims**



1. An electro-optical monitoring system for monitoring objects, comprising: a plurality of optical signal transmitters carried by each monitored object according to predetermined geometrical patterns; means for actuating said transmitters on each of said objects to transmit optical signals; and an optical receiver at a remote location for receiving said transmitted optical signals, and including a processor having means for identifying the objects from the combination of the geometrical pattern of transmitters thereon and the optical signals received therefrom.

5,204,537
THICKNESS SENSOR COMPRISING A LEAF SPRING MEANS, AND A LIGHT SENSOR
Richard I. Bennet, Crewe, England; Guy H. Berthiaume, Charlotte, N.C.; Michael F. Haw, Charlotte, N.C.; Joseph G. Melber, Jr., Charlotte, N.C., and Jimmie Neill, Sherrilles Ford, N.C., assignors to Recognition Equipment Incorporated, Irving, Tex.
Division of Ser. No. 781,683, Oct. 24, 1991, which is a continuation of Ser. No. 502,338, Mar. 30, 1990, abandoned.
This application Jan. 29, 1992, Ser. No. 827,279
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—560 **4 Claims**

1. A thickness sensor for sensing thickness of a series of documents moved sequentially therethrough, comprising:

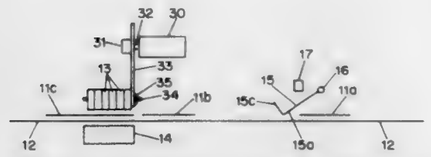
a leaf spring having first and second ends;

a wear plate disposed adjacent said leaf spring;

said leaf spring being biased toward said wear plate, such that said first end of said leaf spring is deflected in response to documents moving between said leaf spring and said wear plate;

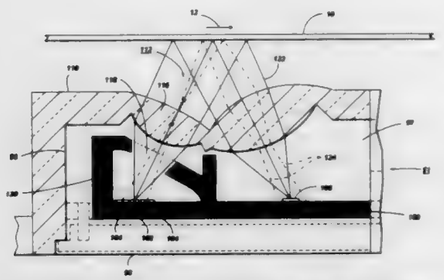
a light source disposed adjacent said first end of said leaf spring; and

a light sensor for detecting light generated by said light source and being positioned with respect to said light source to define a light path disposed between said light source and said light sensor, said light sensor being re-



sponsive to changes in the amount of light impinging upon said light sensor due to deflection of said first end of said leaf spring into said light path resulting in a reduction in the amount of light impinging upon said light sensor based upon the thickness of documents moving between said leaf spring and said wear plate.

5,204,538
DENSITOMETER FOR AN ELECTROPHOTOGRAPHIC PRINTER USING FOCUSED AND UNFOCUSED REFLECTING BEAMS
Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 18, 1992, Ser. No. 884,977
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **16 Claims**



1. An apparatus for measuring the reflectivity of a selected region of a surface, comprising:

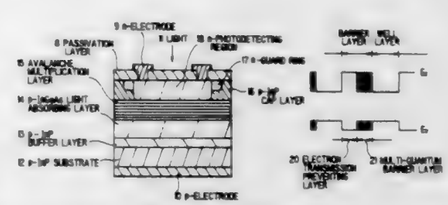
means for creating first and second light beams reflected from the selected region;

a photodetector;

a focusing lens positioned to focus the first light beam reflected from the selected region of the surface onto the photodetector through the axis of the focusing lens with the second light beam being reflected from the selected region and transmitted to the photodetector in a substantially unfocused manner; and

processor means, operatively associated with the photodetector, for deriving a signal representative of the direct reflectance of a light beam reflected from the selected region of the surface into the photodetector as a function of the focused reflected light and the unfocused reflected light detected by the photodetector.

5,204,539
AVALANCHE PHOTODIODE WITH HETERO-PERIODICAL STRUCTURE
Masayoshi Tsuji, and Kikuo Makita, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Jan. 27, 1992, Ser. No. 826,494
Claims priority, application Japan, Jan. 28, 1991, 3-8179; Mar. 28, 1991, 3-64266
Int. Cl.[5] H01L *27/14*
U.S. Cl. 257—21 **12 Claims**



1. An avalanche photodiode, comprising:

a light absorbing layer;

an avalanche multiplication layer of a hetero-periodical structure comprising alternately provided first barrier and well layers, each of said first barrier layers of said avalanche multiplication layer comprising a multi-quantum barrier layer having alternately provided narrow-width barrier and well layers, a virtual barrier being formed which is higher than said first barrier and is generated at the multi-quantum barrier layer, so that electrons which are injected into the avalanche multiplication layer experience large energy differences between the virtual barrier and the well layer so that electrons obtain a large ionizing energy; and

first and second electrodes for applying a predetermined voltage across said light absorbing and avalanche multiplication layers;

wherein said narrow-width barrier and well layers comprise respectively first and second group III–V compounds which meet the following conditions:

$$E_A < E_B \text{ and } E_A + E_{gA} < E_B + E_{gB}$$

where E_A and E_B are average ionization energies of said first and second group III–V compounds, respectively, and E_{gA} and E_{gB} are forbidden band gap energies, respectively.

5,204,540
RESIN SEALED SEMICONDUCTOR DEVICE FOR USE IN TESTING AND EVALUATION METHOD OF STRESS DUE TO RESIN SEAL
Yuichi Nakashima, and Shintaro Matsuda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1991, Ser. No. 673,655
Claims priority, application Japan, Mar. 26, 1990, 2-78282
Int. Cl.[5] H01L *23/48*
U.S. Cl. 257—480 **13 Claims**

1. A resin-sealed semiconductor device for use as a stress-test exemplar, comprising:

first and second electronic elements formed at selected locations in a main surface of a semiconductor substrate; and

resin disposed so as to encapsulate said semiconductor substrate having said first and second electronic elements to seal the same against degradation by the ambient atmosphere, said resin causing mechanical stresses which influence testable electric characteristics of said first and second electronic elements

means respectively connected to said first and second electronic elements to obtain therefrom electrical data indicative of a level of the respective mechanical stresses experi-

enced by said first and second electronic elements,

highly doped region, said fourth region conductively connected to said emitter region,

5,204,543
LATERAL TYPE SEMICONDUCTOR DEVICE HAVING A

insulator layer in correspondence to the base region with an electrical contact to the base region;

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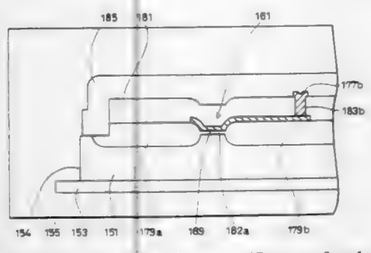
enced by said first and second electronic elements, wherein

the forms, dimensions and materials of said first and second electronic elements are identical, and

said selected locations of said first and second electronic



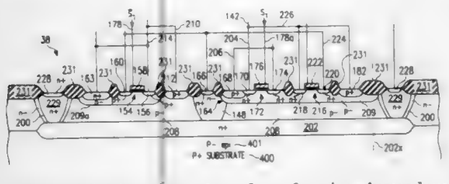
elements are selected so that a specific part of each of said electronic elements is distanced differently with respect to a side edge of the substrate to ensure that the first and second electronic elements are thereby subjected to respectively different magnitudes of said mechanical stresses in a side direction of said semiconductor substrate.

5,204,541

GATED THYRISTOR AND PROCESS FOR ITS SIMULTANEOUS FABRICATION WITH HIGH- AND LOW-VOLTAGE SEMICONDUCTOR DEVICES

Michael C. Smayling, Missouri City, and Lembit Soobik, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1991, Ser. No. 723,082
Int. Cl.[5] H01L *29/74, 27/02*
U.S. Cl. 257—138 **13 Claims**



1. A gated thyristor formed at a face of semiconductor layer of a first conductivity type, comprising:

a first well formed at said face to be of a second conductivity type opposite said first conductivity type;

a second well of a first conductivity type formed at said face to be enclosed by said first well;

an emitter region of said second conductivity type formed at said face to be enclosed by said second well;

first and second highly doped regions formed at said face to be of said first conductivity type, said first highly doped region formed within said first well and said second highly doped region formed in said first well and at least partially within said second well, a subregion of said first well spacing apart said first and second highly doped regions and operable to act as a base of a first bipolar transistor;

third, fourth and fifth highly doped regions formed at said face to be of said second conductivity type, said third and fourth highly doped regions spaced from said first well, said fifth highly doped region formed to be at least partially within said first well, channel regions of said semiconductor layer spacing apart said third region from said fourth region and said fourth region from said fifth region, said third region and said fifth region spaced apart, conductive gates insulatively disposed over said channel regions; and

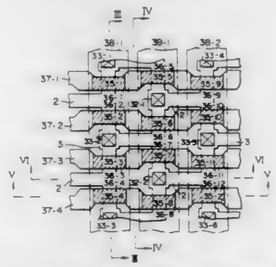
said third region conductively connected to said second highly doped region, said fourth region conductively connected to said emitter region.

5,204,542

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE OF SHARED CONTACT SCHEME NOT HAVING INCLINED WIRING

Satoru Namaki; Shooji Kitazawa, and Teruhiro Harada, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 540,285, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 295,260, Jan. 9, 1989, Pat. No. 4,935,791. This application Oct. 25, 1991, Ser. No. 784,632
Claims priority, application Japan, Jan. 12, 1988, 63-3111
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] H01L *29/68*
U.S. Cl. 257—315 **14 Claims**



1. A read-only semiconductor memory device comprising:

a semiconductor substrate;

a plurality of memory elements arranged in a principal surface of said semiconductor substrate in a matrix to form MOS transistors each having a first electrode, a second electrode and a control electrode for controlling a channel formed between the first and second electrodes, said plurality of memory elements each comprising:

first and second electrode regions respectively formed in said principal surface to form said first and second electrodes respectively;

insulative layers formed on the principal surface;

a control electrode layer formed via said insulative layers on said principal surface to form said control electrode;

said control electrode layer being commonly interconnected over said plurality of memory elements in a first direction of the matrix;

said device further comprising:

a plurality of first conductor members each formed on said insulative layers to interconnect electrically said first electrode of one of said plurality of memory elements to said first electrode of another of said plurality of memory elements in a second direction, substantially perpendicular to the first direction, wherein said first electrode of one of said connected memory elements is adjacent and electrically connected to said first electrode of still another one of said memory elements in the first direction; and

a plurality of second conductor members each formed on said insulative layers to interconnect electrically the second electrode of said one memory element to the second electrode of still another of said plurality of memory elements in a second direction, wherein said second electrode of one of said connected memory elements is adjacent and electrically connected to the second electrode of still another one of said memory elements in the first direction; and

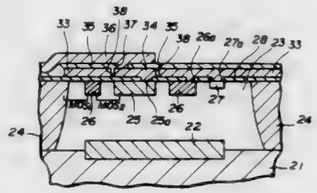
boundaries between said control electrode layer and said first and second electrodes being defined substantially parallel to the first direction.

5,204,543

LATERAL TYPE SEMICONDUCTOR DEVICE HAVING A STRUCTURE FOR ELIMINATING TURNING-ON OF PARASITIC MOS TRANSISTORS FORMED THEREIN

Toshio Hanazawa, Kasugai; Yukinori Fujimura, Owariasahi, and Takashi Matsumoto, Inazawa, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VSLI Limited, Kasugai, both of Japan

Continuation of Ser. No. 831,638, Feb. 10, 1992, abandoned, which is a continuation of Ser. No. 501,751, Mar. 30, 1990, abandoned. This application Jul. 22, 1992, Ser. No. 918,117
Claims priority, application Japan, Mar. 30, 1990, 1-81918
Int. Cl.[5] H01L *27/02, 29/72, 29/78*
U.S. Cl. 257—378 **3 Claims**



1. A bipolar transistor having a base, an emitter and a collector, the base connected to one of an emitter and a collector to form a diode, comprising:

a semiconductor layer of a first conductivity type, said semiconductor layer having upper and lower major surfaces and defined with a device region of the first conductivity type, the device region serving as a base region of the bipolar transistor and having an upper major surface coincident to the upper major surface of the semiconductor layer;

an isolation region of a second, opposite conductivity type, said isolation region having an upper major surface coincident to the upper major surface of the semiconductor layer and formed in the semiconductor layer such that the isolation region surrounds the device region;

an emitter region of the second conductivity type formed in a part of the device region, said emitter region having an upper major surface coincident to the upper major surface of the semiconductor layer;

a collector region of the second conductivity type and formed in part of the device region with a separation from the emitter region between the emitter region and isolation region, said collector region having an upper major surface coincident to the upper major surface of the semiconductor layer;

a first insulator layer having upper and lower major surfaces and provides on the upper major surface of the semiconductor layer;

a first contact hole formed in the first insulator layer in correspondence to the emitter region for exposing the upper major surface of the emitter region;

a second contact hole formed in the first insulator layer in correspondence to the collector region for exposing the upper major surface of the collector region;

a third contact hole formed in the first insulator layer in correspondence to the base region for exposing the upper major surface of the base region;

a first conductor pattern having upper and lower major surfaces and provided on the upper major surface of the insulator layer in correspondence to the emitter region with an electrical contact to the emitter region;

a second conductor pattern having upper and lower major surfaces and provided on the upper major surface of the insulator layer in correspondence to the collector region with an electrical contact to the collector region;

a third conductor pattern having upper and lower major surfaces and provided on the upper major surface of the insulator layer in correspondence to the base region with an electrical contact to the base region;

a second insulator layer having upper and lower major surfaces and provided on the upper major surface of the first insulator layer to bury the first through third conductor patterns;

a fourth contact hole formed in the second insulator layer in correspondence to the first conductor pattern for exposing the upper major surface of the first conductor pattern;

a fourth conductor pattern having upper and lower major surfaces and provided on the upper major surface of the second insulator layer, said fourth conductor pattern being provided with an electrical contact on the exposed upper major surface of the first conductor pattern and extending on the upper major surface of the second insulator layer from a first part thereof located above the emitter region to a second part thereof located above the isolation region, passing over a part of the collector region, said fourth conductor pattern forming a parasitic MOS transistor in a part of the device region located under the fourth conductor pattern and defined between the emitter region and said part of the collector region located under the fourth conductor pattern, and another parasitic MOS transistor in a part of the device region located under the fourth conductor pattern and defined between said part of the collector region under the fourth conductor pattern and the isolation region also located under the fourth conductor pattern;

said second conductor pattern extending on the upper major surface of the first insulator layer at least over a part of the device region wherein the parasitic MOS transistors are formed; and

means for applying a predetermined voltage to said second conductor pattern, said predetermined voltage being chosen such that a turning-on of the parasitic MOS transistors is eliminated;

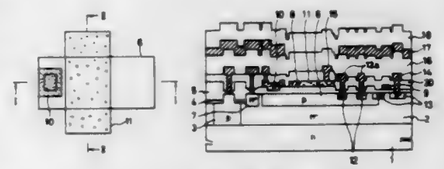
said second conductor pattern and said third conductor pattern being connected with each other to form a common conductor pattern.

5,204,544

PHOTOELECTRIC CONVERSION DEVICE WITH STABILIZING ELECTRODE

Shunsuke Inoue, Hiratsuka, and Shiro Arikawa, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 570,982, Aug. 23, 1990, abandoned, which is a continuation of Ser. No. 213,922, Jun. 30, 1988, abandoned. This application Feb. 24, 1992, Ser. No. 839,074
Claims priority, application Japan, Jul. 3, 1987, 62-165523
Int. Cl.[5] H01L *29/78, 27/14, 31/10*
U.S. Cl. 257—462 **16 Claims**



1. A photoelectric conversion device comprising:

a first region of a first conductivity type;

a second region of a second conductivity type disposed adjacent to said first region;

a third region of the first conductivity type provided within said second region;

a fourth region of the second conductivity type electrically connected to said second region;

fifth region of the second conductivity type disposed adjacent to said first region;

an electrode electrically connected to said first region;

5,204,546

a plurality of resistors, each resistor being coupled in series

in parallel to at least one of the controllable semiconduc-

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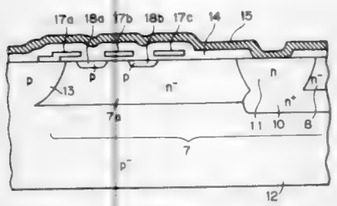
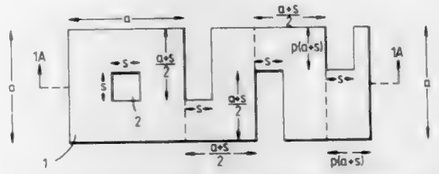
a gate electrode, wherein an insulating layer region is disposed between said gate electrode and a channel region, said channel region being defined by said fourth and fifth regions;
a stabilizing electrode, wherein an insulating layer region is disposed between said stabilizing electrode, and said first and second regions; and
a control electrode for biasing a junction between said second region and said third region, wherein an insulating layer region is disposed between said second region and said control electrode.

5,204,545
STRUCTURE FOR PREVENTING FIELD CONCENTRATION IN SEMICONDUCTOR DEVICE AND METHOD OF FORMING THE SAME
Tomohide Terashima, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 545,600, Jun. 29, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 807,754
Claims priority, application Japan, Nov. 22, 1989, 1-305361
Int. Cl.[5] H01L *29/40*
U.S. Cl. 257—490 **7 Claims**



1. In a semiconductor device comprising a first conductivity type semiconductor substrate, a second conductivity type first semiconductor region formed on said semiconductor substrate which is isolated from said semiconductor substrate through p-n junction isolation, and a conductive layer extending above said first semiconductor region across an end portion of said first semiconductor region, a structure for preventing field concentration caused in said end portion of said first semiconductor region, existing under said conductive layer, through influence exerted by an electric field from said conductive layer, comprising:
an insulating film formed on said end portion of said first semiconductor region between said first semiconductor region and said conductive layer;
at least one conductive plate each having a first and second end portion and being formed in said insulating film in a manner that said at least one conductor plate is fully surrounded by said insulating film so as to be in a fully electrically floating state; and
at least two first conductivity type first semiconductor floating diffusion regions formed in a surface of said end portion of said first semiconductor region to be alternately arranged with said conductive plate so that said first end portion of said at least one conductive plate overlaps with one of said at least two first conductivity type first semiconductor floating diffusion regions and said second end portion of said at least one conductive plate overlaps with another one of said at least two first conductivity type first semiconductor floating diffusion regions through said insulating film.

5,204,546
RATIOED CAPACITANCES IN INTEGRATED CIRCUITS
Kenneth W. Moulding, Horley, England, assignor to U.S. Philips Corp., New York, N.Y.
Filed Jun. 19, 1991, Ser. No. 717,731
Claims priority, application United Kingdom, Jun. 20, 1990, 9013741
Int. Cl.[5] H01L *27/02, 27/08*
U.S. Cl. 257—532 **8 Claims**

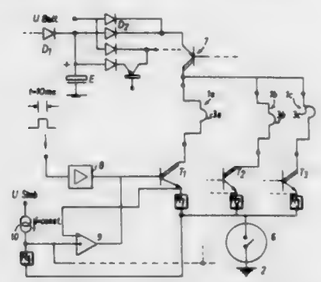


1. An integrated circuit including a first capacitor and a second capacitor, the first capacitor comprising a first continuous plate, a second continuous plate and a first layer of dielectric material of a given composition and thickness for spacing apart the first and second plates, the first continuous plate having an area defined by a boundary, the second capacitor comprising a third continuous plate, a fourth continuous plate and a second layer of dielectric material having a composition and thickness equal to those of the first layer and spacing apart the third and fourth plates, the first continuous plate having an area k times greater than the area of the third plate defined by a boundary which is k times longer than the boundary of the third plate where k is greater than unity, wherein the first plate is provided with an aperture defining a portion of the boundary, and the boundary of that plate comprises convex portions subtending a summation of internal angles and concave portions subtending a summation of external angles which is equal to the summation of internal angles, the third plate is provided with an aperture defining a portion of the boundary, and the boundary of that plate comprises convex portions subtending a summation of internal angles and concave portions subtending a summation of external angles which is equal to the summation of internal angles, and wherein the summation of internal angles and the summation of external angles of the first plate are substantially k times the summation of internal angles and the summation of external angles of the third plate.

5,204,547
AIR BAG SYSTEM FOR PROTECTION OF THE OCCUPANTS OF MOTOR VEHICLES
Hartmut Schumacher, Stuttgart; Norbert Crispin, Markgroningen; Bernhard Mattes, Sachsenheim, and Edmund Jeenicke, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/EP88/00837, § 371 Date Mar. 11, 1991, § 102(e) Date Mar. 11, 1991, PCT Pub. No. WO90/02674, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 14, 1988, Ser. No. 663,842
Int. Cl.[5] B60R *21/16*
U.S. Cl. 307—10 **10 Claims**

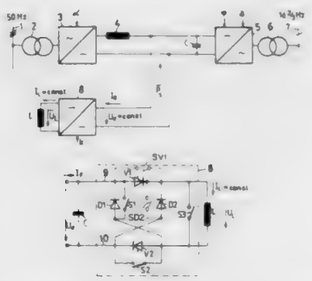
1. A system for the protection of the occupants of a motor vehicle, particularly an air bag protection system, comprising:
a plurality of firing circuits coupled between a battery supply voltage and ground, each firing circuit including a bag igniter, each bag igniter being coupled in series with a respective triggerable power switch,
at least one retardation sensitive mechanical arming switch coupled to said power switches,
a single energy storage capacitor coupled to each of said firing circuits for supplying initiation energy to each circuit over an upper common power stage in the event of a loss of the battery supply voltage,

a plurality of resistors, each resistor being coupled in series with a respective power switch, and
a comparator for comparing the voltage across at least one of the resistors with a reference voltage and controlling



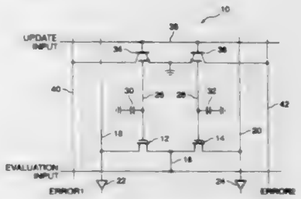
the power switches based upon the comparison to limit the current flowing through the power switches, and hence through the bag igniters, from the energy storage capacitor.

5,204,548
ENERGY STORAGE CIRCUIT WITH DC CHOPPER SUPERCONDUCTING REACTOR
Peter Dähler, Remigen, Switzerland, and Michael Häusler, Weilheim, Fed. Rep. of Germany, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Apr. 9, 1991, Ser. No. 682,237
Claims priority, application Switzerland, May 8, 1990, 1790/90-1
Int. Cl.[5] H02J *9/00, 15/00*
U.S. Cl. 307—66 **11 Claims**



1. A two-quadrant converter, which is actively connected to at least one magnetic memory, comprising:
a) at least a 1st controllable switching element in a 1st d.c. line being actively connected via the at least one magnetic memory to at least a 2nd controllable switching element in a 2nd d.c. line,
b) the at least one 2nd controllable switching element having a side, actively connected to the at least one magnetic memory and being connected via a 3rd valve to a side of the 1st switching element which is not actively connected to the at least one magnetic memory,
c) the at least one 2nd controllable switching element having another side, not actively connected to the at least one magnetic memory and being connected via a 4th valve to another side of the 1st switching element which is actively connected to the at least one magnetic memory, and
d) the 1st and 2nd controllable switching elements being semiconductor valves, wherein
e) a controllable mechanical switching element is connected in parallel to at least one of the controllable semiconductor valves.

5,204,549
SYNAPTIC ELEMENT INCLUDING WEIGHT-STORAGE AND WEIGHT-ADJUSTMENT CIRCUIT
John C. Platt, Mountain View; Janeen D. W. Anderson, Fremont, and Carver A. Mead, Pasadena, all of Calif., assignors to Synaptics, Incorporated, San Jose, Calif.
Filed Jan. 28, 1992, Ser. No. 827,005
Int. Cl.[5] G06G *7/12*
U.S. Cl. 307—201 **6 Claims**



1. A synaptic element including a weight-storage and weight-adjustment circuit, comprising:
an input node;
a positive output node;
a negative output node;
a first floating node;
a second floating node;
a first MOS transistor, having a source connected to said positive output node, a drain connected to said input node, and a gate comprising at least a portion of said first floating node;
a second MOS transistor having a source connected to said input node, a drain connected to said negative output node, and a gate comprising at least a portion of said second floating node;
first means for injecting electrons onto said first floating node;
second means for injecting electrons onto to said second floating node;
third means for simultaneously removing essentially the same number of electrons from said first and second floating nodes to maintain them within a desired voltage range;
means for comparing an output signal at said output node with a desired output signal and for generating a positive error signal if said output signal is more positive than said desired output signal and for generating a negative error signal if said output signal is more negative than said desired output signal;
means for generating a positive-input-present-signal if a positive input signal is present at said input node and for generating a negative-input-signal-present if a negative signal is present at said input node;
means for defining a weight-update interval;
means responsive to the simultaneous presence of said positive error signal and said positive-input-present-signal and active during said weight-update interval, for activating said first means for injecting electrons onto said first floating node at a rate proportional to the product of said positive error signal and said positive-input-present-signal;
means responsive to the simultaneous presence of said positive error signal and said negative-input-present-signal and active during said weight-update interval, for activating said second means for injecting electrons onto said second floating node at a rate proportional to the product of said positive error signal and said negative-input-present-signal;
means responsive to the simultaneous presence of said negative error signal and said positive-input-present-signal and active during said weight-update interval, for activating

from said storage means with the count data provided

said third GaAs field effect transistor receiving said input

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said second means for injecting electrons onto said second floating node at a rate proportional to the product of said negative error signal and said positive-input-present-signal;

means responsive to the simultaneous presence of said negative error signal and said negative-input-present-signal and active during said weight-update interval, for activating said first means for injecting electrons onto said first floating node at a rate proportional to the product of said negative error signal and said negative-input-present-signal.

5,204,550

OUTPUT STAGE HAVING REDUCED CURRENT CONSUMPTION

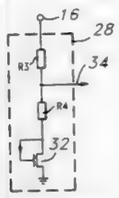
Horst Jungert, Einberg, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Fed. Rep. of Germany

Filed Jan. 21, 1992, Ser. No. 823,225

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1991, 4101906

Int. Cl.[5] **H03K** *5/12, 5/153*

U.S. Cl. 307—263 **6 Claims**



1. A digital output circuit comprising:

an input terminal for receiving a binary input signal;

an output terminal for providing a binary output signal;

a power source terminal for providing a supply voltage;

a bipolar output transistor having a collector, an emitter and a base;

the collector of said bipolar output transistor being connected to said output terminal and to said power source terminal, the emitter of said bipolar output transistor being connected to ground, and the base of said bipolar output transistor being connected to said power source terminal;

means operably connected to said output terminal for generating a control signal having a magnitude dependent upon the magnitude of the voltage at the output terminal;

a first field-effect transistor connected between said power source terminal and the base of said bipolar output transistor and having a control gate connected to said input terminal;

a resistor interposed between said first field-effect transistor and the base of said bipolar output transistor and respectively connected thereto; and

a second field-effect transistor having a source-drain path connected in parallel with said resistor and a control gate connected to said control signal-generating means, the control gate of said second field-effect transistor being responsive to the control signal at a magnitude equal to or above a predetermined threshold to render said second field-effect transistor conductive for decreasing the resistance value of said resistor to enable the base current applied to the base of said bipolar output transistor to increase, thereby rendering said bipolar output transistor conductive.

5,204,551

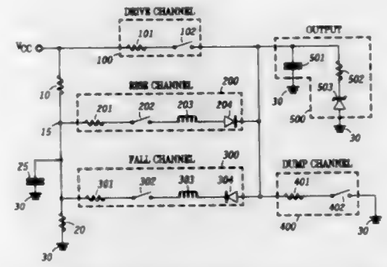
METHOD AND APPARATUS FOR HIGH POWER PULSE MODULATION

John E. Bjornholt, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1991, Ser. No. 724,256

Int. Cl.[5] **H03K** *3/017*

U.S. Cl. 307—265 **32 Claims**



1. A high pulse repetition frequency (PRF), high power, four-channel pulse modulator comprising:

high voltage supply means for providing a high voltage input signal;

drive channel means for providing a drive channel component of an output signal coupled to the high voltage supply means;

rise channel means for providing a rise channel component of the output signal coupled to the high voltage supply means and to the drive channel means at a first junction;

fall channel means for providing a fall channel component of the output signal coupled to the high voltage supply means and to the rise channel means at the first junction;

output means for providing the output signal coupled between the first junction and the electrical ground;

dump channel means for providing a discharge path for the output means coupled between the first junction and an electrical ground; and

timing means for modulating the high voltage input signal to produce the output signal coupled to the drive channel means, rise channel means, fall channel means, and dump channel means.

5,204,552

VOLTAGE CONTROLLED OSCILLATOR AND AN OPERATING METHOD THEREOF

Tsutomu Miki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1992, Ser. No. 836,891

Claims priority, application Japan, Feb. 22, 1991, 3-028923; Feb. 7, 1992, 4-022923

Int. Cl.[5] **H03L** *7/00;* **H03B** *19/00*

U.S. Cl. 307—271 **18 Claims**

1. A voltage controlled oscillator, comprising:

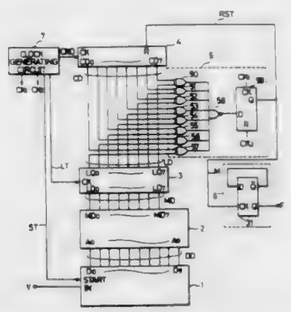
analog to digital converting means for converting an input voltage to a digital signal;

storage means for storing in advance frequency data corresponding to frequencies in respective addresses, receiving said digital signal, and reading out a frequency data from an address designated by said digital signal;

clock pulse generating means for generating clock pulses;

counting means for counting said clock pulses generated from said clock pulse generating means to provide a count data indicating count value; and

comparing means for comparing the frequency data read out from said storage means with the count data provided from said counting means, to provide a signal indicating



comparison result, and to reset said counting means when said frequency data coincides with said count data.

5,204,553

FIELD EFFECT TRANSISTOR CIRCUIT

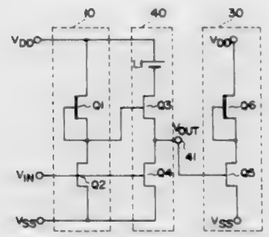
Shigeru Kataoka, Kawasaki, and Shoichi Shimizu, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1991, Ser. No. 728,530

Claims priority, application Japan, Jul. 13, 1990, 2-184012

Int. Cl.[5] **H03K** *17/00, 17/687, 19/003, 19/0185*

U.S. Cl. 307—443 **11 Claims**



1. A field effect transistor circuit comprising:

a first potential source;

a second potential source;

an output terminal for outputting a signal;

a first GaAs field effect transistor of a depletion type which has a drain, a source, and a drain, said drain being connected to said first potential source, and said source and said gate being connected to each other;

a second GaAs field effect transistor of an enhancement type which has a drain, a source, and a gate, the drain of said second GaAs field effect transistor being connected to a node where the source and gate of said first GaAs field effect transistor are connected to each other, and the gate of said second GaAs field effect transistor receiving said input signal;

a voltage level shifting element having two ends, one of which is connected to said second power source and the other of which is connected to the source of said second GaAs field effect transistor;

a current limiting element having two ends, one of which is connected to said first potential source;

a third GaAs field effect transistor of an enhancement type which has a drain, a source, and a gate, the drain and source of said third GaAs field effect transistor being connected respectively to the other end of said current limiting element and said output terminal, and the gate of said third GaAs field effect transistor receiving said input signal; and

a fourth GaAs field effect transistor of an enhancement type which has a drain, a source, and a gate, the drain and source of said fourth GaAs field effect transistor being respectively connected to said output terminal and said second potential source, and the gate of said fourth GaAs field effect transistor receiving a signal obtained at the node where the gate and source of said first GaAs transistor are connected to each other.

5,204,554

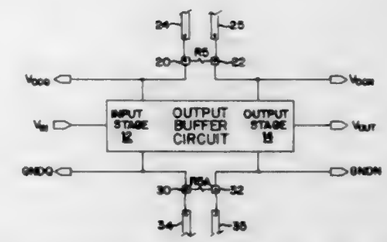
PARTIAL ISOLATION OF POWER RAILS FOR OUTPUT BUFFER CIRCUITS

James R. Ohannes, Portland; Stephen W. Clukey, South Portland; E. David Haacke, Westbrook, and Roy L. Yarbrough, Hiram, all of Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 6, 1991, Ser. No. 802,747

Int. Cl.[5] **H03K** *17/16*

U.S. Cl. 307—443 **20 Claims**



8. An output buffer circuit for delivering output signals of high and low potential levels at an output in response to data signals at an input, said output buffer circuit comprising an input stage coupled between a relatively quiet power supply rail and a relatively quiet power ground rail, and an output stage coupled between a relatively noisy power supply rail and a relatively noisy power ground rail, the improvement for reducing droop in the relatively noisy supply rail for reducing output step in voltage during transition from low to high potential level at the output comprising:

a first coupling resistor coupled between the relatively quiet and noisy supply rails, said resistor having a low resistance value selected for partially coupling said supply rails while maintaining partial isolation for maintaining input dynamic threshold levels of other non-switching quiet output buffer circuits coupled to a common bus.

5,204,555

LOGIC ARRAY HAVING HIGH FREQUENCY INTERNAL CLOCKING

Andrew C. Graham, Sunnyvale; Michael G. France, Fremont; Robert C. Burd, Sunnyvale, and Mark E. Fitzpatrick, San Jose, all of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Continuation of Ser. No. 505,953, Apr. 5, 1990, abandoned. This application Apr. 2, 1992, Ser. No. 863,327

Int. Cl.[5] **H03K** *5/13, 19/02*

U.S. Cl. 307—465 **29 Claims**

1. A state machine structure comprising:

logic array means having input leads and output leads;

at least one register means having input terminals coupled to said output leads of said logic array means and having output terminals coupled to said input leads of said logic array means; and

clock generating means for generating a clock signal having a frequency different than a reference signal applied to said clock generating means, said clock generating means

having an output coupled to a clock input terminal of one

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output terminal to said charge storing means during dis-

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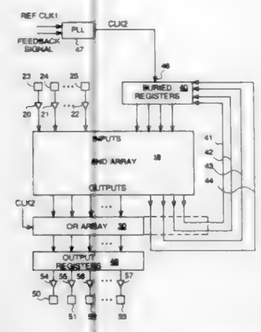
having an output coupled to a clock input terminal of one or more of said register means; wherein said clock generating means incorporates a phase-locked loop having first



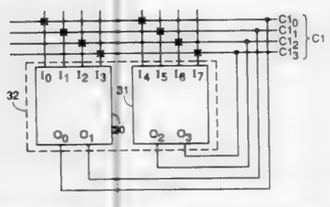
and second inputs, and having said reference signal coupled to said first input of said phase-locked loop, and an output terminal of said register means coupled to said second input of said phase-locked loop.

5,204,556

PROGRAMMABLE INTERCONNECT STRUCTURE FOR LOGIC BLOCKS

Kapil Shankar, San Jose, Calif., assignor to Lattice Semiconductor Corporation, San Jose, Calif.

Filed May 6, 1991, Ser. No. 696,462
Int. Cl.[5] **G06F** *7/38;* **H03K** *3/26*
U.S. Cl. 307—465.1 **19 Claims**



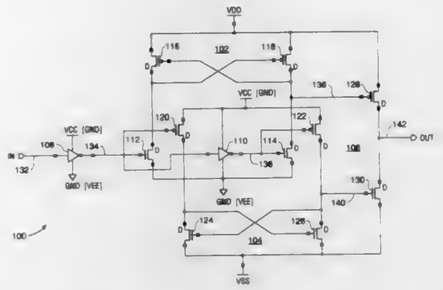
1. A programmable interconnect structure comprising:
a plurality of logic blocks, each of said logic blocks having a plurality of input terminals and a plurality of output terminals, the number of output terminals of each logic block being less than the number of input terminals of said logic block;
an input channel to each of said one or more logic blocks, each input channel comprising a plurality of input lines connected to predetermined input terminals of a predetermined one of said logic blocks;
a plurality of signal routing channels, each of said signal routing channels comprising a plurality of signal routing lines;
said logic blocks being grouped into one or more megacells, each of said megacells containing more than one logic block, the output terminals of the logic blocks in each of said megacells being connected to predetermined signal routing lines in a predetermined one of said signal routing channels; and
a matrix of programmable connections between each of said input channels and each of said signal routing channels wherein the number of said programmable connections in each said matrix is less than the number of input lines in said matrix multiplied by the number of signal routing lines in said matrix and equal to or greater than the number of input lines in said matrix.

5,204,557

DIGITAL SIGNAL LEVEL TRANSLATOR

Thai M. Nguyen, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 15, 1991, Ser. No. 776,838
Int. Cl.[5] **H03K** *19/094*
U.S. Cl. 307—475 **14 Claims**



1. A digital signal level translator for translating an unbalanced digital signal to a balanced digital signal, said digital signal level translator comprising:
first translator means for receiving and translating a first unbalanced digital signal to a second unbalanced digital signal, wherein said first unbalanced digital signal has a first unbalanced dynamic signal range bounded by a first level and a reference level, and wherein said second unbalanced digital signal has a second unbalanced dynamic signal range bounded by a second level and said reference level;
second translator means for receiving and translating said first unbalanced digital signal to a first balanced digital signal, wherein said first balanced digital signal has a first balanced dynamic signal range bounded by said first level and a third level; and
output buffer means for receiving said second unbalanced digital signal and said first balanced digital signal, and for providing a second balanced digital signal, wherein said second balanced digital signal has a second balanced dynamic signal range bounded by said second level and said third level;
wherein said first and second levels have a first polarity relative to said reference level, and said third level has a second polarity relative to said reference level.

5,204,558

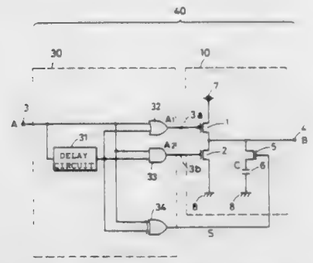
OUTPUT BUFFER CIRCUIT AND METHOD OF OPERATION THEREOF WITH REDUCED POWER CONSUMPTION

Satoshi Kumaki, and Shinichi Uramoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 760,458
Claims priority, application Japan, Sep. 22, 1990, 2-252834
Int. Cl.[5] **H03K** *19/092, 17/56*
U.S. Cl. 307—475 **10 Claims**

1. An output buffer circuit, comprising:
an output terminal for producing an output signal;
charging means responsive to an input signal for charging said output terminal;
discharging means responsive to the input signal for discharging said output terminal;
charge storing means for storing charge;
switching means for supplying charge from said charge storing means to said output terminal during charging by said charging means and for supplying charge from said

output terminal to said charge storing means during discharging by said discharging means; and



control means for switching said switching means in response to the input signal.

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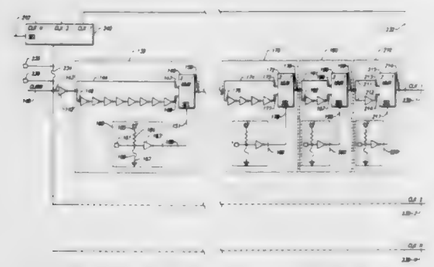
METHOD AND APPARATUS FOR CONTROLLING CLOCK SKEW

Ira Deyhimy; Robert N. Deming; William C. Terrell, all of Thousand Oaks, and David W. Hedges, Sunnyvale, all of Calif., assignors to Vitesse Semiconductor Corporation, Camarillo, Calif.

Filed Jan. 23, 1991, Ser. No. 645,981
Int. Cl.[5] **H03K** *19/00, 5/13*
U.S. Cl. 307—480 **15 Claims**



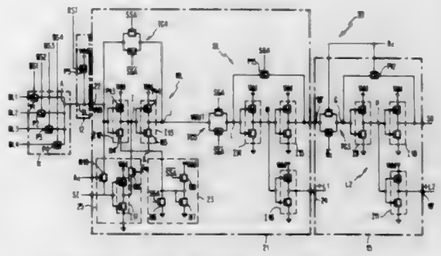
1. A clock distribution circuit for use in a digital logic system, said digital logic system including a primary clock signal and a plurality of digital logic system components, said clock distribution circuit producing from said primary clock signal a plurality of master clock signals on a plurality of master clock output lines, one or more of said digital logic system components receiving a master clock signal on one of said master clock output lines, said clock distribution circuit comprising:
for each master clock output line, means for generating a time delay between said primary clock signal and said master clock signal on said master clock output line, said time delay generating means comprising a series of delay elements, each of said series of delay elements further including one or more subseries of delay elements, each said subseries of delay elements for generating a portion of said time delay, and each of said subseries coupled to a switching means, said switching means for controlling whether said subseries provides said portion of said time delay, said switching means including a fuse;
means for automatically controlling said time delay generated by said time delay generating means for ensuring that differences among delays between said primary clock signal and said master clock signals on said master clock output lines are within a predetermined time range; and
means for emulating a fuse in its blown state before said fuse is blown.

5,204,560

COMBINED SENSE AMPLIFIER AND LATCHING CIRCUIT FOR HIGH SPEED ROMS

Francis Bredin, Maisons Alfort; Thierry Cantiant, Dammarie-Les-Lys, and Pierre Coppens, Savigny-Le-Temple, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1991, Ser. No. 771,669
Claims priority, application European Pat. Off., Mar. 29, 1991, 91480053.7
Int. Cl.[5] **H03F** *3/45;* **H03K** *5/153*
U.S. Cl. 307—530 **12 Claims**



1. A combined sense amplifier and latching circuit (21) comprising:
an input terminal (22) for receiving an input signal (VIN);
a reference voltage generator (23) for generating a reference voltage (VREF);
a first stage including a sense amplifier circuit having a gated-loop master latch (ML) having first and second cascaded inverters (I12, I13) with a first common node (I) coupled therebetween and a first control device (TG4) in the master latch loop controlled by a gating signal (SSA); said first and second inverters being biased between a first supply voltage (Vdd) having a magnitude greater than said reference voltage (VREF) and either a second supply voltage (GND) or said reference voltage (VREF) depending on the value of said gating signal (SSA); said input terminal being connected to the input of said first inverter;
a second stage including a latching circuit connected in series with said first stage and having a gated-loop slave latch (SL) having third and fourth cascaded inverters (I14, I15) with a second common node (M) coupled therebetween and a second control device (P15) in the slave latch loop controlled by said gating signal (SSA); and,
said first and second stages being isolated from each other by a third control device (TG5) controlled by said gating signal (SSA).

5,204,561

GATE CONTROL CIRCUIT FOR MOS TRANSISTOR

Klaus Rischmüller, Aix En Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 16, 1990, Ser. No. 552,951
Claims priority, application France, Jul. 17, 1989, 89 09912
Int. Cl.[5] **H03K** *17/687*
U.S. Cl. 307—571 **4 Claims**

1. A gate control circuit for a power component with a capacitive input such as a power MOS transistor exhibiting an input capacitance, wherein a gate of said power component is in series with an inductance, said inductance being precharged, comprising:
first means comprising a first switch in series with a diode of a first polarity for transferring energy stored in the inductance to the input capacitance during a switching on condition of said power component; and

second means comprising a second switch in series with a

coupled to said source of said first MOSFET, a drain coupled to said drain of the load MOSFET and a gate

at a second ambient temperature, different from said first ambient temperature by a predetermined value are stored,

thereon and said side wall having a connector supporting plate thereon; and

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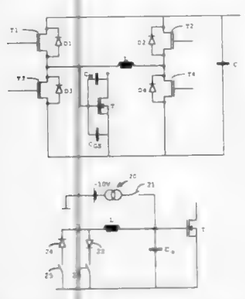
second means comprising a second switch in series with a diode of a second polarity for transferring back to the

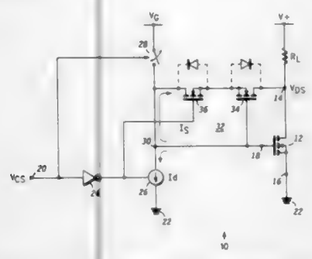


inductance energy stored in the input capacitance during a switching off condition of said power component.

5,204,562
TURN OFF DELAY REDUCTION CIRCUIT AND METHOD

W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 29, 1991, Ser. No. 800,320
Int. Cl.[5] H03K *17/687, 3/33*
U.S. Cl. 307—571 **25 Claims**



1. A driver circuit for switching a load MOSFET on and off responsive to a control signal applied at an input of the driver circuit while reducing delay time for switching the load MOSFET off, comprising:

a current supply coupled to a gate of the load MOSFET and being responsive to the control signal being in a first level state for providing a first current of fixed magnitude for switching off the load MOSFET at a controlled rate;

a current boost circuit coupled between the gate and a drain of the load MOSFET and being responsive to the control signal being in said first level state for providing a second current via a low impedance circuit path to rapidly discharge associated gate capacitance of the load MOSFET during initial switching off of the load MOSFET until a voltage developed at said drain of the load MOSFET reaches a predetermined value after which said current boost circuit is disabled and the load MOSFET is then switched off at a controlled rate by said current supply, said second current having a magnitude greater than the magnitude of said first current, said current boost circuit including a first MOSFET having a drain coupled to said gate of said load MOSFET, a source and a gate to which the control signal is coupled, and diode means coupled between said source of said first MOSFET and said drain of the load MOSFET;

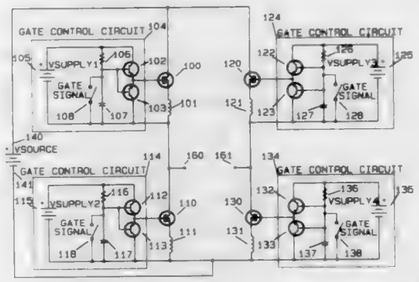
circuit means coupled to said gate of the load MOSFET and being responsive to the control signal being in a second level state for turning on the load MOSFET; and

said diode means being a second MOSFET having a source coupled to said source of said first MOSFET, a drain coupled to said drain of the load MOSFET and a gate coupled to said gate of the load MOSFET.

5,204,563
MOSFET OUTPUT CIRCUIT WITH IMPROVED PROTECTION METHOD

Barry L. Jason, 325 Warbler Dr., Bedford, Tex. 76021

Filed Jan. 22, 1992, Ser. No. 823,884
Int. Cl.[5] H03K *17/687;* **H02H** *7/122*
U.S. Cl. 307—585 **8 Claims**



1. A MOSFET output circuit comprising a power source having a first and a second terminal, a first and a second MOSFET each having a drain terminal a source terminal and a gate terminal, a first and a second inductor each having a first and a second terminal, and a first and a second gate control circuit each having a first and a second terminal, in which:

the drain terminal of the first MOSFET is connected to the first terminal of the power source;

the gate terminal of the first MOSFET is connected to the first terminal of the first gate control circuit;

the source terminal of the first MOSFET is connected to the first terminal of the first inductor;

the second terminal of this first inductor is connected to the drain terminal of the second MOSFET, the second terminal of the first gate control circuit, and an output terminal of said MOSFET output circuit;

the gate terminal of the second MOSFET is connected to the first terminal of the second gate control circuit;

the source terminal of the second MOSFET is connected to the first terminal of the second inductor;

the second terminal of the second inductor is connected to the second terminal of the power source, and the second terminal of the second gate control circuit.

5,204,564
VARIABLE DELAY CIRCUIT

Katsumi Ochiai, Saitama, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jul. 22, 1992, Ser. No. 916,672
Claims priority, application Japan, Jul. 31, 1991, 3-192110
Int. Cl.[5] H03C *5/13*
U.S. Cl. 307—603 **6 Claims**

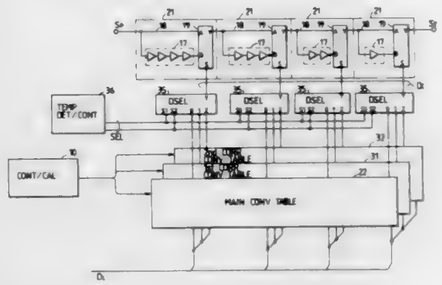
1. A variable delay circuit comprising:

a plurality of cascade-connected delay stages, each including a path passing through a delay element, a path not passing therethrough, and a selector for selecting one of them, said selectors of said delay stages being controlled by corresponding bits of control data to vary a composite delay of said cascade-connected delay stages;

main conversion table means whereby set data of an intended delay is converted to control data which provides said composite delay closest to said intended delay corresponding to said set data at a first ambient temperature;

corrected conversion table means wherein predicted delays

at a second ambient temperature, different from said first ambient temperature by a predetermined value are stored, the predicted delays being the closest to said intended delay corresponding to each piece of said set data corresponding to said composite delay for said control data at said first ambient temperature; and

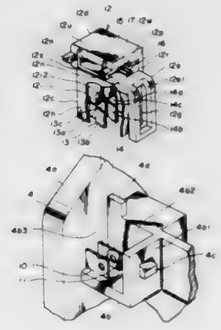


temperature detection/control means which detects ambient temperature and outputs a select control signal for selecting control data from either said main conversion table means and said corrected conversion table means.

5,204,565
SMALL-SIZED ELECTRIC MOTOR WITH CONNECTOR FOR POWER SUPPLY

Shuji Sekine, and Yukihide Shibata, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama City, Japan

Filed Nov. 19, 1991, Ser. No. 794,239
Claims priority, application Japan, Nov. 21, 1990, 2-121978[U]; Nov. 21, 1990, 2-121979[U]; Nov. 21, 1990, 2-121980[U]
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—71 **3 Claims**



2. In combination with a motor housing of a motor and an electrical connector mounted on said housing of the motor:

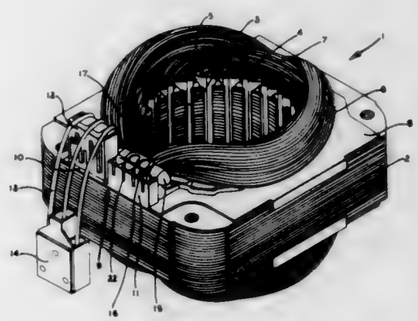
said housing having a pair of power terminals passing therethrough for supplying electric current to the motor and a connector fitting portion protruding therefrom and located in the vicinity of said power terminals, said connector fitting portion having a side wall extending outwardly from said housing adjacent said power terminals and a partition wall supported on the side wall in spaced relation to said housing, said partition wall having a projection thereon and said side wall having a connector supporting plate thereon; and

said electrical connector having a pair of socket terminals for receiving said power terminals of said housing of the motor perpendicularly to the protruding direction of said power terminals, said socket terminals being disposed in a connector body and having a pair of apertures in a bottom wall thereof and a pair of slits communicating with said apertures and located in a side wall thereof, through which said power terminals of said housing are conducted, said connector body being located in said connector fitting portion of said housing of the motor between said housing and said partition wall, a pair of lead wires connected to said socket terminals respectively, a connector cap connected to said connector body by a hinge and holding the lead wires between said cap and the connector body, an engaging piece on said connector body engaged with the projection on said partition wall of said housing of the motor and a hook on said connector body engaged with the connector supporting plate on said side wall of said housing of the motor to secure said connector body to said housing.

5,204,566
ELECTRICAL MACHINE

Sverre Martin Borgen; Poul Petersen, both of Nordborg, Denmark, and Heinz O. Lassen, Flensburg, Fed. Rep. of Germany, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 25, 1991, Ser. No. 798,227
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1990, 4037753
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—71 **14 Claims**



1. An electrical machine, comprising a laminated core having winding slots and frontal faces, at least one winding extending at least in part in said slots and having winding heads and winding ends, electrical connecting wires having ends, each winding end being of an elongated length, an electrically insulating end plate adjacent to each core frontal face and a winding head, and a connecting box joined to one of the end plates and having the electrical connecting wires and winding ends extended therein, the connecting box having a clamp for each winding end to receive the respective end after the introduction of the winding end into the connecting box, each clamp having insulation-piercing contacts, the insulation-piercing contacts comprising two cutting edges that converge with increasing depth for contacting the winding end.

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said magnetic field such that motion of said principal axis

(d) at least one spiral coil of electrically conductive wire

boundary wherein the length of the inner boundary is greater than the outer boundary; and

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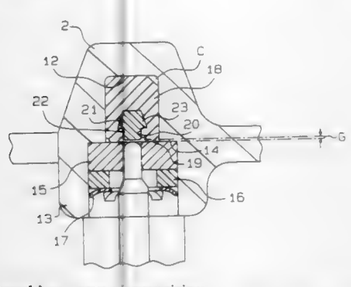
5,204,567
BRUSHLESS MOTOR WITH RESILIENT SHAFT END-PLAY ABSORBER

Tsutomu Kinoshita, Kosai, and Tetsurou Shinmura, Toyohashi, both of Japan, assignors to Asmo Co., Ltd., Kosai, Japan

Continuation of Ser. No. 725,971, Jul. 5, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 905,089
Claims priority, application Japan, Jul. 9, 1990, 2-73107[U]
Int. Cl.[5] H02K *05/24, 05/16, 07/08;* **F16C** *27/08*
U.S. Cl. 310—90 **2 Claims**



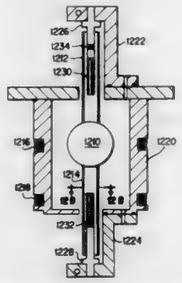
1. A brushless motor comprising:
a housing including an upper case and a lower case, the lower case being made of a magnetic material;
a rotor and a drive shaft rotatable together with the rotor, the rotor and drive shaft being positioned within the housing, the rotor having a magnet thereon that attracts the lower case with an attracting force, the drive shaft having first and second ends, the first end disposed within the upper case and the second end disposed within the lower case;
an impact absorbing means including a resilient member attached to an inner wall of the upper case in a position generally opposite to the first end of the drive shaft; and
a thrust receiving means including a rigid member attached to the resilient member and facing the first end of the drive shaft, there being a predetermined gap between the rigid member and the first end of the drive shaft, the rigid member being positioned to be hit by the first end of the drive shaft only when the drive shaft vibrates whereby the resilient member deforms to absorb the impact of the drive shaft striking the rigid member; and
whereby the attracting force is applied to the drive shaft to bias the drive shaft in the direction of the lower case to help keep the drive shaft separated from the rigid member when the drive shaft does not vibrate.

5,204,568
SUPERCONDUCTING BEARING FOR BOREHOLE AND SURVEY GRAVIMETERS

Robert L. Kleinberg, Ridgefield; Douglas D. Griffin, Bethel, both of Conn., and Richard J. Warburton, Del Mar, Calif., assignors to GWR Instruments, San Diego, Calif.

Filed Sep. 23, 1991, Ser. No. 763,988
Int. Cl.[5] H02K *7/09;* **G01V** *3/08;* **G01C** *9/06;* **G01M** *1/12*
U.S. Cl. 310—90.5 **36 Claims**

1. A bearing for a levitated body comprising superconductive material, comprising:
a. an elongate member of superconductive material affixed to said levitated body and having a principal axis;
b. coil means for generating a magnetic field which defines a bearing axis and which tends to bring said principal axis into coincidence with said bearing axis; and
c. means for dissipating energy from changes in said magnetic field resulting from motion of said principal axis toward and away from coincidence with said bearing axis, said means for dissipating energy comprises at least one damping body of lossy conductive material located within said magnetic field such that motion of said principal axis toward and away from coincidence with said bearing axis

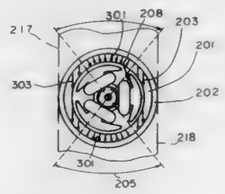


will induce eddy currents in said damping body and thereby dampen said motion.

5,204,569
ANISOTROPIC MAGNET FOR ROTARY ELECTRIC MACHINE

Haruyoshi Hino, Shizuoka, and Takeshi Tanaka, Toyohashi, both of Japan, assignors to ASMO Co., Ltd. and Nippondenso Co., Ltd., both of Japan

Filed Feb. 6, 1991, Ser. No. 651,658
Claims priority, application Japan, Feb. 7, 1990, 2-27976; Sep. 18, 1990, 2-249467
Int. Cl.[5] H02K *1/18*
U.S. Cl. 310—154 **6 Claims**



1. An anisotropic magnet for use in a rotary machine having a plurality of magnetic pole portions in a yoke wherein said anisotropic magnet establishes at least one of said magnetic pole portions, said anisotropic magnet having a center portion with lines of magnetic force oriented in a radial direction and opposite portions each having lines of magnetic force that are successively oriented in such a manner as to be gradually offset from a radial direction toward a direction wherein outermost lines of magnetic force of the opposite portions are mutually parallel.

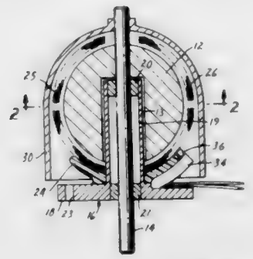
5,204,570
SPHEROIDAL MACHINE

Sten R. Gerfast, 1802 Valley Curve Rd., Mendota Heights, Minn. 55118

Filed Sep. 9, 1991, Ser. No. 756,435
Int. Cl.[5] H02K *21/21*
U.S. Cl. 310—156 **16 Claims**

1. A dynamoelectric machine comprising
(a) a rotor comprising a rotatable shaft,
(b) at least one permanent magnet fixed to the shaft and having working faces of alternating N and S magnet poles lying substantially in a spheroid that has the shaft as its axis and has an equator, each magnet pole being centered on the equator of the spheroid,
(c) a stator comprising a frame in which the shaft is journalled, and

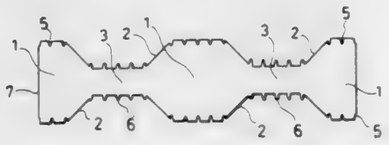
(d) at least one spiral coil of electrically conductive wire fixed to the frame, each coil having a cup-shaped working face centered on said equator and closely spaced from the working faces of the magnet.



5,204,571
MINIATURE ELECTRIC MOTOR WITH RUBBER STATOR MAGNET

Yukako Nojima, Kyoto; Shigenori Uda, Osaka; Hiromi Suyama, Tottori, and Masanori Onda, Yonago, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 22, 1991, Ser. No. 703,263
Claims priority, application Japan, Jul. 13, 1990, 2-186534
Int. Cl.[5] H02K *1/17;* **H01F** *3/02, 7/02*
U.S. Cl. 310—156 **4 Claims**



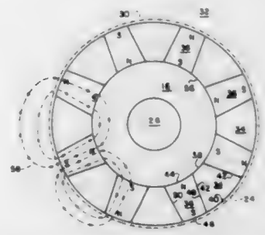
1. A miniature electric motor having a stator including a strip made of a rubber magnet, said strip comprising:
at least one wide width part;
at least one narrow width part;
at least one polarized region disposed on said at least one wide width part; and
at least one non-polarized region disposed on said at least one narrow width part; and
continuously varying width sections which connect the polarized regions to the non-polarized regions.

5,204,572
RADIAL MAGNETIC COUPLING

Caio A. Ferreira, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 13, 1990, Ser. No. 581,759
Int. Cl.[5] H02K *21/12*
U.S. Cl. 310—156 **11 Claims**

1. A permanent magnet coupling having:
an outer member with a plurality of permanent magnets mounted on its inner surface;
an inner member having a radius and lying within said outer member;
a plurality of interpole members circumferentially disposed on the inner member in proximity to said outer member and defining gaps having an inner boundary and an outer boundary wherein the length of the inner boundary is greater than the outer boundary; and

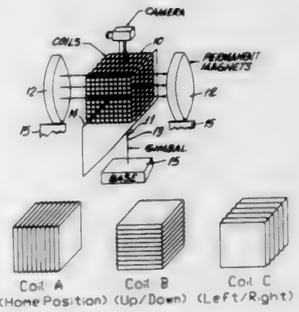


a plurality of permanent magnets each having a north and south pole and wedged into respective ones of the gaps defined by the interpole members.

5,204,573
TWO-DIMENSIONAL POINTING MOTOR

Benjamin B. Bederson; Richard S. Wallace, and Eric L. Schwartz, all of New York, N.Y., assignors to Vision Applications, Inc., Allston, Mass.

Filed Jul. 17, 1991, Ser. No. 731,639
Int. Cl.[5] H02K *3/00*
U.S. Cl. 310—198 **17 Claims**



1. A two-dimensional motor comprising:
(a) a rotor body;
(b) a first conductive coil wound around and on said rotor body and laying in a first plane;
a second conductive coil wound around and on said rotor body and laying in a second plane;
a third conductive coil wound around and on said rotor body and laying in a third plane;
said first, second and third planes being linearly independent to each other;
(c) a base to support portions of the motor;
(d) a magnetic field means mounted on said base to produce a directed magnetic field through said rotor body an to induce torque on said rotor body when current flows in said coils;
(e) gimbal means mounted on said base to pivotly mount said rotor body to provide both tilting motion and panning motion to said rotor body;
(f) current means to provide selected electrical current to said coils and to thereby control the tilting and panning movement of the rotor body.

5,204,574

that the electrode portion of said interdigital transducer is

5,204,577
ULTRASONIC MOTOR IMPROVED IN DRIVING

electrodes therein and further containing a fill of mercury, a metal halide and an inert gas,

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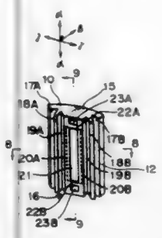
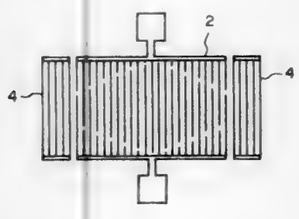
5,204,574
COMMUTATOR FOR A MOTOR AND METHOD OF MANUFACTURING THE SAME
Kazunobu Kanno, and Kouji Takahashi, both of Toyohashi, Japan, assignors to ASMO Co., Ltd., Kosai, Japan
Filed Nov. 27, 1991, Ser. No. 799,109
Claims priority, application Japan, Nov. 30, 1990, 2-337582; Sep. 26, 1991, 3-247428
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—233 **4 Claims**



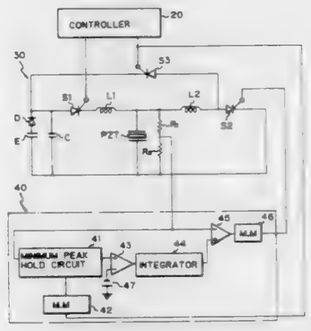
1. A commutator for use in a motor in which a plurality of commutator segments are fixed to an outer circumferential face of a cylindrical insulating resin, comprising:
a recess formed in an inner circumferential face of each of the commutator segments to which the cylindrical insulating resin is fixed;
first claw members formed on both circumferential sides of said recess and slanted inwardly over said recess; and
protrusions formed on both axial sides of said recess and slanted over said recess.

5,204,575
SURFACE ACOUSTIC WAVE RESONATOR
Tadashi Kanda; Koji Asano; Hiroshi Shimizu, all of Sendai, and Yuji Suzuki, Kofu, all of Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan
Filed Oct. 2, 1991, Ser. No. 770,178
Claims priority, application Japan, Oct. 15, 1990, 2-275888
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 B **3 Claims**



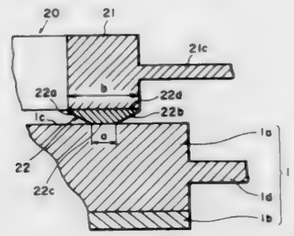
1. A surface acoustic wave resonator having an interdigital transducer on a piezoelectric substrate, characterized in:
that grating reflectors, which have electrode strips of the same width and the same pitch as those of electrodes of said interdigital transducer and of a number smaller than 1/5 that of said electrodes of said interdigital transducer, are disposed at the intervals equal to said pitch at both sides of said interdigital transducer on a surface wave propagation path; and
that the electrode portion of said interdigital transducer is weighted so that the aperture of said interdigital transducer is maximum at the center of said interdigital transducer and uniformly decreases toward its both sides along respective sides of a rhombus with its vertices at the centers of the outermost electrode strips of said grating reflectors.

5,204,576
DEVICE FOR DRIVING A PIEZOELECTRIC ELEMENT
Masaki Mitsuyasu, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jun. 17, 1991, Ser. No. 716,712
Claims priority, application Japan, Jun. 18, 1990, 2-157701
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—317 **17 Claims**



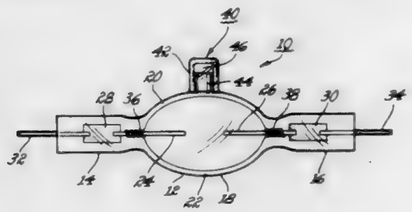
1. A device for driving a piezoelectric element, comprising:
a power condenser having a high voltage side terminal;
first switching mans connected between the piezoelectric element and the high voltage side terminal of said power condenser for charging the piezoelectric element by using a high potential at the high voltage side terminal of said power condenser;
second switching means connected between the piezoelectric element and the ground for discharging the piezoelectric element to the ground via a first discharging coil;
third switching means connected between the piezoelectric element and the high voltage side terminal of said power condenser for discharging the piezoelectric element to the high voltage side terminal of said power condenser via a second discharging coil;
control means coupled to the second and third switching means for controlling said second switching means and said third switching means to initially discharge the piezoelectric element to the high voltage side terminal of said power condenser and then discharge the piezoelectric element to the ground; and
detecting means coupled to the control means and coupled to the piezoelectric element for detecting a negative voltage at a terminal of the piezoelectric element after the discharging operation of the piezoelectric element is completed and before the charging operation of the piezoelectric element is started, said control means controlling a switching time of said second switching means to make said negative voltage equal to a predetermined voltage.

5,204,577
ULTRASONIC MOTOR IMPROVED IN DRIVING EFFICIENCY
Tsuneo Watanabe; Tadao Takagi, both of Yokohama, and Daisuke Saya, Urayasu, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 515,714, Apr. 27, 1990, abandoned. This application May 26, 1992, Ser. No. 888,289
Claims priority, application Japan, May 15, 1989, 1-120685; Mar. 13, 1990, 2-61769
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 **8 Claims**



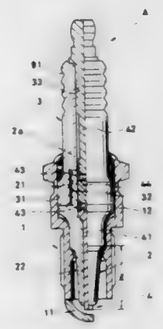
1. An ultrasonic motor comprising:
a stator having a piezoelectric element and an elastic body capable of producing a traveling vibration wave on a drive surface thereof with excitation of said piezoelectric element, said drive surface being formed on a plane perpendicular to a rotating axis; and
a rotor rotatable about said rotating axis by said traveling vibration wave, said rotor having a slider member with a continuous annular contact surface that is brought into contact with the drive surface of said elastic body by being pressed against said drive surface, and a rotor base member bonded to said slider member;
wherein the area of said contact surface is smaller than the area of said slider member at which said slider member is bonded to said rotor base member; and
wherein said rotor base member has an annular recess formed n a surface opposed to said drive surface, and said slider member is retained by being fited in said recess.

5,204,578
HEAT SINK MEANS FOR METAL HALIDE LAMP
Timothy P. Dever, Fairview Park; Gary R. Allen, Chesterland; John M. Davenport, Lyndhurst, and Gerald E. Duffy, Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 608,091, Nov. 1, 1990, abandoned. This application May 15, 1992, Ser. No. 884,606
Int. Cl.[5] H01J *61/52*
U.S. Cl. 313—25 **18 Claims**



1. A metal halide lamp experiencing low light loss during lamp start-up comprising in combination:
(a) a fused quartz arc tube having a hollow cavity formed with walls hermetically sealing spaced-apart discharge electrodes therein and further containing a fill of mercury, a metal halide and an inert gas,
(b) external heat sink means physically engaging the exterior surface of one arc tube wall,
(c) the heat sink means being disposed intermediate the discharge electrodes adjacent the hot spot region of the arc tube for selective condensation of mercury vapor on the inner surface of the arc tube wall at such location; and,
(d) said heat sink means being of a reduced size relative to the surface area of said arc tube and being disposed on a portion of the equatorial surface of said arc tube so as to reduce light blockage by said heat sink means and further being effective during a restarting operation following a recent extinguishment of the arc discharge within said arc tube for preventing condensation of said mercury near said discharge electrodes which would otherwise block light generated immediately upon occurrence of such restarting operation.

5,204,579
CERAMIC INSULATOR FOR SPARK PLUG STRUCTURE
Takafumi Oshima; Shigeyasu Yamada, and Kazuhiko Kozaka, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Aug. 25, 1989, Ser. No. 399,704
Claims priority, application Japan, Aug. 25, 1988, 63-209450; Dec. 9, 1988, 63-312186
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] H01T *13/20, 13/38*
U.S. Cl. 313—143 **5 Claims**



1. A spark plug structure comprising a metallic shell, a ceramic insulator positioned within the metallic shell and a center electrode placed within the ceramic insulator, said ceramic insulator comprising a front half piece extending beyond said metallic shell and having an enlarged projection head at one end and a separate rear half piece provided with a recess at one end corresponding to the projection head of said front half piece, said two half pieces being joined and bonded together upon fitting the projection head of said front half piece into the recess of said rear half piece.

5,204,580
RING SHAPED LAMP DEVICE HAVING BULB

nanometers, said protuberance having been fabricated by being

a top portion which is perpendicular to the lower member;

5,204,585
ELECTRON BEAM DEFLECTION LENS FOR COLOR

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5,204,580

RING-SHAPED LAMP DEVICE HAVING BULB TILTABLE RELATIVE TO BASE STRUCTURE

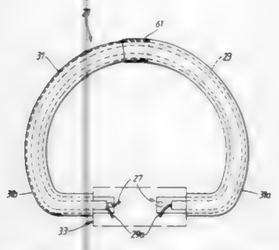
Masaharu Baba; Takao Mizukami, and Masako Nakamura, all of Yokohama, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Continuation of Ser. No. 409,786, Sep. 20, 1989, abandoned. This application Jul. 12, 1991, Ser. No. 729,853

Claims priority, application Japan, Sep. 20, 1988, 63-235316; Sep. 22, 1988, 63-238001

Int. Cl.[5] H01J *5/54, 61/52*

U.S. Cl. 313—318 6 Claims



1. A ring-shaped lamp device which is supported by an external supporter, comprising:

a bulb including:

a tubular ring-shaped body portion having a defined annular length, and

a pair of tubular linear portions each having a defined length, a first end of each tubular linear portion being integrally connected, as one piece, to a corresponding end of the tubular ring-shaped body portion, the second end of each tubular linear portion being sealed, the second end of one tubular linear portion facing the second end of the other tubular linear portion so that the bulb axis of the one tubular linear portion coincides with that of the other tubular linear portion;

a pair of electrodes, one of which is disposed in each of the tubular linear portions, for producing discharge therebetween through the tubular ring-shaped body portion;

a base structure having a connector which is adapted to be connected to the pair of electrodes, the base structure being rotatably connected around the outer surfaces of the tubular linear portions so that the lamp is rotatable with regard to the connection between the base structure and each outer surface of the tubular linear portions; and

two heat shrinkable tubular pieces which cover the ring-shaped body and the linear portions, one end of each tubular piece overlapping one end of the other tubular piece at the ring-shaped body overlap portion located substantially midway between the ring-shaped body portion corresponding ends.

5,204,581

DEVICE INCLUDING A TAPERED MICROMINIATURE SILICON STRUCTURE

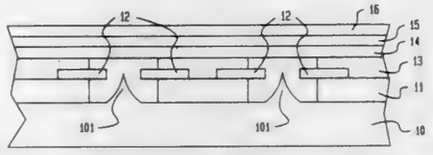
Nicholas C. Andreadakis, White House Station; Robert B. Marcus, Murray Hill, and Tirunelveli S. Ravi, Eatontown, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Division of Ser. No. 774,361, Oct. 8, 1991, which is a continuation of Ser. No. 551,771, Jul. 12, 1990, abandoned. This application Jun. 2, 1992, Ser. No. 892,289

Int. Cl.[5] H01J *1/30, 19/24*

U.S. Cl. 313—336 12 Claims

1. A discharge device comprising at least one tapered silicon protuberance which terminates in an apex whose radius of curvature in a vertical cross-sectional view is less than 10 nanometers, said protuberance having been fabricated by being exposed to an essentially dry oxidizing environment at a temperature not exceeding 1050° C., and by stripping any oxide surface formed from said protuberance.



5,204,582

CATHODE RAY TUBE WITH AN OXYSULFIDE PHOSPHOR

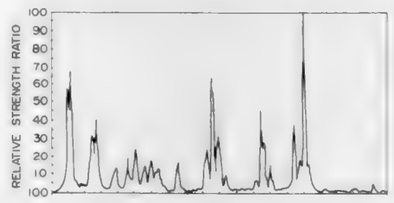
Yasukazu Morita, Mobara; Yasuhiko Uehara, Chiba; Hiromichi Yamada, Hino, and Yoshimasa Hara, Nagoya, all of Japan, assignors to Hitachi, Ltd., Tokyo and Brother Industries, Limited, Aichi, both of Japan

Filed Jul. 11, 1990, Ser. No. 551,010

Claims priority, application Japan, Jul. 12, 1989, 1-177937

Int. Cl.[5] H01J *29/20*

U.S. Cl. 313—468 3 Claims



1. A cathode ray tube comprising a phosphor surface formed of a single phosphor having a substantially equal light emission energy strength in each of three wavelength regions of 400 to 500 nm, 520 to 580 nm and 600 to 700 nm in the visible radiation region; the phosphor surface being formed of a single phosphor having the following chemical composition formula:

$$(M_{1-x-y}Eu_xTb_y)_nD$$

wherein M represent Y or Lu, D represents O_2S, n is 2, x is defined by $0.003 \leqq x \leqq 0.01$, and y is defined by $0.0003 \leqq 0.005$.

5,204,583

FILAMENT SUPPORTER FOR USE IN VACUUM FLUORESCENT DISPLAY TUBES AND METHOD FOR FILAMENT INSTALLATION

Jingyu Jeong, Kyeongsangnam, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Oct. 21, 1991, Ser. No. 781,489

Claims priority, application Rep. of Koren, Oct. 24, 1990, 90-17186

Int. Cl.[5] H01J *9/04, 9/18;* H01K *63/02, 63/06*

U.S. Cl. 313—496 3 Claims

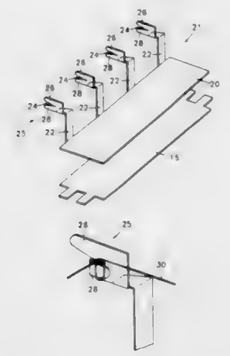
2. A filament supporter for use in a vacuum fluorescent display tube, comprising:

a metallic plate; and

a plurality of spaced metallic projections extending from said plate each projection comprising a lower member which is perpendicular to the plate, each of said projections further comprising:

a top portion which is perpendicular to the lower member; and

an upstanding member which extends from one side edge of the top portion and is perpendicular to the plate, said upstanding member including upper and lower wings separated by a clamping groove formed in said upstanding member, said lower wing being bent so as to sandwich a filament between said lower wing and said upstanding member.



5,204,584

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP

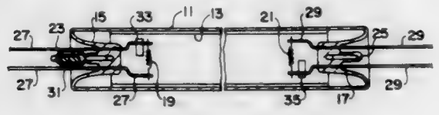
Toshiyuki Ikeda, Kanuma, and Masao Nagai, Yokohama, both of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Sep. 20, 1991, Ser. No. 763,305

Claims priority, application Japan, Sep. 28, 1990, 2-258917

Int. Cl.[5] H01J *61/20, 61/42*

U.S. Cl. 313—565 17 Claims



1. A low pressure mercury vapor discharge lamp, comprising:

a tube forming a discharge space therein, said discharge space containing a discharge gas including a mercury vapor;

a pair of electrodes provided in said tube, said pair of electrodes having a space therebetween;

a main amalgam sealed in said tube for controlling a mercury vapor pressure in said tube, said main amalgam having a mercury vapor pressure not less than a third as much as a mercury vapor pressure of pure mercury at a temperature between 0° C. and 50° C.; and

an auxiliary amalgam sealed in said tube and located closer to one of said pair of electrodes than said main amalgam, said auxiliary amalgam having a composition different from that of said main amalgam and having a mercury vapor pressure less than that of said main amalgam, but not less than a third as much as said mercury vapor pressure of said main amalgam at a temperature between 0° C. and 50° C.

5,204,585

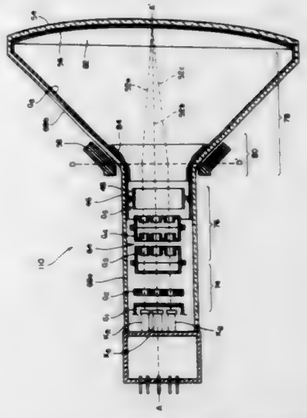
ELECTRON BEAM DEFLECTION LENS FOR COLOR CRT

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes LTD., Tajwar, Rep. of China

Filed Apr. 27, 1992, Ser. No. 874,503

Int. Cl.[5] H01J *29/46, 29/56*

U.S. Cl. 315—15 45 Claims



1. An inline electron gun for directing a plurality of electron beams along an axis onto a display screen in a color cathode ray tube (CRT) having a neck portion and a frusto-conical funnel portion disposed intermediate said neck portion and said display screen, said CRT further including a magnetic deflection yoke disposed generally intermediate said neck and funnel portions for providing a magnetic deflection region for deflecting said electron beams across said display screen in a raster-like manner, said electron gun comprising:

a source of energetic electrons;

low voltage beam forming means disposed adjacent said source of energetic electrons and within the neck portion of the CRT for forming the energetic electrons into a plurality of electron beams directed along said axis; and

high voltage focus means disposed in the magnetic deflection region and intermediate said beam forming means and the display screen for providing a common aperture electrostatic focus region for the plurality of electron beams for focusing the electron beams on the display screen, wherein said magnetic deflection region and said electrostatic focus region overlap and are coincident, wherein said focus means includes a first charged electrode defining a first common aperture aligned with said axis through which the electron beams are directed and disposed intermediate said magnetic deflection yoke and said display screen and adjacent to an inner surface of the funnel portion of the CRT.

5,204,586

SOLAR POWERED LAMP HAVING A CIRCUIT FOR PROVIDING POSITIVE TURN-ON AT LOW LIGHT LEVELS

Fred A. Moore, Newbury Park, Calif., assignor to Siemens Solar Industries, L.P., Camarillo, Calif.

Filed Jul. 17, 1991, Ser. No. 731,672

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—159 13 Claims

1. A solar powered lamp comprising:

a photovoltaic cell for receiving sunlight and generating electrical energy;

an electrical storage device coupled to said photovoltaic cell for receiving and storing electrical energy;

light sensing means other than said photovoltaic cell for

generating a control signal in response to ambient light; and

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QUANTUM PHASE INTERFERENCE TRANSISTOR

output signal for generating a deflection current in a deflection winding.

moving the panel between a closed position and an open position, a control unit for energizing the motor and a setting means connected to the control unit for setting a desired posi-

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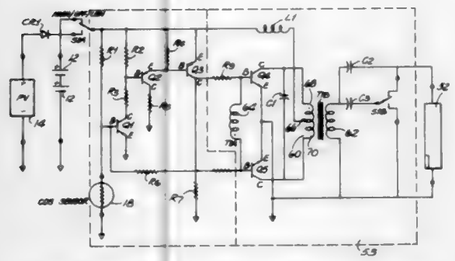
generating a control signal in response to ambient light; and

means for providing positive turn-on at a preselected low light level, said positive turn-on means having a feedback loop which amplifies said control signal to apply said electrical energy to the light source, said positive turn-on means further comprising:



a first transistor having a collector, base and emitter;

a second transistor having a collector, base and emitter, said collector of said first transistor electrically connected to said base of said second transistor; and

a third transistor having a base thereof electrically connected to said emitter of said second transistor.

5,204,587

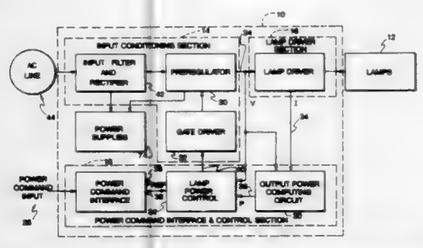
FLUORESCENT LAMP POWER CONTROL

George W. Mortimer, and Robert V. Burke, both of Fort Wayne, Ind., assignors to MagneTek, Inc., Los Angeles, Calif.

Filed Feb. 19, 1991, Ser. No. 657,114

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—308 **15 Claims**



1. Apparatus for controlling a fluorescent lamp comprising:

a) a discontinuous-mode flyback type preregulator receiving power from and providing power factor correction at an AC power line and providing a controllable DC electrical output;

b) a lamp driver having a DC input connected to the DC output of the preregulator and having an output adapted to be connected to a fluorescent lamp such that the output power of lamp driver depends on the voltage level of said DC input;

c) first means for providing an output representative of a voltage across the lamp;

d) second means for providing an output representative of a current through the lamp;

e) multiplier means for multiplying the outputs of the first and second means; and for providing a signal representative of lamp power; and

f) power control means for controlling the output of the preregulator is response to the signal representative of lamp power to hold lamp power constant in the event of variations in the AC power line.

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QUANTUM PHASE INTERFERENCE TRANSISTOR

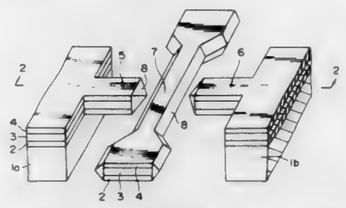
Ryuichi Ugajin, and Akira Ishibashi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 10, 1992, Ser. No. 819,492

Claims priority, application Japan, Jan. 14, 1991, 3-014727; Jan. 18, 1991, 3-018328; Jan. 23, 1991, 3-022779; Jan. 31, 1991, 3-031643

Int. Cl.[5] H01J *1/16*

U.S. Cl. 315—349 **4 Claims**



1. A quantum phase interference transistor comprising: an emitter for emitting electron waves into a vacuum; a gate electrode for controlling the phase difference between a plurality of electron waves; and a collector for collecting the electron waves;

characterized in that the gate electrode has the construction of a capacitor.

5,204,589

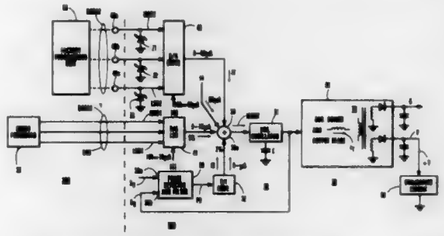
DATA SIGNAL CONTROLLED OSCILLATOR FOR A VIDEO DISPLAY

Karl R. Koblitz, Meylan, France, assignor to Thomson Consumer Electronics, S.A., Courbovoie, France

Filed Mar. 2, 1992, Ser. No. 843,076

Int. Cl.[5] G09G *1/04;* **H01J** *29/70*

U.S. Cl. 315—364 **9 Claims**



1. A video display deflection comprising:

an oscillator for generating an output signal at a frequency related to a deflection frequency;

a microprocessor for developing a first data signal that is susceptible to being altered during operation;

a source of a second data signal that cannot be altered, during operation;

a digital-to-analog converter having a first input responsive to said first data signal and a second input responsive to said second data signal for generating an analog, frequency control signal that is coupled to a control input of said oscillator to control a free-running frequency of said oscillator within a tolerance range, said free-running frequency of said oscillator being compensated partly in accordance with said first data signal and partly in accordance with said second data signal such that variation of said free running frequency via said second input is prevented by said second data signal being unalterable during operation; and

a deflection circuit output stage responsive to said oscillator output signal for generating a deflection current in a deflection winding.

5,204,590

Patent Not Issued For This Number

5,204,591

DEVICE FOR CONTROLLING AT LEAST ONE ELECTRONIC SERVOMOTOR WITH HIGH POWER FROM A LOW-VOLTAGE NETWORK, IN PARTICULAR FOR MOTORIZING A TURRET ON A TANK

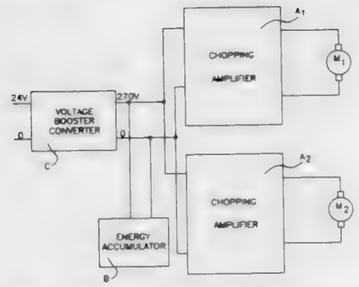
Michel Kaltandjian, Le Chesnay; Philippe J. Pradat, Les Ulis, and Emile Y. Urvoy, Limours, all of France, assignors to Compagnie de Signaux et D'Equipements, France

Continuation of Ser. No. 348,273, May 5, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,398

Claims priority, application France, May 6, 1988, 88 06161

Int. Cl.[5] H02P *1/54*

U.S. Cl. 318—106 **4 Claims**



1. Device for controlling one or more electric servomotors on board a vehicle with high power from a low voltage network comprising:

a uni-directional monoquadrant voltage booster converter (C);

a first bi-directional chopping amplifier (A1) fed by the uni-directional converter (C) and delivering the current required by a first servomotor (M1) to be controlled which is of the type able to operate as a generator;

a capacitive type electric energy accumulator (B) comprised of a set of capacitors connected in parallel, inserted between the uni-directional converter (C) and the first bi-directional chopping amplifier (A1); and

wherein the vehicle is a tank, which tank includes a turret that is motorized about its lateral deflection axis by said first servomotor (M1) controlled by said first chopping amplifier (A1), a weapon carried by the tank turret motorized about its elevational axis by a second servomotor (M2) controlled by a second chopping amplifier (A2), and with both said first and second amplifiers (A1; A2) being simultaneously fed by the uni-directional booster converter (C).

5,204,592

APPARATUS FOR OPERATING THE ROOF PANEL OF A SLIDING ROOF OR A SLIDING TILTING ROOF OF A MOTOR VEHICLE

Johannes N. Huyer, Velserbroek, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Haarlem, Netherlands

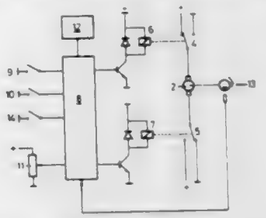
Filed Oct. 2, 1991, Ser. No. 770,101

Claims priority, application Netherlands, Oct. 10, 1990, 9002199

Int. Cl.[5] B60J *7/043*

U.S. Cl. 318—466 **10 Claims**

1. Apparatus for operating the roof panel of a vehicle, the apparatus comprising: a motor connected to the roof panel for moving the panel between a closed position and an open position, a control unit for energizing the motor and a setting means connected to the control unit for setting a desired position of the roof panel, said setting means having a predetermined setting range, wherein when the apparatus is put into operation the control unit energizes the motor to move the roof panel to an extreme open first position and an extreme open second position, wherein means are provided for storing corresponding extreme open positions of the roof panel in a memory, wherein the control unit restricts during operation the movement of the roof panel as controlled by the setting



means by means of the positions stored in the memory, said control unit including means to adapt the setting range of the setting means to the distance of movement of the roof panel between the closed position and the extreme open first position and also between the closed position and the extreme open second position.

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DRIVE SYSTEM FOR INFORMATION RECORDING/REPRODUCING APPARATUS

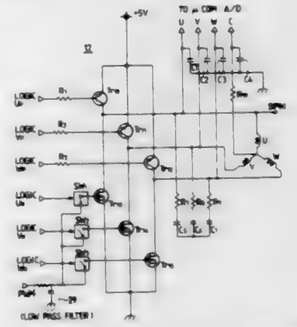
Yasuhiro Ueki, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 5, 1992, Ser. No. 831,598

Claims priority, application Japan, Nov. 8, 1991, 3-321367

Int. Cl.[5] H02P *7/00*

U.S. Cl. 318—254 **5 Claims**



1. A drive system for an information recording/reproducing apparatus having head means to record and reproduce information on and from an information recording disc divided into a plurality of tracks and a plurality of sectors, said drive system comprising:

a spindle motor for rotating said information recording disc;

signal reading means for reading, through said head means, the information from said information recording disc in units of said sectors;

a spindle motor drive means coupled to windings of said spindle motor for succesively selecting said windings thereof to supply a drive current thereto so as to drive said spindle motor;

a voice coil motor for moving said head means to a target track of said information recording disc;

voice coil motor drive means for driving said voice coil

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METHOD AND APPARATUS FOR CONTROLLING A

coils, each allocated to a phase and wound in the same direc-

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METHOD AND APPARATUS FOR STOPPING AN

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voice coil motor drive means for driving said voice coil motor;

voice coil motor control means for detecting a servo signal at a head portion of each of said sectors of said information recording disc through said signal reading means so as to supply a control signal to said voice coil motor drive means in accordance with the detected servo signal;

power supply means for generating a power supply voltage which is substantially in a range from 3 volts to 5 volts;

power supply voltage monitoring means for monitoring said power supply voltage to be applied to said spindle motor drive means to output a signal corresponding to the monitored power supply voltage; and

spindle motor control means for controlling a voltage to be applied to said spindle motor drive means so as to rotate said spindle motor in accordance with a back electromotive voltage occurring due to said windings of said spindle motor, said spindle motor control means including at least one microprocessor to control said voltage to said spindle motor drive means by changing a parameter of switching time between the drive currents successively supplied to said windings of said spindle motor in accordance with the output signal of said power supply voltage monitoring means when said spindle motor starts.

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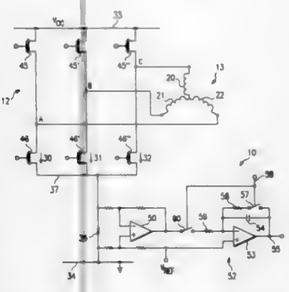
CIRCUIT FOR PROVIDING A SIGNAL PROPORTIONAL TO THE AVERAGE CURRENT FLOWING THROUGH COILS OF A MOTOR OPERATED IN BOTH LINEAR AND PWM MODES

Francesco Carobolante, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 3, 1991, Ser. No. 770,572
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 **17 Claims**



1. A circuit for providing a signal proportional to the average current flowing through coils of a motor operated in both linear and PWM modes, comprising:

a sense resistor across which a voltage representing the drive current supplied to the coils is developed;

an amplifier connected to receive the voltage developed across said sense resistor when said motor is operated in the linear mode;

a capacitor and a second resistor connected to said amplifier to operate as a low pass filter circuit, and

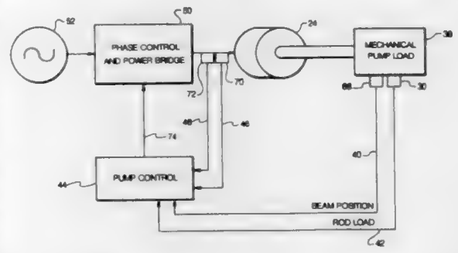
a switch circuit for disconnecting the voltage developed across said sense resistor from said amplifier, and for disconnecting said second resistor from said capacitor, when drive current is not supplied to said coils, to operate as a voltage hold circuit.

5,204,595

METHOD AND APPARATUS FOR CONTROLLING A WALKING BEAM PUMP

Kenneth E. Opal, Oakmont, and William J. Happel, Pittsburgh, both of Pa., assignors to Magnetek, Inc., Los Angeles, Calif.

Continuation of Ser. No. 297,557, Jan. 17, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 664,500
Int. Cl.[5] H02P *1/04*
U.S. Cl. 318—430 **10 Claims**



1. In a walking beam pump system having an electrical motor coupled through a drive system to pumping apparatus which includes reciprocating pump means operated by a walking beam mounted for cyclical rocking movement, the apparatus including an inertial mass tending to maintain the rocking movement, the method of controlling the pump system comprising the steps of:

driving the walking beam by the motor during part of the rocking cycle to provide pumping effort;

turning off the motor when the walking beam approaches the upper limit of its rocking cycle and holding the motor off until the rocking cycle is in a downward movement, and

turning off the motor when the walking beam approaches the lower limit of its rocking cycle and holding the motor off until the rocking cycle is in an upward movement;

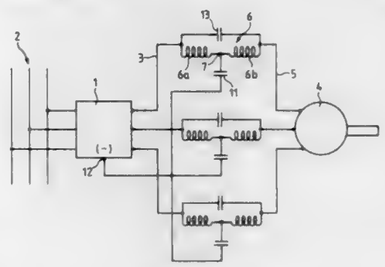
wherein inertial movement of the pumping apparatus continues the rocking cycle and the motor is driven by the pumping apparatus when it is turned off.

5,204,596

DEVICE HAVING A MULTIPHASE LOAD, A STATIC CONVERTER AND INDUCTANCE COILS

Eduard J. Voet, Carasso, Switzerland, assignor to Europe Patent Ltd., Carasso, Switzerland

PCT No. PCT/CH90/00021, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO90/09695, PCT Pub. Date Aug. 23, 1990
PCT Filed Jan. 30, 1990, Ser. No. 582,965
Int. Cl.[5] H02P *1/44*
U.S. Cl. 318—523 **7 Claims**



1. A device comprising a multi-phase load and a static converter for multi-phase supply of the load, as well as inductance coils, each allocated to a phase and wound in the same direction and with the same number of windings on a common magnetic core formed to constitute a closed magnetic circuit, characterized in that each one of the inductance coils is connected with one of the phase leads for supplying the load, the connection being made in series between the converter and the load, the inductance coils and the magnetic core being dimensioned equivalent to a mains filter adjusted to the frequency and rating of spikes of the converter, in order to remove such spikes from the respective phase of the power supply, each inductance coil comprising a central terminal which is connected, via a capacitor, to a reference terminal of the converter leading to a reference pole of the internal DC power supply of the converter, in order to transform the spikes within a ratio of −1:1 and to apply the transformed spikes to the reference terminal.

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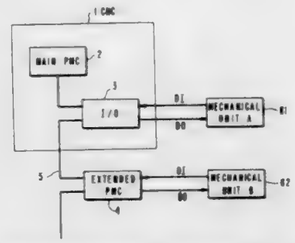
EXTERNALLY EXTENDED TYPE PROGRAMMABLE CONTROLLER

Takashi Yamauchi, and Akira Sakagami, both of Minamitsuru, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP90/00091, § 371 Date Sep. 28, 1990, § 102(e) Date Sep. 28, 1990, PCT Pub. No. WO90/08989, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 25, 1990, Ser. No. 582,200
Claims priority, application Japan, Feb. 1, 1989, 1-23505
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—567 **4 Claims**



1. An externally extended programmable control system operatively coupled to first and second mechanical units and including a part of a numerical control apparatus, the first and second mechanical units each generating signals in response to respective operations performed by the first and second mechanical units, comprising:

a main programmable controller (PC) contained in the numerical control apparatus (CNC) and receiving a command from the numerical control apparatus, for generating first control signals for control of the first mechanical unit based on at least one of the command and the signals generated by the first mechanical unit;

an I/O unit connected to said main PC, for transmitting the first control signals to the first mechanical unit, and for transmitting the signals generated by the first mechanical unit to said main programmable controller;

an extended PC externally coupled to said main PC, for generating second control signals based on at least one of the command and the signals generated by the second mechanical unit, for control of the second mechanical unit using an independent sequence program; and

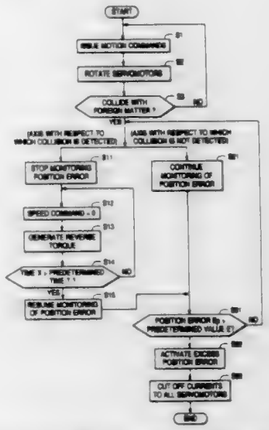
communication means for connecting said main PC, said I/O unit, and said extended PC.

5,204,598

METHOD AND APPARATUS FOR STOPPING AN INDUSTRIAL ROBOT

Nobutoshi Torii, Hachioji; Susumu Ito, Yamanashi; Masayuki Hamura, Yamanashi, and Tamotsu Sakai, Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP91/00353, § 371 Date Nov. 21, 1991, § 102(e) Date Nov. 21, 1991, PCT Pub. No. WO91/14544, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 13, 1991, Ser. No. 773,593
Claims priority, application Japan, Mar. 29, 1990, 2-81694
Int. Cl.[5] B25J *19/06*
U.S. Cl. 318—568.1 **5 Claims**



1. A method of stopping an industrial robot having a plurality of axes drivable by respective servomotors after a collision of the industrial robot with foreign matter is detected, said method comprising the steps of:

after the collision is detected, setting a speed command for a servomotor for an axis with respect to which the collision is detected, to "0", to produce a reverse torque to stop rotation of said servomotor;

calculating a position error as a difference between a position command applied to said servomotor and an actual position thereof after elapse of a predetermined period of time;

activating an alarm if the position error of said servomotor exceeds a predetermined value, or if the position error of another servomotor exceeds the predetermined value; and

cutting off currents supplied to all the servomotors for thereby stopping movement of said industrial robot in response to the alarm.

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CONTOUR COMPENSATION METHOD FOR NUMERICALLY CONTROLLED MACHINES

Georg Höhn, Forchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 21, 1992, Ser. No. 822,708
Claims priority, application European Pat. Off., Jan. 18, 1991, 91100596.5
Int. Cl.[5] G05B *19/415*
U.S. Cl. 318—571 **3 Claims**

1. A method for performing contour compensation for numerically controlled machines, comprising the steps of:

a) guiding a tool along a trajectory curve located at a specified distance from a contour, whereby the trajectory curve is subdivided into a plurality of path segments, each path segment being defined by a start and end interpolation point, wherein each end interpolation point serves

also as the start interpolation point of the next path segment;

(b) repeatedly determining a backlash acceleration amount until a predetermined period has elapsed from the instant

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LINEARIZER FOR A SWITCHED RELUCTANCE GENERATOR

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also as the start interpolation point of the next path segment;

b) determining a plurality of start and end correction interpolation points by adding a correction vector to each start and end interpolation point when a change in a geometry

of the tool necessitates an alteration of the specified distance of the trajectory curve from the contour;

c) generating a corrected trajectory curve by means of the correction interpolation points; and

d) guiding a replacement tool along said corrected trajectory curve.

5,204,600

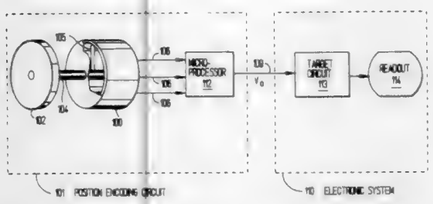
MECHANICAL DETENT SIMULATING SYSTEM

James Kahkoska, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 6, 1991, Ser. No. 651,709

Int. Cl.[5] G05B *19/29*

U.S. Cl. 318—602 **30 Claims**



1. In an electronic system having a position encoding circuit having a manually adjustable position encoder connected to a target circuit and used to control an audio or a video function of said electronic system, said position encoder having a rotatable element capable of being continuously rotated through an angle of greater than 360 degrees in either direction, said position encoding circuit transmitting, to said target circuit, an encoder position signal indicative of said rotational displacement of said rotatable element, said position encoding circuit having a virtual preset point which is a rotational position of said rotatable element corresponding to a predetermined value of encoder position signal, an apparatus for locating said virtual present point for said position encoder comprising:

storing means for storing and outputting data indicative of said virtual preset point; and

processing means for

1) comparing said encoder position signal and said data output by said storing means indicative of said virtual preset point and

2) setting, for a predetermined time interval, said encoder position signal equal to an encoder position signal indicative of said virtual preset point, when said processing means determines that said rotatable element in said position encoder has been rotated past said virtual present point.

5,204,601

MOTOR CONTROL SERVO SYSTEM

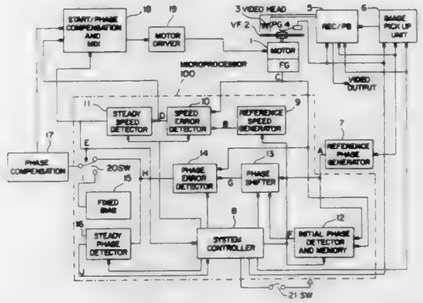
Masafumi Hirata, and Hiroshi Shimaya, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 29, 1990, Ser. No. 619,463

Claims priority, application Japan, Dec. 1, 1989, 1-310677; Dec. 1, 1989, 1-310678

Int. Cl.[5] G05B *13/00*

U.S. Cl. 318—606 **6 Claims**



1. In a system having a motor and a signal generator developing a motor speed signal having a frequency proportional to motor speed, a motor control servo system for quickly driving the motor into speed lock at a desired motor speed by locking onto a phase reference signal comprising:

drive means for driving said motor, said drive means quickly driving said motor to a speed substantially equal to said desired motor speed;

means, responsive to said phase reference signal and said motor speed signal for determining the initial phase difference between the phase reference signal and the phase of said motor speed signal to produce an initial phase difference signal;

means for shifting the phase of said phase reference signal by said initial phase difference to form a phase shifted reference signal;

means for determining the phase error between said phase shifted reference signal and the phase of said motor speed signal;

said drive means being responsive to the phase error determined by said means for determining to adjust the speed of said motor to lock said motor speed signal in phase with said phase shifted reference signal.

5,204,602

SERVOMOTOR CONTROL METHOD

Yasusuke Iwashita, Oshino, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP90/01608, § 371 Date Aug. 12, 1991, § 102(e) Date Aug. 12, 1991, PCT Pub. No. WO91/09358, PCT Pub. Date Jun. 27, 1991

PCT Filed Dec. 10, 1990, Ser. No. 741,447

Claims priority, application Japan, Dec. 12, 1989, 1-320552; Jan. 19, 1990, 2-8347

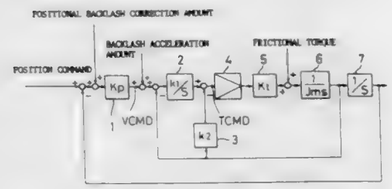
Int. Cl.[5] G05B *11/01*

U.S. Cl. 318—630 **6 Claims**

1. A servomotor control method for a servo system having a speed loop for obtaining an integral value in accordance with a speed command and an actual speed and arranged to control a servomotor for rotating a feed screw of a machine, said servomotor control method comprising the steps of:

(a) determining a target value which is equal in magnitude to the integral value obtained at an instant immediately after reversal of a rotating direction of the feed screw, and which has a sign opposite to that of the integral value;

(b) repeatedly determining a backlash acceleration amount until a predetermined period has elapsed from the instant immediately after the reversal of the feed screw rotating direction, the backlash acceleration amount gradually changing from the integral value to said target value with



passage of time after the instant immediately after the reversal of the feed screw rotating direction; and

(c) repeatedly correcting, during the predetermined period, the speed command in accordance with said backlash acceleration amount.

5,204,603

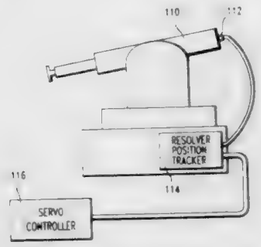
OPEN CIRCUIT DETECTION FOR A PULSED RESOLVER POSITION SENSING SYSTEM

Donald K. Taylor, Piney Flats; Richard J. Maczka, and Carl H. Russell, III, both of Johnson City, all of Tenn., assignors to Siemens Industrial Automation, Inc., Johnson City, Tenn. and Comau S.p.A., Turin, Italy

Filed Jan. 30, 1992, Ser. No. 828,049

Int. Cl.[5] G05B *1/06*

U.S. Cl. 318—657 **3 Claims**



1. An open circuit detection system for a resolver position tracking system (RPT), said RPT having a microprocessor and a position transducer having first and second windings, said system comprising:

excitation means for powering each of said first and second windings to cause each of said windings to return a signal to said microprocessor;

detection means including respective inverting and non-inverting signal amplifying means coupled to receive the signals provided by each of the first and second windings and to provide respective output signals, and means for determining whether the output signals of each of the inverting and non-inverting signal amplifying means have peak amplitude levels which are greater than a predetermined threshold value;

control means for signalling that an error condition has occurred when the detection means determines that the amplitude level of at least one of said output signals is not greater than the predetermined threshold value.

5,204,604

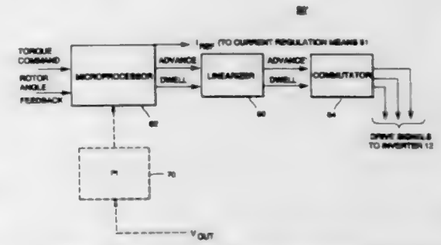
LINEARIZER FOR A SWITCHED RELUCTANCE GENERATOR

Arthur V. Radun, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1992, Ser. No. 843,331

Int. Cl.[5] H02P *19/20*

U.S. Cl. 318—701 **4 Claims**



1. A control for a switched reluctance generator drive including an inverter coupled to a dc bus, comprising:

angle control means for generating a turn-on angle signal and a pulse width angle signal according to a function $F(\theta_{on}, \theta_{off})$ depending on the geometry of said switched reluctance generator and speed of operation;

linearizing means for adjusting the turn-on angle signal and the pulse width angle signal by varying the value of the function $F(\theta_{on}, \theta_{off})$ inversely with the dc bus voltage so as to maintain a substantially constant average generator current; and

commutator means for switching each respective phase of the switched reluctance generator drive according to the adjusted turn-on angle signal and the adjusted pulse width angle signal from said linearizing means.

5,204,605

POSITION-CONTROLLED ACTUATOR

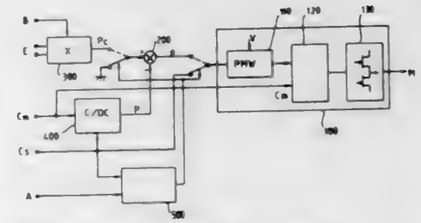
Jacques Delattre, Valpuiseaux, and Philippe Gouze, Villemoisson, both of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy Cedex, France

Filed Sep. 24, 1991, Ser. No. 764,322

Claims priority, application France, Sep. 24, 1990, 90 11739

Int. Cl.[5] G05B *1/00*

U.S. Cl. 318—721 **5 Claims**



1. Position-controlled actuator comprising:

a motor,

a power supply circuit to supply said motor with power,

a speed reducer converting rotary movement of said motor linear movement over a given travel,

at least one motor sensor on said motor supplying a motor position signal,

a circuit receiving said motor position signal and supplying a calculated position of said actuator,

an error signal computation circuit supplying said power supply circuit with an error signal between a commanded position of the actuator and said calculated position,

an output sensor supplying a binary position signal taking

5,204,607

PROCESS FOR CORRECTING THE REFERENCE FLUX

positive terminal having a positive voltage with respect to the voltage at the negative terminal, such positive voltage

ber to direct air currents through the cavity and directing the air currents through the entrance opening,

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an output sensor supplying a binary position signal taking two different values according to the position of the actuator relative to the said travel position of said actuator,

a power up logic circuit receiving said binary position signal and an activation instruction,

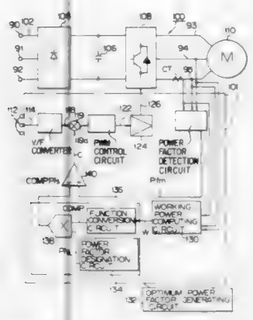
wherein said power up logic circuit, on receiving said activation instruction, switches the input of said power supply circuit to said output sensor so as to apply said binary position signal to said motor power supply circuit until the value of said binary position signal changes, whereupon said power up logic circuit switches the input of said motor power supply circuit to the output of said error signal computation circuit.

5,204,606

INDUCTION MOTOR CONTROL APPARATUS

Naruto Kuwahara, and Takefumi Hatanaka, both of Tokyo, Japan, assignors to Arex Electronics Corp., Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 776,117
Claims priority, application Japan, Dec. 12, 1990, 2-409880
Int. Cl.[5] H02P *7/36*
U.S. Cl. 318—800 **7 Claims**



1. An induction motor control apparatus for controlling a supply of power from an AC power source (**10**) to an induction motor (**12**), comprising:

voltage adjustment means (**46**) coupled between said AC power source and said induction motor and controllable for varying an amplitude of voltage supplied to said induction motor;

power factor detection means (**16**, **18**) for obtaining a value of detected power factor (Pfm) at which said induction motor is operating;

means (**28**, **30**, **32**) for producing a load variation parameter (W) corresponding in value to a level of load on said induction motor;

optimum power factor generating circuit means (**36**) for converting said load variation parameter to an optimum value of power factor (COMP.Pfs), said optimum power factor generating circuit means producing successively increasing values of said optimum power factor in a range between a minimum limit and a maximum limit, in accordance with successively increasing levels of said motor load between a minimum limit and a maximum limit as indicated by respective values of said load variation parameter;

comparator means (**42**) for deriving an amount of difference between said optimum power factor and said detected power factor; and

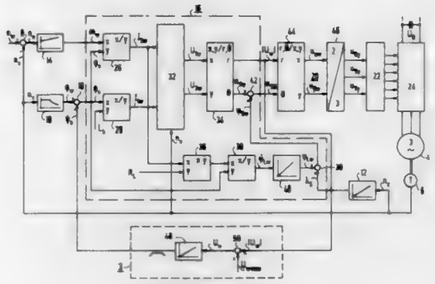
means (**54**) for applying said difference amount to control said voltage adjustment means, to thereby vary the amplitude of said voltage applied to the induction motor such as to reduce said amount of difference.

5,204,607

PROCESS FOR CORRECTING THE REFERENCE FLUX OF A CONVERTER-POWERED MULTI-PHASE MACHINE AND CIRCUIT FOR IMPLEMENTING THE PROCESS

Harald Hügel, Herzofenaurach, and Günther Schwesig, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE90/00540, § 371 Date May 6, 1992, § 102(e) Date May 6, 1992, PCT Pub. No. WO91/03867, PCT Pub. Date Mar. 21, 1991
PCT Filed Jul. 17, 1990, Ser. No. 838,415
Claims priority, application PCT Int'l Appl.,
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—806 **2 Claims**



1. A method for correcting a pre-controlled reference flux for a field-oriented control device, said control device comprising a converter to power a multi-phase machine with a speed detection device and at least one of a reference current model and a reference voltage model, said control device detecting a characteristic of said converter, the method comprising:

generating a reference voltage value in dependence on said characteristic of said converter and said pre-controlled reference flux, said reference voltage value being used as a setting value for said converter;

generating a predetermined maximum converter output voltage value;

comparing said reference voltage value and said maximum converter output voltage value in a comparator;

generating a voltage control difference value in said comparator, said voltage control difference value equal to a difference in magnitude of said reference voltage value and said maximum converter output voltage value;

generating a flux control value from said voltage control difference in a flux correction controller; and

reducing said pre-controlled reference flux with said flux control value until said reference voltage value is less than or equal in magnitude to said maximum converter output voltage value.

5,204,608

BATTERY PACK INCLUDING ELECTRONIC POWER SAVER

Steven E. Koenck, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Nov. 7, 1989, Ser. No. 433,076
Int. Cl.[5] H02J *7/00*; **H01M** *10/46, 14/00*; **H07M** *2/00*
U.S. Cl. 320—2 **18 Claims**

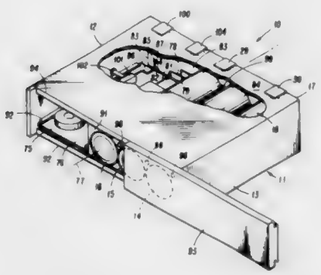
1. A battery pack comprising:

a power cell having positive and negative terminals, the

positive terminal having a positive voltage with respect to the voltage at the negative terminal, such positive voltage having values subject to measurable variations over a first range during a discharge cycle of the power cell;

housing means encasing the power cell, said housing means including external positive and negative contacts; and

means coupled respectively between the positive terminal of the power cell and the positive contact of the housing means, and between the negative terminal of the power cell and the negative contact of the housing means, for



regulating the voltage at the positive terminal with respect to the voltage at the negative terminal of the power cell to values within a predetermined second range with values of a similar magnitude as the first range, and for applying such regulated voltage values to the positive contact with respect to the negative contact of the housing, whereby the power cell appears to have between such positive and negative contacts a characteristic voltage variation of the predetermined, second range of values over the discharge cycle of the power cell.

5,204,609

BATTERY COOLING APPARATUS

Daryl J. Alisauski, 168 N. Arlington Ave., Gloversville, N.Y. 12078

Filed Dec. 16, 1991, Ser. No. 808,232
Int. Cl.[5] H01M *10/50*
U.S. Cl. 320—2 **3 Claims**

1. A battery cooling apparatus, comprising,

a housing, the housing including a first side wall spaced from a second side wall, and a floor spaced from a top wall,

and

an end wall mounted to the first side wall, the second side wall, floor, and top wall, with an entrance opening directed into the housing, and a cavity defined within the housing between the first side wall, second side wall, end wall, floor, and top wall,

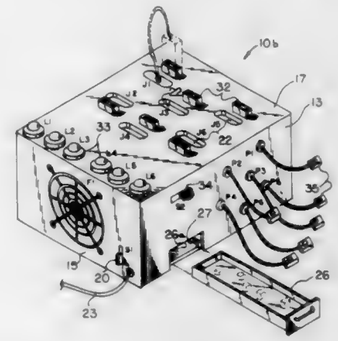
and

a fan member,

and

a fan member opening directed through the end wall, and the fan member mounted within the cavity adjacent the fan member opening, and a fan member switch mounted to the housing to permit selective actuation of the fan member to direct air currents through the cavity and directing the air currents through the entrance opening,

and



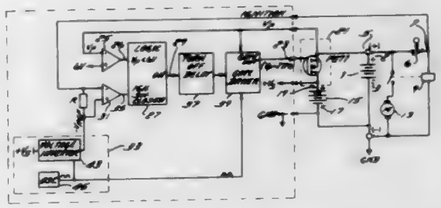
a plurality of battery receiving openings directed through the top wall, wherein each opening is arranged to receive a battery member therethrough to position each battery member within the cavity.

5,204,610

LONG LIVED DUAL BATTERY WITH AUTOMATIC LATCHING SWITCH

John R. Pierson, Brookfield; Thomas J. Dougherty, Waukesha, and Ronald C. Klassen, Elm Grove, all of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Feb. 15, 1991, Ser. No. 656,772
Int. Cl.[5] H02J *7/04, 7/14*
U.S. Cl. 320—15 **25 Claims**



1. An apparatus for supplying electrical power to a system comprising:

an on-off switch, the on-off switch supplying power from a power supply terminal to a system power terminal in a first state and preventing supply of power from the power supply terminal to the system power terminal in a second state;

a first power supply providing power to the power supply terminal;

a second power supply;

a triggerable switch having a first terminal connected to the power supply terminal, a second terminal connected to the second power supply and a trigger input, the trigger input, when activated causing the first and second terminals to be connected through a lower impedance;

a comparator having an output for indicating a low power condition when a voltage level of the first power supply is below a predetermined reference at a time before the on-off switch supplies power form the power supply terminal to the system power terminal in the first state of the on-off switch; and

a trigger coupled to the trigger input of the triggerable

switch and the output of the comparator, the trigger being

pling instant with the value of said electrical charging

anced power sensing with reduced input signal frequency and

wherein said fraction at frequencies where said ratio is

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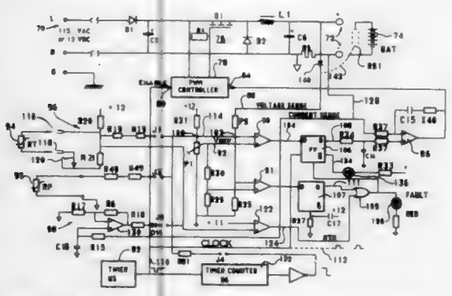
switch and the output of the comparator, the trigger being enabled by engagement of the first state of the on-off switch, the trigger having an output activating the trigger input of the triggerable switch when the comparator output indicates the low power condition.

5,204,611

CHARGING CIRCUITS FOR RECHARGEABLE BATTERIES AND CELLS

Jiri K. Nor, and Josef V. Soltys, both of Oakville, Canada, assignors to Norvik Technologies Inc., Mississauga, Canada

Filed May 2, 1991, Ser. No. 676,523
Claims priority, application Canada, Mar. 13, 1991, 2038160
Int. Cl.[5] H02J *7/10*
U.S. Cl. 320—21 **48 Claims**



40. A method of recharging rechargeable batteries and cells, comprising the steps of:

(a) providing an electrical charging current from a source thereof to an output across which a rechargeable battery or cell may be connected;

(b) periodically interrupting the flow of electrical charging current to said output and determining the resistance free terminal voltage of the rechargeable battery or cell being recharged during the interval when said flow of electrical charging current has been interrupted, and comparing the sensed resistance free voltage with a reference voltage independent of the rechargeable battery or cell being recharged;

(c) wherein for a first fixed and predetermined period of time, said electrical charging current is delivered to said output at the lesser of either a predetermined maximum current value or a current which said rechargeable battery or cell can accept without any substantial rise in its internal temperature; whereby when said rechargeable battery or cell can accept a charging current which is greater than said predetermined maximum current value, said electrical charging current is delivered to said output at a constant value equal to said maximum current value;

and wherein, following said first fixed period of time said electrical charging current continues to be delivered to said output at said maximum value for a second variable time period which exists for so long as said sensed resistance free voltage of the rechargeable battery or cell being recharged is less than said independent reference voltage, whereby said second variable time period is terminated at the first instance when said sensed resistance free voltage reaches the same value as said independent reference voltage, and said electrical charging current is permitted to reduce in such a manner that the sensed resistance free voltage and said independent reference voltage remain substantially at the same value;

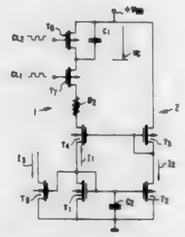
(d) constantly sampling said electrical charging current on a periodic basis during the period of time which follows said second variable time period and while said electrical charging current is permitted to reduce, and comparing the value of said electrical charging current at each sampling instant with the value of said electrical charging current at at least the prior sampling instant thereof; and when any increase of said electrical charging current is sensed, operating a control circuit means so as to force said electrical charging current to continue to reduce.

5,204,612

CURRENT SOURCE CIRCUIT

Ernst Lingstaedt, Zorneding, Fed. Rep. of Germany, assignor to Eurosil electronic GmbH, Eching, Fed. Rep. of Germany

Filed Aug. 9, 1991, Ser. No. 743,026
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1990, 4034371
Int. Cl.[5] G05F *3/16*
U.S. Cl. 323—317 **11 Claims**



1. A current source circuit having a first, second, third and fourth field effect transistor (T1, T2, T3, T4), where said first and second field effect transistors (T1, T2) are of a first channel type and said third and fourth field effect transistors (T3, T4) of a second channel type and the series-connected channel sections of said first and fourth field effect transistors and of said second and third field effect transistors (T1, T4; T2, T3) form a first and second main current path (1, 2) respectively, where the control electrodes of said first and third field effect transistors (T1, T3) are connected respectively to said first main current path (1) and the control electrode of said second field effect transistor (T2), and to said second main current path (2) and the control electrode of said fourth field effect transistor (T4) in order to form a first and second current mirror respectively, and where a fifth field effect transistor (T5) is controlled by said first current mirror (T1, T2) to tap a first source current (i3), wherein a first pair of field effect transistors (T6, T7) is provided, said first pair of field effect transistors (T6, T7) being connected in series in said first main circuit (1) between said fourth field effect transistor (T4) of said second current mirror (T3, T4) and an operating voltage source (V_{DD}), wherein a first capacitor (C1) is connected parallel with channel section of that field effect transistor (T6) of said first field effect transistor pair (T6, T7) which is connected to said operating voltage source (V_{DD}), wherein a second capacitor (C2) connects the connected control electrodes of said first and second field effect transistors (T1, T2) to the reference potential of the circuit, and wherein the control electrodes of said field effect transistors (T6, T7) of said first field effect transistor pair are supplied with clock signals (C11, C12) in phase opposition.

5,204,613

RF POWER SENSOR HAVING IMPROVED LINEARITY OVER GREATER DYNAMIC RANGE

Stephen C. Cripps, Sunnyvale, and Thomas R. Allen, San Mateo, both of Calif., assignors to Wavetek Microwave, Inc., Sunnyvale, Calif.

Filed May 2, 1991, Ser. No. 694,885
Int. Cl.[5] G01R *15/10*
U.S. Cl. 324—95 **12 Claims**

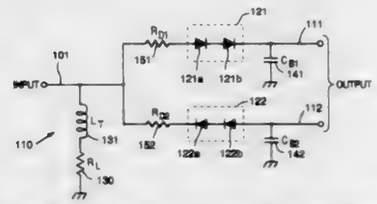
7. A balanced radio frequency power sensor providing balanced power sensing with reduced input signal frequency and power dependency, said balanced power sensor comprising:

an input node for receiving a radio frequency signal having an input signal power;

a first output node for providing a first output voltage representing said input signal power;

a second output node for providing a second output voltage representing said input signal power;

an input shunt impedance coupled between said input node and a circuit ground reference;



first detector means for detecting said input signal power, wherein said first detector means is coupled between said input node and said first output node and comprises a first plurality of series-connected diodes;

second detector means for detecting said input signal power, wherein said second detector means is coupled between said input node and said second output node and comprises a second plurality of series-connected diodes;

a first output shunt impedance coupled between said first output node and said circuit ground reference; and

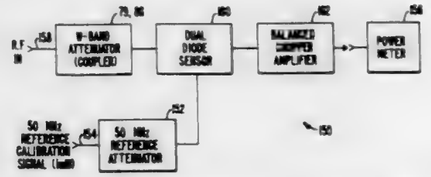
a second output shunt impedance coupled between said second output node and said circuit ground reference.

5,204,614

BROAD-BAND MICROWAVE POWER SENSOR USING DIODES ABOVE THEIR RESONANT FREQUENCY

Pedro A. Szente, Los Altos, and Gratz L. Armstrong, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 14, 1991, Ser. No. 744,858
Int. Cl.[5] G01R *23/04;* **H01P** *5/12, 5/18, 1/00*
U.S. Cl. 324—95 **9 Claims**



1. An apparatus for sensing the power of an input electromagnetic wave having a frequency within a predetermined range, said apparatus comprising:

a diode for indicating the power of said input wave by outputting a DC signal having a magnitude proportional to the power of said input wave, said diode having a specified frequency at which it resonates, said diode also having frequency characteristics such that when the frequency of an electromagnetic wave applied to said diode is near or above said resonant frequency, the ratio of the DC output of said diode to the power of said wave applied to said diode, is dependent upon the frequency of said wave applied to said diode;

an input wave conditioning means for counteracting the frequency dependence of said diode for frequencies near and above said resonant frequency, said conditioning means forming from said input wave a conditioned wave whose power is a fraction of the power of said input wave, wherein said fraction at frequencies where said ratio is below a reference value is greater than the fraction at frequencies where said ratio is above a reference value, such that for input waves having equal power but different frequencies, said conditioning means causes said diode to output DC signals having substantially equal magnitudes; and

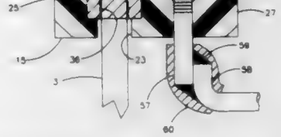
a waveguide, having an input port and an open-ended output port, said waveguide having a larger impedance at the input port than at the output port, the impedance of the output port of said waveguide is smaller to such an extent than the impedance of free space that a virtual open circuit is provided at the output port/free space boundary, said waveguide receiving said conditioned wave and transmitting said conditioned wave to said diode.

5,204,615

MODULE ATTACHMENT FOR PRINTED CIRCUIT BOARD TEST FIXTURES

Michael A. Richards, Congleton, England, and Ulf R. Langgard, Overland Park, Kans., assignors to Interconnect Devices, Inc., Kansas City, Kans.

Filed Oct. 24, 1991, Ser. No. 782,077
Int. Cl.[5] G01R *1/06*
U.S. Cl. 324—158 F **15 Claims**



12. A module attachment for a test fixture having a bed of nails array of spring contact test probes for testing a printed circuit board comprising:

a) spaced spring contact probes extending from said test fixture;

b) a module having first and second sides with said first side having means for mounting said module upon said spaced spring contact probes and supporting said module above a test fixture surface;

c) said module having an edge bar portion extending there along having a plurality of spaced grooves at preselected intervals to accord with a preselected pitch of printed circuit board test pads, said edge bar being a comb structure;

d) an array of wires extending outwardly from said module second side and respectively through said spaced grooves for spacing said wires at said preselected intervals, said array being formed to correspond with a selected test pad array;

e) said wires having conductor leads extending from said second side of said module for connection to a wiring harness of said test fixture.

5,204,616

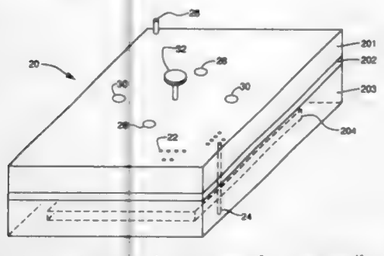
IN-CIRCUIT TEST FIXTURE FOR LEADED PACKAGES

James E. Buchanan, Bowie, Md.; Dan B. Tolley, Wytheville, Va., and Chester W. Waldvogel, Queentown, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 343,924, Apr. 26, 1990, abandoned. This application Sep. 25, 1990, Ser. No. 589,715

Int. Cl.[5] **G01R** *31/02, 1/04*

U.S. Cl. 324—158 P **13 Claims**



1. An in-circuit test probe apparatus for temporarily monitoring signals on the pins of high density finely leaded surface-mounted LSI circuit package comprising in combination:

a rough probe location member for roughly aligning a plurality of probes, said rough probe location member having shape and which includes means for probe guiding, said probe guiding means being arranged along the outer edge of said rough probe location member,

probe holding means for holding said probes, said probe holding means having a predetermined thickness, said probe holding means corresponding to the shape of said rough probe location member, said probe holding means including a plurality of cross-cuts therein which are, respectively, aligned with said probe guiding means, said rough probe location member positioned atop said probe holding means,

a fine probe location member for finely aligning said probes, said fine probe location member having a shape corresponding to the shape of said rough probe location member, said fine probe location member including means for probe guiding means, said fine probe location member having a cavity in its lower surface which is equi-disposed about the center of said fine probe location member, said probe holding means positioned atop said fine probe location member,

means for fastening, said fastening operatively connected between said rough location member and said fine probe location member to form a rigid body, and

whereby said probes removably and selectively inserted into said probe guiding means, through said cross-cuts and through said probe alignment means to extend into said cavity to directly contact a selected pin on said circuit package thereby monitoring the signals thereon, said probe alignment means having a smaller probe diameter than the diameter of said probe guiding means, said cavity of said fine probe location member operatively positioned on a surface-mounted LSI circuit package.

5,204,617

LIQUID CRYSTAL PANEL INSPECTION METHOD

Ryohei Kumagai, Tokyo, Japan, assignor to Ezel, Inc., Tokyo, Japan

Filed Oct. 21, 1991, Ser. No. 780,053

Claims priority, application Japan, Oct. 22, 1990, 2-283760

Int. Cl.[5] **G01R** *31/28*

U.S. Cl. 324—158 R **9 Claims**

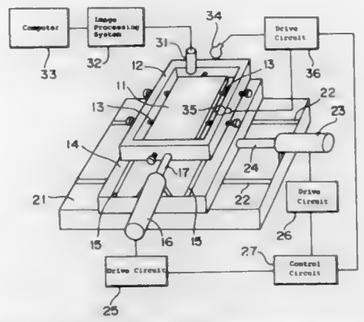
1. An inspection method of liquid crystal panel for judging if a part of said liquid crystal panel is defective or not comprising steps of:

taking an image of said liquid crystal panel with lighting said panel;

calculating histograms of parts mounted on said liquid crystal panel from said image;

classifying said parts into groups according to characteristics value of said histogram;

selecting one group with maximal number of members from said groups;



selecting a reference histogram from histograms of said parts of said group selected; and

comparing histograms of parts belonging to other groups than said groups selected with said reference histogram so that a defective part is extracted as defective part when a difference is greater than a predetermined value between said histogram of said parts of said other groups and said reference histogram.

5,204,618

MONITORED BURN-IN SYSTEM

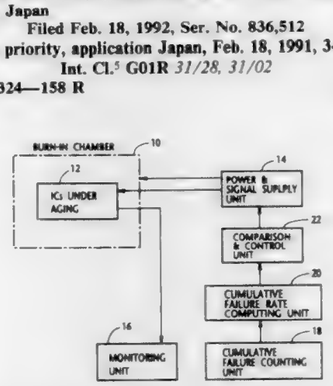
Eiki Matsuoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 18, 1992, Ser. No. 836,512

Claims priority, application Japan, Feb. 18, 1991, 3-022526

Int. Cl.[5] **G01R** *31/28, 31/02*

U.S. Cl. 324—158 R **4 Claims**



1. A monitored burn-in system for screening a group of semiconductor devices kept in a burn-in chamber, the system comprising:

power and signal supplying means for supplying power to said burn-in chamber to control the burn-in temperature in said chamber and supplying operational current and driving input signals to said semiconductor devices in said chamber;

monitoring means for monitoring the manner of operation of each of said devices in said chamber;

counting means for counting a cumulative number of failed devices among said devices in said chamber at predetermined time intervals;

computing means for computing a cumulative failure rate of said devices in said chamber at said time intervals each time based on said cumulative number counted by said counting means and producing a feedback signal representative of an increment of the cumulative failure rate during each of said time intervals; and

control means for comparing said increment of the cumulative failure rate represented by said feedback signal with a predetermined reference increment of cumulative failure rate and commanding said power and signal supplying means to terminate the power and signal supplying operation to thereby automatically terminate the burn-in procedure when said increment of the cumulative failure rate represented by said feedback signal becomes equal to said reference increment of cumulative failure rate or less.

5,204,619

DEVICE FOR MEASURING ROTATIONAL SPEED USING AN OPTICAL FIBER SENSOR

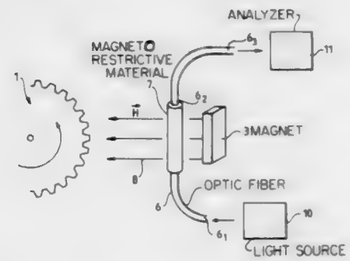
Gérard Beigbeder, and Vincent Michoud, both of Paris, France, assignors to Sextant Avionique, Meudon La Foret, France

Filed Dec. 3, 1991, Ser. No. 801,910

Claims priority, application France, Dec. 4, 1990, 90 15162

Int. Cl.[5] **G01P** *3/486, 3/488*

U.S. Cl. 324—174 **26 Claims**



1. A device for measuring the rotational speed of a shaft coupled to a toothed wheel that is rotationally driven by the shaft comprising: a magnet being placed in the vicinity of the toothed wheel, an optic fiber having two ends and a central portion, one of the ends being connected to a light source, the other end being connected to light analysis means, the central portion being supported by a magnetostrictive material located in a magnetic field produced by the magnet said optic fiber being subjected to stresses generated by a said magnetostrictive material in response to said magnetic field.

5,204,620

PHOTORECEPTOR MOTION SENSOR USING A SEGMENTED PHOTOSENSOR ARRAY

Daniel W. Costanza; William J. Nowak, both of Webster, and Robert P. Loce, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1992, Ser. No. 863,893

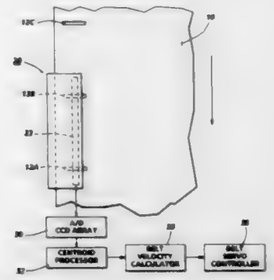
Int. Cl.[5] **G01P** *3/36*

U.S. Cl. 324—175 **6 Claims**

1. A method for determining the velocity of a photoreceptor belt moving in a process direction, said photoreceptor belt characterized as having a series of apertures along an edge extending in a row which is parallel to said process direction, the method comprising the steps of:

positioning an illumination source adjacent said photoreceptor belt so that a band of illumination is directed along said row of apertures, at least two of said apertures being simultaneously illuminated,

placing a segmented position sensor on the side of the photoreceptor opposite that occupied by said illumination source, said position sensor aligned so that illumination from said illumination source is viewed over a group of sensor segments through at least two of said apertures as the photoreceptor belt moves therepast, said sensors producing output signals representing the light distribution intensity sensed by said group of sensor signals during a sampling period,



calculating the centroid positions of said intensity distributions, and

calculating the velocity of the belt using the centroid position information from at least two sampling periods.

5,204,621

POSITION SENSOR EMPLOYING A SOFT MAGNETIC CORE

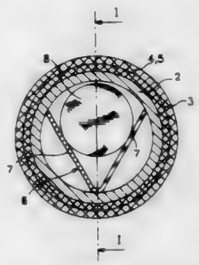
Michael Hermann, Schwenningen; Johann von der Heide, Schramberg; Hans-Dieter Papst, St. Georgen, and Uwe Mueller, Eisenbach, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Feb. 7, 1991, Ser. No. 651,450

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1990, 4003813; Apr. 21, 1990, 9004531[U]

Int. Cl.[5] **G01B** *7/14*

U.S. Cl. 324—207.18 **19 Claims**



1. A position sensor for detecting movements of a part, comprising: an elongate measuring coil having a longitudinal direction, a soft magnetic core arranged stationary with respect to the elongate measuring coil in the longitudinal direction and having a longitudinal extent and a cross-section that is small in relation to the longitudinal extent, a control magnet movable by the part in the longitudinal direction along the soft magnetic core to partially saturate the latter magnetically as a function of position, the soft magnetic core having a trough-shaped cross-section through which the control magnet is movable by the part.

5,204,622

IMPROVED PROBE FOR INSPECTING TUBES HAVING

induced volume variations of a contained fluid and deriving an output signal in correspondence with the orientation of said

flux data representative of magnetic flux at an arbitrary point between the measured points based on the interpola-

5,204,626

METHOD FOR NUCLEAR MAGNETIC RESONANCE

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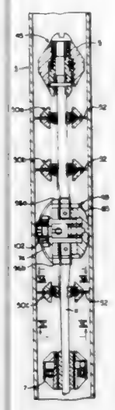
5,204,622

IMPROVED PROBE FOR INSPECTING TUBES HAVING MECHANISM FOR MAINTAINING ALIGNMENT OF PROBE AXIS OF ROTATION

Samuel C. McCaslin, Clairton, and John J. Wilhelm, New Kensington, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1990, Ser. No. 618,978
Int. Cl.[5] G01N *27/82, 27/90;* G21C *17/017*
U.S. Cl. 324—220 28 Claims



1. An improved probe of the type having a probe head assembly that includes a sensor, and a flexible cable connected to said assembly for rotating said assembly within a tube such that said sensor scanningly inspects the inner walls of said tube, wherein the improvement comprises a centering device including an annular member mounted around said cable in the vicinity of said probe head assembly for maintaining the axis of rotation of said cable in alignment with the center line of said tube, said member including a plurality of resilient finger members mounted around and extending away from the periphery of said annular member for engaging the inner walls of said tube and applying a centering force to said cable through said member, wherein each of said fingers is disposed in a plane that is orthogonal to the axis of rotation of said cable, but which is canted at an acute angle with respect to a line tangent to the portion of said periphery of the annular member that it extends away from.

11. An improved probe for inspecting tubes of the type having a rotatable probe head assembly that includes a body member, and a sensor holding mechanism for resiliently holding a sensor with respect to said body member such that said sensor wipingly engages the inner walls of said tube when the head assembly is rotated, wherein the improvement comprises a button member resiliently mounted within and reciprocally movable with respect to said probe body member opposite to said sensor holding mechanism for maintaining the axis of rotation of said probe head assembly in alignment with the center line of said tube.

5,204,623

APPARATUS FOR EVALUATION OF CAPACITIVE TYPE PRESSURE TRANSDUCERS USING HELMHOLTZ COILS

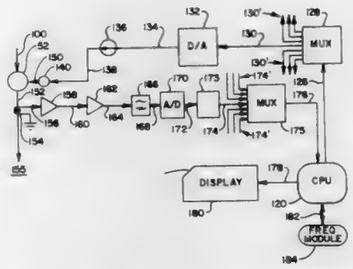
James H. Terhune, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 695,840, May 6, 1991, Pat. No. 5,114,664.
This application Jan. 24, 1992, Ser. No. 824,975
Int. Cl.[5] G01N *27/72;* G01R *33/12*
U.S. Cl. 324—228 11 Claims

1. Apparatus for evaluating the performance of a pressure responsive transducer having a surface movable with pressure induced volume variations of a contained fluid and deriving an output signal in correspondence with the orientation of said surface, comprising:

test coil means positioned in field influencing adjacency with said transducer selectively energizable for generating a magnetic field affecting said surface;

excitation means coupled with said test coil means and responsive to a control input for effecting said energization of said test coil means;



monitoring means responsive to said transducer output signal for providing a monitor signal in correspondence therewith; and

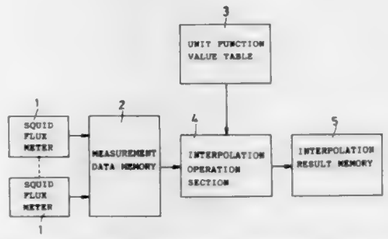
control means for deriving said control input as a predetermined time varying signal, and responsive to said monitor signal to derive a frequency based readout having a fundamental correlatable with said orientation of said transducer surface.

5,204,624

METHOD OF MAGNETIC FIELD MEASUREMENT INCLUDING CONVOLUTION STEPS IN AN INTERPOLATION OPERATION TO DETERMINE MAGNETIC FLUX BETWEEN POINTS AT WHICH MAGNETIC FLUX HAS BEEN MEASURED, AND APPARATUS FOR CARRYING OUT THE SAME

Tomoaki Ueda, Kyoto, Japan, assignor to Daikin Industries, Ltd., Japan

Filed Sep. 5, 1991, Ser. No. 755,571
Claims priority, application Japan, Sep. 7, 1990, 2-237962
Int. Cl.[5] G01R *33/022, 33/035*
U.S. Cl. 324—248 11 Claims



2. A magnetic field measurement apparatus comprising;

plural SQUID flux meters for measuring magnetic flux at plural points which correspond to two dimensional grids and providing data signals representative of measured magnetic flux at said points,

interpolation function obtaining means for obtaining interpolation function data representative of an interpolation function by convoluting sampling unit function data relating to both directions of said two dimensional grids with the data signals representative of measured magnetic flux, and

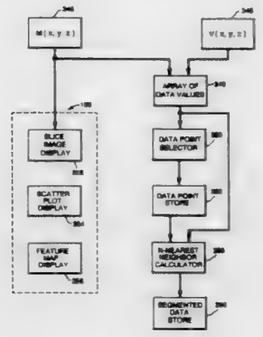
magnetic flux calculating means for calculating magnetic flux data representative of magnetic flux at an arbitrary point between the measured points based on the interpolation function data.

5,204,625

SEGMENTATION OF STATIONARY AND VASCULAR SURFACES IN MAGNETIC RESONANCE IMAGING

Harvey E. Cline, Schenectady, N.Y.; Steven P. Souza, Williamstown, Mass.; William E. Lorensen, Johnsonville, N.Y., and Thomas E. Kennedy, Whitefish Bay, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1990, Ser. No. 631,121
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—306 8 Claims



7. A segmentation system for creating three-dimensional (3D) models by classifying magnetic resonance imaging (MRI) data into stationary tissue and flowing fluid types comprising:

a) a magnetic resonance scanner adapted for simultaneously obtaining a 3D velocity array V and a 3D magnitude array M each having a plurality of entries, with each entry corresponding to a three-dimensional location (x,y,z) of a subject and each set representing a plurality of tissue types within the subject;

b) an image processor adapted for creating an image from the magnitude array M and the velocity array V and a scatter plot diagram;

c) a data point selector adapted for allowing an operator to select desired types of tissue or flowing fluid and a location (x,y) on the image;

d) a data point store unit adapted for storing a classification value indicating the selected tissue type, a velocity entry from the velocity array V and a magnitude entry from the magnitude array M for each selected array element location, the classification value being plotted on a graph of velocity versus magnitude to obtain the scatter plot;

e) a nearest neighbor calculator adapted for synthesizing classification values for velocity and magnitude entries having no classification value, the synthesized values being that of the nearest classification value pertaining to a selected location, and creating a feature map from information stored in the data point store unit and the synthesized classification values, and for looking up all remaining velocity and magnitude entries in the feature map and classifying them according to tissue type or type of moving fluid;

f) a segmented data store unit coupled to the nearest neighbor calculator adapted for storing the classified entires from the nearest neighbor calculator; and

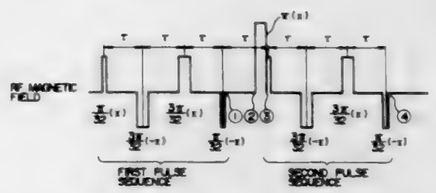
g) a three-dimensional processor for producing a three-dimensional model from the classification values at all array element locations.

5,204,626

METHOD FOR NUCLEAR MAGNETIC RESONANCE MEASUREMENTS ON LOW CONCENTRATION SOLUTES IN SOLVENT

Yukari Onodera, Hachioji; Etsuji Yamamoto, Akishima, and Ryuichi Suzuki, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1991, Ser. No. 751,972
Claims priority, application Japan, Aug. 29, 1990, 2-225224
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 12 Claims



1. A nuclear magnetic resonance measuring method of an object placed in a space to which a static magnetic field having slight inhomogeneity is applied, said method comprising the steps of:

applying a first equidistant radio frequency pulse sequence the phases of which are inversed sequentially and which has a flip angle ratio in accordance with a binominal coefficient, to said object;

applying consecutively an inversion radio frequency pulse to said object;

applying further a second equidistant radio frequency pulse sequence the phases of which are inversed sequentially and which has a flip angle ratio in accordance with a binominal coefficient, to said object; and

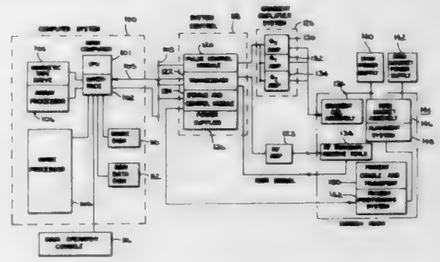
measuring transverse magnetization signals resulting from said object.

5,204,627

ADAPTIVE NMR ANGIOGRAPHIC REPROJECTION METHOD

Charles A. Mistretta; Frank R. Korosec, both of Madison, and David M. Weber, Middleton, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 14, 1991, Ser. No. 669,143
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 9 Claims



1. A method for producing a magnetic resonance angiogram, the steps comprising:

acquiring a 3D NMR data set comprised of a set of values which indicates by their magnitude the translational movement of spins and which indicates by their location in the 3D NMR data set the physical location of said spins;

producing a binary mask having a set of binary values in

which there is a binary value corresponding to each value

serted, for generating a static magnetic field for said subject

interval being of uniform duration immediately preceding a spark event for said spark plug;

5,204,632

APPARATUS AND METHOD FOR DETECTING LEAKS

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which there is a binary value corresponding to each value in the 3D NMR data set and the binary values are determined by a) locating regions in the 3D NMR data set in which the magnitude of its values exceed a first threshold value, b) enlarging those regions and c) setting the binary values in the binary mask which correspond to said enlarged regions to one of their binary values;

combining the 3D NMR data set with the binary mask to produce a 3D adapted data set in which values in the 3D NMR data set which correspond to binary values in the binary mask located outside the enlarged regions are removed from the 3D NMR data set; and

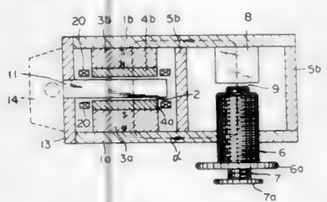
producing a 2D magnetic resonance angiogram from the 3D adapted data set in which a brightness value of each pixel in the 2D magnetic resonance angiogram is determined by the sum of all the data points therein that are disposed along the pixel's projection ray.

5,204,628

ELECTRON SPIN RESONANCE SYSTEM

Kenta Konishi; Akio Nakanishi, and Nahoko Sugahara, all of Mishima, Japan, assignors to Sumitomo Special Metal Co., Ltd., Osaka, Japan

Continuation of Ser. No. 555,593, Jul. 23, 1990, Pat. No. 5,142,232. This application Jul. 7, 1992, Ser. No. 909,709
Claims priority, application Japan, Oct. 9, 1989, 1-263328
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—316 **37 Claims**



1. An electron spin resonance system, comprising:

a magnetic circuit in which each permanent magnet, including a magnetic pole piece on the surface thereof, of a pair of permanent magnets is respectively attached to an opposing surface of a stationary yoke of a pair of stationary yokes mounted opposite to each other to form a gap, a movable yoke mounted for continuously changing the distance between opposing surfaces of the stationary yokes, so that the magnetic resistance of a magnetic path formed by said permanent magnets, stationary yokes and movable yokes is continuously modulated, thereby forming a continuously modulated magnetic field in the gap between the opposed permanent magnets;

coils for applying a modulating magnetic field to said gap and a sweeping magnetic field application coil for applying a sweeping magnetic field to said gap;

a cavity resonator disposed in said gap for receiving specimens to be measured; and

a microwave generator and a microwave detector attached to the outside of said cavity resonator.

5,204,629

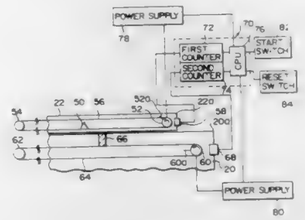
AUTOMATIC ALIGNING MECHANISM FOR NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Akihide Ueyama, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 3, 1990, Ser. No. 620,777
Claims priority, application Japan, Dec. 4, 1989, 1-314554
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—318 **12 Claims**

1. An automatic aligning mechanism for a nuclear magnetic resonance imaging apparatus including a gantry supporting a main coil, having a central space into which a subject is inserted, for generating a static magnetic field for said subject inserted into said central space, and supporting a gradient coil for generating a gradient magnetic field for producing position information of a portion of said subject induced with a nuclear magnetic resonance signal in said static magnetic field, said imaging apparatus producing an image of a section of said subject at a predetermined inspecting position in said central space of said main coil on the basis of said nuclear magnetic resonance signal from said portion of said subject, said mechanism comprising:

a table top supporting base having a table top on which said subject is placed and which is movable to move said subject into and out from an opening of said gantry;



means for measuring a position of an inspected portion of said subject on said table top, wherein said position measuring means includes an inspected-portion indicating member movable along a longitudinal side edge of said table top;

indicating-member-moving-distance measuring means for measuring a moving distance of said inspected-portion indicating member from a predetermined initial position; and

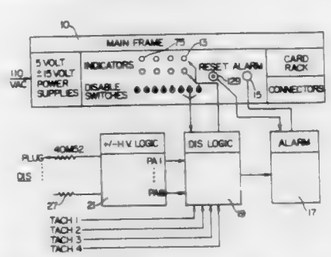
means for detecting a distance between an inspected portion of said subject and a predetermined inspecting position in said central space of said main coil on the basis of a measured result by said position measuring means, and for moving said table top for a detected distance toward said opening of said gantry.

5,204,630

PREIGNITION WARNING DEVICE

William R. Seitz, Birmingham, Mich.; Richard D. Taylor, Findlay, and David M. Smith, Fostoria, both of Ohio, assignors to Allied Signal Inc., Morristown, N.J.

Filed Jun. 26, 1991, Ser. No. 721,046
Int. Cl.[5] F02P *17/00*
U.S. Cl. 324—399 **8 Claims**



1. A method of evaluating the operation of a spark ignited internal combustion engine including the steps of:

applying a relatively low voltage across at least one spark plug associated with at least one cylinder in said engine;

monitoring the current flow through said spark plug;

establishing a time interval during which there should be no current flow through said spark plug, said established time interval being of uniform duration immediately preceding a spark event for said spark plug;

deriving an alarm signal whenever the current flow associated with said spark plug exceeds said predetermined threshold within said established time interval;

temporarily enabling both visible and audible indicators by said alarm signal to inform an operator of an initial excessive current flow condition in said spark plug which could damage said engine;

counting the number of times said current flow though said spark plug exceeds said predetermined threshold level; and

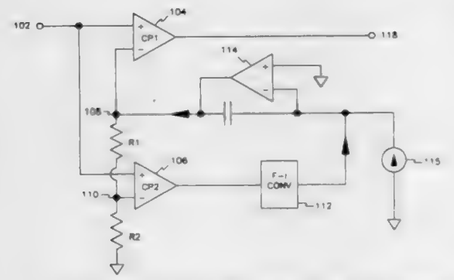
summing said number of times said predetermined threshold level exceeds a predetermined number in a specified length of time to create a cumulative signal for continuously enabling at least said audible indicator.

5,204,631

SYSTEM AND METHOD FOR AUTOMATIC THRESHOLDING OF SIGNALS IN THE PRESENCE OF GAUSSIAN NOISE

Philip C. D. Hobbs, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1991, Ser. No. 703,072
Int. Cl.[5] H03B *1/00, 1/04*
U.S. Cl. 328—165 **10 Claims**



1. A method for detecting information signals by automatically thresholding input signals in the presence of noise of accurately known statistics concerning a predetermined acceptable false alarm rate data, comprising the steps of:

setting a first threshold value signal based on the input signal and the statistics concerning the predetermined acceptable false alarm rate;

comparing the input signal to a second threshold signal related to the first, and outputting a second false alarm rate;

determining the frequency of said second false alarm rate;

adjusting said first threshold value signal based on the predetermined acceptable false alarm rate and said frequency of said second false alarm rate;

setting said second threshold signal to cause said second false alarm rate to be substantially larger that said first false alarm rate;

converting the frequency of said predetermined acceptable false alarm rate to a current signal using a frequency-to-current converter means; and

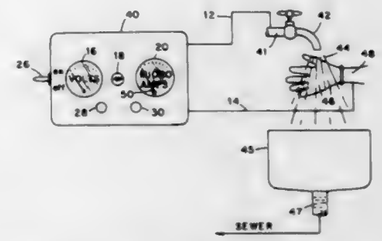
generating an output corresponding to said adjusted first threshold value signal, based on a difference between said current signal and a predetermined current using a servo amplifier means.

5,204,632

APPARATUS AND METHOD FOR DETECTING LEAKS IN SURGICAL AND EXAMINATION GLOVES

Eddie D. Leach, 627 Charlie Hicks Rd., Jonesborough, Tenn. 37659

Continuation-in-part of Ser. No. 729,025, Jul. 12, 1991, abandoned, which is a continuation of Ser. No. 376,065, Jul. 5, 1989, abandoned. This application Mar. 16, 1992, Ser. No. 851,638
Int. Cl.[5] G01R *31/12*
U.S. Cl. 324—557 **12 Claims**



1. An apparatus for detecting holes or perforations in a rubber or plastic surgical or examination glove having an inside surface and an outside surface with the latter being subject to contact with potentially infectious bacteria and viral agents during the use of said glove, said apparatus comprising:

(a) liquid supply means for providing a non-recirculating stream of an ion-containing liquid;

(b) a first electrically conductive lead having first and second ends with the first end indirectly contacting the outside surface of said glove through the stream of the ion-containing liquid when the outside surface of said glove is contacted by said stream of liquid and with the second end connected to a power source;

(c) liquid receiving means for receiving and disposing of the stream of liquid after contact with the outside surface of said glove;

(d) a second electrically conductive lead having a first end for directly contacting a conductive element which is adapted to substantially contact the inside surface of said glove and a second end attached to said power source; and

(e) means for measuring the electrical properties between said first lead and said second lead when a leak through said glove allows ions in said liquid in contact with the outside surface of said glove to penetrate said leak and effect a completion of a circuit between said first lead and said second lead through said stream of liquid, said means for measuring being electrically connected with said first lead and said second lead.

5,204,633

ELECTROMAGNETIC CONTACTOR WITH CLOSURE FAULT INDICATOR

Steven J. Ahladas, Highland, and Edward J. Seminaro, Milton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1992, Ser. No. 841,127
Int. Cl.[5] G01R *31/06;* **G08B** *21/00;* **H02H** *3/26*
U.S. Cl. 324—654 **2 Claims**

1. An electromagnetic actuator having a contact closure sensing ability, said actuator comprising:

an electromagnet having a movable core, and a fixed portion including a coil;

said core movably disposed adjacent said fixed portion and operating to complete a circuit in response to the coil being energized, wherein the distance between said core and said fixed portion is significantly reduced when said coil is energized;

a drive circuit electrically connected to said coil for energiz-

means for receiving an input FM signal to be demodulated

a source connected to the output terminal of said operational amplifier, and

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INTRINSIC OFFSET RECOVERY CIRCUIT

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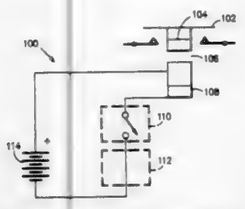
a drive circuit electrically connected to said coil for energizing said coil at a first power level to move said movable core into contact with said fixed portion varying power level to maintain said contact; and

sensor means electrically connected in series with said drive



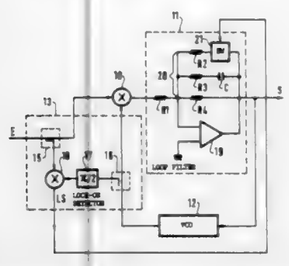
circuit for sensing contact by measuring a change in inductance of said coil between non-energized and energized states wherein said sensor means measures AC current amplitude flowing through said drive circuit and signals contact failure when said current amplitude is above a set value.

5,204,634

PHASE-LOCKED LOOP DEMODULATOR HAVING LOOP FILTER CONTROLLED BY LOCK DETECTOR

Emile Tonello, Toulouse, and Christian Herbere, Plaisance Du Touch, both of France, assignors to Alcatel Espace, Courbevoie, France

Filed Mar. 5, 1992, Ser. No. 846,023
Claims priority, application France, Mar. 8, 1991, 91 02817
Int. Cl.[5] H03D *3/00;* **H03L** *7/093*
U.S. Cl. 329—325 **6 Claims**



1. A phase-locked loop demodulator comprising a mixer and a loop filter between an input and an output of said demodulator, and a voltage-controlled oscillator connected between said output and an input of said mixer, the demodulator further comprising a lock-on detector circuit providing a locking signal as an output signal adapted to increase a static loop gain after lock-on by modifying the characteristics of said filter without significantly modifying loop bandwidth.

5,204,635

DIGITAL FM DEMODULATOR UTILIZING UNCORRELATED CLOCK REFERENCE SIGNALS

Yasuhito Takeuchi, 507-8, Yokogawacho, Hachioji, Tokyo, Japan

PCT No. PCT/JP91/00917, § 371 Date Mar. 11, 1992, § 102(e) Date Mar. 11, 1992, PCT Pub. No. WO92/01332, PCT Pub. Date Jan. 23, 1992
PCT Filed Jul. 9, 1991, Ser. No. 838,738
Claims priority, application Japan, Jul. 9, 1990, 2-181256
Int. Cl.[5] H03D *3/02*
U.S. Cl. 329—336 **2 Claims**

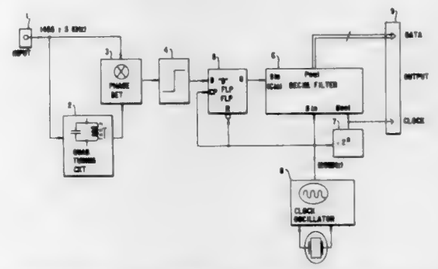
1. An FM demodulator comprising

means for receiving an input FM signal to be demodulated and for generating a first signal of a first phase;

phase comparator means for comparing the phases of said first signal and said input FM signal, and for generating a second signal;

means for receiving said second signal and for providing from said second signal, a binary, unaveraged, pulse width modulated digital signal;

oscillator means for generating a reference clock signal of a



predetermined frequency having no correlation to the frequency of said input FM signal;

time domain quantization means for producing a digital clocked pulse density modulated binary signal by clocking said pulse width modulated digital signal with said reference clock signal; and

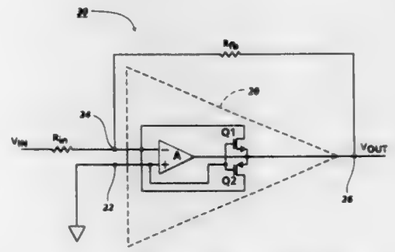
means for filtering said digital clocked pulse density modulated binary signal, and for generating an output signal modulated on and carried by said input FM signal in the form of a digital word chain.

5,204,636

DYNAMIC LIMITING CIRCUIT FOR AN AMPLIFIER

Alan J. Werner, Jr., Rochester, N.Y., and Mostafa R. Yazdy, Los Angeles, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 5, 1992, Ser. No. 878,654
Int. Cl.[5] H03F *3/16*
U.S. Cl. 330—85 **13 Claims**



1. A dynamically limited amplifier, comprising:

an operational amplifier having an inverting input terminal and a non-inverting input terminal with an input potential therebetween, and an output terminal having an output potential; and

transistor means, connected between the inverting input terminal and the output terminal of the operational amplifier, for supplying a feedback current to the inverting input terminal as a function of the output potential, wherein said transistor means comprises a field-effect transistor including:

a drain connected to the inverting input terminal of said operational amplifier

a source connected to the output terminal of said operational amplifier, and

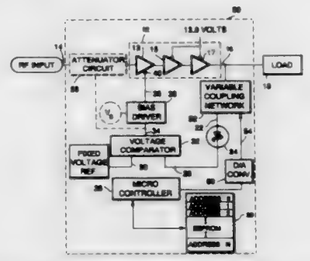
a gate connected to a reference voltage, so that the field-effect transistor will operate in an enhancement mode to provide a feedback current to the inverting input terminal when the output terminal potential of said operational amplifier exceeds a non-zero threshold level, so that said transistor means substantially prevents the input saturation of the operation amplifier.

5,204,637

POWER DETECTION TECHNIQUE FOR AUTOMATIC AMPLIFIER POWER CONTROL

Lanh Trinh, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 17, 1992, Ser. No. 870,070
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—129 **11 Claims**



1. An amplifier power control circuit comprising:

an amplifier having an input for receiving an input signal and an output for providing an output signal;

power detector means for receiving a sample signal representative of the amplifier output signal, said power detector means rectifying said sample signal to thereby provide for a DC output signal;

variable coupling means coupled between the output of said amplifier and said power detector means for providing the sample signal to said power detector means, said variable coupling means receiving said amplifier output signal and an isolation control signal and providing in response a variable amount of isolation between the amplifier output and said power detector means, such that the sample signal provided therefrom is a function of the power level of the output signal;

comparator means for comparing the DC output of said power detector means with a reference voltage to obtain an error voltage;

means for adjusting the output of said amplifier in relation to said error voltage to thereby maintain a desired amplifier output signal;

means for storing a plurality of isolation voltages, each isolation voltage being representative of a given range for the amplifier output signal; and

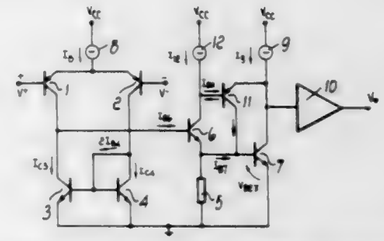
controller means for providing one of said isolation voltages, as said isolation control signal to said variable coupling means.

5,204,638

INTRINSIC OFFSET RECOVERY CIRCUIT PARTICULARLY FOR AMPLIFIERS

Davide Brambilla, Rho, and Fabrizio Stefani, Cardano al Campo, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy

Filed Dec. 17, 1991, Ser. No. 808,492
Claims priority, application Italy, Dec. 20, 1990, 22447 A/90
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—252 **18 Claims**



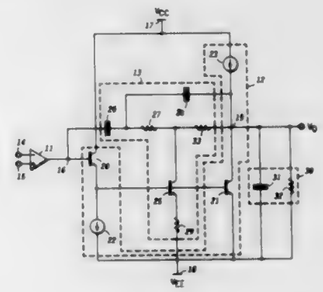
1. In an amplifier circuit having an input differential amplifier having a first PNP transistor, a second PNP transistor, a third NPN transistor, a fourth NPN transistor, a first constant-current source, and a unitary-gain output stage, an intrinsic offset recovery circuit connected between said input differential amplifier and said unitary-gain output stage, comprising a gain stage having a fifth NPN transistor connected to the output of said input differential amplifier and to a sixth NPN transistor and to a seventh PNP transistor, said seventh transistor being connected to sixth transistor, said seventh transistor and said sixth transistor connected to said unitary-gain output stage.

5,204,639

MILLER LOOP COMPENSATION NETWORK WITH CAPACITIVE DRIVE

Bradley T. Moore, Phoenix; Robert L. Vyne, Tempe, and Renwin J. Yee, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 27, 1992, Ser. No. 873,855
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—294 **17 Claims**



12. An operational amplifier frequency compensation network, comprising:

a pole splitting means, the pole splitting means comprising an isolation transistor and a compensation capacitor, wherein the pole splitting means includes an output capacitive drive and creates a dominant pole and at least one zero;

a zero modulation means capable of moving the at least one

a point along the input conductor determined by the

5,204,643

power supplied from single-ports, the circuit arrangement

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a zero modulation means capable of moving the at least one zero in a complex frequency plane; and

an output attenuation means wherein the output attenuation means cooperates with the zero modulation means to create a nondominant pole.

5,204,640

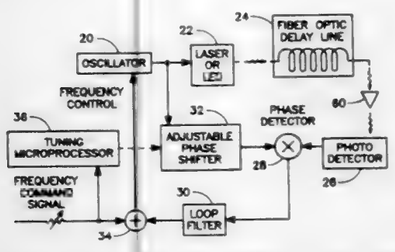
WIDELY TUNABLE OSCILLATOR STABILIZATION USING ANALOG FIBER OPTIC DELAY LINE

Ronald T. Logan, Jr., Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 10, 1992, Ser. No. 832,884

Int. Cl.[5] H03L *7/02;* **H01S** *3/13*

U.S. Cl. 331—9 **28 Claims**



2. A circuit for stabilizing the frequency of an oscillator output signal of an oscillator device, comprising:

delay line means comprising a long optical fiber receiving at one end thereof an optical output signal modulated by said oscillator output signal and transmitting at an opposite end thereof a delayed version of said optical output signal representing a delayed version of said oscillator output signal;

phase detector means for detecting a change in a phase relationship between said oscillator output signal and said delayed version of said oscillator output signal; and

means responsive to said phase detector means for changing the frequency of said oscillator output signal so as to counteract said change in phase relation whereby to stabilize said frequency;

wherein said phase detector means and said delay line means comprise a delay line discriminator characterized by a sensitivity which is a function of the length of said optical fiber, said delayed optical output signal is attenuated in said optical fiber as a function of said length, and said length is such as to optimize said sensitivity against said attenuation.

5,204,641

CONDUCTING PLANE RESONATOR STABILIZED OSCILLATOR

Slawomir J. Fiedziuszko, Palo Alto, and John A. Curtis, Sunnyvale, both of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Mar. 11, 1992, Ser. No. 849,504

Int. Cl.[5] H03B *5/18, 7/14*

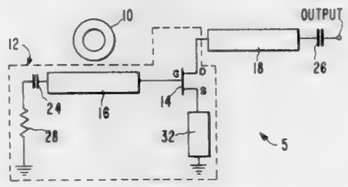
U.S. Cl. 331—96 **15 Claims**

1. A conducting plane resonator stabilized oscillator comprising:

an oscillating means for producing an RF sinusoid at substantially one frequency, said oscillating means having an input conductor;

coupled to the oscillating means, an output conductor for carrying the RF sinusoid; and

a thin, substantially planar conducting plane resonator proximate to the oscillating means and magnetically coupled to the input conductor, for creating a high Q open circuit at a point along the input conductor determined by the desired output frequency of the oscillating means;



wherein the conducting plane resonator is fabricated of a superconductor material.

5,204,642

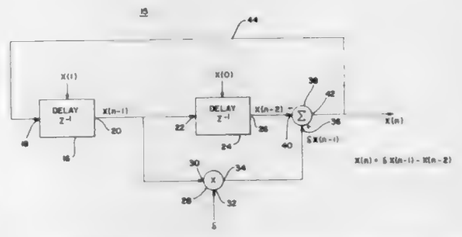
FREQUENCY CONTROLLED RECURSIVE OSCILLATOR HAVING SINUSOIDAL OUTPUT

Safdar M. Asghar, and Alfredo R. Linz, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 785,497, Oct. 31, 1991. This application Sep. 2, 1992, Ser. No. 939,119

Int. Cl.[5] H03B *5/02;* **H04L** *27/12*

U.S. Cl. 331—135 **9 Claims**



1. An apparatus for generating a sinusoidal output signal, the apparatus comprising:

a first delay means for delaying signals, said first delay means receiving a first signal and generating a second signal, said second signal being delayed one clock period with respect to said first signal;

a second delay means for delaying signals, said second delay means receiving said second signal and generating a third signal, said third signal being delayed one clock period with respect to said second signal;

a multiplying means for multiplying a signal by a multiplier, said multiplying means receiving said second signal from said first delay means and receiving said multiplier at a multiplier input, said multiplying means generating a multiplier output signal, said multiplier output signal being said second signal multiplied by said multiplier;

a differential means for determining the difference between two signals, said differential means receiving said third signal from said second delay means and receiving said multiplier output signal from said multiplying means, said differential means generating said sinusoidal output, said sinusoidal output being the difference between said multiplier output signal less said third signal, said sinusoidal output signal also being received by said first delay means as said first signal.

5,204,643

CONTROLLABLE HIGH-FREQUENCY ATTENUATOR

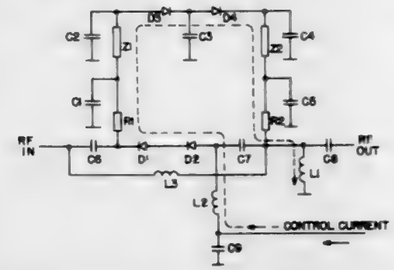
Jouni I. Verronen, Kannokkotie, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Jan. 8, 1992, Ser. No. 817,777

Claims priority, application Finland, Jan. 14, 1991, 910188

Int. Cl.[5] H01P *1/22*

U.S. Cl. 333—81 R **8 Claims**



1. A DC controllable, radio frequency (RF) attenuator having an input and an output and exhibiting substantially constant input and output impedances, respectively, over a range of RF attenuation values, said attenuator comprising:

a signal transmission path between said input and output including series connected first PIN diode means and first capacitor means;

a first transverse circuit comprising an impedance transformer and second PIN diode means connected between said input and an RF ground circuit;

a second transverse circuit comprising an impedance transformer and third PIN diode means connected between said output and said RF ground circuit, said second and third PIN diode means thereby connected so as to be identically poled and to provide a DC current flow path including said first PIN diode means; and

DC control current means connected across said first capacitor means for passing a DC control current through said first, second and third PIN diode means so as to alter the RF impedances of said PIN diode means, said impedance transformers reflecting to said signal transmission path opposite sense RF impedance changes from said second and third PIN diode means to RF impedance changes seen in said first PIN diode means.

5,204,644

CIRCUIT ARRANGEMENT FOR DISTRIBUTING OR FOR COMBINING RADIO-FREQUENCY POWER

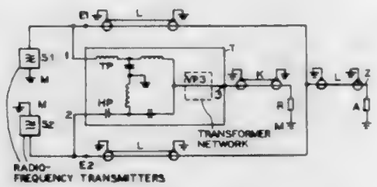
Uwe Dalisda, Olching, Fed. Rep. of Germany, assignor to Rohde & Schwarz GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 27, 1992, Ser. No. 826,518

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1991, 4102930

Int. Cl.[5] H01P *5/12*

U.S. Cl. 333—127 **10 Claims**



1. A circuit arrangement for distributing to a plurality of single-ports radio-frequency power supplied to a summation port or for combining in a summation port radio-frequency power supplied from single-ports, the circuit arrangement comprising: an absorption resistor having one terminal connected to ground and having another terminal coupled to the single-ports via a three-port network, said three-port network having first and second input ports connected to respective single-ports of the plurality of single-ports and having a common output port coupled to said another terminal of said absorption resistor and said three-port network having an operating frequency range such that signals that are substantially in phase at the first and second input ports are substantially in phase opposition at the common output port at least within the operating frequency range.

5,204,645

CIRCUIT CONFIGURATION FOR RANGE SWITCHING IN TUNERS

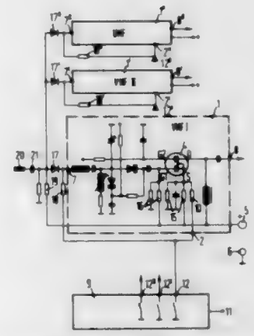
Henning Hohmann, München, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 20, 1991, Ser. No. 703,197

Claims priority, application European Pat. Off., May 21, 1990, 90109584

Int. Cl.[5] H03J *5/24*

U.S. Cl. 334—1 **6 Claims**



1. A circuit configuration for range switching in tuners having at least two ranges, comprising at least two preselector stages each being assigned to a respective tuner range, each of said preselector stages being connected between a supply potential terminal and a reference potential terminal, and each of said preselector stages having an input terminal, an output terminal and an MOS tetrode with a source terminal; a switchgear having switch outputs to be connected to the reference potential terminal for activating each of said MOS tetrodes; and at least one resistor connected between the source terminal of at least one of said MOS tetrodes and at least one of said switch outputs.

5,204,646

ELECTROMECHANICAL SWITCHES WITH SEGMENTED COILS

Arthur Fleming-Dahl, Miller Place, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 17, 1991, Ser. No. 778,262

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—78 **2 Claims**

1. A coil assembly for an electromagnetic switch comprising:

a single plunger connected to switch contacts which make and break electrical connections;

a coil having a plurality of coaxial segments mounted on a solenoid surrounding the plunger; and

input means respectively connected in parallel to all the oil segments which simultaneously inputs an identical voltage

of the same polarity to each segment for generating re-

sponding width end portion of said card over an extended

mixture of plastics and granular ceramics having a high

material, at least one of which is in contact with a plate of high

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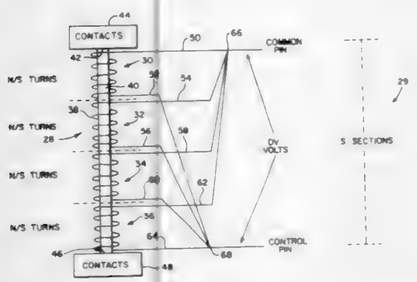
of the same polarity to each segment for generating respective superposed electromagnetic forces that magnetically drive the plunger in a predetermined translational direction.

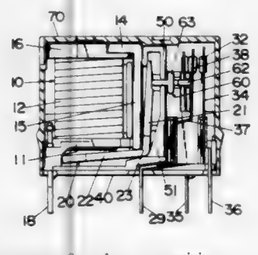


5,204,647

ELECTROMAGNETIC RELAY

Mitsuki, Nagamoto Tsu, and Shigeru, Yokota Tamaki, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 25, 1991, Ser. No. 782,593
Claims priority, application Japan, Oct. 26, 1990, 2-112730[U]
Int. Cl.[5] H01H 51/22
U.S. Cl. 335—80 2 Claims



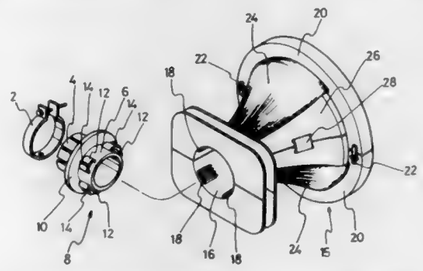
1. An electromagnetic relay, comprising:
a housing having a length and width;
a contact assembly mounted in said housing and including a fixed contact and a movable spring carrying a movable contact;
an electromagnet mounted within said housing in a side-by-side relation with said contact assembly along the length thereof, said electromagnet including an excitation coil and an armature which is movable between two contact operating positions in response to energization and deenergization of said excitation coil;
a card interposed between said armature and said movable spring to establish driving connection therebetween for engaging and disengaging said movable contact to and from said fixed contact in response to the armature movement;
a partition extending between said electromagnet and said contact assembly in a width direction of the housing for electrical insulation therebetween, said partition formed with a slit extending in the width direction thereof for receiving the card such that the card can slide through said slit for contact closing and opening in response to the armature movement; said card having an elongated width extending along the width of said partition and received through said slit; said partition being formed with a guide member extending along one width end portion of the slit and projecting in the sliding direction of said card so as to define an extended guide in cooperation with said width end portion of said slit for slidably supporting one corresponding width end portion of said card over an extended distance in the sliding direction, said card being engaged at the other width end portion spaced from said guide member with said armature in such a manner that said armature can move without being interfered with said guide member;
said card comprising an extended flat plate with a nose extension which projects in the sliding direction of said card from one width end portion of said flat plate remote from said guide member for abutment with said movable spring while leaving the remaining width end portion of said flat plate to be slidably supported by said extended guide, such that the engaging portion of said armature with said card is aligned in the sliding direction of said card with the engaging portion of said card with said movable spring.

5,204,648

DEFLECTION YOKE

Kangryong Jei, Kyunggi, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Jun. 14, 1991, Ser. No. 715,919
Claims priority, application Rep. of Korea, Oct. 24, 1990, 90-16290
Int. Cl.[5] H04N 5/655; H01F 7/00; H01H 1/00, 5/00
U.S. Cl. 335—210 5 Claims



3. A deflection yoke comprising:
a neck holder having at one side thereof a tubular plug, the tubular plug having a plurality of ratchets disposed around the tubular plug, and on another side thereof having means for attachment to a neck of a cathode ray tube; and
a cone part having deflection coils and means for separating the coils, and means for defining an opening in an end of said cone part and having teeth on an inner circumference thereof for meshing with the ratchets of the neck holder.

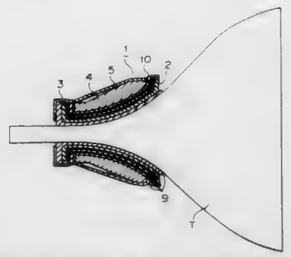
5,204,649

DEFLECTION YOKE

Hikohiro Togane, and Chihiro Ikeda, both of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 599,901, Oct. 19, 1990, Pat. No. 5,138,290. This application Jan. 24, 1992, Ser. No. 825,098
Claims priority, application Japan, Nov. 9, 1989, 1-291518; Nov. 9, 1989, 1-291519
Int. Cl.[5] H01F 7/00; H01J 29/70
U.S. Cl. 335—210 3 Claims

1. A deflection yoke mounted on a television picture tube comprising:
a horizontal deflection coil, a vertical deflection coil, a core disposed outside said horizontal deflection coil, and a separator extending completely between said horizontal deflection coil and said vertical deflection coil for isolating said horizontal deflection coil from said vertical deflection coil, said separator being entirely comprised of a mixture of plastics and granular ceramics having a high thermal conductivity, wherein a resinous material having a high thermal conductivity is filled in spaces between said picture tube and said horizontal deflection coil, said horizontal deflection coil and said separator, said separator and said vertical deflection coil, and said core and said vertical deflection coil so as to bond and fix the deflection yoke to the tube and form a heat transmission passage in said spaces, whereby heat produced in said horizontal and vertical deflection coils is reduced even when they are scanned with a large current of a high frequency.

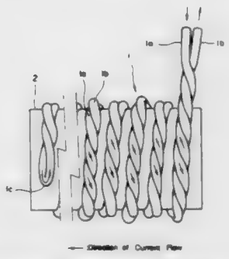


5,204,650

SWITCH FOR CONTROLLING CURRENT FLOW IN SUPERCONDUCTORS

Kaoru Nemoto, Tokyo, Japan, assignor to Railway Technical Research Institute, Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 692,255
Claims priority, application Japan, Apr. 27, 1990, 2-46524[U]
Int. Cl.[5] H01F 1/00
U.S. Cl. 335—216 26 Claims



1. A superconductive switch comprising:
at least one pair of superconductive routes constituting a loop in a superconducting wire wound around a core and having members of the pair of superconductive routes twisted around each other, said at least one pair of superconductive routes having electric current flowing and reciprocating in opposite directions through the respective superconductive routes.

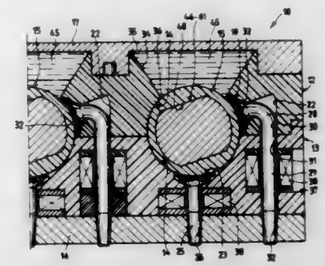
5,204,651

ELEMENTARY CELL COMBINABLE TO FORM DOT MATRIX DISPLAYS

Antonio Fiorentini, Milan, and Claudio Perissinotto, Martignacco, both of Italy, assignors to Solari Udine S.p.A., Udine, Italy

Filed Dec. 6, 1991, Ser. No. 804,822
Claims priority, application Italy, Dec. 12, 1990, 22360 A/90
Int. Cl.[5] G08B 5/00
U.S. Cl. 335—219 25 Claims

1. An elementary cell combinable to form dot matrix displays, in which a plurality of plates of non-magnetic insulating material, at least one of which is in contact with a plate of high magnetic permeability, are arranged to define a seat for housing a sphere provided internally with a permanent magnet, said plates housing a plurality of energizable magnetic poles, said sphere having a polychromatic outer surface divided into sectors, at least one of said plates being provided with a window displaying a portion of said sphere and with a transparent closure element, characterised in that the permanent magnet contained within said sphere comprises composite spatial-surface geometrical shapes in the form of depressions, reliefs and contours, said geometrical shapes being in correlation with other similar shapes on said energizable magnetic poles, said magnet interacting with said plurality of energizable poles and with said geometrical shapes to cause said sphere to assume a combination of n positions where n is even and is greater than or equal to 2.

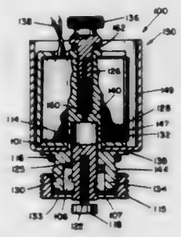


5,204,652

ADJUSTABLE BLEED SYSTEM FOR A UNIVERSAL SOLENOID FOR FLUID CONTROL VALVES

John M. Baker, Corona, and Ronald C. Jess, Garden Grove, both of Calif., assignors to National Irrigation Specialists, Inc., Anaheim, Calif.

Division of Ser. No. 616,214, Nov. 20, 1990. This application May 28, 1991, Ser. No. 706,347
Int. Cl.[5] H01F 7/08; F16K 31/02
U.S. Cl. 335—238 20 Claims



1. A solenoid comprising,
core means,
said core means including an inner bore extending from one end for said core means for a portion thereof,
plunger means moveably disposed within said inner bore in said core means,
coil means mounted around said core means,
said core means including shoulder means integrally formed thereon for supporting said coil means,
bleed control means integrally formed at the other end of said core means,
said bleed control means including an aperture which extends axially through said core means and communicates with said inner bore in said core means in which said plunger means is moveably disposed, and
cap means adjustably mounted to said other end of said core

means and including an aperture therethrough for selec-

constructed and arranged to hold said fuse in fluid, said

digital data to determine if the received data are a part of

of the counter flip-flops, in the oscillator/counter logic

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means and including an aperture therethrough for selectively communicating with said aperture in said bleed control means.

5,204,653

ELECTROMAGNETIC INDUCTION DEVICE WITH MAGNETIC PARTICLES BETWEEN CORE SEGMENTS

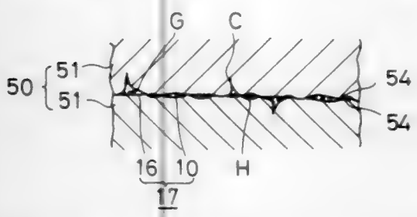
Susumu Saitoh; Tetsurou Itoh, and Naoki Kuroda, all of Osaka, Japan, assignors to Tabuchi Electric Co., Ltd., Osaka, Japan

Filed Jan. 22, 1991, Ser. No. 643,949

Claims priority, application Japan, Jan. 22, 1990, 2-13355; Apr. 20, 1990, 2-105692; Sep. 25, 1990, 2-256616

Int. Cl.[5] H01F *17/06, 27/26*

U.S. Cl. 336—178 **25 Claims**



1. An electromagnetic induction device which comprises a split-type core assembly comprising at least one winding formed thereon and first and second core segments, each of said first and second core segments having at least two joint faces spaced apart from each other, said first and second core segments being connected together with said joint faces of one of the first and second core segments held in contact with said joint faces of the other of the first and second core segments, and a finely divided ferromagnetic material interposed between the joint faces of the respective first and second core segments, said ferromagnetic material having an average particle size less than 1 μm interposed to form a magnetic fluid medium.

5,204,654

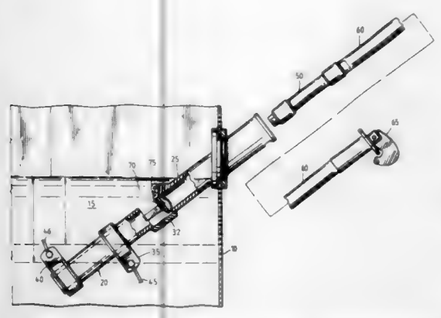
FUSE HOUSING HAVING FLUID SEALING ASSEMBLY

Noah D. Hay, Wingate, N.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 31, 1991, Ser. No. 786,198

Int. Cl.[5] H01H *85/02;* **H02H** *7/04*

U.S. Cl. 337—204 **9 Claims**



1. A fuse housing for a bayonet-type fuse, said fuse housing comprising:

a substantially tubular housing, said housing mountable in a transformer body and having an upper and lower portion, said upper portion accessible from an area outside of said transformer body, said lower portion of said housing constructed and arranged to hold said fuse in fluid, said upper and lower housing portions being connected by at least one rib; and

means for sealing a distal end of said upper portion of said housing to prevent introduction of said fluid into said upper portion of said housing as a fuse holder and said fuse are removed.

5,204,655

RESISTOR ELEMENT WITH A PLANAR CERAMIC SUBSTRATE COVERED WITH A RESISTIVE METALLIC FILM AND HAVING APERTURES FOR LEAD WIRE CONNECTION

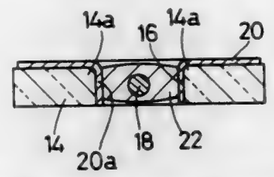
Yasuhiro Yajima, and Takayuki Ogasawara, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 9, 1991, Ser. No. 756,885

Claims priority, application Japan, Sep. 13, 1990, 2-245677

Int. Cl.[5] H01C *1/12*

U.S. Cl. 338—312 **10 Claims**



1. A resistor element for determining a parameter, comprising:

a planar ceramic substrate having opposite major surfaces one of which provides a bearing surface, and at least one aperture formed through the thickness thereof;

an electrically resistive metallic layer which is substantially formed on said bearing surface of said ceramic substrate, said resistive metallic layer having at least one extension which covers at least an entire surface of inner side walls of said at least one aperture;

a pair of conductors for connecting said resistive metallic layer to an external circuit, at least one of said pair of conductors being inserted into a corresponding one of said at least one aperture of said ceramic substrate; and

an electrically conductive adhesive at least partially filling each of said at least one aperture, for securing an end portion of the corresponding one of said pair of conductors to said ceramic substrate, said electrically conductive adhesive electrically connecting said at least one conductor to said at least one extension of said resistive metallic layer.

5,204,656

PAGING RECEIVER WITH POWER SUPPLY DIVIDER

Stefan Scheinert, Eckental/Brand, Fed. Rep. of Germany, and Hervé Hillion, Gallardon, France, assignors to U. S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 549,651, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 216,939, Jul. 8, 1988, abandoned.

This application Feb. 19, 1991, Ser. No. 657,879

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722799

Int. Cl.[5] H04Q *1/30*

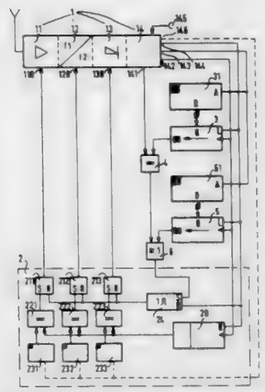
U.S. Cl. 340—311.1 **20 Claims**

1. A paging receiver including a receiver section for producing received digital data from a received signal, an evaluation section for evaluating the digital data, and a power supply divider for selectively switching on and off at least one power supply to the receiver section, characterized in that said paging receiver comprises:

a comparing register for storing a data message which is to be compared with a part of a digital data block of received digital data to determine if the received data are a part of a data block to be processed further, and

a comparator for comparing an already-received portion of a part of the digital data block with the corresponding portion of the data message stored in the comparing register, prior to receipt of all said part of the digital data block, and providing an output signal responsive to non-correspondence of said already-received portion with said corresponding portion prior to receipt of all said corresponding part, and

said power supply divider comprises means for switching off said at least one power supply responsive to said output signal, to reduce power consumption prior to receipt of all said part of the digital data block which is not to be processed further.



5,204,657

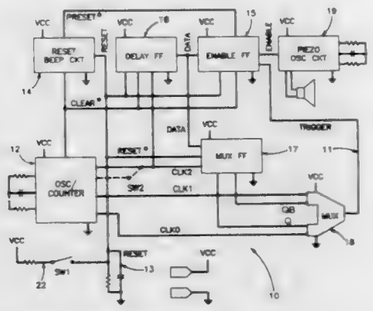
LOCATING DEVICE

Robert L. Prosser, Carlsbad, and Stephen P. Sacarisen, La Jolla, both of Calif., assignors to Impact Products Corporation, San Juan Capistrano, Calif.

Filed May 28, 1991, Ser. No. 706,152

Int. Cl.[5] G08B *13/14*

U.S. Cl. 340—568 **6 Claims**



1. A locating device comprising:

a. a locating circuit comprising a oscillator/counter logic circuit, a reset circuit, a reset beep circuit, an enable flip-flop, a delay flip-flop, a mux (multiplexer) flip-flop and a mux logic circuit and a piezo oscillator circuit;

b. the oscillator/counter logic circuit comprising a plurality of counter flip-flops to generate a first clock delay signal, a second clock delay signal, a third clock delay signal and a clear signal;

c. the reset circuit generating a reset signal to clear the state of the counter flip-flops, in the oscillator/counter logic circuit, to zero and generate a reset* signal to clear the reset beep circuit, the enable flip-flop, the delay flip-flop, and the mux flip-flop;

d. the reset beep circuit supplying a single pulse, preset signal to the enable flip-flop, the enable flip-flop generating an enable signal that triggers the piezo oscillator circuit to drive a piezo alarm element in the piezo oscillator circuit;

e. the clear signal resets the enable flip-flop to control the duration the piezo alarm element is activated, is driven by the oscillator/counter logic circuit;

f. the delay flip-flop, cleared by the reset* signal and set high by the third clock delay signal, supplies a data signal that inhibits the enable flip-flop from being set and enables the mux flip-flop to be set by the next cycle of the third clock delay signal;

g. the mux flip-flop sending a mux state signal to the mux logic circuit;

h. the mux state signal controlling the state of the mux logic circuit to multiplex the first clock delay signal or the second clock delay signal that generates a trigger signal;

i. the enable flip-flop triggered by the trigger signal sets the enable flip-flop setting the enable signal that sets the duration of the activation of the piezo alarm element; and

j. the piezo oscillator circuit, activated by the enable signal, activates the piezo alarm element to emit an audio alarm signal.

5,204,658

STRUCTURE FOR A DOOR INCLUDING A DISPLAY DEVICE

Joel Beauquey, Chenevrey, France, assignor to Schlumberger Industries, Montrouge, France

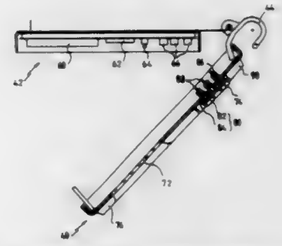
Continuation of Ser. No. 263,167, Oct. 28, 1988, abandoned.

This application Jul. 30, 1991, Ser. No. 741,193

Claims priority, application France, Nov. 19, 1987, 87 15994

Int. Cl.[5] G09G *5/00*

U.S. Cl. 340—700 **7 Claims**



1. A door structure for a machine housing, said structure comprising:

an outer door pivotally mounted on said housing and adapted for moving between a closed position to shut off the interior of said housing from the outside and an open position exposing the interior of said housing, said outer door having an inside face which is turned toward the interior of said housing when the outer door is in its closed position, said outer door including a transparent window, said outer door and said window being adapted to protect said machine against acts of vandalism when said outer door is in its closed position and locked to said housing, said outer door being locked when said machine is in normal use, said machine comprising a backing door, a display device, and manually actuatable command input means; and

said backing door being pivotally mounted relative to said outer door and said housing, said backing door having an outside face wherein, when the outer door is in its closed

means for driving a display in response to signals provided

nals selected in accordance with the input terminal

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position, the outside face of said backing door faces the inside face of said outer door, and an inside face of said backing door faces the interior of said housing;

said display device being disposed on the outside face of the backing door so as to appear behind said window when said backing door is positioned against said outer door, said display device including means to display information in relation to the operation of said machine;

electronic circuit means fixed to one face of said backing door for controlling the operation of said machine; and

said manually actuatable command input means being disposed on the outside face of said backing door for applying commands to said electronic circuit means only when said outer door is in its said open position, said electronic circuit means causing the display device to display information in response to the input of at least some of said commands.

5,204,659

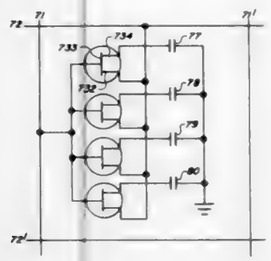
APPARATUS AND METHOD FOR PROVIDING A GRAY SCALE IN LIQUID CRYSTAL FLAT PANEL DISPLAYS

Kalluri R. Sarma, Mesa, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 120,553, Nov. 13, 1987, abandoned. This application Aug. 3, 1990, Ser. No. 563,675

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **19 Claims**



1. A pixel element of a liquid crystal display, each pixel element comprising:

a plurality of subpixel elements, each subpixel element having approximately an equal area, each subpixel element including;

a first and a second conducting region forming plates of a capacitor, said capacitor applying an electric field to a liquid crystal material between said plates when a charge is stored on said plates; and

an active element, said active element having an output terminal coupled to a first conducting region of said subpixel capacitor;

wherein all active elements of a pixel have a common activation voltage and a common control voltage applied thereto, each active element of said each subpixel element having preselected parameters for charging each coupled capacitor at a different rate, a gray scale resulting from differential charging of each subpixel capacitor of said each pixel element being a function of a voltage magnitude of said common activation voltage applied to said subpixel active elements during a presence of said common control voltage, a number of subpixel elements for which liquid crystal material associated therewith is optically saturated being a function of said voltage magnitude.

5,204,660

METHOD AND APPARATUS FOR DRIVING LIQUID CRYSTAL DISPLAY DEVICE

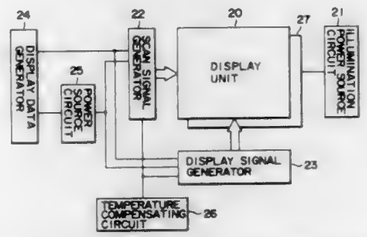
Shinichi Kamagami, Yokohama, and Hiroshi Morita, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 4, 1991, Ser. No. 771,509

Claims priority, application Japan, Oct. 5, 1990, 2-266253

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **8 Claims**



1. A method of driving a liquid crystal display device, said liquid crystal display device comprising:

switching elements each having a nonlinear current-voltage characteristic which is asymmetrical between positive and negative directions of voltage application;

a plurality of pixels each incorporating said switching element; and

a liquid crystal having a threshold voltage Vth (V) and a saturation voltage Vsat (V) as electrooptical characteristics,

wherein said liquid crystal display device is time-divisionally driven by a voltage waveform constituted by a select period in which a signal voltage is written in predetermined pixels and a nonselect period in which the written signal voltage is held, and an absolute value Vb (V) of the voltage applied to said pixels during the nonselect period satisfies a relation of:

$$V'/2-0.4 \leqq Vb \leqq V'/2+0.5$$

(where $V'=Vth+Vsat$).

5,204,661

INPUT/OUTPUT PIXEL CIRCUIT AND ARRAY OF SUCH CIRCUITS

Michael Hack, Mountain View; Alan G. Lewis, Sunnyvale, and Richard H. Bruce, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1990, Ser. No. 626,795

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—784 **7 Claims**

1. An array of combination sensor and display driving apparatus, comprising:

a plurality of combination sensor and display driving apparatus of the type including a sensor circuit, comprising:

a first terminal;

a second terminal;

a conductive element electrically interconnecting said first and second terminals;

a multiple-state sensing device;

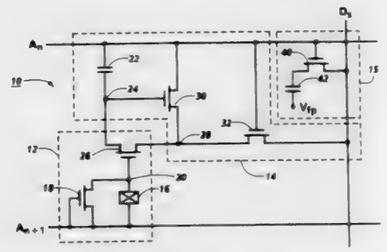
means for establishing an initial state of said sensing device;

means connected to said sensing device for changing the initial state of said sensing device in response to the incidence of electromagnetic radiation thereupon;

means connected to said conductive element and to said sensing device for modifying the conductance of said conductive element as a function of the state of said sensing device; and

means for driving a display in response to signals provided by said first and second terminals, said means being connected to said first and second terminals; and

a plurality of row interconnections, each said row interconnection electrically connected to at least one of said sensor and display driving apparatus and each sensor and display



driving apparatus electrically connected to at least one row interconnection; and

a plurality of column interconnections, each said column interconnection electrically connected to at least one of said sensor and display driving apparatus and each said sensor and display driving apparatus electrically connected to at least one column interconnection.

5,204,662

MONITOR TELEVISION APPARATUS

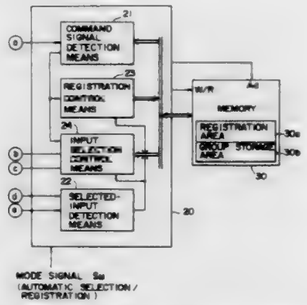
Osamu Oda, Saitama, and Toshio Amano, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1991, Ser. No. 700,865

Claims priority, application Japan, May 16, 1990, 2-124239

Int. Cl.[5] G05B *19/04*; **H04N** *5/44*

U.S. Cl. 340—825.25 **1 Claim**



1. A monitor television apparatus equipped with a plurality of input terminals for audio/visual signals and adapted to serve as an output apparatus electively for a plurality of audio/visual appliances by switching the input terminals, said apparatus comprising:

command signal detection means for detecting command signals relative to the audio/visual appliances connected to said input terminals and identifying the contents of the commands;

memory means for storing in a registration area command signals relative to certain audio/visual appliances and data of input terminals, to which said audio/visual appliances are connected, in a mutually corresponding relation, and further for storing in a group storage area of said memory means a plurality of specific command signals previously detected by said command signal detection means;

selected-input detection means for detecting the input terminals selected in accordance with the input terminal switching operation;

registration control means for storing the command signals detected by said command signal detection means and data corresponding to the input terminals detected by said selected-input detection means in said memory means; and

input selection control means for controlling said switching of the input terminals, so that when any command signal already registered in said memory means by said registration control means is detected by said command signal detection means the input terminals to which the audio/visual appliance corresponding to the detected command signal is connected are grasped by reading out the registered data from said registration area of memory means and the input terminal switching operation is so controlled as to select the relevant input terminals, and when a command signal not registered in said registration area of said memory means by said registration control means is detected if at least one of the command signals was previously registered in said group storage area of said memory means by said registration control means the input terminal switching operation is controlled to select the relevant input terminals in response to said previously registered command signals.

5,204,663

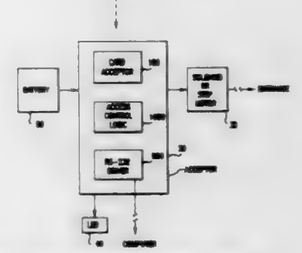
SMART CARD ACCESS CONTROL SYSTEM

Philip S. Lee, Potomac, Md., assignor to Applied Systems Institute, Inc., Washington, D.C.

Continuation of Ser. No. 525,889, May 21, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 778,748

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.34 **74 Claims**



1. An access control system, comprising:

a power source;

key means detachable from the rest of said access control system and including an integrated circuit embedded in said key means for storing key access information and transaction information at respective addresses thereof;

means for activating the opening mechanism of an access controlled area; and

acceptor means, coupled to the power source, for providing a control signal to activate said activating means including:

means for electrically engaging said key means with said acceptor means,

means, coupled to said engaging means, for coupling power from the acceptor to the key means to activate the integrated circuit of the key means during the time when the key means is electrically engaged with the acceptor means and for decoupling the power to deactivate the integrated circuit of the key means at other times,

means for storing lock access information and transaction

trolled by the change data without changing the change pixel data in the overlay memory.

5,204,666

INDICATION DISPLAY UNIT FOR VEHICLES

surface, each connecting portion having a hollow portion, each connecting portion having

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means for storing lock access information and transaction information,
means, coupled to the lock access information storing means, for reading the lock access information,
means, coupled to the engaging means, for reading the key access information from the integrated circuit of the key means during the time when the key means is electrically engaged with the acceptor means and the integrated circuit of the key means is activated,
means, coupled to the lock access information reading means and the key access information reading means, for comparing the key access information with the lock access information,
means, coupled to the comparing means, for providing the control signal to said activating means based on a comparison result,
means for providing transaction information representing the condition of said acceptor means, and
means, coupled to said transaction information providing means and the engaging means, for writing said transaction information into the integrated circuit of the key means at respective addresses during the time when the key means is electrically engaged with the acceptor means and the integrated circuit of the key means is activated, said transaction information writing means being operated following any comparison result indicating an access information match.

5,204,664

DISPLAY APPARATUS HAVING A LOOK-UP TABLE FOR CONVERTING PIXEL DATA TO COLOR DATA

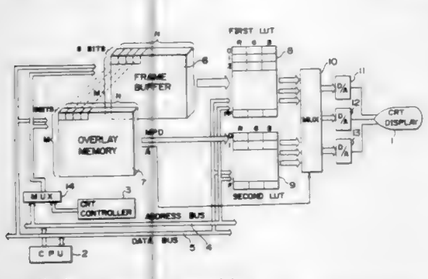
Kouichi Hamakawa, Oora, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 8, 1991, Ser. No. 696,967

Claims priority, application Japan, May 16, 1990, 2-127383; Jul. 16, 1990, 2-188741

Int. Cl.[5] G09G *1/28*

U.S. Cl. 340—703 **2 Claims**



1. A display apparatus comprising:
(a) a frame buffer for storing pixel data corresponding to each pixel of a display screen;
(b) a first look-up table for converting pixel data read from said frame buffer into color data;
(c) an overlay memory having areas for the respective pixels of said display screen, each of said areas for storing change data representing presence/absence of color change in a desired area and change pixel data representing a change color to be displayed in a desired area when the change data indicates the presence of color change;
(d) a second look-up table for converting the change pixel data read from said overlay memory into color data; and
(e) a selector for selecting color data outputted from one of said first look-up table and said second look-up table depending upon the change data in said overlay memory, said change pixel data remaining unchanged for each pixel area of said overlay memory regardless of whether the change data indicates the presence or the absence of the color change for the area so that a change and a non-change of the displayed color in the desired area is controlled by the change data without changing the change pixel data in the overlay memory.

5,204,665

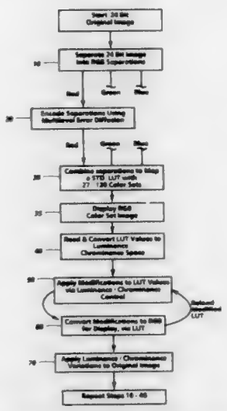
COLOR EDITING WITH SIMPLE ENCODED IMAGES

James E. Bollman, Williamson, N.Y., and Myra E. Van Inwegen, Philadelphia, Pa., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 517,895, May 2, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 805,358

Int. Cl.[5] G09G *1/28*

U.S. Cl. 340—703 **21 Claims**



1. A method of modifying color in an n-bit system, wherein a digitally encoded representation of an original image in red-green-blue color space, the original image composed of pixels defined by the level of red, green and blue therein, each pixel defined by one of a number of encoded values of levels of red, green and blue, such number relatively large with respect to a desired number of levels for modifying the color of the original image, comprising the steps of:
a) separating the original image into red, green and blue color separations, whereby for each separation, each pixel in the original image is defined by one of N different levels of red or green or blue at that pixel position;
b) for each of the red, green and blue color separations, reducing the number of levels N defining pixels in each separation, to a value N_R, N_B, and N_G, respectively, where $N_R \times N_B \times N_G$ is less than 2^n;
c) producing a look up table having a number of entries equal to $N_R \times N_B \times N_G$, each entry of the look up table consisting of one RGB triplet;
d) combining the reduced number of levels N_R, N_B, and N_G together to form an index for each pixel for which an RGB triplet in the look up table is selected;
e) displaying the original image in terms of the reduced number of levels N_R, N_B, and N_G on a display device;
f) converting each RGB triplet in the look up table to a set of luminance and chrominance values, whereby each pixel identified as an RGB triplet is defined by a set of luminance and chrominance values;
g) modifying the of each RGB triplet in the look up table, whereby each pixel identified as an RGB triplet is identified as a modified RGB triplet, whereby the overall appearance of the image is changed; and
h) modifying each pixel of the original image defined by one of a relatively large number of encoded values of levels of red, green and blue, in accordance with the modifications to the set of luminance and chrominance values of each combination of N_R, N_B, and N_G in the look up table.

5,204,666

INDICATION DISPLAY UNIT FOR VEHICLES

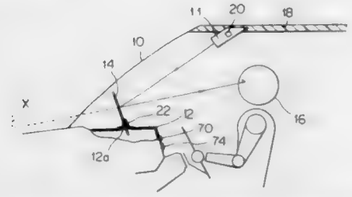
Kunimitsu Aoki, and Tadashi Iino, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 262,377, Oct. 25, 1988, abandoned. This application Aug. 30, 1991, Ser. No. 752,935

Claims priority, application Japan, Oct. 26, 1987, 62-162514[U]; Nov. 24, 1987, 62-177479[U]

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—705 **9 Claims**



1. An indication display unit for vehicles enabling a driver to sight an indicating image comprising:
an image projector device including a display device for projecting an indicating image;
a reflecting means located forwardly of a driver seat for reflecting said indicating image; and
a location shifting means having a mechanism for completely shifting said reflecting means in one of a vertical motion and a transversal motion in accordance with a vehicle velocity, wherein said reflecting means includes a first portion and a second portion, said first portion being located above a dashboard level and a second portion being located below the dashboard level when said reflecting means is in use.

5,204,667

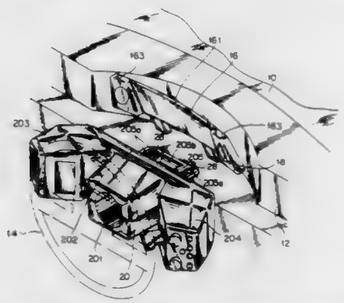
INDICATION DISPLAY UNIT FOR VEHICLES

Tai Inoue, Susono, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 302,649, Jan. 27, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 798,055

Int. Cl.[5] G02D *27/14*

U.S. Cl. 340—705 **2 Claims**



1. An indication display unit for a vehicle, said indication display unit displays information about driving conditions of said vehicle, said indication display unit comprising:
reflecting means having an electric unit, said reflecting means mounted inside a recessed portion of a dash board at a position of an instrument panel for observing said information which is displayed inside said recessed portion, said reflecting means having connecting portions projecting outward from a surface opposite to a reflecting surface, each connecting portion having a hollow portion, each connecting portion having
a) a pivotal shaft, disposed in said hollow portion, for rotatably supporting said reflecting means, and
b) a plug, disposed in each hollow portion, connected to said electric unit;
supporting means having a connecting portion electrically connectable with and disconnectable from said electric unit, said reflecting means removably mounted on said supporting means with a reflecting surface thereof directed to a driver's seat; and
indicating means located at any position other than said dash board with an indicating surface thereof directed to said reflecting surface so as to project said information, indicated on said indicating surface, to said reflecting surface.

5,204,668

PLURAL DOCUMENT IMAGE PROCESSING DISPLAY FOR WORK STATIONS

Jacques Ferrer, Le Petit-Quevilly, and Jean-Jacques Videcoq, Pavilly, both of France, assignors to Unisys Corp., Blue Bell, Pa.

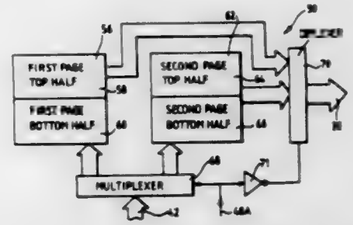
PCT No. PCT/US90/05782, § 371 Date Jun. 3, 1991, § 102(e) Date Jun. 3, 1991

PCT Filed Oct. 10, 1990, Ser. No. 687,898

Claims priority, application United Kingdom, Oct. 11, 1989, 8922897

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—726 **9 Claims**



1. An apparatus for displaying a received image, said apparatus comprising:
a main memory for receiving data representative of a plurality of images,
a video display memory coupled to said main memory for storing data representative of one of the plurality of images to be displayed,
said display memory comprising a first page portion for receiving and storing a first image, and a second page portion for receiving and storing a second different image,
each said page portions of said display memory being divided into a top document half and a bottom document half, and
selection means operative to select one of said page portions to receive and store data and to simultaneously select the other page portion for display, and
when said first page portion is selected for display, data in the top half of said first page portion is transferred to and stored in said bottom half of said second page portion.

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said output signal, said counting means activated for a

body for providing signals transmitted through the body

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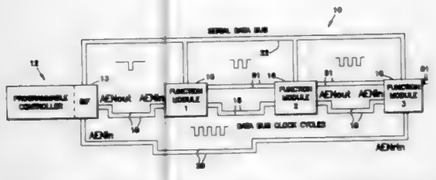
5,204,669

AUTOMATIC STATION IDENTIFICATION WHERE FUNCTION MODULES AUTOMATICALLY INITIALIZE

Steven G. Dorfe, New Hope, and James M. Jordan, Eagan, both of Minn., assignors to DataCard Corporation, Minnetonka, Minn.

Filed Aug. 30, 1990, Ser. No. 575,077
Int. Cl.[5] G05B *24/02*; H04Q *3/00*
U.S. Cl. 340—825.52 14 Claims



1. A method for automatically assigning an address to an individual function module of a plurality of such function modules which are electrically interconnected to a controller by a common data bus for transmitting data to the function modules and a control line to which the modules are interconnected in point to point fashion, the method comprising the steps of:

a) beginning with a first function module F[N] where N equals 1, transmitting from the controller an enable control signal by way of the control line to the function module F[N] of the plurality of function modules F[1]-F[TOTAL] so as to enable the [first] function module F[N] and transmitting along the command data bus a predetermined number of pulses to the [first] function module F[N] of the plurality of function modules F[1]-F-[TOTAL];

b) the function module F[N] assigning itself a unique address as determined by the predetermined number of pulses received by the function module F[N] from the common data bus;

c) changing the number of pulses at the function module F[N] by a predetermined amount;

d) if electrically connected to an adjacent function module F[N+1] by a loopback signal circuit separate and distinct from the common data bus and the control line, transmitting an enable control signal by wall of the control line from the function module F[N] to the adjacent function module F[N+1] of the plurality of function modules by way of the control line so as to enable the adjacent function module F[N+1] and then transmitting from the function module F[N] the changed number of pulses along the common data bus to the adjacent function module F[N+1] connected to the common data bus;

e) repeating steps b)-d), increasing N by one, until the function modules have been assigned addresses; and

f) if not electrically connected to an adjacent function module N[N+1] by a loop back signal circuit, transmitting an enable control signal to the controller by a second control line and transmitting along the common data bus the changed number of pulses determinable of the final module's address to the controller.

5,204,670

ADAPTABLE ELECTRIC MONITORING AND IDENTIFICATION SYSTEM

Vincent D. Stinton, Brighton, Colo., assignor to B. I. Incorporated, Boulder, Colo.

Continuation-in-part of Ser. No. 237,860, Aug. 29, 1988, Pat. No. 4,952,928. This application Aug. 23, 1990, Ser. No. 572,905
Int. Cl.[5] H04B *5/00*
U.S. Cl. 340—825.54 12 Claims

1. An adaptable personnel monitoring and identification system comprising:

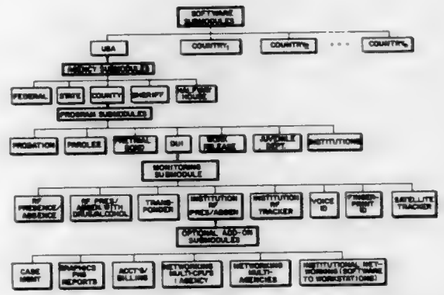
a tag carried by a first individual of a population of individuals being monitored, said tag including means for transmitting a unique identification signal;

a central processing unit (CPU) in telecommunicative contact with said tag; and

means for establishing telecommunicative contact between a second individual of said population of individuals and said CPU;

said CPU having a plurality of software program submodules adapted to be transferred thereto and selectively stored therein, each one of said software program submodules comprising a control program that can be used to help control said personnel monitoring and identification system for a particular application;

a first one of said software control programs comprising a monitoring submodule that receives said unique identification signal from said tag, and processes said unique identification signal in order to confirm that the tag, and hence the first individual carrying said tag, is at a prescribed remote location at a specified time;



a second one of said software control programs comprising an administrative case load management submodule that: (1) verifies the identity of said second individual once said telecommunicative contact is established with said CPU, (2) verifies that the second individual has contacted the CPU within an obligated contact time period, and (3) verifies the status of the second individual;

whereby said population of individuals being monitored by said system may include both individuals like the first individual carrying a tag, and individuals like the second individual who do not carry a tag but who are obligated to regularly contact the CPU to report their status.

5,204,671

RANDOM ONE-OF-N SELECTOR

James W. Kronberg, 353 Church Rd., Beech Island, S.C. 29841

Filed Jan. 22, 1991, Ser. No. 643,305
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—825.650 20 Claims

1. An apparatus for making a decision to select one item from several items, said apparatus comprising:

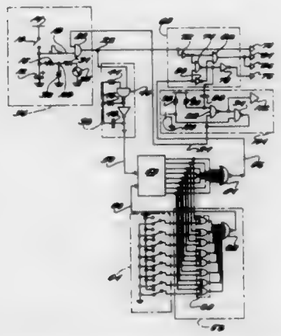
means for generating pulses

means for sensing the presence of each of said items and producing an output signal thereupon, said output signal having a first duration;

means for counting pulses, said counting means in electrical connection with said generating means, said counting means counting pulses from a first number up to a reference number thereby defining a counting cycle, said counting cycle having a second duration;

means in electrical connection with said counting means for resetting said counting means after each of said counting cycles whereby said counting means can begin another counting cycle;

means for activating said counting means upon receipt of said output signal, said counting means activated for a third duration, said counting means responsive to said activating means and in operational connection with said sensing means for receipt of said output signal, said counting means having a count when deactivated, and wherein the sum of said first and said third duration is at least five times longer than said second duration;



means in electrical connection with said counting means for comparing said count of said counting means to said first number; and

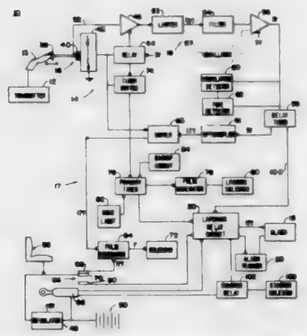
means in electrical connection with said comparing means for indicating said item is selected when said count and said first number are equal.

5,204,672

KEYLESS ENTRY SYSTEM

James E. Brooks, 3106 Tamiami Trail #138, Naples, Fla. 33940

Continuation-in-part of Ser. No. 406,757, Sep. 13, 1989, abandoned. This application Jan. 14, 1991, Ser. No. 641,162
Int. Cl.[5] H04B *5/00*
U.S. Cl. 340—825.71 17 Claims



1. A keyless entry system for locked doors comprising:

signal generating means carried by a person and being completely separated by an electrically insulating medium from said person's skin for generating an output signal with a predetermined frequency characteristic and sufficient signal strength such that said generated signal is transmitted across said medium and through the person's body to a remote portion of the body spaced apart from said signal generating means;

receiver means including detector means having sufficient gain for detecting a signal with said predetermined frequency characteristic, and engagement means that are directly engageable by said remote portion of the person's body for providing signals transmitted through the body to said detector means; and

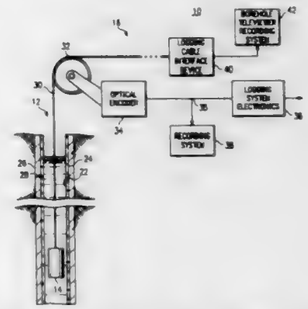
means, responsive to said detector means, for unlocking said door when a signal having said predetermined frequency characteristic is detected.

5,204,673

BOREHOLE TELEVIEWER SYSTEM DEPTH ENCODING AND DECODING METHOD

Donald G. Kyle, Plano, Tex., and William P. Goodwill, Edmond, Okla., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 819,912, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 574,316, Aug. 28, 1990, Pat. No. 5,099,236. This application Oct. 23, 1992, Ser. No. 966,129
Int. Cl.[5] G01V *1/00*
U.S. Cl. 340—853.8 12 Claims



1. A method for continuously recording corresponding depth information synchronously with the data from a well logging system, comprising:

(a) providing a data signal having a synchronizing pulse;

(b) providing a depth signal having the same synchronizing pulse;

(c) recording said data signal on a video channel of a video recorder; and

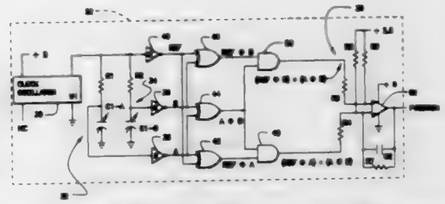
(d) recording said depth signal and the synchronizing pulse on a single audio channel of the same recorder after a predetermined time-delay following occurrence of the synchronizing pulse.

5,204,674

SERVO MECHANISM WITH DIFFERENTIAL PHASE SHIFT FEEDBACK

Daniel E. Holben, Haddonfield, N.J., assignor to Conameter Corporation, Gibbsboro, N.J.

Filed Oct. 28, 1991, Ser. No. 783,364
Int. Cl.[5] G01R *27/26*
U.S. Cl. 340—870.25 11 Claims



1. An apparatus for sensing the position of a movable object such as an actuator member in an industrial processing facility, comprising:

a mechanical sensor element;

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CIRCUIT ARRANGEMENT FOR FREQUENCY

filter means, and including filter coefficient calculating means and data generating means for generating data

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DIFFERENTIAL ANALOG-DIGITAL CONVERTER

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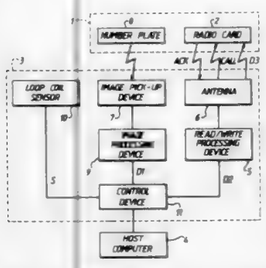
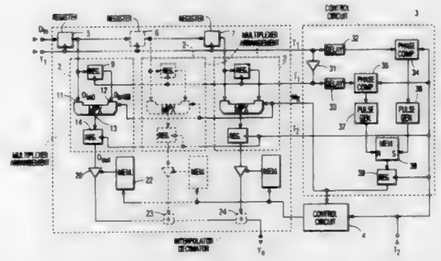
a mechanical sensor element;
an oscillator for generating an oscillating reference signal;
first phase shifting means for shifting the phase of said reference signal in response to movement of said sensor element to create a first phase-shifted signal, said first phase shifting means being constructed so that the magnitude of phase shift between said reference signal and said first phase-shifted signal increases upon movement of said sensor element in a first direction;
second phase shifting means for shifting the phase of said reference signal in response to movement of said sensor element to create a second phase-shifted signal, said second phase shifting means being constructed so that the magnitude of phase shift between said reference signal and said second phase-shifted signal increases upon movement of said sensor element in a second direction which is opposite to the first direction; and
processing means for processing said first and second phase-shifted signals into first and second processed signals which, together, are representative of the position of said sensor element, said processing means being constructed and arranged so that said first processed signal is steady while said second processed signal pulses when said sensor element is to one side of a threshold position, and said first processed signal is pulsed while said second processed signal is steady when said sensor element is positioned to a second, opposite side of the threshold position, the use of said first and second phase-shifting means permitting position detection with minimal interference from component wear and the various environmental factors that tend to affect resistance-bases sensors.

5,204,675
TOLL COLLECTING SYSTEM FOR A VEHICLE
Hiroyoshi Sekine, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Apr. 16, 1991, Ser. No. 685,651
Claims priority, application Japan, Apr. 18, 1990, 2-102296
Int. Cl.[5] G08G *1/01*
U.S. Cl. 340—933 **6 Claims**



1. A system for collecting a toll for a vehicle carrying a number plate and a storage medium, the storage medium stores radio identification data including vehicle number data, the system comprising:
means for receiving the radio identification data from the storage medium via a wireless transmission path;
means for obtaining plate number data including a plate number from the number plate;
means for comparing whether or not the radio identification data coincides with the plate number data wherein the radio identification data is received by the receiving means from the storage medium and the plate number data is obtained by the obtaining means from the number plate; and
means for calculating the toll of the vehicle in accordance with the identification data stored in the storage medium when the radio identification data coincides with the plate number data.

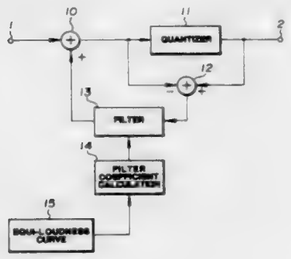
5,204,676
CIRCUIT ARRANGEMENT FOR FREQUENCY CONVERSION OF A DIGITAL SIGNAL
Matthias Herrmann, Braunschweig, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 16, 1991, Ser. No. 808,336
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040299
Int. Cl.[5] H03M *7/00;* **H04N** *7/13;* **H04J** *3/22*
U.S. Cl. 341—61 **8 Claims**



1. A circuit arrangement for conversion of a digital data signal (D_{in}) having a first clock frequency (T_1) into a signal having a second clock frequency (T_2), comprising an interpolator/decimator which includes a series of successively connected input registers for the data signal, each register comprising a clock input for a register clock signal, a data input for the data signal, and a data output which is coupled to an input of arithmetic circuits for calculating a linear combination of output signals, characterized in that at least one multiplexer is provided between an input register and the arithmetic circuits, a first input of the multiplexer being coupled to a data output of an input register, a second input of the multiplexer being coupled, via a first register, to said data output and an output of the multiplexer being coupled to an input of a second register, said first register comprising a clock input which is coupled to the output of an inverter present for applying an inverted first clock signal to said first register, said second register comprising a clock input for a clock signal of the second clock frequency (T_2), said circuit arrangement furthermore comprising a control circuit, an output of which is coupled to a control input of the multiplexer in order to apply a control signal (M_x) thereto so that the output of the multiplexer is connected to that one input of the first and second inputs of the multiplexer that receives a stable signal during writing of data into the second register.

5,204,677
QUANTIZING ERROR REDUCER FOR AUDIO SIGNAL
Kenzo Akagiri, and Makoto Akune, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 12, 1991, Ser. No. 729,388
Claims priority, application Japan, Jul. 13, 1990, P185555/90
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—118 **5 Claims**

1. A quantizing noise reducer for an audio signal comprising:
quantizing means for quantizing an input audio signal,
subtracter means for subtracting an input signal to said quantizing means from an output signal from said quantizing means,
filter means supplied with an output from said subtractor means,
means for synthesizing an output from said filter means and said input audio signal, and
filter control means for controlling a characteristic of said filter means, and including filter coefficient calculating means and data generating means for generating data

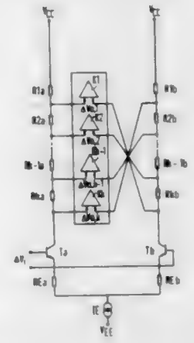


relating to an equi-loudness characteristic, said data being supplied to said filter coefficient calculating means.

5,204,678
DUAL-RANKED TIME-INTERVAL CONVERSION CIRCUIT
Clark P. Foley, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.
Filed Feb. 10, 1992, Ser. No. 834,190
Int. Cl.[5] H03M *1/50*
U.S. Cl. 341—152 **20 Claims**

1. A conversion circuit for converting a time interval between logic level transitions of a first signal and a second signal into a third signal representative of said time interval, comprising:
(a) a first time trap circuit, responsive to said first signal and said second signal, for detecting and storing in coarse quanta of time D(c) a representation of the logic level of said first signal at the time of a logic level transition of said second signal;
(b) a second time trap circuit, responsive to said first signal and a delayed strobe signal, for detecting and storing in fine quanta of time D(f) a representation of the logic level of said first signal at the time of application of said delayed strobe signal to said second time trap circuit; and
(c) nulling means, responsive to said representation of the logic level of said first signal at the time of a logic level transition of said second signal, for applying said delayed strobe signal to said second time trap circuit within a predetermined period of time following the application of said first signal to said second time trap circuit, said predetermined period of time comprising two course quanta of time D(c).

5,204,679
DIFFERENTIAL ANALOG-DIGITAL CONVERTER
Hermann Jessner; Bernhard Zojer, both of Villach, and Berthold Astegher, Klagenfurt, all of Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation-in-part of PCT/DE91/00116, Feb. 14, 1991. This application Aug. 14, 1992, Ser. No. 929,974
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1990, 4004546
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 **6 Claims**



1. An analog-digital converter, comprising:
first and second reference voltage generators each including a series circuit of resistors, each of said reference voltage generators having a circuit node for preparing a lowest reference level, a circuit node for preparing a highest reference level, a circuit node for preparing a second lowest reference level, and a circuit node for preparing a second highest reference level,
first, second, at least one further and last comparators each preparing an output signal as a function of an associated reference voltage and of an analog signal to be converted, said comparators each having two mutually balanced inputs,
one input of said first comparator being connected to the circuit node of said second reference voltage generator for preparing the lowest reference level, and the other input of said first comparator being connected to the circuit node of said first reference voltage generator for preparing the highest reference level,
one input of said second comparator being connected to the circuit node of said second reference voltage generator for preparing the second lowest reference level, and the other input of said second comparator being connected to the circuit node of said first reference voltage generator for preparing the second highest reference level,
said at least one further comparator being connected to the circuit node of said second reference voltage generator for preparing the second highest reference level, and the other input of said at least one further comparator being connected to the circuit node of said first reference voltage generator for preparing the second lowest reference level,
one input of said last comparator being connected to the circuit node of said second reference voltage generator for preparing the highest reference level, and the other input of said last comparator being connected to the circuit node of said first reference voltage generator for preparing the lowest reference level,
whereby the circuit nodes of said first and second reference voltage generators are unambiguously allocated to specific inputs of said comparators,
a differential amplifier circuit having first and second transistors with control inputs, collector terminals and collector circuits, said first reference voltage generator being con-

nected in the collector circuit of said first transistor, and

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RADIO FREQUENCY AUTOMATIC IDENTIFICATION

said first and second directions respectively, and digital data processing means including a spectrum analyser for determin-

comparator means for receiving said MSB and providing a telemetry signal corresponding thereto; and

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nected in the collector circuit of said first transistor, and said second reference voltage generator being connected in the collector circuit of said second transistor,

said series circuit of resistors of said first reference voltage generator having one terminal connected to the collector terminal of said first transistor and another terminal connected to a supply potential, and said series circuit of resistors of said second reference voltage generator having one terminal connected to the collector terminal of said second transistor and another terminal connected to the supply potential, and

the control input of said first transistor and the control input of said second transistor forming a balanced signal input to which push-pull signals are to be applied.

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RADAR REFLECTING TARGET FOR REDUCING RADAR CROSS-SECTION

Marcus L. Allington, Peter W. East, both of Surrey, United Kingdom, assignors to Racal Defence Electronics (Radar) Limited, Surrey, United Kingdom

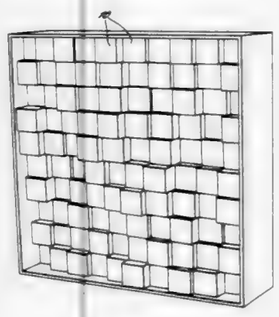
PCT No. PCT/GB90/00647, § 371 Date Oct. 24, 1991, § 102(e) Date Oct. 24, 1991, PCT Pub. No. WO90/13926, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 26, 1990, Ser. No. 775,950

Claims priority, application United Kingdom, Apr. 28, 1989, 8909768

Int. Cl.[5] H01Q *15/14, 17/00*

U.S. Cl. 342—4 **10 Claims**



1. A radar reflecting target comprising a plurality of planar and mutually parallel reflecting elements spread along at least one linear physical dimension of the target, the elements being randomly or pseudo-randomly spaced in the direction normal to said dimension so that respective retro-reflections by the elements of radio frequency energy from a remote source on a line sight at an angle to said dimension, have differing phases and tend to cancel each other out, the elements being randomly or pseudo-randomly spaced in said normal direction over at least one half wavelength of an expected radio frequency energy from the remote source.

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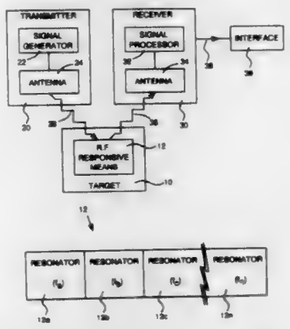
RADIO FREQUENCY AUTOMATIC IDENTIFICATION SYSTEM

Morton Greene, Arlington, Va., assignor to Gordian Holding Corporation, Dover, Del.

Filed Sep. 24, 1991, Ser. No. 765,925

Int. Cl.[5] G01S *13/80*

U.S. Cl. 342—51 **17 Claims**



1. A target for use in an automatic identification system comprising a plurality of independent solid bulk resonators, the resonators in said target resonating at a plurality of radio frequencies.

5,204,682

DOPPLER RADAR SPEED SENSOR

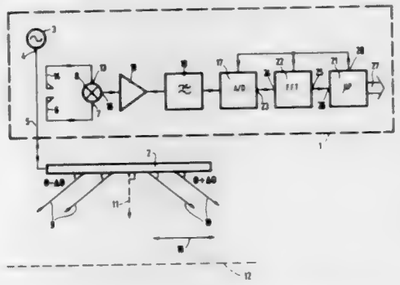
Patrick D. L. Beasley, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1992, Ser. No. 834,071

Claims priority, application United Kingdom, Mar. 22, 1991, 9106110

Int. Cl.[5] G01S *13/60, 13/62*

U.S. Cl. 342—117 **8 Claims**



1. A Doppler radar speed sensor for a land vehicle, comprising a radar transmitter/receiver circuit coupled to a transmit/-receive aerial system for transmitting from said aerial system first and second beams of radio signals, derived from a common source, in first and second directions respectively both of which intersect the ground, and for processing reflected said radio signals received by said aerial system from said first and second directions to obtain information about the speed of said aerial system in a third direction which is parallel to the ground, said first and second directions making acute and obtuse angles respectively with a given sense of said third direction, said circuit comprising a mixer arrangement for mixing the received signals with a reference signal derived from said common source to produce a beat signal having a pair of Doppler frequency components the frequencies of which are representative of the speeds of said aerial system in said first and second directions respectively, and digital data processing means including a spectrum analyser for determining the speed of the aerial system in said third direction from the spectrum of said beat signal, wherein the sum of said acute and obtuse angles is different from 180° and said mixer arrangement is a single-phase mixer arrangement.

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RADAR RECEIVER FOR A RADAR HAVING A DIGITAL BEAM FORMING ANTENNA

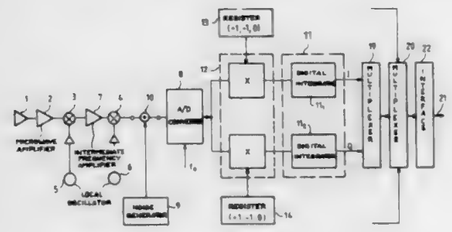
Gérard Auvray, Longpont sur Orge, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 300,650, Jan. 17, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 728,327

Claims priority, application France, Jan. 22, 1988, 88 00681

Int. Cl.[5] G01S *13/00*

U.S. Cl. 342—150 **10 Claims**



1. A radar receiver comprising:

a digital beam forming antenna including a plurality of elemental receivers, each of the elemental receivers comprising:

a microwave amplifier receiving from an antenna element a received signal;

a local oscillator;

a mixer circuit connected to receive a signal from said microwave amplifier and a signal from said local oscillator converting said signal from said microwave amplifier into an intermediate frequency signal;

an analog-to-digital converter for receiving said intermediate frequency signal, said analog-to-digital converter producing a digital signal from over sampling said intermediate frequency signal at a sampling rate much higher than said intermediate frequency signal frequency; and,

means for forming two channels of quadrature related signals from said digital signal and for subsequently demodulating said quadrature signals.

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DEVICE FOR DIGITAL TELEMETRY AND A RADAR SYSTEM INCORPORATING SUCH A DEVICE

Yves Caudroy, Plessis Robinson, France, assignor to Thomson - CSF, Paris, France

Filed Oct. 3, 1984, Ser. No. 700,941

Claims priority, application France, Oct. 7, 1983, 83 16029

Int. Cl.[5] G01S *7/22*

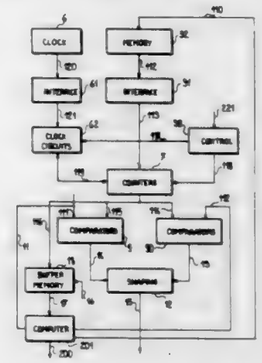
U.S. Cl. 342—182 **14 Claims**

1. A digital telemetry device, comprising:

clock means for providing a clock signal;

counting means, synchronized by said clock signal, for providing a count signal including most significant bits (MSB) and least significant bits (LSB);

comparator means for receiving said MSB and providing a telemetry signal corresponding thereto; and



ranging means adapted for receiving a target echo detection signal and said LSB, and for providing a range signal corresponding to a range to the target.

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ARC RANGE TEST FACILITY

Peter R. Franchi, Winchester, and Harvey E. Tobin, Brookline, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 1, 1992, Ser. No. 907,251

Int. Cl.[5] H01Q *3/00*

U.S. Cl. 342—360 **8 Claims**

1. A process for measuring a phased array antenna's far field antenna pattern which is exhibited as electromagnetic power measured in watts per square centimeter by a beam emitted by the phased array antenna wherein said phased array antenna has an antenna center, said process comprising the steps of:

focusing the beam onto a probe antenna which measures the beam, said probe antenna being positioned at a distance R, where R is a distance between said probe antenna and the antenna center of the phased array antenna given by

$$\frac{R}{\lambda} = \left(\frac{D}{\lambda}\right)^{3/2}$$

where:

is measure of the phased array antenna's aperture and λ is a measure of operational wavelength of the beam;

measuring the electromagnetic power of the beam with the probe antenna to identify a pattern of electromagnetic power emitted there from;

moving the probe antenna to different positions that are on a focal arc of the phased array antenna; and

repeating the focusing, measuring and moving steps.

whereby each of said RF sources provides an RF signal to

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OMNIDIRECTIONAL ANTENNA NOTABLY FOR THE

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INK JET RECORDING HEAD FORMED BY CUTTING

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repeating the focusing, measuring and moving steps.

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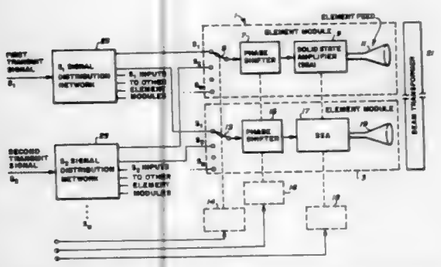
RF FEED ARRAY

Peter G. Petrelis, Huntington Beach, and William C. Wong, Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 6, 1988, Ser. No. 178,689
Int. Cl.[5] H01Q *3/02, 3/22*
U.S. Cl. 342—374 **6 Claims**



1. In a downlink communication system for propagating RF signals within a predetermined frequency range of f1 through fn, the combination comprising:

electronically steerable phased array directional antenna means for radiating RF energy in selected directions; said antenna means containing a plurality of feeder antennas of substantially identical geometry that are spatially arranged into an array; said plurality having the capability of being assigned into a number of groups with each such group of feeder antennas comprising at least two feeder antennas and with each such group of feeder antennas having the capability of radiating a steerable beam of RF energy in selected directions independent of the other groups; and each said feeder antenna in said plurality of being capable of transmitting energy within said predetermined frequency range;

input means for inputting RF signals from an RF signal source means for providing RF carrier signals of at least N carrier frequencies, said RF source means comprising a plurality of N RF signal sources of discrete frequencies within said predetermined frequency range f1 through fn, where N is a positive number greater than the number one, including:

first signal source means of frequency f1 for providing RF output at frequency f1;

second signal source means of frequency fn—1 for providing RF output at frequency f2;

N—1th signal source means of frequency fn—1 for providing RF output at frequency fn—1; and

Nth signal source means of frequency fn for providing RF output at frequency fn;

a plurality of solid state RF amplifier means, said plurality being at least as great in number as the number of said feeder antennas; and each of said feeder antennas having associated therewith a corresponding one of said solid state RF amplifier means, with the output of the associated RF amplifier means being coupled to the input of the associated one of said feeder antennas;

a plurality of phase shifter means with each of said phase shifter means having an input for receiving RF and an output coupled to an associated one of said plurality of solid state RF amplifier means for controlling the phase of signals applied to an input of said respective amplifier means;

switching means for individually selectively connecting at least two of said plurality of RF sources to a selected plurality of different ones of said phase shifter means, whereby each of said RF sources provides an RF signal to a number of phase shifter means and thereby defines corresponding groups of antenna means from said plurality of antenna means, said groups corresponding in number to the number of said selectively connected RF sources for producing multiple steered RF beams of different frequency and whereby the RF power radiated at the particular frequencies of said connected ones of said plurality of RF signal sources may be changed; each one of said feeder antennas in said plurality being coupled in circuit through said associated amplifier means and phase shifter means to a single one of said connected ones of said plurality of RF signal sources at a given time.

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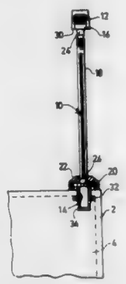
ELECTRICAL DEVICE AND ELECTRICAL TRANSMITTER-RECEIVER PARTICULARLY USEFUL IN A CT2 CORDLESS TELEPHONE

Michael Elliott, Tiberias, and Matti Martiskainen, Lower Galilee, both of Israel, assignors to Galtronics Ltd., Tiberias, Israel

Filed Jul. 19, 1990, Ser. No. 554,492
Int. Cl.[5] H01Q *1/24*
U.S. Cl. 343—702 **20 Claims**



1. An electrical device, comprising:

a housing enclosing electrical circuitry of the electrical device;

an antenna rod carried by said housing for use in long-range operation of the device and pretuned to a predetermined frequency;

an antenna coil carried by one end of said antenna rod for use in short-range operation of the device and pretuned to the same predetermined frequency;

said antenna rod being movably mounted through an opening in the housing to a retracted position wherein substantially only the antenna coil is disposed externally of the housing, or to an extended position wherein substantially the complete antenna rod and the antenna coil are disposed externally of the housing;

an electrical switching means effective when the antenna rod is in its retracted position to connect the antenna coil to said electrical circuit and thereby to condition the device for short-range operation, and when the antenna rod is in its extended position to connect the antenna rod to said electrical circuit, to disconnect the antenna coil therefrom, and thereby to condition the device for long-range operation.

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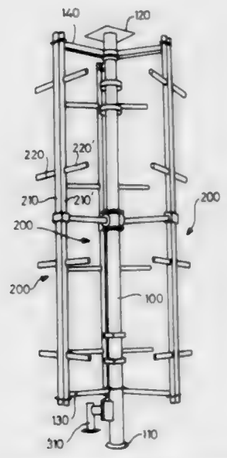
OMNIDIRECTIONAL ANTENNA NOTABLY FOR THE EMISSION OF RADIO OR TELEVISION BROADCASTING SIGNALS IN THE DECIMETRIC WAVEBAND, AND RADIATING SYSTEM FORMED BY A GROUPING OF THESE ANTENNAS

Maurice Loiseau, Courbevoie, and Guy Bastard, Garches, both of France, assignors to Thomson-LGT Laboratoire General des Telecommunications, Conflas Ste Honorine, France

Continuation of Ser. No. 381,787, Jul. 19, 1989, abandoned. This application May 17, 1991, Ser. No. 703,055
Claims priority, application France, Jul. 22, 1988, 88 09940
Int. Cl.[5] H01Q *21/12*
U.S. Cl. 343—800 **12 Claims**



1. An omnidirectional antenna, for the emission of television or radio broadcast signals in the decimetric waveband, comprising:

a vertical central supporting tube;

a plurality of horizontal tubes symmetrically mounted at mid-height of said vertical central supporting tube, each horizontal tube having an inner end connected to said vertical central supporting tube;

a plurality of vertical bifilary lines, each bifilary line having two ends, each bifilary line comprising two parallel lines, each bifilary line connected to and supported by an outer end of one of the horizontal tubes;

a plurality of dipoles evenly distributed along the length of each bifilary line;

a first means for transporting signals to be broadcast up through the center of the vertical central supporting tube;

a second means for transporting and symmetrically distributing said signals to be broadcast from the center of the vertical central supporting tube to the vertical bifilary lines, coupled to the first means for transporting, passing through the horizontal tubes and coupled to the vertical bifilary lines; and

wherein each vertical bifilary line and dipoles connected thereto define a radiating network; and

wherein the second means comprises a coaxial line disposed inside one of the parallel lines of a corresponding bifilary line of the plurality of bifilary lines, said coaxial line electrically connects to the corresponding bifilary line at locations halfway between the center and the two ends of the corresponding bifilary line to provide signals to the corresponding bifilary line.

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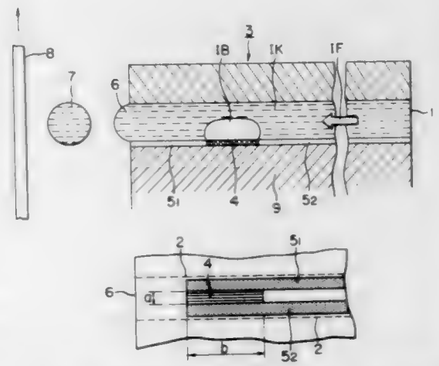
INK JET RECORDING HEAD FORMED BY CUTTING PROCESS

Yoshiaki Shirato, Yokohama; Yasushi Takatori, Sagamihara; Toshitami Hara, Tokyo; Yukuo Nishimura, Sagamihara, and Michiko Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 632,610, Dec. 27, 1990, abandoned, which is a continuation of Ser. No. 403,860, Sep. 1, 1989, abandoned, which is a continuation of Ser. No. 188,071, Apr. 28, 1988, abandoned, which is a continuation of Ser. No. 13,172, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 846,472, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 750,985, Jul. 1, 1985, abandoned, which is a continuation of Ser. No. 639,531, Aug. 9, 1984, abandoned, which is a continuation of Ser. No. 543,224, Oct. 20, 1983, abandoned, which is a continuation of Ser. No. 362,579, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 132,774, Mar. 24, 1980, abandoned. This application Jun. 5, 1991, Ser. No. 711,418
Claims priority, application Japan, Apr. 2, 1979, 54-39478
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—1.1 **50 Claims**



1. A droplet forming apparatus for high speed recording, comprising:

means for generating a high frequency driving signal;

a recording head having a passageway for a liquid with an opening for discharging liquid from said passageway, said opening having a maximum diameter d; and

bubble generating means, formed on a substrate and positioned in said passageway, for sequentially generating a bubble in the liquid in response to the high frequency signal, with the generation and disappearance of the bubble causing the liquid to be discharged through said opening, said bubble generating means having an edge closest to said opening which is spaced from said opening by a predetermined distance D in the range of d to 50d, wherein the relationship of said maximum diameter d and said predetermined distance D produces a bubble of such a size as to generate in the liquid a pressure to cause droplets to be discharged from said opening without the bubble communicating with the atmosphere outside said passageway and said predetermined distance D and the frequency of the driving signal are preselected so as to discharge droplets at a speed of 1.3 m/sec. or greater, wherein said predetermined distance D is formed by cutting and removing a portion of the substrate between the bubble generating means and an edge of the substrate corresponding to said opening.

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ing elements through the addressing electrodes to produce

recording means for effecting energization in plural blocks for acting on said ink sheet thereby recording the image

to the grating at an angle α measured normal to the grating, said grating diffracting said output beam of radiation

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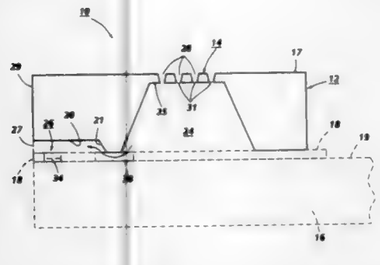
INK JET PRINTHEAD HAVING INTERGRAL SILICON FILTER

Robert V. Lorenze, Jr., Webster, and James F. O'Neill, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1991, Ser. No. 724,297
Int. Cl.[5] B41J *2/05*; C03C *15/00, 25/06*
U.S. Cl. 346—1.1 10 Claims



1. An ink jet printhead having an ink inlet with an integral filter to prevent contaminates from entering the printhead either during subsequent fabrication steps or during a printing mode by contaminates entrained in an ink to be used by the printhead comprising:

each having an opposing first surface and second opposing surface, said second substrate being silicon;

the first surface of the first substrate having a linear array of heating elements and associated addressing electrodes formed thereon;

the first surface of the second substrate having an ink reservoir recess with a bottom floor having a thickness of about 5 to 100 μm and having a parallel set of elongated grooves, the grooves having opposing ends, one end being open and the other end being adjacent the reservoir recess, the reservoir recess and the grooves being etched through a patterned layer of first etch resistant material on said first surface of the second substrate, while the second surface thereof is concurrently being prevented from being etched by a layer of first etch resistant material, the reservoir recess floor having a plurality of openings therein for use as an inlet with an integral filter, the plurality of openings in the reservoir recess floor each being less in size than the groove open ends and being produced by etching through a subsequently applied and patterned layer of second etch resistant material on the second surface of the second substrate, while the reservoir recess and set of elongated grooves are prevented from being etched by a layer of second etch resistant material;

the first surface of the first substrate having the heating elements and addressing electrodes being aligned and bonded to the first surface of the second substrate having the reservoir recess and set of grooves, so that each groove serves as an ink channel and has one of the heating elements therein spaced a predetermined distance from the groove open ends, so that the grooves serve as ink channels and the groove open ends serve as droplet emitting nozzles, and the reservoir recess serves as a reservoir for ink from which the channels are filled;

means for placing the grooves into communication with the reservoir recess;

means for providing ink at a predetermined pressure to the reservoir inlet with the integral filter, so that ink travels through the integral filter and is filtered thereby as said ink flows into the reservoir and then into the channels, a meniscus being formed at the nozzles, which, in combination with the predetermined pressure of the ink, prevents ink from weeping therefrom; and

means for selectively applying electrical pulses to the heating elements through the addressing electrodes to produce momentary vapor bubbles in the ink in contact with the heating elements which eject ink droplets from the nozzles.

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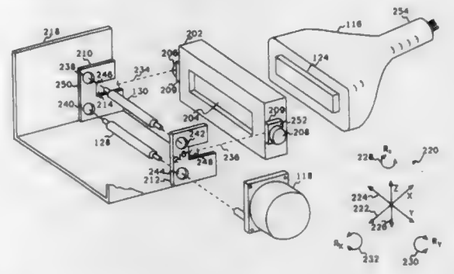
CATHODE RAY TUBE MOUNTING APPARATUS

Herbert F. Sanford, Littleton, Colo., assignor to Alliant Techsystems, Inc., Littleton, Colo.

Filed Mar. 27, 1991, Ser. No. 675,667
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—1.1 9 Claims



7. A method for precisely mounting a CRT to a transport, said apparatus comprising:

(a) fixing at least two alignment pins to the CRT;

(b) aligning said pins to a display area of the CRT;

(c) fixing alignment bracket means to the transport;

(d) forming a slot in said alignment bracket means;

(e) aligning said slot to media rollers connected to the transport; and

(f) placing said pins in said slot.

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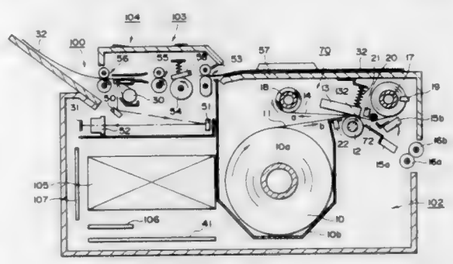
THERMAL TRANSFER RECORDING APPARATUS WITH THE INK SHEET CONVEYED, BEFORE RECORDING, IN A DIFFERENT DIRECTION AND BY A FRACTIONAL AMOUNT RELATIVE TO THAT BY WHICH THE RECORDING MEDIUM IS CONVEYED

Takashi Awai; Minoru Yokoyama, both of Yokohama; Yasushi Ishida, Tokyo; Akihiro Tomoda; Hisao Terajima, both of Yokohama; Takehiro Yoshida, Tokyo; Satoshi Wada, Kawasaki; Takeshi Ono, Yokohama, and Makoto Kobayashi, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 409,790
Claims priority, application Japan, Sep. 22, 1988, 63-236366
Int. Cl.[5] B41J *2/325, 33/36, 15/00*; H04N *1/23*
U.S. Cl. 346—76 PH 7 Claims



1. A thermal transfer recording apparatus for transferring ink of an ink sheet to a recording medium thereby recording an image thereon, comprising:

recording means for effecting energization in plural blocks for acting on said ink sheet thereby recording the image on said recording medium; and

transport means for transporting said recording medium and said ink sheet in different directions at a recording area and in such a manner as to generate a relative speed therebetween, said ink sheet only being conveyed before recording,

wherein said recording means energizes a thermal head in a divided manner in m blocks, and said transport means is adapted to transport said recording medium and/or said ink sheet respectively by $-1/m$ and $1/(m \times n)$ $(m, n > 1)$ of a predetermined length in response to a timing of said energization, so that said recording medium is conveyed by a first amount and said ink sheet being conveyed by a second amount which is a fraction of said first amount.

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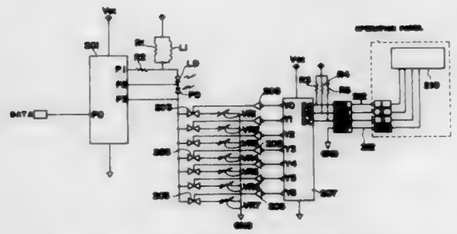
IMAGE RECORDING APPARATUS

Mitsutoshi Yagoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 26, 1991, Ser. No. 661,692
Claims priority, application Japan, Mar. 3, 1990, 2-51975
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 16 Claims



1. An image recording apparatus comprising:

a light-emitting element for emitting light;

a drive means for supplying drive power to the light-emitting element;

a monitor circuit for monitoring output of the light-emitting element and outputting the monitored results;

a control means for controlling the amount of the drive power supplied to the light-emitting element based on the output value of the monitor circuit;

a changing means connected to the monitor circuit and which changes the output value of the monitor circuit that is transmitted to the control means; and

a selection means to select the amount of change in the output value of the monitor circuit that is changed by the changing means, and which has a selection portion that is disposed on the exterior of the image recording apparatus and insulated from the monitor circuit.

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ROS PRINTER INCORPORATING A VARIABLE WAVELENGTH LASER

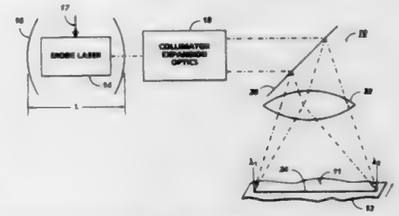
John R. Andrews, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1991, Ser. No. 737,113
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 4 Claims

1. A digital scanning laser printer for forming high resolution scan lines at a photosensitive image medium comprising:

a broad-band wavelength tunable laser source operational in a plurality of longitudinal modes to provide a beam of radiation whose wavelength varies incrementally over the tunable range,

a high resolution diffraction grating in the path of said output radiation beam, wherein the radiation beam is incident to the grating at an angle α measured normal to the grating, said grating diffracting said output beam of radiation through an angle β the magnitude of β being determined by the wavelength of said beam of radiation, to produce an output beam which scans across a diffraction angle, and



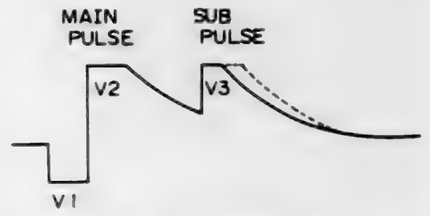
a scan lens positioned between the photosensitive imaging medium and the grating, said scan lens focusing the diffracted beam onto the image medium as a linearized scan line comprising a plurality of neighboring pixels with uniform inter-pixel spacing corrected for distortion and spot size variations.

5,204,695

INK JET RECORDING APPARATUS UTILIZING MEANS FOR SUPPLYING A PLURALITY OF SIGNALS TO AN ELECTROMECHANICAL CONVERSION ELEMENT

Tatsuyuki Tokunaga; Jiro Moriyama; Makoto Aoki, all of Yokohama, and Ikumasa Ikeda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 652,370, Feb. 7, 1991, abandoned, which is a continuation of Ser. No. 501,435, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 182,226, Apr. 15, 1988, abandoned. This application Jul. 19, 1991, Ser. No. 733,013
Claims priority, application Japan, Apr. 17, 1987, 62-94566; Dec. 17, 1987, 62-319695
Int. Cl.[5] B41J *2/045*
U.S. Cl. 346—140 R 3 Claims



1. An ink jet recording apparatus comprising:

a recording head including a liquid path and a discharge port for discharging ink therethrough;

an electromechanical conversion element associated with said liquid path for effecting ink discharge by deforming in a predetermined direction; and

control means for controlling said element by performing a first step of supplying a pre-discharge electrical signal to deform said element in a direction opposite said predetermined direction, a second step, performed after said first step, of supplying a main electrical signal having a first voltage to deform said element in the predetermined direction in accordance with a recording signal, and a third step, performed after ink is discharged by said second step, of supplying a subsequent electrical signal having a second voltage not greater than the voltage of the main electrical signal to deform said element in the predetermined direction to inhibit meniscus retraction, the subsequent electri-

cal signal being supplied before the voltage of the main

relatively low, net image potential of about 50 volts be-

5,204,699

APPARATUS FOR ESTIMATING TONER USAGE

relationship to include a bridge web securing the first lens support ring relative to the second lens support ring, the

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cal signal being supplied before the voltage of the main electrical signal returns to zero,

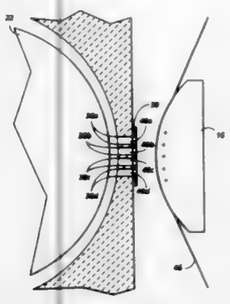
wherein the subsequent electrical signal smoothly changes and quickly attenuates vibration of the meniscus caused by deformation of said element by the main electrical signal and said control means controls the voltage of the subsequent electrical signal by varying a ratio between the voltage of the subsequent electrical signal and the voltage of the main electrical signal when the main electrical signal varies to control the recording quality.

5,204,696

CERAMIC PRINTHEAD FOR DIRECT ELECTROSTATIC PRINTING

Fred Schmidlin, Pittsford, and Heiko Rommelmann, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1991, Ser. No. 807,549
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 **11 Claims**



1. A printhead for electrostatic printing, comprising:

a membrane, made of a non-crystalline ceramic material, defining a first surface and a second surface, and defining a plurality of apertures therein;

a donor member, adapted to convey toner particles to the plurality of apertures in the membrane;

a plurality of addressable segmented electrodes, each disposed on the first surface of the membrane around substantially a periphery of an aperture on the first surface, each segment of the addressable segmented electrodes being isolated from each other segment; and

a conductive layer, disposed on the second surface of the membrane around substantially a periphery of at least one aperture on the second surface, one of said first or second surface of the membrane faces said donor member and is shaped to substantially conform to the shape of the donor member.

5,204,697

IONOGRAPHIC FUNCTIONAL COLOR PRINTER BASED ON TRAVELING CLOUD DEVELOPMENT

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

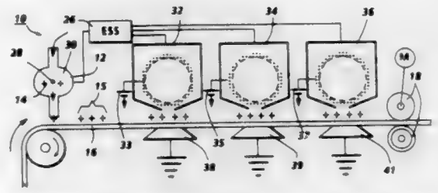
Filed Sep. 4, 1990, Ser. No. 576,877
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—159 **6 Claims**

1. A method of printing color images using relatively low image potentials, said method including the steps of:

using ionographic imaging structure, forming a relatively low voltage, latent image on an image receiver, said relatively low voltage being about 350 volts;

passing said latent electrostatic image past means for developing said latent electrostatic image with toner; and

electrically biasing said developing means for establishing a relatively low, net image potential of about 50 volts between said developing means and said latent image for



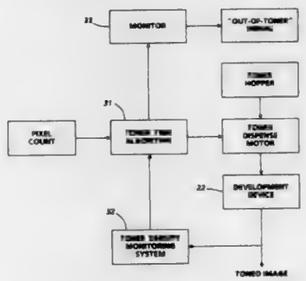
effecting toner deposition on said latent image from said developing means.

5,204,698

TONER MONITORING IN AN ELECTROSTATOGRAPHIC DIGITAL PRINTING MACHINE

Eric J. LeSueur, Wembley, and Krzysztof J. Less, London, both of United Kingdom, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1992, Ser. No. 936,704
Claims priority, application United Kingdom, Sep. 11, 1991, 9119484
Int. Cl.[5] G03G *15/06, 15/08*
U.S. Cl. 346—160 **5 Claims**



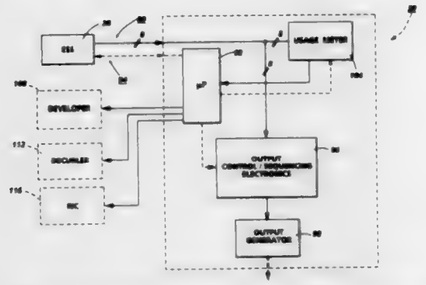
1. An electrostatographic printing/digital copying machine comprising a circulating imaging member; a printing head operable, in accordance with image signals, to generate a latent image on the imaging member; a developer device operable to develop the latent image with toner, and means for dispensing toner to said developer device from a toner supply; means for assessing the extent of the toned area in an image to be printed and for operating the dispensing means in accordance with that assessment, wherein there is a pre-established relationship between said assessment and the length of time for which said toner dispensing means is in operation; means for monitoring the toner density of developed images and arranged to adjust said pre-established relationship in dependence on the monitored toner density, and means for monitoring said adjustment and, in response to a predetermined said adjustment point, indicating that said toner supply is depleted and requires replenishment.

5,204,699

APPARATUS FOR ESTIMATING TONER USAGE

David Birnbaum, Pittsford; Steven M. Palermo, and Douglas A. Ross, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 14, 1992, Ser. No. 944,623
Int. Cl.[5] G01D *15/14;* **G03G** *15/06, 15/04*
U.S. Cl. 346—160 **21 Claims**



1. An apparatus for estimating the mass of toner developed on an electrostatic latent image, comprising:

converting means for generating a toner mass signal approximating a toner mass developed by a latent output pixel of the latent image as a function of a greyscale image intensity signal used to control the formation of the latent output pixel; and

summing means, responsive to the toner mass signal, for determining a sum of the approximated toner mass for a plurality of output pixels and thereby producing a sum signal.

5,204,700

DIVING MASK HAVING DISTORTIONLESS PERIPHERAL VISION

Salvatore N. Sansalone, 12 Paradise Gardens, Bramalea, Ontario, Canada L6S 5C7

Continuation-in-part of Ser. No. 276,470, Nov. 25, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 606,457
Int. Cl.[5] G02C *1/00*
U.S. Cl. 351—43 **27 Claims**

1. An underwater vision device comprising:

a) a supporting member arranged for sealing engagement with the face of the user; and

b) a lens means mounted in said supporting member, said lens means being curved, a portion thereof being formed from a surface created by rotating an ellipse about one of its axes.

5,204,701

EYEGLASS ASSEMBLY MOUNTING A TISSUE ROLL

James R. Chapman, Sr., 67 Crest Dr., Angleton, Tex. 77515

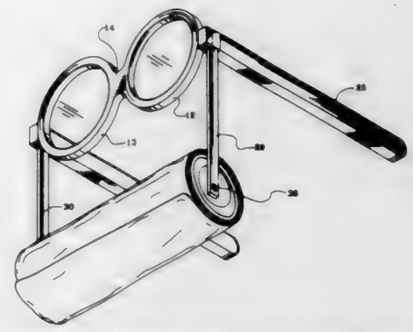
Filed Dec. 30, 1991, Ser. No. 814,588
Int. Cl.[5] G02C *5/14*
U.S. Cl. 351—121 **2 Claims**

1. A novelty apparatus, comprising in combination,

an eyeglass frame, the eyeglass frame including a first lens support ring positioned adjacent a second lens support rings, wherein the first lens support ring and the second lens support ring are arranged in substantially coplanar relationship to include a bridge web securing the first lens support ring relative to the second lens support ring, the first lens support ring includes a first support ring flange, and the second lens support ring includes a second support ring flange, with the first support ring flange positioned at a first distal end of the eyeglass frame and the second support ring flange positioned adjacent a second distal end of the eyeglass frame, and

the first support ring flange includes a first temple leg mounted thereto, the second support ring flange includes a second temple leg mounted thereto, and

the first temple leg includes a first support post orthogonally mounted to the first support ring flange adjacent the first temple leg, and the second support ring flange includes a



second support post orthogonally mounted to the second support ring flange adjacent to and orthogonally oriented relative to the second temple leg, wherein the first support post and the second support post are arranged in a parallel coextensive relationship relative to one another, with the first support post including a first support post bore, the second support post including a second support post bore, wherein the first support post bore and the second support post bore are coaxially aligned, and support roll rotatably mounted between the first support post and the second support post, with the support roll including a first axle directed through the first support post bore, and the support roll including a second axle directed through the second support post bore, and a tissue paper web wound about the support roll spaced from the eyeglass frame.

5,204,702

APPARATUS AND PROCESS FOR RELIEVING EYE STRAIN FROM VIDEO DISPLAY TERMINALS

Allan W. Shapiro, Oakland, Calif., assignor to RAMB, Inc., Burlingame, Calif.

Filed Apr. 15, 1991, Ser. No. 685,344
Int. Cl.[5] G02C *7/02*
U.S. Cl. 351—175 **8 Claims**

8. In a process of refracting a patient for viewing of a video display terminal having the steps of:

refracting said patient to determine sphere, cylinder, and prism for view of said video display terminal at said viewing distance; and,

determining an eye glass prescription for two eye glass lenses for said patient at said viewing distance wherein said patient when wearing said eye glasses has prescribed power of accommodation and power of convergence in prism to keep said terminal in focus;

the improvement to said process of prescription including the steps of:

providing to each lens of said patient base in prism sufficient to enable said patient to gaze with relaxed eye convergence at said video display terminal; and,

providing to each lens of said patient eye glasses sphere of at

least one diopter or more sufficient to relax said patient

between energy pulses applied to heating elements of the head and actual density printed by the energy pulses in a

a manner that the size of the mask aperture is decreased

selecting means, for coding said film when said pseudo format

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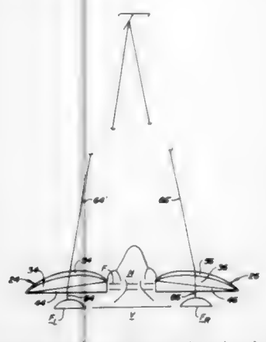
least one diopter or more sufficient to relax said patient power of accommodation;



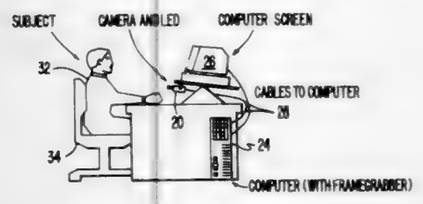
wherein said power of convergence in prism is no more than four times the power of said accommodation.

5,204,703

EYE MOVEMENT AND PUPIL DIAMETER APPARATUS AND METHOD

Thomas E. Hutchinson, Hardendale; Kevin S. Spetz, Lynchburg, and Nirav R. Desai, Richmond, all of Va., assignors to The Center for Innovative Technology, Herndon, Va.

Filed Jun. 11, 1991, Ser. No. 713,969
Int. Cl.[5] A61B *3/14, 3/00*
U.S. Cl. 351—210 **20 Claims**



1. An apparatus for testing the eye response of a subject to test stimuli comprising:
a presentation device for presenting an image to a subject as a test stimuli;
an eye-look detector for detecting a series of lookpoints of the parts of said image being viewed by said subject; and
a computer including a storage device for recording said lookpoints and a program having a means for determining said lookpoints, a means for correlating said lookpoints to locations on said image, and a means for superimposing said lookpoints on said image for review.

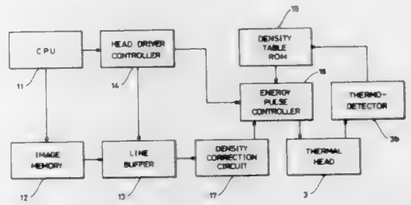
5,204,704

THERMAL TRANSFER PRINTER AND METHOD OF CONTROLLING PRINT DENSITY IN THERMAL TRANSFER PRINTING USING THE SAME

Hirokazu Genno; Yoshio Ozawa, both of Hirakata, and Yoshihisa Fujiwara, Kadoma, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 6, 1991, Ser. No. 695,923
Claims priority, application Japan, May 11, 1990, 2-121988
Int. Cl.[5] B41J *2/32*
U.S. Cl. 346—76 PH **4 Claims**

1. A method of controlling printed density in thermal transfer printing using a thermal printer head with heating elements and a temperature detector, comprising the steps of:
preparing in advance a density table representing a relation between energy pulses applied to heating elements of the head and actual density printed by the energy pulses in a state in which there is no temperature gradient between said heating elements and said temperature detector for various uniform temperatures of the thermal head, and storing the table in a memory;
calculating density correcting amount for printing by using said table; and



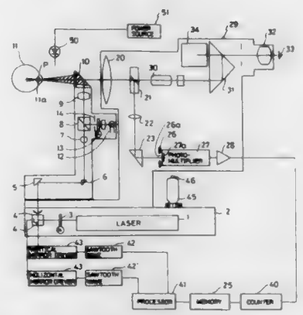
applying pulse energy to said heating elements, which pulse energy is provided by subtracting energy corresponding to said density correcting amount from pulse energy corresponding to a prescribed printed density calculated from said density table corresponding to the temperature measured by the temperature detector, whereby desired printed density can be accurately provided.

5,204,705

OPHTHALMIC MEASUREMENT APPARATUS

Koichi Akiyama, Choufu, and Masunori Kawamura, Aichi, both of Japan, assignors to Kowa Company Ltd., Japan

Filed Jul. 16, 1991, Ser. No. 731,740
Claims priority, application Japan, Jul. 23, 1990, 1-193046
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—221 **9 Claims**



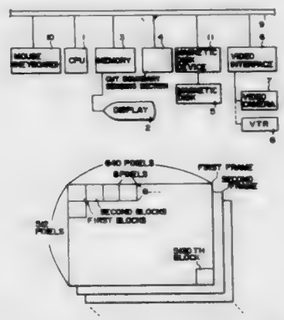
1. An ophthalmic measurement apparatus in which ophthalmic measurement is performed by projecting a laser beam into an eye and detecting light scattered by floating cells in the eye, comprising:
a laser beam projection section for converging a laser beam from a laser source to a predetermined point in the eye;
a light receiving section having a photosensor for detecting scattered laser light from within the eye and producing corresponding output signals;
a mask for defining a field of view that is arranged in front of the photosensor;
means for adjusting the aperture area of the mask;
processing means for performing prescribed processing of signals from the photosensor for counting floating cells;
means for scanning the laser beam horizontally and vertically; and
control means for changing the size of the mask aperture depending on the counted number of floating cells in such a manner that the size of the mask aperture is decreased when there are relatively many cells in the eye and increased when there are relatively few cells in the eye.

5,204,706

MOVING PICTURE MANAGING DEVICE

Akira Saito, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 26, 1991, Ser. No. 797,951
Claims priority, application Japan, Nov. 30, 1990, 2-340316
Int. Cl.[5] G03B *21/00*
U.S. Cl. 352—129 **10 Claims**



1. A moving picture managing device comprising:
input means for inputting a moving picture, said moving picture comprising a plurality of scenes, each scene comprising a plurality of cuts, each cut comprising a plurality of frames, and each frame comprising a plurality of blocks, each of said frames having a code associated therewith;
means for detecting an amount of change in said moving picture by comparing information representative of differences between corresponding blocks in consecutive frames with a reference amount and for outputting a first determination signal when said amount of change is larger than said reference amount and a second determination signal when said amount of change is smaller than said reference amount;
encoding means for encoding information representing a frame responsive to said first determination signal to produce first encoded information and for encoding information based on consecutive frames in said plurality of frames responsive to said second determination signal to produce second encoded information;
means for determining boundaries between adjacent cuts in said plurality of cuts responsive to a sequence of said first and second determination signals; and
storage means for storing said first and second encoded information and for storing said boundaries determined by said determining means.

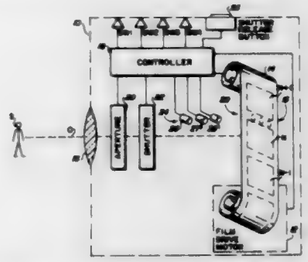
5,204,707

MULTIPLE MODE PRINTS FROM TELE/PAN CAMERA

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1990, Ser. No. 590,241
Int. Cl.[5] G03B *3/00, 27/46*
U.S. Cl. 354—75 **17 Claims**

1. A photographic camera having a shutter release mechanism; an objective leans with an actual field of view; means, responsive to activation of said shutter release mechanism, for exposing a film frame through said lens which frame, if fully printed during subsequent processing, will provide a normal print having a field of view corresponding to said actual field of view; means for selecting between a normal print setting and a pseudo format print setting; and means, responsive to said selecting means, for coding said film when said pseudo format print setting is selected to identify a portion less than all of said frame which, when said portion is printed during said subsequent processing, will provide a pseudo format print having a field of view different from said actual field of view; said camera being characterized in that:
said selecting means includes means for simultaneously selecting both said normal and pseudo format print settings;
said exposing means includes means, responsive to said simultaneously selecting means, for exposing first and second frames in rapid succession with a single activation of said shutter release mechanism when both of said print settings are selected; and
said coding means includes means, responsive to said simultaneously selecting means, for coding said film when both of said print settings are selected to identify said portion less than all of said frame for said first frame and all of said second frame, to provide said pseudo format print rom said first frame and said normal print from said second frame during said subsequent processing.

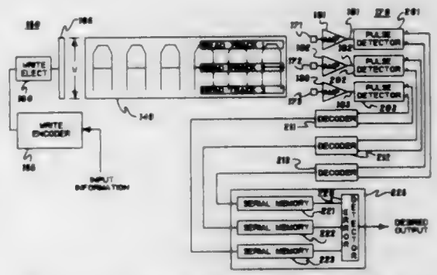


5,204,708

METHOD AND APPARATUS FOR MAGNETICALLY COMMUNICATING VIA A PHOTOGRAPHIC FILMSTRIP WITH ENHANCED RELIABILITY

Arthur A. Whitfield, Rochester, N.Y.; Michael L. Wash, Fort Collins, Colo.; Fernando G. Silva, and Paul L. Taillie, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1991, Ser. No. 811,390
Int. Cl.[5] G03B *17/24*
U.S. Cl. 354—105 **22 Claims**



1. Data readout and evaluation apparatus for use in transferring data from a first stage to a second stage of photographic filmstrip use and processing, the data being magnetically recorded in a longitudinally extending track in a film frame of the photographic filmstrip for data transfer, the data being susceptible to corruption error during data transfer, the apparatus comprising:
a plurality of laterally offset magnetic read heads associated with said track, the heads being positioned at said second

5,204,710

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stage in alignment with a nominal track path, at least one of said heads being aligned with the track of the filmstrip regardless of lateral excursion of the track from said nominal track path;

a plurality of data signal channels equal in number to the plurality of read heads, each channel being connected to a respective one of said read heads and providing a data signal representative of magnetic readout thereof; and

data evaluation means for receiving said data signals from said channels, examining the data content of said signals and determining therefrom whether an individual data signal contains data which has been transferred without corruption error.

5,204,709

CAMERA APPARATUS HAVING FUNCTION FOR CHANGING CONDITION OF RELEASE OPERATION

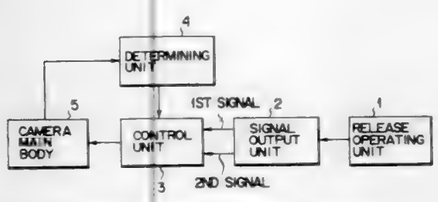
Tatsuya Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1991, Ser. No. 753,917

Claims priority, application Japan, Sep. 17, 1990, 2-243863; Sep. 17, 1990, 2-246439

Int. Cl.[5] G03B *17/38*

U.S. Cl. 354—266 **34 Claims**



1. A control apparatus for a camera, comprising:

a release operating member to be depressed by a predetermined amount, for causing a camera main body to perform a photographing operation;

signal generating means for generating a photographing ready signal when said release operating member is depressed by a first amount, a first photographing start signal when said release operating member is depressed up to a second amount exceeding the first amount, and a second photographing start signal when said release operating member is depressed up to a third amount exceeding the second amount;

measuring means including at least one of a photometering circuit and a distance measuring circuit for measuring a luminance of and a distance to an object to the photographed upon receiving the photograping ready signal from said signal generating means;

control means for enabling the first photographing start signal from said signal generating means in at least one of a case where the luminance of said object which is measured by said measuring means exceeds a predetermined value and a case where said camera is focusable on said object, and for disabling the first photographing start signal and enabling the second photographing start signal from said signal generating means in at least one of a case where the luminance of said object is less than or equal to the predetermined value and a case where said camera is not focusable on said object where said camera is not focusable on said object; and

exposing means for operating upon receiving one of the first and second photographing start signals enabled by said control means.

5,204,710

CAMERA HAVING ZOOM LENS SYSTEM

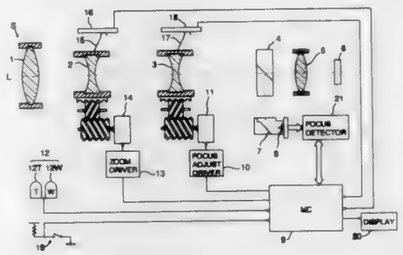
Takeya Tsukamoto, and Masatoshi Itah, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 13, 1990, Ser. No. 537,416

Claims priority, application Japan, Jun. 13, 1989, 1-151942; Jun. 13, 1989, 1-151943; Jun. 13, 1989, 1-151944; Jun. 13, 1989, 1-151946; Jun. 13, 1989, 1-151947; Jun. 13, 1989, 1-151948

Int. Cl.[5] G03B *5/00, 13/36;* **H04N** *5/232*

U.S. Cl. 354—402 **30 Claims**



1. A camera having a zoom lens system, comprising:

detecting means for detecting an object condition about an object to be photographed;

an operating member;

driving means for driving said zoom lens system in order to change a focal length thereof when said operating member is manually operated; and

restricting means, based on the result of said detecting means, for restricting an operation of said driving means within a predetermined range of focal lengths.

5,204,711

PROJECTION EXPOSURE DEVICE

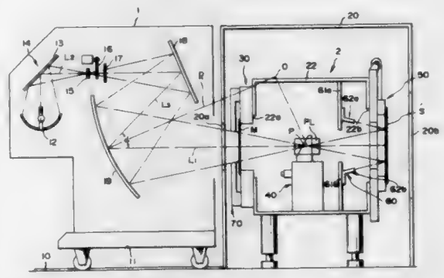
Minoru Takubo, Tokyo; Toshio Fukasawa, Ebina; Masahiro Miyashita, Yokohama, and Yousuke Takagi, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 712,100

Claims priority, application Japan, Jun. 8, 1990, 2-150901; Oct. 22, 1990, 2-283620; May 29, 1991, 3-126006

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **43 Claims**



1. A projection exposure device in which an exposure light from a light source device is transmitted through a mask having a predetermined pattern formed therein and then an image of a mask pattern is focused by a projection lens on an exposure member held by a holding mechanism, the projection exposure device comprising:

means for emitting an exposure light from the light source device along a horizontal optical axis;

the mask, the projection lens and the exposure member being disposed on the horizontal optical axis;

the holding mechanism holds the exposure member such that the exposure member is movable at least within a plane perpendicular to the horizontal optical axis; and

the light source device includes:

a truck movable independently in the direction of the horizontal optical axis;

a light emitting source, mounted on the truck, for emitting an exposure light of a wavelength shorter than that of infrared light;

an integrator, mounted on the truck, for making the light emitted from the light emitting source uniform;

an optical axis changing means, mounted on the truck, for changing the optical path of the light emitted from the integrator; and

a concave mirror, mounted on the truck, for collecting the light from the optical axis changing means and reflecting the same in the direction of the horizontal optical axis.

5,204,712

SUPPORT DEVICE WITH A TILTABLE OBJECT TABLE, AND OPTICAL LITHOGRAPHIC DEVICE PROVIDED WITH SUCH A SUPPORT DEVICE

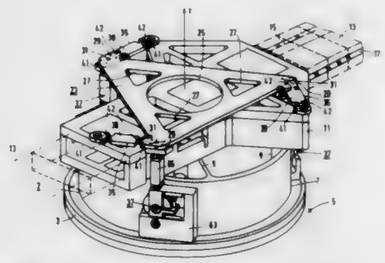
Adrianus G. Bouwer, Eindhoven; Marcel C. M. Baggen, Nuenen; Henricus W. A. Janssen, Eindhoven; Petrus R. Bartray, IJsselsteijn, and Jan Van Eijk, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y. and A.S.M. LIthography B.V., Veldhoven, Netherlands

Filed Oct. 9, 1991, Ser. No. 774,763

Claims priority, application Netherlands, Mar. 8, 1991, 9100421

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **33 Claims**



1. A support device for supporting an object relative to a base surface comprising: a force actuator system; a first bearing unit; a second bearing unit supported by the first bearing unit; said first bearing unit for guiding the support device along said base surface; a straight guide extending parallel to the base surface and coupled to the second bearing unit; a support unit including an object table coupled to a rigidification member, said support unit being displaceable relative to the first bearing unit parallel to a z-direction perpendicular to the base surface by said force actuator system; said support unit being rotatable relative to the first and the second bearing units about at least one axis of rotation extending parallel to the base surface by said force actuator system; and a coupling member for coupling the rigidification member to the second bearing unit, said coupling member being elastically deformable in a direction parallel to the z-direction.

5,204,713

ELECTROPHOTOGRAPHIC APPARATUS

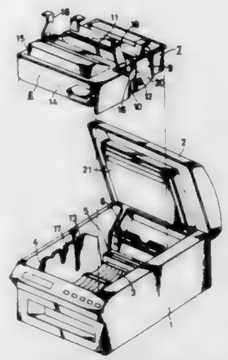
Naoki Yamamura, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 745,881, Aug. 16, 1991, abandoned. This application Jul. 6, 1992, Ser. No. 908,794

Claims priority, application Japan, Aug. 24, 1990, 2-89083[U]

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—210 **7 Claims**



1. An electrophotographic apparatus comprising:

a housing comprising a sheet transportation path, a transfer unit and a fixing unit, said housing further comprising an open upper surface;

an image forming unit comprising a photoconductive drum;

a developing unit comprising a toner container;

holding members disposed on opposite sides of the sheet transportation path arranged in the housing to hold the image forming unit and the developing unit so that the image forming unit and the developing unit can be removed upward therefrom;

supporting means in the developing unit for supporting the image forming unit in a supported engaging state and permitting the removal in an upward direction of the image forming unit from the developing unit when the developing unit with the image forming unit supported thereon are both positioned on the holding members of the housing; and

handle means for removing the developing unit with the image forming unit supported thereon from the housing while maintaining said supported engaging state between said developing unit and said image forming unit, said handle means being provided on the developing unit and extending from the developing unit.

5,204,714

OBJECT DISTANCE DETECTING APPARATUS

Osamu Nonaka, Sagamihara, and Kazuhiro Yamauchi, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1991, Ser. No. 711,641

Claims priority, application Japan, Jun. 15, 1990, 2-157115; Jun. 29, 1990, 2-172499

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—403 **30 Claims**

11. A device for use in a camera having a light measuring means for measuring the luminance of an object to be photographed, a light projecting means for projecting a light pulse a plurality of times toward the object and a position detecting means for receiving the reflected light form the object by the light projecting means and outputting a first current value and second current value at a ratio corresponding to the object distance, comprising:

a first integrating means for integrating a plurality of times

accordance with the magnification of said photographic

5,204,717

operation to a non-fuzzy value to thereby estimate image density between times when the reference image pattern is

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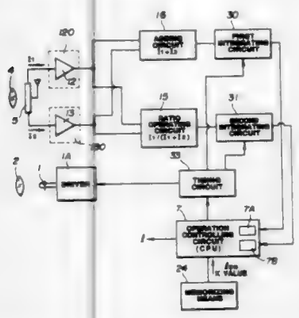
a first integrating means for integrating a plurality of times the sum of said first current value and second current value;
an operating means for ratio-operating said first and second current values to generate an output representing a predetermined ratio of said first and second current values;
a second integrating means for operating an integration a plurality of times at a current value corresponding to said operating means output;
a first distance calculating means for calculating the object distance on the basis of the square root of the output of said first integrating means;

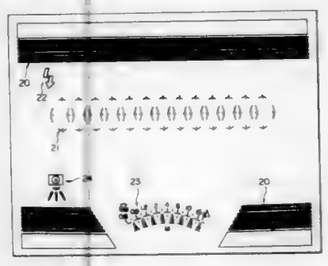


a second distance calculating means for calculating the object distance on the basis of the output of said second integrating means;
comparing means for comparing said first distance calculating means output with a reference value;
a judging means for selectively outputting as distance measuring data one of the first distance calculating means output and second distance calculating means output in response to said comparing means output; and
a means for altering said reference value in response to said light measuring means output.

5,204,715
RANGE-FINDING-DIRECTION-CHANGEABLE-CAMERA

Kazuhiro Nakanishi; Takemi Miyazaki; Kenichi Iwaida, and Hironobu Mikoshiba, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,935
Claims priority, application Japan, Mar. 8, 1990, 2-57268
Int. Cl.[5] G03B *17/20, 13/12*
U.S. Cl. 354—475 **6 Claims**

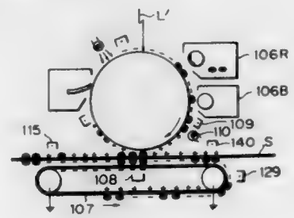


1. A camera comprising
a zoom lens, having an optical axis, for altering the magnification of a photographic image of an object by alteration of the focal length of said lens;
a view finder for displaying an object image corresponding to said photographic image, said view finder altering the magnification of said object image in said view finder in accordance with the magnification of said photographic image;
a detector for detecting the focal length of the zoom lens to obtain focal length information;
a device for measuring an object distance in a distance measuring direction to obtain object distance information;
a shifter for shifting said distance measuring direction toward a target in said photographic image;
an element for measuring the distance measuring direction to obtain shift angle information, said shift information representing an angle between said distance measuring direction and said optical axis; and
a display for indicating said distance measuring direction overlapped on said object image based on said shift information and said focal length information.

5,204,716
SIDE-FREE RECORDING APPARATUS

Nobuo Kasahara, and Katsuo Sakai, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 443,434, Nov. 30, 1989, abandoned. This application Aug. 6, 1991, Ser. No. 742,725
Claims priority, application Japan, Dec. 5, 1988, 63-306065; Feb. 16, 1989, 1-37081; May 24, 1989, 1-130466
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—24 **12 Claims**

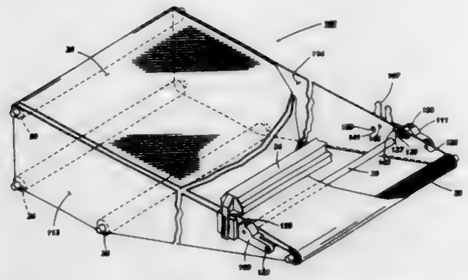


1. An image recording apparatus capable of forming an image freely on the front side and the backside of a recording sheet, comprising:
an image carrier for carrying an electrostatically formed latent image representative of an image to be recorded;
image forming means for forming the latent image on said image carrier as a non-inverted image or an inverted image;
developing means for developing latent images formed on said image carrier by said image forming means to produce a primary toner image;
an intermediate transfer body located to face said image carrier for moving the recording sheet between said intermediate transfer body and said image carrier;
intermediate transferring means for transferring said primary toner image to said intermediate transfer body to form a secondary toner image on said intermediate transfer body;
polarity inverting means for inverting a polarity of said primary toner image such that polarities of said primary and secondary toner images are different from each other;
discharge removing means for dissipating charge of said primary toner image;
primary toner image transferring means for transferring said primary toner image to the recording sheet from said image carrier; and
secondary toner image transferring means for transferring said secondary toner image to the recording sheet from said intermediate transfer body,
said intermediate transferring means and said primary toner image transferring means being constituted by a single charging unit.

5,204,717
PHOTORECEPTOR REMOVAL MECHANISM FOR A PRINTING MACHINE

Scott A. Reese, Farmington; Richard M. Dastin, Fairport; Douglas W. Gates, Rochester, and Robert J. Tannascoli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1991, Ser. No. 739,008
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—219 **23 Claims**



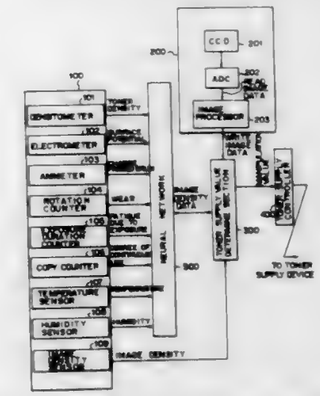
1. An apparatus for recording an electrostatic latent image on a charge receiver, comprising:
means for depositing a substantially uniform electrostatic charge on the charge receiver;
means for selectively dissipating the electrostatic charge on the charge receiver in an imaging zone to record thereon the electrostatic latent image, said dissipating means comprising a support member for supporting at least a portion of the charge receiver in the imaging zone; and
means for removably mounting said charge depositing means substantially adjacent the charge receiver, said mounting means being adapted to position said support member at a first position in contact with the charge receiver and at a second position spaced apart from the charge receiver, with the first position allowing for registration of the charge receiver within the apparatus and the second position facilitating removal of the charge receiver from the apparatus.

5,204,718
ELECTROPHOTOGRAPHIC PROCESS CONTROL DEVICE WHICH USES FUZZY LOGIC TO CONTROL THE IMAGE DENSITY

Tetsuya Morita, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1992, Ser. No. 870,086
Claims priority, application Japan, Apr. 19, 1991, 3-088655
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 **2 Claims**

1. An electrophotographic image process control device comprising:
means for periodically forming a reference image pattern on a photoconductive drum;
an image density sensor for measuring a density of an image formed on the photoconductive drum based on sensing the reference image pattern;
a scanner for writing read image data representative of a document on said photoconductive drum; and
determining means responsive to the image density from said image density sensor and write image data from said scanner for executing a predetermined fuzzy combination operation which uses fuzzy rules registered beforehand, and converting a membership function resulting from said operation to a non-fuzzy value to thereby estimate image density between times when the reference image pattern is

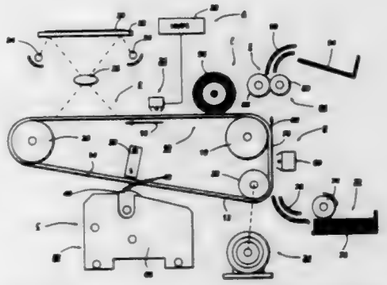


periodically formed and to determine a toner supply manipulation value.

5,204,719
DEVELOPMENT SYSTEM

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 10, 1992, Ser. No. 832,876
Int. Cl.[5] G03G *15/08, 15/06*
U.S. Cl. 355—247 **16 Claims**



1. An apparatus for developing a latent image recorded on a surface with non-magnetic toner, including:
means, spaced from the surface, for transporting non-magnetic toner to a development zone adjacent the surface, said transporting means being substantially non-magnetic;
an electrode member positioned in the development zone between the surface and said transporting means;
means for electrically biasing said electrode member to detach toner from said transporting means so as to form a cloud of toner in the space between said electrode member and the surface with the toner developing the latent image, said electrode member having a substantially constant current flowing therethrough; and
magnetic means for generating a magnetic field interacting with the constant current flowing through said electrode member to substantially dampen vibrations of said electrode member, said magnetic means being disposed on one side of the surface with said electrode member being located on the opposed side of the surface.

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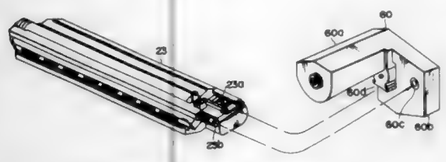
5,204,720

IMAGE FORMING APPARATUS HAVING INTEGRAL TONER SUPPLY CARTRIDGE AND TONER RECOVERY CARTRIDGE

Takao Ishida, Yokohama, and Naoto Higure, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 18, 1991, Ser. No. 793,999
Claims priority, application Japan, Nov. 30, 1990, 2-340533
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—260 **9 Claims**



1. An image forming apparatus comprising:
developing means for developing a latent image formed on an image carrying body with a developing agent;
transferring means for transferring the image developed by the developing means to a recording medium;
removing means for removing the developing agent remaining on the image carrying body after transfer of the developed image by the transferring means;
convey means for conveying the developed agent removed by the removing means;
storing means for storing the developing agent removed by the removing means;
supply means for supplying the developing agent to the developing means;
a first unit having the developing means and the convey means;
a second unit detachably mountable to the first unit, the second unit having the storing means and the supply means,
a developing agent introducing section, provided in the first unit, for introducing the developing agent into one end portion side of the developing means;
a developing agent discharging section, provided in the first unit, for discharging to the outside the developing agent conveyed by the convey means;
a developing agent supply port provided in the supply means of the second unit and connected to the developing agent introducing section of the first unit; and
a developing agent receiving port provided in the storing means of the second unit and connected to the developing agent discharging section of the first unit,
wherein the developing agent supply port and the developing agent receiving port of the second unit are connected/disconnected to/from the developing agent introducing section and the developing agent discharging section, in accordance with the connection/disconnection of the second unit to/from the first unit.

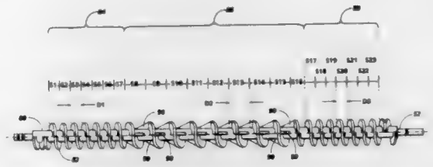
5,204,721

DEVELOPER AUGER FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Gary M. Sharpe, Hilton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1991, Ser. No. 749,850
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 **14 Claims**

1. A developer auger possessing a plurality of flight segments for use in a development system of an electrophotographic printing machine comprising:
a shaft;
a first flight portion, mounted on said shaft, comprising at least two flight segments which define a first pitch distance;
a second flight portion, mounted on said shaft and positioned



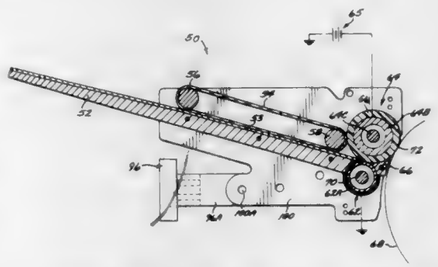
adjacent said first flight portion, comprising at least two flight segments which define a second pitch distance which is greater than the first pitch distance; and
a vane mounted within said second flight portion.

5,204,722

THERMO-ELECTRIC TRANSFER SYSTEM FOR LIQUID TONER

John A. Thompson, and Kenneth E. Heath, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 19, 1992, Ser. No. 932,092
Int. Cl.[5] G03G *15/14, 15/20*
U.S. Cl. 355—279 **18 Claims**



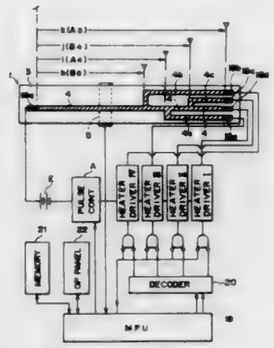
1. A thermo-electric image transfer system, for directly transferring an image formed by liquid toner on a photoconductor to a sheet medium in the absence of a liquid toner carrier applied to the sheet medium, comprising:
a photoconductor carrying an image defined by liquid toner applied to the surface thereof, said toner having an electrostatic polarity;
first and second heated transfer rollers defining a nip therebetween into which said medium is fed, providing a means for heating the image side of said medium to a temperature in excess of the melt temperature of said toner, the second of said rollers having an outer layer of a material which is thermally and electrically conductive, said heated second roller providing a means for heating the backside of said sheet media;
means for guiding said medium out of said nip between said transfer rollers and into contact with said photoconductor, said guiding means maintaining contact between said outer layer of said second roller and said medium until said medium contacts said photoconductor at a second nip between said second roller and said photoconductor; and
means for applying an electrostatic voltage to said second roller which is opposite in polarity to that of said toner to provide an electrostatic attraction of the toner to said medium.

5,204,723

HEATING APPARATUS HAVING HEATER WITH BRANCH

Shinji Hanada; Hisaki Senba, and Koji Masuda, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1991, Ser. No. 786,556
Claims priority, application Japan, Nov. 2, 1990, 2-298419
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **21 Claims**



1. A heating apparatus, comprising:
a heater, said heater including a main resistance layer and a subordinate resistance layer branched from said main resistance layer which extend in a direction crossing with a movement direction of a recording material and which are supplied with electric power;
selecting means for selecting a resistance layer to be supplied with electric power in accordance with a size of the recording material, said selecting means selecting the resistance layers so that a number of resistance layers selected is larger in an area where the recording material does not pass than in an area where the recording material passes; and
control means for controlling an effective voltage applied to said heater in accordance with selected resistance layer.

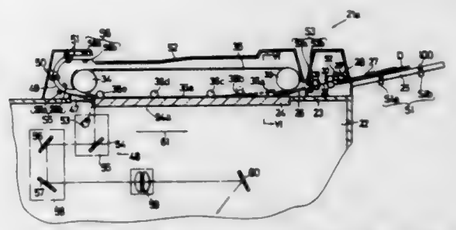
5,204,724

DOCUMENT FEEDING APPARATUS AND A DOCUMENT FEEDING METHOD WITH UPSTREAM PRESSURE RELEASE

Masayoshi Nakabayashi, and Kaoru Suzuki, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1991, Ser. No. 745,492
Claims priority, application Japan, Aug. 16, 1990, 2-216552; Aug. 16, 1990, 2-216553; Aug. 16, 1990, 2-216554; Sep. 7, 1990, 2-237836
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—308 **16 Claims**

1. A document feeding apparatus comprising:
a belt for feeding a document sheet onto a document scanning area of a copying machine; and
a plurality of pressure rollers disposed along the transporting direction of the document for pressing the document being transported against the document scanning area via the belt, wherein:
when the preceding document is positioned on the document scanning area, a prescribed number of pressure rollers counted from the upstream end in the transporting direction are controlled individually in the sequence in which the are arranged in such a manner as to release their



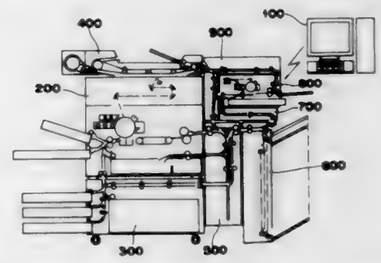
pressures from the belt in accordance with the length of the document measured along the transporting direction.

5,204,725

COMPLEX MACHINE COMPRISING A HOST COMPUTER, A DUPLICATOR, A LASER PRINTER AND A SHEET SUPPLY UNIT

Takayuki Ariyama; Kiyoshi Emori, both of Toyokawa; Koji Shakushi, Toyohashi; Hiroya Sugawa, Toyokawa, and Masamichi Kishi, Okazaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1992, Ser. No. 838,490
Claims priority, application Japan, Feb. 20, 1991, 3-026159; Mar. 5, 1991, 3-038400
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—313 **10 Claims**



8. A complex machine comprising:
first and second image forming means for forming an image on a sheet;
sheet supply means for supplying a sheet selectively to one of said first and second image forming means; and
mode selecting means for selectively setting one of an interruption mode and a rejection mode, wherein in said interruption mode, when there is a demand for supplying the sheet to said second image forming means during a process of supplying the sheet to said first image forming means, the process of supplying the sheet to said first image forming means is interrupted and is proceeded by a process of supplying the sheet to said second image forming means, and wherein in said rejection mode, when there is a demand for supplying the sheet to said second image forming means during the process of supplying the sheet to said first image forming means, the demand is rejected and the process of supplying the sheet to said first image forming means is continued.

5,204,726

cover, for receiving recording sheets after image forma-

automatic document feeder with additional sets of original

to switch the polarity of the charge provided on the copy

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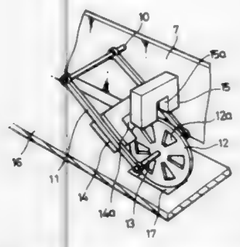
5,204,726

COPYING PAPER FEED SENSING DEVICE FOR A COPYING APPARATUS

Hoon B. Choi, 29-28, Shinsa-dong, Unpyung-ku, Seoul, Rep. of Korea

Filed Nov. 4, 1991, Ser. No. 787,093
Claims priority, application Rep. of Korea, Nov. 8, 1990, 17077/1990
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—316 2 Claims



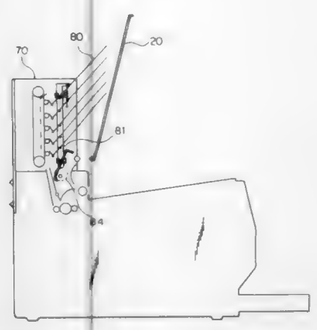
1. A device for sensing feeding of copying papers in a copying apparatus, comprising:
- support bars provided on a paper feed path to be pivotable about a pivot shaft;
- an actuator of a circular disk shape formed with a plurality of slits and rotatably disposed through a support shaft at leading ends of said support bars;
- a first sensor functioning to sense a paper jamming or misfeeding and disposed outwardly of said actuator in such a manner that it describes a trace on said slits during rotation of said actuator; and
- a second sensor functioning to sense the presence and absence of the paper on said paper feed path and disposed outwardly of said actuator in such a manner that it describes a trace on a solid portion of said actuator during rotation of said actuator.

5,204,727

IMAGE FORMING APPARATUS

Satoshi Haneda; Hisao Satoh; Tadayoshi Ikeda, all of Hachioji; Shizuo Morita, Tachikawa, and Masakazu Fukuchi, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 8, 1991, Ser. No. 772,969
Claims priority, application Japan, Oct. 11, 1990, 2-272545; Oct. 11, 1990, 2-272547
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—321 4 Claims



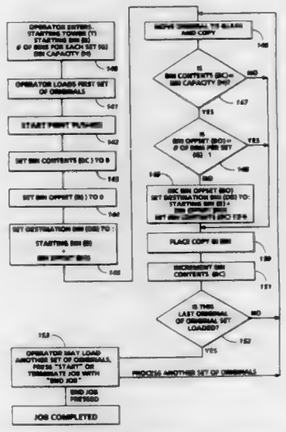
1. An image forming apparatus comprising:
(a) an upper cover being upwardly openable to access a recording sheet conveyance path within said apparatus;
(b) a multistage exit tray means, disposed above said upper cover, for receiving recording sheets after image formation, said multistage exit tray means including means for withdrawing said exit tray means from an interference position with said upper cover when open; and
(c) means for automatically operating said withdrawing means in accordance with the opening of said upper cover.

5,204,728

UNLIMITED DOCUMENT FEEDER

Charles D. Braswell, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 21, 1991, Ser. No. 744,034
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—323 2 Claims



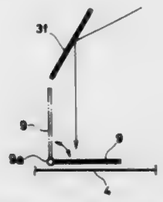
1. In a printing machine having an automatic document feeder and a sorter, the sorter including a plurality of sections, each section having a plurality of bins, the automatic document feeder having a given document capacity, the method of allocating the sorter sections and bins to produce a predetermined number of sets of an unlimited set of original documents comprising the steps of;
- entering into the machine the predetermined number of sets of the original set required to complete a job demand,
- loading a first set of originals into the automatic document feeder,
- determining the number of bins and the number of sections of the sorter needed to complete the predetermined number of sets of the original set required, the step of determining the number of bins and the number of sections of the sorter needed to complete the predetermined number of sets of the original set required including the steps of allocating the bins to provide the requisite capacity to receive the required number reproductions of a given original of the original set and allocating the sections of the sorter to provide the requisite capacity to receive the required number reproductions of each original of the original set,
- initiating the operation of the machine to complete the requirement for the first set of originals loaded into the automatic document feeder,
- instructing the operator to reload the automatic document feeder with a second set of original documents,
- initiating the operation of the machine to complete the requirement for the second set of originals loaded into the automatic dot feeder, and
- repeating the step of instructing the operator to reload the automatic document feeder with additional sets of original documents until the completion of the job demand.

5,204,729

FULL COLOR COPYING MACHINE

Yasutaka Maeda, Ikoma; Taisuke Kamimura, Kitakatsuragi; Hideyuki Nishimura, Yamatokoriyama; Tsuyoshi Miyamoto, Osaka; Katsuhiro Nagayama, Yamatokoriyama; Natsuko Tanaka, Fukuoka, and Yuichi Kazaki, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 7, 1991, Ser. No. 638,296
Claims priority, application Japan, Jan. 23, 1990, 2-14307; Oct. 31, 1990, 2-296309
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 16 Claims



1. A color copying machine for reading an image on a document having a high-density portion and a low-density portion and for forming a copied image on copy materia, the machine comprising:
- scanning means for scanning an original document a plurality of times and forming corresponding pluralities of electrostatic latent images of both the high-density portion and low-density portion of the document,
- a screen filter, freely insertable into and removable from a path of light reflected from an original document, for filtering the reflected light into a pattern of lines,
- a photoreceptor upon which a plurality of electrostatic latent images of both the high-density portion and low-density portion are formed,
- first toner image forming means for forming a first color toner image from the plurality of the electrostatic images relating to the high-density portion,
- second toner image forming means for forming a second color toner image from the plurality of the electrostatic latent images relating to the low-density portion,
- complete toner image forming means for forming the copied image form a superposition of the first color toner image and the second toner image,
- whereby said screen filter is inserted into the path of the light when the plurality of electrostatic latent images of the low-density portion are formed.

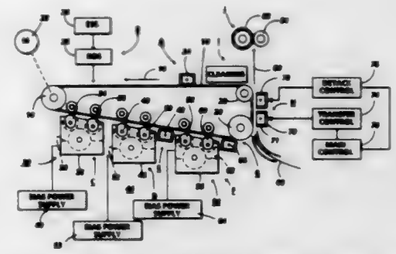
5,204,730

TRANSFER, DETAC POLARITY SWITCHING

David W. Richmond, Webster; Clifford K. Friend, Pittsford, and Robert J. Mead, Hilton, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1992, Ser. No. 891,097
Int. Cl.[5] G03G *15/01, 15/14*
U.S. Cl. 355—326 9 Claims

8. A system for transferring a plurality of selected toner colors to a copy sheet in a single pass of the copy sheet through a transfer station comprising:
- means to select predetermined toner colors,
- a transfer corotron for charging the underside of the copy sheet for toner transfer,
- a high voltage power supply electrically connected to the transfer corotron and responsive to selected toner colors to switch the polarity of the charge provided on the copy sheet by the transfer corotron, and



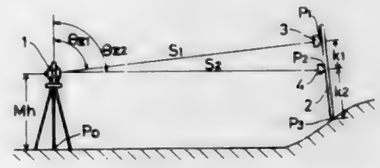
- a detac corona device responding to the copy sheet charge for neutralizing the charge on the copy sheet after toner transfer.

5,204,731

METHOD AND APPARATUS FOR MEASURING THE COORDINATES OF A SURVEYED POINT

Masayoshi Tanaka, Isehara; Haruo Fukawa, Odawara; Masamitsu Endo, Gotenba; Ichiro Kadowaki, Tokyo, and Yasuo Hayama, Ninomiyamachi, all of Japan, assignors to Sokkisha Co., Ltd., Japan

Filed Nov. 28, 1990, Ser. No. 618,856
Claims priority, application Japan, Dec. 4, 1989, 1-313514; Dec. 8, 1989, 1-142314[U]
Int. Cl.[5] G01C *3/00, 3/08*; G01B *11/26*
U.S. Cl. 356—1 27 Claims



1. An apparatus for measuring coordinates of a survey point comprising:
- a reflecting sheet prism locatable at two points present on a line extending through the survey point, the two points being separated from the survey point at predetermined distances, said reflecting sheet prism having a plate on which said reflecting sheet prism is mounted, the plate having cross graduations for collimation formed thereon;
- a tachymeter for transmitting light to said reflecting sheet prism and for receiving light from said reflecting sheet prism resulting from light transmitted from said tachymeter such that receiving light generates a received signal in said tachymeter, said tachymeter determining distances to said reflecting sheet prism at the two points, a horizontal plane angle and a vertical plane angle relative to said tachymeter and said reflecting sheet prism at the two points, the distances to said reflecting sheet prism being based on a phase difference between the received signal and a reference signal;
- first calculating means connected to said tachymeter for calculating coordinate values of the two points at which said reflecting sheet prism is locatable; and
- second calculating means connected to said first calculating means for calculating a coordinate value of the survey point from the coordinate values calculated for the two points for locating said reflecting sheet prism.

5,204,732

5,204,733

5,204,736

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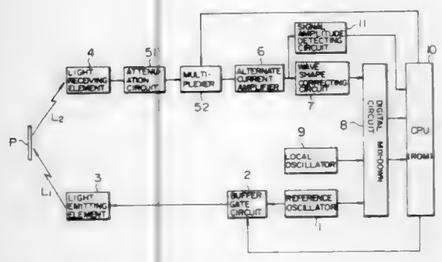
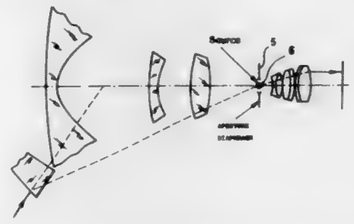
5,204,732
OPTICAL DISTANCE MEASURING APPARATUS
Yukio Ohmamyuda, Sagamihara; Shigeru Kimura, Yokohama; Toru Tanabe, Machida; Kazuhisa Iwasaki, Yokohama; Takao Seto, Yokohama; Hideki Kitamura, Yokohama; Kazuhiko Sugimura, Yokohama, and Yasushi Senoo, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Mar. 6, 1992, Ser. No. 846,811
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—4 12 Claims



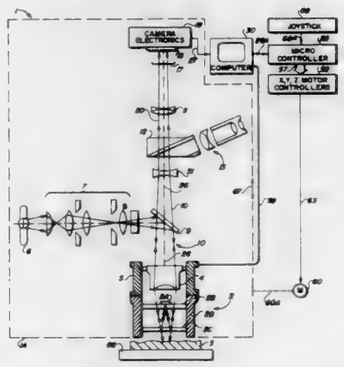
1. A phase difference optical distance measuring apparatus comprising:
a light emitting portion including a light emitting means having a light source for emitting a distance measuring light beam toward an object spaced at a distance that is to be measure from said light emitting portion;
an optical lens system for directing said distance measuring light beam toward said object, said distance measuring light beam is being reflected from said object in the form of a reflected light beam;
a light receiving portion including a light receiving element for receiving the reflected light beam reflected from said object through said optical lens system; and
a processing system comprising:
a first circuit in the light emitting portion; and
a second circuit in the light receiving portion; and
a central processing unit and a digital mix-down circuit for detecting and calculating a phase difference between an electrical phase of a signal derived from said reflected light beam and an electrical phase of a reference signal output from a reference oscillator that is coupled to said light emitting portion through a buffer gate circuit, said central processing unit and said mix-down circuit determining a distance between said light emitting portion and said object spaced at a distance with reference to an electrical phase of a local oscillation signal output from a local oscillator; and said second circuit including:
a demodulating circuit electrically connected to said light receiving portion;
a ladder resistance attenuation circuit;
a multiplexer;
an alternating current amplifier;
a wave shape correcting circuit electrically connected to said central processing unit through said digital mix-down circuit; and
a signal amplitude detecting circuit having an input side which is electrically connected to said alternating current amplifier, said signal amplitude detecting circuit having an output which is coupled to said central processing unit.

5,204,733
APPARATUS FOR CALIBRATING AN OPTICAL INSTRUMENT, AND APPLICATIONS THEREOF
Jean-Pierre Deshayes, Montgiscard, France, assignor to Centre National d'Etudes Spatiales, France
Filed Dec. 20, 1990, Ser. No. 631,599
Claims priority, application France, Dec. 22, 1989, 89 17100
Int. Cl.[5] G01M *11/02*; B64G *1/66*
U.S. Cl. 356—243 7 Claims



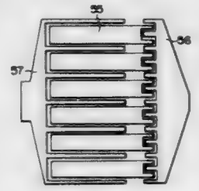
1. Apparatus for calibrating a radiometric optical instrument of the kind including a focal plane, an entrance pupil and an aperture diaphragm, by means of a light source, said focal plane of the optical instrument containing photoelectric detectors which convert image brightness into an electrical signal, wherein said light source is disposed in the entrance pupil or in the aperture diaphragm of the instrument.

5,204,734
ROUGH SURFACE PROFILER AND METHOD
Donald K. Cohen; Paul J. Caber, both of Tucson, Ariz., and Chris P. Brophy, White Bear Township, Minn., assignors to Wyko Corporation, Tucson, Ariz.
Continuation of Ser. No. 714,215, Jun. 12, 1991, Pat. No. 5,133,601. This application May 6, 1992, Ser. No. 880,083
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—359 11 Claims



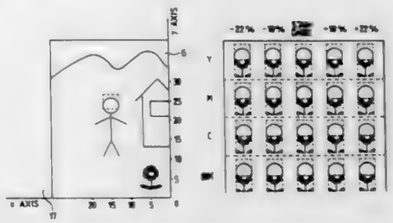
1. A method of profiling a rough surface of an object, comprising the steps of:
(a) positioning the object along an optical axis so that a predetermined feature of the rough surface is optically aligned with an imaging device;
(b) producing an interference pattern of the rough surface by means of an interferometer;
(c) varying an optical path difference between the object and a reference surface of the interferometer;
(d) operating an imaging device to scan the rough surface to produce intensity data for each pixel of an image of the rough surface for a plurality of frames each shifted from the other by a preselected phase difference;
(e) extracting a modulation envelope from the intensity data for each pixel;
(f) locating a preselected characteristic of the modulation envelope for each pixel;
(g) correlating the preselected characteristic of the modulation envelope to a relative height of the rough surface for each pixel,
wherein step (e) includes
(1) eliminates a constant or slow-charging component from the intensity data, as the optical path difference is varied, to produce a first digital signal;
(2) rectifying the first digital signal to produce a second digital signal; and
(3) separating the modulation envelope from the second digital signal, the fist and second digital signals and the modulation envelope being successive values of digital words.

5,204,735
HIGH-FREQUENCY SEMICONDUCTOR DEVICE HAVING EMITTER STABILIZING RESISTOR AND METHOD OF MANUFACTURING THE SAME
Tomohiko Yamamoto; Kazuo Endou, and Takashi Kimura, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 339,762, Apr. 18, 1989, abandoned. This application May 7, 1991, Ser. No. 698,341
Claims priority, application Japan, Apr. 21, 1988, 63-96904
Int. Cl.[5] H01L *23/48, 29/72, 21/82*
U.S. Cl. 257—528 10 Claims



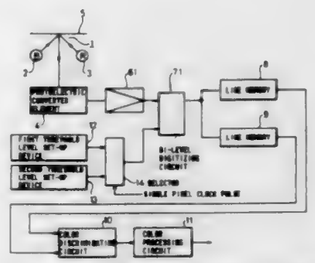
1. A high-frequency transistor including an emitter stabilizing resistor, comprising:
a semiconductor substrate;
a high-frequency transistor formed in said semiconductor substrate, said transistor having a plurality of regions adjacent one another formed in the substrate including an emitter region having a fish-bone structure, a base region having a predetermined impurity concentration surrounding said emitter region, and a base lead region having a higher impurity concentration than the impurity concentration of said base region connected to said base region;
an emitter stabilizing resistor including a resistor layer having the same conductivity type as said base lead region and an impurity concentration and a junction depth substantially equal to said base lead region formed in an area of said substrate laterally spaced from said plurality of transistor regions;
an emitter electrode having a first end and a plurality of spaced fingers defining a second end, the first end being connected to said emitter region and overlaying at least a portion of said plurality of transistor regions, the first end and second end being contiguous, said plurality of spaced fingers being connected in common to and overlaying said resistor layer; and
a wiring lead electrode having a plurality of spaced fingers at one end disposed between and engaged with said spaced fingers of said emitter electrode, said spaced fingers being connected to and overlaying said resistor layer.

5,204,736
IMAGE PROCESSING APPARATUS
Shunichi Abe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 4, 1989, Ser. No. 333,040
Claims priority, application Japan, Apr. 5, 1988, 63-82247
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 43 Claims



1. An image processing apparatus comprising:
a) means for supplying image data in first and second regions;
b) changing means for changing a density of the image data supplied by said supplying means into a plurality of densities different from each other, wherein the plurality of densities correspond to the same image data; and
c) reproducing means for reproducing the image data as a plurality of visible images which can be simultaneously seen, each of the visible images having a corresponding one of the plurality of densities;
wherein a change of density of the image data in the first region by said changing means is the same as a change of density of the image data in the second region by said changing means.

5,204,737
COLOR INFORMATION READING APPARATUS FOR READING BINARY DATA
Kunio Hakkaku, Kanagawa, and Susumu Tomoda, Ayase, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 19, 1992, Ser. No. 836,846
Claims priority, application Japan, Feb. 27, 1991, 3-033106
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 5 Claims



1. A color information reading apparatus comprising:
original information reading means for scanning an original once with each of first and second light of different colors so as to convert light reflected from the original into electric signals, thereby outputting the converted respective signals in line sequence;
bi-level digitizing means for representing each output from said original information reading means in binary form;
threshold level shifting means for changing a threshold-level-upon-bi-level-digitizing to another for each pixel when

5,204,739

mitted image information signal into an original image signal,

tecting circuit for suppressing flicker components of the

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either a signal obtained by scanning the original with the first light or a signal obtained by scanning the original with the second light is converted into a binary level;

color discriminating means for discriminating among colors based on data representing in binary form the signal obtained by scanning the original with the first light and data representing in binary form the signal obtained by scanning the original with the second light; and

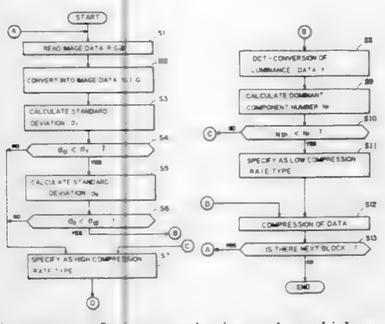
color processing means for converting the output from said color discriminating means into either a white signal or a black signal so as to output the converted signal therefrom when the output of said color discriminating means differs from the output of said color discriminating means prior to one pixel.

5,204,738

METHOD OF AN APPARATUS FOR COMPRESSING IMAGES DATA

Masami Aragaki, Toyonaka, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Dec. 14, 1990, Ser. No. 627,739
Claims priority, application Japan, Dec. 15, 1989, 1-326475
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **16 Claims**



9. An apparatus for compressing image data which represent an image in the form of an array of pixels for each color component, wherein said array of pixels are divided into pixel blocks each having a plurality of pixels, said apparatus comprising:

(a) means for obtaining luminance data representing luminance of said image for each pixel as a function of said image data;

(b) means for obtaining color difference data representing differences between said image data of respective color components for each pixel;

(c) means for obtaining a first statistic representing a standard deviation of said luminance data in each pixel block;

(d) means for obtaining a second statistic representing a standard deviation of said color difference data in each pixel block;

(e) means for comparing said first and second statistics with first and second threshold values, respectively, to classify respective pixel blocks into first and second type pixel blocks; and

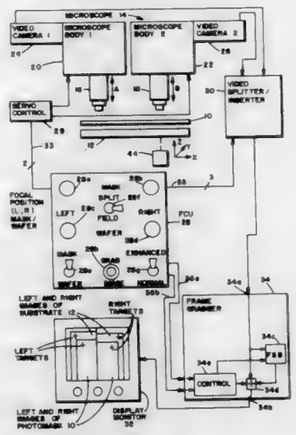
(f) means for compressing said image data on said first type pixel blocks at a first compression rate and compressing said image data on said second type pixel blocks at a second compression rate to thereby obtain compressed image data, wherein said first compression rate is different from said second compression rate.

5,204,739

PROXIMITY MASK ALIGNMENT USING A STORED VIDEO IMAGE

Peter L. Domenicali, Montpelier, Vt., assignor to Karl Suss America, Inc., Waterbury Center, Vt.

Filed Feb. 7, 1992, Ser. No. 832,413
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 **23 Claims**



1. Imaging apparatus comprising:

means for generating and for storing image data, said generating and storing means including imaging means having a focal position that is adjustable between at least a first focal position and a second focal position;

means, having an output coupled to said imaging means, for use by a user of the system for specifying a location of the first focal position and for specifying a location of the second focal position, said specifying means outputting to said imaging means, at any given time, either a specification of the location of the first focal position or a specification of the location of the second focal position; and

control means, coupled to said specifying means and to said generating and storing means, and responsive to an input from the user of the system, for causing said specifying means to change, for a predetermined interval of time, from specifying the location of one of said first or said second focal positions to specifying the location of the other one of said focal positions, for causing said generating and storing means to store, during the predetermined interval of time, image data generated at the location of the other one of the focal positions, and for causing said generating and storing means to superimpose, after an expiration of the predetermined interval of time, the stored image data upon image data being generated at the originally specified one of the first or the second focal positions.

5,204,740

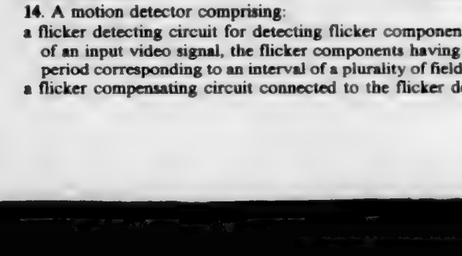
IMAGE SIGNAL DECODING APPARATUS

Yoshiki Ishii, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 852,495, Mar. 17, 1992, which is a continuation of Ser. No. 752,978, Sep. 3, 1991, which is a continuation of Ser. No. 569,730, Aug. 21, 1990, which is a continuation of Ser. No. 459,264, Dec. 29, 1989. This application Jul. 27, 1992, Ser. No. 920,166
Claims priority, application Japan, Jan. 14, 1989, 1-6498
Int. Cl.[5] H04N *7/12, 7/13*
U.S. Cl. 358—105 **37 Claims**

1. An image signal decoding apparatus for decoding a transmitted image information signal into an original image signal, comprising:

decision means for dividing a picture image signal comprising a plurality of image signals into a plurality of blocks each comprising a plurality of image signals, receiving a block characteristic information signal and a coded information signal on a block unit basis, said block characteristic information signal representing the characteristic of a block and said coded information signal being obtained by high-efficiency coding of a plurality of image signals constituting each of said plurality of divided blocks in accordance with said block characteristic information signal, and deciding if the image signals of the block can be decoded or not in accordance with said received block characteristic information signal and coded information signal of the block;



motion decision means for deciding if there is motion of picture image represented by the image signals of the block, in accordance with said block characteristic information signal among said block characteristic information signal and coded information signal received on the block unit basis; and

interpolation means for selecting, in accordance with the decision result provided by said motion decision means, either the image signals in another block included in the same picture image as that in which the block which was decided by said decision means as being incapable of being decoded into original image signals is included, or the image signals of another block which is included in a picture image distinct from that in which said block decided as being incapable of being decoded is included, and is located in a position corresponding to said block decided as incapable of being decoded and interpolating said selected image signals as interpolation image signals.

5,204,741

MOTION DETECTOR AND IMAGE STABILIZING SYSTEM

Takashi Sakaguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

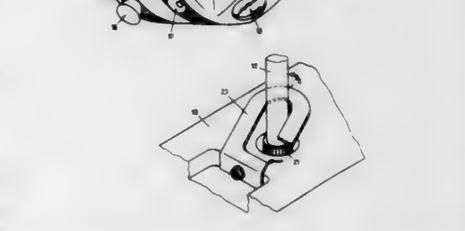
Filed Apr. 16, 1991, Ser. No. 685,796
Claims priority, application Japan, Apr. 19, 1990, 2-103453
Int. Cl.[5] H04N *7/18, 3/14*
U.S. Cl. 358—105 **18 Claims**

14. A motion detector comprising:

a flicker detecting circuit for detecting flicker components of an input video signal, the flicker components having a period corresponding to an interval of a plurality of fields;

a flicker compensating circuit connected to the flicker detecting circuit for suppressing flicker components of the input video signal in response to an output signal of the flicker detecting circuit; and

a motion vector detecting circuit connected to the flicker compensating circuit for detecting a motion vector in response to an output signal of the flicker compensating circuit:



wherein the motion vector detecting circuit comprises means for memorizing an output signal of the flicker compensating circuit during a given time to provide a preceding output signal of the flicker compensating circuit, and means for comparing a current output signal of the flicker compensating circuit and the preceding output signal of the flicker compensating circuit to detect the motion vector.

5,204,742

EASILY REMOVABLE OPTICAL MONITORING INSTALLATION

Kurt Nordmann, Engimattstrasse 20, 8002 Zurich, Switzerland

Filed Feb. 8, 1991, Ser. No. 652,509
Claims priority, application Switzerland, Feb. 13, 1990, 450/90-5
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—108 **10 Claims**

1. An optical monitoring installation including a plurality of

means for causing sum arithmetic means to receive outputs

(b) squaring means for squaring said primary differentiated

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monitoring units which are rotatable around a suspension, each unit having a casing, a pivotably mounted camera of which only a lens is visible from the outside, and dummy lenses mounted pivotably to said casing, and including a means for controlling operations of said camera and of movements of all monitoring units,

each monitoring unit comprising a coupling part which is releasably connectable by means of a mechanical-electrical quick release coupling to said suspension, which casing is rotatable around said coupling part by means of a motor.

5,204,743

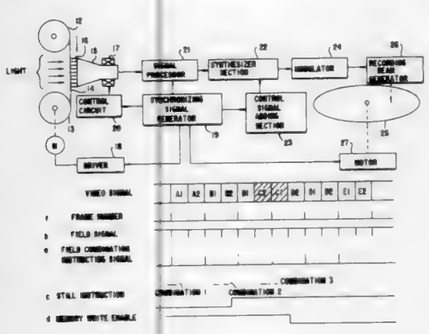
Patent Not Issued For This Number

5,204,744

SYSTEM FOR REPRODUCING A STATIONARY PICTURE

Toru Akiyama, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 7, 1991, Ser. No. 637,734
Claims priority, application Japan, Jul. 4, 1990, 2-178249
Int. Cl.[5] H04N *7/01, 3/40, 5/253*
U.S. Cl. 358—140 **3 Claims**



1. A recording system having reading means for reading information on a film, processing means for producing a video signal from the information read by the reading means, said video signal divided into a series of fields, information in each field derived from a corresponding frame of said film, and recording means for generating recording beams of the video signal for recording the video signal on a video disk, the recording system comprising:

means for inserting a field signal in said video signal at a beginning of each field;

means for inserting a series of frame numbers in the video signal at a beginning of every two fields to form a series of frames; and

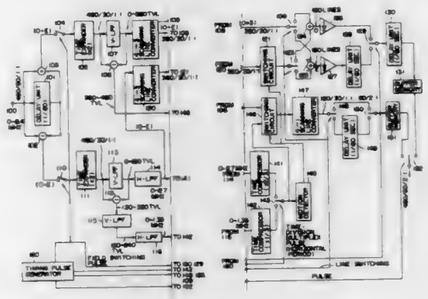
means for inserting a predetermined number of field combination instructing signals, each of the field combination instructing signals being inserted at a beginning of the frame, and each field combination instructing signal representing a combination of how two adjacent fields, represented by the field signals, are combined which is a different combination from a combination by other field combination instructing signals wherein, said recording means provided for recording said video signal on said video disk based on the inserted frame number, field signals and field combination instruction signals.

5,204,745

HIGH-DEFINITION TELEVISION SIGNAL PROCESSING SYSTEM FOR TRANSMITTING AND RECEIVING A TELEVISION SIGNAL IN A MANNER COMPATIBLE WITH THE PRESENT SYSTEM

Kiyoyuki Kawai, Yokosuka, and Seijiro Yasuki, Yokohama, both of Japan, assignors to Nippon Television Network Corp., Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of Japan

Filed Jul. 19, 1991, Ser. No. 741,245
Claims priority, application Japan, Jul. 19, 1990, 2-189415
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **14 Claims**



1. A television signal transmission processing apparatus for transmitting a main signal of M (M: a natural number) scanning lines per frame for a vertically central portion of a screen, the main signal being obtained by converting a progressive scanning signal having N (N: a natural number) scanning lines per frame into a television signal having the M scanning lines, and for transmitting an augment signal of (N—M) scanning lines per frame for upper and lower side portions of the screen, comprising:

means for obtaining an interframe sum output and an interframe difference output from the progressive scanning signals comprising the N scanning lines per frame by interframe sum average calculation and by interframe difference average calculation, respectively, in units of two frames;

first converting means for limiting a spatial frequency band of the interframe sum output in a first band and converting the band-limited output into M scanning lines per frame;

second converting means for limiting a spatial frequency band of the interframe difference output in a second band of a characteristic different from that of the first band and converting the band-limited output into the M scanning lines per frame;

means for causing sum arithmetic means to receive outputs from said first and second converting means to generate a first frame signal in units of two frames, and causing difference arithmetic means to receive the outputs from said first and second converting means to generate a second frame signal in units of two frames; and

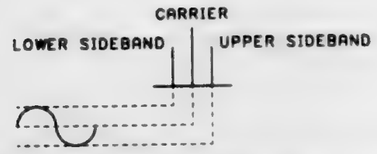
means for transmitting the first and second frame signals as an interlace scanning signal of the M per frame scanning lines for the central portion of the screen.

5,204,746

METHOD AND APPARATUS FOR FREQUENCY MODULATING A PHASE LOCKED LOOP WITH VIDEO INFORMATION

Scott O'Farrell, 4301 Solberg Ave., Apt. 11, Sioux Falls, S. Dak. 57016

Filed Mar. 5, 1991, Ser. No. 664,742
Int. Cl.[5] H03L *7/00*
U.S. Cl. 358—158 **5 Claims**



1. A method of frequency modulating a video carrier with a video signal including periodic sync pulses, comprising the steps of

providing a voltage controlled oscillator which oscillates at the video carrier frequency,

using said video signal to vary the frequency of said oscillator in proportion to the amplitude of said video signal to provide a video modulated output signal including periodic sync pulses,

sampling the video modulated output signal from said oscillator,

dividing the frequency of said video modulated output signal by an adjustable divisor to produce a frequency divided signal,

comparing said frequency divided signal to a constant reference frequency to produce a DC voltage proportional to the difference between the frequency of said output signal and said reference frequency,

adding said DC voltage to said video signal and using the combined signal to control the operating frequency of said oscillator,

comparing the rate of said sync pulses in said video modulated output signal to a reference sync rate, and

adjusting the divisor of said divider in proportion to the difference between said rate of said sync pulses in said video modulated output signal and said reference sync rate,

whereby the frequency of said sync pulses remains the same as said reference sync rate irrespective of changes in the average DC level of said video signal.

5,204,747

APERTURE COMPENSATION CIRCUIT

Kinya Shinkai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

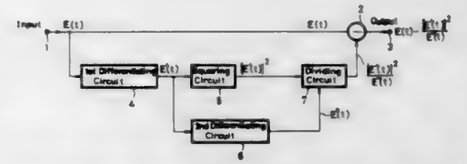
Filed Feb. 20, 1992, Ser. No. 838,108
Claims priority, application Japan, Feb. 20, 1991, 2-026353
Int. Cl.[5] H04N *5/208*
U.S. Cl. 358—162 **2 Claims**

1. An aperture compensation circuit comprising:

(a) first differentiating means for differentiating an input video signal to provide a primary differentiated signal;

(b) squaring means for squaring said primary differentiated signal to provide a first signal $[E'(t)]^2$;

(c) second differentiating means for differentiating said primary differentiated signal to provide a secondary differentiated signal as a second signal;



(d) dividing means for dividing said first signal by said second signal to provide a third signal; and

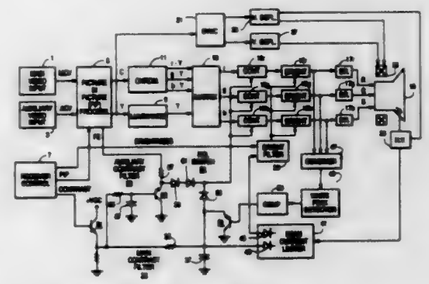
(e) means for superimposing said third signal on said input video signal to compensate for a contour of the video signal.

5,204,748

BEAM CURRENT LIMITING ARRANGEMENT FOR A TELEVISION SYSTEM WITH PICTURE-IN-PICTURE PROVISIONS

William A. Lagoni, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 11, 1991, Ser. No. 805,486
Int. Cl.[5] H04N *5/455, 5/59*
U.S. Cl. 358—169 **20 Claims**



1. A television system comprising:

a picture tube for producing images in response to video signals coupled to it;

a video signal processing channel including means for controlling a characteristics of said video signals coupled to said picture tube in response to a characteristic control signal;

means, including a beam current limiting (BCL) arrangement responsive to the beam current drawn by said picture tube, for generating said characteristic control signal;

means responsive to a main video signal and to an auxiliary video signal and coupled to said video signal processing channel for causing a main picture and an auxiliary smaller picture to be displayed within the same image, said means for causing said main and auxiliary pictures to be displayed generating a signal indicative of the time interval in which said auxiliary picture is displayed; and

means coupled to said BCL arrangement and responsive to said signal indicative of the time interval said auxiliary picture is displayed for modifying the operation of said BCL arrangement during the time interval said auxiliary picture is displayed.

a target member having an electron beam sensitive coating

additional image portion is added to the original image so

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5,204,749

AUTOMATIC FOLLOW-UP FOCUS DETECTING DEVICE AND AUTOMATIC FOLLOW-UP DEVICE

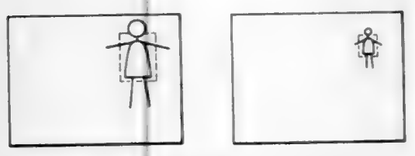
Masamichi Toyama, Tokyo; Youichi Iwasaki; Akihiro Fujiwara, both of Kanagawa; Takashi Amikura, Tokyo; Naoya Kaneda, and Masahiro Takei, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 701,691, May 14, 1991, which is a division of Ser. No. 569,371, Aug. 14, 1990, Pat. No. 5,031,049, which is a continuation of Ser. No. 483,998, Feb. 22, 1990, which is a continuation of Ser. No. 398,301, Aug. 24, 1989, abandoned, which is a continuation of Ser. No. 315,192, Feb. 23, 1989, which is a continuation of Ser. No. 183,482, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 737,163, May 23, 1985, abandoned. This application Mar. 20, 1992, Ser. No. 860,289

Claims priority, application Japan, May 25, 1984, 59-105897; May 25, 1984, 59-105898; May 28, 1984, 59-108188; May 28, 1984, 59-108189; May 30, 1984, 59-110515; May 31, 1984, 59-111962; May 31, 1984, 59-111963; May 31, 1984, 59-111964; Jun. 18, 1984, 59-124891; Jun. 23, 1984, 59-129517; Jun. 25, 1984, 59-130679; Jun. 27, 1984, 59-132441

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—227 **16 Claims**



2. A video camera, comprising:

(A) a photographing optical system for photographing an object and for focusing an image of the object on an image sensing plane;

(B) image sensing means for converting the image of the object on said image sensing plane into an image sensing signal;

(C) area setting means for setting a detecting area for extracting a feature of said image of the object on said image sensing plane;

(D) detecting means for detecting the feature of said image from said image sensing signal corresponding to said detecting area, and for putting out corresponding signals;

(E) first control means for detecting a variation of said image of the object on the basis of an output of said detecting means and for controlling said area setting means so that said detecting area follows the variation of said image of the object; and

(F) second control means for varying a size of said detecting area in response to a focal length of said photographing optical system.

5,204,750

SECTIONAL FRAME FOR FORMING SHEILDING UNITS FOR THE RADIATION EMITTED BY APPARATUS INCORPORATING VARIOUSLY SIZED VIDEO TERMINALS

Silvano Ferraroni, Reggio Emilia, Italy, assignor to Mas-Plast S.r.l., Reggio Emilia, Italy

Filed Sep. 25, 1991, Ser. No. 765,205

Claims priority, application Italy, Oct. 3, 1990, 34851 B/90

Int. Cl.[5] H04N *5/65*

U.S. Cl. 358—247 **5 Claims**

2. A frame for assembling shielding units for the radiation emitted by apparatus incorporating variously sized video terminals comprising

a flat annular front structure,

a flat annular rear structure,

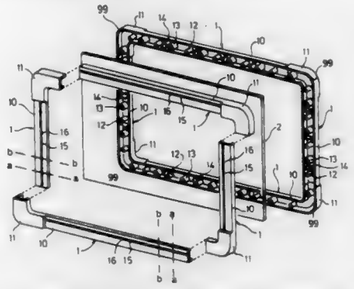
said front structure and said rear structure each being made up of four separate identically configured elements,

each said element being formed as one piece and having a straight portion and a corner portion,

each said element also having fastening means formed thereon and spaced therealong to fasten said front structure to said rear structure,

a shielding plate located between said front structure and said rear structure,

said fastening means also serving to clamp an outer edge of



said shielding plate in place between said front structure and said rear structure,

said fastening means on each element of either said front structure or said rear structure being engaged by said fastening means on two of said elements on the other of said front structure or said rear structure, and an outer face of said straight portion (**10**) of each said element (**1**) is provided with a longitudinal connection seat (**15**, **16**) to which members (**19**, **20**) providing means for supporting the frame in front of a screen (**3**) of said apparatus can be connected.

5,204,751

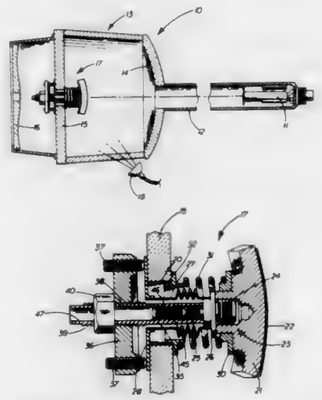
TARGET SUPPORT FOR PROJECTION CATHODE RAY TUBE

Kenneth S. Salyer, and Peter J. Czichon, both of Lexington, Ky., assignors to Hughes Display Products, Lexington, Ky.

Filed Aug. 17, 1990, Ser. No. 568,974

Int. Cl.[5] H04N *5/645*

U.S. Cl. 358—248 **10 Claims**



1. A target assembly for a projection cathode ray tube having a face plate comprising:

a target member having an electron beam sensitive coating for forming an image when excited by an electron beam;

a shaft screw for supporting said target member in spatial relationship in said tube;

mounting means for said shaft screw adapted to engage said face plate;

said mounting means including an adjustment pad for tilting said target member to focus the image of said projection tube; and

positive locking means for said mounting means to secure said target member in said spatial relationship spaced from said face plate to secure the focus;

whereby said target member is protected from being inadvertently tilted and the tube being defocused when subjected to shock loading.

5,204,752

IMAGE PROCESSING APPARATUS HAVING SHADOW COMPOSITION CAPABILITY USING BINARY DATA THINNING AND THICKENING CIRCUITS AND PRESET THINNING AND THICKENING WIDTH DATA

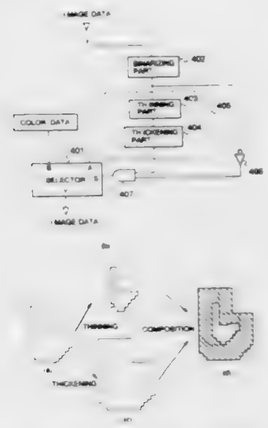
Shinji Yamakawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 24, 1992, Ser. No. 856,722

Claims priority, application Japan, Mar. 25, 1991, 3-082905

Int. Cl.[5] H04N *1/23, 1/387*

U.S. Cl. 358—296 **9 Claims**



1. An image processing apparatus having a scanning unit reading out image data by scanning a document, an image processing unit carrying out an image processing of the image data supplied by the scanning unit, and a recording unit outputting an image supplied by the image processing unit for recording the image, said image processing unit comprising:

control means for allowing real-time operations of the scanning unit and the recording unit;

binarizing means for generating signals indicative of binary data from the image data supplied by said scanning unit;

preset data generating means for generating either a preset thinning width or a preset thickening width;

a thinning circuit for carrying out a choking process in accordance with said preset thinning width whereby the binary data supplied by the binarizing means is moved either in a main scanning direction or in a sub scanning direction and a portion of an original image is removed so a to obtain a choked image;

a thickening circuit for carrying out a spreading process in accordance with said preset thickening width whereby the supplied binary data is moved either in the main scanning direction or in the sub scanning direction and an additional image portion is added to the original image so as to obtain a spread image; and

image composition means for generating a composite image of the choked image supplied by the thinning circuit and the spread image supplied by the thickening circuit so that a shadow is added to the original image.

5,204,753

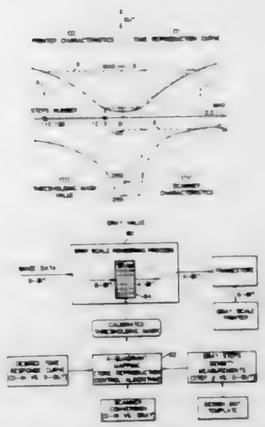
MULTI-BIT RENDERING METHOD AND ARRANGEMENT FOR CONTINUOUS TONE PICTURE REPRESENTATION AND PRINTING

Hwai-Tzuu Tai, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1992, Ser. No. 895,985

Int. Cl.[5] H04N *1/23*

U.S. Cl. 358—298 **10 Claims**



1. An arrangement for reproducing an original image, comprising:

a scanner which scans and digitizes the original image into pixels;

a controller coupled to the scanner to receive the digitized original image, and which produces a first signal corresponding to a gray level halftoned representation of the digitized original image; and

a printer coupled to the controller to receive said first signal and which produces a gray level halftoned reproduction of the original image;

wherein the controller includes means for obtaining a set of thresholding values at each pixel from a specified set of gray dot patterns by 4-quadrant tone reproduction.

5,204,754

VIDEO SIGNAL PROCESSING APPARATUS FOR RESTORING AN INTERLACED VIDEO SIGNAL STORED IN A MEMORY

Tsutomu Fukatsu, and Yoshihiro Nakatani, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 209,491, Jun. 20, 1988, abandoned. This application Jun. 14, 1991, Ser. No. 715,873

Claims priority, application Japan, Jun. 24, 1987, 62-158054; Jun. 26, 1987, 62-160584

Int. Cl.[5] H04N *5/783*

U.S. Cl. 358—339 **12 Claims**

1. A video signal processing apparatus comprising:

a) A memory capable of storing at least an (n+1) horizontal scanning line portion of an interlaced video signal having (2n+1) horizontal scanning lines for one frame which consists of two fields, n being an integer:

transmitting on said telephone line, responsive to signals

5,204,759

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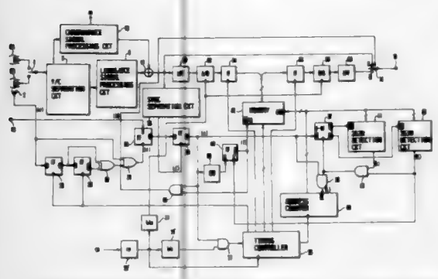
b) input means arranged to supply the interlaced video signal to said memory:

c) writing address control means for controlling a writing address of said memory, said writing address control means being arranged to reset the writing address of said memory in response to a front edge of a vertical synchronizing signal included in the interlaced video signal received by said input means so that a head portion of the



vertical synchronizing signal is written at a first address immediately after the resetting of the writing address; and

d) reading address control means for controlling a reading address of said memory, said reading address control means being arranged to reset the reading address of said memory alternately at an interval of n horizontal scanning periods and at an interval of (n+1) horizontal scanning periods.

5,204,755

RADIATOR SYSTEM IN IMAGE RECORDING APPARATUS

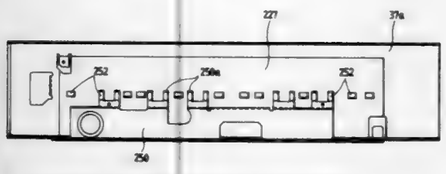
Shinichiro Taga; Izumi Takashima; Mitsuo Shimizu, and Toshiaki Kuraoka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 428,495

Claims priority, application Japan, Oct. 31, 1988, 63-277148

Int. Cl.[5] H04N *1/00*; G03G *15/00*

U.S. Cl. 358—400 **9 Claims**



1. An image recording apparatus, comprising:

a line sensor for reading image data;

a driver, connected to said line sensor, for outputting said image data read by said line sensor, said driver including an integrated circuit and said driver being mounted on a circuit board; and

a radiator system for dissipating heat generated by said driver, said radiator system physically contacting said driver and said radiator system including a radiating plate and a radiating piece protruding from said radiating plate, said radiating plate including a convex region physically disconnected from said circuit board.

5,204,756

METHOD FOR HIGH-QUALITY COMPRESSION OF BINARY TEXT IMAGES

Dan S. Chevion, Haifa; Ehud D. Karnin, and Eugeniusz Walach, both of Kiryat Motzkin, all of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1990, Ser. No. 559,734

Claims priority, application Israel, Aug. 4, 1989, 91221

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—426 **12 Claims**

1. Method for high-quality compression of binary text images for storage and possible future processing including transmission over data links, involving the scanning thereof on the record carrier on which they are presented in a pixel-by-pixel raster scan and deriving a string of digital data from the scanner output, characterized by the step of determining the degree of compressibility of the individual features of the original image based on the nature of the scan data derived from a specific vicinity of pixels in the original image, and, depending on the frequency of the information content of the data from said vicinity, assigning one of at least two different compression ratios to the data from each vicinity, and compressing said data in accordance with said one compression ratio.

5,204,757

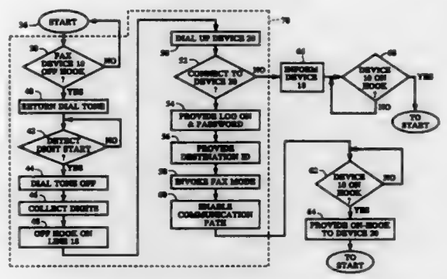
FACSIMILE FRONT END ROUTER

G. William Agudelo, 426 Pleasant St., Malden, Mass. 02148, and Shu-Kuang Ho, 56 Nowell Farme Rd., Carlisle, Mass. 01741

Filed Jan. 10, 1991, Ser. No. 639,796

Int. Cl.[5] H04N *1/00*; H04M *1/27*

U.S. Cl. 358—444 **7 Claims**



3. A method of connecting a facsimile transmission device to a facsimile store-and-forward service device, comprising the following steps:

storing a representation of a telephone number of a facsimile store-and-forward service device,

storing representations of log-on and password information for authorizing access by a facsimile transmission device to said facsimile store-and-forward service device,

maintaining receptivity to an off-hook condition signal received from said facsimile transmission device,

providing to said facsimile transmission device, responsive to a detected said off-hook condition signal, a dial tone signal,

thereafter maintaining receptivity to commencement of receipt of a first destination identifying signal from said facsimile transmission device,

terminating said dial tone signal responsive to detected said commencement,

thereafter collecting and storing a set of destination identifying signals including said first destination identifying signal,

providing an off-hook signal on a telephone line,

transmitting over said telephone line, responsive to a dial tone received on said telephone line, signals representing said stored store-and-forward service device telephone number,

transmitting on said telephone line, responsive to signals indicating establishment of a connection on said telephone line to said store-and-forward service device and to signals received from said service device, signals representing said stored log-on and password information and said stored collected set of destination identifying signals,

transmitting a fax mode invoke signal on said telephone line, enabling a communication path between said facsimile transmission device and said telephone line,

maintaining receptivity to an on-hook signal from said facsimile transmission device,

providing an on-hook signal on said telephone line responsive to a detected said on-hook signal.

5,204,758

FACSIMILE SYSTEM HAVING MULTIPLE MOUNTING PORTIONS

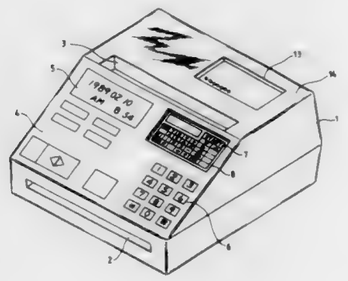
Takahiro Sakamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 644,443

Claims priority, application Japan, Jan. 25, 1990, 2-16810; Jan. 30, 1990, 2-19735; Jan. 31, 1990, 2-20728; Jan. 31, 1990, 2-20729; Jan. 31, 1990, 2-20730; Feb. 2, 1990, 2-23788; Feb. 5, 1990, 2-25490

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—444 **10 Claims**



1. A facsimile system, comprising;

a plurality of mounting portions for detachably mounting thereon data memory cards having data input keys and transmission means for transmitting data, each said card mounting portion having an opening so that said input keys on said card can be operated;

detection means incorporated in each of said plurality of mounting portions which detects whether said card is mounted, said detection means generating a detection signal when detecting a card;

receiving means incorporated in each of said plurality of mounting portions which receives a signal sent from said transmission means; and

a control means capable of inputting a detection signal from each of the detection means incorporated in each of said plurality of mounting portions, said control means activating said pre-determined receiving means when a plurality of detection signals are inputted.

5,204,759

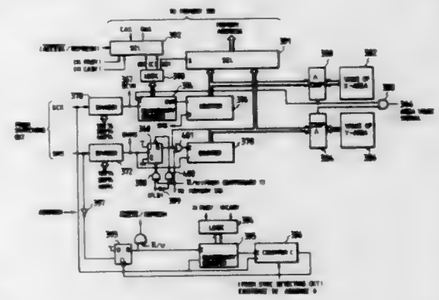
IMAGE PROCESSING APPARATUS

Masanori Sakai; Hiroyuki Horii, both of Yokohama; Takayuki Komine, Kawasaki; Yasumichi Suzuki; Yoshinori Ikeda, both of Tokyo, and Toshio Honma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 665,040, Mar. 21, 1991, abandoned, which is a division of Ser. No. 256,474, Oct. 12, 1988, Pat. No. 5,032,928. This application Aug. 20, 1992, Ser. No. 931,445

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—444 **9 Claims**



1. An image processing apparatus comprising:

a) a memory requiring refreshing operation at a predetermined interval;

b) a first synchronization system for generating synchronization signals for said refreshing operation;

c) a second synchronization system not synchronized with said first synchronization system; and

d) control means for prohibiting the refreshing operation in a cycle longer than said predetermined interval at the switching of said first and second synchronization system.

5,204,760

SYSTEM AND METHOD FOR CONVERTING CONTINUOUS HALF TONE IMAGE INTO PSEUDO HALF TONE IMAGE

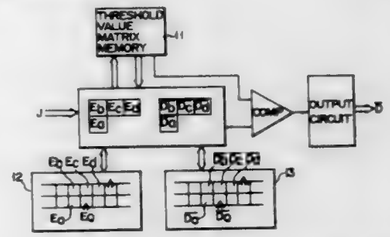
Masayoshi Murayama, and Fumitaka Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 26, 1991, Ser. No. 749,531

Claims priority, application Japan, Aug. 27, 1990, 2-225853; Aug. 27, 1990, 2-225854

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—456 **14 Claims**



1. A system for converting continuous tone image into a pseudo half tone image, which converts input image data expressed by a plurality of bits per pixel into output image data expressed by one bit per pixel, comprising:

error storage means for storing errors generated when input image data of pixels are converted into output image data expressed by one bit per pixel;

correction means for multiplying errors, stored in said error

storage means, at pixels adjacent to a pixel to be converted

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5,204,764

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FERROELECTRIC LIQUID CRYSTAL CELL WITH

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storage means, at pixels adjacent to a pixel to be converted with weighting coefficients so as to correct the density of an input image data value of the pixel to be converted;

threshold value storage means for storing threshold values having different values according to a position of the pixel to be converted, and used for determining a value of output image data; and

comparison means for comparing the input image data value corrected by said correction means, and the threshold value stored in said threshold value storage means corresponding to the position of the pixel to be converted to provide an output binary image data value of the pixel to be converted.

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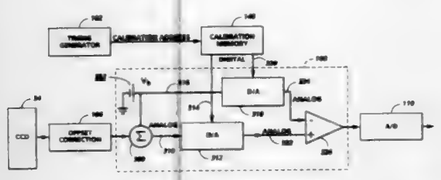
PIXEL BY PIXEL OFFSET AND GAIN CORRECTION IN ANALOG DATA FROM SCANNING ARRAYS

Donald J. Gusmano, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1991, Ser. No. 670,829

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—461 **3 Claims**



1. An image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing an analog response signal indicative of light intensity detected thereby, and gain correction means for correcting the gain of each analog response signal, comprising:

a memory storing digital gain correction values for each photosite;

first and second digital to analog converters, each converter having a reference input, a digital input and an analog output, and having an analog output response proportional to the value of signals directed to the reference input divided by the value of signals directed to the digital input;

a bias signal source, producing a predetermined bias signal;

means for algebraically combining the analog response signals and the predetermined bias signal;

said bias signal source, having a first connection to said reference input of said first digital to analog converter and directing said predetermined bias signal, and having a second connection to said algebraic combining means and directing the predetermined bias signal thereto;

said algebraic combining means directing an algebraic combination of said analog response signals and the predetermined bias signal to said reference input of said second digital to analog converter;

said memory storing digital gain correction values for each photosite, connected to said digital input of said first and second digital to analog converters, and controlled to deliver digital correction value signals thereto in accordance with the photosite from which the analog response signal was derived;

a difference deriving means, having first and second inputs, each input connected to one of the analog outputs of said first and second digital to analog converters, and operable on the analog output response therefrom, whereby a gain corrected analog response signal value is produced.

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IMAGE READING DEVICE

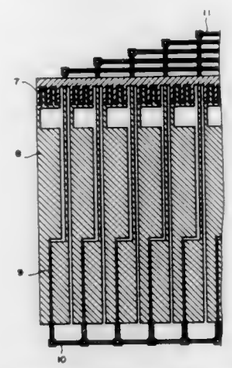
Tatsundo Kawai, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 727,359, Jul. 9, 1991, abandoned, which is a continuation of Ser. No. 563,858, Aug. 7, 1990, abandoned, which is a continuation of Ser. No. 262,726, Oct. 26, 1988, abandoned. This application Aug. 10, 1992, Ser. No. 925,426

Claims priority, application Japan, Oct. 30, 1987, 62-273133

Int. Cl.[5] A04M *3/14*

U.S. Cl. 358—474 **42 Claims**



1. An image reading device having a light-transmitting substrate and plural photoelectric converting elements arranged thereon, comprising:

dummy pattern areas formed in light-transmitting areas of said substrate in the vicinity of said photoelectric converting elements for transmitting a uniform amount of light through said substrate, said dummy pattern areas being formed on at least one of (1) a side portion, and (2) an end portion of said photoelectric elements.

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LIGHT-SCATTERING ELEMENT

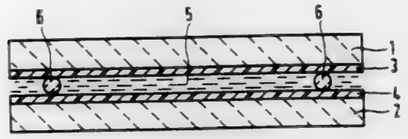
Rifat A. M. Hikmet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1992, Ser. No. 858,253

Claims priority, application European Pat. Off., Mar. 26, 1991, 91200675.6

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—51 **6 Claims**



1. A light-scattering element comprising a liquid-crystal material which is dispersed in a matrix of a transparent polymer material, characterized in that the matrix consists of polymer network of a uniaxially oriented polymer material, the difference between one of the refractive indices of the polymer material and the corresponding refractive index of the dispersed material being less than 0.10, measured at the wavelength at which the element is used.

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ELECTRO-OPTICAL DEVICE HAVING A FIRST AND A SECOND NONLINEAR RESISTANCE ELEMENT FORMED ON EACH PIXEL ELECTRODE

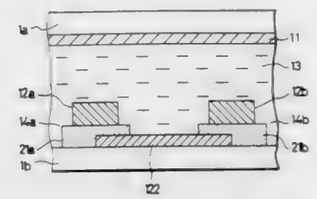
Takeshi Maeda, and Koji Iwasa, both of Tokyo, Japan, assignors to Seiko Instruments, Inc., Japan

Filed Feb. 15, 1991, Ser. No. 657,490

Claims priority, application Japan, Mar. 9, 1990, 2-59090

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—60 **3 Claims**



1. An electro-optical device comprising: two opposite substrates, a material having an electro-optical effect disposed between said two opposite substrates, row electrodes comprising a first row electrode and a second row electrode formed on one of the substrates, column electrodes formed on the other of the substrates, pixel electrodes arranged in a matrix form on at least one of the substrates, nonlinear resistance elements comprising a first nonlinear resistance element and a second nonlinear resistance element formed on respective peripheral portions of each pixel electrode, each pixel electrode being electrically connected to the first row electrode through the first nonlinear resistance element and electrically connected to the second row electrode through the second nonlinear resistance element, and the resistance values of the first and second nonlinear resistance elements being controlled by the voltage values applied to both the first and second row electrodes.

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LIQUID CRYSTAL DISPLAY DEVICE HAVING REFLECTOR OF A SUBSTRATE, A PATTERNED RESIN, AND A REFLECTIVE FILM, AND METHOD OF MAKING SAME

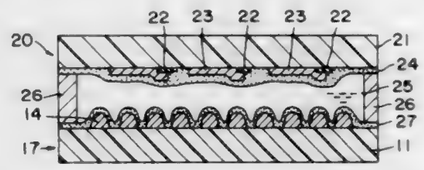
Seiichi Mitsui; Naofumi Kimura, and Yutaka Ishii, all of Nara, Japan, assignors to Sharp Kabushiku Kaisha, Osaka, Japan

Filed Jan. 17, 1992, Ser. No. 822,300

Claims priority, application Japan, Jan. 18, 1991, 3-4573

Int. Cl.[5] G02F *1/1335*

U.S. Cl. 359—70 **7 Claims**



1. A reflective liquid crystal display device comprising:

an insulating substrate having a transparent electrode formed thereon;

a reflector including a core substrate, a number of small convex portions formed on the core substrate by patterning a photosensitive resin applied to one surface of the core substrate by use of a photomask having a predetermined pattern, and a reflective film covering the surface of the core substrate having the convex portions; and

a liquid crystal layer sandwiched between the insulating substrate and the reflector.

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FERROELECTRIC LIQUID CRYSTAL CELL WITH PARTICULATE ADHESIVE DENSITY HIGHER NEAR SIDE

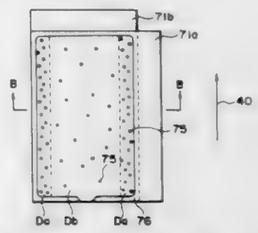
Osamu Taniguchi, Chigasaki; Shinjiro Okada, Isehara; Hironobu Mizuno, Hiratsuka, and Yutaka Inaba, Kawaguchi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 858,338

Claims priority, application Japan, Mar. 28, 1991, 3-087365

Int. Cl.[5] G02F *1/1339, 1/1333, 1/1337, 1/13*

U.S. Cl. 359—81 **6 Claims**



1. A liquid crystal cell, comprising: a pair of substrates each having an electrode thereon and disposed with their faces having the electrode opposite to each other, a spacer and a particulate adhesive disposed to leave a spacing between the substrates, and a liquid crystal disposed to fill the spacing between the substrates, wherein the particulate adhesive is dispersed at a higher density in a region close to a side of the cell than in a central region of the cell.

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PAY-CHANNEL TRANSMISSION SYSTEM FOR CATV

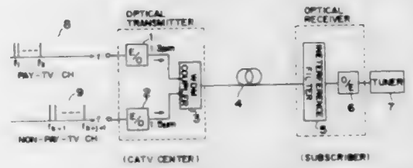
Hiroaki Nakata; Kuniaki Utsumi, both of Hirakata, and Kazuki Maeda, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 7, 1991, Ser. No. 772,486

Claims priority, application Japan, Oct. 9, 1990, 2-271130

Int. Cl.[5] H04J *14/02*

U.S. Cl. 359—125 **5 Claims**



1. A pay-channel transmission system for a CATV comprising:

(I) an optical transmission unit comprising:

a first optical signal generator for generating a frequency multiplexed pay-channel television signal which is multiplexed to an f_1–f_k frequency band and outputs a first optical signal by means of a λ_1 wavelength semiconductor laser;

a second optical signal generator for generating a frequency multiplexed non-pay-channel television signal which is multiplexed to a frequency band other than f_1–f_k and outputs a second optical signal by means of a λ_2 wavelength semiconductor laser; and

an optical combining means for combining said first and second optical signals; and

(II) an optical receiver unit for receiving the optical signal transmitted from the optical transmission unit comprising:

an optical blocking means for blocking said first optical

direction of said first optical pulse in the coherence-decay

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ELECTRICALLY RESPONSIVE LIGHT CONTROLLING

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signal and for transmitting only said second optical signal,

whereby a non-subscriber having said optical blocking means is prevented from receiving the first optical signal, and a subscriber having no optical blocking means is able to receive both the first and second optical signals.

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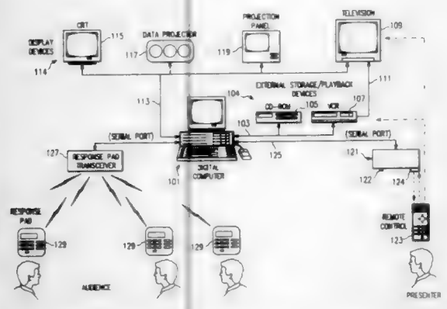
REMOTE CONTROLLED ELECTRONIC PRESENTATION SYSTEM

Alexander L. Tsakiris, and David L. Lawson, both of Dallas, Tex., assignors to Mind Path Technologies, Inc., Dallas, Tex.

Filed Feb. 12, 1991, Ser. No. 654,485

Int. Cl.[5] **H04B** *10/00*

U.S. Cl. 359—148 **25 Claims**



1. A remote controlled electronic system for controlling one or more remotely controllable electronic devices according to transmitted control signals, comprising:

a computer processing unit having a data storage device for storing keypad programming data;

transceiver means coupled to said computer processing unit for transmitting keypad programming data over a wireless communications link and receiving control signals to selectively operate the computer processing unit; and

a wireless remote control unit having a programmable keypad, means for receiving keypad programming data as stored in the computer processing unit and transmitted by said transceiver means over the wireless communications link, means for transmitting control signals over the wireless communications link, and means responsive to said received keypad programming data for programming the keypad and for configuring the wireless remote control unit to generate, in response to actuation of keys on the keypad, control signals reconstructed from the received keypad programming data and transmitted by the means for transmitting over the wireless communications link to selectively operate the computer processing unit and each electronic device.

5,204,769

POSTOBJECTIVE OPTICAL DEFLECTOR

Yasuo Matsumoto; Kazunori Murakami; Tomonori Ikumi, all of Shizuoka, and Yasuo Iwafune, Tokyo, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 772,651, Oct. 7, 1991, Pat. No. 5,153,766. This application Jun. 25, 1992, Ser. No. 904,011

Claims priority, application Japan, Sep. 22, 1987, 62-238534; Oct. 29, 1987, 62-274438; Oct. 29, 1987, 62-274439; Oct. 29, 1987, 62-274440; Dec. 25, 1987, 62-328908; Jan. 7, 1988, 63-001517

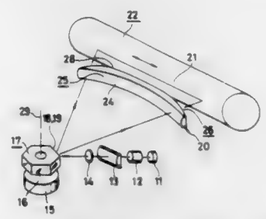
Int. Cl.[5] **G02B** *26/08*

U.S. Cl. 359—205 **4 Claims**

1. A postobjective optical deflector for a postobjective optical scanning device which scans an objective surface by a light beam emitted from a semiconductor laser, comprising:

a polygonal optical deflector for reflecting the light beam emitted from the semiconductor laser toward the objective surface, having a plurality of convex reflecting surfaces each formed of a portion of a spherical surface or a portion of the circumference of a circular cylinder having its power in the scanning direction; and

a correcting lens disposed between the polygonal optical deflector and the objective surface on an optical path; and having a rotationally symmetric curved surface of incidence having a cross section having the shape of an arc of a circle with its center on the axis of rotational symmetry, rotationally symmetric with respect to a plane including the axis of rotation of the polygonal optical deflector and perpendicular to axis of rotational symmetry and having its power in both the feed direction and the scanning direction, and a surface of departure symmetrical with respect to a plane perpendicular to the scanning direction and having its power in the scanning direction.



5,204,770

ALL OPTICAL IMAGE PROCESSING AND PATTERN RECOGNITION APPARATUS USING STIMULATED PHOTON ECHOES

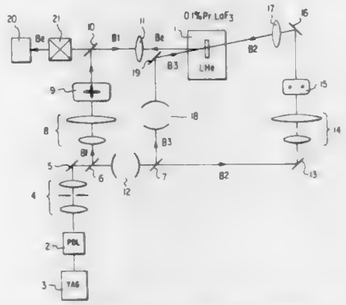
Ravinder Kachru, Redwood City; Emily Y. Xu, Mountain View, both of Calif.; Stefan Kroll, Lund, Sweden; David L. Huestis, Menlo Park, Calif., and Myung-Keun Kim, Troy, Mich., assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

PCT No. PCT/US90/01345, § 371 Date Jul. 5, 1991, § 102(e) Date Jul. 5, 1991

PCT Filed Mar. 15, 1990, Ser. No. 721,459

Int. Cl.[5] **G02F** *1/00;* **G02B** *27/46;* **G06K** *9/74;* **G06E** *3/00*

U.S. Cl. 359—264 **8 Claims**



1. An all optical image processing and pattern recognition apparatus using stimulated photon echoes comprising:

a stimulated photon echo medium having an inhomogeneous broadening line shape function;

first incident means for launching a first optical pulse into said photon echo medium;

second incident means for launching a second optical pulse train including two or more optical pulses into said photon echo medium from a direction different from the incident direction of said first optical pulse in the coherence-decay time of said photon echo medium after the incidence of said first optical pulse;

third incident means for launching a third optical pulse into said photon echo medium in the population-decay time of said photon echo medium after the incidence of said second optical pulse train, said population-decay time being defined as time during which said medium returns to its thermal equilibrium state from its excited state; and

optical detecting means for detecting photon echoes emitted from said photon echo medium,

wherein said second optical pulse train includes a plurality of pieces of image information.

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OPTICAL CIRCULATOR

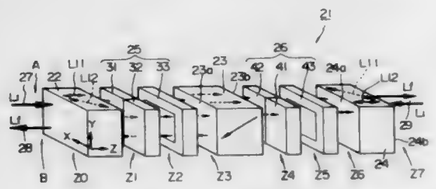
Masafumi Koga, Yokosuka, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Dec. 16, 1991, Ser. No. 807,240

Claims priority, application Japan, Dec. 17, 1990, 2-402944; Jun. 17, 1991, 3-144984

Int. Cl.[5] **G02F** *1/09;* **G02B** *27/28*

U.S. Cl. 359—281 **14 Claims**



1. An optical circulator for transmitting lights from the incoming and outgoing ports circularly, said optical circulator comprising:

a first dividing and combining means for dividing a beam into two beams of orthogonal electric field vectors and for combining two beams of orthogonal electric field vectors from different paths into one on the same path; a beam path determining means for introducing a beam to a different direction depending on the direction of the electric field vector and the propagation; and a second dividing and combining means for dividing a beam into two beams of orthogonal electric field vectors and for combining two beams of orthogonal electric field vectors from different paths into one on the same path, said first dividing and combining means, said beam path determining means and said second dividing and combining means being disposed along the direction of propagation of the incoming beam at predetermined intervals;

a first polarization rotating means between said first dividing and combining means and said beam path determining means for making two orthogonal polarization vectors parallel or the two parallel polarization vectors orthogonal to one another; and

a second polarization rotating means between said beam path determining means and said second dividing and combining means for making two orthogonal polarization vectors parallel or the two parallel vectors orthogonal to one another.

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ELECTRICALLY RESPONSIVE LIGHT CONTROLLING DEVICE

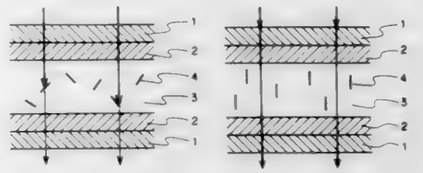
Masahiro Hirata, Takatsuki; Masato Hyohdou, Nishinomiya; Hiroaki Tada, Kobe; Yasuhiro Saito, Nishinomiya, and Hideo Kawahara, Minoo, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 26, 1991, Ser. No. 797,856

Claims priority, application Japan, Nov. 28, 1990, 2-331080

Int. Cl.[5] **G02B** *26/00, 5/02*

U.S. Cl. 359—296 **2 Claims**



1. A light controlling device comprising a suspension of anisotropic particles in a dielectric medium and a pair of electrodes for applying an electric field to said suspension, said anisotropic particles having a form anisotropy of at least 3.5 in aspect ratio and comprising an inorganic titanium compound of the formula: TiO_xN_y wherein $1.37 \leqq x+y \leqq 1.95$ and $0.15 \leqq y \leqq 0.92$ and having an absorption coefficient of at least $5 \times 10^3\ cm^{-1}$.

5,204,773

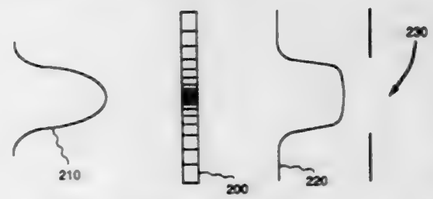
ULTRAVIOLET LIGHT FILTER AND FILTER SYSTEM

Renato Guida, Wynantskill, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 590,847, Oct. 1, 1990, abandoned. This application Dec. 19, 1991, Ser. No. 810,266

Int. Cl.[5] **G02B** *5/22*

U.S. Cl. 359—361 **26 Claims**



1. A filter for reducing the intensity of ultraviolet light comprising:

a substrate which is substantially transparent to ultraviolet light at least for wavelengths in the range of 193 nanometers to 248 nanometers inclusive; and

a pattern of ultraviolet light absorbing chemical species distributed within said substrate.

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NIGHT VISION GOGGLE WITH IMPROVED OPTICAL SYSTEM

R. Calvin Owen, Jr., Lincoln, Mass.; Robert A. Gallagher, Roanoke, Va., and Robert M. Burley, Concord, Mass., assignors to Varo Inc., Garland, Tex.

Filed Dec. 6, 1991, Ser. No. 803,036

Int. Cl.[5] **G02B** *23/00, 13/00*

U.S. Cl. 359—418 **13 Claims**

1. A night vision goggle, comprising:

a housing;

a collimator assembly, supported within the housing, having an optical axis;

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between the wider faces of the slats and with the plurality

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ZOOM LENS CAPABLE OF BEING ADJUSTED FOR

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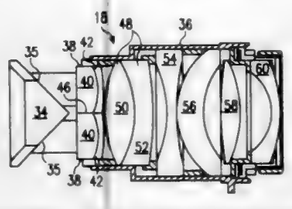
a pair of afocal telescopes, supported within the housing, each of the telescopes having an aspheric singlet objective lens, an aspheric singlet eyepiece lens, and a mirror mounted between the objective lens and the eyepiece lens, each of the telescopes also having an entrance pupil, an exit pupil, and an optical axis offset from the optical axis of the collimator, for transmitting images separately to each eye of a viewer;

a splitter member, mounted within the housing concentrically with the optical axis of the collimator assembly and located optically between the collimator assembly and each telescope, for reflecting an image viewed by the collimator to each of the telescopes;

an objective lens assembly, supported within the housing,



for transmitting an image incident thereon to the collimator assembly;

an image intensifier tube, located between the objective lens assembly and the collimator assembly, for intensifying an image viewed by the objective lens assembly before its transmittal to the collimator assembly; and

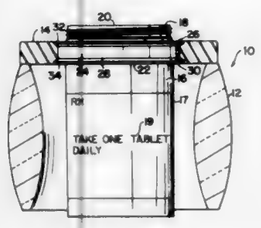
a pair of achromatic doublet lens assemblies, each doublet lens assembly mounted within the housing near the entrance pupil of a telescope and with its optical axis coaxial with the axis of the telescope, each doublet lens assembly being a cemented doublet with approximately zero optical power, for collecting light from a sub-diameter, decentered aperture of the collimator, and for correcting the axial chromatic aberration of the afocal telescope with which it is optically associated.

5,204,775

DEVICE FOR MAGNIFYING INDICIA PRINTED ON A CONTAINER

Timothy E. McDevitt, Clinton, Conn., assignor to TT&B, Inc., Clinton, Conn.

Filed Feb. 4, 1992, Ser. No. 830,728
Int. Cl.[5] G02B *27/02*
U.S. Cl. 359—442 **7 Claims**



1. A device for magnifying indicia printed on a container, wherein said container is in assembly with a cap member, said device comprising:

a bi-convex lens at least partially surrounding said container for magnifying said indicia;

means for releasably attaching said device to said cap member, and

means for maintaining said bi-convex lens in spaced relationship to said indicia to effect magnification thereof when said device is attached to said container.

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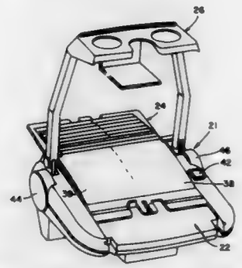
AUTOMATIC VIEWER AND ASSOCIATED PHOTOPRINT CARRIER FOR HALF-FRAME STEREO PRINTS

Tom M. Seamans, Corfu, and Donald M. Harvey, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1991, Ser. No. 747,593
Int. Cl.[5] G02B *27/22*
U.S. Cl. 359—466 **8 Claims**



1. An automatic stereoscopic viewer for viewing stereoscopic photoprints, the viewer comprising:

a stereoscopic lens arrangement mounted on a base over which base a plurality of stereoscopic prints are linearly advanced;

means for pivotally mounting the stereoscopic photoprints on a carrier deck wherein the carrier includes first and second openings;

a foot means for supporting the carrier deck on the base, the foot means including a surface thereon for engaging the photoprint for kicking the photoprint over after the photoprint has been viewed;

means for causing the foot means to sequentially engage the first recesses in the carrier deck individually;

picking means on the base for positively engaging the second recesses on the carrier deck individually; and

control means for retracting and projecting the foot means in concert with advancing the picking means to index the carrier over the base so as to sequentially view the photoprints, the control means includes a drive shaft with cam means thereon for engaging the foot means and picking means and a motor connected to the drive shaft for cycling the cam means by rotating the drive shaft.

5,204,777

ENERGY EFFICIENT SKYLIGHT AND BLIND

Donald B. Curshod, Woodside, Calif., assignor to SEA Corporation, Sunnyvale, Calif.

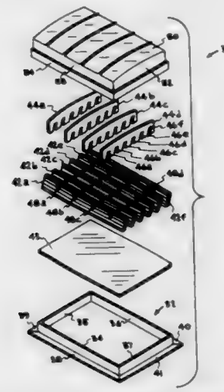
Filed Jan. 23, 1992, Ser. No. 825,204
Int. Cl.[5] G02B *17/00, 27/00*
U.S. Cl. 359—596 **56 Claims**

1. An energy-efficient barrier for the direct rays of the sun, comprising:

a plurality of slats, each slat having a thin cross-section and wider faces, wherein one of the faces has formed on it a plurality of reflective surfaces; and

means for mounting the slats in orientation to the direct rays of the sun, with the slats being aligned to pass the direct rays of the sun, which are coming from a first direction,

between the wider faces of the slats and with the plurality of reflective surfaces on each slat being aligned to reflect



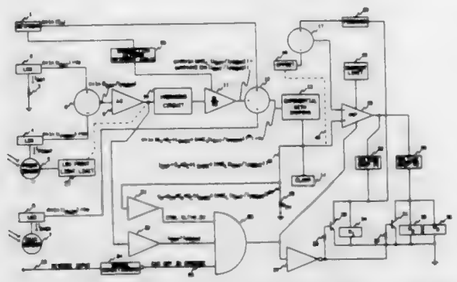
back the rays of the sun, which are coming from a second direction.

5,204,778

CONTROL SYSTEM FOR AUTOMATIC REARVIEW MIRRORS

Jon H. Bechtel, Holland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

Filed Apr. 6, 1992, Ser. No. 863,442
Int. Cl.[5] G02B *5/08*
U.S. Cl. 359—604 **46 Claims**



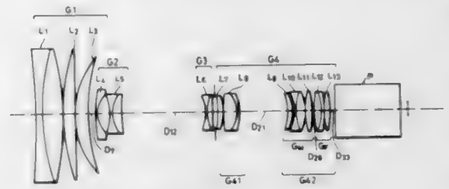
1. An electronic control system for controlling a reflective state of an automatic rearview mirror for an automotive vehicle, said system including a rearview mirror comprising an electrochromic variable reflectance mirror element the reflectivity of which varies over a reflectance range as a function of electrical signal levels applied thereto, first sensing means effective to sense the ambient light level and produce a first electrical signal which is at least in part logarithmically related to the sensed ambient light level, second sensing means effective to sense glare causing light level and produce a second electrical signal which is at least in part logarithmically related to the sensed glare causing light level, means to combine signals derived from said first and second electrical signals to produce at least a third electrical signal which is at least in part indicative of the severity of the glare, and means responding at least in part to said third electrical signal to control the reflective state of said mirror element.

5,204,779

ZOOM LENS CAPABLE OF BEING ADJUSTED FOR TRACKING

Kazuo Nakata, Tokyo, and Shigeru Oshima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 647,760
Claims priority, application Japan, Jan. 31, 1990, 2-20715
Int. Cl.[5] G02B *15/14*
U.S. Cl. 359—688 **6 Claims**



1. A zoom lens comprising:

a front lens portion having a plurality of lens units which are separated from each other by spaces that are variable for zooming; and

a rear lens portion for introducing rays of light emitted from said front lens portion to an image surface, said rear lens portion consisting of a front relay group and a rear relay group, said rear relay group comprising a first movable lens group having a positive refractive power and a second movable lens group having a positive refractive power, wherein a lateral magnification $\beta 1$ of said first movable lens group and a lateral magnification $\beta 2$ of said second movable lens group satisfying the following conditions:

$$0.18 \leqq (1-\beta 1^2)\,\beta 2^2 \leqq 0.5$$

$$0.5 \leqq (1-\beta 2^2) \leqq 0.82$$

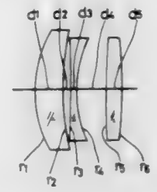
and said first movable lens group is adapted to move along an optical axis for macro photography while said second movable lens group is adapted to independently move along the optical axis for tracking adjustment.

5,204,780

LENS SYSTEM FOR A COPYING MACHINE

Keijiro Sakamoto, Kaloleni, Kenya, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 499,096, Mar. 26, 1990, abandoned.
This application Nov. 12, 1991, Ser. No. 794,355
Claims priority, application Japan, Mar. 28, 1989, 1-077304; Mar. 29, 1989, 1-080119
Int. Cl.[5] G02B *15/14*
U.S. Cl. 359—690 **8 Claims**



4. A three group, three component lens system comprising, in order from one side:

a first, positive meniscus lens defining a convex surface directed to an object plane;

a second lens having a negative power, and

a third lens having a positive power.

said second and third lenses being formed of plastic, and the

Z: Distance from a plane vertical to an optical axis passing

among those particular optical materials for which said

rear plates and in the cavity not occupied by said core, to

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said second and third lenses being formed of plastic, and the lens system included within a photocopier system having a fixed distance between the object plane and an image plane and requiring a clarity of image to correspond across an image having a fixed size in both the object and image planes, the lens system satisfying the following expressions:

$$0.04f<f_1+f_2<0.06f \quad (a)$$

where f is a focal length of the lens system, f_1 is a focal length of said first lens, and f_2 is a focal length of said second lens;

$$0.015f<d_2<0.025f \quad (b)$$

where d_2 is an axial distance between said first and second lenses;

$$0.05f<d_4<0.15f \quad (c)$$

where d_4 ia an axial distance between said second and third lenses;

$$35<\nu_1<50, \text{ and} \quad (d)$$

$$1.65<N_1$$

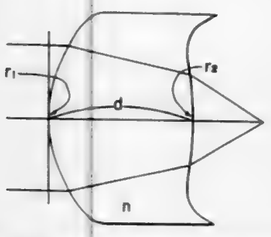
where ν_1 is Abbe number of a material forming said first lens, and N_1 is a refractive index at line d of the material forming said first lens.

5,204,781

INFINITE LARGE-APERTURE LENS SYSTEM WITH ASPHERICAL SURFACES

Isao Ishibai, and Yutaka Kawai, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 482,848, Feb. 22, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 793,272
Claims priority, application Japan, Feb. 24, 1989, 1-44398
Int. Cl.[5] G02B *3/02*
U.S. Cl. 359—708 **4 Claims**



1. An infinite lens system for receiving light having parallel rays and wavelengths between 1300 nm and 1550 nm and for collimating light having wavelengths between 1300 nm and 1550 nm, said lens system comprising a large-aperture lens with first and second aspherical surfaces represented by equation (1), the lens also having a shape and formed from a glass fulfilling the conditions of equations (2) to (4)

$$Z=[C_iY^2/[1+(1-(1+K_i)C_i^2Y^2)^{\frac{1}{2}}]]+E_iY^4+F_iY^6+-G_iY^8+H_iY^{10} \quad (1)$$

$$1.0<(f/NA)<3.0 \quad (2)$$

$$1.2<r_1/[(n-1)f]<2.3 \quad (3)$$

$$n>1.70, \nu>30.0 \quad (4)$$

where,

Z: Distance from a plane vertical to an optical axis passing the apex to one of the first and second aspherical surfaces
Y: Height from the optical axis of the lens
C_i: Curvature of the aspherical surface apex of the i-th surface ($1/r_i$)
K_i: Conical constant of the i-th surface
E_i to H_i: Coefficients of aspherical surfaces of the fourth- to tenth-order of the i-th surface
NA: Numerical aperture
f: Focal length
d: Lens thickness
r_i: Radius of curvature of aspherical surface apex of the i-th surface
n: Refractive index of the glass at wavelengths between 1300 nm and 1550 nm
ν: Abbe number of the glass at wavelengths between 1300 nm and 1550 nm,

wherein i=1 and 2 for said first and second aspherical surfaces, respectively, and said lens has a magnification factor β of zero.

5,204,782

COLOR-CORRECTED OPTICAL SYSTEMS

Romeo I. Mercado, San Jose, and Paul N. Robb, Sunnyvale, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 393,087, Aug. 9, 1989, which is a continuation of Ser. No. 419,705, Sep. 20, 1982, abandoned. This application Dec. 27, 1990, Ser. No. 634,653
Int. Cl.[5] G02B *9/14*
U.S. Cl. 359—786 **12 Claims**

1. An optical system comprising a plurality of refractive elements, the refractive elements of said system being made of only two different optical materials, said optical materials being exclusive of calcium fluoride, each of said optical materials having a characteristic dispersive power, the dispersive powers of said two different optical materials being related to each other so that color correction of said system at more than two wavelengths is possible, the refractive elements comprising said system having specified geometrical configurations and positions with respect to each other along an optic axis so that said system is color-corrected at more than two wavelengths and so that said system is well-corrected for monochromatic aberrations, said system being made by a process that includes selection of said optical materials, said optical materials being selected by:

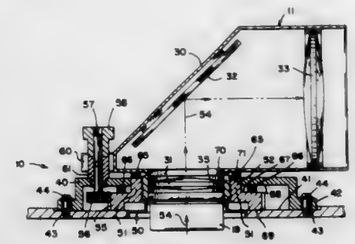
a) representing the dispersive power of each optical material by a polynomial expression in a variable that is a function of wavelength, the polynomial expression for each optical material being of a degree that is numerically one less than the number of wavelengths for which color correction is required;
b) comparing a ratio of coefficients in the polynomial expression for one of said optical materials with corresponding ratios of coefficients in the polynomial expressions for others of said optical materials;
c) identifying particular optical materials for which said corresponding ratios of coefficients in said polynomial expressions are substantially equal; and
d) choosing optical materials for designing said system from among those particular optical materials for which said corresponding ratios of coefficients are substantially equal.

5,204,783

FOCUSING APPARATUS FOR A FOLDED COLLIMATING LENS IN AN X-RAY IMAGING SYSTEM

Terry D. Buss, Watertown; Johnathan C. Boomgaarden, Waukesha; Michael D. Maki, Oconomowoc, all of Wis., and Sharad K. Bohra, St. Nom La Breteche, France, assignors to General Electric Company, Milwaukee, Wis.

Filed Sep. 13, 1991, Ser. No. 759,584
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—811 **7 Claims**



1. A focusing apparatus for a folded optics collimating lens in an X-ray imaging apparatus comprising:

a folded optics collimating lens having a threaded cylindrical member projecting down from a bottom surface of the collimating lens;
an idler member having threads formed in a central bore, with the threads on the idler member being mated to and in mating engagement with the threaded cylindrical member of the collimating lens;
a base having a guide opening, with the idler member including a cylindrical surface rotatably disposed in the guide opening of the base;
means for rotating the idler member within the guide opening of the base; and
means for restraining rotation of the collimating lens;
wherein rotation of the idler member imparts linear movement to the collimating lens along an axis of the rotation.

5,204,784

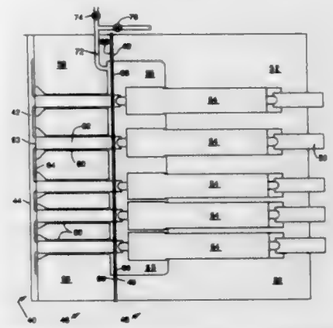
DEFORMABLE MIRROR WITH PNEUMATIC ACTUATOR PRE-LOAD

James M. Spinhirne, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 6, 1990, Ser. No. 622,911
Int. Cl.[5] G02B *7/185*
U.S. Cl. 359—849 **9 Claims**

1. A deformable mirror having a face plate and a plurality of axially movable actuators for controlling the surface contour of such mirror, the improvement comprising, inserting a pneumatic pre-load assembly between such actuators and said face plate, which assembly includes:

a) diaphragm plate mounted behind and proximate said face plate,
b) a rear plate, spaced from and behind said diaphragm plate,
c) an apertured core mounted between said diaphragm and rear plates, which core is attached to said diaphragm plate and spaced from said rear plate to define a cavity therewith and therein.
d) a plurality of contour posts, each mounted in and through an aperture in said core, each post contacting said diaphragm plate and then said face plate at one end and contacting said rear plate at the other end of such post so as to substantially align with an actuator,
e) means to apply gas pressure between said diaphragm and rear plates and in the cavity not occupied by said core, to move said posts and rear plate into contact with said actuators to pneumatically pre-load same, so that the face plate and mirror contour surface are adjustable by axial



adjustment of said posts due to changes in the length of said actuators and

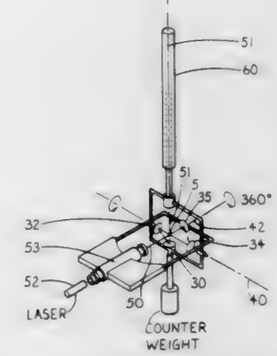
f) means to release the applied gas from said cavity and reduce the actuator pre-load for removal and/or replacement of an actuator or other component of said assembly.

5,204,785

ARTICULATED ARM WITH SHOULDER JOINT

Kenneth Y. Tang, La Jolla; Murray R. Dunn, Carlsbad, and William G. Hulburd, San Diego, all of Calif., assignors to Thermo Electron Technologies Corp., San Diego, Calif.

Continuation-in-part of Ser. No. 618,645, Nov. 27, 1990, Pat. No. 5,115,355. This application May 19, 1992, Ser. No. 886,039
Int. Cl.[5] G02B *7/182*
U.S. Cl. 359—876 **4 Claims**



1. An articulated arm for directing a laser beam comprising:

at least one Coude optics system, each such system comprising a two axis gimbal system defining a first axis and a second axis, said first axis intersecting said second axis at a point defining a Coude center of rotation,
a first mirror,
a second mirror,
a third mirror and
a fourth mirror;
said first and second mirrors being fixed with respect to each other and arranged to rotate about said first axis,

said third and fourth mirrors being fixed with respect to

running speed used when recording said video signal on said

having a record head and an erase head upstream from the

5,204,790

DIGITAL SIGNAL RECORDING CIRCUIT FOR DIGITAL

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said third and fourth mirrors being fixed with respect to each other and arranged to rotate about said second axis;

said mirrors being positioned so as to permit a light beam entering said system along said first axis to be reflected off each mirror in turn and directed to various targets within a wide field of regard by appropriate movement of the two axis gimbal system;

at least one directioning arm means through which said beam is directed.

5,204,786

DIGITAL IMAGE RECORDING AND REPRODUCING APPARATUS

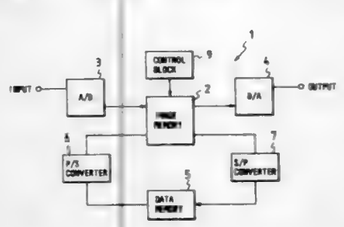
Tsuneo Ishii; Tadashi Ueda, and Kazuhisa Yoshita, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,247

Claims priority, application Japan, Jun. 20, 1989, 1-157465

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—32 **23 Claims**



1. A digital image recording and reproducing apparatus comprising:

an image memory for storing image data as multi-bit data values to be displayed;

a data memory for storing image data;

a serial-to-parallel converter, connected between said image memory and said data memory, for converting serial image data from said image memory into parallel image data;

a parallel-to-serial converter, connected between said image memory and said data memory, for converting parallel image data from said data memory into serial image data;

control means for operating said serial-to-parallel converter when said image data are to be transferred from said image memory to said data memory, and for operating said parallel-to-serial converter when said image data are to be transferred from said data memory to said image memory; and

a TV monitor for displaying said image data, wherein a partial digital image is displayed on said TV monitor when one bit from each multi-bit data value of said image data is transferred to the image memory and before any other bits from each multi-bit data value are transferred to the image memory.

5,204,787

TIME BASE CORRECTING APPARATUS WITH MEANS FOR INHIBITING MEMORY WRITE AND READ ADDRESSES TO PREVENT ADDRESS OVERLAP

Yoshinori Suzuki, and Yuji Nakamura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

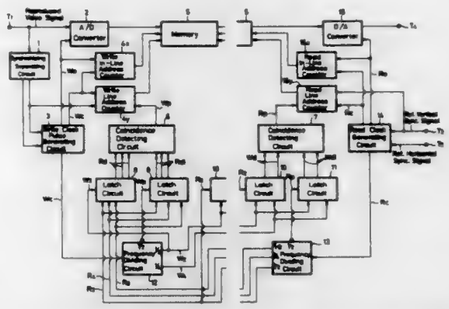
Filed Nov. 26, 1990, Ser. No. 617,878

Claims priority, application Japan, Nov. 28, 1989, 1-308069

Int. Cl.[5] H04N *5/78*

U.S. Cl. 360—36.1 **3 Claims**

1. Apparatus for use in a time base corrector of the type having memory means for storing and reading out a reproduced video signal reproduced by a rotary magnetic head from slant tracks on a magnetic tape which is transported at a desired tape running speed that may be different from a tape running speed used when recording said video signal on said tape, a write in-line address counter for generating a write in-line address signal supplied to said memory means, a write line address counter for generating a write line address signal also supplied to said memory means, means for providing a reproduced horizontal synchronizing signal from said reproduced video signal, a write clock signal generating circuit for generating a write in-line address increment clock signal and a write line address increment clock signal which are each synchronized with said reproduced horizontal synchronizing signal and which are supplied to said write in-line address counter and said write line address counter, respectively, a read in-line address counter for generating a read in-line address signal supplied to said memory means, a read line address counter for generating a read line address signal also supplied to said memory means, and a read clock signal generating circuit supplied with a reference horizontal synchronizing signal for generating a read in-line address increment clock signal and a read line address increment clock signal which are



each synchronized with said reference horizontal synchornizing signal and which are supplied to said read in-line address counter and to said read line address counter, respectively, the combination comprising:

means for generating first and second pairs of periodically recurring signal sequences derived form said reproduced horizontal synchronizing signal and said reference horizontal synchronizing signal, respectively;

detecting means for providing a first detected output when respective signals from said first pair of sequences coincide and for providing a second detected output when respective signals from said second pair of sequences coincide; and

control means for inhibiting a change of said read line address signal from said read line address counter in response to said first detected output from said detecting means and for inhibiting a change of said write line address signal from said write line address counter in response to said second detected output from said detecting means.

5,204,788

DIGITAL MAGNETIC RECORDING AND REPRODUCING CIRCUIT FOR SUPPRESSING GENERATION OF ASYMMETRY

Yasuhide Kasagi, Fukushima; Keiichi Nishikawa, and Yuzou Maruta, both of Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 13, 1991, Ser. No. 714,643

Claims priority, application Japan, Jun. 15, 1990, 2-157365; Nov. 21, 1990, 2-314393

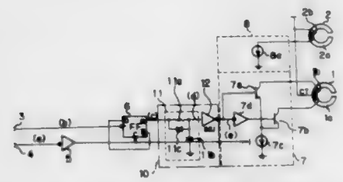
Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—46 **19 Claims**

4. A magnetic recording and reproducing circuit for suppressing assymmetry in a recording and reproducing apparatus

having a record head and an erase head upstream from the record head, the circuit comprising:

a flip-flop means for receiving pulse-shaped record data having means for providing an output signal which reverses state in accordance with the pulses of said record data;



a delay means for receiving the output signal of said flip-flop means and providing an output signal corresponding to the flip-flop output signal delayed by a first predetermined period of time;

means for receiving the output of said delay means and for driving said record and erase heads.

5,204,789

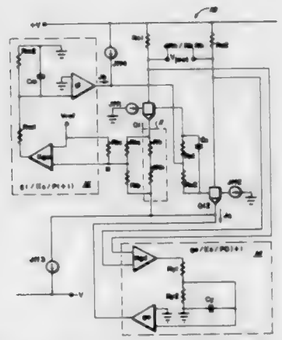
LOW NOISE VOLTAGE-BIASING AMPLIFIER FOR MAGNETORESISTIVE ELEMENT

Stephen A. Jove, Watsonville; Charles R. Nielsen; Calvin S. Nomura, both of San Jose, all of Calif., and Michael L. Workman, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1991, Ser. No. 648,675

Int. Cl.[5] G11B *5/02, 5/127*

U.S. Cl. 360—67 **15 Claims**



1. A circuit for producing low noise electrical output signals which are amplified representations of signals produced by a magnetoresistive (MR) element, said circuit comprising:

a first feedback loop (14) comprising (a) a source of bias current (Ja+Jff3) for biasing the MR element with a bias voltage (Jff1 or Jff2)(Rx1+Rx2) and (b) an input amplifier (Qi1, Qi2, Rc1, Rc2) that is biased by said current and amplifies a signal current ((Jff1 or Jff2)(Rx1+Rx2)/dRh) from the MR element for producing a circuit output signal corresponding to dRh/RhRh, where said RhRh is the square of the time-averaged resistance of the MR element and said dRh is the magnetic-signal-induced change in the resistance of the MR element.

5,204,790

DIGITAL SIGNAL RECORDING CIRCUIT FOR DIGITAL VIDEO CASSETTE TAPE RECORDER

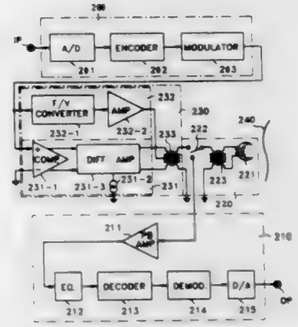
Chang-jin Yang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Feb. 27, 1991, Ser. No. 661,266

Claims priority, application Rep. of Korea, Feb. 28, 1990, 90-2613

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—68 **11 Claims**



1. A digital signal recording circuit, comprising:

recording signal generating means for converting an input signal into a digital signal of a format appropriate for recording on a recording medium;

equalization means for compensating deterioration in said digital signal caused by frequency variations thereof; and

read/write means for recording a compensated digital signal from said equalization means onto a recording medium.

5,204,791

TAPE LOADING DEVICE OF A VIDEO TAPE RECORDER HAVING A LINKAGE DRIVEN INCLINED AUXILIARY TAPE GUIDE MEMBER

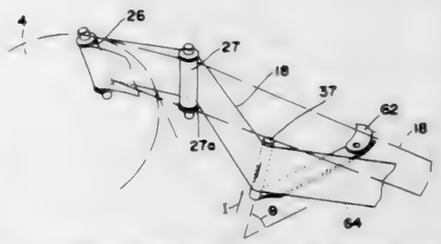
Akio Konishi, Hirakata; Koichiro Hirabayashi, Osaka; Hideaki Yoshio, Moriguchi; Shuzo Takeda, Hirakata, and Nobuaki Takagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 12, 1990, Ser. No. 597,305

Claims priority, application Japan, Oct. 13, 1989, 1-267326; Oct. 13, 1989, 1-267328

Int. Cl.[5] G11B *5/008, 15/61, 5/027*

U.S. Cl. 360—95 **2 Claims**



1. In a magnetic recording and/or reproducing apparatus having a chassis and a rotary magnetic head cylinder rotatably mounted on said chassis, a tape loading device comprising:

a plurality of guide members at least some of which are movable between a storage position and a recording and/or reproducing position for engaging and drawing a magnetic tape out of a tape cassette and for winding the magnetic tape around the magnetic head cylinder through

a given angle therearound and together with the remain-

means comprises a second gear positionable in an engaged

5,204,794

MAGNETIC DISK DRIVE COMPRISING DISK

lengths, which shape includes a first surface defined by said first and second lengths and a second surface defined

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a given angle therearound and together with the remainder of said guide members positioning the tape in a tape path along which the tape is to run during recording and/or reproducing;

a first link having a first end pivotaly mounted on said chassis;

a second link having a first end pivotally mounted on said chassis;

an arm member having a first end pivotally connected with a second end of said first link and an intermediate portion of said arm member being pivotally connected with a second end of said second link;

an auxiliary inclined guide member on a second end of said arm member; and

a driving means connected to said at least some of said guide members for moving said at least some of said guide members in a drawing out operation from the storage position to the recording and/or reproducing position and further connected to one of said first and second links for driving said one of said first and second links in synchronization with said at least some of said guide members for moving said auxiliary inclined guide member into contact with the magnetic tape at least over a limited distance during the drawing out operation, and moving said auxiliary inclined guide member away from said tape path after said drawing out operation is completed.

5,204,792

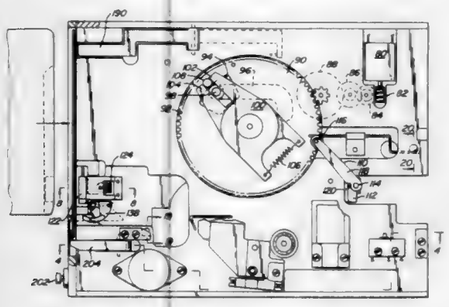
CARTRIDGE TAPE DRIVE

Philip Bryer, Los Angeles, Calif., assignor to Wangtek, Inc., Simi Valley, Calif.

Division of Ser. No. 433,700, Nov. 9, 1989, abandoned. This application Mar. 16, 1992, Ser. No. 851,718

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **18 Claims**



4. A cartridge tape drive for a rectangular cartridge having an access door along an edge thereof which is operable to allow access to a magnetic tape within the cartridge, comprising:

a housing having an opening dimensioned to receive the cartridge endwise and means for supporting the cartridge within said housing;

a magnetic head in said housing;

means for sensing the presence of at least a portion of the cartridge within said housing at a first position;

means comprises a motor and a first gear driven by said motor responsive to said sensing means for automatically moving the cartridge from said first position at least partially laterally to a second position in operative engagement with said magnetic head;

means operative with said moving means for opening the access door of the cartridge as the cartridge is moved from said first position to said second position; and

means comprises a second gear positionable in an engaged position with said first gear and a means for manually rotating said second gear for manually moving the cartridge out of operative arrangement with said magnetic head and withdrawing the cartridge from said housing; and

said second gear is further moveable between said engaged position and a disengaged position in which said second gear does not engage said first gear.

5,204,793

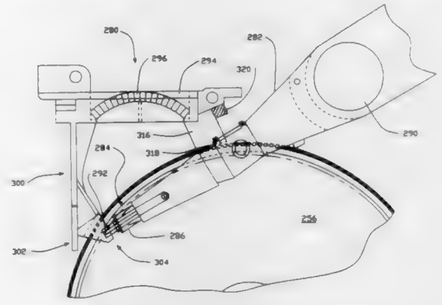
REMOVABLE CARTRIDGE DISK DRIVE WITH AN INTEGRAL HEAD LOADING RAMP, AIR FILTER AND REMOVABLE CARTRIDGE DOOR SAFETY STOP

Garold Plonczak, Livermore, Calif., assignor to Syguest Technology, Fremont, Calif.

Filed Jun. 28, 1991, Ser. No. 724,388

Int. Cl.[5] G11B *5/012, 17/00, 17/08, 5/54*

U.S. Cl. 360—97.01 **33 Claims**



1. An integral apparatus for a disk drive which has a transducer mounted onto a movable actuator arm which disk drive is adapted for receiving a removable cartridge having a door which is positionable in an open and in a closed position and containing a disk for storing data, comprising:

an integral member having:

means adapted for selectably ensuring that the door of the cartridge is properly opened should the door position reach a predefined threshold and for preventing the further reception of the cartridge into the disk drive should the door position not reach the predefined threshold; and

ramp means for receiving the actuator arm in order to ramp the transducer off of the disk; and

means adapted for holding an air filter for filtering air that flows past the disk.

33. An integral apparatus for a disk drive which has a transducer mounted onto a movable actuator arm which disk drive is adapted for receiving a removable cartridge having a door which is positionable in an open and in a closed position and containing a disk for storing data, comprising:

an integral member having:

means adapted for selectably ensuring that the door of the cartridge is properly opened and for preventing the reception of the cartridge into the disk drive should the door not be properly opened; and

ramp means for receiving the actuator arm in order to ramp the transducer off of the disk.

5,204,794

MAGNETIC DISK DRIVE COMPRISING DISK CARTRIDGE AND DRIVING DEVICE, WHICH DISK CARTRIDGE INCLUDES CONNECTOR FOR CONNECTING THE DISK CARTRIDGE TO THE DRIVING DEVICE AND CONNECTOR COVER FOR COVERING THE CONNECTOR

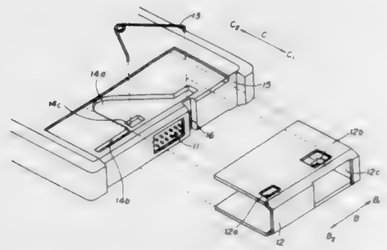
Kobun Yoshida, Sayama, Japan, assignor to TEAC Corporation, Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 610,809

Claims priority, application Japan, Nov. 13, 1989, 1-131817[U]

Int. Cl.[5] G11B *23/03, 5/012*

U.S. Cl. 360—133 **1 Claim**



1. A magnetic disk drive comprising:

a disk cartridge including a magnetic disk; and

a driving device engageable with said disk cartridge,

wherein said driving device comprises:

a disk rotating means, coupled to said magnetic disk, for rotating said magnetic disk,

a magnetic head which records information on said magnetic disk and/or reproduces information therefrom,

a housing which encloses said magnetic disk, disk rotating means, and magnetic head, so as to keep these components in an airtight environment,

a first connector, coupled to said disk rotating means and said magnetic head, which receives electricity, said information, and control signals, said electricity being used to drive said magnetic disk and said magnetic head, and said control signals being used to control operations of said magnetic disk and/or said magnetic head so that said magnetic head can properly record said information on said magnetic disk and/or reproduce said information therefrom, said first connector being embedded in said housing so that even if said first connector is uncovered, an interior of said housing can be kept in an airtight environment;

a connector cover movable between a first position and a second position, said connector cover completely covering said first connector at said first position, said connector cover completely uncovering said first connector at said second position;

wherein said driving device further comprises:

a second connector, connectable to said first connector, which supplies said electricity, said information to be recorded by said magnetic head, and said control signals, to said first connector of said disk cartridge, and which receives said information reproduced by said magnetic head;

cover moving means, coupled to said connector cover, for moving said connector cover between said first position and said second position, said cover moving means moving said connector cover to said second position when said first connector is to be connected to said second connector, and said cover moving means moving said connector cover to said first position when said first connector is disconnected from said second connector,

wherein said disk cartridge has a substantially rectangular parallelepiped shape defined by first, second and third lengths, which shape includes a first surface defined by said first and second lengths and a second surface defined by said second and third lengths, said first connector being embedded in said first surface, and said second surface including a groove extending along a direction of said second length,

wherein said connector cover comprises:

a tab engaged with said groove so that said connector cover can be moved along said groove via said tab; and

an elastic member having two ends, located in said groove, one end of which is engaged with said tab, and the other end of which is engaged with said groove, so that said connector cover is forced toward said first position by said electric member,

said disk cartridge adapted to be inserted into said driving device so as to be engaged therewith,

within said cover moving means comprises a pin, engageable with an end of said connector cover, which is engaged with the end of said connector cover when insertion of said disk cartridge into said driving device is started, and which gradually moves said connector cover from said first position to said second position against a force of said elastic member as said disk cartridge is being gradually inserted into said driving device.

5,204,795

MAGNETIC RECORDING AND REPRODUCTION SYSTEM HAVING OPPOSED MAGNETIC HEADS

Daisuke Mitsuhashi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 507,548, Apr. 11, 1990, Pat. No. 5,107,384. This application Nov. 12, 1991, Ser. No. 789,881

Claims priority, application Japan, Apr. 25, 1989, 1-103522

Int. Cl.[5] G11B *5/48, 21/16*

U.S. Cl. 360—104 **3 Claims**

1. A magnetic record playback device, operable with a magnetic disk having opposite recording surfaces and being rotatable in a free rotary surface plane, comprising:

a first, lower magnetic head disposed at a predetermined position with respect to the free rotary surface plane of said magnetic disk and opposing one recording surface of said magnetic disk;

a second, upper magnetic head disposed opposing said first, lower magnetic head across said magnetic disk;

a gimbal spring for supporting said second, upper magnetic head, said gimbal spring comprising an elastic member which deforms toward said magnetic disk so that said second, upper magnetic head contacts said magnetic disk while preventing said second, upper magnetic head from crushing said first, lower magnetic head during playback of said magnetic disk; and

control portions formed individually on said first, lower and second, upper magnetic heads for generating a negative pressure between said respective control portions and said magnetic disk in association with rotation of said magnetic disk, wherein said negative pressure occurring at said first, lower magnetic head is greater than said negative pressure occurring at said second, upper magnetic head.

5,204,796

5,204,799

PROTECTIVE ARRANGEMENT FOR

receptacle locations free from a respective interrupter device, and a voltage surge suppression device comprising a housing

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5,204,796

TAPE CASSETTE WITH TAPE TENSION CONTROLLED BY GREASE OF A SPECIFIED RANGE OF VISCOSITY

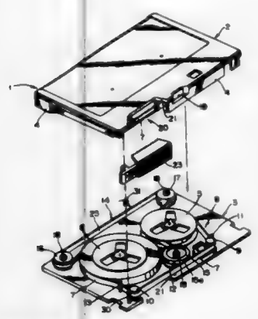
Osamu Koizumi; Kengo Saito; Kazuo Sasaki, and Masayuki Itabashi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 448,622, Dec. 11, 1989, abandoned. This application Feb. 15, 1991, Ser. No. 639,225

Claims priority, application Japan, Dec. 12, 1988, 63-313485; Dec. 15, 1988, 63-317355; Jan. 9, 1989, 1-929; Jan. 9, 1989, 1-930

Int. Cl.[5] G11B *23/02*

U.S. Cl. 360—132 6 Claims



1. A tape cassette comprising:

a pair of reels mounted side by side, on which tape is wound;

a cassette casing for rotatably enclosing said pair of reels therein;

a driven roller being rotated by a drive device of a recording and/or reproducing apparatus, associated with said tape cassette, said driven roller rotatably supported by an upstanding roller shaft fixed on the wall of said casing;

a pair of idle rollers, each rotatably supported by an upstanding roller shaft fixed on the wall of said casing;

a endless flexible drive belt for drivingly engaging said driven roller and said idle rollers to rotate said reels, such that a portion of said drive belt between said driven roller and each idle roller pressingly contacts a portion of the outermost peripheral surface of the tape wound on each reel, said drive belt being driven according to rotation of said driven roller;

means for controlling tape tension of the tape during operation of said tape cassette, said means including grease disposed between said associated rollers and shafts for lubricating the contacting surfaces therebetween, with a predetermined viscous drag;

said grease including a viscosity coefficient of 50 to 500 P (poise) within a grease temperature range of −10° to 60° C.

5,204,797

SOLID STATE OVERCURRENT PROTECTION SYSTEM FOR CIRCUIT BREAKERS

Edward R. O'Brien, III, Wayne, and Edward Rifkin, Plymouth Mtg., both of Pa., assignors to SPD Technologies, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 514,150, Apr. 25, 1990, abandoned, which is a continuation of Ser. No. 336,471, Apr. 12, 1989, Pat. No. 4,922,372. This application Apr. 25, 1991, Ser. No. 691,319

Int. Cl.[5] H02H *3/08*

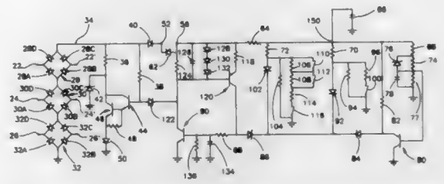
U.S. Cl. 361—93 13 Claims

1. In a three phase current system, a device for detecting a primary fault current and converting said detected fault current into mechanical action for breaking the circuit in which said primary fault current occurred, comprising:

a. means receiving said three phases of primary current, for providing corresponding phases of secondary current and choosing the largest magnitude secondary current as output therefrom;

b. means for providing voltage proportional to said largest magnitude secondary current;

c. means, connected to an object of said proportional voltage providing means, for moving a trip member providing said mechanical action;



d. means for directing said largest magnitude secondary current through said trip member moving means;

e. means for actuating said current directing means upon said voltage proportional to said largest magnitude secondary voltage substantially instantaneously rising to a predetermined first level;

f. means for adjusting said predetermined first level;

g. means for actuating said current directing means upon said voltage proportional to said largest magnitude secondary current reaching a second level and remaining at said second level for a predetermined time interval; and

h. means for adjusting said predetermined time interval.

5,204,798

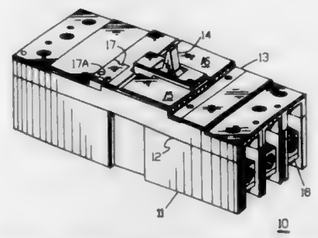
METERING ACCESSORY FOR MOLDED CASE CIRCUIT BREAKERS

Graham A. Scott, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,489

Int. Cl.[5] H02H *3/04*

U.S. Cl. 361—93 10 Claims



1. A metering accessory comprising in combination:

a plastic case and a transparent cover:

an alphanumeric display within said case subjacent said cover displaying circuit current data;

a metering circuit within said case and arranged for connection with an electronic trip unit and with a plurality of current transformers providing said circuit current data to said display; and

a rating resistor within said case arranged for connection with said trip unit to set the ampere rating of said trip unit.

5,204,799

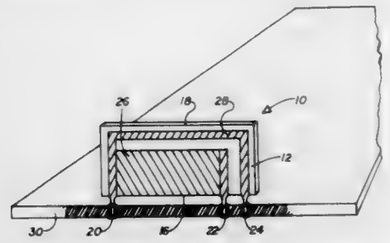
PROTECTIVE ARRANGEMENT FOR TELECOMMUNICATIONS LINE INTERFACE CIRCUIT

Michael E. Stibila, Lake Mary, Fla., assignor to GPT Limited, Coventry, England

Filed Mar. 22, 1990, Ser. No. 497,274

Int. Cl.[5] H01H *85/04*

U.S. Cl. 361—104 33 Claims



1. A circuit protection device designed to protect a pair of electrical circuits by fracturing at such time as an overcurrent condition has occurred in a first of said circuits, said device comprising a substantially flat substrate of non-conductive, frangible material upon which a resistive component and a fuse conductor reside in an adjacent relationship on a common surface, said resistive component being part of a first circuit, and said fuse conductor being part of a second circuit, said resistive component, at the time of an overcurrent therethrough, becoming hot and causing a heating of the near surface of said frangible substrate, said frangible substrate, as a result of such heating, elongating and then fracturing, the fracturing of said frangible substrate thereby bringing about a fracturing of said resistive component as well as a fracturing of said fuse conductor, thus to effect an interruption of said first circuit as well as a substantially simultaneous interruption of said second circuit.

5,204,800

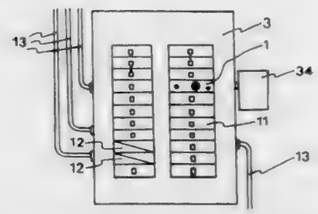
VOLTAGE SURGE SUPPRESSION DEVICE

Paul Wasney, 160 Wexford Street, N., Winnipeg, Manitoba, Canada R3R 0R7

Filed Aug. 6, 1990, Ser. No. 563,084

Int. Cl.[5] H02H *3/22*

U.S. Cl. 361—111 3 Claims



1. An electrical distribution panel for supplying electrical power from a main supply to a plurality of circuits comprising a main housing, a main supply bus mounted in the main housing, a neutral return, a ground connection, a first plurality of overcurrent circuit interrupter devices each having a housing containing circuit interrupter means and a contact terminal for engaging said main supply bus, a second plurality of receptacle locations in the main housing, each shape and arranged to receive one of said plurality of overcurrent circuit interrupter devices with the housing thereof received within the respective receptacle location and the contact terminal thereof engaged with said main supply bus, the second plurality being greater than the first plurality so as to leave at least one of said receptacle locations free from a respective interrupter device, and a voltage surge suppression device comprising a housing shaped and arranged for mounting in one of said receptacle locations, a contact element mounted in the housing of the suppression device for directly contacting the bus, voltage surge suppression circuit means provided in the housing of the suppression device responsive to a voltage surge, and at least two connector lead means, each connecting the circuit means to a respective one of the said neutral return and said ground connection, said housing of said suppression device being mounted in one of said receptacle locations which is free from an interrupter device and an overcurrent circuit interrupter device connected integrally with said voltage surge suppression circuit means within said housing of said suppression device, said overcurrent circuit interrupter device and said voltage surge suppression circuit means being arranged such that an overvoltage at said main supply bus is converted by said voltage surge suppression circuit means to an overcurrent through said voltage surge suppression circuit means which acts to actuate said overcurrent circuit interrupter device, and said voltage surge suppression circuit means being arranged to be responsive to any one of transients, spikes, harmonics, over-/under voltages and high frequency interference.

5,204,801

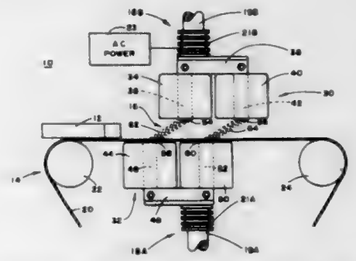
DEGAUSSING TECHNIQUE

Donald G. Becker, and David J. Etherton, both of Lincoln, Nebr., assignors to Garner Industries, Inc., Lincoln, Nebr.

Filed Apr. 17, 1992, Ser. No. 870,476

Int. Cl.[5] H01F *13/00*

U.S. Cl. 361—151 8 Claims



5. Apparatus for degaussing magnetic material comprising:

means for applying a magnetic field to the magnetic material with a flux density of at least 1,000 gauss and at an angle between 20 degrees and 50 degrees for a time period of at least one second; and

means for alternating the field at a frequency of at least ten hertz.

5,204,802

METHOD AND APPARATUS FOR DRIVING AND CONTROLLING AN IMPROVED SOLENOID IMPACT PRINTER

Ronald B. Howes, Jr.; Thomas R. Emmons, both of Minneapolis, and Dennis J. Warwick, Richfield, all of Minn., assignors to DataCard Corporation, Minnetonka, Minn.

Continuation of Ser. No. 276,235, Nov. 23, 1988, abandoned. This application Aug. 19, 1991, Ser. No. 749,625

Int. Cl.[5] H01H *47/32*

U.S. Cl. 361—154 16 Claims

1. An apparatus for controlling an impact imprinting system of a type including print elements used to imprint a chosen material, comprising:

a) solenoid means for driving the print elements in response to a current pulse;

b) current pulse generator means electrically interconnected to the solenoid means for generating and transmitting first

and second current pulses to said solenoid means, said first

both and sized so that a removable panelboard interior will fit

5,204,805

CASING ASSEMBLY FOR ELECTRONIC EQUIPMENT

a tube-like member housed in said casing;

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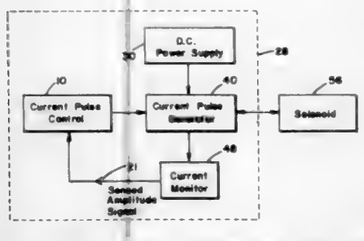
and second current pulses to said solenoid means, said first current pulse having a contact duration and a contact amplitude sufficient to actuate said solenoid means to cause the print elements to move to a position proximate the chosen material, said second current pulse having an imprint duration and an imprint pulse amplitude sufficient to actuate said solenoid means to cause the print elements to imprint the chosen material to a desired character height;

c) current monitor means electrically interconnected to the current pulse generator means for sensing amplitude of said first and second current pulses and for transmitting first and second current amplitude sense signals representative of said amplitude of said first and second current pulses, respectively, and

d) current pulse control means electrically interconnected to said current pulse generator means and said current monitor means for switching said current pulse generator



means between a pulse generating state and a nonpulse generating state, said current pulse control means including a first signal control means for comparing said first current amplitude sense signal received from said current monitor means to a first predetermined amplitude value corresponding to said contact pulse amplitude and, upon detection of said first predetermined amplitude value, switching said current pulse generator to said nonpulse generating state after a first predetermined period of time, corresponding to said contact pulse duration, said current pulse control means including a second signal control means for comparing said second current amplitude sense signal received from said current monitor means to a second predetermined amplitude value corresponding to said imprint pulse amplitude and, upon detection of the second amplitude value, switching said current pulse generator to said nonpulse generating state after a second predetermined period of time, corresponding to said imprint pulse duration.

5,204,803

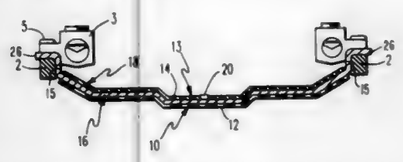
NEUTRAL SYSTEM FOR ELECTRIC DISTRIBUTION PANELBOARD

Louis L. Runge, Clinton, Miss., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1991, Ser. No. 810,089

Int. Cl.[5] H01B *17/06;* **H02B** *1/20*

U.S. Cl. 361—361 **13 Claims**



1. An insulated neutral bus having ends suitable for attachment to two parallel connecting buses or wiring terminals or both and sized so that a removable panelboard interior will fit between the ends comprising

a) a conductive bus having an elongated central portion, a pair of upwardly rising sidewalls attached to opposite ends of the central portion and a pair of end portions each attached to a sidewall and comprised of a substantially vertical wall and a substantially horizontal land extending from one end of the vertical wall, each vertical wall being attached to an upwardly rising sidewall, the horizontal land being sized for attachment to a neutral bar, the central portion and sidewalls being sized so that a removable panelboard interior will fit thereon and be positioned between the vertical walls;

b) an electrically non-conductive base configured to conform to the conductive bus and on which the conductive bus rests, the base having a first set of at least two spaced ribs extending along at least a portion of one side of the conductive bus and a second set of at least two spaced apart ribs extending along an opposite side of the conductive bus; and

c) an electrically non-conductive top sized and positioned to conform to and fit over the base and conductive bus and rest thereon, the top having a first rib frictionally engaging the first set of ribs and a second rib frictionally engaging the second set of ribs.

5,204,804

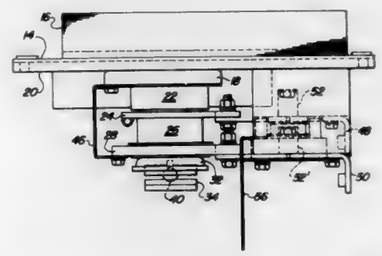
GTO MODULE WITH PIGGYBACK BYPASS DIODE

Ronald B. Bailey, and Stephen T. Radack, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Jan. 15, 1992, Ser. No. 821,517

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—386 **17 Claims**



1. A structure for mounting a power supply, the power supply having a thyristor with a first face and a second face opposite from the first face, and a bypass diode with a first face and a second face opposite from the first face, the structure comprising:

a heat sink;

a first bus plate having a first face contiguous to and thermally connected to the heat sink, and a second face opposite from the first face and engaging the thyristor first face;

a second bus plate having a first face operatively contacting the thyristor second face, and a second face opposite from the second face and engaging the bypass diode first face;

a third bus plate having a first face operatively contacting the second face of the bypass diode second face, and a second face opposite from the first face; and

clamp means, operatively connected to the heat sink, for connecting the bus plate, the thyristor, the second bus plate, the bypass diode and the third bus plate to the heat sink, wherein at least one of the bus plates has a size and consists of a material sufficient to provide local thermal storage to allow the heat sink to be only of a size suitable to dissipate the average heat flow through the power supply.

5,204,805

CASING ASSEMBLY FOR ELECTRONIC EQUIPMENT

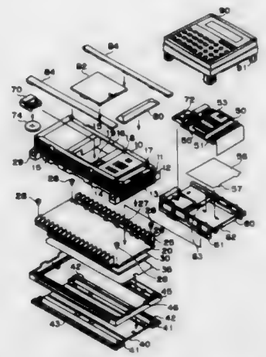
Tatsuhiko Takahashi; Masaaki Taguchi; Minoru Murayama, and Fumio Watanabe, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Jul. 31, 1992, Ser. No. 921,427

Claims priority, application Japan, Sep. 10, 1990, 2-239429

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—386 **6 Claims**



1. In a casing assembly including a printed circuit board on which an exothermic component is mounted, a casing covering said printed circuit board, and a base attaching said casing to a supporting member having a substantially U-shaped cross section and two flanges, said base having a first and a second attaching hole; the improvement comprising

a guide latch member detachably mounted on said base and engaging one flange of said support member and comprising a pawl portion and a hook protrusion engaging said first attaching hole of said base; and

a pressure latch member detachably mounted on said base and engaging the other flange of said support member and comprising a pawl portion, a hook protrusion engaging said second attaching hole of said base, a slider being slidable within at least a range corresponding to the width of said flange, a spring connected to said slider to apply urging force to cause said slider to be in resilient pressure contact with said support member, and a knob disposed on said slider to move said slider in opposition to said urging force of said spring, whereby the casing assembly is readily attached and detached from said support member.

5,204,806

FLEXIBLE PRINTED CIRCUIT BOARD

Takahide Sasaki; Jun Terashima, and Haruhiko Yamanouchi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,297, Nov. 16, 1989, which is a continuation of Ser. No. 136,346, Dec. 22, 1987, abandoned. This application Sep. 30, 1991, Ser. No. 767,366

Claims priority, application Japan, Dec. 27, 1986, 61-200451; Dec. 27, 1986, 61-200452

Int. Cl.[5] H05K *5/04*

U.S. Cl. 361—398 **23 Claims**

1. A flexible printed circuit board of a band shape installed within a tubular or hollow polygonal prismatic casing along the circumferential direction thereof, comprising:

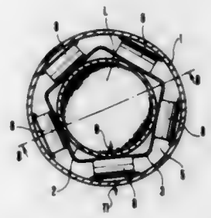
said flexible printed circuit board:

at least two flat areas formed between folds in said flexible printed circuit board along lines substantially parallel to an axial direction of said casing;

at least one chip-like circuit element mounted on one of said flat areas;

a tube-like member housed in said casing;

said flexible printed circuit board being arranged between said casing and said tube-like member along the circumferential direction; and



said flat areas having a width in the circumferential direction larger than the width of said element, said flat areas extending on both sides of said element in the circumferential direction.

5,204,807

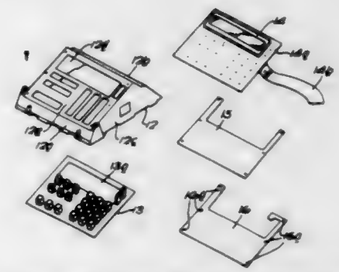
POSTAGE METER HOUSING ARRANGEMENT HAVING RF AND ELECTROMAGNETIC INDUCTION SHIELDING

Barry W. Simkins, and Brian R. O'Neale, both of Harlow, Great Britain, assignors to Pitney Bowes plc., Harlow, England

Continuation of Ser. No. 682,827, Apr. 9, 1991, abandoned. This application Aug. 19, 1992, Ser. No. 930,442

Int. Cl.[5] H05K *5/02, 7/14, 7/20*

U.S. Cl. 361—399 **5 Claims**



1. A postage meter housing arrangement including a keypad including a plurality of keys mounted on a keypad board, a display mounted on a display board, a main logic circuit board, and a power supply, the postage meter housing arrangement comprising:

(I) a first assembly having (a) a first die casting for providing radio frequency interference shielding and electromagnetic induction shielding, said first die casting having front, rear, and two side walls all integral with a sloping top wall, the top wall having a display aperture and a plurality of key apertures disposed therein (b) the keypad board being sized such that the periphery of said keypad board is received matingly between said front, rear, and side walls of said first die casting locating a respective key of said keypad in a respective key aperture and having a display aperture matingly aligned to said display aperture, (c) the display board being sized such that the periphery of said display board is received matingly between said front, rear and side walls of said first die casting locating said display matingly in said display aperture of said keypad board and the display aperture in said top wall, (d) a metal support plate, said metal support plate disposed on said display board opposite said keypad board, and (e) an

insulating plate, said insulating plate disposed on said

porting the financial documents through said data entry

mented by a computer for creating a numerical control sen-

input predetermined information, the user entry pads

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insulating plate, said insulating plate disposed on said metal support plate opposite said display board; and

(II) a second assembly having a second die casting, the second die casting having a front, rear and two side walls all integral with a top wall having an upper and lower surface, said front, rear and two side walls all vertically aligned in a co-planar manner with the respective front, rear and two side walls of said first die casting, to an upper surface of said top wall is attached the main logic circuit board such that the periphery of said main logic circuit is received matingly between said front, rear and two side walls of said second die casting and to the lower surface is attached the power supply unit, the second die casting being substantially planar and having a rim which interfits with the lower edges of the die casting of the first assembly.

5,204,808

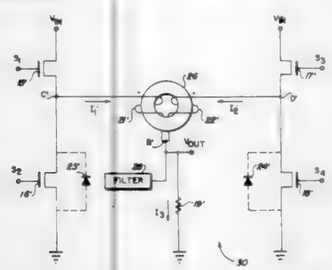
Patent Not Issued For This Number

5,204,809

H-DRIVER DC-TO-DC CONVERTER UTILIZING MUTUAL INDUCTANCE

Rolf Andresen, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1992, Ser. No. 863,620
Int. Cl.[5] H02M *7/5387*
U.S. Cl. 363—132 **8 Claims**



1. A DC-to-DC converter for converting an input voltage having a first magnitude into an output voltage having a second magnitude, the output voltage being made available to a load, the DC-to-DC converter comprising:

a first inductor storage means for providing a first current to the load;

a second inductor storage means for providing a second current to the load;

means for alternately coupling and decoupling the first and second inductor storage means to the input voltage such that the first and second inductor storage means alternately charge and discharge the first and second currents, respectively, ad wherein a mutual inductance between said first and second inductor storage means has a coupling coefficient greater than 0.5.

5,204,810

NC SENTENCE CREATION SYSTEM

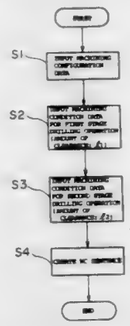
Naoki Fujita, Hachioji; Teruyuki Matsumura, Tokyo, and Noritake Nagashima, Yamato, all of Japan, assignors to Fanuc Ltd., Japan

PCT No. PCT/JP90/00293, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO90/11559, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 6, 1989, Ser. No. 601,787
Claims priority, application Japan, Mar. 24, 1989, 1-72930
Int. Cl.[5] G06F *15/46;* **G05B** *19/403*
U.S. Cl. 364—191 **6 Claims**

1. A numerical control sentence creation method implemented by a computer for creating a numerical control sentence for a two stage drilling operation by which a hole having a bottom drilled by a first stage drilling operation using a first drill having a first diameter is further drilled by a second stage drilling operation using a second drill having a second diameter smaller than the first diameter of the first drill, said numerical control sentence creation method comprising the steps of:

inputting and storing in a memory machining configuration data, and machining condition data including a first amount of clearance and a second amount of clearance; and

creating the numerical control sentence for controlling said first and second drills using the computer, where said first drill is moved to a first machining end point of said first stage drilling operation by a predetermined first cutting



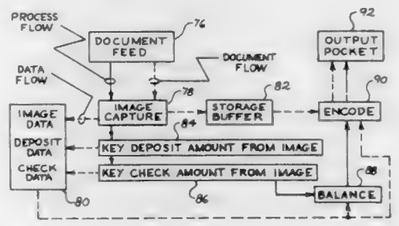
feed after said first drill has been moved by a first quick traverse to a first point which is spaced from an end of a workpiece by said first amount of clearance when said first stage drilling operation is performed, and where said second drill is moved to a second machining end point of said second stage drilling operation by a predetermined second cutting feed after said second drill has been moved by a second quick traverse to a second point which is spaced from the bottom of the hole drilled by said first stage drilling operation by said second amount of clearance, when said second stage drilling operation is performed.

5,204,811

DOCUMENT PROCESSOR WITH TRANSPORT BUFFER

Gregory M. Bednar; Thomas A. E. Miller; Paul L. Olson, all of Charlotte, and Matthew G. Yenik, Matthews, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1991, Ser. No. 673,921
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—406 **22 Claims**



1. Apparatus for processing financial documents, said apparatus comprising:

data entry means for entering data representing a monetary amount displayed on each of said documents;

first document transporting means for individually transporting the financial documents through said data entry means;

inscribing means for placing data on the individual documents which represents the monetary amount displayed on the document;

storage means for holding a document group containing a plurality of said documents after they have been transported through the data entry means and before they are transported to the inscribing means;

calculation means for processing the entered data to balance the monetary amounts in the document group; and

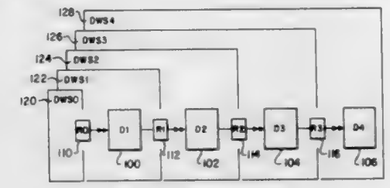
second document transporting means for automatically and individually transporting the held documents in the storage means to the inscribing means after the document group has been balanced, thereby placing the data on the documents after the group of documents has been balanced.

5,204,812

USER ACCESS OF MULTIPLE DOCUMENTS BASED ON DOCUMENT RELATIONSHIP CLASSIFICATION

Chander Kasiraj, Grapevine; James L. Taylor, Coppell, both of Tex., and Timothy J. Wolf, Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 430,846, Nov. 2, 1989, abandoned. This application Jan. 15, 1992, Ser. No. 823,085
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 **8 Claims**



1. A method of classifying a plurality of documents into a single document entity within an electronic office system, where said single document entity is capable of being shared by users having proper credentials, comprising the steps of:

defining a plurality of staple relationships between said plurality of documents to be classified within said single document entity;

creating a plurality of relation classification sets containing sensitivity information by combining said plurality of staple relationships; and

producing a document set having at least one document working set created from said plurality of relation classification sets.

5,204,813

COMPUTER-CONTROLLED TESTING PROCESS AND DEVICE FOR ADMINISTERING AN EXAMINATION

Thomas Samph, Philadelphia, Pa.; Metro Sauper; Edwin J. Price, both of Sewell, N.J., and Kevin Light, Myerstown, Pa., assignors to Assessment Systems, Inc., Philadelphia, Pa.

Filed Jun. 8, 1990, Ser. No. 535,311
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—419 **42 Claims**

1. A computer-controlled testing device for administering a test to a user and for processing and displaying information comprising:

(1) an information storage medium for storing information, such information including test questions and answers of the user to the test questions;

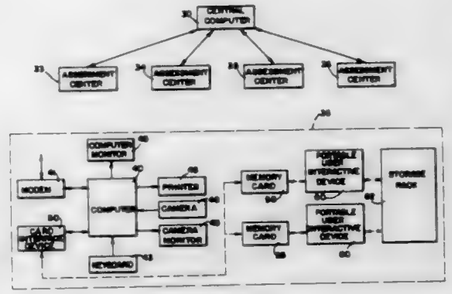
(2) a display for displaying output information including the test questions from the information storage medium to the user and for displaying user entry pads at predetermined locations on the display for use in permitting the user to input predetermined information, the user entry pads including:

(i) information entry pads for use in permitting the user to input predetermined items of response information to the information storage medium, said predetermined items of response information including user-selectable answers to a displayed test question, each information entry pad corresponding to respective predetermined items of response information; and

(ii) function entry pads for use in permitting the user to input predetermined items of control information to the testing device for selectively controlling the output information displayed to the user, each function entry pad corresponding to respective predetermined items of control information;

(3) a touch screen on the display to enable the user to select an item of predetermined control information for input to the testing device and to select an item of predetermined response information for input to the information storage medium by touching the screen at any selected corresponding user entry pad while such user entry pad is displayed on the display;

(4) control means for controlling the administration of the test to the user and for controlling transfer of information between the information storage medium, the display and



the touch screen, the control means including a microprocessor; and

(5) a microprocessor memory;

(6) a display controller for controlling operation of the display;

(7) a display controller memory;

(8) a UART connected between the microprocessor and the touch screen for transferring selected predetermined control and response information from the touch screen to the microprocessor;

(9) an input/output decoder connected with the microprocessor to decode addresses from the microprocessor to selectively enable the predetermined control and response information from the touch screen to be transferred through the UART to the microprocessor and to selectively enable the display controller to cause the output information and the user entry pads to be displayed on the display;

(10) a memory decoder connected with the microprocessor to decode addresses from the microprocessor to enable information to be selectively transferred between the microprocessor and the information storage medium, the microprocessor memory, and the display controller memory; and

(11) an internal power source for supplying power for the device.

5,204,814

wheel speed signals respectively indicative of the detected

mal") wherein said command signals are intended to cause said elayed actuation unit to supply an amount of fuel to

polygons have the shortest perpendicular line between said center points and said straight line; and

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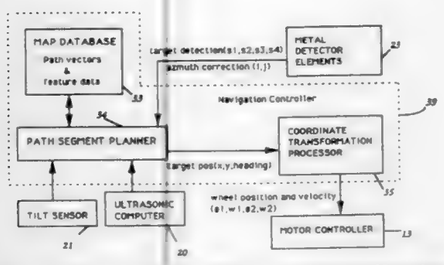
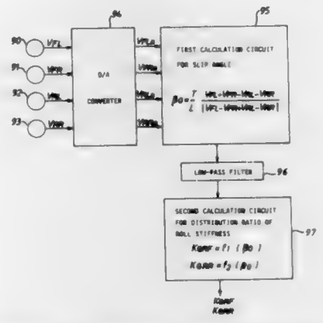
5,204,814
AUTONOMOUS LAWN MOWER
Thomas H. Noonan, Havertown; John Fisher, Avondale, both of Pa., and Barry Bryant, New Baltimore, Mich., assignors to Mobot, Inc., Havertown, Pa.
Filed Nov. 13, 1990, Ser. No. 611,679
Int. Cl.[5] G06F *15/50*; B62D *1/28*
U.S. Cl. 364—424.02 **28 Claims**



1. An autonomous lawn mower operative to self navigate along a prescribed path in accordance with stored route information compared with information from position markers spaced along the prescribed path comprising:
a body for supporting components of the lawn mower;
a power generation means supported by said body for supplying power to the lawn mower;
a plurality of wheels supporting said body;
at least one cutting means driven by said power generation means, with said cutting means extending below said body;
central processor means mounted on said body which includes stored route information including identity and position information indicative of the identity and position of said spaced position markers;
sensing means mounted on said body and operative to sense the presence of a position marker and the position of said position marker relative to said body, said sensing means being connected to said central processor means and operating to transmit a data signal to said central processor means when a position marker is sensed, said processor means operating in response to a data signal from said sensing means to compare said data signal with the stored identity and position information for said spaced position markers to determine an actual position, and
control means mounted on said body and connected to said central processor means for controlling the movement of the lawn mower along the prescribed path, said central processor means operating to provide a correction signal to said control means in response to a deviation of said actual position from the prescribed path, said control means operating to correct the travel of the lawn mower in response to a deviation signal.

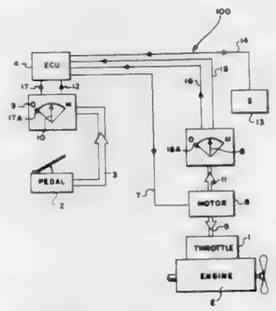
5,204,815
ELECTRIC CONTROL APPARATUS FOR CONTROL OF THE RUNNING CHARACTERISTIC OF A WHEELED VEHICLE
Masaki Yamamoto, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Feb. 20, 1991, Ser. No. 657,763
Claims priority, application Japan, Feb. 20, 1990, 2-39126
Int. Cl.[5] B60T *8/32*
U.S. Cl. 364—424.05 **4 Claims**

1. An electric control apparatus for controlling a running characteristic of a wheeled vehicle having a set of front road wheels and a set of rear road wheels, comprising:
wheel speed detecting means for detecting each rotation speed of the front and rear road wheels for producing wheel speed signals respectively indicative of the detected rotation speeds of the road wheels,
first means, responsive to said wheel speed signals, for detecting a first difference in speed between the front and rear road wheels and a second difference in speed between the left and right road wheels;



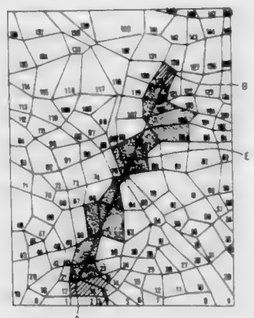
second means for calculating a ratio of the first difference in speed relative to the second difference in speed and for estimating a slip angle of the vehicle based on the calculated ratio; and
third means for controlling the running characteristic of the vehicle in accordance with the estimated slip angle.

5,204,816
THROTTLE ERROR DETECTION LOGIC
Keith Wright; Paul M. Fowler, both of Preston, and Kwok W. Chan, Chorley, all of England, assignors to Eaton Corporation, Cleveland, Ohio
Filed Mar. 13, 1991, Ser. No. 668,832
Claims priority, application United Kingdom, Mar. 29, 1990, 9007012
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—431.11 **6 Claims**



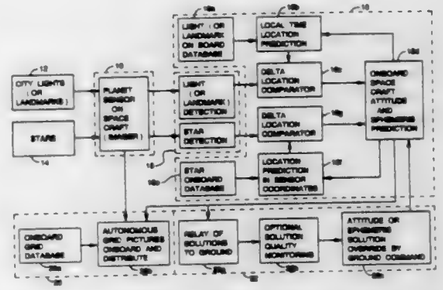
1. An error detecting fuel control system for controlling the supply of fuel to an internal combustion engine, said system comprising:
a master control unit (**2**, **3**, **9**, **10**) for operation by an operator and for supplying a first signal (**2**) indicative of the operator's request for fueling of the engine;
a slaved actuator unit (**6**, **5**, **1**, **11**, **8**) for supplying fuel to the engine in accordance with a command signal (**7**) and providing a second signal (**15**) indicative of the current supply of fuel to the engine; and
a control unit (**4**) for receiving at least said first and second signals and for processing same in accordance with predetermined logic rules to issue said command signal, said control unit having at least one mode of operation ("normal") wherein said command signals are intended to cause said slaved actuation unit to supply an amount of fuel to said engine which is a function of said first signal;
a first two-position switch (**17A**) associated with said master control and assuming one of said first and second positions (on/off, open/closed, 0/1) when said master control is in a position corresponding to the operator's desire for minimum ("idle") fueling of said engine and assuming said other of said first and second positions thereof when said master control is not in the position corresponding to the operator's desire for minimum fueling of said engine, said first switch providing a third signal (**17**) indicative of the current position thereof; and
a second two-position switch (**16A**) associated with said slaved actuation unit and assuming said one of said first and second positions (on/off, open/closed, 0/1) when said slaved actuation unit is not in a position corresponding to desire for minimum ("idle") fueling of said engine and assuming said other of said first and second positions thereof when said slaved actuation unit is in the position corresponding to minimum fueling of said engine, said second switch providing a fourth signal (**16**) indicative of the current position thereof.

5,204,817
CAR MOUNTED NAVIGATION SYSTEM
Motomasa Yoshida, Tokyo, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan
Filed Feb. 8, 1991, Ser. No. 652,879
Claims priority, application Japan, Feb. 15, 1990, 2-34595
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—449 **11 Claims**



1. A navigation system comprising:
a map data base comprising a plurality of polygons each side of each of said polygons corresponding to a road of a predetermined rank;
a display;
a first means coupled to said display for reading said map data base and for providing on said display at least a selected portion of said map data base and for providing on said display a straight line in said map data base connecting a first point in the selected portion of said map data base to a second point in said map data base;
a second means for selecting from said plurality of polygons in said map data base a chain of polygons disposed about said straight line, said chain of polygons connecting a first terminal polygon to a second terminal polygon wherein a first side of said first terminal polygon includes said first point and a first side of said second terminal polygon includes said second point with each polygon in said chain of polygons having at least one side common to an adjacently disposed polygon and wherein the second means provides a perpendicular line from a center point of each of the polygons in said chain of polygons to said straight line and said second means determines which one of said polygons have the shortest perpendicular line between said center points and said straight line; and
a third means for selecting predetermined ones of the sides of said polygons in said chain of polygons, each of said selected sides being connected to at least one other selected side to provide at least one continuous route from said first point to said second point and for computing a distance between said first point and second point along each of a plurality of the routes and for determining a most appropriate route based on at least said computed distances.

5,204,818
SURVEYING SATELLITE APPARATUS
Peter B. Landecker, Manhattan Beach, Calif., and Richard C. Savage, Franktown, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Continuation-in-part of Ser. No. 527,234, May 22, 1990, abandoned. This application May 7, 1992, Ser. No. 883,229
Int. Cl.[5] B64G *1/36*
U.S. Cl. 364—459 **8 Claims**



1. A surveying satellite apparatus with an on-board attitude and ephemeris solution microprocessor comprising in combination:
means for sensing at least one optical signal from a reference point, said sensing means providing a reference signal corresponding to each optical signal,
means for detecting and converting each reference signal to an electrical signal,
means for processing said electrical signals, said means for processing signals including a database, said database containing the characteristics of navigation references, said means for processing signals correlating said electrical signals to location prediction data to establish a frame of reference, said means for processing signals comparing said electrical signals with said frame of reference to establish attitude difference signals, said attitude difference signals are utilized by said means for processing signals to update attitude data of the satellite, and,
means for establishing a grid database, said grid database means storing a grid database, said means for processing signals receiving and converting said reference signals to a visual display, said means for processing signals superimposing said grid database on said visual display to provide grid graphics, said means for processing signals applying a grid correction signal to said grid database means, said grid correction signal utilized by said means for processing signals to update ephemeris data of the satellite.

5,204,819
ARRANGEMENT FOR MEASURING THE SURFACE PROFILE OF A SPECULAR SURFACE
Hans J. Tiziani, Stuttgart, Germany, assignor to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V., Bonn, Germany
Filed Jan. 31, 1991, Ser. No. 648,966
Claims priority, application Germany, Feb. 2, 1990, 4003191
Int. Cl.[5] G01B *11/24*
U.S. Cl. 364—474.24 **4 Claims**

1. An arrangement for measuring the surface profile of a specular surface, comprising:
a measuring arrangement comprising one reflective surface, said arrangement having a measuring range;
a specular surface to be measured, said specular surface having a surface profile and being disposed in said measuring range of said measuring arrangement;
a light source for illuminating said specular surface;
a screen having a grid pattern, said grid pattern being imaged by said specular surface;
a camera for recording said grid pattern imaged by said specular surface;
a computer for evaluating said recorded grid pattern and for calculating said surface profile of said specular surface;
a first mechanical device for displacing said specular surface in a first direction;
a second mechanical device for displacing said specular surface in a second direction;
a third mechanical device for displacing said specular surface in a third direction;
a fourth mechanical device for rotating said specular surface about a first axis;
a fifth mechanical device for rotating said specular surface about a second axis; and
a sixth mechanical device for rotating said specular surface about a third axis.

5,204,820
METHOD FOR FORMING A MULTILAYER MOLECULAR WIRING BOARD HAVING SIDE CONNECTIONS AND A MULTILAYER MOLECULAR WIRING BOARD MADE THEREBY
Yoshihiro Ohta, Kawasaki; Hiroshi Inokawa, Yokohama; Hiroshi Yamada, Kawasaki; Hiroshi Yamamoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 31, 1991, Ser. No. 648,966
Claims priority, application Japan, Feb. 2, 1990, 2-24000
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—474.24 **4 Claims**

1. A method for forming a multilayer molecular wiring board having side connections, comprising the steps of:
a) preparing a model of the multilayer molecular wiring board;
b) a substrate upon which to build the model disposed in said

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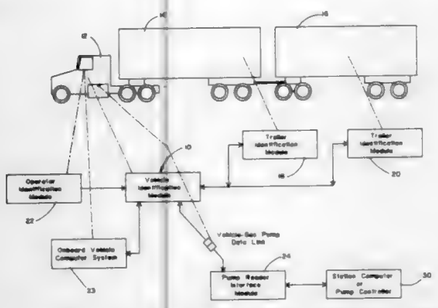
5,204,819

FLUID DELIVERY CONTROL APPARATUS

Michael C. Ryan, 118 Center Ave., N., Mitchellville, Iowa 50169

Filed Aug. 27, 1990, Ser. No. 573,631
Int. Cl.[5] G06F *15/20, 7/04;* H04B *5/02*
U.S. Cl. 364—465 22 Claims



1. Apparatus for authorizing the delivery of fluid to a fluid container from a fluid delivery device, comprising:

a. a first information storage and retrieval device without an independent power source and associated with the fluid container;

b. a second information storage and retrieval device associated with the fluid delivery device and capable of being operatively linked with said first information storage and retrieval device;

c. an RF link between said first and said second information storage retrieval devices for the transmission of operational energy for said first information device from said second information device;

d. means associated with said first information storage and retrieval device for transmitting information from said first information device to said second information device;

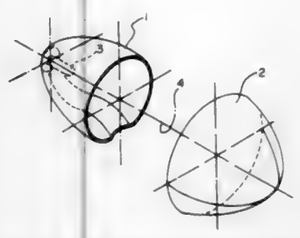
e. security means associated with said second information storage and retrieval device for authorizing delivery of fluid to the fluid container only upon provision by said first information device of an identification signal approved by said second information device.

5,204,820

METHOD OF PRODUCING AN OPTICALLY EFFECTIVE ARRANGEMENT IN PARTICULAR FOR APPLICATION WITH A VEHICULAR HEADLIGHT

Joseph R. Strobel, Winterbach; Ulrich Staiger, Stuttgart, both of Fed. Rep. of Germany, and Peter E. Castro, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 415,228, Sep. 6, 1989, Pat. No. 5,065,287.
This application Oct. 24, 1991, Ser. No. 782,172
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707751; Apr. 25, 1987, 3713867
Int. Cl.[5] G06F *15/46;* F21V *7/00*
U.S. Cl. 364—468 15 Claims



1. A method for producing an optically effective arrangement comprising one reflective surface, said arrangement having a light source related to an optical axis which extends in alignment with the optical arrangement for distributing the light of said light source reflected by said reflective surface according to a desired light pattern, said method comprising the steps of:

formulating an initial mathematical representation of at least one region of an approximated surface of said reflective surface;

mathematically manipulating local regions of said initial representation, wherein mathematical manipulation of a local region affects optical properties of the region that is mathematically manipulated but does not influence optical properties of other regions, until the resulting mathematical surface representation defines a surface having desired optical properties for distributing light with said desired light pattern; and

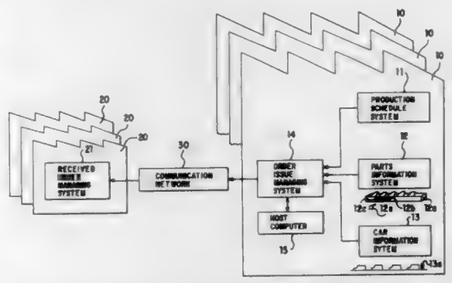
fabricating a reflector with a surface having said desired optical properties.

5,204,821

PARTS SUPPLY INSTRUCTION APPARATUS

Hiroyuki Inui; Satoshi Kuroiwa, both of Aichi; Yoshito Fujii, Nagoya; Toshiaki Ochiai, Toyota; Takao Asahara, Toyota, and Yukito Andou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 12, 1990, Ser. No. 596,495
Claims priority, application Japan, Oct. 16, 1989, 1-266302
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 9 Claims



2. A parts supply instruction apparatus, comprising:

a production schedule system for providing a parts supply schedule for an object assembly factory on the basis of a presumed car production schedule;

a parts information system, provided at the assembly factory, for providing information about the consumption of parts at the assembly factory, the parts information system including a first sensor for detecting the consumption of parts at the assembly factory;

an order issue managing system for scanning a parts master file to extract required data therefrom relating to parts to be ordered on the basis of information fed to the order issue managing system from the production schedule system and the parts information system, said order issue management system including:

a common computer for controlling the production schedule system and the parts information system,

a common parts master file standardized for the production schedule system and the parts information system, the common parts master file having a column in which an order type designation parameter corresponding to the production schedule system or the parts information system is stored for each entry, and

a setting device for changing a present order type designation parameter to a different order type designation parameter, thereby changing a present parts supply system to another parts supply system corresponding to said different order type designation parameter; and

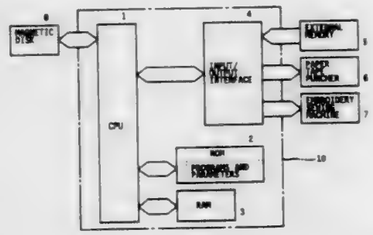
a received order managing system, provided at an object parts supply factory, for receiving orders for parts issued by the order issue managing system and transmitted via a communication network and for printing out the required data relating to the ordered parts.

5,204,822

SEWING DATA PROCESSING APPARATUS

Fumiaki Asano, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 4, 1991, Ser. No. 650,234
Claims priority, application Japan, Feb. 13, 1990, 2-31823
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—470 9 Claims



1. An apparatus for processing sewing data and utilizing the sewing data to sew an embroidery in an area consisting of a plurality of blocks, by filling with stitches each of the blocks in a sewing direction from a sewing start segment toward a sewing end segment, the sewing start and end segments being defined by, and between, a pair of first points and a pair of second points, respectively, the first and second points being positioned on an outline of said each block, the apparatus comprising:

first means for obtaining first information relating to a length of a first straight line segment connecting between one of said two first points defining said sewing start segment and one of said two second points defining said sewing end segment, and a length of a second straight line segment connecting between the other first point and the other second point, said first and second straight line segments intersecting each other;

second means for obtaining second information relating to a length of said each block in said sewing direction in which the filling of said each block with said stitches is advanced from said sewing start segment toward said sewing end segment;

third means for producing said sewing data by utilizing said first information, said second information, and third information representative of a number of stitches formed per unit length which number is predetermined for said embroidery; and

data utilization means for utilizing said sewing data to form said stitches.

5,204,823

METHOD AND APPARATUS FOR HIGH-SPEED LAYER THICKNESS CURING IN 3-D MODEL MAKING

David L. Schlotterbeck, Anaheim, Calif., assignor to CalComp Inc., Anaheim, Calif.

Filed Mar. 20, 1991, Ser. No. 673,767
Int. Cl.[5] G06F *15/46;* B23K *26/02*
U.S. Cl. 364—473 16 Claims

1. Apparatus for curing a photocurable liquid polymer to create a 3-dimensional model comprising:

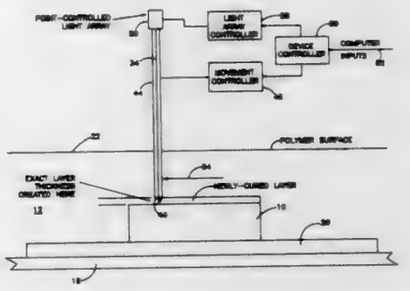
a) a container containing the photocurable liquid polymer;

b) a substrate upon which to build the model disposed in said container and in the polymer;

c) a knife member disposed over said substrate with a bottom edge parallel to said substrate;

d) movement means for moving said bottom edge of said knife member up and down with respect to said substrate and for moving said knife member over said substrate parallel thereto;

e) curing means for creating and conducting a 1-dimensional pattern of light beams for curing the liquid polymer to a



line immediately behind and parallel to said bottom edge and therefrom into the liquid polymer; and,

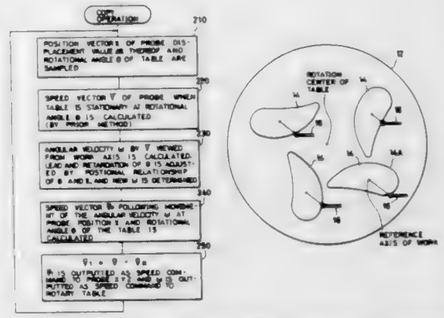
f) control means connected to said movement means for repeatedly moving said knife member over said substrate parallel thereto in a series of adjacent layers and connected to said curing means for simultaneously creating and conducting a series of 1-dimensional patterns of light beams into the liquid polymer to cure the liquid polymer in a line-by-line and layer-by-layer pattern from a bottom layer to a top layer.

5,204,824

METHOD OF AND APPARATUS FOR COPY CONTROLLING COORDINATE MEASURING PROBE WITH ROTARY TABLE

Shigeru Fujimaki, Kawasaki, Japan, assignor to Mitutoyo Corporation, Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,147
Claims priority, application Japan, Aug. 29, 1989, 1-222508
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.03 8 Claims



1. A method of copy controlling a coordinate measuring probe with a rotary table, for copy measuring the coordinates of an object to be measured using the coordinate measuring probe by installing the rotary table on a platen of a coordinate measuring machine and placing said object on said rotary table

to rotate the object by the rotary table, the method comprising

5,204,826

tor which are respective integer values, said sampling rate

pled to the first source bus, said first holding register

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to rotate the object by the rotary table, the method comprising the steps of;

determining a probe speed vector $\bar{V}$ of the probe when the rotary table is at a rotational angle θ;

calculating the angular velocity ω of the rotary table by the probe speed vector $\bar{V}$ relative to a measuring reference line of the object and correcting said angular velocity ω to adjust the lead or retardation due to control error of said rotational angle θ from target value so as to keep unchanged a direction of said probe with regard to said measuring reference line of the object;

calculating a follow-up speed vector $\bar{V}_R$ that compensates the movement by the corrected angular velocity ω; and

issuing as a speed command of the probe the vector sum $\bar{V}_T(=\bar{V}+\bar{V}_R)$ of said follow-up speed vector $\bar{V}_R$ and said probe speed vector $\bar{V}$ and issuing said corrected angular velocity ω as a speed command of the rotary table,

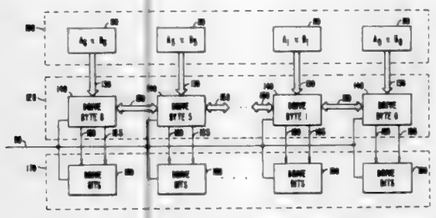
whereby one axis copy control owing to the rotary table is incorporated in addition to three-axis copy control of the probe in the case where the rotary table is not employed, to achieve copy operation by simultaneous four-axes control keeping unchanged said direction of the probe with regard to said measuring reference line of the object.

5,204,825

METHOD AND APPARATUS FOR EXACT LEADING ZERO PREDICTION FOR A FLOATING-POINT ADDER

Kenneth Ng, Saratoga, Calif., assignor to Weitek Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1991, Ser. No. 751,931
Int. Cl.[5] G06F *7/38, 7/50*
U.S. Cl. 364—715.04 **8 Claims**



1. A normalization apparatus for determining a number of leading zeros of a result of an operation subtracting from a first operand a second operand, said apparatus comprising:

a) means for grouping the bits of each operand in sets, each set of bits from the first operand being paired with a corresponding set of bits from the second operand;

b) means, coupled to the set pairs, for performing setwise subtractions with the set pairs to produce a plurality of setwise subtraction results;

c) means, coupled to the setwise subtraction performing means, for selecting one of said setwise results, for determining a need for a borrow from said selected setwise result, and for determining a number of setwise normalization shifts according to a position of said selected setwise result;

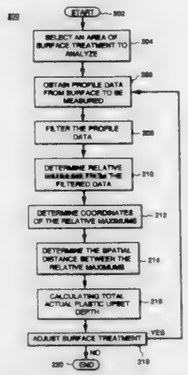
d) means, coupled to the setwise shift determining means, for determining a number of bitwise normalization shifts from said selected setwise result and said need for a borrow from said selected setwise result.

5,204,826

QUALITY ASSURANCE OF SURFACE TREATMENTS BY ANALYSIS OF SUBSTRATE SURFACE LINE TRACES

Robert A. Thompson, Quaker Street, and Trent J. Markell, Delanson, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1991, Ser. No. 650,828
Int. Cl.[5] B24C *1/10*
U.S. Cl. 364—552 **5 Claims**



1. A method of quality assurance for a surface treatment operation on a substrate, a system user having predetermined a desired total plastic upset depth of said surface treatment and a predetermined desired amount of surface treatment data to be omitted, said method comprising the steps of:

recording a wavelength of predetermined area of said substrate which has been surface treated such that at least one line trace is recorded by a profilometer;

filtering said line trace by a software filtering means to substantially eliminate said predetermined desired amount of surface treatment data to be omitted and to produce at least two relative maximums of data;

determining coordinates of said relative maximums;

recording said coordinates of said relative maximums;

determining a spatial distance between said relative maximums;

recording and/or displaying said spatial distance;

determining an actual plastic upset depth; and

adjusting, if needed, said surface treatment operation so that the actual plastic upset depth of a subsequently formed surface treated area should be more in conformance with said predetermined total plastic upset depth.

5,204,827

SAMPLING RATE CONVERTING APPARATUS

Tadao Fujita, Kanagawa; Jun Takayama, Tokyo, and Takeshi Ninomiya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

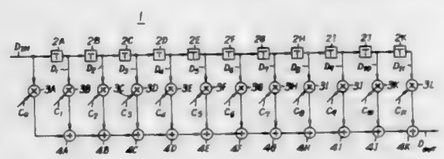
PCT No. PCT/JP91/00175, § 371 Date Oct. 15, 1991, § 102(e) Date Oct. 15, 1991, PCT Pub. No. WO91/12664, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 14, 1991, Ser. No. 768,243
Claims priority, application Japan, Feb. 16, 1990, 2-35614
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.1 **8 Claims**

1. A sampling rate converting apparatus for converting an input digital signal which is sampled with one of a first sampling frequency and a second sampling frequency into an output digital signal sampled with the other of said first sampling frequency and said second sampling frequency, with a frequency ratio of said first sampling frequency and said second sampling frequency having a numerator and a denominator which are respective integer values, said sampling rate converting apparatus comprising:

a number of delay means connected in series for each delaying a sample of said input digital signal and thereby producing a respective delayed signal;

coefficient receiving means for receiving a plurality of coefficients;

a number of multipliers each receiving a delayed signal from



a respective one of said delay means and a coefficient from said coefficient receiving means for producing a respective multiplied signal; and

means for adding the multiplied signals respectively produced by said multipliers and thereby producing said output digital signal;

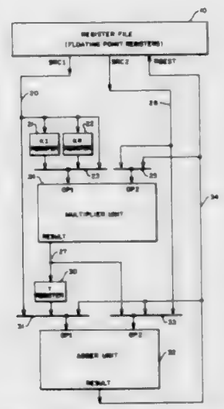
wherein said number of said delay means and said number of multipliers are each based on the product of said numerator and said denominator of said frequency ratio.

5,204,828

BUS APPARATUS HAVING HOLD REGISTERS FOR PARALLEL PROCESSING IN A MICROPROCESSOR

Leslie D. Kohn, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 309,430, Feb. 10, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 803,684
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—736 **6 Claims**



1. A bus apparatus in a floating-point unit that includes a file of floating point registers for supplying one of a plurality of operands including a first source operand to a first source bus and a second source operand to a second source bus, said file coupled to a result bus, said floating point unit also including a pipelined multiplier having first and second operand inputs for multiplying two operands to produce a multiplier result at a last multiplier stage and a pipelined adder having third and fourth operand inputs for adding two operands to produce an adder result that is supplied to the result bus from a last adder stage, said bus apparatus for implementing algorithms which require simultaneous add and multiply operations, said bus apparatus comprising:

a first constant holding register having a single input coupled to the first source bus, said first holding register dedicated for storing a constant;

a temporary holding register having a single input coupled to the last multiplier stage, said second holding register dedicated for storing the multiplier result;

a plurality of multiplexers including a first multiplexer means for selectively coupling into the first operand input of the pipelined multiplier a first one of a plurality of operands including the first source operand and the constant stored in said first constant holding register, a second multiplexer means for selectively coupling into the second operand input a second one of said plurality of operands including the second source operand and the result operand a third multiplexer means for selectively coupling to said third operand input in said adder means a third one of said plurality of operands including the first source operand, the multiplier result stored in said temporary holding register, and the adder result, and a fourth multiplexer means for selectively coupling to said fourth operand input in said adder means a fourth one of said plurality of operands including the multiplexer result, the adder result, and the second source operand; and

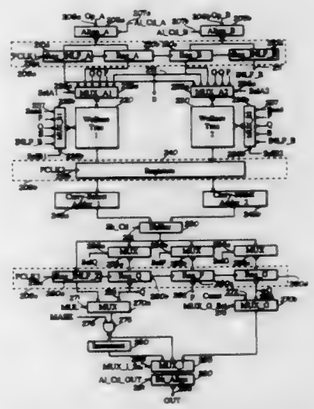
control means coupled to said first, second, third, and fourth multiplexer means for selecting which of said plurality of operands are said first one, said second one, said third one, and said fourth one of said plurality of operands.

5,204,829

INTERLEAVING OPERATIONS IN A FLOATING-POINT NUMERIC PROCESSOR

Allen Lyu, Milpitas, and Charles Stearns, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jul. 10, 1992, Ser. No. 911,854
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **10 Claims**



1. A method of interleaving at least one floating-point multiplication operation with an iterative floating-point operation comprising:

providing an interleaved pipelined floating-point multiplier (pipelined multiplier) for performing an iterative floating point operation according to a control sequence, by:

providing a plurality of pipeline multiplier stages, beginning with a first pipeline multiplier stage having a first input and a second input, continuing with subsequent pipeline multiplier stages, ending with a last subsequent pipeline multiplier stage which is a final pipeline multiplier stage;

providing a first operand input register;

providing a second operand input register;

providing at least one interleaf first operand register;

to a defined initial state, and for enabling said input shift

second parallel adders (**103**, **104**) of said intermediate

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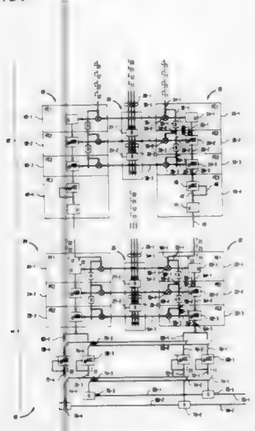
providing at least one interleaf first operand register;
providing at least one interleaf second operand register;
providing at least one fed-back interim value from at least one of said successive pipeline multiplier stages;
selecting said first input of said first pipelined multiplier stage as one of: said first operand input register, said at least one interleaf first operand register, or said at least one fed-back interim value;
selecting said second input of said first pipelined multiplier stage as one of: said second operand input register, said at least one interleaf second operand register, or said at least one fed-back interim value;
said final pipeline multiplier stage has at least one "normal" register adapted to receive a final result from said pipelined multiplier; and
said final pipeline multiplier stage also has at least one interleaf output register adapted to receive a final result from said pipelined multiplier;
further comprising:
analyzing said iterative floating-point operation to identify cycles wherein said first pipelined multiplier stage is unused, said cycles being "bubble" cycles;
selecting one interleaf first operand register and one interleaf second operand register as the first input and second input, respectively, to the first pipelined multiplier stage during each bubble cycle so identified in said iterative floating-point operation, thus initiating one interleaved multiplication for each bubble cycle, eventually producing one result at the final pipeline multiplier stage for each interleaved multiplication so initiated; and
latching into at least one interleaf output register the result of each interleaved multiplication at the final pipeline multiplier stage.

5,204,830
FAST PIPELINED MATRIX MULTIPLIER
Jinn-Shyan Wang, Hsin Chu, and Jiann-Nan Kao, Taipei, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed Feb. 13, 1992, Ser. No. 836,075
Int. Cl.[5] **G06F** *7/52*
U.S. Cl. 364—754 **16 Claims**



1. A matrix multiplication circuit comprising:
a first stage for multiplying a first matrix X having elements x_{ij}, i=1 . . . I, j=1 . . . J with a second matrix A having elements a_{jk}, k=1 . . . k, said first stage comprising:
a first plurality of pipeline circuits which operate in parallel, each pipeline circuit for sequentially outputting the elements:

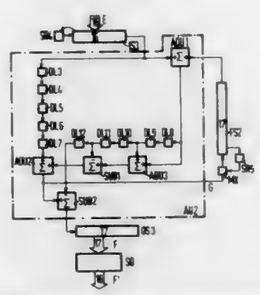
$$y_{ik} = \sum_{j=1}^{J} x_{ij} a_{jk}$$

of an intermediate product matrix Y=X·Z for a particular value of k; and
a second stage for receiving the elements y_{ik} as said elements y_{ik} are output by the first stage and for multiplying said elements y_{ik} with a third matrix C having elements c_{li}, said second stage comprising:
a second plurality of pipeline circuits which operate in parallel, each pipeline circuit of the second stage for sequentially outputting the products $c_{li}y_{ik}$ for a particular value k; and
associated accumulator means, each accumulator means for selectively accumulating products $c_{li}y_{ik}$ for particular values of l from the associated pipeline circuit so that each accumulator means generates the elements

$$z_{fk} = \sum_{i=1}^{I} c_{li} y_{ik}$$

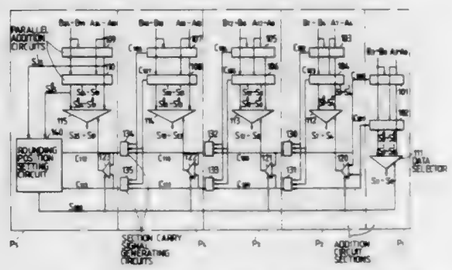
of a product matrix Z=C·2Y.

5,204,831
CIRCUIT CONFIGURATION FOR DIGITAL BIT-SERIAL SIGNAL PROCESSING
Lajos Gazsi, Düsseldorf, Fed. Rep. of Germany, and Peter Caldera, Villach, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Dec. 11, 1991, Ser. No. 805,584
Claims priority, application European Pat. Off., Dec. 11, 1990, 90123865.9
Int. Cl.[5] **G06F** *7/50, 7/31*
U.S. Cl. 364—785 **12 Claims**



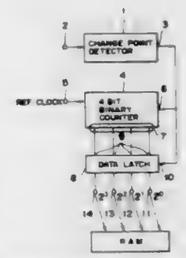
1. A circuit configuration for digital bit-serial signal processing, comprising:
n input shift registers each begin written in parallel or serially with an input data word and then read out by shifting to the right,
sign repetition devices each being assigned to a respective one of said input shift registers for continuously generating and shifting an algebraic sign of the input data word onward in the shift to the right;
a serial arithmetic unit connected downstream of said input shift registers for serially outputting output data words;
m output shift registers connected downstream of said serial arithmetic unit being written in serially with the output data words;
a control unit connected to said serial arithmetic unit, once all of the output data words have been fully written in said respective output shift registers, said control unit ending a reading of said input shift registers and the writing in of said output shift registers, for resetting said arithmetic unit to a defined initial state, and for enabling said input shift registers for writing in new input data words;
k feedback shift registers each being written-in in parallel with data words stored in said output shift registers and being read out serially for a further transmission of the data word to said arithmetic unit, said feedback shift register having a length at least as long as the longest occurring data word; and
other sign repetition devices assigned to said feedback shift registers for continuously generating and shifting the algebraic sign of the data words onward.

5,204,832
ADDITION APPARATUS HAVING ROUND-OFF FUNCTION
Yasuhiro Nakakura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 22, 1991, Ser. No. 673,824
Claims priority, application Japan, Mar. 22, 1990, 2-74177
Int. Cl.[5] **G06F** *7/50, 7/38, 7/52*
U.S. Cl. 364—788 **6 Claims**



1. An addition apparatus having a round-off function for adding together first and second input binary numbers (A24 to A0, B24 to B0) and executing round-off processing of a result of an addition performed thereby, comprising:
a first circuit section (P1) including n parallel adders (101, 102) where n is a fixed plural integer, each parallel adder coupled to add together respective first portions (A3 to A0, B3 to B0) of said input numbers, each said first portion of said input numbers comprising a fixed number of bits extending from and including a bit (A0, B0) corresponding to a normalized least significant bit position of said input numbers, said parallel adders being operable for executing round-off addition at n respectively different bit positions (A1, A0), and said parallel adders generating n respective carry output signals which are outputted from said first circuit section as respective section carry output signals (C100, C101), said first circuit section further including data selector means controllable for selecting one out of n respective sets of bits constituting sum results produced from said n parallel adders of the first circuit section and for outputting the selected set of bits constituting one of the sum results (S3 to S0);
a plurality of intermediate circuit sections (P2, P3, P4) coupled to receive respective pairs of intermediate numeral portions (A7 to A4, B7 to B4, . . . A18 to A13, B18 to B13) of said input numbers, said pairs of intermediate numeral portions successively increasing in significance above said first portions, each intermediate circuit section of said plurality of intermediate circuit sections including a first parallel adder (103) for adding together a pair of intermediate numeral portions supplied to said intermediate circuit section while fixedly adding a "1" state input carry thereto, and a second parallel adder (104) for adding together the pair of numeral portions supplied to said intermediate circuit section while fixedly adding a "0" state input carry thereto, data selector means (112) controllable for selecting one out of 2 respective sets of bits constituting sum results produced from said first and second parallel adders (103, 104) of said intermediate circuit section and for outputting the selected set of bits constituting said sum result (S7 to S4), carry selector means (120) operable for selecting one out of n carry signals supplied from a preceding one of said circuit sections and for applying the selected carry signal to control said data selector means (112), and n section carry generating circuits each receiving respective carry output signals produced from said first and second parallel adders (103, 104) and a corresponding one of n carry output signals produced from a preceding one of said circuit sections, for generating n respective carry output signals; and
a final circuit section coupled to receive respective most significant portions (A24 to A19, B24 to B19) of said input numbers, including a first parallel adder (109) for adding together said most significant portions while fixedly adding a "1" state input carry thereto, and a second parallel adder (110) for adding together said most significant portions while fixedly adding a "0" state input carry thereto, data selector means (115) controllable for selecting one out of 2 respective sets of bits each constituting a carry bit (S^1_{25}, S^0_{25}) and sum result (S^1_{24}, S^0_{24} to S^1_{19}, S^0_{19}) produced from said first and second parallel adders (109, 110) of said final circuit section and for outputting the selected set of bits (S25 to S19), carry selector means (123) operable for selecting one out of n carry signals (C112, C113) supplied from a preceding one of said circuit sections and for applying a selected carry signal to control said data selector means (115), and round-off position setting circuit means (140) coupled to receive said n carry signals (C112, C113) supplied from the preceding one of said circuit sections and to receive respective most significant bits (S^1_{25}, S^0_{25}) that are produced as carry output from said first and second parallel adders (109, 110) of said final circuit section, and including logic circuit means responsive to a combination of logic states of said input carry signals (C112, C113) and most significant bits for producing corresponding output signals (S100) for controlling said respective data selector means and said carry selection means of said circuit sections, to thereby determine a position at which round-off processing has been executed, to thereby obtain an output result formed of the output bits (S25 to S0) produced from all of said data selector means.

5,204,833
METHOD AND APPARATUS FOR RECORDING WAVEFORM
Tadashi Aoki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 29, 1990, Ser. No. 619,458
Claims priority, application Japan, Nov. 30, 1989, 1-312686
Int. Cl.[5] **G11C** *13/00*
U.S. Cl. 365—45 **7 Claims**



7. An apparatus for recording a waveform of a digital signal, comprising:

change point detecting means for receiving a recorded tim-

switches which are coupled to arrays between and includ-

a drain region and a channel region formed between said

said first external control signal at all times without being

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change point detecting means for receiving a recorded timing waveform of a digital signal, for detecting change points of the waveform, and for outputting change point signals;

counting means of a predetermined number of bits for receiving the change point signals input to the counting means from said change point detecting means and for counting reference clocks of a reference clock signal, and for converting numbers of reference clocks which are counted during intervals between pairs of said plurality of change points into converted binary data; and

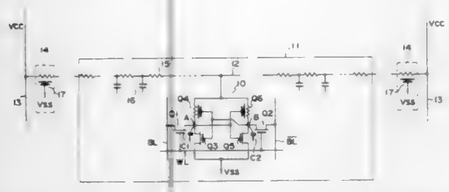
memory means for receiving the converted binary data output from said counting means through a plurality of transmission paths corresponding to said predetermined number of bits and for recording the received data.

5,204,834

STATIC SEMICONDUCTOR MEMORY DEVICE

Kiyofumi Ochii, and Shigeyuki Hayakawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1991, Ser. No. 705,558
Claims priority, application Japan, May 28, 1990, 2-137336
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—154 **10 Claims**



1. A static semiconductor memory device, comprising a memory cell array consisting of a plurality of memory cells each having a data memory node and a thin film transistor used as a load transistor and connected to one end of the memory node;

a first power source wiring arranged within the memory cell array, and connected to each memory cell so as to supply a power source potential to each memory cell;

a second power source wiring of a low resistance to which a power source potential is supplied from the outside and which is electrically connected to the first power source wiring; and

circuit means satisfying the relationship $\tau 2 \geqq \tau 1$ wherein $\tau 1$ denotes a time constant in the case of charging/discharging the memory node of each memory cell by the first power source wiring, and $\tau 2$ represents a time constant in the case of charging/discharging the first power source wiring by the external power source potential supplied to the second power source wiring.

5,204,835

EPROM VIRTUAL GROUND ARRAY

Boaz Eitan, Sunnyvale, Calif., assignor to WaferScale Integration Inc., Fremont, Calif.

Filed Jun. 13, 1990, Ser. No. 539,657
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—185 **22 Claims**

1. An electrically programmable read only memory containing an array of floating gate transistors, said array comprising:

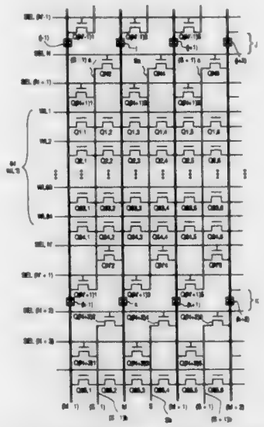
a virtual source;

a first group and a second group of floating gate transistors wherein each floating gate transistor in said first and second groups comprises:

a drain region and a channel region formed between said drain region and said virtual source; and

a floating gate formed over the channel region between said virtual source and said drain region, said floating gate being separated by dielectric material from said channel region;

at least one first select transistor connected between said virtual source and a first bit line which functions as a drain for said first group of floating gate transistors, but as a source for said second group of floating gate transistors, and



at least one second select transistor connected between said virtual source and a second bit line which functions as a drain for said second group of floating gate transistors but as a source for said first group of floating gate transistors, said first and said second select transistors being arranged so that the second select transistor acts as a control transistor for each of the transistors in said first group of floating gate transistors in said array and the first select transistor acts as a control transistor for each of the transistors in said second group of floating gate transistors in said array.

5,204,836

METHOD AND APPARATUS FOR IMPLEMENTING REDUNDANCY IN PARALLEL MEMORY STRUCTURES

John A. Reed, Los Altos, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 30, 1990, Ser. No. 605,510
Int. Cl.[5] G11C *29/00*
U.S. Cl. 365—200 **44 Claims**

1. In a data structure comprising a plurality of arrays, and data paths connected to the data structure for transferring data into and transferring data from said data structure according to a data structure address control signal, a method for bypassing defects detected as present in said arrays of said data structure comprising the steps of:

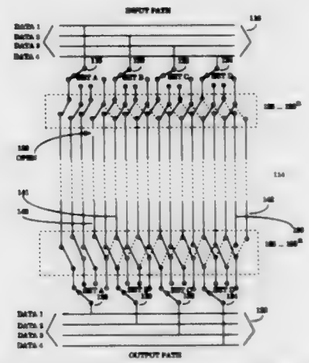
adding M spare alternate arrays to said data structure;

connecting the address control signal and data paths to address switches, said address switches directing the data into and from arrays identified by the address control signal;

connecting the address switches to data switches, said data switches interleaved with one another such that the data switches may be selectively coupled to an array and an alternate array, said array and alternate array spaced M arrays apart;

if a defect in an array is detected, changing the state of data

switches which are coupled to arrays between and including the defective array and spare alternate arrays to be



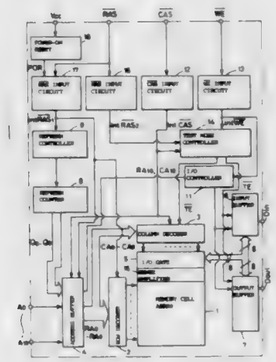
coupled to alternate arrays thereby diverting data around the defective array.

5,204,837

SEMICONDUCTOR MEMORY DEVICE HAVING TEST MODE

Makoto Suwa, and Hiroshi Miyamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1991, Ser. No. 744,750
Claims priority, application Japan, Aug. 16, 1990, 2-216550
Int. Cl.[5] G11C *29/00*
U.S. Cl. 365—201 **43 Claims**



43. A semiconductor memory device comprising:

a memory cell array,

internal circuit means associated with data from said memory cell array and data writing to the same,

reset pulse generating means responsive to a power supply for generating a reset pulse initializing said internal circuit means,

said internal circuit means operating in response to first, second and third external control signals after said reset pulse is output from said reset pulse generating means,

test mode designating signal generating means responsive to a change in the logical level of said third external control signal from a first logical level to a second logical level when said first and second external control signals are at a predetermined logical level for generating a test mode designating signal designating a test mode,

first external control signal buffering means for buffering said first external control signal at all times without being controlled by said reset pulse and applying the same to said internal circuit means and said test mode designating signal generating means,

second external control signal buffering means for buffering said second external control signal at all times without being controlled by said reset pulse and applying the same to said internal circuit means and said test mode designating signal generating means,

first means for buffering said third external control signal for buffering said third external control signal only when said reset pulse is not generated from said reset pulse generating means and applying the same to said internal circuit means, and

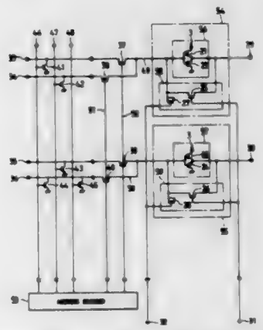
second means for buffering said third external control signal for buffering said third external control signal at all times without being controlled by said reset pulse and applying the same to said test mode designating signal generating means.

5,204,838

HIGH SPEED READOUT CIRCUIT

Jinshu Son, and Nobuaki Miyakawa, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 426,545, Oct. 26, 1989, abandoned.
This application Aug. 21, 1991, Ser. No. 751,618
Claims priority, application Japan, Oct. 28, 1988, 63-270792
Int. Cl.[5] G11C *7/00, 7/02*; G01R *19/00*; H03F *3/45*
U.S. Cl. 365—203 **5 Claims**



1. A high speed readout circuit for reading out data of a memory unit, comprising:

an amplifier unit having an input terminal and an output terminal for sensing variations from a preset voltage on a sense line so as to read out stored data; and

an operating point setting unit for setting an operating point of said amplifier by short-circuiting the input and output terminals of said amplifier unit and for precharging said sense line to said operating point in response to a first signal, said operating point setting unit including capacitor means for setting the voltage on said sense line to a value having a predetermined slight deviation from said operating point in response to a second signal.

main RAM to receive its power from an independent

port static RAM cells, said array being divided into one or

5,204,842

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5,204,839

PROGRAM OPTIMIZING CIRCUIT AND METHOD FOR AN ELECTRICALLY ERASABLE AND PROGRAMMABLE SEMICONDUCTOR MEMORY DEVICE

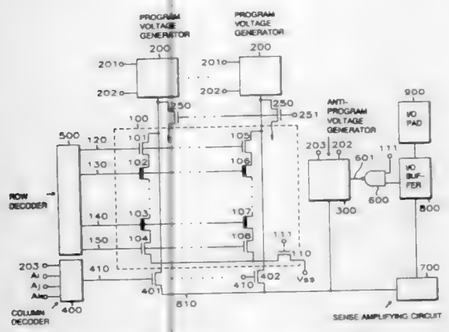
Woong-Mu Lee, and Jin-Ki Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 8, 1991, Ser. No. 681,716

Claims priority, application Rep. of Korea, Sep. 19, 1990, 1990-14829

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—204 **34 Claims**



1. In an electrically erasable and programmable semiconductor memory comprising a memory cell array having a plurality of memory strings connected to a plurality of word lines and bit lines, each memory string comprising a string select transistor, a given number of memory cells and a ground select transistor, a row decoder connected to said plurality of word lines, a data bus and a data input/output buffer, a program optimizing circuit comprising:

program voltage generating means comprising a first high voltage pumping circuit for transferring a high voltage of a first level to said bit lines in response to clock pulses, a latch circuit and transfer means connected between output nodes of said latch circuit and said bit lines;

column decoder means for outputting either one of a second high voltage of a second level and a column address signal according to a program signal;

a plurality of column select transistors, each column select transistor having a channel connected between said data bus and a bit line of said plurality of bit lines, and a gate coupled to receive the alternative output signal of said column decoder means; and

anti-program voltage generating means interposed between said data input/output buffer and said data bus for transferring one of the output of said input/output buffer and the second high voltage to said data bus according to said program signal.

5,204,840

MEANS AND METHODS FOR PRESERVING MICROPROCESSOR MEMORY

Jeffrey G. Mazur, 8041 Sadring Ave., Canoga Park, Calif. 91304

Filed Aug. 8, 1989, Ser. No. 391,096

Int. Cl.[5] G11C *5/14*; G06F *12/14, 12/16*

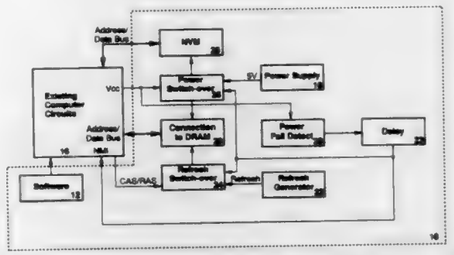
U.S. Cl. 365—228 **5 Claims**

1. A system for preserving at least the main random access memory ("RAM") of a computer system having a power supply on the occasion of a sudden loss in power, said system comprising:

a power loss detection circuit adapted to sense a loss in the power supply of said computer system and emit a signal causing a switch-over circuit to isolate at least said main RAM from the computer system and cause at least said main RAM to receive its power from an independent power source; and

a power switch-over circuit responsive to said power loss detection signal to connect said independent power source to said memory; and

an independent power supply comprising an external transformer power supply, a rechargeable battery, a voltage regulator, and a battery charging circuit connected to said battery, said transformer power supply being connected to said voltage regulator and to said battery charging circuit, said battery being connected to said voltage regulator for delivery of power to said switch-over circuit; and



a power-fall detection circuit comprising a precision voltage reference, means for measuring the input voltage to said computer system, and a comparator for initiating an NMI alert signal when said measured input voltage falls below said precision voltage reference; and

software operatively associated therewith and responsive to said power loss detection circuit signal to initiate a shutdown routine when said signal is activated and to initiate a restart routine when said signal is deactivated; and

security means for interrupting a normal startup sequence of said computer system to invoke a security procedure, whereby further use of said computer system would be allowed only after identifying an authorized user.

5,204,841

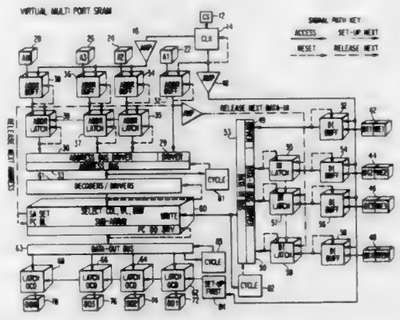
VIRTUAL MULTI-PORT RAM

Barbara A. Chappell; Terry I. Chappell, both of Amawalk; Mahmut K. Ebcioglu, Somers, and Stanley E. Schuster, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 558,994, Jul. 27, 1990, abandoned. This application Apr. 23, 1992, Ser. No. 873,672

Int. Cl.[5] G11C *8/04*

U.S. Cl. 365—230.05 **6 Claims**



1. A RAM structure allowing multiple read and write accesses during a machine cycle, said RAM structure being implemented on a semiconductor chip as an array of single-port static RAM cells, said array being divided into one or more sub-arrays, comprising for each sub-array;

means in the sub-array for generating a release next address signal when a RAM cell within the sub-array has been written or read;

an on-chip clock circuit responsive to a chip select signal to generate a trigger signal to initiate a first access to said sub-array;

a plurality of address lines connected to a plurality of address buffers which receive and temporarily store one or more addresses in response to said trigger signal;

a plurality of address latches connected to receive an output from a corresponding one of said address buffers;

first circuit means responsive to said release next address signal and to said trigger signal for generating a set-up next signal to said address latches in succession;

address bus drivers connected to receive an address signal output from any of the address latches for which a set-up next signal has been generated by said first circuit means and in response to said release next address signal from said sub-array, said address bus drivers providing said address signal on an address bus;

decoder and driver circuit means connected to receive the address signal from said address bus for generating sub-array select, column, wordline, and bitline signals to said sub-array, said decoder and driver circuit means being self-resetting;

a plurality of data input lines connected to a plurality of data-in buffers which receive and temporarily store one or more data input words in response to said trigger signal;

a plurality of data-in latches connected to receive an output from a corresponding one of said data-in buffers;

second circuit means responsive to said trigger signal for generating a set-up next signal to said data-in latches in succession, said second circuit means receiving a release next data-in signal which is derived from said release next address signal;

data-in bus drivers connected to receive a data-in signal output from any of the data-in latches for which a set-up next signal has been generated by said second circuit means and in response to said release next data-in signal, said data-in bus drivers providing the data-in signal on a data-in bus connected to a write input of the sub-array;

a plurality of sense amplifiers in the sub-array to output data read out of RAM cells, said plurality of sense amplifiers being connected to a corresponding one of a plurality of data output lines;

a data-out bus connected to said data output lines to receive data read out of said sub-array;

a plurality of data-out latches connected to receive data output on said data-out bus, said latches including self-resetting circuit means for resetting a latch upon the latch outputting a data-out signal;

third circuit means responsive to said trigger signal for generating a set-up next signal to said data-out latches in succession; and

a plurality of off-chip driver circuits each connected to receive an output from a corresponding one of said data-out latches for which a set-up next signal has been generated by said third circuit means.

5,204,842

SEMICONDUCTOR MEMORY WITH MEMORY UNIT COMPRISING A PLURALITY OF MEMORY BLOCKS

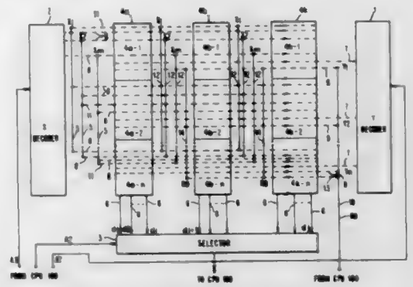
Tsunenori Umeki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 228,585, Aug. 5, 1988, abandoned. This application Aug. 7, 1990, Ser. No. 563,875

Claims priority, application Japan, Aug. 5, 1987, 62-196817; Aug. 5, 1987, 62-196818

Int. Cl.[5] G11C *8/00*

U.S. Cl. 365—230.03 **11 Claims**



1. In a semiconductor memory, including:

a memory unit including a plurality of n memory blocks (4 - 1, 4 - 2, . . . , 4 - n) arranged in a column direction, where n is an integer, wherein each block includes a set of corresponding memory rows 1, 2, . . . , m of memory cells, where m is an integer, the improvement wherein:

each of said memory blocks (4 - 1, 4 - 2, . . . , 4 - n) is divided into k sub-blocks, where k is an integer, arranged in a row direction, thereby providing an array of sub-blocks arranged in n sub-rows and k sub-columns in a two-dimensional manner,

first row address decoder means for generating first row address signals for selecting from said array of (n×k) memory sub-blocks only memory sub-blocks in a particular sub-row of said memory sub-blocks,

a plurality of first gate electrode connectors provided for coupling in said row direction a plurality of memory sub-blocks constituting each particular selected sub-row of said array and for applying each of said first row address signals only to the respective plurality of memory sub-blocks constituting each selected sub-row,

second row address decoder means for generating second row address signals for respectively designating particular memory rows of memory cells in each of said plurality of memory sub-blocks,

a plurality of second gate electrode connectors provided for coupling in said row direction the plurality of memory sub-blocks including each particular memory row and for applying said second row address signals to the designated memory row in each of the memory sub-blocks including said designated memory row,

means for supplying a read control signal for defining timing for reading out data,

a plurality of third gate electrode connectors provided for applying said read control signal to sub-blocks including said designated memory row,

first bypass metal interconnectors formed above said second gate electrode connectors for applying said second row address signals in parallel from said second row address decoder means to corresponding memory rows in each of said plurality of memory sub-blocks, and

second bypass metal interconnectors formed above said third gate electrode connectors for applying said read control signal in parallel from said read control signal supplying means to said plurality of memory sub-blocks,

wherein said first and second bypass metal interconnectors

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5,204,847

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each include a plurality of connectors oriented in a column direction and located in spaces between said memory sub-blocks;

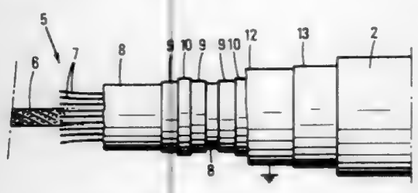
at least one of said first and second bypass metal interconnectors including a plurality of metal connectors for propagating signals in the column direction.

5,204,843

INTEGRATED RECEPTION SYSTEM OF GREAT LENGTH FOR SENSING ACOUSTIC WAVES

Claude Beauducel, Henonville, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 28, 1991, Ser. No. 723,181
Claims priority, application France, Jun. 29, 1990, 90 08269
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—20 **17 Claims**



1. An elongated, integrated system for reception of acoustic waves, comprising:

an elongated continuous supporting core cable including a plurality of continuous electrically conducting wires for electrically connecting the reception system to a data acquisition system;

an elongated acoustic screen member surrounding said core cable over the length thereof;

an elongated continuous piezoelectric layer surrounding said screen member over the length thereof;

an elongated continuous first electrode member positioned on a first side of said piezoelectric layer; and

a plurality of discrete second electrode members positioned at spaced intervals along said piezoelectric layer on a second side of said layer, each second electrode member including means electrically connecting such second electrode member to an associated one of said conducting wires, each second electrode member cooperating with a portion of said piezoelectric layer contacting such second electrode member and with a portion of said first electrode member contacting such portion of said piezoelectric layer to cause such portion of said piezoelectric layer to serve as a distinct piezoelectric acoustic sensor element.

5,204,844

MOMENT BENDER TRANSDUCER

David J. Erickson, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

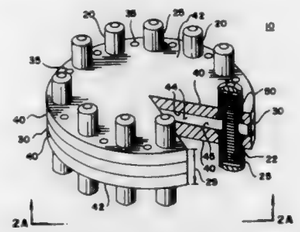
Continuation-in-part of Ser. No. 633,142, Dec. 24, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 831,837
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—163 **15 Claims**

1. A transducer comprising:

a first and a second spaced apart member for defining an inner spacing between the first and second member, each member having a corresponding spaced apart radiating surface, the radiating surface for generating a wave of energy in a transmitting medium in response to a driving force communicated to the first and second member;

a plurality of containment means coupled to the first and second member and extending outwardly beyond at least one of the radiating surfaces, the containment means for communicating the driving force to the first and second member;

a corresponding plurality of driving means respectively disposed within and coupled to the containment means, the driving means for generating the driving force in response to a change in a predetermined dimension of the driving means from influence by excitation energy; and



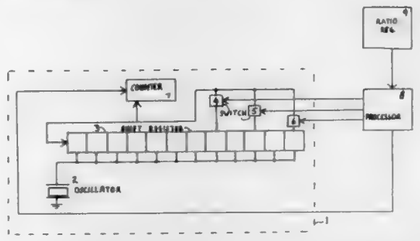
sealing means connected to the first and second member, the sealing means for preventing transmitting fluid from entering the spacing between the first and second member.

5,204,845

CLOCK SYNCHRONIZATION

Evan J. Stanbury, Lakemba, and Peter G. Jeremy, Enmore, both of Australia, assignors to Alcatel N.V., Amsterdam, Netherlands

PCT No. PCT/AU89/00492, § 371 Date Jun. 18, 1991, § 102(e) Date Jun. 18, 1991, PCT Pub. No. WO90/07147, PCT Pub. Date Jun. 28, 1990
PCT Filed Nov. 17, 1989, Ser. No. 691,002
Claims priority, application Australia, Dec. 19, 1988, PJ2029
Int. Cl.[5] G04F *5/00;* **G04B** *18/00*
U.S. Cl. 368—156 **18 Claims**



1. A method of producing a composite clock signal having a clock rate approximating that of a standard clock signal within a given tolerance limit, the method comprising

providing a slow clock signal having a clock rate slightly slower than the standard clock signal by a first difference frequency,

providing a fast clock signal having a clock rate slightly faster than the standard clock signal by a second difference frequency,

applying the fast clock signal as the composite clock signal for a first portion of a period of time, the actual ratio of said first portion to the whole said period of time being approximately equal to the theoretical ratio of the first difference frequency to the sum of the first and second difference frequencies,

applying the slow clock signal as the composite clock signal for the remainder of said period of time, and

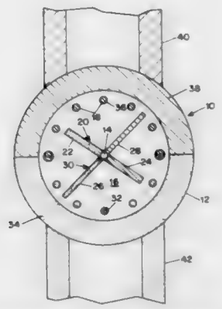
repeating the foregoing steps for successive periods of time.

5,204,846

DUAL TIME-INDICATIVE TIME PIECE

Garth T. Brahaney, 27 Field Point Dr., Greenwich, Conn. 06830

Filed Jul. 24, 1991, Ser. No. 734,903
Int. Cl.[5] G04B *19/04*
U.S. Cl. 368—228 **15 Claims**



1. A dual time-indicating time piece having two distinguishable sets of time-indicating means, each of which can be read with respect to separate and opposite reference indicia, said time piece comprising:

a case,

analog drive means mounted within said case,

a face having a center mounted in said case, said face having display means distributed around said center for displaying continuous analog time information representative of twelve hours, said time information including first and second twelve o'clock representing indicia angularly displaced from each other by 180° with respect to said center,

a first set of hour and minute indicating means coupled to and driven around said center by said drive means for cooperating with said analog time information to indicate time with respect to said first twelve o'clock representing indicia, said first hour indicating means being driven around said center at a rate of one revolution per every twelve hours and said first minute indicating means being driven around said center at a rate of one revolution per every sixty minutes,

a second set of hour and minute indicating means coupled to and driven around said center by said drive means and respectively continuously displaced from the hour and minute indicating means of said first set by 180°, the indicating means of said second set being visually distinguishable from the indicating means of said first set and cooperating with said analog time information to indicate time with respect to said second twelve o'clock representing indicia, and

means for coordinating said first and second sets of indicating means with said first and second twelve o'clock representing indicia, respectively,

whereby said time piece can be read in a first attitude wherein the first twelve o'clock representing indicia is viewed in a position which corresponds to the twelve o'clock position of a conventional time piece with the first set of hour and minute indicating means being read with respect to said first twelve o'clock representing indicia,

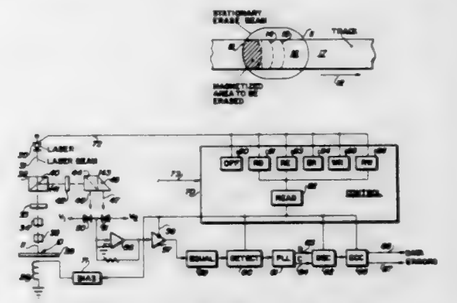
and whereby said time piece can be read in a second attitude wherein the second twelve o'clock representing indicia is viewed in a position which corresponds to the twelve o'clock position of a conventional time piece with the second set of hour and minute indicating means being read with respect to said second twelve o'clock representing indicia.

5,204,847

SENSING PREVIOUSLY-RECORDED INFORMATION WHILE RECORDING OR ERASING A MAGNETOOPTIC STORAGE NUMBER

Morovat Tayefeh, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 438,902, Nov. 20, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 789,865
Int. Cl.[5] G11B *13/04, 11/12*
U.S. Cl. 369—13 **5 Claims**



1. A magnetooptic recorder-player comprising:

optical means including laser means for irradiating a single laser beam onto a magneto-optical recording layer in a data storage member, said storage member recording layer having a plurality of tracks, each said track having magnetic remanence for representing recorded information, said magnetic remanence being stable at temperatures below at Curie point of said recording layer and being astable at temperatures above said Curie point, said laser beam having a rotatable linear polarization, said recording layer rotating the linear polarization of the laser beam in a rotational direction representative of magnetic polarity of said magnetic remanence as the recording layer reflects the laser beam;

first means coupled to said laser means for activating said laser means to emit said single laser beam with an intensity sufficient for sensing but not altering any recorded information in said storage member such that the laser beam is reflected by said recording layer to the optical means as a first reflected laser beam having rotational modulation of said linear polarization rotated to be representative of said magnetic remanence representing information recorded in the recording layer;

second means coupled to said laser means for activating said laser means to emit said single laser beam with an intensity sufficient for momentarily raising the temperature of an irradiated area of the storage member to be above said Curie point for erasing any information recorded in said irradiated area;

magnetic biasing means for supplying a bias magnetic field to said irradiated area, said bias magnetic field having a first magnetic polarity representative of an erasure direction of said magnetic resonance, erasure direction representing no recorded information;

moving means for relatively moving said storage member and said optical means for causing the laser beam to scan one of said tracks at a rate such that the temperature of a leading edge portion of the irradiated area is less than the Curie point while the temperature of a remaining portion of the irradiated area is raised above the Curie point for erasing said recorded information in the remaining portion, said leading edge portion reflecting and modulating a linear polarization of said laser beam as a second reflected laser beam for indicating said recorded information;

control means coupled to said magnetic biasing means, said moving means and to said second means for simulta-

between said disc-exchanging and loaded positions in

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neously activating said magnetic biasing means, said moving means and said second means for erasing a predetermined portion of said one track; and

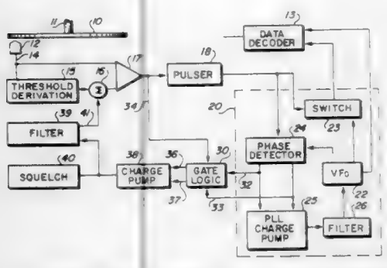
reading means in said optical means for receiving and responding to said first and second reflected laser beams for demodulating the respective rotated linear polarization of the first and second reflected laser beams for generating electrical signals representing said recorded information.

5,204,848

ADJUSTING AMPLITUDE DETECTION THRESHOLD BY FEEDING BACK TIMING-DATA PHASE ERRORS

Silvio A. Cardero, and Glen A. Jaquette, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,477
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—48 **10 Claims**



8. In a machine-effected method of controlling readback and detection of signals from a signal storage medium, including the steps of:

sensing signals stored on the medium for generating a readback signal;

timing a clock to the readback signal for generating a timing signal including comparing the phase of the readback signal and the timing signal for generating a phase errors signal indicating a phase difference between the readback signal and the timing signal; and

deriving an amplitude detection threshold signal from the readback signal for detecting information carried in the readback signal, deriving a threshold adjusting signal from said phase error signal, adding the derived adjusting signal to the threshold signal for creating an adjusted amplitude detection threshold signal and detecting the information carried in the readback signal using the adjusted amplitude detection threshold.

5,204,849

DISK PLAYBACK APPARATUS WITH CENTERING DEVICE FOR DIFFERENT DISK SIZES

Yoshinori Yamada; Kazuo Kobayashi; Masanori Sugihara; Susumu Yoshida; Kiyoshi Morikawa, and Masakazu Kurumada, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 491,906
Claims priority, application Japan, Aug. 11, 1989, 1-208712
Int. Cl.[5] G11B *33/02, 17/04*
U.S. Cl. 369—75.2 **8 Claims**

1. A disk playback apparatus comprising:

a support frame;

a clamper arm swingably mounted on a rear portion of said support frame; and

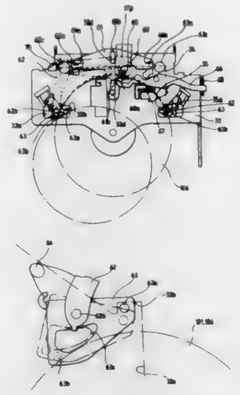
a centering mechanism for guiding a large diameter disk and a small diameter disk from a front side of said playback apparatus to a playing position between said support frame and said clamper arm when the disk is inserted into the playback apparatus;

said centering mechanism comprising:

a pair of centering arms rotatably mounted on said clamper arm on a side of said clamper arm facing said support frame, said centering arms having centering pins extending therefrom for contacting a circumferential edge of said disks in said playing position;

a centering lever slidably attached to said clamper arm and operatively connected to said centering arms so as to cause said pair of centering arms to open and close in concert with each other; and

a lock arm rotatably mounted about each of said centering pins for locking said centering arms, said lock arms each having an opening into which an engagement piece



mounted at tip end portion of said centering arm extends to form a stop mechanism against the rotation of said lock arm, said lock arm further including a lock pin projected upwardly and releasably engaging with a lock recess portion of said clamper arm for locking the swing motion of said centering arm, a lock release pin for rotating the lock arm to release the lock condition, and a lock arm-biasing spring interposed between said centering arm and said lock arm for biasing said lock pin in a direction in which said lock pin is engaged with said lock recess portion said lock arms allowing said pair of centering arms to be swingable only when both of said lock arms are released.

5,204,850

LOADING APPARATUS FOR A DISC-SHAPED RECORDING MEDIUM

Katsuyuki Obata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

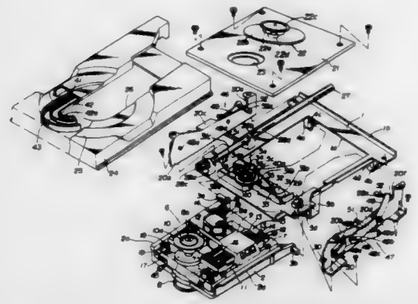
Filed Aug. 20, 1990, Ser. No. 570,136
Claims priority, application Japan, Aug. 31, 1989, 1-225317
Int. Cl.[5] G11B *25/04, 17/04*
U.S. Cl. 369—75.2 **8 Claims**

1. In an apparatus having a player section for reproducing signals recorded on a disc-shaped recording medium, a loading device comprising:

disc transport means including a disc tray adapted to be movable in a plane between a disc-exchanging position remote from said player section for exchanging a disc-shaped recording medium and a loaded position proximate to said player section; and

means thrusting against said disc tray in said loaded position for suppressing vibrations in said disc tray during reproducing by said player section of the signals recorded on said disc-shaped medium, said means for suppressing vibrations being adapted to thrust said disc tray in a direction normal to the plane in which said disc tray is movable

between said disc-exchanging and loaded positions in response to rocking of said player section relative to said disc tray, said means for suppressing vibrations including a first link adapted to be rotated in response to said rock-



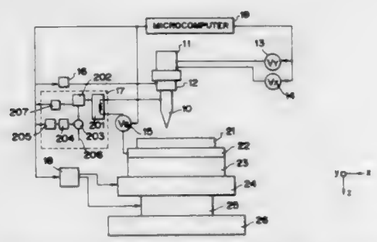
ing of said player section and a second link, said second link having a free end and being rotated by rotation of said first link in a first direction to cause thrusting of the disc tray by the free end of said second link.

5,204,851

APPARATUS FOR READING AND/OR INPUTTING INFORMATION

Haruki Kawada, Yokohama; Hideyuki Kawagishi, Ayase; Kiyoshi Takimoto, Isehara, and Yuko Morikawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 738,113
Claims priority, application Japan, Aug. 1, 1990, 2-205831
Int. Cl.[5] G11B *9/00*
U.S. Cl. 369—126 **24 Claims**



1. An apparatus for reading information from an information medium and/or inputting information to the information medium through a probe electrode, comprising:

voltage application means for applying a voltage between said probe electrode and said information medium, wherein the information is read from the information medium and/or the information is inputted to the information medium by a voltage application of said voltage application means; and

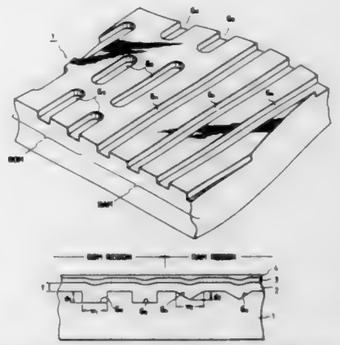
charge removing means by which a charge removing process on the information medium to which the voltage is applied by said voltage application means is performed while maintaining the information in said information medium.

5,204,852

OPTICAL DISC-LIKE RECODING MEDIUM AND MANUFACTURING METHOD THEREOF

Eiji Nakagawa, Yokosuka; Makoto Itonaga, Yokohama, and Toshinori Kawanishi, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 15, 1991, Ser. No. 655,817
Claims priority, application Japan, Feb. 17, 1990, 2-36910; Sep. 30, 1990, 2-103106[U]; Nov. 9, 1990, 2-305524; Nov. 29, 1990, 2-331060
Int. Cl.[5] G11B *3/70*
U.S. Cl. 369—275.1 **7 Claims**



1. An optical disc-like recording medium having on one surface of its transparent substrate a ROM region where a plurality of pits are previously formed in correspondence with a predetermined to be recorded information signal and a RAM region where a plurality of guide grooves for tracking are formed and an information signal can be recorded, a recording film being provided on the entire surface of said transparent substrate, said recording film being made of an organic material and arranged to have a light-absorbing effect to vary its refractive index in response to illumination of laser light with a predetermined wavelength, said recording film having provided thereon a reflection film made of a metal and arranged to reflect light incident thereon, each of said plurality of pits and each of said plurality of guide grooves having respective optical depths defined by respective products of the physical depth and refractive index for each of said plurality of pits and each of said plurality of guide grooves such that said optical depth of each of said plurality of pits formed in said ROM region is arranged to be deeper than said optical depth of each of said plurality of guide grooves formed in said RAM region such that, when the information signal recorded in said RAM region is the same as said predetermined information signal previously recorded in said ROM region and the reproduction light incident on said ROM region is coincident in wavelength and intensity with the reproduction light incident on said RAM region, a property of the reflection light reflected from said ROM region is conincident with a property of the reflection light reflected from said RAM region.

5,204,853

ADAPTOR FOR A DISC CARTRIDGE CASE

Yasuhiko Kamoshita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 27, 1989, Ser. No. 316,238
Claims priority, application Japan, Feb. 29, 1988, 63-25230[U]
Int. Cl.[5] G11B *23/00*
U.S. Cl. 369—289 **6 Claims**

1. An adaptor for a disc cartridge case having a disc housing space for receiving a disc interchangeably, the disc being played back therein and being loaded in a disc playback device main body with the disc received therein for playback of the

disc, said adaptor being used for a disc of a small diameter

fined as a cycle and where the time slots comprise probe and

clock means for maintaining accurate time relative to a

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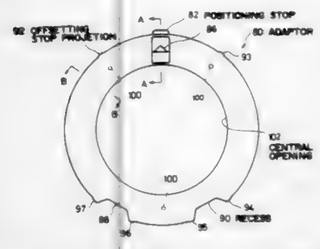
disc, said adaptor being used for a disc of a small diameter, being detachably mounted in the disc housing space of the disc cartridge case and comprising:

a generally annular body;

a central opening in the body for receiving a disc of a small diameter therein, the disc of a small diameter being roughly positioned in the central portion of the disc housing space, and the disc being set on a turntable of the disc playback device main body when the adaptor is mounted in the disc housing space; and



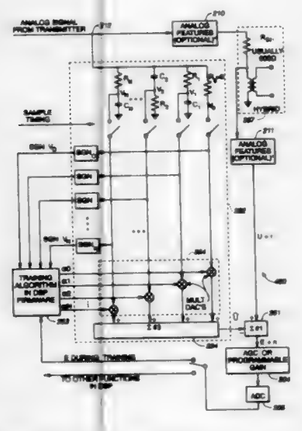
self positioning means for positioning the adaptor with respect to the case such that the adaptor is held in position by the case and does not contact the disc when the disc is set on the turntable.

5,204,854

ADAPTIVE HYBRID

Roubik Gregorian, San Jose, and Earl Gibson, Milpitas, both of Calif., assignors to Sierra Semiconductor Corporation, San Jose, Calif.

Filed Aug. 23, 1991, Ser. No. 749,267
Int. Cl.[5] H04B *3/23*
U.S. Cl. 370—32.1 **9 Claims**



1. An adaptive hybrid comprising:

a first input port for receiving a received signal from a transmission channel;

a second input port for receiving an input signal from a transmitter;

a correction feature comprising a differencer having a first input port coupled to said first input port of said adaptive hybrid for receiving said received signal from said transmission channel, a second input port coupled to said second input port of adaptive hybrid for receiving a an echo correction signal, and an output port serving as said output port of said adaptive hybrid and providing the difference signal between said received signal from said transmission channel and said echo correction signal, said difference signal serving as an analog error signal;

an echo correction feature comprising:

a plurality of analog impedance networks greater than two, connected in parallel, each network having an input port coupled to said input port of said adaptive hybrid and having an output port;

a gain stage having a controllable gain stage having an input port coupled to said output port of its associated impedance network, and an output port;

a summer having a plurality of input ports, each being coupled to the output port of an associated one of said gain stages, and an output port serving as an output port of said echo correction feature for providing said echo correction signal, and being coupled to said second input port of said differencer; and

means for altering the gain of said gain stages in order to provide a desired correction of said signal from said differencer; and

control means for establishing a desired gain of said gain stages, comprising:

a plurality of sign blocks, each having an input connected to said output port of an associated of one of said impedance networks and an output port for providing an output signal representative of the polarity of the signal applied to said input;

an analog-to-digital converter for converting said analog error signal from said output port of said differencer to a digital value; and

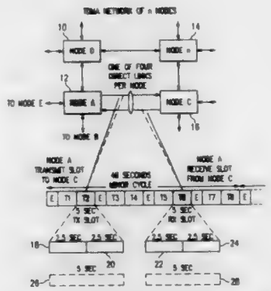
a processor coupled to receive said digital value of said analog error signal and said output signals from said sign blocks and in response thereto modifying the gains of said gain stages, wherein the gain of each of said gain stages is periodically incremented in proportion to the product of said error signal at the output signal of an associated sign block.

5,204,855

SKYWAVE ADAPTABLE NETWORK TRANSCEIVER APPARATUS

Melvin G. Bebee, Richardson; Bill C. Miller, Allen; Daniel O. Weddle, Plano; W. P. Werth, and C. David Young, both of Richardson, all of Tex., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jan. 9, 1991, Ser. No. 639,487
Int. Cl.[5] H04J *4/00*
U.S. Cl. 370—50 **22 Claims**



1. A node in a network of operationally identical nodes where each node can directly communicate with a predetermined number of neighbor nodes on a time multiplexed basis with each neighbor being assigned separate and exclusive transmitting and receiving time slots where the communication carrier frequencies used may be different for transmitting and receiving as well as different for each neighbor, where a set of transmitting and receiving time slots for each neighbor is defined as a cycle and where the time slots comprise probe and traffic portions, comprising in combination:

clock means for maintaining accurate time relative to a common reference of all nodes;

list means for storing a frequency-time related list of probe frequencies to be used for any given time between nodes with the number of cycles required to transmit each of the probe frequencies on said list being defined as an epoch;

transmission means, connected to said clock means, for transmitting a different frequency probe each cycle during a probe preamble portion of the transmitting time slot, in accordance with said frequency-time related list, with no frequency being repeated until an epoch is completed;

reception means for detecting probes transmitted from each of said predetermined neighbor nodes each cycle at a frequency as defined in said frequency-time related list;

means, connected to said list means, said transmission means and said reception means, for at any time calculating the next frequency to be used from said frequency-time related list thereby permitting the joining of the network asynchronously by any already designated neighbor at any time;

measurement means, connected to said transmission and reception means, for adding a frequency used during the successful reception of a probe to a stored set of working frequencies and storing quality measurements associated with that successful reception frequency;

control data means, associated with said transmission means, for using at least some of the transmitting time slot after a probe preamble to transmit control data; and

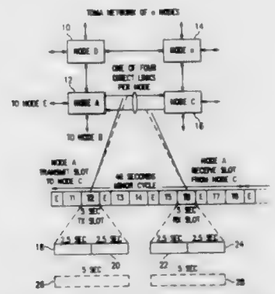
information transfer means, connected to said transmission means, for using the other of said first and second portions of the transmitting time slot to carry traffic information subsequent to recognizing link-up with a given neighbor node.

5,204,856

SKYWAVE ADAPTABLE NETWORK TRANSCEIVER APPARATUS USING PREDICTIVE FREQUENCIES FOR INITIAL LINK-UP

Melvin G. Bebee, Richardson; Bill C. Miller, Allen; Daniel O. Weddle, Plano, and C. David Young, Richardson, all of Tex., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jan. 9, 1991, Ser. No. 638,956
Int. Cl.[5] H04J *4/00*
U.S. Cl. 370—50 **7 Claims**



1. A node in a network of operationally identical nodes where each node can directly communicate with a predetermined number of neighbor nodes on a time multiplexed basis with each neighbor being assigned separate and exclusive transmitting and receiving time slots where the communication carrier frequencies used may be different for transmitting and receiving as well as different for each neighbor, where a set of transmitting and receiving time slots for each neighbor is defined as a cycle and where the time slots comprise probe and traffic portions, comprising in combination:

clock means for maintaining accurate time relative to a common reference of all nodes;

list means for storing a frequency-time related list of probe frequencies to be used for any given time between nodes with the number of cycles required to transmit each of the probe frequencies on said list being defined as an epoch;

means for computing a frequency predicted to provide effective communication between nodes at any given time;

transmission means, connected to said clock means, for transmitting a different frequency probe each cycle during a probe preamble portion of the transmitting time slot, in accordance with said frequency-time related list, with no frequency being repeated until an epoch is completed, and for transmitting signals at said predicted frequency, in the traffic portion of the transmitting time slot prior to recognizing link-up with a neighbor node, in an attempt to hasten said link-up, and for transmitting traffic signals in said traffic portion after said link-up;

reception means for detecting probes transmitted from each of said predetermined neighbor nodes each cycle at a frequency as defined in said frequency-time related list and for detecting said signals at said predicted frequency;

means, connected to said list means, said transmission means and said reception means, for at any time calculating the next frequency to be used from said frequency-time related list thereby permitting the joining of the network asynchronously by any already designated neighbor at any time;

measurement means, connected to said probe transmission and reception means, for adding a frequency used during the successful reception of a probe or of said predicted frequency signals to a stored set of working frequencies and storing quality measurements associated with that successful reception frequency; and

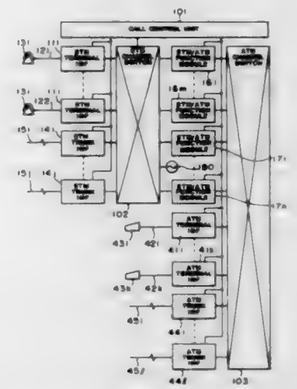
control data means, associated with said transmission means, for using at least some of the transmitting time slot after said probe preamble portion to transmit control data.

5,204,857

ATM EXCHANGE SYSTEM

Keiichi Obara, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1991, Ser. No. 747,869
Claims priority, application Japan, Aug. 20, 1990, 2-218762
Int. Cl.[5] H04J *3/02, 3/12*
U.S. Cl. 370—60 **8 Claims**



2. An ATM exchange system in which STM terminals and STM trunk lines of an STM system and ATM terminals and ATM trunk lines of an ATM system are accommodated, comprising:

an ATM channel switch for providing a direct exchange

connection between an ATM terminal and an ATM trunk

from the output of the source address detecting means as

ing signals from, the network via said U-interface serving to extract from signals received via said U-interface (412)

a digital interface of the switch means and an opposite end terminated at a remote digital communications port of the

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connection between an ATM terminal and an ATM trunk line;

an STM channel switch for providing a direct exchange connection between an STM terminal and an STM trunk line;

STM/ATM conversion module disposed between the ATM channel switch and the STM channel switch, for converting a call of one system to that of another system when a call is made between an ATM terminal/line and an STM terminal/line; and

call control means coupled to the ATM channel switch, the STM channel switch and the STM/ATM conversion module for controlling a call connection between a first ATM terminal, ATM trunk line, STM terminal or STM trunk line and a second ATM terminal, ATM trunk line, STM terminal or STM trunk line.

wherein said call control means includes:

detecting means for detecting a usage condition of the STM/ATM conversion modules when the call is made between an ATM terminal/line and an STM terminal/line, and

control mans for effecting connection processing for connecting the ATM channel switch to the STM channel switch via the STM/ATM conversion module which is detected to be idle, and effecting busy processing if a busy state is detected.

5,204,858

ADDRESS SETTING AND FILTERING SYSTEM FOR TERMINAL ACCOMMODATING CIRCUITS IN A PACKET SWITCHING SYSTEM

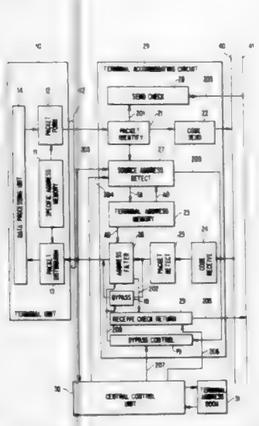
Haruhiko Kinashi; Isao Hisada, and Kiyo Takahashi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,371

Claims priority, application Japan, Aug. 23, 1989, 1-217920; Mar. 30, 1990, 2-84182

Int. Cl.[5] H04L *12/56*

U.S. Cl. 370—94.1 **4 Claims**



1. An address setting and filtering system for terminal accommodating circuits in a packet switching system in which terminal addresses are set in said terminal accommodating circuits, each of said terminal accommodating circuits accommodating a terminal unit to which prescribed packet switching is performed, connecting the terminal unit to a high speed transmission bus and transferring packet frames,

wherein each of said terminal accommodating circuits comprises:

source address detecting means for detecting and outputting an originating source address from a source packet frame received from said terminal unit;

a terminal address memory for storing said source address from the output of the source address detecting means as a terminal source address; and

address filter means for extracting a destination address from a packet frame received from said high speed transmission bus and, if said destination address is found to be identical with the terminal address stored in said terminal address memory, transferring said packet frame to said terminal unit.

5,204,859

METHOD AND APPARATUS FOR DETECTING A FRAME ALIGNMENT WORD IN A DATA SYSTEM

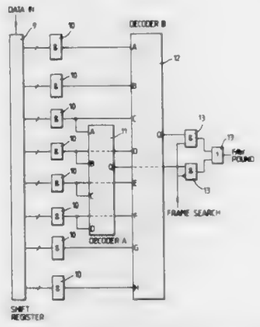
Martin R. A. Paesler, and Sover W. S. Wong, both of Nottingham, England, assignors to GEC Plessey Telecommunications Limited, England

Filed Feb. 13, 1991, Ser. No. 654,949

Claims priority, application United Kingdom, Feb. 23, 1990, 9004188

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—105.1 **11 Claims**



1. Apparatus for error-tolerantly detecting a multi-bit frame alignment word in a time division multiplex data stream of bits despite corruption of the frame alignment word due to bit transmission errors, comprising:

storage means for serially receiving, storing and outputting the data stream of bits;

matching means having a preset bit pattern corresponding to the frame alignment word to be detected, said preset bit pattern being comprised of a predetermined number of groups of bits, said matching means being connected to the storage means for serially receiving and comparing the data stream of bits from the storage means with the groups of bits of the preset bit pattern, and for generating a group output signal from each group when the bits from the data stream match a respective group; and

decoder means connected to the matching means for receiving each group output signal, and for generating a frame alignment signal indicative of detection of the frame alignment word when a specified number, less than said predetermined number, of groups have generated group output signals.

5,204,860

NETWORK TERMINATING TERMINAL APPARATUS FOR INTEGRATED SERVICES DIGITAL NETWORK

Thomas C. Sparks, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 5, 1990, Ser. No. 622,631

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—110.1 **12 Claims**

1. Network terminating terminal apparatus, for an Integrated Services Digital Network, comprising:

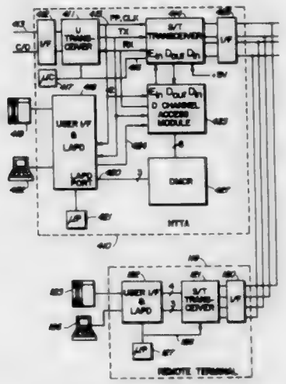
a U-interface (**412**) for connection to the network;

a U-transceiver (**411**) for transmitting signals to, and receiving signals from, the network via said U-interface serving to extract from signals received via said U-interface (**412**) B-channel data and D-channel data, a clock signal and framing signal;

an S/T interface for connecting to remote terminal apparatus and a S/T transceiver (**414**) for transmitting signals to, and receiving signals from, said remote terminal apparatus via said S/T interface (**425**);

a user interface and LAPD circuit (**418**) for interfacing local station apparatus (**419, 422**), including D-channel protocol means responsive to said user interface for generating a D-channel access signal ($D_{request}$, D_{class}) for securing access to said D-channel to enable said user interface and LAPD to transmit data to said U-transceiver (**411**);

D-channel monitoring and contention resolution means (**427**) for monitoring a D-channel in a data signal from said



protocol means and signals received from said remote terminals by said S/T transceiver (**414**) and resolving contention between said user interface and LAPD (**418**) and said remote terminal apparatus and for providing to said user interface and LAPD **418** a signal (D_{grant}) enabling access D_{grant} and a D-channel control signal (D_b);

D-channel access means responsive to said framing signal, said clock signal, said access enabling signal (D_{grant}) and said D-channel control signal (D_b) for controlling application to said U-transceiver **411** of B-channel data and D-channel data in said data signal from said user interface (TX_{LAPD}) and LAPD circuit (**418**) selectively;

said D-channel access means (**423**) serving to supply a D-channel control bit (E_{in}) to said S/T transceiver, said S/T transceiver being arranged to transmit said bit as an ECHO signal to said remote terminals.

5,204,861

KEY TELEPHONE SYSTEM WITH ENHANCED CONNECTIVITY

Charles R. Wiebe, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 19, 1991, Ser. No. 672,032

Claims priority, application Canada, Jan. 31, 1991, 2035357-1

Int. Cl.[5] H04J *3/12*

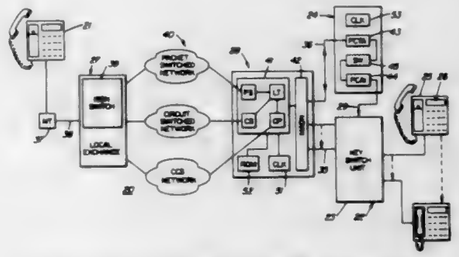
U.S. Cl. 370—110.1 **16 Claims**

1. A key telephone system having enhanced connectivity and which is operably responsive to selected ones of digitally encoded instruments resident in memory means of switch means disposed in a central data and voice communication facility, comprising in combination:

an analog communications path having one end terminated at an analogy interface of the switch means and an opposite end terminated at a remote key switch unit having a visual display;

a digital communications path having one end terminated at a digital interface of the switch means and an opposite end terminated at a remote digital communications port of the key switch unit;

means for accessing the memory means and downloading selected ones of the digitally encoded instructions to the digital communications port; and



control means communicating with the digital communications port and being operably responsive to the downloaded instructions input thereto for enabling the key switch unit with corresponding service connectivity features and visually displaying the features on the visual display.

5,204,862

TDM SLOT MUTING METHOD AND APPARATUS

John W. Maher, Woodstock, and James T. Rydberg, Lombard, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 1, 1990, Ser. No. 567,524

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—110.1 **6 Claims**

1. In a communication system network that comprises a plurality of communication systems and a processing multiplexer, wherein each of the plurality of communication systems is operably associated with the processing multiplexer by at least one source interface bus having a plurality of TDM slots and at least one sink interface bus having a plurality of TDM slots, wherein the each of the plurality of communication systems comprises:

a plurality of signals destinations;

a plurality of signal sources, wherein at least some of the signal sources produce representations of audio signals;

at least one audio signal bus, operably associated with the plurality of signal sources, having a plurality of TDM

serving to extract a data history with respect to said time serial

signal into a first optical beam having a predetermined

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slots, wherein each of the plurality of TDM slots carries information pertaining to the representation of audio signals for one of the plurality of signals sources; and

processing multiplexer interface means, operably associated with the at least one audio signal bus and the plurality of signal sources, for placing at least some of the representations of audio signals onto the source interface bus such that the at least some of the representations of audio signals are supplied to the processing multiplexer;

wherein, for each communication system, the at least one source interface bus has a corresponding TDM slot for each of the plurality of TDM slots of the at least one audio signal bus, and wherein the processing multiplexer processes the at least some of the representations of audio signals and routes, via the sink interface bus, processed signals to at least some of the plurality of signal destinations, a method for each of the communication systems to mute representations of audio signals produced by at least one of the plurality of signal sources such that the processing multiplexer receives a mute signal instead of the representations of audio signals produced by the at least one signal source, the method comprises the steps of:

a) detecting a mute request;

b) determining which of the plurality of TDM slots of the at least one audio signal bus the mute request is for to produce a determined TDM slot; and

c) injecting a null-audio signal into the determined TDM slot's corresponding TDM slot of the at least one source interface bus with negligible affects on the information pertaining to the representation of audio signals contained within the determined TDM slot.

5,204,863

DEVICE FOR MONITORING THE OPERATION OF A MICROPROCESSOR SYSTEM, OR THE LIKE

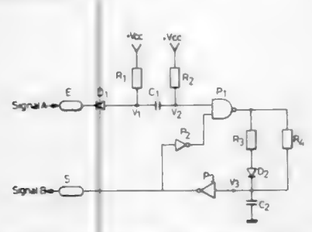
Frédéric Saint-Joigny, Paris, and Alain Sague, Rueil-Malmaison, both of France, assignors to Valeo Neiman, Croissy-sur-Seine, France

Filed Feb. 8, 1991, Ser. No. 652,433

Claims priority, application France, Feb. 9, 1990, 90 01542

Int. Cl.[5] G06F *11/30*

U.S. Cl. 371—16.3 **6 Claims**



1. A device for monitoring the operation of a microprocessor or the like, the device being capable of generating an error signal when the frequency of a signal derived from said microprocessor crosses a lower frequency threshold or an upper frequency threshold, wherein the device comprises:

an oscillator capable of producing a periodic voltage which varies monotonically from a starting voltage, and including a threshold circuit to which said monotonically varying voltage is applied and which is capable of generating an error signal on an output of the device each time said monotonically varying voltage crosses a determined voltage threshold, said oscillator also including a reset input which, on receiving a reset pulse, serves to return the monotonically varying voltage to a level closer to its starting voltage; and

a treatment circuit for treating the derived signal and capable of applying reset pulses to said reset input at a frequency equal to the frequency of the derived signal when said frequency is not greater than the upper frequency threshold, and to apply no reset pulse when the frequency of the derived signal exceeds said upper threshold frequency; the rate at which said monotonically varying voltage varies being such that when said reset pulses are produced at a frequency lower than said lower frequency threshold, the time interval between two successive reset pulses is greater than the time interval required for the monotonically varying voltage to go from the starting voltage to the threshold voltage.

5,204,864

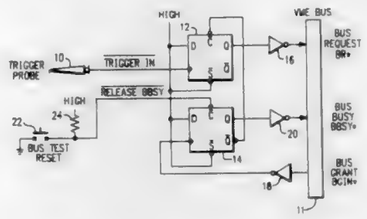
MULTIPROCESSOR BUS DEBUGGER

Chongsoo Won, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 16, 1990, Ser. No. 568,399

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—29.5 **22 Claims**



1. An apparatus for seizing to allow testing over a multiprocessor bus, said apparatus comprising:

a test probe receiving a trigger signal;

a reset circuit commanding an end to a test:

a first latch responsive to said test probe for toggling a bus request signal to the multiprocessor bus when said test probe receives the trigger signal;

a second latch, responsive to said reset circuit and the multiprocessor bus, for toggling a bus busy signal to said multiprocessor bus when said reset circuit commands and end to the test.

5,204,865

DATA EXTRACTING CIRCUIT FOR SERIAL CONTROL APPARATUS

Masakazu Moritoki; Masao Hagiwara; Makoto Takebe, and Yukinori Katayama, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP89/00208, § 371 Date Aug. 9, 1990, § 102(e) Date Aug. 9, 1990, PCT Pub. No. WO89/08361, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 28, 1989, Ser. No. 571,539

Claims priority, application Japan, Feb. 29, 1988, 63-44099; Apr. 27, 1988, 63-104745; Dec. 1, 1988, 63-304635; Dec. 2, 1988, 63-305582

Int. Cl.[5] G06F *7/02*

U.S. Cl. 371—67.1 **7 Claims**

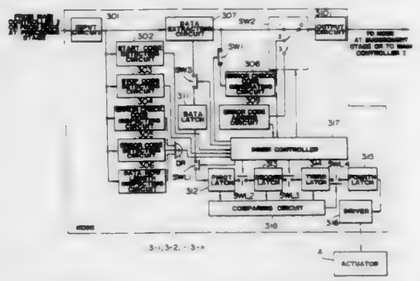
1. A data extracting circuit employable for a serial control apparatus including a main controller and a plurality of nodes each serving as an auxiliary controller, said main controller and said nodes being serially connected in a loop-shaped configuration or in a daisy chain-shaped configuration by a signal transmission line, said serial control apparatus being provided with at least one of time serial data including control data repeatedly periodically transmitted from said main controller to all nodes serially connected to said main controller via said signal transmission line and time serial data including sensing data repeatedly periodically transmitted from a specific one of said plurality of nodes to said main controller and all nodes serially connected to said specific node via said signal transmission line, said data extracting circuit being disposed in said main controller and in each of said plurality of nodes and

serving to extract a data history with respect to said time serial data being repeatedly periodically transmitted, said data extracting circuit comprising:

extracting means for extracting data in a specific time slot of said time series data,

first latching means for latching said extracted data as new data each time said extracting means extracts data,

second latching means for latching as old data the data latched by said first latching means in response to subsequent transmissions of said time series data,



controlling means for controlling a terminal unit in response to the data latched by said second latching means,

detecting means for detecting from said time series data presence or absence of an error and presence or absence of an error history representing that an error is present in said time series data, and

inhibiting means for inhibiting data from being latched by said second latching means when at least one of the error and the error history is detected by said detecting means.

5,204,866

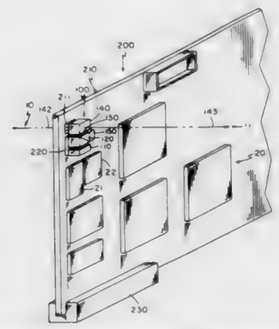
BIDIRECTIONAL FREE-SPACE OPTICAL BUS FOR ELECTRONICS SYSTEMS

Timothy R. Block, and Tong Lu, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 597,230, Oct. 15, 1990, Pat. No. 5,113,403. This application Feb. 5, 1992, Ser. No. 831,729

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—27 **22 Claims**



1. A subsystem for an electronics system having multiple subsystems mounted in a frame so as to define a single axis passing through said subsystems, said one subsystem comprising:

a support adapted for mounting on said frame;

function circuits carried by said support, and adapted to produce a first electrical signal and to receive a second electrical signal;

optical generating means for converting said first electrical signal into a first optical beam having a predetermined polarization;

an amplitude beam splitter mounted on said support so as to intersect said axis, and optically coupled to said generator for transmitting said first optical beam in two opposite directions along said axis in said predetermined polarization, and for receiving a second optical beam having said predetermined polarization from either of said two opposite directions along said same axis;

optical detecting means coupled to said amplitude beam splitter for converting said second optical beam into said second electrical signal.

5,204,867

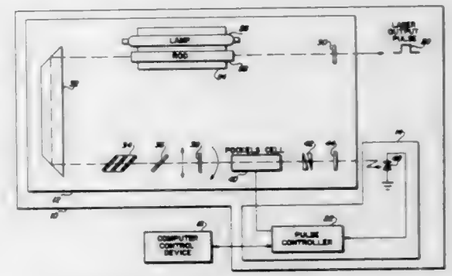
METHOD AND APPARATUS TO DYNAMICALLY CONTROL THE RESONATOR GAIN OF A LASER

Eric Koschmann, Orlando, Fla., assignor to Laser Photonics, Inc., Orlando, Fla.

Filed Jun. 10, 1991, Ser. No. 713,135

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—33 **18 Claims**



1. An apparatus for controlling the resonator gain of a Q-switched laser, the apparatus comprising:

laser resonator means including a Q-switch for generating a Q-switched laser output pulse having a predetermined shape;

means within said resonator means for sensing variations in intensity of laser energy within said resonator means; and

controller means responsive to an output of said sensing means for regulating the shape of said Q-switch output pulse to maintain the predetermined shape.

5,204,868

OPTICAL ISOLATOR AND METHOD FOR ASSEMBLING SAME

Yoshihiro Konno, Kawaguchi, and Hiroshi Kume, Tokyo, both of Japan, assignors to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01465, § 371 Date Jul. 12, 1991, § 102(e) Date Jul. 12, 1991, PCT Pub. No. WO91/07684, PCT Pub. Date May 30, 1991

PCT Filed Nov. 13, 1990, Ser. No. 721,482

Claims priority, application Japan, Nov. 14, 1989, 1-296337; Jun. 7, 1990, 2-149617

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 **5 Claims**

1. An optical transmission arrangement comprising a source of light of wavelength λ and an optical isolator having a polarizer, an analyzer, a Faraday rotator formed of a material having a range of optical properties which decrease symmetrically as a function of temperature from a temperature at which a maximum value of said optical properties occurs and a permanent magnet which magnetizes the Faraday rotator into a Faraday rotation angle of approximately 45°; wherein said optical isolator has been assembled into an optical position, in

which the temperature at which said maximum value of said

5,204,870

emitter region, wherein portions of the first emitter region and

regulator emulator changeable weight controlling a de-

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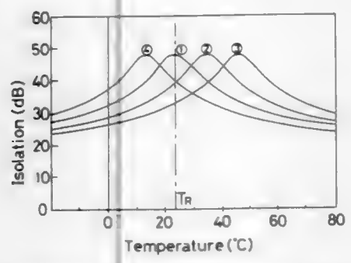
which the temperature at which said maximum value of said optical properties occurs is room temperature, using a source of light having an adjusted assembly wavelength which minutely differs from the wavelength λ by a value Δλ in order to



shift the temperature at which said maximum value of said optical properties occurs from said room temperature to a temperature in the middle of a temperature range in which the optical isolator is used with the light source of wavelength λ.

5,204,869

RADIATION-EMITTING SEMICONDUCTOR DEVICE HAVING EMISSION IN THE VISIBLE RANGE AND A HIGH MAXIMUM OPERATING TEMPERATURE

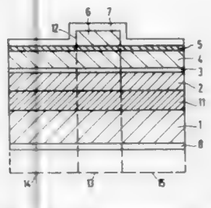
Adriaan Valster, and Coen T. H. F. Liedenbaum, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 23, 1991, Ser. No. 690,443

Claims priority, application Netherlands, May 23, 1990, 9001193

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **7 Claims**



1. A radiation-emitting semiconductor diode comprising a semiconductor body with a semiconductor substrate of a first conductivity type on which are present at least, in that order, a lower cladding layer of the first conductivity type, an active layer, and an upper cladding layer of a second conductivity type, said active layer and at least one of said cladding layers, to be called first cladding layer hereinafter, comprising mutually differing semiconductor materials which each comprise a mixed crystal of at least two binary compounds with two sub-lattices, atoms of different elements being present side by side on at least one of said sub-lattices, to be called first sub-lattice hereinafter, characterized in that the distribution of the atoms of different elements over said first sub-lattice in said active layer is ordered to a greater extent than it is in said first cladding layer, and in that the different in the degree of ordering between said active layer and said first cladding layer results in an increased different between the bandgap of said active layer and the bandgap of said first cladding layer.

5,204,870

METHOD OF IMPLEMENTATION OF SURFACE-EMISSION SEMICONDUCTOR LASERS, AND LASERS OBTAINED BY THE METHOD

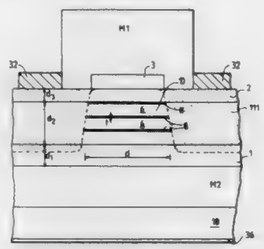
Jérome Faist, Murray Hill, N.J., and Franz K. Reinhart, Chemin de Chandolin, Switzerland, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 13, 1991, Ser. No. 806,208

Claims priority, application France, Dec. 28, 1990, 90 16432

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **15 Claims**



1. A method for implementing a surface-emission laser whose light emission occurs along a direction z perpendicular to the surface of said laser, comprising the steps of:

epitaxially growing on a single-crystal substrate a single-crystal Bragg mirror made up of alternate layers of different compounds, said substrate and said mirror being doped with a first impurity capable of creating in the doped region free charge carriers of a first type;

epitaxially growing at least one single-crystal layer of a first compound with a forbidden band E_2;

epitaxially growing single-crystal multiple layers forming an active medium forming a plurality of quantum wells delimited and separated by intermediate layers of a compound with a forbidden band E_1, said quantum wells being thin layers of another compound with a forbidden band $E_0 < E_1 \leqq E_2$, said multilayer active medium having transverse dimensions perpendicular to said direction z larger than those of said active region of the laser to be obtained;

epitaxially growing a last single-crystal layer of a compound having a forbidden band $E_1 \leqq E_2$;

masking a portion of the surface of said last layer of the active region to define said transverse dimensions of said active region;

implanting and diffusing a second impurity in the region surrounding said active region previously masked to a depth reaching said first epitaxial layer with a forbidden band E_2, said second impurity being capable of creating in said region surrounding the masked active region free charge carriers of a second type different from said first type;

depositing metal ohmic contacts on said last epitaxial layer with a forbidden band E_1 in electrical contact therewith under said substrate and in contact therewith; and

depositing a semitransparent mirror on said active region.

5,204,871

BISTABLE OPTICAL LASER BASED ON A HETEROSTRUCTURE PNPN THYRISTOR

Eric C. Larkins, 5101 SW. 77 St., Miami, Fla. 33141

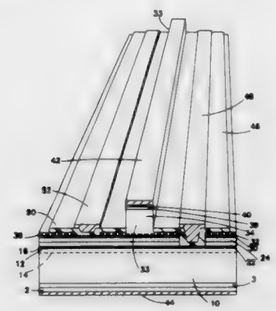
Filed Mar. 29, 1990, Ser. No. 501,253

Int. Cl.[5] H01L *29/161, 33/00, 27/14*

U.S. Cl. 372—45.1 **52 Claims**

1. A semiconductor apparatus which propagates light in a preferred direction, the apparatus comprising, in succession, a substrate, a first emitter region, a first carrier confinement region, a first internal heterojunction barrier, a first base region, a second base region, a second internal heterojunction barrier, a second carrier confinement region, and a second

emitter region, wherein portions of the first emitter region and the second base region are of one conductivity type and portions of the second emitter region and the first base region are of the opposite conductivity type, wherein the first and second emitter regions, the first and second carrier confinement re-



gions, the first and second internal heterojunction barriers and the first and second base regions together define a single optical cavity in the directions perpendicular to the preferred direction of light propagation, and means for causing electrical current to flow through the semiconductor apparatus.

5,204,872

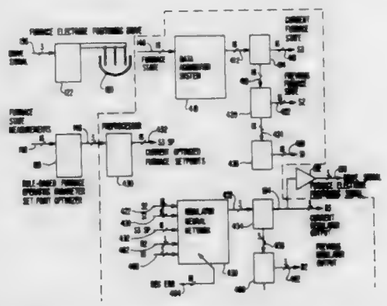
CONTROL SYSTEM FOR ELECTRIC ARC FURNACE

William E. Staib, and Robert B. Staib, both of Davenport, Iowa, assignors to Milltech-HOH, Inc., Davenport, Iowa

Filed Apr. 15, 1991, Ser. No. 685,629

Int. Cl.[5] H05B *7/148*

U.S. Cl. 373—104 **30 Claims**



2. In a control system for an electric arc furnace of a type having electrode means, drive means for changing a position of said electrode means, means for obtaining one or more furnace state measurements, means responsive to said furnace state measurements for establishing one or more state measurement set-points for optimizing operation of said furnace, and furnace regulator means responsive to said set-points and said furnace state measurements to calculate a change in electrode position for causing said furnace state measurements to more closely approach their respective set-points, and for causing said drive means to move said electrode means accordingly; the improvement wherein said regulator means comprises:

furnace regulator emulator neural network means having at least one layer and at least one input means, each said layer having at least one neural element, said furnace regulator emulator neural network means also having at least one coupling means for connecting each said neural element to at least one other said neural element or at least one said input means, each said coupling means having a regulator emulator changeable weight controlling a degree of coupling provided thereby;

means for presenting inputs to said furnace regulator emulator neural network means representing said furnace state measurements and said set-points;

said furnace regulator emulator neural network means being arranged to calculate a regulator output as a function of said inputs representing said furnace state measurements, said inputs representing said set-points and said regulator emulator changeable weight, and to present said regulator output to said drive means to control the position of said electrode means;

means for comparing said set-points and said inputs representing said furnace state measurements for calculating a regulator error signal;

and means responsive to said regulator error signal for practically continuously modifying said regulator emulator changeable weight accordingly.

5,204,873

DC ELECTRIC ARC MELTING APPARATUS

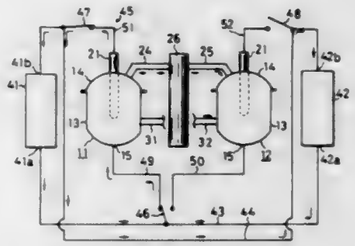
Hiroshi Imagawa, Gifu, Japan, assignor to Daidotokushuko Kabushikikaisha, Japan

Filed Feb. 28, 1992, Ser. No. 843,111

Claims priority, application Japan, Mar. 2, 1991, 3-61217

Int. Cl.[5] H05B *7/144*

U.S. Cl. 373—108 **1 Claim**



1. A DC electric arc melting apparatus comprising first and second DC electric arc furnaces provided with respective anodes and cathodes and being provided side by side, and a duct connecting said first and second DC electric arc furnaces to conduct an exhaust gas from said first DC electric arc furnace to said second one and vice versa, characterized in that power source apparatuses each having an output equal to a half of the operating electric power of said each DC electric arc furnace are located near the first and second DC electric arc furnaces respectively, anodes of said both power source apparatuses are connected mutually by an anode cable, cathodes of said both power source apparatuses are connected mutually by a cathode cable, and said anodes and cathodes of said first and second DC electric arc furnaces are connected to said anode cable and said cathode cable, respectively, through a connection circuit having a switch adapted to supply electric power alternately to either of said first and second DC electric arc furnaces.

5,204,874

METHOD AND APPARATUS FOR USING ORTHOGONAL CODING IN A COMMUNICATION SYSTEM

David D. Falconer, Nepean, Canada, and Fuyun Ling, Jamaica Plain, Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 19, 1992, Ser. No. 839,528

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **25 Claims**

1. An apparatus comprising a signal encoder, the signal encoder comprising:

(a) encoding means for encoding input data bits of a signal

predetermined length of the orthogonal codes being set in

4-ary words, said locally-generated stream of known 4-ary

synchronizing sequence and one data sequence, said method

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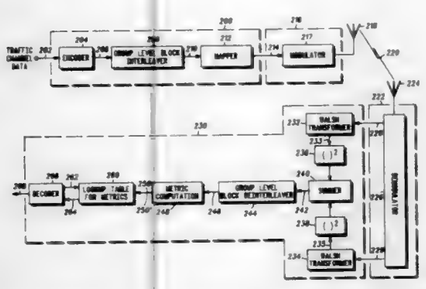
(a) encoding means for encoding input data bits of a signal into data symbols and grouping the data symbols, the data symbols being encoded with an encoding algorithm, wherein the encoding algorithm produces data symbols which are subsequently decoded into data signal bits using maximum likelihood decoding, the encoding algorithm comprising implementing at least one generator function having weight spectrum optimized for use in orthogonal coding; and



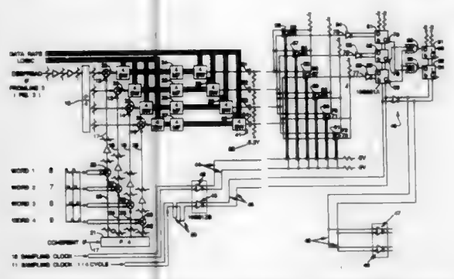
(b) translating means, operatively coupled to the encoding means, for translating the groups of data symbols according to an algorithm selected from the group consisting essentially of (i) interleaving by group each group of data symbols within a predetermined size block and subsequently deriving an orthogonal code from each group of interleaved data symbols and (ii) deriving an orthogonal code from each group of data symbols and subsequently interleaving by orthogonal code each orthogonal code within a predetermined size block.

5,204,875

4-ARY CORRELATOR, MATCHED FILTER, AND DECODER FOR COHERENT, DIRECT SEQUENCE, SPREAD SPECTRUM APPLICATIONS

Vaughn L. Mower, Bountiful, and Merle L. Keller, Salt Lake City, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 9, 1991, Ser. No. 728,906
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 6 Claims



1. In a 4-ary spread spectrum receiver, a despreading system for demodulating a coherent 4-ary transmitted IF signal modulated by a stream of unknown 4-ary words, said transmitted signal having a known spreading rate (PN code), the receiver comprising:

a first mixer (**2**), said modulated IF signal being applied to one input (**1**) of said first mixer;

a PN code generator (**5**), said PN code generator providing a locally-generated PN code and a continuous locally-generated stream of known first, second, third and fourth 4-ary words, said locally-generated stream of known 4-ary words being coherently aligned with the modulations on said transmitted IF signal, said locally-generated stream being applied to a second input (**4**) of said first mixer, whereby the output of said first mixer (**2**) comprises said despread IF modulated by 4-ary words of unknown identity;

said PN code generator (**5**) also having four outputs, one for each of first, second, third and fourth known 4-ary words;

a first group (**26–29**) of first, second, third and fourth mixers, each having first and second inputs and an output, said first, second, third and fourth 4-ary words from said PN generator being applied to the first input of each of said first, second, third and fourth mixers (**26–29**), respectively, a coherent, unmodulated IF being applied to each of said second inputs of said first group, whereby the outputs of said mixers of said first group each comprises an IF modulated with a respective one of said 4-ary words;

a second group (**12–15**) of first, second, third and fourth mixers, each having first and second inputs and an output, the output of the first mixer (**2**) being applied to each of the first inputs of said second group of mixers, the respective output of said first, second, third, and fourth mixers of said first group being applied to the second inputs of the first, second, third, and fourth mixers, respectively, of said second group, whereby the second outputs of each of the mixers of said second group each comprises a baseband signal, the result of phase information derived by correlating unknown 4-ary words with one of the four locally generated known 4-ary words;

means for removing the alternating current carrier components from the IF outputs of said second group of mixers, leaving only the resultant DC baseband signals derived by correlating the known and the unknown 4-ary words; and

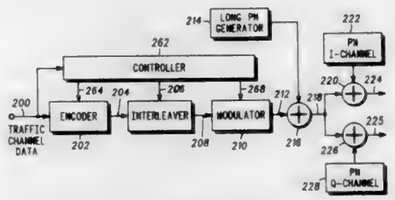
means for determining the sum of the resulting DC voltages, the maximum resultant DC voltage during any given time period being determinative of the identify of the unknown word occurring during a given time period.

5,204,876

METHOD AND APPARATUS FOR PROVIDING HIGH DATA RATE TRAFFIC CHANNELS IN A SPREAD SPECTRUM COMMUNICATION SYSTEM

Eugene J. Bruckert, Arlington Heights, Ill.; Vedat Eyuboglu, Boston, Mass., and David D. Falconer, Nepean, Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1991, Ser. No. 669,127
Int. Cl.[5] H04L *9/00*
U.S. Cl. 375—1 28 Claims



1. A spread spectrum channel apparatus which accommodates variable received data bit rates, comprising:

(a) forward error correction encoder

means for receiving data bits at a particular bit rate and encoding the received data bits at a predetermined encoding rate into data symbols, the predetermined encoding rate being set in response to the received data bit rate; and

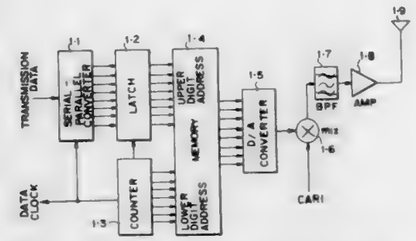
(b) modulator means, operatively coupled to the forward error correction encoder means, for deriving predetermined length orthogonal codes from the data symbols, the predetermined length of the orthogonal codes being set in response to the received data bit rate.

5,204,877

SPREAD SPECTRUM MODULATING DEVICE

Mamoru Endo, and Yoshitaka Uchida, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1992, Ser. No. 829,731
Claims priority, application Japan, Feb. 7, 1991, 3-38127
Int. Cl.[5] H04L *27/04*
U.S. Cl. 375—1 4 Claims



1. A spread spectrum modulating device comprising:

a memory for storing and holding a plurality of parallel data sets corresponding to assignments of address and outputting said parallel data sets, responding to assignments of address;

serial-parallel converting means for converting serial data to be transmitted into parallel data and assigning predetermined addresses among addresses in said memory;

a counter for assigning remaining addresses among the addresses in said memory by counting clock pulses and outputting a count value thus obtained;

a D/A converter for D/A converting parallel data outputted by said memory; and

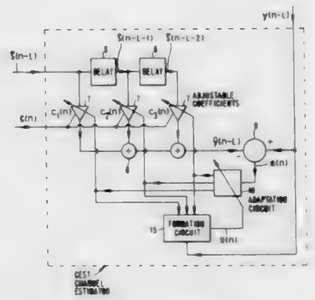
a modulator for modulating a carrier with an analogue signal analogue-converted by said D/A converter.

5,204,878

METHOD OF EFFECTING CHANNEL ESTIMATION FOR A FADING CHANNEL WHEN TRANSMITTING SYMBOL SEQUENCES

Lars G. Larsson, Svartviksslingan, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 3, 1990, Ser. No. 620,710
Claims priority, application Sweden, Dec. 22, 1989, 8904327-7
Int. Cl.[5] H04L *27/01*
U.S. Cl. 375—14 8 Claims



1. A method for effecting channel estimation for a fading channel when transmitting a signal comprising symbol sequences, wherein each of the symbol sequences has at least one synchronizing sequence and one data sequence, said method comprising the steps of:

sampling said signal at a series of sampling time points to obtain a series of signal samples;

generating a channel estimate having plural coefficients, based on knowledge of said synchronizing sequence, for said fading channel at each sampling time point;

estimating values of symbols in a symbol sequence of said signal based on said signal samples and said channel estimate;

adapting said channel estimate according to an adaptation algorithm, based on knowledge of said channel estimate as applied to signal samples corresponding to said data sequence;

calculating mean energy values of said channel estimate by forming a time mean value over multiple sampling time points of energy represented by each of the coefficients of the channel estimate;

selecting at least the largest of the mean energy values; and

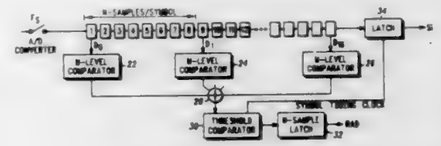
influencing the adaptation algorithm in dependence on the selected mean energy values, such that adaptation of the channel estimate is controlled with the aid of the selected mean energy values enabling a correct estimation to be made of symbols in a remaining part of the symbol sequence subsequent to fading during the symbol sequence.

5,204,879

HIGH SPEED DATA DETECTION AND CLOCK RECOVERY IN A RECEIVED MULTI-LEVEL DATA SIGNAL

Peter R. H. McConnell, Burnaby, Canada, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1991, Ser. No. 648,065
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—20 12 Claims



1. An arrangement for high speed data detection and clock recovery in a received multi-level data signal, including in combination:

means for receiving a multi-level data signal;

means for simultaneously sampling at a plurality of preselected locations on such received signal waveform comprising said multi-level data signal and determining if such samples are within a permitted range of an expected level at each of said preselected locations;

data detect indicator means for indicating the presence of data whenever a given but presettable level of correlation is determined as occurring between said samples and the expected levels at a given number of successive said preselected locations; and

further means for indicating the presence of clock recovery when determining said correlation is occurring at a periodic rate.

5,204,880

to be transmitted, said test signal being generated by selec-

being the number of bits as measured from the start of the framing bit to the start of the next, in an incoming serial bit

nation of said respective compared pulses occurs during said predetermined delay interval;

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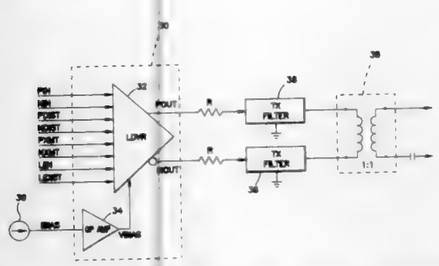
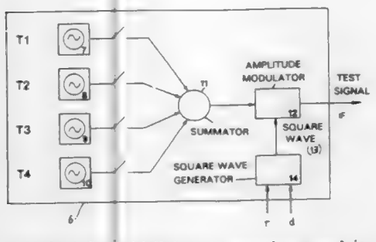
5,204,880
DIFFERENTIAL LINE DRIVER EMPLOYING PREDISTORTION
Stefan M. Wurster, El Dorado Hills, and Daniel L. Ray, Fair Oaks, both of Calif., assignors to Level One Communications, Inc., Folsom, Calif.
Filed Apr. 23, 1991, Ser. No. 690,087
Int. Cl.[5] H04B *3/00*
U.S. Cl. 375—36 **10 Claims**



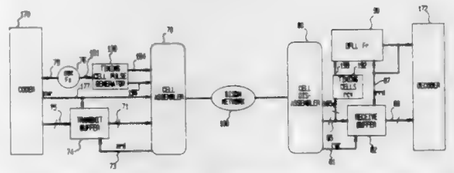
1. A differential line driver, powered between voltage supply rails, for driving a transmission line with predistorted data, comprising:
a) a plurality of input terminals for receiving input signals containing data symbols, the input terminals being coupled to logic means for selecting a fullstep output voltage level in response to identical adjacent data symbols and for selecting a halfstep output voltage level in response to different adjacent data symbols, the fullstep output voltage level substantially spanning the supply rails and the halfstep output voltage level having a selectable value between the supply rails;
b) differential driving means, having an input coupled to the logic means and responsive thereto and having a first and a second output terminal coupled to the transmission line, for impressing the halfstep and fullstep output voltage levels on the transmission line; and
c) means, coupled to the differential driving means, for setting the halfstep output voltage level.

5,204,881
SYSTEM FOR SET-UP OF TRANSMITTERS IN HIGH CAPACITY DIGITAL RADIO LINKS
Lorenzo Cardini; GianCarlo Perego, both of Monza, and Rocco Nobili, Cassina de Pechi, all of Italy, assignors to Telettra-S.p.A., Italy
Filed Dec. 19, 1990, Ser. No. 630,032
Claims priority, application Italy, Dec. 21, 1989, 22771 A/89
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—60 **3 Claims**



1. A method for initializing a transmitter used in a high capacity digital radio link in which multilevel QAM digital signals are sent on a carrier wave, said initializing being accomplished by:
(a) generating a test signal which simulates the digital signal to be transmitted, said test signal being generated by selectively summing four sinusoidal signals amplitude-modulated by a square wave with a variable duty cycle and amplitude, said test signal being adjusted to obtain a signal having a ratio of peak power/mean power which is equal to that of the digital signal to be transmitted,
(b) sending said test signal through the transmitter, said transmitter including a power amplifier which has a non-linear behavior and distorts signals passing therethrough, and
(c) adding pre-distortion signals to the digital signals sent through the power amplifier to compensate for the distortion caused by the non-linearities in the power amplifier of the transmitter.

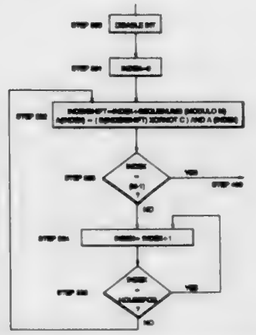
5,204,882
SERVICE CLOCK RECOVERY FOR VARIABLE BIT RATE SERVICES
Hung-Hsiang J. Chao, Lincroft, and Cesar A. Johnston, Berkeley Heights, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Continuation of Ser. No. 627,659, Dec. 14, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 846,769
Int. Cl.[5] H04J *3/06*
U.S. Cl. 375—106 **16 Claims**



1. A method of operating a communications system including a transmitter and a receiver to recover at the receiver the service clock signal of a variable bit rate source from a bit stream generated at the transmitter and received at the receiver, said method comprising the steps of:
at the transmitter, generating data at a rate which is not proportional to a service clock signal at the transmitter and organizing said data into data cells,
generating timing cells at a rate proportional to the service clock signal at the transmitter, and
combining said data cells and said timing cells in the bit stream; and
at the receiver, receiving the data cells and timing cells in the bit stream,
averaging the rate at which the timing cells arrive at the receiver, and
generating a local clock signal at the receiver derived from and proportional to the average rate of the timing cells at the receiver so that the local clock signal is proportional to the service clock signal at the transmitter.

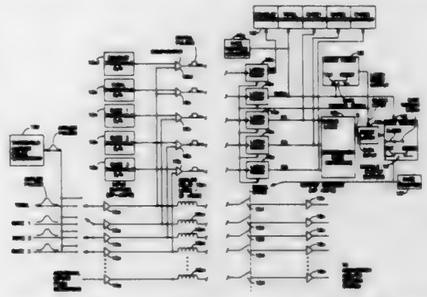
5,204,883
METHOD AND APPARATUS FOR RECOGNITION OF A FRAMING PATTERN DISTRIBUTED IN A SERIAL BIT STREAM
Alain Blanc, Vence, France, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 1, 1991, Ser. No. 693,894
Claims priority, application European Pat. Off., May 15, 1990, 90480068.7
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—116 **8 Claims**

1. A method for recognizing a framing pattern of M single bits, with M being the number of bits in the framing pattern, distributed at intervals of a fixed number N of bits, with N being the number of bits as measured from the start of the framing bit to the start of the next, in an incoming serial bit stream, comprising the steps of:
loading into each one of a plurality of first registers having multiple bits each, identical bit values equal to each one of the M bit values of said framing pattern, and
initializing to a predetermined value the content of each one of a plurality of second registers having multiple bits each, and
upon reception of N consecutive bits in said serial bit stream, loading the received bits into one single third register having multiple bits,



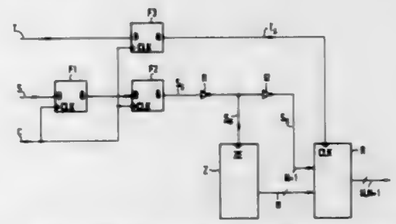
said method being characterized in that it includes the steps of:
performing a XORNOT logical operation between the contents of each one of said plurality of first registers and said third register, followed by an AND logical operation between the results of the latter XORNOT operation and the current contents of each one of said plurality of second registers, the final result being stored as new current contents for each one of said second registers, and
checking the new current contents of each one of said plurality of second registers, and signalling the recognition of said framing pattern if only one binary one is left in only one of all said plurality of second registers.

nation of said respective compared pulses occurs during said predetermined delay interval;
gate means responsive to said logic signal for selectively



allowing said delayed detection signals to pass through said gate means in response to said logic signal and for preventing said delayed detection signals from passing through said gate means in the absence of said logic signal.

5,204,885
METHOD AND DEVICE FOR EVALUATING A DIGITAL SIGNAL USING A DIGITAL COUNTER WITH LSB SIGNAL SEPARATELY APPLIED TO BOTH COUNTER AND REGISTER
Richard Brune, Fürth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 30, 1991, Ser. No. 693,667
Claims priority, application European Pat. Off., May 2, 1990, 90108326.1
Int. Cl.[5] H03K *21/12;* **G06F** *7/62*
U.S. Cl. 377—54 **2 Claims**



1. A digital counting device for evaluating a digital frequency signal (S) comprising:
a) a first D flip-flop having the digital frequency signal (S) as an input, having a clock signal (C) as a clock input, and having an output, wherein the clock signal (C) has a frequency that is at least double a maximum frequency of the digital frequency signal (S);
b) a second D flip-flop having the output of the first D flip-flop as an input, having the clock signal (C) as a clock input, and having a digital signal (S_2) as an output;
c) a third D flip-flop having a timing signal as an input, a clock signal (C) as a clock input, and outputting a synchronous timing signal (T_s) that is synchronized to the clock signal (C);
d) a first inverter receiving the digital signal (S_2) as an input and outputting an inverted digital signal (S_s);
e) a second inverter receiving and inverting the inverted digital signal (S_s), and outputting a delayed digital signal (S'_s);
f) a digital counter:
i) receiving the inverted digital signal (S_s) as an input;
ii) evaluating the inverted digital signal (S_s); and

iii) outputting a plurality of N binary signals representing

lyzing circuit providing the bone mineral content of said object on the basis of said difference data; and

disposing a concave mirror with a multilayered film in a path

ing gap between the bearing surfaces of the rotary an stationary structures; and

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iii) outputting a plurality of N binary signals representing N binary positions;

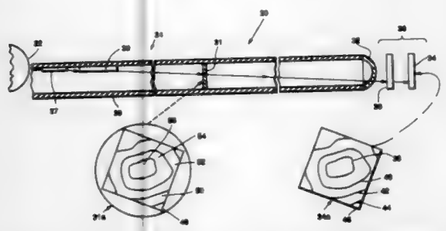
g) a data register receiving the synchronous timing signal as a clock input, receiving the delayed digital signal (S'_2) as a first input, receiving the plurality of N binary signals as a second input, and outputting a single binary signal having a least significant binary position and a plurality of N other binary positions, wherein said delayed digital signal (S'_3) represents the least significant binary position, and the plurality of N binary signals represent the plurality of N other binary positions.

5,204,886

METHOD OF IMPROVING AN X-RAY LITHOGRAPHY BEAMLINE UNIFORMITY

George W. Dugdale, West Redding, Conn., assignor to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Dec. 6, 1991, Ser. No. 804,867
Int. Cl.[5] G01D *18/00*
U.S. Cl. 378—34 **17 Claims**



1. A method of calibrating a beamline for applications requiring spectrally controlled and amplitude uniformity controlled X-rays comprising the steps of:

(a) providing a target wafer with a uniform layer of light sensitive material;

(b) directing a beam from an X-ray source through the beamline and onto the target wafer positioned in a plane transverse of the X-ray beamline;

(c) subjecting the wafer to an etch process so as to develop the pattern resulting from step (b) thereby forming a contoured surface emulating the non-uniformities caused by the components of which the beamline is comprised;

(d) providing a carbon filter intermediate the X-ray source and the target wafer to block electromagnetic radiation; and

(e) applying to the surface of the carbon filter at least one additional layer of filter material resulting in a modified carbon filter having a surface contour which is in inverse proportion to the surface contour of the target wafer.

5,204,887

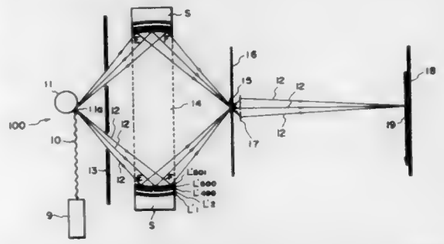
X-RAY MICROSCOPE

Masami Hayashida, Atsugi; Yutaka Watanabe, Isehara; Masahito Niibe; Takashi Iizuka, both of Atsugi, and Yasuaki Fukuda, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 708,249, May 31, 1991, abandoned. This application Sep. 16, 1992, Ser. No. 945,578
Claims priority, application Japan, Jun. 1, 1990, 2-143870
Int. Cl.[5] G21K *7/00*
U.S. Cl. 378—43 **47 Claims**

1. A method of imaging an object illuminated by an X-ray beam, through a zone plate, comprising the steps of:

disposing a concave mirror with a multilayered film in a path of the X-ray beam;



reflecting the X-ray beam from the concave mirror with the multilayered film; and

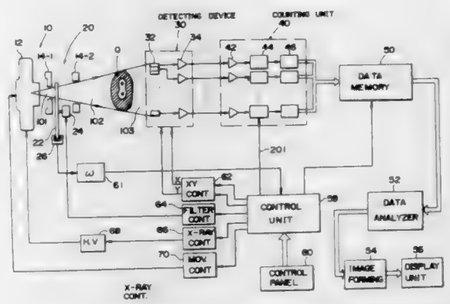
collecting the reflected X-ray beam onto the object.

5,204,888

BONE MINERAL CONTENT MEASURING APPARATUS

Toshiaki Tamegai; Kazuyuki Tamura; Shigeo Kimura; Koichi Kawamura, and Shizuo Ninomiya, all of Tokyo, Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 628,619
Claims priority, application Japan, Dec. 14, 1989, 1-324954; Dec. 14, 1989, 1-324955; Dec. 20, 1989, 1-332279
Int. Cl.[5] G01N *23/06*
U.S. Cl. 378—53 **11 Claims**



1. A bone mineral content measuring apparatus comprising:

(a) an X-ray generating device for generating X-rays having a continuous spectrum;

(b) an X-ray detecting device for detecting the X-rays which have passed through an object to be examined;

(c) a filtering device including at least one pair of X-ray filters which are switched over each other and provided in an X-ray beam path between said X-ray generating device and said X-ray detecting device, and a filter switching device for switching said X-ray filters, said pair of X-ray filters being composed of substances having different X-ray absorbing characteristics with K-absorption edges at different energy values which are approximately equal to each other;

(d) a data analyzer for inputting the X-ray detection data from said X-ray detecting device and analyzing said data, said data analyzer including a spectrum subtracter and a bone mineral content analyzing circuit, said spectrum subtracter calculating the difference data between the X-ray detection data obtained by using one of said pair of X-ray filters and the X-ray detection data obtained by using the other of said pair of X-ray filters, said difference data being equivalent to data obtained by using a monochromatic spectrum, and said bone mineral content analyzing circuit providing the bone mineral content of said object on the basis of said difference data; and

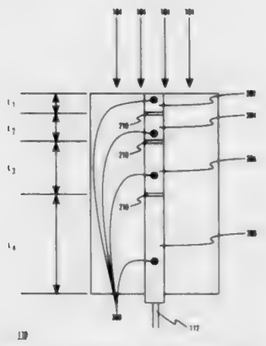
(e) a display unit for displaying the result of analysis of said data analyzer.

5,204,889

APPARATUS FOR MEASURING THICKNESS OF METALS ON A ROLLING MILL

John Kraybill, Cockeysville, Md., assignor to Loral Fairchild Corp., Syosset, N.Y.

Filed Jul. 14, 1992, Ser. No. 912,855
Int. Cl.[5] G01B *15/02*
U.S. Cl. 378—54 **14 Claims**



1. A system for continuously determining the thickness of a material by measuring the radiation transmission through the material, comprising:

source means for generating a polychromatic radiation beam and for directing said polychromatic radiation beam onto a first side of the material, said generated polychromatic radiation beam having a plurality of energy bands and having sufficient energy to penetrate through the material;

detector means positioned on a side of the material opposite from said source means for detecting a plurality of said energy bands of a received polychromatic radiation beam which has penetrated through the material, and for producing output electrical signals representing the intensity of each of said plurality of detected energy bands, said detector means having a plurality of stages of various lengths containing radiation absorption material stacked in such a manner that said received polychromatic radiation beam passes through each of said stages; and

processor means for continuously computing the thickness of the material based on said output electrical signals.

5,204,890

ROTARY ANODE TYPE X-RAY TUBE

Hidero Anno, Ootawara; Katsuhiro Ono, Utsunomiya; Hiroyuki Sugiura, Ootawara; Takayuki Kitami, Tochigi; Hideo Yagoshi, and Murashi Shinto, both of Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 30, 1991, Ser. No. 767,615
Claims priority, application Japan, Oct. 1, 1990, 2-263335; Feb. 8, 1991, 3-17578; Aug. 21, 1991, 3-209406
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—133 **4 Claims**

1. A rotary anode type x-ray tube comprising:

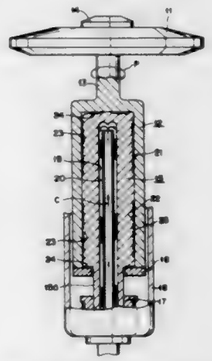
an anode target;

a rotary structure having one end to which the anode target is fixed;

a stationary structure for holding the rotary structure;

a sliding bearing section including bearing surface which are partly formed on the rotary and stationary structures and provided with spiral grooves formed thereon and a bearing gap between the bearing surfaces of the rotary an stationary structures; and

a metal lubricant for allowing the rotary structure to be smoothly rotated, applied to the bearing gap and kept liquid when the x-ray tube is operated;



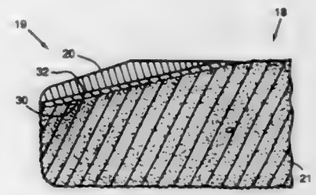
wherein the bearing surface or surfaces of at least one of the rotary and stationary structures are made of ceramics whose main component is the carbide, boride or nitoride of at least one of those transition metals, except chromium, which belong to a Group IVA, VA or VIA of a period 4, 5 or 6 of the Periodic Table.

5,204,891

FOCAL TRACK STRUCTURES FOR X-RAY ANODES AND METHOD OF PREPARATION THEREOF

David W. Woodruff, Clifton Park, and Minyoung Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1991, Ser. No. 785,122
Int. Cl.[5] H01J *35/08;* **C01B** *31/04*
U.S. Cl. 378—143 **8 Claims**



5. A method of producing a graphite substrate comprising:

shape forming said substrate; and

oxidizing any damaged graphite on said shape formed surface by heating in air at about 650°–900° C. for about 45–90 minutes to expose an undamaged surface underneath said damaged graphite.

5,204,892

PRIMARY RADIATION DIAPHRAGM FOR X-RAY TUBE

Hans-Erik Warden, Upplands Vaesby, Sweden, assignor to Siemens Aktiengesellschaft, Munich

Filed Nov. 6, 1991, Ser. No. 789,239
Claims priority, application Sweden, Nov. 14, 1990, 90036385
Int. Cl.[5] G21K *1/04*
U.S. Cl. 378—152 **2 Claims**

1. A primary radiation diaphragm for an x-ray tube comprising:

a first group of first and second perpendicularly disposed

pairs of diaphragm plates mounted proximate a focus of an

said video phone having a standard telephone having a hook

outputting an acknowledge signal depending upon the discriminated result;

scriber stations served thereby, a switching network in each switching means for establishing communication paths be-

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pairs of diaphragm plates mounted proximate a focus of an x-ray tube;

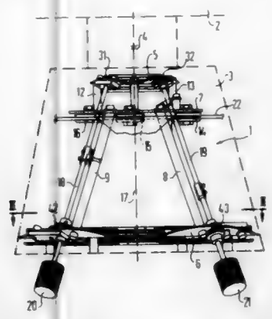
a second group of third and fourth perpendicularly disposed pairs of diaphragm plates mounted distally of said focus;

each of said first, second, third and fourth pairs of diaphragm plates having a respective control means associated therewith for displacing the diaphragm plates in the pair;

a first rotatable shaft mounted to engage said control means of said first and third pairs of diaphragm plates causing simultaneous displacement of said diaphragm plates in said first and third pairs relative to a longitudinal axis extending substantially perpendicularly between said first and second groups;

a second rotatable shaft mounted to engage said control means of said second and fourth pairs of diaphragm plates causing simultaneous displacement of said diaphragm plates in said second and fourth pairs relative to said longitudinal axis;

said first, second, third and fourth pairs of diaphragm plates respectively forming parts of first, second, third and



fourth parallelogram arm systems, wherein said control means for each of said first second, third and fourth pairs of diaphragm plates is a respective toothed segment attached to an arm in said respective first, second, third and fourth parallelogram arm systems, and wherein each control means further includes a toothed wheel rigidly attached to a respective rotatable shaft and engaged with said toothed segment;

said first group of diaphragm plate pairs being smaller in size than said second group of diaphragm plate pairs so that said primary radiation diaphragm has the shape of a truncated cone, with said first and second shafts being disposed at a non-parallel angle to said longitudinal axis; and

said first group of pairs of diaphragm plates defining a first opening for passage of radiation from said focus of said x-ray tube and said second group of pairs of diaphragm plates defining a second opening for passage of said radiation, said first opening being smaller than said second opening so that a radiation pyramid, having tip coinciding with said focus, of desired shape is formed by rotating said first and second shafts.

5,204,893

METHOD AND AN APPARATUS FOR TRANSMITTING/RECEIVING SIGNALS IN A VIDEO PHONE

Hyun J. Choi, Kumi, and Hak R. Kim, Daekujikhal, both of Rep. of Korea, assignors to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 22, 1991, Ser. No. 703,916

Claims priority, application Rep. of Korea, May 22, 1990, 7361/1990; Jul. 31, 1990, 11651/1990

Int. Cl.[5] H04N *1/42, 7/14*

U.S. Cl. 379—53 **6 Claims**

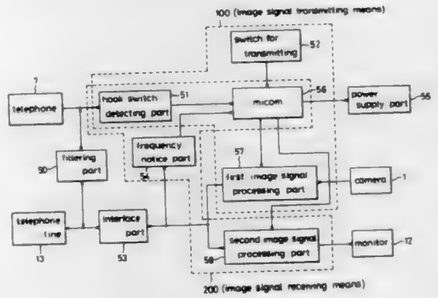
1. In a video phone for transmitting and receiving a video signal and a voice signal by means of a single transmission line, said video phone having a standard telephone having a hook switch, a displaying monitor and a self-camera, an apparatus for transmitting and receiving the voice signal simultaneously with the video signal via the single transmission line, said apparatus comprising:

filtering means connected between said telephone and said transmission line, for inputting the voice signal from either said telephone or said transmission line and passing only voice signal with a frequency region below a first frequency set within a frequency band of said transmission line;

video signal receiving means for discriminating if a carrier frequency in the video signal being sent via said transmission line from a counterpart is which of a second frequency or a third frequency set within said frequency band of said transmission line, demodulating the video signal by one of said second and third frequencies depending upon the discriminated result, and outputting the demodulated video signal to said displaying monitor;

video signal transmitting means for inputting the video signal from said self-camera, modulating the video signal with the other of said second and third frequencies differently from said video signal receiving means and outputting the modulated video signal to said transmission line;

interfacing means connected among said transmission line, said video signal receiving means and said video signal transmitting means, for separately outputting the video signals to be received and transmitted;



a hook switch sensor for sensing ON/OFF states of said hook switch;

a transmitting switch for outputting a control signal for transmission of the video signal;

wherein said video signal transmitting means further comprises first video signal processing means for inputting the video signal from said self-camera and modulating and band-pass filtering the inputted video signal in response to an external control signal to send the modulated and band-pass filtered video signal to the counterpart;

wherein said video signal receiving means further comprises second video signal processing means for inputting the video signal from the counterpart via said transmission line and modulating and band-pass filtering the inputted video signal in response to an external control signal to display the modulated and band-pass filtered video signal through said monitor;

wherein said interfacing means further comprises an interface unit connected among said transmission line, said first video signal processing means and said second video signal processing means, for separately outputting the video signals to be received and transmitted;

wherein said video signal receiving means further comprises a frequency discriminator for discriminating if the carrier frequency in the video signal from the counterpart is which of said second frequency or said third frequency set within said frequency band of said transmission line and

outputting an acknowledge signal depending upon the discriminated result;

a microprocessor for inputting output signals from said hook switch sensor, said transmitting switch and said frequency discriminator and outputting control signals to said first and second video signal processing means;

said microprocessor adapted for perceiving by said output signals from said frequency discriminator and said transmitting switch that frequency component of the video signal sent from the counterpart was one of said second or third frequencies, designating the other of said second or third frequencies as the carrier frequency of the video signal for transmission in accordance with the perceived result, and outputting control signals according to the perceived and designated results to said first and second video signal processing means; and

wherein said first video signal processing means further comprises: a timing signal generator for generating a clock signal,

an A/D converter for inputting the video signal from said self-camera and digitizing the inputted video signal to be transmitted, in response to said clock signal from said timing signal generator,

a memory controller for generating read/write select and address signals in response to the control signal from said microprocessor and said clock signal from said timing signal generator,

a memory unit for storing the digitized video signal from said A/D converter in response to said read/write select and address signals from said memory controller,

a carrier generator for generating said second frequency carrier or said third frequency carrier in response to the control signal from said microprocessor,

a modulator for modulating the digitized video signal stored in said memory unitr146an output signal from said carrier generator,

a first amplifier for amplifying an output signal from said modulator,

a first band pass filter for passing only video signal with said second frequency component to said interface unit,

a second band pass filter for passing only video signal with said third frequency component to said interface unit, and

a first switching circuit for selectively outputting an output signal from said first amplifier to said first band pass filter or said second band pass filter in response to the control signal from said microprocessor.

5,204,894

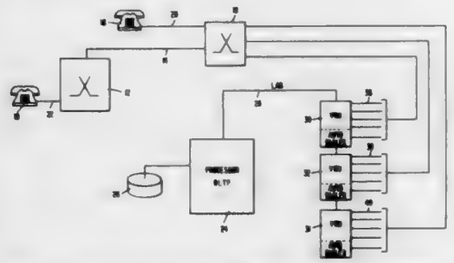
PERSONAL ELECTRONIC DIRECTORY

Pamela Darden, Philadelphia, Pa., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Nov. 9, 1990, Ser. No. 610,881

Int. Cl.[5] H04M *1/50, 1/56, 3/42*

U.S. Cl. 379—88 **15 Claims**



10. A telecommunications system having a plurality of switching means interconnected by trunks, a plurality of subscriber stations arranged in groups with each group being served by one of said switching means, a plurality of subscriber lines connecting each switching means with the group of subscriber stations served thereby, a switching network in each switching means for establishing communication paths between calling subscriber stations and called subscriber stations addressed by the calling stations, the improvement comprising:

an adjunct means associated with at least one of said switching means;

multiline hunt group means associated with a personal directory service access number;

said adjunct means including:

voice response and recognition means connected to said multiline hunt group means, and

processor means responsive to subscriber identification for performing the following functions (a) recognizing that a subscriber selected name and telephone number is to be stored in a selected memory provided to that subscriber from among a plurality of memories dedicated to other subscribers and for storing multiple names and telephone numbers inputted by audio signals originated by that subscriber to said multiline hunt group means and including an alphabetic address of predetermined length articulated by said subscriber for each telephone number, and (b) recognizing in response to spoken audio signals that said subscriber is seeking access to one of said telephone numbers stored for that subscriber,

said voice response and recognition means generating an audio signal repeating the telephone number requested by that subscriber by the alphabetic address, and providing to said subscriber audio instructions for storing and retrieving said inputted telephone numbers.

5,204,895

DATA COMMUNICATING APPARATUS WHICH SELECTS ANALOG OR DIGITAL COMMUNICATION IN ACCORDANCE WITH THE DESTINATION NUMBER

Yoshio Yoshiura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 325,997, Mar. 20, 1989, abandoned.

This application Nov. 14, 1991, Ser. No. 793,312

Claims priority, application Japan, Mar. 22, 1988, 63-065844

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—100 **12 Claims**

1. A data communicating apparatus connected to a first communication line of a first communication network and a second communication line of a second communication network, said apparatus comprising:

first communicating means for performing a calling access to the first communication line and performing a data communication through the first communication network;

second communicating means for performing a calling access to the second communication line and performing a data communication through the second communication network, wherein said second communicating means performs the data communication in a communication mode different from that of said first communicating means;

input means for inputting a destination number; and

control means for discriminating whether the destination

number is a subscriber number of the first communication

5,204,897

MANAGEMENT INTERFACE FOR LICENSE

of the useful lines of at least a part of the frames of the video signal, there is substituted, for at least one zone of each of these

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5,204,900

CODING SYSTEM FOR DESCRAMBLING VIDEO

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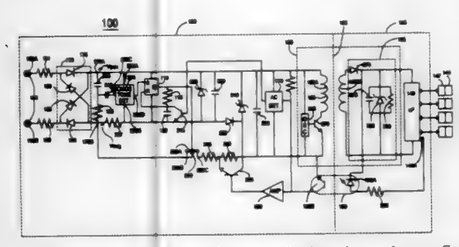
number is a subscriber number of the first communication network or a subscriber number of the second communication network, and selecting either said first communicating means or said second communicating means in accordance with the discrimination result, wherein said first communication network comprises a digital communication network and said second communication network comprises an analog communication network.

5,204,896
OUTBOUND TELEMETRY DEVICE
Stewart W. Oliver, Venice, Calif., assignor to Telegenics, Inc., Los Angeles, Calif.
Continuation of Ser. No. 565,505, Aug. 10, 1990, abandoned. This application May 5, 1992, Ser. No. 880,299
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—106 **6 Claims**



1. A remote outbound telemetry device situated at a first location for monitoring conditions at said first location and for reporting information regarding said conditions over a phone line back to a central station situated at second location which is remote from said first location, said telemetry device comprising:

alerting signal detecting means, responsive to an alerting signal on said phone line, for detecting the presence of said alerting signal and providing a detect signal when said alerting signal is detected;

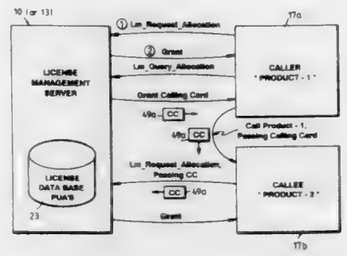
accessing means, coupled to said alerting signal detecting means, for engaging said phone line in response to said detect signal and for disengaging said phone line in response to a disengage signal;

telemetry generating means, coupled to said alerting signal detecting means, for generating telemetry data in response to said detect signal, said data containing information with respect to said conditions;

transmitting means, coupled to said telemetry generating means, for transmitting said telemetry data on said phone line, and

AC detector means, coupled to said telemetry generating means and said accessing means, for detecting the presence of AC waveform transitions in the telemetry data generated by said telemetry generating means, said AC detector means providing said disengage signal when the presence of said AC waveform transitions is no longer detected, such that said outbound telemetry device is disengaged from said phone line a predetermined amount of time after the cessation of said telemetry data is recognized by said AC detector means detecting that said AC waveform transitions are no longer present.

5,204,897
MANAGEMENT INTERFACE FOR LICENSE MANAGEMENT SYSTEM
Robert M. Wyman, Kirkland, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 722,840, Jun. 28, 1991, abandoned. This application Jul. 14, 1992, Ser. No. 914,040
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—4 **31 Claims**



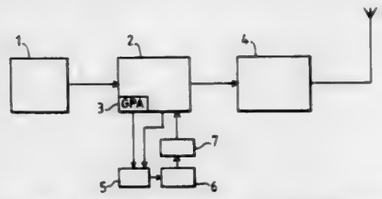
1. A method of managing use of licensed software items, said software items separately executable on a computer system or accessible by said computer system, the computer system including a processor and one or more nodes, comprising the steps of:

maintaining by said processor a store of license authorizations for said software items; each license authorization including an indication of license management policy for a software item, said indication having a plurality of sets of policy components, said sets of policy components granting specified restrictive rights to execute or access said software items by said nodes; said specified restrictive rights including sets of restrictions in at least context of use and duration of use of a software item; said policy components of each set providing alternatives in rights to execute or access said software items by one or more nodes in said computer system; said license authorizations being received by said processor, for storing in said store, from a license grantor external to said processor;

accessing said store by said processor using management functions executed on said processor to identify a license authorization in said store, and to modify in said store one or more of said specified restrictive rights of said policy components of the identified license authorization.

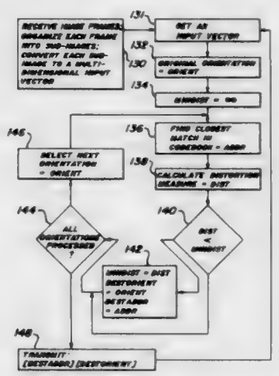
5,204,898
METHOD OF PROTECTION AGAINST THE UNAUTHORIZED UNSCRAMBLING OF SCRAMBLED TELEVISION BROADCASTS, AND IMPLEMENTATION METHOD
Michel Leduc, Boersch, France, assignor to Laboratoire Europeen de Recherches Electroniques Avancees Societe en Nom Collectif, Courbevoie, France
Filed Jul. 23, 1991, Ser. No. 734,781
Claims priority, application France, Aug. 3, 1990, 90 09969
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—14 **7 Claims**

1. A method for the protection, against unauthorized unscrambling, of television transmissions scrambled by line permutation about at least one cut point wherein, in at least a part of the useful lines of at least a part of the frames of the video signal, there is substituted, for at least one zone of each of these



lines, a decoy imitating the structure of the corresponding meeting zone of the line segments after permutation.

5,204,899
VECTOR QUANTIZATION METHOD EMPLOYING MIRRORED INPUT VECTORS TO SEARCH CODEBOOK
Paul D. Israelsen, North Logan, Utah, and Keith Lucas, Richmond Hill, Canada, assignors to Scientific-Atlanta, Inc., Atlanta, Ga.
Filed Nov. 19, 1991, Ser. No. 794,563
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—14 **20 Claims**



1. In a data compression system employing a vector quantization codebook having a plurality of codevectors each representative of a possible input vector, each codevector having an associated address, a method comprising the steps of:

a) receiving data to be compressed, and converting the data to a multi-dimensional input vector having a plurality of possible orientations, and assigning an identifying code to each orientation;

b) selecting one of the orientations;

c) comparing the input vector with the selected orientation to the codevectors of the codebook and selecting the codevector that most closely resembles the input vector with the selected orientation;

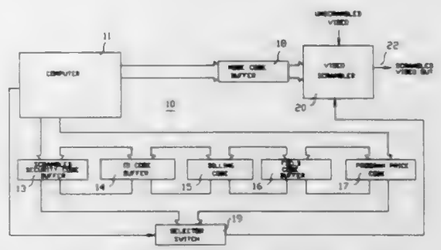
d) obtaining a measure of difference, if any, between the input vector with the selected orientation and the selected codevector;

e) selecting other ones of the remaining orientations of the input vector and, for each other selected orientation, repeating steps (c) and (d);

f) selecting the orientation and associated codevector that provided the least measure of difference in step (d); and

g) transmitting an indication of at least the address of the codevector and the identifying code of the orientation selected in step (f).

5,204,900
CODING SYSTEM FOR DESCRAMBLING VIDEO
H. George Pires, 47H Valley Rd., Hampton, N.J. 08827
Filed Mar. 4, 1991, Ser. No. 664,107
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—20 **23 Claims**



1. A system for supplying video information contained in a video signal from a sending station exclusively to a preselected one of a plurality of receiving stations, the system comprising:

a scrambling system for distorting the video signal in accordance with a selected one of a plurality of distortion modes to produce a distorted video signal, said scramoling system having an input coupled to the sending station for receiving the video signal;

identification encoder means coupled to said scrambling system for encoding said distorted video signal with identification information which identifies the preselected one of the receiving stations;

a security code encoder means coupled to said scrambling system for encoding said distorted video signal with security code information having a predetermined relationship with respect to said identification information on said distorted video signal;

field code encoder means coupled to said scrambling system for encoding said distorted video signal with field code information having a predetermined relationship with respect to said security information on said distorted video signal; and

a plurality of decoder means, each coupled to a respectively associated one of the receiving stations and having associated therewith a respective identification code and a conversion code, each of said decoder means being provided with security code acceptance means responsive to said identification information for accepting said security code information.

5,204,901
PUBLIC KEY CRYPTOGRAPHIC MECHANISM
John E. Hershey, Ballston Lake, N.Y.; Radha Krishna R. Yarlagadda, Stillwater, Okla., and Lawrence H. Ozarow, Brookline, Mass., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 1, 1991, Ser. No. 739,263
Int. Cl.[5] H04K *9/00*
U.S. Cl. 380—21 **5 Claims**

1. A method for ensuring secure communications between two Parties, A and B, over an insecure, predetermined bandwidth communication channel between the parties by establishing a commonly held, electronically generated, private cryptographic keying variable between the parties, each party having both transmitting and receiving capability at its respective location, said method comprising the steps of:

a. establishing a publicly known keying variable K_1 for use by both parties;

b. Party a randomly generating an m-bit vector vec_a, storing said vector vec_A, copying said vector vec_A, corrupting the copied vector vec_A by inverting n bits thereof, and transmitting the corrupted vector vec_A,

designated vector rec_A, over the communication chan-

derived from said key code via a transformation of the key code and additional data; and

sponding to said input information, and second logical operation means for decoding said encrypted signal by

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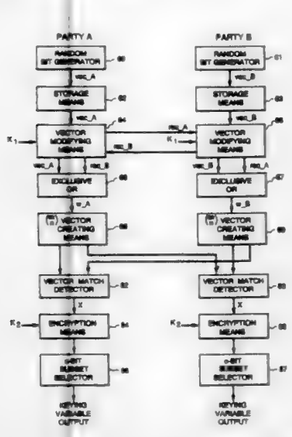
designated vector rec_A, over the communication channel to the location of Party B;

c. Party B randomly generating an m-bit vector vec_B, storing said vector vec_B, copying said vector vec_B, corrupting the copied vector vec_B by inverting n bits thereof, and transmitting the corrupted vector vec_B, designated vector rec_B, over the communication channel to the location of Party A;



d. Party A generating a vector W_A representing the Exclusive-Or combination of the stored vector vec_A with vector rec_B received from Party B;

e. Party B generating a vector W_B representing the Exclusive-Or combination of the stored vector vec_B with vector rec_A received from Party A;

f. Party A producing all

$\binom{m}{n}$

vectors that are n bits different from vector W_a, encrypting said

$\binom{m}{n}$

vectors with a Data Encryption Standard (DES) operated in the ECB/ENCRYPT mode and keyed by keying variable K_1, and producing Party A image vectors representing the Exclusive-Or combination of the

$\binom{m}{n}$

vectors with their encryptions, and transmitting the Party A image vectors in random order over the communication channel to Party B;

g. Party B producing all

$\binom{m}{n}$

vectors that are n bits different from vector W_B and encrypting said

$\binom{m}{n}$

vectors thus produced with a DES operated in the ECB/ENCRYPT mode and keyed by keying variable K_1, and producing Party B image vectors representing the Exclusive-Or combination of the

$\binom{m}{n}$

vectors with their encryptions, and transmitting the Party B image vectors in random order over the communication channel to Party A;

h. each one of Parties a and B thereafter searching the image vectors received from the other Party for exactly two matches with the image vectors transmitted by the one Party;

i. both parties ten determining a commonly held m-bit vector denoted X, equal to the bit-by-bit Exclusive-Or sum of vectors vec_A and vec_B and known only to the parties, for use in deriving a keying variable for a single key encryption algorithm to maintain security for exchanges of traffic;

j. establishing a second publicly known keying variable K_2;

k. both parties enciphering m-bit vector X using an encrypting algorithm keyed by said variable K_2; and

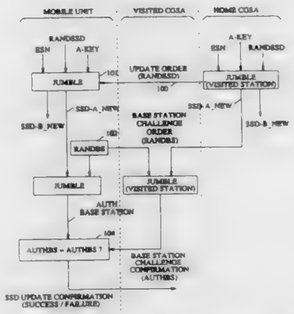
l. each one of Parties A and B then selecting a c-bit subset of m-bit vector X enciphered under keying variable K_2 as said private cryptographic keying variable.

5,204,902

CELLULAR TELEPHONY AUTHENTICATION ARRANGEMENT

James A. Reeds, III, New Providence; Philip A. Treventi, Murray Hill, and I-Hsiang Yu, Cedar Knolls, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 13, 1991, Ser. No. 759,314
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—23 **11 Claims**



1. In an arrangement including a home station, a base station and a mobile station, a method for authenticating the mobile station prior to the establishment of a call between the mobile station and the base station comprising the steps of:

the home station and the mobile station sharing a key code that is not known to the base station while refraining from divulging the key code to the base station;

the mobile station transmitting to the base station the identity of the mobile station and an authentication signal constructed with the aid of a "shared-secret-datum" signal derived from said key code via a transformation of the key code and additional data; and

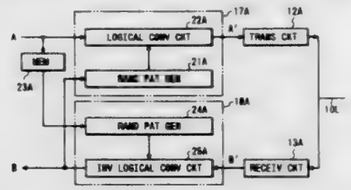
establishing the call between the base station and the mobile station when an evaluation in the base station of the authentication signal, performed with the aid of a "shared-secret-datum" signal in the base station, determines that the authentication signal sent by the mobile station is valid.

5,204,903

SECURE COMMUNICATION EQUIPMENT AND SECURE TRANSMISSION SYSTEM

Kenji Okada; Fumio Maso; Nobuyuki Tokura; Kiyomi Kumozaki, and Noriki Miki, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Nov. 5, 1991, Ser. No. 786,799
Claims priority, application Japan, Nov. 5, 1990, 2-299492
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—46 **24 Claims**



1. A secure transmission system wherein at least first and second communication equipments are connected to one another iva a transmission medium;

wherein said first communication equipment includes: first receiving means for receiving a signal supplied from said second communication equipment via said transmission medium; converting means for generating an encrypted signal by encrypting an information signal to be transmitted to said second communication equipment, by use of a signal corresponding to said received signal from said second communication equipment, output from said first receiving means; and first transmitting means for providing said encrypted signal onto said transmission medium;

wherein said second communication equipment includes: information storage means for storing, as key information, a signal corresponding to an information signal to be transmitted to said first communication equipment; second transmitting means for providing said transmission signal onto said transmission medium; second receiving means for receiving said encrypted signal supplied from said first communication equipment via said transmission medium; and inverse conversion means for decoding said encrypted signal received by said second receiving means, through utilization of said key information corresponding to the preceding transmitted information signal provided from said information storage means and for outputting said decoded information signal; and

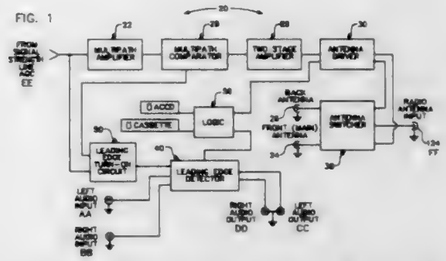
wherein said converting means of said first communication equipment includes first random pattern generating means having input information supplied thereto by a received signal from said second communication equipment and operative to generate a random pattern corresponding to said input information, and first logical operation means for generating said encrypted signal by performing a logical operation of said generated random pattern and said information signal to be transmitted; and wherein said inverse conversion means of said second communication equipment includes second random pattern generating means which is identical in construction with said first random pattern generating means and is supplied as input information with said key information from said information storage means and generates a random pattern corresponding to said input information, and second logical operation means for decoding said encrypted signal by performing a logical operation of said random pattern generated by said second random pattern generating means and said received encrypted signal.

5,204,904

APPARATUS FOR RECEIVING AND PROCESSING FREQUENCY MODULATED ELECTROMAGNETIC SIGNALS

Robert W. Carver, Snohomish, and Victor O. Richardson, Seattle, both of Wash., assignors to Carver Corporation, Lynnwood, Wash.

Filed Dec. 1, 1986, Ser. No. 936,459
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—13 **26 Claims**



1. In a system for generating stereophonically related, first and second audio signals from an incoming, frequency modulated, radio frequency signal: signal processing means for dividing said first and second audio signals from said incoming signal and for blending said first and second audio signals to the extent that the level of said incoming signal drops below a selected threshold value, the means for blending the left and right audio signals comprising: (1) a ring circuit having four legs with diodes in two adjacent legs and balancing capacitors in the other two of the legs through which said signals are blended as said diodes become conductive to keep excessive d.c. control components from appearing at the output of said ring circuit, and, (2) means for so applying control signals to said ring circuit as to gradually increase the conductivity of said diodes and thereby concomitantly increase the blending of the incoming audio signals as the multipath distortion in those signals increases as the level of those signals decreases.

5,204,905

TEXT-TO-SPEECH SYNTHESIZER HAVING FORMANT-RULE AND SPEECH-PARAMETER SYNTHESIS MODES

Yukio Mitome, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 29, 1990, Ser. No. 529,421
Claims priority, application Japan, May 29, 1989, 1-135595
Int. Cl.[5] G10L *5/02, 9/10*
U.S. Cl. 381—52 **6 Claims**

1. A text-to-speech synthesizer comprising:

analyzer means for decomposing a sequence of input characters into phoneme components and classifying the decomposed phoneme components as a first group of phoneme components if each phoneme component is to be synthesized by a speech parameter and classifying said phoneme components as a second group of phoneme components if each phoneme component is to be synthesized by a formant rule;

first memory means for storing speech parameters derived from natural human speech, said speech parameters corre-

sponding to the phoneme components of said first group

5,204,906

VOICE SIGNAL PROCESSING DEVICE

front portion and said aperture of said side portion of said housing.

thereby calculate a multiplication coefficient suitable for achieving compression of the amplified input signal,

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sponding to the phoneme components of said first group and being retrievable from said first memory means in response to each of the phoneme components of the first group;

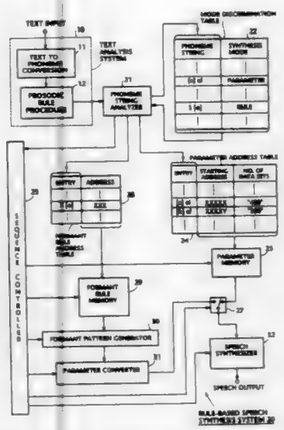
second memory means for storing formant rules for generating formant transition patterns, said formant rules corresponding to the phoneme components of said second group and being retrievable from said second memory means in response to each of the phoneme components of the second group;

means for retrieving a speech parameter from said first memory means in response to one of the phoneme components of the first group;

means for retrieving a formant rule from said second memory means in response to one of said phoneme components of the second group and deriving a formant transition pattern from the retrieved formant rule;

parameter converter means for converting a formant of said derived formant transition pattern into a corresponding speech parameter; and

speech synthesizer means for synthesizing a human speech utterance from the speech parameter retrieved from said first memory means and synthesizing a human speech utterance from the speech parameter converted by said parameter converter means,



wherein said speech parameters stored in said first memory means are represented by auto-regressive (AR) parameters, and said formant of said derived formant transition patterns are represented by frequency and bandwidth values, wherein said parameter converter means comprises:

means for converting the frequency value of said formant into a value equal to $C=\cos(2\pi F/f_s)$, where F is said frequency value and f_s represents a sampling frequency, and converting the bandwidth value of said formant into a value equal to $R=\exp(-\pi B/f_s)$, where B is the bandwidth value;

means for generating a first signal representative of a value $2\times C\times R$ and a second signal representative of a value R^2;

unit impulse generator for generating a unit impulse; and

a series of second-order transversal filters connected in series from said unit impulse generator to said speech synthesizer means, each of said second-order transversal filters including a tapped delay line, first and second tap-weight multipliers connected respectively to successive taps of said tapped delay line, and an adder for summing the outputs of said multipliers with said unit impulse, said first and second multipliers multiplying signals at said successive taps with said first and second signals, respectively.

5,204,906

VOICE SIGNAL PROCESSING DEVICE

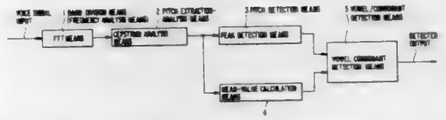
Akira Nohara, Nishinomiya, and Joji Kane, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 3, 1991, Ser. No. 637,271

Claims priority, application Japan, Feb. 13, 1990, 2-033210; Feb. 13, 1990, 2-033211

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—36 **6 Claims**



1. A voice signal processing device comprising:

frequency analysis means for frequency analyzing a voice input signal to provide an output;

pitch extraction-analysis means for pitch extracting and analyzing the output from said frequency analysis means to provide a pitch-extracted and analyzed output;

pitch detection means for detecting a pitch of the pitch-extracted and analyzed output to provide pitch-detected information;

mean-value calculation means for calculating a mean-value level of the analyzed output from said pitch extraction-analysis means to provide mean-value level information; and

vowel/consonant detection means for detecting a vowel on the basis of the pitch-detected information from said pitch detection means, and a consonant on the basis of the mean-value level information from said mean-value calculation means.

5,204,907

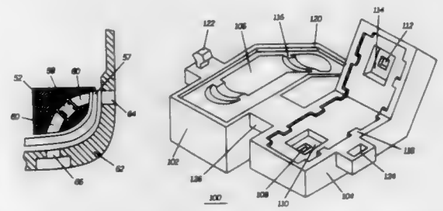
NOISE CANCELLING MICROPHONE AND BOOT MOUNTING ARRANGEMENT

Bruce W. Staple; Bakulesh B. Patel, both of Coral Springs, and David H. Karl, Tamarac, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 28, 1991, Ser. No. 706,459

Int. Cl.[5] H04R *1/02, 25/00*

U.S. Cl. 381—91 **13 Claims**



1. An apparatus for mounting a noise cancelling microphone within a communication device, comprising:

a housing having a front portion, a back portion and side portions, said front portion and one of said side portions having apertures;

a microphone;

a boot having a first portion, a second portion, and a living hinge integrally attaching said first portion to said second portion for retaining said microphone within said housing, said boot being arranged and constructed to form a substantially balanced chamber between said aperture in said front portion and said aperture of said side portion of said housing.

5,204,908

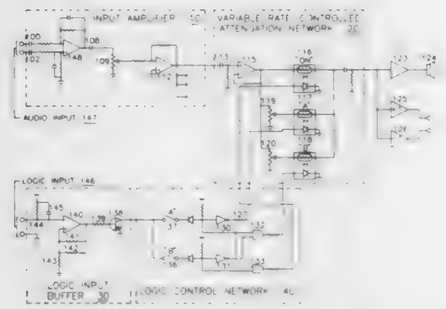
SOUND SYSTEM WITH RATE CONTROLLED, VARIABLE ATTENUATION

Travis M. Sims, Albuquerque, N. Mex., assignor to Lectrosonics, Inc., Rio Rancho, N. Mex.

Filed Sep. 26, 1990, Ser. No. 588,446

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—104 **13 Claims**



1. A multichannel sound system comprising:

means for automatically mixing a plurality of microphone outputs and providing an audio signal;

means for providing a logic signal indicative of activation of at least one of said plurality of microphone outputs;

means for amplifying and coupling said audio signal to rate controlled, variable attenuation network means;

means for amplifying and coupling said logic signal to logic control network means;

means for selectively providing a logic control signal from said logic control network means to said rate controlled, variable attenuation network means;

means of selectively and variably controlling the rate of attenuation of said audio signal;

means for coupling said audio signal to audio output means; and

wherein said means for providing a logic further comprises logic input means corresponding to the number of individual microphone channels, operational amplifier means, and transistor means, and said logic control network means further comprises at least two attenuation switches, inverter means, and AND gate means.

5,204,909

AUDIO PROCESSING SYSTEM USING DELAYED AUDIO

John A. Cowan, 962 Harris Pkwy., Cartersville, Ga. 30120

Filed Sep. 12, 1991, Ser. No. 758,578

Int. Cl.[5] H03G *7/00*

U.S. Cl. 381—106 **6 Claims**

1. A method of limiting the peak audio signal level from a signal source of varying levels to a fixed value, using delayed audio to improve transient response, comprising the following steps of:

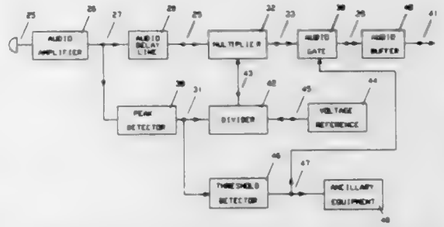
amplifying the input signal to a suitable level.

sampling the amplified input signal by means of an analog or digital peak level detector wherein the output of said detector rapidly rises to the level of the amplified input signal and slowly decreases as the input level falls,

generating a reference level for signal comparison,

dividing the output of the peak level detector into the reference level by means of an analog or digital divider and thereby calculate a multiplication coefficient suitable for achieving compression of the amplified input signal,

delaying the amplified input signal after the sampling stage by means of an analog or digital delay line for a time interval equal to the cumulative delay introduced by the sampling stage, the divider, and the subsequent multiplier,



multiplying the delayed audio signal by the multiplication coefficient by means of an analog or digital multiplier in a manner so that the peak output of the multiplier will be equal to or less than the reference level,

buffering the output of the multiplier for use by tape recorders, radio transmitters, public address amplifiers or any other equipment requiring an audio input signal.

5,204,910

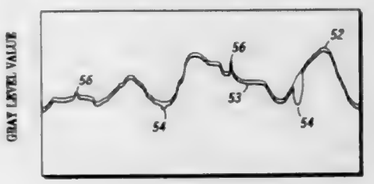
METHOD FOR DETECTION OF DEFECTS LACKING DISTINCT EDGES

Christopher J. Lebeau, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 705,228, May 24, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 896,460

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—8 **11 Claims**



1. A method for detecting defects which lack distinct edges, comprising:

providing a graylevel representation of a taught image of a defect free workpiece;

providing a graylevel representation of a run image of a workpiece being inspected, the run image revealing a defect which lacks distinct edges;

registering the run image by mechanical and optical means to scale, rotation and spatial position of the taught image;

refining the registration between the run image and the taught image by relaxation of the graylevel representation of at least one of the two images;

providing a means to determine a mean brightness level of the run image;

mapping values of the graylevel of each pixel of one image based on a comparison of the mean brightness level of the two images; and

comparing the graylevel representations of the taught image with that of the run image to create a representation of a composite image which highlights the defect which lacks distinct edges.

5,204,911

INSPECTION METHOD USING UNIQUE TEMPLATES

defects having an address on an upper planar surface on the PCB, the system comprising:

pattern located within the outline and comprising a plurality of spaced lines;

(g) adjusting the weights of the trained character identified in (f);

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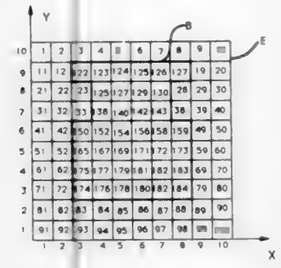
5,204,911

INSPECTION METHOD USING UNIQUE TEMPLATES AND HISTOGRAM ANALYSIS

Nira Schwartz, and Arie Shahar, both of 2800 Plaza Del Amo #187, Torrance, Calif. 90503

Filed May 29, 1991, Ser. No. 706,800
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 29 Claims



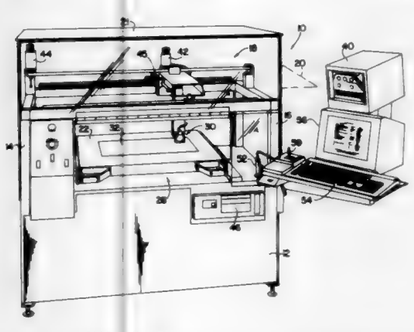
1. A method for inspecting products which may have defects or marks and move on a production line, with the use of a sensor and a processing unit with a memory, comprising:
providing and saving in said memory a computer-generated artificial template image with a plurality of preselected gray levels;
creating a histogram vector of said template image;
creating a product image by sensing one of said products with said sensor,
said product image comprising a multiplicity of pixels with intensity levels expressed as respective gray levels;
modifying said product image to produce a modified product image by increasing the value of said gray levels of said product image by adding a constant value to all of said respective gray levels of said product image so as to make said gray levels of said modified product image higher than said grey levels of said template; and
inspecting said product by superimposing said template image onto said modified product image, thereby creating a superposed image.

5,204,912

DEFECT VERIFICATION AND MARKING SYSTEM FOR USE WITH PRINTED CIRCUIT BOARDS

Freddie G. G. Schimanski, Madison, Conn., assignor to Gerber Systems Corporation, South Windsor, Conn.

Continuation of Ser. No. 485,138, Feb. 26, 1990, abandoned. This application Aug. 15, 1991, Ser. No. 749,479
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 11 Claims



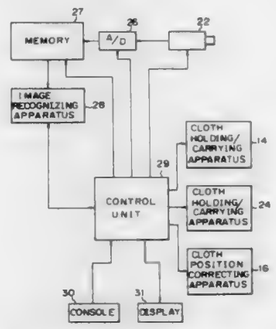
1. A verification system for use in a printed circuit board (PCB) assembly line, for verifying and permitting repair of defects in a PCB bounded by peripheral edges, each of said defects having an address on an upper planar surface on the PCB, the system comprising:
a base;
a gantry apparatus affixed to said base including a positioning apparatus adapted to move in perpendicular directions in a locating plane in response to control signals:
a table affixed to said base in registration with said gantry apparatus;
a platen located on said table adapted to move only along a single axis from a first position extending from said base such that the PCB upper planar surface is misregistered relative to said positioning apparatus and unobstructed thereby to a second position in registration therewith in a plane parallel to said locating plane, said platen further adapted, at a surface thereof, to receive the PCB and including an alignment means to register with and fixedly hold the PCB at a preferred position thereon, said platen further configured relative to said base and said positioning apparatus to enable a worker to load, unload and repair said PCB on said platen in said first platen position and present command signals to said controller from a single worker position;
an optical viewing assembly affixed to said positioning apparatus for providing electrical signal equivalents of an optical image of a selected location of the PCB when the PCB is on said platen in said preferred position and said platen is in said second position; and
a controller for receiving signals identifying the PCB and selecting an associated data file from a computer memory means having signals therein indicative of the addresses of said defects on said PCB; said controller, in response to command signals, further for providing control signals to said positioning apparatus to position said optical viewing assembly at the address of a selected one of the defects and providing image signals in accordance with said optical viewing assembly electrical signal equivalents, said controller further including a means for initializing the system when said data file is received from said computer memory means such that, thereafter, said platen can be repeatably moved between said first and second positions without re-initialization.

5,204,913

PATTERN PROCESSING SYSTEM

Hiroaki Morooka; Ken Aida; Hirokazu Watanabe, and Shigeru Ando, all of Tokyo, Japan, assignors to Juki Corporation, Chofu, Japan

Continuation of Ser. No. 244,831, Sep. 14, 1988, abandoned. This application Mar. 13, 1992, Ser. No. 852,935
Claims priority, application Japan, Sep. 16, 1987, 62-231636
Int. Cl.[5] G06K 9/32
U.S. Cl. 382—8 8 Claims



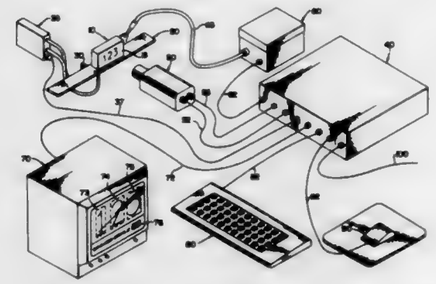
1. A pattern processing system comprising:
means for photographing an internal pattern inherent to at least a part of a piece of cloth having an outline, with the pattern located within the outline and comprising a plurality of spaced lines;
an image memory for storing image data obtained by said photographing means as digital pixel data indicative of luminance;
read address control means for sequentially designating addresses to read out said digital pixel data stored in said image memory from a read start address in the direction of a Y coordinate along each of a plurality of different reading angles; and
recognition means for sequentially reading out the digital pixel data for every reading angle in accordance with the address indicated by said read address control means and for detecting the existing position and angle of the lines of said pattern on the basis of a plurality of maximum and minimum values which represent the results of addition obtained by successively adding said digital pixel data read out from said image memory.

5,204,914

CHARACTER RECOGNITION METHOD USING OPTIMALLY WEIGHTED CORRELATION

James A. Mason, Rochester; Gregory J. Martin, Canandaigua, both of N.Y.; Robert Y. Chen, Seattle, Wash., and John F. Cook, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1991, Ser. No. 753,150
Int. Cl.[5] G06K 9/68
U.S. Cl. 382—14 7 Claims



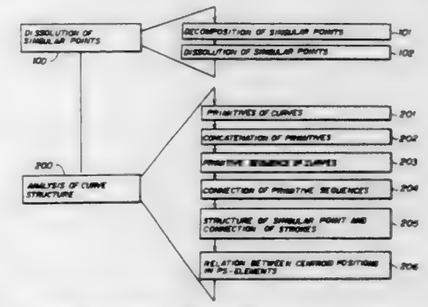
1. A method of character recognition, comprising the steps of:
1) creating a font of trained characters by:
(a) acquiring an image composed of a two dimensional array of pixels;
(b) locating all of the characters in the image by selectively scanning columns or rows of a predetermined area of the image and comparing each pixel's intensity with a reference level to determine the first pixel of each character and recording the location (column and row coordinates) of such pixel and identifying the other pixels adjacent to the first whose intensity also exceeds the reference level and recording the upper left and lower right coordinates of a box bounding each character;
(c) identifying (labeling) all located characters and entering such identified characters as trained characters in memory;
(d) creating a set of weights, initialized to a constant value, for all trained characters of the training set;
(e) computing a correlation matrix composed of weighted correlation coefficients for all possible pairs of trained characters comprising the trained character set;
(f) searching through the correlation matrix and identifying the character corresponding to the row of the correlation matrix containing the most highly correlated pair of trained characters;
(g) adjusting the weights of the trained character identified in (f);
(h) recomputing the row of the correlation matrix corresponding to the trained character identified in (f) using the adjusted weights computed in (g); and
(i) repeating steps (f) through (h) until the highest correlation in the correlation matrix is reduced to an acceptable level or until a maximum count is exceeded and eliminating those trained characters from this iterative process that have been selected an excessive number of times; and
2) recognizing unknown characters by:
(j) acquiring a two dimensional array of pixels;
(k) locating all unknown characters in a manner described in (b);
(l) computing weighted correlation coefficients using the weights determined in steps (a) through (i) between all unknown characters and the trained character set; and
(m) identifying all unknown characters as those trained characters with the highest weighted correlation coefficients above a threshold.

5,204,915

METHOD OF EXTRACTING FEATURE FROM LINE PATTERN AND LINE PATTERN RECOGNITION METHOD USING THE SAME

Hirobumi Nishida, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,800
Claims priority, application Japan, Sep. 21, 1989, 1-245507
Int. Cl.[5] G06K 9/48
U.S. Cl. 382—21 7 Claims



1. A method of extracting a feature from a line pattern comprising the steps of:
(a) extracting a thinned line from the line pattern, said thinned line being represented by branches which are partitioned from each other by vertices;
(b) finding one or a plurality of singular points which are formed on said thinned line, each of said singular points being defined as a vertex to which three or more branches are connected;
(c) decomposing each of said singular points into a number of vertices that is the same as the number of branches connected thereto, based on a presumption that each of said singular points is included in all the branches connected to each of said singular points, wherein each of said vertices has the same coordinate as a corresponding singular point; and
(d) selecting vertices regarded as being identical to each other from the vertices obtained in said step (c), based on conditions in which the branches are connected to each of said singular points, wherein branches including the selected vertices are connected to each other, so that strokes are generated, each stroke having branches successively connected to each other;

wherein the line pattern is characterized by the singular

integrated image comprising plural image parts, comprising the steps of:

while intensifying a signal component of said target spatial

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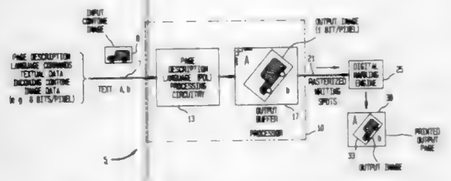
wherein the line pattern is characterized by the singular points and a connection relation of said strokes with respect to each of the singular points.

5,204,916

TILE-ORIENTED TECHNIQUE FOR COLLECTIVELY PERFORMING IMAGE ROTATION, SCALING AND DIGITAL HALFTONE SCREENING

John F. Hamilton, Jr., Rochester, and Anthony J. Leone, III, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1991, Ser. No. 741,877
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—41 22 Claims



1. A method for producing a scaled, rotated and halftoned output image from an input continuous tone (contone) image comprising the steps of:

(A) defining pixel sampling increments, said pixel sampling increments specifying incremental movement between successive sampling locations in a contone tile in said contone image and specifying movement between two adjacent pixel locations in a block of said output image, said defining step includes the steps of:

(1) determining tile increments, wherein said tile increments specify incremental movement between corresponding locations of successive contone tiles in said contone image and said output image is formed of an array of blocks, each of said blocks spatially corresponding to and storing output data for a different one of said contone tiles, wherein said pixel sampling increments and tile increments are a function of a scale factor, an angle of rotation for said contone image and a screen angle;

(2) determining, in response to the scale factor and the angle of rotation, a size of the contone tile, such that the contone image is broken into an array of non-overlapping ones of said contone tiles, each contone tile containing a portion of said contone image;

(3) determining, in response to the scale factor and the angle of rotation, a size of each block in the output image; and

(4) establishing starting locations of a current block in the output image, that is to be written with output data, and of a current tile in the contone image corresponding to said current block that is to be processed;

(B) in response to corresponding ones of said pixel sampling increments:

(1) generating addresses that represent incremental movement through the current block to produce a sequence of output pixel locations;

(2) sampling through said contone image to yield a sampled contone value associated with each addressed output pixel location so as to produce a plurality of sampled contone values; and

(3) producing, in response to each of said sampled contone values and a predefined pattern, a corresponding halftone output value for each addressed output pixel location in said sequence to yield a plurality of halftone output values;

(C) writing each of the halftone output values in the corresponding addressed output pixel location in the current block in the event said each halftone output value is associated with a pixel location situated within the current contone tile; and

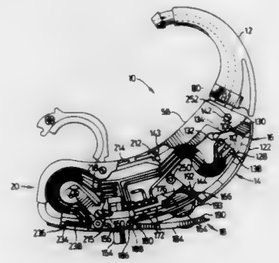
(D) repeating, in response to said tile increments, steps (A) (4), (B), and (C) for each successive output block in the output image as the current block and for each successive tile in said contone image as the current tile until the output image has been completely formed as the output data resulting from processing all of the tiles in the contone image.

5,204,917

MODULAR HEARING AID

Horst Arndt; Edward S. Kroetsch, both of, Kitchener; Terrence D. Spencer, Clarksburg, and Fred J. Stork, Waterloo, all of Canada, assignors to Unitron Industries Ltd., Kitchener, Canada

Filed Apr. 17, 1991, Ser. No. 686,368
Claims priority, application Canada, Apr. 19, 1990, 2014960
Int. Cl.[5] H04R 25/02
U.S. Cl. 381—69 16 Claims



1. A modular hearing aid comprising:

(a) a microphone module having a microphone therein,

(b) a receiver module having a receiver therein,

(c) an amplifier module having an amplifier therein,

(d) a battery module adapted to receive a battery,

(e) said modules having removably connected together by dovetail connections, each dovetail connection between a pair of connected modules comprising a first surface on one of said connected modules defining a slot having a neck of first width and an interior of second width greater than said first width, and a projection on the other of said connected modules shaped to fit snugly and slidingly into said slot, said projection having an outer surface of third width corresponding to said second width and said projection having a neck of fourth width corresponding to said first width, said dovetail connections all extending in a direction substantially parallel to each other, said dovetail connections having ends,

(f) and a pair of cover plates, one on each side of said hearing aid, said cover plates covering said modules and said ends of said dovetail connections and being removably connected to said assembled modules and substantially covering said modules to help seal said modules against ingress of moisture, dust and the like and to provide a changeable cosmetically attractive appearance for said hearing aid.

5,204,918

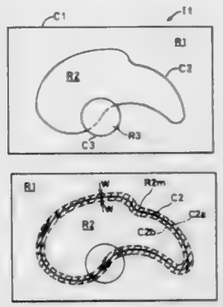
METHOD OF AND APPARATUS FOR CORRECTING CONTOUR OF IMAGE

Makoto Hirosawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 25, 1991, Ser. No. 720,612
Claims priority, application Japan, Jun. 28, 1990, 2-171248
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—41 23 Claims

1. A method of correcting a contour of an image part in an integrated image comprising plural image parts, comprising the steps of:

(a) drawing two supplemental contours with a supplemental contour production means, each supplemental contour being disposed on a respective side of said contour and being spaced from said contour by a predetermined distance and extending along the entirety of said contour;



(b) comparing, by using a correction density determination means, first and second densities of first and second portions of a contour correction region defined between said two supplemental contours, said first and second portions being located on opposed sides of said contour, and determining a correction density in said contour correction region on the basis of said comparison; and

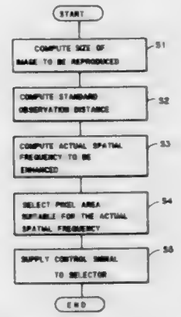
(c) filling said contour correction region with said correction density to substantially obtain a corrected contour.

5,204,919

METHOD OF AND APPARATUS FOR PERFORMING DETAIL ENHANCEMENT

Shigeo Murakami, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 23, 1990, Ser. No. 468,598
Claims priority, application Japan, Jan. 30, 1989, 1-22144
Int. Cl.[5] G06K 9/40; H04N 5/14
U.S. Cl. 382—54 10 Claims



1. A method of performing detail enhancement on an image signal representing an original image to thereby produce an enhanced image signal, comprising the steps of:

(a) determining a dimension of an image-to-be-reproduced,

(b) computing a standard observation distance between an observation point and said image-to-be-reproduced on the basis of said dimension,

(c) finding a target spatial frequency to be intensified on the basis of said standard observation distance, said spatial frequency being defined on said image-to-be-reproduced, and

(d) performing detail enhancement on said image signal while intensifying a signal component of said target spatial frequency, said step (d) comprising the steps of:

(d-1) producing a sharp signal representing density of each pixel on said original image and an unsharp signal representing an average density of an averaging area larger than a pixel,

(d-2) obtaining a first differential signal between said sharp signal and said unsharp signal, and multiplying said first differential signal by a coefficient to produce a second differential signal, and

(d-3) adding said sharp signal and said second differential signal to produce said enhanced image signal,

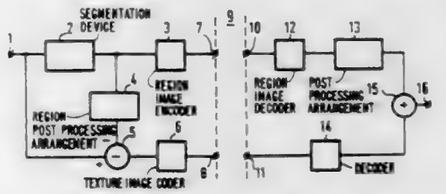
said step (c) comprising the step of determining a dimension of said averaging area such that it be inversely proportional to said target spatial frequency.

5,204,920

METHOD AND APPARATUS FOR REGION AND TEXTURE CODING

David Moran, Crawley, and Octavius J. Morris, Redhill, both of Great Britain, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 640,324, Jan. 10, 1991, abandoned. This application Feb. 12, 1992, Ser. No. 836,178
Claims priority, application United Kingdom, Jan. 12, 1990, 9000721; Mar. 23, 1990, 9006498; Nov. 30, 1990, 9026137
Int. Cl.[5] G06K 9/40
U.S. Cl. 382—54 20 Claims



1. A method of processing a picture signal for conveyance by a transmission path or via a storage medium, said method comprising:

(i) receiving a picture signal which corresponds to luminous intensities in a picture;

(ii) subjecting said picture signal to a segmentation algorithm to derive a region signal corresponding to a profile of step edges of adjoining closed regions of contrasting luminous intensities in said picture;

(iii) post-processing the original region signal derived in (ii) to produce a modified region signal which is more free of false step edges in said profile than is the initial region signal; and

(iv) producing a texture signal which corresponds to the difference between the received picture signal and the modified region signal produced in (iii);

characterized in that the post-processing of the original region signal in (iii) comprises:

(v) deriving a smoothing function which is adapted to the contour of each of the step edges of said original region signal, such adaptation for any step edge being based on the height of such step edge and the widths of the closed regions of contrasting intensities adjacent thereto; and

(vi) adding the smoothing function derived in (v) to said original region signal to produce said modified region signal.

5,204,921

signal transmission and detection system having multiple opti-

fiber having a length greater than said predetermined length of said active fiber and such that a significant por-

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5,204,925

OPTICAL INTERCONNECTION OF CIRCUIT PACKS

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5,204,921

AUTOMATED OPTICAL MAIN DISTRIBUTING FRAME SYSTEM

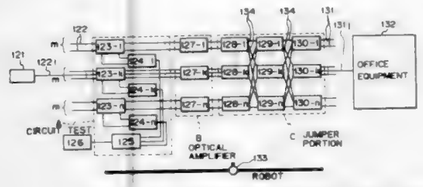
Tsuneo Kanai; Shigefumi Hosokawa; Kunihiko Sasakura, all of Saitama; Syuichirou Inagaki; Shigeru Umemura, both of Tokyo; Hirobumi Kimura, Saitama; Akira Nagayama, Tokyo; Mitsuhiro Makihara, Saitama, and Masao Kawachi, Ibaragi, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jan. 7, 1992, Ser. No. 817,519

Claims priority, application Japan, Jan. 8, 1991, 3-706; Jan. 10, 1991, 3-1502; Jan. 21, 1991, 3-5392; Oct. 18, 1991, 3-270903

Int. Cl.[5] **G02B** *6/30*

U.S. Cl. 385—17 **15 Claims**



1. Automated optical main distributing frame (MDF) system comprising;

a jumper section having a link with at least one matrix waveguide deposited on a substrate with a plurality of waveguides intersecting one another at crosspoints,

said waveguides being coupled with external optical lines and office optical lines so that each of external lines is connected to a selected office line through a crosspoint of the matix waveguide,

each crosspoint of said matrix waveguide having a groove which is slanted to waveguides by a predetermined angle and is subject to be selectively filled with matching oil which has essentially the same refractive index with that of a waveguide so that a light signal in a waveguide goes straight through the crosspoint when a groove is filled with matching oil, and the light signal changes its direction to another waveguide at the crosspoint through total internal reflection by the groove when the groove is empty,

a robot coupled with said matrix waveguide so that the robot is positioned at desired crosspoint of the matrix waveguide to fill and pull out matching oil in a designated groove.

5,204,922

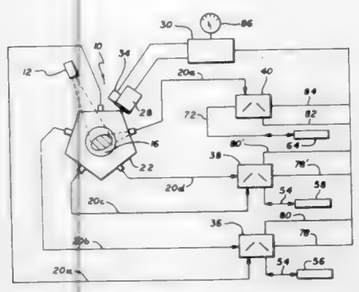
OPTICAL SIGNAL CHANNEL SELECTOR

Charles S. Weir, San Diego, and Karl H. Weise, Valley Center, both of Calif., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.

Filed Oct. 22, 1991, Ser. No. 780,477

Int. Cl.[5] **G02B** *6/26*

U.S. Cl. 385—18 **35 Claims**



1. An optical signal channel selector apparatus for an optical signal transmission and detection system having multiple optical channels for communicating at least one optical signal comprising:

a) at least one first optical channel means for carrying an optical signal;

b) a plurality of a second optical channel means for carrying an optical signal, each said second optical channel means including a solid-state optical fiber block having at least one filter means for receiving said optical signal and transmitting an output optical signal with a limited wavelength range;

c) movable selector means adapted to be in optical communication with any one of said first optical channel means and movable to be in optical communication with any one of said second optical channel means for providing optical communication between one of said first optical channel means and a selected second optical channel means; and

d) means for moving said selector means to provide optical communication between one of said first optical channel means and a different one of said second optical channel means.

5,204,923

UNIT FOR AMPLIFYING LIGHT SIGNALS IN OPTICAL FIBER TRANSMISSION LINES

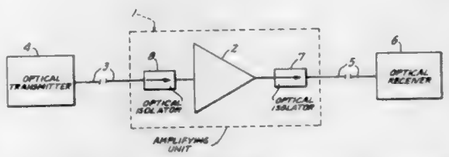
Giorgio Grasso, Monza, and Aldo Righetti, Milan, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

Continuation of Ser. No. 552,918, Jul. 16, 1990. This application Feb. 18, 1992, Ser. No. 839,056

Claims priority, application Italy, Jul. 17, 1989, 21207 A/89

Int. Cl.[5] **H01L** *15/00*

U.S. Cl. 385—24 **5 Claims**



1. An optical signal transmission system for transmitting optical signals at a predetermined wavelength from a transmitter to a receiver of such optical signals, at long distance from said transmitter, said system comprising:

a transmitter of optical signals at said predetermined wavelength;

an active fiber amplifier for amplifying signals at said predetermined wavelength and having an input and an output and comprising an active fiber having a predetermined length connected between said amplifier input and output, said amplifier having a gain greater than 15 dB;

a first optical transmission line fiber having a first line fiber input connected to said transmitter of optical signals at said predetermined wavelength and a first line fiber output, said first optical transmission line fiber having a length between said first line fiber input and said first line fiber output greater than said predetermined length of said active fiber and such that optical signals at said predetermined wavelength applied to said first line fiber input are significantly attenuated in travelling from said first line fiber input to said first line fiber output and having a length such that a significant portion of optical signals applied to said first line fiber output are reflected back toward said first line fiber output, due to Rayleigh scattering;

a receiver of optical signals at said predetermined wavelength;

a second optical transmission line fiber having a second line fiber input and having a second line fiber output connected to said receiver of optical signals at said predetermined wavelength, said second optical transmission line fiber having a length greater than said predetermined length of said active fiber and such that a significant portion of optical signals applied to said second line fiber input are reflected back toward said second line fiber input, due to Rayleigh scattering;

first interconnecting means interconnecting said first line fiber output with said input of said active fiber amplifier comprising a first optical isolator optically connected to said first line fiber output and to said input of said active fiber amplifier for supplying optical signals at said first line fiber output to said input of said active fiber amplifier, said first optical isolator being unidirectional for transmitting optical signals substantially only from said first line fiber output to said input of said active fiber amplifier, and said first interconnecting means having a reflectivity lower than the reflectivity due to Rayleigh scattering of said first optical transmission line fiber;

second interconnecting means interconnecting said output of said active fiber amplifier with said second line fiber input, comprising a second optical isolator optically connected to said output of said active fiber amplifier and to said second line fiber input, for supplying optical signals at said output of said active fiber amplifier to said second line fiber input, said second optical isolator being unidirectional for transmitting optical signals substantially only from said output of said active fiber amplifier to said second line fiber input, and said second interconnecting means having a reflectivity lower than the reflectivity due to Rayleigh scattering of said second optical transmission line fiber,

whereby reflected optical signals, including optical signals reflected in said first optical transmission line fiber and in said second optical transmission line fiber due to Rayleigh's scattering are substantially prevented from reaching said active fiber.

5,204,924

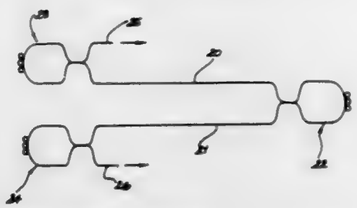
OPTICAL FIBRE REFLECTOR

Peter S. Atherton, Sydney, Australia, assignor to OTC Australia, Sydney, Australia

Filed Sep. 17, 1991, Ser. No. 761,333

Int. Cl.[5] **H01J** *5/16*; **G02B** *6/26, 6/36*

U.S. Cl. 385—43 **12 Claims**



1. An all-fibre mirror including:

a polarisation selective fused taper optical fibre coupler portion consisting of two pairs of optical fibres joined by a coupling region with the fibres extending from one end of the coupling region being joined together so as to form a fibre loop; and

a polarisation rotation device operatively associated with said fibre loop to alter the polarisation of the light passing through the loop.

5,204,925

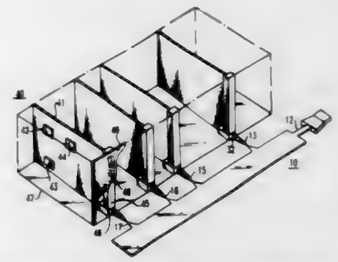
OPTICAL INTERCONNECTION OF CIRCUIT PACKS

Rocco Bonanni, Wayne; William J. Parzygnat, Morris Township, Morris County, and Roger E. Weiss, Denville, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 11, 1991, Ser. No. 757,870

Int. Cl.[5] **G02B** *6/42*

U.S. Cl. 385—89 **19 Claims**



1. Optical interconnection apparatus comprising:

a flexible substrate including a main body portion and a plurality of tab portions extending therefrom, said tab portions being capable of twisting at an angle with respect to the body portion;

a plurality of optical fibers mounted to the substrate so that their ends extend beyond the edges of the tabs and the ends of a plurality of fibers extend to different tabs; and

optical fiber termination means at the edges of the tabs to permit connection to the optical fibers.

5,204,926

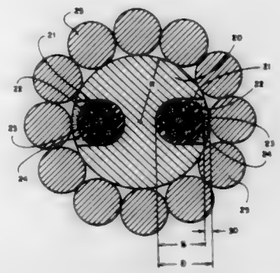
TIGHT BUFFERED FIBER OPTIC GROUNDWIRE CABLE

Jack Bottoms, Jr., 12090 Lonsdale La., Roswell, Ga. 30075, and Charles L. Carter, 350 Singletree Trace, Alpharetta, Ga. 30201

Continuation of Ser. No. 649,612, Feb. 6, 1991, abandoned. This application Jan. 28, 1992, Ser. No. 826,893

Int. Cl.[5] **G02B** *6/00, 6/36*

U.S. Cl. 285—105 **26 Claims**



1. A fiber optic groundwire, comprising:

a central core including at least one helical channel along the length of said core;

at least one optical fiber subunit firmly affixed within a grooved channel by completely filling said grooved channel containing said optical fiber subunit with a filling compound comprising a fixing mastic sealant, said optical fiber subunit comprising a central strength member, a plurality of optical fibers tightly bound within each said at least one subunit about said central strength member, and an outer strain jacket tightly formed about said plurality of optical fibers; and

at least one layer of stranded strength members wound about

an optical fiber;

than that of the cladding material wherein the core polymer and which is obtained from a polymerisable mixture that com-

5,204,932

SERVO CIRCUIT FOR MAGNETIC DISK APPARATUS

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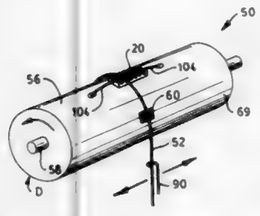
at least one layer of stranded strength members wound about said core.

5,204,927

METHOD AND APPARATUS FOR MAKING A FIBER OPTICAL COUPLER

Aland K. Chin, Sharon, and Jeffrey E. Bisberg, Needham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1992, Ser. No. 844,216
Int. Cl.[5] G02B *6/04*
U.S. Cl. 385—121 **24 Claims**



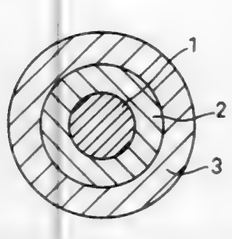
1. A method for stacking and laterally positioning corresponding portions of lengths of optical fibers in an array in which a first end of each fiber is stacked in a first direction in a circumferential slot of a drum and a second end of each fiber is located laterally adjacent each other in a second direction transverse of the first direction, said second end being secured in a body having adjacent grooves therein for receiving a corresponding fiber end comprising the steps of:
securing the body on an outer surface of the drum;
securing a portion of the fiber in at least one of the grooves and a circumferential slot;
rotating the drum and winding the fiber on the drum thereby;
alternately locating the fiber into a portion of the circumferential slot for portions of each revolution and thereby forming a stack of fibers therein, and locating the fiber to one of the grooves in the body for each revolution of the drum;
securing the fibers in the slot together, and securing the fibers in the grooves to the body; and
severing the secured together stack of fibers for forming one end of the array, and severing the fibers at a distal end of the body for forming a second end of the array.

5,204,928

FLAME-RETARDANT COATED OPTICAL FIBER

Eizi Konda, Chiba; Nobuhisa Ishii, Ichihara, and Toru Wakita, Chiba, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1992, Ser. No. 888,915
Claims priority, application Japan, May 28, 1991, 3-123851
Int. Cl.[5] G02B *6/44, 6/10*
U.S. Cl. 385—128 **2 Claims**



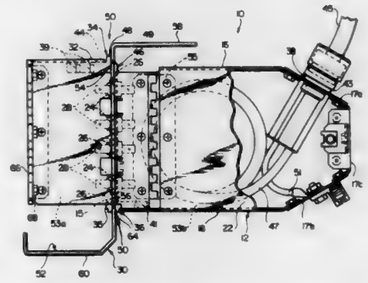
1. A flame-retardant coated optical fiber comprising:
an optical fiber;
a primary coating layer covering the optical fiber, said primary coating layer comprising an ultraviolet-curing resin; and
a secondary coating layer covering the primary coating layer, said secondary coating layer comprising a material containing 20 to 70 parts by weight of ethylene-bis-tetrabromophthalimide and 5 to 40 parts by weight of antimony trioxide, based on 100 parts by weight of thermoplastic polyester elastomer.

5,204,929

FIBER PATCH PANEL

Gregory A. Machall, Schaumburg, and James D. Zipper, Addison, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Sep. 4, 1991, Ser. No. 754,659
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—135 **21 Claims**



1. A fiber optic patch panel module for accepting an incoming optical fiber cable, and for use with telecommunications transmission networks and mountable on a shelf which is, in turn, mountable on an existing network bay frame designed for mounting electrically conductive wire patch panels, comprising: a housing having at least a top panel and a bottom panel; a mounting tang disposed on the top panel for releasably engaging a rack rail on the shelf; a mounting notch located on the bottom panel; and the mounting notch accepting at least one rail tang on the shelf such that the patch panel is pivotally movable about the rail tang when the rail tang is disposed in the mounting notch.

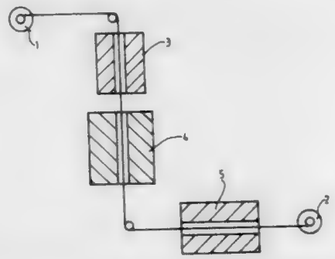
5,204,930

OPTICAL FIBERS, AND A PROCESS FOR THEIR PRODUCTION

Heinz-Dieter Brandt; Wolfgang Ebert; Udo Wolf, and Wilfried Cramer, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1992, Ser. No. 821,106
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102340
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—143 **15 Claims**

1. An optical fibre having a tubular plastic cladding and a core of a polymer whose refractive index is at least 1% greater than that of the cladding material wherein the core polymer and which is obtained from a polymerisable mixture that comprises compounds containing epoxy groups, of which at least 10% by weight of siloxanes containing epoxy groups.

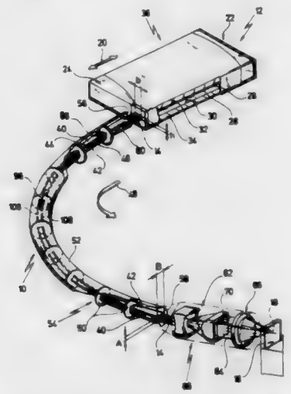


5,204,931

FLEXIBLE WAVEGUIDE

Erwin Gehringer, Boeblingen, and Hans Opower, Krailling, both of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Mar. 25, 1992, Ser. No. 856,246
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1991, 4110452; Aug. 3, 1991, 4125769; Nov. 13, 1991, 4137256
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—146 **75 Claims**



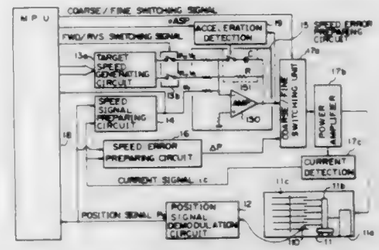
70. Laser system comprising a stationary laser head, and a waveguide being connected to said stationary laser head, said waveguide comprising first and second optically reflecting wall surfaces extending in a longitudinal direction and having a constant width transversely to said longitudinal direction, both wall surfaces facing one another and extending at a constant spacing from one another and enclosing a space in which radiation is guided by reflection in said longitudinal direction, a first region of said waveguide being movable in a flexible manner relative to a second region thereof, and each wall surface being carried for this purpose by a strip which on account of its inherent rigidity is bendable in a non-buckling manner perpendicular to said longitudinal direction, said wall surfaces of said strips being held by a supporting structure at a substantially constant spacing from one another, said supporting structure comprising supporting surfaces which are arranged one after the other in said longitudinal direction and against which said strips rest by the application of force and for sliding displacement in said longitudinal direction.

5,204,932

SERVO CIRCUIT FOR MAGNETIC DISK APPARATUS

Tohru Shinohara, Kawasaki, and Shuichi Hashimoto, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 3, 1990, Ser. No. 460,651
Claims priority, application Japan, Jan. 10, 1989, 1-3189; Jan. 31, 1989, 1-21307; Jan. 31, 1989, 1-21310; Mar. 16, 1989, 1-62149
Int. Cl.[5] G05B *13/00*
U.S. Cl. 388—815 **19 Claims**



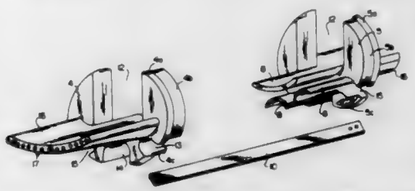
1. A servo circuit for a magnetic apparatus for performing speed control of an object to a target position in accordance with an amount of movement of the object under acceleration control and then deceleration control, comprising:
target speed generating means for generating a target speed signal in accordance with the amount of movement of the object;
speed signal generating means for generating a real speed from a position signal obtained from the object;
speed error preparing means for controlling the speed of the object based on an error between the target speed and the real speed; and
acceleration detection means for detecting acceleration in progress based on an output from said speed error preparing means and outputting an acceleration signal, a cut-off frequency of said speed error preparing means being switched between an acceleration and a deceleration based on the acceleration signal output from said acceleration detection means through a switch, said speed error preparing means further comprising means for limiting a frequency band of the output indicating the error between the target speed and the real speed, and for cutting off the frequency band based on a predetermined frequency indicating the cut off frequency.

5,204,933

SLEEVE COUPLING FOR A BRANCHING OR CONNECTING POINT OF CABLES

Karl-Heinz Marx, Garbsen, Fed. Rep. of Germany, assignor to Kabelmetal Electro GmbH, Fed. Rep. of Germany

Filed Dec. 4, 1991, Ser. No. 802,209
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1990, 4039242
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—53 **14 Claims**



1. Sleeve coupling for a connecting point of cables, particularly of communication cables with optical waveguides, com-

prising a sleeve surrounding the connecting point, which, at

5,204,935

PROGRAMMABLE FUZZY LOGIC CIRCUITS

determining means having input means for manually inputting necessary operation information for providing con-

of said pairs of column electrodes comprising a first column electrode and a second column electrode; and
a plurality of row electrodes positioned on the first face of

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prising a sleeve surrounding the connecting point, which, at each end, is connected in a liquid-tight manner with an end body penetrating into the sleeve, with each end body having at least one through opening for a cable, wherein:

a. the sleeve is a stable plastic tube with a longitudinal slot;
b. each of the end bodies has a circumferential surface on which the sleeve is supported;
c. the through openings are radial slots adapted to receive the cables;
d. the sleeve and the end bodies are surrounded by a heat-shrunk collar, whose longitudinal edges are connected by a flexible attachment member and whose ends are shrunk onto the cable surfaces; and
e. in each entrance region of the sleeve coupling there is provided an extension means for the end body coated at least in part with hot-melt adhesive, the heat-shrunk collar is in contact at least in part with an inner surface of the extension.

5,204,934

SOUND SYNTHESIS DEVICE USING MODULATED NOISE SIGNAL

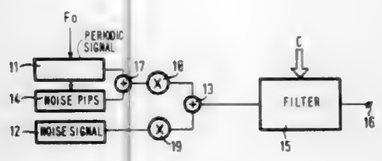
Dirk J. Hermes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1990, Ser. No. 591,904

Claims priority, application Netherlands, Oct. 4, 1989, 8902463

Int. Cl.[5] G10L *9/14*

U.S. Cl. 395—2 **16 Claims**



1. A device for sound synthesis intended to generate a desired acoustic signal comprising:

a first signal source which, during operation, emits a periodic signal having a given repetition frequency as a representation of the voiced parts of the desired acoustic signal,

a second signal source which, during operation, emits an aperiodic signal or a noise signal as a representation of the unvoiced parts of the desired acoustic signal,

a combination circuit for combining the signals of the two signal sources with each other,

a filter circuit having a variable transmission function for processing the combined signal into the desired output signal, and

a third signal source which, during operation, emits a modulated noise signal comprising a train or sequence of noise pips of comparatively short duration, whose temporal envelope is synchronous with the temporal envelope of said periodic signal and which noise pips invariably have at least approximately the same energy, and wherein the modulated noise signal is supplied, during operation, together with the signal of the first signal source to the combination circuit.

5,204,935

PROGRAMMABLE FUZZY LOGIC CIRCUITS

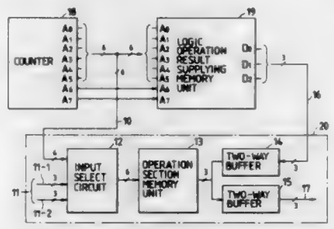
Tohru Mihara; Mitsumasa Narahara; Yasunao Misawa; Yasuo Wakamori, and Shinichi Yasunaga, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 394,483, Aug. 16, 1989, abandoned. This application Apr. 10, 1992, Ser. No. 865,748

Claims priority, application Japan, Aug. 19, 1988, 63-206201; May 1, 1989, 1-112694

Int. Cl.[5] G06G *7/12*

U.S. Cl. 395—3 **5 Claims**



1. A programmable fuzzy logic circuit, responsive to externally supplied input signals, comprising:

logic operation result memory means for storing predetermined fuzzy logic operation results, said logic operation result memory means storing a plurality of sets of predetermined fuzzy logic operation results, each of said plurality of sets having different fuzzy logic operation results;

operation section memory means for storing one of said sets of fuzzy logic operation results from the logic operation result memory means and for outputting as data said fuzzy logic operation results in accordance with the inputs signals;

first input signal selection means, responsive to the input signals, for selecting one of a plurality of the input signals for use in writing data from said logic operation result memory means to said operation section memory means;

memory writing means for writing one of said sets of fuzzy logic operation results into said operation section memory means at an address corresponding to the input signal selected by said first input signal selection means; and

second input signal selection means, responsive to the input signals, for selecting one of a plurality of the input signals for controlling said operation section memory means to output data.

5,204,936

PROCESS STATUS SUPERVISORY SYSTEM

Kazue Kaneko, Kawasaki; Eiji Kato, Yokohama; Tsuneyoshi Takagi, and Kazumasa Kumo, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,999

Claims priority, application Japan, Mar. 14, 1989, 1-63259; Mar. 14, 1989, 1-63260

Int. Cl.[5] G06F *15/18*

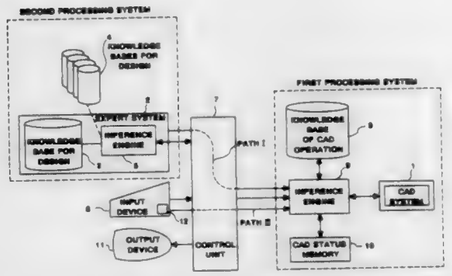
U.S. Cl. 395—11 **19 Claims**

1. An apparatus for supervising the status of processing performed in a system to be supervised which comprises:

first processing means having a first knowledge base, first inference engine means for making an inference with reference to said first knowledge base and data processing means for providing control for conducting a predetermined data process in accordance with the inference made by said first inference engine means; and

second processing means having a second knowledge base and second inference engine means for making an inference with reference to said second knowledge base for the purpose of providing further control over the predetermined data process conducted in said first processing means; said apparatus comprising:

determining means having input means for manually inputting necessary operation information for providing control over the predetermined data process, said determining means in response to the input means determining whether or not said second processing means should provide further control over the predetermined data process conducted in said first processing means; and



control means for causing said second processing means to start the predetermined data process conducted in said first processing means when said determining means determines that said second processing means is to provide further control over said first processing means or for causing said first processing means to start the predetermined data process when said determining means determines that sad second processing means is not to provide further control over said first processing means.

5,204,937

NEURAL DATA-PROCESSING NET WITH ELECTROCHROMIC MATERIAL REGIONS

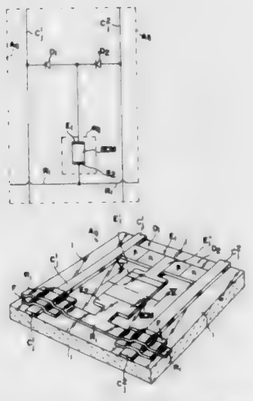
Nicola Minnaja, Rome, Italy, assignor to Enitricerche S.p.A., Milan, Italy

Filed Nov. 9, 1990, Ser. No. 612,233

Claims priority, application Italy, Nov. 15, 1989, 68006 A/89

Int. Cl.[5] H01L *27/14*; G02F *1/01*

U.S. Cl. 395—25 **1 Claim**



1. A neural net for data processing capable of being adapted while on-line, said neural net comprising:

a support substrate which is translucent;

a plurality of pairs of column electrodes positioned on a first face of said support substrate and arranged substantially perpendicular to a first axis of said support substrate, each of said pairs of column electrodes comprising a first column electrode and a second column electrode; and

a plurality of row electrodes positioned on the first face of said support substrate and arranged substantially perpendicular to a second axis of said support substrate;

wherein each of said row electrodes intersects at least one of said pairs of column electrodes, thereby forming a matrix element associated therewith; and

wherein each of said matrix elements comprises:

a phototransistor positioned on a second face of said support substrate;

an element of electrochromic material comprising light transfer characteristics which change in response to an electrical impulse, said element of electrochromic material positioned on the first face of said support substrate and overlapping said phototransistor, a first contact of said electrochromic material connected to its associated row electrode;

a first diode coupling a second contact of said electrochromic material to its associated first column electrode; and

a second diode coupling the second contact of said electrochromic material to its associated second column electrode, the polarity of said second diode being opposite to that of said first diode in relation to said electrochromic material;

whereby, by supplying a current from a particular row electrode to a particular pair of column electrodes or from a particular pair of column electrodes to a particular row electrode, the matrix element associated with the intersection of the particular row electrode and the particular pair of column electrodes supplied with current is uniquely addressed and the light transfer characteristics of the electrochromic material thereof is electronically altered in one direction or in the opposite direction, respectively, and the resulting amount of incident light transferred by said electrochromic material to the phototransistor of the matrix element uniquely addressed is increased or decreased accordingly, thereby modifying impedance characteristics of the phototransistor in the desired fashion.

5,204,938

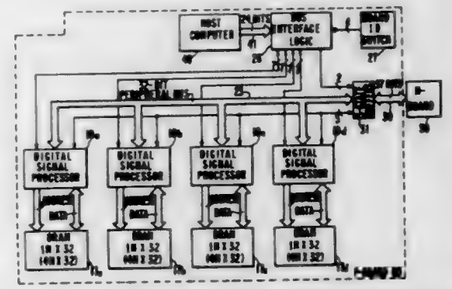
METHOD OF IMPLEMENTING A NEURAL NETOWRK ON A DIGITAL COMPUTER

David M. Skapura, and Gary J. McIntire, both of Friendswood, Tex., assignors to Loral Aerospace Corp., New York, N.Y.

Division of Ser. No. 359,066, May 30, 1989. This application Mar. 18, 1992, Ser. No. 853,105

Int. Cl.[5] G06F *15/600, 15/18*

U.S. Cl. 395—27 **2 Claims**



1. A method for implementing a neural network on a digital computer, wherein the neural network comprises a plurality of nodes organized into at least two ordered layers, with each node not on the lowest-ordered layer performing a calculation modulating an output by a weighting value from each of a

subset of nodes from the immediately lower-ordered layer to which said node is connected, the result of said calculation

knowledge source blocks in said rule base storage to be executed by said inference engine; and

comparing continuing successively when said resource is available;

ship between the pattern number and the node number; and

(k) storing the linked node number as a starting node number

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subset of nodes from the immediately lower-ordered layer to which said node is connected, the result of said calculation being referred to as an output value; and

the digital computer comprises several substantially identical parallel processing elements each coupled to a global memory, whereby the global memory is located on a memory board separate from a processing board containing the processing elements.

said method comprising the steps of:

A. broadcasting from the global memory into a first local memory block of each of the processing elements first layer output values from a first layer of the neural network.

B. causing said processing elements to calculate second layer output values for a set of nodes from a second layer immediately higher-ordered than said first layer, based on values of weights (stored by said processing elements) associated with connectivities between said nodes on said second layer and nodes on said first layer;

C. broadcasting, from each processing element, said second layer output values to the global memory;

D. each processing element substantially simultaneously monitoring the second output values of broadcasting Step C and storing said values in a local memory block; wherein

E. for every layer j except for the first layer, output values from the (j-l)st layer are broadcast from the global memory to a first local memory block of each of the processing elements;

F. the processing elements calculate output values for the jth layer based on stored weights associated wth connectivities between nodes of the jth layer and nodes of the (j-l)st layer and further based on the output values stored in the first local memory block;

G. substantially simultaneously with calculating Step F, additional output values from the (j-l)st layer are broadcast from the global memory into a second local memory block of each of the processing elements;

H. the processing elements then calculate additional output values for the jth layer, based on stored weights associated with connectivities between nodes of the jth layer and nodes of the (j-l)st layer and further based on the output values stored in the second local memory block;

I. each processing element broadcasts, to the global memory and to all the other processing elements, output values of nodes for the jth layer for which said processing element has performed calculations; and

J. each processing element substantially simultaneously monitors the output values of Step I and stores the output values in a local memory block.

5,204,939

RULE BASE PROCESSING SYSTEM AND RULE EVALUATION CONTROL METHOD THEREIN

Masami Yamazaki, Fuchu, and Hisayo Fukushima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1990, Ser. No. 627,151

Claims priority, application Japan, Dec. 14, 1989, 1-322603; Mar. 19, 1990, 2-69452

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—51 **19 Claims**

1. A rule base processing system, comprising:

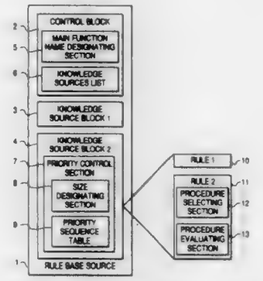
an inference engine;

a rule base storage, operatively connected to said inference engine, including:

knowledge source blocks having a selection mode and rules arranged in a first priority sequence, at least some of said knowledge source blocks further including a priority sequence table describing a second priority sequence of the rules, each of the rules including a condition and a procedure; and

a control block having a knowledge source list of said knowledge source blocks in said rule base storage to be executed by said inference engine; and

a rule base compiler, operatively connected to said rule base storage, to compile said rule base storage and generate a



program for executing the rules in one of the first and second priority sequences, the program executing in each knowledge source block having a single rule selection mode, only the procedure of a first rule having a condition that is satisfied.

5,204,940

INFERENCE ENGINE WITH CONFLICT RESOLUTION BASED UPON THE AVAILABILITY OF A RESOURCE

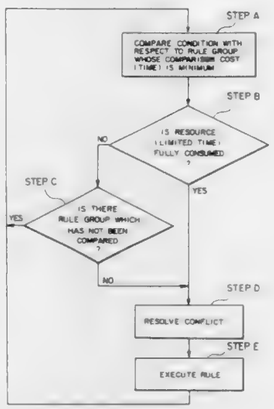
Tetsuya Kitagawa, and Shoichi Kojima, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1991, Ser. No. 687,516

Claims priority, application Japan, Apr. 26, 1990, 2-112978

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—51 **11 Claims**



1. An inference system used for a process system having a resource, comprising:

rule storing means for storing a plurality of production rules, each of which is comprised of an "if statement" and a "then statement";

fact information storing means for storing fact information;

condition comparing means for comparing said "if statement" of each production rule stored in said rule storing means with said fact information stored in said fact information storing means based on the availability of the resource of the process system to obtain at least one production rule with said "if statement" being satisfied, said comparing continuing successively when said resource is available;

conflict resolving means for selecting one of said at least one production rule obtained as the result of the comparison by said condition comparing means based on the availability of the resource of the process system, said selecting occurring when said resource becomes unavailable; and

rule executing means for executing said "then statement" of said production rule selected by said conflict resolving means.

5,204,941

ELEMENT CHECKING SYSTEM FOR USE IN FORWARD INFERENCE SYSTEM

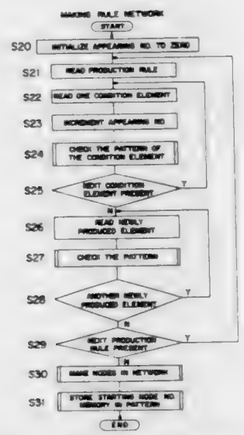
Toshiyuki Tanaka, Yamatokoriyama; Shigeki Kuga, Nara; Nobuo Nakamura, Yamatokoriyama; Taro Morishita, Soraku, and Masahiro Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 250,695, Sep. 28, 1988, abandoned. This application Apr. 5, 1990, Ser. No. 505,028

Claims priority, application Japan, Sep. 30, 1987, 62-248547

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—64 **3 Claims**



1. A method for creating an element checking network for use in a forward inference system comprising the steps of:

(a) creating a pattern table including items of at least pattern number, pattern name and attribute name for at least one pattern and storing the pattern table in a memory;

(b) reading at least one of a plurality of rules from a memory, each rule including at least one condition element;

(c) assigning an appearing number to each condition element;

(d) locating a pattern number for each condition element in the pattern table;

(e) linking the appearing number and corresponding pattern number for each condition element;

(f) reading at least one of a plurality of rules for a second time;

(g) assigning an appearing number to each condition element in the read rule;

(h) forming a node each time a condition element with a pair, including an attribute name and an attribute value, occur for a first time when a present rule is read;

assigning to each condition element a new node number when a new node is formed, or assigning a previously set node number when a node identical to a previously formed node is formed;

(j) linking the appearing number and corresponding node number for each condition element so as to find a relationship between the pattern number and the node number; and

(k) storing the linked node number as a starting node number in the pattern table for each pattern.

5,204,942

ROBOT CONTROL SYSTEM FOR CONTROLLING A SET OF INDUSTRIAL ROBOTS FOR COOPERATIVE OPERATION

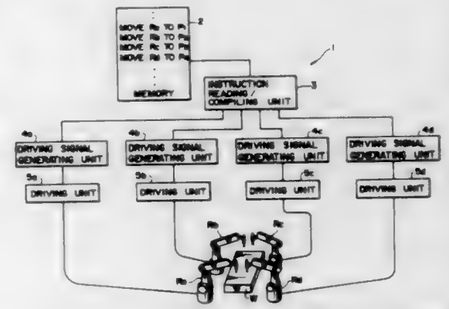
Nobuyuki Otera; Toshihiko Nishimura, and Toru Takahashi, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 409,774, Sep. 20, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 711,724

Claims priority, application Japan, Jan. 10, 1989, 1-3088; Jan. 10, 1989, 1-3089

Int. Cl.[5] G06F *15/46*; G05B *19/42*

U.S. Cl. 395—83 **2 Claims**



1. A robot control system for controlling a plurality of industrial robots for cooperative operation on a workpiece at the same time, comprising:

means for preventing said robots from interfering with each other while moving including a single storage means storing a general program comprising instructions for actuating said industrial robots, the movement of said robots being established in world coordinates so that interference between robots is avoided;

a single reading/compiling means for reading the instructions and separately extracting the instructions for each industrial robot; and

a plurality of driving signal generating units and a plurality of driving units respectively for driving the industrial robots according to the instructions, so that said plurality of robots may move simultaneously by the execution of a single general control program.

5,204,943

IMAGE FORMING APPARATUS

Yoshihiko Watanabe; Kenjiro Fujita, and Yasuro Takiura, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

Continuation of Ser. No. 368,390, Jun. 15, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 581,148

Claims priority, application Japan, Dec. 22, 1986, 61-305771

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—118 **14 Claims**

1. An image forming apparatus for computed tomography comprising

a data acquisition means for continuously scanning a detected body a plurality of times to obtain scan data of the body;

an intermediate buffer memory means connected to said data acquisition means for storing the scan data and having a sufficient capacity to store all of the scan data acquired by said data acquisition means;

a tomographic image reconstruction means for tomograph-

thick line by parallel setting a reference line component and at least one additional line component which is obtained by paral-

said applications, a menu of selectable hypermedia services to a user and comprising the steps of:

first coordinate to which each said pixel is to be trans-

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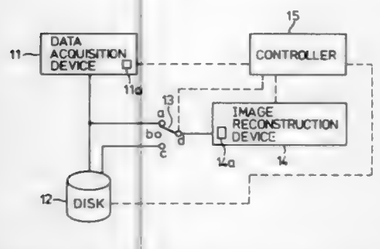
a tomographic image reconstruction means for tomographically processing the scan data and for reconstructing a tomographic image of the detected body being scanned according to the scan data obtained by said data acquisition means; and

control means for connecting said data acquisition means and said intermediate buffer memory means to said tomographic image reconstruction means, and for applying the scan data from said data acquisition means to said tomo-



graphic image reconstruction means and concurrently to said intermediate buffer memory means, and after one sheet of image is tomographically reconstructed by said tomographic image reconstruction means, for applying scan data stored in said intermediate buffer means to said tomographic image reconstruction means so that the process of tomographic image reconstruction is started substantially concurrently with the start of obtaining and applying of the scan data by said data acquisition means.

5,204,944

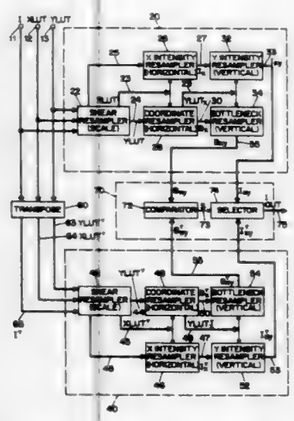
SEPARABLE IMAGE WARPING METHODS AND SYSTEMS USING SPATIAL LOOKUP TABLES

George Wolberg, Elmhurst, N.Y., and Terrance E. Boult, Hightstown, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jul. 28, 1989, Ser. No. 387,605

Int. Cl.[5] G06F *15/00*

U.S. Cl. 395—127 **38 Claims**



4. A separable image warping system for transforming input image data to output image data, comprising:

input image means for supplying data representing an image value for each pixel of a plurality of pixels in a two-dimensional image;

x value means for supplying data representing the value of a first coordinate to which each said pixel is to be transferred in an output image;

y value means for supplying data representing the value of a second coordinate to which each said pixel is to be transferred in said output image;

a first channel, for processing input image value data to derive image values representing preliminary values of output image pixels, comprising:

intensity resampler means coupled to said image value means and to said x value and y value means for providing a two-pass transformation for developing preliminary output pixel values representing said input image pixel values after successive resampling to give effect to image compression variations along the direction of said first and second coordinates; and

bottleneck resampler means coupled to said x value and y value means for resampling coordinate data for developing bottleneck image value data indicative of individual pixels in said preliminary output pixel data that have been subjected to positive compression variations exceeding a predetermined measure;

transposing means coupled to said input image value, x value and y value means for developing transposed input image, transposed first coordinate and transposed second coordinate data representative of said input and output images respectively after rotation of coordinates of said images to a second orientation;

a second channel, for processing said transposed input image value data in parallel with said first channel to derive image values representing preliminary values of output image pixels of said rotated input image, comprising:

intensity resampler means and bottleneck resampler means for providing the same functions as said corresponding elements of said first channel;

comparator means coupled to the bottleneck resampler means of said first and second channels for comparing the respective bottleneck image value data for providing a control signal representative of which of said preliminary output pixel values, as developed in said first and second channels, should be selected on a predetermined basis for inclusion in the final output image data, for each pixel of the output image; and

selector means coupled to the intensity resampler means of said first and second channels and responsive to said control signal for providing final output image data wherein the value for each pixel represents the value for that pixel from either the first or second channel as selected in response to said control signal.

5,204,945

METHOD OF DISPLAYING THICK LINE AND INFORMATION UNIT AND DISPLAY SYSTEM USED THEREFOR

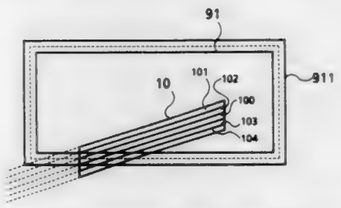
Toru Sakaibara, Kawasaki; Hideyuki Hara, and Ryo Fujita, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1990, Ser. No. 609,615

Claims priority, application Japan, Nov. 8, 1989, 1-290421

Int. Cl.[5] G06F *15/62*

U.S. Cl. 395—134 **6 Claims**



1. A method of displaying a thick line for displaying the thick line by parallel setting a reference line component and at least one additional line component which is obtained by parallel moving said reference line component, comprising:

a step of expanding a clip frame showing a display range by a predetermined width to be equal to or larger than the total width of the at least one additional line component to be set at least at one side of the reference line component and obtaining the at least one additional line component in the expanded clip frame; and

a step for displaying line components within said clip frame of the at least one additional line component obtained and the reference line component within said clip frame.

5,204,946

MIXED TEXT AND IMAGE DATA PROCESSING

Yasuhito Shimamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

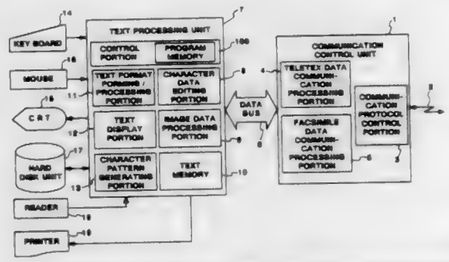
Continuation of Ser. No. 365,718, Jun. 14, 1989, abandoned.

This application Feb. 10, 1992, Ser. No. 831,745

Claims priority, application Japan, Jun. 17, 1988, 63-148315

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—146 **26 Claims**



1. A data processing apparatus for editing mixed data including at least two rectangular text data blocks and at least one rectangular image data block, each of the text data blocks including character code data, the at least one image data block including image data, and each of the data blocks further including at least block information for determining layout and kind-of-data-block thereof, said apparatus comprising:

memory means for storing a plurality of mixed data which are received through a communication line;

designation means for designating mixed data stored in said memory means;

converting means for converting at least two text data blocks in the mixed data designated by said designation means into one text data block; and

editing means for editing the mixed data including the one text data block produced by said converting means.

5,204,947

APPLICATION INDEPENDENT (OPEN) HYPERMEDIA ENABLEMENT SERVICES

Keith Bernstein, Washington, D.C., and John A. Stephens, Boyds, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,320

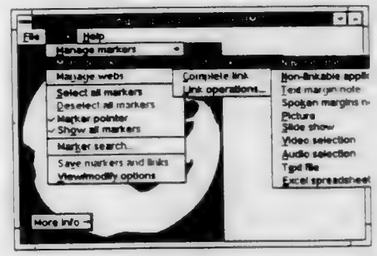
Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—157 **48 Claims**

1. In an open hypermedia system in which data for individual applications may be displayed on a screen of a display device in separate application windows for each of said applications, each of said application windows including a main application workspace in which said data is displayed, a method performed by said hypermedia system and providing a uniform and consistent graphical user interface for applications which utilize hypermedia services available from said open hypermedia system, said method presenting, independent of said applications, a menu of selectable hypermedia services to a user and comprising the steps of:

establishing an awareness between said hypermedia system and an application upon application initialization;

monitoring a current position of a user controlled pointer on said display device; and



responsive to a first input by a user and said current position of said pointer, displaying a menu of selectable services appropriate to a current position of said user controlled pointer within an application window.

5,204,948

METHOD AND APPARATUS FOR EVALUATING COLOR IMAGE SIGNALS

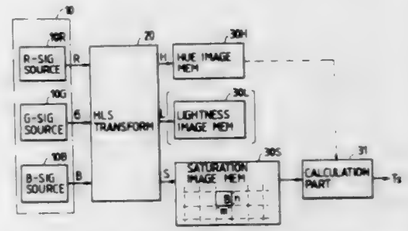
Haruo Kato, Sapporo, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Sep. 4, 1990, Ser. No. 576,860

Claims priority, application Japan, Sep. 8, 1989, 1-233668; Sep. 8, 1989, 1-233669; Sep. 13, 1989, 1-237656; Sep. 13, 1989, 1-237657; Mar. 7, 1990, 1-56065; Mar. 7, 1990, 2-56066

Int. Cl.[5] G06F *15/20*; H04N *1/46*; G09G *1/28*

U.S. Cl. 395—162 **16 Claims**



1. A color image signal evaluating apparatus comprising:

color image signal transform means for transforming a color image signal to saturation image data;

a saturation image memory, operatively connected to said color image signal transform means, for storing at least one frame of said saturation image data provided from said color image signal transform means; and

calculating means for averaging said saturation image data read out of said saturation image memory for each pixel block of predetermined size to obtain means saturation values, determining a maximum one of said means saturation values, calculating a sum total of said maximum mean saturation values obtained for each of a predetermined number of pixel block sizes, and outputting a value corresponding to said sum total as basic chromaticity.

5,204,949

MULTI-CHANNEL/MULTI-CIRCUIT

device controlled by a control unit addressable by an address, an apparatus comprising:

state machine protocol and functions which transfer data to said peripheral device;

maintenance controller, match circuit and interrupt controller of each computing circuit being responsively interconnected

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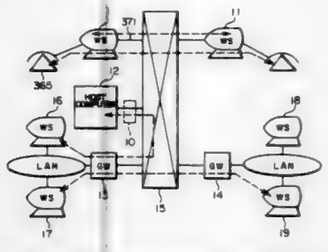
5,204,949
MULTI-CHANNEL/MULTI-CIRCUIT COMMUNICATION CONTROLLER

Toshikazu Yasue, Chigasaki; Tetsuo Oura, Yokohama; Shiro Oishi; Yunji Saeki, both of Hadano, and Yoshinori Watanabe, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 479,069
Claims priority, application Japan, Feb. 15, 1989, 1-033563; May 12, 1989, 1-117301; May 12, 1989, 1-117305
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 **40 Claims**



1. A multi-channel communication controller for use with a main computer utilizing a plurality of channels, the controller comprising:

a plurality of subprocessor sections, each subprocessor section disposed for an associated channel of the plurality of channels to conduct communication processing, each said subprocessor section including a subprocessor CPU, a subprocessor RAM, a subprocessor serial controller connected to the associated channel, a subprocessor local bus for establishing connections in each said subprocessor between said subprocessor CPU, said subprocessor RAM, and said subprocessor serial controller, and a subprocessor controller connected to said subprocessor local bus;

a main processor section for controlling said subprocessor sections, said main processor section including a main CPU, a main ROM, a main RAM, a main local bus for establishing connections between said main CPU, said main ROM, and said main RAM, and a main controller connected to said main local bus;

an upper-level local bus connected to said main controller and each of the subprocessor controllers; and,

a memory sharing section connected to said upper-level local bus and to a system bus of a system processor section for supervising control of the main computer, said memory sharing section including a shared controller connected to said upper-level local bus and said system bus and a shared RAM connected to said shared controller,

wherein each said subprocessor controller includes an address translating section for accomplishing an address translation on an address supplied from said main processor section via said upper-level local bus so as to transfer an address after the address translation to said RAM associated thereto.

5,204,950
DATA PROCESSING SYSTEM FOR TRANSMITTING DATA BETWEEN A HOST PROCESSOR AND AN I/O DEVICE

Kenichi Kawashima, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

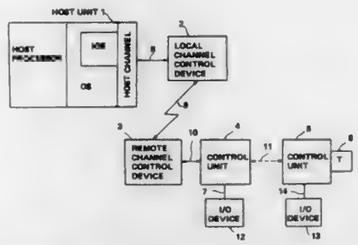
Filed Nov. 28, 1990, Ser. No. 619,788
Claims priority, application Japan, Dec. 8, 1989, 1-317910
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 **8 Claims**

1. In a data processing system transmitting data between a host processor and one of multiple I/O devices, each I/O device controlled by a control unit addressable by an address, an apparatus comprising:

I/O means in the host processor for sending the address of a control unit and a command for controlling the I/O device controlled thereby;

local channel control means connected to the host processor for receiving said address and said command, said local channel control means having look up means for looking up an initial status depending upon the value of said address and said command, first data transmission mean connected between said host and said look up means for transmitting said initial status to said host, and second data transmission means for transmitting said address and said command;

remote channel control means connected to said second data



transmission means for receiving therefrom, said address and said command transmitted from said local channel control means, said remote channel control means having means for sending said command to the control unit addressed by said address; and

said control unit addressed by said address being connected between said remote channel control means and its I/O device, said control unit for receiving said command from said remote channel control means and for controlling its I/O device in accordance with said command;

said host device further having operation means controlling the connection between said host processor and said local channel control means for controlling connections and disconnections between said host processor and said local channel control means dependent on said initial status for the performance of an I/O operation.

5,204,951
APPARATUS AND METHOD FOR IMPROVING THE COMMUNICATION EFFICIENCY BETWEEN A HOST PROCESSOR AND PERIPHERAL DEVICES CONNECTED BY AN SCSI BUS

Don S. Keener, Boca Raton; Andrew B. McNeill, Deerfield Beach, and Edward I. Wachtel, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1989, Ser. No. 416,210
Int. Cl.[5] G06F *13/36*
U.S. Cl. 395—325 **14 Claims**

1. A method for improving communication efficiency between a host processor connected to an SCSI bus through an adapter, and a plurality of SCSI devices connected to said bus comprising:

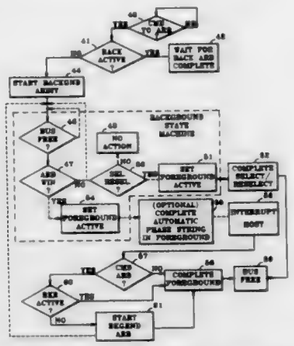
storing arbitration and selection data corresponding to a protocol command phase for a peripheral device in a first set of registers comprising a background state machine;

arbitrating with said background state machine for access to said SCSI bus using said arbitration data when said bus is free, and establishing a communication link with a physical unit of said peripheral device in accordance with said selection data;

storing command out data for said selected physical unit of said peripheral device in a second set of registers comprising a foreground state machine for executing a foreground state machine protocol and functions which transfer data to said peripheral device;

executing said foreground state machine protocol whereby said command out data is transferred to said peripheral device; and

storing in said background state machine additional arbitra-

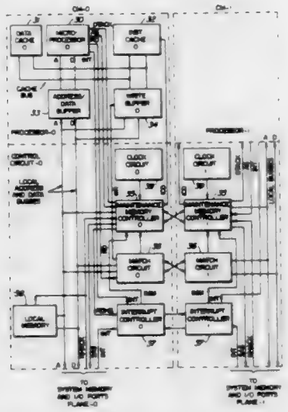


tion and selection data after said communication link is established and prior to completion of said foreground functions execution, whereby said host processor and adapter having a higher priority than said peripheral device are preset to arbitrate and thereby win access as soon as said foreground execution is complete before any other peripheral device can gain access to said bus.

5,204,952
DUPLEX PROCESSOR ARRANGEMENT FOR A SWITCHING SYSTEM

David J. Ayers, Carp, and Jacob Guttman, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 247,793, Sep. 22, 1988, abandoned. This application Jul. 23, 1991, Ser. No. 734,033
Claims priority, application Canada, Jul. 18, 1988, 572331
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—550 **8 Claims**



1. A method of controlling a duplex processor arrangement comprising a pair of computing circuits each comprising a processor portion and a control portion, the processor portion including a microprocessor and an associated instruction cache memory and the control portion comprising a maintenance controller, a match circuit, and an interrupt controller, the maintenance controller, match circuit and interrupt controller of each computing circuit being responsively interconnected to each other and connected to their respective processor portion as well as to respective mate circuits in the other of the computing circuits, the control portion also including an instruction counter for cyclically counting to a predetermined number instructions executed by its respective microprocessor, each of the computing circuits being driven from a respective independent clock circuit, the method comprising the steps of,

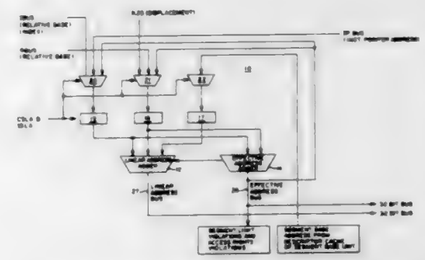
each of the instruction counters counting the instructions executed by its associated microprocessor,

the instruction counter to first reach the predetermined number generating a flag signal, and, the maintenance control associated with that instruction counter responding to the flag signal by inhibiting execution of further instructions by its associated microprocessor until the instruction counter of the other computing circuit has also reached the predetermined number whereby a rendezvous between the computing circuits has occurred, the inhibiting step being achieved by the maintenance controller responsive to the flag signal generating an instruction cache disable signal that causes a cache-miss cycle to occur at the processor instruction that is coincident with the flag signal and for preventing completion of the cache-miss cycle until the match circuits of the computing circuits and the maintenance controller associated with the instruction counter to first reach the predetermined number have determined that the computing circuits are at the same point in the software processing stream.

5,204,953
ONE CLOCK ADDRESS PIPELINING IN SEGMENTATION UNIT

Ashish Dixit, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 4, 1989, Ser. No. 389,749
Int. Cl.[5] G06F *9/34, 12/00, 12/08*
U.S. Cl. 395—400 **1 Claim**



1. A microprocessor circuit for providing an address for each execution stage in a pipelined addressing system having pipelined stages for each instruction including a first decode stage, a second decode stage, a third execution stage, and a fourth writeback stage, said microprocessor circuit comprising

first signal providing means for providing signals representing a displacement, a relative base address, and an index during said first decode stage;

a combining means for combining the signals representing the displacement, the relative base address, and the index to provide an effective address during said second decode stage, said combining means coupled to said first signal providing means;

second signal providing means for providing signals representing a segment base address during said first decode stage;

a three input adder for combining the signals representing the displacement, the relative base address, the index, and the segment base address to provide a linear address dur-

ing said second decode stage comprised of and three input

5,204,955
NETWORK MANAGEMENT METHOD AND SYSTEM

means for executing said lower level language object program and outputting execution information to a host

also capable of executing instructions stored in the second memory;

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ing said second decode stage comprised of and three input adder, said three input adder coupled to said first signal providing means and said second signal providing means;

means for providing the output of the combining means to an input of the three input adder; and

third signal providing means for providing said effective address and said linear address during said third execution stage, said third signal providing means coupled to said combining means and said three input adder.

5,204,954

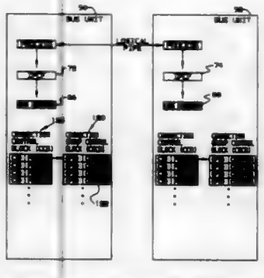
REMOTE STORAGE MANAGEMENT MECHANISM AND METHOD

William E. Hammer, Rochester; Walter H. Schwane, Kasson, and Frederick J. Ziecina, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 524,121, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 122,296, Nov. 18, 1987, abandoned. This application Jul. 29, 1992, Ser. No. 922,283

Int. Cl.[5] G06F *9/46*

U.S. Cl. 395—425 **42 Claims**



1. A first bus unit, having master DMA capability, for coupling to a bus, which is coupled to a second bus unit which has only slave DMA capability, the first bus unit comprising:

a processor which executes a plurality of processes, said processes requesting work from other processes on other bus units and serving work requests from other processes on other bus units, said work serving processes controlling the flow of work processing;

a bus manager for insulating said processes from communication management, the bus manager of the first bus unit comprising:

means for managing a storage area of the second bus unit;

means for transferring information into the storage area of the second bus unit by using the master DMA capability of the first bus unit;

means for generating a storage control block for identifying storage addresses of the second bus unit where the transferred information is stored; and

means for transferring the storage control block to the second bus unit so the information is available to the second bus unit as though it had master DMA capability;

means for processing a work request from the first bus unit to the second bus unit using the information made available to the second bus unit by said means for transferring the information, said information contained in the storage area of the second bus unit; and

means for informing the first bus unit of any response to the work request.

5,204,955

NETWORK MANAGEMENT METHOD AND SYSTEM

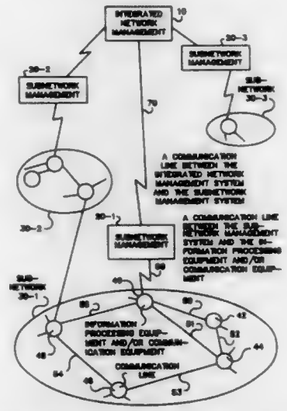
Takashi Kagei, Yokohama; Ryoichi Sasaki, Fujisawa; Michio Suzuki, Yokohama; Keizou Mizoguchi; Hideaki Kobayashi, both of Naka, and Kenzo Iioka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 580,133

Claims priority, application Japan, Dec. 18, 1989, 1-325964

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—575 **11 Claims**



1. A network management method for a network system including a plurality of agents for managing sub-networks individually, and a manager for managing said network as a whole in communication with the agents, wherein the manager includes a timer, the method comprising the steps of:

setting a predetermined period in the timer for timeout of a test for a one of the sub-networks;

autonomously notifying said manager by a one of the agents that manages the one sub-network of a content of the test comprising an identification of preselected test steps to be taken;

executing the test in accordance with said test content;

reporting by the agent of a test result to said manager;

executing autonomously by the agent of a termination process; and

sending a termination report of the test to said manager;

selectively starting and suspending the timer in response to the notifying and sending; and,

instructing the agent by the manager to terminate the test when the timer has timed out to the predetermined period.

5,204,956

METHOD AND APPARATUS FOR MONITORING THE EXECUTION TIME OF A COMPUTER PROGRAM

Andreas Dannser, Gebenstorf, and Lothar Krings, Baden, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Nov. 6, 1989, Ser. No. 431,784

Claims priority, application Switzerland, Nov. 9, 1988, 4161/88

Int. Cl.[5] G06F *11/34*

U.S. Cl. 395—575 **14 Claims**

8. An observation system for determining a time of execution of high level language source program instructions, comprising:

plural, parallel object computers each having:

means for receiving and storing a source program and a modified source program,

means for translating said modified source program into a lower level language object program, and

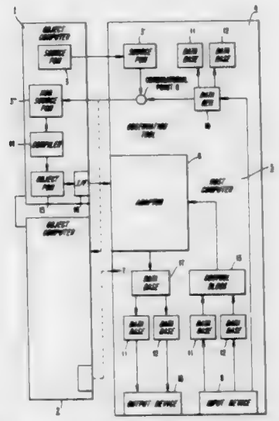
means for executing said lower level language object program and outputting execution information to a host computer; and

said host computer being interfaced with at least one of said object computers and including:

means for receiving a source program from at least one of said object computers;

means for generating said modified source program from said received source program, said generating means further including:

means for selecting instructions whose execution time is to be monitored in said source program,



means for inserting an identification instruction adjacent to at least one of said selected instructions, and

means for transferring said modified source program to said storing means; and

means for monitoring execution of said lower level language object program including:

means for identifying an execution of each identification instruction, and

means for registering a corresponding program execution time along with each identified identification instruction for subsequent evaluation.

5,204,957

INTEGRATED CIRCUIT TIMER WITH MULTIPLE CHANNELS AND DEDICATED SERVICE PROCESSOR

Brian F. Wilkie; Vernon B. Goler, both of Austin; Stanley E. Groves, Round Rock, and John J. Vaglica, Austin, all of Tex., assignors to Motorola, Schaumburg, Ill.

Continuation of Ser. No. 485,204, Feb. 26, 1990, abandoned, which is a continuation of Ser. No. 234,104, Aug. 19, 1988, Pat. No. 4,926,349. This application Sep. 30, 1992, Ser. No. 954,940

Int. Cl.[5] G06F *13/00, 9/22*

U.S. Cl. 395—800 **9 Claims**

1. A microprocessor comprising:

a first memory;

a first bus coupled to the first memory;

a first processing unit coupled to the first bus, the first processing unit is capable of executing instructions stored in the first memory;

a second bus coupled to the first memory; and

a timer unit, the timer unit further comprising:

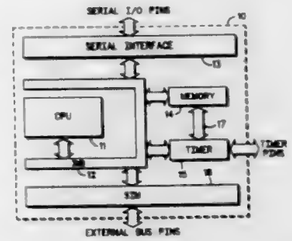
a) a second memory;

b) a third bus coupled to the second memory;

c) a second processing unit coupled to the second bus and to the third bus, the second processing unit is capable of executing instructions stored in the first memory and is also capable of executing instructions stored in the second memory;

d) a third memory coupled to the first bus;

e) a fourth bus coupled to the third memory and to the second processing unit; and



f) timer logic, the timer logic further comprising:

i) pin logic coupled to a pin of the microprocessor;

ii) an event register coupled to the pin logic; and

iii) a fifth bus coupled to the event register and to the second processing unit.

5,204,958

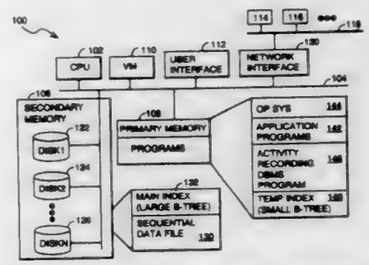
SYSTEM AND METHOD FOR EFFICIENTLY INDEXING AND STORING A LARGE DATABASE WITH HIGH DATA INSERTION FREQUENCY

Edward C. Cheng, South San Francisco; Dieter Gawlick, Palo Alto, both of Calif., and Patrick E. O'Neil, Lexington, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 27, 1991, Ser. No. 722,007

Int. Cl.[5] G06F *15/413*

U.S. Cl. 395—600 **22 Claims**



1. A method of storing and maintaining a database of entries in a computer system having primary random access memory and secondary memory, the steps of the method performed by said computer system comprising:

upon request, storing new records in a database file;

storing indexed pointers to said new records in a first tree data structure which is stored in primary memory;

storing a second tree data structure in secondary memory, said second tree data structure containing indexed pointers to all records in said database file other than records for which indexed pointers are stored in said first tree data structure; wherein said indexed pointers in said second tree data structure are stored in sequential order in said secondary memory;

periodically merging a portion of said first tree data structure into said second tree data structure by (1A) selecting a portion of the indexed pointers in said first tree data structure, (1B) retrieving from said secondary memory a corresponding portion of said indexed pointers in said second tree data structure, (1C) merging said selected portion of the indexed pointers in said first tree data structure into said indexed pointers retrieved from said second

tree data structure to produce sequentially ordered merged indexed pointers, (1D) storing the merged index

size of the image information outputted by the outputting means.

trust realm defining means for storing information denoting which ones of said computers are members of predefined

second operation in response to storage of said data in said holding means,

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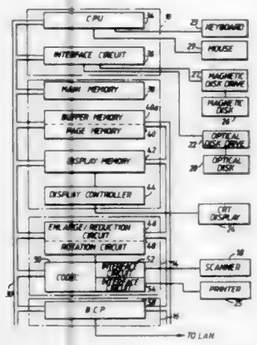
tree data structure to produce sequentially ordered merged indexed pointers, (1D) storing the merged index pointers in said secondary memory so as to maintain the stored index pointers in sequential order, and (1E) removing from said first tree data structure those indexed pointers which were merged with indexed pointers from said second tree data structure.

5,204,959

SYSTEM FOR DETERMINING IMAGE SIZE RATIO OF DATA FOR PRESENTATION OF PROPER SIZE ON DISPLAYS OR PRINTERS FROM OPTICAL STORAGE

Hiroshi Sakuragi, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 22, 1989, Ser. No. 370,002
Claims priority, application Japan, Jun. 30, 1988, 63-163819
Int. Cl.[5] G06F *15/20;* **H04N** *1/04*
U.S. Cl. 395—600 **7 Claims**



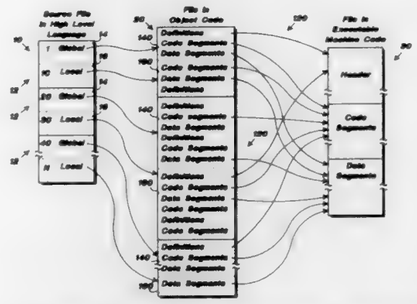
1. An image information processing apparatus, comprising:
first memory means for storing image information;
means for retrieving the image information from the first memory means;
second memory means for storing the image information retrieved by the retrieving means;
means for reducing a size of the image information stored in the second memory means, in accordance with a size converting ratio, a size of the reduced image information being limited to within a predetermined range of the reducing means;
means for outputting the image information reduced by the reducing means;
means for determining a first size converting ratio corresponding to the size of the image information stored in the second memory means and a size of the image information outputted from the outputting means, the determining means including means for ascertaining whether or not the first size converting ratio is within the predetermined range of the reducing means and means for setting a second size converting ratio which is within the predetermined range of the reducing means, when the first size converting ratio is outside the predetermined range; and
means for controlling the converting means, the controlling means including first means for supplying the size reduced image information to the outputting means when the reducing means reduces the size of the image information stored in the second memory means by the first converting ratio and second means for supplying the size reduced image information to the second memory means when the reducing means reduces the size of the image information stored in the second memory means by the second converting ratio, wherein the determining means determines the first converting ratio corresponding to the image information supplied by the second memory means and a size of the image information outputted by the outputting means.

5,204,960

INCREMENTAL COMPILER

Steven P. Smith, Issaquah; Andrew D. Padawer, Redmond; David T. Jones, Preston; Gregory F. Whitten, Bellevue, and Craig H. Wittenberg, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jan. 8, 1990, Ser. No. 462,502
Int. Cl.[5] G06F *9/06*
U.S. Cl. 395—700 **13 Claims**



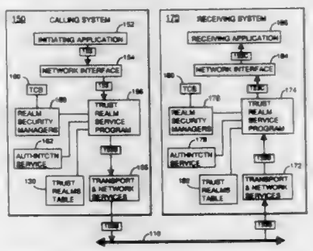
1. The method of incrementally compiling a source file into an object file comprising:
compiling a first version of a source file into a first version of an object file;
storing data corresponding to check points within said source file;
storing data corresponding to check points within said object file;
editing said source file;
recompiling a portion of said source file which includes said edited region of said source file and patching it into said first version of said object file to create a second version of said object file, said portion that is recompiled being selected using said stored check points within said source file and said stored check points within said object file.

5,204,961

COMPUTER NETWORK OPERATING WITH MULTILEVEL HIERARCHICAL SECURITY WITH SELECTABLE COMMON TRUST REALMS AND CORRESPONDING SECURITY PROTOCOLS

Douglas C. Barlow, Redmond, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 25, 1990, Ser. No. 543,164
Int. Cl.[5] H04L *9/00*
U.S. Cl. 395—725 **14 Claims**



1. In a computer network having a multiplicity of computers coupled thereto, message transmission apparatus comprising:

trust realm defining means for storing information denoting which ones of said computers are members of predefined trust realms; wherein for each predefined trust realm there is a corresponding predefined security protocol, enforced by all of each said predefined trust realm's members, for protecting confidentiality of data transmitted between said members of said each predefined trust realm; and
security apparatus in each of a plurality of said computers, comprising:
a trusted computing base which enforces a predefined security policy in said computer and which defines a security level for each set of data stored therein;
authentication means for authenticating and validating messages sent to another computer via said network;
each said message comprising data having an associated label denoting how said trusted computing base is to enforce security policy with respect to said message;
trust realm service means, coupled to said trusted computing base, authentication means and trust realm defining means, for preparing a specified message for transmission to a specified other computer system, including means for
obtaining trust realm information stored by said trust realm defining means, verifying that both said computer system and said specified computer system are members of at least one common trust realm, and selecting a trust realm from among said at least one common trust realm,
authenticating said message and said label associated with said message, and
transmitting to said specified other computer a protocol data unit including said authenticated message and label, and an identifier that identifies said selected trust realm;
said trust realm service means further including:
means for receiving protocol data units transmitted by other ones of said computers via said network,
means for validating the message and label in each protocol data unit received by said computer, and
means for processing said label and said message in said received protocol data unit in accordance with the predefined security protocol corresponding to the selected trust realm identified by said identifier in said received protocol data unit.

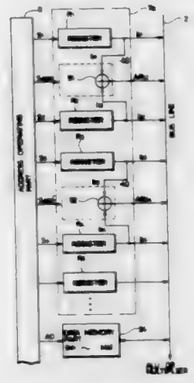
5,204,962

PROCESSOR WITH PRECEDING OPERATION CIRCUIT CONNECTED TO OUTPUT OF DATA REGISTER

Shinichi Uramoto, and Hideyuki Terane, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,285, Nov. 28, 1990, abandoned.
This application May 26, 1992, Ser. No. 888,329
Claims priority, application Japan, Nov. 30, 1989, 1-313864; Dec. 4, 1989, 1-316022; Jul. 16, 1990, 2-188494
Int. Cl.[5] G06F *7/00*
U.S. Cl. 395—725 **29 Claims**

1. A processor comprising:
control signal generation means for generating a control signal,
first operating means responsive to the control signal for carrying out a first operation designated by the control signal,
data bus lines connected to said first operating means for transmitting data used for the first operation by said first operating means,
holding means connected to said data bus lines for holding data used for the first operation by said first operating means and responsive to said control signal to supply said data to said data bus lines, and
second operating means continuously receiving an output of said holding means for carrying out a predetermined second operation in response to storage of said data in said holding means,



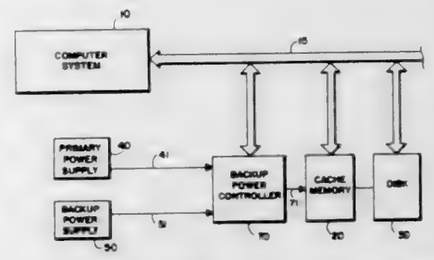
said second operating means being responsive to the control signal to supply data indicative of the result of the second operation to said data bus lines.

5,204,963

METHOD AND APPARATUS FOR A BACKUP POWER CONTROLLER FOR VOLATILE RANDOM ACCESS MEMORY

Eric S. Noya, Groton, and Randy M. Arnott, Clinton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 7, 1990, Ser. No. 626,586
Int. Cl.[5] G06F *12/16*
U.S. Cl. 395—750 **16 Claims**



1. Apparatus for providing power to a volatile random access memory in a computer system comprising:
a circuit board;
volatile random access memory mounted on said circuit board;
a primary power source normally connected to said memory;
a backup power source mounted on said circuit board normally disconnected from said memory;
first means mounted on said circuit board, said first means connected to the computer system, responsive to a command from the computer, for enabling said backup power source in the event that said memory stores data that must be preserved;
second means mounted on said circuit board, said second means connected to said primary power source, for sensing failure in said primary power source; and
coupling means, mounted on said circuit board, said coupling means connected to said first and second means,

responsive to said first means on enablement and to said second means on sensing of a failure in said primary power

means and responsive to the state change signal and to the occurrence of the system reset signal for providing a

(b) determining a second reference value using said geo-

5,204,967

SORTING SYSTEM USING CASCADED MODULES WITH

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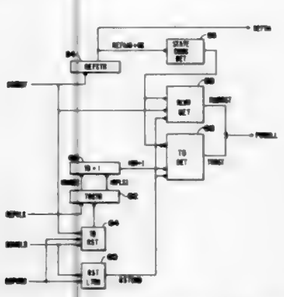
responsive to said first means on enablement and to said second means on sensing of a failure in said primary power source for disabling said primary power source and connecting said backup power source to said memory for enabling preservation of data in said memory on primary power source failure.

5,204,964

METHOD AND APPARATUS FOR RESETTING A MEMORY UPON POWER RECOVERY

Raymond D. Bowden, III, Tewksbury, Mass.; Michelle A. Pence, Nashua, N.H.; George J. Barlow, Tewksbury, Mass.; Marc E. Sanfacon, North Chelmsford, Mass., and Jeffrey S. Somers, Lowell, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Oct. 5, 1990, Ser. No. 593,917
Int. Cl.[5] G06F *12/16*
U.S. Cl. 395—750 4 Claims



1. In a data processing system including a memory for storing data, a power system for providing power to the data processing system, a battery back-up means for providing power to certain of the data processing system circuitry during power system interrupts when the power system is not providing power to the data processing system, and a system manager means for monitoring the power system and asserting a system reset signal when the power system provides power to the data processing system at initial system start-up and upon restoration of power from the power system to the data processing system after a power system interrupt, the memory including memory elements for storing the data and a memory controller including a memory control means for providing memory control signals for controlling operations of the memory and a refresh means including for providing refresh signals to the memory elements, the refresh means including a refresh clock for providing a refresh clock signal indicating refresh clock cycles and a refresh counter connected from the refresh clock and responsive to the refresh clock signal for counting refresh clock cycles and providing refresh signals corresponding to the refresh clock cycles to the memory elements, the memory control means of the memory controller being connected from the power system and the memory elements and the refresh means of the memory controller being connected from the power system and from the battery back-up means, means for resetting the memory controller so that the memory control signals provided by the memory control means of the memory controller are in synchronization with the refresh signals provided by the refresh means when the power system provides power to the data processing system at initial system start-up and upon restoration of power from the power system to the data processing system after a power system interrupt, comprising:

state detection means connected from the refresh counter for detecting a change in count of the refresh counter to a count equivalent to a reset count of the refresh counter and asserting a state change signal, and

memory controller reset means connected from the state detection means and connected from the system manager means and responsive to the state change signal and to the occurrence of the system reset signal for providing a memory controller reset signal to the memory controller, whereby

the memory controller reset signal occurs in synchronization with the change of count of the refresh counter to the count equivalent to the refresh counter reset count, and

the memory controller is responsive to the memory controller reset signal so that the memory control signals provided by the memory control means of the memory controller are in synchronization with the refresh signals provided by the refresh means.

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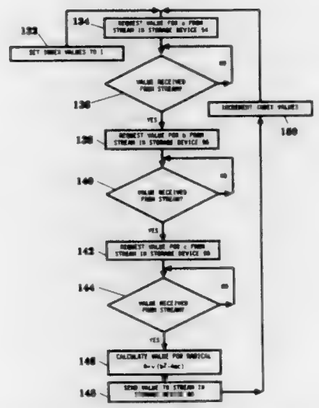
DATA PROCESSING SYSTEM USING STREAM STORES

Scott B. Guthery, Austin, Tex.; Paul S. Barth, Georgetown, and David R. Barstow, Wilton, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 135,546, Dec. 18, 1987, which is a continuation of Ser. No. 767,409, Aug. 20, 1985, abandoned. This application Sep. 19, 1989, Ser. No. 409,969
Int. Cl.[5] G06F *15/82*
U.S. Cl. 395—800 27 Claims



1. A computer method of processing the logging data acquired from a sonde transiting an oil well borehole comprising the steps of:

acquiring data from a transducer in the sonde indicative of a geological property of the formation surrounding the borehole;

writing the geological data to a geological data memory store as a stream of sequential data items, said geological data memory store being operable for receiving and storing only the geological data stream;

performing a first process including the substeps

(a) sequentially reading a geological data item of interest from the geological data store,

(b) determining a first reference value using said geological data item of interest,

(c) writing the first reference value to a first reference value memory store in a stream of sequential data items, said first reference value memory store being operable for receiving and storing only the first reference value stream, and

(d) repeating substeps (a)–(c) with another geological data item read in sequential order;

performing a second process including the substeps

(a) sequentially reading a geological data item of interest from the geological data store,

(b) determining a second reference value using said geological data item of interest,

(c) writing the second reference value to a second reference memory store in a stream of sequential data items, said second reference memory store being operable for receiving and storing only the second reference value stream, and

(d) repeating substeps (a)–(c) with another geological data item read in sequential order;

the first and second processes being concurrent processes with the rate of performing one process not altering the determination of the reference value in the other process.

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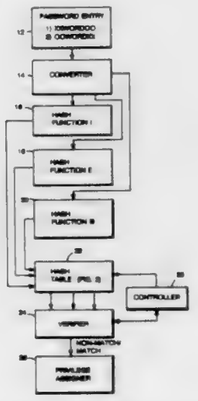
SYSTEM FOR CONTROLLING ACCESS TO A SECURE SYSTEM BY VERIFYING ACCEPTABILITY OF PROPOSED PASSWORD BY USING HASHING AND GROUP OF UNACCEPTABLE PASSWORDS

David K. Wittenberg, Hudson, Mass., and Jerrold S. Leichter, Stamford, Conn., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 9, 1990, Ser. No. 491,431
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—800 37 Claims



2. A method for controlling access to a secure system by verifying acceptability of a proposed password from a user of said secure system, comprising the computer-implemented steps of:

providing a table of indicators,

providing a mapping function that assigns one or more indicators to a password such that one indicator may be assigned to more than one password,

applying said mapping function to one or more unacceptable passwords, and setting all indicators assigned by said mapping function to said unacceptable passwords,

applying said mapping function to said proposed password and checking whether an indicator assigned by said mapping function to said proposed password is not set, whereby, if an indicator assigned by said mapping function to said proposed password is not set, it is determined without error that said proposed password is not one of said unacceptable passwords and therefore is acceptable,

if said proposed password is acceptable, allowing said user to access said secure system, and

if said proposed password is not acceptable, frustrating said user from accessing said secure system.

5,204,967

SORTING SYSTEM USING CASCADED MODULES WITH LEVELS OF MEMORY CELLS AMONG WHICH LEVELS DATA ARE DISPLACED ALONG ORDERED PATH INDICATED BY POINTERS

Philip N. Armstrong, 18 Elk Run, Monterey, Calif. 93940

Continuation-in-part of Ser. No. 816,062, Jan. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 615,102, May 29, 1984, abandoned. This application Mar. 13, 1990, Ser. No. 492,585
Int. Cl.[5] G06F *7/24*
U.S. Cl. 395—800 10 Claims

1. A self-sorting memory system for sorting a plurality of multi-word records into an ordered sequence, the system including: a plurality of modules intercoupled to one another and each module including memory means for storing a different word of each of the records and the memory means collectively forming a composite storage memory means for storing the records; said storage memory means being partitioned into cells, with different numbers of cells in different parts of the partition with the different parts representing different sorting levels; input circuit means for serially introducing each word of the records to be sorted to respective ones of the modules; circuit means included in each of the modules for comparing the respective words of a record feed into the modules with respective words of a record previously entered into the modules and for passing comparison results to the next module to cause the smaller record, with a pointer pointing to the cell at the next higher level to which the larger record is displaced, to be stored in a memory cell representing a first sorting level in the composite storage memory means and to cause the larger records to be displaced to memory cells representing the next higher sorting level, which comparison and displacement is carried out progressively to the highest sorting level, such that each record in any one of said memory cells in the composite storage memory means representing a particular sorting level is smaller than any of the records in the corresponding memory cell representing the next higher sorting level; and control circuitry included in the modules for causing the modules to output records in an ordered sequence by selecting the smallest record in the first sorting level, which record is replaced by the smallest of the records in the cell identified by the pointer of the smallest record at the next lower sorting level and the replacement is carried out progressively to the highest sorting level.

5,204,968

AUTOMATIC DETERMINATION OF OPERATOR TRAINING LEVEL FOR DISPLAYING APPROPRIATE OPERATOR PROMPTS

Aanand Parthasarathi, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1989, Ser. No. 328,975
Int. Cl.[5] G06F *11/28*
U.S. Cl. 395—800 3 Claims

1. In a reproduction machine having a control including a user interface with display for providing a hierarchy of operator prompts for programming the operation of the machine, each level of the hierarchy of prompts providing either a corresponding first sequence of prompts for a first category of prompts or a second sequence of prompts for a second cate-

gory of prompts, the method of automatically altering the

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VEHICLE SOUND SYSTEM

a second local oscillator for generating a second local frequency;

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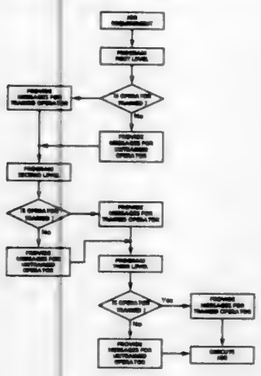
gory of prompts, the method of automatically altering the prompting of the operator comprising the machine implemented steps of:

programming the machine by the operator at a first level,

automatically recognizing the programming of the machine by the control at the first level to be either first category or second category operator programming,

responding to the recognition of either first category or second category operator programming at the first level for providing either first category operator prompt or second category operator prompt,



programming the machine by the operator at a second level after completion of the programming at the first level,

automatically recognizing the programming of the machine by the control at the second level to be either first category or second category operator programming, and

responding to the recognition of either first category or second category operator programming at the second level for providing either a first category operator prompt or a second category operator prompt whereby the relative training of the operator determines the type of prompt provided.

5,204,969

SOUND EDITING SYSTEM USING VISUALLY DISPLAYED CONTROL LINE FOR ALTERING SPECIFIED CHARACTERISTIC OF ADJACENT SEGMENT OF STORED WAVEFORM

Stephen P. Capps, San Carlos; Samuel M. Roberts, Berkeley, both of Calif.; Michael P. Lamoureux, Halifax, Canada, and Josef Sensendorf, Belmont, Calif., assignors to Macromedia, Inc., San Francisco, Calif.

Continuation of Ser. No. 302,510, Jan. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 292,299, Dec. 30, 1988, Pat. No. 5,151,998. This application Mar. 19, 1992, Ser. No. 857,079

The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.

Int. Cl.[5] G06F *3/16*

U.S. Cl. 395—800 **35 Claims**

1. A device for editing sounds comprising:

a memory for storing a sound waveform;

a display for visually displaying the stored waveform;

an editor for editing the appearance of a predetermined portion of the visually displayed waveform by manipulation of said visually displayed waveform; and

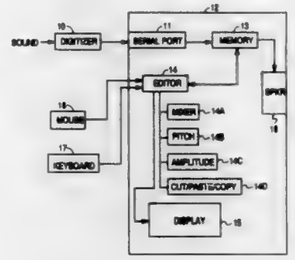
means for changing the sound waveform stored in the means for storing in accordance with changes made in the visually displayed waveform by the editor;

wherein the memory stores a digital representation of the waveform, and the display displays an analog representation of the waveform; and

wherein the display comprises a display displaying the amplitude of the waveform along a first associated axis and time along a second associated axis;

wherein the editor comprises:

means for displaying a sound characteristics control line adjacent to the displayed waveform; and



means for displacing at least one segment of the sound characteristics control line adjacent to the portion of the displayed waveform;

wherein the editor comprises mean for altering a specified characteristic of a portion of the stored waveform corresponding to the portion of the displayed waveform adjacent to the displaced line segment.

5,204,970

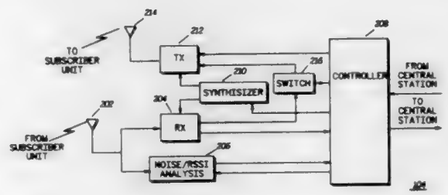
COMMUNICATION SYSTEM CAPABLE OF ADJUSTING TRANSMIT POWER OF A SUBSCRIBER UNIT

Robert E. Stengel, and Roger A. Davenport, both of Fort Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1991, Ser. No. 648,809

Int. Cl.[5] H04B *7/00*

U.S. Cl. 455—69 **3 Claims**



1. A method for adjusting the transmitter power of a subscriber unit, comprising the steps of:

(a) receiving a received signal at a receiver site, said received signal being transmitted by the subscriber unit;

(b) determining noise floor of the receiver site;

(c) determining the strength of the received signal;

(d) determining a power adjust value based on the difference between the noise floor of the receiver site and the strength of the received signal;

(e) transmitting the power adjust value to the subscriber unit; and

(f) adjusting the transmitter power of the subscriber unit according to the power adjust value.

5,204,971

VEHICLE SOUND SYSTEM

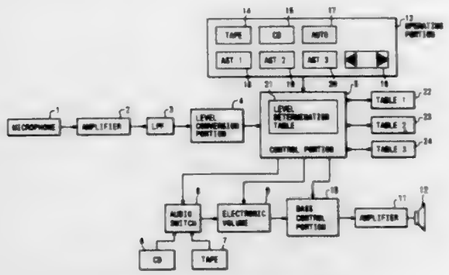
Masahiro Takahashi, and Yoshikatsu Watanabe, both of Iwaki, Japan, assignors to Alpine Electronics, Inc., Tokyo, Japan

Filed Sep. 26, 1991, Ser. No. 766,615

Claims priority, application Japan, Oct. 5, 1990, 2-104940[U]

Int. Cl.[5] H04B *1/18, 1/00*

U.S. Cl. 455—185.1 **5 Claims**



1. A vehicle sound system comprising:

detection means for detecting noise;

level conversion means for converting the noise detected by said detection means into a direct-current level signal;

audio signal reproduction means for reproducing an audio signal;

volume control means for increasing or decreasing the audio signal reproduced by said audio signal reproduction means by a volume change amount according to a volume control signal;

a plurality of tables in each of which a relationship among an output value of the audio signal, the direct-current signal and the volume change amount of the audio signal is stored;

selection means for selecting a desired table from said plurality of tables; and

control means for producing said volume control signal for controlling said volume control means according to said direct-current signal and said output value of the audio signal.

5,204,972

ARRANGEMENT FOR COMPENSATING FOR TEMPERATURE DEPENDENT PERFORMANCE CHARACTERISTICS OF SURFACE ACOUSTIC WAVE FILTER

Kazuya Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 555,077, Jul. 18, 1990, abandoned. This application Jun. 5, 1992, Ser. No. 895,141

Claims priority, application Japan, Jul. 18, 1989, 1-184913; Jul. 26, 1989, 1-193746

Int. Cl.[5] H04B *1/26*

U.S. Cl. 455—207 **8 Claims**

1. A double superheterodyne receiver, comprising:

a first local oscillator for generating a first local frequency;

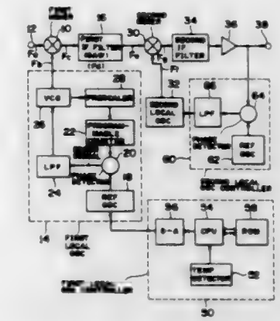
a first mixer which receives an incoming radio frequency signal and said first local frequency, said first mixer generating a first IF signal;

a first IF filter being coupled to receive said first IF signal and having a center frequency which deviates with ambient temperature;

a first controller which detects ambient temperature and generates a control signal as a function of temperature data, said control signal being applied to said first local oscillator for controlling said first local frequency in a manner that the frequency of said first IF signal varies as a function of deviation of said center frequency;

a second local oscillator for generating a second local frequency;

a second mixer which receives an output of said first IF filter and said second local frequency, said second mixer generating a second IF signal having a predetermined frequency value; and



a second controller, coupled to said second local oscillator, and effective for maintaining the frequency of said second IF signal at said predetermined frequency value irrespective of frequency variations associated with said first IF filter.

5,204,973

RECEIVER CAPABLE OF QUICKLY SUPPRESSING DEFECTIVE EFFECT OF MULTIPATH REFLECTION INTERFERENCE

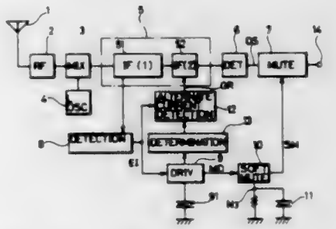
Sakae Sugayama, Ora, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 13, 1990, Ser. No. 612,392

Claims priority, application Japan, Nov. 17, 1989, 1-300246; Nov. 17, 1989, 1-300248

Int. Cl.[5] H04B *1/10*

U.S. Cl. 455—212 **12 Claims**



1. A radio receiver comprising:

means for receiving a modulated radio frequency signal,

means connected to said receiving means for converting the received modulated radio frequency signal into an intermediate frequency signal,

means connected to said frequency converting means for amplifying the intermediate frequency signal,

means connected to said intermediate frequency signal amplifying means for producing a final signal,

means responsive to the intermediate frequency signal for detecting the field strength of the received modulated radio frequency signal,

first means responsive to the level of the detected field strength for reducing at a first rate the level of said final signal,

means for detecting the alternate current signal component of the detected field strength for detecting multipath

reflection interference occurring in the received modu-

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means, responsive to said second control signal, for main-

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DIVERSITY RECEIVING METHOD AND APPARATUS

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reflection interference occurring in the received modulated radio frequency signal, and

second means responsive to the output of said interference detecting means for rapidly reducing the level of said final signal at a second rate faster than said first rate.

5,204,974

Patent Not Issued For This Number

5,204,975

DIGITALLY-CORRECTED TEMPERATURE-COMPENSATED CRYSTAL OSCILLATOR HAVING A CORRECTION-SUSPEND CONTROL FOR COMMUNICATIONS SERVICE

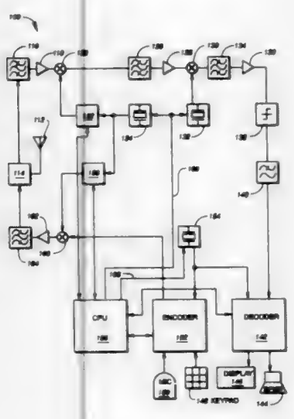
Mikio Shigemori, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 596,172

Claims priority, application Japan, Oct. 12, 1989, 1-265682; Jan. 24, 1990, 2-14116

Int. Cl.[5] H04B *1/10*

U.S. Cl. 455—231 **14 Claims**



1. A temperature-compensated oscillator, comprising:

means to generate a frequency having an output;

means to adjust said frequency coupled to said frequency generator means;

temperature measurement means, coupled to said frequency adjustment means, in thermal proximity to the frequency generator means;

means to periodically update the frequency adjustment means, coupled to said frequency adjustment means, in response to the temperature measurement means;

means to suspend the periodic update of the frequency adjustment, coupled to said update means, in response to an external control signal; and

means to limit to a predetermined timeout the duration in time the suspension means can suspend said periodic update coupled to said means to suspend.

5,204,976

RECEIVERS FOR MOBILE TELEPHONE SYSTEMS

Andrew W. Baldwin, Woodley, and Robert N. Carter, Reading, both of United Kingdom, assignors to Orbitel Mobile Communications Limited, Bracknell, United Kingdom

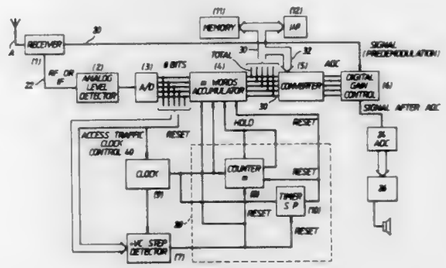
Filed Apr. 15, 1991, Ser. No. 685,816

Claims priority, application United Kingdom, May 1, 1990, 9009814

Int. Cl.[5] H04B *1/06*

U.S. Cl. 455—234.2 **15 Claims**

1. A receiver for a mobile telephone system, the receiver having a gain control means having a plurality of predetermined gain values, the gain control means being coupled to receive an input burst signal and being switchable in response to the value of a gain control signal between a plurality of gain values, detector means for detecting the amplitude of said input burst signal, averaging means responsive to said detector means for storing the value of the detected amplitude, and



timing means responsive to said detector means and operative in response to the detection of said input burst signal by said detector means for timing a sequence of measurements of the amplitude of the input burst signal, said averaging means being operative to compute an average value of the amplitude and to provide a corresponding updated gain control signal for a subsequent time period.

5,204,977

APPARATUS AND METHOD OF AUTOMATIC GAIN CONTROL IN A RECEIVER

Daniel C. Feldt, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1991, Ser. No. 678,920

Int. Cl.[5] H04B *1/06*

U.S. Cl. 455—234.2 **11 Claims**

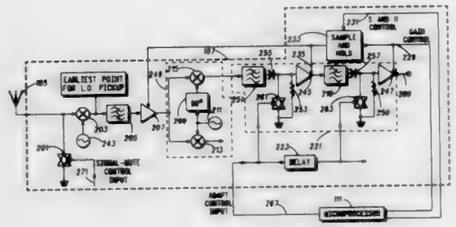
1. A radio receiver capable of receiving an input signal and including at least two amplifier stages each having adjustable gain, the radio receiver comprising:

means for generating a first and a second control signal;

means for adjusting the gain of a first of the at least two amplifier stages in accordance with said first control signal in absence of an input signal;

means, responsive to said second control signal, for maintaining the gain of said first of the at least two amplifiers stages at a constant level;

means for adjusting the gain of a second of the at least two



amplifier stages in accordance with said first control signal to produce an output signal; and

means for maintaining a predetermined amplitude of said output signal while receiving an input signal.

5,204,978

FREQUENCY SETTING METHOD FOR RADIO TRANSMISSION APPARATUS

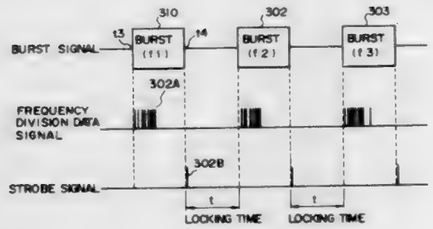
Hiroyuki Shimizu, Tokyo, Japan, assignor to Nec Corporation, Japan

Filed Jun. 25, 1990, Ser. No. 543,216

Claims priority, application Japan, Jun. 23, 1989, 1-159617

Int. Cl.[5] H04B *1/40*

U.S. Cl. 455—76 **7 Claims**



1. An apparatus comprising:

a transmitter means for successively transmitting bursts at predetermined intervals and changing the frequencies of said bursts in response to locally generated frequencies;

a frequency synthesizer for generating said locally generated frequencies in response to control data; and

a means for applying a first control datum of said control data to said frequency synthesizer means immediately after a first one of said bursts had begun, said first control datum being used for setting the frequency of a second one of said bursts which follows said first burst.

5,204,979

DIVERSITY RECEIVING METHOD AND APPARATUS FOR COMBINING A PLURALITY OF RAPIDLY CHANGING SIGNALS

Dieter Schenkyr, Kirchheim, and Walter Buck, Stuttgart, both of Fed. Rep. of Germany, assignors to Richard Hirschmann GmbH & Co., Esslingen, Fed. Rep. of Germany

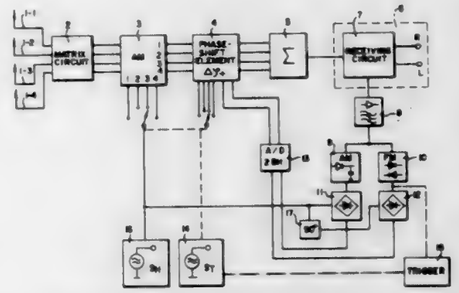
PCT No. PCT/EP88/00981, § 371 Date Jun. 28, 1990, § 102(e) Date Jun. 28, 1990, PCT Pub. No. WO89/04092, PCT Pub. Date May 5, 1989

PCT Filed Oct. 28, 1988, Ser. No. 499,534

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3737011; Oct. 22, 1988, 3836046

Int. Cl.[5] H04B *7/08*

U.S. Cl. 455—276.1 **34 Claims**



1. A method for diversity reception of radio signals using at least two receiving antennas where the output signal of each receiving antenna is modulated by an auxiliary modulation signal, phase shifted, combined in a summation circuit, amplified and selected in a radio receiver, coherently demodulated, then used to control the amount of phase shift made to each antenna output signal such that the resultant signal summation is maximized for best reception, comprising the steps of:

modulating each of a plurality of antenna output signals with an auxiliary modulation signal;

phase-shifting each of said modulated antenna output signals so that the phase of each of said output signals are approximately the same;

summing each of said modulated and phase-shifted antenna output signals together, wherein a summation signal is thereby generated;

receiving said summation signal by amplifying and selecting said summation signal in a receiver circuit;

filtering said received summation signal;

demodulating said filtered received summation signal in amplitude and frequency demodulators;

coherently detecting the demodulated signals from said amplitude and frequency demodulators in synchronous demodulators, wherein the output of said amplitude demodulator is coherently detected with said auxiliary modulation signal and the output of said frequency demodulator is coherently detected with said auxiliary modulation signal phase shifted by ninety degrees, whereby the amplitude and phase relationship of each of said antenna output signals is determined and therefrom the phase position and amplitude contribution of each of said antenna output signals in relation to said summation signal is derived; and

adjusting the phase-shift of each of said antenna output signals by means of the information derived from said synchronous demodulators so that said summation signal is optimized for maximum resulting amplitude and best reception.

5,204,980

RADIO RECEIVER SYSTEMS

from a scrambled data sequence made by an interleaver in

and supplying them to the first and second outputs respec-

receive and mechanically couple with the power source;

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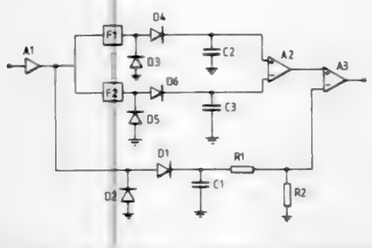
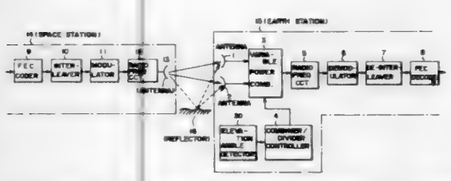
5,204,980
RADIO RECEIVER SYSTEMS
Paul R. Sharples, Lancashire, England, assignor to The General Electric Company, p.l.c., England
Filed Apr. 9, 1992, Ser. No. 865,217
Claims priority, application United Kingdom, Apr. 15, 1991, 9107919
Int. Cl.[5] H04B 7/08
U.S. Cl. 455—277.1 5 Claims



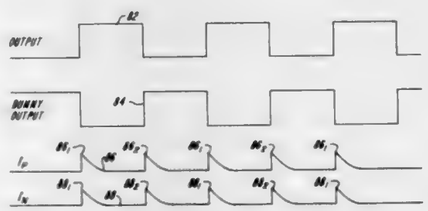
1. A radio receiver system comprising: a radio receiver for receiving double sideband signals applied to an antenna terminal of the receiver; at least two attennas having different reception characteristics; a switching arrangement arranged to connect the antenna terminal of the receiver to a selected one of the antennas; and control means for controlling the operation of the switching arrangement in dependence on the difference in power in the two sidebands of a signal at said antenna terminal.

5,204,981
INTERFERENCE ELIMINATION SYSTEM
Yoshio Karasawa, Hatoyama; Masayuki Yasunaga, Tokyo, and Hisato Iwai, Ohmiya, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 1, 1991, Ser. No. 663,404
Claims priority, application Japan, Jul. 19, 1990, 2-189412
Int. Cl.[5] H04B 1/06
U.S. Cl. 455—277.1 2 Claims



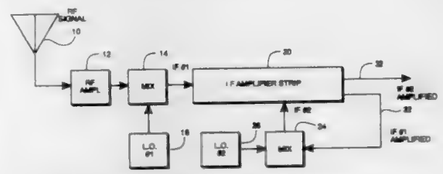
1. A fading or interference elimination system for a digital radio communication system including in combination, a forward error correction (FEC) function or like error correction function and a data scrambling function by an interleaver comprising:
in one radio station of the radio communication system which is physically closer to the source causing fading or interference such as a sea or ground reflected wave;
at least two antennas disposed so as to be negatively correlated or uncorrelated in terms of fading of a received radio wave;
a variable power combiner for alternative switching of received signals from said antennas;
a combiner controller for generating an alternative switching signal for the variable power combiner with a switching period shorter than a fluctuation period of said fading;
a demodulator for demodulating received signals and detecting transmitting data sequences;
a de-interleaver for recovering an original data sequence from a scrambled data sequence made by an interleaver in a transmitting system related to the receiving system; and
a forward error correction (FEC) decoder for making an error correction in the recovered original data;
in which long-lasting burst errors due to long-lasting fading are converted into short-lasting burst errors through the alternative antenna switching in the receiving system, and the short-lasting burst errors are converted into random errors by a function of said de-interleaver, and said random errors are corrected by said forward error correction (FEC) decoder.

5,204,982
METHOD AND APPARATUS FOR DIGITAL SWITCHING OF FM SIGNALS WITH REDUCED CROSSTALK
Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Nov. 14, 1990, Ser. No. 613,177
Int. Cl.[5] H04B 1/10; H03K 17/687
U.S. Cl. 455—295 14 Claims



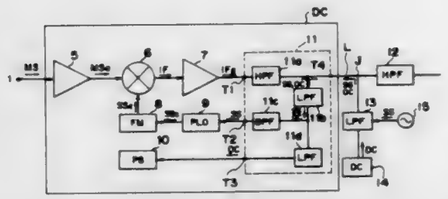
11. A method for reducing crosstalk in apparatus for digital switching of FM signals, said apparatus comprising a plurality of digital switching circuits, each having an input for receiving an FM signal at a first frequency and each generating first switching transients in response to said FM signal, said method comprising the steps of:
generating second switching transients that are shifted in phase relative to said first switching transients such that a crosstalk signal resulting from first and second switching transients has a frequency of twice the first frequency; and
attenuating the crosstalk signal from the outputs of the functional switching circuits.

5,204,983
DUAL CONVERSION REFLEX RECEIVER
Thomas J. Jones, 2274 Apricot Dr., Beavercreek, Ohio 45431
Filed Sep. 17, 1990, Ser. No. 583,611
Int. Cl.[5] H04B 15/00
U.S. Cl. 455—315 1 Claim



1. A dual conversion reflex receiver including:
an intermediate frequency amplifier strip having first and second inputs and first and second outputs, means for combining signals at first and second frequencies from the first and second inputs, a plurality of stages for amplifying the signals at the first and second frequencies simultaneously by the same amplifier circuits, and means for separating the signals at the first and second frequencies and supplying them to the first and second outputs respectively;
first converter means for mixing an RF signal with a first local oscillator signal to produce a signal at a first intermediate frequency which is supplied to said first input, so that the signal at said first output is at said first intermediate frequency; and
second converter means coupled between said first output and said second input for mixing the signal from the first output with a second local oscillator signal to produce a second intermediate frequency signal which is supplied to said second input, so that the signal at said second output is at said second intermediate frequency, said first output being coupled only to the second converter means.

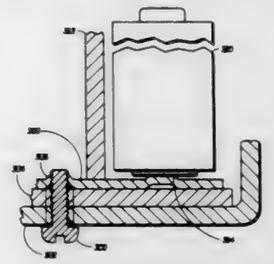
5,204,984
DOWN CONVERTER FOR SATELLITE COMMUNICATION SYSTEM
Hirotaka Fujisaki, Neyagawa; Yukiro Kashima, Takatsuki, and Akihito Deki, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan
Filed Nov. 5, 1991, Ser. No. 788,101
Claims priority, application Japan, May 11, 1990, 2-300798
Int. Cl.[5] H04B 1/26
U.S. Cl. 455—319 6 Claims



1. A down converter for converting a microwave signal to an intermediate frequency signal by the use of a standard signal having a frequency range of several to several tens of MHz, and for applying said intermediate frequency signal to a next stage component, said down converter comprising:
a mixing means for producing said intermediate frequency signal indicative of a frequency difference between said standard signal and said microwave signal; and
a separator means comprising:
a first terminal for receiving said intermediate frequency signal;
a second terminal for producing and supplying said intermediate frequency signal to said next stage component and for receiving said standard signal from said next stage component;
a first filter means for separating said standard signal from said intermediate frequency signal; and
a third terminal for producing said standard signal to said mixing means.

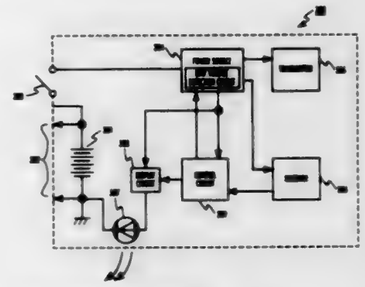
5,204,985
HOUSING FASTENER AND POWER SOURCE CONTACT
Jeffrey S. King, Boynton Beach, Fla., assignor to Motorola, Inc., Schaumberg, Ill.
Filed Jun. 4, 1990, Ser. No. 532,775
Int. Cl.[5] H04B 1/16, 1/08
U.S. Cl. 455—343 6 Claims

1. An electronic device, comprising:
electrical circuits;
a power source having at least one terminal for providing power to the electrical circuits;
a housing having first and second members constructed to cooperative inter-connect to substantially enclose the electrical circuits, the housing further being adapted to receive and mechanically couple with the power source; and
an electrical contact strip for electrically coupling the electrical circuits and the power source, and for fastening the first and second members of the housing together, the electrical contact strip including a spring indentation mechanically coupled to the at least one terminal of the



power source to provide mechanical securing force between the power source and the housing, and the electrical contact strip including a first opening, and the first and second members of the housing including second and third openings, the first, second and third openings being arranged to cooperatively receive a fastener for fastening the first and second members of the housing together.

5,204,986
BATTERY POWERED RADIO DEVICES HAVING A BATTERY SAVING FUNCTION
Koichi Ito, and Yasuo Oonishi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Continuation of Ser. No. 626,329, Dec. 13, 1990, which is a continuation of Ser. No. 314,122, Feb. 23, 1989. This application Jan. 27, 1992, Ser. No. 825,283
Claims priority, application Japan, Feb. 25, 1988, 63-43189
Int. Cl.[5] H04B 1/16
U.S. Cl. 455—343 16 Claims



1. A radio device comprising:
radio receiving means for receiving radio signals broadcast over one or more radio channels, said radio signals including at least one synchronizing signal;
power supply means for supplying said radio receiving means with electrical power;
indicator means coupled to said power supply means for indicating an operating state of the device;
low voltage detecting means for detecting a drop of voltage supplied from the power supply means, the operation of the power supply means being suspended when the low voltage detecting means detects the drop of voltage; and
power supply control means, coupled to said power supply means, said radio receiver means, said low voltage detecting means and said indicator means, said power supply

means responsive to said radio receiving means for detecting said at least one synchronization signal, and generating

said electrodes contacting said major surface of the substrate; and

5,204,990
MEMORY CELL WITH CAPACITANCE FOR SINGLE

trically connected within the on/off circuit so as to receive input from said rectifier;
first transistor means for activating a power supply circuit in

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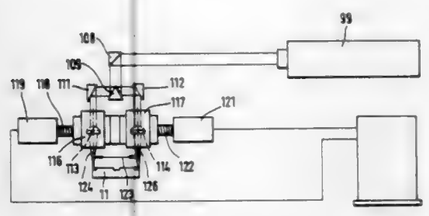
means responsive to said radio receiving means for detecting said at least one synchronization signal, and generating power supply signals in synchronization with said at least one synchronization signal and for controlling said power supply means so that said radio receiving means is intermittently powered by said power supply signals and said power supply control means terminates power to said indicator means when said low voltage detecting means detects a drop of voltage.

5,204,987

APPARATUS FOR TREATING STEEL EDGES OF SKIS AND OTHER RUNNER DEVICES

Hans Klingel, Teckstr. 9, D-7141 Möglingen, Fed. Rep. of Germany

Division of Ser. No. 479,062, Feb. 12, 1990. This application Sep. 30, 1991, Ser. No. 767,412
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.6 **33 Claims**



1. Apparatus for treating the steel edges of skis and other runner devices that have a runner base top layer with a first outer surface, two steel edge profiles mounted on two longitudinal edges of the runner base top layer, each with a second outer surface facing downwards when in use and a third outer surface facing laterally and forming a corner edge area with said second outer surface, comprising:

a) leveling means for leveling the heights of the first and second outer surfaces if they are not level relative to each other,

b) laser beam means having a point of incidence for bringing at least the corner edge area to the hardening temperature of the steel edge profile,

c) means for moving the laser beam and runner device relative to each other in the longitudinal direction of the steel edge profile, and

d) means for drawing off heat to prevent detrimental heating up of the volume of the runner device around the steel edge profile in the area of the point of incidence of the laser beam.

5,204,988

MOS SEMICONDUCTOR DEVICE HAVING A SURGE PROTECTING ELEMENT

Kenya Sakurai, Kanagawa, Japan, assignor to Fuji Electic Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1991, Ser. No. 729,390
Claims priority, application Japan, Jul. 16, 1990, 2-187453
Int. Cl.[5] H01L *29/78, 29/04, 29/90*
U.S. Cl. 257—356 **35 Claims**

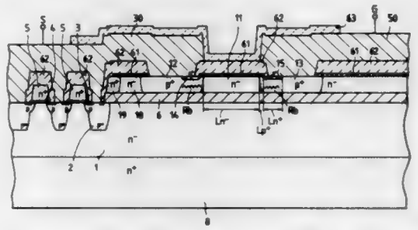
1. A MOS semiconductor device having a surge protecting circuit, comprising:

a semiconductor substrate having a major surface;

a plurality of electrodes overlying said major surface;

a MOS circuit in said major surface;

a bidirectional semiconductor surge absorber, coupled between the gate of said MOS circuit and a reference one of said electrodes contacting said major surface of the substrate; and



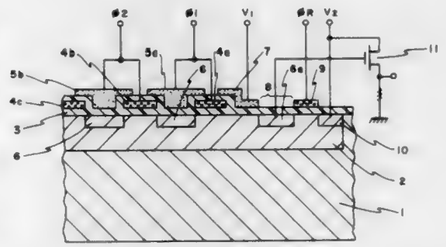
a bidirectional Zener diode connected in series with said bidirectional semiconductor surge absorber.

5,204,989

CHARGE SENSING DEVICE

Junichi Yamamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 10, 1991, Ser. No. 698,555
Claims priority, application Japan, May 14, 1990, 2-123693
Int. Cl.[5] H01L *29/78, 27/02*
U.S. Cl. 257—221 **2 Claims**



1. A charge transfer device comprising:

(a) a semiconductor material region of one conductivity type forming a channel of said charge transfer device

(b) a plurality of charge transfer electrodes formed on the semiconductor material region with an interposed insulating film,

(c) an output gate formed on the semiconductor material region with an interposed insulating film, adjacent to a terminal one of the charge transfer electrodes,

(d) a reset gate formed on the semiconductor material region with an interposed insulating film, said reset gate being formed at a predetermined distance apart from the output gate,

(e) a low impurity density region of one conductivity type formed in the semiconductor material region between the output gate and the reset gate, and

(f) a high impurity density region of one conductivity type formed in the semiconductor material region at a side opposite to the low impurity density region relative to the reset gate,

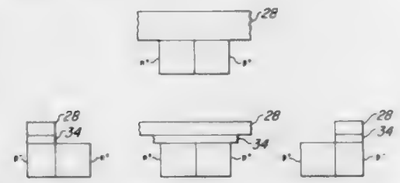
said low impurity density region having an impurity density which is lower than the impurity density of said semiconductor material region and said high impurity density region having an impurity density which is higher than the impurity density of said semiconductor material region.

5,204,990

MEMORY CELL WITH CAPACITANCE FOR SINGLE EVENT UPSET PROTECTION

Terence G. W. Blake, Dallas, and Theodore W. Houston, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 7, 1988, Ser. No. 241,516
Int. Cl.[5] H01K *27/02*
U.S. Cl. 257—904 **12 Claims**



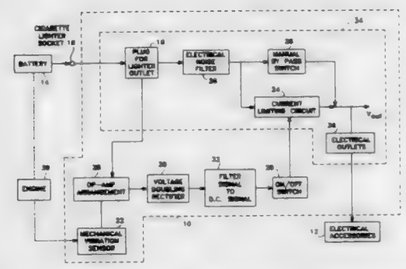
1. A memory cell including a pair of cross-coupled inverters and further including a MOS capacitor connected across the cross-couplings of said pair of inverters, said MOS capacitor including a gate region, a channel region and a source region comprising both heavily doped n-type semiconductor material and heavily doped p-type semiconductor material connected to said channel region.

5,204,991

AUTOMOTIVE ON/OFF CIRCUIT FOR AUTOMATIC CONTROL OF THE POWER SUPPLY TO ELECTRIC AUTOMOTIVE ACCESSORIES

Ignace K. Law, P.O. Box 6803, Alhambra, Calif. 91802

Filed Jul. 22, 1991, Ser. No. 734,238
Int. Cl.[5] B60L *1/00;* **H02H** *7/18*
U.S. Cl. 307—10.7 **2 Claims**



1. In combination with a motor vehicle having an electric system including a battery, an on/off circuit for automatic control of the power supply provided to electrical accessories from the battery of the vehicle, said circuit comprising:

sensor means for detecting mechanical vibrations present during operation of the motor of said vehicle, said sensor means including means for outputting an alternating current electrical signal upon detection of said vibrations;

operational amplifier (op-amp) means, said op-amp means being electrically interconnected with said sensor means for receiving input therefrom, wherein said op-amp means amplifies the electrical signal outputted by the sensor means whenever mechanical vibrations are detected by said sensor means;

means for protecting the op-amp means by preventing voltage at an input pin of the op-amp means from falling below a predetermined minimum voltage level;

a voltage doubling rectifier to rectify an amplified alternating current electrical signal outputted by said op-amp means, said rectifier being electrically connected within said on/off circuit so as to receive input from said op-amp means;

first filter means for filtering the AC component of the rectified current signal outputted by said rectifier into a direct current signal, said first filtering means being electrically connected within the on/off circuit so as to receive input from said rectifier;

first transistor means for activating a power supply circuit in response to a direct current signal from said first filtering means, said first transistor means being electrically connected with, and responsive to, said sensor means via an electrical pathway that includes said op-amp means, said rectifier and said first filtering means; and

a power supply circuit including:

means for electrically connecting the power supply circuit to the battery of the vehicle;

at least one electrical outlet adapted to place an electrical accessory operatively associated therewith in electrical connection with the battery via said power supply circuit;

a current limiting circuit that limits current flow to said electrical outlet to a preselected maximum, said current limiting circuit including:

second transistor means for activating said electrical outlet in response to reception of a current flow from said first transistor means, said second transistor means being electrically interconnected with said first transistor means; and

third transistor means that is in electrical communication with means for grounding the current limiting circuit, said third transistor means being electrically connected between said battery and said second transistor means such that a current flow approaching said preselected maximum will activate said third transistor means, thereby creating a current flow path through said third transistor means to the grounding means in a manner that reduces the current flow to said second transistor means and said electrical outlet;

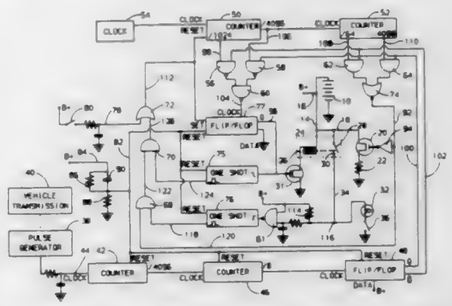
wherein said on/off circuit functions to supply power to the at least one electrical outlet whenever the sensor means is detecting mechanical vibrations emanating from a running motor and functions to automatically discontinue the supply of power to the at least one outlet whenever mechanical vibrations are no longer detected by the sensor means.

5,204,992

MOTOR VEHICLE BATTERY DISCHARGE LOAD CURRENT CONTROL

James A. Carpenter, Durand, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1990, Ser. No. 620,467
Int. Cl.[5] H02H *7/18*
U.S. Cl. 307—10.7 **5 Claims**



4. A battery discharge load current control system for a motor vehicle electrical system comprising, a battery, an electrical load connected to said battery through a switching means, timer means, means connecting said timer means to said switching means including means for causing said switching means to be activated to an open condition to disconnect said electrical load from the battery after the elapse of a time period, means for determining the number of miles travelled by the motor vehicle, and means operative when said vehicle has travelled a predetermined number of miles for increasing said timer period.

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DESIGN PATENTS

GRANTED Apr. 20, 1993

ERRATA

For CLASS	See PATENT NO.
D08-343	D,334,841
D24-133	D,334,969
D24-227	D,334,973
D24-183	D,335,001

VOL

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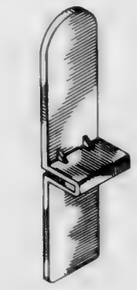
DESIGNS

APRIL 20, 1993

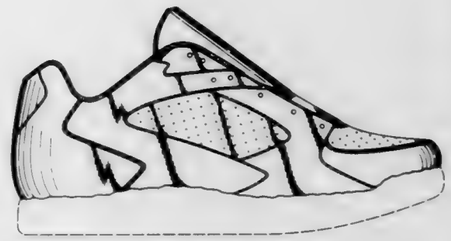
334,828
HANDLE FOR A FROZEN CONFECTION
Jerrilyn C. Kiyokane, Torrance, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Jan. 2, 1991, Ser. No. 636,956
Term of patent 14 years
U.S. Cl. D1—105



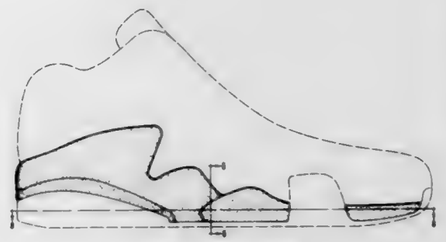
334,829
EDIBLE ICE CREAM CONE SKIRT
Steven M. Sygman, R.D. #2, Box 202-D, Montauk, N.Y. 11954
Continuation-in-part of Ser. No. 153,803, Feb. 8, 1988, abandoned. This application Nov. 4, 1991, Ser. No. 786,989
Term of patent 14 years
U.S. Cl. D1—199

334,830
FABRIC HEADCOVERING
Merrill D. Siegel, 8222 Douglas St., Suite 707, Dallas, Tex. 75225
Filed Nov. 20, 1989, Ser. No. 439,921
Term of patent 14 years
U.S. Cl. D2—245

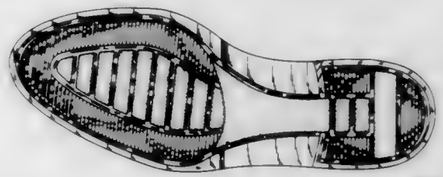
334,831
SHOE UPPER
William J. Worthington, Portland, Oreg., assignor to Nike, Inc., Beaverton, Ohio
Filed May 1, 1992, Ser. No. 877,067
Term of patent 14 years
U.S. Cl. D2—314



334,832
SHOE MIDSOLE PERIPHERY
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed Apr. 10, 1992, Ser. No. 866,546
Term of patent 14 years
U.S. Cl. D2—314



334,833
SHOE SOLE
Malcolm G. Blissett, Grand Rapids, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.
Continuation-in-part of Ser. No. 549,718, Jul. 9, 1990, Pat. No. Des. 322,158. This application Oct. 31, 1991, Ser. No. 785,695
Term of patent 14 years
U.S. Cl. D2—320



334,834
SHOE OUTSOLE

334,837
BICYCLE STORAGE CONTAINER

334,840
PICNIC CASE

334,842
TRIPLE HEAD TOOTHBRUSH

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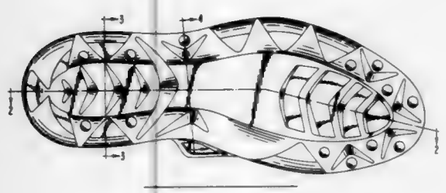
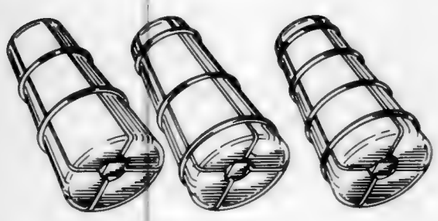
334,834
SHOE OUTSOLE
Steve C. McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,443
The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320



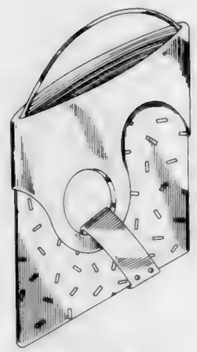
334,835
CORE HOLDER FOR YARN
Glenn E. Randolph, 2300 Dunavant St., Charlotte, N.C. 28203
Filed Oct. 17, 1990, Ser. No. 600,349
Term of patent 14 years
U.S. Cl. D3—23



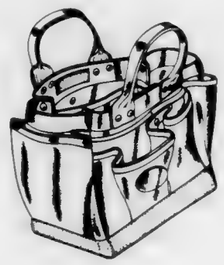
334,836
PORTABLE YARN FRAME
Elizabeth N. Litwin, and Joseph J. Litwin, both of 37 MacKenzie Rd., Waterford, Conn. 06385
Filed Nov. 22, 1991, Ser. No. 796,227
Term of patent 14 years
U.S. Cl. D3—23

334,837
BICYCLE STORAGE CONTAINER
James Bradley, 21486 - 8th Avenue, Langley, British Columbia, V3A 7R2, Canada
Filed Jan. 31, 1991, Ser. No. 648,450
Term of patent 14 years
U.S. Cl. D3—36

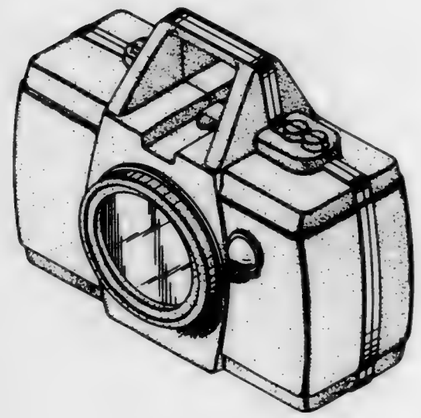
334,838
PURSE
Reginald C. Muse, 5307 S. Hyde Park Ave. #302, Chicago, Ill. 60615
Filed Feb. 22, 1991, Ser. No. 659,069
Term of patent 14 years
U.S. Cl. D3—44



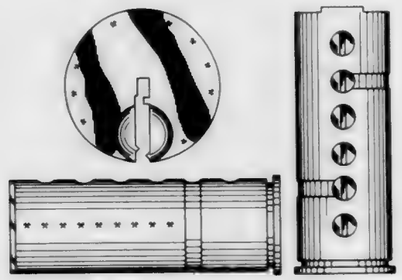
334,839
GARDEN TOOL HOLDER
Michael Dancyger, 811 W. 58th St., Los Angeles, Calif. 90037
Filed Mar. 27, 1991, Ser. No. 676,723
Term of patent 14 years
U.S. Cl. D3—48



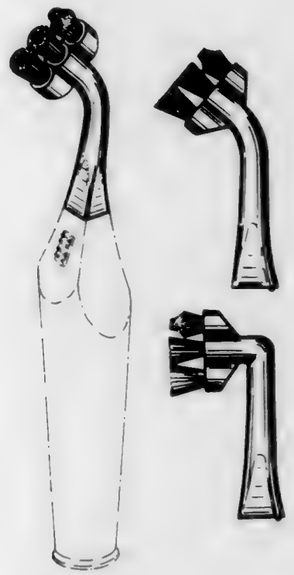
334,840
PICNIC CASE
Stony Lin, No. 11, Shing-Gong Rd., Yeong-Kang Industrial Dist., Tainan Hsien, Taiwan
Filed Jun. 5, 1991, Ser. No. 710,909
Term of patent 14 years
U.S. Cl. D3—73



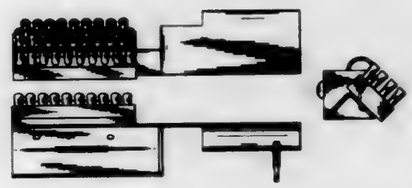
334,841
LOCK CYLINDER
Lewis F. Schmitt, Sr., 213 McClelland Ave., Cinti, Ohio 45217
Filed Jun. 15, 1990, Ser. No. 538,473
Term of patent 14 years
U.S. Cl. D8—343



334,842
TRIPLE HEAD TOOTHBRUSH
J. Robert Lemon, Charlotte; William T. Evans, and Robert E. Christian, both of Batesville, all of Ark., assignors to Professional Dental Technologies, Inc., Batesville, Ark.
Filed Jun. 12, 1991, Ser. No. 714,157
Term of patent 14 years
U.S. Cl. D4—101



334,843
GOLF CLEAT CLEANING DEVICE
Edith L. Curtis, 4005 Brookhaven Club Dr., No. 186, Dallas, Tex. 75244, and Cecil G. Coker, Dallas, Tex., assignors to Edith L. Curtis, Lewisville, Tex.
Filed Jun. 25, 1991, Ser. No. 721,229
Term of patent 14 years
U.S. Cl. D4—121



334,844
HAIRBRUSH HANDLE

334,846
GARMENT HANGER

334,849
CHILD'S SWING

334,851
DESK

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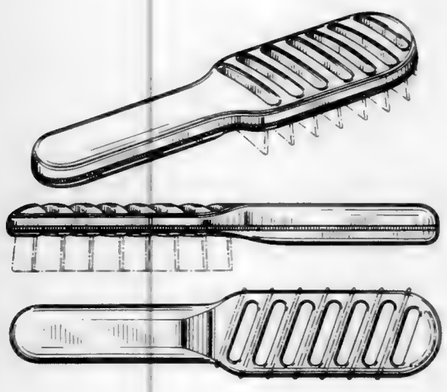
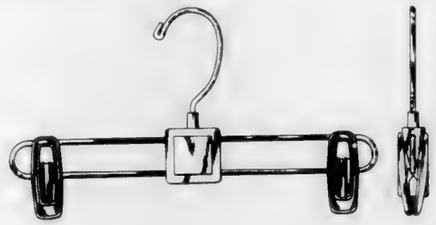
334,844
HAIRBRUSH HANDLE
William H. Lunderman, New York, N.Y., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Jun. 24, 1991, Ser. No. 721,376
Term of patent 14 years
U.S. Cl. D4—138



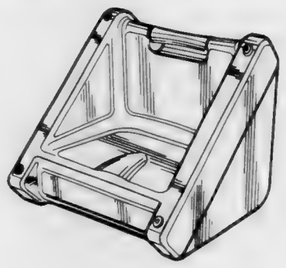
334,845
BRUSH HANDLE
Paul A. Ricciareli, Ayden, N.C., and Sean Simmons, Seacliff, N.Y., assignors to Empire Brushes, Inc., Greenville, N.C.
Filed Jan. 4, 1991, Ser. No. 638,407
Term of patent 14 years
U.S. Cl. D4—138

334,846
GARMENT HANGER
Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.
Filed Oct. 9, 1990, Ser. No. 615,825
Term of patent 14 years
U.S. Cl. D6—317

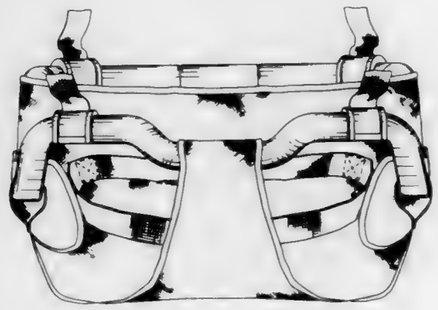


334,847
CHILD'S CAR SEAT
Takehiko Takahashi, and Tomihiro Kaneko, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Mar. 16, 1990, Ser. No. 494,695
Claims priority, application Japan, Dec. 1, 1989, 1-43538
The portion of the term of this patent subsequent to Sep. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—333

334,848
ARTICLE USEFUL AS BOOSTER CHAIR AND AS STEP STOOL
John V. Mariol, 7163 Honeywood Ct., Cincinnati, Ohio 45230
Filed Feb. 11, 1991, Ser. No. 653,810
Term of patent 14 years
U.S. Cl. D6—333

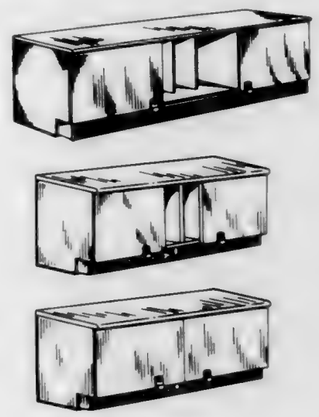


334,849
CHILD'S SWING
Elaine G. Swanger, St. Joseph, Mich., and Tony R. Maness, Booneville, Ark., assignors to Today's Kids, Inc., Booneville, Ark.
Filed Feb. 6, 1991, Ser. No. 651,176
Term of patent 14 years
U.S. Cl. D6—347



334,851
DESK
Paul M. Lacour, Ridgewood, N.J., assignor to Lacour Incorporated, Harrington Park, N.J.
Division of Ser. No. 308,104, Feb. 8, 1989, Pat. No. Des. 324,963. This application Feb. 26, 1992, Ser. No. 841,460
Term of patent 14 years
U.S. Cl. D6—428

334,852
STORAGE CABINET
Jean Beirise, Cincinnati, Ohio, assignor to Herman Miller, Inc., Zeeland, Mich.
Filed May 15, 1990, Ser. No. 524,364
Term of patent 14 years
U.S. Cl. D6—436



334,850
UMBRELLA STAND
Elio Vigna, Genoa, Italy, assignor to Fiam Italia S.p.A., Pesaro, Italy
Filed Jul. 18, 1991, Ser. No. 731,922
Term of patent 14 years
U.S. Cl. D6—416

334,853

334,855

334,857

334,859

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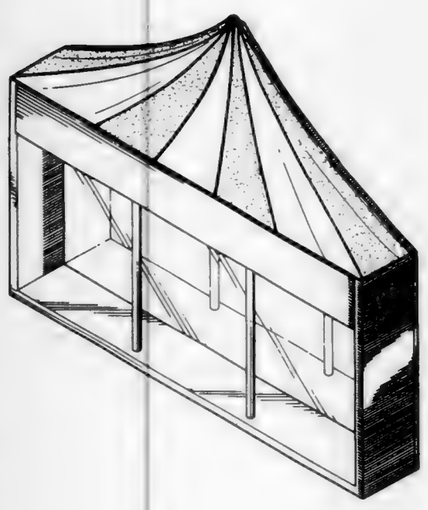
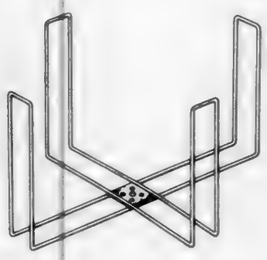
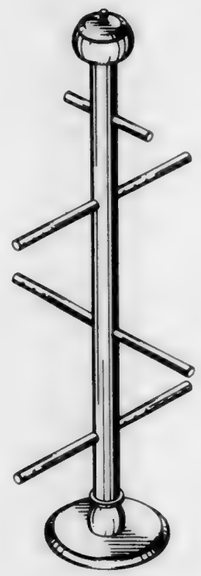
334,853
DISPLAY CASE
Jack Hou, P.O. Box 78-5, Taipei, Taiwan, R.O.C., Taiwan
Filed Feb. 2, 1990, Ser. No. 479,575
Term of patent 14 years
U.S. Cl. D6—449



334,854
NEWSPAPER RACK
William J. Pestone, Cohasset, Mass., assignor to Crawford Products, Inc., West Hanover, Mass.
Filed Feb. 6, 1991, Ser. No. 651,485
Term of patent 14 years
U.S. Cl. D6—458



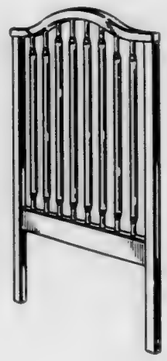
334,855
EARRING TREE
Kim Harrington, and Donald Harrington, both of P.O. Box 722, Waldoboro, Me. 04572
Filed Aug. 29, 1991, Ser. No. 751,686
Term of patent 14 years
U.S. Cl. D6—458



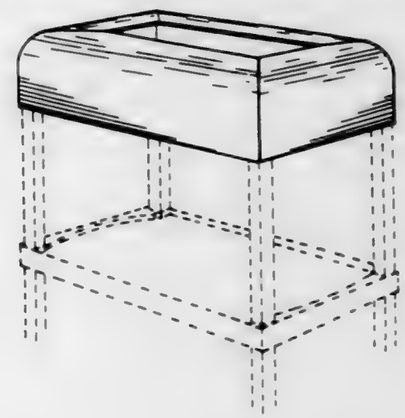
334,856
TABLE
Ulrich Sielaff, 9386 Dunlap Hollow Rd., Mazomanie, Wis. 53560
Filed Jul. 19, 1991, Ser. No. 732,704
Term of patent 14 years
U.S. Cl. D6—474

334,857
TABLE LEG
Virgil Miller, Archbold, Ohio, assignor to Sauder Manufacturing Company, Archbold, Ohio
Division of Ser. No. 503,162, Apr. 2, 1990. This application Sep. 2, 1992, Ser. No. 939,366
Term of patent 14 years
U.S. Cl. D6—495

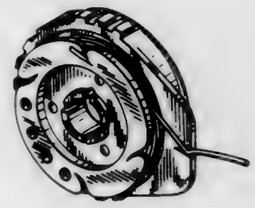
334,858
CRIB ENDBOARD
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Apr. 16, 1992, Ser. No. 870,032
Term of patent 14 years
U.S. Cl. D6—508



334,859
HEADER UNIT FOR MERCHANDISER
Ronald A. Homann, Overland, Mo., assignor to Paul Flam Ideas, Inc., St. Louis, Mo.
Filed May 13, 1991, Ser. No. 699,244
Term of patent 14 years
U.S. Cl. D6—509



334,860
SUTURE DISPENSER
David L. Brown, Wallingford, and Stanley J. Malinowski, Guilford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jan. 7, 1991, Ser. No. 638,412
Term of patent 14 years
U.S. Cl. D6—515



334,861

334,863

334,865
COOKING CONTAINER

334,868
COMBINED COOLER, STEREO RADIO CASSETTE

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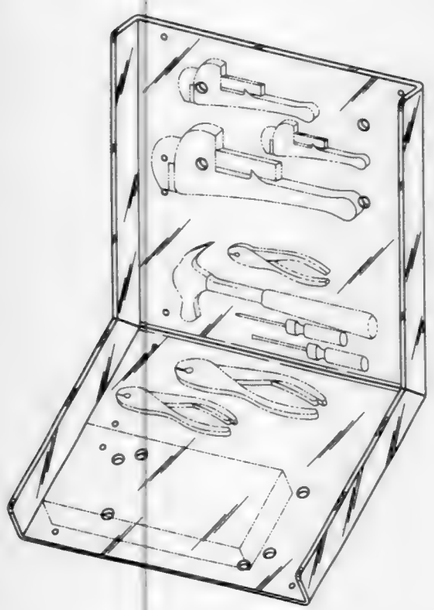
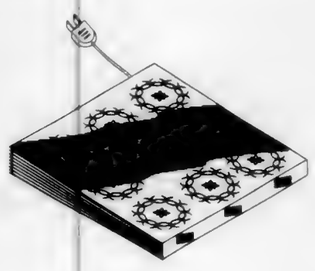
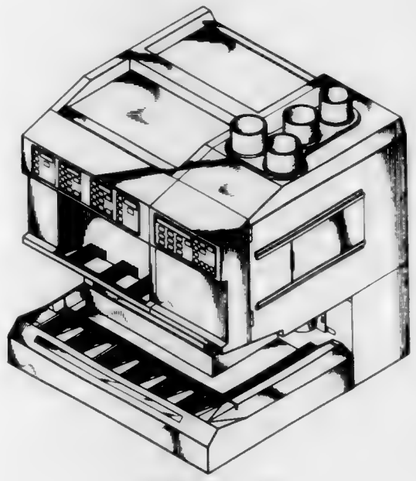
334,861
TOOL DISPLAY RACK
Se L. Cheng, Duarte, Calif., assignor to Se Luh Cheng, Commerce, Calif.
Filed Aug. 12, 1991, Ser. No. 744,014
Term of patent 14 years
U.S. Cl. D6—553



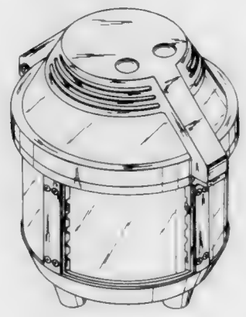
334,862
LIFTING CUSHION FOR DISABLED PERSONS
Mark I. Harris, R.D. #2 Box 522, Muncy, Pa. 17756
Filed Feb. 22, 1991, Ser. No. 659,137
Term of patent 14 years
U.S. Cl. D6—604



334,863
AUTOMATIC BEVERAGE DISPENSER
Paul A. Phillips, Marietta, Ga.; Laszlo L. Vazul, Chicago, Ill.; Frank Golley, Decatur, Ga., and Kristine L. Krause, Naperville, Ill., assignors to The Coca-Cola Company, Atlanta, Ga. and McDonald's Corporation, Oak Brook, Ill.
Filed Oct. 11, 1990, Ser. No. 595,947
Term of patent 14 years
U.S. Cl. D7—308

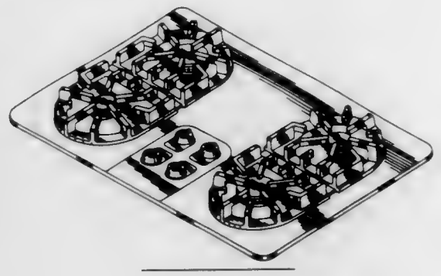


334,864
CONVECTION OVEN
Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao, Taipei Hsien, Taiwan
Filed Oct. 23, 1991, Ser. No. 780,651
Term of patent 14 years
U.S. Cl. D7—350

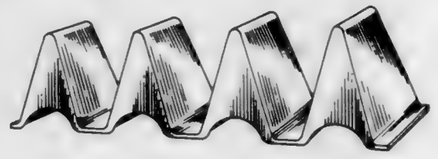


334,865
COOKING CONTAINER
Franz P. Münch, Ransbach-Baumbach, Fed. Rep. of Germany, assignor to Eduard Bay GmbH & Co. KG, Baumbach, Fed. Rep. of Germany
Filed Apr. 9, 1990, Ser. No. 506,359
Term of patent 14 years
U.S. Cl. D7—354

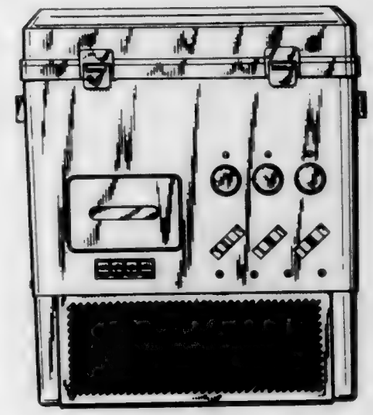
334,866
COOKER TOP
Ronald M. Warren, Maidenhead, United Kingdom, assignor to Glen Dimplex (an Irish Company), Eire, Ireland
Filed Jun. 25, 1990, Ser. No. 543,172
Term of patent 14 years
U.S. Cl. D7—407



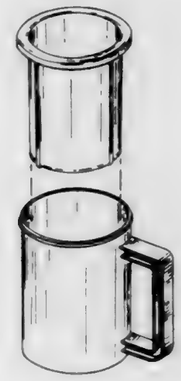
334,867
TACO PREPARATION STAND
Ronald W. May, 105 Lynchester Rd., Greenville, S.C. 29615
Filed Jun. 28, 1990, Ser. No. 546,042
Term of patent 14 years
U.S. Cl. D7—504



334,868
COMBINED COOLER, STEREO RADIO CASSETTE PLAYER AND PICNIC SET
Harry Lau Woon, Fo Tan Shatin, Hong Kong, assignor to Kum Kong Technological Industrial Limited, Shatin, Hong Kong
Filed Mar. 5, 1991, Ser. No. 664,071
Term of patent 14 years
U.S. Cl. D7—605



334,869
TWO PIECE HOT AND COLD MUG
Douglas W. Mills, 1557 W. Fairfield Rd., Freeport, Ill. 61032
Filed Jun. 25, 1991, Ser. No. 721,217
Term of patent 14 years
U.S. Cl. D7—605



334,870

334,872

334,874

334,876

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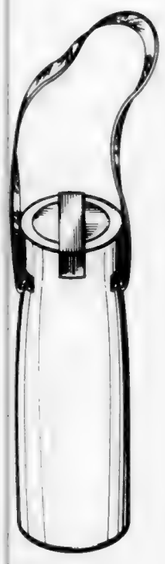
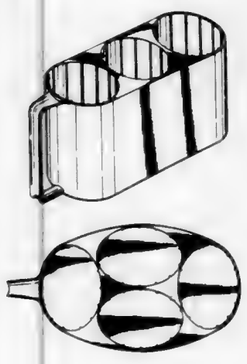
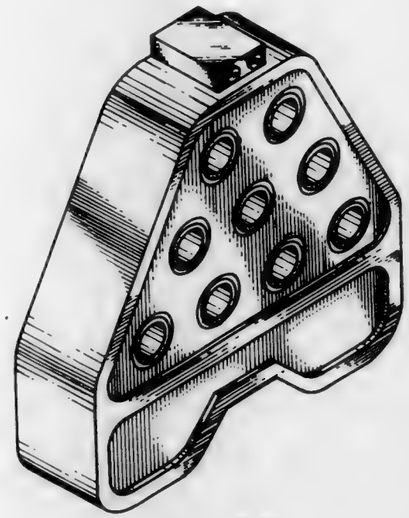
334,870
INSULATED COOLER
Christopher Griffin, 1104 Highland Ave., Ste. Q, Manhattan Beach, Calif. 90266
Filed Jul. 2, 1990, Ser. No. 547,433
Term of patent 14 years
U.S. Cl. D7—607



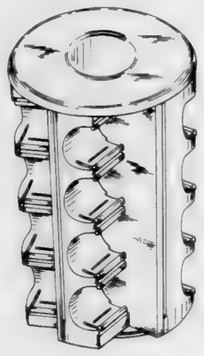
334,871
HOLDER FOR BAGS OF MILK
Roger Kelton, 201 Kennedy Street West, Aurora, Ontario, Canada L4G 2L9
Filed Sep. 10, 1990, Ser. No. 579,494
Claims priority, application Canada, Mar. 9, 1990, 09-03-90-5
Term of patent 14 years
U.S. Cl. D7—616



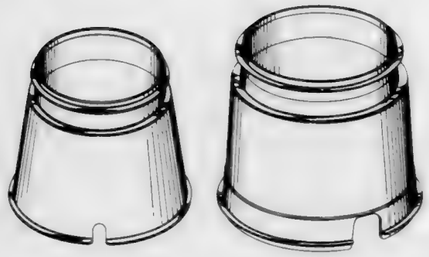
334,872
AUTOMATIC WINE BOTTLE ROTATING RACK
Lawrence M. Tublin, 62 2nd Pl., Brooklyn, N.Y. 11231
Filed Jul. 25, 1991, Ser. No. 738,735
Term of patent 14 years
U.S. Cl. D7—616



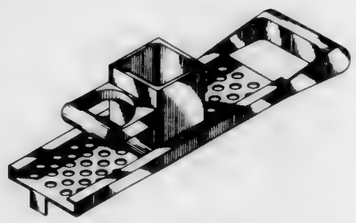
334,873
SPICE RACK
Bruce Ancona, and Jane Ancona, both of New York City, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Nov. 12, 1991, Ser. No. 787,539
Term of patent 14 years
U.S. Cl. D7—616



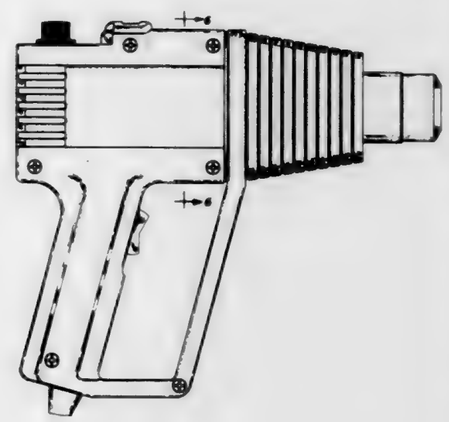
334,874
STRAINER SUPPORT FOR HOLDING A FILTERING CLOTH INSIDE THE SUPPORT
Andrew N. Mealey, 531 N. Gower St., Los Angeles, Calif. 90004, and David E. Bailey, 742 N. Claudina St., Anaheim, Calif. 92801
Continuation-in-part of Ser. No. 370,586, Jun. 23, 1989, abandoned. This application Jul. 10, 1991, Ser. No. 728,252
Term of patent 14 years
U.S. Cl. D7—667



334,875
GRATER
William Behnke, 1288 Elmwood Dr., Ypsilanti, Mich. 48197
Filed Aug. 22, 1991, Ser. No. 748,394
Term of patent 14 years
U.S. Cl. D7—678



334,876
HEAT GUN
Gary B. Swetish, Racine, Wis., assignor to Master Appliance Corporation, Racine, Wis.
Filed Feb. 4, 1991, Ser. No. 650,712
Term of patent 14 years
U.S. Cl. D8—29.1



334,877
PIPE BORE REFINISHING TOOL
Nils Nygards, 7435 Highway 65 NE., Minneapolis, Minn. 55432
Filed Feb. 21, 1991, Ser. No. 659,184
Term of patent 14 years
U.S. Cl. D8—70

334,878
FILM SPLICER

334,880
KEY GUIDE

334,883
DRAPERY BOW RING

334,886
PACKAGE FOR BALL, PUMP, AND CONES

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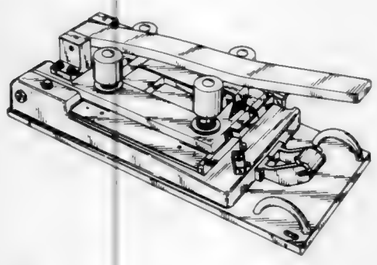
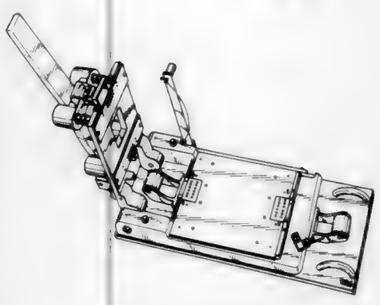
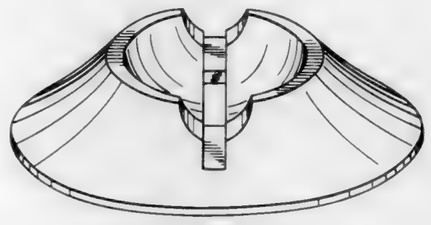
334,878
FILM SPLICER
Shigeo Shioiri, Tokyo; Kunio Kanda; Eiji Takamizawa, both of Chiba, and Yuzo Otomine, Kanagawa, all of Japan, assignors to Somar Corporation and Yugengaisha Tokyo Seiki Seisakusyo, both of Tokyo, Japan
Filed Apr. 24, 1991, Ser. No. 691,600
Claims priority, application Japan, Oct. 24, 1990, 2-35359
Term of patent 14 years
U.S. Cl. D8—70.1



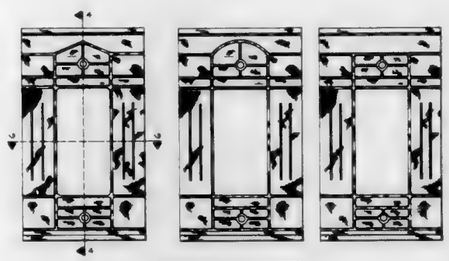


334,879
TRUCK TRAILER EMERGENCY GLADHAND LOCK
Jeffrey P. Few, West Hills, Calif., assignor to Norco Industries, Compton, Calif.
Filed Feb. 19, 1991, Ser. No. 660,091
Term of patent 14 years
U.S. Cl. D8—331

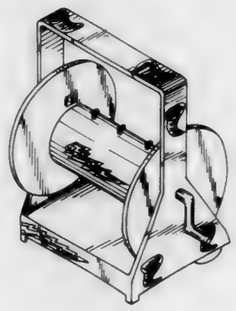
334,880
KEY GUIDE
Douglas R. Davey, 291 Paseo Marguerita, Vista, Calif. 92084
Filed Nov. 8, 1990, Ser. No. 611,354
Term of patent 14 years
U.S. Cl. D8—352



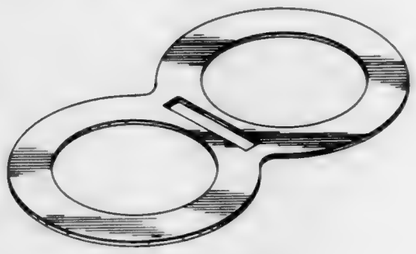
334,881
WALLPLATE
Jake Sentschak, II, 240 Longview Rd., Bridgewater, N.J. 08807, and Lawrence S. Heller, 2103 N. Oaks Blvd., North Brunswick, N.J. 08902
Filed Aug. 5, 1991, Ser. No. 740,486
Term of patent 14 years
U.S. Cl. D8—353



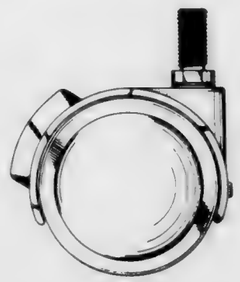
334,882
COMBINED ELECTRIC CORD REEL AND DISPENSER
Tony A. Bunch, 707 Salem La., Tarboro, N.C. 27886
Filed Jun. 14, 1990, Ser. No. 537,757
Term of patent 14 years
U.S. Cl. D8—359



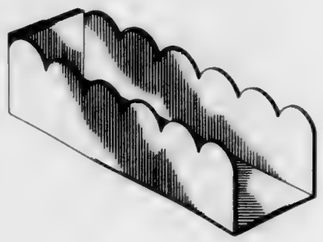
334,883
DRAPERY BOW RING
Stuart R. Fraker, Arlington; Michael R. Loupe, Fort Worth, and Kitty M. Milliorn, Arlington, all of Tex., assignors to Home Furnishings Discount Club of America, Inc., Arlington, Tex.
Filed Jul. 18, 1991, Ser. No. 734,319
Term of patent 14 years
U.S. Cl. D8—369



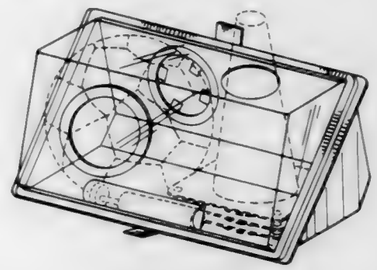
334,884
CASTER
Takuma Harada, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan
Filed Nov. 23, 1990, Ser. No. 617,071
Claims priority, application Japan, May 23, 1990, 2-17288
Term of patent 14 years
U.S. Cl. D8—375



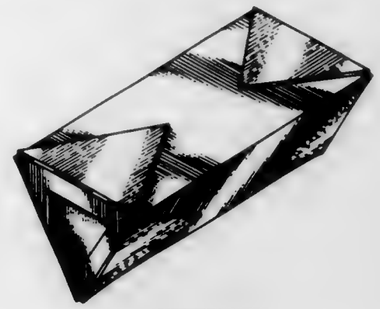
334,885
SANDWICH COOKING TRAY PACKAGE
Robert W. Eastin, 16247 N. 37th St., Phoenix, Ariz. 85032
Filed Apr. 24, 1991, Ser. No. 690,236
Term of patent 14 years
U.S. Cl. D9—414



334,886
PACKAGE FOR BALL, PUMP, AND CONES
David Cortelli, Suffield, Conn.; Frank Carter, Wilbraham, and Kenneth W. Pratt, Ware, both of Mass., assignors to Seneca Sports, Inc., Milford, Mass.
Continuation-in-part of Ser. No. 615,648, Nov. 19, 1990, Pat. No. 329,377. This application Nov. 18, 1991, Ser. No. 793,720
Term of patent 14 years
U.S. Cl. D9—418



334,887
TELEVISION REMOTE CONTROL CONTAINER
Michael Barbans, 320 Hollister SE., Grand Rapids, Mich. 49506
Filed Nov. 13, 1991, Ser. No. 791,613
Term of patent 14 years
U.S. Cl. D9—430



334,888
BOTTLE LIFTER
James A. Merritt, P.O. Box 206, Pleasanton, Calif. 94566
Filed Jan. 29, 1991, Ser. No. 648,442
Term of patent 14 years
U.S. Cl. D9—455

334,889

334,890

334,893

334,895

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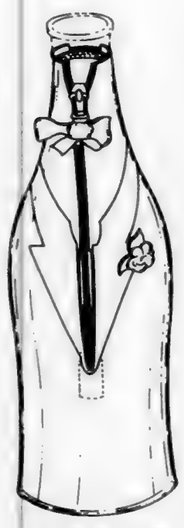
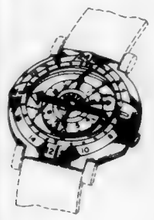
334,889
BOTTLE JACKET
Keith Condemi, 1390 Clover St., Rochester, N.Y. 14610, and Andrew B. Moll, 3497 East Ave., Rochester, N.Y. 14618
Filed May 17, 1991, Ser. No. 703,143
Term of patent 14 years
U.S. Cl. D9—455

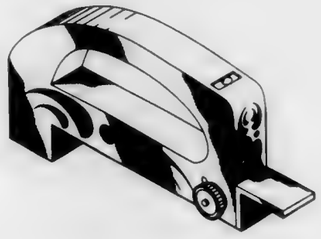


334,891
COMBINED WATCHCASE AND BAND THEREFOR
Takashi Watanabe, and Masanobu Yano, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan
Filed Sep. 21, 1990, Ser. No. 586,023
Claims priority, application Japan, Apr. 24, 1990, D2-14064
Term of patent 14 years
U.S. Cl. D10—32

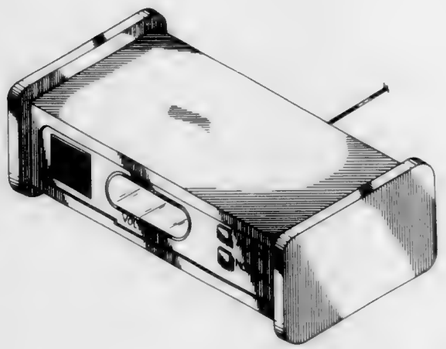
334,890
UPPER AND SIDE PORTIONS OF A WATCH/STOP WATCH
Jacques Meyer, Paris, France, assignor to Compagnie Generale Horlogere, Paris, France
Filed Jul. 13, 1990, Ser. No. 552,214
Claims priority, application Hague, Jan. 15, 1990, DM/015680
Term of patent 14 years
U.S. Cl. D10—30



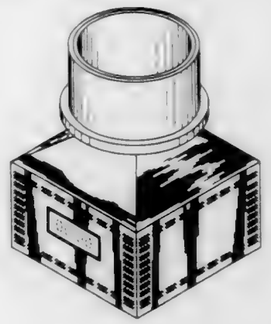
334,892
SIDING SPACER TOOL
Michael R. Jenkins, 1804 Caney Hills Rd., Knoxville, Tenn. 37921
Continuation-in-part of Ser. No. 597,557, Oct. 15, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 796,233
Term of patent 14 years
U.S. Cl. D10—64



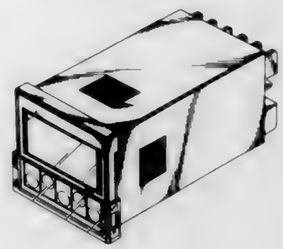
334,893
LINE CURRENT VARIATION INDICATOR
Scott E. Cunningham, P.O. Box 13272, Mexico Beach, Fla. 32410
Filed Oct. 23, 1991, Ser. No. 781,275
Term of patent 14 years
U.S. Cl. D10—75



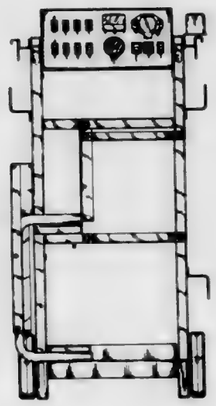
334,895
COIN SCALE
Farzad F. Bavand, 1384 Oakland Bl Apt. 9, Walnut Creek, Calif. 94596-4352
Filed Aug. 22, 1990, Ser. No. 570,690
Term of patent 14 years
U.S. Cl. D10—87



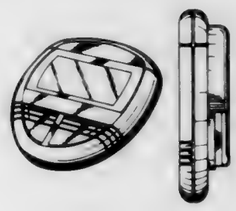
334,896
ELECTRONIC COUNTER
Norio Shimizu, and Hitoshi Ueda, both of Tokyo, Japan, assignors to Koyo Electronics Industries Co., Ltd., Tokyo, Japan
Filed Apr. 2, 1991, Ser. No. 679,406
Claims priority, application Japan, Nov. 13, 1990, 2-37692
Term of patent 14 years
U.S. Cl. D10—97



334,894
VEHICLE TESTING INSTRUMENT
Thomas Timm, Mays Landing Rd., Rte. 3, Box 397, Hammonton, N.J. 08037
Filed Sep. 24, 1990, Ser. No. 586,736
Term of patent 14 years
U.S. Cl. D10—75



334,897
BICYCLE COMPUTER
Lee A. Katz, Evanston, Ill., assignor to Phoenix International Trading, Inc., Evanston, Ill.
Filed Feb. 5, 1991, Ser. No. 650,663
Term of patent 14 years
U.S. Cl. D10—98



334,898
ANTLER SCRAPING SIMULATOR FOR ATTRACTING

334,900
BRACELET

334,903
ORNAMENTAL CHAIN

334,906
DOUBLE CHAIN COLLAR KEEPER

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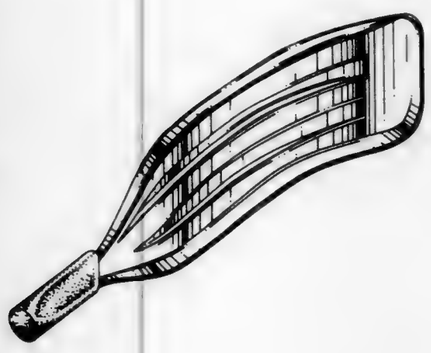
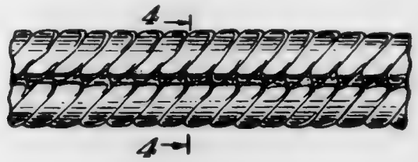
334,898
ANTLER SCRAPING SIMULATOR FOR ATTRACTING MOOSE
John J. Lopez, III, 6233 Prosperity Dr., Anchorage, Al. 99504
Filed Mar. 11, 1991, Ser. No. 667,077
Term of patent 14 years
U.S. Cl. D10—116



334,899
WATCHBAND
Ryoichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Dec. 18, 1991, Ser. No. 810,015
Term of patent 14 years
U.S. Cl. D11—3

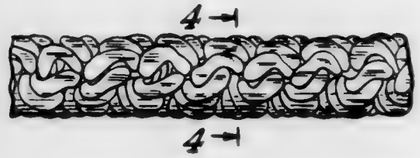
334,900
BRACELET
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari, S.p.A., Rome, Italy
Filed Dec. 18, 1990, Ser. No. 629,357
Claims priority, application Hague, Jul. 3, 1990, DM/017.067
Term of patent 14 years
U.S. Cl. D11—5

334,901
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A., Italy
Filed Jun. 13, 1990, Ser. No. 537,288
Claims priority, application Italy, Dec. 19, 1989, 11776/89
Term of patent 14 years
U.S. Cl. D11—12

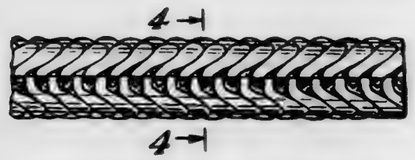


334,902
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A., Italy
Filed Jun. 13, 1990, Ser. No. 537,429
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—12

334,903
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A.
Filed Jun. 14, 1990, Ser. No. 538,161
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—13



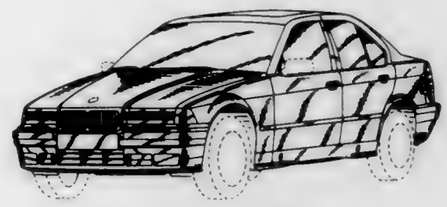
334,904
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A, Italy
Filed Jun. 14, 1990, Ser. No. 538,173
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—18



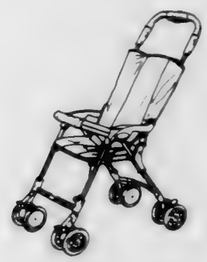
334,905
CORSAGE AND BOUTONNIERE FASTENER
L. James Ritz, 2113 Columbia Ave., Whitehall, Pa. 18052
Filed Apr. 26, 1990, Ser. No. 514,602
Term of patent 14 years
U.S. Cl. D11—43

334,906
DOUBLE CHAIN COLLAR KEEPER
Richard H. Sprick, R.R. 3, Box 105, Lake City, Minn. 55041
Filed Apr. 26, 1991, Ser. No. 692,051
Term of patent 14 years
U.S. Cl. D11—213

334,907
AUTOMOBILE
Boyke Boyer, Seefeld, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Nov. 6, 1990, Ser. No. 610,992
Claims priority, application Fed. Rep. of Germany, May 18, 1990, 9003568
Term of patent 14 years
U.S. Cl. D12—92



334,908
BABY CARRIAGE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Sep. 13, 1991, Ser. No. 759,685
Term of patent 14 years
U.S. Cl. D12—129



334,909
PNEUMATIC TIRE TREAD AND BUTTRESS

334,911
COMBINED MIRROR FRAME AND HINGED COVER,

334,914

334,916

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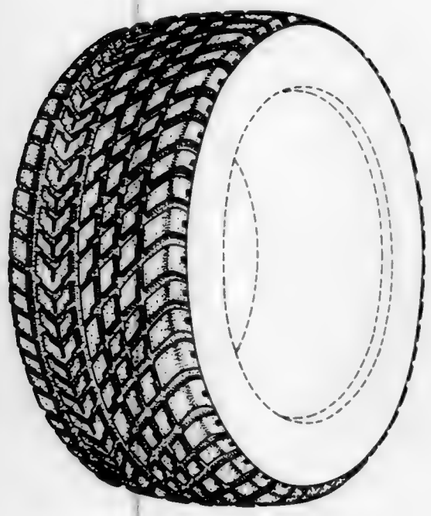
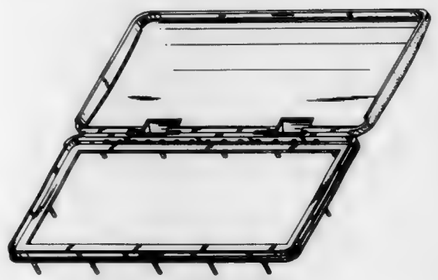
334,909
PNEUMATIC TIRE TREAD AND BUTTRESS
Randall R. Brayer, Uniontown; Warren L. Croyle, Akron, both of Ohio, and Maurice Grass, Reichlange, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 484,731, Feb. 20, 1990, abandoned. This application Jul. 26, 1991, Ser. No. 736,186
Term of patent 14 years
U.S. Cl. D12—147

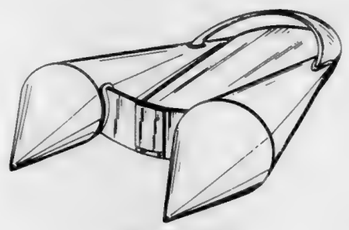


334,910
FRAME FOR A WINDSHIELD WIPER FOR VEHICLES
Albert Lee, 232 Margate Rd., Timonium, Md. 21093
Filed Nov. 1, 1991, Ser. No. 787,327
The portion of the term of this patent subsequent to Dec. 1, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—155

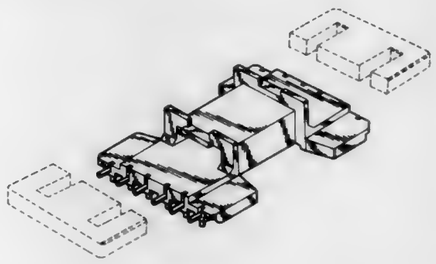
334,911
COMBINED MIRROR FRAME AND HINGED COVER, FOR ATTACHMENT TO A VEHICLE SUN VISOR
John G. Kucharski, Winchester, Va., assignor to Automotive Industries, Inc., Strasburg, Va.
Filed Jun. 11, 1991, Ser. No. 713,337
Term of patent 14 years
U.S. Cl. D12—191



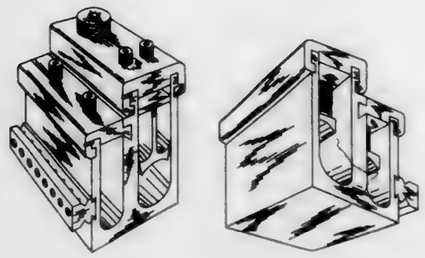
334,912
BOAT
Jayden D. Harman, Clifton Gardens, Australia, assignor to Tank and Pipe Welding Pty Ltd., Australia
Filed Dec. 11, 1991, Ser. No. 805,591
Claims priority, application Australia, Jun. 14, 1991, 1710/91; Sep. 30, 1991, 2975/91
Term of patent 14 years
U.S. Cl. D12—316



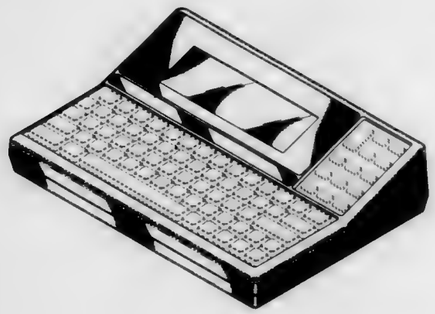
334,913
BOBBIN FOR USE WITH A MAGNETIC CORE
Hironori Sato, and Tadashi Mitsui, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 607,099
Term of patent 14 years
U.S. Cl. D13—118



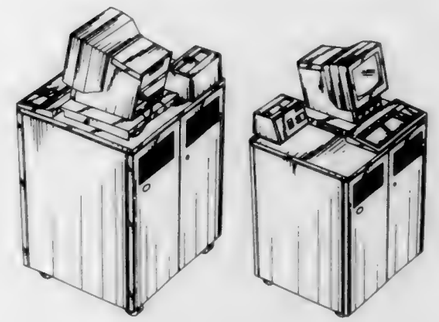
334,914
CABLE CONNECTOR
Gerard S. Walter, 2625 Hardies Rd., Glenshaw, Pa. 15116, and John Hagan, Hardies Rd., Gibsonia, Pa. 15044
Filed Sep. 10, 1990, Ser. No. 579,497
Term of patent 14 years
U.S. Cl. D13—151



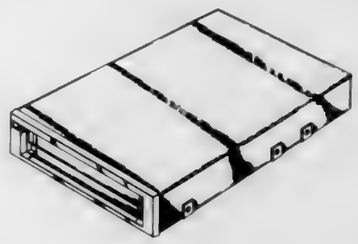
334,915
HOUSING FOR PORTABLE RADIO DATA TERMINAL FOR TRANSMITTING AND RECEIVING SIGNALLING DIGITAL INFORMATION
Roman P. Rak, Delta, Canada, assignor to Motorola Inc., Schaumburg, Ill.
Filed Apr. 15, 1991, Ser. No. 685,003
Term of patent 14 years
U.S. Cl. D14—100



334,916
COMBINED CABINET FOR ELECTRONIC EQUIPMENT AND INTEGRATED CONTROLLER
Michael Basara, Rhinebeck, and John J. Natoli, Woodstock, both of N.Y., assignors to International Busines Machines Corporation, Armonk, N.Y.
Filed Aug. 29, 1990, Ser. No. 575,522
Term of patent 14 years
U.S. Cl. D14—102



334,917
STREAMING CASSETTE TAPE DRIVE
Takashi Miyamoto, Tokyo, Japan, assignor to TEAC Corporation, Japan
Filed Dec. 11, 1990, Ser. No. 625,600
Claims priority, application Japan, Jun. 15, 1990, 2-20311
Term of patent 14 years
U.S. Cl. D14—108



334,918

334,920

334,922
BAR CODE SCANNER

334,924
MEMORY CARTRIDGE FOR A POINT OF

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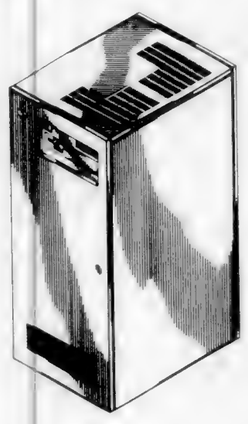
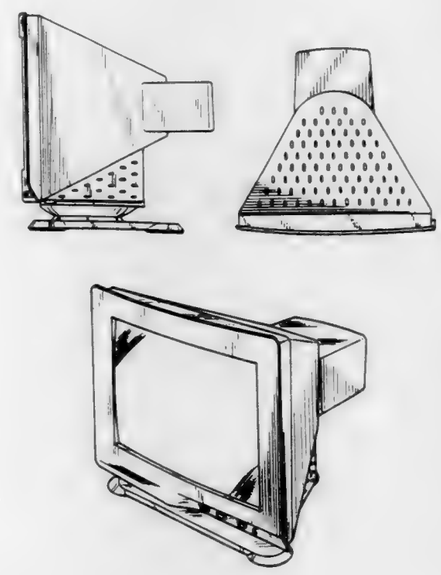
334,918
DISC DRIVE
Yoshio Hirose, Urawa, and Kazuhiko Inoue, Houya, both of Japan, assignors to TEAC Corporation, Japan
Filed Mar. 18, 1991, Ser. No. 673,181
Claims priority, application Japan, Sep. 25, 1990, 2-32123
Term of patent 14 years
U.S. Cl. D14—109

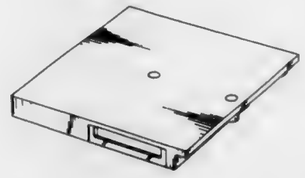
334,919
OPTICAL DISK/CARTRIDGE LIBRARY WITHOUT INTERNAL CONTROLLER
Jerry W. Hammar; Richard D. Kusel, and Roland Zapfe, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1990, Ser. No. 606,786
Term of patent 14 years
U.S. Cl. D14—109



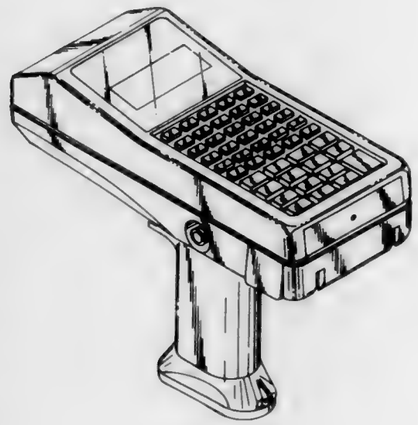
334,920
MONITOR
Liu Hwa-Chen, Taipei, Taiwan, assignor to Supertron Electric Co., Ltd., Taiwan
Filed May 31, 1991, Ser. No. 709,146
Term of patent 14 years
U.S. Cl. D14—113



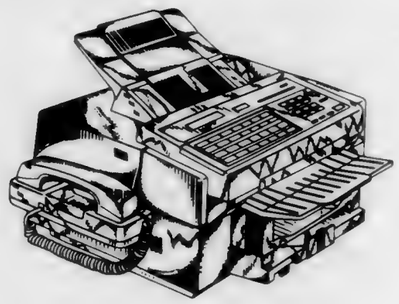
334,921
DESKTOP COMPUTER SYSTEM SUPPORT DEVICE WITH INTEGRATED CABLE MANAGEMENT
Michael Basara, Rhinebeck, and John J. Natoli, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 29, 1990, Ser. No. 578,100
Term of patent 14 years
U.S. Cl. D14—114



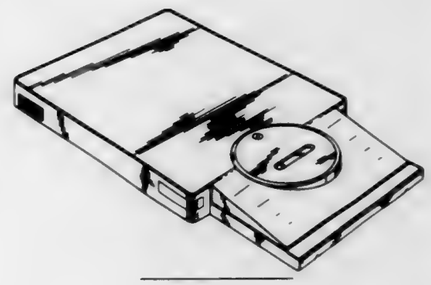
334,922
BAR CODE SCANNER
Robert F. Meyerson, Captiva Island, Fla.; Rajendra Kumar, Akron, Ohio; James A. Campo, Brunswick, Ohio; Roger H. Ramsey, Akron, Ohio, and Mitchell L. Wilgus, Akron, Ohio, assignors to Telxon Corporation, Akron, Ohio
Filed Sep. 25, 1991, Ser. No. 765,163
Term of patent 14 years
U.S. Cl. D14—116



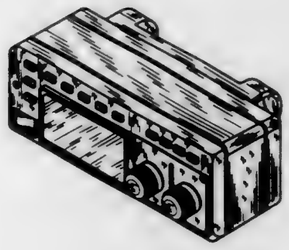
334,923
FACSIMILE TRANSCEIVER
Chuck Dodge, Escondido, Calif.; Yoshikazu Hokura, Yokohama, and Junji Morihiro, Ueda, both of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 9, 1991, Ser. No. 639,824
Claims priority, application Japan, Jul. 10, 1990, 2-23339
Term of patent 14 years
U.S. Cl. D14—118



334,924
MEMORY CARTRIDGE FOR A POINT OF TRANSACTION TERMINAL
David Crawford, Kaneohe, Hi.; James Arakaki, San Carlos, Calif., and Harold Chen, Taipei, Taiwan, assignors to Verifone, Inc., Redwood City, Calif.
Filed Jun. 1, 1990, Ser. No. 532,093
Term of patent 14 years
U.S. Cl. D14—121



334,925
CONTROL HEAD FOR A TWO-WAY RADIO
Thomas G. Beaumont, Bedford, and Masaru Tokiyama, Arlington, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 21, 1990, Ser. No. 586,054
Term of patent 14 years
U.S. Cl. D14—257



334,926
PORTABLE TELEPHONE

334,928
TAPE RECORDER

334,931
TAPE RECORDER

334,933
TAPE RECORDER

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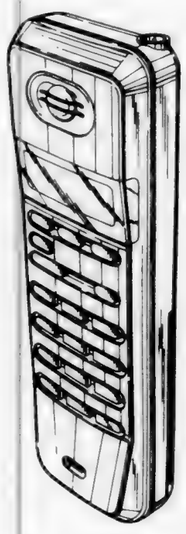
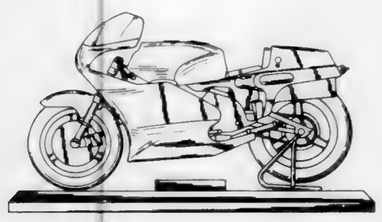
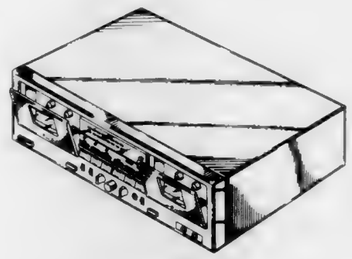
334,926
PORTABLE TELEPHONE
Patrick Hunt; Adam White, and Richard Seymour, all of London, England, assignors to Technophone Limited, Surrey, England
Filed Nov. 1, 1991, Ser. No. 787,965
Claims priority, application United Kingdom, May 2, 1991, 2014566
Term of patent 14 years
U.S. Cl. D14—138



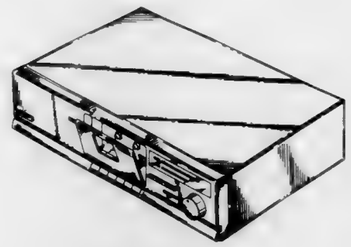
334,927
TELEPHONE SET
Kash Gobindram, Ronkonkoma, N.Y., assignor to Chandiramani, Gobindram Lokumal, Singapore
Filed Jun. 5, 1991, Ser. No. 710,904
Term of patent 14 years
U.S. Cl. D14—143



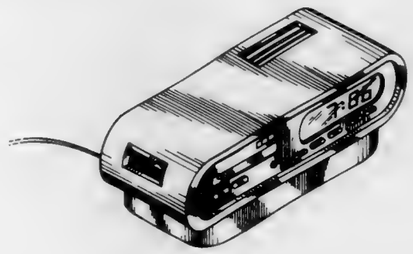
334,928
TAPE RECORDER
Masafumi Ito, Tokyo; Minoru Sube, Hachioji; Haruki Takita, Tokyo; Hiroyuki Watanabe, Hanno, and Yukio Iikura, Asaka, all of Japan, assignors to Teac Corporation, Japan
Filed Mar. 21, 1991, Ser. No. 673,220
Claims priority, application Japan, Sep. 29, 1990, 2-32944
Term of patent 14 years
U.S. Cl. D14—164



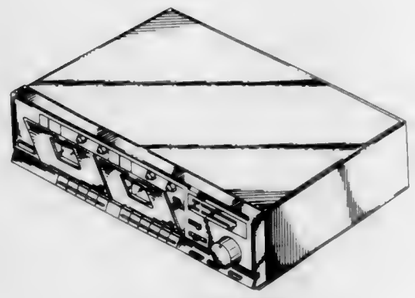
334,929
TAPE RECORDER
Masafumi Ito, Tokyo; Minoru Sube, Hachioji; Haruki Takita, Tokyo; Hiroyuki Watanabe, Hanno, and Yukio Iikura, Asaka, all of Japan, assignors to TEAC Corporation, Japan
Filed Mar. 15, 1991, Ser. No. 670,224
Claims priority, application Japan, Sep. 19, 1990, 31472
Term of patent 14 years
U.S. Cl. D14—164



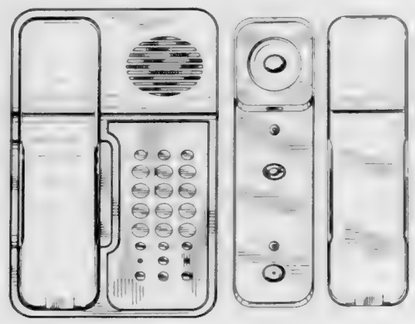
334,930
COMBINATION ALARM CLOCK AND TAPE RECORDER
Frank D. Collins, 5539 Hoyne, Chicago, Ill. 60636
Filed Sep. 6, 1990, Ser. No. 578,847
Term of patent 14 years
U.S. Cl. D14—168



334,931
TAPE RECORDER
Masafumi Ito, Tokyo; Minoru Sube, Hachioji; Haruki Takita, Tokyo; Hiroyuki Watanabe, Hanno, and Yukio Iikura, Asaka, all of Japan, assignors to TEAC Corporation, Japan
Filed Mar. 15, 1991, Ser. No. 670,226
Claims priority, application Japan, Sep. 19, 1990, 31471/1990
Term of patent 14 years
U.S. Cl. D14—164

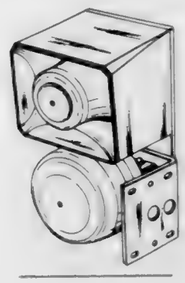


334,932
TELEPHONE SET
Him-Chi Yu, North Point, Hong Kong, assignor to Picotronics Industries Limited, Kowloon, Hong Kong
Filed Apr. 22, 1991, Ser. No. 688,358
Claims priority, application United Kingdom, Oct. 22, 1990, 2010412
Term of patent 14 years
U.S. Cl. D14—151



334,933
TAPE RECORDER
Jun Takahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 5, 1991, Ser. No. 740,214
Claims priority, application Japan, Feb. 6, 1991, 3-2996
Term of patent 14 years
U.S. Cl. D14—165

334,934
VEHICAL BUMPER LOUDSPEAKER
Chen H. Hsieh, Chen Hsieh Bros., Inc., 17921 Lyons Cir., Hungtington Beach, Calif. 92647
Filed Jun. 14, 1990, Ser. No. 537,270
Term of patent 14 years
U.S. Cl. D14—204



334,935
SPEAKER
Nobuhiro Goto, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,154
Claims priority, application Japan, Nov. 28, 1990, 2-39685
Term of patent 14 years
U.S. Cl. D14—216

334,936

334,938
FUEL DISPENSING CABINET

334,941

334,944
PRESSURE PLATE FOR COPYING MACHINE

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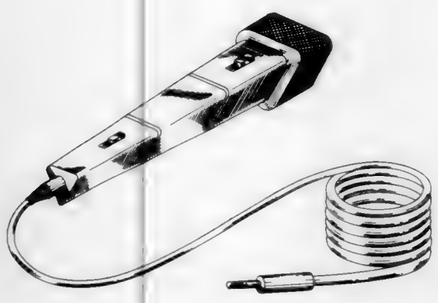
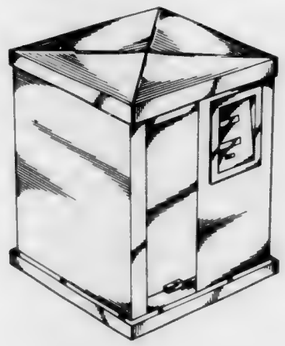
334,936
MICROPHONE
Andrew P. Maldonado, 128 Marigold Dr., Rio Rancho, N. Mex. 87124
Filed Oct. 18, 1991, Ser. No. 778,642
Term of patent 14 years
U.S. Cl. D14—225

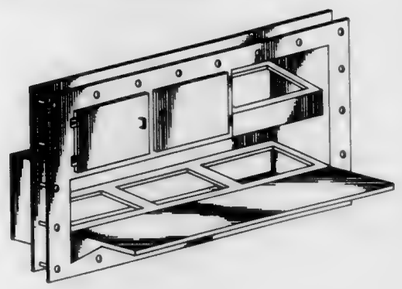


334,937
WIRELESS COMMUNICATION EQUIPMENT HOUSING
Claire T. Kerr, Morris Plains, and Fredrick G. Randall, Newark, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 27, 1990, Ser. No. 544,789
Term of patent 14 years
U.S. Cl. D14—299

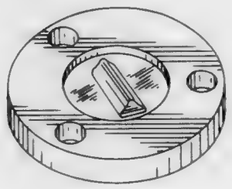
334,938
FUEL DISPENSING CABINET
Manuel Z. Solares, L-11 Patio Hill St. Urbanizacion, Torrimar Guaynabo, P.R. 00657
Filed Aug. 7, 1990, Ser. No. 563,979
Term of patent 14 years
U.S. Cl. D15—9.1



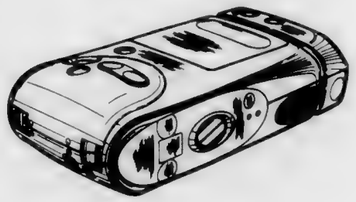
334,939
PREP INSERT FOR WALK IN COOLER
Robert A. Hamilton, P.O. Box 234, Weirsdale, Fla. 32195
Filed Mar. 15, 1991, Ser. No. 670,162
Term of patent 14 years
U.S. Cl. D15—89



334,940
SIGHT GLASS
Robert Wolinsky, Springfield, Ill., assignor to AC & R, Chatham, Ill.
Filed Jul. 19, 1990, Ser. No. 555,746
Term of patent 14 years
U.S. Cl. D16—134

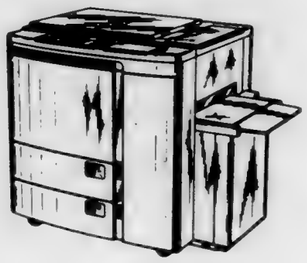


334,941
COMBINED STILL VIDEO CAMERA AND AUDIO ADAPTER
Masahiro Koinuma, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 554,032, Jul. 18, 1990. This application Aug. 20, 1992, Ser. No. 932,053
Claims priority, application Japan, Jan. 18, 1990, 2-1116; Jan. 18, 1990, 2-1117
Term of patent 14 years
U.S. Cl. D16—202



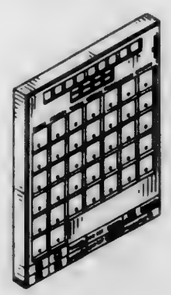
334,942
TYPEWRITER
Tomoyuki Hirose, Mie, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 21, 1991, Ser. No. 718,854
Claims priority, application Japan, Dec. 27, 1990, 2-44268
Term of patent 14 years
U.S. Cl. D18—1

334,943
COPYING MACHINE
Noriyuki Sazaki, Yokohama, and Mitsuru Sakurai, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 30, 1991, Ser. No. 753,625
Claims priority, application Japan, Mar. 7, 1991, 3-6414
Term of patent 14 years
U.S. Cl. D18—39

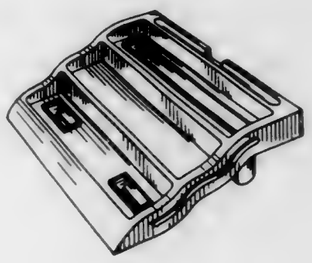


334,944
PRESSURE PLATE FOR COPYING MACHINE
Ei Yamamoto, Tokyo, and Mitsuru Sakurai, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 418,465
Claims priority, application Japan, Apr. 13, 1989, 1-13762
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—40

334,945
ELECTRONIC CALENDAR
Jimmie L. Hill, 12303 S. 31 St., Omaha, Nebr. 68123
Continuation-in-part of Ser. No. 260,265, Oct. 20, 1988, abandoned. This application Jan. 2, 1991, Ser. No. 636,942
Term of patent 14 years
U.S. Cl. D19—20



334,946
TIERED TRAY FOR HOLDING ARTIST'S SUPPLIES
Richard A. Tarozzi, Gales Ferry, Conn., assignor to Binney & Smith Inc., Easton, Pa.
Filed Jul. 23, 1991, Ser. No. 734,810
Term of patent 14 years
U.S. Cl. D19—77



334,947

334,950

334,953
CONSTRUCTION TOY ELEMENT

334,956
DOLL

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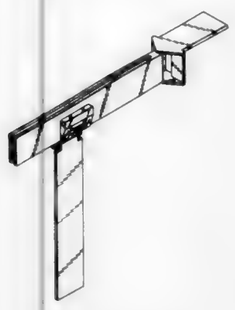
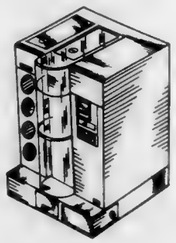
334,947
COPY HOLDER
Robert A. Egly, 31 Belcourt South 30994, Newport Beach, Calif. 92660, and Patrick Sullivan, Orange, Calif., assignors to Robert A. Egly, Newport Beach, Calif.
Filed Mar. 29, 1991, Ser. No. 677,289
Term of patent 14 years
U.S. Cl. D19—88



334,948
PENCIL HOLDER
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria
Filed Aug. 17, 1990, Ser. No. 569,456
Claims priority, application Austria, Feb. 22, 1990, 27.885; Feb. 22, 1990, 27.887; Feb. 22, 1990, 27.888; Feb. 22, 1990, 27.889; Feb. 22, 1990, 27.890; Feb. 22, 1990, 27.891; Feb. 22, 1990, 27.892
Term of patent 14 years
U.S. Cl. D19—85

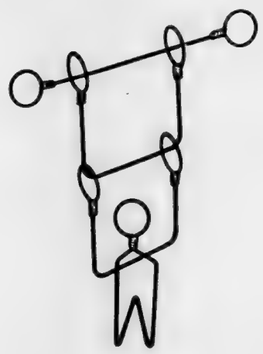
334,949
WALL-MOUNTABLE PENCIL CUP
Mel Evenson, San Pedro, Calif., assignor to Rubbermaid Office Products Group, Inc., Maryville, Tenn.
Filed Dec. 13, 1991, Ser. No. 806,454
Term of patent 14 years
U.S. Cl. D19—85

334,950
POPCORN VENDING MACHINE
Melvin J. Wyman, 1154 Palms Blvd., Venice, Calif. 90201, and David A. Hilderbrand, 4320 Centinella, Los Angeles, Calif. 90066
Filed Apr. 4, 1991, Ser. No. 680,278
Term of patent 14 years
U.S. Cl. D20—4



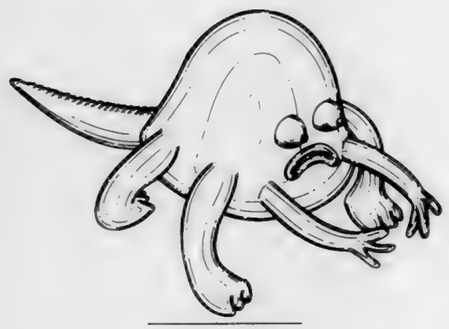
334,951
SIGN
Mark W. Mills, 7285 Calabria Ct., Suite 13, San Diego, Calif. 92122
Filed Apr. 1, 1991, Ser. No. 677,843
Term of patent 14 years
U.S. Cl. D20—10

334,952
WIRE PUZZLE
Tom Davis, 4338 Central Ave., and Scott Carver, 4334 Central Ave., both of San Diego, Calif. 92105
Filed Feb. 21, 1991, Ser. No. 658,561
Term of patent 14 years
U.S. Cl. D21—106



334,953
CONSTRUCTION TOY ELEMENT
Jun Kawahara, and Tatsuo Nakamata, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Oct. 22, 1991, Ser. No. 780,314
Claims priority, application Japan, Apr. 22, 1991, 3-11549
Term of patent 14 years
U.S. Cl. D21—108

334,954
TOY FIGURE
Jack Calhoun, 3267 16th St., San Francisco, Calif. 94114
Filed Nov. 20, 1990, Ser. No. 616,000
Term of patent 14 years
U.S. Cl. D21—148



334,955
TOY GREAT WHITE SHARK
Dennis Kupperman, 3838 Chester Dr., Glenview, Ill. 60025
Filed Nov. 26, 1990, Ser. No. 617,855
Term of patent 14 years
U.S. Cl. D21—157

334,956
DOLL
Georgina Niesen, R.R. #2, Oliver, British Columbia, Canada V0H 1T0
Filed May 30, 1989, Ser. No. 359,074
Claims priority, application Canada, Feb. 1, 1989, 01-02-89-1
Term of patent 14 years
U.S. Cl. D21—166

334,957
CLOWN DOLL
Tom Bain, Sr., 61674 Popular Rd., Montrose, Colo. 81401
Filed Jul. 8, 1991, Ser. No. 726,519
Term of patent 14 years
U.S. Cl. D21—173

334,958

334,961

334,963

334,966

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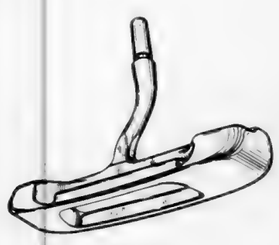
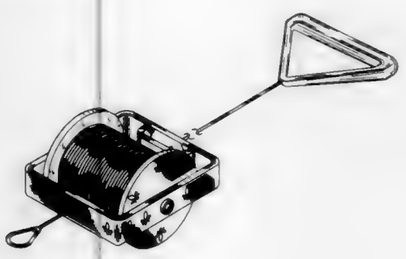
334,958
TOY BASKETBALL GOAL
Steven M. Fischer, 348 Larkspur Plz. Dr., Larkspur, Calif. 94939
Filed Aug. 15, 1990, Ser. No. 567,557
Term of patent 14 years
U.S. Cl. D21—201

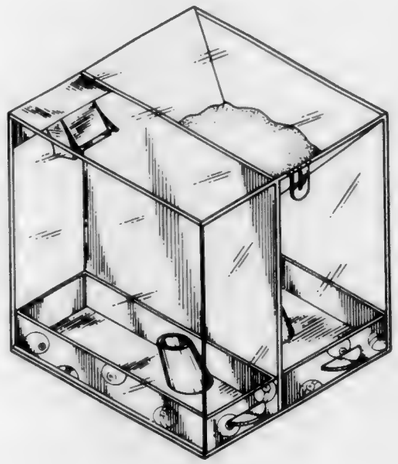
334,959
GOLF CLUB HEAD
Kanji Iinuma, Musashino, and Kazuaki Ando, Higashikurume, both of Japan, assignors to Daiwa Golf Co., Ltd., Tokyo, Japan
Filed Aug. 3, 1990, Ser. No. 562,649
Claims priority, application Japan, Feb. 5, 1990, 2-3214; Feb. 5, 1990, 2-3215
Term of patent 14 years
U.S. Cl. D21—219



334,960
RETRACTABLE WATER SKI ROPE
David G. Goodman, 2326 Foothill Rd., McKinney, Tex. 75069
Filed Oct. 18, 1990, Ser. No. 599,378
Term of patent 14 years
U.S. Cl. D21—230



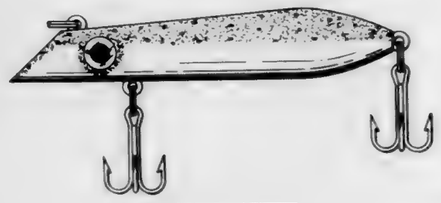
334,961
BILLIARD CUE AND CHALK ASSEMBLY
Larry Allen, 3465 Rebecca La. #B, Colorado Springs, Colo. 80917
Filed Dec. 7, 1990, Ser. No. 624,259
Term of patent 14 years
U.S. Cl. D21—232



334,962
AMUSEMENT GRIP STRENGTH TESTER MACHINE
Mark A. DiLuciano, Wakeman, Ohio, assignor to Sunmark Business Products, Inc., Lorain, Ohio
Filed Oct. 4, 1991, Ser. No. 770,964
Term of patent 14 years
U.S. Cl. D21—240

334,963
SHOOTING SUPPORT FOR A RIFLE
Verner E. Emanuelson, Star Rte. 3, Box 5, Saco, Mont. 59261
Filed Jan. 30, 1991, Ser. No. 648,359
Term of patent 14 years
U.S. Cl. D22—108

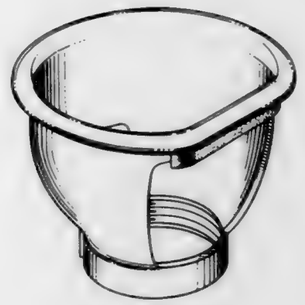
334,964
FISHING LURE
Gregg E. Silks, 6819 Cameo St., Alta Loma, Calif. 91701
Filed Jul. 5, 1991, Ser. No. 726,000
Term of patent 14 years
U.S. Cl. D22—126



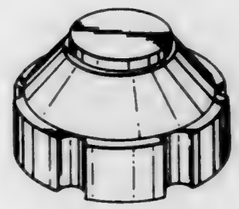
334,965
FISHING LURE
Gregory G. Carnahan, Box 46, Shelocta, Indiana County, Pa. 15774, and Brian Boyer, 1005 N. Ben Franklin St., Indiana, Indiana County, Pa. 15701
Filed Dec. 24, 1990, Ser. No. 632,742
Term of patent 14 years
U.S. Cl. D22—126

334,966
ARTIFICIAL MINNOW WITH HORIZONTAL TAIL
William E. Chambers, Sr., Watkinsville, Ga., assignor to Zoom Bait Company, Inc., Athens, Ga.
Filed Jan. 8, 1991, Ser. No. 638,642
Term of patent 14 years
U.S. Cl. D22—133

334,967
SAFETY CAP FOR GAS CYLINDERS
Sakae Kitsuda, 1-3-5 Nishi-yawata, Hiratsuka, Kanagawa, Japan
Filed Jul. 27, 1989, Ser. No. 386,493
Term of patent 14 years
U.S. Cl. D23—206



334,968
CHEMICAL DETERGENT BLOCK
Elizabeth J. Gladfelter, Falcon Heights; Tina O. Outlaw, Inver Grove Heights; James L. Copeland; Rhonda K. Schulz, both of Burnsville; Daniel K. Boche, Eagan, and Jeff W. Peterson, Minnetonka, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed May 14, 1991, Ser. No. 699,784
Term of patent 14 years
U.S. Cl. D23—207



334,969
DEPILATOR

334,972
PRESSURE SPRAY WASHER
Robert C. Berfield, Jersey Shore, and Craig A. Seasholtz, Avis,

334,975
DISPENSING CONTAINER FOR DETERGENT

334,978
DIAPER

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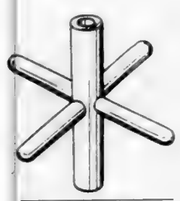
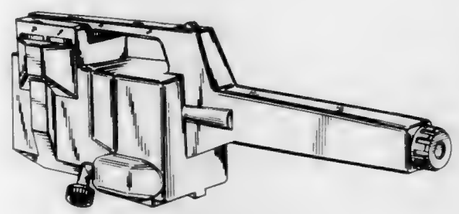
334,969
DEPILATOR
Jacques Gudefin, St Priest, France, assignor to Calor S.A., Lyons, France
Filed Jun. 12, 1990, Ser. No. 536,460
Claims priority, application France, Dec. 22, 1989, 89 7990
Term of patent 14 years
U.S. Cl. D24—133

334,970
FILTER MEDIUM FOR AN AQUARIUM
Kazutoshi Tominaga, Osaka, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan
Filed Apr. 17, 1990, Ser. No. 510,811
Term of patent 14 years
U.S. Cl. D23—209

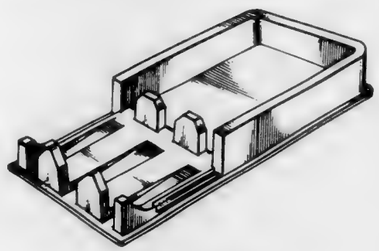


334,971
FILTER MEDIUM FOR AN AQUARIUM
Kazutoshi Tominaga, Higashiosakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan
Filed Sep. 5, 1990, Ser. No. 578,133
Term of patent 14 years
U.S. Cl. D23—209

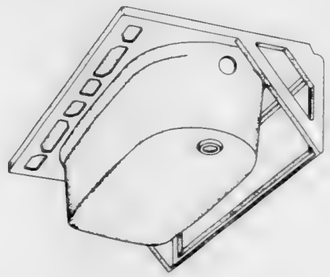
334,972
PRESSURE SPRAY WASHER
Robert C. Berfield, Jersey Shore, and Craig A. Seasholtz, Avis, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Sep. 11, 1990, Ser. No. 580,504
Term of patent 14 years
U.S. Cl. D23—225



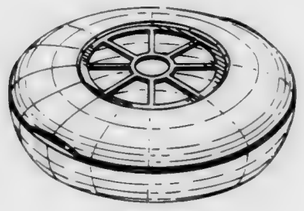
334,973
SURGICAL INSTRUMENT HOLDING TRAY
A. H. Llynn Valentine, Granada Hills, and Rudy Gaba, Simi Valley, both of Calif., assignors to Devon Industries, Inc., Torrance, Calif.
Filed Oct. 2, 1990, Ser. No. 591,869
Term of patent 14 years
U.S. Cl. D24—227



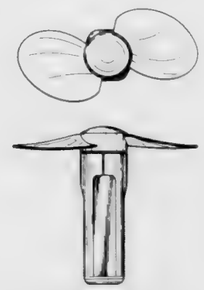
334,974
REINFORCING EXTERIOR SHELL FOR A BATHTUB
Gregory M. Gatarz, East Brunswick, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Jan. 2, 1990, Ser. No. 459,598
Term of patent 14 years
U.S. Cl. D23—304



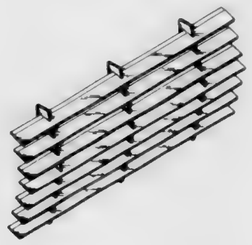
334,975
DISPENSING CONTAINER FOR DETERGENT
Martin C. Bunce, London; Graham P. Gladden, Merseyside, and David P. Myerson, London, all of England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Jan. 24, 1991, Ser. No. 645,661
Claims priority, application United Kingdom, Jul. 25, 1990, 2008537
Term of patent 14 years
U.S. Cl. D23—366



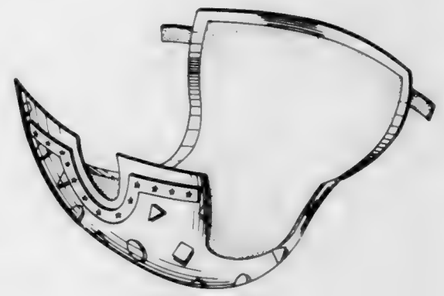
334,976
MINI FAN
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Feb. 24, 1992, Ser. No. 839,441
Claims priority, application United Kingdom, Aug. 23, 1991, 2016927
Term of patent 14 years
U.S. Cl. D23—377



334,977
AIR DIRECTING DEVICE
S. R. Avari, Garden City, N.Y., assignor to CTS Consolidated Technical Services, Inc., Garden City, N.Y.
Filed Jun. 21, 1990, Ser. No. 541,713
Term of patent 14 years
U.S. Cl. D23—387



334,978
DIAPER
Judy Rutherford, Rt. 1, Box 134-A, Grand Chenier, La. 70643
Filed Jun. 26, 1990, Ser. No. 543,576
Term of patent 14 years
U.S. Cl. D24—126



334,979
HYPODERMIC NEEDLE RECAPPER
Kenneth M. Smith, 601 S. Farnum St., Friendsville, Tenn. 37737
Filed Nov. 29, 1990, Ser. No. 620,337
Term of patent 14 years
U.S. Cl. D24—130

334,980
X-RAY MODULAR UNIT

334,982
CONTOURED TOP FOR A MEDICAL EXAMINATION

334,985
FINANCIAL SERVICES KIOSK

334,987
SHUTTER LOUVER WITH VENT OPENINGS

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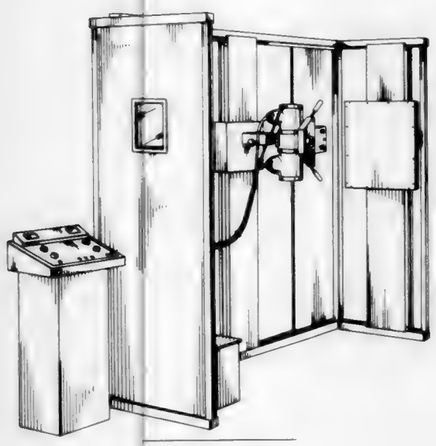
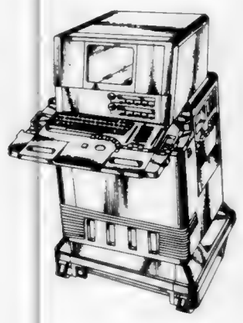
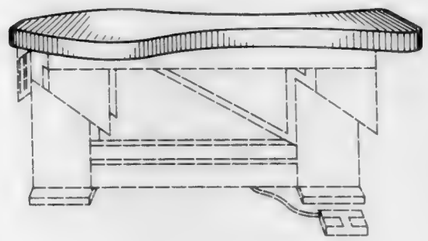
334,980
X-RAY MODULAR UNIT
Joseph B. Pritchard, Willowdale, Canada, assignor to Raymax, Division of 384688 Ontario Limited, Woodbridge, Canada
Filed Apr. 17, 1989, Ser. No. 339,084
Term of patent 14 years
U.S. Cl. D24—158



334,981
CABINET FOR ULTRASOUND IMAGING APPARATUS
Bradley C. Davis, Scottsdale; William G. Shumate, Tempe; Roy Fischer, Phoenix, and Randall Toltzman, Scottsdale, all of Ariz., assignors to Acoustic Imaging Technologies Corporation, Phoenix, Ariz.
Filed Nov. 13, 1989, Ser. No. 434,835
Term of patent 14 years
U.S. Cl. D24—160

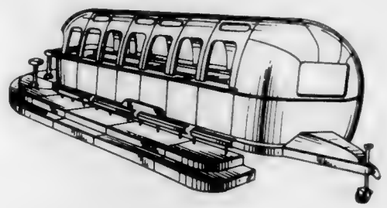


334,982
CONTOURED TOP FOR A MEDICAL EXAMINATION TABLE
Jeffrey M. Riach, Parkton, Md., assignor to Oakworks, Inc., Shrewsbury, Pa.
Filed Jun. 7, 1990, Ser. No. 536,222
Term of patent 14 years
U.S. Cl. D24—183

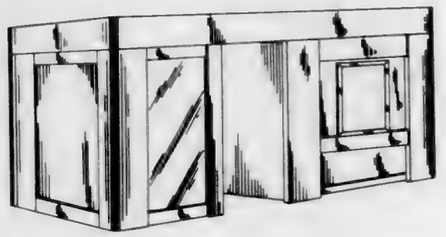


334,983
BABY BOTTLE HOLDER
Kathryn L. Nicholls, 8559 Tunney Ave., Northridge, Calif. 91324
Filed Oct. 18, 1990, Ser. No. 599,385
Term of patent 14 years
U.S. Cl. D24—198

334,984
DINER
Gérard Cholot, Paris, France, assignor to Caravanserail Productions, Paris, France
Filed Jun. 18, 1990, Ser. No. 539,466
Term of patent 14 years
U.S. Cl. D25—1

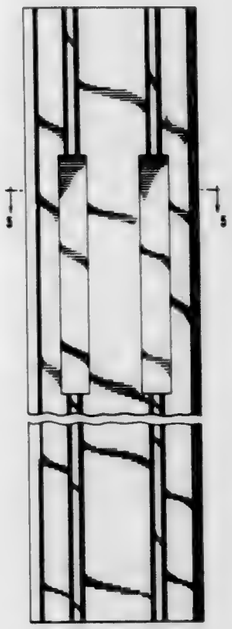


334,985
FINANCIAL SERVICES KIOSK
Richard J. D'Agostino, Charlotte, N.C., and Francis E. Nykiel, East Brookfield, Mass., assignors to Personal Financial Assistant Inc., Charlotte, N.C.
Filed Jul. 16, 1991, Ser. No. 731,014
Term of patent 14 years
U.S. Cl. D25—33

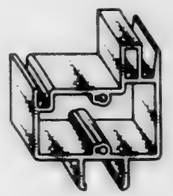


334,986
SHUTTER LOUVER
James W. Robinson, Miami; Jeffery T. Robinson, Davie, and Andrew Bruno, Miramar, all of Fla., assignors to James W. Robinson; Jeffrey T. Robinson and Andrew Bruno, all of Fla.
Filed Jun. 3, 1991, Ser. No. 709,418
Term of patent 14 years
U.S. Cl. D25—47

334,987
SHUTTER LOUVER WITH VENT OPENINGS
James W. Robinson, 15302 SW. 100 Ct., Miami, Fla. 33157; Jeffrey T. Robinson, 15900 Sedgewyck Cir. North, Davie, Fla. 33331, and Andrew Bruno, 7913 Orleans St., Miramar, Fla. 33023, assignors to James W. Robinson; Jeffrey T. Robinson and Andrew Bruno, all of Fla.
Filed Jun. 3, 1991, Ser. No. 709,420
Term of patent 14 years
U.S. Cl. D25—47



334,988
WINDOW MEETING RAIL EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Milkron Industries, Kent, Wash.
Filed May 30, 1991, Ser. No. 708,782
Term of patent 14 years
U.S. Cl. D25—124



334,989

334,991

334,993
COMBINED FLASHLIGHT AND HOLDER THEREFOR

334,995
TUNNEL LIGHTING FIXTURE

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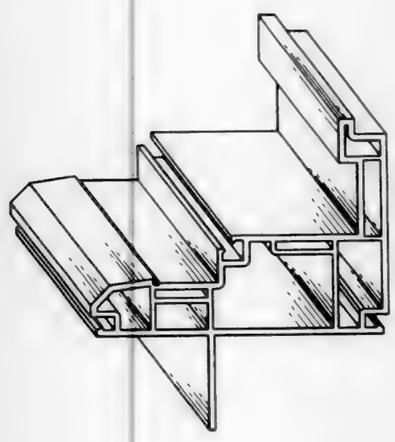
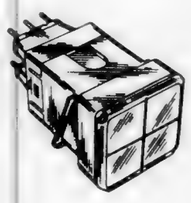
334,989
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed May 7, 1992, Ser. No. 880,355
Term of patent 14 years
U.S. Cl. D25—124

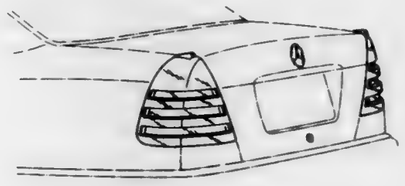


334,990
FLUORESCENT LAMP UNIT FOR LARGE SCREEN INFORMATION DISPLAY
Mikihito Sekiguchi, Tokyo; Nobuaki Shindo, Yokohama; Hitoshi Imamura, Yokohama, and Katsuyuki Ide, Yokohama, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Aug. 29, 1991, Ser. No. 751,697
Claims priority, application Japan, Mar. 4, 1991, 3-5744
Term of patent 14 years
U.S. Cl. D26—1

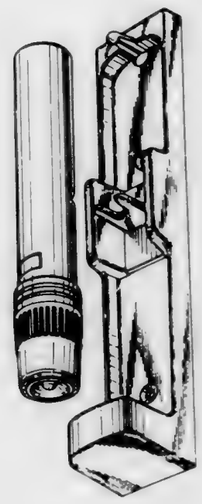


334,991
DECORATIVE LAMP FOR A LIGHT STRING
Kazuaki Murata, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 16, 1991, Ser. No. 731,020
Term of patent 14 years
U.S. Cl. D26—25

334,992
PAIR OF REAR LIGHTS FOR AN AUTOMOBILE
Bruno Sacco; Joseph Gallitzendörfer, and Peter Pfeiffer, all of Sindelfingen, Fed. Rep. of Germany, assignors to Mercedes Benz AG, Fed. Rep. of Germany
Continuation of Ser. No. 710,318, Jun. 5, 1991, abandoned. This application Jun. 19, 1991, Ser. No. 717,703
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1990, 9008363
Term of patent 14 years
U.S. Cl. D26—35

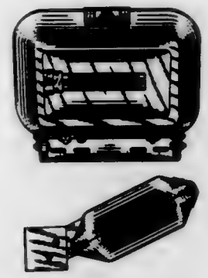


334,993
COMBINED FLASHLIGHT AND HOLDER THEREFOR
Peter K. C. Lee, Kowloon, Hong Kong, assignor to Hip Shing Fat Company Limited, Kowloon, Hong Kong
Filed Feb. 19, 1991, Ser. No. 656,827
Term of patent 14 years
U.S. Cl. D26—38

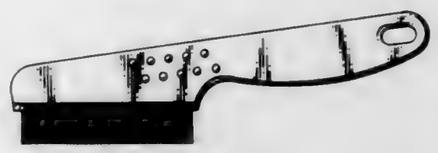


334,994
ADJUSTABLE LAMP
Thierry Blet, Paris, France, assignor to Societe Elixir, Paris, France
Filed Jul. 18, 1991, Ser. No. 732,308
Claims priority, application France, Jan. 18, 1991, 910297
Term of patent 14 years
U.S. Cl. D26—65

334,995
TUNNEL LIGHTING FIXTURE
Francis J. E. Schreder, Linkebeek, Belgium, assignor to Financiere des Applications de L'Electricite S.A., Brussels, Belgium
Filed Aug. 6, 1991, Ser. No. 741,798
Claims priority, application World Int. Prop. O., Feb. 6, 1991, DM/018802; United Kingdom, Jun. 18, 1991, 2015438
Term of patent 14 years
U.S. Cl. D26—87



334,996
COMB
Richard K. Ward, The Paddocks, Lapworth Street, Lapworth, Solihull, West Midlands, Great Britain
Filed Jul. 18, 1990, Ser. No. 553,772
Claims priority, application United Kingdom, Feb. 2, 1990, 2004432
Term of patent 14 years
U.S. Cl. D28—30



334,997
ARTIFICIAL FINGERNAIL FORM
Janet G. McCormick, 117 St. Julian, Worthington, Ohio 43085
Filed Nov. 19, 1990, Ser. No. 616,293
Term of patent 14 years
U.S. Cl. D28—56

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335,000

335,003

335,005
DUAL-CHAMBER BIRD FEEDER

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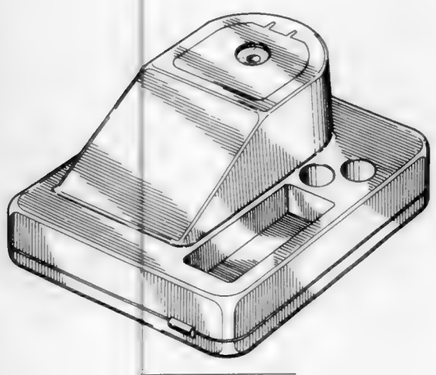
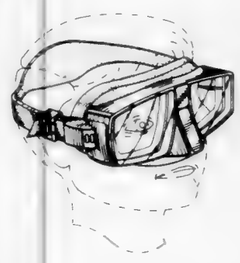
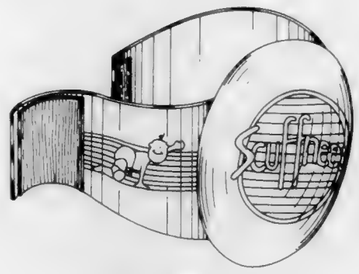
COMBINED ELECTRIC NAIL POLISH REMOVER AND HOLDER FOR MANICURE ITEMS
Ronald C. Warner, Waleska, and Craig M. Warner, Alpharetta, both of Ga., assignors to Ron Warner Associates, Norcross, Ga.
Filed Jan. 7, 1991, Ser. No. 637,746
Term of patent 14 years
U.S. Cl. D28—58



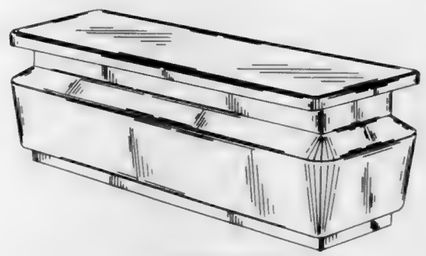
334,999
DIVING MASK
Mark Faulconer, 200 Paris La., #211, Newport Beach, Calif. 92663; Tim Bowman, 2855 Pine Creek Rd. #D429, Costa Mesa, Calif. 92626, and Ian Burgess, 3301 S. Bear St. #46H, Santa Ana, Calif. 92704
Filed Oct. 25, 1991, Ser. No. 782,455
Term of patent 14 years
U.S. Cl. D29—9



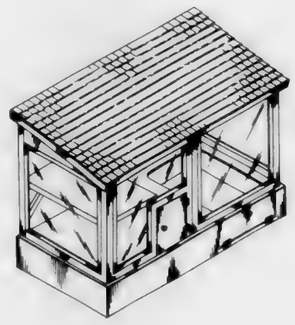
335,000
KNEE PROTECTOR
Kathaleen Johnson, 2300 NE. 33rd Ave. #302, Ft. Lauderdale, Fla. 33305
Filed Jan. 2, 1990, Ser. No. 459,577
Term of patent 14 years
U.S. Cl. D29—10



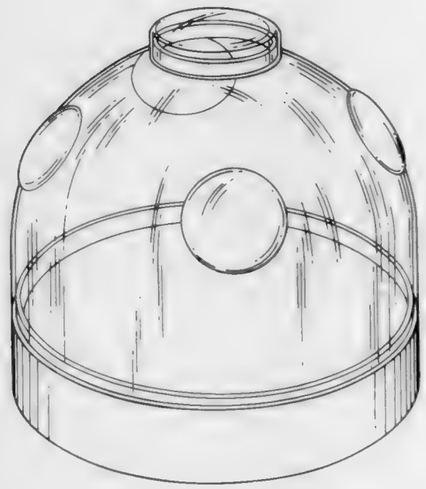
335,001
THERAPEUTIC TRACTION TABLE
George M. Drake, Hixson, Tenn., assignor to Chattanooga Corporation, Hixson, Tenn.
Filed Aug. 6, 1990, Ser. No. 562,956
Term of patent 14 years
U.S. Cl. D24—183



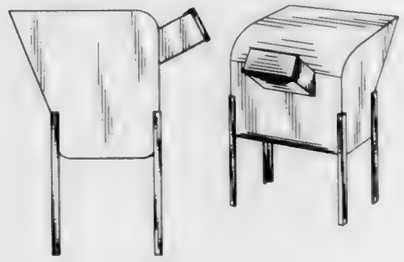
335,002
PET SHELTER
Philip E. Read, and Valerie Read, both of 16711 76th Ave. W., Edmonds, Wash. 98026
Filed Sep. 26, 1991, Ser. No. 766,703
Term of patent 14 years
U.S. Cl. D30—108



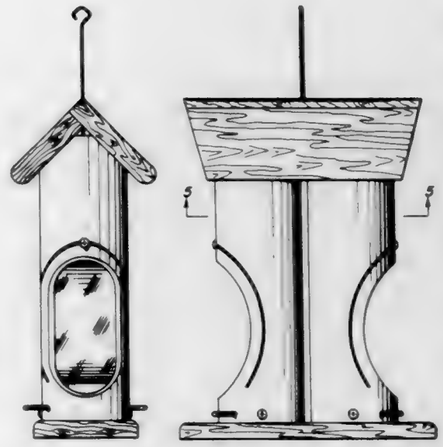
335,003
INSECT HABITAT
Gerard P. O'Connell, 35 Oak Crest Dr., Westfield, Mass. 01085
Continuation-in-part of Ser. No. 377,924, Jul. 10, 1989, Pat. No. Des. 318,935, which is a continuation-in-part of Ser. No. 310,732, Feb. 13, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 740,480
Term of patent 14 years
U.S. Cl. D30—108



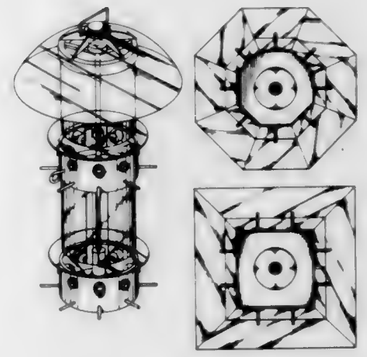
335,004
OSTRICH FEEDER
David N. Poston, Rte. 1, Box 262, Harlingen, Tex. 78552
Filed Jul. 23, 1991, Ser. No. 738,728
Term of patent 14 years
U.S. Cl. D30—121



335,005
DUAL-CHAMBER BIRD FEEDER
Victor Fasino, 62 Oneida; Ave., Landing, N.J. 07850
Filed Apr. 17, 1991, Ser. No. 686,575
Term of patent 14 years
U.S. Cl. D30—126



335,006
BIRD FEEDER
Morton L. Blasbalg, 22 River Rd., East Greenwich, R.I. 02818
Filed Jun. 11, 1990, Ser. No. 535,864
Term of patent 14 years
U.S. Cl. D30—127



335,007
DOG FEEDING TABLE

335,009
PAIL CADDY

335,011
DUST PAN

335,012
TRASH CONTAINER STORAGE CABINET

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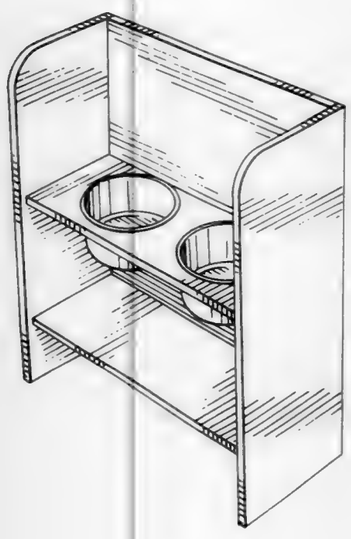
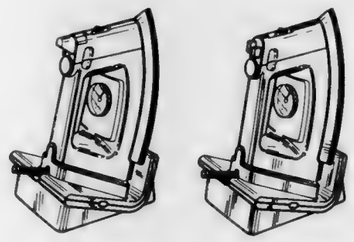
335,007
DOG FEEDING TABLE
Paul D. McPhee, 12 Willis Dr., Aurora, Ontario, Canada L4G 5N8
Filed Aug. 12, 1991, Ser. No. 743,594
Term of patent 14 years
U.S. Cl. D30—133



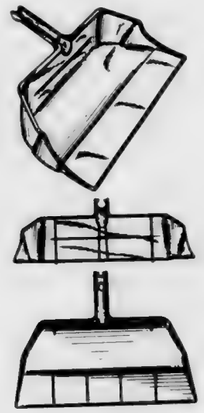
335,008
CLOTHES AND SHOE HOLDER FOR CLOTHES DRYER
David L. Abel, 706 Anthony, Muskogee, Okla. 74403
Filed Apr. 9, 1990, Ser. No. 506,009
Term of patent 14 years
U.S. Cl. D32—36

335,009
PAIL CADDY
Larry K. C. Kunkel, #301, 1655 Haro St., Vancouver, British Columbia, Canada V6G-1G9
Filed Dec. 1, 1988, Ser. No. 278,539
Term of patent 14 years
U.S. Cl. D32—54

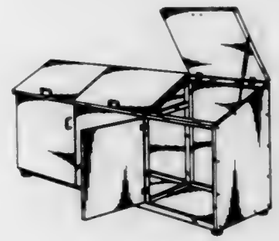
335,010
COMBINED CORDLESS IRON AND ELECTRIC BASE AND STAND UNIT
Tomás B. Vildosola, Eibar Guipuzcoa, Spain, assignor to Oficina de Investigacio Agrupada, Elbar Guipuzcoa, Spain
Filed Dec. 27, 1988, Ser. No. 290,769
Claims priority, application Spain, Jun. 27, 1988, 116.317
The portion of the term of this patent subsequent to Aug. 20, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—68



335,011
DUST PAN
Alan Feldman, Salem, Va., assignor to Empire Brushes, Inc., Greenville, N.C.
Filed Dec. 26, 1990, Ser. No. 633,479
Term of patent 14 years
U.S. Cl. D32—74



335,012
TRASH CONTAINER STORAGE CABINET
Norman J. Broussard, 1766 N. Claudia Ave., Simi Valley, Calif. 93065
Filed Jun. 5, 1991, Ser. No. 710,903
Term of patent 14 years
U.S. Cl. D34—7



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LIST OF PATENTEES

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A. Ahlstrom Corporation: *See—*
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A. B. Dick Company: *See—*
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Abe, Masayuki: *See—*
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Abe, Shunichi, to Canon Kabushiki Kaisha. Image processing apparatus. 5,204,736, Cl. 358-75.000.

Abe, Tomiya: *See—*
Kozakai, Shohei; Hida, Yoshinori; Asano, Hideki; and Abe, Tomiya, 5,204,435, Cl. 528-15.000.

Abiko, Toru; Sakane, Katunobu; Harata, Mitsuru; and Yasuda, Hiroshi, to Toyoda Gosei Co., Ltd.; and Kolbenschmidt Aktiengesellschaft. Method of manufacturing steering wheel. 5,204,043, Cl. 264-267.000.

Abram, Michael F.: *See—*
Erlinger, Michael D.; and Abram, Michael F., 5,203,567, Cl. 273-187.200.

Achan, Douglas M.: *See—*
Cohen, Brett I.; and Achan, Douglas M., 5,204,398, Cl. 524-403.000.

Achelpohl, Fritz; and Jurgens, Werner, to Windmoller & Holscher. Method for manufacturing a sack or bag with a bottom being rectangular in the filled state and with a handle, and a sack or bag manufactured in accordance with said method. 5,203,758, Cl. 493-195.000.

Ackerman, Neil R.; and Jaffee, Bruce D., to Du Pont Merck Pharmaceutical Company. Treatment of organ transplantation rejection. 5,204,329, Cl. 514-15.000.

Acme Manufacturing Company: *See—*
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Adachi, Susumu; Toba, Takahiro; Mukai, Takao; Watanabe, Takashi; and Yokoi, Haruhiko, to Sumitomo Heavy Industries, Ltd. Lactobacillus sp. KPB-167 and method of manufacturing viscose polysaccharides employing the same. 5,204,247, Cl. 435-101.000.

Adam, Randall E.: *See—*
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Adams, Duane A.: *See—*
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Adell, Loren S., 5,203,351, Cl. 128-859.000.

Adlam, Francis C., to Alifabs Limited. Structures. 5,203,131, Cl. 52-236.100.

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Ahladas, Steven J.; and Seminaro, Edward J., to International Business Machines Corporation. Electromagnetic contactor with closure fault indicator. 5,204,633, Cl. 324-654.000.

Ahmad, Syed J.; and Baker, Ralph. Method for making biocontrol agents rhizosphere-competent. 5,204,260, Cl. 435-254.000.

Aida, Ken: *See—*
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Aisin Seiki Kabushiki Kaisha. *See—*
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Naito, Yoshihiro, 5,203,170, Cl. 60-524.000.

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Nozoe, Shigeo; and Ohta, Tomihisa, 5,204,459, Cl. 540-302.000.

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Akahane, Atsushi: *See—*
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Akai, Tadao; and Nishino, Hiromichi, to Shikoku Kakoki Co., Ltd. Apparatus for supplying liquid under constant pressure. 5,203,367, Cl. 137-101.250.

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Akasaka, Hideki: *See—*
Sato, Masatoshi; and Akasaka, Hideki, 5,204,193, Cl. 428-694.000.

Allington, Marcus L., to Racal Defence Electronics (Radar) Limited. Radar reflecting target for reducing radar cross-section. 5,204,680,

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Levenbaum, Warren G.; and Anderson, David, 5,203,472, Cl. 221-15.000.

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Akazawa, Moriaki, to Mitsubishi Denki Kabushiki Kaisha. Vacuum-treatment apparatus. 5,203,981, Cl. 204-298.150.
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Horii, Yoshiharu, to Tokyo Electric Co., Ltd. Ozone filter unit for an electrophotographic apparatus. 5,203,893, Cl. 55-385.100.

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Horne, Frank L., Sr., to Gas-Fired Products, Inc. Apparatus and method for converting an electric water heater to use gas. 5,203,500, Cl. 237-19.000.

Horton, Diego. Device for utilization of geothermal energy. 5,203,173, Cl. 60-641.200.

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Howlett, Philip; Frederickson, Larry; Edwards, Kenneth N.; and Edwards, Edward D., to Dunn Edwards Corp. & Fluid Management Ltd. Part. Process and apparatus for dispensing liquid colorants into a paint can, and quality control therefor. 5,203,387, Cl. 141-103.000.

Hoy, Kenneth L.; Nielsen, Kenneth A.; and Lee, Chinsoo, to Union Carbide Chemicals & Plastics Technology Corporation. Liquid spray application of coatings with supercritical fluids as diluents and spraying from an orifice. 5,203,843, Cl. 239-135.000.

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Hromas, Joe C.; Edwards, A. Glen; and Huber, Klaus B., to Schlumberger Technology Corporation. Method of anchoring a device in a wellbore including opening an orifice between two chambers in response to an electrical signal and moving a piston in response to hydrostatic pressure when the orifice is opened. 5,203,414, Cl. 166-382.000.

Hsieh, Tung-Chiang. Toaster with multi-function. 5,203,252, Cl. 99-339.000.

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Huang, Ming-Chuan. Device for coupling a battery to an electric appliance. 5,203,709, Cl. 439-38.000.

Huang, Shyh-Chin, to General Electric Company. Thermomechanically processed structural elements of titanium aluminides containing chromium, niobium, and boron. 5,204,058, Cl. 420-418.000.

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Inoue, Shunsuke; and Arikawa, Shiro, to Canon Kabushiki Kaisha. Photoelectric conversion device with stabilizing electrode. 5,204,544, Cl. 257-462.000.

Inoue, Tai, to Yazaki Corporation. Indication display unit for vehicles. 5,204,667, Cl. 340-705.000.

Inoue, Toru: *See*—
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Institut Francais du Petrole: *See*—
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Institute of Gas Technology: *See*—
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Intel Corporation: *See*—
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Interconnect Devices, Inc.: *See*—
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InterMetro Industries Corporation: *See*—
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Inui, Hiroyuki; Kuroiwa, Satoshi; Fujii, Yoshito; Ochiai, Toshiaki; Asahara, Takao; and Andou, Yukito, to Toyota Jidosha Kabushiki Kaisha. Parts supply instruction apparatus. 5,204,821, Cl. 364-468.000.

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Parsi, Edgardo J.; Sims, Keith J.; Elyanow, Irving D.; and Prato, Thomas A., 5,203,976, Cl. 204-182.400.

Irwin, Guy L.; and Robin, Andre. Plastic sprocket wheel with replaceable teeth. 5,203,861, Cl. 474-161.000.

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Ishibai, Isao; and Kawai, Yutaka, to Hoya Corporation. Infinite large-aperture lens system with aspherical surfaces. 5,204,781, Cl. 359-708.000.

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Ishida, Takao; and Higure, Naoto, to Kabushiki Kaisha Toshiba. Image forming apparatus having integral toner supply cartridge and toner recovery cartridge. 5,204,720, Cl. 355-260.000.

Ishida, Yasushi: *See*—
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Ishigami, Takashi; Kawai, Mituo; and Yagi, Noriaki, to Kabushiki Kaisha Toshiba. Highly purified titanium material and its named article, a sputtering target. 5,204,057, Cl. 420-417.000.

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Ishii, Tsuneo; Ueda, Tadashi; and Yoshita, Kazuhisa, to Pioneer Electronic Corporation. Digital image recording and reproducing apparatus. 5,204,786, Cl. 360-32.000.

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Ito, Koichi; and Oonishi, Yasuo, to Kabushiki Kaisha Toahiba. Battery powered radio devices having a battery saving function. 5,204,986, Cl. 455-343.000.

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Toussaint, Lee J., to Praxair Technology, Inc. Adsorbent beds for pressure swing adsorption operations. 5,203,887, Cl. 55-25.000.
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Yoneda, Takashi; and Asakura, Takashi, to Kyokuto Kaihatsu Kogyo Co., Ltd. Container carrier. 5,203,670, Cl. 414-589.000.

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Yoneshige, Kazuhiro, to Aisan Kogyo Kabushiki Kaisha. Method of asembling a DC solenoid with a thermistor. 5,204,044, Cl. 264-272.150.

Yoo, Chue-San; Lin, Ting-Hwang; and Kuo, Sui-Hei, to Taiwan Semiconductor manufacturing Company. Contact sidewall tapering with argon sputtering. 5,203,957, Cl. 156-643.000.

York, Robert O., to Du Pont de Nemours, E. I., and Company. Polystyrene foams containing 1,1-defluoroethane. 5,204,169, Cl. 428-220.000.

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Yoshida, Ichiro; Iida, Hiroshi; Kawaashima, Shuzo; Kuroiwa, Fukuji; Ito, Isamu; Asanome, Satoru; and Fujimori, Toshiji, to Fujitsu Limited. Washing/drying method with an aqueous solution containing surfactant. 5,203,927, Cl. 134-21.000.

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Yoshikawa, Mamoru; and Satoh, Taketoshi, to Honda Giken Kogyo Kabushiki Kaisha. Screw type pump. 5,203,683, Cl. 417-440.000.

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Yoshizawa, Atsushi, to Pioneer Electronic Corporation. Optical recording medium. 5,204,152, Cl. 428-64.000.

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Young, Robert N.; Zamboni, Robert; Gauthier, Jacques-Yves; and Belley, Michel L., 5,204,358, Cl. 514-314.000.

Zamir, Amos. Educational device. 5,203,706, Cl. 434-172.000.

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ZCL Mfg Canada Inc.: *See*—
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Zeigler, John M., to United States of America, Energy. Hybird sol-gel optical materials. 5,204,381, Cl. 522-148.000.

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Zimmerman, Steven M., to International Business Machines Corporation. Process and structure of an integrated vacuum microelectronic device. 5,203,731, Cl. 445-24.000.

Zini, Roberto, to Mortara Rangoni Europe S.r.l. Multiple-core, multiple-screen strap-type connecting cable, particularly for electrocardiographs or for other measuring instruments. 5,203,720, Cl. 439-502.000.

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3H Invent A/S: *See*—
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Armbruster, David R.; and Pasion, Merlyn C., to Acme Resin Corp. Alkaline benzylic ether phenolic resin binders. Re. 34,228, Cl. 528-129.000.

Asher, Reginald K.; Endicott, Duane W.; and Lim, Beng L., to Motorola, Inc. Non-cyanide electrode cleaning process. Re. 34,227, Cl. 204-141.500.

Crary Company: *See*—
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Endicott, Duane W.: *See*—
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Federspiel, Mark E.: *See*—
Guntly, Thomas G.; Federspiel, Mark E.; and Kurth, Michael J., Re. 34,224, Cl. 29-888.010.

Guntly, Thomas G.; Federspiel, Mark E.; and Kurth, Michael J., to Tecumseh Products Company. Method of making a carburetor. Re. 34,224, Cl. 29-888.010.

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Guntly, Thomas G.; Federspiel, Mark E.; and Kurth, Michael J., Re. 34,224, Cl. 29-888.010.

Lim, Beng L.: *See*—
Asher, Reginald K.; Endicott, Duane W.; and Lim, Beng L., Re. 34,227, Cl. 204-141.500.

Majkrzak, David S., to Crary Company. Modular sickle bar sections. Re. 34,225, Cl. 56-300.000.

Morishita, Isao, to Yamaha Hatsudoki Kabushiki Kaisha. Cylinder head cooling for multiple valve engine. Re. 34,226, Cl. 123-41.82R.

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Noda, Noriyuki: *See*—
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Shimizu, Motoharu; Noda, Noriyuki; and Noguchi, Yoshihiro, to Hitachi Metals, Ltd. Cylindrical permanent magnet and method of manufacturing. Re. 34,229, Cl. 335-302.000.

Tecumseh Products Company: *See*—
Guntly, Thomas G.; Federspiel, Mark E.; and Kurth, Michael J., Re. 34,224, Cl. 29-888.010.

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Cavaliere, Joseph R.; and Smith, George E., III, to International Business Machines Corporation. Current switch logic circuit with controlled output signal levels. B1 4,894,562, 4-20-93, Cl. 307-455.000.

Choi, Hoon: *See*—
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Pusateri, John F.; and Kidd, Thomas E., to Horsehead Resource Development Co., Inc. Apparatus for the pyrometallurgical treatment of finely divided materials. B1 4,732,368, 4-20-93, Cl. 266-172.000.

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136 5,203,938
148 5,203,939
196 5,203,940
209 5,203,941
230 5,203,942
245 5,203,943
247 5,203,944
345 5,203,945
350 5,203,946
417 5,203,947
443 5,203,948
468 5,203,949
506 5,203,950
554 5,203,951
5,203,952
566 5,203,953
574 5,203,954
628 5,203,955
643 5,203,956
5,203,957
5,203,958
5,203,959
5,203,960
645 5,203,961

CLASS 160
7 5,203,392
67 5,203,393
166.1 5,203,394
263 5,203,395

CLASS 162
4 5,203,962
19 5,203,963
49 5,203,964
55 5,203,965
252 5,203,966
301 5,203,967
380 5,203,968

CLASS 164
305 5,203,396
309 5,203,397
516 5,203,398

CLASS 165
41 5,203,832
5,203,833
59 5,203,400
80.4 5,203,401
104.33 5,203,399
133 5,203,402
5,203,404
151 5,203,403
160 5,203,405
167 5,203,406
174 5,203,407

CLASS 166
70 5,203,408
86 5,203,409
95 5,203,410
186 5,203,412
270 5,203,834
274 5,203,411
281 5,203,413
382 5,203,414

CLASS 168
4 5,203,415

CLASS 169
39 5,203,416

CLASS 173
200 5,203,417

CLASS 174
35 GC 5,204,496
35 R 5,204,497
52.1 5,204,498
65 R 5,204,499

CLASS 175
45 5,203,418

CLASS 177
244 5,203,419
246 5,203,799

CLASS 180
79.1 5,203,420
132 5,203,421
169 5,203,422
179 5,203,423
190 5,203,424

CLASS 181
131 5,204,500
156 5,204,501

CLASS 182
19 5,203,425
57 5,203,426
129 5,203,427
222 5,203,428

CLASS 184
1.5 5,203,429

CLASS 187
17 5,203,430
31 5,203,431
94 5,203,432

CLASS 188
2 F 5,203,433
70 R 5,203,434
322.5 5,203,435
377 5,203,436

CLASS 191
58 5,203,437

CLASS 192
0.094 5,203,440
3.29 5,203,835
58 C 5,203,439
107 C 5,203,438
112 5,203,441

CLASS 198
313 5,203,442
341 5,203,443
418.7 5,203,444
464.3 5,203,445
465.2 5,203,446
807 5,203,447

CLASS 200
4 5,204,502
517 5,203,448

CLASS 203
1 5,203,969
10 5,203,970

CLASS 204
67 5,203,971
129 5,203,972
129.75 5,203,973
141.5 Re.34,227
180.2 5,203,974
181.1 5,203,975
182.4 5,203,976
192.15 5,203,977
252 5,203,978
272 5,203,979
298.08 5,203,980
298.15 5,203,981
301 5,203,982
427 5,203,983
435 5,203,984

CLASS 205
193 5,203,985
305 5,203,986

CLASS 206
1.5 5,203,449
63.5 5,203,450
214 5,203,451
315.3 5,203,453
328 5,203,454
329 5,203,452
333 5,203,455
349 5,203,456
499 5,203,457
507 5,203,836
524.8 5,203,458
572 5,203,459

CLASS 208
59 5,203,987
65 5,203,988

CLASS 209
402 5,203,460
455 5,203,461

CLASS 210
137 5,203,989
169 5,203,990
198.2 5,203,991
5,203,992
221.1 5,203,993
232 5,203,994
274 5,203,995
386 5,203,996
490 5,203,997
493.5 5,203,998
512.3 5,203,999
519 5,204,000
608 5,204,001
634 5,204,002
651 5,204,003
5,204,004
656 5,204,005
696 5,204,006
705 5,204,007
759 5,204,008
772 5,204,009

CLASS 211
14 5,203,462
59.3 5,203,463
151 5,203,464

CLASS 212
195 5,203,837

CLASS 215
253 5,203,838

CLASS 219
10.55 B 5,204,503
5,204,504
86.8 B1 4,904,838
121.37 5,204,506
121.59 5,204,508
121.6 5,204,987
121.63 5,204,505
121 82 5,204,507
201 5,204,509
464 5,204,510

CLASS 220
206 5,203,465
209 5,203,466
254 5,203,467
5,203,468
331 5,203,469
462 5,203,470
755 5,203,471

CLASS 221
15 5,203,472

CLASS 222
94 5,203,473
129.1 5,203,474
136 5,203,476
137 5,203,839
153 5,203,477
321 5,203,840
402.11 5,203,841
402.13 5,203,478

CLASS 224
42.13 5,203,479
103 5,203,480
148 5,203,481
257 5,203,482
321 5,203,483
324 5,203,484

CLASS 226
97 5,203,485
142 5,203,486

CLASS 228
102 5,203,487
122 5,203,488
219 5,203,489

CLASS 229
1.5 B 5,203,490
2.5 R 5,203,491
4.5 5,203,492
103 5,203,493
148 5,203,494
225 5,203,495

CLASS 235
145 R 5,204,511
382 5,204,512
449 5,204,513
454 5,204,514
456 5,204,515
493 5,204,526

CLASS 236
12.2 5,203,496
46 R 5,203,497

CLASS 237
2 A 5,203,498
5,203,499
19 5,203,500

CLASS 238
265 5,203,501
283 5,203,502

CLASS 239
1 5,203,503
10 5,203,504
43 5,203,505
135 5,203,843
224 5,203,506
227 5,203,842
290 5,203,508
373 5,203,507
405 5,203,509
667 5,203,510

CLASS 241
5 5,203,511
16 5,203,512
30 5,203,513
81 5,203,514
89.3 5,203,515

CLASS 242
58.6 5,203,801
71.8 5,203,516
96 5,203,517
130 5,203,518
192 5,203,519

CLASS 244
2 5,203,520
12.2 5,203,521
17.11 5,203,522
30 5,203,523
75 A 5,203,524
129.4 5,203,525
158 R 5,203,844

CLASS 248
87 5,203,526
118 5,203,527
5,203,845
188.4 5,203,528
228 5,203,529
309.1 5,203,530
311.3 5,203,531
394 5,203,532
542 5,203,871
676 5,203,533

CLASS 250
201.5 5,204,516
205 5,204,517
206.1 5,204,518
208.1 5,204,519
214 LS 5,204,521
214 VT 5,204,522
214.1 5,204,520
236 5,204,523
237 G 5,204,524
252.1 5,204,525
255 5,204,528
268 5,204,529
281 5,204,530
306 5,204,531
341 5,204,532
361 R 5,204,533
390.07 5,204,527
492.1 5,204,534
548 5,204,535
551 5,204,536
560 5,204,537
571 5,204,538

CLASS 251
7 5,203,534
48 5,203,535
74 5,203,536
82 5,203,872
129.06 5,203,537
129.19 5,203,538
308 5,203,539

CLASS 252
8.75 5,204,010
48.4 5,204,011
52 A 5,204,012
62.9 5,204,013
117 5,204,014
162 5,204,016
174.12 5,204,015
299.61 5,204,017
299.63 5,204,018
299.66 5,204,019
299.67 5,204,020
301.4 H 5,204,021
363.5 5,204,022
367 5,204,023
384 5,204,024
500 5,204,025
542 5,204,026

CLASS 254
8 B 5,203,540
218 5,203,541

CLASS 256
10 5,203,542
13.1 5,203,543
17 5,203,544

CLASS 257
21 5,204,539
138 5,204,541
221 5,204,989
315 5,204,542
356 5,204,988
378 5,204,543
462 5,204,544
480 5,204,540
490 5,204,545
528 5,204,735
532 5,204,546
904 5,204,990

CLASS 261
112.2 5,204,027
122.1 5,204,028

CLASS 264
4.4 5,204,029
29.2 5,204,030
51 5,204,040
63 5,204,031
85 5,204,032
136 5,204,033
138 5,204,034
146 5,204,035
152 5,204,036
171 5,204,037
184 5,204,038
209.2 5,204,039
210.8 5,204,041
257 5,204,042
267 5,204,043
272.15 5,204,044
323 5,204,045
328.1 5,204,046
5,204,047
339 5,204,048
502 5,204,049
504 5,204,050
572 5,204,051

CLASS 266
172 B1 4,732,368

CLASS 267
47 5,203,545
168 5,203,546

CLASS 269
21 5,203,547
302.1 5,203,548

CLASS 270
1 5,203,549
53 5,203,550
59 5,203,551

CLASS 271
9 5,203,552
10 5,203,553
5,203,554
125 5,203,846
263 5,203,555
308 5,203,556

CLASS 273
25 5,203,557
29 A 5,203,558
37 5,203,559
58 E 5,203,560
81 R 5,203,561
146 5,203,562
148 B 5,203,563
157 R 5,203,847
161 5,203,564
164.1 5,203,565
176 E 5,203,566
187.2 5,203,567
5,203,568
5,203,569
5,203,570
286 5,203,571
344 5,203,572
422 5,203,573
435 5,203,848

CLASS 277
6 5,203,574
59 5,203,575
163 5,203,849
235 B 5,203,576

CLASS 280
30 5,203,577
33.991 5,203,578
5,203,579
47.331 5,203,580
87.051 5,203,581
438.1 5,203,850
477 5,203,582
602 5,203,583
707 5,203,584
713 5,203,585
728 5,203,586
740 5,203,587
804 5,203,588
816 5,203,589

CLASS 281
21.1 5,203,590

CLASS 283
81 5,203,591
5,203,851

CLASS 285
14 5,203,592
49 5,203,593
105 5,204,926
112 5,203,594
325 5,203,595

CLASS 292
204 5,203,596
258 5,203,597

CLASS 294
1.4 5,203,598
8.6 5,203,852
66.1 5,203,599

CLASS 296
68.1 5,203,600
77.1 5,203,601
96.15 5,203,602
100 5,203,603
153 5,203,604
219 5,203,605

CLASS 297
201 5,203,606
214 5,203,607
303 5,203,853
320 5,203,608
344 5,203,609
345 5,203,610
457 5,203,611
466 5,203,612
485 5,203,613

CLASS 299
33 5,203,614
39 5,203,615

CLASS 303
10 5,203,616
116.2 5,203,617

CLASS 307
10 5,204,547
10.7 5,204,991
5,204,992
66 5,204,548
201 5,204,549
263 5,204,550
265 5,204,551

271 5,204,552
272.2 5,203,867
296.2 B1 5,034,625
443 5,204,553
5,204,554
455 B1 4,894,562
465 5,204,555
465 1 5,204,556
475 5,204,557
5,204,558
480 5,204,559
530 5,204,560
571 5,204,561
5,204,562
585 5,204,563
603 5,204,564

CLASS 310
71 5,204,565
5,204,566
90 5,204,567
90.5 5,204,568
154 5,204,569
156 5,204,570
5,204,571
5,204,572
198 5,204,573
233 5,204,574
313 B 5,204,575
317 5,204,576
323 5,204,577

CLASS 312
247 5,203,619
290 5,203,618
334 46 5,203,620

CLASS 313
25 5,204,578
143 5,204,579
318 5,204,580
336 5,204,581
468 5,204,582
496 5,204,583
565 5,204,584

CLASS 315
15 5,204,585
159 5,204,586
308 5,204,587
349 5,204,588
364 5,204,589

CLASS 318
106 5,204,591
254 5,204,593
5,204,594
430 5,204,595
466 5,204,592
523 5,204,596
567 5,204,597
568 1 5,204,598
571 5,204,599
602 5,204,600
606 5,204,601
630 5,204,602
657 5,204,603
701 5,204,604
721 5,204,605
800 5,204,606
806 5,204,607

CLASS 320
2 5,204,608
5,204,609
15 5,204,610
21 5,204,611

CLASS 323
317 5,204,612

CLASS 324
95 5,204,613
5,204,614
158 F 5,204,615
158 P 5,204,616
158 R 5,204,617
5,204,618
174 5,204,619
175 5,204,620
207.18 5,204,621
220 5,204,622
228 5,204,623
248 5,204,624
306 5,204,625
309 5,204,626
5,204,627
316 5,204,628
318 5,204,629
399 5,204,630
493 5,204,403
557 5,204,632
654 5,204,633

CLASS 328
165 5,204,631

CLASS 329
325 5,204,634
336 5,204,635

CLASS 330
85 5,204,636
129 5,204,637
252 5,204,638
294 5,204,639

CLASS 331
9 5,204,640
96 5,204,641
135 5,204,642

CLASS 333
81 R 5,204,643
127 5,204,644

CLASS 334
1 5,204,645

CLASS 335
78 5,204,646
80 5,204,647
210 5,204,648
5,204,649
216 5,204,650
219 5,204,651
238 5,204,652
302 Re 34,229

CLASS 336
178 5,204,653

CLASS 337
204 5,204,654

CLASS 338
312 5,204,655

CLASS 340
311.1 5,204,656
568 5,204,657
700 5,204,658
703 5,204,664
5,204,665
705 5,204,666
5,204,667
726 5,204,668
784 5,204,659
5,204,660
5,204,661
825.25 5,204,662
825 34 5,204,663
825.52 5,204,669
825 54 5,204,670
825.650 5,204,671
825.71 5,204,672
853 8 5,204,673
870 25 5,204,674
933 5,204,675

CLASS 341
61 5,204,676
118 5,204,677
152 5,204,678
159 5,204,679

CLASS 342
4 5,204,680
51 5,204,681
117 5,204,682
150 5,204,683
182 5,204,684
360 5,204,685
374 5,204,686

CLASS 343
702 5,204,687
800 5,204,688

CLASS 346
1.1 5,204,689
5,204,690
5,204,691
76 PH 5,204,692
5,204,704
108 5,204,693
5,204,694
140 R 5,204,695
155 5,204,696
159 5,204,697
160 5,204,698
5,204,699

CLASS 351
43 5,204,700
121 5,204,701
175 5,204,702
210 5,204,703
221 5,204,705

CLASS 352
129 5,204,706

CLASS 354
75 5,204,707
105 5,204,708
266 5,204,709
402 5,204,710
403 5,204,714
475 5,204,715

CLASS 355
24 5,204,716
53 5,204,711
5,204,712
210 5,204,713
219 5,204,717
246 5,204,718
247 5,204,719
260 5,204,720
5,204,721
279 5,204,722
285 5,204,723
308 5,204,724
313 5,204,725
316 5,204,726
321 5,204,727
323 5,204,728
326 5,204,729
5,204,730

CLASS 356
1 5,204,731
4 5,204,732
243 5,204,733
359 5,204,734

CLASS 358
75 5,204,736
5,204,737
5,204,738
93 5,204,739
105 5,204,740
5,204,741
108 5,204,742
133 5,204,743
140 5,204,744
5,204,745
158 5,204,746
162 5,204,747
169 5,204,748
227 5,204,749
247 5,204,750
248 5,204,751
296 5,204,752
298 5,204,753
339 5,204,754
400 5,204,755
426 5,204,756
444 5,204,757
5,204,758
5,204,759
456 5,204,760
461 5,204,761
474 5,204,762

CLASS 359
51 5,204,763
60 5,204,764
70 5,204,765
81 5,204,766
125 5,204,767
148 5,204,768
205 5,204,769
264 5,204,770
281 5,204,771
296 5,204,772
361 5,204,773
418 5,204,774
442 5,204,775
466 5,204,776
540 B1 4,896,943
596 5,204,777
604 5,204,778
688 5,204,779
690 5,204,780
708 5,204,781
786 5,204,782
811 5,204,783
849 5,204,784
876 5,204,785

CLASS 360
32 5,204,786
36.1 5,204,787
46 5,204,788
67 5,204,789
68 5,204,790
95 5,204,791
96 5 5,204,792
97.01 5,204,793
104 5,204,795
132 5,204,796
133 5,204,794

CLASS 361
93 5,204,797
5,204,798
104 5,204,799
111 5,204,800
151 5,204,801
154 5,204,802
361 5,204,803
386 5,204,804
5,204,805
398 5,204,806
399 5,204,807

CLASS 362
66 5,203,621
109 5,203,622
135 5,203,623
158 5,203,624
202 5,203,625
250 5,203,626
374 5,203,627

CLASS 363
132 5,204,809

CLASS 364
191 5,204,810
406 5,204,811
419 5,204,812
5,204,813
424 02 5,204,814
424 05 5,204,815
431.11 5,204,816
449 5,204,817
459 5,204,818
465 5,204,819
468 5,204,820
5,204,821
470 5,204,822
473 5,204,823
474 03 5,204,824
552 5,204,826
715 04 5,204,825
724 1 5,204,827
736 5,204,828
748 5,204,829
754 5,204,830
785 5,204,831
788 5,204,832

CLASS 365
45 5,204,833
154 5,204,834
185 5,204,835
200 5,204,836
201 5,204,837
203 5,204,838
204 5,204,839
228 5,204,840
230.03 5,204,842
230.05 5,204,841

CLASS 366
2 5,203,628
5,203,629
292 5,203,630

CLASS 367
20 5,204,843
163 5,204,844

CLASS 368
156 5,204,845
228 5,204,846

CLASS 369
13 5,204,847
48 5,204,848
75.2 5,204,849
5,204,850
126 5,204,851
275.1 5,204,852
289 5,204,853

CLASS 370
32.1 5,204,854
50 5,204,855
5,204,856
60 5,204,857
94.1 5,204,858
105.1 5,204,859
110.1 5,204,860
5,204,861
5,204,862

CLASS 371
16.3 5,204,863
29 5 5,204,864
67 1 5,204,865

CLASS 372
27 5,204,866
33 5,204,867
34 5,204,868
43 5,204,869
5,204,870
45.1 5,204,871

CLASS 373
104 5,204,872
108 5,204,873

CLASS 374
123 5,203,631
144 5,203,632

CLASS 375
1 5,204,874
5,204,875
5,204,876
5,204,877
14 5,204,878
20 5,204,879
36 5,204,880
60 5,204,881
106 5,204,882
116 5,204,883

CLASS 376
261 5,204,052
267 5,204,053
296 5,204,054

CLASS 377
10 5,204,884
54 5,204,885

CLASS 378
34 5,204,886
43 5,204,887
53 5,204,888
54 5,204,889
133 5,204,890
143 5,204,891
152 5,204,892

CLASS 379
53 5,204,893
88 5,204,894
100 5,204,895
106 5,204,896

CLASS 380
4 5,204,897
14 5,204,898
5,204,899
20 5,204,900
21 5,204,901
23 5,204,902
46 5,204,903

CLASS 381
13 5,204,904
36 5,204,906
52 5,204,905
69 5,204,917
91 5,204,907
104 5,204,908
106 5,204,909

CLASS 382
8 5,204,910
5,204,911
5,204,912
5,204,913
14 5,204,914
21 5,204,915
41 5,204,916
5,204,918
54 5,204,919
5,204,920

CLASS 383
17 5,203,633
205 5,203,634

CLASS 384
433 5,203,854

CLASS 385
17 5,204,921
18 5,204,922
24 5,204,923
43 5,204,924
53 5,204,933
89 5,204,925
121 5,204,927
128 5,204,928
135 5,204,929
143 5,204,930
146 5,204,931

CLASS 388
815 5,204,932

CLASS 395
2 5,204,934
3 5,204,935
11 5,204,936
25 5,204,937
27 5,204,938
51 5,204,939
5,204,940
64 5,204,941
83 5,204,942
118 5,204,943
127 5,204,944
134 5,204,945
146 5,204,946
157 5,204,947
162 5,204,948
200 5,204,949
5,204,950
325 5,204,951
400 5,204,953
425 5,204,954
550 5,204,952
575 5,204,955
5,204,956
600 5,204,958
5,204,959
700 5,204,960
725 5,204,961
5,204,962
750 5,204,963
5,204,964
800 5,204,957
5,204,965
5,204,966
5,204,967
5,204,968
5,204,969

CLASS 400
54 5,203,636
91 5,203,635

CLASS 401
17 5,203,638
202 5,203,637

CLASS 403
382 5,203,639
403 5,203,640

CLASS 404
93 5,203,641
118 5,203,642

CLASS 405
61 5,203,643
128 5,203,644
191 5,203,645
5,203,646
259 1 5,203,647

CLASS 407
113 5,203,648
114 5,203,649

CLASS 408
1 R 5,203,650
5,203,855
59 5,203,651
112 5,203,652
159 5,203,856
207 5,203,653
226 5,203,654

CLASS 410
3 5,203,655

CLASS 411
149 5,203,656
399 5,203,657

CLASS 414
24.6 5,203,658
226 5,203,659
257 5,203,660
320 5,203,802
331 5,203,661
339 5,203,662
401 5,203,663
407 5,203,664
412 5,203,665
416 5,203,666
477 5,203,667
500 5,203,668
525 2 5,203,669
589 5,203,670
791.6 5,203,671

CLASS 415
2 1 5,203,672
173.2 5,203,673
211.2 5,203,674

CLASS 416
96 A 5,203,873
140 5,203,675
223 A 5,203,676

CLASS 417
12 5,203,677
38 5,203,803
218 5,203,678
312 5,203,679
364 5,203,680
424 1 5,203,681
435 5,203,682
440 5,203,683
484 5,203,684
552 5,203,857

CLASS 418
1 5,203,685
36 5,203,858
63 5,203,686

CLASS 419
2 5,204,055

CLASS 420
71 5,204,056
57 5,204,149
58 5,204,150
60 5,204,151
6 5,203,695
8 5,203,804
29 5,203,696

CLASS 446
163 5,203,732
416 5,204,310

CLASS 503
403 5,204,398
404 5,204,399
405 5,204,400

CLASS 602
4 5,203,763

CLASS 604
11 5,203,767
20 5,203,768
104 5,203,773
165 5,203,774
256 5,203,775
338 5,203,806

CLASS 606
7 5,203,779
104 5,203,784
140 5,203,863
151 5,203,786
5,203,864
232 5,203,787

CLASS 623
6 5,203,788
5,203,789

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CLASS 420

71 5,204,056
417 5,204,057
418 5,204,058
445 5,204,059

CLASS 422

28 5,204,060
56 5,204,061
5,204,062
58 5,204,063
106 5,204,064
113 5,204,065
174 5,204,066
177 5,204,067
180 5,204,068
185 5,204,069
186 5,204,070
194 5,204,071

CLASS 423

2 5,204,072
58 5,204,073
112 5,204,074
219 5,204,075
328.2 5,204,077
331 5,204,078
376 5,204,079
412 5,204,080
478 5,204,081
539 5,204,082
613 5,204,083
619 B1 4,654,077
622 5,204,084
700 5,204,076

CLASS 424

4 5,204,085
5 5,204,086
44 5,204,087
45 5,204,113
47 5,204,088
58 5,204,089
59 5,204,090
65 5,204,091
70 5,204,092
73 5,204,093
85.2 5,204,094
86 5,204,095
89 5,204,096
92 5,204,097
5,204,098
93 L 5,204,100
195 5,204,103
195.1 5,204,101
5,204,102
401 5,204,099
5,204,104
5,204,105
423 5,204,106
426 5,204,107
434 5,204,108
443 5,204,109
5,204,110
451 5,204,111
465 5,204,114
470 5,204,115
489 5,204,118
5,204,119
495 5,204,121

CLASS 425

116 5,204,122
132 5,204,120
141 5,204,123
145 5,204,124
298 5,204,125
388 B1 4,508,500
412 5,204,126
544 5,204,127

CLASS 426

3 5,204,128
5,204,129
115 5,204,130
243 5,204,131
283 5,204,132
393 5,204,133
580 5,204,134
589 5,204,135
594 5,204,136
637 5,204,137

CLASS 427

77 5,204,139
126.3 5,204,140
255.3 5,204,141
285 5,204,142
387 5,204,143
569 5,204,144
577 5,204,145
578 5,204,138

CLASS 428

7 5,204,146
35.8 5,204,147
40 5,204,148
57 5,204,149
58 5,204,150
60 5,204,151
64 5,204,152
5,204,153
68 5,204,154
95 5,204,155
96 5,204,156
105 5,204,157
134 5,204,158
143 5,204,159
167 5,204,160
174 5,204,161
192 5,204,162
195 5,204,163
5,204,164
198 5,204,165
209 5,204,166
212 5,204,167
216 5,204,168
220 5,204,169
234 5,204,171
244 5,204,170
251 5,204,172
284 5,204,173
286 5,204,174
288 5,204,175
304.4 5,204,176
328 5,204,177
333 5,204,178
336 5,204,179
349 5,204,180
5,204,181
5,204,182
402.21 5,204,184
5,204,185
402.24 5,204,183
447 5,204,186
473 5,204,116
5,204,187
476.3 5,204,188
484 5,204,189
531 5,204,190
650 5,204,191
694 5,204,192
5,204,193

CLASS 429

7 5,204,194
59 5,204,195
192 5,204,196
249 5,204,197

CLASS 430

49 5,204,198
58 5,204,199
5,204,200
59 5,204,201
66 5,204,202
96 5,204,203
108 5,204,204
109 5,204,205
114 5,204,207
137 5,204,208
198 5,204,210
232 5,204,211
249 5,204,212
253 5,204,206
264 5,204,213
5,204,214
270 5,204,215
5,204,216
5,204,217
5,204,218
272 5,204,219
275 5,204,220
281 5,204,221
5,204,222
5,204,223
315 5,204,224
325 5,204,225
326 5,204,226
331 5,204,227
393 5,204,228
399 5,204,229
450 5,204,230
507 5,204,231
512 5,204,232
523 5,204,233
567 5,204,234
569 5,204,235
579 5,204,236

CLASS 431

14 5,203,687
51 5,203,688
114 5,203,689
236 5,203,690
278 5,203,691
284 5,203,692

CLASS 432

30 5,203,859
110 5,203,693

CLASS 433

1 5,203,694
6 5,203,695
8 5,203,804
29 5,203,696
81 5,203,697
88 5,203,698
93 5,203,699
169 5,203,700
215 5,203,701

CLASS 434

85 5,203,702
127 5,203,703
156 5,203,704
169 5,203,705
172 5,203,706
226 5,203,707
267 5,203,708

CLASS 435

6 5,204,237
5,204,238
7.1 5,204,239
13 5,204,240
15 5,204,241
28 5,204,242
69.1 5,204,243
69.6 5,204,244
87 5,204,245
101 5,204,247
119 5,204,248
122 5,204,249
134 5,204,250
5,204,251
172.3 5,204,253
202 5,204,254
215 5,204,255
226 5,204,256
239 5,204,257
252.3 5,204,259
254 5,204,260
255 5,204,252
5,204,261
270 5,204,246
291 5,204,262
315 5,204,263

CLASS 436

8 5,204,264
5,204,265
11 5,204,266
14 5,204,267
44 5,204,268
47 5,204,269
157 5,204,270

CLASS 437

4 5,204,272
6 5,204,273
31 5,204,274
5,204,275
5,204,276
5,204,277
40 5,204,278
47 5,204,279
52 5,204,280
5,204,281
62 5,204,282
105 5,204,283
127 5,204,284
187 5,204,285
195 5,204,286
217 5,204,287
228 5,204,288

CLASS 439

38 5,203,709
71 5,203,710
199 5,203,805
215 5,203,711
5,203,712
5,203,713
326 5,203,714
354 5,203,715
411 5,203,716
460 5,203,717
489 5,203,718
5,203,719
502 5,203,720
581 5,203,721
589 5,203,723
595 5,203,722
636 5,203,725
792 5,203,724
867 5,203,726

CLASS 440

1 5,203,727
38 5,203,728
48 5,203,729
61 5,203,730

CLASS 441

40 5,203,860

CLASS 445

24 5,203,731

CLASS 446

163 5,203,732
444 5,203,733

CLASS 452

32 5,203,734
38 5,203,735
135 5,203,736

CLASS 454

139 5,203,737

CLASS 455

69 5,204,970
76 5,204,978
185.1 5,204,971
207 5,204,972
212 5,204,973
226 5,204,974
231 5,204,975
234.2 5,204,976
5,204,977
276.1 5,204,979
277.1 5,204,980
5,204,981
295 5,204,982
315 5,204,983
319 5,204,984
343 5,204,985
5,204,986

CLASS 460

16 5,203,738

CLASS 462

6 5,203,739

CLASS 464

89 5,203,740
111 5,203,741

CLASS 470

63 5,203,742
82 5,203,874

CLASS 472

7 5,203,743
131 5,203,744

CLASS 474

161 5,203,861
206 5,203,745
5,203,746

CLASS 475

72 5,203,747
183 5,203,748
204 5,203,749
230 5,203,750
282 5,203,862

CLASS 482

36 5,203,752
54 5,203,800
70 5,203,751
111 5,203,753
124 5,203,754
144 5,203,755

CLASS 492

16 5,203,756

CLASS 493

44 5,203,757
195 5,203,758
214 5,203,759
302 5,203,760
346 5,203,761

CLASS 494

7 5,203,762

CLASS 501

1 5,204,319
5 5,204,289
14 5,204,290
21 5,204,291
61 5,204,292
72 5,204,293
92 5,204,294
96 5,204,295
97 5,204,296
5,204,297
108 5,204,298
127 5,204,299
5,204,300
136 5,204,301

CLASS 502

1 5,204,302
9 5,204,303
116 5,204,304
124 5,204,305
155 5,204,306
5,204,307
208 5,204,308
306 5,204,309
416 5,204,310

CLASS 503

201 5,204,311
227 5,204,312

CLASS 504

191 5,203,907

CLASS 505

1 5,204,313
5,204,314
5,204,315
5,204,316
5,204,317
5,204,318

CLASS 507

121 5,204,320

CLASS 512

6 5,204,322

CLASS 514

1 5,204,321
5,204,323
5,204,324
4 5,204,325
11 5,204,326
12 5,204,327
13 5,204,328
15 5,204,329
31 5,204,330
54 5,204,331
63 5,204,332
5,204,333
96 5,204,334
105 5,204,335
107 5,204,336
182 5,204,337
5,204,339
183 5,204,338
209 5,204,374
210 5,204,340
212 5,204,341
219 5,204,342
221 5,204,343
227.8 5,204,344
231.5 5,204,345
234.5 5,204,346
249 5,204,347
253 5,204,348
5,204,349
255 5,204,350
256 5,204,351
258 5,204,352
5,204,353
259 5,204,354
283 5,204,355
304 5,204,356
307 5,204,357
314 5,204,358
332 5,204,359
342 5,204,360
375 5,204,361
383 5,204,362
5,204,363
399 5,204,364
5,204,365
424 5,204,366
453 5,204,367
455 5,204,368
456 5,204,369
475 5,204,370
530 5,204,371
675 5,204,372
720 5,204,373
784 5,204,375

CLASS 521

32 5,204,376
60 5,204,377

CLASS 522

39 5,204,378
96 5,204,379
148 5,204,380
5,204,381

CLASS 523

115 5,204,382
118 5,204,383
211 5,204,384
417 5,204,385
443 5,204,386
5,204,387

CLASS 524

30 5,204,388
72 5,204,389
91 5,204,390
100 5,204,391
101 5,204,392
5,204,393
125 5,204,394
265 5,204,395
394 5,204,396
401 5,204,397
403 5,204,398
404 5,204,399
405 5,204,400
441 5,204,401
450 5,204,402
501 5,204,404

CLASS 525

64 5,204,405
73 5,204,406
99 5,204,407
105 5,204,408
123 5,204,409
132 5,204,410
185 5,204,412
273 5,204,413
327.8 5,204,414
328.1 5,204,415
390 5,204,416
444 5,204,417
445 5,204,418

CLASS 526

153 5,204,419
162 5,204,420
200 5,204,421
204 5,204,422
256 5,204,423
5,204,424
268 5,204,425
278 5,204,426
282 5,204,427
298 5,204,428
308 5,204,429
314 5,204,430

CLASS 528

4 5,204,431
10 5,204,432
12 5,204,433
14 5,204,434
15 5,204,435
5,204,436
5,204,437
25 5,204,438
44 5,204,439
58 5,204,440
70 5,204,441
125 5,204,442
129 Re.34,228
184 5,204,443
421 5,204,444

CLASS 530

325 5,204,446
326 5,204,445
381 5,204,447
391.5 5,204,448
391.7 5,204,449
395 5,204,450
403 5,204,258
413 5,204,451
420 5,204,452

CLASS 534

602 5,204,453
805 5,204,454

CLASS 536

22.1 5,204,455
25.33 5,204,456
101 5,204,457

CLASS 540

222 5,204,458
302 5,204,459
357 5,204,460
362 5,204,461

CLASS 544

92 5,204,462
114 5,204,463
124 5,204,464
295 5,204,465
317 5,204,466

CLASS 546

94 5,204,467
114 5,204,468
5,204,469
126 5,204,470
144 5,204,471
168 5,204,472
188 5,204,473
193 5,204,474
210 5,204,475
290 5,204,476
303 5,204,477
315 5,204,478
328 5,204,479
344 5,204,480

CLASS 548

157 5,204,481
200 5,204,482

CLASS 602

4 5,203,763
5 5,203,764
18 5,203,765
21 5,203,766

CLASS 604

11 5,203,767
20 5,203,768
32 5,203,769
51 5,203,770
53 5,203,771
95 5,203,772
104 5,203,773
165 5,203,774
256 5,203,775
264 5,203,776
280 5,203,777
317 5,203,778
338 5,203,806

CLASS 606

7 5,203,779
14 5,203,780
15 5,203,781
31 5,203,782
53 5,203,783
104 5,203,784
140 5,203,863
151 5,203,786
5,203,864
166 5,203,865
186 5,203,866
205 5,203,785
232 5,203,787

CLASS 623

6 5,203,788
5,203,789
5,203,790
20 5,203,807
24 5,203,791

D1— 105 334,828
199 334,829
D2— 245 334,830
515 334,860
553 334,861
604 334,862
D10— 30 334,890
32 334,891
64 334,892
114 334,921
116 334,922
118 334,923
D21— 106 334,952
108 334,953
148 334,954
198 334,983
227 334,973
D25— 1 334,984

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CLASSIFICATION OF DESIGNS

D1—	105	334,828		515	334,860	D10—	30	334,890		114	334,921	D21—	106	334,952		198	334,983
	199	334,829		553	334,861		32	334,891		116	334,922		108	334,953		227	334,973
D2—	245	334,830		604	334,862		64	334,892		118	334,923		148	334,954	D25—	1	334,984
	314	334,831	D7—	308	334,863		75	334,893		121	334,924		157	334,955		33	334,985
		334,832		350	334,864			334,894		138	334,926		166	334,956		47	334,986
	320	334,833		354	334,865		87	334,895		143	334,927		173	334,957			334,987
		334,834		407	334,866		97	334,896		151	334,932		201	334,958		.24	334,988
D3—	23	334,835		504	334,867		98	334,897		164	334,928		219	334,959			334,989
		334,836		605	334,868		116	334,898			334,929		230	334,960	D26—	1	334,990
	36	334,837			334,869	D11—	3	334,899			334,931		232	334,961		25	334,991
	44	334,838		607	334,870		5	334,900		165	334,933		240	334,962		35	334,992
	48	334,839		616	334,871		12	334,901		168	334,930	D22—	108	334,963		38	334,993
	73	334,840			334,872			334,902		204	334,934		126	334,964		65	334,994
D4—	101	334,842			334,873		13	334,903		216	334,935			334,965		87	334,995
	121	334,843		667	334,874		18	334,904		225	334,936		133	334,966	D28—	30	334,996
	138	334,844		678	334,875		43	334,905		257	334,925	D23—	206	334,967		56	334,997
		334,845	D8—	29.1	334,876		213	334,906		299	334,937		207	334,968		58	334,998
D6—	317	334,846		70	334,877	D12—	92	334,907	D15—	9.1	334,938		209	334,970	D29—	9	334,999
	333	334,847		70.1	334,878		129	334,908		89	334,939			334,971		10	335,000
		334,848		331	334,879		147	334,909	D16—	134	334,940		225	334,972	D30—	108	335,002
	347	334,849		343	334,841		155	334,910		202	334,941		304	334,974			335,003
	416	334,850		352	334,880		191	334,911	D18—	1	334,942		366	334,975		121	335,004
	428	334,851		353	334,881		316	334,912		39	334,943		377	334,976		126	335,005
	436	334,852		359	334,882	D13—	118	334,913		40	334,944		387	334,977		127	335,006
	449	334,853		369	334,883		151	334,914	D19—	20	334,945	D24—	126	334,978		133	335,007
	458	334,854		375	334,884	D14—	100	334,915		77	334,946		130	334,979	D32—	36	335,008
		334,855	D9—	414	334,885		102	334,916		85	334,948		133	334,969		54	335,009
	474	334,856		418	334,886		108	334,917			334,949		158	334,980		68	335,010
	495	334,857		430	334,887		109	334,918		88	334,947		160	334,981		74	335,011
	508	334,858		455	334,888			334,919	D20—	4	334,950		183	334,982	D34—	7	335,012
	509	334,859			334,889		113	334,920		10	334,951			335,001			

CLASSIFICATION OF PLANTS

P.—	49	8,205		69.1	8,206		74.1	8,207		78	8,208		79	8,209		82.2	8,210

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,203,199	5,203,365	5,203,864	5,204,518	5,204,154	5,203,099
	5,203,647	5,203,382	5,203,895	5,204,521	5,204,219	5,203,128
	5,204,007	5,203,394	5,203,923	5,204,525	5,204,260	5,203,162
02 :	5,203,274	5,203,401	5,203,938	5,204,531	5,204,600	5,203,187
	5,203,729	5,203,415	5,203,956	5,204,549	5,204,670	5,203,277
04 :	Re.34,227	5,203,435	5,203,960	5,204,555	5,204,691	5,203,429
	5,203,038	5,203,446	5,203,961	5,204,556	09 : 5,203,122	5,203,566
	5,203,082	5,203,449	5,203,977	5,204,557	5,203,179	5,203,610
	5,203,202	5,203,450	5,203,987	5,204,559	5,203,217	5,203,673
	5,203,346	5,203,453	5,204,015	5,204,586	5,203,238	5,203,676
	5,203,368	5,203,457	5,204,038	5,204,613	5,203,239	5,203,726
	5,203,389	5,203,467	5,204,042	5,204,614	5,203,247	5,203,771
	5,203,472	5,203,473	5,204,046	5,204,623	5,203,249	5,203,781
	5,203,493	5,203,474	5,204,048	5,204,637	5,203,271	5,203,784
	5,203,544	5,203,481	5,204,053	5,204,640	5,203,430	5,203,785
	5,203,587	5,203,482	5,204,054	5,204,641	5,203,431	5,203,805
	5,204,068	5,203,507	5,204,063	5,204,652	5,203,432	5,203,833
	5,204,551	5,203,519	5,204,081	5,204,657	5,203,522	5,203,894
	5,204,562	5,203,525	5,204,082	5,204,661	5,203,529	5,204,006
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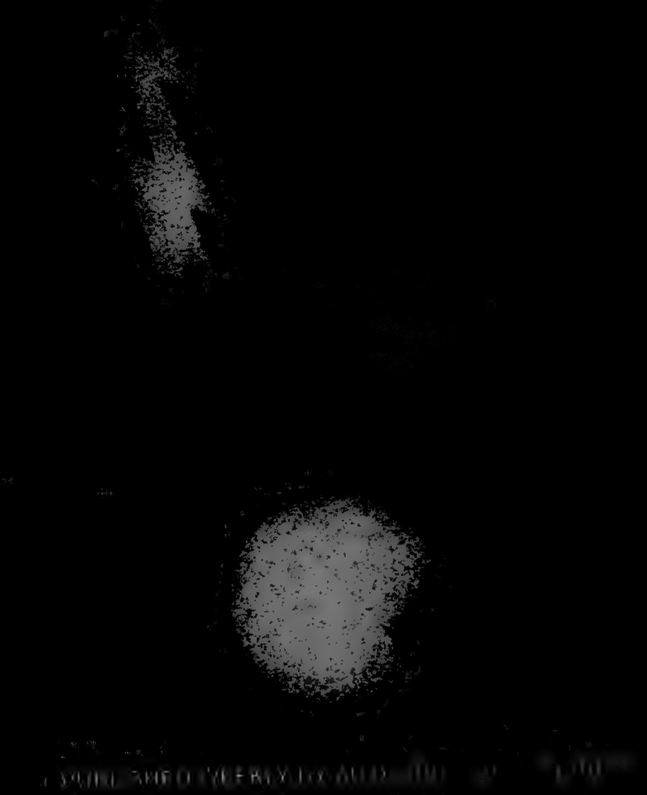

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347-150 O.G.-93-1

The current amounts of the maintenance fees due at 3 years	4,498,232	06/374,286	2/12/85
and six months and seven years and six months and eleven years	4,498,234	06/459,681	2/12/85
and six months are set forth in 37 CFR 1.20(e) (g), as amended	4,498,236	06/491,291	5/12/85

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 24, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,918,752 through 4,920,574
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 22, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,583,246 through 4,584,720
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 12, 1993
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,498,200	06/403,541	2/12/85
4,498,203	06/608,392	2/12/85
4,498,209	06/479,001	2/12/85
4,498,210	06/556,275	2/12/85
4,498,220	06/410,724	2/12/85
4,498,221	06/523,801	2/12/85
4,498,231	06/526,770	2/12/85
4,498,232	06/374,286	2/12/85
4,498,234	06/459,681	2/12/85
4,498,236	06/421,301	2/12/85
4,498,238	06/429,949	2/12/85
4,498,240	06/493,918	2/12/85
4,498,245	06/509,663	2/12/85
4,498,247	06/632,550	2/12/85
4,498,254	06/375,856	2/12/85
4,498,261	06/328,189	2/12/85
4,498,263	06/420,408	2/12/85
4,498,267	06/445,060	2/12/85
4,498,269	06/446,000	2/12/85
4,498,270	06/367,393	2/12/85
4,498,272	06/380,211	2/12/85
4,498,275	06/280,813	2/12/85
4,498,279	06/569,391	2/12/85
4,498,280	06/569,392	2/12/85
4,498,287	06/427,250	2/12/85
4,498,290	06/279,120	2/12/85
4,498,291	06/539,381	2/12/85
4,498,296	06/525,907	2/12/85
4,498,297	06/370,132	2/12/85
4,498,303	06/511,270	2/12/85
4,498,305	06/547,313	2/12/85
4,498,307	06/493,704	2/12/85
4,498,317	06/349,805	2/12/85
4,498,322	06/355,754	2/12/85
4,498,323	06/426,064	2/12/85
4,498,324	06/477,326	2/12/85
4,498,325	06/426,472	2/12/85
4,498,330	06/376,519	2/12/85
4,498,332	06/543,183	2/12/85
4,498,333	06/500,044	2/12/85
4,498,335	06/436,519	2/12/85
4,498,337	06/470,270	2/12/85
4,498,339	06/548,384	2/12/85
4,498,341	06/425,577	2/12/85
4,498,351	06/563,573	2/12/85
4,498,353	06/424,651	2/12/85
4,498,355	06/371,034	2/12/85
4,498,356	06/379,549	2/12/85
4,498,359	06/324,711	2/12/85
4,498,361	06/488,233	2/12/85
4,498,362	06/525,820	2/12/85
4,498,367	06/429,247	2/12/85
4,498,368	06/539,503	2/12/85
4,498,371	06/392,629	2/12/85
4,498,373	06/485,746	2/12/85
4,498,378	06/529,522	2/12/85
4,498,379	06/564,842	2/12/85
4,498,380	06/481,646	2/12/85
4,498,381	06/518,014	2/12/85
4,498,385	06/410,362	2/12/85
4,498,388	06/606,650	2/12/85
4,498,394	06/439,026	2/12/85
4,498,402	06/503,727	2/12/85
4,498,404	06/418,389	2/12/85
4,498,406	06/479,529	2/12/85
4,498,408	06/398,884	2/12/85
4,498,411	06/372,565	2/12/85
4,498,419	06/434,979	2/12/85
4,498,421	06/399,832	2/12/85
4,498,422	06/547,445	2/12/85
4,498,428	06/598,610	2/12/85
4,498,434	06/508,943	2/12/85
4,498,435	06/434,598	2/12/85
4,498,441	06/308,708	2/12/85
4,498,447	06/539,647	2/12/85
4,498,456	06/564,679	2/12/85
4,498,459	06/446,572	2/12/85
4,498,460	06/566,062	2/12/85
4,498,463	06/339,148	2/12/85
4,498,464	06/390,235	2/12/85
4,498,465	06/385,446	2/12/85
4,498,470	06/448,335	2/12/85
4,498,473	06/432,568	2/12/85
4,498,475	06/412,230	2/12/85
4,498,484	06/400,235	2/12/85
4,498,491	06/502,030	2/12/85

Patent Number	Serial Number	Issue Date
4,498,789	06/436,401	2/12/85
4,498,793	06/493,818	2/12/85

Patent Number	Serial Number	Issue Date
4,499,468	06/370,234	2/12/85
4,499,475	06/319,520	2/12/85
4,499,122	06/528,318	2/12/85

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Patent Number	Serial Number	Issue Date
4,498,504	06/421,730	2/12/85
4,498,507	06/508,812	2/12/85
4,498,512	06/404,446	2/12/85
4,498,520	06/343,817	2/12/85
4,498,531	06/432,179	2/12/85
4,498,536	06/538,118	2/12/85
4,498,537	06/452,854	2/12/85
4,498,544	06/540,094	2/12/85
4,498,555	06/480,411	2/12/85
4,498,556	06/466,501	2/12/85
4,498,558	06/443,718	2/12/85
4,498,571	06/386,671	2/12/85
4,498,572	06/327,517	2/12/85
4,498,575	06/588,199	2/12/85
4,498,576	06/371,002	2/12/85
4,498,579	06/624,721	2/12/85
4,498,581	06/540,377	2/12/85
4,498,583	06/528,398	2/12/85
4,498,585	06/565,066	2/12/85
4,498,586	06/465,642	2/12/85
4,498,587	06/592,952	2/12/85
4,498,594	06/417,046	2/12/85
4,498,595	06/424,901	2/12/85
4,498,596	06/498,992	2/12/85
4,498,599	06/523,447	2/12/85
4,498,600	06/497,763	2/12/85
4,498,602	06/559,485	2/12/85
4,498,603	06/417,925	2/12/85
4,498,604	06/401,652	2/12/85
4,498,606	06/442,632	2/12/85
4,498,614	06/507,132	2/12/85
4,498,615	06/526,552	2/12/85
4,498,619	06/544,866	2/12/85
4,498,623	06/339,306	2/12/85
4,498,626	06/534,964	2/12/85
4,498,627	06/412,956	2/12/85
4,498,628	06/285,089	2/12/85
4,498,630	06/413,106	2/12/85
4,498,632	06/418,623	2/12/85
4,498,639	06/419,468	2/12/85
4,498,645	06/437,215	2/12/85
4,498,648	06/507,964	2/12/85
4,498,652	06/518,550	2/12/85
4,498,659	06/484,063	2/12/85
4,498,663	06/535,034	2/12/85
4,498,666	06/438,962	2/12/85
4,498,670	06/409,411	2/12/85
4,498,671	06/492,369	2/12/85
4,498,672	06/542,479	2/12/85
4,498,675	06/488,173	2/12/85
4,498,676	06/606,160	2/12/85
4,498,677	06/477,819	2/12/85
4,498,682	06/442,408	2/12/85
4,498,686	06/586,180	2/12/85
4,498,687	06/335,523	2/12/85
4,498,692	06/529,149	2/12/85
4,498,696	06/501,281	2/12/85
4,498,697	06/377,006	2/12/85
4,498,703	06/381,560	2/12/85
4,498,705	06/474,270	2/12/85
4,498,706	06/523,486	2/12/85
4,498,710	06/475,524	2/12/85
4,498,713	06/436,520	2/12/85
4,498,718	06/614,376	2/12/85
4,498,726	06/561,159	2/12/85
4,498,731	06/480,318	2/12/85
4,498,732	06/381,825	2/12/85
4,498,752	06/481,047	2/12/85
4,498,758	06/498,157	2/12/85
4,498,768	06/349,128	2/12/85
4,498,771	06/374,135	2/12/85
4,498,773	06/491,496	2/12/85
4,498,776	06/410,401	2/12/85
4,498,783	06/421,968	2/12/85
4,498,784	06/394,922	2/12/85
4,498,785	06/432,128	2/12/85
4,498,787	06/636,174	2/12/85
4,498,789	06/436,401	2/12/85
4,498,793	06/493,818	2/12/85
4,498,799	06/293,180	2/12/85
4,498,805	06/556,004	2/12/85
4,498,806	06/513,061	2/12/85
4,498,813	06/269,968	2/12/85
4,498,814	06/418,011	2/12/85
4,498,815	06/434,673	2/12/85
4,498,819	06/439,671	2/12/85
4,498,821	06/478,058	2/12/85
4,498,823	06/428,433	2/12/85
4,498,830	06/523,996	2/12/85
4,498,832	06/380,852	2/12/85
4,498,834	06/445,606	2/12/85
4,498,839	06/502,051	2/12/85
4,498,845	06/503,711	2/12/85
4,498,848	06/479,148	2/12/85
4,498,851	06/477,630	2/12/85
4,498,857	06/556,983	2/12/85
4,498,859	06/483,886	2/12/85
4,498,863	06/496,337	2/12/85
4,498,878	06/413,283	2/12/85
4,498,879	06/462,213	2/12/85
4,498,883	06/514,440	2/12/85
4,498,889	06/511,624	2/12/85
4,498,893	06/343,451	2/12/85
4,498,897	06/546,126	2/12/85
4,498,901	06/403,383	2/12/85
4,498,907	06/393,913	2/12/85
4,498,908	06/606,562	2/12/85
4,498,909	06/438,652	2/12/85
4,498,912	06/444,318	2/12/85
4,498,916	06/508,638	2/12/85
4,498,922	06/401,355	2/12/85
4,498,935	06/282,480	2/12/85
4,498,939	06/455,338	2/12/85
4,498,940	06/528,728	2/12/85
4,498,949	06/418,715	2/12/85
4,498,951	06/423,206	2/12/85
4,498,958	06/491,617	2/12/85
4,498,959	06/363,821	2/12/85
4,498,961	06/277,531	2/12/85
4,498,964	06/502,860	2/12/85
4,498,969	06/552,820	2/12/85
4,498,976	06/368,548	2/12/85
4,498,979	06/530,906	2/12/85
4,498,981	06/592,537	2/12/85
4,498,994	06/413,575	2/12/85
4,498,996	06/541,266	2/12/85
4,499,001	06/585,654	2/12/85
4,499,003	06/344,986	2/12/85
4,499,006	06/501,674	2/12/85
4,499,007	06/449,028	2/12/85
4,499,011	06/607,905	2/12/85
4,499,012	06/376,168	2/12/85
4,499,018	06/434,470	2/12/85
4,499,022	06/393,413	2/12/85
4,499,024	06/545,021	2/12/85
4,499,037	06/504,542	2/12/85
4,499,039	06/335,543	2/12/85
4,499,042	06/481,960	2/12/85
4,499,050	06/501,265	2/12/85
4,499,051	06/501,266	2/12/85
4,499,056	06/545,942	2/12/85
4,499,059	06/552,240	2/12/85
4,499,062	06/499,037	2/12/85
4,499,063	06/536,240	2/12/85
4,499,065	06/489,898	2/12/85
4,499,077	06/471,011	2/12/85
4,499,080	06/488,712	2/12/85
4,499,085	06/490,223	2/12/85
4,499,089	06/608,828	2/12/85
4,499,093	06/458,262	2/12/85
4,499,094	06/482,082	2/12/85
4,499,098	06/514,073	2/12/85
4,499,103	06/476,002	2/12/85
4,499,106	06/496,457	2/12/85
4,499,107	06/435,291	2/12/85
4,499,114	06/620,164	2/12/85

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4,499,122	06/528,318	2/12/85
4,499,123	06/491,022	2/12/85
4,499,127	06/284,939	2/12/85
4,499,132	06/228,358	2/12/85
4,499,136	06/503,221	2/12/85
4,499,140	06/586,116	2/12/85
4,499,148	06/456,637	2/12/85
4,499,150	06/480,152	2/12/85
4,499,156	06/477,793	2/12/85
4,499,161	06/488,358	2/12/85
4,499,173	06/491,814	2/12/85
4,499,178	06/388,336	2/12/85
4,499,179	06/468,398	2/12/85
4,499,190	06/490,551	2/12/85
4,499,195	06/452,839	2/12/85
4,499,197	06/361,426	2/12/85
4,499,199	06/517,110	2/12/85
4,499,201	06/496,147	2/12/85
4,499,204	06/567,659	2/12/85
4,499,205	06/482,533	2/12/85
4,499,218	06/270,386	2/12/85
4,499,220	06/379,847	2/12/85
4,499,227	06/557,514	2/12/85
4,499,231	06/477,754	2/12/85
4,499,240	06/554,665	2/12/85
4,499,242	06/456,433	2/12/85
4,499,258	06/615,507	2/12/85
4,499,260	06/440,656	2/12/85
4,499,263	06/495,541	2/12/85
4,499,266	06/481,122	2/12/85
4,499,268	06/466,454	2/12/85
4,499,269	06/486,795	2/12/85
4,499,272	06/409,798	2/12/85
4,499,276	06/475,017	2/12/85
4,499,277	06/475,020	2/12/85
4,499,282	06/516,147	2/12/85
4,499,290	06/544,517	2/12/85
4,499,299	06/447,467	2/12/85
4,499,300	06/566,007	2/12/85
4,499,303	06/536,218	2/12/85
4,499,307	06/582,755	2/12/85
4,499,309	06/467,715	2/12/85
4,499,314	06/605,166	2/12/85
4,499,316	06/596,598	2/12/85
4,499,328	06/539,213	2/12/85
4,499,335	06/457,898	2/12/85
4,499,337	06/404,699	2/12/85
4,499,339	06/444,460	2/12/85
4,499,340	06/491,293	2/12/85
4,499,353	06/470,067	2/12/85
4,499,358	06/593,988	2/12/85
4,499,360	06/513,020	2/12/85
4,499,364	06/440,221	2/12/85
4,499,365	06/574,365	2/12/85
4,499,367	06/501,903	2/12/85
4,499,371	06/429,766	2/12/85
4,499,376	06/532,294	2/12/85
4,499,377	06/426,980	2/12/85
4,499,380	06/435,817	2/12/85
4,499,381	06/463,812	2/12/85
4,499,383	06/368,511	2/12/85
4,499,395	06/498,336	2/12/85
4,499,401	06/471,609	2/12/85
4,499,405	06/265,462	2/12/85
4,499,407	06/459,797	2/12/85
4,499,417	06/436,806	2/12/85
4,499,420	06/345,420	2/12/85
4,499,423	06/328,506	2/12/85
4,499,425	06/404,959	2/12/85
4,499,427	06/392,099	2/12/85
4,499,435	06/428,980	2/12/85
4,499,439	06/487,649	2/12/85
4,499,443	06/575,598	2/12/85
4,499,447	06/505,334	2/12/85
4,499,450	06/350,974	2/12/85
4,499,456	06/323,660	2/12/85
4,499,467	06/368,482	2/12/85
4,499,468	06/370,234	2/12/85
4,499,475	06/319,520	2/12/85
4,499,481	06/532,122	2/12/85
4,499,483	06/603,983	2/12/85
4,499,485	06/543,787	2/12/85
4,499,486	06/379,945	2/12/85
4,499,490	06/376,326	2/12/85
4,499,491	06/515,825	2/12/85
4,499,495	06/401,449	2/12/85
4,499,501	06/413,858	2/12/85
4,499,503	06/358,733	2/12/85
4,499,506	06/352,305	2/12/85
4,499,524	06/549,112	2/12/85
4,499,525	06/331,432	2/12/85
4,499,527	06/498,637	2/12/85
4,499,528	06/533,482	2/12/85
4,499,532	06/477,985	2/12/85
4,499,552	06/336,128	2/12/85
4,499,564	06/341,982	2/12/85
4,499,566	06/226,668	2/12/85
4,499,579	06/474,070	2/12/85
4,499,582	06/329,267	2/12/85
4,499,584	06/499,030	2/12/85
4,499,588	06/402,428	2/12/85
4,499,591	06/442,318	2/12/85
4,499,593	06/516,745	2/12/85
4,499,601	06/434,868	2/12/85
4,499,603	06/478,070	2/12/85
4,499,606	06/453,470	2/12/85
4,499,608	06/457,531	2/12/85

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

5,053,732, Re. S.N. 07/994,512, Filed Dec. 21, 1992, Cl. 333/106, WAVEGUIDE SWITCHING SYSTEM COMPRISING A SINGLE STATOR AND A PLURALITY OF ROTATABLE WAVEGUIDE SWITCHES THEREIN, Manfred C. Elgass, et. al., Owner of Record: *Logus Manufacturing, Deer Park, N.Y.*, Attorney or Agent: Phillip Furgang, Ex. Gp.: 2502

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,057,829, Reexam. No. 90/002,997, Requested Mar. 16, 1993, Cl. 358/086, COMMUNICATIONS TV MONITORING AND CONTROL SYSTEM, Robert M. Moorehead, Owner of Record: *Spectradyne, Inc., Richardson, Tex.*, Attorney or Agent: Warren H. Kintzinger, Richardson, Tex., Ex. Gp.: 2611, Requester: Comsat Video Co., Clarksburg, Md.

4,138,670, Reexam. No. 90/002,999, Requested Mar. 5, 1993, Cl. 340/507, A.C. POWERED DETECTING DEVICE WITH BATTERY BACKUP, Quentin L. Schneider, et. al., Owner of Record: *Pittaway Corp., Northbrook, Ill.*, Attorney or Agent: Paul M. Vargo, Dressler, Goldsmith, Shore, Sutker & Minalow, Ltd., Chicago, Ill., Ex. Gp.: 2608, Requester: Owner

4,378,313, Reexam. No. 90/002,996, Requested Mar. 10, 1993, Cl. 260/153, REATIVE YELLOW DYE HAVING BOTH MONOCHLOROTRIAZINYL AND VINYLSULFONE TYPE REACTIVE GROUPS, Yutaka Kayane, et, al., Owner of Record:

Sumitomo Chemical Co., Osaka, Japan, Attorney or Agent:	560,403	71/592,041	6/24/1952
	560,404	71/592,065	6/24/1952

Reg. Number	Serial Number	Reg. Date
936,128	72/382,180	6/20/1972
936,130	72/388,087	6/20/1972

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Sumitomo Chemical Co., Osaka, Japan, Attorney or Agent: Stevens, Davis, Miller & Mosher, Alexandria, Va., Ex. Gp.: 1204, Requester: Owner

4,450,572, Reexam. No. 90/002,966, Requested Feb. 24, 1993, Cl. 375/087, INTERFACE FOR SERIAL DATA COMMUNICATIONS LINK, Robert E. Stewart, et. al., Owner of Record: *Digital Equipment Corp., Maynard, Mass*, Attorney or Agent: Cesari & McKenna, Boston, Mass., Ex. Gp.: 2600, Requester: Owner

4,528,481, Reexam. No. 90/003,002, Requested Mar. 22, 1993, Cl. 315/198, TREATMENT OF AMORPHOUS MAGNETIC ALLOYS TO PRODUCE A WIDE RANGE OF MAGNETIC PROPERTIES, Joseph J. Becker, et. al., Owner of Record: *General Electric Co., Schnectady, N.Y.*, Attorney or Agent: Henry J. Policinski, General Electric Co., Schnectady, N.Y., Ex. Gp.: 2606, Requester: Cooper Industries, Inc., Houston, Tex.

4,560,985, Reexam. No. 90/002,967, Requested Feb. 24, 1993, Cl. 340/825.5, DUAL-COUNT, ROUND ROBIN DISTRIBUTED ARBITRATION TECHNIQUE FOR SERIAL BUSES, William D. Strecker, et. al., Owner of Record: *Digital Equipment Corp., Maynard, Mass.*, Attorney or Agent: Cesari & McKenna, Boston, Mass., Ex. Gp.: 2600, Requester: Owner

4,592,072, Reexam. No. 90/002,968, Requested Feb. 24, 1993, Cl. 375/055, DECODER FOR SELF-CLOCKING SERIAL DATA COMMUNICATIONS, Robert E. Stewart, Owner of Record: *Digital Equipment Corp., Maynard, Mass.*, Attorney or Agent: Cesari & McKenna, Boston, Mass., Ex. Gp.: 2600, Requester: Owner

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Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of theprescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED MARCH 29, 1993
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
87,110	71/061,269	6/25/1912
295,109	71/320,345	6/21/1932
295,114	71/321,673	6/21/1932
295,116	71/322,103	6/21/1932
295,134	71/323,863	6/21/1932
295,137	71/323,968	6/21/1932
295,138	71/324,021	6/21/1932
295,140	71/324,085	6/21/1932
295,169	71/321,576	6/21/1932
295,172	71/309,540	6/21/1932
295,227	71/323,998	6/21/1932
295,231	71/324,267	6/21/1932
444,698	71/487,353	6/24/1952
560,340	71/534,202	6/24/1952
560,342	71/543,512	6/24/1952
560,346	71/550,467	6/24/1952
560,365	71/575,445	6/24/1952
560,368	71/577,955	6/24/1952
560,373	71/580,244	6/24/1952
560,378	71/580,971	6/24/1952
560,384	71/583,345	6/24/1952
560,390	71/585,457	6/24/1952
560,399	71/589,243	6/24/1952
560,403	71/592,041	6/24/1952
560,404	71/592,065	6/24/1952
560,405	71/592,199	6/24/1952
560,406	71/592,245	6/24/1952
560,408	71/592,517	6/24/1952
560,413	71/593,440	6/24/1952
560,414	71/593,485	6/24/1952
560,415	71/593,983	6/24/1952
560,420	71/595,723	6/24/1952
560,424	71/596,355	6/24/1952
560,430	71/597,817	6/24/1952
560,435	71/598,423	6/24/1952
560,440	71/599,271	6/24/1952
560,441	71/599,395	6/24/1952
560,443	71/599,817	6/24/1952
560,452	71/601,395	6/24/1952
560,457	71/602,038	6/24/1952
560,460	71/602,304	6/24/1952
560,469	71/603,720	6/24/1952
560,473	71/604,457	6/24/1952
560,475	71/604,509	6/24/1952
560,480	71/604,609	6/24/1952
560,481	71/604,802	6/24/1952
560,491	71/606,044	6/24/1952
560,492	71/606,143	6/24/1952
560,497	71/606,858	6/24/1952
560,502	71/607,423	6/24/1952
560,507	71/607,684	6/24/1952
560,510	71/608,262	6/24/1952
560,518	71/609,662	6/24/1952
560,519	71/609,815	6/24/1952
560,525	71/610,419	6/24/1952
560,527	71/610,630	6/24/1952
560,529	71/610,769	6/24/1952
560,530	71/610,771	6/24/1952
560,539	71/611,368	6/24/1952
560,542	71/611,538	6/24/1952
560,549	71/611,827	6/24/1952
560,551	71/611,836	6/24/1952
560,553	71/611,951	6/24/1952
560,555	71/612,240	6/24/1952
560,558	71/612,431	6/24/1952
560,560	71/612,636	6/24/1952
560,583	71/614,417	6/24/1952
560,587	71/614,608	6/24/1952
560,593	71/615,351	6/24/1952
560,600	71/616,025	6/24/1952
560,603	71/616,110	6/24/1952
560,607	71/616,294	6/24/1952
560,609	71/616,296	6/24/1952
560,613	71/617,076	6/24/1952
560,615	71/617,203	6/24/1952
560,617	71/617,243	6/24/1952
560,623	71/617,682	6/24/1952
560,629	71/618,279	6/24/1952
560,634	71/618,982	6/24/1952
560,640	71/546,007	6/24/1952
560,665	71/595,481	6/24/1952
560,666	71/597,557	6/24/1952
560,684	71/617,082	6/24/1952
560,686	71/540,079	6/24/1952
923,959	72/314,459	11/16/1971
923,978	72/290,340	11/16/1971
923,979	72/292,137	11/16/1971
927,129	72/364,471	1/18/1972
933,079	72/356,745	5/02/1972
935,830	72/309,808	6/20/1972
935,831	72/332,194	6/20/1972
935,832	72/337,742	6/20/1972
935,836	72/377,373	6/20/1972
935,838	72/378,596	6/20/1972
935,845	72/390,320	6/20/1972
935,847	72/391,787	6/20/1972
935,854	72/374,858	6/20/1972
935,857	72/394,311	6/20/1972
935,862	72/364,893	6/20/1972
935,865	72/367,428	6/20/1972
935,874	72/378,502	6/20/1972
935,875	72/378,762	6/20/1972

Reg. Number	Serial Number	Reg. Date
935,882	72/382,267	6/20/1972
935,886	72/387,157	6/20/1972
935,887	72/387,726	6/20/1972
935,890	72/376,523	6/20/1972
935,893	72/385,376	6/20/1972
935,903	72/366,606	6/20/1972
935,905	72/383,895	6/20/1972
935,908	72/363,695	6/20/1972
935,911	72/388,740	6/20/1972
935,914	72/390,650	6/20/1972
935,917	72/392,543	6/20/1972
935,919	72/393,303	6/20/1972
935,920	72/394,464	6/20/1972
935,921	72/394,774	6/20/1972
935,923	72/356,506	6/20/1972
935,925	72/392,148	6/20/1972
935,930	72/385,453	6/20/1972
935,931	72/386,444	6/20/1972
935,936	72/387,566	6/20/1972
935,938	72/387,954	6/20/1972
935,939	72/388,011	6/20/1972
935,940	72/388,594	6/20/1972
935,942	72/388,596	6/20/1972
935,954	72/367,152	6/20/1972
935,957	72/377,050	6/20/1972
935,963	72/363,448	6/20/1972
935,965	72/368,916	6/20/1972
935,970	72/374,942	6/20/1972
935,972	72/378,089	6/20/1972
935,976	72/384,742	6/20/1972
935,984	72/371,608	6/20/1972
935,986	72/378,125	6/20/1972
935,989	72/383,127	6/20/1972
935,991	72/384,912	6/20/1972
935,997	72/390,887	6/20/1972
935,999	72/391,006	6/20/1972
936,001	72/391,163	6/20/1972
936,002	72/391,164	6/20/1972
936,003	72/391,165	6/20/1972
936,004	72/391,166	6/20/1972
936,009	72/331,230	6/20/1972
936,016	72/353,199	6/20/1972
936,017	72/358,837	6/20/1972
936,023	72/370,185	6/20/1972
936,025	72/372,117	6/20/1972
936,033	72/390,335	6/20/1972
936,039	72/332,497	6/20/1972
936,040	72/351,322	6/20/1972
936,047	72/367,885	6/20/1972
936,048	72/368,222	6/20/1972
936,050	72/368,993	6/20/1972
936,053	72/370,748	6/20/1972
936,059	72/376,447	6/20/1972
936,067	72/390,999	6/20/1972
936,069	72/394,703	6/20/1972
936,074	72/376,932	6/20/1972
936,076	72/398,271	6/20/1972
936,085	72/381,201	6/20/1972
936,089	72/385,698	6/20/1972
936,091	72/395,071	6/20/1972
936,095	72/374,312	6/20/1972
936,096	72/375,840	6/20/1972
936,098	72/380,810	6/20/1972
936,099	72/382,565	6/20/1972
936,101	72/385,140	6/20/1972
936,103	72/387,296	6/20/1972
936,104	72/389,535	6/20/1972
936,105	72/389,537	6/20/1972
936,106	72/389,538	6/20/1972
936,108	72/350,985	6/20/1972
936,109	72/355,879	6/20/1972
936,114	72/377,622	6/20/1972
936,115	72/380,138	6/20/1972
936,116	72/382,895	6/20/1972
936,122	72/355,538	6/20/1972
936,124	72/373,523	6/20/1972
936,126	72/376,912	6/20/1972
936,128	72/382,180	6/20/1972
936,130	72/388,087	6/20/1972
936,132	72/388,183	6/20/1972
936,135	72/389,363	6/20/1972
936,137	72/390,297	6/20/1972
936,140	72/367,827	6/20/1972
936,141	72/382,962	6/20/1972
936,142	72/347,626	6/20/1972
936,144	72/368,497	6/20/1972
936,148	72/390,803	6/20/1972
936,149	72/368,443	6/20/1972
936,150	72/372,751	6/20/1972
936,154	72/389,289	6/20/1972
936,157	72/390,063	6/20/1972
936,159	72/364,413	6/20/1972
936,163	72/327,318	6/20/1972
936,165	72/354,195	6/20/1972
936,166	72/358,683	6/20/1972
936,171	72/378,633	6/20/1972
936,172	72/380,474	6/20/1972
936,176	72/388,097	6/20/1972
936,177	72/388,860	6/20/1972
936,178	72/390,199	6/20/1972
936,182	72/390,662	6/20/1972
936,183	72/390,845	6/20/1972
936,184	72/391,419	6/20/1972
936,185	72/391,829	6/20/1972
936,186	72/392,738	6/20/1972
936,196	72/394,525	6/20/1972
936,199	72/349,838	6/20/1972
936,201	72/396,153	6/20/1972
936,205	72/371,488	6/20/1972
936,206	72/378,685	6/20/1972
936,208	72/374,317	6/20/1972
936,211	72/373,301	6/20/1972
936,217	72/377,640	6/20/1972
936,219	72/379,440	6/20/1972
936,220	72/379,526	6/20/1972
936,222	72/384,036	6/20/1972
936,223	72/384,361	6/20/1972
936,227	72/336,891	6/20/1972
936,234	72/383,146	6/20/1972
936,235	72/383,266	6/20/1972
936,236	72/383,576	6/20/1972
936,241	72/386,110	6/20/1972
936,245	72/326,018	6/20/1972
936,247	72/332,594	6/20/1972
936,248	72/332,595	6/20/1972
936,252	72/362,429	6/20/1972
936,254	72/364,695	6/20/1972
936,255	72/373,188	6/20/1972
936,261	72/397,293	6/20/1972
936,275	72/370,362	6/20/1972
936,277	72/373,748	6/20/1972
936,281	72/383,311	6/20/1972
936,287	72/351,619	6/20/1972
936,288	72/356,618	6/20/1972
936,289	72/359,126	6/20/1972
936,290	72/359,278	6/20/1972
936,292	72/364,461	6/20/1972
936,294	72/378,701	6/20/1972
936,295	72/359,088	6/20/1972
936,298	72/371,422	6/20/1972
936,299	72/376,663	6/20/1972
936,302	72/350,936	6/20/1972
936,303	72/381,071	6/20/1972
936,304	72/381,161	6/20/1972
936,306	72/380,022	6/20/1972
936,311	72/349,892	6/20/1972
936,315	72/369,830	6/20/1972
936,316	72/372,565	6/20/1972
936,317	72/378,807	6/20/1972
936,320	72/387,639	6/20/1972
936,321	72/322,503	6/20/1972
936,322	72/358,564	6/20/1972
936,324	72/331,448	6/20/1972
936,325	72/335,146	6/20/1972
936,328	72/381,618	6/20/1972
936,329	72/374,837	6/20/1972

Reg. Number	Serial Number	Reg. Date

Recordation of Trade Name; "Modular Computer Systems, Inc."

Patent No. 4,336,161, *Alan Rosevear, Patrick Mattock*, COMPOSITE MATERIALS COMPRISING DEFORMABLE AQUEOUS EMULSIONS CONTAINING TRIGLYCERIDES, Interference No. 102,607, decided Feb. 12, 1993, claims 1-20.

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Reg. Number	Serial Number	Reg. Date
936,332	72/328,099	6/20/1972
936,334	72/363,243	6/20/1972
936,336	72/382,941	6/20/1972
936,337	72/382,942	6/20/1972
936,338	72/387,919	6/20/1972
936,342	72/396,754	6/20/1972
936,343	72/372,215	6/20/1972

Avoiding Delays in Processing Patent Cooperation Treaty (PCT) Papers

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Box PCT
Washington, D.C. 20231

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When submitting a response to a particular PCT form, please refer to the return address block located in the lower left hand corner of the form for addittional addressing instructions.

Apr. 6, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patent and Trademarks

Recordation of Trade Name; "Coast Foundry & Mfg., Co."

Agency: U.S. Customs Service, Department of the Treasury.
Summary: On Thursday, Sept. 10, 1992, a notice of application for the recordation under section 42 of the Act of July 15, 1946, as amended (15 U.S.C 1124), of the trade name, "Coast Foundry & Mfg., Co.", was published in the *Federal Register* (57 FR 41547). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than Nov. 10, 1992. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "Coast Foundry & Mfg., Co., a corporation organized under the laws of the State of California, located at 2707 North Garey Ave., Pomona, Calif. 91769. The trade name is used in connection with valves and fittings for toilet tanks.
Effective Date: Nov. 27, 1992.
For Further Information Contact: Delois P. Cooper, Intellectual Property Rights Branch, 1301 Constitution Ave., NW., (Frankline Crt.), Washington, D.C. 20229 ((202) 482-6960).

Nov. 20, 1992

JOHN F. ATWOOD
Chief, Intellectual Property Rights Branch

Recordation of Trade Name; "Modular Computer Systems, Inc."

Agency: U.S. Customs Service, Department of the Treasury.
Summary: On Wednesday, Aug. 26, 1992, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "Modular Computer Systems, Inc.", was published in the *Federal Register* (57 FR 38712). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation and received not later than Oct. 26, 1992. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14 Customs Regulations (19 C.F.R. 133.14), the name "Modular Computer Systems, Inc., a/k/a Modcomp, a corporation organized under the laws of the State of Florida, located ar 1650 West McNab Rd., P.O. Box 6099, Ft. Lauderdale, Fla. 33340. The trade name is used in connection with computers, computer peripals, computer programs, and computer systems. The merchandise is manufactured in the United States.
Effective Date: Nov. 27, 1992.
For Further Information Contact: Delois P. Cooper, Intellectual Property Rights Branch, 1301 Constitution Ave., NW., (Frankline Crt.), Washington, D.C. 20229 ((202) 482-6960).

Nov. 20, 1992

JOHN F. ATWOOD
Chief, Intellectual Property Rights Branch

Application for Recordation of Trade Name; "WEMCO, Inc."

Action: Notice of application for recordation of trade name.
Summary: Application has been filed pursuant to § 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "WEMCO, INC.," used by Wemco, Inc., a corporation organized under the laws of the State of Louisiana, located at 966 South White St., New Orleans, La. 70125.

The application states that the trade name is used in connection with mens and boys neckties, ready ties, bow ties, ties and handkerchief sets and formal wear.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name will be published in the *Federal Register*.
Dates: Comments must be received on or before Jan. 26, 1993.
Addresses: Written comments should be addressed to U.S. Customs Service. Attention: Intellectual Property Rights Branch, 1301 Constitution Ave, N.W., (room 2104), Washington, D.C. 20229.
For Further Information Contact: Delois P. Cooper, Intellectual Property Rights Branch, 1301 Constitution Ave., N.W., Washington, D.C. 20229. (202-566-6956)

Nov. 20, 1992

JOHN F. ATWOOD,
Chief, Intellectual Property Rights Branch

Adverse Decisions in Interference

In the designated interference involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,311,515, *Wiliam S. Grove*, SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY, Interference No. 103,062, decided Mar. 10, 1993, claims 1-8.

Patent No. 4,335,017, *Brynley J. Miles, Alan Rosevear*, COMPOSITE MATERIALS COMPRISING DEFORMABLE XEROGEL WITHIN THE PORES OF PARTICULATE RIGID SUPPORTS USEFUL IN CHROMATOGRAPHY, Interference No. 101,826, decided Sept. 17, 1992, claims 1-19.

Patent No. 4,336,161, *Alan Rosevear, Patrick Mattock*, COMPOSITE MATERIALS COMPRISING DEFORMABLE XEROGEL WITHIN THE PORES OF PARTICULATE RIGID SUPPORTS USEFUL IN CHROMATOGRAPHY, Interference No. 101,827, decided Sept. 17, 1992, claims 1-9.

Patent No. 4,531,140, *Toshitake Suzuki, Naoto Arai, Shoji Aoyagi, Toranosuke Saito, Masakatu Kitani, Takashi Ishibashi*, HEAT-SENSITIVE RECORDING MATERIAL, Interference No. 101,834, decided Jan. 25, 1993, claims 1-5.

Patent No. 4,539,240, *Robert V. Wargin*, ASBESTOS FREE FRICTION ELEMENT, Interference No. 102,805, decided Jan. 12, 1993, claims 1-5.

Patent No. 4,666,168, *Steve Hamill, A. A. Knight*, ROLLER SKATE APPARATUS, Interference No. 101,991, decided Mar. 11, 1993, claims 1-19, and 22-28.

Patent No. 4,746,462, *Michael Nakamura, Hitoshi Takeuchi, Tetujiro Takahashi, Minoru Takizawa, Shojiro Horiguchi*, PHOSPHORIC ESTER COMPOUND, Interference No. 102,768, decided Feb. 3, 1993, claims 1 and 3-5.

Patent No. 4,748,240, *Gary P. Stack, Magid A. Abou-Gharbia, Edward J. Podlesny*, PSYCHOTROPIC BICYCLIC IMIDES, Interference No. 102,672, decided Feb. 19, 1993, claims 1-8.

Patent No. 4,754,643, *Arthur R. Weeks, Jr., Anthony D'Aquila, Sidney D. Schwartz, Raymond H. Varian, Donald Viscio*, METHOD AND APPARATUS FOR AUTOMATICALLY INSTALLING MANDREL RIVETS, Interference No. 102,380, decided July 28, 1992, claims 1-19.

Patent No. 4,776,322, *Jack V. D. Hough, Kenneth J. Dormer, Kenneth E. Barton, Jr., Robert Y. Chow*, IMPLANTABLE ELECTRO-MAGNETIC MIDDLE-EAR BONE-CONDUCTION HEARING AID DEVICE, Interference No. 102,296, decided Sept. 23, 1992, claims 1-14.

Patent No. 4,777,253, *Lester A. Mitscher, Daniel T. Chu*, PROCESS FOR PREPARATION OF RACEMATE AND OPTICALLY ACTIVE OFLOXACIN AND RELATED DERIVATIVES, Interference No. 102,548, decided Sept. 10, 1992, claims 1-8.

Patent No. 4,791,139, *Michael J. Bushell, Robin A. E. Carr*, DIPHENYL ETHER DERIVATIVES AND THIER USE AS INSECTICIDES, Interference No. 103,026, decided Jan. 28, 1993, claims 1-7.

Patent No. 4,800,884, *Jorgan Heide, Timothy D. Gooch, Anthony D. Prescott, Thomas W. Sander*, MAGNETIC INDUCTION HEARING AID, Interference No. 102,292, decided Sept. 23, 1992, claims 1-12.

Patent No. 4,816,436, *Cindy A. Jacobs*, ANTI-ARTHRITIC USE OF INTERLEUKIN-1 PROTEINS, Interference No. 102,708, decided Feb. 10, 1993, claims 1-9.

Patent No. 4,839,169, *Brendan J. R. Whittle*, SYNERGISTIC COMBINATION OF T-P9 AND PROSTACYCLIN, Interference No. 102,903, decided Jan. 15, 1993, claims 1-11.

Patent No. 4,878,891, *Millard N. Judy, James L. Matthews, Joseph T. Newman, Franklin Sogandares-Bernal*, METHOD FOR ERADICATING INFECTIOUS BIOLOGICAL CONTAMINANTS IN BODY TISSUE, Interference No. 102,977, decided Jan. 22, 1993, claims 1, 2, 7, 9, 15, 43, 51, 53, 57 and 59-61.

Patent No. 4,894,176, *Ellen L. Swan, Rajat S. Basu, Ian R. Shankland*, AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLOUROETHANE, DICHLOROTRIFLOUROETHANE AND METHANOL, Interference No. 102,973, decided Jan. 15, 1993, claims 1-20.

Patent No. 4,895,876, *Frank K. Schweighardt, Charles R. Kayhart*, CONCENTRATED STABLE FLUOROCHEMICAL AQUEOUS EMULSIONS CONTAINING TRIGLYCERIDES, Interference No. 102,607, decided Feb. 12, 1993, claims 1-20.

Patent No. 4,900,880, *David S. Breed*, GAS DAMPED CRASH SENSOR, Interference No. 102,719, decided Mar. 4, 1993, claims 1-6 and 9-13.

Patent No. 4,950,890, *Daniel Gelbart*, METHOD AND APPARATUS FOR CORRECTING POSITION ERRORS USING WRITABLE ENCODERS, Interference No. 102,964, decided Feb. 11, 1993, claims 1-3.

Patent No. 4,969,458, *Dominik M. Wiktor*, INTRACORONARY STENT AND METHOD OF SIMULTANEOUS ANGIOPLASTY AND STENT IMPLANT, Interference No. 102,816, decided Jan. 13, 1993, claim 10.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals & Interferences
(703) 557-4005

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE COMMISSIONER OF PATENTS AND TRADEMARKS

CAMERON A. WEIFFENBACH,
Petitioner-Appellee,
v.
CHARLES C. LOGAN II,
Respondent-Appellant.

Proceeding D91-11

DECISION ON APPEAL

Charles C. Logan, II (Logan) appeals[1] from an initial decision[2] of an Administrative Law Judge (ALJ) in a practitioner disciplinary proceeding in the Patent and Trademark Office (PTO). The ALJ found that Logan violated the PTO Code of Professional Responsibility and imposed a five-year suspension from practice before PTO. On appeal, two issues are raised. The first issue is whether the five- year suspension is too severe a sanction. The second issue is whether Logan was improperly denied a hearing.

I.

Logan alleges that it was error to impose a five-year suspension under the facts of this case. Logan is a registered practitioner[3] who resides in La Mesa, California. He is an attorney,[4] but is not a member of the California Bar.[5] The Director of the Office of Enrollment and Discipline (Director) filed a complaint[6] charging Logan with unprofessional conduct. A "first" answer[7] was timely filed with the ALJ. Ultimately, a "second" answer[8] was filed. Based on the allegations of the complaint which are admitted in Logan's second answer, the following facts are essentially uncontested.

A. Count 1

In Count 1 of the two-count complaint, the Director charged that by altering an Office action in a patent application, and engaging in conduct involving dishonesty, fraud, deceit or misrepresentation, Logan engaged in unethical conduct. Using essentially the Director's wording in the complaint, Count 1 alleges:

[1] 37 CFR §10.155(a).
[2] Initial Decision, entered April 22, 1992.
[3] 37 CFR § 10.1(f) and (r).
[4] 37 CFR § 10.1(c).
[5] Transcript of the Hearing of January 6, 1993, page 29, line 1 *et seq.* (Tr. 29:1).
[6] Complaint filed with the ALJ on September 11, 1991; *see* 37 CFR § 10.134.
[7] Answer filed October 28, 1991; *see* 37 CFR § 10.136.
[8] Answer received by facsimile on November 25, 1991; a "paper" copy of the second answer, signed by Logan, was received by the ALJ on December 3, 1991. There is no dispute concerning the timeliness of the second answer.

1. Prior to August 1989, Logan was attorney of record [9] in

12. The Director charged that the altered Office action which Logan gave to Needham misled Gilliam to believe that time for

iii) a certificate is included stating the date of deposit of the fee in the U.S. Postal Service.[37]

not divine all possible afterthoughts of counsel that might be asserted for the first time on appeal); and *Brotherhood of Locomotive Engineers v. Interstate Commerce Commission*, 808 F.2d

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1. Prior to August 1989, Logan was attorney of record [9] in application Serial No. 07/129,536 naming Richard Bechtel and Don Needham as inventors (the Bechtel application). [10]

2. In connection with the Bechtel application, Logan received an Office action[11] dated Nov. 3, 1988, stating that a response was due within three months, or on or before February 3, 1989.[12]

3. The Office action is correspondence which could have a significant effect on the Bechtel application and of which a responsible practitioner would believe under the circumstances the applicants[13] should be notified, yet Logan failed to inform the applicants of Logan's receipt of the Office action within three months of the date of the Office action [14].

4 Needham came to Logan's office sometime in the Spring of 1989. At that time Logan told Needham that the examiner had rejected the claims in the Bechtel application. Logan showed Needham the patent references cited by the examiner, and indicated to Needham that Logan did not think the claimed invention was patentable over the references. [15]

5. Logan did not respond to the Office action dated November 3, 1988, and the Bechtel application became abandoned.[16]

6. Logan was notified of the abandonment of the Bechtel application by a Notice of Abandonment dated June 13, 1989. Logan received the Notice of Abandonment sometime in June 1989, and did not inform Needham.[17]

7. Sometime in the summer of 1989, Needham telephoned or came to Logan's office and asked for a copy of the Office action in the Bechtel application.[18]

8. Logan altered the Office action he had received by changing the mailing date on the cover page from "11/03/88" [19] to "7/7/89" [20] and eliminating the date on [page 3 (hereinafter, the altered Office action") in the following manner:

i) Logan made a photostat copy of the original Office action in the Bechtel application, and whited out the mailing date on the cover sheet of the action and the date appearing on the last page of the Office action;

ii) Logan wrote in an incorrect mailing date, "7/7/89," on the cover sheet of the Office action; and

iii) Logan then made a copy of the photostatic copy of the Office action with the alterations.[21]

9. Logan gave Needham the altered Office action.[22]

10. Logan altered the Office action because he did not want Needham to known when Logan received the Office action.[23]

11. On August 28, 1989, Needham filed a Power of Attorney in PTO to revoke Logan's authority to prosecute the Bechtel application, and to empower another registered practitioner (Frank D. Gilliam) to prosecute the Bechtel application. Gilliam filed or caused to be filed in the PTO a "response to the Official Office Action dated July 7, 1989," and the response was received in the PTO on August 28, 1989.[24]

12. The Director charged that the altered Office action which Logan gave to Needham misled Gilliam to believe that time for response remained.[25] Logan admitted in his second answer that it was the photostatic copy of the Office action that was altered to show a mailing date of July 7, 1989, and it is presumed that this misled Gilliam to believe that time for response remained.[26] In view of the Director's definition in the complaint of "altered Office action" to mean the photostatic copy of the document which had been altered,[27] there is no material disagreement between the allegation charged by the Director and the matter admitted by Logan.

13. The Director charged that by altering the Office action and producing the altered Office action, and by giving to Needham the altered Office action, Logan participated in creating and preserving evidence which Logan knew to be false, and/or Logan engaged in conduct involving dishonesty, fraud, deceit or misrepresentation.[28] Logan admitted the allegation, noting however that the Office action referred to as being altered was a photostatic copy of the Office action.[29] Again, there is no material difference between the allegation charged by the Director and the matter admitted by Logan.

B. Count 2

In Count 2, the Director charged that by failing to timely pay the issue fee in a patent application and not exercising reasonable care to revive the application, Logan engaged in unethical conduct. Using essentially the Director's wording in the complaint, Count 2 alleges:

1. Logan was attorney of record in patent application Serial No. 07/088,566 naming Needham as inventor (the Needham application).[30]

2. Logan was notified in a Notice of Allowance and Issue Fee Due,[31] dated June 17, 1988, that payment of an issue fee[32] for the Needham application was due within three months, or on or before Monday, September 19, 1988. Logan received the Notice of Allowance and Issue Fee Due on June 22, 1988.[33]

3. Logan informed Needham of the receipt of the Notice of Allowance and Issue Fee Due. Logan sent to Needham a bill for an amount which included the issue fee, and Logan informed Needham that the issue fee had to be paid by September 17, 1988.[34]

4. On September 15, 1988, as Logan was preparing to leave his office for the day, Logan received from Needham a check in the amount of $325. Logan closed his office and went home.[35]

5. The next morning, Friday, September 16, 1988, Logan wrote a check for the issue fee, and took it to the U.S. Post Office in La Mesa, California, and mailed the issue fee and an Issue Fee Transmittal form to PTO.[36]

6. An issue fee is considered to be timely filed in the PTO if, in accordance with the provisions of 37 CFR § 1.8:

i) the fee (usually in the form of a check) is mailed in an envelope addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231;

ii) the envelope containing the fee is deposited with the U.S. Postal Service with sufficient postage as first class mail prior to the expiration of the period for response (i.e., the period for payment of the fee); and

[9] 37 CFR § 1.34 (b).
[10] Complaint ¶ 1.1; Second Answer, p. 1, ¶1; Initial Decision, Finding 2.
[11] 35 U.S.C. § 132; 37 CFR § 1.106.
[12] Complaint ¶ 1.2; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 3. The Office action was received by Logan approximately on November 8, 1988. Tr. 20:3; Tr. 27:4.
[13] Bechtel and Needham.
[14] Complaint ¶ 1.3; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 4.
[15] Complaint ¶ 1.4; Second Answer, p. 1, ¶1; Initial Decision, Finding *See also* Tr. 22:15. At some unspecified time prior to the meeting in the Spring of 1989, Logan had given Needham copies of the prior art cited by the examiner. Tr. 30:5. At that unspecified time, however, Logan does not contend that he also gave Needham a copy of the Office action or advised Needham of a need to reply to the Office action.
[16] Complaint ¶ 1.5; Second Answer, p. 1, ¶ 1; Initial Decision, 5. Finding 6. *See also* 35 U.S.C. § 133.
[17] Complaint ¶1.6; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 7.
[18] Complaint ¶1.7; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 8. *See also* Tr. 24:6.
[19] November 3, 1988.
[20] July 7, 1989.
[21] Complaint 1.8; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 9.
[22] Complaint 1.9; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 10. Logan admits that he "improperly provided Mr. Needham with an altered Xeroxed (sic—photostatic) copy of the office action." Tr. 24.8.
[23] Complaint ¶ 1.10; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 11.
[24] Complaint ¶ 1.11; Second Answer, p. 1, ¶ 1; Initial Decision, Finding 12.
[25] Complaint, ¶ 1.12.
[26] Second answer, page 1, ¶ 2.
[27] Complaint, ¶ 1.8.
[28] Complaint, ¶ 1.13.
[29] Second answer, page 1, ¶ 3.
[30] Complaint ¶ 2.1; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 17.
[31] 35 U.S.C. § 151.
[32] 37 CFR § 1.18(a).
[33] Complaint ¶ 2.2; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 18. At the hearing on January 6, 1993, Logan testified that he received the Notice of Allowance and Issue Fee Due approximately June 21, 1988. *See* Tr. 16:8. It is immaterial whether the correct date of receipt is the 21st or the 22nd of June.
[34] Complaint ¶ 2.3; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 19. *See also* Tr. 16:11.
[35] Complaint ¶ 2.4; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 20. *See also* Tr. 17:14. Logan testified that he left "for a previous commitment," not home. The difference is not material.
[36] Complaint ¶ 2.5; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 21. *See also* Tr. 17:19.

iii) a certificate is included stating the date of deposit of the fee in the U.S. Postal Service.[37]

7. Logan did not include with the issue fee deposited with the U.S. Postal Service on Sept. 16, 1988 a certificate of mailing.[38]

8. The Director charged that the issue fee and Issue Fee Transmittal form were received in the PTO on Tuesday, September 20, 1988.[39] Logan admits that "it appears that the Issue Fee Transmittal form was received in the PTO on September 20, 1988."[40] There is no material dispute between the fact charged and the fact admitted.

9. Logan was notified of the abandonment of the Needham[41] application by a Notice of Abandonment date "12/09/88."[42] Logan informed Needham of the abandonment of the Needham application sometime in the Spring of 1989. Logan did not attempt to revive the Needham application soon after he became aware of the abandonment of the application[43]. More particularly, shortly after receiving the Notice of Abandonment, Logan telephoned the PTO to see how the Needham application could be revived. Logan says that he was informed when a revival petition would have to be filed and at a later date Needham was informed of "this information."[44]

C. Mitigating circumstances

Logan does not dispute the facts. The undisputed facts demonstrate that Logan engaged in the unprofessional conduct charged by the Director. In fact, Logan "does not deny his misdoings."[45]

Logan contends, however, that a five-year sanction is too severe. Logan further contends that no sanction which includes a suspension should be imposed.

Specifically, Logan argues that little or no weight has been given to his argument that he did not think the invention disclosed in the Bechtel application was patentable.[46] It will be assumed that Logan believed the invention disclosed and/or claimed in the Bechtel application was not patentable over the prior art cited by the examiner. Logan's belief did not alter the fact he was under an obligation to advise Needham of the Office action. Logan's belief provided no justification for preparing an altered Office action to give to Needham.

Logan argues that the ALJ most likely was not aware of the "product involved" in the Needham application.[47] The record will not support a finding that Logan submitted a sample of the "product involved" to the ALJ for consideration.[48] The ALJ could not have made an error on the basis of information not presented to him. *Compare Keeber Co. v. Murray Bakery Products*, 866 F.2d 1386, 9 USPQ2d 1736 (Fed. Cir. 1989) (since Keebler failed to tell PTO that it was interested in Murray's "intent," it could not use intent as a basis for showing "error"; prescience is not a required characteristic of PTO and PTO need not divine all possible afterthoughts of counsel that might be asserted for the first time on appeal); and *Brotherhood of Locomotive Engineers v. Interstate Commerce Commission*, 808 F.2d 1570, 1576 (D.C. Cir. 1987) (it is well settled that a litigant must present a contention for a ruling at the administrative level before it will be considered by a reviewing court; it is not incumbent upon the court to consider whether the Commission abused discretion which it was never pressed to invoke). Moreover, the nature of the product sought to be patented by the filing of the Needham application is of little, if any, importance to any issue in this proceeding.

Logan charges the ALJ with making a decision without observing Logan's "demeanor"[49] and alleges that he could not defend against Count 2 absent an oral hearing.[50] Logan's argument overlooks the fact that the ALJ decided the matter on allegations made by the Director in the complaint which stood admitted. Furthermore, the issue on appeal is not whether Logan engaged in unprofessional conduct. Rather, the issue is whether a five-year sanction is too severe.

At the hearing held on Jan. 6, 1993, Logan offered mitigating circumstances. Logan's explanation of mitigating circumstances has been given full consideration.

Logan is 55 years old and has devoted 29 years to the patent system.[51]

Logan has an engineering degree from Rensselaer Polytechnical Institute.[52] He was employed by the Patent Office from 1963 to 1969.[53] After service in the Patent Office, Logan worked for the firm of Barlow and Barlow in Rhode Island.[54] From 1973 to 1976, he worked as a senior patent attorney for Rohr Industries in Chula Vista, California.[55]

Logan is well-known in his community as a patent attorney and has done many things to project a positive image of his profession.[56] He provided many hours of community service in the form of coaching his daughters' athletic teams, attending events in which his daughters were involved, and acting as chaperon at their dances.[57]

Logan gave valuable assistance to a fellow patent attorney suffering from "a drinking problem."[58] He regularly donates blood.[59] Logan has provided patent counseling, often at no charge, to minorities and foreign immigrants.[60]

Professionally, Logan has obtained patents for over 500 clients.[61] He was President of the San Diego Patent Law Association.[62] On Law Day in San Diego, Logan offered free patent advice.[63]

To the extent that Logan's failure to use a certificate of mailing caused problems in connection with the Needham application, he has corrected office procedures to now use certificates of mailing.[64]

Logan has shown remorse for his unethical behavior.[65]

Logan testified that he is attempting to make Needham whole through full restitution[66] in the form of "[f]ull payment of all fees that he had paid to me for the different patent applications."[67]

[37] Complaint ¶ 2.6; Second Answer, p. 2, ¶ 1; Initial Decision, Finding 22.
[38] Complaint ¶ 2.7; Second Answer, p. 2, ¶ 1 (as further explained the first paragraph on page 1 of the Director's First Status Report filed with the ALJ on November 29, 1991); Initial Decision, Finding 23. At the time he mailed it, Logan believed that the fee would be timely received by PTO. Tr. 18:6.
[39] Complaint ¶ 2.8; Initial Decision, Finding 24.
[40] Second answer, page 2, ¶ 2.
[41] In ¶ 2.9, the charges refer to the Bechtel application when it was intended to refer to the Needham application. *See* OED Exhibit 10 referred to in the charges which relates to the Needham, not the Bechtel application. Based on Logan's second answer to the charges, it is apparent that Logan knew that paragraph 2.9 of the charges was referring to the Needham application.
[42] According to his testimony at the hearing held January 6, 1993, Logan received the Notice of Abandonment on December 12, 1988. Tr. 27:12.
[43] Complaint 2.9; Initial Decision, Finding 25. In the Second Answer, p. 2, ¶ 3, Logan neither admits nor denies the allegations in ¶ 2.9 of the complaint. Hence, they stand admitted. 37 CFR § 10.136(d). In any event, on page 3, ¶ 4 of his Proposed Findings and Conclusions, Logan essentially admits the correctness of the allegations in ¶ 2.9 of the complaint.
[44] Second answer, page 2, ¶ 3. *See also* Tr. 18:13.
[45] Response to Director's Proposed Findings and Conclusions, page 4.
[46] Appeal of Initial Decision, page 4.
[47] Appeal of Initial Decision, page 4.
[48] A sample of the Needham invention (a rebar clamp) was received in evidence at the hearing held on January 6, 1993. Tr. 20:8.
[49] Appeal of Initial Decision, page 5.
[50] Appeal of Initial Decision, page 6.
[51] Tr. 28:21.
[52] Tr. 11:11-12.
[53] Tr. 11:13.
[54] Tr. 11:22.
[55] Tr. 12:7.
[56] Tr. 12:12 and 25:4.
[57] Tr. 12:14.
[58] Tr. 13:19.
[59] Tr. 14:12.
[60] Tr. 15:2.
[61] Tr. 15:11.
[62] Tr. 14:18
[63] Tr. 14:19.
[64] Tr. 19:10.
[65] Tr. 25:15. *See* Director's Post-Hearing Submission, page 4, last paragraph, where the Director states that he "believes that respondent showed genuine remorse and contrition at the hearing for his actions underlying this proceeding." *See also* Tr. 36:6.
[66] Tr. 28:10. There is no evidence that Logan attempted to make restitution prior to entry of the ALJ's initial decision. However, since a hearing was held before the Commissioner in this matter, Logan's restitution efforts will be given full credence in making a decision in this case. Ordinarily, an appeal is on the record made before the ALJ, so that restitutions after an initial decision by an ALJ would not normally be entitled to consideration.
[67] Tr. 35:14.

D. The Director's Rebuttal Exhibit

The violations charged need to be deterred in the future, both by Logan and others. 37 CFR § 10.154(b)(4).

Responding to the Director's first status report, the ALJ entered an order[82] which directed Logan (1) "to submit specific questions or requests for discovery" and (2) "show cause why an

B. Discussion

1. **Logan waived any right to a hearing**

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D. The Director's Rebuttal Exhibit

Based on his testimony as a whole at the hearing on January 6, 1993, it would be fair to say that Logan was trying to give the impression that the events involving the Bechtel and Needham applications were the only "blemishes" on his record. Logan's testimony was consistent with a position expressed in his memorandum on appeal:[68]

> Respondent's past 22 years as a patent attorney have been dedicated to providing individual inventors with quality service at a reasonable price. With the exception of the isolated incidents relating to the inventor, Mr. Needham, Respondent has been successful in upholding that goal and has always had the client's best interest as his guide.

To complete the record, the Director placed in evidence, without objection, a document[69] which establishes—despite the appearance Logan sought to create—that Logan engaged in similar conduct in 1986.

The Rebuttal Exhibit consists of (1) a FINAL ORDER in *Weiffenbach v. Logan*. Disciplinary Proceeding No. DP 86-2, approved by then Deputy Commissioner Donald W. Peterson on November 28, 1986, and (2) an ORDER vacating the FINAL ORDER entered by former Commissioner Donald J. Quigg on September 6, 1989. The Peterson Final Order entered a private reprimand of Logan for altering the mailing date of an Office action in connection with an application of one Hugh R. Curry (Count I); withholding information from Curry (Count II); and failing to deliver property to Curry (Count III). Logan "freely and voluntarily admits that facts [recited] in Count I, Count II, and Count III are true." The Final Order was signed by Logan.[70] As noted, the reprimand was to be private. However, because PTO may not have complied with its part of the bargain to keep the Final Order confidential, former Commissioner Quigg felt it appropriate to vacate the Order—thus eliminating a "prior" insofar as Logan is concerned.[71] As noted at the hearing on January 6, 1993, however, Director's Rebuttal Exhibit 1 is an admission that Logan's alteration of the Needham application Office action is not the first time Logan has altered an Office action given to a client.[72] The exhibit is also evidence of a promise on the part of Logan to comply with all applicable disciplinary rules.[73] Elimination of the "prior," however, does not preclude use of the exhibit to contradict the definite impression Logan was attempting to give through his testimony at the hearing on Jan. 6, 1993.

E. The appropriate sanction in this case

The considerations which enter into imposition of any particular sanction are set out in 37 CFR § 10.154(b). The ALJ does not appear to have addressed the specific criteria set out in § 10.154(b). Nevertheless, on the basis of a consideration of the entire disciplinary file and Logan's testimony at the hearing on Jan. 6, 1993, the various factors set out in § 10.154 can be evaluated and balanced.

The public interest dictates that practitioners not engaged in the kind of conduct alleged in the complaint in this case. 37 CFR §10.54(b)(1). Inventors, such as Needham and Bechtel, should not lose patent rights on the basis of unprofessional conduct by a practitioner. To his credit, Logan says he has attempted to partially mitigate any loss by offering to refund all fees paid by Needham (it is presumed also any fees paid by Bechtel).

The violations charged in the complaint in this proceeding are reasonably serious. 37 CFR § 10.154(b)(2). They involve altering documents and withholding of material information known by the practitioner and unknown to the client.

The violations charged need to be deterred in the future, both by Logan and others. 37 CFR § 10.154(b)(4).

There is a need to preserve the integrity of the legal profession. 37 CFR § 10.154(b)(4). Logan claims to be, and is, a well-respected member of the patent community, having served as President of the San Diego Patent Law Association. If a former President of the bar association is not sanctioned in a meaningful way, the public (including other members of the bar association) are not likely to believe the PTO is serious in carrying out a program to maintain high ethics among those it registers.

There are extenuating circumstances, which in reality are mitigating circumstances in this case. 37 CFR § 10.154(b)(5). They are discussed at some length above. Any mitigating circumstances must be balanced with the fact that Logan knowingly did what he did with the Bechtel and Needham applications and that he had admitted doing similar acts on a previous occasion.

Upon consideration of all factors, a five-year suspension is not inappropriate. However, there are sufficient mitigating circumstances, including a showing of remorse, which justify suspending execution of all but the first six months of the five-year suspension. However, Logan will be required to demonstrate that he has made the restitution he says he wants to make to Needham—whether or not Needham provides Logan with a "release."[74]

II.

Logan alleges error because no hearing was held by the ALJ. The statute provides that a respondent in a practitioner disciplinary case be accorded an "opportunity for a hearing." U.S.C. § 32.

A. Factual background

The Director of the Office of Enrollment and Discipline (Director) filed a complaint[75] charging Logan with unprofessional conduct. A "first" answer[76] was timely filed with the ALJ. No request was made for a hearing in the first answer. Upon receipt of the first answer, the ALJ entered an order[77] noting that neither the Director nor Logan had asked for discovery or a hearing. The ALJ also set times for submitting proposed findings and conclusions.

Inasmuch as the Director had not received Logan's first answer by the time the ALJ entered his order and the Director believed the first answer was not procedurally sufficient, the Director moved for entry of an order (1) vacating the ALJ's order of Oct. 18, 1991, and (2) requiring Logan to file a proper answer.

The ALJ determined that a conference call involving himself, counsel for the Director, and Logan to discuss the Director's motion would be appropriate. The conference call took place on Nov. 6, 1991.[78] During the conference call, the ALJ suggested to Logan that he may wish to retain counsel. Following the conference call, the ALJ entered an order[79] requiring Logan to file another answer and again suggested that Logan may wish to retain counsel.

Logan's "second" answer[80] was timely filed. In the last paragraph of his second answer, Logan states:

> Respondent requests that a period for Discovery be set and he further requests an oral hearing.

In response to Logan's second answer, the Director submitted to the ALJ document styled DIRECTOR'S FIRST STATUS REPORT. In the status report, counsel for the Director notes (1) that he had a telephone conversation with Logan; (2) that Logan felt some discovery would be appropriate; (3) that Logan had "indicated . . . that he would like to use the hearing to state his views of the case"; and (4) that Logan had "indicated at this time that he does not intend to call any other witnesses."[81]

[68] Appeal of Initial Decision, filed in PTO on May 26, 1992.
[69] Director's Rebuttal Exhibit No. 1 Tr. 37:12.
[70] Tr. 42:9. Logan does not doubt the authenticity of Director's Rebuttal Exhibit 1. Tr. 42:8.
[71] Tr. 39:21.
[72] Tr. 40:3.
[73] Tr. 40:9; "Respondent shall comply with all Disciplinary Rules applicable to attorneys and patent agents practicing before the Patent and Trademark Office." Final Order, page 5, ¶ 4.
[74] Tr. 28:17.
[75] Complaint filed with the ALJ on September 11, 1991; *see* 37 CFR § 10.134.
[76] Answer filed October 28, 1991; *see* 37 CFR § 10.136.
[77] Order entered October 18, 1991.
[78] A tape of the conference call appears in the record.
[79] Order of November 8, 1991.
[80] Answer received by the ALJ on November 25, 1991, by facsimile; a "paper" copy of the second answer, signed by Logan, was received by the ALJ on December 3, 1991. There is no dispute concerning the timeliness of the second answer.
[81] Logan did not contest before the ALJ the correctness of any of the statements made by counsel for the Director.

Responding to the Director's first status report, the ALJ entered an order[82] which directed Logan (1) "to submit specific questions or requests for discovery" and (2) "show cause why an evidentiary hearing is appropriate for the adjudication of this proceeding."

In response to the ALJ's order, Logan submitted two papers. The first paper consisted of ten interrogatories.[83] The second paper responded to the ALJ's "show cause" order regarding the need for an evidentiary hearing:[84]

> Respondent has previously requested an oral hearing and at this time Respondent does not know if an evidentiary hearing would be required. Respondent believes that due to the gravity of the charges against him he should have available to him the option to have an evidentiary hearing.

The Director responded to Logan's request for oral hearing as follows:[85]

> [r]espondent has offered nothing in his request for evidentiary hearing as to why a hearing is necessary in this case. The Director submits that it would be appropriate at this time to set a time for submission of proposed findings and conclusions, pursuant to 37 CFR §10.153.

The ALJ then entered an order[86] providing in part as follows:

> Respondent has requested an oral hearing which is opposed by Agency Counsel [meaning counsel for the Director] on the grounds that there are no material facts in issue. In the Order of Dec. 3, 1991, Respondent was solicited to show cause why an evidentiary hearing is appropriate for the adjudication of this proceeding. His response filed on Dec. 19, 1991, makes no such showing. The law does not require a hearing when it can serve no purpose.

• • •

> Where, as here, there are no material facts at issue, there is simply no purpose to holding an evidentiary hearing. Oral hearings and other trial procedures are useful primarily for resolving questions of fact [citation omitted]. In addition to written submissions, further telephone conferences may be arranged and Respondent may reassert the request for an oral hearing with an appropriate showing of a justifiable basis.

The ALJ set times for submitting proposed findings and conclusions.

Logan timely submitted proposed findings and conclusions.[87] In submitting his proposed findings and conclusions, Logan did not renew his request for a hearing. The Director also submitted proposed findings and conclusions.[88] In responding[89] to the Director's proposed findings and conclusions, again Logan did not renew a request for a hearing. Logan did "not deny his misdoings," but maintained that "the charges [do not] warrant suspension or exclusion from practice before the Patent Office."[90]

The record was closed for initial decision.[91] The ALJ then entered his initial decision.[92]

B. Discussion

1. Logan waived any right to a hearing

In his Order entered December 20, 1991, the ALJ denied a request for a hearing, but indicated:

> In addition to written submissions, further telephone conferences may be arranged and Respondent may reassert the request for an oral hearing with an appropriate showing of a justifiable basis.

Logan thereafter never made a renewed request for a hearing until after the ALJ entered the initial decision. If Logan felt at the time he filed his Proposed Findings and Conclusions and his Response to Director's Proposed Findings and Conclusions that a hearing was still necessary he did not say so in either paper. At that point, the ALJ was justified in concluding that Logan no longer wanted a hearing. By failing to take advantage of the ALJ's invitation to file a renewed request for a hearing, Logan waived any right to contest lack of hearing as a basis for error.

2. The ALJ did not err in denying a hearing

Assuming Logan did not waive a right to a hearing, it is concluded that the ALJ did not commit reversible error in denying a hearing in this particular case.

The ALJ indicated:[93]

> Requests for hearings are not lightly rejected. However, . . . even when the statute mandates a hearing, when there is no question of fact, neither due process, the statute, nor the APA [Administrative Procedure Act] requires that the agency hold a meaningless hearing. *United States v. Cheramie Boat Truc No. 5, Inc.*, 538 F.2d 698 (5th Cir. 1976).

The ALJ cited a decision of the Fifth Circuit. The appellate decisional law applicable to PTO disciplinary proceedings is the decisional law of the Court of Appeals for the Federal Circuit. Judicial review of final PTO disciplinary decisions occurs in the U.S. District Court for the District of Columbia. 35 U.S.C. § 32. Appeals from the district court are to the Federal Circuit.[94] In ruling on non-patent matters in "patent" appeals from a district court, the Federal Circuit will apply the law of the regional circuit in which the district court is situated. *Atari, Inc. v. JS & A Group, Inc.* 747 F.2d 1422, 223 USPQ 1074 (Fed. Cir. 1984) (in banc). In a PTO disciplinary case, the "district court" is always the U.S. District Court for the District of Columbia. Hence, in deciding non-patent matters in PTO disiplinary cases the Federal Circuit will apply the law of the D.C. Circuit.

The D.C. Circuit has addressed the question of when a hearing may properly be denied:

> The case law in this Circuit is clear that an agency is not required to conduct an evidentiary hearing when it can serve absolutely no purpose. In such a circumstance, denial of a hearing may be proper even though adjudicatory proceedings are provided for by statute. The agency, however, carries a heavy burden of justification. Where Congress has plainly given interested parties the right to a full hearing, the agency must show that the parties could gain nothing thereby, because they disputed none of the material facts upon which the agency's decision could rest.

Independent Bankers Ass'n of Georgia v. Board of Governors of the Federal Reserve System, 516 F.2d 1206, 1220 (D.C. Cir. 1975). *See also* note 57 of its opinion, where the D.C. Circuit further discusses the basis on which a hearing might be denied. There mentioned is *Anti-Defamation League of B'Nai B'rith, Pacific Southwest Regional Office v. Federal Communications Commission*, 403 F.2d 169, 171, (D.C. Cir. 1968), *cert. denied*, 394 U.S. 930 (1969):

[82] Order entered December 3, 1991.
[83] Respondent's First Set of Interrogatories 1-10, received by the ALJ on December 19, 1991.
[84] Request for Evidentiary Hearing, received by the ALJ on December 19, 1991.
[85] Director's Response to Respondent's Request for Evidentiary Hearing, received by the ALJ on December 19, 1991. The Director simultaneously answered to Logan's interrogatories.
[86] Order entered December 20, 1991.
[87] Proposed findings and conclusions, received by the ALJ on January 27, 1992.
[88] Director's proposed finding and conclusions, received by the ALJ on January 21, 1992.
[89] Response to Director's proposed findings and conclusions, received by the ALJ on February 12, 1992.
[90] *Id.* at 4.
[91] Order entered February 10, 1992.
[92] Initial Decision, entered April 22, 1992.
[93] Initial Decision, page 2 n.1.
[94] *Jaskiewicz v. Mossinghoff*, 802 F.2d 532, 231 USPQ 477 (D.C. Cir. 1986); *Wyden v. Commissioner of Patents and Trademarks*, 807 F.2d 934, 231 USPQ 918 (Fed. Cir. 1986) (in banc); *Atheridge v. Quigg*, 852 F.2d 621, 7 USPQ2d 1577 (D.C. Cir. 1988); *Franchi v. Manbeck*, 947 F.2d 631, 20 USPQ2d 1635 (2d Cir. 1991); *Franchi v. Manbeck*, 972 F.2d 1283, 23 USPQ2d 1847 (Fed. Cir. 1992).

> Our examination of the record satisfies us that

There is a difference between an "oral" hearing and an

was his opportunity to present whatever evidence and oral argument he felt was appropriate.[111] Logan then made an oral

FURTHER ORDERED that execution of all but the first six (6) months of the five-year suspension is suspended, provided:

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> Our examination of the record satisfies us that the Commission acted within its authority in denying an evidentiary hearing as to the undisputed facts which formed the basis of Appellant's claims. The disposition of Appellants's claims turned not on determination of facts but inferences to be drawn from facts already known and legal conclusions to be derived from those facts.

After discussing Anti-Defamation, the D.C. Circuit in Independent Bankers goes on to say, again in note 57:

> These cases, than, made clear that denial of a statutory mandated hearing is justified only in exceptional circumstances. A petition need not make detailed factual allegations in order to meet the requirement that he raise "issues of material fact." He need only show that an "inquiry in depth" is appropriate.[95]

There was some apparent confusion in this case during proceedings before the ALJ as to exactly what Logan wanted in the way of a hearing. In his first answer, Logan did not ask for a hearing. In his second answer, Logan asked for an "oral" hearing. He later told counsel for the Director "that he would like to use the hearing to state his views of the case" and "indicated at this time that he does not intend to call any other witnesses."[96] Logan's statement to counsel for the Director is some indication that Logan wanted to "testify" at an evidentiary-type hearing before the ALJ about the case. However, in a second paper responding to the ALJ's "show cause" order regarding the need for an evidentiary, hearing, Logan indicated:[97]

> Respondent has previously requested an oral hearing and at this time Respondent does not know if an evidentiary hearing would be required. Respondent believes that due to the gravity of the charges against him he should have available to him the option to have an evidentiary hearing.

Logan does not say when he should be allowed to exercise the option" and never renewed his request for an evidentiary hearing after the ALJ gave him an opportunity to do so.[98]

Logan's case is somewhat similar to *Anti-Defamation*. There is no dispute on the facts (as opposed to inferences and legal conclusions to be drawn from the facts) alleged in the complaint. No fact alleged by Logan in his papers before the ALJ seems to have been contested by the ALJ or the Director, albeit some of those facts have been found to be entitled to little or no weight.[99] On the basis of *Anti-Defamation*, it appears that the ALJ's denial of an "evidentiary" hearing is not reversible error.

There is a difference between an "oral" hearing and an evidentiary" hearing. An evidentiary hearing is a trial-type hearing in which evidence is presented to the ALJ in the form of testimony or documents. Testimony may be cross-examined. Objections to the receipt of evidence may be made and ruled upon. An "oral" hearing is one in which a party makes oral argument based on a record which has been created. An ALJ has discretion to permit an "oral" hearing at, or after, the time a record is closed. Indeed, the ALJ may *sua sponte* request the parties to appear and present oral argument and answer questions which may assist the ALJ in making an initial decision. However, the need for an "oral" hearing is a matter within the discretion of the ALJ and is not governed by the principles of *Independent Bankers*. Logan has made no showing that the ALJ abused discretion in not holding an "oral" hearing in this case.

3. Any error by the ALJ in denying a hearing is Cured by the hearing held on Jan. 6, 1993.

Ordinarily, an appeal to the Commissioner from an initial decision of an ALJ is on the record made before the ALJ.[100] However, in an appropriate case, the Commissioner has authority to waive requirements of the rules which are not requirements of a statute and to conduct an evidentiary hearing.[101] Whether a rule is waived is a matter within the discretion of the Commissioner. *See, e.g., Mobil Oil Corp. v. Dann*, 448 F. Supp. 487, 489 n.3, 198 USPQ 347, 349 n.3 (D.D.C. 1978). In view of the "heavy burden of justification" and the need for "exceptional circumstances,"[102] the question of whether Logan was entitled to a hearing could be considered a "close case" by any reviewing court. To eliminate any doubt on the "hearing" issue, discretion was exercised to have a hearing before the Commissioner notwithstanding the normal practice of considering an appeal solely on the record developed before ALJ. A decision to grant Logan a hearing "to present such oral argument and other evidence as Logan or counsel[103] deems appropriate"[104] seemed at the time an effective way to handle this particular appeal since Logan had previously indicated to the ALJ that he wanted to explain the case from his point of view and would not be calling any other witnesses. Accordingly, it was decided to grant Logan's request that he be given (even if not required by law) "an evidentiary hearing that would allow Respondent to present his own arguments and evidence orally."[105] A hearing would give Logan an "opportunity for an evidentiary hearing in order to ensure that the respondent has had every opportunity to present any information which he believes to be material to the issues that are before the office in this matter."[106]

In accordance with the decision to wave the rule limiting appeals from an ALJ to the record, an Interlocutory Order was entered on Nov. 30, 1992, scheduling a hearing for Dec. 14, 1992, to permit Logan to "to present such oral argument and other evidence as Logan or counsel deems appropriate."[107] On December 2, 1992, Logan requested a postponement to obtain counsel.[108] Logan's request was granted and the hearing was rescheduled for January 6, 1993.[109] On January 6, 1993, Logan appeared at the hearing without counsel. At the hearing, Logan indicated that he had retained counsel, but that counsel would represent him in all proceedings subsequent to the hearing.[110] At the beginning of the hearing, Logan was advised that the hearing

[95] Denial of a statutorily mandated hearing, on its face, may seem a contradiction. If Congress provides that an individual is entitled to a hearing, how can one be denied? The answer lies in another statute. An agency can provide "for the exclusion of irrelevant, immaterial, or unduly repetitious evidence" when a hearing is held. 5 U.S.C. § 556(d), second sentence. In an appropriate case, i.e., where all material facts alleged in charges are admitted and fully supported by unquestionably authentic "documents," it is possible that *all* testimony which might be offered at a hearing would be "irrelevant, immaterial, or unduly repetitious evidence." Under those limited circumstances, no hearing would be needed, because no evidence could be submitted. As the D.C. Circuit notes, however, the cases where no hearing is needed are "exceptional circumstances."

[96] Logan did not contest before the ALJ the correctness of any of the statements made by counsel for the Director.

[97] Request for Evidentiary Hearing, received by the ALJ on December 19, 1991.

[98] Neither a respondent nor the Director can hold the ALJ "hostage." The ALJ controls proceedings—not the parties. 37 CFR § 10.139(c). *See also and compare Rosemount, Inc. v. Beckman Instruments, Inc.*, 727 F.2d 1540, 1549, 221 USPQ 1, 10 (Fed. Cir. 1984) (the conduct of a trial is not solely a matter of balancing conveniences of the parties); *Railroad Dynamics, Inc. v. A. Stucki Co.*, 727 F.2d 1056, 1515, 220 USPQ 929, 938 (Fed. Cir. 1984) (courts have broad authority in controlling the conduct of trials).

[99] For example, it matters little that Logan believed the claims in the Needham application were not patentable; Logan was still under an obligation to provide Needham with the Office action (in unaltered form). Furthermore, it matters little that Logan may have been slightly agitated with Needham for his having appeared at the 11th hour to pay the issue fee; Logan was still under an obligation to promptly advise, and not conceal from, Needham the fact that the issue fee had not been timely paid.

[100] 37 CFR § 10.155(b).

[101] 37 CFR § 10.170(a).

[102] *Independent Bankers*, 516 F.2d at 1220.

[103] "Counsel" means counsel for Logan. Logan has appointed counsel to represent him in all proceedings subsequent to the hearing held on January 6, 1993. *See* Appointment of Washington, D.C. Counsel to Represent Respondent, submitted at the hearing on January 6, 1993, and Tr. 8:7.

[104] Interlocutory Order entered December 3, 1992, page 2.

[105] Appeal of Initial Decision, page 4.

[106] Tr 3:14.

[107] Interlocutory Order entered December 3, 1992, page 2.

[108] Request to Delay Hearing until Legal Representation Obtained, filed by facsimile on December 2, 1992.

[109] Interlocutory Order entered December 3, 1992.

[110] Tr. 5:2; Tr. 8:7; *supra* n. 103.

was his opportunity to present whatever evidence and oral argument he felt was appropriate.[111] Logan then made an oral presentation and submitted documents. Logan's oral statement is deemed to be his "testimony." There was brief cross-examination by counsel for the Director. At the conclusion of the hearing, Logan and the Director were given until close of business on January 13, 1993, to present any other material deemed appropriate.[112] The Director filed a post-hearing paper.[113] No paper or material was filed by Logan. The testimony, and all other papers in the file, have been considered in rendering a decision on the nature of the sanction to be imposed in this case. In view of the January 6, 1993, hearing, Logan's contention on appeal that he has been denied due process because he has been denied a hearing affords no basis for reversing the decision of the ALJ or for remanding the matter to the ALJ for holding yet another hearing.

As guidance for future cases, it is the policy of the PTO in disciplinary cases that any doubt as to whether a respondent in a disciplinary case is entitled to an "evidentiary" hearing should be resolved in favor of offering an opportunity for the hearing. The granting of a request for an "oral" hearing (i.e., oral argument on an established record) remains a matter of discretion.

Receiving a sanction in a disciplinary case is very significant to the individual receiving the sanction. The PTO wants individuals who become involved in PTO disciplinary cases to have a reasonable and fair opportunity to present their side of the case. Moreover, public confidence in PTO disciplinary cases is maximized when the PTO accommodates requests for hearings in "close" cases.

4. Logan's motion for an evidentiary hearing before an ALJ

At the hearing on Jan. 6, 1993, Logan requested an evidentiary hearing before an ALJ in San Diego, California.[114] The request is *denied*.

Logan first contends that due process requires that this proceeding "be taken back to the stage" where the ALJ "improperly" denied a hearing. Assuming that the ALJ's denial of a hearing was a denial of due process, remanding to the ALJ would be one way to cure any due process defect. Another way to cure any due process defect is holding an evidentiary hearing before the Commissioner.

Logan seeks an evidentiary hearing in San Diego, California, because both Bechtel and Needham are said to reside in San Diego. According to Logan, both he and his newly appointed counsel have a right to examine both Bechtel and Needham. Logan's argument is not persuasive. *First*, at no time during proceedings before the ALJ did Logan ask for an evidentiary hearing for the purpose of calling Bechtel and/or Needham. Logan's request for their testimony at this time is an afterthought. *Second*, the testimony of Bechtel and Needham is not necessary and would not be authorized even if the proceeding was remanded to the ALJ. Logan admits all the material facts relating to how he handled the Bechtel and Needham applications. The Director has not contested the accuracy of any statement made by Logan as to what Bechtel and/or Needham would say.[115] Indeed, the Director stipulates that any Bechtel and/or Needham testimony would corroborate Logan's version of the facts.[116] Logan's version of the facts, even if fully accepted, justifies imposition of the sanction imposed by this order.

Order

Upon consideration of the entire record, and pursuant to 35 U.S.C. § 32 and 37 CFR Part 10, it is

ORDERED that Charles C. Logan, II, of La Mesa, California, whose registration number is 25,253, is hereby suspended, effective February 19, 1993, from practice before the Patent and Trademark Office for a period of five (5) years, and it is

FURTHER ORDERED that execution of all but the first six (6) months of the five-year suspension is suspended, provided:

(1) that within twenty (20) days of the date of this order Logan files appropriate evidence which shows to the satisfaction of the Director of Enrollment and Discipline that Logan has made full payment of all fees paid by Needham and Bechtel in connection with the Bechtel and Needham applications; *and*

(2) that Logan complies with all requirements of the Patent and Trademark Office Code of Professional Responsibility (37 CFR § 10.20 *et seq.*); *and*

(3) that during the six month period of actual suspension, Logan complies with the conditions applicable to practitioners suspended from practice before the PTO (37 CFR § 1u.158), and it is

FURTHER ORDERED that this order shall be deemed to have been "recorded" (i.e., entered), as that term is used in 35 U.S.C. § 32, on January 19, 1993, and it is

FURTHER ORDERED that this order shall be published.

Appeal rights

Logan is advised that he is entitled to seek judicial review under 35 U.S.C. § 32 in the United States District Court for the District of Columbia. *See* Local Rule 213 of the U.S. District Court for the District of Columbia for the time within which judicial review must be sought and the basis upon which judicial review is conducted.

DOUGLAS B. COMER
Acting Commissioner of Patents and Trademarks

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Associate Solicitor
(Counsel for the Director)

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE COMMISSIONER OF PATENTS AND TRADEMARKS

CAMERON A. WEIFFENBACH, Petitioner-Appellee, v. CHARLES C. LOGAN II, Respondent-Appellant.	Proceeding D91-11

ORDER GRANTING STAY

Charles C. Logan, II, (Logan) has sought judicial review under 35 U.S.C. § 32 and Local Rule 213 of the U.S. District Court for the District of Columbia of a decision entered January 19, 1993, by former Acting Commissioner Douglas B. Comer. By the decision, Logan was suspended, effective February 19, 1993, from practice before the Patent and Trademark Office for a period of five (5) years; execution of all but the first six (6) months of the five-year suspension being suspended, provided (1) that within twenty (20) days of the date of this order Logan files appropriate evidence which shows to the satisfaction of the Director of Enrollment and Discipline that Logan has made full payment of all fees paid by Needham and Bechtel in connection with the Bechtel and Needham applications; *and* (2) that Logan complies with all requirements of the Patent and Trademark Office Code of Professional Responsibility (37 CFR § 10.20 *et seq.*); *and* (3) that during the six-month period of actual suspension, Logan complies with the conditions applicable to practitioners suspended from practice before the PTO (37 CFR § 10.158). It was further decided that the decision would be published.

[111] Tr. 3:14; Tr. 6:18.

[112] Tr. 44:16.

[113] Director's Post-Hearing Submission filed January 8, 1993.

[114] Request for Evidentiary Hearing before an Administrative Law Judge; Tr. 10:11.

[115] Logan did not indicate in his Request what Bechtel and/or Needham would be asked. Logan has not explained the reason why testimony by Bechtel and/or Needham is needed for an inquiry in depth to be made of the events surrounding this case.

[116] Director's Post-Hearing Submission, received January 8, 1993, page 4.

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In a complaint filed in the U.S. District Court for the District of Columbia on February 19, 1993, Logan seeks review of former Acting Commissioner Comer's decision. *Logan v. Commissioner of Patents*, Civil Action No. 93-0335-JHG (D.D.C. filed Feb. 19, 1993). In the first full paragraph on page 16 of the complaint, Logan requests that the decision entered on January 19, 1993 "be stayed under 37 CFR Ch. 1, Section 10.157(b) pending review in the United States District Court for the District of Columbia."

Order

Upon consideration of the request contained in the first full paragraph on page 16 of Logan's complaint in the U.S. District Court for the District of Columbia, in *Logan v. Commissioner of Patents*, Civil Action No. 93-0335-JHG (D.D.C. filed Feb. 18, 1993), it is

ORDERED that the suspension from practice before the Patent and Trademark Office, ordered by Acting Commissioner Comer in his decision of January 19, 1993, to begin on February 18, 1993, is hereby reset to begin on Monday, June 7, 1993, and it is

FURTHER ORDERED that the decision shall be published forthwith as ordered by former Acting Commissioner Comer, there being no request in the complaint to stay publication of the decision.

MICHAEL K. KIRK
Acting Commissioner of Patents and Trademarks

cc: Charles C. Logan, II, Esq. (Via Express Mail)
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Harris A. Pitlick, Esq.
Associate Solicitor
(Counsel for the Director)

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Apr. 2, 1993

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

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Reconstruction of Files ..... 308-9400 (Exts. 37 & 38)

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Status of Registrations and Applications via Automated Voice System

(TMEP) ..... 308-9000 (Exts. 44 & 46)

Status of PTO Services

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Trademark Manual of Examining Procedures (TMEP) ..... 308-9000 (Exts. 44 & 46)

Training for Public Users, Automated Search Systems (Public User Training Branch) 308-3924

Status of PTO Services

The following is an update of the status of PTO services for Mar. 1993:

Service Item	FY 1993 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	34
Trademarks	30	71
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	9 Hours
Window Coupons	5	2
Mail Coupons	12	3
Letter Orders	16	27
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	15
Patent Applications-As-Filed	17	13
Patent Applications Expedited	7	8
Patent File-Wrapper/Contents	N/A	23
TM Applications-As-Filed	17	19
TM Applications Expedited	7	7
Patent Copies	17	13
Trademark Search Library:		
Filing Pending Marks	23	65
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	18
Assignments:		
Recording Patents-New Applications	20	24
Recording Patents-Mail Room Recpts.	20	37
Return Patents-New Applications	34	36
Return Patents-Mail Room Recpts.	34	53
Recording Trademarks	20	37
Returning Trademark Documents	34	55
Avg. Days from Issue Fee Payment to Issue Date	90-100	120
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	99% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.

April 2, 1993

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

SPECIAL BOXES FOR MAIL

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PATENT NOTICES

Certificates of Correction For Week of April 27, 1993

D. 320,397	5,005,412	5,042,919	5,065,424
D. 321,734	5,005,988	5,043,428	5,065,746
D. 321,816	5,006,528	5,043,468	5,065,873
D. 321,948	5,009,457	5,043,749	5,066,587
D. 322,795	5,009,921	5,044,793	5,066,652
D. 323,523	5,009,960	5,045,466	5,066,739
D. 323,696	5,010,094	5,045,533	5,066,788
PP. 6,942	5,011,089	5,045,813	5,067,222
PP. 7,551	5,013,185	5,046,108	5,067,461
Re. 33,149	5,013,190	5,046,305	5,067,558
Re. 33,520	5,013,936	5,046,482	5,067,575
4,593,248	5,014,123	5,046,585	5,067,579
4,658,688	5,014,268	5,047,144	5,068,073
4,739,476	5,016,760	5,047,278	5,068,109
4,759,374	5,017,106	5,048,988	5,068,115
4,775,318	5,017,608	5,049,108	5,068,192
4,800,030	5,019,998	5,049,157	5,068,269
4,802,098	5,020,084	5,049,265	5,068,331
4,818,773	5,020,900	5,049,563	5,068,384
4,826,643	5,021,368	5,049,566	5,068,395
4,826,646	5,021,497	5,049,646	5,068,468
4,828,008	5,023,169	5,049,822	5,068,576
4,831,012	5,023,257	5,049,845	5,068,746
4,840,894	5,023,804	5,050,020	5,068,019
4,847,122	5,024,699	5,050,706	5,069,094
4,849,628	5,024,911	5,051,099	5,069,197
4,857,466	5,025,030	5,051,235	5,069,240
4,863,457	5,025,480	5,051,501	5,069,300
4,868,143	5,025,625	5,051,558	5,069,344
4,885,130	5,026,622	5,051,601	5,069,598
4,892,670	5,026,857	5,051,833	5,069,637
4,900,754	5,027,975	5,053,152	5,069,658
4,908,404	5,028,126	5,054,513	5,069,683
4,918,480	5,028,507	5,054,565	5,069,684
4,924,266	5,028,638	5,055,382	5,069,757
4,928,721	5,028,883	5,055,457	5,070,140
4,930,251	5,029,227	5,055,524	5,070,191
4,933,364	5,029,993	5,055,715	5,070,479
4,938,267	5,030,272	5,055,994	5,071,036
4,938,951	5,030,409	5,056,051	5,071,382
4,941,289	5,030,697	5,056,135	5,071,558
4,941,388	5,031,548	5,056,966	5,071,847
4,941,612	5,032,401	5,057,227	5,071,855
4,941,806	5,032,518	5,057,772	5,072,225
4,942,414	5,032,720	5,058,821	5,072,249
4,943,870	5,033,003	5,059,007	5,072,498
4,943,955	5,033,234	5,059,030	5,072,525
4,951,490	5,033,577	5,059,078	5,072,632
4,952,499	5,033,671	5,059,080	5,072,731
4,953,031	5,033,853	5,059,407	5,072,766
4,956,329	5,034,046	5,059,673	5,072,997
4,961,987	5,034,359	5,059,701	5,073,025
4,963,589	5,034,408	5,060,482	5,073,268
4,964,700	5,034,617	5,060,900	5,073,273
4,968,123	5,034,888	5,061,451	5,073,384
4,969,143	5,035,379	5,061,485	5,073,666
4,969,264	5,036,216	5,061,580	5,073,742
4,972,690	5,037,166	5,061,928	5,073,860
4,975,429	5,037,275	5,061,935	5,073,884
4,976,665	5,037,493	5,062,113	5,074,036
4,982,951	5,037,879	5,062,199	5,074,054
4,983,410	5,038,283	5,062,453	5,074,117
4,985,726	5,039,123	5,062,785	5,074,193
4,986,991	5,039,389	5,063,225	5,074,390
4,988,756	5,039,991	5,063,278	5,074,423
4,988,790	5,040,039	5,063,453	5,074,706
4,990,690	5,040,075	5,063,543	5,074,854
4,991,482	5,040,138	5,063,566	5,075,062
4,991,991	5,040,224	5,063,607	5,075,234
4,992,267	5,041,150	5,063,724	5,075,269
4,994,601	5,041,406	5,063,744	5,075,270
4,995,678	5,041,700	5,064,100	5,075,349
4,996,611	5,401,950	5,064,845	5,075,395
4,997,287	5,042,041	5,064,855	5,075,932
4,997,481	5,042,350	5,065,027	5,076,021
5,003,529	5,042,626	5,065,119	5,076,382
5,076,563	5,079,912	5,083,496	5,086,704
5,076,592	5,080,350	5,083,597	5,086,749
5,076,742	5,080,389	5,083,625	5,086,802
5,076,875	5,080,669	5,083,627	5,087,228
5,076,897	5,080,755	5,083,641	5,087,282
5,076,925	5,081,042	5,083,684	5,087,605
5,077,023	5,081,171	5,083,699	5,087,723
5,077,299	5,081,207	5,083,882	5,087,864
5,077,417	5,081,491	5,084,049	5,088,225
5,077,529	5,081,654	5,084,181	5,088,725
5,077,581	5,081,659	5,084,415	5,089,376
5,077,682	5,082,218	5,084,495	5,089,745
5,077,767	5,082,256	5,084,520	5,091,991
5,077,809	5,082,294	5,084,691	5,121,316
5,078,002	5,082,436	5,084,748	5,134,891
5,078,151	5,082,507	5,084,849	5,140,714
5,078,829	5,082,556	5,085,030	5,148,273
5,078,996	5,082,674	5,085,534	5,148,302
5,079,069	5,082,675	5,085,562	5,153,626
5,079,164	5,082,680	5,085,576	5,154,643
5,079,282	5,082,689	5,085,689	5,166,635
5,079,357	5,082,708	5,085,747	5,172,809
5,079,519	5,082,909	5,085,822	5,173,158
5,079,716	5,083,045	5,086,342	5,177,671
5,079,759	5,083,109	5,086,529	5,195,061
5,079,900	5,083,236	5,086,623	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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	Columbus: Ohio State University Libraries	(614) 292-6175
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PATENT EXAMINING CORPS

REEXAMINATIONS

APRIL 27, 1993

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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	4/25/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	7/23/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	6/05/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/05/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	9/19/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	10/01/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	9/14/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	12/19/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	4/03/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	9/07/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	12/02/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/29/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	6/23/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/19/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	6/26/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	3/03/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during March 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,940,801 to 3,947,895 inclusive
Plant Patents ..... 3,831 to 3,855

REEXAMINATIONS

APRIL 27, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 33,452 (1984th)
METHOD FOR MAKING ALKYLHALOSILANES
William J. Ward, III, Schenectady; Alan Ritzer, Sand Lake; Kenneth M. Carroll, Albany, and John W. Flock, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Reexamination Request No. 90/002,664, Mar. 9, 1992.
Reexamination Certificate for Reissue Patent Re. 33,452, issued Nov. 20, 1990, Ser. No. 911,614, Sep. 25, 1986.
Int. Cl.[5] C07F *7/16, 7/4*
U.S. Cl. 556—472

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 32 is confirmed

1. A method for making alkylhalosilanes comprising effecting reaction between an alkyl halide and powdered silicon in the presence of a copper-zinc-tin catalyst wherein the catalyst has relative weights of tin to copper and zinc to copper and copper to silicon which are selected to substantially enhance the rate of dialkyldihalosilane formation, while substantially reducing the weight ratio of alkyltrihalosilane to dialkyldihalosilane and maintaining or reducing the weight percent of residue in the crude reaction product.

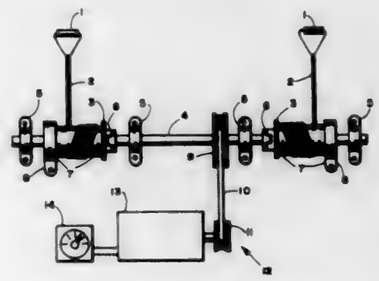
B1 4,076,698 (1985th)
HYDROCARBON INTERPOLYMER COMPOSITIONS
Arthur W. Anderson, Wilmington, and Geln S. Stamatoff, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Reexamination Request No. 90/001,604, Sep. 21, 1988.
Reexamination Certificate for Patent No. 4,076,698, issued Feb. 28, 1978, Ser. No. 632,416, Jan. 4, 1957.
Continuation-in-part of Ser. No. 568,707, Mar. 1, 1956, abandoned
Int. Cl.[3] C08F *210/14, 210/16*
U.S. Cl. 526—348.6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–15 are cancelled.

[2. An interpolymer of ethylene and from 1% to 20% by weight of a higher olefinic hydrocarbon having 5 to 18 carbon atoms per molecule, said higher olefinic hydrocarbon having no non-aromatic unsaturation other than one terminal —CH=CH_2 per molecule, said interpolymer having essentially no other copolymerized components, the proportion of the interpolymerized ethylene component therein being not less than 80% nor more than 99% by weight, the percentage crystallinity of the interpolymer being such that the density ranges from 0.95 at 1% interpolymerized higher olefinic hydrocarbon down to 0.9 at 20% interpolymerized higher olefinic hydrocarbon.]

B1 4,082,267 (1986th)
BILATERAL ISOKINETIC EXERCISER
Evan R. Flavell, 841 Solano Ave. No. 5, Albany, Calif. 94706
Reexamination Request No. 90/002,637, Feb. 7, 1992.
Reexamination Certificate for Patent No. 4,082,267, issued Apr. 4, 1978, Ser. No. 685,446, May 12, 1976.
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—6



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 12 are determined to be patentable as amended.

Claims 2–11, dependent on an amended claim are determined to be patentable.

1. Bilateral isokinetic exercising apparatus, comprising:
a plurality of limb-engagable input means for responding to a power stroke in a power direction of reciprocating movement, so that a person exercising can move each input means with one limb in the power direction,
a plurality of converting means each connected to one only of said input means for converting the reciprocating movement of each said input means into a separate rotational motion, each said converting means including its own rotatable member that is acted on by that rotational motion,
a single speed regulating means for opposing rotational movement of any and all said rotatable members with proportioned isokinetic resistance, *such that below a selected speed the user encounters minimal resistance and at or above the selected speed the user encounters a resistance proportioned to the force applied by the person exercising,*
driving connection means for connecting all said rotatable members to said speed regulating means and including separate one-way clutch means for connecting each rotatable member to said speed regulating means and tranamitting connection means for each said clutch for providing that movement of each input means in a first power direction drives said speed regulating means, and for providing that movement of each said input means in the opposite direction is disengaged from said speed-regulating means,
whereby motion of each input means in the power direction by the person exercising is opposed by said speed-regulating means with a resistance force proportional to the force applied by the person exercising, whereas movement of each said input means in the opposite direction is unopposed by said speed-regulating means.

347-150 O.G.-93-2

B1 4,283,698 (1987th)
MAGNET DEVICE FOR ANIMALS, IN PARTICULAR

Claims 14 and 15 are determined to be patentable as amended.

or tape residues from the board *by rinsing the board with water.*

B1 5,069,691 (1991st)
PORTABLE FILTRATION UNIT
Terrell Travis, Alpharetta; David Shagott, Duluth, both of Ga.;

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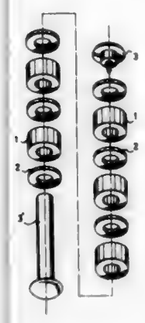
B1 4,283,698 (1987th)
MAGNET DEVICE FOR ANIMALS, IN PARTICULAR CATTLE
Yoshiho Fujisawa, Tokyo, Japan, assignor to TMC Magnet Inc., Piscataway, N.J.
Reexamination Request No. 90/002,835, Sep. 11, 1992.
Reexamination Certificate for Patent No. 4,283,698, issued Aug. 11, 1981, Ser. No. 76,325, Sep. 17, 1979.
Claims priority, application Japan, Aug. 8, 1979, 54-109646
Int. Cl.[5] H01F *7/02;* **A61M** *37/00;* **A61N** *2/00*
U.S. Cl. 335—306



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A magnetic device adapted to be ingested by an animal, the device comprising:

(a) a plurality of cylindrical magnets;

(b) a plurality of cylindrical magnetic spacers disposed between said magnets to form a longitudinal rod having a size which suffices to lodge the device in the stomach of the animal and not pass to the intestines,

(c) said spacers and said magnets having essentially the same diameter and being arranged coaxially and adjacent to each other, said magnets being arranged such that the magnetic poles of the magnets confronting each other through the spacers are of the same polarity; and

(d) two end pieces, one end piece being disposed at each end of the rod, said end pieces being generally semi-circularly shaped and having a diameter essentially the same as the diameter of said cylindrical magnets and spacers.

B1 4,589,876 (1988th)
SANITARY NAPKIN
Kees J. Van Tilburg, Cincinnati, Ohio, assignor to The Procter & Gamble Company
Reexamination Request Nos. 90/002,262, Jan. 28, 1991 and 90/002,354, May 28, 1991 and 90/002,507, Nov. 12, 1991 and 90/002,606, Jan. 10, 1992.
Reexamination Certificate for Patent No. 4,589,876, issued May 20, 1986, Ser. No. 591,621, Mar. 20, 1984.
Continuation-in-part of Ser. No. 511,118, Jul. 5, 1983
Int. Cl.[5] A61F *13/20, 13/15*
U.S. Cl. 604—385.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

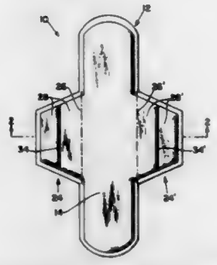
The patentability of claims **1–11** is confirmed.

Claims **12** and **13** are cancelled.

Claims **14** and **15** are determined to be patentable as amended.

New claims **16–41** are added and determined to be patentable.

1. A sanitary napkin that is sized and configured to be worn in a user's panties which panties are so sized and configured that the crotch edge portions can be positioned in the user's groins while the crotch region of the panties noncompressively cover the user's labia majoria, said sanitary napkin comprising



a longitudinally elongate absorbent core, a liquid barrier backsheet, and a pair of flexible side flaps, said core being sized and configured to only span across the distal surfaces of the user's labia majoria, and said flaps being sufficiently flexible and sized and configured to be so disposed in a user's panties that proximal portions of said flaps extend upwardly to the user's groins and cover the laterally outwardly facing surface areas of the user's labia majoria, and so that distal portions of said flaps extend downwardly from said user's groins and are disposed intermediate edge portions of said crotch region of the user's panties and areas of the user's inner thigh regions.

B1 4,640,719 (1989th)
METHOD FOR PRINTED CIRCUIT BOARD AND/OR PRINTED WIRING BOARD CLEANING
Michael E. Hayes; Craig C. Hood; Ronald E. Miller, and Robert Sharpe, all of Fernandina Beach, Fla., assignors to Petroferm Inc., Fernandina Beach, Fla.
Reexamination Request No. 90/002,295, Mar. 13, 1991.
Reexamination Certificate for Patent No. 4,640,719, issued Feb. 3, 1987, Ser. No. 750,198, Jul. 1, 1985.
Int. Cl.[5] C23G *1/00*
U.S. Cl. 134—40

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–9**, dependent on an amended claim, are determined to be patentable.

New claims **10–19** are added and determined to be patentable.

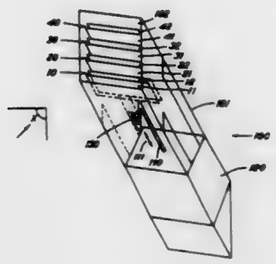
1. A method for removing rosin soldering flux or adhesive tape residues from a printed wiring board, comprising:

(a) contacting the board with a *substantially non-aqueous* composition comprising a terpene compound and [from about 0 to about 40% by weight of] a terpene emulsifying surfactant *present in an amount sufficient to facilitate removal of the terpene compound from said board upon rinsing with water up to an amount of about 40% by weight of the composition;*

(b) allowing the contact to continue for sufficient time to solubilize the soldering flux or tape residues; and

(c) removing the composition and solubilized soldering flux or tape residues from the board *by rinsing the board with water.*

B1 4,958,150 (1990th)
DISPLAY DEVICES AND DISPLAY ELEMENTS THEREOF
Rad H. Dabbaj, Flat 4, 3 Westbourne Crescent, London, United Kingdom W2 3DB
Reexamination Request No. 90/002,448, Sep. 27, 1991.
Reexamination Certificate for Patent No. 4,958,150, issued Sep. 18, 1990, Ser. No. 274,230, Nov. 18, 1988.
Int. Cl.[5] G09G *3/34*
U.S. Cl. 340—783



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

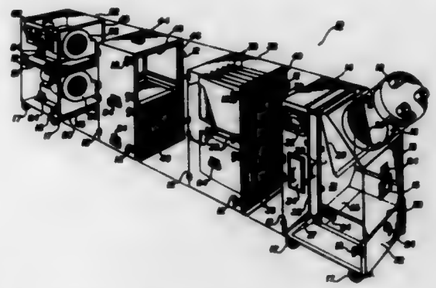
Claims **2** to **12**, **14** and **15** are cancelled.

Claims **1**, **13**, **16**, **17** and **18** are determined to be patentable as amended.

New claims **19** to **33** are added and determined to be patentable.

1. A display device comprising a plurality of *light reflective* pixels arranged *in a regular matrix of rows and columns so as to cover a display* [to from a matrix covering an] area[, and] *with substantially no dead portions thereof, each pixel having its properties individually settable in one of at least two reflective states,* control means for individually setting [the] *said* properties of *the respective individual pixels* [each pixel] whereby desired information can be displayed over *the whole of* said area *in the form of dot-matrix patterns,* [characterised by light reflective pixels which each comprise] *the pixels of said matrix each having* a plurality of sets of two or more vanes arranged one behind the other with a forward surface of each set visible from the front, the vanes within each set lying in closely adjacent parallel planes, the sets being also parallel but displaced [in parallels planes] *one behind the other*; driving means for [conjointly] *individually* driving [a selected group of] *each group of vanes, except the foremost, with each such group of vanes being formed by* corresponding vanes in each set, [except the foremost, so that the] *whereby the* vane forward surfaces are selectively viewable from the front; [the vanes in at least one] *each* group *of vanes* being colored with a respective plain color which is different from that of the vanes in at least one other group.

B1 5,069,691 (1991st)
PORTABLE FILTRATION UNIT
Terrell Travis, Alpharetta; David Shagott, Duluth, both of Ga.; Gary Kruse, Lincoln University, Pa.; Daniel Sutherland, and Blair Harber, Jr., both of Ontario, Canada, assignors to Abatement Technologies, Duluth, Ga.
Reexamination Request No. 90/002,730, May 21, 1992.
Reexamination Certificate for Patent No. 5,069,691, issued Dec. 3, 1991, Ser. No. 613,212, Nov. 14, 1990.
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—126



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**, **2** is confirmed.

New claims **3–20** are added and determined to be patentable.

3. A unit according to claim 1 in which each of the modules has an upper surface and the air inlet is formed at a 45° angle to the upper surface of the module in which it is located, for facilitating attachment of the unit to an HVAC system.

B1 5,108,660 (1992nd)
HARD SURFACE LIQUID DETERGENT COMPOSITIONS CONTAINING HYDROCARBYL-AMIDOALKYLENE SULFOBETAINE
Daniel W. Michael, Cincinnati, Ohio, assignor to The Procter & Gamble Company
Reexamination Request No. 90/002,772, Jul. 2, 1992.
Reexamination Certificate for Patent No. 5,108,660, issued Apr. 28, 1992, Ser. No. 628,064, Dec. 21, 1990.
Continuation-in-part of Ser. No. 471,909, Jan. 29, 1990
Int. Cl.[5] C11D *1/92, 3/32, 3/44;* **B08B** *3/06*
U.S. Cl. 252—545

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **14** and **28** are determined to be patentable as amended.

Claims **2–13** and **15–27**, dependent on an amended claim, are determined to be patentable.

New claims **29–44** are added and determined to be patentable.

1. An aqueous hard surface detergent composition comprising: (a) from about 0.02% to about 20% by weight of hydrocarbyl-amidoalkylenesulfobetaine detergent surfactant *having the formula:*

$$R—C(O)—N(R^2)—(CR^3_2)_n—N(R^2)_2(+)—(CR^3_2)_n—SO_3(-)$$

wherein each R is an alkyl group containing from about 8 to about 13; [and] (d) *optional cosurfactant for* (a) *selected from the*

REISSUES

APRIL 27, 1993

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wherein each R is an alkyl group containing from about 8 to about 18 carbon atoms, each (R^2) is selected from the group consisting of hydrogen, methyl, ethyl, propyl, hydroxy substituted ethyl or propyl and mixtures thereof, each (R^3) is selected from the group consisting of hydrogen and hydroxy groups, at least one of the R^3 groups between the (+) and the (−) charge centers is a hydroxy group, and each n is a number from 1 to about 4; with no more than about 1 hydroxy group in any (CR^3_2) moiety; (b) from about 0.5% to about 20% by weight of solvent that has a hydrogen bonding parameter of less than about 7.7 *and more than about 2;* (c) buffering system to provide a pH of from about 3 to about 13; [and] (d) *optional cosurfactant for* (a) *selected from the group consisting of anionic detergent surfactant, nonionic detergent surfactant, and mixtures thereof; and* (e) the balance being an aqueous solvent system comprising water and optionally, a nonaqueous polar solvent having a hydrogen bonding parameter [about] *above* 7.8, *the ratio of any cosurfactant that is present to said hydrocarbyl-amido-alkylenesulfobetaine being less than about 5:1.*

REISSUES

APRIL 27, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,230
UNIFIED CASEMENT OPERATOR

Daniel G. Tucker, Elysian, and Gregory J. Vetter, Owatonna, both of Minn., assignors to Truth Division of SPX Corporation, Owatonna, Minn.

Original No. 5,054,239, dated Oct. 8, 1991, Ser. No. 504,349, Apr. 4, 1990. Application for reissue Nov. 12, 1991, Ser. No. 790,768

Int. Cl.[5] E05F *11/02*

U.S. Cl. 49—279 **20 Claims**

2. A casement operator for a window having a window frame and a moveable window sash and sash lock comprising:

a base mounted to the window frame;

a deployment linkage connectable between the window frame and said base and operable to cause movement of the window sash;

a [rotatable handle] *rotary drive;*

a *rotatable* gear [drive interconnecting said handle] *between said rotary drive* and said deployment linkage;

a lock linkage coacting with said deployment linkage and sash lock and having a window-actuated trigger for activating said lock linkage, said lock linkage including

a plurality of *pivotable* rigid links in pivotal engagement with said deployment linkage and in driving engagement with said [rotatable handle]ep *rotary drive,*

a motion-transmitting tie rod intermediate said rigid links and the sash lock,

and latching means for restricting the movement of said lock linkage during a non-locking mode of operation of said operator.

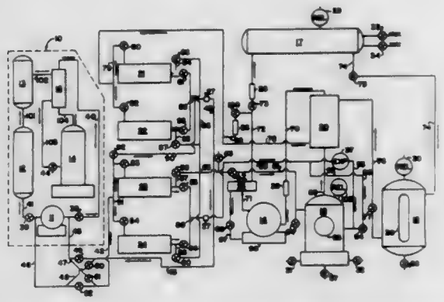
Re. 34,231
REFRIGERATION CLEANING AND FLUSHING SYSTEM

David W. Anderson, Jr., 214 Sandra Rd., Jacksonville, Fla. 32211

Original No. 4,887,435, dated Dec. 19, 1989, Ser. No. 210,087, Jun. 23, 1988. Application for reissue Oct. 2, 1990, Ser. No. 591,770

Int. Cl.[5] F25B *47/00*

U.S. Cl. 62—85 **31 Claims**



1. A process for cleaning and flushing an installed refrigeration system, including an installed compressor and a vaporizable liquid refrigerant used in the system; the process comprising:

(a) disconnecting the refrigerant inlet and exit lines which join the installed compressor to the installed refrigeration system;

(b) connecting the inlet and exit lines of the installed refrigeration system to corresponding input and output lines of a portable refrigeration cleaning and flushing system including a portable compressor, a condenser, a receiver, an evaporator the same refrigerant as that of the installed system to be rejuvenated; and means for cleaning said refrigerant;

(c) operating said portable refrigeration system to flush said refrigerant through the combined installed system and *at least said evaporator and said compressor of said* portable system to clean said installed system and the refrigerant passing therebetween;

(d) returning to said installed refrigeration system a suitable amount of cleaned refrigerant for normal operation thereof;

(e) reconnecting the installed compressor into said rejuvenated installed refrigeration system by reconnecting the inlet and exit lines of the installed compressor to said installed refrigeration system.

29. The process of claim 1, wherein said refrigerant is flushed through said evaporator, said compressor, and said condenser of said portable system.

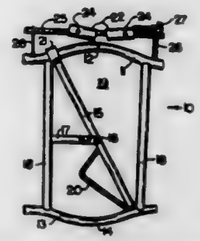
Re. 34,232
CATTLE STANCHION

John A. Da Silveira, 25251 E. Mariposa Rd., Escalon, Calif. 95320

Original No. 4,930,452, dated Jun. 5, 1990, Ser. No. 396,102, Aug. 21, 1989. Application for reissue Oct. 21, 1991, Ser. No. 780,030

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—148 **19 Claims**



10. A self locking and manually unlocking cattle stanchion comprising an essentially co-planar frame,

said frame comprising first and second substantially vertical bars, a substantially horizontal frame bar interconnecting the upper ends of said first and second vertical bars, a lateral arm extending from said first vertical bar and having its inner end approximately half the height of said frame and approximately half the distance from said first vertical bar toward said second vertical bar, a pivotal bar, pivot means pivoting approximately the midpoint of said pivotal bar to said inner end of said lateral arm for movement between a first position extending diagonally between opposite ends of said first and second vertical bars and a second, substantially vertical, position,

and locking means for said pivotal bar, said locking means

comprising an extension of said pivotal bar extending above said horizontal frame bar, a horizontal locking bar bracket

detecting misfire when a signal level of the electrical signal is less than the slice level.

representative of the signals from the program signal source means,

acoustic tube means being substantially transparent to the scanning signals of the scanning signal field,

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comprising an extension of said pivotal bar extending above said horizontal frame bar, a horizontal locking bar bracket means to mount said horizontal locking bar approximately parallel to and above said horizontal frame bar, releasable latch means pivoted to said horizontal locking bar to lock said extension to releasably hold said pivotal bar in second position.

Re. 34,233

ELECTRICALLY CONDUCTIVE FIBROUS WEB SUBSTRATE AND CATHODIC ELEMENT COMPRISED THEREOF

Jean Bachot, Fontenay Aux Roses, and Jean Grosbois, L'isle Adam, both of France, assignors to Atochem, Paris, France

Original No. 4,743,349, dated May 10, 1988, Ser. No. 906,435, Sep. 12, 1986. Continuation of Ser. No. 623,409, Jun. 22, 1984, abandoned. Application for reissue May 9, 1990, Ser. No. 520,802

Claims priority, application France, Jun. 22, 1983, 83 10291

Int. Cl.[5] C25B *9/00, 11/06, 11/12;* **D04H** *1/58*

U.S. Cl. 204—242 **41 Claims**

1. A bonded, coherent fibrous web substrate including a fibrous web matrix which comprises a plurality of fibers, at least a portion of which comprising electrically conductive fibers, and a binder consisting of a fluorine-containing polymer, said plurality of fibers being coherently bonded together with said fluorine-containing polymer, and said web substrate having a resistivity of up to about [0.4 Ω cm.] *4.0 Ω.cm.*

31. A cathodic element comprising the web substrate as defined by claim **1**.

34. In an electrolytic cell comprising a cathode and an anode, the improvement which comprises utilizing as the cathode therefor, the cathodic element as defined by claim **31**.

Re. 34,234

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

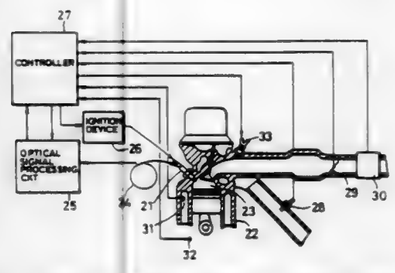
Hiroshi Kuroiwa, Hitachi; Yoshishige Oyama, Katsuta, and Toshiharu Nogi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,887,574, dated Dec. 19, 1989, Ser. No. 184,076, Apr. 20, 1988. Application for reissue Dec. 17, 1991, Ser. No. 808,812

Claims priority, application Japan, Apr. 21, 1987, 62-96123; Jun. 3, 1987, 62-138071

Int. Cl.[5] F02P *5/10;* **G01L** *23/22;* **G01M** *15/00*

U.S. Cl. 123—425 **24 Claims**



14. A method of detecting misfire of an internal combustion engine, comprising the steps of:

detecting combustion light intensity in respective combustion chambers of the engine;

converting the detected combustion light intensity of a combustion chamber into an electrical signal corresponding to a measure of the detected combustion light intensity;

comparing the level of said electrical signal with a predetermined slice level; and

detecting misfire when a signal level of the electrical signal is less than the slice level.

Re. 34,235

SEALING PLUG

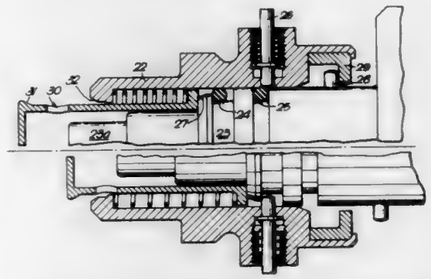
Gordon C. Cooper, Belper, Douglas Dawson, deceased, late Derby, by Margaret Dawson, Executrix, Allestree, all of England, assignors to Rolls-Royce plc, London, England

Original No. 4,492,381, dated Jan. 8, 1985, Ser. No. 631,748, Jul. 17, 1984. Continuation of Ser. No. 393,282, Aug. 14, 1989, abandoned. Application for reissue Nov. 16, 1990, Ser. No. 614,036

Claims priority, application United Kingdom, Sep. 21, 1983, 8325268

Int. Cl.[5] F16J *15/00*

U.S. Cl. 277—2 **5 Claims**



1. A sealing plug *assembly* comprising a plug member [and] *having a radially outermost cylindrical surface, said surface defining at least one circumferentially extending groove for receipt of an O ring seal therein,* a housing [the] *for said plug member, said housing defining a bore for location of said* plug [and housing including] *member therein,* co-operating means *on said plug member and said housing* whereby [the] *said plug member* may be secured [together the radially outermost cylindrical surface of the plug including at least one circumferentially extending groove within which an O ring seal may be disposed, the housing including an aperture within which the plug is adapted to be located] *within said housing, said housing further including at least one radially extending pin moveable between a first position projecting into said base of said housing and a second position in which it does not so project, said pin being adapted to locate* within [the] *said* at least one circumferentially extending groove when [the] *said* O ring is omitted from the assembly [such as] *thereby* to prevent [the] *said* plug *member* being secured within [the] *said* housing by [the] *said* co-operating means.

Re. 34,236

FREQUENCY ATTENUATION COMPENSATED PNEUMATIC HEADPHONE AND LIQUID TUBE AUDIO SYSTEM FOR MEDICAL USE

Jefferson H. Taylor, Dallas, Tex., assignor to Noise Cancellation Technologies, Inc., Linthicum, Md.

Original No. 4,701,952, dated Oct. 20, 1987, Ser. No. 923,668, Oct. 27, 1986. Continuation-in-part of Ser. No. 659,413, Oct. 10, 1984, abandoned. Application for reissue Oct. 20, 1989, Ser. No. 424,699

Int. Cl.[5] H04R *5/00*

U.S. Cl. 381—25 **48 Claims**

20. A sound system for conducting audio signals to a person in an electromagnetic scanning signal field, comprising:

program signal source means disposed outside of said electromagnetic scanning signal field and including means for generating sound signals,

audio signal generator means for generating audio signals representative of the signals from the program signal source means,

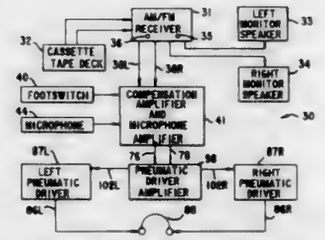
headphone means for a person disposed in said electromagnetic scanning signal field, said headphone means being substantially transparent to the scanning signals of the scanning signal field,

acoustic tube means for conducting the audio signals from a position outside of said scanning field to the headphone means disposed in said scanning signal field, said acoustic tube means having a length of approximately between 10 to 50 feet long so as to accommodate spacing of the program signal source means outside of the scanning field while the headphone means are in the scanning field, said acoustic tube means being substantially transparent to the scanning signals of the scanning signal field,

and frequency response compensation amplifier means interposed between the program signal source means and the audio signal generator means for compensating for different frequencies of the audio signal as it is conducted through the acoustic tube means to the headphone means.

40. A method for conducting audio signals to a person in an electromagnetic scanning signal field, comprising:

disposing program signal source means outside of said electromagnetic scanning signal and generating sound signals therewith,



providing audio signal generator means for generating audio signals representative of the signals from the program signal source means,

providing headphone means for a person disposed in said electromagnetic scanning signal field, said headphone means being substantially transparent to the scanning signals of the scanning signal field,

providing acoustic tube means for conducting the audio signals from a position outside of said scanning field to the headphone means disposed in said scanning signal field, said acoustic tube means having a length of approximately between 10 to 50 feet long so as to accommodate spacing of the program signal source means outside of the scanning field while the headphone means are in the scanning field, said acoustic tube means being substantially transparent to the scanning signals of the scanning signal field,

providing frequency response compensation amplifier means interposed between the program signal source means and the audio signal generator means for compensating for different frequencies of the audio signal as it is conducted through the acoustic tube means to the headphone means, and

activating said electromagnetic scanning field with a person disposed therein while simultaneously supplying audio signals to said headphone means via the audio signal generating means and the acoustic tube means whereby said audio signals are supplied without interfering with said electronic scanning signal field.

Re. 34,237

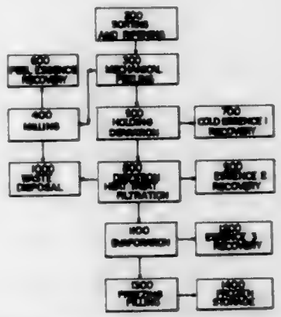
BANANA PROCESSING

Pedro Sole, Cincinnati, Ohio, assignor to Chiquita Brands, Inc., Cincinnati, Ohio

Original No. 4,874,617, dated Oct. 17, 1989, Ser. No. 128,633, Dec. 4, 1987. Application for reissue Oct. 16, 1991, Ser. No. 777,195

Int. Cl.[5] A23L *2/92*

U.S. Cl. 426—49 **15 Claims**



15. A process for obtaining banana pulp from a banana, said process comprising:

providing whole, ripe bananas, each said banana comprising a peel about a pulp, said peel comprising an outer epidermis, a chlorenchyma, and a peel parenchyma;

placing a quantity of said bananas into a mechanical peeling device;

within said mechanical peeling device, separating banana pulp and peel parenchyma from the outer epidermis and the chlorenchyma of banana peels; and

recovering said banana pulp and peel parenchyma.

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GRANTED APRIL 27, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,211

"ROYAL LADY" PEACH TREE

Franklin J. Janzen, 16321 E. Floral Ave., Reedley, Calif. 93654

Filed May 9, 1991, Ser. No. 697,677

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—43.2 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described and which was discovered as a sport of the "Elegant Lady" peach tree (U.S. Plant Pat. No. 4,399), but from which it is distinguished and characterized principally as to novelty by producing a freestone fruit which is mature for harvesting and shipment approximately July 20 to August 2 in the San Joaquin Valley of central California, the fruit having from a light orange-red to a darker red coloration, a flesh which is amber-yellow and of a firm and crisp texture with skin tenacious to the flesh at commercial maturity but will pull free from flesh at soft ripe maturity.

8,212

"CHISLETT SUMMER NAVEL" ORANGE TREE

Gregory J. K. Chislett, Via Piangil, Kenley, Victoria, 3497, Australia

Filed Apr. 9, 1991, Ser. No. 682,529

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—45 1 Claim

1. A new and distinct variety of navel orange tree substantially as illustrated and described and which is somewhat remotely similar to the "Late Lane Navel" orange tree with which it is most closely similar, but from which is distinguished and characterized principally as to novelty by producing fruit which are mature for commercial harvesting and shipment in early September and which holds on the tree until the end of April of the following year in Kenley, Victoria, Australia and which possesses a higher internal flesh and external rind quality and color than comparable varieties.

8,213

DOGWOOD TREE NAMED 'D-184-11'

Elwin R. Orton, Jr., Somerville, and David A. Gant, Wall Township, Monmouth County, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Aug. 5, 1991, Ser. No. 740,637

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—53.2 1 Claim

1. A new and distinct cultivar of dogwood tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unusually vigorous growth, large floral buds, extremely large, tubular bright red fruit, winter hardiness, and tree size being substantially larger than some other varieties.

8,214

DOGWOOD TREE — NAMED 'D-376-15'

Elwin R. Orton, Jr., Somerville, and David A. Gant, Wall Township, Monmouth County, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Aug. 5, 1991, Ser. No. 740,638

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—53.2 1 Claim

1. A new and distinct cultivar of dogwood tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dark red, floral bracts and the rather small, compact rounded form of tree which results from the characteristic of branching more densely and profusely than other plants of *C. florida* var. rubra.

8,215

GOLDEN PYGMY BARBERRY PLANT NAMED BOGOZAM

Nicholas R. Moretti, Geneva, Ohio, assignor to James W. Zampini, Perry, Ohio

Filed Sep. 26, 1991, Ser. No. 765,677

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—58 1 Claim

1. A new and distinct variety of golden pygmy barberry plant which exhibits the following combination of characteristics:

(a) exhibits a dwarf, generally compact, broad, and low-mounding growth habit,
(b) forms mature leaves of a brighter and more intense goldlen coloration than its parent *Berberis thunbergii* 'Aurea',
(c) forms new growth having a brighter and more intense red coloration than its parent *Berberis thunbergii* 'Aurea',
(d) exhibits a rapid growth rate between internodes of a relatively short length, and
(e) generally is more tolerant to sun scald than its parent *Berberis thunbergii* 'Aurea';

substantially as herein shown and described.

8,216

CHRYSANTHEMUM PLANT NAMED DEFINITE EYES

Jack Van Der Knaap, AX De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 7, 1991, Ser. No. 712,086

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—74.1 1 Claim

1. A new and distinct variety of Chrysanthemum plant, substantially as herein described and illustrated.

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ERRATA

For CLASS	See PATENT NO.
030-393	5,205,043
036-269	5,205,071
057-269	5,205,118
056-328	5,205,121
056-400	5,205,122
220-571	5,205,472
244-001	5,205,502
439-059	5,205,738
439-066	5,205,739
439-067	5,205,740
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568-909	5,206,424
338-035	5,206,615
361-393	5,206,712
257-684	5,206,713
360-132	5,206,781
257-307	5,206,787
257-689	5,206,793
257-675	5,206,794

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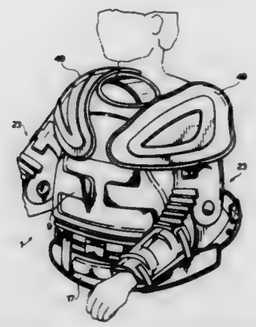
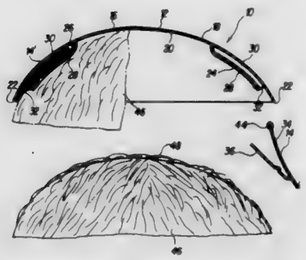
GENERAL AND MECHANICAL

5,204,993
GOALIE CHEST PAD
Victor Siemens, 1310 Gulleden Drive Unit #11, Mississauga, Ontario, Canada L4X 1Y9
Filed Apr. 13, 1992, Ser. No. 867,485
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 3 Claims



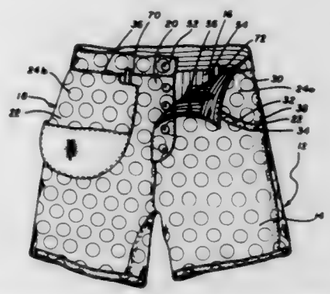
1. A sports goalie protector comprising a rigid frame with a frontal portion and wrap around side portions, said frame having an inside surface and an outside surface, said outside surface being padded and said inside surface being fitted with a suspension strap extending across said frame between said wrap around side portions and spaced behind said frontal portion of said frame, said frame further including wrap over collar bone and shoulder covering portions for direct body contact with a user of said protector.

5,204,994
SKULL-CAP/CLIP-RETAINER COMBINATION
Richard P. Herzberg, and Sue Ellen D. Herzberg, both of 845 Quail Point Cove, Virginia Beach, Va. 23454
Filed Mar. 30, 1992, Ser. No. 860,426
Int. Cl.[5] A42B *7/00*
U.S. Cl. 2—199 8 Claims



1. A combination skull-cap/clip-retainer comprising:
a skull cap for covering a wearer's head, said skull cap including a main shell defining an interior surface and a peripheral outer edge, said skull cap having a shape such that it fits on a wearer's head, the wearer's head being in the interior thereof, with a portion of said interior surface lying on the wearer's head, said skull cap further comprising a clip-retainer pocket attached to the interior surface of said skull cap, said clip-retainer pocket having a wall defining a pocket cavity with a mouth directed substantially toward said peripheral outer edge;
an elongated, spring, clip retainer comprising first and second legs coupled together which, in an open attitude, are substantially spread apart, but which, in a closed attitude, are relatively closer together, said spring, clip retainer being of a size and shape such that at least said first leg of said clip retainer fits into said clip-retainer pocket cavity through the mouth thereof;
whereby, said skull cap can be placed on a wearer's head, said clip retainer can be slid under said main shell along the wearer's head from said outer edge into the interior of said skull cap in said open attitude with said first leg sliding in said pocket and with hair from said wearer's head relatively moving between said first and second legs, and said clip retainer can then be changed into said closed attitude with said first and second legs clamped on said hair and said wall of said clip-retainer pocket between said legs to hold said skull cap on said head.

5,204,995
FASHIONABLE REVERSIBLE PANTS
Dawn P. Knapp, Yorba Linda, Calif., assignor to Creative Garments, Inc., Los Angeles, Calif.
Filed Mar. 16, 1992, Ser. No. 851,578
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—228 20 Claims



1. A reversible pair of pants with reversible pockets comprising:
a pair of pants having a first surface having one configuration or appearance and a second surface having another configuration or appearance;
a pocket slot defined in the pants corresponding to a desired upper edge of each pocket;
a pocket flap corresponding to each of the pockets, the flap being attached to the pants and extending down through each corresponding pocket slot, said flap having a first surface and an opposing second surface;
a first pouch formed on the flap first surface; and
a second pouch formed on the flap second surface.

5,204,996
TODDLER FOOT COVERING ORGANIZATION
Lori A. Ehmka, 3775 Boyd Ave., Apt 80, San Diego, Calif. 92111
Filed Dec. 16, 1991, Ser. No. 808,475
Int. Cl.[5] A41F *11/14*
U.S. Cl. 2—240 2 Claims

1. A toddler foot covering organization, comprising in combination,
an "L" shaped shoe member formed of a flexible fibrous material, wherein the "L" shaped shoe member includes a foot cover portion defining a foot receiving socket cooperative with a tubular leg cavity defined by a leg cover portion, wherein the leg cover portion includes an en-

trance opening directed into the tubular leg cavity and the foot receiving socket, and the entrance opening is formed

5,204,997
DISPOSABLE GARMENTS OF PANTS TYPE

an outer shell;
an inner shell juxtapositionally secured to the outer shell confining an air chamber spaced between the outer shell

each of said branched pipelines upstream from said constant flow valve;
(e) a starting-of-flushing input means for accepting an input

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trance opening directed into the tubular leg cavity and the foot receiving socket, and the entrance opening is formed at an upper terminal end of the leg cover portion, and wherein the upper terminal end of the leg cover portion includes a reinforcement strip, the reinforcement strip includes a plurality of equally spaced strip openings directed therethrough,

and

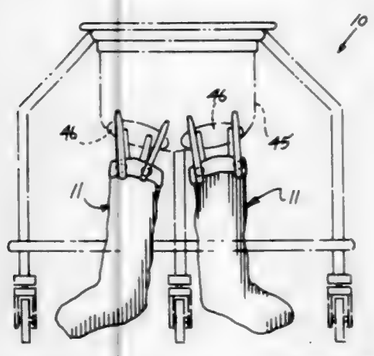
a clip member mounted to each strip opening, and the clip member further adapted for releasable mounting to a clothing garment positioned above the reinforcement strip,

and

the foot cover portion includes a planar bottom surface, the planar bottom surface orthogonally oriented relative to the leg cover portion, and the planar bottom surface including a matrix of spaced parallel ribs directed coextensively along the planar bottom surface,

and

each mounting clip includes a tubular central portion deflectable from a first position to a second position, wherein the clip member is formed of a memory shape retentent material and the tubular central portion includes a top wall spaced from and parallel a bottom wall in the first position, and a first clamp web spaced from a second



clamp web integral with and on opposed distal ends of the tubular central portion, and each mounting clip further including a first clamp projecting longitudinally beyond the tubular central portion and the first clamp joined to the first clamp web, and a second clamp longitudinally extending beyond the tubular central portion and the second clamp joined to the second clamp web, wherein the first clamp and the second clamp are longitudinally aligned relative to one another and the first clamp includes a first clamp top jaw in contiguous communication with a first clamp bottom jaw in the first position, wherein the first clamp top jaw includes a first clamp top jaw bore and the first clamp bottom jaw includes a first clamp bottom jaw boss slidably receivable within the bore in the first position and separated from the bore in the second position to receive one of said strip openings about the boss and to clamp the reinforcement strip between the first clamp top jaw and the first clamp bottom jaw, and the second clamp including a second clamp top jaw and a second clamp bottom jaw, and wherein the second clamp top jaw includes second clamp top jaw teeth, and the second clamp bottom jaw includes second clamp bottom jaw teeth, wherein the second clamp top jaw teeth and the second clamp bottom jaw teeth are arranged to define an interdigited clamp jaw matrix in the first position for securement to the clothing garment.

5,204,997

DISPOSABLE GARMENTS OF PANTS TYPE

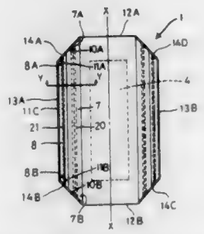
Migaku Suzuki, Kamakura; Takeshi Kudo, Kawanoe; Ritsuko Sakai, and Rumi Yamaki, both of Kakegawa, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 704,424, May 23, 1991. This application Jun. 15, 1992, Ser. No. 899,786

Claims priority, application Japan, May 24, 1990, 2-134439

Int. Cl.[5] A41B *9/00, 9/12, 9/16*

U.S. Cl. 2—400 **8 Claims**



1. A disposable garment of the pants type comprising a basic assembly including at least a liquid-permeable topsheet (2) and a liquid-impermeable backsheet (3), and elastic bands (7) mounted on said basic assembly for partially surrounding a waist-hole, said basic assembly having outlines traversing longitudinally extending opposite side edges (13A, 13B) and transversely extending opposite end edges (12A, 12B) characterized in that each of said opposite side edges (13A, 13B) is provided with a flap (8) and said elastic band (7), said flap (8) surrounding a leg-hole cooperatively with said elastic band (7), an outer side edge of said leg-hole surrounding flap (8) being attached to said basic assembly along one of said opposite side edges (13A, 13B) and end edges (8A, 8B, 7A, 7B) of said leg-hole surrounding flap (8) and said waist-hole surrounding elastic band (7) being attached to said basic assembly by means of bonding lines (10A, 11A, 10B, 11B) provided along the outlines of said garment, said leg-hole surrounding flap (8) and said waist-hole surrounding elastic band (7) overlapping each other at least on said bonding lines (10A, 11A, 10B, 11B) and adjacent thereto with said elastic band (7) being interposed between said leg-hole surrounding flap (8) and said topsheet (2).

5,204,998

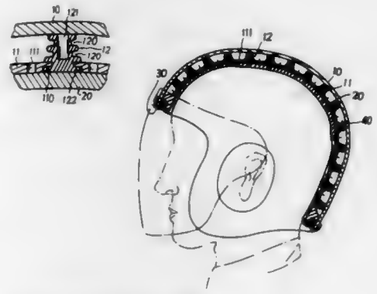
SAFETY HELMET WITH BELLOWS CUSHIONING DEVICE

Huei-Yu Liu, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed May 20, 1992, Ser. No. 885,443

Int. Cl.[5] A42B *3/00*

U.S. Cl. 2—411 **3 Claims**



1. A safety helmet comprising:

an outer shell;

an inner shell juxtapositionally secured to the outer shell confining an air chamber spaced between the outer shell and the inner shell;

a plurality of cushioning bellows each said bellows retained between the outer shell and the inner shell;

an air-penetrable layer adhered on an inside surface of the inner shell; and

a cap frame sealably combining the outer shell, the inner shell and the air-penetrable layer for forming a complete helmet to be worn by a wearer, whereby upon an acting of an external impact force upon the outer shell, the cushioning bellows will dampen the external impact force to prevent a great shock caused by the external force to the wearer's head;

said inner shell formed with a plurality of venting holes in the inner shell for fluidically communicating the air chamber defined between the two shells and the air-penetrable layer adjacent to a wearer's head; and

each said cushioning bellows made of resilient elastomers including: a plurality of flexible corrugated flanges circumferentially gradationally formed on an outer cylindrical wall of the bellows, a central socket formed in a central portion of the bellows and downwardly recessed from an upper portion of the bellows having an uppermost flange of the corrugated flanges normally contacting an inside surface of the outer shell forming an air sac in the central socket between the bellows and the outer shells, and a retaining base portion formed on a bottom portion of the bellows engageably fixed in each bellows hole formed in the inner shell.

5,204,999

FLUSH WATER SUPPLY SYSTEM FOR TOILET STOOL

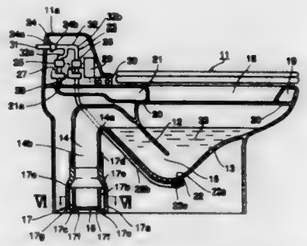
Atsuo Makita; Hirofumi Takeuchi; Shinji Shibata, and Noboru Shimbara, all of Kanagawa, Japan, assignors to Toto Ltd., Japan

Division of Ser. No. 502,063, Mar. 29, 1990, Pat. No. 5,052,060. This application Jun. 10, 1991, Ser. No. 713,437

Claims priority, application Japan, Mar. 30, 1989, 1-79358

Int. Cl.[5] E03D *1/00, 1/24*

U.S. Cl. 4—300 **10 Claims**



1. A flush water supply system for a toilet, comprising:

(a) a toilet stool having a plurality of supply ports;

(b) a pipeline means for supplying flush water to said toilet stool, said pipeline means including a plurality of branched pipelines each having an end connected to a respective one of said supply ports of said toilet stool;

(c) means for differentiating the flows of said branched pipelines from one another, wherein said differentiating means is comprised of a plurality of constant flow valves mounted one in each of said branched pipelines for obtaining a predetermined amount of discharge flow, the constant flow valves including a water passage and means for adjusting the cross-sectional area of the water passage after the water supply pressure reaches a predetermined value;

(d) a plurality of electrically operable valves mounted one in each of said branched pipelines upstream from said constant flow valve;

(e) a starting-of-flushing input means for accepting an input for starting the supply of flush water; and

(f) a control means for driving the electrically operable valves in a preset order in response to the input for starting the supply of flush water, and for keeping said electrically operable valve in an opened position for a preset period of time.

5,205,000

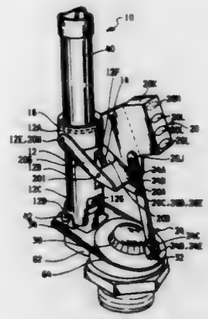
DUAL WATER-LEVEL TOILET FLUSHING APPARATUS

Frank Z. Xia; Mary Z. Luo, and Jack Y. Zhang, all of 4066 E. Mission Blvd., Pomona, Calif. 91766

Filed Mar. 3, 1992, Ser. No. 845,165

Int. Cl.[5] E03D *1/14, 1/35*

U.S. Cl. 4—324 **12 Claims**



1. A dual water-level toilet flushing apparatus that selectively operates in either a normal, preset partial flush or a full flush and that is designed to be installed in a toilet tank and to function in combination with a toilet tank drain, a toilet flush handle that is operated by a chain and flush arm, a flapper valve having a front mounting tab and a pair of back mounting tabs and an overflow tube having a bottom section, said apparatus comprising:

a) an overflow tube sleeve consisting of an elongated structure that includes means for being held in place around the overflow tube,

b) a pendulum/flapper valve link that has an upper section having a pendulum slot and a lower end that has means for pivotally being attached to the front mounting tab of the flapper valve, where the back mounting tabs of the flapper valve are swivelly inserted over a respective pair of flapper valve hooks attached near the bottom section of the overflow tube and,

c) a floatable inverted pendulum having a back section that includes a means for being swivelly attached to the upper section of said overflow tube sleeve, and a front section that is attached to the pendulum slot on said pendulum/flapper valve link, where said pendulum includes means to be attached to and operated by the toilet flush handle via the chain and flush arm, and where said pendulum is designed to control the net torque about the point of attachment of said pendulum to said overflow tube created by the force produced by its buoyancy and the opposite applied force of gravity, where these forces then allow said pendulum to control the timing of the opening and closing of the flapper valve.

5,205,001

PORTABLE SHOWER FOR INVALID USE

lar extendable flap portions sealingly connected along a common axis formed by the largest side of said triangles;

5,205,003

RELEASABLE DUST RUFFLE ARRANGEMENT

and lowering said head end; second actuating means coupled to said frame for raising and lowering said foot end; first and

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5,205,001

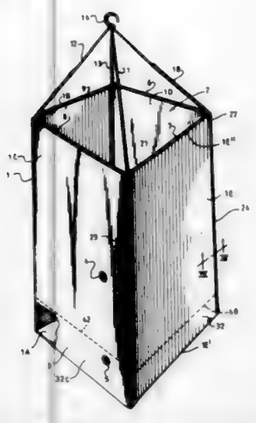
PORTABLE SHOWER FOR INVALID USE

Ann O'Connell, 700 Peter Paul Dr., West Islip, N.Y. 11795

Continuation-in-part of Ser. No. 711,926, Jun. 7, 1991, which is a continuation-in-part of Ser. No. 481,250, Feb. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 340,720, Apr. 20, 1989, abandoned. This application Nov. 5, 1992, Ser. No. 972,121

Int. Cl.[5] **A47R** *3/06*

U.S. Cl. 4—599 **3 Claims**



1. A portable collapsible shower structure for accommodating invalid persons, comprising:

a collapsible shower enclosure unit extending substantially vertically in a working condition and limiting an inner space for accommodating an invalid person;

said collapsible shower enclosure unit including

a first front wall portion having opposite vertical side edges, a lower edge and a top edge,

a rear wall portion,

a floor portion,

and a plurality of side wall portions,

said floor portion integral with said front wall portion, said rear wall portion and said plurality of side wall portions;

a bottom basin portion within said shower enclosure unit at a bottom of said shower enclosure unit, said basin capable of capturing water during taking a shower and capable of preventing spillage of said water;

said bottom basin having a plurality of upwardly extending lip walls extending upwardly within said shower enclosure unit;

a door in said first wall position to permit the entry and exit of persons or limbs of persons using said shower;

said door including said front wall portion being removably attached on either side to a side wall portion, said front wall portion being removable adjacent to respective opposite edges of said side wall portions by respective dual zippers within a corresponding dual zipper guide at each said vertical edge of said first wall portion,

sealing means for sealing said dual zippers wherein said sealing means includes two elongated sealing strips arranged, one on each side of each said dual zipper guide and sealingly abutting against one another in a closed position of said dual zipper guides;

means for supporting said collapsible shower enclosure unit in a vertical orientation;

an opening means for supplying water and an opening means for withdrawing waste water each located in said unit;

a means for opening a portion of said bottom basin portion comprising an upwardly extending front vertical lip wall flap connected to the remainder of said basin by two hinged means each having two coterminous right triangular extendable flap portions sealingly connected along a common axis formed by the largest side of said triangles;

said front vertical lip wall flap being openable flush to the floor level by extension of said triangular portions along their common coterminal axis, in a fully extended position with said triangular portions in a common plane to permit the said flap to extend outwardly in a horizontal position from its vertical erect position;

the walls of said bottom basin portion being encased in waterproof material to permit watertight closure of said flap in an upward closed position.

5,205,002

COUPLING APPARATUS

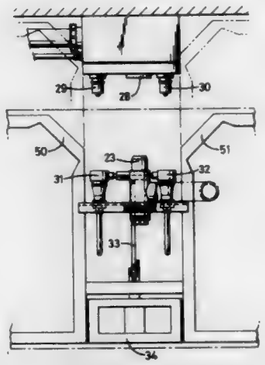
Peter Sage-Passant, Mechline Limited Taylor Street, Luton, Bedfordshire LU2 0EY, England

Filed Jun. 18, 1991, Ser. No. 717,408

Claims priority, application United Kingdom, Feb. 5, 1991, 9102466

Int. Cl.[5] **E03C** *1/322, 1/02, 1/182*

U.S. Cl. 4—643 **8 Claims**



1. A washing unit including an apparatus for coupling to a free-standing washing unit feed liens for hot and cold water and a waste line for waste water, the apparatus comprising:

(i) a wall-mountable connection unit supporting first and second service line base connector elements extending away from the wall and each for connection to a different hot and cold water service lien at the wall, and a waste line base connector element for connection to a waste line at the wall;

(ii) first and second satellite connector elements, each engageable in fluid-tight manner to a different one of the service lien base connector elements, and a satellite waste line connector engageable in fluid-tight manner to the waste line base connector element, and each to be mounted, in use, to the washing unit whereby the washing unit may be freely moved between an operational disposition adjacent the wall with the respective base and satellite connectors mutually engaged, and a de-coupled disposition away from the wall, with all the respective connectors disengaged; and

(iii) latching means for maintaining the washing unit in the operational disposition until release of the latching means allows transition to the de-coupled disposition; and

(iv) the washing unit having bevel frame elements to guide the washing unit from the de-coupled disposition into the operational disposition.

5,205,003

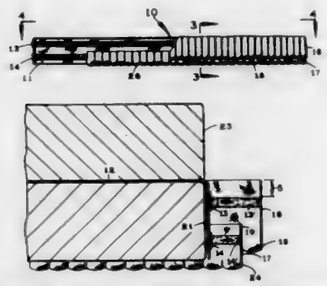
RELEASABLE DUST RUFFLE ARRANGEMENT

Jayne E. Green, 5801 NE. 17th Ave., Fort Lauderdale, Fla. 33334

Filed Sep. 21, 1992, Ser. No. 947,473

Int. Cl.[5] **A47G** *9/04*

U.S. Cl. 5—493 **7 Claims**



1. A releasable dust ruffle arrangement for a bed comprising a box spring; a cover member disposed on top of the box spring, the cover member having two vertical sides, a top, and a first and second end, at least an upper dust ruffle and a lower dust ruffle extending along said sides and along said first end and extending from each of said sides inward a given distance along said second end; said upper and lower dust ruffle each having an upper and lower edge and wherein the lower edge of the upper dust ruffle overlaps the upper edge of the lower dust ruffle, and hook and loop fastener means extending along said dust ruffles between said dust ruffles and said vertical sides of said cover member for releasably attaching said dust ruffle to said cover member.

5,205,004

VERTICALLY ADJUSTABLE AND TILTABLE BED FRAME

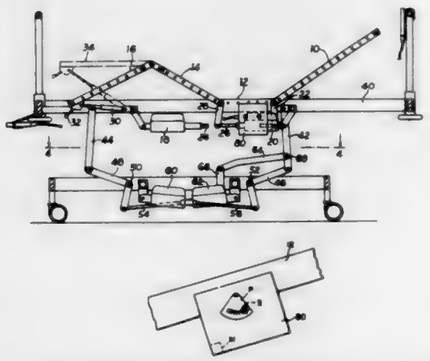
Stephen Hayes, Dudley, and Robert H. Jones, Tipton, both of Great Britain, assignors to J. Nesbit Evans & Co. Ltd., Great Britain

Filed Oct. 30, 1991, Ser. No. 785,274

Claims priority, application United Kingdom, Nov. 28, 1990, 9025897; Apr. 6, 1991, 9107277

Int. Cl.[5] **A61G** *7/005, 7/012, 7/015, 7/018*

U.S. Cl. 5—611 **8 Claims**



1. A bed comprising a frame having a head end and a foot end; means mounting said frame for vertical movements and for tilting movements from and to a substantially horizontal position; first actuating means coupled to said frame for raising and lowering said head end; second actuating means coupled to said frame for raising and lowering said foot end; first and second operating means coupled to the respective first and second actuating means for operating said first and second actuating means to tilt said frame to a selected tilted position relative to the horizontal; and control means coupled to said first and second actuating means, said control means adapted to adjust the power supply to the respective activating means and operable to effect conjoint operation of said first and second actuating means for selectively raising and lowering said frame while said frame remains in a constant selected tilted position regardless of the uneven loading of the ends of the frame.

5,205,005

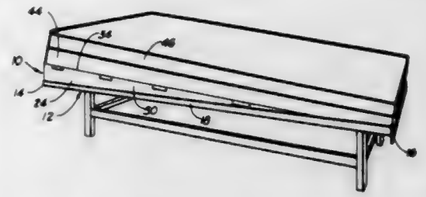
BED ELEVATING APPARATUS

Thomas H. Merrill, and Debra L. Merrill, both of 1911 Pin Oak Cir., Norman, Okla. 73072

Filed Aug. 6, 1992, Ser. No. 926,260

Int. Cl.[5] **A47C** *21/00*

U.S. Cl. 5—660 **12 Claims**



1. A bed elevating apparatus for use with a bed frame having a first end, a second end spaced a distance from the first end, a first side and a second side spaced a distance from the first side, the bed frame being supported on a substantially horizontally extending support surface, and a mattress, comprising:

an elevation frame having a first end, a second end spaced a distance from the first end, a first side and a second side spaced a distance from the first side, an upper surface and a lower surface, the lower surface of the elevation frame being supportable on the bed frame with the first end of the elevation frame being disposed near the first end of the bed frame and the second end of the elevation frame being disposed near the second end of the bed frame, the elevation frame having a first height extending between the upper surface and the lower surface of the elevation frame about adjacent the first end of the elevation frame and a second height extending between the upper surface and the lower surface of the elevation frame about adjacent the second end of the elevation frame with the first height being greater than the second height, the upper surface of the elevation frame extending at an angle to the support surface and extending substantially in a single angularly extending plane with respect to the support surface when the elevation frame is supported on the bed frame, the mattress being supported on the upper surface of the elevation frame whereby the mattress is supported in a position extending at an angle to the support surface and the mattress being supported extending in a substantially single angularly extending plane with respect to the support surface, the elevation frame comprising:

a first side frame having a first end, a second end, an upper surface and a lower surface;

a second side frame having a first end, a second end, an upper surface and a lower surface, and

means for connecting the first side frame to the second side frame whereby the first ends of the first and the second side frames cooperate to form the first end of the elevation frame, the second ends of the first and the second side frames cooperate to form the second end of the elevation frame, the upper surfaces of the first and

the second side frames cooperate to form the upper

cutting means for cutting a piece of ribbon or other mate-

5,205,009

SHOE SUPPORT

first operating means to pivot said ramp upwardly, and time delay means operably connected to said actuating means for

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the second side frames cooperate to form the upper surface of the elevation frame and the lower surfaces of the first and the second side frames cooperate to form the lower surface of the elevation frame, said means comprising:

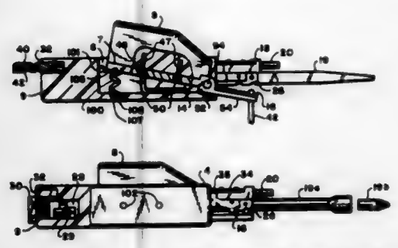
at least two spaced apart slats, each slat having opposite ends and one end of each slat being connected to the first side frame and the opposite end of each slat being connected to the second side frame, the slats cooperating with the upper surfaces of the first and the second side frames to form the upper surface of the elevation frame.

5,205,006

ELECTRICIAN TOOL

Alfred J. Panasuk, 7 Bryant Crescent, White Plains, N.Y. 10605

Filed Sep. 13, 1990, Ser. No. 581,804
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—108 **11 Claims**



1. A combination tool comprising a handle body, said handle body having a front and a rear, a central recess in said handle body, a screwdriver base, and a screwdriver shaft extending forwardly of said body, and having a screwdriver tip at its forward end, the lower surface of said screwdriver base having a downwardly extending cutting blade thereon, a pivotable arm mounted in the forward end of said handle body within said central recess, the forward end thereof extending forwardly of said handle body and having an upwardly extending blade on its forward section, said upwardly extending blade opposed to the blade on said screwdriver base, each of said blades having opposed recesses therein to serve as wire strippers, said pivot arm being biased away from said screwdriver base, a forwardly extending dowel laterally spaced from said screwdriver shaft in longitudinal alignment with said screwdriver shaft, and a sheath cutter blade mounted on said screwdriver base and extending towards the front of said handle body.

5,205,007

RIBBON CURLING TOOL

Fredric Goldstein, Liljekungsvagen 186, Vallingby, Sweden 16242

Continuation of Ser. No. 354,624, May 19, 1989, abandoned.
This application Sep. 10, 1991, Ser. No. 759,188
Claims priority, application United Kingdom, May 19, 1988, 8811834
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—135 **15 Claims**

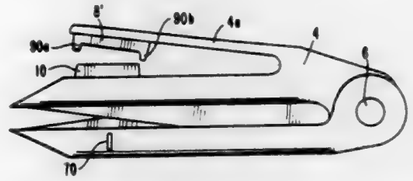
1. A ribbon curling device to facilitate the curling of a length of ribbon, said ribbon curling device comprising:

a. a first arm having a primary section and a secondary section, said secondary section being connected to said primary section at a first end and being spaced from said primary section at a second end;

b. a second arm connected to said first arm, said second arm being moveable relative to said first arm, said primary section of said first arm and said second arm including cutting means for cutting a piece of ribbon or other material;

c. first curling means on said primary section; and

d. second curling means on said secondary section adjacent



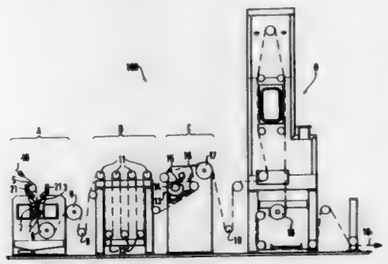
said first curling means, said primary section and said secondary being moveable relative to one another so that said first curling means and said second curling means can clamp a ribbon therebetween to facilitate the curling thereof.

5,205,008

METHOD FOR PRETREATING CONTINUOUS TEXTILE MATERIAL HAVING AT LEAST ONE TUFTED SIDE, PARTICULARLY CARPET GOODS, BEFORE A DYEING PROCESS

Julius Kohnen, and Johannes Kutz, both of Toisvorst, Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 827,304, Jan. 29, 1992, abandoned, which is a division of Ser. No. 552,700, Jul. 16, 1990, abandoned.
This application Sep. 23, 1992, Ser. No. 948,620
Int. Cl.[5] D06B *3/18, 15/00, 21/00*
U.S. Cl. 8—149.1 **5 Claims**



1. A method of pretreating a continuous textile web having at least on tufted side before the web is dyed, said method comprising the steps of:

a. guiding the undyed web in an essentially vertical manner through a wedge-shaped gap filled with a preparatory agent;

b. applying the preparatory agent to the undyed web by conducting the web into the gap;

c. wiping off the preparatory agent from the undyed web at a lower end of the gap;

d. conducting the undyed web through surrounding air for a predetermined dwell time; and

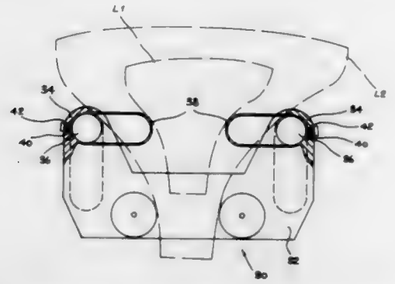
e. hydroextracting the undyed web to a predetermined moisture content after the predetermined dwell time has passed.

5,205,009

SHOE SUPPORT

Giovanni Cottino, Vigevano, Italy; Terence J. Brown, Wigston; Alfred R. Corbett, Birstall, both of England, and Alan Thompson, Bangkok, Thailand, assignors to British United Shoe Machine Ltd., Leicester, England

Filed Apr. 30, 1992, Ser. No. 876,488
Claims priority, application United Kingdom, May 3, 1991, 9109652.9; Mar. 19, 1992, 9206116.7
Int. Cl.[5] A43D *25/20*; B65G *17/32*
U.S. Cl. 12—1 A **12 Claims**



1. A shoe support for supporting a lasted shoe, bottom up, comprising a pair of support members spaced apart from one another and each extending in a direction lengthwise of a shoe to be supported thereby such that a cone of a last can be received between the support members and the shoe is supported by shoe-supporting surface portions of said members with the shoe bottom exposed,

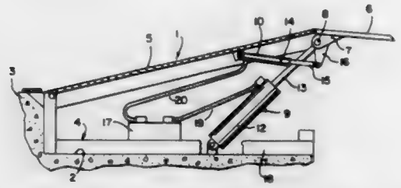
wherein for adjusting the spacing between the shoe-supporting surface portions of the support members to accommodate shoes of different sizes, each member is mounted for pivotal movement about an axis disposed adjacent an elongated edge thereof, a friction arrangement being provided for maintaining the members in adjusted position.

5,205,010

RETURN-TO-DOCK LEVEL MECHANISM FOR A HYDRAULIC DOCKBOARD

Martin P. Hageman, Mequon, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Aug. 13, 1991, Ser. No. 744,312
Int. Cl.[5] E01D *1/00*; E01F *1/00*
U.S. Cl. 14—71.7 **12 Claims**



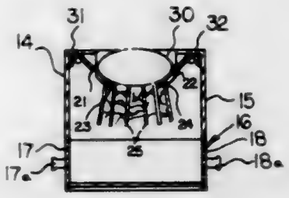
1. A dockboard, comprising a supporting structure, a ramp having a rear edge hinged to the supporting structure and movable between a downwardly inclined position to an upwardly inclined position, a lip hinged to a forward edge of the ramp and movable between a downwardly hanging pendant position and an extended position, first operating means for moving the ramp between said downwardly inclined position to said upwardly inclined position, second operating means for moving the lip between the pendant position and the extended position, actuating means responsive to the lip falling from said extended position toward said pendant position when said ramp is at said downwardly inclined position for operating said first operating means to pivot said ramp upwardly, and time delay means operably connected to said actuating means for delaying operation of said actuating means for a predetermined period of time.

5,205,011

HAIR BRUSH CLEANING APPARATUS

Richard S. Flener, 811 E. Main, Wilburton, Okla. 74578

Filed Feb. 14, 1992, Ser. No. 835,313
Int. Cl.[5] A46B *13/04*
U.S. Cl. 15—142 **7 Claims**



1. A hair brush cleaning apparatus, comprising,

a housing, the housing including a rear end wall spaced from a front end wall, and

a first side wall spaced from a second side wall, and a top wall, and

the rear end wall including a rear end wall recess directed through the rear end wall in communication with the top wall, and the top wall including a top wall opening in communication interiorly of the housing, and with the rear end wall recess, and

a tray member directed through the housing orthogonally oriented and slidably mounted within the housing, and including a first tray wall and a second tray wall spaced from and parallel relative to one another, with the first tray wall and the second tray wall coplanar with the first side wall and the second side wall respectively when the tray member is mounted within the housing, and

the housing including a bottom wall, and the tray member including a floor, the tray member floor coplanar with the housing bottom wall, and

a first plate and a second plate mounted pivotally within the housing, wherein the first plate includes a first hinge, wherein the first hinge is mounted at an intersection of the first side wall and the top wall, and

the second plate mounted to a second hinge, the second hinge mounted at an intersection of the second side wall and the top wall, and the first plate including first plate teeth, the second plate including second plate teeth, wherein the first plate teeth and the second plate teeth are inter-digitated in a first position when the first plate and the second plate are coplanar relative to one another, and wherein the first plate and second plate are displaced and defined at an oblique angle therebetween when a hair brush member is directed through the top wall opening displacing the first plate and the second plate.

5,205,012

CLEANING TOOL

Ella B. Coley, 202 Grotto Blvd., San Antonio, Tex. 78216

Filed Jan. 22, 1992, Ser. No. 823,979
Int. Cl.[5] A47L *13/46*
U.S. Cl. 15—210.1 **2 Claims**

1. Apparatus for cleaning surfaces not readily accessible to manual contact comprising:

a cloth support element having a substantially flat face bounded by a selected arcuate wall extending upwardly from the periphery of said cloth support element flat face,

said arcuate wall having an opposed face opposite said flat face,

ing divider members attached to said shelf and two of said walls,

means responsive to that pressure differential for opening the electrical circuit and deenergizing the fan motor.

5,205,016

DOOR HOLDING DEVICE

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said arcuate wall having an opposed face opposite said flat face,

an elongated handle secured to said arcuate configured wall and extending laterally from said opposed face and having its unsecured end shaped for convenient manual grasping;

a polygonal piece of cloth having an area in excess of said substantially flat face of said support element, whereby peripheral portions of said piece of cloth extend beyond said periphery of said support element when a central

portion of said piece of cloth is positioned in abutment with said substantially flat face of said support element; and

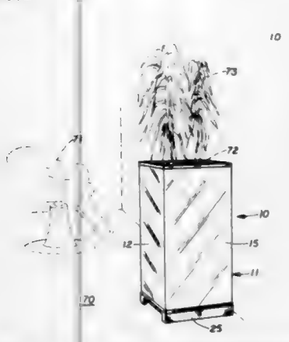
means for detachably securing said peripheral portions of said piece of cloth to said support element said means being only one recess formed in the center of said opposed face of said support element; said recess being dimensioned to snugly receive said peripheral portions of said piece of cloth in inserted relation thereto to detachably secure said piece of cloth to said support element.

5,205,013

COMBINED DECORATIVE STORAGE HOUSING AND VACUUM CLEANER

Gene Lopes, Sacramento, Calif., assignor to Flash Vac Inc., Sacramento, Calif.

Filed Aug. 26, 1991, Ser. No. 750,067
Int. Cl.[5] A47L *5/38*
U.S. Cl. 15—301 **20 Claims**



1. A combined vacuum cleaner storage housing and vacuum cleaner for use by barbers, hair stylists and pet groomers to dispose of cut hair which comprises:

a. a main body having an interior and an exterior, said body being formed from spaced generally vertical front, and rear walls and spaced side walls normal thereto, one of which includes an access door to the interior thereof;

b. a storage area formed in the top of said body and defined by (I) a generally horizontally disposed top shelf, the extent of which in one direction is less than the distance between one of the two pair of opposed spaced walls of the main body, and (II) a pair of spaced parallel upstanding divider members attached to said shelf and two of said walls,

c. a second shelf spaced down from the top shelf disposed within the interior for receipt of a canister vacuum cleaner said second shelf having an opening therein for disposition of one end of a canister vacuum cleaner intake member;

d. a throat defined by a cross brace disposed beneath said second shelf, which cross brace has an opening, and a pair of diverging throat definers which extend from opposite sides of said cross brace opening;

e. a canister vacuum intake member disposed between said central opening of said throat and the opening in said second shelf;

f. a canister vacuum disposed on said second shelf;

g. means fluidly connecting said canister vacuum to said intake member

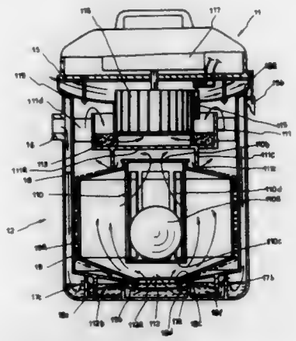
wherein one of said vertical walls has a bottom opening fluidly communicating the space outside of said storage housing with said cross brace opening.

5,205,014

VACUUM CLEANER HAVING A LIQUID MEDIUM FILTER

Byoung H. Yoo, Daejun, Rep. of Korea, assignor to Yong Won Kang, Seoul, Rep. of Korea

Filed Mar. 11, 1991, Ser. No. 667,503
Int. Cl.[5] A47L *9/18*
U.S. Cl. 15—353 **4 Claims**



1. A vacuum cleaner comprising:

an outer tank (**17**) having a suction opening (**16**) through which air and liquid can enter the tank,

means defining within the tank a lower chamber (B), an intermediate chamber (F), and an upper chamber (G)

an air outlet opening in the upper chamber,

a fan (**116**) between the intermediate and upper chambers for drawing air, which enters the outer tank through the suction opening, through the lower and intermediate chambers and into the upper chamber, the air leaving the upper chamber through the outlet opening,

an electrical circuit including a motor (**117**) for operating the fan,

an overflow hole (**110***b*) at the upper end of the lower chamber through which the lower and intermediate chambers communicate,

passageway means through which liquid entering the outer tank through the suction opening can enter and fill the lower chamber,

a float (**110***a*) within the lower chamber for closing the overflow hole when the liquid in the lower chamber reaches a predetermined level, closing of the overflow hole closing off the flow of air to the intermediate chamber and hence producing an air pressure differential between the intermediate and upper chambers, and

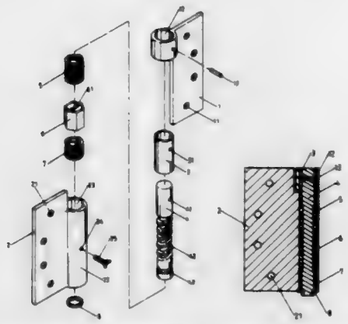
means responsive to that pressure differential for opening the electrical circuit and deenergizing the fan motor.

5,205,015

DOOR HINGE WITH AUTOMATIC RETURNING MEANS

Hao-Tang Huang, 12-2, Lane 771, Shin Juang Rd., Shin Juang City, Taipei, Taiwan

Filed Apr. 17, 1992, Ser. No. 870,254
Int. Cl.[5] E05F *5/08*; E05C *17/00*
U.S. Cl. 16—50 **2 Claims**



1. A door hinge with automatic returning means is comprising a male hinge member, a female hinge member, an inner sleeve, a transmission rod, main spring, a driving element, a buffer spring and a retainer, in which:

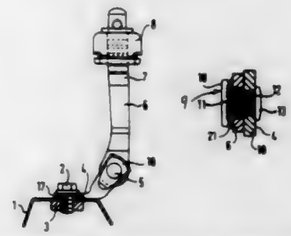
a hollow annular element is provided at inner side of flat surface of male hinge member, on which is formed with a pin hole; a outer sleeve is also provided at the inner side of flat surface of the female hinge member and the outer diameter of which is in match with the annular element: inside of this outer sleeve is a channel in polygon shape and configurate to accommodate a driving element of same polygon shape in loose fit; an inner sleeve is inserted into outer sleeve with its lower portion and inserted into annular member with its upper portion, on which a pin hole is also formed in alignment with the pin hole of annular member; the transmission rod is cylinder in shape and the upper end of which is housed in inner sleeve with a pin to pierce through the holes of annular member, the inner sleeve and hole on the upper portion of this rod, all these parts—the annular member, the inner sleeve and transmission rod—shall be connected as one moving unit, an external thread is provided around the intermediate portion of this rod and a retainer groove is formed at its lower end; the main spring enveloped transmission rod with its upper end urge against the bottom of inner sleeve and its lower end contacted the top surface of driving element: the driving element is accommodated within the outer sleeve with its outer diameter in same configuration with the inner diameter of outer sleeve but little less sized, so that, it can be housed in outer sleeve in loose fit, the inner shape of driving element is a circular hollow channel, on which an internal thread is provided which shall be engaged with above mentioned external thread so as to produce a helical motion; the buffer spring also enveloped the transmission rod with its upper end urge against the bottom of driving element and with its lower end contacted and supported by retainer; and the retainer is engaged with retainer groove which is formed at the lower end of transmission rod in the portion extended further from outer sleeve.

5,205,016

DOOR HOLDING DEVICE

Richard Kalot, Remscheid; Heinz-Walter Heinemann, Wuppertal, and Jürgen Brockhaus, Remscheid, all of Fed. Rep. of Germany, assignors to Ed. Scharwächter GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Continuation of Ser. No. 706,555, May 28, 1991, abandoned, which is a continuation of Ser. No. 610,341, Nov. 5, 1990, abandoned, which is a continuation of Ser. No. 420,674, Oct. 10, 1989, abandoned, which is a continuation of Ser. No. 39,536, Apr. 16, 1987, abandoned. This application Jun. 5, 1992, Ser. No. 895,191
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630463
Int. Cl.[5] E05D *11/08*; E05C *17/04, 17/12*
U.S. Cl. 16—82 **14 Claims**



1. A door holding device for motor vehicle doors, comprising a door holding rod having first and second ends, a carrier member having a cantilevered portion attached to a structural door component, the first end of the door holding rod freely swivelably connected to the cantilevered portion of the carrier member, the second end of the door holding rod extending through a holder housing mounted on another structural door component, door or door post, the door holding rod having along its length increased thickness portions protruding outwardly transversely of the longitudinal direction of the door holding rod near the second end of the door holding rod for cooperating with said holder housing to hold a door, the door holding rod and the carrier member defining openings, a bolt extending through the opening of the door holding rod and of the carrier member, so that the door holding rod is freely swivelable relative to the bolt, means mounting the carrier member non-rotatably relative to the bolt, the carrier member formed of a single shaped piece, the bolt having a head at one end and means at the other end for retaining the bolt in said openings, a spring mounted between the head of the bolt and the door holding rod, the bolt having a shaft portion, the shaft portion of the bolt defining a deformable criss-cross knurled surface profiling on the length of the bolt extending through the opening of the door holding rod, wherein the criss-cross knurled surface profiling ensures a play-free mounting of the bolt in the opening of the door holding rod.

5,205,017

NOTEBOOK COMPUTER TOP COVER MOUNTING HARDWARE

B. J. Wang, Hsin-Chuang, Taiwan, assignor to Jetta Computers Co., Ltd., Taipei Hsien, Taiwan

Filed Mar. 18, 1992, Ser. No. 853,058
Int. Cl.[5] E05D *3/10*
U.S. Cl. 16—367 **1 Claim**

1. A notebook computer top cover mounting hardware comprising:

a mainframe, said mainframe having two opposite pin holes on two adjacent recesses on a top edge at one side thereof, said recesses being separated by a raised block, said raised block having wire holes for inserting electric wires;

a top cover, said top cover comprising an opening at one side, two inward projecting blocks alinged at two oppo-

site locations inside said opening, an intermediate hole on

(2) a charging device arranged for filling the hoppers with fiber tufts from above through the top inlet;

position into said second position in response to the sensing signal emitted by said metal detector.

5,205,021

QUICK RELEASE BUCKLE ASSEMBLY

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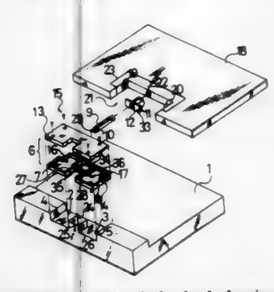
site locations inside said opening, an intermediate hole on a peripheral edge inside said opening between said two inward projecting blocks;

a movable support pivoted to said mainframe, said movable support being formed of two cover plates, and having two opposite pegs respectively revolvably inserted in said pin hole, and two opposite sliding ways for supporting said two inward projecting blocks;

a movable connecting tube fixedly fastened in said intermediate hole of said top cover and secured to said movable support by a holding plate;

wherein said holding plate comprises a tubular body extend-



ing from a flat base, said tubular body having a first annular groove and a second annular groove formed around an inner wall surface thereof at two opposite ends and connected by an elongated groove, said flat base being secured to said movable support; said movable connecting tube has one end fixedly fastened in said intermediate hole of said top cover and an opposite end attached with a side pin, said side pin being engaged in either annular groove; and

wherein moving said side pin of said movable connecting tube from said first annular groove to said second annular groove permits said top cover to be rotated through 180° angle for turning a display thereon to the outside.

5,205,018

APPARATUS FOR MAKING A LAP FROM TEXTILE FIBERS

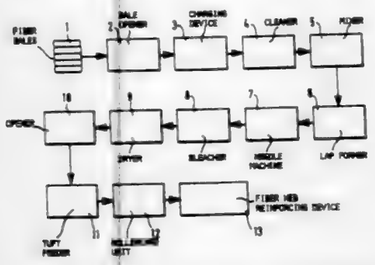
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, and Klaus Staats, Tega Cay, S.C., assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 18, 1990, Ser. No. 629,686

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942440

Int. Cl.[5] D01G *13/00*

U.S. Cl. 19—145.5 **6 Claims**



1. An apparatus for making a fiber lap, comprising in combination

(a) a fiber tuft mixer, including

(1) a plurality of serially arranged, vertically oriented hoppers each having a top inlet and a bottom outlet;

(2) a charging device arranged for filling the hoppers with fiber tufts from above through the top inlet;

(3) delivering devices arranged for withdrawing fiber tufts from the bottom outlet of each hopper; and

(4) a conveyor device extending underneath the hoppers and arranged to successively run past the outlets of the hoppers for successively receiving fiber tufts from the hoppers, whereby a multilayer fiber tuft mass is being continuously formed on the conveyor device;

(b) a needling machine for forming a stabilized fiber lap from the multilayer fiber tuft mass, said needling machine being arranged for receiving the multilayer fiber tuft mass from the conveyor device; and

(c) a wet treatment device arranged for receiving the fiber lap from said needling machine.

5,205,019

APPARATUS FOR SEPARATING METAL BODIES FROM A TEXTILE FIBER STREAM

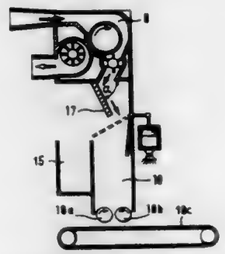
Stefan Schnlichter, Viersen, and Ferdinand Leifeld, Kempen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 760,989

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1990, 4029412

Int. Cl.[5] D01G *9/08, 23/00;* **B07C** *5/344;* **G01N** *33/36*

U.S. Cl. 19—200 **21 Claims**



1. In a fiber processing line for treating fiber tufts, including a plurality of fiber processing machines, fiber duct means for serially interconnecting the fiber processing machines with one another; means for generating a stream of transporting air in said fiber duct means for pneumatically conveying the fiber tufts therein; a metal separator interposed between two fiber-processing machines, the improvement wherein said metal separator comprises

(a) a generally vertical chute having an upper inlet and a lower outlet through which the fiber tufts respectively enter into and exit from the chute; a portion of said fiber duct means being coupled to the chute inlet and the chute outlet for pneumatically introducing the fiber tufts into and conveying the fiber tufts away from the chute;

(b) a metal detector positioned in said chute for detecting a metal body and emitting a sensing signal upon passage of the metal body; said metal detector being an inductive flat-surface detector and being inclined downwardly relative to horizontal;

(c) a waste discharge opening provided in said chute between said metal detector and said chute outlet;

(d) a deflecting mechanism arranged below said metal detector in said chute and having first and second positions; in the first position said deflecting mechanism guiding the stream of fiber tufts so as to proceed in said chute to and through said chute outlet and in said second position said deflecting mechanism guiding the stream of fiber tufts and metal body so as to proceed through said waste discharge opening; and

(e) means for moving said deflecting mechanism from said

position into said second position in response to the sensing signal emitted by said metal detector.

5,205,020

TENSIONING APPARATUS FOR A LASHING STRAP

Hans-Werner Kimper, Wirsalen, Fed. Rep. of Germany, assignor to Spanset Inter AG, Oetwil am See, Switzerland

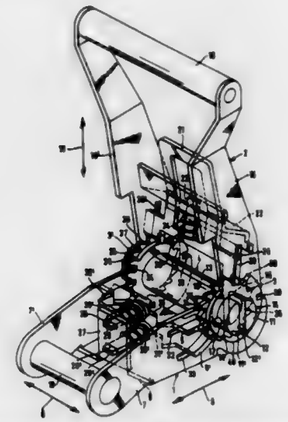
Continuation-in-part of Ser. No. 694,839, May 2, 1991, Pat. No. 5,103,536. This application Mar. 4, 1992, Ser. No. 845,664

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1991, 9102777[U]

The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.

Int. Cl.[5] B25B *25/00*

U.S. Cl. 24—68 CD **17 Claims**



1. A tensioning apparatus for a lashing strap having a fixed end and a free end, comprising:

a frame having two side walls which extend parallel to one another, the fixed end of the lashing strap being operationally connected to the frame;

a wind-up spindle that is rotatably mounted on the frame and that receives the free end of the lashing strap; and

ratchet mechanism means for securing the wind-up spindle from rotation in a first direction with respect to the frame, the ratchet mechanism means including

a ratchet wheel connected to the wind-up spindle,

first and second locking pawls that are mounted on the frame and moveable between an engaged position wherein the locking pawls contact the ratchet wheel and a disengaged position wherein the locking pawls are withdrawn from the ratchet wheel, the first locking pawl having a curved configuration so as to reduce the structural height required for the frame, and

biasing means for biasing the locking pawls toward the engaged position,

wherein the first locking pawl is shaped as a ring segment,

wherein each side wall of the frame has a respective first pawl guide slot through which the first locking pawl extends, the first pawl guide slots conforming to the curved configuration of the first locking pawl and being shaped as ring segments, and

wherein each side wall of the frame additionally has a second pawl guide slot through which the second locking pawl extends.

5,205,021

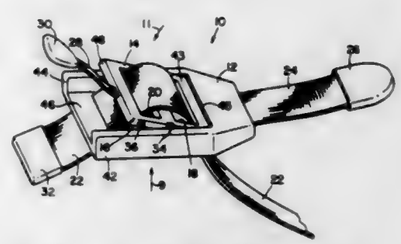
QUICK RELEASE BUCKLE ASSEMBLY

Philip E. Durand, Hudson, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 15, 1992, Ser. No. 883,507

Int. Cl.[5] A44B *11/00*

U.S. Cl. 24—163 R **15 Claims**



1. A quick-release buckle assembly, comprising:

an engaging member having a pair of slots through which a strap is threaded and retained;

a receiving member defining a recess for removably receiving said engaging member in a buckle-engaged position;

said engaging member in the buckle-engaged position being disposed substantially completely within the peripheral bounds of said recess to prevent inadvertent disengagement of said engaging member from said receiving member;

said engaging member in the buckle-disengaged position being detached from said receiving member; and

a flexible tongue protruding from said engaging member to allow said engaging member to be pulled out of said recess to disengage the buckle.

5,205,022

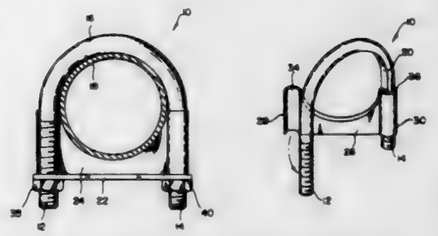
U-BOLT CLAMP ASSEMBLY

John F. Norton, 2814 179th Ave. NE., Redmond, Wash. 98052

Filed Jun. 9, 1992, Ser. No. 895,735

Int. Cl.[5] F16L *33/00;* **B65D** *63/00*

U.S. Cl. 24—277 **6 Claims**



1. A clamp assembly for securing a cylindrical member comprising

a. A U-shaped member having a semi-circular bight portion and a pair of parallel threaded legs;

b. saddle means having a web portion with a semi-circular interior surface for receiving the cylindrical member to be secured, said saddle means having two parallel cylindrical portions on either end of said web portion, said cylindrical portion having a longititudinal cutout portion so as to allow fitting of said cylindrical portions over said threaded legs of said U-shaped member, said cutout portions of said cylindrical portions facing 180° from each other when said saddle means is fitted on said threaded legs of said U-shaped member, said saddle means having

cylindrical portions so sized as to interlock with said

5,205,025

METHOD OF PRODUCING A SAFETY BELT

(2) a conveying path extending parallel to the main conveying path,

an elastically bent state, said elastic seal member exhibiting an annular contour in a restored state;

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cylindrical portions so sized as to interlock with said threaded legs of said U-shaped member; and

c. fastening means fitting on said threaded legs of said U-shaped member for securing the clamp assembly to the cylindrical member.

5,205,023

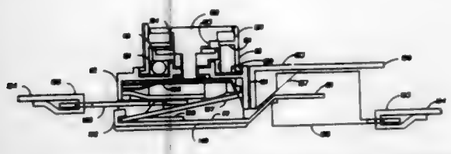
CHILD-RESISTANT BUCKLE AND BUCKLE GUARD COMBINATION

Robert M. Hunter, and Mary M. Hunter, both of 320 S. Willson Avenue, Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 510,621, Apr. 18, 1990. This application Oct. 4, 1990, Ser. No. 592,577

Int. Cl.[5] A44B *11/00*

U.S. Cl. 24—633 **12 Claims**



1. A child-resistant buckle and buckle guard combination comprising

a buckle having a child-resistant feature comprising an actuator button mounted on said buckle, said actuator button having a vertical axis, and a combination lock mechanism having at least one tumbler, said tumbler being rotatable about the vertical axis of said actuator button,

means for connecting said buckle to a conventional safety belt buckle body,

means for denying the child access to a conventional safety belt buckle release mechanism; and

wherein the means for denying access to the release mechanism on said conventional safety belt buckle is a guard, said guard forcibly removable from said combination by an adult thereby allowing said adult access to said conventional safety belt buckle release mechanism.

5,205,024

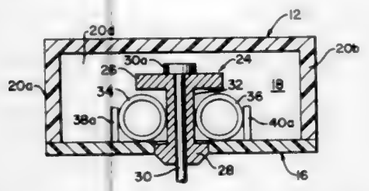
INK TACK WITH ENHANCED VIAL PROTECTION

Alan E. Willard, Coral Springs, Fla., assignor to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Aug. 31, 1992, Ser. No. 937,593

Int. Cl.[5] A44B *9/00*

U.S. Cl. 24—704.1 **16 Claims**



1. A housing assembly for a theft-deterrent tack comprising a housing, at least one frangible vial containing a theft-deterrent substance disposed in the housing and displaceable means supported by the housing for movement therein to cause fracture of the vial and for concurrently opening a theretofore closed portion of the assembly for egress of the theft-deterrent substance.

5,205,025

METHOD OF PRODUCING A SAFETY BELT RETRACTOR

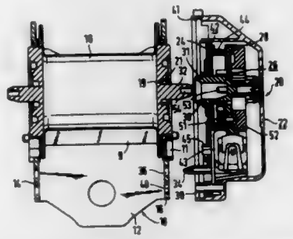
Thomas Kielwein, Eschach, and Johannes Schmid, Schwib.-Gmünd-Hussenhofen, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 21, 1992, Ser. No. 839,179

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1991, 9102117[U]

Int. Cl.[5] B23P *11/00, 11/02*

U.S. Cl. 29—436 **13 Claims**



1. A method of assembling a safety belt retractor having a loadbearing housing, a belt take-up shaft rotatably mounted in the housing, a blocking mechanism with a blocking pawl, and a vehicle-sensitive and/or webbing-sensitive control system with functional parts for activating the blocking pawl, the control system being provided with a mounting plate on which the functional parts are mounted and being surrounded by a cover cap placed onto one side of the housing and secured to the housing by means of detent elements, the control system having a control disc connected non-rotatably to the belt take-up shaft, the control disc and the belt take-up shaft having complementary configurations, said method comprising the steps of:

a) preassembling the control system and the cover cap to provide a unit with the mounting plate fitted into the cover cap;

b) placing the preassembled unit onto the one side of the housing in a location coaxial with the belt take-up shaft; and

c) engaging the complementary configurations of the control disc and the belt take-up shaft with each other by pushing the complementary configurations axially into each other when step b) is performed.

5,205,026

PRODUCTION INSTALLATION

Walter Sticht, Karl-Heinrich-Waggerl-Str. 8, A-4800 Attnang-Puchheim, Austria

Filed Apr. 4, 1990, Ser. No. 504,976

Claims priority, application Austria, Apr. 4, 1989, A791/89

Int. Cl.[5] B65G *47/74*

U.S. Cl. 29—33 P **7 Claims**

1. A production installation for assembling or processing structural components comprised of individual parts, which comprises

(a) carriages supporting pallet trays carrying the structural components or the individual parts,

(b) a conveyor track comprised of individual and separable conveyor track sections, each conveyor track section comprising

(1) vertical and lateral guideways for the carriages,

(c) a feed device at each conveyor track section operable for conveying the carriages independently of each other along the vertical and lateral guideways of the conveyor track, and

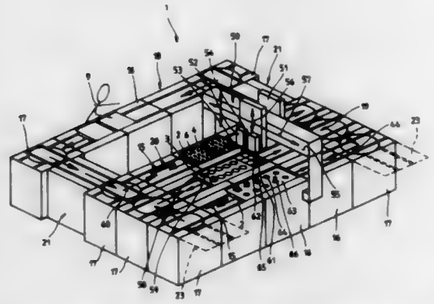
(d) the conveyor track defining

(1) a main conveying path for transporting the carriages in a conveying direction,

(2) a conveying path extending parallel to the main conveying path,

(3) two connecting conveying paths spaced from each other in the conveying direction and extending transversely to the conveying direction between the main conveying path and the parallel conveying path,

(4) an auxiliary conveying path extending between, and parallel to, the main conveying path and the parallel conveying path, and



(5) respective ones of the conveyor track sections constituting transport stations for the carriages and junction stations respectively interconnecting the transversely extending conveying paths with the main conveying path, the auxiliary conveying path and the parallel conveying path, the vertical and lateral guideways on the junction stations guiding the carriages for one of the conveying paths to the interconnected conveying path.

5,205,027

SEAL HOLDING SHUTTLE FOR FITTING ELASTIC SEAL MEMBERS TO A CALIPER

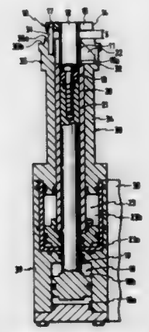
Yuji Watanabe, Tokyo; Mitsuhito Ino, and Masayoshi Kojima, both of Saitama, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1992, Ser. No. 885,617

Claims priority, application Japan, May 22, 1991, 3-145305

Int. Cl.[5] B23P *19/02*

U.S. Cl. 29—235 **4 Claims**



1. A seal holding shuttle employable for fitting elastic seal members to a caliper having an adjustment bolt, said seal holding shuttle comprising:

a main body;

an abutment plate having a cavity formed in said main body for receiving the adjustment bolt at the central part thereof;

a support member for clamping each elastic seal member between said abutment plate and said support member in an elastically bent state, said elastic seal member exhibiting an annular contour in a restored state;

a plurality of pins connected to one of said abutment plate and said support member; said pins being located on the inner diameter side of said elastic seal member, said pins being arranged in a spaced relationship as seen in the circumferential direction with a predetermined distance kept between adjacent pins to support a plurality of outward bend projections of said elastic seal member held in the elastically bent state; and

first driving means for displacing one of said abutment plate and said support member relative to each other in an axial direction, whereby said elastic seal assembly having a plurality of inward bent projections formed therewith without any occurrence of interference with said adjustment bolt while exhibiting the elastically bent state is held in a clamped state or released from a clamped state by displacing one of said abutment plate and said support member relative to each other in the axial direction.

5,205,028

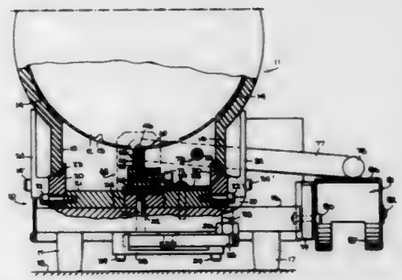
WAFER ALIGNMENT FIXTURE FOR WAFERS HAVING NOTCHES AND/OR FLATS

Thomas E. Leonard, Parsippany, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Apr. 1, 1991, Ser. No. 678,604

Int. Cl.[5] B23R *5/22*

U.S. Cl. 29—271 **21 Claims**



1. A wafer support assembly for a wafer alignment fixture, said assembly comprising

a support having a pair of spaced parallel upstanding walls defining wafer support surfaces at the upper ends;

a dowel pin disposed in parallel between said walls on an axis disposed longitudinally of said walls to support a roller thereon while contacting an outer surface of the roller;

means for adjustably supporting said dowel pin in said support for raising and lowering said pin relative to said walls, said means including a flat bar supporting said dowel pin horizontally thereon and a vertically disposed dowel pin supporting said bar support thereon; and

a screw rotatably mounted in said support for actuating said means in response to rotation of said screw to move said dowel pin relative to said walls.

5,205,029

METHOD OF MANUFACTURING A FREQUENCY ADAPTER

Richard De Antonio, Courcouronnes, and Didier Lacarriere, Chalon St Mars, both of France, assignors to Vibrachoc, Evry Cedex, France

Filed Feb. 18, 1992, Ser. No. 836,561

Claims priority, application France, Feb. 19, 1991, 91 01941

Int. Cl.[5] B29C *45/14*

U.S. Cl. 29—436 **1 Claim**

1. Method of manufacturing a cylindrical type frequency adapter comprising:

molding under heat and pressure at least one assembly of an

ing a main body and a rivet head forming shaft mounted in

smooth surface, wherein one of said substrates has at least one bonding portion, said mount body having at least one

5,205,034

APPARATUS FOR ASSEMBLING RELAYS

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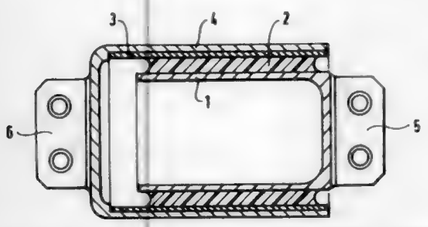
molding under heat and pressure at least one assembly of an elastomer ring molded between an inner armature and a radially outer cylindrical ring such that said elastomer ring adheres to said armature and to said cylindrical ring, and

after said elastomer ring is molded between said inner armature and said radially outer cylindrical ring, cooling the resulting assembly without carrying out any diameter reducing operations, and

then sleeving said assembly into a cylindrical outer sheath, and



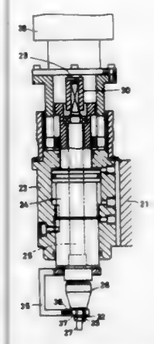
reducing the diameter of the complete adapter by plastic deformation of said cylindrical outer sheath and also simultaneously reducing the diameter of said cylindrical ring such that deformation of the cylindrical ring is by elastic deformation and its diameter is maintained by the outer cylindrical sheath thereby releasing stresses in the elastomer ring, simultaneously the outer cylindrical sheath is clamped onto the assembly comprised of the outer cylindrical ring, the elastomer ring and the inner armature and thereby avoiding the need to subsequently machine the assembly.

5,205,030

RIVET HEAD CAULKING MACHINE

Wataru Uno, Higashiosaka, Japan, assignor to Yoshikawa Iron Works Ltd., Osaka, Japan

Filed Jul. 2, 1991, Ser. No. 724,816
Claims priority, application Japan, Jul. 2, 1990, 2-176084
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—707 **5 Claims**



1. A rivet head forming machine comprising;

a column;

a table mounted to said column and being adapted to receive a workpiece having rivet shanks passing therethrough;

a piston shaft vertically movably mounted to said column;

a spindle rotatably mounted to said piston shaft for rotation about a rotation axis;

a rivet head forming tool secured to said spindle and including a main body and a rivet head forming shaft mounted in said main body; and

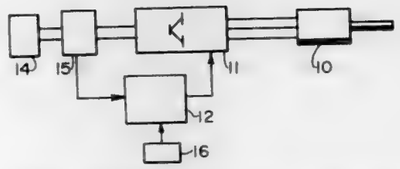
a rivet detecting means for determining whether a rivet shank is present in the workpiece beneath said rivet head forming shaft by measuring rotation of said rivet head forming shaft about said rotation axis.

5,205,031

DEVICE FOR TIGHTENING THREADED JOINTS

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Tools AB, Stockholm, Sweden

Continuation of Ser. No. 585,829, Sep. 20, 1990, abandoned. This application Feb. 20, 1992, Ser. No. 840,609
Claims priority, application Sweden, Sep. 22, 1989, 8903135
Int. Cl.[5] B23P *19/04, 21/00*
U.S. Cl. 29—707 **2 Claims**



1. A device for tightening threaded joints to a predetermined torque level, comprising:

a torque delivering power tool (**10**);

power supply means (**11**) connecting said power tool to a power source, for supplying power to said power tool;

control means (**12**) coupled to said power supply means (**11**) for controlling said power supply means (**11**); and

means for detecting torque delivered by said power tool in relation to time;

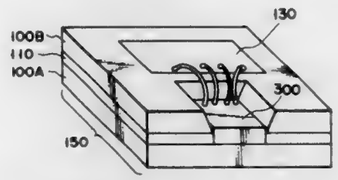
said control means (**12**) comprising means for controlling said power supply means to initiate shutting off of the power supply to said power tool as a predetermined torque level is reached, and for controlling said power supply means to initiate a continued, gradually over time decreasing power supply to said power tool as said predetermined torque level is reached.

5,205,032

ELECTRONIC PARTS MOUNTING APPARATUS

Fumihiko Kuroda, Tokyo; Hideto Furuyama, Yokohama; Mayumi Sakaguchi, Tokyo; Hiroshi Hamasaki, Sagamihara, and Masaru Nakamura, Kawaguchi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,204
Claims priority, application Japan, Sep. 28, 1990, 2-259036; Jul. 3, 1991, 3-162821; Aug. 23, 1991, 3-211846
Int. Cl.[5] H05K *1/18, 3/30;* **B23P** *19/00*
U.S. Cl. 29—740 **18 Claims**



1. An electronic parts mount device comprising:

a mount body which is obtained by bonding at least two substrates each having a predetermined thickness and a smooth surface, wherein one of said substrates has at least one bonding portion, said mount body having at least one recessed portion selectively formed in one exposed surface of said mount body to a depth which reaches said bonding portion; and

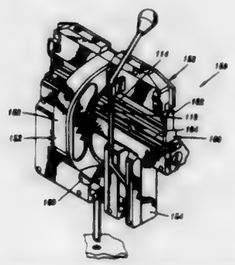
an electronic part mounted in said recessed portion.

5,205,033

TOOL FOR ASSEMBLING MULTIPLE CONDUCTOR CONNECTORS

Robert G. Drach, Douglas, Nebr., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1992, Ser. No. 843,866
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—749 **6 Claims**



1. A tool for assembling stackable elements to form a connector and for assembling conductors to the elements, which comprises:

means for supporting the connector during its assembly in which adjacently positioned elements are secured together to form a stack of elements and conductors are assembled to elements;

means for prohibiting undesirable movement of the lowermost connector element and maintaining alignment of the various elements of the connector by manipulating at least one protrusion into physical engagement with a side portion of the lowermost connector element;

means for applying forces to each successively stacked element positioned in the supporting means to secure it to an adjacent element previously positioned in the supporting means and for applying forces to conductors to assemble the conductors to the elements;

means for mounting said force-applying means for reciprocal movement which includes movement in one direction through first and then second incremental distances;

means for moving the means for applying forces through the first incremental distance to engage each successively stacked element and to engage conductors positioned in an element which is held in the supporting means and for then moving said force-applying means through the second incremental distance to secure conductors to an element; and

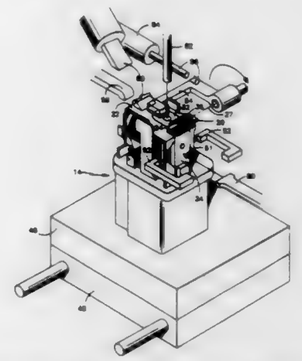
means responsive to the movement of the means for applying forces through the first incremental distance and to the initiation of the movement through the second incremental distance for spacing said force-applying means a predetermined distance from the supporting means, said spacing means capable of compensating for the number of elements which are held in the supporting means to cause the movement of said force-applying means through the second incremental distance to be effective to secure together adjacent elements and to secure conductors to an element.

5,205,034

APPARATUS FOR ASSEMBLING RELAYS

Steven J. Kwapisz, Madison Heights, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Division of Ser. No. 715,066, Jun. 12, 1991, Pat. No. 5,093,979. This application Dec. 19, 1991, Ser. No. 810,226
Int. Cl.[5] H01H *11/00*
U.S. Cl. 29—756 **3 Claims**



1. An apparatus for assembling an armature subassembly to a relay subassembly where the armature subassembly has a contactor blade with distal and proximal ends and an armature mounted to said distal end and the relay subassembly has a frame with an upper wall and a front edge for forming a gap with the armature comprising

mechanical means for moving and holding the distal end of the contactor blade against the relay subassembly so that the armature is aligned flush against the front edge of the frame;

mechanical means for moving and holding the proximal end of the contactor blade against the upper wall of the frame without producing stress or lateral movement of said proximal end; and

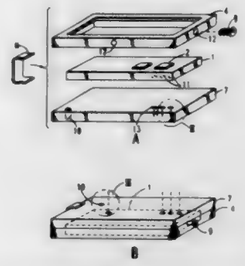
means for welding the proximal end of the contactor blade to the upper wall.

5,205,035

LOW COST PIN AND TAB ASSEMBLY FOR CERAMIC AND GLASS SUBSTRATES

Donald W. DiAngelo, Fishkill; Clifford T. Rogers, Poughkeepsie, and James T. Taylor, Newburgh, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1992, Ser. No. 825,146
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—837 **15 Claims**



1. A method of making an electronic device having at least one connection pin bonded to a first side of a substrate by means of a reflowable material and at least one chip bonded to

a second side of said substrate by means of a reflowable mate-

spacers to a lower side of the sheet member by a melted layer of the synthetic resin fibers contained in the sheet

(d) cleaning and remachining zones (**18, 19'**) of the connectors where the cuts were made;

segments aligned adjacent to each other to form the straight and essentially continuous cutting edge such that

a second side of said substrate by means of a reflowable material, said method comprising the steps of

positioning said substrate adjacent a pin holder which loosely retains said at least one connection pin,

adhering said at least one chip to said second side of said substrate with a flux having a high surface tension, and

heating said substrate, said pin holder, said at least one pin and said at least one chip as a unit to a temperature above the reflow temperature of said reflowable material to bond said at least one chip and said at least one pin to said substrate in a single operation.

5,205,036

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH SELECTIVE COATING ON LEAD FRAME

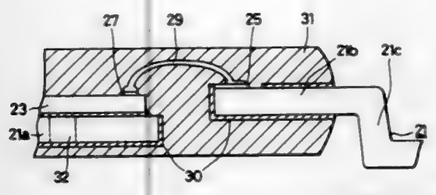
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 731,871, Jul. 18, 1991, abandoned, which is a division of Ser. No. 417,319, Oct. 5, 1989, Pat. No. 5,057,900. This application Jul. 27, 1992, Ser. No. 920,161

Claims priority, application Japan, Oct. 17, 1988, 63-261963; Oct. 17, 1988, 63-261964

Int. Cl.[5] H01R *43/20*; **H01L** *21/60*

U.S. Cl. 29—856 **12 Claims**



1. A method for forming an electric device including at least a lead frame, a semiconductor device mounted on said lead frame, and an electrical connection between said lead frame and a terminal of said semiconductor device, said method comprising the sequential steps of:

coating a protective film on said lead frame except for the portions on which said semiconductor device is to be mounted and said electrical connection will be made;

said semiconductor device on the lead frame;

making said electrical connection between said terminal of said semiconductor device and an uncoated portion of the lead frame; and

encapsulations the lead frame having said protective coating formed thereon with an organic material.

5,205,037

METHOD OF MAKING A HEAT EXCHANGE ELEMENT

Hideaki Kuriki, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 849,957, Mar. 12, 1992. This application Jul. 9, 1992, Ser. No. 911,168

Claims priority, application Japan, Mar. 15, 1991, 3-76937

Int. Cl.[5] B23P *15/26*

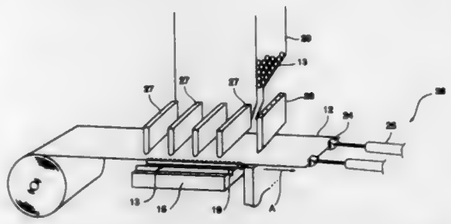
U.S. Cl. 29—890.038 **3 Claims**

1. A method of making a heat exchange element, comprising the steps of:

a) rolling a plurality of elongate rollable shaped spacers on a base having in an upper face a plurality of spaced grooves so that the spacers are positioned in the respective grooves;

b) unrolling a rolled heat exchanging sheet member containing synthetic resin fibers and placing the unrolled portion of the sheet member over the base;

c) heating an upper side of the sheet member over the base by a plurality of heaters so that the synthetic resin fibers contained in the sheet member are melted and bonding the spacers to a lower side of the sheet member by a melted layer of the synthetic resin fibers contained in the sheet member; and



d) cutting the sheet member with the spacers bonded thereto so as to have predetermined dimensions.

5,205,038

METHOD OF REPLACING A TUBE ON A STRAIGHT-TUBE HEAT EXCHANGER

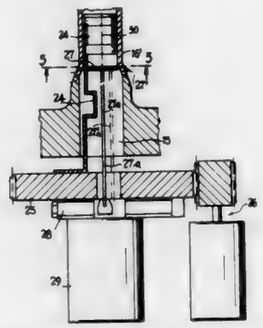
Jacques Archer, Chatenay-Malabry; Georges Moreau, Viriat; Daniel Besson, and Benoit Giraud, both of Lyons, all of France, assignors to Framatome, Courbevoie, France

Filed Sep. 19, 1991, Ser. No. 762,268

Claims priority, application France, Sep. 19, 1990, 90 11574

Int. Cl.[5] B23P *15/26*

U.S. Cl. 29—890.031 **8 Claims**



1. Method of replacing a tube (4) of a straight-tube heat exchanger comprising first and second substantially parallel tube plates 2, 3) spaced apart from one another and having, extending through them, openings (12, 13) at which tubes (4) are fixed at ends of said tubes by welding to connectors (14, 15), each of said tubes of a heat exchanger bundle having a first end fixed on a first connector (14) of said first tube plate (2), and a second end fixed on a second connector (15) of said second tube plate (3), an inside diameter of at least one of the connectors or second connector (15) and of a corresponding opening of the second tube plate (3) being substantially greater than an outside diameter of said tube (4) which is connected to said second connector (15) by a junction zone (16') of substantially frustoconical shape, said method comprising the steps of

(a) cutting said tube (4) transversely in the vicinity of the connectors (14, 15), at each end, from the interior of said tube (4) and through one of said tube plates (2, 3);

(b) cutting and extracting from the heat exchanger space between tube plates, the junction zone (16') connecting said tube (4) to the second connector (15);

(c) extracting said tube from said heat exchanger space between said tube plates (2, 3), through the interior of the second connector (15) and through a corresponding opening (13) in said second tube plate (3);

(d) cleaning and remachining zones (18, 19') of the connectors where the cuts were made;

(e) introducing a replacement tube (34) into said heat exchanger by way of the opening (13) in said second tube plate until a first end of said replacement tube (34) first engaged in said heat exchanger reaches the level of the cut zone (18) of said first connector (14);

(f) joining the first end of said replacement tube (34) to said first connector (14) by an overhang weld;

(g) adjusting the length of said replacement tube (34) so that its second end (34*b*) is engaged over a predetermined length in said second connector (15); and

(h) joining the second end of said replacement tube (34) to the interior of said second connector (15) by an overhang weld.

5,205,039

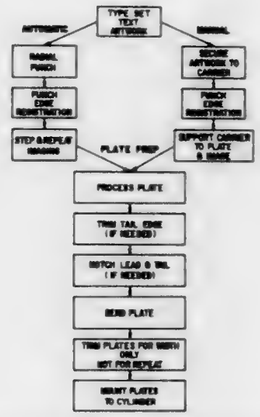
METHOD FOR REGISTERING MULTIPLE PRINTING PLATES

James Ternes, 2361 W. Hwy. 36, St. Paul, Minn. 55113

Filed Nov. 14, 1991, Ser. No. 791,340

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—895.21 **12 Claims**



12. A method for preparing printing plates comprising the steps of:

a) forming a plurality of registration indices along at least one peripheral edge of a section of printing plate stock;

b) aligning at least one of said registration indices with imaging means and transferring a plurality of print images to said plate stock in predefined longitudinal and lateral relation to each other;

c) aligning said plate stock to bending means and bending a leading lateral edge of said plate stock; and

d) separating said plate stock into a plurality of printing plates, each printing plate containing a transferred print image and a bend, whereby each bend is alignable with retainer means provided on said printing press cylinder.

5,205,040

APPARATUS FOR SHAVING

Eric J. Werner, 705 Westminster Rd., Hermitage, Pa. 16148

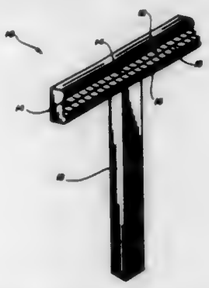
Continuation of Ser. No. 788,105, Nov. 5, 1991. This application Sep. 29, 1992, Ser. No. 954,408

Int. Cl.[5] B26B *21/00, 21/24, 21/54*

U.S. Cl. 30—50 **17 Claims**

1. An apparatus for shaving comprising:

blade means which comprises at least one blade having an essentially straight and essentially continuous cutting edge, said blade comprised of a plurality of pliable blade segments aligned adjacent to each other to form the straight and essentially continuous cutting edge such that each blade segment is capable of being deflected in a direction perpendicular to the cutting edge independently with respect to the other blade segments by a surface



while in contact with the surface during shaving of the surface;

a rectangular shaped head which holds said blade in a desired orientation; and

a handle connected to said head.

5,205,041

DEVICE FOR REMOVING A PEDUNCLE FROM A PRINTED CIRCUIT BOARD

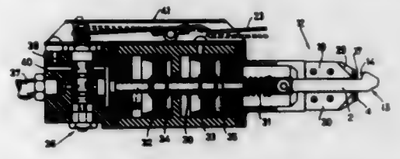
Gianni Brondola, Opera, Italy, assignor to Bros Italia S.r.l., Opera, Italy

Filed Nov. 25, 1991, Ser. No. 796,656

Claims priority, application Italy, Nov. 27, 1990, 22205 A/90

Int. Cl.[5] B26B *15/00*

U.S. Cl. 30—180 **20 Claims**



1. The device for removing a joining peduncle passing through a slot between and separating two printed circuit boards at sides thereof comprising:

a body having an outer end portion;

a pair of bucking elements on said outer end portion of said body in mutually spaced relationship relative to each other to provide a seat therebetween and having outer edges;

a cutting member having a shank portion slidably mounted in close-fitting relationship in said seat for reciprocal movement therein between said bucking elements;

a projection portion projecting laterally on said shank portion and having an underside facing substantially inwardly toward said body; and

a cutting face extending longitudinally on said underside and having a concave surface defining sharp lateral cutting edges;

said cutting member having a transverse width of a predetermined size relative to the width of said slot between said printed circuit boards for insertion of said cutting member in slidable close-fitting guided relationship in said slot with said peduncle between said cutting face and said outer edges of said bucking elements in a cutting position, so that reciprocation of said cutting member inwardly toward said body in said cutting position cuts said peduncle substantially at the sides of said printed circuit boards.

5,205,042

PROCESS FOR ADJUSTING THE VERTICALITY OF AN

a shaft rotatably mounted about a second axis parallel to the first axis;

through said arcuate slot and said guide rod, a length ruler slidably mounted on said straight side of said semi-circular

computing the absolute value of the differences as an indication of the waviness of the panel.

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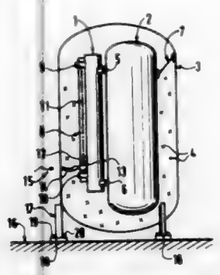
5,205,042

PROCESS FOR ADJUSTING THE VERTICALITY OF AN ARTICLE DISPOSED IN A CLOSED ENVELOPE AND ASSEMBLY FOR CARRYING THIS PROCESS

Lucien Greter, Le Plessis Trevise, and Francois Venet, Paris, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitaion Des Proceden Georges Claude, Paris, France

Filed Oct. 9, 1991, Ser. No. 774,220
Claims priority, application France, Oct. 18, 1990, 90 12890
Int. Cl.[5] G01C 9/00
U.S. Cl. 33—365 10 Claims



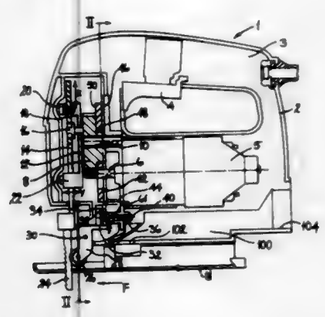
2. An assembly comprising an operative device mounted in a closed envelope to be mounted on a base by means of a support, a veticality indicator connected to the device in the envelope and having position sensing means coupled to position indication means outside the envelope, and adjustable support means for adjusting the inclination of the envelope relative to the base and for securing the envelope to the base in a selected position based on indications from said verticality indicator.

5,205,043

PENDULUM JIGSAWS

Dennis M. Batt, Durham, and Alan W. Briggs, Bishop Auckland, both of England, assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 23, 1992, Ser. No. 824,676
Claims priority, application United Kingdom, Jan. 23, 1991, 9101460
Int. Cl.[5] B23D 49/04
U.S. Cl. 30—393 7 Claims



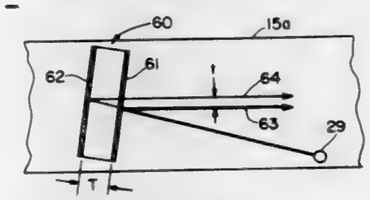
1. A saw comprising:
a housing;
a blade carrier reciprocally slidable in a first direction;
a drive train for reciprocally driving the carrier, the train comprising a gear having a cam surface;
a fork lever journalled on the gear cam surface and pivoted about a first axis perpendicular to the first direction, the fork lever having a cam formed on one end;
a shaft rotatably mounted about a second axis parallel to the first axis;
a bell crank pivoted in the housing about a third axis perpendicular to the first direction and to the first and second axes;
a drive pin reciprocally slidably mounted in the shaft, having one end engaging the cam on the fork lever and having a second end engaging one end of the bell crank;
a wheel carried by the bell crank, disposed behind and supporting in the saw feed direction a blade in the carrier, and reciprocally movable in the saw feed direction through operation of the fork lever, drive pin and bell crank;
a switch assembly for rotating the shaft and adjusting the amplitude of reciprocation of the drive pin; and
the switch assembly comprising (1) a manually acutable slide switch movably mounted in the housing in a plane spaced laterally from the shaft and (2) an adjustment pin interconnected between the shaft and the slide switch.

5,205,044

LUMINOUS DOT SIGHTING INSTRUMENT

Alfred C. DePaoli, 1 Wyman St., Woburn, Mass. 01801

Filed Nov. 12, 1991, Ser. No. 790,338
Int. Cl.[5] G02B 27/34
U.S. Cl. 33—243 11 Claims



1. A sighting instrument comprising,
(a) a housing containing an objective end and an ocular end and defining an optical axis in between,
(b) an aperture at said objective end of said housing for admitting light from a target view along said optical axis,
(c) a source of light,
(d) mean along said optical axis for reflecting light from said source while transmitting said target view light,
(e) whereby images of said target view and said source are visible at said ocular end of said housing along said optical axis with said source image superimposed on said target view image and
(f) said means for reflecting light from said source includes reflecting interfaces that reflect different color light producing separate images of said source of different color superimposed on said target view image.

5,205,045

HOUSEHOLD TILE CUTTING GAUGE

Wun-Hui Liu, No. 2, Jiann Guon Lane, Jiann Guon Li, Taichung, Taiwan

Filed Apr. 8, 1992, Ser. No. 864,997
Int. Cl.[5] B43L 7/12, 13/00
U.S. Cl. 33—468 3 Claims

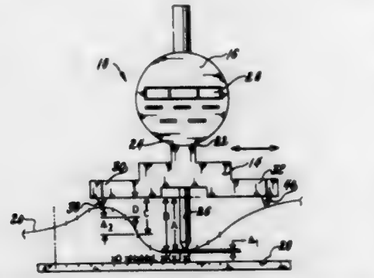
1. A household tile cutting gauge comprising:
a semi-circular protractor having thereon an angle marking and a straight side;
a guide rod pivotally fastened to said semi-circular protractor having an angle indicating means for determining an angle between an axis of said guide and said straight side, said angle indicating means comprising a core hole at an end of said guide rod formed to provide a pointer to indicate said angle on said angle marking,
said semi-circular protractor having an arcuate slot disposed along said angle marking, a first lock means extending through said arcuate slot and said guide rod, a length ruler slidably mounted on said straight side of said semi-circular protractor, a baffle means slidably engaged on said guide rod to move upward, downward, leftward and rightward for support of a tile placed in said gauge for cutting,
said guide rod being provided with a first elongate slot disposed along the long axis thereof and with a second lock means extending through said first elongate alot to engage said baffle means, and
said baffle means having a second elongate slot disposed along the long axis thereof to permit said second lock means to pass therethrough so as to fasten said baffle means to said guide rod.

5,205,046

METHOD FOR MEASURING SURFACE WAVINESS

Andrew J. Barnett, Dearborn Heights, and Hector J. Ramirez, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 5, 1991, Ser. No. 711,488
Int. Cl.[5] G01D 5/20
U.S. Cl. 33—533 3 Claims



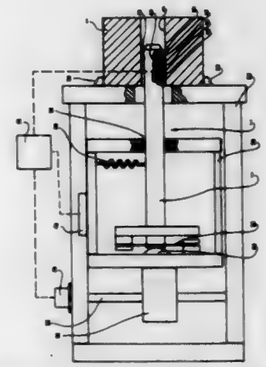
1. A method of determining the waviness of a panel comprising:
providing a fixture defining a flat planar surface;
mounting a depth measuring gauge on the fixture;
moving the fixture and the mounted gauge into confronting relationship with the panel at a first position;
operating the gauge to measure the depth of the panel with respect to the planar surface;
sliding the fixture along a predetermined axis to a plurality of subsequent positions spaced from each other and from the first position in a predetermined sequential relationship;
repeating the operating and measuring step at each of the subsequent positions;
computing the difference between each measurement and the measurement at the directly subsequent position to each measurement; and
computing the absolute value of the differences as an indication of the waviness of the panel.

5,205,047

METHOD AND APPARATUS FOR DYNAMICALLY CHECKING DIMENSIONS OF MECHANICAL PARTS

Franco Danielli, Zola Predosa, Italy, assignor to Marposs Societa' per Azioni, S. Marino di Bentivoglio, Italy

PCT No. PCT/EP91/00483, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/19162, PCT Pub. Date Dec. 12, 1991
PCT Filed Mar. 14, 1991, Ser. No. 807,871
Claims priority, application Italy, May 30, 1990, 3527 A/90
Int. Cl.[5] G01B 7/28
U.S. Cl. 33—542 15 Claims



12. An apparatus for automatically checking linear dimensions of a mechanical part (4), with:
a checking head (2) including a casing (8), at least a feeler (14) movable with respect to the casing (8) to contact the surface of the part (4) and transducer means (20) for providing a signal responsive to the position of the feeler (14) with respect to the casing (8),
driving means (36, 38, 40) for obtaining a first mutual displacement between the checking head (2) and the part (4) along a determined path,
processing and control means (44) connected to the transducer means (20) and the driving means (40) for controlling said mutual displacements and for performing a first detection and processing of the signal of the transducer means (20),
characterized in that the processing and control means (44) and the driving means (36, 38, 40) and also adapted for:
controlling a second mutual displacement between the checking head (2) and the part (4) along said path, the second displacement being performed in a direction opposite to that of the first mutual displacement, and wherein substantially the same points of the surface of the part (4) are scanned by said feeler (14) during said first and second mutual displacement along said path,
performing a second detection and processing of the signal of the transducer means (20), and processing the results of said first and second processing for obtaining a value responsive to the dimension to be checked.

5,205,048

tectable point along a first linear path, which apparatus com-

material outlet (9) at the other end; at least one partition made of a material that not allow microwaves to pass therethrough

5,205,052

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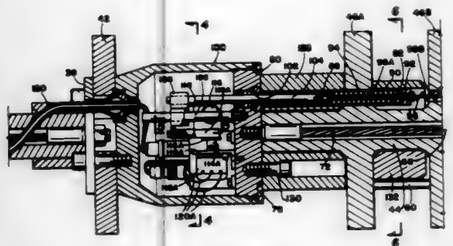
5,205,048

PIPELINE BEND DETECTOR PIG

Danny D. Toomey, Broken Arrow; Gene R. Ralls, Tulsa, and Johnny M. Manley, Owasso, all of Okla., assignors to TDW Delaware, Inc., Tulsa, Okla.

Filed Nov. 20, 1991, Ser. No. 796,065
Int. Cl.[5] G01B 5/20
U.S. Cl. 33—544 23 Claims



1. An apparatus for measuring a bend in a length of cylindrical pipe having a cylindrical axis, comprising:

an elongated flexible body for transposition through the length of cylindrical pipe having a first and a second end, said flexible body having a central substantially cylindrical core portion and a plurality of spaced apart radial integral enlarged diameter disc portions, the external cylindrical surface of said disc portions forming a body external cylindrical surface slidably received in and closely conforming to the cylindrical pipe internal surface, said flexible body having an imaginary central axis that substantially remains coaxial with the pipe cylindrical axis as the body traverses the interior of the pipe, said flexible body central core and said integral disc portions being formed of flexible plastic, said body substantially cylindrical with said body central opening therein at least substantially coincident with said body central axis and including a reinforcing cable received in said body central opening and secured to said body first and second ends;

a first length-measuring means carried by said body in a first radial plane of said body central axis and spaced from said body central axis;

a second length-measuring means carried by said body in a second radial plane having said body central axis therein, the second length-measuring means being spaced from and substantially parallel said body central axis, the second radial plane being angularly spaced from said first radial plane; the first and second length-measuring means responding to bending of said flexible body as it traverses the interior of a pipeline having at least one bend therein;

means of converting length as measured by said first and second length-measuring means to bend signals;

means for providing a distance signal indicating the distance travelled by said flexible body;

means providing a record of said bend signals and said distance signals; and

means to move said body through a length of cylindrical pipe.

5,205,049

LENGTH MEASURING APPARATUS

Heinz Rieder, Oberndorf, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF-Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Sep. 26, 1991, Ser. No. 766,635
Claims priority, application Austria, Oct. 5, 1990, 2014/90
Int. Cl.[5] G01B 7/02
U.S. Cl. 33—703 7 Claims

1. In a length measuring apparatus for indicating the position of a detectable point on a member movable to move said detectable point along a first linear path, which apparatus comprises

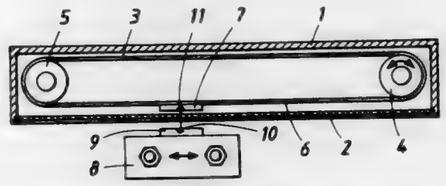
a hermetically sealed housing,

a marker mounted within said housing to be movable along a predetermined linear measuring path having opposite ends,

said housing being adapted to be mounted so that said measuring path is parallel to and laterally aligned with said first path,

follow-up means for moving said marker along said measuring path to a predetermined position of registration relative to said detectable point, which follow-up means comprises means for establishing a non-contacting link between said detectable point and said marker, and

measuring means mounted within said housing for indicating the position of said marker along said measuring path,



the improvement comprising

two rotatably mounted rollers disposed in said housing beyond opposite ends of said measuring path and a strip extending between and around said rollers in contact therewith and having a tensioned course which extends along said measuring path and carries said marker,

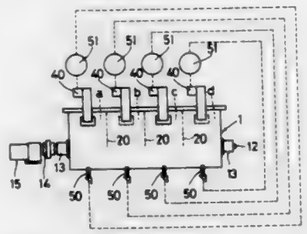
said follow-up means comprises drive means operatively connected to said strip and operable to move said marker by means of said strip along said measuring path, and means for detecting the extent and direction of any deviation of said marker from said predetermined position of registration relative to said detectable point, the detecting means transmitting a control signal to the drive means to move the strip and keep the marker at the predetermined position of registration relative to the detectable point.

5,205,050

APPARATUS FOR DRYING POWDERED OR GRANULAR MATERIALS

Nosaka Masaaki; Ono Tsutomu; Tsutsumi Noriaki, all of Hirakata; Matsui Osamu, Osaka, and Takino Yorinobu, Hirakata, all of Japan, assignors to Matsui Manufacturing Co., Ltd., Osaka, Japan

Filed Dec. 26, 1991, Ser. No. 814,398
Claims priority, application Japan, Oct. 4, 1991, 3-101272[U]
Int. Cl.[5] F26B 3/34; H05B 6/64
U.S. Cl. 34—1 U 48 Claims



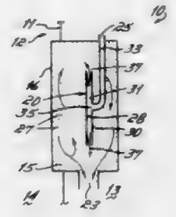
1. An apparatus for drying powdered or granular materials comprising: a drying tank (1) including a transversely extending drying room (7) adapted to be applied with heating by microwaves and having a material inlet (8) at one end and a material outlet (9) at the other end; at least one partition made of a material that not allow microwaves to pass therethrough and defining more than two drying zones (a . . . d) in the drying room (7) of the drying tank (1); a rotary shaft (12) disposed in the drying tank (1) in its longitudinal direction to extend through the drying room (7) in a manner of being freely rotatable and agitating blades (30*a*), (30*b*) . . . provided on the rotary shaft (12) corresponding to each drying zone (a . . . d); microwave application units (40) provided for each drying zone (a . . . d); and temperature sensors (50) for each drying zone (a . . . d); and corresponding temperature adjusters (51) connected to the respective temperature sensors (50).

5,205,051

METHOD OF PREVENTING CONDENSATION OF AIR BORNE MOISTURE ONTO OBJECTS IN A VESSEL DURING PUMPING THEREOF

Steven Hurwitt, Park Ridge, N.J., assignor to Materials Research Corporation, Orangeburg, N.Y.

Continuation-in-part of Ser. No. 573,845, Aug. 28, 1990. This application Jun. 13, 1991, Ser. No. 714,864
Int. Cl.[5] F26B 3/00
U.S. Cl. 34—22 8 Claims



1. A method of preventing contamination of a surface to be coated of a substrate supported in a processing chamber while evacuating a chamber to a predetermined lower pressure level comprising the steps of:

supporting in a chamber a substrate having a surface thereon to be protected from contamination by moisture condensing in the chamber;

forming a gap adjacent to and covering the surface to be protected, the gap having a periphery encircling the surface to be protected;

removing gas from the chamber at a predetermined flow rate to lower the pressure thereof and until the chamber has reached the vacuum pressure level, the pumping being at a rate sufficiently rapid to cause moisture contained in the gas within the chamber to condense within the chamber;

introducing a clean dry gas into the gap, while pumping gas from the chamber to lower the pressure thereof, and at a flow rate less than the predetermined flow rate; and

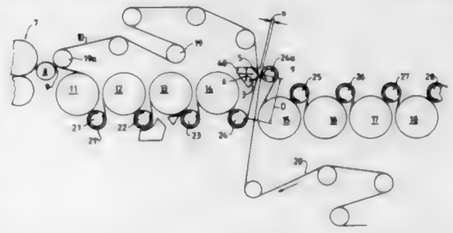
guiding the introduced clean dry gas, while it is being introduced, along the surface to be protected and through the gap so as to flow outwardly at the periphery of the gap into the chamber, the clean dry gas having a moisture content sufficiently low to avoid condensation in the gap while the clean dry gas is flowing therethrough.

5,205,052

DRYER GROUP WEB TRANSFER REGION FOR PAPER MAKING MACHINE WITH OPEN DRAW

Wilfried Kraft, and Hans-Peter Sollinger, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jan. 24, 1992, Ser. No. 825,394
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1991, 9100762[U]; Jan. 17, 1992, 4201107[U]
Int. Cl.[5] F26B 13/08
U.S. Cl. 34—114 24 Claims



1. A dry end of a machine for manufacturing a paper web, comprising:

a first dryer group comprised of a first plurality of heatable dryer cylinders, a respective first web reversal roll next to each of the first dryer cylinders, a first support belt passing alternately over a first dryer cylinder and then over the neighboring first reversal roll, the first dryer cylinders and the first reversal rolls being so placed that the first support belt partially wraps around each first dryer cylinder; the first support belt has a first side for supporting the paper web, the first support belt passes through the first dryer group together with the paper web so that the first side of the web comes into direct contact with the first dryer cylinders while the opposite second side of the web is in continuous contact with the first side of the first support belt;

a second dryer group following the first dryer group in the path of the paper web through the dry end, the second dryer group being comprised of a second plurality of heatable dryer cylinders, a respective second web reversal roll next to each of the second dryer cylinders, a second support belt passing alternately over a second dryer cylinder and then over the neighboring second reversal roll, the second dryer cylinders and the second reversal rolls being so placed that the second support belt partially wraps around each second dryer cylinder; the second support belt has a second side for supporting the paper web, the second support belt passes through the second dryer group together with the paper web so that the second side of the web comes into direct contact with the second dryer cylinders while the opposite first side of the web is in continuous contact with the second support belt;

there is a last one of the first reversal rolls after the last one of the first dryer cylinders in the path of the first support belt through the first dryer group; there is a first one of the second reversal rolls in front of the first one of the second dryer cylinders in the path of the second support belt through the second dryer group; the first one of the second reversal rolls being so placed that the web on the first support belt transfers from the first support belt to the second support belt in the region of the first one of the second reversal rolls;

first guide means for the first support belt, second guide means for the second support belt, the first and second guide means being so placed and the last one of the first reversal rolls and the first one of the second reversal rolls being so placed that there is always a spaced distance between the first and the second support belts and that distance between the support belts exists as those belts

pass the last one of the first reversal rolls and the first one of the second reversal rolls;

gap including a tongue positioned below the lacing gap coextensively thereof, and

a sole,

a toe strap assembly including:

an anchor member attached to one side of the toe portion

an end of said plate is out of contact with an end wall of said recess when said guide portion of said clamp means

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pass the last one of the first reversal rolls and the first one of the second reversal rolls;

a web separation means at the first support belt generally opposite the first one of the second reversal rolls and positioned at the first support belt to force air through the first support belt in the direction toward the second support belt for aiding the transfer of the web off the first support belt toward the second support belt.

5,205,053

APPARATUS FOR CLEANING AND DEMOISTURIZING RUNNING WEBS OF PHOTOGRAPHIC PAPER AND THE LIKE

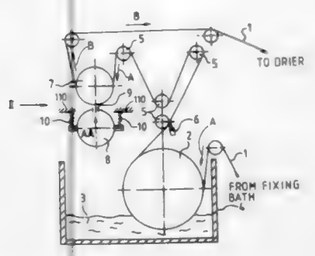
Jürgen Brunner, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1991, Ser. No. 738,465

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 4026616

Int. Cl.[5] B26B *13/08*

U.S. Cl. 34—155 **17 Claims**



1. Apparatus for removing entrained substances from running webs with a gaseous fluid, particularly, for removing moisture from running webs of exposed and developed photographic paper, comprising a web guiding member; a fluid discharging member adjacent said guiding member and defining therewith a web-receiving passage of variable width; and self-adjusting means for supporting at least one of said members for movement relative to the other of said members in directions to vary the width of said passage while a web is running therethrough.

5,205,054

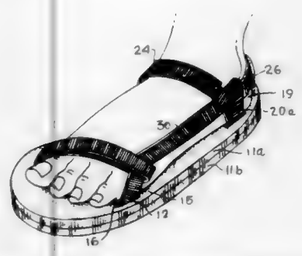
ADJUSTABLE SANDAL

Harold D. York, Jr., 28610 Devils Punchbowl Rd., Pearlblossom, Calif. 93553

Filed May 18, 1992, Ser. No. 884,144

Int. Cl.[5] A43B *3/12*

U.S. Cl. 36—11.5 **6 Claims**



1. A sandal having straps for securing said sandal to the foot of a wearer thereof comprising:

a sole,

a toe strap assembly including:

an anchor member attached to one side of the toe portion of said sole, said anchor member having an upright portion with a slot formed therein, said sole having a first slotted portion in one side thereof in which the upright portion of the anchor member is fitted in a position recessed below the upper surface of said sole,

a toe strap attached at one end thereof to the toe portion of said sole on the side thereof opposite to said one side thereof, the other end of said toe strap being wrapped over the portions of the wearer's foot immediately behind the toes and fitted through the slot of said anchor member, said strap being folder over on itself to bring first and second portions thereof into opposing relationship, and

a fastener device which joins the opposing portions of the strap together with the toe strap wrapped securely over a portion of the wearer's foot directly behind the toes, and

a heel strap assembly including

a ring member attached to one side of the heel portion of the sole,

a first heel strap attached at one end thereof to the side of the heel portion of the sole opposite to said one side thereof, the other end of said first heel strap being wrapped over the portion of the wearer's foot directly behind the instep and fitted through said ring member and folded over on itself to bring two portions thereof into opposing relationship,

a fastener device which joins said two opposing portions of the first heel strap together with said first heel strap wrapped securely around the portion of the wearer's foot directly behind the instep,

a second heel strap attached at one end thereof to the side of the heel portion of the sole opposite to that to which the ring member is attached, the other end of said second heel strap member being wrapped around the wearer's heel and fitted through said ring member and folded over on itself to bring two portions thereof into opposing relationship, and

a fastener device which joins said opposing portions of said second heel strap together with said second heel strap wrapped securely around the wearer's heel.

5,205,055

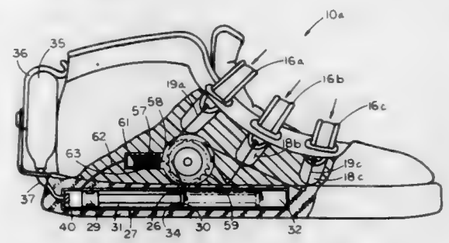
PNEUMATIC SHOE LACING APPARATUS

Aaron D. Harrell, 506 20th St., Virginia Beach, Va. 23451 by Lisa K. Harrell, legal representative

Filed Feb. 3, 1992, Ser. No. 829,231

Int. Cl.[5] A43B *11/00*

U.S. Cl. 36—50.001 **7 Claims**



1. A pneumatic shoe lacing apparatus, comprising,

a shoe assembly, including a shoe sole, the shoe sole including a shoe sole side wall, and

a shoe upper mounted to the shoe sole extending upwardly thereof, the shoe upper including an upper top wall, and the top wall including an elongate lacing gap, the lacing gap including a tongue positioned below the lacing gap coextensively thereof, and

a plurality of securement webs mounted above the lacing gap, with the securement webs including at least a first web and a second web, and

the first web and the second web mounted to a first side of the lacing gap, and the first web and the second web mounted to a second side of the lacing gap, and

the first web and the second web slidably directed through a respective first slot and second slot through the second side of the lacing gap into the shoe upper, and

the first web and the second web including a respective first cavity and second cavity receiving the first web and the second web, and

a first tether line mounted to the first web, with the first tether line directed through the first cavity, and a second tether line mounted to the second web when the second tether line is directed through the second cavity, and

a crank pulley rotatably mounted within the shoe upper above the side wall, with the crank pulley including said first tether line and said second tether line mounted thereto, and

drive means arranged for rotation of the crank pulley, with the drive means mounted within the shoe sole effecting selective rotation of the crank pulley and winding of the first tether line and the second tether line about the crank pulley.

5,205,056

ATTACHMENT STRUCTURE FOR SECURING A CLEAT TO A CYCLING SHOE

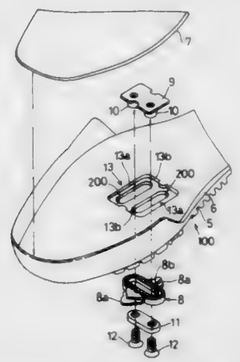
Shinpei Okajima, Izumi, and Yoshinori Inubuse, Kawachinagano, both of Japan, assignors to Shimano, Inc., Osaka, Japan

Filed Jan. 13, 1992, Ser. No. 819,971

Claims priority, application Japan, Jan. 25, 1991, 3-1953[U]

Int. Cl.[5] A43B *5/00, 5/14*

U.S. Cl. 36—131 **5 Claims**



1. A structure for securing a cleat to a cycling shoe comprising:

a shoe bottom defining a recess in an upper surface thereof, and at least one slot extending through a bottom surface of said recess and parallel to a longitudinal axis of the shoe;

a plate accommodated in said recess and having a fore and aft length at least half a length of said slot; and

clamp means connectable to said plate and including a guide portion for extending through said slot, said clamp means allowing said plate to move along said slot, and cooperative with said plate to secure the cleat to a bottom surface of said shoe bottom;

a point of connection between said plate and said clamp means being offset from a center of said plate;

wherein an amount of offset of said clamp means is such that an end of said plate is out of contact with an end wall of said recess when said guide portion of said clamp means contacts an end of said slot lying in the direction in which said guide portion is offset; and

wherein said amount of offset of said guide portion is such that, when said plate is moved, without reversing direction, into contact with the other end wall of said recess, said guide portion lies substantially in a longitudinally middle position of said slot or between said middle position and said other end wall.

5,205,057

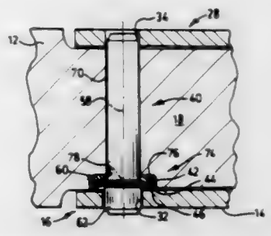
RETAINING MECHANISM FOR A TOOTH ASSEMBLY

James A. Garman, Eureka, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 758,987, Sep. 10, 1991, abandoned. This application Sep. 18, 1992, Ser. No. 947,086

Int. Cl.[5] E02F *9/28*

U.S. Cl. 37—458 **25 Claims**



21. A tooth assembly comprising:

a ground engaging tool having a rearward end portion defining a socket and first and second aligned openings defined therein and located on opposite sides of the socket;

a work implement having a nose portion operative to mate with the socket of the ground engaging tool, a cross passage defined in the nose portion that is generally in axial alignment with the first and second aligned openings, and an annular recess defined in one side of the nose portion concentric with the cross passage, and

a retaining mechanism including a conical spring washer having a concave side, a convex side, an outer peripheral edge on the convex side, and an inner surface defining an opening of a predetermined diameter, and a pin having a predetermined diameter and including means for forming a shoulder thereon having a diameter larger than the diameter of the opening of the conical spring washer, the conical spring washer being located in the annular recess and the pin being disposed in the first and second aligned openings, the cross passage, and the conical spring washer with the shoulder means being located adjacent the convex side of the conical spring washer.

5,205,058

ROADBED MAINTENANCE DEVICE

A. Gregory Allen, 4258 N. Old Hwy. 91, and Frank T. Samarzea, 1119 N. Main #10, both of Pocatello, Id. 83204

Filed Apr. 25, 1990, Ser. No. 514,506

Int. Cl.[5] E01H *5/04*

U.S. Cl. 37—231 **15 Claims**

1. A roadbed maintenance device operable in conjunction with a motor vehicle that rides on a roadway and utilizing a parallelogram linkage to support a moldboard, the roadway maintenance device comprising:

a first metal frame including means for rigidly attaching the metal frame to a motor vehicle, the first metal frame having two oppositely disposed collinear first frame outer hinge pivots and an intermediate first frame inner hinge

pivot within the same horizontal plane as, but non-collinear with, the first frame outer hinge pivots;

said face plate and extending rearwardly substantially perpendicular thereto, said flange being spaced inwardly of said side

5,205,061

MOVEMENT INDICATOR FOR FISHING ROD

David L. Echols, Jr., 9944 S. Prospect, Chicago, Ill. 60643

said contact surface distributes a force having a selected magnitude over the body of the fish to prevent said

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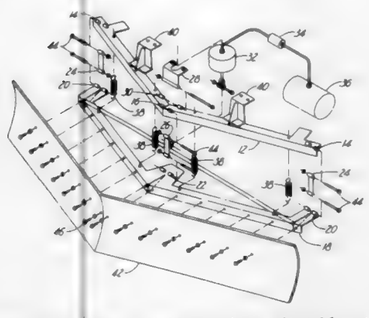
pivot within the same horizontal plane as, but non-collinear with, the first frame outer hinge pivots;

a rigid second metal frame having two oppositely disposed collinear second frame outer hinge pivots and an intermediate second frame inner hinge pivot which is non-collinear with the second frame outer hinge pivots;

a pair of rigid outer linkage arms, each outer linkage arm being pivotably attached at one end to one of the first frame outer hinge pivots, and at the other end to one of the second frame outer hinge pivots;

a rigid inner linkage arm pivotably attached at one end to the first frame inner hinge pivot and at the other end to the second frame inner hinge pivot, the pair of outer linkage arms, the inner linkage arm, the first metal frame and the second metal frame together forming a parallelogram

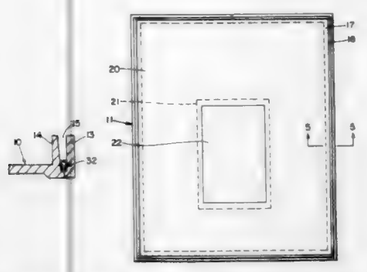


linkage comprising rigid members pivotably attached together at their respective ends, the rigid parallelogram linkage being operable to swing from a raised position when the linkage arms are pivoted rearwardly with respect to the vehicle to a lowered position when the linkage arms are pivoted forwardly with respect to the vehicle;

a moldboard attached to the second frame, the moldboard being dimensioned such that a lower edge of the moldboard contacts the roadway when the parallelogram linkage is in the lowered position, and is raised out of contact with the roadway when the parallelogram linkage is in the raised position; and

means for moving the parallelogram linkage between the lowered and raised positions.

5,205,059
DISPLAY FRAME AND PROTECTIVE CONTAINER
Jacob G. Doll, 23 Terrance Dr., Batesville, Ind. 47006
Filed Jan. 31, 1992, Ser. No. 830,115
Int. Cl.[5] G09F *1/12*
U.S. Cl. 40—152 **12 Claims**



1. A display frame comprising a planar face plate having a transparent viewing area extending over a major portion thereof and a side edge extending rearwardly substantially perpendicular to said face plate, a continuous flange secured to said face plate and extending rearwardly substantially perpendicular thereto, said flange being spaced inwardly of said side edge and parallel thereto whereby to form a groove around the entire periphery of the rear side of said face plate; a planar back plate having the same dimensions as said face plate and having a continuous tongue extending forwardly substantially perpendicular to said back plate, said tongue being spaced inwardly from the edge of said back plate a distance sufficient to provide a mating tongue and groove engagement around the entire Periphery of said display frame when said face plate and said back plate are placed in assembled relation; adhesive material positioned in said groove whereby to form a sealed chamber directly behind said viewing area when said face plate and back plate are in assembled relation; and a desiccant material in communication with said sealed chamber.

5,205,060
DECOY LEG ATTACHMENT ASSEMBLY
Augusto Franceschini, Rero, Italy, assignor to Carry-Lite, Inc., Milwaukee, Wis.
Filed Jul. 24, 1992, Ser. No. 919,725
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3 **3 Claims**

1. A decoy including a leg attachment assembly comprising:

an upper main body in the shape of a bird;

a lower support structure in the shape of the bird's legs;

a fastening bar angled at one end and pointed at the other end;

the main body having on its lower side an elongated, slotted, sleeve opening;

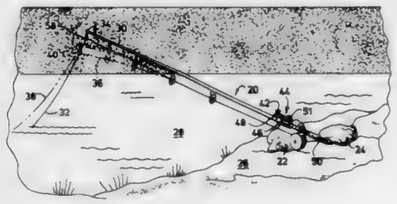
the lower support structure having on its upper end a tab section which slidingly fits into the sleeve opening in the main body;

the lower support structure also having extending from outer sides of the tab section, two outer, upward projecting supports which each fit snugly around side edges of the sleeve opening of the main body;

the upward projection supports having angled upper edges which abut against corresponding angled support surfaces on the main body for supporting the upper main body in an upright position; and

the fastening bar extending the full height of the decoy and being slidable through a first hole in the upper surface of the main body, through a second hole in the lower surface of the main body, and through a third hole in the lower support structure, and one end of the bar being angled for holding the main body in place and the other end being pointed for inserting it into the ground to secure the decoy.

5,205,061
MOVEMENT INDICATOR FOR FISHING ROD
David L. Echols, Jr., 9944 S. Prospect, Chicago, Ill. 60643
Filed Dec. 23, 1991, Ser. No. 815,383
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—17.5 **12 Claims**



1. A movement indicator assembly kit for use with a flexible fishing rod, which comprises:

(a) a light-emitting diode;

(b) means for operatively connecting said light-emitting diode to a source of electrical power;

(c) switch means for connecting and disconnecting said light-emitting diode and said source of electrical power;

(d) a casing for housing said light-emitting diode, said casing (i) being in addition adapted to house a source of electrical power, and (ii) being adapted to be secured to said fishing rod adjacent the inner end of the rod;

(e) a light-transmitting reflector cap adapted to be attached to the outer end portion of said fishing rod; and

(f) at least one length of optical fiber for operatively connecting said light-emitting diode and said reflector cap, said at least one length of optical fiber being adapted to be selectively housed within the fishing rod or attached to the outside of the fishing rod, as desired,

whereby when said various means and members are assembled on said flexible fishing rod together with a source of electrical power and said switch means is turned on, any movement of the outer end of the fishing rod will be indicated by the light that is transmitted from the light-emitting diode through said at least one length of optical fiber to the reflector cap.

5,205,062
FISH LURE
Jeffery C. Zimmerman, 13238 N. Victor Hugo, Phoenix, Ariz. 85032
Filed Dec. 26, 1991, Ser. No. 813,445
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.04 **16 Claims**

1. A fish lure including

(a) a body member attached to a length of fish line;

(b) at least one arm member attached to said body member and movable between at least two operative positions,

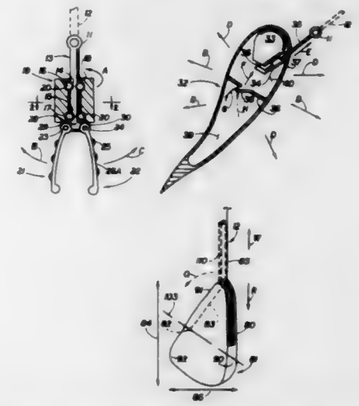
(i) first operative storage position for ingestion by a fish, and

(ii) a second deployed position with said arm member displaced from said first operative position and extending outwardly from said body member in a curvilinear orientation after said lure is ingested by the fish;

(c) at least one arcuate convex contact surface on said arm member;

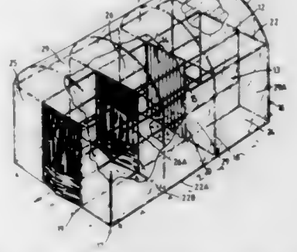
said arm member and said contact surface being shaped and dimensioned such that

when said lure is ingested by a fish and said arm member is in said second operative position said arcuate contact surface bears against and engages the body of the fish to prevent said lure from being withdrawn from said fish; and said contact surface distributes a force having a selected magnitude over the body of the fish to prevent said



contact surface and said lure from piercing the body of the fish.

5,205,063
INSECT TRAP
Robert W. Sutherst, and Robert S. Tozer, both of Queensland, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australian Capital Territory, Australia
Filed Apr. 23, 1992, Ser. No. 872,413
Claims priority, application Australia, Apr. 24, 1991, 75380/91
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—107 **16 Claims**



1. An insect trap including a housing having a support frame; a skin of flexible transparent or translucent material attached to and substantially covering the support frame to thereby provide a housing interior which is substantially totally exposed to sunlight; a walk through passage extending through the housing interior, said flexible skin being spaced from said walk through passage to provide a spacing in said housing interior, and at least one partition being located in said spacing, and brush means forming a dense curtain in said walk through passage for brushing flies off an animal passing through said housing interior in said walk through passage wherein said brush means is formed from dark material in contrast to said flexible skin whereby insects parted from said animal by said brush means may be attracted to said flexible skin in said housing for subsequent desiccation after exposure to the sunlight passing through said flexible skin.

5,205,064
DEVICE FOR ATTRACTING AND DESTROYING

tially rigid rib components which enable the fixed positioning of said inner hollow housing with respect to the

flow creation means and be carried into the 3-space within said first hollow outer housing between the outer side wall of said

in which the insecticide remains toxic to the Phorid Fly, for at least five years;

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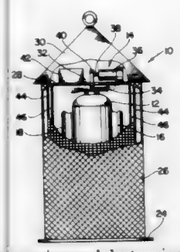
5,205,064

DEVICE FOR ATTRACTING AND DESTROYING INSECTS

James A. Nolen, West Greenwich, R.I., assignor to James Nolen & Company, Warwick, R.I.

Filed Aug. 19, 1992, Ser. No. 932,348
Int. Cl.[5] A01M *1/22*
U.S. Cl. 43—112 **8 Claims**



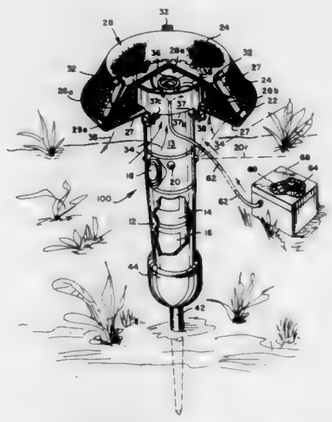
1. A device for attracting and destroying insects comprising:
a pressurized canister charged with an insect attractant comprising an insect pheromone, said canister including means for discharging said insect attractant into the air; and
electrified grid means surrounding said canister.

5,205,065

USE OF KETONE, ALCOHOL AND SCHIFF BASE-CONTAINING COMPOSITIONS FOR REPELLING BLOOD FEEDING ARTHROPODS AND APPARATUS FOR DETERMINING REPELLENCY AND ATTRACTANCY OF SEMIO-CHEMICALS AGAINST AND FOR BLOOD FEEDING ARTHROPODS

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel, both of N.J.; Jerry F. Butler, Gainesville, Fla.; Eleanor Fox, New York, and Vincent F. Kuczinski, Staten Island, both of N.Y., assignors to International Flavors & Fragrances, Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 789,694, Nov. 8, 1991, abandoned, which is a division of Ser. No. 643,206, Jan. 18, 1991, Pat. No. 5,126,369. This application Jan. 23, 1992, Ser. No. 824,591
Int. Cl.[5] A01M *1/04*
U.S. Cl. 43—113 **10 Claims**



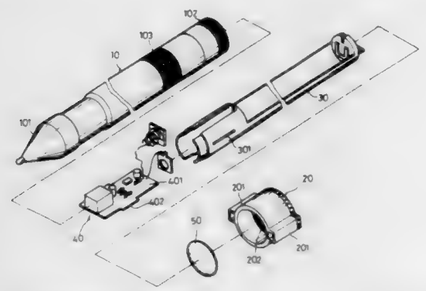
1. A semiochemical field trap for blood feeding arthropods comprising:
(1) an upright vertically-disposed first hollow outer housing having substantially rigid arthropod-impermeable first side walls, an upper arthropod-impermeable horizontal surface substantially entirely contiguous with said first side walls, and a substantially entirely open bottom having a substantially horizontal plane substantially perpendicular to the vertical axis of said first hollow outer housing;
(2) located along an axis substantially perpendicular to the horizontal plane of said substantially entirely open bottom of said first outer housing, substantially parallel to the vertical axis of said first hollow housing and within said first hollow housing, a second inner hollow housing having a hollow interior, opposite open upper first and lower second ends, vertically-disposed rigid arthropod-impenetrable side walls, and a longitudinal dimension extending between the two ends, said upper first end being at a substantial distance below said upper substantially horizontal surface of said first outer housing;
(3) extending outwardly from the said substantially vertically disposed side walls of the second inner hollow housing to the side walls of the first hollow outer housing at an angle of from about −5° up to about −40°, measured downwardly from the substantially horizontal plane of the open bottom of said first hollow outer housing, substantially rigid rib components which enable the fixed positioning of said inner hollow housing with respect to the positioning of and within said outer hollow housing;
(4) completely encompassingly traversing in a substantially tight fitting manner the area between (i) the first side walls of said first outer hollow housing and (ii) the second side walls of said second inner hollow housing along the directional vectors of said rib components and in a curvilinear plane below and substantially contiguous to said rib components a continuous substantially macroporous mesh substance having such a mesh size as to be impenetrable by arthropods sought to be entrapped, but pervious to gas and liquid and, in addition, radiation transmittable, and capable of supporting a matrix article containing sustainably releaseable semiochemical;
(5) at least one semiochemical-containing matrix comprising a porous containment agent containing in the interstices thereof at least one semiochemical sustainably releasable therefrom, located on the upper surface of said macroporous mesh substance;
(6) a substantially vertically disposed drive shaft supported for rotary motion about its axis, extending from below and into the hollow interior of said second inner hollow housing along the said longitudinal dimension thereof;
(7) motor means connected to a first lower end of said drive shaft for rotating said drive shaft about its axis;
(8) air flow creation means attached to a second upper end of said of said drive shaft, being of such a design whereby the rotation of said drive shaft directly causes the rotation of said air flow creation means and induces the flow of air from beneath said second inner hollow housing upwardly into the 3-space within said first hollow outer housing between the outer side wall of the second inner hollow housing and the inner side wall of said first outer hollow housing;
(9) radiation emission means for emission of radiation of a specific wave length or of a range of wave lengths outwardly from the apparatus located in the vicinity of the lower portion of said second inner hollow housing, below the location of said rib components;
(10) at least one power supply means associated with said trap energizing said radiation means and said motor means;
whereby; on engagement of the power supply means with said motor means and said radiation emission means, arthropods in the vicinity of said trap are attracted by said radiation to a location so close to said trap that in the event that an attracting semiochemical in said matrix is detected by said arthropods, said arthropods will enter the air stream created by said air flow creation means and be carried into the 3-space within said first hollow outer housing between the outer side wall of said second inner hollow housing and the inner side wall of said first outer hollow housing.

5,205,066

MOLE CHASER

Te Chin Jan, 6Fl, No. 15, Lane 174, Hsin Ming RD., Taipei, Taiwan

Filed Sep. 30, 1992, Ser. No. 954,868
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—124 **1 Claim**



1. A mole chaser comprising:
a main stem being a hollow pipe with a point end at one end, and outer threads and a granular surface on the other end thereof;
a cap having two lugs on both sides thereof, and having inner threads;
a battery chamber, of which one end being furnished with slots;
an audio frequency circuit for generating an audio frequency vibration, and a circuit board for said circuit having two lugs; and
a washer;
said lugs of said circuit board being mated and retained in said slots; said circuit board being inserted in said main stem before closed with said cap and said washer; to form a waterproof structure said point end of said main stem being planted in ground; and an audio frequency signal generated with said audio frequency circuit and being sent out through said main stem to chase moles away; and said battery chamber capable of being pulled out easily for replacing said battery therein.

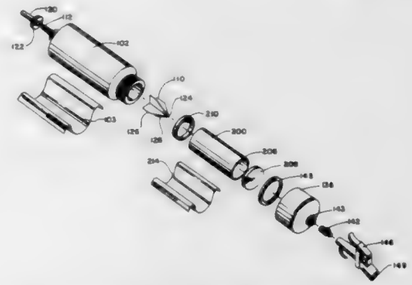
5,205,067

DEVICE AND METHOD FOR TREATING MAUSOLEUMS AGAINST PHORID FLY INFESTATION

Matthew J. Thomas, 548 Mech St., Green Bay, Wis. 54302

Division of Ser. No. 539,142, Jun. 18, 1990, Pat. No. 5,148,627. This application Oct. 3, 1991, Ser. No. 770,250
Int. Cl.[5] A01M *9/00*
U.S. Cl. 43—125 **7 Claims**

1. A device for treating mausoleums against Phorid Fly infestation comprising in operative combination:
(a) an injector gun (**100**) having a central core (**104**) formed therein;
(b) an insecticide cartridge (**200**) made of tube (**206**) and frangible tube end caps (**208**) and (**210**) containing a quantity of insecticide (**212**) placed within said central core (**104**), the quantity of insecticide (**212**) contained within the cartridge (**200**), being selectable to provide insecticide sufficient to coat all surfaces within a mausoleum cell; said insecticide (**212**) being carried in a powder base, said powder base selected having a property of adherence to all surfaces within a mausoleum cell; said insecticide being selected from those insecticides toxic to the Phorid Fly, relatively non-toxic to other life, having an insecticide life in which the insecticide remains toxic to the Phorid Fly, for at least five years;
(c) an air inflow fitting (**142**) having a bore (**144**) formed therethrough, affixed to said injector gun (**100**), said air inflow fitting bore (**144**) being in air flow relationship, through said bore (**144**) with the central core (**104**) of the injector gun (**100**);
(d) an ejection fitting (**112**) affixed to said injector gun (**100**), said ejection fitting (**112**) having an ejection fitting bore (**116**) formed therethrough, said ejection fitting bore (**116**) being in air flow relation, through an orifice, (**118**), with the central core (**104**) of the ejector gun (**100**);



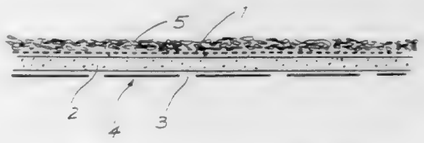
(e) a compressable resilient covering (**120**) affixed to the outside of ejection fitting (**112**), a raised compressible resilient washer (**122**) mounted on covering (**120**); the compressible resilient covering (**120**), and the sealing washer (**122**) being operable to prevent leakage around ejection fitting (**112**) when the insecticide (**212**) is blown into a mausoleum cell;
(f) a source of compressed air (**148**) connected in air flow relation through the air inflow fitting bore (**144**) through central core (**104**) and out the ejection fitting bore (**116**).

5,205,068

METHOD FOR CULTIVATION OF TURF

Christopher J. Solomou, 3 Smiths Lane, East Maitland, New South Wales 2323, Australia

Filed Mar. 19, 1991, Ser. No. 671,389
Claims priority, application Australia, Mar. 20, 1990, 9201
Int. Cl.[5] A01G *1/00*
U.S. Cl. 47—56 **11 Claims**



1. A method for cultivation of turf comprising the steps of:
a) providing a close mesh base;
b) providing under said close mesh base a support of sand or a sand/aggregate mix;
c) supporting said sand or sand/aggregate mix on a plastics sheet, introducing grass seeds to said mesh and utilizing a moistening spray over said seeds in order that said seeds might sprout into grass, and said grass may propagate with roots of said propagated grass extending through said close mesh base and into said sand or sand/aggregate mix; and
d) lifting the mesh base with the propagated grass extending therethrough from the sand or sand/aggregate mix, thereby removing said roots from the sand or sand/aggregate mix.

5,205,069

HIGH SPEED DOOR ASSEMBLY

5,205,070

DOOR MANEUVERING ARRANGEMENT

head of the second through fifth metatarsals and extending

extending from a first point P_1 generally away from the hinge point to a second point P_2, the control slot being

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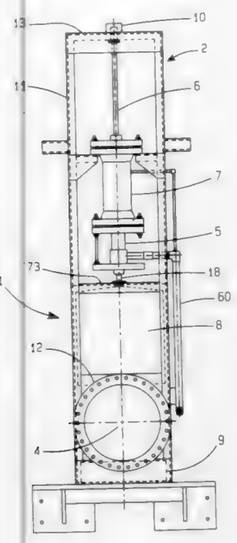
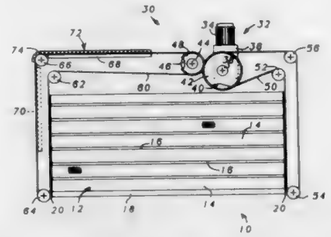
5,205,069
HIGH SPEED DOOR ASSEMBLY
Carolyn Shapiro, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Oct. 2, 1991, Ser. No. 769,657
Int. Cl.[5] E05F *15/20;* **E05B** *65/10*
U.S. Cl. 49—31 **20 Claims**



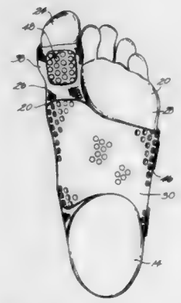
1. A high speed door assembly for fast closure of an opening comprising:
a frame, said frame including two vertical channel members each having an upper and lower end, an upper horizontal channel member, and a lower horizontal channel member with one end of each of said upper and lower horizontal channel members connected to and traversing said vertical channel members at each of said upper and lower ends forming a continuing channel around the inner periphery of said high speed door, and said upper traversing horizontal channel member having an orifice located midway between said two vertical channel members;
a pressure supply cylinder connected to said frame;
an actuator cylinder encased in said pressure supply cylinder, said actuator cylinder having a piston encased therein including an upper and lower piston rod extending axially therefrom and said upper piston rod passing through said orifice of said upper traversing horizontal channel member;
a honeycomb door element having a top and bottom surface area depose din said frame, said top surface area attached to said lower piston rod, and said honeycomb door element being held in a open position over said opening;
means for deceleration affixed to said lower traversing horizontal channel member, wherein when said honeycomb door element is released said means for deceleration is positioned in such a way that the bottom surface of said honeycomb door element impacts said means for deceleration at a closed position thereby preventing movement of said honeycomb door element beyond a predetermined distance across said opening; and
means for actuation connected to said upper piston rod and affixed to said upper traversing horizontal channel member.

5,205,070
DOOR MANEUVERING ARRANGEMENT
Lars B. Lundström, Stockholm, Sweden, assignor to Megadoor AB, Skelleftea, Sweden
Filed Feb. 11, 1992, Ser. No. 834,889
Claims priority, application Sweden, Feb. 26, 1991, 9100551
Int. Cl.[5] E05F *15/00*
U.S. Cl. 49—200 **19 Claims**



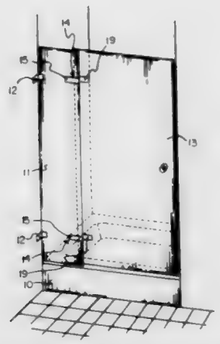
1. A drive arrangement for manoeuvering a substantially vertically moveable door, comprising a bendable door lifting element which is connected at least to one of the two longitudinal side edges of the door, characterized in that connected to the door lifting element (**60**) is an elongated, bendable counterweight device (**72**) which is intended to be moved by the door lifting element (**60**) between an inactive position in which the counterweight device is generally horizontal and an active position in which at least part of the weight of the counterbalance device exerts a lifting force on the door (**12**) through the intermediary of said door lifting element.

5,205,071
SURFING SANDAL
David J. Hergenroeder, 755 Hillside Dr., Solvang, Calif. 93463
Continuation of Ser. No. 665,537, Mar. 6, 1991, abandoned. This application Sep. 15, 1992, Ser. No. 946,018
Int. Cl.[5] A43B *5/08*
U.S. Cl. 36—8.1 **7 Claims**



1. A surfing sandal to be worn on a wearer's foot having an instep, a big toe, a heel, and an arch, the sandal comprising:
an instep pad extending across the instep of the foot and covering that portion of the foot over the metatarsals whereby forces on the covered portion of the foot are mitigated by the pad when the wearer is kneeling on a surf board;
a flexible sole portion extending under the arch of the foot and integrally connected over an inner portion of the foot to a first end of the instep pad and over an outer portion of the foot to a second end of the instep pad, the sole portion further terminating at a posterior end of the arch of the foot to expose the heel and terminating at an anterior end of the arch to expose that portion of the foot under the head of the second through fifth metatarsals and extending to the anterior end of the arch, thereby allowing said exposed portion to directly contact a surf board, said sole portion further being highly pliable to snugly fit the contour of the arch of the foot gripping the foot in combination with the instep pad;
an ankle strap extending from the first end of the instep pad around the back of the foot above the heel to the second end of the instep pad, the attachment of the ankle strap substantially perpendicular to the attachment of the sole portion thereby urging the instep and sole portion firmly against the instep and arch of the foot respectively; and
a forward strap encircling the big toe and attached to the sole portion under that portion of the foot under the head of the first metatarsal thereby constraining the sole portion from rearward movement.

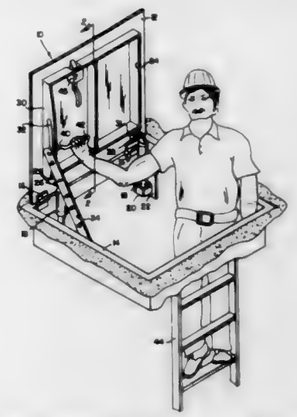
5,205,072
SHOWER DOOR OR DIVIDER
Peter Eutebach, Bad Salzuflen, Fed. Rep. of Germany, assignor to Dorma-Glas Gesellschaft fur Glastur-Beschlage, Bad Salzuflen, Fed. Rep. of Germany
Filed Aug. 16, 1991, Ser. No. 746,783
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1990, 9012039[U]
Int. Cl.[5] E05D *15/00, 7/04*
U.S. Cl. 49—381 **19 Claims**



1. A shower divider for a shower basin, comprising at least two wall section elements made of glass or synthetic/plastic material, which are respectively supported without a frame and are articulately connected to one another by means of hinges, wherein the improvement comprises that at least one wall section element is equipped with a plurality of longitudinal slots, said slots being arranged in vertical alignment with respect to one another but in the same plane, and threaded securement screws which are operatively screwed in preselected manner and exchangeably into respective screw-thread holes of said hinges to mount said hinges to said wall section elements.

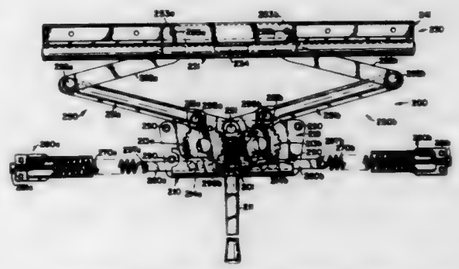
5,205,073
COUNTERBALANCED DOOR ASSEMBLY WITH REDUCED INITIAL CLOSING FORCE
Robert Lyons, Sr., 1060 Ridge Rd., Hamden, Conn. 06517
Filed Oct. 1, 1992, Ser. No. 955,314
Int. Cl.[5] E05F *1/10*
U.S. Cl. 49—386 **17 Claims**

1. A counterbalanced door assembly with reduced initial closing force comprising:
a frame;
a door hingedly mounted to the frame at a hinge point for motion between an open and a closed position;
a slot plate mounted to the door including a control slot extending from a first point P_1 generally away from the hinge point to a second point P_2, the control slot being curved relative to a reference straight line between points P_1 and P_2;
a counterbalance mechanism connected between the door and the frame to at least partially counterbalance the door;
a control arm having first and second ends, the first end being pivotally mounted on the frame to swing the second



end of the control arm in a closing arc as the door is closed;
a handle for closing the door connected to swing the second end of the control arm in the closing arc; and
a slot engager mounted to the second end of the control arm, the slot engager engaging and moving along the curved control slot from point P_1 to point P_2 when the handle is pulled to close the door.

5,205,074
COUNTERBALANCED WINDOW OPERATORS
James C. Guhl, Hudson, Wis.; Jurgen R. Martens, Leinfelden-Echterdingen, Fed. Rep. of Germany; Hartmut Ginnow-Merkert, Orono, Minn., and Harald Tomanek, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Andersen Corporation, Bayport, Minn.
Continuation-in-part of Ser. No. 619,111, Nov. 28, 1990, Pat. No. 5,097,629. This application Nov. 27, 1991, Ser. No. 800,595
Int. Cl.[5] E05F *1/10, 11/00*
U.S. Cl. 49—386 **23 Claims**



1. An operator for a pivoting unit, the unit having a first, pivoted end and a second, rotatable end, the operator comprising:
(a) a housing;
(b) a rotatable drive member operatively mounted in said housing, said drive member having an axis of rotation;

(c) a pair of first arm members having first and second ends, said drive member operatively connected to said first arm

5,205,076
SELF-ALIGNED LENS MANUFACTURING SYSTEM AND METHOD

having an abrasive means for honing, lapping, or polishing the surface of a work-piece and adapted to be driven by a variable

portion extending to an outside of said shell and adapted to carry a working tool;

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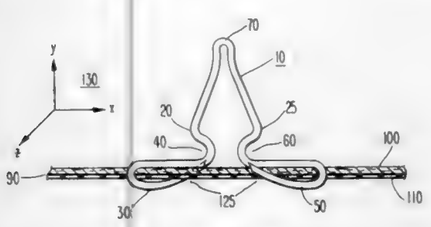
(c) a pair of first arm members having first and second ends, said drive member operatively connected to said first arm members proximate said first ends;
(d) a pair of second arm members having first and second ends, said first ends of said second arm members operatively connected to said second ends of said first arm members, and said second ends of said second arm members operatively connected to the second, rotatable end of the pivoting unit, wherein a torque from the unit is transmitted to said first and second arm members, wherein the second, rotatable end of the pivoting unit is rotatable from a closed position to an open position, and when the second, rotatable end is in said open position, said first arm members generally define a first plane, and said second arm members generally define a second plane at an oblique angle relative to said first plane;
(e) rotating drive means for rotating said drive member;
(f) counterbalancing means, operatively connected to said first arm members, for counterbalancing the torque on said first and second arm members, said counterbalancing means creating a force that is transmitted to said first and second arm members; and
(g) a pair of linking members that operatively connect said first arm members to said drive member so as to provide an over center advantage as the second, rotatable end of the pivoting unit is rotated to said closed position.

5,205,075

GASKETS FOR SEALING A SPACE BETWEEN SURFACES AND CLIPS FOR MOUNTING GASKETS TO SURFACES

James D. Moyer, Downington, Pa., assignor to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed Mar. 6, 1991, Ser. No. 665,289
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—493 **13 Claims**



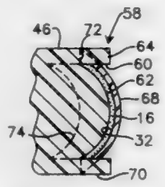
1. An oven gasket for sealing a space between two surfaces comprising:
tubular bulb means for providing resilient support to the gasket, the tubular bulb means having a first radius;
tubular resilient sealing means disposed around the tubular bulb means for providing a resilient seal between the two surfaces when the gasket is placed therebetween, the tubular resilient sealing means having a second radius larger than the first radius; and
a plurality of individual clips secured to the gasket through the tubular resilient sealing means for securing the gasket to one of the surfaces, the individual clips further comprising shoulder means for interfacing with one of the two surfaces and securing the gasket to one of the two surfaces,
first retaining means integrally formed on a first side of the shoulder means for fixedly retaining the clips to the gasket, and
second retaining means integrally formed on a second side of the shoulder means for further fixedly retaining the clip to the gasket, the first and second retaining means each being further adapted to be bent substantially parallel to each other so as to provide radial rigidity to the clip when the clip is fixed to the gasket.

5,205,076

SELF-ALIGNED LENS MANUFACTURING SYSTEM AND METHOD

Edward W. Vernon, and Thomas E. Nelson, both of Santa Barbara, Calif., assignors to Development Associates Controls, Inc., Carpinteria, Calif.

Filed Mar. 27, 1991, Ser. No. 676,762
Int. Cl.[5] B24B 3/00
U.S. Cl. 51—95 R **10 Claims**



1. A lens forming system, comprising:
means for forming a posterior surface in a contact lens blank corresponding to a desired inner surface for the lens, and a flat annular reference surface at a known location in the lens blank relative to said inner surface,
a support structure, and
a blocking means for carrying said lens blank with its surface opposite to said inner surface facing outward for formation of an outer lens surface, said blocking means being mountable to said support structure and including means for alignment at a known position relative to said support structure, said blocking means further including a flat forward directed surface that is complementary to the reference surface on said lens blank, and abuts said reference surface when the lens blank is carried by said blocking means, for positioning the lens blank at a known position relative to said blocking means, such that said inner lens surface is at a known position with respect to said support structure and said outer lens surface can be formed in said lens blank based upon the position of said support structure,
said support structure comprising a spindle with an interior bore that is sloped outward at its forward end, and an associated collet for mounting the blocking means to said spindle, said collet being retained within said spindle bore and having an exterior surface that is sloped outward at its forward end complementary to the slope of said spindle bore, said blocking means including a shank which is engaged by said collet and a fixed positioned flange for aligning the blocking means with respect to said spindle, said spindle having a flat forward end which abuts the flange on said blocking means, the distance between said flange and said complementary blocking means surface determining the position between said inner lens surface and said spindle, and said collet terminating rearward of the spindle's forward end by an amount sufficient to recess the collet back from the abutment between the spindle's forward end and said blocking means flange over a full range of manufacturing tolerances.

5,205,077

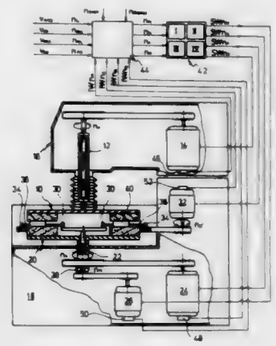
APPARATUS FOR CONTROLLING OPERATION OF A LAPPING, HONING OR POLISHING MACHINE

Gerhard Wittstock, Uetersen, Fed. Rep. of Germany, assignor to Peter Wolters AG, Rendsburg, Fed. Rep. of Germany

Filed Aug. 28, 1991, Ser. No. 751,266
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027628
Int. Cl.[5] B24B 49/00
U.S. Cl. 51—165 R **12 Claims**

1. An apparatus for controlling operation of a lapping, honing or polishing machine comprising at least one working disk

having an abrasive means for honing, lapping, or polishing the surface of a work-piece and adapted to be driven by a variable working disk drive, at least one planetary gear member for carrying said work-piece and having teeth at its outer periphery, and inner and outer gear members in driving engagement with said planetary gear member, at least said inner gear member being driven by a variable inner gear member drive, said apparatus including a control stage for providing a control signal to said working disk drive and said inner gear member drive for controlling desired drive speeds, the improvement of which includes a computer (**44**) connected to said control stage (**42**) for generating input signals for said control stage (**42**), which computer is arranged to calculate the speed of said inner gear member drive (**26**) and the speed of said working disk drive (**24**; **14**) by the following formulas:



$$n_L = K_L \cdot n_M$$

$$n_\Delta = n \pm K_{UL} \cdot n_M,$$

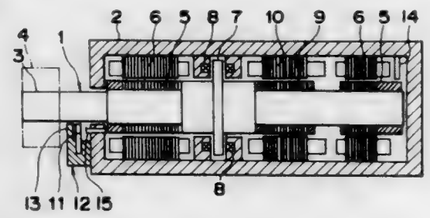
wherein K_L and K_{UL} are constants of the rolling geometry of said gear members and n_M representing the speed of said inner gear member, n_M, representing the drive speed of the inner gear member, n representing the speed of said working disk and n_L representing the rotational speed of the planetary gear member and n_Δ representing the difference between the speed n of the working disk and the orbital speed of the planetary gear member (**36**) are preselected desired values.

5,205,078

ROTARY APPARATUS

Akira Takara, Moriguchi, and Toru Nakagawa, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 28, 1991, Ser. No. 750,985
Claims priority, application Japan, Aug. 28, 1990, 2-228562
Int. Cl.[5] B24B 49/02
U.S. Cl. 51—165.77 **5 Claims**



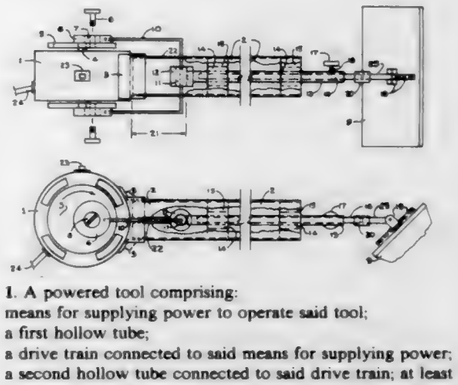
1. A rotary apparatus comprising:
a shell;
a rotary spindle mounted in said shell and having a front end portion extending to an outside of said shell and adapted to carry a working tool;
magnetic bearings mounted in said shell and magnetically supporting said rotary spindle when said spindle rotates;
a first sensor for detecting a radial position of said front end portion of said spindle relative to said shell;
a second sensor for detecting a radial position of a rear end portion of said spindle relative to said shell;
wherein said second sensor is mounted in a rear end portion of said shell;
wherein said first sensor is mounted to a front end portion of said shell outside said shell; and
wherein said first sensor occupies an arc-shaped area extending about less than 50% of a circumference of said spindle.

5,205,079

POWERED TOOL

Anthony W. Lashley, Rte. #1, Box 914, Grover, N.C. 28073, and Paul R. McKerahan, P.O. Box 313, Whittier, N.C. 28789

Filed Sep. 3, 1991, Ser. No. 754,410
Int. Cl.[5] B24B 23/00
U.S. Cl. 51—180 **18 Claims**



1. A powered tool comprising:
means for supplying power to operate said tool;
a first hollow tube;
a drive train connected to said means for supplying power;
a second hollow tube connected to said drive train; at least portions of said second hollow tube received in said first hollow tube; a retractable extension rod; portions of said retractable extension rod received within said second hollow tube; means for locking and unlocking said retractable extension rod attached to said second hollow tube; swivel means connected to said retractable extension rod; a work head; said work head connected to said swivel means;
a housing enclosing said means for supplying power; a saddle attached to said housing; said first tube being attached to said housing through an opening in said saddle; wherein said first tube includes a pair of elongated slots; a push-pull rod attached to said means for supplying power and to said second tube; said push-pull rod passing through at least one of said slots.

5,205,080

JIG FOR CLAMP-POSITIONING SINGLE CRYSTAL INGOT

Hiroyuki Ibe, Nyu, and Toshisa Nakata, Takehu, both of Japan, assignors to Shin-Etsu Handotai Company, Limited, Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 828,261
Claims priority, application Japan, Jan. 31, 1991, 3-31532
Int. Cl.[5] B24B 5/02, 41/06
U.S. Cl. 51—237 R **4 Claims**

1. A jig clamp-positioning a single crystal ingot having an

uneven peripheral surface and two flat parallel ends each having a center, comprising:

starting profile of the blank and a desired final profile of the intermediate turbomachine blade part, which comprises:

across the permeable membrane exerts a uniform pressure on the lens and causes the flexible permeable membrane to adopt the shape of the lens.

having an upper end, a lower end, and flat, straight walls, the lower end of the return corridor communicating with

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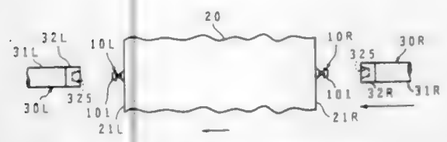
uneven peripheral surface and two flat parallel ends each having a center, comprising:

a pair of male positioning fixtures (**10L, 10R**) each having an elastic or viscoelastic cup (**105**) for suction attachment to the center of one of the ends of the single crystal ingot by pressing an open end of said cup against a flat end of the single crystal so as to make an interior of said cup airtight and attach to a flat end by negative pressure, each said cup having a block (**101**) fixed thereto at an opposite end to said open end, each said block being tapered and concentric with said cup; and

a pair of female positioning fixtures (**32L, 32R**), each formed at an end of a pair of clamp rotary shafts (**30L, 30R**) of a device for grinding the peripheral surface of the single



crystal ingot, each said female positioning fixture having a hole (**325**) for accommodating said male positioning fixture by removably fitting said block into said hole, said hole being concentric with said clamp rotary shaft, wherein at least one of said female positioning fixtures (**32L, 32R**) is linked with a respective said end of said clamp rotary shaft (**30L, 30R**) by pin (**324**) arranged perpendicular to the axis of said clamp rotary shaft such that said female positioning fixture is rotatable about said pin each said hole having a tapered wall with a degree of taper substantially the same as said block,

said cup of each said male positioning fixture contacting an end of the ingot and each male positioning fixture being within said each hole when the single crystal ingot is clamped by said clamp rotary shafts.

5,205,081

METHOD FOR PRODUCING PROFILED PARTS BY GRINDING AND A TURBOMACHINE BLADE PRODUCED THEREBY

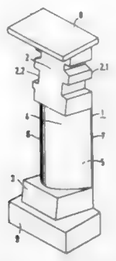
Ulrich Kuehne, Schwalbenweg 11, D-4230 Wesel; Karlheinz Heine, Wesel; Klaus Meyer, Neunkirchen am Brand, and Klaus Rueschmann, Wesel, all of Fed. Rep. of Germany, assignors to Ulrich Kuehne, Erlangen, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,764

Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714805

Int. Cl.[5] **B24B** *1/00, 19/14*

U.S. Cl. 51—281 R **9 Claims**



1. Method of producing a profiled intermediate turbomachine blade part from a blank, wherein the cross-sectional profile of the intermediate turbomachine blade part to be produced differs in some portions both quantitatively and qualitatively from the cross-sectional profile of the blank, so that different amounts of material must be removed between a starting profile of the blank and a desired final profile of the intermediate turbomachine blade part, which comprises:

a) pre-shaping and finish-grinding a blank of any arbitrary cross section into the intermediate turbomachine blade part to be produced in one chucking position with at least one profiled grinding wheel by removing a relatively large volume of material in the pre-shaping step and removing a relatively small volume of material in the finish-grinding step;

b) translating and rotating the blank relative to the at least one profiled grinding wheel during the pre-shaping step for giving the blank approximately a desired profile; and

c) performing the finish-grinding step at least partially after the pre-shaping step for smoothing surfaces and producing the final profile to accurate dimensions.

5,205,082

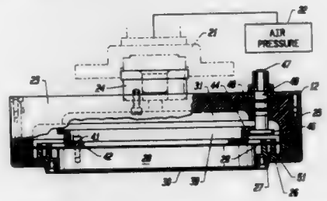
WAFER POLISHER HEAD HAVING FLOATING RETAINER RING

Norm Shendon; Kenneth C. Struven, both of San Carlos, and Robert J. Kolenkow, Berkeley, all of Calif., assignors to Cybeq Systems, Inc., Menlo Park, Calif.

Filed Dec. 20, 1991, Ser. No. 811,568

Int. Cl.[5] **B24B** *1/00*

U.S. Cl. 51—283 R **21 Claims**



1. A polishing head for positioning a semiconductor wafer for the polishing of a face thereof by a procedure which includes engagement of said face with a polishing surface, comprising:

(a) a carrier for a wafer;

(b) a retainer for resisting lateral force on a wafer caused by engagement of the face thereof with said polishing surface during the polishing of said face, which retainer engages said polishing surface with said wafer during the polishing of said face; and

(c) a connector between said carrier and said retainer allowing the latter both to float on said surface while said wafer face is polished and to project beyond said carrier to form a pocket therewith for a wafer to facilitate application of the same to said carrier.

5,205,083

METHOD AND APPARATUS FOR POLISHING OPTICAL LENSES

Dennis R. Pettibone, 142 Marian Ave., Elmira Heights, N.Y. 14903

Filed Oct. 24, 1991, Ser. No. 782,369

Int. Cl.[5] **B24B** *1/00, 13/02, 29/00*

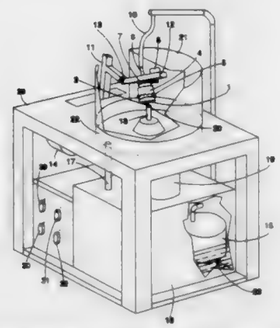
U.S. Cl. 51—284 R **10 Claims**

1. A method of polishing a lens using free-flowing polishing fluid pumped across a flexible permeable membrane, wherein the lens is mounted on a rotatable lens supporting device, comprising the steps of:

a) pressurizing the flexible permeable membrane with a free-flowing polishing fluid, whereby the free-flowing polishing fluid is caused to flow across the flexible permeable membrane,

b) pressing the flexible permeable membrane against the lens, whereby the pressure of the free-flowing polishing fluid across the permeable membrane exerts a uniform pressure on the lens and causes the flexible permeable membrane to adopt the shape of the lens,

c) rotating the flexible permeable membrane atop the lens, and



d) rotating the lens supporting device is the counter direction to or the same direction as the rotating flexible permeable membrane,

whereby the lens is polished by the action of the flexible permeable membrane, and is cooled by the flow of the free-flowing polishing fluid.

5,205,084

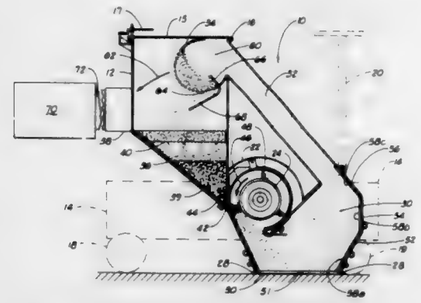
FLAT-WALLED APPARATUS AND HOUSING FOR TREATING HORIZONTAL SURFACES

Jerry W. Roberts, Oklahoma City, Okla., assignor to Nelco Manufacturing Corporation, Oklahoma City, Okla.

Filed Jan. 23, 1992, Ser. No. 824,635

Int. Cl.[5] **B24C** *3/06, 9/00*

U.S. Cl. 51—429 **15 Claims**



1. An apparatus for treating a substantially horizontal surface by blasting the surface with abrasive particles, the apparatus comprising:

a housing having a bottom with a blast opening adapted to overlie a substantially horizontal surface;

a rotatable drum within the housing, the drum having an outer periphery with a plurality of radially extending blades for propelling abrasive particles through the blast opening and against the surface;

a hopper having an upper end and a lower end within the housing for holding and releasing abrasive particles, the hopper having a feed opening positioned at the lower end of the hopper to gravity-feed abrasive particles into contact with the blades of the drum as the drum rotates;

a rebound chamber within the housing, the rebound chamber having a plurality of flat rebound walls and communicating with the blast opening;

a return corridor within the housing, the return corridor having an upper end, a lower end, and flat, straight walls, the lower end of the return corridor communicating with the rebound chamber;

a collection chamber within the housing above the hopper and communicating with the upper end of the return corridor for collecting abrasive particles for reuse, the collection chamber communicating with the hopper to gravity feed abrasive particles from the collection chamber into the hopper; and

means communicating with the housing for creating an air flow from the blast opening through the rebound chamber, and return corridor and the collection chamber;

wherein the return corridor extends linearly into communication with the collection chamber.

5,205,085

CENTRIFUGAL BLASTING APPARATUS

Fukashi Urakami, Maruyoshi Bldg. 608, 4-17-24, Kohnandai, Kohnan-ku, Yokohama, 233, Japan

Filed May 21, 1992, Ser. No. 886,575

Int. Cl.[5] **B24C** *9/00, 5/06, 7/00*

U.S. Cl. 51—433 **13 Claims**

1. A centrifugal blasting apparatus for blast cleaning or shot peening treatment of a selected surface of an object to be treated by throwing pulverized abrasive material onto the surface, comprising:

a rotary blade wheel;

a wheel casing to enclose said rotary blade wheel, said wheel casing having defined therein an elongated slot to permit pulverized abrasive material to pass therethrough and scatter through air with centrifugal force;

an inlet suction conduit connected at a downstream end of said wheel casing to permit transportation of airborne pulverized abrasive material from an upperstream suction end to an inside of said wheel casing to said rotary blade wheel; and

an outlet suction conduit connected at the upperstream end to said wheel casing and at the downstream end, said outlet suction conduit including suction means for drawing air from a side of said wheel casing.

5,205,086

INFLATABLE TENT

Daniel G. Heim, 27 Fay Road, S.E., Calgary, Alberta, Canada T2H 1H5

Continuation of Ser. No. 632,999, Dec. 24, 1990, abandoned. This application Apr. 10, 1992, Ser. No. 865,757

Int. Cl.[5] **E04B** *1/34*

U.S. Cl. 52—2.13 **12 Claims**

1. A tent comprising:

a unitary flexible canopy having an extended condition in which the canopy alone encloses a space;

a plurality of inflatable tubes independent of the canopy;

a plurality of tube holding means independent of the canopy and spaced therealong for selectively engaging the inflatable tubes, the tube holding means being readily openable and readily reclosable for selectively removing and re-

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5,205,088

ROOFING SNOW PANEL AND METHOD OF

5,205,089

PORTABLE SHELTER ASSEMBLY

Matthew S. Cunningham, 2 Woodland Rd., Dover, N.H. 03820

ing building block, the improvement wherein said block has a structure permitting assembly of said block into said seawall, wherein:

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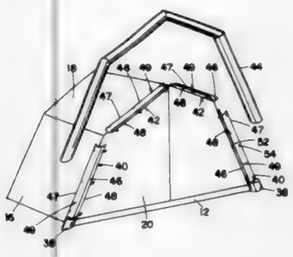
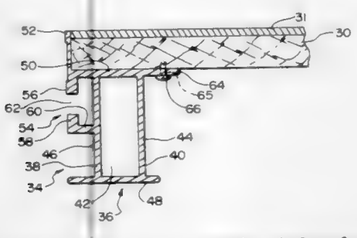
able tubes, the tube holding means being readily openable and readily reclosable for selectively removing and replacing the tubes;

securement means securing the tube holding means to the canopy; and



fastener means independent of the securement means for selectively fastening the tube holder means in a closed condition, the fastener means being readily engageable and readily disengageable whereby the tubes are selectively and detachably secured to the canopy.

5,205,087
PORTABLE STAGING PLATFORM
Michael D. Jines, 144 14th St. NE., Owatonna, Minn. 55060
Filed Feb. 8, 1991, Ser. No. 652,889
Int. Cl.[5] E04B *5/00;* **E04H** *3/10*
U.S. Cl. 52—6 **3 Claims**



1. A panel assembly for use in a staging platform formed by a selected number of said panel assemblies, said panel assembly comprising:

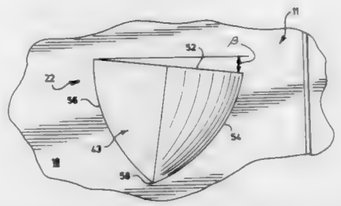
a horizontally disposed panel member having a central region, an upper surface, a lower surface parallel to said upper surface and a periphery; and

a panel member cladding frame affixed to said panel member along said periphery and attached to and extending from said lower surface, to thereby support said periphery of said panel member, said cladding frame comprising:

upper and lower flanges generally parallel to each other and to said panel member upper surface and lower surface with said upper flange engaging said lower surface of said panel member, and said lower flange disposed below and spaced from said upper flange, and

a web extending generally perpendicularly between and connecting said flanges, said web having a panel facing side and an exposed side, said cladding frame further including a channel at said exposed side adjacent said upper flange, said channel having a channel base extending perpendicularly from said web at a location between said upper and lower flanges and channel legs projecting upwardly from said channel base and downwardly from said upper flange so as to form a lateral opening into said channel.

5,205,088
ROOFING SNOW PANEL AND METHOD OF CONSTRUCTING SAME
George B. Mueller, 3540 Chalet, Crete, Ill. 60417
Filed Feb. 21, 1992, Ser. No. 839,387
Int. Cl.[5] E04D *13/10*
U.S. Cl. 52—24 **17 Claims**



1. A roofing panel for holding accumulated snow in equilibrium, comprising:

a sheet of metallic material having an upper surface and having a transverse and a longitudinal dimension;

said sheet of material having a generally rectangular shape and including a plurality of integrally formed smoothly rounded contoured shaped upstanding barriers for helping to hold back an avalanche of accumulated snow or ice, each barrier having a transverse dimension substantially less than the transverse dimension of said sheet;

said plurality of integrally formed upstanding barriers being arranged angularly displaced in spaced apart rows for helping to hold accumulated snow in its originally deposited position on said upper surface;

each integrally formed barrier having a smoothly rounded contoured back portion for facilitating the initial accumulation of snow thereabout curvilinearly, said back portion having a longitudinal dimension;

each integrally formed barrier further having an upstanding front wall portion for helping to arrest downward motion of accumulated snow along said upper surface;

said back portion being interconnected to said sheet of material along a curvilinearly shaped smoothly rounded bottom edge portion of said back portion;

said front wall portion being interconnected to said sheet of material along a straight bottom edge portion of said front wall portion;

said front wall extending upwardly from said upper surface at an angle θ relative thereto and terminating at a distance d sufficient to help reduce an avalanche of accumulated snow from moving along said upper surface;

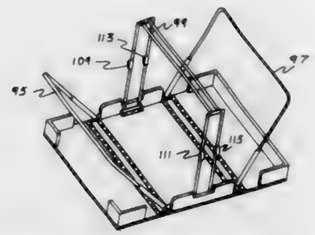
said front wall having a smoothly rounded top edge extending traversely across the entire transverse dimension of the barrier for helping to prevent metal failures between the back portion and the front wall;

said back portion sloping downwardly and rearwardly from the smoothly rounded top edge of said wall to the upper surface along said back bottom edge portion for strengthening the body portion and the wall sufficiently to help prevent collapse when subjected to accumulated snow or ice loading;

said back body being generally triangularly shaped in cross section throughout the longitudinal dimension of each barrier for strengthening said body under accumulated snow or ice loading; and

said front wall having a flat plane disposed at an angle β other than zero relative to the transverse dimension to said sheet forming a lower corner and to guiding water flow downwardly under the force of gravity along said front wall and around said lower corner and downwardly away from said back portion for helping prevent the accumulation of standing water as accumulated snow or ice melts gradually.

5,205,089
PORTABLE SHELTER ASSEMBLY
Matthew S. Cunningham, 2 Woodland Rd., Dover, N.H. 03820
Filed Jan. 2, 1992, Ser. No. 815,505
Int. Cl.[5] E04H *1/12*
U.S. Cl. 52—79.1 **12 Claims**



1. A portable shelter assembly comprising:

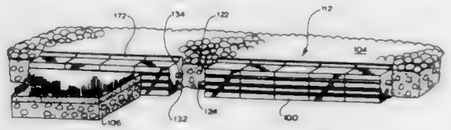
(a) a substantially rectangular container adapted to be mounted horizontally atop a vehicle, said container having a central floor portion and first and second side portions respectively hingedly connected to first and second opposite edges of said central floor portion, said first and second side portions in turn having respectively first and second top portions hingedly connected thereto and adapted to form an upper closure surface of said substantially rectangular container above and spaced from said central floor portion, said first and second side portions and said first and second top portions being also adapted to rotate about said respective hinged connections to form, together with said central floor portion, a deck in which said central floor portion, said first and second side portions, and said first and second top portions are all substantially coplanar;

(b) first and second arch members pivotally connected to said central floor portion so as to be rotatable into erected positions forming obtuse angles with said central floor portion when said first and second side portions and said first and second top portions are in the aforementioned coplanar position;

(c) a folding arch member hingedly attached at its respective ends to third and fourth opposite edges of said central floor portion and erectable from a folded position adjacent said central floor portion to provide a supporting structure intermediate said first and second arch members when they are in their erected positions; and

(d) a weatherproof tent canopy adapted to be supported by said first and second arch members in their erected positions and by said folding arch member in its erected position, opposite ends of said weatherproof tent canopy being secured on the extremities of said first and second top portions when in their coplanar positions.

5,205,090
BUILDING BLOCK, AND WALL OR YARD EDGING THEREFROM
Terrence J. Lavery, 167 Hawkins Cir., Wheaton, Ill. 60187
Filed Oct. 16, 1991, Ser. No. 777,005
Int. Cl.[5] E04C *1/10;* **E02D** *27/00*
U.S. Cl. 52—102 **11 Claims**



11. In a yard edging formed from a plurality of an interlocking building block, the improvement wherein said block has a structure permitting assembly of said block into said seawall, wherein:

a) said block being of a generally rectangular solid shape;

b) said block having a front side, back side, a bottom side, a top side, a first end and a second end;

c) said front side being oppositely disposed from said back side;

d) said bottom side being oppositely disposed from said top side;

e) said first end being oppositely disposed from said second end;

f) said first end having a first indentation and a first protruding member;

g) said second end having a second indentation and a second protruding member;

h) said first indentation being adapted to receive said second protruding member;

i) said second indentation being adapted to receive said first protruding member;

j) said top side having a protruding lip;

k) said bottom side having a bottom slot;

l) said bottom slot being adapted to receive said protruding lip;

m) said first indentation and said second protruding member being substantially coaxial;

n) said second indentation and said first protruding member being substantially coaxial;

o) said front side having at least one horizontal front slot;

p) said back side having at least one horizontal back slot;

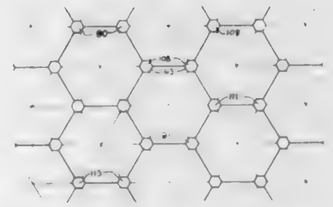
q) said first indentation and said second indentation being substantially symmetrical;

r) said first protruding member and said second protruding member being substantially symmetrical;

s) said first indentation and said second indentation being substantially hemispherical or conical; and

t) said first protruding member and said second protruding member being substantially hemispherical or conical.

5,205,091
MODULAR-ACCESSIBLE-UNITS AND METHOD OF MAKING SAME
John G. Brown, 20205 State Line Rd., Harvard, Ill. 60033
Continuation-in-part of Ser. No. 436,158, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 106,204, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 783,309, Oct. 2, 1985, Pat. No. 4,698,249, which is a continuation of Ser. No. 391,760, Jun. 24, 1982, Pat. No. 4,546,024, which is a continuation of Ser. No. 131,516, Mar. 18, 1980, abandoned. This application Jul. 25, 1991, Ser. No. 737,885
Int. Cl.[5] E04B *9/00*
U.S. Cl. 52—126.6 **135 Claims**



1. A conductor-accommodating supporting layer for use in a floor, ceiling, wall or partition system, comprising a supporting layer disposed over a base surface and an array of modular units disposed over said supporting layer, characterized in that said supporting layer comprises a plurality of spaced discrete support elements arranged in a first patterned layout; said

modular units including a first set of identical units having a

substantially flush with the first and second side upper surfaces and a block end surface substantially flush with

tary sash having a light opening adapted to receive a glass pane, said combination comprising

column including key means formed generally radially in a first block of said pair and complementary keyway

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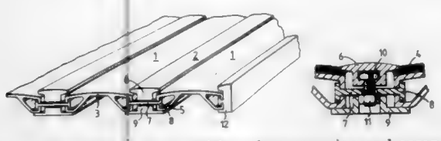
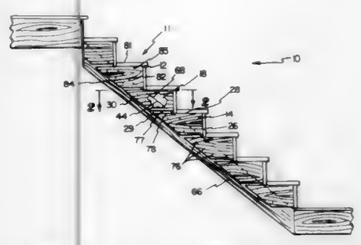
modular units including a first set of identical units having a plurality of corners and supported on said spaced discrete support elements in a second patterned layout, such that every corner in said second patterned layout is free of said spaced discrete support elements; said second patterned layout further including a second set of units which are similar in shape to said first set of units and fully interchangeable with said first set of units; each of said units in said second set of units having at least one corner removed and interspersed in said second patterned layout, thereby forming accessible nodes in said second patterned layout; said nodes being movable by interchanging units from said first and second sets.

5,205,092
THRESHOLD MAT
Brian J. Taylor, Faversham, United Kingdom, assignor to PSA Threshold Limited, United Kingdom
Filed Jul. 17, 1992, Ser. No. 916,204
Claims priority, application United Kingdom, Jul. 18, 1991, 9115514
Int. Cl.[5] A47L *23/26*
U.S. Cl. 52—177 **5 Claims**



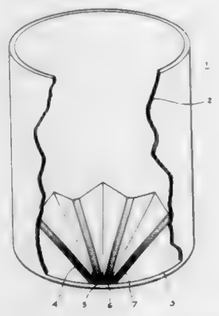
1. A threshold mat comprising alternate wipe and scraper units linked together at adjacent edges as alternating strips, each wiper unit being in the form of an extrusion carrier carrying a length of wiper material, and each scraper unit being in the form of separable components, said mat further comprising linking means for linking adjacent wiper and scraper units which includes a tightenable clamp which enables each scraper unit to grip an edge of the adjacent wiper material and to accommodate wiper materials of differing thickness.

5,205,093
PRE-MANUFACTURED STEP SUPPORT
Gail D. Schuette, Route 2, Box 281A, Watertown, Minn. 55388
Filed Jun. 22, 1992, Ser. No. 901,751
Int. Cl.[5] E04F *11/00*
U.S. Cl. 52—182 **10 Claims**



1. A step support for use in constructing a staircase of the type having standard size stringers and a plurality of treads and risers, the step support comprising:
a first side member having a first side upper surface and a first side end surface substantially perpendicular to each other, to support the tread and the riser of a step;
a second side member having a second side upper surface and a second side end surface substantially perpendicular to each other, to support the tread and the riser of a step;
a filler block between the first side member and the second side member having a width equal to that of a standard size stringer, the filler block having a block upper surface substantially flush with the first and second side upper surfaces and a block end surface substantially flush with the first and second side end surfaces, and the filler block having a block support surface between the first side member and the second side member at an angle with respect to the block upper surface substantially equal to the angle of a facing surface of the stringer to which the step support is attached said first and second side members and said filler block being substantially parallel to one another.

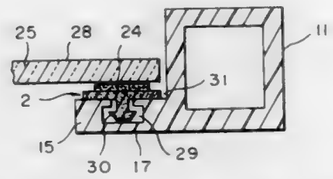
5,205,094
SILO INCLUDING A DEVICE FOR PREVENTING OBSTRUCTION TO AIR FLOW
Mats Holmqvist, Lidköping, Sweden, assignor to PM Luft AB, Kvanum, Sweden
Filed Dec. 4, 1991, Ser. No. 802,201
Claims priority, application Sweden, Feb. 26, 1991, 9100552
Int. Cl.[5] E04B *1/70*
U.S. Cl. 52—197 **2 Claims**



1. In a silo for cereals where an air supply is employed for aiding the emptying of the cereals,
means or preventing obstruction to the flow of air because of dust particle accumulation,
the silo having a vertical side wall (**2**), a sloping bottom (**3**), and an outlet opening (**12**) for the cereals,
said means for preventing obstruction to the flow of air comprising:
a plurality of channels (**4–7**) formed in said sloping bottom, said channels having two ends and being arranged with one of their ends converging toward the outlet opening (**12**),
said air supply (**14**, **15**) connected to the other ends of the channels,
each of said channels (**4–7**) being covered with means having perforations permitting the passage of air but inhibiting the passage of cereals,
said means having perforations substantially coinciding with the sloping bottom, and
a transverse wall (**16**) near the outlet opening (**12**) of each of the channels,
said transverse wall (**16**) having at least one opening (**17**) sufficiently large to permit dust particles collected in the channels to pass but limiting the air flow to a small quantity.

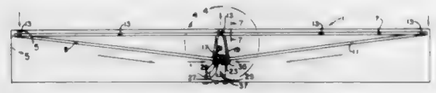
5,205,095
DROP-IN GLAZING
Gerald Kessler, P.O. Box 389, Youngstown, Ohio 44501
Filed May 24, 1991, Ser. No. 705,437
Int. Cl.[5] E06B *3/62, 7/16*
U.S. Cl. 52—208 **5 Claims**

1. A combination of an adhesive-supporting clip and a unitary sash having a light opening adapted to receive a glass pane, said combination comprising
a continuous sash forming a light opening, said sash having a glazing leg extending inwardly toward said light opening;
a lip formed of rigid material and having mechanical means for detachably securing said clip directly to said glazing leg;
engagement means on said clip for directly receiving, supporting and substantially solely adhesively engaging a glass pane, said engagement means comprising an adhe-



sive-coated surface of said clip extending substantially parallel to said glazing leg and being unobstructed so that the glass pane can be dropped directly onto said adhesive coated surface without deformation of said clip;
said adhesive being sufficiently strong so that said adhesive will hold the pane of glass on said clip by itself whereby the glass pane is secured to said sash by directly adhesively engaging the perimeter oft he glass pane to the adhesive on said surface of said clip, and
whereby the residual of a broken glass pane can be removed by detaching said clip from said sash.

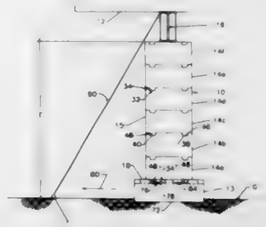
5,205,096
REINFORCING ASSEMBLY FOR A GARAGE DOOR OR THE LIKE
Rex A. Pace, 1222 Treetop Village, Ballwin, Mo. 63025
Filed Oct. 31, 1991, Ser. No. 784,227
Int. Cl.[5] E06B *3/48*
U.S. Cl. 52—223.6 **8 Claims**



5. A reinforcing assembly for a garage door or the like comprising:
an upper cross member extending from one side of the garage door to the other side;
a plurality of lower cross members, each lower cross member having one ned thereof extending from an end of the upper cross member downwardly;
a plurality of vertical members, said vertical means extending from the other end of the lower cross members to the upper cross member; and
tensioning means connected to said lower cross members.

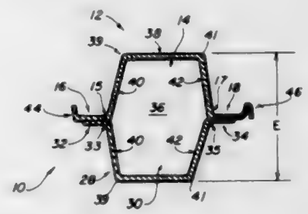
5,205,097
INTERLOCKING BLOCK PIER ASSEMBLY
Gary L. Harvey, 1466 Covington Cir., Fort Myers, Fla. 33919
Filed Feb. 11, 1991, Ser. No. 652,984
Int. Cl.[5] E02D *27/00*
U.S. Cl. 52—294 **14 Claims**

1. An interlocking block pier assembly comprising:
a plurality of annular blocks for stacking in a generally vertical column to support a load thereon; and
means for interlocking each pair of adjacent blocks in said column including key means formed generally radially in a first block of said pair and complementary keyway means formed generally radially in the other block of said pair for receiving said key means to prevent said blocks in said pair from moving rotatably or laterally relative to



each other; said key means including four key segments arranged radially at generally 90 degree intervals about said first block and said keyway means including four keyway segments arranged radially at generally 90 degree intervals about said other block.

5,205,098
LONG-SPAN DECKING PANEL
Donald H. Landis, 308 Hermitage Dr., and David F. Landis, 50 Holland Rd., both of Pittsburgh, Pa. 15235
Filed Jun. 11, 1992, Ser. No. 897,264
Int. Cl.[5] E04B *1/20*
U.S. Cl. 52—336 **21 Claims**



1. A long-span decking panel comprising:
a first panel section having a first open channel, a first side flange integrally extending from a first edge of the first open channel and a second side flange integrally extending from a second edge of the first open channel, said first panel section having a first end for bearing against a first support surface and a second end for bearing against a second support surface, said first panel having a first length; and
a second panel section having a second open channel, a first side flange integrally extending from a first edge of the second open channel, a second side flange integrally extending from a second edge of the second open channel, said first side flange and second side flange of the first panel section fixedly connected to the first side flange and the second side flange of the second panel section, respectively, such that the first and second open channels form a cell, said second panel having a second length, said second length shorter than the first length such that the second panel section extends below said first and second support surface when the first panel section is supported thereupon.

5,205,099
FIRE-RETARDANT GLAZING

hearth grate layers comprising a longitudinal succession of alternately fixed and mobile grate bars, said sealing beam com-

gate toggle links pivotally connected together for pivoting movement between locked and released positions, one of said links having a locking element thereon and being

disposed at generally right angles relative to said first track;

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5,205,099

FIRE-RETARDANT GLAZING

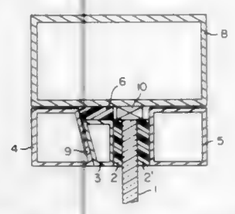
Holger Grünhage, Mainz; Roland Leroux, Elsheim; Jürgen Thürk, Schornsheim, and Lothar Frenz, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Nov. 27, 1990, Ser. No. 618,242

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1989, 3939149

Int. Cl.[5] E04B *1/94, 2/88*

U.S. Cl. 52—475 14 Claims



1. A fire-retardant glazing arrangement comprising:

a frame for supporting a pane of glass having opposite surfaces, the frame including a frame channel with depending first and second beams spaced from one another and having spaced opposed surfaces defining a channel therebetween with a first bevel in the channel extending at an acute angle with respect to the pane;

a pair of gaskets disposed between the opposed surfaces defining the channel and opposite surfaces of the pane;

movable wedge means disposed between one of the gaskets and the first bevel for exerting pressure against the one gasket to help hold the pane against the other gasket and thus clamp the pane in the channel between the opposed surfaces, the wedge means including a second bevel in engagement with and extending at an interface therewith at a wedge angle which is substantially parallel to the first bevel; and

thermally sensitive biasing means disposed in the channel and urging the wedge means in a direction parallel to the surfaces of the pane upon the application of heat to provide a pressure medium which increases clamping forces on the pane upon the occurrence of fire.

5,205,100

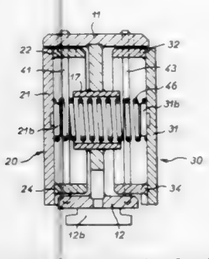
BEAM FORMING AN EXPANSION SEAL BETWEEN TWO SIDE-BY-SIDE GRATE LAYERS WITH ALTERNATELY FIXED AND MOBILE BARS

Didier Lecointre, Montigny-Le-Bretonneux, France, assignor to Traitement Industriel Des Residus Urbains (T.I.R.U.), Paris, France

Filed Jun. 19, 1991, Ser. No. 717,793

Int. Cl.[5] E04B *1/68*

U.S. Cl. 52—573 37 Claims



11. A sealing beam for compensating for thermal expansion of opposed hearth grate layers, and defining a seal between facing edges of the opposed hearth grate layers, each of the hearth grate layers comprising a longitudinal succession of alternately fixed and mobile grate bars, said sealing beam comprising a longitudinal succession of elongate elements, each of said elongate beam elements comprising an I-shaped structural member having a vertical web extending between a lower flange defining a baseplate for fixing the I-shaped member to a support and an upper flange having an outer surface forming a top side of the sealing beam, and a pair of sealing members, each of the sealing members being of U-shaped configuration and including a vertical web with a substantially planar outer surface and opposed parallel legs extending parallel to the flanges of the I-shaped structural member, the legs of the sealing member being disposed immediately inwardly of the flanges of the I-shaped structural member, slight clearance being formed between free edges of the legs of the U-shaped members and the web of the I-shaped member, coil springs extending through openings in I-shaped member web and bearing respectively on inner surfaces of the webs of the U-shaped members to urge said sealing members into contact with the respective facing edges of the hearth grate layers.

5,205,101

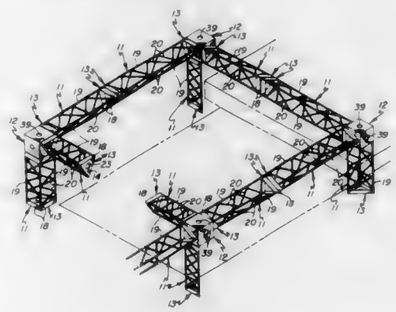
SUPPORT SYSTEM

David Swan, 12078 Fleetwood Cir., Coon Rapids, Minn. 55448, and Michale Emerson, 181 90th La., Blaine, Minn. 55434

Filed Jun. 14, 1991, Ser. No. 715,576

Int. Cl.[5] E04H *3/10*

U.S. Cl. 52—650.1 7 Claims



1. A sectional rail structure for a support system used in supporting lights, video monitors and similar devices, comprising,

a plurality of elongate similar rails, each including a plurality of elongate, laterally spaced-apart, parallel longitudinal rail elements, each rail including a plurality of elongate, transversely extending rail elements extending between and being rigidly connected with a pair of adjacent longitudinal rail elements,

each rail including a pair of longitudinally spaced apart substantially identical end plates, each end plate having inner and outer surfaces, one of said end plates being rigidly secured to the end portions of the longitudinal rail elements at one end of a rail, the other of said end plates being rigidly secured to the end portions at the other end of a rail, each end plate having a plurality of similar spaced apart openings therein arranged in a predetermined pattern whereby when a pair of rails are disposed in end-to-end abutting relation, with the outer surface of one end plate being disposed in confronting relation with the outer surface of the end plate of the adjacent rail, each opening in one end plate will be disposed in registering relation with an opening in the abutting end plate,

and a plurality of substantially identical, quick-connect toggle connector devices releasably securing abutting rails together, each connector device including a pair of elongate toggle links pivotally connected together for pivoting movement between locked and released positions, one of said links having a locking element thereon and being inserted through registering openings in the abutting end plates and securing the rails together upon rotation of a connector device and pivoting movement of the links thereof from the release to the locking position.

5,205,102

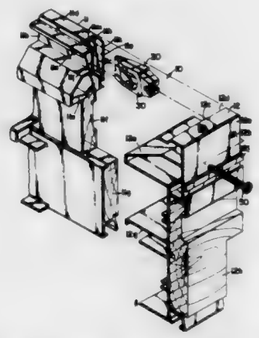
CORNER FASTENER FOR HOLLOW SECTION MEMBERS

David D. Plummer, Hudson, Wis., assignor to Andersen Corporation, Bayport, Minn.

Filed Apr. 18, 1991, Ser. No. 687,229

Int. Cl.[5] E04C *2/38*

U.S. Cl. 52—656.9 15 Claims



1. A corner fastener for use in securing first and second frame members together to form a corner of a frame, the first frame having spaced apart outside and inside walls thereby defining a cavity, the cavity defining at least one detent, the second frame having an outer wall, the outer wall having an opening in general axial alignment with the cavity, said fastener comprising:

(a) a body generally sized to be inserted in the cavity, said body comprising a first section operatively connected to a second section by hinge means, wherein said first and second sections are generally adjacent when manufactured, but are folded on top of each other during use;

(b) locking means having a first end operatively connected to said body and a second end free to move between an unengaged position and an engaged position, said locking means having a detent engaging member;

(c) said body defining a fastening member aperture, said aperture in general axial alignment with the opening, wherein when, said body is positioned in the cavity and when a fastening member is inserted in the opening and said aperture, said detent engaging member is locked in the detent by the fastening member, thereby fastening the first and second frame members together.

5,205,103

SHINGLE LAYING APPARATUS

Rodney P. Burton, Ste. D, 6770 E. Livingston Ave., Reynoldsburg, Ohio 43068

Filed May 31, 1991, Ser. No. 708,757

Int. Cl.[5] E04D *15/00*

U.S. Cl. 52—749 11 Claims

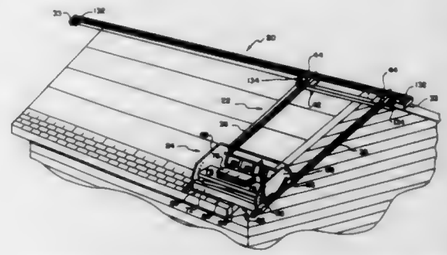
1. A shingle laying apparatus comprising, in combination;

a) a first track detachably connected to and longitudinally extending a predetermined distance horizontally across a roof;

b) a second track including at least one pair of longitudinally extending track members spaced from one another and disposed at generally right angles relative to said first track;

c) means for mounting said second track to said first track for movement across said roof parallel to said first track, each of said track members of said second track extending along the pitch of said roof and including an elongate channel having a top opening extending parallel to the length of said track member and a plurality of stop pins, each laterally extending across and fixed within said elongate channel in longitudinally spaced relationship to one another;

d) a carriage frame provided with a platform conformed to carry a load of shingles and connected to said at least one pair of track members of said second track for horizontal



movement with horizontal movement of said second track along said roof in a path parallel to said first track and slidably mounted on said pair of track members for movement longitudinally along said second track in a perpendicular direction to said first track; and

e) at least one lever arm pivotally mounted on each side of said carriage frame, each of said lever arms including a lower end extending downwardly and rearwardly into a respective one of said elongate channels of a respective track member and freely engaging a bottom surface of said elongate channel, said lower end conformed to engage a respective one of said laterally extending stop pins to prevent slideable travel of said carriage frame rearwardly from a higher to a lower position along said second track members.

5,205,104

DEVICES FOR SUPPLYING AND TRANSPORTING FILM FOR PACKAGING APPARATUS

Masami Nakashima, and Kazuhiko Takemura, both of Shiga, Japan, assignors to Ishida Scales Mfg. Co., Ltd., Shiga, Japan

Division of Ser. No. 611,022, Nov. 9, 1990, Pat. No. 5,157,903.

This application Jun. 23, 1992, Ser. No. 903,236

Claims priority, application Japan, Nov. 10, 1989, 1-131377[U]; Nov. 14, 1989, 1-296407; Nov. 30, 1989, 1-139531[U]; Dec. 1, 1989, 1-140183[U]; Feb. 24, 1990, 2-18041[U]; Feb. 26, 1990, 2-19338[U]; Feb. 27, 1990, 2-20090[U]; Sep. 4, 1990, 2-235104; Sep. 7, 1990, 2-94685[U]

Int. Cl.[5] B65B *41/14*

U.S. Cl. 53—64 15 Claims

1. In a packaging apparatus which supports a stretched film sheet at a packaging station, lifts an object from below said stretched film sheet and packages said object by folding edge sections of said film sheet towards the bottom surface of said object, the improvement wherein said packaging apparatus includes a film supplying device which comprises

roll supporting means for rotatably supporting a film roll,

film transporting means for clamping side edge sections of a film pulled out of said roll supporting means and transporting said film to said packaging station, and

adjusting means for automatically adjusting clamping posi-

means pivotably movable between an initial position jux-

storage position to said operating position where said side plates and said base are in engagement, and means for tempo-

5,205,109

METHOD AND APPARATUS FOR EXPANDING A

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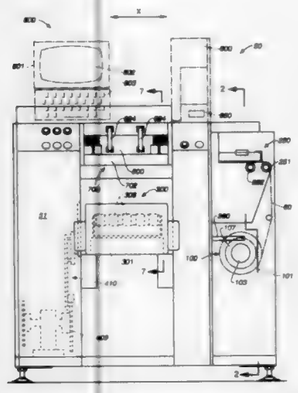
adjusting means for automatically adjusting clamping positions where said film transporting means clamps said film



according to film roll position where said film roll is set in said roll supporting means.

5,205,105

MACHINE FOR RECEIVING AND COMPRESSING AGRICULTURAL HARVESTED CROPS

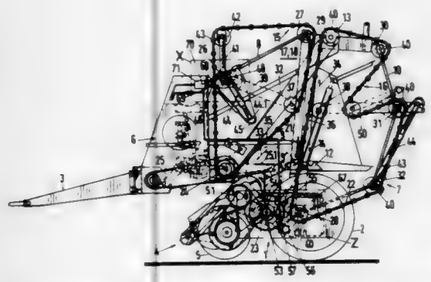
Bernard Krone, Spelle, and Wilhelm Ahler, Stadtlohn, both of Fed. Rep. of Germany, assignors to Maschinenfabriken Bernard Krone GmbH, Spelle, Fed. Rep. of Germany

Filed Feb. 10, 1992, Ser. No. 833,249

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1991, 4104643

Int. Cl.[5] **A01F** *15/07, 15/08*

U.S. Cl. 53—118 **20 Claims**



1. A machine for receiving and compressing an agricultural harvested crop comprising:

a chassis support means;

bale conveyor means carried by said chassis support means and having two conveyor parts spaced from one another to define a bale-forming space between said two conveyor parts, said bale conveyor means comprising a first conveyor device and a second conveyor device with said first conveyor device including said first conveyor part and said second conveyor device including said second conveyor part;

movable means for moving one of said conveyor parts relative to the other conveyor part, said movable means comprising pivotal means for pivotably moving said first conveyor device on said chassis support means; and

a crop conveyor means carried by said chassis support means and juxtaposed to said bale-forming space, said crop conveyor means comprising pivotal cutting tool means pivotably movable between an initial position juxtaposed to said bale-forming space and a cutting position disposed within said bale-forming space.

5,205,106

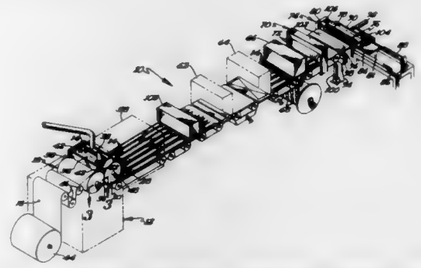
ROLLED FOOD ITEM FABRICATING APPARATUS AND METHODS

Craig E. Zimmermann, Waconia, and René K. Merle, Crystal, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Mar. 4, 1991, Ser. No. 664,715

Int. Cl.[5] **B65B** *27/00, 61/18, 63/04*

U.S. Cl. 53—118 **23 Claims**



1. An apparatus for depositing continuous, multiple, spaced, strips of food for support on and separable from a continuous sheet of support material comprising, in combination: a first roller rotatable about a horizontal axis in a first direction, with the first roller including a plurality of spaced, parallel, circumferential lands defining depressions on the periphery of the first roller; a second roller rotatable about a horizontal axis in a direction opposite to the first direction and abutting with the plurality of lands of the first roller to define an upper, mating side and a lower, exit side; means for supplying the sheet of support material to extend over the first roller, between the first and second rollers, and under the second roller; means for holding and evenly feeding the food by gravity to and within the upper, mating side of the first and second rollers; and means for providing the food in a flowable form to the holding means and the upper, mating side of the first and second rollers intermediate the continuous sheet of support material and the second roller, with the food filling the depressions of the first roller as the food and the support material advance vertically downward between the first and second rollers by the rotation of the first and second rollers to form the continuous, multiple, spaced, strips of food on the continuous sheet of support material.

5,205,107

BAG LOADING APPARATUS

Albert R. Herink, Akron, Ohio, assignor to Sheridan Lee Combs, Akron, Ohio, a part interest

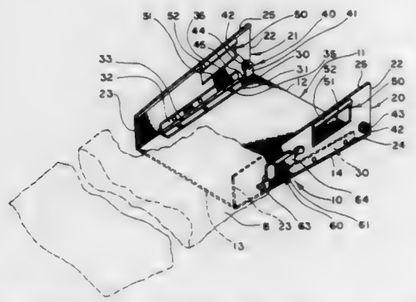
Filed May 27, 1992, Ser. No. 890,020

Int. Cl.[5] **B65B** *39/08, 67/12*

U.S. Cl. 53—255 **12 Claims**

1. Loading apparatus for collecting particulate matter and directing it into a bag comprising, a generally planar base having a pair of spaced lateral edges and a pair of spaced ends joining the edges, a pair of side plates pivotally attached to said spaced lateral edges and movable between a storage position underlying and substantially parallel to said base and an operating position substantially perpendicular to said base by hinges attached outwardly of said side plates and said base for moving said side plates through approximately 270 degrees from said

storage position to said operating position where said side plates and said base are in engagement, and means for tempo-



rarily positioning and retaining the bag when said side plates are in said operating position.

5,205,108

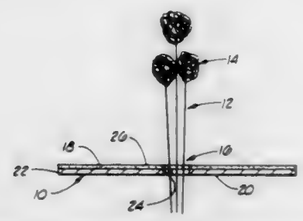
METHOD OF WRAPPING A FLORAL GROUPING WITH A WRAPPER HAVING A CENTRAL OPENING

David A. Weder, and Donald E. Weder, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Filed Jun. 29, 1992, Ser. No. 906,089

Int. Cl.[5] **B65B** *25/02, 11/02, 11/54, 27/12*

U.S. Cl. 53—397 **9 Claims**



1. A method for wrapping a floral grouping comprising:

providing the floral grouping having a bloom end and a stem end;

providing a substantially flat, flexible wrap having an upper surface and a lower surface and an outer periphery, a wrap opening being formed through a portion of the wrap intersecting the upper and the lower surfaces of the wrap and being spaced a distance from the outer periphery, said wrap being provided with a bonding material on at least one of the upper and lower surfaces of the wrap at least near the wrap opening;

inserting the stem end of the floral grouping through the wrap opening to a position wherein the stem end of the floral grouping extends a distance beyond the lower surface of the wrap; and

forming the wrap about the floral grouping with the upper surface of the wrap being disposed near the floral grouping and the wrap encompassing a substantial portion of the floral grouping while a portion of the stem end of the floral grouping remains extended through the wrap opening and the bloom end remains partially exposed, and portions of the wrap with bonding material thereon being brought into contact and bonded with other portions of the wrap for forming bonded overlapping folds cooperating to secure the wrap tightly wrapped about the stem of the floral grouping.

5,205,109

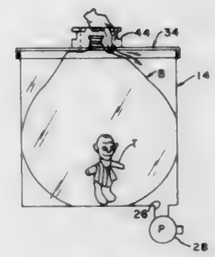
METHOD AND APPARATUS FOR EXPANDING A BALLOON AND ACCESSING THE INTERIOR THEREOF

Matthew J. Conway, 1305 North Hills Blvd., #104, North Little Rock, Ark. 72116

Filed Dec. 23, 1991, Ser. No. 816,344

Int. Cl.[5] **B65B** *43/36, 67/04*

U.S. Cl. 53—403 **6 Claims**



1. An apparatus for expanding a balloon and for providing access to the interior of the balloon comprising:

a chamber having a first opening and a second opening;

means for evacuating air from said chamber through said first opening;

said second opening being defined at least in part by a member extending outwardly from said chamber;

means on said member outside said chamber for holding the neck of a balloon on said member such that when said chamber is evacuated, the balloon will be expanded within said chamber by air entering the balloon through the neck of the balloon;

said means for holding the neck of a balloon include a lip extending around at least a portion of the exterior of said member over which the neck of the balloon will contract; and

a pair of diametrically opposed flats are formed in said lip to aid in removing the neck of the balloon from said lip.

5,205,110

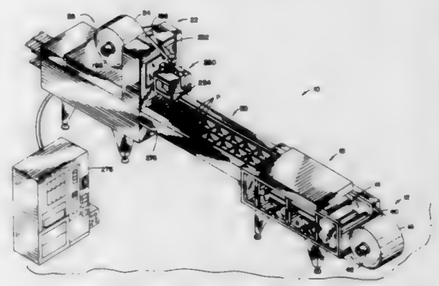
SERVO MOTOR OPERATED INDEXING MOTION PACKAGING MACHINE AND METHOD

Raymond G. Buchko, 1016 E. Florida Ave., Appleton, Wis. 54911

Filed Dec. 12, 1990, Ser. No. 626,278

Int. Cl.[5] **B65B** *47/02, 47/10*

U.S. Cl. 53—453 **28 Claims**



1. An indexing motion packaging machine, comprising:

web supply means for indexingly supplying a flexible web of packaging material to a forming station associated with the packaging machine wherein the web is temporarily maintained stationary at the forming station;

forming means located at the forming station for deforming

the flexible web as it is maintained stationary at the forming station to form a cavity adapted to receive product to

second ends of each ear with one of the spaced walls adjacent the slot formed therein; and

recycle means attached to the discharge port for receiving cuttings produced by the rotatable cutting means and

a first doffer means downstream of said third picking cylinder;

a first pair of rotatable separating cylinders disposed down-

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the flexible web as it is maintained stationary at the forming station to form a cavity adapted to receive product to be packaged, the forming means including forming tooling having a forming cavity, the forming tooling being movable between a first position in which the forming tooling engages the flexible web and acts on the web to form the web into the forming cavity, and a second position in which the forming tooling is moved away from the web; and

means for moving the forming tooling between its first and second positions and for temporarily maintaining the forming tooling stationary in its first position while the forming tooling engages the web and acts on the web to form it into the forming cavity, comprising motor means having a rotatable output shaft and a programmable control associated with the motor means, and means interposed between the motor output shaft and the forming tooling for moving the forming tooling between its first and second positions in response to rotation of the motor output shaft.

5,205,111

PACKAGING METHOD FOR A LEVEL AND CASE

Robert A. Johnson, Mequon, Wis., assignor to Johnson Level & Tool Mfg. Co., Inc., Mequon, Wis.

Division of Ser. No. 368,670, Jun. 20, 1989, Pat. No. 5,027,951. This application Apr. 22, 1991, Ser. No. 689,363

Int. Cl.[5] **B65B** *5/02, 5/08, 43/08*

U.S. Cl. 53—456 **8 Claims**

1. A method of packaging a level and a case for the level for shipping and display of the level and case prior to purchase by a consumer, wherein the case is adapted to receive and enclose the level when the level is not in use, the method comprising the steps of:

providing a tray defining a pair of spaced walls, each wall having a slot formed therein;

positioning the level and case next to each other in a side-by-side manner within the tray between the spaced walls;

retaining the level and case within the tray, so as to maintain the level and case in a side-by-side manner during shipping and display of the level and case, by providing a retainer member having a pair of spaced ears, each ear defining a first end and a second end, and engaging the retainer member with the tray by positioning the first end of each retainer member ear within the slot formed in one of the spaced walls toward one end of the slot, and pivoting the second end of each retainer member ear downwardly toward the opposite end of the slot, to engage the first and second ends of each ear with one of the spaced walls adjacent the slot formed therein; and

constructing the tray and the retainer member such that a portion of the level and case are visible, to allow visual access to the level and case when retained within the tray.

5,205,112

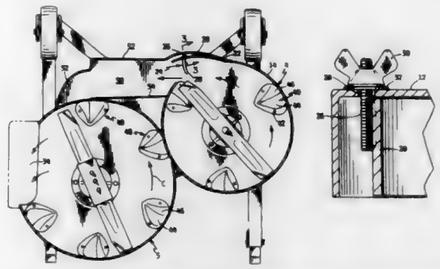
MULTI-BLADED MULCHING/BAGGING MOWER

Henry B. Tillotson, Minneapolis, and James R. Baumann, Saint Louis Park, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Mar. 20, 1992, Ser. No. 854,168

Int. Cl.[5] **A01D** *34/66, 34/73*

U.S. Cl. 56—2 **20 Claims**



17. A multi-bladed mower which includes a grass discharge/collection mode, which comprises:

(a) a cutting deck which is movable over the ground;

(b) first and second cutting chambers carried on the cutting deck in each of which at least one generally horizontal cutting blade is contained, the cutting blades being rotatable about a vertical axis to sever grass or the like;

(c) wherein the first cutting chamber is provided with a discharge outlet which is open in the discharge-collection mode of the mower to allow the grass clippings to be evacuated from the first cutting chamber through the discharge outlet; and

(d) wherein the second cutting chamber has means which is open in the discharge/collection mode of the mower for allowing the grass clippings circulating therein to exit therefrom and be deposited on the ground in advance of the first cutting chamber to be picked up and evacuated by the blade in the first cutting chamber as the first cutting chamber passes over the grass clippings deposited on the ground from the second cutting chamber.

5,205,113

CUTTING APPARATUS MULCH RECYCLE SYSTEM

Arthur L. Fassauer, 420 Foster La., Canyon, Tex. 79015

Continuation-in-part of Ser. No. 680,788, Apr. 3, 1991, Pat. No. 5,123,235, which is a continuation-in-part of Ser. No. 528,718, May 24, 1990, Pat. No. 5,101,615. This application Mar. 26, 1992, Ser. No. 857,766

Int. Cl.[5] **A01D** *53/00*

U.S. Cl. 56—12.8 **30 Claims**

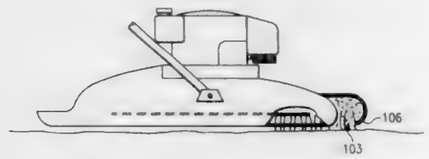
1. A cutting apparatus, comprising:

a substantially endless housing having an open bottom, an air intake opening and a discharge port;

projection means projecting inwardly from a bottom part of said housing, said housing cooperating with said projection means to define a substantially enclosed centrifuge chamber;

rotatable cutting means mounted in the housing; and

recycle means attached to the discharge port for receiving cuttings produced by the rotatable cutting means and



delivering said cuttings to a predetermined location adjacent said endless housing for mulching.

5,205,114

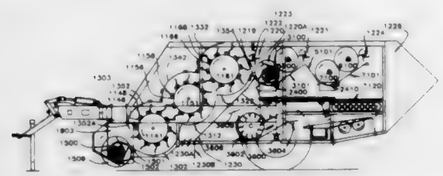
PEANUT COMBINE

Oliver K. Hobbs, c/o Hobbs Engineering Company 300 Kenyon Rd., Suffolk, Va. 23434

Continuation-in-part of Ser. No. 599,038, Oct. 17, 1990, Pat. No. 5,138,826. This application Jul. 22, 1992, Ser. No. 917,187

Int. Cl.[5] **A01D** *29/00*

U.S. Cl. 56—14.6 **12 Claims**



1. A peanut combine for thrashing peanuts from their vine comprising:

a combine body including first and second spaced apart side walls defining a flow path through said body;

a rotatable header cylinder for receiving cut peanut vines from the ground;

a first picking cylinder rotatably mounted between said first and second walls for carrying the peanut vines from the header and for separating peanuts from the peanut vines;

a second picking cylinder rotatably mounted between said first and second walls for receiving peanut vines from said first picking cylinder and for separating peanuts from said peanut vines;

a third picking cylinder rotatably mounted between said first and second walls for receiving peanut vines from said second picking cylinder and for separating peanuts from their vines, said first, second and third picking cylinders being located in said flow path downstream from each other with the third picking cylinder being at a higher elevation above the ground than the first picking cylinder;

first, second and third concave screens each disposed in a spaced relationship respectively beneath said first, second and third picking cylinders in a lengthwise direction;

first, second and third covers each disposed in a spaced relationship over each said picking cylinder in a lengthwise direction;

said header cylinder and said picking cylinders being positioned and rotated for routing peanut vines from said header cylinder to said first picking cylinder over said first concave screen and beneath said first picking cylinder to beneath said second picking cylinder over said second concave screen and to beneath said third picking cylinder over said third concave screen;

vine control means for routing selected ones of said peanut vines from beneath said third picking cylinder over a top of said rotating third picking cylinder and into a space between said third picking cylinder and said third cover;

a first doffer means downstream of said third picking cylinder;

a first pair of rotatable separating cylinders disposed downstream from said third picking cylinder, said first pair of separating cylinders comprising a first separating cylinder disposed in substantially the same horizontal plane as said third picking cylinder and a second separating cylinder downstream of said first separating cylinder and at a higher elevation with respect to the horizontal than said first separating cylinder;

said first doffer means being positioned to route said selected ones of said peanut vines from beneath said third picking cylinder to said first pair of separating cylinders;

a second doffer means downstream of said first pair of separating cylinders;

a second pair of rotatable separating cylinders downstream of said second doffer means and comprising a third separating cylinder disposed in substantially the same horizontal plane as said first separating cylinder and a fourth separating cylinder downstream of said third separating cylinder and disposed at a higher elevation with respect to the horizontal than said third separating cylinder;

vine slide means for routing peanut vines beneath said first and second pairs of separating cylinders;

said second doffer means being positioned to route first selected ones of said peanut vines from said first pair of separating cylinders to said second pair of separating cylinders, the arrangement being such that peanut vines not so selected are routed to go back again beneath said first pair of separating cylinders;

said vine slide means further comprising spaced apart tine means for allowing peanuts separated from their vines to fall therethrough; and

a third doffer means positioned to accept said first selected vines from said second pair of separating cylinders and routing said second selected vines downstream of said third doffer means, the arrangement being such that vines not so selected are routed to go back again beneath said second pair of separating cylinders.

5,205,115

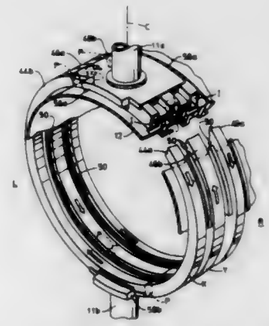
GAS TURBINE ENGINE CASE COUNTERFLOW THERMAL CONTROL

Larry W. Plemmons, Fairfield; Robert Proctor, West Chester, both of Ohio; Robert J. Albers, Park Hills, Ky., and Donald L. Gardner, West Chester, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 4, 1991, Ser. No. 787,498

Int. Cl.[5] **F02C** *3/00*

U.S. Cl. 60—39.75 **12 Claims**



1. A thermal control apparatus for a gas turbine engine casing, said thermal control apparatus comprising:

at least two axially spaced apart circumferentially disposed

continuous flowpaths in heat transfer communication with

first stream to provide an air/fuel ration of about 5/1 or

comprising spinning yarn at a spinning unit,

cross-winding the yarn being spun at the spinning unit on a

a secondary-air cut-off valve in the secondary air line,

secondary-air cut-off valve control apparatus for opening

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continuous flowpaths in heat transfer communication with an axially extending section of the casing,

a means of counterflowing a heat transfer fluid through said flowpaths such that said fluid in one flowpath flows in a clockwise direction and said fluid in the other of said flowpaths flows in a counterclockwise direction, and

a means for effecting heat transfer between said fluid and said casing section.

5,205,116

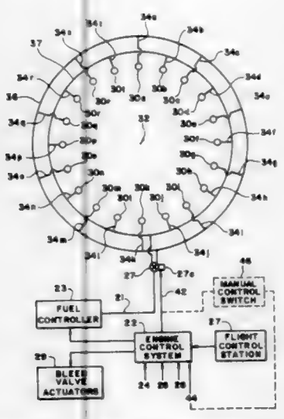
COMPRESSOR STALL RECOVERY APPARATUS

Thomas V. Ng, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 732,895, Jul. 19, 1991. This application Sep. 25, 1992, Ser. No. 950,541

Int. Cl.[5] F02C *9/28*

U.S. Cl. 60—39.281 **7 Claims**



1. A compressor stall recovery apparatus for a gas turbine engine having a combustor downstream of the compressor, the combustor having a plurality of nozzles disposed in an annular array around an axis of the gas turbine engine, the apparatus comprising:

a first manifold interconnecting a portion of the plurality of nozzles;

a second manifold interconnecting a remaining portion of the plurality of nozzles;

valve means for regulating the flow of fuel to the first and second manifolds;

means for detecting a compressor stall condition; and

control means operable in response to the detecting means, for controlling the valve means to block the flow of fuel to one of the first and second manifolds when the detecting means detects a compressor stall condition.

5,205,117

HIGH ALTITUDE STARTING TWO-STAGE FUEL INJECTION

Jack R. Shekleton, and Steven A. Sachrison, both of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 455,519, Dec. 21, 1989, abandoned. This application Feb. 1, 1991, Ser. No. 649,601

Int. Cl.[5] F02C *3/00, 7/26*

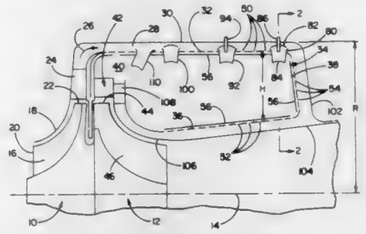
U.S. Cl. 60—39.06 **6 Claims**

1. A method of combusting fuel in an annular combustor for a gas turbine engine so as to permit a reduction in the dome height of the combustor comprising the steps of:

a) injecting a first fuel stream into the combustor adjacent the dome thereof while supplying air to the area of the first stream to provide an air/fuel ration of about 5/1 or less;

b) downstream of the performance of step a), injecting a second fuel stream into the combustor while supplying air to the area of the second stream to provide an air/fuel ratio of about 5/1 or less;

c) downstream of the performance of step b) supplying additional air to raise the overall ratio of air supplied



during the performance of steps a), b) and c) to the fuel supplied during the performance of steps b) and c) to about 13/1 to 17/1; and

wherein the supplying of air during at least steps a) and b) is primarily achieved by the introduction of air into the combustor in the circumferential direction; and

wherein at least part of the air supplied as part of step a) is supplied through tangentially directed air blast tubes.

5,205,118

PROCESS AND AN ARRANGEMENT FOR EXCHANGING SPOOLS AND PACKAGES AT AN INDIVIDUAL SPINNING UNIT OF A SPINNING MACHINE

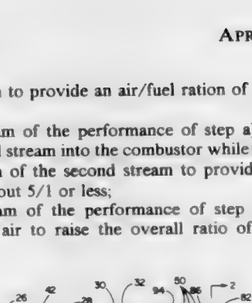
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of Fed. Rep. of Germany

Filed Mar. 21, 1990, Ser. No. 496,690

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909420

Int. Cl.[5] D01H *9/00, 7/92;* **D02G** *1/16;* **B65H** *54/00*

U.S. Cl. 57—269 **40 Claims**



1. A process for forming spool packages at an individual spinning unit of a spinning machine having a plurality of spinning units of the type which each produce at least one yarn which is withdrawn by means of a withdrawal device and is wound onto a spool package by means of a winding device which contains a cross-winding yarn guide distributing the yarn in longitudinal direction of the spool package, in which case, after a given filling ratio of the spool package is reached, the further yarn production at the respective spinning unit is interrupted and a yarn end is wound onto the spool package, said process comprising:

comprising spinning yarn at a spinning unit,

cross-winding the yarn being spun at the spinning unit on a spool package arranged at the spinning unit, said cross-winding being performed by a cross-winding yarn guide arranged at the spinning unit,

disengaging the yarn being spun from the cross-winding yarn guide when a given filling ratio of the spool package is reached,

and subsequently winding the yarn being spun as final windings onto a predetermined longitudinal of the spool package to thereby facilitate location of the yarn end on the completed spool package during subsequent processing of the yarn, and separating the spool package from the winding device in which case the yarn which continues to be produced for a given time period is stored in a storage device connected behind the withdrawal device, after which the stored yarn subsequently is wound up as the final windings bypassing the cross-winding yarn guide when the spool package is driven again.

5,205,119

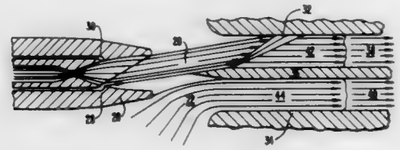
EJECTOR RAMJET

Melvin J. Bulman, Folsom, Calif., assignor to Aerojet-General Corporation, Rancho Cordova, Calif.

Filed Jun. 14, 1991, Ser. No. 715,291

Int. Cl.[5] F02K *7/12*

U.S. Cl. 60—269 **1 Claim**



1. An ejector ramjet comprising:

a nozzle having first and second sides, the nozzle configured to produce a primary fluid jet and an entrained secondary fluid;

a propulsion duct through which the primary fluid jet and entrained secondary fluid flow, the propulsion duct comprising a plurality of reactangular cross-sectional tubes positioned downstream from the nozzle for alternately receiving the primary fluid and entrained secondary fluid; and

means for alternately separating the primary fluid jet from the first and second sides of the nozzle, thereby directing the primary jet and entrained secondary flow to said rectangular cross-sectioned tubes in alternating manner.

5,205,120

MIXTURE-COMPRESSING INTERNAL-COMBUSTION ENGINE WITH SECONDARY-AIR INJECTION AND WITH AIR-MASS METERING IN THE SUCTION PIPE

Kurt Obländer, Kernen; Ludwig Fricker; Alexander Anderson, both of Stuttgart; Hans-Karl Weining, Esslingen; Selcuk Geldec, Talheim; Ralf Krukenberg, Aichwald, and Gerhard Fingerle, Köngen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Dec. 23, 1991, Ser. No. 811,669

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041628

Int. Cl.[5] F01N *3/22*

U.S. Cl. 60—284 **2 Claims**

1. Mixture-compressing internal-combustion engine comprising:

a suction pipe provided with a throttle flap and an air-mass meter and opening to an engine cylinder inlet valve,

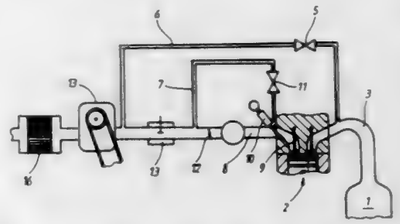
a secondary air line leading to an exhaust line in bypassing relationship to the suction pipe,

a secondary-air cut-off valve in the secondary air line,

secondary-air cut-off valve control apparatus for opening the secondary-air cut-off valve during an engine warming-up phase,

an injection valve for sequential fuel injection into the suction pipe,

a supercharger to provide a supercharged internal combustion engine; and



wherein the secondary-air line leading to the exhaust line via the secondary-air cut-off valve branches-off from the suction pipe between the supercharger and the air mass meter

wherein, downstream of the air mass meter, an additional air line connected with the injection valve branches-off from the suction pipe.

5,205,121

SYSTEM FOR COLLECTING FRUIT FROM TREES

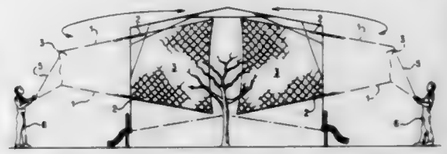
Luis G. de Morais Zoio, and Johanna W. van Mourik, both of Rua Candido dos Reis, Lote 4, Carcavelos, Portugal

Filed Jul. 15, 1991, Ser. No. 729,319

Claims priority, application Portugal, Jul. 16, 1990, 94709

Int. Cl.[5] A01D *46/24*

U.S. Cl. 56—328.1 **9 Claims**



1. An apparatus for collecting fruit from a tree, comprising:

a plurality of panels surrounding the tree, each said panel including a framing element having a free end and a hinged end, and a flexible material region connected to said framing element;

a support structure;

tensioning means linking said hinged end of said framing element to said support structure so that said panels are configured in a biased position; and

means for manipulating each said panel with respect to said biased position of each said panel.

5,205,122

COMBINATION SAND RAKE AND SHOVEL

Albert H. Wong, Los Angeles, Calif., assignor to Dawn Tozour, Glendale, Calif.

Filed Sep. 30, 1991, Ser. No. 768,998

Int. Cl.[5] A01B *1/02, 7/06*

U.S. Cl. 56—400.04 **17 Claims**

1. A combination sand rake and shovel comprising:

a generally planar frame having at least a first edge;

a screen supported by said frame to form a screen frame member;

at an angle with respect to the longitudinal axis of said first pistons;

outlet ports which receive fluid for lubrication and provide a hydrodynamic bearing surface, said porting plate member

5,205,126

VEHICULAR COOLING APPARATUS

Brian E. Schaupp, 3618 Flaherty Cir., and Michael S. Preston

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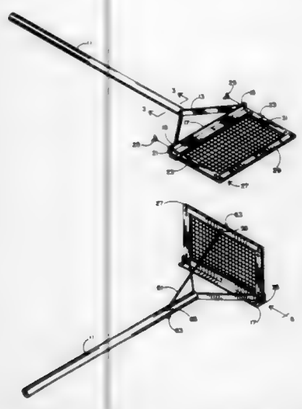
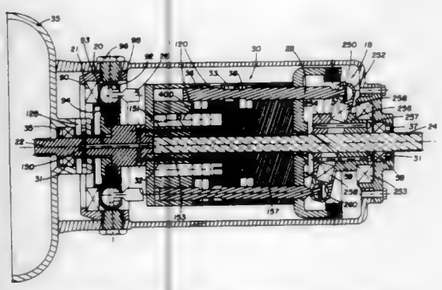
a screen supported by said frame to form a screen frame member;
handle means;
means attaching said handle means to said first edge of said



frame for in either of at least two positions of attachment with respect to said handle for manual operation of said screen frame member, and wherein said handle means is linear and said attaching means attaches said screen frame member to said handle means at a right angle.

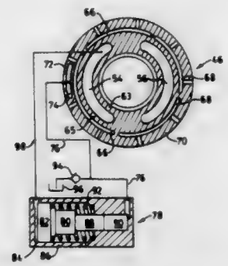
5,205,123
INFINITELY VARIABLE DIFFERENTIAL HYDROSTATIC TRANSMISSION
Phillip E. Dunstan, 1022 S. 208th, Seattle, Wash. 98198
Continuation-in-part of Ser. No. 578,743, Sep. 6, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 812,425
Int. Cl.[5] F16D *39/00*
U.S. Cl. 60—487 **20 Claims**



1. A differential hydrostatic transmission, comprising:
an outer case;
an input shaft and an output shaft rotatably disposed in said case;
a first unit having a plurality of first pistons respectively slidably disposed in a plurality of first piston chambers therein, said first unit being fixedly attached to said input shaft so as to rotate therewith;
a second unit having a plurality of second pistons respectively slidably disposed in a plurality of second piston chambers therein, said second unit being fixedly attached to said input shaft so as to rotate therewith;
a first swashplate means connected to said first pistons and to said output shaft for converting oscillatory motion of said first pistons to rotational movement of said output shaft and vice versa, said first swashplate means being disposed at an angle with respect to the longitudinal axis of said first pistons;
a second swashplate means connected to said second pistons for converting rotational movement of said second unit into oscillatory motion of said first pistons and vice versa, said second swashplate being angularly adjustable from a first position to a second position and being rotatably fixed to said outer case;
means for communicating said second piston chambers with said first piston chambers and vice versa such that fluid pumped from said first piston chambers flows into said second piston chambers and fluid from said second piston chambers flow into said first piston chambers wherein the output speed and output torque of said output shaft is controlled by adjusting the angular position of said second swashplate means between said first position and said second position so as to correspondingly adjust the fluid displacement of said second unit with respect to said first unit;
means for controlling the angle of said second swashplate means to provide an infinite range of output shaft speeds and torques;
wherein said first swashplate means comprises:
an alignment collar fixedly attached to said output shaft so as to be rotatable therewith;
an outer swashplate ring to which each of said first pistons are attached, said outer swashplate ring having pivot attaching means for connecting said first pistons to said outer swashplate ring in such a manner as to allow said outer swashplate ring to freely pivot in a sinusoidal manner with respect to said first pistons when said first pistons are oscillating;
antifriction bearing means for allowing said outer swashplate ring to rotate with respect to said alignment collar;
wherein said outer swashplate ring includes a plurality of spherical cavities disposed therein for respectively receiving an end of said first pistons and wherein said pivot attaching means comprises:
a plurality of pairs of semispherical segments respectively disposed in said cavities in such a manner that the planar surfaces thereof oppose one another, one of said segments in each of said pairs having a through-hole;
a plurality of end fittings respectively secured to the end of each of said first pistons, each of said fittings having an axial portion and a flat portion, said axial portion extending through said through-hole of said one segment, said flat portion being disposed between said opposing planar surfaces of said pair of segments; and
antifriction sliding means disposed between said flat surface of each of said end fittings and said planar surface of the other of said segments in each of said pair of segments such that when said outer swashplate ring is disposed at an angle with respect to said first pistons, any forces exerted by said outer swashplate ring are aligned along the longitudinal axis of said first pistons.

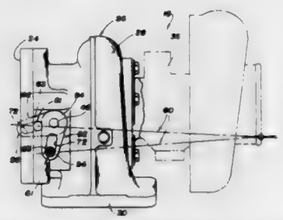
5,205,124
PISTON MOTOR WITH STARTING CHARGE DEVICE
Tadeusz Budzich, deceased, late of Moreland Hills, Ohio by Euphemia Agnes Marshal Budzich, executrix , assignor to Caterpillar Inc., Peoria, Ill.
Filed Jan. 16, 1992, Ser. No. 821,204
Int. Cl.[5] F16D *31/02;* **F01B** *1/00;* **F01M** *1/00*
U.S. Cl. 60—456 **5 Claims**

1. A fluid pressure driven motor having a rotatable driven piston barrel member containing a plurality of pistons reciprocable within cylinder bores in the piston barrel member, an output shaft connected to and driven by said piston barrel member and a fixed porting plate member abutting the barrel containing inlet and outlet arcuate shaped slots in alignment with said pistons to supply fluid to and receive fluid from said pistons, respectively, said porting member having bearing surfaces radially inwardly and outwardly of said inlet and outlet ports which receive fluid for lubrication and provide a hydrodynamic bearing surface, said porting plate member further containing a force pad along a radius passing through said inlet port, said force pad having an opening abutting said piston barrel member, the improvement comprising:
a supplementary charge device having a charge chamber



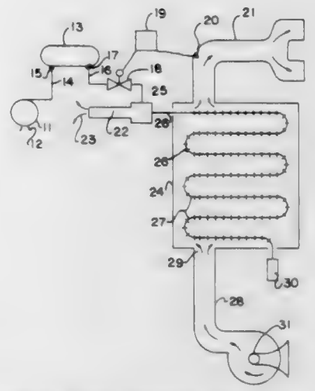
containing a quantity of fluid, passage means connecting said charge chamber to said opening formed in said force pad, and differential area piston means actuated by high pressure motor driving fluid to expel said quantity of fluid into said opening during the motor starting phase to induce temporary separation between the barrel and said porting member.

5,205,125
TURBOCHARGED INTERNAL COMBUSTION ENGINE HAVING EXHAUST GAS PRESSURE ACTUATED TURBINE BYPASS VALVE
Michael A. Potter, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 553,018, Jul. 16, 1990, Pat. No. 5,146,753. This application May 26, 1992, Ser. No. 887,962
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—602 **4 Claims**



1. An exhaust driven supercharger for use with an internal combustion engine comprising a turbine operable by exhaust gas from said engine, a compressor, driven by said turbine, a turbine inlet pressure dependent control means operable to regulate exhaust gas pressure in said turbine, said pressure dependent control means comprising a turbine wastegate having a valve member actuable, in response to turbine inlet pressure, to regulate the flow of exhaust gas through said turbine, a crank member having a first end operably connected to said valve member, a second end spaced radially from said first end to define a lever arm between said ends, biasing means operably connected to said crank member to exert a closing force on said valve, and radially extending lost-motion means disposed between said crank member and said biasing means and operable as said crank member is rotated by the movement of said valve member from a closed to an opened position, to vary the effective lever arm between said biasing means and said valve member and said closing force exerted on said valve by said biasing means.

5,205,126
VEHICULAR COOLING APPARATUS
Brian F. Schnurr, 3618 Flaherty Cir., and Michael S. Preston, 991-E Tulip Pl., both of Honolulu, Hi. 96818
Filed Apr. 15, 1992, Ser. No. 868,672
Int. Cl.[5] F25B *9/04*
U.S. Cl. 62—5 **1 Claim**



1. A vehicular cooling apparatus, comprising,
a compressor, the compressor including a compressor intake, and a first conduit directed from the compressor at first conduit first distal end,
and
a storage flask, the storage flask in fluid communication with the first conduit at a first conduit second distal end,
and
a first conduit check valve within the first conduit between the compressor and the storage flask,
and
a second conduit, the second conduit including a second conduit first distal end directed into pneumatic communication with the storage flask,
and
a solenoid valve, with a second conduit second distal end directed into the solenoid valve,
and
a second conduit check valve oriented between the solenoid valve and the storage flask,
and
a third conduit directed from the solenoid valve,
and
a directional tube directing cooled air from the third conduit exteriorly of the directional tube,
and
a fourth conduit directed from the directional tube in pneumatic communication with the directional tube and the third conduit,
and
a cooling chamber, the fourth conduit directed into the cooling chamber,
and
a plurality of spaced cooling fins mounted in surrounding relationship relative to the fourth conduit within the cooling chamber,
and
an exit plenum directed in pneumatic communication with the cooling chamber exteriorly thereof, with the exit plenum including a temperature sensor positioned therewithin,
and
a thermostatic control, and the thermostatic control in communication with the temperature sensor and the solenoid valve for effecting actuation of the solenoid valve in rela-

tion to a predetermined temperature detected by the temperature sensor

f) introducing the liquid nitrogen fraction to an upper part of the ultra high purity nitrogen column as feed;

servable product viscosity; product supply means for supplying unfrozen product to the freezing chambers, refrigeration

said one of the freezing chambers and for generating and applying a periodic pulse width modulated signals having

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tion to a predetermined temperature detected by the temperature sensor,

and

an inlet plenum directed into the cooling chamber,

and

the inlet plenum directed into a first wall of the cooling chamber, and the exit plenum directed into the second spaced parallel wall of the cooling chamber,

and

the cooling chamber including a hinged lid hingedly mounted to the cooling chamber for access interiorly of the cooling chamber,

and

the fourth conduit projecting from the cooling chamber, and including a muffler positioned exteriorly of the cooling chamber,

and

the inlet plenum including a blower motor mounted within the inlet plenum for directing air through the inlet plenum and the cooling chamber for projection into the exit plenum.

5,205,127

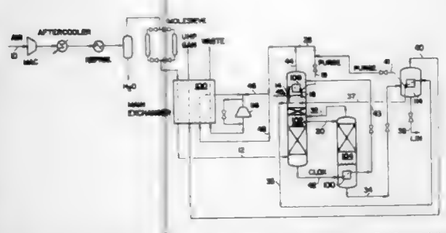
CRYOGENIC PROCESS FOR PRODUCING ULTRA HIGH PURITY NITROGEN

Rakesh Agrawal, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 638,483, Jan. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 563,012, Aug. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 562,878, Aug. 6, 1990, abandoned. This application Aug. 27, 1991, Ser. No. 750,332

Int. Cl.[5] **F25J** *3/02*

U.S. Cl. 62—24 **8 Claims**



1. In a process for the cryogenic separation of air which comprises nitrogen, oxygen and volatile impurities in an integrated multi-column distillation system wherein an air stream is compressed, freed of condensible impurities, and cooled generating a feed for the integrated multi-column distillation system, the improvement for producing an ultra high purity nitrogen product in a multi-column distillation system comprising a first column and an ultra high purity nitrogen column which comprises:

a) generating a nitrogen rich vapor containing volatile impurities in an upper part of the first column and a crude liquid oxygen fraction in a lower part of said first column;

b) removing a fraction of said nitrogen-rich vapor containing volatile impurities and at least partially condensing at least a portion of said stream thereby forming a first condensed fraction and an uncondensed fraction;

c) returning at least a portion of said first condensed fraction as reflux to a column in the distillation system;

d) a portion of the uncondensed nitrogen rich vapor fraction rich in volatile impurities generated in step b) as a purge stream;

e) generating a liquid nitrogen fraction in an upper part of said first column and removing said liquid nitrogen fraction from the first column;

f) introducing the liquid nitrogen fraction to an upper part of the ultra high purity nitrogen column as feed;

g) generating a nitrogen rich vapor fraction containing residual volatile impurities in the ultra high purity nitrogen column and removing that fraction as an overhead; and

h) removing an ultra high purity nitrogen fraction from the ultra high purity nitrogen column.

5,205,128

MULTICHAMBER STORAGE APPARATUS AND RELATED METHOD

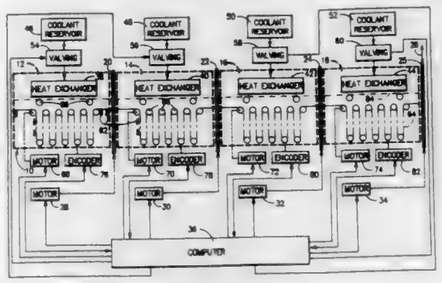
Daniel D. Richard, Sedona, Ariz., assignor to Cryo-Cell International, Inc., Baldwin, N.Y.

Continuation-in-part of Ser. No. 670,979, Mar. 18, 1991, which is a continuation-in-part of Ser. No. 535,414, Jun. 8, 1990, Pat. No. 5,029,447. This application Jul. 8, 1991, Ser. No. 726,841

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] **F25D** *13/06*

U.S. Cl. 62—63 **25 Claims**



1. A storage apparatus comprising:

housing means for defining a plurality of chambers disposed one next to the other, said housing means including partition means for separating said chambers from one another;

temperature control means for controlling temperature independently in each of said chambers;

first access means for enabling communication between each one of said chambers and at least one other of said chambers contiguous with said one of said chambers;

support means for holding a plurality of specimens within each of said chambers;

conveyance means for transfering selected specimens between contiguous ones of said chambers via said first access means, independently of other specimens in said housing means; and

second access means for enabling deposition and removal of given specimens from said housing means.

5,205,129

APPARATUS FOR FREEZING AND DISPENSING SEMI-FROZEN FOOD PRODUCTS HAVING DUAL FREEZING CHAMBERS AND METHOD

Gregory A. Wright, Machesney Park, Ill., and Peter F. McNamee, Beloit, Wis., assignors to Specialty Equipment Companies, Inc., Rockton, Ill.

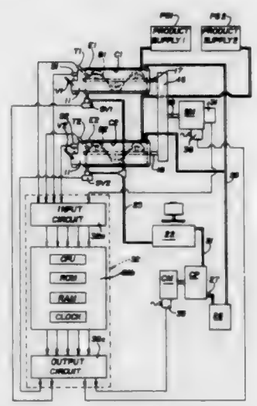
Filed Apr. 30, 1992, Ser. No. 875,836

Int. Cl.[5] **A23G** *9/12*

U.S. Cl. 62—68 **25 Claims**

1. In a soft-serve dispensing apparatus including two freezing chambers each having an evaporator and a rotary beater, dispensing valve means for dispensing semi-frozen product from the freezing chambers, dispense sensing means for sensing when product is dispensed from each freezing chamber, product condition sensing means for sensing a condition of the product in the freezing chambers that is related to a minimum servable product viscosity; product supply means for supplying unfrozen product to the freezing chambers, refrigeration producer means including a compressor having a compressor drive motor, a condenser, a high pressure refrigerant supply means including a refrigerant expansion control means individual to each evaporator means and low pressure refrigerant return line means for returning refrigerant from both evaporator means to the compressor, and beater drive means for driving the beaters, the improvement comprising, the beater drive means has a single drive motor and power transmission means for connecting the drive motor to the beaters in both freezing chambers to drive both beaters concurrently, said refrigerant expansion control means each comprising an on-off solenoid valve, means for starting an auto-cycle operation of the apparatus, and control means for controlling operation of the compressor drive motor and the beater drive motor and the solenoid valves,

(a) said control means including means responsive to starting an auto-cycle of the apparatus for operating the apparatus in an initial freeze mode, said control means including means operative in the initial freeze mode for generating and applying peroidic pulse width modulated signals having substantially equal duty cycles PWF1 to the solenoid valves associated with the evaporators for both freezing chambers where the duty cycle PWF1 provides an



effective refrigerant flow rate sufficient to increase the viscosity of the product in the freezing chambers,

(b) said control means including means responsive to the dispense sensing means for operating apparatus in a first refreeze mode, the control means including means operative in the first refreeze mode when product is dispensed from one of the freezing chambers for generating and for applying a periodic pulse width modulated signal to the solenoid valve associated with said one of the freezing chambers having a duty cycle PWF2 and for generating and applying a periodic pulse width modulated signal to the solenoid valve associated with the other of the freezing chambers having a duty cycle PWH, where the duty cycle PWF2 provides an effective refrigerant flow rate sufficient to increase the viscosity of the product in said one freezing chamber and the duty cycle PWH provides an effective refrigerant flow rate sufficient to substantially maintain the viscosity of the product in said other freezing chamber,

(c) said control means further including means responsive to said product condition sensing means for operating the apparatus in a second refreeze mode, said control means including means operative in said second refreeze mode when the product in one freezing chamber is below a minimum servable product viscosity for generating and applying a periodic pulse width modulated signals having a duty cycle PWF2' to the solenoid valve associated with said one of the freezing chambers and for generating and applying a periodic pulse width modulated signals having a duty cycle PWH' to the solenoid valve associated with the other of the freezing chambers where the duty cycle PWF2' provides an effective refrigerant flow rate sufficient to increase the viscosity of the product in said one freezing chamber and the duty cycle PWH' provides an effective refrigerant flow rate to substantially maintain the viscosity of the product in said other freezing chamber.

5,205,130

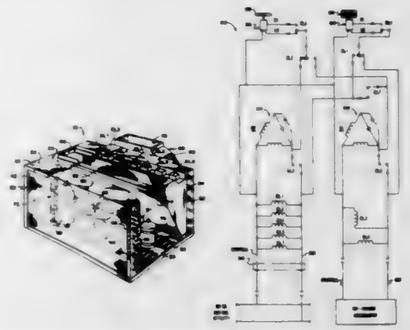
DUAL STAGE AC SYSTEM FOR RECREATIONAL VEHICLE

Bobby L. Pannell, P.O. Box 116968, Carrollton, Tex. 75007

Filed Jul. 2, 1991, Ser. No. 724,832

Int. Cl.[5] **F25B** *27/00*

U.S. Cl. 62—236 **5 Claims**



2. A dual stage air conditioning system for installation in a recreational vehicle of the type having an on-board AC power generator and a power cable for connection to an electrical utility power outlet, said dual stage air conditioning system comprising:

first and second refrigeration stages including first and second refrigerant compressors, first and second condensers, first and second refrigerant expansion valves and first and second evaporators;

said first compressor, first condenser, first refrigerant expansion valve and first evaporator being serially connected in a first refrigeration circuit;

said second compressor, second condenser, second refrigerant expansion valve and second evaporator being serially connected in a second refrigeration circuit;

a condenser fan for circulating outside air across the first and second condensers;

an evaporator fan for circulating interior air from the recreational vehicle across the first and second evaporators; and,

a control circuit for automatically applying electrical operating power to the evaporator fan, the condenser fan and the compressor of only one refrigeration stage when power is applied from an on-board generator, and for automatically applying AC operating power to the evaporator fan, the condenser fan and the compressors of both refrigeration stages when operating power is applied from a utility outlet.

5,205,131

REFRIGERATOR SYSTEM WITH SUBCOOLING FLOW

(DUT) to a setpoint temperature, the method comprising the steps of:

in heat transfer relation with said water for delivering heat from said refrigerant material thereto to condense said refrigerant material to liquid;

axis from said inlet to said outlet, said conveyor including a foraminous portion which supports said food products, refrigeration apparatus within said enclosure including heat

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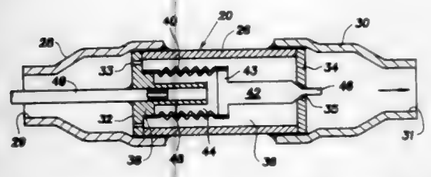
5,205,131

REFRIGERATOR SYSTEM WITH SUBCOOLING FLOW CONTROL

Jerome D. Powlas, Maple Grove, Minn., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 671,390, Mar. 19, 1991, abandoned. This application Apr. 9, 1992, Ser. No. 867,281
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—203 2 Claims



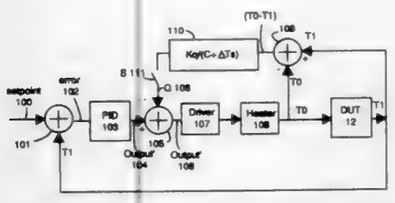
1. A refrigerated cabinet comprising a compartment in said cabinet, a compressor and a condenser mounted on said cabinet, an evaporator in said compartment, a capillary tube connecting said evaporator and said condenser in a closed circuit containing a first refrigerant, a thermostat responsive to the temperature in said compartment for selectively energizing said compressor to maintain the temperature in said compartment within a predetermined range, a flow control valve between said condenser and said capillary tube, said flow control valve having a housing defining a first chamber, an inlet to said first chamber connected to said condenser, an outlet from said first chamber to said capillary tube, said housing being mounted on said cabinet at a low point in the system with said inlet and said outlet fittings being in substantially vertical alignment to insure that only a subcooled liquid flows to said inlet, a valve seat on said housing at said outlet, a movable wall member within said first chamber defining a second chamber, said movable wall member being secured to said housing, a valve member operable by movement of said movable wall member to move to and from said valve seat, said second chamber being filled with a predetermined saturated charge of a second refrigerant whereby said valve member is spaced from said valve seat when the subcooling of said first refrigerant in said first chamber is greater than a predetermined amount and said valve member is moved into engagement with said valve seat when the subcooling of said refrigerant in said first chamber is less than said predetermined amount, engagement of said valve member with said valve seat preventing any flow of said first refrigerant from said inlet to said outlet.

5,205,132

COMPUTER-IMPLEMENTED METHOD AND SYSTEM FOR PRECISE TEMPERATURE CONTROL OF A DEVICE UNDER TEST

Deng-Yuan Fu, Sunnyvale, Calif., assignor to Thermonics Incorporated, Santa Clara, Calif.

Filed Jun. 12, 1992, Ser. No. 898,073
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—208 9 Claims



1. A method of temperature forcing of a device-under-test (DUT) to a setpoint temperature, the method comprising the steps of:

measuring the temperature of an air flow directed at the DUT to obtain a value T0;

measuring the temperature of the DUT to obtain a value T1; and

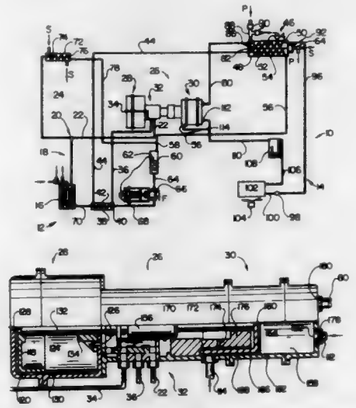
compensating a closed-loop temperature control system in control of said DUT with a value Q that is equal to a constant times the difference between T0 and T1 when T1 is within a predetermined temperature window embracing the setpoint temperature.

5,205,133

HIGH EFFICIENCY POOL HEATING SYSTEM

David Lackstrom, Medina, Ohio, assignor to R & D Technologies, Inc., Willington, Conn.

Filed Jan. 16, 1992, Ser. No. 821,391
Int. Cl.[5] F25B *27/00, 1/00, 1/02*
U.S. Cl. 62—238.4 22 Claims



1. A system for heating water in at least one of a swimming pool or a spa, comprising:

at least one of swimming pool or spa housing water; and

a power circuit including:

hydrocarbon fired heating means for heating and vaporizing a refrigerant material;

a first enclosed chamber;

a first member means movably mounted in said first chamber for movement responsive to pressure of refrigerant material in said first chamber;

first valve means in fluid communication with said heating means and said first chamber for selectively delivering refrigerant material to said first chamber and for exhausting refrigerant material from said first chamber;

first heat exchanger means in fluid communication with said first valve means, said first heat exchanger means receiving refrigerant exhausted from said first chamber, said first heat exchanger means in heat transfer relation with said water and delivering heat from said refrigerant material thereto to condense said refrigerant material to liquid; and

pumping means in fluid communication with said first heat exchanger means and said heating means, for pumping liquid refrigerant material from said first heat exchanger means to said heating means; and

a heat pump circuit including:

compressor means in mechanically powered connection with said first member means of said power circuit, for compressing vaporized refrigerant material;

second heat exchanger means in fluid communication with said compressor means and receiving compressed refrigerant material therefrom, said second heat exchanger means

in heat transfer relation with said water for delivering heat from said refrigerant material thereto to condense said refrigerant material to liquid;

expansion means in fluid communication with said second heat exchanger means for expanding refrigerant material delivered to said expansion means from said second heat exchanger means; and

evaporator means in fluid communication with said expansion means and said compressor means, said evaporator means in heat transfer relation with atmosphere, said refrigerant material receiving heat therefrom to vaporize said refrigerant material, whereby vaporized refrigerant material is delivered from said evaporator means to said compressor means;

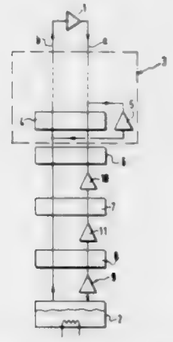
the system further comprising, third heat exchanger means in heat transfer relation with said water, and bypass valve means in said power circuit for directing said refrigerant in said power circuit through said third heat exchanger means in lieu of said first chamber and said first heat exchanger means.

5,205,134

GAS LIQUEFACTION PROCESS AND REFRIGERATION PLANT

Guy Gistau-Baguer, Biviers, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 16, 1991, Ser. No. 777,139
Claims priority, application France, Oct. 26, 1990, 90 13280
Int. Cl.[5] F25B *7/00*
U.S. Cl. 62—335 4 Claims



1. A refrigeration plant having a cooling circuit of a fluid having a low boiling point comprising, serially arranged:

a pre-cooling stage,

a refrigeration stage comprising, in series, a first heat exchanger, a first turbine, a second heat exchanger, a second turbine, and a third heat exchanger,

a downstream dynamic expansion device, and

a liquid fluid reservoir.

5,205,135

HELICAL CONVEYOR FREEZER

Gary D. Lang, Wooster, Ohio, assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Nov. 13, 1991, Ser. No. 791,893
Int. Cl.[5] F25D *25/02*
U.S. Cl. 62—381 25 Claims

1. A freezer for freezing food products comprising:

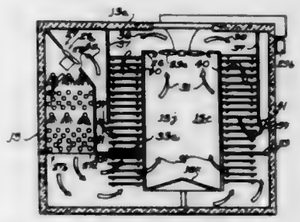
an insulated enclosure having a inlet and an outlet,

a helical conveyor disposed within said enclosure and including a plurality of superimposed flights for transporting food products along a helical path around a vertical axis from said inlet to said outlet, said conveyor including a foraminous portion which supports said food products,

refrigeration apparatus within said enclosure including heat exchange means and gas circulation means to cool an atmosphere gas and circulate said atmosphere gas through and across said conveyor into contact with said food products on said conveyor,

baffle means positioned adjacent to said conveyor to direct the circulating atmosphere gas through and across said conveyor to provide a first cooling zone in which said food products are cooled rapidly and a second cooling zone in which said food products are cooled less rapidly at a substantially uniform rate,

a plurality of the flights of said helical conveyor being disposed in said first cooling zone adjacent to said inlet, the



flights of said helical conveyor positioned out of said first cooling zone being positioned in said second cooling zone,

said refrigeration apparatus having an output supplying cooled atmosphere gas to the portion of said enclosure adjacent to said first cooling zone and an input for drawing in and recirculating atmosphere gas which has extracted heat from said food products,

said cooled atmosphere gas in said first cooling zone passing horizontally across said flights inwardly toward said vertical axis,

said baffle means directing said atmosphere gas from said first cooling zone vertically within said helical conveyor in a first direction and then vertically in the reverse direction through all of the flights of said helical conveyor within said second cooling zone and then to said input for said refrigeration apparatus.

5,205,136

TRIPLE-EFFECT ABSORPTION REFRIGERATION SYSTEM WITH DOUBLE-CONDENSER COUPLING

Robert C. DeVault, Knoxville, Tenn., and Wendell J. Biermann, Fayetteville, N.Y., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 11, 1992, Ser. No. 850,364
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—476 18 Claims

1. A multiple-effect absorption refrigeration system having a double-coupled condenser, said system comprising:

first second and third generator means, first, second and third condensing means, evaporating means, and absorber means operatively coupled together and with the first, second and third condensing means adapted to respectively receive vaporous refrigerant from the first, second and third generator means for condensing the vaporous refrigerant;

means for heating refrigerant-containing absorption solution in the third generator means to a first refrigerant-vaporizing temperature;

first heat exchange means operatively associated with the third condensing means and the second generator means for heating refrigerant-containing absorption solution in the second generator means to a second refrigerant-vaporizing temperature that is lower than said first temperature;

second heat exchange means operatively associated with the

second condensing means and the first generator means for providing heat to the refrigerant-containing adsorp-

obtained by condensing vapor of said refrigerant generated in said regenerating chamber; and

evaporator chamber, said rows being so positioned relative to one another that said fins on said elongated straight

manipulating means and the take-up location, the sueding means comprising a sueding roll having an abrasive peripheral

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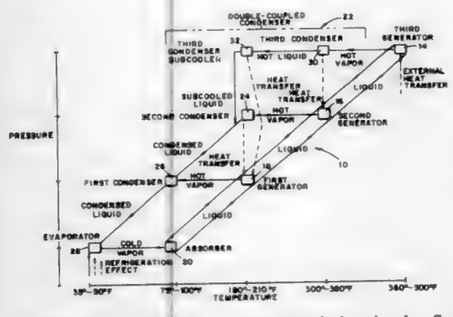
second condensing means and the first generator means for providing heat to the refrigerant-containing adsorption solution in the first generator means; and

heat transfer means for combining heat from refrigerant condensed in the third condensing means with the heat provided to the refrigerant-containing solution in the first generator means by the second heat exchange means for



heating the refrigerant-containing solution in the first generator means to a third refrigerant-vaporizing temperature that is lower than said second temperature, said heat transfer means comprising means for combining the condensed refrigerant from the third condensing means with vaporous refrigerant from the second generator means prior to being received by the second condensing means.

5,205,137

ABSORPTION AIR CONDITIONER

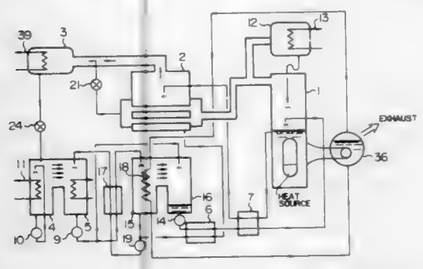
Tomihisa Ohuchi, Tsukuba; Akira Nishiguchi, Ushiku; Daisuke Hisajima, Ibaraki; Seiichiro Sakaguchi, Ibaraki; Yoshifumi Kunugi, Ibaraki; Michihiko Aizawa, Ushiku; Katsuya Ebara, Mito, and Hiroaki Yoda, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,159

Claims priority, application Japan, Sep. 5, 1990, 2-233263; Sep. 7, 1990, 2-235623

Int. Cl.[5] F25B *15/00*

U.S. Cl. 62—484 **23 Claims**



1. An absorption air conditioner having an evaporator, an absorber for discharging a dilute solution, a regenerator, a condenser and a first conduit for connecting the evaporator, the absorber, the regenerator and the condenser, said absorption air conditioner comprising:

a regenerating chamber for generating a refrigerant and an absorbing chamber connected to each other by a passage for vapor;

means disposed in said regenerating chamber and for heating said dilute solution;

a second conduit for conducting a portion of said dilute solution discharged from said absorber to said regenerating chamber;

a third conduit for returning, to said absorber, a solution obtained by condensing vapor of said refrigerant generated in said regenerating chamber; and

a fourth conduit for conducting, after a residual portion of said dilute solution discharged from said absorber has been introduced into said absorption chamber and said vapor of said refrigerant generated in said regenerating chamber has been absorbed by said residual portion of said dilute solution, said dilute solution to said regenerator.

5,205,138

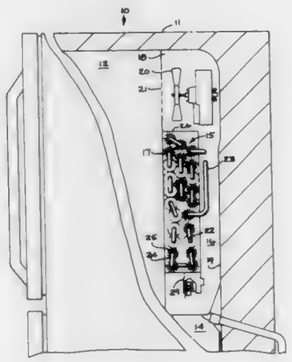
SPINE FIN REFRIGERATOR EVAPORATOR

John K. Besore; Bruce L. Ruark, both of Louisville, Ky., and Jerry C. Martin, Corydon, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 8, 1992, Ser. No. 818,137

Int. Cl.[5] F25B *39/02*

U.S. Cl. 62—515 **15 Claims**



1. A refrigerator including:

an evaporator chamber;

means for causing air to flow through said evaporator chamber in a predetermined direction;

a refrigerant evaporator disposed within said evaporator chamber;

said refrigerant evaporator including:

an elongated tube having elongated straight runs and return bent ends joining said elongated straight runs in a serpentine arrangement;

a plurality of heat exchange fins disposed along at least each of said elongated straight runs, said fins projecting outwardly therefrom;

said elongated straight runs being arranged in said evaporator chamber in a plurality of passes extending substantially perpendicular to the direction of air flow through said evaporator chamber;

said refrigerant evaporator having a first section of said elongated straight runs initially exposed to air flow through said evaporator chamber;

said elongated straight runs of said first section being arranged in two rows extending generally in the direction of air flow through said first section in which said fins on said elongated straight runs in one of said rows are spaced from said fins of said elongated straight runs in the other of said rows to form an air passage therebetween for air flowing through said evaporator chamber;

and said refrigerant evaporator having a second section of said elongated straight runs connected to said first section of said elongated straight runs and exposed to air flow after it has passed through said first section of said elongated straight runs, said elongated straight runs of said second section being arranged in a plurality of rows extending generally in the direction of air flow through said

evaporator chamber, said rows being so positioned relative to one another that said fins on said elongated straight runs in each of said rows overlap said fins on said elongated straight runs in each of said rows adjacent thereto.

5,205,139

METHOD AND DEVICE COMPRISING DEFORMABLE SPRING CONTRAINTS FOR NEEDLE SELECTION IN A CIRCULAR KNITTING MACHINE

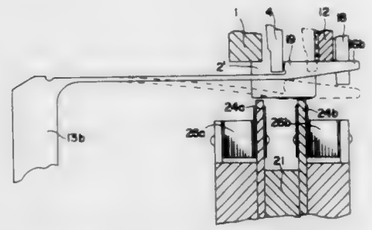
Piero Aria, Florence, Italy, assignor to Savio S.p.A., Pordenone, Italy

Filed Dec. 19, 1991, Ser. No. 810,388

Claims priority, application Italy, Dec. 21, 1990, 22472 A/90

Int. Cl.[5] D04B *15/78*

U.S. Cl. 66—13 **11 Claims**



1. An electromagnetic device for selecting needles in a circular knitting machine having a needle cylinder, comprising:

a) a jack for activating a corresponding needle, wherein said jack is slidably housed in a groove of the cylinder and is biased toward an active position;

b) a cam for radially moving said jack from said active position to an inactive position;

c) a spring corresponding to said jack, and positioned below said jack and substantially within the circumference of the needle cylinder, wherein said spring is biased for engaging said jack in said inactive position, and wherein said spring is axially deformable for releasing said jack from said engagement thereby allowing said jack to return to its active position; and

d) a stationary selection electromagnetic device located proximate said spring, wherein said selection device has a permanent magnet for attracting said spring and an electromagnet, wherein said electromagnet is selectively deenergized or is selectively energized for creating a concurrent force with said permanent magnet for selectively attracting said spring out of engagement with said jack when said jack is to be placed in said active position and said electromagnet is selectively energized for creating a counter force to said permanent magnet for selectively repelling said spring thereby allowing said spring to engage said jack when said jack is to be placed in said inactive position.

5,205,140

SUEDING MEANS IN A TEXTILE FABRIC-PRODUCING MACHINE

Majid N. Moghaddassi, Greensboro, N.C., assignor to Guilford Mills, Inc., Greensboro, N.C.

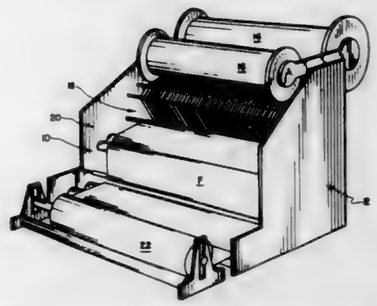
Continuation-in-part of Ser. No. 355,917, May 23, 1989, Pat. No. 5,025,644. This application Jun. 21, 1991, Ser. No. 718,945

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] D04B *35/00;* **D06C** *11/00*

U.S. Cl. 66—147 **10 Claims**

1. In a textile fabric-producing machine of the type having means for manipulating yarn to form a fabric in flat open-width form and a location following the yarn manipulating means for take-up of the fabric, the improvement comprising means for sueding the fabric in full width form intermediate the yarn manipulating means and the take-up location, the sueding means comprising a sueding roll having an abrasive peripheral surface, means for directing the fabric to travel intermediate the yarn manipulating means and the take-up location in peripheral surface engagement with the sueding roll, and means for driving rotation of the sueding roll at a peripheral surface



speed compatibly related to the traveling speed of the fabric, the fabric directing means including dancer roll means for monitoring tension and speed fluctuations in the fabric and adjusting the fabric directing means in relation thereto, the dancer roll means including a dancer roll and biasing means for urging the dancer roll with a predetermined force into tensioning engagement with the traveling fabric.

5,205,141

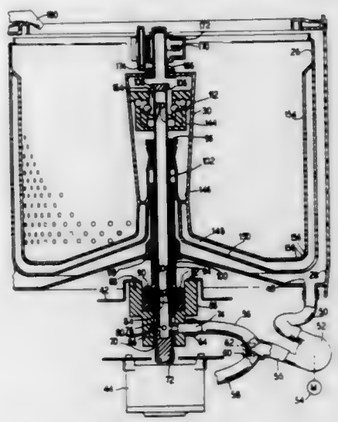
RECIPROCATING LAUNDRY BASKET FOR AN AUTOMATIC WASHER

Devinder Singh, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 28, 1990, Ser. No. 635,484

Int. Cl.[5] D06F *13/00*

U.S. Cl. 68—53 **18 Claims**



5. An automatic washer comprising;

a wash tub for receiving wash liquid;

a wash basket concentrically mounted within said tub for rotation relative to said tub;

a post mounted within said basket for rotation with said basket;

spray means mounted on said post for spraying wash liquid into the interior of said wash basket; and

agitation enhancing means positioned adjacent a peripheral

a lock body having an interior surface formed with first and second grooves,

attached to said holder head body slot and a magnetic disk portion, when the head portion enters the die cavity, cause

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agitation enhancing means positioned adjacent a peripheral wall of said basket into an interior of said basket for enhancing agitation of a fabric load positioned within said basket, said agitation enhancing means comprising vertical fins on said peripheral wall,

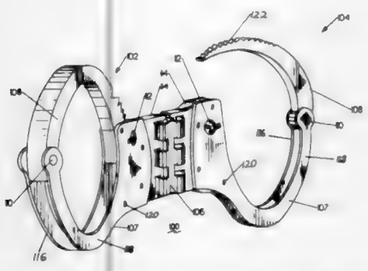
said vertical fins comprising wash liquid conduits and include spray inlets for spraying wash liquid into said interior of said basket.

5,205,142

HINGED HANDCUFFS

James B. Kruger, Oxford, Conn., and John T. Fitzpatrick, Houlton, Me., assignors to Smith & Wesson Corp., Springfield, Mass.

Filed Apr. 20, 1992, Ser. No. 871,004
Int. Cl.[5] E05B *75/00*
U.S. Cl. 70—16 **3 Claims**



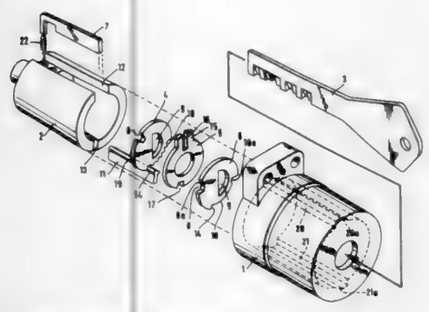
1. A device for restraining the hands of a person comprising first and second handcuff members and a link member configured to hingedly connect said first handcuff member to said second handcuff member, said first and second handcuff members each comprise a mounting plate having at least one post member integral to said mounting plate, said link member comprises a spine portion having a plurality of fingers which extend oppositely from said spine portion and forming substantially closed loops disposed abut each post member to hingedly interconnect said handcuff members together.

5,205,143

CYLINDER LOCK

Reijo Hakkarainen; Seija Rämö; Kaarlo Martikainen, and Kyösti Nevalainen, all of Joensuu, Finland, assignors to Abloy Security Ltd Oy, Helsinki, Finland

Filed Nov. 14, 1991, Ser. No. 792,294
Claims priority, application Finland, Nov. 30, 1990, 905909
Int. Cl.[5] E05B *29/08*
U.S. Cl. 70—366 **21 Claims**



1. A cylinder lock comprising:

a lock body having an interior surface formed with first and second grooves,

a rotatable lock cylinder inside the lock body, the lock cylinder being formed with first and second slots,

a plurality of locking discs enclosed by the lock cylinder, each locking disc having a key engagement surface that is engaged when the key of the lock is inserted in the lock and is turned, and also having a peripheral locking notch that is at one of a predetermined number of permitted angular positions relative to the key engagement surface of the disc, the permitted angular positions all being within a predetermined angular range and being at a predetermined angular pitch within said angular range, and each locking disc also having a set of second peripheral notches arranged side by side and located outside said predetermined angular range, the number of second peripheral notches in each locking disc being equal to said predetermined number and the angular pitch between the second peripheral notches being substantially equal to said predetermined angular pitch,

a locking bar, which in the locked position of the lock is located partly in the first groove in the lock body and partly in the first slot in the lock cylinder and thereby prevents turning of the lock cylinder relative to the lock body,

an auxiliary bar, which in the locked position of the lock is located partly in the second groove in the lock body and partly in the second slot in the lock cylinder, the set of second peripheral notches of each locking disc being arranged in cooperation with said auxiliary bar so that when the locking discs are turned in the opening direction of the lock, said auxiliary bar and said second peripheral notches prevent turning of the locking discs relative to each other at the end phase of the turning movement before the locking bar moves into its position for releasing the lock, and said auxiliary bar being continuously located partly inside the lock cylinder so that it limits the turning range of the locking discs, and

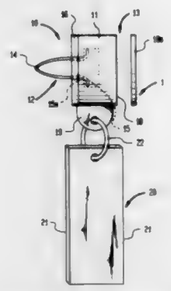
at least one member continuously turning with the key and arranged to guide radial movement of the auxiliary bar.

5,205,144

DOOR LOCK MESSAGE HOLDER

Robert M. Montano, 2474 Rockville Centre Parkway, Oceanside, N.Y. 11572

Filed Oct. 9, 1990, Ser. No. 593,945
Int. Cl.[5] E05B *7/14*
U.S. Cl. 70—455 **5 Claims**



1. A door lock message holder having door lock keyhole attachment means and door lock body attachment means,

a holder head including a holder head body substantially comprising a cylindrical body having a holder head body slot communicating with an end of said holder head body via a slot opening, said slot opening having a smaller diameter than a diameter of said holder head body slot, said door lock keyhole attachment means comprising a keyhole pin extending from the holder head body and attached to said holder head body slot and a magnetic disk disposed about said keyhole pin and fixedly attached to said holder head body; and

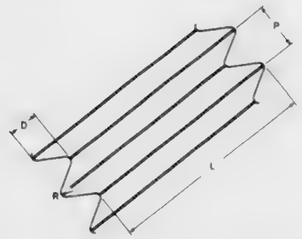
a message board attached to said holder head.

5,205,145

METHOD OF PRODUCING TORQUE SENSOR SHAFTS

Renshiro Ishino, and Yoshio Shibata, both of Hirakata, Japan, assignors to Kubota Corporation, Osaka, Japan

Continuation of Ser. No. 586,423, Sep. 21, 1990, abandoned. This application Apr. 30, 1992, Ser. No. 876,520
Claims priority, application Japan, Sep. 25, 1989, 1-249821
Int. Cl.[5] B21D *31/06;* **H01L** *41/12*
U.S. Cl. 72—53 **6 Claims**



1. A method of improving the magnetic performance characteristics of a magnetostriction type torque sensor in respect of hysteresis, sensitivity and non-linearity, said torque sensor having a torque sensor shaft, comprising:

forming on the surface of said torque sensor shaft a magnetostrictive portion comprised of a plurality of knurled grooves each having a radius at its bottom;

applying to the surface of said torque sensor shaft including at least said magnetostrictive portion a plurality of shot peening operations successively using shot particles of different, decreasing diameters; and,

using for the second and any subsequent one of said shot peening operations shot particles having a diameter smaller than two times said radius of said knurled grooves.

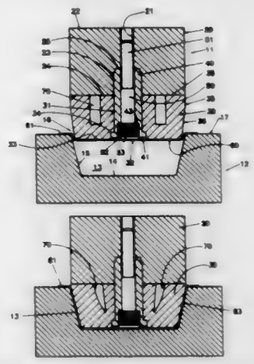
5,205,146

SHEET METAL FORMING TOOL AND METHOD

Nicholas H. Wilkins, Yeovil, and Frederick B. M. Page, Ravenshead, both of United Kingdom, assignors to Lawson Mardon (MI) Limited, United Kingdom

Filed Jul. 14, 1992, Ser. No. 913,501
Claims priority, application United Kingdom, Jul. 20, 1991, 9115717
Int. Cl.[5] B21D *22/10*
U.S. Cl. 72—57 **13 Claims**

1. A tool for cold forming a hollow article from sheet material, the tool comprising a die having a cavity and a punch having support means and a head portion mounted on the support means and movable to engage in the die cavity for forming the sheet material, the head portion having a leading face and at least one side face, said head portion comprising a solid mass of resiliently deformable material, said solid mass having spaced discrete interior portions of different resilience from the solid mass, said discrete interior portions being spaced from said leading face and said at least one side face and spaced from said support means, whereby reaction forces on the head portion, when the head portion enters the die cavity, cause predetermined controlled collapse of the head portion,



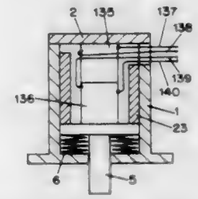
whereby cold flow of the sheet material is controlled to prevent wrinkling of said sheet material.

5,205,147

PRE-LOADED ACTUATOR USING PIEZOELECTRIC ELEMENT

Tatuya Wada; Hiroshi Hikita; Nobutaka Machida; Mituharu Nonami, all of Saitama; Yukinori Kawamura, Kanagawa; Norikatu Matumoto, Yokosuka; Yoshiyuki Ohmura, Saitama, and Tetuo Nomoto, Tokyo, all of Japan, assignors to Fuji Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 522,183, May 11, 1990, Pat. No. 5,095,725. This application Jul. 30, 1991, Ser. No. 738,156
Claims priority, application Japan, May 12, 1989, 1-117493; May 12, 1989, 1-117494; Sep. 4, 1989, 1-227451
Int. Cl.[5] B21J *7/20*
U.S. Cl. 72—429 **17 Claims**



9. A self-contained piezoelectric actuator unit adapted to be attached to a press for repetitively displacing a work piece from a reference position for producing a force on a load in response to a voltage and returning the work piece to said reference position, comprising:

an elongate hollow cylindrical container being closed at a first end by an end member and closed at the opposite second end by a guide plate having a centrally located guide hole there through,

a piezoelectric element comprising a stack of layers of piezoelectric material, which stack is axially compressible by a predetermined amount by a non-destructive compression force, said piezoelectric element being contained within said cylindrical container with a first end thereof engaging said end member,

a cylindrical support member positioned within said container for axial longitudinal movement relative thereto and having a first surface engaging a second end of said stack of layers of piezoelectric material,

an elongate work piece secured to a second surface of said

support member opposite said first surface and extending through the guide hole in said guide plate, and

by the transmission of hydraulic pressure to the pressure

ward-surface having a constant leadward-radius and being centrally provided with a flexible cable extending out-

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5,205,152

ENGINE OPERATION AND TESTING USING FULLY

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support member opposite said first surface and extending through the guide hole in said guide plate, and

spring means disposed between said guide plate and said second surface of said support member for applying a pre-loading compressive force to said piezoelectric element not less than the greater of 30 kilograms per square centimeter or the force necessary to limit the duration of piezoelectric actuator unit deactivation vibration of said piezoelectric element to less than one period of the frequency of said repetitive displacing of said work piece from said reference position to axially compress said element by said predetermined amount.

5,205,148

UPSETTING PRESS FOR REDUCING THE WIDTH OF SLABS IN HOT-ROLLED WIDE STRIP BREAKING-DOWN TRAINS

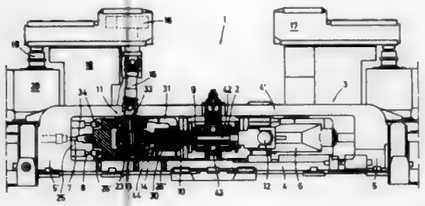
Gerhard Heitze, Netphen, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 4, 1991, Ser. No. 787,054

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1990, 4035001

Int. Cl.[5] B21J *13/08*

U.S. Cl. 72—446 **11 Claims**



1. An upsetting press for reducing the width of rolled material, particularly for reducing the width of slabs in hot-rolled wide strip breaking-down trains, comprising:

tools carried arranged on both sides of the slab and including pressing tools;

at least one crank drive for moving the pressing tools in direction of slab reduction, the crank drive and a feeding drive arranged in a crank housing, wherein the crank housing with crank drive and feeding drive and the tool carrier are combined into a structural unit;

a housing post having a housing window; and

a rail arrangement for displacing the structural unit laterally and approximately parallel to the slab movement through the housing post window.

5,205,149

PRESS MACHINE HAVING ADJUSTABLE STRIKER

Tetsuji Hayashi, La Mirada, Calif., assignor to Amada Mfg. America Inc., La Mirada, Calif.

Filed Sep. 11, 1991, Ser. No. 757,578

Int. Cl.[5] B26D *5/08*

U.S. Cl. 72—446 **5 Claims**

1. A press machine comprising:

a movable ram;

a striker device connected to the ram, to strike a tool;

the striker device including a striker for striking the tool and a drive mechanism to adjust the position of the striker with respect to the tool, the drive mechanism comprising

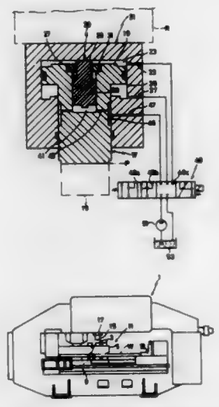
a hydraulic cylinder having a pressure chamber formed therein;

a piston fitted into the hydraulic cylinder, said piston having a pressure section formed therein; and

a pressure passage for transmission of hydraulic pressure to the pressure chamber of the hydraulic cylinder;

the piston being connected to the striker and caused to move by the transmission of hydraulic pressure to the pressure passage;

a freely reciprocating mini-piston, having a fixed stroke and having a pressure section, slidably mounted in a direction of projection into the pressure section of the piston;



a mini-piston passage which transmits hydraulic pressure to the pressure section of the mini-piston, in the direction of projection of the mini-piston; wherein

the piston is caused to move by the transmission of hydraulic pressure to the mini-piston passage.

5,205,150

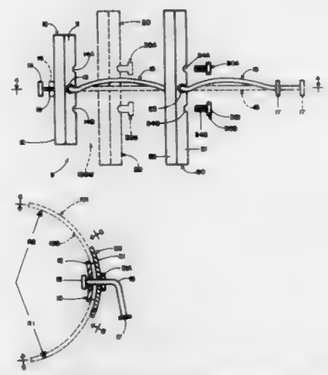
IRRIGATION-PIPE DENT-REMOVAL TOOL AND METHOD

Mark R. Nyffeler, R.R. 4 (Box 23), Columbus, Nebr. 68601

Filed Aug. 24, 1992, Ser. No. 933,816

Int. Cl.[5] B21D *3/14*

U.S. Cl. 72—454 **5 Claims**



1. For the environment of an agricultural irrigation-pipe extending lengthily along a central-axis and having an inside-surface located a finite inside-radius from said central-axis and having an outside-surface located a finite outside-radius from said central-axis, said irrigation-pipe having a sideward water delivery-opening therethrough and which is adjacently inflicted with at least one inimicable irrigation-pipe dent, each dent being exhibited as a depression at the irrigation-pipe outside-surface and as a bulge at the irrigation-pipe inside-surface, an irrigation-pipe dent-removal tool and comprising:

(A) a rear-plate including a linearly-generated convex leadward-surface having a constant leadward-radius and being centrally provided with a flexible cable extending outwardly away from said leadward-surface and through the sideward water delivery-opening for a said irrigation-pipe;

(B) a front-plate centrally slidably surrounding said flexible cable and including a linearly-generated concave trailward-surface having a constant trailward-radius that dimensionally exceeds said rear-plate leadward-radius; and

(C) extendable through said irrigation-pipe sideward water delivery-opening, inter-plates drawing means for controllably tightly drawing together said rear-plate and said front-plate, whereby said drawn-together rear-plate and front-plate squeeze the dent inflicted irrigation-pipe and pressurably remove said at least one dent from said irrigation-pipe.

5,205,151

ALCOHOL CONCENTRATION SENSOR TESTING APPARATUS

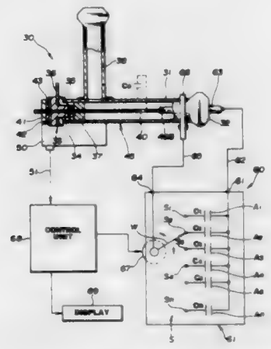
Masahiko Shimamura; Kazumitsu Koboyashi, and Hideki Kamioka, all of Gunma, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed May 22, 1991, Ser. No. 703,091

Claims priority, application Japan, May 22, 1990, 2-132029

Int. Cl.[5] G01D *18/00*

U.S. Cl. 73—1 R **10 Claims**



1. An apparatus for testing an alcohol concentration sensor used in measuring an alcohol concentration of a fluid containing alcohol, the alcohol concentration sensor including a capacitive probe having a capacitance dependent upon the alcohol concentration of the fluid, and a circuit responsive to the capacitance of the capacitive probe for producing an output signal indicative of a sensed alcohol concentration, the apparatus comprising:

a plurality of capacitors having different capacitances each corresponding to a predetermined alcohol concentration;

first means for connecting a selected one of the capacitors in parallel with the capacitive probe;

second means for reading a value of the output signal when the selected capacitor is connected with the capacitive probe; and

third means for comparing the read value with a value to be produced when the alcohol concentration sensor is exposed to an alcohol concentration predetermined for the selected capacitor to test the alcohol concentration sensor.

5,205,152

ENGINE OPERATION AND TESTING USING FULLY FLEXIBLE VALVE AND INJECTION EVENTS

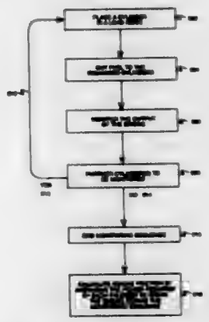
John M. Clarke, Chillicothe, and James J. Faletti, Spring Valley, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 656,653, Feb. 19, 1991, Pat. No. 5,117,790.

This application Jan. 23, 1992, Ser. No. 824,381

Int. Cl.[5] G01L *5/13;* **G01N** *19/02*

U.S. Cl. 73—9 **6 Claims**



1. A method for performing a plurality of diagnostic testing modes on an engine having a plurality of cylinders by controlling, independently, a mode of operation for each of the cylinders, each cylinder including intake and exhaust valves and a fuel injector for injecting fuel into a corresponding cylinder, said method comprising the steps of:

(1) cutting fuel to all but one cylinder;

(2) monitoring the output of the engine;

(3) repeating said fuel cutting and monitoring steps for the remaining cylinders; and

(4) calculating engine friction by averaging the power required to crank the engine by the cylinders during said monitoring steps.

5,205,153

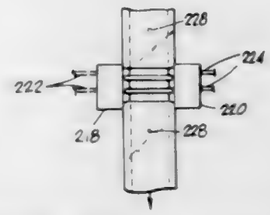
METHOD AND APPARATUS FOR DETECTION OF AIR BUBBLES IN TUBING

Dennis J. Hlavinka, Golden, and Byron W. Larson, Lakewood, both of Colo., assignors to COBE Laboratories, Inc., Lakewood, Colo.

Filed Jan. 23, 1992, Ser. No. 825,657

Int. Cl.[5] G01N *29/002*

U.S. Cl. 73—79.03 **17 Claims**



1. An apparatus to engage a device for detecting bubbles in a fluid stream, the device having a transmitting transducer for transmitting signals into the fluid and a receiving transducer for receiving signals from the fluid, the apparatus comprising a channel with an interior surface in contact with the fluid and an exterior surface in contact with the transducers, the exterior surface having at least-one portion that is recessed relative to an unrecessed portion, so that at least one of the transducers

contacts the unrecessed portion and is adjacent to but not in

5,205,155

AIR MONITORING CASSETTE

means for outputting a signal indicating that a predetermined degree of clogging has occurred in the dust filter when a

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5,205,158

SAMPLING RHEOMETER AND METHOD

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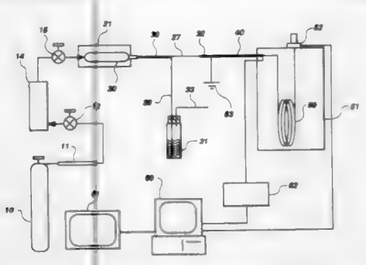
contacts the unrecessed portion and is adjacent to but not in contact with the recessed portion.

5,205,154

APPARATUS AND METHOD FOR SIMULTANEOUS SUPERCRITICAL FLUID EXTRACTION AND GAS CHROMATOGRAPHY

Milton L. Lee, Pleasant Grove; Paul B. Farnsworth, Orem, and Zaiyou Liu, Provo, all of Utah, assignors to Brigham Young University, Provo, Utah

Filed Nov. 1, 1991, Ser. No. 786,252
Int. Cl.[5] G01N *30/30*
U.S. Cl. 73—23.35 **22 Claims**



1. A method for conducting simultaneous on-line supercritical fluid extraction and chromatographic analysis of one or more organic species of interest from a sample matrix comprising;

(a) providing in sequence, a supercritical fluid extraction cell, a thermal desorption modulator and a heated gas chromatography column; said system also containing a supercritical fluid source, pump means for directing the flow of supercritical fluid through said system, heating means for applying heat to said thermal desorption modulator at regulated time intervals, detection means for detecting bands eluted from said gas chromatography column at regulated time intervals, means for transducing said detected bands into electrical signals, and processing means for receiving, processing and displaying said signals as analytical results;

(b) directing supercritical fluid from said fluid source to said extraction cell containing said matrix sample at a constant pressure via said pump means thereby forming an extractant in said cell consisting of said organic species dissolved into said supercritical fluid;

(c) passing said extractant into said thermal desorption modulator, maintained at a minimum standing temperature by said heating means, under reduced pressure where the organic species are retained as a deposit onto a stationary phase in said modulator and said supercritical fluid as a gas passes through said modulator to said analytical column;

(d) applying additional heat at regulated time intervals to said modulator whereby the retained organic species are suddenly released from said stationary phase of said modulator as a shortband concentration pulse,

(e) injecting said short-band concentration pulse containing said organic species into said heated gas chromatography column by means of said supercritical fluid gas where said organic species are separated into detectable bands;

(f) detecting said bands by said detection means at regulated time intervals as chromatograms and transducing said chromatograms to electrical signals; and

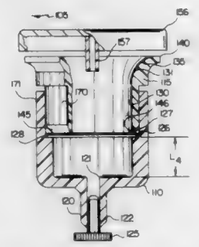
(g) digitizing and recording said electrical signals, as a function of time, by said processing means into displayable analytical results.

5,205,155

AIR MONITORING CASSETTE

Patrick H. Cooper, North Charleston, S.C., assignor to Environmetrics, Inc., Charleston, S.C.

Filed Mar. 28, 1991, Ser. No. 676,323
Int. Cl.[5] B01D *27/08, 35/30*; G01N *1/00*
U.S. Cl. 73—28.04 **25 Claims**



1. An air monitoring cassette for monitoring airborne particulate, said cassette comprising:

a housing defining an airway therethrough, said housing including an outlet end adapted for connection to a means for drawing air through the housing;

said housing further including an inlet end opposite said outlet end, said inlet end having an outwardly flared inside surface; and

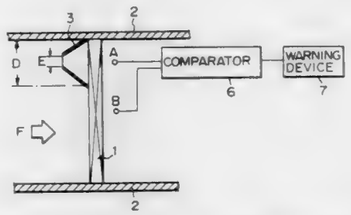
a filter adapted to collect particulate thereon, said filter located within said housing intermediate said outlet end and said inlet end so that particulate laden air can be drawn through said cassette and particulate deposited on the filter.

5,205,156

DEVICE FOR DETECTION OF DEGREE OF CLOGGING OF A DUST FILTER

Hideo Asano, Gifu; Kenichi Fujiwara, Kariya, and Toshihiro Takahara, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1991, Ser. No. 792,605
Claims priority, application Japan, Nov. 16, 1990, 2-310918; Apr. 26, 1991, 3-122905; Sep. 20, 1991, 3-268615
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—38 **10 Claims**



1. A device for detecting a degree of clogging of a filter for capturing dust in a flow of air in an air passageway, due to an accumulation of dust in said filter, said device comprising:

at least one pair of sensors arranged in said air passageway at parts of the air flow corresponding to different sections of the dust filter, respectively, said sensors outputting electric signals indicating an air flow speed of the respective parts of the air flow;

means for generating a difference in a speed of an air flow introduced into the dust filter at said parts of the air flow;

a comparator for comparing levels of signals output from said sensors arranged at the respective parts of the air flow; and

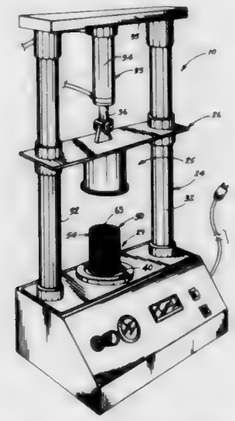
means for outputting a signal indicating that a predetermined degree of clogging has occurred in the dust filter when a predetermined relationship is established between the signals output from the sensors.

5,205,157

EMPTY CONTAINER LEAK TESTING

Patrick K. McDaniel, Pasco, Wash., assignor to Seal Integrity Systems, Inc., Richland, Wash.

Continuation-in-part of Ser. No. 303,358, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 106,229, Oct. 6, 1987, Pat. No. 4,930,342, which is a continuation-in-part of Ser. No. 938,027, Dec. 4, 1986, Pat. No. 4,747,298. This application Apr. 19, 1990, Ser. No. 512,752
Int. Cl.[5] G01M *3/02*
U.S. Cl. 73—49.2 **43 Claims**



1. A container testing apparatus for applying a differential pressure to a container to aid in detecting leaks therein, said container including outward and inward surfaces, comprising:

a frame;

a testing head on the frame;

seal means defining a test chamber for sealed contact with a selected test area on one of the container surfaces;

a contractible support means having a network of (a) member engaging support surfaces positioned against a rigid base for releasably engaging and rigidly supporting the member along one of its opposed surfaces against deflection in a direction toward the one surface and (b) open fluid passages interspersed with the support surfaces for receiving and transmitting fluid away from the one member surface;

wherein the contractible support means is provided on the testing head for movement between an operative condition to engage the selected test area of the container and buttress the selected test area against deformation responsive to applied differential pressure, and an inoperative condition to facilitate disengagement of the container;

differential pressurizing means for applying a differential fluid pressure within the test chamber against the container test area to produce seepage of fluid through a leak if present in the test area and into the open fluid passages; and

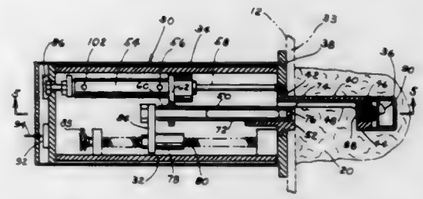
detecting means on the frame for sensing flow of fluid through the fluid passages from seepage through a leak in the container.

5,205,158

SAMPLING RHEOMETER AND METHOD

Theodore N. Janulis, West Orange, N.J., assignor to Rheometrics, Inc., Piscataway, N.J.

Filed Jul. 26, 1991, Ser. No. 736,576
Int. Cl.[5] G01N *11/04*
U.S. Cl. 73—54.06 **7 Claims**



1. An in-line rheometer for measuring rheological properties of a fluid material flowing in a stream along a path of flow in a given direction through a conduit in a processing apparatus, the conduit having a conduit wall, the rheometer comprising:

a frame for projecting into the conduit from a near end at the conduit wall to a far end spaced from the conduit wall, the frame extending transverse to the direction of flow of the stream and including an opening through which the fluid material is passed between the near end and the far end of the frame as the stream of fluid material flows along the path of flow;

capturing means on the frame for capturing a volume of the fluid material of the stream to close off the captured volume of fluid material from the fluid material in the stream and for essentially confining the captured volume of fluid material against movement within the capturing means between the near end and the far end of the frame;

orifice means including an orifice member and drive means for advancing the orifice member into the volume of fluid material confined in the capturing means, the orifice member including an orifice through which the fluid material flows relative to the orifice as the orifice member is advanced through the confined captured volume of fluid material; and

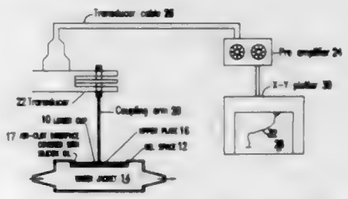
transducer means mounted on the frame for providing information pertaining to pressure in the confined volume of fluid material as the orifice member is advanced through the confined volume of fluid material, the pressure information being indicative of the rheological properties to be measured.

5,205,159

APPARATUS AND METHOD FOR MEASURING CLOT ELASTIC MODULUS AND FORCE DEVELOPMENT ON THE SAME BLOOD SAMPLE

Marcus E. Carr, Jr., Richmond, Va., assignor to Virginia Commonwealth University, Richmond and Center for Innovative Technology, Herndon, both of Va.

Filed Jan. 17, 1992, Ser. No. 822,415
Int. Cl.[5] G01N *33/48*
U.S. Cl. 73—64.41 **11 Claims**



1. An apparatus for analyzing blood and plasma samples,

comprising both a means for analyzing platelet function and a means for analyzing clot structure for the same sample,

arranged for use with an engine or combustion device having a fuel supply means in which a portion of the fuel fed thereto

within said channel to enter said tubular chamber and surround said vehicle with said vehicle at a rest position;

determining an index property value of an index property of the wellbore shale sample,

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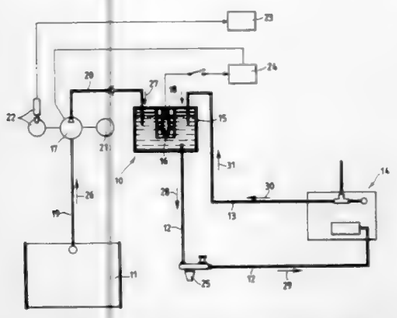
comprising both a means for analyzing platelet function and a means for analyzing clot structure for the same sample, wherein both said means for analyzing platelet function and said means for analyzing clot structure for the same sample utilize a common pair of spaced apart plates wherein a first plate of said pair of spaced apart plates is connected to a displacement sensor which monitors movement of said first plates towards a second plate of said spaced apart plates.

5,205,160

DEVICE FOR MEASURING THE CONSUMPTION OF FUEL IN AN INTERNAL COMBUSTION ENGINE

Roberto Gandini, Via Einaudi 23, Quinzano D'Oglio (Brescia), Italy

Filed Sep. 9, 1991, Ser. No. 756,917
Claims priority, application Italy, Sep. 13, 1990, 21459 A/90
Int. Cl.[5] G01F *9/00*
U.S. Cl. 73—113 **8 Claims**



1. A device for measuring the consumption of fuel in an internal combustion engine, inserted in a feed system which includes a fuel tank, delivery and return pipes and an injection group, wherein said device comprises:

a suction pump communicated with the fuel pump;

a cup provided with a level sensor which controls actuation of said suction pump; said cup being connected at an inlet side thereof with said suction pump by a first pipe and connected by a second pipe with said injection group, and, said cup being connected at an outlet side thereof, with a delivery pipe which feeds said injection group; and

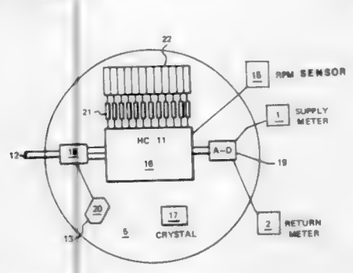
a fuel consumption meter wherein said suction pump includes impulse generator means for incrementing said fuel consumption meter.

5,205,161

FUEL CONSUMPTION MEASUREMENT SYSTEM

Curtis L. Erwin, 5805 SE. Gladstone, Portland, Oreg. 97206

Continuation-in-part of Ser. No. 627,233, Dec. 14, 1990, abandoned. This application May 10, 1991, Ser. No. 698,152
Int. Cl.[5] G01F *9/02*
U.S. Cl. 73—114 **31 Claims**



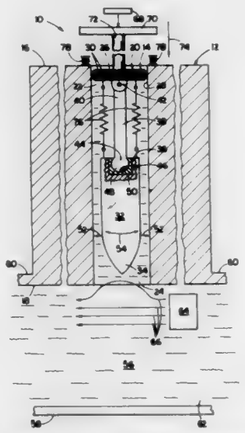
1. A frequency based fuel consumption measuring system arranged for use with an engine or combustion device having a fuel supply means in which a portion of the fuel fed thereto is unburned and including a return line from the engine arranged to return fuel back to the fuel supply means, said compensated measuring system comprising volumetric measuring means having means for connection in the fuel supply means of an engine and arranged to measure fuel supplied to the engine, temperature sensing means associated with said fuel supply measured means, volumetric measuring means having means for connection in the return line of an engine and arranged to measure return flow in the return line, temperature sensing means associated with said return fuel measuring means, each of said fuel flow measuring means and temperature sensing means having an output, means responsive to said two fuel flow measuring means outputs and at least one of said temperature sensing means outputs compensating the fuel flow measurements for variations in the temperature of the fuel and means determining an output which comprises the differential of the compensated measurements, adjustable means modifying the differential output frequency for various engine calibrations, and means responsive to the output of the modified fuel flow differential producing a single pulse output interface signal related to fuel flow rate.

5,205,162

UNDERWATER VEHICLE LAUNCH PERFORMANCE TEST FACILITY

Paul J. Lefebvre, Tiverton, and John A. Schwemin, Middletown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1992, Ser. No. 956,326
Int. Cl.[5] B63B *9/02*; **G01M** *10/00*
U.S. Cl. 73—148 **16 Claims**



1. A facility for permitting launch performance tests to be conducted on an underwater vehicle such as a torpedo, comprising:

a housing having an opening therethrough defining a tubular chamber for receiving said underwater vehicle therein, said housing mounted on a wall of a raceway forming a channel therein;

a piston positioned within said tubular chamber;

linkage means disposed between said piston and said vehicle and having a pair of opposing end portions connected with said piston and said vehicle, respectively;

said channel adjacent to said housing having water therein which flows at a predetermined velocity and is communicating with said tubular chamber to allow water flowing

within said channel to enter said tubular chamber and surround said vehicle with said vehicle at a rest position;

drive means operable to move said piston through said tubular chamber a preselected distance sufficient to move said vehicle and said water surrounding said vehicle out of said tubular chamber and into said channel; and

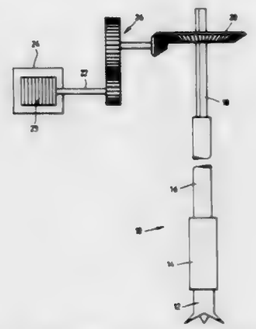
said linkage means being connected with said piston and said vehicle to permit said vehicle to move both laterally and in rotational fashion within said tubular chamber with said vehicle at its rest position and as said vehicle moves through said tubular chamber in response to hydrodynamic forces acting on said vehicle generated by said flowing water and also stop the advancement f said vehicle after said piston has moved said preselected distance.

5,205,163

METHOD AND APPARATUS FOR DETERMINING THE TORQUE APPLIED TO A DRILLSTRING AT THE SURFACE

Prasert Sananikone, Saint Nom La Breteche, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jun. 20, 1991, Ser. No. 718,061
Claims priority, application European Pat. Off., Oct. 7, 1990, 90201862.1
Int. Cl.[5] E21B *44/00*
U.S. Cl. 73—151 **12 Claims**



1. A method of determining torque T_s acting at the surface in a drillstring while drilling a borehole, said drillstring being rotated by rotating driving elements which include an electrical motor with an output shaft, the method being characterized by the steps of:

measuring the angular acceleration γ of said output shaft by sensing the angular position of said shaft;

measuring the torque T_m of said motor;

determining the moment of inertia Mt of said rotating driving elements; and

determining the torque T_s from measured values of γ, T_m and the determined moment of inertia Mt.

5,205,164

METHODS FOR DETERMINING IN SITU SHALE STRENGTHS, ELASTIC PROPERTIES, PORE PRESSURES, FORMATION STRESSES, AND DRILLING FLUID PARAMETERS

Ronald P. Steiger, Houston, and Peter K. Leung, Sugar Land, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 31, 1990, Ser. No. 577,337
Int. Cl.[5] G01N *33/24*
U.S. Cl. 73—153 **14 Claims**

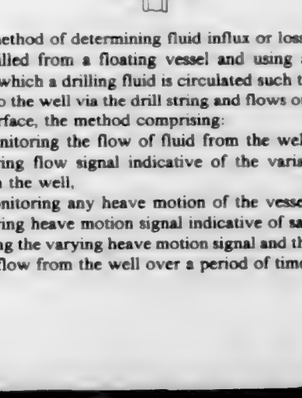
1. A method for stabilizing shale in a wellbore, the method comprising

obtaining a wellbore shale sample of the shale from the wellbore,

determining an index property value of an index property of the wellbore shale sample,

calculating a value for effective stress around the wellbore,

determining a plurality of values for stress-strain behavior of the wellbore shale sample, and



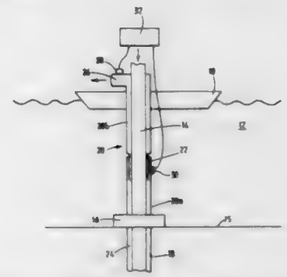
based on the value for effective stress, stress-strain behavior, and the index property, and a mathematical constitutive relationship between them calculating a stabilizing density for drilling fluid to be introduced into the wellbore, and introducing drilling fluid of the stabilizing density into the wellbore.

5,205,165

METHOD FOR DETERMINING FLUID INFLUX OR LOSS IN DRILLING FROM FLOATING RIGS

Stuart I. Jardine, and Dominic P. J. McCann, both of Paris, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Feb. 6, 1992, Ser. No. 832,161
Claims priority, application European Pat. Off., Feb. 17, 1991, 91400302
Int. Cl.[5] E21B *21/08*; **G01V** *9/02*
U.S. Cl. 73—155 **14 Claims**



1. A method of determining fluid influx or loss from a well being drilled from a floating vessel and using a drill string through which a drilling fluid is circulated such that said fluid flows into the well via the drill string and flows out of the well at the surface, the method comprising:

(a) monitoring the flow of fluid from the well to obtain a varying flow signal indicative of the variation in flow from the well,

(b) monitoring any heave motion of the vessel to obtain a varying heave motion signal indicative of said motion,

(c) using the varying heave motion signal and the variance in the flow from the well over a period of time to calculate

an expected variation in said fluid flow from the well due

of said gamma rays being chosen such that there is a small

automatic adjusting means for resetting the barrel to its

(a) a support structure including a base having a plurality of

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an expected variation in said fluid flow from the well due to said motion,

(d) using the calculated expected variation in flow to correct the varying flow signal to compensate for any varying flow component due to said heave motion thereby generating a compensated flow signal; and

(e) monitoring the compensated flow signal for an indication of fluid influx or loss from the well.

5,205,166

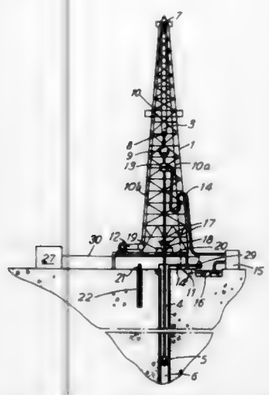
METHOD OF DETECTING FLUID INFLUXES

Dominic P. J. McCann; Stuart I. Jardine, both of Paris, and David B. White, Orsay, all of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 7, 1991, Ser. No. 741,283

Int. Cl.[5] E21B *47/10*

U.S. Cl. 73—155 **3 Claims**



1. A method of detecting a fluid influx in a well being drilled with a drill string comprising a plurality of pipes joined end-to-end and having a drilling fluid circulated therethrough from a tank via a supply line system connected to said drill string, said method being used while connecting or disconnecting a pipe to or from said drill string and comprising the steps of:

a) ceasing circulation of said drilling fluid;

b) disconnecting said supply line system from said drill string so as to allow any drilling fluid in said system to flow back into said tank while connecting or disconnecting a pipe;

c) reconnecting said supply line to said drill string and recommencing circulation of said fluid;

d) while repeating a)–c) during the normal course of drilling the well, monitoring the change in level of fluid in said tank so as to determine a model of the change in level in the tank with respect to time during steps a)–c); and

e) comparing the change in tank level observed when subsequently performing steps a)–c) with the change predicted by said model so as to detect a difference therebetween indicative of an influx.

5,205,167

METHOD AND APPARATUS FOR LOCATING STRATIFICATION IN PRODUCTION FLUID IN A WELL

Michael L. Gartner, Austin, and Larry L. Gadeken, Houston, both of Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed Feb. 26, 1992, Ser. No. 841,948

Int. Cl.[5] E21B *47/00*; G01V *5/12*

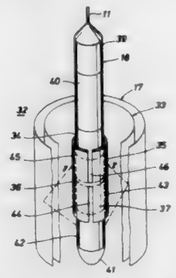
U.S. Cl. 73—155 **18 Claims**

1. A system for determining the existence of stratified flow in the gas phase of well fluids produced in a cased well borehole and flowing upwardly through a metal casing comprising:

(a) a source of relatively low energy gamma rays, the energy of said gamma rays being chosen such that there is a small probability that a gamma ray from said source could penetrate a metal casing in the borehole and be scattered back through the metal casing by material outside the casing;

(b) means for collimating gamma rays from said source of low energy gamma rays selectively along an azimuthal direction with respect to the axis of the well casing and for generating a signal indicative of said azimuthal direction;

(c) a scintillation detector of gamma radiation and cooperative shielding means for preventing direct irradiation of said detector by said source while allowing the placement



of said detector in as close proximity to said source as allowed by said cooperative shielding means to allow detection of gamma rays emitted by said source and scattered by materials inside said metal casing;

(d) means for counting gamma rays detected by said detector and storing count rate signals indicative thereof;

(e) means for processing said count rate signals according to a predetermined relationship to derive a measurement signal indicative of the gas holdup phase of well fluid in the vicinity of said source; and

(f) means for displaying said gas holdup signal as a function of said azimuthal signal to provide an indication of stratified fluid flow.

5,205,168

DEVICE FOR CARRYING OUT QUALITY TEST FIRINGS AS WELL AS THE USE THEREOF

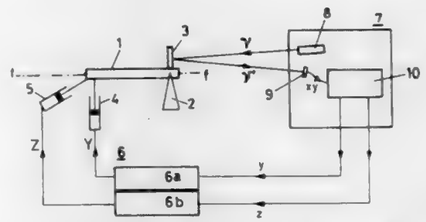
René Cattin, Steffisburg; Raymond Corthesy, and Beat Kneubühl, both of Thun, all of Switzerland, assignors to Schweizerische Eidgenossenschaft vertreten durch die Eidg., Switzerland

Filed Jul. 11, 1991, Ser. No. 728,677

Claims priority, application Switzerland, Jul. 30, 1990, 02510/90

Int. Cl.[5] G01L *5/14*; F15B *15/00*

U.S. Cl. 73—167 **9 Claims**



1. A device for carrying out test firings for determining the quality of ammunition, comprising:

means for mounting a barrel for relative movement with respect to a foundation;

means for firing the ammunition from said barrel; and

automatic adjusting means for resetting the barrel to its desired direction after firing, said adjusting means including

a source of radiation emitting a radiation beam, said source being provided radially offset relative to the direction of firing, the beam (ν) emitted by said source being directed to a mirror rigidly connected with the barrel and the beam (84 ') reflected by said mirror being detected by a position detector arranged in the direction of firing; and

a servomechanism operatively connected to the barrel, said servomechanism receiving signal outputs (Y, Z) from an evaluation circuit means for computing and evaluating deviations of said barrel from said desired direction using output signals from the detector.

5,205,169

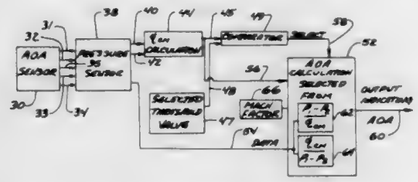
ANGLE OF ATTACK SENSOR USING INVERTED RATIO OF PRESSURE DIFFERENTIALS

Floyd W. Hagen, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Aug. 8, 1991, Ser. No. 741,955

Int. Cl.[5] G01C *21/00*

U.S. Cl. 73—180 **10 Claims**



1. An apparatus for determining angles of attack across a substantial range comprising:

means for measuring pressures which vary as a function of angle of attack and for providing a first signal that is a function of the difference of such pressures;

means for providing a second signal which is a function of a measured pitot pressure and a measured static pressure;

means for determining when the second signal is at a selected value different from zero;

means for providing a ratio indicative of angles of attack across a first portion of the substantial range substantially equal to the first signal divided by the second signal; and

means for providing an inversion of the ratio indicative of angles of attack across a second portion of the substantial range when the means for determining indicates that the second signal is equal to the selected value.

5,205,170

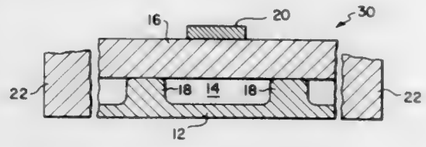
MASS FLOW SENSOR

Chester J. Blechinger, Bloomfield Hills, and Paul E. Stevenson, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 1, 1991, Ser. No. 678,379

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.26 **17 Claims**



1. A flow sensor comprising:

(a) a support structure including a base having a plurality of spaced mesas on a surface thereof;

(b) a low thermal conductivity, dielectric diaphragm spanning said mesas; said diaphragm having first and second ends wherein said mesas are positioned at said first and second ends and at least one of said mesas is positioned intermediate said first and second ends to support said diaphragm so as to prevent breakage along its length; said diaphragm forming an electrical and thermal insulation barrier over said support structure and said mesas; and

(c) at least one flow sensing element superposed on said diaphragm so that said at least one flow sensing element is substantially electrically and thermally isolated from said support structure.

5,205,171

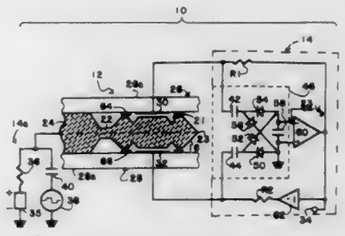
MINIATURE SILICON ACCELEROMETER AND METHOD

Benedict B. O'Brien, Manhattan Beach; Brent E. Burns, Torrance, both of Calif., and John A. Geen, Wrentham, Mass., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 11, 1991, Ser. No. 640,449

Int. Cl.[5] G01P *15/13, 15/125*

U.S. Cl. 73—517 B **22 Claims**



1. A miniature accelerometer, comprising:

a pair of spaced insulating layers;

a pair of electrodes disposed on said insulating layers;

a silicon proofmass assembly including a proofmass and a mounting;

means for suspending said proofmass from the mounting between said electrodes with a gap between each electrode and said proofmass;

means for applying an AC excitation signal directly to said proofmass;

means for detecting AC signals coupled to said electrodes therefrom; and

means responsive to the AC signals detected for applying acceleration opposing forces to said proofmass.

5,205,172

ELECTRONIC GAUGE FOR INTERFACE MEASUREMENTS

Roni K. Doak, 2379 Briarwest Blvd. No. 29, Houston, Tex. 77077

Filed Sep. 23, 1991, Ser. No. 764,030

Int. Cl.[5] G01F *23/04, 23/24*

U.S. Cl. 73—295 **19 Claims**

1. An interface gauge, comprising:

at least one transducer for sensing the level of an interface between two media within a reservoir;

an elongated flat member having opposite faces and begin made of a dielectric flexible material which is easily deformable in a direction perpendicular to its longitudinal axis;

said member defining between said opposite faces at least one transverse bore dimensioned for loosely containing said transducer therewithin;

a logic network;

a cable including conductor means for connecting said trans-

digital signal samples, and for converting said second

5,205,175

MULTIPLE TRANSDUCER SELECTOR

chanically, electrically and acoustically interconnect said acoustoelectric film to said first surface.

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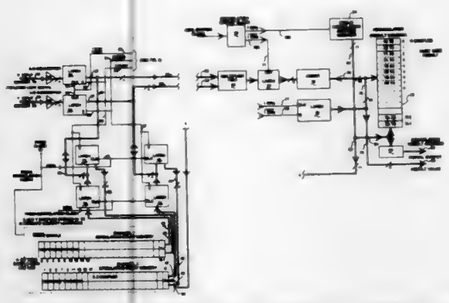
a cable including conductor means for connecting said transducer to said logic network;
said conductor means including printed conductors on said dielectric material;

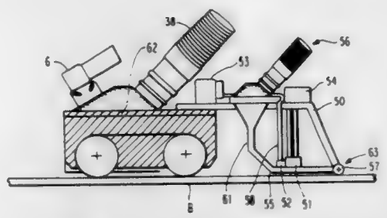
a pair of wires for connecting said transducer to said printed conductors; and
a signal comparator coupled to said network, and said comparator having means for signaling a change in said interface level.

5,205,173
METHOD AND APPARATUS FOR DETECTING LEAKS IN PIPELINES USING CROSS-CORRELATION TECHNIQUES
Trevor J. Allen, Hopton-on-Sea, England, assignor to Palmer Environmental Services, England
Filed Jun. 21, 1991, Ser. No. 718,746
Int. Cl.[5] G01M *3/00*
U.S. Cl. 73—592 **9 Claims**



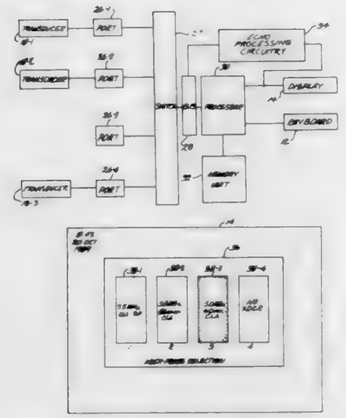
1. Apparatus for detecting a leak position in a pipeline comprising:
first sensor means for disposition at a first position on one side of a pipeline leak to detect sounds generated by the leak and operative to develop a first analog electrical signal corresponding to such sounds;
second sensor means for disposition at a second position on the opposite side of the leak at a known distance from said first sensor means to detect sound generated by the leak and operative to develop a second analog electrical signal corresponding to such sounds;
analog-to-digital converter means for converting said first analog signal to a digital signal including a series of first digital signal samples, and for converting said second analog signal to a digital signal including a series of second digital signal samples;
first latch means for temporarily storing each said first signal sample;
second latch means for temporarily storing each said second signal sample;
memory means having a first sample storage channel coupled to said first latch means and operative to store the "n" most recent first signal samples each previously temporarily stored in said first latch means, and a second sample storage channel coupled to said second latch means and operative to store the "n" most recent second signal samples each previously temporarily stored in said second latch means, where "n" is a predetermined nonzero integer;
multiplier means having a first input coupled to said first latch means and said first sample storage channel, and a second input coupled to said second latch means and said second sample storage channel;
control means for causing said multiplier means to alternately multiply each first signal sample temporarily stored in said first latch means with each of the "n" samples stored in said second storage channel, and each second signal sample temporarily stored in said second latch means with each of the "n" samples stored in said first storage channel;
accumulator means for accumulating the results of each said multiplication; and
display means for displaying the accumulated results to indicate the position of said leak relative to the positions of said first and second sensor means.

5,205,174
SCAVENGER SUBMERSIBLE VISUAL AND ACOUSTICAL TANK INSPECTION SYSTEM AND METHOD
Eugene B. Silverman, 4217 Scarlet Sage Ct., Ellicott City, Md. 21043; Seymour R. Kotler, 1054 St. Margarets Dr., Annapolis, Md. 21401, and Harry T. Roman, 25 Laurel Ave., East Orange, N.J. 07017
Filed May 24, 1991, Ser. No. 705,687
Int. Cl.[5] G01N *29/10, 29/24*
U.S. Cl. 73—623 **16 Claims**



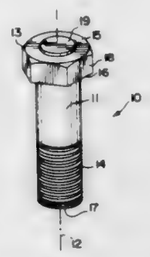
1. An apparatus for the preparation and inspection of a submerged surface of a fluid reservoir, said apparatus comprising:
means for moving the apparatus within a fluid in a direction of travel over an area of the submerged surface to be inspected;
cleaning means for preparing said area for inspection comprising means for removing deposited sediment from the submerged surface and means for irrigating the cleaned surface with a stream of clean fluid; and
inspection means for examining said prepared surface through said clean fluid.

5,205,175
MULTIPLE TRANSDUCER SELECTOR
José A. Q. Garza; George W. Gilman, both of Tempe, and David J. Thomas, Mesa, all of Ariz., assignors to Acoustic Imaging Technologies Corporation, Phoenix, Ariz.
Filed Feb. 27, 1990, Ser. No. 485,419
Int. Cl.[5] G01N *29/24; A61B 10/00*
U.S. Cl. 73—628 **39 Claims**



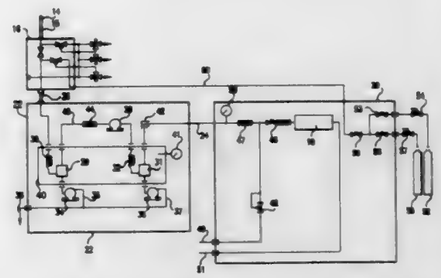
1. An ultrasonic imager comprising:
a plurality of ports each capable of being connected to an ultrasonic transducer having a plurality of attributes;
a control unit for polling each port to determine attributes of the transducer connected to each port; and
a display for displaying the transducer attributes determined from the polling of the ports.

5,205,176
ULTRASONIC LOAD CELL WITH TRANSDUCER
Ian E. Kibblewhite, Frazer, Pa., assignor to Ultrafast, Inc., Malvern, Pa.
Division of Ser. No. 572,415, Aug. 27, 1990, Pat. No. 5,131,276.
This application Nov. 25, 1991, Ser. No. 797,716
Int. Cl.[5] F16B *31/02*
U.S. Cl. 73—761 **41 Claims**



1. A method of making a load indicating cell comprising the steps of:
providing a load bearing member subjected to deformation when stressed such that one portion thereof moves relative to another portion thereof, said load bearing member having a first surface functioning as a first electrode; and
growing ultrasonic transducer means including an acoustoelectric film directly on said first surface adapted to mechanically, electrically and acoustically interconnect said acoustoelectric film to said first surface.

5,205,177
METHOD AND APPARATUS FOR GAS MONITORING
Robert E. DuBrock, Jr., Dana Point, and Donald J. Kobout, Lake Elsinore, both of Calif., assignors to Research-Cottrell, Inc., Somerville, N.J.
Filed Jan. 23, 1991, Ser. No. 644,706
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—863.12 **1 Claim**



1. A system for sampling a gas stream and for analyzing the gas stream sample, comprising:
means for taking a gas sample from the gas stream;
means for conditioning the gas sample, said conditioning means receiving the gas sample and removing moisture therefrom and being disposed proximate to said sampling means,
means for analyzing the gas sample to determine the concentration of at least one component of the gas sample, said analyzing means being at a location distant from said sampling means and said conditioning means;
a first gas sample transport line fluidically connecting said conditioning means to said analyzing means to conduct the gas sample from said conditioning means to said analyzing means; and
a second gas sample transport line fluidically connecting said sampling means to said conditioning means to conduct the gas sample from said sampling means to said conditioning means, said conditioning means including:
a first condenser;
a first drain to remove condensed liquid from said first condenser;
a gas sample pump having an inlet and an outlet, said gas sample pump creating a gas suction at its inlet and a gas exhaust pressure at its outlet, said pump inlet being in fluidic communication with said first condenser to draw the gas sample through said sampling means and said first condenser into said sample pump inlet, said sample pump outlet being in fluidic communication with said first gas sample transport line;
a second condenser in which vapor in the gas sample is condensed, said second condenser being in fluidic communication with said sample pump outlet and said first transport line such that the gas sample discharged from said pump outlet enters said second condenser before entering said first sample transport line, the pressure of the sample in said second condenser being greater than ambient air pressure outside said system; and
a second drain to remove condensed liquid from said second condenser;
said first and second condensers including refrigerated coils through which the gas sample passes.

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parallel to the driven shaft (3), characterized in that the gear-

(ii) a plurality of manual shift mode positions in the form of a second pattern; and

means being operable to adjust the speed of the machine above and below said selected speed; and

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METHOD FOR NON-INTRUSIVE CONTINUOUS AND AUTOMATIC TAKING OF SAMPLES, STORING AND SUPPLYING OF SAMPLES AND DATA FOR A POSSIBLE EVALUATION

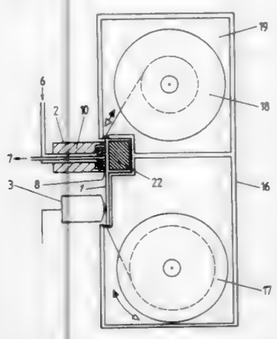
Bernhard Odernheimer, Munster, Fed. Rep. of Germany, assignor to Bruker-Franzen Analytik GmbH, Fed. Rep. of Germany

Division of Ser. No. 602,327, Nov. 26, 1990. This application Jun. 4, 1992, Ser. No. 893,573

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818210

Int. Cl.[5] **G01N** *35/00*

U.S. Cl. 73—863.12 **6 Claims**



1. Method for non-intrusive continuous and automatic taking of samples with material and data-like storing of the samples comprising the steps of:

creating a sample from a sample stream, taking the sample and applying the sample to a sorption layer of a sorptive storage body by means of a sample storing head to cause the sample to penetrate into the sorption layer of the storage body by means of solution and diffusion at a suitable temperature to form a sample spot, said sorption layer being heated by the sample storing head to a temperature suitable for storage;

simultaneously with the sample storing, recording correlating data on the storage body in a data track by means of a data recording head;

thereafter evaluating the sample spot by contacting the storage body with a sample taking head by means of a contact membrane in order to desorb at least a portion of the sample out of the sample spot of the sorption layer of the storage body by the influence of temperature;

transporting the desorbed sample to an analyzer by means of a carrier gas stream; and

reading the correlating data on the data track by means of a data reading head.

5,205,179

SPEED CHANGING DEVICE

Joachim Schneider, Dusseldorf, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

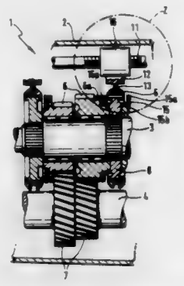
Continuation of Ser. No. 729,042, Jul. 12, 1991, abandoned. This application Sep. 23, 1992, Ser. No. 950,422

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023321; Feb. 20, 1991, 4105157

Int. Cl.[5] **F16H** *3/08*

U.S. Cl. 74—365 **14 Claims**

1. A speed changing device for a toothed change speed gear (**1**) of a motor vehicle in which a gearwheel (**6**) freely rotatable on a driven shaft (**3**) can be coupled with the driven shaft (**3**) by an axially displaceable claw ring (**5**) and a toothed bushing (**8**), the claw ring (**5**) being axially displaceable by a one-piece gearshift fork (**12**) which is actuated by an electric driving means and is arranged on a selector shaft (**11**) which extends parallel to the driven shaft (**3**), characterized in that the gearshift fork (**12**) is axially displaceable by a spindle drive (**16**) which radially surrounds only the associated unrotatable selector shaft (**11**), the spindle drive (**16**) comprises an externally threaded section (**17**) arranged on the selector shaft (**11**) and an



internally threaded section (**18**), a longitudinal axis D1 of the selector shaft (**11**) coincides with longitudinal axes of the components carrying the externally and internally threaded sections, one of the externally threaded section and internally threaded section (**17**, **18**) being actuatable by an electromotor (**19**) integrated and mounted in the gearshift fork (**12**).

5,205,180

MANUAL SPEED SELECTOR OF AUTOMATIC VEHICLE TRANSMISSION

Shuzo Moroto; Shiro Sakakibara, both of Aichi; Mutumi Kawamoto, Tokyo; Takesi Inuzuka, and Masahiro Hasebe, both of Aichi, all of Japan, assignors to Aisin AW Co., Ltd., Japan

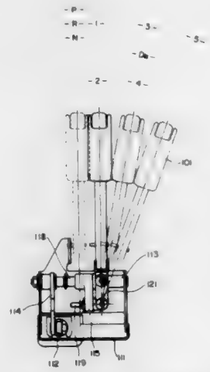
Filed Nov. 7, 1990, Ser. No. 611,825

Claims priority, application Japan, Nov. 9, 1989, 1-291738

The portion of the term of this patent subsequent to Oct. 12, 2008, has been disclaimed.

Int. Cl.[5] **F16H** *59/04*

U.S. Cl. 74—473 R **18 Claims**



1. A manual speed selector for an automatic transmission for a vehicle having a plurality of frictional engagement elements and a torque converter, said automatic transmission providing a manual mode and an automatic mode of operation, said manual speed selector comprising:

(a) shift lever means for providing:

(i) a plurality of automatic shift mode positions in the form of a first pattern;

(ii) a plurality of manual shift mode positions in the form of a second pattern; and

(iii) a transitive position connecting said first and second patterns of shift positions,

and including a shift lever for manual selection of a shift position in one of said patterns;

(b) a hydraulic control system including:

(i) a manual valve linked to said shift lever at least in said first pattern, for movement responsive to movement of said shift lever;

(ii) a plurality of shifting solenoid valves turned on or off responsive to the selection of a shift position;

(iii) a plurality of shift valves, operated by said solenoid valves, for selectively transmitting hydraulic pressure to at least one frictional engagement element to establish a shift stage; and

(iv) a source of hydraulic pressure in hydraulic communication with the frictional engagement devices through said shift valves;

(c) means for setting the manual valve to connect said hydraulic pressure source to at least one of the frictional engagement elements when said shift lever is placed in said transitive position;

(d) manual valve disconnection means for disconnecting said manual valve from said shift lever responsive to movement of said shift lever within said transitive position away from said first pattern and toward said second pattern, whereby said manual valve is operatively disconnected from said shift lever in said plurality of manual mode shift positions; and

(e) an electronic controller including manual mode control means for controlling operation of said solenoid valves to provide engine braking when a manual shift mode position is selected, with said shift lever operatively disconnected from said manual valve.

5,205,181

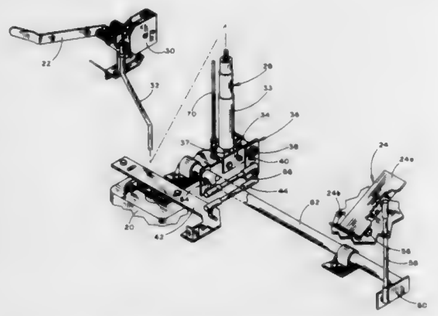
MANUAL MOTION CONTROL OVERRIDE APPARATUS

Stephen D. Wright, Knoxville, Iowa, assignor to Vermeer Manufacturing Company

Filed Feb. 3, 1992, Ser. No. 830,708

Int. Cl.[5] **G05G** *11/00*

U.S. Cl. 74—480 R **16 Claims**



1. An override control system for a ground traveling machine, comprising:

(a) means for driving the machine in a forward and reverse direction over a first, high range of speeds and a second, low range of speeds;

(b) first control means for said high and said low range of speeds operable to select and maintain a selected speed within said speed ranges;

(c) second control means;

(d) self-centering means operably connected to said second control means and said driving means, said second control means being operable to adjust the speed of the machine above and below said selected speed; and

(e) said self-centering means operable to return the speed of the machine to said selected speed upon release of said second control means.

5,205,182

CABLE ACTUATED MIRROR TILT CONTROL

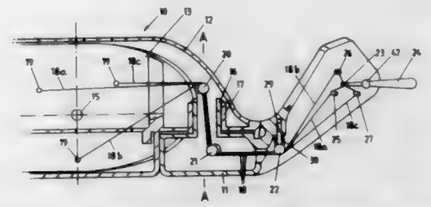
Robert W. Gilbert, Lonsdale, Australia, assignor to Britax Rainsfords Pty Ltd, South Australia, Australia

Filed Jan. 28, 1992, Ser. No. 827,015

Claims priority, application Australia, Feb. 4, 1991, PK4442

Int. Cl.[5] **F16C** *1/10*

U.S. Cl. 74—502.1 **10 Claims**



1. Tilt control means for an exterior "break-away" mirror assembly of a motor vehicle, having a mounting frame of shape to be secured to an exterior portion of the motor vehicle body, a mirror casing, a mirror back carrying a mirror and coupled to the casing by a tilt joint for tilting about at least a horizontal axis, and hinge means so operatively coupling the mirror casing to the mounting frames as to provide means for the mirror casing "break-away" about at least one generally vertical axis, comprising:

control lever retention means having a surface defining a concave part-spherical socket,

a control lever having a convex part-spherical protuberance intermediate its ends engaging in said socket and constrained by the concave socket walls for universal pivotal movement,

rigid curved line guide surface means located radially outwardly from and uniformly spaced around said control lever, a corresponding number of retention anchors on the mirror back spaced radially from said tilt joint, and a corresponding number of flexible lines each extending from a respective retention anchor, around said line guide surface means to a said control lever end, the paths of said lines between said line guide surface means and said control lever end being substantially in a common plane containing said control lever end,

and further rigid curved line guide surfaces which guide said lines between the mounting frame and the mirror back to extend through a zone adjacent said "break-away" axis.

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BICYCLE SPEED CHANGE LEVER ASSEMBLY

Yoshihisa Iwasaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

PCT No. PCT/JP91/00380, § 371 Date Nov. 4, 1991, § 102(e) Date Nov. 4, 1991, PCT Pub. No. WO91/14614, PCT Pub. Date Mar. 10, 1991

PCT Filed Mar. 22, 1991, Ser. No. 773,907

Claims priority, application Japan, Mar. 26, 1990, 2-31700

Int. Cl.[5] **G05G** *5/06*

U.S. Cl. 74—502.2 **9 Claims**

1. The combination of a bicycle handlebar having two end grip portions and a speed change lever assembly, the lever assembly comprising:

a mounting bracket attached to the handlebar adjacent to an end grip portion thereof;

a lever shaft extending downwardly from the mounting

(**19**; **32**) can push the pawl (**4**) in order to release it from

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STEERING WHEEL

element and another portion of the circumference thereof

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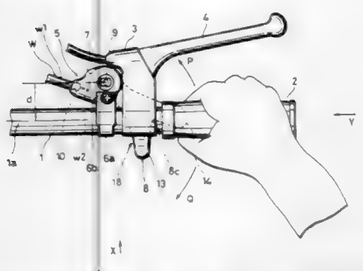
a lever shaft extending downwardly from the mounting bracket; and

a lever pivotally supported on the lever shaft, the lever including a tubular body rotatably fitted on the lever shaft, the lever further including a control arm extending radially outward from the tubular body;



wherein the mounting bracket has a forward extension located in front of the handlebar, the lever shaft being mounted on the forward extension of the mounting bracket to be positioned in front of the handlebar without horizontally overlapping the handlebar.

5,205,184

PARKING HAND BRAKE FOR A MOTOR VEHICLE AND MANUFACTURING PROCESS OF BRAKE LEVER

Jean-Pierre Noel, and Philippe Clerc, both of St. Die, France, assignors to Rockwell Automotive Body Systems, France

Filed Feb. 7, 1992, Ser. No. 832,821

Claims priority, application France, Feb. 11, 1991, 91 01549

Int. Cl.[5] **G05G** *5/18*

U.S. Cl. 74—538 **2 Claims**

1. Hand brake for a motor vehicle, designed so as to be connected to a brake cable (**15**), comprising a ratchet plate (**1**, **2**) intended to be fixed to the floor of the vehicle, a pawl (**4**) designed so as to interact with the ratchet plate, and a handgrip lever (**6**; **26**) equipped with a push-button (**18**) associated with the pawl, characterised in that it comprises a cassette casing (**5** mechanically integral with the grip lever, containing the ratchet plate (**1**, **2**) and the pawl (**4**), and this cassette casing is articulated about a transverse pivot pin (**13**) traversing the ratchet plate and is adapted so as to receive the end of the cable (**15**);

the cassette casing (**5**) is formed from two end pieces (**5***a*) rigidly interconnected by the abovementioned transverse pivot pin (**13**), between which are arranged the ratchet plate (**1**) and the pawl (**4**) and which are provided with means (**8**, **11**, **12**) for fastening to the lever (**6**; **26**);

the cassette casing (**5**) is housed in an end part (**6***b*; **28**) of the lever (**6**; **26**), integrally connected to the cassette casing, which is provided with internal ribs (**8**; **8***a*) over which hook complementary retaining flanks (**9**) of the cassette casing, the said means for fastening the cassette casing to the lever also comprising, at least one rivet (**12**);

the grip lever (**6**; **26**), contains a semi-rigid push rod (**17**; **29**) capable of sliding inside the lever (**6**; **26**) and whose head (**19**; **32**) can push the pawl (**4**) in order to release it from the ratchet plate (**2**) and to enable the lever and the cassette casing (**5**) to pivot about their common axis of rotation (**13**);

the lever (**26**) is angled and the push rod (**29**) is curved so as to match the angle of the lever;

the grip lever (**6**; **26**) is made from moulded plastic and has two hollow zones (**6***a*, **6***b*; **27**, **28**) respectively in the handgrip zone and in the zone for fastening to the cassette casing (**5**), these hollow zones being obtained by means of two movable cores of the mould having opposite and non-parallel axes of displacement (**N1**, **N2**); and

a return spring (**7**) housed in the cassette casing (**5**) and a first end (**7***a*) of which interacts with the pawl (**4**) in order to return it into its position bearing on the ratchet plate (**1**, **2**), and the second end (**7***b*) interacts with the push rod (**17**, **29**) in order to return it into its initial rest position, which corresponds to the bearing position of the pawl on the ratchet plate.

5,205,185

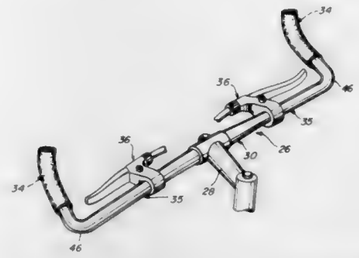
HANDLEBAR

William P. Herman, Marblehead, Mass., assignor to Hsin Lung Accessories Co., Ltd., Taipei Hsien, Taiwan

Filed Apr. 11, 1991, Ser. No. 684,002

Int. Cl.[5] **B62K** *21/12*

U.S. Cl. 74—551.1 **12 Claims**



1. A one-piece handlebar for use with a brake control assembly having a pinch clamp base for mounting the brake control assembly to the handlebar comprising:

a first central grip section having a first outer diameter sized for mounting the pinch clamp base thereon;

a pair of second grip sections each extending from each of respective opposing ends of the central grip section, the second grip sections being unitary with the central grip section and being connected to the central grip section by substantially sharply curved sections having a predetermined rapid radius of curvature wherein ends of the sharply curved sections adjacent the opposing ends of the central grip section have a steady decreasing diameter taper so that the sharply curved sections have a second outer diameter that is less than the first outer diameter of the central grip section so that the pinch clamp passes over the sharply curved sections free of increase of the hole diameter substantially beyond the first diameter and thereby free of resistance to passage of the clamp over the sharply curved sections.

5,205,186

STEERING WHEEL

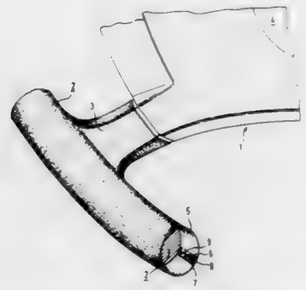
Fritz Dräxlmaier, Sr., Vilsbiburg, Fed. Rep. of Germany, assignor to Eldra-Kunststofftechnik GmbH, Geisenhausen, Fed. Rep. of Germany

Continuation of Ser. No. 492,729, Mar. 13, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 728,755

Claims priority, application Fed. Rep. of Germany, May 23, 1989, 8906358[U]

Int. Cl.[5] **B62D** *1/06*

U.S. Cl. 74—558 **4 Claims**



1. A steering wheel adapted to be grasped by a driver, comprising:

a steering wheel rim having an underside bellow a center line and a radial inner circumference intersecting said center line;

a plurality steering wheel spokes joining said rim at a point on said radial inner circumference;

a cover of leather or leather-like material for covering the steering wheel rim, wherein said cover is made of a single-piece material blank having two longitudinal edges having end faces, wherein said longitudinal edges are uniformly and uninterruptedly connected to each other at a connection extending along the entire steering wheel rim such that the end faces of the longitudinal edges abut each other and

wherein the connection of the two longitudinal edges of the blank forming the cover is located on the underside of the steering wheel at a distance downward from said point on said radial inner circumference of said rim.

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HOLLOW SHAFT

Alfred Ebbinghaus, Aalen, Fed. Rep. of Germany, assignor to Gesenkschmiede Schneider GmbH, Aalen, Fed. Rep. of Germany

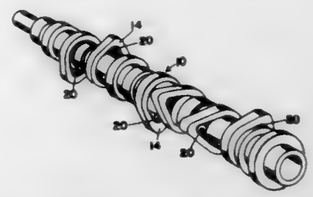
Continuation of Ser. No. 737,561, Jul. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 625,642, Dec. 7, 1990, abandoned, which is a continuation of Ser. No. 301,886, Jan. 4, 1989, abandoned. This application Mar. 20, 1992, Ser. No. 855,144

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715813; Jun. 22, 1987, 3720597

Int. Cl.[5] **F16H** *53/00;* **B21D** *39/00*

U.S. Cl. 74—567 **5 Claims**

1. A hollow shaft with torque transmitting structural elements mounted along a length thereof, said hollow shaft comprising at least one torque transmitting structural element having a noncircular opening for mounting on a pipe provided with a substantially identical wall thickness and having at least one support body disposed between the pipe and the structural element, said structural element being provided with the noncircular opening into which the pipe is widened by internal pressure for positive and nonpositive connection to the structural element that covers a portion of the circumference thereof so that the pipe engages an inner wall of the structural element and another portion of the circumference thereof engages an outer wall of the one support body, wherein the support body is constructed as a component separate from any structural element, further characterized in that the structural



element has a uniform wall thickness that is provided with the noncircular opening and still further characterized in that the wall of the pipe is provided with an increased thickness under each structural element.

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FRICTION PAIRING AND PROCESS FOR ITS PRODUCTION

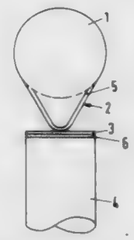
Detlef Repenning, Seelandstrasse 65, 24000 Luebeck 14, and Barry L. Mordike, Edelhof 3, 3360 Osterode-Dorste, both of Fed. Rep. of Germany

Filed Nov. 5, 1991, Ser. No. 786,809

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1990, 9015179[U]; Aug. 21, 1991, 4127639

Int. Cl.[5] **F16H** *53/06;* **B32B** *9/00*

U.S. Cl. 74—569 **20 Claims**



1. A friction pairing comprising:

a) a camshaft which contains a cam running surface,

b) a counterrunner base; and

c) a counterrunner layer which is applied to said counterrunner base and which interacts with said cam running surface,

wherein said counterrunner layer comprises a nanodisperse, amorphous, layer including:

i) about 50 to about 90 atomic percent carbon which at least partly is in the form of a diamond bond structure,

ii) about 2 to about 25 atomic percent hydrogen, and

iii) up to about 48 atomic percent of at least one metal.

5,205,189

ENGINE SHAFT BALANCE ASSEMBLY

Richard A. Wesling, Cincinnati; Terry T. Eckert, Fairfield, and Phillip W. Rambo, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 17, 1990, Ser. No. 628,527

Int. Cl.[5] **F16F** *15/32*

U.S. Cl. 74—573 R **10 Claims**

1. An engine shaft balancing assembly for establishing a predetermined imbalance correction characterized by a magnitude and a direction, the balancing assembly comprising:

a) gas turbine hollow drive shaft having an inside surface;

b) carrier means insertable in the drive shaft and expandable

against the drive shaft inside surface, the carrier means

a first pressure control valve of electromagnetic type for

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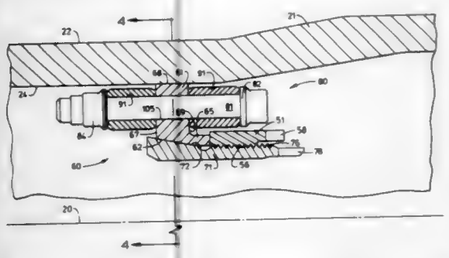
against the drive shaft inside surface, the carrier means including a radially inward first inclined surface, the carrier means adapted to eccentrically receive a plurality of balance weights at a plurality of positions on the carrier means for establishing the predetermined imbalance correction magnitude; and



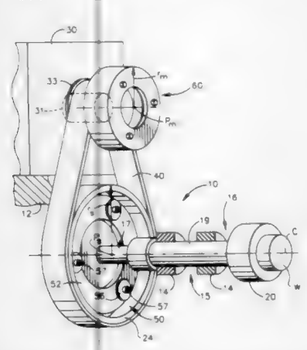
c) expansion means for expanding the carrier means against the drive shaft inside surface to fix the direction of imbalance correction relative to the drive shaft, the expansion means insertable in a center of the carrier means and including a second inclined surface for sliding engagement with the carrier means first inclined surface.

5,205,190

STABILITY HIGH GAIN AND DYNAMIC STIFFNESS SERVO AXIS DRIVE SYSTEM AND METHOD

Mark D. Kohring, West Chester, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Aug. 3, 1992, Ser. No. 924,223
Int. Cl.[5] F16F *15/10*; F16H *7/10*
U.S. Cl. 74—574 **8 Claims**



1. A high gain and high torsional stiffness servo axis drive system for machine tools with improved stability, said system comprising:
a base;
a spindle rotatably supported with respect to said base, said spindle comprising first and second ends;
means on said spindle for securing a workpiece adjacent said first end of said spindle;
a spindle drive mens affixed adjacent the second end of said spindle for rotatably driving said spindle;
a servo motor mounted on said base and having a rotary output shaft;
means for connecting said servo output shaft with said spindle drive means, said connecting means comprising a driving member affixed to said shaft;
first damping means attached to said spindle drive means and tuned for damping torsional oscillations of the output shaft, connecting means, and spindle drive means when said system is not fitted with a workpiece; and
independent second damping means attached to said driving member and tuned for damping torsional oscillations of said driving member, connecting means and spindle in conjunction with said first damping means when said system is fitted with a workpiece.

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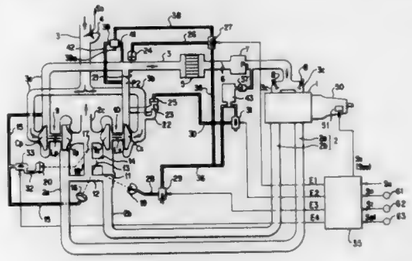
CONTROL SYSTEM FOR SUPERCHARGED ENGINE EQUIPPED WITH AUTOMATIC TRANSMISSION

Minoru Takata, Hiroshima; Hiroaki Yokota, Fuji; Hiroyuki Morioka, Hiroshima, and Osamu Yamashita, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 20, 1991, Ser. No. 671,411
Claims priority, application Japan, Mar. 20, 1990, 2-68221
Int. Cl.[5] F16H *59/32*
U.S. Cl. 74—860 **8 Claims**



1. A control system for supercharged internal combustion engine equipped with an automatic transmission, comprising:
transmission shift control means for causing the automatic transmission to be shifted to a desired speed gear according to a gear shift control pattern;
supercharging means, capable of changing its supercharging capacity, for supercharging the internal combustion engine; and
supercharging control means for changing said supercharging capacity of said supercharging means according to a supercharging capacity control pattern;
said transmission shift control means switching the supercharging capacity control pattern according to said desired speed gear and causing a delay of any change in said supercharging capacity, according to said supercharging capacity control pattern, by said supercharging control means when said transmission shift control means demands a shift of the automatic transmission to a desired speed gear.

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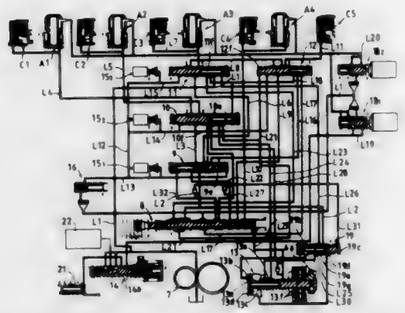
FAIL-SAFE SOLENOID VALVE APPARATUS FOR CONTROLLING OIL PRESSURE FOR VEHICULAR AUTOMATIC TRANSMISSION

Tatsuyuki Ohashi, Minami-Kawachimamachi, and Tetsuya Mochizuki, Utsunomiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1992, Ser. No. 889,402
Claims priority, application Japan, Jul. 31, 1991, 3-192300
Int. Cl.[5] F16H *59/24*
U.S. Cl. 74—867 **4 Claims**

1. An apparatus for controlling an oil pressure for a vehicular automatic transmission, said apparatus comprising:
an accumulator connected to an oil passage which is in communication with each of hydraulic engaging elements for power transmission or speed changing;
a regulator valve for regulating an oil pressure to be supplied to said hydraulic engaging elements;

a first pressure control valve of electromagnetic type for controlling an output oil pressure of said regulator valve by causing an oil pressure to act thereupon;
a second pressure control valve of electromagnetic type for controlling a back pressure of said accumulator;



wherein a drain port of one of said first and second pressure control valves is connected to an oil passage on an output side of the other of said pressure control valves.

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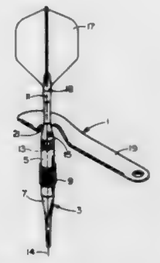
DART TOOL

Dennis R. Wield, W1707 County Trunk J, Sheboygan, Wis. 53083

Filed Jun. 26, 1991, Ser. No. 721,417
Int. Cl.[5] B25B *13/48*
U.S. Cl. 81—176.15 **7 Claims**



1. A dart tool comprising:
a. an elongated handle having first and second ends and first and second opposed side edges, the first side edge being generally straight between the first and second ends, the handle defining a recess having an edge formed in the first side edge thereof and extending a predetermined distance toward the second side edge thereof, the recess edge intersecting the first side edge at a first corner located at a predetermined distance from the first end to thereby define a straight land extending along the first side edge between the first corner and the first end, the recess edge intersecting the first side edge at a second corner located a predetermined distance from the first corner; and
b. a pin having a first end secured to the handle and extending from the recess edge into the recess, the pin having a free end that is located at a predetermined distance from the recess edge to enable a hole in the dart to be placed over the pin,
so that the dart tool can be used to apply a torque to the dart.

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CAN OPENER APPARATUS

Fred W. Rodey, 237 Babcock Dr., Palatine, Ill. 60067

Filed Aug. 4, 1992, Ser. No. 924,758
Int. Cl.[5] B67B *7/44*
U.S. Cl. 81—3.09 **2 Claims**

1. A can opener apparatus, comprising,
an elongate shaft, the elongate shaft having a bottom wall spaced from and parallel a top wall, with a cylindrical side wall extending coextensively between the bottom wall and top wall, with the cylindrical side wall defined by an elongate shaft axis, with the bottom wall and top wall orthogonally oriented relative to the shaft axis, and
a hook member mounted to the top wall projecting exteriorly thereof, and
a latch member mounted to the side wall projecting from the side wall and spaced adjacent the top wall, and
a handle rod is diametrically directed through the elongate shaft adjacent the bottom wall between the latch member and the bottom wall.

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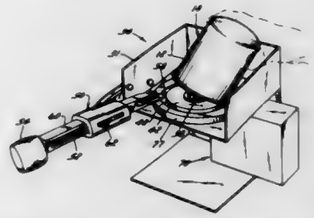
OIL FILTER RECYCLER APPARATUS

John Crosslen, Saukville; John Tolentino, New Berlin, and Gary Monroe, Jackson, all of Wis., assignors to Frank Mayer & Associates, Grafton, Wis.

Filed Jun. 27, 1991, Ser. No. 722,153
Int. Cl.[5] B23B *5/14*
U.S. Cl. 82—92 **13 Claims**



1. An apparatus for severing the casing of an automotive oil filter, the filter having a substantially cylindrical shape and being of the type which includes on one end thereof a circular metal base plate, a casing forming the wall and other end of the cylinder, and a filter cartridge contained therein, the apparatus including:
a turntable for rotating the filter about the axis of its cylindrical shape;

a knife for severing the casing as the filter is being rotated,

ground-engaging deck, interconnecting components inter-

stock on a tool having a table and a cutting element, comprising first means for mounting said apparatus in a predetermined

pressurized supply of fluid to the first booster compartment, which fluid acts against the bottom of said booster

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a knife for severing the casing as the filter is being rotated, with the knife being radially adjustable toward and away from the axis of the turntable, and the knife being a rotatable circular blade protrudable through the casing of the filter;
a slidable knife holder for supporting the knife;
a rotatable threaded rod on the slidable knife holder; and
a ratchet pawl releasably engageable with the threaded rod.

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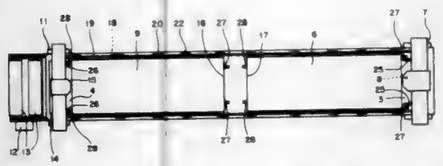
MACHINE TOOL, PARTICULARLY CUTTING MACHINE

Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft für Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Dec. 6, 1991, Ser. No. 804,130
Claims priority, application European Pat. Off., Dec. 13, 1990, 90890322.2
Int. Cl.[5] B65H *16/00;* **B26F** *1/38*
U.S. Cl. 83—272 **10 Claims**



1. In a machine tool for processing flat stock, comprising
a work table having a receiving end and a processing surface for supporting flat stock,
a tool carriage mounted to be movable relative to said work table in a predetermined direction and comprising tool means for processing said flat stock supported on said processing surface, and
a feeder for delivering flat stock adjacent to said receiving end of said work table,
the improvement comprising
a receiving table arranged adjacent to said receiving end of said work table and having a receiving surface of substantially the same size as said processing surface,
said work table and said receiving table constituting a machine table,
two pallets mounted on said machine table for supporting said flat stock, each pallet being reciprocable between a first end position, in which said pallet constitutes said receiving surface, and a second end position, in which said pallet constitutes said processing surface,
actuating means for reciprocating each pallet on said machine table in opposition to the other pallet between said first and second end positions, and
said feeder being operable to deposit the flat stock on each pallet when it is in said first end position.

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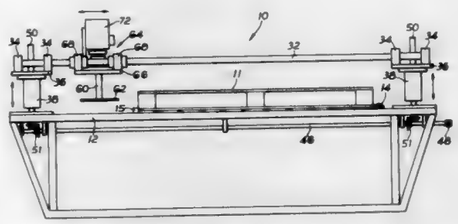
PALLET CUTTING MACHINE

Cecil K. Wiltshire, Southampton, United Kingdom, assignor to GKN Chep Limited, Addlestone, United Kingdom

PCT No. PCT/GB89/01381, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/05615, PCT Pub. Date May 31, 1990
PCT Filed Nov. 20, 1989, Ser. No. 689,805
Claims priority, application United Kingdom, Nov. 23, 1988, 8827341
Int. Cl.[5] B26D *1/18;* **B27B** *5/02*
U.S. Cl. 83—364 **20 Claims**

1. A pallet-cutting machine for selectively removing individual components of a load-bearing pallet, the pallet being composed of load-supporting deck components forming a load-supporting deck, ground-engaging deck components forming a ground-engaging deck, interconnecting components interposed between the decks and fastening means fastening the decks to the interconnecting components, the machine comprising:
support means defining a support plane to support the pallet during a cutting operation thereon,
holding means operable to hold the pallet against movement relative to said support means during a cutting operation on the pallet,
at least one guideway having a guide axis extending parallel to said support plane,
at least one rotary cutter mounted for movement along said guide axis of said at least one guideway, said cutter having a cutting edge extending parallel to said guide axis whereby said cutting edge is movable parallel to one of said deck components of the pallet when the pallet is held on said support means to cut through at least one of the components and fastening means of the pallet,



drive means for imparting rotary motion to said rotary cutter;
adjusting means for imparting relative movement between said cutter and the pallet when held on said support means in directions parallel and perpendicular to said support plane whereby said cutter is selectively adjustable relative to the pallet in directions parallel and perpendicular to the support plane for cutting the pallet in a preselected region where a selected deck component is fastened to a selected interconnecting component in order to separate the selected deck component from the selected interconnecting component, said adjusting means comprising control means operable to bring said cutter to a selected one of a plurality of predetermined positions, and
sensing means operable to sense a part of the pallet to enable said plurality of predetermined positions to be determined.

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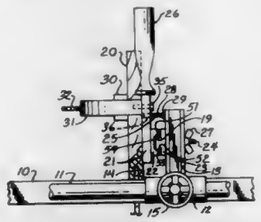
WORK-HOLDING APPARATUS FOR TABLE POWER TOOLS

Brian B. Foray, 8008 S. Austin Ave., Burbank, Ill. 60459, and Thomas Ricciardone, 10650 W. 67th St., Countryside, Ill. 60525

Filed Oct. 31, 1991, Ser. No. 786,246
Int. Cl.[5] B26D *7/06*
U.S. Cl. 83—435.001 **13 Claims**



7. A work holding apparatus for positioning and moving

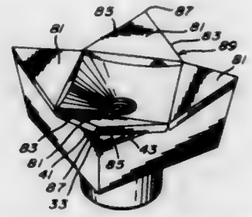
stock on a tool having a table and a cutting element, comprising first means for mounting said apparatus in a predetermined position relative to said cutting element; second means for releasably holding said stock on said apparatus in a selected substantially vertical plane relative to said cutting element; third means for slidably moving said second means along a longitudinal axis; and fourth means for adjustably positioning said second means relative to said mounting means; whereby said stock is held by said second means for sliding by said third means along said longitudinal axis, said fourth means providing angular adjustment substantially around said longitudinal axis, and said first, second, third and fourth means co-act to reduce unwanted relative vertical and angular movement and to substantially limit movement of said second means relative to said means to that along the longitudinal axis.

5,205,199

SAW TOOTH FOR CIRCULAR SAW

Charles D. MacLennan, Hudson Heights, Canada, assignor to Quadco Equipment Inc., St-Eustache, Canada

Filed Oct. 9, 1992, Ser. No. 958,790
Int. Cl.[5] B27B *33/08*
U.S. Cl. 83—839 **8 Claims**



1. A saw tooth having a frusto-pyramidal shaped body with a mounting end and a cutting end, the cutting end being recessed inwardly, the body having a plurality of flat sides extending between the mounting end and the cutting end, the flat sides forming corners at the cutting end where they meet, a pair of straight edges diverging from each corner at a shallow angle toward the mounting end, each straight edge from each corner joining with a straight edge from an adjacent corner to form an angled cutting edge, each angled cutting edge defining the end of a flat side.

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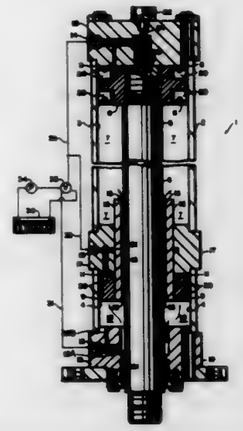
HYDRAULIC BOOSTER DEVICE FOR LINEAR ACTUATOR

John J. Wright, 9 Hix Ave., Rye, N.Y. 10580

Continuation-in-part of Ser. No. 558,228, Jul. 26, 1990. This application Jan. 9, 1992, Ser. No. 818,300
Int. Cl.[5] F01B *25/26*
U.S. Cl. 91—1 **11 Claims**

1. A linear actuator comprising:
a pressurized fluid supply;
a housing having a primary piston chamber and a booster piston chamber;
a piston rod disposed within said housing;
a primary piston secured to one end of said piston rod and disposed within said primary piston chamber, said primary piston chamber having a first primary compartment and a second primary compartment disposed on opposite sides of said primary piston;
a booster piston movably disposed about said piston rod within said booster piston chamber, said booster piston chamber having a first booster compartment and a second booster compartment disposed on opposite sides of said booster piston;
a thrust column, affixed to said booster piston and movable relatively axially with respect to the piston rod, for pushing directly against said primary piston, responsive to the pressurized supply of fluid to the first booster compartment, which fluid acts against the bottom of said booster piston, so as to provide an initial thrust component to said piston rod, said thrust column being disposed radially between said booster piston and said piston rod so as to define an annular fluid channel extending axially between said first booster compartment and said first primary compartment for enabling said fluid to move therebetween, thereby to contribute a substantial additional thrust component to move said primary piston;
a first port, located below the extreme point of travel of said booster piston, when the piston rod is fully extended, said port extending radially in fluid communication with said first booster compartment, thereby to be capable of supplying or draining said fluid to or from said first primary compartment and said first booster compartment concurrently;



a second port capable of supplying and draining fluid to or from said second primarly compartment; and
a third port capable of supplying and draining fluid to or from said second booster compartment; and,
in which, to enable a precisely directed, copious parallel flow of pressurized fluid, said device includes a first axial passageway which connects the first, radially extending port to a point in said first booster compartment immediately adjacent and aligned with said annular fluid channel when the piston rod is fully extended, and further includes a second axial passageway spaced radially from the first axial passageway which connects the first port to a point in said first booster compartment immediately adjacent said booster piston bottom surface when the piston rod is fully extended.

5,205,201

DISPLACEMENT CONTROL VALVE

Wilhelm Göllner, Neumünster, Fed. Rep. of Germany, assignor to Sauer, Inc., Ames, Iowa

Filed Aug. 19, 1991, Ser. No. 746,907
Int. Cl.[5] F15B *13/16;* **F16D** *39/00*
U.S. Cl. 91—387 **9 Claims**

1. A displacement control valve for use in a control for a variable displacement hydraulic unit, the control having command input means for generating a differential command pressure representative of a desired hydraulic unit displacement and servo means for varying the displacement of the hydraulic unit, the displacement control valve comprising:
an elongated valve body, having a lateral opening with an

interior bore communicating at opposite ends with the

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WORKING CYLINDER WITHOUT PISTON ROD AND WITH A BRAKING DEVICE, IN PARTICULAR FOR

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TAMPER RESISTANT BRAKE ACTUATOR

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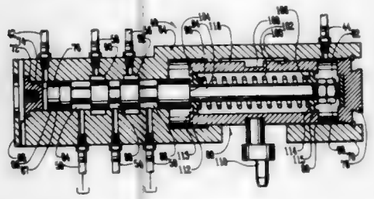
interior bore communicating at opposite ends with the differential command pressure;
inlet means communicating the valve body with a source of pressurized fluid;
outlet means for directing pressurized fluid from the valve body to the servo means;
a valve spool axially moveable within the interior bore in



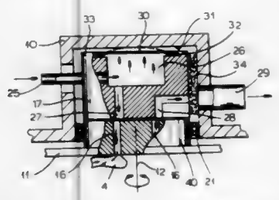
response to the differential command pressure to interconnect the inlet means and the outlet means; and
feedback means, having an elastic component and a non-elastic component, for elastically coupling the valve spool through said lateral opening with the variable displacement hydraulic unit and said elastic component being movably mounted in sealed engagement with the interior of the valve body.

5,205,202

COMPRESSED AIR RADIAL MOTOR

René Kägi, Stäfa, Switzerland, assignor to Peter Richner, Hagglingen; Gerold Richner, Wohlen; Bruno Paul Wernli, Habsburg and Riwisa AG Kunststoffwerke, Hagglingen, all of Switzerland

Filed Aug. 22, 1991, Ser. No. 748,656
Claims priority, application Switzerland, Aug. 23, 1990, 02739/90
Int. Cl.[5] F01B *3/06, 19/00*
U.S. Cl. 91—485 3 Claims



1. A compressed air radial motor comprising:
a housing formed with a wall;
a motor shaft rotatably mounted on said housing opposite said wall;
a conical supporting disc rotatably fixed with said shaft in said housing;
a flat supporting disc mounted rotatably in said housing and facing said supporting disc;
fluid cell means between said discs for transmitting a torque to said motor shaft;
a control head for pneumatically controlling said fluid cell means and mounted rotatably fixed in said housing, said control head being formed with:
an inner face facing said flat disc,
an outer face spaced from and facing said wall of said housing and provided with an annular groove, and
a chamber extending axially inwardly from said annular groove;
means for delivering a pressure medium into said chamber; and
a pressure round elastomer diaphragm, said diaphragm being a disc received in said groove and spanning said chamber, said diaphragm urging against said wall of said housing under a pressure generated by said medium upon delivering thereof into said chamber and pressing thereby said inner face of said control head against said flat disc.

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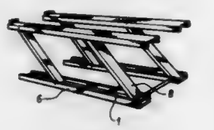
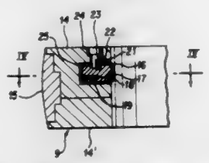
HYDRAULIC CYLINDER-PISTON UNIT PROVIDED WITH A MECHANICAL SAFETY DEVICE, PARTICULARLY FOR PANTOGRAPH TYPE MOTOR VEHICLE LIFTS

Eride Rossato, Via Mazzini, 7, I-30035, Ballo di Mirano, Italy

Continuation of Ser. No. 110,722, Jul. 31, 1987, abandoned. This application Jun. 8, 1989, Ser. No. 418,681
Claims priority, application Italy, Dec. 5, 1985, 84159 A/85
Int. Cl.[5] F15B *15/26*
U.S. Cl. 92—19 5 Claims





1. A hydraulic cylinder-piston unit having a mechanical safety device, particularly for motor vehicle lifts of the pantograph type, comprising
a cylinder having a first, close, endpiece at one end thereof and a second endpiece at the opposite end thereof, said second endpiece having an aperture therein,
a piston slidably contained within said cylinder and dividing the same into a rod end chamber and a closed end chamber,
a hollow rod attached to said piston and extending through the aperture of said second endpiece,
a toothed rod fixed at one end of said cylinder to the closed endpiece thereof,
said hollow rod being axially movable with respect to said toothed rod by means of said piston,
said piston containing a pawl assembly cooperating with said toothed rod, said pawl assembly comprising at least one radially movable stop member and means for biasing said stop member toward said toothed rod, whereby during elongation of the cylinder-piston unit the stop member yields elastically in passing from one tooth to the next, whereas during retraction of the unit said stop member engages within a notch defined between two successive teeth, thereby forming a mechanical safety stop, and further comprising, for each stop member,
a plunger mounted in said piston for movement parallel to the axis thereof and having an upper surface exposed to the rod end chamber of the cylinder and said plunger further comprising means for retracting the respective stop member into the piston and out of engagement with the toothed rod.

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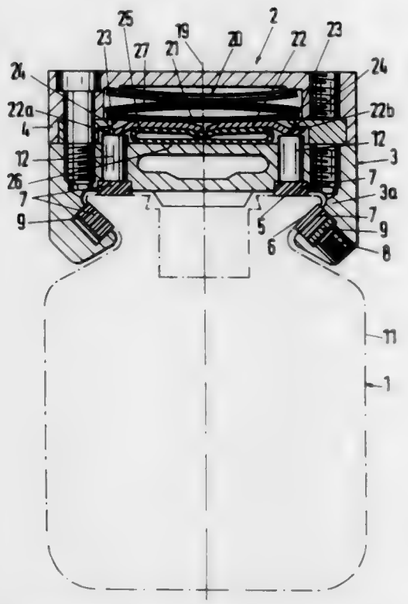
WORKING CYLINDER WITHOUT PISTON ROD AND WITH A BRAKING DEVICE, IN PARTICULAR FOR COMPRESSIBLE MEDIA

Helmut Göttling, Iserhagen; Rudolf Möller, Gehrden; Horst Janetzko, Celle, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 17, 1991, Ser. No. 731,629
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1990, 4023058
Int. Cl.[5] F15B *15/26*
U.S. Cl. 92—28 23 Claims



1. A piston-rod-less working cylinder comprising
a force collector formed as a slider;
a working cylinder;
slider tracks disposed on the slider;
a cylinder casing forming counter slider tracks and receiving the working cylinder;
sliding bodies disposed between the slider tracks and the counter slider tracks;
adjusting elements positioned and engaged in a direction toward the sliding bodies for adjusting a slide play or brake play, respectively;
a braking device disposed, relative to the slider track and to the counter slider track, at a side distance relative to a slider plane and a casing center longitudinal plane, respectively;
a force member attached to the braking device in an upper region of the braking device between the sliding bodies and an adjusting element, respectively, wherein the force member operates in a region of the casing center longitudinal plane;
a lever element engaging the adjusting element centrically with lever arms, and where a press-on force engages the lever element in the center for thereby generating the brake force.

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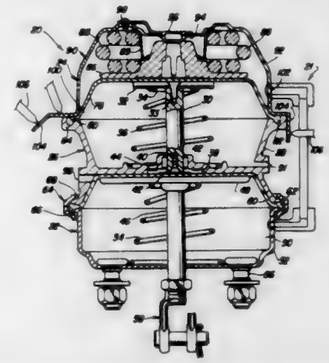
TAMPER RESISTANT BRAKE ACTUATOR

Graydon J. Choinski, Utica, Mich.; Allen L. Gummer, Santa Rosa, Calif., and David W. Brooks, Royal Oak, Mich., assignors to Indian Head Industries, Inc., Southfield, Mich.

Continuation of Ser. No. 778,307, Oct. 16, 1991, abandoned, which is a continuation of Ser. No. 583,795, Sep. 17, 1990, Pat. No. 5,067,391, which is a continuation of Ser. No. 118,372, Nov. 6, 1987, Pat. No. 4,960,036. This application Jul. 8, 1992, Ser. No. 910,465
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] F01B *7/00*
U.S. Cl. 92—63 10 Claims



1. A tamper-resistant fluid operated brake actuator comprising:
a flange case having a pair of opposed chamber portions defining portions of a spring chamber and a service chamber respectively, said flange case having an annular flange which extends generally radially outwardly from said portion defining part of said spring chamber;
a service chamber housing defining said service chamber with said flange case portion, a diaphragm received between said service chamber housing and said flange case, a spring mounted between said service chamber housing and said service chamber diaphragm and biasing said service chamber diaphragm towards said flange case;
a head having an annular rim secured to said annular flange to define said spring chamber;
a spring chamber diaphragm having an outer peripheral portion disposed between said annular flange of said flange case and said annular rim of said head, a power spring piston mounted on said spring chamber diaphragm, a power spring mounted in contact with said power spring piston, and between said power spring piston and said head;
a second spring mounted between said spring chamber diaphragm and said flange case;
a push rod mounted in contact with said spring chamber diaphragm and extending through said flange case, into said service chamber and outwardly through said service chamber housing and adapted to be connected to a yoke assembly; and
a securing member securing said annular rim to said annular flange, said securing member having a radially extending portion radially aligned with said annular flange and said spring chamber diaphragm, and on a side of said spring chamber diaphragm spaced towards said head, said securing member being deformed beyond its elastic limit around said annular flange to entrap said outer peripheral portion of said spring chamber diaphragm between said annular flange and said annular rim, and to retain said head to said flange case such that said head is rigidly

secured to said flange case by said securing member,

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MULTIMODAL ROTISSERIE

spaced apart in a distal relationship in the plane of the

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METHOD AND APPARATUS FOR DRY PRINTING

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secured to said flange case by said securing member, whereby to remove said head from said flange case, said securing member must be deformed beyond its elastic limit.

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FOOD PRODUCTION APPARATUS

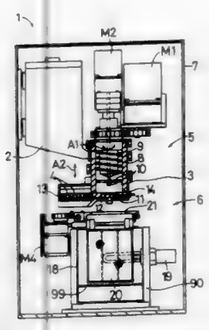
Shozo Kitama, Sakai; Hiroshi Yoshikawa, and Akimitsu Kanemaki, both of Fukui, all of Japan, assignors to Kabushiki Kaisha JNT, Fukui, Japan

Filed Apr. 13, 1992, Ser. No. 867,605

Claims priority, application Japan, Apr. 12, 1991, 3-80185; Apr. 16, 1991, 3-84153; Oct. 25, 1991, 3-279623

Int. Cl.[5] A23L *1/216;* **A23P** *1/00;* **A47J** *37/12*

U.S. Cl. 99—326 **13 Claims**



1. A food production apparatus, comprising:

a shaping means for combining water and a powder, mixing the water and powder and extruding the mixture in a predetermined shape, said shaping means comprising:

a cylindrical casing defining a mixing chamber and a downwardly directed opening,

a hopper connected to said cylindrical casing for storing and supplying a powder,

a conveyor in said cylindrical casing for transferring powder from said hopper to said mixing chamber,

a blade member driven to rotate in forward and reverse directions about a rotation axis in said mixing chamber and to vertically move along said rotation axis,

a shutter member closing said opening of said cylindrical casing, said shutter member including a water supply portion having a water supply hole for supplying water to said mixing chamber and an extrusion portion having a plurality of extrusion holes therein, wherein said shutter member is moveable between a first position in which said water supply hole communicates with said mixing chamber and a second position in which said extrusion holes communicate with said mixing chamber, and

a means for driving said shutter member between said first and second positions; and

a heating means for heating the shaped mixture extruded from said shaping means, said heating means comprising:

a storage bath for storing a liquid therein,

a temperature regulating means for heating the liquid in said storage bath and for maintaining the temperature of the liquid at a predetermined value,

a scooping member disposed in said storage bath so as to be moveable above and below the level of the liquid in said storage bath, said scooping member having a plurality of openings therein, and

a sweeping member driven to move along an upper surface of said scooping member when said scooping member is positioned at an upper limit position above the level of the liquid in said storage bath.

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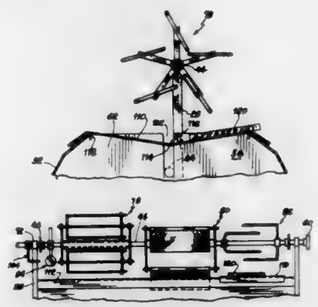
MULTIMODAL ROTISSERIE

Kevin McGuire, 7811 Mission Gorge Rd. Ste. K, San Diego, Calif. 92120

Filed Jul. 17, 1992, Ser. No. 914,323

Int. Cl.[5] A47J *37/04*

U.S. Cl. 99—340 **15 Claims**



1. A multimodal rotisserie comprising:

(a) a body having:

(i) a frame;

(ii) a housing supported on said frame and having a floor, two spaced sidewalls defining a longitudinal direction parallel thereto, and a pair of spaced endwalls connected to said sidewalls such that said housing defines a heating chamber having an at least partially open top;

(b) heat producing means in said heating chamber;

(c) a spit;

(d) spit support bearing means defined by said body to rotationally mount said spit longitudinally extended above said floor at a cooking level in a cooking mode;

(e) said body defining carving mode mounts for mounting said spit at a carving level in a carving mode elevated above said cooking level;

(f) said housing side walls each having an upper edge defining a support rail such that two parallel support rails are defined; and,

(g) a carving tray configured to seat on said support rails and cover at least a portion of said heating chamber top beneath said carving level to permit the carving of meat on said spit and on said carving tray without removing said spit from said mounts, said carving tray being movable between selected positions on said rails between the endwalls of the housing so that the tray can be selectively positioned directly under the food on the spit.

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FOOD PRODUCT CARRIER FOR AN AUTOMATIC COOKING MACHINE

Dean Gongwer, Wakarusa, Ind., assignor to Nelgo Manufacturing, Inc., Wakarusa, Ind.

Filed Jul. 23, 1992, Ser. No. 917,313

Int. Cl.[5] A47J *37/04*

U.S. Cl. 99—345 **2 Claims**

1. A food product carrier for use in a food cooking machine having an endless conveyor comprising:

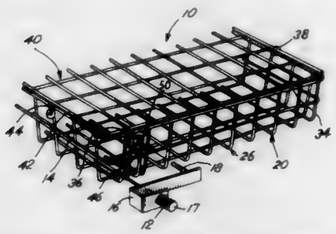
a wire basket having a bottom and side members with an open top portion defining a food holding area therein,

a wire lid pivotally mounted to said basket for shiftable movement between an open position wherein said lid being spaced apart from said top opening and a closed position wherein said lid overlies said top opening, and

two opposed wire arch members, a first of said arch members mounted to said basket, a second of said arch members extending from said lid,

in said open position said first and second arch members spaced apart in a distal relationship in the plane of the overlay,

in said closed position said arch members in an overlying relationship so as to define an aperture in the plane of the overlay bounded by the curvature between said first and second arch members when viewed in the plane of the overlay,



whereby said cooking machine includes retractable mounting parts for restrictively engaging said carrier through said aperture when said carrier is in said closed position for securing said carrier to said endless conveyor and preventing said shiftable movement while said carrier is mounted within said cooking machine.

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METHOD AND APPARATUS FOR DRY PRINTING USING A HOT EMBOSSING FOIL

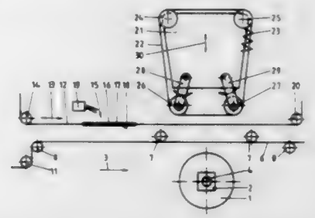
Walter Mathis, Feldheim 1, CH - 6312 Steinhausen, Fed. Rep. of Germany

Filed Apr. 1, 1992, Ser. No. 861,903

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1990, 4025712

Int. Cl.[5] B41F *1/07*

U.S. Cl. 101—32 **5 Claims**



1. Method for dry printing onto a workpiece or printed article through application of a hot embossing foil and a thinly formed embossing die and by the application of heat, pressure and time in which the workpiece and the embossing die are moved towards each other, brought into contact with intermediate clamping of the hot embossing foil thereby transferring heat and moved apart again, whereby the hot embossing foil adheres to the workpiece according to the embossing die and, after a cooling down time, detached from the workpiece with the exception of the printed image, characterized in that the surface of the workpiece (**1**), the hot embossing foil (**6**) and the thinly-formed embossing die (**15**) are moved in the same direction in synchronism and in mutual engagement with surfaces in contact, and that the contact time of the embossing die and the cooling time for the hot embossing foil are controlled through the seed and the angles of contact (**9**, **10**, **39**).

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DEVICE APPLIABLE TO AN APPARATUS FOR MANUFACTURING "RAVIOLI" IN ORDER TO OBTAIN "TORTELLINI"

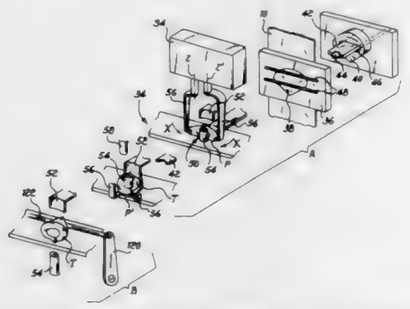
Luigi Tansini, S. Colombano al Lambro, Italy, assignor to Off. Mecc. Giacomo Toresani S.p.A., Milan, Italy

Filed May 5, 1992, Ser. No. 878,935

Claims priority, application Italy, May 10, 1991, MI91 A 001283

Int. Cl.[5] A21C *9/00, 9/08, 11/08;* **A23P** *1/00*

U.S. Cl. 99—450.6 **8 Claims**



1. A device (**34**) for making tortellini from a single sheet of pastry (**10**) and stuffing, said device (**34**) being for attachment to an apparatus (**4**) which includes a ravioli making device (**2**), means for providing the single sheet of pastry (**10**) and a feeding conduit (**16**) for providing the stuffing, said ravioli making device (**2**) being replaced by said device (**34**) for making tortellini, the device (**34**) comprising means for forming a tortellino and means for ejecting the tortellino from the device (**34**).

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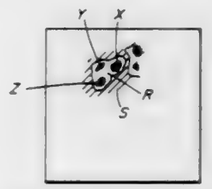
PRINTED PRODUCT HAVING ADJACENT OR CLOSELY SPACED MULTICOLOUR HALFTONE DOTS

Wallace Edwards, P.O. Box 1265, Station B, Weston, Ontario, Canada M9L 2R9

Division of Ser. No. 667,757, Mar. 11, 1991, Pat. No. 5,074,206, which is a division of Ser. No. 302,539, Jan. 25, 1989, Pat. No. 4,998,962. This application Dec. 23, 1991, Ser. No. 813,648

Int. Cl.[5] B41F *3/04*

U.S. Cl. 101—171 **7 Claims**



1. A printed product having at least two distinct pluralities of printed halftone dots, each of which is printed in a different colour with a different printing plate, characterized in that the dots of the first plurality of halftone dots are separated from adjacent dots of the second plurality of halftone dots by a distance of between zero and a few thousandths of an inch, when printed in perfect register.

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right hand and left hand thread means axially spaced on the

a platform on which said ink circulating assembly is

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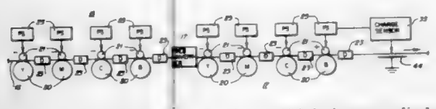
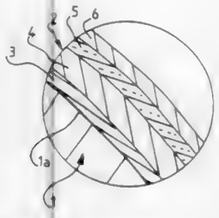
METHOD OF REDUCING INK ELECTRETS IN GRAVURE WEB PRINTING
Gene H. Wolfe, c/o R. R. Donnelley & Sons Co., 77 W. Wacker, 9th Floor, Chicago, Ill. 60601
Continuation-in-part of Ser. No. 658,534, Feb. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 324,674, Mar. 17, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 923,322
Int. Cl.[5] B41F 9/02, 5/06
U.S. Cl. 101—170 36 Claims



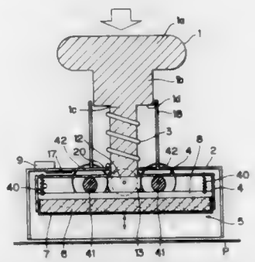
1. In a gravure web press having multiple image cylinders and associated impression rolls forming nips through which a web passes, the press utilizing electrostatic assist with each impression roll operated at a DC potential with respect to the associated gravure cylinder to enhance the transfer of ink from the cylinder to the web, the method of reducing the potential of the electrets in the dry ink on the printed web, which comprises:
creating an electric field in the web by at least one impression roll on the order of 5×10^4 volts/cm, such that electric charges are trapped in electrets in the dry ink on the printed web and
after electrets form in dry ink on the web, subjecting the web to an electric field opposite in polarity and at least equal in magnitude to the electric field created in the web by the impression rollers and image cylinders.

5,205,213
AXIALLY SYMMETRICAL GAPLESS LAYERED SLEEVE PRINTING BLANKET SYSTEM
Michel Bresson, 55 Hayden Ave., Lexington, Mass. 02173
Filed Apr. 8, 1991, Ser. No. 682,048
Claims priority, application France, Apr. 12, 1990, 90 04749
Int. Cl.[5] B41F 7/02
U.S. Cl. 101—217 13 Claims



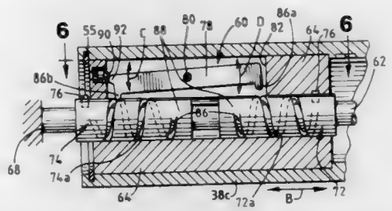
1. A printing blanket comprising:
a sleeve for mounting around a cylinder, said sleeve being gapless for rotational symmetry thereby minimizing vibration at high speeds, said sleeve comprising a gapless inner layer of cellular rubber operative for disposition around an outer surface of a cylinder, a gapless hard elastomeric layer disposed around said inner layer, and a gapless printing layer disposed around said hard elastomeric layer, said printing layer being operative to print ink onto paper.

5,205,214
STAMP DEVICE HAVING CONTROLLED PROJECTION AMOUNT OF INK PAD FROM PAD HOLDER
Keiji Seo, and Takashi Miki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed May 22, 1992, Ser. No. 887,149
Claims priority, application Japan, May 27, 1991, 3-037516[U]; Mar. 3, 1992, 4-045523
Int. Cl.[5] B41K 1/42
U.S. Cl. 101—333 17 Claims



1. A stamp device for providing an inked image on an image receiving sheet through a heat sensitive stencil paper in which a perforated image section is formed, the stamp device comprising:
an outer frame;
a pressure means movably supported by the outer frame;
an ink cartridge having an ink-impregnated pad contactable with the image receiving sheet through the perforated stencil paper for transferring an ink in the ink-impregnated pad to the image receiving sheet through the perforated imaging section;
a pad holder for supporting the ink cartridge, the pressure means being connected to the pad holder for providing projected and retracted positions of the ink-impregnated pad relative to the outer frame; and
projection length adjusting means positioned between the pad holder and the ink cartridge for adjusting a projecting amount of the ink-impregnated pad from the pad holder.

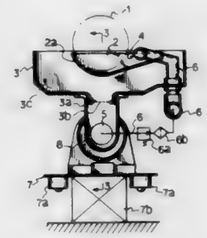
5,205,215
OSCILLATING ROLLER MECHANISM FOR PRINTING OR DUPLICATING MACHINES
Stanley Witczak, Chicago, Ill., assignor to A.M. International, Inc., Chicago, Ill.
Filed Mar. 20, 1991, Ser. No. 672,578
Int. Cl.[5] B41F 31/14
U.S. Cl. 101—348 9 Claims



1. In a printing, duplicating or like machine which includes a moisture or ink system having a plurality of distribution rollers for distributing moisture or ink to the printing couple of the machine, a mechanism for axially oscillating one of the distribution rollers relative to a fixed member on the machine comprising:
shaft means extending axially of said one distribution roller;

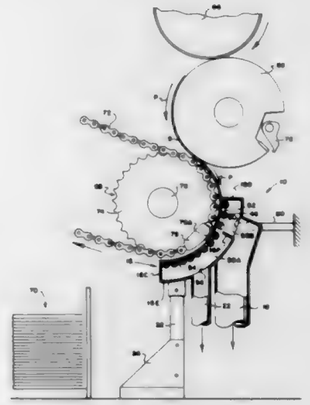
right hand and left hand thread means axially spaced on the shaft means;
actuator means for alternating engagement in the right hand and left hand thread means for axially oscillating the distribution roller in response to rotation of the roller;
means for moving the actuator means alternatingly into and out of the right hand and left hand thread means; and
a single means for temporarily holding the actuator means in either of two positions of engagement with either the right hand or left hand thread means including complementary interengaging detent means operatively associated between the actuator means and the fixed member and having a spring loaded detent member on one of the actuator means and fixed member and a detent engaging projection on the other of the actuator means and fixed member whereby the detent engaging member can snap back and forth over the spring loaded detent member to define said positions,
wherein said actuator means comprises a pivotable teeter member with spaced ends,
further wherein said single holding means comprises one of the spring loaded detent member and detent engaging projection on the fixed member and the other of the spring loaded detent member and detent engaging projection on one end of the teeter member.

5,205,216
INKING UNIT
Yuichi Okamura, and Hideo Ohta, both of Tokyo, Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan
Filed Jun. 11, 1991, Ser. No. 713,733
Claims priority, application Japan, Oct. 3, 1990, 2-266106
Int. Cl.[5] B41F 31/02
U.S. Cl. 101—367 1 Claim



1. In an ink supply system of a keyless offset rotary printing press wherein excess dampening water from a water supply system invades the ink supply system, the ink supply system in which a roller and an ink fountain adapted to supply ink onto a peripheral surface of said roller are relatively arranged such that the distance between an internal bottom surface of said ink fountain and the peripheral surface of said roller is decreased gradually to a downstream end from an upstream end of said ink fountain in the direction of rotation of said roller, an inking unit comprising
an ink circulating assembly including said ink fountain provided in said ink reservoir, ink outlet means for introducing the ink into said ink fountain, an ink reservoir having an open top and surrounding said ink fountain from beneath the ink fountain, a screw conveyor arranged along the longitudinal direction within said ink reservoir for conveying the ink and mixing said excess dampening water therewith and diffusing said excess dampening water thereinto, and a pipe connecting said ink reservoir and said ink outlet means;
a platform on which said ink circulating assembly is mounted, and
means for moving said platform, including a lifter for vertically moving said platform, and casters for horizontally moving said platform, in order for use both as adjustment of a position of said ink fountain in relation to said roller and as removal of said ink circulating assembly to repair and/or to change one to another.

5,205,217
VACUUM TRANSFER APPARATUS FOR ROTARY SHEET-FED PRINTING PRESSES
Howard W. DeMoore, 10954 Shady Trail, Dallas, Tex. 75220, and Howard C. Secor, Coppell, Tex., assignors to Howard W. DeMoore, Plano, Tex.
Filed Dec. 31, 1990, Ser. No. 636,445
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] B41F 5/00
U.S. Cl. 101—420 24 Claims



1. A vacuum transfer apparatus for use in combination with a rotary sheet fed offset printing press having an impression cylinder for applying wet ink to one side of a sheet, and a transfer conveyor having means for gripping and pulling the freshly printed sheet from the impression cylinder and conveying the sheet along a transfer path to a further processing station of the press, said vacuum transfer apparatus comprising:
a frame defining a vacuum chamber;
a plurality of support bars mounted on said frame and arranged in first and second groups overlying said chamber and arrayed to extend in spaced side-by-side parallel relation;
means communicating with said vacuum chamber for inducing a negative pressure within said chamber, whereby negative pressure induced within said chamber causes air to flow into said chamber through the spaces between said support bars to draw the unprinted side of a sheet; and,
means coupled to said frame for producing a differential airflow through the spaces between the support bars of said first group relative to the airflow through the spaces between the support bars of said second group, said differential airflow being greater per unit area through the first group than through the second group.

5,205,218
METHOD AND APPARATUS FOR

ence with a tapered groove formed thereabout which

5,205,221
BOARD WITH CELLULAR STRUCTURE

5,205,223
FOLDING TABLE

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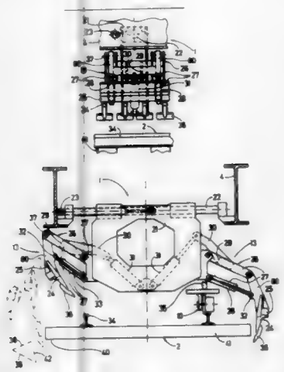
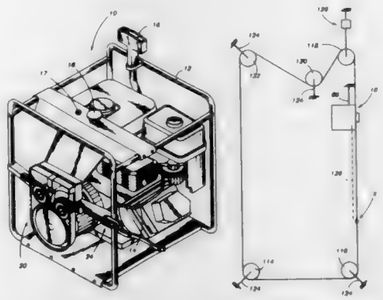
5,205,218
TAMPING MACHINE AND METHOD FOR CONSOLIDATING THE BALLAST OF A TRACK
Josef Theurer, Wien, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria
Filed Jun. 9, 1992, Ser. No. 895,909
Claims priority, application Austria, Jun. 12, 1991, 1178/91; Feb. 4, 1992, 184/92
Int. Cl.[5] E01B *27/00*
U.S. Cl. 104—12 23 Claims



1. A method for continuously consolidating ballast under a track, comprising rails and sleepers which are arranged transversely to said rails and have sleeper ends with sleeper end faces, by a machine having tamping picks, comprising
raising said track to a desired position,
causing said tamping picks to push said ballast in front of and under said sleeper ends by a cycle of shovel movements comprising a consolidating movement in a direction which is perpendicular to said rails, an upward movement occurring immediately in front of said sleeper end faces, and a return movement counter to said consolidating movement, and
continuously causing said tamping picks to repeat said cycle of shovel movements.

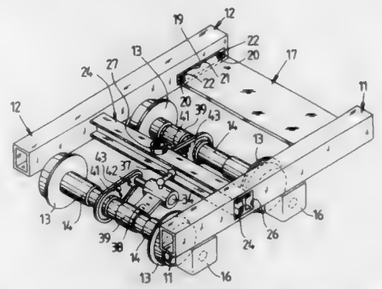
5,205,219
SKIER ROPE TOWING APPARATUS AND WINCH THEREFOR
Marc Groskreutz, 5121 N. Bannen, Spokane, Wash. 99216, and Patrick W. Foster, Spokane, Wash., assignors to Marc Groskreutz, Spokane, Wash.
Filed Apr. 3, 1991, Ser. No. 680,238
Int. Cl.[5] B61B *11/00*
U.S. Cl. 104—173.2 32 Claims

1. A portable snow skier rope towing system comprising:
an endless loop of flexible tow rope;
a series of pulleys supporting the endless loop of tow rope for driving about an elongated enclosed path, the elongated path having opposed extreme ends, each extreme end being defined by at least one end pulley;
a supporting frame separate from said series of pulleys and separate from said end pulleys;
a motor operably mounted relative to the supporting frame, the motor having an output drive; and
a winch apparatus operably connected with the motor output drive and relative to the supporting frame, the tow rope passing through the winch at a location within the enclosed path which is displaced from each of the extreme end pulleys, the winch apparatus comprising:
a drive wheel mounted for rotation and engagement with the output drive, the drive wheel having a circumference with a tapered groove formed thereabout which receives the tow rope; and
a rope outlet pinch wheel mounted for rotation adjacent the drive wheel, the tow rope being received about the



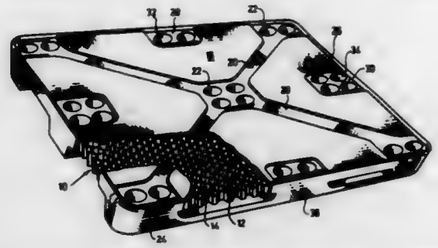
pinch wheel, the pinch wheel being mounted for selective movement relative to the drive wheel to urge the tow rope into the tapered circumferential drive wheel groove; the tow rope being received about at least 180° and less than 360° of the drive wheel circumference.

5,205,220
RAILWAY TRUCK
Brooks Wallace, 921 Coosa St., Birmingham, Ala. 35222
Filed Jun. 8, 1992, Ser. No. 895,126
Int. Cl.[5] B61F *5/00*
U.S. Cl. 105—167 11 Claims



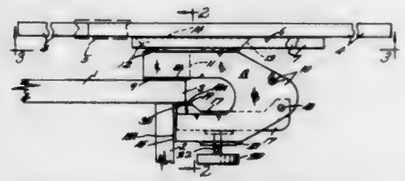
9. An improvement in a railway truck, used to transport highway vehicles along a railway, said railway truck having a pair of parallel frame members supported by a pair of railway axles operatively connected thereto and having rail wheels on both ends of each axle, said improvement comprising:
(a) an engine support beam affixed to a first of said frame members and having at least one aperture extending vertically therethrough at an end thereof distal said first frame member, wherein said aperture slidably receives a vertical pin connected to a second of said frame members such that said engine support beam is displaceably coupled to said second frame member to accommodate the vertical deflection thereof relative to said engine support beam and said first frame member; and
(b) a stabilizer beam affixed to said second frame member and slidably received in a horizontally extending passage defined by said first frame member in normal relation thereto to accommodate vertical and horizontal deflection of said first frame member relative to said stabilizer beam and said second frame member.

5,205,221
BOARD WITH CELLULAR STRUCTURE
Ulf Melin, and Carin Melin, both of Nordhemsvagen 12, Sjalevad, Sweden S-890 23
Continuation of Ser. No. 246,310, Sep. 9, 1988, abandoned. This application May 22, 1990, Ser. No. 526,673
Claims priority, application Sweden, Mar. 14, 1986, 8601221
Int. Cl.[5] B65D *19/00*
U.S. Cl. 108—51.3 4 Claims



1. In a load carrying pallet having an interior core of cellular structure including a plurality of cells located adjacent one another the improvement comprising, each pair of adjacent cells having a common side wall, each of said side walls of the cells having upper and lower ends, said upper and lower ends of the cells being covered and hermetically sealed by upper and lower covering layers, respectively, each of said side walls of the cells being elastically deformable so as to yield resiliently when a load is applied thereto but recover its original shape when the load is removed therefrom, and said covered and sealed cells thereby forming a plurality of deformable air chambers which function to absorb and transmit to adjacent cells, shocks and loads directed to said upper and lower covering layers.

5,205,222
COUNTER ATTACHABLE IRONING BOARD
Ronald V. Bernard, P.O. Box 2588, Florence, Oreg. 97439
Filed Jun. 4, 1992, Ser. No. 893,571
Int. Cl.[5] A47B *57/00*
U.S. Cl. 108—97 3 Claims

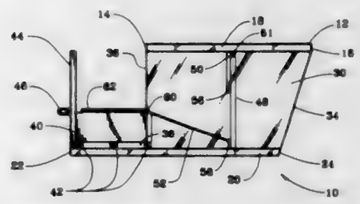


1. An ironing board for temporary attachment to a counter or table edge portion having an upper surface and a lower surface and a wall surface, said ironing board comprising,
an elongate main member for positioning above said edge portion and including spaced apart rail members,
support means for superimposed placement on said edge portion and including a disk, said rail members and said disk having engageable inclined surfaces for wedged engagement with one another to permit mounting of the elongate main member on said support means in various angularly offset positions about the center of said disk,
a clamp assembly having an arm including a generally horizontal surface adjacent its distal end for upward biased contact with said lower surface, said arm including an upright surface at its distal end, pivot means attaching said arm to said support means, and
adjustable means acting on said arm for urging same upwardly into biased contact with said edge portion.

5,205,223
FOLDING TABLE
Douglas C. Ball, Seaneville, Canada; Donald R. Ritter, Grapevine, and Johnny C. Fraga, Ft. Worth, both of Tex., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Apr. 18, 1991, Ser. No. 689,704
Int. Cl.[5] A47B *3/00*
U.S. Cl. 108—124 20 Claims

1. A folding table which comprises:
(a) a table top;
(b) at least two pedestal members;
(c) an elongated cross brace member rotatably connected to both of said pedestal members;
(d) pivot means for pivotably connecting said table top to said pedestal members;
(e) each of said pedestal members comprising an arm section, a leg section, and means for securing the arm section and the leg section together to prevent relative motion therebetween, the arm section including at least one radially extending arm, and the leg section including two legs disposed in fixed relation to each other, at least one leg being radially extending, the pedestal member being rotatable a substantial angle with respect to said cross brace member whereby the arm section supports said table top in a horizontal position and the leg section maintains said folding table in an upright position when said table is in an unfolded conformation.

5,205,224
PROTECTABLE PASS-THROUGH DRAWER
Sharon A. Durst, 2304 Wallea Pl., Sacramento, Calif. 95833
Filed Feb. 14, 1992, Ser. No. 835,810
Int. Cl.[5] E06B *7/32*
U.S. Cl. 109—19 11 Claims



1. A protectable pass-through drawer for securely transferring articles through a wall comprising: a support structure having a upper wall and a bottom wall, the upper wall and the bottom wall each having a first end and a second end, the upper wall positioned a fixed distance from the bottom wall by a first and second side wall; a drawer having a means for slidable movement of said drawer toward and away from the first and second ends and along the bottom wall of said support structure, said drawer having a substantially flat horizontal shelf surface for receipt of articles; a transparent access door rigidly secured to said drawer disposed at a right angle to the drawer surface; a transparent delivery door hingedly attached to the upper wall of said support structure intermediate the

lected from the group consisting of vitiated air, fresh air, industrial grade oxygen and mixtures thereof into the

vertical plane in the direction of advance of the cloth, and the hooks being mounted on the hook frame so that linear

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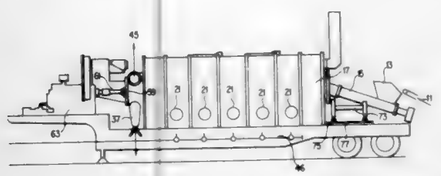
first end and the second end of the upper wall, said access door placing said delivery door in a closed vertical position and permitting placement of articles onto the drawer surface when said access door is opened, said access door causing said drawer to traverse said support structure while simultaneously opening said delivery door and allowing for external access to said drawer when said access door is closed; and a means for coupling said delivery door to said drawer.

5,205,225

APPARATUS FOR ALLOWING THERMAL DIMENSIONAL CHANGES OF METAL PARTS IN A RETORT MECHANISM

Isaac H. Milsap, III, Memphis, Tenn., assignor to Covenant Environmental Technologies, Inc., Memphis, Tenn.

Filed Jul. 22, 1992, Ser. No. 917,186
Int. Cl.[5] F23B *3/00*
U.S. Cl. 110—240 **8 Claims**



1. Apparatus for allowing thermal dimensional changes of metal parts in a retort mechanism comprising:
a retort chamber,
a retort pipe axially extending within said retort chamber and having a material inlet and outlet portion;
a retort auger axially extending from said inlet portion to said outlet portion of said retort pipe;
said retort pipe having an outer end wall at said inlet end thereof;
said retort auger being fixed to said outer end wall so as to be rotatable within said retort pipe;
said retort pipe, said retort auger and said outer end wall being mounted so as to be axially slidable within said retort chamber in response to thermal expansion; and
a circumferential seal mounted on said retort chamber and in contact with said retort pipe so as to maintain a sealing relationship during said axial sliding.

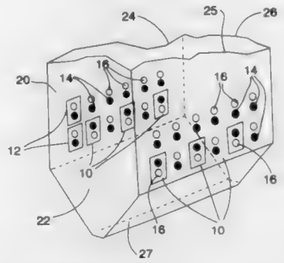
5,205,226

LOW NO_x BURNER SYSTEM

John B. Kitto, Jr., North Canton; Roger J. Kleisley, Plain Twp., Stark County; Albert D. LaRue, Summit; Chris E. Latham, Knox Twp., Columbiana County, and Thomas A. Laursen, Canton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 13, 1992, Ser. No. 850,600
Int. Cl.[5] F23D *1/02*
U.S. Cl. 110—264 **20 Claims**

1. A low NO_x burner system for a furnace having spaced apart front and rear walls connected between spaced apart side walls, the furnace including a lower hopper, the system comprising:
a plurality of cell burners lying along at least one horizontal row in at least one of the front and rear walls, each cell comprising a coal nozzle for projecting a primary air plus coal mixture into the furnace, and a secondary air port spaced vertically from the coal nozzle for supplying secondary air into the furnace at a vertically spaced yet adjacent location to the primary air plus coal mixture supplied to the furnace, at least one of the cells having its secondary air port spaced vertically below its coal nozzle and representing an inverted cell, at least some remaining cells in the at least one horizontal row having a secondary air port spaced above the coal nozzle and representing a non-inverted cell;
means for supplying primary air and coal to the coal nozzles; and



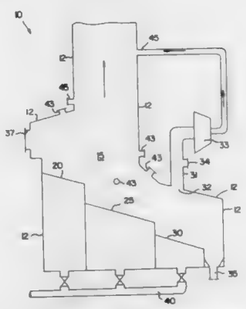
means for supplying secondary air to the secondary air ports.

5,205,227

PROCESS AND APPARATUS FOR EMISSIONS REDUCTION FROM WASTE INCINERATION

Mark J. Khinkis, Morton Grove, and Hamid A. Abbasi, Darien, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 486,065, Feb. 28, 1990, Pat. No. 5,020,456. This application May 21, 1991, Ser. No. 703,812
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] F23J *11/00*
U.S. Cl. 110—345 **30 Claims**



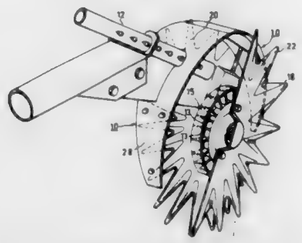
1. A process for combustion of combustible material comprising the steps of:
(a) introducing the combustible material into a drying zone within a combustion chamber;
(b) supplying air to the drying zone for preheating, drying, and partially combusting the combustible material;
(c) advancing the combustible material to a combustion zone within the combustion chamber;
(d) supplying air to the combustion zone for further combusting the combustible material;
(e) advancing the combustible material to a burnout zone within the combustion chamber;
(f) supplying air to the burnout zone for final burnout of organics in the combustible material;
(g) removing ash from the combustion chamber;
(h) injecting at least one of a fuel and a carrier fluid selected from the group consisting of recirculated flue gases, steam, water, industrial grade nitrogen and mixtures thereof into the combustion chamber to create an oxygen deficient secondary combustion zone; and
(i) injecting overfire air comprising an oxidizing fluid selected from the group consisting of vitiated air, fresh air, industrial grade oxygen and mixtures thereof into the combustion chamber for thorough mixing and final burnout of combustibles in combustion products of the combustible material in a tertiary combustion zone.

5,205,228

STAR WHEEL SEED PLANTER

Alan Mitchell, Harare, Zimbabwe, assignor to Tinto Industries Limited, Zimbabwe, Zimbabwe

Filed Dec. 9, 1991, Ser. No. 803,878
Claims priority, application Zimbabwe, Mar. 13, 1991, 28/91
Int. Cl.[5] A01C *5/04*
U.S. Cl. 111—89 **8 Claims**



1. A device for inserting seeds into soil at fixed intervals, comprising:
(a) two discs, rotatable about the same substantially horizontal axis, said discs having radially projecting spikes, said discs being oriented non-parallel to each other so as to bring said spikes into close proximity with each other at one point in the rotation, thereby forming a channel between said spikes for the insertion of the seed by said spikes into the soil;
(b) means for rotating said discs synchronously with each other; and
(c) means for feeding the seed to said channel.

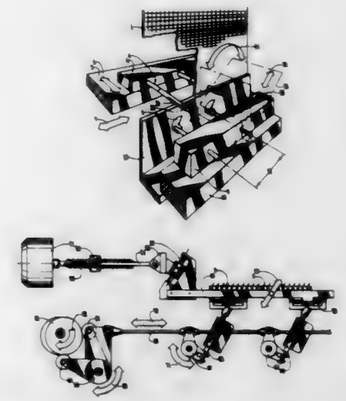
5,205,229

TUFTING PROCESS, AND A DEVICE FOR IMPLEMENTING SAID PROCESS

Pierre G. E. Job, Dison, Belgium, assignor to Societe Anonyme des Ateliers Houget Duesbeg Bosson, Verviers, Belgium

Filed Oct. 24, 1991, Ser. No. 781,895
Claims priority, application Belgium, Oct. 26, 1990, 90001018
Int. Cl.[5] D05C *15/30*
U.S. Cl. 112—80.41 **2 Claims**

1. A tufting device comprising:
a needle frame bearing needles;
a hook frame bearing hooks;
means for advancing a woven cloth between the needle frame and the hook frame;
means for stitching the needles carrying thread through the cloth;
means for pivoting the hooks so as to hold the thread passing through the cloth and operating simultaneously with the means for stitching;
means for advancing the cloth at variable speed and to maintain the cloth in a fixed position during successive lateral stitching operations; and
means for maintaining the cloth in a continuous tensioned condition during the advancing and the stopping of the cloth;
each needle having a blade with an eye, and being mounted in the needle frame and its longitudinal axis turned so that the blade forms an angle of between 15° and 45° with a vertical plane in the direction of advance of the cloth, and the hooks being mounted on the hook frame so that linear



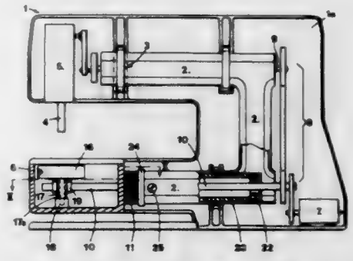
movement of each hook forms an angle equal to that of the needle with which the hook cooperates.

5,205,230

SEWING MACHINE

Antonio Jiminez, Meyrin, Switzerland; Patrice Deplante, Annemasse, France, and Michel Combepine, Les Avanchets, Switzerland, assignors to Mefina S. A., Switzerland

Filed Nov. 29, 1991, Ser. No. 798,929
Claims priority, application Switzerland, Nov. 29, 1990, 3781/90
Int. Cl.[5] D05B *69/10, 73/04*
U.S. Cl. 112—220 **4 Claims**



1. A sewing machine, having a frame with a first and a second arm said first arm including a needle bar and a needle bar drive mechanism, and said second arm including a loop-taker, a loop-taker drive mechanism, and a drive mechanism for feeding a material to be sewn, said drive mechanism including an electric motor slaved to an electronic pilot-controlled circuit for controlling the amplitude and direction of the feeding of the material to be sewn, characterized in that the loop-taker and the drive mechanism for feeding the material are mounted on an intermediate support, and said sewing machine further includes means for fixing said intermediate support to the body of the electric motor and means for fixing the body of the electric motor to the second arm of the frame.

5,205,231

machine in a longitudinal direction substantially normal to said row of reciprocating needles;

toward the bow and having a roller means positioned at

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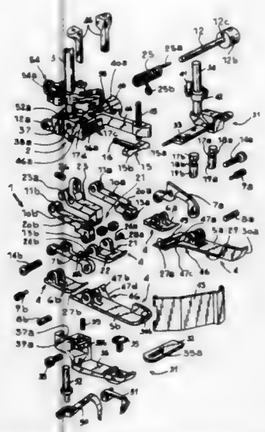
5,205,231

SELF-ADJUSTING PRESSER FOOT FOR ASSEMBLER SEWING MACHINES

Roberto Sanvito, Buccinasco; Franco Marchesi, San Martino Siccomario, and Davide Artioli, San Giorgio Su Legnano, all of Italy, assignors to Rimoldi, S.R.L., Milan, Italy

Filed Feb. 19, 1992, Ser. No. 838,536
Claims priority, application Italy, Apr. 30, 1991, MI91A00178
Int. Cl.[5] D05B *29/00, 37/00*
U.S. Cl. 112—235 **17 Claims**



1. A self-adjusting presser foot in combination with a sewing machine, comprising:

a small bearing frame (**2**) fixedly fastened to a presser bar (**3**) of the sewing machine;

a shoe (**4**) engaged at a lower part of the small bearing frame (**2**), said shoe having a longitudinal opening (**29**) for receiving and guiding two opposite edges of two fabric pieces disposed in mutual side by side relation, said shoe having has a transverse slit (**49**) for accessing sewing means;

cutting means (**31**) positioned upstream of the transverse slit (**49**) and close to said longitudinal opening (**29**) for trimming the side by side fabric piece edges; and

said shoe having guide means (**46**) positioned at one end of said longitudinal opening (**29**) and acting downstream of the cutting means (**31**) and upstream of the transverse slit (**49**) for overlapping the trimmed fabric piece edges, wherein said shoe (**4**) comprises:

a pair of front portions (**5***a*, **5***b*) disposed parallel is side by side relation and defining said longitudinal slit (**29**);

a pair of rear portions (**6***a*, **6***b*) each disposed in alignment with one of said front portions (**5***a*, **5***b*);

a pair of side rocker arms (**7***a*, **7***b*) each of which oscillably engages, according to horizontal axes transverse to the sewing direction, one of said front portions (**5***a*, **5***b*) and one of said rear portions (**6***a*, **6***b*) in respective alignment;

a pair of interconnecting elements (**10***a*, **10***b*) oscillatably engaged to the small bearing frame (**2**) and each carrying a fulcrum pin (**14***a*, **14***b*) for one of said side rocker arms (**7***a*, **7***b*), the axes of oscillation of said side rocker arms (**7***a*, **7***b*) being oriented horizontally in a direction perpendicular to the sewing direction;

a center rocker arm (**15**) oscillatably engaged to the small bearing frame (**2**) according to a horizontal axis parallel to a sewing direction and said rocker arms having opposite ends (**15***a*, **15***b*) operatively connected to the interconnecting elements (**10***a*, **10***b*) in order to balance the fulcrum pins (**14***a*, **14***b*) of the side rocker arms (**7***a*, **7***b*).

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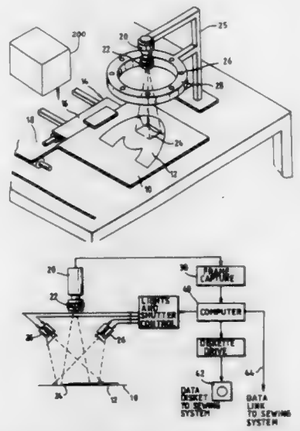
APPARATUS FOR ADVANCE EDGE DETECTION AND SEWING

Yaacov Sadeh, Nes Ziona; Yaacov Makover, Moshav Beit Elazari, and Bar C. Mardix, Ramat Gan, all of Israel, assignors to Orisol Ltd., Israel

Filed Aug. 27, 1990, Ser. No. 573,369
Claims priority, application Israel, Aug. 30, 1989, 91470; Sep. 13, 1989, 91624; Sep. 13, 1989, 91625
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—262.3 **7 Claims**



7. A method for edge location analysis for use in a computerized sewing system comprising:

scanning edges of an object to be sewn in a preliminary scanning cycle to generate images thereof, said scanning cycle comprising the steps of:

causing relative motion of the object relative to a scanning assembly in accordance with a predetermined sewing path; and

scanning sequential segments of the object and generating image data corresponding to each scanned frame;

generating true edge location data from the scanned images in an image analysis step, said image analysis step comprising the steps of:

determining the true edge locations of the object from said image data; and

determining necessary modifications of the predetermined sewing path in light of the true edge location data;

sewing adjacent the object edge utilizing the predetermined path as modified in accordance with the true edge location data on a sewing machine separate from said scanning assembly; and

transferring the object to be sewn from said scanning assembly to said sewing machine before said step of sewing.

5,205,233

FABRIC SHIFT SEQUENCING FOR PATTERN PRODUCING HOLLOW NEEDLE TUFTING APPARATUS

Gary L. Ingram, Ooltewah, Tenn., assignor to Tapistron International, Inc., Ringgold, Ga.

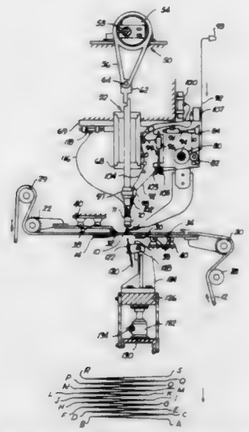
Filed Apr. 6, 1992, Ser. No. 863,835
Int. Cl.[5] D05C *15/00*
U.S. Cl. 112—266.2 **6 Claims**

1. A method for inserting tufts into a backing material in a tufting machine having a plurality of laterally spaced apart reciprocating needles in a row for penetrating the backing material to insert the tufts therein, said method comprising:

feeding said backing material continuously through said machine in a longitudinal direction substantially normal to said row of reciprocating needles;

shifting said backing material laterally in seriatim a first plurality of steps in a first direction between a pair of adjacent needles and penetrating said backing by said needles after each shift to form in said backing a first plurality of spaced apart tufts by each needle;

the individual tufts of said first plurality of tufts formed by each needle being disposed along a first line inclined with respect to said longitudinal direction and inclined with respect to said row of needles;



thereafter shifting said backing material laterally in seriatim a second plurality of steps different in number than the first plurality of steps in a second direction opposite to said first direction and penetrating said backing material by said needles after each shift to form in said backing material a second plurality of spaced apart tufts by each needle different in number than the first plurality of tufts; and

the individual tufts of said second plurality of tufts formed by each needle being disposed along a second line inclined with respect to said longitudinal direction, inclined with respect to said row of needles and inclined with respect to said first line.

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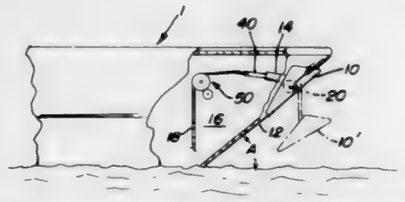
ANCHOR AND WINCH

Harry L. Schoell, 2698 S.W. 23rd. Ave., Ft. Lauderdale, Fla. 33312

Filed Oct. 25, 1991, Ser. No. 782,484
Int. Cl.[5] B63B *21/22*
U.S. Cl. 114—210 **7 Claims**



1. A bow anchor for mounting on the bow of a boat hull and having an anchor blade having a configuration that conforms to the shape of the bow of the hull to give the anchor on the bow a low profile appearance comprising:

a conduit means mounted on the bow of the hull and extending through the hull, said conduit means being inclined toward the bow and having a roller means positioned at the end of conduit means end nearest the bow,

a winch mechanism inside said hull for operating an anchor line to pay said anchor line through said conduit means, and to retract the anchor line through said conduit means,

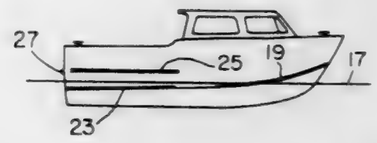
said anchor connected to the anchor line for lowering and raising according to the direction of movement of said anchor line, said anchor having a generally triangular shape in plan view and a V-shaped cross section perpendicular to said triangular shape to provide a plough blade means and a pivotal arm means connected to said plough blade means, where said plough blade means is shaped to fit close to said boat hull bow to conform to the shape of said bow.

5,205,235

EXTERNAL RAIL SYSTEM FOR BOATS

Christopher A. Hodges, 706 Greatplain Ave., Needham, Mass. 01292

Filed Mar. 13, 1992, Ser. No. 855,354
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—290 **19 Claims**



1. A system of elongated rail means for the hulls of any one of displacement planing or deep-v boats, cathedral planing boats and flatbottomed runabout boats, said boat hulls having exterior hull surfaces, said exterior hull surfaces and said rail means being in structural bonding relationships, said rail means, in such structural bonding relationships, projecting externally from said exterior hull surfaces, said rail means providing physical barriers to intercept and deflect water spray away from the boats; providing physical barriers against which choppy or turbulent seas impact to raise the bows of the boats to reduce the tendencies of the bows of the boats to go under in plowing through such choppy or turbulent seas; grabbing or biting the water to act as brakes upon or within the water to reduce heel and side-slipping of the boats from the effects from resulting and reacting centrifugal forces when the boats turn; providing physical barriers against which waters continuously impact to contribute lift to the hulls of boats when the boats are speeding or plowing through such waters; acting as fenders to protect the hulls of the boats when docks, piers, pilings, other boats, floating objects and submerged objects come into contact with said rail means; contributing safety factors by providing accessible hand holds and foot steps for men and women overboard, or swimmers, whether or not in distress, by which access to the boats can be gained, or to hold onto said rail means until help arrives for purposes of rescue; providing physical barriers to resist rocking movements imparted to the boats from wakes caused by other boats or from the natural effects from winds or waves; providing floatation and buoyancy for the boats; and said rail means having elongated rails in such structural bonding relationships with said exterior hull surfaces, said rails cross-sectionally defining truncated isosceles triangles having bottom bases, top bases and lateral sides, said lateral sides having uppermost portions, said top bases of said rails, joining said uppermost portions of said lateral sides, having radius-curve corners, said exterior hull surfaces and said bottom bases of said rails being in common engagements, and each of said rails having an exterior skin of woven fabric material coating and enclosing an interior of polyethylene foam.

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of recirculating including passing the recirculating water

disposed side-by-side on a base plate, the longitudinal axes

a set of stalls for penning animals, with each stall having a

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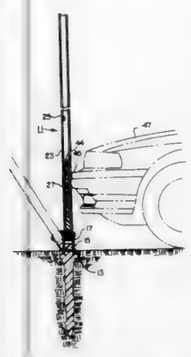
STIFFENER CORE FOR A HIGHWAY MARKER

Robert K. Hughes, Fort Meyers, Fla., assignor to Flexstake, Inc., Ft. Myers, Fla.

Filed Jul. 26, 1991, Ser. No. 736,735
Int. Cl.[5] E01F 9/01
U.S. Cl. 116—63 R 4 Claims



1. An impact resistant marker, comprising in combination:
a base adapted to be secured to the ground and having an upward protruding mandrel;
a post having a longitudinal hole extending therethrough and having a lower end;
an elastomeric flexible element having a lower end secured to the mandrel and an upper end secured to the lower end of the post, so as to allow the post to pivot from an upright position to an inclined position if struck by a vehicle;
a stiffener core extending through the hole in the post from the lower end o the post upward for a selected distance, to cause the post to pivot at the flexible element rather bend above the flexible element, if struck by a vehicle; and
wherein the hole is generally elliptical in transverse cross-section, having cross-sectional major and a minor dimensions, and wherein the core has a lower portion that is generally elliptical in transverse cross-section, having substantially the same dimensions as the major and minor dimensions of the hole, the core having an upper portion that has substantially the same major dimension but a lesser minor dimension than the hole.

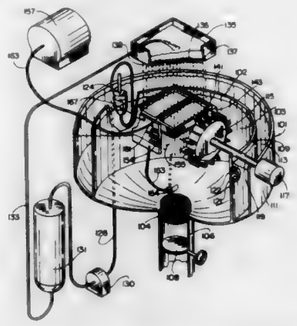
5,205,237

METHOD AND APPARATUS FOR GROWING FISH IN A RECIRCULATING TANK

Leonard T. Skeggs, 10212 Blaie La., Kirtland, Ohio 44094; Mitsuo Teraguchi, deceased, late of Cleveland Hgt., and by Sonja E. Teraguchi, executrix, 2517 Norfolk Rd., Cleveland Hgt., both of Ohio 44106

Filed Oct. 18, 1991, Ser. No. 779,022
Int. Cl.[5] A01K 63/04
U.S. Cl. 119—3 29 Claims

1. A method of providing an enhanced environment for fish in an open container of water comprising the steps of positioning an oxygenated canopy to overlie a portion of the body of water in the container, and recirculating at least a portion of the water in the container through the oxygenated canopy to oxygenate the water and then back into the container, the step of recirculating including passing the recirculating water through vertically spaced trays having apertured bottoms



containing downwardly extending tubes for passage of the water therethrough.

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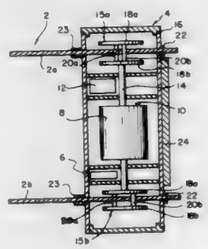
METHOD AND APPARATUS FOR INDUCING CONTROLLED STRESSED BEHAVIOR IN ANIMALS, SUCH AS ENHANCED EATING, DRINKING, MATING, MATERNAL OR THE LIKE BEHAVIOR

Harry E. Boice, 15811 Hunton La., Haymarket, Va. 22069

Filed Jun. 27, 1991, Ser. No. 722,292
Int. Cl.[5] A01K 29/00
U.S. Cl. 119—29 24 Claims



1. A stress-applying apparatus for inducing controlled stressed behavior in animals, such as increased eating, drinking, mating, maternal or the like behavior, comprising:
(a) means for mounting said apparatus on a body part of the animal;
(b) means operatively associated with said body mounting means for applying variable stress to the body part; and
(c) means operatively connected with said stress-applying means for controlling the variation of said stress over time in a predetermined manner;
said stress applying means including:
a motor;
means driven by said motor for increasing and decreasing the amount of stress applied to the body part; and
a power supply operatively connected with said motor.

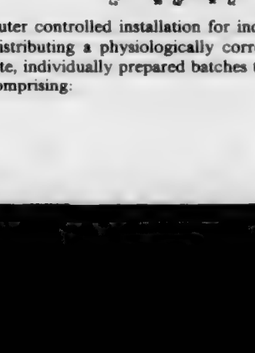
5,205,239

BIRD FEEDING DEVICE WITH SQUIRREL GUARD

Walter Stolwein, 5211 Roosevelt St., Bethesda, Md. 20814

Filed May 8, 1992, Ser. No. 879,899
Int. Cl.[5] A01K 39/01
U.S. Cl. 119—52.3 8 Claims

1. An apparatus for feeding seed to birds and guarding the seed from squirrels or the like comprising:
a plurality of substantially cylindrical containers for seed disposed side-by-side on a base plate, the longitudinal axes of the containers being parallel;
the cylindrical walls of each container being open along the top to define an upwardly facing longitudinal slot in each cylindrical container;
each said longitudinal slot being wide enough to permit a bird's beak to pass therethrough to access the seed but too narrow for a squirrel's mouth to pass therethrough;
whereby birds can access and feed on the seed but squirrels are precluded from accessing the seed;



trough means disposed above each longitudinal slot of each cylindrical container for feeding seed into each said container;
a slidable feed plate, and a feedbox supported over at least a portion of the trough means, the feedbox having slots in the bottom aligned with said feed plate, whereby slidable movement of said feed plate permits the flow of seed by gravity from said feedbox to said trough means to fill the cylindrical containers with seed.

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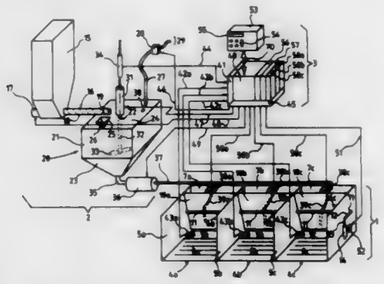
METHOD AND SYSTEM FOR PREPARATION OF FEED RATIONS FOR ANIMALS

Pierre Colas, Lannedern; Michel Guillou, La Roche Maurice, and Yvon Coroller, Ruffec, all of France, assignors to Volac Limited, Hertfordshire, England

PCT No. PCT/FR91/00096, § 371 Date Oct. 3, 1991, § 102(e) Date Oct. 3, 1991, PCT Pub. No. WO91/11908, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 8, 1991, Ser. No. 768,311
Claims priority, application France, Feb. 8, 1990, 90 01636
Int. Cl.[5] A01K 5/00
U.S. Cl. 119—57.4 4 Claims



3. A computer controlled installation for individually preparing and distributing a physiologically correct portion of feed in discrete, individually prepared batches to animals, the installation comprising:
a set of stalls for penning animals, with each stall having a trough for accepting feed therein,
a hopper for storage of dry feed,
a mixer for mixing dry feed and a diluting liquid, the mixer having two inlets and one outlet, one inlet being configured to receive dry feed stored in the hopper and the other inlet being configured to receive a diluting liquid,
means for controlling supply of dry feed into the mixer through the dry feed inlet, the dry feed controlling means being controllable by computer to supply a physiologically correct portion of dry feed,
means for controlling supply of diluting liquid into the mixer through the diluting liquid inlet, the diluting liquid controlling means being controllable by computer to supply a physiologically correct portion of diluting liquid,
a conduit connected to receive a feed mixture prepared by mixing of dry feed and diluting liquid in the mixer, the conduit being connected to supply a trough in each of the stalls with the feed mixture,
means for alternately preventing and allowing access to each trough, said access means being controllable by computer.

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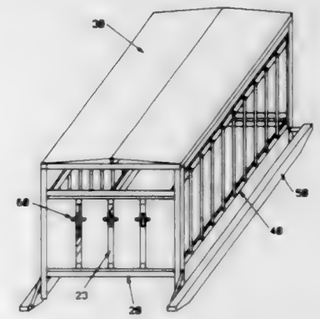
LIVESTOCK HAY STORAGE/FEEDER

Sharon K. Halpin, and Daniel O. Halpin, both of 1800 McCarty's Landing, Dowling, Mich. 49050

Filed Jan. 21, 1992, Ser. No. 822,727
Int. Cl.[5] B60Q 5/00
U.S. Cl. 119—60 9 Claims



1. A combination livestock hat feeder and storage device comprising a partially enclosed box-like structure including upright opposing sidewalls and end walls joined to one another about their top and bottom corners, said end walls are constructed of an upper and lower framework positioned parallel to one another and on an interior surface of said end walls, one of said sidewalls is comprised of a gate releasably and movably supported about its corners in said framework of said end walls, wherein said framework is a channel which includes a means by which the position of said gate may be fixed in multiple locations across the width of said structure, further, said gate is constructed of a series of vertical bars and said bars are spaced such that an animal may reach the hay through the spacing between adjacent bars.

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PET FOOD CONTAINER

Leslie L. Kasselman, 11550 Sage Canyon, Houston, Tex. 77089

Continuation-in-part of Ser. No. 610,577, Nov. 8, 1990, Pat. No. 5,069,167. This application Dec. 2, 1991, Ser. No. 801,716
Int. Cl.[5] A01K 5/01
U.S. Cl. 119—61 8 Claims

1. A food container comprising:
a dish member having a concavity formed therein, said dish

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vided to selectively regulate flow of air from the inlet manifold to each of said transfer ports and to vary the rate of flow of air

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INFINITELY VARIABLE LIFT CAM FOLLOWER WITH

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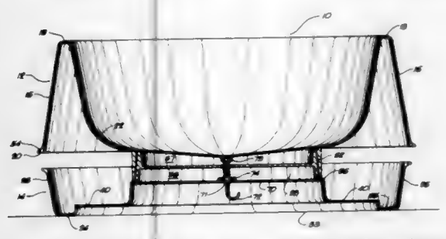
member having a connector formed on a bottom surface of said concavity;

a base member having a bottom surface, said base member having a raised rim extending outwardly from an outer periphery of said bottom surface of said base member, said base member having a central member for detachably engaging said connector of said dish member, said base member having a liquid-receiving moat formed therein, said dish member having an upper surface nestable within said moat of said base member, said concavity of said dish



member having an area larger than said central member of said base member, said concavity surrounding said central member when said upper surface of said dish member is in nested relationship with said moat of said base member; and

a spring clip means releasably engaging an edge of said dish member and an edge of said base member when said upper surface of said dish member is in nested relationship with said moat, said spring clip means causing said upper surface to be in pressurized contact with said moat.

5,205,243

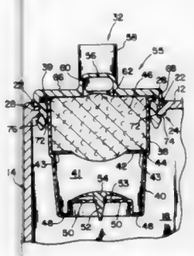
CRANKCASE BREATHER HAVING A FITTED RETAINER FOR RETAINING A VALVED CUP ASSEMBLY

Brian S. Buchholz, Malone, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 26, 1992, Ser. No. 857,742

Int. Cl.[5] F01M *13/00*

U.S. Cl. 123—41.86 **15 Claims**



1. In an internal combustion engine including a crankcase having a crankcase interior, a crankcase breather assembly for venting of combustion gases from the crankcase interior, comprising:

a breather opening in the crankcase for providing communication of gases out from the crankcase interior, said opening including a peripheral edge;

a cup in said opening and including a valve for permitting the venting of gases from the crankcase interior upon a condition of positive crankcase pressure; and

a retaining member being interlocked with said cup to form a separate breather unit that is insertable into said breather opening, said retaining member including an outer groove that frictionally receives said peripheral edge thereby retaining said retaining member in said opening.

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AIR INTAKE SYSTEM FOR FUEL INJECTION TYPE MOTORCYCLE ENGINE

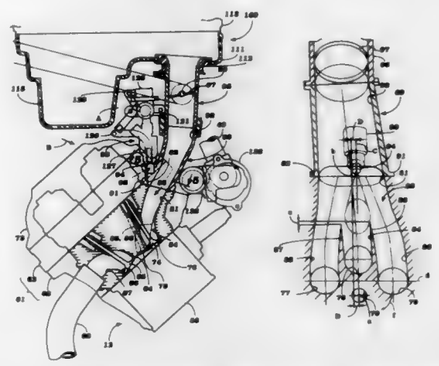
Kimiaki Nakamura, and Hideaki Ueda, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 12, 1992, Ser. No. 834,478

Claims priority, application Japan, Feb. 22, 1991, 3-050410

Int. Cl.[5] F02M *35/10*

U.S. Cl. 123—52 MC **14 Claims**



1. An internal combustion engine having a cylinder head cylinder block assembly defining a combustion chamber, an intake passage extending through one side of said engine and terminating in said combustion chamber for delivering a charge thereto, an intake manifold affixed to said one side of said engine in registry with said intake passage and defining a void area between said one side of said engine and said intake manifold, a fuel injector mounted in said void area for injecting fuel into said intake passage, said fuel injector having a portion extending beyond said one side of said engine and beyond said void area and an air inlet device for supplying air to said intake manifold including a transverse portion extending across the upper end of said portion of said fuel injector toward said one side of said engine and terminating adjacent said one side of said engine and a depending portion depending from said transverse portion and extending along the side of said portion of fuel injector opposite to said intake manifold and terminating adjacent said one side of said engine for substantially enclosing said void area and said fuel injector portion for silencing noise emanating from said fuel injector.

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TWO STROKE ENGINES

Robert Flack, Ballyclare, and David Thornhill, Belfast, both of Northern Ireland, assignors to Jaguar Cars Limited, United Kingdom

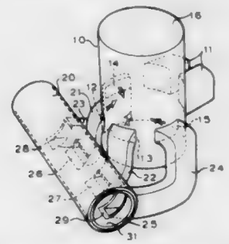
Filed May 30, 1991, Ser. No. 707,642

Claims priority, application United Kingdom, Jun. 2, 1990, 9012349

Int. Cl.[5] F02B *33/04*

U.S. Cl. 123—65 P **9 Claims**

1. A two stroke internal combustion engine comprising a cylinder with a piston slidably sealed in the cylinder, the cylinder including a plurality of transfer ports and at least one exhaust port, each of said transfer ports being connected to a common inlet manifold, a common valve means being provided to selectively regulate flow of air from the inlet manifold to each of said transfer ports and to vary the rate of flow of air



through one of said transfer ports relative to the flow of air through at least one of said other transfer ports.

5,205,246

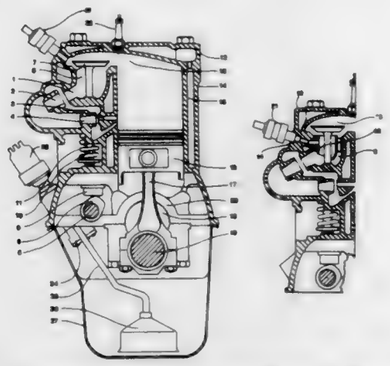
ECONOMY ENGINE

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95621

Filed Sep. 11, 1992, Ser. No. 943,555

Int. Cl.[5] F02B *75/32*

U.S. Cl. 123—79 R **6 Claims**



1. An internal combustion reciprocating piston engine comprising a cylinder head fixedly mounted on an engine block, said cylinder head having a plurality of aligned and evenly spaced combustion chambers, fuel injectors mounted on said cylinder head to inject fuel into said combustion chambers, each said combustion chamber having a passageway leading to a respective cylinder of said engine block, a piston slidably mounted in each said cylinder and caused to reciprocate in accordance with the engine cycle by a reciprocating means, said engine block having a valve port below each said combustion chamber, a poppet valve slidably mounted in said engine block to control the flow through said valve port, a camshaft rotatively mounted in said engine block for actuating said poppet valves in said valve ports, said camshaft having double-cycle cam lobes opening said valve port at the beginning of the exhaust stroke of said piston bringing said combustion chamber into communication with said valve port, said valve port in communication with a nozzle of an ejector, the exit of said nozzle in communication with an air chest, a diffuser inlet of said ejector opposite the nozzle exit, said diffuser inlet also in communication with said air chest and the exit of said diffuser is in communication with an exhaust manifold, said double-cycle cam of said camshaft allowing said poppet valve to close at the end of the intake stroke of said piston.

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INFINITELY VARIABLE LIFT CAM FOLLOWER WITH CONSISTENT DWELL POSITION

Christopher J. Hoffman, 857 Colonial Ct., Birmingham, Mich. 48009

Filed Jan. 29, 1992, Ser. No. 827,448

Int. Cl.[5] F01L *1/12*

U.S. Cl. 123—90.16 **26 Claims**

1. An apparatus for cyclically actuating an actuation member in response to rotation of a camshaft having a cam carried thereon, the apparatus comprising:

cam follower means continuously engaging said cam and having an axis of reciprocation parallel to and offset from an axis of angular displacement, the cam follower means for transmitting infinitely variable reciprocating movement to said actuation member to move said actuation member from a consistent first position to an infinitely variable second position.

5,205,248

INTAKE- AND/OR EXHAUST-VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

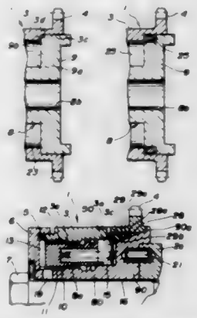
Seinosuke Hara, and Seiji Tsuruta, both of Kanagawa, Japan, assignors to Atsugi Unisia Corp., Atsugi, Japan

Filed Nov. 14, 1991, Ser. No. 792,358

Claims priority, application Japan, Nov. 16, 1990, 2-310848; Sep. 30, 1991, 3-251724

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **14 Claims**



1. In an intake- and/or exhaust-valve timing control system for an internal combustion engine including a phase angle changing mechanism disposed between a rotating member having a driven connection with an engine crankshaft and a camshaft for changing a relative phase angle between said rotating member and said camshaft so as to control intake- and/or exhaust valve timing of said engine depending on the operating state of said engine; the improvement comprising:

means for generating frictional torque between said rotating

member and said camshaft so as to suppress a rapid change

prior to feeding the fuel to a vehicle engine, the apparatus comprising

having at least one port connecting said cylindrical cavity to a source of intake change;

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ENGINE OPERATION INTERRUPT USING ENGINE

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member and said camshaft so as to suppress a rapid change in relative rotational speed of said camshaft to said rotating member; and

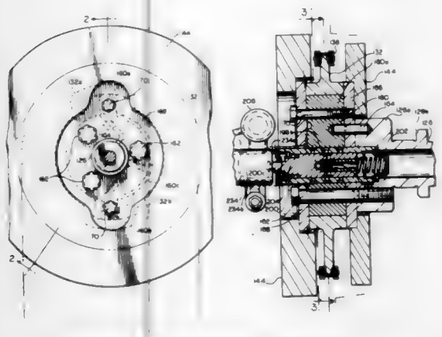
said frictional torque generating means comprises at least one abutting pair of frictional surfaces, respectively provided on said rotating member and said camshaft, and means for press-fitting one of said frictional surfaces to the other.

5,205,249

VARIABLE CAMSHAFT TIMING SYSTEM FOR INTERNAL COMBUSTION ENGINE UTILIZING FLYWHEEL ENERGY FOR REDUCED CAMSHAFT TORSIONALS

George L. Markley, Montour Falls, and Roger P. Butterfield, Interlaken, both of N.Y., assignors to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed May 14, 1992, Ser. No. 883,581
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 **25 Claims**



7. An internal combustion engine comprising:

a crankshaft, said crankshaft being rotatable about an axis;

a camshaft, said camshaft being rotatable about a second axis, said second axis being parallel to said axis, said camshaft being subject to torque reversals during the rotation thereof;

a weighted body fixedly attached to said camshaft for rotation therewith to counteract torque reversals in said camshaft;

a vane having at least one lobe, said vane being attached to said camshaft, being rotatable with said camshaft and being non-oscillatable with respect to said camshaft;

a housing which is rotatable with said camshaft and being oscillatable with respect to said camshaft, said housing having at least one recess, said at least one recess receiving said at least one lobe, said at least one lobe being oscillatable within said at least one recess;

conduit means permitting unobstructed flow of a hydraulic fluid to and from said at least one recess; and

means reactive to torque reversals in the camshaft for varying the position of the housing relative to the camshaft.

5,205,250

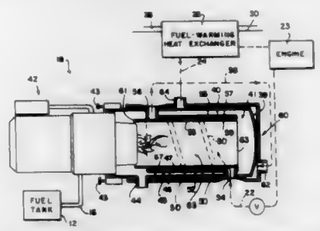
FUEL PREHEATING SYSTEM

Herbert Easterly, Rte. 13, Box 66, Crossville, Tenn. 38555, and Charlie F. Hunter, Cookeville, Tenn., assignors to Herbert Easterly, Crossville, Tenn.

Filed Dec. 6, 1991, Ser. No. 802,749
Int. Cl.[5] F02N *17/02*
U.S. Cl. 123—142.5 R **10 Claims**

1. An apparatus for preheating fuel from a vehicle fuel tank prior to feeding the fuel to a vehicle engine, the apparatus comprising

first heat exchange means for using fuel from the fuel tank to heat engine coolant received from the vehicle engine, the first heat exchange means including means for burning fuel received from the fuel tank to form a combustion products stream and first passageway means for passing engine coolant in counterflow heat exchange relationship with the combustion products stream to heat the engine coolant to a predetermined temperature, the first passageway means including an outer cylinder, an inner cylinder positioned in spaced-apart, coaxial relationship with the outer cylinder so as to define an annular space therebe-



tween, the inner cylinder including an inner wall providing an inner heat exchange surface, the outer cylinder including an outer wall providing an outer heat exchange surface, the inner and outer cylinders cooperating to define a flow path for the combustion products stream in the interior region so that the combustion products stream passes along the inner heat exchange surface and the outer heat exchange surface to reach the discharge means, and means for guiding the engine coolant through the annular space along a helical path, the guide means being positioned in the annular space, and

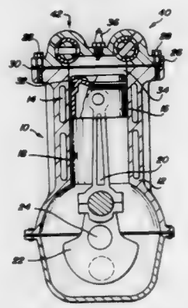
second heat exchange means for using engine coolant discharged from the first heat exchange means to heat fuel received from the fuel tank.

5,205,251

ROTARY VALVE FOR INTERNAL COMBUSTION ENGINE

Ronald J. Conklin, Grosse Pointe Woods, Mich., assignor to IBEX Technologies, Inc., Grosse Pointe Farms, Mich.

Filed Aug. 5, 1992, Ser. No. 926,122
Int. Cl.[5] F01L *7/02*
U.S. Cl. 123—190.12 **24 Claims**



1. An engine apparatus for obtaining variable intake valve timing in an internal combustion engine comprising at least one cylinder and a crankshaft, said apparatus comprising:

a support member having an internal cylindrical cavity, said cylindrical cavity in communication with each cylinder of said internal combustion engine, said support member having at least one port connecting said cylindrical cavity to a source of intake change;

a valve sleeve rotatably disposed within said cylindrical cavity, said valve sleeve having first porting means for connecting said source of intake charge with each of said cylinders of said internal combustion engine;

a valve body rotatably disposed within said valve sleeve, said valve body having second porting means for connecting said source of intake charge with each of said cylinders of said internal combustion engine;

means for rotating said valve sleeve in synchronized relationship to the rotation of said crankshaft of said internal combustion engine;

means for rotating said valve body in synchronized relationship to the rotation of said crankshaft of said internal combustion engine; and

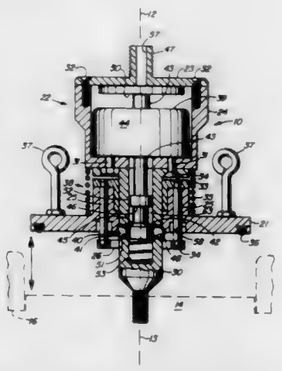
means for varying the rotational speed of said valve sleeve with respect to said crankshaft wherein the point at which effective communication between said source of input charge and each of said cylinders of said internal combustion engine can be advanced or retarded.

5,205,252

ENGINE AIR SHUTDOWN VALVE

Joseph Krepela, Edmonton, Canada, assignor to Barber Industries Ltd., Calgary, Canada

Filed Jun. 13, 1991, Ser. No. 725,290
Int. Cl.[5] F02D *9/08*
U.S. Cl. 123—198 D **9 Claims**



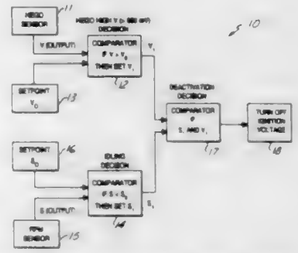
1. An engine air shutdown valve to close an air intake of an engine having a longitudinal axis, said valve comprising a housing, a gate movable relative to said housing from a first position wherein said air intake is open to a second position wherein said air intake is closed, said gate moving in a direction parallel to said longitudinal axis of said air intake, a retainer coaxial with said gate and being movable relative to said gate, a gate spring mounted between said housing and said gate and biasing said gate to move relative to said housing in a first locked position, means for maintaining said gate in said locked position, said gate maintaining means being movable between a first position wherein said gate is in said first locked position and a second position wherein said gate is released, means for releasing said gate maintianing means such that said gate separates from said housing under the influence of said gate spring, said retainer retaining said gate maintaining means in said second position when said gate closes said air intake.

5,205,253

ENGINE OPERATION INTERRUPT USING ENGINE OPERATING PARAMETERS

Mordecai Shelef, Bloomfield Village, and Eleftherios M. Logothetis, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1992, Ser. No. 933,537
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D **14 Claims**



1. A system for the interruption of the operation of a motor vehicle equipped with an internal combustion engine, including the steps of:

means for sensing when the exhaust gas oxygen (EGO) sensor signal level of the vehicle exhaust gas rises above a predetermined value and providing a first output signal;

means for recognizing an idling condition of the engine and providing a second output signal; and

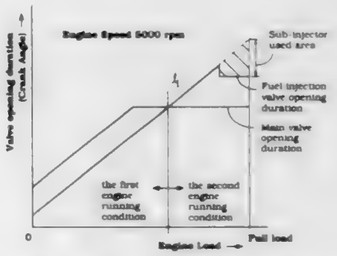
means for interrupting engine operation when the first output signal indicates an EGO sensor signal level above the predetermined value and the second output signal indicates an idling engine.

5,205,254

AIR FUEL INJECTOR AND CONTROL

Takeshi Ito, and Yoshihiko Moriya, both of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 10, 1991, Ser. No. 805,318
Claims priority, application Japan, Dec. 14, 1990, 2-410975
Int. Cl.[5] F02M *67/00*; **F02B** *17/00*
U.S. Cl. 123—305 **37 Claims**



1. A fuel/air injector unit comprising an outer housing assembly defining chamber means, air means for supplying air under pressure to said chamber means, fuel means for supplying fuel to said chamber means, an injector port communicating said chamber means with an engine chamber, an injector valve for opening and closing said injector port, sensor means for sensing engine running conditions and control means for controlling fuel delivery by said fuel means to said chamber means and opening and closing of said injector valve in response to sensed engine conditions for varying at least the opening of said injector valve at certain sensed engine condi-

frame, said coils and magnets being angularly spaced

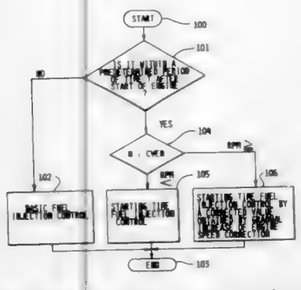
said cylinder head and engine cylinder combination comp-

tions, holding the time of opening of said injector valve constant in at least a range of sensed conditions, varying at least the initiation of fuel delivery by said fuel means at certain sensed running conditions, and initiating the fuel delivery of said fuel means beginning at a time before said injector valve is opened and terminating at a time after said injector valve is opened under at least one running condition of said engine.

5,205,255
STARTING TIME ENGINE SPEED CONTROL DEVICE

Takashi Yamagata; Hiroyuki Shimase, both of Hamamatsu; Mitsuru Miyata, and Tomoyuki Hirose, both of Isesaki, all of Japan, assignors to Suzuki Motor Corporation, Shizuoka and Japan Electronic Control Systems Co., Ltd., Gunma, both of Japan

Filed Nov. 26, 1991, Ser. No. 798,509
Claims priority, application Japan, Nov. 26, 1990, 2-321666; Nov. 26, 1990, 2-321669
Int. Cl.[5] F02D *41/06*
U.S. Cl. 123—331 **2 Claims**



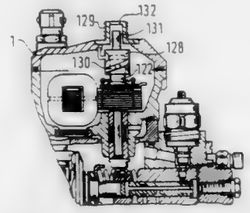
1. A starting time engine speed control device for controlling fuel to be injected by correcting an amount thereof within a predetermined period of time after the start of an internal combustion engine by means of a starting time fuel injection control with respect to a basic fuel injection control, the engine being mounted on a vehicle and having a clutch mechanism which is coupled when the engine speed exceeds a coupling engine speed, wherein said starting time engine speed control device includes control means adapted to control the fuel to be injected by gradually increasingly correcting the amount thereof by means of said starting time fuel injection control in accordance with increasing engine speed up to said coupling engine speed at the time fuel is injected.

5,205,256
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Klaus Dobler, Gerlingen, and Hansjörg Hachtel, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00498, § 371 Date Apr. 1, 1991, § 102(e) Date Apr. 1, 1991, PCT Pub. No. WO90/03511, PCT Pub. Date Apr. 5, 1990
PCT Filed Aug. 1, 1989, Ser. No. 671,862
Claims priority, application Japan, Oct. 1, 1988, 3833398
Int. Cl.[5] F02D *31/00*
U.S. Cl. 123—357 **12 Claims**

1. A fuel injection pump for internal combustion engines, comprising a pump housing which encloses a pump interior space; at least one control element arranged in said pump housing; a displacement pickup, said displacement pickup having a stationary electrical part arranged outside of said pump housing and a movable mechanical part arranged in said pump interior space as a part which is moved by said control element, said displacement pickup operating in accordance with the principle of a measuring process which measures in a contactless manner; a pump plunger; a shaft; and a quantity adjusting member arranged in said pump interior space for controlling a fuel injection quantity delivered under high pressure by said pump plunger, said quantity adjusting member being adjustable via said shaft which acts at said quantity adjusting member, said movable part of said displacement pickup being connected with said shaft on a side of said shaft facing said pump housing, said shaft having a longitudinal axis, said pump housing having a wall at which said stationary part

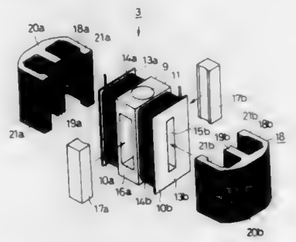


of said displacement pickup is externally arranged, said movable part of said displacement pickup being connected with said shaft so as to be fixed with respect to rotation relative to it and being arranged at a slight distance from said pump housing, said movable part of said displacement pickup being constructed as a structural component part which projects on one side eccentrically relative to said longitudinal axis of said shaft and extends parallel relative to said wall of said housing at which the stationary part is externally arranged.

5,205,257
ACTUATOR

Akira Tsunoda, Kosai, and Shigeki Okabe, Toyohashi, both of Japan, assignors to Asmo Co., Ltd., Japan

Filed Feb. 27, 1992, Ser. No. 842,928
Claims priority, application Japan, May 31, 1991, 3-129949
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—399 **13 Claims**



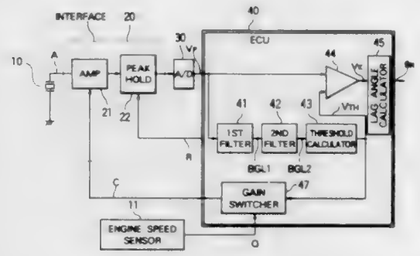
1. An actuator comprising:
a rotor assembly that is rotatable about an axis, the rotor assembly including a rotor magnet;
an integral stator frame formed of a synthetic resin material, the stator frame having a borehole therein that receives the rotor assembly, a pair of mounting recesses, and a pair of bobbin portions, the bobbin portions each including a slot;
first and second magnets, each magnet being mounted in an associated mounting recess of the stator frame such that it faces the rotor assembly, the first magnet having a rotor-side portion magnetized as a north pole, and the second induction magnet having a rotor-side portion magnetized as a south pole;
first and second coils positioned in facing relationship on opposite sides of the rotor assembly, each coil being wound about an associated bobbin portion of the stator

frame, said coils and magnets being angularly spaced about the rotor assembly; and
a pair of core sections, each core section having a core pole, a pair of holding arms that extend substantially in parallel with the core pole, and a linking portion for linking the core pole to the holding arms, each core pole extending through an associated one of said bobbin slots and facing the rotor magnet, each of the holding arms being arranged to abut against outer walls of an associated magnet to hold the associated magnet in place.

5,205,258
KNOCK SUPPRESSING APPARATUS AND METHOD

Atsuko Hashimoto; Toshio Iwata; Yasuhiko Hosoya, and Atsushi Ueda, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 749,348
Claims priority, application Japan, Aug. 28, 1990, 2-224478; Sep. 27, 1990, 2-255136; Oct. 3, 1990, 2-263875
Int. Cl.[5] F02P *5/145;* **G01L** *23/22*
U.S. Cl. 123—425 **13 Claims**



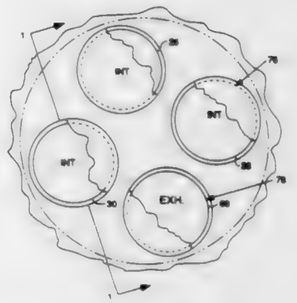
1. A knock suppressing apparatus for an internal combustion engine comprising:
a knock sensor for generating a knock signal indicative of engine virbrations;
a variable gain amplifier connected to the knock sensor for amplifying the knock signal and generating an output signal;
means for generating a vibration level signal indicative of the level of the amplifier output signal;
means for generating a threshold signal indicative of the level of the vibration level signal;
a comparator for comparing the vibration level signal and the threshold signal;
engine control means responsive to the comparator for controlling an engine operating parameter so as to suppress knocking based on the result of comparison by the comparator; and
gain control means for varying the gain of the amplifier based on the threshold signal,
wherein the gain control means comprises means for changing the gain in a step-wise manner between at least two different levels, with hysteresis.

5,205,259
MODIFIED CYLINDER HEAD

John M. Clarke, Chillicothe; James J. Faletti, Spring Valley, and David E. Hackett, Washington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US91/06169, § 371 Date Aug. 30, 1991, § 102(e) Date Aug. 30, 1991
PCT Filed Aug. 30, 1991, Ser. No. 752,507
Int. Cl.[5] E02B *15/00*
U.S. Cl. 123—432 **6 Claims**

1. A cylinder head (**16**) adapted for use in an internal combustion engine (**10**) for the reduction of heat rejection, said cylinder head used in combination with an engine cylinder, said cylinder head and engine cylinder combination comprising:

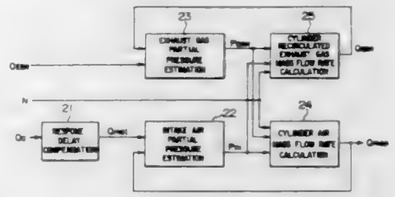


only one exhaust valve port (**66**); and
only three intake valve ports (**26,28,30**).

5,205,260
METHOD FOR DETECTING CYLINDER AIR AMOUNT INTRODUCED INTO CYLINDER OF INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECIRCULATION SYSTEM AND FOR CONTROLLING FUEL INJECTION

Shinsuke Takahashi, Yokohama; Teruji Sekozawa, Kawasaki, and Makoto Shioya, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1992, Ser. No. 865,338
Claims priority, application Japan, Apr. 10, 1991, 3-077570
Int. Cl.[5] F02D *41/18;* **F02M** *25/07*
U.S. Cl. 123—494 **20 Claims**



1. In an electronic engine control system for an internal combustion engine, in which a cylinder air mass flow rate to be actually introduced into an engine cylinder is calculated using measured value of a parameter associated with engine operating condition, and a fuel injection amount is controlled corresponding to the calculated cylinder air mass flow rate, a method for calculating the cylinder air mass flow rate comprising the steps of:
deriving a mass flow rate of a recirculated exhaust gas flowing into an induction passage of the engine, said engine having an exhaust gas recirculation system;
estimating a partial pressure of the exhaust gas within said induction passage on the basis of said mass flow rate of the recirculated exhaust gas; and
deriving said cylinder air mass flow rate on the basis of the estimated value of the partial pressure of the recirculated exhaust gas.

5,205,261

pregiven state of the engine is present and the completely closing said valve when said pregiven operating state sprayed from a fuel injector and through said divergent

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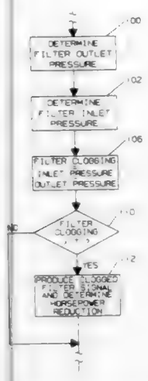
5,205,261
AIR RESTRICTION DERATE FOR INTERNAL COMBUSTION ENGINES
Edward H. Betts, Jr., Chillicothe, and Clark C. Schweigert, Tremont, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Jul. 7, 1992, Ser. No. 909,861
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—494 **14 Claims**



1. A method of operating an internal combustion engine having an inlet air filter and a plurality of solenoid operated fuel injection units adapted to receive fuel injection signals and responsively inject fuel into associated engine cylinders, wherein the engine is controlled by an electronic controller that produces the fuel injection signals as a function of sensed operating parameters and in accordance with a preselected horsepower curve, comprising the steps of:
sensing the level of clogging of the air filter and responsively producing a clogging level signal;
comparing the clogging level signal to a preselected value and limiting the maximum engine horsepower in response to the clogging level signal being greater than or equal to the preselected threshold.

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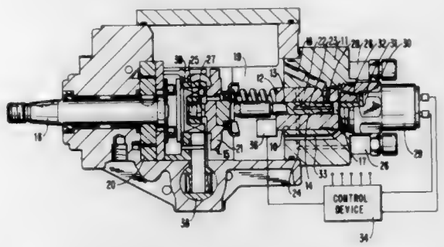
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES
Karle Anton, Leonberg, and Pape Werner, Lyons, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE89/00032, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO89/07708, PCT Pub. Date Aug. 24, 1989
PCT Filed Jan. 21, 1989, Ser. No. 427,855
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805033
Int. Cl.[5] F02M *51/00, 37/04*
U.S. Cl. 123—494 **7 Claims**

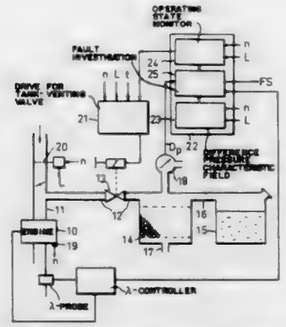
1. Fuel injection pump system, particularly of the distributor type, for internal combustion engines, comprising a pump plunger delimiting a pump work space and being set at least in an axially oscillating motion, particularly by means of a cam drive, an electrically controlled switching valve arranged in a connection line between the pump, work space and a low-pressure space filled with fuel and being operated between two switching positions for opening and closing the connection line, whereby closing or blocking periods of the switching valve determine the start of delivery and the fuel delivery quantity arriving from the pump work space per pump plunger stroke for injection, a control device for controlling the switching valve, the control device including a control computer which calculates the desired delivery stroke of the pump plunger effecting injection as a function of operating parameters of the internal combustion engine, such as speed, load, temperature, accelerator pedal position and the like, particularly determines it from a stored characteristic field, and transmits it as a desired delivery stroke signal to the control device, a stroke transmitter (**36**) which detects the delivery stroke path of the pump plunger (**14**) starting from a reference point and transmits to the control device a corresponding actual delivery stroke signal, the control device (**34**) comparing the actual delivery stroke signal with a reference signal corresponding to a predetermined plunger stroke of the pump plunger and, with the desired delivery stroke signal, and the control device (**34**) generates a closing signal for the switching valve (**29**) as soon as the actual delivery stroke signal is equal to the desired delivery stroke signal, the actual delivery stroke signal being weighted with a correction factor (k) prior to the comparison in the control device, the correction factor (k) being calculated



as a ratio of a predetermined geometric maximum stroke (h_{geo}) of the pump plunger (**14**) and of a measured maximum stroke (h_{max}) of the pump plunger (**14**) measured by the stroke transmitter (**36**) during the preceding stroke period, the control device (**34**) containing two comparators (**43, 44**) each having two inputs, one of the inputs being connected to the output of the stroke transmitter (**36**) via a weighting stage (**42**) whose wighting factor (k) is equal to the ratio of the predetermined geometric maximum stroke (h_{geo}) and the maximum stroke (h_{max}) of the pump plunger (**14**) measured by the stroke transmitter (**36**) in the immediately preceding stroke period, the other input of the first comparator (**43**) being supplied with the reference signal and the other input of the second comparator (**44**) is supplied with the desired delivery stroke signal, and in that the two comparators (**43, 44**) are constructed in such as way that they generate an output signal when their input signals are equal.

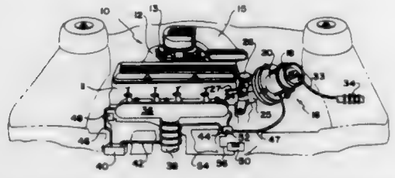
5,205,263
TANK-VENTING APPARATUS AS WELL AS A METHOD AND AN ARRANGEMENT FOR CHECKING THE SAME
Andreas Blumenstock, Ludwigsburg; Helmut Denz, Stuttgart; Werner Mezger, Eberstadt, and Ernst Wild, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Apr. 9, 1992, Ser. No. 865,923
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1991, 4111361
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 **5 Claims**

1. A method of checking a tank-venting apparatus for a motor vehicle equipped with a fuel tank and an internal combustion engine having an intake pipe, the apparatus including an adsorption filter having a venting end and an intake end, a supply line connecting the intake end to the tank, a connecting line interconnecting the intake pipe of the engine and the intake end of the adsorption filter, a tank-venting valve mounted in the connecting line between the intake pipe and the intake end of the adsorption filter and a drive unit for actuating the tank-venting valve, the method comprising the steps of:
at least partially opening the tank-venting valve when a pregiven state of the engine is present and the completely closing said valve when said pregiven operating state range is present;
detecting the difference pressure between the pressure at the intake end of the adsorption filter and the ambient pressure;



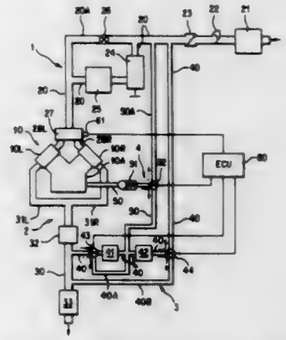
detecting the time-dependent course of said difference pressure starting at the time point of the closing of said valve;
checking if the decay time constant of said difference pressure is in a pregiven region; and, if not,
issuing a fault announcement.

5,205,264
FUEL VAPORIZER AND SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Larry L. Hoffman, Sr., 2521 Victory Palm Dr., Edgewater, Fla. 32141
Continuation of Ser. No. 614,243, Nov. 16, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 758,205
Int. Cl.[5] F02G *5/00*
U.S. Cl. 123—555 **23 Claims**



1. A fuel vaporier for use in conjunction with a fuel injector on an internal combustion engine, comprising:
a base plate having a fluid passage extending therethrough;
a cone shaped nozzle section extending from one side of said base plate in alignment with and converging toward the fluid passage;
an annular body connected at one end to the base plate and extending from the same side of the base plate as said nozzle section, and surrounding said nozzle section in concentric, spaced relationship thereto, defining an annular space therebetween;
an end cap connected to an opposite end of said annular body, said end cap having a divergent opening extending therethrough, defining another nozzle section facing said nozzle section on said base plate and defining a mixing region therebetween; and
an air injector passing through a wall portion of the annular body and extending into the annular space defined between said nozzle section of said base plate and an inner wall surface of said annular body to cause air to enter said annular space with a swirling motion and to pass upwardly through said space and around said convergent nozzle section into the mixing region, whereby fuel sprayed from a fuel injector and through said divergent nozzle enters said mixing region and encounters said swirling air, atmozing said fuel and preventing it from contacting the wall of said annular body or said convergent nozzle section.

5,205,265
EXHAUST GAS RECIRCULATION SYSTEM
Kenji Kashiyama, Hiroshima; Kazumasa Nomura, Higashihiroshima; Noriyuki Iwata, and Naoyuki Yamagata, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 30, 1992, Ser. No. 858,999
Claims priority, application Japan, Mar. 28, 1991, 3-089769
Int. Cl.[5] F02M *25/06, 25/07*
U.S. Cl. 123—570 **12 Claims**



1. An exhaust gas recirculation system of an internal combustion engine, having an intake system for introducing fresh air into the internal combustion engine and an exhaust system for discharging exhaust gas produced in the internal combustion engine therethrough, said exhaust gas recirculation system comprising:
an exhaust gas circulation passage, interposed between said intake system and said exhaust system, for circulating exhaust gas into said intake system from said exhaust system;
filtering means, disposed in said exhaust gas circulation passage, for filtering exhaust gas passing therethrough;
cooling means, disposed in said exhaust gas circulation passage between said filtering means and said exhaust system, for cooling exhaust gas passing therethrough; and
a blowby gas passage, connected between the internal combustion engine and said exhaust gas circulation passage at a position between said filtering means and said cooling means, for introducing blowby gas produced in the internal combustion engine into said exhaust gas circulation passage therethrough.

5,205,266
RUBBER BAND PROJECTILE TOY GUN
A. Harold Kilby, Jr., Rte. 3, Box FM75, Tuttle, Okla. 73089
Filed May 18, 1992, Ser. No. 884,825
Int. Cl.[5] F41B *7/02*
U.S. Cl. 124—19 **4 Claims**

1. A toy gun, comprising:
a hollow gun frame defined by opposing side walls having an elongated top opening and having a stock portion at its handle end and a barrel with a front sight at its forward portion, the sight having a forward recess for engaging one end of a rubber band;
a sprocket wheel journalled by an axle extending transversely between the frame side walls, the sprocket wheel

5,205,268
an elongated riser;
a first limb pivotably connected to one end of said riser and

use pellets as projectiles and shoot said pellets through a bore through said barrel along an axis, that further have loading

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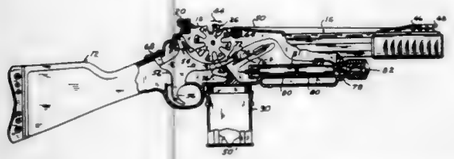
being characterized by a plurality of parallel wall U-shaped radially disposed rubber band receiving slots defining a like plurality of substantially fan-shaped wheel spokes for respectively engaging the opposite ends of a like plurality of rubber bands stretched between the front sight recess and respective slots in readiness for firing and preventing premature release of a rubber band being fired until the side walls of a slot containing the rubber band are inclined toward the gun barrel;

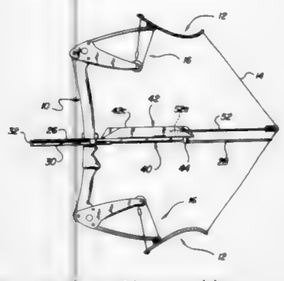
first pawl means projecting into a sprocket wheel slot for normally maintaining said sprocket wheel in rubber band firing position;



trigger means including a second pawl pivotally supported between the frame walls for biasing said first pawl means out of the slot and biasing the second pawl into sprocket wheel rotation limiting stopped position; and,

a roller transversely journalled between the frame side walls adjacent the upward forward limit of the circumferential travel path of said sprocket wheel with the peripheral portion of the roller projecting above the upper limit of said frame for supporting an intermediate portion of a rubber band stretched between the front sight recess and a sprocket wheel spoke.

5,205,267
OVERDRAW ASSEMBLY FOR AN ARCHERY BOW
Richard Burdick, 8409 Henry Clay Blvd., Clay, N.Y. 13041
Filed Jul. 20, 1990, Ser. No. 555,103
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—24.1 **36 Claims**



13. A archery bow assembly comprising:

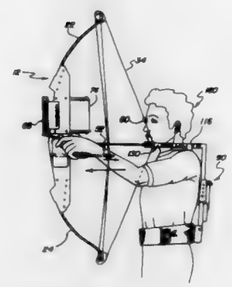
a bow including a central handle section and limb sections;

a bow string extending between the free ends of the limb sections rearwardly of the central handle section;

a slide mounted for sliding movement on said central handle section of said bow along a path generally transverse to said handle section and to said bow string and including means to receive the forward end of an arrow with the nock of the arrow engaging said bow string; and

resilient means extending between said bow string and said slide.

5,205,268
ARCHERY APPARATUS
Huey P. Savage, Lake Forest, Calif., assignor to Savage Systems, Inc., San Clemente, Calif.
Filed May 24, 1991, Ser. No. 705,299
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—24.1 **38 Claims**



30. A bow comprising:

a central section;

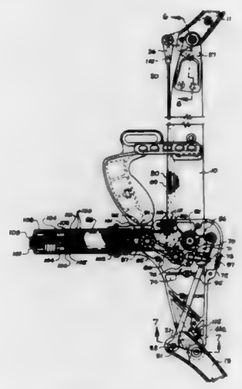
a pair of resilient limbs extending in opposite directions from the central section;

a bowstring connected between the ends of the limbs and having a nocking point, the bowstring, limbs and central section lying generally in a central plane encompassing the path of the arrow to be launched;

an arrow rest disposed in said central plane for supporting the shaft of the arrow, the arrow rest and nocking point aligning the arrow on a shooting axis along which the arrow travels when departing the bow; and

a pair of hand grips mounted on the central section on opposite sides of the central plane, said hand grips each having one end mounted to the central section and an elongated gripping portion extending outwardly from said central plane, said handgrips providing means for simultaneously accommodating both hands of the archer.

5,205,269
TOGGLE LINK POWER CELL BOW
Matthew P. Guzzetta, 10425 Loma Rancho Dr., Spring Valley, Calif. 92077
Filed Sep. 12, 1990, Ser. No. 582,519
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—25.6 **15 Claims**



1. A toggle link compound bow comprising:

an elongated riser;

a first limb pivotably connected to one end of said riser and extending therefrom with a free outer end;

a second limb pivotably connected to the other end of said riser and extending therefrom with a free outer end;

the free outer ends of said limbs adapted to have a bowstring fastened therebetween, said bowstring being translatable from a normal rest position to a drawn unrest position;

an energy storage means mounted on the riser;

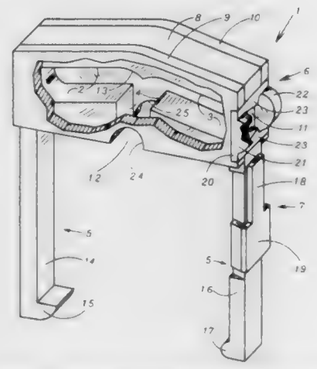
a toggle link assembly operatively connected to the energy storage means, said toggle link assembly includes a first toggle link means pivotably mounted on the riser and operatively connected to both a first and second connecting means so that movement of the limbs of the bow cause pivoting of the first toggle link means, a second toggle link means pivotably coupled to the first toggle link means through an adjustment link whereby the effective connection of the second link means to the first link means can be changed and operably connected between said first toggle link means and the energy storage means, said first toggle link means is pivotally mounted on the riser by a torque shaft, wherein said adjustment link is independently pivotally mounted about the torque shaft, and additionally including an adjustment means to adjust the relative angular positioning of said first link means and said adjustment link, whereby as the limbs are moved from the rest position to the unrest drawn position, first and second toggle link means move from a first position to a second position causing energy to be stored in said energy storage means;

first connecting means operably connecting the first toggle link means to the first limb; and

second connecting means operably connecting the first toggle link means to the second limb;

said toggle link assembly, first connecting means, and second connecting means providing simultaneous, coordinated movement of said first and second limbs, whereby as a bowstring connected between the free outer ends of the limbs is moved from a rest position to a drawn position, said limbs and toggle link assembly cause energy to be stored in said energy storage means, and whereby the energy stored in said energy storage means causes forceful movement of said limbs and bowstring back to the rest position when the bowstring is released.

5,205,270
MAGAZINE FOR COMPRESSED GAS SINGLE-SHOT BOLT-ACTION PELLET SHOULDER GUNS
Pedro A. Szente, 80 E. Portola Ave., Los Altos, Calif. 94022
Filed Jun. 1, 1992, Ser. No. 890,845
Int. Cl.[5] F41B *11/02*
U.S. Cl. 124—50 **25 Claims**



1. A gravity operated magazine for loading pellets into rifles and smooth barrel shoulder guns of the single shot type that use pellets as projectiles and shoot said pellets through a bore through said barrel along an axis, that further have loading mechanisms which include a bolt, that use as pellet propellant either compressed air (precharged or provided by a pump) or carbon dioxide cartridges, said magazine comprising:

a plate block of thickness larger than the length of said pellets, said block having three channels, said channels having their long axes parallel to said plate block's two largest surfaces, said channels being of a width larger than the caliber of said pellets, two of the three said channels being pellet reservoir channels, the third of said channels being a pellet chute channel, one first end of a first pellet reservoir channel being connected to one first end of the second pellet reservoir channel, the second end of the first pellet reservoir channel being closed, the second end of the second pellet reservoir channel being open, the two connected ends of the pellet reservoir channels being further connected to one first end of the pellet chute channel, the second end of the pellet chute channel being open;

two cover plates, one first surface of one first cover plate being attached to one first surface of the two largest surfaces of said block, one first surface of the second cover plate being attached to the second of the two largest surfaces of said block, said two pellet reservoir channels and said cover plates forming two pellet reservoir ducts, said pellet chute channel and said cover plates forming one pellet chute duct, said reservoir ducts and chute duct being able to contain one rifle pellet or a plurality of rifle pellets lying side by side to each other, said pellets being free to roll along inside said reservoir ducts and chute duct propelled by gravity, the open end of the second pellet reservoir channel and the cover plates forming a magazine filling hole allowing said magazine to be filled with pellets through said magazine filling hole, the open end of the pellet chute channel and the cover plates forming a magazine's rifle loading hole, allowing said pellets to be loaded from said magazine into the breech of said rifle through said magazine's rifle loading hole, the edges of the cover plates adjacent to said magazine's rifle loading hole being shaped into two identical arcs encompassing approximately 180 degrees, the arcs further having diameters of dimensions as required to seat snugly said arcs on the exposed lateral surface of said rifle's bolt adjacent to said rifle's breech when said bolt is in closed position, thus enabling said bolt to close said magazine's rifle loading hole when said bolt is in closed position;

a means for attaching said magazine to the breech of said rifle, causing a plane parallel to the axes of said reservoir ducts and chute duct to lie perpendicularly to the rifle's bore axis, further causing said magazine's rifle loading hole arcs to seat on the exposed lateral surface of the rifle's bolt when said bolt is in closed position; and

a means for opening or closing said magazine filling hole.

5,205,271
AIR RIFLES OF THE HINGED BARREL TYPE
Francisco Casas Salva, San Baudilio de Llobregat, Spain, assignor to Industrias El Gamo, S.A., Sant Boi de Llobregat, Spain
Filed Jul. 19, 1991, Ser. No. 732,208
Claims priority, application France, Jul. 20, 1990, 90 09538
Int. Cl.[5] F41B *11/18, 11/14*
U.S. Cl. 124—66 **6 Claims**

1. An air rifle of the hinged barrel type having a tiltable barrel with a bore pivotly connected to a buttstock, comprising:

a compression chamber within said buttstock;

a compression spring disposed within said compression chamber;

a first sub-assembly at the rear end portion of said barrel adjacent said buttstock comprising a casing substantially enclosing the rear end portion of said barrel with a part of

said barrel extending rearwardly from said casing, and a

center leg having terminal thread connection directly into the

apertures in said shield member toward the apertures in said duct member.

tally formed in the valve body perpendicularly communicating the gas inlet port for rotatably engaging a rotor

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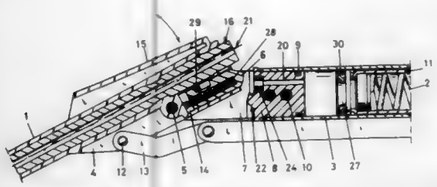
said barrel extending rearwardly from said casing, and a releasable locking means on said casing;

a second sub-assembly comprising an injection molded plastic forked member having a cylindrical portion inserted within said compression chamber, a circumferential groove on said cylindrical portion, an O-ring seal in said circumferential groove to provide an airtight seal between said cylindrical portion and said compression chamber, at least two transverse open passages through said cylindrical member, locking pins in said transverse open passages and engaging said buttstock for securing said cylindrical portion in said compression chamber, two parallel fork limbs receiving therebetween a part of said first sub-assembly, a fork bottom between said parallel fork limbs, an intermediate part on said fork bottom having a flat transverse wall, an axial transfer passage extending through said cylindrical portion and through said transverse wall communicating said compression chamber with the bore of said barrel when said barrel is in a closed firing position for use, a semi-cylindrical shaped rabbet on said



transverse wall and centered coaxially with said axial transfer passage for supporting said rearwardly extending part of said rear end of said barrel when in firing position and coaxially centering said bore of said barrel with said axial transfer passage, an inclined plane on said transverse wall engagable with said locking means on said first sub-assembly when in firing position for retaining said bore of said barrel in alignment with said axial transfer passage, and two-side rectilinear profiles on said forked member delimiting said transverse wall and engaging said rearwardly extending part of said rear end of said barrel for reinforcing and centering said barrel with the bore thereof aligned with said axial transfer passage in firing position;

aligned transverse passages through said fork limbs and said first sub-assembly casing;

a hinge pin extending through said aligned passages for pivotly connecting said sub-assemblies together; and

a lever mechanism pivotly connecting said buttstock with said first sub-assembly casing for compressing said spring within said compression chamber when said sub-assemblies are aligned in the firing position.

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BOW STABILIZER AND STAND COMBINATION

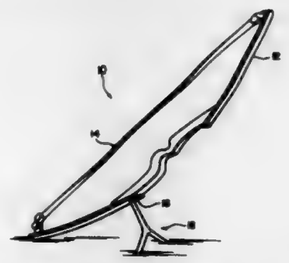
Bob Boyer, P.O. Box 3707, Paso Robles, Calif. 93447

Filed Jun. 17, 1991, Ser. No. 715,985

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—89 **10 Claims**

1. A combination stabilizer and stand for an archery bow having a stabilizer port, comprising an inverted Y or rigid material of sufficient weight to act as a bow stabilizer, said Y having a center leg projecting normal to said bow a distance providing a leg outer end spaced substantially from said bow and two divergent legs which commence at the outer end of said center leg is substantially spaced relation to said bow, said center leg having terminal thread connection directly into the bow at the stabilizer port of the bow, said divergent legs being



outwardly extended and spread sufficiently to support said bow with its end off the ground.

5,205,273

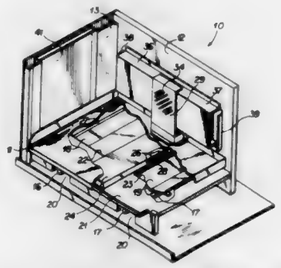
CONVECTION-RADIANT HEATED OVEN

Michael W. Sparks, and Bob G. Harrell, both of Greenwood, Miss., assignors to Viking Range Corporation, Greenwood, Miss.

Filed Dec. 23, 1991, Ser. No. 811,998

Int. Cl.[5] A21B *1/00*

U.S. Cl. 126—21 A **13 Claims**



1. An oven for providing substantially uniform heating in a cooking chamber comprising,

an oven cooking chamber having a bottom, a rear wall, first and second side walls, a front wall portion having an air inlet and a top wall,

means forming a burner box below said bottom,

heating means within said burner box,

an apertured shield member positioned over said heating means,

a duct member positioned between said shield member and said bottom, said duct member extending above said shield member toward said rear wall and having apertures therein,

a convection duct positioned at an end of said duct member adjacent said rear wall, said convection duct being in communication with said duct member to permit passage of air from said duct member to said convection duct and extending from said duct member toward said top wall, said convection duct having an upper end remote from said duct member,

a fan housing having first and second laterally extending air ducts and positioned adjacent said upper end of said convection duct and in communication therewith to permit passage of air from said convection duct into said fan housing,

a convection fan within said fan housing, and

at least one baffle means positioned over said heating means for directing heated air from said burner box through the apertures in said shield member toward the apertures in said duct member.

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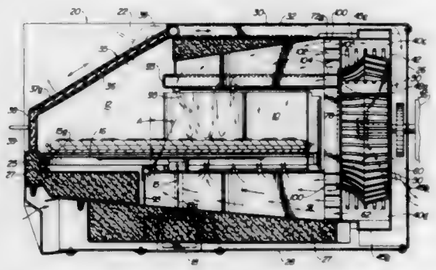
TURNTABLE CONVECTION OVEN

Donald P. Smith, Dallas; William W. Plumb, Longview, and Jarald E. High, Grand Prairie, all of Tex., assignors to Patentsmith II, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 411,400, Sep. 22, 1989, abandoned. This application May 14, 1991, Ser. No. 699,774

Int. Cl.[5] A21B *1/08*

U.S. Cl. 126—21 A **40 Claims**



1. Apparatus for heat treatment of a food product comprising:

a chamber having an interior and a product loading opening communicating with said interior of said chamber;

heat transfer means in said chamber to deliver a plurality of spaces streams of temperature controlled air;

closure means;

product support means;

means movably securing said product support means to said closure means;

drive means secured to said closure means;

driven means operably secured to said drive means and said product support means, said driven means being adapted to move said product support means relative to said heat transfer means such that said streams of air move over the surface of a product on said product support means, said heat transfer means having openings configured to provide substantially equivalent heat transfer over the surface area of said product; and

means movably securing said closure means to said chamber such that said closure means is movable between a first position closing said loading opening, wherein said product support means is positioned in the interior of said chamber, and a second position spaced from said loading opening, wherein said product support means is positioned outside said chamber.

5,205,275

GAS OVEN WITH OXYGEN SUPPLY MEANS

Che-Yuan Chang, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan

Filed Nov. 20, 1991, Ser. No. 794,924

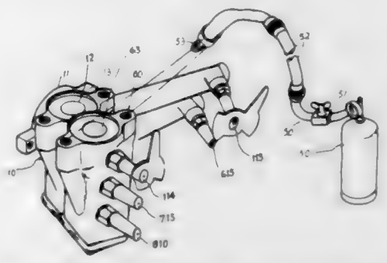
Int. Cl.[5] F24G *3/00*

U.S. Cl. 126—39 R **6 Claims**

1. A gas oven comprising: a gas valve means formed in the gas oven for controlling a flow rate of fuel gas from a fuel gas source to a fuel gas burner by leading a fuel gas stream through said gas valve means; and an oxygen supply system supplying oxygen fluid led through said gas valve means parallelly flowing towards the fuel gas burner as controlled by said gas valve means for helping a complete combustion of the fuel gas at the gas burner;

said gas valve means including a valve body having a gas inlet port vertically formed in a gas tube adapter for directing fuel gas into the port, a rotor plug hole horizontally formed in the valve body perpendicularly communicating the gas inlet port for rotatably engaging a rotor plug in the hole, and a rotating knob secured with the rotor plug rotatably mounted on the gas oven for operating the rotor plug for adjusting gas flow rate to a burning nozzle of the oven;

said rotor plug having a stem secured to a knob and a plug portion formed with a central longitudinal hole about a longitudinal axis of the plug, a large gas inlet opening radially formed through a cross section of the plug perpendicularly intersecting and communicating the central longitudinal hole having a large gas outlet opening formed in an opposite end of the inlet opening on a perimeter of the plug communicating with a first gas passage formed in the valve body to be finally connected with an outer large gas nozzle of the gas burner, a small gas inlet opening radially formed in the plug to be angularly separated from the large opening along a cross sectional plane perpendic-



ular to the longitudinal axis and communicating with the central longitudinal hole and communicating a second gas passage formed in the valve body to be finally connected with an inner small gas nozzle of the gas burner, and a pilot gas outlet opening formed in an outer portion of the plug communicating with a pilot gas passage formed in the valve body to be finally communicated with a pilot gas nozzle for discharging pilot gas to be ignited by an igniting means secured to the valve body; and an oxygen passage means formed in said valve body; and

said oxygen passage means including: an oxygen adapter base provided on the valve body for connecting an oxygen adapter of said oxygen supply system including an oxygen source connected with an oxygen cylinder and a oxygen gas tube, and an oxygen inlet port formed in the valve body on the oxygen adapter base, juxtapositional to the gas inlet port formed in the valve body for directing oxygen into the valve means.

5,205,276

COMPACT FURNACE HEAT EXCHANGER

Michael A. Aronov, Mayfield Hts., and Roger D. Sheridan, Wadsworth, both of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Nov. 21, 1991, Ser. No. 795,507

Int. Cl.[5] F24H *3/08*

U.S. Cl. 126—109 **20 Claims**

1. A heating system comprising a compact heat exchanger including a first heat transfer conduit means disposed within a first surrounding enclosure that substantially surrounds the first conduit means, and a second heat transfer conduit means disposed within a second surrounding enclosure that substantially surrounds the second conduit means, said first conduit means being in fluid communication with said second enclosure and said first enclosure being in fluid communication with said second conduit means, burner means for burning air and fuel to form products of combustion and for conveying the products of combustion through the heat exchanger, and blower means for flowing air to be heated through said heat

exchanger and to a space to be heated, said burner means being

said piercing body provided with a plurality of bending

5,205,279

LINEAL SLOT VENTILATION SYSTEM

surface angularly disposed relative said axis and extending radially inwardly from said tab, whereby when recipro-

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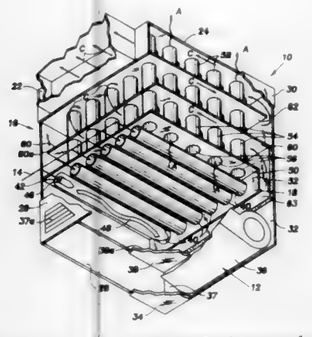
exchanger and to a space to be heated, said burner means being operatively connected to said heat exchanger to convey said products of combustion through said first conduit means and said second enclosure, and said blower means being operatively connected to said heat exchanger to flow air to be heated through said first enclosure and said second conduit means, said second conduit means including a plurality of tubular members having longitudinal axes extending through said second enclosure, said second enclosure including wall means providing a serpentine flow path for said products of combus-



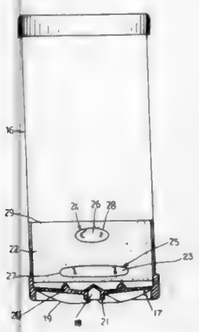
tion extending transversely back and forth across the longitudinal axes of said tubular members and through said second enclosure, said second enclosure and said wall means confining the path of the products of combustion as they enter the second enclosure to a cross-section that is sufficiently less in dimension, measured in the direction of the longitudinal axes of said tubular members, than the effective lengths of the tubular members to permit the wall means to divide the second enclosure into at least three transverse paths across the tubular members and of generally equal cross-sectional area.

5,205,277

FOOD HEATING TECHNIQUE FOR PRODUCING HIGH TEMPERATURE

Chen Chao-Tsung, No. 58-1, Sec. 2., Tan Fu Rd., Tan Tsu Hsiang, Taichung Hsien, Taiwan

Filed Apr. 22, 1992, Ser. No. 872,148
Int. Cl.[5] A47G *23/04*
U.S. Cl. 126—262 **13 Claims**



1. A food heating technique for producing a high temperature in a container of food, comprising the steps of:

providing a receiving tank in the container having a heater lid that comprises a pressing pin located at the midpoint thereof, a protruding piercing body surrounding said pin, said piercing body provided with a plurality of bending grooves;

providing quicklime in the receiving tank;

providing a first pack in the receiving tank, said first pack for producing a medium temperature heating and comprising a covering layer of plastic film and a first liquid mixture, said first liquid mixture that includes about 0.03 g NaCl(s), about 0.8 cc CH_3 COOH(1), and about 8 cc H_2O(1);

providing a second pack in the receiving tank, said second pack for producing a high temperature and comprising a covering layer of plastic film having a melting point of about 140° C. and a second liquid mixture that includes about 0.02 cc NaCl(aq), about 0.8 cc CH_3 COOH(1), and about 9 cc H_2O;

piercing said medium temperature heating pack with said pressing pin and protruding piercing body such that said temperature raising liquid therein can rapidly mix with said quicklime; and

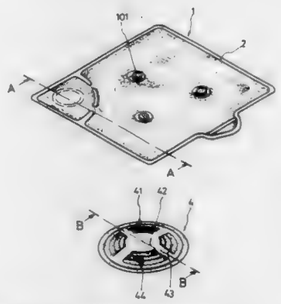
creating a chemical reaction such that the temperature increases to about 250° C., thereby heating the contents of the container to reduce any residual bacteria.

5,205,278

CHEMICAL BAG WARMER

Ching-Chuan Wang, No. 17. Lane 16. Ying-An street, Yung-Ho, Taipei, Taiwan

Filed May 1, 1992, Ser. No. 877,834
Int. Cl.[5] F24J *1/00*
U.S. Cl. 126—263 **2 Claims**



1. A chemical bag warmer comprising:

a plastic bag sealed completely;

a sodium acetate solution being filled in said sealed bag, said sodium acetate solution having a molality ranging from 8 m to 24 m;

a triggering member disposed in said sodium acetate solution, said triggering member being adapted to generate an oscillation wave when a pressure is applied thereupon causing said triggering member to bend;

said triggering member being a disc-shaped member made of a flexible metal piece, said triggering member being characterized by having a flat outer circular portion, a flat center portion, and a rugged middle portion therebetween, said middle portion comprising a plurality of segmented and rugged concentric annuluses separated by a plurality of channel-shaped flat surfaces extending from said center portion to said outer circular portion;

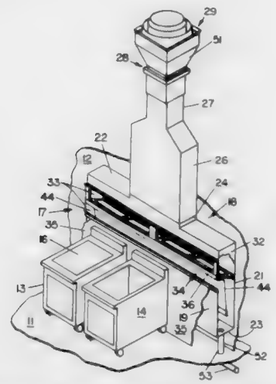
said triggering member is adapted to vibrate and generate an oscillation wave when a pressure is applied thereupon, thereby causing said sodium acetate solution to crystallize and providing a warming effect through the dissipation of heat due to such crystallization.

5,205,279

LINEAL SLOT VENTILATION SYSTEM

Stephen L. Brown, 13144 Tudor Dr., Carmel, Ind. 46032

Filed Jul. 24, 1991, Ser. No. 735,282
Int. Cl.[5] F24C *15/20*
U.S. Cl. 126—299 R **20 Claims**



1. In a building having a roof and a kitchen with a floor and a wall and a cooking unit in front of the wall and having a cooking surface in a horizontal plane above the floor, a ventilating system including an intake unit the cooking unit comprising:

a housing including front, rear, top, bottom, left and right end walls for receiving and directing cooking fumes and located behind a vertical plane extending behind the cooking unit;

a horizontally extending slot at the front wall and located immediately above the level of the back of the cooking unit and communicating with the kitchen to receive cooking fumes from the cooking unit;

means for extending the travel distance of cooking fumes from the cooking unit to a grease separator means and including a first baffle having an upper end portion inside the housing behind the front wall at the level of the top of the slot and extending downward below the level of the horizontal plane of the cooking surface to a line near the bottom wall of the housing spaced in front of the rear wall of the housing; and

said grease separator means extending between the front and rear walls above the baffle.

5,205,280

QUICK-RELEASE ENDOSCOPIC COUPLING ASSEMBLY

Allan G. Dennison, Jr., Action, Mass., and Larry E. Shephard, Providence, R.I., assignors to MP Video, Inc., Hopkinton, Mass.

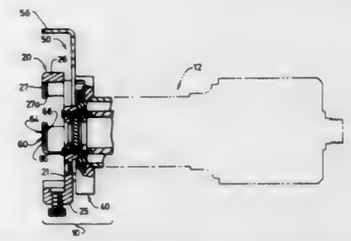
Filed Dec. 21, 1990, Ser. No. 632,131
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—3 **21 Claims**

1. A quick-release coupling assembly for an endoscopic ocular having a proximal end, said assembly comprising:

an ocular mounting surface having an aperture and a longitudinal axis passing through said aperture;

a stationary guidewall radially spaced from said aperture, said guidewall extending outwardly from said mounting surface and at least partially defining an alignment recess adjacent said mounting surface about said aperture for receiving the proximal end of an endoscopic ocular; and

at least one gripping jaw reciprocable substantially parallel to said axis and having a clamping position and a release position, said jaw comprising an inner tab extending outwardly from said mounting surface and an engagement surface angularly disposed relative said axis and extending radially inwardly from said tab, whereby when reciprocated to said release position said engagement surface of said jaw is axially moved substantially outside of said



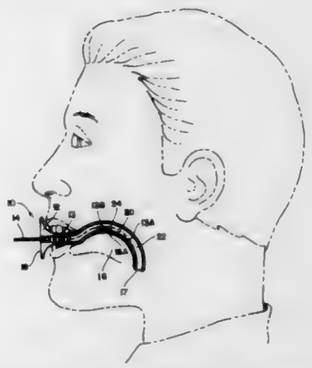
alignment recess, and when reciprocated to said clamping position, said jaw can engage a portion of the proximal end of an ocular received within said alignment recess to effectively clamp the ocular therewithin.

5,205,281

ORAL AIRWAY WITH OXIMETRY MEANS

Dale C. Buchanan, 4217 Horseshoe Bend, Matthews, N.C. 28105

Filed Aug. 2, 1991, Ser. No. 739,881
Int. Cl.[5] A61M *16/00*; **A62B** *9/06*; **A61B** *6/00, 5/00*
U.S. Cl. 128—207.14 **7 Claims**



1. An oral airway for insertion over a surgical patient's tongue, which both assists in patient breathing and provides for the measurement of oxygen saturation in the patient's blood, comprising:

a) a main body configured to extend through the patient's mouth over the tongue to prevent blockage of the patient's pharnyx during surgery;

b) means for transmitting light;

c) means for detecting light transmitted by said transmitting means;

d) said transmitting means and said detecting means being positioned on said main body in spaced relation to one another for passage of light through the patient's tongue when transmitted from said transmitting means to said detecting means during surgical use of the airway; and

e) means for operatively connecting said transmitting means and said detecting means with an oximeter for measuring oxygen saturation in the patient's blood as a function of the transmitted light detected by said detecting means.

5,205,282

THERAPEUTIC NASAL INHALATOR

time intervals (VCL's) between successive ventricular event detection signals;

5,205,285

VOICE SUPPRESSION OF VAGAL STIMULATION

5,205,287

ULTRASONIC CONTRAST AGENTS, PROCESSES FOR THEIR PREPARATION AND THE USE THEREOF AS

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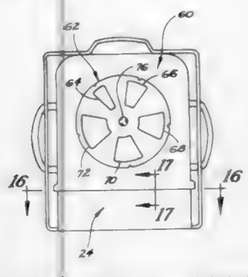
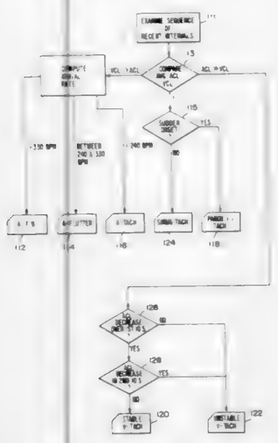
5,205,282
THERAPEUTIC NASAL INHALATOR
Yousef Daneshvar, 33200 Slocum, Farmington, Mich. 48024
Filed Nov. 15, 1991, Ser. No. 792,688
Int. Cl.[5] A61M *16/00*; H05B *3/12*
U.S. Cl. 128—203.26 20 Claims



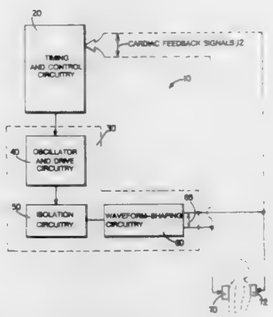
1. Therapeutic apparatus for the nasal inhalation of steam by a user comprising: an enclosure cooperatively defined by an open-top pan and a removable cover, said enclosure defining inner volume means for holding hot water and steam, said enclosure further comprising a first wall portion and a second wall portion, said first wall portion having a nose-accommodating aperture means for allowing the user's nose to substantially sealingly project into said inner volume means and for allowing the inhalation of steam from the inner volume means by the user, and said second wall portion further comprising selection means for selectively communicating said inner volume means to the ambient.

5,205,283
METHOD AND APPARATUS FOR TACHYARRHYTHMIA DETECTION AND TREATMENT
Walter H. Olson, North Oaks, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Jul. 30, 1991, Ser. No. 737,947
Int. Cl.[5] A61N *1/368*; A61B *5/04*
U.S. Cl. 128—419 PG 18 Claims



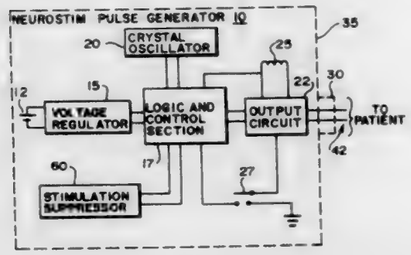
10. An apparatus for detecting and treating tachyarrhythmias of a living patient's heart comprising:
means for sensing the atrium and ventricle of the patient's heart and providing atrial (AS) and ventricular (VS) event detection signals;
means for measuring and storing the time intervals (ACL's) between successive atrial event detection signals and the time intervals (VCL's) between successive ventricular event detection signals;
means for detecting the presence of tachycardia by comparing the measured VCL's to predetermined tachycardia detection criteria;
means for comparing said stored ACLs and VCLs with one another if tachycardia is detected, to determine whether said patient exhibits a greater ventricular than atrial rate during said detect tachycardia;
means for defining a predetermined time period during said detected tachycardia;
means for monitoring the patient's ACLs during said predetermined time period, if said ventricular rate is greater than said atrial rate;
means for delivering a first predetermined therapy to said patient's heart if said ACL's tend to shorten during said predetermined time period; and
means for delivering a second therapy differing from said first therapy to said patient's heart if said ACL's tend to lengthen during said predetermined time period.

5,205,284
METHOD AND APPARATUS FOR TRANSCUTANEOUS ELECTRICAL CARDIAC PACING WITH BACKGROUND STIMULATION
Gary A. Freeman, Newton Center, Mass., assignor to Zoll Medical Corporation, Woburn, Mass.
Filed Jun. 12, 1990, Ser. No. 537,069
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG 29 Claims



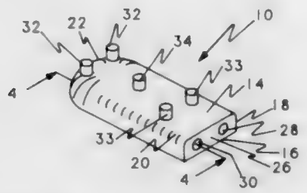
1. Apparatus for transcutaneously pacing the heart of a patient at a pacing rate, the apparatus comprising
stimuli generating circuitry means having an output for generating electrical stimuli, and
electrodes connected to the output of the stimuli generating circuitry means for delivering the electrical stimuli to the patient,
wherein said stimuli generated and delivered to the patient include
pacing stimuli occurring generally at the pacing rate, and having a shape and amplitude capable of causing contractions of the cardiac muscle, and
background stimuli occurring at times other than said pacing stimuli, and having a shape and amplitude incapable of causing contractions of the cardiac muscle.

5,205,285
VOICE SUPPRESSION OF VAGAL STIMULATION
Ross G. Baker, Jr., Houston, Tex., assignor to Cyberonics, Inc., Webster, Tex.
Filed Jun. 14, 1991, Ser. No. 715,428
Int. Cl.[5] A61N *1/08*
U.S. Cl. 128—423 R 20 Claims



1. A medical device for stimulating the vagus nerve of a patient to modulate the electrical activity thereof as part of a prescribed therapy, comprising:
signal generating means for generating a predetermined signal to stimulate the vagus nerve, and
sensing means responsive to speech by the patient for automatically inhibiting said signal from stimulating the nerve.

5,205,286
SUBCUTANEOUS ELECTRICAL DATA PORT
Thomas M. Soukup, Lake Jackson, and Warren J. Block, Angleton, both of Tex., assignors to Intermedics, Inc., Austin, Tex.
Filed Jul. 24, 1991, Ser. No. 734,947
Int. Cl.[5] A61B *5/00*; H01R *4/58*
U.S. Cl. 128—630 5 Claims

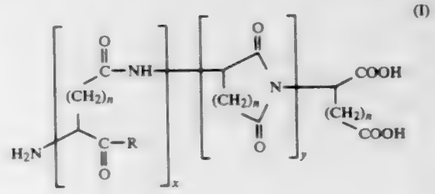


1. A subcutaneously implanted data port comprising
a non-conductive body;
at least one access sport on said body;
said at least one access port comprising a conductive elastomeric filler and a non-conductive, penetrable cap, said cap covering said conductive elastomeric filler; and
means for electrically connecting said data port to an implanted apparatus, said connecting means being in the electrical communication with said conductive elastomeric filler;
an indifferent electrode on said body; and
a ground port electrically connected to said indifferent electrode, said ground port comprising a conductive elastomeric ground filler and a nonconductive, penetrable ground cap, said ground cap covering said conductive ground filler.

5,205,287
ULTRASONIC CONTRAST AGENTS, PROCESSES FOR THEIR PREPARATION AND THE USE THEREOF AS DIAGNOSTIC AND THERAPEUTIC AGENTS
Raimund Erbel; Rainer Zotz, both of Mainz; Volker Krone, Flörsheim; Michael Magerstädt, Hofheim am Taunus, and Axel Walch, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Division of Ser. No. 859,257, May 26, 1992, which is a division of Ser. No. 690,761, Apr. 24, 1991, Pat. No. 5,137,928. This application Oct. 1, 1992, Ser. No. 955,146
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013231
Int. Cl.[5] A61B *5/00, 8/00, 17/20*
U.S. Cl. 128—632 3 Claims

1. A method for visualizing organs comprising using a diagnostic or therapeutic agent, wherein said diagnostic or therapeutic agent comprises one or more ultasonic contrast agent composed of microparticles which contain a gas and a polyaminodicarboxylic acid-co-imide derivative of the formula I

(I)



in which
n is 1 or 2
x is 1 to 500
y is 1 to 500, where
x+y is 2 to 1000, and
R is O—R^1 or NH—R^2, in which R^2 is H, $(CH_2)_m$—OR^1, $(CH_2)_m$—O—C(O)—R^1 or $(CH_2)_m$—O—C(O)—OR^1, and
m is 2 to 6, and
R^1 is H, aryl, aralkyl, arylalkenyl, alkyl or C_3–C_8-cycloalkyl or a biologically inactive steroid alcohol or an amino acid, where aryl is unsubstituted or is substituted by C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkoxy or hydroxyl,
where the alkyl radicals specified for R^1 have 1–22 carbon atoms and the alkenyl radicals have 2–22 carbon atoms, which are not interrupted or are interrupted by a carbonyloxy or oxycarbonyl group, where the repeating units placed in square brackets are distributed randomly and/or in blocks in the polymer, and where both the repeating units labeled with x and those labeled with y are identical or different and where the amino acids are α- and/or β-linked.

5,205,288
FETAL ELECTRODE PRODUCT WITH FEMALE SOCKET CONNECTOR AND CONNECTOR DEVICE WITH MALE PLUG CONNECTOR EACH FOR USE IN MONITORING FETAL HEART RATE
Phillipp J. Quedens, Berlin; Donald R. Boucher, Wallingford; John T. Shipherd, Madison, and James W. Poirier, Northford, all of Conn., assignors to American Home Products Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 661,253, Feb. 26, 1991, Pat. No. 5,168,876, and a continuation-in-part of Ser. No. 605,843, Oct. 30, 1990. This application Oct. 7, 1991, Ser. No. 772,691
Int. Cl.[5] A61B *5/0444*
U.S. Cl. 128—642 24 Claims

1. A connector device for use in monitoring fetal heart rate, comprising:

a housing;

termined volume to be dosed from image data obtained from a single one of a plurality of imaging scanners;

illuminating a diagnostic region simultaneously with an

plural thermocouples arranged in series between said disc

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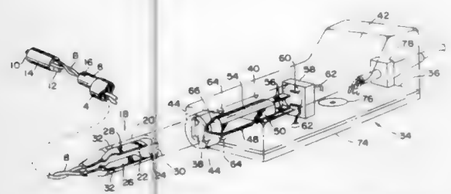
a housing;
electrical connection means for making electrical connection between a remote fetal monitoring device and fetal and maternal electrodes, the connection means including a male plug connector and output means which are electrically connected together within the housing, the output means being adapted for making electrical connection with the remote fetal monitoring device, the electrical connection means also including a female socket connector engaging the male plug connector for establishing electrical connection therebetween, the female socket connector adapted to be electrically connected with the fetal and maternal electrodes;



releasable retaining means for releasably retaining the connectors together when the electrical connection is established between the connectors;
a base;
ground electrode means supported by the base for providing an electrical ground;
means for electrically connecting the ground electrode means with the output means and for securing the base to the housing; and
means for securing one of the base and the housing to an expectant mother's leg so that the ground electrode means is in electrical contact with the mother and thereby provide the electrical ground.

5,205,289

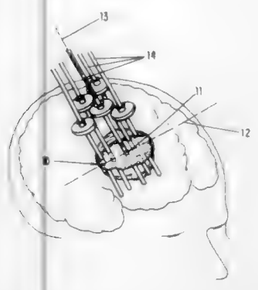
THREE-DIMENSIONAL COMPUTER GRAPHICS SIMULATION AND COMPUTERIZED NUMERICAL OPTIMIZATION FOR DOSE DELIVERY AND TREATMENT PLANNING

Tyrone L. Hardy, Albuquerque, N. Mex.; Gary W. Glover, Huntington Beach, Calif., and Laura D. Brynildson, Albuquerque, N. Mex., assignors to Medical Instrumentation and Diagnostics Corporation, Albuquerque, N. Mex., by said Laura D. Brynildson and Gary W. Glover

Continuation-in-part of Ser. No. 500,788, Mar. 28, 1990, which is a continuation-in-part of Ser. No. 290,316, Dec. 23, 1988, Pat. No. 5,099,846. This application Jun. 8, 1990, Ser. No. 534,975

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—653.1 **16 Claims**



1. A method of optimizing dose delivery involving stereotactic computer techniques comprising the steps of:
1) generating and displaying graphic simulation of a predetermined volume to be dosed from image data obtained from a single one of a plurality of imaging scanners;
2) providing a stereotactic frame and thereby establishing three-dimensional coordinates about the predetermined volume to be dosed;
3) determining an enclosing volume circumscribing said predetermined volume to be dosed;
4) meshing said enclosing volume with node points;
5) providing problem variables relating to dosage;
6) calculating the dose to be delivered to each of said node points;
7) formulating an objective function for evaluating the dosage;
8) solving a numerical optimization algorithm minimizing the objective function;
9) repeating steps 7) and 8) until said problem variables are optimized; and
wherein the step of determining an enclosing volume circumscribing the predetermined volume to be dosed further comprises the steps of:
1) graphically simulating a calculated tumor volume as said predetermined volume;
2) calculating the centroid and major axis dimension of said calculated tumor volume; and
3) calculating and providing an enclosing volume with said centroid of said tumor volume at the center of the enclosing volume, said enclosing volume enclosing said tumor volume plus a nonpathologic margin.

5,205,290

LOW DENSITY MICROSPHERES AND THEIR USE AS CONTRAST AGENTS FOR COMPUTED TOMOGRAPHY

Evan C. Unger, 13365 E. Camino La Cebadilla, Tucson, Ariz. 85749

Filed Apr. 5, 1991, Ser. No. 680,984

Int. Cl.[5] A61B *5/05, 6/03;* **C08J** *9/16*

U.S. Cl. 128—653.4 **10 Claims**

1. A kit for computed tomography imaging of the gastrointestinal region or other body cavities comprising low density biocompatible synthetic polymeric or copolymeric microspheres having an internal void volume of at least about 75% of the total volume of the microsphere, and a thickening or suspending agent.

5,205,291

IN VIVO FLUORESCENCE PHOTOMETER

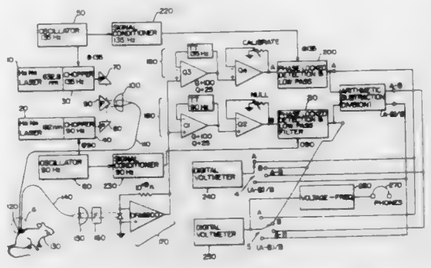
William R. Potter, Grand Island, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.

Continuation of Ser. No. 268,723, Nov. 8, 1988, Pat. No. 5,111,821. This application Oct. 7, 1991, Ser. No. 772,235

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—654 **15 Claims**



1. A method for detecting abnormal tissue in a patient, including the steps of:
introducing a photosensitizing drug into the patient;

illuminating a diagnostic region simultaneously with an incident light of a first wavelength and an incident light of a second wavelength;
detecting fluorescence at the diagnostic region in response to said incident light of said first and second wavelengths;
determining a first contribution to the fluorescence from said light of the first wavelength and a second contribution to the fluorescence from said light of the second wavelength;
differencing said first contribution and said second contribution to achieve a contribution difference; and
generating an output from said contribution different for indicating presence of abnormal tissue at the diagnostic region; and
wherein the illuminating step comprises interrupting said incident light of the first wavelength at a first frequency and said incident light of the second wavelength at a second frequency.

5,205,292

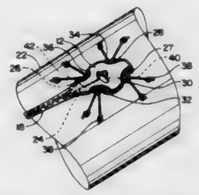
REMOVABLE IMPLANTED DEVICE

Carl T. Czar, Shoreview, and Edward J. Mikolajczyk, Minneapolis, both of Minn., assignors to Applied Biometric, Inc., Minneapolis, Minn.

Filed Jun. 3, 1991, Ser. No. 709,343

Int. Cl.[5] A61B *8/12*

U.S. Cl. 128—662.03 **7 Claims**



1. An implantable, extractable probe for attachment to a vessel or organ, comprising:
(a) an elongate probe body having front and rear ends, the elongate probe body terminating in a flexible tube;
(b) at least one biological sensor attached to the probe body;
(c) at least one lead wire connected to the biological sensor, said lead wire extending through the flexible tube; and
(d) a suture attachment wire for attaching at least one suture to secure the probe body to a predetermined sensor site, the suture attachment wire extending through the flexible tube and being releasably connected to the front of the elongate probe body, at least a portion of the suture attachment wire between the flexible tube and the front of the probe body extending exterior of the elongate probe body;
whereby the elongate probe body may be secured to a predetermined sensor site by attaching at least one suture to the suture attachment wire, such that when the suture attachment wire is released, the probe body is released for extraction from the body.

5,205,293

METHOD OF MEASURING SURFACE BLOOD FLOW

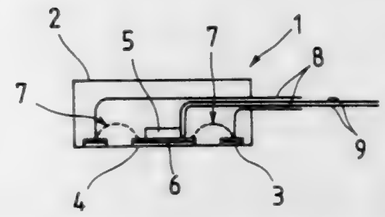
Katsuki Ito, Nagoya; Kaname Ito, Chita; Shoichiro Ikeda, Nagoya, and Koichi Sakurai, 101 Aza Motomachi, Ohaza Terano, Shinkawa-cho, Nishikasugai-gun, Aichi-pref., all of Japan, assignors to Koichi Sakurai, Aichi, Japan

Filed Oct. 30, 1991, Ser. No. 785,036

Int. Cl.[5] B61B *5/026*

U.S. Cl. 128—691 **10 Claims**

1. A method of measuring skin blood flow on a test site using a blood flow meter having
a probe having a heated disc, a heat-sensitive ring plate, and plural thermocouples arranged in series between said disc and said ring plate
the method comprising the steps of
calibrating the probe by means of a bio-simulating model, having similar thermal properties to a test site to produce a thermo-EMF flow curve,



attaching the probe to a test site for generating an electromagnetic force in response to the test site, and
comparing the electromagnetic force of the test site with the thermo-EMF curve produced in the calibrating step to determine the skin blood flow of the test site.

5,205,294

APPARATUS AND METHODOLOGY FOR DIGITAL TELEMETRY OF BIOMEDICAL SIGNALS

Terry E. Flach, Altadena, and William C. McBride, Corona Del Mar, both of Calif., assignors to Pacific Communications, Inc., Santa Ana, Calif.

Filed Feb. 19, 1991, Ser. No. 656,704

Int. Cl.[5] A61B *5/0402*

U.S. Cl. 128—696 **11 Claims**

1. An improvement in a biomedical apparatus for monitoring biopotentials derived from a patient comprising:
instrumentation means for detecting said biopotentials from said patient and for processing an analog signal at said patient corresponding thereto;
analog-to-digital conversion means for converting said analog signals corresponding to said biopotential signals to digital format at the situs of said patient; and
transmitter means for telemetering digital signals corresponding to said digitized biopotential signals generated by said analog-to-digital conversion means, said transmitter means being a tunable frequency modulated radio transmitter,
wherein said digital signals have a pattern characterized by a DC data bias and wherein said tunable frequency modulated radio transmitter comprises:
an averaging means for averaging said pattern of said digital signals to generate a DC value signal of said pattern;
first voltage controlled crystal oscillator means having its control input coupled to said averaging means, said first voltage controlled crystal oscillator means for generating a variable reference frequency dependent upon said DC value signal of said pattern of said digital signals;
a phase detector having its input coupled to an output of said first voltage controlled crystal oscillator means;
a loop filter having an input coupled to an output of said phase detector;
a second voltage controlled oscillator means having a control input coupled to an output of said loop filter, an output of said second voltage control oscillator generating

upon, said matrix being adapted to make contact with the

lower portion adapted to engage with the internal threads

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an output frequency of said phase-lock-loop circuit within said tunable frequency modulated radio transmitter;

divider means for feeding back said output frequency to said phase detector divided by a predetermined integer; and

wherein said digital signals is also coupled into said input of said second voltage controlled oscillator means so that said output frequency of said second voltage controlled oscillator means is frequency modulated by said digital signals and so that said DC data bias is compensated by said DC value signal corresponding to an average DC value of said pattern of said digital data,

whereby biomedical information is directly telemetered from a patient in digital format.

5,205,295

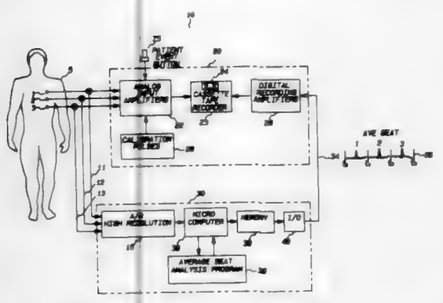
METHOD AND APPARATUS FOR HOLTER RECORDER WITH HIGH RESOLUTION SIGNAL AVERAGING CAPABILITY FOR LATE POTENTIAL ANALYSIS

Bruce Del Mar, Laguna Beach, and Isaac R. Cherry, Mission Viejo, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Continuation-in-part of Ser. No. 710,377, Jun. 3, 1991, abandoned. This application Aug. 18, 1992, Ser. No. 932,907

Int. Cl.[5] A61B *5/0436*

U.S. Cl. 128—711 **27 Claims**



1. A long term ambulatory (Holter) based electrocardiographic (ECG) system for recording and analyzing bioelectric signals of the human heart comprising:

electrode means, consisting of a plurality of electrocardiographic (ECG) electrodes adapted for placement on a human patient, for detecting bioelectric signals of the human heart and generating, therefrom, an analog signal;

recorder means electrically connected to said plurality of electrodes for making a real time recording of bioelectric signals detected by said electrodes, said recorder means having a plurality of data channels such that there is at least one data channel for each of said ECG electrodes;

storage means contained within said recorder means;

digitizing means contained within said recorder for converting said analog signals into a series of digital signals representative of bioelectric signals of the human heat;

analysis means contained within said recorder means for taking a sample form said series of digital signals and computing, therefrom, a signal average for each of said ECG data channels.

5,205,296

UTERINE CONTRACTION DETECTION

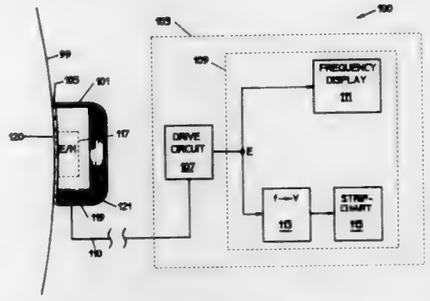
John N. Dukes, Los Altos Hills, and Alan P. Greenstein, Menlo Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 607,217, Oct. 30, 1990. This application May 19, 1992, Ser. No. 885,579

The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.

Int. Cl.[5] A61B *5/11*

U.S. Cl. 128—775 **7 Claims**



1. A system for detecting contractions in and adapted for coupling to a human body, said body having a variable mechanical impedance which changes with contractions, said system comprising:

a transducer including a relatively rigid interface having a first side for contacting the body and a second side disposed away from the body;

vibrating means being arranged for converting drive signals into vibrations and being connected to said second side of the transducer so that vibrations can be mechanically coupled by said relatively rigid interface into said body, said vibrations having a frequency which varies with the mechanical impedance of said body;

a drive circuit coupled to said vibrating means for providing a drive signal thereto; and

monitor means coupled to said drive circuit and said vibration means for detecting contractions.

5,205,297

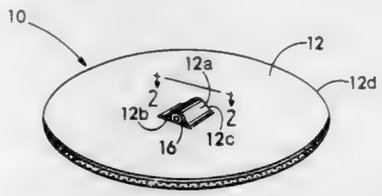
MULTIPURPOSE MEDICAL STIMULATION ELECTRODE

David A. Montecalvo, Eden Prairie, and David Rolf, Minneapolis, both of Minn., assignors to LecTec Corporation, Minnetonka, Minn.

Continuation-in-part of Ser. No. 173,589, Mar. 25, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 344,698

Int. Cl.[5] A61N *1/18*

U.S. Cl. 128—798 **12 Claims**



1. A multipurpose medical stimulating electrode comprising, an electrically conductive backing having a resistivity on the order of about 1 to 1,000 ohm/square and an electrically conductive self-supporting hydrogel matrix coated thereupon, said matrix being adapted to make contact with the skin of a patient and being sufficiently flexible to conform to the contours of the body, said matrix comprising, a hydrophilic polymer, water in an amount of about 10% to 70% of the matrix and a humectant and said matrix

a) being substantially free of acid or of a salt of a strong acid,

b) having a resistivity greater than the resistivity of the backing and

c) having a resistivity between about 2,000 and 10,000 ohm-centimeters to thereby reduce current concentration i localized areas and prevent a runaway condition wherein a disproportionate amount of current passes through a localized area of the skin of the patient where electrical resistance has declined for inhibiting the perception of pain by the patient and the matrix has uniformly distributed therein a gelation inhibitor in an amount sufficient to inhibit gelation of the matrix prior to forming the matrix into a coating layer.

5,205,298

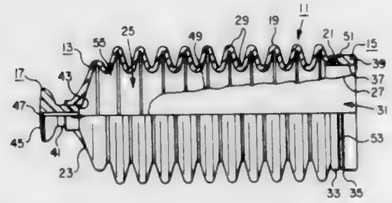
METHOD AND APPARATUS FOR USE IN APPLYING ELASTOMERIC COVERINGS TO BODY

Carroll Hurst, P.O. Box 741, Granbury, Tex. 76048

Filed Nov. 26, 1991, Ser. No. 799,050

Int. Cl.[5] A61F *6/04*

U.S. Cl. 128—844 **13 Claims**



1. An apparatus for use in applying an elastomeric covering to a body member, comprising:

a) a hollow member being formed by a wall and having an interior cavity for receiving said covering;

b) said wall having a first opening that communicates with said interior cavity, said first opening being sized large enough so that said body member can be inserted through said first opening, said wall having a lip that surrounds said first opening, said lip being adapted for receiving and retaining a portion of said covering;

c) said interior cavity having a volume, said wall being expandable and contractible so as to change the volume of said interior cavity, said wall having means automatically and resiliently for returning said wall to a relaxed condition from an expanded or contracted condition;

d) said wall having a second opening that is separate and apart from said first opening, said second opening communicating with said interior cavity, said second opening being capable of being opened and closed.

5,205,299

ASHTRAY

Ken W. Chen, 349, Ta-Wu Street, Tai-Nan City, Taiwan

Filed Apr. 17, 1992, Ser. No. 870,256

Int. Cl.[5] A24F *19/00, 19/06*

U.S. Cl. 131—241 **1 Claim**

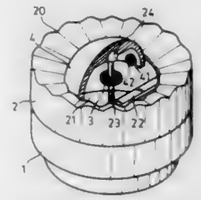
1. An ashtray comprising:

a base formed with a cavity at a central portion and internal threads at an upper portion;

an upper annular member provided with a center hole, a plurality of recesses extending radially and slantwise towards the center hole thereof, and external threads on a lower portion adapted to engage with the internal threads of said base;

a support mounted across a diameter of bottom of said upper annular member;

an axle arranged on the center of said support with a ball member on a top end and a flange below said ball member;



a permanent magnet mounted on the flange of said axle;

a cover having a recess adapted to receive said ball member and a plurality of seats on an inner surface; and

a plurality of elements made of ferrous metal embedded into the seats of said cover.

5,205,300

METHOD FOR DETERMINING EFFECTIVENESS OF RELAXER TREATMENT

Geoffrey R. Hawkins; Clyde B. Simpson, Jr., both of Jacksonville, Fla., and Gustave J. Klein, Great Neck, N.Y., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Filed Jun. 9, 1992, Ser. No. 896,525

Int. Cl.[5] A61K *7/06*

U.S. Cl. 132—202 **12 Claims**

1. A method for determining the effectiveness of a hair relaxer treatment comprising the steps of:

a) Cutting a representative sample of hair from a subject's head prior to relaxer treatment,

b) Gently stretching the hair until straight and cutting a sample of a predetermined length,

c) allowing the hair sample of (b) to contract to its natural configuration and measuring the length,

d) treating the subject's hair with relaxer,

e) cutting a representative sample of hair from the subject's head after relaxer treatment,

f) gently stretching the hair until straight and cutting a sample of the same predetermined length as in (b),

g) allowing the hair sample of (f) to contract to its natural configuration and measuring the length,

h) determining the percent relaxation according to the formula:

$$\% \text{ relaxation} = 100 \times \frac{(\text{length of hair after relaxation } (g)) - (\text{length of hair before relaxation } (b))}{(\text{length of hair } (b))}$$

5,205,301

APPLICATOR FOR MAKEUP USE

Kenji Nakamura, Osaka, Japan, assignor to Kennak U.S.A. Inc., New York, N.Y.

Filed May 9, 1990, Ser. No. 521,153

Claims priority, application Japan, Mar. 16, 1990, 2-66033

Int. Cl.[5] A45D *40/26*

U.S. Cl. 132—320 **10 Claims**

1. An applicator for makeup use, wherein an applying portion and at least a front portion of a handle portion are made of a bundle of fibers, and wherein:

said bundle of fibers comprises a sheath portion and a core portion, said core portion being made of a bundle of fibers comprising a plurality of straight fibers, and said sheath portion being made of thermoplastic fibers, which have

crimps therein and partially adhere to each other, and

in the cleaning tank and a second liquid seal divider ex-

having a first end extending into the chamber and a second end extending exteriorly of the door; and

supportable ring of tubing to conduct a cleaning liquid therein around its periphery, said ring being flat and lying between

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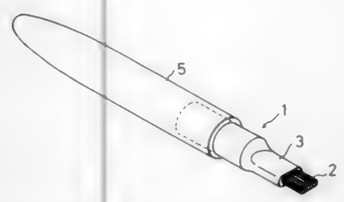
crimps therein and partially adhere to each other, and wrapped about said core portion;

said applying portion of said applicator is made of said straight fibers of said core portion and has a base portion adjacent to said sheath portion;



said handle portion is made of said fibers of said core portion and said fibers of said sheath portion; and

said fibers of said sheath portion are thermoformed at said handle portion located near said base portion of said applying portion.

5,205,302

SOFT BRUSH GUM STIMULATOR

J. Robert Lemon, Charlotte; William T. Evans, and Robert E. Christian, both of Batesville, all of Ark., assignors to Professional Dental Technologies, Inc., Batesville, Ark.

Division of Ser. No. 585,479, Sep. 19, 1990, Pat. No. 5,109,563.
This application Mar. 19, 1992, Ser. No. 854,329
Int. Cl.[5] A61C *15/00;* **A61H** *7/00;* **A46B** *9/04*
U.S. Cl. 132—321 **6 Claims**

1. A gum stimulator and toothbrush comprising a handle, a removable non-rotational brush disposed on the handle, the brush having a thin flat bottom plate and having a high density of soft fibers for gum stimulation, extending upwardly from the bottom plate and being unsupported around the sides thereof, and means for attaching the brush to the handle, the attachment means comprising an immovable shaft permanently embedded in either one of the handle or brush and a shaped mating receptacle formed in the other of the brush or handle for accepting the shaft therein with a socket fit, the handle having an end including a plurality of brush tufts extending upwardly therefrom to form a toothbrush, the handle having a planar gripping portion adjacence the toothbrush end, and the gum stimulating brush disposed at the end of the griping portion opposite the toothbrush end.

5,205,303

LIQUID CLEANING PROCESS AND APPARATUS FOR CIRCUIT BOARDS AND THE LIKE

John Gileta, Chateauguay, Canada, assignor to Electrovert Ltd., La Prairie, Canada

Filed Dec. 6, 1990, Ser. No. 624,199
Int. Cl.[5] B08B *15/00*
U.S. Cl. 134—73 **10 Claims**

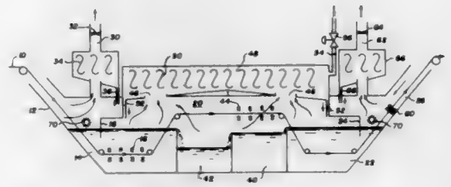
1. A closed system liquid cleaning apparatus for cleaning workpieces on a conveyor comprising:

a cleaning tank at the system entrance for containing a liquid cleaning agent,

a water tank at the system exit for holding water,

an enclosure means isolated from the atmosphere extending between a first liquid seal divider extending into the liquid in the cleaning tank and a second liquid seal divider extending into the water in the water tank,

a conveyor means adapted to carry work pieces thereon into and through the cleaning liquid in the cleaning tank and under the first liquid seal divider into and through the free space in the isolated enclosure means in which the cleaning liquid on the work pieces vaporizes and out of the isolated enclosure means into and through the water in the water tank and under the second liquid seal divider and out of the water tank,



means for supplying an inert gas purge to the isolated enclosure means, and

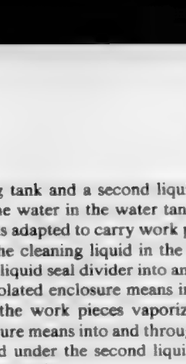
condenser means communicating with the interior of said isolated enclosure means and the portion of said cleaning tank and said water tank between said first and second liquid seal means and adapted to condense the cleaning liquid and water vapors within the isolated enclosure means and recirculate the condensate to the cleaning tank and the water tank.

5,205,304

RINSE AID DISPENSER

Randall L. Cooper, and Thomas M. Johnson, both of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Jan. 16, 1992, Ser. No. 821,076
Int. Cl.[5] A47L *15/44*
U.S. Cl. 134—99.2 **19 Claims**



1. An adjustable rinse additive dispenser for a dishwasher having a washing compartment and a door to provide access to the washing compartment, the door being pivotal between a horizontal open position and a vertical closed position, the dispenser comprising:

an additive reservoir mounted on the door;

a chamber formed in the reservoir for receiving rinse additive from the reservoir and having an opening communicating with the washing compartment;

release means for releasing rinse additive from the reservoir to the chamber;

a knob assembly adjustably mounted in the reservoir and having a first end extending into the chamber and a second end extending exteriorly of the door; and

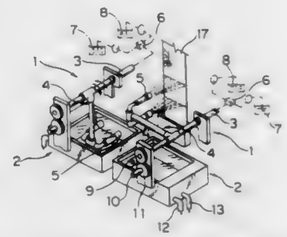
a leak path in the knob assembly providing communication between the chamber and the washing compartment, the leak path being selectively positioned by turning the knob assembly such that a varying amount of rinse additive can be dispensed from the chamber into the washing compartment.

5,205,305

COLOR CHANGING SYSTEM FOR SPRAY DYEING

Yoshimichi Yamakita, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 775,089
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—104.1 **1 Claim**



1. A color changing system for spray dyeing; comprising:

(a) at least a washing tub filled with a washing liquid;

(b) a source of dye liquid;

(c) a source of washing liquid; and

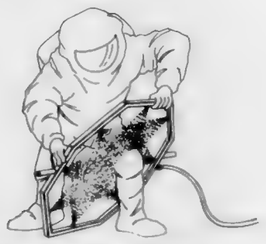
(d) at least a pair of spraying units, each spraying unit including a feed pipe, a movable pipe and at least a nozzle, said feed pipe having valve means for selectively switching between the source of dye liquid and the source of washing liquid, said movable pipe being connected to an end of said feed pipe, and said nozzle being connected to said movable pipe, means for rotating said movable pipe to move said nozzle between a spraying position and a washing position immersed in the washing liquid of said washing tub, and valve means for supplying said nozzle with dye liquid via said feed pipe when in said spray position and for supplying said nozzle with washing liquid via said feed pipe when in said washing position.

5,205,306

SPRAYING EQUIPMENT FOR REMOVING HAZARDOUS MATERIALS FROM OBJECTS

Mark D. Peterson, 1430 Cannell, Grand Junction, Colo. 81501

Filed Aug. 16, 1990, Ser. No. 568,210
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—104.2 **38 Claims**



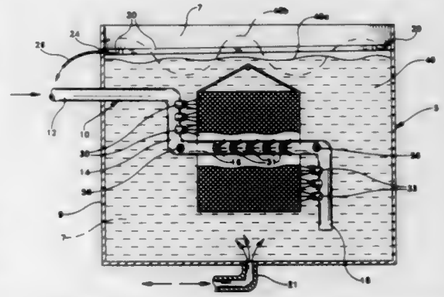
1. A flat spray ring device for removing hazardous materials including toxic, caustic or flammable materials from an exterior surface of an object or of a person comprising a manually supportable ring of tubing to conduct a cleaning liquid therein around its periphery, said ring being flat and lying between two parallel planes defined by opposite surfaces of the ring which define its thickness, said tubing having a surface facing radially inwardly generally toward the center of the ring, said ring device having only several holes and only several nozzles for discharge of cleaning liquid, said nozzles being attached to said tubing at said holes and located on and spaced around said surface and being inwardly oriented to direct their discharge in spray patterns toward the center of the ring, each nozzle having a centerline of its spray discharge pattern pointing essentially at a point centrally of the ring which is between said two planes, the spray patterns of the several nozzles being flat fan-patterned generally in the plane of the ring and providing a low rate of flow in a concentrated flat essentially peripherally continuous spray pattern on the surface of said object or person for impingement of cleaning liquid at all outwardly exposed surfaces of said object or person between said two planes, liquid connection means extending outwardly from the ring generally in the plane thereof for connecting a liquid supply hose to the ring, said device including means for manually supporting it during a cleaning operation, the maximum thickness of said device being essentially the same as the thickness of said ring tubing, the inside of the ring being large enough to encircle and enable spraying of the outer cylindrical surface of a standard fifty-five gallon drum, whereby the effluent cleaning liquid containing removed hazardous material is kept to a low quantity.

5,205,307

SYSTEM FOR CLEANING CONTAMINANTS FROM PARTS

Robert P. Di Stefano, New Rochelle; Richard E. Knipe, Jr., Monsey, both of N.Y., and Sheldon R. Green, Thomaston, Conn., assignors to American Polychemical Manufacturing Corp., Spring Valley, N.Y.

Filed Feb. 28, 1992, Ser. No. 843,314
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—104.4 **11 Claims**



1. A system for cleaning contaminants from unclean parts comprising:

a wash tank adapted to be filled with hot aqueous solution up to a fill level, for cleaning contaminated articles, the tank having a rear wall, opposite side walls and a front wall;

a manifold with spray nozzles secured in the wash tank below the fill level and near the rear wall, for spraying aqueous solution toward the front wall and for agitating the aqueous solution in the wash tank;

retainer means engaged with the front wall of the wash tank and the manifold, for retaining the manifold in the tank near the rear wall of the tank;

a trough arranged in the wash tank near the fill level and above the manifold for collecting a waste mixture of contaminated particles and agitated aqueous solution from near the fill level;

a waste discharge for discharging the waste mixture col-

space for holding a quantity of oil and water to allow a separate oil layer to accumulate above a volume of water

and the second arm of the two holding the first arm in the valve closed holding condition;

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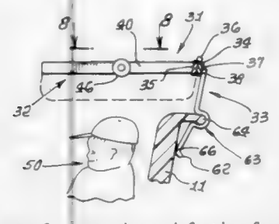
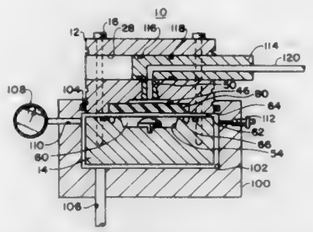
a waste discharge for discharging the waste mixture collected on the trough from the wash tank;
a separator for receiving the waste mixture from the waste discharge and for separating contaminated particles from aqueous solution discharged from the wash tank; and
means for returning the separated aqueous solution from the separator to the manifold.

5,205,308
PROTECTION APPARATUS FOR INFANTS
Gloria B. Kendall, 15727 Elmbrook, La Mirada, Calif. 90638, and Henry M. Hernandez, 13267 Sonrisa Dr., Chino Hills, Calif. 91709
Filed Sep. 3, 1991, Ser. No. 754,006
Int. Cl.[5] E04H *15/04*
U.S. Cl. 135—90 **13 Claims**



1. In apparatus for protecting an infant in a forwardly facing infant's seat, in a vehicle, from direct exposure to sun rays, the combination comprising:
a) a generally horizontally forwardly extending frame having multiple frame sections, with pivot means connecting adjacent sections, so that the sections extend above the infant's seat,
b) a foldable canopy carried by the frame to extend protectively above said seat, and to be folded as the frame sections are relatively pivoted,
c) and support means connected with the frame and extending generally downwardly to in turn be supported rearwardly of the infant's seat,
d) said frame including a first section pivotally carried by the support means, and a first stop shoulder on the support means to limit downward pivoting of the frame relative to the support means at a position in which said first section extends generally horizontally,
e) said frame including a second section pivotally carried by the first section, and a second stop shoulder on the first section to limit downward pivoting of the second section relative to the first section at a position in which the second section extends generally horizontally,
f) the second frame section having an alternate position swung upwardly and rearwardly of the first section,
g) the first frame section having an alternate position swung upwardly and rearwardly of the support means, at which time the second section extends beneath the first section,
h) said support means including a support which extends generally downwardly from a rearward portion of said frame, said support having a channel-shaped connecting portion projecting rearwardly to forwardly interfit with structure at the rear of the infant's seat, and below said first frame section in its alternate rearwardly swung position.

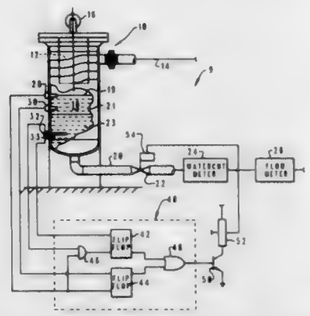
5,205,309
ADJUSTABLE PRESSURE CONTROL DEVICE FOR HYDRAULIC BRAKE SYSTEMS
Richard A. Cardenas, 12610 Jupiter Rd., Dallas, Tex. 75238, and Mark C. Lipski, 6900 Skillman #104, Dallas, Tex. 75231
Division of Ser. No. 521,849, May 7, 1990, Pat. No. 5,161,864.
This application Nov. 3, 1992, Ser. No. 970,770
Int. Cl.[5] F16L *55/04*
U.S. Cl. 137—1 **3 Claims**



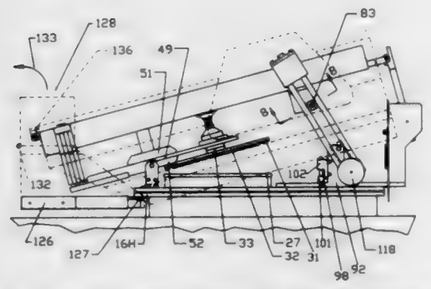
1. A method of adding an inert gas to a control chamber of an adjustable pressure control device for a hydraulic brake system having a housing with a brake fluid port and a cavity for receiving a diaphragm, a resilient diaphragm mounted in said cavity, fluid passage means in said housing for connecting said fluid port to said cavity to enable brake fluid to pass to one side of said diaphragm, a cap adapted to be affixed to said body by a plurality of fasteners such that it overlies the opposite side of said diaphragm, a control chamber formed in said cap which opens to the opposite side of said diaphragm and adapted to receive a control element, a removable control element mounted in said chamber and in contact with said opposite side of said diaphragm wherein said control element cooperates with said resilient diaphragm to control the volume of the diaphragm which enters into said control chamber and the rate at which the diaphragm collapses into said control chamber around said control element and seal means at the interface of said housing and said cap to seal said control chamber comprising the steps of;
loosening said fasteners such that a narrow opening exists between said housing and said cap;
mounting said cap and a portion of said housing in a bore formed in a base tool having an inert gas port and a bleed port such that said housing sealingly engages the wall of said base tool bore and the interface of said housing and said cap is beneath said bore seal;
opening said bleed port in said base tool;
providing a source of inert gas to said inert gas port to enable inert gas to flow into the opening at the interface of said housing and said cap to thereby fill said control chamber with inert gas;
closing said bleed port after said control chamber has been filled with inert gas and said gas flows from said bleed port;
tightening said fasteners to secure said cap to said housing such that said control chamber is sealed;

5,205,310
SYSTEM AND METHOD FOR FLOW CONTROL FOR HIGH WATERCUT OIL PRODUCTION
Miroslav M. Kolpak, Plano, and William D. Hetherington, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Sep. 12, 1991, Ser. No. 758,659
Int. Cl.[5] B01D *17/025*
U.S. Cl. 137—2 **20 Claims**

18. A method for measuring net oil production from a source of a mixture of oil and water comprising:
providing a vessel including a conduit for admitting an oil-water mixture to said vessel, said vessel including a space for holding a quantity of oil and water to allow a separate oil layer to accumulate above a volume of water in said vessel, a discharge conduit for discharging liquid from said vessel, valve means interposed in said discharge conduit for controlling the flow of liquid from said vessel and control means for controlling the operation of said valve means to discharge liquid from said vessel, said control means including first sensor means for sensing a first liquid level in said vessel, second sensor means for sensing a second liquid level in said vessel below said first sensor means, oil detector means for sensing said oil layer and third sensor means for sensing a third liquid level below said second sensor means;
causing said valve means to discharge liquid from said vessel if the liquid level increases in said vessel to the level of said first sensor means; and
causing said valve means to close at a selected one of a condition wherein said liquid level decreases to a level sensed by said second sensor means and said liquid level decreases to a level sensed by said third sensor means if said oil detector means senses said oil layer prior to the liquid level decreasing to the level sensed by said second sensor means.

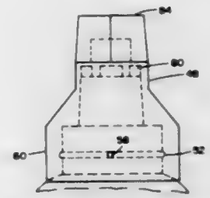


5,205,311
COMPOUND LEVER CONTROLLED SPILL VALVE
Larry C. Wilkins, New Albany, Ind., assignor to Electromechanical Research Laboratories, Inc., New Albany, Ind.
Filed Mar. 6, 1992, Ser. No. 846,855
Int. Cl.[5] F16K *17/12*
U.S. Cl. 137—14 **16 Claims**



13. A method of holding pressure in a tank but relieving the pressure upon attainment of a predetermined maximum pressure in the tank and comprising the steps of:
maintaining tank closure by at least two cooperating arms, the first arm of the two holding a valve closed on the tank, and the second arm of the two holding the first arm in the valve closed holding condition;
placing the arms in a compound lever arrangement with loading points and pivot points arranged to multiply the force applied by the second arm to the first arm to produce the force applied by the first arm to the valve and thereby holding the valve closed with a much larger force than the force applied by the second arm to the first arm; and
using movement of the valve from closed condition upon attainment of the predetermined pressure to reduce the closing force on the valve.

5,205,312
FIRE HYDRANT LOCKING ARRANGEMENT
James K. Jerman, Northport, and Guido Salvato, Garden City, both of N.Y., assignors to Magna-Loc Valve Corp., Garden City, N.Y.
Filed Jun. 2, 1992, Ser. No. 893,213
Int. Cl.[5] F16K *31/08, 35/16*
U.S. Cl. 137—15 **17 Claims**



9. A method of providing a fire hydrant locking arrangement including an inner cylindrical member having a cavity for receiving a conforming configured upstanding post located on a fire hydrant, said post being fastened to said inner cylindrical member so as to be secured against rotational and axial displacement relative thereto, said post being operatively connected to operative structure of said fire hydrant; and an outer cylindrical member having an axially extending central bore terminating at an end wall, said bore having a peripheral wall surface for receiving said inner cylindrical member in closely spaced relationship and being rotatable relative thereto; at least a portion of said inner cylindrical member being axially movable into said bore so as to selectively couple said inner and outer cylindrical members to enable the operative structure of said fire hydrant to be actuated only by an authorized user comprising:
(a) providing oppositely facing, axially aligned grooves in, respectively, the outer circumferential surface of said inner cylindrical member and in the peripheral surface of the bore in said outer cylindrical member;
(b) and introducing an annularly extending ring into said grooves so as to facilitate relative rotation between said inner and outer cylindrical members and with said ring coupling said members so as to concurrently prevent relative axial displacement therebetween, said ring being constituted from a generally ductile material possessing a substantially lower melting point than the material of each of said cylindrical members whereby application of heat at temperature in excess of the liquidus melting point of the material of said ring to the region of said locking arrangement containing said ring causes said ring to melt and flow out of said grooves and through an annular gap present between said cylindrical members so as to enable an easy axial removal of said outer cylindrical member from said inner cylindrical member.

5,205,313
DISPENSING DEVICES WITH MULTIPLE-WAY TAP

shaped wall opposite said first side for discharging from said expansion chamber said compressed air circulating

valving means having an inlet port connected to the drain

from the tank when the headspace air pressure is too high

5,205,313

DISPENSING DEVICES WITH MULTIPLE-WAY TAP

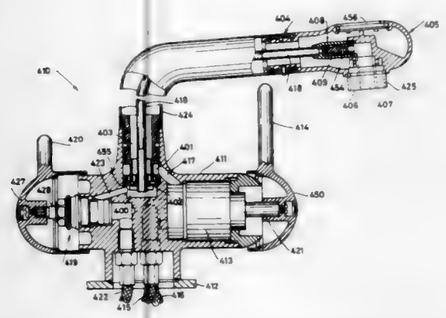
Giovanni Moretti, Recanati, Italy, assignor to Telma Guzzini S.r.l., Montelupone, Italy

Filed Nov. 26, 1991, Ser. No. 797,976

Claims priority, application Italy, Dec. 5, 1990, 22300 A/90; May 31, 1991, MI91 A 001498

Int. Cl.[5] F16K *11/22*

U.S. Cl. 137—112 27 Claims



1. A device for dispensing fluid through at least one delivery outlet, comprising:

at least one first source for at least one first fluid;

at least one second source for at least one second fluid;

first flow control means operable between open and closed positions for controlling flow of said at least one first fluid from said at least one first source to said at least one delivery outlet;

second flow control means operable between open and closed positions for controlling flow of said at least one second fluid from said at least one second source to said at least one delivery outlet;

disenabling means comprising a first chamber for passage of said at least one first fluid between said first flow control means and said at least one delivery outlet, a second chamber for passage of said at least one second fluid between said second flow control means and said at least one delivery outlet; and

flexible diaphragm means between said first and second chambers, so that when said first flow control means is operated to an open position thereof, pressure of said at least one first fluid in said first chamber displaces said flexible diaphragm means into a closed position for inhibiting the flow of said at least one second fluid from said second chamber to said at least one delivery outlet.

5,205,314

AIR COMPRESSOR CONDENSATE REMOVAL SYSTEM

Odis A. Moore, Odessa, Tex., assignor to James A. Kyer, Odessa, Tex.

Filed May 15, 1992, Ser. No. 883,953

Int. Cl.[5] B01D *47/00*

U.S. Cl. 137—203 5 Claims

1. A condensate removal system for removing condensate from an air compressor system having at least one compression chamber stage for discharging compressed air into an air holding tank, said condensate removal system comprising:

an expansion chamber having a cylindrically shaped wall and a top portion at the top end of said cylindrically shaped wall as well as a bottom portion at the bottom end of said cylindrically shaped wall;

an air inlet connected to a first side of said cylindrically shaped wall for allowing compressed air to enter said expansion chamber along with any moisture suspended in the air;

an air outlet connected to a second side of said cylindrically shaped wall opposite said first side for discharging from said expansion chamber said compressed air circulating therein;

a drain outlet located on said bottom portion;

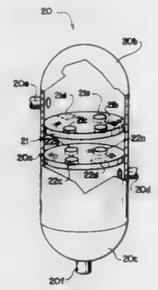
a first black pipe arrangement connected at one end to said air inlet for directing compressed air entering a second end of said first black pipe arrangement to said air inlet; and

a second black pipe arrangement connected at one end to said air outlet for directing air exiting said air outlet to a second end of said second black pipe arrangement;

said expansion chamber comprising:

a top circular baffle plate located therein whose outer perimeter is in contact with said cylindrically shaped wall, wherein said top circular baffle plate is located below said air outlet a first predetermined distance;

a bottom circular baffle plate located therein whose outer perimeter is in contact with said cylindrically shaped wall, wherein said bottom circular baffle plate is located below



said air outlet a second predetermined distance, wherein said second predetermined distance is greater than said first predetermined distance, and wherein said air inlet is located below said air outlet by a third predetermined distance greater than said second predetermined distance;

a first, second, and third circular cutout each located on said top circular baffle plate, wherein each of said first, second, and third circular cutouts are equally spaced from the other two circular cutouts located on said top circular baffle plate; and

a fourth, fifth, and sixth circular cutout located on the bottom circular baffle plate, wherein each of said fourth, fifth and sixth circular cutouts are equally spaced from the other two circular cutouts located on said bottom circular baffle plate,

wherein not one of said fourth, fifth, and sixth circular cutouts are located directly below any of said first, second, and third circular cutouts, and

wherein said top portion and said bottom portion both comprise semi-spherical hollow portions.

5,205,315

AUTOMATIC WET TANK DRAIN VALVE

Wayne R. Margerum, 15 Alden Ave., Delran, N.J. 08075

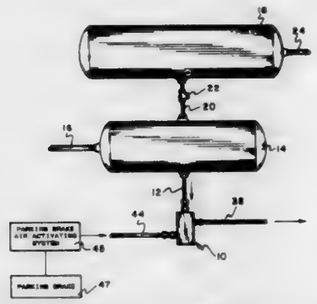
Continuation-in-part of Ser. No. 529,145, May 25, 1990, abandoned, which is a continuation of Ser. No. 331,595, Mar. 30, 1989, Pat. No. 4,928,724. This application Feb. 10, 1992, Ser. No. 833,018

Int. Cl.[5] B01D *5/00*

U.S. Cl. 137—204 2 Claims

1. Apparatus for use in an automotive air pressure system of a vehicle having a parking brake activated by a parking brake air activating system, said air pressure system employing an air pressure tank, a wet tank for accumulating moisture within the system, a drain line and valving for draining the moisture from the wet tank, the improvement providing for automatic draining of the wet tank comprising:

valving means having an inlet port connected to the drain line and an outlet port vented to atmosphere and including a valve body having a valve bore therein, a valve piston movable within the valve bore between an open position wherein there is communication between said inlet and said outlet ports and a closed position wherein there is no communication between said inlet and outlet ports and a spring urging the piston into said closed position; and



an air line connected to the parking brake air activating system of the vehicle to apply air pressure to the piston during vehicle operation, said air pressure to the piston urging said piston into said closed position along with said spring during vehicle operation and urging said piston to said open position whenever the parking brake is engaged.

5,205,316

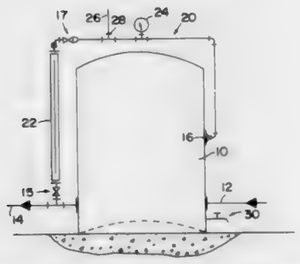
AIR/WATER VOLUME CONTROL SYSTEM

Kearney L. Pruett, P.O. Box 297, Keithville, La. 71047

Continuation-in-part of Ser. No. 789,014, Nov. 7, 1991, abandoned. This application Sep. 8, 1992, Ser. No. 941,532

Int. Cl.[5] F04F *1/00*

U.S. Cl. 137—209 20 Claims



1. Apparatus for controlling the volumes of water and headspace air in a water storage/delivery tank of an individual water well system which includes a pump for maintaining water within said tank and for maintaining the pressure in the tank within preselected limits, said tank having a water outlet pipe proximate to the bottom of said tank and a port located in said tank at an elevation above a normal water level within said tank and providing communication between the exterior of said tank and the headspace within said tank, said apparatus comprising:

a) a piping section extending between said water outlet pipe said port and including an in-line sight glass enabling visual observation of the water level within said tank;

b) an air conduit connected to said piping section for introducing pressurized air into said piping section;

c) an air pressure gauge for ascertaining the air pressure with the headspace in said tank; and

d) an air valve enabling control of the air pressure within the headspace in said tank either by allowing the escape of air from the tank when the headspace air pressure is too high or by allowing pressurized air to be delivered from said air conduit into said tank when the headspace air pressure is too low;

the water level within said tank and the headspace air pressure within said tank being correlated to each other and to the volume of said tank such that adjustment in either (i) the headspace air pressure in said tank or (ii) the water level and the headspace air pressure in said tank is performed only when the ratio between said headspace air pressure and said water level departs by a variance from an optimal ratio between said headspace air pressure and said water level for the volume of said tank.

5,205,317

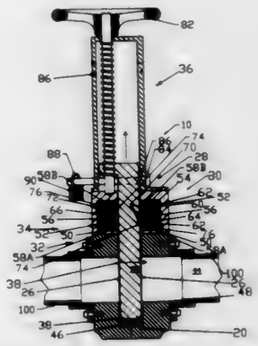
VALVE ASSEMBLY

Duane P. Neuerberg, South Bend, Ind.; Wannis C. Parris, and Keith F. Stelter, both of Niles, Mich., assignors to Delta Industrial Valves, Inc., Niles, Mich.

Continuation-in-part of Ser. No. 758,639, Sep. 12, 1991. This application Mar. 31, 1992, Ser. No. 861,245

Int. Cl.[5] F16K *11/04*; F16J *15/40, 15/48*

U.S. Cl. 137—242 5 Claims



1. A valve having a housing and a generally flat gate movable therein between open and closed positions, a transverse seal including a generally U-shaped casing having a bottom member and two oppositely disposed leg members, said bottom member and leg members generally defining a cavity therebetween, packing material disposed generally within said cavity supporting said casing and providing pressure against said casing in the direction of said gate when said gate is in said open and closed positions, each leg member including a foot extending generally longitudinally outward of said cavity from the terminal end of said leg, and a scraper blade in contact with said gate and fitted restrictively between said housing and one of said leg members of the casing in overlying abutting contact with the foot of said one leg member, said last mentioned foot constituting means for biasing said contacting scraper blade into contact with said gate when in its said open and closed positions, said last mentioned foot including a bevel therein, said packing material within said cavity positioned behind said bevel and constituting means for pushing outwardly on said casing and said last mentioned foot thereof to urge said casing and said scraper blade outwardly for maintaining a more effective seal and scraping contact with said gate.

5,205,318

5,205,319

5,205,320

FLOW RATE CONTROL UNIT

conduit through which fluid can flow in a forward direction and a reverse direction comprising:

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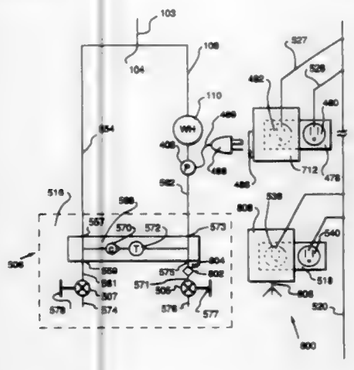
5,205,318
RECIRCULATION HOT WATER SYSTEM

Donald J. Massaro, Atherton, and Herbert E. Thompson, Los Gatos, both of Calif., assignors to Sjoberg Industries, Inc., Mountain View, Calif.

Filed Jul. 21, 1992, Ser. No. 917,509
Int. Cl.[5] F16K *49/00*
U.S. Cl. 137—337 5 Claims

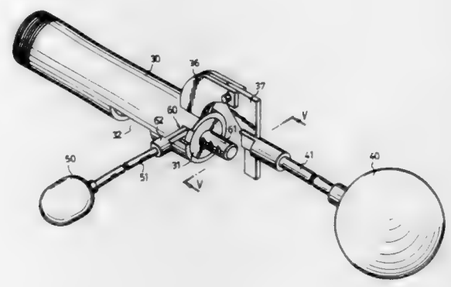


1. A system for delivering, to a demand site located in a home, a quantity of potable water, at an ambient temperature and at an elevated temperature, comprising:
a main potable water delivery path for generally directing said potable water;
a closeable bifurcated flow path communicatively coupled to said main delivery path and for directing said water to said demand sites, said bifurcated path including a first flow path for directing said potable water generally at said elevated temperature, and a second flow path for directing said potable water generally at said ambient temperature;
heater means installed in said first flow path, for heating said potable water to said elevated temperature;
a manifold including a temperature responsive valve, a first inlet, a second inlet, a first outlet, and a second outlet, wherein said first inlet connection is communicatively coupled to said first flow path and said second inlet connection is communicatively coupled to said second flow path, and said manifold is internally ported so as to communicatively couple said first flow path to said second flow path, wherein said temperature responsive valve is responsive to a temperature of said water flowing in said first flow path and is operative to permit said water to flow from said first flow path, through said manifold, and into said second flow path if said temperature is below a predetermined temperature level:
pump means inserted in said first flow path between said heater means and said manifold, for pumping said water at said elevated temperature through said first flow path:
faucet means communicatively coupled to said first outlet and said second outlet, for delivering said water to said demand site;
actuation means for selectively energizing said pump means to cause water to flow;
whereby if said pump means is energized and if said water flowing in said first flow path is below said predetermined temperature level, then said pump means causes said water to flow from said first flow path, through said manifold, into said second flow path until said actuation means de-energizes said pump or said water flowing in said first flow path is at or above said predetermined temperature level.

5,205,319
FLOAT-OPERATED VALVE ASSEMBLY

Wen-Chun Chiang, No. 47, Lane 142, Tzu-Chiang I Rd., Chien-Chin Dist., Kaohsiung City, Taiwan

Filed Mar. 9, 1992, Ser. No. 848,445
Int. Cl.[5] F16K *31/28*
U.S. Cl. 137—423 7 Claims

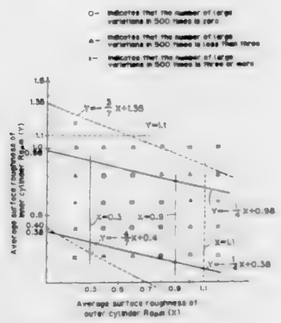


1. A float-operated valve assembly for a water tank, comprising:
a valve housing to be provided inside said water tank and being formed as an elongated pipe member having a first end to be connected to an external water source, a second end sealingly closed by a cover plate, an outlet opening formed at an intermediate portion of said valve housing, and a partition plate provided inside said valve housing between said first end and said outlet opening and being formed with an inlet opening;
a float ball assembly including: a pivot arm pivotably secured to said valve housing and having a downwardly extending part disposed adjacent to said cover plate; a first float arm having one end secured to said downwardly extending part of said pivot arm; and a primary float ball mounted on the other end of said first float arm and having an appropriate weight; and
an arresting mechanism including: a ratchet pole extending into said valve housing and having an end portion which extends through said cover plate adjacent to said downwardly extending part of said pivot arm, said end portion being formed with aligned ratchet teeth, said ratchet pole having one section which extends between said partition plate and said second end of said valve housing and which is provided with a stopper means that is urged by water from the external water source so as to block said inlet opening, said primary float ball urging said downwardly extending part of said pivot arm to apply a pushing force on said end portion of said ratchet pole so as to move said stopper means away from said inlet opening when water inside said water tank no longer applies a buoyant force on said primary float ball; and a separate float-controlled pawl means adapted to engage said ratchet teeth of said ratchet pole when water inside said water tank is below a predetermined level so as to arrest untimely movement of said stopper means toward said inlet opening when said water tank is being refilled, said pawl means disengaging said ratchet teeth of said ratchet pole only when water inside said water tank is at least equal to the predetermined level so as to activate said float-controlled pawl means and permitting water from the external water source to urge said stopper means to block said inlet opening when said water tank has been refilled.

5,205,320
FLOW RATE CONTROL UNIT

Noboru Nishimura, Shiga, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Jul. 17, 1991, Ser. No. 731,814
Int. Cl.[5] F16K *17/32, 27/00*
U.S. Cl. 137—504 9 Claims

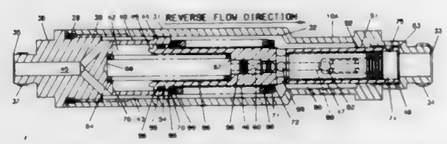


1. A flow rate control unit comprising:
a fluid inlet;
a fluid outlet;
a ceramic outer cylinder defining a plurality of fluid passing holes coupled to the fluid outlet;
a ceramic inner cylinder defining a fluid inflow hole therein coupled to the fluid inlet; and
an elastic member resiliently coupled to said inner cylinder;
said inner cylinder being movable inside said outer cylinder depending on the pressure difference between an interior and an exterior of said inner cylinder for changing the opening area of said fluid passing holes thereby maintaining the flow rate of a liquid discharged from said fluid inlet to said fluid outlet constant, said outer cylinder having an inner circumferential surface and said inner cylinder having an outer circumferential surface spaced a distance from said inner circumferential surface, wherein the relationship between an average surface roughness Raμm=X of the inner circumferential surface of said outer cylinder and an average surface roughness Raμm=Y of the outer circumferential surface of said inner cylinder satisfies the formula $-4/7\,X+0.4 \leqq Y \leqq -3/7\,X+1.35$
where $X \leqq 1.1$ and $Y \leqq 1.1$.

5,205,321
TWO-WAY HYDRAULIC VALVE WITH ONE WAY TIME DELAY

George Earl Maroney, Clarkston; Larry P. Bennett, Franklin; Mark B. Chamberlin, Royal Oak, and Fred L. Stark, Clarkston, all of Mich., assignors to M. C. Aerospace Corporation, Lake Orion, Mich.

Filed Nov. 21, 1991, Ser. No. 795,539
Int. Cl.[5] F16K *17/18*
U.S. Cl. 137—493.3 20 Claims

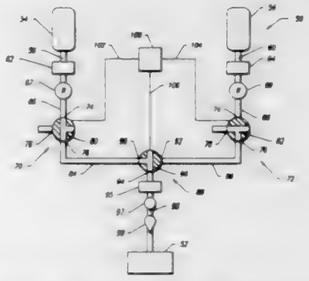


1. A two-way hydraulic valve adapted to be installed in a conduit through which fluid can flow in a forward direction and a reverse direction comprising:
a valve body having opposite front and rear ends each provided with a conduit connector;
forward and reverse flow passage means extending between said opposite ends for permitting fluid flow through said valve body from said front to rear ends and from said rear to front ends in said forward and reverse directions respectively;
check valve means in said reverse flow passage means for preventing fluid flow therethrough in said forward direction;
spool means moveable in said valve body between a closed forward flow position and an open forward flow position for controlling fluid flow through said forward flow passage means, spool biasing means for normally urging said spool means to said closed forward flow position, said spool means being moveable to said open forward flow position in response to fluid pressure acting in said forward direction against said spool means; and
hydraulic damping means for restricting the rate of movement of said spool means to said open forward flow position whereby the opening of said forward flow passage means is delayed when fluid pressure is applied to said valve in said forward direction.

5,205,322
METHOD AND APPARATUS FOR FLOW CONTROL FOR SENSOR CALIBRATION

Ed Merick, Stow, Mass., and Al Signorelli, Encinitas, Calif., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.

Filed Jun. 17, 1992, Ser. No. 900,010
Int. Cl.[5] F16K *11/24*
U.S. Cl. 137—597 13 Claims



9. An improved gas flow control apparatus for use with a tonometer for calibration of biomedical sensors, said gas flow control apparatus including first and second gas supply means for supplying first and second gas compositions under pressure to said tonometer, first and second flow communication means for providing gas flow communication between said first and second gas supply means, respectively, and said tonometer, and control means for controlling the operation of said first and second flow communication means, said improved gas flow apparatus comprising:
common selector valve means connected for gas communication between said first and second valve means and said tonometer for selecting gas flow from one of said first and second valve means and deselecting gas flow from the other of said first and second valve means to said tonometer, said control means being connected to said common selector valve means for controlling the operation of said common selector valve means; and
first and second respective valve means in said first and second flow communication means for controlling gas flow through said flow communication means, said first and second valve means comprising selector valves which select between gas flow of a supplied gas from one of said

first and second gas supply means to said common selector

opening means, second opening means through said first mem-

respectively, such that a fluid-tight seal is formed therebetween;

impacts said entire forward face of said moveable mem-

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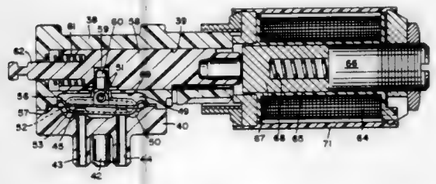
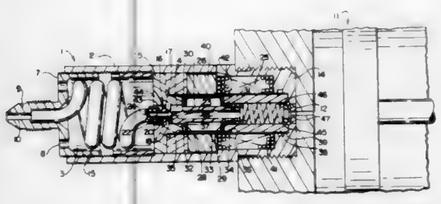
first and second gas supply means to said common selector valve means in a first position, and venting to an output having a reduced pressure relative to said pressure of said gas supply means in a second position.

5,205,323
VALVE AND OPERATOR THEREFOR
Joseph W. Baker, Sommerville, N.J., assignor to Automatic Switch Company, Florham Park, N.J.
Filed Mar. 18, 1992, Ser. No. 854,879
Int. Cl.[5] F16K *11/052, 31/10*
U.S. Cl. 137—625.44 10 Claims



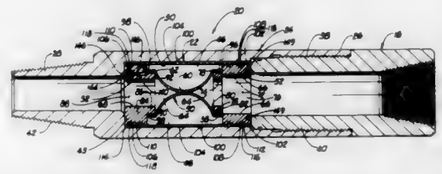
1. A valve including a valve member having two different stable positions, the valve including two ports, each surrounded by a valve seat, the valve member engaging one of the valve seats when in one of its stable positions, and the valve member engaging the other valve seat when in the other of its stable positions, and a valve operator for shifting the valve member between its two stable positions and holding the valve member in those positions, the valve operator comprising:
a shuttle moveable between two extreme positions corresponding to the two stable positions, respectively, of the valve member,
means for transmitting movement of the shuttle to the valve member,
a first spring for urging the shuttle toward one of its extreme positions,
a second spring, stronger than the first spring, for urging the shuttle toward its other extreme position, and
means for selectively rendering the second spring ineffective with respect to the shuttle,
whereby, when the second spring is ineffective the first spring causes the valve member to assume one of its stable positions, and when the second spring is not ineffective the second spring causes the valve member to assume the other of its stable positions.

5,205,324
CLOSED CENTER VALVES
Robert M. Salemka, Portage, Mich., assignor to Pneumo Abex Corporation, Hampton, N.H.
Filed Nov. 19, 1991, Ser. No. 794,025
Int. Cl.[5] F15B *13/044*
U.S. Cl. 137—627.5 30 Claims



1. A closed center valve comprising a housing containing first opening means for venting fluid through said valve, a first member movable toward and away from said first opening means for respectively closing and opening said first opening means, means for biasing said first member toward said first opening means, second opening means through said first member for directing high pressure fluid through said valve, and a second member movable away from said first member to open said second opening means while said first opening means remains closed by said first member, said second member also being movable toward said first member to close said second opening means while said first opening means remains closed by said first member, and being further movable toward said first member to cause said first member to move away from said first opening means to open said first opening means while said second opening means remains closed by said second member.

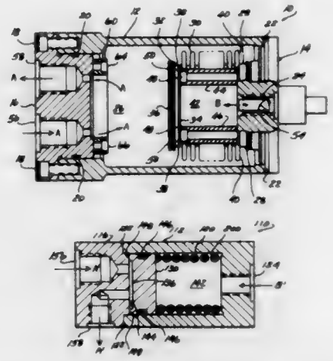
5,205,325
FLOW CONTROL VALVE
Britton F. Piper, Edmond, Okla., assignor to Piper Oilfield Products, Inc., Oklahoma City, Okla.
Filed Nov. 12, 1991, Ser. No. 791,069
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—844 19 Claims



1. A pressurized flow control valve assembly connectable to a rotatable drill string and adapted to prevent drainage of fluid from a stand pipe and rotary hose of a drilling rig when fluid flow through the drill string is interrupted, the pressurized flow control valve assembly comprising:
a tubular body member having a first end portion, and opposed second end portion and a fluid flow passage extensive therethrough;
flow control valve means supported within the fluid flow passage of the tubular body member for controlling fluid flow therethrough, the flow control valve means having an annular pressure cavity such that the flow control valve means selectively opens and closes the fluid flow passage in response to pressure differential between the annular pressure cavity and the fluid flow passage, the flow control valve means comprising:
a collapsible sleeve having a first end portion and an opposed second end portion;
a first sleeve support member adapted to support the first end portion of the collapsible sleeve, the first sleeve support member having a bore extensive therethrough;
a second sleeve support member spatially disposed from the first sleeve support member and adapted to support the second end portion of the collapsible sleeve, the second sleeve support member having a bore extensive therethrough, each of the first and second sleeve support members comprising:
a body portion; and
a mounting hub extending from the body portion, the mounting hub having a retaining lip on its distal end so as to define a retaining surface, in an assembled position the mounting hubs of the first and second sleeve support members being disposed in a facing relationship and each of the retaining surfaces of the mounting hubs supportingly engaging an adjacent end portion of the collapsible sleeve;
sleeve retaining means for securing the first and second end portions of the collapsible sleeve to the mounting hubs of the first and second sleeve support members,

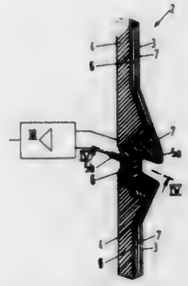
respectively, such that a fluid-tight seal is formed therebetween;
a support cylinder having a first end portion, a medial portion and an opposed second end portion, the first end portion connected to the body portion of the first sleeve support member and the second end portion connected to the body portion of the second sleeve support member, the medial portion of the support cylinder cooperating with the body portions of the first and second sleeve support members and the collapsible sleeve to define the annular pressure cavity; and
means for sealing the annular pressure cavity.

5,205,326
PRESSURE RESPONSE TYPE PULSATION DAMPER NOISE ATTENUATOR AND ACCUMULATOR
Edward D. Paley, Grosse Point; Gregory E. Leemhuis, Auburn Hills, and Kerry A. Machesney, Farmington Hills, all of Mich., assignors to Hydraulic Power Systems, Inc., Oak Park, Mich.
Filed Aug. 23, 1991, Ser. No. 749,127
Int. Cl.[5] F16L *55/04*
U.S. Cl. 138—30 6 Claims



1. A pulsation damper and noise attenuator assembly for use in a liquid flow path of a fluid flow system comprising:
an elongated housing having a longitudinal axis with first and second ends;
a base mounted to said housing at one end defining an internal chamber in cooperation with said housing;
a rigid movable member having a forward face extending substantially across an entire cross sectional area of said housing, said moveable member disposed within said internal chamber of said housing for longitudinal reciprocation, said moveable member separating said internal chamber of said housing into an expandable first chamber and an expandable second chamber;
a fluid tight seal member for connecting said moveable member to said housing;
a first inlet port formed in said housing fluidly connecting said first chamber of said housing to an external pressurized gas source, such that said moveable member is normally disposed, during a stable steady liquid flow, in an intermediate position between said first and second ends of said housing;
a second inlet port and an outlet port formed in said base, said second inlet port having a central axis parallel with said longitudinal axis of said housing, said second inlet port and said outlet port fluidly connecting the second chamber of said housing to the liquid flow path of said fluid flow system, such that said liquid flow path directly impacts said entire forward face of said moveable member;
at least one stop connected to the housing for restraining movement of said moveable member, such that said first chamber is prevented from fully contracting within said housing;
at least one ring shaped should connected to one of the moveable member and the base for restraining movement of said moveable member, such that said first chamber is prevented from fully expanding within said housing; and
a check valve connected to the first inlet port for allowing gas flow from said external pressurized gas source into said first chamber and preventing back-flow of gas out of said first chamber;
wherein said assembly is mounted directly in the liquid flow path of said fluid flow system and said liquid flow path is directed across the entire forward face of said moveable member.

5,205,327
ELECTROSTATIC WEFT DETECTOR
Godert De Jager, Benglen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Mar. 25, 1992, Ser. No. 860,746
Claims priority, application Switzerland, May 15, 1991, 01449/91-0
Int. Cl.[5] D03D *51/34*
U.S. Cl. 139—370.1 20 Claims



1. Apparatus for sensing an electrical charge of a weft thread for installation on a loom, the apparatus comprising a plate-like sensor element defined by at least three layers of a conductive material and insulation material between and separating adjacent layers of the conductive material to thereby define a middle conductive layer and first and second outer conductive layers, means for grounding the outer conductive layers, and means for electrically coupling the middle conductive layer with means for registering an electrical potential, whereby an electric charge of the weft thread located in the vicinity of and spaced from the middle conductive layer can be sensed without physical contact between the weft thread and the middle conductive layer.

5,205,328
PORTABLE CABLE TIE TOOL
Brett W. Johnson, Darien; Robert F. Levin, Braceville; Steven S. Timian, New Lenox; Mark B. Richardson, Joliet, and David W. West, Naperville, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Mar. 18, 1992, Ser. No. 853,464
Int. Cl.[5] B21F *9/02*
U.S. Cl. 140—93.2 16 Claims

1. A portable cable tie application tool for fastening an individual cable tie around an object where the cable tie has a strap and a strap locking head and is provided in a continuous ribbon of cable ties, comprising:

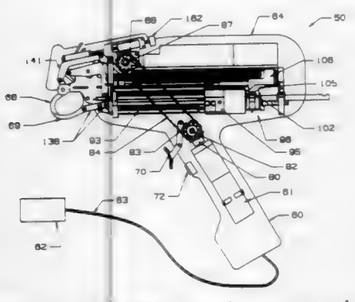
upper and lower jaws for positioning the cable tie around an

locking said first electric wire end portions in said clamps,

said tank for preventing fuel from flowing backward

said second plug having a ratchet from which a pole coaxi-

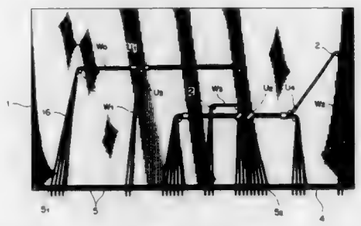
upper and lower jaws for positioning the cable tie around an object to be fastened;
tensioning means for withdrawing the strap of the cable tie from the locking head of the cable tie to tighten the cable tie around the object to be fastened;
cable tie receiver means for positioning the ribbon of cable ties, separating a leading cable tie from the ribbon of cable ties and positioning the separated cable tie for advancement to the upper and lower jaws; and
cable tie advancing means for advancing the separated cable tie into position in the upper and lower jaws including a carriage, carriage mounting means for mounting the carriage to the tool for reciprocal movement between a rearward position and a forward position and cable tie pusher means carried on the carriage for pushing the separated



cable tie from the cable tie receiver means to the upper and lower jaws;
wherein the upper jaw is pivotally mounted to the tool and operatively connected to a linkage means for pivoting the upper jaw upwardly within the lower jaw to insert the strap of a cable tie positioned therein through the locking head of the cable tie into engagement with the tensioning means and wherein the carriage includes insertion cam means disposed for engaging the linkage means to actuate the linkage means to pivot the upper jaw and insert the cable tie when the carriage is advanced to the forward position whereby the movement of the carriage effects the timed advancement of the cable tie within the tool and the timed insertion of the cable tie through the locking head of the cable tie.

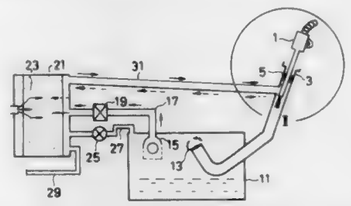
5,205,329
WIRE HARNESS AND METHOD OF AND APPARATUS FOR MANUFACTURING THE SAME
Yoshitsugu Suzuki; Shougo Iizuka; Shigeo Kajiyama; Sanae Suzuki; Shigeji Kudo; Toshihiro Inoue; Norio Isobe, and Yoshihisa Oosumi, all of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Continuation of Ser. No. 271,970, Nov. 16, 1988, abandoned. This application Aug. 9, 1991, Ser. No. 744,684
Claims priority, application Japan, Nov. 17, 1987, 62-288353; Nov. 17, 1987, 62-288354; Nov. 17, 1987, 62-288355; Nov. 17, 1987, 62-288356; Nov. 17, 1987, 62-288357
Int. Cl.[5] B21F *27/00*
U.S. Cl. 140—92.1 **7 Claims**

1. A method of manufacturing a wiring harness assembly which comprises:
providing a wiring harness board;
detachably attaching a chain, comprising a single support bar and a plurality of wire clamps juxtaposed each other in a line at predetermined pitches on said support bar, to said wiring harness board;
laying a first electric wire end portion in a preselected one of said clamps;
laying the other end portion of said first electric wire in another preselected one of said clamps;
locking said first electric wire end portions in said clamps, respectively;
similarly laying the end portions of at least one additional electric wire in preselected clamps;
locking said additional end portions in said clamps whereby to form a multiplicity of said wires with only said end portions being held in substantially parallel relationship at predetermined pitches with respect to each other in said preselected clamps;



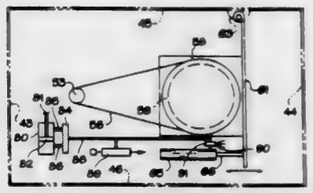
processing the ends of said wires;
detaching said clamp chain, with said wires with processed ends clamped thereto, from said board;
storing said clamp chain and clamped wires without substantially changing the relationship therebetween;
removing said clamp chain and clamped wires from storage, and attaching such to a support; and
thereafter subjecting said wire ends to further processing.

5,205,330
AIR BREATHER SYSTEM FOR FUEL TANK
Hidetoshi Sekine, Kiryu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 13, 1991, Ser. No. 792,201
Claims priority, application Japan, Nov. 22, 1990, 2-123170[U]
Int. Cl.[5] B65B *31/00, 57/14*
U.S. Cl. 141—59 **4 Claims**



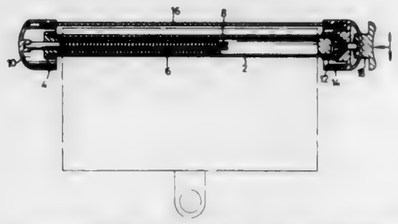
1. An air breather system for a fuel tank mounted on a vehicle having, a canister mounted on said vehicle for adsorbing fuel vapor generated in said fuel tank, a vapor recovery hose connected between an upper portion of said fuel tank and said canister for communicating said fuel vapor, a float valve provided to close an opening of said vapor recovery hose to said fuel tank when said fuel tank has become filled by fueling, a solenoid valve interposed in said vapor recovery hose for controlling a flow of said fuel vapor, a filler pipe connected with said fuel tank for fueling, and a mechanical seal inserted in a mouth of said filler pipe for sealing a filler gun, said air breather system comprising:
an air breather passage provided separate from said vapor recovery hose and connected between an upper wall of said canister and a position of said filler pipe beneath said mechanical seal for inducing the fuel vapor into said canister without overflowing from said filler pipe when filling said fuel tank; and
a blowback preventing valve provided in said filler pipe at said tank for preventing fuel from flowing backward through said filler pipe to said canister.

5,205,331
TENSION REDUCER FOR A POWER TOOL DRIVE APPARATUS
John Onsrud, Statesville, N.C., assignor to C.R. Onsrud, Inc., Troutman, N.C.
Filed May 11, 1992, Ser. No. 881,420
Int. Cl.[5] B27C *5/02*
U.S. Cl. 144—134 A **15 Claims**



1. In an inverted router characterized by having a drive motor, a motor driven pulley, a router bit-carrying spindle moveable between a lowered inoperative position and an raised cutting position, a drive belt for transferring rotational motion from the motor driven pulley to said spindle, and a drive belt tension control apparatus, said drive belt tension control apparatus including mounting means for mounting said motor driven pulley in continuously variable spaced-apart relation to said spindle during operation of the router and pressure means for exerting a predetermined pressure on said motor driven pulley and thereby a predetermined tension on said drive belt during operation of the router for rotating the spindle;
the improvement which comprises tension reducing means for reducing the tension on the spindle during movement of the spindle between its lowered inoperative position and raised cutting positions for preventing tension-induced hesitation in the movement of the spindle.

5,205,332
WIND-SHIELD BLIND
Jong Yi Lii, No. 17, Alley 160, Lane 164, Chungshan N. Rd., Yungkang Hsiang, Tainan Hsien, Taiwan
Filed Jun. 2, 1992, Ser. No. 892,339
Int. Cl.[5] E06B *9/08*
U.S. Cl. 160—23.1 **1 Claim**



1. A wind-shield blind comprising a hollow spindle which carries an opaque film having a first end in which a tubular plug fits and a second end in which a second plug fits, a shaft substantially inserted in the spindle through the tubular plug, a spring securely attached to a bifurcate end of the shaft at an end and securely attached to the tubular plug at the other end, a first terminal element to which a flat end of the shaft is securely attached, and a second terminal element securely connected to the first terminal element by a connecting element, the improvement comprising:
said second plug having a ratchet from which a pole coaxially protrudes;
said second terminal element having a wall surrounding a disk defining a slot, a ratchet cooperating with said ratchet of said second plug for maintaining the opaque film at any desired position, and a hole through which said pole protrudes;
a switch having a button, a cylinder protruding from said button and defining a rim enclosing a smooth cavity, and two wedges laterally projecting from said cylinder and being pressable through said slot, thereby restricting said switch to slide along said slot between a first position where said pole contacts said cavity, whereby said ratchets contact each other and a second position where said pole contacts said rim, whereby said ratchets are away from each other.

5,205,333
SHADE AND METHOD FOR THE MANUFACTURE THEREOF
Ren Judkins, Pittsburgh, Pa., assignor to Verosol USA Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 340,301, Apr. 19, 1989, Pat. No. 4,974,656, which is a continuation-in-part of Ser. No. 30,167, Mar. 25, 1987, abandoned. This application Dec. 3, 1990, Ser. No. 621,319
Int. Cl.[5] A47H *5/00*
U.S. Cl. 160—84.1 **9 Claims**

1. A shade body intended for use in a pleated shade that may be raised and lowered, comprising:
(a) a first continuous pleated layer having a plurality of parallel pleats extending laterally thereacross, said pleats alternately projecting from a front face and a back face of said first layer; and
(b) a second pleated layer having a plurality of parallel pleats extending laterally thereacross, said pleats of said second layer alternately projecting towards a front face and a back face of said second layer, each pleat forming a vertex on the opposite face, said back face of said second layer facing said first layer, said pleats of said second layer having a width and projecting towards said front face thereof further comprising tabs extending outwardly therefrom, said tabs being formed on each said pleat of said second layer by bonding together each pleat along the entire width of the pleat, said front facing pleats of said first layer affixed to said second layer at the rearward facing vertex of each forward facing pleat of said second layer.

5,205,334
DOUBLE LAYER SHADE
Ren Judkins, Killbuck Township, Allegheny County, Pa., assignor to Verosol USA Inc., Pittsburgh, Pa.
Filed Oct. 3, 1991, Ser. No. 771,148
Int. Cl.[5] E06B *9/40*
U.S. Cl. 160—89 **27 Claims**

1. An energy efficient double layer shade having two independently movable layers comprising
a) a headrail having a bottom and an interior sized to receive a roller shade,

a support arm having two ends and an inner and an outer face, the outer face having means to support the curtain;
said slide valve overlyingly seals said filling hole during axial movement of said plunger.

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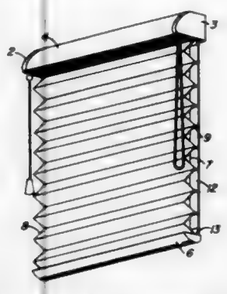
b) a panel of pleated material attached to the bottom of the headrail thereby permitting the pleated material to be folded and unfolded; and

c) a roller shade of the type having a roller and a rolled panel of shade material positioned within the headrail thereby



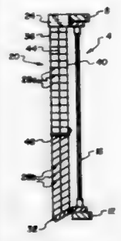
permitting the panel of shade material to be unrolled to a position substantially parallel to the pleated material when the pleated material is unfolded wherein the unfolded pleated material and unrolled shade material are sufficiently close to one another so that convection currents will not develop therebetween.

5,205,335

APPARATUS AND METHOD FOR SELECTIVELY OPENING A PORTION OF A VENETIAN WINDOW BLIND WHILE CLOSING ANOTHER PORTION

Walter J. Horton, and Don R. Brown, both of Salt Lake City, Utah, assignors to Blind Ambition, Inc., Salt Lake City, Utah

Filed Oct. 31, 1990, Ser. No. 606,499
Int. Cl.[5] E06B *3/48*
U.S. Cl. 160—115 **18 Claims**



1. In use with a venetian blind having a head rail for mounting at the top of a window frame over which the blind is to be positioned, first and second pairs of tilt strings depending from the head rail at spaced-apart locations, a first string of each pair being disposed closest to the window and a second string of each pair being disposed farthest from the window, first and second arrays of bridging ties extending between the strings of the first and second pairs respectively in vertically spaced-apart locations, first and second lift strings depending from the head rail generally between the first and second pairs of tilt strings respectively, a bottom rail attached to the lower ends of the lift strings, a plurality of horizontally disposed, vertically spaced-apart slats positioned between the first and second strings of the pairs of tilt strings, each resting on respective bridging ties of the first and second arrays so that as the first and second strings of the pairs of tilt strings are moved vertically relative to one another, the slats are caused to rotate about their long axes generally in unison, and each slat having a pair of spaced-apart openings through which respective lift strings extend, and control means disposed in the head rail and operable to move the first and second strings of the pairs of tilt strings vertically relative to one another,

apparatus for selectively allowing rotation of an upper group of slats by a certain degree different from the degree of rotation of a lower group of slats comprising

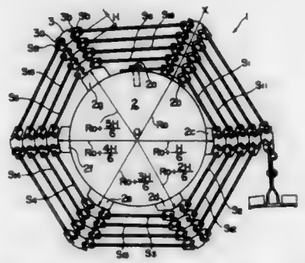
means for clamping together a lift string and a tilt string to prevent relative vertical movement therebetween so that operation of the control means causes rotation of the slats above the location of the clamping means by an amount different from the amount of rotation of the slats below the location of the clamping means.

5,205,336

ROLLING SHUTTER

Masaaki Munekata; Norihisa Isemura, and Kazunobu Fukano, all of Tokyo, Japan, assignors to Sanwa Shutter Corporation, Tokyo, Japan

Filed May 8, 1992, Ser. No. 880,672
Claims priority, application Japan, Nov. 20, 1991, 3-331222
Int. Cl.[5] E06B *9/08*
U.S. Cl. 160—133 **4 Claims**



1. A rolling shutter comprising a shutter curtain wound around a winding drum and forming multiple winding layers, each layer approximating a polygon having n sides, where n is a whole number, and wherein:

said shutter curtain comprises a plurality of slats pivotally connected to each other at parallel horizontal axes;

each winding layer comprises n slats each of which have the same height dimension, the height dimension incrementally increasing from those in one winding layer to those in the next adjacent outer winding layer; and

said rolling shutter further comprises a plurality of shutter curtain receiving surfaces spaced about the periphery of the winding drum adjacent the apexes of the first polygonal shaped winding layer, each said curtain receiving surface being spaced a different distance from the center of the winding drum, such that, when said shutter curtain is wound around said winding drum, the distance between the center of said winding drum and adjacent apexes of said n-sided polygon, in the direction of winding of said shutter curtain about the winding drum, incrementally increases by H/n, where H is the difference between a radius of a winding layer and that of an adjacent winding layer at each apex.

5,205,337

STRUCTURE FOR HANGING CURTAIN ON CURVED FRAME

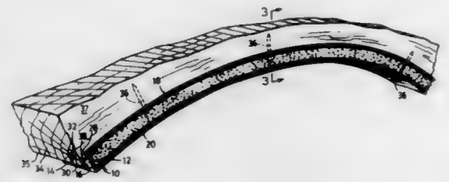
Romolo T. Bozzo, 775 King Street East, Hamilton, Ontario, Canada L8M 1A7

Filed Sep. 4, 1991, Ser. No. 754,851
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **8 Claims**

1. In a frame having an arched surface and a support structure attached to the frame for hanging a curtain therefrom, the improvement in which the support structure is made of flexible plastics material and the structure comprises:

a support arm having two ends and an inner and an outer face, the outer face having means to support the curtain;

a mounting arm disposed substantially at right angles to the support arm at one end thereof and adapted to receive fastenings for mounting the mounting arm to said arched surface and whereby said mounting arm is bent to conform to said arched surface; and



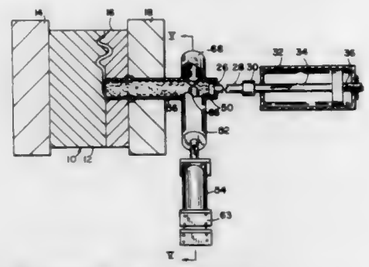
a stabilizing arm extending from the inner face of the support arm and substantially parallel to the mounting arm, the stabilizing arm being shorter than the mounting arm and of thickness, length and spacing from the mounting arm to maintain the support arm substantially in a flat plane without perceptible buckling when the mounting arm is bent to a curved configuration.

5,205,338

CLOSED SHOT DIE CASTING

Dennis S. Shimmell, Hudsonville, Mich., assignor to Nelson Metal Products Corporation, Grandville, Mich.

Filed Dec. 11, 1991, Ser. No. 805,033
Int. Cl.[5] B22D *13/00*
U.S. Cl. 164—113 **27 Claims**



1. A die casting apparatus comprising:

a die having a die cavity;

a shot sleeve having an axial internal bore in fluid communication with said die cavity and a filling hole in fluid communication with said internal bore;

a plunger disposed in said internal bore of said shot sleeve for reciprocating axial movement therein;

a filling cylinder having an axial internal bore disposed with its axis angularly offset with respect to the axis of said shot sleeve and spaced apart from the axis of said shot sleeve, a central extent of said filling cylinder overlapping and partially intersecting said shot sleeve at said filling hole such that both of said internal bores are in overlapping fluid communication with each other through said filling hole, said filling cylinder further having an opening for the introduction of molten material into said internal bore of said filling cylinder;

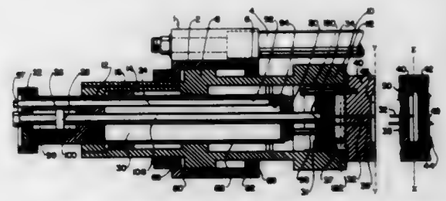
a slide valve means disposed in said internal bore of said filling cylinder for reciprocating axial movement therein between a first position in which said filling hole is open to allow molten material to flow from said internal bore of said filling cylinder through said filling hole into the internal bore of said shot sleeve and a second position in which said slide valve overlyingly seals said filling hole during axial movement of said plunger.

5,205,339

DIE-CASTING MACHINE

Guido Perrella, Westmount, Canada, assignor to DBM Industries Limited, Quebec, Canada

PCT No. PCT/CA90/00094, § 371 Date Sep. 17, 1991, § 102(e) Date Sep. 17, 1991, PCT Pub. No. WO90/11151, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 20, 1990, Ser. No. 768,584
Claims priority, application Canada, Mar. 21, 1989, 5943817
Int. Cl.[5] B22D *17/10*
U.S. Cl. 164—113 **8 Claims**



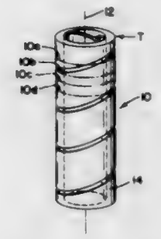
1. A die casting machine (1) having reciprocating main (8), ejector (18) and core pistons (28), wherein there is at least one stationary main cylinder (2), at least one reciprocating main piston (8) which brings the molds (40, 42) together for metal injection or apart for releasing a die casting, characterized by a portion of the interior of said main piston (8) constituting an ejector cylinder (14), with an ejector piston (18) in said ejector cylinder (14), a portion of the interior of said ejector piston constituting a core cylinder (26), with a core piston (28) in said core cylinder (26).

5,205,340

INSULATED PAPER SLEEVE FOR CASTING METAL ARTICLES IN SAND MOLDS

Robert G. Brown, and Phillip R. McCarthy, both of Fairhope, Ala., assignors to Brown Foundry System, Inc., Fairhope, Ala.

Continuation of Ser. No. 599,502, Oct. 18, 1990, abandoned, which is a division of Ser. No. 372,252, Jun. 27, 1989, Pat. No. 4,981,166. This application Aug. 19, 1991, Ser. No. 747,400
Int. Cl.[5] B22C *9/08*
U.S. Cl. 164—412 **4 Claims**



1. A foundry, sand mold riser comprising a plurality of paper sheet plies tightly wrapped around one another to produce a longitudinally-extending stiff and rigid tubular sleeve, each sheet having width edges and wrapped as a ply with one width edge in contact with the other to form a seam which extends generally as a spiral along the length of said sleeve, said sleeve having at least two adjacent overlying plies with longitudinally offset seams to produce therebetween a ventilation space extending along the length of said sleeve whereby said sleeve decomposes uniformly under heat and in combination therewith, an annular reducer at one end of said sleeve, said reducer

having an inside diameter smaller than the inside diameter of

first longitudinal conveying means to said second longitudinal

tainer and a second end portion connected to the first portion, the end portion defining outlet openings directed toward the

slab therefrom, said received molten metal being effective to exert a certain pressure within said mold, said method compris-

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having an inside diameter smaller than the inside diameter of said sleeve and being formed entirely of paper.

5,205,341

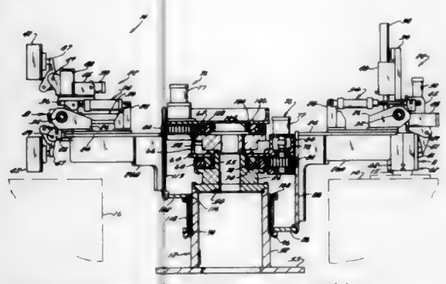
LOW PRESSURE DOUBLE ARM CASTING APPARATUS

Frederick F. Treul, Milwaukee; Thomas R. Hoesly, Oconomowoc, and William F. Mackay, Waukesha, all of Wis., assignors to Starline Manufacturing Company, Inc., Milwaukee, Wis.

Filed Feb. 27, 1990, Ser. No. 485,748

Int. Cl.[5] B22D *18/04, 33/00*

U.S. Cl. 164—306 **2 Claims**



1. A low pressure casting apparatus comprising:

a pedestal;

a low pressure casting furnace disposed in a spaced relation to said pedestal;

a pair of immersion stations located in equally spaced relation to said pedestal and to said furnace;

a first arm mounted for rotary motion on said pedestal between one of said immersion stations and said furnace;

a second arm mounted for rotary motion on said pedestal between said other immersion station and said furnace;

bearing means mounted on said pedestal below each of said arms wherein said arms ride on said bearing means on said pedestal;

a casting mold mounted on each of said arms and being disposed for movement into operative engagement with said immersion station and said casting furnace; and

means for cycling each of said arms independently of the other of said arms, said cycling means includes a pair of ring gears mounted on said pedestal and a drive motor assembly mounted on each arm in a position to operatively engage said corresponding ring gear,

radial bearing means located in said ring gears for countering lateral forces transverse to said pedestal, whereby one of said arms can be stopped for maintenance or repair without interrupting the motion of the other of said arms.

5,205,342

CONTINUOUS SLAB CASTER ARRANGEMENT FOLLOWED BY A ROLLING MILL

Dietmar Eichler, Linz, Austria, assignor to Voest-Alpine Industrieanlagenbau G.m.b.H., Linz, Austria

Filed Dec. 16, 1991, Ser. No. 809,267

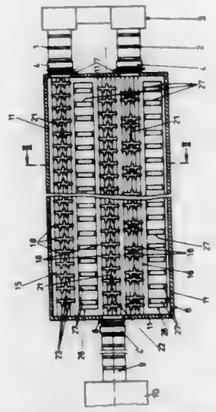
Claims priority, application Austria, Dec. 20, 1990, 2600/90

Int. Cl.[5] B22D *4/12;* **B21B** *1/46*

U.S. Cl. 164—417 **17 Claims**

1. In a continuous slab caster arrangement followed by a rolling mill, of the type including a run-out roller table including a strand separating means and a furnace arranged between said strand separating means and said rolling mill, said furnace having a furnace roof, a furnace interior, a feed side through a transverse wall of said furnace and a delivery side and being equipped with a first longitudinal conveying means arranged on said feed side, a second longitudinal conveying means arranged on said delivery side and including a slab storage place located parallel to said longitudinal conveying means, and a transverse conveying means for conveying a slab from said first longitudinal conveying means to said second longitudinal conveying means,

the improvement comprising at least one fixed hearth arranged within said furnace parallel to said longitudinal conveying means and having a minimum width adapted to the width of a slab and adapted to receive a plurality of slabs stacked one above the other, and a lifting means forming said transverse conveying means and projecting



through said furnace roof into said furnace interior, said lifting means being displaceable from a position above said longitudinal conveying means into a position above said fixed hearth and from a position above said fixed hearth into a position above said longitudinal conveying means, said lifting means further comprising a plurality of serially arranged grapplers disposed along the length of said furnace.

5,205,343

POURING TUBE FOR FEEDING MOLTEN STEEL INTO A CONTINUOUS CASTING MOLD

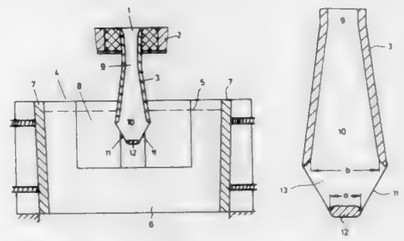
Hans Streubel, Erkrath; Horst Grothe, Kaarst, and Jürgen Friedrich, Essen, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 529,116, May 25, 1990, abandoned. This application May 28, 1991, Ser. No. 706,557

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1989, 3918228

Int. Cl.[5] B22D *11/10*

U.S. Cl. 164—437 **6 Claims**



1. In a pouring tube for feeding molten steel into a pouring zone of a steel strip casting mold, the mold having broad side walls and narrow side walls connecting the broad side walls, the pouring tube having a side wall with an inner wall surface and including a first tube portion connected to a pouring container and a second end portion connected to the first portion, the end portion defining outlet openings directed toward the narrow side walls of the mold, each outlet opening having an upper end located in the side wall of the pouring tube and a lower end located in a bottom piece at the end of the pouring tube, the improvement comprising the bottom piece having a width between the lower ends of the outlet openings which is at most 80% of the distance between the inner wall surface of the side wall of the tube at the upper ends of the outlet openings, wherein the bottom piece is substantially flat and lipless adjacent the lower ends of the outlet openings.

5,205,344

HORIZONTAL CONTINUOUS CASTING DEVICE

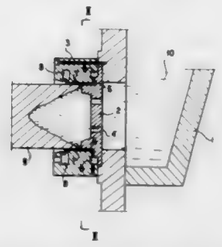
Yoshitaka Nagai; Makoto Arase, and Norio Ohatake, all of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 10, 1990, Ser. No. 521,421

Claims priority, application Japan, May 11, 1989, 1-116023

Int. Cl.[5] B22D *11/08*

U.S. Cl. 164—440 **1 Claim**



1. In a horizontal continuous casting device including a mold horizontally mounted with an orifice plate on a front side of a tundish; the improvement wherein a front portion of said orifice plate is exposed into said mold, and a horizontally extending small gap is formed between an outer circumferential surface of said front portion of said orifice plate and an inner circumferential surface of said mold, and a facing surface between said mold and said orifice plate is provided with an annular lubricating oil passage and a plurality of radial grooves which communicate from said lubricating oil passage to said gap.

5,205,345

METHOD AND APPARATUS FOR SLAB WIDTH CONTROL

John T. McClellan, Farmdale, Ohio; John W. Grove, Seneca, Pa., and Frank Kowalczyk, Lowellville, Ohio, assignors to Acutus Industries, Pontiac, Mich.

Filed Aug. 7, 1991, Ser. No. 741,284

Int. Cl.[5] B22D *11/04, 11/16*

U.S. Cl. 164—452 **8 Claims**

1. A controller for use in combination with a continuous casting mold into which molten metal is poured and which is adapted to output a slab of metal therefrom, said controller comprising:

measurement means for measuring the temperature of said molten metal; and

width control means, coupled to said measurement means, for specifying a width of said mold based upon said measured temperature and for adjusting said mold so as to cause said mold to have said specified width.

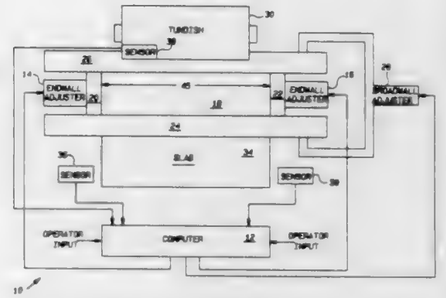
5. A method for producing a slab having a constant width from a continuous casting mold having opposite and movable narrow endwalls, each of said endwalls being adapted to be engaged at opposite sides thereof by movable and opposite broad sidewalls, said mold being adapted to receive molten metal, of a certain grade and having a certain temperature associated therewith, and to output, at a certain speed, a metal slab therefrom, said received molten metal being effective to exert a certain pressure within said mold, said method comprising the steps of:

(a) determining said grade of said molten metal;

(b) determining an initial position for each of said endwalls by use of said determined grade;

(c) placing each of said endwalls at said respective endwall positions;

(d) measuring said temperature;



(e) determining said certain pressure;

(f) measuring said certain speed;

(g) determining a second position for at least one of said endwalls by use of said measured temperature, said determined certain pressure, and said certain speed; and

(h) moving at least one of said endwalls to said respective determined second position associated therewith, thereby causing the production of a slab having a certain and constant width.

5,205,346

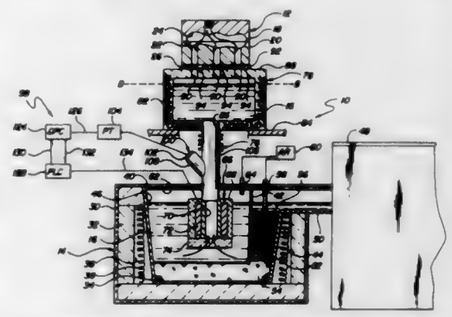
METHOD AND APPARATUS FOR COUNTERGRAVITY CASTING MOLTEN METAL

John W. Kuhn, Bristol, and Richard J. Wylie, Wabash, both of Ind., assignors to CMI International, Bristol, Ind.

Filed Jun. 11, 1992, Ser. No. 897,236

Int. Cl.[5] B22D *21/04, 35/04, 18/04*

U.S. Cl. 164—500 **13 Claims**



1. An apparatus for countergravity casting molten metal within a mold, comprising:

reservoir means (**14**) having a receiving chamber (**44**) and a casting chamber (**46**) therein separated by a partition (**42**) for containing a supply of the molten metal;

a casting mold (**12**) supported above said reservoir means (**14**);

electromagnetic pump means (**66**) disposed in said casting chamber (**46**) and fluidly coupled to said mold (**12**) for

pumping the molten metal upwardly against gravity from

opposed ends, the first of said rows defining the front of the evaporator and the last of said rows defining the rear

quantity of heat transfer fluid for thermally affecting the

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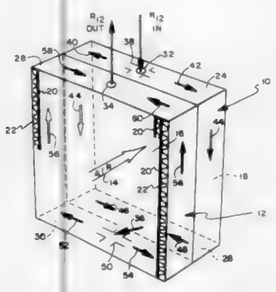
pumping the molten metal upwardly against gravity from said reservoir means (**14**) into said mold (**12**);
cover means (**40**) for covering said chambers (**44**, **46**) of said reservoir means (**14**) and defining an enclosed air space over the metal in said casting chamber (**46**);
filter means (**52**) disposed in said receiving chamber (**44**) for filtering impurities from the metal introduced into said receiving chamber (**44**) before the metal enters said casting chamber (**46**);
degassing means (**58**) associated with said receiving chamber (**44**) for bubbling inert gas into said filter means (**52**) and thereby scavenging hydrogen gas from the metal passing through said filter means (**52**) before entering said casting chamber (**46**);
and inert gas purging means (**64**) associated with said casting chamber (**46**) for supplying protective inert gas directly to the air space and thereby purging the air space of external atmospheric gases which would otherwise react with and recontaminate the molten metal present in said casting chamber (**46**) that was previously cleansed in said receiving chamber (**44**).

9. A method of countergravity casting molten metal into a mold, comprising the steps of:
melting metal in a melting furnace (**48**);
introducing the molten metal into a receiving chamber (**44**) of a casting furnace (**14**);
passing the molten metal through a filter media (**52**) disposed within the receiving chamber (**44**) to remove impurities from the molten metal;
bubbling inert gas into the filter media (**52**) to scavenge hydrogen gas from the metal as it passes through the filter media (**52**);
passing the cleansed metal around a partition (**32**) and into a casting chamber (**46**) of the furnace (**14**);
disposing an electromagnetic pump (**66**) into the casting chamber (**46**);
covering the receiving chamber (**44**) and casting chamber (**46**) with an insulating cover (**40**) and defining an enclosed air space over the cleansed metal within the casting chamber (**46**);
introducing inert gas into the air space of the casting chamber (**46**) to purge it of any external atmospheric gases which would otherwise react with and recontaminate the cleansed metal in the casting chamber (**46**);
and actuating the pump (**66**) to pump the cleansed metal from the casting chamber (**46**) upwardly into an above-situated casting mold (**12**).

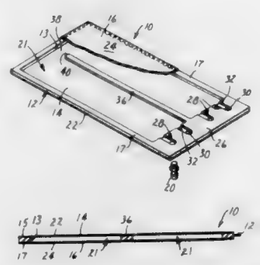
5,205,347
HIGH EFFICIENCY EVAPORATOR
Gregory G. Hughes, Milwaukee, Wis., assignor to Modine Manufacturing Co., Racine, Wis.
Filed Mar. 31, 1992, Ser. No. 861,118
Int. Cl.[5] F28F *9/26*
U.S. Cl. 165—1 **18 Claims**



1. An evaporator for a refrigerant comprising:
at least two elongated rows of refrigerant passages having opposed ends, the first of said rows defining the front of the evaporator and the last of said rows defining the rear of the evaporator;
means defining at least four elongated header passages, two for each of said rows, one at each of the said ends in each of the rows, and in fluid communication with the refrigerant passages of the associated row, the header passages at corresponding ends of said rows being adjacent to one another;
an inlet to one of said header passages in said last row and intermediate the ends thereof;
an outlet from another of said header passages in said first row and intermediate the ends thereof; and
at least one fluid passage extending between pairs of each of the remaining header passage and intermediate the ends thereof, each pair being made up of two immediately adjacent header passages.

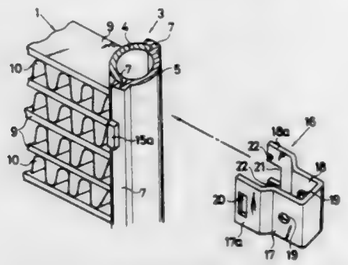
13. A method of cooling a fluid stream comprising the steps of:
a) flowing the stream of fluid to be cooled in a particular path and a particular direction;
b) placing at least two elongated rows of refrigerant passages across said path;
c) introducing refrigerant into the refrigerant passages of a row that is downstream in relation to said particular direction from the general center of the downstream row toward at least one end thereof;
d) collecting the refrigerant as it emerges from the refrigerant passages of said downstream row and introducing it into the refrigerant passages in the immediately upstream row at its general center and toward at least one end thereof;
e) sequentially repeating steps c) and d) until the refrigerant has passed through all of said rows; and
f) collecting the refrigerant as it emerges from the most upstream row.

5,205,348
SEMI-RIGID HEAT TRANSFER DEVICES
Lew A. Tousignant, St. Paul; Douglas E. Maddox, Minneapolis, and Larry G. Headrick, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 31, 1991, Ser. No. 708,341
Int. Cl.[5] F28F *3/14*
U.S. Cl. 165—46 **16 Claims**



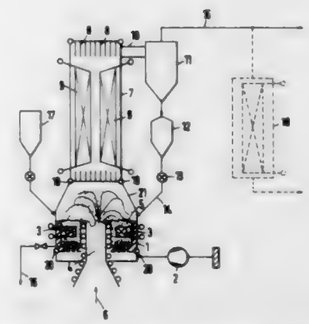
1. A heat transfer apparatus for placement proximate to an article to be thermally affected thereby, comprising:
a flexible frame including an outwardly facing perimetric surface; and
a flexible film sealingly bonded to said perimetric surface of said flexible frame, said flexible film providing an external major surface of the heat transfer apparatus for contacting the article to be thermally affected;
wherein said flexible frame is elastically deformable in at least one direction by a significant amount but is more rigid than said flexible film, and said flexible frame and said flexible film define a first fluid cavity for containing a quantity of heat transfer fluid for thermally affecting the temperature of the article by heat transfer through said flexible film.

5,205,349
HEAT EXCHANGER BRACKET MOUNTING STRUCTURE
Teruyuki Nagao, Higashimatsuyama, and Yoshikiyo Nagasaka, Kohnan, both of Japan, assignors to Zexel Corporation, Tokyo, Japan
Filed May 22, 1992, Ser. No. 886,812
Claims priority, application Japan, May 23, 1991, 3-46436[U]
Int. Cl.[5] F28F *9/00*; **B60K** *11/04*
U.S. Cl. 165—67 **20 Claims**



1. In a heat exchanger bracket mounting structure in which a plurality of radiator fins **10** are respectively interposed between a plurality of tubes **9**, having a first end and a second end connected to header pipes **2**, **3** and a bracket **16** mounted to header pipes **2**, **3**, the improvement comprising the following structures:
each of said header pipes **2**, **3** is composed of a trough-shaped tank plate **5** and a trough-shaped end plate **4**;
each of said header pipes **2**, **3** is constructed by putting said tank plate **5** having two end portions **7** and said end plate **4** having two end portions face to face with each other and then by connecting said two end portions of said tank plate **5** to the outer surfaces of said two end portions of said end plate **4**;
said tank plate **5** includes engagement means on at least one of said two end portions **7** thereof;
a bracket **16** mounted to said two end portions **7** of said tank plate **5** disposed on the outside of each of said header pipes **2**, **3**;
said bracket **16** has a main portion which has a substantially U- or C-shaped section;
said bracket **16** includes a pair of engagement pieces **17**, **18** each having an inwardly biasing elasticity;
said engagement pieces **17**, **18** respectively include holding portions **17***a*, **18***a* which are able to hold therebetween said engagement means and said two end portions **7** of said tank plate **5**; and
at least one of said holding portions **17***a*, **18***a* include engagement projections **22** which is engageable or fittable on a terminal end of one of said two end portions of said tank plate **5**.

5,205,350
PROCESS FOR COOLING A HOT PROCESS GAS
Martin Hirsch, Friedrichsdorf; Wolfgang Frank, Eschborn, and Manfred Heil, Obermörlen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany
Filed Jul. 17, 1991, Ser. No. 731,490
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1990, 4023060
Int. Cl.[5] F28C *3/16*
U.S. Cl. 165—104.18 **19 Claims**



1. A process of cooling a hot process gas, comprising: feeding the process gas through a central opening into a stationary fluidized bed which contains cooling elements and is contained in an annular trough; introducing fluidizing gas into the fluidized bed through a gas-permeable bottom of the trough; flowing cooled solids into the process gas stream over an inner rim of the trough whereby said cooled solids are entrained in said process gas stream into a dust-containing space over the top surface of the fluidized bed, at least a part of the solids suspended in the gas stream are separated in the dust-containing space over the fluidized bed and fall back into the annular fluidized bed; feeding the cooled gas which contains the remaining solids into a gas cooler which comprises cooling surfaces; introducing the gas leaving the upper portion of the gas cooler into a solids separator; removing solids in the separator and recycling at least a portion thereof to the stationary fluidized bed.

5,205,351
PROCESS FOR VAPORIZING A LIQUID, HEAT EXCHANGER THEREFOR, AND APPLICATION THEREOF TO AN APPARATUS FOR AIR DISTILLATION WITH A DOUBLE COLUMN
Christiane Muller, Jouy-en-Josas, and Frédéric Rousseau, Paris, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Mar. 27, 1992, Ser. No. 858,931
Claims priority, application France, Apr. 3, 1991, 91 04013
Int. Cl.[5] F25J *1/00*
U.S. Cl. 165—110 **6 Claims**

1. A process of boiling a liquefied first fluid in a condenser-reboiler having substantially vertical first and second passages in heat exchange relationship, the first passages having an open lower end and having smooth surfaces, comprising the steps of
partially immersing the condenser-reboiler in a bath of said liquefied first fluid so as to have a lower portion of the first passages in the lower end, not exceeding a predetermined extent, immersed within said liquefied first fluid,
passing a second fluid, initially in a gaseous state, downwardly through the second passages and
continuously introducing a gaseous flow of said first fluid into said lower portion of the first passages to establish

permanently a two-phase rising flow of the first fluid all

said absorber comprising a heat exchanger for performing a the direction of entry via the heat exchanging material to the

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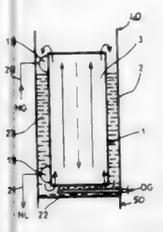
permanently a two-phase rising flow of the first fluid all along the lower portion of the first passages, thereby



reducing subcooling of the first liquefied fluid in the lower portion of the first passages.

5,205,352

HEAT EXCHANGER FOR CONDENSING VAPOR INTO LIQUID PHASE, POWER GENERATING PLANT USING THE HEAT EXCHANGER AND ABSORPTION REFRIGERATOR USING THE HEAT EXCHANGER

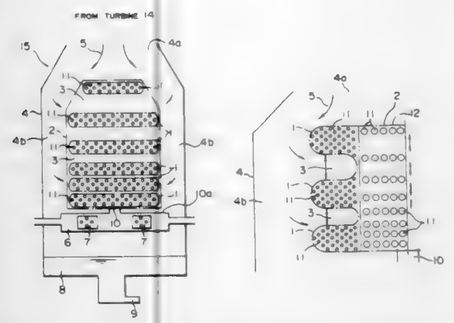
Fumio Takahashi, Hitachi; Iwao Harada, Mito; Yasuo Fujitani, Ibaraki, and Michihiko Aizawa, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1992, Ser. No. 827,934

Claims priority, application Japan, Jan. 29, 1991, 3-008913

Int. Cl.[5] F28B *1/02*

U.S. Cl. 165—113 **12 Claims**



1. A heat exchanger for performing a heat exchange between a vapor containing non-condensable gas components and a heat exchanging medium, thereby condensing said vapor into liquid phase, said heat exchanger comprising:

a vessel having a vapor inlet for receiving said vapor containing said non-condensable gas components and a discharge port through which said non-condensable gas components are to be discharged; and

a tube nest disposed in said vessel and having a plurality of tubes through which said heat exchanging medium flows;

said vapor containing non-condensable gas components flowing towards said discharge port across said tube nest so as to be condensed into liquid phase through heat exchange with said heat exchanging medium flowing through said tubes while said non-condensable gas components are separated from said liquid phase and flow towards said discharge port;

said tube nest having such a structure as to produce a change in the dynamic pressure of flow of said vapor towards said discharge port for thereby creating such a static pressure distribution in said heat exchanger that a lower static pressure is established in a region where said discharge port is provided than in a region where said vapor inlet is provided,

wherein said tube nest comprises a plurality of tube groups disposed in spaced relationship to define therebetween vapor passages communicating with said vapor inlet, said discharge port being disposed adjacent one of said tube groups, said tube groups being so arranged that the widths of said vapor passages in terms of the distance between adjacent tube groups are varied such that the width of a vapor passage closer to said discharge port is smaller than the width of a vapor passage remoter from said discharge port, and

wherein said tube nest is disposed in said vessel such that at least one additional vapor passage is defined between said tube nest and a wall of said vessel, said vapor passages formed between adjacent tube groups communicating with said inlet through said additional passage.

10. A power generating plant including steam generating means for generating steam, turbine means driven by the steam generated in said steam generating means, a condenser for condensing into liquid phase the steam which has driven said turbine means, and feeding means for returning the liquid phase to said steam generating means, said steam containing non-condensable gas components, wherein said condenser comprises a heat exchanger for performing a heat exchange between said steam containing non-condensable gas components and a heat exchanging medium, thereby condensing said steam into liquid phase, said heat exchanger comprising:

a vessel having a steam inlet for receiving said steam containing said non-condensable gas components and a discharge port through which said non-condensable gas components are to be discharged; and

a tube nest disposed in said vessel and having a plurality of tubes through which said heat exchanging medium flows;

said steam containing said non-condensable gas components flowing towards said discharge port across said tube nest so as to be condensed into liquid phase through heat exchange with said heat exchanging medium flowing through said tubes while said non-condensable gas components are separated from said liquid phase and flow towards said discharge port;

said tube nest having such a structure as to produce a change in the dynamic pressure of flow of said vapor towards said discharge port for thereby creating such a static pressure distribution in said heat exchanger that a lower static pressure is established in a region where said discharge port is provided than in a region where said vapor inlet is provided, wherein said tube nest comprises a plurality of tube groups disposed in spaced relationship to define therebetween steam access lanes communicating with said steam inlet, said discharge port being disposed adjacent one of said tube groups, said tube groups being so arranged that the widths of said steam access lanes in terms of the distance between adjacent tube groups are varied such that the width of a steam access lane closer to said discharge port is smaller than the width of a steam access lane remoter from said discharge port, and wherein said vessel has formed therein an inlet chamber disposed in communication with said steam inlet, said tube nest being so disposed that said steam access lanes are in direct communication with said inlet chamber.

11. An absorption refrigerator including a vapor generator for heating an absorbent liquid to generate first vapor and thickened absorbent liquid, a condenser for condensing the first vapor into first liquid, an evaporator for evaporating the first liquid thereby generating second vapor, an absorber for cooling and condensing the second vapor into liquid phase, and means for introducing the thickened absorbent liquid from said vapor generator into said absorber, said second vapor containing non-condensable gas components which are separated from said second vapor when said second vapor is condensed in said absorber, said thickened absorbent liquid being introduced into said absorber to absorb the liquid phase formed by condensation in said absorber, whereby said thickened absorbent is thinned by said liquid phase, the thinned absorbent liquid being then returned to said vapor generator,

said absorber comprising a heat exchanger for performing a heat exchange between said second vapor and a heat exchanging medium, thereby condensing said second vapor into liquid phase, said heat exchanger comprising:

a vessel having a vapor inlet for receiving said vapor containing said non-condensable gas components and a discharge port through which said non-condensable gas components are to be discharged; and

a tube nest disposed in said vessel and having a plurality of tubes through which said heat exchanging medium flows;

said vapor containing non-condensable gas components flowing towards said discharge port across said tube nest so as to be condensed into liquid phase through heat exchange with said heat exchanging medium flowing through said tubes while said non-condensable gas components are separated from said liquid phase and flow towards said discharge port;

said tube nest having such a structure as to produce a change in the dynamic pressure of flow of said vapor towards said discharge port for thereby creating such a static pressure distribution in said heat exchanger that a lower static pressure is established in a region where said discharge port is provided than in a region where said vapor inlet is provided, wherein said tube nest comprises a plurality of tube groups disposed in spaced relationship to define therebetween vapor passages communicating with said vapor inlet, said discharge port being disposed adjacent one of said tube groups, said tube groups being so arranged that the widths of said vapor passages in terms of the distance between adjacent tube groups are varied such that the width of a vapor passage closer to said discharge port is smaller than the width of a vapor passage remoter from said discharge port, and wherein said vessel has formed therein an inlet chamber disposed in communication with said vapor inlet, said tube net being so disposed that said vapor passages are in direct communication with said inlet chamber.

5,205,353

HEAT EXCHANGING MEMBER

Henricus P. Willemsen, Aarle-Rixtel; Carolina A. M. C. Dirix, Westervoort, and Theodorus G. J. Te Boekhorst, Zevenaar, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

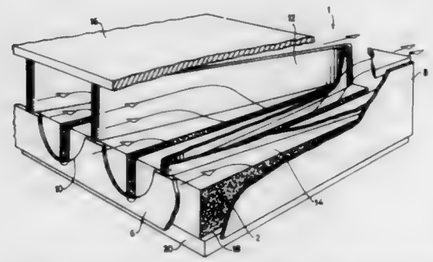
Continuation-in-part of Ser. No. 788,057, Nov. 5, 1991, which is a continuation of Ser. No. 444,085, Nov. 30, 1989, abandoned.

This application Feb. 18, 1992, Ser. No. 837,504

Claims priority, application Netherlands, Feb. 20, 1991, 9100296

Int. Cl.[5] F28F *3/12*

U.S. Cl. 165—170 **10 Claims**



1. A heat exchanging member having at a first and a second side, respectively, inlets and outlets, respectively, for a heat exchanging medium, and having a heat exchanging component made of a highly thermal conductive material in which channels disposed side by side and running from its inlet side to its outlet side have been formed, such that medium flowing in through the inlet channels is constrained to flow at an angle to the direction of entry via the heat exchanging material to the adjacent outlet channels, characterized in that the heat exchanging material comprises packed parts.

5,205,354

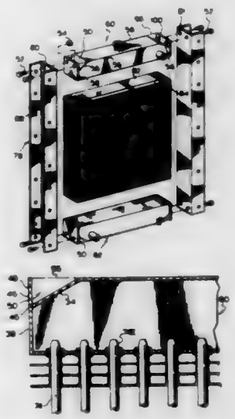
VEHICLE RADIATOR AND METHOD OF MAKING

Philip G. Lesage, 7835 Highway 50, Unit 8, Box B-1, Woodbridge, Ontario, Canada L4L 1A8

Filed Jan. 28, 1992, Ser. No. 826,788

Int. Cl.[5] F28F *9/06*

U.S. Cl. 165—173 **8 Claims**



1. In combination, radiator core and upper and lower header tanks for assembly thereto, wherein:

said radiator core comprises generally parallel open ended tubes and fins extending from said tubes,

a header plate is adapted to seal to side walls of said header tanks and is apertured to receive resilient grommets which in turn receive the ends of said tubes, whereby a seal is established between said header plate and said grommets and between said grommets and said tubes,

characterized in that:

each said header tank comprises opposed longer side walls, opposed shorter side walls and a core remote wall wherein each said longer side wall is sealed to each adjacent shorter side walls by welds,

wherein said header plate and longer side walls are formed from a unitary metal sheet,

and said header plate is sealed to the shorter side walls by welds.

5. In combination, a radiator core and upper and lower header tanks for assembly thereto, wherein:

said radiator core comprises generally parallel open ended tubes and fins extending from said tubes,

a header plate is adapted to seal to side walls of said header tanks and is apertured to receive resilient grommets which in turn receive the ends of said tubes, whereby a seal is established between said header plate and said grommets and between said grommets and said tubes.

characterized in that:

each said header tank comprises opposed longer side walls, opposed shorter side walls and a core remote wall wherein each said longer side wall is sealed to each adjacent shorter side walls by welds,

and said header plate is secured to the shorter side walls by welds,

wherein said grommets each define a side and an end to end central aperture,

said side comprising peripheral outstanding lips spaced by a groove adapted to receive the edge of said header plate,

each said grommet defining a lip having in side view

a slips actuating ring;

well tool from a tubular receiver having an internally projecting locking shoulder with upper and lower angularly beveled

inner end of said tube being straight, said tube having a central axis, an inflatable resilient flexible plug having inner and outer

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each said grommet defining a lip having in side view rounded outside contours on one side of said groove and substantially rectilinear contours on the other side of said groove.

5,205,355

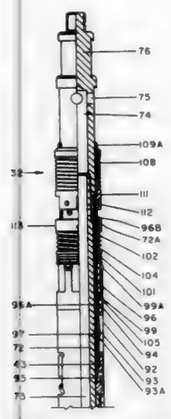
SUBSURFACE SAFETY VALVES AND METHOD AND APPARATUS FOR THEIR OPERATION

Marion H. Gay, Houston; Phillip S. Sizer, Dallas, and Imre I. Gazda, Fort Worth, all of Tex., assignors to Otis Engineering Corp., Dallas, Tex.

Division of Ser. No. 699,454, May 13, 1991. This application May 18, 1992, Ser. No. 884,831

Int. Cl.[5] E21B *23/02*

U.S. Cl. 166—72 **3 Claims**



1. A bypass latch for running a tool past a first landing nipple and landing the tool in a second landing nipple comprising;

a key retainer,

a plurality of keys in said retainer,

a key expander sleeve reciprocal within the key retainer,

a spring engaged by said expander sleeve and in a first position of said expander sleeve retracting said keys and in a second position of said expander sleeve urging the keys radially outward,

collet means slidable on said key retainer and in one position holding said expander sleeve in its first position,

said collet means movable along said key retainer to a second position by engagement with a landing nipple and retracted to a nonengaging position and releasing said expander sleeve,

means retaining said collet in said nonengaging position, and

means moving said expander sleeve to its second position in response to said collet moving to its second position.

5,205,356

WELL STARTER HEAD

Charles D. Bridges; Lawrence A. Eckert, both of Houston, Tex., and Dale B. Marietta, Singapore, Singapore, assignors to ABB Vetco Gray Inc., Houston, Tex.

Continuation-in-part of Ser. No. 634,465, Dec. 27, 1990, abandoned. This application Oct. 7, 1991, Ser. No. 772,827

Int. Cl.[5] E21B *33/03*

U.S. Cl. 166—85 **6 Claims**

1. A connector for a tubular member, comprising in combination:

a tubular head having an end and an annular first recess extending from the end, the head adapted to be placed over the tubular member, with the first recess encircling the tubular member;

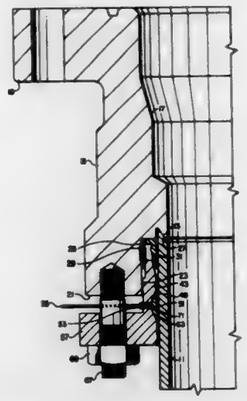
a slips actuating ring;

a seal actuating ring;

an annular recess located in one of the actuating rings and adapted to encircle the tubular member;

an annular seal ring carried in one of the recesses for sealing against the tubular member;

slips carried in the other of the recess for gripping the tubular member;



means for moving one of the actuating rings relative to the head to set fully a first one of the lips and the seal ring while a second one of the slips and the seal ring remains unset, then for setting said second one of the slips and seal ring while said first one remains stationary relative to the tubular member; and

wherein the seal ring is set in the second recess and the slips in the first recess.

5,205,357

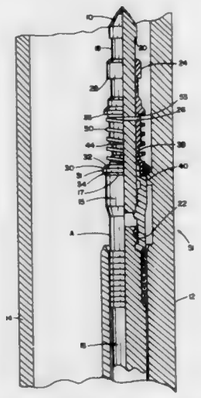
LATCHING DEVICE

Ben D. Terral, 118 Timberwilde, Huntsville, Tex. 77340

Continuation-in-part of Ser. No. 279,995, Dec. 5, 1988, Pat. No. 4,940,089, which is a division of Ser. No. 64,872, Jun. 19, 1987, Pat. No. 4,813,730. This application Jul. 9, 1990, Ser. No. 550,338

Int. Cl.[5] E21B *23/03*

U.S. Cl. 166—117.5 **6 Claims**



1. A latching device for selectively locking and retrieving a well tool from a tubular receiver having an internally projecting locking shoulder with upper and lower angularly beveled surfaces, the latching device comprising:

means for attaching the latching device to an upper portion of the well tool;

a substantially cylindrical body provided with means to facilitate installation of the latching device within the tubular receiver;

a locking sleeve mounted in axially slidable, surrounding relationship on the cylindrical body, said locking sleeve having an upper shoulder to facilitate retrieval of the latching device from the tubular receiver, said locking sleeve forming an external diameter back-up surface and defining a longitudinal axis and defining a reduced diameter portion above said external diameter back-up surface, said locking sleeve further defining a reduced diameter annular spring retainer recess located below said upper shoulder;

an annular locking ring movably mounted on the locking sleeve means for effectively locking the latching device in the tubular receiver, the locking ring having upper and lower angularly beveled surfaces which are angled to be complementary to the beveled surfaces of the locking shoulder of the tubular receiver and which contact the locking shoulder during locking and retrieving of the well tool, said locking ring defining an internal diameter surface being receivable in non-interference pivotal relation with said external diameter back-up surface permitting said locking ring to pivot to angulated relation with respect to said longitudinal axis;

a compression spring compressively arranged to urge the locking ring toward the well tool, said spring being compressed by the locking ring when the locking ring passes the locking shoulder of the tubular receiver and being released after passing of the locking shoulder by the locking ring, said compression spring having an upper coil of smaller dimension as compared to other coils thereof, said upper coil being received within said spring retainer recess thus retaining said compression spring in assembly with said locking sleeve after release of said compression spring.

5,205,358

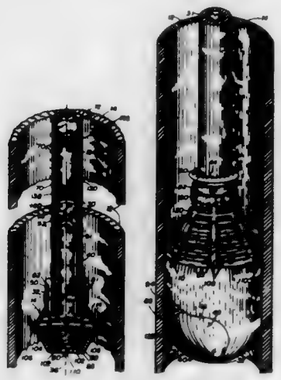
PIPE PLUGGING SYSTEM

Darald D. Mitzlaff, 2805 Hanscom Blvd., Omaha, Nebr. 68105

Filed Jul. 16, 1991, Ser. No. 730,651

Int. Cl.[5] E21B *33/127*

U.S. Cl. 166—187 **13 Claims**



1. A pipe plugging system for plugging a pipe having an outer end which is open and accessible and having an inner portion, comprising: a plug-carrying tube having an outer end and an inner end, said inner end being insertable into a pipe, the inner end of said tube being straight, said tube having a central axis, an inflatable resilient flexible plug having inner and outer ends, said plug having its outer end open and has its inner end closed, the inner end of said plug being inflatable for plugging a pipe, said plug defining an enclosure with a hollow interior, said plug having a hollow neck at its outer end and attached to said inner end of said tube whereby said neck can receive fluid from said tube and can deliver fluid to said hollow interior of said plug, means attaching said neck to the inner end of said tube and capable of holding said neck onto said tube and of permitting an inflation means to deliver fluid under pressure into said plug to inflate an inner portion of said plug by a fluid from said tube whereby said pipe becomes plugged by expansion of said inner end portion of said plug, a restrainer having an outer end attached to the inner end of said tube and surrounding a portion of said plug during pipe plugging, plug-inflated times, said restrainer having an inner end farthest from said outer end of said tube.

5,205,359

AUTOMATIC BALL INJECTOR APPARATUS AND METHOD

Stanley V. Stephenson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 17, 1991, Ser. No. 761,208

Int. Cl.[5] E21B *33/13*

U.S. Cl. 166—284 **11 Claims**

1. An apparatus for injecting sealing balls into a well, comprising:

means for controllably releasing sealing balls into a fluid flowing into the well; and

means for controlling said ball releasing means in response to the fluid flowing into the well so that said controlling means automatically adjustably regulates the release of the sealing balls from said ball releasing means in closed loop response to variations in the fluid flowing into the well, said controlling means including:

means for sensing the fluid flowing into the well, said sensing means comprising a flow meter; and

means, responsive to said sensing means, for actuating said ball releasing means, said actuating means including:

means for computing the amount of fluid flowing through said flow meter; and

valve means, connected to said computing means, for operating said ball releasing means in response to said computing means.

5,205,360

PNEUMATIC WELL TOOL FOR STIMULATION OF PETROLEUM FORMATIONS

Billy F. Price, Houston, Tex., assignor to Price Compressor Company, Inc., Houston, Tex.

Filed Aug. 30, 1991, Ser. No. 753,091

Int. Cl.[5] E21B *43/26*

U.S. Cl. 166—308 **7 Claims**

1. An apparatus for stimulating the flow of petroleum from a perforated subsurface formation adjacent a fluid-filled well bore, comprising:

a generally cylindrical housing body adapted to be in the well bore adjacent the subsurface formation;

means defining a fluid chamber within said housing,

a) a length of tubing lowered down a cased wellbore;

end opening at the non-impact end thereof and an elongated, internal, constant diameter, sealing section inwardly of said

drilling mud to said drill bit through said axially telescoping assembly; and

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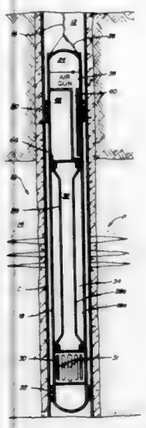
means defining a fluid chamber within said housing,

said means comprising a flexible tubular member supported in said housing body within an annular pressure chamber formed as a space between said tubular member and said housing body;



said fluid chamber being formed within said tubular member and in fluid communication with fluid in said well bore; and

pneumatic actuation means to force fluid from said fluid chamber into the well bore and perforated formation to cause fracturing of the subsurface formation.

5,205,361

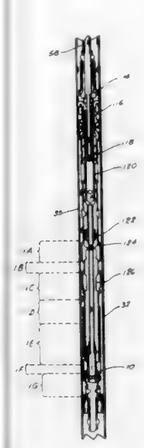
UP AND DOWN TRAVELLING DISC VALVE ASSEMBLY APPARATUS

David Farley, and Kent T. Fink, both of Lafayette, La., assignors to Completion Services, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 693,679, Apr. 30, 1991. This application Dec. 2, 1991, Ser. No. 801,958

Int. Cl.[5] **F21B** *34/06*

U.S. Cl. 166—317 **14 Claims**



1. An improved travelling disc valve assembly for allowing increased production flow to the surface, the assembly comprising:

a) a length of tubing lowered down a cased wellbore;

b) a crossover tool secured to the lower end of the length of tubing;

c) a disc valve assembly secured to the crossover tool and positioned to a lower circulation position in the well bore, said assembly further comprising a disc valve secured in a bore of the assembly;

d) means interconnecting the crossover tool with the disc valve assembly;

e) means in the upper portion of the disc valve assembly for severing the disc valve assembly from the crossover tool when the disc valve assembly is moved to an upper position blocking production flow up the production string; and

f) means lowered into the bore of the production casing to rupture the disc valve and to disengage the disc valve assembly and push it to a position below the production screen to allow production to commence.

5,205,362

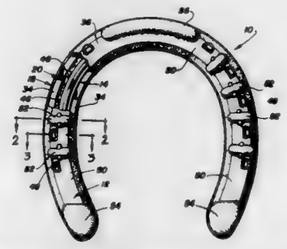
CUSHIONED HORSESHOE

Alfred A. Noffsinger, 84-189 Indio Blvd., Indio, Calif. 92201

Filed Jan. 13, 1992, Ser. No. 819,832

Int. Cl.[5] **A01L** *7/02, 1/04*

U.S. Cl. 168—13 **6 Claims**



1. A cushioned horseshoe comprising:

a mounting plate having an upper hoof-engaging surface and a lower mounting surface;

a depending boss member formed in said mounting plate that defines said lower mounting surface;

a sole member formed from a resilient material and secured to said lower mounting surface of said mounting plate;

means for securing said sole member to said mounting plate, said securing means comprising a plurality of interlocking channels, wherein said resilient material of said sole member is molded into each of said interlocking channels;

locking means formed in one of said interlocking channels, whereby a nail may be driven through said mounting plate to engage said locking means to prevent the nail from being inadvertently loosened after the nail has been driven through said horseshoe and into the hoof of a horse, wherein said interlocking channels comprise:

a pair of horizontal channel members formed adjacent the outer edges of said mounting plate; and

a pair of vertical channel members, whereby said resilient material is affixed to said lower mounting surface and disposed within each of said vertical and horizontal channel members.

5,205,363

PORTING SYSTEM FOR PNEUMATIC IMPACT HAMMER

Jack H. Pascale, P.O. Box 371, Bloomsbury, N.J. 08804

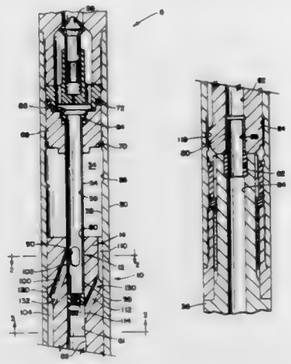
Filed May 16, 1991, Ser. No. 701,668

Int. Cl.[5] **B23Q** *5/033*

U.S. Cl. 173—17 **26 Claims**

24. In an impact piston having impact and non-impact ends at the opposite axial ends thereof and a coaxial bore with an

end opening at the non-impact end thereof and an elongated, internal, constant diameter, sealing section inwardly of said opening, the impact piston being adapted for use in a pneumatic impact device having a cylinder for mounting the impact piston for reciprocation and a pneumatic pressure fluid delivery tube mounted coaxially in the cylinder to extend through said end opening into the coaxial bore of the piston and having an elongated, external, constant diameter, sealing section for sealing engagement with the internal elongated sealing section of the coaxial bore of the piston and a set of a plurality of equiangularly spaced outlet ports in said external sealing section for the delivery of pressure fluid for reciprocation of the piston; the impact piston having first and second fluid passage-



ways for supplying pressure fluid to the opposite ends of the piston for and upon reciprocation of the piston, at least one of said fluid passageways having a set of drilled radially extending bores in the piston; the improvement wherein said set of radially extending bores has a set of a plurality of equiangularly spaced inlet ports in the internal sealing section and with the internal sealing section extending around each inlet port and circumferentially between adjacent inlet ports of said set of inlet ports and in both axial directions therefrom, the total circumferential width of the inlet ports of said set of inlet ports being at least approximately 180° to provide substantial direct fluid communication with the set of outlet ports at all angular positions of the piston.

5,205,364

PROCESS AND DRILLING EQUIPMENT FOR SINKING A WELL IN UNDERGROUND ROCK FORMATIONS

Rainer Juergens, Celle, and Friedhelm Makohl, Hermannsberg, both of Fed. Rep. of Germany, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 30, 1991, Ser. No. 737,771

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1990, 4024107

Int. Cl.[5] **E21B** *21/08*

U.S. Cl. 175—38 **25 Claims**

1. A process for sinking a well in underground rock formations using a drilling tool suspended from a drill casing and having a drill bit disposed at the leading end thereof, said drilling tool including an axially telescoping assembly therein, comprising:

supplying said drilling tool with a flow of drilling mud through said drill casing during a drilling operation;

transferring an hydraulic force generated by said flow of drilling mud to said drill bit through said axially telescoping assembly; and

varying the surface area within said drill tool on which said flow of drilling mud acts.

5,205,365

PRESSURE ASSISTED RUNNING OF TUBULARS

Julio M. Quintana, La Habra, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 28, 1991, Ser. No. 662,168

Int. Cl.[5] **E21B** *4/00*

U.S. Cl. 175—97 **19 Claims**

1. An apparatus useful in moving a portion of elements in a duct string relative to the remaining portion of the duct string, the duct string forming a passageway capable of transmitting a fluid from near one end to near the other when located in a borehole, said apparatus comprising:

a first duct portion for transmitting a fluid at a first pressure along a major axis;

means for supporting said duct portion when a first end of said duct portion is located within said borehole;

a telescoping subassembly attached to said first end and also attached to a second duct portion in a first axial position, said subassembly capable of overcoming a resistance to axial motion to actuate said second duct portion to a second axial position in the absence of motion of said first duct portion when said first pressure is changed to a second pressure, wherein said second duct portion in said second axial position is capable of contacting said borehole;

means for rotary drilling attached to said second duct portion; and

wherein at least a portion of said borehole is substantially deviated from a vertical direction.

5,205,366

means for extruding a continuous stock of polymeric material having a substantially constant cross-sectional area;

(b) means for removably connecting one end of said deviating member with one of said housing and pan carrier

torque bar, and the first clamp rod extending a distance above one of the platform, the frame, the first torque bar

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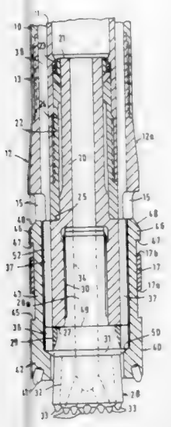
5,205,366
SUPERPOSED DRILLING DEVICE
Guenther W. Klemm, Olpe, Fed. Rep. of Germany, assignor to Ing. Guenter Klemm Bohrtechnik GmbH, Fed. Rep. of Germany
Filed May 4, 1992, Ser. No. 878,124
Claims priority, application Fed. Rep. of Germany, May 3, 1991, 4114457
Int. Cl.[5] E21B *17/07*
U.S. Cl. 175—390 **7 Claims**

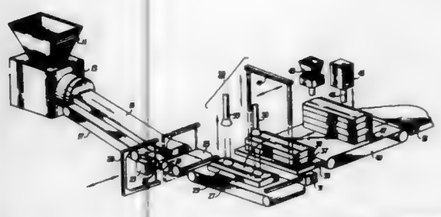


1. A superposed drilling device comprising a solid drill bit (**28**) onto which impacts are exerted or transmitted, and an annular drill bit (**40**) enclosing said solid drill bit (**28**), which is axially movable relative to said solid drill bit (**28**), said solid drill bit (**28**) and said annular drill bit (**40**) being coupled to each other by impact transmission surfaces (**31**, **50**) that abut against each other and transmit the impacts onto said annular drill bit (**40**),

characterized in that

said annular drill bit (**40**) has axially projecting tongues (**43**) that engage windows (**15**) of an outer pipe end piece (**12**) in a longitudinally displaceable manner, said outer pipe end piece guiding said annular drill bit.

5,205,367
STACKER-CUTTER-WEIGHER
Lee R. Andre, Tecumseh, and Mark E. Salemka, Adrian, both of Mich., assignors to Wacker Silicones Corporation, Adrian, Mich.
Filed Dec. 23, 1991, Ser. No. 812,458
Int. Cl.[5] G01G *19/52;* **B26D** *7/00*
U.S. Cl. 177—50 **5 Claims**



1. Stacker-cutter-weigher apparatus for providing a continuous supply of a product having a selected weight comprising means for extruding a continuous stock of polymeric material having a substantially constant cross-sectional area;

cutter means for selectively cutting said stock into sections having a finite length;

first conveyor means for moving said continuous stock to said cutter;

means for measuring the length of said stock passing through said cutter;

second conveyor means for moving each of said cut sections away from said cutter;

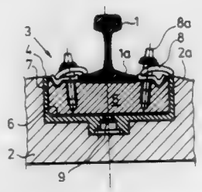
a scale for measuring the weight of said sections;

means for individually transferring each of said cut sections from said second conveyor to said scale;

control means connected to said extruding means, said cutter means, said measuring means, and said scale means for making any necessary adjustment of the finite lengths of each additional section in response to the total weight of said previously cut sections as measured by said scale after each individual section is transferred to said scale; and

means for removing said sections from said scale after a predetermined number of said sections have been placed on said scale.

5,205,368
APPARATUS AND METHOD FOR WEIGHING RAIL-SUPPORTED VEHICLES
Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister Messtechnik GmbH, Augsburg, Fed. Rep. of Germany
Filed Jul. 22, 1991, Ser. No. 733,532
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1990, 4023745
Int. Cl.[5] G01G *21/22*
U.S. Cl. 177—163 **17 Claims**



1. An apparatus for measuring vertical forces exerted on at least one of a pair of parallel continuous rails by a rail-supported vehicle comprising:

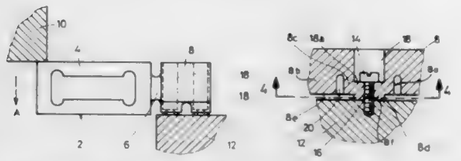
at least one sleeper in form of a bar-type support member extending laterally below said pair of rails; and force measuring means including a receiving member including a pressure sensor inserted in a recess formed in said sleeper at a location below at least one of said pair of rails, and a force introduction member including a piston for supporting said at least one continuous rail resiliently seated within said receiving member.

5,205,369
FORCE MEASURING CELL
Christiaan Neeleman, Zülrich, Switzerland, assignor to Mettler - Toledo AG, Greifensee, Switzerland
Filed Apr. 8, 1992, Ser. No. 865,328
Claims priority, application Switzerland, Apr. 30, 1991, 1300/91
Int. Cl.[5] G01G *3/08, 21/28*
U.S. Cl. 177—229 **11 Claims**

1. A force measuring cell for use in a weighing apparatus having a weighing pan carrier member (**10**) movably connected with a housing member (**12**), comprising:

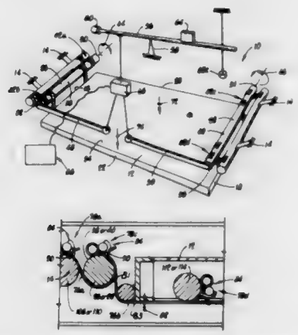
(a) a parallogram-type deviating member (**4**), which deviates under load; and

(b) means for removably connecting one end of said deviating member with one of said housing and pan carrier members, said connecting means including a fastener member (**8**) having a fastening portion (**8***a*) in engagement



with said one member, a connecting portion (**8***b*) adjacent said deviating member, and a transition zone (**8***c*) operable to decouple said fastening portion from said connecting portion with respect to mechanical stress.

5,205,370
TORQUE BAR SUSPENSION SCALE WITH STRAP ASSEMBLIES
John Paul, and Adrian J. Paul, both of Duncan, Okla., assignors to Adrian J. Paul Co., Duncan, Okla.
Filed Jul. 17, 1991, Ser. No. 731,558
Int. Cl.[5] G01G *21/08*
U.S. Cl. 177—256 **18 Claims**



1. A torque bar suspension scale for weighing an object, comprising:

a frame;

a platform having a first end and a second end and an upper surface for supporting an object to be weighed;

a first torque bar having a first end and a second end, the first torque bar being disposed near the first end of the platform;

a second torque bar having a first end and a second end, the second torque bar being disposed near the second end of the platform; and

at least two strap assemblies connected to the platform and the first and the second torque bars and the frame for rotatingly supporting the first and the second torque bars whereby the first and the second torque bars are rotated in a direction in response to an object being disposed on the platform for weighing, the strap assemblies comprising:

a plurality of straps, each strap having a rectangularly shaped cross section with a width and a thickness; and

a plurality of clamp assemblies, each clamp assembly connecting one of the straps to one of the first torque bar, the second torque bar, the frame and the platform,

wherein each clamp assembly comprises:

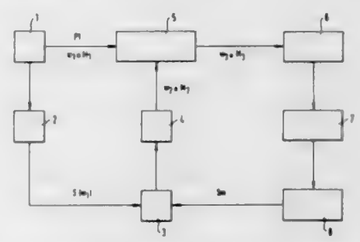
a first clamp rod having a first end and a second end, the first end of the first clamp rod being connected to one of the platform, the frame, the first torque bar and the second torque bar, and the first clamp rod extending a distance above one of the platform, the frame, the first torque bar and the second torque bar;

a second clamp rod having a first end and a second end, the first end being connected to one of the platform, the frame, the first torque bar and the second torque bar, and the second clamp rod extending a distance above one of the platform, the frame, the first torque bar and the second torque bar, the second clamp rod being spaced a distance from the first clamp rod for cooperating with a portion of one of the platform, the frame, the first torque bar and the second torque bar to form a strap opening between the first rod and the second clamp rod, the strap opening being sized and shaped to receive a portion of one of the straps;

a first retaining rod disposed near the first and the second clamp rods and extending generally between the first and the second clamp rods and over the strap opening; and

a second retaining rod disposed near the first retaining rod and extending parallel with the first retaining rod and extending over the strap opening, one of the straps extending through the strap opening and under the first and the second retaining rods and extending back over a portion of the second retaining rod and extending from the second retaining rod back under the first retaining rod and back through the strap opening whereby a force on the strap tending to pull the strap out of the strap opening pulls the first and the second retaining rods against the first and the second clamp rods and pulls the first clamp rod into clamping engagement with the portions of the strap thereunder for clamping the strap against a portion of one of the platform, the frame, the first torque bar and the second torque bar.

5,205,371
MOTOR-DRIVEN SERVO STEERING SYSTEM
Dean Karnopp, Davis, Calif., assignor to Robert Boech GmbH, Gerlingen-Schillerhohe, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 749,876
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1990, 4031316
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—79.1 **15 Claims**



1. Motor-driven servo steering system for a motor vehicle, said steering system comprising:

an actuator for superimposed steering intervention, said actuator including first means for transmitting first power by means of a first input shaft, with said first power having first torque and first angular velocity; second means for transmitting second power by a second input shaft, with said second power having second torque and second angular velocity; and third means for additively combining said first power and said second power to provide third power to an output shaft, said third power having third torque and third angular velocity, and said third power substantially equalling the sum of said first power and said second power disregarding frictional losses;

a steering system for the vehicle, said steering system being

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STRUCTURE OF VEHICLE POWER TRAIN

body to the engine and frame respectively in such a way that forces exerted on said body are primarily in a direc-

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LUBRICATING SYSTEM FOR MULTI-SPINDLE

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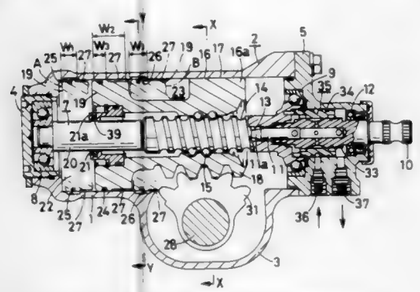
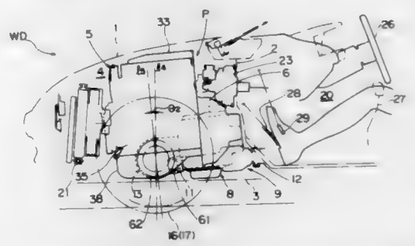
a steering system for the vehicle, said steering system being operably connected to said output shaft of said actuator;
a steering wheel for transmitting steering wheel power to said first input shaft of said actuator, said steering wheel power including steering wheel torque and steering wheel angular velocity;
an electric motor for providing output power to said second input shaft of said actuator, said electric motor controlled by a controller, said output power having output torque and output angular velocity;
means for monitoring said steering wheel angular velocity and providing angular velocity signals when said steering wheel is actuated by the driver; and
means for transmitting said angular velocity signals to said controller.

5,205,372
HYDRAULIC POWER STEERING DEVICE
Yoshimi Kotake, Nara, and Tatsuro Motoyama, Kanagawa, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of Japan
Filed Jul. 16, 1991, Ser. No. 730,165
Claims priority, application Japan, Jul. 17, 1990, 2-75942[U]; Jul. 17, 1990, 2-75943[U]
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—132 **3 Claims**



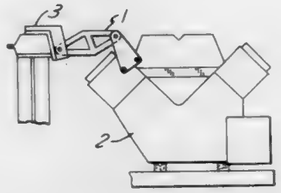
1. A hydraulic power steering device comprising:
a cylinder;
a piston slidably fitted within said cylinder, said piston having a metal piston ring attached to the outer periphery thereof;
a recess in each of a plurality of portions of said cylinder for dividing the inner periphery of the cylinder circumferentially thereof and opposed to the piston ring when the piston reaches a first position in the vicinity of each of its opposite stroke ends, said recess having a width smaller than the width of fit of the piston to the cylinder;
a recess in said piston corresponding to the recess in the cylinder inner periphery, said piston recess being formed in each of a plurality of portions of the piston in the vicinity of the piston ring and dividing the outer periphery of the piston circumferentially thereof;
two oil chambers formed within said cylinder on respective opposite sides of the piston and adapted to communicate with each other through the recess in the cylinder inner periphery and the recess in the piston outer periphery upon the piston reaching the position in the vicinity of each stroke end; and
an output shaft within said cylinder, said output shaft including a ball screw portion and a ball nut fitted around said ball screw portion with a multiplicity of balls interposed therebetween movably in circulation, said piston being movable with the ball nut within said cylinder.

5,205,373
STRUCTURE OF VEHICLE POWER TRAIN
Masaki Kadokura, and Hideaki Akaboshi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 6, 1991, Ser. No. 665,278
Claims priority, application Japan, Mar. 9, 1990, 2-59524
Int. Cl.[5] B60K *17/34, 17/344*
U.S. Cl. 180—248 **12 Claims**



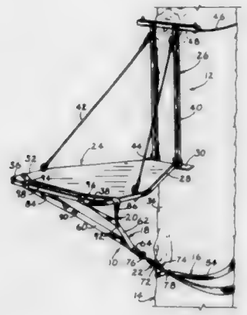
1. A structure of a vehicle power train comprising an engine positioned lengthwise in a vehicle a transmission positioned adjacent to said engine in a widthwise direction of the vehicle, and a power train, said power train comprising
a front differential unit for distributing a power outputted from said transmission to a front right wheel and a front left wheel, said front differential unit being disposed in front of said transmission in the longitudinal direction of said vehicle and between an engine output shaft and a transmission output shaft in the widthwise direction of said vehicle.

5,205,374
SYNTHETIC ENGINE MOUNT STRUT
Mickey L. Love; Edward N. Campbell, and Douglas Von Massey, all of Oklahoma City, Okla., assignors to Dana Corporation, Toledo, Ohio
Filed Jun. 13, 1991, Ser. No. 714,604
Int. Cl.[5] B60K *5/12*
U.S. Cl. 180—300 **15 Claims**



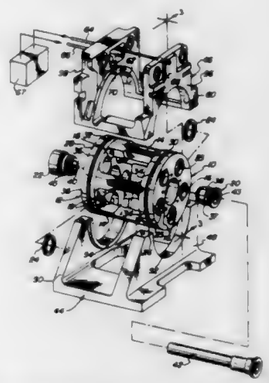
1. A resilient strut assembly for rigidly securing an engine to a vehicle frame to restrict engine torque induced motion, isolate engine and drive line vibration, and dampen engine torque reactions comprised of any one or more of pitch, yaw, and roll as characteristic of engine orientation, and comprising:
a body of vigorous synthetic material composition having a high modulus of elasticity, said body having a closed geometric periphery with an open center extending completely therethrough and at least one non-linear integral and elongate brace having a first and second end, and extending through said open center, so as to partition at least a portion of said open center, said first and second ends being integral with said periphery of said body, the remainder of said brace exclusive of said first and second ends being disposed within said open center and in dissociated relationship with said periphery, said body having opposed ends for fastening to the engine and frame, respectively, and means for fastening opposed ends of said body to the engine and frame respectively in such a way that forces exerted on said body are primarily in a direction between said fastening means,
said at least one brace providing for dampening of small displacement high frequency vibrations by said body, while restricting large displacement low frequency structural deformations of said body.

5,205,375
TREE STAND STABILIZER
Jarold A. Shriver, 801 NE. Holliman La., Lee's Summit, Mo. 64063
Filed May 2, 1991, Ser. No. 694,506
Int. Cl.[5] A45F *3/26*
U.S. Cl. 182—187 **10 Claims**



1. In combination:
a platform adapted for releasable mounting to an upright tree trunk in a general horizontal orientation for supporting a person thereon, said platform including an inboard trunk-engaging portion and an outboard distal portion presenting the outer margin of the platform; and
means for releasably securing said platform to said trunk, including:
an upper attachment assembly comprising a pair of elongated, obliquely oriented upper tension members respectively secured to said outboard platform portion at spaced locations thereon and extending upwardly therefrom, and upper trunk attachment means for releasably engaging said trunk at a point above said platform, the upper ends of said upper tension members remote from said platform being operably coupled with said upper truck attachment means for placing the upper members under tension; and
a lower attachment assembly comprising a pair of elongated, obliquely oriented lower flexible members operably coupled to said outboard platform portion at spaced locations, said lower flexible members extending downwardly from said outboard platform portion towards said trunk and in a mutually converging relationship with each other, said lower attachment assembly also including flexible lower trunk attachment means extending at least partially around and releasably engaging said trunk at a point below said platform and remote therefrom, there being structure for coupling said lower flexible members and said lower trunk attachment means, and for placing the lower flexible members in tension, in order to maintain the inboard portion of said platform in operative engagement with said trunk in the event that said person stands on said inboard portion.

5,205,376
LUBRICATING SYSTEM FOR MULTI-SPINDLE REVOLVING HEAD MECHANISM
Florian I. Nowak, Newington, Conn., assignor to Nowak Products, Inc., Newington, Conn.
Filed Jun. 10, 1992, Ser. No. 896,574
Int. Cl.[5] F01M *1/00*
U.S. Cl. 184—6.14 **8 Claims**



1. In a multiple-spindle mechanism, including a housing having a forward journal portion with a circular internal bearing surface; a revolving head mounted for rotation in said housing, said head comprising a front plate having a circumferential external bearing surface in contact with said internal bearing surface of said housing and defining a machining zone outwardly thereof, and a multiplicity of spindle bearings mounted at locations spaced about said front plate, each of said spindle bearings having a cylindrical internal bearing surface; a multiplicity of spindles, each rotatably mounted in an associated one of said spindle bearings and having a cylindrical external bearing surface in contact with said internal bearing surface of said associated bearing; and means for supplying lubricant substantially between all of said bearing surfaces that are in mutual contact; wherein the improvement comprises a system in which said head has a continuous groove formed into said circumferential external bearing surface of said front plate; said front plate and said spindle bearings have a multiplicity of ducts and ports therein, respectively, operatively connecting said internal bearing surfaces of said spindle bearings to said groove; said housing has a passage therein for communicating with said means for supplying and opening at said circumscribing groove of said head; and said means for supplying is adapted to supply an air suspension of lubricant under pressure to said passage, said mutually contacting bearing surfaces opening to said machining zone, and said head being substantially devoid of means providing mechanical seals for preventing the passage of lubricant into said zone from between said mutually contacting bearing surfaces.

5,205,377
METHOD OF AND DEVICE FOR TIMED LUBRICATION BY MEANS OF A LUBRICANT MIST
Erwin Pfarrwaller, Winterthur, and Rudolf Lehn, Bülach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Feb. 28, 1992, Ser. No. 843,883
Claims priority, application Switzerland, May 3, 1991, 661/91
Int. Cl.[5] F01M *1/08*
U.S. Cl. 184—6.26 **11 Claims**

1. A method of lubricating at least one movable part of a machine, said part having at least one rubbing surface to be lubricated, the maching having a drive shaft for moving the

movable part, the method comprising the steps of dispersing a

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engine abutment means and the first brake shoe pass through said attached and being operatively attached to said plates

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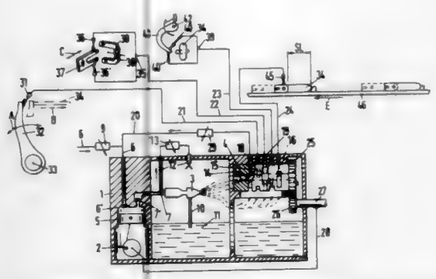
movable part, the method comprising the steps of dispersing a lubricant into fine droplets and distributing the droplets in a gaseous medium to form a lubricant mist, supplying the mist in



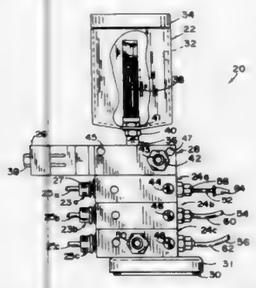
timed fashion to at least one nozzle associated with a lubrication station near the movable part, and interrupting the supply of the lubricant mist in dependence upon the relative position of the drive shaft.

5,205,378

PULSE-ACTION MIST LUBRICATION SYSTEM

Wallace G. Boelkins, 7101 Hidden Ridge Dr., SE., Grand Rapids, Mich. 49506

Filed Dec. 31, 1990, Ser. No. 636,502
Int. Cl.[5] F16N *7/32*
U.S. Cl. 184—55.1 **13 Claims**



1. A method of generating a fluidized mist, comprising the steps of:

using a positive-displacement device to repetitively move discrete quantities of liquid into a chamber;

applying compressed gas to said chamber to disperse the liquid in said chamber into a plurality of smaller quantities and move the smaller quantities of liquid into a tube, said compressed gas passing through said chamber to positively displace the smaller quantities of liquid from said chamber into said tube, whereby said liquid is propelled through said tube to a remote end thereof;

emitting said smaller quantities of liquid from said tube in dispersed form in response to said compressed gas being applied to said chamber; and

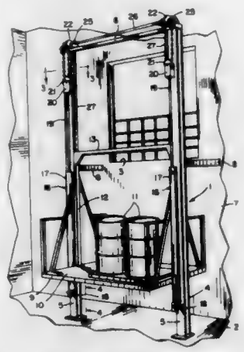
using a fluid-dispensing variable-resistance orifice at the end of said tube remote from said chamber, said orifice dispensing a generally uniform mist of said liquid from said chamber when the pressure in said tube is sufficiently high to exceed a cracking pressure threshold of said orifice.

5,205,379

VERTICAL CONVEYOR

Robert H. Pfleger, Milwaukee, Wis., assignor to Pflow Industries Inc., Milwaukee, Wis.

Filed Sep. 27, 1991, Ser. No. 767,262
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—26 **15 Claims**



1. A vertical conveyor, comprising a frame including a pair of spaced vertical supports, a carriage mounted for vertical movement on said supports, reciprocating drive means having one end connected to the frame and having a second end, a first sheave mounted on said second end of said drive means, a second sheave mounted on said frame, and a link chain comprised of a plurality of interconnects loops and trained over said first and second sheaves, said first and second sheaves each including a peripheral surface containing circumferentially spaced pockets to receive said loops, said chain having one end fixed with relation to the frame and the opposite end connected to said carriage, the axis of said first sheave disposed at about 90° to the axis of the second sheave, movement of said drive means in one direction acting through said link chain to raise said carriage.

5,205,380

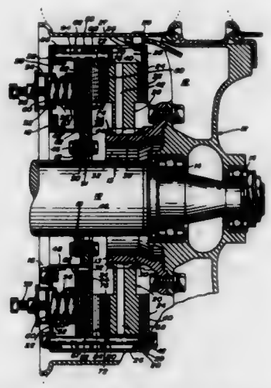
DISC BRAKE ASSEMBLY

J. Jacques Paquet, 682 12ième Ave., Thetford Mines, Quebec, Canada G6G 7T9 , and Claude Rancourt, 1400 54ième Rue Nord, St. Georges Ouest, Beauce County, Quebec, Canada G5Y 2E1

Continuation-in-part of Ser. No. 552,184, Jul. 13, 1990, abandoned. This application Jun. 20, 1991, Ser. No. 719,130
Int. Cl.[5] B60T *1/06*
U.S. Cl. 188—18 A **16 Claims**

1. A disc brake assembly for a vehicle wheel on a vehicle, wherein the wheel includes a hub journaled to an axle on the vehicle, the disc brake assembly is within the confines of the wheel and concentric with the axle, the disc brake assembly including a housing mounted to the vehicle and a radial disc within the housing and means mounting the disc to the wheel, the disc having at least a first radial planar friction surface and a first brake shoe provided adjacent the first planar friction surface movable axially towards and away from the first friction surface of the disc for friction engagement therewith and release thereof, means provided for restraining the first brake shoe from rotating with the disc, an intermediate wall member mounted within the housing and fixed thereto extending parallel with the radial disc and located such that the first brake shoe moves axially between the intermediate wall and the radial disc, a movable spring abutment means mounted for axial movement within the housing between the intermediate wall and the housing wall such that the intermediate wall is between the movable spring abutment means and the first brake shoe, rigid pusher link members extending between the

spring abutment means and the first brake shoe pass through the intermediate wall such that the spring abutment means moves in unison, axially with the first brake shoe, a spring means extending between the housing wall and the spring abutment means such that the spring urges against the spring abutment means to press the first brake shoe against the first



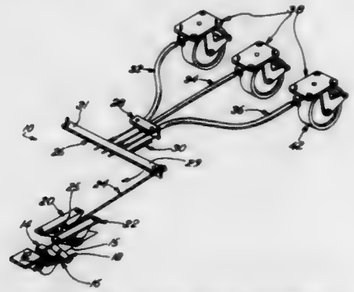
friction surface of the disc, and a first fluid bladder being provided between the intermediate wall and the spring abutment means whereby the first bladder, when expanded, forces the spring abutment means to overcome the spring means to release the first brake shoe from the first friction surface of the disc.

5,205,381

BRAKE SYSTEM

Robert J. Mehmen, Shell Rock, Iowa, assignor to Waterloo Industries, Inc., Waterloo, Iowa

Filed Feb. 19, 1991, Ser. No. 657,663
Int. Cl.[5] B62B *05/04*
U.S. Cl. 188—19 **2 Claims**



1. A moveable tool storage cabinet comprising a planar underside portion, a plurality of attached wheels, and a brake system, the brake system including:

brake mechanisms for slowing the motion of a plurality of said wheels, each said brake mechanism including two L-shaped wheel mounts, a curved brake arm pivotally attached at one end to said L-shaped wheel mounts, and a brake pad on said curved brake arm;

a brake cable for engaging each of said brake mechanisms, said brake cables being in a plane substantially parallel with said planar underside portion of said moveable tool storage cabinet, and also being operatively attached to said curved brake arms;

an actuator bracket having an attached end and a free end, said attached end being operatively attached to said planar underside portion of said moveable tool storage cabinet, said free end of said actuator bracket being adapted to swing about said attached end in a plane substantially parallel to said planar underside portion of said moveable tool storage cabinet, and said brake cables being operatively attached to said actuator bracket intermediate to said attached and free ends of said actuator bracket;

an actuator rod for swinging said actuator bracket, said actuator rod having one end operatively attached to said free end of said actuator bracket and being in a plane substantially parallel with said planar underside portion of said moveable tool storage cabinet;

a brake pedal pivotally mounted to said moveable tool storage cabinet and operatively attached to said actuator rod, said free end of said actuator bracket swinging upon engagement of said actuator rod by said brake pedal, thereby engaging the brake mechanisms;

a brake catch adapted to lock said brake pedal in a position where said brake pedal is engaging said actuator rod; and

a brake release pedal operatively attached to said brake catch and adapted to release said brake catch, thereby releasing said brake pedal from a locked position and disengaging said actuator rod.

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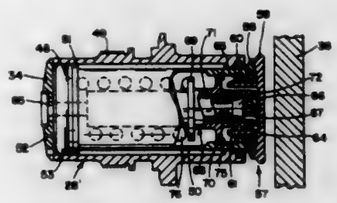
AIRCRAFT BRAKE

Frank D. Edmisten, Troy, Ohio, assignor to The B F Goodrich Company, Akron, Ohio

Continuation of Ser. No. 594,471, Oct. 9, 1990, abandoned. This application Mar. 5, 1992, Ser. No. 846,318
Int. Cl.[5] F16D *55/36*
U.S. Cl. 188—71.5 **7 Claims**



1. In an aircraft multiple disc and brake assembly having an axle means with a central axis; a cylindrical wheel member journaled on said axle means; said cylindrical wheel member having an inner peripheral circumferentially extending portion and a radially disposed rim portion for mounting on said axle means for rotation thereon; said inner peripheral portion has a plurality of circumferentially spaced splines; a plurality of axially spaced rotor discs mounted on said axle and keyed to said splines for rotation therewith; said axle means having a stationary hub means; a torque tube secured to said hub means; said torque tube having a plurality of axially extending ribs; a plurality of stator discs with circumferentially spaced slots engaging said ribs for axial movement of said stator discs; said rotor discs interleaved between said stator discs to define a brake stack; a piston support member secured to said hub, a plurality of circumferentially spaced cylinders mounted on said piston support member; each cylinder having an elongated piston sleeve slidably mounted therein; one end of said piston sleeve has an end wall that is cooperative with said cylinder to define a piston chamber which is selectively pressurized, the other end of said piston sleeve has a pair of caps integral therewith and with annular mating surfaces; one of said caps has an annular portion secured to said sleeve while the other one of said caps has a rearwardly disposed annular portion movably retained relative to said one cap, said other one of said caps has a forwardly disposed disc portion operative to engage said brake stack; and said annular mating surface of said one cap secured to said sleeve has a convex surface mating with a

a position at which the valve member is raised off of said valve seat to thereby open said one of the passages

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HYDRAULIC ACTUATOR FOR A FRICTION CLUTCH

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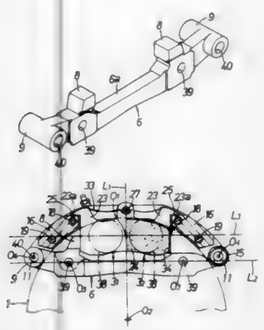
concave surface of said other cap to distribute forces away from the axis of said sleeve as said other cap engages said brake stack.

5,205,383
REACTION FORCE TYPE DISK BRAKE
Hideyuki Terashima, Nagano, Japan, assignor to Nissin Kocyo Co., Ltd., Ueda, Japan
Filed Nov. 6, 1991, Ser. No. 788,696
Claims priority, application Japan, Dec. 11, 1990, 2-400348
Int. Cl.[5] F16D *65/20*
U.S. Cl. 188—73.45 **3 Claims**

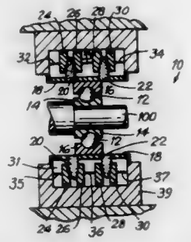


1. A reaction force type disk brake comprising a first and a second friction pad facing opposite faces of a brake disk, respectively; a brake caliper provided with a first and a second clamping arm for clamping both the friction pads; opposite ends of the brake caliper in a circumferential direction of the brake disk being supported by a pair of slide-pin support portions of a fixed bracket through slide pins outside an outer periphery of the brake disk for sliding movements in a direction of a rotational axis of the brake disk; an urging member provided on the first clamping arm and having a center of urging at a central position of the first friction pad in the circumferential direction of the brake disk for urging the first friction pad to the brake disk; a pair of first braking-torque support portions mounted on the bracket for supporting a braking torque of the first friction pad; and a pair of second braking-torque support portions mounted on the brake caliper for supporting a brake torque of the second friction pad; wherein

a pair of fixing points at which the bracket is fixed to a stationary member are located on the opposite sides of a first straight line which passes the center of urging and a center of rotation of the brake disk, the fixing points being disposed on a second straight line which crosses the first straight line at a location closer to the center of rotation with respect to the center of urging, and wherein a slide-pin support portions and the first braking-torque support portions are formed in a body of the bracket in a bifurcated manner from the fixing points, and slide-pin support points of both the slide-pin support portions are arranged in a region defined between the second straight line and a third straight line which passes through the center of urging in parallel with the second straight line.

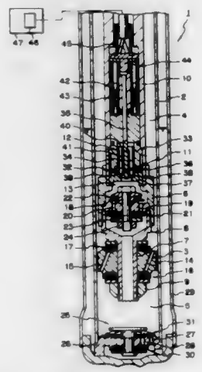
5,205,384
POWDER-LUBRICATED DAMPER WITH WAVY DAMPER PADS
Hooshang Heshmat, Niskayuna, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.
Filed Oct. 22, 1990, Ser. No. 601,304
Int. Cl.[5] F16D *65/78, 55/00*
U.S. Cl. 188—264 B **8 Claims**

1. A damper arrangement adapted for use in temperatures exceeding 1000° F., comprising circular damper pads abutting damper elements thereby forming a shearing zone, said damper pads including a wavy outer surface, and a dry solid powdered



lubricant circulated about said damper pads and said damper elements in response to motion between said damper pads and said damper elements.

5,205,385
ADJUSTABLE DAMPING FORCE HYDRAULIC SHOCK ABSORBER
Masahiro Ashiba, Kanagawa, Japan, assignor to Tokico, Ltd., Kanagawa, Japan
Filed Jul. 18, 1991, Ser. No. 732,122
Claims priority, application Japan, Jul. 20, 1990, 2-192264
Int. Cl.[5] F16F *9/34*
U.S. Cl. 188—299 **7 Claims**



1. An adjustable damping force hydraulic shock absorber comprising:

a cylinder containing hydraulic fluid therein;

a piston slidably disposed in the cylinder;

two partitioned chambers communicating with each other via a plurality of passages, one of the passages defining a valve seat therein;

damping force generating mechanism means for generating a damping force by controlling a flow of hydraulic fluid through the passages generated by a sliding of the piston in the cylinder; and

valve means for adjusting the damping force by selectively opening and closing said one of the passages, said shock absorber being in a hard mode in which a relatively large damping force is generated when said one of the passages is closed and being in a soft mode in which a relatively small damping force is generated when said one of the passages is open, said valve means including

a valve member axially movable in the cylinder between a position at which the valve member is seated on said valve seat to thereby close said one passage of the passages and

a position at which the valve member is raised off of said valve seat to thereby open said one of the passages,

a plunger having a shaft extending through said valve member and slidable relative thereto, said plunger being made of a magnetic material,

a retainer internal with said shaft and adapted to engage said valve member to lift the valve member from said valve seat,

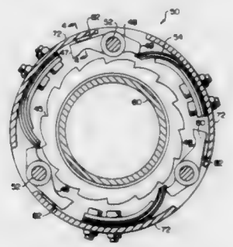
first biasing means for biasing said valve member away from said valve seat,

second biasing means for biasing said valve member towards said valve seat,

a supporting member disposed below said plunger, said supporting member being made of a magnetic material, said shaft of the plunger extending through said supporting member, and

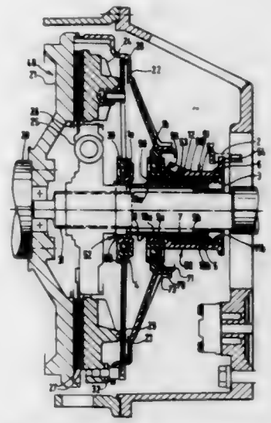
a solenoid into which said plunger extends and is slidable relative thereto, said plunger being displaced into contact with said supporting member against the force of said first biasing means and said retainer being separated from said valve member when said solenoid is energized so as to permit said second biasing means to seat said valve member on the valve seat.

5,205,386
PAWL AND RATCHET CLUTCH WITH PAWL HOLDBACK
Robert B. Goodman, West Hartford, Conn., and Robert Telakowski, Fairlawn, N.J., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 5, 1992, Ser. No. 846,653
Int. Cl.[5] F16D *41/12, 43/04*
U.S. Cl. 192—46 **2 Claims**



1. A pawl and ratchet clutch assembly for use in transmitting rotational drive torque from a driving member to a driven member, said pawl and ratchet clutch assembly comprising ratchet means mounted to the drive member, a plurality of ferromagnetic pawls disposed circumferentially about said ratchet means and operable in engagement therewith to transmit the rotational drive torque from the driving member to the driven member, each of said pawls being pivotally supported for movement into and out of engagement with said ratchet means, spring means for biasing said pawls to pivot radially inwardly into engagement with said ratchet means, and holdback means operatively associated with said pawls for retarding said pawls from pivoting inwardly when said driven shaft is rotating at a speed above a desired reengagement speed, said holdback means comprising a plurality of magnets with at least one magnet being operatively associated with each of said pawls, each of said magnets disposed radially outwardly of its associated pawl whereby said ferromagnetic pawls are held by said magnets out of engagement with said ratchet means.

5,205,387
HYDRAULIC ACTUATOR FOR A FRICTION CLUTCH
Eduardo A. Checa, Murcia, Spain, assignor to Valeo, Cedex, France
Filed Mar. 19, 1992, Ser. No. 854,391
Claims priority, application France, Mar. 22, 1991, 91 03489
Int. Cl.[5] F16D *25/08*
U.S. Cl. 192—85 CA **13 Claims**



1. A motor vehicle clutch assembly comprising a fixed part of a vehicle, a friction type transmission clutch, and means mounting the clutch to said fixed part of the vehicle, the clutch including a cover plate, a first bearing mounted centrally in the cover plate, a declutching means within the cover plate, and an actuating member engaging the declutching means and comprising a second bearing in the form of a rolling bearing having a fixed bearing ring, for acting in traction on the declutching means whereby to disengage the clutch, the clutch assembly further including a fluid operated actuator comprising a hollow tubular cylinder having a leading end portion and a free end, a hollow tubular piston mounted concentrically within the cylinder and capable of axial translation with respect to the cylinder, a central chamber delimited by said cylinder and said piston, and means for preventing relative rotation between the piston and cylinder, the cylinder defining axial thrust means for axial engagement on said first bearing, and the piston having means for engaging the declutching means for acting on the declutching means, wherein said leading end portion of the cylinder is arranged to bear on said first bearing, the actuator further including first rotation stop means carried by the cylinder for preventing rotation of the cylinder with respect to said fixed part, the piston projecting axially beyond said leading end portion of the cylinder for cooperation with said fixed bearing ring of the second bearing.

5,205,388
CLUTCH COVER ASSEMBLY
Yasuyuki Hashimoto; Toru Hamada, and Hiroshi Takeuchi, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan
PCT No. PCT/JP91/00306, § 371 Date Nov. 18, 1991, § 102(e) Date Nov. 18, 1991, PCT Pub. No. WO91/14879, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 7, 1991, Ser. No. 773,640
Claims priority, application Japan, Mar. 23, 1990, 2-30346[U]
Int. Cl.[5] F16D *13/71*
U.S. Cl. 192—89 B **2 Claims**

1. A clutch cover assembly comprising:

an annular pressure plate;

a diaphragm spring disposed at a backside of and in coaxial

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individually to an empty forming station, and a following

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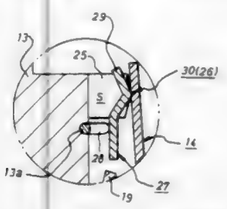
relation to said pressure plate, said pressure plate having a plurality of projections extending at a backside of said pressure plate, said plurality of projections arranged in the same circumferential direction with a clearance left between each said projection and projecting to an outer peripheral part of said diaphragm spring, each said projection having a loading fulcrum point supporting an outer peripheral part of said diaphragm spring at time of clutch engagement, wherein an annular bearing plate is installed



in a coaxial relationship between said pressure plate and said diaphragm spring, the bearing plate integrally having a releasing fulcrum point which is disposed in the clearance and elastically supporting the outer peripheral part of said diaphragm spring by being distorted in an axial direction, wherein said releasing fulcrum point and said loading fulcrum point are arranged on the same circumference; and

a spring member displaceable in an axial direction interposed between said pressure plate and said diaphragm spring.

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CLUTCH DISK

Harald Raab, Schweinfurt, and Norbert Ament, Werneck, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1991, Ser. No. 768,815

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1990, 4031762

Int. Cl.[5] **F16D** *13/64, 3/14*

U.S. Cl. 192—106.2 **6 Claims**

limited rotational clearance but otherwise non-rotatably to the hub (**1**);

an idling damper, which acts only within the first rotational clearance and is designed for idle running, with an input disk part (**10, 11**) coupled to the output part (**2**) and an output disk part (**12, 13**) which is held non-rotatably on the hub (**1**) and is coupled torsionally elastically to the input disk part (**11**) by means of at least one second spring (**14, 15**) designed for idle running;

a load friction device, designed for load running, with a rotatable friction disk (**23, 24**) arranged axially between the two disk parts (**11, 12; 11, 13**) of the idling damper;

a friction device designed for idle running, wherein the friction disk (**23, 24**) is axially resiliently in direct frictional contact with the input disk part (**11**) on one of its sides and, with the output disk part (**12; 13**) of the idling damper on the other of its sides, and wherein a friction pair between the friction disk (**23, 24**) and the input disk part (**11**) has a coefficient of friction that is different from a coefficient of friction of a friction pair between the friction disk (**23, 24**) and the output disk part (**12, 13**); and

the friction disk (**23, 24**) is coupled with a second limited rotational clearance but otherwise non-rotatably to a first one (**12, 13**) of the two disk parts and the coefficient of friction of the friction pair between the first disk part (**12, 13**) and the friction disk (**23, 24**) is lower than the coefficient of friction of the friction pair between the second one (**11**) of the two disk parts and the friction disk (**23, 24**).

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STOCK SEPARATING APPARATUS

Masahiro Ikenaka, and Kunihiko Tanaka, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

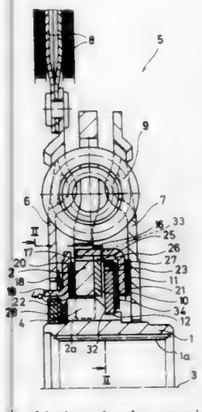
PCT No. PCT/JP89/00948, § 371 Date Jul. 16, 1991, § 102(e) Date Jul. 16, 1991, PCT Pub. No. WO90/03234, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 19, 1989, Ser. No. 525,170

Claims priority, application Japan, Sep. 20, 1988, 63-122089

Int. Cl.[5] **B65G** *11/00*

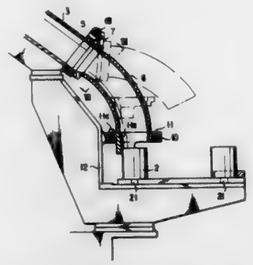
U.S. Cl. 193—2 R **2 Claims**



1. Clutch disk for a friction clutch comprising:

a hub (**1**) which is concentric to an axis of rotation (**3**);

a load damper, designed for load running, with an input part (**6, 7**) which is rotatable relative to the hub (**1**) and an outer part (**2**) which is torsionally elastically coupled to the input part (**6, 7**) by means of a plurality of first springs (**9**) designed for load running and is coupled with a first



1. In a stock separating apparatus which separates articles that drop successively from a stock feed source through an upper chute and feeds them one by one to a working machine, wherein the improvement comprises means for mounting said upper chute provided at a lower end of said upper chute, a circularly curved lower chute provided at said lower end of said upper chute, an attachment provided at the lower end of said lower chute, said attachment being detachably mounted to an attachment holder which is horizontally pivotally secured to the body of the apparatus via a bracket, said attachment being provided with a hole through which said articles pass, wherein the attachment is replaceable with ease and within a short time period, in accordance with varying sizes of said articles.

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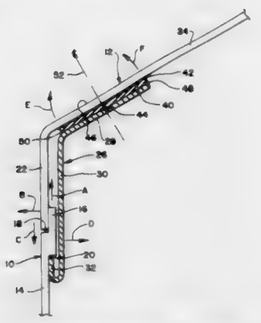
ADHESIVE ATTACHING SYSTEM

Thomas R. Nurnberg, Bettendorf, Iowa, and James J. VanMeenen, Atkinson, Ill., assignors to Mongomery Elevator Company, Moline, Ill.

Filed Jul. 16, 1992, Ser. No. 913,831

Int. Cl.[5] **B65G** *15/00, 17/00;* **B66B** *21/00, 29/04*

U.S. Cl. 198—325 **4 Claims**



1. In a passenger conveyor which includes a series of platforms movable along a path between a pair of side skirts, the side skirts being attached respectively to decks projecting upwardly from the skirts, an improved system for attaching a skirt member to a deck member wherein one of the members includes a generally planar portion, comprising:

an attachment clip having a generally planar portion at one end and an opposite end adapted to be coupled to the other of said skirt and deck members;

a generally planar base sandwiched between the generally planar portion of the attachment clip and the generally planar portion of said one of the skirt and deck members;

adhesive means between the base and the generally planar portion of said one of the skirt and deck members; and

weld means between the base and the generally planar portion of the attachment clip,

wherein said attachment clip and said base are fabricated of sheet metal material.

5,205,392

METHOD AND APPARATUS FOR FORMING WORKPIECES, USING A SEQUENCE OF STATIONARY FORMING STATIONS

Sigurd von Seld, Hamburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Rissen GmbH, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP90/00653, § 371 Date Oct. 21, 1991, § 102(e) Date Oct. 21, 1991, PCT Pub. No. WO90/12673, PCT Pub. Date Nov. 1, 1990

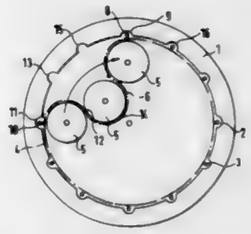
PCT Filed Apr. 23, 1990, Ser. No. 773,851

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913213

Int. Cl.[5] **B65G** *17/00*

U.S. Cl. 198—343.1 **18 Claims**

1. Method of guiding a closed row of workpiece holders through a closed sequence of forming stations which are arranged in a stationary position in a generally circular shape and in which the workpiece holders are temporarily held in place and are periodically transferred, wherein the forming stations are constantly occupied by workpiece holders except for at least one empty forming station, and the workpiece holders, which are arranged flexibly in a row and the number of which is different from the number of forming stations, are transferred in succession by a transfer means which revolves continuously and concentrically relative to the sequence of forming stations, and wherein each workpiece holder is transferred individually to an empty forming station, and a following workpiece holder is transferred to the empty forming station



formerly occupied by the previously transferred workpiece holder.

5,205,393

APPARATUS FOR TRANSFERRING SMALL GOODS OUT OF AND ONTO A CONVEYOR BELT

Siegmar Malow, Constance, and Norbert Brucks, Berlin, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

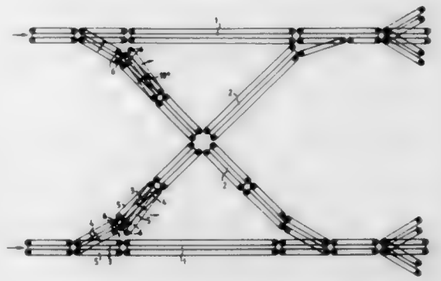
PCT No. PCT/EP91/01198, § 371 Date Mar. 10, 1992, § 102(e) Date Mar. 10, 1992, PCT Pub. No. WO92/00906, PCT Pub. Date Jan. 23, 1992

PCT Filed Jun. 26, 1991, Ser. No. 838,298

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1990, 4022163

Int. Cl.[5] **B65G** *37/00*

U.S. Cl. 198—369 **3 Claims**



1. An apparatus for transferring small goods from a main conveyor belt (**1**) to a branch-off conveyor belt (**2**), the apparatus including a pivotal lateral guide perpendicular to the conveyor belt, characterized in that a pivotal module (**3**) is provided in the main conveyor belt (**1**) as well as at the beginning of the branch-off conveyor belt (**2**), with each module (**3**) including two lateral conveyor belts (**4**) that are perpendicular to the conveyor belt and the lateral conveyor belts (**4**) of the pivotal module (**3**) of the main conveyor belt (**1**) have the same length and the lateral conveyor belts (**4**) of the pivotal module of the branch-off conveyor belt (**2**) have different lengths, with the difference in length corresponding to the offset of the lateral conveyor belts of the main conveyor belt when pivoted out.

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the vertical plane, where the second direction is substan-

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REMAINED ROVING BOBBIN EXCHANGING DEVICE

compressed in an amount within the range of from about 50 percent to about 80 percent to a fiber density, basis dry fiber

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DEVICE FOR THE PERPENDICULAR CHANGE IN THE DIRECTION OF CONVEYANCE OF A FOODSTUFF, IN PARTICULAR CHEESE, SAUSAGE AND SIMILAR PRODUCT IN SLICE FORM

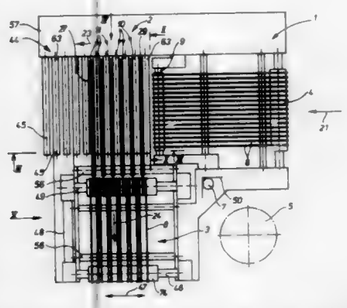
Roland Zeuschner, Hergatz, Fed. Rep. of Germany, assignor to Natec, Reich, Summer GmbH & Co. KG., Opfenbach, Fed. Rep. of Germany

Filed Jul. 31, 1991, Ser. No. 738,571

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1991, 9102061

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—369 **9 Claims**



1. Device for the perpendicular change in the direction of transportation of a food, in particular cheese, sausage and such a slice form, whereby the food in connection with a rotation of 90° is transferred to a perpendicular transfer belt, whereby a supply belt in the direction of travel places the food as individual slice on a reorientation device, whereby the reorientation device features a first and second lift position and the first raised lift position transports the individual slice in longitudinal direction in a first conveyor device in the original direction of travel while in the second lowered lift position a second displaced conveyor device engages the individual slice and transfers it onto the transfer belt, the second conveyor device comprising a conveyor belt device and the transfer belt having a drive shaft, the conveyor belt device and the transfer belt being arranged on a plane behind one another and being swingable jointly around the drive shaft.

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VIBRATORY MOVEMENT AND MANIPULATION APPARATUS AND METHOD

David A. Bruno, San Diego; Mark J. Brooks, Oceanside; Quang Nguyen, San Diego, and David M. Brooks, Vista, all of Calif., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Jun. 10, 1991, Ser. No. 714,155

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—389 **20 Claims**

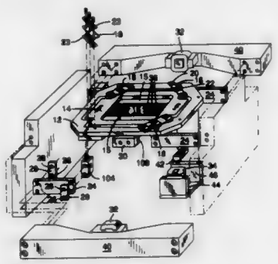
1. An apparatus for reversibly transporting parts along a surface comprising:

an electromagnetic coil oriented in a horizontal plane capable of displacing the surface in a first direction in the horizontal plane;

a means for displacing the surface in a second direction in the horizontal plane, where the second direction is substantially opposite to the first direction in the horizontal plane;

an electromagnetic coil oriented in a vertical plane capable of displacing the surface in a first direction in the vertical plane; and

a means for displacing the surface in a second direction in the vertical plane, where the second direction is substantially opposite to the first direction in the vertical plane,



thereby generating bidirectional part movement along the surface.

5,205,396

CONVEYOR APPARATUS FOR MUTUALLY INDEPENDENT PALLETS THAT CARRY BOBBINS OR BOBBIN TUBES

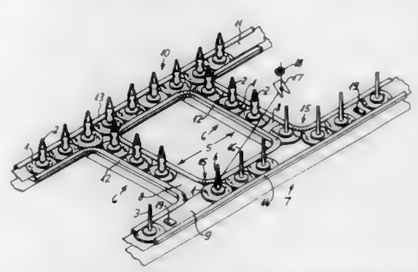
Hans Grecksch, Mönchengladbach, and Rene Bucken, Grefrath, both of Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 17, 1991, Ser. No. 716,066

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1990, 4019100

Int. Cl.[5] B65G *49/00*

U.S. Cl. 198—465.1 **12 Claims**



1. In a conveyor system for mutually independent pallets carrying bobbins or bobbin tubes, a conveyor apparatus, comprising a conveyor route, mutually independent pallets for carrying bobbins or bobbin tubes and having base plates, a moving surface for imparting a slaving force to said base plates standing on said moving surface and for slaving said base plates in a general conveying direction along said conveyor route by friction for a given first period of time, and means associated with said moving surface acting upon unmoving pallets for temporarily varying said slaving force of said moving surface for a given second period of time, said second period of time being substantially shorter than said first period of time, said slaving force varying means being spaced-apart uneven features protruding from said moving surface, and the base plates having lower surfaces with beveled peripheries.

5,205,397

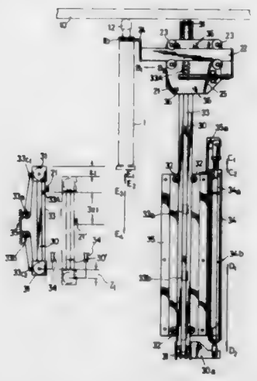
REMAINED ROVING BOBBIN EXCHANGING DEVICE

Hiroaki Sanno, Ishikawa, Japan, assignor to Kabushiki Kaisha Murao and Company, Kanazawa, Japan

Continuation of Ser. No. 654,059, Feb. 12, 1991, abandoned. This application Apr. 14, 1992, Ser. No. 867,087

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—465.1 **9 Claims**



1. A device for exchanging a roving bobbin between a first position hanging from a transporting line and a second position on a tray in a tray transporting device provided beneath the transporting line, said device for exchanging a roving bobbin comprising:

a vertical moving block seat for removing a roving bobbin from said transporting line, said vertical moving block seat being attached to a movable belt;

a rod which can be moved up and down relative to a fixed frame, said rod having a guide roller rotatably mounted at each end thereof for receiving said belt, said belt passing around each of said guide rollers and said belt also passing around a plurality of fixed rollers rotatably mounted on said fixed frame; and

at least one cylinder extending between an end of said rod and said fixed frame, said cylinder being expandable to move said rod and said belt relative to said fixed frame such that said vertical moving block seat is moved with a stroke of several times the length of a stroke of said at least one cylinder.

5,205,398

INSULATING ROLL COVER

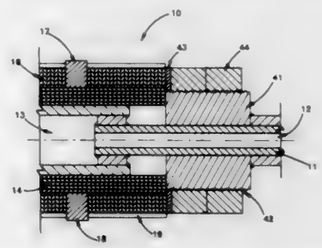
Charles M. Hart, Streetsboro; James D. Rogers, Mantua; Harry L. King, Hudson, and John J. Bartholomew, Mentor, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 559,736, Jul. 27, 1990, abandoned. This application Jun. 27, 1951, Ser. No. 719,252

Int. Cl.[5] B65G *13/02*

U.S. Cl. 198—780 **66 Claims**

1. A roller especially adapted for use in roller conveying articles, which articles are at substantially elevated temperature, or which articles are being conveyed through a zone of substantially elevated temperature, which roller comprises an inner shaft having at least one dense and refractory, elevated temperature resistant annular insulating cover member of highly compressed at least substantially ceramic fiber, including fibers of different lengths, with there being some fibers having lengths of at least about 2 inches, said fibers being compressed in an amount within the range of from about 50 percent to about 80 percent to a fiber density, basis dry fiber,



within the range of from about 16 to about 50 pounds per cubic foot.

5,205,399

CONVEYOR BELT RETURN TRAINING DEVICE

Billy B. Millhollin, P.O. Box 549, Forsyth, Mont. 59327

Filed Dec. 6, 1991, Ser. No. 804,081

Int. Cl.[5] B65G *39/16*

U.S. Cl. 198—840 **6 Claims**

1. A training device for guiding a continuous belt having opposite sides and edges defining a belt width in between and moving in a direction of travel, the device comprising:

a frame having opposite sidewalls each positioned adjacent to an opposite edge of the belt;

a first pair of elongate low friction devices fixedly attached between the widewalls, the pair of low friction devices positioned one above the other and further positioned to engage opposite sides of the belt with each device having a respective longitudinal axis positioned generally perpendicular to the direction of travel and in a generally horizontal direction and each device having a belt engaging surface which extends continuously and completely across the width of the belt;

a second pair of elongate low friction devices spaced apart downstream from the first pair of low friction devices in the direction of travel and fixedly attached between the sidewalls; the second pair of low friction devices positioned one above the other and further positioned to engage opposite sides of the belt with each device having a respective longitudinal axis positioned generally perpendicular to the direction of travel and in a generally horizontal direction and each device having a belt engaging surface which extends continuously and completely across the width of the belt;

a pair of low friction guide devices positioned intermediate the first and second pair of low friction devices and connected to the frame so as to engage opposite edges of the belt;

the pair of low friction guide devices each having a longitudinal axis extending generally perpendicular to the direction of travel and in a generally vertical direction.

5,205,400

TRANSPORTATION DEVICE FOR TRANSPORTATION

a separate lid having a top wall, an end wall and a pair of spaced parallel side walls; and

ture with said fixed end wall (1*a*) that is large enough

bearing said adhesive being positioned across at least two

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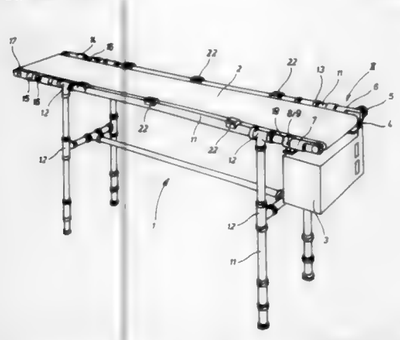
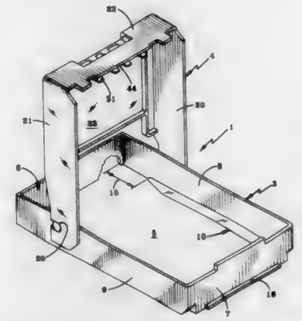
5,205,400
TRANSPORTATION DEVICE FOR TRANSPORTATION OF FOODSTUFFS
Walter Breuss, and Erwin Wolf, both of Heimenkirch, Fed. Rep. of Germany, assignors to Natec, Reich, Summer GmbH & Co. KG., Opfenbach, Fed. Rep. of Germany
Filed Oct. 11, 1991, Ser. No. 775,176
Int. Cl.[5] B65G *15/60*
U.S. Cl. 198—812 8 Claims



1. A transportation device for the transportation of items such as foodstuffs, comprising:
a conveyor frame having a pair of spaced elongate side members extending between opposite ends of the frame;
a first pair of end supports releasably connected to the ends of respective side members at one end of the frame;
a second pair of end supports releasably connected to the ends of respective side members at the opposite end of the frame;
each pair of ends supports having free outer ends;
a first roller rotatably supported between the free outer ends of the first pair of supports at one end of the frame;
a second roller rotatably supported between the free ends of the second pair of supports at the opposite end of the frame;
the first roller comprising a driven roller;
one of said first pair of supports comprising means for swinging up at one end away from said frame; and
a continuous conveyor belt extending over said rollers.

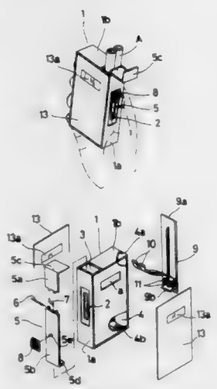
5,205,401
CASSETTE SECURITY CONTAINER
James T. Weisburn, Massillon, and John P. Hoerger, Minerva, both of Ohio, assignors to Alpha Enterprises, Inc., East Canton, Ohio
Filed Jun. 26, 1991, Ser. No. 721,113
Int. Cl.[5] A45C *13/10*; B65D *85/672*
U.S. Cl. 206—1.5 18 Claims

18. A security container for an article including:
a base having a storage compartment formed by first and second spaced parallel end walls, a pair of spaced parallel side walls and a bottom wall, and having an access opening opposite of the bottom wall for placing and removing the package into and from the storage compartment, said compartment having a size and configuration generally equal to that of the article being contained therewith, said bottom wall terminating in a spaced relationship from the first end wall to provide an end portion of the container defined only by the first end wall and adjacent portions of the sidewalls and having a thickness defined by the height of said end wall and sidewall portions nearly equal to the thickness of the package contained within the storage compartment;
a separate lid having a top wall, an end wall and a pair of spaced parallel side walls; and



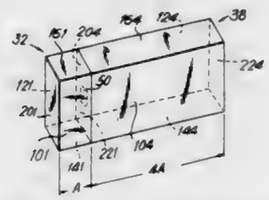
pivot means spaced inwardly from the first wall of the base for pivotally mounting the lid on said base.

5,205,402
CIGARETTES CASE
Hikotaro Maeda, Nagoya, Japan, assignor to Nagoya Kenkotabako Yugen Kaisha, Nagoya, Japan
Filed Dec. 30, 1991, Ser. No. 813,748
Claims priority, application Japan, Dec. 28, 1990, 2-406880[U]
Int. Cl.[5] A24F *15/06*; B65D *85/10*
U.S. Cl. 206—250 3 Claims



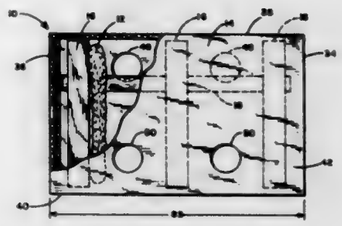
1. A container for holding and dispensing cigarettes comprising in combination
(A) a case body (1) which comprises
(a) a rectangular top wall (1*b*) and a spaced apart rectangular bottom wall of corresponding size and shape,
(b) two spaced apart side walls connecting said top wall (1*b*) and said bottom wall along the longer of said dimensions of said rectangular top wall (1*b*) and the corresponding rectangular bottom wall,
(c) a fixed end wall (1*a*) connecting said top wall (1*b*) and said bottom wall along the shorter dimension of said rectangular top wall (1*b*) and the corresponding rectangular bottom wall,
(d) a removable end wall (9) extending between said top wall (1*b*) and said bottom wall along the shorter dimension of said rectangular top wall (1*b*) and the corresponding rectangular bottom wall,
(e) an opening (3) in said top wall (1*b*) adjacent the juncture with said fixed end wall (1*a*) that is large enough for the removal for one or two cigarettes,
(f) a vertical slit (2) in said fixed end wall (1*a*), and
(B) a slider (5) mounted for vertical sliding movement along the interior side of said fixed end wall (1*a*) in a path which is closely parallel to said fixed end wall (1*a*) and perpendicular to said top wall (1*b*), said slider (5) including
(a) an upper portion (5*a*) and a lower portion (5*b*) that are hingedly connected together so that the upper portion (5*a*) can pivot outwardly after it passes through said opening (3),
(b) a lid portion (5*c*) on said upper portion (5*a*) which covers said opening (3) when the slider (5) is in its lowermost position, and which does not cover said opening (3) when the slider (5) is in its uppermost position,
(c) a bottom support (5*d*) on said lower portion (5*b*) which is parallel to said bottom wall, which projects toward said removable end wall (9) and which is of sufficient size to support one or two cigarettes thereon, and
(d) a control member (5*e*) (8) on said slider (5) which extends outwardly through the vertical slit (2) in said fixed end wall (1*a*) that permits said slider (5) to be manually moved up and down along a controlled vertical path within said case body (1).

5,205,403
MULTIPLE UNIT CARTON
James A. DeBlasio, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 774,529, Oct. 8, 1991, Pat. No. 5,141,106. This application Feb. 19, 1992, Ser. No. 836,836
Int. Cl.[5] B65D *85/10, 5/54*
U.S. Cl. 206—256 42 Claims



1. A multiple unit cigarette carton for packaging cigarette packs and of dimensions compatible with commercially available tax-stamping machinery used in the automated processing of cigarette cartons, each said cigarette pack having a pair of opposed long walls and a pair of opposed short walls, said multiple-unit cigarette carton comprising:
a first carton having a first pair of first and second opposed walls, each wall at least as wide as a first number of times the width of the long wall of a cigarette pack; and a second pair of third and fourth opposed walls, each wall at least as wide as a second number of times the width of the short wall of a cigarette pack;
a second carton having a third pair of fifth and sixth opposed walls, each wall at least as wide as a third number of times the width of the long wall of a cigarette pack; and a fourth pair of seventh and eighth opposed walls, each wall being substantially the same width as said third and fourth walls of said first carton; wherein:
said first and second cartons are positioned with one of said third and fourth walls of said first carton adjacent and coextensive with one of said seventh and eighth walls of said second carton to form said multiple unit carton composed of at least said first and second carton joined along adjacent coextensive walls; said multiple unit carton further comprising:
at least one substantially flat carrier means having a first side and a second side, and an adhesive borne on at least part of at least one side of said carrier means, said carrier means bearing said adhesive being positioned across at least two adjacent walls of said first and second cartons with said adhesive in operative contact with said at least two adjacent walls to securely yet releasably connect said cartons in position adjacent one another.

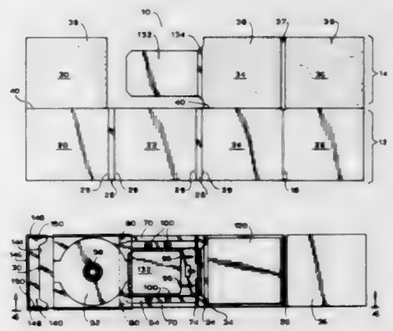
5,205,404
DECORATIVE WREATH SHIPPING CONTAINER
Christopher R. Mickman, Anoka, and John S. Mickman, Wyoming, both of Minn., assignors to Mickman Bros. Nurseries, Inc., Anoka, Minn.
Filed Sep. 21, 1992, Ser. No. 947,624
Int. Cl.[5] B65D *85/02*
U.S. Cl. 206—303 21 Claims



1. A container comprising:
(a) a carton having four sides and two opposed ends;
(b) at least one insert having a base with a tube hole formed therethrough, the insert fitting inside the carton; and
(c) an elongated tube extending through the tube hole from one end of the carton to the other end of the carton.

19. A container comprising:
(a) two ends and four sides therebetween;
(b) an insert having a base and side walls, the base having a tube hole; and
(c) an elongated tube extending through the tube hole for supporting an article being transported or stored, the tube extending perpendicular to a plane of the base and generally from one end to another.

5,205,405
COMPACT DISC HOLDER AND PACKAGE THEREFOR
Patrick J. O'Brien, Hackensack, N.J., and Larry Durham, Terre Haute, Ind., assignors to Ivy Hill Corporation, New York, N.Y.
Filed May 10, 1991, Ser. No. 698,201
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—310 51 Claims



1. A holder for a compact disc comprising:

5,205,409
NEEDLE REMOVAL (CONTAINMENT AND

depressions in the surface of the panel, said depressions being

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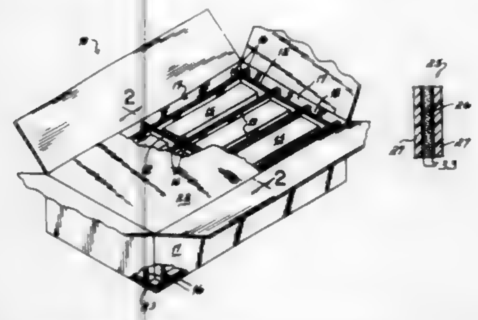
(A) a tray adapted to releasably receive a compact disc thereon, and
(B) a base in telescopic relationship with said tray;
said holder being movable from a spanning configuration wherein said base and said tray are substantially untelescoped to a telescoped configuration wherein said base and said tray are substantially overlying and non-releasable into said spanning configuration.

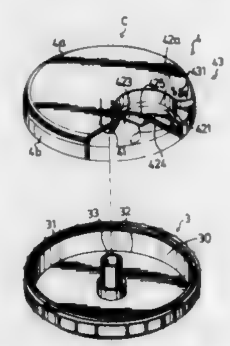
5,205,406
ANTI-STATIC COATED PAPERBOARD OR SIMILAR RIGID MATERIAL
Judson A. Bradford, Holland, Mich., assignor to Bradford Company, Holland, Mich.
Continuation of Ser. No. 585,718, Sep. 20, 1990, which is a division of Ser. No. 366,434, Jun. 15, 1989, Pat. No. 5,017,260, which is a continuation-in-part of Ser. No. 336,733, Apr. 12, 1989, Pat. No. 4,966,280, which is a continuation-in-part of Ser. No. 190,044, May 4, 1988, abandoned. This application Jun. 11, 1991, Ser. No. 713,756
Int. Cl.⁵ B65D *81/00, 25/14;* **B32B** *27/32*
U.S. Cl. 206—328 **18 Claims**



12. A multiple-ply paperboard comprising:
a first layer of permanently anti-static/static-dissipative material;
a second layer of permanently anti-static material;
a third layer of paperboard having first and second sides, said first and second layers being permanently applied to said first and second sides, respectively, of said paperboard so as to sandwich said paperboard between said first and second layers, said first and second layers being amine free and having been precast into solid form and rendered permanently anti-static/static-dissipative prior to application to said first and second sides of said paperboard; and
wherein said first and second layers have a surface resistivity of more than 10^5 but less than 10^{12} ohms per square.

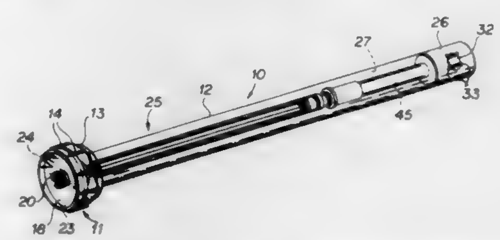
5,205,407
CASE FOR RECEIVING PAPER CLIPS, PINS OR THE LIKE
Charlie Tu, Taipei, Taiwan, assignor to C&T Products Corp., Taipei City, Taiwan
Filed Apr. 13, 1992, Ser. No. 867,858
Int. Cl.⁵ B65D *85/24*
U.S. Cl. 206—338 **5 Claims**

1. A case for receiving paper clips and pins comprising:
a pan having a bottom, a peripheral wall extending upwardly from said bottom and an open top;
an upper cover covering said open top and being rotatably mounted to said pan, said pan and said upper cover defining therebetwen a receiving space for receiving said paper clip and said pins, said upper cover including a top wall having an eccentric opening and a shoveling portion integral with said top wall and extending from a portion of a periphery of said opening toward said bottom of said pan in a circumferential direction, said paper clips and said pins being shoveled into said shoveling portion when said upper cover is rotated relative to said pan in a first direction, said paper clips and said pins being put into said receiving space through said opening when said upper



cover is rotated relative to said pan in a second direction opposite to said first direction.

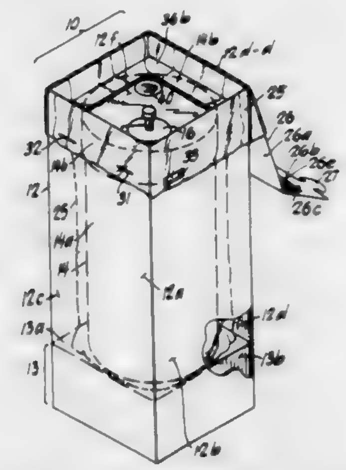
5,205,408
SYRINGE CASE
Neal E. Cobb, 181 Sloan St., Roswell, Ga. 30075
Filed Feb. 12, 1992, Ser. No. 834,657
Int. Cl.⁵ A65D *85/00*
U.S. Cl. 206—364 **7 Claims**



1. A case for housing a syringe of the type having an elongated barrel with a hub at one end from which a needle extends and a protective sheath removably mounted to the hub covering the needle, and wherein the case comprises an elongated, tubular member open at one end and having an aperture located adjacent the other end extending completely through said tubular member, said aperture being oriented transversely with respect to the axis of said elongated tubular member and being sized and shaped to receive and releasably hold the protective sheath, and means for removably capping said tubular member open end, whereby the needle may be manually unsheathed by a user for syringe use and resheathed by the user for syringe storage by insertion of the sheath into and extraction from the aperture.

6. A case for housing a syringe having a needle, a hub from which the needle extends, a barrel coupled with the hub and a removable protective sheath covering the needle, wherein said case comprises an elongated tubular member having an open end and an aperture located adjacent the other end having a size and shape to hold the removable protective sheath, a cap for capping said open end of said tubular member and having a passage therethrough, and indicator means for indicating that said cap has been removed and replaced upon said tubular member, said indicator means including a post mounted adjacent said tubular member open end positioned to extend through said cap passage upon said cap being replaced on said tubular member.

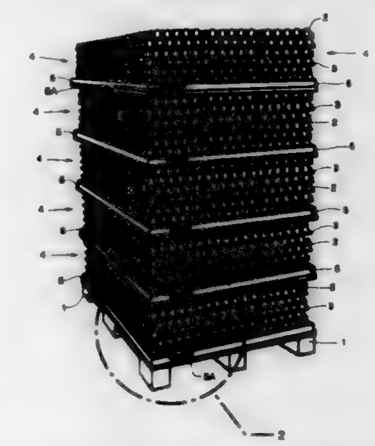
5,205,409
NEEDLE REMOVAL/CONTAINMENT AND TRANSPORT APPARATUS FOR SAFE STORAGE AND DISPOSAL OF HYPODERMIC NEEDLES/SYRINGE ASSEMBLIES
John Bruno, 77-83 Second Ave., Paterson, N.J. 07514
Division of Ser. No. 423,977, Oct. 19, 1989, Pat. No. 5,031,767. This application May 6, 1991, Ser. No. 696,447
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.⁵ B65D *83/10*
U.S. Cl. 206—370 **6 Claims**



1. An apparatus for safely collecting and storing medical waste for transport to disposal, comprising:
a transport housing having sidewall means forming an opening therewithin, said housing providing a cover member adapted to releasably close said opening;
a storage container disposed within said housing, said storage container having entry means for receiving medical waste therewithin; and
plastic bag means surrounding said storage container, said plastic bag means being adapted to contain liquid which may inadvertently leak out of said storage container; and
a needle removal device engaging said container in communication with said entry means, said needle removal device adapted to engage a hypodermic needle/syringe assembly having connectable needle hub and syringe body portions so as to permit said syringe body to be disconnected from said needle hub and said needle to be deposited into said container via said entry means.

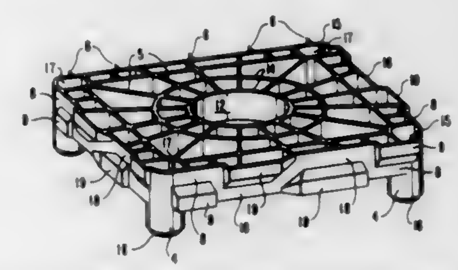
5,205,410
LOOSE-EGG TRANSPORT PANEL
Kenneth J. Kuipers, New Holland, and William F. Smith, New Oxford, both of Pa., assignors to Say Plastics, New Oxford, Pa.
Filed Mar. 16, 1992, Ser. No. 851,789
Int. Cl.⁵ B65D *19/00, 85/32*
U.S. Cl. 206—386 **5 Claims**

1. In an egg-stacking system for improved safety in shipping eggs comprising a pallet and including a plurality of egg containing trays mounted one atop another to form a stack, a plurality of stacks of equal height positioned side by side to form an array, and a plurality of arrays separated one above the other by a panel, the improved panel comprising a high density synthetic plastic having raised edges to prevent a plurality of egg-containing trays from sliding on the panel, a plurality of depressions in the surface of the panel, said depressions being positioned to lie between rows of eggs in the trays below the



panel to lock the panel and underlying stacks of eggs into a shift-resistant unit.

5,205,411
END WALL FOR A WOUND ROLL, EXHIBITING IMPROVED RESISTANCE TO LATERAL BREAKING
Norbert Born, Blieskastel, and Wolfgang Oberhausen, Mainz-Ebersheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Jul. 8, 1992, Ser. No. 910,441
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1991, 9108405
Int. Cl.⁵ B65D *21/02, 85/66, 85/672*
U.S. Cl. 206—391 **8 Claims**



1. An end wall for a wound roll, said end wall being made from a moldable material and comprising:
a rectangular plate having a plurality of sidewalls, rounded-off corners, and a front side facing in the direction of the wound roll, the front side having a smooth, flat surface; the rectangular plate further including a backside facing outwardly away from the wound roll;
radial webs and annular webs formed on the backside for reinforcing the rectangular plate;
locking bosses formed on the front side of the rectangular plate;
a central insertion peg for insertion in the wound roll located on the front side of the rectangular plate; and
stacking bosses and stacking pockets provided on at least two of said side walls of the rectangular plate, the stacking bosses being delimited by the stacking pockets of complementary design relative to the stacking bosses;
wherein at least one of said side walls has a plane surface;
wherein when wound rolls with end walls attached thereto are stacked side-by-side or vertically, the stacking bosses and stacking pockets of each end wall fit snugly into the stacking pockets and stacking bosses, respectively, of mutually adjoining end walls.

the adaptation of the internal space configuration to the shape

5,205,415

bottom portion; wherein, at least the bottom portion of the

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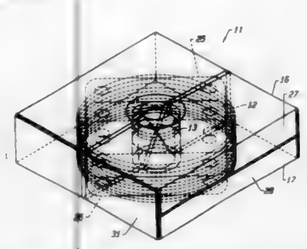
5,205,412

RECYCLABLE PACKAGE FOR A STACK OF ROLLS OF MAGNETIC TAPE

Alejandro V. Krieg, Mexico City, Mexico, assignor to Aurex, S.A. DE C.V., Mexico City, Mexico

Filed Apr. 8, 1992, Ser. No. 866,026
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—394 6 Claims



1. A recyclable package for a plurality of rolls of magnetic tape, comprising:
(a) a plurality of packaging components made of a biodegradable or reusable material for enclosing said plurality of rolls of magnetic tape, wherein the magnetic tape of each roll is wound on a ring core, and said rolls are stacked; and
(b) means for holding said components together in an assembly providing an enclosure of the stack of rolls, which means includes a hollow, generally cylindrical central hub having an exterior surface accommodating the cylindrical surface formed by the stacked ring cores, and which means further includes a band of packaging tape extending through said hub and a plurality of spacers on opposed ends of said hub, which spacers extend to the exterior of said assembly.

4. A recyclable package for a stack of rolls of magnetic tape, comprising:
(a) a pair of packaging components made of paperboard for enclosing a stack of rolls of magnetic tape the magnetic tape being wound on a ring core in each roll; and
(b) means for holding said pair of components together in mating relationship in an assembly providing an enclosure for said stack of rolls, which means includes a hollow, generally cylindrical central hub of paperboard having an exterior surface accommodating the cylindrical surface formed by the stack of ring cores, and which means further includes a strapping band extending through said hub.

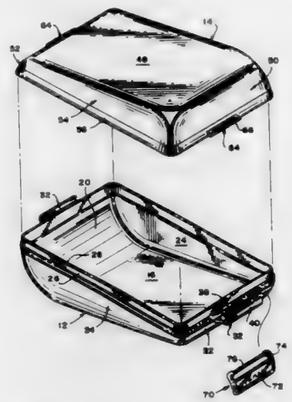
5,205,413

LUNCHBOX WITH REVERSIBLE COVER

Victor J. J. Cautereels, Borsbeek, Belgium; Lee E. Fether, London, and Ian Ferris, Wokingham, both of United Kingdom, assignors to Dart Industries Inc., Deerfield, Ill.

Filed May 21, 1992, Ser. No. 886,799
Int. Cl.[5] B65D *6/28*; A45C *13/26*, *11/20*
U.S. Cl. 206—541 15 Claims

1. A lunchbox comprising a tray and a separate cover, said cover being positionable over and engaged with said tray selectively in any one of a plurality of positions, said cover defining with said tray a different internal space configuration in each of said positions for the accommodation of goods and the adaptation of the internal space configuration to the shape of the goods to be accommodated, and latch means for releasably securing said cover to said tray selectively in each of said positions.



5,205,414

PROCESS FOR IMPROVING THE CONCENTRATION OF NON-MAGNETIC HIGH SPECIFIC GRAVITY MINERALS

Edward Martinez, 13 Bayswater Pl., Chapel Hill, N.C. 27514

Filed Jun. 17, 1991, Ser. No. 716,068
Int. Cl.[5] B03C *1/00*
U.S. Cl. 209—8 30 Claims

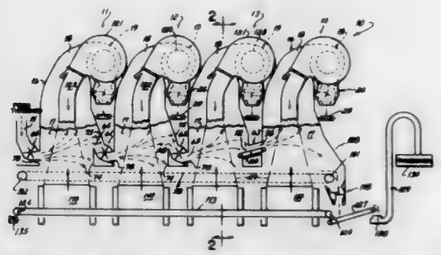
1. A solids separation process for separating high specific gravity non-magnetic solids material from a feed mixture also comprising non-magnetic solids material having a lower specific gravity than said high specific gravity non-magnetic solids material, for enhanced recovery of said high specific gravity non-magnetic solids material relative to the recovery obtained by gravity separation of the feed mixture, said process comprising the steps of:
(a) combining said feed mixture with a magnetic solids material to form a magnetic solids material-augmented feed mixture; and
(b) separating the magnetic solids material-augmented feed mixture by gravity-magnetic separation to recover a concentrate comprising high specific gravity non-magnetic solids material and magnetic solids material, wherein the concentration of high specific gravity non-magnetic solids material in the concentrate is enhanced, relative to conventional gravity separation or gravity-magnetic separation of the feed mixture in the absence of the added magnetic solids material.

5,205,415

MODULAR CLASSIFIER

Guy F. Surtees, Wilson, N.C., assignor to The Standard Commercial Tobacco Co., Inc., Wilson, N.C.

Filed Jul. 10, 1991, Ser. No. 727,974
Int. Cl.[5] B07B *9/00*
U.S. Cl. 209—21 34 Claims



27. Apparatus for separating tobacco lamina threshed from tobacco stem including:
a plurality of serially interconnected single-pass vertical lift classifiers, each having a classifying chamber, infeed means for receiving mixed tobacco lamina and stem and for projecting a stream of such mix across said classifying chamber, and means for directing a flow of separation air upwardly through said stream to lift lighter lamina from heavier stem,
a first common conveyor extending horizontally beneath the classifying chambers of the plurality of classifiers for receiving tobacco stem, and
said infeed means having an inlet disposed to receive a portion of said projected stream directly from an upstream classifier which portion is neither lifted from said projected stream nor dropped onto said conveyor,
said classifiers being interchangeable, one with another, and being oriented along the same horizontal disposition.

33. A method of separating from a mixed stream of tobacco the lighter fractions of tobacco from the heavier fractions of tobacco in a modular classifier comprising a series of side-by-side operationally interconnected separation chambers, each method including, in each upstream chamber:
projecting said stream across said chamber;
dividing said mixed stream into three components including a lighter fraction component, and a heavy fraction component;
lifting away said lighter fractions from each chamber by blowing said lighter fractions upwardly;
conveying heavier fractions falling out of said stream horizontally into a downstream chamber on a common conveyor; and
receiving a mixed stream of fractions neither lifted away nor fallen out from said projected stream in said chamber, and projecting said received stream across a downstream separation chamber.

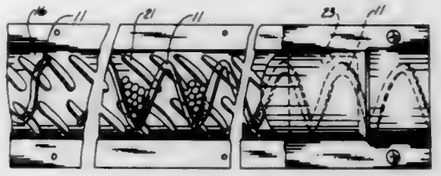
5,205,416

FEED HOPPER HAVING OUTLET SLOTS THAT REDUCE MATERIAL SHEARING AND ARE POSITIONED TO STRENGTHEN THE AUGER HOUSING

Larry J. Van Zee, Beacon, Iowa, assignor to Intraco, Inc., Oskaloosa, Iowa

Filed Nov. 25, 1991, Ser. No. 797,229
Int. Cl.[5] G07B *1/06*
U.S. Cl. 209—283 2 Claims

1. An auger apparatus for delivering granular or pelletized frangible materials of a certain size to a desired location; wherein, the auger apparatus comprises
an elongated generally cylindrical housing means for permitting the granular or pelletized materials to pass therethrough said housing means including a top portion and a bottom portion; wherein, at least the bottom portion of the housing has a semi-circular half-moon cross-sectional configuration;
inlet means for introducing material to be conveyed into one end of said housing means;
outlet means for causing said material of a certain size to drop therethrough to the desired location, said outlet means comprising a pair of opposed offset rows of spaced elongated openings disposed in the lower portion of the housing; wherein, each row of said pair of rows of elongated openings are disposed on the opposite sides of the lowermost point of the bottom portion of the housing for providing increased strength thereto; and wherein, an



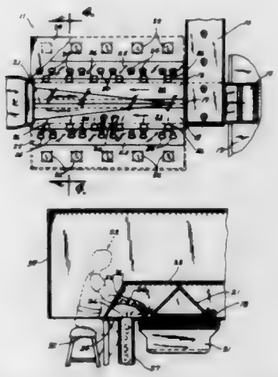
imaginary line drawn longitudinally through the middle of one of said rows of elongated openings from one end to the other thereof will be neither perpendicular to or parallel to said axis;
auger means disposed therein in one direction through said housing means, said auger means including a helical flighting thereon; and,
means for rotating said auger means about an axis in a direction to cause material disposed in said housing means to move from said inlet means to said outlet means; to minimize the amount of frangible material that can become trapped and pulverized between the auger means and the lower portion of the housing.

5,205,417

SANITARY TRASH RECYCLING APPARATUS

John T. Herren, 1001 River Rd., Farmville, Va. 23901

Filed Dec. 9, 1991, Ser. No. 803,951
Int. Cl.[5] B07C *7/04*
U.S. Cl. 209—630 17 Claims



1. A sanitary trash recycling apparatus comprising:
a conveyor belt means for receiving refuse at one end thereof and moving it toward the other end thereof, said conveyor belt means being disposed along a longitudinal center line; and

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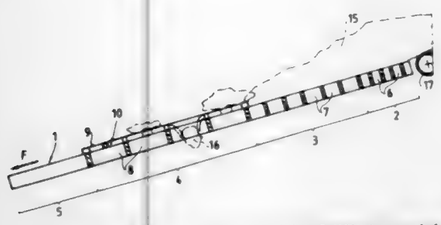
progressively tapered means disposed above and extending along the entire remaining length of said conveyor belt means for causing said refuse to move continuously outwardly from said longitudinal centerline as the refuse is moved from said one end to said other end of said conveyor belt means, whereby said refuse is more easily manually sorted as it is moved on said conveyor belt means; due to the fact that as refuse is removed along the conveyor belt means, at least a portion of the remaining refuse is forced outwardly along the remaining length of the conveyor belt means by continued contact with said progressively tapered means.

5,205,418

SCREEN FOR THE SIFTING OF MATERIALS OF DIFFERING WEIGHT

Angelo Toschi, Castellarano, Italy, assignor to Iperfin S.p.A., Italy

Filed Oct. 24, 1991, Ser. No. 782,836
Claims priority, application Italy, Oct. 24, 1990, 21862 A/90
Int. Cl.[5] B07C *5/16*
U.S. Cl. 209—645 **17 Claims**



1. A sieve for sifting a flow of materials of differing weights, comprising:

(a) a screen having orifices extending through the screen and successively arranged along the flow; and

(b) means responsive to the weights of the materials in the flow, for admitting entry of a material having a predetermined weight into at least one of the orifices, and for barring entry of a material having a weight less than said predetermined weight, said means including resilient diaphragms overlying at least part of said one orifice in a covering position, and yieldable under the force of said predetermined weight to an open position in which said material having said predetermined weight passes into and through said one orifice, said resilient diaphragms being self-returnable to the covering position after passage of said material having said predetermined weight.

5,205,419

DISHWASHER RACKING SYSTEM

Dennis L. Purtilo, Newton, Iowa, assignor to Maytag Corporation, Newton, Iowa

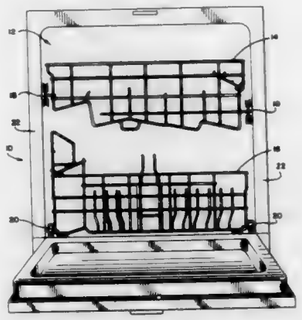
Continuation of Ser. No. 767,018, Sep. 27, 1991, abandoned. This application Jul. 29, 1992, Ser. No. 921,844
Int. Cl.[5] A47G *19/02*
U.S. Cl. 211—41 **5 Claims**

1. A dishwasher having an enclosure defining a washing chamber and a dish racking system mounted therein, the combination comprising:

a lower rack having a bottom support means including a plurality of spaced-apart generally longitudinal and lateral wire members and means extending generally perpendicular to said bottom support means for defining front, rear and a first and a second side wall, said first side wall extending substantially higher than said front, rear and second side walls to define a protective barrier between a side panel of said washing chamber and various oversize articles placed adjacent said first side wall for washing;

rack mounting means associated with opposed side panels of said washing chamber; and

an upper rack supported above said lower rack by said rack mounting means, said upper rack having bottom support



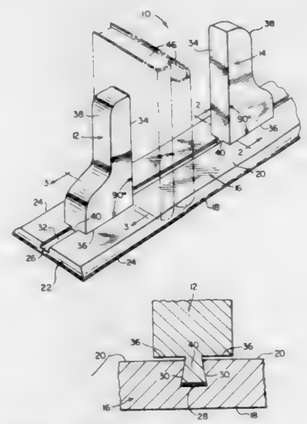
means including a plurality of spaced-apart generally longitudinal and lateral wire members formed to provide at least one upwardly stepped portion adjacent said first side wall of said lower rack, said upper rack wire members projecting upwardly and generally perpendicular to said bottom support means for at least partially defining front, rear and side walls.

5,205,420

ADJUSTABLE AND SELF-LOCKING BOOK RACK OR BOOK SUPPORT

Joseph Petryszak, Box 116, Bruceton Mills, W. Va. 26525

Filed Apr. 20, 1992, Ser. No. 871,012
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—43 **24 Claims**



1. An adjustable and self-locking book rack or book support for securely holding books or the like in an upright position comprising

a planar base member having side walls, end walls, and top and bottom walls,

said base member having a longitudinally extending dovetail groove in the upper portion thereof intermediate said top and bottom walls,

said dovetail groove extending the entire length of said base member and terminating in the two end walls thereof,

said dovetail groove having a bottom wall, a pair of sloping side walls and terminating in an opening or longitudinally extending slot in the top wall of said base member, and

at least a pair of bookends or book support members each having a front wall, a bottom wall and an end wall with a longitudinally extending dovetail depending from said bottom wall at the approximate mid-point thereof and adapted to be slidably received within said dovetail groove,

said dovetail extending the entire length of said bottom wall and being formed integral with said bottom wall,

said dovetail having sloping side walls and a bottom wall with the dovetail or groove or both being dimensioned to provide a slight clearance between the walls of the dovetail groove and the dovetail,

said dovetail dividing said bottom wall of each bookend into two parts or shoulders which are slidably supported on the top wall of said base member and hold the bookends in an upright position on the top wall of said base member,

said front wall and said bottom wall of each bookend intersecting and defining an angle of intersection of substantially 90°,

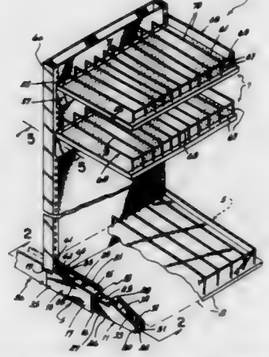
the front wall of each bookend when moved into engagement with said books moving the front wall and the front portion of each bookend upwardly and tilting or rotating said front wall and front portion rearwardly to move the sloping side walls of the corresponding front portion of each dovetail into tight engagement with the sloping side walls of the dovetail groove and move the shoulders of the rear portion of the bottom wall of each bookend downwardly into firm engagement with the top wall of the base member to thereby move the bookends into a self-locking position to hold the books firmly together in an upright position.

5,205,421

GONDOLA DISPLAY RACK

Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 1, 1991, Ser. No. 678,583
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—59.2 **15 Claims**



1. A gondola display rack for merchandising product supported on said rack, said rack comprising:

a floor contacting base having a rear edge,

a shelf atop said base,

at least one upright extending vertically from said rear edge of said base, said upright having a column of vertically spaced slots therein.

at least one other shelf having a rear edge, said at least one other shelf including engaging means for engaging said slots of said upright, and

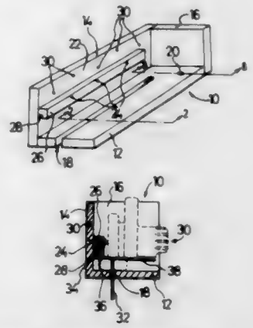
shelf supporting bracket means separable from said at least one other shelf and being selectively engageable with said slots of said upright and being removably engageable with said underside of said at least one other shelf to support said at least one other shelf from said upright in a position cantilevered over said base.

5,205,422

HOLDER FOR POWER ROTARY HANDSAWS

Kenneth D. Morris, Box 14, Group 25, RR 2 St. Anne, Manitoba, Canada R0A 1R0

Filed Jun. 17, 1992, Ser. No. 899,718
Claims priority, application Canada, Jun. 20, 1991, 2045097
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.6 **20 Claims**



1. A holder for a rotary power tool,

said tool including rotary disc shaped tool means and guard means for said tool means,

said holder comprising horizontally disposable base means including longitudinal slot means closed at a first end and open at a second end to accommodate said disc shaped tool means, and upright means spaced apart from said slot means, extending upward from said base means, said upright means having horizontally projecting means to engage said guard means.

5,205,423

SYNTHETIC RESIN BOTTLE-SHAPED CONTAINER HAVING BOTTOM SUPPORT

Akiho Ota, Funabashi, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 663,938, Mar. 5, 1991, abandoned. This application Apr. 1, 1992, Ser. No. 860,275
Claims priority, application Japan, Jul. 7, 1989, 1-80237[U]
Int. Cl.[5] B65D *23/00*
U.S. Cl. 215—12.1 **9 Claims**

1. A synthetic resin bottle-shaped container comprising:

a biaxially-oriented blow-molded bottle-shaped body having a body portion with a diameter and a curved bottom portion, said curved bottom portion having an inwardly concave bottom and an outer peripheral outwardly convex surface extending between the concave bottom and body portion forming an outwardly convex press-fit recess, said convex press-fit recess extending circumferentially around said bottom portion and longitudinally from said body portion to an annular groove located between the concave bottom and the convex press-fit recess of said bottom portion, wherein a high-projecting portion extends circumferentially around said concave bottom below said annular groove radially outwardly from said convex press-fit recess; and

a pedestal body for supporting said bottle-shaped body hav-

5,205,425

strips for securing the shell sections in assembled condition, the joining means extending along mating edges of

mit the floor to occupy a minimum portion of the vertical space whereby the vertical space between the floor and

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a pedestal body for supporting said bottle-shaped body having an exterior surface and an inner surface, said inner surface including an upper concave portion and a lower pedestal portion with a press-fir rib therebetween, said upper concave portion being shaped to abut and substan-

tially entirely cover said convex press-fit recess, said press-fit rib engaging said annular groove and being retained therein by said high projecting portion, said lower pedestal portion extending around and below said bottom portion.

5,205,424

CHILD RESISTANT CAP AND CONTAINER ASSEMBLAGE

Ruben C. Gaspar, St. Davids, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 10, 1992, Ser. No. 896,775
Int. Cl.[5] B65D *47/08, 55/02, 83/04*
U.S. Cl. 215—210 **6 Claims**

1. A child resistant cap and container assemblage being in a normally upright position during non-use comprising:

(a) a container body having a closed lower end and an open upper end;

(b) a cap member;

(c) means to secure said cap member to said container body such that said cap member cannot be normally removed from said container body so as to form an integral, unitary article;

(d) a nozzle member hingeably secured to said cap member;

(e) spring means within said cap member to maintain said nozzle member in a normally closed position; and

(f) locking means within said cap member to engage said nozzle member and prevent it from being rotated when said assemblage is in its normally upright position.

5,205,425

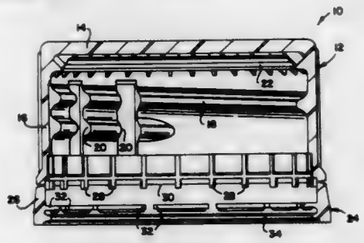
Patent Not Issued For This Number

5,205,426

TAMPER-INDICATING PLASTIC CLOSURE

Stephen W. McBride, Brownsburg, and Thomas J. McCandless, Crawfordsville, both of Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Continuation-in-part of Ser. No. 682,635, Apr. 9, 1991, Pat. No. 5,167,335. This application Mar. 13, 1992, Ser. No. 847,544
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 **10 Claims**



1. A tamper-indicating plastic closure for a container having an annular locking ring, said closure comprising:

a plastic cap including a top wall portion, and an annular depending cylindrical skirt portion, and

an annular pilfer band depending from said skirt portion and at least partially detachably connected to said skirt portion by frangible means,

said pilfer band including an annular band portion, and inwardly extending flexible tab means comprising a plurality of circumferentially spaced, flexible tabs extending inwardly of said annular band portion, and inwardly extending interference bead means positioned beneath said tab means, said flexible tabs of said tab means being positionable between said container locking ring and said interference bead means during removal of said closure from said container for at least partially detaching said pilfer band from said skirt portion by fracture of said frangible means,

wherein at least some of said flexible tabs are configured for enhanced flexibility, and include a central portion having a relatively thick pad means, said pad means defining a base portion of said tab having a relatively reduced thickness adjacent said annular band portion to enhance the flexibility of the tab, said pad means of each said tab having an edge portion generally adjacent the base portion of the respective flexible tab, said pad means of each said flexible tab being engageable with said interference bead means at the region of said pad means edge portion when said flexible tabs are positioned between said container locking ring and said interference bead means for fracture of said frangible means.

5,205,427

MODULAR FUEL TANK SYSTEM

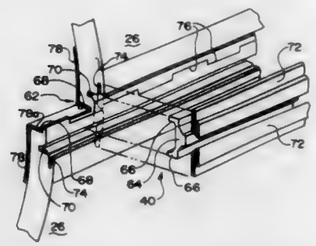
Steven C. Crago, Clarksville, Ohio; John A. Eihusen, Kearney, and Norman L. Newhouse, Lincoln, both of Nebr., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 17, 1992, Ser. No. 852,687
Int. Cl.[5] B65D *6/24*
U.S. Cl. 220—4.15 **8 Claims**

1. A modular fuel tank system for use on aircraft, comprising:

a plurality of nestable shell sections which, when assembled in proper edgewise orientation, form a shell for a fuel tank;

joining means including transversely irregularly shaped joint strips for securing the shell sections in assembled condition, the joining means extending along mating edges of adjacent shell sections and including retaining means for engaging complementary inter-engaging retaining means on the adjacent shell sections to secure the sections together in assembled condition,



said joint strips being generally C-shaped and spanning the mating edges of adjacent shell sections, with one leg of the C-shape extending into a groove in one shell section an another leg of the C-shape extending into a groove in the adjacent shell section thereby preventing separation of the shell sections; and

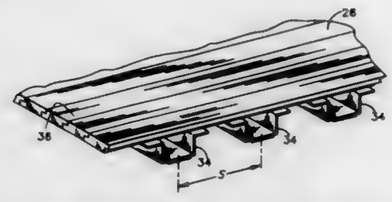
retainer strips on the shell sections for holding the C-shaped strips in the grooves in the shell sections.

5,205,428

LARGE CUBIC VOLUME CARGO CONTAINER

Howard J. Yurgevich, and Thomas J. Rosby, both of Monticello, Ind., assignors to Rosby Corporation, Monon, Ind.

Filed Feb. 21, 1992, Ser. No. 839,811
Int. Cl.[5] B65D *81/00*
U.S. Cl. 220—1.5 **8 Claims**



1. In a cargo container for carrying cargo within an enclosed compartment defined generally by a floor, a roof, a vertical space defined between the floor and the roof, a pair of parallel side walls, and first and second end walls, at least one of the side walls and end walls including an opening to permit the entry and exit of cargo, the improvement comprising:

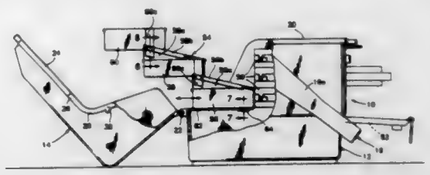
a plurality of low profile floor supports extending transversely between the side walls, with each floor support having end joining means at each end for attachment to one of the sidewalls, the plurality of floor supports being substantially uniformly distributed throughout the entire length of the floor, each floor support comprising a pair of uniformly spaced apart vertical members having upper and lower ends, a horizontal member joining with the lower ends of the vertical members, outwardly extending floor support flanges extending from the tops of each of the vertical members, reinforcing means for reinforcing the horizontal member, floor surface strips positioned on and above the low profile floor supports and extending at a perpendicular angle with respect thereto, each floor surface strip being coupled to the floor support flanges to define the upper surface of the floor, the vertical dimension of the floor supports being less than the space between the vertical members of each floor support to permit the floor to occupy a minimum portion of the vertical space whereby the vertical space between the floor and the roof is maximized.

5,205,429

TACKLE BOX WITH SLIDING TRAYS

Andrew B. Woolworth, Lancaster; Arthur Jeffreys, York, and John H. Coldren, Lancaster, all of Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Sep. 26, 1991, Ser. No. 765,812
Int. Cl.[5] B65D *85/50*
U.S. Cl. 220—23.83 **7 Claims**



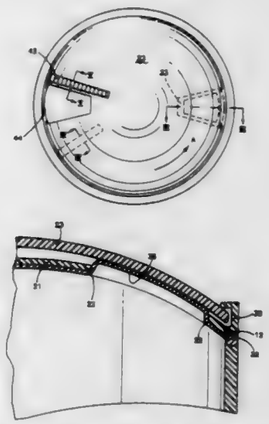
1. A portable box structure comprising a box body and a lid, the box body having an upper rim portion and the structure having a first tray, first interengaging slide elements on the first tray and the rim portion of the box body mounting the first tray for sliding movement on the rim portion from a stacked position on the box body to an extended cantilevered position externally of the box body, when the lid is opened, a second tray, and second interengaging slide elements on the first tray and the second tray mounting the second tray for sliding movement on the first tray between a stacked position on the first tray and a cantilevered position relative to the first tray.

5,205,430

PLASTIC CONTAINER CLOSURE

Emery I. Valyi, 19 Moseman Ave., Katonah, N.Y. 10536

Filed Jul. 2, 1992, Ser. No. 907,814
Int. Cl.[5] B65D *17/44, 51/22*
U.S. Cl. 220—278 **17 Claims**



1. A plastic container closure for plastic containers which comprises: a plastic lid having top and bottom surfaces and a peripheral rim suitable for engagement with a plastic container to close said container, said lid having an access opening therein; a barrier liner adjacent the bottom surface of the lid, said barrier liner having a raised portion extending through the access opening of the lid; and movable means adjacent the top

surface of said lid operative to provide an opening in the liner

rigidly supported by the casing, with the dimensional relation-

receive any liquid that may be container in the waste, said grate means comprising a fork-like grate which includes a

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5,205,435

METHOD OF AND MEANS FOR DISPENSING

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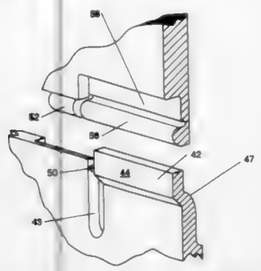
surface of said lid operative to provide an opening in the liner corresponding to the access opening in a first position of said movable means and to close said opening in a second position of said movable means.

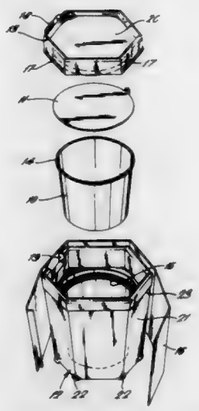
5,205,431
COSMETIC CASE
Gerald B. Zinnbauer, Charlotte, N.C., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 18, 1991, Ser. No. 732,275
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—326 **5 Claims**



1. A case including a cover and a base, the cover and base having end and peripheral walls which together define an interior compartment, the peripheral walls having front and rear portions, a hinge associated with the rear portions of the base and cover peripheral walls rotatably mounts the cover on the base, and a latching device located in the front portion of the case, the latching device comprising:
(i) a resilient push tab in the form of a tongue-like section which is a single integral part of the base peripheral wall, the distal and intermediate portions of said push tab being separated from adjacent portions of the base peripheral wall by at least one slot which extends alongside said push tab to its proximal end;
(ii) coacting cam means for producing a force biasing the front portion of the base and cover apart when the push tab is moved inwardly with the latch device engaged, said push tab including a portion of the coacting cam means and the cover peripheral wall adjacent the push tab including a cooperating portion of the coacting cam means; and
(iii) a pair of protrusions integrally formed on the cover peripheral wall and a cooperating pair of indentations integrally formed on the base peripheral wall, said protrusions and said indentations latching the cover to the base when the front portions of the base and cover are pressed together and unlatching when the front portions of the base and cover are forced apart.

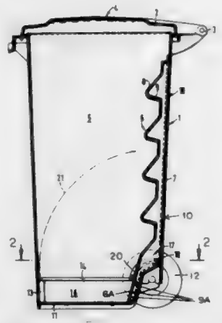
5,205,432
PACKAGING
Bryan B. Gullan, Douglas, Isle of Man, assignor to Manx Ices Limited, Douglas, Isle of Man
PCT No. PCT/GB90/00820, § 371 Date Nov. 22, 1991, § 102(e) Date Nov. 22, 1991, PCT Pub. No. WO90/14296, PCT Pub. Date Nov. 29, 1990
PCT Filed May 25, 1990, Ser. No. 777,332
Claims priority, application United Kingdom, May 26, 1989, 8912170
Int. Cl.[5] B65D *23/08*
U.S. Cl. 220—412 **10 Claims**

1. A packaging unit for a consumable product, comprising, in combination: a tub-shaped container of a first, thin-walled material for containing the product, a casing of a second, thick-walled thermally-insulating material, with the casing having an opening therein, with the container being insertable into the casing via said opening and received in, held by, and rigidly supported by the casing, with the dimensional relationships of the container in the casing forming a tight fit therebetween to prevent dissassembly of the container and the casing once the container has been received by the casing, with the opening of the casing allowing access to the contents of the container when the container is held in the casing, a closure of thick-walled thermally-insulating material for the casing, with



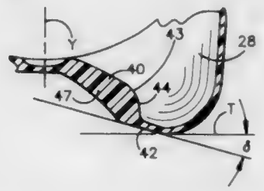
the thick-walled thermally-insulating material of the casing and of the closure being substantially thicker than the thin-walled material of the container, means for removable and replaceable engagement of said closure with the casing for alternately sealing off or freeing said access to the contents of the container, and a sleeve located on the outer wall of the casing for finishing off and carrying decorative artwork for the casing.

5,205,433
WASTE-COLLECTING CONTAINER
Bartholomaeus Bitsch, Eckweg 15, W-6145 Lindenfels, Fed. Rep. of Germany
Filed Feb. 20, 1992, Ser. No. 839,106
Int. Cl.[5] B65F *1/14*
U.S. Cl. 220—572 **10 Claims**



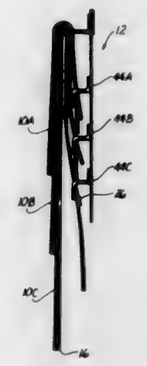
1. A waste-collecting container for compostable waste, comprising an open top container housing and an upper lid therefor, said open top container housing having means defining an upstanding wall and a bottom wall connected to said upstanding wall, grate means separating a bottom space in the region of said bottom wall from an upper interior space inside of said container housing, said bottom space being adapted to receive any liquid that may be container in the waste, said grate means comprising a fork-like grate which includes a plurality of spaced and generally parallel tines all connected together only adjacent their respective common ends, and pivot means for pivotally securing said grate means to said upstanding wall at a location adjacent said common ends of said plural tines and for movement between a first position wherein said tines are generally parallel to said bottom wall for separating said bottom space from said upper interior space and a second position wherein said tines becomes oriented generally parallel to said upstanding wall, said free ends of said tines, when said grate means is in said second position, being closer to said open top of said container housing than when said grate means is in said first position thereof so that when said waste-collecting container is upended for purposes of dumping collected compostable waste, said grate means will pivot to said second position to enable said compostable waste to slide freely off said tines, past said free ends thereof.

5,205,434
FOOTED CONTAINER
David A. Brunson, Marietta; David A. Deemer, and Stephen R. Lynn, both of Douglasville, all of Ga., assignors to Constar Plastics, Inc., Atlanta, Ga.
Filed Jun. 9, 1992, Ser. No. 896,136
Int. Cl.[5] B65D *1/42*
U.S. Cl. 220—608 **20 Claims**



1. A blow-molded container of thermoplastic resin adapted to receive a filling liquid, said container having a hollow body with a generally cylindrical side wall portion rotationally symmetric about a longitudinal axis of the container, the container additionally having a finish, a shoulder portion integrally joining an upper end of the side wall portion to the finish, and an integral base merging with a lower end of the side wall portion, said base comprising:
a plurality of generally arcuate segments extending essentially from the cylindrical side wall portion to the longitudinal axis of the container;
a like plurality of downward projections separated from each other by one of said generally arcuate segments, said downward projections including a first inclined portion adjacent to the longitudinal axis, a second inclined portion situated radially outside of, and axially displaced downwardly from, the first inclined portion, a generally perpendicular ring segment having an upper edge united with the first inclined portion and a lower edge united with the second inclined portion, and a radially outwardly and upwardly curved portion uniting the second inclined portion to the side wall portion and defining the axially lower most extent of each downward projection; and
a like plurality of webs extending between the first inclined portion and the generally perpendicular ring segment of each of said downward projections for providing enhanced stability against deflection during entry of the filling liquid into the container.

5,205,435
METHOD OF AND MEANS FOR DISPENSING SHOPPING BAGS FROM DIFFERENT SIZE BAG PACKS
Mark E. Daniels, Redondo Beach, Calif., assignor to The Advantage Group, Inc., Redondo Beach, Calif.
Filed Apr. 21, 1992, Ser. No. 871,856
Int. Cl.[5] A47K *10/24*
U.S. Cl. 221—44 **6 Claims**



1. A method of providing a suitable sized shopping bag from a plurality of packs of plastic bags, each pack having bags of the same size, but each pack being of a different size bag; each bag of each pack being of the "T-shirt" type having a closed bottom and sides, and side straps closed along their top edges, and an open top between the side straps, said open top being initially partially closed by a detachable slotted piece centrally attached along the edges of the bag defining the open top between the straps, said method comprising:
(a) providing a rack with a projecting transverse bar;
(b) providing a plurality of vertically aligned U-shaped members, spaced apart from each other, each member being bent downwardly at an angle, said U-shaped members being aligned centrally with the bar to project below the bar with the uppermost U-shaped member being spaced from, and disposed below the level of the bar;
(c) hooking the detachable slotted pieces of a first pack of bags of a predetermined size over one U-shaped member, and the detachable slotted pieces of a second pack of bags of a larger size over another U-shaped member, the slotted pieces of the bags of larger size being hooked over a U-shaped member disposed below the U-shaped member over which the slotted pieces of bags of smaller sizes are hooked;
(d) draping the lower portions of the bags of the first bag pack over the transverse bar in a reverse position;
(e) draping the lower portions of the bags of the larger and second size bag pack in a reverse position over the lower portions of the bags of the first bag pack which latter portions are draped over the transverse plate in a reverse position;
(f) folding the lower portions of the hooked bag packs of various sizes from their reverse positions over the transverse bar forward over the transverse bar to cause said lower portions to hang downwardly over and parallel to the bags of the third bag pack in front of the U-shaped members; and
(g) removing a bag from any of the first or second bag packs from the rack and the U-shaped members by grasping a lower portion of the bag draped over the transverse bar or hanging downwardly therefrom, and pulling the bag to detach it from its slotted piece on the U-shaped member on which its said detachable slotted piece is hooked.

5,205,436

first and second plates in face-to-face relation within said

5,205,439
DISPENSER FOR SUPPLYING SMALL AMOUNTS OF A

and a rear cylindrical body portion, said main cylindrical body portion provided with a tip portion, said main cylin-

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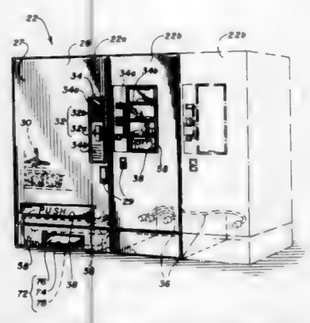
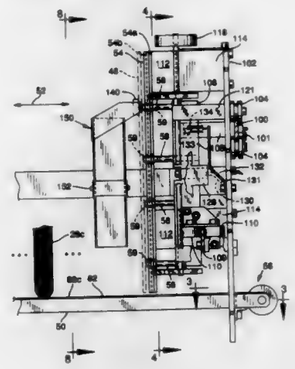
5,205,436
MAINE TOOL DISPENSING DEVICE AND SYSTEM
Kent V. Savage, Morrow, Ohio, assignor to Electronic Merchandising Systems, Inc., Cincinnati, Ohio
Filed Nov. 6, 1991, Ser. No. 788,336
Int. Cl.[5] G06F *7/00*; **B65G** *49/00*
U.S. Cl. 221—7 **33 Claims**



1. A system for dispensing tools for industrial, manufacturing, construction, maintenance or like operations, said system comprising:
one or more automatic tool dispensers, each of said one or more automatic tool dispensers having a housing;
means for delivering comprising a plurality of separate delivery devices each operable to receive at least one of a plurality of different tools, said means for delivering disposed in each of said housings; and
means for controlling operation of said means for delivering, wherein at least a portion of said means for controlling is disposed in at least one of said housings, said means for controlling including:
at least one user means for entering data operatively connected to simultaneously operate a plurality of said separate delivery devices to deliver a plurality of different tools as a kit; and
processor means for automatically operating said means for delivering, wherein:
said processor means is adapted to receive and automatically respond to data from one or more of said user means for entering data to simultaneously operate a plurality of said separate delivery devices; and
and processor means automatically limits the operation of said means for delivering to authorized users identified by said user means for entering data.

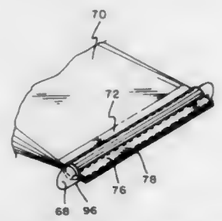
5,205,437
SINGLE ARTICLE NEWSPAPER DISPENSING APPARATUS
Richard A. Elder, Springfield; Norman C. Locati, Lake Oswego, and R. Wayne Fields, Gladstone, all of Oreg., assignors to Univend, Inc., Lake Oswego, Oreg.
Filed Aug. 16, 1991, Ser. No. 746,788
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—103 **18 Claims**

1. (Amended) A newspaper vending machine for providing newspapers to a customer of the machine, the machine comprising:
an enclosure including an output door;
a dispensing handle having a portion accessible from the exterior of said enclosure for actuation by the customer of said vending machine;
first and second plates in face-to-face relation within said enclosure and adapted for supporting therebetween a bundle of newspapers, the second plate positioned adjacent the output door;



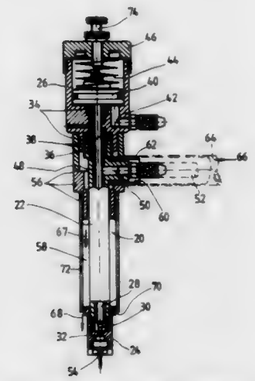
biasing means urging said first plate toward said second plate; and
dispensing means within said enclosure and responsive to actuation of said dispensing handle to [slide] *push* one newspaper of said bundle out said output door.

5,205,438
SQUEEZE TUBE OPERATION AND ENABLING STRUCTURE
Albert A. Southard, R.R. #3, Box 47, Council Grove, Kans. 66846
Filed Jul. 1, 1991, Ser. No. 723,569
Int. Cl.[5] B65D *35/00*
U.S. Cl. 222—1 **10 Claims**



1. A method of forcibly urging and retaining the viscous contents of an elongated and flexible dispenser tube of the type having a capped end and a flattened and sealed end toward the capped end from its sealed end, after partially dispensing the contents of the dispenser tube and capping the tube said method comprising the step of securing an elongated flexible loop structure to the tube adjacent the sealed end thereof so that an extent of such structure is disposed along and embraces one side of the tube with such extent being normal to the length of the tube, said method further comprising the steps of flattening and rolling the tube from its flattened and sealed end toward the capped end thereof to form convolutions that are disposed on the side of the tube opposite said one side thereof, said rolling the loop structure extent along said one side of the tube toward the capped end of the tube to prevent unrolling of the convolutions and to hold the convolutions against the side of the tube opposite said one side of the tube, wherein the loop structure is elongated and has spaced opposite end portions, and wherein the securing step entails securing the end portions of the loop structure to the tube.

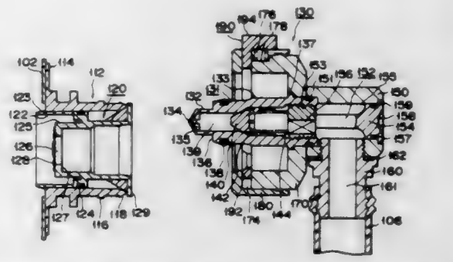
5,205,439
DISPENSER FOR SUPPLYING SMALL AMOUNTS OF A PASTY SUBSTANCE FOR SURFACE MOUNTING OF ELECTRONIC PARTS
Karsten Sturm, Uferstrasse 19, D-5000 Cologne 50, Fed. Rep. of Germany
Filed May 8, 1991, Ser. No. 697,067
Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014760
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—1 **8 Claims**



1. A method for dispensing small amounts of a pasty substance in the form of one of adhesive and solder paste onto printed circuit boards for surface mounting of electronic components, comprising;
proving a generally tubular housing having a nozzle and a valve face at a lower end, and defining an inner component having an inlet for the pasty substance;
slidably arranging a nozzle element in said housing, said nozzle element having a stroke defined by movement between points in said housing, said nozzle element including a valve needle cooperating with said valve face, said nozzle element being biased by a spring to close said valve needle against said valve face, said nozzle element being connected to a plunger arranged in a cylindrical portion of the housing;
surrounding the housing with a tubular shell thereby defining a toroidal chamber between said housing and said shell, said toroidal chamber carrying temperature modifying fluid, said fluid being provided at an upper connector connected to a supply duct and exiting at a lower outlet so that the fluid is directed toward and touches the nozzle to modify the temperature of the nozzle and pasty substance;
choosing the pressure under which the pasty substance is provided, whereby the pasty substance remains in the compartment when a valve comprising said valve needle and said valve face is in an open position.

5,205,440
DISPENSING VALVE/COUPLING ASSEMBLY
Kaoru Matsushita, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 604,165, Oct. 29, 1990, abandoned.
This application May 4, 1992, Ser. No. 879,465
Claims priority, application Japan, Nov. 2, 1989, 1-128894[U]; Jan. 10, 1990, 2-1440[U]
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—83 **5 Claims**

1. A dispensing coupling for a container comprising a female connector having an opening closed by a seal, and adapted for detachable attachment to the container;
a male connector having a main cylindrical body portion and a rear cylindrical body portion, said main cylindrical body portion provided with a tip portion, said main cylindrical body portion and said tip portion adapted to be inserted into said opening to break said seal, said tip portion having a hole for sucking fluid from the container;
a valve seat formed in said main cylindrical body portion;
a valve body arranged in a fluid passing path in said rear cylindrical body portion and movable relative to said main cylindrical body portion and said tip portion, said valve body in fluid communication with said hole;
a spring for urging said valve body toward said opening and said valve seat to thereby maintain said valve body engaged with said valve seat upon insertion of said male connector into said female connector; and



wherein when a sucking pump is made operative to suck fluid from the container, said valve body is drawn toward and against said spring to disengage the valve body from the valve seat and thereby communicate said fluid passing path with the container, said coupling further comprising a spout having a protrusion ring on its outer circumference, said spout serving to attach said female connector to the container;
a sleeve rotatably fitted onto the outer circumference of said main cylindrical body portion of said male connector;
a lock ring arranged perpendicular to the longitudinal direction of said male connector and provided with a projection on its inner face to engage with a side of the protrusion ring, so as to fix said sleeve to said spout and;
a compression coil spring for urging said lock ring in the diameter direction of the ring.

5,205,441
SUCTION AND/OR DISCHARGE VALVE FOR A METERING AND SPRAY PUMP FOR DISPENSING LIQUID, LOW-VISCOSITY AND PASTY SUBSTANCES
Raimund Andris, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Firma Raimund Andris GmbH & Co. KG., Villingen-Schwenningen, Fed. Rep. of Germany
Filed Dec. 20, 1991, Ser. No. 810,843
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1990, 4041135
Int. Cl.[5] B65D *37/00*; **F16K** *15/14*; **F04B** *21/04*
U.S. Cl. 222—207 **13 Claims**

1. A dispensing pump comprising:
pump means for changing a volume of pump chamber;
a valve seat connected to said pump chamber, said valve seat having one of a substantially conical or substantially hemispherical shape, and said valve seat defining a passage bore;
a valve annular wall movable into and out of contact with said valve seat, said valve annular wall having an open edge means for forming a seal between said valve annular wall and said valve seat when said valve annular wall is in contact with said valve seat, said valve annular wall has a closing wall closing one end of said valve annular wall;
a first connection web means for supporting said valve annular wall movable in an axial and radial direction;

a connection ring connected by said first connection web

liquid from the container, the hole being covered by a

the distal end portion of said actuating rod, said elastic rod-like member and said fluid-discharging passage being

from a closed position when a downward force is exerted upon the upper surface of said cover section of said lid,

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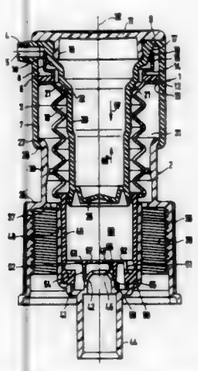
a connection ring connected by said first connection web means to said valve annular wall;

a second connection web means for connecting said connection ring to said pump means and for supporting said connection ring and said valve annular wall movable in said axial and radial direction, said second connection web means and said first connection web means forming to



move said valve annular wall into contact with said valve seat when said pressure against said valve annular wall is greater than a pressure of said passage bore, said first connection web means and said second web means deforming to moving said valve annular wall away from said valve seat when said pressure against said valve annular wall is less than said pressure of said passage bore.

5,205,442

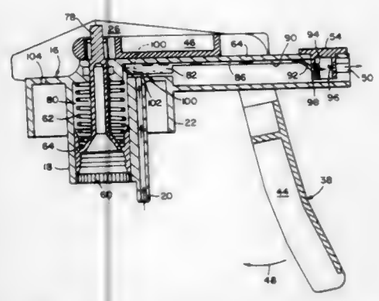
HAND-HELD DISPENSING PUMP FOR SPRAY BOTTLES

Clark E. Harris, Fairport; Michael W. Didas, Rochester, both of N.Y., and Anthony J. Imperto, Purdys, N.J., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1991, Ser. No. 674,839

Int. Cl.[5] G01F *11/42*

U.S. Cl. 222—341 **3 Claims**



1. A dispensing pump for mounting in the mouth of a container having a liquid therein, comprising:

a base having a chamber for receiving a liquid, the chamber extending in a first longitudinal direction for receipt through the mouth of the container; the base including a sleeve extending laterally with respect to the chamber and in communication therewith for dispensing liquid from the container and the base including a hole therein communicating with a dip tube for the chamber in the base with a liquid from the container, the hole being covered by a vane which serves as a check valve;

a piston within the chamber, the piston having an axially projecting rod extending therefrom into he base and being biased away from the base by a spring;

a handle movably mounted on the base and engaging the rod for moving the piston upwardly against the bias of the spring when pressed toward the container; the handle being L-shaped and having one leg extending over the base and another leg extending transversely of the sleeve, the handle being pivoted to the base and connected to a portion of the axially projecting rod extending through the base, whereby pivoting the handle in one direction lifts the rod to move the piston against the bias of the spring to eject liquid from the pump;

a rotary dispensing valve disposed within the sleeve to rotate about an axis normal to the sleeve, the rotary dispensing valve including a cylindrical wall defining a central chamber and first and second apertures communicating with the central chamber and configured to release liquid from the pump as a stream and as a spray of relatively fine droplets, respectively; and

the dispensing valve further including a relatively narrow channel in communication with the chamber wherein liquid in the channel has a greater resistance to flowing back toward the chamber than the elasticity of the vane which serves as the check valve closing the hole in the base in communication with the dip tube, so that the chamber is filled with liquid from the container when the handle is released to create a vacuum within the chamber.

5,205,443

ACTUATOR FOR LIQUID EJECTION

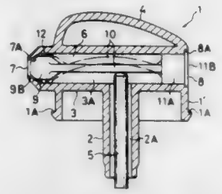
Ryosuke Inui, Yamagata, and Susumu Matsubara, Tokyo, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo and Kabushiki Kaisha Tatsumi Kogyo, Yamsoata, both of Japan

Continuation-in-part of Ser. No. 651,293, Jan. 11, 1991, Pat. No. 5,085,353. This application Dec. 20, 1991, Ser. No. 810,411

Claims priority, application Japan, Jan. 12, 1990, 2-2231; Dec. 28, 1990, 2-425948

Int. Cl.[5] B65D *83/00*

U.S. Cl. 222—402.13 **8 Claims**



1. An actuator for liquid ejection, which is adapted to be mounted on a container of the type that is filled therein with a pressurized fluid and having a valve spout, said actuator comprising:

a fluid-introduction passage, which is adapted to be communicated with a valve spout of the container;

a fluid-discharging passage intersecting with a distal end of said fluid-discharging passage, and forming an ejection spout at a tip portion thereof;

an actuating rod coaxially disposed in said fluid-introduction passage, said actuating rod having a proximal end for effecting opening the valve spout of the container and a distal end portion thereof being projected into said fluid-discharging passage;

an elastic rod-like member disposed in and along said fluid-discharging passage, a proximal end portion thereof being secured to the proximal end portion of said fluid-discharging passage, and a middle portion thereof comprising over the distal end portion of said actuating rod, said elastic rod-like member and said fluid-discharging passage being located within a body portion carried on said container means and held in position by said actuating rod, one end of said actuating rod being disposed within said container and spring means being disposed to extend between said body portion and said container to maintain said housing in spaced relationship from said container when in a deactuated position;

a plug attached to the distal end portion of said elastic rod-like member and adapted to close said ejection spout formed at the tip portion of said fluid-discharging passage, said plug being forced to move backward to open the ejection spout as said elastic rod-like member is arched by a pushing movement of said actuating rod against the middle portion of said elastic rod-like member, thereby communicating said ejection spout with said fluid-discharging passage.

5,205,444

FOOD CONTAINER FOR HOUSEHOLD USE

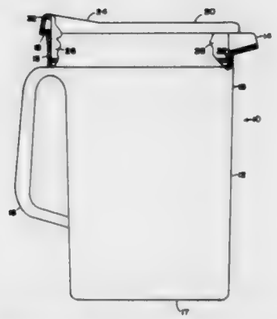
Marlan H. Polhemus, Chicago, Ill., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 636,519, Dec. 31, 1990, Pat. No. 5,086,956, which is a continuation-in-part of Ser. No. 464,516, Jan. 12, 1990, Pat. No. 4,993,603. This application Dec. 16, 1991, Ser. No. 807,690

The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.

Int. Cl.[5] B65D *43/02*

U.S. Cl. 222—472 **20 Claims**



16. An easy-opening, leak-resistant food storage container, comprising:

(a) a thermoplastic container body having substantially upright walls, said walls having an upper rim portion and a bottom portion, said upper rim portion having an inner surface and an outer surface; and

(b) a removable thermoplastic lid, said lid including:

(i) a cover section having an upper surface and a lower surface;

(ii) a plug section integral to said lower surface of said cover section, said plug section having an outer peripheral surface adapted to substantially conform to the inner surface of said upper rim portion of said container body walls for providing a close conforming fit when said lid si installed on aid container body; and

(iii) a lip integral to said cover section, said lip spaced apart from said outer peripheral surface of said plug section, wherein said lip combines with said lower surface of said cover section and said outer peripheral surface of sis plug section to form a track, said tack having a pair of rocker points;

whereby said rocker points are effective to release said lid from a closed position when a downward force is exerted upon the upper surface of said cover section of said lid.

5,205,445

DEVICE FOR WASHING MACHINES TO CONTROL THE INTRODUCTION OF DETERGENT

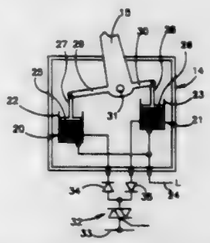
Daniele Bravin, Azzano X, Italy, assignor to Zanussi Elettrodomestici S.P.A., Pordenone, Italy

Filed Dec. 12, 1991, Ser. No. 806,050

Claims priority, application Italy, Dec. 14, 1990, 45777 A/90

Int. Cl.[5] A47L *15/46*

U.S. Cl. 222—651 **1 Claim**



1. A device for the control of the introduction of detergent into a tub of a washing machine, in particular a laundry-washing machine or a combined machine for the washing and drying of laundry, comprising at least one microprocessor controlling the action of selected operating cycles as well as a dispenser having a number of separate compartments to contain detergents or additives, the dispenser communicating with the tub and being provided with at least two rotary selector connected to a water supply of the machine and settable to each compartment of said dispense, said rotary selector being suitable to be set to different regulatory positions by means of a system of jointed levers associated with at least two box-like housings containing wax heatable by at least a relevant PTC sensor, wherein said PTC sensors (**20**, **21**) are supplied with power by an electric circuit of the machine through a semiconductor switch such as a triac (**32**) or similar bidirectional conductor, and through at least a respective first and second unidirectional conductors, such as diodes (**34**, **35**), which are biased in a mutually opposite direction.

5,205,446

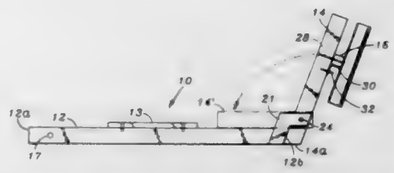
FISHING POLE HOLDER/CARRIER FOR USE WITH A VEHICLE

Philip J. Greenberg, 20622 Superior St., Unit 6, Chatsworth, Calif. 91311

Filed Jan. 25, 1991, Ser. No. 645,823

Int. Cl.[5] B60R *9/00*

U.S. Cl. 224—42.03 A **20 Claims**



1. A collapsible fishing pole holder/carrier for coupling to a vehicle, said apparatus comprising.

an elongate main support member having a first end configured for being detachably mounted to a coupler secured to a vehicle and to extend in a cantilevered manner from said vehicle;

a second elongate support member attached at a first end

thereof to the other end of said main support member in a

second axle to permit scrolling of the elongate web relative to the first axle and the second axle within the cavity.

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FOREARM GAUGE AND EQUIPMENT HOLDER FOR SCUBA DIVERS

are coupled at spaced apart locations to the belt means and

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thereof to the other end of said main support member in a manner to extend upwardly therefrom, said second member having attachment means for selectively collapsing said second member to overlie said main member;

a cross-member coupled adjacent to the other end of said second member in substantially transverse relation thereto and having attachment means for rotating said cross-member into substantial alignment with said second support means; and

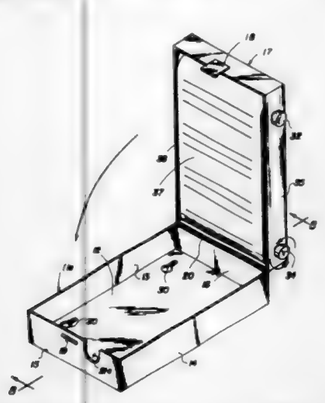
fish pole handle receiving means secured to said cross-member for receiving and retaining fishing poles.

5,205,447

CAR TELEPHONE COVER APPARATUS

Kathleen D. Hambrick, 410 Link Dr., Alcoa, Tenn. 37701

Filed Dec. 16, 1991, Ser. No. 808,233
Int. Cl.[5] B60R *11/02*
U.S. Cl. 224—42.42 **2 Claims**



1. A car telephone cover apparatus, comprising,

a container, the container including a container floor, with a first end wall spaced from a second end wall, and a front wall spaced from a rear wall, and a cover pivotally mounted to the rear wall, with the cover including a latch, and the front wall including a front wall receiving boss for selective securement of the latch thereto, and

the cover including a cover first side wall spaced from and parallel a cover second side wall defining a cover cavity therebetween, and

the front wall including a front wall slot directed downwardly from the front wall to receive a telephone cord therethrough, and

securement means mounted to the floor for securement of the container to an underlying support, and

the securement means includes a plurality of keyhole apertures directed through the floor spaced apart a predetermined spacing, and the support including a mounting plate, the mounting plate including a plurality of lug projections projecting upwardly and orthogonally relative to the mounting plate, wherein the lug projections are spaced apart the predetermined spacing for projection through the keyhole openings, and

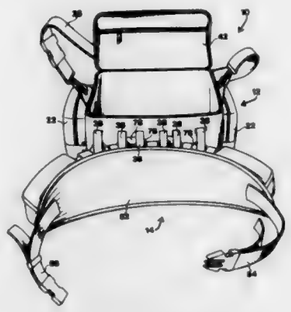
a first axle directed orthogonally through the cover first side wall and through the second side wall in a rotatable relationship, and a second axle rotatably and orthogonally directed through the cover first side wall and the cover second side wall, wherein the first axle is arranged parallel and spaced from the second axle, and a first axle handle mounted to the first axle positioned exteriorly of the first side wall, and a second axle handle mounted fixedly to the second axle projecting exteriorly relative to the first side wall, and the first axle and the second axle include an elongate flexible web wound between the first axle and the second axle to permit scrolling of the elongate web relative to the first axle and the second axle within the cavity.

5,205,448

MULTIFUNCTIONAL CAMERA BAG WITH WAIST BELT SUPPORT

Eugene A. Kester, Santa Cruz, and Hans M. Wain, Truckee, both of Calif., assignors to Photoflex, Inc., Santa Cruz, Calif.

Filed May 2, 1991, Ser. No. 695,577
Int. Cl.[5] A45F *4/00*
U.S. Cl. 224—151 **10 Claims**



1. A camera transport system comprising:

a camera bag for containing camera equipment, said camera bag having a substantially rectangular bottom with four sides extending upward therefrom, one of said sides being a generally flat rear side intended to abut against the body of the user when the bag is carried normally;

carrying means whereby the camera bag is carried; and

a substantially rectangular top closure flexibly attached about the one of said sides opposite said rear side such that said top closure hinges up and away from the user of the camera bag to open, when the camera bag is being carried by the carrying means with said generally flat rear side toward the user, wherein; the carrying means includes:

a belt attached to h camera bag such that said camera bag may be worn by the user with said top closure positioned so as to hinge up and away from said user;

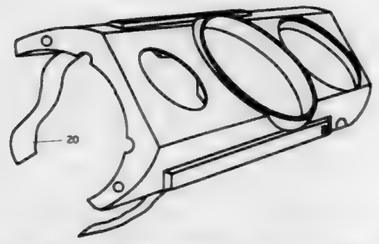
said belt is attached to the camera bag by means of a plurality of camera bag attachment loops, a plurality of belt attachment loops, and an attachment strap, said camera bag attachment loops being permanently affixed to the camera bag and said belt attachment loops being permanently affixed to said belt, said attachment strap being interlaced through said camera bag attachment loops and through said belt attachment loops such that said belt is effectively removably attached to the camera bag and further wherein said belt is attached to said camera bag by a Velcro brand type fastener system comprising a first panel and a second panel, said first panel being firmly attached to said belt and said second panel being firmly attached to said camera bag such that, when said attachment strap is interlaced through said camera bag attachment strap is interlaced through said belt attachment loops, said first panel mates with said second panel thus providing additional disconnectable support for holding said camera bag fixed n relation to said belt.

5,205,449

FOREARM GAUGE AND EQUIPMENT HOLDER FOR SCUBA DIVERS

Stephen T. Davies, 2351 Jackson St. #9, San Francisco, Calif. 94115

Filed Sep. 30, 1992, Ser. No. 954,158
Int. Cl.[5] A44C *5/00*
U.S. Cl. 224—152 **7 Claims**



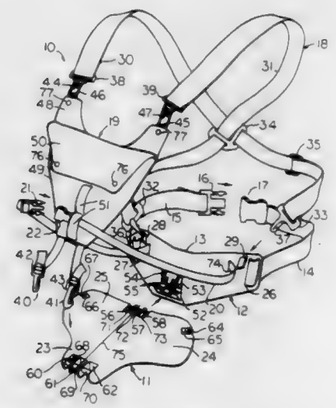
1.A device for mounting gauges or instruments to a human forearm comprising: a mounting structure of a flexible material having an outer surface, an inner surface, and opposite ends and being sized to extend over a substantial length of a forearm and adapted to conform to a human forearm when placed longitudinally thereon and including longitudinal grooves defining air channels on said inner surface extending the entire length thereof and through said opposite ends; the device further including semi-rigid rods for removable insertion within the mounting structure adjacent and parallel to said grooves for providing rigidity to said mounting structure; said outer surface including at least one receptacle for removably retaining at least one gauge or instrument; and means for securing said device to said forearm.

5,205,450

CHILD CARRIER

Daniel P. Derosier, 715 Jonathan La., La Crescent, Minn. 55947

Filed Nov. 12, 1991, Ser. No. 790,858
Int. Cl.[5] A61G *1/00*
U.S. Cl. 224—161 **13 Claims**



1. A carrier for a child comprising:

belt means for fastening around a waist of a person, the belt means including a front portion extending across a front of the waist, the front portion having a support thereon;

a seat having a portion for mounting to the support;

a shoulder harness that extends over the shoulders and along sides of the person and having a pair of first ends which are coupled at spaced apart locations to the belt means and having a pair of second ends extending down in front of the person for coupling to a portion of the seat extending away from the person;

wherein the support and the portion of the seat for mounting to the support are formed such that the seat is releasably detached from the support by pivoting the seat upward relative to the support, but such that the seat is secured to the support and restricted from pivoting downward from the position in which the seat mounts on the support.

5,205,451

INFANT CARRIER

Donna S. Manzer, 108 Hidden Glen La., Montvale, Va. 24122

Filed Jan. 27, 1992, Ser. No. 826,386
Int. Cl.[5] A61G *1/00*
U.S. Cl. 224—161 **6 Claims**

1. A carrier for the forward facing carriage of an infant or small child, said carrier temporarily securable to the front of an adult and comprising:

a central member formed of a pliable planar material and having a rear surface, first and second edges and an upper edge;

a seat extending forwardly therefrom opposite said upper edge with said seat laterally supported by first and second side supports extending respectively from said central member first and second edges;

a frontal restraint extending forwardly from said seat;

first and second lateral restraints having a common upper edge, wherein an end of said first lateral end is located nonadjacent an end of said second lateral restraint, and wherein said first and second lateral restraints extend from either side to said frontal restraint;

first and second shoulder straps extending from said central member upper edge and being secured adjacent one another;

first and second lateral straps extending from said central member;

first and second infant restraining straps extending from said upper edge of said lateral restraints and secured adjacent one another;

first and second upper infant restraining straps respectively secured to said first and second shoulder straps;

means for adjusting the length of said shoulder straps and said infant restraining straps and for temporarily and positively securing said shoulder straps to said lateral straps and said infant restraining straps to said upper infant restraining straps; and

means for securing said end of said first lateral restraint and

said end of said second lateral restraint to said first and second side supports, respectively, whereby

longitudinally spaced along said bottom wall, and said supporting member comprises engaging means for detach-

rated tear lines, said perforated tear lines being spaced from one another and extending across the width of said web, and

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DISPENSER WITH STABILIZER FOR CORELESS ROLL

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said end of said second lateral restraint to said first and second side supports, respectively, whereby

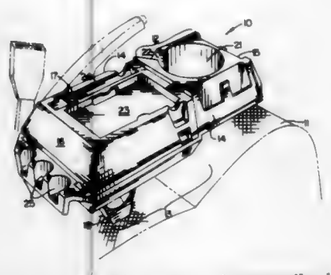
said central member rear surface is placed adjacent said front of the adult, said first shoulder strap is passed over a shoulder and diagonally across the back of the adult and secured to said second lateral strap, said second shoulder straps is passed over an opposite shoulder and diagonally across the back of the adult and secured to said first lateral strap, said end of said first lateral restraint and said end of said second lateral restraint securing means are respectively secured to said first and second side supports to form leg openings for the infant, the infant is placed within said carrier facing forward with the legs of the infant extending through said leg openings, and said first and second infant restraining straps are respectively secured to said first and second upper infant restraining straps, thereby providing a five way infant restraint system comprised of said first and second infant restraining straps, said first and second lateral restraints, and said frontal restraint.

5,205,452

PORTABLE CAR CONSOLE

Neal N. Mankey, Charlotte, N.C., assignor to Allied Plastics, Inc., Gastonia, N.C.

Filed Oct. 16, 1991, Ser. No. 777,076
Int. Cl.[5] B60R *7/00*
U.S. Cl. 224—275 **12 Claims**



1. A console adapted for use on a downwardly sloping car seat of the type that slopes generally downwardly from front to rear and which console is characterized by the ability to properly hold various articles such as beverage containers, notepads, pens and the like, and particularly in a substantial horizontal orientation despite the slope of the car seat, said console comprising

a body comprising top, bottom, side and end walls defining a front portion and a rear portion, each of said front and rear portions comprising a substantial portion of said body,

said top wall of said body further comprising means for receiving and supporting various articles,

said bottom wall further comprising means for being rested on a sloping car seat with said front portion of said body toward the front of the car seat and said rear portion toward the rear of the car seat, and

a supporting member carried by said rear portion of said body and extending downwardly from said bottom wall for supporting said rear portion on the car seat with said top wall of said body substantially horizontal despite the slope of the car seat, and

adjusting means located on said bottom wall at said rear portion thereof for adjusting the longitudinal position of said supporting member with respect to the front portion of said body to thereby increase or decrease the angle between the front portion and the bottom of the supporting member to thereby level the top wall with respect to a sloping car seat regardless of the degree of slope of the seat, and

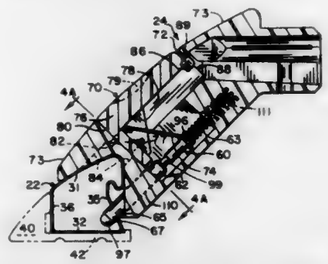
wherein said adjusting means on said bottom wall of said rear portion comprises a plurality of receiving means longitudinally spaced along said bottom wall, and said supporting member comprises engaging means for detachable attachment to said receiving means for attaching said supporting member to any one of a plurality of locations along the length of said bottom wall of said rear portion.

5,205,453

LOCKING MECHANISM FOR AUTOMOBILE LUGGAGE RACKS

Richard I. Pudney, Croswell; Charles R. Schriner, Port Huron; Charles E. Stringer, Deckerville; Mark C. Towns, and Gary M. Cronce, both of Port Huron, all of Mich., assignors to Masco Industries, Inc., Taylor, Mich.

Filed Aug. 1, 1990, Ser. No. 561,696
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—321 **32 Claims**



1. An article carrier for an automotive vehicle having an exterior body surface, comprising in combination,

at least one elongated member adapted to be mounted on said exterior body surface, said elongated member having a plurality of longitudinally spaced apertures therein,

an article securing member adapted to be mounted for longitudinal movement on said elongated member,

said article securing member including means cooperable with said apertures for locking and longitudinally adjusting said article securing member at predetermined positions along said elongated member,

said locking and adjusting means including a latching member carried by said article securing member and having one end thereof engageable and disengageable with said apertures, an actuating member carried by said article securing member and being depressed and extended linearly relative to an outer surface of said article securing member from a latching position to an unlatching position, and means including a pivotally movable lever link having an elongated body and first and second ends, said elongated body of said lever link extending between and being pivotally connected adjacent each of said first and second ends respectively to said latching member and said actuating member for disengaging said one end of said latching member from said apertures incident to said actuating member being manually moved to said unlatching position causing corresponding relative pivotal movement of said lever link with respect to both said actuating member and said latching member.

5,205,454

PAPER TOWEL DISPENSING SYSTEM

Rudolph W. Schutz, Walnut Creek, and Lawrence E. Weinert, Antioch, both of Calif., assignors to James River II, Inc., Oakland, Calif.

Filed May 18, 1992, Ser. No. 884,923
Int. Cl.[5] B65H *35/10*
U.S. Cl. 225—1 **13 Claims**

1. A method of separating individual segments from a web of sheet material divided into segments by a plurality of perforated tear lines, said perforated tear lines being spaced from one another and extending across the width of said web, and said segments including an end-most segment, said method comprising the steps of:

pulling said end-most segment by applying a pulling force on said end-most segment in a predetermined direction;

during said pulling step, transporting said end-most segment through a nip defined by nip rollers;

pressing said rollers together and deforming at least one of the nip roller rollers to create a drag force on said end-most segment with said rollers as said end-most segment passes through said nip, said drag force being opposed to said pulling force;

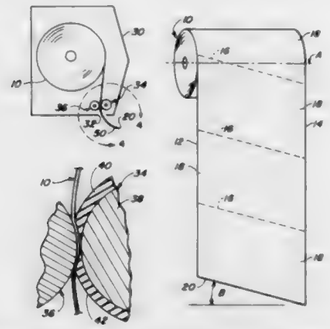
utilizing said opposed pulling and drag forces to tear said web of sheet material along the perforated tear line separating the end-most segment from an adjacent segment as said end-most segment is transported through said nip; and

completing the tearing of said perforated tear line separating the end-most segment from said adjacent segment after a portion of the adjacent segment has passed through said nip.

4. In combination:

a dispenser housing defining an interior and an opening in communication with said interior;

a roll of sheet material having side edges positionable in said dispenser housing interior, said sheet material having a



plurality of perforated tear lines dividing said sheet material into a plurality of sheet material segments including an end-most segment having a terminal end, said roll of sheet material having a principal axis and said perforated tear lines being parallel to each other and extending across the sheet material between said side edges, with at least a portion of each tear line disposed at an angle to said principal axis whereby the terminal end of the end-most segment of said sheet material will incrementally emerge from said opening in said housing during dispensing of said sheet material from said roll;

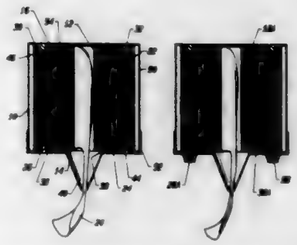
nip defining means operatively associated with said housing defining a nip through which said sheet material passes when a pulling force is applied to said end-most segment and exerting a drag force on said sheet material in opposition to said pulling force whereby the end-most segment will tear along the tear line separating the end-most segment from an adjacent segment and present a portion of said adjacent segment externally of said housing for subsequent manual grasping by an individual, said nip defining means including nip rollers, at least one of said nip rollers having a deformable surface, said nip rollers being in tight engagement and said deformable surface of said at least one nip roller being deformed by another of said nip rollers to a degree sufficient to impede rotational movement of said nip rollers and to create said drag force.

5,205,455

DISPENSER WITH STABILIZER FOR CORELESS ROLL PRODUCTS

John R. Moody, Antioch, Calif., assignor to James River II, Inc., Oakland, Calif.

Filed May 21, 1992, Ser. No. 886,592
Int. Cl.[5] A47K *10/32*; **B65D** *85/671*
U.S. Cl. 225—106 **10 Claims**



1. Dispenser apparatus for dispensing sheet material from the center of a coreless roll of said sheet material, said coreless roll being formed from convolutions of said sheet material having spaced first and second edges, and said coreless roll having a first end defined by the first edges and an opposed second end defined by said second edges, said coreless roll first end having a first planar portion formed by the first edges of a first plurality of convolutions of sheet material and a first offset portion defined by the first edges of a second plurality of sheet material convolutions offset from the first edges of said first plurality of convolutions, said dispenser apparatus comprising, in combination:

a housing defining an interior and including a support engageable by the coreless roll first end to support said coreless roll of sheet material, said support defining a dispensing aperture through which sheet material from the coreless roll is pulled when dispensing said sheet material from the center of said roll; and

stabilizing means on said housing for engaging said coreless roll and maintaining said coreless roll in a predetermined position relative to said dispensing aperture when said coreless roll is supported by said support and for resisting collapse of said coreless roll when said coreless roll nears depletion caused by dispensing of said sheet material through said dispensing aperture, said stabilizing means including a first stabilizing element at least partially registrable with said first offset portion and cooperable therewith to resist movement of said coreless roll relative to said stabilizing means and said dispensing aperture.

5,205,456

BLIND RIVETTING GUN WITH AUTOMATIC LOADER

Masatoshi Ohuchi, 6-12, Shizuka-machi, Kooriyama-shi, Fukushima-ken, and Masaru Matsumoto, 1-10-11, Narusegaoka, Machida-shi, Tokyo, both of Japan

Filed Jun. 5, 1991, Ser. No. 710,022
Claims priority, application Japan, Jun. 5, 1990, 2-146850
Int. Cl.[5] B21J *15/20*
U.S. Cl. 227—57 **4 Claims**

1. A blind rivetting gun comprising a head section, a hydropneumatic driving section and a rivet loader section, said head section including:

a rivet clamping portion including:

a housing having a vertical slit for allowing blind rivets to pass in a feed belt, and

a pair of clamps pivoted on a lower portion thereof which are openable to a front and normally closed by a pair of springs;

a rivet rod securing portion including:

a pneumatic jaw release cylinder connected to an upper

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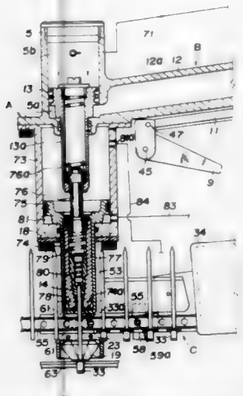
end of said housing and having an upper air port and a lower air port,

a jaw release piston slidably inserted into said pneumatic jaw release cylinder and having a jaw release cylinder integrally connected to a lower end thereof which is provided with a through hole on a bottom thereof for receiving a rivet rod, and



a cylindrical jaw case slidably supported in said jaw release cylinder by a pushing rod and provided with an inner tapered portion to a front, wherein a pair of jaws are normally pushed downward by springs inserted therein; and

a jaw pulling up portion.

5,205,457

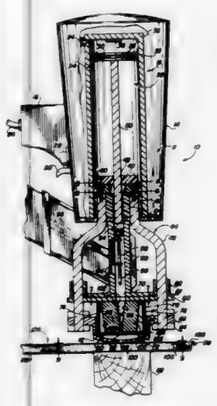
DRIVING TOOL AND METHOD

Roy A. Blomquist, Jr., 1725 Arredondo Grant Rd., De Leon Springs, Fla. 32130

Filed Jan. 6, 1992, Ser. No. 817,148

Int. Cl.[5] B25C *1/04*

U.S. Cl. 227—66 **8 Claims**



1. A tool for driving a fastener into drywall having a paper layer or the like formed on the drywall surface, the tool comprising:

, a housing enclosing a cylinder;

a barrel being coupled to said housing;

said barrel having an open end and being adapted to receive fasteners;

means for placing a fastener in the barrel;

a piston head abutting the sides of said cylinder, said piston head being attached to a piston rod extending away from said piston head and into said barrel;

means for forcing the piston head forward in said cylinder from an initial position to a terminal position, said piston rod moving with the piston head forward to contact the fasteners within said barrel such that said fasteners are pushed, forward through the barrel by the rod and out an open end of said barrel;

means disposed adjacent the open end of said barrel for indenting said drywall as said fastener is discharged out the open end of said barrel;

connecting means disposed along opposite sides of said barrel coupled to said indenting means and being formed from a rigid material, for stopping the forward velocity of said piston head and transferring the force of said forward velocity of said piston head to said indenting means;

means disposed between said connecting means and said piston head and being formed of a resilient material for preventing said piston head from contacting said connecting means and for reducing the forward velocity of said piston head, said resilient material being compressed between said piston head and said connecting means when said piston head forward velocity is reduced, said resilient material having a thickness selected such that when compressed on successive fastener dischargings, the terminal position of one end of the piston rod will not vary more than a predetermined amount from an open end of the indenting means, the predetermined amount having a dimension less than the thickness of paper formed on the surface of the drywall.

5,205,458

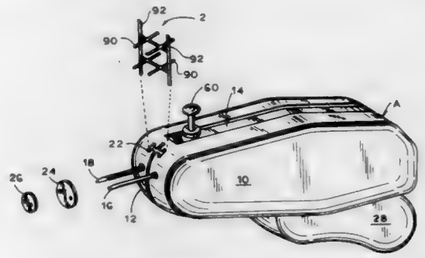
BUTTON ATTACHER WITH VARIABLE NEEDLE SPACING

Steven Kunreuther, 285 Central Park West, New York, N.Y. 10024

Filed Mar. 27, 1992, Ser. No. 858,960

Int. Cl.[5] B65C *5/06;* **B25C** *1/00*

U.S. Cl. 227—71 **29 Claims**



1. Apparatus for dispensing double "T" bar fasteners through spaced hollow needles, the apparatus comprising a housing from which the needles extend, means in said housing, effective when actuated, to push the "T" bar ends of a fastener through the needles, said housing comprising first and second portions, a different one of the needles extending from each of said housing portions, means for resiliently connecting said housing portions to permit relative movement of said housing portions from a remote position toward a proximate position to alter the spacing between the needles when external forces are applied to said housing portions and for biasing said housing portions toward said remote position to permit said housing portions to return to said remote position when said external forces are released, said push means comprising first and second spaced push rods, means for simultaneously moving said rods to push the "T" bar ends through the needles and means for mounting said rods to said moving means to permit the relative position of said rods to change, as said housing portions move between said remote and proximate positions, so as to accommodate the alterations in needle spacing.

5,205,459

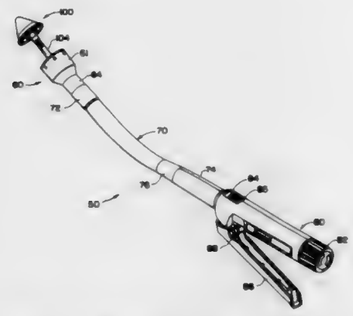
SURGICAL ANASTOMOSIS STAPLING INSTRUMENT

Ronald J. Brinkerhoff, Amelia; Rudolph H. Nobis, Mason; Helmut Wolf, Cincinnati, all of Ohio; Federico Bilotti, Hamburg, Fed. Rep. of Germany; William Fox, Ohio Township, Clermont County, Ohio; Mark S. Zeiner, Cincinnati, Ohio, and E. David Allen, Okeana, Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 749,393, Aug. 23, 1991, abandoned. This application Sep. 1, 1992, Ser. No. 938,982

Int. Cl.[5] A61B *17/04*

U.S. Cl. 227—179 **15 Claims**



1. A surgical stapling instrument for applying one or more surgical staples to tissue, comprising:

a stapling head assembly including a staple holder for receiving one or more surgical staples, an anvil fo clamping the tissue against said staple holder, and driver means for engaging and driving the staples from said staple holder into the tissue and against said anvil;

an actuator handle assembly for actuating said staple driver;

a shaft assembly including a longitudinally curved support shaft for mounting said stapling head assembly on said actuator handle assembly said shaft assembly having a tubular shape with a circular cross section, defined by a diameter and containing a hollow interior;

a tension member contained within said hollow interior of said support shaft for transmitting tension from said actuator handle assembly to said anvil to resist the forces exerted on said anvil when the staples are formed said tension band placed generally along the center of said shaft along said diameter;

a compression member contained within said hollow interior of support shaft for transmitting a compressive force from said actuator handle assembly to advance said staple driver to drive the staples from said staple holder into the tissue and to form the staples against said anvil; and

said compression member placed entirely on one side of said diameter with said hollow interior and having an elongated wall section extending through said support shaft and including an integral guide surface thereon for engaging and supporting said tension member.

5,205,460

BONDING APPARATUS

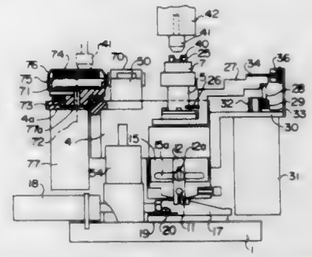
Koji Sato, and Akio Bando, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed May 19, 1992, Ser. No. 885,186

Claims priority, application Japan, May 20, 1991, 3-143927

Int. Cl.[5] B23K *3/08*

U.S. Cl. 228—6.2 **2 Claims**



1. A semiconductor bonding apparatus comprising:

a bonding stage which positions and carries a chip thereon;

a bonding tool which press-bonds said chip to leads of a film carrier, and

a wire brush installed adjacent to said bonding stage such that a longitudinal axis of said wire brush is displaced from a center of said bonding tool for cleaning said bonding tool;

wherein said wire brush is attached to an upper surface of a brush-rotating section which is supported so as to be rotatable about its vertical axis, and said brush-rotating section being rotary-driven by a rotary driving means.

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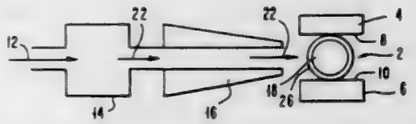
METHOD AND APPARATUS FOR FLUXLESS SOLDER BONDING

Harry R. Bickford, Ossining; Raymond R. Horton, Dover Plains; Ismail C. Noyan, Peekskill; Michael J. Palmer, Walden, all of N.Y., and John C. Zyzo, Waterbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 226,161, Jul. 29, 1988, Pat. No. 4,937,006. This application May 16, 1990, Ser. No. 524,408

Int. Cl.[5] B23K *1/12*

U.S. Cl. 228—20 **12 Claims**



1. A method for a fluxless solder bonding a solder mound to a wettable surface comprising:

placing said solder mound against said solder wettable surface;

directing at said solder mound a gas, said gas having a predetermined temperature and momentum, said temperature being sufficient to melt said mound to a molten mass, there being an oxide at the surface of said molten mass, said gas momentum at said oxide being sufficient to disperse said oxide on said surface permitting the nonoxidized molten solder to wet said solder wettable surface without requiring flux; and

cooling said molten solder to solder bond said solder mound to said solder wettable surface.

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COMPRESSIVE BRAZING FIXTURE

tool vertically to pay out a length of wire equal to the clearance height of link L1,

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ends together and then stopping such relative rotation to permit the two ends to fuse together;

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MANUFACTURING METHOD OF AUSTENITIC STAINLESS STEEL SELF-TAPPING AND

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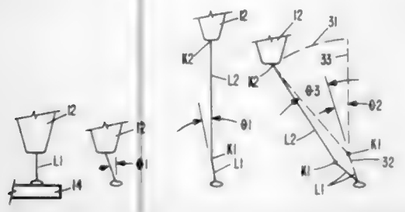
5,205,462
COMPRESSIVE BRAZING FIXTURE
Andrew D. Crosier, Canton; Mark R. Nock, Ypsilanti, and Josef Hirmann, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jun. 29, 1992, Ser. No. 906,052
Int. Cl.[5] B23K *37/00*
U.S. Cl. 228—44.3 **18 Claims**

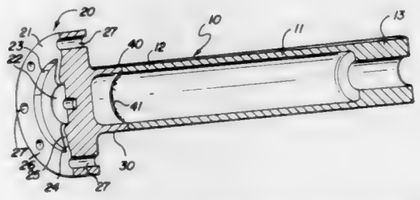
1. An apparatus for holding an article during a brazing process, comprising:
a generally rectangular frame including an article contact member disposed on one side thereof and ribs for supporting said article thereon; and
a single lever extending axially along the length of said frame and being pivotally mounted to said frame opposite said contact member, said lever being operative to pivot from a first position to allow placement of said article onto said frame to a second position in contact with said article in response to gravity such that in the second position, said lever applies a constant compressive force to said article during the brazing process.

5,205,463
METHOD OF MAKING CONSTANT CLEARANCE FLAT LINK FINE WIRE INTERCONNECTIONS
William J. Holdgrafer, Burlington, N.J.; Lee R. Levine, New Tripoli, Pa., and Douglas L. Gauntt, Mickleton, N.J., assignors to Kulicke and Soffa Investments, Inc., Wilmington, Del.
Filed Jun. 5, 1992, Ser. No. 894,552
Int. Cl.[5] H01L *21/60;* **H05K** *3/32*
U.S. Cl. 228—102 **10 Claims**



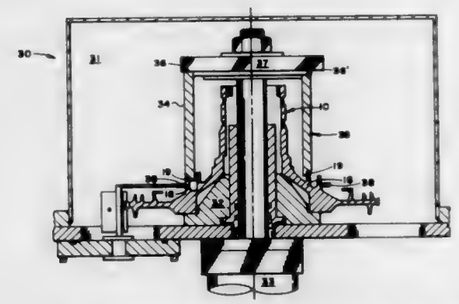
1. A method of directing an automatic wire bonder to make a fine wire interconnection between a first and a second bonding pad on a semiconductor device to be bonded and to simultaneously pre-forming said fine wire, comprising the steps of:
teaching the automatic wire bonder the X,Y and Z locations of the desired bonding points at the first and second bonding pads of the semiconductor device to be bonded,
generating in the processor of the automatic wire bonder a desired three link geometric profile of each of the wire interconnections to be made between bonding points,
generating in the automatic wire bonder the lengths of the links L1, L2 and L3 and the kink angle theta 3 between the links L2 and L3 in said geometric profile,
bonding an end of a fine wire to the first bonding point employing a capillary bonding tool on the automatic wire bonder,
pre-forming kinks K1 and K2 in said fine wire while simultaneously paying out said predetermined lengths of wire L1, L2 and L3,
said first link L1 being pre-formed by raising said bonding tool vertically to pay out a length of wire equal to the clearance height of link L1,
moving said bonding tool horizontally and vertically downward to form a kink K1 at length L1 of said fine wire,
pre-forming said second link L2 by raising said bonding tool substantially vertically from kink point K1 to pay out a length of wire equal to length L2,
moving said bonding tool horizontally and vertically downward along an arcuate path to form a kink K2 at length L2 of said fine wire,
pre-formed and said third link L3 by raising said bonding tool vertically and horizontally to pay out a length of fine wire equal to link L3,
clamping said fine wire from further movement in said capillary bonding tool,
moving said bonding tool horizontally and vertically downward in an arcuate path to the desired second bond position while simultaneously bending said fine wire at said kink points K1 and K2 for producing said three link geometric profile interconnecting wire, and
bonding said fine wire to said second bonding point.

5,205,464
METHOD FOR FORMING A LIGHTWEIGHT FLANGED AXLE SHAFT
Joseph Simon, 237 Lothrup, Grosse Pointe Farms, Mich. 48236
Filed Dec. 19, 1991, Ser. No. 811,452
Int. Cl.[5] B23K *20/12*
U.S. Cl. 228—114 **8 Claims**



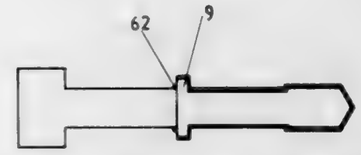
1. A method for forming a lightweight flanged axle shaft and the like, such as for use in transmitting power from the differential of a vehicle to a power driven wheel, comprising:
inserting a tubular blank, having a lead end and trailing end, in a tubular die having an inlet end for receiving the blank and an opposite die extrusion throat through which the blank is extruded starting with its lead end to its trailing end;
moving a punch, which is sized to closely fit within the die, axially within the die towards the die throat for engaging and pushing the trailing end of the blank towards the die throat and, thereby, extruding the blank through the die throat;
providing a mandrel-like extension on the lead end of the punch means and positioning said extension within the blank and the die throat while moving the punch for thereby collapsing the blank radially inwardly as it is moved through the die throat for forming an elongated, hollow, relatively thin wall tube out of the blank which is extruded through the die throat;
separately forming a flange in a generally disk-like, roughly flat shape with a central hub integrally formed on one face thereon and with the hub having roughly the same outer diameter as the outer diameter of an end of said shaft and with the free end of the hub formed with a blunt, flat surface;
positioning the blunt end of the hub against an end of the shaft and aligning the two coaxially;
rapidly rotating the hub or the shaft relative to the other while engaging the adjacent ends of the hub and shaft for generating heat in a sufficient amount to weld the two ends together and then stopping such relative rotation to permit the two ends to fuse together;
whereby an enlongated, hollow, relatively lightweight metal shaft is formed with a laterally extending flange formed on one end thereof, for providing a means for fastening that end of the shaft to a drive or driven member;
and forming a coupling means on the opposite end of the shaft for securing said opposite end to the other of the two driving and driven members.

5,205,465
METHOD FOR REPLACING WORN AIRSEAL LANDS ON ENGINE COMPRESSOR OR TURBINE DISKS
Ralph B. Bogard, North Palm Beach; Robert W. Baumgarten, Palm Beach Gardens, and John M. Robertson, Tequesta, all of Fla., assignors to United Technologies Corporation Hartford, Conn.
Filed Sep. 19, 1990, Ser. No. 595,342
Int. Cl.[5] B23P *6/00;* **B23K** *31/02*
U.S. Cl. 228—119 **11 Claims**



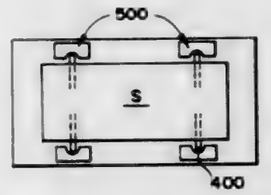
1. A method for the replacement of an airseal land on a disk, said disk comprising a compressor or turbine disk manufactured of a wrought nickel-base superalloy or titanium alloy, said method including the steps of:
a) removing a pre-existing airseal land, leaving a stub portion thereof to provide a bonding surface to which a replacement airseal land ring may be bonded;
b) preparing a replacement airseal land ring of a wrought alloy selected so as to be readily forge joined to said stub, said replacement ring having a bonding surface of the same dimensions as said stub, and a cross-section having a narrower bonding surface than the load bearing upper section thereof;
c) positioning the bonding surface of said replacement ring adjacent to the bonding surface of said stub, and drawing a vacuum around said bonding surfaces;
d) applying a bonding force to said replacement ring and said stub;
e) locally heating the interface between said replacement ring and said stub to a temperature within the solution range of the alloy of said replacement ring but not causing localized melting, to obtain a solid state bonding at said interface;
f) removing said force and subjecting the bonded assembly to an isothermal vacuum heat treatment so as to optimize properties thereof;
g) removing said bonded assembly, and machining the replacement airseal land to the desired final configuration.

5,205,466
MANUFACTURING METHOD OF AUSTENITIC STAINLESS STEEL SELF-TAPPING AND SELF-DRILLING SCREW
Yao-Tin Ker, Shiaan Shi Shiang, Taiwan, assignor to Chieh-Chang Tzeng, Jang Huah County, Taiwan
Filed Jul. 15, 1992, Ser. No. 913,353
Int. Cl.[5] B23K *20/24, 101/34, 103/04*
U.S. Cl. 228—125 **4 Claims**



1. A method of manufacturing an austenitic stainless steel self-tapping and self-drilling screw formed from low carbon or low carbon alloy steel including the steps of:
(a) forming a low carbon or low carbon alloy steel rod having a rod shoulder section, a rod non-threaded bolt section and a rod drilling end section;
(b) carburizing and heat treating said rod to a predetermined carburization depth to provide a carburized portion of said rod;
(c) establishing an austenitic stainless steel rod having a head section and a non-threaded bolt section;
(d) welding said austenitic stainless steel non-threaded bolt section to said rod shoulder section in aligned relation thereto forming a weld flash;
(e) removing said rod shoulder section and said weld flash to provide a non-carburized section of said rod;
(f) threading said rod non-threaded bolt section and said austenitic stainless steel rod non-threaded bolt section.

5,205,467
SPF/DB GAS NEEDLE IMPROVEMENT
Seb R. Sarkisian, Torrance; George W. Stacher, Westminster, and Arthur Martinez, Pico Rivera, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Sep. 3, 1991, Ser. No. 753,466
Int. Cl.[5] B23K *20/00, 31/02;* **B23P** *17/00*
U.S. Cl. 228—157 **7 Claims**



2. In a stack of sheets of titanium alloy materials including gas-conveying circular passageways extending from the interior of the stack to the ambient, a method of using dummy needles to maintain the circular shape of said passageways, comprising:
inserting a dummy needle in each stack passageway,
performing diffusion bonding
removing the dummy needles
reaming out said each passageway to ensure a circular shape; and
fitting said each reamed out passageway with needles adapted for superplastic forming.

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BUTT WELDING SHEETS

covering 90 degrees of said interior surface of said hollow article; and

ing path of the hot rolling mill; positioning a rear end edge of a first, leading piece of steel adjacent a front end of a

5,205,473
RECYCLABLE CORRUGATED BEVERAGE CONTAINER AND HOLDER

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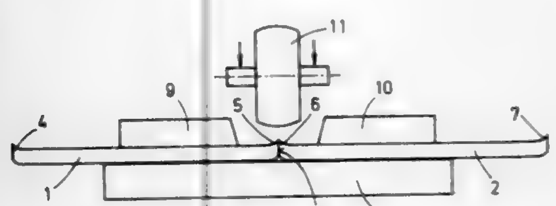
5,205,468
BUTT WELDING SHEETS
Bernd Büdenbender, Schubertweg 5, 2160 Stade, Fed. Rep. of Germany
Filed Mar. 23, 1990, Ser. No. 498,585
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909620
Int. Cl.[5] B23K *26/00*
U.S. Cl. 228—164 **8 Claims**

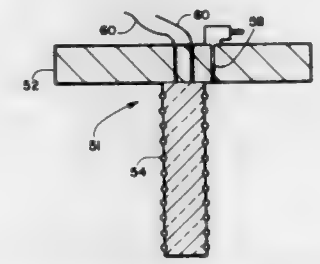


1. A method of joining fusible metal sheet edges, the method comprising the steps of sequentially:
forming each of the edges with a laterally projecting burr;
butting the edges together at a join line with both the burrs directed in the same lateral direction adjacent each other but with some small gaps remaining between the butted edges;
plastically deforming the laterally projecting burrs at the join line in the lateral direction opposite their projection direction and thereby closing the gaps; and
directing a laser beam at the join line and thereby fusing the edges together at the join line.

5,205,469
WELD OVERLAY DEVICE AND METHOD
Dan Capitanescu, 4031 Rundlehorn Dr. N.E., Calgary, Alberta, Canada T1Y 2K2
Filed Aug. 13, 1992, Ser. No. 928,786
Int. Cl.[5] B23K *9/18, 9/04*
U.S. Cl. 228—225 **6 Claims**

1. A method for the overlaying of the interior surface of a curved hollow article comprising the steps of:
applying a first pass series of longitudinal overlapping welds by welding means curved to follow the curvature of said hollow article wherein said first pass overlapping welds cover 90 degrees of said interior surface of said hollow article;
rotating said hollow article and applying a second pass series of longtudinal overlapping welds by said welding means wherein said second pass series of welds are located 180 degrees from said first pass series of overlapping welds and said second pass series of overlapping welds covers 90 degrees of said interior surface of said hollow article;
rotating said hollow article and applying a third pass series of longitudinal overlapping welds by said welding means wherein said third pass series of overlapping welds commences adjacent to either end of said first pass series of overlapping welds and ends by overlapping the corresponding end weld of said second pass series of overlapping welds with said third pass series of overlapping welds covering 90 degrees of said interior surface of said hollow article; and
rotating said hollow article and applying a forth pass series of overlapping welds by said welding means wherein said forth pass series of overlapping welds are located 180 degrees from said third pass series of overlapping welds and said forth series of overlapping welds covers 90 degrees of said interior surface of said hollow article.

5,205,470
METHOD AND APPARATUS FOR SUPERPLASTIC FORMING OF HOLLOW PARTS
Gilbert C. Cadwell, Lakeside, Calif., assignor to Rohr, Inc., Chula Vista, Calif.
Filed Oct. 31, 1988, Ser. No. 264,392
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—265 **14 Claims**

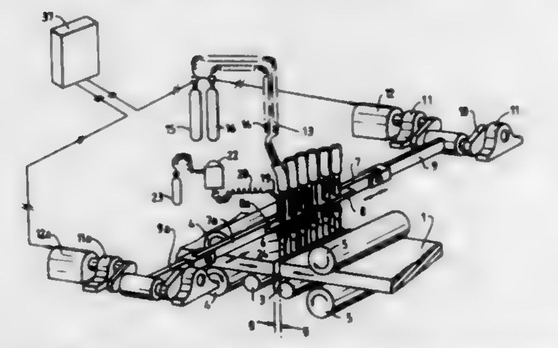


1. A method of superplastic forming of hollow metal parts which comprises the steps of:
providing a hollow frangible ceramic die having an interior forming surface corresponding to the exterior surface of a part to be formed;
placing metal parts to be formed against the interior forming surface of said die;
enclosing the exterior of said die;
sealing the enclosure to said parts to provide a gas-tight enclosure for said die;
heating the resulting assembly to a selected forming temperature;
exposing said assembly to external forming pressure for a selected period;
reducing said pressure and cooling said assembly;
removing said enclosure; and
breaking away said die to free the resulting formed part.

9. An apparatus for superplastic forming of metal parts which comprises:
a hollow frangible ceramic die having an interior forming surface corresponding to the desired exterior surface of a part to be formed;
an enclosure surrounding the exterior surface of said die and sealable to metal parts engaging said forming to form a gas-tight enclosure around said die;
means for heating the resulting assembly to a selected forming temperature; and
means for applying substantially isostatic pressure to said assembly for a selected period.

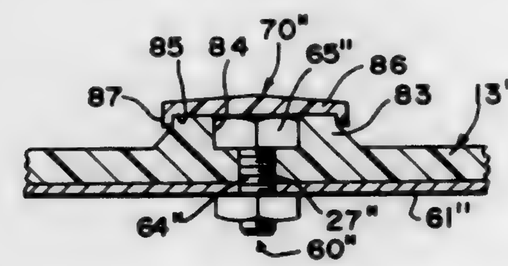
5,205,471
METHOD AND APPARATUS FOR JOINING STEEL PIECES IN A HOT ROLLING MILL
Ryohei Kinose; Yasutsugu Yoshimura, both of Hitachi, and Teruo Sekiya, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 9, 1992, Ser. No. 848,083
Claims priority, application Japan, Mar. 20, 1991, 3-57033
Int. Cl.[5] B23K *7/00, 20/00;* **B22D** *11/00, 11/12*
U.S. Cl. 228—265 **25 Claims**

1. A method for joining consecutive pieces of steel in a hot rolling mill, comprising
conveying the pieces of steel longitudinally along a processing path of the hot rolling mill; positioning a rear end edge of a first, leading piece of steel adjacent a front end of a second, following piece of steel to be joined thereto;
determining lateral location of side edges of the pieces;
passing multiple fusing torches laterally relative to the processing path along said end edges, in a fusing movement controlled on the basis of said determined side edge locations, causing fusing at at least one of said end edges, and



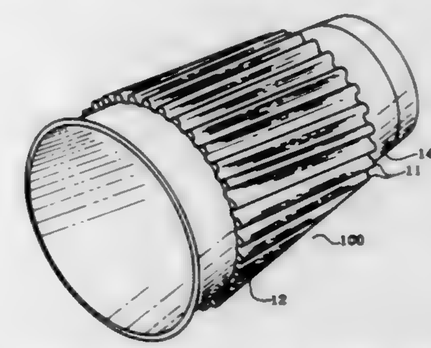
urging the first and second pieces of steel together longitudinally to join them;
said fusing movement of the fusing torches being controlled to keep the time between fusing of steel at lateral extremities of the joint, and urging together of said pieces to form the joint, less than a predetermined limit time for regrowth of oxide scale.

5,205,472
FAN COIL UNIT
John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781
Division of Ser. No. 642,767, Jan. 18, 1991, Pat. No. 5,113,667.
This application Mar. 25, 1992, Ser. No. 857,368
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[5] B65D *25/18*
U.S. Cl. 220—571 **12 Claims**



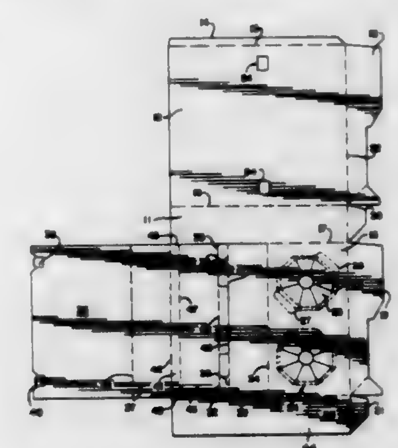
1. A primary pan comprising a pan body including a bottom wall and an upstanding peripheral wall collectively defining a condensation chamber, said bottom wall having an inner surface, at least one motor mount in the form of a raised portion of said bottom wall projecting above said inner surface, a bore through said motor mount and a bottom wall generally normal to the latter, said bore including a counterbored portion, a fastener having a stem inserted into said bore and an enlarged portion seated in said counterbored portion, and a sealant disposed in said counterbored portion over said fastener enlarged portion to thereby prevent condensation from damaging said fastener.

5,205,473
RECYCLABLE CORRUGATED BEVERAGE CONTAINER AND HOLDER
David W. Coffin, Sr., Fayetteville, N.Y., assignor to Design By Us Company, Philadelphia, Pa.
Filed Mar. 19, 1992, Ser. No. 854,425
Int. Cl.[5] B65D *3/28*
U.S. Cl. 229—1.5 B **18 Claims**



1. A recyclable, insulating beverage container holder, comprising a corrugated tubular member comprising cellulosic material and at least a first opening therein for receiving and retaining a beverage container, said corrugated tubular member comprising fluting means for containing insulating air; said fluting means comprising fluting adhesively attached to a liner with a recyclable adhesive.

5,205,474
EASY SET-UP CARTON AND METHOD
Aurel E. Stuart, Marietta, and William Taylor, Riverdale, both of Ga., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Jun. 2, 1992, Ser. No. 892,450
Int. Cl.[5] B65D *5/20, 5/48*
U.S. Cl. 229—1.5 H **16 Claims**



1. A carry out tray for food and beverage formed from a blank of paperboard material capable of being folded from a collapsed condition prior to use into an erect useable condition, said tray in its erect usable condition comprising:
a substantially planar top wall having an integral product receptacle,
a pair of substantially parallel sidewalls foldably connected to opposite edges of said top wall, said sidewalls being in substantially perpendicular relationship to said top wall,
a substantially planar bottom wall spaced from said top wall, said bottom wall having an opening and foldably connected in substantially perpendicular relationship to each of said pair of sidewalls,
a compartment member adjacent said bottom wall, said

compartment member having a lock portion extending

cooperating slot and cantilevered tab pairs in said cover for releasably engaging said double wall detents.

located such that when the lid is placed on the carton the

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DOUGH CONTAINER WITH PREWEAKENED

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compartment member having a lock portion extending into the opening of said bottom wall;

an end member substantially perpendicular to said top wall and foldably connected to said compartment member, said end member being rotatively coupled to said pair of sidewalls; and

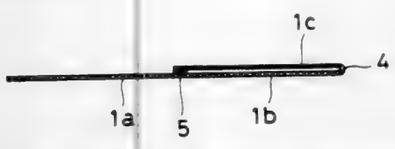
an intermediate member foldably connected to said top wall and spaced from said end member and attached to said compartment member to form an open compartment, said intermediate member having a guide portion depending therefrom deflecting said lock portion of said compartment member into the opening of said bottom wall for locking the tray in its erect usable condition.

5,205,475

SEALED LETTERS, POSTCARDS AND LIKE CONFIDENTIAL SHEETS, AND PAPER, CONTINUOUS FORM OR DOCUMENT SHEET FOR PREPARING SAME

Kenji Shibahara, and Norio Hochin, both of Osaka, Japan, assignors to Kabushiki Kaisha Challenge Five and Evercoat Kabushiki Kaisha, both of Osaka, Japan

Filed Mar. 16, 1989, Ser. No. 324,087
Claims priority, application Japan, Dec. 16, 1988, 63-163627
Int. Cl.[5] B42D *15/04*
U.S. Cl. 229—92.8 1 Claim



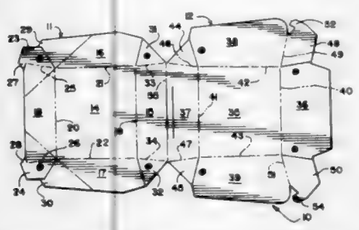
1. A confidential sheet in the form of a sealed letter, postcard or the like and having a sheet body bearing the information to be concealed on one surface thereof, the confidential sheet being formed in a lapped state by folding the sheet body in at least two with the information bearing surface inside, said sheet body comprises front and back sheets, with a nontransparent sheet interposed and permanently secured therebetween for preventing the information on the inner surface from being seen through from outside, and said front and back sheets are formed of paper.

5,205,476

CLAMSHELL CARTON HAVING AN IMPROVED LATCHING MECHANISM

John F. Sorenson, Naperville, Ill., assignor to Perseco Division of The HAVI Group LP, Oak Brook, Ill.

Filed Jun. 12, 1992, Ser. No. 898,027
Int. Cl.[5] B65D *5/66, 43/16*
U.S. Cl. 229—114 13 Claims



1. A clamshell carton having a tray, a cover fitting over said tray, a fold line hinge connecting said tray and cover and means for latching the cover and tray in a closed position, said latching means comprising:

double wall detents projecting forwardly above the front wall of said tray; and

cooperating slot and cantilevered tab pairs in said cover for releasably engaging said double wall detents.

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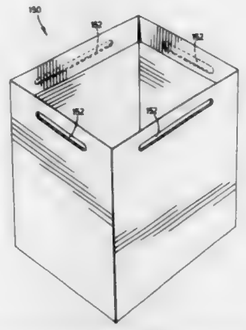
INTERLOCKING CARTON AND LID

John Zimmermann, Scarborough, Canada, assignor to Paperboard Industries Corporation, Mississauga, Canada

Continuation-in-part of Ser. No. 818,383, Jan. 9, 1992, Pat. No. 5,148,973. This application Jun. 8, 1992, Ser. No. 894,927
Int. Cl.[5] B65D *43/08*
U.S. Cl. 229—125.28 8 Claims



1. An interlocking carton and lid, comprising:

a) a generally rectangular storage carton having side members and a bottom member, the carton provided with a top opening for providing access into the interior of said carton, at least two opposed side members provided each with a peripheral flap integrally formed therewith at the upper edges thereof adjacent said top opening, the flaps adhesively coupled to the interior surface of the corresponding side members, the connection between the flaps and the side members forming a crease, said at least two opposed side members each provided with at least one slot located therein at a predetermined position between said crease and the outer edge of said flap, the adhesive coupling between said flap and the interior surface of the side member being positioned between said slot and the outer edge of said flap, wherein that unglued portion of the side member located between the crease and the slot is bowed outwardly due to spring tension created in said unglued portion by the close proximity of said slot to said crease, the slots being bounded by an upper edge and a lower edge, the upper edge of the slot also being the free edge of the unglued portion on the carton which is bowed outwardly; and

b) a lid member having a generally rectangular, central portion, the peripheral edge portion of each side of said central portion provided with a flange member integrally formed therewith and extending substantially perpendicularly therefrom, the flange members including an outer member and an inner flap member, the connection between the inner flap portions and the outer members forming a crease, the flaps adhesively coupled to the interior surface of the corresponding outer members, said at least two opposed flange members each provided with at least one slit located on the flap member at a predetermined position between said crease and the outer peripheral edge of said flap, the adhesive coupling between said flap and the interior surface of the flange outer member being positioned between said slit and the outer edge of said flap, wherein that unglued portion of the flap member located between the crease and the slit is bowed outwardly due to spring tension created in said unglued portion by the close proximity of said slit to said crease, the slits in the lid and the slots in the carton being so

located such that when the lid is placed on the carton the bowed out portion in the flap members pass over the bowed out portions in the carton side members so that the slots in the carton and the slits in the lid come into registration, and whereby the bowed out portion of the flap in the side members interferes with the bowed out portion of the flap on the lid flange members thereby locking the lid and carton together.

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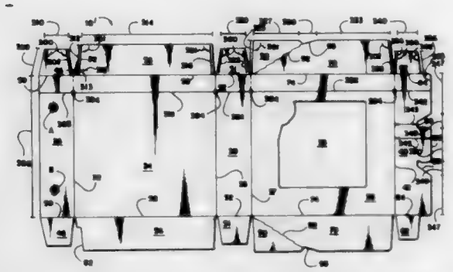
END-LOADING, HOODED CONTAINER

Henry Wiscusen, III, Lilburn, and Jerry A. Garmon, Lawrenceville, both of Ga., assignors to Rock-Tenn Company, Norcross, Ga.

Filed May 31, 1991, Ser. No. 708,928
Int. Cl.[5] B65D *5/20, 5/54*
U.S. Cl. 229—145 6 Claims



1. An end construction for a sleeve-type container loadable through said end, said end construction comprising:

a bottom panel;

a first side panel and a second side panel extending upwardly from opposite sides of said bottom panel;

a top panel foldably connected to an uppermost longitudinal edge of said first side panel and positioned in a spaced apart relation to said bottom panel;

a third side panel extending downwardly from said top panel, said third side panel positioned in parallel, abutting relationship with an exterior surface of said second side panel;

a first minor flap panel foldably connected to an end of said first side panel, said first minor flap panel foldably positioned between said bottom panel and said top panel, substantially perpendicular to said first side panel;

a second minor flap panel foldably connected to an end of said second side panel, said second minor flap panel foldably positioned between said bottom panel and said top panel, substantially perpendicular to said second side panel;

an inner major flap panel foldably connected to an end of said bottom panel, said inner major flap panel foldably positioned against and secured to said first minor flap panel and said second minor flap panel;

an intermediate minor flap panel foldably connected to an end of said third side panel, said intermediate minor flap panel removably positioned against an outer surface of said inner major flap panel substantially perpendicular to said third side panel; and

an outer major flap panel foldably connected to an end of said top panel, said outer major flap panel foldably positioned against and secured to said intermediate flap panel;

said inner major flap panel including a cutout along an edge of said inner major flap panel, said cutout being perpendicular to the fold connecting said bottom panel to said one of said inner major flap panels and being located at the end of said one of said inner major flap panels which is adjacent said second side panel.

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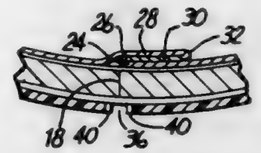
DOUGH CONTAINER WITH PREWEAKENED NON-PEEL LABEL

Michael J. Rice, St. Paul; Gregory P. Holl, Coon Rapids, and Robert A. Strange, Andover, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 15, 1991, Ser. No. 792,456
Int. Cl.[5] B65D *3/26*
U.S. Cl. 229—202 9 Claims



6. A no-peel, easy-open composite cylindrical container for refrigerated dough products, comprising:

a container body comprising:

a fibrous tubular core including a longitudinal butt joint;

an inner liner adhesively bonded to an inner surface of the fibrous core, the inner liner having a longitudinal seam located proximate the butt joint;

an outer label layer adhesively bonded to an outer surface of the fibrous core,

means for weakening the outer label layer proximate the butt joint while providing sufficient strength to resist internal container pressure without removal of a portion of the container body prior to opening, wherein the means for weakening the outer label layer comprises at least one perforation in the label layer proximate the butt joint, wherein each perforation includes a heat affected area surrounding the perforation for substantially eliminating tearing of the label layer prior to applying force to the butt joint; and

at least one end member for sealing the container.

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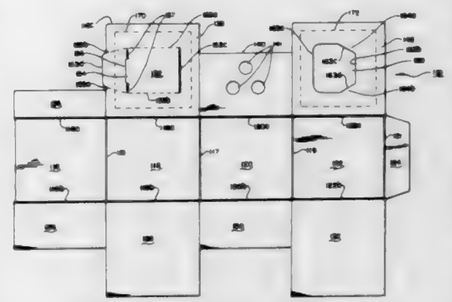
RECLOSEABLE CARTON WITH POURING SPOUT

Harry L. Roccaforte, Chicago, Ill., assignor to Waldorf Corporation, St. Paul, Minn.

Filed Nov. 27, 1991, Ser. No. 798,924
Int. Cl.[5] B65D *5/54*
U.S. Cl. 229—229 14 Claims



1. A recloseable pouring spout structure for a wall of a product dispensing carton, comprising:

a first wall panel connected to the carton at a first fold line, said first wall panel having an opener tab therein defined by a leader edge, a pair of generally parallel weakened lines extending from the leader edge to a hinge line generally parallel to the leader edge and a locking tab interme-

diate the leader edge and the hinge line, said locking tab

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SANITARY MIXING UNIT

a thermostat in the housing connected to the valve body;

an abutment ring fixed on the housing around the stem and

preventing the air, after passing through the radiator, from being returned back around the radiator into the

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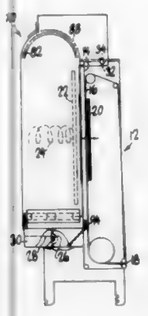
diate the leader edge and the hinge line, said locking tab extending in the same general direction as the opener tab;
a second wall panel connected to the carton at a second fold line generally parallel and opposite to the first fold line, said second wall panel lying interior to said first wall panel and having a single, generally central aperture therein with a locking edge positioned to engage the locking tab when the first wall panel overlies the second wall panel and the locking tab is pushed out of the plane of the first wall panel and toward the carton interior; and
a third wall panel connected to the carton at a third fold line generally perpendicular to the first and second fold lines, said third wall panel lying interior to the first and second wall panels and having one or more product dispensing apertures therein.

5,205,481

LOCKED CASSETTE BILL BOX

Donald A. Dekker, Grand Rapids, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed Nov. 7, 1991, Ser. No. 788,809
Int. Cl.[5] B65D *91/00;* **G07B** *15/00*
U.S. Cl. 232—16 **15 Claims**



1. A bill box assembly adapted to be brought into operative relationship with a bill acceptor adapted to insert acceptable bills into said box through an opening therein, said assembly including in combination a box body formed with an opening through which bills can be inserted, a door, means mounting said door on said box body for movement between an open position at which bills can be inserted through said opening and a closed position over said opening, means on said body for locking said bill box to an acceptor, a lever, means mounting said lever on said body for pivotal movement around a point intermediate its ends between a first position and a second position, said door being free to move and said locking means being operative in said first position of said lever, first interengageable means on one end of said lever and on said door for preventing movement of said door in the second position of said lever and second interengageable means on the other end of said lever and on said locking means for rendering said locking means inoperative in the second position of said lever.

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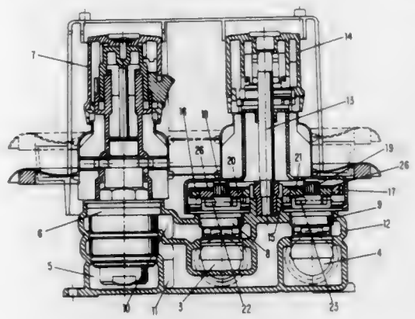
SANITARY MIXING UNIT

Josef Ems, Wittlich, Fed. Rep. of Germany, assignor to Ideal-Standard GmbH, Bonn, Fed. Rep. of Germany

PCT No. PCT/DE90/00059, § 371 Date Jul. 21, 1992, § 102(e) Date Jul. 21, 1992, PCT Pub. No. WO91/08532, PCT Pub. Date Jun. 13, 1991
PCT Filed Jan. 31, 1990, Ser. No. 859,442
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939077
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.1 **3 Claims**



1. A thermostat-controlled sanitary mixing unit, comprising:
a thermostat control;
a flow control comprised of a central spindle and a cold water inlet and a hot water inlet, further comprising a first valve connected to said cold water inlet and a second valve connected to said hot water inlet, said first and said second valves serving to shut off and control water flow, said spindle simultaneously activating said first and said second valves;
said first and said second valves each comprising a movable valve closing member and a valve seat, said valve closing members being fine adjustable relative to said corresponding valve seat independent of one another for a secure shut-off;
said central spindle comprising a toothed wheel that is fixedly attached to one end of said central spindle facing said valves; and
each said valve comprising a single spindle connected with one end to said valve for activating said valve, said single spindle comprising a bearing ring fixedly connected to a free end of said spindle and a spur gear connected to said bearing ring so as to be movable relative to said bearing ring, said spur gear engaging said toothed wheel, with said bearing ring and said spur gear forming a slip coupling.

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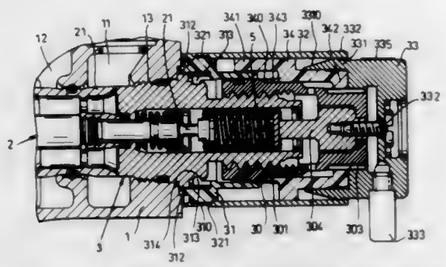
VANDAL-PROOF THERMOSTATIC MIXING VALVE

Jan R. Kostorz, Menden, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,513
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1990, 4019233
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.2 **11 Claims**

1. A self-regulating mixing valve comprising:
a main housing having hot- and cold-water inlets and provided with an externally threaded stem defining an axis;
a valve body displaceable axially in the housing between hot and cold end positions blocking flow from the inlets and through intermediate positions permitting flow from both inlets;

a thermostat in the housing connected to the valve body;
an abutment ring fixed on the housing around the stem and provided with a stop;
an adjustment nut threaded on the stem adjacent the ring and axially operatively engaged with the thermostat, whereby rotation of the nut in one direction about the axis axially displaces the thermostat in one direction and opposite rotation axially oppositely displaces it;
a protective sleeve centered on the axis, fixed on the ring, extending axially outward from the ring coaxially around the sleeve, and projecting axially outward past the sleeve;



an adjustment knob having an annular skirt engaging coaxially between the protective sleeve and the knob, the knob being provided with another stop angularly engageable with the stop of the abutment ring to limit angular displacement of the knob on the stem;
interengaging axially extending formations on and between the knob and the nut rotationally coupling same together while permitting same to move axially relative to each other; and
a screw engaged axially between the knob and the nut and fixing the knob axially to the nut.

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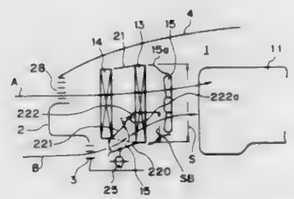
COOLING SYSTEM FOR A WATER COOLED INTERNAL COMBUSTION ENGINE FOR VEHICLE HAVING AN AIR CONDITIONING APPARATUS

Sumio Susa, Anjo; Kazutaka Suzuki, Kariya; Toshio Morikawa, Aichi; Tatsuo Sugimoto, Kariya, and Atsushi Katoh, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 22, 1991, Ser. No. 795,896
Claims priority, application Japan, Nov. 23, 1990, 2-320010; Jan. 23, 1991, 3-24203; Aug. 16, 1991, 3-231189
Int. Cl.[5] F01P *7/02*
U.S. Cl. 236—35.3 **12 Claims**



1. In an arrangement of a vehicle with an internal combustion engine having an engine body and a radiator located at the front of the engine in the direction of the forward movement of the vehicle and an airconditioning system having a condenser arranged in front of the radiator, the improvement comprising:
means for allowing a flow of air to be generated when the vehicle moves forward;
guide wall means for defining a first passageway for receiving said flow generated and for obtaining a first flow of air from the condenser to the radiator, said guide wall means preventing the air, after passing through the radiator, from being returned back around the radiator into the flow from the condenser to the radiator;
means for defining at least one second passageway for receiving said flow generated and for obtaining an air flow by-passing the condenser and for directly introducing the by-passed air flow into the radiator, and;
means, responding to thermal load conditions of the engine, for selectively opening or closing said second passageway.

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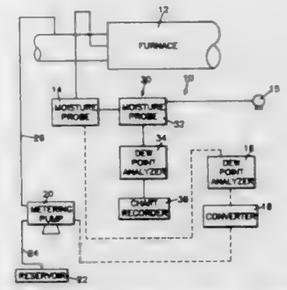
APPARATUS AND METHOD OF CONTROLLING MOISTURE CONTENT WITHIN A REACTION VESSEL

Dan N. Baciu, Parsippany, and Bohdan A. Wasiczko, South Orange, both of N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Jun. 25, 1992, Ser. No. 904,127
Int. Cl.[5] G05D *22/00*
U.S. Cl. 236—44 R **11 Claims**



1. A method of controlling the moisture content within a reaction vessel comprising:
(a) detecting the water vapor content within the reaction vessel;
(b) converting the water vapor content measurement into an electric current signal corresponding to a predetermined dew point range;
(c) translating the electric current signal to a frequency output signal; and
(d) transmitting liquid water to the reaction vessel in response to the frequency output signal.

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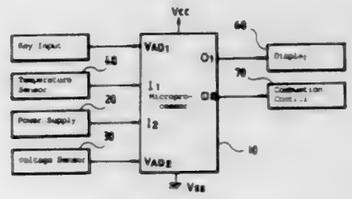
CONTROL DEVICE FOR COMBUSTION APPARATUS AND METHOD FOR CONTROLLING THE SAME

Jae-Hwan Jung, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Jan. 10, 1992, Ser. No. 818,905
Claims priority, application Rep. of Korea, Jan. 31, 1991, 91-1682
Int. Cl.[5] G05D *27/00*
U.S. Cl. 236—94 **6 Claims**



1. A method for controlling an apparatus, said method comprising the steps of:

inputting a predetermined temperature value into a micro-

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PROCESS AND DEVICE FOR SPRAYING A LIQUID

closing said valve means of said spray means (4) and opening said shutoff element (13) resulting in the providing of

a valve body receivable in said housing having an inlet portion and an outlet portion;

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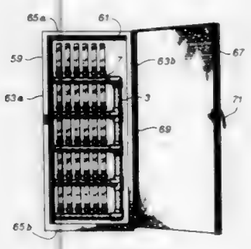
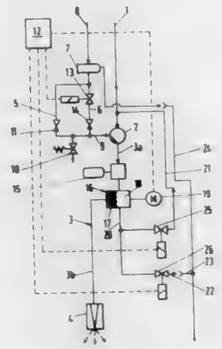
inputting a predetermined temperature value into a microprocessor;
detecting a voltage value of a power supply;
determining a variation in voltage from said power supply by comparing the detected voltage from said power supply with a reference voltage value stored in said microprocessor;
detecting a temperature variation;
determining a fuzzy correlation by comparing a variation in room temperature stored in said microprocessor with the detected temperature variation over a predetermined time period; and
displaying an operating state, which corresponds to said variation in voltage or said fuzzy correlation, of the apparatus on a display.

5,205,487
IRRIGATION CONTROL DEVICE
Raymond G. Paulk, Jr., 2311 Crooked La., Southlake, Tex. 76092
Filed Mar. 2, 1992, Ser. No. 844,170
Int. Cl.[5] B67D *5/38*
U.S. Cl. 239—74 **9 Claims**



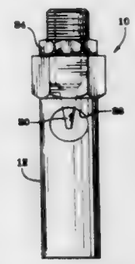
1. An irrigation control device, comprising:
a) a primary water supply tube for operable connection to a pressurized water source;
b) a plurality of water manifold pipes extending horizontally from said supply tube having formed along the tops thereof a plurality of apertures;
c) a manifold seat for water-tight connection with each of said apertures and including an upwardly opening receptacle in flow communication with said supply tube;
d) a plurality of rotameters arranged upright for receipt in said receptacles, each rotameter including a base through-which is formed a passageway for receipt of a flow of water, a transparent water tube extending upright therefrom having formed therethrough a vertical passageway and a weighted element therein positionally responsive to the flow of water therethrough, and a water outlet located above said valve for connection to a water line to convey the controlled flow of water to areas requiring irrigation; and,
e) a cabinet for housing said manifold pipes and said rotameters, including an access panel operably attached thereto.

5,205,488
PROCESS AND DEVICE FOR SPRAYING A LIQUID INTERMITTENTLY, ESPECIALLY A LUBRICANT SUSPENSION TO BE SPRAYED UNDER HIGH PRESSURE
Willi Heusser, Forch, Switzerland, assignor to Lonza Ltd., Basle, Switzerland
Filed Mar. 22, 1991, Ser. No. 673,799
Claims priority, application Switzerland, Mar. 26, 1990, 996/90
Int. Cl.[5] B05B *9/00*
U.S. Cl. 239—124 **10 Claims**



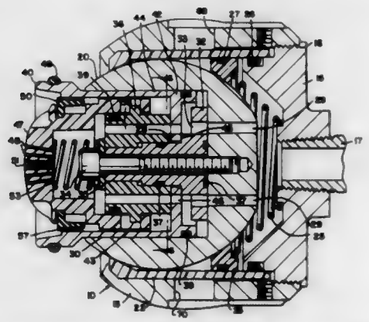
1. A device for spraying a liquid or suspension, comprising:
a pump (**2**) having an input (**1**) and an output (**3**),
a spray means (**4**) for spraying the liquid or suspension,
a filtering device (**16**) having an input (**3***a*) for the liquid or suspension joining into an antechamber (**18**), a filter pad or sieve (**17**) and a filtrate output (**3***b*) laying in the direction of flow behind said filter pad or sieve (**17**), said antechamber (**18**) laying in the direction of flow in front of said filter pad or sieve (**17**) and having a filter cake output (**20**, **21**, **22**), and
a shutoff means (**25**, **26**) for shutting off said filter cake output (**20**, **21**, **22**),
said filtering device input (**3***a*) communicating with said pump output (**3**), said filtrate output (**3***b*) communicating with said spray means (**4**) and said filter cake output (**20**, **21**, **22**) communicating with said pump input (**1**).
5. A device for spraying a liquid or suspension, comprising:
a spray means (**4**) for spraying the liquid or suspension,
said spray means (**4**) having a spray nozzle (**4**) including a valve means for automatically opening and closing, respectively, when the hydraulic input pressure of the liquid or suspension exceeds and falls short respectively of a hydraulic threshold pressure,
a pump (**2**) driven pneumatically and adapted to produce a hydraulic pause pressure and a hydraulic spray pressure, said hydraulic pause pressure being lower and said hydraulic spray pressure being higher than said hydraulic threshold pressure,
said pump (**2**) being connected to first and second pneumatic pipe means (**5**, **6**),
said first and second pneumatic pipe means (**5**, **6**) being connected in parallel and fed from a common compressed air source (**8**),
said first pneumatic pipe means (**5**) including a pneumatic pressure reducing means (**11**) for limiting the pneumatic pressure to a pneumatic pressure calculated to produce said hydraulic pause pressure,
said second pneumatic pipe means (**6**) providing a pneumatic pressure calculated to produce said hydraulic spray pressure, and being provided with a shutoff element (**13**), and
closing of said shutoff element (**13**) resulting in the providing of said hydraulic pause pressure and, hence, automatically closing said valve means of said spray means (**4**) and opening said shutoff element (**13**) resulting in the providing of said hydraulic spray pressure by said pump and, hence, automatically opening said valve means of said spray means (**4**).

5,205,489
ADJUSTABLE EDUCTOR
Ted D. Milner, Westminster, Colo., assignor to Silver Engineering Works, Inc., Aurora, Colo.
Continuation of Ser. No. 619,585, Nov. 29, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 855,167
Int. Cl.[5] B05B *7/14*
U.S. Cl. 239—434 **3 Claims**



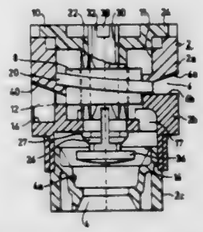
3. An adjustable eductor, comprising:
a body which has an inlet section, a suction section which has an opposed pair of holes formed through its walls which open onto opposite sides of said body, to define a transverse passage into said body for ingesting fluent material into said suction section, a mixing, section, a diverging-bore discharge section, and
a nozzle axially positionable within said body; wherein
said nozzle comprises means for selectively varying intrusion into, and withdrawal from said passage, for establishing a rate of ingestion of fluent material of a given viscosity through said opposed holes.

5,205,490
BODY SPRAY NOZZLE
Michael D. Steinhardt, Kiel; Kathleen S. DeKeyser, Hingham; Kenneth J. Sieth, Cedarburg, and David K. Rische, Sheboygan, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 8, 1991, Ser. No. 790,274
Int. Cl.[5] B05B *1/12*
U.S. Cl. 239—449 **10 Claims**



1. A body spray nozzle for use in a housing and of a type wherein the flow path of fluid from outlets in a valve can be interchanged to produce two kinds of sprays, comprising:
a valve body receivable in said housing having an inlet portion and an outlet portion;
a stationary valve element connected to said valve body in said inlet portion, said stationary valve element having at least one fluid passage therethrough;
a movable valve element having a first wall portion extending over a portion of the stationary valve element at an inlet side thereof, said movable valve element having a first aperture for alignment with said fluid pathway in said stationary valve element to provide a first fluid pathway, said movable valve element having a second aperture to provide a second fluid pathway in conjunction with said stationary valve element, said movable valve element having a second wall extending from said first wall to the outside of said valve body; and
a nozzle member receivable in said valve body, said nozzle member having first and second spray portions;
wherein the stationary valve element and the movable valve element are constructed and arranged to provide communication of said first fluid pathway with said first nozzle spray portion when in one position and with said second fluid pathway and said second spray portion when said movable valve element is rotated to a second position.

5,205,491
STATIC SECTOR-TYPE WATER SPRINKLER
Yoram Hadar, Haifa, Israel, assignor to Lego M. Lemelshtrich Ltd., Natania, Israel
Filed Dec. 2, 1991, Ser. No. 801,133
Claims priority, application Israel, Dec. 5, 1990, 96547
Int. Cl.[5] B05B *1/32*
U.S. Cl. 239—457 **19 Claims**



1. A static, sector-type water sprinkler producing a variable-sector water-distribution pattern, including a housing formed with an inlet opening at one end connectible to a supply of pressurized water, and an outlet opening having an effective length around the circumference of the housing which may be varied for preselecting the sector angle of the water distribution around the sprinkler;
characterized in that said outlet opening is defined by a slot extending helically around substantially the complete circumference of the housing; and
in that said sprinkler further includes a blocking member movable with respect to said slot to preselect the portion thereof to be unblocked by said blocking member, and thereby the sector angle of the water distribution around the sprinkler.

5,205,492
FUEL INJECTION VALVE
Gregory Khinchuk, 15 Westbourne Ter., Apt. #3, Brookline, Mass. 02146
Filed Dec. 16, 1991, Ser. No. 807,179
Int. Cl.[5] F02M *61/10*
U.S. Cl. 239—533.4 **3 Claims**

1. A fuel injection valve for an internal combustion engine, comprising:

a nozzle holder having a fuel inlet port connected to a fuel injection pump;

classifying step using the combined product to obtain the fine carbonate particle slurry, wherein the process is car-

5,205,495
APPARATUS FOR SHREDDING AND PACKAGING

housing adjacent said rotor assembly for feeding materials to be comminuted into said milling chamber, said recipro-

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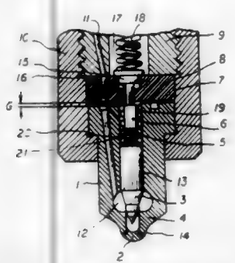
a nozzle holder having a fuel inlet port connected to a fuel injection pump;
a nozzle body attached to said nozzle holder and having an axial bore, a spray tip with at least one discharge orifice, a pressure chamber and fuel passage provided for communication of said pressure chamber with said fuel inlet port;
a nozzle need being slideable fitted into the said axial bore of said nozzle body in a not liquid-tight manner to open and close said discharge orifice in response to the pressure change of fuel supplied into said pressure chamber;
a spacer interposed between said nozzle body and said nozzle holder;
a movable spring seat located in an axial through hole formed in said spacer along its axis;
a valve spring interposed between said movable spring seat and stationary spring seat for urging said nozzle needle in the direction of closing said discharge orifice;



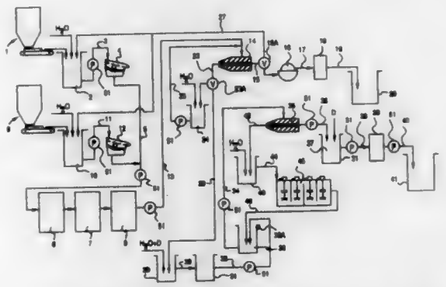
a bellows arranged within said axial bore of said nozzle body coaxially with said nozzle needle and the bottom of said bellows permanently kept in contact with an upper end face of said nozzle needle and the flange of said bellows held in a liquid-tight manner between a lower surface of said spacer and top end face of said nozzle body for sealing the clearance between said nozzle needle and said nozzle body, wherein the bottom contact surface of said bellows is smaller than the cross-sectional area on the upper end face of said nozzle needle;
a stepped push rod, having the larger outside diameter equal to the internal diameter of said bellows is interposed between said movable spring seat and the bottom of said bellows to impart an urging spring force to said nozzle needle and for providing a lifting gap between the stepped portion of said push rod and the lower surface of said spacer.

5,205,493
PROCESS FOR PRODUCING A CARBONATE COMPOSITION

Paul E. Adler, 103 Georgetown Ct., Macon, Ga. 31210, and Charles B. Denholm, 3340 Scarret Oak La., Appleton, Wis. 54915

Division of Ser. No. 806,717, Dec. 12, 1991. This application Aug. 10, 1992, Ser. No. 927,325
Int. Cl.[5] C01F *5/24*
U.S. Cl. 241—21 **20 Claims**

1. A process for the production of a carbonate composition, comprising the steps of:
preparing an aqueous slurry of particles of a carbonate;
classifying the slurry to remove a coarse fraction comprising carbonate particles larger than a predetermined particle size therefrom to obtain a slurry of fine carbonate particles by centrifuging the aqueous slurry;
combining the coarse fraction with water;
then grinding the coarse fraction to reduce the size of carbonate particles therein to form a ground product;
combining the ground product with fresh aqueous slurry to form a combined product; and
reclassifying the coarse fraction to obtain an additional quantity of a slurry of fine carbonate particles by repeating the classifying step using the combined product to obtain the fine carbonate particle slurry, wherein the process is carried out in a closed circuit system including a tank

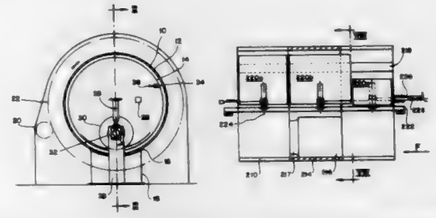


wherein the ground product is combined with the fresh aqueous slurry, a centrifuge, a tank wherein water is added to the coarse fraction, and a grinder are connected in the foregoing order by conduits.

5,205,494
GRINDING PROCESS AND MILL FOR CARRYING OUT THIS PROCESS

Rene Durinck, Villeneuve d'Ascq; Alain Cordonnier; Bernard Boussekey, both of Lille, and Yves Verbaere, Salomé, all of France, assignors to FCB, Montreuil Cedex, France

Filed Nov. 8, 1991, Ser. No. 790,666
Claims priority, application France, Nov. 12, 1990, 90 14004; Aug. 1, 1991, 91 09788
Int. Cl.[5] B02C *4/40*
U.S. Cl. 241—30 **13 Claims**

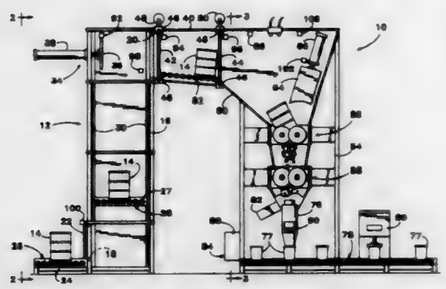


1. A process for grinding a material, which comprises the steps of
(a) providing a circular grinding path having a horizontal axis and two axially spaced edges,
(b) feeding the material onto the circular grinding path adjacent one of the edges,
(c) rotating the circular grinding path about the horizontal axis at a speed higher than a critical speed to form a continuous layer of the material on the path,
(d) rolling a roller over the continuous layer of material on the rotating circular grinding path and exerting a pressure comprised between 10 MPa and 40 MPa on the material by the roller, and
(e) moving the material transversely from the one edge of the circular grinding path to the other edge thereof and so controlling the transverse movement that the material is displaced only over a fraction of the distance between the edges during each rotation of the path and passes several times under the roller before leaving the grinding path over the other edge.

5,205,495
APPARATUS FOR SHREDDING AND PACKAGING HAZARDOUS WASTE CONTAINERS AND THE CONTENTS THEREOF

Thomas J. Garnier, Portland, Oreg., assignor to Shredding Systems, Inc., Wilsonville, Oreg.

Filed Feb. 18, 1992, Ser. No. 835,826
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—31 **4 Claims**



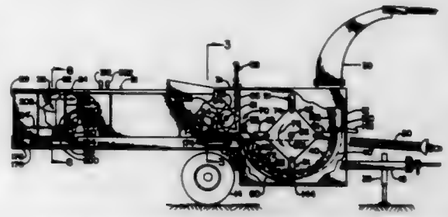
1. An apparatus for shredding hazardous waste containers and the material carried therein and packaging the shredded material in fuel pails, comprising:
(a) an elevated airlock sized to carry at least one container;
(b) lift means for raising containers to the level of said airlock;
(c) ejection means for moving containers off of said lift means into said airlock;
(d) shredding means located below said airlock for shredding the containers;
(e) discharge means for moving containers out of said airlock and into said shredding means one container at a time;
(f) shredding means, located below said first shredding means, for receiving shredded material from said first shredding means and shredding it into uniform pieces of predetermined size;
(g) feed means for collecting the shredded material from said shredding means and feeding it out of said shell;
(h) purge means for introducing inert gas into said shell and maintaining the oxygen level in said shell below a predetermined level; and
(i) dispenser means associated with said feed means for placing a metered amount of shredded material into each fuel pail.

5,205,496
UNIVERSAL GRINDER WITH RECIPROCAL FEEDER

Ralph T. O'Donnell, Loveland, Colo.; Donald A. Egging; James G. Nickels, both of Sydney, Nebr., and William A. Eddy, Houston, Tex., assignors to O.D.E. Investments Corporation, Greeley, Colo.

Filed Jun. 5, 1991, Ser. No. 711,048
Int. Cl.[5] B02C *23/00*
U.S. Cl. 241—34 **35 Claims**

1. Grinder apparatus for comminuting fodder, feed grains, and wood materials, comprising:
a rotor assembly, including a horizontal main shaft that defines the axis of rotation of said rotor assembly and a plurality of grinding hammers extending radially outward at the periphery of said rotor assembly;
a main housing partially enclosing said rotor assembly in a milling chamber and leaving a portion of said rotor assembly not enclosed by said main housing;
rotor drive means connected to said rotor assembly for imparting high angular velocity rotary motion to said rotor assembly; and
reciprocating feed means adapted for mounting on said main housing adjacent said rotor assembly for feeding materials to be comminuted into said milling chamber, said reciprocating feed means including a horizontal feed chute extending radially toward the portion of said rotor assembly not enclosed by said main housing, an adjustable cylindri-

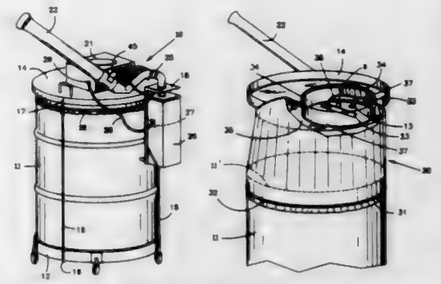


cal feed drum positioned at about the intersection of said horizontal feed chute with said milling chamber for engaging and metering said material into said milling chamber, and a linear reciprocating feed plate slidably mounted in said horizontal feed chute for moving said material towards said adjustable cylindrical feed drum.

5,205,497
FLUORESCENT LAMP CRUSHER

Joseph W. Deklerow, Rochester, N.Y., assignor to Dextrite, Inc., Rochester, N.Y.

Filed Aug. 13, 1992, Ser. No. 928,721
Int. Cl.[5] B02C *19/14*
U.S. Cl. 241—36 **18 Claims**



1. In a fluorescent lamp crusher apparatus of the type including a replaceable waste container closed at its upper end by a removable cover, and a housing having an inlet for accepting fluorescent lamp bulbs and an outlet for discharging crushed lamp particles into said waste container through an opening in said cover, the improvement comprising an extensible duct member releasably and sealingly secured at one end thereof to said outlet of said housing and at its opposite end to said upper end of said container and operative upon removal of said cover from said container to maintain a sealed connection between said outlet and said upper end of said container thereby to prevent escape of gas and dust from said container to the ambient atmosphere.

5,205,498
CUTTER DEVICE FOR WOOD CHIPPER

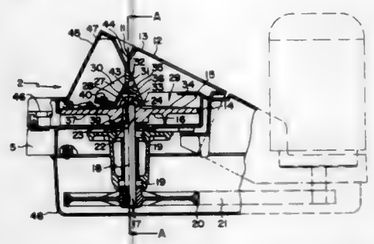
by said base and drivingly interconnected with said rotatable drum assembly to rotate the latter.

includes at least two rotor disc assemblies each having a plurality of hammer elements pivotally coupled to the periphery

5,205,503
WINDING MACHINE, ESPECIALLY FOR THIN STRIP

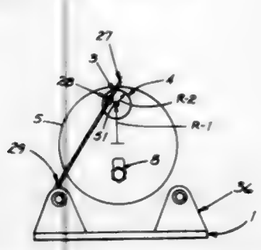
VOL 1149 ISS 4 AP 27 1993 UMI

5,205,498
CUTTER DEVICE FOR WOOD CHIPPER
Heinrich Ostermeier, Cologne, and Dieter Dell, Wiehl, both of Fed. Rep. of Germany, assignors to SABO-Maschinenfabrik Aktiengesellschaft, Gummersbach, Fed. Rep. of Germany
Filed Sep. 4, 1990, Ser. No. 577,686
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929257; Aug. 3, 1990, 4024757
Int. Cl.[5] B02C *18/12*
U.S. Cl. 241—55 **30 Claims**



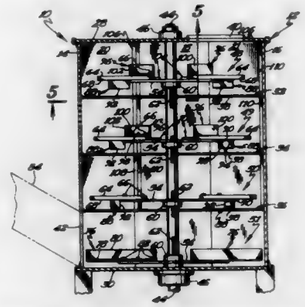
1. A cutting device for a chipper used for cutting garden waste, such as branches, foliage, and grass, comprises a cutter housing, a generally horizontal slotted cutter disk having an axis of rotation and rotatably supported in said housing, a motor arranged to rotationally drive said drive about the axis of rotation, said cutter disk having an upper surface and an oppositely facing lower surface with cutter blades detachably secured to said upper surface and ejection vanes secured to said lower surface, a stationary counter knife located within said housing in spaced relation to and cooperating with said cutter blades, said counter knife extends above and across the upper surface of said cutter disk in a bridge-like manner traversing and covering the axis of rotation of said cutter disk and is detachably secured to said cutter housing on generally diagonally opposite sides thereof.

5,205,499
PLANETARY GRINDING APPARATUS
Rodger L. Gamblin, 8 Springhouse Rd., Dayton, Ohio 45409
Continuation-in-part of Ser. No. 427,815, Oct. 26, 1989, Pat. No. 5,029,760. This application Jul. 3, 1991, Ser. No. 725,275
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] B02C *17/08*
U.S. Cl. 241—137 **20 Claims**



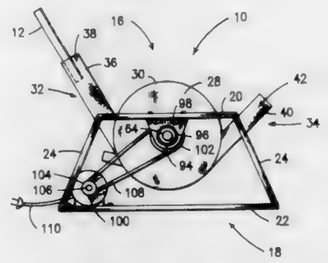
1. A planetary grinding mill comprising a base, a rotatable drum assembly supported on said base for rotation about an axis, said drum assembly including a cylindrical grinding tube having an axis parallel to and offset from said axis of said rotatable drum assembly, said cylindrical grinding tube mounted in said drum assembly for rotation relative to said rotatable drum assembly, means for limiting rotation of said cylindrical grinding tube with respect to said base while said drum assembly is being rotated, and driving means supported by said base and drivingly interconnected with said rotatable drum assembly to rotate the latter.

5,205,500
MILL FOR GRINDING GARBAGE
Russel L. Eide, Columbia Heights, Minn., assignor to Light Work Inc., New Underwood, S. Dak.
Continuation-in-part of Ser. No. 400,095, Aug. 29, 1989, Pat. No. 4,989,796, which is a continuation-in-part of Ser. No. 377,712, Jul. 10, 1989, Pat. No. 5,067,661. This application Feb. 1, 1991, Ser. No. 649,658
Int. Cl.[5] B02C *13/18*
U.S. Cl. 241—154 **20 Claims**



1. In a mill for grinding material such as garbage including a housing having a multiplicity of plates attached by their side edges at interconnections to define a grinding chamber, the improvement comprising a system for preventing internal wear of the housing plates from the grinding operation comprising, in combination: a multiplicity of wear plates having a size and shape complementary to and for abutment with the plates of the housing inside of the grinding chamber, with the wear plates having interior surfaces; means removably insertable into the grinding chamber and located adjacent to the interconnections of the housing side edges for abutting with the interior surfaces adjacent the side edges of the wear plates; and means for retaining the abutting means adjacent to the housing plates.

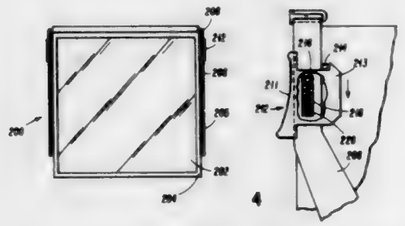
5,205,501
HAMMER MILL APPARATUS
Oscar E. Alvarez, Apartment 701, 5700 Mariner South, Tampa, Fla. 33609
Filed Feb. 12, 1992, Ser. No. 833,792
Int. Cl.[5] B02C *13/04, 13/26*
U.S. Cl. 241—189.1 **35 Claims**



1. A hammer mill apparatus to shred and chip pallets fed therethrough comprising a shredding rotor assembly rotatably disposed within a rotor housing including an entry portion and an exit portion formed therein, said shredding rotor assembly

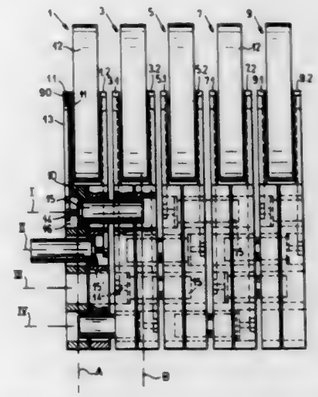
includes at least two rotor disc assemblies each having a plurality of hammer elements pivotally coupled to the periphery thereof being operatively connected to a rotor drive assembly including a drive motor and a rotatable rotor drive shaft, each said rotor disc assembly comprises a plurality of hammer elements pivotally mounted to the periphery of a pair of substantially parallel, spaced apart circular rotor discs by a corresponding rotor disc aperture and hammer element aperture, each said circular rotor disc is mounted on said rotatable rotor drive shaft by a corresponding mounting collar having a centrally disposed aperture formed therethrough to receive said rotatable rotor drive shaft, each said mounting collar comprises a mounting element affixed within a corresponding centrally disposed rotor disc aperture and a spacer element having a width slightly greater than the width of said hammer elements, said rotatable rotor drive shaft rotating said rotor disc assemblies exerting centrifugal force on each said plurality of hammer elements such that a line coincident with the longitudinal axis of each said hammer element extends through said rotatable rotor drive shaft whereby the outer end of each said hammer element engages pallets in said entry portion to shred and chip such pallets entering said rotor housing and discharges the reduced material from said exit portion.

5,205,502
AVIATION ELECTRONICS INSTRUMENT LATCHING SWING HANDLE
Richard T. Hill, Marion, and Roger W. Heidt, Robins, both of Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Sep. 26, 1991, Ser. No. 766,469
Int. Cl.[5] G01D *11/24;* **G01L** *19/14;* **G01P** *1/02;* **G12B** *9/10*
U.S. Cl. 244—1 R **3 Claims**



1. An improved avionics display instrument mounting assembly comprising:
- a bezel, disposed about a display instrument for providing an exterior surface of the instrument, the bezel having a first side, a second side, a third side, a fourth side, and a front side;
- a swing handle pivotally disposed on said bezel, the handle having a first side, a second side, and a third side;
- a swing handle holding pin disposed on said first side of said bezel;
- said swing handle having a sliding latch thereon; and
- said swing handle being pivotally mounted, so that, when said swing handle is pivoted across the front side of the bezel said sliding latch engages with said swing handle holding pin thereby attaching said swing handle to said bezel.

5,205,503
WINDING MACHINE, ESPECIALLY FOR THIN STRIP WEBS AND THIN FILMS
Armin Hutzenlaub, Wiehl, Fed. Rep. of Germany, assignor to Kampf GmbH & Co. Maschinenfabrik, Wiehl, Fed. Rep. of Germany
Filed Feb. 14, 1992, Ser. No. 837,070
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1991, 4109103
Int. Cl.[5] B65H *18/10*
U.S. Cl. 242—56.9 **18 Claims**



1. A winding machine for winding webs onto winding sleeves, comprising:
- a support;
- a plurality of pairs of support arms on said support defining respective winding stations with the arms of each pair receiving a respective winding sleeve between them for winding up a respective web into a respective roll about a respective axis;
- slide means on said support carrying said arms and enabling shifting of said arms parallel to said axes for adjustment of said arms to widths of said webs to be wound into said rolls;
- respective holders on said arms of each pair engageable with said respective winding sleeve and rotatable about the respective axis, each of said arms being formed with a plurality of openings throughgoing in a direction parallel to said axes;
- a respective elongated drive motor assigned to each arm, received in one of said openings of the respective arm, operatively connected to a respective one of said holders, and driving said holders to rotate said respective winding sleeves and wind said webs into said rolls on said pairs of arms,
- each of said drive motors extending through at least one other of said openings in each of at least two neighboring arms,
- each of said pairs of arms including a first arm on one axial side of the respective pair and a second arm on an opposite axial side of the respective pair,
- each motor assigned to the first arm of a respective pair being end-reversed through 180° and offset in said direction with respect to a said motor assigned to the second arm of the respective pair,
- each motor assigned to the first and second arms of each pair being laterally offset from the motors assigned to the arms of an adjacent pair but being of the same end orientation,
- a motor assigned to the first arm of a respective pair being end-reversed through 180° and nonoffset in said direc-

tion with respect to said motor assigned to the second

each for receiving a different one of two different types of bobbins (13, 14);

5,205,507
HUB FOR TAPE CASSETTE
Takateru Satoh, Saku; Haruo Shiba, Komoro; Masaru Ikebe,

higher than the roll of rod and exerts on the rod being unwound an upward drawing action.

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tion with respect to said motor assigned to the second arm of said adjacent pair.

5,205,504

AUTO-THREADING APPARATUS

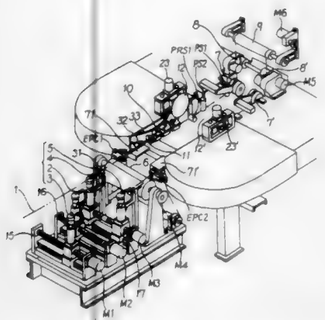
Noboru Kusafuka; Akira Yoshida; Susumu Tsuyuki; Tatsushi Seko; Yoshimitsu Tsutsui; Toshio Miki, and Ryoji Mouri, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 612,147, Nov. 13, 1990. This application Aug. 17, 1992, Ser. No. 930,561

Claims priority, application Japan, Nov. 10, 1989, 1-293118; Sep. 21, 1990, 2-252242

Int. Cl.[5] **B65H** *35/02*; **G03B** *1/56*

U.S. Cl. 242—56.2 **16 Claims**



1. An auto-threading apparatus of a film processing line, said apparatus comprising:

take-up unit means for taking up a film;

two pairs of first cutters disposed upstream of said take-up unit means with respect to the direction in which said take-up unit means takes up film in the apparatus, each of said cutters having a cutter blade and a support supporting said cutter blade so as to be freely rotatable;

means for moving said cutter blades vertically and transversely in the apparatus;

chain clips disposed between said cutters and said take-up unit means, said chain clips being located across from one another in the transverse direction of the apparatus, and said chain clips comprising grippers;

chain means for driving said chain clips in a longitudinal direction of the apparatus;

second cutters disposed downstream of the chain clips in the apparatus and across from one another in the transverse direction of the apparatus; and

control unit means for controlling the respective operations of said means for moving said cutter blades, said chain clips, and said second cutters.

5,205,505

DEVICE FOR SUPPLYING PACKAGING MACHINES WITH PACKAGING MATERIAL

Heinz Focke, and Wolfgang Oertel, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 722,827

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024284

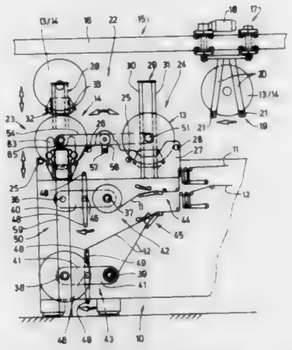
Int. Cl.[5] **B65H** *19/12*

U.S. Cl. 242—58.6 **6 Claims**

1. A device for supplying a packaging machine with packaging material in the form of wound webs in bobbins, said device comprising:

two bobbin storages (**23**, **24**) located next to one another, each for receiving a different one of two different types of bobbins (**13**, **14**);

a common vertically extending bobbin supplier (**50**, associated with both bobbin storages (**23**, **24**), for feeding the bobbins (**13**, **14**) to a packaging machine located below said bobbin storages (**23**, **24**); and



an intermediate bobbin supplier for extracting the bobbins (**13**, **14**) from said bobbin storages (**23**, **24**) and for feeding the bobbins to said common bobbin supplier (**50**);

wherein said intermediate bobbin supplier has a transport arm (**54**) which is mounted for pivoting movement about a shaft (**56**) and which is displaceable for axial movement in a direction parallel to the axis of said shaft.

5,205,506

PHOTOGRAPHIC FILM CASSETTE HAVING LIGHT TRAPPING PILE FABRICS ATTACHED TO A MOUTH THEREOF

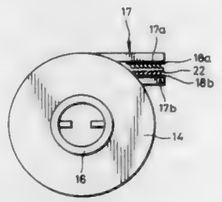
Kazunori Mizuno, and Hideaki Kataoka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1991, Ser. No. 650,340

Claims priority, application Japan, Feb. 2, 1990, 2-24214; Jun. 18, 1990, 2-159342; Oct. 15, 1990, 2-277118

Int. Cl.[5] **G03B** *1/04*

U.S. Cl. 242—71.1 **15 Claims**



1. A film cassette comprising:

a cassette formed with a film passage mouth for allowing a film to pass therethrough, said film passage mouth having upper and lower surfaces; and

light trap fabric attached to said upper and lower surfaces, wherein each of said light trap fabrics comprises pile threads, said pile threads of at least one of said light trap fabrics being inclined in a direction of advancement of the film from said cassette,

wherein said light trap fabric comprises a warp knitted fabric having said pile threads, said pile threads being knitted in a base fabric of said pile knitted fabric, and

further wherein said pile threads protrude from said base fabric, with said inclination being along a direction from a needle loop toward a sinker loop of said base fabric.

5,205,507

HUB FOR TAPE CASSETTE

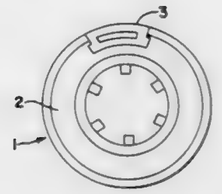
Takateru Satoh, Saku; Haruo Shiba, Komoro; Masaru Ikebe, Saku; Hiroki Suzuki, Saku, and Yukio Miyazaki, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 493,193, Mar. 14, 1990, abandoned. This application Sep. 4, 1991, Ser. No. 754,769

Claims priority, application Japan, Mar. 15, 1989, 1-60697

Int. Cl.[5] **B65H** *75/28*

U.S. Cl. 242—74.1 **6 Claims**



1. A hub for winding a tape thereabout for a tape cassette, the hub consisting of a hub body and a tape clamp, the hub body having a periphery defining a recess therein, the tape clamp being fit in the recess of the periphery of the hub body, characterized in that the hub body and the tape clamp have a coefficient of linear expansion below 6×10^{-5} cm/cm °C. at temperatures of minus 10°–90° C., wherein the material of the hub body and the tape clamp is an aromatic polyester containing an inorganic filler, the inorganic filler being present in an amount effective to achieve the coefficient of linear expansion below 6×10^{-5} cm/cm °C. at temperatures of minus 10°–90° C.

5,205,508

TURRET-TYPE ROTARY ROD-FEEDER MACHINE

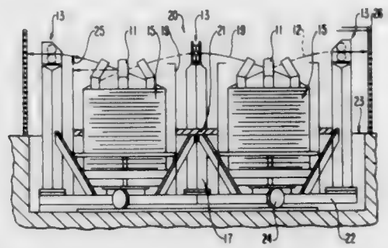
Ercole Masera, Roveredo In Piano, and Giorgio D. Fabro, Cassacco-Fraz.Montegnacco, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy

Filed Mar. 11, 1991, Ser. No. 667,649

Claims priority, application Italy, Mar. 15, 1990, 83347 A/90

Int. Cl.[5] **B21C** *47/18*

U.S. Cl. 242—80 **7 Claims**



1. Turret-type rotary rod-feeder machine located upstream of a user machine such as a straightener machine, shears and-/or bending and shaping machine, the rod-feeder machine being suitable to bear rolls of rod made with a hot or cold process for reinforced concrete and being characterized in that it comprises a rotary support, which has a substantially vertical axis of rotation and bears along a circumference at least two reels holding rolls of rod and having their axes of rotation substantially parallel to the axis of rotation of the rotary support, each reel cooperating with a specific rod engagement and guide stand that engages and guides the rod, wherein the rod engagement and guide stand is installed on the rotary support beside and outside a circumference of the specific reel and is higher than the roll of rod and exerts on the rod being unwound an upward drawing action.

5,205,509

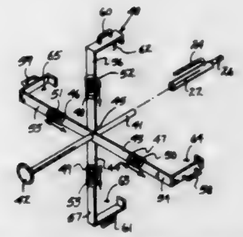
HOSE ROLLER APPARATUS

Lance S. Noggle, 112 Tyler St., Oswego, Ill. 60543

Filed Oct. 3, 1991, Ser. No. 770,444

Int. Cl.[5] **B65H** *75/00*

U.S. Cl. 242—86 **4 Claims**



1. A winding and reeling apparatus, comprising,

a support member, the support member including a first support beam, the first support beam including a rear distal end, and

the first support beam including a forward distal end, the forward distal end including a second support beam fixedly mounted to the first support beam extending upwardly thereof, and the second support beam including a third support beam mounted to the second support beam, and

a receiver socket, the receiver socket including a receiver socket cavity, the receiver socket cavity arranged for reception of the rear distal end of the first support beam therewithin, and

the third support beam including a plurality of support flanges fixedly mounted to the third support beam extending upwardly thereof, wherein a crank arm is rotatably mounted through the support flanges, and

an extension leg for receiving a hose to be wound thereon, the extension leg including an extension leg projection cylinder received within the crank arm for mounting to the crank arm, and

the extension leg including an "L" shaped extension leg lock leg fixedly mounted to the extension leg, wherein the lock leg includes a spaced arm spaced above and parallel the extension leg defining a hose coupling receiving gap for receiving a hose coupling therewithin, and

the extension leg projection cylinder removably mounted relative to the crank arm, and

the extension leg including an extension leg forward distal end defining an extension leg socket therewithin, and

a hose support bracket, the hose support bracket including a support bracket axle, the axle including an axle first end, the axle first end including a handle fixedly mounted thereto, and the axle including an axle second end, the axle second end complementarily receivable within the extension leg socket for mounting the extension leg on the axle, and

a support bracket first leg fixedly and orthogonally mounted to a support bracket second leg, the first leg and the second leg orthogonally and integrally mounted to one another bisecting one another at a junction, and the axle orthogonally directed through the first leg and the second leg at the junction extending through the junction, and

the first leg includes a first leg first end and first leg second end, the second leg includes a second leg first end and a second leg second end, the first leg first end includes a first extension spring, the first leg second end includes a second extension spring, the second leg first end including a third extension spring, and the second leg second end including

a second extension spring, and the first extension spring and the second extension spring coaxially aligned relative

said spool, each of said driven clutch pins having a round cross section; and

with and connected to said duct for receiving fluid therefrom;

barrier vane means in said control chamber attached to said

point, there being a pair of lugs located on the axle or the bogie beam at the measurement point; and

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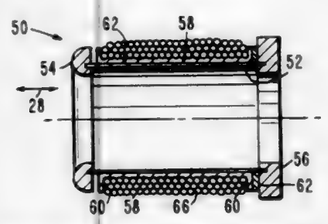
a second extension spring, and the first extension spring and the second extension spring coaxially aligned relative to one another and longitudinally aligned with the first leg, and the third extension spring and the fourth extension spring coaxially aligned relative to one another and longitudinally aligned with the second leg, and the first extension spring including a "J" shaped first bracket fixedly mounted thereto spaced from the first leg first end, and the second extension spring including a "J" shaped second bracket fixedly mounted to the second extension spring spaced from the first leg second end, and the third extension spring including a "J" shaped third bracket, fixedly mounted thereto spaced from the second leg first end, and a "J" shaped fourth bracket fixedly mounted to the fourth extension spring spaced from the second leg second end, wherein the first bracket and the second bracket each include a respective first bracket cavity and second bracket cavity, wherein the first bracket cavity and the second bracket cavity are in confronting relationship relative to one another, and the third bracket and the fourth bracket include a third cavity and fourth cavity, wherein a third cavity and a fourth cavity are in confronting relationship relative to one another, wherein the first cavity, second cavity, third cavity, and the fourth cavity are arranged for reception of a coiled hose therewithin.

5,205,510

OPTICAL FIBER BOBBIN WITH STRESS-REDUCING SLEEVE

Daniel K. Schotter, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 3, 1990, Ser. No. 562,190
Int. Cl.[5] B65H *55/00, 75/02*
U.S. Cl. 242—159 **16 Claims**



1. A bobbin that supports an optical fiber pack, comprising:
sleeve means for supporting a fiber pack wound thereupon, the sleeve means having a longitudinal axis; and
support means within the sleeve means for supporting the sleeve means while permitting relative sliding movement of the sleeve means and the support means parallel to the longitudinal axis over at least a portion of the length of the sleeve means, the support means having a coefficient of thermal expansion parallel to the longitudinal axis of less than that of the sleeve means.

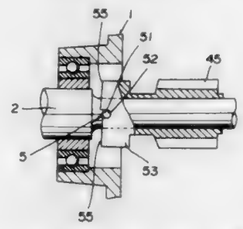
5,205,511

CLUTCH MECHANISM FOR A DOUBLE BEARING FISHING REEL

Shinichi Morimoto, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

Continuation of Ser. No. 575,618, Aug. 31, 1990, abandoned. This application Dec. 30, 1991, Ser. No. 816,535
Claims priority, application Japan, Oct. 16, 1989, 1-121378[U]
Int. Cl.[5] A01K *89/015*
U.S. Cl. 242—261 **3 Claims**

1. A clutch mechanism for a double bearing fishing reel provided with a rotatable spool and a driving mechanism for driving said spool, said clutch mechanism comprising:
first and second driven clutch pins rotatable together with said spool and extending perpendicularly to the axis of said spool, each of said driven clutch pins having a round cross section; and
a rotatable clutch cylinder which is movable axially of said spool, said clutch cylinder comprising:
first and second engaging recesses engageable with said first and second driven clutch pins, respectively, each of said engaging recesses having a bottom surface, first and second upper edges, and first and second side surfaces which extend from said bottom surface to said first and second upper edges, respectively, the distance from said second upper edge to said bottom surface being greater than the distance from said first upper edge to said bottom surface, and the distance from said first upper edge to said bottom surface being greater than the



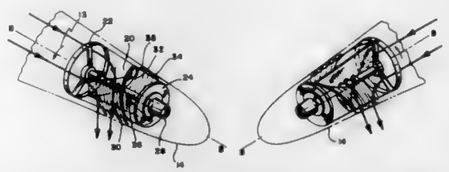
radius of said round cross section of said clutch pins; and
first and second sloping planar guide surfaces extending from said second upper edges to said first upper edges of said engaging recesses, respectively, each of said sloping guide surfaces being located within a plane which is slanted with respect to a plane which is perpendicular to the axis of said spool, such that said clutch pins make point contact with said sloping guide surfaces, and such that said clutch pins are guided by said guide surfaces from said second upper edges to said first upper edges and then into said engaging recesses when said driving mechanism is operated in a direction for driving said spool.

5,205,512

FLUID CONTROL APPARATUS

William E. Rumberger, Newtown Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 19, 1991, Ser. No. 746,635
Int. Cl.[5] B64C *27/82*
U.S. Cl. 244—17.19 **2 Claims**



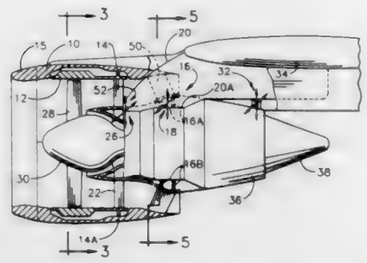
1. A fluid control apparatus for controlling the direction of flow of a pressurized fluid comprising:
a fluid duct for containing a pressurized fluid, said duct having an axis defining a direction of flow in the duct;
fluid exhaust means arranged around the periphery of said duct for exhausting fluid in a specified direction;
rotary fluid control means for directing fluid flow to preselected exhaust means, said fluid control means comprising;
a shaft supported in said duct for rotation about the axis of said duct;
a control chamber mounted on said shaft for rotation therewith and connected to said duct for receiving fluid therefrom;
barrier vane means in said control chamber attached to said shaft and extending radially from said shaft and forming a moveable seal with the interior wall of the duct;
helical vane means in said control chamber attached to said shaft for rotation therewith, said helical vane means forming a helical chamber within said control chamber, its exterior edge forming a moveable seal with the interior wall of said fluid duct; and
actuator means attached to said shaft for rotating said shaft about the axis of the fluid duct.

5,205,513

METHOD AND SYSTEM FOR THE REMOVAL OF LARGE TURBINE ENGINES

Jan C. Schilling, Middletown, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 26, 1991, Ser. No. 765,797
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 **10 Claims**



1. A detachable support structure for a turbofan engine comprising:
a fan casing having a distal portion and enclosing a plurality of fan blades;
a fan outlet guide van assembly connecting the distal end portion of said fan casing to the turbofan;
a nacelle connected to said fan casing, said nacelle having an upper portion;
first means for permitting the intact removal of said fan casing, said plurality of fan blades, and said fan outlet guide vane assembly from nacelle;
an auxiliary support frame having an upper portion connected to said upper portion of said nacelle; and
second means for permitting the intact removal of said fan casing, said plurality of fan blades, and said fan outlet guide van assembly from the auxiliary support frame.

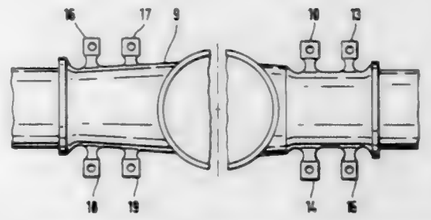
5,205,514

ARRANGEMENT OF AT LEAST ONE SENSOR ON THE LANDING GEAR OF AN AIRCRAFT FOR MEASURING ITS WEIGHT AND POSITION OF CENTER OF GRAVITY

Hans-Norbert Patzig, Bad Homburg, and Klaus Schult, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 23, 1991, Ser. No. 763,642
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1990, 4033429; Apr. 18, 1991, 4112675
Int. Cl.[5] B64C *25/00*
U.S. Cl. 244—103 R **8 Claims**

1. A system of sensors for a landing gear of an aircraft, comprising
at least one sensor on a landing gear of an aircraft for measuring weight of the aircraft and the position of the center of gravity of the aircraft, wherein
the landing gear includes an axle or bogie beam, and a sensor for a measurement of shear is arranged at a measurement point, there being a pair of lugs located on the axle or the bogie beam at the measurement point; and
the axle or the bogie beam varies in cross section at the measurement point and is asymmetrical about a vertical plane which bisects said at least one sensor and lies centrally between the pair of lugs, there being a larger cross section to one side of the vertical plane and a smaller cross section to an opposite side of the plane; wherein
the sensor comprises a first sensor part attached to a first lug



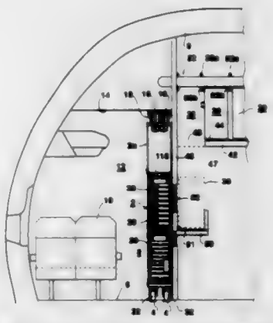
of the pair of lugs and a second sensor part attached to a second lug of the pair of lugs, the first lug being at the larger beam cross section and further from the vertical plane than the second lug which is at the smaller beam cross section;
the sensor operates via an asymmetrical operation, wherein the first sensor part attached to the first lug and the second part attached to the second lug differently influence a mutual relative movement of the first and the second sensor parts to produce an electric output variable.

5,205,515

AIRCRAFT FUSELAGE CONSTRUCTION INCLUDING FOOD CARRIER

David Luria, Tel Aviv, Israel, assignor to Fuselage Engineering Services Ltd., Tel-Aviv, Israel

Filed Dec. 23, 1991, Ser. No. 812,466
Claims priority, application Israel, Dec. 27, 1990, 96803
Int. Cl.[5] B64D *11/00*
U.S. Cl. 244—118.5 **16 Claims**



1. An aircraft fuselage construction including a cabin, a deck, a ceiling, and a plurality of passenger seats fixed to the deck and defining an aisle providing access to the seats; characterized in that said cabin further includes a track spaced above said deck to overlie, and to be parallel to, said aisle, a food carrier having wheels on its bottom engageable with the deck, and a guiding member engageable with said track for guiding the movement of the food carrier along said aisle.

5,205,516

CANOPY OR COVER ASSEMBLIES AND PIVOT

respect to said main skirt means of said main canopy means;

nent of momentum along the satellite roll and yaw axes, respectively;

5,205,519

BOUNDARY LAYER RELAMINARIZATION DEVICE

Theodore R. Creel, Yorktown, Va., assignor to The United

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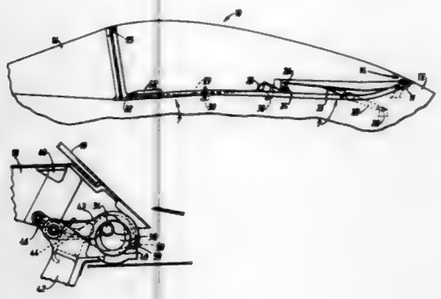
5,205,516

CANOPY OR COVER ASSEMBLIES AND PIVOT ARRANGEMENTS

Frederick A. Bright, Preston, and Christopher R. Hoare, Kingston-upon-Thames, both of United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 16, 1991, Ser. No. 642,211
Claims priority, application United Kingdom, Jan. 16, 1990, 9000951
Int. Cl.[5] B64C 1/14
U.S. Cl. 244—121 8 Claims



1. An assembly comprising:
a canopy or cover element;
a body structure including walls defining
an aperture, and
hinge means supporting said canopy or cover element for hinging movement between open and closed positions;
said hinge means comprising a hinge pivot means associated with one of said canopy or cover element and said body structure and rotatably carried by a cooperating element associated with the other of said canopy or cover element or body structure, said hinge pivot means and said cooperating element together defining a hinge axis which is fixed with respect to said canopy or cover element, said hinge pivot means being mounted for limited movement relative to said body structure in a direction transverse to said hinge axis, thereby to allow movement of said hinge axis to accommodate differential expansion of said body structure and said canopy or panel element, wherein said assembly includes support means supporting said hinge pivot means for movement along an arc about an axis spaced from said hinge axis.

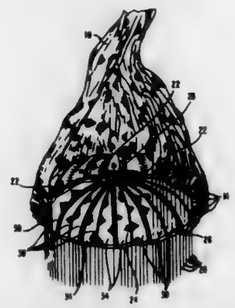
5,205,517

LARGE PARACHUTE WITH MEANS TO POSITIVELY EXPAND AND CIRCULARIZE THE INLET AREA TO FACILITATE DEPLOYMENT THEREOF

James D. Reuter, Manchester, Conn., assignor to Pioneer Aerospace Corporation, South Winsdor, Conn.

Filed Aug. 27, 1992, Ser. No. 936,166
Int. Cl.[5] B64D 17/08, 17/20, 17/34
U.S. Cl. 244—147 20 Claims

1. A large parachute with means to positively expand the inlet area to facilitate deployment thereof which comprises:
A. a main parachute means including:
(1) a main canopy means further including:
a. a plurality of main gore panels joined together to form said main canopy means;
b. a main skirt means defined along the lower portion of said main canopy means, said main skirt means defining a main inlet area adapted to receive incoming air to aid in deployment of said main parachute means;
(2) a main reefing attachment means attached to said main skirt means of said main parachute means to facilitate reefing thereof;
(3) a plurality of main suspension line means attached with respect to said main skirt means of said main canopy means;
B. an inlet control reefing means attachable with respect to said main reefing attachment means to control deployment of said main canopy means;
C. an inlet control parachute means for positively expanding said inlet area of said main parachute to facilitate deployment thereof, said inlet control parachute means including:
(1) an inlet control canopy means defining an upper vent means therein, said inlet control canopy means further including:
a. a plurality of inlet control gore panels detachably joined together to form said inlet control canopy means and to define said upper vent means therein;
b. a gore panel attachment means positioned adjacent said inlet control gore panels to detachably attach



each of said inlet control gore panels with respect to another of said inlet control gore panels positioned thereadjacent to form said inlet control canopy means;
c. an inlet control skirt means defined along the lower portion of said inlet control canopy means, said inlet control skirt means being selectively attachable with respect to said inlet control reefing means to facilitate control of deployment of said main parachute means; and
D. a gore panel release means operatively attached with respect to said gore panel attachment means, said gore panel release means being operative responsive to activation thereof to release said inlet control reefing means and to release said inlet control gore panels from attachment with respect to one another for dismembering of said inlet control canopy means and allowing full deployment of said main parachute means.

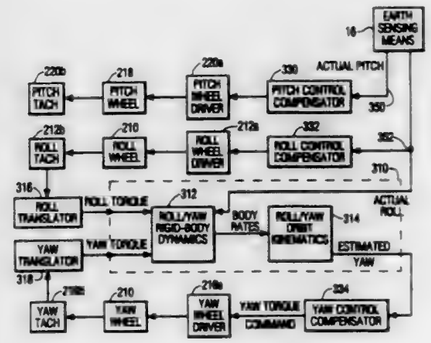
5,205,518

GYROLESS YAW CONTROL SYSTEM FOR A THREE AXIS STABILIZED, ZERO-MOMENTUM SPACECRAFT

John B. Stetson, Jr., New Hope, Pa., assignor to General Electric Co., East Windsor, N.J.

Filed Nov. 25, 1991, Ser. No. 799,457
Int. Cl.[5] B64G 1/28, 1/36
U.S. Cl. 244—165 8 Claims

1. An attitude control system for controlling the orientation of a zero momentum satellite relative to a heavenly body, said satellite having gyroscopic freedom in the orbital plane, and deriving orientation references in the absence of operative gyroscopes, comprising:
a satellite body defining roll and yaw axes, said yaw axis being Earth pointing, said roll axis being parallel to the satellite motion, said satellite body having yaw and roll body inertias about said yaw and roll axes respectively;
first and second reaction wheels mounted on said body, each of said first and second reaction wheels having a component of momentum along the satellite roll and yaw axes, respectively;
Earth sensing means mounted on said body for generating signals representing roll attitude of said satellite relative to said heavenly body;
first and second reaction wheel driving means coupled to said first and second reaction wheels, respectively, for accelerating said wheels under the control of torque command signals representing torque commands about said satellite yaw and roll axes;
first and second tachometer means coupled to said first and second reaction wheels, respectively, for generating speed signals representing the angular velocities of said reaction wheels;
roll attitude control means coupled to said Earth sensing means, and to at least one of said first and second reaction wheel driving means for processing said roll attitude error signals with at least proportional and rate compensation of said roll attitude, for generating said torque command signals representing said torque commands about said roll axis, for accelerating at least an associated one of said reaction wheels;
yaw attitude control means coupled to at least one of said first and second reaction wheel driving means for processing estimated yaw signals with at least proportional and rate compensation of said yaw attitude, for generating said torque command signals representing said torque commands about said yaw axis, for accelerating at least an associated one of said reaction wheels;
roll reaction wheel torque translation means coupled to at least one of said first and second tachometer means for differentiating said speed signals to generate roll reaction wheel torque representative signals;
yaw reaction wheel torque translation means coupled to at least one of said first and second tachometer means for differentiating said speed signals to generate yaw reaction wheel torque representative signals;
yaw estimating means coupled to said Earth sensing means, to said roll and yaw reaction wheel torque translation means, and to at least one of said first and second reaction wheel driving means, for modelling the linearized roll-/yaw orbit kinematics of said satellite, and for additionally modelling the roll/yaw rigid body dynamics of said satellite, and for applying said signals representing roll attitude, and said yaw and roll reaction wheel torque representative signals to said model, for generating and applying signals representing torque commands about said satellite yaw axis, to said at least one of said first and second reaction wheel driving means.

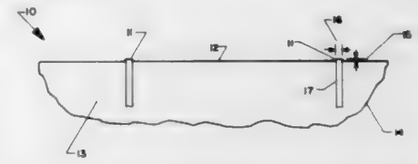


5,205,519

BOUNDARY LAYER RELAMINARIZATION DEVICE

Theodore R. Creel, Yorktown, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 7, 1992, Ser. No. 823,809
Int. Cl.[5] B64C 3/58
U.S. Cl. 244—198 4 Claims



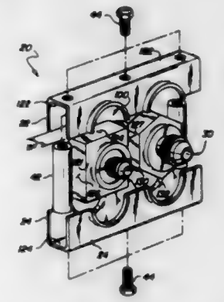
1. A device for relaminarization of a boundary layer formed in supersonic flow over the leading edge of a swept airfoil, the device comprising a square band conforming to the leading edge and the upper and lower surfaces of the swept airfoil as an integral part thereof, the square band being formed in the surface of the airfoil and extending perpendicularly from the leading edge and having a height of about two times the thickness of the maximum expected boundary layer.

5,205,520

RETAINING BLOCK FOR CLAMPING SYSTEM

William R. Walker, Rochester, Mich., assignor to Hydro-Craft, Inc., Rochester Hills, Mich.

Filed May 26, 1992, Ser. No. 888,883
Int. Cl.[5] F16L 3/08
U.S. Cl. 248—74.1 12 Claims



1. A retaining block for securing a junction adapter of a first size, into a plural line clamping system for junction adapters of a second size larger than the first size, the junction adapters of the first size having a central body portion of predetermined configuration, and two cylindrical collar portions located on opposite sides of the central body portion, the clamping system being the type having (1) a plurality of channel members, each of generally U-shaped cross-section and each provided with two leg sections separated by a predetermined distance and joined by a connecting section therebetween, the leg sections having interior wall surfaces and provided with semi-cylindrical collar portions formed at the outer ends thereof, the collar portions each including a semi-cylindrical surface and a radiused surface extending from the semi-cylindrical surface and an adjoining interior wall surface of its respective leg section, and (2) stacking nut means, disposed between and for separating the channel members in an assembled position with the U-shapes of the channel members facing each other and pairs of semi-cylindrical collar portions opposing each other and encompassing a diameter, the retaining block comprising:

a generally rectangularly-shaped central support portion adapted to be received between the channel members

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STAND APPARATUS FOR MEDICAL OPTICAL INSTRUMENT

prising first and second arms extending outwardly from said upper rear portion; and

said tubular member to prevent forward movement of said tubular member over a continuous range of positions of said tubular member unless released therefrom; and

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a generally rectangularly-shaped central support portion adapted to be received between the channel members when facing each other in an assembled position; and

two substantially cylindrical collar support portions, each of the cylindrical collar support portions located at an axial side of the central support portion, and sized to span the diameter encompassed by one pair of the opposed semi-cylindrical collar portions and to be snugly held therebetween; and

two interior ridge portions, spaced from one another by the axial thickness of the central body portion of the junction adapter,

the retaining block having a passageway extending through the entire axial length thereof, the passageway having a shaped interior portion between the two ridge portions generally corresponding to the predetermined configuration of the central body portion of the junction adapter, thereby helping prohibit axial and rotational movement of the junction adapter when installed in to the retaining block,

the two interior ridge portions each forming part of the passageway and having an internal diameter corresponding to the cylindrical collar portions of the junction adapter, and

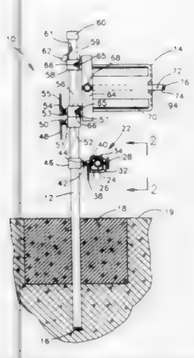
the retaining block being formed in two half sections capable of being spread apart to enable the junction adapter to be positioned within the retaining block.

5,205,521

HOSE REEL STAND WITH PIVOT MEANS

John H. Smith, Allen Park, Mich., assignor to David E. Kafka, Wyandotte, Mich.

Filed Feb. 3, 1992, Ser. No. 829,217
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—87 **20 Claims**



1. A hose reel stand (**10**) for rotatably supporting a hose reel (**20**) having a length of hose wound thereon, said hose reel stand (**10**) comprising:

(a) a support member (**12**) having a longitudinal axis and a support end for anchoring said support member (**12**) permanently in the earth;

(b) means (**56,58**) for rotatably and removably supporting said hose reel (**20**) on said support member (**12**) such that said hose reel (**20**) is freely rotatable about said longitudinal axis of said support member (**12**); and,

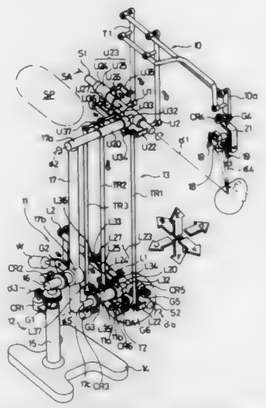
(c) means (**52**) for vertically adjusting the position of said rotatable supporting means (**56,58**) upon said support member (**12**).

5,205,522

STAND APPARATUS FOR MEDICAL OPTICAL INSTRUMENT

Katsushige Nakamura, Tokyo, Japan, assignor to Kesanori Sahara, Tokyo, Japan

Filed May 27, 1992, Ser. No. 889,223
Claims priority, application Japan, Dec. 25, 1991, 3-342577
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—123.1 **2 Claims**



1. A stand apparatus for a medical optical instrument, characterized by comprising:

a center shaft having an axis;

an auxiliary center shaft located at a position below said center shaft;

a front-side parallel link mechanism having the medical optical instrument and located on fulcrums;

a rear-side parallel link mechanism having a counterweight;

said center shaft being provided with said front-side parallel link mechanism;

said auxiliary center shaft being provided with said rear-side parallel link mechanism; and

a transmission mechanism having a first system and a second system,

wherein angularly moving operation of said center shaft about said axis and longitudinal tilting operation of said front-side parallel link mechanism about said fulcrums are capable of being transmitted respectively to said auxiliary center shaft and to said rear-side parallel link mechanism, through said first system and said second system of said transmission mechanism.

5,205,523

PORTABLE LIGHT-WEIGHT HANGER

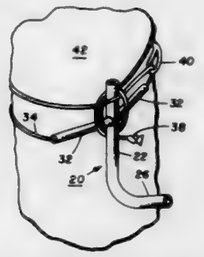
Niles G. Jones, 3185 Robertson Rd., Pensacola, Fla. 32507

Filed Dec. 11, 1991, Ser. No. 804,682
Int. Cl.[5] F16B *45/00*
U.S. Cl. 248—218.4 **9 Claims**

1. A portable hanger comprising:

(a) a first elongated member in a given vertical plane, said first member comprising an upper rear portion and a lower front finger projecting forwardly therefrom;

(b) a relatively small hollow tube having an intermediate region extending generally horizontally through said upper rear portion in a second vertical plane forming a right angle with said given vertical plane, said tube comprising first and second arms extending outwardly from said upper rear portion; and



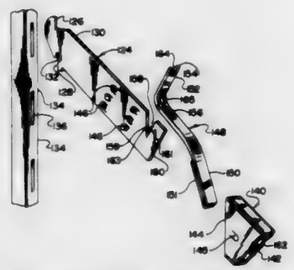
(c) a flexible cord extending entirely through said tube, said cord having two ends and being more than twice as long as said tube.

5,205,524

ADJUSTABLE BRACKET

Maurice Cohen, Miami, Fla., assignor to Capitol Hardware Manufacturing Co., Inc., Chicago, Ill.

Filed Feb. 14, 1992, Ser. No. 836,106
Int. Cl.[5] A47G *29/02*
U.S. Cl. 248—235 **13 Claims**



1. A bracket comprising an inner bracket body having an inner end configured for interlocking engagement with vertical upright means providing a vertical mounting surface, an outer tubular member having front and rear ends and having an inner wall surface forming a sleeve telescoping over said inner bracket body, said outer tubular member being continuously progressively moveable along said inner bracket body over a range of positions unless locked against such movement, the rear end of said tubular member being shaped to be moved flush against said mounting surface when pushed fully rearwardly toward the inner end of said inner bracket body, and locking means for locking said tubular member against forward movement on said bracket member, the improvement comprising:

said locking means including a latching member having a locking end configured for locking engagement with said inner wall surface of said tubular member;

pivot-forming means on said inner bracket body for supporting said latching member for pivotal movement thereon, wherein said locking portion is normally urged into locking engagement with the inner wall surface of said tubular member, said locking end of said latching member being configured to engage said inner wall surface at an angle thereto, wherein movement of said outer tubular member rearwardly toward the inner end of said inner bracket body causes said locking end to freely slide over said inner wall surface, so that the rear end of said tubular member can be brought flush against said mounting surface, said angle of said locking end of said latching member causing said locking end to lock against said inner wall surface of said tubular member to prevent forward movement of said tubular member over a continuous range of positions of said tubular member unless released therefrom; and

manually operable release means for at least momentarily releasing said locking end of said latching member from engagement with said outer tubular member, to permit the outer tubular member to be moved forwardly upon said inner bracket body.

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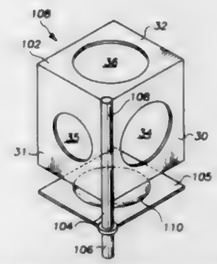
CUP HOLDER FOR VEHICLES

Schuyler B. Peck, Bothell, Wash., assignor to Piccar Inc., Bellevue, Wash.

Filed Jun. 4, 1992, Ser. No. 893,799
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.2 **10 Claims**



1. A holder for supporting drinking containers in the cab compartment of a vehicle comprising:

a shaft having first and second ends, said first end of said shaft being secured to said vehicle, a protruding portion being fixed to said second end of said shaft and angled thereto;

first and second screws secured to said shaft;

a base plate having first and second substantially planar portions wherein said first planar portion is angled with respect to said second planar portion, said first planar portion having first and second sides with a substantially circular and shallow well formed in said first side, said well having sloped sidewalls and being sized to receive the bottom portion of the drinking container, said second planar portion having a through-hole for receiving said shaft so that said base plate may be supported upon said shaft, said through-hole having an edge defining the size of said through-hole, said through-hole being sized so that when said second planar portion is positioned at a substantially right angle with respect to said shaft, said through-hole can be moved over said screws, said through-hole being further sized so that when said second planar portion is positioned at an angle substantially smaller than a right angle with respect to said shaft, said edge abuts said first and second screws to support said base plate upon said shaft;

a template having a first, second, and third sides, said first, second, and third sides including respective first, second and third holes sized to receive drinking containers of differing diameters, said first, second, and third sides being joined at right angles with respect to one another to form a corner, said template having a knob secured to said corner; and

a coupling member coupled at one end to said first end of said shaft and coupled at the other end to said template, said coupling member including a spring positioned for biasing said template toward said shaft to secure said template in position with respect to said shaft.

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from the second bottom wall and the first bottom wall is

5,205,529

FRICTION-DAMPENED GUSSET

5,205,531

SOLENOID OPERATED CARTRIDGE VALVE

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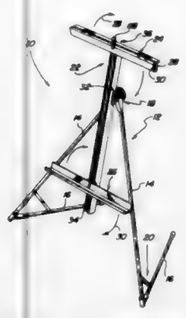
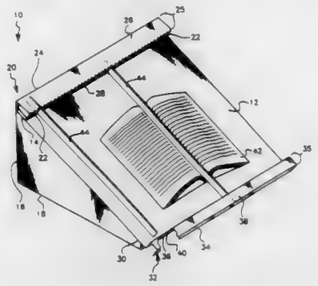
5,205,526
COLLAPSIBLE DISPLAY EASEL
Dennis Deutsch, Hastings, Minn., assignor to Pierce Companies, Inc., Santa Ana, Calif.
Filed Feb. 5, 1992, Ser. No. 831,485
Int. Cl.[5] A47B 97/04
U.S. Cl. 248—449 22 Claims



1. A collapsible display easel comprising:
two, and only two, support legs;
leg connection means for pivotably connecting one leg to the other;
a brace;
brace mounting means for slidably mounting the brace to the legs; and
one or more crossbars having means for holding a display board, a crossbar mounting means provided with each respective crossbar for pivotably mounting each respective crossbar to the brace, the legs pivoting within a plane generally parallel to said brace and crossbars between an extended position wherein the legs are disposed at an angle with respect to each other for standing on a surface, to a collapsed configuration, wherein the legs are parallel to each other and parallel to the brace;
wherein the legs each have a foot, each foot being connected to a lower end of a respective leg by a hinge means for varying an angle between the leg and the foot from a extended position, wherein the foot extends rigidly outward from the leg for supporting the leg, and a contracted position wherein the foot is disposed parallel to the leg;
with the easel being expendable into an erect configuration for holding a display board and collapsible into a compact configuration for transport.

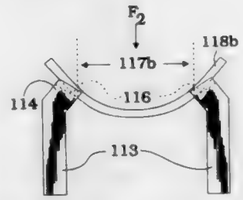
5,205,527
RACK AND METHOD FOR MOUNTING READING MATERIAL
George L. Anderson, Delta, Canada, assignor to Bow-Wow Parts of B.C. Ltd., British Columbia, Canada
Filed Feb. 14, 1992, Ser. No. 837,033
Int. Cl.[5] A47B 97/00
U.S. Cl. 248—451 20 Claims

1. A rack for releasably retaining reading materials, comprising:
a rigid rack face having a bottom end and a top end, the top end being raised vertically with respect to the bottom end;
a first top wall extending from the rack face along the top end, the first top wall having a plurality of apertures extending therethrough, each of the apertures having a permanently closed upper side;
a support structure extending along the bottom end of the rack face, the support structure having a first bottom wall extending upwardly from the rack face, the first bottom wall having a plurality of apertures extending therethrough, each of the apertures having a permanently closed upper side, a second bottom wall positioned such that the first bottom wall is spaced a selected distance from the second bottom wall and the first bottom wall is between the second bottom wall and the first top wall; and
an elongated rib having a first end portion positioned within a first top wall aperture, a second end portion positioned in a first bottom wall aperture, the second bottom wall preventing the rib from extending more than the selected



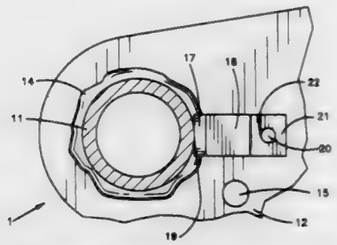
distance through the first bottom aperture beyond the first bottom wall, the rib being longer than the distance between the first top wall and the second bottom wall such that the rib is retained within the apertures of the first top wall and the first bottom wall so that the rib retains the reading material to the rack face.

5,205,528
EARTHQUAKE-RESISTANT ARCHITECTURAL SYSTEM
John Cunningham, 35 Louthberry Rd., Saratoga Springs, N.Y. 12866
Filed Apr. 17, 1992, Ser. No. 870,261
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—602 20 Claims



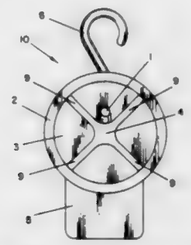
1. An earthquake-resistant architectural system comprising:
a. at least two support posts;
b. bearings being mounted on the support and facing each other, each of the bearings having a grooved channel which has opposite open ends and is inclined downwardly at an angle from a horizontal ordinate; and
c. at least one resilient transverse member having a longitudinal axis aligned coaxially with the horizontal ordinate when the transverse member is unloaded and at rest, said transverse member extending between the bearings and having a point of contact in each grooved channel with end portions of the transverse member overhanging opposite open ends of the grooved channels;
wherein a horizontal distance, when measured in a straight line between the points of contact in each grooved channel, decreases as the resilient transverse member is loaded so that the resilient transverse member bends and slides in the grooved channels.

5,205,529
FRICTION-DAMPENED GUSSET
Michael L. Killian, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Aug. 2, 1991, Ser. No. 739,890
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—636 33 Claims



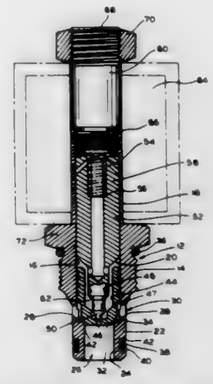
1. A bracket structure resistant to fatigue comprising:
a first member and a second member connected at a junction, each of said members extending outward from the junction to establish an angular gap between them; and
a gusset spanning the gap,
the gusset having a spanning portion, a first contact surface bearing on said first member, thereby forming a first interface therebetween, and a second contact surface bearing on said second member, thereby forming a second interface therebetween,
the first contact surface being affixed at the first interface to said first member,
the second contact surface being in frictional contact with said second member at the second interface, and
a bending stress on the spanning portion of the gusset forcing said frictional contact between said second contact surface and said second member.

5,205,530
RADIALLY SLITTED HOLDER, METHOD OF USE AND APPARATUS FACILITATING USE
Ivan L. Fish, 2804 Carolina, NE., Albuquerque, N. Mex. 87110-3312
Filed Nov. 1, 1991, Ser. No. 786,454
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—690 10 Claims



1. A radially slitted closer, holder, and display device comprising: a central membrane having a first access hole, a plurality of slits radially disposed from said first access hole, a plurality of flaps in said central membrane which are defined by said slits, and a second access hole disposed in one of said flaps.

5,205,531
SOLENOID OPERATED CARTRIDGE VALVE
Abel E. Kolchinsky, Riverwoods, Ill., assignor to Sterling Hydraulics, Inc., Schaumburg, Ill.
Filed Apr. 9, 1992, Ser. No. 865,927
Int. Cl.[5] F16K 31/40, 31/42
U.S. Cl. 251—30.04 20 Claims



1. A solenoid operated cartridge valve, comprising:
an elongate one-piece cylindrical valve housing having an axial bore having a unitary inner diameter defining an interior chamber, one end of said housing comprising a port end including a plurality of port openings, and an axial opposite end comprising a sleeve end receivable in a solenoid, in use;
a valve member movable in said chamber at the port end between first and second valve positions for selectively coupling said port openings, said valve member having an axial pilot through bore defining a pilot chamber;
a solenoid plunger movable in said interior chamber at the sleeve end;
a pilot valve movable in said pilot chamber for selectively opening or closing said pilot through bore;
means for coupling said pilot valve to said plunger for axial movement therewith for selectively positioning said pilot valve and thus also said valve member;
a stop mounted to said valve housing at the sleeve end for retaining the plunger in said chamber; and
biasing means operatively associated with said plunger for normally maintaining said valve member in one of said first and second valve positions, said valve member, said plunger, said pilot valve and at least a portion of said stop being enclosed in said bore defining the interior chamber to maintain precise alignment of said valve member, said plunger and said pilot valve of all times therein.

5,205,532
PIVOTING AIR LOCK FOR A TREATMENT CHAMBER
Herbert Naehring, Rodenbach, Fed. Rep. of Germany, assignor to Leybold Aktiengesellshaft, Hanau, Fed. Rep. of Germany
Filed Jun. 2, 1992, Ser. No. 892,288
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1992, 4203473
Int. Cl.[5] F16K 25/00
U.S. Cl. 251—85 5 Claims

1. Air lock assembly for an opening in a wall of a treatment chamber, said air lock assembly comprising
a valve beam arranged for pivotable movement about an axis of rotation from an open position to a closed position, said valve beam having a plurality of spaced apart first ribs extending transversely of said axis of rotation, each rib having a pair of first grooves therein,

a valve plate extending parallel to said valve beam and pivotably connected thereto, said valve plate being ar-

5,205,534
ACTUATOR AND ZONE VALVE

an annular valve seating surface disposed internally within the valve body adjacent the centrally located cavity and encircling the fluid flow passageway at one location there-

5,205,536
TOP ENTRY, TRUNNION-TYPE BALL VALVE
Edward J. Holec, Hampton, Va., assignor to Newport News

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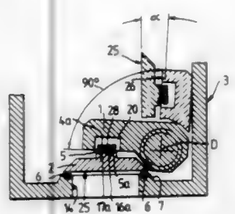
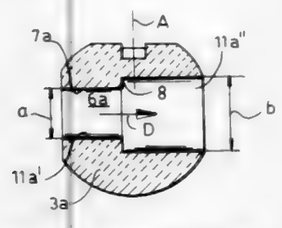
a valve plate extending parallel to said valve beam and pivotably connected thereto, said valve plate being arranged to close said opening when said valve beam is in the closed position, said valve plate having a plurality of spaced apart second ribs extending transversely of said axis of rotation, each rib having a pair of second grooves therein, and



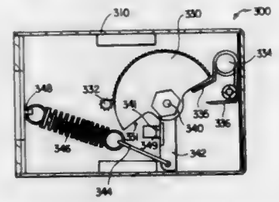
two lengths of resilient material extending parallel to said axis of rotation, each length engaging a respective groove in each first rib and a respective groove in each second rib, said length being fixed to said first ribs by first clamps, said lengths being fixed to said second ribs by second clamps.

5,205,533
BALL VALVE
Rütger Berchem, Essen, Fed. Rep. of Germany, assignor to Metalpraecis Berchem + Schaberg Gesellschaft Fur Metallformgebung mbh, Gelsenkirchen, Fed. Rep. of Germany
Filed Jun. 7, 1991, Ser. No. 712,124
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 9006504
Int. Cl.[5] F16K *47/04*
U.S. Cl. 251—118 **5 Claims**



1. In a throttle-type metering valve having:
a housing having an inlet connection and an outlet connection and formed with a valve seat having spaced inlet and outlet ports connected to the respective connections; and
a valve ball formed with a throughgoing passage having an inner wall of a wear-resistant material and having an upstream end and a downstream end, the ball fitting in the seat and being displaceable therein between an open position with its passage aligned between the respective inlet and outlet ports and a closed position with its passage out of alignment between the ports,
the improvement wherein
the passage is formed centrally between its downstream end and its upstream end as a restriction,
the flow cross section of the passage is uniform downstream and upstream of the restriction, and
the passage is of larger flow cross section at its downstream end than at the restriction and upstream thereof, whereby on fluid flow through the valve from the inlet to the outlet flow separation from the wall is initiated at the restriction.

5,205,534
ACTUATOR AND ZONE VALVE
Attilio G. Giordani, Greenwich, R.I., assignor to Taco, Inc., Cranston, R.I.
Division of Ser. No. 660,792, Feb. 25, 1991, Pat. No. 5,131,623. This application Sep. 27, 1991, Ser. No. 767,021
Int. Cl.[5] F16K *31/04*
U.S. Cl. 251—129.11 **1 Claim**

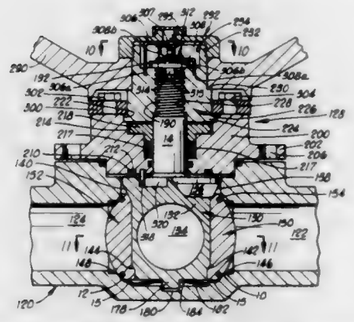


1. An actuator mechanism for a heating system valve, comprising:
a support structure;
a torque producing member mounted on said support structure;
a rotatable shaft with a coupling at one end for making a connection to said valve;
a torque transfer segment having one end coupled to said shaft;
a hinge member rotatably coupled to said torque transfer segment at a location radially outward from said shaft; and
a tension spring coupled at one end of said support structure and at the other to said hinge member, said tension spring working in conjunction with said hinge member to provide a restoring torque to said shaft, said restoring torque being equal to the product of the spring force and an effective moment arm,
wherein the spring, hinge member, and torque transfer segment are configured so that the effective moment arm varies inversely with the force of the spring to reduce variation in said restoring torque over an angular range of movement of said shaft,
wherein said torque transfer segment is coupled to said shaft so that it rotates in conjunction with said shaft;
said torque producing member comprises
a motor,
a gear pinion coupled to said motor, and
a gear segment mounted so that it rotates about the same axis as said shaft but rotates freely relative to said shaft, said gear segment meshing with said gear pinion so as to rotate said gear segment in response to said motor turning said gear pinion; and wherein
said gear segment abuts said torque transfer segment in at least some angular positions, so that as said gear segment is rotated in those angular positions, said motor, when energized, works against said restoring torque of said spring to rotate said shaft in one direction, and said restoring torque, when said motor is not energized, works to rotate said shaft in the reverse direction.

5,205,535
EXPANDING GATE VALVE ASSEMBLY
Venkatesh R. Nevrekar, 6 Castle Creek Pl., Shawnee, Okla. 74801
Continuation-in-part of Ser. No. 437,896, Nov. 17, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 639,917
Int. Cl.[5] F16K *3/14*
U.S. Cl. 251—163 **8 Claims**

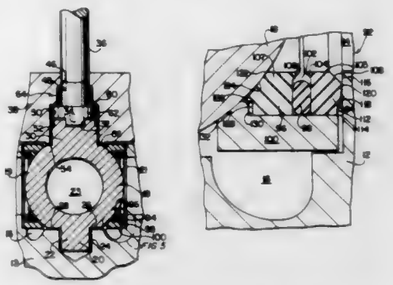
1. An expanding valve comprising:
a valve body having a fluid flow passageway extending through the valve body and defining a fluid flow path through the valve body, the valve body defining a centrally located cavity in the fluid flow path;

an annular valve seating surface disposed internally within the valve body adjacent the centrally located cavity and encircling the fluid flow passageway at one location therealong;
an elongated stem including at least a portion located outside of the valve body and having a longitudinal axis extending transversely with respect to the axis of the fluid flow path;
valve operator means, having a movable handle connected to the stem, for moving the stem solely when the valve operator means is moved, the valve operator means further characterized as comprising a lift-and-turn means connected to the valve stem and the gate for reciprocating the value stem and gate in a direction transverse with respect to the direction of fluid flow through the valve during a limited interval of movement of the handle, and for causing the valve stem and the gate to move with movement of the handle for rotation of the valve stem and the gate at a time of movement of the handle other than the limited interval, the lift-and-turn means comprising spring means resiliently interconnecting the handle and the valve stem;
a gate connected to the stem and undergoing movement when the stem is moved by the valve operator means, the gate having an upstream face and a downstream face, a major portion of the gate located in the centrally located cavity within the valve body, the gate being reciprocably



movable by the valve operator means in a direction transverse to the direction of the fluid flow path, the gate having two spaced apart, substantially parallel wedging-camming surfaces disposed on one of the gate faces facing toward the annular valve seating surface;
a floating segment movably mounted on the one gate face and having;
a sealing face on one side facing toward the annular valve seating surface in the valve body; and
a gate-contacting face on the opposite side thereof and contacting the gate face, the gate-contacting face defining two spaced apart, substantially parallel segment-carried wedging-camming surfaces, the segment-carried wedging-camming surfaces being spaced from each other and coacting with, mating with and extending substantially parallel to the wedging-camming surfaces carried on the gate face;
arresting means interposed in the path of movement of the floating segment for arresting movement of the floating segment and, by the wedging-camming action of the gate-carried wedging-camming surfaces against the segment-carried wedging-camming surfaces, for wedging the segment substantially parallel to, and toward, the annular valve seating surface in the valve body so that the floating segment is sealingly forced against the annular valve seating surface by movement of the floating segment away from the gate.

5,205,536
TOP ENTRY, TRUNNION-TYPE BALL VALVE
Edward J. Holec, Hampton, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.
Filed Sep. 24, 1992, Ser. No. 950,796
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—172 **21 Claims**



1. A trunnion-type ball valve assembly for use with high pressure fluids in a fluid passageway, comprising
a trunnion-type ball,
a valve body for rotatably receiving said ball,
a sealing assembly being positioned between said ball and said body,
a seal carriage surrounding said sealing assembly for retaining said sealing assembly in position,
said sealing assembly including a body seal and a ball seal each surrounding said passageway,
said body seal having a first body seal surface for sealing engagement with said body, a second body seal surface facing oppositely to said first body seal surface and a third body seal surface facing said passageway,
said ball seal having a first ball seal surface for sealing engagement with said ball, a second ball seal surface confronting said second body seal surface and forming a first cavity in fluid communication with said passageway and a third ball seal surface facing said passageway,
a resilient O-ring positioned within said cavity for both sealing engagement with said seal carriage and for resiliently urging said ball seal and said body seal into sealing engagement with said body and said ball respectively upon a pressure from fluid in said fluid passageway.

5,205,537
VALVE WITH ENHANCED RANGEABILITY AND LOGARITHMIC FLOW CHARACTERISTIC
Robert W. Pfeiffer, 3 Hidden Spring La., Rye, N.Y. 10580
Continuation-in-part of Ser. No. 639,414, Jan. 10, 1991, abandoned, which is a continuation of Ser. No. 563,932, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 84,635, Aug. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 48,078, May 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 570,171, Jan. 12, 1984, Pat. No. 4,664,139. This application Jul. 26, 1991, Ser. No. 736,702
Int. Cl.[5] F16K *3/26, 3/32*
U.S. Cl. 251—205 **32 Claims**

1. A control valve comprising (a) a valve body having a slide chamber therein and an inlet passage and an outlet passage cooperating to partially define a flow passageway transversely intersecting the slide chamber; (b) a plug member mounted for movement within the slide chamber and having a flow orifice extending transversely therethrough, the plug member and its flow orifice being each dimensioned and configured to seal the flow passageway when the flow orifice is out of registration with the inlet passage and to complete the flow passageway by connecting the inlet and outlet passages in flow communication when the flow orifice is registered therewith; and (c) positioning means operatively connected to the plug member

to position the plug member at selected locations within the slide chamber to selectively adjust registration of the flow

material and which further comprises a passage channel for passage of a medium;
an upper housing portion which is constructed of a plastic

ment of said operating element and thereby said valve member to permit tool operation
wherein said means for capturing said extended operating

5,205,542
OPTICAL FIBRE INSTALLATION
Peter Keeble, Ipswich, England, assignor to British Telecommu-

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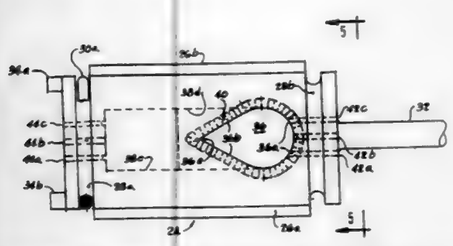
to position the plug member at selected locations within the slide chamber to selectively adjust registration of the flow orifice with the inlet and outlet passages, at fully open, fully closed and a plurality of intermediate throttling positions, the flow orifice and flow passageway being respectively dimensioned and configured to provide for flow which is unconstricted by the flow orifice at the fully open position and further to provide a flow characteristic such that a plot of percentage lift on the ordinate versus percentage flow as the abscissa on log—log coordinates defines a substantially straight line of positive slope.

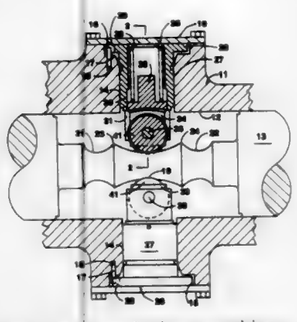


5,205,538

DETENT MECHANISM FOR A FLUID CONTROL VALVE

John P. Mackoway, Jr., Washington, and Charles E. Holzinger, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 9, 1991, Ser. No. 803,847
Int. Cl.[5] F16K 31/00
U.S. Cl. 251—297 8 Claims



1. A cartridge detent mechanism comprising:
a housing having an axially extending bore;
a roller carrier slidably positioned in the bore;
a pin carried by the roller carrier;
a spring disposed in the bore and resiliently biasing the carrier outwardly of the bore; and
a roller rotatably disposed on the pin and having an annular concave peripheral surface.

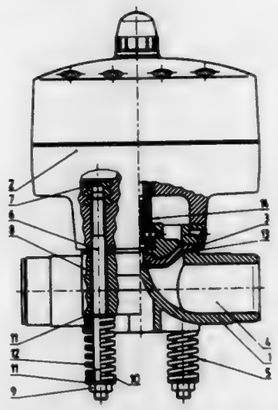
5,205,539

DIAPHRAGM VALVE

Adelbert Schalk, Watöschingen-Horheim, Fed. Rep. of Germany, assignor to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland

Filed Jun. 3, 1992, Ser. No. 893,136
Claims priority, application Switzerland, Jun. 7, 1991, 01712/91
Int. Cl.[5] F16K 7/12, 27/00
U.S. Cl. 251—331 39 Claims

1. A diaphragm valve which comprises:
a lower housing portion which is constructed of a plastic material and which further comprises a passage channel for passage of a medium;
an upper housing portion which is constructed of a plastic material;
a diaphragm wherein said diaphragm is located between said lower housing portion and said upper housing portion;
a fastening device for connecting said lower housing portion to said upper housing portion; and



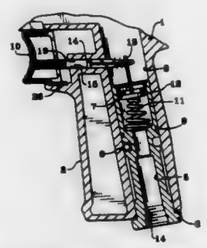
a compression spring which is pre-stressed and which is further arranged adjacent to each fastening device;
wherein said lower housing portion and said upper housing portion are clamped together by said fastening device with a pre-determined force and further wherein said diaphragm is supported between said lower housing portion and said upper housing portion.

5,205,540

TRIGGER VALVE ASSEMBLY

John M. Clapp, Sayre, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 16, 1992, Ser. No. 853,231
Int. Cl.[5] F16K 31/00
U.S. Cl. 251—339 9 Claims



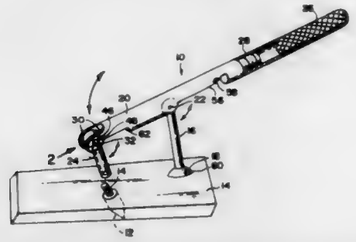
1. A trigger valve assembly for a power tool comprising:
a finger operated actuator mounted in said tool for reciprocation along a longitudinal axis;
said actuator being further provided with a projection along said longitudinal axis;
a valve member disposed generally perpendicular to said longitudinal axis having an extended operating element thereof intercepting said projection of said actuator;
said projection of said actuator being further provided with means for substantially capturing encircling, and securing thereto said extended operating element upon initial insertion and operation of said actuator for selected displacement of said operating element and thereby said valve member to permit tool operation
wherein said means for capturing said extended operating element further comprises an aperture formed in said projection of said actuator for substantially encircling said operating element, and
wherein said finger operated actuator projection is further provided with a means for deflecting and directing said extended operating element towards said means for capturing said extended operating element.

5,205,541

ARROW HEAD EXTRACTOR

Joseph S. Roberts, 2066 Placida Rd, Englewood, Fla. 34224, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Apr. 30, 1992, Ser. No. 876,304
Int. Cl.[5] B66F 3/00
U.S. Cl. 254—131 3 Claims



1. A device for removing an arrowhead embedded into wood, the arrowhead having a threaded end, said device comprising:
a) a support leg having a foot at one end to rest against the wood;
b) a lever arm having a central portion pivotly attached to other end of said support leg;
c) means attached adjacent an end of said lever arm for engaging with the threaded end of the arrowhead, whereby pivoting of said lever arm will cause said engaging means to pull the arrowhead out of the wood, further including a hollow handle grip detachable to said lever arm so that a person may store small items therein; wherein said engaging means includes:
d) said lever having a forked end;
e) a pivot pin having a head at one end and a transverse hole at other end, said pivot pin mounted between the bifurcations of said forked end;
f) an engagement member being a hollow shank with an eye head which rotates on said pivot pin, said shank having internal threads to engage with the threaded end of the arrowhead;
g) a cotter pin disposed within said transverse hole in said pivot pin to retain said engagement member thereto; further including:
h) a ball bearing mounted into one of the furcations of the forked end; and
i) said eye head having four indentations spaced at 90° positions thereabout so that any one of said indentations can bear against said ball having to hold said engagement member in a stable position.

5,205,542

OPTICAL FIBRE INSTALLATION

Peter Keeble, Ipswich, England, assignor to British Telecommunications Public Limited, London, England

Division of Ser. No. 399,533, Aug. 21, 1989, Pat. No. 5,022,634.
This application Feb. 27, 1991, Ser. No. 661,224
Claims priority, application United Kingdom, Mar. 23, 1987, 8706803
Int. Cl.[5] B66F 3/24
U.S. Cl. 254—134.4 17 Claims

1. A process for installing a transmission line in a passageway by means of viscous drag of a fluid, so that the transmission line extends between a transmission line inlet to the passageway and a transmission line outlet remote from the inlet, the method comprising admitting fluid at an upstream end of the passageway to advance the transmission line along the passageway from the inlet towards the outlet, and discharging some of the fluid from the passageway at a location intermediate the inlet and outlet during at least part of the installation process, and whereby the transmission line continues to advance along the passageway to the outlet by means of viscous fluid drag forces acting thereon in the passageway downstream of said location.

5,205,543

CHAIN LINKING DEVICE

Perry C. Thiede, 31331 Kenady La., Cottage Grove, Oreg. 97424

Filed Feb. 15, 1991, Ser. No. 655,809
Int. Cl.[5] B25B 27/22
U.S. Cl. 254—231 4 Claims

1. A chain linking device, in combination with a chain including a plurality of links in series, the chain linking device comprising:
a. an elongated member having a straight portion, with a longitudinal axis, and a curved portion, with the curved portion being located at one end of the straight portion; said curved portion of said elongated member being formed in an arc of greater than ninety degrees so as to form a hook having a concave link-engaging surface; said straight portion of said elongated member being externally threaded;
b. a sleeve member formed to slidingly engage said elongated member; said sleeve member being formed with a straight pin member which extends radially outwards from said sleeve member, said pin member having a straight and uninterrupted link-engaging surface which is substantially perpendicular to the longitudinal axis of the straight portion of the elongated member; and
c. an internally threaded member formed to threadingly engage said externally elongated member;
d. said sleeve member being located upon the elongated member between the internally threaded member and the curved portion of the elongated member.

5,205,544

REMOTELY CONTROLLED WINCH

[illegible]

5,205,545

ELASTIC RUBBER BEARING ALLOWING CARDANIC MOVEMENT WITH LOW RESTORING MOMENTS

a first portion being disposed along the circumference of the housing element;
a second portion being disposed directly about the longi-

attached to the rigid body member and covering the open side of the cavity at a spaced distance from the concave wall of the body member, said diaphragm

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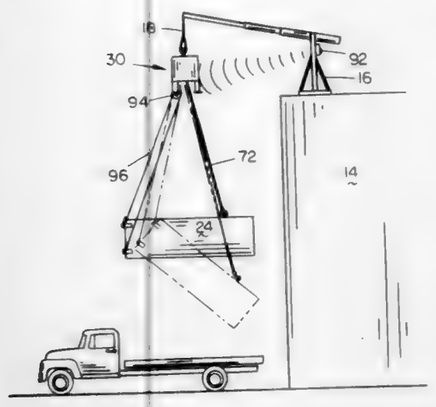
5,205,544

REMOTELY CONTROLLED WINCH

Donald E. Kroeger, R.R. #1, Elkhorn, Nebr. 68022

Filed Mar. 1, 1991, Ser. No. 663,245
Int. Cl.[5] B66D *1/00, 1/08;* B66C *1/34*
U.S. Cl. 254—329 4 Claims



1. An apparatus for use with a hoisting crane, including a hoisting cable, to enable the hoisting crane to lift a building panel from the bed of a truck, the building panel having an upper end, a lower end and first and second side edges, said panel being normally positioned on said first side edge on the truck bed, comprising,

a frame having upper and lower ends,

said hoisting cable being secured to the upper end of said frame,

a first sheave operatively secured to said frame at the lower end thereof,

a second cable extending around said first sheave and having opposite ends, said opposite ends of said second cable being adapted to be secured to the upper end of said building panel in a spaced-apart manner,

a winch mounted on said frame, said winch comprising a winch drum having a winch cable wrapped thereon and extending downwardly from said winch drum with the free end of said winch cable being operatively secured to said second side edge of said building panel adjacent the lower end thereof, so that upward vertical movement of said hoisting cable will cause said frame, said second cable, and said winch cable to be moved upwardly, without activating said winch, thereby causing said building panel to be raised from the bed of the truck;

and means for selectively operating said winch so that said winch cable may be unwound from said winch drum and lowered relative to said frame after said hoisting cable has sufficiently raised the building panel from the bed of the truck so that the building panel may be rotated 90° and so that said second cable supports the building panel by its upper end,

said first sheave permitting length compensation of said second cable during the rotation of said building panel,

said means for selectively operating said winch including means for winding said winch cable onto said winch drum once said winch cable has been released from said building panel,

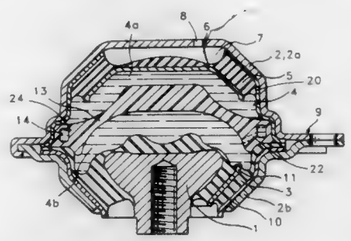
said means for selectively operating said winch including a remotely controlled hydraulic pump and motor operatively connected thereto.

5,205,545

ELASTIC RUBBER BEARING ALLOWING CARDANIC MOVEMENT WITH LOW RESTORING MOMENTS

Jörn-Rainer Quast, Bad Bodendorf, Fed. Rep. of Germany, assignor to Boge AG, Eitorf, Fed. Rep. of Germany

Filed Aug. 23, 1991, Ser. No. 749,252
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1990, 4027808
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.13 17 Claims



1. A bearing comprising:

a housing element;

a movable connecting element for connecting the bearing to a member, said movable connecting element being movably disposed at least partly within said housing element;

said movable connecting element generally being positioned in a spaced-apart relationship with said housing element;

a lower resilience element connected between said movable connecting element and said housing element for transmitting a force between said movable connecting element and said housing element during movement of said movable connecting element;

fluid in communication with said movable connecting element and said housing element for transmitting a force between said movable connecting element and said housing element during movement of said movable connecting element;

a greater fluid cavity defined by said movable connecting element, said lower resilient element and said housing element, said fluid being disposed within said greater fluid cavity;

an upper resilient element attached to said housing element for receiving a force transmitted by said fluid;

said movable connecting element having a shaft portion and a head portion attached to said shaft portion;

a longitudinal axis being defined through and generally parallel to said shaft portion of said movable connecting element;

said head portion of said movable connecting element being at least partly spherical;

said movable connecting element being disposed for at least:

movement in a first linear direction;

movement in a second linear direction generally opposite said first linear direction;

rotational movement about said longitudinal axis;

rotational movement about at least one other axis generally transverse to said longitudinal axis;

partition means separating said greater fluid cavity into at least an upper fluid cavity and a lower fluid cavity, said partition means being disposed between said movable connecting element and said upper resilient element;

said partition means having throttle means for conveying fluid between said upper fluid cavity and said lower fluid cavity;

said partition means being positioned is a spaced-apart relationship with each of said upper resilient element and said movable connecting element;

said head portion of said movable connecting element being generally in the shape of a truncated sphere;

said partition means comprising:

a first portion being disposed along the circumference of the housing element;

a second portion being disposed directly about the longitudinal axis of the bearing; and

a third portion connecting said first portion and said second portion;

said head portion of said movable connecting element having a generally flat face portion forming said truncated sphere shape, said generally flat face portion facing generally towards said partition means;

a trough portion surrounding said movable connecting element, said trough portion being indented in said lower resilient element such that said lower fluid cavity completely surrounds said movable connecting element; and

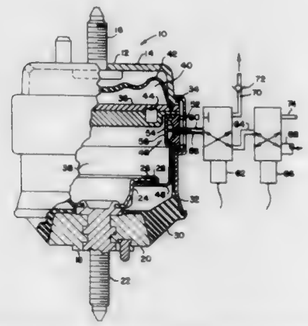
said third portion of said partition means being defined by an upper concave portion and a lower concave portion, said upper concave portion and said lower concave portion converging to form an area of reduced thickness.

5,205,546

HYDRO-ELASTIC ENGINE MOUNT

Robert C. Schisler, Munroe Falls, and George W. Eisenzimmer, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 10, 1992, Ser. No. 833,209
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.13 11 Claims



1. A hydro-elastic engine mount for mounting an engine on a vehicle frame said mount comprising:

(A) a first end member;

(B) a second end member spaced in an axial direction from the first end member;

(C) an annular elastomeric spring element sealingly attached to the first end member;

(D) an annular sidewall extending between the elastomeric spring element and the second end member to form an enclosed chamber between the first and second end members;

(E) a fixed partition inside the enclosed chamber dividing it into a main fluid chamber and an auxiliary fluid chamber;

(F) said partition containing a damping channel therethrough which permits fluid to flow back and forth between the main fluid chamber and the auxiliary fluid chamber when certain vibration conditions occur to provide relative vibration damping between the first and second end members; and

(G) a coupling/decoupling means mounted inside the main fluid chamber to alternately couple and at least partially decouple the vibration damping action of the fluid flow through the damping channel said coupling/decoupling means comprising:

(1) a rigid annular body member having a concave wall forming a cavity with an open side facing on the inside of the main fluid chamber,

(2) a flexible extensible elastomeric diaphragm sealingly attached to the rigid body member and covering the open side of the cavity at a spaced distance from the concave wall of the body member, said diaphragm being deflectable into the cavity a distance relative to the pressure differential between the fluid pressure in the main fluid chamber and the air pressure in the cavity, one surface of the diaphragm facing the cavity and the opposite surface thereof lying within the main fluid chamber and being directly exposed to the interior of said chamber,

(3) the body member having a port extending through the concave wall thereof and in communication with the exterior of the engine mount to permit the flow of air in and out of the cavity, and

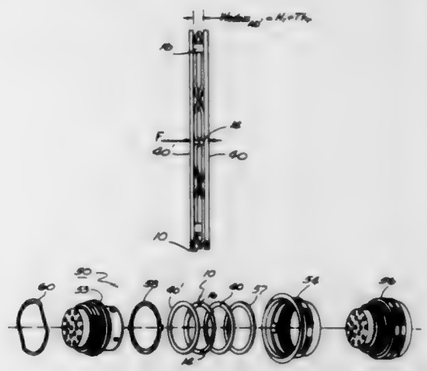
(4) means to control the flow of air through the port in and out of the cavity to effect pressure changes within the cavity and thereby change the amount of deflection of the diaphragm.

5,205,547

WAVE SPRING HAVING UNIFORMLY POSITIONED PROJECTIONS AND PREDETERMINED SPRING

William R. Mattingly, 14162 Brenan Way, Santa Ana, Calif. 92705

Continuation of Ser. No. 647,956, Jan. 30, 1991, abandoned. This application Aug. 19, 1992, Ser. No. 932,273
Int. Cl.[5] F16F *1/34;* H01R *13/635*
U.S. Cl. 267—158 21 Claims



1. A spring having uniformly positioned surface projections and predetermined spring tension deflection, comprising:

(a) a washer disposed substantially in a common plane when unstressed and having a top and a bottom surface, said washer having a predetermined radial width, thickness, internal diameter, material modulus and external diameter;

(b) said top surface including at least one top surface projection extending upwardly therefrom each at a respective selected position therearound;

(c) said bottom surface including at least on bottom surface projection extending downwardly therefrom each at a respective selected position therearound remote from a said angular position of any said top projection; and

(d) each said top and bottom surface projection being substantially incompressible under load,

whereby said washer is deflectable under load between opposing parallel surfaces urged toward each other a distance not greater than the lesser of said predetermined heights to a spacing at least equal to the metal thickness plus the greater of said predetermined heights to assume a wave shape and is operable to provide and consistently maintain a spring tension deflection in response to a given load.

5,205,548

AUTOMATIC DOCUMENT SHEET CONVEYANCE DEVICE

representing a transfer speed of the sheet transferred to the sheet post-processing apparatus, whereby the sheet

first conveying means for conveying a sheet toward said image forming section;

second conveying means or conveying the sheet in a direc-

ing in the heel of said clubhead with its collar in engagement with said barrier and with its upward extension affixed within the end of said tubular shaft thereby providing an added swing-

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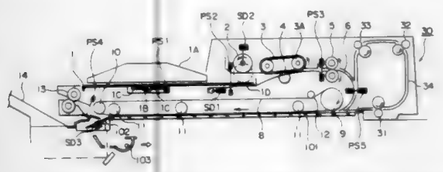
5,205,548

AUTOMATIC DOCUMENT SHEET CONVEYANCE DEVICE

Yasushi Yamada, Tokyo; Masaru Ushio, Hachioji; Masanobu Kawano, Hachioji; Yoshikazu Maekawa, Hachioji, and Yoshio Ueda, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,569
Claims priority, application Japan, Sep. 14, 1989, 1-238854
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—3 **9 Claims**



1. An automatic document conveyance apparatus for use with a photoelectric copying device for copying an image of a document, at a document copying position of said photoelectric copying device, onto a copying sheet, comprising:

first conveyance means for conveying a plurality of documents in a sheet form one-by-one to a document waiting position in said document conveyance apparatus;

second conveyance means for conveying said documents from said documents waiting position to said document copying position;

third conveyance means for conveying said documents from said document copying position to a position outside of said photoelectric copying device after a copying operation of said photoelectric copying device; and

means for controlling the second and third conveyance means so that a document held at said document waiting position and a document at said document copying position are automatically ejected outside of said automatic document conveyance apparatus when a copying operation is cancelled,

wherein the second conveyance means includes means for holding one of said documents conveyed to said document waiting position thereat until said copying operation for another of said documents previously conveyed to said document copying position is ended.

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SHEET HANDLING APPARATUS

Shunji Sato, and Takeshi Honjo, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

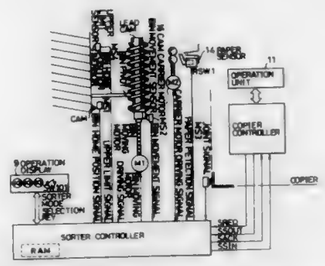
Continuation of Ser. No. 511,291, Apr. 19, 1990, abandoned, which is a division of Ser. No. 90,103, Aug. 27, 1987, Pat. No. 4,940,225. This application Aug. 20, 1991, Ser. No. 750,236
Claims priority, application Japan, Aug. 29, 1986, 61-203394; Aug. 29, 1986, 61-203395
Int. Cl.[5] B65H *29/60*
U.S. Cl. 271—176 **7 Claims**

1. A sheet output apparatus detachably combinable with a sheet post-processing apparatus, said sheet output apparatus also adapted to perform predetermined processing of a sheet and then discharge the sheet to the sheet post-processing apparatus, comprising:

transfer means for transferring the sheet to the sheet post-processing apparatus, said transfer means transferring the sheet to a sheet container in the sheet post-processing apparatus where transferred sheets are grouped in units of a predetermined number of sheets; and

communication means for communication data between said transfer means and the sheet post-processing apparatus,

wherein said communication means transmits speed data representing a transfer speed of the sheet transferred to the sheet post-processing apparatus, whereby the sheet



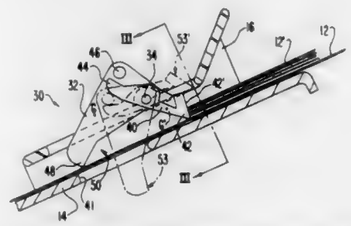
post-processing apparatus can be controlled based on the transfer speed data.

5,205,550

BLOCKING DEVICE FOR A SHEET FEEDER

Andrea Perino, Cuorgnè, Italy, assignor to Olivetti-Canon Industriale S.p.A., Ivrea, Italy

Filed Dec. 23, 1991, Ser. No. 811,681
Claims priority, application Italy, Dec. 24, 1990, 68057 A/90
Int. Cl.[5] B65H *7/02*
U.S. Cl. 271—157 **2 Claims**



1. A device for blocking the entrance of a sheet feeder having an entry hopper to introduce sheets to a supporting surface and a pick-up roller to remove said sheets from said supporting surface, said device comprising:

a lever rotatable from an operating position in which a first end is kept raised by a sheet present on said supporting surface, to a rest position in which said first end engages an aperture when said sheet is not present; and,

a stop member engageable with said lever and movable, in response to rotation of said lever, from an operating position in which said stop member engages said supporting surface thereby preventing further sheets from being inserted into said hopper, to a rest position in which said stop member is raised from said supporting surface.

5,205,551

APPARATUS FOR TRANSPORTING SHEET

Toshiyuki Nagano, Yokohama; Masanari Shirai, Chigasaki; Masashi Ohashi, Tokyo, and Tatsuya Shiratori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

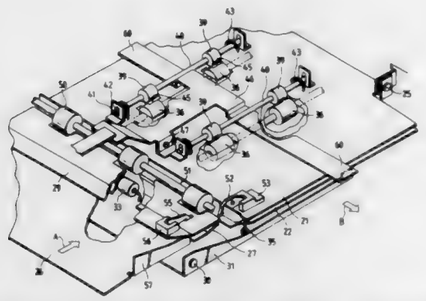
Continuation of Ser. No. 494,399, Mar. 16, 1990, abandoned. This application Mar. 27, 1992, Ser. No. 860,222
Claims priority, application Japan, Mar. 20, 1989, 1-067917; Apr. 6, 1989, 1-087462; Apr. 24, 1989, 1-105641; May 10, 1989, 1-118093; Jun. 15, 1989, 1-154054; Jun. 21, 1989, 1-159312
Int. Cl.[5] B65H *5/00*
U.S. Cl. 271—225 **18 Claims**

16. An image forming system, comprising:

an image forming section for forming an image on a sheet;

first conveying means for conveying a sheet toward said image forming section;

second conveying means or conveying the sheet in a direction transverse to the conveying direction of said first convey means, said first and second conveying means being disposed offset in a highlight direction; and



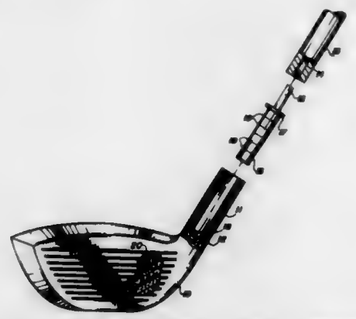
height level means for levelling a height of said second conveying means and a height of said first conveying means, so that a sheet conveyed from said second conveying means is conveyed to said first conveying means.

5,205,552

SWINGWEIGHTED METALWOOD GOLF CLUB AND METHOD OF ASSEMBLY THEREOF

Robert Green, Jr., 9041 Puesta del Sol, Desert Hot Springs, Calif. 92240

Continuation-in-part of Ser. No. 709,117, Jun. 3, 1991. This application May 26, 1992, Ser. No. 887,863
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—808 **3 Claims**



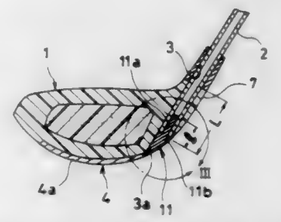
1. A metalwood golf club which comprises a clubhead comprising a cast metal shell having a playing face with a heel and a hosel extending upwardly from said heel providing a shaft receiving socket, a hollow shaft positioned therein, a barrier at the base of said hosel forming with said shell an enclosure means for receiving a rigid foam forming material injected through an opening in said barrier to provide a rigid cellular core, said barrier also providing a stop for the end of said shaft, a swingweight incorporated into said core at said heel which comprises an elongated cylindrical weight unit having a predetermined weight, length and diameter, an opening in said barrier conforming to the diameter of said weight unit, a cylindrical opening, in said core in alignment with said opening and said hosel, said weight having a collar extending around its periphery at its upper end having a diameter slightly larger than the opening in said barrier to permit engagement therewith and an upwardly extending extension having an outer diameter conforming to the inner diameter of the hollow shaft, said weight being positioned within the said cylindrical opening in the heel of said clubhead with its collar in engagement with said barrier and with its upward extension affixed within the end of said tubular shaft thereby providing an added swingweight extending downward from said shaft and hosel in continuous alignment therewith into the heel of said clubhead.

5,205,553

GOLF CLUB

Takaharu Okumoto, Chigasaki, and Tetsuo Hayashi, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Japan

Filed Nov. 25, 1991, Ser. No. 797,031
Claims priority, application Japan, Nov. 28, 1990, 2-124174[U]; Nov. 28, 1990, 2-124175
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—80.8 **6 Claims**



1. A golf club comprising a club head having a hosel portion having an upper end and a sole portion having a lower surface, a shaft receiving bore having an inner annular surface extending from an opening in the upper end of the hosel portion to an opening in the lower surface of the sole portion, a tubular club shaft having a lower end and an inner annular surface extending downwardly into said bore, a bottom plug having a lower and fitted in said opening in said sole portion and extending upwardly into said bore, said bottom plug comprising a smaller-diameter upper portion having an outer diameter substantially equal to the diameter of the inner annular surface of the club shaft, said upper portion being inserted into the lower end of and being bonded to said inner surface of said tubular club shaft, and a larger-diameter lower portion having an outer diameter substantially equal to the diameter of said inner annular surface of said shaft receiving bore and being fitted in and bonded to said inner surface of said bore, said lower portion extending between said upper portion and the lower end of the plug, the lower end of said plug being flush with and exposed on the lower surface of the sole portion, wherein said upper portion of said bottom plug comprises a rod and said lower portion of said bottom plug comprises a separate tubular member, said rod extending through said tubular member to said lower end of said plug and being integrally combined with said tubular member to form said bottom plug and wherein said tubular member is of a fiber reinforced plastic material.

5,205,554

INTERSECTING RACE TRACK WITH OBSTRUCTING MEANS TO PROMOTE COLLISIONS

Alexander G. Copson, 3419 Dent Pl., NW., Washington, D.C. 20007

Filed Jun. 21, 1990, Ser. No. 541,319
Int. Cl.[5] A63F *9/14*
U.S. Cl. 273—86 R **6 Claims**

1. A toy car racing game wherein electrically driven cars are moved along tracks, the game including a game board having at least two independent and distinct tracks intersecting each

other at at least one intersection, and means along the tracks and spaced from said intersection for obstructing portions of

the number of playing mediums to be paid in response to the operation result.

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space formed between said upper housing and said lower housing; wherein said puzzle is provided with a maze plate disposed between said upper housing and said lower housing

shell and medially intersected by the axis at the South pole,

and

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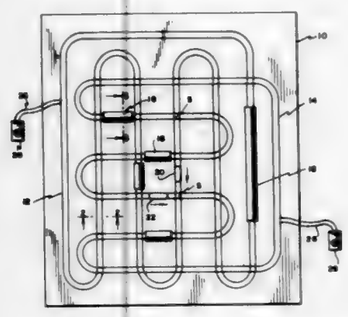
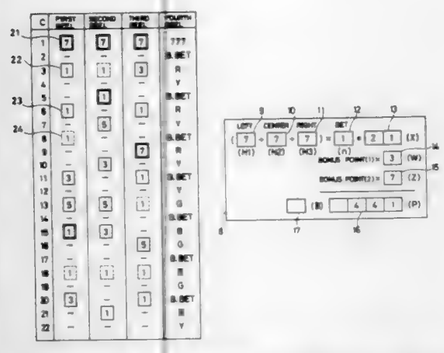
other at least at one intersection, and means along the tracks and spaced from said intersection for obstructing portions of



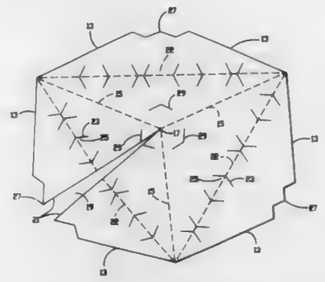
the tracks from view and for maintaining toy cars on the tracks except at said intersection.

5,205,555
ELECTRONIC GAMING MACHINE
Masahiro Hamano, Osaka, Japan, assignor to Takasago Electric Industry Co., Ltd., Osaka, Japan
Filed Apr. 27, 1992, Ser. No. 874,494
Claims priority, application Japan, May 23, 1991, 3-149572; Jul. 11, 1991, 3-198778
Int. Cl.[5] G07F *17/34*
U.S. Cl. 273—143 R **8 Claims**



1. An electronic gaming machine, in which after a game has been executed by betting playing mediums, the number of playing mediums to be paid is determined in response to a result of the game, said electronic gaming machine comprising:
a plurality of movable bodies containing numerical symbols and non-numerical symbols together thereon;
drive means for separately driving and stopping the movable bodies such that one of the symbols on each movable body stops at a predetermined stop position;
symbol detecting means for detecting the types of symbols on the movable bodies stopped at the stop position and the numerical value of any numerical symbols of the movable bodies stopped at the stop position; and
operation means for substituting the detected numerical values into a predetermined operational equation and for performing an operation in response thereto to produce an operation result, when the symbols of the movable bodies detected by the symbol detecting means are all numerical symbols having numerical values, to thereby determine the number of playing mediums to be paid in response to the operation result.

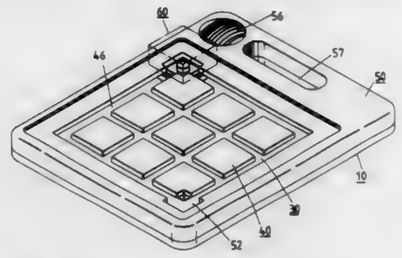
5,205,556
GEODESIC GLOBE PUZZLE
William T. Stallman, Alameda, Calif., assignor to Volunteers of America Bay Area, Inc., Oakland, Calif.
Filed May 19, 1992, Ser. No. 886,667
Int. Cl.[5] A63F *9/12*; E04B *7/10*; A63H *33/08*
U.S. Cl. 273—157 R **4 Claims**



1. A geodesic dome comprised of identical overlapping and interlocking segments, each of said segments being made of a semi-rigid material which can be bent along predetermined lines and defined by a specific geometric configuration, said geometric configuration being comprised of several geometric subconfigurations and planes of juncture including
one narrow equilateral diamond and two wider equilateral diamonds joined along their edges to form a generally six-sided segment, said diamonds having equal length sides and being joined along two sides of each diamond to one side of each adjacent diamond with an apex of each diamond disposed proximate the center of said segment forming a common triple apex,
each of said geometric subconfiguration diamonds including radiating cross-axes which radiate from the common apex and longitudinal spanning axes which span the length of each subconfiguration diamond and generally form a triangle,
the radiating cross-axis of one of the wider diamonds being split and forming a V-shaped slot in said segment,
said segments being formed to bend along each of the common or joined edge lines of said diamonds and along said spanning axes to angulate the adjacent surface planes of the diamonds with respect to each other and to cause each diamond to form two surfaces which are angulated with respect to each other on opposite sides of said spanning axes,
each of said diamonds including pairs of slots formed in said material and extending therethrough and forming tabs which interlock with similar slots and tabs formed in adjacent segments of said dome,
said segments being interlocked together to form said dome by bending said segments along said diamond joined edge lines and said spanning axes and cupping said segment by bringing the edges of said V-slot into close proximity and overlapping said segments in interlocking relation by means of said slots to form a dome structure.

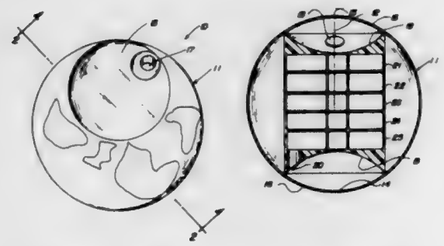
5,205,557
MAZY PUZZLE
Jewry Kuo, No. 339, Taya Rd., Taichung, Taiwan
Filed Apr. 23, 1992, Ser. No. 872,381
Int. Cl.[5] A63F *9/08*
U.S. Cl. 273—153 S **4 Claims**

1. A mazy puzzle comprising an upper housing, a lower housing, and an opening in communication with a receiving space formed between said upper housing and said lower housing; wherein said puzzle is provided with a maze plate disposed between said upper housing and said lower housing, said maze plate having thereon a plurality of maze blocks of polygonal construction to form therebetween surface pathways having equal width and communicating with one another, each of said maze blocks further comprising a face plate, which forms an obstacle pathway wider than said surface pathway in spaced relation with said maze plate, at least one said face plate of said maze blocks having an obstacle extending downwardly into said obstacle pathway; wherein said puzzle is provided with at least one movable piece having a lower portion serving as a sliding block capable of sliding in



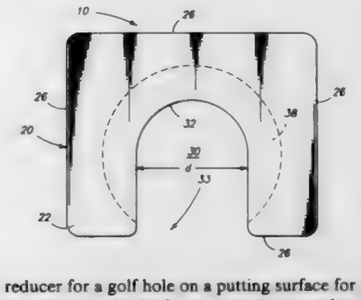
said obstacle pathway and having at least one recess cut permitting said movable piece to pass through said obstacle pathway, said movable piece further comprising an upper portion of any shape serving as a movable piece body, said lower portion being integral to said upper portion; and wherein said puzzle is provided with at least an inlet located between said maze blocks and said lower housing such that said inlet is in communication with said surface pathway so that said inlet permits said sliding block of said movable piece to be placed thereinto, wherein said maze plate is a flat plate having around its edges a side frame having equal height throughout and having a plurality of hook holes engageable with retaining hooks of said upper housing.

5,205,558
SPHERICAL PUZZLE
Henry G. Wilson, 340 E. 92nd St., Brooklyn, N.Y. 11212
Filed May 4, 1992, Ser. No. 877,998
Int. Cl.[5] A63F *9/08, 7/04*
U.S. Cl. 273—153 R **3 Claims**



1. A spherical puzzle, wherein the puzzle comprises,
a rigid spherical shell having a spherical cavity therewithin defined along an axis, the axis having opposed ends which intersect the shell at a North pole and a South pole,
and
a transparent North window medially intersected by the axis at the North pole,
and
a Southern semi-spherical window directed through the shell and medially intersected by the axis at the South pole,
and
a North window entrance directed through the North window, with a North cap concave support trough positioned below the North window, with the North concave support trough having a North support trough exit opening directed therethrough,
and
a plurality of maze sections coaxially aligned along the axis, with each maze section having a maze floor orthogonally oriented relative to the axis, and each maze floor having a respective exit opening, wherein a lowermost maze section below the North concave support trough includes a South cap exit opening in communication with a South cap support trough.

5,205,559
PUTTING PRACTICE TARGET
Raymond P. Plopper, N. 6607 Ash, Suite 1000, Spokane, Wash. 99208
Filed Mar. 9, 1992, Ser. No. 848,112
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—177 R **24 Claims**



1. A reducer for a golf hole on a putting surface for practicing putting with a golf ball of a selected diameter, the golf hole having a circular shape and a size defined by a selected diameter, the putting surface forming a circular peripheral lip around the golf hole, the reducer comprising:
a cover for positioning over the golf hole, the cover having a U-shaped cutout for exposing a front segment of the golf hole peripheral lip, the U-shaped cutout having opposing sides forming an open cross dimension which is smaller than the golf hole diameter and larger than the golf ball diameter, the cover being sized and shaped to extend radially beyond the circular peripheral lip of the golf hole to effectively mask the size and shape of the golf hole and to extend to the front segment of the peripheral lip of the golf hole; and
means for retaining the cover in position over the golf hole and restraining lateral movement thereof while the opposing sides of said U-shaped cutout are positioned inwardly of the peripheral lip of the golf hole so that a practice hole is defined by the U-shaped cutout and by the exposed front segment of the golf hole peripheral lip, the U-shaped cutout being positioned to allow a golf ball to roll over the front segment of the golf hole peripheral lip between said opposing sides into the practice hole.

5,205,560
GOLF CLUB HEAD

a flat shoulder (**54**) spaced to the other side of said hinge pin; and,

material and rendering the first layer stiff and hard but flexible and energy absorbing upon being impacted by a golf club

walls which are connected by a top wall, said sidewalls having lower edges adapted to be located directly adja-

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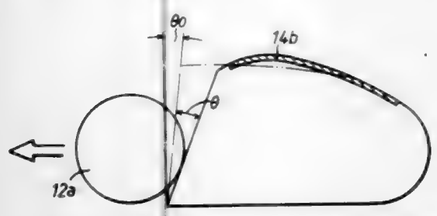
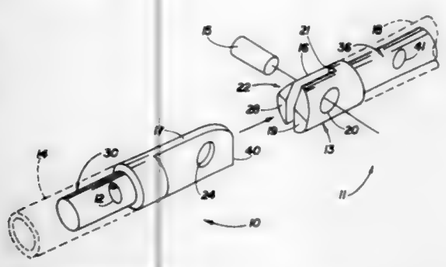
5,205,560
GOLF CLUB HEAD
Toshiharu Hoshi; Takashi Iijima, and Atsushi Tsuchida, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Sep. 26, 1991, Ser. No. 766,825
Claims priority, application Japan, Sep. 27, 1990, 2-258234
Int. Cl.[5] A63B 53/08
U.S. Cl. 273—167 H 5 Claims



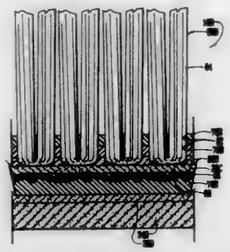
1. A hollow metallic wood club head formed of a superplastic metallic material, the club head having a crown portion, a hitting face portion having a loft angle and a sole portion, said crown portion extending rearwardly of said face portion and disposed generally opposite said sole portion, said crown portion having a rigidity that is lower than the rigidity of said sole portion, wherein the metallic average grain size of the material forming the crown portion enables the crown portion to flex relative to sole portion to increase the loft angle of said face portion within an angle range of 0.5 to 2.5 degrees at the moment of impact against a golf ball.

5,205,561
GOLF CLUB
Michael S. Lux, P.O. Box 508, Twin Lakes, Wis. 53181
Filed Nov. 25, 1991, Ser. No. 796,862
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—186.2 4 Claims



1. A golf club including
(a) a head at the lower end thereof provided with a face on its forward side;
(b) a grip at the upper end thereof;
(c) a shaft having a longitudinal axis and interconnecting said head and said grip; and
(d) a hinge interposed in said shaft and dividing said shaft into two portions and including
(i) first and second hinge members, said first hinge member being fixed to one of said shaft portions, said second hinge member being fixed to the other of said shaft portions, and
(ii) a hinge pin (15) pivotally connecting said hinge members;
said first hinge member including
an outer end spaced to one side of said hinge pin;
a flat shoulder (54) spaced to the other side of said hinge pin; and,
a flat surface (40) on said outer end;
said second hinge member including
an outer end spaced to the other side of said hinge pin;
a flat shoulder (21) spaced to said one side of said hinge pin (15) to contact said flat surface (40) of said first hinge member, said surface (40) and shoulder 21 being generally normal to the longitudinal axis of said shaft when contacting one another; and,
a flat surface (19) on said outer end of said second hinge member, to contact said shoulder (54) of said first hinge member, said surface 19 and shoulder 54 being generally normal to the longitudinal axis of said shaft when contacting one another,
said first and second hinge members being movable between two operative positions,
a first operative position with said
flat surfaces (19) (40) simultaneously bearing against and contacting said shoulders (54) (21) to prevent movement of said head about said hinge pin (15) in a first direction of travel and to permit movement of said head about said hinge pin in a second direction of travel, and,
said shaft portions in alignment; and,
a second operative position with said
hinge members pivoted about said hinge pin (15),
said shaft portions moved out of alignment, and
said flat surfaces (19) (40) spaced apart from said shoulders (54) (21).

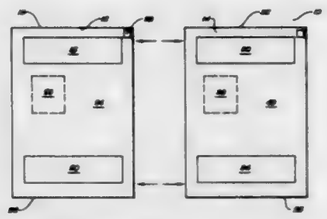
5,205,562
GOLF BALL DRIVING RANGE MAT
Mark A. Hammon, Woodward, Iowa, assignor to AGR Inc., Perry, Iowa
Continuation of Ser. No. 557,592, Jul. 25, 1990, Pat. No. 5,026,580, which is a continuation-in-part of Ser. No. 328,232, Mar. 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 202,398, Jun. 6, 1988, Pat. No. 4,844,470. This application Jun. 24, 1991, Ser. No. 719,489
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—195 A 17 Claims



1. A laminated golf mat from which golf balls are driven at a driving range comprising,
a first layer having top and bottom sides,
fabric-like material in said first layer and being partially exposed on the top side of said first layer,
a second layer of turf having top and bottom sides on the top side of said first layer and said turf having filaments of yarn exposed on the bottom side adjacent the fabric-like material in the top side of said first layer, and
said first and second layers including adhesive having points of intimate contact which are continuous and of sufficient quantity to penetrate said second layer around said filaments and said fabric-like material for forming chemical and mechanical bonds between said filaments and fabric

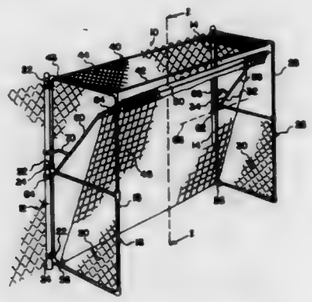
material and rendering the first layer stiff and hard but flexible and energy absorbing upon being impacted by a golf club.

5,205,563
CARD GAME
Albia P. Dearing, 2027 Bolsover St., Houston, Tex. 77005
Filed May 20, 1991, Ser. No. 703,182
Int. Cl.[5] A63F 1/02
U.S. Cl. 273—296 18 Claims



1. A card game comprising:
a plurality of cards, each of said cards having a front side and a back side, said front side having a first identification information section printed thereon, said front side having a first name information section printed thereon, said first identification information section and said first name information section positioned in different locations on said front side, said first name information section having information corresponding in subject matter to a first identification information section on another of said plurality of cards, said back side having a second name information section, said second name information section having information corresponding in subject matter to said first identification information section of said front side of same card, said back side having a leader information section printed thereon at a different location than said second name information section, said leader information section having information corresponding in subject matter to a second name information section on another of said plurality of cards.

5,205,564
BALL CATCHING NET APPARATUS
Catherine B. Lamberti, 1435 State St., #526, Santa Barbara, Calif. 93101; Nancy L. Honea, 2285 Whitney Ave., Summerland, Calif. 93067, and Rodney D. Every, 171 Nectarine Ave. #1, Goleta, Calif. 93117
Filed Apr. 27, 1992, Ser. No. 873,725
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—400 9 Claims



1. A ball catching net apparatus comprising:
an outer net arrangement having parallel spaced-apart sidewalls which are connected by a top wall, said sidewalls having lower edges adapted to be located directly adjacent the supporting surface upon which said ball catching net apparatus is located, said outer net arrangement enclosing a ball confining area, said ball confining area having an open front and a closed back, said closed back having a back net, through said open front, there is to be conducted a ball at a trajectory that is to be contained by said ball catching net apparatus; and
an internal net assembly mounted within said ball confining area, said internal net assembly comprising a first net and a second net located in juxtaposition, both said first net and said second net extending substantially the entire width and height of said ball confining area, both said first net and said second net being mounted on a mounting frame, said mounting frame being moveable within said ball confining area between a retracted position and an extended position, with said mounting frame in said retracted position, both said first net and said second net being located substantially against said back net, with said mounting frame in said extended position, both said first net and said second net being located spaced from said back net.

5,205,565
SEALING ASSEMBLY TO BE INTERPOSED BETWEEN TWO MEMBERS IN RELATIVE MOTION
Giovanni Gironella, Marina Di Carrara, Italy, assignor to SKF Industrie S.p.A., Turin, Italy
Filed Aug. 8, 1991, Ser. No. 750,035
Claims priority, application Italy, Aug. 28, 1990, 53212/90[U]
Int. Cl.[5] F16J 15/32
U.S. Cl. 277—11 3 Claims

1. A sealing assembly to be interposed between a first and a second member, which are movable relatively to each other, so as to form a fluid tight seal for a cavity delimited between said members, the sealing assembly comprising:
a substantially rigid annular screen at least partially made of a plastically deformable material, said screen having an shoulder portion to cooperate in a fluid tight manner with said second member and said screen having a peripheral portion designed to be coupled with a housing seat formed on said first member, said screen further including a plastic hinge for said peripheral portion of the screen, said plastic hinge being defined by a stamped embossment provided on said screen and said embossment having a convexity facing, when in use, towards a side of the cavity into which said sealing assembly is to be introduced into said cavity so that said plastic hinge allows said peripheral portion of the screen to selectively assume a first undeformed position in which the peripheral portion is inclined forwardly towards said side and forms, with an axis of symmetry of said sealing assembly, a first angle, and when the sealing assembly is mounted between said members,

said peripheral portion is moved to a second deformed position in which the peripheral portion is inclined back-

layers being an effective amount that upon inflation of said packer, the same hand members of all said layers achieve

wherein a circumferentially extending inner underpressure sealing portion is provided on an inner surface of the thrust

5,205,570
DOG SLED CONSTRUCTION

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said peripheral portion is moved to a second deformed position in which the peripheral portion is inclined backwardly away from said side and forms, with said axis of symmetry of the sealing assembly, a second angle that greater than and opposite to said first angle; and

a sealing element made of elastomeric material and carried fixedly by said screen.

5,205,566

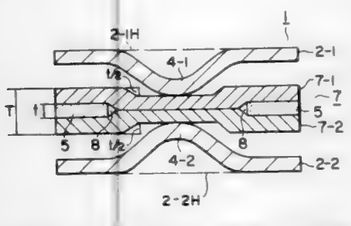
METALLIC GASKET

Kosaku Ueta, Kumagaya; Masahiko Nakada, Toyota; Yukio Kawai, Toyota; Takeshi Kitamura, Toyota, and Kazuya Yoshijima, Toyota, all of Japan, assignors to Nihon Metal Gasket Kabushiki Kaisha, Saitama, Japan

Continuation-in-part of Ser. No. 594,571, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 337,974, Apr. 14, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 790,891

Int. Cl.[5] F16J *15/06*

U.S. Cl. 277—180 **5 Claims**



1. A metallic gasket having bores therein corresponding to combustion chambers and comprising a pair of spaced elastic metallic base plates, said base plates having inwardly extending projections defining beads around said bores, an intermediate plate disposed between said base plates and including two pieces laminated together at said beads, said pieces having edge surfaces disposed adjacent said bores and including outwardly extending steps between said beads and said edge surfaces to define spaces formed between said pieces and opening at said edge surfaces, and a thermal spray stopper disposed within each of said spaces.

5,205,567

REINFORCED INFLATABLE PACKER

Roy G. Quinlan, Littleton, and James C. Vance, Sr., Sedalia, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Oct. 30, 1991, Ser. No. 784,835

Int. Cl.[5] F16J *15/32*

U.S. Cl. 277—34 **15 Claims**

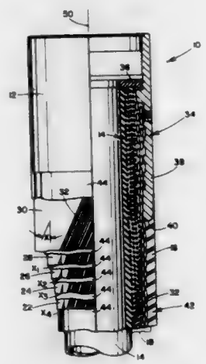
1. An inflatable packer comprising:

an elastomeric tubular body adapted for radial expansion and having a longitudinal axis;

an elastic outer cover surrounding said tubular body;

coupling members disposed on each end of said tubular body; and

a plurality of substantially concentric reinforcing layers stacked atop each other and sandwiched between said body and said cover, each said layer including spirally wound reinforcing members extending the length of said body between said coupling members, with alternating layers having alternating right and left hand wound members, respectively, the reinforcing members in each said layer having a uniform lay angle at any cross-sectional circumferential position along the length of said body, with the lay angle of the members in one said layer differing from the lay angle of the same hand members of the remaining layers at the same cross-sectional circumferential position along the length of said body, the difference between the lay angles of the same hand members of said layers being an effective amount that upon inflation of said packer, the same hand members of all said layers achieve



a substantially common equilibrium angle at the same cross-sectional circumferential position along the length of said body.

5,205,568

SEALING RING

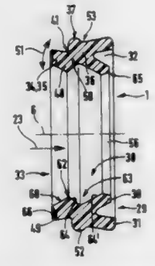
Kurt Stoll, Esslingen, and Herbert Koengeter, Reichenbach, both of Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany

Filed Mar. 12, 1992, Ser. No. 849,766

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1991, 4108221

Int. Cl.[5] F16J *15/32;* **F16L** *37/00*

U.S. Cl. 277—205 **15 Claims**



1. A sealing ring for providing a sealing connection between a fluid power line and a fluid power joint element, the sealing ring being arranged between a cylindrical sealing surface of a female socket part in the joint element and an outer surface of the fluid power line introduced into the female socket part from an insertion end thereof, comprising first and second integral overpressure sealing lips which have a V-like configuration on a first axially facing side thereof which is remote from the insertion end, the first overpressure sealing lip being radially outwardly of the second overpressure sealing lip and sealingly engaging with the sealing surface and the second radially inner overpressure sealing lip operatively sealingly engaging the outer surface of the fluid power line, a thrust portion provided on a second axially facing side opposite the first side, wherein the thrust portion is defined by an annular, axially extending projection which is of a reduced radially outermost dimension in relation to an axially adjoining section of the sealing ring so that in an operational position between the thrust portion and a radially inwardly facing and opposing sealing surface of the female socket there is an annular gap, and

wherein a circumferentially extending inner underpressure sealing portion is provided on an inner surface of the thrust portion, and wherein the underpressure sealing portion together with the thrust portion define an integral pivot ring connected with the axially adjoining section of the sealing ring by means of a circumferentially extending flexible zone so that the inner underpressure sealing portion of the sealing ring in an operative position thereof is able to be pressed automatically radially inwardly against the outer surface of the fluid power line when the fluid power line is at a lower pressure than the surroundings.

5,205,569

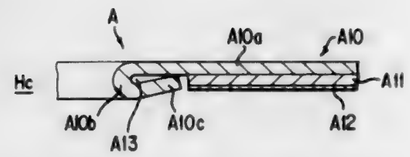
METAL LAMINATE GASKET WITH GRAPHITE SHEET

Tsunekazu Udagawa, Ichikawa, and Susumu Inamura, Tokyo, both of Japan, assignors to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 673,892, Mar. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 193,215, May 11, 1988, Pat. No. 5,054,795, which is a continuation of Ser. No. 928,937, Nov. 10, 1986, abandoned. This application Jun. 22, 1992, Ser. No. 900,789

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—235 B **6 Claims**



1. A metal laminate gasket for an internal combustion engine having at least one hole therein comprising:

a first metal plate including a base section having at least one first hole corresponding to the hole of the engine, a flange situated under the base section around the first hole, and a curved portion situated between the flange and the base section to define the first hole, said base section and flange sealing around the first hole when the gasket is tightened,

a second metal plate placed under the base section of the first plate, said second plate forming an outer plate of the gasket and having at least one second opening, the diameter of the second opening being larger than the diameter of the flange to permit the second plate to be placed over the base section without laying over the flange, the thickness of the second plate being less than that of the first plate, and

a thin graphite layer attached to the second plate at an opposite side relative to the first plate, the thickness of the second plate with the graphite layer being greater than the thickness of the first plate so that when the gasket is tightened, the flange and the base section are compressed and deformed without providing substantial compressibility thereat to securely seal around the hole of the engine and the graphite layer is compressed on the second plate while providing surface pressure thereat and filling dents on an engine part to which the graphite layer abuts to thereby allow the gasket to closely fit to the engine part without using a bead and to improve sealing ability between the gasket and the engine part.

5,205,570

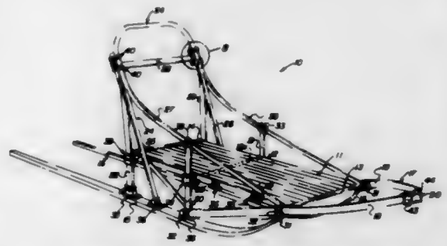
DOG SLED CONSTRUCTION

Carl W. Brown, P.O. Box 370, Intervale, N.H. 03845

Filed Nov. 12, 1991, Ser. No. 790,823

Int. Cl.[5] B62C *1/04*

U.S. Cl. 280—24 **5 Claims**



1. A dog sled construction, comprising in combination,

a platform member, the platform member including a forward support bar fixedly mounted to a forward distal end of the platform member orthogonally oriented relative to the platform member, a medical support bar orthogonally and integrally mounted medially of the platform member, and a rear support bar mounted to a rear distal end of the platform member, wherein the rear support bar, the forward support bar, and the medial support bar are arranged in a parallel relationship, and

a right "J" shaped skid positioned below the platform member and extending forwardly of the platform member secured to a right distal end of the forward support bar, and a left "J" shaped skid oriented parallel to the right "J" shaped skid positioned below the platform member and extending forwardly to the forward support bar fixedly mounted to a left distal end of the forward support bar, and

a forward right support leg fixedly mounted to a right distal end of the medial support bar and extending below the medial support bar fixedly mounted to the right skid, and

a forward left support leg oriented parallel to the forward right leg fixedly and orthogonally mounted to the medial support bar extending below the medial support bar and fixedly secured to the left "J" shaped skid, and

a rear right support leg mounted to a right distal end of the rear support bar extending below the rear support bar fixedly mounted to the right skid, and

a rear left support leg fixedly mounted to a left distal end of the rear support bar extending below the rear support bar and orthogonally oriented thereto, wherein a lower distal end of the rear left support leg is fixedly mounted to the left skid, wherein the rear right support leg is positioned rearwardly of the forward right support leg and the rear left support leg is positioned rearwardly of the forward left support leg, and

a "U" shaped handle including a right handle leg and a left handle leg arranged parallel relative to one other, wherein the right handle leg is secured to an upper distal end of the rear right support leg extending downwardly below the support position and fixedly secured to the right skid between the rear right support leg and the forward right support leg, and

the left handle leg mounted to an upper distal end of the rear left support leg extending downward below the support platform and fixedly secured to the left skid between the rear left support leg and the forward left support leg, and

a right side bar mounted adjacent the upper terminal end of the rear right support leg extending forwardly of the rear right support leg fixedly secured to an upper terminal end of the forward right support leg secured to the platform member, and

a left side bar secured adjacent the rear left support leg extending forwardly thereof and mounted fixedly to an

with a seat supporting member located forwardly of a rear wheel, said suspension system comprising:

(a) a front subassembly including a head tube, a front wheel fork pivotally connected to a lower end of said head tube and downwardly extending therefrom, and a down tube

a support post between the first plate, second plate, top plate, and lock bolt, and

the top plate includes a fluid reservoir, the fluid reservoir

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a left side bar secured adjacent the rear left support leg extending forwardly thereof and mounted fixedly to an upper terminal end of the forward left support extending forwardly thereof secured to the support member, and

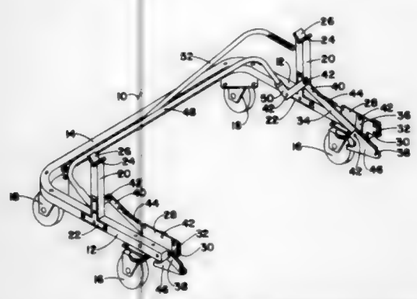
a brush bow having a right bow leg and as left bow leg, the right bow leg fixedly secured to the lower terminal end of the forward right support leg an the forward terminal end of the right skid and fixedly secured to a forward terminal end of the left bow leg, wherein the left bow leg is mounted adjacent the lower terminal end of the forward left support leg and the left distal end of the forward support bar.

5,205,571

EASY LIFT AIRCRAFT CHAIR CART

Allen J. Geier, 917 27th Ave. S., Wausau, Wis. 54401, and George F. Engebrecht, 8435 14th Ave. S., Bloomington, Minn. 55425

Filed May 26, 1992, Ser. No. 888,525
Int. Cl.[5] B62B *3/02, 3/04, 3/10*
U.S. Cl. 280—47.35 **16 Claims**



1. An easy lift aircraft chair unit cart apparatus comprising;

a planar U-shaped main frame element with generally parallel leg portions and perpendicular transverse portion;

wheel means attached to an undersurface of said planar main frame element;

a pair of upright support tube members each attached at one end to a frame leg portion at a point about equidistant between each frame leg portion end and said transverse frame portion, said upright support tube members oriented perpendicular to and above said planar main frame element and in opposite orientation to said wheel means;

a support member attached to each upright support tube member at an end opposite the upright support tube end attached to the frame leg portion for supporting a chair unit;

a stop means attached to and extending beyond each of said frame leg portion ends, opposite said transverse frame portion;

a movable retaining means movably mounted to and extending beyond each of said frame leg portion ends, opposite said transverse frame portion, said retaining means oriented in opposition to said stop means for retaining a chair unit baggage bar against said stop means; and

a release means for moving said retaining means out of opposition with said stop means to release said baggage bar therefrom.

5,205,572

CYCLE REAR SUSPENSION SYSTEM

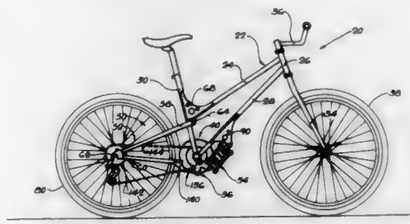
Erik F. Buell, Mukwonago, and Marc Muller, Waterford, both of Wis., assignors to Schwinn Bicycle Company, Chicago, Ill.

Filed Aug. 27, 1991, Ser. No. 750,648
Int. Cl.[5] B60G *15/00;* **B62K** *25/04*
U.S. Cl. 280—284 **33 Claims**

1. A rear suspension system for a cycle having a main frame with a seat supporting member located forwardly of a rear wheel, said suspension system comprising:

a pivotable rear frame assembly including elongated swing arm means for supporting a rear wheel for up and down movement relative to the main frame and being pivotally connected at its front end portion to the main frame and having means at its rear end portion for supporting a rear wheel for up and down movement relative to the main frame, said rear frame assembly also including elongated, forwardly extending chain stay means for controlling movement of the swing arm means and having a rear end portion thereof connected to the rear end portion of the swing arm means and movable therewith and having a forward end portion extending forwardly toward the main frame;

a shock absorber assembly comprising elongated fluid-



damped piston and cylinder means located forwardly of the seat supporting member and supported at one end by the main frame and having coupling means at the other end movable in opposite directions for receiving and dampening impact forces generated by movements of the rear frame assembly;

spring means urging said coupling means in one direction; and

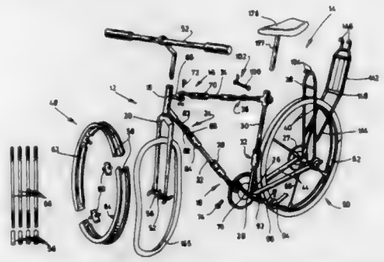
connecting and guiding means supported by the main frame connecting the forward end portion of the chain stay means with the coupling means to move the coupling means in a direction opposite said one direction against the urgence of the spring means in response to upward pivotal movement of the rear frame assembly, said connecting and guiding means enabling the spring means to move the coupling means in said one direction in response to downward pivotal movement of the rear frame assembly.

5,205,573

BICYCLE THAT CAN BE DISASSEMBLED IN A VERY COMPACT ARRANGEMENT

Sghaier Mhedhbi, 5540, 5th Avenue, Montréal, Québec, Canada H1Y 2S7

Filed Apr. 17, 1992, Ser. No. 870,090
Int. Cl.[5] B62K *15/00;* **B65D** *85/68*
U.S. Cl. 280—287 **16 Claims**



1. A bicycle that can be disassembled in a compact arrangement, comprising:

(a) a front subassembly including a head tube, a front wheel fork pivotally connected to a lower end of said head tube and downwardly extending therefrom, and a down tube having an upper end pivotally connected to said head tube via first articulation means for folding said down tube over said front wheel fork in said compact arrangement;

(b) a rear subassembly including a chain stay provided with a pedal crank axle housing at its front end, a seat tube having a lower end pivotally connected to said pedal crank axle housing via second articulation means for folding said seat tube over said chain stay in said compact arrangement, a crossbar having a rear end connected to an upper end of said seat tube via third articulation means for folding said crossbar over said seat tube in said compact arrangement, and a seat stay having an upper end detachably connected to said upper end of the seat tube and a pair of legs whose ends are pivotally connected respectively to corresponding ends of a pair of legs of said chain stay such that said seat stay can be folded over said chain stay in said compact arrangement;

(c) first coupling means for detachably connecting a front end of said crossbar to said head tube; and

(d) second coupling means for detachably connecting a lower end of said down tube to said pedal crank axle housing;

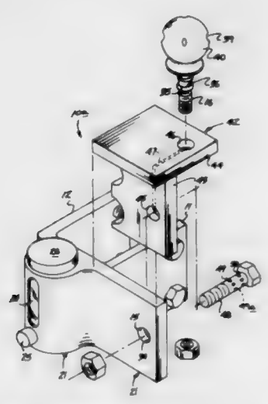
whereby said bicycle can be disassembled in said compact arrangement by uncoupling said first and second coupling means, by folding said down tube over said front wheel fork, by disconnecting said upper end of the seat stay from said seat tube, by folding said crossbar over said seat tube, and by folding said seat tube and said seat stay over said chain stay.

5,205,574

TOW HITCH APPARATUS

John A. Heath, State Rd., Phillipston, Mass. 01331

Filed Aug. 5, 1991, Ser. No. 740,129
Int. Cl.[5] B60D *1/06*
U.S. Cl. 280—495 **4 Claims**



1. A tow hitch apparatus, comprising,

a first plate spaced from and parallel to a second plate, and

a top plate fixedly and orthogonally mounted to the first plate and the second plate, with the top plate including a projecting flange extending orthogonally beyond the first plate, and

the top plate including a flange opening, the flange opening including a mounting sphere means mounted thereon for receiving a trailer tongue thereon, and

at least one lock bolt orthogonally directed through the first plate, and

the second plate including an internally threaded bore threadedly receiving the lock bolt to permit securement of a support post between the first plate, second plate, top plate, and lock bolt, and

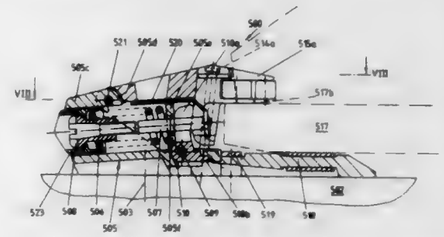
the top plate includes a fluid reservoir, the fluid reservoir including a transparent sight glass to permit visual observation of fluid contained within the reservoir, and a fill plug directed through the top plate into the fluid reservoir received within a fill bore permitting selective filling of the reservoir, and a threaded rod threadedly directed coaxially of the reservoir, with the threaded rod including a first end rotatably mounted within the top plate and a second end extending exteriorly of the top plate, including a handle mounted fixedly thereto, and a piston including an internally threaded coaxial bore threadedly mounted to the threaded rod, and a seal ring circumferentially mounted to the piston, and a guide rod directed through the piston and positioned fixedly within the reservoir to align the piston within the reservoir, whereupon rotation of the handle effects compression of fluid contained within the reservoir, and a first feed conduit in fluid communication with the reservoir, and a second feed conduit in fluid communication with the first feed conduit, with the second feed conduit including a second feed conduit outlet opening in communication with the flange opening to provide directing of lubricant into the flange opening.

5,205,575

FRONT JAW

Helmut Wladar, Vienna, Austria, assignor to HTM Sport- und Freizeitgeraete Gesellschaft m.b.H., Schwechat, Austria

PCT No. PCT/EP89/01131, § 371 Date Jun. 6, 1990, § 102(e) Date Jun. 6, 1990, PCT Pub. No. WO90/03830, PCT Pub. Date Apr. 19, 1990
PCT Filed Sep. 27, 1989, Ser. No. 499,387
Claims priority, application Austria, Oct. 7, 1988, A2480/88
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—625 **5 Claims**



1. In a front jaw having two pivotally supported, laterally spaced, two arm toggle levers, each having a long lever arm and a short lever arm, said toggle levers each being adapted to be swung laterally outwardly against a force of a release spring housed in a housing fastened to a base plate, and a pull rod extending through the housing, the improvement wherein said two short lever arms of said toggle levers are each loaded by said release spring in said housing acting through said pull rod on an angular intermediate lever pivotally supported in a lower area of said housing on a first pivot axle, said intermediate lever being operable by a pedal arranged on the ski, and wherein said housing consists of first and second parts, of which said first part is fastened to an upper side of the ski, wherein said second part supports said first pivot axle for said intermediate lever, and wherein said two toggle levers are pivotally supported each on a second pivot axle inclined with respect to the upper side of the ski, said second part being pivotal about a third pivot axle extending spaced from the upper side of the ski.

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SIDEWAYS RELEASABLE TOE JAW OF A SKI BINDING

position positioning slot below said groove; said pull rods have each a first internally threaded stub tube on the middle on one side inserted through the sliding slot on the respective upper

side rods by a pair of holes, a first upper pair of cushions pivotally connected to first respective ends of said side

5,205,579

HANDLE BAR FOR BABY CARRIAGE

Hitoshi Kato, and Yuichi Arai, both of Tokyo, Japan, assignors

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5,205,576

SIDEWAYS RELEASABLE TOE JAW OF A SKI BINDING

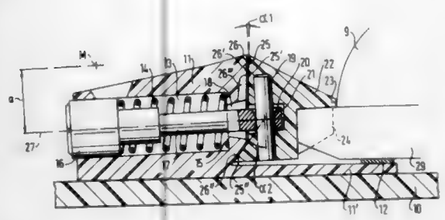
Martin Bogner, Ostfildern, and Otto Harsányi, Leonberg, both of Fed. Rep. of Germany, assignors to GEZE Sport International GmbH, Leonberg, Fed. Rep. of Germany

Filed Sep. 3, 1991, Ser. No. 753,296

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027995

Int. Cl.[5] A63C 9/085

U.S. Cl. 280—629 5 Claims



1. A sideways releasable ski binding for holding a front end of a ski boot (9) on a ski, the boot having a sole with an upper side, the binding comprising a binding house (11), a release spring arranged in the housing which extends substantially in a longitudinal direction of the ski along a line of action and which is supported at one end of the binding housing (11) and with another end exerts a release force having a substantial component in the longitudinal direction of the ski in a direction away from the ski boot, a sole clamp (22) for engaging the ski boot front end, the side limbs (24) being mounted to pivot sideways about at least one essentially upright tilt axis and release the ski boot (9) when the boot exerts a predetermine sideways force, the sole clamp (22) being vertically displaceably arranged on the binding housing (11) along at least one essentially upright sliding guide (25, 26, 35, 36) which is inclined relative to the lien of action (27) of the release spring force to cause the generation of a downwardly directed force component urging the hold-down member (23) against the upper side of the sole, the sliding guide (25, 26) including at least an upper section and a lower section (25', 26', 25'', 26'') which are so differentially inclined relative to the lien of action (27) of the release spring force that an instantaneous turning center (M) is formed which is arranged at a distance (a) above the line of action (27) of the release spring force, the upper section of the sliding strip (25) having a lesser inclination relative to the line of action (27) of the release spring than the lower section.

5,205,577

COLLAPSIBLE FOLDING BABY CART COLLAPSE CONTROL MECHANISM

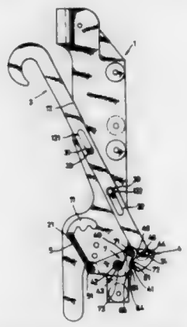
Kun-Hei Liu, 2F., No. 32, Lane 200, Tung Hwa Street, Taipei, Taiwan

Filed Jul. 21, 1992, Ser. No. 915,634

Int. Cl.[5] B62B 7/08

U.S. Cl. 280—642 1 Claim

1. A collapsible folding baby cart collapse control mechanism comprised of two symmetrical upper frames having each an upper end connected to a baby cart's hand rail, a lower end connected to the baby cart's handle, and a multiple-position positioning slot to hold a cross bar of the baby cart's back rest; two symmetrical pull rods respectively connected to said upper frames for collapse control; two positioning plates respectively connected between said pull rods and the cross bar of the baby cart's back rest; two stop plates respectively connected to said positioning plates; and two torsional springs respectively connected between said positioning plates and said stop plates; wherein said upper frames have each a sliding slot and an internally threaded stub tube spaced on a groove on an inner side, and a through hole spaced from said multiple-position positioning slot below said groove; said pull rods have each a first internally threaded stub tube on the middle on one side inserted through the sliding slot on the respective upper frame and secured in place by a screw, a sliding slot spaced from the first internally threaded stub tube into which the internally threaded stub tube of the respective pull rod is inserted and secured in place by a screw, and a second internally threaded stub tube on an opposite side adjacent to a bottom end thereof inserted through an elongated hole on the respective positioning plate and secured in place by a screw; said positioning plates have each an elongated slot hung on the second internally threaded stub tube on the respective pull rod, a bottom notch hung on a locating rod on a sub-frame of the baby cart's rear wheel frame, a stub rod inserted into a hole on the respective stop plate, a stop rod spaced from the stub rod to limit movement of the respective stop plate within a fixed range, an axle holder, an axle inserted through a hole on the axle holder into the through hole on the respective upper



frame permitting the respective positioning plate to be rotated on the respective upper frame upon folding of the baby cart, and a connecting rod on an opposite end connected to the cross bar of the baby cart's back rest by a spring; said stop plates have each an eye head on one end pivotably hung on the stub rod on the respective positioning plate, and a hook on the middle connected to either torsional spring; said torsional springs have each one end connected to the axle on the respective positioning plate, an opposite end connected to the hook on the respective stop plate, and a curved middle part hung on the stub rod of the respective positioning plate; pulling said pull rods upwards from said upper frames causes said positioning plates to be rotated on the respective axle permitting said stop plates to be forced by said torsional springs to stop against the respective locating rod, and continuously pulling said pull rods upwards from said upper frames causes said stop plates to disconnect from the respective locating rod permitting the baby cart to be collapsed.

5,205,578

STRUCTURE OF FOLDING BABY CARRIAGE FRAME ASSEMBLY

Kun-Hei Liu, 2F., No. 32, Lane 200, Tung Hwa Street, Taipei, Taiwan

Filed May 20, 1992, Ser. No. 885,829

Int. Cl.[5] B62B 7/06

U.S. Cl. 280—642 3 Claims

1. A folding baby carriage frame assembly which comprises a handle, a back support frame, one pair of side frames, a rear wheel frame, a front wheel frame, foot pedal lever, one pair of folding links, and two springs,

said handle including two parallel side rods, a corrugated hand-hold portion connected between respective ends of said parallel side rods and a cross rod connecting said two parallel side rods and spaced from said corrugated hand-hold portions, a canopy frame pivotally connected to said

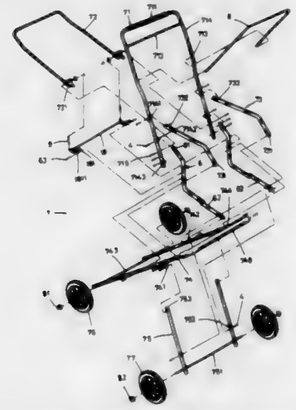
side rods by a pair of holes, a first upper pair of cushions pivotally connected to first respective ends of said side frames by rivets, an intermediate pair of cushions pivotally connected to said folding links, a pair of projecting blocks, and a first lower pair of cushions pivotally connected to said rear wheel frame by rivets;

said back support frame having two adjustment sheets formed at opposite ends thereof respectively connected to said projecting blocks of said handle;

said rear wheel frame having a second upper pair of side frames by rivets, a pair of connecting sheets pivotally connected to said front wheel frame, a second lower pair of cushions pivotally connected to said pair of folding links by rivets, a bottom including a transverse rear wheel axle, two rear wheels mounted at two opposite ends of said rear wheel axle and secured in place by locknuts;

said pair of folding links having stub rods; one end of said pair of folding links respectively pivoted to said first intermediate cushions of said handle, an intermediate part thereof respectively pivoted to said second lower cushions of said rear wheel frame, and an opposite end thereof respectively pivoted to said front wheel frame;

said front wheel frame having two opposite ends respectively connected to said connecting sheets of said rear wheel frame, a third pair of lower cushions respectively



pivoted to said pair of folding links at said opposite end thereof, and a bottom including a transverse front wheel axle, two front wheels are mounted at two opposite ends of said front wheel axle and secured in place by locknuts;

said food pedal lever having two locating plates at opposite ends thereof, each said locating plate having a retaining notch thereon respectively hooked on said stub rods of said pair of folding links; said two springs being respectively connected between said locating plates of said food pedal lever and said adjustment sheets of said back support frame;

wherein said handle and said corrugated hand-hold portion, said parallel side rods, said cross rods, said first upper pair of cushions, said intermediate pair of cushions, said projecting blocks and said first lower pair of cushions thereof are integrally made of a plastic material by injection molding; said back support frame and said adjustment sheets thereof are integrally made of a plastic material by injection molding; said rear wheel frame and said connecting sheets, said second upper pair of cushions, said second lower pair of cushions and said transverse wheel axle thereof are integrally made of a plastic material by injection molding; said front wheel frame and said third lower pair of cushions and said transverse wheel axle thereof are integrally made of a plastic material by injection molding.

5,205,579

HANDLE BAR FOR BABY CARRIAGE

Hitoshi Kato, and Yuichi Arai, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan

Continuation of Ser. No. 770,813, Oct. 4, 1991, abandoned. This application Mar. 31, 1992, Ser. No. 863,515

Claims priority, application Japan, Oct. 8, 1990, 2-105279[U]

Int. Cl.[5] B62D 7/08

U.S. Cl. 280—642 10 Claims

1. An operating mechanism disposed on a handle bar of a baby carriage for actuating locking mechanisms disposed at opposite ends of the handle bar which lock said handle bar at a predetermined position or lock the baby carriage in a folded or an unfolded position, said handle bar having a hollow tubular construction and being bent in a U-shape or an inverted U-shape as viewed from its front, said operating mechanism comprising:

a pair of slide members each of which is slidably disposed at the central portion of said handle bar;

operating wires inserted into said handle bar, each of said operating wires having an upper end respectively retained by each of said slide members and a lower end attached to said locking mechanisms;

slide guide projections projecting from upper and lower sides of each of said slide members; and

an operating grip rotatably mounted on the surface of said handle bar, said operating grip having U-shaped guide grooves formed therein into which said slide guide projections are received such that said slide members can slide in the horizontal directions in said handle bar in response to rotation of said operating grips to thereby actuate said locking mechanisms.

5,205,580

WHEEL SUSPENSION SYSTEM

Martin Luger, Leonberg, and Reinhard Lechner, Rapperswil, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Jun. 21, 1991, Ser. No. 717,822

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1990, 4019761

Int. Cl.[5] B60G 3/26

U.S. Cl. 280—675 10 Claims

1. A wheel suspension system for a motor vehicle for influencing wheel movement during suspension operations comprising:

link bearings coupled to a wheel carrier of the motor vehicle;

a positively guided wheel suspension link which is swivellable on a vehicle body about an axis formed by the link bearings and is supported on the wheel carrier in an articulated manner;

bridge elements, which form coupling squares, said bridge elements linking the wheel suspension link to the wheel carrier in the articulated manner the bridge elements being

set with respect to one another at an angle with respect to a perpendicular wheel center longitudinal plane, and such

means (22) provided with a piston (25) at one extremity thereof, the slide means being operable by motion of said

5,205,583

INFLATABLE AIRBAG

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OCCUPANT SAFETY DEVICE FOR AUTOMOTIVE

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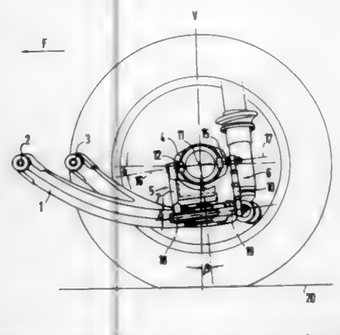
set with respect to one another at an angle with respect to a perpendicular wheel center longitudinal plane, and such that longitudinal planes which extend through the bridge



elements intersect with one another approximately in the perpendicular longitudinal center plane and approximately at a level of a wheel contact surface.

5,205,581

SYSTEM FOR CONTROLLING A CHASSIS

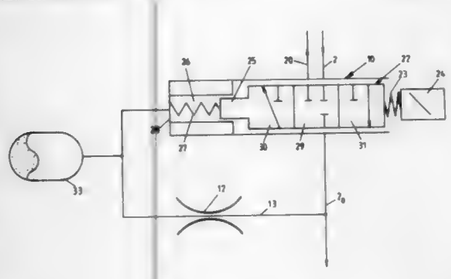
Rainer Kallenbach, Stuttgart; Michael Tischer, Abstatt, and Michael Wanner, Holzgerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 6, 1991, Ser. No. 788,670

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1990, 4035313

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—714 **5 Claims**



1. A system for controlling spring cylinders that serve as a semiactive shock absorber for a vehicle body, in which

said spring cylinders are disposed between wheel suspensions and the vehicle body, at least one chamber of each spring cylinder communicates via line means with a pressure fluid supply means,

at least one control member (**9**) being connected between said pressure fluid supply means and the at least one chamber,

said at least one control member (**9**) including a control valve (**10**), and further including a shunt line (**13**) disposed between the control valve (**10**) and a spring cylinder line (**2***a*), said shunt line (**13**) includes a throttle (**12**) and discharges into a pressure chamber (**26**) provided in said control valve (**10**), a reservoir (**33**) is connected to said shunt line between said throttle and said pressure chamber (**26**) and together with said throttle forms a low-pass filter,

said control valve being responsive to a change in pressure in the shunt line, said control valve further includes a slide means (**22**) provided with a piston (**25**) at one extremity thereof, the slide means being operable by motion of said piston within said at least one chamber, said pressure chamber (**26**) includes a spring (**27**) disposed between a bottom portion (**28**) thereof and the piston (**25**), the slide (**22**) is associated on an opposite extremity thereof, with a control magnet (**24**), and a low frequency pressure course involved in a motion of the vehicle body is set in accordance with a set-point value via said control valve (**10**).

5,205,582

OCCUPANT PROTECTIVE SYSTEM

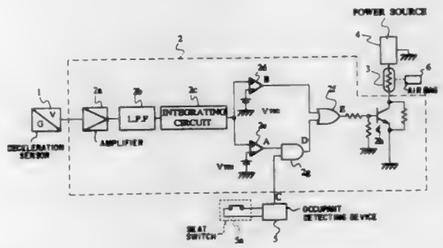
Masayuki Shiga, and Makie Morata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1991, Ser. No. 750,168

Claims priority, application Japan, Sep. 20, 1990, 2-98592[U]

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—735 **3 Claims**



1. An occupant protective system for an automotive vehicle having a driver's seat and an assistant driver's seat, comprising:

a first air bag provided in front of said driver's seat of said vehicle;

a second air bag provided in front of said assistant driver's seat;

deceleration detecting means for detecting a magnitude of deceleration exerted on said vehicle;

occupant detecting means for detecting whether or not there is an occupant seated on said assistant driver's seat; and

actuator means responsive to an output from said occupant detecting means for causing at least said first air bag to be inflated to absorb shock, when said magnitude of deceleration detected by said deceleration detecting means exceeds a predetermined value,

wherein said actuator means comprises:

comparison means for comparing said magnitude of deceleration detected by said deceleration detecting means with first and second threshold values forming said predetermined value, said second threshold value being greater than said first threshold value; and

selecting means responsive to outputs from said comparison means which compares said detected deceleration magnitude with said predetermined value and responsive to said occupant detecting means for causing both of said first and second air bags to be inflated even when no occupant is seated on said assistant driver's seat, if said magnitude of deceleration detected exceeds said second threshold value, and for causing said first air bag alone to be inflated when no occupant is seated on said assistant driver's seat, if said magnitude of deceleration detected exceeds said first threshold value and does not exceed said second threshold value.

5,205,583

INFLATABLE AIRBAG

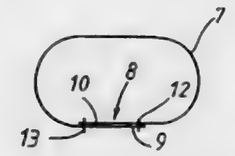
Wolfgang Henseler, Tübingen, and Manfred Müller, Deizisau, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Continuation of Ser. No. 672,425, Mar. 20, 1991, abandoned. This application Jun. 26, 1992, Ser. No. 905,181

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 4010796

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—743 **7 Claims**



1. An inflatable airbag to protect the occupants of a vehicle from an impact on parts in the vehicle passenger compartment, comprising a bag fabric having at one end thereof a first opening whose complete edge region is reinforced by another end of the bag fabric with a second opening mating with the first opening and joined to the one end of the bag fabric to form only a double layer, and joining seams of the two fabric ends of the airbag provided near sides of the openings, wherein the fabric ends are overlapped in the double layer around the openings such that together they form the complete edge region with the openings so as to define an unobstructed aperture for inflating the airbag.

5,205,584

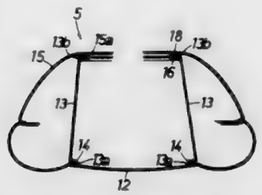
AIR BAG SYSTEM AND PROCESS FOR PRODUCING THE SAME

Kiyoshi Honda, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,432

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—743 **2 Claims**



1. A process for producing an air bag system, comprising the steps of:

sewing tip ends of hanging strings to appropriate portions on a back surface of an upper base fabric;

overlapping a front surface of a lower base fabric having an opening portion provided at a central portion thereof, onto a front surface of said upper base fabric and sewing outer peripheries of said two base fabrics to each other;

turning said lower base fabric inside out and leading the base ends of said hanging strings out of the opening portion of said lower base fabric;

fixing a retaining ring to the base ends of said hanging strings; and

securing said retaining ring to a mounting base provided around a gas generator, so that the opening portion of said lower base fabric is clamped and fixed between said retaining ring and said mounting base.

5,205,585

OCCUPANT SAFETY DEVICE FOR AUTOMOTIVE VEHICLES

Gerhard Reuber, Drolshagen; Achim Brana, Nuembrecht; Horst Stupperich, and Manuela Kahlert, both of Bergneustadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

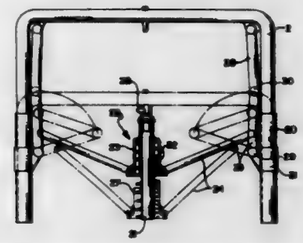
PCT No. PCT/EP90/01066, § 371 Date Apr. 10, 1991, § 102(e) Date Apr. 10, 1991, PCT Pub. No. WO91/02669, PCT Pub. Date Mar. 7, 1991

PCT Filed Jul. 4, 1990, Ser. No. 674,373

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1989, 3927265

Int. Cl.[5] B60R *21/13*

U.S. Cl. 280—753 **15 Claims**



1. An occupant safety device for automotive vehicles comprising a roll bar displaceable from a lowered position to an extended operative position in response to a signal generated during a vehicle crash by preloaded resilient means and selectively positionable between a stowed position and said extended position, wherein movement of the said roll bar takes place substantially in a plane which runs at right angles relative to the longitudinal axis of the vehicle, and in that at least one headrest is displaceable with said roll bar.

5,205,586

MULTI-PURPOSE STABILIZER ASSEMBLY

Andrew L. Tallman, San Pedro, Calif., assignor to Norco Industries, Inc., Compton, Calif.

Continuation of Ser. No. 545,141, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 326,972, Mar. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 163,197, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 920,680, Oct. 19, 1986, abandoned. This application Oct. 7, 1991, Ser. No. 772,630

Int. Cl.[5] B60S *9/02*

U.S. Cl. 280—764.1 **1 Claim**

1. A narrow body elongated adjustable length stabilizer apparatus for mounting transversely on the underside of a resiliently supported recreational vehicle of the type incorporating laterally disposed longitudinally side frame beams, said apparatus comprising:

first and second complementally shaped channels formed with proximal and distal ends, said channels being so constructed that the proximal end of said first channel telescopes in close fitting, load transmitting relationship with the proximal end of said second channel for telescoping relative thereto along an elongated axis, each said

channel having a longitudinal channel and being formed with a respective top wall for engaging said underside of

plurality of apertures aligned with each other in opposite side rails;

upper side of the anchor fitting part is pushed against a biasing force of the elastic member, the engaging parts of

from the wheel of a vehicle, and channels arranged on said rear

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channel having a longitudinal channel and being formed with a respective top wall for engaging said underside of said recreational vehicle, oppositely disposed side walls and respective inturned bottom flanges cooperating with the respective said top wall to form respective first and second tracks for each channel and the flanges terminating in edges which are spaced apart to form an elongated downwardly opening passages in each of said channels;

first and second mounting means carried on the respective distal ends of said first and second channels for mounting to the underside of said side beams;

said channels having sufficient length and being so constructed that, when positioned under said vehicle, projecting transversely to said side beams, said channels may be telescoped to position said first and second mounting means in alignment under said respective side beams for anchoring thereto;

means for attaching the telescoped channels together to provide a transverse member of the length required for mounting said channels to said side beams to thereby provide a transverse support for said side beams;

respective first and second trunnion assemblies received in said respective first and second tracks, said trunnion assemblies including respective pairs of oppositely disposed pins including on their ends respective enlarged heads engaged on the respective flanges of said respective first and second channels and held captive between said respective flanges and said respective top walls, said assemblies including respective first and second open ended, threaded drive screw bores;

first and second elongated drive screws mounted rotatably in said respective channels and received screwably in said respective first and second threaded bores;

respective first and second pairs of linear braces pivotally connected on their upper ends to the respective distal ends of said first and second channels and projecting downwardly in respective planes extending parallel to said longitudinal axes of said channels and formed with respective pairs of first and second lower extremities;

first and second jack support legs carried on their respective top ends from said respective first and second trunnions and angling downwardly and outwardly therefrom through said respective channel passages toward said respective distal ends of said respective first and second channels and formed on their lower extremities with foot elements;

first and second pivot means connecting said respective first and second lower extremities of said respective braces to said respective first and second legs, whereby said apparatus may be placed in position under such recreational vehicle extending transversely thereunder, said first and second channels telescoped relative to each other to position said respective first and second mounting means in alignment under said respective side beams, and said drive screws rotated to advance said trunnions to lower the lower extremities of said jack support legs to engage said foot elements with the underlying surface and elevate said channels to engage said underside of said recreational vehicle to be held in position for anchoring of said mounting means to said respective beams.

5,205,587

MODULAR FRAME FOR AUTOMOTIVE VEHICLES

Larry W. Orr, Bellevue, Wash., assignor to Paccar Inc., Bellevue, Wash.

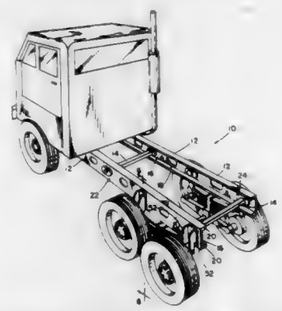
Filed Apr. 19, 1991, Ser. No. 688,094
Int. Cl.[5] B62D *21/12*
U.S. Cl. 280—785 **29 Claims**

1. A modular frame for automotive vehicles, comprising:

a pair of spaced side rails oriented parallel to each other and parallel to a longitudinal axis of a vehicle for substantially the entire length of the vehicle, each side rail defining a plurality of apertures aligned with each other in opposite side rails;

a cross member capable of being connected between any two oppositely aligned apertures;

a pair of cross member adapters, each adapter being secured



to respective ends of the cross members for securing the cross member to the side rails at the apertures, each cross member adapter being similar in size and shape to the side rail apertures; and

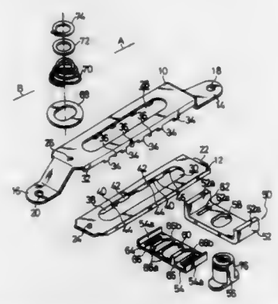
securing means for securing the cross member adapters to the side rails.

5,205,588

SHOULDER ADJUSTER

Mikimasa Yamaoka, Osaka, and Noriyuki Kosugi, Shiga, both of Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 740,702
Claims priority, application Japan, Sep. 5, 1990, 2-235059
Int. Cl.[5] B60R *22/20*
U.S. Cl. 280—801 A **6 Claims**



1. A shoulder adjuster for a vehicle comprising:

an elongated guide rail fixed to the vehicle to extend in a vertical direction, said guide rail including flanges at side fringes thereof, said flanges being formed by folding the guide rail rearwardly, a plurality of notches formed in the respective flanges at intervals in a longitudinal direction, and a slot situated between the flanges and extending in the longitudinal direction of the guide rail,

a slide member attached to the guide rail to slide along the longitudinal direction thereof and having engaging parts engaging the notches of the guide rail, and

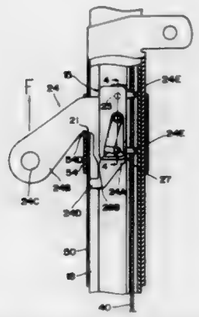
an anchor fitting part having a lower side attached to the slide member, an upper side adapted to attach to a shoulder anchor for a seat belt, and an elastic member situated between the guide rail and the anchor fitting part for urging the anchor fitting part in a direction away from the guide rail to thereby bias the engaging parts of the slide member to the notches of the guide rail so that when the upper side of the anchor fitting part is pushed against a biasing force of the elastic member, the engaging parts of the slide member disengage from the notches of the guide rail to allow the anchor fitting part to move freely.

5,205,589

AUTOMATIC SEAT BELT SYSTEM

Yasutaka Watanabe, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Aug. 16, 1991, Ser. No. 745,885
Claims priority, application Japan, Aug. 30, 1990, 2-229194
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 **19 Claims**



1. An automatic seat belt system comprising:

a guide rail mounted on a vehicle body;

a slider to which one end of a webbing for restraining an occupant is supported, said slider being movable longitudinally along said guide rail and disposed in such a manner so as to be swingable with respect to said guide rail;

an elongated member on which said slider is mounted, said elongated member being movable reciprocatively along the length of said guide rail;

driving means for moving said elongated member longitudinally along said guide rail so as to dispose said slider in either one of two positions where said webbing restrains the occupant and releases the occupant therefrom; and

a stopper engaged with said slider in the webbing-restraining position so as to prevent said slider from being moved in the direction to which the webbing is pulled, said stopper being brought into engagement with said slider when a load in an upward direction is applied to said slider so that said slider is swingingly moved upward, thereby preventing said slider from being moved upward along said guide rail wherein said slider includes a pair of slider members capable of sliding along said guide rail and wherein said slider is swingable with respect to said slider members.

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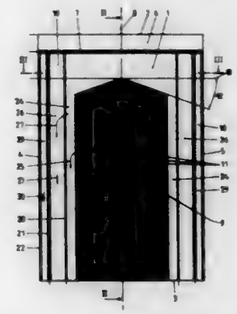
MUDFLAP FOR VEHICLES

Walter Drabing, Niestetal; Manfred Müller, Kassel, and Thomas Barth, Witzenhausen, all of Fed. Rep. of Germany, assignors to WEGU Gummi- und Kunststoffwerke Walter Drabing KG, Kassel, Fed. Rep. of Germany

Filed May 8, 1992, Ser. No. 880,029
Claims priority, application Fed. Rep. of Germany, May 11, 1991, 4115516.5
Int. Cl.[5] B62D *25/16*
U.S. Cl. 280—851 **9 Claims**

1. A mudflap for vehicles, said mudflap comprising a generally flat main body made from rubber, plastic or similar material, and a rear surface for facing the wheel of a vehicle, ribs arranged on said rear surface being provided in a V-formation in a central area of said rear surface of said main body for intercepting, slowing-down and diverting water thrown up from the wheel of a vehicle, and channels arranged on said rear surface for guiding water intercepted and diverted in the central area downwardly, said channel being located in two side areas arranged symmetrically about a central longitudinal plane of the mudflap, the improvement therein comprising said ribs (**11**) being provided in an inverted V-formation inclined downwardly from their apex at the central longitudinal plane (**8**), the ribs each having a cross-section which tapers from the main body (**1**) to a free end (**18**) and the ribs being arranged in close proximity to each other so that grooves (**14**) between the ribs (**11**) have approximately the same cross-sectional area as the cross-sectional area of the ribs (**11**),



and the channels (**24, 26, 29**) located in the side areas (**10**) being open on the sides facing the wheel of the vehicle and each having at least two continuous longitudinal ribs (**20, 21, 22**) one spaced closer to the central longitudinal plane than the others, with the one longitudinal rib (**20**) nearest the central longitudinal plane (**8**) being lower in height than the other longitudinal rib (**22**) spaced farther from the central longitudinal plane of the mudflap,

wherein the ribs (**11**) are provided in a V-formation at an angle (**12**) in a range 18° to 22° to the horizontal (**13**).

5,205,591

GREETING CARD SYSTEM FOR COLLEGES AND OTHER ORGANIZATIONS

Geoffrey R. Lorenz, P.O. Box 802, Dayton, Ohio 45401-0802

Filed Apr. 1, 1991, Ser. No. 678,014
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—117 **16 Claims**

1. A greeting card system for sale to a store which sells articles to individuals associated with a college or other organization, said system comprising a plurality of generally rectangular cards of paper-like material and having substantially the same corresponding height and width, said cards having printed thereon substantially different multiple color artwork in the form of pictures associated with a particular time of celebration, each of said cards having a set of spaced identification portions forming parts of the corresponding said pictures,

said identification portions of each of said cards having the same locations as said identification portions of each of the

element provided with a circular orifice and a second element, said method comprising:

ments radially inwardly so as to engage an outer surface of the connection end when the connection end is inserted into the

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DOOR LATCH MEMBER

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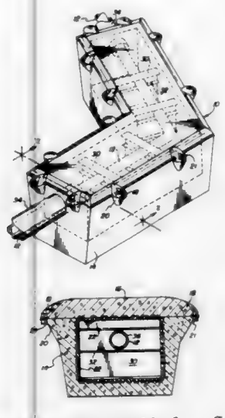
said identification portions of each of said cards having the same locations as said identification portions of each of the other said cards, and corresponding said identification portions of all of said cards having custom printed thereon the same corresponding information identifying said organization for providing the individual with a selection from a variety of custom printed multiple color greeting cards associated with the organization while minimizing the cost of producing said custom printed cards.

5,205,592

UNDERGROUND CONAINMENT TANK AND PIPING ASEMBLY

Christopher G. Ziu, Somerville, Mass., assignor to Double Containment Systems, Monroe, Conn.

Filed Jun. 24, 1991, Ser. No. 719,840
Int. Cl.[5] F16L *11/12*
U.S. Cl. 285—45 **20 Claims**



1. A double containment assembly for a fluid carrying pipe comprising:
a primary pipe adapted to conduct a fluid through the assembly;
a concrete receptacle having a concrete cover housing said primary pipe;
means within said concrete receptacle for supporting said primary pipe for longitudinal movement with respect to an elongated axis of said concrete receptacle;
said concrete receptacle including a plastic liner precluding the penetration of fluid from the interior of said receptacle into said concrete;
said cover including a plastic liner along its interior surface adapted to contact the top of the plastic liner on said concrete receptacle; and
means for removably mounting said cover on said concrete receptacle to enable access to said primary pipe, including mating tabs on said cover and receptacle receiving fasteners therethrough.

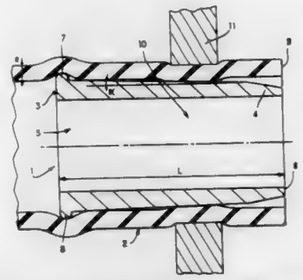
5,205,593

METHOD OF TIGHT CONNECTION, AND CORRESPONDING TIGHT CONNECTION FITTING

Francois Fondeur, 78 rue du Chevalier Francais, 59800 Lille, France

Filed Aug. 1, 1991, Ser. No. 739,095
Claims priority, application France, Aug. 3, 1990, 90 10091
Int. Cl.[5] F16L *41/00*
U.S. Cl. 285—222 **7 Claims**

1. Method of tight connection between a first fixed and rigid element provided with a circular orifice and a second element, said method comprising:
a) introducing inside a pipe of flexible material, whose external diameter is slightly larger than the diameter of the orifice, a truncated cone-shaped bushing whose angle of conicity is less than an angle expressive of friction coefficient between the materials constituting the bushing and the pipe, respectively, such that a head of the truncated bushing is at a certain distance from one given end of the pipe;
b) force-introducing said end of the pipe into the orifice; and
c) causing the bushing to slide inside the pipe until the pipe is completely blocked between the bushing and the orifice.

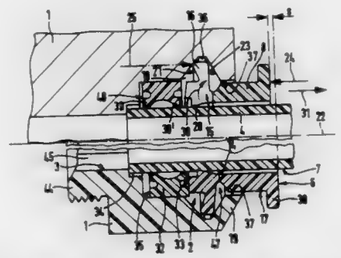


5,205,594

CONNECTING DEVICE FOR FLUID CONDUITS AND THE LIKE

Kurt Stoll, Esslingen, and Herbert Köngeter, Reichenbach, both of Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 648,221, Jan. 31, 1991, abandoned. This application Jul. 27, 1992, Ser. No. 919,982
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1990, 4007101
Int. Cl.[5] F16L *17/00*
U.S. Cl. 285—322 **14 Claims**



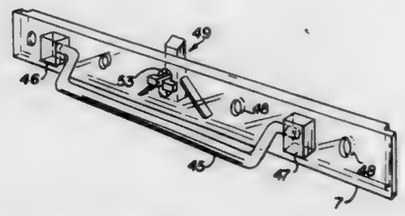
1. A connection device for use in facilitating a connection of a fluid conduit to a housing means having means defining a recess adapted to receive a connection end of the fluid conduit therein, comprising a unitary annular gripper means encircling the conduit and adapted to be axially slidably received into the recess for effecting a detachable securement of the connection end of the fluid conduit in the recess when the annular gripper means is a first position in the recess, wherein the unitary annular gripper means is provided with an annular actuating part having on an axial end facing an interior of the recess a plurality of circumferentially spaced clamping elements, bending means on the annular gripper means for supporting the clamping elements thereon for movement between a radially inwardly clamping position and a radially outwardly release position and for forcibly yieldably urging the clamping elements radially inwardly so as to engage an outer surface of the connection end when the connection end is inserted into the recess, the clamping elements, when so engaged by the connection end, being urged radially outwardly slightly due to a difference in circumferential dimension between an outer circumference of the connection end and an inner circumference of the clamping elements, a respective clamping element each having a pressing part arranged radially outwardly from the bending means and axially offset to the bending means, each said pressing part being received in a groove-like retaining recess in an inner circumferential surface of the recess of the housing means, the retaining recess having an axially inwardly located side face facing axially outwardly of the recess in the housing means and an axially outwardly located side face spaced axially outwardly of the recess in the housing means therefrom and opposing the inward side face, the pressing parts being located in an intermediate region between the axially inward side face and the axially outward side face, the axially inward side face of the retaining recess defining a support surface having an oblique configuration, the radially outer portion of the support surface being arranged axially closer to the outer end of the recess in the housing means than the radially inner portion of the support surface, the support surface axially opposing the pressing parts in such a manner that when the actuating part is slid axially further into the recess to a second position thereof in a effort to effect a release of the connection end, the pressing parts operatively engage the obliqued support surface and cause the clamping elements to be rocked about the bending means radially outwardly into the release position to allow for the removal of the clamped connection end from the recess in the housing means.

5,205,595

LOCK MECHANISM

Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 92173

Continuation-in-part of Ser. No. 795,540, Nov. 21, 1991, abandoned, and a continuation of Ser. No. 699,432, May 13, 1991, Pat. No. 5,099,581. This application Jun. 23, 1992, Ser. No. 902,855
Int. Cl.[5] E05C *1/10*
U.S. Cl. 292—175 **15 Claims**



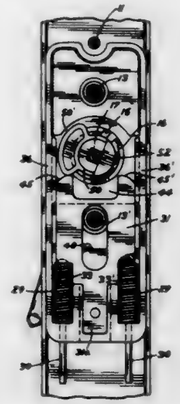
15. A lock mechanism mountable against a substantially flat section of a cover, drawer, door, or door-jamb, having a front face and an aperture which comprises:
a bolt having a front side;
means for biasing the bolt in one axial direction;
means for mounting said bolt to said section consisting of:
a pair of reailiently flexible prongs spaced apart and extending orthogonally from said front side of said bolt, sized and dimensioned to insert through said aperture when compressed;
each of said prongs having a nib projecting against said front face of said section beyond the periphery of said aperture when said prongs are uncompressed and inserted.

5,205,596

DOOR LATCH MEMBER

James L. Ralph, Shoreview, Minn., assignor to Cole-Sewell Corporation, St. Paul, Minn.

Filed Aug. 24, 1992, Ser. No. 934,241
Int. Cl.[5] E05C *3/14*
U.S. Cl. 292—336.3 **2 Claims**



1. A latch structure for a door, comprising
an elongated plate member mounted onto the outer side of a door,
a handle attached to said plate member having a recessed inner end portion extending through said plate member,
an adapter at the inner side of said plate member having a shaft extending into said recess of said handle to be rotated by said handle,
a spindle extending from said adapter to a latch member to operate the same,
a spring engaged sliding plate member mounted onto the inner side of said plate member,
said plate member having a U-shaped forked opening at one end thereof adjacent said adapter,
said adapter having a cylindrical body portion disposed at right tangles to the plane of said U-shaped opening,
a forward semi-circular projection from the upper cylindrical portion of said body portion of said adapter seated into said opening,
the lower cylindrical portion of said adapter being disposed at the rear of said sliding plate member,
shoulders at each side of said opening forming radiused cam lobes,
said adapter seated into said opening having an upward arcuate projection having its respective end portions radiused to form cam lobes, the same resting upon said first mentioned cam lobes, whereby
a rotation of said handle actuates said adapter causing a cam lobe thereof to engage the adjacent first mentioned cam lobes in a rolling cam action wherein the adjacent cam surfaces have only a line engagement reducing the engagement to one resulting in no appreciable wear.

5,205,597

FLEXIBLE GRILLE

Lee A. Chase, Ada, Mich., assignor to Lacks Industries, Inc., Grande Rapids, Mich.

Filed Nov. 4, 1991, Ser. No. 787,558
Int. Cl.[5] B62D *25/08*
U.S. Cl. 293—115 **25 Claims**

1. An elastic automobile grille for an automobile having a bumper, said automobile grille comprising:
a body member having a first segment and a second segment;

fastening means mounted to said body member for securing

opposing relation to said notches in said side rails of the

means for automatically rotating said means for hooking

dle, so that the pivotal angled restraint in combination with the

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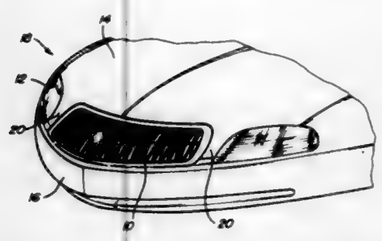
fastening means mounted to said body member for securing said automobile grille to said automobile; and

a plurality of support members secured to one of said first segment and second segment of said body member, said plurality of support members being formed from a material having a predetermined yield strength, said plurality of support members having a variable section modulus along a portion thereof so as to provide a predetermined elastic deformation of said plurality of support members at



said portion without exceeding said predetermined yield strength of said material whereby said predetermined elastic deformation of said plurality of support members provides a degree of resiliency to said automobile grille such that said automobile grille can be rigidly attached to said automobile by said fastening means and such that said automobile grille may sustain a predetermined elastic deformation upon said bumper being impacted without said automobile grille exceeding said predetermined yield strength of said material.

5,205,598

MULTIPLE-OBJECT GRASPING DEVICE

Wallace B. Miller, 17365 Caminito Caldo, San Diego, Calif. 92127

Filed Jun. 22, 1992, Ser. No. 925,341
Int. Cl.[5] A63B *47/00*
U.S. Cl. 294—19.2 **8 Claims**

1. A multiple-object grasping device comprising;

an elongated body having a pair of spaced side rails providing a hand gripping and actuating end, and an opposite object gripping end having a pair of congruently related object receiving notches with a pair of object gripping fingers individually adjacent thereto;

an object grasping arm pivotally mounted on said body adjacent to said object gripping end thereof having operating connection to said hand gripping and actuating end, and providing an object engaging notch disposable in opposing relation to said notches in said side rails of the body, and an object gripping finger disposed in closely spaced adjacent relation to its object engaging notch which is extendable between said fingers of the side rails;

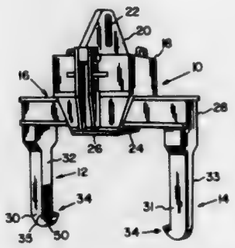
and an undercut portion between said object receiving and object engaging notches and their respectively adjacent fingers for accommodating a second object therein adjacent to the first.

5,205,599

AUXILIARY PROTECTIVE COIL LIFTER SADDLE

Peter J. Wassmer, Conneaut Lake, and David G. Kiser, Franklin, both of Pa., assignors to Drafto Corporation, Cochranton, Pa.

Filed Aug. 12, 1992, Ser. No. 928,989
Int. Cl.[5] B66C *1/62*
U.S. Cl. 294—67.33 **20 Claims**



1. An auxiliary protective coil lifter saddle adapted to be mounted on an arm of a coil lifter for transporting a coil of material having an inner surface defining a core, the arm having a lifting segment with a lifting surface and two side walls depending therefrom, said auxiliary protective coil lifter saddle comprising:

a frame having a body with at least two opposite ends and a plurality of lugs, wherein at least one of said lugs attaches to a respective end of said body, and with said body and said lugs having upper surfaces and lower surfaces; and

a pad having an upper surface and a bottom surface, said pad attached to said upper surface of said body and made of a soft resilient material, whereby a bottom surface of said body can be placed on the lifting surface of the arm and said lugs deformed so that said lugs depend from the body, and said respective bottom surfaces of said lugs abut against the lifting segment so that the inner surface of the coil rests on an upper surface of said pad.

5,205,600

AUTOMATIC RELEASE COUPLING

Richard Moore, 2332 NE. 28th Ct., Lighthouse Point, Fla. 33064

Filed Mar. 18, 1992, Ser. No. 853,101
Int. Cl.[5] B66C *1/38*
U.S. Cl. 294—82.27 **7 Claims**

1. An automatic release hook apparatus for retrieving and deploying a tethered object, comprising:

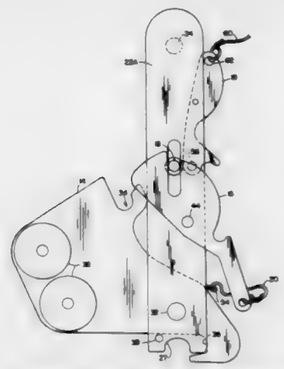
a frame, defining an elongated slot;

means for hooking said tethered object, said means for hooking pivotally connected to said frame about a first axis;

means for releasably retaining said means for hooking pivotally connected to said frame about a second axis, remote from said first axis;

a lock member slidably disposed in said slot, said lock member engageable with said means for retaining in a first, locked, position and a second, open, position; and

means for automatically rotating said means for hooking from a first, hooked, position to a second, unhooked,



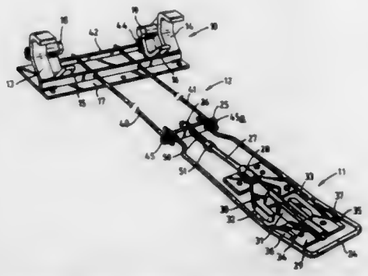
position when said means for retaining is rotated from said first, locked, position to said second, open, position.

5,205,601

AMBULANCE LOCK

Kenneth R. Ferris, Scarborough, Australia, assignor to Ferno-Washington, Inc., Wilmington, Ohio

Filed Aug. 11, 1992, Ser. No. 928,516
Claims priority, application Australia, Aug. 30, 1991, PK8046
Int. Cl.[5] B60N *1/02*
U.S. Cl. 296—20 **20 Claims**



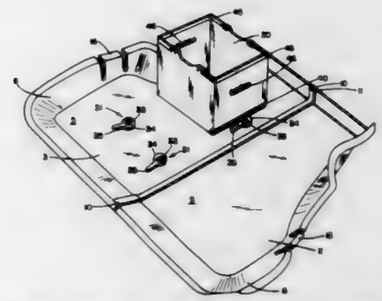
1. A stretcher frame securing system for a patient transport vehicle having a rearwardly located patient access, said system comprising a part for mounting on the floor of the transport vehicle adjacent said access, a part for mounting on the floor forwardly of said access, and an actuating mechanism connecting said parts; said forwardly mounting part including fixed and pivotal angled restraints for securing a stretcher frame wherein said fixed angled restraint inclines upwardly and rearwardly in a direction toward said vehicle access and said pivotal angled restraint is adapted to pivot between an orientation in which it inclines downwardly and rearwardly to said vehicle access, and an orientation in which it inclines upwardly and forwardly of said vehicle; said part adjacent the access including a longitudinally movable handle and associated hooking member which pivots between a horizontal plane and a vertical plane upon movement of the handle in a direction toward said access, said pivotal action of said hooking member being accompanied by a longitudinal movement which takes the hooking member into and out of locking correspondence with an appendage on the rear section of the stretcher; said interconnecting actuating mechanism acting to pivot said pivotal angled restraint upon longitudinal movement of the handle, so that the pivotal angled restraint in combination with the fixed restraint secures the stretcher frame therebetween.

5,205,602

MOTOR VEHICLE BOOT INSERT

Brendan F. Hoare, Ballinasloe, and Patrick E. Ryan, Loughrea, both of Ireland, assignors to B.E.T. Corporation Limited, Loughrea, Ireland

Filed Feb. 8, 1991, Ser. No. 653,351
Claims priority, application Ireland, Feb. 9, 1990, 3873/89; Dec. 4, 1990, 4361/90
Int. Cl.[5] B60R *13/01*
U.S. Cl. 296—39.1 **13 Claims**



1. A removable motor vehicle boot insert comprising;

at least two associated substantially rigid boot insert portions,

each insert portion comprising a base and a side wall means extending upwardly from the base and defining an open-topped container, said side wall means including a boot engaging side section, a front end-wall section, and a rear end-wall section and

engagement means for engagement of the insert portions,

the engagement means of each insert portion having a raised flange section opposite the boot engaging side section,

one of the respective flange sections of the boot insert portions overlapping the other on assembly and the boot insert substantially following the contour of a motor vehicle boot on assembly of the insert portions within the boot.

5,205,603

TRUCK TAILGATE LADDER APPARATUS

Orin F. Burdette, Jr., 102 Mulberry La., Harbeson, Del. 19951

Filed Feb. 24, 1992, Ser. No. 840,168
Int. Cl.[5] B60R *3/02*
U.S. Cl. 296—62 **7 Claims**

1. A truck tailgate ladder apparatus, comprising,

a truck bed, wherein the truck bed includes a tailgate pivotally mounted to the truck bed, the tailgate including a tailgate bottom wall pivotally mounted relative to the truck bed, and the tailgate further including a top wall spaced from the bottom wall, and a first wall spaced from a second wall, and

a tailgate cavity defined within the tailgate extending orthogonally relative to the top wall and the bottom wall oriented between the first wall and the second wall, and the cavity including a cavity entrance directed through the top wall, and

the first wall including a first groove and a second groove arranged in a parallel coextensive relationship within the first wall interiorly of the cavity, and

a first runner plate slidably mounted to the first groove, and a second runner plate mounted slidably to the second groove, the first runner plate including a first runner plate rib slidably received within the first groove, and the sec-

ond runner plate including a second rib slidably received

5,205,605

recess; a substantially rectangular mounting plate hingedly connected along the top edge thereof to said elongated plate; a

the overall size of the squab when the squab elements are in the operative position being greater than the size when the squab

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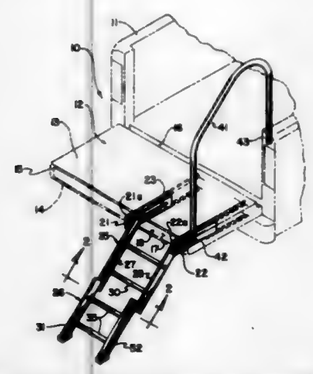
ond runner plate including a second rib slidably received within the second groove, and

a first ladder member slidably and rotatably mounted to the first runner plate and the second runner plate oriented between the first runner plate and the second runner plate, and



a second ladder member slidably and rotatably mounted relative to the first ladder member, and

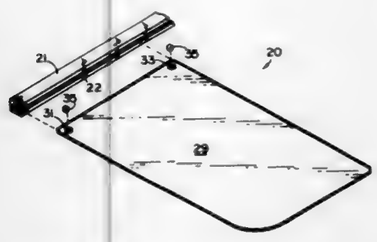
latch means to latch the first ladder member relative to the second ladder member.

5,205,604

LOW PROFILE VISOR ASSEMBLY

Nels R. Smith, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 20, 1991, Ser. No. 810,834
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.11 **14 Claims**



1. A low profile visor for a vehicle comprising:

a support track for attachment to a supporting pillar surface in said vehicle, said support track having a longitudinal slot in one edge thereof including opposed longitudinal guide surfaces on each side of said slot and at least one longitudinal channel in one of said guide surfaces, said longitudinal slot extending along the edge portion of a window to be covered by said visor;

a visor blade having an aperture therein near each end of an edge thereof, said visor blade edge extending into said slot; and

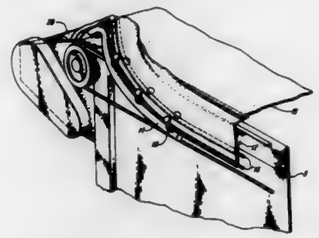
an alignment member mounted in each aperture in said visor blade, said edge of said visor blade including said alignment members being mounted in said slot in said support track with said alignment members mounted in said channel in said slot in said support track, said alignment member extending on opposite sides of said visor blade to engage said opposed guide surfaces including said at least one channel.

5,205,605

COVER FOR AN OPEN TOP RECEPTACLE

Edward N. Haddad, Jr., Worcester, Mass., assignor to Pioneer Consolidated Corporation, North Oxford, Mass.

Filed Mar. 26, 1992, Ser. No. 858,398
Int. Cl.[5] B60P *7/02*
U.S. Cl. 296—98 **26 Claims**



1. An open top receptacle cover apparatus for covering an open top receptacle having a first end, a second end, and two sides, the apparatus comprising:

a cover having a main portion and descending side portions, and extendable from said first end to said second end;

a beam, connected to said main portion of said cover, for extending said cover from said first end to said second end;

a driven pulley;

an undriven pulley;

a cable, connected to said beam, movably mounted on said driven pulley and said undriven pulley, and driven by said driven pulley so as to urge said beam towards said second end;

a roller, mounted at said first end, for storing said cover in a rolled condition; and

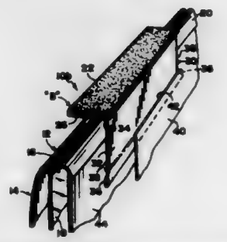
a guide assembly, mounted at said first end, for urging each said descending side portions between an extended condition extending partly down each of said two sides, and said rolled condition as said cover moves across said open top receptacle, wherein the width of said cover in said rolled condition is generally equal to the width of said open top receptacle.

5,205,606

ARMREST FOR A WINDOW OF A MODERN DAY MOTOR VEHICLE

Daniel S. Canseco, 28 Elva Rd., North Weymouth, Mass. 02191

Filed Dec. 2, 1991, Ser. No. 800,966
Int. Cl.[5] B60J *9/00*
U.S. Cl. 296—153 **1 Claim**



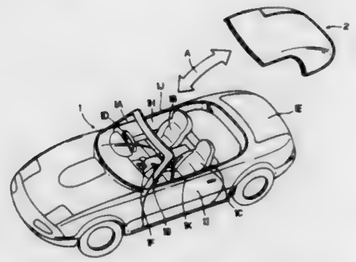
1. An improved armrest for a modern day motor vehicle of the type having a door, window sill, a retractable window glass and a piece of weather stripping, said improved armrest comprising: an elongated pad of a soft flexible material having a longitudinal recess along the bottom surface thereof; an elongated plate of a durable stiff material affixed within said recess; a substantially rectangular mounting plate hingedly connected along the top edge thereof to said elongated plate; a pair of stop tabs, each extending outwardly from opposite side edge of the bottom portion of said mounting plate; a panel having an elongated pocket therein, said panel mounted to an inner surface of the door, so that said mounting plate can slide fit within said elongated pock, and said elongated plat with said pad can be pulled upward with said stop tabs preventing removable from said pocket, and said elongated plat with said pad can be put in an operative position to extend over the window sill.

5,205,607

AUTOMOBILE WITH REMOVEABLE ROOF

Yoshinori Takeuchi, Tokyo, Japan, assignor to International Prototype Laboratory, Inc., Tokyo, Japan

Filed Dec. 6, 1991, Ser. No. 803,411
Claims priority, application Japan, Sep. 30, 1991, 3-087437[U]
Int. Cl.[5] B60J *7/00*
U.S. Cl. 296—210 **5 Claims**



1. An automobile, comprising:

a body 1 in which seats 1B and 1C are arranged, said seats having four sides which are open and unobstructed;

a rigid hood 2, provided separately from said body 1 and being integrally formed, said hood 2 comprising in its entirety a transparent material and being freely mountable on said body 1, such that said hood 2 encloses said four sides of said seats; and

means for supporting said hood, said hood supporting means solely comprising a windshield and said body such that a field of vision of an occupant in said automobile is substantially completely unobstructed by said hood supporting means.

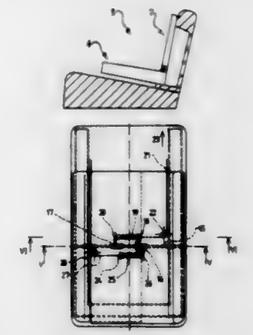
5,205,608

CHILD SEAT FOLDABLE FROM WITHIN SEAT BACK HAVING EXTENSION CONTROL MECHANISM

Ingemar Stig, Alingsas, Sweden, assignor to General Engineering (The Netherlands) B.V., Utrecht, Netherlands

Filed Dec. 4, 1991, Ser. No. 802,283
Claims priority, application United Kingdom, Dec. 4, 1990, 9026339
Int. Cl.[5] A47C *15/00*
U.S. Cl. 297—238 **9 Claims**

1. A seating arrangement for a motor vehicle, the seating arrangement comprising a primary seat for occupation by an adult comprising a squab and a back, a child's seat being incorporated in the back of the primary seat, and being movable from the retracted position in which the child-seat is accommodated within a recess formed in the back of the primary seat, to an operative position, the child-seat presenting a squab having squab elements incorporating a means for moving said squab elements from an initial position to an operative position, the overall size of the squab when the squab elements are in the operative position being greater than the size when the squab



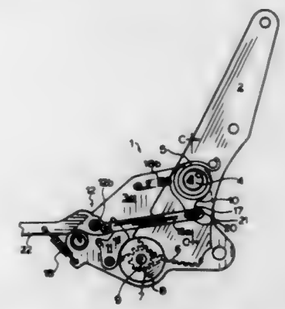
elements are in the initial position, and a control element coacting with said moving means for actuating the latter.

5,205,609

ECCENTRIC GEAR BACKLASH TAKE-UP MECHANISM FOR SEAT LATCHES

Adolf Notta, Toronto, and Gulam Premji, Mississauga, both of Canada, assignors to Bertrand Faure Ltd., Mississauga, Canada

Filed Feb. 5, 1991, Ser. No. 650,827
Int. Cl.[5] B60N *2/02*
U.S. Cl. 297—367 **1 Claim**



1. A vehicular seat back-recliner hinge for the selective incremental adjustment of the inclination of a backrest relative to a seat cushion, said hinge comprising:

first and second hinged members, mutually rotatably arranged about a common pivot, with said first member having a gear rack arranged thereon;

a pinion spur gear being fixed to an adjacent ratchet wheel spur gear in mutually dependently rotatable relation therewith about a common concentric shaft mounted on said second hinged member;

said common pivot being eccentrically mounted on a rotatable bushing mounted for rotation on said first hinged member, said bushing being operable during rotation thereof to selectively position said rack and said pinion spur gear in first mutually proximal and second mutually spaced positions;

a locking pawl arranged on said second hinged member, and adapted to selectively lockingly engage with, and unlockingly disengage from, said ratchet wheel spur gear, said locking pawl being operably positionable in selected first locking and second unlocking positions corresponding to

concurrent first mutually proximal and second mutually

5,205,611

HEAD SUPPORT PILLOW

spaced longitudinal locations therealong by a first beam support and a second beam support;

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WHEEL TRIM ATTACHMENT SYSTEM USING STUD

concurrent first mutually proximal and second mutually spaced positions, respectively;

means for rotating said bushing in one rotational direction to thereby reduce backlash between said pinion spur gear and said rack when said locking pawl, said ratchet wheel spur gear, said pinion spur gear and said rack are serially engaged in mutually secured relation to prevent relative rotation between said hinged members about said pivot and for rotating said bushing in a second opposite rotational direction, to increase backlash between said pinion spur gear and said rack when said locking pawl is serially disengaged from said ratchet wheel spur gear to thereby ease the relative rotation of said hinged members about said common pivot.

5,205,610

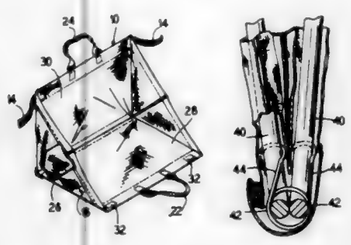
FOLDING SEAT

Donald J. Reninger, 1223 W. Grand Ave., Chicago, Ill. 60622

Filed Oct. 7, 1991, Ser. No. 772,249

Int. Cl.[5] B60N *2/02*

U.S. Cl. 297—380 **1 Claim**



1. A folding seat comprising:

a first wire frame member having a base, a first side, and a second side;

a second wire frame member having a base, a first side, and a second side, said first wire frame member and said second wire frame member having identical dimensions;

a first torsion spring, mounted on said base of said first wire frame and on said base of said second wire frame, including first and second extensions having hook-shaped end members, said first side of said first wire frame seated in said hook-shaped end member of said first extension, and said first side of said second wire frame seated in said hook-shaped end member of said second extension;

a second torsion spring, mounted on said base of said first wire frame and on said base of said second wire frame, including third and fourth extensions having hook-shaped end members, said second side of said first wire frame seated in said hook-shaped end member of said third extension and said second side of said second wire frame seated in said hook-shaped end member of said fourth extension;

said first and second torsion springs selectively spreading said wire frame members apart from a carrying position to a seating position;

a fabric surrounding said first and second wire frame members to form a back portion, a seat portion, and at least one triangular-shaped seat side;

a pair of straps arranged on said back portion;

a pair of releasable securing retainers arranged on said seat portion;

a first handle attached to said back portion;

a second handle attached to said seat portion; and

an attachment connected to a bottom face of said folding seat, said attachment adapted to secure a seat cushion to said folding seat, said triangular-shaped seat side limiting spreading of said wire frame members apart under influence of said first and second torsion springs.

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HEAD SUPPORT PILLOW

Frederick O. Stephens, 16 Inkerman Street, Mosman, Australia 2088 , assignor to Frederick Oscar Stephens; Sheilagh Kelly; Jennifer Louise Azzopardi; Robert Bruce Henry Stephens; Gillian Dorys Janet Stephens; Katriona Alison Stephens and Frederick William Peter Stephens, all of Mosman, Australia

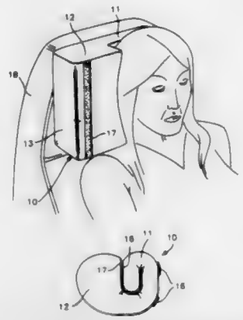
PCT No. PCT/AU91/00219, § 371 Date Feb. 18, 1992, § 102(e) Date Feb. 18, 1992, PCT Pub. No. WO91/17685, PCT Pub. Date Nov. 28, 1991

PCT Filed May 21, 1991, Ser. No. 807,831

Claims priority, application Australia, May 22, 1990, PK0266

Int. Cl.[5] A47G *9/00*

U.S. Cl. 297—391 **8 Claims**



1. A travelling cushion formed of a resiliently compressible foam material and having a base portion which is generally thin and substantially planar and a lateral head support portion formed integrally with the base portion, the head support portion being relatively thick and projecting laterally of and upwardly from an upper surface of the base portion, the base portion and the lateral head support portion defining a generally continuous and substantially planar lower surface of the travelling cushion, the construction of the travelling cushion being such that it may be positioned between a user's head and an upwardly inclined supporting surface with the user's head bearing against the upper surface of the base portion and leaning against the lateral support portion which supports the user's head against rotation about the axis of the user's neck, with the head support portion being of sufficient length such that, in use, a bottom edge thereof rests on the shoulder of the user, the travelling cushion being enclosed within a unitary removable cover and being such that it may be rolled or folded into a compressed condition, the travelling cushion being provided with securing means for retaining the cushion in a compressed condition said securing means comprising a pair of complimentary portions of hook and loop fastener means, whereby when the cushion is in a compressed condition the complimentary portions are operatively juxtaposed.

5,205,612

TRANSPORT APPARATUS AND METHOD OF FORMING SAME

David B. Sugden, Tasmania, Australia; John Turner, Renton, Wash.; Robert J. Boyd, Queensland, Australia; Thomas M. Hartman, Des Moines, Wash.; Gerald L. Dollinger, Bellevue, Wash., and John G. Moore, Puyallup, Wash., assignors to Z C Mines Pty. Ltd., New South Wales, Australia

Filed May 16, 1991, Ser. No. 701,503

Claims priority, application Australia, May 17, 1990, PK0197

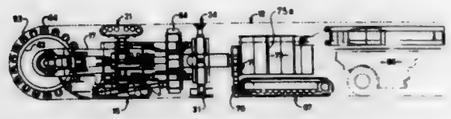
Int. Cl.[5] E21C *29/02*; B62D *11/20*

U.S. Cl. 299—10 **12 Claims**

10. A transport assembly comprising:

an elongate main beam assembly supported at a pair of spaced longitudinal locations therealong by a first beam support and a second beam support;

wherein said first beam support includes a travel assembly adapted for relatively free longitudinal movement, said second beam support includes a rear frame supported on a rear travel assembly, said rear frame being attached to the rear portion of said main beam assembly through a rear pivot, said rear pivot including a ball joint supporting a vertical steering slide, said steering slide including steering means for rotating said rear travel assembly about said ball joint relative to said main beam assembly, said ball joint allowing pivotal movement of said rear frame around a first longitudinal axis parallel with said elongate main beam assembly, a second vertical axis perpendicular to said first axis, and a third transverse axis perpendicular to said first axis and said second axis, said vertical steering slide allowing pivotal movement of said rear frame around said second vertical axis and allowing linear movement of said rear frame along said second vertical axis.



5,205,613

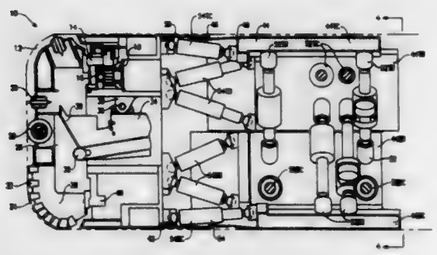
TUNNEL BORING MACHINE WITH CONTINUOUS FORWARD PROPULSION

Howard K. Brown, Jr., Kent, Wash., assignor to The Robbins Company, Kent, Wash.

Filed Jun. 17, 1991, Ser. No. 716,849

Int. Cl.[5] E21C *29/00*; E21D *9/08*

U.S. Cl. 299—31 **19 Claims**



1. A tunnel boring machine comprising:

a frame;

a full face cutterhead on said frame having a plurality of cutting units, said cutterhead being rotatable with respect to said frame;

three anchor shoes floating relative to said frame and being disposed circumferentially thereof in an equispaced manner;

gripper means walkable relative to said frame and connecting each of said three anchor shoes to the other of said three anchor shoes, said gripper means being extensible to anchor said three anchor shoes against the tunnel wall; and

thrust means connected to said frame and to each of said three anchor shoes for advancing said frame relative to said three anchor shoes.

5,205,614

WHEEL TRIM ATTACHMENT SYSTEM USING STUD EXTENDERS

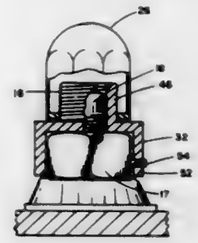
James P. Wright, 1060 Robin La., Cookeville, Tenn. 38501

Continuation of Ser. No. 602,127, Oct. 23, 1990, abandoned. This application Mar. 13, 1992, Ser. No. 851,488

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.[5] B60B *7/14*

U.S. Cl. 301—37.37 **8 Claims**



1. A system for attaching decorative wheel trim to a wheel of a motor vehicle having an odd number of wheel studs including a first stud and two adjacent studs opposite said first stud, said wheel studs having corresponding lug nuts that need not be removed for attaching said decorative wheel trim to said wheel, said system comprising:

(a) a bridge bracket having holes to receive said adjacent said wheel studs, said bridge bracket comprising a bracket stud placed equidistant between said adjacent wheel studs such that said bracket stud is opposite said first stud;

(b) means for attaching said trim member to said bridge bracket stud; and

(c) means for attaching said bridge bracket to said adjacent wheel studs.

5,205,615

WHEEL COVER MOUNTING DEVICE

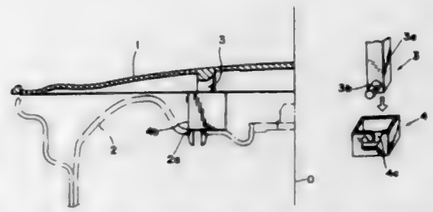
Yasuhide Narita; Takashi Ichikawa, and Tokuo Hayakawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed May 24, 1991, Ser. No. 705,343

Claims priority, application Japan, May 30, 1990, 2-140626

Int. Cl.[5] B60B *7/06*

U.S. Cl. 301—37.35 **8 Claims**



1. A wheel cover mounting device in use for an automobile comprising:

a plurality of first engagement means which are, respectively, to be arranged circumferentially on a wheel cover so as to extend inwardly from an inner surface thereof, and

a plurality of second engagement means, corresponding to the first engagement means, which are, respectively, to be arranged circumferentially on a disc wheel, to which the

wheel cover is to be attached, so as to extend outwardly from an outer surface thereof,

said valve including a plunger slidably disposed in said valve bore and having a first end face opposed to said first end

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TWO FORCE LEVELS OF MECHANICAL BRAKING FOR

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wheel cover is to be attached, so as to extend outwardly from an outer surface thereof,

one of the first and second engagement means including a pin member, while the other including a hook member with which the pin member becomes engaged when the wheel cover is depressed and subsequently rotated in a predetermined direction with respect to the disc wheel,

said other engagement means having a spring means for urging the pin member to ensure an engagement of the pin member with the hook member,

said each first engagement means comprises a leg member extending from the inner surface of the wheel cover and the pin member provided on a tip portion of the leg member,

said each second engagement means comprises a housing member secured on the disc wheel, the housing member having a surrounding wall which forms therein a chamber for receiving the tip portion of the leg member, the surrounding wall of the housing member having a cutout which forms a hook portion of the hook member to receive and guide the pin member so as to engage the hook portion,

the housing member having therein the spring member and a slide plate member which is supported on the spring member, whereby the tip portion of the leg member is guided to the hook portion by sliding on the slide plate member.

5,205,616

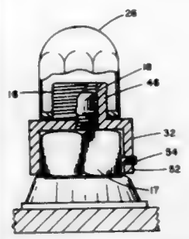
WHEEL TRIM ATTACHMENT SYSTEM USING STUD EXTENDERS

James P. Wright, 1060 Robin Ln., Cookeville, Tenn. 38501

Continuation-in-part of Ser. No. 602,127, Oct. 23, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 822,971

Int. Cl.[5] B60B *7/14*

U.S. Cl. 301—37.37 **6 Claims**



1. A stud extender for use in attaching a trim member on a wheel, said wheel having a stud and corresponding, existing lug nut threadibly receiving said stud, said stud extender having a first side placed proximate to said wheel and a second side placed away from said wheel, said stud extender attached to said stud without removing said existing lug nut, said stud extender comprising:

(a) internal threads which receive said stud;

(b) external threads which extend beyond said stud away from said wheel; and

(c) a basal mounting plate located at said first side of said stud extender, said basal mounting plate separating said trim member from said lug nut.

5,205,617

HUB CAP

Daniel Hoffmann, 2020 Lovewood Dr., Wisconsin Rapids, Wis. 54494

Filed Nov. 6, 1989, Ser. No. 432,239

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—108.1 **31 Claims**

1. A hub cap for use with an oil-lubricated wheel hub, and wherein a hub with which said hub cap is to be associated contains bearings, and defines a primary oil reservoir for lubricating the bearings, said hub cap comprising:

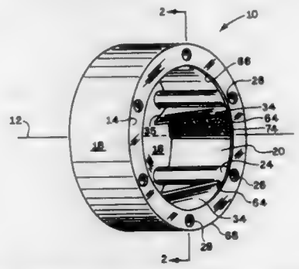
(a) securing means, said securing means including a securing locus for securing said hub cap to a wheel hub,

(b) an outer wall disposed away from said securing locus,

(c) a peripheral connecting wall extending between said outer wall and said securing means,

said hub cap thereby defining an inner space radially within said peripheral connecting wall,

said inner space having a length along a longitudinal axis of said hub cap between said securing locus and said outer wall, portions of said connecting wall being disposed outwardly of said securing locus and way from said longi-



tudinal axis along substantially the entire extent of said axis length,

said securing locus comprising an inner wall adapted to face a wheel hub to which said cap is to be secured, and a plurality of closed bolt channels extending through said inner space and communicating with corresponding holes in said inner wall and said outer wall,

whereby said hub cap defines a secondary oil reservoir, said secondary oil reservoir comprising said outer wall and said peripheral connecting wall, said secondary reservoir being large enough to contain sufficient oil to lubricate a bearing in the hub to which said hub cap is to be secured, until the next daily inspection.

5,205,618

HYDRAULIC BRAKE SYSTEM

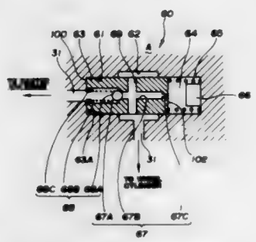
Yukio Sudo, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Jun. 24, 1991, Ser. No. 719,414

Claims priority, application Japan, Jun. 22, 1990, 2-65415[U]

Int. Cl.[5] B60T *15/46*

U.S. Cl. 303—84.1 **11 Claims**



1. A hydraulic brake system comprising:

a master cylinder with a brake pedal;

a wheel cylinder; and

a valve fluidly disposed between said master cylinder and said wheel cylinder,

said valve including a valve bore having a first end wall opening and communicating with said master cylinder and a second end wall closed,

said valve including a plunger slidably disposed in said valve bore and having a first end face opposed to said first end wall of aid valve bore and a second end face opposed to said second end wall of said valve to define therebetween a chamber within said valve bore,

said valve including peripheral wall means interconnecting said first and second end walls to define said valve bore, said wall means being formed with a groove communicable with said wheel cylinder,

said valve including means for permitting restricted fluid flow communication between said chamber and said groove,

said valve including a spring biasing said plunger to a first position wherein said plunger covers said groove,

said plunger having a first pressure acting bore on said first axial end face, which is subject to a first hydraulic fluid pressure from said master cylinder, and a second pressure acting area, on said second axial end face, which is subject to a second hydraulic fluid pressure within said chamber,

said plunger being movable from said first position against said spring in response to a deference between said first pressure and said second pressure and to a second position wherein said plunger uncovers said groove to open fluid flow communication of said groove with said master cylinder.

5,205,619

ELECTRONIC CIRCUIT FOR SURVEILLANCE OF FINAL AMPLIFIER AND ITS LOAD

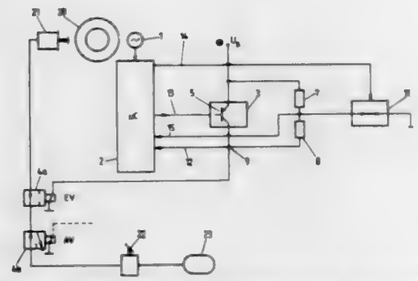
Hans Holst; Klaus Pape, both of Hanover, and Gerhard Ruhnau, Neustadt, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 28, 1990, Ser. No. 573,082

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928651

Int. Cl.[5] B60T *8/32, 17/18*

U.S. Cl. 303—92 **28 Claims**



1. An electronic circuit for surveillance of a final electronic stage and load comprising a load;

a final amplifier comprising a final transistor and wherein the final amplifier is connected to the load;

a microcomputer connected to the final amplifier for a generation of control signals for the load;

a resistor circuit disposed parallel to the final transistor of the final amplifier and connected to the load and to the microcomputer;

an electronic switch connected to the resistor circuit and connected to ground such that the resistor circuit is switched to the ground;

a junction nodal point of the final transistor and of the load allowing scanning of a voltage value present at the junction nodal point and allowing testing of a voltage value for consistency with a proper voltage signal.

5,205,620

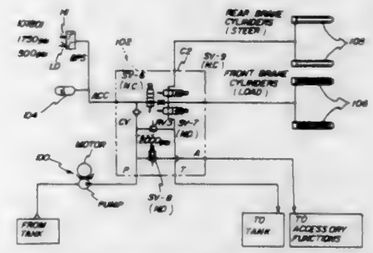
TWO FORCE LEVELS OF MECHANICAL BRAKING FOR MATERIALS HANDLING VEHICLES

Ned E. Dammeyer, and Harold A. Stammen, both of New Bremen, Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Continuation-in-part of Ser. No. 446,269, Dec. 5, 1989, abandoned. This application Sep. 27, 1991, Ser. No. 766,785

Int. Cl.[5] B60T *8/58*

U.S. Cl. 303—100 **10 Claims**



3. Apparatus for controlling the braking force applied to a materials handling vehicle having at least two pairs of wheels, the method comprising

first brake means for applying a first braking force to one pair of wheels,

first actuating means for actuating said first brake means,

second brake means for applying a second braking force to another pair of wheels,

second actuating means for actuating said second brake means,

means for sensing the speed of the vehicle,

means for sensing a demand for the application of braking force,

circuit means responsive to said demand sensing means for controlling the operation of said first actuating means and said second actuating means wherein one of said first and second brake means will be actuated alone when the speed of the vehicle is at or less than a predetermined speed and wherein said first and second brake means will be actuated together when the speed of the vehicle is above a predetermined speed.

5,205,621

BRAKE-PRESSURE REDUCTION MEANS FOR A MOTOR VEHICLE

Patrice Moinard, Montreuil; Philippe Castel, Paris, and Roland Levrai, Stains, all of France, assignors to Bendix Europe Services Techniques, Drancy, France

Filed Nov. 19, 1991, Ser. No. 794,185

Claims priority, application France, Dec. 13, 1990, 90 15609

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—113.5 **3 Claims**

1. A pressure reduction means installed in a brake circuit of the rear axle of a motor vehicle, comprising a master cylinder and at least one monitoring device, said means executing the brake-presaure reduction only in specific circumstances and comprising a regulating piston sliding sealingly in a bore and stressed by at least one spring in an opening direction of a regulating valve, wherein said spring being arranged in a

sealed chamber filled with an incompressible fluid, a solenoid

brake associated with said excessively spinning wheel as

line connection to the brake fluid tank upon brake pedal actua-

frame and said gap, at all times, including times when said

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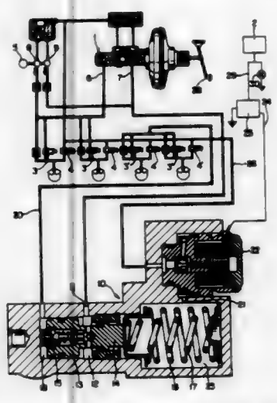
sealed chamber filled with an incompressible fluid, a solenoid valve controling the opening and closing of communication



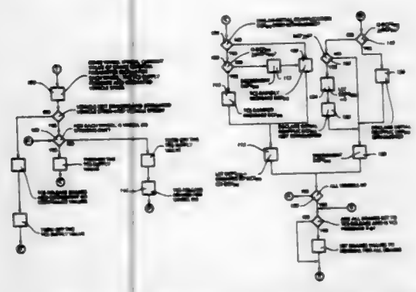
between said chamber and a reservoir of said fluid under low pressure.

5,205,622

VEHICULAR TRACTION CONTROL SYSTEM

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 8, 1991, Ser. No. 652,735
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—113.2 **5 Claims**



1. A method for controlling a vehicular traction control system (**10**) of the type comprising first (**28**) and second (**38**) drive wheels driven by a common open differential (**14**), first (**40**) and second (**42**) foundation brakes for retarding the rotational motion of said first and second wheels, respectively, brake control means (**52**, **68**, **44** and **46**) for independently controlling the operation of said first and second foundation brakes, said control means effective to increase the braking torque of said foundation brakes at either a relatively rapid or a relatively slower rate, means (**48**, **50**) for sensing the value of a brake control parameter indicative of the braking torque applied by said first and second brakes, and first (**36**) and second (**38**) wheel speed sensors for sensing the rotational speed or a time derivative of rotational speed of said first and second wheels, respectively, said method comprising:

sensing that one of said first and second wheels is excessively spinning:

applying the foundation brakes associated with said one excessively spinning wheel to substantially slow the rotation of said excessively spinning wheel;

monitoring the rotational speed or time derivative of rotational speed of said excessively spinning wheel and the value of the brake control parameter of said foundation brake associated with said excessively spinning wheel as said foundation brake associated with said excessively spinning wheel is applied, and sensing and memorizing the value of said brake control parameter (BCP) at the time said excessively spinning wheel is caused to rotate at a rotational speed or time derivative of rotational speed less than a predetermined reference value;

releasing the foundation brakes associated with said excessively spinning wheel, and

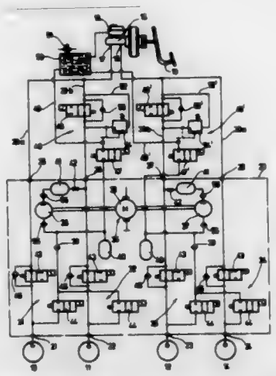
if said one wheel resumes excessively spinning, reapplying the foundation brakes associated with said one wheel at said relatively rapid rate to a target valve (BCPT) of said brake control parameter indicative of braking torque, said target valve (BCPT) of said brake control parameter indicative of braking torque being less than said memorized value of said brake control parameter (BCP) at the time said excessively spinning wheel is caused to rotate at a rotational speed or time derivative of rotational speed less than a predetermined reference value.

5,205,623

HYDRAULIC BRAKE SYSTEM

Roland Holzmann, Stuttgart, and Karl-Heinz Willmann, Freiberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 1, 1991, Ser. No. 786,672
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1990, 4035527
Int. Cl.[5] B60T *8/32*; B60K *28/16*
U.S. Cl. 303—113.2 **28 Claims**



1. A hydraulic brake system with an anti-lock system (ABS) and traction control (ASR) for a motor vehicle, including at least one brake circuit (I, II) having a master brake cylinder with at least one brake circuit outlet for controlling a brake pressure by brake pedal actuation, having a brake fluid tank that communicates with the master brake cylinder of at least one drive wheel, a hydraulic unit connected to the at least one brake circuit outlet, said hydraulic unit has at least one outlet channel for connection of a wheel brake cylinder associated with said at least one drive wheel of the motor vehicle, at least one control valve connected on a first side to the at least one brake circuit outlet via a first connecting line and on a second side to the at least one outlet channel, and a return pump having at least one pump element embodied as self-aspirating, said at least one pump element is connected on an inlet side to the at least one outlet channel via the at least one control valve and on an outlet side said at least one pump element is connected to the first connecting line, at least one valve assembly for furnishing a brake supply pressure in traction control, said at least one valve assembly has a charging valve, which at least in traction control connects the pump element to said brake fluid tank via a second line connection and blocks said second

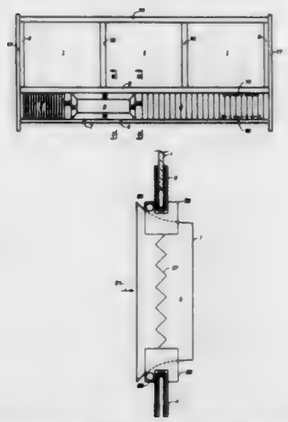
line connection to the brake fluid tank upon brake pedal actuation, and an electromagnetic reversing valve disposed in the first connecting line, said electromagnetic reversing valve blocks the first connecting line in traction control, said charging valve (**47**, **47'**) is embodied as a 2/2-way magnet valve, and that upon traction control, said at least one valve assembly (**46**, **46'**) and said charging valve are triggered in such a manner that for pressure buildup in the wheel brake cylinder (**10**) of the at least one drive wheel (**11**, **12**), the electromagnetic reversing valve (**48**, **48'**) assumes a blocking position and the charging valve (**47**, **47'**) assumes an open position, for pressure holding, each the charging valve (**47**, **47'**), and the electromagnetic reversing valve (**48**, **48'**) assume a blocking position, and for brake pressure reduction, the charging valve (**47**, **47'**) assumes a blocking position and the electromagnetic reversing valve (**48**, **48'**) assumes an open position.

5,205,624

MATERIAL ISOLATION ENCLOSURE

Calvin J. Martell; Joel W. Dahlby; Bradford F. Gallimore, all of Los Alamos, N. Mex.; Bob E. Comer, Versailles, Mo.; Water A. Stone, Los Alamos, and David O. Carlson, Tesuque, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1991, Ser. No. 667,915
Int. Cl.[5] A61G *11/00*
U.S. Cl. 312—1 **1 Claim**



1. An enclosure for isolating material from the atmosphere comprising:

a. an access zone;

b. an access frame which is capable of being moved to a plurality of locations within said access zone, said access frame having an access space through which an operator may insert his hands to manipulate material which is within said enclosure, where said access frame is comprised of members having an airfoil shape, which members are disposed to minimize turbulence at the perimeter of the access space;

c. means for exhausting air from said enclosure; thereby causing air to flow into the enclosure;

d. a gap at the exterior perimeter of said access frame to provide a path for air flow into the enclosure, where a minor portion of the air flow into the enclosure is through said gap and a major portion of the air flow into the enclosure is through said access space in the access frame; and

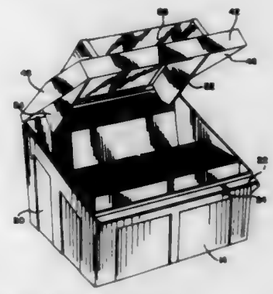
e. at least one flexible curtain which is disposed such that it covers all of said access zone not occupied by said access frame and said gap, at all times, including times when said access frame is being moved.

5,205,625

MULTI-MEDIA FILE

Richard C. Koch, Trabuco Canyon, Calif., assignor to Fellowes Manufacturing Company, Itasca, Ill.

Filed Jul. 26, 1991, Ser. No. 736,719
Int. Cl.[5] A47B *81/06*; B65D *85/57*
U.S. Cl. 312—9.54 **22 Claims**



1. A multi-media tray comprising:

a. a bottom having a front wall, a rear wall, a first side wall and a second side wall opposite the first side wall, each wall extending upward from the bottom, the front wall being opposite to the rear wall and perpendicular to the side walls;

b. a first plurality of spaced apart transverse ridges extending upward from the inside of the bottom along the first side wall of the tray with adjoining ridges defining a first plurality of grooves;

c. a second plurality of spaced apart transverse ridges extending upward form the inside of the bottom along the second side wall of the tray with adjoining ridges defining a second plurality of grooves which correspond to the first grooves; and,

d. at least one removable center insert having a partition member that extends upward from and longitudinally along the approximate center line of a top surface of the insert, the insert further having a plurality of transverse spaced apart ridges extending upward from the top surface, with adjoining ridges defining a plurality of insert grooves such that when the insert is placed in the inside of the bottom at least a portion of the insert grooves correspond to the first and second grooves.

5,205,626

HANGING FILE SYSTEM

Bobby Fotioo, Helena, Ark., assignor to B & L Products, Inc., Helena, Ark.

Filed Apr. 13, 1992, Ser. No. 867,343
Int. Cl.[5] B42F *15/00*; F16B *9/00*
U.S. Cl. 312—184 **20 Claims**

1. A hanging file frame system adapted to be disposed within a drawer for slidably supporting a plurality of conventional, hooked hanging file folders, said system comprising:

a pair of elongated rails adapted to be disposed in parallel, spaced apart relation within said drawer to form opposite upper sides of said system;

a pair of crossmember rods adapted to be disposed in parallel spaced apart relation to each other within said drawer to brace said rails, said rods oriented generally perpendicularly with respect to said rails and forming transverse ends of said system;

a pair of spaced apart hoops hanging portions projecting downwardly from said ends to contact a floor of said drawer to support and elevate said system, said hoops

having outwardly projecting tangs substantially parallel

longitudinal anti-tip retainer disposed forwardly of said

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MOBILE CABINET

tion, said inner corner member embracing and snapping partially around one of said corner posts, said inner corner

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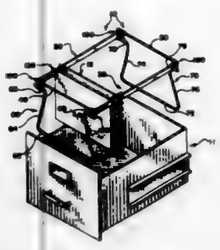
having outwardly projecting tangs substantially parallel with said rods, and,

joint support means for rigidly establishing corners of said system, said joint support means perpendicularly joining



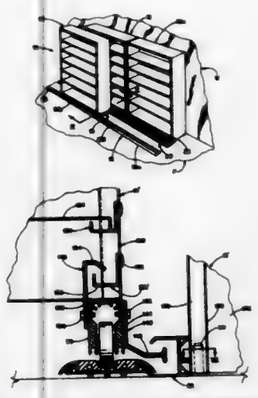
said rods to said rails, perpendicularly joining said hoops to said rails, and maintaining said rods in spaced apart, generally coplanar relation with said downwardly projecting portions of said hoops.

5,205,627

MODULAR ANTI-TIP LATERAL MOBILE STORAGE SYSTEM

Thomas R. Davison; Philip M. Croel, and Alan R. Leist, all of Grand Rapids, Mich., assignors to Ripp Mobile System, Inc., Grand Rapids, Mich.

Filed Mar. 14, 1991, Ser. No. 670,187
Int. Cl.[5] A47B *53/00*
U.S. Cl. 312—201 **22 Claims**



1. An anti-tip mobile storage system comprising:

at least one fixed storage unit having a front and a back, said front disposed forwardly of said back, said back disposed rearwardly of said front;

at least one mobile storage unit disposed forwardly of said front of said fixed storage unit;

a first track disposed forwardly of said front of said fixed storage unit and a second track disposed forwardly of said first track;

carriage supported on said tracks and movably carrying said mobile storage unit longitudinally along said first and second tracks;

an underlayment having a base supported by a supporting surface, said underlayment being elongated in the direction of movement of said carriage and having a foot extending rearwardly form aid base and under said front of said fixed storage unit with the weight of said fixed storage ,unit bearing down on said foot, an arm extending forwardly form said base under said first track, and a longitudinal anti-tip retainer disposed forwardly of said fixed storage unit and rearwardly of said mobile storage unit;

an underlayment engagement fixed to said carriage and extending rearwardly from said carriage, said underlayment engagement cooperatively engaging said longitudinal anti-tip retainer to arrest tipping of said mobile storage unit; and

means for retaining said mobile storage unit on said carriage;

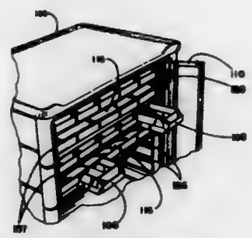
whereby said underlayment engagement engages said longitudinal anti-tip retainer when said mobile storage unit is tipped forwardly away form said fixed storage unit.

5,205,628

PHARMACEUTICAL CABINET LOCKING ARRANGEMENT

Mark D. Swets, Grand Rapids; George A. Williams, Hudsonville, and Steven F. Goodman, Wyoming, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Continuation of Ser. No. 766,623, Sep. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 521,640, May 10, 1990, Pat. No. 5,069,511. This application Sep. 23, 1992, Ser. No. 950,976
Int. Cl.[5] E05B *65/46*
U.S. Cl. 312—216 **18 Claims**



1. A pharmaceutical cabinet comprising:

a housing having a pair of side walls in spaced-apart relationship and an open front;

a support shelf mounted horizontally between said side walls and having a front edge and an upper surface;

a plurality of pharmaceutical dispensing bins supported on said upper surface of said shelf in a side-by-side relation and removable from said shelf by sliding said bins in a direction substantially perpendicular to said front edge; and

cooperating bin and cabinet locking bars mounted to said housing and extending substantially in mutually perpendicular directions;

said bin locking bar having an elongated cross section and rotatable about an axis of rotation extending in a direction substantially parallel to said front edge, said axis disposed frontally to said shelf and at approximately the same horizontal level as said shelf, said bin locking bar rotatable to a releasing position wherein a longer dimension of said elongated cross section extends in a direction parallel to said direction of sliding of said bins for sliding removal of said bins, said bin locking bar being further rotatable about said axis to a locking position wherein said longer dimension extends above said shelf upper surface for restraining removal of said bins; and

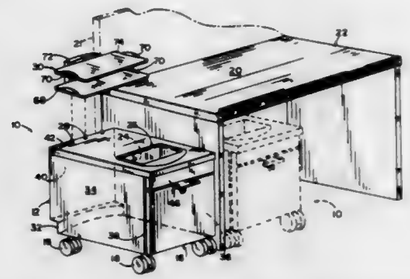
said cabinet locking bar is selectively movable to a position frontal with respect to said housing for blocking rotation of said bin locking bar and to maintain said bin locking bar in said locking position, and to another position free from interference with said bin locking bar to permit rotation of said bin locking bar to the releasing position.

5,205,629

MOBILE CABINET

George J. Simons, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 27, 1991, Ser. No. 676,095
Int. Cl.[5] A47B *91/00*
U.S. Cl. 312—249.9 **9 Claims**



1. A mobile storage unit for office workstations, and the like, comprising:

a cabinet having a rigid exterior and a hollow interior shaped to receive and store objects therein, said cabinet including a top with an upper surface thereof positioned to be received underneath a worksurface of an associated workstation for storage;

a drawer slideably mounted in said cabinet for fore-to-aft movement therein to selectively access the interior of said cabinet;

means for movably supporting said cabinet on a floor surface to enable said storage unit to be readily manually translated over the floor surface between remote work area;

a recess positioned in the top of said cabinet, and extending through the upper surface thereof to define a top marginal edge;

a plurality of amenity trays, each having means for equipping the associated workstation, at least one of said amenity trays being shaped to be individually dropped into said recess, and be removable supported in a hanging fashion from the marginal edge of said recess to personalize said storage unit for selected tasks;

means for locating located along the width of said top and near a rear edge thereof; and

at least one of said amenity trays being of a second type having a lower end thereof with means for engaging said means for locating in said top, said second type amenity tray further having an upper and thereof with means for equipping said cabinet, said means for engaging being shaped to closely engage said means for locating in said top to securely yet removably locate said one second type amenity tray, whereby one or more of said second type amenity trays can be arranged and detachably located on said top along said rear edge of said to personalize said cabinet.

5,205,630

MULTIPLE PURPOSE, KNOCK-DOWN MODULAR STORAGE SYSTEM AND METHOD OF ASSEMBLING SAME

Robert J. Welch, Dallas; Willard J. Sickles, Dalton, and Douglas J. Kaminski, Wilkes-Barre, all of Pa., assignors to Inter-Metro Industries Corporation, Wilkes-Barre, Pa.

Filed Apr. 5, 1991, Ser. No. 680,333
Int. Cl.[5] A47B *91/00*
U.S. Cl. 312—249.11 **22 Claims**

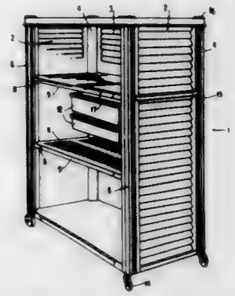
15. A modular utility storage system, comprising:

a plurality of substantially vertical corner posts;

a plurality of beams each interconnecting two of said corner posts;

an inner corner member having a generally C-shaped section, said inner corner member embracing and snapping partially around one of said corner posts, said inner corner member being formed with a notch on an outer surface of said C-shaped section and including at least one opening for receiving fastening means;

an outer corner member formed to mate with said inner corner member to at least partially envelop said corner post, said outer corner member including a protrusion



engageable with said notch, and at least one opening aligned with said opening in said inner corner member when said outer corner member and inner corner members are mated; and

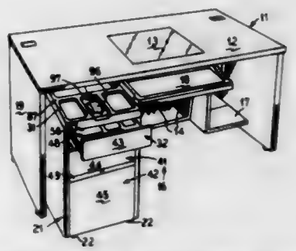
a panel having an end portion located between said outer corner member and inner corner member, said end portion having an opening aligned with the openings in the outer corner member and inner corner member and through which fastener means can pass.

5,205,631

PLATFORM STRUCTURE FOR DRAWERS AND WORKING SURFACES

Thomas Wegman, and John N. Lechman, both of Effingham, Ill., assignors to Nova Manufacturing & Assembly, Inc., Effingham, Ill.

Filed Oct. 10, 1991, Ser. No. 774,416
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.3 **12 Claims**



1. A platform assembly for incorporation into a drawer or the like comprising in combination:

a) a formed sheet member defining a platform with a front face, an opposed back face and opposing sides, and having at least one recess defined in said front face, said platform and said recess(es) each having respective perimeters defined by upstanding rib-like proejctions in said front face, and said rib-like projections being downturned along portions of said opposing sides to define peripheral wall portions extending downwardly to locations below said platform perimeter;

b) a frame means defining support for said platform and

having a rear face, an opposed forward face, and peripheral opposed edge portions, and further having a generally

source, reflector and casing upon the first and second casing parts being disassembled from each other,

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VEHICLE ACCESSORY BODY AND INTEGRAL CIRCUIT

5,205,637

TOUCH OPERATED LIGHTING ATTACHMENT

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having a rear face, an opposed forward face, and peripheral opposed edge portions, and further having a generally flattened configuration, said forward face being in abutting engagement with areas of said back face that are generally opposite said recess(es), and at least some area of said edge portions being in abutting engagement with back face areas of said peripheral wall portions; and

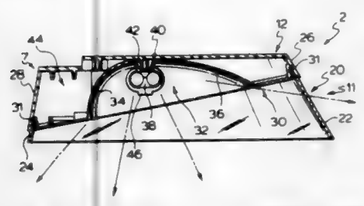
c) adhesive means bonding together at least some of said areas of abutting engagement.

5,205,632

UNDERCABINET LAMP

Jonathan Crinion, Toronto, Canada, assignor to Esmond Manufacturing Inc., Scarborough, Canada

Filed Jun. 5, 1992, Ser. No. 894,614
Int. Cl.[5] F21M *3/20*; F21V *7/14*
U.S. Cl. 362—33 **15 Claims**



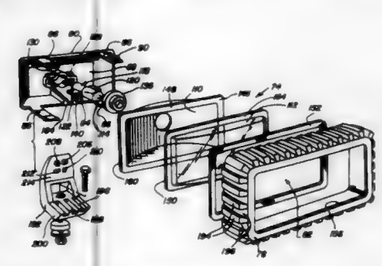
1. A task light comprising a base releasably securable to a support surface, a light reflector cavity shaped to provide different zones of light intensity, a longitudinal light source positioned within said cavity, a peripheral rim member of varying surface area about the lamp base which further diffuses the light by reflecting a portion of the light and allowing a portion of the light to pass therethrough.

5,205,633

VEHICLE LAMP WITH UNIVERSAL MOUNTING CAPABILITY

George C. Kasboske, 2820 N. Whipple, Chicago, Ill. 60618

Continuation-in-part of Ser. No. 615,446, Nov. 19, 1990, Pat. No. 5,146,392, which is a division of Ser. No. 297,265, Jan. 18, 1989, Pat. No. 4,972,301. This application May 20, 1991, Ser. No. 703,275
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **15 Claims**



1. A vehicle lamp comprising:

an illumination source;

a reflector for focusing light from the illumination source;

a casing having first and second joinable parts;

means on the first and second casing parts for snap-fitting the first and second casing parts into assembled relationship; and

cooperating means on the illumination source, reflector and first and second casing parts for maintaining the illumination source, reflector and casing in operative relationship with the first and second casing parts in assembled relationship and for permitting separation of the illumination source, reflector and casing upon the first and second casing parts being disassembled from each other,

wherein a resilient gasket is captively interposed between the illumination source and the reflector with the first and second casing parts snap-fit into assembled relationship,

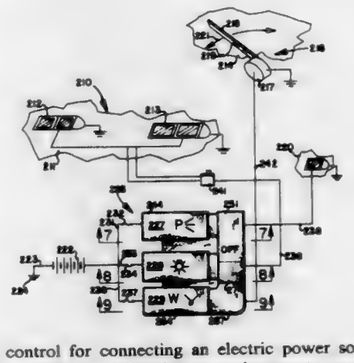
there being cooperating means on the resilient gasket, first and second casing parts, illumination source and reflector for biasing the resilient gasket sealingly against the reflector as an incident of the first and second casing parts being placed in assembled relationship.

5,205,634

COMBINED HEADLIGHT AND WINDSHIELD WIPER CONTROL

Lewis L. Ruter, 919 W. Broadway, Minneapolis, Minn. 55411

Continuation-in-part of Ser. No. 763,282, Sep. 20, 1991, Pat. No. 5,130,905, which is a continuation-in-part of Ser. No. 615,355, Nov. 6, 1990, Pat. No. 5,051,873. This application Feb. 10, 1992, Ser. No. 833,698
Int. Cl.[5] B60Q *1/00*; H01H *21/6*
U.S. Cl. 362—61 **15 Claims**



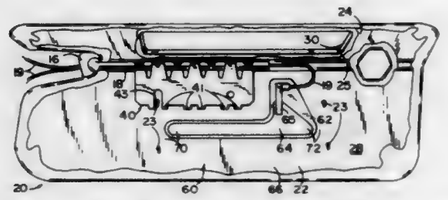
1. A control for connecting an electric power source to vehicle headlights and electric powered means to operate the windshield wiper means of the vehicle only when the headlights are ON comprising: windshield wiper switch means connected to said electric power source having windshield wiper actuator means selectively movable to ON and OFF conditions to control the operation of the electric powered means to operate the windshield wiper means, headlight switch means operable to selectively switch means having headlight actuator means selectively moveable to ON and OFF positions to turn the headlights ON and OFF, said windshield wiper actuator means and headlight actuator means having coacting means operable to move the headlight switch actuator means to the ON position when the windshield wiper actuator is moved to the ON position whereby the electric powered means operated the windshield wiper actuator means to the OFF position when the headlight actuator means is moved to the OFF position thereby terminating the operation of the electric powered means and turning the headlights OFF, said wiper actuator means includes a wiper actuator having a wiper ON arm and a wiper OFF arm, first pivot means pivotally mounting the wiper actuator for movement between ON and OFF positions, the headlight actuator means includes a headlight actuator located adjacent the wiper actuator having a headlight ON arm and a headlight OFF arm, second pivot means pivotally mounting the headlight actuator for movement between ON and OFF positions, said wiper OFF arm having a lateral projection extended under the headlight OFF arm and engageable with the headlight OFF arm whereby movement of the wiper actuator to the ON position moves the headlight actuator to the ON position.

5,205,635

VEHICLE ACCESSORY BODY AND INTEGRAL CIRCUIT

Kim L. Van Order, Hamilton, and Nels R. Smith, Holland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Continuation-in-part of Ser. No. 548,024, Jul. 5, 1990, Pat. No. 5,091,831. This application Apr. 19, 1991, Ser. No. 688,913
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.
Int. Cl.[5] B60Q *3/00*
U.S. Cl. 362—83.1 **15 Claims**



1. A visor including an electrical accessory mounted thereto, said visor comprising:

a substrate formed in the shape of a visor body, said substrate including a layer made of an electrically insulating material and a layer of conductive material attached to said insulating material, said conductive material defining an electrical circuit on a surface of said insulating layer which is located within a visor formed by said body;

an electrical accessory mounted to said visor body and including contact means which electrically engage said circuit of said substrate for receiving at least operating power therefrom; and

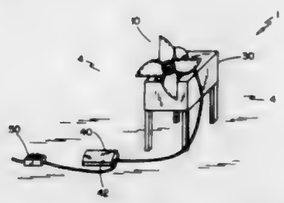
means for supplying electrical operating power to said electrical circuit, wherein said body is defined by a folded core of said substrate and wherein said circuit is positioned on an inner surface of said body when said core is folded to define said visor body.

5,205,636

ROTATING DISPLAY

Duane P. Carpenter, 3643 Lavell Dr., Los Angeles, Calif. 90065

Filed Jun. 5, 1992, Ser. No. 894,463
Int. Cl.[5] F21V *9/16*
U.S. Cl. 362—84 **14 Claims**



1. A rotating display, having a front, back, two sides, top and bottom, comprising:

a platform;

a rotating blade apparatus mounted on said platform;

a black light shining on said blade apparatus; and

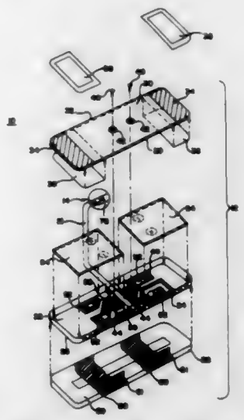
a control mechanism connected to said blade apparatus and said black light for determining the speed of rotation of said blade apparatus and the intensity of said black light.

5,205,637

TOUCH OPERATED LIGHTING ATTACHMENT

Fred Caspari, 2929 Ridge Rd., Long Beach, Ind. 46360

Filed Feb. 14, 1992, Ser. No. 836,103
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—109 **14 Claims**



1. A lightweight and portable touch activated flashlight apparatus for illuminating the keyboard of a remote control device, comprising:

a mounting box consisting of an upper cover panel, and internal circuit board, and a lower cover panel;

said upper cover panel having an outer surface, an inner surface and fastening means for fastening at least one magnet to said inner surface of said upper cover panel;

said at least one magnet being configured and arranged when fastened to said inner surface of said upper cover panel to releasably affix the flashlight apparatus to the remote control device;

means extending downwards through said upper cover panel for releasably securing said upper cover panel to said internal circuit board;

a support stem mounted to said mounting box for placement of a distal end over different selected portions of said keyboard;

a light source supported by said support stem for direction of the light over said different portions of said keyboard;

touch activated switching means integrally formed on said internal circuit board for switching on said light source when the apparatus is held by the user; and

an energy means connected to said light source through said switching means for providing the requisite amount of voltage for powering said light source.

5,205,638

LIGHTED MERCHANDISE SHELVES

Anthony C. Squitieri, Norwalk, Conn., assignor to Mechtronics Corporation, Stamford, Conn.

Filed Jul. 29, 1992, Ser. No. 921,218
Int. Cl.[5] A47F *11/10*
U.S. Cl. 362—125 **7 Claims**

1. A shelving bank formed of a plurality of shelving units wherein the line of juncture between the shelving units is substantially concealed, said shelving bank including

at least two shelving units, each said shelving unit including a plurality of shelves, said shelving units being joined together with said shelves in adjacent said shelving units being in smooth abutting relationship, whereby boxes of merchandise can be placed over the areas of said abutting relationship,

light plenums under at least one of said shelves of said shelving units, each, said light plenum extending the length of

molded in said molded plastic base core member for movement from a closed position covering said vanity

5,205,641

SOCKET FOR A MINIATURE INCANDESCENT LAMP

Paul Albrecht, Stauffenbergstrasse 43, D-8600 Bamberg, Fed.

said double ended lamp secured at one end to said cap with an adhesive, wherein

said front edge is provided, at a front end face, with lower

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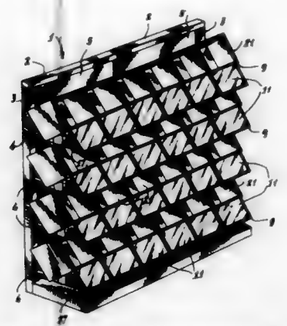
light plenums under at least one of said shelves of said shelving units, each, said light plenum extending the length of its respective said shelf and having a front and a bottom, so that light plenums of adjacent said shelving units are adjacent to one another and abut one another,

each said light plenum including a light source extending for



substantially the length of said light plenum, light panels, mounting means to receive said light panels along the front of said light plenums, and said mounting means of adjacent said plenums providing for said light panels to bridge the point of abutment of said light plenums,

whereby the line of juncture between adjacent said shelving units is substantially concealed.

5,205,639

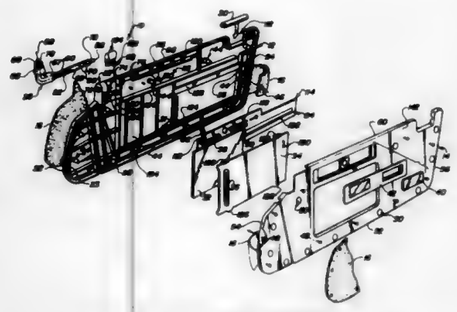
VEHICULAR SUN VISOR ASSEMBLY

Jay E. White, 4079 Willoway Pl., Bloomfield Hills, Mich. 48013, and Jay R. White, 4388 Lehigh Dr., Troy, Mich. 48098

Division of Ser. No. 576,357, Aug. 31, 1990, Pat. No. 5,054,839. This application Jul. 22, 1991, Ser. No. 733,298

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—137 **17 Claims**



1. A vehicular visor assembly comprising:

a molded plastic base core member having a longitudinally extending top, a longitudinally extending bottom and generally transverse sides,

a socket molded adjacent the longitudinally extending top and one of said transverse sides of said molded plastic base core member;

a pivot rod received in said socket;

a torque spring surrounding said pivot rod being preloaded and contained in said molded plastic base core member;

a circuit board mounted in said molded plastic base core member having a switch integral therewith and a part of a lighting circuit contained on said circuit board;

a vanity mirror mounted in said molded plastic base core member,

a sliding door mounted in longitudinally extending guides molded in said molded plastic base core member for movement from a closed position covering said vanity mirror to an open position exposing said vanity mirror for use and concealing said sliding door within said vehicular visor assembly, said sliding door having a switching element which contacts said switch to close it as said sliding door is moved from its closed to its open position;

at least one lamp connected with said lighting circuit and a lens for directing light from said lamp towards an object to be observed in said vanity mirror;

a molded plastic cover core member having an access opening providing access to said sliding door and underlying vanity mirror; and

a plurality of spaced complimentary locking means adjacent the peripheries of said molded plastic base core member and said molded plastic cover core member for snap locking said molded plastic cover core member to said molded plastic base core member.

5,205,640

MINIATURE FLASHLIGHT

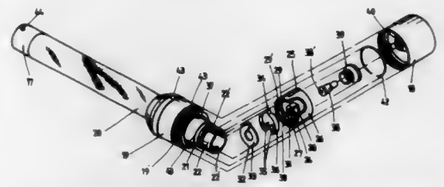
Yong-Mik Shin, Seoul, Rep. of Korea, assignor to Nuri Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 28, 1991, Ser. No. 782,983

Claims priority, application Rep. of Korea, Apr. 11, 1991, 91-4944

Int. Cl.[5] F21L *7/00, 15/00*

U.S. Cl. 362—205 **13 Claims**



1. A flashlight comprising:

an electrically conductive casing adapted to hold a battery therein, said battery having positive and negative electrodes, said negative electrode electrically communicating with said casing;

a head assembly rotatably mounted on one end of said casing so as to rotate in a clockwise or counterclockwise direction;

an insulating rotatable member received between said casing and said head assembly, said rotatable member being rotatable with said head assembly;

a bulb mounted in said rotatable member, said bulb having positive and negative terminals;

means on said rotatable member for establishing electrical communication between the positive electrode of said battery and the positive terminal of said bulb; and

rotary switch means comprising first contact means on said rotatable member and second contact means rotatable with said casing, said first contact means being in electrical communication with the negative terminal of said bulb and said second contact means being in electrical communication with the negative electrode of said battery,

said switch means being operated by rotating said head assembly relative to said casing wherein said first contact means contacts said second contact means at one of a plurality of predetermined circumferential locations irrespective of the direction of rotation of said head assembly.

5,205,641

SOCKET FOR A MINIATURE INCANDESCENT LAMP

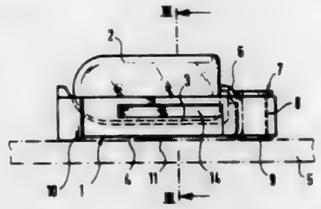
Paul Albrecht, Stauffenbergstrasse 43, D-8600 Bamberg, Fed. Rep. of Germany

Filed May 21, 1991, Ser. No. 703,522

Claims priority, application Fed. Rep. of Germany, May 26, 1990, 4017131

Int. Cl.[5] H01R *33/00*

U.S. Cl. 362—226 **26 Claims**



1. A miniature incandescent lamp assembly for contact mounting on a printed circuit board comprising a socket having an elongate recess, a miniature incandescent cylindrical lamp disposed in said recess, said socket having a bottom adapted to be disposed juxtaposed to a printer circuit board, said recess having a longitudinal axis that is parallel to said bottom, said recess being substantially fully open on the side of said axis that is opposite said bottom for at least a part of the length of said recess, said cylindrical lamp having an axis parallel to said bottom, electrical contact means extending from said lamp, and mounting means mounting said contact means on said socket such that a part of said contact means extends along a part of said bottom of said socket for contact with mating contacts on said circuit board.

5,205,642

MIRROR AND LAMP ASSEMBLY

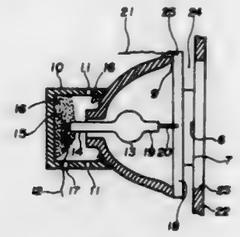
Kenzo Kai, Numazu, and Mitsuo Horikoshi, Mishima, both of Japan, assignors to Ushio Denki, Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 784,189

Claims priority, application Japan, Oct. 30, 1990, 2-290789; Mar. 11, 1991, 3-69430

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—341 **2 Claims**



1. A lamp assembly comprising:

a mirror which includes a front edge having an engaging mechanism for mounting to another apparatus, a cylindrical portion into which a double ended lamp can be inserted and positioned at a distance spaced apart from an inner surface of the cylindrical portion, and a central portion formed into a reflector surface, said mirror being integrally formed;

a cap secured to said mirror to cover the cylindrical portion and having at least one of a ventilating hole and a ventilating cutout;

said double ended lamp secured at one end to said cap with an adhesive, wherein

said front edge is provided, at a front end face, with lower portions at two places, each having a lead groove, and a higher portion having a positioning groove and a wall of said front edge around at least one of said lead grooves is formed with a thickness reduced inwardly from outside; and

a rigid metal member placed to extend between the lead grooves, a covered wire connected to said metal member in a recess of the thinner wall portion of said front edge, another covered wire connected to an external lead bar extending from the one end of said lamp, and another external lead bar extending from another end of said lamp connected to said metal member.

5,205,643

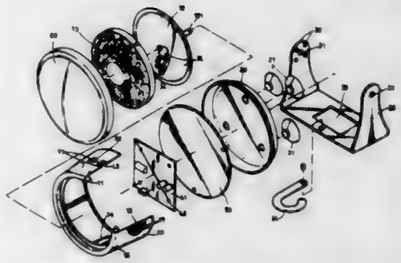
LIGHTING EQUIPMENT

Steve Lin, No. 304, Chung Cheng South Road, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Oct. 9, 1992, Ser. No. 958,921

Int. Cl.[5] F21Y *21/08, 21/30*

U.S. Cl. 362—371 **3 Claims**



1. A lighting device comprising a cylindrical housing including a front portion having an annular flange provided therein and a rear portion and including a pair of shafts oppositely extended therefrom, a reflector received in said front portion of said housing and engaged with said annular flange, a cap received in said front portion of said housing and engaged with said reflector, a light bulb disposed on said reflector, a lid engaged on said rear portion of said housing, at least one suction cup attached to said lid for attaching said lighting device to any suitable surface, an electric means disposed in said housing and electrically connected to said light bulb for controlling said light bulb, and a bracket including a pair of lugs extended therefrom for engagement with said shafts of said housing and arranged such that said housing is rotatable about said shafts, at least one first engaging means formed beside said shafts of said housing, and at least one second engaging means formed in said lugs for engagement with said first engaging means of said housing in order to couple said housing relative to said bracket in any suitable angular position.

5,205,644

RELAMPABLE CHANDELIER BASKET

George Bayer, Plattsburg, and Daniel Tucker, Chazy, both of N.Y., assignors to A. Schonbek & Co., Plattsburgh, N.Y.

Filed Jul. 3, 1991, Ser. No. 725,634

Int. Cl.[5] F21S *1/06*

U.S. Cl. 362—405 **29 Claims**

1. A chandelier of the type carrying a plurality of trimming comprising:

an upper framework carrying some of the trimmings and defining an interior, and

a lower framework carrying other of the trimmings,

wherein the upper and lower frameworks are moveable and detachably securable at two discrete positions with re-

spect to one another, one of the discrete positions with

from the two hand driving screws; said handle bail providing convenience to customers upon removal of said halogen flood

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5,205,647

FLUID MIXING APPARATUS AND METHOD OF MIXING

supersonic velocity is brought to an end pressure as a one-phase mixture by means of the shock wave.

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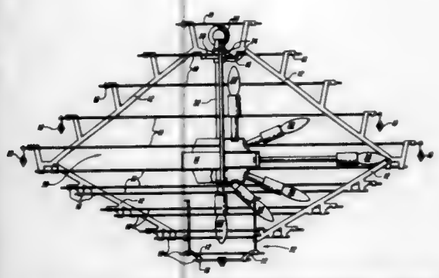
spect to one another, one of the discrete positions with respect to one another, one of the discrete positions being a first position in which the trimmings form a predetermined decorative pattern and the other being a second position in which the predetermined decorative pattern is interrupted by separation of the trimmings on the upper framework from the trimmings on the lower framework, thereby providing an opening between the trimmings permitting access to the interior.

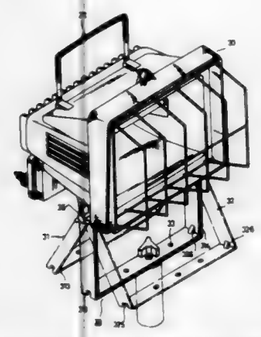


5,205,645

HALOGEN FLOOD LIGHT WITH A FOLDAWAY STAND

Jin T. Lee, No. 65, Tan-Fu Rd. Sec. 2, Ta-Feng Tsun, Tan-Tgu, Taichung Hsien, Taiwan

Filed Feb. 3, 1992, Ser. No. 829,269
Int. Cl.[5] F21S *1/10*
U.S. Cl. 362—431 **1 Claim**



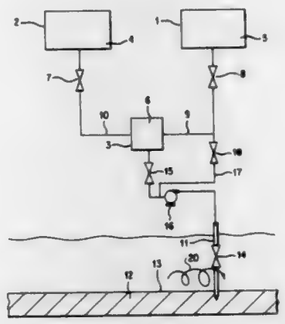
1. A foldaway stand of a halogen flood light comprises a foldaway stand, a lamp head with two spiral holes on the lateral sides near a bottom portion of the lamp head, and a handle bail on top of the lamp head wherein; said foldaway stand is comprised of two U-shape legs with more than one round through holes on a bottom portion of two U-shape legs at respective positions, two round through holes near the top ends in associated with two triangular positioning lugs at the bottom corners on an outsider leg and two oblong through holes with a crescent piece near one top end in cooperated with recessed notches at the bottom corners on an insider leg; said two oblong through holes near the top ends of said insider leg to be sliding to and fro on two hand driving screws fastening to said two spiral holes for obtaining various illuminative angles for said lamp head; said two round through holes near the top ends of said outsider leg serving merely the engagement of said foldaway stand to said lamp head; said two triangular positioning lugs in cooperated with said recessed notches at the bottom corners of said insider leg providing a firm folding up to said foldaway stand; said crescent piece at one top end of said insider leg serving as a fulcrum to keep said two U-shape legs from overflattening and sharing most tensions from the two hand driving screws; said handle bail providing conveniency to customers upon removal of said halogen flood light; said more than one round through holes on the bottom portion of said two U-shape legs being prepared ready for connection of successive support.

5,205,646

METHOD FOR CONVEYANCE OF CEMENT UNDER WATER TO FORM CONCRETE

David M. Kyllonen, 405 Snowflake Cir., Jeffersonville, Pa. 19403, and Charles F. Kyllonen, 2592 Ashurst Rd., University Heights, Ohio 44118

Filed Dec. 19, 1991, Ser. No. 810,203
Int. Cl.[5] B28C *5/06*
U.S. Cl. 366—3 **4 Claims**



1. A method for the in situ information of concrete within a hydrated aggregate mass in a subsurface region under water, which method comprises:

a) creating a suspension of cement particles in a nonreactive, environmentally safe liquid vehicle, by

i) conveying said nonreactive, environmentally safe liquid vehicle into a mixer;

ii) conveying cement to said mixer; and,

iii) mixing said nonreactive, environmentally safe liquid vehicle and cement together until particles of said cement are suspended in the liquid vehicle;

b) conveying the suspension of step (a) to a subsurface aggregate mass at an underwater placement site through a feed pipe having an outlet end within said aggregate mass;

c) diffusing said suspension into said aggregate mass, by

i) inserting the outlet end of said feed pipe into the subsurface aggregate mass to a preferred depth;

ii) continuously discharging said suspension through the outlet end of said feed pipe; and,

iii) continuously moving said feed pipe through the aggregate mass in a controlled manner, thereby providing agitation;

d) permitting said nonreactive, environmentally safe liquid vehicle to disperse from said suspension into the surrounding water; and,

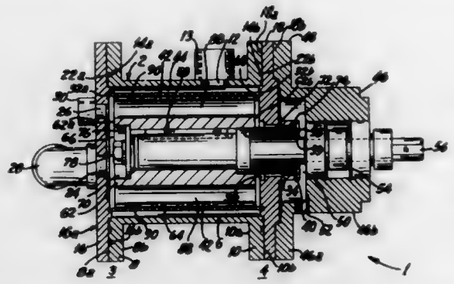
e) permitting the cement to react with water in the aggregate mass, thereby causing the mixture of cement, water, and aggregate to become concrete within the subsurface region of an underwater placement site.

5,205,647

FLUID MIXING APPARATUS AND METHOD OF MIXING

Ronald J. Ricciardi, Woodclifflake, N.J., assignor to Acrison, Inc., Moonachie, N.J.

Filed Oct. 9, 1991, Ser. No. 773,419
Int. Cl.[5] B01F *5/12*
U.S. Cl. 366—176 **20 Claims**



1. An apparatus for mixing at least a first fluid and a second fluid comprising:

a hollow cylindrical casing;

inlet means for injecting the first fluid and the second fluid into the hollow portion of the casing;

a drive shaft rotatably mounted coaxially within the casing;

a cylindrical rotor fixedly mounted on the drive shaft within the casing and coaxial with the casing;

a cylindrical sleeve fixedly mounted within the casing and coaxial with the casing wherein the sleeve encloses the rotor and the inlet means;

at least two cylindrical bores running through a significant portion of the length of the rotor wherein the bores are parallel to the axis of the casing;

at least one conduit leading from each bore to an outer wall of the rotor; and

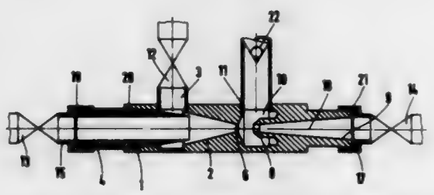
at least one slot in the sleeve.

5,205,648

METHOD AND DEVICE FOR ACTING UPON FLUIDS BY MEANS OF A SHOCK WAVE

Vladimir V. Fisseako, Moscow, U.S.S.R., assignor to Transsonic Uberschall-Anlagen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 5, 1991, Ser. No. 755,050
Claims priority, application Bulgaria, Sep. 6, 1990, 92 795
Int. Cl.[5] B01F *15/02, 5/02*
U.S. Cl. 366—177 **6 Claims**



1. Method for acting upon fluids by means of a shock wave, wherein

a two-phase mixture comprising at least two fluids, which is supplied with subsonic velocity, is accelerated to its sound velocity,

the two-phase mixture is expanded to its supersonic velocity and

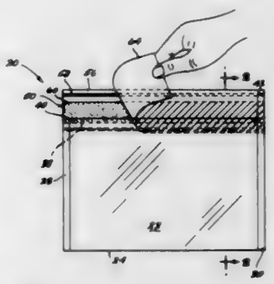
the two-phase mixture accelerated by said expansion to supersonic velocity is brought to an end pressure as a one-phase mixture by means of the shock wave.

5,205,649

LEAKPROOF PACKAGING

Murray G. Fullerton, Redmond, Wash., assignor to Trigon Packaging Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 575,064, Aug. 29, 1990. This application Nov. 9, 1990, Ser. No. 612,213
Int. Cl.[5] B65D *33/18, 33/34*
U.S. Cl. 383—5 **7 Claims**



1. A self-sealing, fluidtight bag having a bottom margin, side edges and an upper end, said bag comprising:

a main body component fabricated of a flexible, impervious sheet material, said main body component having front and back walls and bottom and side margins and outer sides which are integrated along said bottom and side margins to define a compartment open at the upper end of the bag, said front and back walls having upper edges which both coincide with the upper end of the bag;

a closure which extends from one side edge of the bag to the other, is integrated at a bottom margin thereof with one of said walls on the outer side thereof, and is displaceable over the upper end of the bag and into sealing engagement with the outer surface of the other wall,

said bag having at least one line of adhesive extending from one side edge of the bag to the other side edge thereof for sealing said closure to said other of said walls coincident with its being brought into sealing engagement with said other wall, said line of adhesive also sealing said closure to said one wall when said closure is brought into sealing engagement with the other side wall to thereby promote the formation of a liquidtight seal at the upper end of the bag;

the front and back walls of the bag being integrated by seams which extend continuously from the bottom margin of the bag to the upper end thereof at both of the side edges of the bag; and

said seams so increasing in width over a span which is: (a) between the upper end of said bag and a level spaced downwardly from that end, and (b) overlaid by said line of adhesive as said closure is brought into sealing engagement with said other bag wall as to, (c) provide fluidtight seals at the upper end of the bag and at the side margins thereof between: (d) the front and back walls of the bag and (e) the closure and said other wall of the bag.

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TUBULAR BAG WITH SHOCK ABSORBER BAND TUBE

lines for defining edges of the formed container; and thereafter,

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BEARING ASSEMBLY AND SUBMERSIBLE

said side channel pump is positioned on the same shaft as the bearing to be lubricated; and

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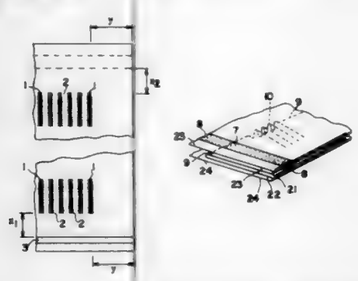
5,205,650

TUBULAR BAG WITH SHOCK ABSORBER BAND TUBE FOR MAKING SUCH BAG, AND METHOD FOR ITS PRODUCTION

Ole-Bendt Rasmussen, 23, Forchwaldstrasse, CH 6318 Walchwil, Switzerland

PCT No. PCT/GB89/00394, § 371 Date Dec. 13, 1989, § 102(e) Date Dec. 13, 1989, PCT Pub. No. WO89/10312, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 17, 1989, Ser. No. 435,471
Claims priority, application United Kingdom, Apr. 18, 1988, 8809077.4
Int. Cl.[5] B65D *33/00, 30/10*
U.S. Cl. 383—107 29 Claims



1. A tube for forming a tubular bag closed at at least one end by a generally transverse seam at a predetermined generally transverse locus along the length of the tube, said seam resulting in a rupture zone adjacent thereto which is susceptible to rupture when subjected to impact stress, said tube being formed of generally continuous orientable thermoplastic polymeric material, the film material of said tube including adjacent the predetermined locus of said rupture zone a shock-absorbing band of limited depth perpendicular to said predetermined locus which is separated from said locus by a region of unstretched film material and extends in width over a significant portion of the transverse dimension of the tube, said shock absorbing band comprising:

a plurality of discrete stretched zones of film material stretched in a direction generally perpendicular to the locus and alternating one by one with a plurality of generally narrow stripes of substantially unstretched film material with the stripes extending lengthwise in substantially the same generally perpendicular direction,

whereby impact stress forces applied to the tube material adjacent said rupture zone are transmitted away from said rupture zone and absorbed by said shock absorber band to thereby significantly improve the resistance of the tube to impact stress applied to said rupture zone.

5,205,651

CONTAINER MADE OF SYNTHETIC MATERIAL WITH IMPROVED RIGIDITY

Laurent Decottignies, and Daniel Chatourel, both of Vittel, France, assignors to Société Generale des Eaux Minerales de Vittel, Vittel, France

Division of Ser. No. 499,330, Jul. 26, 1990, Pat. No. 5,097,651.
This application Mar. 6, 1992, Ser. No. 846,819
Claims priority, application France, Sep. 26, 1988, 88 12717
Int. Cl.[5] B65D *33/02*
U.S. Cl. 383—119 8 Claims

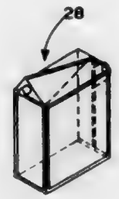
1. A flexible container of improved stiffness and shaped as a parallelepiped for enclosing a liquid to be packaged, produced according to a process comprising the steps of:

drawing a first plastic film from a first supply;

drawing a second plastic film from a second supply so that the second film is caused to overly a first surface of the first film;

securing the second film to the first film by welding the second film to the first film along a plurality of spaced lines for defining edges of the formed container; and thereafter,

forming the container from the welded films so that the first surface of the first film, and the second film, form outer



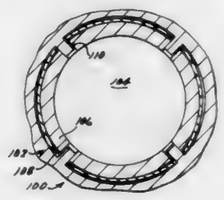
portions of the container which will not subsequently come into contact with a contained liquid and so that the welding lines delineate a plurality of strips defining vertical panels of the formed container.

5,205,652

NONLINEAR SPRING SUPPORTED HYDRODYNAMIC BEARING

William I. Chapman, Birmingham, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Aug. 18, 1992, Ser. No. 931,687
Int. Cl.[5] F16C *32/06, 17/03*
U.S. Cl. 384—119 4 Claims



1. A compliant hydrodynamic bearing having a nonlinear spring support comprising:

a bearing housing disposed around a journal;

a plurality of curved spring elements located equidistantly around the inner periphery of said housing, said plurality of spring elements positioned so as to form a clearance between at least an arcuate portion of each of said plurality of spring elements and the inner periphery of said housing;

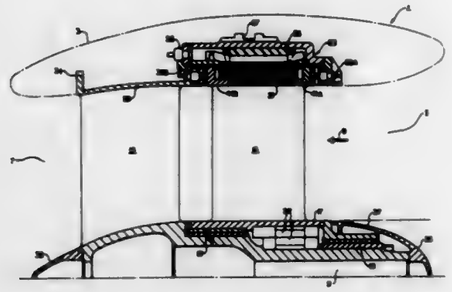
a plurality of moveable arcuate pads disposed between said plurality of spring elements and an outer periphery of said journal for hydrodynamically carrying any radial journal loads, said plurality of arcuate pads contoured so as to contact a surface portion of each of said plurality of spring elements, wherein any radial journal load causes an increase in contacting surface between said plurality of arcuate pads and said plurality of spring elements thereby increasing the load-deflection capability of said plurality of spring elements.

5,205,653

BEARING ASSEMBLY AND SUBMERSIBLE PROPULSOR UNIT INCORPORATING THE SAME

Luciano Veronesi, and James A. Drake, both of O'Hara Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1991, Ser. No. 694,322
Int. Cl.[5] H02K *5/12*
U.S. Cl. 384—306 31 Claims



25. A submersible propulsor unit, comprising:

1) a shroud having a water inlet and a water outlet;

2) a propeller means having a hub rotatably mounted on a shaft, and a peripheral portion rotatably mounted within said shroud;

3) a radial bearing assembly having bearing surfaces disposed between the hub of said propeller means and said shaft; and

4) a thrust bearing assembly having bearing surfaces disposed within said shroud and the peripheral portion of said propeller means.

5,205,654

AUTOMATIC DELIVERY DEVICE FOR LUBRICATING A BEARING

Werner Zeller, Weiz, Austria, assignor to Elin Energieversorgung GmbH, Vienna, Austria

PCT No. PCT/AT90/00045, § 371 Date Nov. 15, 1991, § 102(e) Date Nov. 15, 1991, PCT Pub. No. WO90/14523, PCT Pub. Date Nov. 29, 1990
PCT Filed May 11, 1990, Ser. No. 773,959
Claims priority, application Austria, May 18, 1989, 1194/89
Int. Cl.[5] F16C *33/10*
U.S. Cl. 384—404 10 Claims

1. An arrangement having an automatic delivery device for lubricating a bearing of a shaft, said arrangement comprising:

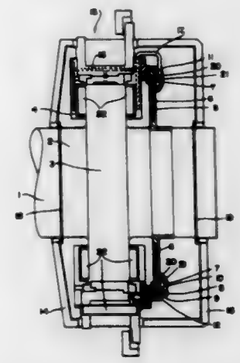
a side channel through which lubricating oil flows, said side channel having a predetermined cross section;

an oil inlet opening in said side channel;

an oil outlet opening in said side channel; and

a side channel pump having delivery blades, wherein:

said side channel pump is positioned on the same shaft as the bearing to be lubricated; and



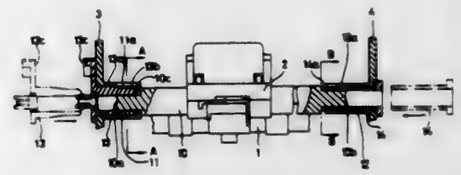
each of said delivery blades has a cutout at said side channel equivalent to and corresponding with said predetermined cross section of said side channel.

5,205,655

SHAFT SUPPORTING STRUCTURE

Hiroyuki Sato, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 442,045, Nov. 27, 1989, Pat. No. 5,026,175.
This application Dec. 5, 1990, Ser. No. 622,659
Claims priority, application Japan, Dec. 9, 1988, 63-160247[U]
Int. Cl.[5] F16C *29/00, 35/02;* F16B *21/00*
U.S. Cl. 384—428 14 Claims



1. A shaft supporting structure comprising a shaft having a longitudinal axis and longitudinal end portions, support means supporting said longitudinal end portions of said shaft, said support means comprising a receiver means and a cylindrical means, said cylindrical means having a continuous inner bore receiving each longitudinal end portion of said shaft and having an assembled position in which said cylindrical means is disposed between one end portion of said shaft and said receiver means, said receiver means having a recess permitting said one end portion of said shaft to be inserted into said receiver means in an insertion direction generally perpendicular to said axis, said cylindrical means being placed in said assembled position by sliding said cylindrical means axially between said one end portion of said shaft and said receiver means such that said one end portion of said shaft is slidably received in said cylindrical means and said receiver means slidably receives said cylindrical means.

5,205,656

HOUSED BEARINGS

5,205,658

PRINT GAP DETECTING DEVICE IN PRINT HEAD

a magnet yoke formed of lamellas with capillary hollow spaces disposed between the lamellas and wherein the capillary spaces are formed by superposition of the lamel-

5,205,661

PRINTER HAVING CONTINUOUS PAPER/CUT PAPER CHANGEOVER APPARATUS

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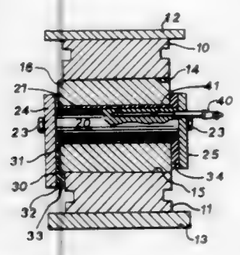
5,205,656
HOUSED BEARINGS
Peter T. Cornish, Gloucestershire, and Reginald Williams, Wolverhampton, both of England, assignors to The Torrington Company, Torrington, Conn.
Filed May 17, 1991, Ser. No. 702,051
Int. Cl.[5] F16C *35/04*
U.S. Cl. 384—474 12 Claims

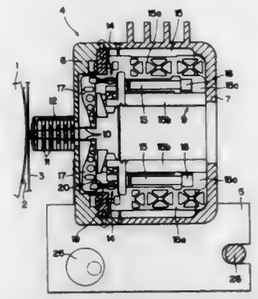
1. A housing for a ball or roller bearing, the housing comprising a first part and a second part which removably mate together to define a volume in which the bearing is housed and held, an annular seal around the bearing and between the bearing and the joint between the two parts of the housing; and an annular seal for location between an outer ring of the bearing and one inner lateral face of one of the parts.

5,205,657
THRUST CAGE ROLLER CIRCLE
Gregory N. Feld, Franklin, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Apr. 7, 1992, Ser. No. 864,697
Int. Cl.[5] F16C *19/30, 33/58*
U.S. Cl. 384—621 8 Claims



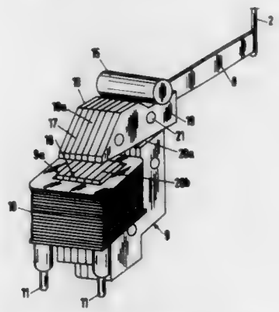
1. A roller circle, comprising:
upper and lower arcuate rails each having a bearing surface that is spaced from and opposes the bearing surface of the other rail;
a plurality of tapered rollers in the space between the rails and in rolling contact with the bearing surfaces, each roller being mounted on a shaft; and
an inner cage connecting the ends of the shafts of adjacent rollers at the smaller ends of the rollers,
said inner cage including a portion that overlies a side face of one of said rails and engages said side face and transfers thrust loads from the rollers, through the cage, and to the rail.

5,205,658
PRINT GAP DETECTING DEVICE IN PRINT HEAD
Akira Iriguchi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 9, 1992, Ser. No. 848,149
Claims priority, application Japan, Mar. 8, 1991, 3-068874
Int. Cl.[5] B41J *11/20*
U.S. Cl. 400—55 10 Claims



1. A print gap detecting device for detecting a print gap between a distal end of a print wire and a printing paper wrapped around a platen in a dot impact printer having an actuator for actuating the print wire with amplified extending and contracting movements of a piezoelectric element by virtue of a motion transmitting mechanism responsive to a voltage applied to the piezoelectric element, the detecting device comprising:
monitoring means for monitoring a waveform of a voltage induced across the piezoelectric element after the contracting movement; and
determining means for determining the magnitude of the print gap based on a peak level of the waveform of the voltage induced thereacross.

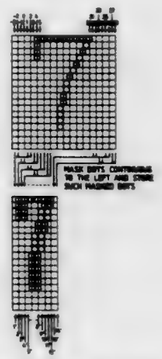
5,205,659
PRINT HEAD WITH LUBRICATOR
Bernd Gugel, Ulm-Einsinger, and Johann Stempfle, Pfaffenhofen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 387,343, Jul. 28, 1989, Pat. No. 5,000,593. This application Jul. 10, 1990, Ser. No. 550,547
Claims priority, application European Pat. Off., Aug. 31, 1988, 88 730 194.3; Fed. Rep. of Germany, Jul. 10, 1989, 3922993
Int. Cl.[5] B41J *2/28*
U.S. Cl. 400—124 20 Claims



1. A matrix print head comprising
a plurality of armature device groups, with each armature device group comprising

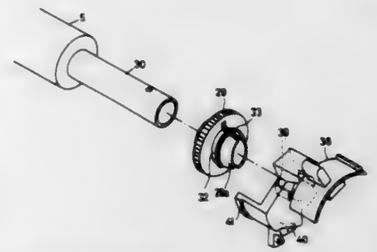
a magnet yoke formed of lamellas with capillary hollow spaces disposed between the lamellas and wherein the capillary spaces are formed by superposition of the lamellas and wherein the lamellas are fixedly attached to each other, said magnet yoke having a first arm and having a second arm and each arm having a pole wear face, wherein the capillary hollow spaces are leading to and adjoining the pole wear faces of the magnet yoke and forming a first magnetic circuit element to be attached to a print head casing;
an electromagnetic coil disposed on the first arm of the magnet yoke;
a print pin element;
an armature mechanically connected to the print pin element and forming a second magnetic circuit element and having an armature wear face for contacting a respective one of the pole wear faces during operation and serving as a driver for the print element, where the armature is movable and positionable in a rapid sequence against the pole wear faces of the respective magnet yoke and back into a rest position depending on actuating currents passing through the electromagnetic coil; a temperature-stable lubricant deposited into the capillary hollow spaces.

5,205,660
PRINTER CAPABLE OF GENERATING REDUCED WIDTH BOLD CHARACTERS
Hiroaki Momose, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Aug. 5, 1992, Ser. No. 925,013
Claims priority, application Japan, Sep. 18, 1991, 3-238133
Int. Cl.[5] B41J *2/505*
U.S. Cl. 400—304 3 Claims



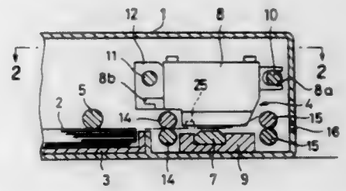
1. A printer capable of printing a reduced bold character, comprising:
storage means for storing print data of a character;
first converting means for converting print data stored in said storage means into a single dot pattern by performing an OR function of a total of four dot patterns, assuming that a print head moves in a horizontal direction, said four dot patterns being said print data, data next thereto, data four pieces of data ahead thereof, data five pieces of data ahead thereof;
means for inverting said single dot pattern generated by said first converting means;
second converting means for converting two dot patterns into a single dot pattern by performing an AND function of said two dot patterns, said two dot patterns being a new dot pattern generated by said first converting means and said dot pattern inverted by said inverting means, so that said print data is printed while changing a number of print data in the horizontal direction.

5,205,661
PRINTER HAVING CONTINUOUS PAPER/CUT PAPER CHANGEOVER APPARATUS
Hiroyuki Kato, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 9, 1992, Ser. No. 848,317
Claims priority, application Japan, Apr. 12, 1991, 3-24115[U]
Int. Cl.[5] B41J *11/50*
U.S. Cl. 400—605 10 Claims



1. A printer, comprising:
a frame;
a platen shaft rotatably supported on said frame;
a platen mounted on said platen shaft and extending in one direction;
a print head movable reciprocally in a longitudinally direction parallel to said platen to perform a print operation with respect to a print paper placed on said platen;
a paper feeder disposed in said frame;
a drive mechanism disposed in said frame and having a platen gear fittingly secured to the platen shaft and a gear train rotatably driving said paper feeder; and
changeover means for connecting/disconnecting said paper feeder to/from said drive mechanism, wherein the platen gear is provided with an extension portion extending from one side surface toward the axial direction thereof and the changeover means comprises a continuous paper/cut paper changeover lever for changing over the state of said changeover means, lever being said continuous paper/cut paper changeover lever being supported on said extension portion of the platen gear in such a manner as to be turnable relative to the platen gear.

5,205,662
METHOD OF FEEDING PAPER
Noriyuki Kurokawa; Akio Tajima, and Kazuaki Ikeda, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Feb. 19, 1992, Ser. No. 838,389
Claims priority, application Japan, Feb. 21, 1991, 3-027542
Int. Cl.[5] B41J *11/58*
U.S. Cl. 400—636 10 Claims



1. A method for feeding paper between a pair of transport rollers mounted downstream of a print head, the paper having a front end and a pair of opposite side edges, comprising the steps of:
moving the head idly in a direction perpendicular to the

direction of movement in which the paper is fed, at least

hole which passes through the center of said holder along its longitudinal axis and is substantially coaxial with the

a slot radially formed in a circular outward end of the second leg, the slot having a clearance less than the diameter

5,205,667
PIVOT PIN FOR SHREDDER
Robert C. Montgomery, Sr., Jacksonville, Fla., assignor to

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direction of movement in which the paper is fed, at least once, substantially from one edge of the paper to the other edge thereof, immediately before the front end of the paper arrives between the transport rollers; and

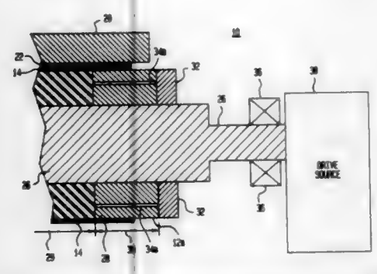
then feeding the paper between the transport rollers.

5,205,663

CAPSTAN BODIES IN PRINTER ROLLERS

Stanley W. Stephenson, Spencerport, and William D. Goodwin, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 7, 1991, Ser. No. 711,687
Int. Cl.[5] B41J *11/057*
U.S. Cl. 400—662 **24 Claims**



1. A printing mechanism for reproducing an image on a print medium comprising:

a cylindrical rotatable platen for contacting and supporting the print medium on which the image is to be reproduced, the platen comprising:

a circumference which is smaller than a printing length of the image to be reproduced;

a predetermined longitudinal length which is wider than a width of a print medium;

a central longitudinal section including a cylindrical elastomer printing surface with a predetermined compliancy in a radial direction; and

a first and a second end section, each end section extending from an opposite end of the cylindrical elastomer printing surface, each of the end sections comprising means for providing a significantly higher torsional rigidity than that of the cylindrical elastomer printing surface, a compliancy in a radial direction which approximates the predetermined compliancy in a radial direction of the cylindrical elastomer printing surface, and a length which extends under a nearest edge of the print medium when the print medium is placed on the platen.

5,205,664

LEAD-AUTO-SHARPENED PROPELLING PENCIL AND THE MAKING PROCESS THEREOF

Fu Yushan, No. 118, Xihongju Road, Urumqi Shi, Xinjiang Autonomous Region, and Zhang Ru, Urumqi Shi, both of China, assignors to Fu Yushan, China

Filed Jan. 3, 1992, Ser. No. 816,252
Claims priority, application China, Jan. 7, 1991, 91 1 00007.0
Int. Cl.[5] B43K *29/06;* **B43L** *23/00*
U.S. Cl. 401—50 **4 Claims**

1. A lead-auto-sharpened propelling pencil which comprises a pencil body and a pencil cap;

said pencil body comprises a body case, a lead holder, a screwing sleeve, and a lead; said propelling pencil is characterized in that:

on the outside of the front portion of said body case, said screwing sleeve with outside screwthread is installed to cooperate with a screwing insert in said pencil cap, which insert is coaxial with the tapered surface formed inside the front end of said body case;

said lead holder has a front tapered portion and a through hole which passes through the center of said holder along its longitudinal axis and is substantially coaxial with the front tapered portion; the diameter of the front portion of said through hole is less than that of its hind portion in order to snug said lead; there are several grooves uniformally formed circumferentially around the front tapered portion of said lead holder and radially extending to said through hole;

a lead is inserted in said lead holder, and is held by means of resilience of the front tapered grooved portion of said lead holder; said lead holder is arranged inside the body case with its front tapered portion fitting with the inside surface of the front tapered portion of said body case so that said lead is automatically positioned along the longitudinal axis of said body case;

said pencil cap comprising a screwing insert, a cap case, a sharpener and a powder remover; said screwing insert is a hollow cylinder with inside screwthread; said cap case is cylindrical with a hollow stepped chamber; said sharpener consists of a sharpener body, blades and a powder spacer, said sharpener body is cylindrical with a through hole in

its center; a notch is formed at one of the ends of said sharpener body; six blade insertion grooves which extend axially and radially to the through holes are formed and spaced uniformlly around the circumferential surface of the other end portions of the sharpener body; the blades, of which the edges are inclined with respect to its longitudinal axis, are adhered in these grooves, respectively, with their edges located on an imaginary cone which is coaxial with the through hole of said sharpener body; said powder spacer is seated on said notch of said sharpener body;

the powder remover consists of a remover body and an outlet ring; said removed body is cylindrical with a flange in one end and a through hole in the center; a powder hole is radially formed on its circumferential surface and connects with the through hole; and said circular outlet ring also has a through hole on its circumferential surface and is rotationally installed around said remover body; said screwing insert is coaxially positioned at one end of said cap case while said sharpener is coaxially adhered inside said cap case from its other end where said powder remover is adhered.

5,205,665

FITTING RELEASE UTILIZING BOLT ACTION

Armand J. Aronne, Mass, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 5, 1991, Ser. No. 650,599
Int. Cl.[5] B64D *25/08*
U.S. Cl. 403—15 **8 Claims**

1. A releasable fitting comprising:

a first member including a central leg having a through bore formed therethrough;

a bolt coaxially located in the through bore;

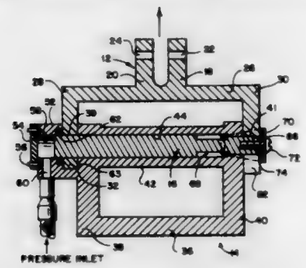
a second member having first and second parallel legs extending from a median section;

the ends of the legs having openings therein and receiving respective ends of the bolt for normally latching the first and second members together;

an intermediate length of bolt having a stepped-down diameter;

means located at one end of the through bore for introducing pressurized fluid against one end of the bolt which actuates translational motion of the bolt;

a slot radially formed in a circular outward end of the second leg, the slot having a clearance less than the diameter of the bolt end received in a central opening that is formed in the circular outward end of the second leg, the slot having a clearance greater than the stepped-down bolt



diameter which permits disengagement of the bolt from the second leg in a translated position of the bolt;

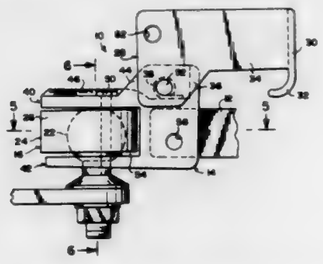
the translated position of the bolt also freeing the bolt from engagement with the first leg thus unlatching the first member from the second member.

5,205,666

TRAILER COUPLER

Michael S. Hollis, 1326 East St., Minden, La. 71055

Filed Sep. 10, 1992, Ser. No. 942,792
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 **4 Claims**



1. An improved trailer coupler for a trailer having a forwardly extending tongue, which comprises:

a) a housing for fixing on and extending forwardly from the tongue;

b) a pair of opposed jaws pivoted on vertical axes on said housing, each said jaw having a forward end, an outer side and an inner side formed with a concavity for embracing a hitch ball;

c) each said jaw having a surface for forcing said improved trailer coupler to align with a said hitch ball;

d) a jaw locking bail having a bight portion with a finger tab to facilitate operation of said bail and a pair of side portions each with an ear extension, the side portions being horizontally pivoted on said housing at the ear extensions at opposite sides of said housing, said bail being swingable forwardly and downwardly from an elevated retracted position to a horizontal jaw-locking position, wherein the side portions completely engage the outer sides of said jaws and the bight portion completely engages the forward ends of said jaws in the closed positions of said jaws; and

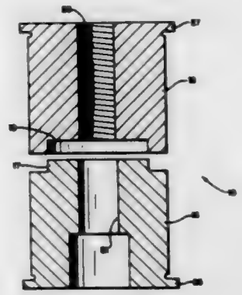
e) a closure compression spring located inwardly at one horizontally pivoted ear extension for biasing said bail towards the jaw-locking position.

5,205,667

PIVOT PIN FOR SHREDDER

Robert C. Montgomery, Sr., Jacksonville, Fla., assignor to Montgomery Industries International Inc., Jacksonville, Fla.

Filed Oct. 7, 1991, Ser. No. 772,679
Int. Cl.[5] F16C *11/04*
U.S. Cl. 403—151 **8 Claims**



1. A pivot pin assembly for use such as in pivotally mounting a swing hammer on a ring for use in a shredder comprising:

a cylindrical-shaped male pin member with inner and outer end portions and having an outwardly extending cylindrical-shaped shoulder portion at the inner end thereof, said shoulder portion being coaxial with the male pin member and being of uniform height around the circumference thereof;

a cylindrical-shaped female pin member with inner and outer end portions and having an inwardly extending cylindrical-shaped recess at the inner end thereof of a size for receiving the shoulder portion of said male pin member, said recess being coaxial with the female pin member and being of uniform depth around the circumference thereof; and

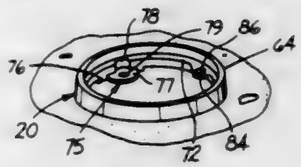
a means for securing said male and female members, wherein said means for securing includes a bore extending through each of the male and female pin members, wherein the bore through the female pin member is threaded, and further including a screw means which passes through said male pin member from the outer to the inner end portion thereof, and wherein the screw means is threadly received in said female pin member.

5,205,668

MANHOLE ADAPTER

Charles Adams, Melville, La., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 29, 1991, Ser. No. 677,719
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 **7 Claims**



1. A manhole, said manhole comprising:

an enclosure having an access opening at an upper portion thereof;

a head ring which is disposed about the access opening of the enclosure and supported by an upper portion of the enclosure, said head ring having an inwardly projecting flange and diametrically opposed lugs which project radially

from said flange toward a center of the opening and which include threaded apertures therein, and said head ring

(d) control means situated on the panel in cooperative contact directingly with the attack angle adjusting means;

for gripping a stem therebetween and including means on the opposing member for rotating the stem when engaged by said opposing members to effect assembly of said stem

positioned under a foundation slab in its normal position of use;

cross arm means extending laterally in a direction generally

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from said flange toward a center of the opening and which include threaded apertures therein, and said head ring further including an upper edge surface;

an adapter which includes an annular post portion which is supported in engagement with said upper edge surface of said head ring and having a stem portion which depends downwardly along and in engagement with an inwardly facing surface of said head ring, said stem portion having a peripherally extending lip which includes an annular surface, wherein said stem portion of said adapter includes opposed radially and inwardly projecting ear portions which project from said lip and which have threaded apertures therein, and said adapter further including diametrically opposed depending portions which depend from said stem portion and which include radially projecting ledges each having an aperture therein, each said aperture in each said ledge being aligned with one of said threaded apertures in said head ring with said each ledge being in engagement with an upwardly facing surface of said flange of said head ring;

a cover which is disposed in engagement with said annular surface of said lip of said stem portion wherein said cover includes two diametrically opposed openings therethrough and wherein said ear portions projecting radially inwardly from said lip of said stem portion have threaded apertures therein and said manhole further includes means extending through said openings in said cover into said threaded apertures of said ear portions of said adapter to secure said cover to said adapter; and

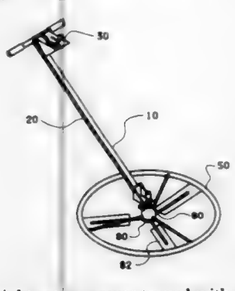
means extending through said apertures in said ledges of said adapter into said aligned apertures in said head ring to hold said adapter secured to said head ring.

5,205,669

ROTARY TROWEL FOR TROWELING POLYMER/AGGREGATE TOPPINGS ON SUBSTRATES

Michael Neff, Levittown, Pa., assignor to Advanced Coatings, Inc., Sinking Spring, Pa.

Filed Mar. 22, 1991, Ser. No. 673,944
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—97 **4 Claims**



1. A light weight rotary power trowel with a multiplicity of rotating troweling blades which have an attack angle which is adjustable relative to a surface for finish troweling a movable aggregate/-resin topping on a substrate comprising:

(a) a boom having an upper end and a lower end with a hand hold disposed transversely to the upper end;

(b) attack angle adjustment means;

(c) a panel with controls situated on the hand hold for operating the trowel and the attack angle adjusting means;

(d) a safety frame attached to the arm's lower end for holding

(1) a fluid driven adjustable speed rotary motor with a shaft to which are attached the troweling blades disposed equiangularly and radially about the shaft, each blade being planarly rectangular and having a major attack surface adjacent to and in contact with the movable topping so as to form therewith the attack angle;

(d) control means situated on the panel in cooperative contact directingly with the attack angle adjusting means;

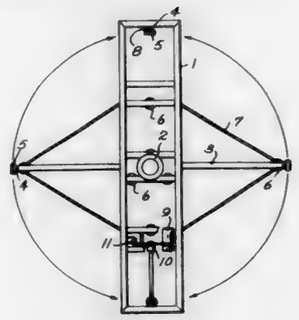
(e) the rotary trowel being of a mass not greater than about 40 pounds nor less than about 20 pounds.

5,205,670

ROTATING SURFING WAVE SIMULATOR

Kenneth D. Hill, 58-025 Kapuai Pl., Haleiwa, Hi. 96712

Filed Sep. 4, 1991, Ser. No. 754,633
Int. Cl.[5] E02B *3/00*; E04H *3/18*
U.S. Cl. 405—79 **27 Claims**



1. A rotatable surfing simulator comprising:

a container, open at the top for holding a body of water of sufficient volume to support a surf craft and rider thereon;

means for rotating said container in a given direction of rotation so as to rotate the body of water therewith in said direction of rotation, at a speed which generates an inclined surface of the body of water; and

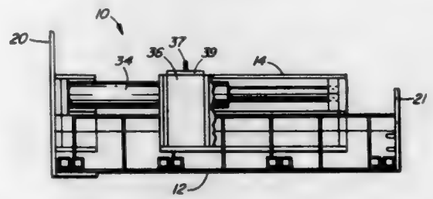
means for restraining movement in said direction of rotation of a surf craft and rider supported on said inclined surface.

5,205,671

TRENCHLESS PIPELINE REPLACEMENT

Reginald G. Handford, Calgary, Canada, assignor to Trenchless Replacement Systems, Ltd., Calgary, Canada

Filed Nov. 14, 1991, Ser. No. 791,513
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—154 **5 Claims**



1. A hydraulic apparatus comprising:

a stationary frame portion;

a moving frame portion capable of performing sliding movement relative to said stationary frame portion between a pair of limiting positions;

hydraulic cylinder means between said stationary and said moving frame portions for effecting movement of said moving frame portion between said limiting positions;

connection means on said movable frame portion for connection to a stem attached to a pipe removing tool; and

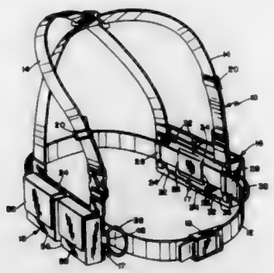
gripping and rotating means associated with said movable frame portion comprising a number of opposing members for gripping a stem therebetween and including means on the opposing member for rotating the stem when engaged by said opposing members to effect assembly of said stem from individual screw-threaded stem portions or disassembly of the stem into said individual stem portions.

5,205,672

DIVER'S WEIGHT ASSEMBLY

Robert T. Stinton, Lakeside, Calif., assignor to Diving Unlimited International, Inc., San Diego, Calif.

Filed Jan. 14, 1992, Ser. No. 820,362
Int. Cl.[5] B63C *11/30*
U.S. Cl. 405—186 **18 Claims**



1. A diver's weight assembly, comprising:

a belt for fitting around a diver's waist;

at least one weight pack for attaching to the belt;

an attachment and release mechanism for releasably attaching the weight pack to the belt, the mechanism including interengageable fastener means for attaching the weight pack to the belt, and release means for releasing the fastener means to separate the weight pack from the belt; and

the release means including a handle for pulling by the wearer to actuate the release mechanism, and a lanyard securing the handle directly to the weight pack to allow the weight pack to be pulled away from the diver when released.

5,205,673

FOUNDATION SLAB SUPPORT AND LIFTING APPARATUS

William B. Bolin, Ada, Okla., and William B. McCown, Jr., Allen, Tex., assignors to Power Lift Foundation Repair, Ada, Okla.

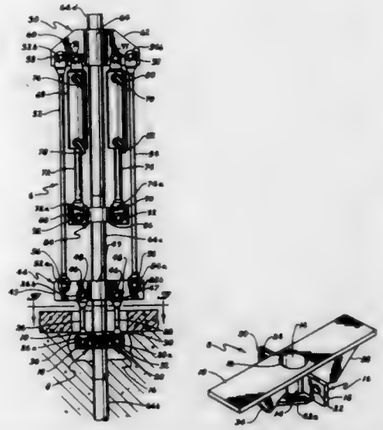
Filed Jul. 18, 1991, Ser. No. 732,113
Int. Cl.[5] E02D *7/20*
U.S. Cl. 405—230 **9 Claims**

1. Apparatus for stabilizing and supporting building foundation slabs comprising:

a slab support bracket comprising an elongated slab support plate adapted for insertion through an access opening in a building foundation slab so as to extend horizontally under the slab in engagement therewith, guide means extending through said slab support plate in a direction generally perpendicular thereto for receiving and guiding slab support pilings to be driven into the ground, and lift attachment means on opposite sides of said support plate, said lift attachment means comprising a pair of laterally extending arm segments projecting generally perpendicular to the longitudinal direction of extent of said slab support plate and being attached to said support bracket substantially centrally of said plate, said arm segments being apertured on opposite sides of said slab support plate;

a pair of lift rods removably attached to said apertured arm segments and projecting upwardly from said slab support plate through the access opening when said bracket is positioned under a foundation slab in its normal position of use;

cross arm means extending laterally in a direction generally perpendicular to the longitudinal direction of extent of said slab support plate at a vertically spaced position above said slab support plate, and said lift rods having upper ends attached to said cross arm means at laterally spaced locations thereon;



power cylinder means connected to said cross arm means in a vertical orientation of use at a laterally offset position with respect to the vertical path of support pilings to be driven into the ground under the slab; and

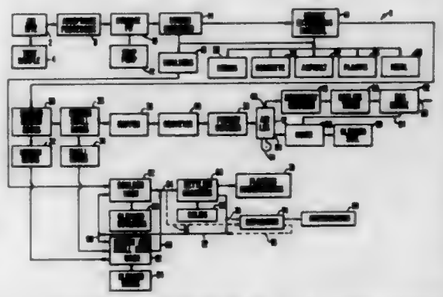
clamp means connected to said hydraulic cylinder means for vertical movement therewith and constructed and arranged to engage a length of slab support piling to be driven through said guide means by said hydraulic cylinder means.

5,205,674

SOIL DECONTAMINATION METHOD

Charles C. Chisholm, 1455 Washington Ct., Reno, Nev. 89507, and Eugene J Botts, Reno, Nev., assignors to Charles C. Chisholm, Reno, Nev.

Continuation of Ser. No. 568,310, Aug. 16, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 823,036
Int. Cl.[5] F23G *7/14*
U.S. Cl. 405—258 **17 Claims**



1. A method for decontaminating a soil mixture contaminated with a hydrocarbon, the soil mixture including soil, rock and, optionally, extraneous material, comprising the following steps:

checking the soil mixture for the type of contaminant;

separating substantially all of the rock and extraneous mate-

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HYDRAULIC STEEL MINE PROP

blower means for maintaining a sub-atmospheric pressure in said hopper;

a forward cutting edge that extends beyond the ledge and a rear locating portion;

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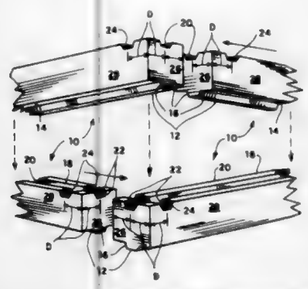
checking the soil mixture for the type of contaminant;
separating substantially all of the rock and extraneous material from the soil in the soil mixture;
separating the rock from said any extraneous material;
washing the rock with a washing liquid; and
heating the separated soil in a heating gas at a temperature sufficient to combust the hydrocarbon in the soil to get cleaned soil.

5,205,675
PRECAST CRIBBING WALL SYSTEM
Arthur L. Hamel, 7880 Red Jacket Way, Jessup, Md. 20794
Filed Mar. 10, 1992, Ser. No. 847,271
Int. Cl.[5] E02D *5/00*
U.S. Cl. 405—273 **8 Claims**



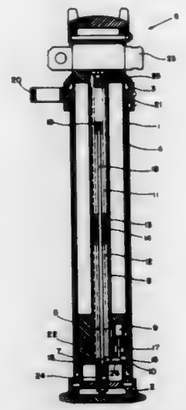
1. A system for the construction of retaining and cribbing walls and similar structures containing linear walls and corners and formed of a plurality of preformed blocks, said preformed blocks are of generally rectangular solid form and defined by upper and lower surfaces defining a height, two oppositely spaced apart lateral surfaces defining a width, and two opposite end surfaces defining a length, wherein;

each of said preformed block includes a longitudinal ridge extending downward from said lower surface, a longitudinal upper channel within said upper surface, and at least two lateral channels extending across said upper surface between said lateral surfaces and forming an intersection with said longitudinal channels,

coping blocks having lower surfaces including cooperating longitudinal ridges and level upper surfaces, said ridges of said coping blocks each have sides inwardly sloped to provide a decreasing width for each of said ridges, and said longitudinal and lateral channels of said preformed blocks each have outwardly sloping sides to provide an increasing width for each said longitudinal and lateral channels of said preformed blocks, whereby

a first course of said preformed blocks is laid and a second course of said preformed blocks is laid overlying said first course with said longitudinal ridges of said preformed blocks forming said second course mating with said longitudinal channels of said preformed blocks forming said first course to form at least one said linear wall and at least one said longitudinal ridge of at least one said preformed block forming said second course mating with at least one said lateral channel of at least one said preformed block forming said first course to form at least one said corner, thus continuing to form a plurality of said courses defining said wall having at least one said corner, and a plurality of said coping blocks is installed upon an upper part of a last course of said wall.

5,205,676
HYDRAULIC STEEL MINE PROP
Robert W. Heiliger, Hochkoppel 11, D 5166 Kreuzau-Untermaubach, Fed. Rep. of Germany
PCT No. PCT/EP91/00706, § 371 Date Jan. 6, 1992, § 102(e) Date Jan. 6, 1992, PCT Pub. No. WO91/18186, PCT Pub. Date Nov. 28, 1991
PCT Filed Apr. 13, 1991, Ser. No. 781,223
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 9005343[U]
Int. Cl.[5] E21D *15/44*
U.S. Cl. 405—290 **4 Claims**



1. A hydraulic steel mine prop, comprising a bottom ram including an outer cylindrical tube with a cylinder foot at one end and a collar ring at the other end, and further including a top ram coaxially guided in said bottom ram, said top ram comprising a cylindrical tube having at its one end a piston that is guided in and sealed relative to the inner wall of the outer cylindrical tube and which has a prop head at its other end, said top ram further including an inner prop extension stop and a return spring formed as a screw spring which is secured with one end to said prop head and with its other end to said cylinder foot, said return spring passing through a bore in said piston, whereby a further tube which encloses said screw spring, is arranged coaxially between said prop head and said piston, said piston including a safety valve which relieves pressure from a compression chamber when said piston assumes a predetermined end position, wherein said screw spring is divided into two separate spring members (**11**, **12**) which are interconnected by an intermediate member (**13**) at a separation location, said intermediate member (**13**) comprising a flange extending outside of an outer spring diameter, an operating element, said flange cooperating with said operating element guided by said piston (**5**) in a desired end position of said piston for moving said operating element which in turn activates said safety valve (**9**).

5,205,677
FRUIT HARVESTING MACHINE
Frank J. McKenna, Shaker Heights, Ohio, assignor to Kathleen McKenna, Shaker Hts., Ohio
Continuation-in-part of Ser. No. 550,811, Jul. 10, 1990, Pat. No. 5,007,772, which is a continuation of Ser. No. 261,337, Oct. 24, 1988, abandoned. This application Apr. 12, 1991, Ser. No. 685,592
Int. Cl.[5] B60P *1/60*; B65G *51/18, 53/52, 53/54*
U.S. Cl. 406—39 **20 Claims**

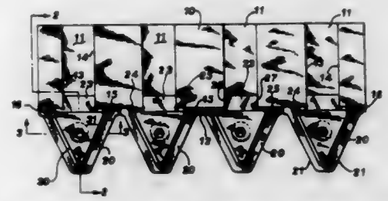
1. A machine for harvesting fruit from trees comprising:
a supporting vehicle;
a hopper mounted on the vehicle;

blower means for maintaining a sub-atmospheric pressure in said hopper;
an extendable/retractable boom rotatably mounted on said vehicle; said boom including inner, middle and outer telescopically slidable boom sections; said boom sections increasing in transverse size from the outer section to the inner section;
a worker-supporting bucket attached to the outer section of said boom;
a conduit system extending from said bucket, through said boom, and into said hopper whereby fruit may be transferred from said bucket to said hopper; said conduit system including inner, middle and outer telescopically slidable conduit sections;
said boom sections and said conduit sections each having an inner end, an outer end, an interior surface and an exterior surface;
said conduit sections increasing in transverse size from the outer section to the inner section; the outer end of said outer conduit section being fixedly mounted to the outer

end of said outer boom section; and the inner end of said inner conduit section being fixedly mounted to the inner end of said inner boom section;
a first deflection-preventing member mounted on the inner end of said middle boom section, said first deflection-preventing member comprising means for preventing deflection of said inner conduit section relative to said middle boom section;
a second deflection-preventing member mounted on the interior surface of the inner end of said outer boom section, said second deflection-preventing member comprising means for preventing deflection of said middle and outer conduit sections relative to said outer boom section and means for accommodating both said inner conduit section and said middle conduit section at various extension/retraction patterns; and
a plug groove assembly which includes a set of plugs mounted on the outer end of said middle conduit section and a corresponding set of grooves, positioned on said outer boom section, for slidably receiving said set of plugs.

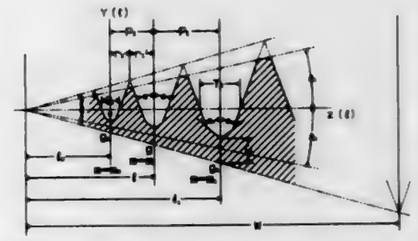
5,205,678
GEAR CUTTING TOOL
Heinz G. Britsch, New Berlin; Harvey H. Corda, South Milwaukee; Larry S. Gallett, Oak Creek, and John G. Lawton, Milwaukee, all of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Aug. 27, 1992, Ser. No. 936,168
Int. Cl.[5] B23P *15/28*; B26D *1/06*
U.S. Cl. 407—6 **15 Claims**

1. A gear cutting tool comprising:
a tool holder block having a forward ledge and a plurality of spaced parallel tracks extending rearwardly from the ledge, the tracks being defined by parallel upright side walls and the side walls of adjacent tracks being joined by an upright front wall that is perpendicular to the side walls and rises from the ledge;
a removable cutter insert for each track, each insert having a forward cutting edge that extends beyond the ledge and a rear locating portion;
said rear locating portion including upright rear faces disposed against the front walls on either side of a track and



a central projection extending rearwardly of the rear faces and having parallel side faces that mate with the side walls of the track; and
a clamp for removably clamping each insert onto the holder block.

5,205,679
ROTARY TOOL FOR GENERATING BEVEL GEARS
Shigeyoshi Nagata, Tokyo, Japan, assignor to Kyoiku Hagurumo Kogyo Kabushiki-kaisha, Tokyo, Japan
Filed Jan. 24, 1992, Ser. No. 825,123
Claims priority, application Japan, Jan. 30, 1991, 3-9915
Int. Cl.[5] B23F *21/18*
U.S. Cl. 407—23 **9 Claims**



1. A rotary tool for generating bevel gears, characterized in that a module m at a plane of rotation which is away from a reference point on a central axis by a distance ξ in the axial direction is shown by an equation;

$$m = m_0(1 + \kappa\xi)$$

where, m_0 denotes a module at the reference point and κ is a constant.

5,205,680
METAL CUTTING INSERT WITH ROUNDED CUTTING EDGE
Lars Lindstedt, Sandviken, Sweden, assignor to Sandvik AB, Sweden
Filed Jul. 5, 1991, Ser. No. 726,401
Claims priority, application Sweden, Jul. 19, 1990, 9002464
Int. Cl.[5] B23B *27/22*
U.S. Cl. 407—116 **7 Claims**

1. A cutting insert for turning and grooving tools, comprising:
upper and lower front-to-rear extending surfaces,
two oppositely disposed side surfaces interconnecting said upper and lower front-to-rear extending surfaces, and
front and rear end surfaces each intersecting said upper and lower front-to-rear extending surfaces and said side surfaces,

a front portion of said upper front-to-rear extending surface

5,205,683
DEVICE FOR WORKING PLATE-SHAPED MEMBERS
Henricus D. Ubbens, Ministerlaan 38, 5631 Nd Eindhoven,

is disengaged from said differential rotation gear, said method comprising the steps of:

diamond elements coextensively terminating at a substantially planar cutting face substantially perpendicular to the orientation of said diamond element axes and predomi-

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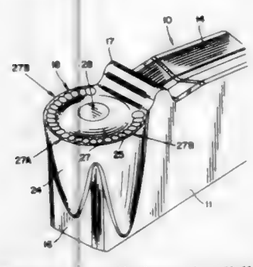
a front portion of said upper front-to-rear extending surface including

a generally annularly extending cutting edge for cutting a chip having a varying thickness along the cut depth, wherein the chip has a smaller thickness adjacent a forward end of said front portion than adjacent a location spaced circumferentially from said forward end in a direction toward said rear end surface,

a chipforming surface disposed radially inside of said cutting edge, and



a chip breaking rear wall disposed radially inside of said chipforming surface, and extending upwardly therefrom,

a first section of said rear wall disposed adjacent said forward end of said front portion having a steeper upward inclination than a second section of said rear wall, disposed adjacent said location so that said first section acts on a smaller chip thickness than does said second section.

5,205,681

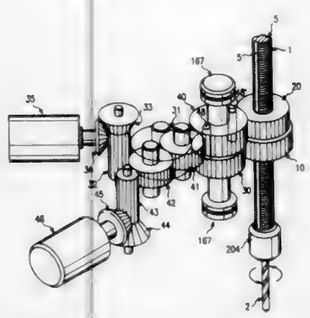
MECHANICAL PECK DRILL AND METHOD

Richard E. Eckman, Harris, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 374,306, Jun. 30, 1989, Pat. No. 5,062,745. This application Sep. 10, 1991, Ser. No. 757,453

Int. Cl.[5] B23B *35/00*

U.S. Cl. 408—1 R **27 Claims**



1. A method for mechanically reciprocating a rotatable spindle along its longitudinal axis, wherein a spindle rotation gear is slidably mounted on and keyed to said spindle to effect rotation of said spindle as said spindle is moved along its longitudinal axis, wherein a differential rotation gear is provided in engagement with said spindle rotation gear, wherein a spindle feed gear is threaded to said spindle to effect movement of said spindle along said longitudinal axis upon relative rotation between said spindle and said spindle feed gear, and wherein a differential feed gear is provided in engagement with said spindle feed gear, said differential feed gear being shiftable between a first shift position wherein it is engaged with said differential rotation gear and a second shift position wherein it is disengaged from said differential rotation gear, said method comprising the steps of:

(1) advancing said spindle at a first advance speed in a first longitudinal direction along the longitudinal axis of said spindle, until said spindle reaches a first predetermined position, by rotating said differential feed gear in said second shift position to rotate said spindle feed gear in a first rotational direction at a first rotational speed while said differential feed gear is disengaged from said differential rotationg ear;

(2) upon said spindle reaching said first predetermined position, mechanically changing the advance speed of the spindel from said first advance speed to a second advance speed by shifting said differential feed gear to said first shift position to thereby engage and rotate with said differential rotation gear; and

(3) rotating said spindle about its longitudinal axis by utilizing said differential rotation gear to rotate said spindle rotation gear, while mechanically advancing said spindle at said second advance speed to further advance said spindle in said first longitudinal direction by rotating said spindle feed gear in said first rotational direction at a second rotational speed.

5,205,682

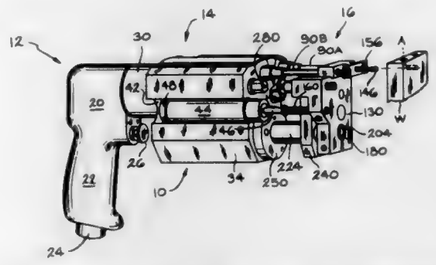
ADJUSTABLE DUAL BIT DRILLING MACHINE

Danny R. Jinkins, Hicksville, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 12, 1991, Ser. No. 684,295

Int. Cl.[5] B23B *45/14*

U.S. Cl. 408—46 **34 Claims**



1. A dual bit drilling machine comprising, in combination,

a pair of spaced-apart spindles adapted to receive a respective pair of drill bits,

means for driving said spindles,

first means for adjusting the axial spacing between said spindles,

collet means for engaging a pilot opening,

means for expanding and contracting said collet means,

means for advancing and retracting said spindles, and

control means for sequentially activating said means for driving, said means for expanding and said means for advancing, wherein said first means for adjusting includes a first housing having an aperture for receiving one of said spindles and a second housing pivotally secured to said first housing and defining a second aperture for receiving the other of said spindles and means for maintaining the position of said second housing relative to said first housing.

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DEVICE FOR WORKING PLATE-SHAPED MEMBERS

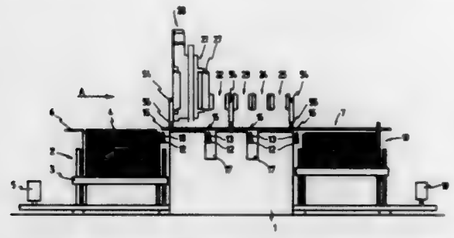
Henricus D. Ubbens, Ministerlaan 38, 5631 Nd Eindhoven, Netherlands

Continuation of Ser. No. 677,404, Mar. 28, 1991, abandoned. This application Aug. 7, 1992, Ser. No. 927,243

Claims priority, application Netherlands, Apr. 3, 1990, 9000777

Int. Cl.[5] B23B *39/16*

U.S. Cl. 408—46 **15 Claims**



1. A device for working plate-shaped members comprising:

a frame;

conveying means on said frame for supporting plate-shaped members and for stepwise moving the plate-shaped members along a path extending in a predetermined direction;

a plurality of tool holders vertically displaced from the plate-shaped members and substantially arranged in a row in a direction transverse to said predetermined direction and carrying tools for working on the plate-shaped members;

a carrier for each said tool holder, including means for supporting and adjustably moving said tool holder along said carrier a limited distance in a direction parallel to said predetermined direction, each said tool holder being adjustable along its corresponding carrier independent of the other tool holders; and

elongated support means supported by said frame, said support means situated at substantially the same vertical level as said tool holders and extending lengthwise in a direction transverse to said predetermined direction, said support means including means for supporting and adjustably moving said carriers independent of each other along said support means in a direction transverse to said predetermined direction; and wherein

said conveying means comprises means for moving the plate-shaped member stepwise in said predetermined direction with respect to said tool holders over a distance smaller than or substantially equal to said limited distance.

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MULTI-COMPONENT CUTTING ELEMENT USING CONSOLIDATED ROD-LIKE POLYCRYSTALLINE DIAMOND

Alexander K. Meskin, and Louis K. Bigelow, both of Salt Lake City, Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Continuation of Ser. No. 184,494, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 797,858, Nov. 14, 1985, abandoned, which is a continuation of Ser. No. 593,124, Mar. 26, 1984, abandoned. This application Aug. 11, 1992, Ser. No. 393,862

Int. Cl.[5] E21B *10/58;* **B23B** *27/20*

U.S. Cl. 408—145 **10 Claims**

1. A cutter on a rotary drag bit for earth boring, comprising:

a plurality of thermally stable rod-like polycrystalline diamond elements each having a longitudinal axis, said diamond elements being oriented with their axes in a mutually parallel relationship;

a metal matrix surrounding and securely holding said diamond elements in place, said metal matrix and said diamond elements coextensively terminating at a substantially planar cutting face substantially perpendicular to the orientation of said diamond element axes and predominantly comprised of ends of said diamond elements; and

a carrier element supporting said diamond elements in said matrix on said bit in an orientation substantially parallel to the instantaneous direction of linear displacement of said cutter resulting from rotation of said bit.

5,205,685

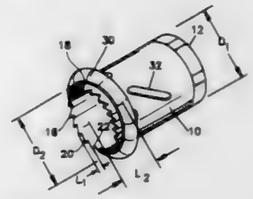
HOLE SAW

Henry R. Herbert, 730 Lakewood-Farmingdale Rd., Howell, N.J. 07731

Filed Oct. 5, 1992, Ser. No. 956,385

Int. Cl.[5] B23B *51/05*

U.S. Cl. 408—204 **7 Claims**



1. A hole saw comprising:

a cylindrical body of diameter D_1, having a first end adapted to be secured to a drill;

a set of cutting teeth at a second end of said body arranged in a circle on said body of a diameter D_2;

an annular ring surrounding said body at a point adjacent said second end, of a diameter greater than that of said cylindrical body; and

wherein said ring is fabricated as a TEFLON-coated band.

5,205,686

APPARATUS AND METHOD FOR HYDRAULICALLY FED CUTTINGS REMOVAL AND COLLECTION FOR CUTTING TYPE MACHINE TOOLS

Rodney A. de Cassia, Northridge, Calif., assignor to Fadal Engineering Co., North Hollywood, Calif.

Filed Feb. 7, 1992, Ser. No. 832,377

Int. Cl.[5] B23Q *11/00*

U.S. Cl. 409—131 **26 Claims**

1. An apparatus for the hydraulic removal and collection of cuttings from a machine tool, said apparatus comprising:

a housing at least partially enclosing said machine tool;

a plurality of collection trays at a bottom of said housing for collecting cuttings as they fall from said machine tool;

a rotating drum for collecting said cuttings from said collection trays, said drum having a hollow annular structure with fins disposed in an axial direction along an interior of said drum for carrying said cuttings in a circumferential direction as said drum rotates;

a plurality of hydraulic nozzles in said housing for directing

flow of a fluid so as to force said cuttings in said collection

until said device is located at a predetermined location of

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connectable element and spanning the diameter of said

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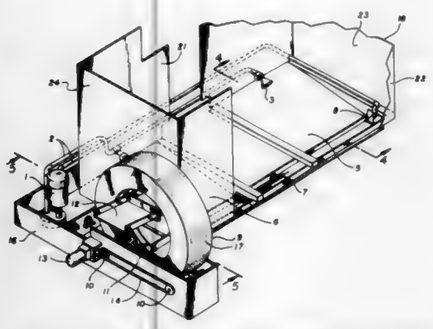
flow of a fluid so as to force said cuttings in said collection trays into said drum;

pump means for pumping said fluid to said hydraulic nozzles; and



a drop tray extending through the interior of said drum, whereby said cuttings fall from said interior of said drum onto said drop tray.

5,205,687

METHOD FOR SECURING LOAD USING ROPE TYING DEVICE

Russell Boyland, 136 Evans Road, Wilberforce 2756, Australia

Continuation of Ser. No. 445,684, Jul. 13, 1990, abandoned. This application Nov. 14, 1991, Ser. No. 793,497

Claims priority, application Australia, Mar. 24, 1988, P17423

Int. Cl.[5] B60P *1/64*

U.S. Cl. 410—98 **3 Claims**

1. A method for securing a load to a loadbed using a rope tying device and a rope, said loadbed having at least three rope anchoring sites, said rope tying device comprising:

rope fixing means for attaching said rope to said device;

tensioning means for receiving a loop of said rope; receiving means for securing a free end of said rope;

said rope fixing means including an opening for threading said rope through and a first double hook for looping said rope around thereby affixing said device to a desired location of said rope and dividing said rope into a secured section between said device and a first end of said rope tied a first said anchoring site, and a free end section; said tensioning means including a single hook for receiving said loop of said rope; said receiving means including a second double hook for looping said free end of said rope around, thereby securing said free end of said rope to said device,

said method including the steps of

a) securing one end of the rope to said first anchoring site;

b) threading said rope through the opening of said device until said device is located at a predetermined location of said rope;

c) winding said rope around the first double hook of said device;

d) connecting said rope to a second and a third anchoring site of said loadbed thereby providing a rope loop therebetween;

e) placing said rope loop over said tensioning hook of said device and applying tension to said rope; and

f) winding said free end of said rope around the second double hook of said device.

5,205,688

DEFORMABLE PLUG OF A WALL FASTENER

Inge Sundstrom, Nyköping, Sweden, assignor to Thorsman & Co Aktiebolag, Nykoping, Sweden

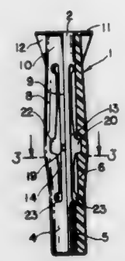
PCT No. PCT/SE90/00009, § 371 Date Jul. 3, 1991, § 102(e) Date Jul. 3, 1991, PCT Pub. No. WO90/08265, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 4, 1990, Ser. No. 721,455

Claims priority, application Sweden, Jan. 11, 1989, 8900069

Int. Cl.[5] F16B *13/04, 13/06*

U.S. Cl. 411—38 **12 Claims**



1. A fastening device including a plug comprising an elongated body having a central, longitudinal hole for receiving a threaded fastener, said body having a tubular wall surrounding said longitudinal hole, said body having inner and outer end portions, said inner end portion including means for threadably engaging the threaded fastener such that upon turning said threaded fastener said inner end portion will be urged longitudinally towards said outer end portion, said elongated body being provided with two slots extending longitudinally, in parallel planes, between said end portions, each slot being offset from the center of said longitudinal hole to pass through the wall of said body twice in two aligned regions of the wall to define four legs arranged, in two pairs, circumferentially around said body, said four legs defining an increasing diameter of said body in the longitudinal direction from said end portions to a central portion of said body, each of said legs having a thickness which increases from said end portions towards said central portion, the arrangement of said legs being such that when the plug is inserted into a bore in a wall, the legs will be radially compressed at said central portion to reduce the size of said hole thereat, and radial force will be developed between the fastener and said plug to apply radial force to the wall by said legs at four circumferential locations.

5,205,689

EXPANSIBLE PLUG

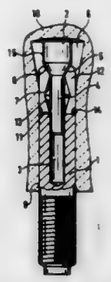
Artur Fischer, Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. KG, Tumlingen, Fed. Rep. of Germany

Filed May 8, 1992, Ser. No. 880,569

Claims priority, application Fed. Rep. of Germany, May 10, 1991, 4115222

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—54 **3 Claims**



1. An expansible plug for anchoring in conical inwardly expanding drilled holes, comprising a multi-slotted expansion anchor having an inner opening with a cylindrical part; and an expander body having a bearing slope and a pin engaging in said inner opening of said expansion anchor, said inner opening of said expansion anchor having a front end provided with a funnel, a conically expanding first portion adjoining said funnel and a second portion having a length corresponding to the length of said first portion and reducing to a diameter of said inner opening, said bearing slope of said expander body resting in said funnel of said inner opening of said expansion anchor and being held by said pin clampingly engaging in said cylindrical part of said inner opening.

5,205,690

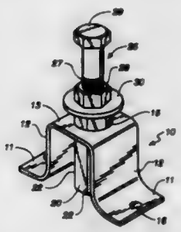
CONCRETE INSERT FOR ATTACHING UTILITY HANGERS TO A STRUCTURE

Steven Roth, 2891 Danville Blvd., Alamo, Calif. 94507

Filed Mar. 23, 1992, Ser. No. 856,364

Int. Cl.[5] F16B *39/02*; E04B *1/38*; E04C *5/00*

U.S. Cl. 411—82 **6 Claims**



1. A concrete insert comprising a U-shaped support having two legs connected with a bridge, said legs terminating in lateral flanges which lie substantially in a plane.

an opening in said bridge,

a coupling having connecting means, said coupling positioned between said legs, said coupling comprised of an external surface dimensioned to be in frictional engagement with said opening,

an elongated connectable element engaged with said coupling, and

a position-adjusting means on said connectable element, said position-adjusting means being movable axially on said connectable element and spanning the diameter of said opening.

5,205,691

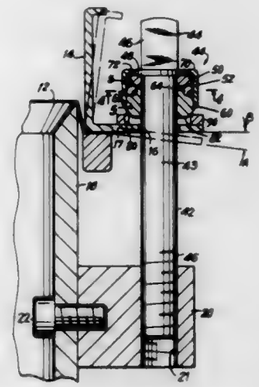
SCREW STABILIZER

Richard N. Steinberger, 153B Jackson Ave., New Windsor, N.Y. 12553

Filed Dec. 10, 1991, Ser. No. 804,565

Int. Cl.[5] F16B *39/24*

U.S. Cl. 411—147 **36 Claims**



1. A screw stabilizer for selectively adjusting a first element with respect to a second element comprising a screw having a first end adapted to be supported by at least a portion of said first element and a second end having threads adapted to be selectively threaded to said second element, first and second opposing washers supported intermediate said first end of said screw and said at least a portion of said first element, said first washer having an inner surface facing said second washer, said inner surface having a plurality of radially extending detents thereon, and a plurality of ball bearings sandwiched intermediate said first and second washers to be selectively received in said detents to releaseably lock said screw in a desired position to prevent loosening of said screw.

5,205,692

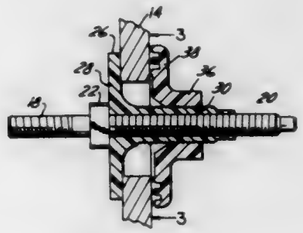
THREE-AXES VARIABILITY COMPENSATING FASTENER

David L. Kelbert, Brighton, and Richard T. Smith, Pinckney, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 30, 1992, Ser. No. 876,157

Int. Cl.[5] F16B *37/02*

U.S. Cl. 411—173 **11 Claims**



1. An apparatus for securing a component to a panel to

provide variable positioning of the component with respect to

cylindrical sleeve in the other direction lowers said bolt

an upper damper movable in a horizontal direction for parti-

assemblies until the other of said plurality of rows of tray

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provide variable positioning of the component with respect to three mutually perpendicular axes, said apparatus comprising:

an elongate, threaded stud having a first shank portion for threaded attachment to said component, a second shank portion and a flange formed integrally therebetween;

a generally planar member adapted to be positioned axially intermediate one side of said panel, said member having a generally cylindrical, elongate collar projecting perpendicularly from the plane of said member, said collar having internal threads formed therein for threaded attachment along the length of said stud second shank portion and external threads formed in an opposite direction on an outer surface thereof, said collar being adapted to be inserted into an aperture formed in said panel, said aperture being sized to provide substantial diametrical clearance about said collar outer surface; and

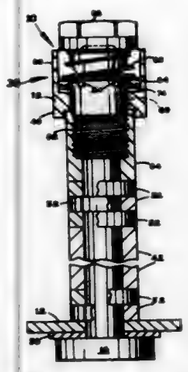
an internally threaded fastener threadedly engageable with said external threads of said collar and abuttingly engageable with an opposite side of said panel and operative, upon tightening said fastener, to draw said planar member against said panel to secure said component in a desired position in two axes and wherein said stud is variably positionable along its axis of elongation in a third mutually perpendicular axis.

5,205,693

QUICK RELEASE BOLT

S. Wyatt Faller, 6289 NW. 62nd Ter., Parkland, Fla. 33067; John Suggs, 140 SW. 12th St., Pompano Beach, Fla. 33060, and Salvatore Ambrico, 11680 NW. 24th St., Plantation, Fla. 33323

Filed May 11, 1992, Ser. No. 881,238
Int. Cl.[5] F16B *19/00, 35/02*
U.S. Cl. 411—354 3 Claims



1. A locking bolt apparatus, comprising:

a bolt having a fastening end with a circumferential channel around said fastening end,

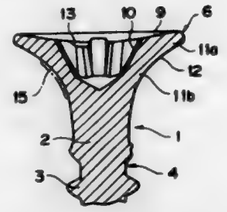
a bolt lock assembly comprising a cylindrical sleeve for receiving said fastening end of said bolt, said cylindrical sleeve having a pin slot angled with respect to said cylindrical sleeve longitudinal axis, a locking pin in said slot oriented perpendicular to the longitudinal axis of said cylindrical sleeve and having two ends extending beyond said slot, said pin being positioned to laterally enter said circumferential channel, and an annular release member, slidably encircling said cylindrical sleeve, for engaging said two ends of said pin and pushing said pin out of said slot and out of said channel to release said bolt, an annular bolt adjustment member surrounding said bolt adjacent to said cylindrical sleeve and having screw threads corresponding to and engaging said screw threads on said cylindrical sleeve, such that rotating said cylindrical sleeve in one direction elevates said bolt and rotating said cylindrical sleeve in the other direction lowers said bolt with respect to said annular bolt adjustment member.

5,205,694

SELF-TAPPING SCREW

Eiichi Nagoshi, Chigasaki; Osami Iwasaki, and Tetsuya Akashi, both of Hatano, all of Japan, assignors to Topura Co., Ltd., Osaka, Japan

Filed Apr. 29, 1992, Ser. No. 875,292
Claims priority, application Japan, May 29, 1991, 3-152282
Int. Cl.[5] F16B *23/00, 35/06*
U.S. Cl. 411—399 4 Claims



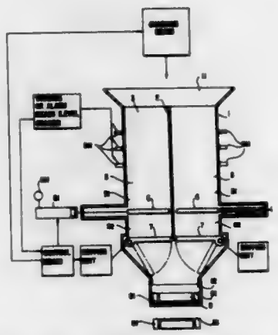
1. A screw comprising a screw shaft part, a sharp end integrally formed with the screw shaft part, and a head part integrally formed with the screw shaft part at a side opposite to the sharp end, said head part including a seat part extending to the screw shaft and having a shape of an inverse truncated cone with a curved outer surface, a spherical concave surface at an upper end surface of the head part, and an engaging groove adapted to engage with a screw driver tool, said engaging groove extending inwardly from the spherical concave surface and having chamfered portions with inwardly tapered shapes at an entire edge of the engaging groove so that the screw driver tool can be easily engaged with the engaging groove.

5,205,695

REFUSE STORAGE EQUIPMENT

Seizo Katsui, Osaka, Japan, assignor to Kabushiki Kaisha Plantec, Osaka, Japan

Continuation of Ser. No. 541,855, Jun. 21, 1990, abandoned.
This application Feb. 12, 1992, Ser. No. 833,586
Claims priority, application Japan, Jun. 22, 1989, 1-73218[U]
Int. Cl.[5] F23K *5/00*
U.S. Cl. 414—196 8 Claims



1. A medical refuse storage apparatus for temporary storage and timely discharge of medical refuse intermingled general refuse and industrial waste comprising:

a storage tank having a refuse charging hopper at its top and a refuse discharge port at its bottom;

an upper damper movable in a horizontal direction for partitioning an interior space within said storage tank into two storage compartments, an upper storage compartment and a lower storage compartment, when closed;

a lower damper disposed vertically swingable in a bottom of said interior space for individually opening and closing said refuse discharge port;

upper damper actuating means for actuating said upper damper between an open position and a closed position;

lower damper actuating means for actuating said lower damper between an open position and a closed position;

a pressure gauge, for measuring a reaction of said upper damper against the refuse during said upper damper closing, being disposed in the upper damper actuating means;

a conveyance system disposed under said refuse discharge port of said storage tank for transporting the refuse discharged from said refuse discharge port away from said storage tank;

control means for adjusting the conveying speed of said conveyance system and the opening and closing timing of said dampers; and

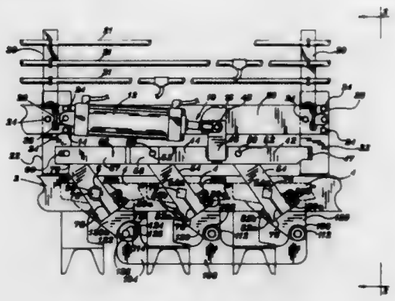
wherein the upper and lower dampers are sequentially opened and closed to fall the refuse once into said lower storage compartment from the upper storage compartment, then the refuse is discharged from said refuse discharge port, while the refuse is continuously conveyed into an incinerator by adjusting the conveying speed of said conveyance system and opening and closing timing of said dampers by said control means, and the closing action of said upper damper is stopped when the measurement by said pressure gauge exceeds a preset pressure during the closing action of said upper damper so that refuse packages packed with the medical refuse may not be broken by said upper damper.

5,205,696

DUMPING SYSTEM FOR A KILN FLOOR

Norman H. Andreasen, 1522 Norwood Ave., Itasca, Ill. 60143

Filed May 14, 1990, Ser. No. 522,903
Int. Cl.[5] F16H *21/44*
U.S. Cl. 414—287 14 Claims



1. A dumping system for a kiln floor comprising

a plurality of rows of tray assemblies forming the kiln floor in a horizontal position, shaft means for mounting each of said rows of tray assemblies for pivotal movement about a respective horizontal axis between said horizontal position and an open position for dumping material arranged on the floor,

power means for effecting said pivotal movement of said plurality of rows of tray assemblies on said shaft means between said horizontal position and said open position,

linkage means connecting said power means to said plurality of rows of tray assemblies for effecting said pivotal movement,

said linkage means having first delay means for delaying said pivotal movement of at least one of said rows of tray assemblies until the other of said plurality of rows of tray assemblies have initiated said pivotal movement from said horizontal position to said open position,

harmonizing means operatively connected to said shaft means at a position horizontally spaced from said linkage means, and

said harmonizing means locking said plurality of rows of tray assemblies in said horizontal position and in said open position,

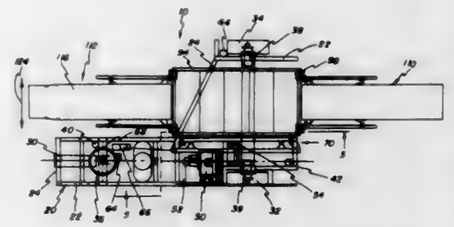
said harmonizing means being operatively connected to said shaft means of said at least one of said rows of tray assemblies, said harmonizing means further having second delay means for permitting said delay of pivotal movement of said at least one of said rows of tray assemblies.

5,205,697

MOBILE PASSENGER ACCESS LIFT

Paul M. Getty, Sunrise; Peter J. Driver, Miami; Caner Unsal, Plantation, and William J. Wilcox, Jr., Miami, all of Fla., assignors to Wollard Airport Equipment Company, Miami, Fla.

Filed Apr. 19, 1991, Ser. No. 687,804
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—341 14 Claims



1. A self-powered, three wheel, steerable vehicle for transporting a mobility impaired passenger in a boarding wheelchair and an attendant between a first location and the entrance to an aircraft at a second location at a different elevation, the aircraft having stairs with handrails descending from the entrance thereinto, said vehicle comprising

a frame assembly including a single forward component offset to one side so as to be positionable to one side of any stairs descending from the aircraft, and a rear component,

a first wheel mounted on the forward component of said frame assembly, and a pair of wheels mounted on said rear component of said frame assembly,

an operator's compartment mounted on and located at the offset forward end of said frame assembly,

a lift assembly mounted on said frame assembly for movement from a lowermost position to an operator selectable upper position,

a passenger compartment carried by said lift assembly, and

a boarding ramp located at the front end of said passenger compartment for placement into the aircraft entrance to provide a bridge between said passenger compartment and the aircraft and over the stairs and between the handrails of the aircraft whereby a passenger in a boarding wheelchair may be moved from the passenger compartment onto the aircraft by an attendant.

5,205,700

LOAD CARRYING ATTACHMENT FOR MOTOR

driving means for driving said first to third arms;

control means for controlling said driving means; and

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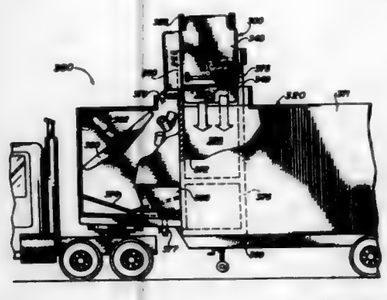
5,205,698
WASTE COLLECTION SYSTEM FOR SEGREGATING SOLID WASTE INTO PRESELECTED COMPONENT MATERIALS

Armand G. Mezey, 2724 W. Palm La., Phoenix, Ariz. 85009
Division of Ser. No. 324,697, Mar. 17, 1989, Pat. No. 5,035,563.
This application Jun. 27, 1991, Ser. No. 722,156
Int. Cl.[5] B65F *3/04*
U.S. Cl. 414—406 4 Claims

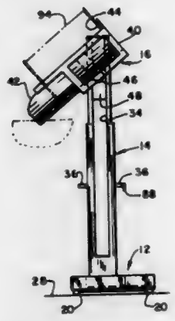


1. An improved waste collection system of the type for collection of waste from on-site locations along a route and transporting the collected waste to a centralized dumping station, said system comprising:
(a) at least one on-site waste storage container having a bottom and an upstanding side wall defining an interior chamber, an interiorly extending divider means in said chamber forming at least first and second waste-receiving compartments adapted to receive first and second types of waste, said first and second waste receiving compartments respectively having first and second openable covers, said container defining a third compartment adjacent said first and second compartments adapted to receive a third type of waste;
(b) a mobile waste collection vehicle having a trailer with upstanding side walls, a front wall, a rear wall and at least a partially open top defining a waste-receiving hopper, said hopper having divider means extending therein dividing the trailer into first and second separate mobile waste storage chambers;
(c) a bin positioned on said trailer adjacent said hopper to receive the waste from said container third compartment;
(d) loader means for said waste storage container associated with said vehicle, said loader means having container pick-up means for releasably holding said container and lift means for elevating said container from an on-site, lowered position to a dump position in which the container is partially inverted over said hopper, said container in said dump position being positioned relative to said chambers and bin to move said first and second covers to an open position each adjacent one of said first and second chambers to substantially cause the waste contained in said first and second compartments to be respectively emptied into said first and second separate mobile waste storage chambers and the waste contained in said third container compartment to be emptied into said bin thereby separating the waste into separate components.

5,205,699
METHOD AND APPARATUS FOR LIFTING AND TILTING DRUMS OF FLOWABLE MATERIAL

Helmut Habicht, 15 Royal Park Ter., Hillsdale, N.J. 07642
Filed Mar. 31, 1992, Ser. No. 860,891
Int. Cl.[5] B65G *65/23*
U.S. Cl. 414—420 19 Claims

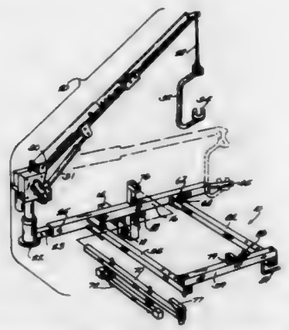
1. Apparatus for lifting and tilting a container of flowable material placed on the apparatus which includes:
(a) a base support and first elongated tubular column, an axis of the first elongated tubular column being arrayed in a substantially vertical position while being secured to said base support;
(b) a second elongated tubular column configured so as to be slidably positioned within said first tubular column;
(c) a slot formed in each of the first elongated tubular column and the second tubular column, each slot being in substantial alignment with each other while providing an access opening to an interior of the first elongated tubular column and the second elongated tubular column;
(d) a container support having a bottom portion adapted to receive and support a weight of said container;
(e) means for retaining the support in a placed condition on the container support during lifting and tilting of the container;
(f) a movable carriage member positioned within the second elongated tubular column, said moveable carriage member being lifted at a selected rate as the second elongated tubular column is lifted, this moveable carriage member having guide rollers rotatably secured thereto;
(g) at least two U-shaped channel members, each of said U-shaped channel members being attached to opposing walls of the second elongated tubular column for providing guideways for each of the guide rollers secured to the moveable carriage member;



(i) a selectively actuated lift and lowering means which includes a hydraulic cylinder secured to and supported by a base plate in the first elongated tubular column and with this hydraulic cylinder having a piston rod end secured to a support carried by and fixed to a top portion of said second elongated tubular column, this hydraulic cylinder adapted to lift the second elongated tubular column;
(j) a flexible tension means for connecting the first elongated tubular column to the moveable carriage member to provide said lifting at said selected rate;
(k) a reversible rotary gear-motor secured to said moveable carriage member, said rotary gear-motor being moveable with said moveable carriage member, said rotary gear-motor being operated by a pressurized fluid, an output shaft of said rotary gear-motor providing for the tilting of the container support; said output shaft extending through each of said slots;
(l) a pump means adapted for providing a hydraulic fluid at a selected pressure to said hydraulic cylinder;
(m) a flexible conductor means for fluidically connecting and selectively carrying said pressurized fluid to said rotary gear-motor, said flexible conductor being adapted to allow full lifting of said rotary gear-motor on and with said movable carriage member; and
(n) wherein said lifting of said container support is controllable by a first valve means, and said lifting of the container support is controllable by a second valve means.

5,205,700
LOAD CARRYING ATTACHMENT FOR MOTOR VEHICLE

Jhy-hong Lin, Milwaukee, and John J. Daily, Waukesha, both of Wis., assignors to Ortho-Kinetics, Inc., Waukesha, Wis.
Filed Oct. 31, 1991, Ser. No. 785,554
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—540 5 Claims

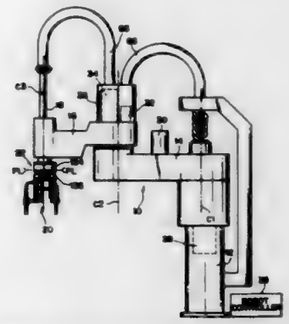


1. An attachment for a rear of a motor vehicle for transporting a load thereon comprising
a first frame member removably attachable to the rear of a motor vehicle in a horizontal orientation transverse to a longitudinal axis of the vehicle,
a load carrying frame pivotally attached to said first frame member at at least one pivot point, said load carrying frame being pivotable from a storage position in a horizontal plane parallel to said first frame member to an extended load carrying position transverse to and extending rearwardly from the first frame member,
means to secure said load carrying frame in the storage position,
means to secure said load carrying frame in the extended position, and,
a hoist mechanism attached to one end of said first frame member by a support member affixed to said first frame member, said hoist mechanism being rotatable on said support member about a vertical axis and pivotable thereon in a vertical plane, said hoist mechanism being further provided with an extendable retractable flexible load lifting line.

5,205,701
INDUSTRIAL ROBOT

Hiroyuki Kigami, Yokohama; Masatoru Yasuhara, Kawasaki; Katsumi Ishihara, Yokohama, and Yasuhiro Sawada, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 31, 1991, Ser. No. 709,028
Claims priority, application Japan, Jun. 4, 1990, 2-146432; Feb. 19, 1991, 3-24326; Feb. 19, 1991, 3-24327
Int. Cl.[5] B25J *18/04*
U.S. Cl. 414—744.5 9 Claims

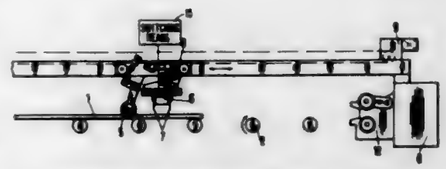
1. An industrial robot, comprising:
a base unit;
a first arm having opposite end portions, one end portion is attached to said base unit to be rotatable about a first axis;
a second arm having opposite end portions, one end portion is attached to the other end portion of said first arm to be rotatable about a second axis;
a third arm which is attached to the other end portion of said second arm to be vertically movable along a third axis and to be rotatable about the third axis, and to a lower end of which hand means for holding parts is detachably attached;
driving means for driving said first to third arms;
control means for controlling said driving means; and
wiring and piping means for supplying a control signal from said control means to said driving means, and for supplying a control signal and a working fluid from said control means to said hand means,
said wiring and piping means including:
a first fixing jig extending to a position above said first arm and above the first axis;
a second fixing jig arranged on said second arm and on the second axis;



a third fixing jig arranged on an upper end of said third arm and on the third axis;
a first pipe, one end of which is connected on the first axis on said first fixing jig, the other end of which is connected to a position near the second axis on said second fixing jig, and through which a bundle of wiring and piping lines is inserted; and
a second pipe, one end of which is connected to a position near the second axis on said second fixing jig, the other end of which is connected on the third axis on said third fixing jig, and through which the bundle of wiring and piping lines is inserted.

5,205,702
DEVICE FOR INTRODUCING ROLLED-STEEL SECTIONS INTO A COLD SHEAR

Karlheinz Varwig, Mülheim, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Sep. 30, 1991, Ser. No. 769,086
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1990, 4032335
Int. Cl.[5] B25J *15/06*
U.S. Cl. 414—751 7 Claims



1. An apparatus for feeding and introducing rolled steel sections into a cold shear or straightening machine including a roller path for carrying said steel sections and for transporting said steel sections at a speed of transport in a direction of transport toward one of said shear and straightening machine, said apparatus comprising:
a carriage arranged above said roller path and comprising a

drive for moving said carriage along said direction of

prefeeder assembly supported on a support floor and compris-

at least one panel alignment device operably positionable

axially downstream surface of the turbine rotor to oppose

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drive for moving said carriage along said direction of transport at a speed;

means connected to said carriage for holding down said steel sections; and

a holding device comprising a lift magnet mounted on said carriage, said magnet being displaceable on said holding device relative to said holding device along a predetermined path parallel to said direction transport of said carriage, said lift magnet comprising means for measuring the displacement of said magnet along said predetermined path relative to said holding device and for generating and transmitting a signal to said carriage drive as a function of said displacement for adapting said speed of movement of said carriage to said speed of transport of said steel sections.

5,205,703

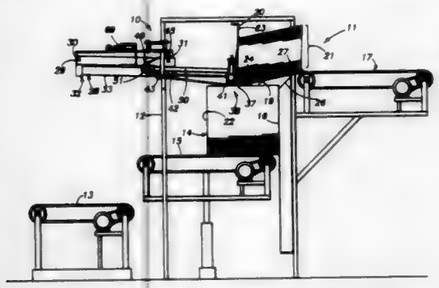
TOP SHEET HOLD DOWN FOR STACKED SHEET HANDLING MACHINE

David Shill, Spokane, Wash., and Curtis A. Roth, Post Falls, Id., assignors to Thermoguard Equipment, Inc., Spokane, Wash.

Filed May 14, 1991, Ser. No. 699,967

Int. Cl.[5] B65G *59/02*

U.S. Cl. 414—796 **31 Claims**



1. A top sheet hold down apparatus for use with a stacked sheet handling machine which progressively removes successive blocks of sheets from the top of an upright stack of sheets by a sheet block pusher plate moved by a driver substantially horizontally to engage a block of sheets along one side surface of the block and to move the engaged block of sheets substantially horizontally across the sheet stack to a discharge station at an opposite side of the stack, said top sheet hold down apparatus comprising:

a hold down traction means mounted for movement with the pusher plate, said hold down traction means including a sheet engaging friction surface which engages a top surface of a prescribed sheet in the stack immediately below a block of sheets engaged by the pusher plate;

driver link means for driving the sheet engaging friction surface independently of contact with the top surface of the prescribed sheet in a direction opposite to that in which the pusher plate is moved to hold the prescribed sheet stationary relative to the stack of sheets.

5,205,704

APPARATUS FOR PREFEEDING SHEETS OF PAPERBOARD PRODUCTS

Terry M. Frost, Spokane, Wash.; Terry B. Smith, Coeur d'Alene, Id.; Jon P. Drake, and Hugh F. Moran, both of Spokane, Wash., assignors to ASC Machine Tools, Inc., Spokane, Wash.

Filed Aug. 20, 1990, Ser. No. 572,144

Int. Cl.[5] B65H *3/24, 5/36*

U.S. Cl. 414—796.8 **16 Claims**

2. An improved prefeeder assembly for shingling sheets of planar material from block segments removed from a sheet stack and passing the sheets to a sheet feeder hopper, the prefeeder assembly supported on a support floor and comprising:

infeed lift conveyor means for receiving the sheet stack substantially at floor level, for lowering the sheet stack below floor level and for selectively lifting the sheet stack so that the block segments can be moved therefrom, the infeed lift conveyor having an elevator frame;

block pusher means for sequentially pushing each block segment from the sheet stack;

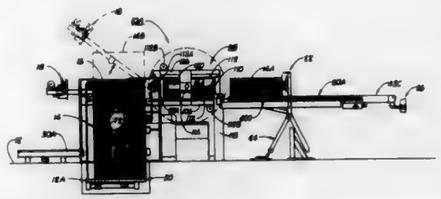
conveyor means for receiving block segments and for moving same to discharge the sheets into the sheet feeder hopper;

shingling means for shingling the sheets on the conveyor means prior to discharge into the sheet feeder hopper; and

bottom sheet removal means for removing the bottom sheet of the last removed block segment from the sheet stack; and

wherein the block pusher means comprises:

a pair of support arms pivotally connected to the elevator frame;



a travel assembly supported by the support arms, the travel assembly comprising:

a pusher plate and;

travel means for moving the pusher plate alternatively in opposing forward and reverse directions along the support arms so that movement of the pusher plate in the forward direction pushes the block segments one at a time from the stack on the infeed lift conveyor means onto the conveyor means; and

fluid cylinder means for pivoting the support arms upwardly in an extended mode and for pivoting the support arms downwardly in a retracted mode, there being access provided for horizontal stack movement beneath the pusher plate for placement of the stack onto the infeed lift conveyor means when the fluid cylinder means is in the extended mode, the pusher plate positionable in pushing engagement with the uppermost block segment in the stack supported by the infeed lift conveyor means when the fluid cylinder means is in the retracted mode.

5,205,705

APPARATUS AND PROCESS FOR FEEDING PANELS TO A PANEL CUTTING SAW

Erwin Jenkner, Lindenstrasse 13, Gechingen, Fed. Rep. of Germany

Filed Jan. 6, 1992, Ser. No. 817,858

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1991, 4100458

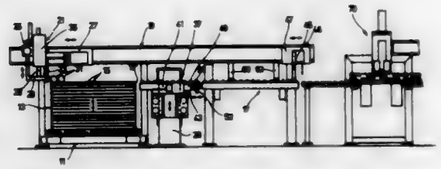
Int. Cl.[5] B65G *59/02*

U.S. Cl. 414—796.8 **12 Claims**

1. A panel feed device for a panel cutting saw having a cutting plane and wherein a panel feed platform is arranged adjacent the panel cutting saw, the panel feed device having an elevator platform for receiving and transiently supporting a plurality of stacked workpiece panels to be cut, a barrier member operably arranged parallel to the cutting plane, and a first conveyer device for conveying at least one of the stacked workpiece panels along a feed path from the elevator platform toward the panel feed platform, the panel feed device comprising:

at least one panel alignment device operably positionable between the elevator platform and the panel feed platform and arranged for movement along the feed path, for aligning the panels against the barrier member;

the barrier member being operably disposed adjacent to the feed path, for reciprocating movement at least parallel thereto, substantially adjacent to the panel feed platform,



and repositionable from at least a barrier position to a release position; and

means operably disposed adjacent to the feed path for reciprocating movement at least parallel to the feed path, for incrementally feeding to the panel cutting saw workpiece panels which have been aligned and stacked on the panel feed platform.

5,205,706

AXIAL FLOW TURBINE ASSEMBLY AND A MULTI-STAGE SEAL

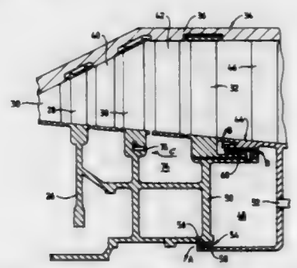
Bryan L. Belcher, Leamington Spa, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 4, 1992, Ser. No. 831,060

Claims priority, application United Kingdom, Mar. 2, 1991, 9104457

Int. Cl.[5] F01D *3/00, 3/02*

U.S. Cl. 415—105 **18 Claims**



1. An axial flow turbine assembly comprising means defining a radially inner extremity of an annular turbine flowpath, means defining a radially outer extremity of the annular turbine flowpath,

a turbine rotor being rotatably mounted about an axis, the turbine rotor having an axially downstream surface, the turbine rotor having at least one stage of radially outwardly extending turbine rotor blades in said flowpath,

a turbine stator having an outer casing defining at least a portion of the radially outer extremity of said flowpath, the outer casing including at least one stage of radially inwardly extending turbine stator vanes in said flowpath, the turbine stator vanes having inner platform means defining at least a portion of the radially inner extremity of said flowpath,

the axially downstream surface of the turbine rotor and the inner platform means at least partially defining a first chamber, means being arranged to supply fluid at a predetermined pressure into the first chamber to provide a thrust load acting in an axially upstream direction on the axially downstream surface of the turbine rotor to oppose loads acting on the turbine rotor,

a multi-stage seal being arranged between the turbine rotor and the inner platform means to control a leakage flow of fluid from the first chamber into said flowpath,

means to bleed fluid from a predetermined position in the multi-stage seal to reduce the leakage flow of fluid from the first chamber into said flowpath through the multi-stage seal, means to supply the fluid bled from the multi-stage seal to cool at least one component of the turbine assembly.

5,205,707

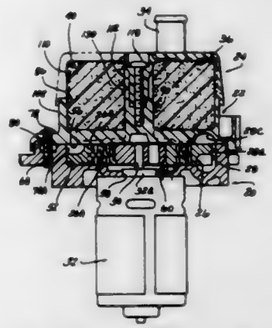
IORIC PUMP WITH CAST IMPELLER HOUSING REQUIRING THREE MACHINED SURFACES AND ONE CENTRAL PILOTING BORE TO CONTROL CRITICAL TOLERANCES

John E. Smith, Rochester Hills; Dennis N. Koenig, Jr., Waterford Township, and William E. Ruhig, Jr., Sterling Heights, all of Mich., assignors to Coltec Industries Inc., New York, N.Y.

Continuation-in-part of Ser. No. 502,157, Mar. 28, 1990. This application Apr. 3, 1991, Ser. No. 679,948

Int. Cl.[5] F03B *11/08*

U.S. Cl. 415—121.2 **8 Claims**



1. A toric pump comprising an impeller housing having a front end face lying in a first general plane and a cup shaped impeller receiving recess in said front end face having a bottom surface lying in a second general plane parallel to said first general plane, said recess having a central axis normal to said first and second general planes, an impeller received in said impeller receiving recess for rotation about said axis, said impeller having front and rear side surfaces lying in parallel general planes normal to said axis and disposed between and respectively closely adjacent to said first and second general planes, an impeller cover having a front face and a flat rear face disposed in sealed face to face engagement with said front end face of said housing around the periphery of said impeller receiving recess, means defining a pump chamber in said rear face of said impeller cover cooperable with said impeller and extending circumferentially of said axis from an inlet end to an outlet end circumferentially separated from said inlet end by a stripper portion of said rear face, said impeller cover having externally accessible outlet port means in fluid communication with said outlet end of said pump chamber, means defining a generally cup shaped filter receiving recess in said front face of said cover having an inlet passage opening from said filter receiving recess into said pump chamber at said inlet end, a filter cover mounted on said front face of said impeller cover in overlying relation to said filter receiving recess and sealingly engaged with said front face around the periphery of said filter receiving recess, means defining an externally accessible inlet port in said filter cover opening into said filter receiving recess at a location remote from said inlet end in said impeller cover,

and filter means resiliently gripped between said filter cover

a rotor hub mounted to said support means, said hub having a plurality of rows of fan blades thereon;

5,205,711

HAND-PORTABLE FIRE FIGHTING POSITIVE

output member independently rotatably carried by said engine

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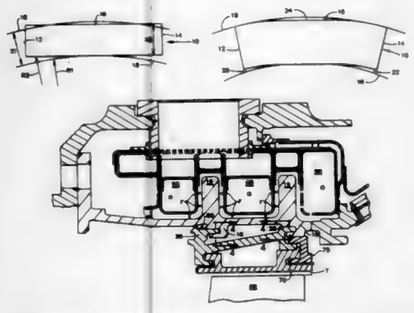
and filter means resiliently gripped between said filter cover and said impeller cover between said inlet port and said inlet passage.

5,205,708

HIGH PRESSURE TURBINE COMPONENT INTERFERENCE FIT UP

Larry W. Plemmons, Fairfield; Robert Proctor, W. Chester, both of Ohio, and Robert J. Albers, Park Hills, Ky., assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 7, 1992, Ser. No. 832,823
Int. Cl.[5] F01D *25/24, 11/00;* B21D *53/92*
U.S. Cl. 415—173.1 20 Claims



1. A method for accomplishing an interference fit comprising the steps of:
providing a support having a first radius and having a first width;
providing a hanger having a second radius and having a second width, and further having a first end and a second end;
offsetting said second radius of said hanger and said first radius of said support, such that said second radius is greater than said first radius;
driving said hanger into said support; and
creating a spring in said hanger by flexing said first end and said second end of said hanger to conform to said first width of said support, and providing first and second clearance indentations at said first and second ends, and a third clearance indentation between said hanger and said support.

12. An interference fit hanger comprising:
support having a first radius and having a first width;
a flexible hanger having a second radius and having a second width, and further having a first end and a second end wherein second radius is greater than said first radius and wherein said hanger is elastically flexed to fit within said support and achieves an spring force interference fit with said support when installed; and
an air flow control seal means located between said hangar and said support.

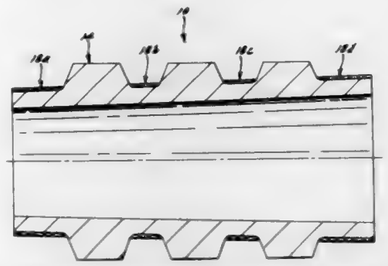
5,205,709

FILAMENT WOUND DRUM COMPRESSOR ROTOR

William P. Schimmel, Milford; Irvin J. Pollock, Farmington Hills, and Lawrence T. Halstead, Hartland, all of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Mar. 24, 1992, Ser. No. 856,569
Int. Cl.[5] T04D *29/04*
U.S. Cl. 415—216.1 8 Claims

1. A drum compressor rotor for use in a turbine engine comprising:
a means for supporting rotation of said rotor within said compressor;
a rotor hub mounted to said support means, said hub having a plurality of rows of fan blades thereon;
a plurality of high strength, low weight filaments tightly wound axially around said hub, said plurality of filaments tightly wound between said row of fan blades respectively, said plurality of filaments structurally reinforcing said hub.



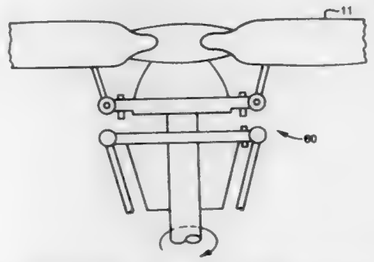
5. A method of structurally reinforcing a rotor hub of a compressor rotor used in a turbine engine comprising the steps:
covering at least one high strength, low weight filament with an adhesive resin; and tightly winding said at least one filament axially around said hub.

5,205,710

HELICOPTER BLADE CRACK DETECTION SYSTEM

Geoffrey P. Engels, and Mark C. Thomas, both of Warner Robins, Ga., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 4, 1991, Ser. No. 680,458
Int. Cl.[5] B63H *1/00*
U.S. Cl. 416—61 3 Claims



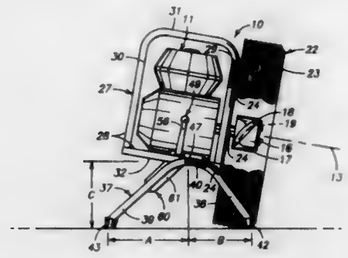
1. A crack detection system for a helicopter having hollow spars in blades that are either pressurized or evacuated to a low pressure, said crack detection system comprising:
rotating assembly means mounted on a helicopter rotor shaft-blade apparatus for detecting and indicating a crack in each of the blades;
means mounted on a helicopter airframe for warning a pilot of the crack; and
said rotating assembly means for detecting and indicating and said means for warning being in periodic photo-optic communications, said communications being between a light emitter of said means for detecting and a photo-optic detector of said means for warning located within a few thousands of an inch of each other.

5,205,711

HAND-PORTABLE FIRE FIGHTING POSITIVE PRESSURE BLOWER

Daniel G. Raczykowski, Cheney, Wash., assignor to Unifire Power Blower, Inc., Spokane, Wash.

Filed Feb. 28, 1992, Ser. No. 843,464
Int. Cl.[5] A62C *39/00*
U.S. Cl. 416—63 17 Claims



1. A hand-portable fire fighting positive pressure blower, comprising:
an engine having a drive shaft rotatable about a drive shaft axis;
a positive pressure propeller mounted to the drive shaft;
a propeller guard enclosing the propeller and including a face surface forward of the propeller;
a central frame mounting the engine and propeller guard and having central frame elements forming a protective cage substantially surrounding the engine;
wherein the central frame includes top and bottom sides;
a support frame;
the support frame including forward and rearward legs extending to forward and rearward feet, the forward legs being joined integrally to the rearward legs in arcuate configurations to provide clearance between the legs and under the engine;
a pivot mounting the central frame to the support frame about an adjustment axis adjacent the bottom side of the central frame and situated downwardly of and substantially transverse to the drive shaft axis, for selectively enabling the central frame, engine, propeller, and propeller guard to pivot about the adjustment axis from a balanced position wherein the propeller axis is substantially horizontal;
adjustment means connected between the support frame and the central frame, selectively operable to secure the central frame at a prescribed angle to the support frame; and
stop means for preventing pivotal movement of the central frame relative to the support frame beyond prescribed upward and downward angular limits.

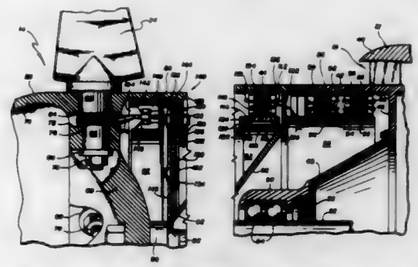
5,205,712

VARIABLE PITCH FAN GAS TURBINE ENGINE

Paul U. Hamilton, Palos Verdes Estates, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 13, 1991, Ser. No. 700,371
Int. Cl.[5] B64C *11/44*
U.S. Cl. 416—155 14 Claims

1. Pitch change apparatus for a variable-pitch fan of a fan propulsion turbine engine, said pitch change apparatus comprising a first and second axially spaced alternator, each alternator having a stator carried by a housing of said engine and a rotor rotated by a rotatable portion of said engine, a motor axially spaced from said alternators and receiving excitation current from a selected one of said alternators, said motor including an annular stator rotated by said engine rotatable portion, and an annular motor armature rotatable relative to said engine rotatable portion, speed reduction means, carried by said rotatable engine portion, having an input rotated by said motor armature and an output rotatably driving a torque output member independently rotatably carried by said engine rotatable portion, and linkage means coupling said torque



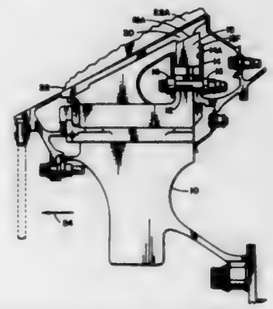
output member with fan blades of said fan to alter the pitch angle thereof in response to rotation of said torque output member.

5,205,713

FAN BLADE DAMPER

Stephen J. Szpunar, West Chester, and Christopher C. Glynn, Hamilton, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 29, 1991, Ser. No. 693,165
Int. Cl.[5] F01D *5/26*
U.S. Cl. 416—193 A 15 Claims



1. A fan blade damper system comprising:
damper means for frictionally engaging a highest vibratory region of a fan blade; and
retainer means for retaining said damper means so that said damper means is mounted in a statically determinant fashion, said retainer means having at least three sides with two opposite sides for mounting to a fan disk post with said damper means being disposed directly radially above the fan disk post.

5,205,714

AIRCRAFT FAN BLADE DAMPING APPARATUS

Samir I. Shah; Ramon Themudo, and Michael Even-Nur, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 559,792, Jul. 30, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 852,833
Int. Cl.[5] F01D *5/26*
U.S. Cl. 416—220 R 26 Claims

1. A blade damping structure for a gas turbine engine, said structure comprising:
a. a blade including an airfoil portion configured to define a damping cavity;
b. means for mounting said blade to a gas turbine engine;

c. means for damping vibrations of said blade, said means for

5,205,716

(23), and in that in response to this sensed subpressure the

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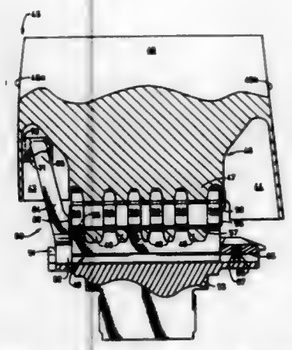
c. means for damping vibrations of said blade, said means for damping

i) extending between said airfoil portion and said means for mounting, and



ii) including a base member and a spring member attached thereto and extending therefrom, wherein said base member is integral with said means for mounting; and

d. wherein said blade includes a clevis and wherein said means for mounting includes a mating clevis and a trunnion attached thereto.

5,205,715

HELICOPTER ROTOR BLADES

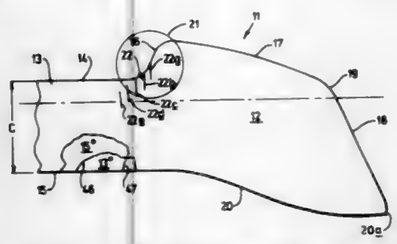
Frederick J. Perry; Nicholas C. G. Isaacs, both of Yeovil, and Alan Brocklehurst, Sherborne, all of England, assignors to Westland Helicopters, Ltd., England

Filed Oct. 10, 1991, Ser. No. 774,331

Claims priority, application United Kingdom, Oct. 13, 1990, 9022271

Int. Cl.[5] B64C *27/46*

U.S. Cl. 416—228 18 Claims



1. A helicopter rotor blade having a leading edge and a trailing edge defining a blade chord, a pitch change axis, a swept tip including a forwardly swept leading edge blended with the blade leading edge to define a notch region, and a plurality of rearwardly extending boundary layer control vanes protruding from an upper aerofoil surface of the rotor blade and spaced-apart along the notch region, the control vanes comprising thin fences extending between leading and trailing edges thereof with the leading edges of at least some of the control vanes substantially coincident with said forwardly swept leading edge, and the lengths of the control vanes being between 5 percent and 40 percent of the blade chord dimension.

5,205,716

COMPOSITE MATERIAL TURBINE WHEEL

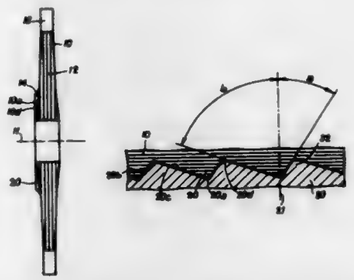
Jean-Michel Georges, Gradignan, and Jacques G. Feuillet, Floirac, both of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

Filed Sep. 30, 1991, Ser. No. 768,385

Claims priority, application France, Oct. 2, 1990, 90 12133

Int. Cl.[5] F01D *5/02*

U.S. Cl. 416—229 A 2 Claims



1. A turbine wheel driven by a gear means comprising:

a composite material hub including a drive gear formed of teeth that extend radially on one face of said wheel, each of said teeth having edges and being asymmetric with respect to a meridian plane passing through an apex thereof, and each of said teeth further having,

a first shoulder centering the turbine wheel against an abutting face of said gear means and transmitting a drive torque from said gear means to said turbine wheel, said first shoulder subtending an angle substantially in a range of 15° to 45° relative to said meridian plane, and

a second shoulder absorbing pressure exerted by said gear means and subtending an angle substantially in a range of 55° to 85° relative to said meridian plane,

said first shoulder and said second shoulder decreasing stresses exerted at a root of each of said teeth and said edges of said teeth and roots of cogs of said gear means between adjacent teeth being on lines that converge to a common point located on an axis of said turbine wheel.

5,205,717

EJECTOR ARRAY AND A METHOD OF ACHIEVING IT

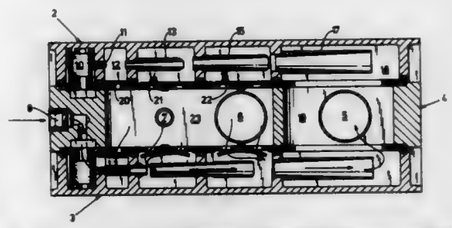
Peter Tell, Åkersberga, Sweden, assignor to Piab AB, Akersberga, Sweden

Filed Oct. 14, 1992, Ser. No. 960,881

Claims priority, application Sweden, Oct. 31, 1991, 9103237

Int. Cl.[5] F04F *5/48*

U.S. Cl. 417—189 3 Claims



2. Ejector array (1) including at least two compressed air operated ejectors (2, 3), characterised in that each ejector (2, 3) has its own optimum efficiency for the same values of the supplied compressed air, in that the ejectors (2, 3) are connected such that the subpressure generated by the ejectors (2, 3) is available in a common subpressure collection chamber

(23), and in that in response to this sensed subpressure the sensor steers the compressed air supply to one ejector (2, 3) a time, the first ejector (2) to be supplied being the one evacuating the greatest amount of air per time unit, while the ejector (3) generating the lowest subpressure is supplied last.

5,205,718

VARIABLE DISPLACEMENT SWASH PLATE TYPE COMPRESSOR

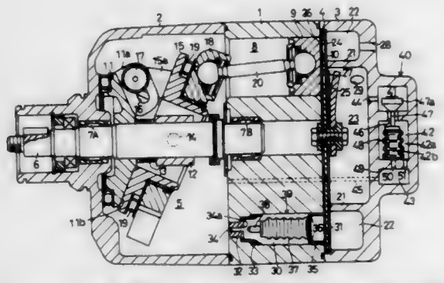
Yoshihiro Fujisawa; Hiroaki Kayukawa; Kazuya Kimura; Chuichi Kawamura, and Hideki Mizutani, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 9, 1992, Ser. No. 942,714

Claims priority, application Japan, Sep. 18, 1991, 3-238402; Apr. 28, 1992, 4-110531

Int. Cl.[5] F04B *1/28*

U.S. Cl. 417—222.2 10 Claims



1. A variable displacement swash plate type compressor having a suction chamber, a discharge chamber and a crank chamber, the compressor comprising:

flow rate control valve means provided along a refrigerant supply passage for connecting the discharge chamber to the crank chamber, said flow rate control valve means including:

a discharge pressure chamber located on the discharge chamber side along the refrigerant supply passage;

an intermediate chamber located on the crank chamber side in the refrigerant supply passage;

a valve hole provided between said discharge pressure chamber and said intermediate chamber, to permit said discharge pressure chamber to communicate with said intermediate chamber;

pressure sensitive means provided in said intermediate chamber for separating said intermediate chamber into a first pressure sensitive chamber, which communicates with said discharge pressure chamber via said valve hole, and a second pressure sensitive chamber, which communicates with at least one of said crank chamber and said suction chamber, said pressure sensitive means being displaceable as a function of a pressure difference between said first and second pressure sensitive chambers;

a restriction provided along said refrigerant supply passage for permitting said first pressure sensitive chamber and said crank chamber to communicate with each other;

a valve body connected to said pressure sensitive means, and being displaceable in synchrony with the action of said pressure sensitive means, and being capable of regulating the opening of said valve hole according to that displacement; and

a return member for returning said valve body and said pressure sensitive means to predetermined positions where said valve hole is opened by said valve body when pressure in said discharge chamber becomes almost zero.

5,205,719

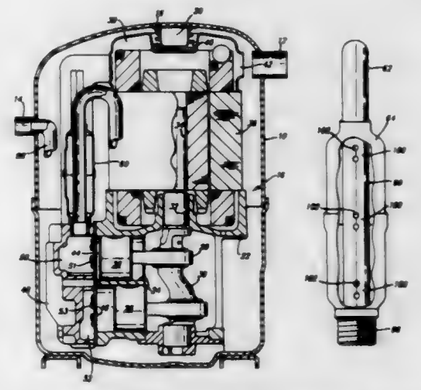
REFRIGERANT COMPRESSOR DISCHARGE MUFFLER

Austin S. Childs, Piqua; Hubert Bukac, Sidney, and Simon Y. Wang, Tipp City, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Jan. 13, 1992, Ser. No. 819,763

Int. Cl.[5] F04B *21/00*

U.S. Cl. 417—312 11 Claims



1. A compressor discharge muffler comprising:

a shell defining a generally cylindrical sound attenuation chamber having a longitudinal axis, said chamber having an inlet opening disposed at a first end of said shell and an outlet opening disposed at a second end of said shell;

a single piece tube disposed within said attenuation chamber and having a center axis, a central passage, an outlet end and an inlet end, said inlet end sealingly connected to said inlet opening for receiving gas entering said muffler, said outlet end sealingly connected to said outlet opening for discharging said gas from said muffler, said tube being straight with said center axis of said tube extending generally parallel to said longitudinal axis of said shell; and

means defining a plurality of spaced arrangements of apertures through the wall of said tube, each arrangement of apertures being spaced a specified distance from adjacent arrangements of apertures, each arrangement of apertures comprising a plurality of apertures extending generally perpendicular to said center axis of said tube, each aperture of said plurality of apertures connecting said attenuation chamber to said central passage of said tube.

5,205,720

METHOD AND APPARATUS FOR PRODUCING COMPRESSED AIR AND WATER PUMPING APPARATUS UTILIZING THE PRODUCED AIR

Tsugio Nagata, 16-6, Kobenjiminami 4-chome, Suginami-ku, Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,662

Claims priority, application Japan, Jul. 3, 1990, 2-174532

Int. Cl.[5] F04F *11/00*

U.S. Cl. 417—328 17 Claims

1. An apparatus for compressing air, comprising:

a container, said container defining an air chamber therein that is capable of having its volume reduced by external hydraulic pressure;

a recovery vessel connected to said container by a check valve for recovering compressed air produced when the

volume of said chamber is reduced by hydraulic pressure;

pling a hydraulic fluid to another fluid while preventing

fluid transducer means while simultaneously delivering said hydraulic fluid only to said third transducer means;

rate of hydraulic fluid withdrawn from said third fluid transducer means decreases;

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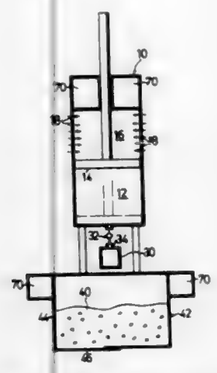
volume of said chamber is reduced by hydraulic pressure; and



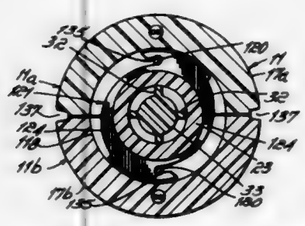
means for sinking said container and said recovery vessel under water, said means comprising a weight attached to said container.

5,205,721

SPLIT STATOR FOR MOTOR/BLOOD PUMP

Milton S. Isaacson, Dayton, Ohio, assignor to Nu-Tech Industries, Inc., Dayton, Ohio

Filed Feb. 13, 1991, Ser. No. 654,833
Int. Cl.[5] F04B *35/04*
U.S. Cl. 417—356 **20 Claims**



1. A motor/blood pump combination comprising:
an axial flow blood pump including a cylindrical housing;
a motor to drive the pump, the motor including a pair of stator halves surrounding and mechanically connectable to the housing to form a stator for driving the pump; and
a rotor located within the housing and rotatably driven by the stator, the rotor being rotatable within the housing on a hydrodynamic bearing, whereby the pump is easily removable from the housing by separating the stator halves.

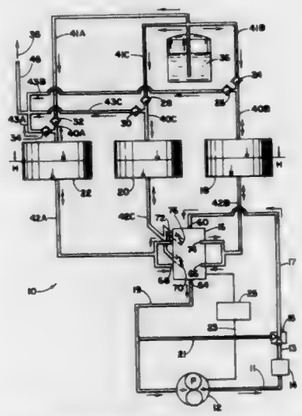
5,205,722

METERING PUMP

John M. Hammond, 6172 Knickerbocker Rd., Ontario, N.Y. 14519

Filed Jan. 4, 1991, Ser. No. 710,323
Int. Cl.[5] F04B *43/06*
U.S. Cl. 417—395 **10 Claims**

1. An apparatus for pumping fluid at a substantially constant flow rate, wherein said apparatus is comprised of:
(a) a first fluid transducer means for hydraulically coupling a hydraulic fluid to another fluid while preventing said hydraulic fluid from contacting said other fluid;
(b) a second fluid transducer means for hydraulically coupling a hydraulic fluid to another fluid while preventing said hydraulic fluid from contacting said other fluid;
(c) a third fluid transducer means for hydraulically coupling a hydraulic fluid to another fluid while preventing said hydraulic fluid from contacting said other fluid;
(d) means for delivering said hydraulic fluid to said first fluid transducer means, said second fluid transducer means, and said third fluid transducer means so that the sum of the flow rates of said hydraulic fluid delivered to said first transducer means, said second transducer means, and said third transducer means is substantially constant;
(e) timing means for continuously and sequentially repeating a timing cycle, wherein said timing cycle is comprised of the steps of:
1. withdrawing said hydraulic fluid from said first fluid transducer means while simultaneously delivering said hydraulic fluid to said second fluid transducer means while none of said hydraulic fluid is delivered to said third fluid transducer means;
2. thereafter, withdrawing said hydraulic fluid from said first fluid transducer means while simultaneously delivering said hydraulic fluid to said second fluid transducer means and simultaneously commencing delivery of said hydraulic fluid to said third fluid transducer means, wherein:



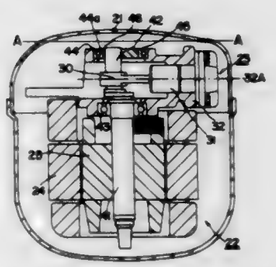
(a) said hydraulic fluid is initially delivered to said third transducer means at a substantially zero flow rate which thereafter increases;
(b) when said hydraulic fluid has been initially delivered to said third fluid transducer means, the flow rate of fluid delivered to said second fluid transducer means decreases; and
(c) the total flow rate of fluid delivered to both said second fluid transducer means and said third fluid transducer means is substantially constant;
3. thereafter, withdrawing said hydraulic fluid from said first fluid transducer means while simultaneously commencing withdrawal of said hydraulic fluid from said second fluid transducer and simultaneously delivering said hydraulic fluid only to said third fluid transducer, wherein:
(a) said hydraulic fluid is initially withdrawn from said second fluid transducer means at a substantially zero flow rate which thereafter increases; and
(b) when said hydraulic fluid has been initially withdrawn from said second fluid transducer means, the flow rate of hydraulic fluid withdrawn from said first fluid transducer means decreases;
4. discontinuing the withdrawal of said hydraulic fluid from said first fluid transducer means and thereafter withdrawing said hydraulic fluid only from said second fluid transducer means while simultaneously delivering said hydraulic fluid only to said third transducer means;
5. withdrawing said hydraulic fluid from said second fluid transducer means while simultaneously delivering said hydraulic fluid to said third fluid transducer means while none of said hydraulic fluid is delivered to said first fluid transducer means;
6. thereafter, withdrawing said hydraulic fluid from said second fluid transducer means while simultaneously delivering said hydraulic fluid to said third fluid transducer means and simultaneously commencing delivery of said hydraulic fluid to said first fluid transducer means, wherein:
(a) said hydraulic fluid is initially delivered to said first transducer means at a substantially zero flow rate which thereafter increases;
(b) when said hydraulic fluid has been initially delivered to said first fluid transducer means, the flow rate of fluid delivered to said third fluid transducer means decreases; and
(c) the total flow rate of fluid delivered to both said first fluid transducer means and said third fluid transducer means is substantially constant;
7. thereafter, withdrawing said hydraulic fluid from said second fluid transducer while simultaneously commencing withdrawal of said hydraulic fluid from said third fluid transducer and simultaneously delivering said hydraulic fluid, only to said first fluid transducer, wherein:
(a) said hydraulic fluid is initially withdrawn from said third transducer means at a substantially zero flow rate which thereafter increases; and
(b) when said hydraulic fluid has been initially withdrawn from said third fluid transducer means, the flow rate of hydraulic fluid withdrawn from said second fluid transducer means decreases;
8. discontinuing the withdrawal of said hydraulic fluid from said second fluid transducer means and thereafter withdrawing said hydraulic fluid only from said third fluid transducer means while simultaneously delivering said hydraulic fluid only to said first transducer means;
9. withdrawing said hydraulic fluid from said third fluid transducer means while simultaneously delivering said hydraulic fluid to said first fluid transducer means while none of said hydraulic fluid is delivered to said second fluid transducer means;
10. thereafter, withdrawing said hydraulic fluid from said third fluid transducer means while simultaneously delivering said hydraulic fluid to said first fluid transducer means and simultaneously commencing delivery of said hydraulic fluid to said second fluid transducer means, wherein:
(a) said hydraulic fluid is initially delivered to said second transducer means at a substantially zero flow rate which thereafter increases;
(b) when said hydraulic fluid has been initially delivered to said second fluid transducer means, the flow rate of fluid delivered to said first fluid transducer means decreases; and
(c) the total flow rate of fluid delivered to both said first fluid transducer means and said second fluid transducer means is substantially constant;
11. thereafter, withdrawing said hydraulic fluid from said third fluid transducer while simultaneously commencing withdrawal of said hydraulic fluid from said first fluid transducer and simultaneously delivering said hydraulic fluid only to said second fluid transducer, wherein:
(a) said hydraulic fluid is initially withdrawn from said first fluid transducer means at a substantially zero flow rate which thereafter increases; and
(b) when said hydraulic fluid has been initially withdrawn from said first fluid transducer means, the flow rate of hydraulic fluid withdrawn from said third fluid transducer means decreases;
12. discontinuing the withdrawal of said hydraulic fluid from said third fluid transducer means and thereafter withdrawing said hydraulic fluid only from said first fluid transducer means while simultaneously delivering said hydraulic fluid only to said second transducer means;
(f) means for synchronizing said timing means with said means for providing a substantially constant flow of hydraulic fluid;
(g) means for allowing flow of said other fluid into said first fluid transducer, said second fluid transducer, and said third fluid transducer through a first conduit means; and
(h) means for allowing flow of said other fluid out of said first fluid transducer, said second fluid transducer, and said third fluid transducer through a second conduit.

5,205,723

HERMETICALLY SEALED COMPRESSOR

Hideki Kawai; Satoshi Wada, both of Fujisawa, and Masahiko Osaka, Chigasaki, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

Filed Aug. 28, 1991, Ser. No. 751,128
Claims priority, application Japan, Jan. 22, 1991, 3-5593; Jan. 22, 1991, 3-5594; Apr. 3, 1991, 3-70923
Int. Cl.[5] F04B *35/04*
U.S. Cl. 417—415 **6 Claims**



1. A hermetically sealed compressor, comprising:
an electric element having a rotor and a crankshaft, said crankshaft being arranged vertically;
a compression element for compressing gas said element having a connecting rod operatively connected to said crankshaft; and
a hermetic container resiliently supporting said electric element and compression elements therein;
said crankshaft being secured to said rotor of the electric element and supported by a ball bearing, wherein said ball bearing includes an outer washer;
said crankshaft comprising a principal part, a secondary part and an eccentric axial part, positioned between the principal part and the secondary part,
said eccentric axial part being connected to one end of said connecting rod, said ball bearing being installed in at least one of said principal part and secondary part so that downward force caused by weight of both said crankshaft and said rotor are supported at the outer washer of said ball bearing in order to preload said ball bearing.

5,205,724

REVOLVING PISTON COMPRESSOR

through, said inlet openings located on said pump housing and communicating exteriorly of said pump housing en-

5,205,727

PULSE COMBUSTOR

tion of air thereto, a combustion chamber in communication with said valve means, and a resonance tube in com-

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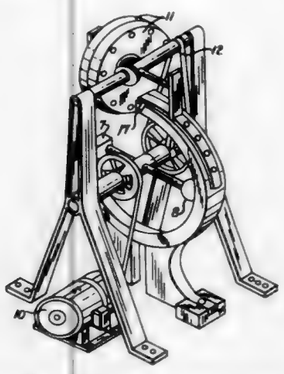
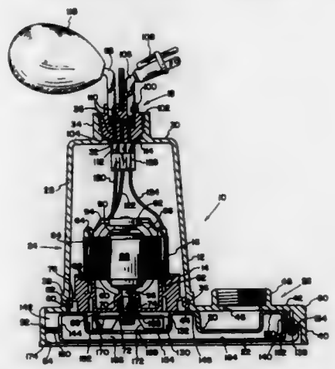
5,205,724
REVOLVING PISTON COMPRESSOR
Esteban T. Alexander, Calle J. No. 1, Unidad Alianza Revolucionaria, Coyoacan, D.F., C.P. 04800, Mexico
Filed Dec. 31, 1991, Ser. No. 815,953
Claims priority, application Mexico, Jul. 23, 1991, 9100336
Int. Cl.[5] F04B *17/00*; F01C *3/02*
U.S. Cl. 417—420 9 Claims



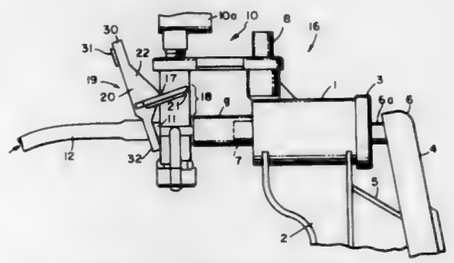
1. A revolving piston compressor comprising:
a compression chamber having an open-ended non-magnetic annular sleeve for receiving a magnetically reactive piston;
a piston driver having a magnet disposed on a radial arm rotating about a central geometric axis of said annular sleeve wherein said magnet interacts with said piston thereby propelling said piston through said annular sleeve;
a transverse gate having a non-magnetic chamber, a non-magnetic rotating disc disposed in said non-magnetic chamber, said non-magnetic chamber having opposing gate ports interconnecting said non-magnetic chamber to said open ends of said annular sleeve, said rotating disc having a window therethrough wherein said rotating disc interposed said annular sleeve and wherein said window may be aligned with said opposing gate ports;
means for rotating said piston driver and said rotating disc;
means for synchronizing the position of said rotating disc and said piston driver relative to said annular sleeve thereby allowing said piston to pass through said window in said rotating disc;
whereby said piston creates a pressure gradient in said compression chamber.

5,205,725
TOP SUCTION SUMP PUMP HAVING BOTTOM SUCTION IMPELLER
Herbert G. Pattison, Fort Wayne, Ind., assignor to Wayne/Scott Fetzer Company, Fort Wayne, Ind.
Filed Jul. 16, 1991, Ser. No. 730,640
Int. Cl.[5] F04D *29/70*
U.S. Cl. 417—423.3 20 Claims

1. A sump pump for pumping a standing fluid comprising:
a pump housing defining a volute chamber;
a centrifugal impeller mounted within said volute chamber for rotation about a substantially vertical axis;
an electric motor having a substantially vertical driven shaft extending into said volute chamber in driving engagement with said centrifugal impeller;
said pump housing further defining a fluid chamber having an outlet opening communicating with said volute chamber axially below said centrifugal impeller, and a plurality of inlet openings for receiving standing fluid therethrough, said inlet openings located on said pump housing and communicating exteriorly of said pump housing entirely above a horizontal plane passing through said outlet opening of said fluid chamber.

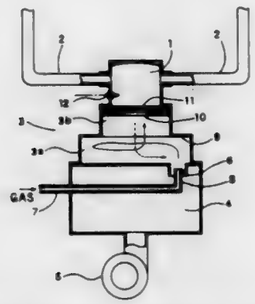


5,205,726
TUBING REMOVER
Theodore C. Neward, 521 Scripps Dr., Claremont, Calif. 91711
Filed Jul. 3, 1991, Ser. No. 725,029
Int. Cl.[5] F04B *23/00, 21/00*
U.S. Cl. 417—572 18 Claims



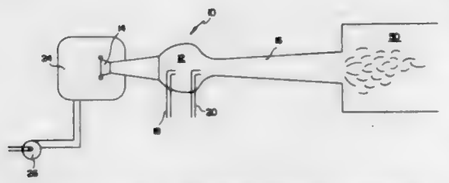
1. A hand-held vacuum pump, comprising
a cylinder for isolating a volume from the atmosphere and having an inlet port and an outlet port,
biased piston means for drawing a vacuum through the inlet port of the cylinder and including a piston which can be moved in the cylinder,
handle means coupled with the cylinder means and the piston means, and
a tubing remover having a lever with at least two arms, one arm of the lever having an opening sized and dimensioned to at least partially encircle the inlet port and to allow the lever to rock while an engagement between the one arm of the lever and a tubing end on the inlet port is maintained, the opening juxtaposed between the tubing end and the vacuum pump, a rocker means for establishing a fulcrum between the lever and the vacuum pump, which rocker means enables the lever to reciprocate back and forth in a rocking motion, and means for stabilizing the rocking motion of the lever.

5,205,727
PULSE COMBUSTOR
Yutaka Aoki, Sapporo, and Tadashi Itakura, Ebetu, both of Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Aug. 7, 1992, Ser. No. 927,161
Claims priority, application Japan, Aug. 13, 1991, 3-228827
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 10 Claims



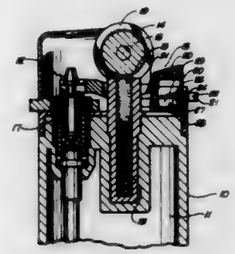
1. A pulse combustor for continuous combustion of air/fuel mixture, comprising:
a combustion chamber receiving mixture of air and fuel gas for pulsative combustion;
one or plural tail pipes connecting to said combustion chamber for exhausting combustion byproducts from said combustion chamber;
a mixing chamber being coupled with and connected to said combustion chamber via a first opening provided with a flame trap, for mixing air and fuel gas and supplying the air/fuel mixture to said combustion chamber;
an air chamber being coupled with and connected to said mixing chamber via a second opening formed on a face opposite to said first opening, for supplying air to said mixing chamber;
a fan for feeding air into said air chamber; and
a gas supply conduit for supplying fuel gas to said mixing chamber, said gas supply conduit going through said air chamber and having one end projecting to connect with said mixing chamber via said second opening;
wherein said second opening is formed eccentrically with respect to said first opening.

5,205,728
PROCESS AND APPARATUS UTILIZING A PULSE COMBUSTOR FOR ATOMIZING LIQUIDS AND SLURRIES
Momtaz N. Mansour, Columbia, Md., assignor to Manufacturing and Technology Conversion International, Columbia, Md.
Filed Nov. 18, 1991, Ser. No. 793,834
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 17 Claims



1. A liquid or slurry atomization apparatus comprising:
a) a pulse combustor for generating an oscillating flow field of atomization fluid, said pulse combustor including means for introduction of fuel thereto, valve means for introduction of air thereto, a combustion chamber in communication with said valve means, and a resonance tube in communication with said combustion chamber wherein said resonance tube and said combustion chamber communicate with each other at a juncture; and
b) means for introducing a liquid or slurry to be atomized to said pulse combustor, said introduction means being located adjacent said juncture of said combustion chamber and said resonance tube so that said liquid or slurry may be atomized.
13. A method for atomizing liquids or slurries comprising:
a) pulse combusting a fuel in a combustion chamber;
b) generating combustion-induced oscillations to produce a stream of atomization fluid; and
c) introducing a liquid or slurry to be atomized to the influence of said stream of atomization fluid immediately after combusting said fuel so that an atomized liquid or slurry is produced under the influence of said oscillated stream.

5,205,729
SAFETY MECHANISM FOR A LIGHTER
Masayuki Iwahori, 15-19, Nakada Houmachi, Shizuoka-shi, Shizuoka-ken, Japan
Filed May 8, 1992, Ser. No. 879,992
Claims priority, application Japan, Nov. 1, 1991, 3-315349
Int. Cl.[5] F23D *11/36*
U.S. Cl. 431—153 3 Claims



1. A safety mechanism for a lighter comprising a lock button for preventing a gas lever from being turned in the direction of raising the gas nozzle, said lock button being disposed on a lighter body under a rear portion of said gas lever, said lock button being movable forward and backward, the rear end of said lock button usually protruding backward from said lighter body, said lock button having a hole, said lock button having a pair of elastic arms protruding forward, said lock button further having an engagement projection at a lower portion thereof, said lighter body being provided with contact walls corresponding to said elastic arms, said lighter body being provided under said lock button with an elastic action member, said action member having an engagement portion corresponding to said engagement projection of said lock button, said gas lever being provided at a rear portion thereof with a downward projection which can be inserted into said hole of said lock button when said lock button has been pushed forward, said gas lever further being provided at a rear portion thereof with a downward protrusion which pushes said action member downward when said downward projection has been inserted into said hole of said lock button.

5,205,730
GARDEN TORCH WITH REMOVABLE CONTAINER
Martin Capdeville, 4106 Storm #W., Yakima, Wash. 98908
Filed Aug. 4, 1992, Ser. No. 924,674
Int. Cl.[5] F23D *3/24*
U.S. Cl. 431—320 10 Claims

1. A garden torch comprising:
a pole;

a bracket having a horizontal lower leg affixed to the top of

5,205,732
PIPE HEATING APPARATUS

tips and to engage said lower jaw teeth cusp tips to retain a jaw in an open position.

said exterior side of said face pillows having means to secure said face pillow on sides of a mouth bow;

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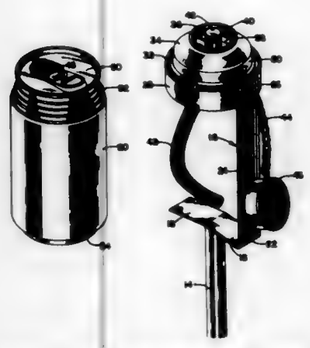
a bracket having a horizontal lower leg affixed to the top of the pole;

a circular cover forming the upper leg of said bracket, said cover having a hole therein;



a wick slidable within the hole in said cover; and

a container having a hole in its top suitable for insertion of the wick, said container being removably insertable into said bracket between the lower bracket leg and the cover.

5,205,731

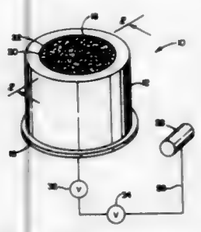
NESTED-FIBER GAS BURNER

James J. Reuther, Worthington, and Robert D. Litt, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Feb. 18, 1992, Ser. No. 837,872

Int. Cl.[5] F23D *14/12*

U.S. Cl. 431—328 **17 Claims**



1. A method of making a gas burner comprising,

forming fibers of material having a diameter in the range of about 0.008 in. to about 0.03 in., a length in the range of about 0.3 in. to about 0.7 in. and an aspect ratio in the range of about 15–50,

depositing said fibers randomly into a mold having a cross-sectional shape to a depth in the range of about 0.3 in. to about 0.7 in.,

heating said mold to a temperature in the range of about 1000° C. to about 1500° C. to effect a sintering of the fibers together to form a fibrous mat having said cross-sectional shape,

providing a burner body with an inlet on one end and a burner port on the other end, and

securing said mat in said burner port.

5,205,732

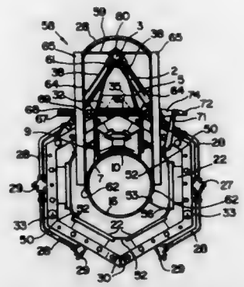
PIPE HEATING APPARATUS

Alan Kirby, Edmonton, Canada, assignor to Cis-Can Industries Ltd., Alberta, Canada

Filed Dec. 23, 1991, Ser. No. 812,048

Int. Cl.[5] F24J *3/00*

U.S. Cl. 432—238 **9 Claims**



1. A pipe heating apparatus comprising skeletal frame means; roller means on said frame means for movably supporting the apparatus on a pipe to be heated; clamp means on said frame means for releasably engaging the pipe to stabilize the apparatus on the pipe; and heater means pivotally mounted in said frame means for rotation between a closed position around a pipe to be heated and an open position.

5,205,733

VETERINARY MOUTH PROP

John L. Scheels, 12705 W. Wilbur Dr., New Berlin, Wis. 53151

Filed Feb. 19, 1992, Ser. No. 837,751

Int. Cl.[5] A61D *5/00*; A61C *5/00*

U.S. Cl. 433—1 **6 Claims**

1. A veterinary mouth prop adapted to be placed between the teeth cusp tips of an upper jaw and the teeth cusp tips of a lower jaw of a veterinary patient comprising

an upper jaw support, said upper jaw support including an essentially planar prop body having a concave top surface, said prop body top surface being curved slightly inwardly of said prop body,

a lower jaw support, said lower jaw support including a convex bottom prop body surface being curved slightly outwardly of said prop body,

an upper jaw teeth cusp tip engagement means, said upper jaw teeth cusp tip engagement means comprising a plurality of transverse ridges situated along said prop body top surface which are functionally adapted to engage said upper jaw teeth cusp tips, and

a lower jaw teeth cusp tip engagement means, said lower jaw teeth cusp tip engagement means comprising a plurality of transverse ridges situated along said prop body bottom surface which are functionally adapted to move along said lower jaw teeth cusp tips when said prop body bottom surface is urged along said lower jaw teeth cusp tips and to engage said lower jaw teeth cusp tips to retain a jaw in an open position.

5,205,734

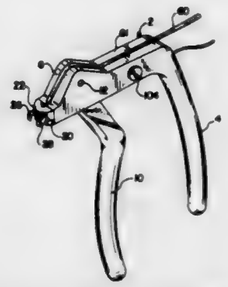
APPARATUS FOR REMOVING CERAMIC ORTHODONTIC BRACKETS AND AN ASSOCIATED METHOD

Roy D. Marangoni, and Jeffery L. Rickabaugh, both of Pittsburgh, Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Jan. 21, 1992, Ser. No. 824,258

Int. Cl.[5] A61C *3/00, 1/00*

U.S. Cl. 433—4 **21 Claims**



1. Apparatus for removing a ceramic orthodontic bracket secured to a patient's tooth comprising

a body portion having a handle and a head portion,

bracket engaging means for engaging and removing the orthodontic bracket

said bracket engaging and removing means being disposed within said head portion,

operating means for opening and closing said bracket engaging and removing means whereby a force can be applied to the apparatus facilitating removal of the orthodontic brackets,

laser generating means for generating a laser beam,

guide means operatively associated with said body means and said laser generating means, for delivery of said laser beam from said laser generating means to the orthodontic bracket,

said guide means having a discharge opening adjacent to said bracket engaging and removing means, and

switch means for activating said laser generating means.

5,205,735

HEAD GEAR PILLOW

Staci B. McLauchlan, 1343 Delta Ave., Cincinnati, Ohio 45208

Filed Feb. 14, 1992, Ser. No. 835,769

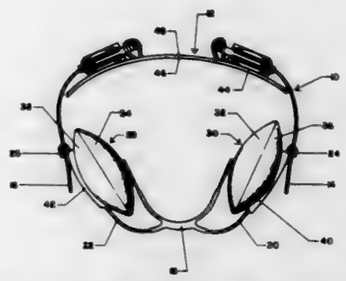
Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—5 **2 Claims**

1. A head gear pillow for use with an orthodontic appliance comprising

a pair of face pillows adapted to fit on sides of said orthodontic appliance;

said face pillows having an interior side and an exterior side; said exterior side of said face pillows having means to secure said face pillow on sides of a mouth bow;



wherein said face pillows have a diameter of approximately 2.5 inches and a width of 162 to one inch.

5,205,736

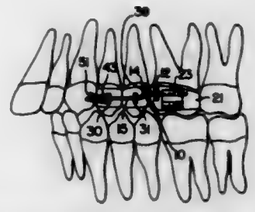
MAGNETIC ORTHODONTIC APPLIANCE

Abraham M. Blechman, 153 Lester Dr., Tappan, N.Y. 10983

Filed Mar. 26, 1992, Ser. No. 858,340

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—18 **9 Claims**



1. An orthodontic appliance for distalizing a posterior tooth or teeth without surgical extraction, comprising a plurality of anchoring bands adapted to be mounted to certain selected teeth on a single arch of a patient inclusive of the posterior tooth or teeth to be distalized, and at least one proximal tooth anterior thereto; an edgewise member affixed to the anchoring band on the posterior tooth to be distalized, bracket means affixed to the other band(s); an orthodontic sectional wire extending from said edgewise member to said bracket means; and a pair of permanent magnets of cylindrical geometry, each having an opening axially extending through the symmetrical center thereof, with said magnets slidably mounted on said sectional wire through said central openings in an arrangement to repel one another, with the magnet on the distal side of said sectional wire abutting said edgewise member, and with the other magnet in close proximity thereto, and means for securing said magnetic on the mesial side of said sectional wire relative to the proximal tooth or teeth supporting said bracket means.

5,205,737

ARTICULATORS FOR USE IN CONSTRUCTING ARTIFICIAL TEETH

Graham E. White, Sheffield, England, assignor to The University of Sheffield, Sheffield, England

Filed Aug. 22, 1991, Ser. No. 689,929

Claims priority, application United Kingdom, Nov. 17, 1988, 8526896

Int. Cl.[5] A61C *11/00*

U.S. Cl. 433—55 **15 Claims**

1. Means for use in measuring the condylar movements of

artificial temporomandibular joints in an articulator of the type

spring contacts adapted to bear against exposed portions of

force spreading means for equalizing forces on said cables insertable within said chamber and disposed on at least

circuit package having a substantially rectangular shape with an upper surface, a lower surface, and four lateral edges with

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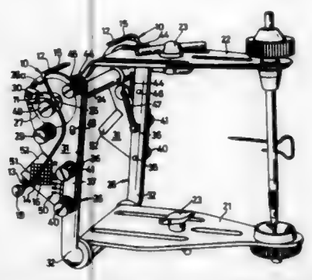
artificial temporomandibular joints in an articulator of the type incorporating a lower, stationary base plate and an upper, movable base plate, these base plates being connected with one another by supports the top portion of each of which has a transverse bore in which is rotatably mounted a disc, and screw means to prevent axial displacement of the disc and to selectively secure the disc within a range of rotational positions as indicated by an arcuate scale, each disc also being provided with a radially extending elongated aperture in which rests a guide portion on one end of a shaft member forming a pivot for the movable base plate, and each guide portion having the form of two truncated cones which abut one another at their smaller base surfaces, thereby forming a waist urged into cen-



tralising engagement with the lower edges of the elongated apertures by tension springs between the guide portions and their respective supports;

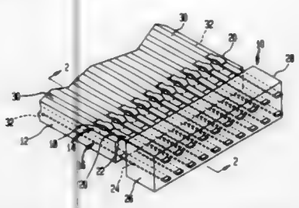
the said measuring means comprising a boss adapted to be secured coaxially at one end of the shaft member forming the pivot for the movable base plate, a first arm extending from the boss, axial scale bearing means adapted to extend from the first arm over the adjacent support and generally parallel to the axis of the shaft member, a second arm extending from the boss, a pointer extending generally parallel to the axial scale bearing means, and slide means on the second arm for the pointer to enable its point to be brought into contact with a face area of the support when the boss has been secured coaxially with the shaft member.

5,205,738

HIGH DENSITY CONNECTOR SYSTEM

Herbert R. Anderson, Jr., Patterson; Arthur Bross, Poughkeepsie; Julian G. Cempa, Deposit; Robert O. Lussow, Hopewell Junction; Donald E. Myers, and Thomas J. Walsh, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1992, Ser. No. 863,643
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—59 **14 Claims**



1. An electronic connector system comprising:

a body of plastic insulating material;

a plurality of conductive traces supported by the body;

a plurality of pieces of metal seated in mechanical and electrical engagement with respective ones of the conductive traces and captivated by surrounding portions of the plastic insulating material; and

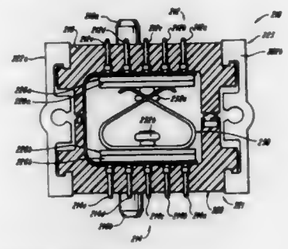
spring contacts adapted to bear against exposed portions of the respective metal pieces with a desired contact force.

5,205,739

HIGH DENSITY PARALLEL INTERCONNECT

Cheryne Malo, Foxboro; Steven P. Marian, Plainville, both of Mass., and David W. Mendenhall, Greenville, R.I., assignors to Augat Inc., Mansfield, Mass.

Continuation-in-part of Ser. No. 435,191, Nov. 13, 1989, Pat. No. 5,102,342. This application Apr. 2, 1992, Ser. No. 863,340
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—66 **6 Claims**



1. A connector comprising:

a contact module comprising,

a housing having first and second sides;

a first array of contacts disposed on the first side of said housing along a first plane of said contact module; and

a second array of contacts disposed on the second side of said housing along a second plane of said contact module with the second plane being parallel to the first plane in which said first array of contacts are disposed;

a matched impedance film disposed in contact with said first and second arrays of contacts said matched impedance film comprising,

a dielectric sheet;

first and second arrays of contact pads disposed on said dielectric sheet, said first and second arrays of contact pads corresponding to said first and second arrays of contacts, respectively, of said contact module; and

means for electrically interconnecting said first and second arrays of contact pads; and

at least one interactive biasing module including at least one resilient pad, at least one plate in cooperation with said at least one resilient pad and at least one force generating means interacting with said matched impedance film for providing substantially uniform contact force distribution and displacement tolerance relief for said first and second arrays of contacts of said contact module.

5,205,740

SUPER CONNECTOR FOR CONNECTING FLAT RIBBON CABLES

Richard F. Frankeny, Austin, Tex.; Karl Hermann, Romulus, N.Y.; Ronald E. Hunt, Georgetown, and Verlon E. Whitehead, Austin, both of Tex., assignors to International Business Machines, Corp., Armonk, N.Y.

Filed Dec. 13, 1991, Ser. No. 808,261
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—67 **16 Claims**

1. A connector for electrically joining two electrical cables comprising:

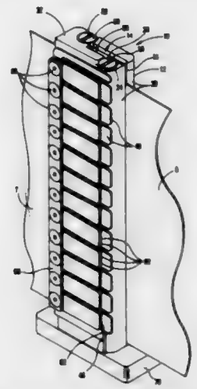
a frame comprising a rigid member having an exterior and having a long axis disposed transverse to an axis of conductors of said cables, said rigid member comprising a pair of retaining members forming a chamber extending transverse to said long axis;

at least one slot communicating with said chamber and said exterior;

force spreading means for equalizing forces on said cables insertable within said chamber and disposed on at least one side of said cables;

spring means disposed on said frame and rigidly attached thereto;

force transmission means projecting through said frame intermediate said force spreading means and said spring means for transmitting spring force to said force spreading means;



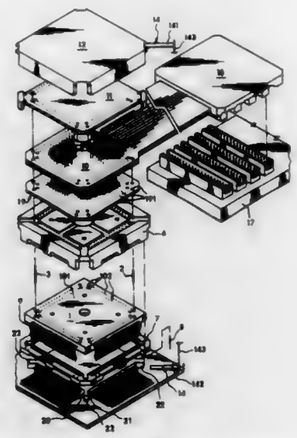
relief means for relieving forces from said spring means against said force spreading means, thereby permitting insertion of said cables and said force spreading means into said chamber, application of said force to said cable ends to connect said conductors on said cables, and relieving said force to permit removal of said cable ends from said connector.

5,205,741

CONNECTOR ASSEMBLY FOR TESTING INTEGRATED CIRCUIT PACKAGES

Michael J. Steen; Robert H. Wardwell, and Joseph A. McKenzie, Jr., all of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 14, 1991, Ser. No. 744,763
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—70 **5 Claims**



1. A connector for use primarily in testing an integrated circuit package having a substantially rectangular shape with an upper surface, a lower surface, and four lateral edges with at least one of said lateral edges having a plurality of electrical leads extending therefrom, said connector comprising:

a connector housing having a defined recess of a substantially rectangular shape adapted to fit over said integrated circuit package;

at least one comb made of an insulative material having a plurality of teeth extending laterally inward from said connector housing into said recess with predefined spacing between each pair of adjacent teeth, said teeth being adapted for removable insertion between said leads as said connector housing is fitted over said integrated circuit package;

a plurality of test leads, each test lead having a lower portion extending into one of said spaces between said teeth to make electrical contact with a corresponding one of said integrated circuit package leads when said connector housing is fitted over said integrated circuit package;

a cable having a plurality of conductors extending between a first end and a second end; and

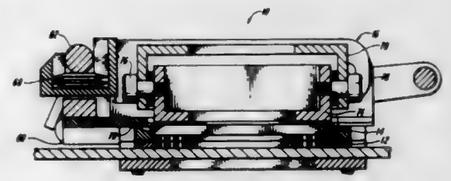
a leadframe assembly attached to said connector housing within said recess, interconnecting a predetermined set of said test leads with the first ends of a predetermined set of said cable conductors.

5,205,742

HIGH DENSITY GRID ARRAY TEST SOCKET

Jay Goff, Warwick, R.I., and Mark E. Lewis, Mansfield, Mass., assignors to Augat Inc., Mansfield, Mass.

Continuation-in-part of Ser. No. 748,505, Aug. 22, 1991. This application Dec. 6, 1991, Ser. No. 804,127
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—73 **20 Claims**



1. A high density contact test socket comprising:

a contact socket assembly having an insulative portion, said insulative portion having a plurality of holes disposed therein;

a plurality of resilient contacts disposed in at least some of said plurality of holes, said plurality of resilient contacts comprising a contact tip and a contact base;

a cover adapted to be disposed on said contact socket assembly and adapted for applying sufficient pressure on a component installed in said contact socket assembly, said cover being adapted for manual actuation and comprising a hinged lid assembly engaging a base plate supporting said contact socket assembly, said hinged lid assembly comprising a plurality of side plates hinged to said base plate at a first end of said side plates, a full motion 2-axis gimbal, said 2-axis gimbal comprising an outer gimbal and an inner gimbal, said inner gimbal rotatably hinged along a first axis to said outer gimbal, said outer gimbal rotatably hinged along a second axis to said plurality of side plates; and

a latch mechanism for latching said cover to maintain said component in electrical engagement with said plurality of resilient contacts;

wherein said latch mechanism comprises a plurality of side levers fastened to said base plate by a fastener at a first end and a lever handle attached to at least one of said plurality of side levers at a second end, said plurality of side levers each having a link member attached thereto proximate to

said first end and said link members having a latch rod

5,205,745

housing and so juxtaposed with the electrical circuit means as

rounded end portion to a point within said threaded portion of

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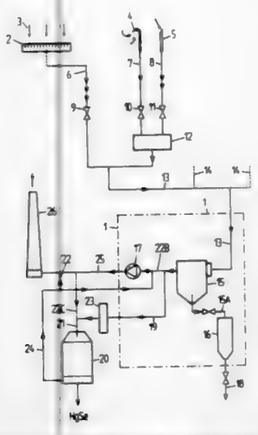
said first end and said link members having a latch rod attached therebetween whereby rotational motion of said level handle about said fastener is translated into a vertical motion imparted to said latch rod via said link members.

5,205,743

DENTAL TREATMENT METHOD

Björn M. Ludvigsson, Örviken, and Ulf D. L. Strömberg, Gothenburg, both of Sweden, assignors to Boliden Contech AB, Stockholm, Sweden

Filed Jan. 21, 1992, Ser. No. 822,912
Claims priority, application Sweden, Feb. 7, 1991, 9100380
Int. Cl.[5] A61C *17/06, 17/14*
U.S. Cl. 433—92 13 Claims



1. A method of reducing the risk of injury from mercury in conjunction with dental treatment comprising passing an air flow immediately outside an oral cavity in which the dental treatment is taking place; passing the air flow , together with air removed by suction from the oral cavity when removing saliva by suction during the dental treatment, through a first filter for extracting solid and liquid particles from said air flow; and passing the air flow through a second filter which comprises a selenium filter so that essentially all of the mercury vapor is adsorbed on the selenium filter.

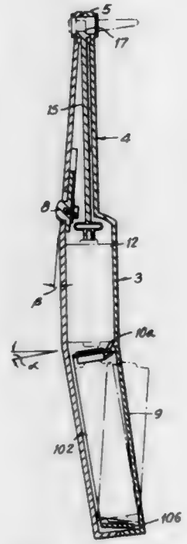
5,205,744

DUAL POSITION SELF POWERED DENTAL DEVICE

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Continuation-in-part of Ser. No. 353,999, May 19, 1989, Pat. No. 5,040,977, which is a continuation-in-part of Ser. No. 179,332, Apr. 8, 1988, Pat. No. 4,954,082. This application Nov. 20, 1990, Ser. No. 616,114
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] A61C *1/07*
U.S. Cl. 433—122 10 Claims

1. A self-powered hand-held dental device for the cleaning of teeth, the dental device comprising an outer housing; a portion of the outer housing providing a hand grip for the device; within the housing there being provided a battery section, a motor section, a transmission section and a tool bit hear section having a first side and a second side and defining a transverse aperture extending fully there between so as to be open at both ends; the battery section comprising a positive and a negative terminal so juxtaposed as to retain a battery within the housing; an electric motor provided with a driving member within the motor section of the housing; switchable electric circuit means connecting the electric motor with the terminals and a switching means exposed to the exterior of the housing and so juxtaposed with the electrical circuit means as to cause the opening and closing of a circuit gap upon operation of the switch so as to initiate and terminate operation of the electric motor when an electric battery is provided between the terminals; the tool bit head section being located at the end of the transmission section distal the electric motor section; a rotatable transmission shaft held rotatably in the transmission section, one end of which is mechanical operating connection with the electric motor driving member, the distal end of the transmission shaft comprising an eccentric cam member located radially outwardly of the axis of rotation of the transmission shaft and extending longitudinally out of the transmission shaft and extending radially from the axis of the transmission shaft, the eccentric cam member extending into the head section aperture, the aperture extending into the head section along an axis transverse to the axes of the transmission shaft and of the cam; a tool bit, comprising tool head and tool blade, in operating relationship to the eccentric cam member, such that rotation of the transmission shaft causes reciprocating movement of the tool bit transversely of the shaft axis; the



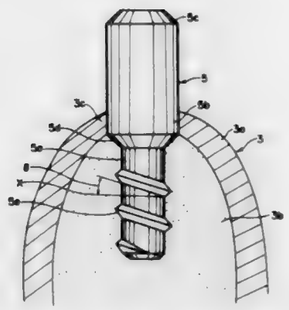
tool head having a blade end secured to the blade and a distal end, located with the transverse aperture; the tool head being removably retained within the head section aperture, the head section and the tool head being each so configured that the distal end of the tool head can be inserted into the transverse aperture from either the first side or the second side; a collar axially slidably secured to the tool head with the transverse aperture, the collar comprising a narrow central shank neck and an annular flange at each end of the shank neck, the eccentric cam member facing the shank neck between the two flanges, the collar having an internal circumferential surface defining a central aperture extending completely through the collar so as to be open at each end and capable of holding the head of a tool bit, in the operating relationship of the tool, from each end; cooperating locking means formed adjacent each end of the internal circumferential surface to interact with cooperating means on the tool to prevent axial motion of a tool relative to the collar, and second cooperating locking means formed adjacent each end of the collar to restrict rotation of the tool relative to the collar.

5,205,745

ARTIFICIAL DENTAL ROOT

Takashi Kamiya, Ichihara; Tohru Nonami, Narita, and Sachiko Shirakawa, Ichikawa, all of Japan, assignors to TDK Corporation, Tokyo, Japan

PCT No. PCT/JP90/01094, § 371 Date Jun. 11, 1991, § 102(e) Date Jun. 11, 1991, PCT Pub. No. WO91/03213, PCT Pub. Date Mar. 21, 1991
PCT Filed Aug. 29, 1990, Ser. No. 684,927
Claims priority, application Japan, Aug. 30, 1989, 1-223587; Dec. 4, 1989, 1-314915
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 21 Claims



1. An artificial dental root comprising a main body to be implanted into the jaw bone and an upper structure to be attached with a crown;
wherein the main body and the upper structure are separable, and the circumference of the main body is integrally constructed of ceramic material,
the main body comprising a large diameter dental neck corresponding portion to be implanted into dense matter of the top of the jaw bone and a smaller diameter base of the root,
and the part between the base and the dental neck corresponding portion is tapered,
wherein said neck corresponding portion has a diameter of 3–14 mm and said base has a diameter of 2–8 mm, and wherein a ratio of the base diameter divided by the neck corresponding portion diameter is in the range of 0.15–0.8.

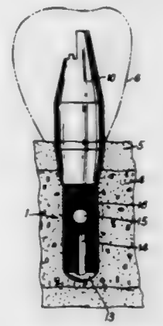
5,205,746

SURGICAL IMPLANT FOR ORAL AND MAXILLOFACIAL IMPLANTOLOGY

Manuel Chansvax, Rouen, France, assignor to Societe de Fabrication de Materiel Orthopedique - Sofamor, Paris, France

Continuation of Ser. No. 638,868, Jan. 11, 1991, abandoned. This application Jul. 17, 1992, Ser. No. 913,991
Claims priority, application France, Jan. 11, 1990, 9000283
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—174 11 Claims

1. A surgical implant for osteo-integrated maxillo-facial implantation, comprising a longitudinal body which consists of a cylindrical rod having a substantially uniform diameter along its length, said cylindrical rod having a rounded end portion at the apical end of said rod, a smooth head portion at the other end of said rod, and a threaded portion between said rounded end portion and said smooth head portion, said cylindrical rod being threaded over the entire length of said threaded portion, said rod having at least two longitudinal grooves formed externally on said rod and extending from a point within said rounded end portion to a point within said threaded portion of said rod, and said rod being pierced with at least one diametral



transverse hole at a point substantially midway along the length of said rod within said threaded portion of said rod.

5,205,747

BEAD CALCULATOR EDUCATIONAL TOY

Daravuth Tan, 1821 Josey La., Apt. G, Carrollton, Tex. 75006

Filed May 13, 1992, Ser. No. 882,577
Int. Cl.[5] G06C *1/00*; G09B *19/02, 23/02, 23/04*
U.S. Cl. 434—203 10 Claims

1. An educational toy useable to visually teach selectively variable mathematical relationships to children, comprising:
a base portion;
a series of first rod members each having first and second end portions;
two second rod members each having first and second end portions;
means for anchoring said first and second end portions of said first and second rod members to said base portion in a manner positioning said first and second rod members in a mutually spaced side-by-side array in which said first end portions are generally parallel to one another and disposed on one side of the array, said second end portions are generally parallel to one another and disposed on an opposite side of the array, and each of said second rod members is interposed between a different pair of said first rod members;
series of counting beads captively carried by said first rod members for sliding movement thereon between said first and second end portions thereof;
first and second operational sign beads respectively and captively carried by said second rod members for rotation relative thereto and sliding movement thereon between said first and second end portions thereof, each of said first and second operational sign beads having a side periphery circumscribing its associated second rod member and defined by flattened areas a selectively variable one of

flexible electrical circuit toward engagement with said substrate.

5,205,752

LOW INSERTION/WITHDRAWAL-FORCE

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which may be rotated to an orientation in which it generally faces the user of the toy;

mathematical operating sign indicia disposed on said flattened areas of said first and second operational sign beads; and

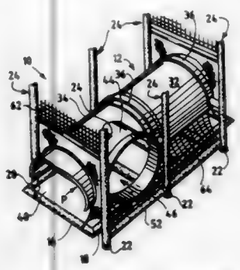
cooperating interengageable means on said base portion and said first and second operational sign beads for releasably locking said first and second operational sign beads against rotation relative to their associated second rod members when said first and second operational sign beads are moved along either of said first and second end portions to positions adjacent said base portion.

5,205,748

PLAY APPARATUS HAVING OBSTACLES

Richard J. Petersheim, Charlotte, N.C., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Mar. 3, 1992, Ser. No. 845,414
Int. Cl.[5] G09B *19/00*; A63B *7/00*
U.S. Cl. 434—258 **18 Claims**



1. A play apparatus for children comprising:

an elongated tunnel structure defining a tunnel ceiling, side walls and at least one opening defining an entrance and an exit, the tunnel structure further defining a pathway through the interior of the apparatus through which a child is able to walk;

a base having a plurality of leg members defining a base bottom and the base allowing the apparatus to stand on a generally flat supporting surface, said base also supporting the elongated tunnel structure a predetermined distance above the flat supporting surface;

a plurality of spaced apart elongated obstacle members supported by the base, the elongated obstacle members extending transverse to the pathway through the interior of the apparatus and located above the bottom of the base.

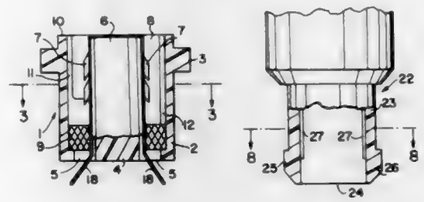
5,205,749

ELECTRIC PLUG-AND-SOCKET CONNECTION

Bernhard Weingartner, Feldkirch, Fed. Rep. of Germany, assignor to Neutrik Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 283,957, Nov. 9, 1988, abandoned. This application Nov. 8, 1991, Ser. No. 790,146
Claims priority, application Austria, Mar. 9, 1987, 540/87
Int. Cl.[5] H01R *13/625*
U.S. Cl. 439—335 **5 Claims**

1. In an electric plug-and-socket connection including a cylindrical plug connector and a cylindrical plug-inn counterpart connector, each connector having an axis, each connector including contact supports and contacts, wherein the plug connector and the plug-in counterpart connector are coupleable by a bayonet-type coupling, the plug connector being cup-shaped and having a circumferential wall and a circumferential edge and a bottom remote from the edge, grooves being defined in the wall of the plug connector, the grooves having a first portion extending parallel to the axis of the connector and a second portion extending circumferentially adjacent the first portion, the second portion having a length which determines and angle of relative rotation between the plug connector and the counterpart connector, the counterpart connector is a rod of solid cross-section, the rod being received in an axially extending recess of the contact support, the rod projecting over its entire length radially beyond the contact support, wherein two imaginary diameter planes of the connector with the rod contact extending through the contact and the at least one nose are offset relative to each other by an angle which corresponds to the angle of relative rotation between the con-



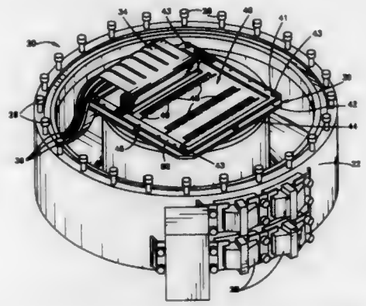
nectors, each of the other contacts being received in a recess of the other contact support of the plug connector, the other contact support having a wall, the recess being provided in the wall, the improvement comprising the other contacts in the other contact support each having at least one elastically deformable contact vane, the at least one contact vane extending in circumferential direction from the wall of the contact support and at a distance from the wall of the contact support which increases in circumferential direction.

5,205,750

TEMPERATURE COMPENSATING STRAIN RELIEF CONNECTION FOR FLEXIBLE ELECTRICAL CIRCUITS

Robert E. Darrow, Apalachin, and David E. Engle, Vestal, both of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Dec. 6, 1991, Ser. No. 802,917
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—77 **13 Claims**



1. A mounting structure for mounting a flexible electrical circuit to a rigid substrate to effect electrical connection between contacts on one side of the flexible electrical circuit with electrical pads on one side of the substrate comprising:

a clamping member disposed to clamp said flexible electrical circuit and position said flexible electrical circuit with said one side thereof in face to face relationship with said one surface of said substrate;

a supporting structure carried by said substrate and mounting said clamping member to maintain said flexible electrical outlet and said substrate in face to face relationship;

said mounting structure including a mechanism yieldingly responsive to thermal expansion normally urging said flexible electrical circuit toward engagement with said substrate.

5,205,751

ELECTRICALLY-CONDUCTIVE ELASTOMERIC CONNECTOR

Mark W. Schwartz, Addison, and Scott R. Semonik, Lake Zurich, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 21, 1992, Ser. No. 839,160
Int. Cl.[5] H05K *9/00*
U.S. Cl. 439—86 **17 Claims**

1. An electrically-conductive, elastomeric connector for electrically connecting an electrically-conductive portion of a first substrate with an electrically-conductive portion of a second substrate, said connector comprising:

a tubular-shaped body elongated along a longitudinal axis thereof and defined by an outer circumference, said tubular-shaped body capable of elastic deformation responsive to compressive forces exerted thereagainst by the first substrate when the electrically-conductive portion of the first substrate is positioned against a seating surface formed of a circumferential portion of a first side surface of the tubular-shaped body thereby to connect electrically the electrically-conductive portion of the first substrate and the tubular-shaped body along said first side surface; and

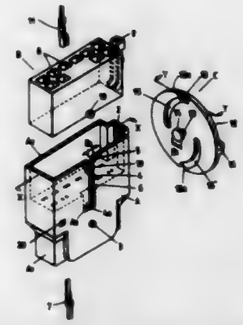
a pair of symmetrically-positioned claw arms formed integral with the tubular-shaped body, each claw arm of said pair of claw arms having a proximal end portion, a distal end portion, and an inwardly-inclined inner surface extending between the proximal end portion and the distal end portion, wherein a first claw arm of the pair of claw arms is affixed to the tubular-shaped body to extend therebeyond in a direction generally transverse to the longitudinal axis of the tubular-shaped body at a location upon the circumference of the tubular-shaped body spaced an angular distance beyond the seating surface, and a second claw arm of the pair of claw arms is affixed to the tubular-shaped body to extend therebeyond in a direction generally transverse to the longitudinal axis of the tubular-shaped body at a location upon the circumference of the tubular-shaped body spaced an angular distance beyond the seating surface corresponding to, but in a direction reverse of, the angular distance beyond the seating surface at which the proximal end portion of the first claw arm is positioned, the pair of claw arms for affixing the tubular-shaped body in releasable engagement at an edge surface of the second substrate, such that, when positioned in the releasable engagement at the edge surface of the second substrate, the inwardly-inclined inner surfaces of the first and second claw arms, respectively, abut against the electrically-conductive portion of the second substrate to connect electrically the electrically-conductive portion of the second substrate and the inwardly inclined inner surfaces.

5,205,752

LOW INSERTION/WITHDRAWAL-FORCE CONNECTOR

Naoto Taguchi; Yuji Hatsuishi, and Katsuhiko Onoda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 26, 1992, Ser. No. 841,794
Claims priority, application Japan, Feb. 28, 1991, 3-16468[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—157 **12 Claims**



1. A low insertion/withdrawal-force connector comprising:

a cam member including a rotation plate, a rotation shaft extending from a lower surface of said rotation plate, and a pair of cam grooves provided in said lower surface of said rotation plate, said cam grooves being continuous respectively with introduction grooves and disposed symmetrically with respect to said rotation shaft;

a male housing having a first cam follower pin;

a female housing in which said male housing is movably fitted, said female housing having a second cam follower pin and a pin guide groove for receiving said first cam follower pin and said rotation shaft; and

means for locking said male housing and said female housing when said male housing is completely fitted in said female housing,

wherein when said cam member is angularly moved in an initial fitting condition of said male and female housing in which said first and second cam follower pins are respectively engaged in said pair of cam grooves, said cam member and said male housing move toward an inner end of said pin guide groove, and, attendantly said male and female housings are moved toward each other.

5,205,753

CIRCUIT BOARD STRUCTURE

David J. Butterfield, and Birney D. Dayton, both of Nevada City, Calif., assignors to NVision, Inc., Nevada City, Calif.

Filed Apr. 7, 1992, Ser. No. 864,693
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—157 **11 Claims**

1. A circuit board comprising:

a generally planar substrate having first and second opposite edges,

a first connector part attached to the substrate at its first edge,

a second connector part, complementary to the first connector part, and

mounting means attaching the second connector part to the substrate at its second edge in a manner allowing forcible movement of the second connector part relative to the substrate in a direction having a component perpendicular both to the second edge and to a line normal to the substrate,

whereby when said circuit board and a second circuit board

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that is identical to the first-mentioned circuit board are

said key when said engagement portion is engaged with said

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opening upon movement of the top in a downward direction to space said contacts from said carrier and allow the insertion of

5,205,758

COMMUNICATIONS DISTRIBUTION INTERFACE UNIT

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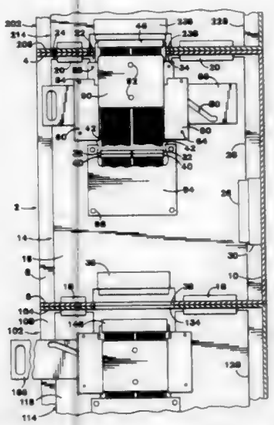
that is identical to the first-mentioned circuit board are held in substantially coplanar relationship with the first connector part of the second circuit board spaced from but presented toward the second connector part of the first-mentioned circuit board, the mounting means of the



first-mentioned circuit board can be employed to advance the second connector part of that circuit board from a first position in which it is spaced from the first connector part of the second circuit board to a second position in which it engages the first connector part of the second circuit board.

5,205,754

CLOCK SPRING CONNECTOR

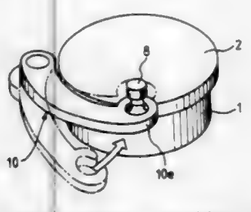
Masanori Kuramoto, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1992, Ser. No. 851,448

Claims priority, application Japan, Mar. 18, 1991, 3-023379[U]

Int. Cl.[5] H01R *35/00*

U.S. Cl. 439—164 8 Claims



1. A clock spring connector comprising a fixed body; a movable body rotably installed on the fixed body for rotation about an axis; a flexible cable wound between the fixed body and the movable body; a lock member provided for restricting relative rotation of the fixed body and the movable body about the axis of rotation; an engagement portion provided on one of the fixed body and the movable body; and a supporting portion having a key groove on the other of the fixed body and the movable body, said lock member being provided with an engaging portion capable of engaging with said engagement portion and disengaging therefrom and a key capable of entering into said key groove, said lock member being locked to said supporting portion by inserting said key into said key groove and rotating said lock member about said key, said engaging portion preventing said lock member from being rotated about said key when said engagement portion is engaged with said engaging portion.

5,205,755

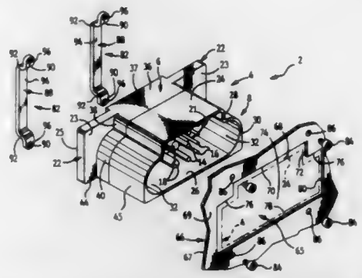
FLOAT MOUNT ELECTRICAL CONNECTOR

George H. Douty, Mifflintown; David J. Fabian, Mount Joy, and John M. Landis, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1992, Ser. No. 860,951

Int. Cl.[5] H01R *13/74*

U.S. Cl. 439—247 11 Claims



1. An electrical connector for mounting on a panel, the panel having a front face and a rear face and being formed with a cut out opening into both of said faces, the connector comprising:

a pair of coplanar flanges projecting in opposite directions, and a forward part projecting from the flanges adapted to extend through the cut out and being undersized in respect thereto;

a pair separate straps each having an inner face engaging a rear face of a respective one of the flanges and opposite ends secured to the rear face of the panel, the inner faces of the straps being spaced from the rear face of the panel substantially by the thickness of the flanges and each flange being slideably received between the inner face of a respective one of the straps and the rear face of the panel, whereby the connector can float in the cut out of the panel.

5,205,756

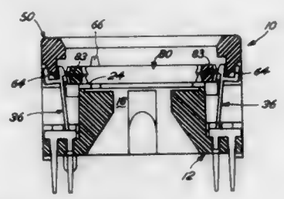
CHIP CARRIER SOCKET

Bruce B. Myers, South Bend, Ind., assignor to Wells Electronics, Inc., South Bend, Ind.

Filed Jan. 28, 1992, Ser. No. 826,968

Int. Cl.[5] H01R *13/629*

U.S. Cl. 439—266 3 Claims



1. A socket for an integrated circuit carrier, said socket including a base member and a movable top overlying said base, said base member having a central opening therein, a plurality of conductive resilient contacts for engaging said carrier, each contact anchored in said base member and including an upwardly extending part, said movable top having a central opening therein and including abutment means in contact with each contact part for moving and flexing said contacts in an outward direction relative to said base member

opening upon movement of the top in a downward direction to space said contacts from said carrier and allow the insertion of the carrier into said socket, said top carrying upwardly extending guide pin means for protruding into said carrier to anchor and maintain the carrier in proper orientation relative to said top during said insertion of the carrier.

5,205,757

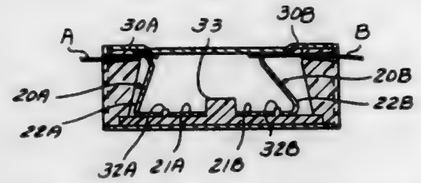
ELECTRICAL CONNECTOR

Chris Hertelendy, 3364 Newburg Rd., Louisville, Ky. 40218

Filed Mar. 2, 1992, Ser. No. 844,189

Int. Cl.[5] H01R *4/26, 11/20*

U.S. Cl. 439—441 4 Claims



1. An electrical connector for establishing a splice connection between electrical leads having an insulating jacket and a conductor core, comprising:

a hollow, elongated connector body of an electrically insulating material having interior walls defining a cavity therein and having an opening at each end; a plug fit into each end having an opening extending into said connector cavity;

a C-clip of a strip of resilient, conductive material disposed in said cavity, said C-clip having a pair of ends, each end extending from an elongated straight portion lying against an inside surface of one wall of said cavity of said connector body and extending lengthwise within said cavity, each of said ends inclined towards the other and away from a respective adjacent opening of said connector body, each end having a tip lying at a point closely adjacent another inside surface of another wall of said cavity of said connector body opposite the inside surface of said first mentioned wall, said tip inclined to form an acute and obtuse angle with said another inside surface, a contact recess formed into a edge of each tip comprised of a slot having closely spaced opposite edges adapted to slice through said insulating jacket and contact said conductor core as an electrical lead is pulled back after insertion into said connector body to be seated within a contact recess, whereby an electrical lead may be inserted at either end to engage and deflect a respective C-clip leg and move past said terminal edge and thereby be gripped against pullout by the edges of said contact recess sliced into said insulating jacket; and,

a set recess defined between each of said plugs, including a step said at either end of another inside surface of said another wall located outward of said each C-clip end tip prior to pulling out of said C-clip tip, each step facing a respective plug thereby creating an increased space outside of said tip and adjacent said respective plug so as to allow a respective tip to move into said increased space as said C-clip end is pulled out, whereby said tip and electrical lead may be wedged into said set recess to secure said connection.

5,205,758

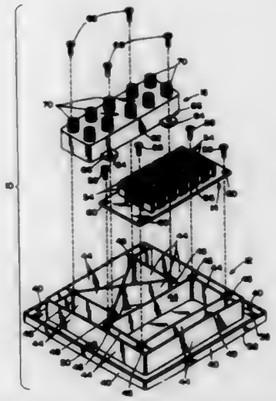
COMMUNICATIONS DISTRIBUTION INTERFACE UNIT ASSEMBLY

Joseph D. Comerci, Elmhurst; Robert DeRoss, Naperville, both of Ill.; Edward L. Nichols, III, Annapolis, and Mark T. Smith, Damascus, both of Md., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 2, 1992, Ser. No. 892,296

Int. Cl.[5] H01R *13/60*

U.S. Cl. 439—535 13 Claims



1. A communications distribution interface unit assembly for mounting to appropriate frame means behind an opening in a wall panel, comprising:

a unitary cover adapted for mounting to the frame means and including a front face, a rear face, integral structural support means on said rear face extending in a direction generally perpendicular to the wall panel for rigidifying the cover and for aligning the unit assembly with the opening in the wall panel and integral fastener receptacle means on the rear face of the cover; and

at least one communications module, including electrical connector means mounted on a connector support, having means for facilitating fastening the module to the fastener receptacle means of the cover, with the electrical connector means exposed at the rear of the assembly for easy access thereto, whereby the entire communications module assembly can be preassembled and, thereafter, mounted to said frame means behind the opening in the wall panel.

5,205,759

MOUNT FOR A PLUG/SOCKET COMBINATION

Johann Haderer, Dunsdorf, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP90/00839, § 371 Date Jan. 9, 1992, § 102(e) Date Jan. 9, 1992, PCT Pub. No. WO91/03083, PCT Pub. Date Mar. 7, 1991

PCT Filed May 25, 1990, Ser. No. 793,415

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928138

Int. Cl.[5] H01R *13/74*

U.S. Cl. 439—545 6 Claims

1. A connector/socket combination to be installed in a motor vehicle comprising:

a first element including a slot on two opposing sides thereof;

a second element; and

a holder, said holder including at least two webs for receiving the first element therebetween, and a projection extending from and perpendicular to at least one end of one

of said at least two webs, said webs being positioned

5,205,761

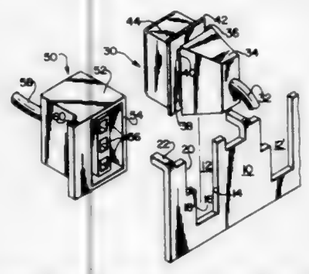
SHIELDED CONNECTOR ASSEMBLY FOR COAXIAL

interposed between said first and second circuit segments on said insert to isolate said segments from each other whereby

5,205,764

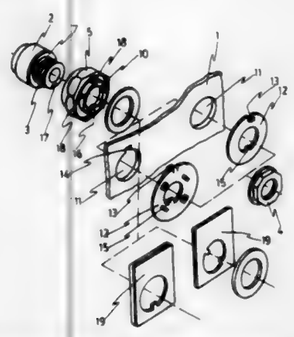
STEERING MECHANISM IN A BOAT PROPULSION

of said at least two webs, said webs being positioned within said slots of said first element, said projection en-



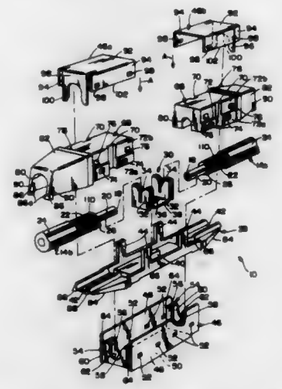
gaging said second element after said second element has been joined to said first element, whereby said first and second elements are immobilized by said holder.

5,205,760
ADAPTER FOR ELECTRIC PUSHBUTTONS AND THE LIKE
Agut Sanz, Terrassa, Spain, assignor to Agut, S.A., Terrassa, Spain
Filed Jul. 3, 1991, Ser. No. 724,428
Claims priority, application Spain, Jul. 4, 1990, 9002129; Jul. 4, 1990, 9002130
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—551 **9 Claims**



1. Improved adapter for an electric component of the type to be coupled to a hole in a control panel, said component having a cylindric body with a threaded rear extension of smaller diameter, the adapter comprising: a ring provided inside with a front shoulder similar to a rear shoulder provided between the cylindric body and the rear extension of the component, said ring having two inner sections with diameters corresponding respectively to the diameter of the cylindric body and to the diameter of the rear extension of the component, said ring having a rear tubular portion that fits adjustably between the rear extension of the component and the hole of the control panel.

5,205,761
SHIELDED CONNECTOR ASSEMBLY FOR COAXIAL CABLES
Uno Nilsson, Saltajö-Boo, Sweden, assignor to Molex Incorporated, Lisle, Ill.
Filed Jun. 15, 1992, Ser. No. 899,398
Claims priority, application Sweden, Aug. 16, 1991, 9102375-4
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 **22 Claims**

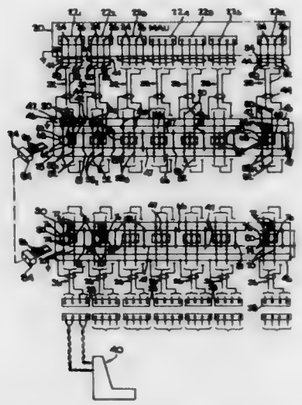


1. A shielded connector assembly for a coaxial cable which includes a center conductor with an insulating layer thereabout, a conductive shield and an outer insulating covering, comprising:
a non-conductive body for receiving an end of the coaxial cable with the conductive shield thereof exposed, the body having conductive contact means thereon for engaging the center conductor of the cable;
conductive outer casing means about at least a portion of the body for shielding the cable end and having a portion for engaging the outside of the conductive shield of the cable; and
insert means positioned between the insulating layer and the conductive shield of the cable to provide backing support for the shield on the inside thereof wherein said insert means is generally rigid and is resilient in a transverse direction, with the transverse resiliency therefor being provided by a longitudinal slit.

5,205,762
HIGH FREQUENCY PATCH CORD DATA CONNECTOR
William V. Carney, Oyster Bay, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Dec. 6, 1991, Ser. No. 803,424
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—607 **29 Claims**

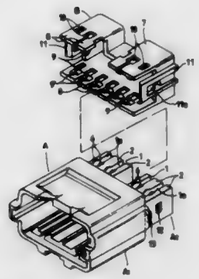
1. A patch cable and connector assembly for making a patch connection into a high wiring density connector block having separable spring finger contacts, said assembly comprising a cable containing transmit and receive signal conductors, a circuit board insert attached to one end of said cable, first and second electrically conductive circuit segments on said circuit board insert and connected, respectively, to said transmit and receive signal conductors and an electrically conductive shield

interposed between said first and second circuit segments on said insert to isolate said segments from each other whereby



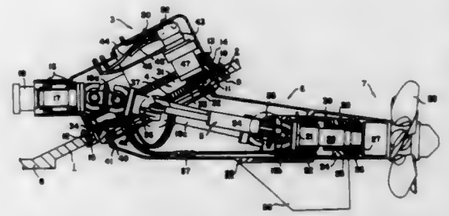
mutual signal interference and crosstalk between said segments at high signal frequencies is substantially reduced.

5,205,763
CONNECTOR WITH TERMINAL HOLDER
Tamio Watanabe; Masanori Tsuji; Motohisa Kashiyama, and Terutoshi Satoh, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Mar. 19, 1992, Ser. No. 854,446
Claims priority, application Japan, Mar. 20, 1991, 3-056827
Int. Cl.[5] H01R *13/514*
U.S. Cl. 439—752 **7 Claims**



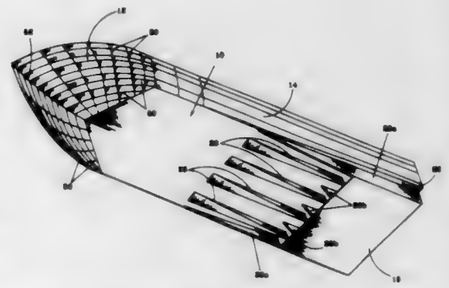
1. A connector comprising:
a plurality of metal terminals;
a connector housing for receiving said metal terminals; and
a terminal holder movably engaged with said connector housing in two steps, provisionally and completely, said terminal holder including a plurality of flexible, deformable plates each of which has a terminal retaining member,
wherein said connector housing is provided with a plurality of projection members corresponding to said flexible, deformable plates, and wherein said flexible, deformable plates abut and are directed outwardly by said projection members so as to permit insertion and withdrawl of said metal terminals in the provisionally-connected condition, and wherein said terminal retaining member urges and fixes said metal terminal in eh completely-connected condition.

5,205,764
STEERING MECHANISM IN A BOAT PROPULSION SYSTEM
Hans Thiger, Enhörna, Sweden, assignor to CPS Drive A/S, Norway
PCT No. PCT/SE89/00592, § 371 Date May 28, 1991, § 102(e) Date May 28, 1991, PCT Pub. No. WO90/06256, PCT Pub. Date Jun. 14, 1990
PCT Filed Oct. 25, 1989, Ser. No. 689,836
Claims priority, application Sweden, Nov. 28, 1988, 8804296-5
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—58 **9 Claims**



1. A marine propulsion drive apparatus for an inboard engine in which the input drive shaft with its propeller shaft extends generally horizontally through the stern of a boat, comprising:
a drive body extending generally horizontally substantially straight out from the stern of the boat and having a propeller attached to the drive body and extending generally axially and horizontally at the outer end thereof, said propeller arranged and designed to operate at the water surface, and wherein steering of the boat is accomplished by operating the drive body itself,
a common connection surface of the drive body and the stern of the boat having an obliquely upwards-rearwards slope from the bottom of the boat,
the connection surface of the drive body at the stern of the boat being rotatably mounted about an axis which is perpendicular to said connection surface,
whereby the boat is turned by rotating the entire drive body in one direction or the other about said connection surface.

5,205,765
BOAT HULL AND PROPULSION SYSTEM OR THE LIKE
Joseph T. Holden, Houston, Tex., assignor to The Pinnacle Corporation, Houston, Tex.
Filed Nov. 27, 1990, Ser. No. 618,495
Int. Cl.[5] B63H *11/02*
U.S. Cl. 440—66 **45 Claims**



1. A boat hull comprising:

a bow portion having an undersurface defined by a plurality

engagement with a normally lower portion of the leg of a

second toothwheels (21) which are coaxial by means of

5,205,769

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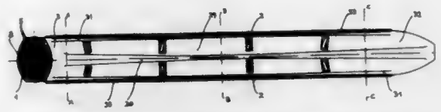
a bow portion having an undersurface defined by a plurality of flat bow plates angularly joined at their edges to approximate a streamlined, convergent bow configuration;
an aft portion having an undersurface continuous with that of said bow portion;
at least two stern channel means extending longitudinally forward from respective stern corners adjacent respective sides of the hull, each having
a top defined by said undersurface and inclined upwardly and rearwardly,
a bottom plate spaced downwardly from the top and extending along the rearmost portion of the channel means,
laterally inner and outer side plates interconnecting said top and said bottom plate to form a fully laterally enclosed core section of said channel means along the foremost part of said bottom plate, said side plates projecting forwardly of said bottom plate, lower edges of the projecting portions of said side plates being inclined upwardly and forwardly from the bottom plate to the undersurface to partially structurally define sides of said channel means, the outer side plate projecting forward a substantially greater distance than the inner side plate but spaced from said bow portion,
and a rib depending downwardly from said top and extending longitudinally through the channel means from the fore end of the bottom plate to about the foremost part of the outer side plate, the aft end of said rib extending from said top to said bottom plate, said rib having a lower face inclined upwardly and forwardly to meet said top, and said rib being true with respect to the length of the boat.

5,205,766
PROPELLER GUARD
Armand Arsenault, 11 Prospector Road, Whitehorse, YT Y1A 5G6, Canada
Filed Jan. 4, 1992, Ser. No. 894,376
Claims priority, application Canada, Jun. 11, 1991, 2,043,771
Int. Cl.[5] B63B *35/08*
U.S. Cl. 440—72 **6 Claims**

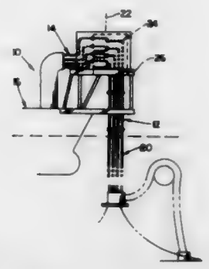
1. A propeller guard adapted for use with an outboard or stern drive marine motor comprising:
(a) a generally rigid and arcuate main spine, including a normally forward and upper generally upright portion and a normally rear and lower generally horizontal portion, whereby the spine has an upper end and a rear end;
(b) a plurality of side ribs, each including a normally forward portion and a normally rear portion, each said normally forward portion being connected to said generally upright portion of the said main spine, said side ribs extending normally rearwardly from and generally transversely to the generally upright portion of the main spine; portion of the main spine;
(c) an arcuate, normally generally upright brace fixedly secured to the rear portions of said side ribs and to the main spine at the rearmost end of the spine; said brace including brace locking means for releasably connecting, when activated, end portions of the arcuate brace to each other to thus change the form of said brace from an arc to an enclosed, generally oval reinforcing structure;
(d) said spine including an inwardly open channel means for engagement with a normally lower portion of the leg of a motor;
(e) clamping strap means for attachment of the propeller guard to the motor, said clamping strap means being adapted to clamp against opposite sides of the leg of a motor, the clamping strap means including a normally foremost portion and a normally rearmost portion, the foremost portion being fixedly secured to the main spine at the upper end thereof; the rearmost portion of the clamping strap means being adapted for engagement with the brace locking means such that the brace locking means, when activated, also causes the clamping strap means to tightly engage the leg of the motor.

5,205,767
PROPELLING SYSTEM SUITABLE FOR USE ON WATERCRAFT
Lucio Potocnik, Via D. Rossetti 41, 34141 Trieste TS, Italy
PCT No. PCT/IT90/00038, § 371 Date Oct. 7, 1991, § 102(e) Date Oct. 7, 1991, PCT Pub. No. WO90/11928, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 2, 1990, Ser. No. 768,411
Claims priority, application Italy, Apr. 5, 1989, 82803 A/89
Int. Cl.[5] B63H *5/02*
U.S. Cl. 440—90 **2 Claims**



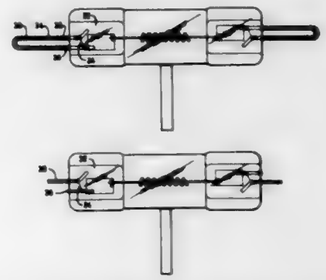
1. A propelling system for use with watercraft, said propelling system comprising:
a watercraft having a bow, a stern, and a bottom;
a main rotor for primary propelling of said watercraft;
said main rotor having an axle;
said main rotor mounted on said bow with said axle transverse to a vertical plane through a longitudinal axis of said watercraft;
wherein said main rotor (**1**) comprises:
two cylindrical wheel sets (**5**);
each of said two wheel sets supported by an axle shaft (**6**);
each said axle shaft (**6**) being fixed transverse to said vertical plane (**4**) and connected to a differential (**9**) driven by an engine (**11**) through a drive shaft (**10**) having a gear box (**12**);
each wheel of each said cylindrical wheel sets having a decreasing diameter from a first wheel closest to said differential (**9**) to a last wheel most distant from said differential (**9**);
said each wheel of each said cylindrical wheel sets having two removable disks (**14**), a hub (**15** and a crown (**16**), whose external surface suports blades (**17**) having a horse-hoof profile;
said first wheel fastened to a circular flange (**18**), connected to said differential (**9**);
a hub (**15**) of said first wheel having a first toothwheel (**19**) coaxial with said axle shaft (**6**) that rotates a plurality of second toothwheels (**21**) on their internal axles (**22**);
said internal axles (**22**) fixed to a cylindrical capsule (**20**) located inside said each wheel;
said cylindrical capsule (**20**) housing said first toothwheel (**19**), said second toothwheels (**21**), third toothwheels (**23**) and a fourth toothwheel (**24**) forming an epicycloidic gearing;
said internal axles (**22**) being parallel to said axle shaft (**6**) and symmetrically located around said axle shaft (**6**);
said internal axles (**22**) also supporting said third toothwheel (**23**) stiffly connected to capsule (**20**) and linked to said second toothwheels (**21**) which are coaxial by means of pawls (**25**);
said pawls (**25**) alternatively acting on a saw-tooth wheel (**26**) integral with said internal axle (**22**) or on specific recesses (**27**) made on said second toothwheels (**21**);
said third toothwheels (**23**) being supported by said fourth toothwheel (**24**) which is keyed on axle shaft (**6**) and spaced from its adjacent cylindrical wheel;
said axle shaft (**6**) being fastened onto one end of a side plate (**7**), close to a pulley (**13**);
a braking system on each of said two of cylindrical wheel sets, acting on said pulley (**13**);
said differential (**9**) being supported by a frame (**28**);
said frame (**28**) having a lower part integral to said bow (**3**) and an upper part to provide support for forward coverage (**8**); and
said forward coverage (**8**) having a hemispheric shape which forms part of said bow (**3**) and protects a top, front and sides of said main rotor (**1**).

5,205,768
MULTIPLE FLUID SWIVEL ARRANGEMENT
Jack Pollack, Camarillo, Calif., assignor to Imodco, Inc., Calabasas Hills, Calif.
Filed Aug. 1, 1991, Ser. No. 739,608
Int. Cl.[5] B63B *21/52*
U.S. Cl. 441—5 **18 Claims**



1. A fluid transfer installation comprising:
a ship which can weathervane and which has a plurality of rotatable pipes that weathervane with the ship, said ship having a turret and said ship being rotatable about a substantially vertical turret axis relative to said turret so said turret can avoid large rotation about a vertical turret axis as said ship weathervanes;
a plurality of stationary pipes with substantially nonrotatable upper portions that are mounted to said turret;
a plurality of fluid swivels that each couples one of said stationary pipe portions to one of said rotatable pipes;
a first of said fluid swivels includes a largely horizontally-extending elongated arm with an inner end pivotally coupled to a first of said stationary pipes to enable rotation of said arm about a primarily vertically-extending swivel axis relative to said first stationary pipe, said arm having an outer end spaced from said swivel axis;
a plurality of couplings arranged substantially along an imaginary circle centered on said turret axis as seen in a plan view, said arm outer end being detachably connectable to each of said couplings, and each of said couplings being connected to one of said rotatable pipes.

5,205,769
METHOD OF MAKING A LAMP WITH AN INTERNALLY PRESSED FUSE
Christopher E. Mahonski, Winchester, and Raymad T. Fleming, Lexington, both of Ky., assignors to GTE Products Corporation, Danvers, Mass.
Filed Aug. 14, 1992, Ser. No. 930,073
Int. Cl.[5] H01J *9/32*
U.S. Cl. 445—27 **3 Claims**



1. A method of forming a lamp with an internally pressed fuse comprising the steps of:
a) forming an envelope with an internal surface defining an enclosed volume,
b) forming a filament structure having a filament coupled through a first end to an inner lead that couples to a fuse that couples to a first outer lead, wherein the inner lead is additionally mechanically coupled to the first outer lead, the filament being coupled through a second end to a second outer lead,
c) positioning the filament structure in the envelope with at least a portion of the first outer lead, and at least a portion of the mechanical connection between the inner lead and first outer lead extending to the exterior of the envelope, and a portion of the second outer lead extending to the exterior of the envelope,
d) press sealing the envelope to seal the filament in the enclosed volume, and sealing the fuse in the press seal, leaving at least a portion of the first outer lead, and at least a portion of the mechanical connection between the inner lead and first outer lead exposed on the exterior of the envelope, and leaving a portion of the second outer lead exposed on the exterior of the envelope,
e) dividing the connection between the inner lead and first outer lead to electrically separate the outer lead, while leaving the inner lead connected to the fuse and the fuse connected to the outer lead.

5,205,770
METHOD TO FORM HIGH ASPECT RATIO SUPPORTS (SPACERS) FOR FIELD EMISSION DISPLAY USING MICRO-SAW TECHNOLOGY
Tyler A. Lowrey; Trung T. Doan; David A. Cathey, and J. Brett Rolfson, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Mar. 12, 1992, Ser. No. 851,036
Int. Cl.[5] H01J *1/88*
U.S. Cl. 445—24 **20 Claims**

11. A process for the formation of interelectrode support structures, said process comprising the following steps:
sawing grooves in a selectively-etchable substrate with a micro-saw;
depositing a support forming material into said grooves of said substrate;
sealing said substrate to a first electrode plate;
etching away said selectively-etchable substrate from said support forming material;

5,205,774
ANIMATION METHOD AND DEVICE

said forward and rear directions between a repose position in which said hind legs extend substantially horizontally and a

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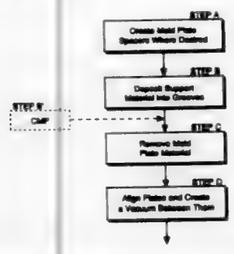
attaching and sealing said first electrode plate to a second electrode plate; and



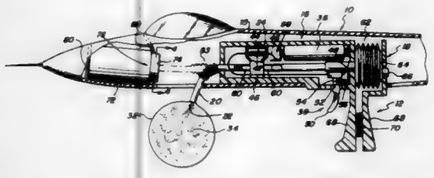
creating a vacuum between said first electrode plate and said second electrode plate.

5,205,771

TOY BOMBER FOR GENERATING SMOKE-FILLED BUBBLES

Anson Sims, 12708 Daria Ave., Granada Hills, Calif. 91344

Filed Feb. 10, 1992, Ser. No. 833,555
Int. Cl.[5] A63H *33/28, 33/14, 29/10*
U.S. Cl. 446—21 3 Claims



1. A device for producing smoke-filled inflated, enclosed, flexible films, the device comprising:
a conduit terminating in an aperture;
a chamber for storing a soapy liquid, the chamber being disposed near the aperture of the conduit, said chamber including a foam cap enclosing an open end of the chamber, the foam cap being saturable by a portion of the soapy liquid, the foam cap having at least one slit;
means for allowing insertion of the aperture of the conduit into the slit of the chamber for collecting a soap film from the soapy liquid;
means for pumping a gas through the conduit past the aperture to inflate the soap film into a bubble; and
smoke-generating means connected to the conduit for injecting smoke into the conduit while the soap film is inflated.

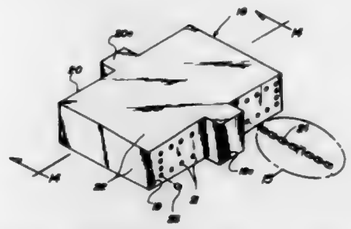
5,205,772

SEGMENTED TOY HOUSE CONSTRUCTION

Amy M. Kennard, and James R. Kennard, both of 114 Country Club Dr., Lansdale, Pa. 19446

Filed Jan. 21, 1992, Ser. No. 823,388
Int. Cl.[5] A63H *33/00*
U.S. Cl. 446—124 2 Claims

1. A segmented toy house construction, comprising,
a housing, the housing including a plurality of segment members in interfitting communication relative to one another, wherein each segment is of a complementary configuration relative to an adjacent segment. and
each segment includes a first end wall spaced from and parallel a second end wall, and
a plurality of conduits extend coextensively between the first end wall and the second end wall, with a continuous side wall extending between the first end wall and the second end wall, and at least one spinal member arranged for projection into at least one of said conduits, and a predetermine spacing is defined between the first end wall and the second end wall defined by a predetermined length,
wherein each spinal member is of a spinal member length substantially equal to the predetermined length, and
wherein each spinal member includes a plurality of spaced cylindrical segments, the cylindrical segments compli-



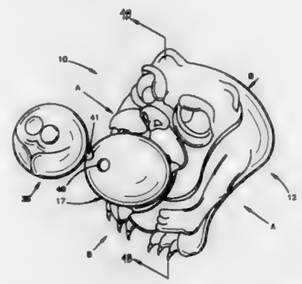
mentarily received into said at least one of said conduits, and a deformable wire spine coaxially directed through each of the cylindrical segments to permit selected deformation of the segment upon deformation of the deformable wire spine.

5,205,773

DEFORMABLE TOY STRUCTURE WITH INVERTED MOUTH

Ingrid M. Koepcke, Lakewood; Michael A. Robertson, Cleveland, both of Ohio; Richard E. Knight, Dubuque, Iowa; Edward G. Chanter, Lakewood, and Thomas G. Barnum, Reading, both of Ohio, assignors to Those Characters From Cleveland, Cleveland, Ohio

Filed Nov. 15, 1991, Ser. No. 792,964
Int. Cl.[5] A63H *3/06, 13/00, 29/00;* F41B *11/00*
U.S. Cl. 446—183 27 Claims



1. A device for ejecting a projectile, comprising:
a projectile to be propelled away from said device
a body formed of resiliently deformable material which defines a main cavity, a portion of said body forming a receptacle with a wall which normally extends inwardly into the main cavity and is at least partially enclosed by the remainder of said body, said receptacle having a mouth portion interconnecting said receptacle with the remainder of the body, said mouth portion being configured to frictionally engage said projectile when it is inserted through said mouth and located and supported in the receptacle and retained in said receptacle by said mouth, said receptacle wall forcing said projectile through the mouth and away from the body when said body is squeezably deformed.

5,205,774

ANIMATION METHOD AND DEVICE

Thomas J. Smart, Marengo, Ill., assignor to Fox Valley Systems, Inc., Cary, Ill.

Division of Ser. No. 575,984, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 482,146, Feb. 20, 1990, Pat. No. 5,104,346. This application Jul. 10, 1991, Ser. No. 727,889
Int. Cl.[5] A63H *13/00;* G09F *19/08*
U.S. Cl. 446—199 5 Claims

1. An apparatus for attaining motion in an animated figure comprising (1) at least one collapsible, fluid chamber which is capable of being repetitively inflated to a predetermined, desired shape and subsequently deflated, and (2) means for controlling the fluid pressure in said chamber, at least one of said chambers having a section of wall which is less elastic than the remaining portion of the wall, wherein said means for controlling the fluid pressure for the fluid chamber comprises (1) a first valve, (2) a first conduit which is in fluid communication with said chamber and said first valve, (3) a fluid supply means, (4) a second conduit which is in fluid communication with said fluid supply means and said first valve, (5) a second valve in fluid communication with said chamber, (6) first means for controlling the position of said first valve and (7) second means for controlling the position of said second valve.

5,205,775

AMBULATORY ANIMAL TOY

William A. Brodrib, 2700 SE. 7th Dr., Pompano Beach, Fla. 33062

Filed Mar. 16, 1992, Ser. No. 852,007
Int. Cl.[5] A63H *3/00*
U.S. Cl. 446—317 12 Claims

1. An ambulatory animal toy, comprising a skeleton including a substantially horizontal torso having forward and rear ends defining forward and rear directions, mutually spaced apart front and hind legs attached to said torso, feet attached to said legs, means for providing friction between said feet and a walking surface, means for causing said torso to bend substantially horizontally while preventing said torso from bending substantially vertically when said skeleton is pulled, said means for causing said torso to bend substantially horizontally while preventing said torso from bending substantially vertically comprising at least one piece of material incorporated in said torso being inherently resilient in the horizontal direction and inherently inflexible in the vertical direction, and means for pivotally attaching said hind legs to said torso and allowing rotation thereof about an axis substantially perpendicular to said forward and rear directions between a repose position in which said hind legs extend substantially horizontally and a

standing position in which said hind legs extend substantially vertically relative to the walking surface.

5,205,776

FIGURE TOY CONSTRUCTION WITH FLAT HAIR FIBERS

Carole A. Lenz, 6214 W. 129th Pl., Palos Heights, Ill. 60464

Filed Mar. 18, 1991, Ser. No. 670,982
Int. Cl.[5] A63H *3/44*
U.S. Cl. 446—394 6 Claims

1. A toy doll head having hair wherein said hair is formed entirely from a plurality of individual substantially flat flexible metallized polyvinyl chloride fibers, said fibers having a cross section with the longest dimension in the range of from about 0.01 inches to about 0.10 inches.

5,205,777

PROCESS AND APPARATUS FOR PROCESSING MEAT

Hermann Hohenester, Straße 21, D-8269 Burghkirchen-Alz, Fed. Rep. of Germany

Filed Feb. 8, 1991, Ser. No. 652,581
Claims priority, application European Pat. Off., Nov. 28, 1990, 90122740.5
Int. Cl.[5] A22C *9/00*
U.S. Cl. 452—142 49 Claims

1. Process for processing meat, comprising the steps of,

cutting up the meat by dividing the meat into planar pieces

f) container means for collecting the chunks of chum bait

a rotatable disc having a resilient top surface,
means for rotating said disc,

ing fan after the first ventilating fan has been activated by said gradual starting means.

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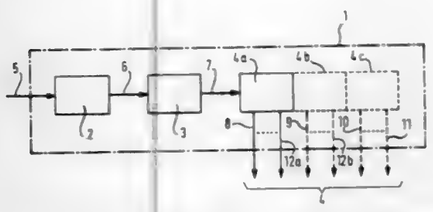
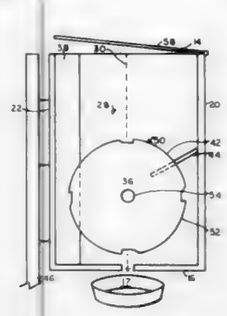
cutting up the meat by dividing the meat into planar pieces of a certain thickness,
mechanically tenderizing the planar pieces; and



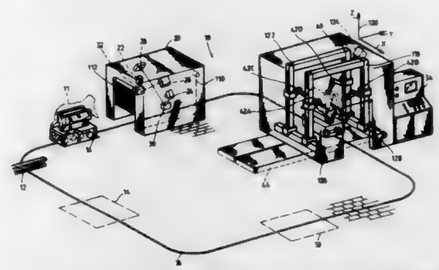
separating the tenderized pieces of meat into constituents using a pattern that is matched to a tenderizing pattern used in performing said tenderizing step.

5,205,778
APPARATUS FOR CHOPPING FISH FOR CHUM BAIT AND METHOD
William Korkuch, 116 Rte. 6A, Sandwich, Mass. 02563
Filed Jan. 16, 1992, Ser. No. 821,083
Int. Cl.[5] A22C *25/18*
U.S. Cl. 452—155 **8 Claims**



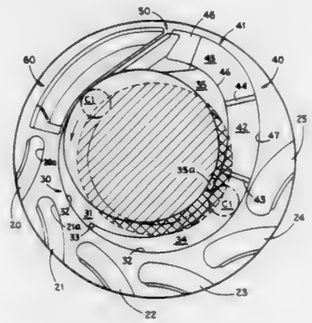
1. A portable cutting apparatus configured for low speed operation adapted for use in a fishing vessel while underway for cutting fish into chum bait, which apparatus comprises
a) a housing having a fish inlet and a chum bait outlet and a central duct defining a path for cutting fish, wherein the housing includes a base for mounting said housing such that the central axis of the path is in a vertical plane such that fish placed in the fish inlet are drawn into the duct for cutting by the action of gravity;
b) base means for mounting the housing in a vertical plane with the path in a vertical plane;
c) a chopping means including a rotatable shaft rotatably mounted in the housing for chopping the fish into a plurality of chunks of chum bait comprising a plurality of generally parallel, spaced apart circular saw blades having a toothed periphery mounted on a rotatable shaft and arranged within the central duct;
d) feed means for feeding the fish to be chopped into chum bait into the fish inlet of the housing for chopping by the chopping means, wherein the feed means for feeding the fish to be chopped into chum bait is gravity feed augmented by the toothed periphery of the circular saw blade acting to draw fish into engagement with the multiple circular saw blades mounted in the path in the housing;
e) drive means for driving the chopping means at low cutting speed in a circular path for engaging the fish fed into the housing, comprising a manually operated hand crank rigidly connected to the one end of the rotatable shaft configured to stop upon release of the hand crank.
f) container means for collecting the chunks of chum bait exiting the chum bait outlet, and
g) safety means for protecting the operators hands from being cut while feeding fish into the inlet of the housing; whereby a fish positioned in the fish inlet above and in contact with the chopping means can be cut into chunks by manual force applied to the hand crank rigidly connected to the chopping means directed to turning the circular saw blades acting to draw the fish into contact with the circular saw blades for cutting the fish for deposit in a container.

5,205,779
METHOD AND APPARATUS FOR AUTOMATICALLY SEGMENTING ANIMAL CARCASSES
William H. O'Brien, Amarillo, Tex., and James M. Malloy, Albany, Calif., assignors to Texas Beef Group, Amarillo, Tex.
Continuation of Ser. No. 754,527, Sep. 4, 1991, abandoned. This application May 22, 1992, Ser. No. 888,256
Int. Cl.[5] A22C *25/14*
U.S. Cl. 452—157 **28 Claims**



27. A method for segmenting an animal carcass, said method comprising the steps of:
scanning said carcass and delivering signals representing a three-dimensional interior and exterior image of said carcass in response to said scanning;
receiving said signals and creating a cutting path in response to said signals;
controllably segmenting said carcass along said cutting path.

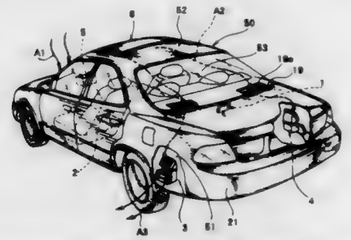
5,205,780
DISC-TYPE COIN SORTER WITH ECCENTRIC FEED
James M. Rasmussen, Chicago, Ill., assignor to Cummins-Allison Corporation, Mt. Prospect, Ill.
Filed Apr. 29, 1991, Ser. No. 694,952
Int. Cl.[5] G07D *3/00*
U.S. Cl. 453—10 **7 Claims**



1. A coin sorter comprising

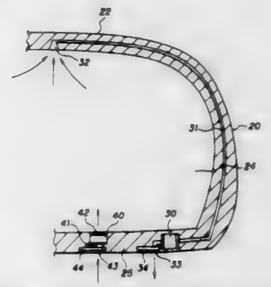
a rotatable disc having a resilient top surface,
means for rotating said disc,
a stationary sorting head having an opening in the central region thereof for feeding coins between the opposed surfaces of said disc and sorting head, said opening having a center that is offset from the center of rotation of said disc so that coins deposited on said disc at the side of the opening spaced farthest away from said center of said disc are carried under the sorting head by rotation of said disc, said sorting head having a contoured surface spaced slightly away from and generally parallel to said resilient surface of said rotatable disc, and including means for sorting and discharging said coins of different denominations at different exits around the periphery of said stationary sorting head, said sorting head forming a spiral channel for guiding coins radially outwardly along the lower surface of the sorting head as the coins are carried in a circumferential direction by the rotating disc, the inlet end of said spiral channel being located at least 90° away, in the direction of coin travel from the point of maximum radial spacing between the inner periphery of the sorting head and the center of rotation of the disc.

5,205,781
PRELIMINARY VENTILATION DEVICE FOR VEHICLES
Yoshihisa Kanno; Shinshi Kajimoto, both of Hiroshima; Masayuki Jinno, Higashihiroshima, and Akihiro Furuzawa, Kure, all of Japan, assignors to Naldec Corporation and Mazda Motor Corporation, Hiroshima, Japan
Continuation of Ser. No. 822,102, Jan. 17, 1992, abandoned. This application Aug. 4, 1992, Ser. No. 921,998
Claims priority, application Japan, Jan. 18, 1991, 3-004585; Jan. 18, 1991, 3-004586; Dec. 25, 1991, 3-343574
Int. Cl.[5] B60H *1/26*
U.S. Cl. 454—164 **19 Claims**



1. A preliminary ventilating device for a vehicle, said device having a control device connected to a solar battery, a storage battery, an operation means and a ventilation means, said preliminary ventilating device being able to be set by a changeover operation of said operation means to either of charging mode in which said storage battery is charged from said solar battery, forced exhaust mode in which said ventilation means is driven by power supplied from said storage battery, and parking ventilating mode in which said ventilation means is driven by an electromotive force supplied from said solar battery, said ventilation means including a plurality of ventilating fans driven by a d.c. motor,
said preliminary ventilating device comprising:
a gradual starting means for activating a first ventilating fan in said ventilating fans by gradually increasing and continuously applying a voltage and a current from the electromotive force supplied from said solar battery; and
a switch means for controlling simultaneous application of the voltage and the current from the electromotive force supplied from said solar battery to a second ventilating fan in the ventilating fans,
wherein, when the parking ventilation mode is set, said switch means is operated to activate the second ventilating fan after the first ventilating fan has been activated by said gradual starting means.

5,205,782
CAR VENTILATING SYSTEM
Shunji Ohba, 2667-5, Funaki, Shimada-shi, Shizuoka, Japan
Continuation of Ser. No. 669,838, Mar. 15, 1991, abandoned. This application Aug. 27, 1992, Ser. No. 936,880
Claims priority, application Japan, Mar. 22, 1990, 2-29517[U]; Jun. 20, 1990, 2-65189[U]
Int. Cl.[5] B60H *1/26*
U.S. Cl. 454—141 **4 Claims**



2. A car ventilating system for ventilating the air in the cabin of a vehicle having an engine, and for lowering the temperature in the cabin, the cabin having a floor and a ceiling, comprising an air intake port in said floor open externally of said vehicle below said vehicle and floor and directed to intake air upwardly from below said floor and vehicle, an air exhaust port in said floor of said cabin, said exhaust port opening externally of said vehicle below said floor and being directed to exhaust air below said floor and vehicle, electrically operated valves in each of said intake and exhaust ports, bulkheads in each of said intake and exhaust ports, outwardly of the respective valves and positioned to inhibit the flow of rainwater into said cabin, an electrically operated first air moving means in said air intake port inwardly of the respective valve with respect to said cabin, for flowing air directly into said cabin from below said floor and vehicle, an air exhaust piping means connected to direct air from the ceiling of said cabin into said air exhaust port, an electrically operated second air moving means in said air exhaust port inwardly of the respective valve with respect to said cabin, a solar cell mounted to the exterior of the vehicle, and an electric circuit connected to energize said first and second air moving means with electrical power from said solar cell and to control said valves, said circuit including a serially connected switch that is responsive to the temperature in said cabin, and a serially connected switch adapted to be closed in response to operation of said engine.

5,205,783
AIR FLOW CONTROL EQUIPMENT IN CHEMICAL LABORATORY BUILDINGS
Joseph C. Dieckert, Bryan, and Swiki A. Anderson, College Station, both of Tex., assignors to Acco*Aire Systems, Inc., Bryan, Tex.
Filed Aug. 22, 1991, Ser. No. 748,793
Int. Cl.[5] F24F *7/00*
U.S. Cl. 454—238 **39 Claims**

19. Apparatus for controlling the flow of air in a building module having predominantly special procedure rooms that are to be maintained different by a negative offset pressure from residual areas of the building module adjoining said rooms and for maintaining the residual areas at neutral pressurization relative to the building's exterior, said residual areas being connected by constricted passages to said special procedure rooms, said apparatus including

a frame having ends and a top and a bottom and defining an

of said plurality of screens, said pendulum being on an axis in the same plane as the aforesaid longitudinal axes lying in the

monolithic to form a record sheet, and with other sheets in the stack being formed as strip sheets; with the strip sheets each

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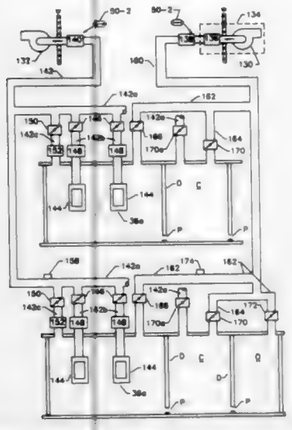
an exhaust fan for discharging exhaust from the building module and an exhaust duct system extending from said exhaust fan to said special procedure rooms,

a supply fan for drawing air into the building module and a supply duct system extending from said supply fan to said special procedure rooms, exhaust damper means for regulating exhaust flows drawn from the special procedure rooms into the exhaust duct system at controlled exhaust volumetric flow rates,

supply damper means for regulating supply flows of air from said supply duct system to said special procedure rooms at volumetric flow rates lower than said controlled exhaust volumetric flow rates of said rooms, respectively, for



maintaining the special procedure rooms at negative offset pressured relative to said residual areas,

residual area damper means for regulating a flow of supply air from said supply duct system to said residual areas for making up the difference between the exhaust flows and the supply flows of said rooms, and

means for maintaining the volumetric flow rates of the exhaust duct system and of the supply duct system in balance, said maintaining means including means for sensing and comparing the volumetric flow rates of the supply and exhaust duct systems and means responsive to said comparing means for regulating said residual area damper means for maintaining said balance.

5,205,784

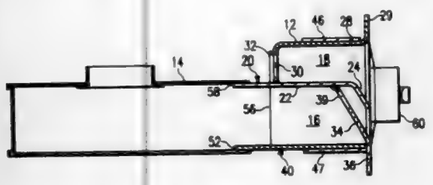
SECURITY SLOT DIFFUSER

Marvin L. DeHart, Mesquite, Tex., and Steven J. Bowser, Tucson, Ariz., assignors to Tomkins Industries, Inc., Dayton, Ohio

Filed Aug. 30, 1991, Ser. No. 751,809

Int. Cl.[5] F24F *7/08*

U.S. Cl. 454—245 **7 Claims**



7. A diffuser for air flow, comprising:

a frame having ends and a top and a bottom and defining an opening therethrough;

a divider plate dividing the opening into a first passage and a second passage;

a slotted plate secured to the frame and said divider plate and disposed across the first passage, the slotted plate having a plurality of slots formed therein for air passage;

the divider plate having a deflector portion that extends over the slots in the slotted plate to direct the flow through the slots in a first direction;

the diffuser further comprising a second slotted plate secured to the frame and said divider plate, said second slotted plate disposed across the second passage, the second slotted plate having a plurality of slots formed therein for air passage, said divider late extending over the slots in both slotted plates to direct the flow through the slots in the first direction and a second direction.

5,205,785

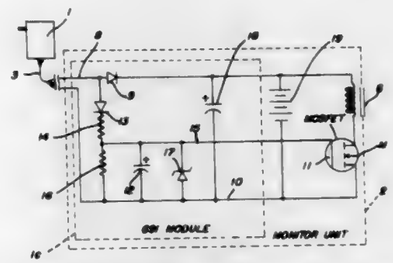
CONTROL SYSTEM FOR THE VENTILATING MEANS IN A POULTRY BUILDING OR THE LIKE

R. H. Richardson, Rte. 31, Box 12A, Hayesville, N.C. 28904, and Hank D. Beesley, 2991 Woodrow Way, Atlanta, Ga. 30319

Filed Feb. 13, 1992, Ser. No. 834,933

Int. Cl.[5] F24F *11/02*

U.S. Cl. 454—256 **14 Claims**



1. A control system for opening normally closed ventilating means in a poultry building or the like, said system comprising a power module for supplying direct electric current, at least one electromagnet arranged when energized to engage and hold an associated armature and to release said armature when deenergized, circuit means including the drain to source channel of a MOSFET for connecting said power module in series with said electromagnet, a capacitor connected in parallel with a resistor and with the gate of said MOSFET and arranged to increase the drain to source channel resistance of said MOSFET in coordination with the discharge of said capacitor through said resistor following a predetermined reduction in the voltage of said power module thereby to deenergize said electromagnet and release said armature.

5,205,786

LEVEL BED HARVESTER

Ronald G. Murphy, 1349 E. Clearwater La., Gilbert, Ariz. 85234

Filed Apr. 18, 1991, Ser. No. 687,169

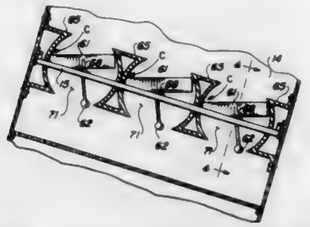
Int. Cl.[5] A01F *12/34*

U.S. Cl. 460—9 **3 Claims**

1. In a combined harvester wherein the passage of seeds and waste material is over a series of laterally adjacent screens which rise and fall relative to each other as the harvester changes its angle relative to the horizontal, but which remain level from side to side, said harvester having a housing, a plurality of screens arranged side by side in said housing, means pivotally mounting said screens for rocking movement about longitudinal axes between the sides thereof, said longitudinal axes lying in the same plane, a pendulum coupled to each

of said plurality of screens, said pendulum being on an axis in the same plane as the aforesaid longitudinal axes lying in the same plane, a pendulum coupled to each of said plurality of screens, said pendulum being on an axis in the same plane as the aforesaid longitudinal axes so as to swing transverse to said axes, said coupling of said screens and said pendulum being operative to maintain said screens at right angles to the arm of said pendulum, the improvement comprising: maintain said screens at right angles to the arm of said pendulum, The improvement comprising:

a first one of said plurality of screens being independently pivotal without introducing rocking motion in the remaining plurality of screens;



said pendulum comprising a plurality of pendulums interior of said housings a first one of said plurality of pendulums being coupled to said first one of said screens, said first one of said plurality of pendulums being on an axis in the same plane as said aforesaid longitudinal axes so as to swing transverse to said axes;

said coupling of said first one of said plurality of screens and said first one of said plurality of pendulums being operative to maintain said first one of said screens side-to-side horizontal, independent of any of said rocking motion experienced by the remaining plurality of screens.

5,205,787

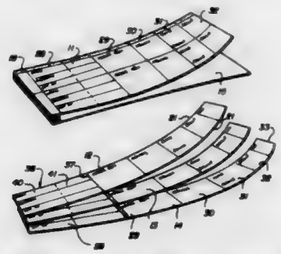
FORM FOR RECORDING ORDER AND DELIVERY INFORMATION

James N. Simoneau, 32901 Blossom Ct., Birmingham, Mich. 48025

Filed Mar. 31, 1992, Ser. No. 861,289

Int. Cl.[5] B42D *15/00*

U.S. Cl. 462—56 **10 Claims**



1. In a pizza-type delivery, multi-sheet form, used for recording and delivering orders for pizza and other food and non-food items, constructed of a stack of overlapped, aligned sheets that are joined together along one common edge thereof, with said sheets provided with means for transferring information written upon the uppermost sheet through the stack to the successive lower sheets, and with overlapped, aligned printed columns formed on the sheets to provide overlapped, aligned spaces thereon for receiving handwritten order and delivery information, such as the items ordered, the customer's name and address, prince data and the like information; and with one of the sheets of the stack being substantially monolithic to form a record sheet, and with other sheets in the stack being formed as strip sheets; with the strip sheets each being cut transversely to said one edge into substantially uniform, narrow, elongated strips, and with each strip having the aligned information spaces formed thereon so that each strip receives a copy of the order and delivery information for a single order and to form an overlapped set of strips; and with the overlapped set of strips being separably into individual strips from each other and from along said common edge to which the sheets are joined, the improvement comprising:

the space provided by the printed columns for receiving the delivery information being arranged adjacent one end of the sets of strip, that is, along one side of the overlapped sheets so as to form an elongated, address receiving portion extending inwardly from one end of the strips toward the middle of the strips;

and with the delivery address space portion of one of the strips in each set being separated by a tear line means which enables said delivery address space portion to be manually separable from its strip so that the separate address space portion may be carried separably from its respective strip and from the order during delivery of the order in a location readily accessible to the delivery person and the remainder of its strip may remain with the order items or elsewhere.

5,205,788

TORSIONAL SHOCK ABSORBER WITH CONSECUTIVE STEP-WISE ELASTIC RESISTANCE TO RELATIVE ROTATION

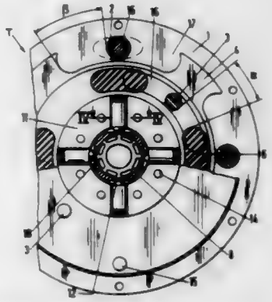
Christoph Sacher, Sauerlach/Arget, and Johann Eichinger, Vaterstetten, both of Fed. Rep. of Germany, assignors to Hurth Getriebe und Zahnraeder G.m.b.H., Munich, Fed. Rep. of Germany

Filed May 8, 1990, Ser. No. 521,269

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915527

Int. Cl.[5] F16D *3/16, 3/12*

U.S. Cl. 464—61 **8 Claims**



1. A torsional shock absorber, comprising:

a primary part adapted to be coupled with a rotatable flywheel of a motor and rotated therewith;

a secondary part adapted to be coupled with a rotatable input shaft of a boat transmission, said secondary part being rotatable relative to said primary part only through a limited angle;

compressible first and second resilient means for resisting said relative rotation of said primary part and said secondary part and mounting means for orienting said first and second resilient means symmetrically with respect to an axis of rotation of said primary part and said secondary part;

first means for effecting said second resilient means becoming active only after said first resilient means has become active, said second resilient means having a greater hard-

ness and, therefore, requiring a greater force to compress it than for said first resilient means;

5,205,790

STEERING-WHEEL SHAFT FORMING AN ANTI-THEFT

perimeter of said sheet for standing in substantially vertical relation to said sheet when said sheet is spread in a substantially flat horizontal condition and for collapsing

a hub;

a first set of opposed pairs of radially extending teeth circularly spaced around said hub, each pair of opposed teeth of

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ness and, therefore, requiring a greater force to compress it than for said first resilient means;

at least one friction element arranged between said primary part and said secondary part for hindering said relative rotation; and

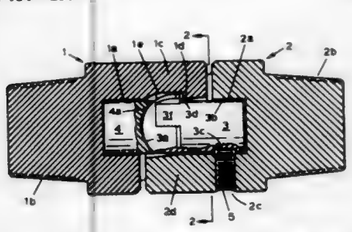
said first resilient means including bearing means directly, relatively movably, supported on at least one inclined surface extending in a peripheral direction, said surface being provided on at least one of said primary part and said secondary part so that said bearing means will move along said inclined surface to increasingly compress said first resilient means in response to increasing relative rotation between said primary part and said secondary part to increasingly resist said relative rotation, said second resilient means also defining a limit and thereby a finite size for said limited angle, said second resilient means thereby preventing further relative rotation between said primary part and said secondary part beyond said limited angle.

5,205,789

FLEXIBLE DRILLING MOTOR COUPLING

Thomas E. Falgout, Sr., 110 Bellaire Rd., Lafayette, La. 70503

Filed Oct. 24, 1991, Ser. No. 782,090
Int. Cl.[5] F16D *3/18*
U.S. Cl. 464—157 **13 Claims**



9. An improved shaft coupling that accepts limited deflection of the axes of rotation of coupled shafts and carries axial forces on surfaces independent of surfaces used to transmit torque, the coupling comprising:

(a) rotational coupling means arranged to transmit torque between two machine members that have independent rotational axes that intersect at a point within the coupling means such that one axis may deflect from a line containing the other axis with an angle up to a preselected amount;

(b) axial coupling means arranged to axially couple said machine members and accept forces in both axial directions;

the improvement wherein the axial coupling means comprises

(c) a thrust seat, mounted on one said machine member, with a concave spherical surface opening toward the other machine member;

(d) an axial stress element with a convex spherical surface, sized to fit said concave surface, with a center of radius located on said line, an abutment facing away from said convex surface, said abutment having a plurality of peripherally distributed slots opening radially outward, and means for attachment to said other machine member after the coupler is assembled in position to transmit torque;

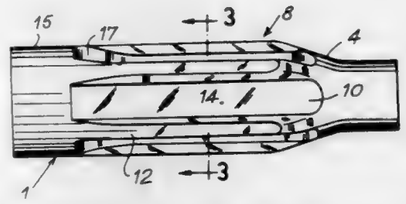
(e) axial capture lugs peripherally distributed about said line on said one machine member sized to move through said slots and engage said abutments after said axial stress element is rotated to place said abutment, between said slots, in opposition to said capture lugs.

5,205,790

STEERING-WHEEL SHAFT FORMING AN ANTI-THEFT LOCK ELEMENT

Jean-Pierre Barnabe; André Hoblingre; Nicolas Lapalu, and Ghislain Passebecq, all of Valentigney, France, assignors to ECIA, France

Continuation of Ser. No. 525,578, May 21, 1990, abandoned. This application Oct. 10, 1991, Ser. No. 774,380
Claims priority, application France, May 22, 1989, 89 06655
Int. Cl.[5] F16D *3/06*
U.S. Cl. 464—162 **9 Claims**



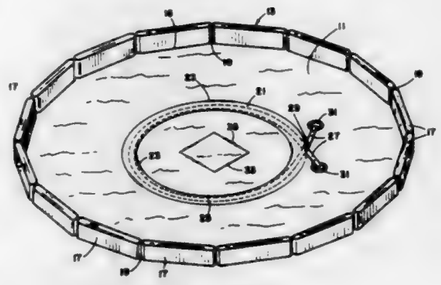
1. A lockable steering-wheel shaft comprising a longitudinally-extending cylindrical hollow sleeveless tubular body (1) which has a circular cross-section and which has at a first end thereof an extension having a diameter smaller than that of said body and forming a steering-wheel support (2); said body and said steering wheel support being connected by a tapered body potion (4); wherein a wall of the body has a profiled part (8) forming, on the one hand, directly in the body's outside face and adjacent said tapered body portion (4) in a direction away from said first end, a plurality of longitudinal receiving and locking grooves (10) having inner bottoms (14) which are connected at first ends thereof to said outside face by tapered portions (17), and which have opposite second ends extending into said tapered body portion (4); and wherein said grooves (10) form a locking element for an anti-theft catch (24), are distributed over the body's entire circumference and have a radial depth at least equal to an initial wall thickness of the tubular body; said profiled part (8) forming, on the other hand, in the body's inside face, a plurality of regularly and circumferentially spaced longitudinal projections (16, 36) projecting radially inwardly.

5,205,791

PORTABLE SANDBOX

Frances E. Pledger, 1608 W. Gulfport St., Broken Arrow, Okla. 74011

Filed Feb. 14, 1992, Ser. No. 836,983
Int. Cl.[5] A63G *31/00*
U.S. Cl. 472—126 **21 Claims**



1. A portable sandbox comprising:

a fabric-like sheet;

wall means having a bottom edge thereof fixed along a perimeter of said sheet for standing in substantially vertical relation to said sheet when said sheet is spread in a substantially flat horizontal condition and for collapsing when said sheet is gathered out of said substantially flat horizontal condition; and

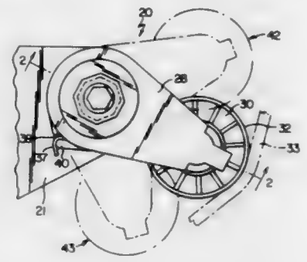
gathering means disposed substantially along a continuous path on an upper surface of said sheet and inwardly of said perimeter for drawing said continuous path toward confluence.

5,205,792

TENSIONER FOR A POWER TRANSMISSION BELT AND METHOD OF MAKING THE SAME

James G. Quintus, and Mark P. Foley, both of Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 867,259, Apr. 10, 1992, Pat. No. 5,169,368, which is a division of Ser. No. 771,291, Oct. 4, 1991, Pat. No. 5,129,864, which is a division of Ser. No. 661,141, Feb. 27, 1991, Pat. No. 5,083,984. This application Sep. 18, 1992, Ser. No. 947,188
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—135 **20 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt and having a shaft means, a belt engaging means carried by said support means and having an arbor means rotatably disposed on said shaft means and being movable relative thereto, a coiled torsion spring having a first end operatively interconnected to said support means and a second end operatively interconnected to said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension support means and against said belt with a force to tension said belt, said spring having a certain torque when said belt engaging means is disposed at a certain position relative to said support means, the improvement wherein said tensioner has changeable structure holding said second end of said spring in an adjusted position relative to said belt engaging means so as to provide for said certain torque of said spring when said belt engaging means is disposed at said certain position relative to said support means.

5,205,793

ROPE OR CHAIN HAULING PULLEY

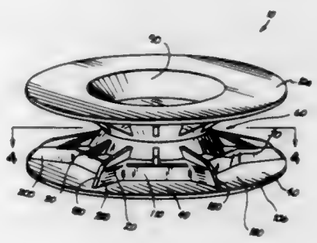
Stephen K. Jones, Stratford, Conn., assignor to Campbell Hausfeld/Scott Fetzer Company, Harrison, Ohio

Filed May 6, 1991, Ser. No. 696,046
Int. Cl.[5] F16H *55/36*
U.S. Cl. 474—141 **13 Claims**

1. A rope-chain pulley comprising:

a hub;

a first set of opposed pairs of radially extending teeth circularly spaced around said hub, each pair of opposed teeth of said first set having confronting rope-engaging surfaces which slope away from each other in a radially outward direction, said first set of teeth defining chain link receiving pockets and having flanks transverse to said confronting surfaces adapted to drivingly engage the links of a chain wrapped around said pulley;



base surface portions in said pockets facing radially outward for engaging the links of a selected size chain received in said pockets; and,

a second set of opposed pairs of radially extending teeth circularly spaced around said hub, said second set of teeth being radially shorter than said first set of teeth and having confronting rope-engaging surfaces which taper away from each other in a radially outward direction on the same angle as the rope-engaging surface of said first set of teeth.

5,205,794

SHIFT MECHANISM FOR BICYCLE

Bruce W. Browning, Seattle, Wash., assignor to Bicycle Partnership #1, Bainbridge Island, Wash.

Filed Nov. 14, 1983, Ser. No. 551,211
The portion of the term of this patent subsequent to Mar. 24, 2007, has been disclaimed.
Int. Cl.[5] F16H *55/12*
U.S. Cl. 474—160 **11 Claims**

1. A shift mechanism for a bicycle or the like comprising a drive sprocket assembly including at least one drive sprocket;

means for rotating each drive sprocket;

a wheel sprocket assembly including at least one sprocket;

a second member;

holding means connected to said second member for selec-

5,205,798

SPORTING AND EXERCISING UNIT

fined by said wall (18) and extending between said base hole (22) and said top hole (20);

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means for rotating each drive sprocket;
a wheel sprocket assembly including at least one sprocket;
a chain interconnecting a sprocket of the drive sprocket assembly and a sprocket of the wheel sprocket assembly;
at least one of the sprocket assemblies including at least two sprockets of different diameters;
means for pivoting at least a segment of one of said two sprockets to place the teeth of said pivoted portion of one of said two sprockets in alignment with teeth of the other of said two sprockets;
a movable guide channel;
a guide pawl;
means attaching the guide pawl to the pivoted segment;
means for positioning the guide channel according to the sprocket on which the chain is to be entrained; and
means directing the pawl through the guide channel whereby the position of the pawl as it passes through the guide channel determines the position of each pivoting segment of a sprocket.

5,205,795

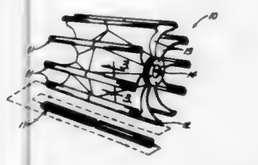
Patent Not Issued For This Number

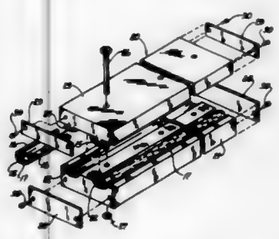
5,205,796

APPARATUS FOR SHAPING A REPLACEABLE LEGGING FOR WING PULLEYS PRIOR TO VULCANIZATION

Karl C. Valster, and Allen V. Reicks, both of Pella, Iowa, assignors to Precision Pulley, Inc., Pella, Iowa

Division of Ser. No. 688,449, Apr. 22, 1991. This application Sep. 17, 1992, Ser. No. 946,401
Int. Cl.[5] F16H 55/00
U.S. Cl. 474—185 1 Claim





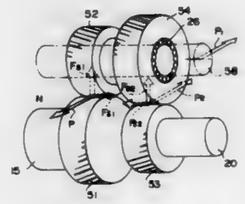
1. An apparatus for shaping a replaceable lagging for wing pulleys prior to vulcanization of a portion of said replaceable lagging comprising:
a first member having an elongated depression therein for receiving an elastomeric substance in a plastic condition;
a second member;
holding means connected to said second member for selectively holding a backing member in a predetermined position with respect thereto; and
means for selectively securing said second member to said first member so that said backing member extends into the elongated depression in said first member, thereby forming said elastomeric substance into the shape of said depression prior to and during a vulcanization process.

5,205,797

TORQUE DISTRIBUTION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Toshio Kobayashi, Tokyo, and Takao Omata, Uenohara, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,518
Claims priority, application Japan, Oct. 20, 1989, 1-274592; Oct. 20, 1989, 1-274593
Int. Cl.[5] B60K 17/346
U.S. Cl. 475—221 7 Claims



1. A system, for controlling a torque distribution to front wheels and rear wheels of a motor vehicle having a transmission, having a central differential operatively connected so as to transmit output of the transmission to the front and rear wheels, the system comprising:
said central differential comprising a planetary gear device including a first sun gear, a carrier, first and second planetary pinions integral with each other and rotatably supported on a shaft secured to the carrier, and a second sun gear, said first planetary pinion being engaged with said first sun gear, and said second planetary pinion being engaged with said second sun gear;
each of said sun gears and said planetary pinions being arranged such that a resultant force produced by a separative load and a tangential load at a contact point of the pinion and sun gear exerts on a bearing on said shaft through the corresponding planetary pinion, whereby a friction at said bearing produces a differential operation restricting torque; and
each of said sun gears and said planetary pinions is a helical gear, each helix angle of the helical gears is determined such that the difference between a first thrust load on the first planetary pinion and a second thrust load on the second planetary pinion acts to produce a friction between an end of one of the pinions and an outside bearing member.

5,205,798

SPORTING AND EXERCISING UNIT

Gregory Lekhtman, Montreal, Canada, assignor to Unique Life and Fitness Products Corp., Plattsburgh, N.Y.

Filed Feb. 19, 1992, Ser. No. 838,461
Int. Cl.[5] A63B 25/10
U.S. Cl. 482—77 6 Claims

1. A sporting and exercising unit, comprising:
A) a foot receiving member;
B) a plastic spring member detachably attached to and disposed at the bottom of the foot receiving member, said spring member comprising:
i) a top, arched, layer having a first end and a second end;
ii) a bottom, arched, layer having a first end, a second end, a bottom surface and a top surface;
iii) spring rate and weight adjustment means having a first end and a second end, said spring rate and weight adjustment means being disposed between said top and bottom layers;
iv) the first end of the top layer and the first end of the bottom layer being disassemblingly attached to the first end of the spring rate and weight adjustment means, and the second end of the top layer and the second end of the bottom layer being disassemblingly attached to the second end of the spring rate and weight adjustment means;
said spring rate and weight adjustment means comprising a strap member having a first end and a second end;
a first snap-fitting means at said first end of said strap, and a second snap-fitting means at said second end of said strap;
said first end of said top layer and said first end of said bottom layer being snap-fittingly received on said first snap-fitting means; and
said second end of said top layer and said second end of said bottom layer being snap-fittingly received on said second snap-fitting means;
whereby, the spring member will automatically disassemble under the influence of an extraordinary lateral force.

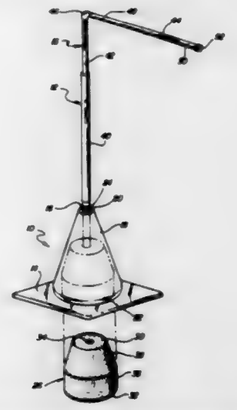
5,205,799

TELESCOPING HURDLE WITH BASE ADAPTER

Kurt K. Carbonero, Birmingham, Mich., assignor to Pull-Buoy, Inc., Rochester Hill, Mich.

Filed Jan. 7, 1992, Ser. No. 817,607
Int. Cl.[5] A63B 5/02
U.S. Cl. 482—16 17 Claims

1. A playground base and standard assembly (10) comprising:
support means (28) including a base (14), a top (16), a conical wall (18) extending between said base (14) and said top, a top hole (20) through said top (16), a base hole (22) through said base (14) and a conical inner space (24) defined by said wall (18) and extending between said base hole (22) and said top hole (20);
a separate stabilizing insert means (26), made of light weight foam material and being disposed within said inner space (24) for supporting a standard (12), said insert (26) defining a receiving hole (34) for receiving the standard into said insert whereby the standard can be in snug contact within said insert;
characterized by said insert (26) having a top portion (38) conical in shape, to engage said conical wall of said support means in a snug fit, below said top hole, in order to a minimize movement of the standard (12) with respect to said support means (28).



5,205,800

ALL TERRAIN TREADMILL

Fred W. Grant, 3177 Terrace Ct., Apt. H, Norcross, Ga. 30092

Filed Nov. 15, 1991, Ser. No. 792,367
Int. Cl.[5] A63B 22/02
U.S. Cl. 482—54 6 Claims

1. An exercise apparatus comprising:
a frame including a base member;
first means defining a longitudinally extending tread surface, said first means having first and second ends with said first end being pivotally mounted to said frame along an axis lying in a first plane and said second end being movable with respect to said frame;
a longitudinally movable endless belt having an upper and lower flight, said upper flight being supported on said surface;
drive means on said frame for moving said endless belt longitudinally along said surface; and
adjusting means on said base member for moving said second end of said first means through a range of positions extending from above said first plane to below said first plane whereby said thread surface is moved through a range extending from an inclined slope to a declined slope, said adjusting means comprising a rotatable support member

mounted on said base member for supporting said second

5,205,804

METHOD FOR STRENGTHENING THE MUSCLES OF

conditioning comprising a support means and hand grip means,

and changing operations, and wherein said controller causes

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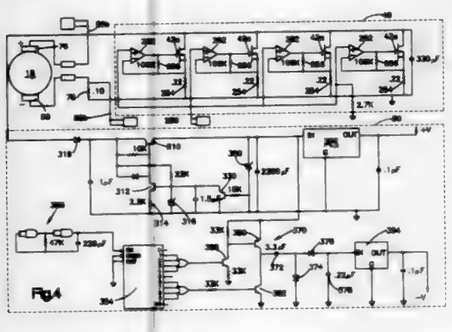
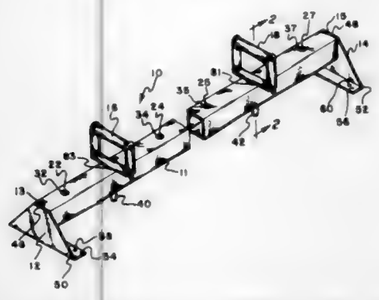
mounted on said base member for supporting said second end.

5,205,801
EXERCISE SYSTEM
Lambert Haner, Rocky River, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio
Filed Mar. 29, 1990, Ser. No. 502,069
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—63 **33 Claims**



1. An exercise device, comprising:
a) a user operated device actuating mechanism;
b) a DC generator means coupled to said actuating mechanism by a coupling means such that actuation of said actuating mechanism produces rotation in a drive shaft of said DC generating means;
c) power dissipation means electrically coupled to said DC generating means operative to dissipate the output of said DC generator means in order to control a braking effect exerted by said DC generator means on said actuating mechanism; and,
d) compensation means forming part of a control means for compensating for electrical related losses in said DC generating means, said compensating means including a compensating signal derived directly from the current output of the DC generating means, said compensating signal being used by said control means to at least partially compensate for a reduced output voltage in said DC generator means due to internal electrical resistance in said DC generator means.

5,205,802
EXERCISE APPARATUS
William J. Swisher, 68 Picadilly Cir., Marlton, N.J. 08053
Filed Nov. 27, 1991, Ser. No. 798,809
Int. Cl.[5] A63B *26/00*
U.S. Cl. 482—141 **12 Claims**

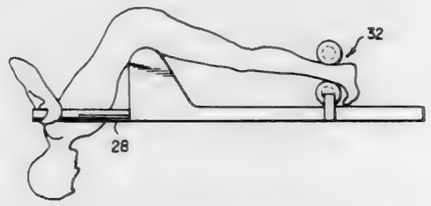


1. An exercise apparatus for obtaining improved muscle conditioning comprising a support means and hand grip means, said hand grip means being comprised of an elongated handle attached to a rigid structure having a pin attached thereto, said hand grip means being secured to said support means and being adapted to be grasped by a user, said apparatus having location adjustment means comprised of a plurality of openings through said support means and said pin having a free end fitting slidably and rotatably within said openings, said hand grip means being rotatable through only a limited range of motion of less than 360° about a vertical axis during use of said apparatus, said apparatus having means for locking said hand grip means to said support for preventing unwanted removal and allowing wanted removal of said hand grip means from said support means, said locking means being comprised of a removable spring clip attached tos aid free end of said pin which interacts with the support means.

5,205,803
ELASTIC CORD APPARATUS
Martin S. Zemitis, P.O. Box 974, Davis, Calif. 95617
Filed Apr. 6, 1992, Ser. No. 864,303
Int. Cl.[5] A63B *21/02, 21/04*
U.S. Cl. 482—121 **7 Claims**

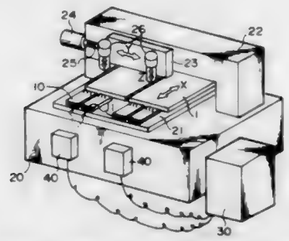
1. In combination:
an elastic cord having spaced ends;
an attachment element at each of said elastic cord ends for attaching said elastic cord ends to relatively moveable objects, movement of said objects away from each other stretching said elastic cord;
shroud means wholly covering said elastic cord, extending between said attachment elements, and affixed to said attachment elements, said shroud means comprising flexible generally tubular-shaped member extending along the full length of said elastic rod and forming a plurality of pleats when said elastic cord is in the elongated condition, said generally tubular-shaped member being formed of woven fabric material which becomes unpleated when said objects are moved away from each other a predetermined distance, and said generally tubular-shaped member operable upon unpleating thereof to positively prevent said objects from moving substantially further apart than said predetermined distance, said generally tubular-shaped member being unaffixed to the elastic cord along the full length of said elastic cord whereby stretching of said elastic cord will not be impeded by said generally tubular-shaped member until the objects have moved said predetermined distance, at least one of said attachment elements comprising a strap affixed to an end of said elastic cord and forming a loop projecting from said elastic cord end and having overlapping strap portions, said generally tubular-shaped member partially covering said strap and affixed thereto by stitching passing through both said overlapping portions of said strap and through said generally tubular-shaped member on opposed sides of said strap to close the end of said as generally tubular-shaped member, said stitching big spaced outwardly away from the end of said elastic cord to which said strap is affixed, said elastic cord being doubled back on itself to form engaging cord segments defining a bight at each said elastic cord end and additionally comprising fastener means disposed about said engaging cord segments for maintaining said bight, said attachment elements being connected to said bights.

5,205,804
METHOD FOR STRENGTHENING THE MUSCLES OF THE LOWER BACK
Henry V. Hall, Star Rte. 62, Box 433, Center Harbor, N.H. 03226
Division of Ser. No. 625,319, Dec. 10, 1990, Pat. No. 5,106,083. This application Apr. 13, 1992, Ser. No. 867,490
Int. Cl.[5] A63B *26/00*
U.S. Cl. 482—141 **7 Claims**



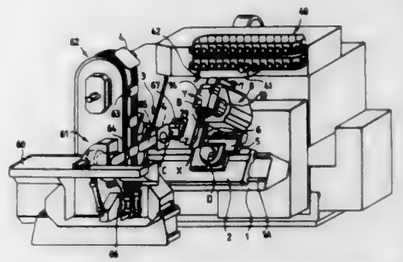
1. A method for strengthening the muscles of the lower back of a user comprising:
positioning the user on the platform having a protrusion and an ankle engaging element such that the user's ankles are restrained by the ankle engaging means and the user's anterior pelvic area is supported by said protrusion;
the user engaging supports of the platform with the user's hands;
the user lowering and raising the user's torso by employing back and arm muscles of the user.

5,205,805
PRINTED CIRCUIT BOARD PROCESSING MACHINE INCORPORATING TOOL HOLDING DEVICE
Tamio Otani, Hadano; Yasuhiko Kanaya, Machida, and Tetsuo Murakami, Atsugi, all of Japan, assignors to Hitachi Seiko Ltd., Ebina, Japan
Continuation of Ser. No. 577,034, Sep. 4, 1990, abandoned. This application Sep. 15, 1992, Ser. No. 944,983
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 483—9 **3 Claims**



1. A machine tool for machining printed circuit boards comprising: a work spindle movable by a motor; a work table for mounting the printed circuit boards; at least one tool holding device detachably mounted on the work table, said at least one tool holding device including a plurality of tool posts each for receiving a tool and spaced at predetermined intervals; and a controller for programmed controlling of machining and tool changing operations, wherein said at least one tool holding device includes data carrier memory means having stored data corresponding to a degree of wear of all tools located in said at least one tool holding device and a communication device for communicating with said controller for transferring new data corresponding to a new tool installed in said at least one tool holding device to said controller prior to each of said machining and tool changing operations and for updating the stored data in said data carrier memory means after each of machining and changing operations, and wherein said controller causes said communication device to replace said stored data in said data carrier memory means with said new data after replacement of a worn-out tool by a new tool in said at least one tool holding device.

5,205,806
COMPOSITE-MACHINING MACHINE TOOL
Kenichi Ishida; Shinichi Yamazaki, and Masaki Yoshioka, all of Niigata, Japan, assignors to Tsugami Corporation, Tokyo, Japan
Filed Feb. 19, 1992, Ser. No. 836,910
Claims priority, application Japan, Feb. 20, 1991, 3-047623
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 483—18 **4 Claims**



1. A composite-machining machine tool comprising:
a bed;
a table movable relative to said bed in a horizontal Z-axis direction;
a Z-axis drive device for reciprocally moving said table in the Z-axis direction; a headstock mounted on said table;
a workpiece-holding work spindle rotatably held by said headstock in such a manner that an axis of said work spindle extends in the Z-axis direction;
a spindle drive device for rotating said work spindle;
a column fixedly mounted on said bed and having a guide surface extending in an X-axis direction perpendicular to the Z-axis direction;
an X-axis slide supported on said guide surface of said column so as to move in the X-axis direction;
an X-axis drive device for reciprocally moving said X-axis slide in the X-axis direction; a
Y-axis slide supported on said X-axis slide so as to move in a Y-axis direction perpendicular to the X-axis and the Y-axis;
a Y-axis drive device for reciprocally moving said Y-axis slide;
a B-axis shaft supported on said Y-axis slide for rotation about an axis extending in the Y-axis direction; a tool spindle head mounted on a front end of said B-axis shaft, said tool spindle head having a rotatably-supported tool spindle having an axis perpendicular to the Y-axis direction;
a tool spindle drive device for rotating said tool spindle;
a B-axis indexing mechanism for indexingly rotating said B-axis shaft;
a positioning coupling for fixing said B-axis shaft at a plurality of rotational angle positions with respect to said Y-axis slide;
a clamp piston member provided at said Y-axis slide so as to fix said B-axis shaft at an arbitrary rotational angle position with respect to said Y-axis slide;
a control device for synchronizing the rotation of said work spindle with the rotation of said tool spindle so as to form gear teeth by hobbing;
a tool magazine provided above said column; and
an automatic tool exchange device for exchanging a tool in

said tool magazine with a tool held by said tool spindle

means for feeding a source of first plastic sheet material into

c. wrapping said first skeletal muscle mass about the atria of a heart;

5,205,812
HAND SPLINT

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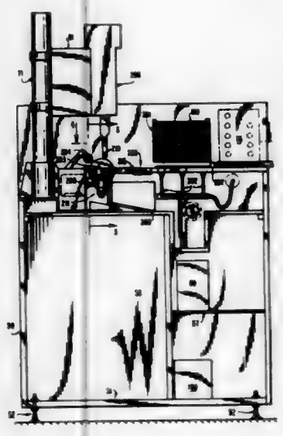
said tool magazine with a tool held by said tool spindle head.

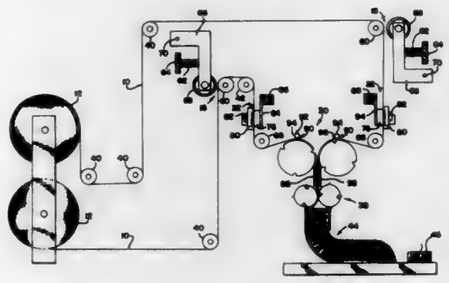
5,205,807

APPARATUS AND METHOD FOR FORMING HINGED TOP CIGARETTE BOX

Jonah Adams, Jr., Chesterfield; John Tomanovits, Richmond, and Duane C. Wilder, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 568,351, Aug. 15, 1990, abandoned. This application Mar. 12, 1992, Ser. No. 851,227
Int. Cl.[5] B31B *1/34*; B31C *1/00*
U.S. Cl. 493—125 **24 Claims**





13. A method of forming a hinged top cigarette box having dual layers and an arcuate surface from a one piece blank, the one piece blank having first and second edges and located therebetween, cut-out and hinge features, the method comprising the steps of:

engaging said first edge of said one piece blank to a mandrel while aligning said one piece blank by abutting a portion of said one piece blank to a stop located near said mandrel;

aligning said cut-out and hinge features by rotating said mandrel to wind said one piece blank around itself to form a dual layered shell having inner and outer sleeves and having an arcuate surface; and

securing said second edge of said one piece blank to said outer sleeve of said dual layered shell.

5,205,808

METHOD AND APPARATUS FOR MAKING INTERFOLDED BOXED BAGS

Terry D. Gebhardt, Longview, Tex., assignor to T C Manufacturing Co. Inc., Evanston, Ill.

Filed Dec. 10, 1991, Ser. No. 804,431
Int. Cl.[5] B31B *23/96, 23/98, 23/56*; B65H *45/24*
U.S. Cl. 493—194 **6 Claims**

1. A device for making interfolded boxed bags comprising:

means for feeding a source of first plastic sheet material into said device;

means for feeding a source of second plastic sheet material into said device;

means for moving said first and second sheet material through said device;

first means for cutting and sealing said first sheet material into a first series of discrete plastic bags;

second means for cutting and sealing said second sheet material into a second series of discrete plastic bags, said bags of said second series of bags being staggered relative to said bags of said first series of bags, each said bag in said first and second series of bags including a leading edge and a trailing edge;

first means for selectively holding each bag of said first series of bags in a substantially flattened condition as said first series of bags move through said device;

second means for selectively holding each bag of said second series of bags in a substantially flattened condition as said second series of bags move through said device;

means for receiving said first and second series of said flattened bags in said staggered relationship; and

means for interfolding said first series of bags with said second series of staggered bags to create a stack of interfolded bags adapted for insertion into a dispensing container.

5,205,809

Patent Not Issued For This Number

5,205,810

MUSCLE POWERED CARDIAC ASSIST SYSTEM

Gerard M. Guiraudon, London, Canada, and Ivan Bourgeois, Verviers, Belgium, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 15, 1990, Ser. No. 597,316
Int. Cl.[5] A61M *1/12*
U.S. Cl. 600—16 **3 Claims**

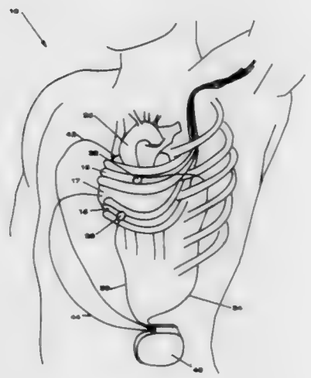
1. A method of assisting cardiac function comprising:

a. surgically preparing a first skeletal muscle mass;

b. surgically preparing a second skeletal muscle mass;

c. wrapping said first skeletal muscle mass about the atria of a heart;

d. wrapping said second skeletal muscle mass about the ventricles of said heart;



e. stimulating said second skeletal muscle mass to contract upon contraction of said ventricles of said heart; and

f. stimulating said first skeletal muscle mass to contract upon contraction of said atria of said heart.

5,205,811

BABY BLANKET WITH HEARTBEAT SIMULATOR

Belinda J. Fornarelli, 1636 N. 21st Ave., Melrose Park, Ill. 60160

Filed Jan. 3, 1992, Ser. No. 816,230
Int. Cl.[5] A61M *21/00*
U.S. Cl. 600—28 **12 Claims**

1. An infant blanket in combination with a removable heartbeat simulator, the improvement comprising said simulator being encased within a foam form and placed within the blanket, said simulator being pressure activated by placement of the weight of an infant's torso in a manner to overlie said simulator.

5,205,812

HAND SPLINT

Constance V. Wasserman, Mill Valley, Calif., assignor to L'Nard Associates, Inc., St. Petersburg, Fla.

Filed Jan. 13, 1992, Ser. No. 819,988
Int. Cl.[5] A61F *5/00, 5/37*
U.S. Cl. 602—5 **4 Claims**

1. A contour hand splint, comprising,

an elongated base member having a length extending from an upper end to a lower end, with the upper end being normally positioned adjacent the forearm of a patient, and the lower end positioned adjacent to the palm of a patient's hand, said length supporting the patient's wrist between said upper and lower ends,

means for securing said base member to the patient's arm,

a cross member of integral construction with said base member on the lower end of said base member and being at right angles to the length thereof,

a single pad member on said base member and being positioned between said base member and the forearm, wrist and palm of the patient,

said pad member having a lower end forming a finger pad means wrapped around said crossbar so that the fingers of the patient can partially encircle said crossbar to resist contracture of the fingers,

and releasable means on said finger pad means detachably maintaining said finger pad means in its wrapped position on said crossbar; said releasable means comprising tabs wrapped around said crossbar on opposite sides of said base member.

5,205,813

CEPHALIC AND CERVICAL SUPPORT APPLIANCE

Shawn M. Schmidt, 812 Tipperary Dr., Papillon, Nebr. 68046

Continuation-in-part of Ser. No. 461,815, Jan. 8, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 753,925
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—17 **21 Claims**

1. A cephalic and cervical support apparatus for immobilization and traction of the cervical rachis, comprising

a semirigid flexible unitary shell having a facial opening and upper, middle, and lower sections,

said upper section formed to substantially conform to a wearer's head adjacent and behind said facial opening, extending upwards along the rear and sides of said head to an extent above the upper portion of the wearer's forehead and above the wearer's ears and conforming to the sides of the wearer's head,

said middle section formed to substantially conform to a wearer's neck area, encircling said neck area with a division in the front face of said shell below said facial opening to allow placement of said shell on the wearer and extending from underneath the wearer's jaw area downwards to said lower section,

said lower section formed to substantially conform to a

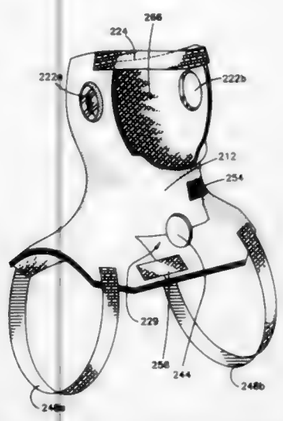
wearer's upper shoulder, back and chest area and to rest

said cushion device by said last mentioned means being

means for connecting said first end of said tube to means for

solution to the vein access device having a concentration from

wearer's upper shoulder, back and chest area and to rest thereon, a division in a front face of said lower section connected to said division in said middle section whereby said unitary shell may be opened to allow said shell to be placed underneath a wearer's head, neck and shoulders,
said upper, middle and lower sections joined to form a unitary substantially convex joining curve along the sides and rear of said sections,
a pair of arm straps connected to and extended forwardly between front and back portions of said lower section in nonintersecting spaced apart relation on opposite sides of said lower section whereby said shell may be securely anchored on said wearer,



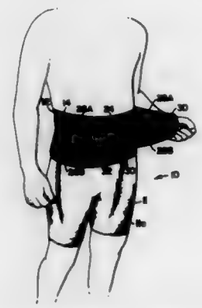
said upper section further comprising ear openings in and through the sides of said upper section,
a forehead strap releasably and adjustably mounted on said upper section at positions above said ear openings, extending between opposite sides of said upper section, whereby said forehead strap may be placed on and across the forehead of a support wearer in a substantially horizontal direction thereby substantially to eliminate downward vertical pressure on the wearer's spine by said strap and to leave the wearer's ears exposed for visual inspection,
fastening means for releasably and adjustably closing and securing said division in said front face of said shell whereby a range of differently sized wearers may be accommodated.

5,205,814
LUMBAR SUPPORT DEVICE
John C. Landrigan, 11451 Goose Lk. Rd., Champlin, Minn. 55316, and Fabio Lopez, 27913-145th St., Zimmerman, Minn. 55398
Filed Jun. 1, 1992, Ser. No. 890,856
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—19 **10 Claims**

1. A flexible lumbar support, comprising
a lumbar support cushion device to be positioned to engage a specific back portion area as desired,
a compressible foam forming a cushion disposed into said cushion device,
said cushion having a cavity therein substantially the full extent thereof,
an inflatable bladder disposed within said cavity,
inflating means in connection with said bladder,
a body encompassing band,
releasable securing means attached to said band centrally thereof,
means for releasable attachment to said securing means carried by said cushion device,
said cushion device by said last mentioned means being secured to said band, whereby

said band is disposed about a body carrying said cushion device, in pressurized engagement with said specific back area without disturbing the outer appearance of the attire worn about the body.

5,205,815
ATHLETIC BACK SUPPORT APPARATUS
Harold D. Saunders, 9840 Purgatory Rd., Eden Prairie, Minn. 55347
Filed Jun. 21, 1991, Ser. No. 719,267
Int. Cl.[5] A61F *5/00*; **H04B** *17/02*
U.S. Cl. 602—19 **18 Claims**

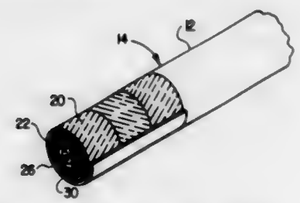


1. A garment for providing back support to the spine of a wearer, comprising:
(a) a compression short having elastic means for conforming said compression short tightly to the pelvis, groin area, and lower abdominal muscles of the user; and
(b) a lumbosacral support having means for engaging the spine from approximately the sacrum to at least the L_3 lumbar vertebrae operatively connected with said compression short, wherein said compression short maintains the vertical position of said lumbosacral support relative to the spine of the wearer during active movement of the wearer.

5,205,816
LAPAROSCOPIC IRRIGATOR-ASPIRATOR BLUNT DISSECTOR
Donald Dodson, Fort Worth, Tex.; Rand J. Podell, Marietta, Ga.; James B. Elder, Fort Worth, and Joseph A. Staley, Jr., Roanoke, both of Tex., assignors to O. R. Concepts, Inc., Roanoke, Tex.
Filed Apr. 13, 1992, Ser. No. 867,553
Int. Cl.[5] A61M *35/00*
U.S. Cl. 604—1 **8 Claims**

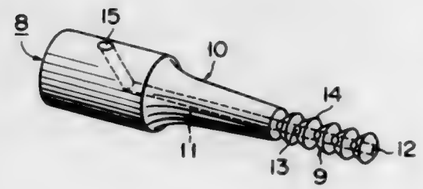
1. A medical instrument, comprising:
an elongated tube having a first end, a second end and a bore extending between said first end and said second end;

means for connecting said first end of said tube to means for passing fluid through said tube;
textured means for dissecting tissue disposed at said second end of said tube; and



a cannulated mandrel having a first end disposed within said second end of said tube and a second end extending form said second end of said tube, wherein said textured means for dissecting tissue is disposed on said second end of said mandrel.

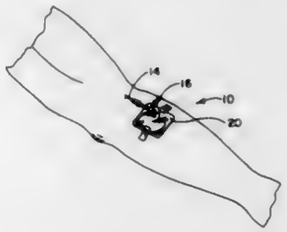
5,205,817
SURGICAL INSTRUMENT
Morito Idemoto; Naohiko Inoue, and Yasuo Noguchi, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan
PCT No. PCT/JP90/00627, § 371 Date Jan. 17, 1992, § 102(e) Date Jan. 17, 1992, PCT Pub. No. WO91/17716, PCT Pub. Date Nov. 28, 1991
PCT Filed May 17, 1990, Ser. No. 820,859
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 **4 Claims**



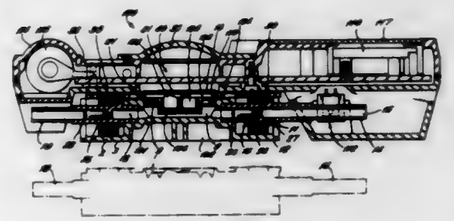
1. A surgical instrument for scraping or carving organic tissue by ultrasonic vibration, comprising an ultrasonic transmitter adapted to be connected to an ultrasonic source to generate ultrasonic mechanical vibration, a plurality of ring-shaped cutting blade portions provided at an interval of 1 to 3 mm on and surrounding a periphery of an operational part which contacts organic tissue, said operational part having a round cross section, each of said blade portions extending in a plane traversing a longitudinal axis of said operational part, and a liquid passage extending through said transmitter for supplying a liquid such as physiological salt water and opening at a front end of said operational part and at recesses each having a depth of 0.1 to 1 mm between said blade portions.

5,205,818
PATENCY MAINTENANCE SYSTEM
Chris M. Kolber, Nashua, N.H., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Dec. 28, 1990, Ser. No. 635,456
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—53 **6 Claims**

1. A method for maintaining the patency of an indwelling vein access device, comprising the step of delivering a heparin solution to the vein access device having a concentration from about 0.01 to about 0.99 international heparin units per milliliter of diluent and a flow rate from about 0.01 to about 1.0 milliliters per hour.



5,205,819
PUMP APPARATUS FOR BIOMEDICAL USE
Calvin J. Ross, Suffolk; Victor C. Humberstone, Cambridge, and Richard J. Warby, Wisbech, all of United Kingdom, assignors to Bespak PLC, Norfolk, United Kingdom
Continuation-in-part of Ser. No. 520,191, May 9, 1990, abandoned. This application Dec. 30, 1991, Ser. No. 813,756
Claims priority, application United Kingdom, May 11, 1989, 8910843; Nov. 21, 1989, 8926314; Jan. 25, 1991, 9101648
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—67 **28 Claims**



1. A pump apparatus comprising, a pump body defining a pump chamber, an inlet duct communicating between the pump chamber and a source of a liquid to be pumped whereby, in use, the liquid fills the pump chamber, an outlet duct communicating with the chamber for the delivery of the liquid when pumped, actuating means operable to vary the volume of the pump chamber by movement of a flexible wall of the pump chamber to pump the liquid therefrom, the actuating means comprising a composite piezoelectric element having at least one sensor electrode sensing the amplitude of deflection and electronic circuit means operable to energize the piezoelectric element in a pulsed manner, wherein the electronic circuit means includes detection means for comparing the sensed amplitude of deflection with at least one threshold level to provide an indication of abnormal operation of the pump apparatus consistent with occlusion or bubble formation in a volume of the liquid defined by the pump chamber and the inlet and outlet ducts.

5,205,820

member for engaging and advancing the connectable tube

proximal end of said barrel including a mounting collar [14, 214] with a bore [76] having a wall;

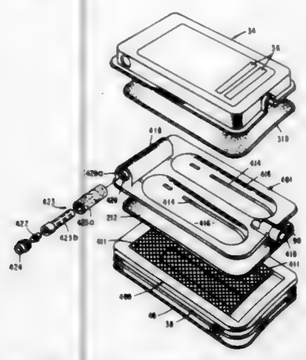
dinal axis thereof and made of a plastic material; a closed, distal end, and an open, proximal end for movement of a plunger

5,205,820

FLUID DELIVERY APPARATUS

Marshall S. Kriesel, Saint Paul, Minn., assignor to Science, Incorporated, Bloomington, Minn.

Continuation of Ser. No. 642,208, Jan. 16, 1991, Pat. No. 5,169,389, which is a continuation-in-part of Ser. No. 367,304, Jun. 16, 1989, Pat. No. 5,019,047. This application Apr. 17, 1992, Ser. No. 870,269
Int. Cl.[5] A61M *5/14*
U.S. Cl. 604—85 43 Claims



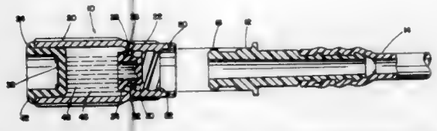
1. A device for use in infusing fluids into an ambulatory patient at a controlled rate comprising:
(a) a base having a fluid inlet and fluid outlet interconnected by a fluid flow path;
(b) filling means for introducing fluid into said fluid inlet;
(c) a distendable membrane constructed of an elastic material which is fitted over said base to define a chamber in communication with said fluid inlet and said fluid outlet, said membrane being distendable by fluid introduced into said chamber under pressure through said fluid inlet, said membrane having a tendency to return to a substantially nondistended configuration whereby fluid within said chamber will be expelled through said fluid outlet; and
(d) adding means disposed within said fluid flow path for adding an additive to fluid flowing therethrough.

5,205,821

TERMINAL SELF-RELEASING FLUID RESERVOIR

Robert J. Kruger, Arlington Heights; Con A. Lasaitis, Waukegan, and Sheldon M. Wecker, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Nov. 1, 1991, Ser. No. 786,462
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—91 14 Claims



1. A terminal reservoir device for a connectable tube connector, comprising:
a hollow member having first and second open ends;
first means for sealing said first open end, said first sealing means being inwardly displaceable into the hollow member;
second means for sealing said second open end;
an enclosed chamber defined by said hollow member, said first sealing means and second sealing means; and
means axially extending from said first end of said hollow member for engaging and advancing the connectable tube connector toward said chamber so as to inwardly displace the first sealing means into said chamber, wherein said first sealing means is a first plug member sealingly engageable in the first open end of the hollow member from the direction of the second end only.

5,205,822

REPLACEABLE DILATATION CATHETER

Kirk L. Johnson, Miami Lakes, and Mark N. Inderbitzen, Miramar, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Jun. 10, 1991, Ser. No. 713,430
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 22 Claims

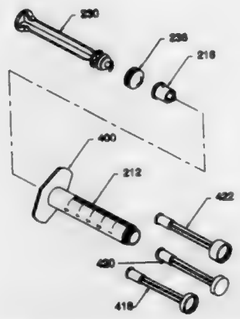
1. A balloon dilatation catheter having proximal and distal ends, which comprises, a flexible, tubular catheter shaft which carries a dilatation balloon adjacent the distal end, said catheter shaft defining an inflation lumen communicating with said balloon and a guidewire lumen extending at least most of the length of said catheter and extending through the catheter distal end; a longitudinal slit defined in said catheter shaft between the guidewire lumen and the catheter exterior, said slit extending longitudinally along the majority of the catheter length from a position proximal of said balloon to a position that is at least adjacent the catheter proximal end, in which said catheter shaft carries a hub at said proximal end, said hub defining a conduit connecting with said guidewire lumen, said slit of the catheter shaft extending to said hub, and a longitudinal slot extending the length of said hub in communication between said hub conduit and the hub exterior, said slot also being aligned with said slit to permit a sliding member in said slot to slide into said slit.

5,205,823

RETRACTABLE SYRINGE

Brian Zdeb, Round Lake Park, Ill., assignor to Retrax, Inc., Tomball, Tex.

Continuation-in-part of Ser. No. 592,623, Oct. 4, 1990, Pat. No. 5,112,315. This application Oct. 4, 1991, Ser. No. 771,762
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 8 Claims



1. A retractable syringe for use with a hypodermic needle cartridge [18, 218], comprising:
a barrel [12, 212] having a proximal end and a distal end, said

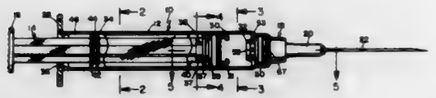
proximal end of said barrel including a mounting collar [14, 214] with a bore [76] having a wall;
a piston plunger [30, 230], having sealing means [36, 236] telescopingly received within said distal end of said barrel [12, 218];
a needle carrier [660] having a body, said body having a proximal end and a distal end and an exterior wall;
means [48, 248] disposed on said body and engageable in contact with correlatively shaped means [84, 256] disposed on said mounting collar [14, 214] for releasably latching said body in said bore of said mounting collar [14, 214], said distal end of said body having means [50, 250] engageable with said sealing means [36, 236] for retracting said body into said barrel [12, 212]; and
wherein the end [446]]of said sealing means [236] rotates upon intrusion of said plunger [30, 230] and side [800] collapses.

5,205,824

RETRACTABLE SYRINGE WITH A CLOSED BARREL

Matthew S. Mazur, 3366 Columbia St., San Diego, Calif. 92103

Filed Jun. 13, 1991, Ser. No. 714,431
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 42 Claims



1. A retractable syringe, comprising:
a syringe barrel with open forward and rearward ends and a piston and shaft in the barrel with one end of the shaft extending out the rearward open end, said shaft having a pair of spaced collars along its length for locking the shaft in the inserted position in the rearward end of the barrel, the rearward end of said barrel having a lip at the open end with a diameter slightly smaller than the diameter of the collars, said lip moving over one of said collars to be locked between the collars;
a needle holder and needle fitting into the forward end of the barrel in a releasable connection that releases the needle holder for movement toward the rearward end and to a retracted position where the barrel encloses the needle holder and needle, and the forward end of the barrel is open;
said piston and needle holder having engaging means for securing the piston to the needle holder;
said piston being movable in said barrel for pulling the needle holder out of said releasable connection to the retracted position; and
said shaft being breakable along its length with the broken end of the shaft inserted into the forward end of the barrel holding the needle holder and needle in the retracted position.

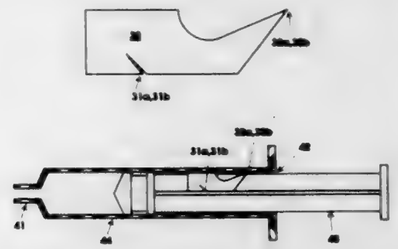
5,205,825

INSERTABLE ELEMENT FOR PREVENTING REUSE OF PLASTIC SYRINGES

Alan C. Allison, 233 Marvilla Cir., Pacifica, Calif. 94044, and Richard A. Jaffe, 786 Wildwood La., Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 644,465, Jan. 17, 1991, abandoned, which is a continuation of Ser. No. 390,083, Aug. 7, 1989, abandoned. This application Jul. 19, 1991, Ser. No. 732,782
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 19 Claims

1. A locking device, capable of being retrofitted by insertion into a plastic syringe, wherein the syringe is of the type having a cylindrical inner wall elongated in the direction of a longitudinal axis thereof and made of a plastic material; a closed, distal end, and an open, proximal end for movement of a plunger thereon, the plunger having a plunger stem which extends in the direction of and is movable along the longitudinal axis of the syringe, the plunger stem being made of plastic material and having at least one longitudinal rib formed therewith, said locking device comprising:
a clip-type body portion formed of a compact size and shape to allow its insertion through the open end of the syringe between the plunger stem and the inner wall of the syringe, and having a U-shaped channel for clipping onto the at least one longitudinal rib of the plunger stem,
said clip-type body portion of said locking device being



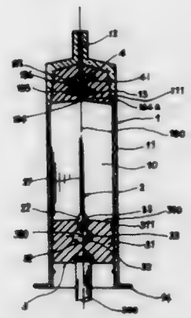
formed with a first set of barbed points spaced apart in a transverse direction perpendicular to the longitudinal axis of the syringe and angled toward the plunger stem facing in the direction toward the proximal end of the syringe for engaging into the plastic material of the plunger stem when the plunger stem is depressed toward the distal end of the syringe after a first retraction movement toward the proximal end of the syringe, and a second set of barbed points spaced apart in the transverse direction and angled toward the inner wall of the syringe facing in the direction toward the proximal end of the syringe for engaging into the plastic material of the syringe inner wall in order to lock the plunger stem from a second retraction movement, thereby preventing reuse of the syringe.

5,205,826

AUTOMATICALLY BLOCKED SAFETY SYRINGE

Long-Hsiung Chen, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Nov. 30, 1992, Ser. No. 983,144
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 8 Claims



1. A safety syringe comprising:
a syringe means having a flexible plug inserted in a front portion inside a syringe cylinder of said syringe means, said flexible plug having a first disk socket formed in a rear

portion in said plug normally perpendicular to a syringe

subsequent relative rotation of the plunger and the barrel,

(b) a handle means secured to the needle rearwardly of said pointed forward end said handle means having at least one

a. a geometrically configured cylinder including a top edge and a bottom edge;

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portion in said plug normally perpendicular to a syringe axis longitudinally existing in a central portion of said syringe cylinder, and a second disk socket formed in a front portion in said plug and communicating with said first socket and normally inclinedly positioned in said plug; and

a rigid blocking member having a central through hole normally engageable held in the first disk socket of said plug; and a hollow needle normally held in said blocking member and in said plug, and operatively thrusted frontwardly as urged by a plunger means reciprocatively held in said syringe means to be transferred into said second disk socket when finishing an injection, said needle being operatively coupled to said plunger means when finishing the injection, whereby upon a retraction of said needle into said syringe cylinder, said plug will automatically restore said second disk socket to inclinedly orient said rigid block member to unalign the through hole of said blocking member with said needle, thereby preventing an outward protrusion of the needle from said syringe cylinder.

5,205,827

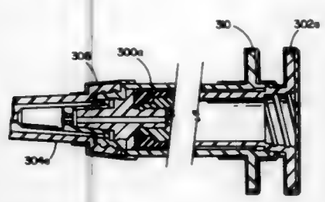
SAFETY SYRINGE NEEDLE DEVICE WITH INTERCHANGEABLE AND RETRACTABLE NEEDLE PLATFORM

Laurel A. Novacek; Fraser R. Sharp, and Donald A. McLean, all of Vancouver, Canada, assignors to Patco Ventures Ltd., Vancouver, Canada

Division of Ser. No. 687,108, Apr. 18, 1991, Pat. No. 5,122,124, which is a continuation-in-part of Ser. No. 607,127, Oct. 3, 1990, Pat. No. 5,122,824, which is a continuation-in-part of Ser. No. 410,318, Sep. 21, 1989, Pat. No. 5,030,208, which is a continuation-in-part of Ser. No. 327,344, Mar. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 285,012, Dec. 14, 1988, abandoned. This application Nov. 29, 1991, Ser. No. 800,849

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **22 Claims**



1. A syringe comprising:

(a) a hollow axially-elongated barrel for containing fluid to be injected by the syringe;

(b) an adapter removably mounted at the distal end of said barrel, having a portion projecting into the barrel toward its proximal end and having a fluid passage in communication with the interior of the barrel;

(c) a ferrule carrying a hollow needle and adapted for removable connection with one of the distal barrel end and the adapter adjacent the barrel end, with the hollow needle in communication with the fluid passage of the adapter;

(d) a plunger axially movable in the hollow barrel between retracted and extended positions;

(e) an adapter engagement structure disposed at the distal end of the plunger and engageable with a mating connection engagement structure on the projecting adapter portion in response to axial movement of the plunger toward the distal end of the barrel, said structures being cooperable to cause (1) relative rotation of the plunger end and the adapter in response to such axial movement, and (2) the adapter and needle ferrule with the needle attached thereto to part from the end of the barrel in response to subsequent relative rotation of the plunger and the barrel, thereby enabling the adapter and the needle ferrule with the needle attached thereto to be withdrawn into the interior of the barrel when the plunger is withdrawn from the distal end of the barrel; and

(f) means connecting between said barrel and said plunger in the retracted position of said plunger to indicate attempted movement of said plunger and said barrel relative to one another.

5,205,828

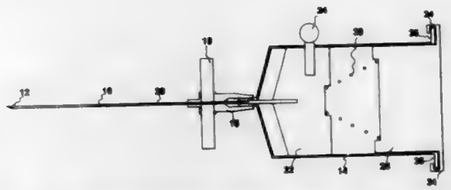
EPIDURAL NEEDLE LOCATION INDICATOR ASSEMBLY

Dan Kedem, 43 Weizmann Street, 76283 Rehovot, Israel

Filed Oct. 24, 1991, Ser. No. 782,205

Int. Cl.[5] A61M *5/18*

U.S. Cl. 604—158 **13 Claims**



1. An epidural needle location indicator assembly capable of indicating when a needle traveling through hard tissue first penetrates soft tissue, comprising:

(a) a housing;

(b) a hollow needle secured near its posterior end to the anterior end of said housing and having an anterior end which is directed laterally;

(c) a displaceable piston located in said housing, capable of traveling between a fixed forward displaceable piston position and a fixed back displaceable piston position, said piston positions being a preselected distance apart;

(d) a flexible blind end catheter located in said needle, passing through said displaceable piston, said blind end catheter preventing coring of tissues during the forward travel of said needle and serving to transmit tissue pressure to said displaceable piston;

(e) a grasping means connected to said displaceable piston for alternately grasping or releasing said catheter;

(f) means for releasably locking said displaceable piston to said housing at said back displaceable piston position; and

(g) means for biasing said displaceable piston toward said front piston position.

5,205,829

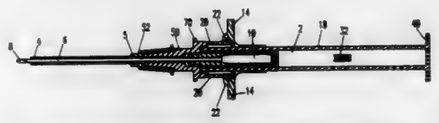
SAFETY DISPOSABLE INTRAVENOUS (I.V. ASSEMBLY)

Andrew E. Litschy, 50 Columbus Ave., Apt. 618, Tuckahoe, N.Y. 10707

Filed Feb. 9, 1990, Ser. No. 477,625

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—164 **2 Claims**



1. A disposable safety needle apparatus comprising:

(a) a needle assembly comprising a base and a needle having a pointed forward end adapted to intentionally puncture the skin of a patient;

(b) a handle means secured to the needle rearwardly of said pointed forward end said handle means having at least one wing which extends substantially outwardly and further comprising a locking means for securing said handle means to said needle assembly which is released by pressing backward on an outer portion of said handle means to release a latch; and

(c) a protective housing means for receiving the needle and having a slot contained therein adapted to enable said handle means to traverse rearwardly along the length of said protective housing means.

5,205,830

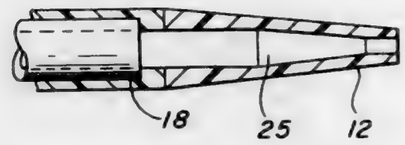
CATHETER ASSEMBLY

Alyssa J. Dassa, Flying Hills, and Philip B. Fleck, Douglassville, both of Pa., assignors to Arrow International Investment Corporation, Wilmington, Del.

Filed Nov. 12, 1991, Ser. No. 791,022

Int. Cl.[5] A61M *5/178*

U.S. Cl. 604—164 **12 Claims**



6. In combination:

an elongated drainage catheter having a tapered distal tip comprising a soft pliant material and a flexible body portion of uniform outer diameter which is stiff relatively to said tip;

a central lumen extending lengthwise of the body portion of the catheter and exiting at the distal tip;

a plurality of side ports adjacent the tip, said side ports being in communication with the lumen and being axially spaced from one another;

a proximally facing abutment surface within said lumen;

a removable hollow stiffening assembly adapted to slidably fit within said catheter lumen and extending lengthwise thereof, said stiffening assembly having a tapered distal tip portion adapted to stiffen said tapered distal tip of said catheter and a distally facing surface portion proximally of said tapered distal tip portion and being adapted to interface with said proximally facing abutment surface, said stiffening assembly being relatively dimensioned to transmit pressure applied to the proximal end of the stiffening assembly directly to said abutment surface, the tapered distal tip portion of said stiffening assembly terminating within the tapered distal tip of the catheter.

5,205,831

COMPRESSION GASKET FOR Y-CONNECTOR

William P. Ryan, Plymouth, and Steven D. Savage, Brooklyn Center, both of Minn., assignors to Barron Medical, Inc., Bethlehem, Pa.

Filed Apr. 22, 1991, Ser. No. 688,176

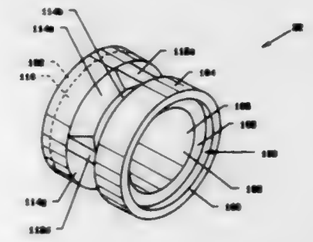
Int. Cl.[5] A61M *5/31*

U.S. Cl. 604—167 **2 Claims**

1. A compression gasket for a Y-connector comprising:

a. a geometrically configured cylinder including a top edge and a bottom edge;

b. an hour glass configured outer circumference;



c. opposing ribs extending between said edges and engaging said hour glass configured outer circumference; and,

d. a rim extending inwardly from an inner circumference.

5,205,832

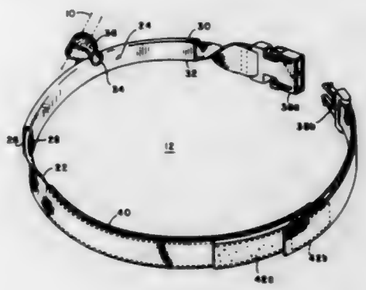
ENDO-TRACHEAL TUBE SUPPORT DEVICE

David H. Tuman, 5001 Miners Ranch Rd., Ordville, Calif. 95966

Continuation of Ser. No. 505,560, Apr. 6, 1990, abandoned. This application May 7, 1992, Ser. No. 881,305

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—179 **15 Claims**



1. An apparatus for supporting an endo-tracheal tube in the vicinity of a patient's nose or mouth, comprising

a predetermined length of tubing having two parallel sides extending over substantially the entire length of tubing, which are joined together at the top and bottom by rounded edge sections to provide a substantially uniform oblong cross section over substantially the entire length of tubing prior to being positioned on the patient, and an aperture formed in one of the rounded edge sections along the length of tubing; and

strap means positionable about the face and back of head of an patient, a portion of which is threaded through the

length of tubing, for securing the tubing in the vicinity of

5,205,834

TWO-WAY OUTDWELLING SLIT VALVING OF

5,205,835

PROCESS TO REMOVE MANGANESE DIOXIDE FROM WET PROCESS DENIM FIBERS BY NEUTRALIZING

or inorganic particles having a lamellar structure and a size less than 50 microns, said particles containing at least one synthetic melanotic pigment formed in situ by oxidation of an indole

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length of tubing, for securing the tubing in the vicinity of the patient's nose or mouth, wherein a portion of the strap means protrudes through the aperture to form a loop for capturing the endo-tracheal tube.

5,205,833

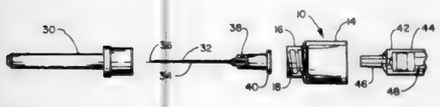
DEVICE FOR REMOVING HYPODERMIC NEEDLES FROM SYRINGE BARRELS

Don J. Harsh, 5670 S. 920 East; Linda R. Hills, 6298 S. Lorreen Dr., both of Salt Lake City, Utah 84121, and Kennalyn Howard, 3706 Market St., West Valley City, Utah 84119

Continuation of Ser. No. 465,910, Jan. 16, 1990, abandoned, Continuation-in-part of Ser. No. 158,767, Feb. 28, 1988, Pat. No. 4,904,244. This application Aug. 16, 1991, Ser. No. 747,395

Int. Cl.[5] A61M *5/00, 5/31*

U.S. Cl. 604—240 **17 Claims**



1. An apparatus for removing needles from hypodermic syringes without re-capping said needles, said syringes comprising a barrel and a needle socket attached to one end of the barrel, the needle socket configured such that a needle can be removably attached to said needle socket, the apparatus comprising:

a structure capable of being slidably mounted over the exterior of at least a portion of a syringe barrel and over at least a portion of a needle socket, the structure having means for attachment to said needle such that said needle, while attached to said structure, is capable of being securely attached to the needle socket, said apparatus further comprising an opening configured such that the needle can be placed directly onto the needle socket of the syringe while said apparatus is positioned over the syringe barrel and needle socket, and when the needle is securely attached to the needle socket the attachment of the needle to the needle socket secures the apparatus to the syringe, such that if the apparatus is slid forward with respect to the syringe barrel, the apparatus causes the needle to disengage from the needle socket.

5,205,834

TWO-WAY OUTDWELLING SLIT VALVING OF MEDICAL LIQUID FLOW THROUGH A CANNULA AND METHODS

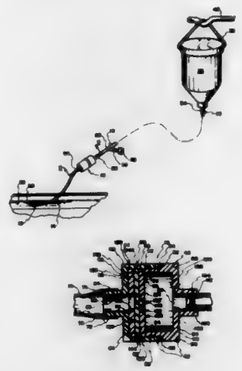
H. Robert Moorehead, 1694 E. 5685 South, Salt Lake City, Utah 84121, and Thomas A. Wiits, 1127 Goldenrod, Corona del Mar, Calif. 92625

Continuation of Ser. No. 776,927, Oct. 15, 1991, Pat. No. 5,169,393, which is a continuation of Ser. No. 577,941, Sep. 4, 1990. This application Jun. 24, 1992, Ser. No. 903,410

The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—247 **24 Claims**



1. A method of controlling medical liquid flow in a cannula comprising the steps of:

placing a distal end of the cannula indwelling within an internal body cavity of a medical patient;

connecting a distal end of an outdwelling slit valve housing directly to a proximal end of the cannula in selective internal medical liquid communication along a predetermined flow path solely due to pressure differential;

causing a substantially planar normally closed slit diaphragm comprising a centrally disposed slit of predetermined length comprising lips normally disposed in tight edge-to-edge relation and otherwise being impervious to be interposed across the flow path within the housing;

connecting a proximal end of the outdwelling slit valve housing directly to a distal end of a tube having a proximal end connected to an effluent only source of medical liquid which provides a predetermined distally directed pressure;

creating a negative pressure at an outdwelling site proximal of the slit diaphragm but remote from the source of a magnitude such that the diaphragm is thereby flexed proximally and the lips of the slit are opened proximally to accommodate unidirectional distal-to-proximal medical liquid flow through the slit from the body cavity of the patient to the remote site.

5,205,835

PROCESS TO REMOVE MANGANESE DIOXIDE FROM WET PROCESS DENIM FIBERS BY NEUTRALIZING WITH PERACETIC ACID

Robert H. Tieckelmann, Trenton, and Lisa M. Kurschner, Hamilton Square, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 7, 1991, Ser. No. 651,811

Int. Cl.[5] D06L *3/02*

U.S. Cl. 8—111 **6 Claims**

1. In a process for wet processing denim fabric by the steps of desizing the denim fabric, washing the desized fabric, contacting the washed fabric with potassium permanganate to oxidize part of the colorbodies in the denim fabric to a form which is easily removed from the fabric surface thereby partially decolorizing the denim fabric, and neutralizing the decolorized denim fabric by removing residues of the potassium permanganate and of the oxidized colorbodies, the improvement comprising neutralizing the oxidized denim fabric by contacting the fabric with an aqueous solution containing about 1.5 to 30 parts by weight peracetic acid per hundred parts by weight denim fabric, said aqueous solution also containing sufficient acetic acid and hydrogen peroxide to provide a peracetic acid:acetic acid:hydrogen peroxide weight ratio of at least 1:1:1.5.

5,205,836

FORMALDEHYDE-FREE TEXTILE FINISH

John H. Hansen, and Phillip H. Riggins, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 13, 1990, Ser. No. 626,769

Int. Cl.[5] D06M *13/00*

U.S. Cl. 8—120 **7 Claims**

1. A process for treating and imparting durable wrinkle resistance to a cellulosic fibrous material, comprising the steps of:

(a) impregnating a cellulosic material with a treating solution containing a polycarboxylic acid selected from the group consisting of citric acid, tricarballylic acid, trans-aconitic acid, 1,2,3,4-butanetetracarboxylic acid, all-cis-1,2,3,4-cyclopentanetetracarboxylic acid, mellitic acid, oxydisuccinic acid and thiodisuccinic acid and a catalytic amount of a cyanamide compound selected from cyanamide or a compound of the formula

where R^1 is NH, oxygen or sulfur, and R^2 is CN or H, the polycarboxylic acid esterifying with the hydroxyl groups of the cellulosic material in the presence of the cyanamide catalyst; and

(b) heating the material treated in step (a) to esterify and cross-link the cellulose with the polycarboxylic acid in the material.

5,205,837

PRODUCT BASED ON INORGANIC OR ORGANIC LAMELLAR PARTICLES, CONTAINING A MELANOTIC PIGMENT, PROCESS FOR PREPARING IT AND ITS USE IN COSMETICS

Hervé Andrean, Paris, and Alex Junino, Livry-Gargan, both of France, assignors to L'Oreal, Paris, France

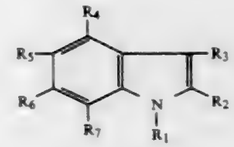
Filed Jul. 16, 1991, Ser. No. 731,046

Claims priority, application France, Jul. 16, 1990, 90 09053

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—405 **23 Claims**

1. A product in the form of a powder consisting of organic or inorganic particles having a lamellar structure and a size less than 50 microns, said particles containing at least one synthetic melanotic pigment formed in situ by oxidation of an indole compound, wherein said indole compound has the formula



(I)

wherein

R_1 and R_3, each independently, represent hydrogen or C_1–C_4 alkyl;

R_2 represents hydrogen, C_1–C_4 alkyl, carboxyl or (C_1–C_4) alkoxycarbonyl;

R_4 and R_7, each independently, represent hydrogen, hydroxyl, C_1–C_4 alkyl, amino, (C_1–C_4) alkoxy, (C_2–C_{14}) acyloxy or (C_2–C_4) acylamino;

R_5 represents hydrogen, hydroxyl, (C_1–C_4) alkoxy, (C_1–C_4) alkyl, halogen, amino, (C_2–C_4) acyloxy, (C_2–C_4) acylamino or trimethylsilyloxy;

R_6 represents hydrogen, hydroxyl, (C_1–C_4) alkoxy, amino, (C_2–C_4) acyloxy, (C_2–C_4) acylamino, trimethylsilyloxy or hydroxy (C_2–C_4) alkylamino;

or R_5 and R_6, together with the carbon atoms to which they are attached, form a methylenedioxy ring optionally substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy or a carbonyldioxy ring;

at least one of R_4 to R_7 represents OZ or NHR and at most one of R_4 to R_7 represents NHR; and

at most two of R_4 to R_7 represent OZ, said OZ groups being in the 5- and 6- positions when Z represents hydrogen, and at least one of R_4 to R_7 represents hydrogen and, in this case, if only one of R_4 to R_7 represents hydrogen, only one of R_4 to R_7 represents NHR or OZ, the remainder representing C_1–C_4 alkyl;

and wherein R in said NHR represents hydrogen, C_2–C_4 acyl or C_2–C_4 hydroxyalkyl and Z in said OZ represents hydrogen, C_2–C_{14} acyl, C_1–C_4 alkyl or trimethylsilyl;

or a corresponding salt of said indole compound of formula I.

5,205,838

LIQUID DYE PREPARATIONS: BIS PHENYL-AZO-RESORCINOL IN SOLVENT FOR COLORED RIBBON OR BALL PEN INK

Rainer Dyllick-Brenzinger, Weinheim; Heinz Hartmann, Bobenheim; Helmut Bellaire, Ludwigshafen, and Georg Zeidler, Darmstadt-Schnaarsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

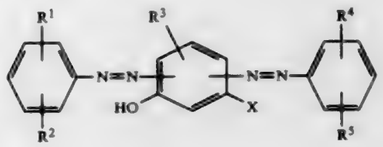
Filed Jan. 24, 1992, Ser. No. 825,377

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1991, 4105866

Int. Cl.[5] B41M *5/03;* **C09B** *33/02, 67/36;* **C09D** *11/16*

U.S. Cl. 8—527 **9 Claims**

1. A liquid dye preparation containing at least one dye of the formula I



I

where

X is hydroxyl, amino or C_1–C_{15}-monoalkylamino,

petroleum product with an extractant comprising between about 20 and 100 volume percent of an aqueous solution of

ated wet components away from the permeate side thereof;

trations A, B, C and D are in the relative relationship A<C<B<D.

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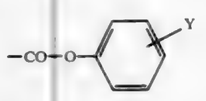
X is hydroxyl, amino or C_1–C_{15}-monoalkylamino,

R^1 and R^4 are identical or different and each is independently of the other C_1–C_{15}-alkoxycarbonyl, wherein the alkyl group can be interrupted by from 1 to 3 oxygen atoms in ether function, a radical of the formula



where Y is C_1–C_{13}-alkyl, which can be interrupted by from 1 to 3 oxygen atoms in ether function, or C_1–C_{15}-alkoxy, which can be interrupted by from 1 to 3 oxygen atoms in ether function,

R^2 and R^5 can be identical or different and each is independently of the other hydrogen, nitro or chlorine, and

R^3 is hydrogen or C_1–C_{13}-alkyl, plus as solvent at least one product selected from the group consisting of benzyl alcohol, tridecanol, isotridecanol, glycol ethers, olein, C_4–C_{13}-dialkyl phthalates, C_5–C_{30}-chloroalkanes, C_1–C_{20}-alkanes disubstituted by phenyl, C_1–C_{10}-dialkylnaphthalenes and partly hydrogenated terphenyl,

said dye preparation containing from 10 to 80% by weight, based on the weight of the preparation, of said dye.

5,205,839

TERPOLYMERS OF ETHYLENE, THEIR PREPARATION AND THEIR USE AS ADDITIVES FOR MINERAL OIL DISTILLATES

Werner Reimann, Duisburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 716,949, Jun. 18, 1991. This application Oct. 29, 1992, Ser. No. 968,428

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020640

Int. Cl.[5] C10L *1/18*

U.S. Cl. 44—393 **11 Claims**

1. A mineral oil distillate comprising 0.001% to 2% by weight, based on said distillate, of the terpolymer prepared from a mixture of monomers comprising ethylene, 5 to 20 mol % of vinyl acetate, and 0.2 to 5 mol % of isobutyl vinyl ether, said terpolymer having a mean molecular weight (M_n) of 500 to 5000 g/mol in dissolved form.

5,205,840

MARKERS FOR PETROLEUM, METHOD OF TAGGING, AND METHOD OF DETECTION

Michael R. Friswell, Wayne, and Michael P. Hinton, Neshanic Station, both of N.J., assignors to Morton International, Inc., Chicago, Ill.

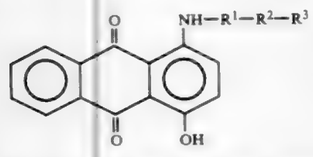
Filed Sep. 30, 1991, Ser. No. 769,033

Int. Cl.[5] C10L *1/22*

U.S. Cl. 44—428 **4 Claims**

1. A method of tagging a liquid petroleum product with a marker and detecting said marker, the method comprising:

(A) adding to a liquid petroleum product between about 1 and about 100 ppm of a marker which is a compound or mixture of compounds having the formula:



wherein R^1 is C_1–C_6 alkyl, and R^2 and R^3 are nothing or —O—(C_1–C_3 alkyl); and

(B) subsequently extracting said marker from said liquid petroleum product with an extractant comprising between about 20 and 100 volume percent of an aqueous solution of up to about 10 wt. % NaOH or KOH and up to about 80 volume percent of water-soluble organic cosolvent.

5,205,841

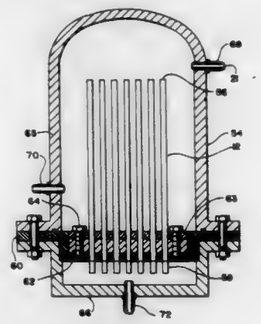
APPARATUS AND METHOD FOR EXTRACTING HYDROGEN

Lev A. Vaiman, Bellevue, Wash., assignor to TPC Technologies, Inc., Seattle, Wash.

Filed Apr. 3, 1992, Ser. No. 862,802

Int. Cl.[5] B01D *53/22, 71/02*

U.S. Cl. 55—16 **16 Claims**



1. A membrane comprising:

A. a substrate consisting essentially of palladium metal and having opposed first and second sides;

B. a first film consisting essentially of palladium metal applied in overlying relation to the first side of said substrate;

C. a second film consisting essentially of a metal black selected from the group consisting of palladium black and palladium/platinum black overlying said first film; and

D. a third film consisting essentially of a metal black selected from the group consisting of palladium black and palladium/platinum black overlying the second side of said substrate.

4. A method of extracting essentially pure hydrogen from a fluid mixture including free molecular hydrogen, comprising the steps of:

A. providing the membrane of claim 1;

B. exposing the second film of said membrane to a fluid mixture including free hydrogen at a partial pressure of hydrogen, pressure drop across said membrane, and a temperature, and for a time sufficient to selectively pass hydrogen from said mixture through said membrane; and

C. collecting the hydrogen passed through said membrane.

5,205,842

TWO STAGE MEMBRANE DRYER

Ravi Prasad, East Amherst, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Feb. 13, 1992, Ser. No. 834,787

Int. Cl.[5] B01D *53/22*

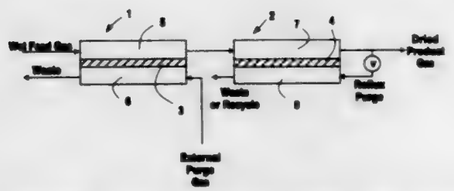
U.S. Cl. 55—16 **15 Claims**

1. A process for drying wet gas streams in a membrane system, said process comprising steps of:

(a) passing a feed gas stream containing wet components under pressure to at least one first stage membrane having about 6% to about 80% of the total membrane surface area in the system;

(b) passing a gas stream from an external source comprising a foreign gas to at least one low pressure, permeate side of said at least one first stage membrane to carry the permeated wet components away from the permeate side thereof;

(c) passing the partially dried feed gas stream resulting therefrom under pressure to at least one second stage membrane having about 20% to about 94% of the total membrane surface area in the system;



(d) passing at least a portion of the resulting dried product gas from said at least one second stage membrane to at least one low pressure, permeate side of said at least one second stage membrane to carry the permeated wet components away from the permeate side thereof, wherein step (d) is carried out at a cleaning ratio of less than about 4; and

(e) recovering the remaining portion of the dry product gas.

5,205,843

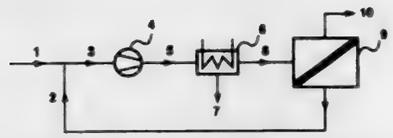
PROCESS FOR REMOVING CONDENSABLE COMPONENTS FROM GAS STREAMS

Jürgen Kaschemekat; Richard W. Baker, both of Palo Alto, and Johannes G. Wijmans, Menlo Park, all of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 649,305, Jan. 30, 1991, Pat. No. 5,089,033, which is a continuation of Ser. No. 432,592, Nov. 7, 1989, abandoned. This application Feb. 14, 1992, Ser. No. 836,101

Int. Cl.[5] B01D *53/22*

U.S. Cl. 55—16 **34 Claims**



1. A process for recovering a condensable component, characterized by a boiling point higher than −100° C., from a raw gas stream, comprising the steps of:

(a) providing a raw gas stream containing a low concentration, A, of a condensable component, said concentration A being below saturation under the condensation conditions of step (c);

(b) mixing said raw gas stream with a product stream from a membrane separation step, said product stream containing a concentration, D, of said condensable component to form an incoming gas stream containing a concentration, B, of said condensable component;

(c) performing a condensation step, comprising:

bringing said incoming gas stream to a pressure and temperature condition characterized in that said concentration B is greater than the saturation concentration of said condensable component at said pressure and temperature condition, so that condensation of a portion of said condensable component occurs;

withdrawing a condensed stream comprising said condensable component in liquid form;

withdrawing a non-condensed stream containing a concentration, C, of said condensable component;

(d) passing said non-condensed stream as a feed stream to said membrane separation step; wherein said concentration A is less than said concentration C and said concentrations A, B, C and D are in the relative relationship A<C<B<D.

5,205,844

DEGASSING APPARATUS

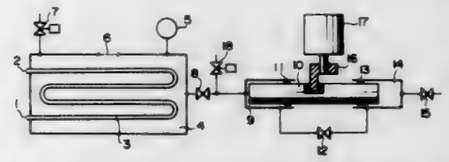
Hideyuki Morikawa, Tokyo, Japan, assignor to Uniflows Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,353

Claims priority, application Japan, Nov. 30, 1990, 2-336625

Int. Cl.[5] B01D *53/22*

U.S. Cl. 55—158 **2 Claims**



1. A degassing apparatus in which a tube made of permeable film is laid in a vacuum chamber decompressed under control by a vacuum pump and a liquid flowing through said tube is degassed by causing gas to permeate the wall of said tube,

characterized in that said vacuum pump can be exposed to the atmosphere by way of a valve disposed between a primary valve and a primary cylinder of said vacuum pump.

5,205,845

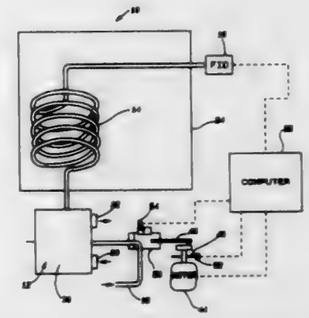
MECHANICAL GAS CHROMATOGRAPHY INJECTION VALVES AND COLUMN MULTIPLEXING TECHNIQUES

Richard D. Sacks, Ann Arbor, and Anita J. Peters, Ypsilanti, both of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 590,174, Sep. 28, 1990, Pat. No. 5,096,471, and a continuation-in-part of Ser. No. 710,703, Jun. 5, 1991, Pat. No. 5,141,532, and a continuation-in-part of Ser. No. 717,356, Jun. 18, 1991, Pat. No. 5,141,534. This application Jun. 6, 1992, Ser. No. 817,306

Int. Cl.[5] B01D *15/08*

U.S. Cl. 55—197 **31 Claims**



1. A gas chromatography injection valve for controlling the flow of a sample vapor to an analytical separation column, comprising:

a housing having an internal passageway and an outlet port communicating with said separation column,

a linearly moveable shuttle within said housing having an injection port communicating with said sample vapor,

actuator means for moving said shuttle within said housing to cause said injection port to be moveable between an

injection position with said injection port in registry with said outlet port providing fluid communication between

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5,205,847

AIR CLEANING APPARATUS

Gary E. Monteith, Centerville, and Terry R. Monteith, Dayton,

having an inside cavity and a base equipped with means for securing it on said crankcase, and on the other hand, a filter

aligned with said outlet port, said housing forming an annular chamber surrounding said filter element, the improvement

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injection position with said injection port in registry with said outlet port providing fluid communication between said ports, to a non-injection position with said injection port and said outlet port out of registry,

inlet means for communicating said housing internal passageway with a source of a flushing gas, and

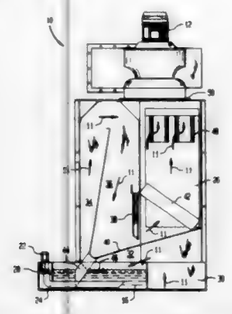
means for controlling the flow of said flushing gas through said housing such that said sample vapor flowing into said housing does not communicate between said injection port and said outlet port when said shuttle is in said non-injection position said means for controlling including at least one capillary flow restrictor allowing said flushing gas to be continuously vented from said housing and at least one sealing element acting as a bearing for allowing said linear movement of said shuttle while controlling leakage of said flushing gas.

5,205,846

WATER WASH SYSTEM, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Carlo Fabrizi, Arezzo, Italy, assignor to Nova Verta North America Co., Ltd., Toronto, Canada

Filed Jun. 4, 1991, Ser. No. 709,832
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—227 **17 Claims**



1. An apparatus for the treatment of contaminated air, comprising:

a housing having a lower water containment portion and an upper portion, said upper portion enclosing a plurality of cells and at least one chamber said cells and chamber are defined by baffles;

a first aperture at the lower end of said upper housing portion for the admittance of contaminated air forming a gas stream;

a water/air interchange chamber interconnected to said first aperture and connecting said upper housing portion to said water containment portion where said gas stream is water vapor saturated;

a first cell within said upper housing portion adjacent to and interconnected with said interchange chamber wherein an upward gas stream is present;

a second cell within said upper housing portion interconnected with and adjacent to said first cell wherein a downward gas stream flow is present;

said first cell and said second cell comprising a contaminate separation chamber wherein contaminates adhere to water droplets and condensation collected; and

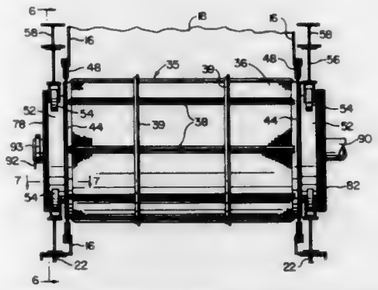
a third cell having a first end and a second and interconnected with said second cell at a lower end thereof at said third cell first end by a third cell first aperture and having a third cell second aperture at said second end for exhaust of said gas stream comprised of purified air.

5,205,847

AIR CLEANING APPARATUS

Grover F. Montieth, Centerville, and Tony R. Montieth, Dayton, both of Ohio, assignors to Roxie's Inc., West Carrollton, Ohio

Filed Sep. 13, 1991, Ser. No. 759,493
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—294 **3 Claims**



1. Apparatus for separating small scrap pieces of paper or cardboard or other material from a flow of air used to collect and convey the pieces, said apparatus comprising an enclosed housing having opposite end walls connected by opposite side walls and a top wall to define a chamber having a bottom opening, means defining at least one air inlet within said housing for directing the flow of air carrying the pieces into said chamber, a hollow cylindrical drum disposed within said chamber and having opposite end portions connected to corresponding circular tracks and connected by a cylindrical perforated wall, a set of rollers engaging said tracks and supporting said drum for rotation within said chamber on a generally horizontal center axis of said drum, power operated means for rotating said drum, a stationary manifold disposed adjacent one of said end portions of said drum and defining at least one clean air outlet, means forming rotary air seals between said end walls of said housing and said end portions of said drum and between said drum and said manifold for directing the air flowing into said chamber inwardly through said perforated wall of said drum and from said drum through said manifold for collecting the scrap pieces on the outer surface of said perforated wall, a non-rotating air conduit extending axially within the center portion of said drum, a non-rotating air tube extending axially within a lower portion of said drum, means extending from said air conduit and supporting said air tube below said air conduit, air duct means connecting said air conduit to said air tube, said air tube having means defining an axially extending air jet slot adjacent the inner surface of said perforated wall, blower means connected to said air conduit for supplying a flow of air through said air duct means to said air tube and for producing a high velocity stream of air downwardly through said air jet slot to remove pieces from said perforated wall of said drum, and a hopper connected to said bottom opening of said housing for collecting the scrap pieces blown downwardly from said perforated wall of said drum.

5,205,848

DEVICE ENSURING FILTRATION AND COMMUNICATION BETWEEN THE ATMOSPHERE AND THE INSIDE OF A CRANKCASE

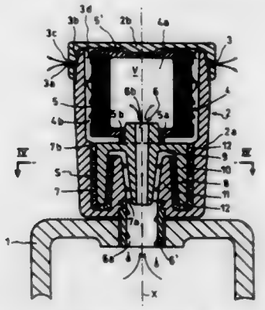
Pierre Blanc, Vaux sur Seine, and Jean-Paul Travassac, Saint Germain en Laye, both of France, assignors to Pall France Services, Saint Germain en Laye Cedex, France

Filed Mar. 27, 1992, Ser. No. 858,667
Claims priority, application France, Mar. 29, 1991, 91 03905
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—310 **7 Claims**

1. Device ensuring filtration and communication between the atmosphere and a liquid reservoir, such as a crankcase with oil sump, of the type comprising, on the one hand, a housing having an inside cavity and a base equipped with means for securing it on said crankcase, and on the other hand, a filter cartridge placed inside said housing so as to divide said inner cavity into:

a first chamber communicating with said crankcase through a vertical passageway provided in said base and said crankcase, and

a second chamber surrounding at least partly said first chamber and communicating with the outside via vents provided in said housing, said cartridge containing a filtering



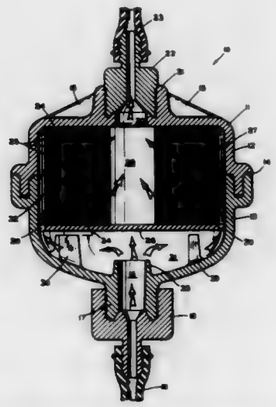
agent placed substantially vertically, device wherein said vents issue into the upper part of said second chamber, the lower part of said second chamber is not directly communicating with the outside, and said device further comprises internal means for recovering and recycling the oil from the filtering agent, which means are interposed between the lower part of said second chamber and said crankcase, branching means being provided for placing said crankcase in direct communication with said second chamber in case of excessive pressure in said crankcase.

5,205,849

AIR FILTER HAVING A LOW INTERNAL PRESSURE DROP

Michael J. Kosmyna, Toledo; Robert H. Verb, Graytown, and Andrew P. Gargac, Oregon, all of Ohio, assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Jun. 29, 1992, Ser. No. 905,773
Int. Cl.[5] B01D *46/40*
U.S. Cl. 55—337 **9 Claims**



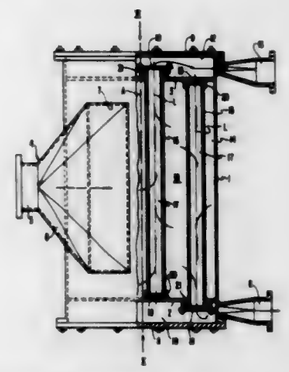
1. In an air filter including a closed housing having an inlet port and an outlet port axially aligned with said inlet port, an annular filter element in said housing having a central chamber aligned with said outlet port, said housing forming an annular chamber surrounding said filter element, the improvement comprising a movable baffle mounted in said housing between said inlet port and said filter element to form an inlet chamber, said baffle having a perimeter, said baffle being free to move in said housing under the influence of inlet air flow towards said filter element and said outlet port, a plurality of air passages spaced around said baffle perimeter connecting said inlet chamber with said annular chamber, and wherein air flow through said inlet port into said inlet chamber impinges on said baffle to urge said baffle against said filter element to form a seal between said baffle and said filter element and to form a seal around said outlet port between said filter element and said housing.

5,205,850

PARTICULAR FILTER

Thielo Jenrich, Wiesbaden; Dietmar Thalheim, Offenbach, and Horst Kalfa, Idstein, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed May 26, 1992, Ser. No. 888,906
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1991, 4120920
Int. Cl.[5] B01D *29/17*
U.S. Cl. 55—350 **22 Claims**



1. A particulate filter comprising:

a housing having opposite ends;

a pair of support walls adjacent respective said opposite ends of said housing and defining therein an interior;

a pair of pure gas chambers defined at respective said opposite ends of said housing at sides of respective said support walls outwardly of said interior;

a plurality of elongated filter bodies having respective longitudinal axes and hollow interiors, said filter bodies being supported by said support walls to extend therebetween within said housing with said longitudinal axes extending generally parallel, such that said filter bodies define outwardly thereof within said housing a raw gas chamber in the from of a plurality of elongated raw gas compartments, and such that said hollow interiors of said filter bodies define respective elongated pure gas channels;

each said pure gas chamber having opening thereinto at least one of said pure gas channels, and each said pure gas channel opening into at least one of said pure gas chambers;

said housing having, at a position between said pair of support walls, a raw gas supply connection opening into said interior of said housing in a direction transverse to the direction of elongation of said raw gas compartment; and

means for discharging pure gas from said pair of pure gas chambers.

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in which

fluorine or chlorine, C_1–C_4-alkoxy which is optionally

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5,205,851

METHOD AND APPARATUS FOR PRODUCING OPTICAL FIBER COUPLER

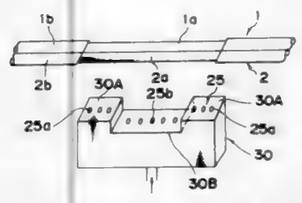
Hiroshi Suganuma; Hiroaki Takimoto; Hiroshi Yokota; Masumi Fukuma, all of Yokohama, and Kazuhiko Arimoto, Tokyo, all of Japan, assignors to Sumitomo Electric Industries, Ltd. and Sumiden Opcom Ltd., both of Osaka, Japan

Filed Sep. 27, 1991, Ser. No. 766,202

Claims priority, application Japan, Oct. 12, 1990, 2-274825; Nov. 26, 1990, 2-323516; Nov. 26, 1990, 2-323517

Int. Cl.[5] C03B 37/10

U.S. Cl. 65—4.21 18 Claims



1. In a method of producing an optical fiber coupler, in which a plurality of optical fibers are arranged in parallel with each other, glass portions of the optical fibers are heated so as to be fusion bonded to each other integrally and then, the integral glass portions are heated so as to be stretched, the method comprising:

providing a gas burner which acts as a heating device and has a plurality of gas nozzles arranged in parallel with an axial direction of the optical fibers so as to be fixed in position during heating of the glass portions;

the gas nozzles including first gas nozzles disposed at opposite end portions of the gas burner and second gas nozzles disposed at a central portion of the gas burner such that the second gas nozzles are spaced farther away from the glass portions than the first gas nozzles are.

5,205,852

ALKYLPHOSPHONAMIDATE HERBICIDES

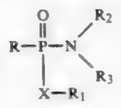
Michael D. Broadhurst, Novato, and Tsze H. Tsang, El Cerrito, both of Calif., assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Nov. 12, 1991, Ser. No. 792,532

Int. Cl.[5] A01N 57/04, 57/06; C07F 9/44

U.S. Cl. 504—199 14 Claims

1. A compound having the formula



in which

R is C_3–C_6 alkyl or C_3–C_6 cycloalkyl;

X is oxygen or sulfur;

R_1 is C_2–C_{12} alkyl, C_3–C_6 cycloalkyl optionally substituted with up to 2 C_1–C_3 allyl groups, phenyl, or substituted phenyl having from 1 to 2 substituents selected from halo, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 thioalkyl, C_3–C_4 alkenyl, C_1–C_1–C_4 alkoxycarbonyl, and phenyl;

R_2 is C_1–C_6 alkyl or C_3–C_6 cycloalkyl; and

R_3 is phenyl or substituted phenyl having from 1 to 2 substituents selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl and halogen;

provided that: if R is n-propyl and X is oxygen, then neither R_1 nor R_2 is ethyl.

5,205,853

HERBICIDAL SULPHONYLATED CARBOXAMIDES

Hilmar Wolf, Langenfeld; Rolf Kirsten, Monheim; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1991, Ser. No. 704,544

Claims priority, application Fed. Rep. of Germany, May 30, 1990, 4017338

Int. Cl.[5] A01N 43/02, 43/48; C07D 285/10, 261/04

U.S. Cl. 504—247 10 Claims

1. A sulphonylated carboxamide of the formula

$$R^1—CO—NH—SO_2—(A)_n—R^2 \quad (I)$$

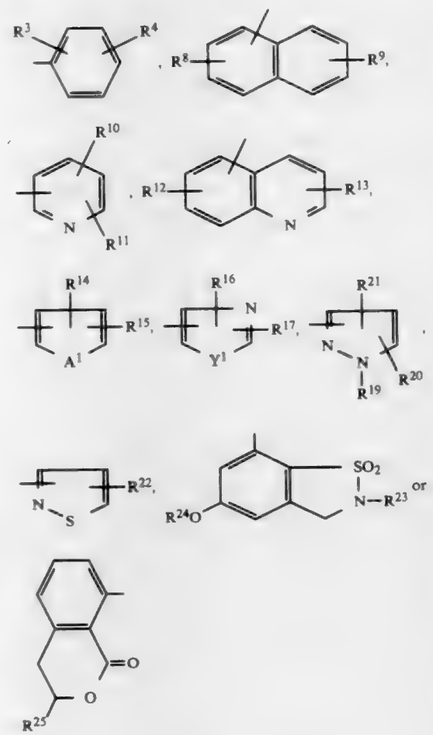
in which

n is 0 or 1,

A is oxygen, NH or CH_2,

R^1 is isoxazolyl, thiodiazolyl or 1,2,4-oxadiozolyl, which is optionally substituted by fluorine, chlorine, bromine, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, tert-butyl, fluoromethyl, chloromethyl, difluoromethyl, dichloromethyl, trifluoromethyl, trichloromethyl, chlorofluoromethyl, chlorodifluoromethyl, fluorodichloromethyl, phenyl, methoxy, ethoxy, propoxy, isopropyloxy, difluoromethoxy, trifluoromethoxy, chlorodifluoromethoxy, methylthio, ethylthio, propylthio, isopropylthio, difluoromethylthio, trifluoromethylthio, chlorodifluoromethylthio, methylsulphinyl, ethylsulphinyl, propylsulphinyl, methylsulphonyl, ethylsulphonyl, propylsulphonyl, methylamino, ethylamino, propylamino, isopropylamino or dimethylamino, and

R^2 represents the radical



in which

R^3 and R^4 are identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, carboxyl or C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylamino-carbonyl, di-C_1–C_4-alkyl-)aminocarbonyl, hydroxyl, C_1–C_4-alkoxy, formyloxy, C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylamino-carbonyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, di-(C_1–C_4-alkyl-)aminosulphonyl, C_3–C_6-cycloalkyl or phenyl, or R^3 and R^4 furthermore independently of one another represent C_2–C_6-alkenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxycarbonyl, carboxyl or phenyl, or R^3 and R^4 additionally independently of one another represent C_2–C_6-alkinyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl; C_1–C_4-alkoxy which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl; C_1–C_4-alkylthio which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl; C_3–C_6-alkenyloxy which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl, C_2–C_6-alkenylthio which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkylthio or C_1–C_4-alkoxy-carbonyl; C_3–C_6-alkynyloxy, C_3–C_6-alkynylthio or the radical $—S(O)_p—R^5$, or

R^3 and R^4 furthermore represent phenyl or phenoxy, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkoxycarbonylamino, C_1–C_4-alkylamino-carbonylamino, di-(C_1–C_4-alkyl)-amino-carbonylamino, or the radical $—CO—R^6$, or R^3 and R^4 furthermore represent C_1–C_4-alkysulphonyloxy, di-(C_1–C_4-alkyl)-aminosulphonylamino or the radical $—CH=N—R^7$, in which p represents the numbers 1 or 2 and

R^5 represents C_1–C_4-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxycarbonyl, or R^5 represents C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino,

R^6 represents C_1–C_6-alkyl, C_1–C_6-alkoxy which is optionally substituted by fluorine, chlorine, methoxy or ethoxy; C_3–C_6-cycloalkoxy, C_3–C_6-alkenyloxy, C_1–C_4-alkylthio, amino, C_1–C_4-alkylamino, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)amino which are optionally substituted by fluorine or chlorine and

R^7 represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, benzyl which is optionally substituted by fluorine or chlorine, C_3–C_6-alkenyl or C_3–C_6-alkynyl which are optionally substituted by fluorine or chlorine, phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, C_1–C_6-alkoxy, C_3–C_6-alkenyloxy, C_3–C_6-alkynyloxy or benzyloxy which are optionally substituted by fluorine or chlorine, or R^7 furthermore represents amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)-amino, phenylamino, C_1–C_4-alkyl-carbonylamino, C_1–C_4-alkoxycarbonylamino, C_1–C_4-alkyl-sulphonylamino or phenyl sulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl,

R^8 and R^9 are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl which is optionally substituted by fluorine or chlorine; or C_1–C_4-alkoxy which is optionally substituted by fluorine or chlorine;

R^{10} and R^{11} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, or C_1–C_4-alkyl which is optionally substituted by fluorine or chlorine; C_2–C_4-alkenyl which is optionally substituted by fluorine or chlorine, C_1–C_4-alkoxy which is optionally substituted by fluorine or chlorine; C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl which are optionally substituted by fluorine or chlorine; and di-(C_1–C_4-alkyl)-aminosulphonyl, C_1–C_4-alkoxy-carbonyl, dimethylaminocarbonyl or dioxolanyl;

R^{12} and R^{13} are identical or different and represent hydrogen, fluorine, chlorine, bromine or C_1–C_4-alkyl which is optionally substituted by fluorine or chlorine; C_1–C_4-alkoxy which is optionally substituted by fluorine or chlorine; C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl which are optionally substituted by fluorine or chlorine; or di-(C_1–C_4-alkyl)aminosulphonyl;

R^{14} and R^{15} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro or C_1–C_4-alkyl which is optionally substituted by fluorine, chlorine, C_1–C_4-alkoxy or C_1–C_4-halogenoalkoxy; C_1–C_4-alkoxy which is optionally substituted by fluorine or chlorine; C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl which are optionally substituted by fluorine or chlorine, di-(C_1–C_4-alkyl)-amino-sulphonyl or C_1–C_4-alkoxycarbonyl, and

A^1 represents oxygen, sulphur or the group $N—Z^1$, in which

Z^1 represents hydrogen or C_1–C_4-alkyl which is optionally substituted by fluorine, chlorine, bromine or cyano; C_3–C_6-cycloalkyl, benzyl or phenyl, phenyl optionally being substituted by fluorine, chlorine, bromine or nitro; C_1–C_4-alkylcarbonyl, C_1–C_4-alkoxy-carbonyl or di-(C_1–C_4-alkyl)aminocarbonyl;

R^{16} and R^{17} are identical or different and represent hydrogen, C_1–C_4-alkyl, halogen, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy or C_1–C_4-halogenoalkoxy,

Y^1 represents sulphur or the group $N—R^{18}$, in which

R^{18} represents hydrogen or C_1–C_4-alkyl,

R^{19} represents hydrogen, C_1–C_4-alkyl, phenyl or (iso)-quinolinyl,

R^{20} represents hydrogen, halogen, cyano, nitro or C_1–C_4-alkyl which is optionally substituted by fluorine or chlorine; C_1–C_4-alkoxy which is optionally substituted by fluorine or chlorine; dioxolanyl or C_1–C_4-alkoxy-carbonyl,

R^{21} represents hydrogen, halogen or C_1–C_4-alkyl,

R^{22} represents hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy-carbonyl,

R^{23} represents C_1–C_4-alkyl,

R^{24} represents C_1–C_4-alkyl and

R^{25} represents hydrogen or methyl,

or a salt thereof.

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ISOXAZOLE(ISOTHIAZOLE)-5-CARBOXAMIDES

Wolfgang Freund, Neustadt; Thomas Kuekenhoehner, Frankenthal; Gerhard Hamprecht, Weinheim; Bruno Wuerzer, Otterstadt; Karl-Otto Westphalen, Speyer; Norbert Meyer, Ladenburg, and Hans Theobald, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 337,640, Apr. 13, 1989, Pat. No. 5,080,708.

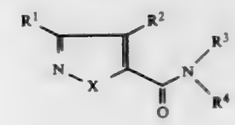
This application Sep. 23, 1991, Ser. No. 764,214

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812225

Int. Cl.[5] A01N 43/80; C07D 275/03

U.S. Cl. 504—191 6 Claims

1. Isothiazole-5-carboxamides of the formula I



where

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INOCULATION WIRE

Bruno Prinz, Oberursel; Karl-Josef Reiffengerhold, Koeln, and

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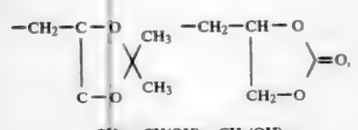
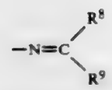
where
X is sulfur,
R^1 is: hydrogen;
C_1–C_{10}-alkyl which is unsubstituted or substituted by C_1–C_3-alkoxy, C_1–C_3-haloalkoxy, halogen, cyano or phenyl, which in turn may be substituted by halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, cyano, or nitro;
C_1–C_4-alkoxy;
C_3–C_8-cycloalkyl which is unsubstituted or substituted by C_1–C_4-alkyl or halogen;
phenyl which is unsubstituted or substituted by C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, halogen, nitro or cyano;
or 5- or 6-membered heterocyclic radical which is unsubstituted or substituted by C_1–C_4-alkyl, carboxyl or C_1–C_4-alkoxycarbonyl, said heterocyclic radical being attached via carbon and selected from the group consisting tetrahydrofuryl, tetrahydropyranyl, pyridyl, thienyl, furyl and pyrazolyl;
R^2 is: formyl; 4,5-dihydrooxazol-2-yl; or a radical of the formula —$COYR^5$ or —$CONR^6R^7$,
where
Y is oxygen or sulfur;
R^5 is: hydrogen;
C_1–C_8-alkyl which is unsubstituted or substituted by C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkoxy, halogen, cyano, hydroxy, trimethylsily, C_1–C_4-alkylthio, C_1–C_4-alkylamino, C_1–C_4-dialkylamino, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-dialkyloaminocarbonyl, C_1–C_4-dialkoxyphosphonyl, 2-propane-iminooxy, thienyl, furyl, tetrahydrofuryl, phthalimido, pyridyl, benzyloxy, benzoyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_3-alkoxy or halogen; and phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, halogen, nitro, cyano, thienyl, furyl tetrohydrofuryl, phthalimido or pyridyl;
C_3–C_8-alkenyl which is unsubstituted or substituted by phenyl which in turn may be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, halogen, nitro or cyano;
C_3–C_6-haloalkenyl;
C_3–C_8-alkynyl which is unsubstituted or substituted by hydroxy or C_1–C_4-alkoxy;
C_3–C_6-cycloalkyl;
C_5–C_6-cycloalkenyl; phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, halogen, nitro, cyano, C_1–C_4-alkoxycarbonyl or formylamino;
a 5- or 6-membered heterocyclic radical selected from the group consisting of thienyl, furyl, tetrahydrofuryl, triazolyl bonded via nitrogen, imidazolyl bonded via nitrogen, bernzotriazolyl, tetrahydropyranyl, pyridyl, morpholino bonded via nitrogen, or piperidino bonded via nitrogen;
C_6–C_7-cycloalkanimino; phthalimido; succinimido; or a radical



for one equivalent of a cation from the group consisting of the alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and substituted ammonium;
or a radical



where R^8 and R^9 independently of one another are C_1–C_4-alkyl; C_2–C_6-alkoxyalkyl; C_3–C_6-cycloalkyl; phenyl; furyl; or together form a methylene chain of the formula —$(CH_2)_m$—, where m is from 4 to 7; R^9 is additionally hydrogen;
R^6 is: hydrogen; C_1–C_8-alkyl or C_3–C_8-cycloalkyl
R^7 is: hydrogen or C_1–C_8-alkyl, or
R^6 and R^7 form a methylene chain having 4 or 5 members;
R^3 is: hydrogen;
C_1–C_8-alkyl which is unsubstituted or substituted by hydroxy, halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_4-dialkylamino;
C_3–C_8-cycloalkyl which is unsubstituted or substituted by C_1–C_4-alkyl, halogen or C_1–C_4-haloalkyl;
R^4 is: hydrogen; hydroxyl; C_1–C_4-alkoxy;
C_1–C_{10}-alkyl which is unsubstituted or substituted by C_1–C_4-alkyloxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-dialkylamino, halogen, C_3–C_6-cycloalkyl or phenyl, which in turn may be substituted by halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio or C_1–C_4-haloalkylthio;
C_3–C_{10}-alkenyl or C_3–C_{10}-alkynyl which is unsubstituted or substituted by halogen or C_1–C_4-alkoxy;
C_3–C_8-cycloalkyl which is unsubstituted or substituted by C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, halogen, nitro or cyano;
C_1–C_4-dialkylamino;
a 3-membered tó 6-membered heterocyclic radical which is unsubstituted or substituted by C_1–C_6-alkyl, C_1–C_6-haloalkyl or halogen, said heterocyclic radical being one member selected from the group consisting of tetrahydropyranyl, tetrahydrofuryl, thiazolyl, pyridyl, pyrimidyl, morpholino bonded via nitrogen and piperidino bonded via nitrogen;
phenyl which is unsubstituted or substituted by C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, halogen, nitro, cyano, formyl, C_1–C_6-alkanoyl or C_1–C_6-haloalkanoyl; or
R^3 and R^4 together from a radical of the structure —$(CH_2)_n$—Y_p—$(CH_2)_q$—, where n and q are each 1, 2 or 3, p is 0 or 1 and Y is oxygen, sulfur or N-methyl, or the radical of the formula —$(CH_2)_3$—CO—;
with the proviso that R^3, R^4, R^5, R^6 and R^7 are not simultaneously hydrogen;
and their agriculturally acceptable salts.

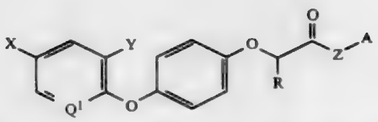
5,205,855

HERBICIDALLY ACTIVE PHENOXYALKANECARBOXYLIC ACID DERIVATIVES

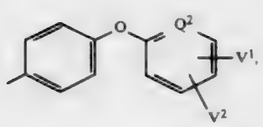
Harukazu Fukami, Kyoto; Naoki Higuchi, Ikeda; Naoko Kawaguchi, Moriguchi; Masaki Hashimoto, Ibaraki; Kinya Ide, Kusatsu, and Toshio Takahashi, Nishinomiya, all of Japan, assignors to Suntory Limited and Shionogi & Co., Ltd., both of Osaka, Japan

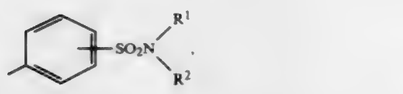
Division of Ser. No. 230,481, Aug. 10, 1988, Pat. No. 4,976,773. This application Sep. 6, 1990, Ser. No. 578,254
Claims priority, application Japan, Aug. 11, 1987, 62-199040; Aug. 11, 1987, 62-199041; Oct. 23, 1987, 62-266563; Jan. 4, 1988, 63-000010; Jul. 12, 1988, 63-171941; Jul. 12, 1988, 63-171942
Int. Cl.[5] **C07D** *213/64;* **A01N** *43/40*
U.S. Cl. 504—257 **18 Claims**

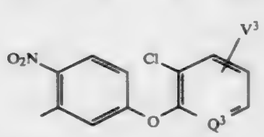
1. A compound of the formula:



wherein Q^1 is CH or N; R is H or C_1–C_5 alkyl; X is H, halogen, CF_3, or NO_2; Y is H or halogen; Z is —O— or —NH—; A is

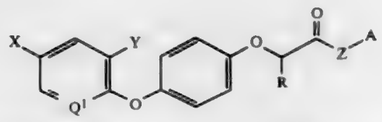






wherein Q^2 Q^3 are each CH or N; R^1 and R^2 are each H, C_1–C_5 alkyl; C_1–C_5 alkoxy, or C_2–C_6 alkoxycarbonyl; R^3, R^4, and R^5 are each H or C_1–C_5 alkyl; R^6 is H, halogen, or C_1–C_5 alkyl; R^7, R^8, R^9, and R^{10} are each H or C_1–C_5 alkyl; R^{11} is H, C_1–C_5 alkyl, C_1–C_5 alkoxy, C_2–C_6 alkenyl, C_6–C_{10} aryl, C_7–C_{15} aryloxyalkyl, or C_7–C_{15} aralkyl; V^1 and V^2 are each H, halogen, NO_2, CN, or CF_3; V^3 is halogen or CF_3; W^1 is —O— or —NH—; W^2 is —$(CH_2)_n$— wherein n is 0 or 1, or —CO—; and X^1 is halogen; or salt thereof, with the proviso that at least one of Q^1, Q^2 and Q^3 is nitrogen.

13. A method for killing weeds or plants other than rice, wheat or barley, said method comprising applying a compound of the formula:



wherein Q^1 is CH or N; R^1 and R^2 are each H, C_1–C_5 alkyl; C_1–C_5 alkoxy, or C_2–C_6 alkoxycarbonyl; R^3, R^4, and R^5 are each H or C_1–C_5 alkyl; R^6 is H, halogen, or C_1–C_5 alkyl; R^7, R^8, R^9, and R^{10} are each H or C_1–C_5 alkyl; R^{11} is H, C_1–C_5 alkyl, C_1–C_5 alkoxy, C_2–C_6 alkenyl, C_6–C_{10} aryl, C_7–C_{15} aryloxyalkyl, or C_7–C_{15} aralkyl; V^1 and V^2 are each H, halogen, NO_2, CN, or CF_3; V^3 is halogen or CF_3; W^1 is —O— or —NH—; W^2 is —$(CH_2)_n$— wherein n is 0 or 1, or —CO—; and X^1 is halogen; or salt thereof, to a crop comprising rice, wheat or barley in an effective amount to kill weeds or plants other than rice, wheat or barley, with the proviso that at least one of Q^1, Q^2 and Q^3 is nitrogen.

5,205,856

INOCULATION WIRE

Bruno Prinz, Oberursel; Karl-Josef Reifferscheid, Karben, and Thomas Schulze, Altenstadt, all of Fed. Rep. of Germany, assignors to Skw Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Feb. 12, 1992, Ser. No. 834,430
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 4104562
Int. Cl.[5] **C22C** *33/00*
U.S. Cl. 75—304 **7 Claims**

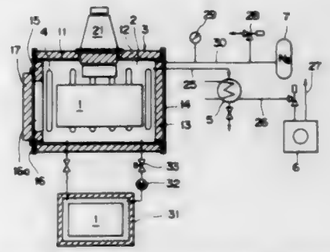
1. An inoculation wire for the production of cast iron with spheroidal graphite or vermicular graphite, said wire consisting of a sheath of steel, copper or nickel filled with a composition comprising powdered ferrosilicon and 1 to 50% by volume of powdered magnesium silicide.

5,205,857

METHOD AND APPARATUS FOR RECOVERING SUBSTANCE ADHERED TO OBJECT TO BE PROCESSED

Yoshiaki Yokoyama, Urawa, Japan, assignor to Ogihara Technical Center Co., Ltd., Ota, Japan

Filed Dec. 26, 1991, Ser. No. 813,975
Claims priority, application Japan, Dec. 27, 1990, 2-414963
Int. Cl.[5] **C22B** *7/00*
U.S. Cl. 75—401 **10 Claims**



1. A method of cleaning a substance from a surface of a solid object to be processed and recovering the substance, which comprises the steps of placing the object to be processed in a closed atmosphere, and heating and evacuating the closed atmosphere to increase temperature therein after reducing pressure in the closed atmosphere, thereby evaporating and then recovering the substance comprising at least one member selected from the group consisting of liquid and solid adhered to the object to be processed, through variations in the temperature and pressure in the closed atmosphere.

5,205,858

PRECIOUS METALS RECOVERY PROCESS

Michael D. Manke, 905 ½ 10th St., Apt. 4, Spearfish, S. Dak. 57783

Filed Feb. 10, 1992, Ser. No. 833,060
Int. Cl.[5] **C22B** *11/00*
U.S. Cl. 75—426 **1 Claim**

1. A new and improved precious metals recovery process for removing precious metals from a precious metals containing ore, the steps of said process comprising:
delivering a supply of said ore from a stock pile to a primary crusher to effect an initial disintegration thereof;
removing said ore from said primary crusher and delivering said ore to a secondary crusher to effect a greater disintegration thereof;
removing said ore from said secondary crusher and delivery said ore to a grinder to effect a further disintegration thereof, whereby said ore is effectively reduced in granular size;

removing said ore from said grinder and delivering said ore to a screen sifter;

5,205,859

APPARATUS FOR CONTINUOUS COPPER SMELTING

Masaki Nakano, Kiyoshi Ogawa, Hideo Kawashima, Osamu Ide, all of Tokyo

(c) a nitrogen heterocyclic diol having a solubility in water of at least 4.5 parts in 100 parts of water at 25° C., and

combining the whole flour with an acetylation agent to form a organic solvent-free reactant mixture; and

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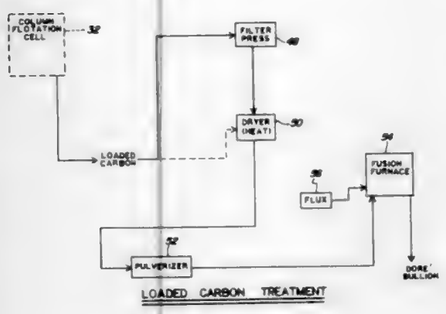
removing said ore from said grinder and delivering said ore to a screen sifter;
recycling ore which does not pass though said screen sifter back to said grinder so as to effect a recycling thereof;
delivering said ore which passes though said screen sifter to a slurry preparation tank;
adding water to said slurry preparation tank so as to form a slurry formed from said water and said ore;
delivering said slurry from said slurry preparation tank to a column floatation cell;
delivering a continuous supply of air to said slurry within said column floatation cell, thereby to aerate said slurry and to effect an air-lift agitation thereof;
adding lime to said slurry in said column floatation cell until a pH in the range of about 10 to about 12 is obtained;
adding cyanide to said slurry after said pH has been obtained;
continuing said air-lift agitation of said slurry until maximum metal compounding has been achieved;
adding fine carbon of a particle size of minus 80 mesh to said slurry after said maximum metal compounding has been achieved, whereby noble metals are leached from said ore and are bonded to said fine carbon to create loaded carbon and leaving non-metal containing ore as tailings;



LOADED CARBON TREATMENT

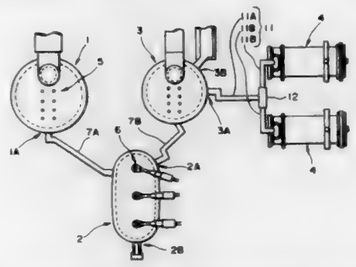
adding a floatation reagent comprising a carbon/noble metal specific chemical to said slurry so as to effect a separation of said loaded carbon and said tailings from said slurry;
removing said tailings from said floatation cell and delivering said tailings to a holding facility for further treatment;
removing said loaded carbon from said floatation cell and delivering said loaded carbon to a filter press;
filtering said loaded carbon in said filter press to remove impurities therefrom;
pressing said loaded carbon in said filter press to effect an initial drying thereof;
delivering said loaded carbon to a dryer to effect a removal of water through an applied application of thermal energy therefrom;
delivering said loaded carbon to a pulverizer so as to convert said loaded carbon into pellets;
delivering said pellets to a fusion furnace for providing an additional application of thermal energy;
adding an oxidant to said pellets in said fusion furnace during said application of thermal energy to said pellets, thereby to effect a fluxing thereof and causing precious metals to form into a doré bullion; and
removing said doré bullion comprising said precious metals from said fusion furnace.

5,205,859

APPARATUS FOR CONTINUOUS COPPER SMELTING

Moto Goto; Nobuo Kikumoto; Osamu Iida, all of Tokyo; Hiroaki Ikoma, Osaka, and Shigemitsu Fukushima, Tokyo, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Nov. 20, 1991, Ser. No. 797,116
Claims priority, application Japan, Nov. 20, 1990, 2-314671; Nov. 20, 1990, 2-314673; Nov. 20, 1990, 2-314675; Nov. 20, 1990, 2-314682
Int. Cl.[5] C22B *15/04*
U.S. Cl. 75—640 **7 Claims**



1. An apparatus for continuous copper smelting, comprising:
a smelting furnace for melting and oxidizing copper concentrate to produce a mixture of matte and slag;
a separating furnace for separating the matte from the slag;
a converting furnace for oxidizing the matte separated from the slag to produce blister copper;
melt launder means for connecting said smelting furnace, said separating furnace and said converting furnace in series;
a plurality of anode furnaces for refining the blister copper produced in said converting furnace into copper of higher quality; and
blister copper launder means for connecting said converting furnace and said anode furnaces.

5,205,860

WATER REPELLENTS CONTAINING ORGANOSILICON COMPOUNDS

Dipak Narula, and Lori A. Stark, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 23, 1992, Ser. No. 824,272
Int. Cl.[5] B05D *3/02*; C08F *283/16*
U.S. Cl. 106—2 **20 Claims**

1. A composition comprising a solution obtained by combining (i) water; (ii) an alkyltrialkoxysilane selected from the group consisting of C_1 to C_6 alkyl groups on silicon and blends of alkyltrialkoxysilanes with C_1 to C_6 alkyl groups on silicon; (iii) a water soluble silane coupling agent or hydrolysis product thereof; and (iv) an aqueous silicone emulsion of an anionically stabilized hydroxyl endblocked polydiorganosiloxane, amorphous silica and an organic tin salt.

5,205,861

AQUEOUS INK JET INKS CONTAINING ALKYLENE OXIDE CONDENSATES OF CERTAIN NITROGEN HETEROCYCLIC COMPOUNDS AS COSOLVENTS

Howard Matrick, Highlands, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1991, Ser. No. 774,074
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 D **35 Claims**

1. An aqueous ink jet ink composition comprising:
(a) an aqueous carrier medium,
(b) a colorant selected from the group consisting of a pigment dispersion and a dye; and

(c) a nitrogen heterocyclic diol having a solubility in water of at least 4.5 parts in 100 parts of water at 25° C., and which is the reaction product of a heterocyclic compound which is monocyclic and comprises either a 5- or 6- membered ring which comprises 2 trivalent nitrogen atoms with one carbon atom spaced between them, and said carbon atom is a part of one carbonyl group; and an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, and mixtures thereof.

5,205,862

WATER RESISTANT INK COMPOSITIONS AND PROCESS FOR PREPARATION

Hiroshi Kiyomoto, and Yasuyuki Segimoto, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Pilot, Tokyo, Japan

Continuation of Ser. No. 599,902, Oct. 19, 1990, abandoned. This application Mar. 3, 1992, Ser. No. 844,877
Claims priority, application Japan, Oct. 26, 1989, 1-277313
Int. Cl.[5] C09D *11/00*
U.S. Cl. 106—22 R **11 Claims**

1. A water-resistant ink composition comprising:
(A) water,
(B) an anionic dye selected from the group consisting of C.I. Acid Yellow 40, C.I. Acid Orange 51, C.I. Acid Red 114 and 249, C.I. Acid Blue 83, 90, 103, and 127, C.I. Acid Green 25 and 27, C.I. Direct Black 154, and epoxydized C.I. Direct Black 154, and
(C) a water-resistance modifier which contains as an effective component at least one sparingly water-soluble compound containing at least one oleophilic group selected from an aromatic ring or an aliphatic hydrocarbon having 6–12 carbon atoms, and at least one hydrophilic group having at least one of O, N and S atoms;
wherein said sparingly water-soluble compound is a compound which is one or two of the compounds selected from the group consisting of
(a) a compound having a dicarboxylate structure selected from bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate or bis(1,2,2,6,6-pentamethyl-4-piperidyl)sebacate;
(b) a compound having a benzophenone structure selected from benzophenone, 2,2'-dihydroxy-4-methoxybenzophenone, or 2,4-dihydroxy-benzophenone;
(c) a compound having a phenol structure selected from ethyl 2,2-bis(4'-hydroxyphenyl)propane gallate, n-propyl gallate, isoamyl gallate salicylic aidoxime, diethyl 4-hydroxy1,2-phthalate, or para-tert-butylphenol;
(d) benzimidazole;
(e) a compound having a benzothiazole structure selected from 2-chloro-benzothiazole, 2-methyl-5-chlorobenzothiazole, or 2-mercaptobenzothiazole;
(f) benzoin methyl ether; and
(g) a compound having a benzoate structure selected from propyl p-hydroxybenzoate or phenyl benzoate.

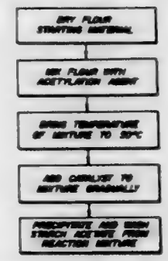
5,205,863

AGRICULTURAL BIODEGRADABLE PLASTICS

Glenn R. Elion, Chatham, Mass., assignor to International Communications & Energy, Sausalito, Calif.

Filed Nov. 14, 1991, Ser. No. 791,721
Int. Cl.[5] C08L *89/00*
U.S. Cl. 106—154.1 **23 Claims**

1. A process for converting a whole agricultural flour into biodegradable starch acetate polymers comprising the following steps:
combining the whole flour with an acetylation agent to form a organic solvent-free reactant mixture; and



adding a catalyst to the reactant mixture to form a reaction mixture, wherein the temperature of said reaction mixture is held between 50 and 90 degrees Centigrade.

5,205,864

INORGANIC BASED STRIPPABLE COATINGS FOR ISOLATING HAZARDOUS MATERIALS AND METHOD FOR MAKING AND USING THE SAME

Thomas S. Snyder, Oakmont, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 20, 1991, Ser. No. 811,362
Int. Cl.[5] C09K *3/00*
U.S. Cl. 106—287.26 **7 Claims**

1. A process for isolating contamination on a surface of a vessel comprising the steps of
(a) forming a metal alkoxide sol-gel solution;
(b) applying said sol-gel solution to said vessel surface;
(c) allowing said solution to dry, said contamination being fixed in the matrix of said coating;
(d) removing at least a portion of said coating from said vessel; and
(e) firing said removed coating to form a silica-encapsulated waste.

5,205,865

METHOD AND COMPOSITION FOR BONDING STYRENIC SURFACES

Douglas G. Placek, Fairless Hills, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 23, 1991, Ser. No. 763,684
Int. Cl.[5] C08K *00/00*
U.S. Cl. 106—311 **6 Claims**

1. A composition for forming a tacky surface area on a styrenic resin, the composition comprising a first solvent a solid alkyl, aryl or alkaryl ester of a phosphorus oxyacid, and a sufficient amount of a cosolvent for the styrenic resin to maintain the composition as a liquid at the temperature of application to the surface of a styrenic resin, thereby providing a tacky area on the surface suitable for bonding the tacky area to another surface, wherein the cosolvent has a flash point of at least 35° C., and a boiling point between about 100° C. and about 260° C. and is a terpenoid compound or an oxidized derivative thereof, the terpenoid compound consisting of two or three isoprene structural units $((C_5H_{10})_n$ where n=2 or 3), and wherein the ester of the phosphorus oxyacid is selected from the group consisting of phosphates, phosphites and phosphonates.

5,205,866

METHOD FOR MAKING GREY-BLACK INCLUSION

5,205,868

LOST FOAM PATTERN ASSEMBLY APPARATUS

[illegible], assignors to Outboard Marine

5,205,870

VAPOR DEPOSITION APPARATUS

steel sheets having improved magnetic properties by hot rolling a slab of silicon-containing steel, rendering the hot rolled

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5,205,866
METHOD FOR MAKING GREY-BLACK INCLUSION PIGMENTS

Akos Kiss, Alzenau-Wasserlos; Dietrich Speer, Hanau; Peter Kleinschmit, Hanau, and Jenny Horst, Gelnhausen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

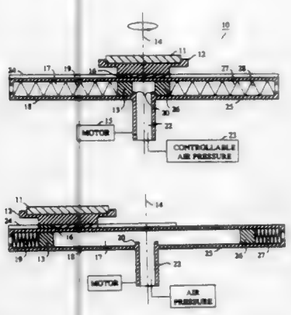
Continuation of Ser. No. 580,386, Sep. 11, 1990, abandoned. This application Mar. 12, 1992, Ser. No. 857,074
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931092
Int. Cl.[5] C08K *3/36, 3/04*
U.S. Cl. 106—450 18 Claims

1. A method for making gray-black inclusion pigments based on zirconium silicate as the encasing substance into which are enclosed carbon black particles as the discrete phase, comprising forming a mixture containing the components zirconium dioxide, a source of silicon dioxide, carbon black and at least one mineralizer; heating said mixture under reducing conditions at between 900° and 1400° C., wherein the source for the silicon dioxide is zeolite with an SiO_2/Al_2O_3 molar ratio of about 10 or more than about 10, to thereby obtain an inclusion pigment, wherein said inclusion pigment has a L value below 40 in a 5% by weight transparent glaze.

5,205,867
SPIN COATING APPARATUS HAVING A HORIZONTALLY LINEARLY MOVABLE WAFER HOLDER

David H. Ziger, San Antonio, Tex., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 396,200, Aug. 21, 1989, Pat. No. 5,032,492.
This application Mar. 14, 1991, Ser. No. 652,826
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—54 7 Claims

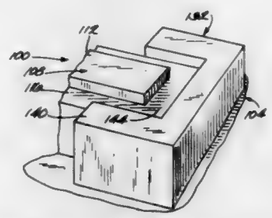


1. Apparatus for coating semiconductor wafers comprising:
a first member having a horizontal track;
support means contained on said track for supporting a semiconductor wafer in a horizontal plane;
means for rotating the first member about a fixed vertical axis at a sufficient speed to disperse liquid on the surface of said wafer;
and means for moving the support means and the wafer along said track during the rotation of the first member about the fixed axis, thereby to make the liquid distribution on the wafer surface more uniform.

5,205,868
LOST FOAM PATTERN ASSEMBLY APPARATUS

Willie R. Anglin, Burnsville, N.C., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 512,954, Apr. 23, 1990, abandoned.
This application Nov. 15, 1991, Ser. No. 793,317
Int. Cl.[5] B29C *65/52*
U.S. Cl. 118—263 8 Claims

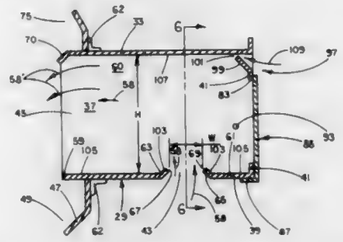


1. Apparatus for applying glue to a foam pattern section, said apparatus comprising a glue plate including an upper surface having an inner raised portion, a lower portion at least partially surrounding said raised portion, being spaced below said raised portion at a first distance and including a non-apertured bottom wall, and dam means at least partially surrounding said lower portion and defining with said lower portion a glue reservoir for reducing squeeze-out of glue from between said inner raised portion and the pattern section, said dam means extending upwardly from said lower portion at a distance substantially the same as said first distance.

5,205,869
OVERSPRAY EXTRACTOR

Michael D. Ahern, Fond du Lac, Wis., assignor to Harbridge, Inc., Fond du Lac, Wis.

Filed Jul. 22, 1991, Ser. No. 734,150
Int. Cl.[5] B05B *13/02*
U.S. Cl. 118—324 23 Claims

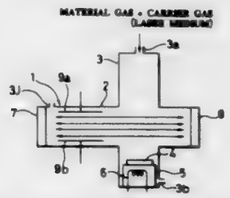


17. A hood useful for collecting overspray from a sprayed coating material comprising:
a. opposed end walls of a predetermined height;
b. a top wall connected to the end walls and perpendicular thereto;
c. a bottom wall connected to the end walls and perpendicular thereto and defining a slot of a predetermined width extending between the end walls, the end, bottom, and top walls defining a throat; and
d. an outside wall connected to the top, end, and bottom walls and perpendicular thereto and opposite the throat, the end, top, bottom, and outside walls cooperating to define a chamber,
so that overspray can enter the chamber through the slot in the bottom wall and leave through the throat.

5,205,870
VAPOR DEPOSITION APPARATUS

Yusuke Sato; Akio Ui, both of Tokyo; Keiichi Akagawa, Kanagawa, and Toshimitsu Okuine, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1992, Ser. No. 890,145
Claims priority, application Japan, May 29, 1991, 3-125725
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—722 29 Claims



1. A vapor deposition apparatus comprising:
(a) a laser having a resonator for exciting a laser medium with an excitation medium, to produce a laser beam; and
(b) means for introducing a material gas into the resonator so that the laser beam may irradiate the material gas to cause a photochemical reaction of the material gas in the resonator.

5,205,871
MONOCRYSTALLINE GERMANIUM FILM ON SAPPHIRE

David J. Godbey, Bethesda, Md., and Syed B. Qadri, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

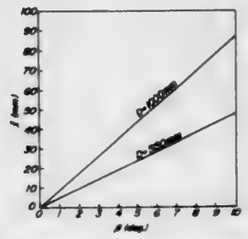
Filed Jun. 1, 1990, Ser. No. 531,720
Int. Cl.[5] H01L *29/12*
U.S. Cl. 148—33.3 22 Claims

1. A germanium on sapphire substrate for a semiconductor device, comprising:
a single crystal sapphire substrate which has a surface with an index of plane $(1\bar{1}02)$; and
an epitaxial monocrystalline germanium layer on said surface of the sapphire substrate.

5,205,872
METHOD OF PRODUCING CRYSTAL BODIES HAVING CONTROLLED CRYSTALLINE ORIENTATION

Hiromi Mitsunori, and Toshio Sadayori, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

PCT No. PCT/JP89/01238, § 371 Date Jun. 21, 1990, § 102(e) Date Jun. 21, 1990, PCT Pub. No. WO90/06378, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 8, 1989, Ser. No. 499,442
Claims priority, application Japan, Dec. 10, 1988, 63-311024; Dec. 10, 1988, 63-311025
Int. Cl.[5] C21D *8/12;* C30B *28/02*
U.S. Cl. 148—111 9 Claims



2. A method of producing grain oriented electromagnetic steel sheets having improved magnetic properties by hot rolling a slab of silicon-containing steel, rendering the hot rolled sheet into a final thickness without annealing and cold rolling or through annealing and/or cold rolling at least one time, and then subjecting it to a primary recrystallization annealing and further to a finish annealing, including a step of joining a recrystallization seed material on an edge portion of the steel sheet as a treating material at a step after the hot rolling and before the finish annealing under a condition satisfying the following orientation relationships, in which said seed material is contacted with said steel sheet through an insert member having a melting point lower than those of said seed material and steel sheet, and then heated to a temperature causing grain boundary movement to grow the crystalline orientation of said seed material over a whole of said steel sheet,

$$|\alpha| \leqq 5°$$

$$1 \leqq |\beta| \leqq 5°$$

where
α: angle defined by a projection line of <001> axis of seed material with respect to rolling face of steel sheet and the rolling direction of steel sheet;
β: inclination angle of <001> axis of seed material with respect to rolling face of steel sheet.

5,205,873
PROCESS FOR THE LOW PRESSURE CARBURIZATION OF METAL ALLOY PARTS

André Faure, Colombes, and Jacques Frey, Lamorlaye, both of France, assignors to Acieries Aubert & Duval, Neuilly Sur Seine, France

Filed Jul. 1, 1991, Ser. No. 724,134
Claims priority, application France, Jul. 2, 1990, 90 08330
Int. Cl.[5] C21D *9/00*
U.S. Cl. 148—206 10 Claims

1. Process for the low pressure carburization of metal alloy parts contained in a furnace chamber heated to a temperature between about 820° C. and about 1100° C. comprising the steps of:
a) forming a preliminary vacuum in the chamber to a pressure of 10^{-1} hPa so as to eliminate the air,
b) filling the chamber with purified nitrogen at atmospheric pressure,
c) loading the metal parts into the chamber,
d) forming a vacuum at 10^{-2} hPa in the chamber,
e) heating the chamber to the austenitization temperature and maintaining this temperature for homogenizing the parts,
f) introducing hydrogen into the chamber at a pressure of up to 500 hPa,
g) introducing ethylene into the chamber at a pressure of 10 to 100 hPa and forming an ethylene-based fuel gas mixture with said hydrogen, said fuel gas mixture consisting of hydrogen and ethylene, ethylene being present in an amount of from about 2% to about 60% by volume for carbonization to provide carbon,
h) vacuum diffusing carbon at 10^{-1} hPa, and

i) introducing nitrogen into the chamber for unloading the

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ALLOYED TITANIUM ALUMINIDE HAVING

5,205,878
COPPER-BASED ELECTRIC AND ELECTRONIC PARTS

groove is the same, and the tangent of said angle of said sides of said grooves differs, whereby for each pitch, the proportion

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i) introducing nitrogen into the chamber for unloading the parts.

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PROCESS OF PROTECTING METALLIC AND WOOD SURFACES USING SILICATE COMPOUNDS

Nathan C. Crews, IV, 6815 Old Clifton Rd.; Daniel A. Young, and Lance A. Young, both of 6825 Old Clifton Rd. SW., all of Port Orchard, Wash. 98366

Continuation-in-part of Ser. No. 611,140, Nov. 13, 1990, abandoned. This application May 22, 1991, Ser. No. 704,125

Int. Cl.[5] B05D *3/10*; C23C *28/00*

U.S. Cl. 148—254 18 Claims

1. A process of treating an article made of metal or wood, comprising the following steps:

a. forming a fixed surface on said article;

b. forming a plurality of layers of silicate salt over said fixed surface; and

c. exposing a last of said layers of silicate salt to an acid solution to form an outer layer of silicon dioxide over said layers of silicate salt thereby forming a protective barrier on said article.

5,205,875

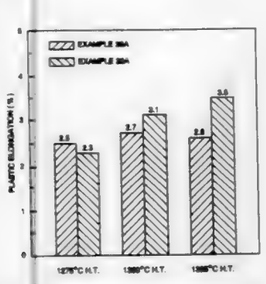
WROUGHT GAMMA TITANIUM ALUMINIDE ALLOYS MODIFIED BY CHROMIUM, BORON, AND NIONIUM

Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 2, 1991, Ser. No. 801,557

Int. Cl.[5] C22C *14/00*

U.S. Cl. 148—421 5 Claims



1. A cast and wrought body of alloy, said alloy consisting essentially of a gamma titanium aluminide modified by chromium, niobium, and boron according to the expression:

$$Ti\text{-}Al_{46\text{-}50}Cr_{1\text{-}3}Nb_{1\text{-}5}B_{0.05\text{-}0.3}$$,

said body having been homogenized for one to three hours at a temperature close to or above the alpha transus temperature, and

said body having been wrought to cause a deformation thereof of at least 10% and annealed.

5,205,876

ALLOYED TITANIUM ALUMINIDE HAVING LAMILLAR MICROSTRUCTURE

Kuniyasu Sakai, Kitamine, Japan, assignor to Taiyo Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1992, Ser. No. 870,860

Claims priority, application Japan, Dec. 6, 1991, 3-348666

Int. Cl.[5] C22C *14/00*

U.S. Cl. 148—421 1 Claim

1. A titanium/aluminum alloy having a lamellar structure, comprising 0.01 to 0.05 wt. % of carbon, 31 to 35 wt. % of aluminum, 0.5 to 2.5 wt. % of manganese, 0.01 to 0.3 wt. % of nickel, 0.01 to 0.03 wt. % of cobalt, 0.05 to 0.2 wt. % of tungsten, 0 to 0.02 wt. % of magnesium, 0.01 to 0.05 wt. % of gold, 0.03 to 0.06 wt. % of boron, 0.04 to 0.08 wt. % of iron, and the balance of titanium.

5,205,877

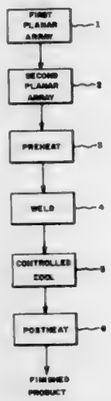
PROCESS FOR MAKING WIRE MESH SCREENS

John D. Collier, Amherst, and James W. Scheeler, North Tonawanda, both of N.Y., assignors to Bison Steel, Inc., Depew, N.Y.

Filed Mar. 28, 1991, Ser. No. 676,811

Int. Cl.[5] B23K *11/32*

U.S. Cl. 148—526 18 Claims



1. A process for making non-woven steel wire screens from high carbon steel wires which comprises providing steel wires having a carbon content of at least 0.5% by weight, providing a first planar array of said wires in a longitudinal configuration, providing a second planar array of said wires in a transverse configuration extending transversely of said first planar array, all of said wires having relatively large diameters, heating at least one junction where a longitudinal and a transverse wire cross to a temperature of from about 700° F. to about 1000° F. for a sufficient period of time to allow heat to disperse to adjacent wire areas but insufficient to cause wire fusion, applying a pulse of electrical current to said junction sufficient to cause fusion or welding of said junction and subsequently heating the resulting welded portion to a post weld temperature of from at least about 1575° F. to result in the formation of pearlite in substantial amounts by controlled cooling through the continuing controlled use of welding contacts or electrodes.

5,205,878

COPPER-BASED ELECTRIC AND ELECTRONIC PARTS HAVING HIGH STRENGTH AND HIGH ELECTRIC CONDUCTIVITY

Toshihiro Kanzaki, Akikawa; Akira Sugawara, Hachioji; Isamu Amatsu, Akikawa, and Kouichi Hatakeyama, Hachioji, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

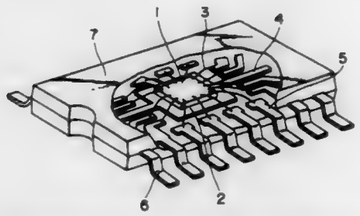
Continuation-in-part of Ser. No. 792,248, Nov. 14, 1991, Pat. No. 5,147,469. This application Dec. 16, 1991, Ser. No. 808,535

Claims priority, application Japan, Nov. 15, 1990, 2-309032

The portion of the term of this patent subsequent to Sep. 5, 2009, has been disclaimed.

Int. Cl.[5] C22C *9/06*

U.S. Cl. 148—684 8 Claims



6. An electric or electronic part which comprises a plurality of electrically conductive leads made of a copper-based alloy having high strength and high electric conductivity, said copper-based alloy being produced by a process which comprises the steps of preparing a copper-based alloy consisting essentially of 0.01–3.0 wt % Co, 0.01–0.5 wt % P and less than 0.5 wt % in total of at least one element selected from the group consisting of Zr, Fe, Mg, Zn, Sn, Ag, Cr, Si, B, Te, Ti, Ni, Be, Pb, Al, Ca, Mo, Mn, Cd, Ga, Ge and Bi with the balance being Cu and incidental impurities, quenching said alloy from a temperature not lower than 750° C. down to 450° C. and below at a cooling rate of at least 1° C./sec, heat treating the quenched alloy at a temperature of 480°–600° C. for 30–600 minutes, cold working said alloy for a working ratio of 20–80%, further heat treating the alloy at a temperature of 440°–470° C. for 30–600 minutes, and subsequently performing cold working for a working ratio of at least 50% and heat treatment at 380° C. and below.

5,205,879

PNEUMATIC VEHICLE TIRE TREAD HAVING TRANSVERSE GROOVES

Hans Seitz, Langenhagen, and Hagen Trabandt, Sehnde, both of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

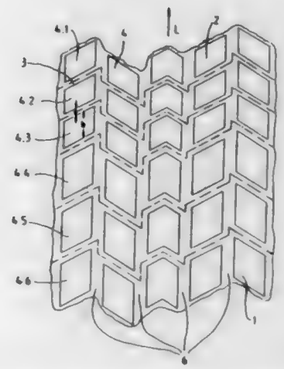
Filed Jun. 14, 1991, Ser. No. 715,902

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1990, 4022615

Int. Cl.[5] B60C *11/11*

U.S. Cl. 152—209 R 1 Claim

1. A profiled pneumatic vehicle tire comprising a tread surface that includes grooves that, when viewed in plan, extend at an angle relative to a circumferential direction of said tire, said grooves having sides that extend at an angel relative to a radial line, said tread surface being divided into a number of pitches, the dimension of at least two successive pitches in said circumferential direction being different, the width of said grooves in said circumferential direction differs, whereby for each pitch, the proportion of said dimension thereof in said circumferential direction to said width of the pertaining groove is the same, and the tangent of said angle of said sides of said grooves differs, whereby for each pitch, the proportion



of said dimension thereof in said circumferential direction to the tangent of the angle of the pertaining groove is the same.

5,205,880

PNEUMATIC TIRES WITH RECESSES IN THE BEAD REGION

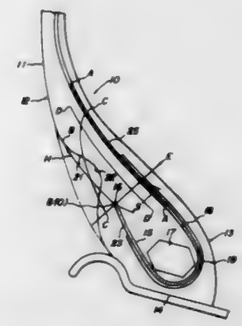
Hiroyuki Iida; Makoto Tsuruta; Yasuhiko Kobayashi, and Hiroyuki Koseki, all of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 789,890

Claims priority, application Japan, Nov. 13, 1990, 2-306864

Int. Cl.[5] B60C *3/00*, *15/024*

U.S. Cl. 152—454 4 Claims



1. A pneumatic tire comprising a pair of beads and a toroidal carcass ply extending between a pair of said beads, said carcass ply consisting of a main body located axially inside said beads and a pair of outer ply portions each extending along the main body of the carcass ply and on an axially outer side of the bead, and a recess provided on an outer surface of the tire between a radially outer end of each of said outer ply portions of the tire and that location of the tire having a maximum width which is located radially outwardly from the radially outer end of the outer ply portion, wherein a part of said recess is located in a zone surrounded by a curve C—C, a curve D—D, and an E-axis, said curve C—C satisfying the following equation: $d/s = 1 - 0.825 \times \sqrt{2.65 - (h/s)}$, said curves C—C, and D—D, said E-axis, d, s, h are defined as follows:

a widthwise center line of said main body of the carcass ply being taken as A—A;

a curve passing through said radially outer end of the outer

ply portion and parallel with said curve A—A being taken

5,205,882

HEAVY DUTY HIGH SPEED RADIAL TIRE WITH

5,205,883

PNEUMATIC TIRE WITH POLYGONAL BEAD CORE

said pane members facing other edges of said pane mem-

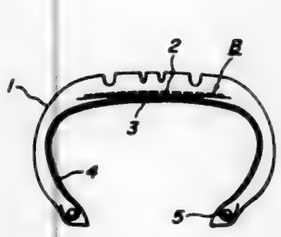
ply portion and parallel with said curve A—A being taken as B—B;
an axis lying on said curve B—B and extending from said radially outer end of the outer ply portion toward said location having maximum width being taken as an H-axis;
an axis extending from said radially outer end of the outer ply portion toward an interior of the tire in a direction orthogonal to said H-axis being taken as the E-axis;
a distance from an origin as measured along the E-axis extending from the radially outer end of the outer ply portion toward the interior of the tire in a direction orthogonal to said H-axis being taken as d, said origin being an intersection between said E-axis and said H-axis;
a distance from the radially outer end of the outer ply portion to the center line A—A as measured on said E-axis being taken as s;
a distance from the origin as measured along the H-axis being taken as h; and
said curve D—D being a curve extending between said curves A—A and B—B and being parallel with the center line A—A, while being spaced from the center line A—A by $\frac{1}{3}s$.

5,205,881

PNEUMATIC TIRE FOR PASSENGER CAR INCLUDING WAVE-SHAPED BELT REINFORCING ELEMENTS

Yoshihide Kohno, and Hiroyuki Koseki, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 19, 1989, Ser. No. 409,172
Claims priority, application Japan, Sep. 19, 1988, 63-232251
Int. Cl.[5] B60C *9/00, 9/18*
U.S. Cl. 152—527 **9 Claims**



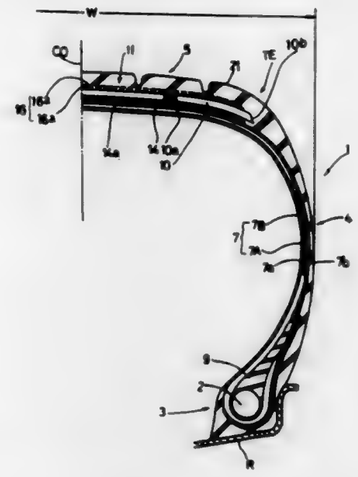
1. A pneumatic tire for a passenger car comprising; a toroidal carcass anchored by at least a pair of bead cores, and a belt made of layers having a number of reinforcing elements of either cords or filaments surrounding a crown of the toroidal carcass, said layers being coated with a high molecular weight material lower in modulus of elasticity than the reinforcing elements, said belt consisting of a laminated construction of at least one wavy cord first layer and a single parallel cord second layer, said first layer having wave-shaped metallic reinforcing elements arranged side by side and directed in parallel with an equatorial plane of the tire and located in the same plane, and said second layer is a single strip having reinforcing elements arranged in parallel with each other at angles of 15°–75° with respect to the equatorial plane.

5,205,882

HEAVY DUTY HIGH SPEED RADIAL TIRE WITH AROMATIC POLYAMIDE BELT CORDS

Kiyoshi Ueyoko, Osaka; Shinichi Miyazaki, Kobe; Mikio Takatsu, Takarazuka, and Masayoshi Nishitani, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jan. 26, 1990, Ser. No. 544,228
Claims priority, application Japan, Jun. 30, 1989, 1-170689
Int. Cl.[5] B60C *9/22, 9/18, 9/06*
U.S. Cl. 152—527 **5 Claims**



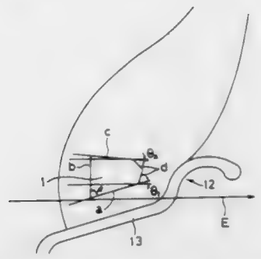
1. A heavy duty high speed radial tire comprising:
a pair of bead portions, each with a bead core disposed therein,
a carcass turned up around said bead cores and composed of at least one ply of carcass cords laid at angles in a range from 75 degrees to 90 degrees with respect to the tire equator; and
an aromatic polyamide fiber cord belt structure disposed radially outside the carcass and inside a rubber tread, said belt structure comprising
a breaker disposed radially outside the carcass and composed of at least one ply of the aromatic polyamide fiber belt cords laid at angles of from 10 to 30 degrees to the tire equator, and
a band disposed radially outside the breaker and composed of a plurality of plies of at least one aromatic polyamide fiber belt cord wound spirally and continuously from one edge to the other edge thereof to be laid at an angle of from 0 to 5 degrees to the tire equator,
the product $T\sqrt{D}$ of the cable twist number T (turns/10 cm) of the belt cord and the square root of the total denier number D (deniers) of the belt cord, being in a range from 2.466×10^3 to 3.036×10^3,
the elongation E (%) at breakage of the belt cord divided by the total denier number D of the belt cord, being in a range from 7.78×10^{-4} to 12.22×10^{-4},
said carcass cords being aromatic polyamide fiber cords,
the product $T\sqrt{D}$ of the cable twist number T (turns/10 cm) of the carcass cord and the square root of the total denier number D (deniers) of the carcass cord, being in a range from 2.466×10^3 to 3.036×10^3, and
the elongation E (%) at breakage of the carcass cord divided by the total denier number D of the carcass cord, being in a range from 7.78×10^{-4} to 12.22×10^{-4}.

5,205,883

PNEUMATIC TIRE WITH POLYGONAL BEAD CORE

Masahiko Kanamaru, Zushi, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 493,262, Feb. 26, 1990, abandoned, which is a continuation of Ser. No. 310,168, Feb. 15, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 687,657
Claims priority, application Japan, Feb. 23, 1988, 63-38628
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] B60C *15/04*
U.S. Cl. 152—540 **5 Claims**



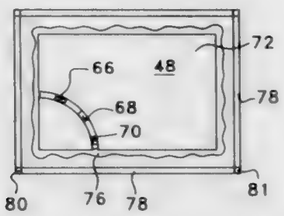
1. A pneumatic radial tire having a circular bead core, wherein said bead core has substantially a polygonal cross section comprising a base (a) adjacent an inclined bead base portion of said tire, an inner side (b) on a side of said bead core nearest a bead toe portion of said tire, an outer side (d) on a side of said bead core nearest a bead heel portion of said tire, and a top side (c) opposite said base (a) and joining said inner side (b) and said outer side (d), an inclination θ_1 of said base (a) relative to the axial direction of the tire is substantially the same as that of said bead base portion relative to the axial direction of the tire, a cross angle β between said base (a) and said inner side (b) is 70° to 90°, an inclination θ_2 of said top side (c) relative to the axial direction of the tire is smaller than said inclination θ_1 and the direction of inclination of said top side (c) is opposite to that of said base (a).

5,205,884

METHOD OF MAKING INSULATED STAINED GLASS UNIT

Anton Rauscher, 14 Cricket La., Norwalk, Conn. 06850

Filed Nov. 19, 1990, Ser. No. 615,475
Int. Cl.[5] B44F *1/06*
U.S. Cl. 156—63 **8 Claims**



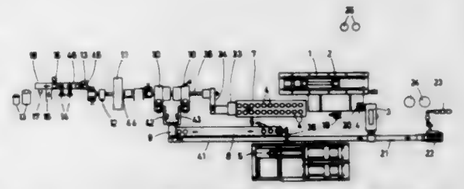
1. Method of manufacturing a window, comprising an array of individual pane members and having the appearance of a conventional stained glass window, using a pattern, comprising the steps of:
(a) forming a plurality of pane members, said pane members having a face side and a reverse side;
(b) taping said face side of said pane members along edges of said pane members facing other edges of said pane members in said pattern;
(c) aligning said plurality of taped pane members with respect to each other, forming gaps between each of the adjacent pane members and forming the desired pattern;
(d) filling said gaps between each of the adjacent pane members with a caulking material;
(e) allowing said caulking material to harden to form said pane members into a unitary member with a periphery;
(f) removing portions of said caulking material to define gaps in the hardened caulking material;
(g) placing said unitary member on a finishing pane;
(h) placing uncured caulking material into said gaps where caulking material has been removed; and
(i) bringing said uncured caulking material into contact with said finishing pane in order to adhere said unitary member to said finishing pane.

5,205,885

PROCESS AND APPARATUS FOR THE PRODUCTION OF TIGHTHEAD DRUMS AND WIDEMOUTH DRUMS

Udo Schutz, Ruckersteg 4, D-5418 Selters, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 732,758
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1990, 4022926
Int. Cl.[5] B29C *45/03, 45/16, 49/04, 49/18*
U.S. Cl. 156—69 **15 Claims**



1. In a process for the production of barrels from thermoplastic synthetic resin wherein a closed cylindrical twin body of an extruded tubular preform is blow-molded in a blowing mold, removed from the mold, and divided into two barrel bodies by cutting out a central ring which latter contains the blow opening of a shot-in blow mandrel; the improvement comprising manufacturing bunghole lids from plastic by injection molding in an injection mold, cooling the barrel bodies and the bunghole lids to a mutually fitting shape while moving the bodies and lids along cooling and calibrating paths arranged downstream of the blowing mold and the injection mold, and welding the bunghole lids to the barrel bodies to obtain bunghole barrels.

5,205,886

METHOD OF LINING METALLIC PIPE USING CONCENTRIC TUBES OF THERMOPLASTIC POLYMER AND TEAR RESISTANT MATERIAL

George White, Glenburnie, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Continuation of Ser. No. 692,160, Apr. 26, 1991, abandoned. This application Jun. 12, 1992, Ser. No. 898,167
Claims priority, application United Kingdom, May 2, 1990, 90 09900
Int. Cl.[5] E04B *2/00*; B05D *7/22*
U.S. Cl. 156—71 **7 Claims**

1. A method of lining a metallic pipe consisting essentially of:
(a) forming a plurality of at least five concentric flexible tubes of thermoplastic polymer enveloped with a layer of a flexible, expansive, tear resistant material, said tubes

being capable of being bonded together under the influ-

inserted in the vulcanizer so as to join the first and second sections to form a vulcanized portion of tube;

convolution to be separated from contiguous convolutions and paved out without entanglement and without damage

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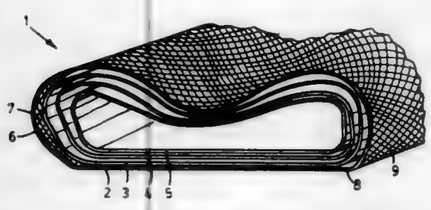
being capable of being bonded together under the influence of heat and pressure;

(b) inserting the enveloped plurality of concentric tubes into a section of metallic pipe by pulling the enveloped tubes into the metallic pipe;

(c) inflating the tubes using a fluid under pressure; and



(d) heating the tubes within the pipe to cause the tubes to be bonded together to form a single tube lining said metallic pipe, each tube of the plurality of tubes having a thickness of about from 40 to 800 microns, and the thickness and number of tubes being selected to provide said single bonded tube with a total thickness of about from 0.1 to 2.5 cm.

5,205,887

MANUFACTURING METHOD FOR ARTICLE HAVING FOAMED LAYER

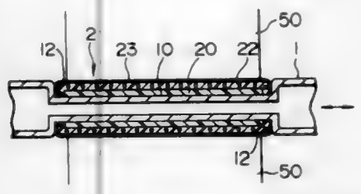
Shigeru Yabuya; Katsuhiro Katagiri; Akiyoshi Nagano; Norio Jogan, and Hiroshi Suyama, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 1, 1991, Ser. No. 694,235

Claims priority, application Japan, May 1, 1990, 2-115415; Oct. 29, 1990, 2-291282

Int. Cl.[5] B29C *65/06*

U.S. Cl. 156—73.5 **10 Claims**



1. A manufacturing method for an article having a formed layer, comprising the steps of:

providing a thermoplastic base portion and an adherent portion, said adherent portion including a thermoplastic reinforcing layer and a foamed layer formed on a surface of said reinforcing layer;

holding said foamed layer;

contacting said base portion with said reinforcing layer and holding an end portion of said foamed layer between an end portion of said reinforcing layer and said base portion; and

vibrating said base portion and compressing said end portion of said foamed layer by vibrations so as to weld said reinforcing layer and said base portion.

5,205,888

PROCESS FOR PRODUCING CARBON FIBER REINFORCED CARBON MATERIALS

Isao Mochida, Fukuoka, and Ryuji Fujiura, Niigata, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 2, 1991, Ser. No. 724,892

Claims priority, application Japan, Jul. 3, 1990, 2-174548; Nov. 1, 1990, 2-293684

Int. Cl.[5] B29C *43/18;* **C01B** *31/04*

U.S. Cl. 156—89 **8 Claims**

1. A process for producing a carbon fiber reinforced carbon material, which process comprises the steps of:

(a) impregnating a carbon fiber assembly with a melt of mesophase pitch that has a softening point of no higher than 350° C. and a viscosity of 80 poises at a temperature not higher than 400° C., and that can be carbonized in a yield of at least 70% when it is gradually heated to a temperature of about 600° C. in an inert gas atmosphere and then held at that temperature for two hours wherein said mesophase pitch contains almost 100% of an optical anistropic phase as examined under a polarizing microscope,

(b) shaping the pitch-impregnated carbon fiber assembly, and

(c) firing the shaped assembly at about 600°–1500° C. in a non-oxidizing atmosphere thereby obtaining the carbon fiber reinforced carbon material, which is optionally followed by graphitization at a temperature of about 2000°–3000° C.

5,205,889

METHOD AND APPARATUS FOR PRODUCING FLEXIBLE TUBES OF ANY LENGTH

Giuseppe Cioffi, Castel di Lama; Guido Albertini, Roccafluvione, and Stefano Barbieri, Rome, all of Italy, assignors to Manuli Rubber Industries S.r.l., Ascoli Piceno, Italy

PCT No. PCT/EP89/00908, § 371 Date Apr. 11, 1991, § 102(e) Date Apr. 11, 1991, PCT Pub. No. WO90/01407, PCT Pub. Date Feb. 22, 1990

PCT Filed Aug. 2, 1989, Ser. No. 654,603

Claims priority, application Italy, Aug. 10, 1988, 67755 A/88

Int. Cl.[5] B29C *53/70;* **B29D** *23/22*

U.S. Cl. 156—158 **8 Claims**

1. A method of producing flexible tubes of desired length from several superposed strips of rubber and/or fiber-reinforced rubber comprising the steps of:

fitting an unvulcanized end of a previously-wrapped first section of tube onto a lateral surface of an end portion of an elongate cylindrical core leaving a remaining portion of the lateral surface of the core uncovered;

covering said remaining portion of the core with a plurality of superposed strips of rubber so as to form, as an extension of the first section, a second section of tube having a first end adjacent the first section, an intermediate portion and a second end opposite the first end;

inserting into a vulcanizer a portion of the core covered by the unvulcanized end of the first section, the first end and the intermediate portion of the second section leaving outside the vulcanizer a portion of the core covered by the second end of the second section;

vulcanizing the unvulcanized end of the first section, the first end and the intermediate portion of the second section inserted in the vulcanizer so as to join the first and second sections to form a vulcanized portion of tube;

separating the vulcanized portion of tube from the core by blowing air into the core so that the air passes through holes formed in the surface of the core and works its way between the outer surface of the core and the inner surface of the tube to separate them;

expelling the core from the vulcanizer until the second end of the second section of tube is fitted onto the lateral surface of the end portion of the core with the vulcanized portion of the tube remaining inside the vulcanizer; and

repeating the above steps until the tube has reached the desired length using as the first section of tube at any time the entire portion of the tube produced up to that time.

5,205,890

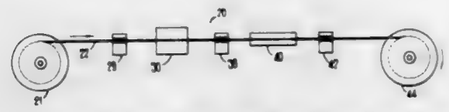
METHOD FOR PROVIDING STABLE PACKAGE OF ELONGATED OPTICAL FIBER WITH BONDED CONVOLUTIONS

Ralph J. Darsey, Lawrenceville; John W. Shea, Chamblee, and Carl R. Taylor, Lawrenceville, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 549,906, Mar. 26, 1990, abandoned, which is a division of Ser. No. 316,615, Feb. 28, 1989, Pat. No. 4,950,049. This application Sep. 11, 1991, Ser. No. 758,172

Int. Cl.[5] B65H *55/00, 55/04*

U.S. Cl. 156—169 **11 Claims**



1. A method of providing a stable package comprising a plurality of convolutions of optical fiber, said method comprising:

advancing optical fiber which includes at least one layer of a suitable coating material long a path of travel;

applying an adhesive material which exhibits viscoelastic behavior to an outer surface of the coating material of the optical fiber as it is advanced along the path of travel, said adhesive material being such that it is in a non-tacky state at ambient temperature and has a modulus which varies with respect to time and temperature and is such that, upon suitable treatment, interpenetration of polymer chains, which is capable of being tuned by treatment correlated to exposure to a predetermined elevated temperature for a predetermined length of time to achieve a desired level of adhesion between adhesive material on contiguous portions of the optical fiber, is caused to occur;

causing the adhesive material to become non-tacky;

taking up the optical fiber to which the adhesive material has been applied in a plurality of convolutions;

paying out and then winding the optical fiber to which the adhesive material has been applied in a precision wound package; and

subsequently, treating the precision wound optical fiber with the adhesive material applied thereto by exposing wound convolutions to a predetermined temperature for a predetermined length of time to cause interpenetration of polymer chains of the adhesive material to occur between contiguous portions of adjacent convolutions which cause the adhesive material to hold the convolutions together when said package is cooled to a temperature substantially less than the elevated temperature at which molecular bonding occurs with a level of adhesion which has been tuned by the exposure to the predetermined temperature for the predetermined time to provide a degree of interpenetration of polymeric chains of the adhesive material across boundaries of contiguous portions which is sufficient to provide a stable package and which allows each convolution to be separated from contiguous convolutions and payed out without entanglement and without damage to the coated optical fiber.

5,205,891

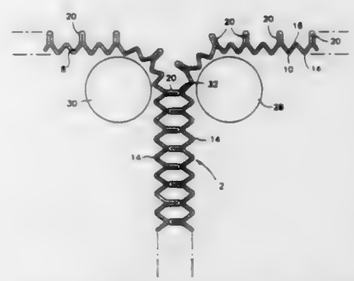
METHOD FOR MANUFACTURING AN EXPANDABLE COLLAPSIBLE PRODUCT

Craig A. Neff, Golden, Colo., assignor to Hunter Douglas, Inc., Upper Saddle River, N.J.

Division of Ser. No. 229,381, Aug. 5, 1988, Pat. No. 4,943,454, which is a continuation-in-part of Ser. No. 90,766, Aug. 28, 1987, Pat. No. 4,861,404. This application Dec. 7, 1989, Ser. No. 447,287

Int. Cl.[5] B32B *31/08, 3/12*

U.S. Cl. 156—204 **11 Claims**



1. A method of manufacturing an integral expandable, collapsible product having a row of parallelly arranged, transversely extending hollow cells therein, comprising the steps of:

folding a first sheet of flexible material to form a folded first sheet having a plurality of transverse folds therein, said plurality of transverse folds of said folded first sheet including a plurality of first folds which project to one side of the folded first sheet and a plurality of second folds which project to the other side of the folded first sheet, wherein the first folds alternate with the second folds such that adjacent ones of said transverse folds of the folded first sheet project to opposite sides of the folded first sheet;

folding a second sheet of flexible material to form a folded second sheet having a plurality of transverse folds therein, said plurality of transverse folds of said folded second sheet including a plurality of first folds which project to one side of the folded second sheet and a plurality of second folds which project to the other side of the folded second sheet, wherein the first folds alternate with the second folds such that adjacent ones of said transverse folds of the folded second sheet project to opposite sides of the folded second sheet;

forming a plurality of first legs on said folded first sheet, each of said first legs being formed by securing portions of said folded first sheet together adjacent one of the second folds, whereby each of said first legs projects from the same side of the folded first sheet;

feeding said folded first sheet and said folded second sheet toward one another such that said first legs of said folded first sheet project toward said folded second sheet and the second folds of said folded second sheet project toward the folded first sheet; and then

securing each of said first legs of said folded first sheet to a respective second fold of said folded second sheet.

5,205,892

inserting a tubular, flexible cover material into a hollow

nol, a halophenol, cresol, nitrobenzene, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, sulfolane and N,N-dimethyl-

thereon to said substrate until said items contact said substrate,

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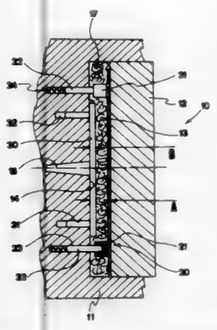
5,205,892

METHOD OF LINING PLASTIC OBJECTS WITH A THIN LAYER OF HEAT SENSITIVE MATERIAL

Giuseppe Gagliani, and Margherita Sagona, both of 10126/2 Via Ugo La Malfa, I-90146 Palermo PA, Italy

PCT No. PCT/IT91/00005, § 371 Date Sep. 27, 1991, § 102(e) Date Sep. 27, 1991, PCT Pub. No. WO91/11326, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 20, 1991, Ser. No. 768,071
Claims priority, application Italy, Jan. 31, 1990, 19206 A/90
Int. Cl.[5] B29C *35/16, 45/14, 47/02, 51/12*
U.S. Cl. 156—212 9 Claims



1. A process for producing a product by uniting a permeable thin layer of low heat conductivity with a plastic material, comprising:

impregnating said thin layer with a liquid or paste substance having good heat conducting properties;

placing said impregnated thin layer adjacent to a heat conducting wall,

contacting said impregnated thin layer with a molten plastic material so that said thin layer and said plastic material are stably united,

passing heat from the molten plastic material to the thin layer, and

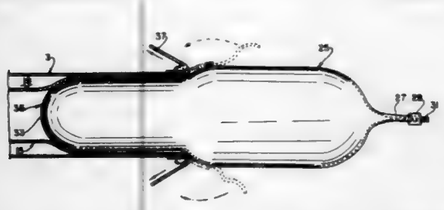
rapidly passing said heat through said liquid or paste substance impregnated in said thin layer to the heat-conducting wall, a sufficient amount of heat being passed through said impregnated thin layer to said heat-conducting wall to prevent the thin layer from becoming so hot as to damage it.

5,205,893

METHOD AND APPARATUS FOR ATTACHING LAGGING MATERIAL TO A ROLLER

Richard W. New, and Amos J. Lewman, both of St. Louis, Mo., assignors to Beltservice Corporation, St. Louis, Mo.

Continuation of Ser. No. 370,813, Jun. 23, 1989, abandoned.
This application Dec. 18, 1991, Ser. No. 809,788
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—215 6 Claims



4. A method of attaching a cover on a device to be covered comprising:

inserting a tubular, flexible cover material into a hollow fixture said hollow fixture having a sidewall;

inserting a flexible tool into one end of the cover material; said flexible tool defining an open end receptacle when positioned in said cover material;

inserting an expandable member into the tool;

expanding the expandable member, the tool and the cover material, to assist in folding of the flexible tool and flexible cover material over the end of the fixture, and clamping at least the cover material in sealing relationship to the fixture along one end thereof;

deflating and covering the expandable member;

inserting at least an expandable member in a second end of the cover material, expanding the member so as to seal the cover material against the fixture along a second end thereof, so that a chamber is formed between the cover material and said fixture;

creating a vacuum to evacuate the chamber and expand the tube against the side wall of the fixture;

inserting a device to be covered into the fixture; and

releasing the vacuum whereby the tube falls away from the side wall and collapses around the outer surface of the device being covered.

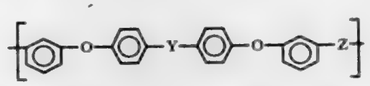
5,205,894

POLYIMIDE AND HIGH-TEMPERATURE ADHESIVE OF POLYIMIDE

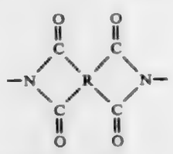
Masahiro Ohta, Yokohama; Saburo Kawashima, Yokosuka; Yoshiho Sonobe, Yokohama; Shoji Tamai, Yokohama; Hideaki Oikawa, Yokohama; Kouji Ohkoshi, Zushi, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 611,471, Nov. 19, 1990, which is a continuation of Ser. No. 334,372, Apr. 6, 1989, abandoned, which is a division of Ser. No. 44,028, Jun. 3, 1987, Pat. No. 4,847,349.
This application Jun. 17, 1991, Ser. No. 724,548
Claims priority, application Japan, Aug. 27, 1985, 60-186610; Sep. 19, 1985, 60-205283; Oct. 11, 1985, 60-224812; Mar. 5, 1986, 61-046369
Int. Cl.[5] C08G *73/10*
U.S. Cl. 156—283 9 Claims

1. A method for adhering a first substrate and a second substrate, which comprises: applying a solution of a polyimide dissolved in an organic solvent, onto a surface of the first substrate and optionally onto a surface of the second substrate, the polyimide consisting essentially of recurring units of the formula:



wherein Y is radical —S— or —$C(CH_3)_2$—, Z is:



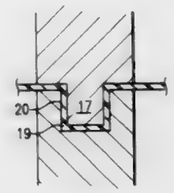
and R is a tetra-valent radical selected from the group consisting of (a) an aliphatic radical having at least 2 carbon atoms, (b) a cyclo-aliphatic radical, (c) a monoaromatic radical, (d) a condensed polyaromatic radical wherein the aromatic radicals are mutually connected with a bond or a crosslinking function, and (e) a non-condensed polyaromatic radical wherein the aromatic radicals are mutually connected with a bond or crosslinking function, and the organic solvent is selected from the group consisting of a halogenated aliphatic hydrocarbon, phenol, a halophenol, cresol, nitrobenzene, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, sulfolane and N,N-dimethylformamide; overlapping the applied surface of the first substrate with an untreated or applied surface of the second substrate; preheating the overlapped substrates to remove the organic solvent present; and heating the overlapped substrates at a temperature of from 50° to 400° C. under a pressure of from 1 to 1,000 kg/cm^2.

5,205,895

METHOD OF FORMING BONDED JOINTS

Alvin E. Hohman, Jr., Dallas, and Howard M. Price, Burleson, both of Tex., assignors to Loral Vought Systems Corporation, Grand Prairie, Tex.

Filed May 5, 1989, Ser. No. 347,625
Int. Cl.[5] B32B *31/00*; C09J *5/04*
U.S. Cl. 156—293 20 Claims



1. In a method for the formation of a multi-component adhered structure, the steps comprising:

(a) establishing a primer layer of a curable primer resin on at least one of the conforming mating surfaces of the components to be joined together in forming said structure;

(b) heating said primer layer at a first temperature and for a period to expel volatile matter from said primer resin but insufficient to cross-link said primer resin to a completely cured state thereby leaving active bonding sites in said primer resin;

(c) joining the mating surfaces of said components together with an intermediate adhesive layer between said mating surfaces and formed of a curable adhesive resin having bonding sites available for reaction with bonding sites in said primer layer; and

(d) thereafter heating the thus joined structure at a substantially greater temperature than said first temperature and for a period sufficient to cure said adheaive and primer resins and establish cross-linking between the interfaces of said adhesive and primer resins.

5,205,896

COMPONENT AND SOLDER PREFORM PLACEMENT DEVICE AND METHOD OF PLACEMENT

Raymond L. Brown, Fountain Valley, and Gerald B. Smith, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 3, 1992, Ser. No. 829,665
Int. Cl.[5] B23K *17/00, 20/00*
U.S. Cl. 156—297 17 Claims

1. A method of placing discrete items in a predetermined pattern on a substrate comprising the steps of:

providing an item holder having a pattern of item areas conforming to said predetermined pattern,

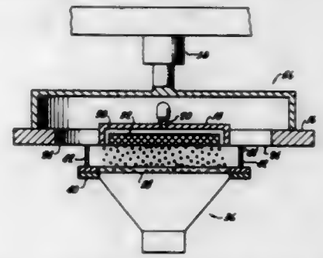
providing a kinetic cloud of discrete items,

detachably securing those items that approach said item holder at said item areas thereof,

positioning said item holder with said items adjacent said substrate with said item pattern of said holder in registration with said predetermined pattern on said substrate,

moving said item holder with the detachably secured items thereon to said substrate until said items contact said substrate,

releasing said items from said item holder, and



removing said item holder from said substrate and items thereon.

5,205,897

METHOD OF BONDING LOUDSPEAKER DIAPHRAGM

Yoshinori Nonaka, Kashiwara, Japan, assignor to Onkyo Corporation, Osaka, Japan

Filed Jun. 24, 1991, Ser. No. 720,062
Claims priority, application Japan, Jun. 29, 1990, 2-172987
Int. Cl.[5] C09J *5/04*
U.S. Cl. 156—315 12 Claims

1. A method of bonding a loudspeaker diaphragm formed of an olefinic resin to another loud speaker component such as a surround, a voice coil bobbin and a dust cap, comprising the steps of:

applying an adhesion primer comprising an air-curing unsaturated polyester resin to bonding positions on said loudspeaker diaphragm,

allowing said adhesion primer to cure,

applying either a rubber or acrylic adhesive to said bonding positions subsequent to curing said adhesive primer,

superimposing said loudspeaker and said another loudspeaker component so that the respective components are juxtaposed, and

then joining said loudspeaker and said another loudspeaker component together at said bonding positions.

5,205,898

CONTINUOUS FIBER THERMOPLASTIC PREPREG

Maywood L. Wilson, Tabb, and Gary S. Johnson, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1990, Ser. No. 613,046
Int. Cl.[5] B05C *3/152*; B29B *15/12*; B29C *67/14*
U.S. Cl. 156—441 2 Claims

1. In a pultrusion machine for making continuous length prepreg tape wherein a plurality of fiber tows are pulled through a resin impregnation bath into a drying area and through a heated, shaping die system before being wound onto a take-up spool, the improvement therein comprising:

an impregnator vessel having an entrance and an exit side permitting pulling of multiple fiber tows therethrough, the impregnator vessel including an exiting orifice and an adjustable metering device disposed adjacent and com-

pletely covering said exiting orifice of said impregnator

5,205,899

THERMAL EXPANSION COMPENSATED HOT KNIFE

thin-film crystal by a diffracted laser beam-detecting device provided at a position standing apart from the optical axis of

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5,205,903

PRODUCTION OF HONEYCOMB

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pletely covering said exiting orifice of said impregnator vessel to control the quantity of impregnating material contained within said fiber tows exiting said impregnator vessel, the metering device comprising a first elongated plate member and a second elongated plate member disposed in adjacent relationship thereto, a pair of spaced shims disposed between and in contact with both said first and said second elongated plate members, said shims and surfaces of said first and said second elongated plate members defining a thin rectangular opening between said first and said second elongated plates, bolt means securing said first and said second elongated plate members in fixed relationship, whereby said thin rectangular opening serves as a metering orifice to control the quantity of impregnating material permitted to exit said impregnator vessel with said fiber tows;

said impregnator vessel containing a quantity of fiber impregnating material and having a corrugated interior bottom surface therein;

said corrugated interior bottom surface including alternate raised and depressed areas disposed transverse to said entrance and said exit sides of said vessel;

an insert for said impregnator vessel including a pair of support walls and a cylindrical rod extending the length of and disposed partially within each of said depressed areas of said corrugated interior bottom surface of said impregnator vessel;

multiple spools of fiber tow disposed adjacent said impregnator vessel;

a guide fixture disposed adjacent one side of said impregnator vessel and between said vessel and said multiple spools of fiber tow and serving to maintain individual fiber tows from said multiple spools of fiber tow separated when entering said impregnator vessel;

a drying area for the impregnated fiber tows disposed adjacent said exit side of said impregnator vessel;

said drying area including a pair of spaced perforated sheets receiving the impregnated fiber tows therebetween and a source of hot air directed toward said perforated sheets to facilitate drying of the impregnated fiber tows;

a series of heated dies receiving the impregnated fiber tows from said drying area, wherein said heated dies comprise a plurality of elongated dies positioned in spaced relationship on a planar die mounting plate surface and transversely disposed relative to the impregnated fiber tows, the plurality of elongated dies comprising six elongated heated dies, and wherein a first, second, third, fourth and sixth member thereof are provided with a flat heated surface having radiused edges, said radiused edges of said first, second and fourth members of said six elongated heated dies being spaced from said die mounting plate surface, and said flat heated surface having radiused edges of said third and said sixth heated dies being disposed adjacent said die mounting plate surface; and wherein a fifth die including an elongated heated nip roll is disposed adjacent the flat heated surface having radiused edges of said fourth die; and wherein the impregnated tow fibers pass over and contact the flat heated surface of said first and said second members of said six elongated heated dies, pass beneath while maintaining contact with the flat heated surface of said third die, pass between and maintain contact with the flat heated surface of said fourth die and said heated nip roll of said fifth die, and then pass beneath and maintain contact with the flat heated surface of said sixth die; and

at least some members of said series of heated dies being provided with flat heated surfaces having radiused edges for contacting the impregnated fiber tows;

a pulling mechanism receiving the prepreg tape; and

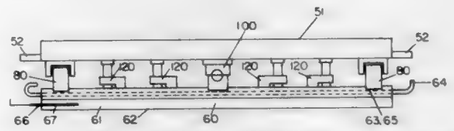
a take-up spool disposed adjacent said pulling mechanism receiving the prepreg tape.

5,205,899

THERMAL EXPANSION COMPENSATED HOT KNIFE

Daniel W. Woodman, Jr., Beverly, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Jun. 4, 1992, Ser. No. 893,463
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—515 **8 Claims**



1. A thermal expansion compensated heat sealing apparatus comprising:

a) a support beam including means for mounting said heat sealing apparatus to a means for reciprocating said heat sealing apparatus towards and away from a workpiece;

b) a heated knife body for engagement with said workpiece;

c) a fixed support assembly for connecting the heated knife body to the support beam at one point;

d) an end support assembly adapted to permit sliding of the heated knife body parallel to the support beam while permitting rotation of the end of the knife body in a plane parallel to the plane of seal bar reciprocation; and

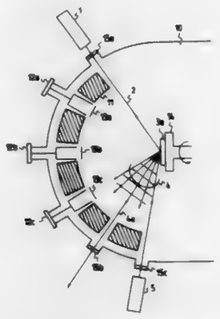
e) one or more jacking bolts between the support beam and the hot knife body and located between the fixed support and the end support for forcing the hot knife body towards or away from the support beam.

5,205,900

METHOD OF MONITORING SURFACE ROUGHNESS OF CRYSTAL, AND CRYSTAL GROWTH EQUIPMENT

Kaoru Inoue, Osaka, Japan; Jean C. Harmand, Villejuif, France, and Toshinobu Matsuno, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 21, 1991, Ser. No. 702,816
Claims priority, application Japan, Jun. 11, 1990, 2-151998
Int. Cl.[5] C30B *23/06*
U.S. Cl. 156—601 **3 Claims**



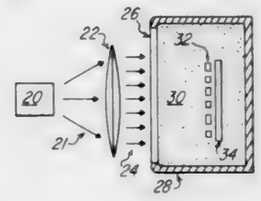
1. A method of monitoring the surface roughness of a crystal, said crystal being grown on a main plane of a first-material substrate crystal provided on a surface of a rotatable substrate holder in a vacuum chamber, said surface generally perpendicular to an axis of said rotatable substrate holder, said crystal grown as a second-material thin-film crystal being different from said first-material substrate crystal, which comprises making a laser beam incident on the surface of the second-material thin-film crystal which is growing, and detecting a diffracted laser beam from the surface of the second-material thin-film crystal by a diffracted laser beam-detecting device provided at a position standing apart from the optical axis of mirror face reflected light of said incident laser beam while rotating the substrate holder about said axis, to detect the change in the intensity of the diffracted laser beam.

5,205,901

ANISOTROPIC BARIUM STRONTIUM TITANATE ETCH

Monte A. Douglas, Coppell; Howard R. Beratan, Richardson, and Scott R. Summerfelt, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 20, 1992, Ser. No. 870,988
Int. Cl.[5] B44C *1/22*; C23F *1/00*
U.S. Cl. 156—635 **13 Claims**



1. A method to anisotropically etch barium strontium titanate comprising the steps of

(a) submersing a surface of said barium strontium titanate in a liquid ambient; and

(b) illuminating portions of said surface with radiation,

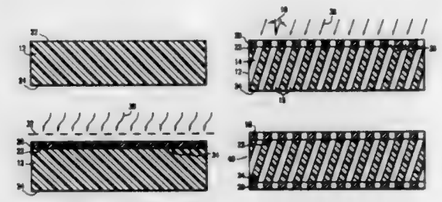
thereby etching said illuminated portions of said surface at a substantially greater rate than the unilluminated portions of said surface.

5,205,902

METHOD OF MANUFACTURING MICROCHANNEL ELECTRON MULTIPLIERS

Jerry R. Horton, Cape Elizabeth, Me., and G. William Tasker, West Brookfield, Mass., assignors to Galileo Elecro-Optics Corporation, Sturbridge, Mass.

Division of Ser. No. 395,586, Aug. 18, 1989, Pat. No. 5,086,248. This application Nov. 12, 1991, Ser. No. 789,975
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/00*
U.S. Cl. 156—643 **26 Claims**



1. A method for manufacturing a microchannel plate comprising the steps of:

forming a body of etchable material;

directionally applying a flux of reactive particles against the body in selected areas corresponding to microchannel locations for removing material from the selected areas to produce microchannels in the body aligned in accordance with the directionality of the applied flux; and

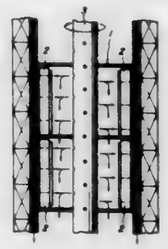
activating the microchannels by forming a continuous thin film dynode of less than 1,000 nm to exhibit secondary electron emissivity.

5,205,903

PRODUCTION OF HONEYCOMB STRUCTURE-EXTENDING DIES

Kazuo Suzuki, Inazawa; Kenji Arai, Nagoya, and Masayuki Matsuzaki, Inabe, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 9, 1992, Ser. No. 818,538
Claims priority, application Japan, Jan. 14, 1991, 3-14832
Int. Cl.[5] B44C *1/22*; C23F *1/00*; B05D *3/04*; C23C *16/00*
U.S. Cl. 156—646 **7 Claims**



1. A process for producing a honeycomb structure-extruding die, said process including the steps of:

etching a surface of a base material for a honeycomb structure-extruding die with a gas; and

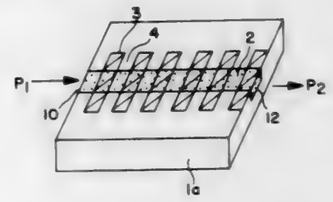
coating the etched base material by CVD before an oxidized film is formed on the etched base material after the etching.

5,205,904

METHOD TO FABRICATE FREQUENCY DOUBLER DEVICES

Kazuhisa Yamamoto, Settsu; Kunihiko Takeshige, Hirakata, and Tetsuo Taniuchi, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 13, 1991, Ser. No. 668,950
Int. Cl.[5] H01L *21/00*; G02B *6/12*
U.S. Cl. 156—664 **10 Claims**



1. A fabricating method of an optical frequency doubler device comprising the steps of: forming periodically disposed protection masks on a nonlinear optical crystal substrate; forming domain-inverted regions by heat treatment after applying a proton exchange process on said non-linear optical crystal substrate; and forming an optical waveguide on said nonlinear optical crystal substrate surface.

5,205,905

evaporation process that simultaneously produces concen-

(g) solidifying the resultant mixture of step (e) to form a

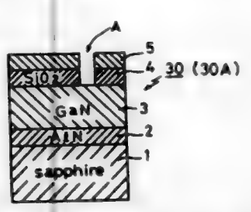
through a venturi throat, a liquid trap or a combination

5,205,905

DRY ETCHING METHOD FOR SEMICONDUCTOR

Masahiro Kotaki; Katsuhide Manabe; Masaki Mori, all of Inazawa, and Masafumi Hashimoto, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of Japan

Filed May 30, 1991, Ser. No. 708,883
Claims priority, application Japan, May 30, 1990, 2-140740
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—662 **8 Claims**



1. A dry etching method for forming an etched surface to make an ohmic contact on semiconductor comprising the steps of:

introducing a boron trichloride (BCl_3) etching gas into a reaction chamber under vacuum;

applying high-frequency power to said boron trichloride (BCl_3) gas for producing plasma thereof;

etching said $Al_XGa_{1-X}N$ ($0 \leqq X \leqq 1$) semiconductor with said plasma;

successively introducing an inert gas into said reaction chamber under vacuum after etching with said plasma;

successively applying high-frequency power to said inert gas for producing plasma of said inert gas; and

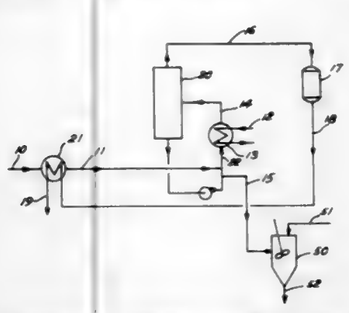
etching an etched surface of said $Al_XGa_{1-X}N$ ($0<X<1$) semiconductor with said plasma of said inert gas after etching said $Al_XGa_{1-X}N$ ($0 \leqq X \leqq 1$) semiconductor with said plasma of said boron trichloride (BCl_3) gas.

5,205,906

PROCESS FOR THE CATALYTIC TREATMENT OF WASTEWATER

James F. Grutsch, Hammond, Ind., and George A. Mortimer, Lake Charles, La., assignors to Chemical Waste Management, Inc., Oak Brook, Ill.

Continuation of Ser. No. 417,885, Oct. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 230,241, Aug. 8, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 654,417
Int. Cl.[5] B01D *1/00*; C02F *1/04*
U.S. Cl. 159—47.3 **13 Claims**



1. A process for continuously treating an aqueous waste stream contaminated with volatile chemically oxidizable pollutants and nonvolatile pollutants comprising, in combination, the steps of:

(a) continuously concentrating the nonvolatile pollutants in the aqueous waste stream to be treated by a continuous evaporation process that simultaneously produces concentrated nonvolatile pollutants originally present in the waste stream and a water rich vapor phase stream substantially free of minerals, dissolved solids and metals, the waste stream to be treated including inorganic nonvolatile pollutants comprising minerals, metals selected from the group consisting of nickel, lead, arsenic, cadmium, mercury, and zinc, and inorganic compounds containing either sulfate compounds or chloride compounds, the water rich vapor stream comprising steam and at least 45% of the volatile chemically oxidizable pollutants originally contained in the waste stream;

(b) operating the continuous evaporation process at conditions sufficient to achieve a solids content of the concentrated nonvolatile pollutants of from about 20 to about 70 wt. %;

(c) removing a stream from the continuous evaporation process comprising a portion of the concentrated nonvolatile pollutants of step (b), the removal occurring while the continuous evaporation process is ongoing;

(d) removing from the continuous evaporation process a portion of the concentrated nonvolatile pollutants of step (b) in order to maintain the solids content in the concentrated nonvolatile pollutants at about 20 to about 70 wt. %;

(e) recycling the stream removed in step (c) back to the continuous evaporation process; and

(f) contacting substantially all of the water rich vapor stream with a solid oxidation catalyst in the presence of steam at gas phase oxidation conditions to convert the volatile chemically oxidizable pollutants, thereby producing a gaseous reaction product comprising steam and incondensible gases, the solid oxidation catalyst comprising an inorganic oxide support containing at least one metal oxide.

12. A process for continuously treating an aqueous waste stream contaminated with volatile chemically oxidizable pollutants and nonvolatile pollutants comprising, in combination, the steps of:

(a) continuously concentrating the nonvolatile pollutants in the aqueous waste stream to be treated by a continuous evaporation process that simultaneously produces concentrated nonvolatile pollutants originally present in the waste stream and a water rich vapor phase stream substantially free of dissolved solids, the waste stream to be treated comprising inorganic nonvolatile pollutants, the water rich vapor phase stream comprising steam and at least 45% of the volatile chemically oxidizable pollutants originally contained in the waste stream;

(b) operating the continuous evaporation process at conditions sufficient to achieve a solids content of the concentrated nonvolatile pollutants of from about 20 to about 70 wt. %;

(c) removing from the continuous evaporation process a portion of the concentrated nonvolatile pollutants of step (b) in order to maintain the solids content of concentrated nonvolatile pollutants at about 20 to about 70 wt. %;

(d) contacting substantially all of the water rich vapor phase stream with a solid oxidation catalyst in the presence of steam at gas phase oxidation conditions to convert the volatile chemically oxidizable pollutants, thereby producing a gaseous reaction product comprising steam and incondensible gases, the solid oxidation catalyst comprising an inorganic oxide support containing at least one metal oxide;

(e) mixing a part of the portion of concentrated nonvolatile pollutants removed from the continuous evaporation process in step (c) with a stabilizing agent selected from the group consisting of cements, lime, fly ash, kiln dusts, alkali metal silicates, asphalts, pozzolans, and mixtures thereof;

(f) recycling a second part of the portion of concentrated nonvolatile pollutants removed in step (c) back to the continuous evaporation process; and

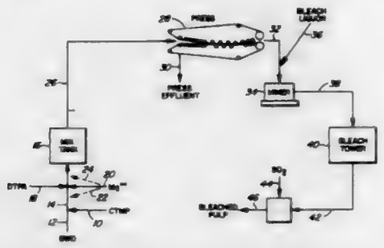
(g) solidifying the resultant mixture of step (e) to form a solid.

5,205,907

REMOVAL OF MANGANESE FROM PULP USING A CHELATING AGENT AND MAGNESIUM SULPHATE

Denis G. Fortier, Burnaby, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Nov. 25, 1991, Ser. No. 796,952
Int. Cl.[5] D21C *3/04*
U.S. Cl. 162—76 **8 Claims**



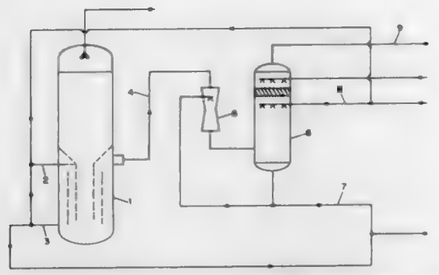
1. A method of enhancing removal of manganese from wood pulps containing manganese comprising applying a suitable chelating agent to said pulp, applying magnesium ions to said pulp in an amount of at least 500 ppm based on the oven dried weight of the pulp to provide a treated pulp substantially free of bleaching chemical having a consistency of less than about 5%, thickening said treated pulp to a consistency of at least 12% by dewatering of said treated pulp to thereby remove an amount of manganese from said pulp greater than the amount of manganese than would be separated if said pulp were treated with said chelating agent but without the addition of the magnesium ions.

5,205,908

PURIFICATION OF PROCESS GAS FROM A PARTIAL COMBUSTION OF BLACK LIQUOR

Lars Stigsson, Bjärred, and Nils Bernhard, Täby, both of Sweden, assignors to Chemrec Aktiebolag, Danderyd, Sweden

Filed May 10, 1991, Ser. No. 698,657
Claims priority, application Sweden, May 31, 1990, 9001957
Int. Cl.[5] D21C *11/06*
U.S. Cl. 162—30.1 **7 Claims**



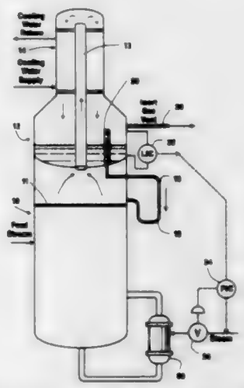
1. Process for the separation of sulphur and sodium compounds from a hot process gas generated during gasification of spent liquor from the kraft pulping industry, through contact with hydrogen sulphide ion and hydroxide ion containing alkaline wash liquids in two or more stages, characterized in that the process gas in a first stage is brought into contact with a wash liquid selected from the group consisting of water and an aqueous alkaline washing liquid by passing the process gas through a venturi throat, a liquid trap or a combination thereof, where melt droplets consisting essentially of water soluble sodium and sulfur compounds in the process gas are separated from the gas and drawn off as an aqueous solution, and where the process gas in a subsequent washing stage is brought into contact with a finely dispersed alkaline washing liquid other than green liquor containing hydroxide ions and hydrogen sulphide ions with a molar ratio of 8:1 or greater wherein said ratio of 8:1 or greater is higher than the molar ratio of hydroxide:hydrogen sulphide ions in the washing liquid used in the first stage, thereby avoiding reformation of gaseous hydrogen sulphide in the subsequent washing stage.

5,205,909

APPARATUS FOR MEASURING REFLUX FLOW IN A DISTILLATION COLUMN

Gerald L. Smith, Galveston, Tex., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 4, 1991, Ser. No. 802,203
Int. Cl.[5] B01D *3/42, 5/00*
U.S. Cl. 202—160 **6 Claims**



1. Apparatus for controlling the operation of a distillation column which comprises:

a distillation column;

a condenser mounted on top of and in flow communcation with said distillation column;

an accumulator associated with said condenser for collecting condensate from said condenser;

a reflux line from said accumulator to the top stage of said distillation column;

a standpipe mounted in said accumulator on the outlet from the accumulator to the reflux line, said standpipe having a pattern of openings around the surface thereof for permitting accumulated condensate to flow into the reflux line;

a liquid level measuring device connected to said accumulator to measure the level of accumulated condensate in said accumulator and to generate a signal; and

a control device in a heat input line to said distillation column operated in response to the generated signal to change the flow of heat to the distillation column.

5,205,910

5,205,912

5,205,914

SYNTHESIS OF DESFLURANE

a diagnostic carbohydrate present in a sample containing a mixture of carbohydrates, said method comprising the steps:

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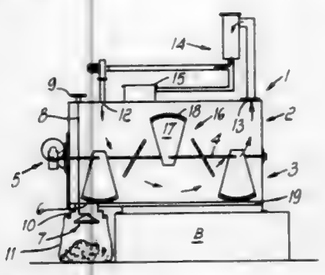
5,205,910
DISTILLATION CHAMBER FOR EXTRACTING DRY-CLEANING SOLVENT FROM SLUDGE

Tommaso Arbizzani, and Gualtiero Ghelardini, both of Pontecchio Marconi, Italy, assignors to Sodibo S.p.A., Bologna, Italy

Filed Aug. 29, 1991, Ser. No. 752,120
Claims priority, application Italy, Sep. 19, 1990, 3658 A/90
Int. Cl.[5] B01D *3/02*
U.S. Cl. 202—175 4 Claims



1. A distillation apparatus for removing dry-cleaning solvents from sludge, comprising:
- distillation chamber for containing the sludge, said distillation chamber comprising an upper portion and a lower portion, said lower portion having a semi-cylindrical shape with a horizontally arrangeable axis;
- means for heating the sludge inside said distillation chamber to evaporate solvents from the sludge;
- means for condensing and separating evaporated solvents;
- a rotatable shaft which is arranged inside said distillation chamber and parallel to said horizontally arrangeable axis;
- a plurality of sector elements which are rigidly connected to said rotatable shaft and which are provided with curved brush-like end portions, said curved brush-like end portions being arranged so as to scrape said lower portion of said distillation chamber upon rotation of said rotatable shaft, said sector elements being arranged in an inclined and mutually spaced manner on said rotatable shaft so as to push sludge inside said distillation chamber toward an end thereof upon rotation of said rotatable shaft;
- a sludge removing outlet provided at a bottom of said lower portion of said distillation chamber at said end thereof;
- means for sealingly closing said sludge removing outlet; and
- a shaped lip connected to said sludge removing outlet and extending downwardly from said bottom of said lower portion; and
- a sludge collecting bag which is removably fixable in a sealed manner about said shaped lip.

5,205,911
CATHODE RESTORATION

Richard J. Kawolics; Rudolf C. Matousek, both of Chagrin Falls, and Anthony J. Vaccaro, Mentor, all of Ohio, assignors to OxyTech Systems, Inc., Chardon, Ohio

Filed Nov. 13, 1990, Ser. No. 611,581
Int. Cl.[5] C25B *15/00*
U.S. Cl. 204—98 17 Claims

1. The method of conditioning a metal cathode which has been used in a chlor-alkali cell, and especially wherein a separator is utilized in said cell in conjunction with said cathode and said cell is susceptible to the generation of hydrogen impurity in chlorine product, which method comprises heating said cathode in an oxygen-containing atmosphere at a temperature, and for a time, sufficient to at least substantially effect a change in the form of any oxygen-containing constituent present at the surface of said metal cathode.

5,205,912
CONVERSION OF METHANE USING PULSED MICROWAVE RADIATION

William J. Murphy, Brights Grove, Canada, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

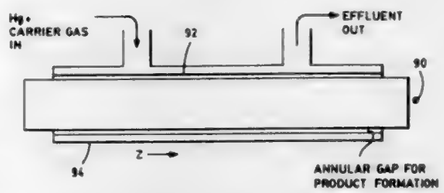
Continuation of Ser. No. 686,333, Apr. 16, 1991, abandoned, which is a continuation of Ser. No. 457,426, Dec. 27, 1989, abandoned. This application Mar. 27, 1992, Ser. No. 858,917
Int. Cl.[5] C07C *1/00*
U.S. Cl. 204—157.15 14 Claims

1. A method for converting methane to acetylene, ethylene, and hydrogen which comprises
- (a) introducing methane into a reaction zone that contains at least one elongated plasma initiator capable of initiating an electric discharge in an electromagnetic field, and
- (b) subjecting the methane and plasma initiator to pulsed microwave radiation, thereby initiating an electric discharge, ionizing the methane in the reaction zone, and converting at least a portion of the methane to acetylene, ethylene, and hydrogen.

5,205,913
PROCESS OF ^{196}HG ENRICHMENT

Mark W. Grossman, Belmont, and Charles E. Mellor, Salem, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 526,952, May 21, 1990, which is a continuation of Ser. No. 289,644, Dec. 23, 1988, abandoned. This application Jul. 18, 1991, Ser. No. 732,866
Int. Cl.[5] B01D *5/00*
U.S. Cl. 204—157.22 1 Claim



1. A process of producing mercury isotopically enriched in ^{196}Hg isotope comprising forming a feedstock comprising a predetermined concentration of ^{196}Hg isotope, flowing said feedstock through a reactor at a predetermined flow rate to isotopically enrich said isotope and yield a product enriched in said isotope, said reactor comprising a source of light in the form of a tube having a diameter of about 10 millimeters for producing mercury excitation radiation of about 2537 Å and a glass reaction chamber for photochemically reacting mercury, said glass being selected so as to filter wavelengths below about 200 for reducing ozone formation wherein the exterior surface of said glass comprises a reflective coating formed thereon by the use of photoresist masking for completely coating the exterior surface without coating the interior surface, said reactor comprising a gas inlet and outlet ports situated so as to define a gas flow path along a reactor length of at least about 40 cm to about 150 cm, a filter arranged concentrically around the lamp, adjusting said predetermined flow rate of said feedstock for substantially maximizing said yield of a product enriched in said isotope for said reactor length, and selecting a reactor length for obtaining a desired yield of product enriched in said isotope wherein said yield increases with increasing reactor length.

5,205,914
SYNTHESIS OF DESFLURANE

Leonid A. Rozov, Fair Lawn; Chialang Huang, Edison, and Gerald G. Vernice, Nutley, all of N.J., assignors to Anaquest, Inc., Liberty Corner, N.J.

Filed Aug. 14, 1992, Ser. No. 930,867
Int. Cl.[5] C07C *17/00*
U.S. Cl. 204—157.94 10 Claims

1. A process for the preparation of 1,2.2,2-tetrafluoroethyl difluoromethyl ether comprising:
- (a) reacting hexafluoropropene epoxide with methanol to yield methyl 2-methoxytetrafluoropropionate;
- (b) hydrolyzing the product of step (a) to form 2-methoxytetrafluoropropionic acid;
- (c) decarboxylating said acid to form 1,2,2,2-tetrafluoroethyl methyl ether;
- (d) chlorinating said ether to form $CF_3CFHOCHCl_2$; and
- (e) reacting the product of step (d) with a fluorinating agent to form 1,2,2,2-tetrafluoroethyl difluoromethyl ether.

5,205,915
CONVERSION OF METHANE USING CONTINUOUS MICROWAVE RADIATION (OP-3690)

Alberto Ravella, Sarnia, and William J. Murphy, Brights Grove, both of Canada, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 686,332, Apr. 16, 1991, abandoned, which is a continuation of Ser. No. 457,428, Dec. 27, 1989, abandoned. This application Mar. 27, 1992, Ser. No. 858,810
Int. Cl.[5] C07C *1/00*
U.S. Cl. 204—157.15 14 Claims

1. A method for converting methane to acetylene, ethylene, and hydrogen which comprises
- (a) introducing methane into a reaction zone that contains at least one elongated plasma initiator capable of initiating an electric discharge in an electromagnetic field, and
- (b) subjecting the methane and plasma initiator to continuous microwave radiation, thereby initiating an electric discharge, ionizing the methane in the reaction zone, and converting at least a portion of the methane to acetylene, ethylene, and hydrogen.

5,205,916
CATHODIC ELECTRODEPOSITION COATINGS CONTAINING AN ANTIOXIDANT ADDITIVE

Ding Y. Chung, Rochester Hills, and Kenneth S. Kirshenbaum, West Bloomfield, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1991, Ser. No. 805,042
Int. Cl.[5] C25D *13/06*; C08L *63/00*; C08K *5/36*, *5/13*
U.S. Cl. 204—181.7 8 Claims

1. In a cathodic electrocoating composition comprising an aqueous carrier having dispersed therein a film forming binder comprising an epoxy-amine adduct and a blocked aromatic polyisocyanate crosslinking agent; wherein the improvement comprises the use of about 0.1–10% by weight, based on the weight of the binder, of an antioxidant mixture consisting of a phenolic antioxidant and a sulfur containing antioxidant; whereby the antioxidant mixture substantially reduces yellowing of the composition after electrodeposition to a substrate and subsequent baking and substantially reduces delamination of a topcoat applied to the electrodeposited composition.

5,205,917
FLUOROPHORE ASSISTED CARBOHYDRATE ELECTROPHORESIS DIAGNOSIS

John C. Klock, Jr., Mill Valley, Calif., assignor to Glyko, Inc., Novato, Calif.

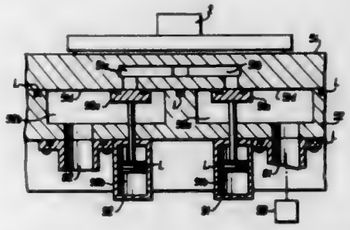
Filed May 7, 1991, Ser. No. 696,584
Int. Cl.[5] G01N *27/26*, *27/447*
U.S. Cl. 204—182.8 25 Claims

1. A method of diagnosing a disease by measuring labels of a diagnostic carbohydrate present in a sample containing a mixture of carbohydrates, said method comprising the steps:
- separating said diagnostic carbohydrate from other carbohydrates that may be present in said sample by fluorophore assisted carbohydrate electrophoresis, and,
- comparing the quantity of at least one diagnostic carbohydrate present in said sample with the quantity of the same diagnostic carbohydrate present in a reference standard.
- wherein said sample is a patient sample, and the quantity of said standard is the quantity of said diagnostic carbohydrate present in a comparable sample from an individual with or without said disease.

5,205,918
APPARATUS HAVING A VACUUM CHAMBER

Kyoji Kisokiri, and Hisashi Ubukata, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shibaura Seisakusho, Japan

Filed May 30, 1991, Ser. No. 707,891
Claims priority, application Japan, May 31, 1990, 2-142650
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.07 6 Claims



1. A sputtering apparatus having a vacuum chamber, comprising:
- a walled vacuum chamber capable of holding a pressure therein at a pressure different from an outside pressure;
- a load-lock chamber formed at a portion of said vacuum chamber, for transferring an object between the chamber and outside of said vacuum chamber while holding the pressure in said vacuum chamber at a pressure different from the outside pressure; and
- a piping apparatus comprising:
  - an exhaust valve means comprising a seat and a seal means, for regulating flow of exhaust gas with respect to said load-lock chamber;
  - a common passage of limited length formed within a wall of said vacuum chamber, said common passage communicating with said load-lock chamber;
  - means for actuating said valve means;
  - an intake passage, communicating with said common passage and an outer surface of said vacuum chamber, said intake passage further communicating with an intake gas pipe;
  - an exhaust passage, communicating with said common passage and an outer surface of said vacuum chamber which forms said seat of said exhaust valve means seat, said exhaust passage further communicating with an exhaust gas pipe, said exhaust passage being interruptable by said seal means of said exhaust valve means contacting said seat of said exhaust valve means;
  - wherein said valve is positioned to directly open and close said exhaust passage at the seat of said exhaust valve means.

5,205,919

5,205,921

drodemetallization catalyst is in the range of from 25% to 75% of the catalytic bed, wherein hydrogen is fed into the

ature of 900° to 1200° F. and comprising cracked products

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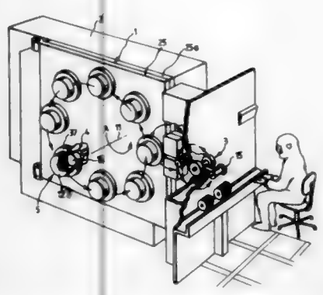
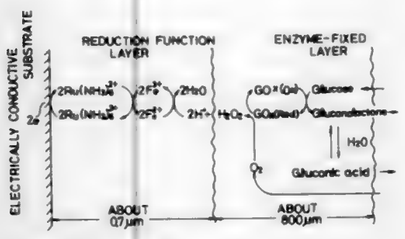
5,205,919
CATHODE SPUTTERING APPARATUS
Jaroslav Zejda, Rodenbach, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany
Filed Jun. 20, 1991, Ser. No. 731,857
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1991, 4110490
Int. Cl.[5] C23C *14/56, 14/50*
U.S. Cl. 204—298.25 **15 Claims**



1. Cathode sputtering apparatus for coating substrates in a vacuum chamber which accommodates a rotating substrate carrier including a central hub, comprising at least one cathode sputtering station and at least one feeding and discharge station, wherein the substrate carrier further comprises at least one substrate gripper which interacts with a pair of annular closing elements of a lock valve which serves to separate the sputtering space in front of at least one cathode sputtering station from the remaining segment of the vacuum chamber.

5,205,920
ENZYME SENSOR AND METHOD OF MANUFACTURING THE SAME
Noboru Oyama, 5-24, Shinmachi 3-chome, Fuchu-shi, Tokyo; Takeshi Shimomura, and Shuichiro Yamaguchi, both of c/o Terumo Kabushiki Kaisha : 1500, Inokuchi, Nakai-cho, Ashigarakami-gun, Kanagawa-ken, all of Japan
Filed Mar. 2, 1990, Ser. No. 487,372
Claims priority, application Japan, Mar. 3, 1989, 1-51291; Mar. 28, 1989, 1-76218
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—403 **4 Claims**

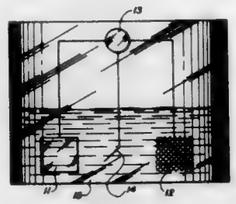


1. An enzyme sensor comprising:
an electrically conductive substrate;
a reduction function layer covering at least part of said electrically conductive substrate, including an electron movement medium with a structure represented as $[Ru(NH_3)_6]^{3+}$ or $[Ru(NH_3)_5X]$, where X represents pyridine, halogen ion, nicotinamide or crystal water, and di-valent iron ions, and capable of causing a reduction reaction of hydrogen peroxide; and
an enzyme-fixed layer covering at least part of said reduction function layer.

5,205,921
METHOD FOR DEPOSITING BIOACTIVE COATINGS ON CONDUCTIVE SUBSTRATES
Morteza Shirkanzadeh, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada
Filed Feb. 4, 1991, Ser. No. 650,189
Int. Cl.[5] C25D *11/00*
U.S. Cl. 205—318 **14 Claims**

1. A process for electodepositing an adherent ceramic phosphate coating on a conducting substrate comprising:
(a) providing an electrolytic cell having an inert anode and containing an electrolyte comprising an aqueous solution containing ions of said ceramic and having a pH of less than 8;
(b) activating said conducting substrate;
(c) immersing said conducting substrate in said electrolyte;
(d) applying a DC potential between said anode and said activated conducting substrate so as to raise the pH of said electrolyte at an interface between said electrolyte and said activated conducting substrate sufficient to precipitate said ceramic from said electrolyte and onto said activated conducting substrate.

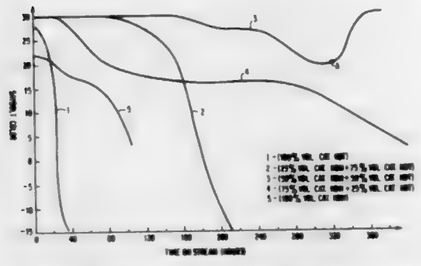
5,205,922
FORMATION OF PITTING RESISTANT ANODIZED FILMS ON ALUMINUM
John S. Ahearn, Jr., Sykesville; Guy D. Davis, Columbia, both of Md., and William C. Moshier, Englewood, Colo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 20, 1990, Ser. No. 618,190
Int. Cl.[5] C25D *11/06*
U.S. Cl. 205—332 **7 Claims**



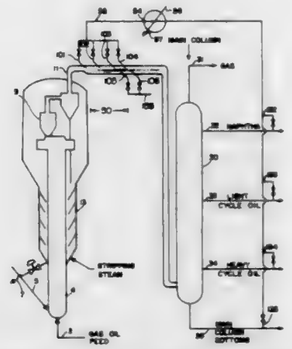
1. A method of protecting aluminum from pitting, comprising the steps of:
(a) growing an oxide film on aluminum and (b) incorporating a molybdenum inhibitor into said film by anodizing the aluminum in the presence of a molybdate inhibitor in solution.

5,205,923
PROCESS FOR HYDROGENATION OF MACRO- AND MICROCRYSTALLINE PARAFFINS
Guilherme Lués M. De Souza, Niterói; Antonio Adolfo F. Valle, and Rosa Maria P. Wodtke, both of Rio de Janeiro, all of Brazil, assignors to Petroleo Brasileiro S.A. Petrobras, Rio de Janeiro, Brazil
Filed Apr. 4, 1991, Ser. No. 680,475
Claims priority, application Brazil, Jul. 17, 1990, 9003449
Int. Cl.[5] G10G *73/02, 73/38*
U.S. Cl. 208—27 **7 Claims**

1. A process for the hydrogenation of macro- and microcrystalline paraffins which comprises:
contacting said macro- and microcrystalline paraffins with a catalytic bed comprising a first catalytic bed and a second catalytic bed, the contacting being with the first catalytic bed and then with the second catalytic bed, wherein the first catalytic bed comprises a hydrodemetallization catalyst and the second catalytic bed comprises a hydrotreatment catalyst, wherein the volume amount of the hydrodemetallization catalyst is in the range of from 25% to 75% of the catalytic bed, wherein hydrogen is fed into the catalytic bed with the macro- and microcrystalline paraffins, wherein said hydrodemetallization catalyst comprises between 1 and 14 wt % Mo, between 0 and 4 wt % Ni, between 0 and 4 wt % Co, and between 0 and 3 wt % P, and said hydrotreating catalyst comprises between 5 and 20 wt % Mo, between 0 and 8.0 wt % Ni, between 0 and 8 wt % Co, and between 0 and 6 wt % P, wherein at least once during said process the feed of the microcrystalline paraffin is stopped and the macrocrystalline paraffin is used as the feed, whereby the Saybolt color index is increased as compared to the Saybolt color level obtained while feeding said microcrystalline paraffin, wherein said contacting is at a temperature between 280° and 345° C., at a hydrogen pressure of from 75 to 150 kg/cm^2, wherein the hydrogen to macro- and microcrystalline paraffin feed ratio is from 150 to 400 L/L, and wherein the weight hourly space velocity during said contacting is from 0.20 to 0.80 h^{-1}, and wherein said contacting is co-current.



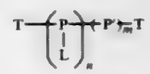
5,205,924
TRANSFER LINE QUENCHING PROCESS AND APPARATUS
Paul J. Betts, Rockville Centre, N.Y., and Frank M. Buyan, Yardley, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Jul. 12, 1991, Ser. No. 729,136
Int. Cl.[5] C10G *9/16, 9/18, 11/00*
U.S. Cl. 208—113 **16 Claims**



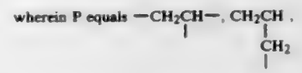
1. In a fluidized catalytic cracking process wherein a heavy hydrocarbon feed comprising hydrocarbons having a boiling point above about 650° F. is catalytically cracked to cracked products comprising the steps of:
a. catalytically cracking said feed in a catalytic cracking zone operating at a riser top temperature of 900° to 1200° F., catalyst/oil ratios of 0.5:1 to 15:1, and catalyst contact times of 0.1 to 50 seconds, by contacting said feed with a source of hot regenerated cracking catalyst to produce a cracking zone effluent mixture having an effluent temperature of 900° to 1200° F. and comprising cracked products and spent cracking catalyst containing coke and strippable hydrocarbons;
b. separating said cracking zone effluent mixture into a cracked product vapor phase having a temperature above 900° F. and a spent catalyst rich phase;
c. stripping and regenerating said spent catalyst to produce regenerated catalyst which is recycled to crack heavy feed;
d. transferring said cracked product vapor from said catalytic cracking zone to a main fractionator which recovers liquid product fractions from said cracking zone effluent via a transfer line having a cross sectional area and an upstream portion near said cracking zone and a downstream portion near said main fractionator at a transfer line temperature above 900° which is sufficient to cause thermal cracking of said cracked vapor product in said transfer line;
e. quenching in a quench zone, comprising a portion of the transfer line having a cross sectional area at least 25% greater than the cross sectional area of the transfer line near said cracking zone, in the upstream portion of said transfer line said cracked product vapor by injection of a liquid product fraction recycled from said main fractionator into said transfer line in an amount and at a temperature sufficient to reduce the temperature of the cracked product vapor in said transfer line by at least 30° F. and to vaporize at least 90% of the injected product liquid, wherein the amount of thermal cracking, as measured by Equivalent Reaction Time at 800° F., in said transfer line is reduced by at least 50%.

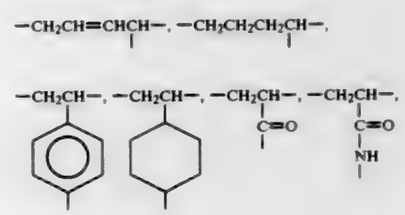
5,205,925
RECOVERING POLYCHLORINATED BIPHENYLS FROM SOLUTION
Robert G. Shoug, Houston, and Robert L. Horton, The Woodlands, both of Tex., assignors to Texaco Inc., White Plains, N.Y.
Filed Jan. 31, 1992, Ser. No. 828,622
Int. Cl.[5] C10G *17/00*
U.S. Cl. 208—262.5 **16 Claims**

1. A method of recovering polychlorinated biphenyls from solution, which comprises:
mixing and reacting a soluble polymer with polychlorinated biphenyls in non-aqueous solvent to form a precipitate reaction complex of the soluble polymer and polychlorinated biphenyls,
said soluble polymer containing functional groups which will interact with polychlorinated biphenyls and having the formula:



wherein P equals





-continued

5,205,927
APPARATUS FOR TREATMENT OF SOILS

5,205,929
HIGH STABILITY POROUS ZIRCONIUM OXIDE

downstream end of said screw thread section is positioned

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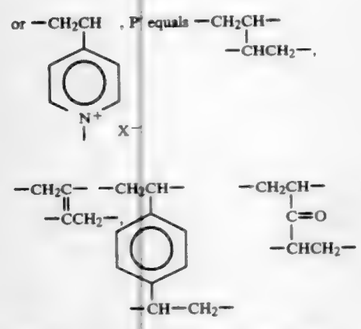
-continued



(P—L)$_y$, P—T, (P—T)$_y$, P—X$_y$, or (P—X)$_y$,

L equals $—NR_3^+OH^-$, $—NR_3^+X^-$, —OH, $—O^-M^+$ —N=C=O, —N=C=S, —COOH, or $—COO^-M^+$,

L' equals any member of the group defined by L, provided that for any given polymer, L ≠ L,

T equals H, a C_1–C_{18} alkyl group or an alkylaryl group with about 1 to 12 carbons in the alkyl chain,

R equals C_1–C_4 alkyl group,

n+y equals about 2 to one million,

m equals 0 to n, provided that m is selected so that the resulting polymer is suitably soluble in non-aqueous solvent,

M^+ equals NH_4^+, or an alkali metal ion, and

X equals Cl, Br, I, or another highly electronegative group; and

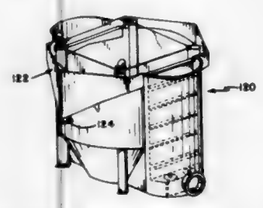
separating the precipitated reaction complex from the solvent.

5,205,926

FROTH FLOTATION MACHINE

George A. Lawrence, Weston, Conn., assignor to Dorr-Oliver Incorporated, Milford, Conn.

Filed Mar. 9, 1992, Ser. No. 849,114
Int. Cl.[5] B03D *1/14, 1/16*
U.S. Cl. 209—168 8 Claims



1. A froth flotation machine comprising:

(a) at least one upright cylindrical flotation cell having an upper end;

(b) an inlet box attached to said cell,

(c) a discharge box attached to said cell;

(d) a rotation mechanism means contained in said cell for producing a mineral rich froth; and

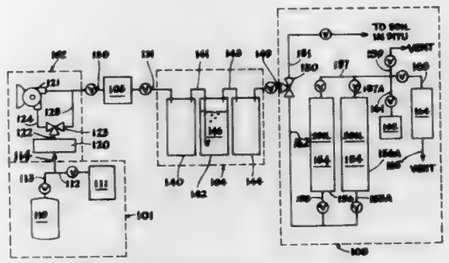
(e) an hexagonally shaped overflow froth launder mounted to and circumferentially extending about the entire periphery of said upper end of said flotation cell for collection of said mineral rich froth.

5,205,927

APPARATUS FOR TREATMENT OF SOILS CONTAMINATED WITH ORGANIC POLLUTANTS

Godage B. Wickramanayake, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 101,049, Sep. 25, 1987, abandoned. This application Aug. 1, 1990, Ser. No. 561,474
Int. Cl.[5] C02F *1/78*
U.S. Cl. 210—170 11 Claims



1. An apparatus for treating soil contaminated with organic compounds comprising:

a. an ozone generator adapted to receive an oxygen containing gas from a gas supply means, that generates ozone from oxygen in the gas to produce a gas-ozone mixture;

b. ozone stabilizing means, containing an acid, connected to the ozone generator by a first pipe for receiving the gas-ozone mixture from the ozone generator, that stabilizes the gas-ozone mixture by contacting the mixture with the acid to produce a stabilized gas-ozone mixture, wherein the acid has a pH of about one (1) or less; and

c. gas-ozone mixture distribution means, connected to the ozone stabilizing means by a second pipe for receiving the stabilized gas-ozone mixture, that distributes the mixture to the soil as a gas.

5,205,928

PROCESS FOR THE PREPARATION OF MICROSPHERICAL SINTERED BODIES OF HYDROXYAPATITE AND A CHROMATOGRAPHIC PACKING MATERIAL COMPRISING THE MICROSPHERICAL SINTERED BODIES OF HYDROXYAPATITE

Senya Inoue; Akira Ono, and Nobuyuki Otaki, all of Soka, Japan, assignors to Kanto Kagaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 704,732, May 20, 1991, Pat. No. 5,108,956, which is a continuation of Ser. No. 321,879, Mar. 10, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 774,512
Claims priority, application Japan, Mar. 11, 1988, 63-56233
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] B01D *15/08;* C01B *25/32;* C04B *35/00, 38/06*
U.S. Cl. 210—198.2 8 Claims

1. Microspherical sintered bodies of hydroxyapatite prepared by a spray firing process comprising:

atomizing into a flame a suspension of hydroxyapatite microparticles dispersed in an inflammable organic solvent, or in a mixture of water and an inflammable organic solvent compatible with water, whereby the resulting microdroplets of the suspension of said hydroxyapatite are heated by the heat of the combustion of said inflammable organic solvent or said inflammable organic solvent compatible with water, to instantaneously form microspherical sintered bodies of hydroxyapatite; and

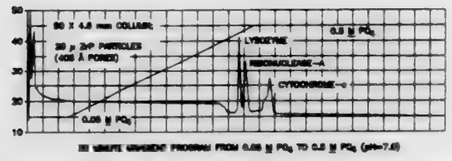
collecting the formed microspherical sintered bodies of hydroxyapatite.

5,205,929

HIGH STABILITY POROUS ZIRCONIUM OXIDE SPHERULES

Peter W. Carr, Minneapolis; Eric F. Funkenbusch, White Bear Lake; Martin P. Rigney, Roseville; Patrick L. Coleman, Minneapolis; Douglas A. Hanggi, St. Paul, and Wes A. Schafer, Minneapolis, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 654,312, Feb. 12, 1991, Pat. No. 5,141,634, which is a division of Ser. No. 420,150, Oct. 11, 1989, Pat. No. 5,015,373, which is a continuation-in-part of Ser. No. 151,819, Feb. 3, 1988, abandoned. This application May 28, 1992, Ser. No. 889,729
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 3 Claims



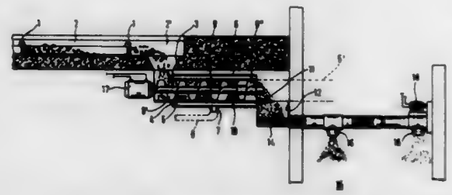
1. A bed comprising porous ZrO_2 spherules of about 0.5–500 microns in diameter, about 1–200 m^2/g surface area and of about 20–500 Å pore diameter; wherein said spherules are substantially stable in an aqueous solution of a pH of about 1–14, and comprise an immobilized protein.

5,205,930

SCREW PRESS FOR SEPARATING MANURE INTO WET AND DRY PHASES

Harald Obrestad, Naerbo, Norway, assignor to Reime A/S, Norway

Continuation of Ser. No. 679,887, Apr. 3, 1991, abandoned. This application Aug. 5, 1992, Ser. No. 925,515
Int. Cl.[5] B01D *29/64*
U.S. Cl. 210—251 4 Claims



1. A device for the mechanical separation of wet natural manure masses into a wet phase and a dry phase, said device comprising:

a substantially horizontal cylindrical sleeve having an upstream end longitudinally spaced from a downstream end, means for receiving masses of natural manure at said upstream end of said sleeve, said sleeve having a cylindrical strainer portion intermediate said ends of said sleeve through which the wet phase of the manure masses is discharged;

a jacket surrounding said strainer portion of said sleeve for receiving the wet phase of the manure masses, said jacket having at least one outlet for the wet phase of the manure masses;

a rotatable screw conveyor arranged concentrically within said sleeve, said screw conveyor comprising a central, driven rotary shaft carrying a first longitudinally extending screw thread section having an upstream end and a downstream end, said upstream end of said first screw thread section being proximate to said upstream end of said sleeve, said first screw thread section extending along a portion of said strainer portion of said sleeve so that said downstream end of said screw thread section is positioned in said sleeve at a location that is longitudinally spaced in the upstream direction from said downstream end of said sleeve, said first screw thread section moving manure masses longitudinally through said sleeve from said upstream end of said sleeve toward said downstream end of said sleeve, said rotary shaft carrying a second longitudinally extending screw thread section positioned within said strainer portion and having an upstream end and a downstream end, said downstream end of said first screw thread section being longitudinally separated from said upstream end of said second screw thread section along said rotary shaft to form a longitudinal space along said shaft intermediate said downstream end of said first screw thread section and said upstream end of said second screw thread section, said longitudinal space forming a corresponding longitudinal, annular zone within said sleeve which is free of obstruction around the entire circumference of said shaft, said longitudinal, annular zone being located upstream of said downstream end of said sleeve and establishing a zone within said sleeve in which a plug of relatively dry manure is continuously formed from the manure masses moved by said first screw thread section, said plug comprising a barrier in said sleeve exerting pressure on said manure masses moved through said sleeve by said first screw thread section for assisting in removing the wet phase from the manure masses upstream of said plug for discharge into said jacket, said second screw thread section removing manure in its dry phase from a downstream end of said manure plug for discharge from said downstream end of said sleeve; and

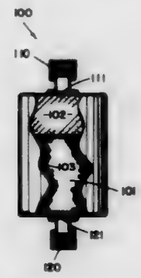
driving means for rotating said screw conveyor.

5,205,931

CERAMIC AND CALCIUM FILTER MECHANISM

Yukio Iida, 1-1-2 Yamanouchi, Kanagawa-Ku, Yokohama-Shi, Kanagawa-Ken, Japan

Filed Jul. 29, 1991, Ser. No. 737,063
Int. Cl.[5] B01D *27/02*
U.S. Cl. 210—264 11 Claims



1. A filter apparatus comprising,

a housing having inlet and outlet means,

a first layer comprising pieces of material including calcium therein disposed within said housing, and

a second layer comprising pieces of ceramic material disposed within said housing,

said ceramic material contains the elements Fe and Cl,

whereby fluid is passed through said housing and through said first and second layers.

5,205,932

a housing;

plate and a contaminated water recirculating outlet micro-emulsion water-based cleaner and contaminants com-

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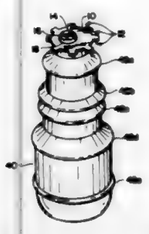
5,205,932

POINT-OF-USE WATER PURIFICATION APPLIANCE

Fred Solomon, Wetumpka, Ala., and Bruce Benefield, Nashville, Tenn., assignors to Nu-Water Systems, Inc., Tallassee, Ala.

Filed Aug. 22, 1991, Ser. No. 748,704
Int. Cl.[5] B01D *27/02*
U.S. Cl. 210—264 11 Claims



1. A pressure canister for bacteriostatic purification and filtration treatment of water, said canister comprising:

a cylindrically symmetrical hollow body of varying diameters and unitary construction including a plurality of interiorly spaced annular grooves, said body having a top neck opening and a base which supports said canister in an upright position;

a series of sections having respective volumes and being axially arranged within said body, said sections containing respective layers of granular filter media;

a plurality of semi-rigid porous filter discs separating adjacent layers of said granular filter media, said filter discs having peripheral edges disposed within said grooves; and

a cap attachable to said neck opening to seal said body against leakage, said cap provided with water input means and water output means, said input means communicating with a first of said sections adjacent said top opening and said output means connected to a centrally positioned axial riser tube which extends proximate said base; whereby

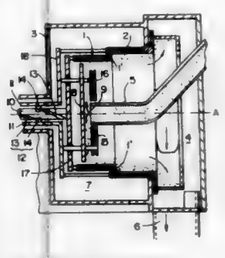
water under pressure entering said canister through said input means sequentially passes through said series of sections containing the respective layers of granular filter media at flow rates determined by the respective volumes of said sections, then the water moves upward through the riser tube and exits said canister through said output means.

5,205,933

PUSHER CENTRIFUGE

Hoppe Bernd, Weiningen, Switzerland, assignor to Sulzer Escher Wyss AG, Zurich, Switzerland

Filed Sep. 28, 1990, Ser. No. 589,547
Claims priority, application Switzerland, Sep. 29, 1989, 03531/89-4
Int. Cl.[5] B01D *33/06*
U.S. Cl. 210—374 14 Claims



14. A pusher centrifuge comprising:

a housing;

two screening drums, comprising a first screening drum and a second screening drum, arranged in longitudinal succession, said screening drums being mounted for rotary movement about a longitudinal axis, each of said screening drums having a respective inner surface, at least portion of said first screening drum positioned within at least portion of said second screening drum;

a pusher ring mounted for rotary movement about said longitudinal axis, said pusher ring comprising an end portion of said first screening drum;

an inlet pipe for feeding material to be centrifuged into said housing;

an outlet through which material exits from said housing;

means for transmitting oscillatory movement to said pusher ring along said longitudinal axis, for advancing said material towards said outlet along said inner surface of said second screening drum; and

means for rotating said pusher ring with respect to said inner surface of said second screening drum during said advancing of said material toward said outlet.

5,205,934

SILICONE-DERIVED SOLVENT STABLE MEMBRANES

Charles Linder, Rehovot; Mara Nemas, Neve Monosson; Mordechai Perry, Petach Tikva, and Reuven Katraro, Rishon Lezion, all of Israel, assignors to Membrane Products Kiryat Weitzman Ltd., Rehovot, Israel

Continuation of Ser. No. 752,847, Aug. 30, 1991, abandoned.
This application Aug. 13, 1992, Ser. No. 929,464
Int. Cl.[5] B01D *71/42*
U.S. Cl. 210—500.43 17 Claims

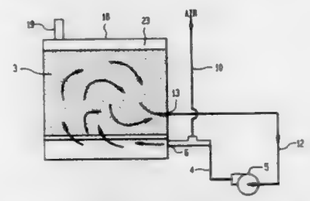
1. A composite membrane which is substantially insoluble in the following solvents, namely, acetonitrile, ethanol, hexane, toluene, N-methylpyrrolidone, dimethylsulfoxide, dimethylformamide, dimethylacetamide, mixtures thereof with each other, and mixtures of any of the foregoing with water, and which comprises a substrate made from a polymer selected from copolymers and homopolymers of ethylenically unsaturated nitriles, which substrate has been subjected to a stepwise treatment sequence comprising the steps of: (1) insolubilizing said polymer by crosslinking; (2) coating with a silicone layer; and (3) crosslinking the silicone layer.

5,205,935

HIGH PERFORMANCE FIXED FILM BIOREACTOR

Joseph J. Ruocco, Longboat Key, Fla., assignor to AAA Environmental Services Corp., Longboat Key, Fla.

Filed Feb. 10, 1992, Ser. No. 833,065
Int. Cl.[5] C02F *3/06, 3/28*
U.S. Cl. 210—603 12 Claims



7. A continuous method of treating contaminated water comprising the steps of:

A. maintaining a flow of contaminated water into a treatment chamber through a contaminated water main inlet connected through an upper surface of said chamber, said chamber also having a perforated plate connected within, and spaced above, a bottom surface of said chamber;

said chamber including bioreactor packing supporting microorganisims disposed therein atop said perforated plate and a contaminated water recirculating outlet positioned above said perforated plate and below the liquid level of the contaminated water maintained within said chamber, said recirculating outlet operably connected to an inlet of a pump, an outlet of said pump operably connected to a recirculating inlet into said chamber positioned between said bottom surface and said perforated plate;

B. continually circulating the contaminated water from said recirculating outlet through said pump, then into said recirculating inlet for generally circular movement up through said perforated plate and through and over said packing material;

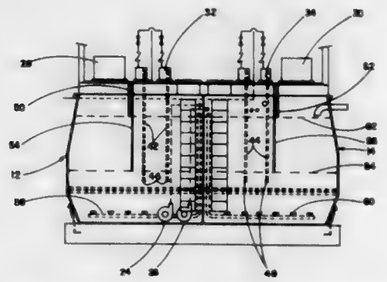
C. continually draining treated water from the bottom of said chamber through an outlet conduit connected at one end thereof through said bottom surface, said outlet conduit configured to establish and maintain the contaminated water level within said chamber.

5,205,936

SEQUENCING BATCH REACTORS

Brian H. Topnik, Waterloo, Canada, assignor to Bio Clear Technology Inc., Manitoba, Canada

Filed Feb. 5, 1992, Ser. No. 831,537
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—614 9 Claims



1. A storm control procedure for use in a process of treating influent waste

water which treatment process comprises:

fill and react cycle comprising supplying waste water to be treated to a reactor and injecting air into the waste water;

react cycle comprising aerobically treating the waste water in the reactor for a predetermined react time after completion of the fill and react cycle;

settle cycle comprising maintaining quiescent conditions in the reactor for a predetermined settle time to allow sludge in the waste water to settle; and

decant cycle comprising withdrawing effluent from the reactor, the storm control procedure comprising:

monitoring the actual waste water influent rate;

comparing the actual waste water influent rate with a selected waste water influent rate; and

reducing the duration of at least one of said cycles when the actual waste water influent rate exceeds the selected waste water influent rate.

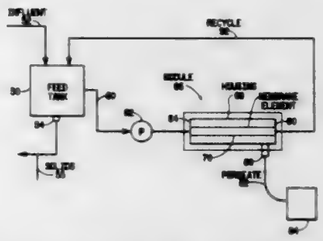
5,205,937

RECOVERY AND REUSE OF WATER-BASED CLEANERS

Ramesh R. Bhave, Cranberry Township, Pa.; Stephen P. Evans, III, Fort Worth, Tex.; Abraham S. Chen, Wexford, Pa., and Henry J. Weltman, Fort Worth, Tex., assignors to U.S. Filter Membralox, Warrendale, Pa.

Filed Apr. 30, 1992, Ser. No. 875,840
Int. Cl.[5] B01D *61/14*
U.S. Cl. 210—651 20 Claims

1. A process for separating contaminants from micro-emulsion water-based cleaner in a feed solution containing said micro-emulsion water-based cleaner and contaminants comprising passing said feed solution by cross flow filtration through a sintered multichannel monolithic metal oxide membrane on ceramic support to form a permeate of said micro-



emulsion water-based cleaner wherein said metal oxide membrane has a nominal pore size greater than about 50 Angstroms and less than about 1000 Angstroms and recovering micro-emulsion.

5,205,938

POLYESTER BAG FILTER

Frank A. Fiumano, East Meadow; Colin F. Harwood, Glen Cove, and Carl H. Meyers, Great Neck, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Mar. 12, 1992, Ser. No. 850,657
Int. Cl.[5] B01D *61/00, 27/00*
U.S. Cl. 210—653 19 Claims

1. A bag filter comprising at least one sheet of a filter medium comprising a melt-blown fibrous web of polyester fibers intertwined and layered on a porous polyester substrate and having a graded pore structure formed into a bag configuration with an opening, an inside surface, an outside surface, and at least two adjoining portions sewn together with thread to form a seam.

5,205,939

REMOVAL OF SILVER FROM AQUEOUS SYSTEMS

Allen R. Syrinek, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 6, 1992, Ser. No. 909,519
Int. Cl.[5] C02F *1/62*
U.S. Cl. 210—727 6 Claims

1. A process for removing dissolved and colloidal silver from an alkaline aqueous liquid which comprises the sequential steps of:

a) treating the alkaline aqueous liquid with at least 3 ppm of a water soluble cationic acrylamide co-polymer which contains from 3 to 50 mole per-cent of diallyldimethyl ammonium chloride and has a molecular weight of at least 1,000,000 to flocculate the colloidal silver;

b) filtering the flocculated alkaline aqueous liquid to form silver rich filtered solids and a filtrate;

c) treating the filtrate produced in step (b) with at least 10 ppm of a water soluble C_1–C_4 alkyl substituted dithiocarbamate to react with the dissolved silver to form a colloidal suspension of silver;

d) treating the filtrate produced in step (c) with at least 0.1 ppm of said water soluble cationic copolymer to flocculate the colloidal silver, and then;

e) filtering the flocculated filtrate produced in step (d) to produce silver rich filtered solids and a filtrate having a silver content of less than 2 ppm.

5,205,940

blies; each assembly including a vertical leg having a base, and a laterally-extending horizontal leg having an end

of said forming members by nails extending through said nail holes; and

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5,205,940

IRON (III) SALT-CATALYZED OXIDATION OF WASTE WATER

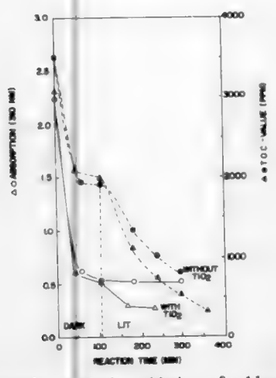
Michael Graetzel, St. Sulpice, Switzerland, assignor to EMS-Inventa AG, Switzerland

Filed Aug. 26, 1991, Ser. No. 749,973

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1990, 4026831

Int. Cl.[5] C02F *1/72*

U.S. Cl. 210—748 **12 Claims**



1. A process for catalytic oxidation of a blend of organic components and water, said process comprising

introducing into said blend TiO_2, hydrogen peroxide, and at least one Fe (III) salt to form a reaction mixture and exposing said reaction mixture to light at a reaction temperature below 80° C.

5,205,941

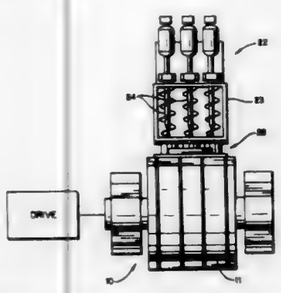
FEEDING EQUALIZATION FOR SLUDGE PRESSES

Erwin Funk; John Bolles, and John Baldwin, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Aug. 2, 1991, Ser. No. 739,472

Int. Cl.[5] B01D *33/64*

U.S. Cl. 210—770 **20 Claims**



16. A method of continuously extracting liquid from a humid mass by pressurization of said mass, said method comprising the steps of:

(a) positively feeding under substantial pressure the humid mass to each of a plurality of inlets to each of a plurality of annular channels as a continuous stream, each of the annular channels having perforations in at least a working section thereof;

(b) creating an axial pressure at the interior of said humid mass;

(c) continuously moving movable side wall sections of the annular channels rotationally about the axis along at least said working section, the movable side wall section having a surface area greater than the surface area of the remaining side wall sections of the annular channels whereby to continuously displace the mass toroidally along at least the working sections and to generate between the movable side wall sections and the humid mass a dynamic friction force thereby creating a pressure which is inferior to the axial pressure whereby to create between the side wall sections and the humid mass a low pressure zone which causes the liquid in said liquid mass to be displaced transversely to the direction of travel of the humid mass and to flow out of said conduit through the perforations;

(d) continuously discharging the mass which contains only a small percentage of liquid at an outlet end of the annular channels; and

(e) equalizing the amount of the humid mass fed to the annular channels at the inlets so as to minimize the chance that one annular channel will be overfed and will not produce a discharged mass with as small a percentage of liquid as desired.

5,205,942

LIPPED CHANNEL FORMWORK

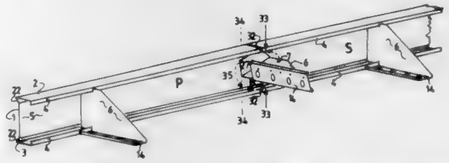
Leonard R. Fitzgerald, 2659 Pacific Highway Eight Mile Plains, Brisbane Queensland 4123, Australia

Continuation-in-part of Ser. No. 249,380, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 87,160, Aug. 19, 1987, Pat. No. 4,846,437. This application Jun. 18, 1990, Ser. No. 540,895

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] E01C *19/50*; E04G *17/04*

U.S. Cl. 249—3 **9 Claims**



1. A formwork for concrete comprising a lipped channel edge form having upper and lower lips projecting towards one another to form a lipped cavity;

at least one edge form support bracket for supporting said edge form;

said bracket including a base member with an aperture therein and an upright member generally perpendicular to said base member;

said upright member including means for attaching said bracket to said edge form by insertion into the lipped cavity and then rotating said bracket until the attaching means securely engages both said upper and lower lips.

5,205,943

APPARATUS FOR MANUFACTURE OF PRECAST CONCRETE BUILDING UNITS

M. Omar A. Jazzar, P.O. Box 777, Clearwater, Fla. 34617

Continuation-in-part of Ser. No. 558,858, Jul. 27, 1990, Pat. No. 5,081,805, which is a division of Ser. No. 398,095, Aug. 23, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 712,179

Int. Cl.[5] B28B *7/22*

U.S. Cl. 249—27 **16 Claims**

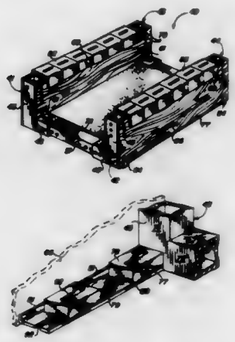
1. Apparatus for the molding of a precast concrete building unit comprising a horizontal web, and flanges respectively joined at opposite juncture edges to the web and extending vertically therefrom out toward extremities of the flanges; said apparatus comprising:

two longitudinally-spaced pairs of L-shaped corner assemblies; each assembly including a vertical leg having a base, and a laterally-extending horizontal leg having an end joined to said vertical leg at said base and having a free end facing the corresponding free end of another assembly of the same pair;

two laterally-extending spacers, each having opposite ends respectively telescopingly received within the facing free ends of the assemblies of each pair;

adjustable means releasably locking the position of said spacers relative to said free ends to establish the lateral spacing of said assemblies of each pair and, thereby, establishing a lateral dimension of the web of the building unit;

two pairs of laterally-spaced vertically-oriented plates, each pair of plates extending between corresponding vertical legs of associated longitudinally-spaced assemblies of each



of said pairs of assemblies; the spacing between said plates in each of said pairs of plates establishing a lateral dimension of the flanges of the unit; each of said plates having a top edge;

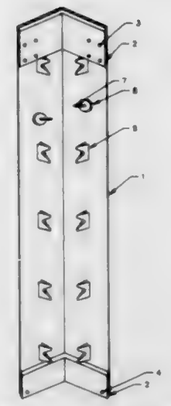
means removably mounting said plates on said corner assemblies;

inserts, having alternating block and void forming members, positioned longitudinally between each of said corresponding vertical legs and between each of said pairs of plates, for forming complementary block and void patterns on the juncture edges of the unit; and

retainers, removably located over the top edges of each of said pairs of plates and respectively including tongue forming means and groove forming means for forming corresponding tongue and groove portions on the extremities of the flanges of the unit.

of said forming members by nails extending through said nail holes; and

a plurality of locking elements welded to the back surface of each of said forming members and being vertically spaced-



apart from the top shim plate to the bottom shim plate whereby said locking element receives the rod of the rod type forming system for holding the corner forming device and the form panels in a locked position.

5,205,944

UNIVERSAL CORNERING SYSTEM

Cort Taylor, 1828 Main St., Munfordville, Ky. 42765

Filed Jul. 15, 1991, Ser. No. 730,345

Int. Cl.[5] E04G *9/08*, *11/08*

U.S. Cl. 249—194 **10 Claims**

1. A concrete corner forming device adapted for using with a rod type forming system having a rod and form panels, said corner forming device comprising:

an angle metal form having first and second forming members defining a desired angle, each of said forming member having a forming surface adapted to contact with a molding concrete material and an opposing back surface;

a plurality of metal shim plates welded to the back surface of top and bottom portions of each of the forming members;

a plurality of nail holes formed in the bottom and top shim plates of each of said forming members whereby the angle metal form is flush with the form panels located adjacent to the first and second forming members by waler members which are mounted to the top and bottom shim plates

5,205,945

MULTIFUNCTIONAL ADDITIVES

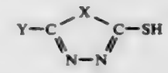
Angeline B. Cardis, Florence; Arjun K. Goyal, Woodbury, and Virginia C. Wisniewski, Voorhees, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 18, 1991, Ser. No. 779,452

Int. Cl.[5] C10M *133/56*, *133/58*

U.S. Cl. 252—47.5 **19 Claims**

1. A multifunctional additive for lubricants comprising a reaction product of a hydrocarbon-substituted succinimide dimer, an aldehyde and a thiol-substituted diazole, the thiol-substituted diazole having the structural formula:



where X is a sulfur atom or oxygen atom and Y is a thiol group or nitrogenous group when Y is a nitrogenous group it is a primary amine characterized by the formula NH_2 or a secondary amine characterized by the formula NHR_1, wherein R1 is a hydrocarbon group containing 1 to 60 carbon atoms.

5,205,946

PROCESS FOR THE PRODUCTION OF OVERBASED CALIXARATES

Stephen J. Cook, North Humberside; Sean P. O'Connor, Reigate, and Andrew Pearce, North Humberside, all of Great Britain, assignors to BP Chemicals (Additives) Limited, London, England

Division of Ser. No. 674,509, Mar. 22, 1991, Pat. No. 5,114,601. This application Feb. 6, 1992, Ser. No. 831,964

Claims priority, application United Kingdom, Mar. 31, 1990, 90/07314.9

Int. Cl.[5] C10M *145/00*; C07C *35/22*

U.S. Cl. 252—25 **14 Claims**

1. A process for the production of an overbased metal salt which comprises reacting at elevated temperature:

(A) either (i) available for reaction with metal base, (ii) a low

based metal calixarate, (iii) a neutral metal calixarate or an

5,205,949

DISPERSANT AND VI IMPROVER ADDITIVE AND

5,205,951

PHOSPHATE ESTER-BASED FUNCTIONAL FLUIDS

aqueous solution including an effective amount of a wetting agent selected from the group consisting of the inor-

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based metal calixarate, (iii) a neutral metal calixarate or an non-sulphurized overbased metal salt of a sulphur-free calixarene having a substituent hydroxyl group or groups available for reaction with a metal base,

(B) a metal base added either in a single addition or in a plurality of additions at intermediate points during the reaction,

(C) a solvent comprising either: (C_1) either (i) a polyhydric alcohol having 2 to 4 carbon atoms, (ii) a di- (C_3 or C_4) glycol, (iii) a tri- (C_2–C_4) glycol or (iv) a mono- or polyalkylene glycol alkyl ether of the formula:

$$R^9(OR^{10})_fOR^{11} \quad \text{(III)}$$

wherein in the formula (III) R^9 is a C_1 to C_6 alkyl group, R^{10} is an alkylene group, R^{11} is hydrogen or a C_1 to C_6 alkyl group and f is an integer from 1 to 6, either alone or in combination with either (C_2) a hydrocarbon solvent or C(3) either (i) water, (ii) a C_1 to C_{20} monohydric alcohol, (iii) a C_1 to C_{20} ketone, (iv) a C_1 to C_{10} carboxylic acid ester or (v) an aliphatic, alicyclic or aromatic C_1 to C_{20} ether, or, (C_4) a C_1 to C_4 monohydric alcohol, in combination with a hydrocarbon solvent (C_2), and

(D) carbon dioxide added subsequent to each addition of component (B).

5,205,947

DISPERSANT ADDITIVES COMPRISING AMINE ADDUCTS OF DICARBOXYLIC ACID MONOEPOXY THIOL REACTION PRODUCTS

Jacob Emert, Brooklyn, N.Y., and Robert D. Lundberg, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 268,400, Nov. 7, 1988, Pat. No. 5,057,617. This application Jun. 27, 1991, Ser. No. 722,064

Int. Cl.[5] C10M *129/72, 129/76, 135/12;* **C07C** *327/00*

U.S. Cl. 252—47.5 **36 Claims**

1. An oil soluble dispersant adduct useful as a lubricating oil dispersant prepared by a process which comprises:

(a) contacting (i) a long chain hydrocarbyl polymer-substituted C_4 to C_{10} dicarboxylic acid producing material formed by reacting an olefin polymer of C_2 to C_{10} monoolefin having a number average molecular weight of about 700 to 5,000 and a C_4 to C_{10} monounsaturated dicarboxylic acid material, said acid producing material having an average of at least about 0.7 dicarboxylic acid producing moieties, per molecule of said olefin polymer present in the reaction mixture used to form said acid producing material; and (ii) a monoepoxy thiol, for a time and under conditions sufficient to form a first adduct monoepoxy hemi-thioester of said dicarboxylic acid producing material, and

(b) contacting said first adduct with at least one amine nucleophilic reagent for a time and under conditions sufficient to form said dispersant adduct.

5,205,948

SULFURIZED OLEFIN-GLYCEROL MONOOLEATE ADDUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 227,949, Aug. 3, 1988, Pat. No. 4,929,253. This application May 11, 1990, Ser. No. 521,866

Int. Cl.[5] C10M *135/02*

U.S. Cl. 252—48.6 **14 Claims**

1. A lubricating oil composition comprising a major proportion of a hydrocarbon lubricating oil or grease prepared therefrom and between 0.01 and 20 percent by weight of an additive which is the reaction product of a sulfurized olefin with glycerol monooleate.

5,205,949

DISPERSANT AND VI IMPROVER ADDITIVE AND LUBRICATION OIL COMPOSITION CONTAINING SAME

Theodore E. Nalesnik, Wappingers Falls; Benjamin J. Kaufman, Hopewell Junction, both of N.Y., and James G. Dadura, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 19, 1991, Ser. No. 717,762

Int. Cl.[5] C10M *105/56*

U.S. Cl. 252—50 **8 Claims**

1. An additive composition prepared by the steps comprising:

A) reacting a styrene-ethylenebutylene-styrene block copolymer, having styrene-ethylenebutylene-styrene molecular weight ratios, respectively, of 1:10:1 to 1:3:1 characterized in that unsaturation in the styrene blocks is equal to or greater than 50 percent and the ethylene butylene block is hydrogenated leaving no more than 10 percent unsaturation, with at least one olefinic carboxylic acid acylating agent to form one or more acylating reaction intermediates characterized by having a carboxylic acid acylating function within their structure, and

B) reacting said reaction intermediate in (A) with an aminoaromatic compound selected from the group consisting of aminopyridines, aminopyrazines and aminopyrimidines represented by the following formulas:

in which R is hydrogen or an alkyl or alkoxyl radical having from 1 to 5 carbon atoms.

5,205,950

PROCESS FOR PREPARING IRON CARBIDE FINE PARTICLES

Yoshiyuki Shibuya; Naoki Miyamoto, and Shigeo Daimon, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Jul. 1, 1991, Ser. No. 723,887

Claims priority, application Japan, Jul. 2, 1990, 2-175819

Int. Cl.[5] C01B *31/30, 35/56*

U.S. Cl. 252—62.51 **14 Claims**

1. A process of preparing iron carbide fine particles having an average particle size (long axis) of 0.1 to 2 μm, and an average axial ratio of 3 to 20, comprising:

(a) coating a first iron compound selected from at least one of iron oxide particles and iron oxyhydroxide particles with a first coating composition comprising a second iron compound, which is different from said iron oxide or iron oxyhydroxide, and further with a second coating composition selected from at least one of an aluminum compound or silicon compound to form a coated iron containing composition;

(b) reducing said coated iron containing composition with at least one reducing agent which does not contain carbon atoms; and

(c) contacting the product of said reducing step (b) with a reducing and carburizing agent comprising at least one compound which contains at least one carbon atom.

5,205,951

PHOSPHATE ESTER-BASED FUNCTIONAL FLUIDS CONTAINING AN EPOXIDE AND A COMPATIBLE STREAMING POTENTIAL-INHIBITING METAL SALT

Hugh S. MacKinnon, Hercules, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 511,494, Apr. 20, 1990, Pat. No. 5,035,824, which is a continuation of Ser. No. 329,743, Mar. 28, 1989, abandoned, which is a continuation of Ser. No. 158,178, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 68,075, Jun. 30, 1987, abandoned. This application Apr. 29, 1991, Ser. No. 692,770

The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.

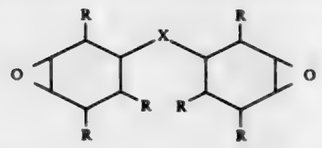
Int. Cl.[5] C10M *105/74, 129/18*

U.S. Cl. 252—78.5 **21 Claims**

1. A functional fluid comprising:

(a) 5 to 5000 parts per million of a soluble streaming potential-inhibiting metal salt having a cation selected from the group consisting of barium, cadmium, calcium, cobalt, copper, gold, iron, magnesium, manganese, nickel, tin, titanium, zinc and zirconium; and an inorganic anion selected from the group consisting of borate, bromide, chloride, iodide, nitrate, phosphate, sulfate and tetrafluoroborate;

(b) a minor amount of an epoxide having the formula:



wherein X is a divalent organic radical containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms; and each R is the same or different and is selected from the group consisting of hydrogen and lower aliphatic radicals; and

(c) a major amount of a phosphate ester;

wherein the functional fluid has a wall current of less than 0.15 microamperes and wherein said metal salt is compatible with said epoxide in said functional fluid at a temperature of about 260° F.

5,205,952

METHODS FOR CONTROLLING AIRBORNE DISSEMINATION OF LEAD AND LEAD-CONTAMINATED FINES DURING THE STORAGE AND PROCESSING OF LEAD-CONTAMINATED MATERIALS

Alistair H. Montgomery, Lakewood, and Wolfram H. Kube, Denver, both of Colo., assignors to NL Industries, Inc., N.J.

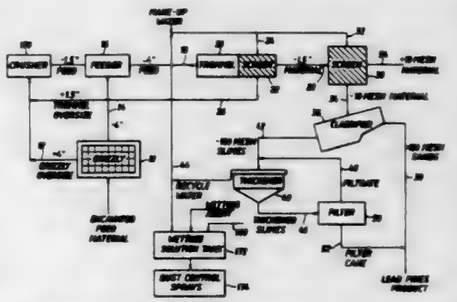
Division of Ser. No. 659,243, Feb. 22, 1991, Pat. No. 5,173,277. This application Sep. 16, 1991, Ser. No. 760,876

Int. Cl.[5] B08B *7/00*

U.S. Cl. 252—88 **8 Claims**

1. A method for controlling airborne spreading of lead and lead-contaminated fines and dust from lead-contaminated materials including said fines and dust, comprising:

wetting the surface of said materials by spraying with an aqueous solution including an effective amount of a wetting agent selected from the group consisting of the inor-



ganic carbonates, bicarbonates, sesquicarbonates and mixtures thereof.

5,205,953

LINEAR VISCOELASTIC AQUEOUS LIQUID AUTOMATIC DISHWASHER DETERGENT COMPOSITION

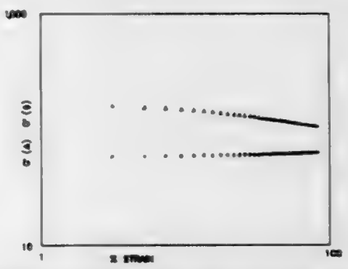
Nagaraj S. Dixit, Plainsboro, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 353,712, May 18, 1989, Pat. No. 5,064,553. This application Jul. 5, 1991, Ser. No. 726,089

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[5] C11D *7/00*

U.S. Cl. 252—94 **12 Claims**



1. A linear viscoelastic aqueous liquid automatic dishwasher detergent composition having a G"/G' value of less than one comprising approximately by weight:

(a) 10 to 35% of at least one alkali metal detergent builder salt, said alkali metal detergent builder salt being selected from the group consisting essentially of alkali metal tripolyphosphate, alkali metal pyrophosphate, alkali metal metaphosphate, alkali metal carbonate, alkali metal citrate and alkali metal nitrilotriacetate and mixtures thereof;

(b) 5 to 15% alkali metal silicate;

(c) 0 to 6% alkali metal hydroxide;

(d) 0 to 3.0% chlorine bleach stable, water-dispersible, organic detergent active material;

(e) 0 to 1.5% chlorine bleach stable foam depressant;

(f) chlorine bleach compound in an amount to provide to 4% of available chlorine;

(g) 0.1 to 2.0% of a cross-linked polyacrylic acid thickening agent having a molecular weight of from about 1,000,000 to 4,000,000;

(h) 0.02 to 2% of a long chain fatty acid or a metal salt of a fatty acid;

(i) 0.1 to 10% of a non-crosslinked polymeric chelating agent having a molecular weight of about 1,000 to 20,000; and

(J) balance being water, said polyacrylic acid thickening

tion by volume upon storage at 25° C. for 21 days, and having a viscosity of less than 1500 mPas at 21 s^{-1}

factant and about 2 to 10% by weight of a solubility control agent

ponents to a second agglomerator to form a detergent composition.

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(J) balance being water, said polyacrylic acid thickening agent is selected from the group consisting essentially of acrylic acid or methacrylic acid, water-dispersible or water-soluble salts, esters, or amides thereof, and water-soluble copolymers of these acids or their salts, ester or amides with or with one or more other unsaturated monomers, wherein the aqueous phase includes both sodium and potassium ions at a K/Na weight ratio of from about 1/1 to about 45/1, wherein substantially all of the normally soluble components of the composition are present dissolved in the aqueous phase, and substantially all of the water in the composition is tightly bound to the crosslinked polyacrylic acid thickening agent, said composition having a bulk density of from 1.32 g/cm^3 to 1.42 g/cm^3 and said composition does not exhibit phase separation and remains homogenous, when said composition is centrifuged at 1000 rpm for 30 minutes.

5,205,954

AUTOMATIC DISHWASHER POWDER DETERGENT COMPOSITION

Fahim U. Ahmed, Dayton, and Charles E. Buck, West Caldwell, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 444,250, Dec. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 323,138, Mar. 19, 1989, Pat. No. 4,968,445, which is a continuation of Ser. No. 102,205, Sep. 19, 1987, abandoned, and a continuation-in-part of Ser. No. 323,136, Mar. 19, 1989, Pat. No. 4,889,653, which is a continuation of Ser. No. 113,562, Oct. 28, 1987, abandoned, and a continuation-in-part of Ser. No. 323,134, Mar. 19, 1989, Pat. No. 4,970,016, which is a continuation of Ser. No. 114,911, Oct. 30, 1987, abandoned, and a continuation-in-part of Ser. No. 323,137, Mar. 19, 1989, Pat. No. 4,968,446, which is a continuation of Ser. No. 117,184, Nov. 19, 1987, abandoned. This application Jul. 15, 1991, Ser. No. 730,315

Int. Cl.^{5} C11D *3/12, 3/43, 3/395, 3/08*

U.S. Cl. 252—99 **10 Claims**

1. An automatic dishwasher powder detergent composition comprising approximately by weight:

(a) 20 to 70% inorganic or organic detergent builder salt, said inorganic or organic detergent builder salt being selected from the group consisting essentially of alkali metal polyphosphates, alkali metal borates, alkali metal carbonates, alkali metal bicarbonates, alkali metal citrates and alkali metal tartarates and mixtures thereof;

(b) 5 to 40% alkali metal silicate;

(c) 0 to 30% alkali metal carbonate;

(c) 0.1 to 6% chlorine bleach stable, water-dispersible organic detergent active material;

(e) 0 to 6% chlorine bleach stable foam depressant;

(f) chlorine bleach compound in an amount sufficient to provide about 0.5 to 8% of available chlorine; and

(g) 0.5 to 3% of a nonabrasive silica anti-filming agent having a particle size of 0.75 to 3.0 microns.

5,205,955

LAVATORY CLEANSING AND SANITIZING BLOCKS CONTAINING A HALOGEN RELEASE BLEACH AND A MINERAL OIL STABILIZER

Charles J. Bunczk, Norristown; Peter A. Burke, Downingtown; William R. Camp, Reading, and John L. Orehotsky, Gilbertsville, all of Pa., assignors to Kiwi Brands, Inc., Douglassville, Pa.

Filed Jul. 3, 1991, Ser. No. 725,538

Int. Cl.^{5} C11D *1/24, 3/395, 3/43, 17/00*

U.S. Cl. 252—102 **14 Claims**

1. An extruded lavatory cleansing block comprising about 20 to 40% by weight of a halogen release bleaching agent, about 0.1 to 8% by weight of mineral oil to stabilize the bleaching agent, about 50–65% by weight of oxidation resistant surfactant and about 2 to 10% by weight of a solubility control agent.

12. A lavatory cleansing tablet comprising:

a) from 5 to 90% by weight of a surface active component;

b) from 0.5 to 75% by weight of a binder selected from clays and water-soluble or water-dispersible gel-forming organic polymeric materials;

c) from 0 to 20% by weight of a dye;

d) from 0 to 35% by weight of a perfume;

e) a total of from 0 to 75% by weight of an inert water-soluble filler,

f) from 10 to 20% by weight of a chlorine release agent.

g) about 0.1 to 8% by weight of mineral oil to stabilize the chlorine release agent.

5,205,956

PRODUCTION OF PLASTIC FOAMS, PREFERABLY RIGID FOAMS CONTAINING URETHANE GROUPS OR URETHANE AND ISOCYANURATE GROUPS, AND BLOWING AGENT-CONTAINING EMULSIONS FOR THIS PURPOSE

Otto Volkert, Weisenheim, Fed. Rep. of Germany, and Corinne A. Meynard, Clichy, France, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 26, 1992, Ser. No. 904,919

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1991, 4121161

Int. Cl.^{5} C08J *9/14*

U.S. Cl. 252—350 **3 Claims**

1. A blowing agent-containing emulsion which contains at least one vinylfluoroalkane of the formula

$$CH_2{=}CH{-}C_nF_{2n+1}$$

in which n is an integer from 1 to 6, (di), and at least one organic and/or modified organic polyisocyanate (a) or at least one relatively high-molecular-weight compound containing at least two reactive hydrogen atoms (b), or at least one low-molecular-weight chain extender and/or crosslinking agent (c), or a mixture of (b) and (c).

5,205,957

STRUCTURED AQUEOUS LIQUID DETERGENTS CONTAINING FUNCTIONAL POLYMERS

Johannes C. Van de Pas, Vlaardingen, Netherlands, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Sep. 19, 1989, Ser. No. 409,224

Claims priority, application United Kingdom, Oct. 7, 1988, 8823665

Int. Cl.^{5} C11D *3/00*

U.S. Cl. 252—173 **8 Claims**

1. An aqueous liquid detergent composition substantially free of insoluble abrasive comprising water, electrolyte and from 15 to 50% by weight of detergent active material in amounts sufficient to form a structuring system capable of suspending particulate solids, said composition further comprising from 0.5 to 12.5% by weight of a functional polymer selected from the group consisting of polyethylene glycols, Dextran, Dextran sulphonates, plyacrylates, polymethacrylates, polyacrylate/maleic acid copolymers and salts or part salts thereof, said functional polymer ingredient having an average molecular weight below 2000, provided that when the composition comprises:

(a) at least 15% by weight of the detergent active material and from 1 to 30% by weight of a salting-out electrolyte; or

(b) contains 5% or more of a swelling clay;

then the average molecular weight of the polymer ingredient is less than 1000; and

said composition yielding no more than 2% phase separation by volume upon storage at 25° C. for 21 days, and having a viscosity of less than 1500 mPas at 21 s^{-1}.

5,205,958

ZEOLITE AGGLOMERATION PROCESS AND PRODUCT

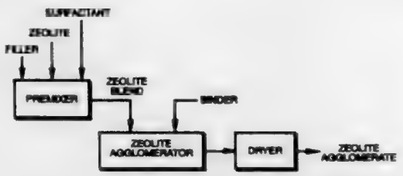
Donald K. Swatling, Oakland; Leslie E. Finn, Fremont, and Erle D. Mankin, Concord, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 367,392, Jun. 16, 1989, Pat. No. 5,024,782. This application Mar. 18, 1991, Ser. No. 671,277

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.^{5} C11D *7/10, 7/20, 11/00, 17/06*

U.S. Cl. 252—174.13 **2 Claims**



1. A zeolite agglomerate for use as a granular detergent component, a detergent booster or a detergent by itself, comprising

about 5–70 parts by wgt. zeolite,

about 10–94 parts by wgt. of a low absorptivity filler material selected from the group consisting of alkali-metal chlorides, carbonates, perborates, sulfates, citrates, citric acid, and mixtures of the foregoing with each other, the filler comprising a substantial portion of sodium chloride with low absorptivity,

an amount of a selected binder effective for binding the agglomerate, and

about 1–20 parts by wgt. of a nonionic surfactant,

the agglomerate formed therefrom having a particle size range of about 0.15–1.7 mm. and a density of at least about 0.6 grams/cc., the agglomerate further having mechanical particle strength suitable for resisting particle fracture and also having a nucleus formed from the low absorptivity material as a seed for the agglomerate with the zeolite and binder forming a shell adhering to the surface of the filler seed, the agglomerate being further characterized by good solubilization and dispersion qualities in aqueous solution.

2. A method of forming a zeolite agglomerate suitable for use as a granular detergent component, a detergent booster or a detergent by itself, comprising the steps of

blending zeolite particles of about 1–20 micron size with a filler and a surfactant to form a zeolite blend, the filler being selected from the group consisting of alkali-metal chlorides, carbonates, perborates, sulfates, citrates, citric acid and mixtures of the foregoing with each other,

charging the zeolite blend to a first agglomerator,

spraying a zeolite binder selected from the group consisting of a polyacrylate, a silicate and combinations thereof, onto the zeolite blend in the first agglomerator with a composition entering the first agglomerator of about 5–70 parts of wgt. zeolite, about 10–94 parts by wgt. filler, about 1–20 parts by wgt. surfactant, an amount of the zeolite binder effective for agglomerating the zeolite blend and at most about 20 parts by wgt. water,

drying the zeolite agglomerate from the first agglomerator to remove a portion of the water and to form the zeolite agglomerate having a particle size of about 0.15–1.7 mm. and a density of at least about 0.6 gm/cc. while being characterized by mechanical particle strength sufficient to resist substantial particle fracture and good solubilization/dispersion qualities in aqueous solution,

charging the zeolite agglomerate and other detergent components to a second agglomerator to form a detergent composition,

spraying the detergent composition with a detergent binder while agitating the detergent composition in the second agglomerator to produce a detergent agglomerate having a composition with at most about 20 parts by wgt. water added with the binder, and

drying the detergent agglomerate to remove a portion of the water and form the detergent agglomerate to have a generally uniform particle size and density while being characterized by substantial freedom from segregation and dusting and exhibiting good solubilization and dispersion qualities in aqueous solution.

5,205,959

ALKALI-STABLE FOAM INHIBITORS

Karl-Heinz Schmid, Mettmann; Karin Koren, Duesseldorf; Detlev Stanislowski, Ratingen, and Michael Langen, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/01382, § 371 Date Feb. 25, 1992, § 102(e) Date Feb. 25, 1992, PCT Pub. No. WO91/03538, PCT Pub. Date Mar. 21, 1991

PCT Filed Aug. 21, 1990, Ser. No. 835,922

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928602

Int. Cl.^{5} C11D *1/72, 3/37*

U.S. Cl. 252—174.17 **12 Claims**

1. A foam-inhibiting concentrate composition useful in formulating stable, aqueous alkali solutions for low-foaming cleaning products, said concentrate composition comprising,

(a) about 5 to about 30% by weight of alkyl glucoside based on C_6–C_{12} fatty alcohols having a degree of glucosidation of about 1 to about 2,

(b) about 5 to about 70% by weight of end-capped polyethylene glycol ether compound corresponding to formula I

$$R_1O{-}(CH_2CH_2O)_n{-}R_2 \quad (I)$$

wherein the radical R_1O is derived from 2-branched, even-numbered alkanols containing from 16 to 20 carbon atoms, R_2 is an alkyl radical containing 4 to 8 carbon atoms, and n is a number of about 5 to about 9,

(c) about 5 to about 70% by weight of non-end-capped polyethylene glycol ether compound corresponding to formula II

$$R_5O{-}(CH_2CH_2O)_z{-}H \quad (II)$$

wherein the radical R_5O is derived from 2-branched even-numbered alkanols containing from 12 to 20 carbon atoms, and z is a number of about 2 to about 5, and optionally,

(d) 0 to about 70% by weight of end-capped polyethylene glycol ether compound corresponding to formula III

$$R_3O{-}(CH_2CH_2O)_m{-}R_4 \quad (III)$$

wherein R_3 is a linear alkyl radical containing 8 to 18 carbon atoms or a branched alkyl radical containing 8 to 14 carbon atoms, R_4 is an alkyl radical containing 4 to 10 carbon atoms, and m is a number of about 5 to about 15,

(e) 0 to about 5% by weight of alkali metal cumenesulfonate or alkali metal xylenesulfonate, and

(f) 0 to about 70% by weight of deionized water, all weights being based on the weight of said concentrate composition.

9. The process of preparing a foam-inhibiting concentrate composition useful in formulating stable, aqueous alkali solutions for low-foaming cleaning products, comprising adding to said composition

(a) about 5 to about 30% by weight of alkyl glucoside based on C_6–C_{12} fatty alcohols having a degree of glucosidation of about 1 to about 2,

(b) about 5 to about 70% by weight of end-capped polyeth-

5,205,961

X is H, or in case of Y=F or Cl, also F and

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ORGANIC POLYMER SOLUTION

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(b) about 5 to about 70% by weight of end-capped polyethylene glycol ether compound corresponding to formula I

$$R_1O-(CH_2CH_2O)_n-R_2 \quad (I)$$

wherein the radical R_1O is derived from 2-branched, even-numbered alkanols containing from 16 to 20 carbon atoms, R_2 is an alkyl radical containing 4 to 8 carbon atoms, and n is a number of about 5 to about 9,

(c) about 5 to about 70% by weight of non-end-capped polyethylene glycol ether compound corresponding to formula II

$$R_5O-(CH_2CH_2O)_z-H \quad (II)$$

wherein the radical R_5O is derived from 2-branched even-numbered alkanols containing from 12 to 20 carbon atoms, and z is a number of about 2 to about 5, and optionally,

(d) 0 to about 70% by weight of end-capped polyethylene glycol ether compound corresponding to formula III

$$R_3O-(CH_2CH_2O)_m-R_4 \quad (III)$$

wherein R_3 is a linear alkyl radical containing 8 to 18 carbon atoms or a branched alkyl radical containing 8 to 14 carbon atoms, R_4 is an alkyl radical containing 4 to 10 carbon atoms, and m is a number of about 5 to about 15,

(e) 0 to about 5% by weight of alkali metal cumenesulfonate or alkali metal xylenesulfonate, and

(f) 0 to about 70% by weight of deionized water, all weights being based on the weight of said concentrate composition.

5,205,960

METHOD OF MAKING CLEAR, STABLE PRESPOTTER LAUNDRY DETERGENT

Karen K. Kristopeit, Franksville, and Calvin J. Verbrugge, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 130,768, Dec. 9, 1987, abandoned. This application Mar. 29, 1991, Ser. No. 677,710

Int. Cl.[5] C11D *3/37, 1/66, 3/075, 3/20*

U.S. Cl. 252—174.24 **21 Claims**

1. A method of stabilizing and forming a clear, stable, single phase built solvated aqueous detergent composition consisting essentially of:

(a) at least one nonionic surfactant in an amount of from about 5 to 25% by weight of the composition;

(b) a builder selected from the group consisting of nonphosphorus inorganic builders, phosphates, nonphosphorus organic builders and mixture thereof, said builder being present in an amount of from about 2 to 25% by weight of the composition; and

(c) the balance consisting essentially of water; said method consisting essentially of adding to said aqueous composition an amount of a water-soluble polymeric anionic hydrotrope effective to render the aqueous detergent composition clear, stable and single phase, about 1 to 10% by weight of the composition being said hydrotrope, said hydrotrope being a hydrolyzed polymer selected from the group consisting of a copolymer of maleic anhydride monomer and an alpha olefin monomer having from 6 to about 24 carbon atoms and a ter- or higher polymer of maleic anhydride and alpha olefins selected from the group consisting of alpha olefins having a carbon content of C_2 to C_{30+} and said ter- or higher polymer contains at least two different alpha olefins, at least one of said alpha olefins being a C_2 to C_{18} alpha olefin and the ratio of alpha olefins present in such that the average alpha olefin carbon chain length in said ter- or higher polymer is greater than about 6 and less than about 18, and wherein the aqueous solvated detergent composition has a pH in the range of from about 6 to 9.

5,205,961

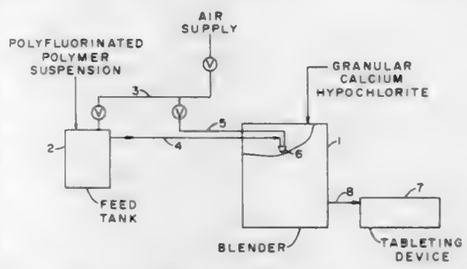
GRANULAR CALCIUM HYPOCHLORITE TREATMENT PROCESS

Donald E. Shenefiel, and Richard H. Ferguson, both of Wetzel, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 18, 1991, Ser. No. 687,142

Int. Cl.[5] C01B *11/06*

U.S. Cl. 252—186.37 **15 Claims**



1. A method for preparing calcium hypochlorite articles for use in slow dissolving applications, comprising treating the surface of granular calcium hypochlorite having a principal particle size range of between −6 and +100 U.S. Sieve Series with from about 0.005 to about 0.5 weight percent of an agent consisting essentially of polyfluorinated polymer, and forming said treated granular hypochlorite into a shaped article having a mass of between about 1 gram and about 350 grams.

5,205,962

PYRIDINE DERIVATIVES

David Coates, Dorset; Simon Greenfield, Poole; Ian C. Sage, Broadstone; Robert Clemitson, Poole, all of Great Britain; Herbert Plach, Darmstadt, and Volker Reiffenrath, Rossdorf, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Fed. Rep. of Germany

PCT No. PCT/EP90/01536, § 371 Date Feb. 6, 1991, § 102(e) Date Feb. 6, 1991, PCT Pub. No. WO91/04248, PCT Pub. Date Apr. 4, 1991

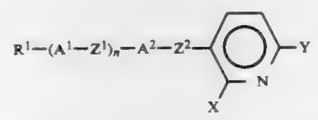
PCT Filed Sep. 12, 1990, Ser. No. 651,392

Claims priority, application United Kingdom, Sep. 22, 1989, 8921520

Int. Cl.[5] C09K *19/34;* **C07D** *213/54, 213/61, 239/02*

U.S. Cl. 252—299.61 **15 Claims**

1. Pyridine derivatives of the formula I



I

wherein

R^1 denotes alkyl with up to 12 carbon atoms wherein one or two non-adjacent CH_2-groups may also be replaced by —O—, —O—CO—, —CO—O— and/or —CH=CH—,

Y is F, Cl, $—CF_3$, $—OCF_3$ or $OCHF_2$,

A^1 and A^2 in each case independently of one another are trans-1,4-cyclohexylene, wherein one or two non-adjacent CH_2-groups may also be replaced by —O— or —S—, or 1,4-phenylene which is unsubstituted or substituted by one or more halogen atoms and/or nitrile and/or CH_3 groups, and wherein one or more CH groups may also be replaced by N,

Z^1 and Z^2 in each case independently of one another are —CH —CO—O—, —O—CO—, $—CH_2O—$, $—OCH_2—$, —C≡C— or a single bond,

X is H, or in case of Y=F or Cl, also F and n is 0, 1 or 2.

5,205,963

VINYL CHLORIDE PLASTISOL COMPOSITIONS CONTAINING OPTICAL BRIGHTENERS AND PROCESS FOR THEIR PRODUCTION

Marquinas J. Brito, and Ferreira J. Garcia, both of Zaragoza, Spain, assignors to EMS-TOGO AG, Switzerland

Filed Jul. 6, 1992, Ser. No. 909,372

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1991, 4123211

Int. Cl.[5] C09K *11/02*

U.S. Cl. 252—301.35 **21 Claims**

1. A plastisol composition comprising homo- and/or copolymers of vinyl chloride, said composition further including 0.001% to 0.25% of at least one optical brightener.

5,205,964

METHOD OF BREAKING CRUDE OIL EMULSIONS USING ETHYLENE CARBONATE ADDUCTS OF ALKYLPHENOL-FORMALDEHYDE RESINS

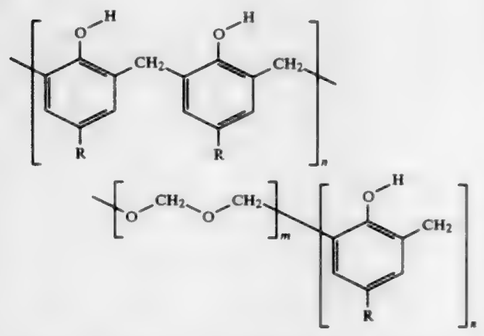
W. Kirk Stephenson, Sugarland, and J. Derwin DeShazo, Richmond, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 151,054, Feb. 1, 1988, abandoned. This application Nov. 7, 1991, Ser. No. 789,521

Int. Cl.[5] B01D *17/05*

U.S. Cl. 252—340 **5 Claims**

1. A method of breaking crude oil emulsion, which comprises treating said emulsion with an effective amount of an emulsion breaker represented by a product obtained by reacting, in anhydrous condition, for at least one hour, an alkyl substituted phenol-formaldehyde polymer having the structure:



wherein R is a linear or branched alkyl group having from 4–20 carbon atoms, and wherein m and n are both independent integers, the sum of which is sufficient to achieve a molecular weight of at least 1000 and further that m, but not n, may be zero; with (b) ethylene carbonate, said reaction being further accomplished in an oleophilic solvent having a boiling point of at least 180° C., the reaction further at a temperature of at least 160° C. in the presence of an alkaline catalyst, said catalyst being present at a concentration, based on total weight of reactants a & b, of at least about 0.1 weight percent.

5,205,965

ORGANIC POLYMER SOLUTION

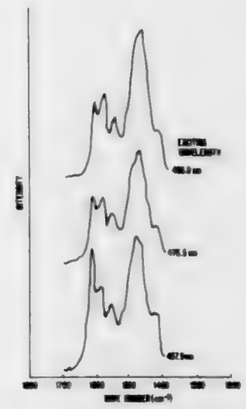
Yoshihiro Uetani; Masao Abe; Akira Ohtani, and Minoru Esoe, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 21, 1992, Ser. No. 822,981

Claims priority, application Japan, Feb. 1, 1991, 3-12316; Oct. 21, 1991, 3-272168

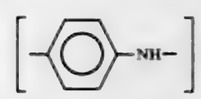
Int. Cl.[5] H01B *1/00*

U.S. Cl. 252—500 **3 Claims**



1. An organic polymer solution comprising an organic solvent and, dissolved therein,

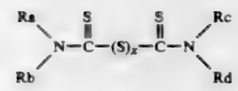
(a) an organic polymer which has an imino-p-phenylene structural unit of the formula



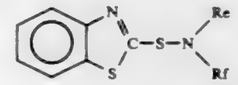
as a major repeating unit and is organic solvent-soluble,

(b) a protonic acid having a pK_a value of 4.8 or less or a derivative thereof,

(c) at least one oxidizing agent which does not have oxidizing ability at ordinary temperature but has oxidizing ability at temperatures not lower than 60° C., selected from the group consisting of a thiuram-type compound represented by the formula



wherein Ra, Rb, Rc, and Rd each independently represents an alkyl group and x is an integer of from 1 to 6, a sulfenamide-type compound represented by the formula



wherein Re and Rf each independently represents hydrogen atom, an alkyl group, or an alkylene group, or an oxime-type compound represented by the formula

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supplying wax in liquid form to a heat exchanger;

of alumina, zirconium oxide, silicon carbide, silicon ni-

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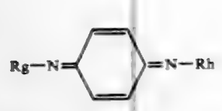


wherein Rg and Rh each independently represents hydroxyl group or benzoyl group and an oxidation catalyst.

5,205,966

PROCESS FOR HANDLING LOW LEVEL RADIOACTIVE WASTE

David Elmaleh, Brookline, Mass., assignor to David R. Elmaleh, Brookline, Mass.

Filed Sep. 20, 1991, Ser. No. 763,116
Int. Cl.[5] G21F 9/00
U.S. Cl. 252—626 20 Claims

1. A process for continuous disposal of materials comprising plural different radionuclides, each having a half-life of less than 50 years, the process comprising the steps of:

a. separating the radionuclides into plural categories, each comprising radionuclides having similar half-lives;

b. accumulating for a fixed time interval predetermined for each category, radionuclides from each category to form a series of batches of waste in each category, the time interval being different for each category;

c. placing each batch in a static storage unit and storing the serially accumulated batches in each category for a time period sufficient to reduce the level of radioactivity of the oldest batch in the series to a level permitting disposal of the material as conventional waste;

d. at the end of the time period in step (c), removing said oldest batch from said storage unit; and

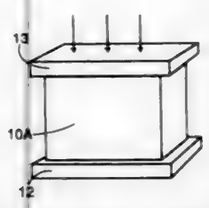
e. repeating steps (a), (b), (c), and (d), in such a way that a new batch of waste is placed in the storage unit from which said oldest batch has been removed for disposal, thereby providing a continuous system for disposal of said waste.

5,205,967

METHOD OF FORMING RETARDATION PLATE UTILIZING DEFORMED ZINC SELENIDE

John Macken, 3755 Wallace Rd., Santa Rosa, Calif. 95404

Filed Mar. 26, 1992, Ser. No. 857,977
Int. Cl.[5] B29D 11/00
U.S. Cl. 264—1.2 10 Claims



1. A method of forming a phase retardation plate, the steps, comprising:

heat a piece of zinc selenide to a predetermined temperature in excess of 100° C.;

exert a force on said heated piece of zinc selenide such that said piece of zinc selenide will deform at said predetermined temperature and become birefringent;

cool said piece of zinc selenide thereby permanently holding some birefringence (Δm) after said force is released;

form said piece of birefringent zinc selenide into an optical element of predetermined thickness "t" such that when the steps are complete, the following equation is true: $(\Delta m)t > 0.00013$ cm.

5,205,968

PROCESS FOR MAKING A MICROPOROUS MEMBRANE FROM A BLEND CONTAINING A POLY(ETHERETHERKETONE)-TYPE POLYMER, AN AMORPHOUS POLYMER, AND A SOLVENT

Paul A. Damrow, Walnut Creek; Robert D. Mahoney, Danville; H. Nelson Beck, Walnut Creek, and Mark F. Sonnenschein, Antioch, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 380,058, Jul. 14, 1989, Pat. No. 5,064,580, which is a continuation-in-part of Ser. No. 175,716, Mar. 31, 1988, Pat. No. 4,904,426. This application Dec. 28, 1990, Ser. No. 636,633
Int. Cl.[5] B29C 67/20
U.S. Cl. 264—28 23 Claims

1. A process for preparing a microporous membrane from an unsulfonate poly(etheretherketone)-type polymer comprising the steps of:

A. forming a mixture comprising:

(i) at least one unsulfonated poly(etheretherketone)-type polymer,

(ii) a plasticizer comprising at least one organic compound capable of dissolving at least about 10 weight percent of said poly(etheretherketone)-type polymer at the extrusion or casting temperature, and

(iii) at least one amorphous polymer which is stable at elevated temperatures, which possesses a glass transition temperature of at least about −100° C., and which is at least partially immiscible in said poly(etheretherketone)-type polymer in the presence of said plasticizer;

B. heating the mixture to a temperature at which said mixture becomes a fluid;

C. extruding or casting said fluid under conditions such that a membrane is formed;

D. quenching or coagulating said membrane by passing said membrane through at least one zone under conditions such that said membrane solidifies; and

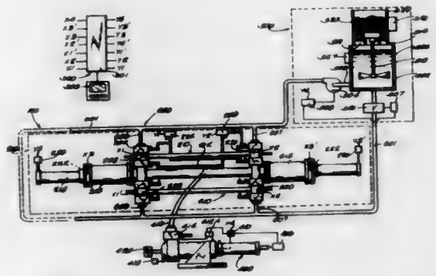
E. leaching said membrane by passing said membrane through at least one zone under conditions such that at least a portion of said plasticizer for said poly(etheretherketone)-type polymer, at least a portion of said amorphous polymer, or a combination thereof, is removed from said membrane.

5,205,969

PROCESS FOR DISTRIBUTING A SEMI-SOLID WAX TO AN INJECTION PRESS

John A. Nett, Jr., Milwaukee; Walter C. Schmitt, Jr., Glendale; Walter S. Lutz, Jr., and James A. Capadona, both of Cedarburg, all of Wis., assignors to Signicast Corporation, Brown Deer, Wis.

Division of Ser. No. 198,458, May 25, 1988, Pat. No. 4,971,547. This application Nov. 20, 1990, Ser. No. 616,176
Int. Cl.[5] B29C 45/70, 45/78
U.S. Cl. 264—40.4 11 Claims



1. In a process for molding wax in a wax injection press, a process for distributing the wax to the press comprising the steps of:

supplying wax in liquid form to a heat exchanger;

cooling the wax in the heat exchanger to a predetermined temperature so that the wax assumes a semi-solid form;

feeding semi-solid wax from the heat exchanger to an accumulator through an inlet connected to receive the wax from the heat exchanger, the accumulator having a variable volume chamber in which the semi-solid wax is stored, and an outlet through which the semi-solid wax is fed out of the accumulator to the injection press;

accumulating a supply of semi-solid wax in the accumulator, wherein a temperature control system maintains the wax in semi-solid form within the accumulator, and storing the semi-solid wax in the accumulator in a condition substantially free of voids;

feeding semi-solid wax on demand from the accumulator to an internal, variable-volume chamber of a wax injection press by opening an accumulator outlet valve, forcing the semi-solid wax through an accumulator outlet using a first shot piston disposed in the accumulator, which first shot piston defines the variable volume chamber of the accumulator, and conducting a stream of the semi-solid wax from the accumulator to the injection press through an elongated conduit connected to the accumulator outlet; and

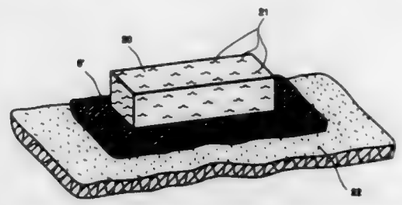
isolating the accumulator from the injection press prior to actuating a second shot piston of the injection press.

5,205,970

METHOD OF INFILTRATION FORMING A SILICON CARBIDE BODY WITH IMPROVED SURFACE FINISH

Milivoj K. Brun, Ballston Lake, and William A. Morrison, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1992, Ser. No. 863,604
Int. Cl.[5] C04B 35/56
U.S. Cl. 264—60 3 Claims



1. A method of infiltration forming a silicon carbide body having improved surface finish comprising:

infiltrating a porous carbonaceous perform with molten silicon infiltrant to form a silicon carbide body, whereby droplets of silicon form on the body surface, placing the body in contact with an infiltrant wicking means, and heating the body in an inert atmosphere or vacuum to a temperature where the infiltrant is molten, whereby the droplets are substantially removed.

5,205,971

MANUFACTURE OF NON-WHITEWARE CERAMIC ARTICLES

Alan P. Croft, Lake Jackson, and Brian D. Koblinski, Missouri City, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 202,626, Jun. 6, 1988, abandoned. This application Oct. 2, 1990, Ser. No. 591,914
Int. Cl.[5] C04B 35/10, 35/48, 35/56, 35/58
U.S. Cl. 264—86 21 Claims

1. A slip composition essentially free of added elemental sulfur comprising:

(1) a slip medium;

(2) a dispersant;

(3) a particulate material selected from the group consisting of alumina, zirconium oxide, silicon carbide, silicon nitride, and mixtures thereof and capable of being processed to form a non-whiteware ceramic article; and

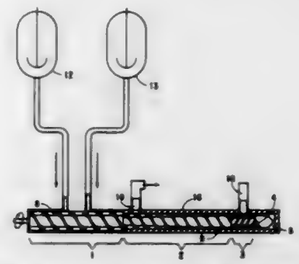
(4) an additive selected from the group consisting of (1) a polyalkylene polyamine, comprising linear isomers and having an average molecular weight of less than about 1,000, in an amount effective to increase the green strength of non-whiteware ceramic articles prepared from the slip composition; and (2) a mixture of a first component consisting of a polyalkylene polyamine, comprising linear isomers and having an average molecular weight of less than about 1,000, in an amount effective to increase the green strength of non-whiteware ceramic articles prepared from the slip composition and a second component consisting of latexes, lignosulfonates, polyvinyl alcohols, alknaolamines, polypropylene glycols and polyethylene glycols or mixtures thereof in an amount, less than about 6.5 weight percent based on the solid content of the slip, which is effective to maintain the viscosity of the slip and the cast weight of non-whiteware ceramic articles prepared therefrom.

5,205,972

PROCESS FOR INCORPORATING ORGANIC FIBROUS FILLERS IN ELASTOMERS

Fred Y. Kafka, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 429,675, Oct. 31, 1989, abandoned. This application Oct. 28, 1991, Ser. No. 784,732
Int. Cl.[5] B29C 47/00, 47/76
U.S. Cl. 264—101 9 Claims



1. A process for incorporating fibrous filler into an elastomer which comprises:

(a) feeding to a screw extruder an elastomer latex and an aqueous slurry containing about 1–100 parts by weight synthetic fibrous filler having a length less than about 25 mm per 100 parts elastomer, the slurry and latex being fed to the extruder either premixed or as separate streams and subsequently mixed in the extruder,

(b) adding a coagulating agent subsequent to the mixing of the slurry and the latex,

(c) coagulating the elastomer latex in the screw extruder to form a coagulated elastomer containing the synthetic fibrous filler,

(d) feeding the coagulated elastomer containing a synthetic fibrous filler into a dewatering zone,

(e) feeding the coagulated fiber-filled elastomer through a flow restriction which applied back pressure sufficient that water present in the coagulated elastomer is forced out of a vent provided in the extruder upstream from the flow restriction, and

(f) discharging and recovering the synthetic fiber-filled elastomer.

5,205,973

cle being heated to and stretched at a temperature lying be-

(iv) drying said balls thus covered so as to obtain free ball structures with a covering layer; and

insert is placed within said shell, said recess and said channel defining a seal set peripherally surrounding said body

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5,205,973

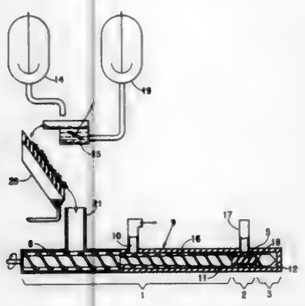
PRECOAGULATION PROCESS FOR INCORPORATING ORGANIC FIBROUS FILLERS

Fred Y. Kafka, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 429,439, Oct. 31, 1989, abandoned. This application Oct. 28, 1991, Ser. No. 784,100

Int. Cl.[5] B29C *47/00, 47/76*

U.S. Cl. 264—101 5 Claims



1. A process for incorporating fibrous filler into a styrene-butadiene rubber which comprises:

a) mixing a styrene-butadiene rubber latex and about 1-400 parts by weight synthetic fibrous filler per 100 parts styrene-butadiene rubber,

b) contacting the mixture with a coagulant for the styrene-butadiene rubber latex to form a coagulated fiberfilled rubber,

c) feeding the coagulated fiber-filled styrene-butadiene rubber to a dewatering extruder and through a flow restriction in the extruder that applies back pressure sufficient that water present in the coagulated fiber-filled styrene-butadiene rubber is forced out of a vent provided in the extruder upstream from the flow restriction, and

d) discharging the fiber-filled coagulated styrene-butadiene rubber from the extruder.

5,205,974

PROCESS FOR THE PREPARATION OF CONTINUOUS OBJECTS OF PLASTICS

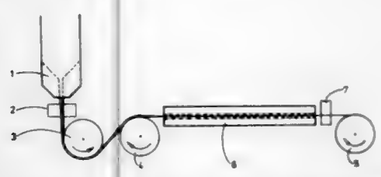
Cornelis W. M. Bastiaansen, Geleen; Henricus E. H. Meijer, Born, both of Netherlands, and Zaheer Bashir, Coventry, Great Britain, assignors to Stamicarbon B.V., Geleen, Netherlands

Division of Ser. No. 360,838, Jun. 2, 1989, Pat. No. 5,080,849. This application Nov. 20, 1991, Ser. No. 794,973

Claims priority, application Netherlands, Jun. 3, 1988, 8801426

Int. Cl.[5] D01D *5/12;* D01F *6/04*

U.S. Cl. 264—210.1 8 Claims



1. Process for the manufacture of continuous objects of plastic that possess a shish kebab morphology, wherein a non-oriented plastic with a relatively high weight average molecular weight (Mw) and containing chain molecules with a particular rate of relaxation is in a melt state and then converted to a continuous article, said article being cooled, the cooled article being heated to and stretched at a temperature lying between the melting temperature of the non-orientated plastic (Tm) and a certain higher temperature (Tc), in that the rate of stretching lies between a lower rate (Ve) which is higher than the rate of relaxation of the chain molecules and a higher rate which is not so high that the melt begins to show elastic behavior, and rapidly cooling the resulting stretched article, while stressed, to a continuous object.

5,205,975

PROCESS FOR PRODUCING LARGE-SIZE FORMED ARTICLES CONSISTING OF A MODIFIED POLYAMIDE

Piero Furlan, Treviso; Sergio Tonti, and Gianpietro Talamini, both of Mestre, Venzia, all of Italy, assignors to Montedipe S.r.l., Milan, Italy

Filed Mar. 30, 1990, Ser. No. 501,477

Claims priority, application Italy, Mar. 31, 1989, 19972 A/89

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] C08G *69/20;* B29C *41/04*

U.S. Cl. 264—240 24 Claims

1. A process for producing molded articles consisting of a polyamide, comprising casting or rotationally molding a plymerizable mixture comprising an omega-lactam corresponding to the polyamide and:

a) a polymerization catalyst selected from the group consisting of sodium and potassium salts of said omega-lactam and mixtures thereof containing a functional group M, where M is an alkali ion;

b) a polyoxyalkylene polyamine having NH_2 terminations, as an elastomerizing agent, having a molecular weight from 400 to 5,000 and an aminic functionality substantially ranging from 1.9 to 2.5; and

c) an activator consisting of a polyiocyanate having all the isocyanic (NCO) groups blocked with a lactam;

wherein the reagents are distributed, prior to polymerizatio, among two distinct feeding tanks such that a part of the omega-lactam, catalyst (a) and polyoxyalkylene polyamine (b) are fed to one of said tanks, the remaining amount of omega-lactam together with activator (c) are fed to the other of said tanks, and then the contents of the respective tanks are combined to form a mixture and said mixture is fed at a temperature from 105° to 125° C. to a mold which is heated to a temperature from 130° to 170° C.

5,205,976

METHOD FOR THE MANUFACTURE OF HOLLOW SPHERULES OF SYNTHETIC MATERIALS

Yves Blottiere, Montauban; Philippe Chapuis, Tournefeuille, and Mireille Valaud, Colomiers, all of France, assignors to Ateca RDM, Montauban, France

Filed Jan. 16, 1991, Ser. No. 641,771

Claims priority, application France, Jan. 17, 1990, 90 00484

Int. Cl.[5] B28B *1/02, 1/16;* B29C *33/40, 33/76*

U.S. Cl. 264—255 10 Claims

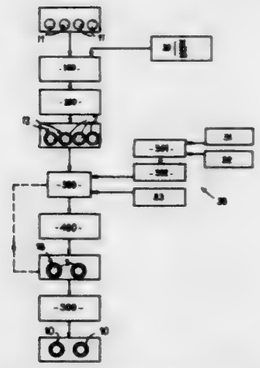
1. Method for manufacturing hollow spherules from synthetic materials by coating degradable consumable cores, comprising the steps of:

(i) mixing degradable consumable cores with a liquid coating composition comprising an aqueous solvent, a water-soluble resin and an anti-agglomerant additive;

(ii) drying said coated cores so as to obtain free balls with a substrate film;

(iii) mixing said balls first of all with a liquid covering substance comprising a hardenable resin and then with an anti-agglutinant adjuvant;

(iv) drying said balls thus covered so as to obtain free ball structures with a covering layer; and



(v) stoving said free ball structures so as to harden said covering layer and degrade said cores and thereby obtain hollow spherules.

5,205,977

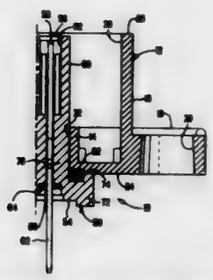
METHOD OF SECURING AN INSERT IN A SHELL

Eric T. Green, Hummelstown, and James P. Scholz, New Cumberland, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 578,928, Sep. 6, 1990, abandoned, which is a division of Ser. No. 401,356, Aug. 31, 1989, Pat. No. 4,976,634. This application Sep. 10, 1991, Ser. No. 758,240

Int. Cl.[5] B29C *65/54*

U.S. Cl. 264—261 11 Claims



1. A method of joining an insert to a shell at an interface and simultaneously sealing the interface therebetween, the insert being of the type including a body section disposed within and extending axially along an insert-receiving aperture extending axially through the shell from a forward end to a rearward end thereof, the insert body section including an outwardly facing surface peripherally surrounded by a continuous portion of the shell upon assembly, and the insert including a flange section extending transversely outwardly from the outwardly facing surface of a rearward portion of the body section and peripherally therearound and having a forwardly facing surface section abutting a rearwardly facing surface section of a rearward portion of the shell continuously around the insert flange section, comprising the steps of:

forming a channel in said forwardly facing surface section of said insert flange section extending transversely outwardly from said insert body section and opposing said rearwardly facing shell surface section;

forming an opposing recess in said rearwardly facing shell surface section opposed from said channel when said insert is placed within said shell, said recess and said channel defining a seal set peripherally surrounding said body section of said insert and shaped cross-sectionally to eventually contain a bead of cured sealing material;

selecting uncured material having low melt viscosity and good ability to flow along surfaces upon being liquefied, and having good adhesive characteristics upon curing;

disposing said selected material in one of said channel and said recess substantially entirely therearound prior to assembling said insert and said shell, obviating any need for openings providing access to said seal seat for injection of material;

placing said insert within said shell with said forwardly facing insert surface section at least adjacent said rearwardly facing shell surface section; and

melting said selected material so that it liquefies, flows along all surfaces defining said seal sat, and cures thereby bonding said insert to said shell both defining the inert-to-shell joint and defining a hermetic seal entirely peripherally around the interface therebetween.

5,205,978

METHOD OF MAKING PNEUMATIC RADIAL TIRES

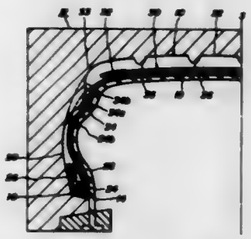
Hisao Uchikubo, and Tadashi Yamazaki, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 842,619

Claims priority, application Japan, Mar. 5, 1991, 3-78726; Aug. 29, 1991, 3-242387

Int. Cl.[5] B29C *35/06;* B60C *3/06*

U.S. Cl. 264—315 3 Claims



1. A method of producing pneumatic radial tires by vulcanization in a mold of a green tire having a carcass comprised of at least one radial cord ply toroidally extending between a pair of bead cores and turned at its side portions around the bead core from inside toward outside and a belt superimposed around a crown portion of a carcass and comprised of plural cord layers, wherein the vulcanization of the green tire is carried out by providing a mold having at its inner surface portion corresponding to a given position between a region of a shoulder portion and a position of tire maximum width in a tire to be manufactured at least one protrusion which continuously extends in the circumferential direction of the mold, said protrusion consisting of a first arc segment having a center of curvature located outside from the inner surface of the mold and second arc segments each having a center of curvature located inside from the inner surface of the mold, said first and second arc segments being smoothly connected at upper and lower ends in the radial direction of the mold, and providing a bladder having a reduced expansion ratio located at a position corresponding to said given position of said protrusion and touching said green tire, such that upon vulcanization a portion of the carcass deviates inward from its natural equilibrium profile at a position of the protrusion.

5,205,979

METHOD FOR CONTROLLING FLUID FLOW OF BURNERS OF

for calculating air pressures Q_A, Q_B, . . . of each zone from the burning power determined by the Fuzzy Logic part

5,205,981

METHOD AND APPARATUS FOR THE PRODUCTION

the flow of metal into the trough as a plurality of falling

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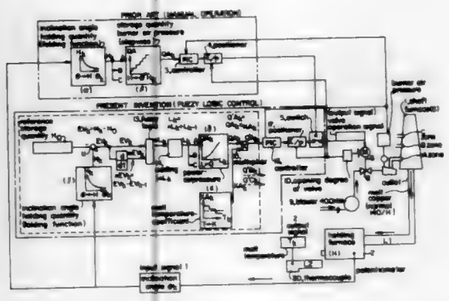
5,205,979

AUTOMATIC CONTROLLING DEVICE OF BURNERS OF A SHAFT FURNACE UTILIZING FUZZY LOGIC

Hiroyuki Matsuyama, Hyogo; Masaki Ojima, Osaka; Yasutoshi Takemoto, Hyogo, and Hirokazu Sugawara, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1992, Ser. No. 828,233
Int. Cl.[5] C21B *7/24*
U.S. Cl. 266—80 1 Claim



1. An automatic controlling device of burners of a shaft furnace in an apparatus including a shaft furnace for melting copper solid into copper melt by a plurality of burners A, B . . . , and a holding furnace for holding the copper melt exhausted from the shaft furnace, for the purpose of stabilizing storage quantity and melt temperature of the holding furnace, taking an inclination angle of the holding furnace and melt temperature into account as input signals, and assigning opening degrees of valves of air passages to the burners as output signals comprising:

a preprocessor part

for predetermining relation between the inclination angle of the holding furnace and the storage quantity of copper melt in the holding furnace by a folding-line function,

for calculating actual storage quantity from the inclination angle in accordance with the folding-line function,

for calculating a deviation E of the actual storage quantity H_k from the reference storage quantity $H_□$,

for calculating a time change ΔE of the deviation in a sampling time,

a Fuzzy Logic part

for predetermining more than three membership functions from PB (positive big) to NB (negative big) for both the deviation E of the storage quantity and for the time change ΔE of the deviation,

for predetermining more than three membership functions from PB (positive big) to NB (negative big) for a time change ΔL of burning power

for predetermining a rule map for determining a preferable time change ΔL of burner power for a set of the deviation E and the time change ΔE,

for calculating the preferable time change Δ L of burning power by Fuzzy Logic according to the rule map,

for calculating the burning power of the present sampling time by adding the time change ΔL to the burning power of the last sampling time, and

for setting the burning power of the first sampling time by predetermining the relation between the storage quantity and the burning power at an initial state by a folding-line function and by determining the initial burning power from the folding-line function,

a postprocessor part

for predetermining a relation between the burning power L and the burner air pressure of each zone A, B, . . . by folding-line functions,

for calculating air pressures Q_A, Q_B, . . . of each zone from the burning power determined by the Fuzzy Logic part according to the folding-line functions for predetermining coefficients for each zone A, B, . . . which change stepwise according to the melt temperature,

for predetermining coefficients KA_k, KB_k, . . . which shall multiply the air pressure of each zone, as functions of the melt temperature,

for calculating coefficients KA_k, KB_k, . . . which shall multiply the air pressure of each zone from the melt temperature at the present sampling time t_k,

for multiplying the air pressures QA_k, QB_k, . . . of each zone by the coefficients KA_k, KB_k, . . . calculated in order to obtain the revised air pressure $Q'A_k$, $Q'B_k$, . . . of each zone, and

for supplying the air pressures $Q'A_k$, $Q'B_k$, . . . to controllers of valves as last controlling variables,

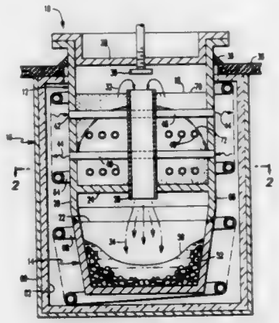
a hardware part including a controller and a positioner for supplying a valve-adjusting signal to a motor for driving a valve in order to give the air pressures of each zone access to the reference air pressures obtained by the postprocessor part.

5,205,980

SUBLIMER ASSEMBLY

Hani A. Abodishish, Aiken, S.C., and R. James Adams, West Point, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 22, 1991, Ser. No. 733,525
Int. Cl.[5] C22B *9/02*
U.S. Cl. 266—153 6 Claims



1. A sublimer assembly for vaporizing particulates, comprising:

a retort having a sidewall extending from a bottom wall for containing particulates, the sidewall having an outer surface;

a peripheral heater adjacent the outer surface of the side wall;

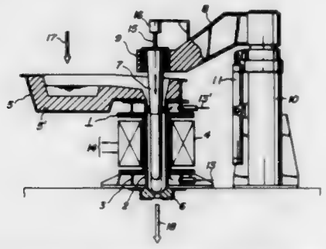
an interior heater extending through the retort, the interior heater having a plurality of spaced apart members on maximum centers of about one foot from each other, the members having a total surface area of at least about 20% of the surface area of the sidewall of the retort.

5,205,981

METHOD AND APPARATUS FOR THE PRODUCTION OF SEMI-SOLIDIFIED METAL COMPOSITION

Yasuo Fujikawa; Yuji Yoshikawa, and Katsuhiro Takebayashi, all of Chiba, Japan, assignors to Rheo-Technology, Ltd., Japan

Division of Ser. No. 703,901, May 22, 1991. This application Apr. 9, 1992, Ser. No. 865,999
Claims priority, application Japan, Dec. 28, 1990, 2-418097; Apr. 2, 1991, 3-94990
Int. Cl.[5] C22C *23/00*
U.S. Cl. 266—234 10 Claims



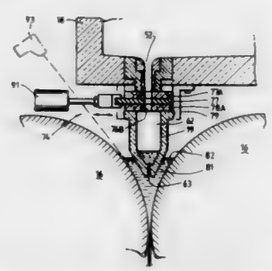
1. An apparatus for producing semi-solidified metal compositions through electromagnetic agitation, comprising a cooling agitation tank provided with means for cooling molten metal, an electromagnetic induction coil producing a rotating magnetic field across a section of the tank to rotate molten metal in the tank, and a non-magnetic and non-conductive core member positioned in a central portion of the tank.

5,205,982

TUNDISH FLOW CONTROL

Hisahiko Fukase, Wollongong, and Walter Blejde, Balgownie, both of Australia, assignors to Ishikawajima-Harima Heavy Industries, Co., Ltd., Tokyo, Japan and John Lysaght (Australia) Limited, Sydney, Australia

Filed Nov. 4, 1991, Ser. No. 787,428
Int. Cl.[5] B22D *41/22*
U.S. Cl. 266—236 11 Claims



1. In an apparatus for casting metal strip comprising a pair of parallel casting rollers forming a nip between them, a metal delivery nozzle disposed above and extending along the nip for delivery of molten metal downwards into the nip along its length, metal confining means at the ends of the nip to confine metal delivered into the nip by the metal delivery nozzle into a casting pool within the nip, and a tundish disposed above the metal delivery nozzle for downwardly supply of molten metal to the metal delivery nozzle, the improvement which comprises:

said metal delivery nozzle having an upwardly facing trough to receive metal from the tundish and flow passage means to permit the flow of metal form the trough to the nip between the rolls,

said tundish having a plurality of outlet openings to permit the flow of metal into the trough as a plurality of falling streams spaced along the trough,

tundish outlet flow control means comprising moving plate means having a plurality of spaced apertures aligned with said tundish outlet openings to permit flow of metal from the tundish openings into the trough via said apertures in said moving plate means, and

actuator means operable to move said moving plate means whereby to move the apertures therein into and out of alignment with said tundish outlet openings to thereby regulate metal flow from said tundish into said trough of said delivery nozzle, and thereby also to regulate the flow of metal into said casting pool in the nip between the casting rollers.

5,205,983

ENERGETIC PLASTICIZER AND IMPROVED GAS PRODUCING CHARGES

Albert T. Camp, Welcome; Hermann S. Haiss, and Paul R. Mosher, both of Indian Head, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1974, Ser. No. 470,109
Int. Cl.[5] C06B *25/24, 25/14, 25/00*
U.S. Cl. 149—97 18 Claims

1. As energetic plasticizer for solventless double base propellants comprising, based on total energetic plasticizer weight,

(1) from 40 to 86 weight percent of a sorbitol nitrate mixture comprising, based on total sorbitol nitrate mixture weight,

(a) from about 10 to about 20 weight percent of sorbitol tetranitrate,

(b) from about 60 to about 85 weight percent of sorbitol pentanitrate, and

(c) from about 5 to about 20 weight percent of sorbitol hexanitrate; and

(2) an additional polyolpolynitrate selected from the group consisting of diethyleneglycoldinitrate, triethyleneglycoldinitrate, nitroglycerin, and mixtures thereof; wherein the amount of said polyolpolynitrate is from 15 to 60 weight percent if diethyleneglycoldinitrate is selected, from 14 to 60 weight percent if triethyleneglycoldinitrate is selected, from 18 to 50 if nitroglycerin is selected, and from 15 to 60 weight percent if a mixture of the polyolpolynitrates is selected.

5,205,984

ORTHORHOMBIC TITANIUM NIOBIUM ALUMINIDE WITH VANADIUM

Raymond G. Rowe, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1991, Ser. No. 795,576
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—420 9 Claims

1. A titanium aluminum alloy, comprising in atomic percent:

about 18 to 30 percent aluminum,

about 18 to 34 percent niobium,

about 0.25 to 7 percent vanadium, and the balance substantially titanium.

5,205,985

with analyte to the collecting means, said element having

an aldehyde measuring mechanism for continuously measur-

(a) an extruded, one-piece honeycomb body comprised of

5,205,985

HYDROGEN STORAGE ALLOY AND HYDRIDE ELECTRODES HAVING C15 CRYSTAL STRUCTURE

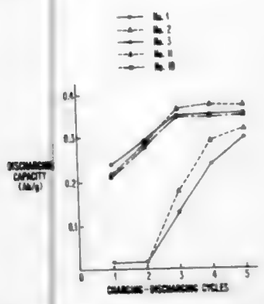
Hajime Seri, Izumiotsu; Yoshio Moriwaki, Hirakata; Yasuharu Yamamura, Katano; Yoichiro Tsuji, Hirakata, and Tsutomu Iwaki, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 26, 1992, Ser. No. 858,366

Claims priority, application Japan, Mar. 29, 1991, 3-066354; Mar. 29, 1991, 3-66355; Mar. 29, 1991, 3-66359

Int. Cl.[5] C22C *22/00*

U.S. Cl. 420—422 7 Claims



1. A hydrogen storage alloy of the general formula $ZrMn_wV_xM_yNi_z$ comprising C15-type Laves phases having a crystal structure similar to that of $MgCu_2$ as a main alloy phase, where M is an element selected from the group consisting of Fe and Co; w, x, y, and z are respectively the mole ratios of Mn, V, M and Ni to Zr; the conditions $0.4 \leqq w \leqq 0.8$, $0.1 \leqq x \leqq 0.3$, $0 \leqq y \leqq 0.2$, $1.0 \leqq z \leqq 1.5$ and $2.0 \leqq w+x+y+z \leqq 2.4$ are satisfied.

5,205,986

ALUMINIUM-STRONTIUM MASTER ALLOY AND PROCESS OF MAKING THE ALLOY

Jan Noordegraaf, TE Delfzijl; Piet Krahmer, and Martin Donnelly, both of AT Arnhem, all of Netherlands, assignors to Shell Research Limited, United Kingdom

Filed Oct. 5, 1990, Ser. No. 592,476

Claims priority, application United Kingdom, Oct. 5, 1989, 8923487

The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.

Int. Cl.[5] C22C *1/03;* B22F *9/08*

U.S. Cl. 420—528 19 Claims

1. In a process for the preparation of an aluminum-strontium master alloy suitable for use as a structure refiner during the solidification of molten aluminum-silicon alloys, comprising forming a molten alloy containing aluminum and 5–35% by weight of strontium, the improvement comprising atomizing a stream of said molten alloy and collecting atomized particles of said molten alloy as a solid mass on a collecting surface.

5,205,987

OFF-LINE SUPERCRITICAL FLUID EXTRACTION COLLECTION SYSTEM

Mehdi Ashraf-Khorassani, Pittsburgh; Gregory Shogan, North Huntingdon, and Raymond K. Houck, Oakmont, all of Pa., assignors to Suprex Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1991, Ser. No. 662,255

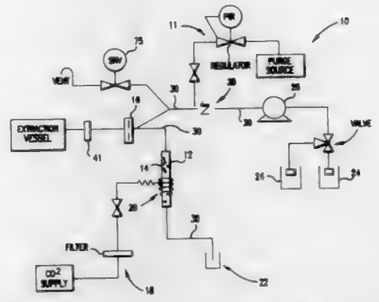
Int. Cl.[5] G01N *7/00;* B01D *15/08, 11/00*

U.S. Cl. 422—83 13 Claims

1. An off-line collection system for use with supercritical fluid extraction comprising:

means for collecting analyte from a fluid associated with the supercritical fluid extraction;

an element having an orifice for controlling flow of a fluid with analyte to the collecting means, said element having a high pressure side which receives said fluid with analyte at a first pressure, and a low pressure side in fluidic communication with said high pressure side through said orifice which receives said fluid with analyte after it has been converted to a second pressure by passing through said orifice, said second pressure less than said first pressure, said high pressure side capable of transporting fluid



with analyte thereacross without essentially any loss of analyte, said low pressure side in fluidic communication with said collecting means, said fluid with analyte having essentially constant pressure as it is transported across the high pressure side; and

means for desorbing the analyte from the collection means, said desorbing means in fluidic communication with said collecting means.

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APPARATUS FOR MEASURING GASEOUS ALDEHYDE

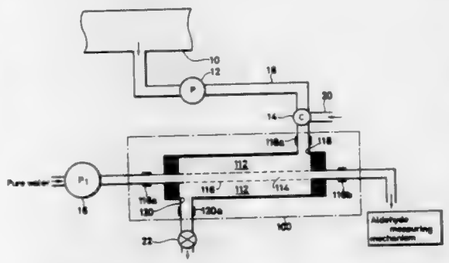
Toshiaki Tanaka, Numazu; Kiyokatsu Hibi, Hachioji, and Toshihiko Miyaji, Hino, all of Japan, assignors to Nihon Bunko Kogyo Kabushiki Kaisha, Tokyo and Toyota Jidoshi Kabushiki Kaisha, Aichi, both of Japan

Filed Apr. 5, 1990, Ser. No. 507,411

Claims priority, application Japan, Apr. 6, 1989, 1-87187; Apr. 6, 1989, 1-87188; Apr. 6, 1989, 1-87189

Int. Cl.[5] G01N *35/08, 33/01, 1/18;* C22C *38/00, 38/42*

U.S. Cl. 422—91 4 Claims



1. A continuous gaseous aldehyde measuring apparatus comprising:

a gaseous aldehyde capturing mechanism comprising an aldehyde capturing solvent and a semipermeable membrane for continuously capturing aldehyde in a gaseous sample, wherein the gaseous sample is separated from the aldehyde capturing solvent by the semipermeable membrane,

a gaseous supply means for delivering a gaseous sample to said gaseous aldehyde capturing mechanism,

an aldehyde measuring mechanism for continuously measuring the amount of aldehyde in the aldehyde capturing solvent,

means for adding a reagent to said aldehyde capturing solvent, wherein said reagent reacts with said aldehyde measuring mechanism,

connector means between connecting portions of the gaseous aldehyde capturing mechanism and the aldehyde measuring mechanism so that the gaseous aldehyde capturing mechanism may be readily separated from the aldehyde measuring mechanism,

a gaseous sample discharge for removing gaseous samples form said gaseous aldehyde capture mechanism,

a pressure valve provided at said gaseous sample discharge to control the aldehyde capturing ratio of said gaseous aldehyde capture mechanism by varying gas pressure in said gaseous aldehyde capture mechanism,

compensating gaseous supply means for delivering gas free of aldehyde to said gaseous aldehyde capturing mechanism, and,

switching cock means in said gaseous supply means for alternatively supplying either gaseous sample or gas free of aldehyde to said gaseous aldehyde capturing mechanism.

5,205,989

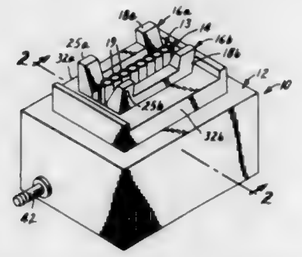
MULTI-WELL FILTRATION APPARATUS

James E. Aysta, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 18, 1991, Ser. No. 761,433

Int. Cl.[5] B01D *35/30*

U.S. Cl. 422—101 20 Claims



1. A multi-well filtration apparatus, which comprises:

(a) a housing;

(b) a multi-well filtration plate having a plurality of wells that each have located therein; and

(c) attached to the housing a means for securing the multi-well filtratic to the housing, the securing means including at least one pivotable member and permitti multi-well filtration plate to be secured to the housing by pressing the multi-well filtration against the at least one pivotable member of the securing means.

5,205,990

OXYGEN GENERATOR HAVING HONEYCOMB STRUCTURE

William N. Lawless, c/o CeramPhysics, Inc., 921 Eastwind Dr., Ste. 110, Westerville, Ohio 43081

Filed Aug. 2, 1990, Ser. No. 562,901

Int. Cl.[5] C25B *9/00;* H01M *14/00*

U.S. Cl. 422—121 40 Claims

1. An oxygen generator for separating oxygen from a first gas and generating therefrom a second gas having a high concentration of oxygen, comprising:

(1) a body comprising one or more cells, each of said cells having:

(a) an extruded, one-piece honeycomb body comprised of oxygen ion conductive material and including:

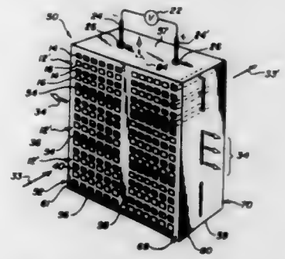
(b) a plurality of faces including at least a first, second, and third face; and

(c) a plurality of first and second channels defined by channel walls, and at least one third channel disposed therein, wherein:

(i) said first channels extend from inlet openings in said first face of said honeycomb body to outlet openings in said second face of said honeycomb body, to receive a first gas having a partial pressure of oxygen therein; and

(ii) said second channels extend generally parallel to said first channels from openings in said first face to openings in said second face;

(iii) said at least one third channel extending laterally to an oxygen outlet opening in said third face, and each of said at least one third channels intersecting at least one of said second channels at a point between said first and second



faces of said honeycomb body, such that each of said second channels is intersected by at least one third channel to provide flow communication therebetween, allowing oxygen generated in said second channels to flow outward therefrom through said third channels; and

(d) electrodes disposed on said channel walls in said first and second channels;

(e) means for electrically interconnecting said electrodes in said first channels;

(f) means for electrically interconnecting said electrodes in said second channels;

(g) means for sealing said second channels at said first and second faces;

(2) a voltage source and means disposed on said body for electrically connecting said electrodes in said one or more cells to said voltage source;

(3) means for collecting oxygen enclosing said oxygen outlet opening.

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MANUFACTURE OF EXTRUDED CERAMICS

James F. Avery, Horseheads; Edward C. Fletcher; Trevor A. Francis, both of Corning; Tudor C. Gheorghiu, and Larry J. Zook, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 30, 1991, Ser. No. 737,485

Int. Cl.[5] B01J *19/00;* F26B *3/08;* B29C *47/88*

U.S. Cl. 422—129 8 Claims

1. An apparatus for preventing or substantially reducing the formation of cracks and fissures in a ceramic body comprising:

a forming member for shaping a ceramic batch into a green ceramic body, the forming member having an exit or outlet end;

support member abutting said forming member immediately adjacent to the exit end of the forming member, said support member having a plurality of apertures;

a mantle substantially surrounding the support member to form an enclosed support chamber, said apertures of the support member opening into said chamber;

means for passing or conveying the green ceramic body

through said chamber immediately as the body exits the

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disposed tightly on one side of the solid electrolyte, and a cathode disposed tightly on the other side of the solid electro-

with said first solid-liquid filter means for receiving so-

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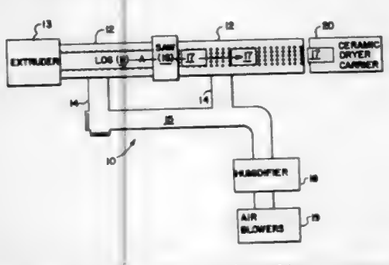
through said chamber immediately as the body exits the forming member;

means for supplying and maintaining air under pressure and at a relative humidity to said support chamber through



said apertures to provide an air cushion to support the ceramic body within said chamber and to prevent the formation of cracks and fissures on the surface of the ceramic body.

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APPARATUS FOR INTRODUCING CATALYST PARTICLES INTO A MOVING BED OF CATALYST

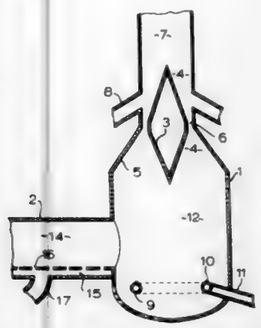
Klaas van Ommen, and Christian E. Brakel, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 17, 1991, Ser. No. 701,715

Claims priority, application United Kingdom, May 22, 1990, 9011407

Int. Cl.[5] **F27B** *15/08;* **B01J** *8/20*

U.S. Cl. 422—140 **4 Claims**



1. A riser reactor comprising a wall extending downwardly to an enlarged housing at the bottom of said riser reactor, said housing having

(a) inlet means for introducing catalyst particles into the housing comprising a first fluidization means, wherein the length of the inlet means is from about two to about three times the diameter of said inlet means, and

(b) a second fluidization means below said first fluidization means and said inlet means, and

(c) said housing having above said first fluidization means and said inlet means a substantially centrally arranged substantially diamond-shaped directing means fixedly secured onto said wall, said directing means having a lower and upper portion and wherein said directing means and said wall define a passage, wherein the lower portion of said directing means and said wall defines an upwardly converging portion in said passage and wherein the upper portion of said directing means and said wall defines an upwardly diverging portion in said passage.

5,205,993

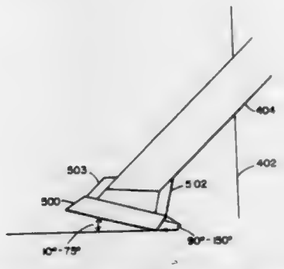
CATALYTIC CRACKING APPARATUS USING CROSS-FLOW REGENERATOR

Tiberiu M. Leib, Voorhees, and Ajit V. Sapre, W. Berlin, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 571,399, Aug. 23, 1990, which is a division of Ser. No. 431,953, Nov. 6, 1989, Pat. No. 4,980,048. This application Dec. 13, 1991, Ser. No. 808,953

Int. Cl.[5] **F27B** *15/08;* **B01J** *8/18*

U.S. Cl. 422—144 **2 Claims**



2. A cross-flow FCC catalyst regeneration apparatus for the fluidized catalytic cracking of hydrocarbons by contact with a source of regenerated fluidized catalytic cracking (FCC) catalyst to produce catalytically cracked products and spent catalyst, and for the regeneration of coked FCC catalyst, comprising:

a regenerator vessel defined by a cylindrical sidewall with a diameter of at least 8 feet for maintaining a dense phase, bubbling fluidized bed of catalyst having a depth of at least 8 feet;

a single catalyst inlet and a single catalyst outlet, wherein said catalyst inlet is defined by a downwardly connected coked FCC catalyst inlet normal to the sidewall, having an inlet diameter of at least 1 foot and connective with the sidewall of said regenerator for discharging coked catalyst into said regenerator vessel;

a regeneration gas inlet connective with an air distribution means in a lower portion of said regenerator vessel;

a flue gas outlet means in an upper portion of said regenerator vessel for removal of flue gas;

said catalyst outlet consisting essentially of a single non-centrally located regenerated catalyst outlet located in a lower portion of said regenerator vessel at the opposite side of the regenerator vessel from the catalyst inlet;

a baffle having a baffle area disposed normal to the coked catalyst inlet, and spaced inwardly inside said vessel from said catalyst inlet by a distance at least equal to 50% of the diameter of said coked catalyst inlet and having a baffle width, as measured on a plane normal to said coked catalyst inlet, at least equal to the diameter of said coked catalyst inlet and containing holes or slits equal to 10–30% of the baffle area.

5,205,994

ELECTROLYTIC OZONE GENERATOR

Isao Sawamoto, Kanagawa, and Takayuki Shimamune, Tokyo, both of Japan, assignors to Permelec Electrode, Ltd., Kanagawa, Japan

Filed Sep. 4, 1991, Ser. No. 755,424

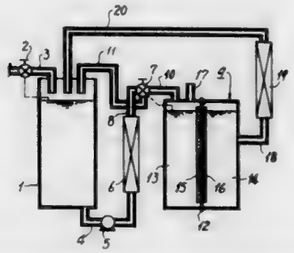
Claims priority, application Japan, Sep. 6, 1990, 2-236210

Int. Cl.[5] **B01J** *19/08*

U.S. Cl. 422—186.07 **2 Claims**

1. An electrolytic ozone generator which comprises a feed tank in which water is stored, an ion-exchange column connected to the feed tank, a pump for feeding the stored water in the feed tank to the ion-exchange column, an electrolytic cell connected to the ion-exchange column and containing a solid electrolyte which is an ion-exchange membrane, an anode

disposed tightly on one side of the solid electrolyte, and a cathode disposed tightly on the other side of the solid electrolyte, an electromagnetic valve connected to and disposed between the ion-exchange column and the electrolytic cell, and a hydrogen-separating column connected to the electrolytic cell for separating hydrogen from a gas-liquid mixture sent



from the electrolytic cell with means to circulate the resulting water to the feed tank, and a means by which the liquid level of the anolyte in the electrolytic cell is sensed, and, in a case wherein said liquid level is below a predetermined value, ion-exchanged water is fed from the ion-exchange column to the electrolytic cell by controlling the electromagnetic valve.

5,205,995

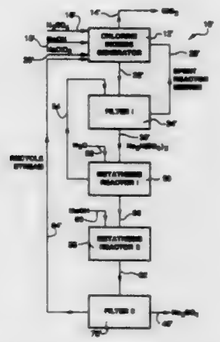
METATHESIS OF ACIDIC BY-PRODUCT OF CHLORINE DIOXIDE GENERATING APPARATUS

Herbert C. Scribner, Monroe, La.; Maurice C. J. Fredette, Mississauga, and Edward J. Bechberger, Etobicoke, both of Canada, assignors to Sterling Canada Inc., Islington, Canada

Division of Ser. No. 688,438, Apr. 22, 1991, Pat. No. 5,116,595. This application Mar. 2, 1992, Ser. No. 844,231

Int. Cl.[5] **B01J** *8/04*

U.S. Cl. 422—189 **1 Claim**



1. Apparatus for the generation of chlorine dioxide, comprising:

chlorine dioxide generator means for housing an aqueous acid reaction medium capable of generating chlorine dioxide and of precipitating sodium sesquisulfate therefrom in said generator means,

means for removing the precipitated sodium sesquisulfate from said generator means and for conveying the removed sodium sesquisulfate to first solid-liquid filter means,

first wash water applying means operatively associated with said first solid-liquid filter means for applying wash water to the sodium sesquisulfate on the filter to assist in freeing the sodium sesquisulfate from entrained aqueous acid reaction medium,

first mixing tank means connected in fluid flow relationship with said first solid-liquid filter means for receiving sodium sesquisulfate from said first solid-liquid filter means,

metathesis liquid applying means for applying an aqueous metathesis liquid to the sodium sesquisulfate in the first mixing tank means to convert the sodium sesquisulfate to solid neutral anhydrous sodium sulfate,

second solid-liquid filter means connected in fluid flow relationship to said first mixing tank means for separating solid neutral sodium sulfate from spent metathesis liquid,

first conduit means for recycling a portion of filtrate from said second solid-liquid filter means to said first solid-liquid filter means, and

second conduit means for recycling the remainder of filtrate from said second solid-liquid filter means to said chlorine dioxide generator means.

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SILVER LINED CERAMIC VESSEL

William Ferrando, Arlington; Amarnath Divecha, Falls Church, both of Va., and James Kerr, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 700,375, Oct. 10, 1990, Pat. No. 5,120,575. This application Feb. 19, 1992, Ser. No. 838,635

Int. Cl.[5] **B01J** *19/00;* **B05D** *3/02;* **H01B** *12/00*

U.S. Cl. 422—241 **6 Claims**

1. A reaction vessel comprising:

A. a porous ceramic structure which defines the shape of the reaction vessel and which includes an inner surface which will contain the reaction, wherein the ceramic structure has interconnecting open pores; and

B. a silver metal coating which provides a uniform coating of silver metal over the inner surface of the ceramic structure and which fills the interconnecting open pores of the ceramic structure with silver metal to form a strong bond between the porous ceramic structure and the silver metal structure.

5,205,997

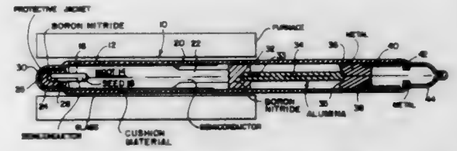
AMPOULE FOR CRYSTAL GROWTH

Gregory W. Knowles, Lexington, Va., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 387,197, Jul. 31, 1989, abandoned. This application May 6, 1991, Ser. No. 698,195

Int. Cl.[5] **C30B** *35/00*

U.S. Cl. 422—248 **2 Claims**



1. An ampoule for growing monocrystalline structures comprising:

a generally cylindrically shaped sealed envelope;

a generally cylindrically shaped non-monocrystalline ingot contained within the envelope, the ingot having a first section stepping down to a second section, a portion of a first section outer surface in contact with an inner envelope wall surface;

a piston located in the envelope and bearing directly against an outward end of the ingot second section;

a rod connected at a first end thereof to the piston and movable together therewith, the rod extending away from the ingot;

a monocrystalline seed of the same material received within one end of the ingot;

a strongly compressed spring biasing the piston against the

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ACTINIDE DISSOLUTION

5,206,002

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a strongly compressed spring biasing the piston against the ingot for maintaining contact between the seed and the ingot in response to anticipated vibrational forces while the ingot is in an original solid state;

the length of the stepped down ingot section being sufficiently long to permit expansion of the spring when the material is melted and thus shortened to precisely contain the melted material in the envelope volume bounded by the piston, the melted material being newly configured to a uniform cross section;

the expanded spring having a decreased compression force to minimize leakage past the piston when the ingot is in a melted state.

5,205,998

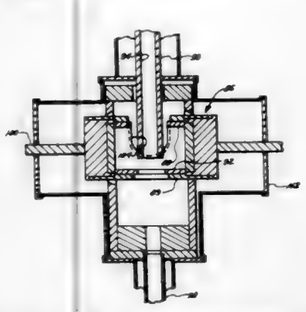
ANGLE OF REPOSE VALVE

James E. Boone; David W. Owens; Robert E. Farritor, all of Baton Rouge, La., and Wesley D. Blank, Pasadena, Tex., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 814,322, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 346,219, May 2, 1989, abandoned, which is a continuation of Ser. No. 59,038, Jun. 8, 1989, abandoned, which is a division of Ser. No. 761,434, Aug. 1, 1985, abandoned. This application May 28, 1992, Ser. No. 892,698

Int. Cl.[5] F27B *15/09*

U.S. Cl. 422—310 **2 Claims**



1. An angle of repose valve for dispensing high purity solids from a protective environment, said valve comprising:

a) a housing having a top inlet and a bottom outlet;

b) an inlet tube sealingly disposed in said top inlet for receiving a flow of high purity solids from said protective environment, said inlet tube having an interior which is non-contaminating to granular silicon for contacting said solids;

c) high purity solids, said blocking means for controlling said flow of high purity solids, said blocking means being disposed within said housing and blocking but not contacting said inlet tube, said blocking means having surfaces which are non-contaminating to granular silicon for contacting said solids, said blocking means being movable within said housing between a first position to receive and block said high purity solids and accumulate solids in said inlet tube and a second position to unblock and discharge said high purity solids to said bottom outlet, said blocking means being cylindrical in shape, having a horizontally disposed cylindrical axis, said inlet tube extending into the interior of the cylindrically shaped blocking means, said blocking means having a wall having a hole formed therein for discharging solids when said blocking means is in said second position, said cylindrical shaped blocking means being rotatable on its cylindrical axis to move between said first position and said second position; and

d) means for moving said blocking means between said first position and said second position, said moving means being controllable from outside said housing.

5,205,999

ACTINIDE DISSOLUTION

John S. Willis, Prescot, and David A. White, London, both of England, assignors to British Nuclear Fuels plc, Warrington, England

Filed Sep. 18, 1991, Ser. No. 761,060

Int. Cl.[5] B01F *1/00*

U.S. Cl. 423—20 **13 Claims**

1. A process for the treatment of soil contaminated with contaminants comprising plutonium or a compound of plutonium with or without other actinides or compounds thereof which process comprises removing the contaminated soil from the site of the contamination, transporting the soil to a treatment site and at the treatment site contacting the material with an aqueous solution having a pH in the range 5.5 to 10.5 which is non-toxic, free of heavy metal ions and comprises ingredients which are naturally degradable to non-toxic products with or without mild physical assistance, said solution comprising:

(a) carbonated water;

(b) a conditioning agent, and

(c) a complexing agent which comprises the anion of a simple carboxylic acid having from 2 to 6 carbon atoms, and thereby dissolving said contaminants as actinide complexes in said solution to decontaminate said soil.

5,206,000

PROCESS FOR THE RECOVERY OF RHODIUM FROM AQUEOUS SOLUTIONS CONTAINING RHODIUM COMPLEXES

Gerhard Diekhaus, and Harald Kappesser, both of Oberhausen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,444

Int. Cl.[5] C22B *11/00*

U.S. Cl. 423—22 **45 Claims**

1. A process for the recovery of rhodium from aqueous solutions containing rhodium complexes comprising, in a first stage, treating said solutions at 80° to 140° C. with oxygen and/or an oxygen-containing gas in the presence of a water soluble salt of a carboxylic acid, which acid has 7 to 22 carbon atoms, to form a mixture and, in a second stage, treating said mixture with a hypochlorite at 50° to 140° C. to form a composition containing rhodium compounds.

5,206,001

REMOVAL OF BASE METALS AND CYANIDE FROM GOLD-BARREN CIP SOLUTIONS

Vaikuntam I. Lakshmanan, Mississauga, Canada, assignor to Ortech Corporation, Ontario, Canada

Filed Mar. 25, 1991, Ser. No. 674,677

Claims priority, application United Kingdom, Mar. 30, 1990, 9007122

Int. Cl.[5] C01G *3/00, 9/00, 49/00*

U.S. Cl. 423—24 **5 Claims**

1. A process for substantially removing base metals from cyanide leachate comprising contacting said leachate with a strong base anion exchange resin conditioned by treatment with a solution of a cyanide salt for a sufficient time to remove said base metals followed by separation of said leachate from said resin.

5,206,002

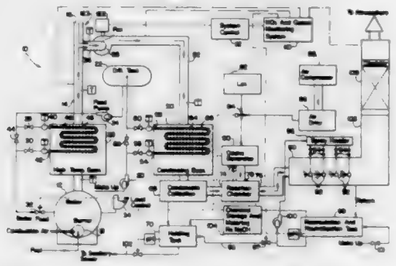
PROCESS FOR REMOVING NO_x AND SO_x FROM EXHAUST GAS

Arthur P. Skelley, Pittsburgh; James C. McMichael, Monroeville; James T. Cobb, Jr., Pittsburgh; Wesley M. Rohrer, Jr., Pittsburgh; Phillip E. Custer, II, Pittsburgh, and Taha M. Elsubki, Pittsburgh, all of Pa., assignors to Cannon Boiler Works, Inc., New Kensington, Pa.

Filed Aug. 29, 1991, Ser. No. 751,728

Int. Cl.[5] C01B *21/00, 17/00*

U.S. Cl. 423—235 **10 Claims**



1. A process for removing nitrogen and sulfur oxide contaminants from exhaust gas comprising the steps of,

directing exhaust gas containing nitrogen and sulfur oxide contaminants at an elevated temperature from a process system to an exhaust duct,

conveying the contaminated exhaust gas through a series of heat exchangers in the exhaust duct to reduce and control the temperature of the contaminated exhaust gas,

reducing the temperature of the exhaust gas from an elevated temperature to about ambient temperature,

removing moisture from the exhaust gas by condensing water vapor present in the exhaust gas by rapidly lowering the temperature of the exhaust gas,

mixing the exhaust gas in a reaction chamber with ozone in a molar ratio of at least 1.5 moles of ozone to each mole of nitrogen and sulfur oxides to oxidize the contaminants in the exhaust gas and increase the absorbability of the nitrogen and sulfur oxides in water,

maintaining the exhaust gas in contact with the ozone in the reaction chamber for a preselected residence time,

monitoring the residence time of mixing the exhaust gas with the ozone in the reaction chamber to assure substantially complete conversion of all the nitrogen and sulfur oxides in the exhaust gas to N_2O_5 and higher order sulfur oxides and substantially complete consumption of all of the ozone in the reaction chamber so that exhaust gas substantially containing N_2O_5 and free of ozone is emitted from the reaction chamber,

introducing the oxidized contaminants substantially containing N_2O_5 higher order sulfur oxides in the exhaust gas at about ambient temperature into a combination spray/absorption chamber,

generating a mist-like spray of water in the spray/absorption chamber,

admixing the exhaust gas containing substantially N_2O_5 with the water mist to transform N_2O_5 and sulfur oxides to dilute acids including HNO_3 and H_2SO_4,

absorbing the admixture of water mist containing the dilute acids including HNO_3 and H_2SO_4 in the exhaust gas into liquid water,

converting the dilute acids to solids including nitrates and sulfates containing the contaminants removed from the exhaust gas in the spray/absorption chamber, and

thereafter discharging the exhaust gas at about ambient temperature and substantially free of the contaminants from the exhaust duct.

5,206,003

METHOD OF DECOMPOSING FLOW

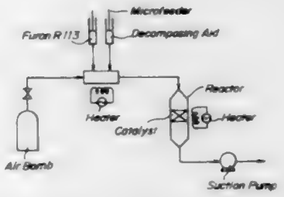
Yoshinori Imoto; Katsunosuke Hara, both of Aichi, and Masakatsu Hiraoka, 39-763, Kohata Okurayama, Uji City, Kyoto-Fu, all of Japan, assignors to NGK Insulators, Ltd. and Masakatsu Hiraoka, both of Japan

Continuation of Ser. No. 547,041, Jul. 2, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 803,903

Claims priority, application Japan, Jul. 7, 1989, 1-176012

Int. Cl.[5] C01B *7/01, 7/19, 7/24*

U.S. Cl. 423—240 S **9 Claims**



1. A method of decomposing flon, comprising contacting a gas containing flon with a catalyst at a temperature of 200–700° C. and a space velocity of 2,000 to 50,000 (hr^{-1}), the catalyst being selected from the group consisting of Rh, Pd, Mn, and Cu and an oxide or oxides thereof.

6. A method of decomposing flon, comprising contracting a gas containing flon with a catalyst at a temperature of 200–700° C. and a space velocity of 2,000–50,000 (hr^{-1}), the catalyst consisting of components A and B, the component A being a single oxide of a metal selected from the group consisting of Zr, Ti, and W or a complexed multi oxide of at least two metals selected from the group consisting of Zr, Ti, Al, W and Si, and the component B being a metal or metals selected from the group consisting of Pt, Rh, Pd, Ru, Mn, Cu, Cr, and Fe, and an oxide or oxides thereof.

5,206,004

SILANE COMPOSITIONS AND PROCESS

Won S. Park, Baton Rouge, La., assignor to Ethyl Corportion, Richmond, Va.

Continuation of Ser. No. 516,315, Apr. 30, 1990. This application Jul. 1, 1991, Ser. No. 723,785

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—700 **4 Claims**

1. A process for treating a molecular sieve comprising a sodium zeolite means for separating ethylene and silane in admixture, said process comprising treating said molecular sieve with silane for an effective time and at an effective temperature of from about 150° C. to about 300° C. and an effective pressure to prevent the formation of ethylsilane at a concentration greater than from about 0.1 weight percent to about 5.0 weight percent when separating said ethylene and said silane.

5,206,005

SYNTHESIS OF ECR-1 USING METHYLTRIETHANOLAMMONIUM CATIONS

David E. W. Vaughan, Flemington, and Karl G. Strohmaier, Port Murray, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Aug. 19, 1992, Ser. No. 932,435

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—707 **7 Claims**

1. A process for preparing an ECR-1 crystalline zeolite comprising:

(a) preparing a reaction mixture comprising an oxide of sodium, an ammonium salt, water, a source of silica, a source of alumina and sodium aluminosilicate nucleating seeds, said reaction mixture having a composition, in

terms of mole ratios of oxides, within the following

5,206,007

ANTI-HUMAN MYOCARDIAL C PROTEIN

5,206,009

NON-AEROSOL, LOW VOC, PUMP HAIR SPRAY

acetate, propyl acetate, n-butyl acetate and amyl acetate, said solvent combination dissolving said primary film

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terms of mole ratios of oxides, within the following ranges:

$R_2O:Al_2O_3$	0.2 to 1.0
$Na_2O:Al_2O_3$	1.0 to 7
$SiO_2:Al_2O_3$	5 to 20
$H_2O:Al_2O_3$	120 to 300
$R_2O:Na_2O$	0.05 to 0.4

where R is a $(CH_3)(C_2H_4OH)_3N^+$, and said seeds being present in an amount to yield 1 to 15 mole percent of the total alumina content of the reaction mixture;

(b) blending the reaction mixture sufficiently to form a substantially homogeneous mixture;

(c) maintaining the reaction mixture at between about 120° C. and 200° C. under autogeneous pressure for a sufficient period of time to form crystals of a zeolite having a composition, in terms of mole ratios of oxides, in the range:

$$0.5 \text{ to } 0.02R_2O:0.90 \text{ to } 0.98Na_2O:Al_2O_3:5 \text{ to } 12SiO_2:xH_2O$$

where R and x are defined above, and such that the x-ray powder diffraction pattern of said zeolite is essentially identical to that given in Table 1, and

(d) recovering said zeolite crystals.

5,206,006

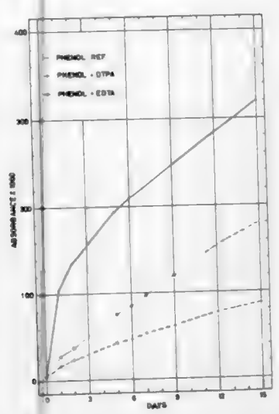
STABILIZED TRINDER REAGENT

Dario Frontini, Milan, and Maurizio D'Alterio, Brugherio, both of Italy, assignors to Instrumentation Laboratory SpA, Milan, Italy

Division of Ser. No. 575,206, Aug. 30, 1990, Pat. No. 5,108,733. This application Mar. 17, 1992, Ser. No. 852,816

Int. Cl.[5] G01N *33/15;* **C12Q** *1/28*

U.S. Cl. 424—7.1 **9 Claims**



1. A composition of the Trinder type for detecting hydrogen peroxide evolved in a solution, consisting essentially of:

a) a phenylpyrazone derivative,

b) a phenol or an aromatic amine,

c) a peroxidase enzyme,

d) aqueous buffer, and

e) a chelating agent comprising a polyalkylaminepolyacetic acid or a salt thereof.

5,206,007

ANTI-HUMAN MYOCARDIAL C PROTEIN MONOCLONAL ANTIBODY AND HYBRIDOMA PRODUCING THE ANTIBODY

Akira Ooshima, Wakayama, and Toshiro Yamaguchi, Chiba, both of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

Filed Dec. 26, 1990, Ser. No. 633,677

Claims priority, application Japan, Dec. 27, 1989, 1-339082

Int. Cl.[5] A61K *49/00;* **C12N** *5/12;* **C07K** *15/28*

U.S. Cl. 424—9 **5 Claims**

1. An anti-human myocardial C protein monoclonal antibody which is obtained from hybridoma AOC-1 (FERM BP-2473), wherein the antibody specifically binds to human myocardial C protein.

5,206,008

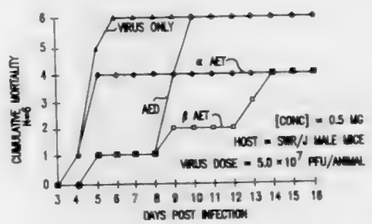
ENHANCEMENT OF IMMUNE RESPONSE

Roger Loria, Richmond, Va., assignor to Virginia Commonwealth University, Richmond, Va.

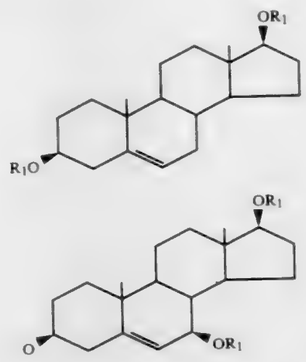
Continuation-in-part of Ser. No. 685,078, Apr. 15, 1991. This application Aug. 2, 1991, Ser. No. 739,809

Int. Cl.[5] A61K *31/56, 9/02, 9/20, 9/72*

U.S. Cl. 424—45 **24 Claims**



1. A method of enhancing protective immune response and treating complications accompanying immune suppression in a mammal by administration of an immune response enhancing effective amount of a composition containing at least one compound of the structure:



wherein R_1 may be H, alkenyl of 2–8 carbons, alkyl of 1–8 carbons, benzyl, phenyl or COR_2, wherein R_2 is H, alkyl of 1–8 carbons, alkenyl of 2–8 carbons, benzyl, or phenyl wherein the phenyl moiety may have up to three substituents selected from the group consisting of hydroxy, carboxy of 1–4 carbons, halo, alkoxy of 1–4 carbons, alkyl of 1–4 carbons, and alkenyl of 2–4 carbons.

5,206,009

NON-AEROSOL, LOW VOC, PUMP HAIR SPRAY COMPOSITION

Ian A. Watling, Surrey; Daksha Patel, Middlesex, and Peter J. Petter, Berkshire, all of England, assignors to ISP Investments Inc., Wilmington, Del.

Filed Jun. 17, 1992, Ser. No. 899,835

Int. Cl.[5] A61K *7/11*

U.S. Cl. 424—45 **4 Claims**

1. A non-aerosol pump, low VOC hydroalcoholic hair spray composition consisting essentially of a hair fixative polymer at a solids level of about 1–15%, an alcohol content of about 50–70%, a water content of about 10–30%, and dimethoxymethane in an amount of about 10–30%, by weight of the composition.

5,206,010

COMPOSITION FOR USE IN ORAL CAVITY

Takeshi Inoue; Kouji Maeda, both of Utsunomiya, and Yasuteru Eguchi, Tokyo, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Dec. 19, 1991, Ser. No. 810,117

Claims priority, application Japan, Jan. 25, 1991, 3-23768

Int. Cl.[5] A61K *7/16, 9/16*

U.S. Cl. 424—49 **7 Claims**

1. A composition for use in the oral cavity comprising granules composed of a water-insoluble powder, said powder comprising particles having an average diameter in the range of from 0.1 to 20 μm, and a water-insoluble organic binder; said granules having an apparent density of from 0.1 to 1.5 g/cc measured in accordance with JIS No. K 3361; said granules collapsing at a deformation rate of from 0.1 to 20% under a load of from 0.1 to 50 g per granule, said deformation rate being the change in particle size in the direction of compression measured for a single granule, placed between two hard surfaces after being immersed in water, and then compressed by decreasing the clearance between said hard surfaces at a speed of from 0.1 to 10 mm per minute.

5,206,011

QUICK-DRYING NAIL ENAMEL COMPOSITIONS

Dennis A. Pappas, New York, N.Y., and Harold J. Larsen, Wayne, N.J., assignors to Amalia Inc., New York, N.Y.

Continuation-in-part of Ser. No. 452,618, Dec. 18, 1989, Pat. No. 5,093,108, which is a continuation-in-part of Ser. No. 311,479, Feb. 16, 1989, abandoned. This application Nov. 15, 1990, Ser. No. 614,309

The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.[5] A61K *7/04*

U.S. Cl. 424—61 **46 Claims**

32. A quick-dry composition for coating natural and synthetic nails of animals and humans comprising:

a) an amount of nitrocellulose as a primary film-forming polymer ranging from about 5% to about 25% by weight of said composition;

b) an amount of toluene-sulfonamide formaldehyde resin as a secondary film-forming polymer ranging from about 3% to about 13% by weight of said composition;

c) an amount of at least one plasticizer in an amount ranging from about 2.0% to about 10% by weight of said composition;

d) an amount of an organoclay thixotropic agent effective to produce gelling of said composition;

e) at least one pigment in an amount ranging from about 0.025 to about 4% by weight of said composition; and

f) a solvent combination comprising an amount of acetone ranging from about 13% to about 35% by weight of said composition in combination with at least one wetting agent selected from the group consisting of ethanol, isopropanol and n-butanol in an amount less than about 20% by weight of said composition and at least one ester selected from the group consisting of methyl acetate, ethyl acetate, propyl acetate, n-butyl acetate and amyl acetate, said solvent combination dissolving said primary film-forming polymer and said secondary film-forming polymer and producing a gelled composition in combination with said organoclay thixotropic agent having a static viscosity ranging from about 400 to about 1200 centipoises, said composition drying within a period of about three minutes or less to a coating exhibiting a substantial absence of tack.

5,206,012

COMBINATION OF HOLLOW MICROSPHERES OF A THERMOPLASTIC SYNTHETIC MATERIAL, HEXAGONAL BORON NITRIDE AND N-ACYL LYSINE AS A HOMOGENIZATION AGENT FOR COSMETIC COMPACTED POWDERS

Alan M. Farer, Morganville; Fifi Hanna, Kearny; Elisa L. Fox, Upper Montclair, and A. John Penicnak, Mountain Lakes, all of N.J., assignors to L'Oreal, Paris, France

Filed Feb. 27, 1991, Ser. No. 660,612

Claims priority, application France, Feb. 28, 1990, 90 02508

Int. Cl.[5] A61K *7/035*

U.S. Cl. 424—69 **7 Claims**

1. A homogenization agent for use in the preparation of a cosmetic powder composition in pressed or compact form so as to impart fluidity to said cosmetic powder composition, said homogenization agent consisting of a combination of three components which assist and improve the homogenization of the particulate ingredients of said cosmetic powder composition, said three components being;

x weight percent of hollow microspheres of a thermoplastic non-toxic and nonirritating synthetic polymeric material having a specific mass lower than 0.1 g/cm^3 and having a size lower than 30 μm and being selected from the group consisting of an ethylenic hydrocarbon, a polyester, a polyamide, a urea formaldehyde polymer and a copolymer of vinylidene chloride,

y weight percent of particles of hexagonal boron nitride, and

z weight percent of N-acyl lysine wherein the acyl moiety has 8 to 18 carbon atoms,

wherein x, y and z are numbers varying, respectively, in the following ranges:

x: 0.2–30,

y; 0.2–90,

z: 8–99.78

and wherein the sum of $X+y+z=100$.

5,206,013

SULFUR CONTAINING QUATERNARY AMMONIUM SALTS AS HAIR CONDITIONING AGENTS

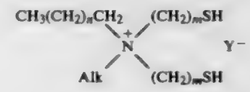
Thomas M. Deppert, Waterbury; Janusz Z. Jachowicz, Bethel, and Bryan P. Murphy, Monroe, all of Conn., assignors to Clairol, Inc., New York, N.Y.

Division of Ser. No. 562,307, Aug. 3, 1990, Pat. No. 5,087,733. This application Oct. 23, 1991, Ser. No. 781,475

Int. Cl.[5] A61K *7/075*

U.S. Cl. 424—71 **2 Claims**

1. Aqueous compositions useful as hair conditioners for human hair containing at least one compound represented by the formula



15% by weight of dissolved aluminum potassium sulphate, der formed by spray evaporation and having particles ranging

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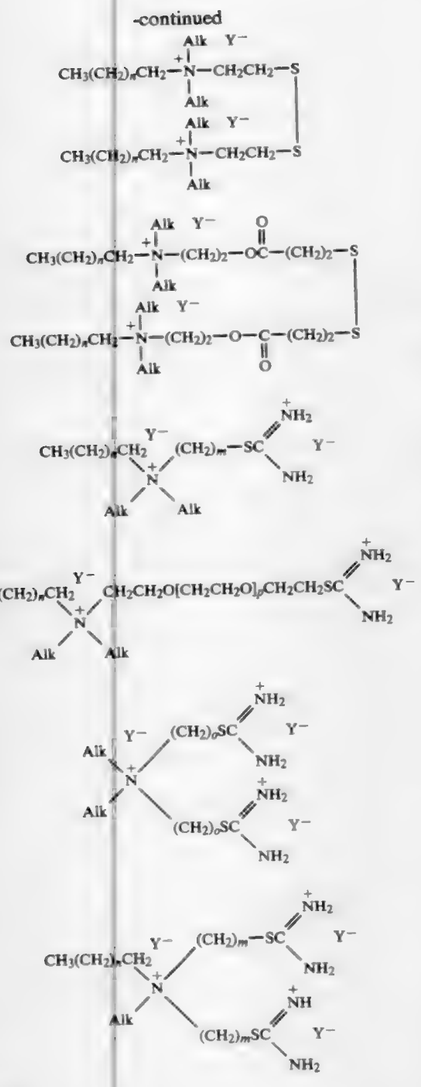
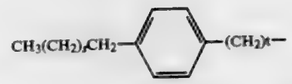


wherein
Alk is an alkyl group containing from about 1 to about 4 carbon atoms
Y is an anion
n is an integer with a value of from about 10 to 24
m is an integer with a value of from about 1 to about 4
o is an integer with a value of from about 8 to about 11
p is an integer with a value of from about 0 to about 20
provided that, in compounds with only one n inteqer, the total number of carbon atoms in the cation is not greater than 28, and in compounds with two n integers, the total number of carbon atoms in the cation is not more than about 52, and further compounds in which one or both long chain alkyl groups is interrupted with a phenylene group so that the structure of the interrupted group can be represented by



wherein s is an integer of from about 8 to about 17 and t is an integer from about 1 to about 5, in an amount which is effective when the hair is treated by contact with the composition for from about 5 to about 30 minutes to improve the combability of the hair compared with hair which has not been so treated.

5,206,014
SYNTHETIC NONAPEPTIDE FOR USE AS AN ADJUVANT

Luciano Nencioni; Guido Antoni; Diana Boraschi, and Aldo Tagliabue, all of Siena, Italy, assignors to Sclavo, S.p.A., Siena, Italy

Filed Feb. 12, 1988, Ser. No. 156,301
Claims priority, application Italy, Feb. 20, 1987, 19434 A/87
Int. Cl.[5] C07K *7/06*
U.S. Cl. 424—88 **11 Claims**

1. A pharmaceutical composition capable in living organisms including man of potentiating the primary and secondary antibody response to antigens having low immunogenicity, comprising a solution of 1 pg to 100 mg/kg of the hydrochloride salt of the nonapeptide having the following formula:

Val-Gln-Gly-Glu-Glu-Ser-Asn-Asp-Lys-X

where:
Val=L=Valine, Gln=L-Glutamine, Gly=Glycine, Glu=L-Glutamic acid, Ser=L-serine, Asn=L-Asparagine, Asp=L-aspartic acid, Lys=L-Lysine and X=OH in a pharmacologically acceptable solvent.

5,206,015
INTRODUCTION OF BACTERIA IN OVO

Nelson A. Cox, Bogart, and Joseph S. Bailey, Athens, both of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 5, 1989, Ser. No. 362,635
Int. Cl.[5] A01N *63/00;* **A61K** *37/00;* **C12N** *1/02*
U.S. Cl. 424—93 C **7 Claims**

1. A method of introducing viable bacteria into the digestive tract of a bird so as to prevent Salmonella infection comprising administering to the region of the air cell of an egg which contains a viable embryonic bird, a viable unattenuated probiotic bacterial culture obtained form the caecum or large intestine of the digestive tracts of mature birds which are free of Salmonella in an amount effective to colonize the digestive tract of the embryonic bird contained within said fertilized bird egg which is selected from the group consisting of chicken, turkey, duck, goose, quail, and pheasant egg.

5,206,016
CREAM CONTAINING ALUMINUM POTASSIUM SULFATE AND PROCESS FOR PREPARING SAME

Ernő Orbán, and Péter Várnai, both of Budapest, Hungary, assignors to Florin Vegyipari Szövetkezet, Szeged, Hungary

Filed Nov. 19, 1991, Ser. No. 792,854
Claims priority, application Hungary, Nov. 14, 1991, 3568/91
Int. Cl.[5] A61K *9/107*
U.S. Cl. 424—401 **8 Claims**

1. An oil-in-water (o/w) cream composition containing aluminum potassium sulfate for therapeutical use which comprises:
10 to 80% by weight an oily phase of pharmaceutically acceptable lipid ointment bases, and
20 to 90% by weight of an aqueous phase comprising 1 to 15% by weight of dissolved aluminum potassium sulphate, 0 to 10% by weight of propylene glycol, 0.1 to 5.0% by weight of cetyltrimethylammonium bromide, cetyltrimethylammonium chloride or mixtures thereof and water, calculated from the total weight of the cream composition.

5,206,017
USE OF PROTEASE NEXIN-I AS AN ANTIINFLAMMATORY

Randal A. Scott, Cupertino, Calif., assignor to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 505,442, Apr. 5, 1990, Pat. No. 5,112,608, which is a continuation-in-part of Ser. No. 25,450, Mar. 13, 1987, which is a continuation-in-part of Ser. No. 871,501, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 870,232, Jun. 3, 1986, abandoned. This application Dec. 6, 1991, Ser. No. 804,332
Int. Cl.[5] A61K *37/547, 37/54, 37/00*
U.S. Cl. 424—94.64 **15 Claims**

1. A method of reducing the loss of glycosaminoglycans in connective tissue of a patient suffering from a disease which causes the loss of glycosaminoglycans from connective tissue, comprising
administering to the patient an amount of protease nexin-I sufficient to reduce the loss of glycosaminoglycans from connective tissue.

5,206,018
USE OF RAPAMYCIN IN TREATMENT OF TUMORS

Sureadra N. Sehgal, Princeton, N.J., and Claude Vezina, Oka, Canada, assignors to Ayerst, McKenna & Harrison, Inc., St. Laurent, Canada

Continuation-in-part of Ser. No. 682,813, Apr. 9, 1991, Pat. No. 5,066,493, which is a continuation-in-part of Ser. No. 391,334, Aug. 9, 1989, abandoned, which is a division of Ser. No. 592,193, Mar. 22, 1984, Pat. No. 4,885,171, which is a continuation of Ser. No. 126,276, Mar. 3, 1980, abandoned, which is a continuation of Ser. No. 957,626, Nov. 3, 1978, abandoned. This application Oct. 29, 1991, Ser. No. 784,274
Int. Cl.[5] A61K *35/00, 31/66, 31/505;* **A01N** *57/00*
U.S. Cl. 424—122 **12 Claims**

1. A method of treating a malignant neoplasm selected from the group consisting of a mammary carcinoma, a skin carcinoma, and a central nervous system neoplasm in a mammal in need thereof which comprises administering an antineoplastic amount of rapamycin to said mammal orally or parenterally with the proviso that said malignant neoplasm has not been transplanted into said mammal.

5,206,019
SOAP COMPOSITIONS CONTAINING LIQUID-LOADED POWDERS

Larry D. Nichols, Arlington, Mass., assignor to Moleculon, Inc., Elizabeth, N.J.

Continuation of Ser. No. 619,729, Nov. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 358,690, May 30, 1989, Pat. No. 5,000,947. This application Apr. 14, 1992, Ser. No. 869,108
Int. Cl.[5] A61K *7/02, 9/14*
U.S. Cl. 424—401 **6 Claims**

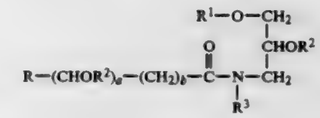
1. A soap composition for the delivery of a personal care agent during washing, the composition comprising a soap formulation and a frangible, liquid-containing, cellulosic powder formed by spray evaporation and having particles ranging in average diameter from about 1 to about 500 micrometers, the particles being microporous with a plurality of interconnecting pores ranging in size from about 1 to about 500 nonometers and having a liquid personal care agent loaded within the pores, such that the composition has a liquid content ranging from about 50 percent to about 95 percent by weight and upon washing use of the soap, the loaded pores readily release their load.

5,206,020
SYNTHETIC PSEUDOCERAMIDE AND COSMETIC COMPOSITIONS THEREOF

Peter Critchley, Bedford; Anthony V. Rawlings, Raunds, Northants, both of England, and Ira R. Scott, Allendale, N.J., assignors to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.

Filed Jan. 14, 1992, Ser. No. 820,576
Claims priority, application United Kingdom, Jan. 15, 1991, 9100816
Int. Cl.[5] A61K *7/00, 7/48, 21/685*
U.S. Cl. 424—401 **6 Claims**

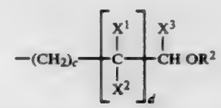
1. A synthetic pseudoceramide having the structure (2):



(2)

where
R represents a linear or branched, saturated or unsaturated, hydroxylated or non-hydroxylated, phosphorylated or non-phosphorylated, sulphated or non-sulphated aliphatic hydrocarbon group having from 1 to 49 carbon atoms;
R^1 represents a linear or branched, saturated or unsaturated, hydroxylated or non-hydroxylated, phosphorylated or non-phosphorylated, sulphated or non-sulphated aliphatic hydrocarbon group having from 1 to 28 carbon atoms;
R^2 represents H, a sugar residue, a sulphate residue or a phosphate residue P_f;
P_f represents the group:

R^3 represents H, or the sub group (3):



X^1, X^2 and X^3 each individually represent H, C_{1-5} alkyl or C_{1-5} hydroxyalkyl;
a is 1
b is 0 or 1
c is 0 or an integer of from 1 to 4
d is 0 or 1.

5,206,021

5,206,023
METHOD AND COMPOSITIONS FOR THE

a) an inclusion compound comprising: at least one pharma-

5,206,028
DENSE COLLAGEN MEMBRANE MATRICES FOR

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5,206,021

STABILIZED OIL-IN-WATER EMULSIONS OR SUSPOEMULSIONS CONTAINING PESTICIDAL SUBSTANCES IN BOTH OIL AND WATER PHASES

Mohammad Dookhith, Raleigh, N.C., and Hubert Linares, Calaire, France, assignors to Rhone-Poulenc AG Company, Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 526,776, May 17, 1990, Pat. No. 5,096,711, which is a continuation of Ser. No. 343,043, Apr. 25, 1989, abandoned. This application Nov. 7, 1990, Ser. No. 610,392

Claims priority, application France, May 9, 1988, 88 06494

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—405 **15 Claims**

1. A stabilized oil-in-water (O/W) macroemulsion, comprising in grams/liter:

a.	an oil phase lipophilic pesticidal substance, optionally dissolved in an organic solvent, wherein the average dispersed oil droplet particle size is between about 1 and about 8 microns;	25 to 800	oily phase
b.	an organic solvent;	0 to 350	
c.	a hydrophobic surface-active emulsifying agent;	0 to 100	
d.	a hydrophilic surface-active emulsifying agent;	20 to 60	
e.	a water phase compatible water soluble pesticidal substance;	20 to 600	
f.	a titanium dioxide-based emulsion dispersing or stabilizing agent, being a fine powder with an average particle size between about 0.1 and about 1 microns, to effectively maintain or improve the stability of the emulsion;	1 to 100	
and			
g.	water;	balance to 1,000.	

5,206,022

INSECT REPELLENT COMPOSITIONS

Larry D. Nichols, Arlington, Mass., assignor to Purepac, Inc., Elizabeth, N.J.

Continuation of Ser. No. 619,721, Nov. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 358,690, May 30, 1989, Pat. No. 5,000,947. This application Apr. 24, 1992, Ser. No. 875,198

Int. Cl.[5] A01N *25/12, 37/44*

U.S. Cl. 424—409 **4 Claims**

1. An insect repellent composition for the delivery of a topical insect repellent, the composition comprising a formulation of a frangible, liquid-containing, cellulosic powder formed by spray evaporation and having particles ranging in average diameter from about 1 to about 500 micrometers, the particles further characterized by being microporous with a plurality of interconnecting pores ranging in size from about 1 to about 500 nanometers and having a structure which is readily fragmented and a liquid insect repellent preparation loaded within the pores of the powder particles, such that the liquid-containing powder has a liquid content ranging from about 50 percent to about 95 percent by weight, and, upon application and rubbing, the rubbed particles fragment and the insect repellent preparation is readily released.

5,206,023

METHOD AND COMPOSITIONS FOR THE TREATMENT AND REPAIR OF DEFECTS OR LESIONS IN CARTILAGE

Ernst B. Hunziker, Riedholz, Switzerland, assignor to Robert F. Shaw, San Francisco, Calif.

Filed Jan. 31, 1991, Ser. No. 648,274

Int. Cl.[5] A61F *2/02;* **A61K** *37/22;* **C07K** *15/06;* **C09H** *3/02*

U.S. Cl. 424—423 **24 Claims**

1. A method of inducing cartilage formation at a selected site in the cartilage tissue of an animal comprising dressing the site with a composition comprising:

a biodegradable matrix or matrix-forming material,

a proliferation agent at an appropriate concentration in the matrix or matrix-forming material to stimulate the proliferation of repair cells in the matrix, and

a transforming factor associated with a delivery system in the matrix or matrix-forming material and at an appropriate concentration such that upon subsequent delivery of the transforming factor to repair cells in the matrix, the repair cells are transformed into chondrocytes that produce cartilage tissue.

5,206,024

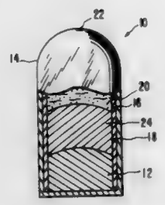
DENSITY ELEMENT FOR RUMINAL DELIVERY DEVICE

John R. Peery, Palo ALto, and James B. Eckenhoff, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 591,923, Oct. 2, 1990, abandoned, which is a division of Ser. No. 335,028, Apr. 7, 1989, abandoned. This application Dec. 24, 1991, Ser. No. 814,083

Int. Cl.[5] A23K *1/18*

U.S. Cl. 424—438 **17 Claims**



1. A density element for use in a ruminal drug delivery device comprising an agglomeration of high density particles bonded together, said density element having:

a) a density of at least 2.2 gm/ml and sufficient to maintain the delivery device in the rumen of a living animal; and

b) a transverse rupture strength no greater than about 30,000 psi such that said element fragments upon contact with the blades of grindng equipment without damage to the blades; said density element being free of the drug being delivered and having a corrosion resistance sufficient to prevent any significant loss in weight of said density element in the rumen from insertion to slaughter.

5,206,025

POROUS PHARMACEUTICAL FORM AND ITS PREPARATION

Frédéric Courteille, Cachan, and Magali Vanhoeve, Savigny s/Orge, both of France, assignors to Rhone-Poulenc Sante, France

Continuation of Ser. No. 526,726, May 22, 1990, abandoned. This application Jun. 4, 1992, Ser. No. 892,673

Claims priority, application France, May 24, 1989, 89 06781

Int. Cl.[5] A61K *47/40*

U.S. Cl. 424—439 **27 Claims**

1. A porous, unitary, freeze-dried pharmaceutical form of homogeneous appearance, which consists of:

a) an inclusion compound comprising: at least one pharmaceutically active substance and cyclodextrin, and

b) at least one substance chosen from: diluents, binders;

said pharmaceutical form being prepared by carrying out the following operations:

1) preparation of a dough containing the constituents a) and b), together with water so as to adjust the viscosity of the dough obtained,

2) division of the dough into unitary quantities having shape and volume, and

3) freeze drying.

5,206,026

INSTANTANEOUS DELIVERY FILM

Clyde L. Sharik, 828 Pine St., Trenton, N.J. 08536

Continuation of Ser. No. 197,940, May 24, 1988, abandoned. This application Jan. 2, 1990, Ser. No. 455,788

Int. Cl.[5] A61L *15/00*

U.S. Cl. 424—445 **2 Claims**

1. An instantaneous delivery film form delivery of a therapeutic agent to a wound site comprising

a delivery material comprising about 75 percent by weight of polyvinylpyrrolidone and about 25 percent by weight of polyethylene glycol; and

a proteolytic enzyme selected from trypsin and subtilisin in an amount of from about 25 to about 50 mg per square inch of said debridement film.

5,206,027

AMPHIPATHIC COMPOUND AND LIPOSOME COMPRISING THE SAME

Hiroshi Kitaguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

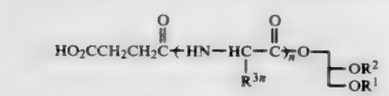
Continuation of Ser. No. 757,374, Sep. 10, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 927,723

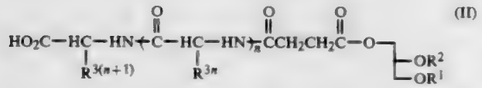
Claims priority, application Japan, Sep. 13, 1990, 2-242981

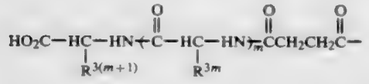
Int. Cl.[5] A61K *9/127, 37/02;* **C07C** *229/00*

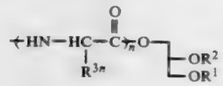
U.S. Cl. 424—450 **4 Claims**

1. A compound represented by formula (I), (II) or (III):


(I)


(II)


(III)



wherein

R^1 and R^2 each represents a straight chain or branched alkyl or acyl group having 8 to 24 carbon atoms, which has or does not have substituents or unsaturated groups;

R^{3n}, $R^{3(n+1)}$, R^{3m} and $R^{3(m+1)}$ each represents a side chain residue of an α-amino acid;

m represents an integer of from 0 to 5;

n is an integer of from 1 to 5;

the compound is racemic or optically active and the terminal carboxyl group may form a salt with a cation.

5,206,028

DENSE COLLAGEN MEMBRANE MATRICES FOR MEDICAL USES

Shu-Tung Li, 1 Kiowa Ter., Oakland, N.J. 07436

Filed Feb. 11, 1991, Ser. No. 653,178

Int. Cl.[5] A61K *9/14*

U.S. Cl. 424—484 **28 Claims**

1. A method of making a dense collagen membranous matrix material which when wetted with water is translucent and non-slippery comprising the steps of:

a) forming an aqueous dispersion containing insoluble Type I collagen;

b) freezing the aqueous dispersion;

c) subjecting the frozen dispersion to freeze-drying conditions to remove frozen water and form a collagen sponge matrix;

d) subjecting the collagen membranous matrix to humidification conditions for a time period of about 10 to about 65 minutes, such that the collagen membranous matrix absorbs about 10% to about 30% water by weight based on the weight of the collagen membranous prior to the humidification step;

e) compressing the humidified collagen membranous matrix;

f) cross-linking the compressed collagen matrix in either a liquid or vapor phase by treatment with a cross-linking agent selected from the group consisting of chromium sulfate, formaldehyde, glutaraldehyde, carbodiimide and adipyl dichloride, by immersing the collagen matrix in a solution of the cross-linking agent and then substantially removing the cross-linking agent;

g) refreezing the cross-linked collagen matrix;

h) resubjecting the frozen collagen matrix to freeze-drying conditions to remove frozen water;

i) resubjecting the dried cross-linked collagen matrix to humidification conditions comprising a for a time period of about 5 to about 30 minutes; and then

j) further compressing the humidified, collagen matrix to form the dense collagen membrane matrix material.

5,206,029

MEDICAMENT AND ITS PRODUCTION AND USE IN THE TREATMENT OF PAIN, INFLAMMATION AND FEVER IN MAN AND ANIMALS

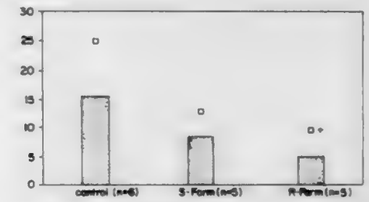
Gerd Geisslinger, Nuremberg, and Kay Brune, Marloffstein, both of Fed. Rep. of Germany, assignors to PAZ Arzneimittel-Entwicklungsgesellschaft mbH, Frankfurt, Fed. Rep. of Germany

Filed May 16, 1991, Ser. No. 700,798

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1990, 4028906

Int. Cl.[5] A61K *9/14, 9/48, 31/19*

U.S. Cl. 424—489 **21 Claims**



1. A medicament effective for the treatment of a disease characterized by pain or inflammation which comprises

(a) a mixture of the previously-separated R(−) and S(+) enantiomers of flurbiprofen and

(b) a pharmaceutically acceptable carrier, wherein the ratio of said R(−) and S(+) enantiomers of flurbiprofen is from about 99.5:0.5% to 0.5:99.5% wherein the medicament further comprises 2–10% of a release agent.

5,206,030

a housing having at least one inlet opening for the entry of

a mold having at least one supply conduit for a molten material;

5,206,035

AUTOMATIC MOLD CLAMPING APPARATUS FOR

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5,206,030

FILM-FORMING COMPOSITION AND USE FOR COATING PHARMACEUTICALS, FOODS AND THE LIKE

Thomas A. Wheatley, Richboro, Pa.; Clayton I. Bridges, Jr., Somerset, and Carl R. Steuernagel, Medford, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 26, 1990, Ser. No. 484,309
Int. Cl.[5] A61K 9/16
U.S. Cl. 424—490 15 Claims

1. A water-dispersible, particulate film-forming composition for use in film coating solid pharmaceutical dosages comprising a dry mixture produced by dry blending on a 100% weight basis in an amount of from about 50% to about 90%

particles of water-soluble cellulose acetate

pigment particles in an amount from about 0% to about 20%

a plasticizing amount of plasticizer in an amount from about 2% to about 40% for the water-soluble cellulose acetate, and

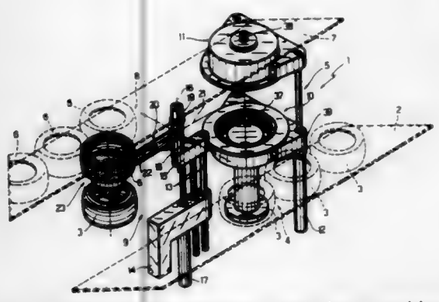
a surfactant in an amount from about 0.2% to about 2.0% which can be a separate component or a plasticizer having surfactant properties.

5,206,031

VEHICLE TIRE LOADING-UNLOADING DEVICE

Karl J. Siegenthaler, Rome, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 3, 1991, Ser. No. 725,158
Claims priority, application Italy, Jul. 27, 1990, 67592-A/90
Int. Cl.[5] B29C 35/02
U.S. Cl. 425—38 6 Claims



1. A device for loading-unloading vehicle tires comprising a mobile loading-unloading unit having an upper unit with plate means for supporting a first tire, and a lower unit having means for carrying a second tire; fixed supporting means for supporting said mobile loading-unloading unit; and activating means for moving said mobile loading-unloading unit through a processing unit and between a loading station, wherein said second tire is loaded, and an unloading station, wherein said first tire is unloaded.

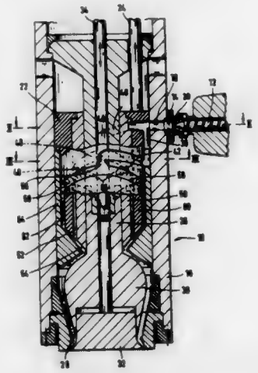
5,206,032

APPARATUS FOR PRODUCING A PREFORM FOR THE MANUFACTURE OF A HOLLOW BODY FROM THERMOPLASTIC MATERIAL

Stefan Bock, Berlin, Fed. Rep. of Germany, assignor to Krupp Kautex Maschinenbau GmbH, Bonn, Fed. Rep. of Germany

Filed Jun. 24, 1991, Ser. No. 719,908
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020819
Int. Cl.[5] B29C 47/06, 49/04
U.S. Cl. 425—131.1 6 Claims

1. Apparatus for producing a hollow body from thermoplastic material by blow molding, including an extrusion unit comprising at least one extruder for plasticising the thermoplastic material and an extrusion head, the extrusion head comprising: a housing having at least one inlet opening for the entry of plasticised material from said extruder into the housing, and an annular extrusion opening; at least one storage chamber in the housing for the storage of plasticised material from said extruder; a piston reciprocatable in the housing for ejecting stored material from the storage chamber to form a preform; in the peripheral surface of the piston at least one groove-like recess which extends at least substantially parallel to the direction of movement of the piston and which with the housing



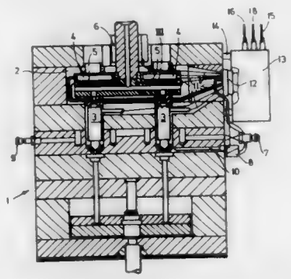
forms at least one receiving passage disposed opposite said inlet opening for receiving plasticised material therefrom, the length of said receiving passage in the direction of movement of the piston corresponding at least to the stroke movement of the piston; and first and second duct means communicating with respective opposing end regions of said receiving passage whereby the flow of thermoplastic material entering through said inlet opening flows as respective flow portions through each of said duct means towards said storage chamber.

5,206,033

DEVICE FOR PRODUCING INJECTION MOLDED PARTS AND COMPRISING HEATED AND/OR COOLED AS WELL AS TEMPERATURE-CONTROLLED SUPPLY CONDUITS FOR MOLTEN MATERIAL

Erich Stastny, Parkstrasse 9, A-2521 Trumau, Austria

PCT No. PCT/AT87/00061, § 371 Date Jun. 15, 1988, § 102(e) Date Jun. 15, 1988, PCT Pub. No. WO88/02688, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 16, 1987, Ser. No. 221,514
Claims priority, application Austria, Oct. 16, 1986, 2749/86
Int. Cl.[5] B29C 45/78
U.S. Cl. 425—143 9 Claims



1. A device for producing injected molded parts comprising:

a mold having at least one supply conduit for a molten material;

heating means for heating said molten material in said at least one supply conduit;

temperature measuring means for measuring the temperature of said molten material in said at least one supply conduit;

at least one regulator removably attached to said mold; and

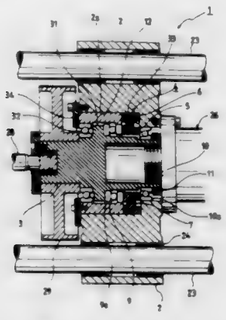
an electrical connector having a first member attached to said mold and a second member attached to said at least one regulator, said second member of said electrical connector being electrically connected to said first member of said electrical connector when said at least one regulator is attached to said mold, said first member of said electrical connector being connected to said heating means and said temperature measuring means by electrical conduits disposed within said mold.

5,206,034

INJECTION MOLDING MACHINE HAVING AN ANNULAR LOAD CELL

Shin Yamazaki, Nagano, Japan, assignor to Nissei Jushi Kogyo K.K., Nagano, Japan

Filed Jul. 17, 1991, Ser. No. 731,248
Claims priority, application Japan, Jul. 18, 1990, 2-190104
Int. Cl.[5] B29C 45/77
U.S. Cl. 425—145 14 Claims



1. An injection molding machine for use with a ball screw mechanism, comprising:

guide coupling means for providing linear movement to said ball screw mechanism;

screw coupling means for providing rotary movement to a screw;

an annular load cell including an inner tubular portion having first and second ends, an outer tubular portion, and an intermediate distortion portion, said load cell being positioned between said guide coupling means and said screw coupling means to detect pressure applied to said screw coupling means; and

first and second bearing portions positioned at said first and second ends, respectively, of said inner tubular portion of said load cell,

wherein said inner tubular portion of said load cell and said first and second bearing portions are secured to said screw coupling means to provide said first and second bearing portions with a predetermined load, said predetermined load being applied only to said inner tubular portion of said load cell, said load cell being rotatably fixed to said screw coupling means, and said predetermined load having no affect on said intermediate distortion portion, and

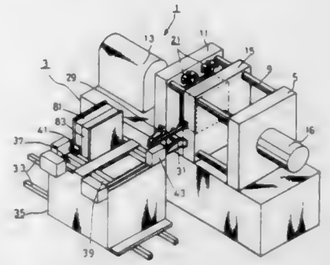
wherein said outer tubular portion of said load cell is secured only to said guide coupling means.

5,206,035

AUTOMATIC MOLD CLAMPING APPARATUS FOR MOLDING MACHINE

Yosuke Shiotani, Nagoya, Japan, assignor to Star Seiki Co., Ltd., Aichi, Japan

Filed Apr. 3, 1992, Ser. No. 863,426
Claims priority, application Japan, Aug. 8, 1991, 3-224799
Int. Cl.[5] B29C 45/66
U.S. Cl. 425—186 4 Claims



1. An automatic mold clamping apparatus for a molding machine, comprising: support bolts anchored at a peripheral edge of mold clamping positions of the stationary and movable mounts of the molding machine and having axes aligned with the axes of tie bars; clamping members each supported movably relative to the corresponding one of said support bolts between an engaged position, in which said each clamping member is engaged with a portion of a mold, and a disengaged position in which the same is disengaged from said mold; a moving member for moving said each clamping member between said engaged position and said disengaged position; nut members each meshing with said each clamping member for moving said each clamping member to the mold; a wrench member having a socket portion meshing with said each nut member for turning said socket member forward or backward; and a wrench drive member actuated by a cylinder connected to said wrench member for turning said wrench member reciprocally on said socket portion.

5,206,036

APPARATUS FOR SHAPING FIBER REINFORCED RESIN MATRIX MATERIALS

Steven J. Medwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 463,898, Jan. 9, 1990, Pat. No. 5,077,110, which is a division of Ser. No. 347,054, May 4, 1989, Pat. No. 4,927,581, and a continuation-in-part of Ser. No. 259,837, Oct. 19, 1988, abandoned. This application Oct. 25, 1990, Ser. No. 603,280
Int. Cl.[5] B29C 53/40, 55/00
U.S. Cl. 425—327 1 Claim

1. An apparatus for shaping an elongated composite structure of a thermoplastic resin matrix reinforced with fibers into a predetermined path of successive component lengths comprising:

a) a fixed forming tool having a surface defined by said predefined path in contact with said structure;

b) means for heating said forming tool;

c) means for stretching said structure from each of its ends into successive component lengths by applying a force to

each of said ends along the longitudinal axis of the struc-

5,206,038

means for serially cooling said articles and temperature control means to impose thereon the axial temperature

face of the manifold in alignment with one of the gates, the improvement wherein:

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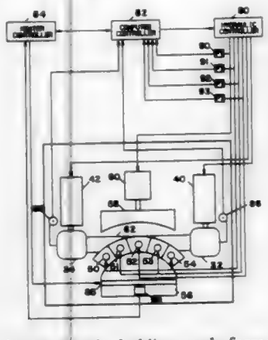
each of said ends along the longitudinal axis of the structure away from said ends as the structure is formed; and



d) means for separately holding each formed component length of the structure in place against said forming tool.

5,206,037

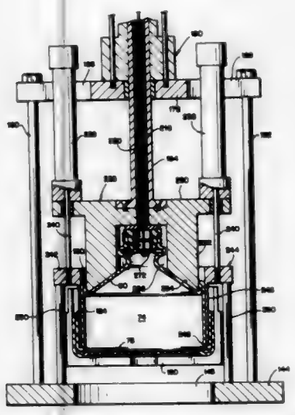
APPARATUS FOR COLLAPSING A CONTAINER

Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35631

Division of Ser. No. 576,080, Aug. 31, 1990. This application Jan. 30, 1992, Ser. No. 828,473

Int. Cl.[5] B29C *53/02*

U.S. Cl. 425—397 **15 Claims**



1. Apparatus for forming a collapsed and folded container in a sequential cycle, the container having a bottom wall, peripheral side wall, and a narrow neck portion including a discharge opening, the apparatus comprising:

a container holder mounted on a support surface for holding the container upright;

a plug for engaging the discharge opening in sealing relationship and loading the container into a predetermined working position relative to said container holder;

an outer pusher member positioned for engaging a predetermined portion of the container side wall to form a first folded side wall portion;

an inner pusher member positioned for engaging the tapered shoulder portion of the container and pushing the shoulder portion downwardly to form a second folded sidewall portion; and

means for actuating and controlling sequential movements of the plug and the outer and inner pusher members.

5,206,038

CLAMPING APPARATUS

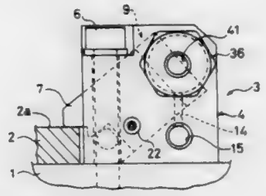
Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha KOSMEK, Japan

Filed Dec. 16, 1991, Ser. No. 808,007

Claims priority, application Japan, Dec. 28, 1990, 2-417580

Int. Cl.[5] B28B *1/00*

U.S. Cl. 425—450.1 **4 Claims**



1. A clamping apparatus comprising:

a first cylinder for clamping provided with a first piston and a first actuation chamber, said first piston being advanced from an unclamping position to a clamping position by adjusting a fluid pressure within said first actuation chamber through a fluid pressure introducing/removal means;

a clamping member carried by said first piston so as to be moveable with said first piston between unclamping and clamping positions;

a locking chamber communicated crosswise with said first actuation chamber;

a wedge type locking member having a first pressure receiving surface and a second pressure receiving surface and inserted into said locking chamber so as to be movable between a locking position where said locking member has been advanced into said first actuation chamber and an unlocking position where said locking member has been retracted into said locking chamber;

said first pressure receiving surface serving to move said locking member toward said unlocking position by means of the fluid pressure within said first actuation chamber;

said second pressure receiving surface serving to move said locking member toward said locking position by means of the fluid pressure within said first actuation chamber;

pressure receiving areas of those pressure receiving surfaces being defined substantially equal;

a second cylinder for unlocking provided with a second piston and a second actuation chamber, said second piston shifting said locking member from said locking position to said unlocking position by adjusting a fluid pressure within said second actuation chamber through said fluid pressure introducing/removal means; and

a pushing means biasing said locking member toward said locking position, a pushing force of said pushing means being set at a value smaller than an unlocking actuation force of said second cylinder.

5,206,039

APPARATUS FOR CONDITIONING PRESSURE MOLDED PLASTIC ARTICLES

Emery I. Valyi, 19 Moseman Ave., Katonah, N.Y. 10536

Filed Sep. 24, 1991, Ser. No. 764,911

Int. Cl.[5] B29C *49/64*

U.S. Cl. 425—526 **32 Claims**

1. Apparatus for conditioning pressure molded plastic articles preparatory to a finishing operation, which comprises:

means for delivering a number of pressure molded plastic articles;

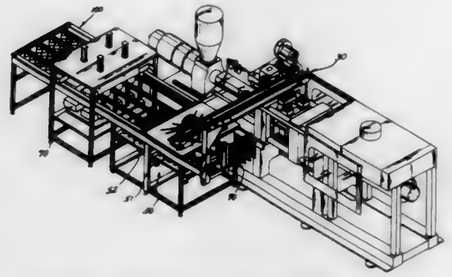
a finishing machine for performing a finishing operation upon said articles downstream of the delivery means;

a conditioning section having means to adjust the temperature of said articles between said delivery means and said finishing machine comprising independently operable

means for serially cooling said articles and temperature control means to impose thereon the axial temperature distribution required to perform said finishing operation, said conditioning section comprising;

at least one conditioning station within said conditioning section including means to cool said articles according to a predetermined pattern;

at least one conditioning station within said conditioning section including means to heat said articles according to a predetermined pattern;



wherein said conditioning station including means to cool is separate from and spaced from said conditioning station including means to heat;

first transport means positioned to remove said articles from said delivery menas;

second transport means positioned to transfer said articles form said first transport means to said conditioning section; and

wherein each of said conditioning station processes the complete number of pressure molded articles delivered by the means for delivering.

5,206,040

INJECTION MOLDING SEALING COLLAR WITH A CENTRAL HOT TIP SHAFT

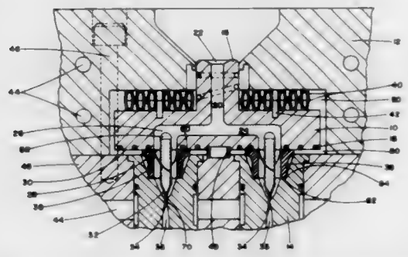
Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada L7G 2X1

Filed Feb. 14, 1992, Ser. No. 835,501

Claims priority, application Canada, Dec. 11, 1991, 2057438

Int. Cl.[5] B29C *45/22*

U.S. Cl. 425—549 **8 Claims**



1. In a hot tip gated injection molding apparatus having a plurality of spaced gates, each gate extending centrally from a well in a cooled cavity insert to a respective cavity, a heated melt distribution manifold having a forward face mounted with an insulative air space extending between the forward face of the heated manifold and the cooled cavity insert, and a melt passage extending from a common inlet and branching in the manifold to a plurality of branches, each branch having a portion which extends forwardly to an outlet on the forward face of the manifold in alignment with one of the gates, the improvement wherein:

a sealing and conductive member having a plurality of spaced ribs which connect an elongated central conductive hot tip shaft to a surrounding outer sealing collar portion is mounted between the heated manifold and the cooled cavity insert in alignment with each of the gates, the outer collar portion having a rear end, a forward end, and a central bore wherethrough melt from the melt passage flows around the hot tip shaft to the gate, the outer collar portion bridging the insulative air space between the heated manifold and the cooled cavity insert with the rear end of the collar portion abutting against the forward face of the heated manifold and the forward end of the collar portion being seated in the well in the cavity insert, the hot tip shaft having a rear end and a forward end, the rear end of the hot tip shaft extending rearwardly past the rear end of the collar portion through the outlet on the forward face of the manifold a predetermined distance into the forwardly extending portion of a respective one of the melt passage branches, the forward end of the hot tip shaft being pointed and extending forwardly past the forward end of the collar portion a predetermined distance into the well in the cavity insert in alignment with the gate.

5,206,041

RUMINANT ANIMAL FEED SUPPLEMENT

Fred H. Wellons, Greensboro, N.C., assignor to CBP Resources, Inc., Greensboro, N.C.

Continuation of Ser. No. 470,391, Jan. 24, 1990, abandoned, which is a continuation of Ser. No. 272,095, Nov. 16, 1988, Pat. No. 4,919,940. This application Sep. 11, 1992, Ser. No. 944,037

The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—2 **8 Claims**

1. A process for supplying fatty acids containing at least 10 carbon atoms to ruminant animals while protecting the microorganisms in the animal's rumen from attack by the fatty acids comprising feeding highly saturated fatty acids to said animals in the form of triglycerides along with the dry matter content of said animal feed, said dry matter content including at least one vegetable material edible by ruminant animals selected from the group including legume hay, grass hay, corn silage, grass silage, legume silage, corn grain, oats, barley, distillers grain, brewers grain, soya bean meal, and cotton seed meal, said triglycerides being present in an amount effective to protect the microorganisms in the animals' rumen from attack by the fatty acids, wherein the iodine value of said triglycerides is in the range of 5 to 25.

5,206,042

MANNITOL/SORBITOL ROLLING COMPOUND BLEND

Jayant C. Dave, Bloomingdale, and Mansukh M. Patel, Downers Grove, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation of Ser. No. 761,278, Sep. 17, 1991, abandoned. This application Sep. 21, 1992, Ser. No. 948,458

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 **19 Claims**

1. A rolling compound comprising a blend of about 5 to about 10 weight percent sorbitol and about 90 to about 95 weight percent mannitol, the sorbitol and mannitol having similar particle size distributions, the blend having an angle of repose of not greater than about 39 degrees.

14. A chewing gum composition which has been dusted with a blend of about 90 to about 95 weight percent mannitol and about 5 to about 10 weight percent sorbitol powders, the mannitol and sorbitol powders having particle size distributions such that greater than 95 weight percent of the mannitol particles and greater than 95 weight percent of the sorbitol particles

have at least one peripheral dimension that does not exceed 100

being achieved immediately upon reaching a desired color in order to halt the caramelization reaction which results

10° F. above the melting point of the hydrogenated vegetable oil

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have at least one peripheral dimension that does not exceed 100 mesh, the blend having an angle of repose of not greater than about 39 degrees.

5,206,043

CONTAINERS AND COMPOSITIONS FOR SEALING THEM

Steven A. C. White, Buzzard, England, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 19, 1991, Ser. No. 762,664

Claims priority, application United Kingdom, Nov. 30, 1990, 9026053

Int. Cl.[5] B65D *1/02*

U.S. Cl. 426—106 18 Claims

1. A package comprising a wood structure wherein the wood structure has been impregnated with a chlorinated substance, a bottle filled with a potable material, a cap and a sealing gasket between the bottle and the cap, wherein the gasket is formed of a thermoplastic composition that is a homogeneous blend of from about 20 to about 60% by weight of the composition of butyl rubber formed a copolymer of isoprene and butylene and has a Mooney viscosity (ML1+8 at 110° C.) of below 50 and from about 40 to about 80% by weight of the composition of one or more thermoplastic polymers and wherein the thermoplastic composition is impermeable to chlorinated substances selected from the group consisting of chlorinated phenols, chlorinated anisoles and both.

5,206,044

WRAPPER FOR PREPARING A ROSIN BAKED POTATO

Daniel P. Walton, Jr., 470 Greenway Ave., Satellite Beach, Fla. 32937

Division of Ser. No. 763,802, Sep. 23, 1991. This application Oct. 26, 1992, Ser. No. 966,421

Int. Cl.[5] B65D *81/34, 65/42*

U.S. Cl. 426—132 18 Claims

1. A flexible laminated wrapper for preparing a rosin baked potato consisting essentially of a flexible sheet comprising either a plastic film or a metal foil, laminated by rosin to a flexible absorbent cellulosic substrate, said flexible wrapper being dimensioned to fully enwrap a whole potato and said flexible absorbent cellulosic substrate being coated with rosin such that the substrate is impregnated and layered with an amount of rosin such that when said whole potato is fully enveloped with said flexible wrapper with said potato being placed in contact with the rosin coated substrate side of said wrapper and said wrapped potato is baked in a heating apparatus, said layered and absorbed rosin is melted and retained around said potato during the heating to improve the heat transfer into said potato and allow said melted rosin to flavor said potato and such that after said rosin is allowed to cool sufficient to resolidify on and within said cellulosic substrate after heating is completed, said flexible wrapper forms a somewhat rigid container around said potato and adheres to the potato skin which facilitates eating the fluffy potato food contained within said potato skin.

5,206,045

APPARATUS AND METHOD FOR COOKING FOOD PRODUCTS

Robert M. Stuck, Clover, S.C., assignor to Marshall Air Systems, Inc., Charlotte, N.C.

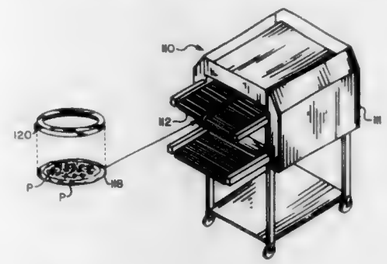
Continuation-in-part of Ser. No. 561,096, Aug. 1, 1990, Pat. No. 5,006,355, Continuation-in-part of Ser. No. 396,945, Aug. 22, 1989, Pat. No. 5,013,563, which is a continuation-in-part of Ser. No. 886,478, May 23, 1986, Pat. No. 4,924,767. This application Mar. 8, 1991, Ser. No. 666,256

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] A23L *1/00;* A47J *37/00*

U.S. Cl. 426—243 27 Claims

12. A method for cooking food products comprising the steps of applying cooking energy to a food product and selectively modifying the cooking energy applied to a predetermined portion of the food product to be subject to a modified amount of cooking without contacting the food product and without correspondingly modifying the cooking energy re-



ceived by other portions of the food product, said cooking energy modifying step comprising partially filtering cooking energy directed at the predetermined portion of the food product.

5,206,046

FRIED FLAVOR ROUX BASE AND METHOD FOR PRODUCTION

W. R. Seeds, 208 Oldham Ave., Waxahachie, Tex. 75165

Continuation-in-part of Ser. No. 613,253, Nov. 14, 1990, Pat. No. 5,145,705. This application Jul. 24, 1992, Ser. No. 918,969

Int. Cl.[5] A23L *1/39*

U.S. Cl. 426—589 28 Claims

1. A process for producing a roux base having a definitive flavor which is adjustable in intensity and definition through a combination of controlled heating, dwell time during heating and quenching comprising:

admixing flour with a liquified shortening, the mixture having a ratio from about 75:25 to about 25:75 percentage by weight of flour to shortening;

heating the mixture at a temperature for sufficient time to reduce the moisture content of the mixture to less than about 1% by weight;

continuously mixing and stirring the mixture while elevating the mixture temperature through various stages of caramelization and corresponding colors with the process and color change occurring at a more rapid rate as the temperature of the mixture increases;

flowing the caramelized mixture across a flat surface and exposing the flowing mixture to air flow which allows for efficient flashing or removal of remaining moisture and off-flavor components; and

quenching the caramelized mixture upon reaching a predetermined color in a color range wherein L ranges from about 20 to about 75; a ranges from about 5 to about 10; and b ranges from about 6 to about 20, the quenching being achieved immediately upon reaching a desired color in order to halt the caramelization reaction which results in fixing a definitive flavored roux base.

5,206,047

PROCESS FOR MAKING HIGH BRIX CITRUS CONCENTRATE

Philip G. Crandall, Fayetteville, Ak., and Kathryn C. Davis, Lakeland, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Jun. 5, 1991, Ser. No. 710,784

Int. Cl.[5] A23L *2/06*

U.S. Cl. 426—599 34 Claims

1. A method for producing a concentrate essentially free of high methoxyl gel, which comprises the steps of:

(a) providing a feed juice;

(b) concentrating the feed juice to a concentration of from about 65° Brix to about 80° Brix; and

(c) subjecting the concentrated juice to a shear of sufficient force to prevent formation of high methoxyl gel in the concentrated juice.

5,206,048

PROCESS FOR MANUFACTURING POTATO CHIPS

Zae I. Shin, Incheon; Hyung J. Lee, Seoul; Sung J. Yang, and Un S. Lee, both of Kyungki, all of Rep. of Korea, assignors to Nong Shim Co., Ltd., Seoul, Rep. of Korea

Filed May 30, 1991, Ser. No. 707,461

Int. Cl.[5] A23L *1/217*

U.S. Cl. 426—637 2 Claims

1. A process for manufacturing potato chips using chemically treated frozen potatoes which consists essentially of:

(a) washing, peeling and slicing potatoes to obtain potato slices;

(b) preparing a heated dipping solution having a concentration of 0.2–1.0% by weight of ultraphosphate, wherein the dipping solution is heated to a temperature of 40°–50° C.;

(c) dipping potato slices in the heated dipping solution for 3–5 minutes;

(d) rapidly freezing the dipping potato slices a −40° to −60° C. for 5 to 30 minutes;

(e) storing the frozen potato slices at about −20° C.;

(f) thawing the frozen potato slices at about 30°–80° C; and

(g) frying the thawed potato slices in vegetable oil.

5,206,049

CHOLINE-CONTAINING COMPOSITIONS AS SALT SUBSTITUTES AND ENHANCERS AND A METHOD OF PREPARATION

Stuart Fielding, Morris Plains, N.J.; Kenneth W. Locke, Charlestown, Mass., and Alvin Kershman, St. Louis, Mo., assignors to Interneuron Pharmaceuticals, Inc., Lexington, Mass.

Continuation-in-part of Ser. No. 654,448, Feb. 12, 1991. This application Feb. 11, 1992, Ser. No. 834,883

Int. Cl.[5] A23L *1/227, 1/237*

U.S. Cl. 426—649 16 Claims

1. A process for preparing a salt substitute and salt enhancer composition which comprises:

a) blending an effective amount of sodium chloride and choline-containing compound to form a mixture;

b) heating the mixture to about 120°–130° F.;

c) adding maltodextrin to the hot mixture such that the final dry weight of the maltodextrin is about 10% to about 75% of the weight of the sodium chloride, so that a dry aggregate comprising sodium chloride, choline-containing compound, and maltodextrin is formed;

d) adding a coating mixture comprising lecithin and hydrogenated vegetable oil onto the aggregate to at least partially but not completely cover the aggregate with a water-insoluble layer to form a coated granular mixture; and

e) cooling the coated granular mixture, wherein the coating mixture is heated prior to being added to the aggregate to 10° F. above the melting point of the hydrogenated vegetable oil.

5,206,050

FOOD ANALOG AND PROCESS FOR MAKING THE SAME

Richard A. Jennings, Santa Fe, N. Mex., assignor to Rudolph Holscher, Santa Fe, N. Mex., a part interest

Filed Feb. 1, 1991, Ser. No. 649,432

Int. Cl.[5] A23J *3/16*

U.S. Cl. 426—656 20 Claims

1. A process for producing a cooked food analog from soybeans comprising the steps of:

(a) obtaining a soybean milk;

(b) adding a coagulant to the soybean milk to form a mixture of curds and whey;

(c) breaking the mixture of curds and whey to obtain curd differentiation;

(d) cooking the formed curds, while maintaining said curd differentiation, at a temperature and for a time effective to harden the curds and form small pieces of curd;

(e) separating the curds from the supernatant liquid; and

(f) rapidly cooling the curds.

5,206,051

METALLIZED POLYPROPYLENE FILM AND PROCESS FOR MANUFACTURE

Henry Theisen, New London, and Kevin Nelson, Appleton, both of Wis., assignors to Curwood, Inc., Oshkosh, Wis.

Filed Nov. 8, 1990, Ser. No. 610,528

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—458 14 Claims

1. A process for producing metallized polypropylene film, the steps of the process comprising:

a) blending polypropylene with an acid terpolymer,

b) producing a film from said blend, and

c) depositing a thin layer of metal on said film.

5,206,052

ELECTROLESS PLATING PROCESS

Akishi Nakaso, Oyama; Kaoru Oginuma, Mito; Takeshi Shimazaki, Hitachi, and Akio Takahashi, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed May 2, 1990, Ser. No. 518,500

Claims priority, application Japan, Mar. 9, 1989, 1-115834

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—97 12 Claims

1. A process for carrying out electroless plating which consists of:

conditioning a surface of a material to be plated,

contacting the resulting material with an aqueous catalyst solution for electroless plating,

subjecting the resulting material contacted with the aqueous catalyst solution for electroless plating to an activation accelerating treatment, and

carrying out electroless plating;

the material to be plated comprising an insulating substrate and a metal layer or foil adhered thereto, and said activation accelerating treatment being carried out by using an aqueous solution consisting of water, sulfuric acid and cupric chloride; the concentration of sulfuric acid being 0.01 to 5 mole/liter and the concentration of cupric chloride being 0.00003 to 0.03 mole/liter.

5,206,053

18. A method for applying a coating on at least a portion of

said applied liquid flows, the improvement wherein the thickness of a coated film is controlled by changing the relative

to a polypropylene substrate a chlorinated interpolymer of ethylene and carbon monoxide having an amount of carbon

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5,206,053

METHOD OF COATING FOR ENHANCEMENT OF BULK AND HAND IN CARPETS

Lidia T. Calcaterra, and Mathias P. Koljack, both of Arlington Heights, Ill., assignors to Allied-Signal Inc., Morris Township, Morris Country, N.J.

Filed Oct. 30, 1991, Ser. No. 784,838
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—373 8 Claims

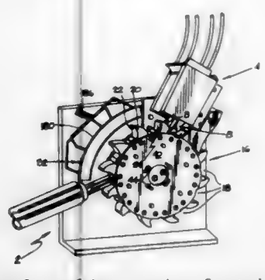
1. A process for the enhancement of bulk and hand of carpeting comprising applying to said carpeting an amount effective to enhance the bulk and hand of a terpolymer which is the reaction product of (a) phenyl vinyl ether, (b) 2-(4-hydroxymethyl-phenoxy)ethyl vinyl ether, (c) maleic anhydride in proportions effective to enhance the bulk and hand of said carpeting.

5,206,054

APPARATUS AND METHOD FOR APPLYING A COATING TO A CAN BODY

Robert H. Schultz, Golden, Colo., assignor to Coors Brewing Company, Golden, Colo.

Continuation-in-part of Ser. No. 336,104, Apr. 11, 1989, Pat. No. 5,023,112. This application Feb. 1, 1991, Ser. No. 649,414
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] B05D 5/08, 1/28; B05C 1/02, 13/02
U.S. Cl. 427—287 20 Claims



1. Apparatus for applying a coating of material on at least a portion of the outer peripheral surface of a can body comprising:
a fixedly mounted support frame;
feeding means for continuously feeding can bodies to a feed station, each of said can bodies having a bottom end and an integral sidewall having a generally cylindrical outer peripheral surface;
a main drive shaft which is mounted for rotation on said support frame;
drive means for rotating said main shaft around an axis of rotation;
a turret mounted on said main drive shaft for rotation therewith;
a plurality of pockets formed on said turret between radially outwardly projecting members for rotation therewith and wherein each of said pockets removes a can body from said feed station as said pocket moves through said feed station;
can body holding means in each of said pockets for holding each of said can bodies in each of said pockets so that at least a portion of said outer peripheral surface is freely exposed;
can body rotating means for rotating each of said can bodies in said pockets as said turret rotates; and
coating material applying means mounted on said support frame and positioned so that said at least a portion of said outer peripheral surface of said rotating can body contacts said coating material applying means as said turret rotates for applying a coating of material thereon.

18. A method for applying a coating on at least a portion of the outer peripheral surface of a can body comprising:
mounting a turret for rotation about a relatively fixed axis;
forming a plurality of pockets on the outer peripheral surface of said turret;
feeding a can body having a generally cylindrical outer peripheral surface into each of said pockets as said turret is rotating;
holding each of said can bodies in one of said pockets by applying a force thereto using holding means within each of said pockets so that at least a portion of said outer peripheral surface is freely exposed;
rotating said can body about its own axis as it is being held in said pocket;
moving said at least a portion of said outer peripheral surface of said can body into contact with a coating applying means so as to apply a coating thereon; and
applying heat to said coating applying means.

5,206,055

METHOD FOR ENHANCING THE UNIFORM ELECTROLESS DEPOSITION OF GOLD ONTO A PALLADIUM SUBSTRATE

Charles D. Iacovangelo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,485
Int. Cl.[5] C23C 26/00
U.S. Cl. 427—304 3 Claims

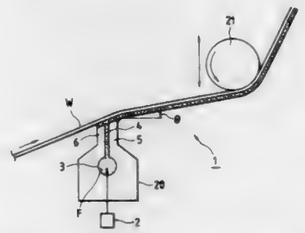
1. A method for making a gold-palladium composite which comprises,
(1) activating a palladium substrate by immersing it in an aqueous activating solution for at least 6 seconds at a temperature in the range of 50° C. to 100° C., where the aqueous activating solution comprises from about 2 to about 50% by weight solids, and consists essentially of about 1.0 to about 15% by weight of alkali metal hydroxide, about 1.0 to about 30% by weight of alkali metal carbonate and about 0.05 to about 5% by weight of a reducing agent based on the weight of aqueous activating solution, and
(2) immersing the activated palladium substrate of (1) into an electroless gold bath until at least 0.1 micron of gold has been uniformly electrolessly deposited onto the palladium substrate.

5,206,056

METHOD OF APPLICATION AND DEVICE FOR APPLICATION

Norio Shibata, and Naoyoshi Chino, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1991, Ser. No. 770,005
Claims priority, application Japan, Oct. 8, 1990, 2-268533
Int. Cl.[5] B05D 1/26; B05C 5/00
U.S. Cl. 427—356 5 Claims



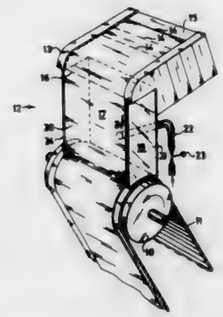
1. In a method of continuously applying a liquid to the surface of a continuously moving flexible carrier through the use of a curved surface of a doctor edge portion of an application head facing the surface of said carrier and along which said applied liquid flows, the improvement wherein the thickness of a coated film is controlled by changing the relative positional relationship between said curved surface and said carrier and wherein a clearance between the surface of said carrier and said curved surface of said doctor edge portion is larger at a downstream end of said surface of said doctor edge portion than at an upstream part of said surface of said doctor edge portion.

5,206,057

METHOD AND APPARATUS FOR ADJUSTING THE CURTAIN IMPINGEMENT LINE IN A CURTAIN COATING APPARATUS

Douglas S. Finnicum, Webster; Kenneth J. Ruschak, Rochester, and Steven J. Weinstein, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 10, 1992, Ser. No. 819,536
Int. Cl.[5] B05D 1/30
U.S. Cl. 427—420 17 Claims



1. A curtain coating apparatus comprising
means for continuously moving a substrate along a path through a coating zone, from an upstream direction to a downstream direction,
a hopper means positioned above said path for forming a continuously flowing, curtain of liquid in said coating zone, said curtain having an upstream and a downstream side and impinging on the moving substrate in a line transversely across the substrate to form a coated layer of said liquid thereon,
an enclosure means which includes (a) a pair of planar side walls positioned on opposite sides of the substrate parallel to the direction of movement thereof, said walls extending vertically from said hopper means to said substrate and (b) an upstream wall extending from the hopper means to a position close to said substrate,
said enclosure means, in combination with the hopper means, the substrate and the curtain, forming a pressure controlled zone in which a substantially static gas pressure can be maintained, and
means for controlling the static gas pressure in said zone and for establishing a pressure differential between the upstream and downstream sides of the curtain.

5,206,058

PROCESS FOR PAINTING POLYPROPYLENE

Slaton E. Fry; Allen J. Blankenship, both of Batesville; David W. Magouyrk, Locust Grove, all of Ark.; Paul J. Greene, Kingsport, Tenn., and Thomas W. Smith, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 26, 1992, Ser. No. 840,975
Int. Cl.[5] B05D 1/38, 5/04
U.S. Cl. 427—412.3 1 Claim

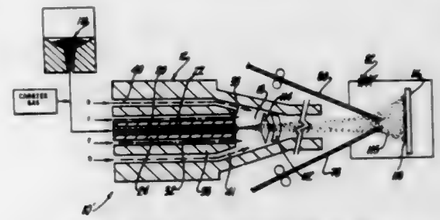
1. A process comprising
(A) preparing an adhesion promoting coating by applying to a polypropylene substrate a chlorinated interpolymer of ethylene and carbon monoxide having an amount of carbon monoxide in the range of 2.5 to 6.8 weight percent and an amount of chlorine in the range of 19 to 26 weight percent, and
(B) coating the adhesion promoting coating with a paint.

5,206,059

METHOD OF FORMING METAL-MATRIX COMPOSITES AND COMPOSITE MATERIALS

Daniel R. Marantz, Sands Point, N.Y., assignor to Plasma-Technik AG, Switzerland

Division of Ser. No. 247,024, Sep. 20, 1988, Pat. No. 5,019,686. This application Mar. 4, 1991, Ser. No. 664,271
Int. Cl.[5] B05D 1/08
U.S. Cl. 427—449 8 Claims



1. A method of forming a composite material having at least two components on a target, including the following steps:
flowing a first component of said composite material as a fine particulate entrained in a gaseous carrier axially through a heated chamber of a thermal spray gun and simultaneously heating and accelerating said first component and carrier gas to at least near supersonic velocity;
melting a second component of said composite material in rod form in the path of said accelerated and heated particulate first component and carrier gas to form a liquid second component of said composite material;
atomizing said liquid second component by flowing said accelerated and heated particulate first component and said carrier gas into contact with said liquid second component, accelerating said atomized liquid second component to said near supersonic velocity and forming a stream of said first and second components and carrier gas substantially uniformly distributed in said stream; and
impacting said stream of first and second components against a target in the path of said stream, forming a substantially homogeneous composite material.

5,206,060

PROCESS AND DEVICE FOR THE DEPOSITION OF THIN LAYERS AND PRODUCT MADE THEREBY

Pierre Balian, Paris, and Jean-Paul Rousseau, Boulogne, both of France, assignors to Saint Gobain Vitrage Int'l. "Les Miroirs", Coubevoie, France

Filed Aug. 9, 1990, Ser. No. 565,295
Claims priority, application France, Aug. 14, 1989, 89 10870
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—489 13 Claims

1. A process for the deposition of a protective layer comprising the steps of:
providing an electrically grounded vacuum chamber;
providing a substrate comprising an electrically conductive surface acting as an electrode, said substrate being fixed in position relative to said vacuum chamber; and
depositing a material on said substrate by performing plasma chemical vapor deposition by applying an alternating current between said conductive surface of said substrate and said vacuum chamber wherein said alternating current is applied to said conductive surface of said substrate

by at least one power lead-in, said power lead-in compris-

and the content of unsaturated nitrile compound in the non-

agent comprising a solid support and an antifoaming composition retained by the solid support, said solid support

5,206,067

LANDFILL GAS CAPPING LINER SYSTEM

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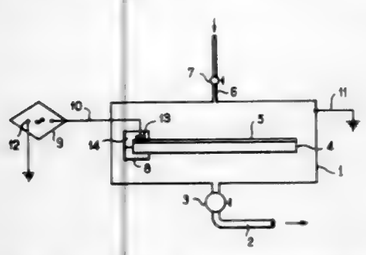
by at least one power lead-in, said power lead-in comprising a conductive element contacting said substrate along an entire edge and an insulating element covering said



conductive element except where said conductive element contacts said substrate and except where a conductor for supplying said alternating current makes contact with the conductive element.

5,206,061

DUST-PROOF HEADGEAR

Katsutoshi Ando, Otsu, and Ryoichi Togashi, Shiga, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP89/00532, § 371 Date Mar. 25, 1991, § 102(e) Date Mar. 25, 1991, PCT Pub. No. WO90/14024, PCT Pub. Date Nov. 29, 1990

PCT Filed May 26, 1989, Ser. No. 640,432

Int. Cl.[5] B32B *1/08*

U.S. Cl. 428—34.7 **12 Claims**

1. A dust-proof headgear made from a material having, as a major component thereof, an electret non-woven fabric having a surface electrostatic charge density of 1×10^{-10} Coulomb/cm^2 or greater and an air-permeability of between 10 cc/cm^2.sec and 1000 cc/cm^2 sec.

5,206,062

VESSEL FOR AEROSOL

Hideo Amemiya, Yokohama; Minoru Kuroda, Urawa; Tsutomu Shike, and Mikio Minagawa, both of Gotenba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo and Kabushiki Gaisha Tokai, Kanagawa, both of Japan

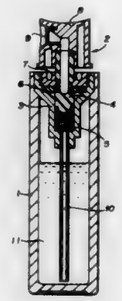
Continuation of Ser. No. 523,534, May 15, 1990, abandoned. This application May 20, 1992, Ser. No. 887,582

Claims priority, application Japan, May 23, 1989, 1-127760

Int. Cl.[5] B65B *5/40;* **B65D** *1/00;* **C08L** *51/04*

U.S. Cl. 428—36.92 **4 Claims**

1. A vessel for aerosol comprising a high-nitrile resin blend, said vessel capable of storing ethyl alcohol, wherein said high-nitrile resin blend comprises a polymer having from 60 to 90 weight parts of a mixture of monomers comprising at least 60 weight % of an unsaturated nitrile compound and at least above 5 weight % of an aromatic vinyl compound which has been graft polymerized to 1 to 40 weight parts of diene synthetic rubbers containing 50 weight % or more of a conjugated diene monomer, wherein said high-nitrile resin comprises a grafted resin blend and a non-grafted resin wherein the content of unsaturated nitrile compound in resin grafted to the diene synthetic rubbers in the polymer is represented by X weight % and the content of unsaturated nitrile compound in the non-grafted resin is represented by Y weight %, the vessel for aerosol comprising a high-nitrile resin blend which satisfies a relation of



$$[60]63<X\leq Y<[90]75$$

between X and Y.

5,206,063

OPTICAL RECORDING ELEMENT WITH ROM AND RECORDING REGIONS

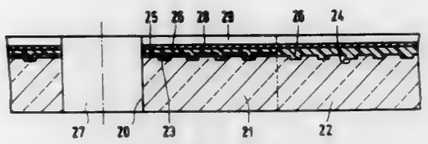
Gerrit D. Westerhout, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 11, 1991, Ser. No. 758,916

Claims priority, application Netherlands, Sep. 14, 1990, 9002024

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—64 **2 Claims**



1. An optical recording element having a ROM (read only memory) region containing information which can be read optically and a RC (recording) region in which information can be recorded and read optically, comprising a transparent supporting plate, a first reflective layer disposed over said ROM and RC regions, and a dye-containing recording layer disposed in said RC region between said substrate and said first reflecting layer,

characterized in that said recording layer extends over said ROM region, and

a second reflective layer is disposed over said ROM region between said recording layer and said substrate.

5,206,064

CURABLE RESINS WITH SOLID SUPPORTED ANTIFOAMING AGENTS

Matthew T. Scholz, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1991, Ser. No. 687,440

Int. Cl.[5] A61L *15/07;* **A61F** *5/04, 13/04;* **B32B** *17/04*

U.S. Cl. 428—86 **31 Claims**

1. An article comprising:

a fabric sheet; and

a water-curable resin coated onto said fabric sheet, said resin having an antifoaming agent therein, said antifoaming agent comprising a solid support and an antifoaming composition retained by the solid support, said solid support having the property that it breaks down in water so as to allow contact between the water and the antifoam composition, said antifoaming composition being capable of reducing foaming as said resin cures.

5,206,065

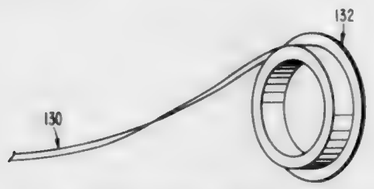
METHODS, APPARATUS AND DEVICES RELATING TO MAGNETIC MARKERS FOR ELONGATED HIDDEN OBJECTS

John B. Rippingale, Leesburg, and Erick O. Schonstedt, Reston, both of Va., assignors to Schonstedt Instrument Company, Reston, Va.

Division of Ser. No. 477,447, Feb. 9, 1990, Pat. No. 5,114,517, which is a continuation-in-part of Ser. No. 428,757, Oct. 30, 1989, Pat. No. 5,006,806, which is a continuation-in-part of Ser. No. 323,860, Mar. 15, 1989, abandoned. This application Feb. 12, 1992, Ser. No. 834,155

Int. Cl.[5] B32B *3/28*

U.S. Cl. 428—98 **1 Claim**



1. A magnetic marker capable of being located and identified when hidden from view, comprising an elongated flexible strip of magnetic material magnetized transverse to its length and twisted lengthwise so as to provide a magnetic field that varies repetitively along the length of the strip in a pre-determined manner, whereby the strip can be located and identified by detecting variations of the magnetic field with a magnetic field detector moved along the length of the strip.

5,206,066

MELAMINE RESIN PREPREGS AND MELAMINE RESIN LAMINATES BASED ON MODIFIED MELAMINE RESINS

Heinrich Horacek, Puchenau, Austria, assignor to Chemie Linz Gesellschaft M.B.H., Linz, Austria

Filed Jul. 10, 1992, Ser. No. 911,931

Claims priority, application Austria, Aug. 5, 1991, 1547/91

Int. Cl.[5] B32B *5/12*

U.S. Cl. 428—113 **9 Claims**

1. Melamine resin prepregs or melamine resin laminates consisting of a web-like fiber reinforcement impregnated with at least partly etherified, modified melamine resins comprising

a) 40–85% by weight of at least partly etherified melamine resins, which are obtained by reaction of melamine, formaldehyde and alkanols having 1 to 8 C atoms in a molar ratio of melamine:formaldehyde:alkanol of 1:(5 to 6):(4 to 6), and

b) 60–15% by weight of diols consisting of 25 to 75% by weight of polyester-diols and/or polyether-diols having a molecular weight of at least 400 g/mol and 75 to 25% by weight of low molecular weight diols having 2 to 12 C atoms and a molecular weight of less than about 350 g/mol.

5,206,067

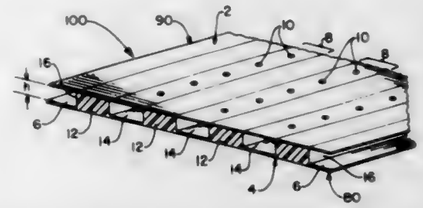
LANDFILL GAS CAPPING LINER SYSTEM

Kevin M. Bouzo, 4915 Sannybrook Rd., Kent, Ohio 44240

Filed Jan. 28, 1992, Ser. No. 826,802

Int. Cl.[5] B32B *3/10;* **B09B** *1/00*

U.S. Cl. 428—119 **18 Claims**



1. A flexible landfill gas capping polymeric liner capable of collecting a landfill gas from the entire surface area of a landfill which comprises:

(a) a top channeled member having at least two parallel spaced longitudinal structural channels disposed within the channeled member and at least one gas receiving longitudinal channel for collecting the landfill gas, adjacent to and coextending with the structural channels;

(b) a bottom sheet layer having a plurality of gas-permeable regions attached to a substantial portion of the channeled member such that the gas-permeable regions are positioned at an open end of the gas-receiving channel; and

(c) an induced negative pressure means for transporting the collected landfill gas to a collection station.

5,206,068

SURFACING FOR POLYMER MODIFIED OR UNMODIFIED BITUMEN ROOFING MEMBRANES

Husnu Kalkanoglu, Swarthmore, Pa., assignor to Tarmac Roofing Systems, Inc., Wilmington, Del.

Filed Oct. 15, 1991, Ser. No. 775,552

Int. Cl.[5] B32B *11/02, 11/12;* **D06N** *5/00*

U.S. Cl. 428—143 **8 Claims**

1. A light weight bitumen roofing membrane with improved sealing properties for adhesion to a roof substrate, wherein said roofing membrane has the form of long sheets and is adapted to be applied to said roofing substrate by overlapping approximately 3 to 4 inches along the sides of the sheets and approximately 4 to 6 inches along the ends of the sheets to form a water tight seal, said bitumen roofing membrane comprising

a bitumen roofing sheet comprising a felt reinforcement saturated and coated with bitumen, said bitumen roofing sheet having an outer surface and an inner surface;

an exposed roofing surface comprising fine quartzite particles coated with a colored ceramic coating said particles being in the range of about 30 to 50 U.S. Sieve Size adhered to said outer surface; and

adhesion means applied to said inner surface for adhering said bitumen roofing membrane to a roof substrate.

5,206,069

PANEL TYPE MASKING MEMBER

Seinosuke Horiki, and Reiji Makino, both of Tokai, Japan, assignors to Nagoya Oilchemical Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 785,916, Nov. 4, 1991, abandoned, which is a continuation of Ser. No. 231,523, Aug. 11, 1988, abandoned. This application Jun. 2, 1992, Ser. No. 893,599

Claims priority, application Japan, Aug. 12, 1987, 62-201310

Int. Cl.[5] B32B *3/26, 3/30, 7/12*

U.S. Cl. 428—43 **1 Claim**

1. A panel type masking member comprising a molded foamed polystyrene panel made by expandable polystyrene bead molding using a mold comprising a movable mold part

and a fixed mold part wherein said movable mold part and said

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5,206,071

ARCHIVABLE INK JET RECORDING MEDIA

said electrically conductive filler being at least one selected from the group consisting of (i) electrically conduc-

a density of from about 0.88 to about 0.915 g/cm^3, a melt index of from about 0.5 to about 7.5 dg/min, a molecular

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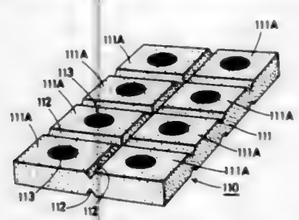
and a fixed mold part wherein said movable mold part and said fixed mold part have an opening part of the breathing path on the surfaces thereof and said opening part of said breathing path of said movable mold part and/or said fixed mold part rises from said surface thereof and an adhesive coating layer is provided on one side of said molded foamed polystyrene panel,



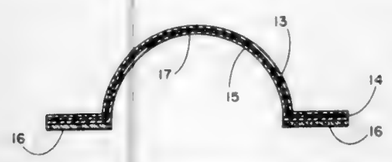
said foamed polystyrene panel having a plurality of grooves defining a checkerboard structure and further having at least one dent on at least one side on which said adhesive coating layer is formed, said dent being a trace of the opening part of the breathing path of said mold raising the surface of said mold and lying within a square of said checkerboard structure.

5,206,070

ZONE COATED ADHESIVE MATERIAL FOR PROTECTING AND SECURING ELECTRONIC/ELECTRICAL CABLES

John W. Haibach, Kenosha, Wis., and John F. Starkey, Hoffman Estates, Ill., assignors to Specialty Tapes Division of RSW Inc., Racine, Wis.

Filed Mar. 25, 1991, Ser. No. 675,249
Int. Cl.[5] B32B *1/04, 3/06, 7/14*
U.S. Cl. 428—194 6 Claims



1. A zone adhering composite retaining article in generally strip form for releasably adhesively retaining one or more elongated flexible members, such as electrical cables, positioned with respect to an adjacent surface comprising:

a continuous, hand tearable, flexible laminated web backing consisting essentially of a fabric scrim layer sandwiched between first and second polymer layers in strip form, the laminate further having first and second outer surfaces;

an amount of adhesive applied along both edges of the first outer surface of the backing thereby forming a pair of spaced parallel adhesive zones defining an adhesive-free zone therebetween, wherein the adhesive-free zone is of greater width than the adhesive zones;

wherein the adhesive is a re-adhering synthetic pressure sensitive composition which is retained on the backing but adheres repeatedly to and readily releases from adjacent surfaces; and

wherein the first and second polymer layers are high and low density polyethylene, respectively.

5,206,071

ARCHIVABLE INK JET RECORDING MEDIA

David Atherton, North Kingstown, R.I.; Kang Sun, North Attleboro, Mass., and Sen Yang, Warwick, R.I., assignors to Arkwright Incorporated, Fiskeville, R.I.

Filed Nov. 27, 1991, Ser. No. 798,923
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 34 Claims

1. A film composite, which comprises a transparent, translucent or opaque substrate, having on at least one side thereof, an essentially clear water-insoluble, water-absorptive and ink-receptive matrix layer, the matrix layer comprising a hydrogel complex and a polymeric high molecular weight quaternary ammonium salt.

5,206,072

ELECTROSTATIC RECORDING FILM

Katsuhiko Haga, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1991, Ser. No. 796,556
Claims priority, application Japan, Nov. 22, 1990, 2-319749
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 12 Claims

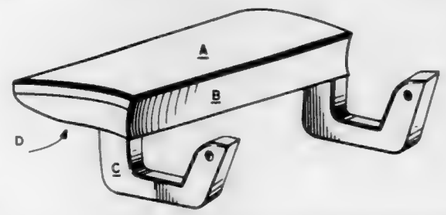
1. An electrostatic recording film comprising an insulating film having provided thereon an electroconductive layer and an insulating layer in this sequence, wherein the insulating layer comprises at least a polymeric binder, insulating spacer grains and electroconductive grains; said electroconductive grains being prepared by coating an electroconductive material on the surface of organic polymer grains.

5,206,073

ELECTROSTATIC SPRAY-COATED POLYCRYSTALLINE RESIN ARTICLE

Yoshiharu Suzuki, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Division of Ser. No. 407,933, Sep. 15, 1989, Pat. No. 5,135,773. This application Feb. 21, 1992, Ser. No. 838,935
Claims priority, application Japan, May 10, 1988, 63-251671
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 3 Claims



1. An electrostatic spray-coated article which consists essentially of:

a polycrystalline resin; and

between 2 to 100 parts by weight, based on 100 parts by weight of the polycrystalline resin, of an electrically conductive filler in admixture with said polycrystalline resin to achieve a surface resistivity of between 10^0 to $10^9\Omega$,

said electrically conductive filler being at least one selected from the group consisting of (i) electrically conductive particulate fillers having an average particle size of 30 μm or less, and (ii) electrically conductive fibrous material having an average fiber diameter of 30 μm or less, wherein

said polycrystalline resin normally has a surface skin, and wherein

said article includes at least one surface region where said skin of said polycrystalline resin is removed so as to expose a portion of said filler material; and wherein

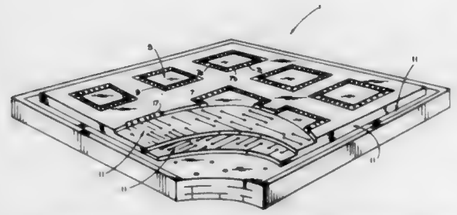
said article includes an electrostatically applied surface coating adhered to said at least one surface region.

5,206,074

ADHESIVES ON POLYMIDE FILMS AND METHODS OF PREPARING THEM

Charles R. Davis, Endicott; Ashit A. Mehta, Vestal; Konstantinos Papathomas, Endicott; Lee P. Springer, Endicott; William J. Summa, Endicott, and David W. Wang, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 380,195, Jul. 17, 1989, Pat. No. 5,015,719, which is a continuation-in-part of Ser. No. 154,861, Feb. 10, 1988, abandoned, which is a division of Ser. No. 33,557, Apr. 3, 1987, Pat. No. 4,745,215. This application Feb. 20, 1991, Ser. No. 657,795
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 4 Claims



1. An electronic circuit package adapted to receive at least one microelectronic circuit chip having signal leads, a power lead, and a ground lead; said circuit package comprising a laminate of individual cores, at least one core comprising a substrate of an organic polymeric dielectric composite comprising:

(a). an organic polymeric film; and

(b). an organic copolymeric adhesive reaction product of

(i) diglycidyl bis phenol p-dialkyl benzene, and

(ii) dicyanate diphenyl hexafluoro isopropane, said organic film carrying and reinforcing said copolymeric adhesive, said internal core having Cu circuitization adapted to co-operate with at least one of said leads on at least one surface thereof.

5,206,075

SEALABLE POLYOLEFIN FILMS CONTAINING VERY LOW DENSITY ETHYLENE COPOLYMERS

William J. Hodgson, Jr., Baytown, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 19, 1991, Ser. No. 810,473
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—216 15 Claims

1. A multiple layer heat sealable film comprising a base layer and a heat sealable layer superimposed on one or both sides of said base layer;

said base layer comprising a blend of (a) an olefin polymer having a density in excess of 0.915 g/cm^3 and (b) from about 1 to about 30 weight percent based on base layer polymer content of a copolymer of ethylene and a C_3 to C_{20} alpha monoolefin comonomer, said copolymer having a density of from about 0.88 to about 0.915 g/cm^3, a melt index of from about 0.5 to about 7.5 dg/min, a molecular weight distribution of no greater than about 3.5 and a composition distribution breadth index greater than about 70 percent;

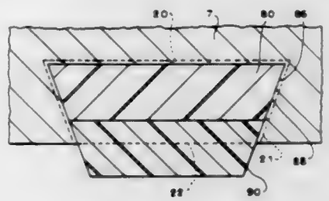
said heat sealable layer comprising a copolymer of ethylene and a C_3 to C_{20} alpha-monoolefin comonomer, said copolymer having a density of from about 0.88 to about 0.915 g/cm^3, a melt index of from about 0.5 to about 7.5 dg/min, a molecular weight distribution of no greater than about 3.5 and a compositional breath index greater than about 70 percent, said film further characterized in that the ethylene/alpha-monoolefin copolymer present in one of said layers is a copolymer of ethylene and a C_6 to C_{10} alpha-monoolefin which alpha-monoolefin differs from the alpha-monoolefin comonomer present in the copolymer of the other said layers.

5,206,076

ELASTOMERIC MOLD SEALS

Gregory M. Gatarz, East Brunswick, N.J., and Ronald M. Marsilio, Mogadore, Ohio, assignors to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 467,771, Jan. 19, 1990, abandoned. This application Aug. 19, 1992, Ser. No. 931,436
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—217 23 Claims



1. A seal for molding articles, comprising:

(a) a first layer of elastomeric material having a first hardness value and a first lateral cross-sectional dimension for cooperation with an inside surface of a seal groove in a first molding surface, said first lateral cross-sectional dimension of said seal being larger than a lateral cross-sectional dimension of an opening of the seal groove, and

(b) a second layer of elastomeric material joined to said first layer for engagement to a second molding surface, said second layer having a different hardness value than said first layer, and said second layer having a lateral cross-sectional dimension extending beyond said seal groove, said second lateral cross-sectional dimension of said seal being smaller than said lateral cross-sectional dimension at the opening of said seal groove,

whereby said elastomeric seal is releasably retained in said seal groove by a portion of said seal having said first lateral cross-sectional dimension and the portion of said seal extending beyond said seal groove engages a second molding surface for molding an article, the hardness value of the first layer being in the range of from about 35 to about 45 Shore A durometer and the hardness value of said second layer being from about 45 to about 80 Shore A

5,206,077

LOW VAPORIZABLE ETHYLENICALLY

reinforcing cloth having high rigidity and essentially no

the slab and binding mutually adjacent fibers in a punctiform fashion to form a coherent matrix; in that the individual fibers

particles have a particle size of from about 0.01 to about 5.0 micrometer diameter; the matrix has a particle size of from

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5,206,077

LOW VAPORIZABLE ETHYLENICALLY UNSATURATED MONOMER EMISSION VINYL ESTER AND POLYESTER RESIN COMPOSITIONS

Terry W. Cowley, and Mary L. N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 25, 1991, Ser. No. 797,640
Int. Cl.[5] B05D 7/00
U.S. Cl. 428—221 4 Claims

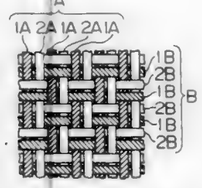
1. The article resulting from shaping into a desired configuration and curing one or more plies of a substrate material saturated or impregnated with a curable composition comprising (A) at least one vinyl ester resin or at least one unsaturated polyester resin or a combination thereof; (B) at least one polymerizable, vaporizable, ethylenically unsaturated monomer; (C) a polymerizable, vaporizable, ethylenically unsaturated monomer emission suppression amount of ceresin was; (D) a drying oil in an amount of from about 0.1 to about 0.70 percent by weight based upon the combined weight of resin and polymerizable, vaporizable, ethylenically unsaturated monomer; (E) an epoxidized drying oil employed in an amount of from about 0.2 to about 0.7 percent by weight based upon the combined weight of resin and polymerizable, vaporizable, ethylenically unsaturated monomer; and (F) a curing amount of a curing agent.

5,206,078

PRINTED CIRCUIT-BOARD AND FABRIC THEREFOR

Hirokazu Inoguchi; Shoichi Watanabe; Shin Kasai; Keiichi Kato, and Mikiya Fujii, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Dec. 14, 1989, Ser. No. 450,864
Claims priority, application Japan, Dec. 15, 1988, 63-316800
Int. Cl.[5] D03D 3/00
U.S. Cl. 428—225 4 Claims



1. A fabric for a printed circuit-board which comprises a joint weave of glass fiber and at least one fiber selected from the group consisting of polyether ether ketone fiber, polyetherimide fiber and polysulphone fiber.

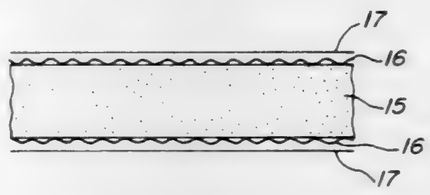
5,206,079

TAKING-UP LINERS FOR UNVULCANIZED RUBBER MEMBERS

Koichi Sanada; Kenichi Haraga, and Koushi Nonaka, all of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,169
Claims priority, application Japan, May 26, 1988, 63-127134
Int. Cl.[5] B32B 7/00
U.S. Cl. 428—252 7 Claims

1. A taking-up liner for taking-up an unvulcanized rubber member in a laminated fashion, said liner comprising; a laminate consisting of a strip-like soft foamed member, a reinforcing cloth in a central portion of said soft foamed member, said reinforcing cloth having high rigidity and essentially no stretchability, and at least one elastomer layer bonded to at least one surface of said foamed member, at least one surface of said laminate being smooth.



5,206,080

FRAGRANT NON-HOLLOW CORE-IN-SHEATH TYPE COMPOSITE STAPLE FIBER AND TEXTILE MATERIAL CONTAINING SAME

Mikio Tashiro, Matsuyama; Tetsuya Hongu, Tokuyama, and Kazunori Orii, Kasatsu, all of Japan, assignors to Tree Extracts Research Association, Tokyo, Japan

Filed Feb. 5, 1992, Ser. No. 831,864
Claims priority, application Japan, Feb. 13, 1991, 3-40535; Feb. 13, 1991, 3-40537; Feb. 20, 1991, 3-45682
Int. Cl.[5] D02G 3/00; B32B 7/00; D04B 1/00
U.S. Cl. 428—253 16 Claims

1. A fragrant non-hollow core-in-sheath type composite staple fiber having a length of from 3 mm to 150 mm and comprising:

(1) a non-hollow core portion comprising (i) 0.1 to 5%, based on the total weight of the core portion, of an essential oil and (ii) the balance consisting of an olefin polymer composition; and

(2) a sheath portion covering the core portion and comprising a polyester resin,

the olefin polymer composition (ii) comprising:

(A) 50 to 98% by weight of an olefin polymer which is a polymerization product of at least one member selected from the group consisting of ethylene and α-olefins, and free from polar radicals; and

(B) 2 to 50% by weight of a modified olefin polymer that is a copolymerization product of (a) 70 to 97% by weight of at least one olefin with (b) 3 to 30% by weight of at least one ethylenically unsaturated polar monomer selected from the group consisting of ethylenically unsaturated carboxylic acids, ethylenically unsaturated alcohols, ethylenically unsaturated esters, and anhydrides and amides of the above-mentioned carboxylic acids and uniformly blended with the olefin polymer (A).

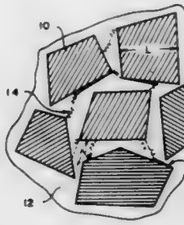
5,206,081

SOUND ABSORBENT AND HEAT INSULATING FIBER SLAB

Sven Fredriksson, Treklovervagen 13, S-459 00 Ljungskile, Sweden

PCT No. PCT/SE89/00277, § 371 Date Nov. 1, 1990, § 102(e) Date Nov. 1, 1990, PCT Pub. No. WO89/11384, PCT Pub. Date Nov. 30, 1989
PCT Filed May 18, 1989, Ser. No. 603,680
Claims priority, application Switzerland, May 19, 1988, 8801876
Int. Cl.[5] D04H 1/58
U.S. Cl. 428—288 2 Claims

1. A sound absorbing and heat insulating fiber slab comprising cellulose fibers bonded together by means of an inorganic, flame-proof binder, characterized in that the binder belongs to the group of polymeric silicate binders which dry at room temperatures, said binder being homogeneously distributed in the slab and binding mutually adjacent fibers in a punctiform fashion to form a coherent matrix; in that the individual fibers are not impregnated with but are only thinly coated with binder and retain a high degree of mobility in the formed slab between their fixed intersection points; wherein the matrix exhibits from 5 to 40 bonding points calculated on each 100 fibers present; in that the slab has a density of 30–70 kg/m; and in that the binder is present in an amount of 1–20% by weight.



5,206,082

NONDISTORTED POLYETHYLENE FOAM STRUCTURES AND PROCESS FOR MAKING

Bruce A. Malone, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 674,007, Mar. 25, 1991, abandoned. This application Jun. 1, 1992, Ser. No. 892,411
Int. Cl.[5] B32B 3/26, 7/00
U.S. Cl. 428—294 15 Claims

1. A closed-cell, non-crosslinked foam structure comprising a plurality of coalesced extruded strands or profiles of a foamed polyolefin composition, the foamed polyolefin composition having an average cell size of from 0.02 to 0.5 millimeters, the foam structure having a ratio of minor dimension to major dimension in cross-section of about 1 or less, the cross-sectional geometry of the foam structure substantially corresponding to the geometry of the overall arrangement of the orifices of the die from which it was extruded.

5,206,083

DIAMOND AND DIAMOND-LIKE FILMS AND COATINGS PREPARED BY DEPOSITION ON SUBSTRATE THAT CONTAIN A DISPERSION OF DIAMOND PARTICLES

Rishi Raj, and Albert J. Sievers, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,646
The portion of the term of this patent subsequent to Feb. 2, 2010, has been disclaimed.
Int. Cl.[5] C23C 6/26; B32B 33/00
U.S. Cl. 428—323 12 Claims

1. A diamond coated article comprising a uniform film of diamond deposited on a composite comprising a three dimensional matrix having uniformly dispersed throughout at lateral distances from about 0.01 to about 5.0 μm finely divided diamond particles at a volume concentration of from 0.1 to about 75 percent wherein the said finely divided diamond particles have a particle size of from about 0.01 to about 5.0 micrometer diameter; the matrix has a particle size of from about 0.5 micrometer to about 50 micrometer; and wherein said matrix transmits infrared light at wavelengths from about 1 to at least 10 micrometers and said composite transmits infrared light at wavelengths from about 8 micrometers to about 15 micrometers.

5,206,084

MAGNETIC RECORDING MEDIUM COMPRISING AN ORIENTED POLYESTER SUBSTRATE, AN ANTISTATIC COATING OF A POLYMER WITH PYRROLIDIUM RINGS IN THE MAIN CHAIN AND A MAGNETIC LAYER

Naohiro Takeda, Yokohama; Yuzo Otani, Tokyo; Nariaki Okajima, Yokohama, and Masahiro Kita, Nagahama, all of Japan, assignors to Diafoil Hoechst Co., Ltd., Tokyo, Japan

Division of Ser. No. 279,199, Dec. 2, 1988, Pat. No. 5,082,730.
This application Oct. 8, 1991, Ser. No. 774,522
Claims priority, application Japan, Dec. 4, 1987, 62-307272; Dec. 22, 1987, 62-324469; Dec. 28, 1987, 62-334957; Dec. 28, 1987, 62-334958; Dec. 28, 1987, 62-334959; Dec. 28, 1987, 62-334961
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—336 6 Claims

1. A magnetic recording medium, comprising:

a stretched antistatic laminate film comprising at least one coating layer containing a polymer having pyrrolidium rings in the main chain of the polymer and a polyester film layer, and

a magnetic layer laminated over the coating layer,

wherein said stretched antistatic laminate film comprising at least one coating layer having a thickness in the range of from 0.01 to 5 μm and containing a polymer having pyrrolidium rings in the main chain of the polymer on a polyester film layer, said polymer having pyrrolidium rings in the main chain of the polymer containing the repeating unit represented by the following formula (I) or (II):

(I)

(II)

wherein R^1 and R^2 independently represent respectively an alkyl or phenyl group which maybe substituted, R^1 and R^2 may chemically bond to form a ring, or one of R^1 and R^2 represents a hydrogen atom and X- represents a halogen atom, an inorganic acid residue, and organic sulfonic acid residue or a carboxylic acid residue, said coating layer being formed on the polyester film layer by an in-line coating method, said in-line coating method comprising applying said coating layer to a uniaxially stretched polyester film which has been uniaxially stretched by 2–6 times at a temperature from 60° to 130° C. by a roll stretching method and then optionally drying, stretching the resultant coated uniaxially stretched polyester film by 2–6 times at a temperature from 80° to 130° C., in the direction perpendicular to the uniaxial stretching direction and then heat treating the coated stretched polyester film at a temperature from 150° to 250° for 1 to 600 seconds.

5,206,085

PREFORMED YARN USEFUL FOR FORMING

high molecular weight substance and said filler being attached to the outer surfaces of said thermoplastic resin particles, said

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5,206,092

ELECTRON BEAM-CURABLE COMPOSITION FOR

5,206,095

CARBONATE FUEL CELL ANODES

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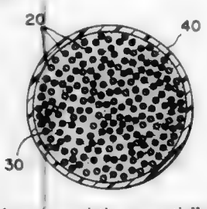
5,206,085

PREFORMED YARN USEFUL FOR FORMING COMPOSITE ARTICLES AND PROCESS FOR PRODUCING SAME

Takao Nakagawa, Kashiwa; Mihoko Yamashita, Tokyo; Masaharu Tachibana; Shoko Namba, both of Funabashi, and Takuya Ueda, Zushi, all of Japan, assignors to Across Co., Ltd., Japan

Continuation of Ser. No. 230,499, Aug. 10, 1988, abandoned. This application May 13, 1991, Ser. No. 700,897
Claims priority, application Japan, Aug. 13, 1987, 62-202761
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—372 8 Claims



1. A preformed yarn consisting essentially of:
a core of multiplicity of fibers, said core being 30–70% of the total volume of the preformed yarn;
a fine powder of carbon, metal or metal compound provided in the interstices between said fibers; and
a flexible sleeve formed of a thermoplastic resin and surroundings said core;
said fine powder being present in an amount constituting about 0.01 to about 10% based on the volume of said fibers and being formed of a material which neither melts nor reacts with said thermoplastic resin neither at a temperature up to 450° C. nor at a temperature up to the melting point of said thermoplastic resin.

5,206,086

PARTICLE-STABILIZED EPITOPES FOR STANDARDIZATION AND CONTROL OF IMMUNOASSAYS

Charles E. Sparks; Janet D. Sparks, both of Pittsford, and Michael R. Violante, Rochester, all of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Oct. 13, 1987, Ser. No. 108,260
Int. Cl.[5] B32B 33/00; G01N 33/543; C07K 17/02
U.S. Cl. 428—403 19 Claims

1. Apolipoprotein attached to solid particles obtained by delipidating lipoprotein in the presence of said solid particles.

5,206,087

BIODECOMPOSABLE OR BIODISINTEGRABLE MOLDABLE MATERIAL

Yutaka Tokiwa, Tsuchiura; Masahiro Suzuki, Kounosu, and Masatoshi Koyama, Tsukuba, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology and Chuokagaku Ltd., both of Japan

Filed Feb. 26, 1991, Ser. No. 659,958
Claims priority, application Japan, Feb. 28, 1990, 2-45725
Int. Cl.[5] B32B 19/00
U.S. Cl. 428—403 12 Claims

1. A biodecomposable or biodisintegrable moldable material in the form of porous granules each having a diameter of 0.1–20 mm and including (a) a plurality of thermoplastic resin particles which are fuse-bonded to each other, (b) a naturally-occurring high molecular weight substance which is in the form of particles having an average volume within the range of $4.2\times1/10^3$ μm^3-520×10^3 μm^3 or in the form of fibers having a diameter of less than 100 μm and a length of less than 10 mm, and (c) a filler which is in the form of particles having an average volume within the range of $4.2\times1/10^3$ μm^3-910×10^3 μm^3 or in the form of fibers having a diameter of less than 100 μm and a length of less than 10 mm, said naturally-occurring high molecular weight substance and said filler being attached to the outer surfaces of said thermoplastic resin particles, said thermoplastic resin, said naturally-occurring high molecular weight substance and said filler being present in amounts of 30–70% by volume, 10–70% by volume and 0–45% by volume, respectively.

5,206,088

ABLATIVE-INTUMESCENT SYSTEM

Vitaly Raevsky, Cherry Hill, N.J., assignor to Development Products, Inc., Pennsauken, N.J.

Filed Nov. 13, 1991, Ser. No. 792,031
Int. Cl.[5] B32B 27/38; B27N 9/00; C08K 3/34
U.S. Cl. 428—413 6 Claims

1. The method of protecting construction materials from the thermal effects of fire comprising applying to said construction material a layer of an aluminum sulfate-based ablative protective material, the exposed surface of which is coated with an intumescent paint.

5,206,089

PRODUCT WITH GLASS SUBSTRATE CARRYING A TRANSPARENT CONDUCTIVE LAYER CONTAINING ZINC AND INDIUM PROCESS FOR OBTAINING IT

Pablo Vilato; Dominique Bruneel, both of Paris; Bertrand Testulat, Sarcelles; Jean-Francois Oudard, Thiescourt, and Jean-Michel Grimal, Poissy, all of France, assignors to Saint-Gobain Vitrage International c/o Saint-Gobain Recherche, Aubervilliers, France

Filed May 16, 1991, Ser. No. 701,067
Claims priority, application France, May 16, 1990, 90 06097
Int. Cl.[5] B32B 18/00
U.S. Cl. 428—426 12 Claims

1. A coated glass product, comprising a glass substrate and a transparent conductive layer of metal oxide thereon, wherein the layer is comprised of mixed oxide of zinc and indium containing 10–34 at. % of indium, values determined by electron microprobe analysis wherein said coated glass product exhibits a resistance of less than or equal to 10×10^{-4} ohms/cm and an emissivity of less than 0.18 at a thickness of greater than 360 nm.

5,206,090

Patent Not Issued For This Number

5,206,091

LOW DIELECTRIC CONSTANT, LOW MOISTURE UPTAKE POLYIMIDES AND COPOLYIMIDES FOR INTERLEVEL DIELECTRICS AND SUBSTRATE COATINGS

Allyson J. Beuhler, Indian Head Park; Neal R. Nowicki, St. Charles, and Douglas E. Fjare, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 212,511, Jun. 28, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 436,301
Int. Cl.[5] B32B 9/04, 27/00; C08G 69/26
U.S. Cl. 428—446 15 Claims

1. An interlevel dielectric comprising a thin layer of a polyimide or copolyimide made essentially from a compound selected form the group consisting of 2,2-bis(3,4-dicarboxyphenyl)propane dianhydride, 2,2-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride, and their respective acids and esters, and an aromatic diamine selected from the group consisting of 2,2-bis(4-aminophenyl)propane and 4,4'-bis(p-aminophenoxy)biphenyl coated on a substrate to form a coated substrate overlayed with a thin adhering layer of a metal or an inorganic material.

5,206,092

ELECTRON BEAM-CURABLE COMPOSITION FOR RELEASE MATERIAL AND PROCESS FOR PREPARATION OF RELEASE MATERIAL

Takumi Araki; Hiroyuki Nagaishi, and Shigeru Kurosawa, all of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,863
Claims priority, application Japan, Feb. 24, 1988, 63-41450
Int. Cl.[5] B32B 9/04; C08F 2/46; C08J 3/28; C08K 5/24
U.S. Cl. 428—447 19 Claims

1. A process for the preparation of a release material comprising a substrate and a film laminated onto the substrate, which comprises melt-extruding a composition onto said substrate to form the film laminated onto the substrate, said composition comprising a thermoplastic polyolefin resin, a dimethylsiloxane and a polyfunctional compound having at least two vinyl groups, at least two methacryloyl groups or at least two thiol groups, and irradiating the laminated film with electron beams.

5,206,093

MULTILAYER METAL-COATED STEEL SHEET

Katsuhiko Masaki, Sakai; Suenori Mori, Amagasaki, and Tsugnyasu Yoshii, Matsudo, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1991, Ser. No. 773,497
Claims priority, application Japan, Oct. 17, 1990, 2-278306; Nov. 30, 1990, 2-334423
Int. Cl.[5] B32B 15/18
U.S. Cl. 428—651 14 Claims

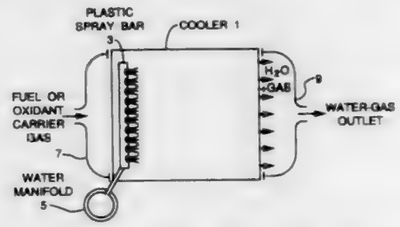
1. A multilayer metal-coated steel sheet comprising as a first layer a coating layer consisting essentially of Zr formed on the surface of a steel sheet, and as a second layer an Al coating layer formed on said first layer.

5,206,094

FUEL CELL EVAPORATIVE COOLER

Murray Katz, Newington, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 30, 1990, Ser. No. 621,098
Int. Cl.[5] H01M 8/04, 8/12
U.S. Cl. 429—26 8 Claims



1. In a system for cooling a fuel cell stack, each fuel cell including an anode, a cathode spaced from said anode, and an electrolyte between said cathode and anode,
a cooler for said fuel cell, said cooler being in heat transfer relationship with said fuel cell, said cooler having a coolant inlet and a carrier gas inlet, coolant being supplied to said cooler through said coolant inlet, and a carrier gas being separately supplied to said cooler through said carrier gas inlet, and wherein said coolant and carrier gas are mixed within said cooler.

5,206,095

CARBONATE FUEL CELL ANODES

Rafael A. Donado, Chicago; Kenneth E. Hrdina, Glenview, and Robert J. Remick, Bolingbrook, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 19, 1990, Ser. No. 495,277
Int. Cl.[5] H01M 4/86
U.S. Cl. 429—16 21 Claims

1. A process for production of stable, high performance molten alkali metal carbonates fuel cell porous metal anodes, said process comprising:
mixing metal powder selected from the group consisting of nickel, nickel oxide, cobalt, cobalt oxide, nickel/aluminum alloy, cobalt/aluminum alloy, and mixtures thereof with an iron powder selcted from the group consisting of iron, iron oxide, lithium ferrite and mixtures thereof in quantities to form a powder mixture comprising about 25 to about 80 weight percent iron based upon the total weight of all components forming the anode structure, provided said aluminum when present comprises less than about 5 weight percent of said total weight;
mixing said powder mixture, a binder system, and sufficient liquid to form a slurry;
slipcasting said slurry into a thin tape;
evaporating said liquid;
heating to remove said binder to result in a powder mixture in thin tape form; and
sintering said powder mixture in thin tape form under chemically reducing atmosphere to form a porous composite structure of lithium ferrite and a metal selected from the group consisting of nickel, cobalt, and an alloy of nickel/iron, cobalt/iron, nickel/iron/aluminum, cobalt/iron-/aluminum and mixtures thereof.

5,206,096

SLURRY FOR USE IN RECHARGEABLE METAL-AIR BATTERIES

Jonathan Goldstein, Jerusalem, and Arieh Meitav, Rishon Lezion, both of Israel, assignors to Electric Fuel Limited, Jerusalem, Israel

Filed Dec. 31, 1990, Ser. No. 636,226
Int. Cl.[5] H01M 4/86
U.S. Cl. 429—27 43 Claims

1. A slurry for use in rechargeable metal-air batteries, comprising particulate porous zinc containing material of a particle size within the range of 100–500 microns and having density within the range of 0.3–1.4 g./cc and a surface area within the range of 0.5–6.0 m^2/g, an aqueous solution of at least one Group Ia metal hydroxide, and an inorganic inhibitor ingredient effective to inhibit interaction of said particulate porous zinc containing material and said aqueous solution to prevent evolution of hydrogen gas, wherein the weight ratio in said slurry between said porous zinc containing material, said aqueous solution and said inorganic inhibitor is 1:0.5–2.0:0.00-05–0.04.

5,206,097

BATTERY PACKAGE HAVING A COMMUNICATION WINDOW

Arthur G. Burns, Plantation, and David L. Muri, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1991, Ser. No. 710,421
Int. Cl.[5] H01M 10/48
U.S. Cl. 429—90 21 Claims

1. A battery package, for providing non-contact communications between the battery package and a battery powered device, comprising:
a housing having a transparent window;
at least two energy storage devices contained within the housing;
electronic means, coupled to the energy storage devices, for

generating a signal containing information about the en-

toner powders and the separation images are combined to form the multi-color image, comprising forming color separation

layers are alternately arranged in closely packed, sandwich

layer comprised of a mixture of biphenyl diamine and a polysilylene

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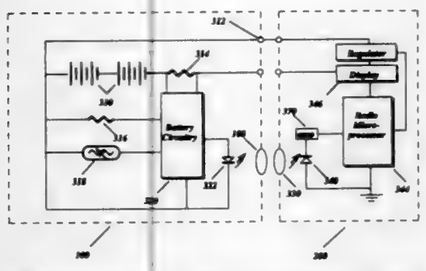
generating a signal containing information about the energy storage devices; and



communicating means, coupled to the electronic means, for communicating the signal to the battery powered device through the transparent window, comprising an optical transmitter.

5,206,098

BATTERY COVER LOCKING DEVICE

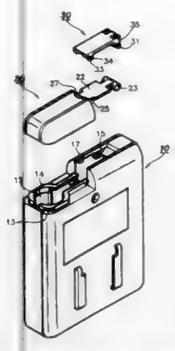
Young-In Cho, and Young-Mok Jeon, both of Seoul, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 2, 1992, Ser. No. 815,758

Claims priority, application Rep. of Korea, Dec. 28, 1991, 1991-24804

Int. Cl.[5] H01M *2/10*

U.S. Cl. 429—96 **17 Claims**



1. A battery cover locking device of a small electronic apparatus using a battery, comprising:

a locker provided in the rear side of a battery cover; and

a hinge attached to said locker for cooperating with a guide box groove formed in a main housing, whereby said battery cover is slid and rotated in said main housing by operating said locker so as to open and close a battery inserting hole formed in a side of said main housing.

5,206,099

HIGHLY RESISTIVE CELL SEPARATOR FOR BI-POLAR BATTERY

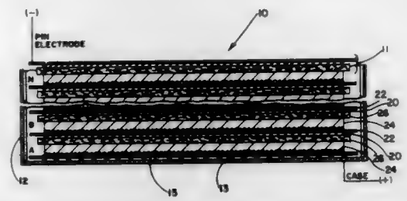
Milind V. Kulkarni, Seabrook, Md., and William J. Eppley, Skippack, Pa., assignors to Alliant Techsystems Inc., Edina, Minn.

Filed Sep. 5, 1991, Ser. No. 755,320

Int. Cl.[5] H01M *2/16*

U.S. Cl. 429—142 **5 Claims**

1. In an electrochemical cell having a bi-polar layered construction wherein a plurality of commonly connected metal anode layers and a plurality of commonly connected cathode layers are alternately arranged in closely packed, sandwich fashion, each anode and cathode layer being separated by one of a plurality of thin insulating separator membranes to produce a cell stack, the improvement comprising incorporating conductive material in each of the cell separator membranes which gives each cell separator membrane a high but known



resistance value such that the total resistance of the plurality of separators can be measured across the entire stack when the stack is assembled without the presence of an electrolyte thereby enabling the total cell resistance to be readily tested to verify the integrity of the layers of the stack of the assembled cell.

5,206,100

SEPARATOR AND SEALED LEAD ACID BATTERY

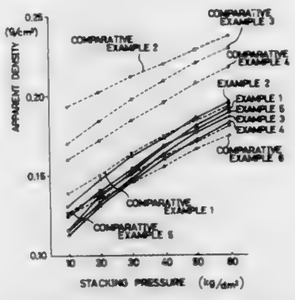
Junji Muto; Hironori Kitawaki; Shoji Sugiyama; Yasuhide Nakayama; Katsumi Kitagawa, and Kenjiro Kishimoto, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd. and Yuasa Battery Co., Ltd., both of Osaka, Japan

Filed Jul. 15, 1991, Ser. No. 731,148

Claims priority, application Japan, Aug. 24, 1990, 2-223219

Int. Cl.[5] H01M *2/16*

U.S. Cl. 429—247 **26 Claims**



1. A sealed lead acid battery using a separator substantially comprising only alkali-containing glass fibers with an average fiber diameter of less than 2 μm, and having an electrolyte dripping speed of lower than 80 mm/hr and a content of sulfur S at surfaces of the glass fibers of less than 0.02% by weight.

5,206,101

METHOD OF AND APPARATUS FOR FORMING A MULTI-COLOR IMAGE

Jacobus H. M. Schonenberg, Velden, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Nov. 20, 1990, Ser. No. 616,089

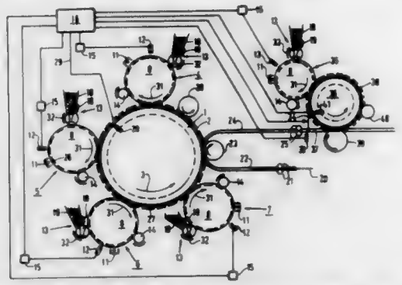
Claims priority, application Netherlands, Nov. 27, 1989, 8902918

Int. Cl.[5] G03G *13/01*

U.S. Cl. 430—44 **6 Claims**

1. A method of forming a multi-color image of the type wherein color separation images are formed with colored

toner powders and the separation images are combined to form the multi-color image, comprising forming color separation images in at least the secondary colors (magenta, cyan and yellow) and one of the primary colors (red, green or blue) with colored toner powders and registering these color separation images to produce said multi-color image, wherein of the color



separation images which are formed in the secondary colors, at least as many as formed with transparent toner powder such that the two remaining primary colors not represented as color separation images, are represented by said color separation images in said secondary colors formed by said transparent toner powder.

5,206,102

PHOTOELECTROCHEMICAL IMAGING SYSTEM

D. Morgan Tench, Ventura, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Nov. 15, 1991, Ser. No. 793,040

Int. Cl.[5] G03G *17/00, 13/26*

U.S. Cl. 430—49 **15 Claims**

1. A method of reproducing an image on a printing plate, comprising the steps of:

providing a surface layer of hydrophilic semiconductor material on the plate;

applying a film of a metal plating solution on said surface layer of semiconductor material;

illuminating selected areas of said surface layer of semiconductor material through said film of plating solution; and

photoelectrochemically depositing a layer of oleophilic metal plating material on said illuminated areas of said surface layer of semiconductor material to form the image.

5,206,103

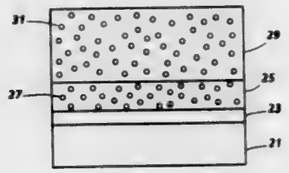
PHOTOCONDUCTIVE IMAGING MEMBER WITH A CHARGE TRANSPORT LAYER COMPRISING A BIPHENYL DIAMINE AND A POLYSILYLANE

Milan Stolka, Fairport, and Martin A. Abkowitz, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

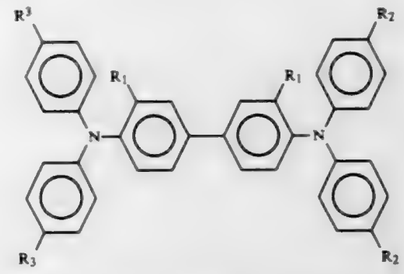
Filed Jan. 14, 1991, Ser. No. 640,712

Int. Cl.[5] G03G *5/06, 5/14*

U.S. Cl. 430—59 **15 Claims**



1. An imaging member consisting essentially of a supporting substrate, a photogenerating layer, and a charge transport layer comprised of a mixture of biphenyl diamine and a polysilylene



(I)

wherein the biphenyl diamine is N,N'-bis(4-methylphenyl)-N,N'-bis(4-ethylphenyl)-[1,1'-(3,3'-dimethyl)biphenyl]-4,4'-diamine, and wherein the polysilyene is selected from the group consisting of poly(methylphenyl) silylene, poly(cyclohexyl methyl) silylene, poly(betaphenethylmethyl silylene), poly(n-propylmethyl-co-methylphenyl silylene), poly(n-propylmethyl silylene), poly(methylphenyl-co-cyclohexylmethyl) silylene, and poly(methylphenyl-co-p-methoxyphenyl) silylene.

5,206,104

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1991, Ser. No. 655,608

Claims priority, application Japan, Feb. 16, 1990, 2-33955; May 10, 1990, 2-118532

Int. Cl.[5] G03G *5/08*

U.S. Cl. 430—96 **6 Claims**

1. An electrophotographic light-sensitive material comprising a support having provided thereon at least one photoconductive layer containing an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises at least one resin (A) or (A') and at least one resin (B):

Binder Resin (A): a graft copolymer having a weight average molecular weight of from 1×10^3 to 2×10^4 formed from at least a monofunctional macromonomer (MA) and a monomer represented by formula (III), wherein the macrofunctional macromonomer (MA) has a weight average molecular weight of not more than 2×10^4 and has a polymerizable double bond group represented by the following formula (I) at only one terminal of the main chain of a polymer containing at least one kind of the polymer components represented by the following formula (IIa) and (IIb), wherein the copolymer has at least one acidic group

selected from $-PO_3H_2$, $-SO_3H$, $-COOH$,

(wherein

R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group)), and a cyclic acid anhydride-containing group bonded to only one terminal of the main chain of the copolymer;

molecular weight of not more than 2×10^4 and has a polymerizable double bond group represented by the

and R_{21} represents a hydrocarbon group, provided that, when X_3 is

(III)

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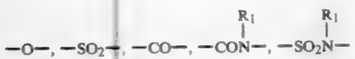
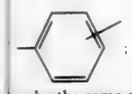
(I)

wherein A_o represents —COO—, —OCO—, —CH_2)-$_{l_1}$OCO—, —CH_2)$_{l_2}$OCO— (wherein l_1 and l_2 each represents an

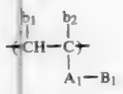
integer of from 1 to 3),



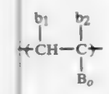
(wherein R_1 represents a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH—, —CONH-SO_2—, or



and a_1 and a_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—D_1 or —COO—D_1 via a hydrocarbon group (wherein D_1 represents a hydrocarbon group which may be substituted);



(IIa)



(IIb)

wherein A_1 has the same meaning as A_o in formula (I) described above; B_1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; b_1 and b_2, which may be the same or different, have the same meaning as a_1 and a_2 in formula (I); and B_o represents —CN, —$CONH_2$, or

(wherein J represents a hydrogen atom, a halogen atom, an alkoxy group or —$COOD_4$ (wherein D_4 represents an alkyl group, an aralkyl group, or an aryl group));

(III)

wherein A_2 has the same meaning as A_1 in formula (IIa); B_2 has the same meaning as B_1 in formula (IIa); and c_1 and c_2, which may be the same or different, have the same meaning as a_1 and a_2 in formula (I);

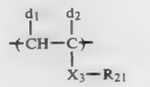
Binder Resin (A'): a copolymer having a weight average molecular weight of from 1×10^3 to 2×10^4 and formed from at least a monofunctional macromonomer (MA') and a monomer represented by the above formula (III), wherein said macromonomer (MA') has a weight average molecular weight of not more than 2×10^4 and has a polymerizable double bond group represented by the above formula (I) at only one terminal of the main chain of a polymer containing at least one of the polymer components represented by the above formulae (IIa) and (IIb) and a polymer component containing at least one acidic group selected from —COOH, —PO_3H_2,

(wherein R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group));

Binder Resin (B): a graft type copolymer having a weight average molecular weight of from 3×10^4 to 1×10^6 formed from a monomer and as a copolymer component at least one of a monofunctional macromonomer (M) having a weight average molecular weight of from 1×10^3 to 2×10^4 having a polymerizable double bond group at the terminal of the polymer main chain of a B block of an AB block copolymer composed of an A block containing at least one of a polymer component containing at least one acidic group selected from —PO_3H_2,

—COOH, —SO_3H, phenolic OH,

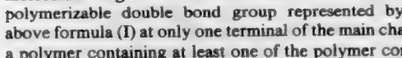
(wherein R_o has the same meaning as R as described above), and a cyclic acid anhydride-containing group and a B block containing at least a polymer component represented by the following formula (IV);



(IV)

wherein d_1 and d_2 each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—R_{24} or —COO—R_{24} via a hydrocarbon group (wherein R_{24} represents a hydrocarbon group which may be substituted), and X_3 represents —COO—, —OCO—, —CH_2)$_{l_3}$OCO—, —CH_2)$_{l_4}$COO—, (wherein l_3 and l_4 each represents an

integer of from 1 to 3),



(wherein R_{23} represents a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH—, or

and R_{21} represents a hydrocarbon group, provided that, when X_3 is

R_{21} represents a hydrogen atom or a hydrocarbon group.

5,206,105

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1991, Ser. No. 702,575
Claims priority, application Japan, May 21, 1990, 2-129263
Int. Cl.[5] G03G 5/08
U.S. Cl. 430—96 **12 Claims**

1. An electrophotographic light-sensitive material comprising a support having provided thereon at least one photoconductive layer containing an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises (A) at least one AB block copolymer (Resin (A)) having a weight average molecular weight of from 1×10^3 to 2×10^4 and composed of an A block comprising at least one polymer component containing at least one acidic group selected from —PO_3H_2, —COOH, —SO_3H, a phenolic hydroxy group,

(wherein R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group, and a B block containing at least a polymer component represented by the following general formula (I):

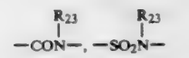
(I)

wherein R_1 represents a hydrocarbon group; and (B) at least one graft type copolymer (Resin (B)) having a weight average molecular weight of from 3×10^4 to 1×10^6 and containing, as a copolymerizable component, at least one monofunctional macromonomer (M) having a weight average molecular weight of from 1×10^3 to 2×10^4 and comprising an MAB block copolymer composed of an MA block comprising at least one polymer component containing at least one acidic group selected from —PO_3H_2, —COOH, —SO_3H, a phenolic hydroxyl group,

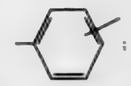
(wherein R_0 represents a hydrocarbon group or —OR_0' (wherein R_0' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group, and an MB block containing at least one polymer component represented by the general formula (III) described below and having a polymerizable double bond group bonded to the terminal of the main chain of the MB block polymer:

(III)

wherein d_1 and d_2 each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —$COOR_{24}$ or —$COOR_{24}$ bonded via a hydrocarbon group (wherein R_{24} represents a hydrocarbon group); X_1 represents —COO—, —OCO—, —CH_2)$_{l_1}$OCO—, —CH_2)$_{l_2}$COO— (wherein l_1 and l_2 each represents an integer of from 1 to 3), —O—, —SO_2—, —CO—,



(wherein R_{23} represents a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH—, or



and R_{21} represents a hydrocarbon group, provided that when X_1 represents

R_{21} represents a hydrogen atom or a hydrocarbon group.

5,206,106

CONDUCTIVE MAGNETIC TONER

Yuichi Moriya, Shizuoka, Japan, assignor to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 791,287
Claims priority, application Japan, Nov. 14, 1990, 2-306122
Int. Cl.[5] G03G 9/083
U.S. Cl. 430—106.6 **10 Claims**

1. A conductive magnetic toner for use in a low-developing-potential system including a magnetic powder having a specific resistance of not more than 1×10^6 Ω.cm in the amount of from 40% by weight to 60% by weight, a carbon black having a specific surface area of 800 m^2/g to 1500 m^2/g and an oil absorption of dibutyl phthalate of not less than 200 cc/100 g in the amount of from 8% by weight to 15% by weight, and a binder resin.

5,206,107

SILOXANE SURFACTANTS AS LIQUID DEVELOPER ADDITIVES

Kathryn A. Pearistine, Wilmington, Del., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1991, Ser. No. 814,515
Int. Cl.[5] G03G 9/135
U.S. Cl. 430—115 **17 Claims**

1. A liquid electrostatic developer which provides high resolution and improved image transfer efficiency comprising a liquid dispersion medium, marking particles and a polymeric siloxane surfactant, wherein said polymeric siloxane surfactant is a siloxane-alkylene oxide block copolymer and is present in an amount effective to improve image transfer efficiency.

5,206,108

the total solids content of said radiation-sensitive composi-

5,206,112

line phase comprising In_3SbTe_2 are present, said dual

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5,206,108

METHOD OF PRODUCING A HIGH SOLIDS REPLENISHABLE LIQUID DEVELOPER CONTAINING A FRIABLE TONER RESIN

Thomas C. Felder, Pannal, England; Jill R. Lorey, Grove City, Ohio, and Kenneth W. Leffew, Kennett Square, Pa., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1991, Ser. No. 812,659
Int. Cl.[5] G03G *9/12*
U.S. Cl. 430—137 **27 Claims**

1. A continuous method for producing a high solids replenishable electrostatic liquid developer concentrate, comprising the steps of:
adding dry particles containing a friable thermoplastic resin and a colorant to a liquid toner dispersant to form a toner dispersant mixture;
reducing the size of the particles in the toner dispersant mixture; and
concentrating the toner dispersant mixture to more than about 50% solids content.

5,206,109

PRODUCTION METHOD OF PARTICLES FOR DEVELOPER COMPONENT

Masahiro Anno, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1991, Ser. No. 687,007
Claims priority, application Japan, Apr. 20, 1990, 2-105925
Int. Cl.[5] G03G *9/083*
U.S. Cl. 430—137 **28 Claims**

1. A particle production method of a developer component for developing electrostatic latent images comprising;
a step of producing core particles,
a step of mixing the core particles with fine particles for surface modification by a mixing means to adhere the fine particles to the surfaces of the core particles;
a step of fixing the fine particles on the surfaces of the core particles by a fixing means; and
a step of heat-treating the core particles having the fine particles fixed on the surfaces thereof in a hot gas current at 200°–600° C. by a heating means to fix firmly the fine particles on the surfaces of the core particles.

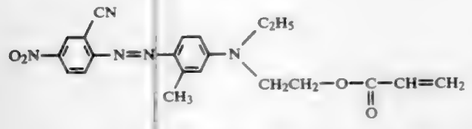
5,206,110

NEGATIVE-WORKING RADIATION-SENSITIVE MIXTURES CONTAINING CYCLIZED RUBBER POLYMER AND CONTRAST ENHANCING AZO DYE

Stephen F. Marcotte, Jr., Cumberland, R.I., and John Griffiths, Garforth, United Kingdom, assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Filed Feb. 4, 1991, Ser. No. 650,341
Int. Cl.[5] G03F *7/012*; G03C *1/695*
U.S. Cl. 430—167 **10 Claims**

1. A negative-working, radiation-sensitive composition comprising an admixture in a solvent of:
(a) at least one cyclized rubber polymer;
(b) at least one photoactive compound; and
(c) an effective contrast enhancing amount of an azo dye of the formula:



the amount of said cyclized rubber being about 90% to 99.5% by weight, the amount of said photoactive component being about 0.5% to about 10% by weight, based on the total solids content of said radiation-sensitive composition.

5,206,111

BINDERS SOLUBLE IN AQUEOUS ALKALI AND CONTAINING SILANYL GROUPS IN THE SIDE CHAIN FOR A PHOTOSENSITIVE MIXTURE

Peter Wilharm, Wiesbaden; Gerhard Buhr, Koenigstein, and Juergen Fuchs, Floersheim-Wicker, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 332,511, Apr. 3, 1989, Pat. No. 5,008,362. This application Jan. 10, 1991, Ser. No. 639,354
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811242
Int. Cl.[5] G03C *1/52, 1/695*; C08C *19/00*; C08G *65/48*
U.S. Cl. 430—192 **16 Claims**

1. A photosensitive mixture comprising:
a photosensitive component, and
a silylated polymeric binder which bears a plurality of at least one of aliphatic and aromatic hydroxyl groups, at least a portion of which are derivatized by units of the formulae I and II

$$[(A—B_n)_mC]—[(D_oE_p)BC]_u— \quad (I)$$

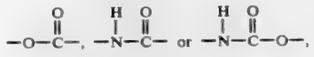
and

$$[(D_oE_p)BC]_y— \quad (II),$$

which are side chains of the polymeric binder, wherein
A denotes a silanyl group containing at least 2 silicon atoms in total linked to each other, but not more than 3 silicon atoms linked to each other in an unbranched chain of silicon atoms;
B denotes a bridging group having the formula IV:

$$—b_1)_r—(X)—(b_2)_s— \quad (IV)$$

wherein
b_1 denotes C_1—C_4)-alkylene or a group containing at least one C—C double bond and resulting from Diels-Alder reaction of an alkadienylene with a dienophile;
X denotes a single bond, —O—, —S—, —SO_2—, —NH—, —NR^1—,



wherein R^1 is a (C_1–C_3) alkyl;
b_2 denotes arylene or cycloalkylene; and
r, s each denote 0 or 1, with the proviso that the bridging group B the sum of the values of r and s is at least 1;
C denotes a functional group which has formed a covalent bond with an aromatic, aliphatic or cycloaliphatic hydroxyl group of the binder, the group D or the group E;
D denotes a grafted monohydric or polyhydric aliphatic alcohol group;
E denotes a grafted monohydric or polyhydric aromatic alcohol group;
n denotes 0 or 1;
m denotes 1 or 2; and
o, p, u and y each denote 0 or 1.

5,206,112

POSITIVE IMAGING DIFFUSION - TRANSFER DRY SILVER SYSTEM

Richard C. Cotner, Stillwater; David C. Weigel, White Bear Lake, and Kumars Sakizadeh, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1991, Ser. No. 722,178
Int. Cl.[5] G03C *8/10*
U.S. Cl. 430—203 **17 Claims**

1. A photothermographic composite structure for use in a solvent-free dye thermal positive imaging diffusion-transfer process, said composite structure comprising:
(a) an image-receiving element comprising a polymeric dyeable image-receiving layer having a glass transition temperature in the range of 20° to 200° C., and
(b) strippably adhered to said image-receiving element, an imageable photothermographic element comprising in at least one layer thereof a binder, a silver source material, photosensitive silver halide in catalytic proximity to said silver source material, and a colored, image-forming formazan dye.

5,206,113

GRAFT POLYMER WITH UNSATURATED LATERAL CHAINS, PHOTOSENSITIVE MIXTURE CONTAINING SAID GRAFT POLYMER AND RECORDING MATERIAL PRODUCED THEREFROM

Waltraud Mueller-Hess, Wiesbaden; Dieter Mohr, Budenheim, and Matthias Kroggel, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1990, Ser. No. 575,642
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928825
Int. Cl.[5] C08F *2/48, 283/04*; G03C *1/492, 1/494*
U.S. Cl. 430—270 **28 Claims**

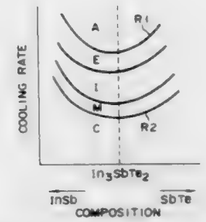
1. A graft polymer comprising a polyurethane backbone and grafted-on chains which comprise units of vinyl alcohol and units with styrylpyridinium or styrylquinolinium groups that are lateral with respect to said grafted-on chains.

5,206,114

INFORMATION STORAGE MEDIUM CONTAINING A RECORDING LAYER CAPABLE OF EXHIBITING A DUAL PHASE STATE

Tadashi Kobayashi, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 28, 1990, Ser. No. 619,080
Claims priority, application Japan, Nov. 30, 1989, 1-311353
Int. Cl.[5] G03C *1/72*; G11B *7/24*
U.S. Cl. 430—270 **20 Claims**



1. An information storage medium comprising:
a substrate; and
a recording layer in which a portion irradiated with a light beam is subjected to a phase transformation between different phases,
said recording layer exhibiting a dual phase state in which both an amorphous phase and a non-equilibrium crystalline phase comprising In_3SbTe_2 are present, said dual phase state corresponding to a recorded or erased state.

5,206,115

SILVER SALT DIFFUSION TRANSFER IMAGE-FORMING PROCESS

Koukichi Waki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1992, Ser. No. 885,868
Claims priority, application Japan, May 20, 1991, 3-114563
Int. Cl.[5] G03C *5/54*
U.S. Cl. 430—230 **2 Claims**

2. A silver salt diffusion transfer image-forming film unit comprising a light-sensitive element having a light-sensitive silver halide emulsion layer, an alkaline treating element, and an image-receiving element, wherein the light-sensitive silver halide emulsion layer contains a light-sensitive silver halide emulsion which comprises silver bromoiodide or silver bromoiodochloride having a silver iodide content of 0.5 to 3.5 mol %, wherein silver bromoiodide having a silver iodide content of 1 to 5 mol % is formed on the surface of the silver halide grains in an amount of from 3 to 10% on a silver basis after completion of chemical sensitization, and wherein the alkaline treating element comprises a water-soluble iodide in an amount of from 0.3 to 3.0 mM/l and tetrahydropyrimidinethione in an amount of from 0.3 to 3.0 mM/l.

5,206,116

LIGHT-SENSITIVE COMPOSITION FOR USE AS A SOLDERMASK AND PROCESS

George R. E. Daniels, Mattapan, Mass.; Michael J. Oddi, Springhill, Fla.; Kevin J. Cheetham, Milbury, and Stephen S. Rodriguez, Monument Beach, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Mar. 4, 1991, Ser. No. 663,604
Int. Cl.[5] G03F *7/16, 7/30, 7/38, 7/40*
U.S. Cl. 430—311 **11 Claims**

1. A method for forming an imaged dielectric layer adhesively bonded to metal conductors of a printed circuit board, said method comprising the steps of coating a photoimageable composition comprising an admixture of a phenolic resin, an acid activated cross linking agent, a cationic photoinitiator and a melamine thermal curing agent on said circuit board; exposing at least a portion of said layer of photoimageable composition to activating radiation; partially heat curing-said layer; developing said layer by contact with an aqueous alkaline developer and thermally curing said layer to crosslink the same.

5,206,117

PHOTOSENSITIVE POLYAMIC ALKYL ESTER COMPOSITION AND PROCESS FOR ITS USE

Jeffrey W. Labadie, 1618 Kamsack Dr., Sunnyvale, Calif. 94087; Dennis R. McKean, 10677 Amulet Pl., Cupertino, Calif. 95014; Willi Volksen, 372 El Portal Way, San Jose, Calif. 95123, and Gregory M. Wallraff, 16925 Del Monte Ave., Morgan Hill, Calif. 95037

Continuation-in-part of Ser. No. 745,575, Aug. 14, 1991, abandoned. This application Mar. 13, 1992, Ser. No. 850,623
Int. Cl.[5] G03F *7/32, 7/038*
U.S. Cl. 430—325 **3 Claims**

1. A process for generating a negative tone image of polyimide on a substrate comprising the steps of: (a) coating the substrate with a film comprising polyamic alkyl ester and a photosensitive base generator; (b) imagewise exposing the film to radiation; and (c) developing the image.

5,206,118

ACID SENSITIVE LEUCO DYE POLYMERIC FILMS

lizing solution used in said washing-substitutive stabilizing step has a salt concentration of at least 1,000 ppm.

for processing a photosensitive material, said method comprising the steps of:

5,206,124

LIGHT-SENSITIVE SILVER HALIDE COLOR

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5,206,118

ACID-SENSITIVE LEUCO DYE POLYMERIC FILMS

La Ann N. Sidney, Vadnais Heights; Doreen C. Lynch, Afton, and Peggy S. Willett, Stillwater, all of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 462,447, Jan. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 319,637, Mar. 6, 1989, abandoned. This application Jan. 19, 1991, Ser. No. 722,391

Int. Cl.[5] G03C *1/72, 1/73*

U.S. Cl. 430—343 14 Claims

1. A color-change dosimeter film, comprising: substantially colorless acid-sensitive leuco dye dispersed in an organosol film of halogen-containing polymer particles fused in a plasticizer containing said dye at a minimum sufficient temperature of fusion and a minimum sufficient time of fusion to form the film but keep the film as free from color as possible;

said dye (a) being substantially free from groups that are sensitive to high-energy radiation, (b) becoming colored in acid released from said polymer upon exposure of the film to high-energy radiation, and (c) retaining color substantially unchanged in the film after the exposure of the film to high-energy radiation is completed;

wherein said leuco dye comprises carbazolyl methane, bisindophthalide, fluoran, or mixtures thereof; and

wherein the film has a protective clear coat on at least one surface of the film.

5,206,119

METHOD OF PROCESSING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL, AND STABILIZING SOLUTION AND STABILIZING AGENT KIT USED FOR SAID LIGHT-SENSITIVE MATERIAL

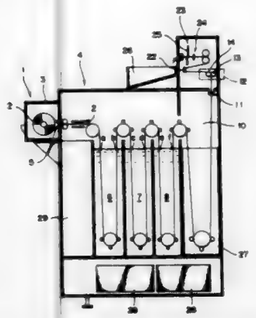
Satoru Kuse; Shigeharu Koboshi; Masayuki Kurematsu, and Masao Ishikawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 616,702, Nov. 20, 1990, abandoned, which is a continuation of Ser. No. 393,592, Aug. 14, 1989, abandoned. This application Jul. 1, 1992, Ser. No. 908,775

Claims priority, application Japan, Aug. 19, 1988, 63-205900; Aug. 24, 1988, 63-210976

Int. Cl.[5] G03C *11/00*

U.S. Cl. 430—372 22 Claims



1. A method of processing a light-sensitive silver halide color photographic material subjected to imagewise exposure, substantially through a color developing step, a bleach-fixing step and a washing-substitutive stabilizing step in this order, wherein at least one layer of said light-sensitive silver halide color photographic material comprises a silver halide containing not less than 80 mol % of silver chloride and a nitrogen containing heterocyclic mercapto compound, said washing-substitutive stabilizing step is carried out in a processing time of not more than 45 seconds, and a washing-substitutive stabilizing solution used in said washing-substitutive stabilizing step has a salt concentration of at least 1,000 ppm.

5,206,120

METHOD FOR FORMING COLOR IMAGES

Hiroshi Hayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1990, Ser. No. 627,105

Claims priority, application Japan, Dec. 15, 1989, 1-324045

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[5] G03C *7/32*

U.S. Cl. 430—376 10 Claims

1. A method for forming a color image comprising the step of:

developing a silver halide color photographic material for a color developing time of about 5 to 20 seconds and for a total processing time from color developing to drying of about 20 to 100 seconds,

wherein said silver halide photographic material comprises

(a) a support; and

(b) at least two layers on at least one side of said support, each of said at least two layers containing

(i) a silver halide emulsion containing 98 to 100 mol% silver chloride and at least 50% by weight of gelatin as a binder, said gelatin having an isoelectric point of at least 5.3, and

(ii) a diffusion resistant oil-soluble couple that forms a dye by coupling with an oxidation product of an aromatic primary amine developing agent; and

(c) said silver halide in said at least two layers differing in sensitivity wavelength range;

and wherein the total amount of said gelatin is 3.5 to 6.0 g/m^2; and wherein a color development replenishment rate is 60 to 150 ml/m^2.

5,206,121

METHOD OF REPLENISHING PHOTOGRAPHIC PROCESSING APPARATUS WITH PROCESSING SOLUTION

Yoshihiro Fujita, and Chuji Tsukada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

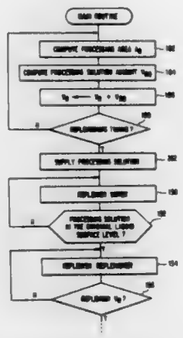
Division of Ser. No. 618,863, Nov. 28, 1990, Pat. No. 5,124,239.

This application Apr. 2, 1992, Ser. No. 862,469

Claims priority, application Japan, Nov. 30, 1989, 1-311229; Feb. 28, 1990, 2-47777; Feb. 28, 1990, 2-47779

Int. Cl.[5] G03C *5/00, 7/00*

U.S. Cl. 430—398 2 Claims



1. A method of replenishing a photographic processing apparatus with processing solution for a replenishing with processing solution a processing tank provided in a photographic processing apparatus and storing a processing solution for processing a photosensitive material, said method comprising the steps of:

replenishing said processing tank with a replenisher by an amount corresponding to the amount of said photosensitive material which has been processed at a predetermined timing;

discharging the liquid from said processing tank by an amount which is determined by subtracting an amount of the processing solution carried out of said processing tank by said photosensitive material from the sum of the amount of said replenisher and the amount of the processing solution carried into said processing tank by said photosensitive material; and

replenishing said processing tank with water until the liquid surface level is said processing tank reaches an original liquid surface level.

5,206,122

LIGHT STABLE PHYSICAL DEVELOPER

Marcus J. M. Noppe, Kalmthout, and Lucas A. M. Van Nuffel, Merksem, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Feb. 28, 1991, Ser. No. 662,586

Claims priority, application United Kingdom, Mar. 14, 1990, 9005753

Int. Cl.[5] G03C *5/24*

U.S. Cl. 430—414 6 Claims

1. A physical developer comprising an aqueous solution of silver ions, a densensitizing agent and a reducing agent.

5,206,123

HIGH CONTRAST DEVELOPER CONTAINING AN APROTIC SOLVENT

Richard A. Ooms, Hofstade, and Piet Kok, Gent, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

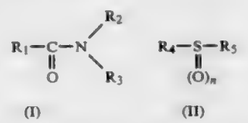
Filed Feb. 18, 1992, Ser. No. 835,856

Claims priority, application European Pat. Off., Feb. 26, 1991, 91200411

Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—264 15 Claims

1. A method for high contrast development of an image-wise exposed photographic element comprising a support and at least one silver halide emulsion layer, which method comprises contacting said exposed element in the presence of a hydrazine compound with an aqueous alkaline developing solution which has a pH between 10 and 13 and contains a dihydroxybenzene developing agent, a 3-pyrazolidinone or an aminophenol developing agent, sulphite ions and a contrast promoting amount of an amino compound characterized in that said developing solution further contains an aprotic solvent corresponding to general formula (I) or (II) :



(I) (II)

wherein R_1 represents alkyl, substituted alkyl, alkylamino, or substituted alkylamino, and

R_2 and R_3 each independently represent alkyl substituted alkyl or

wherein R_1 together with R_2 represent the necessary atoms to form together with the carbon and the nitrogen atom respectively to which they are attached a heterocyclic ring and R_3 represents alkyl substituted alkyl or hydrogen:

R_4 and R_5 each independently represent, alkyl, substituted alkyl, alkylamino or substituted alkylamino, or

R_4 together with R_5 represent the necessary atoms to form together with the sulphur atom to which they are attached a heterocyclic ring, and

n is 1 or 2.

5,206,124

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hiroshi Shimazaki, Hachioji; Yasushi Irie, Hino, and Katuya Yabuuchi, Musashimurayama, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 11, 1992, Ser. No. 832,934

Claims priority, application Japan, Feb. 14, 1991, 3-42530

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—505 3 Claims

1. A silver halide color photographic light-sensitive material comprising a support having thereon a blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler, a green-sensitive silver halide emulsion layer containing a magenta dye-forming coupler and a red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler, wherein

said blue-sensitive emulsion layer has the maximum spectral sensitivity S_{Bmax} at a wavelength λ_{Bmax} within the range of from 415 nm to 470 nm, and a spectral sensitivity of said blue-sensitive emulsion layer at 480 nm, S_{B480}, is not more than 35% of said maximum sensitivity S_{Bmax} of said blue-sensitive emulsion; and

said green-sensitive emulsion layer has the maximum spectral sensitivity S_{Gmax} at a wavelength λ_{Gmax} within the range of from 530 nm to 560 nm, and a spectral sensitivity of said green-sensitive emulsion layer at 500 nm, S_{G500}, is not less than 25% of said maximum sensitivity S_{Gmax} of said green-sensitive emulsion layer,

wherein said sensitivity is defined by a reciprocal of the amount of exposure necessary to form an image having a density higher than the minimum density of each emulsion layer by 0.7.

5,206,125

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 13, 1990, Ser. No. 611,640

Claims priority, application Japan, Nov. 14, 1989, 1-297216

Int. Cl.[5] G03C *1/86*

U.S. Cl. 430—507 11 Claims

1. A silver halide color photographic material comprising a reflective support and coated thereon at least one each of a cyan dye-forming silver halide emulsion layer, a magenta dye-forming silver halide emulsion layer and a yellow dye-forming silver halide emulsion layer, each of said emulsion layers containing substantially silver iodide-free silver chloride or silver chlorobromide and respectively having spectral sensitivity peaks in different wavelength regions, at least two of said emulsion layers containing silver halide grains having an average grain size of 0.35 μm to 0.65 μm and at least one of said emulsion layers having a silver halide content of 0.19 g Ag/m^2 or less, a third emulsion layer containing silver halide grains having a grain size of from 0.05 μm to 2 μm, the total silver amount in all the silver halide emulsion layers being 0.78 g/m^2 to 0.2 g/m^2, and a water-soluble or bleachable dye being available on said support in such an amount that the sensitivity of the silver halide emulsion layer having a sensitivity peak at the longest wavelength is reduced to 35 to 10% of the sensitivity in the absence of said water-soluble or bleachable dye, the sensitivity of the silver halide emulsion layer having a sensitivity peak at the second longest wavelength is reduced to 50 to 20% of the sensitivity in the absence of said water-soluble or bleachable dye, and the sensitivity of the silver halide emulsion layer having sensitivity peak at the shortest wavelength is reduced to 70 to 30% of the sensitivity in the absence of said water-soluble or bleachable dye, said water-soluble or bleachable dye is represented by general formula (A):

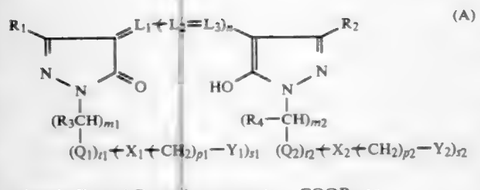
5,206,128

SILVER HALIDE PHOTOGRAPHIC MATERIAL

5,206,130

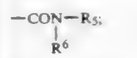
CYAN COUPLER, CYAN IMAGE FORMING METHOD

may be joined together to form a five to eight membered ring.



(A)

wherein R_1 and R_2 each represents —$COOR_5$ or



R_3 and R_4 each represents a hydrogen atom or an alkyl or substituted alkyl group; R_5 and R_6 each represents a hydrogen atom, an alkyl or substituted alkyl group, or an aryl or substituted aryl group; Q_1 and q_2 each represents an aryl group; X_1 and X_2 each represents a bond or a divalent linking group; Y_1 and Y_2 each represents a sulfo group or a carboxyl group; L_1, L_2 and L_3 each represents a methine group m_1 and M_2 each represents 0, 1 or 2; n represents 0, 1 or 2, p_1 and p_2 each represents 0, 1, 2, 3 or 4; s_1 and s_2 each represents 1 or 2; t_1 and t_2 each represents 0 or 1; provided that m_1, p_1 and t_1 or m_2, p_2 and t_2 are not simultaneously equal to 0.

5,206,126

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL OFFERING EXCELLENT HUE REPRODUCTION

Hiroshi Shimazaki; Yasushi Irie, and Fumie Fukazawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 3, 1992, Ser. No. 829,942
Claims priority, application Japan, Feb. 8, 1991, 3-60915
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—508 **2 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein a wavelength weight-averaged in spectral sensitivity distribution of said red-sensitive silver halide emulsion layer is within a range of 595 to 625 nm; a maximum sensitivity wavelength in spectral sensitivity distribution of said blue-sensitive silver halide emulsion layer is within a range of 415 to 470 nm; and a sensitivity of said blue-sensitive silver halide emulsion layer at 480 nm is not more than 35% of the sensitivity at said maximum sensitivity wavelength.

5,206,127

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kunio Ishigaki, and Yuuzou Muramatsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 21, 1991, Ser. No. 718,517
Claims priority, application Japan, Jun. 22, 1990, 2-165266
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—523 **13 Claims**

1. A silver halide photographic material having on one surface of a support at least one silver halide emulsion layer and having on the other surface of the support, a backing layer containing a mat agent, wherein the mat agent comprises grains having a grain size of 15 μm or more in a proportion of at least 5% by volume and the surfaces of the mat agent grains have been modified with an alkali.

5,206,128

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Naoki Arai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1991, Ser. No. 725,115
Claims priority, application Japan, Jul. 4, 1990, 2-176825
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—539 **4 Claims**

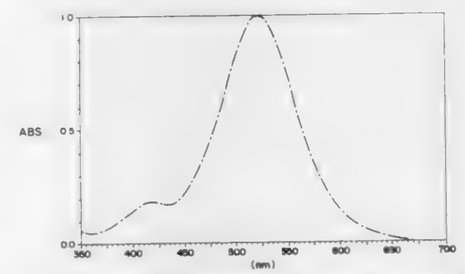
1. A silver halide photographic material element comprising a support having thereon, in sequence, a hydrophilic silver halide emulsion layer and a protective layer, wherein gelatin is contained in said protective layer in an amount of at least 1.5 g/m^2, gelatin is contained in said emulsion layer in an amount of at least 1.0 g/m^2, and the coated amount of gelatin in said protective layer and said emulsion layer is a total of at most 3.5 g/m^2.

5,206,129

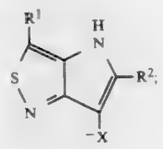
DYE FORMING COUPLERS, AND A METHOD OF COLOR IMAGE FORMATION AND SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS IN WHICH THEY ARE USED

Kozo Sato; Kiyoshi Takeuchi, and Yoshio Ishii, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 7, 1991, Ser. No. 789,023
Claims priority, application Japan, Nov. 22, 1990, 2-315906
Int. Cl.[5] G03C *7/38*
U.S. Cl. 430—558 **13 Claims**



1. A silver halide color photosensitive material comprising a support having thereon at least one layer containing a dye forming coupler represented by formula (I):



(I)

wherein R^1 and R^2, which may be the same or different, each represents a substituent group, and R^1 and R^2 substantially cannot be eliminated when the dye forming coupler is reacted with the oxidized species of a primary aromatic amine derivative, and X is a hydrogen atom or a group which can be eliminated by a coupling reaction with the oxidized species of a primary aromatic amine derivative.

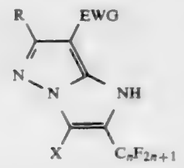
5,206,130

CYAN COUPLER, CYAN IMAGE FORMING METHOD USING THE SAME AND SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING THE SAME

Yasuhiro Shimada, and Yoshio Ishii, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 6, 1991, Ser. No. 788,416
Claims priority, application Japan, Nov. 6, 1990, 2-300306
Int. Cl.[5] G03C *7/38*
U.S. Cl. 430—558 **7 Claims**

1. A silver halide color photographic material comprising a support thereon having at least one red-sensitive silver halide emulsion layer containing at least one cyan coupler which forms a cyan dye having a maximum absorption peak wavelength of from 605 to 700 nm of the general formula (I):



(I)

where

R represents a substituent group;

EWG represents an electron-attaching group having a σ_p of 0.30 or more and which does not substantially split off from the formula on reaction of the coupler with an oxidation product of an aromatic primary amine developing agent;

X represents a hydrogen atom or a releasable group which splits off from the formula on reaction of the coupler with an oxidation product of an aromatic primary amine developing agent; and

n represents an integer of from 1 to 7.

5,206,131

DIFFUSION TRANSFER TYPE SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS

Naoto Matsuda; Takeshi Nakamine; Koki Nakamura, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1991, Ser. No. 683,913
Claims priority, application Japan, Apr. 12, 1990, 2-96756
Int. Cl.[5] G03C *5/54*
U.S. Cl. 430—559 **17 Claims**

1. A diffusion transfer-type silver halide color photographic photosensitive thermally developable material comprising a support, having thereon at least a photosensitive silver halide, a binder, a reducible and diffusible dye donating compound which reacts with reducing agents which remain unoxidized upon development and releases a diffusible dye, a development inhibitor releasing compound which releases a development inhibitor, and a compound represented by Formula (I):

(I)

wherein R^1 represents an alkyl group, an aryl group, an alkylamino group, an arylamino group, an alkoxy group, an aryloxy group, a heterocyclic residual group, or a polymer residual group of said groups,

Y represents

or —SO_2—NR^2—, R^2 represents a hydrogen atom, an alkyl group, an aryl group or an acyl group, an R^1 and R^2 may be joined together to form a five to eight membered ring.

5,206,132

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsuyoshi Mitsuhashi, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed May 3, 1991, Ser. No. 695,697
Claims priority, application Japan, May 14, 1990, 2-123714
Int. Cl.[5] G03C *1/36*
U.S. Cl. 430—567 **5 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing surface-fogged type direct positive silver halide grains, wherein said direct positive silver halide emulsion layer comprises two or more silver halide emulsions substantially different in sensitivity and/or gradation; the ratio of the total area of (111) face to the total surface area of grains in said emulsions is not less than 50%; the average silver iodide content of grains in said emulsions is not more than 5 mol %; and wherein said photographic material is processed with an automatic processing machine for an overall processing time of more than 20 seconds and less than 60 seconds.

5,206,133

SILVER HALIDE COLOR REVERSAL PHOTOGRAPHIC MATERIAL

Shinsuke Bando, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 624,506, Dec. 7, 1990, abandoned, which is a continuation of Ser. No. 235,812, Aug. 23, 1988, abandoned, which is a continuation of Ser. No. 887,771, Jul. 21, 1986, abandoned. This application Oct. 4, 1991, Ser. No. 770,784
Claims priority, application Japan, Jul. 19, 1985, 60-158430
Int. Cl.[5] G03C *1/035*
U.S. Cl. 430—567 **6 Claims**

1. A silver halide color reversal photographic material having at least one light-sensitive silver halide emulsion layer on a support, comprising silver iodobromide grains having a silver iodide content of 5 mol % or less in at least one silver halide emulsion layer, wherein said silver iodobromide grains comprise a core phase comprising the center thereof and a shell phase covering said core and comprising the surface thereof, with the silver iodide content of said shell phase being higher than that of said core phase, wherein said silver iodobromide grains are tabular silver iodobromide grains which are present so as to amount to at least 50% of the total projected area of all silver iodobromide grains present and wherein said tabular silver halide grains have an average aspect ratio of from 5 to 8.

5,206,134

METHOD FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC EMULSION

Sumito Yamada, and Tetsuo Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1991, Ser. No. 750,684
Claims priority, application Japan, Aug. 28, 1990, 2-225637
Int. Cl.[5] G03C *1/005, 1/035*
U.S. Cl. 430—569 **16 Claims**

1. A method for producing a silver halide photographic emulsion comprising silver iodobromide or iodobromochloride grains having an average iodine content of less than 1.0 mol %, wherein each grain comprises a basic grain and a surface portion, which comprises the following step (a) or (b) to form said surface portion of the grains such that said step (a) or said step (b) provides the surface portion having an iodine content of 0.005 mol % to less than 0.3 mol % based on the total amount of silver of said grains:

(a) adding simultaneously a silver nitrate solution and a solution which contains iodine ion; or

(b) adding fine particles of AgI and/or fine particles of AgBrI.

generate the D-dimer fragment of said fibrin polymers and measuring the amount of said D-dimer.

-continued

aqueous environment containing about 0.1 x SSC, or less, at about 65° C., and wherein said polynucleotide sequence is

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(b) adding fine particles of AgI and/or fine particles of AgBrI.

5,206,135

USE OF THE OXYGENASE ACTIVITY OF ACETOLACTATE SYNTHASE FOR HERBICIDE DETECTION

Lynn M. Abell, New Castle, and John V. Schloss, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1990, Ser. No. 635,013
Int. Cl.[5] C12Q *1/00, 1/26*
U.S. Cl. 435—4 **7 Claims**

1. A process for detecting acetolactate synthase-inhibiting herbicides by the use of acetolactate synthase and an oxygen-sensitive electrode, which comprises

mixing a solution to be tested with a substrate selected from the group consisting of pyruvate, α-ketobutyrate, α-acetolactate, and α-aceto-α-hydroxybutyrate;

placing the mixture in contact with an oxygen-sensitive electrode;

adding to the mixture an acetolactate synthase, in soluble form or immobilized to an inert support;

adding to the mixture flavin adenine dinucleotide, thiamine pyrophosphate, a divalent metal, and a buffer to control the pH of the solution to the physiologic range of 6 to 10 pH; and

monitoring the consumption of oxygen by the ensuing reaction by use of the oxygen-sensitive electrode.

5,206,136

RAPID MEMBRANE AFFINITY CONCENTRATION ASSAYS

Nobuo Monji, and Carol-Ann Cole, both of Seattle, Wash., assignors to Genetic Systems Corporation, Redmond, Wash.

Continuation of Ser. No. 590,886, Oct. 1, 1990, which is a continuation-in-part of Ser. No. 108,485, Oct. 20, 1987, which is a continuation-in-part of Ser. No. 932,656, Nov. 19, 1986, abandoned. This application Jul. 31, 1992, Ser. No. 925,311
Int. Cl.[5] G01N *33/538;* **C12Q** *1/00*
U.S. Cl. 435—5 **21 Claims**

1. A method for determining the presence of an HIV analyte of interest in a fluid sample, which comprises:

incubating in the substantial absence of unconjugated polymer a sample suspected of containing the HIV analyte of interest with (i) a labelled conjugate which comprises a first reactant conjugated to a label capable of providing a detectable signal, said first reactant being capable of specifically binding with the analyte and (ii) a second conjugate which comprises a second reactant that binds to the analyte, and a polymer selected from a group consisting of N-alkylacrylamides, N-arylacrylamides, alkyl acrylates, aryl acrylates, and combinations thereof conjugated to said second reactant, thereby forming a reaction mixture;

contacting the reaction mixture with a solid phase which comprises a cellulose ester; and

measuring the amount of label bound to the solid phase and therefrom determining the presence of said analyte.

5,206,137

COMPOSITIONS AND METHODS USEFUL FOR GENETIC ANALYSIS

Nancy Y. Ip, Stamford, Conn., and Howard J. Baum, Stony Point, N.Y., assignors to Lifecodes Corporation, Valhalla, N.Y.

Continuation of Ser. No. 241,639, Sep. 8, 1988. This application Nov. 21, 1991, Ser. No. 798,358
Int. Cl.[5] C12Q *1/68;* **G01N** *33/48, 33/566;* **C07H** *15/12*
U.S. Cl. 435—6 **7 Claims**

1. A polynucleotide sequence which forms stable hybrids under high stringency conditions with genomic Variable Tandem Repeat DNA sequences at multiple, polymorphic loci of a human, wherein said high stringency conditions comprise an aqueous environment containing about 0.1 x SSC, or less, at about 65° C., and wherein said polynucleotide sequence is selected from the group consisting of:

(a) the human DNA insert in pAC329;

(b) the human DNA insert in pAC344;

(c) the human DNA insert in pAC365; and

(d) mutational, insertional, or deletional variants of (a)–(d), wherein said variants form stable hybrids, under high stringency conditions, with DNA sequences which hybridize with said polynucleotide sequences of (a)–(d) above.

5,206,138

Patent Not Issued For This Number

5,206,139

Patent Not Issued For This Number

5,206,140

ASSAY FOR SOLUBLE CROSSLINKED FIBRIN POLYMERS

Victor J. Marder, and Charles W. Francis, both of Rochester, N.Y., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 213,572, Jun. 24, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,250
Int. Cl.[5] G01N *33/535, 33/53;* **C07K** *15/28;* **C12N** *5/12*
U.S. Cl. 435—7.1 **17 Claims**

1. A process for the in vitro determination of crosslinked soluble fibrin polymers in a patient sample which comprises contacting said sample with at least one proteolytic enzyme to

generate the D-dimer fragment of said fibrin polymers and measuring the amount of said D-dimer.

5,206,141

OKADAIC ACID TESTING FOR CIGUATOXIN

Douglas L. Park, Tucson, Ariz., assignor to Hawaii Chemtect International, Pasadena, Calif.

Filed Sep. 24, 1991, Ser. No. 765,052
Int. Cl.[5] C12Q *1/00;* **G01N** *33/53, 33/48, 33/543*
U.S. Cl. 435—7.1 **33 Claims**

1. A kit for detecting the presence of ciguatoxin or related polyether marine toxins in fish, comprising positive control reagents which react reproducibly with antibodies against ciguatoxins or related polyether marine toxins wherein the positive control reagents comprise:

okadaic acid; and

a carrier, selected from the group consisting of toxic fish extract, non-toxic fish extract, oils, oil/organic solvent mixtures, fatty-acid solutions, and non-ionic detergent solutions.

5,206,142

ENTAMOEBA HISTOLYTICA DIAGNOSTIC ASSAY

Samuel L. Stanley, Jr., and Ellen Li, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Division of Ser. No. 516,388, Apr. 30, 1990, Pat. No. 5,130,417. This application Apr. 27, 1992, Ser. No. 874,312
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—7.22 **1 Claim**

1. A serologic method for the detection of amebiasis comprising treating an aqueous dilution of a sample of the blood serum of a test host with a protein having the following amino acid sequence of a fusion protein having said amino acid sequence fused to the N-terminal two-thirds of the trpE gene of *E. coli*, assaying the resulting immunological reaction product and comprising against a control standard

Met Phe Ala Phe Leu Leu Phe Ile
Ala Phe Thr Ser Ala Thr Asn 15

Ile Ile Leu Asp Leu Asp Gln Glu
Val Lys Asp Thr Asn Ile Tyr 30

Gly Val Phe Leu Lys Asn Glu Ala
Ser Pro Glu Lys Leu Glu Glu 45

Ala Glu Glu Lys Glu Lys Ser Ser
Ser Ala Lys Pro Glu Ser Ser 60

Ser Asn Glu Asp Asn Glu Asp Asp
Glu Asp Glu Lys Ala Ser Ser 75

Ser Asp Asn Ser Glu Ser Ser Ser
Ser Asp Lys Pro Asp Asn Lys 90

Pro Glu Ala Ser Ser Ser Asp Lys
Pro Glu Ala Ser Ser Ser Asp 105

Lys Pro Asp Asn Lys Pro Glu Ala
Ser Ser Ser Asp Lys Pro Asp 120

-continued

Asn Lys Pro Glu Ala Ser Ser Ser
Asp Lys Pro Asp Asn Lys Pro 135

Glu Ala Ser Ser Ser Asp Lys Pro
Asp Asn Lys Pro Glu Ala Ser 150

Ser Ser Asp Lys Pro Asp Asn Lys
Pro Glu Ala Ser Ser Thr Asn 165

Lys Pro Glu Ala Ser Ser Thr Asn
Lys Pro Glu Ala Ser Ser Thr 180

Asn Lys Pro Glu Ala Ser Ser Thr
Asn Lys Pro Glu Ala Ser Ser 195

Thr Ser Asn Ser Asn Asp Lys Ser
Gly Ser Ser Ser Asp Asn Asp 210

Asn Asn Asn Leu Asp Ala Ala Ser
Ser Pro Phe Ile Val Phe Cys 225

Ala Ile Ile Ile Ala Ile Ile Phe
233.

5,206,143

METHOD AND REAGENTS FOR PERFORMING SUBSET ANALYSIS USING QUANTITATIVE DIFFERENCES IN FLUORESCENCE INTENSITY

Paul K. Horan, West Chester, and Sue E. Slezak, Downingtown, both of Pa., assignors to SmithKline Beecham Corporation, King of Prussia, Pa.

Continuation of Ser. No. 296,394, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 794,945, Nov. 1, 1985, abandoned. This application Jan. 6, 1992, Ser. No. 818,473
Int. Cl.[5] C07K *15/28;* **C12Q** *1/00;* **C01N** *15/10, 33/533*
U.S. Cl. 435—7.24 **42 Claims**

1. A method for distinguishing at least two subpopulations of biologic particles in a sample comprising the steps of

a. selecting a first reagent that comprises:

a first amount of a first labelled antibody that is labelled solely with a first fluorochrome, or

a mixture of the first amount of the first labelled antibody and a first unlabelled antibody that is free of any fluorochrome,

wherein the first labelled antibody and the first unlabelled antibody have the same antigen specificity and are specifically reactive to a first subpopulation biologic particle in the same, and

wherein the first labelled antibody, or the first labelled antibody and the first unlabelled antibody, are present in a quantity sufficient to obtain maximum binding to the first subpopulation biologic particle and sufficient to confer upon the first subpopulation biologic particle a first fluorescence intensity,

b. selecting a second reagent that comprises:

a second amount of a second labelled antibody that is labelled solely with the first fluorochrome, or

a mixture of the second amount of the second labelled

antibody and a second unlabelled antibody that is free of

electrochemically remove any interferent species present

of its activity after treatment at 40° for 10 minutes at pH 6.8 in the absence of potassium chloride and bovine serum

derivative, other than methanol and ethanol, and R'—CHO is a corresponding aliphatic aldehyde or its α-carboxylic acid

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antibody and a second unlabelled antibody that is free of any fluorochrome,

wherein the second labelled antibody and the second unlabelled antibody have the same antigen specificity and are specifically reactive to a second subpopulation biologic particle in the sample, and

wherein the second labelled antibody, or the second labelled antibody and the second unlabelled antibody, are present in an quantity sufficient to obtain maximum binding to the second subpopulation biologic particle and sufficient to confer upon the second subpopulation biologic particle a second fluorescence intensity,

wherein the first and second amounts of the labelled antibodies are adjusted, relative to each other, so that one subpopulation biologic particle is distinguished from another subpopulation biologic particle based upon the difference in their fluorescence intensities,

c. mixing the reagents with the sample,

d. inducing fluorescence of the fluorochrome, and

e. quantitatively measuring the intensity of fluorescence of each biologic particle in the sample.

5,206,144

DETERMINATION OF GLYCATED (GLYCOSYLATED) HEMOGLOBIN IN BLOOD

Jesper Zeuthen, Virum; Annette Prento, Ballerup, and Viggo Kruse, Skovlunde, all of Denmark, assignors to Novo Industri A/S, Denmark

Continuation of Ser. No. 248,250, Sep. 19, 1988, abandoned, which is a continuation of Ser. No. 844,854, Mar. 27, 1986, abandoned. This application Oct. 30, 1990, Ser. No. 607,766

Claims priority, application Denmark, Mar. 29, 1985, 1453/85

Int. Cl.[5] **G01N** *33/543, 33/577*

U.S. Cl. 435—7.25 **13 Claims**

1. A method for the determination of glycated hemoglobin (HbA_{1c}) in a sample comprising a mixture of HbA_{1c} and non-glycated hemoglobin (HbA_o) in the absence of prior denaturation, which comprises:

(A) insolubilizing hemoglobin in said sample on a solid phase;

(B) contacting said insolubilized hemoglobin with a murine monoclonal antibody which has binding selectivity for HbA_{1c} relative to HbA_o when said HbA_{1c} is insolubilized on a solid phase;

(C) measuring the amount of bound monoclonal antibody; and

(D) relating said measured amount of bound monoclonal antibody to the amount of glycated hemoglobin in said sample.

5,206,145

METHOD OF MEASURING THE CONCENTRATION OF A SUBSTANCE IN A SAMPLE SOLUTION

Alan F. Cattell, Buckinghamshire, England, assignor to Thorn EMI plc, London, England

Continuation of Ser. No. 354,038, May 19, 1989, abandoned. This application Aug. 23, 1991, Ser. No. 751,670

Claims priority, application United Kingdom, May 19, 1988, 8811860

Int. Cl.[5] **G02N** *27/26;* **C12Q** *1/26, 1/54*

U.S. Cl. 435—14 **6 Claims**

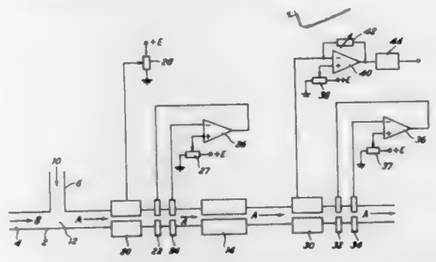
1. A method for the absolute measurement of the concentration of a substance in a predetermined volume of a sample solution comprising,

(a) providing an apparatus comprising first and second electrode structures and an enzyme channel between said first and second electrode structures containing an enzyme for catalyzing a reaction of a substance contained in a predetermined volume of a sample solution;

(b) providing a mixture of an excess of a mediator and said sample solution, presenting said mixture to the first electrode structure and applying a voltage to said first electrode structure effective to oxidize said mediator and electrochemically remove any interferent species present in said sample solution;

(c) passing the mixture through the enzyme channel effective to catalyze a reaction of all of said sample substance such that a quantity of said mediator is reduced;

(d) presenting the mixture to the second electrode structure and applying a voltage to said second electrode structure effective to completely re-oxidize all of said quantity of reduced mediator;



(e) measuring the current flowing through said second electrode structure required to completely re-oxidize all of said quantity of reduced mediator;

(f) integrating said current to provide a measurement of the quantity of charge required to completely re-oxidize all of said quantity of reduced mediator, and,

calculating the concentration of the sample substance in said sample solution from said measurement.

5,206,146

ASSAY METHOD USING NAD SYNTHETASE

Hideo Misaki; Hidehiko Ishikawa, and Kazuo Matsuura, both of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

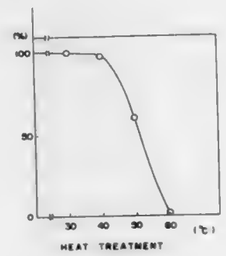
Continuation of Ser. No. 155,424, Feb. 12, 1988, abandoned, which is a division of Ser. No. 603,710, Apr. 25, 1984, Pat. No. 4,767,712. This application Feb. 15, 1990, Ser. No. 481,752

Claims priority, application Japan, Apr. 25, 1983, 58-71513

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] **C12Q** *1/00, 1/48, 1/20;* **C12N** *1/00*

U.S. Cl. 435—16 **6 Claims**



1. A method for assaying a component in a specimen, said component being selected from the group consisting of ATP, desamido-NAD+, and an amide donor, said donor being an ammonia compound, L-glutamine or L-asparagine; said method comprising:

performing a main reaction comprising incubating said specimen with NAD+ synthetase from *Bacillus licheniformis* B-0844 FERM P-6809 in the presence of ATP, desamido-NAD+, an amide donor, and Mg++ to generate NAD+, wherein the components not being measured are in excess of the component being measured and wherein said NAD synthetase is capable of retaining at least 95% of its activity after treatment at 40° for 10 minutes at pH 6.8 in the absence of potassium chloride and bovine serum albumin;

subjecting the thus-generated NAD+ to a coenzyme cycling reaction comprising reducing said generated NAD+ to reduced NAD in a reaction system comprising a dehydrogenase while dehydrogenating a substrate of said dehydrogenase, and then oxidizing the thus-generated reduced NAD to NAD+ in said coenzyme cycling reaction system further comprising diaphorase while reducing a tetrazolium salt to a formazan; and

measuring the progress of said cycling reaction by measuring a compound participating in said cycling reaction, said compound being selected from the group consisting of said substrate of said dehydrogenase, said dehydrogenated substrate, said tetrazolium salt and said formazan.

5,206,147

COLORIMETRIC ASSAY BY ENZYMATIC OXIDATION IN THE PRESENCE OF AN AROMATIC NITROSO OR OXIME COMPOUND

Joachim Hoenes, Weinheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 9, 1989, Ser. No. 390,946

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826922

Int. Cl.[5] **C12Q** *1/26, 1/32*

U.S. Cl. 435—25 **8 Claims**

1. A process for the colorimetric determination of an analyte which comprises:

a) oxidizing the analyte in a reaction mixture comprising an oxidoreductase enzyme which is dependent from the cofactors flavin or PQQ, said enzyme catalyzing said oxidizing of the analyte, and a color-forming aromatic nitroso compound or a tautomerically equivalent oxime compound which directly accepts electrons from the enzyme/cofactor and causes a color change in the reaction mixture;

b) measuring the color change in the reaction mixture; and

c) comprising standard values to the color change to obtain the amount of the analyte being oxidized.

5,206,148

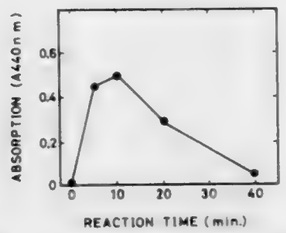
METHOD FOR ASSAYING ALIPHATIC ALCOHOL, ALIPHATIC ALDEHYDE OR ω-CARBOXYLIC ACID DERIVATIVES THEREOF

Shigeyuki Imamura; Naoki Muto, and Kenya Ishizawa, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Asaka, Japan

Division of Ser. No. 570,591, Aug. 21, 1990, Pat. No. 5,171,681. This application Nov. 5, 1991, Ser. No. 788,298

Int. Cl.[5] **C12R** *1/84;* **C12P** *7/24*

U.S. Cl. 435—25 **7 Claims**



1. A method for assaying aliphatic alcohol, aliphatic aldehyde or ω-carboxylic acid derivatives thereof, comprising reacting in an aqueous medium 1) a sample containing a compound of the formula, R'—CH_2OH or R'—CHO, wherein R'—CH_2OH is an aliphatic alcohol or its ω-carboxylic acid derivative, other than methanol and ethanol, and R'—CHO is a corresponding aliphatic aldehyde or its ω-carboxylic acid derivative, with 2) ω-carboxyalcohol oxidase having the following biochemical properties:

enzymatic action: catalyzing both of the following reactions a) and b)

a) $R—CH_2OH+O_2 \rightarrow R—CHO+H_2O_2$

b) $R—CHO+O_2+H_2O \rightarrow R—COOH+H_2O_2$

wherein R—CH_2OH is an aliphatic alcohol or its ω,carboxylic acid derivative, other than methanol and ethanol, R—CHO is a corresponding aliphatic aldehyde or its ω-carboxylic acid derivative, and R—COOH is the oxidized form of R—CHO;

substrate specificity: having substrate specificity on at least $HO_2C—(CH_2)_{11}—OH$, $H_3C—(CH_2)_{11}—OH$, $H_3C—(CH_2)_9—OH$, $H_3C—(CH_2)_7—OH$ and $H_3C—(CH_2)_5—OH$, and having no substrate specificity on methanol, ethanol or glycerol; and

utilization of coenzyme: does not require presence of NAD or NADP;

and quantitatively determining an amount of a component consumed or generated in one of said reactions a) and b).

5,206,149

METHOD OF HIGH SENSITIVITY LUMINESCENCE ANALYSIS

Yoshihiro Oyama, Kanagawa; Shuntaro Hosaka, Tokyo, and Tetsuya Makino, Kanagawa, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

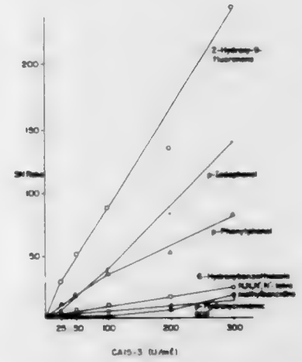
PCT No. PCT/JP90/00558, § 371 Date Feb. 5, 1991, § 102(e) Date Feb. 5, 1991, PCT Pub. No. WO90/13665, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 27, 1990, Ser. No. 623,426

Claims priority, application Japan, Apr. 28, 1989, 1-109598; Sep. 5, 1989, 1-229575; Feb. 19, 1990, 2-37997

Int. Cl.[5] **C12Q** *1/68, 1/28;* **G01N** *53/00, 21/52*

U.S. Cl. 435—28 **14 Claims**

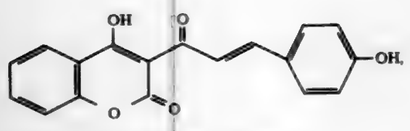


1. A process for detecting or determining the presence of a substance by the chemiluminescence produced through reaction of (a) peroxidase or a derivative thereof, (b) an oxidant and (c) luminol or isoluminol or a derivative thereof, wherein said chemiluminescence-inducing reaction is carried out in the presence of at least one compound selected from the group consisting of 2-hydroxy-9-fluorenone, the compound

ple which reacts with microorganisms producing dehy-

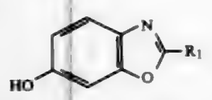
5,206,155

maintaining said reaction mixture at ring-forming conditions



I

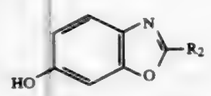
and oxazole derivatives of the formula



II

wherein R_1 represents hydrogen, C_nH_{2n+1}, XC_nH_{2n}, $C_nH_{2n+1}CO_2$, a phenyl group, a naphthyl group, $C_nH_{2n+1}C_6H_4$, YC_6H_4, or XYC_6H_3; wherein n is a positive integer from 1 to 4, X is F, Cl, Br, or I, and Y is F, Cl, Br, I, or a phenyl group.

8. An oxazole derivative having the formula



wherein R_2 is selected from the group consisting of XC_nH_{2n}, $C_nH_{2n+1}CO_2$, a naphthyl group, $C_nH_{2n+1}C_6H_4$, Y_6H_4 and XYC_6H_3, wherein n is a positive integer of 1 to 4, X is F, Cl, Br, or I, and Y is F, Cl, Br, I, or a phenyl group.

5,206,150

COMPOSITION OF, METHOD OF PRODUCING AND METHOD OF USING A STABILIZED FORMULATION FOR ASSAYING PEROXIDASE ACTIVITY

Hsin-Hsiung Tai, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Oct. 26, 1990, Ser. No. 604,590

Int. Cl.[5] C12Q *1/28;* C12N *9/96*

U.S. Cl. 435—28 **22 Claims**

1. A formulation for the detection and determination of peroxidase activity, comprising:

a chromatic compound;

a peroxide;

a water-miscible organic solvent;

an aqueous buffer solution; and

a stabilizing agent selected from a group consisting of bacitracin, bacitracin precursors, bacitracin components derived by hydrolysis and mixtures thereof.

5,206,151

RAPID SELECTION OF BIOCIDE USING A REDUCTION OXIDATION INDICATOR SYSTEM

Linda R. Robertson, St. Charles, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 11, 1990, Ser. No. 536,390

Int. Cl.[5] C12Q *1/00, 1/02;* C12N *5/00*

U.S. Cl. 435—32 **11 Claims**

1. A method of determining the minimum inhibitory concentration of an antimicrobial agent in a contaminated aqueous system selected from the group consisting of stock or furnished solutions from a pulp and paper manufacturer, waters from open recirculating cooling water systems, waste effluent streams, chemical process streams and fermentation streams, which contain microbiological organisms, comprising the steps of:

(a) Obtaining a sample of said contaminated aqueous system;

(b) Adding a reduction oxidation indicator dye to said sample which reacts with microorganisms producing dehydrogenase enzymes;

(c) Adding dairy half and half creamer to said sample to form a dye treated nutrient aqueous system;

(d) Obtaining aliquots of the dye treated nutrient aqueous system;

(e) Performing multiple serial dilutions of an antimicrobial agent to be tested and forming mixtures of said aliquots of the dye treated nutrient aqueous system with each of the said serial dilutions;

(f) Incubating said mixtures at a temperature essentially equivalent to the temperature of the contaminated aqueous system for a period of time sufficient to develop the change in the dye color by the reaction of the dye with reducing enzymes; and

(g) Determining the minimum inhibitory concentration of antimicrobial agent that inhibits those microbial organisms contained in said contaminated aqueous system by observing a change in color.

5,206,152

CLONING AND EXPRESSION OF EARLY GROWTH REGULATORY PROTEIN GENES

Vikas P. Sukhatme, Chicago, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 179,587, Apr. 8, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 249,584

Int. Cl.[5] C07K *3/00;* C07H *15/12*

U.S. Cl. 435—69.1 **12 Claims**

1. A purified and isolated DNA sequence encoding a mammalian early regulatory growth protein which comprises one or more histidine-cysteine finger amino acid sequences, said DNA capable of hybridizing with the mouse Egr-1 gene of FIGS. 1.1–1.8, under hybridization conditions which include 1 M NaCl and 10% dextran sulfate at 50°–65°.

5,206,153

METHOD OF PRODUCING HUMAN α-FETOPROTEIN AND PRODUCT PRODUCED THEREBY

Taiki Tamaoki, Alberta, Canada; Tomonori Morinaga, Tochigi, and Shinzo Nishi, Hokkaido, both of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Continuation of Ser. No. 544,336, Jun. 27, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 852,844

Int. Cl.[5] C07K *13/00;* C12N *15/62*

U.S. Cl. 435—69.7 **7 Claims**

1. A modified recombinant α-fetoprotein comprised of an amino acid sequence of Arg-Val-Pro-Asp-Pro-Met-Arg-Thr-Leu-His, which is a signal peptide of a rat α-fetoprotein and a peptide linker, and an amino acid sequence of mature human α-fetoprotein in which said signal peptide and peptide linker are fused at the 5′ terminal site of said mature human α-fetoprotein.

5,206,154

METHOD OF PRODUCING CECROPINS BY MICROBIOLOGICAL TECHNIQUES

Jiunu Lai; Jar-How Lee, both of Los Angeles; Yun-Long Liu, Los Angeles; Dan Ray, Encino, and Gary Wilcox, Malibu, all of Calif., assignors to Xoma Corporation, Berkeley, Calif.

Division of Ser. No. 474,304, Feb. 5, 1990, Pat. No. 5,028,530, which is a continuation-in-part of Ser. No. 645,309, Jan. 28, 1985, abandoned. This application Jan. 3, 1991, Ser. No. 637,199

Int. Cl.[5] C07K *13/00;* C17N *15/62, 15/63*

U.S. Cl. 435—69.7 **15 Claims**

1. A genetic construct which comprises a first genetic sequence coding for a polypeptide which is capable of suppressing the bactericidal effect of the resulting fusion protein towards an otherwise cecropin-sensitive bacterium operably linked to a second genetic sequence coding for cecropin.

5,206,155

MICROORGANISM FOR SELECTIVE PRODUCTION OF A SPECIFIC COMPOUND OF AVERMECTIN AND A METHOD FOR SELECTIVE PRODUCTION THEREOF

Satoshi Omura, and Haruo Ikeda, both of Tokyo, Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,448

Claims priority, application Japan, Mar. 5, 1990, 2-53411

Int. Cl.[5] C12P *21/04, 17/00, 17/16;* C12N *1/20*

U.S. Cl. 435—71.3 **7 Claims**

1. A biologically pure culture of the microorganism *Streptomyces avermitilis*, wherein the culture is capable of producing essentially only avermectin compound "a" and wherein further the culture retains the ability to degrade isoleucine or its keto acid (3-methyl-2-oxovaleric acid) but has a decreased ability to degrade valine or its keto acid (2-oxoisovaleric acid) in the avermectin biosynthetic pathway.

5,206,156

PROCESS FOR THE PREPARATION OF A PARTICULATE ANTIMICROBIAL PRODUCT, ANTIMICROBIAL PRODUCT OBTAINED AND APPLICATIONS THEREOF

Daniel Samain, Toulouse; Frédérique Nguyen, Vaux Sur Mer, and Michel Degre, Alzonne, all of France, assignors to Bio Serae Laboratoires SA, Saint Affrique, France

Filed May 11, 1990, Ser. No. 521,977

Claims priority, application France, May 12, 1989, 89 06668

Int. Cl.[5] C12P *19/04;* A61K *37/22, 37/50*

U.S. Cl. 435—101 **13 Claims**

1. A process for preparation of a particulate antimicrobial product using the antimicrobial LP system of lactoperoxydase enzyme/oxygen donor/oxidizable substrate, wherein the oxygen donor is a peroxide, a reactive substance, or micro-organisms, for modifying the physiochemical properties of the LP system and providing the LP system in the form of particles insoluble in an aqueous medium, the process comprising:

bonding at least the lactoperoxydase enzyme of the LP system to a particulate vector, each particle of said particulate vector comprising a nucleus formed of a hydrophilic polysaccharidic polymer, a first lipidic layer chemically bound to the nucleus by hydroxy functional groups or derivatives thereof, and a second phospholipidic layer so that the molecules of enzyme are inserted into the second phospholipidic layer and/or into the first lipidic layer,

introducing said particulate vector into a non-aqueous medium.

5,206,157

PREPARATION OF N-SUBSTITUTED-2-MORPHOLONE

Kechia J. Chou, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

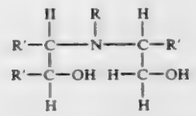
Filed Sep. 28, 1988, Ser. No. 250,052

Int. Cl.[5] C12P *17/14;* C12N *1/00*

U.S. Cl. 435—120 **8 Claims**

1. The method of preparing a product 2-morpholone which comprises

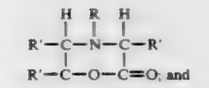
maintaining a reaction mixture containing as charge dialkanolamine



wherein R is alkyl, cycloalkyl, alkaryl, aralkyl, aryl, alkenyl, alkynyl, or hydrogen and R′ is alkyl, cycloalkyl, alkaryl, aralkyl, aryl, alkenyl, alkynyl, or hydrogen;

adding to said reaction medium *Gluconobacter* or *Acetobacter* bacteria;

maintaining said reaction mixture at ring-forming conditions thereby forming product 2-morpholone



and

recovering said product 2-morpholone.

5,206,158

PROCESS FOR THE PREPARATION OF DIFLUOROBENZAMIDE

Kenneth H. Clifford, Sittingbourne; Philip J. Geary, Ashford, and Robert J. Pryce, Faversham, all of United Kingdom, assignors to Gist-Brocades N.V., Delft and Shell Internationale Research Maatschappij B.V., The Hague, both of Netherlands

Continuation of Ser. No. 60,552, Jun. 11, 1987, abandoned. This application Aug. 21, 1990, Ser. No. 569,729

Claims priority, application United Kingdom, Jul. 2, 1986, 8616160

Int. Cl.[5] C12P *13/02;* C12N *1/20*

U.S. Cl. 435—129 **2 Claims**

1. A process for the preparation of 2,6-difluorobenzamide which comprises subjecting 2,6-difluorobenzonitrile to the action of *Rhodococcus* sp. NCIB 12218 or a mutant thereof capable of the hydrolysis of 2,6-difluorobenzonitrile to 2,6-difluorobenzamide, under irradiation of light, to form 2,6-difluorobenzamide and recovering the formed 2,6-difluorobenzamide.

5,206,159

POLYMER PARTICLES CONTAINING COLLOIDAL IRON OXIDE GRANULES FOR USE AS A MAGNETICALLY RESPONSIVE REAGENT CARRIER

Beri Cohen, White Plains, N.Y.; Tak K. Wong, Hamden, Conn., and Bartholomew Hargitay, White Plains, N.Y., assignors to Miles Inc., as Legal Successor by Merger with Technicon Instruments Corp., Tarrytown, N.Y.

Continuation of Ser. No. 676,010, Mar. 27, 1991, abandoned, which is a continuation of Ser. No. 53,562, May 21, 1987, abandoned. This application Aug. 25, 1992, Ser. No. 934,287

Int. Cl.[5] C12N *11/08;* C12Q *1/00;* G01N *33/53, 33/545*

U.S. Cl. 435—180 **8 Claims**

1. A process for preparing a stable superparamagnetic particulate reagent carrier having high magnetic permeability and low magnetic remanence comprising the steps of: a) providing a water-insoluble swellable substantially spherical and essentially non-ionic polyacrylamide gel matrix; b) contacting said polyacrylamide matrix with a solution of soluble iron salts whereby substantially all of said iron salt solution is taken up by said polyacrylamide matrix, said matrix becomes swollen, and said soluble salts pass into said polyacrylamide hel matrix; c) converting the iron salts to insoluble iron oxide granules having a diameter of from about 5 nm to 500 nm whereby a colloidally and stably dispersed magnetically responsive moiety is generated in situ within said polyacrylamide gel matrix and entrapped therein, said entrapped iron oxide essentially free to rotate within said matrix under the influence of a magnetic field and thermal motion; and d) washing the polyacrylamide gel matrix to remove soluble by-products.

5,206,160

COMPOSITION CONTAINING PUF 3 AND

-continued

CAATTGAGAAACCCACTGGAGATGAACAGTCT

5,206,163

DNA ENCODING BOVINE DIARRHEA VIRUS PROTEIN

5,206,168

METHOD FOR SMALL SYSTEM WASTEWATER

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5,206,160

COMPOSITION CONTAINING BUF-3 AND SUPEROXIDE DISMUTASE AS A CELL CLEAVAGE PROMOTING AGENT

Michio Takahashi, No. 1-8-502, Takatsuka-danchi, Takatsuka-shinden, Matsuod-shi, Chiba-ken; Kunio Shioda, Tokyo, and Hiroshiro Shibai, Kawasaki, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo and Michio Takahashi, Matsudo, both of Japan

Filed Sep. 11, 1990, Ser. No. 580,876
Claims priority, application Japan, Sep. 11, 1989, 1-234934
Int. Cl.[5] C12N *9/02;* C07K *13/00;* A61K *37/36*
U.S. Cl. 435—189 1 Claim

1. A cleavage promoting agent, comprising BUF-3 and superoxide dismutase.

5,206,161

HUMAN PLASMA CARBOXYPEPTIDASE B

Dennis T. Drayna, San Francisco, and Dan L. Eaton, San Rafael, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Feb. 1, 1991, Ser. No. 649,591
Int. Cl.[5] C12N *9/48;* C12P *21/06*
U.S. Cl. 435—212 4 Claims

1. An isolated monomeric human plasma carboxypeptidase B (PCPB) having a molecular weight on non-reducing SDS-PAGE of about 60 kD and having in its mature form the N-terminal sequence PheGluSer.

5,206,162

PROCESS FOR MAKING D-AMINOACYLASE

Ying C. Tsai; Chyuan S. Lin; Ching P. Tseng, and Yunn B. Yang, all of Taipei, Taiwan, assignors to National Science Council of Republic of China, Taipei, Taiwan

Filed Oct. 17, 1991, Ser. No. 778,240
Int. Cl.[5] C12R *1/05;* C12N *9/80, 9/78*
U.S. Cl. 435—228 1 Claim

1. A process for producing D-aminoacylase comprising adding 1% (weight/volume) of an N-acetyl-DL-amino acid selected from the group consisting of N-acetyl-DL-methionine and N-acetyl-DL-leucine to a culturing medium, culturing bacteria of the strain *Alcaligenes faecalis* DA-1 having accession number CCRC 14817 in said culturing medium, and recovering D-aminoacylase from the cultured bacteria;

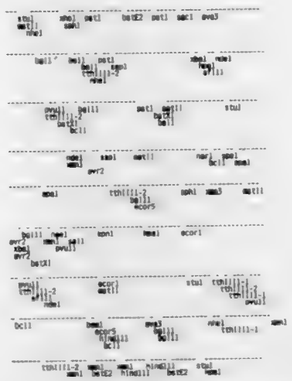
said D-aminoacylase having properties including: a substrate specificity capable of hydrolyzing N-acetyl-D-amino acids and unable to hydrolyze N-acetyl-L-amino acids and having a relative activity of 0.8% for the reaction of said D-aminoacylase with N-acetyl-L-methionine with respect to a relative activity of 100% for the reaction of said D-aminoacylase with N-acetyl-D-methionine; a molecular weight of 55,000; an isoelectric point of 5.35; and being inhibited by metallic ions of mercuric, cupric and carbonyl ions and inhibited by p-chloromercuribenzoic acid, N-ethylmaleimide and EDTA.

5,206,163

DNA ENCODING BOVINE DIARRHEA VIRUS PROTEIN

Andre Renard, Beaufays, Belgium; Dino Dina, San Francisco, Calif., and Joseph Martial, Esneux, Belgium, assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 331,037, Mar. 29, 1989, abandoned, which is a continuation of Ser. No. 752,981, Jul. 8, 1985, abandoned. This application Jul. 6, 1990, Ser. No. 550,816
Int. Cl.[5] C12N *5/10, 1/19, 1/21, 15/40*
U.S. Cl. 435—240.2 10 Claims



1. Am isolated and purified recombinant DNA fragment which encodes at least one viral polypeptide encoded by the BDV genomic sequences shown in FIG. 2.

5,206,164

DNA ENCODING A SYNTHETIC PEPTIDE ENDOWED WITH IMMUNOLOGICAL ACTIVITY AND CAPABLE OF INDUCING THE PRODUCTION OF ANTIBODIES WITH A HIGH SPECIFICITY TOWARDS ALPHA-FETOPROTEIN

Mario F. Tecce, Siena; Marzia M. Giuliani, Colle Di Val D'Elsa; Sterfano Ricci, Siena; Rattil Giulio, Siena, and Benedetto Terrana, Siena, all of Italy, assignors to Sclavo S.p.A., Siena, Italy

Division of Ser. No. 384,411, Jul. 24, 1989, Pat. No. 5,130,415.
This application Feb. 13, 1992, Ser. No. 835,278
Claims priority, application Italy, Jul. 29, 1988, 21553 A/88
Int. Cl.[5] C07H *21/04;* C12N *1/21, 15/12, 15/70*
U.S. Cl. 435—240.2 7 Claims

1. A DNA fragment which codes for a peptide defined by the amino acid sequence:

GluAlaThrTyrLysGluValSerLysMetValLysAsp
AlaLeuThrAlaIleGluLysProThrGlyAspGluGln
SerSerGlyCysLeuGluAsnGlnLeuProAlaPheLeu
GluGluLeuCysHisGluLysGluIleLeuGluLysTyr
GlyHisSerAspCysCysSerGlnSerGluGluGlyArg
HisAsnCysPheLeuAlaHisLysLysProThrProAla
SerIleProLeu

said DNA fragment consisting essentially of the nucleotide sequence:

5' GATCCGACCCGGAAGCCACTTACAAGGAAGTA
GCTGGGCCTTCGGTGAATGTTCCTTCAT

AGCAAAATGGTGAAAGATGCATTGACTG
TCGTTTTACCACTTTCTACGTAACTGAC

-continued

CAATTGAGAAACCCACTGGAGATGAACAGTCT
GTTAACTCTTTGGGTGACCTCTACTTGTCAGA

TCAGGGTGTTTAGAAAACCAGCTACCTG
AGTCCCACAAATCTTTTGGTCGATGGAC

CCTTTCTGGAAGAACTTTGCCATGAGAAAGAA
GGAAAGACCTTCTTGAAACGGTACTCTTTCTT

ATTTTGGAGAAGTACGGACATTCAGACT
TAAAACCTCTTCATGCCTGTAAGTCTGA

GCTGCAGCCAAAGTGAAGAGGGAAGACATAAC
CGACGTCGGTTTCACTTCTCCCTTCTGTATTG

TGTTTTCTTGCACACAAAAAGCCCACTC
ACAAAAGAACGTGTGTTTTTCGGGTGAG

CAGCATCGATCCCACTTTGATA 3'
GTCGTAGCTAGGGTGAAACTATTCGA

5,206,165

IMMORTAL HUMAN MAMMARY EPITHELIAL CELL SUBLINES

Robert J. Pauley, Farmington; Paine Terry J., Detroit, and Herbert D. Soule, Dearborn, all of Mich., assignors to Michigan Cancer Foundation, Detroit, Mich.

Filed Jul. 9, 1991, Ser. No. 727,518
Int. Cl.[5] C12N *5/00, 5/08*
U.S. Cl. 435—240.2 4 Claims

1. A biologically pure culture of an immortal human mammary epithelial cell subline designated Registration No. ATCC CRL 10782.

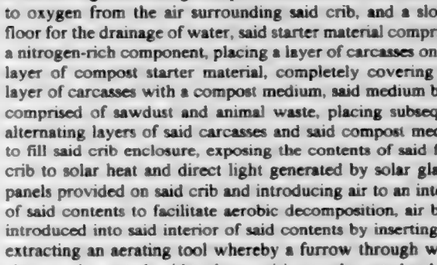
2. A biologically pure culture of an immortal human mammary epithelial cell subline designated Registration No. ATCC CRL 10783.

5,206,166

GENES ENCODING LEPIDOPTERAN-ACTIVE TOXINS AND TRANSFORMED HOSTS

Jewel Payne, San Diego, and August J. Sick, Oceanside, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 451,389, Dec. 14, 1989, Pat. No. 5,164,180, which is a continuation-in-part of Ser. No. 353,860, May 18, 1989, abandoned. This application Jun. 25, 1992, Ser. No. 904,243
Int. Cl.[5] C12N *1/21, 15/32, 15/70*
U.S. Cl. 435—252.3 10 Claims



5. A bacterial host transformed to express a *Bacillus thuringiensis* toxin having the amino acid sequence shown in FIG. 3 or FIG. 6.

5,206,167

Patent Not Issued For This Number

5,206,168

METHOD FOR SMALL SYSTEM WASTEWATER DENITRIFICATION

Gregory Boyle, 113 Wincsap Rd., Cherry Hill, N.J. 08003

Filed Feb. 28, 1991, Ser. No. 661,968
The portion of the term of this patent subsequent to Feb. 9, 2010, has been disclaimed.
Int. Cl.[5] C12N *11/14;* H01R *4/48;* C02F *3/00*
U.S. Cl. 435—262 9 Claims

1. A method for the denitrification of nitrate-containing wastewater from home or commercial sources in which said wastewater prior to said denitrification has been subjected to primary settling, aeration, and secondary settling underground which method comprises:

a) introducing said wastewater into an underground denitrification chamber, and

b) periodically introducing tablets comprising compressed denitrifying bacteria and a nutrient source of carbon into said underground denitrification chamber,

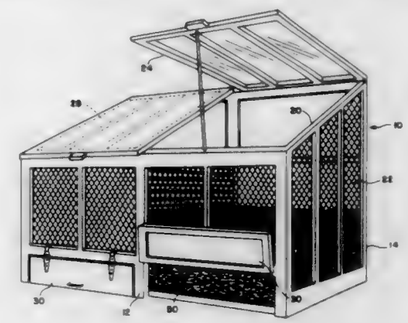
whereby said wastewater is denitrified.

5,206,169

ANIMAL CARCASS COMPOST CRIB

Robert O. Bland, 8015 Brandon St., Little Rock, Ark. 72204

Continuation-in-part of Ser. No. 517,047, May 1, 1990, abandoned. This application Sep. 30, 1991, Ser. No. 769,935
Int. Cl.[5] C05F *1/00, 11/08;* B09B *3/00*
U.S. Cl. 435—284 6 Claims



1. A method for composting animal carcasses, said method comprising depositing a layer of compost starter material within a crib enclosure, said enclosure being comprised of walls having mesh siding to expose an interior of said enclosure to oxygen from the air surrounding said crib, and a sloping floor for the drainage of water, said starter material comprising a nitrogen-rich component, placing a layer of carcasses on said layer of compost starter material, completely covering said layer of carcasses with a compost medium, said medium being comprised of sawdust and animal waste, placing subsequent alternating layers of said carcasses and said compost medium to fill said crib enclosure, exposing the contents of said filled crib to solar heat and direct light generated by solar glazing panels provided on said crib and introducing air to an interior of said contents to facilitate aerobic decomposition, air being introduced into said interior of said contents by inserting and extracting an aerating tool whereby a furrow through which air passes is created, said tool comprising an elongated rod, said contents further being rotatively mixed by extracting a bottom portion of said crib contents through a door at a bottom of said crib and inserting said bottom portion onto a top of said crib contents, whereby said contents are effectively aerated, whereby said carcasses are decomposed.

4. A crib for composting animal carcasses, said crib comprising a framework for receiving carcasses defining four walls, a top cover and a floor, a rear wall of said framework being

greater in height than a front wall of said framework whereby

5,206,171

PROGRAMMABLE AUTOMATED

a heating medium introduction pipe connected to said

activity samples of high purity radionuclides and a clean

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greater in height than a front wall of said framework whereby a top plane of said framework slopes downward from a rear side of said crib to a front side of said crib, said top cover being connected to a top of said rear wall in hinged relationship whereby said top cover is moveable between open and closed positions for loading material into said crib, said floor having a slope for the drainage of water, said walls having mesh siding whereby air may pass freely therethrough, said top cover having solar glazing panels whereby solar heat and light are transmitted directly to an interior of said crib, said framework being provided with a plurality of access doors, at least one of said access doors being placed at a top portion of said rear wall whereby material may be placed within said crib, and at least one other of said access doors being placed at a bottom portion of one of said walls whereby material may be removed from said crib.

5,206,170

SULFUR DIOXIDE DETECTOR DEVICE EMBODIED BY USING S02-OXIDANT BIOAGENT

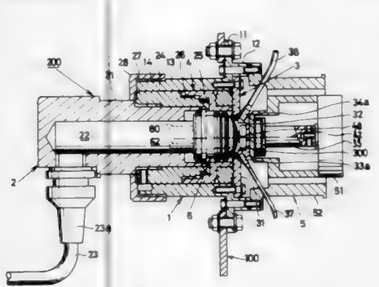
Takeshi Sato, Toki; Nobuko Kubo, Anjyo; Hirofumi Akano, Handa; Yoshiya Kawamura, Kounan, and Shigesada Iijima, Nukata, all of Japan, assignors to Nakano Vinegar Co., Ltd., Handa, Japan

Filed Oct. 1, 1991, Ser. No. 769,534

Claims priority, application Japan, Mar. 28, 1991, 3-64951; Mar. 28, 1991, 3-65004

Int. Cl.[5] G01N *27/327*; **C12M** *1/34*

U.S. Cl. 435—211 **7 Claims**



1. A sulfur dioxide detector device using SO_2-oxidant bioagent, the detector device comprising:

a horizontally arranged sensor housing;

an oxygen concentration sensor removably disposed within the sensor housing;

a bio-membrane concentrically located at one end of the oxygen concentration sensor, the bio-membrane including an SO_2-oxidant bioagent provided between an immobilized membrane and a gas permeable membrane;

the oxygen concentration sensor having an oxygen electrode placed in contact with the immobilized membrane of the bio-membrane;

a dish-shaped cell formed with a horizontally extending axis, and having an open end which is in contact with the gas permeable membrane of the bio-membrane so that SO_2-laden solution supplied to the cell oxidizes sulfurous acid into sulfuric acid as SO_2 permeates through the bio-membrane so as to change an output from the oxygen concentration sensor depending on an amount of SO_2; and

an inlet hole and an outlet hole each formed on a sidewall of the cell in diametrically opposed relationship, the outlet hole being always located directly above the inlet hole so as to quickly drain foam formed when the SO_2-laden solution is supplied to the dish-shaped cell through the inlet hole and drained from the outlet hole, the inlet and outlet holes being directed toward the gas permeable membrane to make an angle with the axial direction of the cell of less than 90 degrees.

5,206,171

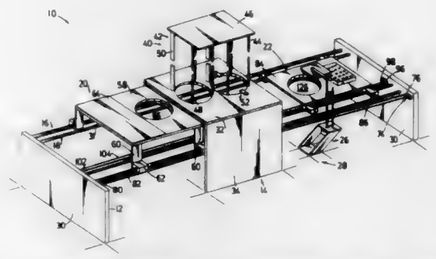
PROGRAMMABLE AUTOMATED INOCULATOR/REPLICATOR

Jo-Anne Dillon; Kwok-Him Yeung, both of Ottawa, and Sam S. Lightstone, Kingston, all of Canada, assignors to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Dec. 17, 1990, Ser. No. 628,156

Int. Cl.[5] C12M *1/32*

U.S. Cl. 435—293 **18 Claims**



1. Laboratory apparatus for performing repetitive tasks comprising: a frame; a table removably located in said frame; first parallel bearing ways in said frame below and parallel to said table; second parallel bearing ways in said frame below and parallel to said table; first carriage means supported by said first bearing ways for independent movement therealong; second carriage means supported by second bearing ways for independent movement therealong in a plane below and parallel to said first carriage means; independently operable transfer means for transferring objects as desired between said table and a selected one of said carriage means or between said first and second carriage means; action means at a work station adjacent to or spaced from said table for performing an operation on an object positioned on said table or on said carriage means; and means for coordinating the movement of said first and second carriage means, said transfer means and said action means in accordance with repetitive tasks to be performed.

5,206,172

COUNTERFLOW PREVENTION SYSTEM FOR A FERMENTATION TANK

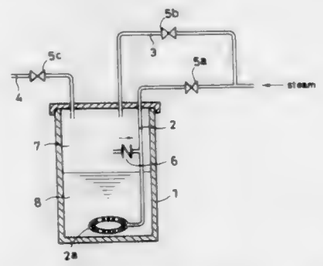
Yuji Uchihori, Hikari; Goichi Aimoto, Kudamatsu, and Toshihiko Nakayama, Tokuyama, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 13, 1991, Ser. No. 714,935

Claims priority, application Japan, Jun. 13, 1990, 2-156519

Int. Cl.[5] C12M *1/12*

U.S. Cl. 435—311 **2 Claims**



1. A system for preventing back flow of a fermentation medium contained in a fermentation tank comprising:

a fermentation tank containing a fermentation medium;

a sparger submerged in said fermentation medium;

a heating medium introduction pipe connected to said sparger for introducing a heating medium into said fermentation medium through said sparger;

a branch pipe branching out from said heating medium introduction pipe so as to provide flow communication between an interior of the tank at a level above the liquid surface of said fermentation medium and said heating medium introduction pipe; and

a check valve connected to said branch pipe so as to make gas or vapor flow only in the direction from said interior of the tank toward said heating medium introduction pipe.

5,206,173

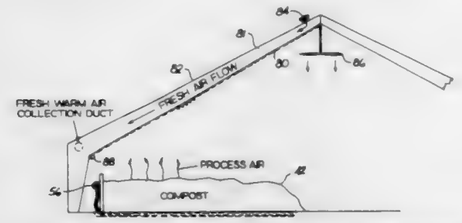
AIR HOOD

Larry J. Finn, Gladewater, Tex., assignor to Bedminster Bioconversion Corporation, Cherry Hill, N.J.

Filed Jun. 5, 1991, Ser. No. 710,450

Int. Cl.[5] C05F *17/02*

U.S. Cl. 435—313 **19 Claims**



1. In a closed facility for the composting of solid waste and sewage sludge, a system comprising: a hood made of heat-conductive, moisture-impervious material disposed over a compost pile during active composting thereof; means for directing outside air over exteriorly presented surface portions of said hood to place the outside air in heat exchange relation with heated, moisture laden air emanating from the compost pile impinging on interiorly presented surface portions of said hood; gutter means for collecting condensate resulting from cooling of the impinging air and duct means for directing the heated outside air into the facility.

5,206,174

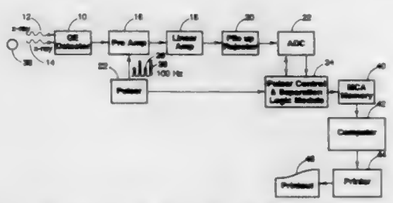
METHOD OF PHOTON SPECTRAL ANALYSIS

Robert J. Gehrke; Marie H. Putnam; E. Wayne Killian; Richard G. Helmer, all of Idaho Falls; Ronnie L. Kynaston, Blackfoot; Scott G. Goodwin, Idaho Falls, and Larry O. Johnson, Pocatello, all of Id., assignors to EG&G Idaho, Inc., Idaho Falls, Id.

Filed Sep. 24, 1992, Ser. No. 949,955

Int. Cl.[5] G01N *23/00, 23/223*

U.S. Cl. 436—58 **6 Claims**



1. A method for measuring and analyzing an x-ray and γ-ray spectrum of radionuclides in a medium by a spectrometer, comprising the steps of:

a. preparing a plurality of unknown activity samples of the medium within sample containers;

b. preparing a set of calibration samples consisting of known activity samples of high purity radionuclides and a clean background sample;

c. measuring response spectra of the calibration samples with the spectrometer;

d. measuring the radionuclide activities or activity concentrations from the spectra associated with the plurality of unknown activity samples;

e. injecting a low-energy and a high-energy pulse into a spectrometer preamplifier circuit while accumulating the above spectra thereby providing an energy calibration signal at a periodic interval during steps c. and d.;

f. analyzing a γ-ray region of the spectra from the unknown activity samples using a non-linear peak fitting function;

g. analyzing an x-ray region of the spectra from the unknown activity samples using a linear-least-squares spectral-fitting method by fitting the spectra of the plurality of unknown activity samples with the response spectra of the calibration samples;

h. computing and displaying a Chi-squared number and a quality-of-fit value of the x-ray region data wherein a value less than two (2) indicates a good correlation between the unknown activity samples and the known activity samples, and a value greater than two (2) indicates a poor correlation between the unknown activity samples and the known activity samples;

i. displaying the quality-of-fit value and a calibrated channel-by-channel residual when the quality-of-fit value is greater than two (2); and

j. displaying an activity value for each nuclide.

5,206,175

METHOD FOR THE DETECTION OF BIS(2-CHLOROETHYL) SULFIDE OR BIS (2-CHLOROETHYL) IMINE

Klaus Rossmann, Rumisberg, Switzerland; Wolfgang Diehl, Frankfurt, Fed. Rep. of Germany; Wolfram Krieger, Hamburg, Fed. Rep. of Germany, and Jörg Boscher, Preetz, Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt, Fed. Rep. of Germany

PCT No. PCT/EP84/00383, § 371 Date Aug. 8, 1985, § 102(e) Date Aug. 8, 1985, PCT Pub. No. WO85/02679, PCT Pub. Date Jun. 20, 1985

Continuation of Ser. No. 432,418, Nov. 3, 1989, abandoned, which is a continuation of Ser. No. 298,286, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 764,257, Aug. 8, 1985, abandoned. This PCT application Dec. 1, 1984, Ser. No. 810,361

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344700

Int. Cl.[5] G01N *21/64, 31/22*

U.S. Cl. 436—106 **14 Claims**

1. A process of detecting the presence on a surface of at least one of bis(2-chloroethyl)sulfide or bis(2-chloroethyl)imine, comprising:

a. providing a solution comprising at least one dyestuff selected from the group consisting of brilliant blue R, guinea green B, neutral red, and lissamine green B, which at least one dyestuff is capable of fluorescing and is capable, when applied as a solution, of forming an adduct with at least one of bis(2-chloroethyl)sulfide or bis(2-chloroethyl)imine when present on a surface, which at least one adduct is capable of fluorescing in a spectral range which is different from that of the corresponding at least one dyestuff;

b. applying the solution to the surface;

c. inducing fluorescence of the applied solution by irradiating the surface onto which the solution has been applied with light having a wavelength effective to excite the at least one dyestuff and, when present, the at least one adduct, and induce light emission by fluorescence therefrom;

d. measuring the wavelength of the light emitted from the surface; and

e. determining the presence of the at least one adduct on the

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5,206,177

APPARATUS FOR DETERMINING AN ANALYTE AND

first and second reactants and said analyte, thereby forming a ternary complex;

5,206,181

METHOD FOR MANUFACTURING A

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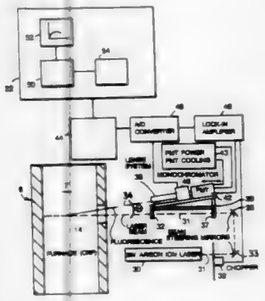
e. determining the presence of the at least one adduct on the surface from the presence of a measured difference in the wavelength of the light emitted by the at least one adduct and the at least one dyestuff.

5,206,176

DETECTION AND CONTROL OF AROMATIC COMPOUNDS IN COMBUSTION EFFLUENT

János Beér, Winchester, Mass.; Arslan Kahn, Princess Anne, Md.; Adel F. Sarofim, Milton, Mass.; Jan H. Thijssen, Cambridge, and Majed A. Toqan, Wellesley, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 2, 1990, Ser. No. 591,721
Int. Cl.[5] G01N *21/64*
U.S. Cl. 436—140 31 Claims



1. A method for detecting the presence of polycyclic aromatic compounds in the effluent of a turbulent commercial combustion system for monitoring or controlling the composition of said effluent, comprising:

directly, selectively detecting the presence in said effluent of high molecular weight polycyclic aromatic compounds having five or more rings by,

selecting excitation radiation having a fluorescence excitation wavelength that induces substantial fluorescence by said high molecular weight polycyclic aromatic compounds having 5 or more rings in the gas phase, and

selecting a position along the effluent system at which said high molecular weight polycyclic aromatic compounds having 5 or more rings may be present in sufficient amounts such that fluorescence from said effluent at said position at said excitation wavelength is predominantly from said high molecular weight polycyclic aromatic compounds having 5 or more rings when said high molecular weight polycyclic aromatic compounds are present in said amounts,

illuminating said effluent at said position with said excitation radiation,

detecting fluorescence from said illuminated effluent; and

analyzing said fluorescence to directly, selectively determine the presence of said high molecular weight polycyclic aromatic compounds in said effluent.

5,206,177

APPARATUS FOR DETERMINING AN ANALYTE AND METHOD THEREFOR

Fern DeLaCroix, Johann Berger; Harvey Buck, all of Indianapolis, Ind., and Hans-Joachim Guder, Weilheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Continuation of Ser. No. 146,345, Jan. 21, 1988, abandoned. This application Sep. 21, 1990, Ser. No. 587,533
Int. Cl.[5] G01N *33/533*
U.S. Cl. 436—518 45 Claims

1. An apparatus for determining at least one analyte in a fluid sample, comprising:

(a) a first porous zone comprising an immobilized, non diffusible reagent capable of specifically binding to at least one diffusible labeled reactant comprising a label conjugated to either said analyte, an analogue of said analyte or a specific binding partner for said analyte, and

(b) a second porous zone comprising (i) a diffusible interactive reagent capable of reacting with the label portion of said diffusible labeled reactant to produce a diffusible detectable moiety and (ii) a means for separating said diffusible interactive reagent for said diffusible detectable moiety.

42. Method for determining at least one analyte in a fluid sample, comprising:

(a) contacting said sample with a labeled binding partner which specifically binds to said analyte to form a mixture comprising (i) complexes of analyte and labeled binding partner and (ii) uncomplexed labeled binding partner,

(b) contacting said mixture to an immobilized reagent which binds to uncomplexed labeled binding partner but not complexes of analyte and labeled binding partner, so as to remove uncomplexed labeled binding partner from said mixture,

(c) contacting said mixture to an apparatus comprising a diffusible, interactive reagent capable of reacting with the label portion of said labeled binding partner to produce a detectable moiety in said mixture,

(d) contacting said mixture with a means for separating detectable moiety from any unreacted diffusible interactive reagent, and

(e) measuring one of unreacted diffusible interactive reagent, removed uncomplexed labeled binding partner or detectable moiety as a measure of analyte in said sample.

5,206,178

MEMBRANE AFFINITY CONCENTRATION IMMUNOASSAY

Nobuo Monji, and Carol-Ann Cole, both of Seattle, Wash., assignors to Genetic Systems Corporation, Redmond, Wash.

Continuation of Ser. No. 108,451, Oct. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,656, Nov. 19, 1986, abandoned. This application Feb. 28, 1991, Ser. No. 663,193
Int. Cl.[5] G01N *33/538;* C12Q *1/00*
U.S. Cl. 436—518 34 Claims

1. A method for determining the presence and/or concentration of an analyte in a biological fluid sample, comprising:

conjugating a first reactant, which specifically binds with said analyte, to a polymer comprising monomers of N-alkylacrylamides, N-arylacrylamides, alkyl acrylates or aryl acrylates, and combinations thereof to form a polymer/reactant conjugate;

conjugating a second reactant, which specifically binds with said analyte, to a reporter to form a reporter/reactant conjugate;

admixing in solution in the substantial absence of unconjugated polymer said polymer/reactant conjugate, reporter/reactant conjugate and said biological fluid sample suspected of containing said analyte to form a reaction mixture, such that specific binding occurs between said first and second reactants and said analyte, thereby forming a ternary complex;

contacting the reaction mixture with a solid phase comprising cellulose acetate or a cellulose ester which selectively binds by noncovalent means said polymer/reactant conjugate and said ternary complex, thereby removing said complex from the reaction mixture; and

measuring the amount of reporter activity in the bound complex or in solution and therefrom determining the presence and/or concentration of said analyte.

5,206,179

FLUORESCENCE POLARIZATION IMMUNOASSAYS FOR MULTIPLE ANALYTES USING SEQUENTIAL ADDITION OF TRACERS

Jack F. Ramsey, Lewisville, Tex., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 25, 1991, Ser. No. 674,803
Int. Cl.[5] G01N *33/542*
U.S. Cl. 436—537 11 Claims

1. A method for performing multiple fluorescence polarization immunoassays of a biological fluid sample contained in a single container wherein the presence of specific analytes (A_n) where n is an integer of 2 or greater, and their respective quantitative amounts are determined, comprising:

(a) contacting the sample and a combination of at least two antiserum reagents (S_n wherein n is an integer of 2 or greater) from at least two or more assays, incubating the resultant mixture of A_n and S_n to an equilibrium state;

(b) taking a fluorescence reading, recording said reading as a blank reading B_1;

(c) adding a tracer T_1 and incubating the mixture of A_n, S_n and T_1 to an equilibrium state;

(d) taking a fluorescence reading R_1, recording said reading R_1 as B_2;

(e) adjusting the R_1 reading by subtraction of B_1 and calculating a mP value; and

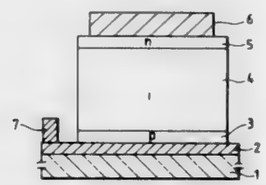
(f) repeating at least once steps (c), (d) and (e) using T_2, B_2 and sequentially T_{2+}m and B_{2+m} wherein m is an integer of 1 or greater.

5,206,180

PROCESS FOR PRODUCING AN AMORPHOUS PHOTOELECTRIC TRANSDUCER

Takashi Yoshida, Kanagawa, Japan, assignor to Fuji Electric Corporate Research and Development Ltd., Kanagawa, Japan

Filed Aug. 8, 1991, Ser. No. 742,333
Claims priority, application Japan, Aug. 10, 1990, 2-211952
Int. Cl.[5] H01L *31/18, 31/0376, 21/205*
U.S. Cl. 437—4 5 Claims



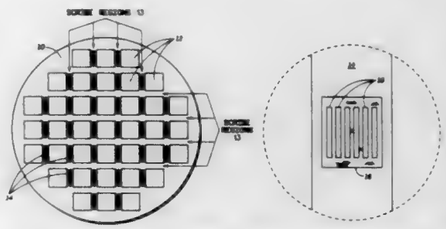
1. In a process for producing an amorphous photoelectric transducer which converts light energy to electric energy using a p-n or p-i-n junction in an amorphous semiconductor having a p-type film on the light entrance side, the improvement wherein the p-type amorphous semiconductor film is formed by a pulse discharge-assisted chemical vapor deposition technique which decomposes a feed gas by discharging, said feed gas containing gaseous boron trifluoride dopant.

5,206,181

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE WITH A SLOTTED METAL TEST PAD TO PREVENT LIFT-OFF DURING WAFER SCRIBING

David E. Gross, Dripping Springs, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1991, Ser. No. 709,553
Int. Cl.[5] H01L *21/304*
U.S. Cl. 437—8 12 Claims



1. A process for fabricating a semiconductor device with features to aid in cutting metal within a scribe region of the device, comprising the steps of:

providing a semiconductor wafer;

forming a plurality of spaced apart semiconductor die on the semiconductor wafer, each die being separated from one another by one of a plurality of scribe regions; and

forming a test structure in at least one of the scribe regions, the test structure having at least one metal probe pad, the metal probe pad having a plurality of slots oriented in a predetermined direction; and

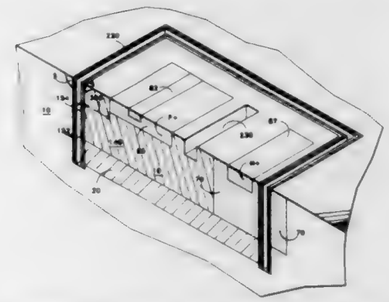
scribing the semiconductor wafer along the plurality of scribe regions and through the metal probe pad substantially parallel to the longitudinal axes of the slots to substantially prevent metal lift-off generated from the metal probe pad.

5,206,182

TRENCH ISOLATION PROCESS

Guy R. Freeman, Colorado Springs, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 8, 1989, Ser. No. 363,000
Int. Cl.[5] H01L *21/302, 21/328, 21/334*
U.S. Cl. 437—33 21 Claims



1. A method of making an integrated circuit having active and passive devices formed in a epitaxial silicon layer disposed above a substrate region, comprising the steps of:

forming a buried layer in selected regions of said silicon layer below said epitaxial layer, said buried layer being formed by doping with a predetermined buried layer dopant;

providing a gate array having rows of base cells, wherein a padding under pressure and at a temperature sufficient to

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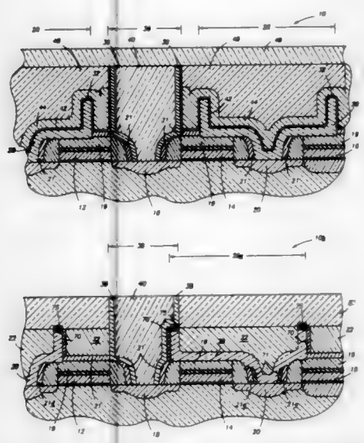
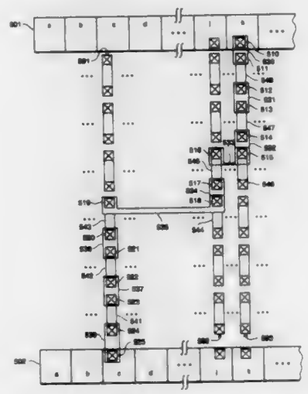
forming surface isolation boundary regions in and below the surface of said epitaxial silicon layer about selected areas, by doping said epitaxial silicon layer with a predetermined surface isolation dopant of the same polarity as said buried layer dopant, for isolating said selected areas from one another;
forming components of said active and passive devices in said epitaxial silicon layer;
thereafter cutting a trench, having a sidewall, from said surface isolation boundary regions down through said epitaxial silicon layer to said buried layer;
forming a sidewall liner on a sidewall of said trench by oxidizing said sidewall to a predetermined thickness of sidewall oxide and subsequently depositing a layer of sidewall nitride to a predetermined nitride thickness on said sidewall oxide
filling at least the upper portions of said trench with a temporary backfill material;
depositing a cover layer above at least a portion of said trench, said cover layer being patterned to expose a portion of said temporary backfill through backfill removal apertures;
removing at least a portion of said temporary backfill, whereby said trench is at least partially empty; and
connecting said components to form an integrated circuit having said trench substantially empty.

5,206,183
METHOD OF FORMING A BIT LINE OVER CAPACITOR ARRAY OF MEMORY CELLS
Charles Dennison, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Feb. 19, 1992, Ser. No. 838,537
Int. Cl.[5] H01L *21/265, 21/70*
U.S. Cl. 437—47 **31 Claims**



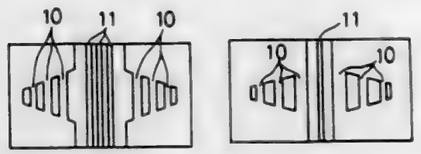
21. A method of forming a bit line over capacitor array of memory cells comprising:
providing an array of substantially electrically isolated word lines atop a semiconductor wafer;
providing active areas about the word lines to define an array of memory cell FETs, the active areas being defined by a first active region for electrical connection with a memory cell capacitor and a second active region for electrical connection with a bit line;
providing a layer of a first material atop the wafer to a selected thickness, the first material being selectively etchable relative to oxide and polysilicon;
patterning and etching the layer of first material to define buried contact openings to the first active regions;
providing a first layer of conductively doped polysilicon to a selected thickness atop the wafer over the patterned layer of first material and within the buried contacts;
providing a layer of second material atop the wafer to a selected thickness over the first layer of conductively doped polysilicon, the second material being selectively etchable relative to oxide and polysilicon;
etching the layer of second material and first layer of polysilicon over the patterned layer of first material to define isolated cell storage nodes which contact the first active regions;
providing a layer of third material atop the wafer to a selected thickness over the isolated cell storage nodes and remaining layer of second material, the third material being selectively etchable relative to oxide and polysilicon;
patterning and etching the layers of third and first material to define bit line contact openings to the second active regions;
providing insulating spacers of oxide within the bit line contact openings;
providing conductive material pillars within the bit line contact openings having the oxide insulation spacers therewithin, the pillars being surrounded by the oxide insulating spacers;
etching remaining portions of the layers of first, second and third materials from the wafer;
providing a capacitor cell dielectric layer atop the individual storage nodes;
providing a capacitor cell polysilicon layer atop the capacitor cell dielectric layer to define an array of memory cell capacitors;
providing an insulating layer atop the cell polysilicon layer; and
providing an array of digit lines atop the wafer which electrically connect with the conductive material pillars elevationally above the cell capacitors.

5,206,184
METHOD OF MAKING SINGLE LAYER PERSONALIZATION
Joanne M. Allen, Scotts Valley; Richard B. Hansen, Bonny Doon; Guntram K. Wolski, Watsonville, and Keith R. Venes, Aptos, all of Calif., assignors to Sequoia Semiconductor, Inc., Scotts Valley, Calif.
Filed Nov. 15, 1991, Ser. No. 792,586
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—51 **11 Claims**



1. A process for fabricating an electrical connection between base cells of different rows in a gate array comprising the steps of:
providing a gate array having rows of base cells, wherein a space is between said rows, wherein columns of segments of a first conductive layer are fabricated between the rows, said array having an insulative layer disposed on said segments, said insulative layer having vias over the base cells and each end of said segments
determining a connection path for coupling said base cells of different rows in said gate array, such that said connection path comprises a plurality of said segments of said first conductive layer; and
coupling said segments of said connection path using the vias of said path segments and a second conductive layer, such that said base cells of different rows are coupled at said second conductive layer utilizing a portion of said first conductive layer.

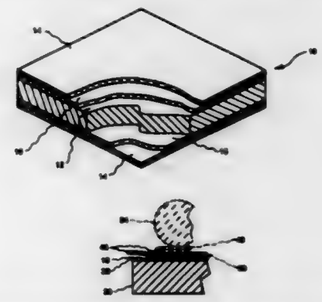
5,206,185
SEMICONDUCTOR LASER DEVICE
Hiroyuki Hosoba, Tenri; Mitsuhiro Matsumoto, Nara; Sadayoshi Matsui, Tenri, and Taiji Morimoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 455,574, Dec. 22, 1989, Pat. No. 5,054,031. This application May 30, 1991, Ser. No. 707,449
Claims priority, application Japan, Dec. 29, 1988, 63-334138
Int. Cl.[5] H01L *21/20, 21/208*
U.S. Cl. 437—129 **2 Claims**



1. A method for producing a semiconductor laser device, comprising the steps of: forming a ridge portion on a semiconductor substrate, the width of said ridge portion being smaller in the vicinity of the facets than in the inside of the device; forming at least three V-striped side grooves symmetrically on both sides of the center region of said ridge portion with the same width as that of the regions thereof near the facets, respectively; growing a current blocking layer on the entire surface of said substrate including the ridge portion; forming at least one striped groove for an optical waveguide on the center of said ridge portion through the current blocking layer; and forming a multi-layered structure on said current blocking layer, said multi-layered structure having an active region for laser oscillation.

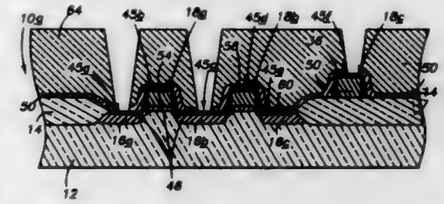
5,206,186
METHOD FOR FORMING SEMICONDUCTOR ELECTRICAL CONTACTS USING METAL FOIL AND THERMOCOMPRESSION BONDING
Constantine A. Neugebauer, Schenectady; Homer H. Glascock, II, Scotia; Kyung W. Paik, Clifton Park, and James G. McMullen, Pattersonville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 603,495, Oct. 26, 1990, Pat. No. 5,184,206. This application Sep. 25, 1992, Ser. No. 950,553
Int. Cl.[5] H01L *21/283, 21/60, 21/603*
U.S. Cl. 437—183 **7 Claims**

1. A method for providing substantially inductance-free connection to selected surfaces of a semiconductor chip that bears thereon metal contact padding having a thickness, comprising preparing a foil laminate by coating a conductive foil with at least one metallic conductor capable of forming an intermetallic bond with the chip metal contact padding, and thermocompressively bonding said laminate to the padding by placing the metallic conductor coating in registry with the padding under pressure and at a temperature sufficient to induce a stable intermetallization bond between said metallic



conductor and and padding so as to form an intermetallic layer therebetween.

5,206,187
METHOD OF PROCESSING SEMICONDUCTOR WAFERS USING A CONTACT ETCH STOP
Trung T. Doan, Boise, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Continuation-in-part of Ser. No. 753,356, Aug. 30, 1991, abandoned. This application Dec. 17, 1991, Ser. No. 812,063
Int. Cl.[5] H01L *21/283, 21/311*
U.S. Cl. 437—192 **36 Claims**



1. A method of processing a semiconductor wafer comprising the following steps:
fabricating a wafer to define a plurality of conductively doped silicon containing active regions, the active regions having outwardly exposed surfaces positioned at varying elevations on the wafer;
depositing a layer of transition metal atop the wafer which contacts the surfaces of the active regions and other areas on the wafer; the transition metal layer having a thickness, an outer region and an inner region;
processing the wafer under conditions which reacts a) the transition metal of the inner region over the silicon containing active regions with such silicon to produce a transition metal silicide, and b) the transition metal of the outer region to form a transition metal oxide thereby transforming the outer region over the other areas into transition metal oxide and the transition metal over the silicon containing active regions into sandwich regions of outer transition metal oxide and adjacent transition metal silicide in contact with the active regions; the outer transition metal oxide regions of the sandwich regions having outer surfaces positioned at varying elevations on the wafer;
applying an insulating dielectric layer atop the wafer;
selectively etching the insulating dielectric layer over selected portions of different elevation sandwich regions using an etch chemistry which is highly selective to the transition metal oxide and using the transition metal oxide as an effective etch in etching of the insulating dielectric

layer in a single etch step to selected outer surfaces of the

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5,206,189
SOL-GEL METHOD FOR THE PREPARATION OF

sufficient to improve the mechanical properties and increase the resistance to thermal shock and chemical corrosion of the hardened paste
to remove at least a portion of said carbonaceous deposits via combustion; and

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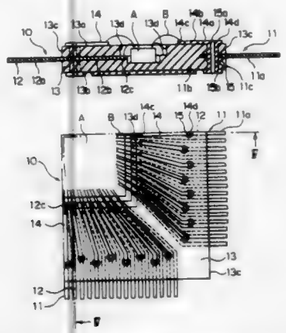
layer in a single etch step to selected outer surfaces of the sandwich regions which are at different elevations; and etching the transition metal oxide from the selected portions of outer transition metal sandwich regions.

5,206,188

METHOD OF MANUFACTURING A HIGH LEAD COUNT CIRCUIT BOARD

Atsushi Hiroi; Mitsuhiro Kondo, and Kinya Ohshima, all of Oogaki, Japan, assignors to Ibiden Co., Ltd., Tokyo, Japan

Division of Ser. No. 646,355, Jan. 28, 1991, Pat. No. 5,151,771.
This application May 15, 1991, Ser. No. 700,251
Claims priority, application Japan, Jan. 31, 1990, 2-143977
Int. Cl.[5] H01L *21/52, 21/56, 21/58, 21/60*
U.S. Cl. 437—211 9 Claims



1. A method for manufacturing a circuit board for mounting an electronic component, the method comprising the steps of:

providing a lead frame having a plurality of leads including a plurality of first leads disposed in a substantially side-by-side relationship with a space therebetween and a plurality of second leads disposed between the first leads with a space therebetween, the first leads each having an outer end for external electrical connection and an inner end having a connection pad, and the second leads each having an outer end for external electrical connection and an inner end inwardly extending for electrical connection to the electronic component;

forming an electrically insulating substrate on the lead frame to have first and second major surfaces substantially parallel to the lead frame;

forming a plurality of first conductors and a plurality of through-hole conductors on the substrate, the first conductors each being attached to the first major surface of the substrate and having an outer end and an inner end and the through-hole conductors each extending through the substrate to be electrically connected between the inner end of one of the first leads and the outer end of one of the first conductors;

forming a recess in the first major surface of the substrate for mounting the electronic component therein, the recess exposing the inner end of the second leads for electrical connection to the electronic component; and

removing an outer region of the substrate to allow the outer ends of the first and second leads to project from said substrate for external electrical connection.

2. A method for manufacturing a circuit board for mounting an electronic component as claimed in claim 1 further comprising the step of applying a separator layer on said lead frame at an outer region corresponding to said outer ends of said first and second leads before said formation of said substrate.

5,206,189

SOL-GEL METHOD FOR THE PREPARATION OF MONOLITHIC MULTICOMPONENT OXIDE GLASSES

J. Brian Caldwell, Highland Park, N.J., assignor to Instituto Guido Donegani S.p.A., Novara and Enichem S.p.A., Milan, both of Italy

Filed Oct. 25, 1991, Ser. No. 782,830
Int. Cl.[5] C03C *3/00, 3/076, 3/095*
U.S. Cl. 501—12 27 Claims

1. A method for the preparation of a monolithic multicomponent oxide glass, comprising the steps of:

(a) gelling a mixture comprising a silicon alkoxide, a titanium alkoxide, an alcohol, and an amount of water and acid sufficient to partially hydrolyze the silicon alkoxide, to obtain a gel, wherein said silicon alkoxide is present in an amount sufficient to result in said glass containing from 30 to 98 mole percent of silica;

(b) diffusing uniformly into said gel a solution of at least one salt of at least one alkali metal selected from the group consisting of Li, Na, K, Rb, Cs and mixtures thereof in an amount sufficient to result in said glass containing from 5 to 30 mole percent of an oxide of said alkali metal;

(c) precipitating said uniformly diffused alkali metal salt in said gel to obtain a gelled mixture; and

(d) sintering said gelled mixture.

5,206,190

DIELECTRIC COMPOSITION CONTAINING CORDIERITE AND GLASS

Jau-Ho Jean, Export, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 4, 1990, Ser. No. 576,853
Int. Cl.[5] C03C *1/00*
U.S. Cl. 501—32 18 Claims

1. A glass-ceramic composition for forming a glass-ceramic dielectric body having a dielectric constant of less than about 4.5, a thermal expansion coefficient of less than about 4.0 ppm/°C., a firing temperature of less than about 950° C. and a sintered density of greater than 95% theoretical density, said composition consisting essentially of a mixture of finely divided particles of:

(a) 40–50 volume percent borosilicate glass containing 20–35 wt. % boron oxide and 60–75 wt. % silicon oxide; and

(b) 50–60 volume percent cordierite.

5,206,191

METHOD OF PRODUCING REFRACTORY MATERIALS AND THEIR APPLICATIONS IN THE CASTING OF CORROSIVE ALLOYS

Jean A. Alary, Gardanne, France, assignor to Pechiney Recherche, Courbevoie, France

Filed Dec. 4, 1991, Ser. No. 802,300
Claims priority, application France, Dec. 4, 1990, 90 15633
Int. Cl.[5] C04B *38/06*
U.S. Cl. 501—83 26 Claims

1. A method for producing a refractory material adapted for protection of foundry equipment from contact with liquid metal, comprising the steps of:

forming a charge, at a temperature between ambient and 200° C., comprising (1) refractory aggregate having a bimodal granulometric distribution in which at least 50% by weight of said aggregate is greater than 800 μm and at least 20% by weight of said aggregate is less than 400 μm, and (2) a liquid alkaline binder including a polysilicate mineral polymer and a sialate mineral polymer of the formula $(—SiO—O—AlO—O—)^{-}M^{+}$, where M is an alkali metal;

blending said charge to distribute the binder uniformly throughout and forming a homogeneous paste;

shaping said paste, and allowing said shaped paste to harden at a temperature between 200° C. and 1300° C. for a time

sufficient to improve the mechanical properties and increase the resistance to thermal shock and chemical corrosion of the hardened paste.

5,206,192

STABILIZED METAL OXIDES

Graham P. Dransfield, and Paul McColgan, both of Stockton on Tees, England, assignors to Tioxide Group Services Limited, London, England

Filed Nov. 20, 1991, Ser. No. 794,920
Claims priority, application United Kingdom, Dec. 12, 1990, 9026952
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—103 13 Claims

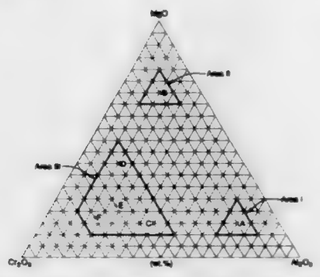
1. A composition suitable for use in the manufacture of a ceramic material comprising particulate zirconia in which the particles are coated with a hydrous oxide of cerium and with at least one hydrous oxide selected from the group consisting of hydrous oxides of lanthanum, neodymium and praseodymium.

5,206,193

HIGH PURITY FUSED GRAIN IN THE SYSTEM AL_2O_3-CR_2O_3-MGO

Albert L. Renkey, Bridgeville, and Stanley R. Pavlica, Irwin, both of Pa., assignors to Indresco, Inc., Dallas, Tex.

Filed Dec. 19, 1991, Ser. No. 810,227
Int. Cl.[5] C04B *35/04*
U.S. Cl. 501—117 8 Claims



1. A high purity fused refractory grain consisting essentially of 35 to 85 wt. % chromia, 5 to 55 wt. % alumina, and 5 to 45 wt. % magnesia.

5,206,194

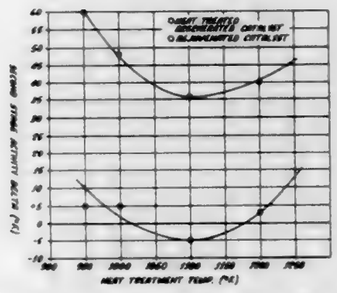
PROCESS FOR REACTIVATING A DEACTIVATED CRYSTALLINE MOLECULAR SIEVE GROUP VIII METAL CATALYST

Danford E. Clark, Fountain Valley, Calif., assignor to Union Oil Company of America, Los Angeles, Calif.

Filed Jun. 20, 1991, Ser. No. 717,985
Int. Cl.[5] B01J *29/38, 38/66, 38/14;* C10G *47/18*
U.S. Cl. 502—26 43 Claims

1. A process for reactivating a deactivated hydrocracking catalyst produced by subjecting a fresh catalyst to hydrocracking conditions in the presence of a hydrocarbon feedstock wherein said deactivated catalyst comprises (1) a crystalline, dealuminated Y zeolite having an overall silica-to-alumina mole ratio above about 6.0, said zeolite having been ion-exchanged with rare earth-containing cations and Group VIII noble metal-containing cations, (2) a porous, inorganic refractory oxide and (3) carbonaceous deposits, which process comprises:

(a) contacting said deactivated catalyst with a flowing gas containing between about 20 and about 25 volume percent molecular oxygen in a combustion zone at a temperature between about 1025° F. and 1175° F. for a time sufficient to remove at least a portion of said carbonaceous deposits via combustion; and



(b) recovering a reactivated catalyst from said combustion zone, said reactivated catalyst having an activity temperature for hydrocracking less than about 48° F. above the activity temperature of said fresh catalyst.

5,206,195

STABLIZED SYNTHETIC ZEOLITE AND A PROCESS FOR THE PREPARATION THEREOF

Satoshi Ando; Kazuhiko Nakajima, and Akira Dohno, all of Osaka, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,948
Claims priority, application Japan, May 31, 1990, 2-140094; Aug. 30, 1990, 2-226619; Oct. 30, 1990, 2-290947; Nov. 2, 1990, 2-297841; Nov. 30, 1990, 2-334618; Feb. 1, 1991, 3-033507
Int. Cl.[5] B01J *20/18;* C01B *33/34*
U.S. Cl. 502—64 19 Claims

5. A process to prepare stabilized fluid synthetie zeolite, characterized in that synthetic zeolite is soaked in a buffered acid aqueous liquid; buffered or non-buffered acid is replenished, if needed, to maintain the pH of the soaking liquid at a value of about 7 or less and the soaking is continued until the pH remains approximately constant for at least 0.5 hour without replenishing the acid; and then the synthetic zeolite is heat-dried without being washed or after washed in conditions that the pH of a washing liquid does not substantially exceed about 6.5.

10. The process as claimed in claim 5, wherein the soaking liquid contains a gel-forming substance.

5,206,196

CATALYST FOR PURIFYING EXHAUST GAS

Masao Nakano, Hikari; Akinori Eshita, and Kazuhiko Sekizawa, both of Shinnanyo, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Dec. 12, 1991, Ser. No. 805,611
Claims priority, application Japan, Dec. 18, 1990, 2-411258; Dec. 18, 1990, 2-411259; Dec. 18, 1990, 2-411260; Dec. 18, 1990, 2-411261
Int. Cl.[5] B01J *29/10*
U.S. Cl. 502—73 16 Claims

1. A catalyst for purifying an exhaust gas to remove nitrogen oxides, carbon monoxide and hydrocarbons from an oxygen-rich exhaust gas containing nitrogen oxides, carbon monoxide and hydrocarbons comprising (i) a zeolite having an SiO_2/Al_2O_3 mole ratio of at least 15 and (ii) (a) cobalt, (b) a rare earth metal and (c) silver, incorporated therein.

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isopropyl group, or hydroxyl group and n is an integer in the range of from 1 to 3, by catalytic vapor-phase oxidation of a thereof, wherein said catalysts, after thermal treatment of the

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5,206,197

CATALYST COMPOSITION FOR PREPARATION OF SYNDIOTACTIC VINYL AROMATIC POLYMERS

Richard E. Campbell, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich. and Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1991, Ser. No. 664,699
Int. Cl.[5] C08F 4/64
U.S. Cl. 502—103 6 Claims

1. A catalyst composition for preparing polymers of vinyl aromatic monomers having high stereo-regularity comprising:
1) a metal complex of the formula:

$$[Cp_mMX_nX'_p]^+A^+$$

wherein:
Cp is a single η^5-cyclopentadienyl group or a η^5-substituted cyclopentadienyl group;
M is a metal of Group 3, 4, 5, 6, 8, 9, 10 or the Lanthanide Series of the Periodic Table;
each X independently is an inert anionic ligand or a group of formula R, with the proviso that at least one X is R;
X' is an inert, neutral donor ligand;
each R independently is R' or hydride, wherein R' is hydrocarbyl, silyl or a mixture thereof, optionally substituted with one or more halogen atoms or alkoxy groups, said R' having up to 20 carbon and/or silicon atoms;
m and p are independently 0 or 1;
n is an integer greater than or equal to 1; and
the sum of m and n is one less than the valence of M; and
A— is a noncoordinating, compatible anion of a Bronsted acid salt; and
2) an aluminum, magnesium or zinc metal hydrocarbyl, the molar ratio of the metal complex: metal hydrocarbyl being 1:1 to 1:1000;
said metal complex and metal hydrocarbyl being combined prior to contacting of the metal complex with a vinyl aromatic monomer.

5,206,198

CATALYTIC SOLID USABLE FOR THE STEREOSPECIFIC POLYMERIZATION OF ALPHA-OLEFINS, PROCESS FOR PREPARING IT AND PROCESS FOR POLYMERIZING ALPHA-OLEFINS IN ITS PRESENCE

Jean-Louis Costa, Grimbergen, and Sabine Pamart, Mons, both of Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Oct. 31, 1991, Ser. No. 786,043
Claims priority, application Belgium, Nov. 8, 1990, 09001054
Int. Cl.[5] C08F 4/642
U.S. Cl. 502—107 18 Claims

1. A catalytic solid for the stereospecific polymerisation of alpha-olefins, obtained by heat treatment, in the presence of a halogenated activating agent, of a liquid material prepared by contacting $TiCl_4$, pretreated with an electron-donor compound, with a composition (C) of the formula

$$AlR_p(Y)_qX_{3-(p+q)} \quad (I)$$

in which
R represents a hydrocarbon radical;
Y represents a group chosen from —OR', —SR' and —NR'R'', in which R' and R'' each represent a hydrocarbon radical or a hydrocarbon atom;
X represents a halogen;
p is an arbitrary number such that $0<p<3$; and
q is an arbitrary number such that $0<p<3$; the sum $(p+q)$ being such that $0<(p+q)\leqq 3$
to precipitate a catalytic solid comprising a titanium trichloride complex.

5,206,199

CATALYST FOR POLYMERIZING AN OLEFIN AND PROCESS FOR POLYMERIZING AN OLEFIN

Mamoru Kioka; Norio Kashiwa, both of Iwakuni; Toshiyuki Tsutsui, Ohtake, and Akinori Toyota, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 290,110, Dec. 16, 1988, Pat. No. 5,122,491.
This application Mar. 30, 1992, Ser. No. 860,014
Claims priority, application Japan, Apr. 20, 1987, 62-95445; Apr. 20, 1987, 62-95446
Int. Cl.[5] C08F 4/642
U.S. Cl. 502—117 28 Claims

1. A catalyst for polymerizing or copolymerizing an olefin, said catalyst comprising
(A') a supported transition metal compound component consisting essentially of a transition-metal metallocene compound loaded on a fine-particle carrier, said transition metal being hafnium, zirconium or titanium, said transition-metal metallocene compound having a ligand including conjugated π electron,
(B) an aluminoxane, and
(C) an organoaluminum compound represented by the general formula (I) or (II):

$$R^1_mAl(OR^2)_{3-m} \quad (I)$$

$$R^3_nAl(OSiR^4_3)_{3-n} \quad (II)$$

wherein R^1, R^2, and R^3 are selected from hydrocarbon radicals, R^4 is selected from the group consisting of hydrocarbon, alkoxy, and aryloxy radicals, and m and n are positive numbers of $0<m<3$ and $0<n<3$.

5,206,200

TIN CATALYSTS FOR HYDROLYSIS OF LATENT AMINE CURING AGENTS

Richard W. Bush, Columbia, and Euegene E. Carney, Sykesville, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Apr. 22, 1991, Ser. No. 689,385
Int. Cl.[5] B01J 31/12
U.S. Cl. 502—167 9 Claims

1. A composition comprising a latent amine curing agent and a catalyst for the moisture-induced hydrolysis of the agent, said catalyst comprising an amine-modified organotin compound formed from the reaction of a stannous alkanoate having from 2 to 20 carbon atoms and an amine-containing compound.

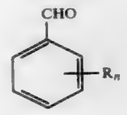
5,206,201

CATALYST FOR PRODUCTION OF SUBSTITUTED BENZALDEHYDE AND METHOD FOR PRODUCTION OF THE CATALYST

Nobuji Kishimoto; Isao Nakamura, both of Osaka; Taizou Matsueda, Amagasaki, and Yoshitaka Arita, Kobe, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed May 22, 1991, Ser. No. 704,069
Claims priority, application Japan, May 25, 1990, 2-134105; May 25, 1990, 2-134106
Int. Cl.[5] B01J 21/02, 23/02, 23/22, 23/28
U.S. Cl. 502—206 10 Claims

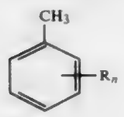
1. A catalyst for the production of a substituted benzaldehyde represented by the general formula I:



(I)

wherein R is tert-butyl group, methoxy group, phenoxy group,

isopropyl group, or hydroxyl group and n is an integer in the range of from 1 to 3, by catalytic vapor-phase oxidation of a substituted toluene represented by the general formula II:



(II)

wherein R and n are the same meanings as defined above, which catalyst has a catalytically active substance an oxide represented by the general formula III

$$V_aMo_bX_cY_dO_e \quad (III)$$

wherein V, Mo, and O are respectively vanadium, molybdenum, and oxygen, X is at least one element selected from the group consisting of potassium, rubidium, cesium, and thallium, Y is at least one element selected from the group consisting of niobium, tantalum, phosphorus, antimony, bismuth, tellurium, tin, lead, boron, copper, and silver, and a, b, c, d, and e indicate the atomic ratios of relevant elements such that where $a+b=1$, then $b=0.05$ to 0.4, $c=0.1$ to 1, $d=0$ to 1, and e=the value determined by the state of oxidation of other elements.

5,206,202

CATALYST DEVICE FABRICATED IN SITU AND METHOD OF FABRICATING THE DEVICE

Irwin M. Lachman; Mallanagouda D. Patil, both of Corning; Jimmie L. Williams, and Raja R. Wusirika, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 25, 1991, Ser. No. 735,861
Int. Cl.[5] B01J 23/02, 23/10, 27/04, 32/00
U.S. Cl. 502—216 27 Claims

1. A method of fabricating a catalyst structure in situ, wherein at least one of a group of metal powders, metal alloy powders and mixtures thereof, are introduced to a substrate and then transformed into active catalyst and catalyst support materials, comprising the steps of:
(a) introducing to a substrate, at least one of a group of metal powders, metal alloy powders and mixtures thereof, said metal powders, metal alloy powders, and mixtures thereof having particles in average diameter sizes exceeding approximately one or two microns; and
(b) transforming in situ said particles of said metal powders and metal alloy powders and mixtures thereof, whereby said metals, metal alloys and mixtures thereof are converted into active catalyst and catalyst support materials having average diameter sizes of less than approximately one or two microns.

5,206,203

ACID-RESISTANT COPPER OXIDE-CHROMIUM OXIDE CATALYST FOR THE HYDROGENATION OF FATTY ACIDS AND FATTY ESTERS

Michael Schneider, Ottobrunn-Riemerling; Gerd Maletz, Brückmühl, and Karl Kochloefl, Brückmühl/Heufeld, all of Fed. Rep. of Germany, assignors to Sud-Chemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 21, 1991, Ser. No. 795,491
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1990, 4037731
Int. Cl.[5] B01J 21/06, 23/10, 23/26, 23/72
U.S. Cl. 502—304 7 Claims

1. An acid-resistant catalyst for the hydrogenation of fatty acids or fatty acid esters or mixtures thereof which comprises (in analytical terms) about 20 to about 70 weight percent CuO, about 20 to about 70 weight percent Cr_2O_3 and about 0.5 to about 25 weight percent of additional metal oxide selected from zirconium, cerium, or lanthanum oxide or mixtures thereof, wherein said catalysts, after thermal treatment of the metal oxides or precursor compounds convertible into the oxides, has a specific surface area of about 8 m^2/g to about 60 m^2/g and wherein the acid resistance as measured by the solubility of the copper in the catalyst in acid is a maximum of 200 mg. as determined by stirring 10 grams of the catalyst in 10 weight percent aqueous acetic acid at 20° C. for 2 minutes.

5,206,204

ABSORBENT FOR LOWER ALDEHYDES

Yoshio Tsutsumi, Takatsuki; Kazumi Matsuura, Itami, and Katsuya Noguchi, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 19, 1991, Ser. No. 794,016
Claims priority, application Japan, Nov. 30, 1990, 2-338862; Aug. 26, 1991, 3-213890
Int. Cl.[5] B01J 20/22
U.S. Cl. 502—401 12 Claims

1. An adsorbent for lower aldehyde which comprises a saturated cyclic secondary amine and a halogenide of an alkali metal or alkaline earth metal supported on a porous carrier.

5,206,205

THERMAL TREATMENT OF SUPERABSORBENTS TO ENHANCE THEIR RATE OF ABSORBENCY UNDER LOAD

Chuan-Ling Tsai, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 745,319, Aug. 15, 1991, abandoned. This application Nov. 27, 1991, Ser. No. 800,877
Int. Cl.[5] B01J 20/26
U.S. Cl. 502—402 20 Claims

1. A method of treating a once-dried water-insoluble superabsorbent material comprising heating the once-dried water-insoluble superabsorbent material at a temperature of about 125° C. or greater for a time sufficient to increase the two-minute Absorbency Under Load of the superabsorbent material at least about 1 gram per gram.

5,206,206

METHOD OF PRE-TREATING PEAT FOR USE IN BIOFILTERS FOR WASTEWATER TREATMENT AND USE THEREOF

Gérardo Buelna, Duberger, and Ginette Bélanger, Rivière-du-Loup, both of Canada, assignors to Les Tourbieres Premier Ltée, Quebec, Canada

Filed Jul. 26, 1991, Ser. No. 736,525
Claims priority, application Canada, Jul. 27, 1990, 2022097
Int. Cl.[5] B01J 20/24
U.S. Cl. 502—404 17 Claims

1. A method for pretreating peat to be used in a peat-based biofilter for wastewater treatment, said peat originally containing large, intermediate and small fibers, said method comprising:
a) sieving said peat through a first grid of approximately $\frac{1}{4}$th of an inch diameter in order to eliminate the large fibers thereof and then through a second grid of approximately 3/16th of an inch in diameter in order to eliminate the small fibers while retaining and recovering the intermediary fibers of said peat,
b) mixing the intermediate fibers retained by said second grid with a Fe-containing compound or equivalents thereof, and $CaCO^3$ or equivalents thereof.

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(II)

applying to said formed elongate body a pressure of 500–2,000 bar; and

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5,206,207

PREPARATION FOR HIGH ACTIVITY HIGH DENSITY CARBON

Edward D. Tolles, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 18, 1992, Ser. No. 853,133
Int. Cl.[5] C01B *31/12;* **B01J** *20/20*
U.S. Cl. 502—424 **14 Claims**

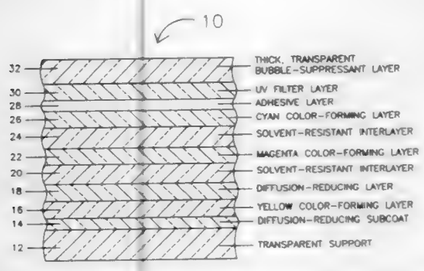
1. A process for activating lignocellulosic material comprising the steps of:
(a) blending together fragments of the lignocellulosic material with an activating agent selected from the group consisting of phosphoric acid and zinc chloride to effect chemical activation of the lignocellulosic material;
(b) subjecting the blended materials to sufficient heat to effect plasticization of the acid-treated lignocellulosic material fragments to begin transition to thermoset;
(c) densifying the heat-treated, acid-treated lignocellulosic material by mechanically shaping the plastic fragments in a spheronizer;
(d) subjecting the shaped, acid-treated lignocellulosic material to sufficient heat for a sufficient time to effect thermosetting of the material; and
(e) subjecting the thermoset, shaped, acid-treated lignocellulosic material to a final activation by heating the material to from about 425° to about 650° C. to produce an activated lignocellulosic material with a butane working capacity of greater than 15 g/100 cm^3.

5,206,208

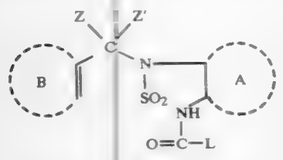
STABILIZATION OF THERMAL IMAGES

Rong C. Liang, Lexington; William C. Schwarzel, Billerica; Rita S. Shon Baker, Brookline; Robert P. Short, Arlington; Stephen R. Sofen, Lexington, and Michael A. Young, Natick, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

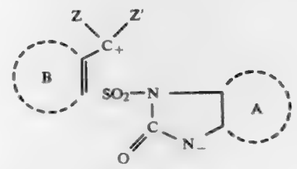
Filed Nov. 20, 1991, Ser. No. 795,101
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—201 **36 Claims**



1. A thermal imaging medium comprising at least one imaging layer, the imaging layer comprising a binder and a color-forming compound which undergoes a change of color upon heating above a color-forming temperature for a color-forming time, the color-forming compound being of the formula:



and forming after its change in color a dye compound of the formula:



in which formulae:
rings A and B are aromatic nuclei;
Z and Z', which may be linked other than via the meso carbon atom, represent the moieties sufficient to complete the auxochromophoric system of a diarylmethane or a triarylmethane dye in the dye compound, Z and Z' being such that the dye compound has absorption in the visible region;
L is a leaving group which is removed on heating; and
the broken line between the SO_2 group and ring B denotes that the sulfonamide ring in the color-forming compound may be 5- or 6-membered,
the imaging layer further comprising a source of zinc, nickel, copper(II), cobalt(II) or aluminum(III) cations.

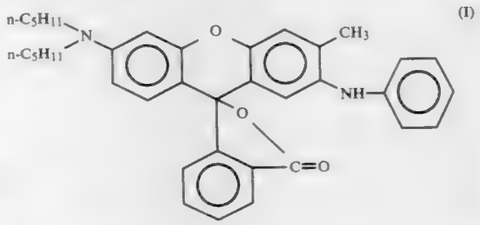
5,206,209

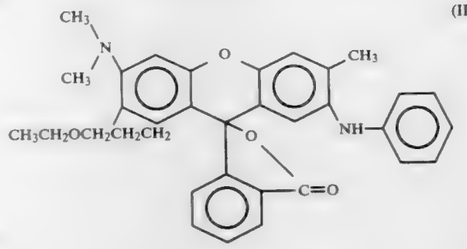
HEAT-SENSITIVE RECORDING SHEET

Toshiaki Minami; Tadakazu Fukuchi, and Toshio Kaneko, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,548
Claims priority, application Japan, Apr. 10, 1990, 2-94429
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—209 **10 Claims**

1. A heat-sensitive recording sheet comprising a support having thereon a color-developing layer which comprises as main ingredients a colorless or pale colored basic chromogenic dye and an organic color-developing agent, wherein said color-developing layer comprises both bis(4-hydroxyphenyl)butylacetate as an organic color-developing agent and at least one fluorane-leuco dye selected from dyes represented by the following formulae (I), (II), (III) and (IV) as a colorless or pale colored basic chromogenic dye:





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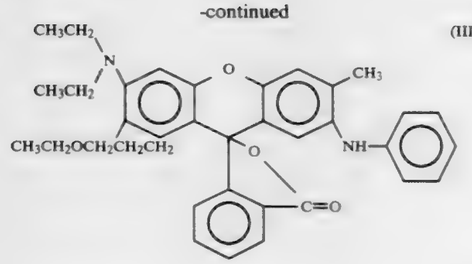

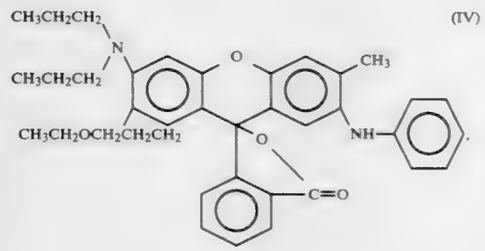

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HEAT-SENSITIVE RECORDING MATERIAL

Tetsuo Tsuchida, Takarazuka; Yukihiro Abe, Kobe; Takehiro Minami, Osaka, and Naoto Arai, Ikeda, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Japan

Filed Jul. 23, 1991, Ser. No. 734,745
Claims priority, application Japan, Jul. 23, 1990, 2-196532; Jul. 23, 1990, 2-196533
Int. Cl.[5] B41M *5/32*
U.S. Cl. 503—210 **20 Claims**

1. A heat-sensitive recording material comprising (A) a support and (B) a heat-sensitive recording layer formed on the support and containing a colorless or pale-colored basic dye and a color developing material which develops a color on contact with the dye, the recording material being characterized in that the color developing material comprises at least one member selected from the group consisting of α-naphthoic acid and polyvalent metal salts thereof.

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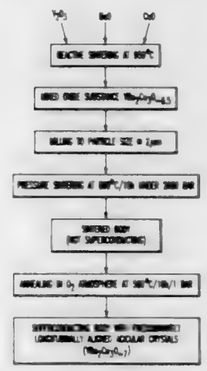
PROCESS FOR THE PRODUCTION OF AN ELONGATE BODY CONSISTING OF LONGITUDINALLY ALIGNED ACICULAR CRYSTALS OF A SUPERCONDUCTING MATERIAL

Gundolf Meyer, Birmenstorf, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Continuation of Ser. No. 494,394, Apr. 16, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 751,568
Claims priority, application Switzerland, Mar. 31, 1989, 1184/89
Int. Cl.[5] C04B *35/00, 35/64;* **H01L** *39/24*
U.S. Cl. 505—1 **11 Claims**

1. A process for the production of an elongate body of a high temperature superconductor consisting of longitudinally aligned acicular crystals of a superconducting ceramic material based on $REBa_2Cu_3O_{6.5+y}$, with RE = a rare earth metal and $0<y<1$, comprising the steps of
preparing a homogeneous, non-superconducting precursor in powder form with an average particle diameter of 0.5–5 μm; said precursor containing the elements RE, Ba and Cu in a stoichiometric ratio of RE:Ba:Cu = 1:2:3;
forming from said precursor powder said elongate body;
applying to said formed elongate body a pressure of 500–2,000 bar; and



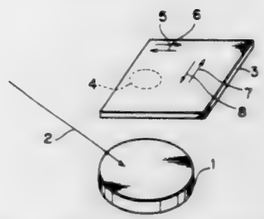
sintering said formed elongate body under said applied pressure for 5–20 h at a temperature of 600°–850° C.

5,206,212

FABRICATION OF SUPERCONDUCTING OXIDE FILMS BY LASER ABLATION

Shigeru Okuda, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 519,716, May 7, 1990, abandoned. This application Jan. 9, 1992, Ser. No. 819,588
Claims priority, application Japan, May 19, 1989, 1-126847
Int. Cl.[5] B05D *3/06, 5/12*
U.S. Cl. 505—1 **2 Claims**



1. A method of fabricating an oxide superconducting film comprising the steps of:
(a) applying a laser beam to a target of an oxide superconducting material and depositing atoms and/or molecules scattered from said target on a portion of a heated substrate under an atmosphere containing oxygen;
(b) moving said heated substrate
(i) along a plurality of straight lines parallel to each other; and
(ii) along at least one other line in a direction vertical to said plurality of straight lines parallel to each other for depositing atoms and/or molecules scattered from said target under said atmosphere containing oxygen so that said heated substrate is deposited with an area of said oxide superconducting film;
(c) applying said laser beam to said target of said oxide superconducting material and depositing atoms and/or molecules scattered from said target to a portion of said heated substrate on which said atoms and/or molecules from said target were previously deposited;
(d) moving said heated substrate
(i) along a plurality of straight lines parallel to each other; and
(ii) along at least one other line in a direction vertical to

said plurality of straight lines parallel to each other for

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METHOD OF PREPARING THIN FILM OF

5,206,216

METHOD FOR FABRICATING OXIDE

wherein
R^1 is H, CH_3, and CH_2CH_3,

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said plurality of straight lines parallel to each other for depositing atoms and/or molecules scattered from said target under said atmosphere containing oxygen so that said area of said of said oxide superconducting film is deposited at least in part with another layer of said oxide superconducting film;

(e) repeating steps (c) and (d) until a final thickness of said oxide superconducting film is obtained over an area at said substrate.

5,206,213

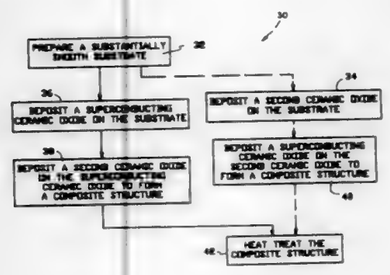
METHOD OF PREPARING ORIENTED, POLYCRYSTALLINE SUPERCONDUCTING CERAMIC OXIDES

Jerome J. Cuomo, Lincolndale; Charles R. Guarnieri, Somers; Eugene S. Machlin, Croton-On-The-Hudson; Ronnen A. Roy, Briarcliff Manor, and Dennis S. Yee, Pleasantville, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 23, 1990, Ser. No. 498,180

Int. Cl.[5] B05D *3/02*

U.S. Cl. 505—1 **25 Claims**



1. A process for preparing an oriented superconducting ceramic oxide from a bilayer structure of an anisotropic polycrystalline superconducting rare earth alkaline earth copper ceramic oxide having a superconducting phase and a second rare earth alkaline earth copper ceramic oxide material having a lower melting point than the superconducting ceramic oxide comprising the steps of:

(a) preparing a substantially smooth substrate;

(b) forming a bilayer structure having a polycrystalline superconducting ceramic oxide layer and a second ceramic oxide layer alternately arranged by sequential deposition on the substrate, said second ceramic oxide layer having a thickness enabling said second ceramic oxide layer to act as a solvent for said superconducting phase of said superconducting ceramic oxide layer; and

(c) heat treating a composite structure of said substrate and said bilayer structure, initially to a temperature above the melting point of said second ceramic oxide and below the incongruent melting point of said superconducting ceramic oxide, to obtain an oriented structure having the c-axes of the unit cells of the crystallites predominantly normal to the surface of the substrate.

5,206,214

METHOD OF PREPARING THIN FILM OF SUPERCONDUCTOR

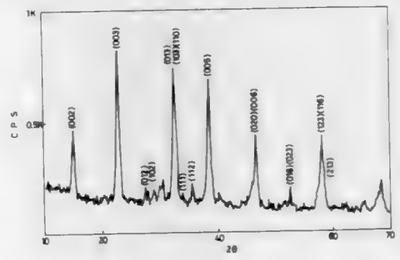
Naoji Fujimori; Keizo Harada; Shuji Yazu, and Tetsuji Jodai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 649,121, Jan. 28, 1991, abandoned, which is a continuation of Ser. No. 463,908, Jan. 10, 1990, abandoned, which is a continuation of Ser. No. 200,275, May 31, 1988, abandoned. This application Feb. 10, 1992, Ser. No. 833,576

Claims priority, application Japan, May 31, 1987, 62-136938; Jun. 4, 1987, 62-140610; Jun. 4, 1987, 62-140612

Int. Cl.[5] C23C *14/34*; H01L *39/24*

U.S. Cl. 505—1 **25 Claims**



1. A method for preparing a superconductive thin film comprising the steps of:

preparing a target from the oxides of Ba, Y, and Cu in atomic ratio of Cu/Y of 2.5 to 3.5 and Ba/Y of 1.8 to 2.2;

sputtering said target to form a superconducting thin film on a substrate at a temperature of 650° to 750° C., said sputtering step being carried out in an atmosphere having a total gas pressure of 1×10^{-1}, to 5×10^{-2} Torr and containing Ar and O_2 content with an O_2 content of 16 to 80 vol. %;

performing a heat treatment at 600° to 800° C. of said thin film thus formed; and

cooling said thin film after said heat treatment at a rate of up to 4° C./min.

5,206,215

PROCESS FOR OBTAINING PRECURSORS FOR HIGH CRITICAL TEMPERATURE SUPERCONDUCTOR CERAMICS COMPRISING A FIRST AND SECOND PRECIPITATION

Gérard Duperray, La Norville, and Françoise Ducatel, Bonnelles, both of France, assignors to Alcatel Alsthom Compagnie Generale d'Electricite, Paris, France

Filed Mar. 13, 1992, Ser. No. 850,926

Claims priority, application France, Mar. 18, 1991, 91 03260

Int. Cl.[5] C01B *13/36*; C01F *11/02*; C01G *3/02*

U.S. Cl. 505—1 **8 Claims**

1. Process for obtaining precursors for high critical temperature superconductor ceramics by precipitating salts which are insoluble in water comprising the following stages:

a starting solution of soluble salts is prepared in which the cations are in the stoichiometric proportions of the required superconductor phase,

a first full precipitation is carried out of a first series of cations at a first value of pH,

the first precipitate obtained is filtered out and washed and the filtrate is retained,

the pH of said filtrate is changed to a second value and the residual cations are precipitated,

the second precipitate is filtered,

the first and second precipitates are combined and subsequently homogenized,

the product obtained is dried, calcined, and ground.

5,206,216

METHOD FOR FABRICATING OXIDE SUPERCONDUCTING WIRES BY LASER ABLATION

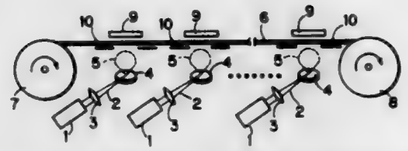
Noriyuki Yoshida, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 525,530, May 18, 1990, abandoned. This application Sep. 16, 1991, Ser. No. 759,846

Claims priority, application Japan, May 19, 1989, 1-126848

Int. Cl.[5] B05D *3/06, 5/12*

U.S. Cl. 505—1 **7 Claims**



1. A method of fabricating an oxide superconducting wire using laser ablation of applying a laser beam onto a target containing components of an oxide superconductive material and depositing particles thereby scattered from said target on a heated long base material, said method comprising the steps of:

arranging a mask between said target and said long base material for limiting a film forming region;

feeding said long base material along its longitudinal direction to be passed through a film forming station provided therein with said target;

applying said laser beam onto said target thereby scattering particles from said target by laser ablation under an oxygen pressure of at least 300 mTorr; and

depositing said particles on said limited film forming region of said long base material for forming an oxide superconducting film.

5,206,217

INDANE COMPOUNDS AND COMPOSITIONS

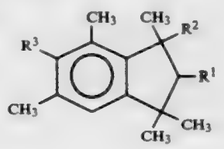
Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 618,356, Nov. 21, 1990, Pat. No. 5,095,152. This application Dec. 20, 1991, Ser. No. 811,545

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—18 **16 Claims**

1. A compound of the formula (I)



[I]

wherein

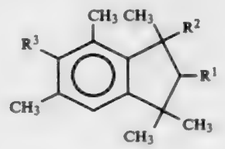
R^1 is H, CH_3, and CH_2CH_3,

R^2 is CH_3, and CH_2CH_3, and

R^3 is CHO, and OCHO, provided that

when R^1 and R^2 are both CH_3, R^3 is other than CHO.

13. A fragrance composition comprising a compound of the formula (I)



[I]

wherein

R^1 is H, CH_3, and CH_2CH_3,

R^2 is CH_3, and CH_2CH_3, and

R^3 is CHO, and OCHO, provided that

when R^1 and R^2 are both CH_3, R^3 is other than CHO, in combination with at least one of a carrier and additional perfumery material.

5,206,218

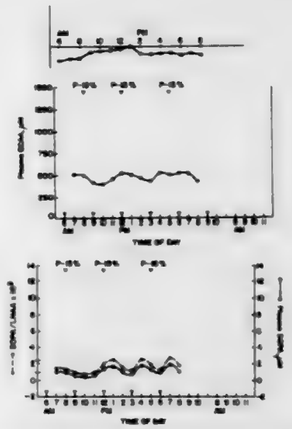
REDUCING POST-PRANDIAL FLUCTUATIONS IN PLASMA CONCENTRATIONS OF LARGE NEUTRAL AMINO ACIDS (LNAA)

Richard J. Wurtman, and Judith J. Wurtman, both of Boston, Mass., assignors to Interneuron Pharmaceuticals, Inc., Lexington, Mass.

Filed Apr. 3, 1989, Ser. No. 332,871

Int. Cl.[5] C07D *37/02*; A23J *3/04, 3/08*

U.S. Cl. 514—2 **8 Claims**



1. A composition for administration to an individual to reduce fluctuations in plasma large neutral amino acid (LNAA) levels, comprising a ratio of carbohydrate to protein of approximately 3:1 to approximately 6:1.

5,206,219

ORAL COMPOSITIONS OF PROTEINACEOUS MEDICAMENTS

Ashok J. Desai, Wilmington, N.C., assignor to Applied Analytical Industries, Inc., Wilmington, N.C.

Filed Nov. 25, 1991, Ser. No. 797,221

Int. Cl.[5] A61K *9/10, 9/48, 9/66, 37/02*

U.S. Cl. 514—3 **13 Claims**

1. A pharmaceutical enteric coated composition adapted for oral administration comprising:

(a) a dosage unit of a protease inhibitor and of a proteinaceous medicament which is a member selected from the group consisting of erythropoietin, insulin, a growth hormone, calcitonin, growth colony stimulating factor, cyclosporine, vasopressin, a vasopressin agonist, a vasopressin antagonist, t-PA, vampire bat plasminogen amplifier, urokinase, streptokinase, interferon and interleukin each in a biologically effective, non-toxic quantity;

(b) a phospholipid;

(c) cholesterol;

(d) a hydrophyllic or hydrophobic surfactant; and

(e) a substantially non-aqueous, non-alcoholic pre-emulsion emulsifiable solution medium therefor comprising from 15 to 35% of a liquid polyol pharmaceutical solvent for said proteinaceous medicament which is selected from the

group consisting of propylene glycol and a polyethylene

5,206,223

-continued

i) R^5 represents hydrogen or chlorine,

and optionally at least one member selected from the group

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group consisting of propylene glycol and a polyethylene glycol combined with from 30 to 60% of a liquid lipid pharmaceutical solvent for said proteinaceous medicament which is selected from the group consisting of oleic acid, isostearic acid, linoleic acid and linolenic acid.

5,206,220

SOLUBLE AND STABLE SOURCES OF TYROSINE, CYSTEINE AND GLUTAMINE FOR TOTAL PARENTERAL NUTRITION

Mary A. Hilton, Louisville, Ky., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 512,698, Apr. 23, 1990, abandoned. This application Aug. 8, 1991, Ser. No. 742,782

Int. Cl.[5] **A61K** *37/02*

U.S. Cl. 514—19 **42 Claims**

1. A method for total parenteral nutrition (TPN) of a patient which comprises administering to said patient γ-glutamyltyrosine in a TPN solution in an amount effective to provide a sufficient nutritional level of free tyrosine in said patient.

5,206,221

DIPEPTIDE ALKYL ESTERS AND THEIR USES

Peter E. Lipsky, Dallas, and Dwain L. Thiele, Coppell, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 168,177, Mar. 15, 1988, Pat. No. 5,047,401, which is a continuation-in-part of Ser. No. 744,051, Sep. 9, 1985, Pat. No. 4,752,602. This application Jan. 18, 1991, Ser. No. 643,538

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.[5] **A61K** *37/00;* **C07K** *5/06*

U.S. Cl. 514—19 **8 Claims**

1. A method of inhibiting the natural killer cell or cytotoxic T-lymphocyte mediated rejection of tissue transplanted into a host, the method comprising treating said host with a therapeutically effective amount of an alkyl ester of a dipeptide consisting essentially of the L-amino acids leucine, phenylalanine, valine, isoleucine, alanine, proline, glycine, or aspartic acid beta methyl ester, individually or in combination.

5,206,222

METHODS FOR THE REDUCTION OF MYOCARDIAL REPERFUSION INJURY

Mervyn B. Forman, Nashville, Tenn., and Edwin K. Jackson, Pittsburg, Pa., assignors to Vanderbilt University, Nashville, Tenn.

Filed May 22, 1991, Ser. No. 704,058

Int. Cl.[5] **C07H** *19/067;* **A61K** *31/70*

U.S. Cl. 514—46 **8 Claims**

1. The method to reduce myocardial reperfusion injury in a patient without causing a hypotensive reaction comprising:

A) coadministering between 0.03 μg/kg/min. to 30 μg/kg/min. of adenosine or an analogue thereof and an effective dose of lidocaine.

2. The method of claim 1 wherein said analogue is 2-[p-(2-carboxyethyl)phenethylamino]-5'-N-ethylcarboxamido adenosine.

4. The method of claim 1 wherein said analogue is N^6-cyclopentyladenosine.

5,206,223

METHOD FOR INHIBITING HEPARANASE ACTIVITY

Israel Vlodavsky; Amiram Eldor; Yaakov Naparstek, all of Jerusalem, and Irun Cohen, Rehovet, all of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 418,710, Oct. 3, 1989, abandoned, which is a continuation of Ser. No. 67,583, Jun. 24, 1987, abandoned. This application Sep. 17, 1990, Ser. No. 583,851

Claims priority, application Israel, Jun. 26, 1986, 79254

Int. Cl.[5] **A61K** *31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **9 Claims**

1. A method for inhibiting heparanase activity comprising administering to a patient in need thereof an effective heparanase inhibiting amount of a composition consisting essentially of an active ingredient selected from the group consisting of heparin and an effective chemically modified derivative thereof which inhibits heparanase and a pharmaceutically acceptable carrier.

5,206,224

TREATMENT OF MALE HORMONE RELATED DISEASES BY CYCLODEXTRINS AND THEIR DERIVATIVES

Ryuji Ueno, Hyogo, Japan, assignor to Kabushikikaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 599,582

Claims priority, application Japan, Oct. 18, 1989, 1-274424; Nov. 15, 1989, 1-298090

Int. Cl.[5] **A61K** *31/715, 31/72*

U.S. Cl. 514—58 **7 Claims**

1. A method for lowering in a patient the level of male hormone which comprises administering to a patient an etherified cyclodextrim in an amount effective for lowering the level of male hormone by said etherified cyclodextrin.

5,206,225

ALKYLCARBOXYLIC ACID DIMETHYLAMIDES AS CRYSTALLIZATION INHIBITORS

Heinz-Otto Horstmann, Bergisch-Gladbach; Uwe Priesnitz, Solingen; Ulrich Engelhardt, Leverkusen; Karl Reizlein, Cologne, and Klaus Wangermann, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

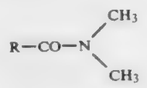
Filed Apr. 19, 1991, Ser. No. 688,183

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013522

Int. Cl.[5] **A01N** *43/04, 55/00;* **C07D** *249/00, 249/08*

U.S. Cl. 514—63 **10 Claims**

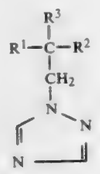
1. A composition comprising an alkylcarboxylic acid dimethylamide of the formula



(I)

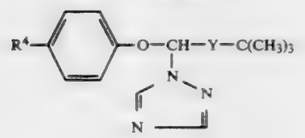
in which

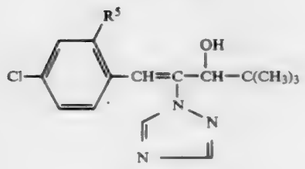
R represents alkyl having 5 to 11 carbon atoms, and A) at least one compound selected from the group consisting of



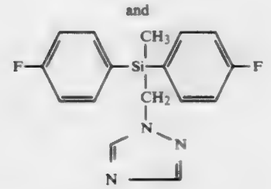
(II)

-continued



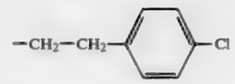


and

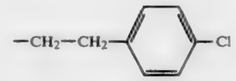


in which

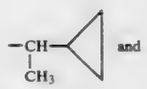
a) R^1 represents



R^2 represents tert.-butyl and
R^3 represents hydroxyl, or
b) R^1 represents 4-fluorophenyl,
R^2 represents 2-fluorophenyl and
R^3 represents hydroxyl, or
c) R^1 represents 2,4-dichlorophenyl,
R^2 represents n-butyl and
R^3 represents hydroxyl, or
d) R^1 represents



R^2 represents phenyl and
R^3 represents cyano, or
e) R^1 represents 2-chloro-benzyl,
R^2 represents 1-chloro-cycloprop-1-yl and
R^3 represents hydroxyl, or
f) R^1 represents 4-chlorophenyl,
R^2 represents



and

R^3 represents hydroxyl, or
g) Y represents —CH(OH) and
R^4 represents chlorine or phenyl, or
h) Y represents CO and
R^4 represents chlorine, and
i) R^5 represents hydrogen or chlorine,

(III) and optionally at least one member selected from the group consisting of a surface-active agent, organic diluent, water, low temperature stabilizer and adhesive, and wherein the weight ratio of active compound from the group (A) to alkylcarboxylic acid dimethylamide of the formula (I) is from about 1:0.2 to 1:5.

5,206,226

(IV) **METHOD OF TREATMENT OF PARKINSONS'S DISEASE USING PHYTIC ACID**

Robert Sabin, Goosedown Estate, Box 332, Horseshoe Rd., Mill Neck, Long Island, N.Y. 11765

Continuation of Ser. No. 602,819, Oct. 24, 1990, Pat. No. 5,112,814. This application Dec. 13, 1991, Ser. No. 806,751

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[5] **A61U** *31/66, 31/685*

U.S. Cl. 514—75 **3 Claims**

(V) 1. A method of treating Parkinson's Disease comprising orally administering to a subject an effective symptom-alleviating amount of one or more compounds selected from the group consisting of phytic acid, a phytate salt, and an isomer or hydrolysate of phytic acid or a phytate salt, in combination with a dephosphorylating enzyme.

5,206,227

COMPOSITION AND USE OF PHOSPHONIC ACID, (2-HALO-2-CYANOETHENYL)-DIALKYL ESTERS AS ANTIMICROBIALS

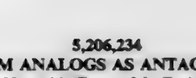
Kalakota S. Reddy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 2, 1992, Ser. No. 892,836

Int. Cl.[5] **A61K** *31/66;* **C07F** *9/40*

U.S. Cl. 514—112 **17 Claims**

1. A compound corresponding to the formula:



wherein R^1 and R^2 independently represent an alkyl group, and X represents a halogen.

5,206,228

CONTROL OF ARTHROPOD PESTS WITH PHOSPHOROUS ACID AND MONO-ESTERS AND SALTS THEREOF

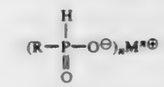
James R. Collins, Cary, N.C., assignor to Rhone-Poulenc Ag Company, Research Triangle Park, N.C.

Filed Oct. 29, 1991, Ser. No. 784,563

Int. Cl.[5] **A01N** *57/18*

U.S. Cl. 514—141 **18 Claims**

1. A method of use to control arthropod pests which comprises applying to said pests or an infested locus thereof an effective amount, sufficient to control or combat said arthropods, of an active ingredient compound of a formula (I)



(I)

wherein:

R is an OH or an alkoxy having 1 to 4 carbon atoms;
M is a hydrogen atom (when R is a hydroxyl radical) or an alkali metal, alkaline earth metal or aluminum cation; and
n is an integer from 1 to 3.

5,206,229

VITAMIN D ANALOGUES

[I]

5,206,234

BENZOLACTAM ANALOGS AS ANTAGONISTS OF CCK

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5,206,229

VITAMIN D ANALOGUES

Martin J. Calverley, Herlev; Lise Binderup, and Ernst T. Binderup, both of Tåstrup, all of Denmark, assignors to Leo Pharmaceutical Products LTD, Ballerup, Denmark

PCT No. PCT/DK89/00079, § 371 Date Oct. 10, 1990, § 102(e) Date Oct. 10, 1990, PCT Pub. No. WO89/10351, PCT Pub. Date Nov. 2, 1989

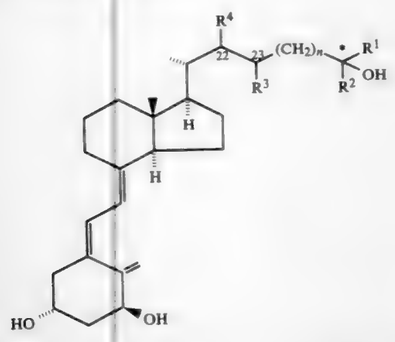
PCT Filed Apr. 7, 1989, Ser. No. 582,944

Claims priority, application United Kingdom, Apr. 21, 1988, 8809466; Apr. 21, 1988, 8809467; Dec. 23, 1988, 8830169; Dec. 23, 1988, 8830174

Int. Cl.[5] A61K *31/59*; C07J *9/00*; C07C *35/06*

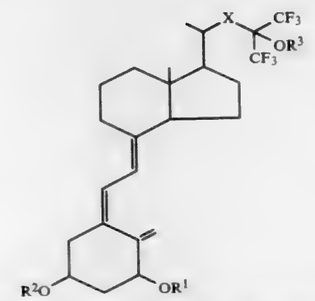
U.S. Cl. 514—167 10 Claims

1. A compound of the formula I



I

in which formula n is an integer from 1–7; and R^1 and R^2, which may be the same or different, stand for hydrogen, or straight or branched, saturated or unsaturated C_1–C_7-alkyl; with the provisos that when n=1, R^1 and R^2 cannot simultaneously be hydrogen, nor can R^1 and R^2 simultaneously be an alkyl group independently chosen from methyl, ethyl and normal-propyl, and when n=2, R^1 and R^2 cannot simultaneously be methyl; or C_3–C_8-cyclo-alkyl, or, taken together with the carbon (starred in formula I) bearing the hydroxyl group, R^1 and R^2 can form a saturated or unsaturated C_3–C_9 carbocyclic ring; and R^3 and R^4 represent either both hydrogen, or when taken together constitute a bond, such double bond (either in the Z or E configuration) connecting carbons numbered 22 and 23; and derivatives of the compounds of formula I in which one or more hydroxy groups have been transformed into -O-acyl or -O-glycosyl or phosphate ester groups, such masked groups being hydrolyzable in vivo, or derivatives of the compounds of formula I in which the hydroxyl group at the starred carbon atom is lacking, these compounds being converted to active compounds of formula I by enzymatic hydroxylation after administration.



[I]

wherein R^1, R^2 and R^3 are independently hydrogen atom, a chemically inactive hydroxy-protecting group, an acyl having 2 to 8 carbon atoms, or an alkyl having 1 to 8 carbon atoms, X is a straight carbon chain having 4 to 6 carbon atoms which contains at least one double or triple bond at the 24-position.

5,206,231

2,5-BENZODIAZOCINE ANTIARRHYTHMIC AGENTS

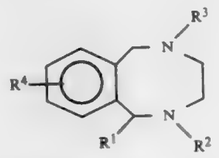
Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., Rensselaer, N.Y.

Filed Sep. 10, 1991, Ser. No. 757,167

Int. Cl.[5] A61K *31/44*, *31/395*; C07D *245/06*

U.S. Cl. 514—183 8 Claims

1. A compound of formula



or acid-addition salt thereof wherein

R^1 is phenyl, naphthyl, thienyl, pyridinyl, furanyl, benzyl, or phenyl having one or two substitutents chosen independently from the group consisting of lower-alkyl, lower-alkoxy and halogen;

R^2 is hydrogen or lower-alkyl,

R^3 is cyano; and

R^4 is one or two substituents chosen independently from the group consisting of hydrogen lower-alkyl, lower-alkoxy and halogen.

5,206,230

FLUORINE-CONTAINING VITAMIN D3 ANALOGUES AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Nobuo Ikekawa, Musashino; Yoshiro Kobayashi, Tokyo; Takeo Taguchi, Hachioji, all of Japan; Yoko Tanaka, Delmar, N.Y., and Yutaka Ohira, Tsukuba, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Jun. 5, 1991, Ser. No. 710,396

Int. Cl.[5] A01N *45/00*; A61K *31/59*; C07F *7/04*

U.S. Cl. 514—167 5 Claims

1. A fluorine-containing vitamin D_3 analogue of the formula [I]:

5,206,232

FUNGICIDAL IMIDAZOLE COMPLEXES

Joseph Sharvit, Lehavim; Daniel Shohat, Beer-Sheva, and Yosef Gur, Omer, all of Israel, assignors to Makhteshim Chemical Works Ltd., Beer-Sheva, Israel

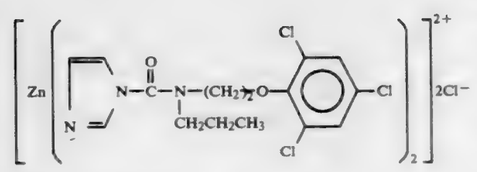
Filed Mar. 1, 1991, Ser. No. 662,650

Claims priority, application Israel, Mar. 5, 1990, 93636; Feb. 7, 1991, 97181

Int. Cl.[5] A61K *31/555*; C07F *3/06*, *7/22*

U.S. Cl. 514—184 11 Claims

1. A crystalline metal complex of prochloraz having the formula:



having a melting point of 100° C.–102° C. .

5,206,233

SUBSTITUTED THIAZEPINES AS CENTRAL NERVOUS SYSTEM AGENTS

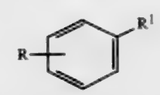
William J. Smith, III; Lawrence D. Wise, and David J. Wustrow, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 27, 1991, Ser. No. 750,667

Int. Cl.[5] C07D *28/106*; A61K *31/55*

U.S. Cl. 514—211 6 Claims

1. A compound of Formula I

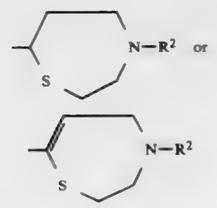


I

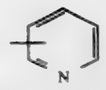
wherein

R is hydrogen, lower alkyl, lower alkoxy, hydroxy, halogen, amino, nitro, trifluoromethyl, or cyano; and

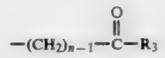
R^1 is



wherein R^2 is hydrogen, lower alkyl, $-(CH_2)_n-R^3$ wherein R^3 is



and n is an integer of 1, 2, 3, 4, or 5;



wherein R^3 and n are as defined above or

wherein m is an integer of 2, 3, 4, 5, or 6; and corresponding optical isomers thereof; or a pharmaceutically acceptable acid addition salt thereof.

5,206,234

BENZOLACTAM ANALOGS AS ANTAGONISTS OF CCK

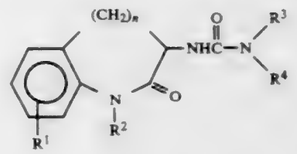
Mark G. Bock, Hatfield; Roger M. Freidinger, and Ben E. Evans, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 602,031, Oct. 22, 1990, abandoned. This application Jun. 20, 1991, Ser. No. 718,075

Int. Cl.[5] A61K *31/55*; C07D *223/16*

U.S. Cl. 514—213 34 Claims

1. A compound of Formula I:



I

wherein:

R^1 is H, halo, hydroxy, nitro, amino, cyano, C_1–C_8-alkyl, C_1–C_4-alkylamino, C_1–C_4-alkoxy;

R^2 is unsubstituted or mono-, di-, or trisubstituted C_1–C_8-straight- or branched-alkyl, where the substituents are selected from the group consisting of C_1–C_4-alkylthio, C_1–C_4-alkyloxy, C_1–C_4-alkylamino, unsubstituted or mono-, di-, or trisubstituted phenyloxy or naphthyloxy unsubstituted or mono-, di-, or trisubstituted phenylthio or naphthylthio, unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl, and the substituents on the phenyloxy or naphtholoxy, the phenylthio or naphthylthio, the C_6- or C_{10}-aryl being selected from C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; substituted carbonyl-C_1–C_4-alkyl, which carbonyl group is substituted with hydroxy, C_1–C_8-straight- or branched-alkoxy, C_1–C_8-straight- or branchedalkyl, unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl, unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl-C_1–C_8-alkyl, and unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl-C_1–C_4-alkoxy, where the substituents on the phenyl or naphthyl, the phenyl or naphthyl-C_8-alkyl or the phenyl or naphthyl-C_1–C_4-alkoxy are selected from the groups consisting of hydroxy, C_1–C_8-straight-or branched-alkyl, C_1–C_4-alkoxy, halo, cyano, nitro, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4- alkylamino, or NR^6R^7, where R^6 and R^7 are independently selected from hydrogen, C_1–C_6-straight- or branched-alkyl, unsubstituted or mono-, di-, or trisubstituted-carboxy-C_1–C_8-straight- or branched-alkyl, or unsubstituted or mono-, di-, or trisubstituted-carboxamido-C_1–C_8-straight- or branched-alkyl, wherein the substituents on the carboxy-C_1–C_8-straight- or branched-alkyl or on the carboxamido-C_1–C_8-straight- or branched-alkyl are selected from the group consisting of unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl, unsubstituted or mono-, di- or trisubstituted phenyl or naphthyl-C_1–C_8-alkyl, unsubstituted or mono-, di-, or trisubstituted phenyl or naphthyl-C_{10}-aryl-C_1–C_4-alkoxy, where the substituents on the phenyl or naphthyl, the phenyl or naphthyl-C_1–C_8-alkyl or the phenyl or naphthyl-C_1–C_4-alkoxy are selected from the group consisting of hydroxy, C_1–C_8-straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, cyano, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4-alkylamino;

R^3 and R^4 are independently unsubstituted or mono-, di- or trisubstituted phenyl or naphthyl, where the substituents are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, cyano, C_1–C_4-alkylthio and mono-or di-C_1–C_4-alkylamino; C_3–C_{10}-cycloalkyl; C_3–C_{10}-cycloalkyl-C_1–C_4-alkyl; C_1–C_6-straight- or branched-alkyl-Q-

$(CH_2)m$, where m is 2 to 4 and Q is O, S, SO, SO_2, $NG-CH_3$ or substituted amino, wherein the substitu- to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy and y is 0 to 3; R^{3a} and R^{3b} are independently hydrogen,

5,206,236

METHOD FOR THE TREATMENT OF MALARIA

Richard R. Tidwell, 101 Forest Ridge Dr., J. Dixton County, 713

VOL 1149 ISS 4 AP 27 1993 UMI

$(CH_2)m$, where m is 2 to 4 and Q is O, S, SO, SO_2, —HC=CH—, or substituted amino, wherein the substituent is hydrogen, C_1–C_8-straight- or branched-alkyl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl, or C_9–C_{12}-benzofused cycloalkyls;

n is 0–3;

or the optical isomers or pharmaceutically acceptable salts thereof.

2. A method of antagonizing the binding of cholecystokinin to cholecystokinin receptors which comprises contacting said cholecystokinin receptors with a therapeutically effective but non-toxic amount of a compound of claim 1 to a mammal.

5,206,235

BENZO-FUSED LACTAMS THAT PROMOTE THE RELEASE OF GROWTH HORMONE

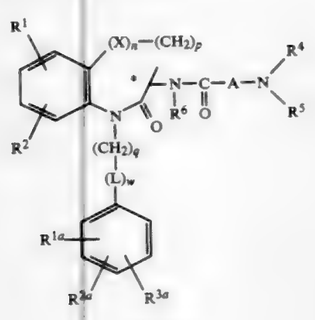
Michael H. Fisher, Ringoes; William R. Schoen, Edison; Matthew J. Wyvratt, Mountainside, and Robert J. DeVita, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 673,695, Mar. 20, 1991, abandoned. This application Feb. 28, 1992, Ser. No. 839,742

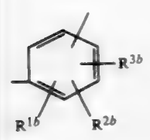
Int. Cl.[5] A61K *31/55*; **C07D** *223/16, 285/36, 267/14*

U.S. Cl. 514—213 **8 Claims**

1. A compound having the formula:



where L is



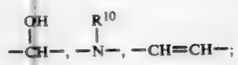
n is 0;

p is 2;

q is 0 to 4;

w is 0 to 1;

X is C=O, O, $S(O)_m$,

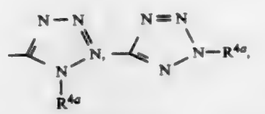


m is 0 to 2;

R^1, R^2, R^{1a}, R^{2a}, R^{1b}, and R^{2b} are independently hydrogen, halogen, C_1–C_7 alkyl, C_1–C_3 perfluoroalkyl, C_1–C_3 perfluoroalkoxy, —$S(O)_mR^{7a}$, cyano, nitro, $R^{7b}O(CH_2)_r$—, $R^{7b}COO(CH_2)_r$—, $R^{7b}OCO(CH_2)_r$—, phenyl or substituted phenyl where the substituents are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy;

R^{7a} and R^{7b} are independently hydrogen, C_1–C_3 perfluoroalkyl, C_1–C_6 alkyl, substituted C_1–C_6 alkyl, where the substituents are phenyl or substituted phenyl; phenyl or substituted phenyl where the phenyl substitutents are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy and v is 0 to 3; R^{3a} and R^{3b} are independently hydrogen, R^9, C_1–C_6 alkyl substituted with R^9, phenyl substituted with R^9 or phenoxy substituted with R^9;

R^9 is



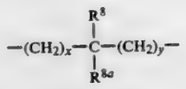
$R^{7b}O(CH_2)_r$—, $R^{7b}COO(CH_2)_r$—, $R^{7b}OCO(CH_2)_r$—, $R^{7b}O(CH_2)_rCO$—, $R^4R^5N(CH_2)_r$—, $R^{7b}CON(R^4)(CH_2)_r$—, $R^4R^5NCO(CH_2)_r$—, $R^4R^5NCS(CH_2)_r$—, $R^4R^5NN(R^5)CO(CH_2)_r$—, $R^4R^5NN(R^5)CS(CH_2)_r$—, $R^{7b}CON(R^4)N(R^5)CO(CH_2)_r$—, $R^{7b}CON(R^4)N(R^5)CS(CH_2)_r$—, $R^4N(OR^{7b})CO(CH_2)_r$— or $R^{7a}CON(OR^{7b})CO(CH_2)_r$—;

and v is as defined above;

R^4, R^{4a}, R^5 are independently hydrogen, phenyl, substituted phenyl, C_1–C_{10} alkyl, substituted C_1–C_{10} alkyl, C_3–C_{10} alkenyl, substituted C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, or substituted C_3–C_{10} alkynyl where the substituents on the phenyl, alkyl, alkenyl or alkynyl are from 1 to 5 of hydroxy, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, fluoro, R^1 substituted or R^1, R^2 independently disubstituted phenyl C_1–C_3 alkoxy, R^1 substituted or R^1, R^2 independently disubstituted phenyl, where the substituents on the phenyl are as defined for R^1, C_1–C_5-alkanoyloxy, C_1–C_5 alkoxycarbonyl, carboxy, formyl, or —$NR^{10}R^{11}$ where R^{10} and R^{11} are independently hydrogen, C_1–C_6 alkyl, phenyl, phenyl C_1–C_6 alkyl, C_1–C_5-alkoxycarbonyl or C_1–C_5-alkanoyl-C_1–C_6 alkyl; or R^4 and R^5 can be taken together to form —$(CH_2)_rB(CH_2)_s$— where B is CH_2, O or $S(O)_m$ or N-R^{10}, r and s are independently 1 to 3, and R^{10} is as defined above;

R^6 is hydrogen, C_1–C_{10} alkyl, phenyl or phenyl C_1–C_{10} alkyl;

A is



where x and y are independently 0-3;

R^8 and R^{8a} are independently hydrogen, C_1–C_{10} alkyl trifluoromethyl, phenyl, substituted C_1–C_{10} alkyl where the substituents are from 1 to 3 of imidazolyl, indolyl, hydroxy, fluoro, $S(O)_mR^{7a}$, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, R^1 substituted or R^1, R^2 independently disubstituted phenyl C_1–C_3 alkoxy, R^1 substituted or R^1, R^2 independently disubstituted phenyl, C_1–C_5-alkanoyloxy, C_1–C_5 alkoxycarbonyl, carboxy, formyl, or —$NR^{10}R^{11}$ where R^{10} and R^{11} are as defined above; or

R^8 and R^{8a} can be taken together to form —$(CH_2)_t$— where t is 2 to 6; and R^8 and R^{8a} can independently be joined to one or both of R^4 and R^5 to form alkylene bridges between the terminal nitrogen and the alkyl portion of the A group wherein the bridge contains from 1 to 5 carbon atoms; and pharmaceutically acceptable salts thereof.

5,206,236

METHOD FOR THE TREATMENT OF MALARIA

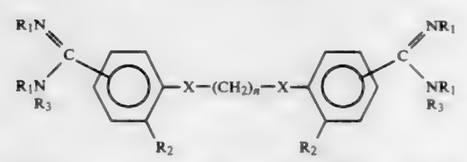
Richard R. Tidwell, 101 Forest Ridge Dr.; J. Dieter Geratz, 713 Kenmore Rd.; James E. Hall, 2440 Springview Trail, all of Chapel Hill, N.C. 27514; Dennis E. Kyle, 9415 Curran Rd., Silver Spring, Md. 20901; Max Grogl, 3404 Tan Terra Cir., Brookville, Md. 20833, and Kwasi A. Ohemeng, 112 Overlook Dr., Clinton, N.J. 08809

Continuation of Ser. No. 334,590, Apr. 6, 1989, abandoned. This application Sep. 5, 1991, Ser. No. 755,228

Int. Cl.[5] A61K *31/55, 31/505, 31/415, 31/155*

U.S. Cl. 514—218 **1 Claim**

1. A method for treating malaria which comprises the to an afflicted host patient a therapeutically effective amount of a compound have the structure of formula I:



wherein X is O or NH; R_1 is H or two R_1 groups on the same amidine group together represent —$(CH_2)_m$—, wherein m≦2,3 or 4; R_2 is H, NH_2, OCH_3, Cl, NO_2; $R_3$is H, CH_3 or CH_2CH_3 and n=2–6 or a pharmaceutically acceptable salt thereof provided that when X is O, both R_2 and both R_3 can not be H.

5,206,237

BENZODIAZEPINE ANALOGS

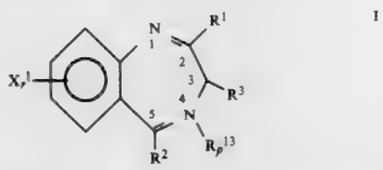
Roger M. Freidinger, Lansdale; Mark G. Bock, Hatfield, and Ben E. Evans, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 14, 1991, Ser. No. 699,849

Int. Cl.[5] A61U *31/55*

U.S. Cl. 514—219 **3 Claims**

1. A method of treating panic disorder or anxiety disorder in a mammal which comprises administering to said mammal a therapeutically effective amount of a compound of the formula:

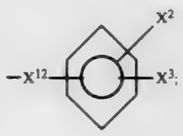


I

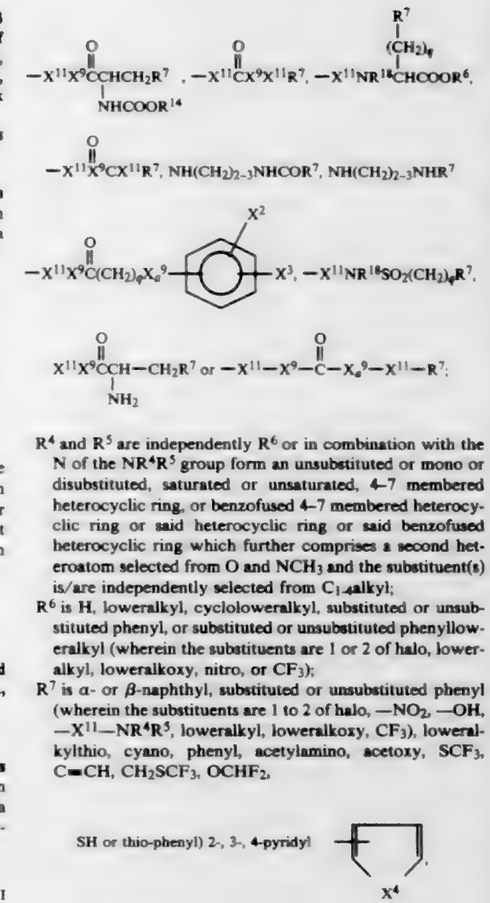
wherein

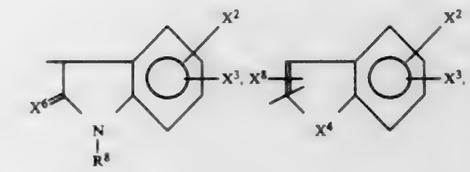
R^1 is —$NR^{16}R^{17}$,;

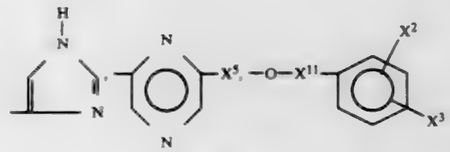
R^2 is H, loweralkyl, substituted or unsubstituted phenyl (wherein the substituents are 1 or 2 of halo, loweralkyl, loweralkoxy, loweralkylthio, carboxyl, carboxyloweralkyl, nitro, —CF_3, or hydroxy), 2-, 3-, 4-pyridyl, —$X^{12}COOR^6$,

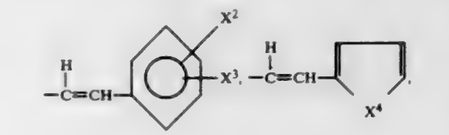


R^3 is —$X^{11}R^7$,









R^4 and R^5 are independently R^6 or in combination with the N of the NR^4R^5 group form an unsubstituted or mono or disubstituted, saturated or unsaturated, 4–7 membered heterocyclic ring, or benzofused 4–7 membered heterocyclic ring or said heterocyclic ring or said benzofused heterocyclic ring which further comprises a second heteroatom selected from O and NCH_3 and the substituent(s) is/are independently selected from C_{1-4}alkyl;

R^6 is H, loweralkyl, cycloloweralkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted phenylloweralkyl (wherein the substituents are 1 or 2 of halo, loweralkyl, loweralkoxy, nitro, or CF_3);

R^7 is α- or β-naphthyl, substituted or unsubstituted phenyl (wherein the substituents are 1 to 2 of halo, —NO_2, —OH, —X^{11}—NR^4R^5, loweralkyl, loweralkoxy, CF_3), loweralkylthio, cyano, phenyl, acetylamino, acetoxy, SCF_3, C≡CH, CH_2SCF_3, $OCHF_2$,

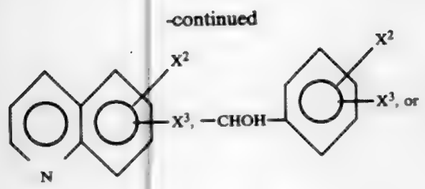
SH or thio-phenyl) 2-, 3-, 4-pyridyl

-continued

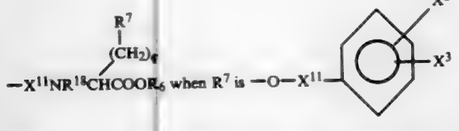
R^{18} is H or loweralkyl;

p is 0 or 1;

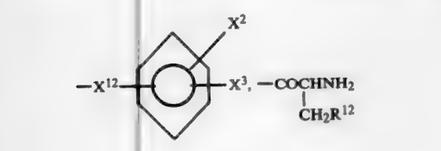
-continued



with the proviso that q is not 0 in



R^8 is H, loweralkyl, cycloloweralkyl, $-X^{12}CONH_2$, $-X^{12}COOR^6$, $-X^{11}$-cycloloweralkyl, $-X^{12}NR^4R^5$,



R^{11} and R^{12} are independently loweralkyl or cycloloweralkyl;

R^{13} is O;

R^{14} is loweralkyl or phenylloweralkyl;

R^{16} and R^{17} are, when separate, independently H, loweralkyl, lower alkenyl, $-X^{11}$cycloloweralkyl, $-X^{12}-NR^4R^5$, $X^{12}CONR^4R^5$, $-X^{12}C{\equiv}N$,

$-X^{12}COOR^6$, or —CN; or, when joined, form with N, a heterocycle

wherein n′ is 2–6;

R^{18} is H or loweralkyl;

p is 0 or 1;

q is 0–4;

r is 1 or 2;

X^1 is H, $-NO_2$, CF_3 CN, OH, loweralkyl, halo, loweralkylthio, loweralkoxy, $-X^{11}COOR^6$ or $-X^{11}NR^4R^5$;

X^2 and X^3 are independently H, —OH, $-NO_2$, halo, loweralkylthio, loweralkyl or loweralkoxy;

X^4 is S, O, CH_2 or NR^8;

X^5 is H, CF_3, CN, $COOR^6$, NO_2, or halo;

X^6 O or HH;

X^8 is H or loweralkyl;

X^9 and $X^9{}_a$ are independently NR^{18}, O;

X^{11} is absent or C_{1-4} linear or branched alkylidene;

X^{12} is C_{1-4} linear or branched alkylidene;

or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

5,206,238

CHOLECYSTOKININ ANTAGONISTS

Mark G. Bock, Hatfield, and Roger M. Freidinger, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

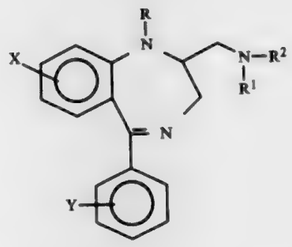
Continuation of Ser. No. 612,646, Nov. 13, 1990, abandoned. This application Apr. 15, 1992, Ser. No. 870,157

Int. Cl.[5] A01K *31/55*

U.S. Cl. 514—221 **6 Claims**

1. A method of treating panic disorder or anxiety disorder in a mammal which comprises administering to said mammal a therapeutically effective amount of a compound of formula I:

I



wherein:

X is one or two of the substituents: F, Cl or Br; C_1–C_4-straight- or branched-chain alkyl, including methyl, ethyl, propyl, isopropyl, butyl, isobutyl, and t-butyl; C_1–C_4-alkoxy; C_1–C_4-alkylthio; hydroxy; nitro; cyano; amino; or trifluoromethyl, and may be attached at either or both the 7- and/or 8-positions;

Y is independently, the same as X, and may be attached at any of positions 2–6 on the aromatic ring;

R is H, C_1–C_4-alkyl, cyclo-C_3–C_5-alkyl, C_1–C_4-alkenyl, or acetyl;

R^1 is H, C_1–C_4-alkyl, or cyclo-C_3–C_5-alkyl;

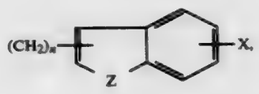
R^2 is unsubstituted or mono- or disubstituted phenyl, where the substituents are as defined under X, above;

where R^3 is $(CH_2)_n$–C_1–C_4-alkyl, $-(CH_2)_n$-2-indole, $-(CH_2)_n$-3-indole, or $-(CH_2)_n$-phenyl (unsubstituted or mono- or disubstituted, where the substituents are as defined for X, above), where n is 0–4, and R^4 is H or C_1–C_4-alkyl;

where R^5 is

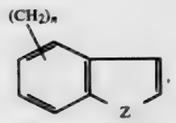
wherein R^6 is $(CH_2)_n$-2-indole, or $(CH_2)_n$-3-indole, where n is 0–4, where R^7 is H, $COOR^8$, or

and where R^8 is C_1–C_4-alkyl; where R^5 is $(CH_2)_m SCH_2NHCOCH_3$, where m is 1–4; where R^5 is C_1–C_4-alkyl; where R^5 is pyrazine (unsubtituted or mono-substituted where the substituents may be Cl, $COOR^8$, CN or NO_2), wherein R^8 is as defined above; where R^5 is

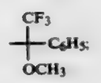


wherein Z is O, S or NR, $(CH_2)_n$ is attached at the 2- or 3-position, and R, n and x are as defined above;

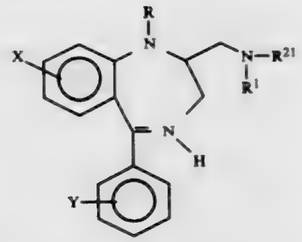
where R^5 is



wherein $(CH_2)_n$ is attached at the 4- or 5-position, and n and Z are as defined above; where R^5 is $(CH_2)_m CO_2CH_2$phenyl, wherein m is as defined above; where R^5 is —O—C_1–C_4-alkyl, —$CHOHC_6H_5$, or

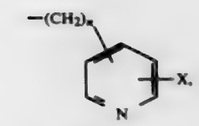


or of the formula II:

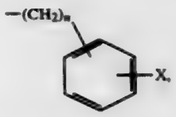


wherein:

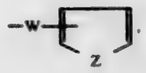
X, Y, R and R^1 are as defined above; and R^{21} is R^2 as defined above, including wherein R^5, as defined above, also is pyridine,



where $(CH_2)_n$ is attached at the 2-, 3- or 4-position and n and X are as defined above;



where the point of attachment is at any position on the ring and n and X are as defined above; or



where the point of attachment is at the 2- or 3-position and W is H, straight or branched chain C_1–C_4-alkyl or C_1–C_4-alkoxy, nitro, F, Cl or Br, and Z is as defined above; or the optical isomers of formula I, or pharmaceutically acceptable salts of the compounds of formulas I or II.

5,206,239

PYRROLOAZEPINE DERIVATIVES

Akira Mizuno, Kyoto; Hidetsura Cho, Ibaraki; Mikiko Hamaguchi, Kawanishi; Toshio Tatsuoka, Nishinomiya, and Takafumi Ishihara, Takatsuki, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Feb. 7, 1991, Ser. No. 651,778

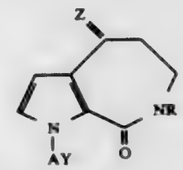
Claims priority, application Japan, Feb. 7, 1990, 2-26137; Jan. 30, 1991, 3-27739

Int. Cl.[5] A61K *31/55*; C07D *487/04*

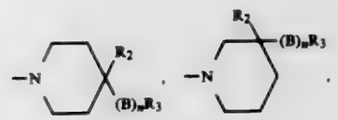
U.S. Cl. 514—215 **9 Claims**

1. A pyrroloazepine derivative represented by the following formula (I):

(I)



wherein R means a hydrogen atom, a linear or branched C_{1-6} alkyl group or a C_{7-10} aralkyl group, A denotes a linear or branched C_{2-10} alkylene, alkenylene or alkynylene group, Z stands for O, NOR_1 in which R_1 is a hydrogen atom or an alkyl, aryl or aralkyl group, or $NOCOR_5$ in which R_5 is a hydrogen atom or an alkyl, aryl or aralkyl group, and Y means a group



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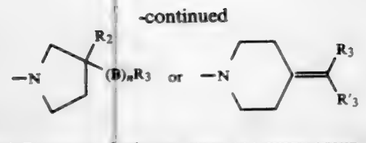
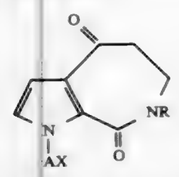


in which R_2 means a hydrogen atom or a cyano group, R_3 and R'_3 may be the same or different and individually denote a substituted or unsubstituted phenyl group or a substituted or unsubstituted aralkyl group, and B is an oxygen or sulfur atom or a carbonyl, substituted or unsubstituted hydroxymethylene, sulfinyl, sulfonyl or substituted or unsubstituted, cyclic or acyclic acetal; wherein said substituents are selected from the group consisting of lower alkyl, phenyl and phenyl substituted by at least one halogen atom or C_{1-4} alkoxy group; and n stands for 0 or 1; or a salt thereof.

4. An intermediate suitable for use in the production of a pharmaceutical product, said intermediate being represented by the following formula (III):

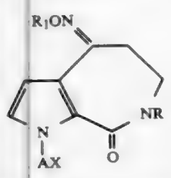
(III)



wherein A denotes a linear or branched C_{2-10} alkylene, alkenylene or alkynylene group, R means a hydrogen atom, a linear or branched C_{1-6} alkyl group or a C_{7-10} aralkyl group, and X represents a substituent selected from the group consisting of halogen, methanesulfonyl and p-toluenesulfonyl.

5. An intermediate suitable for use in the production of a pharmaceutical product, said intermediate being represented by the following formula (X):

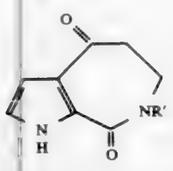
(X)



wherein A denotes a linear or branched C_{2-10} alkylene, alkenylene or alkynylene group, R means a hydrogen atom, a linear or branched C_{1-6} alkyl group or a C_{7-10} aralkyl group, R_1 is a hydrogen atom or an alkyl, aryl or aralkyl group, and X represents a substituent selected from the group consisting of halogen, methanesulfonyl and p-toluenesulfonyl.

8. An intermediate suitable for use in the production of a pharmaceutical product, said intermediate being represented by the following formula (II'):

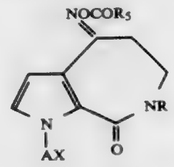
(II')



wherein R' means a linear or branched C_{1-6} alkyl group or a C_{7-10} aralkyl group.

9. An intermediate suitable for use in the production of a pharmaceutical product, said intermediate being represented by the following formula (XII):

(XII)



wherein A denotes a linear or branched C_{2-10} alkylene, alkenylene or alkynylene group, R means a hydrogen atom, a linear or branched C_{1-6} alkyl group or a C_{7-10} aralkyl group, R_5 is a hydrogen atom or an alkyl, aryl or aralkyl group, and X represents a substituent selected from the group consisting of halogen, methanesulfonyl and p-toluenesulfonyl.

5,206,240

NITROGEN-CONTAINING SPIROCYCLES

John J. Baldwin, Gwynedd Valley; Jason M. Elliott, Blue Bell; David A. Claremon, Audubon; Gerald S. Ponticello, Lansdale; David C. Remy, North Wales, and Harold G. Selnick, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

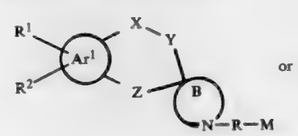
Continuation-in-part of Ser. No. 612,091, Nov. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 447,950, Dec. 8, 1989, abandoned. This application Jun. 3, 1991, Ser. No. 709,686

Int. Cl.[5] **A61K** *31/445;* **C07D** *211/94*

U.S. Cl. 514—231.5 **4 Claims**

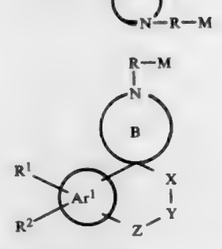
1. A compound of structural formula:

I



or

II



or a pharmaceutically acceptable salt thereof, wherein

Ar^1 is benzo;

the ring system comprising X, Y and Z is a 5-, 6- or 7-membered ring system wherein X is CHOH or CO; Y is CH, a bond or $(CR_4R_5)_m$; and Z is —O—; wherein:

R^4 and R^5 are independently

a) hydrogen, or

b) C_{1-6}alkyl;

M is

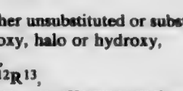
1) —H,
2) —OH,
3) —O(C_{1-6}alkyl),
4) —CN,
5) —NHSO$_2$$C_{1-6}$alkyl,
6) —COOH,
7) —COOC_{1-6}alkyl,
8) —CONR^{12}R^{13}, wherein R^{12} and R^{13} are independently

a) hydrogen,

b) C_{1-6}alkyl, or

c) R^{12} and R^{13} taken together with the nitrogen atom to which they are attached represent a 5 or 6 membered saturated heterocyclic ring which may contain an additional heteroatom selected from N, S(O)$_n$ or O, wherein n is 0–2, selected from the group consisting of pyrrolidine, morpholine, piperidine, piperazine or N-methylpiperazine,

9) —NR^{12}R^{13},
10) halo,
11) C_{5-8}cycloalkane,
12) C_{5-8}cycloalkene, or
13)



wherein s is 1–3 and the R^3 groups may be the same or different;

R is —(CR^{4}R^5)$_m$—Q—(CR^{4}R^5)$_q$—, wherein R^4 and R^5 are as defined above, m and q are O, Q is a bond;

R^1, R^2, and R^3 are independently selected from:

1) hydrogen,
2) C_{1-6} alkyl, either unsubstituted or substituted with
   a) —NR^{4}R^5, wherein R^4 and R^5 are as defined above,
   b) —N(R^5)COC$_{1-6}$alkyl,
   c) —NHSO$_2$(C_{1-6}alkyl),
   d) —CONR^{12}R^{13}, wherein R^{12} and R^{13} are as defined above,
   e) —CO(C_{1-6}alkyl),
   f) —OH,
   g) —O(C_{1-6}alkyl),
   h) —O(C_{1-6}alkyl)—O—(C_{1-3}alkyl),
   i) —S(O)$_n$(C_{1-6}alkyl),
   j) imidazole,
   k) 2-imidazolidinone,
   l) 2-pyrrolidinone,
   m) —NH—C(NHR^5)=N—CN, or
   n) —NH—C(SR^5)=N—CN,
3) —OH,
4) C_{1-3} alkoxy, either unsubstituted or substituted with C_{1-3} alkoxy,
5) —N(R^5)SO$_2$(C_{1-6}alkyl),
6) —N(R^5)SO$_2$(CH$_2$)$_g$CO$_2$H,
7) —N(R^5)SO$_2$(CH$_2$)$_g$CO$_2$$C_{1-6}$alkyl,
8) —NO$_2$,
9) —N(R^5)COC$_{1-6}$alkyl,
10) —N(R^5)SO$_2$—C$_6$H$_4$—R^4,
11) —N(R^5)CO—C$_6$H$_4$—R^4,
12) —NR^{4}R^5,
13) halo,
14) —CO—C_{1-6}alkyl,
15) —CONR^{12}R^{13},
16) —CN,
17) —CO$_2$R^5,
18) —C(R^5)=N—OR^9,
19) benzoyl, either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, halo, or hydroxy,
20) —N(R^5)COO(C_{1-6}alkyl),
21) —N(R^5)COO—phenyl either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy or halo,
22) —N(R^5)CONR^{4}R^5,
23) —S(O)$_n$$C_{1-6}$alkyl,
24) —S(O)$_n$—C$_6$H$_4$—R^4,
25) —CF$_3$,
26) phenyl, either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, halo or hydroxy,
27) imidazolyl,
28) —SO$_2$NR^{12}R^{13},
29) —N[S(O)$_2$$C_{1-6}$alkyl][(CH$_2$)$_p$CN], wherein p is 2–5,
30) —N(R^5)—C(NR^{4}R^5)=N—CN, or
31) —N(R^5)—C(SR^5)=N—CN;

B is piperidine; and

Ar^2 is benzene or naphthalene;

with the proviso that if Ar^1 is benzo, and R^1 and R^2 are hydrogen, hydroxyalkyl or alkoxy, then M is other than unsubstituted phenyl or hydrogen.

5,206,241

LABDANES AND PROCESS FOR THEIR PREPARATION

Yatendra Khandelwal; Rajeshwari Kannan; Basni Lal; Ramanujam Rajagopalan; Vijay A. Areskar; deceased AliHussein N. Dohadwalla; Rashida A. Dohadwalla; Asia S. Dohadwalla; Samina A. Dohadwalla, all of Bombay, India Heirs , and Richard H. Rapp, Königstein/ Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

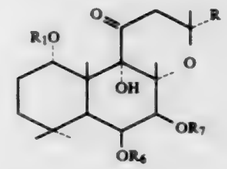
Filed Mar. 14, 1991, Ser. No. 669,685

Claims priority, application European Pat. Off., Mar. 17, 1990, 90105072.4

Int. Cl.[5] **A61K** *31/535, 31/495, 31/445, 31/35*

U.S. Cl. 514—232.8 **8 Claims**

1. A compound having the formula



wherein

R is vinyl;

R_1 is hydrogen;

R_6 is —CO(CH$_2$)$_2$NX$_1$Y$_1$, wherein X_1 and Y_1 are each methyl or X_1 and Y_1 form, together with the N atom to which they are bonded, a piperidine, morpholine, or N-methylpiperazine ring; and

R_7 is —COCH$_2$OZ$_1$, wherein Z_1 is methyl, ethyl, phenyl, or 4-chlorophenyl;

and the optical and geometric isomers and pharmaceutically acceptable salts thereof.

5,206,243

DIARYL-SUBSTITUTED PYRAZOLE COMPOUNDS AND DRUGS AND COSMETICS OBTAINED THEREFROM

Hans-Heiner Wenzel, Dossenheim; Bernd Jansson, Ludwigshafen, both of Fed. Rep. of Germany; William V. Murray, Belle Mead; Michael P. Wachter, Bloomsbury, both of N.J., and Stanley Bell, Narberth, Pa., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 476,875, Feb. 8, 1989, Pat. No. 5,061,705. This application Sep. 3, 1991, Ser. No. 753,916

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903993

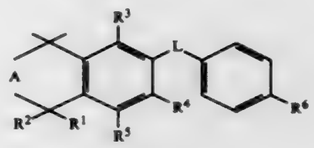
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] **A61K** *7/48;* **C07D** *231/12, 413/10*

U.S. Cl. 514—236.5 **6 Claims**

1. A compound of the formula I:

I



where

R^1 and R^2 are each hydrogen or methyl,

A is an ethylene or methylene radical which is unsubstituted or substituted by methyl, hydroxyl or oxo,

L is 1,4-disubstituted pyrazole which is substituted by mercapto, C_1–C_4-alkyl, or C_1–C_4-alkanoyl,

5,206,244

HYDROXYMETHYL (METHYLENECYCLOPENTYL)

-continued

OSO$_2$R^1, SR^1, SOR^1, SO$_2$R^1, SO$_2$OR^1, SO$_2$NR^{1}R^2, COR^1, CR^1=NOR^2, CHR^{1}CO$_2$R^2, CO$_2$R^1, CONR^{1}R^2, CSNR^{1}R^2

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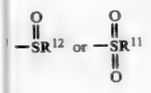
L is 1,4-disubstituted pyrazole which is substituted by mercapto, C_1–C_6-alkyl, or C_1–C_4-alkanoyl,
R^3 is hydrogen, a hydroxy group or C_1–C_6-alkoxy group,
R^4 is hydrogen, C_1–C_4-alkyl, halogen or methoxy,
R^5 is hydrogen or methoxy or tert-butyl,
R^6 is hydrogen, methyl, nitrile or a C_2–C_{10}-ketal group or the radical $—CHR^7OR^8—CHR^7—NR^9R^{10}$, $—COR^{11}$, $—SR^{12}$,



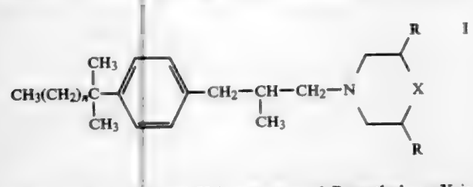
in which
R^7 is hydrogen or C_1–C_4-alkyl,
R^8 is hydrogen, C_1–C_4-alkyl or C_1–C_{20}-alkanoyl or is benzoyl which is unsubstituted or substituted by methoxy, nitro, methyl or chlorine, R^9 and R^{10} are each hydrogen, C_1–C_4-alkyl or C_1–C_6-alkanoyl or are each benzoyl which is unsubstituted or substituted as for R^8, or R^9 and R^{10}, or together with the nitrogen atom to which they are bonded, form a saturated, 5-membered or 6-membered heterocyclic radical which may contain oxygen as the second heteroatom,
R^{11} is hydrogen, C_1–C_4-alkyl, $—OR^{13}$ or $—NR^{14}R^{15}$, where R^{13} is hydrogen, unsubstituted or hydroxyl-substituted C_1–C_8-alkyl, aryl or aralkyl which is unsubstituted or substituted by chlorine, bromine, methyl, methoxy or nitro, substitution in the case of the aralkyl group being in the aryl moiety, and where R^{14} and R^{15} are each hydrogen, unsubstituted or hydroxyl-substituted C_1–C_6-alkyl or an aralkyl or aryl group which is unsubstituted or substituted as for R^{13}, or R^{14} and R^{15}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical as defined above for R^9 and R^{10}, and R^{12} is C_1–C_4-alkyl, and their physiologically tolerated salts.

5,206,243
CONTROL OF FUNGAL INFECTIONS IN AQUACULTURE

Dieter Hofmann, Reinach, and Walter Rehm, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 8, 1991, Ser. No. 666,833
Claims priority, application European Pat. Off., Mar. 12, 1990, 90104627.6; Jan. 26, 1991, 91101019.7
Int. Cl.[5] A61K *31/535, 31/445*
U.S. Cl. 514—239.5 **16 Claims**

1. A method for controlling a fungal infection in fish and crustacea caused by the genus Fusarium spp., comprising applying to the fish or crustacea a compound of the formula



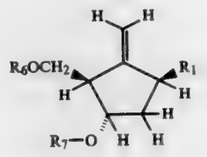
wherein n is 0 or 1 and X is oxygen and R methyl, or X is methylene and R hydrogen, or a salt thereof, its racemates, and isomers, in an amount which is effective as a fungicidal or fungistatic agent.

5,206,244
HYDROXYMETHYL (METHYLENECYCLOPENTYL) PURINES AND PYRIMIDINES

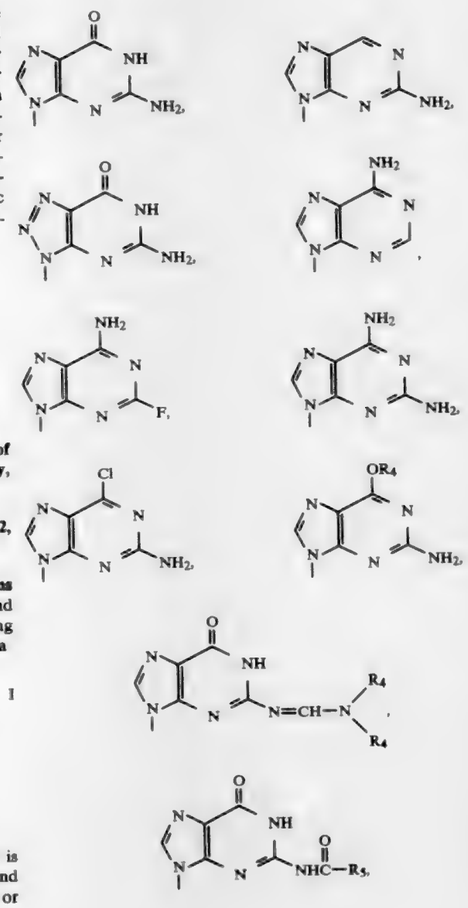
Robert Zahler, Pennington, and William A. Slusarchyk, Skillman, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 599,568, Oct. 18, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 763,033
Int. Cl.[5] A61K *31/52, 31/505;* **C07D** *473/16, 473/18*
U.S. Cl. 514—262 **11 Claims**

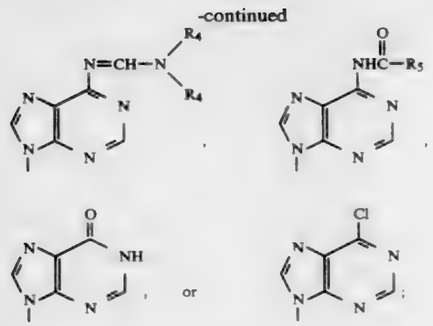
1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein R_1 is

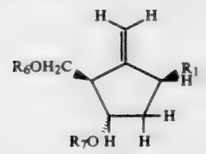


-continued



R_4 is alkyl;
R_5 is hydrogen, alkyl, substituted alkyl, or aryl; and
R_6 and R_7 are independently hydrogen, $—PO_3H_2$, or

10. An antiviral composition useful for treating herpes simplex virus 1 and 2, varicella zoster virus, and human cytomegalovirus comprising a pharmaceutically acceptable carrier and an effective amount of a compound of the formula



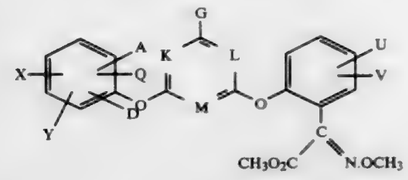
wherein R_1, R_6 and R_7 are as defined in claim 1.

5,206,245
FUNGICIDAL AROMATIC PYRIMIDINYL OXIME ETHERS

John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell; Ian T. Streeting, Wokingham; Rex Cheetham, Bracknell, and Paul J. de Fraine, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 26, 1991, Ser. No. 736,168
Claims priority, application United Kingdom, Jul. 27, 1990, 9016584
Int. Cl.[5] A61K *31/505;* **C07D** *239/26*
U.S. Cl. 514—269 **6 Claims**

1. A compound having the formula (I):



in which any two of K, L and M are nitrogen and the other is CE; X and Y are independently hydrogen, halogen, C_{1-4} alkyl, C_{3-6} cycloalkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{2-4} alkynyloxy, phenyl, benzyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, NR^1R^2, NR^1OR^2, N_3, $NHCOR^1$, $NR^1CO_2R^2$, $NHCONR^1R^2$, $N{=}CHNR^1R^2$, $NHSO_2R^1$, OR^1, $OCOR^1$, OSO_2R^1, SR^1, SOR^1, SO_2R^1, SO_2OR^1, $SO_2NR^1R^2$, COR^1, $CR^1{=}NOR^2$, $CHR^1CO_2R^2$, CO_2R^1, $CONR^1R^2$, $CSNR^1R^2$ $CH_3O_2C.C{=}CH.OCH_3$, $CH_3O_2C.C{=}N.OCH_3$, or 1-(imidazol-1-yl); or X and Y, when ortho to one another, together form methylenedioxy, or together with the phenyl ring to which they are attached form a naphthalene, quinoline, benzimidazole or benzothienyl ring; A, Q, D, E, G, U and V are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, cyano, nitro or trifluoromethyl; and R^1 and R^2 are independently hydrogen, C_{1-4} alkyl or phenyl; the aliphatic moieties of any of the foregoing being optionally substituted with one or more halogen, cyano, OR^1, SR^1,NR^1R^2, Sir^1_3, or $OCOR^1$ and the phenyl moieties of any of the foregoing being optionally substituted with one or more of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, nitro or cyano.

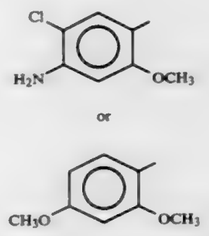
5,206,246
ANXIOLYTIC-R-N(1-AZABICYCLO{2.2.2}OCT-3-YL) BENZAMIDES AND THIOBENZAMIDES

Michel Langlois, Bac; Alain Renaud, Rueil Malmaison, both of France; Robert J. Naylor, and Brenda Naylor, both of West Yorkshire, England, assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation of Ser. No. 609,018, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 257,632, Oct. 14, 1988, abandoned. This application Jul. 23, 1991, Ser. No. 735,174
Claims priority, application European Pat. Off., Oct. 16, 1987, 87402321
Int. Cl.[5] A61K *31/505, 31/44;* **C07D** *239/02, 453/02*
U.S. Cl. 514—272 **13 Claims**

1. A compound of formula:

wherein Ar is:



the N-oxide thereof, a pharmaceutically acceptable salt thereof or both the N-oxide and pharmaceutically acceptable salt thereof.

5,206,247
SPIRO(4.5.)DECANE COMPOUNDS

Gilbert Regnier, Chatenay Malabry; Claude Guillouzeau, Clamart; Jean-Paul Vilaine, Chatenay; Albert Lenaers, Triel Sur Seine, and Jean-Pierre Iliou, Puteaux, all of France, assignors to Adir Et Compagnie, Courbevoie, France

Filed Sep. 5, 1991, Ser. No. 755,155
Claims priority, application France, Sep. 6, 1990, 90 11044
Int. Cl.[5] A61R *31/44;* **C07D** *221/20*
U.S. Cl. 514—278 **9 Claims**

1. A compound selected from those of formula I:

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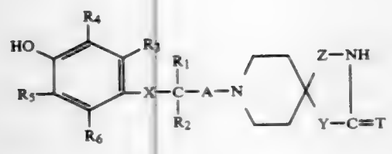
ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3)(2H)-dione].

5,206,253
DISPHOSPHONIC ACID DERIVATIVES, PROCESSES



(I)

in which:
X represents oxygen or sulphur,
A represents a straight-chain or branched hydrocarbon radical containing 2 to 10 carbon atoms inclusive which optionally contains a double bond and/or is optionally substituted by hydroxy;
Y represents oxygen, sulphur, or CH_2;
T represents oxygen or sulphur;
Z represents:
CH-R_7 in which R_7 represents hydrogen or alkyl containing 1 to 3 carbon atoms, inclusive or carbonyl;
R_1 and R_3:
each simultaneously represents hydrogen,
together form a $(CH_2)_n$ bridge in which n is 1 or 2, or
R_1 represents methyl and simultaneously R_3 represents hydrogen;
R_2 and R_6, which are the same or different, each represents hydrogen or methyl, and
R_4 and R_5, which are the same or different, each represents a straight-chain or branched alkyl containing 1 to 6 carbon atoms inclusive;
its diastereoisomers and enantiomers, as well as its addition salts with a physiologically-tolerable acid.

9. A method for treating a mammal afflicted with an atherosclerotic condition characterized by membrane lipid peroxidation comprising the step of administering to the said mammal an antioxidative amount of a compound of claim 1 which is effective for alleviation of the said atherosclerotic condition.

5,206,248

METHOD FOR REDUCING EMOTIONAL LABILITY

Richard A. Smith, 7569 Cabrillo Ave., La Jolla, Calif. 92037

Filed Mar. 27, 1992, Ser. No. 859,105
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—289 **15 Claims**

1. A method for reducing emotional lability in human patients, comprising orally administering, to a patient in need thereof, a therapeutically effective quantity of non-addictive analog of morphine which penetrates a mammalian blood-brain barrier, and which causes a reduction in spasmodic outbursts of emotion without significantly interfering with consciousness or alertness in the patient.

5,206,249

BIS-NAPHTHALIMIDES CONTAINING AMINO-ACID DERIVED LINKERS AS ANTICANCER AGENTS

Jung-Hui Sun, Hockessin, Del., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,061, Mar. 27, 1991. This application Dec. 11, 1991, Ser. No. 805,044
Int. Cl.[5] C07D *221/14*; A61K *31/435*
U.S. Cl. 514—296 **6 Claims**

1. A compound, or a pharmaceutically acceptable salt thereof, which si selected from the group consisting of:
(S,S)-2,2'-[1,2-ethanedylbis[imino(1-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]disoquinoline-1,3(2H)-dione];
(Racemic+Meso)-2,2'-[1,2-ethanedylbis[imino(1-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione;
(R,R)-2,2'-[1,2-ethanediylbis[imino(1-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione];
(Meso)-2,2'-[1,2-ethanediylbis[imino(1-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione];
(S,S)-2,2'-[1,2-ethanediylbis[imino(2-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3-(2H)-dione];
(Racemic+Meso)-2,2'-[1,2-ethanediylbis[imino(2-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione];
(R,R)-2,2'-[1,2-ethanediylbis[imino(2-methyl-2,1-ethanediyl)]]-bis[5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione];
(Meso)-2,2'-[1,2-ethanediylbis[imino(2-methyl-2,1-ethanediyl)]]-bis [5-nitro-1H-benz[de]isoquinoline-1,3(2H)-dione].

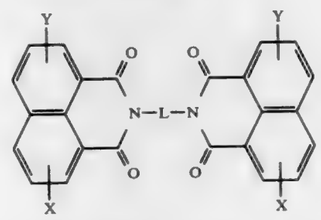
5,206,250

BIS-NAPHTHALIMIDES CONTAINING AMIDE AND THIOAMIDE LINKERS AS ANTICANCER AGENTS

Jung-Hui Sun, Hockessin, Del., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

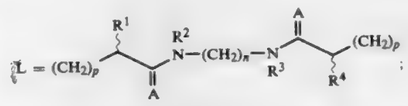
Filed Mar. 27, 1991, Ser. No. 676,062
Int. Cl.[5] C07D *471/06*; A61K *31/44*
U.S. Cl. 514—296 **8 Claims**

1. A compound of the formula:



(i)

or a diastereomerically pure or racemate or a mixture of racemate and meso, pharmaceutically acceptable salts thereof, wherein:



each R^1 and R^4 independently are H, CH_3or CH_2CH_3;
R^2 and R^3 are H; each A independently is O or S;
XS and Y independently are H or NO_2,
each p is 0;
n is 2 or 3.

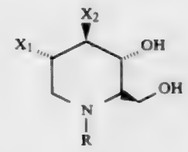
5,206,251

2- AND 3- AMINO AND AZIDO DERIVATIVES OF 1,5-IMINOSUGARS

Ish K. Khanna, Vernon Hills; Richard A. Mueller, Glencoe, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 1, 1992, Ser. No. 861,696
Int. Cl.[5] A61K *31/445*; C07D *211/56, 211/58*
U.S. Cl. 514—315 **8 Claims**

1. A compound selected from the group consisting of derivatives of 1-deoxynojirimycin having an azido substituent at C-2 represented by the formula



wherein
R=H, alkyl, and 4,4,4-trifluorobutyl
$X_1=N_3$;
X_2=OH.

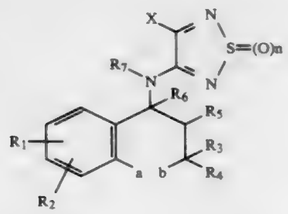
5,206,252

THIADIAZOLYL-AMINO DERIVATIVES OF BENZOPYRANS AND INDANES

John A. Butera, Kendall Park, and Jehan F. Bagli, Princeton, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1992, Ser. No. 880,433
Int. Cl.[5] C07D *417/12, 285/10*; A61K *31/41*
U.S. Cl. 514—362 **18 Claims**

1. A compound of the formula:



wherein:
R_1 and R_2, independent from each other, are selected from the following: C_{1-6} perfluoroalkoxy, C_{1-6} perfluoralkyl, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxyl, C_{2-6} alkoxycarbonyl, nitro, cyano, halogeno, C_{1-6} alkylsulfonamido, C_{1-6} perfluoroalkylsulfonamido, amino, C_{2-6} alkanoylamino, C_{2-6} perfluoroalkanoylamino, C_{1-12} mono- or di-alkylamino, C_{1-6} alkylsulfonyl, C_{6-12} arylsulfonyl, carboxyl, C_{2-12} mono- or di-alkylcarbamoyl, or hydrogen;
a and b together form an —O— linkage or a direct bond;
R_3 and R_4, independent from each other, are C_{1-6} alkyl when a and b form an —O— linkage or, H or C_{1-6} alkyl when a and b form a direct bond;
either R_5 is hydrogen, hydroxyl, C_{26} alkanoyloxy, C_{7-12} aroyloxy, carbamoyloxy, formyloxy, C_{2-6} alkoxycarbonyloxy, mono or di C_{2-12} alkylcarbamoyloxy, and R_6 is hydrogen, or R_5 and R_6 together are a bond;
R_7 is hydrogen, C_{1-6} alkyl, C_{1-6} alkanocarbonyl, or C_{1-6} alkanosulfonyl;
X is selected from the following:
—NR_8R_9, wherein R_8 and R_9, independent from each other are hydrogen, C_{1-6} alkyl, C_{2-6} alkylcarbonyl, C_{7-12} arylalkyl, thienylmethyl, pyridinylmethyl, piperazinylmethyl, or pyrimidinylmethyl, or R_8 and R_9 taken together are polymethylene of 3-10 carbon atoms or R_8 and R_9 taken with the nitrogen atom to which they are attached complete a piperazine, morpholine, pyrrolidine, pyrrolidinone, imidazole, imidazolone, piperidine or piperidinone ring structure;
or —OR_{10}, wherein R_{10} is hydrogen, C_{1-6} alkyl or C_{2-6} alkylcarbonyl; and n is an integer from 0–2;
or a pharmaceutically acceptable salt thereof.

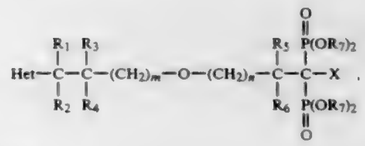
5,206,253

DISPHOSPHONIC ACID DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS

Elmar Bosies, Weinheim, and Frieder Bauss, Lambsheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim, GmbH, Mannheim, Fed. Rep. of Germany

PCT No. PCT/EP90/00798, § 371 Date Nov. 25, 1991, § 102(e) Date Nov. 25, 1991, PCT Pub. No. WO90/14348, PCT Pub. Date Nov. 29, 1990
PCT Filed May 18, 1990, Ser. No. 776,407
Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917153
Int. Cl.[5] A61K *31/41, 31/42, 31/415*; C07F *9/06*
U.S. Cl. 514—363 **6 Claims**

1. Diphosphonates having the general formula I



(I)

in which
Het is selected from the group consisting of a pyrazolyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, dithiazolyl and tetrazolyl ring as well as their dihydro and tetrahydro derivatives which ring can be partially hydrogenated and is unsubstituted or substituted at least once by C_1–C_6 alkyl, halogen, amino or CF_3,
R_1–R_7 are each independently hydrogen or C_1–C_5 alkyl,
X is hydrogen, OH or —NR_8R_9, in which R_8 and R_9 are, independent hydrogen or C_1–C_5 alkyl,
m and n are independently 0, 1 or 2, and
their pharmacologically safe salts and optically active forms.

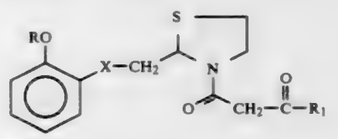
5,206,254

β-CARBONYL-CARBOXYAMIDES OF 1,3-THIAZOLIDINES

Carmelo A. Gandolfi; Roberto Di Domenico; Silvano Spinelli; Licia Gallico; Bruno Lumachi, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Mannheim Italia S.p.A., Milan, Italy

PCT No. PCT/EP89/00205, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO89/08648, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 2, 1989, Ser. No. 549,011
Claims priority, application Italy, Mar. 17, 1988, 19813 A/88
Int. Cl.[5] C07D *277/04, 417/06, 417/12*; A61K *31/425*
U.S. Cl. 514—365 **7 Claims**

1. Compounds of formula I:



(I)

wherein:
R is hydrogen, a linear or branched C_1–C_4-alkyl, allyl or propargyl;
X is O, CH_2 or S;
R_1 is selected in the group of —$(CH_2)_nRa$, hydroxy, —O—$(CH_2)_nRa$, —NRbRc, —NH c$(CH_2)_m$—NRbRc;
Ra is hydrogen, a linear or branched C_1–C_4-alkyl, phenyl, p-methoxy-phenyl, 3,4,5-trimethoxyphenyl, B-pyridyl, cyclopentyl or cyclohexyl;

Rb and Rc, that can be the same or different are selected independently in the group of hydrogen, linear or

lower alkanoyloxy; amino; lower alkanoylamino; nitro, lower alkanoyl, arylcarbonyl, carboxy, lower alkoxycarbonyl, car-

Ar represents a substituted 2,4-disubstituted phenyl group of the formula

c) nitro or amino;
d) a

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Rb and Rc, that can be the same or different are selected independently in the group of hydrogen, linear or branched C_1–C_4-alkyl, cyclohexyl cyclopentyl, benzyl, hexahydrobenzyl, α,β or γ-pyridylmethyl or Rb and Rc taken together with the N atom to which they are bound can form a morpholino, piperidino or piperazino residue for formula Rd—$N(CH_2—CH_2)_2$—N— wherein Rd is hydrogen, linear or branched C_1–C_4-alkyl, benzyl, hexahydrobenzyl, $(C_6H_5)_2CH$—, $(p—F—C_6H_4)_2CH$ or B-pyridylmethyl;

m is zero or an integer from 1 to 3 and n is 2 or 3.

5,206,255

HETEROCYCLIC COMPOUND

Masaru Ubasawa; Shuitiro Kadowaki, both of Yokohama, and Yoshio Hayashi, Ushiku, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

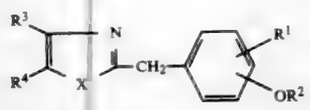
Filed Sep. 26, 1990, Ser. No. 588,549

Claims priority, application Japan, Sep. 29, 1989, 1-254530

Int. Cl.[5] C02D *263/32;* A61K *31/42*

U.S. Cl. 514—374 **9 Claims**

1. A heterocyclic compound represented by the following formula (I):



wherein X represents an oxygen atom; R^1 represents a hydrogen atom or a halogen atom; R^2 represents a C_2–C_{10} alkoxyalkyl group, C_3–C_{15} alkenyl group, C_7–C_{12} aralkyl group, C_8–C_{18} aralkyloxyalkyl group, C_7–C_{12} aryloxyalkyl group, C_3–C_{10} alkynyl group, C_4–C_{12} alkadienyl group, C_6–C_{18} alkatrienyl group, C_6–C_{12} alkadiynyl group, or C_6–C_{12} alkatriynyl group, wherein said aryloxyalkyl group, alkynyl group, alkadienyl group, alkatrienyl group, alkadiynyl group and alkatriynyl group is unsubstituted or has at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 alkyl group, C_1–C_4 halogenated alkyl group, phenyl group, hydroxyl group and C_1–C_4 alkoxy group; and each of R^3 and R^4 independently represents a hydrogen atom, C_1–C_6 alkyl group, phenyl group or tolyl group, or R^3 and R^4 may be combined together to form a benzene ring which may have at least one halogen atom; or a pharmaceutically acceptable salt thereof.

5,206,256

NAPHTHALENE DERIVATIVES

Marc Lang, Rixheim, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

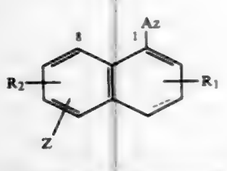
Filed Apr. 19, 1991, Ser. No. 687,802

Claims priority, application Switzerland, Apr. 20, 1990, 1339/90

Int. Cl.[5] A61K *31/41;* C07D *249/08, 249/12*

U.S. Cl. 514—383 **10 Claims**

1. A compound of formula I



(I)

wherein the dotted line indicates the presence or absence of an additional bond, Az is 1,2,4-triazolyl bonded by way of a ring nitrogen atom, said triazolyl being unsubstituted or substituted at carbon atoms by lower alkyl, aryl-lower alkyl, trifluoromethyl, lower alkoxy, halogen or hydroxy, Z is C_3–C_8cycloalkyl, aryl-lower alkyl, hydroxy, aryl-lower alkoxy, aryloxy; lower alkanoyloxy; amino; lower alkanoylamino; nitro, lower alkanoyl, arylcarbonyl, carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, N-arylcarbamoyl, cyano, mercapto, lower alkylthio, lower alkylsulfonyl, sulfemoyl, N-lower alkylsulfamoyl or N,N-di-lower alkylsulfamoyl, and each of R_1 and R_2 independently of the other is hydrogen or one or more of the substituents selected from lower alkyl, trifluoromethyl, C_3–C_8cycloalkyl, aryl-lower alkyl, hydroxy, lower alkoxy, aryl-lower alkoxy, aryloxy; lower alkanoyloxy; halogen, amino; lower alkanoylamino; nitro, lower alkanoyl, arylcarbonyl, carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, N-arylcarbamoyl, cyano, mercapto, lower alkylthio, lower alkylsulfonyl, sulfamoyl, N-lower alkylsulfamoyl or N,N-di-lower alkylsulfamoyl, with the provision that neither Z nor R_2 is a hydroxy substituent in the 8-position, or a salt thereof; in which aryl is phenyl or naphthyl which may be unsubstituted or substituted by one or two substituents from the group consisting of lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy, nitro, amino, halogen, trifluoromethyl, carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, cyano, lower alkanoyl, lower alkylsulfonyl, sulfamoyl, N-lower alkylsulfamoyl and N,N-di-lower alkylsulfamoyl.

5,206,257

PESTICIDAL METHOD USING 2-PHENYLIMIDAZOLE DERIVATIVES

Susan M. Cramp, and Leslie R. Hatton, both of Chelmsford, England, assignors to May & Baker Limited, Essex, England

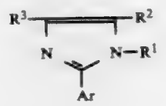
Continuation of Ser. No. 163,868, Mar. 3, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 488,108

Claims priority, application United Kingdom, Mar. 5, 1987, 8705183; Oct. 15, 1987, 8724192

Int. Cl.[5] A01N *43/50*

U.S. Cl. 514—398 **5 Claims**

1. A method for the control of arthropod pests at an infected locus which comprises treating said locus with an arthropodicidally effective amount of a 2-phenylimidazole derivative of the formula (I):

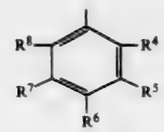


I

wherein

R^1 represents the hydrogen atom or a straight- or branched-chain alkyl group having from 1 to 6 carbon atoms, which is optionally substituted by a straight- or branched-chain alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl group having from 1 to 6 carbon atoms, a cyano group, a carboxy group or a straight- or branched-chain alkoxycarbonyl group having from 2 to 7 carbon atoms; R^2 and R^3, which can be the same or different, each represents a hydrogen atom, a halogen atom, a nitro group, a carboxy group, a cyano group, a straight- or branched-chain alkoxycarbonyl or alkanoyl group having from 2 to 7 carbon atoms, a carbamoyl or sulphamoyl group which can be substituted by one or two straight- or branched-chain alkyl groups each having from 1 to 6 carbon atoms, an amino group which can be substituted on the nitrogen atom by one or two substituents selected from the group consisting of straight- and branched-chain alkyl groups having from 1 to 6 carbon atoms and straight- and branched-chain alkoxycarbonyl and alkanoyl groups having 2 to 7 carbon atoms, or represents a group R, RO, RS, RSO or RSO_2 in which R represents a straight- or branched-chain alkyl group having 1 to 6 carbon atoms which is optionally substituted by one or more halogen atoms; and

Ar represents a substituted 2,4-disubstituted phenyl group of the formula



II

wherein R^4 and R^6, which can be the same or different, each represents a halogen atom or a group R, RO, RS, RSO or RSO_2 in which R represents a straight-or branched-chain alkyl group having 1 to 6 carbon atoms which is substituted by one or more halogen atoms;

and R^5, R^7 and R^8, which can be the same or different, each represents a substituent as defined above for R^4, a hydrogen atom, a hydroxy group, a carboxy group, a nitro group, a cyano group, an amino group, a straight- or branched-chain alkylamino group having from 1 to 6 carbon atoms which can be substituted on the nitrogen atom by a straight- or branched-chain alkyl group having 1 to 6 carbon atoms or by a straight- or branched-chain alkoxycarbonyl or alkanoyl group having 2 to 7 carbon atoms; or an arthropodicidally acceptable salt thereof; with the exclusion of compounds in which R^2 and R^3 simultaneously represent hydrogen atoms.

5,206,258

USE OF HETEROARYL-3-OXO-PROPANENITRILE DERIVATIVES IN TREATING CLINICAL WHEREIN MYELOPOIESIS SUPPRESSION OCCURS

Gianfederico Doria, Milan; Anna M. Isetta, Rho; Rinaldo Ferreccio, Gorgonzola; Mario Ferrari, Milan; Maria C. Fornasiero, Vigevano, and Domenico Trizio, Cassina Rizzardi, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

PCT No. PCT/EP90/01129, § 371 Date Mar. 12, 1991, § 102(e) Date Mar. 12, 1991, PCT Pub. No. WO91/01309, PCT Pub. Date Feb. 7, 1991

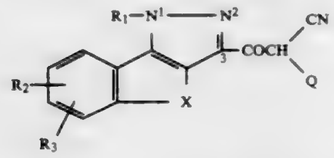
PCT Filed Jul. 11, 1990, Ser. No. 663,843

Claims priority, application United Kingdom, Jul. 17, 1989, 8916290.3

Int. Cl.[5] A61K *31/415;* C07D *231/54, 49/052, 495/04*

U.S. Cl. 514—403 **4 Claims**

1. A method for the treatment of a mammal suffering from suppression of myelopoiesis caused by cancer chemotherapy, cancer radiation therapy, immunosuppressant therapy following an organ or tissue transplantation, immunosuppressant therapy for an autoimmune disease, an autologous or allogenic bone marrow transplant, a burn, exposure to radiation or to a chemical which suppresses myelopoiesis, aplastic anemia, myelodysplastic syndrome or a congenital or acquired bone marrow disorder, the said method comprising administering thereto a therapeutically effective amount of a heteroaryl-3-oxopropanenitrile derivative of formula (I):



(I)

wherein

X represents $—CH_2—$, $—O—CH_2—$or $—S—CH_2—$;

R_1 represents phenyl, the phenyl being unsubstituted or substituted by one or two halogen atoms;

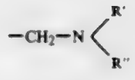
R_2represents:

a) hydrogen, halogen or C_1–C_6 alkyl;

b) C_1–C_6 alkoxy;

c) nitro or amino;

d) a



group

wherein R' and R'', taken together with the nitrogen atom to which they are linked, form a heterocyclic ring which is selected from the group consisting of N-pyrrolidinyl, N-piperazinyl, hexahydroazepin-1-yl, thiomorpholino, morpholino and piperidino which is unsubstituted or substituted by C_1–C_6 alkyl;

e) C_2–C_7 alkoxycarbonyl;

f) an $—NHCO(CH_2)_nCOOR$ group, wherein n is zero and R is C_1–C_6 alkyl; or

g) a C_2–C_7 alkoxycarbonyl group substituted by a

group, wherein R' and R'' are each a C_1–C_6 alkyl group; R_3 is as previously defined for R_2 above under a), b) and c); Q represents a

group

wherein R_a represents hydrogen and R_b represents a $—(A)_m—R_5$ group wherein m is zero or 1, A is C_1–C_6 alkylene and R_5 is phenyl, unsubstituted or substituted by one or two substituents independently selected form halogen, CF_3, and nitro; or a pharmaceutically acceptable salt thereof.

5,206,259

AMIDE COMPOUND AND ITS PRODUCTION AND USE

Akira Shuto; Hiroi Kisida, both of Takarazuka; Naoto Meki, Misawa; Tomotoshi Imahase, Ibaraki; Hiroaki Fujimoto, and Kimitoshi Umeda, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

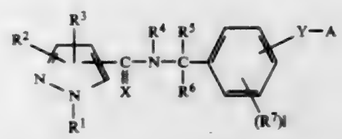
Continuation-in-part of Ser. No. 506,336, Apr. 9, 1990, abandoned. This application Oct. 16, 1991, Ser. No. 776,042

Claims priority, application Japan, Apr. 19, 1989, 1-101203; Dec. 25, 1989, 1-337698

Int. Cl.[5] C07D *231/14;* A01N *43/56*

U.S. Cl. 514—406 **10 Claims**

1. An amide compound represented by the formula of



wherein R^1 is a hydrogen atom, an alkyl group of 1–4 carbons or a haloalkyl group of 1–4 carbons; R^2 and R^3 independently are a hydrogen atom, a halogen atom, an alkyl group of 1–6 carbons, a cycloalkyl group of 3–6 carbons, a haloalkyl group of 1–6 carbons, a phenyl group or an alkoxy group of 1–6 carbons,

R^4 is a hydrogen atom, an alkyl group of 1–4 carbons or a

carbons, a haloalkylsulfonyloxy group of 1–4 carbons,

R^2 is $—CH_2R^8$;

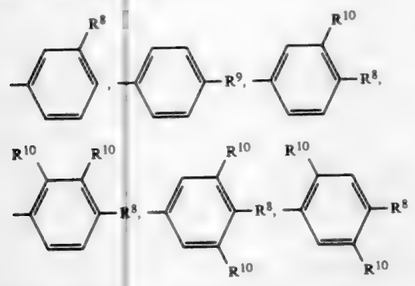
5,206,263

ACIDIC POLYCYCLIC ETHER USEFUL AS AN

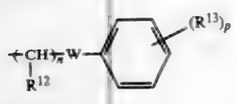
R^4 is a hydrogen atom, an alkyl group of 1–4 carbons or a group represented by the formula of

$$-S(O)_mR^{11};$$

R^5 is a hydrogen atom, an alkyl group of 1–4 carbons or a cyano group;
R^6 is a hydrogen atom or an alkyl group of 1–4 carbons;
R^7 is a same or different, a hydrogen atom, a halogen atom or an alkyl group of 1–4 carbons;
A is the group represented by the formula of

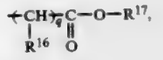


R^8 is a halogen atom, an alkyl group of 1–8 carbons, a haloalkyl group of 1–8 carbons, a haloalkoxy group of 1–8 carbons, an alkylthio group of 1–8 carbons, a haloalkylthio group of 1–8 carbons, an alkenylthio group of 2–8 carbons, a haloalkenylthio group of 2–8 carbons, an alkynylthio group of 2–8 carbons, an alkylsulfinyl group of 1–8 carbons, an alkylsulfonyl group of 1–8 carbons;
R^9 is a haloalkoxy group of 1–8 carbons, an alkylthio group of 1–8 carbons, a haloalkylthio group of 1–8 carbons, an alkenylthio group of 2–8 carbons, a haloalkenylthio group of 2–8 carbons, an alkynylthio group of 2–8 carbons, an alkylsulfinyl group of 1–8 carbons, an alkylsulfonyl group of 1–8 carbons,
Each R^{10} is a same or different, a halogen atom, an alkyl group of 1–8 carbons, a haloalkyl group of 1–8 carbons; provided that R^8 and R^{10} may be linked at their ends, when they are adjacent each other, to form a saturated five-membered ring which contains 0–2 oxygen atom therein; R^{11} is is an alkyl group of 1–18 carbons, a haloalkyl group of 1–18 carbons, or a group represented by the formula of



or the formula of

R^{12} is a hydrogen atom, an alkyl group of 1–4 carbons or a haloalkyl group of 1–4 carbons;
R^{13} is a same or different, a hydrogen atom, a halogen atom, an alkyl group of 1–4 carbons, a haloalkyl group of 1–4 carbons, an alkoxy group of 1–4 carbons, a haloalkoxy group of 1–4 carbons, an alkythio group of 1–4 carbons, a haloalkylthio group of 1–4 carbons, an alkylsulfinyl group of 1–4 carbons, a haloalkylsulfinyl group of 1–4 carbons, an alkylsulfonyl group of 1–4 carbons, a haloalkylsulfony group of 1–4 carbons, an alkylsulfonyloxy group of 1–4 carbons, a haloalkylsulfonyloxy group of 1–4 carbons, nitro or cyano group;
R^{14} is an alkyl group of 1–8 carbons, a haloalkyl group of 1–8 carbons, an alkoxyalkyl group of 3–8 total carbons or a (haloalkoxy)alkyl group of 3–8 total carbons;
R^{15} is an alkyl group of 1–8 carbons, a haloalkyl group of 1–8 carbons, an alkoxyalkyl group of 3–8 total carbons, a (haloalkoxy)alkyl group of 3–8 total carbons or a group represented by the formula of



provided that R^{14} and R^{15} may be linked at their ends to form a saturated or unsaturated five- or six-membered ring which contains 0–2 oxygen or sulfur atoms therein and may be substituted with a halogen atom, an alkyl group of 1–4 carbons, an alkoxy group of 1–4 carbons or an alkylthio group of 1–4 carbons;
R^{16} is a hydrogen atom, an alkyl group of 1–8 carbons, a haloalkyl group of 1–8 carbons, an alkoxyalkyl group of 2–8 total carbons or a (haloalkoxy)alkyl group of 2–8 total carbons; R^{17} is an alkyl group of 1–18 carbons, a haloalkyl group of 1–18 carbons, an alkoxyalkyl group of 3–18 total carbons, a (haloalkoxy)-alkyl group of 3–18 total carbons, an alkoxyhaloalkyl group of 3–18 total carbons, an alkylthioalkyl group of 3–18 total carbons, a (haloalkylthio)alkyl group of 3–18 total carbons, a cycloalkyl group of 3–8 carbons which may be substituted with an alkyl group of 1–10 carbons, a cycloalkyl group of 3–8 carbons substituted with a haloalkyl group of 1–10 carbons, a halocycloalkyl group of 3–8 carbons which may be substituted with an alkyl group of 1–10 carbons, a cycloalkyl group of 3–8 carbons substituted with an alkoxy group of 1–10 carbons, or a cycloalkyl group of 3–8 carbons substituted with a haloalkoxy group of 1–10 carbons;
W is an oxygen atom, a sulfur atom, a sulfinyl group or single bond;
l is an integer of 1 or 2;
m is an integer of 0–2;
n is an integer of 1–4;
p is an integer of 1–5;
q is an integer of 0–10;
X is an oxygen atom or a sulfur atom; Y is an oxygen atom, a sulfur atom, a sulfinyl, sulfonyl or methylene group.

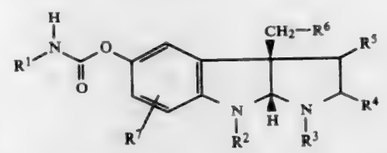
5,206,260

HEXAHYDROPYRROLO[2,3-B]INDOLE DERIVATIVES

Martin Hichens, Lansdale; Hanumath G. P. Kari, Hatfield, and Kamlesh P. Vyas, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 7, 1991, Ser. No. 789,223
Int. Cl.[5] C07D *487/04*; A61K *31/405*
U.S. Cl. 514—411 15 Claims

1. A compound of Formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:
R^1 is selected from the group consisting of:
(1) $-(CH_2)_6CH_3$
(2) $-C_7H_{14}OH$,
(3) $-(CH_2)_4-CO_2H$, and
(4) $-(CH_2)_2-CO_2H$;

R^2 is $-CH_2R^8$;
R^3 is $-CH_2R^9$;
R^4, R^5, R^6, R^7, R^8 and R^9 are independently selected from: hydrogen and hydroxy;
with the proviso that if R^4, R^5, R^6, R^7, R^8 and R^9 are hydrogen, then R^1 is other than $-(CH_2)_6CH_3$.

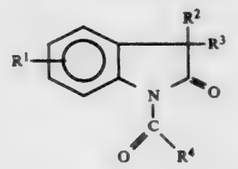
5,206,261

OXINDOLE DERIVATIVE

Akihiro Kawaguchi, Honjo; Atsushi Sato; Makoto Kajitani, both of Saitama; Mitsugi Yasumoto, Honjo, and Junji Yamamoto, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

PCT No. PCT/JP90/00945, § 371 Date Mar. 20, 1991, § 102(e) Date Mar. 20, 1991, PCT Pub. No. WO91/01306, PCT Pub. Date Feb. 7, 1991
PCT Filed Jul. 23, 1990, Ser. No. 663,960
Claims priority, application Japan, Jul. 25, 1989, 1-191822
Int. Cl.[5] C07D *209/34*; A01K *31/40*
U.S. Cl. 514—418 7 Claims

1. An oxindole derivative represented by the formula



(I)

wherein R^1 is hydrogen atom, halogen atom, lower alkyl group or lower alkoxyl group, R^2 is hydrogen atom or lower alkyl group, R^3 is $-CH_2-R^5$ group, R^5 is lower alkyl; C_{3-6} cycloalkyl, pyridyl, benzodioxanyl and phenyl optionally substituted with 1 to 3 substituents selected from the group consisting of halogen, lower alkyl, lower alkoxyl, hydroxyl, diethylamino, cyano, nitro, trifluoromethyl and benzyloxy, R^2 and R^3 may form together=CH—R^5 (R^5 being the same as above), R^4 is 1-propylbutyl group; pyridyl group; or phenyl group which may be substituted by lower alkoxyl group, halogen atom, diethylamino group, benzyloxy group, trifluoromethyl group, nitrile group, nitro group or lower alkyl group.

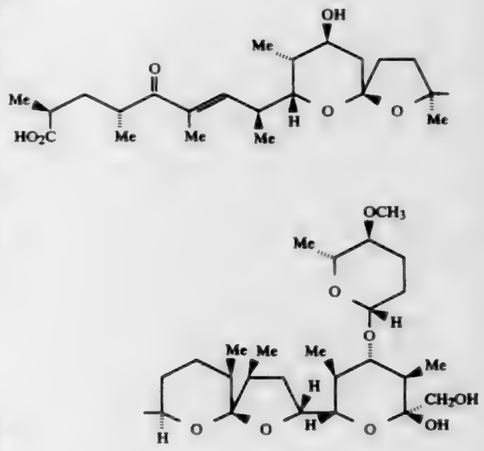
5,206,263

ACIDIC POLYCYCLIC ETHER USEFUL AS AN ANTICOCCIDIAL AGENT AND AS A GROWTH PROMOTANT

John P. Dirlam, Gales Ferry; Walter P. Cullen, East Lyme, both of Conn.; Hiroshi Maeda, and Junsuke Tone, both of Chita, Japan, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US87/01487, § 371 Date Dec. 5, 1989, § 102(e) Date Dec. 5, 1989
PCT Filed Jun. 24, 1987, Ser. No. 438,506
Int. Cl.[5] C07D *311/96*; C12P *17/18*; A61K *31/35*
U.S. Cl. 514—460 8 Claims

1. A compound of the absolute stereochemical formula



wherein Me=CH_3, or a pharmaceutically acceptable cationic salt thereof.

5,206,262

SOLUBLE SALTS OF IBUPROFEN AND NAPROXEN WITH N-(2-HYDROXYETHYL) PYRROLIDINE AND PHARMACEUTIC COMPOSITIONS CONTAINING SAID SALTS

Elisabetta Donati, Breccia, Italy; Irina Rapaport, Rovio, Switzerland, and Paolo Lualdi, Grandate, Italy, assignors to Altergon S.A., Lugano, Switzerland

Filed Jun. 23, 1992, Ser. No. 902,824
Claims priority, application Italy, Jul. 1, 1991, 001804 A/91
Int. Cl.[5] A61K *31/40*; C07D *207/06*
U.S. Cl. 514—428 8 Claims

1. Soluble salt, in the crystalline form, of a non-steroid anti-inflammatory drug (NSAID) selected from the group consisting of ibuprofen (2-(4-isobutylphenyl)proprionic acid) and naproxen (6-methoxy-α-methyl-2-naphthalenacetic acid) with N-(2-hydroxyethyl)pyrrolidine.

5,206,264

USE OF DISULFIRAM TO PREVENT CARDIOVASCULAR DAMAGE

Paul J. Marangos, Encinitas, Calif., assignor to Cypros Pharmaceutical Corporation, San Diego, Calif.

Filed Nov. 4, 1991, Ser. No. 787,062
Int. Cl.[5] A61K *31/27*, *31/16*, *31/105*
U.S. Cl. 514—483 3 Claims

1. A method of reducing hypoxic or ischemic damage to the cardiovascular system of a mammal, comprising the administration to a susceptible mammal of a therapeutically effective quantity of a compound selected from the group consisting of disulfiram, a pharmaceutically acceptable and effective salt of disulfiram, and a pharmaceutically acceptable and effective analog of disulfiram.

5,206,265

IRON CITRATE COMPLEX, PROCESS FOR ITS

C_1–C_4-alkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_2-haloalkoxy, halogen, cyano or nitro,

5,206,270

METHOD OF INHIBITING MELANOMA CELLS

5,206,273

COMPOSITIONS AND METHOD FOR IMPROVING THE SLIP OF POLYOLEFINS AND THE ADHESION OF

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5,206,265

IRON CITRATE COMPLEX, PROCESS FOR ITS PRODUCTION, AND ITS PHARMACEUTICAL

Hans-Jörg Vidic, Berlin, Fed. Rep. of Germany, and Eraldo Antonini, deceased, late of Rome, Italy by Virginia Antonini, Giovanni Antonini, Paola Antonini De Somma, Andrea Antonini, Cristina Antonini, executors , assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE88/00568, § 371 Date Mar. 23, 1992, § 102(e) Date Mar. 23, 1992, PCT Pub. No. WO89/02426, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 9, 1988, Ser. No. 646,789
Claims priority, application Italy, Sep. 14, 1987, 21904 A/87
Int. Cl.[5] A61K *31/295*; C07F *15/02*
U.S. Cl. 514—502 5 Claims

1. An iron citrate micellar complex, which is a brown solid having the properties set out below:
(a) average composition by weight of about: 10.6% carbon, 2.62% hydrogen, 50.2% oxygen, 32% iron, 4.6% sodium;
(b) molecular weight about 33,000 (HPLC-LALLS measurement);
(c) empirical formula $(C_{31}H_{92}O_{110}Fe_{20}Na_7)_n$ wherein n=9–10;
(d) soluble in water, glycerol-water mixtures, practically insoluble in conventional organic solvents;
(e) ultraviolet absorption in water; λmax (470 nm); $E_{1\ cm}^{1\%}$=23–26.5;
(f) resistance (1% strength solution) 600–750 Ω.cm;
(g) turbidity pH (1% strength solution) 2.6–2.8.

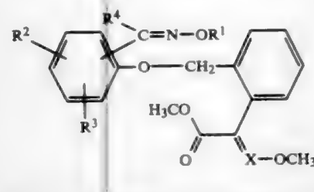
5,206,266

SUBSTITUTED OXIME ETHERS AND FUNGICIDES WHICH CONTAIN THESE COMPOUNDS

Franz Schuetz, Ludwigshafen; Hubert Sauter, Mannheim; Albrecht Harreus, Ludwigshafen; Wolfgang Rohr, Wachenheim; Michael Hepp, Ladenburg; Siegbert Brand, Weinheim; Bernd Wenderoth, Lampertheim; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 484,544, Feb. 26, 1990. This application May 21, 1992, Ser. No. 886,085
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907629; Nov. 10, 1989, 3937457
Int. Cl.[5] A01N *37/10*
U.S. Cl. 514—522 1 Claim

1. A process for combating fungi, wherein the fungi, or the materials, plants, seed or the soil threatened by fungus attack are treated with a fungicidally effective amount of a substituted oxime ether of the general formula I



I

where R^1 is C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_4-alkynyl, C_1–C_6-haloalkyl, C_3–C_6-haloalkenyl, C_1–C_4-alkoxy-C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_4-alkyl, cyano-C_1–C_6-alkyl, C_1–C_6-alkoxycarbonyl-C_1–C_6-alkyl, aryl-C_1–C_6-alkyl, pyridyl-C_1–C_6-alkyl, thienyl-C_1–C_6-alkyl aryl-C_3–C_6-alkenyl or aryloxy-C_1–C_6-alkyl, it being possible for the aromatic, pyridyl on thienyl ring to be substituted by one or more of the following: C_1–C_4-alkyl, C_1–C_2-haloalkyl, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy, C_1–C_2-haloalkoxy, halogen, aryl or aryloxy,
R^2 and R^3 are identical or different and are hydrogen, C_1–C_4-alkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_2-haloalkoxy, halogen, cyano or nitro,
R^4 is hydrogen, C_1–C_6-alkyl or aryl, it being possible for the aromatic ring to be substituted by one or more of the following: C_1–C_4-alkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_2-haloalkoxy, halogen, cyano or nitro, and
X is CH or N.

5,206,267

PAIN CONTROLLING COMPOSITION AND METHOD OF PREPARATION

Morton Shulman, 1115 Thorntree La., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 697,618, May 9, 1991, abandoned. This application Apr. 20, 1992, Ser. No. 870,767
Int. Cl.[5] A61M *31/24*
U.S. Cl. 514—536 26 Claims

1. A composition for producing pain relief in a body region by introduction of said composition under the skin, said composition consisting essentially of:
a sterile, stable suspension of butyl aminobenzoate in a non-toxic, carrying medium in which said butyl aminobenzoate is substantially insoluble;
said carrying medium consisting essentially of water as the major constituent and a suspending agent composed of (a) polyethylene glycol having a molecular weight of at least about 1000 and (b) a wetting agent for said butyl aminobenzoate;
said butyl aminobenzoate being present in effective amounts up to about 15 wt. % of said suspension;
said polyethylene glycol being present in an amount sufficient to reduce substantially the tendency of said butyl aminobenzoate to settle in said carrying medium;
said wetting agent being present in an amount sufficient to prevent said butyl aminobenzoate from floating in said carrying medium;
the ratio of (a) said polyethylene glycol to (b) said wetting agent being at least about 50/1.

5,206,268

MEDICAMENTS

Victoria S. Latter; Winston E. Gutteridge, and Alan T. Hudson, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 15, 1989, Ser. No. 394,224
Claims priority, application United Kingdom, Aug. 16, 1988, 8819478; Aug. 16, 1988, 8819479; Aug. 16, 1988, 8819480
Int. Cl.[5] A61K *31/225*
U.S. Cl. 514—548 2 Claims

1. A method of treating malaria in a mammal comprising administering to said mammal an effective antimalarial amount of a compound 2-[trans-4-(4-chlorophenyl)cyclohexyl]-1,3,4triacetoxynaphthalene.

5,206,269

HIGHLY CONCENTRATED AMINO ACID SOLUTION

Josef K. Ludwig, Vernon Hills, and Douglas G. Johnson, Grayslake, both of Ill., assignors to Clintec Nutrition Co., Deerfield, Ill.

Filed Mar. 20, 1992, Ser. No. 854,227
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—561 15 Claims

1. A stable amino acid solution having a nutritionally appropriate balance of amino acids comprising a total amino acid concentration equal to or greater than 18% (wt/vol), the solution including ionic and nonionic amino acids, and wherein the ratio (wt/wt) of nonionic to ionic amino acids, excluding branched chain amino acids, is 0.57 to 0.65.

5,206,270

METHOD OF INHIBITING MELANOMA CELLS

Reiko F. Irie, Los Angeles, Calif., assignor to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Mar. 5, 1992, Ser. No. 846,087
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—562 2 Claims

1. A method of inhibiting melanoma cell proliferation in a mammal, which comprises administering to the mammal a melanoma cell inhibiting effective amount of 2-allylcysteine or a pharmaceutically acceptable salt thereof.

5,206,271

EXPANDABLE STYRENE POLYMERS, AND AROMATIC-RESISTANT FOAMS PRODUCED THEREFROM

Klaus Hahn, Kirchheim; Uwe Guhr, Gruenstadt; Hans Hintz, Ludwigshafen, and Hans Hoenl, Obersuelzen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 606,314, Oct. 31, 1990. This application Mar. 24, 1992, Ser. No. 856,756
Claims priority, application Japan, Nov. 3, 1989, 3936596
Int. Cl.[5] C08J *9/16*
U.S. Cl. 521—59 2 Claims

1. A foam which has a density of from 0.005 to 0.1 g/cm^3 and contains
a) from 10 to 90% by weight of uncrosslinked polystyrene and/or an uncrosslinked styrene copolymer containing 50% by weight or more of copolymerized styrene,
b) from 10 to 90% by weight of a crosslinked styrene-diene copolymer containing from 2–45% of diene, and, optionally,
c) conventional additives in effective amounts.

5,206,272

IMPRESSION MATERIAL COMPOSITIONS

Sunao Urabe, and Shouichi Narui, both of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Tokuyama, Japan

Filed Jun. 18, 1991, Ser. No. 717,009
Claims priority, application Japan, Jun. 18, 1990, 2-157659
Int. Cl.[5] A61K *6/10*; C08L *5/04*
U.S. Cl. 523—109 23 Claims

1. An impression material composition comprising:
(A) 100 parts by weight of a water soluble alginate salt,
(B) 5 to 100 parts by weight of an unsaturated carboxylic acid polymer or its water-soluble salt,
(C) 30 to 500 parts by weight of anhydrous or hydrated calcium sulfate, and
(D) 3 to 100 parts by weight of an oxide or hydroxide of a divalent or polyvalent metal which is capable of converting the unsaturated carboxylic acid polymer (B) into its insoluble form, through its reaction with the unsaturated carboxylic acid polymer;
said composition being characterized in that, it is easily kneaded with water, and after kneading with water the viscosity of the kneaded material increases in two stages, in which
(1) in the first stage a gel of a water-insoluble, unsaturated carboxylic acid polymer is formed by reaction of above component (B) with the component (D), and thereafter,
(2) in the second stage a hardened product of a water-insoluble alginate is formed by reaction of above component (A) with the component (C).

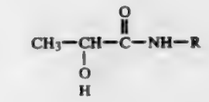
5,206,273

COMPOSITIONS AND METHOD FOR IMPROVING THE SLIP OF POLYOLEFINS AND THE ADHESION OF WATER BASED INKS TO POLYOLEFINS

Bing-Lin Chen, Germantown, and James A. Barker, Memphis, both of Tenn., assignors to Witco Corporation, New York, N.Y.

Filed Nov. 12, 1991, Ser. No. 791,562
Int. Cl.[5] C08J *3/28*; C08K *5/20*
U.S. Cl. 523—300 24 Claims

1. A composition of matter having improved slip and adhesion to water based inks comprising a polyolefin and an effective amount of at least one lactamide having the structural formula:



wherein R is alkenyl having from about 12 to about 22 carbon atoms.

5,206,274

AQUEOUS DISPERSION OF CATIONIC ADVANCED DIGLYCIDYL ETHER BLEND

Nancy A. Rao, and Richard A. Hickner, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 404,725, Sep. 8, 1989, Pat. No. 5,064,890, which is a division of Ser. No. 69,475, Jul. 2, 1987, Pat. No. 4,883,572. This application Jun. 21, 1991, Ser. No. 718,749
Int. Cl.[5] C08K *3/20*; C08L *63/02*
U.S. Cl. 523—404 4 Claims

1. A coating composition suitable for electrodeposition comprising
(I) an aqueous dispersion of an advanced epoxy cationic resin prepared from an epoxy resin composition having terminal oxirane groups which includes the step of converting oxirane groups to cationic groups by reacting a nucleophile with at least some of the oxirane groups of the epoxy resin composition wherein an organic acid and water are added during some part of this conversion; wherein said epoxy resin composition is a blend of
(A) an advanced epoxy resin obtained by reacting in the presence of a suitable catalyst
(1) a composition comprising
(a) from about 20 to 100 weight percent of a diglycidylether of an aliphatic diol essentially free of ether oxygen atoms; and
(b) from zero to about 80 weight percent of a diglycidylether of a dihydric phenol; and
(2) at least one dihydric phenol wherein components (1) and (2) are employed in such quantities that the resultant epoxide equivalent weight is from about 350 to about 10,000, and
a different epoxy-based resin wherein at some time during preparation of the composition, the resins are converted to cationic resins whereby there is obtained a blend of a cationic, advanced epoxy resin and a different cationic epoxy-based resin; said blend containing from about 10 to about 90 percent of (A) and from about 90 to about 10 percent of (B) based on the total weight of cationic resin and having a charge density of from about 0.2 to about 0.6 milliequivalent of charge per gram of resin; in combination with
(II) curing agent selected from a blocked polyisocyanate, an amine aldehyde resin, and a phenol aldehyde resin.

5,206,275

THERMOPLASTIC POWDER COATING COMPOSITION

Ralf Nickel, Bad Duerkheim; Hans-Juergen Kress, Ludwigshafen, and Hans-Juergen Wagner, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Lacke + Farben Aktiengesellschaft, Muenster-Hiltrup, Fed. Rep. of Germany

Filed Jul. 31, 1991, Ser. No. 738,744
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1990, 4024506
Int. Cl.[5] C08L *67/00*; C09D *5/03*
U.S. Cl. 523—414 10 Claims

1. A thermoplastic powder coating composition comprising
(A) a polyester containing carboxyl groups and
(B) a polyester containing hydroxyl groups,
wherein the polyester (A) is a polyester containing carboxyl groups and having an acid number of 10 to 100 mg of KOH/g, a glass transition temperature of 30° to 80° C. and a number average molecular weight of 1,000 to 10,000 and the polyester (B) is a polyester containing hydroxyl groups and having a hydroxyl number of 15 to 150 mg of KOH/g, a glass transition temperature of 30° to 80° C. and a number average molecular weight of 1,000 to 10,000, and the polyester (A) and the polyester (B) are present in the powder coating composition in such amounts that the ratio of the number of carboxyl groups to the number of hydroxyl groups is 0.5:1 to 1.5:1.

5,206,277

ELIMINATION OF FILM DEFECTS DUE TO SILICONE CONTAMINATION

Ronald J. Kessel, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 31, 1991, Ser. No. 738,744
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—387 10 Claims

1. A method of eliminating film defects due to silicone contamination on a substrate comprising
(A) applying to the substrate a film forming composition containing
(1) a film forming resin,
(2) a solvent for the film forming resin, and
(3) a silicone surfactant,
(B) drying the film forming composition to form a film on the substrate, and
(C) applying to the film a solvent which is capable of dissolving the silicone surfactant.

5,206,279

METHOD OF PREPARING AQUEOUS DISPERSIONS OF

5,206,282

MOLDING COMPOSITIONS COMPRISING

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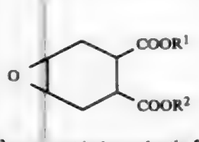
5,206,275

EXPANDABLE POWDER COATING COMPOSITION

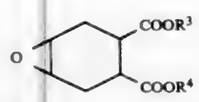
Masao Kubo, Koshigaya; Atumi Nakamura, Abiko; Tetsuo Miyake, Saitama; Katsuji Kitagawa, Kasukabe; Katsuya Sano, Chiryu; Kiyoshi Kittaka, Okazaki, and Tetsuya Sakakibara, Gamagoori, all of Japan, assignors to Somar Corporation, Japan

Filed Jun. 6, 1991, Ser. No. 710,203
Claims priority, application Japan, Jun. 8, 1990, 2-150701
Int. Cl.[5] C08K 5/15
U.S. Cl. 524—114 10 Claims

1. An expandable, powder coating composition comprising:
(a) a thermoplastic resin containing a hydroxyl group-containing polymer;
(b) a cross-linking agent containing a polyisocyanate compound which is capable of reacting with the hydroxyl groups of said polymer at a temperature higher than the melting point of said thermoplastic resin to crosslink said polymer and which is solid at room temperature;
(c) a blowing agent capable of decomposing and generating a gas when heated to a temperature higher than the melting point of said thermoplastic resin; and
(d) a mixture of solid and liquid plasticizers, said solid plasticizer being selected from the group consisting of triphenyl phosphate and a first ester having the following general formula:



wherein R^1 and R^2 represent independently from each other an alkyl group having 12 or more carbon atoms, said liquid plasticizer being selected from the group consisting of dioctyl phthalate and a second ester having the following general formula:



wherein R^3 and R^4 represent independently from each other an alkyl group having 1–10 carbon atoms.

5,206,276

FLAME RETARDANT FLEXIBILIZED POLYPHENYLENE ETHER COMPOSITIONS

Gim F. Lee, Jr., 11 Drawbridge Dr., Albany, N.Y. 12203

Continuation of Ser. No. 948,233, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 603,663, Apr. 26, 1984, Pat. No. 4,684,682, which is a continuation of Ser. No. 197,933, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 752,731, Dec. 21, 1976, abandoned. This application Nov. 9, 1987, Ser. No. 118,525
Int. Cl.[5] C08K 5/521, 5/523; C08L 53/07, 71/12
U.S. Cl. 524—151 16 Claims

1. A flame retardant, flexibilized thermoplastic composition which comprises, in admixture:
(a) a normally flammable polyphenylene ether resin;
(b) 65 to 100 parts by weight of a flame retardant aromatic phosphate plasticizer based upon 100 parts by weight of (a); and
(c) 10 to 100 parts by weight of a thermoplastic elastomer, based upon 100 parts by weight of (a), comprising an A-B-A^1 block copolymer wherein terminal blocks A and A^1 are polymeric units of a vinyl aromatic compound and center block B is a polymer of a conjugated diene.

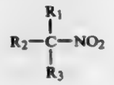
5,206,277

ELIMINATION OF FILM DEFECTS DUE TO HYDROGEN EVOLUTION DURING CATHODIC ELECTRODEPOSITION

Mark R. Winkle, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 585,428, Sep. 20, 1990. This application Jul. 1, 1991, Ser. No. 724,065
Int. Cl.[5] C08K 5/32
U.S. Cl. 524—259 5 Claims

1. An electrophoretically depositable polymer composition comprising an aqueous solution or emulsion of at least one polymer and a compound reduced by hydrogen produced during said deposition, wherein said compound reduced by hydrogen is selected from the group consisting of:
compounds characterized by the formula



wherein R_1 is hydrogen, or a C_1–C_{10} alkyl group, R_2 is hydrogen, a C_1–C_{10} alkyl group, an aromatic hydrocarbon group of hydroxyl substituted C_1–C_{10} alkyl group and R_3 is hydrogen, a C_1–C_{10} alkyl group, an aromatic hydrocarbon group, or a hydroxyl substituted C_1–C_{10} alkyl group and when R_1 and R_2 are both hydrogen, R_3 is hydrogen, a C_1–C_{10} alkyl group, an aromatic hydrocarbon group, or a hydroxyl substituted C_1–C_{10} alkyl group, when R_1 is hydrogen and R_2 is a C_1–C_{10} alkyl group or an aromatic hydrocarbon group, R_3 is a C_1–C_{10} alkyl group, an aromatic hydrocarbon group, or a hydroxyl substituted C_2–C_{10} alkyl group, when R_1 is hydrogen and R_2 is a hydroxyl substituted C_1–C_{10} alkyl group, R_3 is a hydroxyl substituted C_1–C_{10} alkyl group, when R_1 is a C_1–C_{10} alkyl group and R_2 is a C_1–C_{10} alkyl group or a hydroxyl substituted C_1–C_{10} alkyl group, R_3 is a hydroxyl substituted C_1–C_{10} alkyl group; nitrobenzene, nitrobenzene substituted with hydroxyl groups, C_1–C_{10} alkyl groups, or hydroxyl substituted C_1–C_{10} alkyl groups, furan and furan substituted with hydroxyl groups, C_1–C_{10} alkyl groups, or hydroxyl substituted C_1–C_{10} alkyl groups.

5,206,278

EXTRUDABLE POLYVINYL ALCOHOL COMPOSITIONS CONTAINING THERMOPLASTIC POLYETHYLENE OXIDE

Amir Famili, Schnecksville; Flan L. Marten, Macungie, and James F. Nangeroni, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 18, 1991, Ser. No. 779,218
Int. Cl.[5] C08K 5/06; C08L 29/04
U.S. Cl. 524—377 21 Claims

1. In a melt extrudable composition consisting essentially of melt extrudable polyvinyl alcohol and 1–30 wt % plasticizer, based on polyvinyl alcohol, which has been made melt extrudable by adding sufficient energy to the polyvinyl alcohol to both melt it and substantially eliminate the crystallinity in the melt while simultaneously removing energy from the melt at a rate sufficient to avoid decomposition of the polyvinyl alcohol, the improvement which comprises 5–95 wt % thermoplastic polyethylene oxide, based on polyvinyl alcohol, the polyethylene oxide having an average molecular weight from 100,000 to 2,000,000.

5,206,279

METHOD OF PREPARING AQUEOUS DISPERSIONS OF ETHYLENE/α,β-UNSATURATED CARBOXYLIC ACID INTERPOLYMERS

Michael E. Rowland, Lake Jackson, and Kenneth E. Springs, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 25, 1991, Ser. No. 646,134
Int. Cl.[5] C08K 5/05
U.S. Cl. 524—379 14 Claims

1. In a method of forming an aqueous dispersion of at least one ethylene/α,β-unsaturated carboxylic acid interpolymer comprising contacting the interpolymer(s) in a stirred aqueous medium with a mixture of bases, the improvement characterized by contacting the interpolymer with at least about 0.2 equivalents of base per mole of α,β-unsaturated carboxylic acid, said base being a mixture of monoethanolamine, diethanolamine or ammonium hydroxide and at least one alkali metal hydroxide in a ratio of from about 1.5 to about 3 moles of ammonium hydroxide per mole of alkali metal hydroxide, thereby forming a dispersion having at least about 10 weight percent of dispersed solids, total weight basis at not more than about 1 weight percent of non-dispersibles, based on the weight of the interpolymer.

5,206,280

LASER MARKABLE WHITE PIGMENT COMPOSITION

Stewart W. Williams, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Mar. 8, 1991, Ser. No. 666,898
Claims priority, application United Kingdom, Mar. 15, 1990, 9005872
Int. Cl.[5] C08K 3/22
U.S. Cl. 524—409 8 Claims

1. A laser markable white pigment composition, which composition consists essentially of
a first pigment which is markable by ultraviolet laser,
a second pigment, which is nonabsorbing in the ultraviolet region of the optical spectrum and which has a white appearance in the visible region of the optical spectrum, with the ratio of the amount of first pigment to amount of second pigment being in the range of from 4:1 to 1:10, so that the second pigment is present in an amount sufficient to increase the optical density, that is the whitening effect, of the composition, without adversely affecting the laser markability of the composition, and
a balance of the composition being a carrier which is at least one fluoropolymer transparent in the ultraviolet region of the optical spectrum.

5,206,281

THERMOPLASTIC RESIN COMPOSITION

Motonobu Furuta, Tsukuba, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 21, 1990, Ser. No. 496,665
Claims priority, application Japan, Jun. 13, 1989, 1-148482
Int. Cl.[5] C08G 63/91; C08L 51/04, 51/06
U.S. Cl. 524—425 13 Claims

1. A thermoplastic resin composition comprising:
(a) a polyphenylene ether or a composition containing a polyphenylene ether,
(b) (i) a modified propylene polymer obtainable by grafting a propylene polymer with a styrene-based monomer alone or in combination with a monomer copolymerizable with a styrene-based monomer, or (ii) a composition composed of said modified propylene polymer and a propylene homopolymer or a propylene copolymer,
(c) a rubbery substance, and
(d) an inorganic filler having an average particle diameter of 0.05–10 μm.

5,206,282

MOLDING COMPOSITIONS COMPRISING REINFORCED FILLED WHOLLY AROMATIC POLYESTERS

Paul D. Frayer, Martinez, Ga., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 349,718, May 10, 1989, abandoned, which is a continuation of Ser. No. 28,306, Mar. 20, 1987, abandoned. This application Nov. 12, 1990, Ser. No. 620,160
Int. Cl.[5] C08L 67/03, 67/04
U.S. Cl. 524—451 18 Claims

1. A molding composition having a tensile strength of at least 10,000 pounds per square inch, an as molded warpage value of less than about 5 mils, and a warpage value, after thermal treatment at 500° F. for 10 minutes, of less than about 15 mils, said molding composition comprising;
(a) from about 60 to about 80 percent, by volume, of a wholly aromatic oxybenzoyl polyester component;
(b) from about 10 to about 20 percent, by volume, of a glass fiber component; and
(c) from about 10 to about 30 percent, by volume, of a filler component,
wherein an article molded from the composition exhibits a tensile strength of at least 10,000 pounds per square inch and wherein the sum of components (b) and (c) is from about 20 to about 40 percent, by volume.

5,206,283

RUBBER COMPOSITION FOR AUTOMOBILE TIRES

Kinya Kawakami, Kanagawa; Takao Muraki, Hiratsuka, and Shigeru Shinoda, Chigasaki, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Japan

Continuation of Ser. No. 507,771, Apr. 12, 1990, abandoned. This application Oct. 3, 1991, Ser. No. 770,141
Claims priority, application Japan, Apr. 14, 1989, 1-93012
Int. Cl.[5] C08K 3/04
U.S. Cl. 524—496 4 Claims

1. A rubber composition for use as tread portions in automobile tires, which comprises:
(a) a base rubber comprising at least one styrene-butadiene rubber having a glass transition temperature of lower than −40° C.; and
(b) a carbon black in an amount of from 30 to 100 parts by weight per 100 parts by weight of said base rubber, said carbon black having an N_2SA of form 110 to 140 m^2/g as determined by nitrogen adsorption, a 24M4 DBP of from 85 to 95 ml/100 g as determined by dibutyl phthalate adsorption, a ΔDst of smaller than 55 mμ as determined by aggregate size distribution, a {Dst to N_2Sa ratio of less than 0.43 and a ΔHs not exceeding 12 as determined by hardness difference at two varying temperatures.

5,206,284

THERMOPLASTIC RESIN COMPOSITION

Osamu Fukui, Kamakura; Kiyoshi Tsutsui, Sakai; Tomohiko Akagawa, Sakai; Ikunori Sakai, Sakai; Takao Nomura, Toyota; Takeyoshi Nishio, Okazaki; Toshio Yokoi, and Nobuya Kawamura, both of Toyota, all of Japan, assignors to UBE Industries Ltd., Yamaguchi and Toyota Jidosha Kabushiki Kaisha, Aichi, both of Japan

Division of Ser. No. 493,459, Mar. 14, 1990, Pat. No. 5,091,462. This application Jul. 11, 1991, Ser. No. 728,285
Claims priority, application Japan, Mar. 17, 1989, 1-65105
Int. Cl.[5] C08L 51/00; C08K 3/34
U.S. Cl. 524—504 13 Claims

1. A polypropylene thermoplastic resin composition comprising:
95–5% by weight of (a) a modified polypropylene obtained by grafting a crystalline polypropylene with 0.05 to 5% by weight of at least one compound selected from the group consisting of an unsaturated carboxylic acid, an unsaturated carboxylic acid anhydride, an unsaturated carbox-

ylic ester, an unsaturated carboxylate salt and an unsatu-

5,206,287

REACTIVE SYSTEMS AND A PROCESS FOR THE

butadiene, polychloroprene, copolymers of isoprene and butadiene, copolymers of acrylonitrile and butadiene, copolymers

-continued

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ylic ester, an unsaturated carboxylate salt and an unsaturated carboxylic acid amide, or a crystalline polypropylene comprising at least 5% by weight of said modified polypropylene, and

5–95% by weight of (b) a modified polyamide obtained by partially or wholly modifying a polyamide with 0.05 to 10% by weight of a clay mineral.

5,206,285

AQUEOUS COATING OF SILANE PRECURSOR FROM EPOXY AND AMINO TRIALKOXYSILANES

Nicholas T. Castellucci, San Pedro, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 21, 1990, Ser. No. 631,562

Int. Cl.[5] C08K *3/20*; C08L *83/06*

U.S. Cl. 524—588 **16 Claims**

1. An aqueous composition for forming coatings having excellent bonding properties for metallic surfaces and capable of rendering said metallic surfaces resistant to corrosion, said aqueous composition comprising:

an aqueous vehicle having solubilized therein a hydrolyzable silane polymer precursor, said silane polymer precursor being formed by anhydrously reacting an epoxy trialkoxy silane with a primary amino trialkoxy silane in relative stoichiometric amounts providing one epoxy group for reaction with each primary amino hydrogen site,

said reaction occurring for a period of approximately twenty-four hours at room temperature and under an inert gas atmosphere,

said aqueous vehicle also comprising an amount of a high vapor pressure organic acid sufficient to provide a pH of between about 4.5 and 6.5 to said aqueous vehicle, whereby said silane polymer precursor is solubilized in said aqueous vehicle; and,

a silicone-base wetting agent in a concentration of between about 0.05% and 1.00% by weight,

said silane polymer precursor being applicable to a metal surface and hydrolyzable thereon to form a silanol polymer precursor capable of being dehydrated and crosslinked thereon, whereby a corrosion-resistant coating strongly bonded to said metal surface is formed, said high vapor pressure organic acid evaporating during said formation and crosslinking of said silanol polymer precursor.

5,206,286

AQUEOUS EMULSION POLYMERS PREPARED WITH CROSSLINKABLE NON-IONIC SURFACTANTS

Shanti Swarup; Gregory J. McCollum, both of Gibsonia, and Charles M. Kania, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 502,973, Apr. 2, 1990, abandoned. This application Jul. 11, 1991, Ser. No. 728,807

Int. Cl.[5] C08K *5/04*

U.S. Cl. 524—761 **7 Claims**

1. A stable aqueous polymer emulsion comprising an aqueous continuous phase, a dispersed polymer phase which comprises an acrylic polymer and a polyhydroxyl functional nonionic surfactant having a repeating polymer unit in the backbone and containing from 3 to 31 hydroxyl groups wherein the hydroxyl groups on the repeating polymer unit are separated by 4 or more carbon atoms and the surfactant is substantially free of oxyethylene units.

5,206,287

REACTIVE SYSTEMS AND A PROCESS FOR THE PREPARATION OF MODIFIED DUROPLASTS

Hanns-Peter Müller, Bergisch Gladbach; Joachim Franke; Christian Lindner, both of Cologne; Horst Gruttmann, and Hans-Dieter Jacob, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 12, 1991, Ser. No. 758,041

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029887

Int. Cl.[5] C08G *18/04*

U.S. Cl. 525—65 **12 Claims**

1. A reactive system comprising:

a) a storage stable mixture of (i) a polyisocyanate component containing at least one organic polyisocyanate and (ii) an epoxide component containing at least one organic epoxide, in which the stability in storage has been ensured by a heat treatment of the epoxide component (ii) in the presence of an alkylating agent, optionally carried out in the presence of at least part of polyisocyanate component (i), the quantitative ratios of components (i) and (ii) being chosen so that 100 g of component a) contain from 0.005 to 0.4 mol of epoxide groups,

b) a polymer modifier which is a graft rubber,

c) a catalyst and

d) optionally auxiliary agents and additives, at most 100 g of polymer modifier of component b) being used for 100 g of the resin of component a).

5,206,288

ADHESIVE FOR LOW TEMPERATURE APPLICATIONS

Donald E. Gosiewski, Peabody, and Paul C. Briggs, Charlestown, both of Mass., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 238,302, Aug. 29, 1988, Pat. No. 4,942,201. This application Jul. 5, 1990, Ser. No. 547,969

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.[5] C08L *9/06*

U.S. Cl. 525—83 **7 Claims**

1. An adhesive composition comprising:

a) a methacrylate ester monomer wherein the alcohol portion of the ester contains one to about 8 carbon atoms;

b) an elastomeric polymer selected from the group consisting of nitrile rubber; polychloroprene; copolymers of butadiene or isoprene with styrene; copolymers of butadiene or isoprene with acrylate esters; copolymers of butadiene or isoprene with methacrylate esters; copolymers of ethylene and acrylate esters; homopolymers of epichlorohydrin; and copolymers of epichlorohydrin and ethylene oxide, wherein said elastomeric polymer is soluble in the ester monomer wherein soluble is defined as capable of forming solutions of from about 10 to about 35 weight percent elastomer in methyl methacrylate and wherein said elastomeric polymer has a Tg below about −25° C.;

c) a core-shell graft copolymer which swells in the monomer but does not dissolve therein; and

d) a free radical producing catalyst.

5,206,289

RUBBER STOCK CONTAINING A POLYHYDRIC PHENOXY RESIN

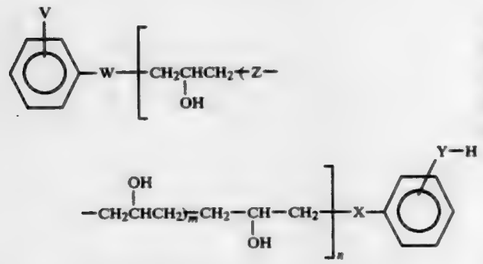
Mark S. Sinsky, Akron; Richard G. Bauer, Kent; Paul H. Sandstrom, Tallmadge, and Jerry L. Brenner, Copley, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 27, 1992, Ser. No. 826,566

Int. Cl.[5] C08L *7/00, 9/00, 63/02, 71/10*

U.S. Cl. 525—114 **19 Claims**

1. A rubber stock comprising (1) a rubber selected from the group consisting of natural rubber, cis-1,4-polyisoprene, polybutadiene, polychloroprene, copolymers of isoprene and butadiene, copolymers of acrylonitrile and butadiene, copolymers of acrylonitrile and isoprene, copolymers of styrene, butadiene and isoprene, copolymers of styrene, and butadiene and mixtures thereof and (2) from about 0.1 to about 10.0 phr of polyhydric phenoxy resin of the formula:



wherein V is —OH or —NH_2 and W is —O— or

however, when V is —NH_2, W is —O— and when W is

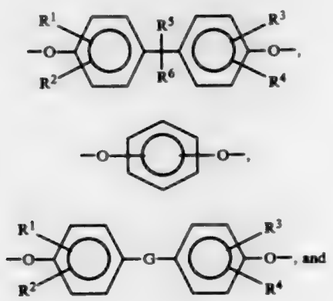
V is —OH;

wherein X and Y are each selected from the group consisting of —O— and

however, when X is —N—, Y is —O— and when Y is

X is —O—;

wherein Z is selected from the group consisting of:



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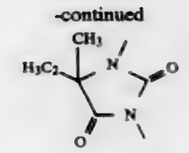
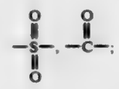


wherein R^1, R^2, R^3, and R^4 are each independently selected from the group consisting of H and Cl; R^5 and R^6 are independently selected from the group consisting of hydrogen, alkyls having from 1 to 9 carbon atoms, and CQ_3 where Q is selected from the group consisting of F and Cl; G is selected from the group consisting of —O—,



n is an integer of from 1 to 20; and m is an integer of from 0 to 10.

5,206,290

THERMOPLASTIC RESIN COMPOSITION

Yukio Mizuno, and Takashi Maruyama, both of Chiba, Japan, assignors to Sumitomo Chemical Company, Osaka, Japan

Continuation-in-part of Ser. No. 375,491, Jun. 30, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 620,414

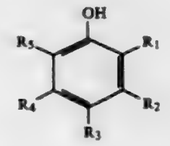
Claims priority, application Japan, Jul. 6, 1988, 63-169238

Int. Cl.[5] C08L *61/24, 61/26, 61/34, 71/12*

U.S. Cl. 525—134 **6 Claims**

1. A thermoplastic resin composition which comprises:

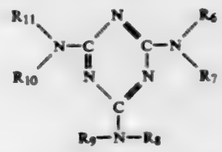
(A) 100 parts by weight of a composition comprising 95–5% by weight of a polyphenylene ether obtained by oxidation polymerization of at least one phenol compound represented by the following formula:



wherein R_1, R_2, R_3, R_4, and R_5 which may be identical or different, each represents a hydrogen atom, a halogen atom, a hydrocarbon radical or a substituted hydrocarbon radical and at least one of them is a hydrogen atom, and 5–95% by weight of a thermoplastic polyester,

(B) 0.1–30 parts by weight of (i) a natural or synthetic polymer material elastic at room temperature, or (ii) a modified natural or synthetic polymer material elastic at room temperature;

(C) 0.01–10 parts by weight of at least one amino resin, wherein the amino resin (C) is represented by the following formulas (I), (II), or (III):



(I)

wherein R_6, R_7, R_8, R_9, R_{10} and R_{11} each represents a hydrogen atom, an alkyl group, an aryl group or a substitu-

ent denoted by the formula (I'): , wherein R_{12} represents a hydrogen atom, an alkyl group of 1–10

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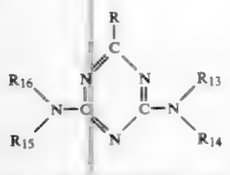
THERMOPLASTIC POLYMER ALLOY COMPOSITION

5,206,297

ELECTRICALLY CONDUCTIVE MOULDING COMPOSITIONS AND FILLERS FROM

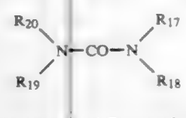
ent denoted by the formula (I'): $-CH_2-O-R_{12}$, wherein R_{12} represents a hydrogen atom, an alkyl group of 1–10 carbon atoms or a cycloalkyl group of 10 carbon atoms or less, and at least one of R_6–R_{11} is a substituent denoted by the formula (I'),

(II)



wherein R represents a hydrogen atom, an alkyl group, an alkoxy group or an aryl group excluding amino group, R_{13}, R_{14}, R_{15}, and R_{16}, each represents a hydrogen atom, an alkyl group, an aryl group or a substituent represented by the above-mentioned formula (I') and at least on of R_{13}–R_{16} is a substituent represented by the formula (I'); and

(III)



wherein R_{17}, R_{18}, R_{19}, and R_{20}, each represents a hydrogen atom, an alkyl group, an aryl group or a substituent represented by the above-mentioned formula (I') and at least one of R_{17}–R_{20} is a substituent represented by the formula (I').

5,206,291

POLYMER COMPOSITIONS HAVING IMPROVED IMPACT STRENGTH

Mark E. Stewart, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

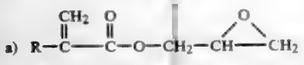
Continuation-in-part of Ser. No. 632,672, Dec. 24, 1990, abandoned. This application Jun. 24, 1991, Ser. No. 720,051

Int. Cl.[5] C08L *67/02*

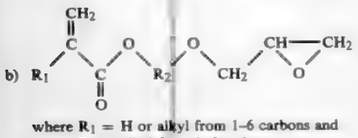
U.S. Cl. 525—173 **3 Claims**

1. Molding compositions having improved impact strength at low temperatures comprising

a) about 60–98 wt % of a copolyester consisting essentially of repeat units from terephthalic acid, ethylene glycol and 1,4-cyclohexanedimethanol wherein the mole ratio of ethylene glycol to 1,4-cyclohexane-dimethanol is from 2:98 to 98:2, said copolyester having an I.V. of about 0.3 to 1.0, and about 2–40 wt % of an epoxy functional polyolefin having an average of about 1 to about 100 epoxy groups per polymer chain based on the number average molecular weight of said polyolefin, said polyolefin consisting essentially of repeat units of α-olefins at 2–6 carbon atoms and repeat units from at least one epoxy functional monomer selected from

a) 

where R = H or an alkyl group of 1–6 carbons,

b) 

where R_1 = H or alkyl from 1–6 carbons and R_2 = alkyl from 1–6 carbons,

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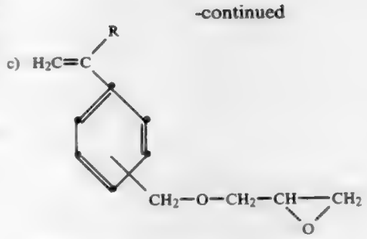
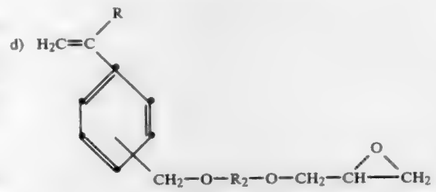
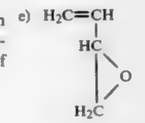
c) 

where R = H or alkyl from 1–6 carbons,

d) 

where R_1 = H or alkyl from 1–6 carbons, and R_2 = alkyl from 1–6 carbons, and

e) 

5,206,292

PELLETIZING AID FOR MANUFACTURING POLYOLEFINS

Charles C. Hwo, Sugar Land, and William J. Graff, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 28, 1992, Ser. No. 889,870

Int. Cl.[5] C08L *23/04*

U.S. Cl. 525—240 **16 Claims**

1. A method for minimizing the agglomeration of freshly manufactured polyolefin pellets comprising adding an effective amount of oxidized high density polyethylene powder to a device comprising a cooling agent and said freshly prepared pellets during the manufacturing of said pellets.

5,206,293

RUBBER COMPOSITION AND CROSSLINKABLE RUBBER COMPOSITION

Masato Sakai; Isao Sugita, both of Suzuka; Itsuki Umeda, Mie, and Yoji Mori, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,740

Claims priority, application Japan, Oct. 13, 1989, 1-267527

Int. Cl.[5] C08L *27/12, 23/00, 33/04, 33/02*

U.S. Cl. 525—194 **14 Claims**

1. A rubber composition obtained by subjecting a mixture of (I) 35-95 parts by weight of a fluoroelastomer, (II) 65-5 parts by weight of at least one member selected from the group consisting of polyethylene, ethylene-vinyl acetate copolymer and ethylene-unsaturated carboxylic acid ester copolymer, and (III) an organic peroxide to reaction while imparting shearing deformation to the mixture, wherein the total amount of component (I) plus component (II) is 100 parts by weight.

5,206,294

THERMOPLASTIC POLYMER ALLOY COMPOSITION

Robert L. Dawson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 6, 1991, Ser. No. 788,622

Int. Cl.[5] C08L *23/08, 23/12, 33/02, 33/14*

U.S. Cl. 525—196 **11 Claims**

1. A thermoplastic polymer alloy composition comprising a blend of

a) 10–40 wt. % polypropylene,

b) 15–50 wt. % uncrosslinked ethylene propylene copolymer rubber having an ethylene content of 60–80 wt. %,

c) 20–60 wt. % of an ionomeric copolymer of ethylene and an alpha, beta-unsaturated C_3–C_8 carboxylic acid, and

d) 1–5 wt. % of a copolymer of ethylene and glycidyl acrylate or glycidyl methacrylate.

5,206,295

COATING COMPOSITION COMPRISING AN ANHYDRIDE-CONTAINING POLYMER AND A STRUCTURED EPOXY-CONTAINING POLYMER

Lee R. Harper, Media, and Gaysan S. McDonnell, Lafayette Hill, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1991, Ser. No. 660,087

Int. Cl.[5] C08L *35/00*

U.S. Cl. 525—207 **17 Claims**

1. A coating composition comprising a binder in 20–80% by weight of an organic liquid carrier and about 0.1–5% by weight, based on the weight of the binder, of a curing catalyst, wherein the binder comprises the following:

(a) 25–90% by weight, based on the weight of the binder, of an anhydride functional polymer having at least two reactive anhydride groups and having a weight average molecular weight of about 2,000–50,000; and

(b) 5–50% by weight, based on the weight of the binder, of an epoxy functional polymer having at least two reactive epoxy groups, wherein the epoxy functional polymer is structured as a product of group transfer polymerization, so that the epoxy groups are skewed to have a majority of the epoxy groups at one end of the polymer, which end was first formed during said group transfer polymerization.

5,206,296

NEW PROCESSING AID (8-CB-10.483)

Jacky P. Dominique, Rantigny, and Marc Loibl, Beauvais, both of France, assignors to General Electric Company, N.Y.

Division of Ser. No. 501,567, Mar. 30, 1990, Pat. No. 5,095,083. This application Jul. 15, 1991, Ser. No. 730,143

Claims priority, application France, Apr. 26, 1989, 89 05537

Int. Cl.[5] C08L *33/06*

U.S. Cl. 525—230 **5 Claims**

1. Thermoplastic resin composition comprising at least one thermoplastic resin and a polymeric processing aid characterized in that the composition comprises as a processing aid a terpolymer comprising 10–49% by weight of a vinylaromatic monomer, 5–35% by weight of an acrylic nitrile and 21–60% by weight of an alkylacrylate or alkylmethacrylate, with a viscosity number of more than four as is measured in dimethylformamide at 30° C. at a concentration of 100 mg terpolymer per 100 ml dimethylformamide.

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ELECTRICALLY CONDUCTIVE MOULDING COMPOSITIONS AND FILLERS FROM POLYHETEROAROMATIC COMPOUNDS AND POLYMERIC SULFATES

Wolfgang Wernet, Freiburg, Fed. Rep. of Germany; Friedrich Lohse, Oberwil, Switzerland; Jürgen Finter; Hartmut Bieler, both of Freiburg, Fed. Rep. of Germany; Bruno Rotzinger, Aesch, Switzerland, and Thomas Vogel, Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

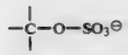
Filed Mar. 6, 1991, Ser. No. 665,494

Claims priority, application Switzerland, Mar. 8, 1990, 759/90

Int. Cl.[5] C08F *271/02, 273/00*

U.S. Cl. 525—279 **24 Claims**

1. A moulding composition in the form of a free-flowing powder consisting of particles of a) at least one polyheteroaromatic compound or an aniline in the oxidised, polycationic form and b) at least one polyanion of a thermoplastic polymer having sulfated alcohol groups



in recurring structural units.

5,206,298

GRAFT COPOLYMER, SOLUTION CONTAINING THE GRAFT COPOLYMER FOR TREATING CONTACT LENS, AND METHOD OF TREATING CONTACT LENS WITH THE SOLUTION AND MAKING HYDROPHILIC LENS SURFACE

Toru Kawaguchi, Gifu, Japan, assignor to Tomei Sangyo Kabushiki Kaisha, Japan

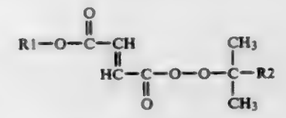
Filed Dec. 14, 1990, Ser. No. 627,333

Claims priority, application Japan, Dec. 19, 1989, 1-329113

Int. Cl.[5] C08F *271/02; G02C 7/04*

U.S. Cl. 525—283 **3 Claims**

1. A graft copolymer produced by polymerizing 2-hydroxyethyl methacrylate, or a mixture of ethylenically unsaturated monomers which contains as a major constituent thereof 2-hydroxyethyl methacrylate and contains not more than 20 weight % of at least one ethylenically unsaturated monomer other than 2-hydroxyethyl methacrylate, by using a polymeric polymerization initiator having a number average molecular weight of from about 1,000 to about 1,000,000 produced by copolymerizing (A) 40 to 60 mole % of an N-vinyllactam and (B) 60 to 40 mole % of at least one peroxy-fumarate, said peroxy fumarate (B) being represented by the following formula:



wherein R1 is a linear alkyl, branched alkyl or cycloalkyl group containing not more than 18 carbon atoms, or an aromatic hydrocarbon group containing 6 to 18 carbon atoms; and R2 is a linear alkyl, branched alkyl or cycloalkyl group containing not more than 13 carbon atoms, or a phenyl group.

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CORE-SHELL POLYMER, RESIN COMPOSITION AND

5,206,301

HYDROGENATED BLOCK COPOLYMER AND

and attached to para-alkyl groups of the main chain para-alkyl styrenes, wherein an average weight average molec-

carbon atoms, and having a Mooney viscosity (ML_{1+4} (121° C.)) of 10 to 190.

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5,206,299

CORE-SHELL POLYMER, RESIN COMPOSITION AND MOLDED ARTICLES THEREOF

Junji Oshima, Toyonaka; Takao Teraoka, Akashi; Minoru Yamada, Kawanishi; Shizuo Togo, Ichikawa; Goro Shimaoka, Hiratsuka, and Kazuhiko Ishii, Hiratsuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 501,762, Mar. 30, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 851,223

Claims priority, application Japan, Mar. 31, 1989, 1-078297

Int. Cl.[5] C08F *265/06, 236/02, 212/36;* C08L *71/10*

U.S. Cl. 525—305 9 Claims

1. A core-shell polymer which comprises:

(a) a core consisting essentially of a member selected from the group consisting of (i) alkyl acrylate polymer wherein the alkyl has 2–8 carbon atoms, and (ii) a copolymer of an alkyl acrylate monomer wherein the alkyl has 2–8 carbon atoms with a monomer selected from the group consisting of an aromatic vinyl monomer, a vinyl cyanide monomer and an alkyl methacrylate, in an amount of 50–90% by weight;

(b) an intermediate layer comprising a polymer having a glass transition temperature of not less than 60° C. in an amount of 5–30% by weight; and

(c) a shell consisting essentially of an aromatic vinyl polymer in an amount of 5–30% by weight,

each based on the core-shell polymer, and the total of the core, the intermediate layer and the shell amounting to 100% by weight.

5,206,300

FUNCTIONALIZED ELASTOMERIC POLYMERS

Linda R. Chamberlain, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1990, Ser. No. 503,412

Int. Cl.[5] C08F *297/04*

U.S. Cl. 525—314 15 Claims

1. In the process of producing a functionalized derivative of an elastomeric block polymer having at least one block of at least predominantly polymerized alkenyl aromatic compound and at least one block of an at least predominantly polymerized conjugated alkadiene, selectively hydrogenated in the aliphatic portion thereof, by the sequential steps of metallation, carboxylation and acidification, wherein the block copolymer has a peak molecular weight as determined by GPC or light scattering of about 11,000 to about 2,500,000, wherein the alkenyl aromatic block content is no more than about 55 wt %, and wherein no more than 25% of the unsaturation in the alkenyl aromatic block and at least 80% of the aliphatic unsaturation in the block copolymer is hydrogenated; the improvement of contacting the resulting carboxylic acid-functionalized, selectively hydrogenated block polymer thereby produced with ammonia and heating the resulting product to a temperature of at least about 180° C.

8. A carbamoyl-functionalized, selectively hydrogenated block polymer derived from a base block polymer of at least one block of predominantly polymerized alkenyl aromatic compound and at least one block of at least predominantly polymerized conjugated alkadiene, wherein the block copolymer has a peak molecular weight as determined by GPC or light scattering of about 11,000 to about 2,500,000, wherein the alkenyl aromatic block content is no more than about 55 wt %, and wherein no more than 25% of the unsaturation in the alkenyl aromatic and at least 80% of the aliphatic unsaturation in the block copolymer is hydrogenated; wherein the carbamoyl functionalizing groups are present as substituents on aromatic rings.

5,206,301

HYDROGENATED BLOCK COPOLYMER AND COMPOSITION COMPRISING THE SAME

Iwakazu Hattori; Noboru Oshima; Tooru Shibata, and Yasuo Takeuchi, all of Tokyo, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/01157, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO90/05753, PCT Pub. Date May 31, 1990

PCT Filed Nov. 14, 1989, Ser. No. 536,564

Claims priority, application Japan, Nov. 14, 1988, 63-285774

Int. Cl.[5] C08F *297/04;* C08L *53/02*

U.S. Cl. 525—314 6 Claims

1. A hydrogenated block copolymer comprising a copolymer having a number-average molecular weight of 40,000–700,000, obtained by hydrogenating at least 80% of the olefinic bonds of a block copolymer having in the molecule at least one each of

a polymer block A composed of 90% by weight or more of a vinyl aromatic compound,

a polybutadiene polymer block B having a 1,2-vinyl structure of 30–70%, and

a polybutadiene polymer block D having a 1,2-vinyl structure of less than 30%,

in which block copolymer the content of the polymer block A is 10–50% by weight, the content of the polymer block B is 30–80% by weight, and the content of the polymer block C is 5–30% by weight, wherein the block copolymer is represented by the formula A—B—C or $(C—B—A)_nX$ where n is 2, and X is a coupling agent residue.

4. A thermoplastic resin composition comprising 100 parts by weight of a thermoplastic resin and 5–50 parts by weight of a hydrogenated block copolymer according to claim 1.

5,206,302

STYRENE-BASED RESIN COMPOSITION

Tuneaki Kohsaka, Ichihara; Kazuo Sato, Sodegaura; Yutaka Tsubokura, Ichihara, and Takashi Kanezaki, Sodegaura, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 21, 1990, Ser. No. 496,908

Claims priority, application Japan, Mar. 31, 1989, 1-78142

Int. Cl.[5] C08F *279/02*

U.S. Cl. 525—316 3 Claims

1. A rubber-modified styrene-based resin composition comprising a styrene-based resin as a continuum of the matrix phase, wherein said styrene-based resin composition is selected from the group consisting of vinyl aromatic homopolymers and copolymers of vinyl aromatic monomers with copolymerizable monomers, and a diene rubber polymer as a dispersed particulate phase in the matrix, in which the particles of the rubbery polymer have an average particle diameter in the range from 0.08 to 1 μm, peripheral parameter in the range from 0.1 to 2.5 $(\mu m)^{-1}$. (% by weight)$^{-1}$ and relaxation time T_2 in the range from 300 to 2000 μ seconds.

5,206,303

ENTANGLEMENT-INHIBITED MACROMOLECULES

Mun-Fu Tse, Seabrook; Anthony J. Dias, Houston; Prasadarao Meka, Seabrook, all of Tex., and Kenneth O. McElrath, Waterloo, Belgium, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 27, 1990, Ser. No. 634,846

Int. Cl.[5] C08F *255/08, 257/02*

U.S. Cl. 525—319 32 Claims

1. A graft polymer, comprising:

main chain of at least about 25,000 weight average molecular weight comprising a polymer of an iso-olefin having about 4 to about 7 carbon atoms and a para-alkyl styrene, wherein said main chain polymer has a substantially homogeneous compositional distribution; and

a plurality of side chains distributed along said main chain and attached to para-alkyl groups of the main chain para-alkyl styrenes, wherein an average weight average molecular weight of segments of said main chain between adjacent side chains (M_{MCS}) is in a range of from about 0.02 M_e^A to a about 2 M_e^A, wherein M_e^A is the entanglement molecular weight of said main chain, and wherein the side chains have an average weight average molecular weight (M_{SC}) in a range from about 0.02 M_e^B to about 2 M_e^B, wherein M_e^B is the entanglement molecular of said side chains, and at least about 95 weight % of said side chain has a para-alkyl styrene content within about 10 weight % of the average para-alkyl styrene content polymer.

5,206,304

VULCANIZABLE RUBBER MIXTURES CONTAINING BIS-(2,4-ORGANYLTHIO-TRIAZINE-6-YL) POLYSULFIDES

Georg Hellwig, Freigericht; Reinhard Stober, Hasselroth; Christoph Klatte; Ulrich Deschler, both of Hanau; Siegfried Wolff, Bornheim, and Udo Görl, Meckenheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

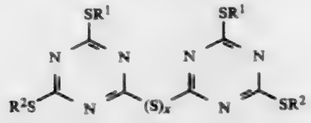
Continuation of Ser. No. 369,239, Jun. 22, 1989, abandoned. This application Aug. 22, 1991, Ser. No. 751,586

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3820969

Int. Cl.[5] C08C *19/20*

U.S. Cl. 525—329.3 5 Claims

1. A vulcanizable mixture comprising bis(2,4-organylthio-s-triazine-6-yl) polysulfides of the Formula (I)



in which R^1, R^2 are identical or different and represent hydrogen, branched or unbranched alkyl with 1–4 carbon atoms, allyl, C_3–C_8-cycloalkyl, 2-hydroxyethyl, 3-hydroxypropyl, 2-hydroxypropyl, phenyl, $(S)_x$ is a polysulfide chain with 2–10 S atoms ($2 \leqq x \leqq 10$) and the individual sulfides are present in such concentrations that the statistical mean $x \approx 4$, as an accelerator and a vulcanizable rubber selected from the group consisting of natural rubber (NR), isoprene rubber (IR), butadiene rubber (BR), styrenebutadiene rubber (SBR), isobutylene-isoprene rubber (IIR), ethylene-propylene terpolymer (EDPM), nitrile rubber (NBR), halogen-containing rubbers, epoxidized natural rubbers (ENR), and blends of these rubbers, the amount of triazinylpolysulfides being 0.1 to 10 parts per 100 parts of rubber, and with a sulfur content of 0.1 to 10 parts by weight per 100 parts of rubber.

5,206,305

CHLORINATED ETHYLENE-ALPHA-OLEFIN COPOLYMER RUBBER AND COMPOSITION THEREOF

Tetsuo Tojo; Keiji Okada; Yoshiharu Kikuchi, all of Ichihara; Yasuhiko Otawa, Tokyo; Toshiyuki Maeda, Tokyo, and Katsuo Okamoto, Tokyo, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 17, 1991, Ser. No. 686,381

Claims priority, application Japan, Apr. 17, 1990, 2-99392; Jun. 29, 1990, 2-171677

Int. Cl.[5] C08F *8/22*

U.S. Cl. 525—331.7 17 Claims

1. Chlorinated ethylene-α-olefin copolymer rubber comprising 20 to 40% by weight of chlorine, based on weight of the chlorinated copolymer rubber, wherein 0.6% by weight or more of the chlorine is bonded to primary carbon atoms, and 1.6% by weight or less of the chlorine is bonded to tertiary carbon atoms, and having a Mooney viscosity (ML_{1+4} (121° C.)) of 10 to 190.

5,206,306

PROCESS FOR MAKING A POLYMER FOR AN OPTICAL SUBSTRATE BY HYDROGENATING A CYCLOOLEFIN COPOLYMER

Dennis C. Shen, Brecksville, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 331,310, Mar. 31, 1989. This application Mar. 3, 1992, Ser. No. 845,207

Int. Cl.[5] C08F *8/04*

U.S. Cl. 525—332.1 12 Claims

1. A process for forming a substantially clear hydrogenated copolymer suitable for molding into an optical substrate, comprising,

a) polymerizing a mixture of comonomers comprising from 60–95% methyltetracyclododecene and 5–40% dicyclopentadiene,

based on the total weight of said mixture, in the presence of a catalyst effective to promote ring-opening polymerization of said comonomers, to yield an unsaturated copolymer; and, b) hydrogenating said unsaturated copolymer to produce said hydrogenated copolymer having a weight average molecular weight in the range from 35×10^3 to 50×10^3, and a melt flow index in the range from 40–65 g/10 min at 300° C. with a 1.2 kg load, as determined on a Tinius Olsen melt-flow index system.

5,206,307

PROCESS FOR SELECTIVE HYDROGENATION OF CONJUGATED DIOLEFIN POLYMERS

Linda Rae Chamberlain, Richmond, and Carma J. Gibler, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 756,392, Sep. 9, 1991, Pat. No. 5,132,372. This application Jul. 1, 1992, Ser. No. 907,349

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.[5] C08F *8/04*

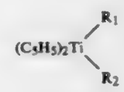
U.S. Cl. 525—338 20 Claims

1. In a process for the hydrogenation of conjugated diolefin polymers which comprises:

(a) polymerizing or copolymerizing at least one conjugated diolefin with an organo-alkali metal polymerization initiator in a suitable solvent thereby creating a living polymer,

(b) terminating the polymerization by the addition of H_2, and

(c) selectively hydrogenating the unsaturated double bonds in the conjugated diolefin units of said terminated polymer by contacting the polymer, in the absence of hydrocarbon lithium and alkoxy lithium compounds, with hydrogen in the presence of at least one bis(cyclopentadienyl)titanium compound of the formula:



wherein R_1 and R_2 are the same or different and are selected from the group consisting of halogen groups, C_1–C_8 alkyl and alkoxy groups, C_6–C_8 aryloxy groups, aralkyl, cycloalkyl groups, silyl groups and carbonyl groups, the improvement which comprises using an alkyl benzoate as a promoter in step (c) to enhance the hydrogenation of the polymer.

5,206,308

GRAFTING OF AMIDE-FUNCTIONAL POLYMERS

Ralph Dowbenko, Kensington, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 1, 1991, Ser. No. 723,722

Int. Cl.[5] C08F *8/00*

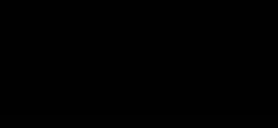
U.S. Cl. 525—329.4 10 Claims

1. A process for grafting an amide-functional polymer to a substrate polymer, comprising:

(a) providing a substrate polymer having a plurality of pendant or terminal groups selected from the group consisting of primary amine, secondary amine, hydroxyl, carboxylic acid, and mercaptan;

(b) providing an amide-functional polymer having a plurality of pendant or terminal groups selected from the group consisting of primary amine, secondary amine, hydroxyl, carboxylic acid, and mercaptan;

(c) providing a bis-oxazoline compound having the formula:



wherein R is a divalent radical selected from the group consisting of a covalent bond, alkylene, arylene, alkarylene, and aralkylene;

(d) reacting said substrate polymer, said amide-functional polymer, and said bis-oxazoline compound at a temperature sufficient to form a melt of said polymers and said bis-oxazoline compound, thereby grafting said amide-functional polymer to said substrate polymer.

5,206,309

PROCESS FOR PREPARING POLYMER COMPOSITIONS

Hiroshi Ito, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1992, Ser. No. 829,555

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—329.4 10 Claims

1. A process for preparing a polymer composition comprising:

(a) providing a polymer having a plurality of pendant or terminal groups selected from the group consisting of primary amine, secondary amine, hydroxyl, carboxylic acid, and mercaptan;

(b) providing a bis-oxazoline compound having the formula:

wherein R is a divalent radical selected from the group consisting of a covalent bond, alkylene, arylene, alkarylene, and aralkylene;

(c) reacting said polymer and said bis-oxazoline compound at a temperature sufficient to form a melt of said polymer and said bis-oxazoline compound, thereby grafting said bis-oxazoline compound to said polymer.

5,206,310

POLYAMIDE RESIN COMPOSITION

Yoshiaki Kawase; Yoshiaki Takeda, both of Kurashiki; Yoshiaki Kawamura, Okayama, and Yoshiaki Kawagoe, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jan. 31, 1991, Ser. No. 648,966

Claims priority, application Japan, Feb. 2, 1990, 2-23000

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—425 5 Claims

1. A polyamide resin composition comprising a polyamide resin and a polyamide elastomer, wherein the polyamide resin is a polyamide resin having a glass transition point Tg and the polyamide elastomer is a polyamide elastomer having a glass transition point Tg lower than that of the polyamide resin, and the polyamide elastomer is dispersed in the polyamide resin as a discontinuous phase, and the polyamide resin is a crystalline substance having the glass transition point Tg serving as a binder;

-continued

Formula II

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GRAFTING OF AMINE FUNCTIONAL POLYMERS ONTO FUNCTIONALIZED OXYMETHYLENE POLYMERS AND THE RESULTING GRAFT POLYMERS THEREOF

Andrew B. Auerbach, Livingston; Jerry A. Broussard, Summit, both of N.J.; Nan L. Yang, Staten Island, N.Y., and James L. Paul, Summit, N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

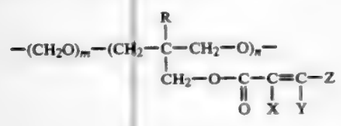
Continuation of Ser. No. 350,821, May 12, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 664,436

The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

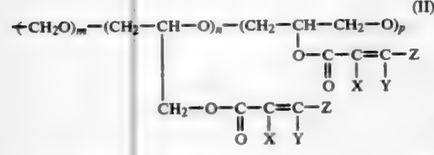
Int. Cl.[5] C08F *283/12, 283/06;* **C08G** *77/04;* **C08L** *74/00*

U.S. Cl. 525—410 **12 Claims**

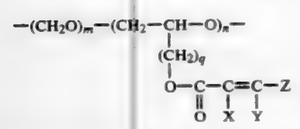
1. An oxymethylene graft polymer comprising (i) a polyoxymethylene backbone having pendant acrylate or substituted acrylate ester functional groups, and (ii) an amine functional polymer grafted onto said polyoxymethylene backbone via said acrylate or substituted acrylate ester functional groups, and wherein said polyoxymethylene backbone is selected from oxymethylene copolymers having recurring units represented by the following Formulas I, II and III:



(I)



(II)



(III)

where R is alkyl; X is H or alkyl; Y and Z, which may be the same or different are H, alkyl, or aryl; q is an integer between 1 and 4; and m, n and p are each integers such that m+n or m+n+p is between 5 and 20,000 and the ratio of units of subscript m to the units of subscript n or units of subscript n+p is between 1:1 and 1000:1.

5,206,309

HEAT STABLE FILM COMPOSITION COMPRISING POLYEPSILONCAPROLACTAM

Carl E. Altman, Pitman, Pa., assignor to Allied Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 6, 1991, Ser. No. 665,394

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—432 **9 Claims**

1. A film comprising:

polyepsiloncaprolactam and

poly(epsiloncaprolactam-hexamethylene adipamide) copolymer,

wherein said copolymer has polyepsiloncaprolactam segments comprising between 10% to 35% of said copolymer.

5,206,310

POLYAMIDE RESIN COMPOSITION

Kenji Yasue; Tsuneo Tamura; Akio Motoyama, and Hiromasa Itakura, all of Chuo Kenkyusho, 23, Ujikozakura, Uji-shi, Kyoto, Japan

Filed Jan. 25, 1991, Ser. No. 645,877

Claims priority, application Japan, Jan. 29, 1990, 2-20282

Int. Cl.[5] C08L *77/06*

U.S. Cl. 525—432 **6 Claims**

1. A polyamide resin composition comprising (A) nylon 46, (B) an aliphatic polyamide having a methylene group/amide group ratio (CH_2/NHCO) in the polymer backbone chain of from 6 to 11 and (C) a non-crystalline polyamide having a glass transition temperature of at least 100° C., and satisfying the following formulas (1) and (2):

$$0.05 \leqq \frac{W(B) + W(C)}{W(A) + W(B) + W(C)} \leqq 0.5 \quad (1)$$

$$0.2 \leqq \frac{W(C)}{W(B)} \leqq 5.0 \quad (2)$$

where W(A), W(B) and W(C) represent parts by weight of the respective components (A), (B) and (C).

5,206,311

BLENDS OF POLYETHER SULFONES AND COPOLYMIDES

M. Jamal El-Hibri, Roswell, Ga., and John L. Melquist, Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1991, Ser. No. 768,005

The portion of the term of this patent subsequent to Mar. 2, 2010, has been disclaimed.

Int. Cl.[5] C08L *77/00, 77/06*

U.S. Cl. 525—434 **14 Claims**

1. A composition comprising a blend of polyether sulfone and an imide-containing copolymer of sulfonyl bis(phthalic anhydride), 1,4-bis(p-aminocumyl) benzene and at least one aromatic diamine selected from the group consisting of m-phenylene diamine, p-phenylene diamine, oxybisaniline, 2,2-bis(4-aminophenyl) propane, and 2,2-bis(4-aminophenoxyphenyl) propane, wherein said polyether sulfone does not contain a biphenyl unit.

5,206,312

AROMATIC HYDROXYL-CONTAINING COMPOUNDS CONTAINING ORGANOSILOXANE MOIETIES, EPOXY COMPOUNDS AND CURED PRODUCTS THEREOF

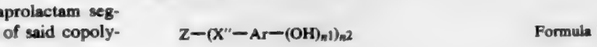
Zeng K. Liso, Lake Jackson, Tex., and Chun S. Wang, Tainan, Taiwan, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 439,208, Nov. 20, 1989, abandoned. This application Jul. 12, 1991, Ser. No. 729,508

Int. Cl.[5] C08F *283/12*

U.S. Cl. 525—474 **25 Claims**

1. An advanced resin prepared by reacting (1) at least one compound containing an average of more than one aromatic hydroxyl group per molecule; and (2) at least one compound containing an average of more then one vicinal epoxy group per molecule; with the proviso that at least one compound of components (2) or (2) is a compound which contains at least one organosiloxane moiety and which compound containing at least one organosiloxane moiety is represented by the following general formulas I or II



Formula I

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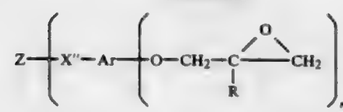
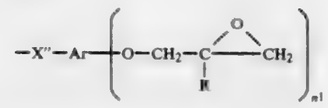


Formula II

wherein Ar is any divalent or multivalent aromatic moiety or divalent or multivalent inert substituted aromatic moiety; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each X'' is independently a divalent aliphatic or a divalent cycloaliphatic group or a divalent alkoxy or or a divalent cycloalkoxy group having from 2 to about 12 carbon atoms; Z is an n^2-valent entity containing at least one organosiloxane moiety; n^1 has a value from 1 to about 3; and n^2 has a value from 1 to about 200; with the proviso that (a) when n^2 has a value of 1, n^1 has a value greater than 1; and (b) the group(s)

and/or



is (are) attached to a silicon atom.

5,206,313

PROCESS FOR PREPARING POWDER COATING COMPOSITION

Kazuya Ono, Tokyo; Mikio Osa, Saitama; Masao Kubo, Koshigaya, and Katsuji Kitagawa, Kasukabe, all of Japan, assignors to Somar Corporation, Japan

Filed Apr. 13, 1992, Ser. No. 867,368

Claims priority, application Japan, Jun. 25, 1991, 3-180401

Int. Cl.[5] C08L *63/00*

U.S. Cl. 525—524 **4 Claims**

1. A process for the preparation of a powder coating composition, comprising the steps of:

(a) providing a crystalline material consisting of two or more crystalline substances each of which has a melting point of at least 90° C. and one of which has a melting point Mp that is lower than those of the other crystalline substances, said crystalline substances consisting of at least one crystalline epoxy resin and at least one crystalline curing agent;

(b) providing a non-crystalline material consisting of one or more non-crystalline substances each of which has a softening point of at least 50° C. and one of which has a glass transition point Tg which is lower than those of the other non-crystalline substances and which is lower than said melting point Mp, said non-crystalline substances being selected from the group consisting of non-crystalline epoxy resins, non-crystalline curing agents and mixtures thereof;

(c) blending said crystalline material with said non-crystalline material to obtain a mixture having a content of said crystalline material of 55–90% by weight based on the total weight of said crystalline and non-crystalline materials and 5–45% by weight of said at least one crystalline curing agent based on the total weight of said crystalline and non-crystalline materials;

(d) pressing said mixture at a temperature which is higher than said glass transition point Tg but lower than said melting point Mp and which is lower than any softening point of said one or more non-crystalline substances so that said crystalline substances and non-crystalline substances are bonded with each other with said non-crystalline substance having the glass transition point Tg serving as a binder;

(e) then cooling the mixture obtained in step (d) to a temperature lower than said glass transition point Tg; and

(f) then pulverizing the cooled mixture obtained in step (e).

5,206,314

POLYOLEFIN POLYMERIZATION PROCESS, PROCESS OF PRODUCING CATALYST, AND CATALYST

Kent E. Mitchell, Bartlesville, Okla.; Paul F. Schubert, Campbell, Calif., and Gil R. Hawley, Dewey, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1992, Ser. No. 938,725

Int. Cl.[5] C08F *4/642*

U.S. Cl. 526—125 **14 Claims**

1. A process for preparing a catalyst suitable for the polymerization of olefins comprising:

(1) contacting a metal dihalide compound and a transition metal compound to form a first catalyst component,

wherein the metal in said metal dihalide compound is selected from Group 2 and Group 12 metals of the Periodic Table,

wherein said transition metal compound is a hydrocarbyloxide of a transition metal selected from Group 4 and Group 5 of the Periodic Table;

(2) contacting said first catalyst component and an organoaluminum precipitating agent to form a solid product,

wherein said organoaluminum precipitating agent contains at least one hydrocarbyl radical selected from hydrocarbyl radicals containing 1 to 20 carbon atoms per radical;

(3) contacting said solid product and an ester,

wherein said ester is selected from alkyl or aromatic esters of linear or cyclic carboxylic acids having from 2 to 20 carbon atoms; and

(4) after step (3) contacting said solid product and an activating agent to form said catalyst,

wherein said activating agent comprises at least one halogen-containing compound of an element selected from groups 4, 5, 14, and 15 capable of adding halogen to said catalyst.

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PROCESS FOR POLYMERIZING 1-OLEFINS AND CATALYST THEREFOR

Phil M. Stricklen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 10, 1989, Ser. No. 335,777

Int. Cl.[5] C08F *4/642, 10/14*

U.S. Cl. 526—142 **10 Claims**

1. A process for preparing a polymer of 1-olefin monomer comprising polymerizing said monomer in contact with a two-component catalyst, the first component being comprised of a solid titanium trichloride complex having the formula

$$TiCl_3(AlR_nX_{3-n})_x(C)_y$$

wherein

R is a hydrocarbon radical containing from 1 to 18 carbon atoms,

X is a halogen,

n is a number from 0 to 2,

C is an organic complexing agent selected from compounds having the formula

R'-O-R'', R'-S-R'' and R'-SH

wherein R' and R'' are independently hydrocarbon radicals containing from 1 to 15 carbon atoms,

x is a number less than 0.3, and

y is a number higher than 0.001, and the second component being comprised of an alkylaluminum hydride of the formula

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STYRENE DERIVATIVES HAVING

and (c) 5 to 45 mole % of alkyl vinyl ether units, the mole % of (a) being substantially equal to (b) +(c).

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SILYL DERIVATIVES OF EUGENOL

Mary K. Hays, 3000 Daniel La., 7-106, Monroeville, Pa. 15146

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AlR'''_mH_{3-m}

wherein

R''' is a hydrocarbon radical containing from 1 to 18 carbon atoms, and

m is a number from 1 to 2.

5,206,316

LACTAM-CONTAINING EMULSIFIER SYSTEMS FOR WATER-IN-OIL EMULSION POLYMERS

Jui-Chang Chuang, Wayne, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Filed Sep. 16, 1991, Ser. No. 760,272

Int. Cl.[5] B01F *17/16*; C08F *2/00, 2/44*

U.S. Cl. 252—35 G **13 Claims**

1. An emulsifier for an inverse emulsion polymerization to produce a water soluble polymer consisting essentially of a mixture of a nonionic oil-soluble surfactant and a compound selected from the group consisting of an N-alkyl lactam and an alkylated polymer of an N-vinyl lactam, and combinations thereof, the amount of surfactant to said compound being such that the HLB value of the mixture is not greater than about 7.

5,206,317

RESIST MATERIAL AND PROCESS FOR USE

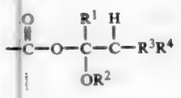
Walter R. Hertler, Kennett Square, Pa.; Dotsevi Y. Sogah, Wilmington, Del., and Gary N. Taylor, Bridgewater, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del. and American Telephone and Telegraph Company, New York, N.Y.

Filed Apr. 10, 1990, Ser. No. 507,342

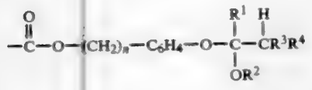
Int. Cl.[5] C08F *24/00*

U.S. Cl. 526—220 **22 Claims**

1. A material comprising 1) a polymer chosen from the group consisting of compositions having a polymer backbone and pendant groups bound directly or indirectly to said backbone, said pendant groups represented by the formulae:



or



where

n is 0–4;

R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl; and

R^3 and R^4 independently are hydrogen or lower alkyl where the definition of lower alkyl includes the joining of R^1 and R^2 or R^1 and either R^3 or R^4, or R^2 and either R^3 or R^4 to form a 5-, 6- or 7-membered ring; and (2) a material that forms an acid upon irradiation.

5,206,318

STYRENE DERIVATIVES HAVING N-ACETYLCHITO-OLIGOSACCHARIDE CHAINS AND METHOD FOR THE SAME

Kazukiyo Kobayashi, Aichi; Toshihiro Akaike, Tokyo; Hosei Shinoda, Aichi, and Kazushi Morimoto, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

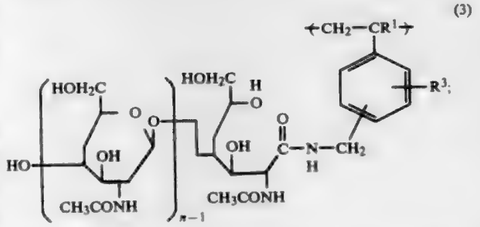
Continuation of Ser. No. 510,583, Apr. 18, 1990, abandoned. This application Mar. 20, 1992, Ser. No. 855,159

Claims priority, application Japan, Apr. 20, 1989, 1-98839

Int. Cl.[5] C08B *37/08*

U.S. Cl. 526—238.23 **5 Claims**

4. A polystyrene comprising 2 to 500 of repeating units represented by the following general formula (3):



(3)

wherein R^1 represents a hydrogen atom or a methyl group; R^2 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom; and n is an integer ranging from 1 to 10.

5,206,319

PROCESS FOR PREPARING A TONER RESIN, TONER RESIN PREPARED THEREBY AND TONER COMPOSITION CONTAINING PARTICLES OF THE TONER RESIN

Nobuki Kobayashi, Adrian, Mich., and Richard L. Hively, Sylvania, Ohio, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 746,712

Int. Cl.[5] C08F *2/10*

U.S. Cl. 526—224 **17 Claims**

1. A process for preparing a toner resin comprising polymerizing styrene and butadiene in a weight ratio of styrene to butadiene of from about 85:15 to about 97:3 in the presence of a mixture of n-dodecyl mercaptan and t-dodecyl mercaptan in a weight ratio of from about 1:9 to about 9:1 to form said toner resin wherein said toner resin has a weight average molecular weight of from about 50,000 to about 140,000, a number average molecular weight of from about 5,000 to about 13,000, a polydispersity of from about 5 to about 15 and a melt index of from about 5 to about 80 g/10 min.

5,206,320

CURABLE FLUOROCOPOLYMER WITH DUAL FUNCTION VINYL ETHER

Fulvio J. Vara, Chester, and James A. Dougherty, Pequannock, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 765,296, Sep. 25, 1991. This application Jun. 15, 1992, Ser. No. 898,605

Int. Cl.[5] C08F *12/20*

U.S. Cl. 526—249 **4 Claims**

1. A rapidly curable fluorocopolymer composition to provide hard coatings without brittleness, and in a suitable mole ratio for copolymerization reaction between its components consisting essentially of (a) 40 to 60 mole % of fluoroolefin units, (b) 8 to 60 mole % of the monovinyl ether of cyclohexanedimethanol units containing primary hydroxyl groups only, and (c) 5 to 45 mole % of alkyl vinyl ether units, the mole % of (a) being substantially equal to (b) +(c).

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POLYCYANATES CONTAINING MESOGENIC MOIETIES AS LATERAL SUBSTITUENTS

Robert E. Hefner, Jr., and Jimmy D. Earls, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1991, Ser. No. 770,791

Int. Cl.[5] C08G *73/06*

U.S. Cl. 526—256 **14 Claims**

1. A polymerizable composition comprising a mixture of

(A) at least one thermosettable polycyanate containing one or more mesogenic moieties as lateral substituents; and

(B) at least one component selected from the group consisting of

(1) at least one polycyanate or polycyanamide containing one or more mesogenic moieties in the main chain of the molecule or at least one polycyanate or polycyanamide which does not contain mesogenic moieties, or any combination thereof;

(2) at least one epoxy resin;

(3) at least one polymaleimide;

(4) at least one polyamine;

(5) at least one polyphenol;

(6) at least one compound containing one or more polymerizable ethylenically unsaturated group(s);

(7) at least one compound which contains in the same molecule both a cyanate or cyanamide group and a polymerizable ethylenically unsaturated group;

(8) at least one compound which contains in the same molecule both a 1,2-epoxide group and a polymerizable ethylenically unsaturated group;

(9) at least one compound which contains in the same molecule both a maleimide group and a cyanate group;

(10) at least one compound which contains one or more mesogenic moieties and only one cyanate or cyanamide group per molecule;

(11) at least one prepolymer of any of the aforesaid components (1) through (10) or any combination of any two or more of said components; and

(12) a mixture of any two or more of components (1) through (11) in any proportion and any combination.

5,206,322

CROSSLINKABLE, FUNCTIONAL POLYMERS OF VINYLPYRROLIDONE AND AMINOALKYL ACRYLAMIDES

Robert B. Login, Oakland; Jean S. Shih, Paramus, and Jui-Chang Chuang, Wayne, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed May 26, 1992, Ser. No. 888,998

Int. Cl.[5] C08F *26/10*

U.S. Cl. 526—264 **2 Claims**

1. A crosslinkable, functional polymer which is obtained by polymerizing vinylpyrrolidone and N-(3-aminopropyl)methacrylamide.

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SILYL DERIVATIVES OF EUGENOL

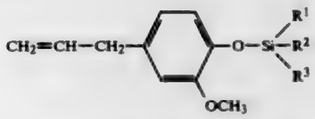
Mary K. Hays, 3000 Daniel La., 7-106, Monroeville, Pa. 15146, and Andrew J. Sivak, 132 Hawthorne St., Edgewood, Pa. 15218

Division of Ser. No. 577,713, Sep. 5, 1990, Pat. No. 5,110,971, which is a continuation-in-part of Ser. No. 438,560, Nov. 20, 1989, abandoned, which is a continuation of Ser. No. 375,648, Jul. 5, 1989, abandoned. This application Dec. 2, 1991, Ser. No. 801,134

Int. Cl.[5] C08F *30/08*

U.S. Cl. 526—279 **6 Claims**

1. Copolymer of a lower olefin and a compound of the formula



in which R^1, R^2 and R^3 are independently selected from linear, branched, and cyclic hydrocarbon groups having a total of from eight to twenty-four carbon atoms, except that, where one of R^1, R^2 or R^3 is a phenyl group, the total carbon atoms must be at least nine.

5,206,324

BUTENE-1 COPOLYMER AND RESIN COMPOSITION CONTAINING THE SAME

Tadashi Asanuma, Takaishi; Tetsunosuke Shiomura, Tokyo; Tateyo Sasaki, Takaishi; Tatsuo Iwatani, Takaishi; Nobutaka Uchikawa, Takaishi, and Kouji Kitabayashi, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,315

Claims priority, application Japan, Oct. 6, 1989, 1-260202

Int. Cl.[5] C08F *210/06, 210/08*

U.S. Cl. 526—348.6 **4 Claims**

1. A copolymer of butene-1 and propylene, wherein, of an absorption of the side-chain methylene groups of butene-1 units of said copolymer as measured in the form of a 1,2,4-trichlorobenzene solution by ^{13}C-NMR, the intensity of an absorption observed at about 26.9 ppm using tetramethylsilane as a standard is at least 0.3 of the intensity of a full absorption of the side-chain methylene groups observed at about 27.8–26.0 ppm using tetramethylsilane as a standard; the content of propylene units ranges from 0.1 wt.% to 20 wt.%; and the intrinsic viscosity as measured at 135° C. in the form of a tetralin solution is at least 0.05.

5,206,325

THERMOPLASTIC GRAFT COPOLYMER AND PROCESS FOR PRODUCING THE SAME

Tadashige Hata; Kazuhiko Matsuzaki, and Shiyuzi Yahiro, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP91/00254, § 371 Date Oct. 25, 1991, § 102(e) Date Oct. 25, 1991, PCT Pub. No. WO91/13108, PCT Pub. Date Sep. 5, 1991

PCT Filed Feb. 26, 1991, Ser. No. 773,922

Claims priority, application Japan, Feb. 27, 1990, 2-46416

Int. Cl.[5] C08G *2/18*; C08B *11/00, 37/00, 37/16*

U.S. Cl. 527—305 **12 Claims**

7. A process for producing a thermoplastic graft copolymer consisting essentially of monosaccharide or polysaccharide units, each having a functional group selected from the group consisting of the hydroxyl group, carboxyl group, amino group and amido group, and polyacetal units consisting of repetitive oxymethylene units (—CH_2O—) which are reaction bonded with each other through said functional group, said

monosaccharide or polysaccharide units constituting backbone of the copolymer and said polyacetal units constituting graft of

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5,206,328

PROCESS FOR THE PRODUCTION OF AN

5,206,331

SEALANT COMPOSITION COMPRISING MOISTURE

5,206,334

BRANCHED POLYCARBONATE FROM

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monosaccharide or polysaccharide units constituting backbone of the copolymer and said polyacetal units constituting graft of the copolymer, said graft being graft-polymerized to said backbone, and said copolymer having viscosity of 0.1–10 (dl/g) as determined in a mixed solvent system consisting of 50% by weight of p-chlorophenol and 50% by weight of tetrachloroethane by using a conventional Ostwald's viscometer at 60° C. and a melting point of 150°–175° C. by homopolymerizing formaldehyde in the presence of said monosaccharide or polysaccharide units or combination of both, with an anionic polymerization catalyst to impart biogradability.

5,206,326

GRAFTED COPOLYMERS HIGHLY ABSORBENT TO AQUEOUS ELECTROLYTE SOLUTIONS

Iqbal Ahmed, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 665,880, Mar. 7, 1991, abandoned. This application Jul. 21, 1992, Ser. No. 917,700

Int. Cl.[5] C08G *63/48, 63/91*

U.S. Cl. 527—309 **26 Claims**

1. A graft copolymer formed by:

(A) graft polymerizing onto a first polymer selected from the group consisting of polysaccharide, polypropylene, and polyethylene; at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, 2-methacryloyloxyethyldiethylamine, 2-acrylamido-2-methylpropane sulfonic acid, alkali salts of 2-acrylamido-2-methylpropane sulfonic acid, 2-methacryloylozyethane sulfonic acid, alkali salts of 2-methacryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof;

(B) graft copolymerizing therewith an ampholytic ion pair monomer having an ammonium cation and a sulfonate anion wherein

(i) the ammonium cation is 2-methacryloyloxyethyldiethylammonium; and

(ii) the sulfonate anion is selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, vinyl sulfonate, styrene sulfonate and any combination of two or more thereof;

wherein the comonomers and ion pair monomers are provided in amounts which are effective to produce a highly absorbent graft copolymer; and

(C) partially saponifying neutralization of said graft copolymer formed in step (B).

5,206,327

PRECERAMIC POLYMERS INCORPORATING BORON AND THEIR APPLICATION IN THE SINTERING OF CARBIDE CERAMICS

Roger L. K. Matsumoto, Newark, and Joanne M. Schwark, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 7, 1991, Ser. No. 772,524

Int. Cl.[5] C08G *79/08*

U.S. Cl. 528—4 **33 Claims**

1. A composition comprising a boron-substituted polysilazane wherein the boron is derived from a borone and is bound to the polysilazane through boron-carbon bonds.

5,206,328

PROCESS FOR THE PRODUCTION OF AN ORGANOPOLYSILOXANE

Yoshio Okamura; Nobuyuki Terae; Tetsuo Okamoto; Hiroshi Ohashi, and Hiroyasu Hara, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1991, Ser. No. 652,139

Claims priority, application Japan, Feb. 8, 1990, 2-29235; Mar. 5, 1990, 2-53165

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—14 **18 Claims**

1. A process for the production of an organopolysiloxane containing at least one epoxy group and a relatively high degree of polymerization with respect to the starting epoxy group containing organopolysiloxane, said process comprises equilibrating a mixture of (a) an epoxy-containing organopolysiloxane having at least one epoxy group in the molecule; (b) an amount effective to react with (a) by a disproportionation equilibration reaction of an epoxyless organosiloxane lacking an epoxy group; (c) an aprotic polar organic solvent; and (d) a basic catalyst.

5,206,329

ONE PART HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Chris A. Sumpter; Larry N. Lewis, both of Scotia, N.Y., and Samuel J. Danishefsky, New Haven, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1991, Ser. No. 800,310

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **8 Claims**

1. A one part heat curable organopolysiloxane composition comprising,

(A) vinyl substituted organopolysiloxane fluid

(B) siloxane hydride

(C) an amount of a platinum group metal catalyst which is sufficient to effect addition between (A) and (B), and

(D) an amount of a triazoline dione which is effective as a hydrosilylation inhibitor.

5,206,330

METHOD FOR THE PREPARATION OF ORGANOPOLYSILOXANE FREE FROM ACID CATALYST RESIDUE

Kouichirou Kobayashi; Naoyuki Ida, both of Gunma, and Shigeru Mori, Kanagawa, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,918

Claims priority, application Japan, Jan. 26, 1990, 2-17079

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—23 **2 Claims**

1. A method for the preparation of an organopolysiloxane free from residue of acid catalyst, which method comprises the successive steps of:

(a) subjecting a mixture of organosiloxane oligomers to a siloxane rearrangement reaction in the presence of sulfuric acid or fuming sulfuric acid as a catalyst to effect polymerization of the organosiloxanes to equilibrium to give an organopolysiloxane containing residue of the acid;

(b) admixing and agitating the acid residue-containing organopolysiloxane with water to affect hydrolysis of the acid residue bonded to the organopolysiloxane molecules;

(c) subjecting the water-admixed organopolysiloxane to phase separation into an aqueous phase and a phase of the organopolysiloxane to discard the aqueous phase; and

(d) washing the organopolysiloxane freed from the aqueous phase with water;

wherein the amount of water admixed in step (b) is in the range from 30% to 100% by weight based on the amount of acid catalyst used in step (a).

5,206,331

SEALANT COMPOSITION COMPRISING MOISTURE CURABLE ISOCYANURATE CONTAINING COMPOUND

Shingo Tsuno, Sakai; Ryuichi Ueda, Ikeda, and Masahiro Ito, Shimamoto, all of Japan, assignors to Sunstar Engineering, Inc., Osaka, Japan

Filed Jun. 13, 1991, Ser. No. 714,844

Claims priority, application Japan, Jun. 15, 1990, 2-158261

Int. Cl.[5] C08G *18/18*

U.S. Cl. 528—52 **8 Claims**

1. A moisture-curing sealant composition which comprises (a) an active isocyanato-terminated urethane prepolymer containing a polyol component with a molecular weight of 2,000 to 20,000 and (b) an isocyanurate catalyst, the sealant composition being able to cure first on isocyanuration, at least in part, under the action of the catalyst, with the residual isocyanato group being then caused to take part in the curing reaction by moisture.

5,206,332

CURING AGENT FOR THE PRODUCTION OF LOW GLOSS POWDER COATINGS BASED ON EPOXY RESINS

Benedikt Hammer; Thomas Guthner, and Helmut Hintermaier, all of Trostberg, Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Dec. 27, 1991, Ser. No. 813,397

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1990, 4042191

Int. Cl.[5] C07D *251/32, 251/18;* C08G *59/00, 59/50*

U.S. Cl. 528—118 **30 Claims**

1. A curing agent composition for curing an epoxy resin comprising:

a mixture of:

a 2-imidazoline derivative having a melting point of greater than 60° C.; and cyanuric acid

wherein the proportions of the components of said curing agent to each other, and the proportion of said curing agent to said epoxy resin cured are sufficient to cure said resin into a low gloss coating and sufficient to provide substantial adhesiveness of said low gloss coating to a substrate.

5,206,333

METHOD OF PRODUCING A NAPHTHOL-MODIFIED PHENOLIC RESIN OF HIGHLY INCREASED MOLECULAR WEIGHT

Haruaki Sue; Ken Nanaumi, both of Shimodate; Takuji Itou, Ibaraki; Ken Madarame, and Shinsuke Hagiwara, both of Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed May 7, 1992, Ser. No. 879,363

Claims priority, application Japan, May 7, 1991, 3-101152; May 7, 1991, 3-101153

Int. Cl.[5] C08G *8/04, 14/40*

U.S. Cl. 528—139 **17 Claims**

1. A method of producing a highly increased molecular weight naphthol-modified phenolic resin by inhibiting gellation time, comprising: allowing a phenol (P), a naphthol (N) and formaldehyde (F) to react in quantities which provide a mol % of the phenol ranging from 95 to 5 mol % and a mol % of the naphthol ranging from 5 to 95 mol %, each based on the total of the phenol and the naphthol, and a molar ratio of formaldehyde to the total of the phenol and the naphthol {F/(P+N)} ranging from 0.5 to 2.0, in the presence of a metallic element selected from the group consisting of transition metallic elements and metallic elements of Group IIa, Group IIIa, Group IVa, Group Va and Group VIa of the Periodic Table and in the presence of an acid.

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BRANCHED POLYCARBONATE FROM 2',4,4''-M-TERPHENYLTRIOL

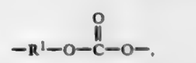
Peter D. Phelps, Schenectady, and James L. Spivack, Cobleskill, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 797,755, Nov. 25, 1991, which is a division of Ser. No. 703,324, May 20, 1991, Pat. No. 5,105,025, which is a division of Ser. No. 632,888, Dec. 24, 1990, Pat. No. 5,049,498. This application May 26, 1992, Ser. No. 888,072

Int. Cl.[5] C08G *64/04*

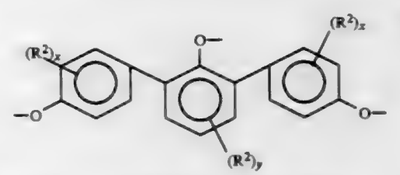
U.S. Cl. 528—204 **5 Claims**

1. A branched polycarbonate comprising structural units of the formula



(I)

wherein R^1 is a divalent organic radical, and branching units of the formula



(II)

wherein each R^2 is a substantially inert substituent, x is 0–4 and y is 0–3.

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SELECTED POLY(DIANHYDRIDES)

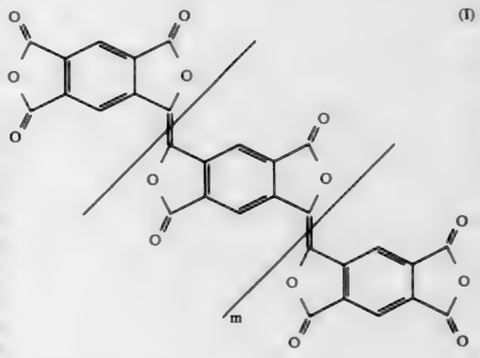
Bruce A. Marien, Woodbridge, and Keith O. Wilbourn, Manchester, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 16, 1991, Ser. No. 808,141

Int. Cl.[5] C08G *61/12;* C07D *307/83*

U.S. Cl. 528—206 **2 Claims**

1. Poly(dianhydride) compounds having formulae (I) and (II):



(I)

where m is 0 to 50.

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SOLVENT-SOLUBLE POLYIMIDESILOXANE

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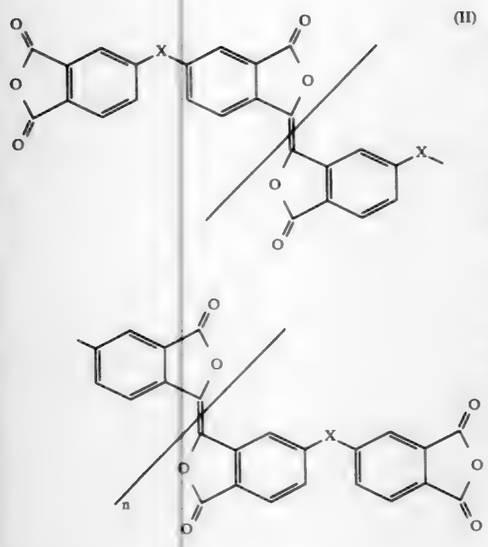


(II)

wherein n is 0 to 20 and X is bond junction, oxygen atom, sulfur atom, SO_2, $C(CF_3)$, CO, $C(CH_3)_2$, CF_2—O—CF_2, CH_2, and CHOH.

5,206,336

PROCESS FOR THE PREPARATION OF NAPHTHALENESULFONIC ACID/FORMALDEHYDE CONDENSATES HAVING A LOW FREE FORMALDEHYDE CONTENT

Emmerich Jager, Rohr, and Walter Lechner, Linz, both of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 653,229, Feb. 8, 1991, Pat. No. 5,101,007. This application Nov. 1, 1991, Ser. No. 786,846

Claims priority, application Austria, Feb. 19, 1990, 372/90

The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.

Int. Cl.[5] **C08G** *12/20, 12/24, 16/02, 75/00*

U.S. Cl. 528—265 **5 Claims**

1. In a process for the preparation of naphthalenesulfonic acid-formaldehyde condensates having a low content of free formaldehyde, the improvement which comprises bringing the condensation product of naphthalenesulfonic acid and formaldehyde to a pH of greater than 11.5 at not less than 80° C. immediately after the condensation, and keeping it at this temperature until the desired low content of free formaldehyde is reached and then bringing the napthalenesulfonic acid-formaldehyde condensates having a low content of free formaldehyde to a pH of 7 to 9, after the desired low content of free formaldehyde is reached.

5,206,337

SOLVENT-SOLUBLE POLYIMIDESILOXANE OLIGOMER AND PROCESS FOR PRODUCING THE SAME

Toshiro Takeda; Naoshige Takeda, both of Yokohama, and Akira Tokoh, Tokyo, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

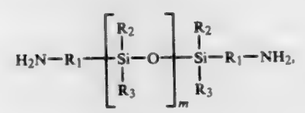
Filed May 7, 1991, Ser. No. 696,647

Claims priority, application Japan, May 10, 1990, 2-118772; May 14, 1990, 2-121174; Jun. 5, 1990, 2-145289; Jun. 8, 1990, 2-148776; Jun. 8, 1990, 2-148777; Jun. 8, 1990, 2-148778; Jun. 25, 1990, 2-164044

Int. Cl.[5] **C08G** *69/08;* **C07D** *323/04;* **C07F** *7/04, 7/08*

U.S. Cl. 528—313 **20 Claims**

1. A low molecular weight polymer having an inherent viscosity η of 0.001–0.5 dl/g as measured at a concentration of 0.5 g/dl in N-methyl-2-pyrrolidone at 30° C. and having an imidization degree of 80–100%, which has been obtained by subjecting to polymerization and imidization (a) an acid component consisting of an aromatic tetracarboxylic acid dianhydride and/or a derivative thereof and (b) a diamine component consisting of 5–100 mole % of a diaminosiloxane represented by the undermentioned formula (I) and 95–0 mole % of an organic diamine other than the formula (I):



(I)

wherein R_1 is a divalent aliphatic group of 1–5 carbon atoms or a divalent aromatic group of 6 or more carbon atoms; R_2 and R_3 are each a monovalent aliphatic or aromatic group and may be the same or different; and m is an integer of 1–100.

5,206,338

N,N'-BIS(MALEIMIDE)/HINDERED DIAMINE COPOLYMERIZATE

Pascal Barthelemy, Lyon, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

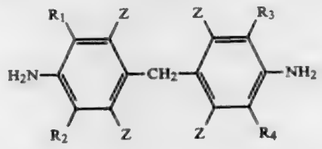
Continuation of Ser. No. 497,721, Mar. 2, 1990, abandoned, which is a continuation of Ser. No. 134,068, Dec. 17, 1987, abandoned. This application Nov. 5, 1991, Ser. No. 790,023

Claims priority, application France, Dec. 17, 1986, 86/17918

Int. Cl.[5] **C08G** *73/12*

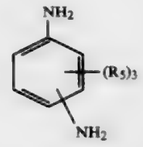
U.S. Cl. 528—322 **15 Claims**

1. An imido polymer comprising the copolymerizate of (a) at least one N,N'-bis(maleimide), with (b) at least one hindered diprimary diamine having the general formula (II):



(II)

in which the symbols R_1, R_2, R_3 and R_4, which are identical or different, are each a methyl, ethyl, propyl or isopropyl radical; and the symbols Z, which are identical or different, are each a hydrogen atom or a chlorine atom; or the general formula (III):



(III)

which the amino radicals are in the meta or para position relative to each other; and the symbols R_5, which are identical or different, are each a methyl, ethyl, propyl or isopropyl radical; and (c_2) an admixture of at least one N-[(meth)allyloxyphenyl]maleimide with at least one N-(meth)-allyloxy-(meth-)allylphenyl]maleimide.

5,206,339

EXTRUSION PROCESS OF POLYIMIDE AND POLYIMIDE PELLET USED FOR THE PROCESS

Masumi Saruwatari, Nagoya; Syoichi Tsuji, Tanashi, and Yasuhiro Fujii, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

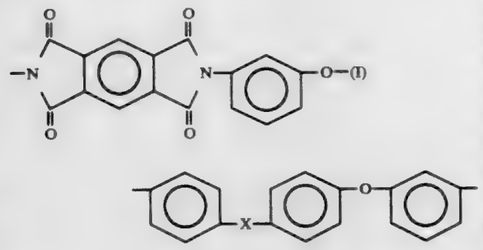
Division of Ser. No. 498,975, Mar. 26, 1990, Pat. No. 5,069,848. This application May 10, 1991, Ser. No. 698,147

Claims priority, application Japan, Apr. 5, 1989, 1-84889

Int. Cl.[5] **C08G** *69/26, 8/02, 73/10*

U.S. Cl. 528—353 **4 Claims**

1. A polyimide pellet for use in an extrusion process comprising polyimide consisting essentially of recurring structural units represented by the formula (I)



(I)

wherein X is a single bond or a hexafluoroisopropylidene group, and wherein the polyimide pellet has a crystallinity of 5% or more by heat-treating at 250° to 370° C. a non-crystallized polyimide pellet.

5,206,340

INTEGRATED CIRCUIT SOCKET COMPRISING A POLYIMIDE POLYMER

Toshihiko Tsutsumi; Toshiyuki Nakakura, both of Yokohama; Taizo Nagahiro, Tokyo; Shuithi Morikawa, Kanagawa, and Nobuhito Koga, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

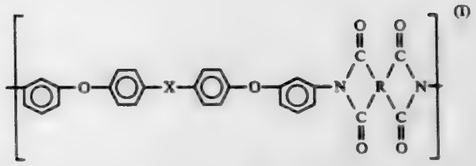
Filed Dec. 19, 1989, Ser. No. 452,369

Claims priority, application Japan, Dec. 27, 1988, 63-327636

Int. Cl.[5] **C08G** *69/26, 8/02, 75/00;* **C08J** *67/02*

U.S. Cl. 528—353 **9 Claims**

1. An integrated circuit socket which is constructed and adapted to fix an integrated circuit on a printed board, said integrated circuit socket comprising a polyimide consisting essentially of recurring units represented by the formula (I):



(I)

wherein x is a bond or x is a radical selected from the group consisting of a bond or a radical selected from the group consisting of a divalent hydrocarbon having from 1 to 10 carbon atoms, carbonyl, thio, or sulfonyl, and R is a tetravalent radical selected from the group consisting of an aliphatic radical having two or more carbon atoms, cycloaliphatic radical, monoaromatic radical, condensed polyaromatic radical, and non-condensed polyaromatic radical wherein aromatic radicals are mutually connected with a bond or a crosslinking function.

5,206,341

POLYMERS FROM HYDROXY ACIDS AND POLYCARBOXYLIC ACIDS

Augusto C. Ibay, and Linwood P. Tenney, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Nov. 21, 1991, Ser. No. 795,776

Int. Cl.[5] **C08G** *63/06*

U.S. Cl. 528—361 **68 Claims**

1. A copolymer from a hydroxyalkanoic acid containing 2 to 22 carbon atoms and polycarboxylic component selected from the group consisting of non-polymeric polycarboxylic acid containing 2 to 22 carbon atoms, activated derivative thereof, water soluble homo-or copolymer of ethylenically unsaturated carboxylic acid, activated derivative thereof, and mixtures thereof, wherein the amount of said hydroxyalkanoic acid is about 99.95 mole % to about 90 mole % based upon the total moles of said hydroxyalkanoic acid and the reactive carboxylic moieties of the polycarboxylic component; and correspondingly said reactive carboxylic moieties of said polycarboxylic component is about 0.05 mole % to about 10 mole % based upon the total of said hydroxyalkanoic acid and said reactive moieties of polycarboxylic component. The end groups of said polymer are at least 90% carboxyl groups.

5,206,342

POLYMERIZATION OF CARBON MONOXIDE/NON CONJUGATED ALKENYL BENZENE

Eit Drent, and Eric Kragtwijk, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 17, 1991, Ser. No. 808,832

Claims priority, application Netherlands, Feb. 28, 1991, 9100372

Int. Cl.[5] **C08G** *67/02*

U.S. Cl. 528—392 **19 Claims**

1. A process for the production of linear alternating polymers of carbon monoxide, a non-conjugated alkenylbenzene compound, with or without ethylene, by contacting carbon monoxide and the non-conjugated alkenylbenzene compound, with or without ethylene, under polymerization conditions in the presence of an inert reaction diluent and a catalytic quantity of a catalyst composition formed from a compound of palladium, the anion of a non-hydrohalogenic acid having a pKa less than 2 and a bis(dialkylphosphino)alkane.

5,206,343

OLIGOPEPTIDES WITH CYCLIC PROLINE-ANALOGOUS

5,206,345

IL-4 AND TNF INDUCE MAB 6G10-RECOGNIZED

5,206,348

HEXAHYDROXYBENZOPHENONE SULFONATE

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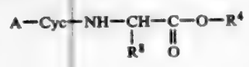
OLIGOPETIDES WITH CYCLIC PROLINE-ANALOGOUS AMINO ACIDS

Stephan Henke, Bad Soden am Taunus; Dietrich Brocks, Wiesbaden; Volkmar Günzler-Pukall, Marburg-Cappel, all of Fed. Rep. of Germany; Kari I. Kivirikko, and Raili M. H. Myllylä, both of Oulu, Finland, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

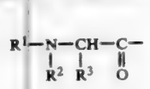
Filed Jun. 1, 1989, Ser. No. 360,177
Int. Cl.[5] A61K *37/02*; C07D *231/00*
U.S. Cl. 530—331 **3 Claims**

1. A compound of the formula



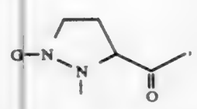
(I)

in which
A denotes (C_1–C_8)-alkoxycarbonyl, in which one hydrogen atom is optionally replaced by (C_6–C_{12})-aryl, or
A denotes a radical of the formula IIa



(IIa)

in which
R^1 denotes (C_6–C_{12})-aryl-(C_1–C_4)-alkoxycarbonyl;
R^2 denotes hydrogen;
R^3 denotes (C_1–C_4)-alkyl which is monosubstituted by phenyl; and
Cyc denotes



wherein G denotes hydrogen;
R^4 denotes (C_6–C_{12})-aryl-(C_1–C_5)-alkyl; and
R^8 is hydrogen,
as well as the salts thereof.

5,206,344

INTERLEUKIN-2 MUTEINS AND POLYMER CONJUGATION THEREOF

Nandini Katre, El Cerrito; Robert F. Halenbeck, San Rafael; Robert J. Goodson, Albany; Peter C. McCabe, Pittsburg, and Michael J. Knauf, San Bruno, all of Calif., assignors to Cetus Oncology Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 866,459, May 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,955, Jun. 26, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 142,467
Int. Cl.[5] C07K *13/00*; A61K *37/02*
U.S. Cl. 530—351 **12 Claims**

1. An interleukin-2 mutein conjugate comprising a polymer covalently conjugated to an IL-2 mutein through a cystein residue, that is not essential to bioactivity, which has been introduced between amino acid positions 1 and 20 as measured from the N-terminus of the mature IL-2 sequence, wherein the polymer is selected from the group consisting of polyethylene glycol or polyoxyethylated polyols.

5,206,345

IL-4 AND TNF INDUCE MAB 6G10-RECOGNIZED EXPRESSION ON BONE MARROW STROMAL CELLS

Boris Masinovsky, Bellevue; William M. Gallatin, Mercer Island, and Paul J. Simmons, Seattle, all of Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Aug. 2, 1990, Ser. No. 562,008
Int. Cl.[5] C07K *15/00*
U.S. Cl. 530—388.7 **2 Claims**

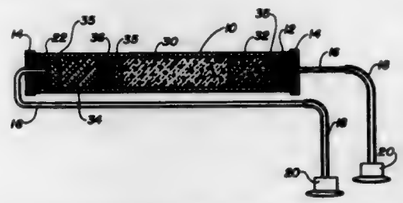
1. A binding partner selected from the group consisting of monoclonal antibodies and antigen-binding fragments of said monoclonal antibodies that specifically binds to a mAb 6G10-recognized epitope of a cell surface molecule having a molecular weight of either 115–130 kD or greater than 200 kD on IL4-activated human bone marrow stromal cells.

5,206,346

METHOD FOR IODINATION/PURIFICATION

William R. Taylor, Lowell, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1990, Ser. No. 623,261
Int. Cl.[5] A61K *43/00*; C07K *3/08, 15/28*
U.S. Cl. 530—391.3 **11 Claims**



1. A method of labelling iodinatable species with a radioisotope comprising the steps of:
providing a sealed column having an inlet end and an outlet end, the column being packed with sequential stages of (a) beads coated with an oxidizing reagent for coupling the radioisotope to the iodinatable species, (b) an anion exchange resin, and (c) a material for trapping elemental radioisotope;
flowing a mixture of the radioisotope and a solution of the iodinatable species to be labelled through the column.

5,206,347

ISOLATION AND USE OF RECEPTORS BINDING TO A PEPTIDE COLUMN

Erkki I. Ruoslahti, Rancho Santa Fe, and Michael D. Pierschbacher, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 242,712, Sep. 9, 1988, abandoned, which is a division of Ser. No. 763,046, Aug. 6, 1985, abandoned. This application Jul. 13, 1990, Ser. No. 553,355
Int. Cl.[5] C07K *3/18*
U.S. Cl. 530—413 **9 Claims**

1. A method for isolating cell surface receptors from a cell extract preparation, comprising the steps of:
a. providing a synthetic peptide consisting essentially of the amino acid sequence Arg-Gly-Asp;
b. coupling said peptide to an affinity matrix in an affinity column;
c. running said cell extract preparation through the column so as to achieve binding between the cell surface receptors to be isolated and said peptide;
d. eluting said column with a solution containing a substance which selectively elutes said cell surface receptor; and
e. collecting said cell surface receptors eluted thereby.

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HEXAHYDROXYBENZOPHENONE SULFONATE ESTERS OF DIAZONAPHTHOQUINONE SENSITIZERS AND POSITIVE PHOTORESISTS EMPLOYING SAME

Elaine C. Jacovich, Middlebury, and Wells C. Cunningham, New Hartford, both of Conn., assignors to Morton International, Inc., Chicago, Ill.

Filed Jul. 23, 1992, Ser. No. 919,357
Int. Cl.[5] C07C *245/12, 309/71*
U.S. Cl. 534—557 **4 Claims**

1. A 1,2-diazonaphthoquinone-4- or -5-sulfonate ester product of 2,3,4,3',4',5'-hexahydroxybenzophenone, said ester product producing, by reverse phase HPLC analysis, peaks for two major isomers, said two major isomers comprising at least 70% by weight of the ester product and wherein a least polar isomer of said two major isomers comprises only about 37 to 44% by weight of the product.

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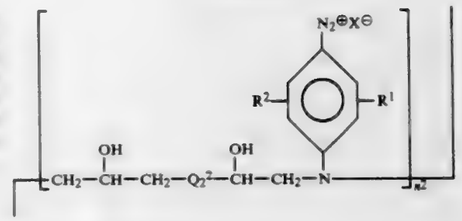
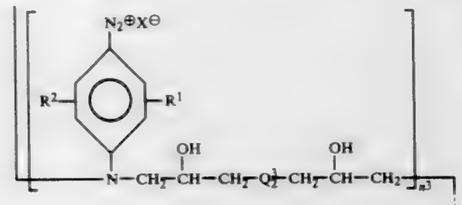




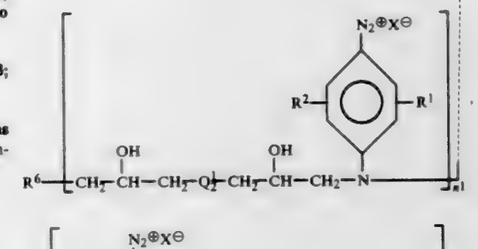
5,206,349

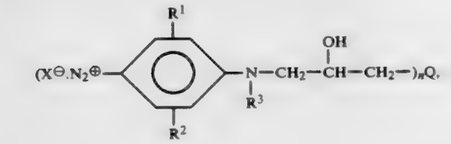
AROMATIC DIAZO COMPOUNDS AND PHOTOSENSITIVE COMPOSITIONS USING THE SAME

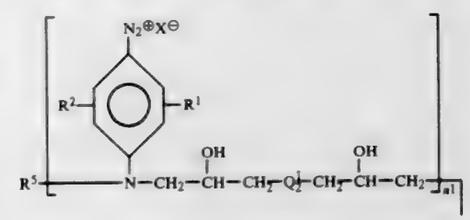
Hirotada Iida; Hajime Arai; Hitoshi Sugiura; Katsuhiko Sugou, and Kieko Harada, all of Funabashi, Japan, assignors to Toyo Gosei Kogy Co., Ltd., Chiba, Japan

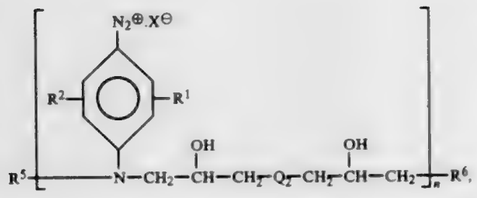
Filed Aug. 5, 1991, Ser. No. 740,636
Claims priority, application Japan, Aug. 10, 1990, 2-210253; Jun. 25, 1991, 3-153295
Int. Cl.[5] C07C *245/20*; G03C *1/54*; G03F *7/016*
U.S. Cl. 534—561 **5 Claims**

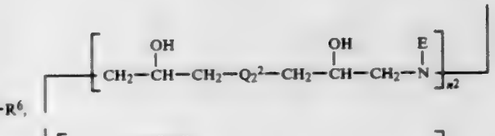
1. A photosensitive polyfunctional aromatic diazo compound selected from the group consisting of:

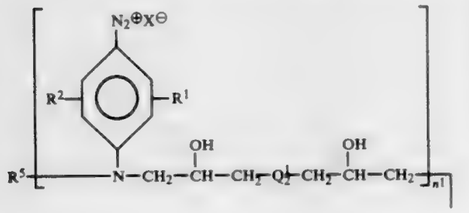


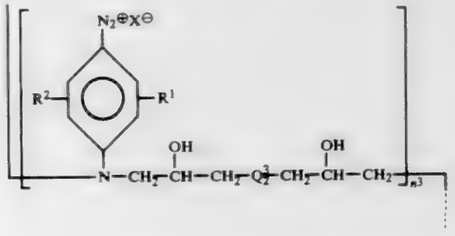












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propionic acid, bis(3,5-dibromo-4-hydroxyphenyl)acetic acid, 2,2-bis(3,5-dibromo-4-hydroxyphenyl)pro-

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SYNTHETIC PROCESS FOR THE PREPARATION OF

(19)

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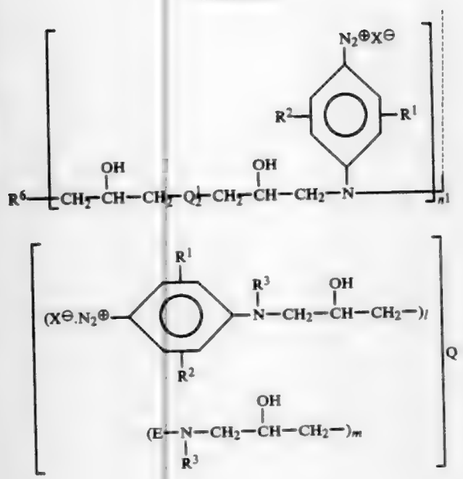


or

wherein

R^1 and R^2 are selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms;

R^3 is selected from the group consisting of alkyl, aralkyl, chloro, bromo, hydroxy, alkoxy, aryloxy, aralkoxy, carboxy, sulfo, carbamoyl, sulfamoyl, substituted alkyl of 1 to 10 carbon atoms, substituted aralkyl of 7 to 20 carbon atoms, 2-(4-pyridyl)-ethyl, $-CH_2CH(OH)CH_2Cl$, $-CH_2CH(OH)CH_2OH$, $-CH_2CH(OH)CH_2OR_4$ and

R^4 is selected from the group consisting of alkyl, aralkyl, aryl, alkylaryl, chloro, alkoxy, aryloxy, aralkoxy, carboxy, sulfo, carbamoyl, sulfamoyl-substituted alkyl, substituted aralkyl, aryl, alkylaryl, the alkyl having 1 to 10 carbon atoms and the aryl having 6 to 20 carbon atoms;

E is selected from the group consisting of alkyl, alkylphenyl, chloro, bromo, carboxy, sulfo, carbamoyl, sulfamoyl-substituted phenyl, and similarly substituted alkyl or alkylphenyl or phenylalkyl, the alkyl having 1 to 8 carbon atoms;

X^- is an anion selected from the group consisting of chloride, bromide, sulfate, hydrogensulfate, phosphate, phosphite, tetrafluoroborate, hexafluorophosphate, chloride-zinc chloride, trifluoroacetate, oxalate, alkylsulfonate of 1 to 8 carbon atoms, trifluoromethane sulfonate, arylsulfonate of 6 to 24 carbon atoms, and 2-hydroxy-4-methoxybenzophenone-5-sulfonate;

Q is a residual group of the following polyhydroxy compounds or amino compounds from which n hydrogen atoms of hydroxyl groups or amino groups are removed:

polyhydroxy compounds selected from the group consisting of alkylene glycol of 2 to 8 carbon atoms, oxa-alkylene glycol of 4 to 9 carbon atoms, aralkylene glycol of 8 to 16 carbon atoms, glycerol, polyglycerol, trimethylolpropane, sorbitan, sorbitol, pentaerythritol, tris(2-hydroxyethyl)isocyanurate, hydroquinone, resorcinol, pyrogallol, phloroglucinol, bis(4-hydroxyphenyl)methane, 2,2-bis(4-hydroxyphenyl)propane, 2,2-bis(4-hydroxyphenyl)butane, bis(4-hydroxyphenyl)sulfone, 2,2-bis(3,5-dibromo-4-hydroxyphenyl)propane, bis(4-hydroxyphenyl)acetic acid, 2,2-bis(4-hydroxyphenyl)-propionic acid, bis(3,5-dibromo-4-hydroxyphenyl)acetic acid, 2,2-bis(3,5-dibromo-4-hydroxyphenyl)propionic acid, 1,1,2,2,-tetra(4-hydroxyphenyl)ethane, phenol-formaldehyde-condensate, cresolformaldehyde-condensate and polyhydroxy compounds formed by the condensation of each above-mentioned polyhydroxy compounds and epichlorohydrin, respectively;

amino compounds selected from the group consisting of alkylamine of 4 to 16 carbon atoms, aralkylamine of 7 to 14 carbon atoms, arylamine of 6 to 14 carbon atoms, alkyarylamine of 7 to 20 carbon atoms, chloro, bromo, carboxy, sulfo, carbamoyl, sulfamoyl substituted compounds of the above-mentioned four groups of amines, diethylenetriamine, triethylenetetramine, ethyleneurea, isocyanuric acid, aniline-formaldehyde-condensate, toluidine-formaldehyde-condensate, and amino compounds formed by the condensation of each above-mentioned amino compounds and epichlorohydrin, respectively;

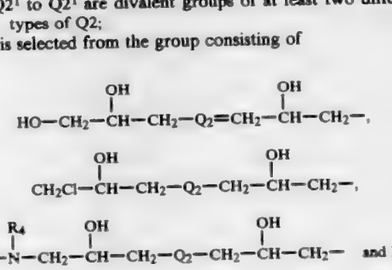
Q_2 is a divalent group derived from the following diols or amines from which two hydrogen atoms of hydroxyl groups or amino groups are removed:

diols selected from the group consisting of alkylene glycol of 2 to 8 carbon atoms, oxaalkylene glycol of 4 to 9 carbon atoms, aralkylene glycol of 8 to 16 carbon atoms, hydroquinone, resorcinol, bis(4-hydroxyphenyl)methane, 2,2-bis(4-hydroxyphenyl)propane, 2,2-bis(4-hydroxyphenyl) butane, bis(4-hydroxyphenyl)sulfone, 2,2-bis(3,5-dibromo-4-hydroxyphenyl)-propane, bis(4-hydroxyphenyl)acetic acid, 2,2-bis(4-hydroxyphenyl)propionic acid, bis(3,5-dibromo-4-hydroxyphenyl)acetic acid, 2,2-bis(3,5-dibromo-4-hydroxyphenyl)propionic acid, and diols formed by the condensation of each above-mentioned diols and epichlorohydrin, respectively;

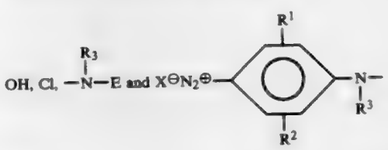
amino compounds selected from the group consisting of alkylamine of 4 to 16 carbon atoms, aralkylamine of 7 to 14 carbon atoms, arylamine of 6 to 14 carbon atoms, alkylarylamine of 7 to 20 carbon atoms, chloro, bromo, carboxy, sulfo, carbamoyl, sulfamoyl-substituted compounds of the above-mentioned four groups of amines, and amino compounds formed by the condensation of each above-mentioned amines and epichlorohydrin, respectively;

$Q2^1$ to $Q2^1$ are divalent groups of at least two different types of Q2;

R^5 is selected from the group consisting of



R^1 is selected from the group consisting of



n is an integer from 2 to 20; n^1 to n^i is an integer from 0 to 4 and $n^1+n^2+n^3+\ldots+ni=2$ to 20; is an integer from 1 to 15, m is an integer from 1 to 15.

5,206,350

SYNTHETIC PROCESS FOR THE PREPARATION OF ANTI-TUMOR AGENT-ETOPOSIDE

Zhi-guang Wang; Wei-yong Ma, and Chun-nian Zhang, all of Shanghai, China, assignors to Shanghai Institute of Pharmaceutical Industry, Shanghai, China

Filed Jun. 7, 1991, Ser. No. 711,900

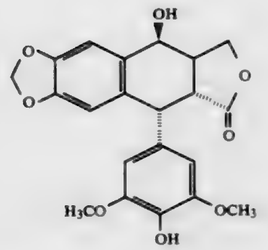
Claims priority, application Switzerland, Jun. 7, 1990, 90102873

Int. Cl.[5] **C07H** *17/04, 1/00;* **A61K** *31/70*

U.S. Cl. 536—18.1 **2 Claims**

1. A process for preparing the anti-tumor agent etoposide, the process comprising the steps of:

Step 1: condensing 4'-demethyl-epipodophyllotoxin of formula (7):

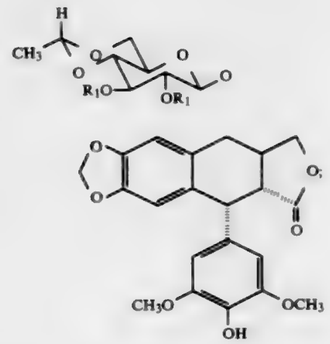


(7)

with a compound of formula (16):

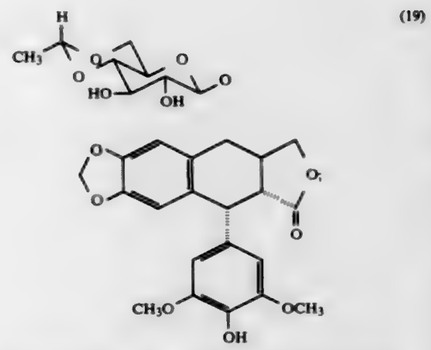
(16)

at a temperature of 0° to −30° C., in the presence of a boron trifluoride ether catalyst to give a compound of formula (19):



(19)

Step 2—reacting the compound of formula (19) obtained in Step 1 with zinc acetate in methanol at a temperature of 80° to 85° C. for 2 hours, to give etoposide of the formula:



(19)

wherein R_1 in formulae (16) and (19) is $C(O)CH_2Cl$.

5,206,351

PROCESS FOR THE PREPARATION OF 2-AMINO (2,3,5-TRI-O-BENZYL-BETA-D-ARABINOFURANOSYL-)ADENINE

Anica Markovac, Lathrup Village, and Maurice P. LaMontagne, Farmington Hills, both of Mich., assignors to Ash Stevens, Inc., Detroit, Mich.

Filed Jun. 15, 1990, Ser. No. 538,661

Int. Cl.[5] **C07H** *19/19*

U.S. Cl. 536—27.11 **6 Claims**

1. A process for the preparation of the compound 2-amino-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl)adenine (V) which comprises:

(a) reacting 2,6-di(trialkylsilylanino)-9-trialkylsilylpurine (II) with 2,3,5-tri-O-benzyl-1-chloro-D-arabinofuranose (III) wherein alkyl is a lower alkyl group containing 1 to 4 carbon atoms which can be straight chain or branched in a non-polar organic solvent selected from the group consisting of 1,2-dichloroethane and acetonitrile at 80° to 85° C. for at least 18 hours to produce 2,6-di(trialkylsilylamino)-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl)purine (IV);

(b) reacting (IV) with a lower alkanol containing 1 to 4 carbon atoms in a second reaction mixture at between about 50°–60° C. for at least 30 minutes to produce 2-amino-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl) adenine (V); and

(c) separating 2-amino-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl)adenine (V) from the second reaction mixture wherein the yield is at least 65% based upon the purine (II).

5,206,352

COMPOSITIONS FOR CLONES CONTAINING DNA SEQUENCES ASSOCIATED WITH MULTIDRUG RESISTANCE IN HUMAN CELLS

Igor B. Roninson, Chicago, Ill.; Ira H. Pastan, Potomac, and Michael M. Gottesman, Bethesda, both of Md., assignors to Board of Trustees of the University of Illinois, Urbana, Ill.

Continuation of Ser. No. 892,575, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 845,610, Mar. 28, 1986, abandoned. This application Sep. 24, 1990, Ser. No. 622,836

Int. Cl.[5] **C07H** *21/00;* **C12Q** *1/68*

U.S. Cl. 536—24.31 **8 Claims**

1. An isolated nucleic acid of the human mdr1 or mdr2 gene, or the complement thereof, selected from the group consisting of:

a) a polynucleotide comprising a continuous sequence of

nucleotides as set forth in FIG. 4 or the RNA equivalent thereof;

5,206,355

PREPARATION OF TRISACCHARIDES (KESTOSES)

a hydroxyl value of 40–120 mg KOH/g and represented by formula (I):

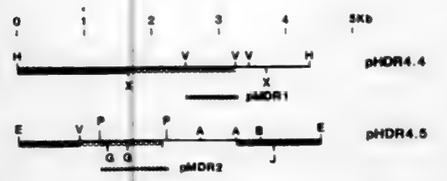
1,3-diiminoisoindolene in a 1-chloronaphthalene solvent; heating said mixture to reflux temperature of from about 130 degrees to about 180 degrees; removing any volatile byproducts

nucleotides as set forth in FIG. 4 or the RNA equivalent thereof;

b) a polynucleotide comprising a continuous sequence of nucleotides as set forth in FIG. 5 or the RNA equivalent thereof;

c) a polynucleotide comprising the DNA insert present in pHDR4.4 (ATCC 40227) or the RNA equivalent thereof;

d) a polynucleotide comprising the DNA insert present in pHDR4.5 (ATCC 40228) or the RNA equivalent thereof;



e) a polynucleotide comprising the DNA insert present in pHDR5A (ATCC 67040) or the RNA equivalent thereof;

f) a polynucleotide comprising the DNA insert present in pHDR5B (ATCC 67041) or the RNA equivalent thereof;

g) a polynucleotide comprising the DNA insert present in pHDR10 (ATCC 67042) or the RNA equivalent thereof; and

h) a polynucleotide comprising the DNA insert present in pHDR104 (ATCC 67156) or the RNA equivalent thereof.

5,206,353

CD-4/CYTOTOXIC GENE FUSIONS

Edward A. Berger, Rockville; Bernard Moss, Bethesda; Thomas R. Fuerst, Gaithersburg; Ira Pastan, Potomac; David Fitzgerald, Silver Spring; Tamio Mizukami, Bethesda, and Vijay K. Chaudhary, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 22, 1988, Ser. No. 223,270

Int. Cl.[5] C12N *15/11*

U.S. Cl. 536—23.4 **9 Claims**

1. A chimeric gene which encodes a hybrid protein, wherein the hybrid protein comprises a sequence of human CD4 containing a binding site for HIV gp120 linked to a sequence of Pseudomonas exotoxin A essential for cell toxicity.

5,206,354

DNA SEQUENCE ENCODING ACTIVE FRAGMENT OF FIBROBLAST GROWTH FACTOR, HBF-2

Andrew P. Seddon, Monroe, and Peter Bohlen, Peekskill, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 23, 1990, Ser. No. 615,207

Int. Cl.[5] C12N *15/00, 15/18, 15/19*

U.S. Cl. 536—23.5 **3 Claims**

1. An isolated DNA molecule consisting of a sequence that codes for a fragment of mammalian recombinant basic fibroblast growth factor, the fragment consisting of amino acids 70 to 155 of basic fibroblast growth factor.

2. An isolated DNA molecule consisting of a sequence that codes for a fragment of mammalian recombinant basic fibroblast growth factor, the fragment consisting of amino acids 70 to 155 of mammalian basic fibroblast growth factor, the sequence modified by replacing amino acid 78 and amino acid 96 independently with an amino acid selected from the group consisting of alanine, glycine, arginine, tryptophan, lysine, aspartic acid, glutamic acid, asparagine, glutamine, histidine, isoleucine, leucine, valine, phenylalanine, tyrosine, methionine, serine, threonine and proline.

5,206,355

PREPARATION OF TRISACCHARIDES (KESTOSES) AND POLYMERS BY PYROLYSIS OF AMORPHOUS SUCROSE

Geoffrey N. Richards, and Merilyn Manley-Harris, both of Missoula, Mont., assignors to The University of Montana, Missoula, Mont.

Continuation-in-part of Ser. No. 767,324, Sep. 30, 1991, abandoned. This application Mar. 19, 1992, Ser. No. 855,355

Int. Cl.[5] C07H *1/00*; C08B *37/00*

U.S. Cl. 536—4.1 **38 Claims**

1. A compound selected from the group consisting of iso-1-kestose, iso-neokestose, iso-6-kestose, 6-[α-D-fructofuranosyl]-D-glucose, and mixtures thereof.

5,206,356

INHIBITORS FOR ALPHA-L-FUCOSYL TRANSFERASE

James M. Pierce, Miami, Fla., and Ole Hindsgaul, Edmonton, Canada, assignors to Chembiomed, Ltd., Edmonton, Canada

Continuation of Ser. No. 274,069, Nov. 21, 1988, Pat. No. 5,032,505. This application Jul. 15, 1991, Ser. No. 730,227

Int. Cl.[5] C07H *15/02*; A61K *31/70*; C12N *9/10*; C12Q *1/48*

U.S. Cl. 536—53 **1 Claim**

1. A compound useful in inhibiting the activity of alpha-L-fucosyl transferase of the formula

2-deoxy-beta-Gal(1–4)beta-GlcNAc-OY (3)

wherein Y is a hydrocarbyl of 3–20C which is unsubstituted or is substituted with 1–2 substituents selected from the group consisting of alkoxy (1–4C).

5,206,357

PROCESS FOR THE PREPARATION OF ALKYL GLYCOSIDES AND ALKYL POLYGLYCOSIDES

Stefan Schmidt, Recklinghausen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 28, 1991, Ser. No. 783,247

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1991, 4101252

Int. Cl.[5] C07H *15/00, 17/00*; C07G *3/00*

U.S. Cl. 536—18.6 **12 Claims**

1. A method for the preparation of alkyl glycosides and alkyl polyglycosides from which transparent aqueous solutions having good color can be prepared comprising: reacting saccharides and alcohols having 12 to 20 carbon atoms by acid catalysis in the presence of sodium hypophosphite and up to 1.3% by weight water, relative to the total of saccharides and alcohols, the molar ratio of saccharide to alcohol ranging from 1:5 to 1:10; and, after reaction is complete,

neutralizing the reaction medium with an alkali metal hydroxide dissolved in an alcohol having 1 to 4 carbon atoms.

5,206,358

PROCESS FOR MANUFACTURING PETROLEUM RESIN

Akira Takahashi, Sugito; Fumio Ochiai, Ichihara; Yo-ichi Ikeda, Ichihara, and Katsumi Minomiya, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1992, Ser. No. 850,270

Claims priority, application Japan, Mar. 14, 1991, 3-49618

Int. Cl.[5] C08F *36/00*

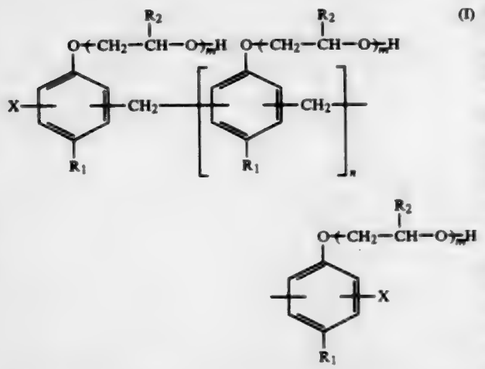
U.S. Cl. 526—290 **10 Claims**

1. A process for manufacturing a petroleum resin which comprises:

polymerizing a petroleum fraction containing unsaturated hydrocarbons in the presence of Friedel-Crafts catalyst, and

washing the polymerized product with water or an alkaline solution in the presence of 1–200 ppm of a polymer having

a hydroxyl value of 40–120 mg KOH/g and represented by formula (I):



wherein R_1 represents a C_{4-16} alkyl group, each R_2 individually represents H or a methyl group, each X individually represents H, an alkyl or an aminomethyl group, n is an integer of 0–8, and m is an integer of 8–20.

5,206,359

PROCESSES FOR PREPARATION OF TITANYL PHTHALOCYANINES TYPE X

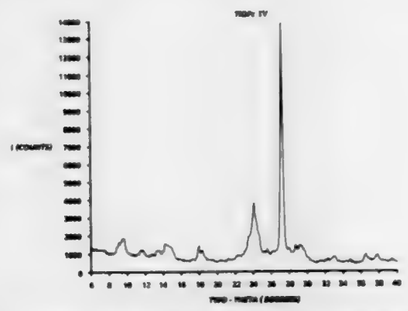
James D. Mayo, Toronto; James M. Duff, Mississauga; Trevor I. Martin, Burlington; Terry L. Bluhm, Oakville; Cheng K. Hsiao, and Ah-Mee Hor, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1991, Ser. No. 683,935

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.[5] C09B *67/12*

U.S. Cl. 540—141 **39 Claims**



1. A process for the preparation of titanyl phthalocyanine Type IV consisting of the treatment of titanyl phthalocyanine Type X with halobenzene at room temperature.

3. A process for the preparation of titanyl phthalocyanine Type IV consisting of dissolving Type I titanyl phthalocyanine in a mixture of trihaloacetic acid and an alkylene halide; adding the aforementioned dissolved solution to a solution containing in a 1:1 ratio an aliphatic alcohol and water; isolating Type X titanyl phthalocyanine from said aliphatic alcohol solution, and wherein said aliphatic alcohol contains from 1 to 6 carbon atoms; subsequently washing the Type X obtained with aliphatic alcohol; thereafter dispersing the Type X in a halobenzene at room temperature; and isolating Type IV titanyl phthalocyanine.

32. A process for the preparation of titanyl phthalocyanine Type IV which consists of adding titanium tetrabutoxide to 1,3-diiminoisoindolene in a 1-chloronaphthalene solvent; heating said mixture to reflux temperature of from about 130 degrees to about 180 degrees; removing any volatile byproducts by distillation thereby increasing the reflux temperature from about 180° to about 200° C.; maintaining the reaction mixture at said temperature for a time period of from about 0.5 to about 8 hours; followed by cooling of the reaction mixture to a temperature of from about 130° to about 180° C. by removal of the heat source; and filtering said hot mixture to separate the solid titanyl phthalocyanine Type I product; admixing the Type I obtained in a solution of trifluoroacetic acid and methylene chloride; isolating Type X titanyl phthalocyanine; admixing the Type X with a halobenzene at room temperature; and separating Type IV titanyl phthalocyanine therefrom.

37. A process for the preparation of titanyl phthalocyanine Type IV consisting of dissolving Type I titanyl phthalocyanine in a mixture of trihaloacetic acid and an alkylene halide in a ratio of from about 1 volume part of acid to about 1 volume part of halide to about 1 volume part of acid to about 10 volume parts of halide; adding the aforementioned dissolved solution to a solution containing in a 1:1 ratio an aliphatic alcohol and water; isolating Type X titanyl phthalocyanine from said aliphatic alcohol solution; subsequently washing the Type X obtained with aliphatic alcohol, and then heated water; thereafter dispersing the Type X in a halobenzene at room temperature; and isolating Type IV titanyl phthalocyanine, and wherein said aliphatic alcohol contains from 1 to 6 carbon atoms.

5,206,360

INTERMEDIATES FOR CYCLOBUTENEDIONE SUBSTITUTED (1-CARBA)CEPHALOSPORIN COMPOUNDS

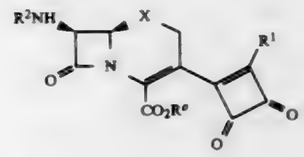
Thomas W. Hudyma, Durham, and Richard A. Partyka, Killingworth, both of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 600,656, Oct. 22, 1990, Pat. No. 5,106,842. This application Apr. 17, 1992, Ser. No. 870,017

Int. Cl.[5] C07D *501/18*

U.S. Cl. 540—205 **28 Claims**

1. A compound of formula I

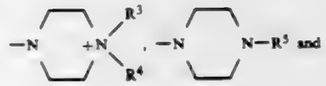


I

wherein

X is sulfur or CH_2;

R^1 is hydrogen, hydroxy, amino, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, phenyl optionally substituted with one to three C_{1-6} alkyl, C_{1-6} alkyloxy or hydroxy, C_{1-6} alkylthio, phenylthio optionally substituted with one to three C_{1-6} alkyl or C_{1-6} alkyloxy on the phenyl ring, phenylmethyloxy optionally substituted with one to three C_{1-6} alkyl or C_{1-6} alkyloxy on the phenyl ring, 1-morpholino, C_{1-6} alkyloxy, C_{2-6} alkenylmethyloxy, C_{3-6} alkenylmethyloxy, C_{1-6} alkylamino, C_{1-6} dialkylamino or a radical selected from the group consisting of



-continued

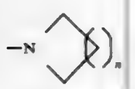
of $—CH_2Cl$, $—CHCl_2$, $—CCl_3$, $—CH_2Br$, $—CHBr_2$, $—CBr_3$, $—CH_2F$, $—CHF_2$, $—CF_3$, $—CHXR^3$ group

of one of the diastereoisomers and a partial resolution of the other diastereoisomer into the enantiomers on which

W is N;

X is CH;

-continued



in which n is 0 to 3, R^5 is C_{1-6} alkyl or hydrogen, and R^3 and R^4 are independently C_{1-6} alkyl;
R^2 is hydrogen or a conventional amino protecting group;
R^0 is hydrogen or a conventional carboxy protecting group, or $—CO_2R^0$ taken together forms a physiologically hydrolyxable ester; or
pharmaceutically acceptable salts or solvates thereof.

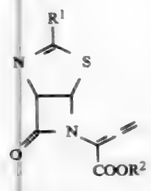
5,206,361

THIAZOLINOAZETIDINONE DERIVATIVE

Sigeru Torii, Okayama; Hideo Tanaka, Okayama; Masatoshi Taniguchi, Tokushima; Michio Sasaoka, Tokushima; Takashi Shiroi, Tokushima, and Yutaka Kameyama, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1991, Ser. No. 665,863
Claims priority, application Japan, Mar. 8, 1990, 2-56956; Mar. 8, 1990, 2-56957
Int. Cl.[5] C07D *205/12*
U.S. Cl. 540—352 **1 Claim**

1. A thiazolinoazetidinone derivative represented by the formula



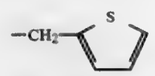
(1)

wherein R^1 is selected from the group consisting of phenyl, substituted phenyl, methyl, substituted methyl and

group, R^3 being one of phenyl and substituted phenyl, and R^2 being one of a hydrogen atom and a carboxylic acid protective group,
wherein substituents of the substituted phenyl are selected from the group consisting of halogen atoms, straight-chain or branched-chain C_{1-4} lower alkyl groups, straight-chain or branched-chain C_{1-4} lower alkoxy groups, straight-chain or branched-chain C_{1-4} alkylthio groups, amino group, amino groups having one to two straight-chain or branched-chain C_{1-4} lower alkyl groups as substituent(s), hydroxy group, protected hydroxy group, nitro group, cyano group, phenyl group

group (wherein R^5 is a straight-chain or branched-chain C_{1-4} lower alkyl group), and

group (wherein R^5 is as defined above); and
said substituted methyl is selected from the group consisting of $—CH_2Cl$, $—CHCl_2$, $—CCl_3$, $—CH_2Br$, $—CHBr_2$, $—CBr_3$, $—CH_2F$, $—CHF_2$, $—CF_3$, $—CHXR^3$ group (wherein X is a hydrogen atom, a halogen atom, hydroxyl group, protected hydroxyl group, acetoxy group, amino group or protected amino group, and R^3 is as defined above).



group, $—CY_2R^3$ group (wherein Y is a halogen atom and R^3 is as defined above), and $—CH_2OR^3$ group (wherein R^3 is as defined above).

5,206,362

TWO-STEP METHOD FOR PREPARING CYCLIC UREAS

George P. Speranza, Austin, and Donald H. Champion, Pflugerville, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Feb. 19, 1992, Ser. No. 837,131
Int. Cl.[5] C07D *413/12, 14/06*
U.S. Cl. 540—454 **12 Claims**

1. A two-step method for the preparation of a large ring cyclic urea which comprises:
heating about one mole of a diamine having 8 to 22 carbon atoms between NH_2 groups with one mole of urea to a temperature from about 120° C. to 140° C. until 1 mole of ammonia is liberated and slowly heating the intermediate with a solvent selected from the group consisting of alcohols and polyethers to a temperature from about 160° C. to 200° C. to produce the large ring cyclic urea products.

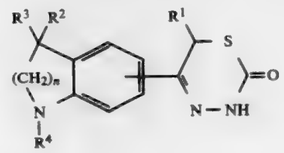
5,206,363

PROCESS FOR THE RESOLUTION OF ENANTIOMERS OF 5-HETEROARYL-1,3,4-THIADIAZINONES

Rochus Jonas, Darmstadt, and Peter Ersing, Stockstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 2, 1992, Ser. No. 939,754
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1991, 4129062
Int. Cl.[5] C07D *285/16, 417/02*
U.S. Cl. 540—593 **22 Claims**

1. A process for the resolution of enantiomers of 5-heteroaryl-1,3,4-thiadiazinones of formula I:



I

wherein
R^1 is A,
R^2 and R^3 are each H or A,
R^4 is H, A or acyl having 1–15 C atoms,
A is alkyl having 1–8 C atoms and
n is 1, 2 or 3,
by kinetic resolution of a racemate thereof, said process comprising:
dissolving a racemate of a compound of Formula I in an inert solvent or inert solvent mixture;
reacting said racemate with a chiral acid chloride;
reacting the resulting mixture of diastereoisomers with an amine or alcohol, thereby achieving a complete resolution of one of the diastereoisomers and a partial resolution of the other diastereoisomer into the enantiomers on which they are based;
separating the resolved enantiomer from the unresolved diastereomer;
converting the unresolved diastereoisomer into its corresponding enantiomer by reaction with an amine or alcohol.

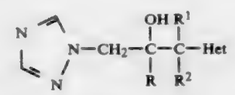
5,206,364

TRIAZOLE ANTIFUNGAL AGENTS

Roger P. Dickinson, Dover, and Kenneth Richardson, Birchington, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 392,686, Aug. 11, 1989, Pat. No. 5,116,844.
This application Mar. 4, 1992, Ser. No. 845,986
Claims priority, application United Kingdom, Aug. 13, 1988, 8819308
Int. Cl.[5] C07D *403/06*
U.S. Cl. 544—216 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R is chlorophenyl, fluorophenyl, dichlorophenyl or difluorophenyl; R^1 is alkyl having one to four carbon atoms; R^2 is hydrogen or alkyl having one to four carbon atoms; and Het is triazinyl, optionally substituted with a fluoro, chloro, bromo, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, trifluoromethyl, nitro, alkanoylamino having one to four carbon atoms, alkoxycarbonylamino having two to five carbon atoms, amino or cyano group.

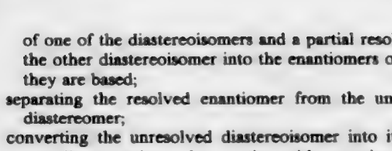
5,206,365

PSYCHOTROPIC HETEROBICYCLOALKYLPIPERAZINE DERIVATIVES

James S. New, 168 Bradley Corners, Madison, Conn. 06483, and William L. Christopher, 103 Charlesberry La., Chapel Hill, N.C. 27514

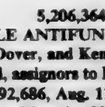
Division of Ser. No. 630,672, Dec. 20, 1990, Pat. No. 5,116,970, which is a division of Ser. No. 157,016, Feb. 18, 1988, Pat. No. 5,001,130. This application Mar. 2, 1992, Ser. No. 844,336
Int. Cl.[5] C07D *491/048, 495/04, 519/00*
U.S. Cl. 544—278 **5 Claims**

1. A compound of Formula I and its pharmaceutically acceptable acid addition salts thereof



I

wherein
V is



(A)

in which one of Q^1, Q^2 or Q^3 is an oxygen or sulfur atom and the other two Qs are carbon atoms bearing either a hydrogen atom or R which is a C_{1-4} alkyl group;
W is N;
X is CH;
the dotted line accompanying the full line is a double bond; and
Z is a heteroaromatic ring system selected from pyrimidine, 1,2-benzisothiazole, thieno[3,2-c]pyridine, and furo[3,2-c]pyridine.

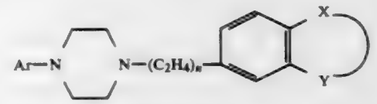
5,206,366

PROCESS FOR PREPARING ARYL PIPERAZINYL-HETEROCYCLIC COMPOUNDS

Paul Bowles, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

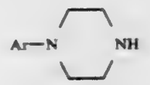
Filed Aug. 26, 1992, Ser. No. 936,179
Int. Cl.[5] C07D *417/06, 413/06*
U.S. Cl. 544—368 **16 Claims**

1. A process for preparing a compound of the formula:

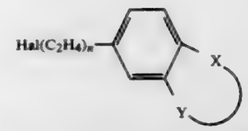


I

or a pharmaceutically acceptable acid addition salt thereof, wherein
Ar is naphthyl optionally substituted by fluoro, chloro, trifluoromethyl, methoxy, cyano or nitro; quinolyl; 6-hydroxy-8-quinolyl; isoquinolyl; quinazolyl; benzoisothiazolyl or an oxide or dioxide thereof, each optionally substituted by fluoro, chloro, trifluoromethyl, methoxy, cyano, or nitro; benzothiazolyl; benzothiadiazolyl; benzotriazolyl; benzoxazolyl; benzoxazolonyl; indolyl; indanyl optionally substituted by one or two fluoro; 3-indazolyl optionally substituted by 1-trifluoromethylphenyl; or phthalazinyl;
n is 1 or 2; and
X and Y together with the phenyl to which they are attached form quinolyl; 2-hydroxyquinolyl; benzothiazolyl; 2-aminobenzothiazolyl; benzoisothiazolyl; indazolyl; 2-hydroxyindazolyl; indolyl; spiro[cyclopentane-1,3'-indolinyl-indolinyl]; oxindolyl optionally substituted by one to three of $(C_1–C_3)$alkyl, or one of chloro, fluoro or phenyl, said phenyl optionally substituted by one chloro or fluoro; benzoxazolyl; 2-aminobenzoxazolyl; benzoxazolonyl; 2-aminobenzoxazolinyl; benzothiazolonyl; benzoimidazolonyl; or benzotriazolyl;
which comprises reacting a monosubstituted piperazine of the formula



wherein AR is as defined above, with an alkyl halide containing compound of the formula



wherein n, X and Y are as defined above and Hal is fluoro, chloro, bromo or iodo, in water with a reagent to neutralize the hydrohalic acid and refluxing the mixture under conditions which are suitable to effect the coupling of said monosubstituted piperazines with said alkyl halide containing compound

and, if desired, preparing the corresponding pharmaceutically acceptable acid addition salt.

5,206,370

CERTAIN PYRIDYL HYDRAZINES AND HYDRAZIDES

fluoroalkyl—NH—CO—O, $(C_{1-6}$fluoroalkyl$)_2$—NH—CO—O—,

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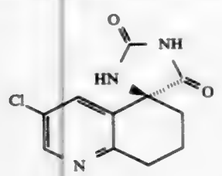
and, if desired, preparing the corresponding pharmaceutically acceptable acid addition salt.

5,206,367
PREPARATION OF OPTICALLY ACTIVE SPIRO-HYDANTOINS

Frank J. Urban, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

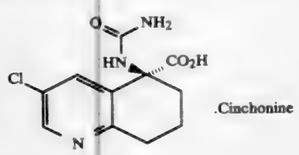
Filed Feb. 18, 1992, Ser. No. 837,794
Int. Cl.[5] C07D *215/48, 471/10*
U.S. Cl. 546—15 **14 Claims**

1. The method of preparing a compound of the formula



I

comprising reacting a compound of the formula



XI

.Cinchonine

with acid at an elevated temperature.

5,206,368
PROCESS FOR EXTRACTING PYRIDINE- AND QUINOLINEDICARBOXYLIC ACIDS FROM AQUEOUS MEDIA

Richard L. Yager, Palmyra, Mo., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 667,832, Mar. 12, 1991, abandoned. This application Feb. 7, 1992, Ser. No. 829,397
Int. Cl.[5] C07D *213/80*
U.S. Cl. 546—168 **17 Claims**

1. A process for extracting a pyridine- or quinolinedicarboxylic acid from an aqueous medium which comprises mixing the aqueous medium with a binary solvent system which comprises a water soluble solvent and aromatic hydrocarbon separating the binary solvent system to obtain a solution of the pyridine- or quinolinedicarboxylic acid and optionally distilling said solution.

5,206,369
PROCESS FOR THE DEHYDRATION OF DIHYDROXYPIPERIDINEDICARBOXYLATES

William H. Miller, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.

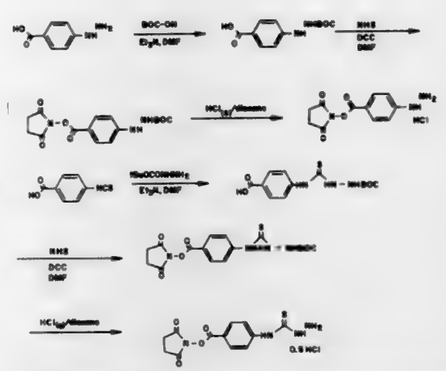
Filed Jan. 21, 1992, Ser. No. 822,791
Int. Cl.[5] C07D *211/02*
U.S. Cl. 546—249 **5 Claims**

1. A process for dehydrating a dialkyl 2,6-bis(trifluoromethyl)-2,6-dihydroxy-4-(alkyl)-3,5-piperidinedicarboxylate to prepare the corresponding dialkyl 2,6-bis(trifluoromethyl)-dihydro-4-(alkyl)-3,5-pyridinedicarboxylates comprising contacting the dihydroxypiperidine starting material with concentrated sulfuric acid, in a molar ratio between about 1.5 and about 2.2 moles of the acid per mole of dihydroxypiperidine, at a temperature at which the dihydroxypiperidine or mixture containing it is substantially liquid, and essentially in the absence of a solvent for the dihydroxypiperidine.

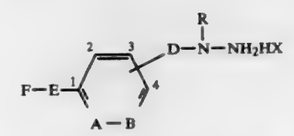
5,206,370
CERTAIN PYRIDYL HYDRAZINES AND HYDRAZIDES USEFUL FOR PROTEIN LABELING

David A. Schwartz, Exton; Michael J. Abrams, Glenmore; Christen M. Gladomenico, Exton, all of Pa., and Jon A. Zubieta, Albany, N.Y., assignors to Johnson Matthey, Inc., Valley Forge, Pa.

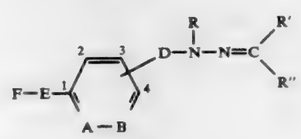
Continuation of Ser. No. 483,201, Feb. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 315,270, Feb. 24, 1989, abandoned. This application May 26, 1992, Ser. No. 888,282
Int. Cl.[5] C07D *401/02, 403/02*
U.S. Cl. 546—281 **6 Claims**



1. A hydrazine or hydrazide compound of the formula (I) or (II):



(I)

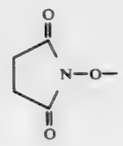


(II)

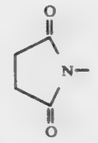
wherein:
A is a carbon or nitrogen atom;
B is carbon or nitrogen atom except that only one of said terms A and B is nitrogen;
D is a direct bond or

E represents

and
F is



or
E and F together represent



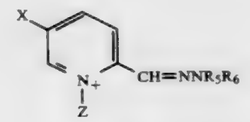
r is hydrogen or lower alkyl;
R′ and R″ independently represent hydrogen and lower alkyl; and
X is a negative counterion.

5,206,371
QUATERNARY PYRIDINIUM COMPOUNDS

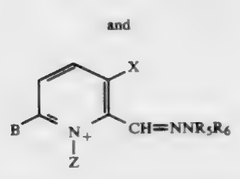
James C. Powers; Sheldon W. May, both of Atlanta; Maria A. Hernandez, Norcross, all of Ga.; Steve Thornton, Raleigh, N.C., and Jan Glinski, New Fairfield, Conn., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Division of Ser. No. 565,520, Aug. 10, 1990. This application Jun. 2, 1992, Ser. No. 892,222
Int. Cl.[5] C07D *213/80*
U.S. Cl. 546—290 **1 Claim**

1. A compound of the group consisting of the formulas:



and



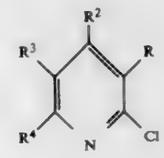
with any counterion to make pharmaceutically acceptable salts, wherein
Z is selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached naphtyl group, C_{1-6} alkyl with two attached phenyl groups, C_{1-6} alkyl with an attached phenyl group mono, di, or trisubstituted with J, C_{1-6} alkyl with two attached phenyl groups mono, di, or trisubstituted with J, C_{1-6} alkyl with an attached naphtyl group mono, di, or trisubstituted with J,
wherein J is selected from the group consisting of halogen, COOH, OH, CN, NO_2, NH_2, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylamine, C_{1-6} alkyl—O—CO—,C_{1-6} alkyl—O—CO—NH—C_{1-6} alkyl—NH—CO—NH—, C_{1-6} alkyl—NH—CO—NH—, C_{1-6} alkyl—NH—CO—O, C_{1-6} alkyl NH—CO—$(C_{1-6}$ alkyl$)_2$N—CO—, wherein X is selected from the group consisting of OH, C_{1-6} alkyl—NH—CO—O—, $(C_{1-6}$ alkyl$)_2$—N—CO—O—, C_{1-6} fluoroalkyl—NH—CO—O, $(C_{1-6}$fluoroalkyl$)_2$—N—H—CO—O—,
R_5 is selected from the group consisting of C_{1-6} alkyl, phenyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached phenyl group mono, di, or trisubstituted with K, C_{1-6} alkyl with an attached naphthyl group, C_{1-6} alkyl with an attached naphthyl group mono, di, or trisubstituted with K,
wherein R_6 is selected from the group consisting of H, C_{1-6} alkyl, phenyl, C_{1-6} alkyl with an attached phenyl group, C_{1-6} alkyl with an attached phenyl group mono, di, or trisubstituted with K
wherein K is selected from the group consisting of halogen, COOH, OH, CN, NO_2, NH_2, C_{1-6} alkyl—, C_{1-6} alkoxy, C_{1-6} alkylamine, C_{1-6} alkyl—O—CO—, C_{1-6} O—CO—NH—, (C_{1-6} alkyl—NH—CO—NH, C_{1-6} alkyl—NH—CO—O—, C_{1-6} alkyl NH—CO, $(C_{1-6}$ alkyl$)_2$N—CO—,
wherein B is selected from the group consisting of H,C_{1-6} alkyl.

5,206,372
PREPARATION OF 2-CHLOROPYRIDINE DERIVATIVES

Ludwig Schröder, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Shell Research Limited, United Kingdom

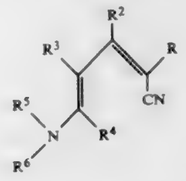
Filed May 29, 1991, Ser. No. 706,861
Claims priority, application European Pat. Off., Jun. 5, 1990, 90110636.9
Int. Cl.[5] C07D *213/71, 213/56, 401/04*
U.S. Cl. 546—294 **9 Claims**

1. A process for the preparation of a compound of the formula



(I)

in which
R represents a group —$CONR^1R^7$ or —SO_2R^8 where R^1 and R^7 independently represent a hydrogen or an optionally substituted C_{1-10} alkyl or aryl group and R^8 represents an optionally substituted C_{1-10} alkyl or aryl group;
R^2 represents a hydrogen atom or an optionally substituted C_{1-10} alkyl or C_{1-10} alkoxy group; and
R^3 and R^4 independently represent a hydrogen atom or an optionally substituted C_{1-10} alkyl or $C_{14\ 10}$ alkoxy group or R^3 and R^4 together represent an optionally substituted C_{1-8} alkylene group; said process comprising the steps of reacting gaseous hydrogen chloride in the presence of a solvent with a compound of the formula



(II)

in which R, R^2, R^3, and R^4 are as defined above and R^5 and R^6 independently represent a hydrogen atom or an optionally substituted C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-10} cycloalkyl or aryl group or R^5 and R^6 together with

the interjacent nitrogen atom represent an optionally substituted pyrrolidine ring.

-continued

5,206,377
COMPOUNDS USEFUL AS ANTIPROLIFERATIVE

the interjacent nitrogen atom represent an optionally substituted pyrrolidine ring,

said optional substituents being selected from halogen atoms, nitro, cyano, hydroxyl, C_{3-6} cycloalkyl, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, amino, C_{1-6} alkylamino, di-C_{1-6} alkylamino, formyl, C_{1-6} alkoxycarbonyl, carboxyl, C_{1-6} alkanoyl, C_{1-6} alkylthio, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, carbamoyl and C_{1-6} alkylamino groups.

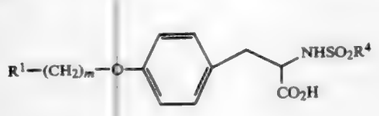
5,206,373

PROCESS FOR PREPARING FIBRINOGEN RECEPTOR ANTAGONISTS

John Y. L. Chung, Edison; David L. Hughes, Old Bridge, and Dalian Zhao, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 28, 1992, Ser. No. 843,658
Int. Cl.[5] C07D *213/00*
U.S. Cl. 546—335 **4 Claims**

1. A process for preparing compounds of the following formula:



wherein:

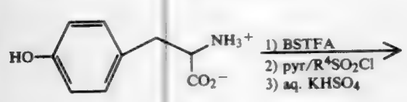
R^1 is 4-piperidinyl or 4-pyridinyl;

m is an interger from two to six; and

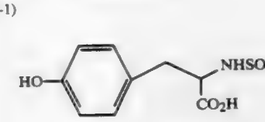
R^4 is aryl, C_{1-10} alkyl, or C_{4-10} aralkyl,

according to the process steps whereby

a)



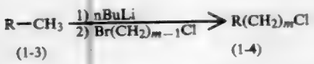
(1-1)



(1-2)

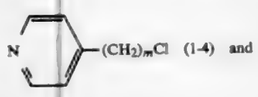
tyrosine or tyrosine-derivative (1-1) is subjected to bis(trimethylsilyl) trifluoroacetamide (BSTFA) mediated sulfonylation, using R^4SO_2Cl, to give the corresponding sulfonamide (1-2);

b)



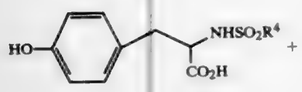
(1-3) (1-4)

R is 4-pyridinyl, methylated 4-picoline (1-3) is reacted with n-BuLi, before quenching with a straight chain alkyl group having Br at one end and Cl at the other end, to yield



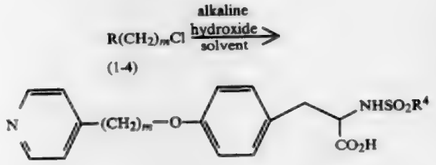
(1-4) and

c)



(1-2)

-continued



(1-5)

(1-2) is added to (1-4) and subjected to phenolic O-alkylation in aqueous alkaline hydroxide in a highly polar aprotic solvent; and when R^1 is optionally 4-piperidinyl, further selectively hydrogenating product (1-5) using Pd/C in acetic acid.

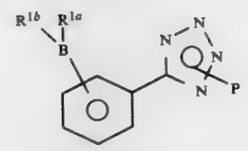
5,206,374

PROCESS FOR PREPARING TETRAZOLYLPHENYLBORONIC ACID INTERMEDIATES

Young S. Lo, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 793,514, Nov. 18, 1991, Pat. No. 5,130,439.
This application Jul. 10, 1992, Ser. No. 911,813
Int. Cl.[5] C07D *257/02*
U.S. Cl. 548—110 **6 Claims**

1. A process for preparing a compound of formula I



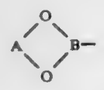
I

wherein:

P is triphenylmethyl, tertiary-butyl, C_1–C_4 alkoxymethyl, methylthiomethyl, phenyl C_1–C_4 alkoxymethyl, p-methoxybenzyl, 2,4,6-trimethylbenzyl, 2-(trimethylsilyl-)ethyl, tetrahydropyranyl, piperonyl, or benzenesulfonyl; and

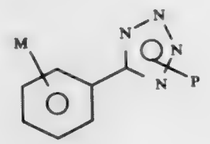
R^{1a} and R^{1b} are each independently chlorine, bromine, C_1–C_4 alkoxy or hydroxy; and

R^{1a} and R^{1b} can be taken together with B to form a cyclic structure



where A is phenyl, or $(CH_2)_n$, where n is 2–4,

comprising reacting in an inert atmosphere a carbanion having the formula



wherein:

P is defined as above; and

M is a metal selected from the group consisting of lithium, sodium, potassium, or magnesium

with a boron compound having the formula

wherein

R^{1a} and R^{1b} are as above, and

R^{1c} is chlorine, bromine or C_{1-4} alkoxy in an aprotic solvent at a temperature ranging from −70° C. to 25° C.

5,206,375

THIOPHENE DERIVATIVES

Ernst Schefczik, Ludwigshafen; Karl-Heinz Etzbach, and Heinz Ellingsfeld, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 512,583, Apr. 23, 1990, abandoned, which is a continuation of Ser. No. 385,951, Jul. 28, 1989, abandoned, which is a continuation of Ser. No. 282,856, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 833,281, Feb. 27, 1986, abandoned. This application Apr. 8, 1992, Ser. No. 865,685
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507421; Oct. 2, 1985, 3535134
Int. Cl.[5] C07D *277/60, 277/62, 263/52, 333/38*
U.S. Cl. 548—152 **3 Claims**

1. A thiophene derivative of the formula

wherein X^1 is chlorine, methoxy, ethoxy, phenylthio, methylsulfonyl or phenylsulfonyl and B is formyl.

5,206,376

PREPARATION OF 2-AMINO-5-FORMYL-4-HALOTHIAZOLES

Matthias Wiesenfeldt, Mutterstadt, and Karl-Heinz Etzbach, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 2, 1991, Ser. No. 679,200
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010514
Int. Cl.[5] C07D *277/40, 277/593*
U.S. Cl. 548—194 **21 Claims**

1. A process for the preparation of 2-amino-5-formyl-4-(chloro or bromo)thiazole, comprising

a) reacting, in a first stage, thiourea with chloroacetic or bromoacetic acid in the presence of a disubstituted formamide selected from the group consisting of an N,N-di(C_1–C_4-alkyl)formamide and an N-(C_1–C_4-alkyl)-N-phenylformamide,

b) treating the reaction mixture, in a second stage, with phosphorus oxide trichloride or phosphorus oxide tribromide, and

c) treating the reaction mixture, in a third stage, with water in the presence of a base,

said reacting in said first stage and said treating in said second stage being conducted in a single reactor.

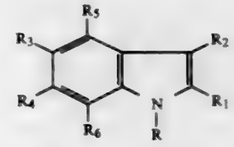
5,206,377

COMPOUNDS USEFUL AS ANTIPROLIFERATIVE AGENTS

Donald A. McAfee, Richmond, Va., assignor to Whitby Research, Inc., Richmond, Va.

Filed Dec. 5, 1991, Ser. No. 802,723
Int. Cl.[5] C07D *209/10*
U.S. Cl. 548—253 **8 Claims**

1. Compounds of the formula



where R is hydrogen or C_1 to C_6 linear or branched alkylene substituted with phenyl;

R_1 is benzyl, or naphthylmethyl;

R_2 is the group $-(CH_2)_m-NHR_2'$, where m is 1 to 3 and R_2' is phenyl sulfonyl, the phenyl group optionally substituted with alkyl, or $-C(O)-R_2''$, where R_2'' is C_1 to C_6 linear or branched alkylene substituted with a substituent selected from the group consisting of hydrogen, phenyl, alkoxy, alkoxy substituted with phenyl, carboxylic acid or the alkyl esters thereof, carbamoyloxy alkyl, carbamoyloxy alkyl substituted with phenyl or phenyl substituted with at least one substituent selected from the group consisting halo, amino, nitro, hydroxy, alkyl, alkoxy, and haloalkyl, and amino or 5-(2-alkanoyl) tetrazole;

R_3, R_4, R_5 and R_6 are the same or different and are hydrogen, C_1 to C_6 linear or branched alkyl, C_1 to C_6 linear or branched alkoxy, phenoxy or phenoxy substituted with one or more C_1 to C_6 linear or branched alkyl.

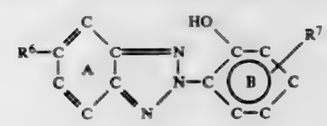
5,206,378

HYDRAZIDO FUNCTIONALIZED 2-(2-HYDROXYPHENYL)-2H-BENZOTRIAZOLES

Ronald E. MacLeay, and Terry N. Myers, both of Erie, N.Y., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 586,931, Sep. 24, 1990, which is a division of Ser. No. 370,376, Jun. 23, 1989, Pat. No. 4,981,914, which is a division of Ser. No. 84,608, Aug. 12, 1987, Pat. No. 4,868,246.
This application Nov. 14, 1991, Ser. No. 791,716
Int. Cl.[5] C07D *249/16*
U.S. Cl. 548—259 **8 Claims**

1. A hydrazido functionalized 2-(2-hydroxyphenyl)-2H-benzotriazole compound having a formula:



wherein

R^6 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, carboxyl, alkoxycarbonyl of 2 to 11 carbons, carboxylic acid amide, chlorine, bromine, sulfonic acid, alkylsulfonyl or a primary hydrazido group H_2N-X^2,

R^7 is hydrogen, alkyl of 1 to 8 carbons, aralkyl of 7 to 12 carbons, aryl of 6 to 14 carbons or a primary hydrazido group X^3-NH_2,

wherein only one of the substituents R^6 or R^7 must be a primary hydrazido group H_2N-X^2 for R^6 or X^3-NH_2 for R^7,

X^2 is $-NH-C(=O)-$ or $-NH-S(=O)_2-$,

X^3 is

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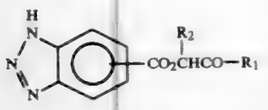
$-(CH_2)_y-NH-C(=O)-(CH_2)_b-C(=O)-NH-$
$-(CH_2)_y-NH-(CH_2)_b-C(=O)-NH-$
$-(CH_2)_2-C(=O)-NH-$
$-(CH_2)_y-NH-C(=O)-CH_2-S-(CH_2)_z-C(=O)-NH-$
$-O-(CH_2)_b-C(=O)-NH-$ or $-C(=O)-NH-$

in which b is 0, 1 or 2, y is 1, 2 or 3, and z is 1 or 2 and rings A and B may be additionally substituted by alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, chlorine or bromine.

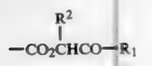
5,206,379
α-ACYLMETHOXYCARBONYLBENZOTRIAZOLES
Masuji Motoki; Seiji Ichijima, and Keiji Mihayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 29, 1991, Ser. No. 751,839
Claims priority, application Japan, Nov. 7, 1990, 2-302079
Int. Cl.[5] C07D *401/10, 249/18*
U.S. Cl. 548—261 **6 Claims**

1. An α-acylmethoxycarbonylbenzotriazole represented by formula (I):



(I)

wherein R_1 is an aliphatic oxy group having 1–10 carbons or an aliphatic amino group having 2–10 carbons; R_2 is hydrogen or an aliphatic group having 1–5 carbons; and the group



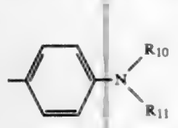
is bonded to a 5- or 6-position of the benzotriazole.

5,206,380
DIVINYL CARBINOL OR CARBINOL DERIVATIVE CHROMOGENIC COMPOUNDS
Kenneth J. Shanton, Neenah, Wis., assignor to The Wiggins Teape Group Limited, Basingstoke, England
Division of Ser. No. 613,019, Nov. 15, 1990, Pat. No. 5,143,891. This application Jun. 8, 1992, Ser. No. 894,814
Claims priority, application United Kingdom, Nov. 15, 1989, 8925802
Int. Cl.[5] C07D *209/82*
U.S. Cl. 548—444 **9 Claims**

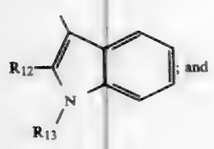
1. A chromogenic compound of the formula (I):

$$R_1-CH=CH-CR_3(OR_4)-CH=CH-R_2 \quad (I)$$

wherein R_1 and R_2 are the same or different and are selected from the group of compounds represented by the formulae (II):



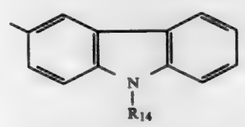
(IIa)



(IIb)

; and

-continued

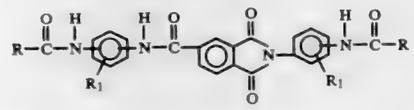


(IIc)

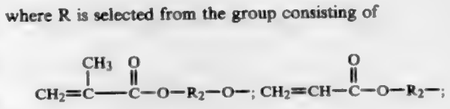
wherein the benzene ring of the group of formula (IIa) may be further substituted, and wherein R_{10} and R_{11} are each independently hydrogen or an optionally-substituted alkyl, aryl or aralkyl group, or R_{10} and R_{11} together with the nitrogen atom to which they are attached form an optionally-substituted heterocyclic ring, which may include one or more additional hetero atoms; R_{12}, R_{13} and R_{14} are each independently hydrogen or an optionally-substituted alkyl, aryl or aralkyl group; R_3 is an optionally-substituted aryl group; and R_4 is hydrogen or an optionally-substituted alkyl, aryl or aralkyl group.

5,206,381
ULTRAVIOLET RADIATION CURABLE POLYAMIDEIMIDE OLIGOMERS
Wei-Fang A. Su, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 390,123, Aug. 7, 1989, abandoned. This application Jul. 11, 1991, Ser. No. 728,811
Int. Cl.[5] C07D *209/48*
U.S. Cl. 548—476 **5 Claims**

1. A compound having the general formula:



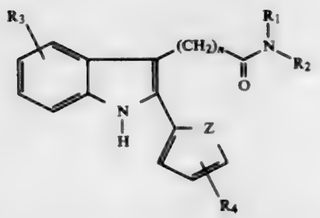
where R is selected from the group consisting of



where R_2 is alkyl or alkenyl (C_1 to C_{12}) and R_1 is hydrogen or alkyl (C_1 to C_4).

5,206,382
INDOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATING NEUROLOGICAL AND PSYCHIATRIC DISORDERS
Erminio Costa, Chevy Chase, Md.; Alessandro Guidotti, Washington, D.C.; Alan Kozikowski, Ponte Vedra Beach, and Dawei Ma, Jacksonvile, both of Fla., assignors to Fidia Georgetown Institute for the Neurosciences, Washington, D.C.
Filed Jun. 27, 1991, Ser. No. 722,196
Int. Cl.[5] C07D *401/12, 403/12, 407/14, 409/04;* A61K *209/20*
U.S. Cl. 548—494 **23 Claims**

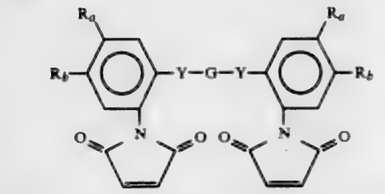
1. A compound having the formula:



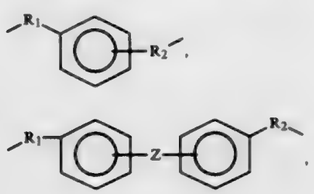
wherein R_1 and R_2 independently is selected from the group consisting of H, C_3–C_{12} straight or branched alkyl, aryl or lower alkyl-substituted aryl; or R_1 and R_2 may be joined to form a 4-to 6-membered saturated or unsaturated ring or a 4-to 6-membered saturated or unsaturated lower alkyl-substituted ring;
R_3 is H, C_1–C_{12} straight or branched alkyl, NO_2, NH_2, N_3, CN, halogen, CO_2R, OR, or SR wherein R is H or lower alkyl;
R_4 is H, C_1–C_{12} straight or branched alkyl, NO_2, NH_2, N_3, CN, halogen, CO_2R, OR, or SR wherein R is H or lower alkyl;
Z is O, NH, S or —CH=CH—; and
n is an integer of 1–3; or a pharmaceutically acceptable salt thereof.

5,206,383
O,O′-BISMALEIMIDE RESIN SYSTEMS
Raymond J. Swedo, Mt. Prospect, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Jan. 28, 1992, Ser. No. 827,182
Int. Cl.[5] C07D *207/452;* C07F *7/02*
U.S. Cl. 548—521 **4 Claims**

1. An o,o′-bismaleimide resin with good processibility having the formula:



wherein Y is selected from the group consisting of oxygen, sulfur, and selenium, R_a and R_b are selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl, iso-butyl, methoxy, ethoxy, propoxy, isopropoxy, n-butoxy, iso-butoxy, chlorine, and bromine, or R_a and R_b together form a fused 6-membered carbocyclic ring, G is selected from the group consisting of:



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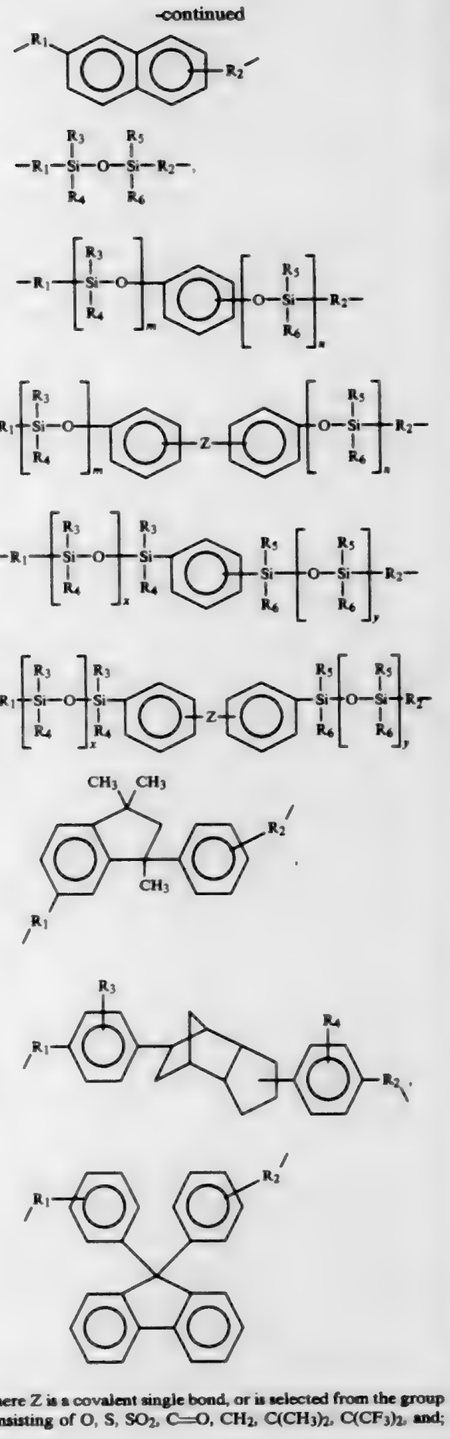

where Z is a covalent single bond, or is selected from the group consisting of O, S, SO_2, C=O, CH_2, $C(CH_3)_2$, $C(CF_3)_2$, and;

R_1 and R_2 are CH_2; R_3, R_4, R_5, and R_6 are alkyl groups con-

5,206,390
SUBSTITUTED BISACYLOXYNAPHTHACENES

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R_1 and R_2 are CH_2; R_3, R_4, R_5, and R_6 are alkyl groups containing from 1 to 6 carbons or are phenyl groups; m and n are integers from 1 to 10; and x and y are integers from 0 to 10.

5,206,384

ACTINONIN DERIVATIVES AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Seiji Shibahara; Yoshiyuki Koyama; Shigeharu Inoue; Mitsugu Hachisu; Shinichi Kondo, all of Yokohama; Takaaki Aoyagi, Fujisawa, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kai and Meiji Seika Kaisha Ltd., both of Japan

Filed Sep. 4, 1991, Ser. No. 754,543

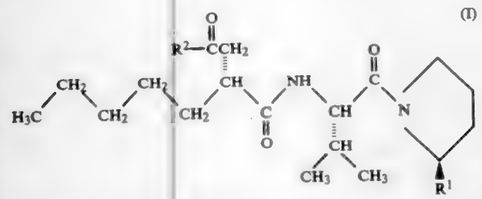
Claims priority, application Japan, Sep. 4, 1990, 2-232469

Int. Cl.[5] **C07D** *207/08*

U.S. Cl. 548—537 **6 Claims**

1. An actinonin derivative represented by general formula (I):

(I)



wherein R_1 denotes sulfoxymethyl group or a substituted carboxyl group selected from carboxamide and hydroxyaminocarbonyl groups, and R^2 denotes hydroxyl group, an alkoxy group, hydroxyamino group or sulfoxyamino group, and a pharmaceutically-acceptable salt thereof.

5,206,385

UREA-HYDROGEN PEROXIDE-POLYVINYLPYRROLIDONE PROCESS

Robert B. Login, Oakland; John J. Merianos, Middletown; Russell B. Biss, Wayne, and Paul Garelick, South Plainfield, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 825,359, Jan. 24, 1992, Pat. No. 5,183,901. This application Jul. 2, 1992, Ser. No. 908,107

Int. Cl.[5] **C07D** *403/14;* **C01B** *15/01*

U.S. Cl. 548—543 **1 Claim**

1. A urea-hydrogen peroxide-polyvinylpyrrolidone product in the form of a free-flowing powder which is non-hydroscopic at room temperature having

(a) about a 1:1 molar ratio of polyvinylpyrrolidone to urea-hydrogen peroxide,

(b) a hydrogen peroxide content of about 14% by weight, and

(c) about 4% or less water therein.

5,206,386

CONTROLLED RELEASE N-SUBSTITUTED PYRROLIDONE ESTERS AND PROCESS FOR THE USE THEREOF

Kolazi S. Narayanan, Palisades Park, and Paul D. Taylor, West Milford, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

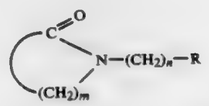
Filed Mar. 20, 1991, Ser. No. 675,367

Int. Cl.[5] **C07D** *207/27;* **A61K** *31/40*

U.S. Cl. 548—551 **4 Claims**

1. A controlled release N-alkylene substituted cyclic lactam ester of a biologically active organic acid as represented by Formula I:

I



where n=1 to 3, m=3, and R is ester moiety of a biologically active medicinal carboxylic acid or amino carboxylic acid, the ester group being hydrolyzabel in vivo to release the biologically active carboxylic acid substance, where R is derived from a carboxylic acid from the group consisting of aspirin(acetyl salicyclic acid), 2,4 dichlorophenoxy acetic acid, 3,6, dichloro 2- methyoxybenzoic acid, endothall, alpha and beta naphthoic acids, N-phenylphthalamic acid, acrylic acid, glycine, alphaamino butyric acid, phosphonomethyl glycine, amiben, indobufen, idoprofen, indomethacin, and ibuprofen.

5,206,387

FUSED HETEROALKYLENE QUINOLINAMINES

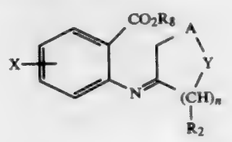
Gregory M. Shutske, Somerset, and Richard C. Effland, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 841,168, Feb. 25, 1992, which is a division of Ser. No. 645,384, Jan. 10, 1991, Pat. No. 5,112,830, which is a division of Ser. No. 337,603, Apr. 13, 1989, Pat. No. 5,002,955, which is a division of Ser. No. 171,103, Apr. 13, 1988, Pat. No. 4,843,079, which is a continuation-in-part of Ser. No. 41,562, Apr. 23, 1987, abandoned. This application Oct. 19, 1992, Ser. No. 963,175

Int. Cl.[5] **C07D** *335/02, 309/28, 307/30, 313/04*

U.S. Cl. 549—9 **1 Claim**

1. A compound having the formula



wherein n is 1–4; A is a direct bond or $(CHR_3)_m$, m being 1–3; X is hydrogen, loweralkyl, cycloalkyl, loweralkoxy, halogen, hydroxy, nitro, trifluoromethyl, formyl, loweralkylcarbonyl, arylcarbonyl, —SH, loweralkylthio, —NHCOR$_4$ or —NR$_5$R$_6$, R_4 being hydrogen or loweralkyl, and R_5 and R_6 being independently hydrogen, loweralkyl or cycloalkyl; Y is O or S; R_8 is hydrogen or loweralkyl; and R_2 and R_3 are independently hydrogen or loweralkyl.

5,206,388

PROCESS FOR THE PREPARATION OF 5,6,11,12-TETRATHIOTETRACENE

Alex Alder, Arisdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 22, 1992, Ser. No. 872,735

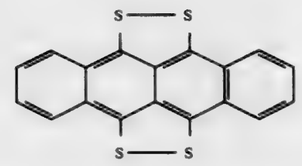
Claims priority, application Switzerland, Apr. 25, 1991, 1236/91

Int. Cl.[5] **C07D** *339/02*

U.S. Cl. 549—31 **11 Claims**

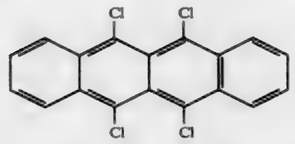
1. A process for the preparation of 5,6,11,12-tetrathiotetracene of formula I

(I)



by reacting 5,6,11,12-tetrachlorotetracene of formula II

(II)



with thiourea in the presence of a polar aprotic solvent, which process comprises carrying out the reaction with a mixture of thiourea and sulfur.

5,206,389

ACRYLATES CONTAINING AN ALCOHOL, ALDEHYDE AND/OR ETHER FUNCTIONAL GROUP, PROCESS FOR THEIR MANUFACTURE AND THEIR APPLICATION TO THE PRODUCTION OF NEW POLYMERS AND COPOLYMERS

Marie-Christine Berthe; Paul Caubere, and Yves Fort, all of Vandoeuvre les Nancy, France, assignors to Atochem, France

Filed Jun. 27, 1991, Ser. No. 721,751

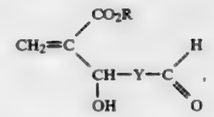
Claims priority, application France, Jun. 27, 1990, 90 08108

Int. Cl.[5] **C07D** *333/32, 307/46*

U.S. Cl. 549—72 **9 Claims**

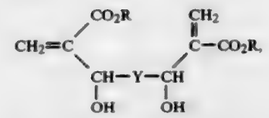
1. Acrylates chosen from those of formula

(I)



those of formula

(II)



in which:

R is a radical chosen from alkyl radicals containing from 1 to 12 carbon atoms, cycloalkyl radicals containing from 5 to 12 carbon atoms, and aryl, arylalkyl and alkylaryl radicals, and

Y is a radical chosen from alkylene radicals containing from 1 to 12 carbon atoms, arylene radicals containing from 6 to 12 carbon atoms, heterocyclic radicals whose ring contains from 5 to 10 members and whose heteroatom is chosen from nitrogen, oxygen and sulphur, and alkylarylene radicals in which the alkyl part contains from 1 to 4 carbon atoms, and Y not being able to denote 1,4-phenylene when R denotes methyl.

5,206,390

SUBSTITUTED BISACYLOXYNAPHTHACENES

Marcus Baumann, Basel; Carl W. Mayer, Riehen, both of Switzerland; Wolfgang Wernet, Freiburg, Fed. Rep. of Germany, and Walter Fischer, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1989, Ser. No. 356,827

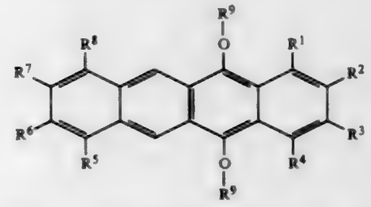
Claims priority, application Switzerland, May 27, 1988, 2008/88; Jul. 19, 1988, 2754/88

Int. Cl.[5] **C07C** *43/267*

U.S. Cl. 549—214 **8 Claims**

1. A compound of the formula I

(I)



in which R^1 to R^8 independently of one another are H and at least one of R^1 to R^8 is —F, —Si(C_1–C_4alkyl)$_3$ or —COOR^{10}; or each pair of adjacent radicals of R^1 to R^8 is —CO—O—CO—; or at least one of R^1 to R^8 is C_1–C_{20}alkyl—$(X)_p$—, C_2–C_{20}alkenyl—$(X)_p$—, C_2–C_{20}alkynyl—$(X)_p$—, C_3–C_8cycloalkyl—$(X)_p$—, C_1–C_{12}alkyl—C_3–C_8cycloalkyl—$(X)_p$—, C_3–C_8—cycloalkyl—$CH_2(X)_p$—, C_1–C_{12}alkyl—C_3–C_8cycloalkyl—CH_2—$(X)_p$—, C_6–C_{10}aryl—X—, C_7–C_{20}alkaryl—X—, C_7–C_{12}aralkyl—$(X)_p$— or C_8–C_{20}alkaralkyl—$(X)_p$— or —Y—$(C_mH_{2m}$—$O)_n$—R^{10} each of which is unsubstituted or substituted by —F, —OH, —CN, C_1–C_{12}alkoxy, C_1–C_{12}acyloxy or —COOR^{10}; R^{10} is H or C_1–C_{18}alkyl, X is —O—, —S—, —SO— or —SO_2— and Y is —O— or —S—, and p is 0 or 1, m is a number from 2 to 6 and n is a number from 2 to 20; and R^9 is C_1–C_4acyl which is unsubstituted or substituted by -F, provided that when R^1–R^6 and R^8 are H and, R^7 is methyl, R^9 is not C_2-acyl.

5,206,391

PROCESS FOR THE PREPARATION OF HALOPHTHALIC ANHYDRIDES

Karl W. Seper, Youngstown; Edward J. Colman, Niagara Falls; David Y. Tang, E. Amherst; Mary K. Cocoman, Grand Island, and Harry E. Buckholtz, Lewiston, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

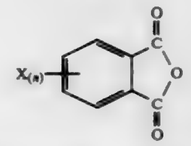
Continuation-in-part of Ser. No. 405,606, Sep. 11, 1989, Pat. No. 5,049,682. This application Aug. 29, 1991, Ser. No. 751,841

Int. Cl.[5] **C07D** *307/74*

U.S. Cl. 549—246 **15 Claims**

1. A process for the preparation of a halogen substituted phthalic anhydride of the formula

1



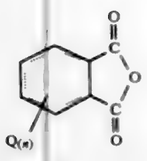
wherein X is independently F-, Cl-, Br-, or I-; and n is 1 or 2, which comprises

a) reacting in the liquid phase at temperatures below about 230° Celsius, bromine with a halogen substituted hexa-, or tetra- hydrophthalo- reactant of the formula

wherein:

R is a lower alkyl, trifluoromethyl, phenyl, substituted

VOL 1149 ISS 4 AP 27 1993 UMI



II

wherein Q is monohalo and is the same as X or is gem-dihalo, wherein at least one halogen is the same as X, and n is the same number as in formula I, with the proviso that each monohalo is directly attached to a double bond carbon and each gem-dihalo is directly attached to a non-double bond carbon and with the proviso that the initial reaction is carried out at a temperature below 170° Celsius to produce the halogen substituted phthalo compound, of Formula I, and gaseous HBr; and

B) reacting the gaseous HBr with chlorine to produce bromine and HCl.

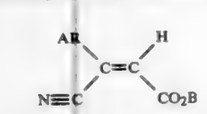
5,206,392

FACILE SYNTHESIS OF ARYLMALEIC ACIDS AND ANHYDRIDES

William D. Dean, Arlington, Tex., assignor to American Cyanamid Company, Wayne, N.J.

Filed Apr. 27, 1992, Ser. No. 873,846
Int. Cl.[5] C07C *51/08*; C07D *307/60*
U.S. Cl. 549—261 **13 Claims**

1. A process for preparing compounds of the formula III:



III

wherein Ar is phenyl or substituted phenyl having one or more substituents selected from the group consisting of straight or branched chain (C_1-C_4) alkyl, (C_1-C_3) alkoxy, or halo selected from bromine, chlorine, fluorine or iodine, and B is a salt selected from sodium, potassium or cesium, which comprises:

reacting a compound of the formula Ar—CH_2CN, wherein Ar is as defined above, with glyoxylic acid hydrate in the presence of a sodium, potassium or cesium containing base to yield the compound of formula III.

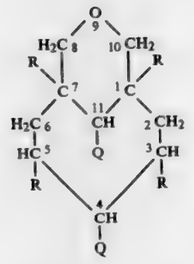
5,206,393

OXA-BICYCLIC POLYFUNCTIONAL COMPOUNDS AND PREPARATION THEREOF

Ronald S. Newman, North Brunswick, N.J., and St. Clair W. Greenidge, Brooklyn, N.Y., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 767,800, Sep. 30, 1991, Pat. No. 5,145,973. This application Jun. 11, 1992, Ser. No. 896,986
Int. Cl.[5] C07D *311/94*
U.S. Cl. 549—397 **7 Claims**

1. A compound having the formula,



where:

R is an alkyl group having from 1 to 12 carbon atoms;

Q is —OH, —NH_2, —NHR', —NHC(O)R', —OCH_2CH_2CN or —$O(C_nH_{2n}O)_mCH_2CH_2CN$ where R'is an alkyl group having from 1 to 12 carbon atoms, an arylalkyl group having from 7 to 12 carbon atoms, an aryl group having from 6 to 12 carbon atoms, or a cycloaliphatic group having from 5 to 12 carbon atoms; n has a value from 2 to 4, and m has a value from one to 50.

5,206,394

LEWIS BASE COMPLEXES OF ALKALI METAL SALTS

Ronald Snaith, and Dominic S. Wright, both of Cambridge, England, assignors to The Associated Octel Company Limited, London, United Kingdom

PCT No. PCT/GB88/00915, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989, PCT Pub. No. WO89/03835, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 372,362
Claims priority, application United Kingdom, Oct. 21, 1987, 8724662
Int. Cl.[5] C07C *211/00*
U.S. Cl. 549—429 **12 Claims**

1. A method for the preparation of alkali metal salt complexes of the formula $(M_xX.nL)_y$ where M is an alkali metal, X is an anion, L is an organic electron-donating ligand (Lewis base), x is the valency of the anion X, n is a number such that n:1 is the molar ratio of ligand to alkali metal salt in the complex, and y is an integer up to infinity, comprising the step of reacting an alkali metal or a hydride or alkyl thereof with an anhydrous ammonium salt of the anion X in the presence of the ligand (L), the reaction being carried out under anhydrous conditions and under an inert atmosphere and in the presence of a hydrocarbon solvent.

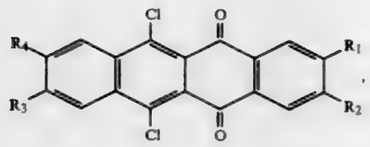
5,206,395

PHOTOCHROMIC NAPHTHACENEQUINONES, PROCESS FOR THEIR PREPARATION AND THE USE THEREOF

Walter Fischer, Reinach, Switzerland; Evelyn Fischer, Weil am Rhein, Fed. Rep. of Germany; Ernst Minder, Sissach; Manfred Hofmann, Marly, both of Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany, and Heinz Spahni, Frenkendorf, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 639,463, Jan. 10, 1991. This application May 8, 1992, Ser. No. 880,458
Claims priority, application Switzerland, Jan. 18, 1990, 161/90
Int. Cl.[5] C07C *50/36*
U.S. Cl. 552—201 **7 Claims**

1. A compound of formula II



(II)

wherein at least one of R_1 to R_4 is an organic thio group, and the other members R_1 to R_4 are H, —F, —Cl or —Br.

5,206,396

TELOMERIZATION OF 1,3-BUTADIENE

Bert Gruber, Bedburg, Fed. Rep. of Germany; Kenneth J. Weese, Santa Rosa; Steven M. Hoagland, San Francisco, both of Calif.; Hans-Peter Mueller, Neusse, Fed. Rep. of Germany; Karlheinz Hill, Santa Rosa, Calif.; Arno Behr, Bearath, Fed. Rep. of Germany, and James R. Tucker, Cincinnati, Ohio, assignors to Henkel Research Corporation, Santa Rosa, Calif.

Filed Jul. 25, 1990, Ser. No. 558,047
Int. Cl.[5] C09F *7/06*
U.S. Cl. 554—27 **9 Claims**

1. A process for telomerizing 1,3-butadiene with a carboxylic acid which comprises reacting 1,3-butadiene and a carboxylic acid in the presence of a catalyst effective amount of a palladium (II)/tris-(aryl)phosphite catalyst in the presence of a secondary or tertiary alcohol.

5,206,397

Patent Not Issued For This Number

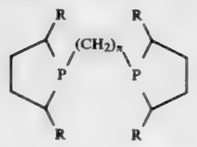
5,206,398

CHIRAL PHOSPHOLANE TRANSITION METAL CATALYSTS

Mark J. Burk, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 644,526, Jan. 23, 1991, abandoned, which is a division of Ser. No. 524,737, May 17, 1990, Pat. No. 5,008,457. This application Jun. 26, 1992, Ser. No. 904,764
Int. Cl.[5] C07F *15/00, 9/28*
U.S. Cl. 556—16 **8 Claims**

1. A complex comprising one or more transition metals, lanthanides or actinides and one or more of the following compounds as ligands

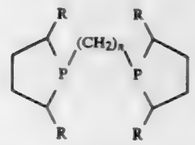


I

wherein:

R is a lower alkyl, trifluoromethyl, phenyl, substituted phenyl, aralkyl or ring-substituted aralkyl; and n is an integer having a value from 1 to 12.

5. A process for the preparation of a compound of formula I

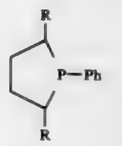


I

wherein:

R is a lower alkyl, trifluoromethyl, phenyl, substituted phenyl, aralkyl or ring-substituted aralkyl; and

n is an integer of 1 to 12; comprising reacting a phenyl substituted phospholane of formula III



III

wherein R is defined as in formula I, with lithium and a dihalo compound of formula

$$X—(CH_2)_n—X \text{ or } R^1O—(CH_2)_n—OR^1$$

wherein X is halogen, OR^1 or R^1O are methanesulfonate, trifluoromethanesulfonate or p-toluenesulfonate, and n is an integer from 1 to 12 to yield the desired compound of formula I.

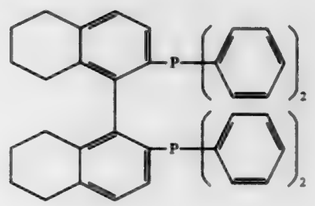
5,206,399

2,2'-BIS(DIPHENYLPHOSPHINO)-5,5',6,6',7,7',8,8'-OCTAHYDRO-1,1'-BINAPHTHYL AND TRANSITION METAL COMPLEX CONTAINING THE SAME AS LIGAND

Noboru Sayo, and Hidenori Kumobayashi, both of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Oct. 1, 1991, Ser. No. 769,264
Claims priority, application Japan, Oct. 1, 1990, 2-263440
Int. Cl.[5] C07F *15/00, 9/50*
U.S. Cl. 556—20 **6 Claims**

1. 2,2'-Bis(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl represented by formula (I).



(I)

5,206,400

(A) contacting a mixture comprising an organohydrosilane described by formula

5,206,404

TRIARYL PHOSPHATE ESTER COMPOSITION AND

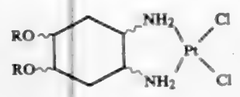
5,206,407

PROCESS FOR THE PREPARATION OF SECONDARY

VOL 1149 ISS 4 AP 27 1993 UMI

5,206,400
DIASTEREOMERIC MONO- AND DI-SUBSTITUTED DIAMINO CYCLOHEXANE COMPOUNDS AND THE METHOD OF PREPARATION THEREOF
Donald T. Witiak, Mt. Vernon, Ohio, and David P. Rotella, State College, Pa., assignors to Ohio State University, Columbus, Ohio
Filed Jul. 7, 1986, Ser. No. 882,258
Int. Cl.[5] C07F 15/00
U.S. Cl. 556—137 19 Claims

1. A diastereomeric S,P-4,2-dichloro(4,5-di-substituted-oxy-1,2-cyclohexanediamine-N,N')-platinum compound defined



according to the generic formula wherein R is an ester group having from 2 to 22 carbon atoms

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5,206,401
METHOD OF MAKING ALKYLALUMINOXANE
Dennis L. Deavenport, Seabrook; James T. Hodges, III, Alvin, both of Tex.; Dennis B. Malpass, Peekskill, N.Y., and Nam H. Tran, Houston, Tex., assignors to Akzo Chemicals Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 534,913, Jun. 8, 1990, Pat. No. 5,041,585, Ser. No. 560,952, Aug. 1, 1990, Pat. No. 5,041,584, and Ser. No. 560,953, Aug. 1, 1990, Pat. No. 5,086,024. This application Jun. 7, 1991, Ser. No. 712,310
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] C07F 5/06
U.S. Cl. 556—175 10 Claims

1. In a process for the production of alkylaluminoxane by the reaction of water and a trialkylaluminum compound in an organic solvent medium, wherein the improvement comprises conducting the reaction in the presence of an aluminoxane which functions as a reaction moderator.

5,206,402
PROCESS FOR PREPARATION OF OMEGA-ALKENYLCHLOROSILANES
Donald E. McVannel, Hemlock, and Kelly J. Wall, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Sep. 17, 1992, Ser. No. 946,136
Int. Cl.[5] C07P 7/08
U.S. Cl. 556—479 34 Claims

1. A process for preparing Ω-alkenylchlorosilanes, the process comprising:

(A) contacting a mixture comprising an organohydrosilane described by formula

$$R_aHSiCl_{3-a}$$

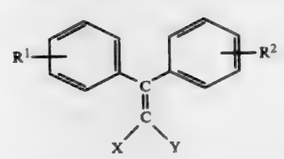
and an α,Ω-diene comprising five to 14 carbon atoms, where the mole ratio of the α,Ω-diene to the organohydrosilane is within a range of about 6:1 to 50:1, with a supported platinum catalyst at a temperature within a range of about 10° C. to 100° C., and
(B) recovering an Ω-alkenylchlorosilane described by formula

$$R_aR^1SiCl_{3-a}$$

where each R is independently selected from a group consisting of alkyls comprising one to six carbon atoms, R^1 is selected from a group consisting of Ω-alkenyls comprising five to 14 carbon atoms, and a=0, 1, or 2.

5,206,403
DIPHENYLETHYLENE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND TREATMENT METHODS
Youji Yamagishi, Kamiinsyoshi; Kozo Akasaka; Takeshi Suzuki, both of Ushiku; Mitsuaki Miyamoto, Sakura; Kouji Nakamoto, Tsuchiura; Kazuo Okano, Yatabemachi; Shinya Abe, Ushiku; Hironori Ikuta, Ushiku; Kenji Hayashi; Hiroyuki Yoshimura, both of Yatabemachi; Tohru Fujimori, Toyosato; Koukichi Harada, Yatabemachi, and Isao Yamatsu, Ushiku, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Division of Ser. No. 364,711, Jun. 9, 1989, Pat. No. 5,034,418, which is a division of Ser. No. 24,737, Mar. 11, 1987, Pat. No. 4,886,834. This application Nov. 5, 1990, Ser. No. 609,374
Claims priority, application Japan, Mar. 17, 1986, 61-57061; Mar. 26, 1986, 61-65963
Int. Cl.[5] C07C 331/04, 251/16, 317/14, 331/08, 251/34
U.S. Cl. 558—1 6 Claims

1. A diphenylethylene derivative having the formula



wherein
each of R^1 and R^2 is hydrogen, hydroxy or lower alkoxy;
X is hydrogen or —COR^6, wherein R^6 is hydroxyl or amino; and
Y is (1)

$$(1)\ -CH_2-NHSO_2-C_6H_5 \text{ or}$$

$$(2)\ -\underset{\displaystyle VR^9}{\overset{|}{C}}=NR^7,$$

wherein V is O or S, R^7 is lower alkoxy or aryl and R^9 is alkyl or aryl, or a pharmacologically acceptable salt of said diphenylethylene derivative.

5,206,404
TRIARYL PHOSPHATE ESTER COMPOSITION AND PROCESS FOR ITS PREPARATION
Louis T. Gunkel, Yardley; Douglas G. Placek, Fairless Hills; Michael P. Marino, Jr., Radnor, all of Pa.; John Crosby, Lawrenceville, and Sandeep G. Shankwalkar, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.
Filed Apr. 27, 1992, Ser. No. 873,867
Int. Cl.[5] C07F 9/12
U.S. Cl. 558—146 12 Claims

1. A composition of mixed alkylated triphenyl phosphate esters comprising by weight 1% to 20% trialkylphenyl phosphate, 10% to 50% dialkylphenyl monophenyl phosphate, 15% to 60% monoalkylphenyl diphenyl phosphate and less than 2% triphenyl phosphate, wherein the alkyl moieties are selected from the group consisting of isopropyl, isobutyl, tertiary-butyl, isoamyl and tertiary-amyl.

4. A process for purifying a composition of mixed alkylated triphenyl phosphate esters also containing from about 5% to about 50% by weight unalkylated triphenyl phosphate, the process comprising passing the composition at least once through a thin film evaporator, concomitantly agitating the surface of the composition and heating the composition at a temperature of about 200° C. to about 250° C. at a pressure sufficiently less than 5 kPa to evaporate about 5% to about 30% of the composition and withdrawing the residue as product without substantial condensation of vapor into the residue, thereby reducing the concentration of unalkylated triphenyl phosphate in the product.

5,206,405
2-ALKENYLOXY-3-(PHOSPHONO)OXYPROPANOIC ACIDS DERIVED FROM THE CLEAVAGE OF PHOSPHOGLYCOLIPID ANTIBIOTICS
Werner Aretz, Königstein/Taunus; Dirk Böttger, Hünstetten; Gerhard Seibert, Darmstadt; Alois Tumulka, Königstein/-Taunus; Peter Weizel, and Kurt Hobert, both of Bochum, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 617,635, Nov. 26, 1990, abandoned, which is a division of Ser. No. 395,790, Aug. 18, 1989, abandoned. This application Aug. 11, 1992, Ser. No. 927,886
Int. Cl.[5] C07F 9/09
U.S. Cl. 558—182 4 Claims

1. The compound of the formula II

$$R^1O-CH_2-\underset{\displaystyle COOH}{\overset{|}{CH}}-OR^2 \qquad II$$

in which R^1 is a phosphono group and R^2 is a branched or unbranched, unsaturated (C_5 to C_{55})-alkyl group.

5,206,406
METHOD FOR THE PREPARATION OF N-ETHYLHYDROXYLAMINE HYDROCHLORIDE
George E. Lee, Somerville, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.
Division of Ser. No. 763,682, Sep. 23, 1991, Pat. No. 5,166,436. This application Aug. 21, 1992, Ser. No. 933,142
Int. Cl.[5] C07C 69/96, 239/10
U.S. Cl. 558—262 1 Claim

1. A process for preparing N,O-bis-[(1,1-dimethylethoxy)-carbonyl]-hydroxylamine which comprises reacting hydroxylamine hydrochloride with a base in water followed by treatment with di-t-butyl-dicarbonate.

5,206,407
PROCESS FOR THE PREPARATION OF SECONDARY OF TERTIARY DIALKYL DICARBONATE
Jean Desmurs, Communay, and Serge Ratton, Germain-en-Laye, both of France, assignors to Rhone-Poulenc Chimie, Cedex, France
Filed Oct. 9, 1990, Ser. No. 594,155
Claims priority, application France, Oct. 9, 1989, 89 13140
Int. Cl.[5] C07C 68/04
U.S. Cl. 558—276 54 Claims

1. A process for the preparation of a secondary or tertiary dialkyl dicarbonate comprising,
contacting an alkali metal salt of an alkyl carbonate half ester and $(CO)_nX_2$ wherein X is a leaving group and n is an integer from 1 to 2, in the presence of an effective amount of a complexing agent with the proviso that if said $(CO)_nX_2$ is phosgene, diphosgene or triphosgene and said complexing agent is a tertiary monoamine, or an amine selected from 1,4-diazabicyclo(2,2,2) octane, 1,8-diazabicyclo (5,4,0)undec-7-ene, hexamethylenetetramine, N-methylpiperidine or N-ethylpiperidine then the alkali metal is selected from sodium or lithium,
wherein said complexing agent is selected from compounds which contain either at least one amine group or at least two ether groups with the proviso that if only ether groups are present, the complexing agent is tridentate.

5,206,408
PROCESS FOR THE PREPARATION OF UNSYMMETRIC DIALKYL CARBONATES
Frank J. Liotta, Jr., Collegeville, Pa., assignor to Arco Chemical Technology, L.P., Wilmington, Del.
Filed May 21, 1992, Ser. No. 886,719
Int. Cl.[5] C07C 69/96, 68/00
U.S. Cl. 558—277 22 Claims

1. A process for producing an unsymmetric dialkyl carbonate, said process comprising reacting a symmetric dialkyl carbonate with an alcohol selected from the group consisting of C_1–C_{20} linear, branched, and cyclic aliphatic and aromatic alcohols, in the presence of a basic cesium compound either in the absence of or in the presence of a cocatalyst to produce the unsymmetric dialkyl carbonate.

5,206,409
PROCESS FOR PREPARING DI-ALKYL CARBONATES
Ugo Romano, Vimercate, and Franco Rivetti, Schio, both of Italy, assignors to Enichem Synthesis, S.p.A., Palermo, Italy
Continuation of Ser. No. 420,542, Oct. 11, 1989, abandoned. This application Jul. 19, 1991, Ser. No. 734,014
Claims priority, application Italy, Oct. 19, 1988, 22353 A/88
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—277 3 Claims

1. A process for increasing the rate of formation of di-alkyl carbonate via oxidative carbonylation of the corresponding lower alkanol in the presence of a catalyst system wherein said catalyst system consists essentially of a copper alkoxy halide and a quantity of between 0.5 and 10 mol % of CuX_2 with respect to the total moles of copper, where X is a halogen atom; and wherein the overall halogen to copper molar ratio ranges from 1.005 to 1.100.

5,206,410
MULTIFUNCTIONAL SYNTHONS AS USED IN THE

tyl-L-phenylalanine methyl ester in an aqueous solvent with an anion exchange resin in free base form, thereby producing an

-continued

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5,206,410

MULTIFUNCTIONAL SYNTHONS AS USED IN THE PREPARATION OF CASCADE POLYMERS OR UNIMOLECULAR MICELLES

George R. Newkome, and Charles N. Moorefield, both of Temple Terrace, Fla., assignors to University of South Florida, Tampa, Fla.

Division of Ser. No. 681,613, Mar. 26, 1991, Pat. No. 5,136,096, which is a continuation of Ser. No. 401,323, Aug. 31, 1989, abandoned. This application Apr. 14, 1992, Ser. No. 868,449
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] C07C *255/00*
U.S. Cl. 558—389 1 Claim

1. The compound 4-[1-(2-cyanoethyl)]-4-[1-(3-(4-chlorobenzyloxy))propyl]-bis-1,7-(4-chlorobenzyloxy)heptane.

5,206,411

CURED ARYLCYCLOBUTENE CARBOXYLATE ESTER COMPOSITIONS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 370,507, Jun. 23, 1989, Pat. No. 5,068,396. This application Aug. 5, 1991, Ser. No. 740,341
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—8 18 Claims

1. A cured, crosslinked product obtained by heating to a temperature above 150° C. a 1-arylcyclobutenecarboxylate ester of a N-glycidyl compound wherein the arylcyclobutene moiety has up to 4 aromatic rings and up to 30 carbon atoms, inclusive, and has at least one cyclobutene ring fused to an aromatic ring, and the N-glycidyl compound has up to 4 rings and up to 30 carbon atoms, inclusive, has at least one amino nitrogen and at least two glycidyl groups attached to amino nitrogen atoms.

5,206,412

SELECTIVE PROCESS FOR THE PREPARATION OF DIPHENYLMETHANE DIISOCYANATE PRECURSORS

Carmen L. Rodriguez; Edward T. Shawl, Wallingford, and Haven S. Kealing, Jr., Drexel Hill, all of Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Feb. 7, 1992, Ser. No. 832,251
Int. Cl.[5] C07C *261/00*
U.S. Cl. 560—25 13 Claims

1. A selective process for making a diphenylmethane dicarbamate, said process comprising:

(a) slowly adding a mixture of an alkyl phenylcarbamate and an effective amount of an acid to a methylene bis(alkyl carbamate) at a temperature within the range of about 20° C. to about 55° C. to produce an aryl-alkyl dicarbamate; and

(b) heating the aryl-alkyl dicarbamate in the presence of additional alkyl phenylcarbamate at a temperature within the range of about 60° C. to about 100° C. for a time sufficient to produce the diphenylmethane dicarbamate.

5,206,413

METHOD FOR PREPARING α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Masanobu Ajioka, Yokohama; Takeshi Oura, Zushi; Chojiro Higuchi, Kamakura; Toshio Katoh, Kawasaki, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,451
Claims priority, application Japan, Jun. 14, 1989, 1-149515
Int. Cl.[5] C07C *229/00*; A61K *37/00*
U.S. Cl. 560—41 9 Claims

1. A method for converting substantially pure α-L-aspartyl-L-phenylalanine methyl ester (α-APM) in acid addition salt form to its free base form, substantially free from acid ion contamination, which comprises the steps of contacting a solution of a substantially pure acid addition salt of α-L-aspartyl-L-phenylalanine methyl ester in an aqueous solvent with an anion exchange resin in free base form, thereby producing an aqueous solution of substantially pure α-APM in free base form; separating the ion exchange resin therefrom; and then isolating therefrom α-APM substantially free from the acid anions of the acid addition salt.

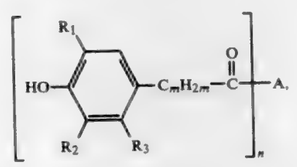
5,206,414

PROCESS FOR THE PREPARATION OF HYDROXYPHENYLPROPIONIC ACID ESTERS

Samuel Evans; Paul Dubs, both of Marly; Milos Rusek, Binningen; Zdenek Mazour, Lausen, and Arpad Major, Kaisten, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 639,466, Jan. 10, 1991, abandoned. This application Apr. 29, 1992, Ser. No. 876,813
Claims priority, application Switzerland, Jan. 11, 1990, 86/90; Jan. 11, 1990, 87/90
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—75 12 Claims

1. An improved process for the preparation of a compound of the general formula



(I)

in which

R_1 and R_2 are identical or different and are hydrogen, C_1–C_{18}alkyl, phenyl, C_1–C_4alkyl-substituted phenyl, C_7–C_9phenylalkyl, C_5–C_{12}cycloalkyl or C_1–C_4alkyl-substituted C_5–C_{12}cycloalkyl,

R_3 is hydrogen or methyl,

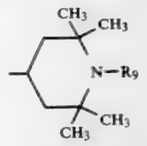
m is 0, 1, 2 or 3, and

n is 1, 2, 3, 4 or 6, where

if n=1,

A is —OR_4 in which

R_4 is C_2–C_{45}alkyl, C_5–C_{12}cycloalkyl, C_2–C_{18}alkenyl,



or —CH_2CH_2—XR_{5a},

R_9 is hydrogen, C_1–C_8alkyl, C_3–C_5alkenyl, benzyl,

—O. or —$OR_{9'}$ in which

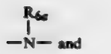
$R_{9'}$ is hydrogen, C_1–C_{25}alkyl or

and

R_{10} is hydrogen or C_1–C_{20}alkyl,

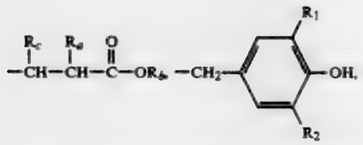
X is —O—, —S— or

-continued

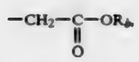


and

R_{5a} is



hydrogen, C_1–C_{24}alkyl, phenyl, C_5–C_{12}cycloalkyl or



in which

R_a is hydrogen or methyl,

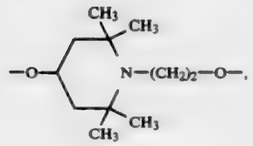
R_b is hydrogen or C_1–C_{24}alkyl and

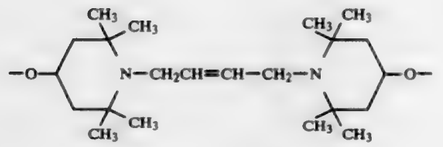
R_c is hydrogen or methyl with the proviso that R_a and R_c are not simultaneously methyl, and

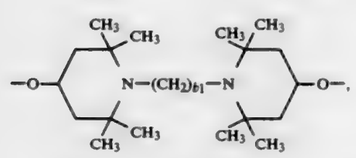
R_{6a} is C_1–C_{18}alkyl, phenyl, phenyl which is substituted by one or more alkyl groups having a total of 1 to 24 carbon atoms, or is C_5–C_8cycloalkyl, or,

if n=2,

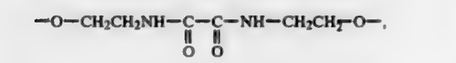
A is —O—C_xH_{2x}—O—, —O—$(CH_2CH_2O)_aCH_2CH_2O$—, —O—CH_2—CH_2—B—CH_2CH_2O—,

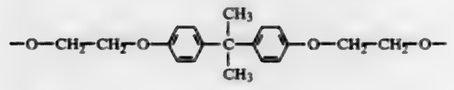




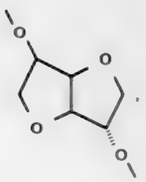


—O—CH_2CH=$CHCH_2$—O—, —O—CH_2C≡CCH_2—O—,





or

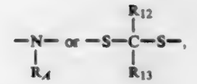


in which

a is a number from 1 to 30 and

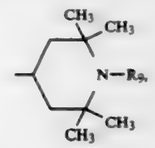
x is a number from 2 to 20,

B is —S—,



in which

R_A is C_1–C_{20}alkyl, phenyl, phenyl which is substituted by one or more alkyl groups having a total of 1 to 20 carbon atoms, or is cyclohexyl or



in which R_9 is as defined above, and

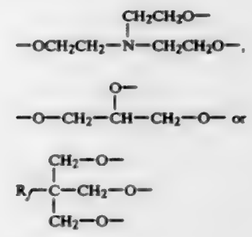
R_{12} and R_{13}, independently of one another, are hydrogen, C_1–C_{12}alkyl or phenyl, or

R_{12} and R_{13}, together with the carbon atoms to which they are bonded, form a cycloalkyl ring having 5 to 12 carbon atoms, and

b_1 is a number from 2 to 10, or,

if n=3,

A is



in which

R_f is C_1–C_{24}alkyl or phenyl, or

if n=4,

A is

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or

5,206,418

AMINO-TETRAHYDRONAPHTHALENE DERIVATIVES

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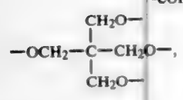
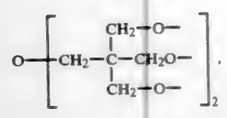
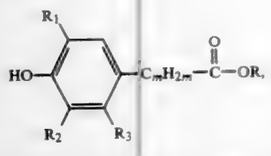


if n=6,
A is



by reacting a compound of the formula II



(II)

where m, R_1, R_2 and R_3 are as defined above, and R is alkyl having 1 to 4 carbon atoms, with a compound of the formula II

$$A(+H)_n \quad \text{(III)}$$

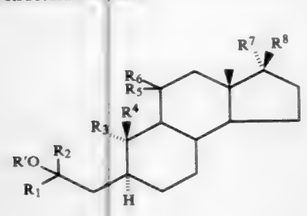
where A and n are as defined above, which improvement comprises carrying out the reaction in the presence of a catalyst which contains, as active material, an alkali metal compound of the formula IV

$$M_mAn \quad \text{(IV)}$$

in which
M is Li, Na, K, Rb or Cs,
m is the valency of An and
An is a fluoride, hydroxide, phosphate, formate, acetate or $-OR_5$ radical, and R_5 is C_1–C_4alkyl or phenyl,
and, as support, an alkaline material which, measured in 10% strength by weight aqueous suspension, has a pH >10, selected from one or more groups of substances from the series consisting of the alkaline earth metal oxides, hydroxides, aluminates and silicates.

5,206,415
TRICYCLIC STEROID ANALOGS
Douglas F. Covey, Ballwin; Yuefei Hu, and Charles F. Zorumski, both of St. Louis, all of Mo., assignors to Washington University, St. Louis, Mo.
Filed Dec. 20, 1991, Ser. No. 811,208
Int. Cl.[5] C07C *69/608*
U.S. Cl. 560—117 **10 Claims**

1. A 1H-benz[e]indene dodecahydro compound of the following structural formula:



(I)

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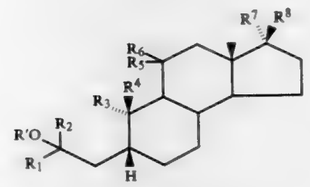
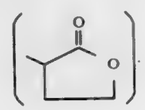
or



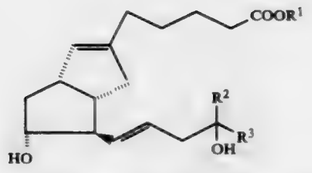
(II)

wherein
R_1=H or C_1–C_4 alkyl or fluoroalkyl;
R_2=H or C_1–C_4 alkyl or fluoroalkyl, in which R_1 and R_2 can be the same or different;
R_3=H or CH_3;
R_4=H or CH_3, in which R_3 and R_4 can be the same or different;
R_5=H;
R_6=H;
R_5,R_6==O(carbonyl);
R_7=H;
R_8=a hydrogen bond accepting group.
R_7,R_8==O(carbonyl); and
R'=H or an ester group,
wherein said ester group (R') is a group derived from reaction between a hydroxyl group with a C_1–C_{18} organic acid, acid halide or anhydride, and said hydrogen bond accepting group (R_8) is (1) a keton, —CO—R'', wherein R'' is a C_1–C_4 alkyl or fluoroalkyl group or a C_3–C_6 cycloalkyl group, (2) an α-hydroxy ketone, —CO— CH_2OH, or ester thereof, —CO—CO_2OXOR''', wherein X=C, P=O(OR'''), or S=O, and R''' is a C_1–C_{20} alkyl group, (3) an alkyl ester of a carboxylic acid, —COOR'' or —CH_2COOR''', wherein R'''is a C_1–C_{20} alkyl group, (4) an amine NHR'' or $N(R'')_2$, wherein R'' is a C_1–C_4 alkyl or fluoroalkyl group or a C_3–C_6 cycloalkyl group, (5) a nitrile, CN, or a γ-lactone



5,206,416
ISOCARBACYCLIN DERIVATIVE
Seizi Kurozumi, Kokubunji, Japan, assignor to Teijin Limited, Osaka, Japan
Continuation of Ser. No. 536,752, Jun. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 905,976, Sep. 11, 1986. This application Sep. 24, 1991, Ser. No. 764,068
Claims priority, application Japan, Sep. 13, 1985, 60-201716; Oct. 14, 1985, 60-226973; Oct. 14, 1985, 60-226974
Int. Cl.[5] C07C *177/00*
U.S. Cl. 560—119 **5 Claims**

1. An isocarbacyclin derivative represented by the following formula:



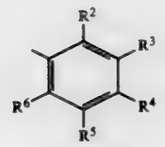
wherein R^1 represents H or methyl group, R^2 represents H, a methyl group or a vinyl group, and R^3 represents an unsubstituted linear or branched C_3–C_8 alkyl group or a C_5–C_6 cycloalkyl group, and a pharmaceuticaly acceptable salt thereof.

5,206,417
RADIATION-SENSITIVE, ETHYLENICALLY UNSATURATED COPOLYMERIZABLE COMPOUNDS AND THEIR PREPARATION
Andreas Boettcher, 38 Konrad-Adenauer-Ring, 6907 Nussloch, and Gerd Rehmer, 1 Koenigsberger Strasse, 6712 Bobenheim-Roxheim, both of Fed. Rep. of Germany
Continuation of Ser. No. 365,132, Jun. 12, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 810,348
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820463
Int. Cl.[5] C07C *269/02, 271/32, 271/54*
U.S. Cl. 560—137 **14 Claims**

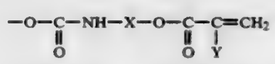
1. An ethylenically unsaturated copolymerizable radiation-sensitive organic compound of the formula (I)

(I)

where R is a straight-chain alkyl radical of 1 to 4 carbon atoms, an unsubstituted or hydroxy substituted, branched alkyl radical of 3 to 4 carbon atoms, aryl or a radical R^1, and R^1 is a radical



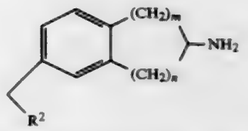
where R^2 to R^6 are identical or different and are each H, alkyl of 1 to 3 carbon atoms, OCH_3, OC_2H_5. $N(CH^3)_2$, $N(C_2H_5)_2$ or $N(CH_3)C_6H_5$, and not less than one but not more than three of the radicals R^2 to R^6 are each a radical



where X is a divalent alkylene radical $-(CH_2)_m-$ in which m is from 1 to 10, an oxaalkylene radical of the formula $-(CH_2)_n-O-(CH_2)_p-$ in which n is from 1 to 5 and p is from 1 to 5, or a polyoxaalkylene having 2 to 12 carbon atoms and 2 to 5 oxygen atoms which are bonded to one another by one or more $-CH_2-$ groups and Y is H or methyl.

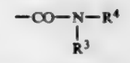
5,206,418
AMINO-TETRAHYDRONAPHTHALENE DERIVATIVES
Hideo Nakai, Takarazuka; Toyoharu Yamashita, Ageo; Haruuchi Kohno; Yasuhiko Sasaki, both of Urawa, and Akio Odawara, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan
Division of Ser. No. 605,433, Oct. 30, 1990. This application Mar. 13, 1992, Ser. No. 850,882
Claims priority, application Japan, Nov. 16, 1989, 1-297878
Int. Cl.[5] C07C *69/013, 229/50, 215/42*
U.S. Cl. 560—139 **2 Claims**

1. An aminotetrahydronaphthalene derivative of the formula:



(II)

wherein R^2 is hydroxymethyl group, carboxyl group, a lower alkoxycarbonyl group or a group of the formula:



wherein R^3 is hydrogen atom or a lower alkyl group, R^4 is a lower alkoxycarbonyl-lower alkyl group or carboxy-lower alkyl group, and m and n are different and are 1 or 2, or a mineral or organic acid salt thereof.

5,206,419
3-HYDROXY-2,2-DIMETHYLPROPYL 3-HYDROXY-2,2-DIMETHYLPROPANOATE BIS(ACETOACETATE)
J. Stewart Witzeman, and W. Dell Nottingham, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 735,082, Jul. 24, 1991, Pat. No. 5,113,011, which is a continuation of Ser. No. 620,388, Nov. 30, 1990, Pat. No. 5,051,529, which is a continuation of Ser. No. 484,595, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 283,353, Dec. 12, 1988, abandoned. This application Feb. 25, 1992, Ser. No. 840,541
Int. Cl.[5] C07C *69/72*
U.S. Cl. 560—176 **1 Claim**

1. 3-Hydroxy-2,2-dimethylpropyl 3-hydroxy-2,2-dimethylpropanoate bis(acetoacetate).

5,206,420
PROCESS FOR THE PREPARATION OF SUCCINYLCHOLINE HALIDES
Walter Raml, Hellmonsödt, and Günther Eichberger, Weinkirchen, both of Austria, assignors to Hafsland Nycomed Pharma Aktiengesellschaft, Linz, Austria
Filed Jun. 24, 1992, Ser. No. 903,324
Claims priority, application Austria, Aug. 13, 1991, 1591/91
Int. Cl.[5] C07C *69/34*
U.S. Cl. 560—196 **7 Claims**

1. A process for the preparation of a succinylcholine halide of formula I:

are included in the calculation by taking 1,4-butanediol di(-

dium salt to form a palladium-tin metal complex coating on the support substrate surface; and (3) recovering and drying the

the presence of a boric acid catalyst, at least one stabilizer selected from the group consisting of picolinic acid, dipicolinic

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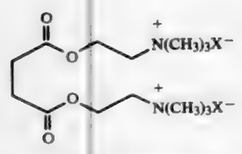
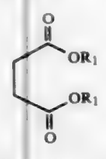


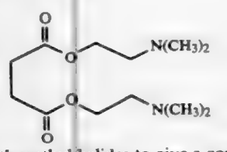
(I)

in which X is chlorine, bromine or iodine, characterized in that a dialkyl succinate of formula II:



(II)

in which R_1 is $(C_1–C_4)$-alkyl, is treated with an excess of dimethylaminoethanol in the presence of alkali metal alcoholates or amides as a catalyst, the alcohol formed in the reaction being distilled off continuously, excess dimethylaminoethanol being recovered and the catalyst then being inactivated and filtered off, after which the resulting bis(2-dimethylaminoethyl) succinate of formula III:



(III)

is reacted with methyl halides to give a compound of formula I.

5,206,421

METHOD FOR PRODUCING 4-HYDROXYBUTYL (METH)ACRYLATE

Toshihiro Sato, and Masao Kobayashi, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1991, Ser. No. 715,244
Claims priority, application Japan, Jul. 11, 1990, 2-181484
Int. Cl.[5] C07C *69/52, 67/05*
U.S. Cl. 560—224 **2 Claims**

1. In a method for producing 4-hydroxybutyl (meth)acrylate by reacting (meth)acrylic acid with 1,4-butanediol in the presence of an acidic catalyst, the improvement in which 1,4-butanediol di(meth)acrylate is added from the beginning of the reaction so that a relationship represented by the following equation,

$$1 > \frac{\text{[number of moles of 1,4-butanediol]}}{\text{[number of moles of (meth)acrylic acid]}} > 0.5 < 1$$

is maintained in the reaction system, and besides the molar ratio of added 1,4-butanediol di(meth)acrylate to added (meth-)acrylic acid is in a range represented by the following equation,

$$1.3 > \frac{\text{[number of moles of 1,4-butanediol di(meth)acrylate]}}{\text{[number of moles of (meth)acrylic acid]}} > 0.7$$

provided that in calculating the former equation, both the 1,4-butanediol di(meth)acrylate and 4-hydroxybutyl (meth)acrylate which are present in the reaction system by addition at the beginning of the reaction or formation during the reaction are included in the calculation by taking 1,4-butanediol di(meth)acrylate to correspond to the presence of 1 mole of 1,4-butanediol and 2 moles of (meth)acrylic acid per 1 mole thereof, and 4-hydroxybutyl (meth)acrylate to correspond to the presence of 1 mole of 1,4-butanediol and 1 mole of (meth)acrylic acid per 1 mole thereof.

5,206,422

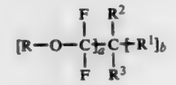
PROCESS FOR PREPARATION OF FLUORINATED CARBONYL COMPOUNDS

David A. Babb, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 11, 1991, Ser. No. 775,326
Int. Cl.[5] C07C *69/63, 53/21*
U.S. Cl. 560—227 **24 Claims**

1. A process for preparing a fluorinated carbonyl compound, comprising

(a) contacting a fluorinated ether which is generally described by formula as follows:



where

R is a methyl or ethyl radical;

R^1 is —F, —Cl, —Br, $—SO_2F$, —COF, $—OCH_3$, —CN, $—CO_2H$, $—CO_2CH_3$, $—OC_6F_5$, or $—OR^4$, $—SR^4$ or $—R^4$, where R^4 is a linear or branched fluorinated alkyl radical of 1 to 8 carbon atoms, interruptible with either oxygen or keto groups, and optionally selected from the group consisting of —F, —Cl, —Br, $—SO_2F$, —COF, $—OCH_3$, —CN, $—CO_2H$, $—CO_2CH_3$, $—OC_6F_5$;

R^2 is —H or —F;

R^3 is —F or $—CF_3$;

a is 1 or 2;

b is 0 or 1; and

a+b is 2 in a reaction mixture with tin tetrachloride at a first temperature which is at least about 90 percent of the boiling point of the fluorinated ether, until fluorinated carbonyl product begins to form;

(b) upon the beginning of formation of fluorinated carbonyl product, heating said reaction mixture at a second temperature which is about 50 to about 90 percent of said first temperature; and

(c) recovering a fluorinated carbonyl compound in at least a 35 weight percent yield.

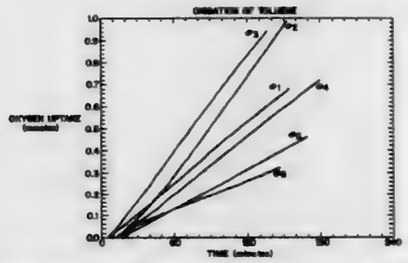
5,206,423

ACYLOXYLATION OF ALKYLAROMATIC COMPOUNDS WITH PALLADIUM-TIN CATALYSTS

Robert L. Augustine, Livingston, and Setrak K. Tanielyan, South Orange, both of N.J., assignors to Philip Morris Incorporated, New York, N.Y. and Philip Morris Products Inc., Richmond, Va.

Filed Nov. 6, 1991, Ser. No. 788,447
Int. Cl.[5] C07C *27/10*
U.S. Cl. 560—241.1 **10 Claims**

1. In a selective oxidation process which comprises reacting a $C_1–C_4$ alkylaromatic compound with oxygen in the presence of carboxylic acid and a palladium-tin catalyst to produce an alpha-acyloxy $C_1–C_4$ alkyl-substituted aromatic compound, the improvement which comprises employing a palladium-tin catalyst which is a product of a preparative process which comprises (1) treating a suspension of particulate inorganic support substrate in an aqueous medium with a tin salt under basic conditions to form a coating of tin hydroxide on the support surface;; (2) treating the tin-coated support substrate suspension in an aqueous medium with a water-soluble palladium salt to form a palladium-tin metal complex coating on the support substrate surface; and (3) recovering and drying the



metal complex-coated support substrate to provide the catalyst.

5,206,424

DECOMPOSITION OF TERTIARY BUTYL HYDROPEROXIDE USING CYCLOALKENYL IRON CATALYST

John R. Sanderson, Leander, and John F. Knifton, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Sep. 8, 1992, Ser. No. 941,505
Int. Cl.[5] C07C *31/12, 29/132*
U.S. Cl. 568—909.8 **15 Claims**

1. In a method wherein a solution of a tertiary butyl hydroperoxide charge stock in tertiary butyl alcohol is brought into contact with a catalytically effective amount of a hydroperoxide decomposition catalyst in a hydroperoxide decomposition reaction zone in liquid phase with agitation to convert said tertiary butyl hydroperoxide to decomposition products, principally tertiary butyl alcohol, the improvement which comprises:

a) using, as said hydroperoxide decomposition catalyst, a soluble iron hydroperoxide decomposition catalyst consisting essentially of a soluble cycloalkenyl iron compound, and

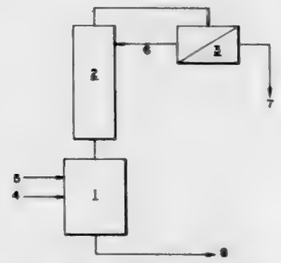
b) recovering tertiary butyl alcohol from the products of said hydroperoxide decomposition reaction.

5,206,425

PROCESS FOR PREPARING PERPROPIONIC ACID SOLUTION

Yukio Inabe; Takafumi Hirakawa; Yohsuke Ueno, and Suzuo Takiguchi, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Mar. 15, 1991, Ser. No. 669,755
Claims priority, application Japan, Mar. 20, 1990, 2-68374
Int. Cl.[5] C07C *409/24*
U.S. Cl. 562—6 **25 Claims**



1. A process for preparing perpropionic acid solution comprising (a) reacting propionic acid with hydrogen peroxide in the presence of a boric acid catalyst, at least one stabilizer selected from the group consisting of picolinic acid, dipicolinic acid, 2-picoline, rutidine and an N-oxide thereof, and a reaction solvent to form a reaction solution, wherein the reaction solvent is ethyl propionate, (b) continuously removing water from the reaction solution by an azeotropic distillation with the reaction solvent, said azeotropic distillation resulting in a distillate comprising an aqueous phase and (c) maintaining a concentration of said peroxide in the aqueous phase of the distillate of not more than 0.1% by weight.

5,206,426

PHENYLENE DIAMINES AND PROCESS FOR THE PREPARATION OF PHENYLENE DIAMINES

Klaus Pandl, Ludwigshafen, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 509,137, Apr. 16, 1990, Pat. No. 5,117,050.
This application Dec. 31, 1991, Ser. No. 815,159
Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914650
Int. Cl.[5] C07C *309/29*
U.S. Cl. 562—52 **1 Claim**

1. A phenylene diamine of formula I

(I)

in which

R^1 denotes formyl or oxalyl,

R^2 denotes hydrogen or $C_1–C_4$-alkyl and

R^3 denotes $C_2–C_4$-alkanoyl.

5,206,427

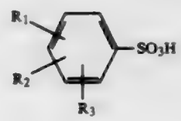
PROCESS FOR THE PREPARATION OF AROMATIC (DI)CHLOROSULPHONIC ACIDS AND (DI)BROMOSULPHONIC ACIDS

Heinz U. Blank, Odenthal, and Uwe Heinz, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 577,378, Sep. 4, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 741,985
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3930994
Int. Cl.[5] C07C *303/00, 307/00, 309/00*
U.S. Cl. 562—83 **10 Claims**

1. A process for the preparation of an aromatic (di)chlorosulphonic acid or (di)bromosulphonic acid by reacting an aromatic sulphonic acid with a halogenating agent selected from the group consisting of chlorine and bromine, said chlorine and bromine being in elemental form or in the form of a compound which releases chlorine or bromine under the process conditions, wherein the reaction is carried out without the use of a catalyst and in a melt, consisting essentially of the aromatic sulphonic acid at a temperature of 40°–200° C.,

wherein the aromatic sulphonic acid reacted is an aromatic sulphonic acid or mixture of aromatic sulphonic acids of the formula



in which

R_1 denotes hydrogen, straight-chain or branched $C_1–C_{20}$-

changing the types and/or amounts of the A group elements in the general formula (I) and then filling the catalysts into the reaction zones of each reaction tube so that

which is not directly bonded to the N atom can be replaced by an oxygen atom.

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in which
R_1 denotes hydrogen, straight-chain or branched C_1–C_{20}-alkyl, C_3–C_8-cycloalkyl, benzyl, substituted benzyl, phenyl, substituted phenyl, straight-chain or branched C_1–C_{20}-alkoxy, benzyloxy, substituted benzyloxy, phenoxy, substituted phenoxy, nitro or cyano,
R_2 represents hydrogen, methyl or ethyl and
R_3 represents hydrogen, methyl, ethyl, fluorine, chlorine or bromine, where furthermore R_1 and R_2 together can denote a fused benzene ring or substituted benzene ring, a fused aromatic or non-aromatic 5- or 6-membered heterocycle, or trimethylene or tetramethylene.

5,206,428

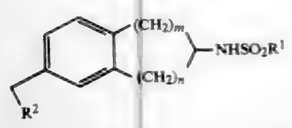
TETRAHYDRONAPHTHALENE DERIVATIVES AND PREPARATION THEREOF

Hideo Nakai, Takarazuka; Toyoharu Yamashita, Ageo; Harumichi Kohno; Yasuhiko Sasaki, both of Urawa, and Akio Odawara, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

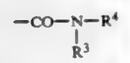
Filed Oct. 30, 1990, Ser. No. 605,433
Claims priority, application Japan, Nov. 16, 1989, 1-297878
Int. Cl.[5] C07C *317/26*
U.S. Cl. 562—427 **10 Claims**

1. A tetrahydronaphthalene derivative of the formula:

(I)



wherein R^1 is a phenyl group, a lower alkylphenyl group or a halogenophenyl group, and R^2 is a hydroxymethyl group, a carboxyl group, a lower alkoxycarbonyl group or a group of the formula:



wherein R^3 is a hydrogen atom, R^4 is a lower alkoxycarbonyl-lower alkyl group or a carboxy-lower alkyl group, and m and n are different and are 1 or 2, or a pharmaceutically acceptable salt thereof.

5,206,429

NITRATION REACTIONS WITH ACID ANHYDRIDE PROMOTERS

Roy R. Odle, Schuylerville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 170,708, Mar. 14, 1988, abandoned, which is a continuation of Ser. No. 945,585, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 567,484, Jan. 3, 1984, abandoned. This application Jul. 13, 1989, Ser. No. 379,665
Int. Cl.[5] C07C *205/00*
U.S. Cl. 562—434 **15 Claims**

1. An improved process for the nitration of a phthalic acid substrate, comprising (1) forming a solution of the phthalic acid substrate selected from the group consisting of phthalic acid, phthalic anhydride, halo and C_1 to C_{10} alkyl substituted derivatives of either and diacid, dianhydride, acid anhydide and acid halide functional derivatives of the foregoing in a solvent consisting essentially of nitric acid of at least about 95% concentration, (2) reacting the mixture within a temperature range of from about −20° C. to about the boiling point of nitric acid, (3) allowing the nitration reaction to run to produce the nitrated derivatives of the phthalic acid substrate and (4) thereafter recovering the nitrated derivatives by methods known in the art, wherein the improvement consists essentially of adding an effective rate-enhancing amount of a nitration-promoting inorganic acid anhydride to said phthalic acid substrate solution prior to initiation of the nitration reaction as a means of enhancing the rate of nitration.

5,206,430

METHOD FOR OBTAINING HIGH-PURITY CINNAMIC ACID

Hiroyuki Itoh; Yoshitsugu Kono; Ryoichi Taneda, all of Fukuoka, and Usaji Takaki, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Oct. 24, 1991, Ser. No. 782,299
Claims priority, application Japan, Oct. 31, 1990, 2-291867; Oct. 31, 1990, 2-291868
Int. Cl.[5] C07C *63/33*
U.S. Cl. 562—494 **4 Claims**

1. A method for obtaining high-purity cinnamic acid from a crude cinnamic acid ester produced by reacting styrene with an alcohol in the presence of a metallic catalyst, said method being characterized by comprising the steps of hydrolyzing the crude cinnamic acid ester in the presence of water in an amount enough to completely dissolve an alkali metal salt of cinnamic acid produced from an alkali metal hydroxide and the cinnamic acid ester; bringing the hydrolyzed material into contact with active carbon and then removing the active carbon to obtain an aqueous phase only; adding a mineral acid as much as the equivalent weight or more of the alkali metal salt of the cinnamic acid contained therein to precipitate a solid; and then separating and collecting the solid.

5,206,431

PROCESS FOR PRODUCING METHACRYLIC ACID

Hideto Hashiba; Shigeru Ohno; Ikuo Kurimoto, all of Himeji, and Yukio Aoki, Hyogo, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 651,951, Feb. 7, 1991, abandoned. This application Aug. 14, 1992, Ser. No. 928,184
Int. Cl.[5] C07C *51/21*
U.S. Cl. 562—534 **3 Claims**

1. A process for producing methacrylic acid, which comprises
filling a plurality of catalysts of different activities into a plurality of reaction zones which have been formed in each of the reaction tubes of a fixed bed multi-tubular reactor by dividing said reaction tube into two or more portions in the direction of tubular axis, so that the activity of catalyst is higher as the reaction zone is closer to the outlet of the reaction tube, and
introducing into the reaction zones containing the catalysts at least one compound selected from methacrolein, isobutyl aldehyde and isobutyric acid to oxidize the at least one compound with molecular oxygen or a molecular oxygen-containing gas, characterized in that said catalyst are compound oxides represented by the following general formula (I)

$$Mo_aP_bA_cB_dC_eO_x \quad (I)$$

wherein Mo represents molybdenum; P represents phosphorus; A represents at least one element selected from arsenic, antimony, germanium, bismuth, zirconium, selenium, cerium, copper, iron, chromium, nickel, manganese, cobalt, tin, silver, zinc, palladium, rhodium and tellurium; B represents at least one element selected from vanadium, tungsten, and niobium; C represents at least one element selected from alkali metals, alkaline earth metals and thallium; O represents oxygen; a, b, c, d, e and x represent the atom number of Mo, P, A, B, C and O, respectively; when a is 12, b is 0.5–4, c is 0.001–5, d is 0.001–4 and e is 0.001–4; and x is a value determined by the oxidation state of each element, and in that said process comprises
(i) preparing a plurality of catalysts of different activities by changing the types and/or amounts of the A group elements in the general formula (I) and then filling the catalysts into the reaction zones of each reaction tube so that the activity of catalyst is higher as the reaction zone is closer to the outlet of the reaction tube,
(ii) preparing a plurality of catalysts of different activities by changing the types and/or amounts of the B group elements in the general formula (I) and then filling the catalysts into the reaction zones of each reaction tube so that the activity of catalyst is higher as the reaction zone is closer to the outlet of the reaction tube, or
(iii) preparing a plurality of catalysts of different activities by changing the types and/or amounts of the elements of at least two groups selected from the A group, the B group and the C group in the general formula (I) and then filling the catalysts into the reaction zones of each reaction tube so that the activity of catalyst is higher as the reaction zone is closer to the outlet of the reaction tube.

5,206,432

PROCESS FOR PREPARING MONOAMIDO ACIDS

Yueting Chou, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 28, 1992, Ser. No. 920,717
Int. Cl.[5] C07C *205/00*
U.S. Cl. 562—553 **28 Claims**

1. A process for the preparing highly pure monoamido acid which comprises the steps of
a. reacting a molten dibasic acid in large molar excess with a primary or secondary amine;
b. combining the reaction mixture of step a. with water at an elevated temperature whereby the unreacted dibasic acid dissolves leaving a solid residue;
c. separating the solid residue of b. from the dibasic acid solution;
d. combining the solid residue from step c. with a basic aqueous solution whereby a water soluble salt of monoamido acid forms and dissolves in said solution and then separating the solution from any insoluble material; and,
e. acidifying the separated solution of step
d. thereby precipitating the monoamido acid and recovering said acid.

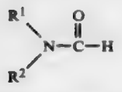
5,206,433

PREPARATION OF FORMIC ACID

Heinz Hohenschutz, Mannheim; Johannes E. Schmidt, Ludwigshafen, and Hans Kiefer, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,265
Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417790
Int. Cl.[5] C07C *51/44*; B01D *3/40*
U.S. Cl. 562—609 **10 Claims**

1. In a process for the preparation of anhydrous or substantially anhydrous formic acid by hydrolyzing methyl formate and then obtaining the formic acid from the hydrolysis mixture by distillation, the improvement which comprises:
carrying out the hydrolysis in the presence of 0.5-3 moles, per mole of methyl formate, of a water-soluble formamide of the formula I



where R^1 and R^2 are each alkyl or together form an alkylene group, giving a 5-membered to 7-membered ring, with the proviso that the sum of the carbon atoms in R^1 and R^2 is 5 or 6 and that, in the case of an alkylene group, a carbon atom which is not directly bonded to the N atom can be replaced by an oxygen atom.

5,206,434

PURIFICATION PROCESS FOR METHYL ACETATE

Mark O. Scates, Pearland; Russell K. Gibbs, Jr., Houston, and G. Paull Torrence, Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 19, 1990, Ser. No. 615,939
Int. Cl.[5] C07C *67/27, 67/48*
U.S. Cl. 562—891 **10 Claims**

1. In a process for carbonylating methyl acetate to acetic anhydride, acetic acid or to coproduce acetic acid and acetic anhydride in the presence of a Group VIII metal carbonylation catalyst, the improvement which comprises: using as said methyl acetate a methyl acetate stream which contains carbonyl impurities and has been purified prior to carbonylation to remove said carbonyl impurities by contacting said methyl acetate with an aqueous solution of an amino compound under conditions at which said amino compound reacts with said carbonyl impurities for conversion to water soluble nitrogenous derivatives of said carbonyls, forming two separate phases comprising an organic phase containing a major portion of said methyl acetate and an aqueous phase containing said nitrogenous derivatives, distilling said organic phase and recovering a purified methyl acetate distillate stream for use in said carbonylation.

5,206,435

4-AMINO-2-CYCLOPENTENE-1-METHANOL

Susan M. Daluge, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 630,129, Dec. 19, 1990, Pat. No. 5,087,697, which is a continuation-in-part of Ser. No. 455,201, Dec. 22, 1989, Pat. No. 5,034,394, which is a continuation-in-part of Ser. No. 371,870, Jun. 26, 1989, abandoned. This application Sep. 27, 1991, Ser. No. 767,134
Claims priority, application United Kingdom, Jun. 27, 1988, 8815265
Int. Cl.[5] C07C *211/00*; A61K *31/52*; C07D *473/02, 473/26*
U.S. Cl. 564—1 **4 Claims**

1. (1S,4R)-4-Amino-2-cyclopentene-1-methanol substantially free of the corresponding (1R,4S) enantiomer.

4. The dibenzoyl-L-tartrate salt of (1R,4S)-4-Amino-2-cyclopentene-1-methanol substantially free of the corresponding (1S,4R) enantiomer.

5,206,436

TAPED PURIFICATION PROCESS

Enrico Pontoglio; Giordano Donelli, both of Brescia, and Sandro Parodi, Nuvolento, all of Italy, assignors to Caffaro S.P.A., Vasto, Italy

Filed Jul. 22, 1991, Ser. No. 734,234
Claims priority, application Italy, Nov. 9, 1990, 22011 A/90
Int. Cl.[5] C07C *233/05*
U.S. Cl. 564—153 **8 Claims**

1. A process for the production of microcrystalline TAED from a solution containing acetic anhydride and crude TAED obtained by acetylation of DAED, said microcrystalline TAED having a titer of at least 99.5% and particle sizes in the range of from 40 to 250 microns with about 80% by weight in the range of from 40 to 100 microns, said process being performed in two steps at different temperatures, a first of said steps (a) comprising heating a solution containing a concentration of TAED very close to saturation at a temperature between 80° and 120° C. and a second of said steps (b) comprising crystallizing TAED by instantaneously cooling said heated solution at a temperature 55 to 110 degrees below the temperature of said solution of step (a), said microcrystalline TAED being obtained without the use of a grinding step.

5,206,437

PROCESSES FOR

5,206,439

PREPARATION OF HIGH PURITY POLYSULFIDES

5,206,442

MANUFACTURING OF α,β-UNSATURATED

an amount of 1 to 3 molar equivalents, based on the amount of cyclic α,β-unsaturated acetal or ketal of the formula II used,

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5,206,437

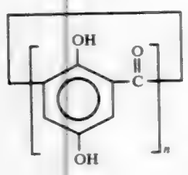
CALIXARENE DERIVATIVES AND PROCESSES FOR PRODUCTION THEREOF

Yutaka Morita, 101, Heights US, 2-52, Yamanoshita, Kamiueno-cho, Kyoto-fu, Mukou-shi, Japan

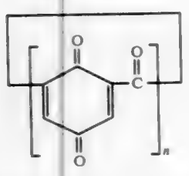
Filed Oct. 2, 1990, Ser. No. 592,546
Claims priority, application Japan, Oct. 2, 1989, 1-257331
Int. Cl.[5] C07C *243/22*
U.S. Cl. 564—310 2 Claims

1. A calixarene derivative represented by formula [I] of formula [II]:

[I]



[II]



wherein n represents an integer of 3 to 8.

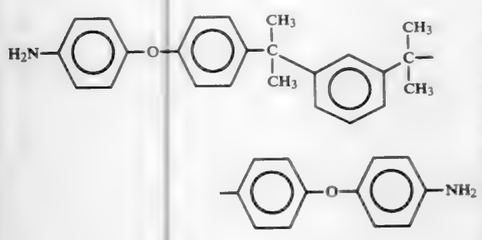
5,206,438

AROMATIC DIAMINE COMPOUNDS, BISMALEIMIDE COMPOUNDS, THERMOSETTING RESIN FORMING COMPOSITIONS THEREFROM, RESINS THEREFROM, AND METHODS FOR THEIR PREPARATION

Keizaburo Yamaguchi, Chiba; Tatsuhiro Urakami; Yoshimitsu Tanabe, both of Yokohama; Midori Yamazaki, Hiratsuka; Shoji Tamai; Norimasa Yamaya, both of Yokohama; Masahiro Ohta, Ohmuta, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,424
Claims priority, application Japan, Oct. 24, 1989, 275050; Mar. 6, 1990, 052779; May 11, 1990, 119679; May 24, 1990, 132711; Jul. 6, 1990, 177517; Jul. 6, 1990, 177518; Aug. 10, 1990, 210246
Int. Cl.[5] C07C *211/50*
U.S. Cl. 564—315 1 Claim

1. 1,3-bis(4-(4-aminophenoxy)-α,α-dimethylbenzyl)benzene represented by the following formula:



5,206,439

PREPARATION OF HIGH PURITY POLYSULFIDES

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1992, Ser. No. 826,356
Int. Cl.[5] C07C *321/14*
U.S. Cl. 568—21 32 Claims

1. A process for purifying a polysulfide comprising the steps of:

(a) contacting said polysulfide with an alcohol-based wash solution comprising at least 50 wt % alcohol, an oxidizing agent which has some solubility in said alcohol and negligible solubility in said polysulfide, and an inorganic basic catalyst to give a washed polysulfide-bearing lower phase and a spent wash solution upper phase;

(b) separating said washed polysulfide-bearing lower phase from said spent wash solution upper phase to obtain a washed polysulfide and a spent wash solution; and

(c) recovering from said washed polysulfide a purified polysulfide product.

5,206,440

OXIDATION OF FLUORINE CONTAINING SULFIDES TO SULFONES

Richard Beckerbauer, Wilmington, Del., and Shlomo Rozen, Tel Aviv, Israel, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 822,790, Jan. 21, 1992, abandoned. This application Jul. 28, 1992, Ser. No. 920,514
Int. Cl.[5] C07C *315/02, 209/68, 255/02, 381/00*
U.S. Cl. 568—35 13 Claims

1. A process for oxidizing sulfides to sulfones, comprising, contacting an oxidizing agent made by passing fluorine through a mixture of water and acetonitrile with a sulfide of the formula R^1SR^2 wherein:

R^1 is hydrocarbyl or substituted hydrocarbyl, both not containing olefinic or acetylenic bonds;

R^2 is perfluoroalkenyl or $—CR^3R^4R^5$;

R^3 and R^4 are each independently fluorine, perfluoroalkyl, perfluoroalkenyl, or hydrocarbyl or substituted hydrocarbyl not containing olefinic or acetylenic bonds;

R^5 is fluorine, perfluoroalkyl, perfluoroalkenyl, hydrocarbyl or substituted hydrocarbyl not containing olefinic or acetylenic bonds, or hydrogen; and

provided that at least two of R^3, R^4 and R^5 are fluorine, perfluoroalkenyl, or perfluoroalkyl.

5,206,441

HIGH RATE PROCESS FOR PREPARATION OF CYCLOHEXANOL AND CYCLOHEXANONE

Ronald A. Reimer, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1992, Ser. No. 863,737
Int. Cl.[5] C07C *45/53*
U.S. Cl. 568—342 4 Claims

1. A process for the conversion of cyclohexyl hydroperoxide contained in a mixture with cyclohexane, cyclohexanone, cyclohexanol and aqueous caustic, to cyclohexanone and cyclohexanol, which comprises adding a metal salt that accelerates the decomposition of cyclohexyl hydroperoxide and thereafter subjecting the mixture to turbulent high-intensity mixing to create a dispersed phase drop size of between 50 to 500 microns, for a time of between 3 and 45 seconds at a temperature between 100 to 140 degrees C., and then subjecting the mixture to a non-turbulent decantation.

5,206,442

MANUFACTURING OF α,β-UNSATURATED ALDEHYDES AND KETONES

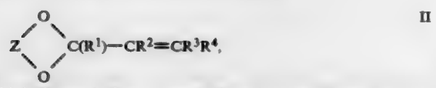
Christiane Mackenroth, Bad Durkheim, and Ernst Buschmann, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 14, 1992, Ser. No. 835,552
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1991, 4106908
Int. Cl.[5] C07C *45/60*
U.S. Cl. 568—447 7 Claims

1. A process for the preparation of an α,β-unsaturated aldehyde or ketone of the formula I

I,

in which the substituents R^1, R^2, R^3, and R^4 independently denote hydrogen, alkyl, substituted alkyl, aryl, or substituted aryl, by acid hydrolysis of the corresponding cyclic α,β-unsaturated acetal or ketal of the formula II



II

in which Z stands for an unsubstituted or substituted carbon chain having 2 to 3 carbon atoms, wherein the substituted alkyl, substituted aryl, or substituted carbon chain may be interrupted by heteroatoms, such as nitrogen, oxygen, and sulfur, or substituted with radicals, such as halogen, nitro, sulfonyl, arylsulfonyl, carboxyl, cycloalkyl, or cycloalkenyl, wherein the hydrolysis is carried out in the presence of a saturated aldehyde, wherein the saturated aldehyde is used in an amount of 1 to 3 molar equivalents, based on the amount of cyclic α,β-unsaturated acetal or ketal of the formula II used, and wherein the hydrolysis is carried out at a temperature from 0° to 150° C.

5,206,443

ALKANEDIOL BISACETALS

Richard Baur, Mutterstadt; Helmut Guembel, Ludwigshafen; Alfred Oftring, Bad Durkheim; Johannes Perner, Neustadt, and Gerhard Wolf, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 20, 1992, Ser. No. 871,093
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1991, 4113163
Int. Cl.[5] C07C *43/11, 43/15*
U.S. Cl. 568—596 5 Claims

1. An alkanediol bisacetal of the general formula I

I

where

R^1 is alkyl or alkenyl of from 6 to 30 carbon atoms,

A is 1,2-alkylene of from 2 to 4 carbon atoms,

m is from 0 to 50,

within each of the pairs R^1, A and m the meanings being identical or different, and

n is from 2 to 20.

5,206,444

grip portion extending axially between the front and rear

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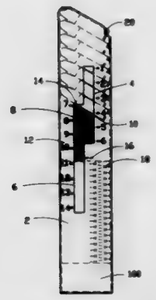
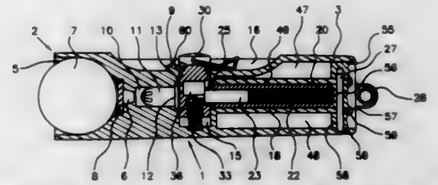
5,206,444
DEVICE THAT DISPLAYS COUNT OF ROUNDS IN FIREARM MAGAZINES
Harry M. Oliver, 701 E. Harrison St., Dillon, S.C. 29536
Filed Nov. 16, 1990, Ser. No. 614,937
Int. Cl.[5] F41A 9/62
U.S. Cl. 42—1.02 **7 Claims**



1. A display device which shows the exact count of rounds in a firearm magazine having a follower, said device comprising:
a. a grip panel assembly which further comprises:
i. a grip providing a textured gripping surface, there being defined in said grip an elongate aperture centrally positioned therethrough;
ii. a window formed of transparent shatterproof material, said window surrounded by said grip;
b. means for displaying on a scale visible through said window the number of rounds in said magazine, which means comprises:
i. a plate, attached to the outside of the magazine, having defined therein two vertical slits centrally positioned thereon, the top of the first such slit extending upward beyond the top of the second such slit, the top of said second slit being adjacent to the mid-section of said first slit, the bottom of said first slit being adjacent to the mid-section of said second slit and the bottom of said second slit extending downward beyond the bottom of said first slit, said slits forming a generally Z-shape; and
ii. a scale attached to said plate, said scale including a group of numbers adjacently positioned to said slits wherein said first slit includes a first set of numbers in increasing value such as, but not limited to, "1,2,3,4,5,6," and said second slit includes a second set of numbers in increasing value such as, but not limited to, "7,8,9,10,11,12,13,14," said numbers vertically imprinted on said scale, alongside said slits, and corresponding and indicating the positions of said rounds inside said magazine;
iii. a mark on the top left section of the follower such that said mark is visible only through said second slit; and
iv. a mark on the bottom right section of the follower such that said mark is visible only through said first slit.

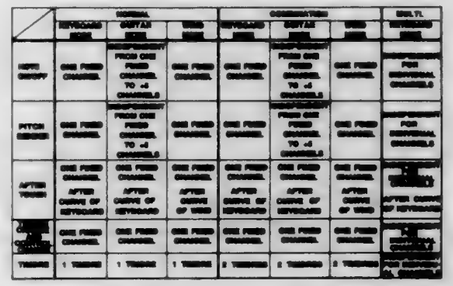
5,206,445
PROJECTION DEVICES
Jack W. Comley, 15 Perriors Close, Cheshunt, Hertfordshire EN7 6AX, and Andrew D. S. McFarlane, Fourwinds, Widdington, Saffron Walden, Essex CB11 3SA, both of England
Filed May 3, 1991, Ser. No. 695,384
Claims priority, application United Kingdom, Jul. 16, 1990, 9015565.6
Int. Cl.[5] F41C 9/08
U.S. Cl. 42—105 **29 Claims**

11. A hand-held self-protection device comprising
(a) an elongate body, the elongate body having front and rear ends and defining an axial direction, and comprising a grip portion extending axially between the front and rear ends by which the device is grippable in one hand;
(b) a firing chamber defined within the body, and an explosive propellant charge in said firing chamber
(c) a firing mechanism in the body, for firing the explosive propellant charge;
(d) a forwardly-opening muzzle recess defined at the front of the elongate body and in front of the firing chamber;



(e) an elastomeric projectile retained in the muzzle recess, said elastomeric projectile having a weight of from 10 to 50 g, and
(f) a trigger operable by a hand holding the grip portion to actuate the firing mechanism and thereby fire the propellant charge to discharge the elastomeric projectile from the muzzle with an energy of 40J to about 100J.

5,206,446
ELECTRONIC MUSICAL INSTRUMENT HAVING A PLURALITY OF TONE GENERATION MODES
Naoaki Matsumoto, Akishima; Hitoshi Ando, Hachioji; Jun Yoshino, and Hitoshi Kato, both of Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jan. 16, 1990, Ser. No. 465,039
Claims priority, application Japan, Jan. 18, 1989, 1-9434; Jan. 18, 1989, 1-9435; Jan. 19, 1989, 1-10388
Int. Cl.[5] H03C 1/00
U.S. Cl. 84—624 **7 Claims**



1. An electronic musical instrument supplied with a music play data via MIDI channels, comprising:
tone generating means having a plurality of tone generating modules each generating a tone signal based on given music play data;
tone generation mode selecting means for selecting an arbitrary one of a plurality of tone generation modes corresponding to a plurality of musical operation modes including a keyboard instrument play mode and a stringed instrument play mode; and
control means for permitting said tone generating means to generate a tone signal corresponding to input music play data in accordance with a tone generation mode selected by said tone generation mode selecting means;
said control means, when said keyboard instrument play mode is specified by said tone generating mode selecting means, assigning one MIDI channel commonly to said plurality of tone generating modules of said tone generat-

347-150 O.G.-93-17

ing means to thereby control generation of a tone signal

said musical tone control signals having increasing and

a first transition section which is variable in cross-sectional dimension and shape between an inlet and an outlet end,

side walls and a cover which is pivotally mounted on one of said side walls and extends contiguous to the opposite

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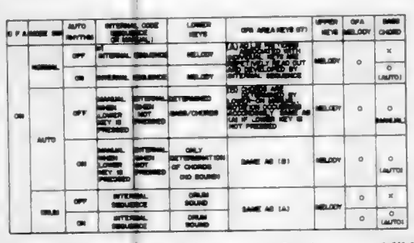
ing means to thereby control generation of a tone signal for said keyboard instrument play mode, and when said stringed instrument play mode is specified by said tone generation mode, assigning respective MIDI channels to said plurality of tone generating modules of said tone generating means for each string, to thereby control generation of a tone signal independently for said music play data input for individual MIDI channels.

5,206,447

ELECTRONIC MUSICAL INSTRUMENT HAVING AN AD-LIBBING FUNCTION

Masafumi Yamaguchi, Hamamatsu, and Hideki Takahashi, Iwata, both of Japan, assignors to Kawai Musical Instruments Manufacturing Co., Ltd., Hamamatsu, Japan

Filed Dec. 1, 1989, Ser. No. 444,757
Claims priority, application Japan, Dec. 4, 1988, 63-306507
Int. Cl.[5] G10H *7/00, 1/40*
U.S. Cl. 84—635 **4 Claims**



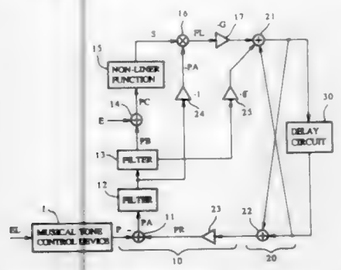
1. An electronic musical instrument having an ad-libbing function, comprising:
a keyboard having a plurality of keys arranged thereon;
tone generating means;
storing means for storing ad lib melody patterns corresponding to keys in a prescribed range on said keyboard respectively and;
ad lib selecting switch means for controlling said tone generating means and said storing means to selectively operate in an ad lib play mode in which said tone generating means generates ad lib melodies corresponding to said stored ad lib melody patterns when the respective keys in said prescribed range are pressed.

5,206,448

MUSICAL TONE GENERATION DEVICE FOR SYNTHESIZING WIND OR STRING INSTRUMENTS

Toshifumi Kunimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 14, 1991, Ser. No. 640,919
Claims priority, application Japan, Jan. 16, 1990, 2-6938
Int. Cl.[5] G10H *5/02*
U.S. Cl. 84—659 **11 Claims**



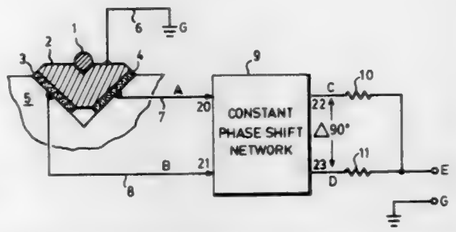
1. A musical tone generation device comprising:
a) control means for generating musical tone control signals, said musical tone control signals having increasing and decreasing values;
b) musical tone signal generating means for generating musical tone signals in response to said musical tone control signals, said musical tone signal generating means including a closed-loop means for circulating a signal thereto in response to said musical tone control signals, said closed-loop means further including a delay means for delaying said circulating signal, and said musical tone signal generating means having an input musical tone control signal versus output musical tone signal hysteresis characteristic which changes said generated musical tone signals dependent on said increasing and decreasing values of said musical tone control signals; and
c) canceling means for canceling out said hysteresis characteristic of said musical tone signal generating means.

5,206,449

OMNIPLANAR PICKUP FOR MUSICAL INSTRUMENTS

Richard E. D. McClish, 1739 Addison Suite 15, Berkeley, Calif. 94703

Continuation of Ser. No. 218,950, Jul. 14, 1988, abandoned. This application Dec. 14, 1989, Ser. No. 505,213
Int. Cl.[5] G10H *3/00*
U.S. Cl. 84—723 **9 Claims**



1. A pickup for detecting planar vibrations of a vibrating element of a musical instrument, comprising:
first transducer means maximally responsive in a first plane of vibration of said vibrating element for producing a first transducer signal,
second transducer means maximally responsive in a second plane of vibration of said vibrating element different from said first plane of vibration, for producing a second transducer signal,
means to phase shift said first and second transducer signal thereby creating a phase shift between said first and said second transducer signal wherein a sensitivity in a third plane of vibration of said vibrating element is increased, and a
means to combine said phase shifted said first and said second transducer signals and produce a joint transducer signal therefrom, whereby said pickup is simultaneously responsive to all of said planar vibrations of said vibrating element.

5,206,450

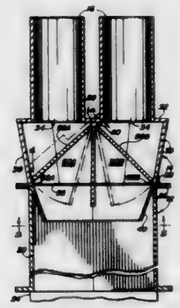
MULTI-MISSILE CANISTER GAS MANAGEMENT SYSTEM

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation Air Defense Systems Division, Pomona, Calif.

Filed May 13, 1991, Ser. No. 698,769
Int. Cl.[5] F41F *3/077*
U.S. Cl. 89—1.8 **12 Claims**

1. An exhaust gas management system for a multi-missile arrangement wherein at least two cells for containing missiles are arrayed side-by-side in a vertical launching orientation, said system comprising:

a first transition section which is variable in cross-sectional dimension and shape between an inlet and an outlet end, said inlet end having means defining an opening mating with the exhaust ends of said cells, said outlet end being generally rectangular in cross section for mating with an adjacent exhaust chamber;
at least two aft closures individually associated with said at least two cells, said closures being pivotably mounted at a common hinge mechanism situated between said cells and equidistant from the central axis thereof, said closures extending downwardly and outwardly from said common hinge mechanism to a region of contact with a wall of an associated cell at an acute angle with the axis of said cell;



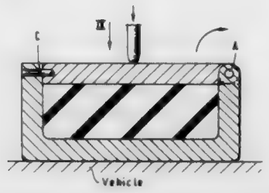
at least one divider wall positioned downstream from said cells and in line with said hinge mechanism to divide said first transition section into equal volume spaces, each space providing room for movement of a corresponding aft closure therein between open and closed positions, said divider wall having means for arresting further movement of adjacent aft closures away from the closed position thereof; and
means for controlling exhaust gas flow to automatically drive an open aft closure from an open position toward the closed position and to maintain a closed aft closure in the closed position in response to reverse exhaust gas glow toward said aft closure from an adjacent exhaust chamber.

5,206,451

ARMOR-PROTECTION FOR A WALL, FOR EXAMPLE A BOMBSHELTER OR AN ARMORED VEHICLE

Jürgen Böcker, Oberhausen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 45,715, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 654,100, Aug. 22, 1984, abandoned. This application Feb. 6, 1989, Ser. No. 314,696
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335002
Int. Cl.[5] F41H *5/007*
U.S. Cl. 89—36.02 **4 Claims**



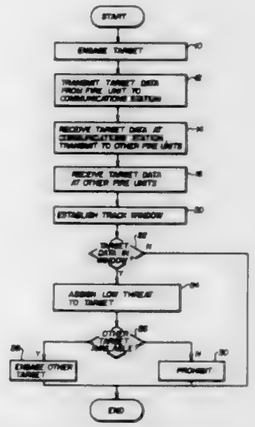
1. An improved kinetic energy projectile deflecting armor protection for an armored wall, the improvement comprising, an armored wall;
armor protection module means operatively mounted on said armored wall; said module means having two pairs of side walls and a cover which is pivotally mounted on one of said side walls and extends contiguous to the opposite side wall of one of said two pairs of side walls or contiguous to an other pivotally mounted cover, whereby each module defines an inner space by means of said cover and said two pairs of side walls;
shear pins means detachably securing said cover to said opposite side wall or said contiguous cover;
the inner space of each module means being filled with a substantially incompressible material which bursts out or explodes upon being impacted by said projectile;
said material being selected from an explosive, glass and ceramic material, whereby when said cover is impacted on by a projectile, said material in said inner space produces an increasing outward pressure on said cover to such extent that it pivots said cover outwardly after shearing said pin means to thereby act in a kinetic energy consuming manner on said impacting projectile.

5,206,452

DISTRIBUTED WEAPON LAUNCH SYSTEM

Ralph H. Stamper, and Deborah Norman, both of Stevenage, Great Britain, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 14, 1992, Ser. No. 820,035
Claims priority, application United Kingdom, Jan. 14, 1991, 9100731
Int. Cl.[5] G06G *15/00;* **F41A** *13/00*
U.S. Cl. 89—1.11 **15 Claims**



11. A method of controlling weapons in a distributed weapon system comprising the steps of:
engaging a target with a first weapon launch station;
transmitting data relating to the location of the target to a central communications station;
receiving said data at said central communications station;
transmitting said data from said central communications station to a second weapon launch station;
receiving said data at said second launch station; and
inhibiting engagement of the target by said second launch station responsive to said received data.

5,206,453

EJECTION MODULE FOR SUBAMMUNITION

first and second horizontally spaced apart front and rear end walls;

5,206,456

ORDNANCE THERMAL BATTERY

striker is adapted for striking said primer when said slider is in said armed position and when said submunition im-

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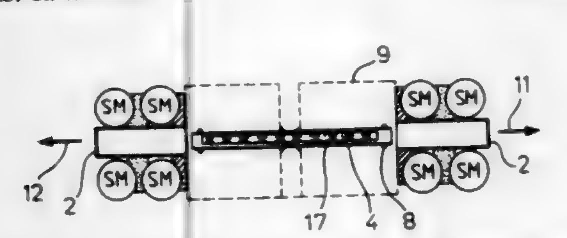
5,206,453
EJECTION MODULE FOR SUBAMMUNITION CONTAINER

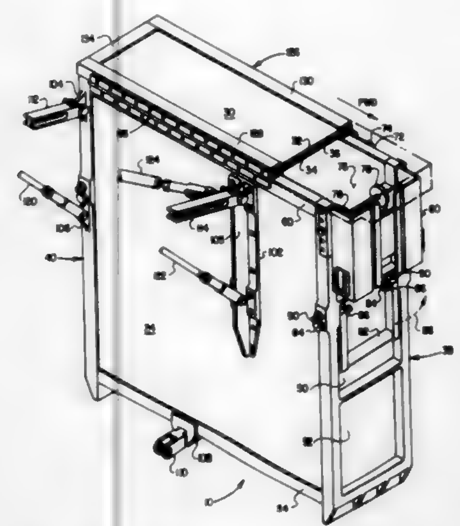
Ulrich Rieger, Feldkirchen/Westerham, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany
Filed Sep. 27, 1991, Ser. No. 766,192
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1990, 4033476
Int. Cl.⁵ F42B *12/58;* **B64D** *1/04*
U.S. Cl. 89—1.51 **13 Claims**



1. Ejection module arrangement for a subammunitions container of the type wherein subammunitions are ejected from said subammunitions container by gas-driven ejecting pistons, transversely with respect to a flat direction of the munitions container, said ejection arrangement comprising:
a gas generator;
at least one pair of interacting ejection pistons which are acted upon by said gas generator; and
driving devices for ejecting said subammunitions, said driving devices being mounted on an peripheral exterior surface of the ejecting pistons, each of said driving devices being arranged to receive and support at least one subammunition;
said ejecting pistons being arranged such that the subammunitions are ejected by said driving devices in an essentially horizontal direction.

5,206,454
EXTERNALLY MOUNTED AIRCRAFT AMMUNITION MAGAZINE BOX STRUCTURE

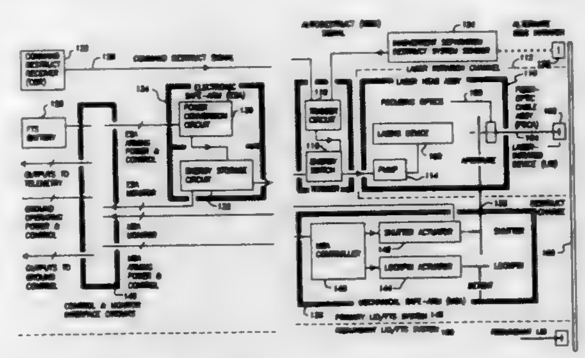
Paul H. Sanderson, 2019 Cripple Creek, Lewisville, Tex. 75067
Filed Mar. 16, 1992, Ser. No. 851,809
Int. Cl.⁵ F41A *9/34*
U.S. Cl. 89—33.14 **25 Claims**



1. A high strength ammunition magazine structure for storing an elongated ammunition belt, said ammunition magazine structure comprising:
first and second horizontally spaced apart opposite side walls;
first and second horizontally spaced apart front and rear end walls;
a bottom wall;
means for connecting said side, end and bottom walls to form therefrom a magazine box having an open upper end and adapted to store therein, in a serpentined orientation, said elongated ammunition belt;
a lid structure including a honeycombed metal lid panel;
means for securing said lid structure to said magazine box for movement relative thereto between a closed position in which said lid structure covers said open upper end of said magazine box, and an open position in which said lid structure uncovers said open upper end; and
means, including cooperating means carried by said lid structure and said side walls, for securely interlocking said side walls and said honeycombed metal lid panel, in response to closure of said lid structure, in a manner such that front-to-rear movement of either of said side walls relative to the other of said side walls is directly resisted in shear by said honeycombed metal lid panel,
said lid structure including a lid frame secured to and peripherally bordering said honeycombed metal lid panel, said lid frame having first and second opposite side edge portions extending in front-to-rear directions,
said means for securing said lid structure to said magazine box including means for hingedly securing said first side edge portion of said lid frame to an upper edge portion of said first side wall, and
said cooperating means include interlockable means carried by said second side edge portion of said lid frame and an upper edge portion of said second side wall.

5,206,455
LASER INITIATED ORDNANCE SYSTEMS

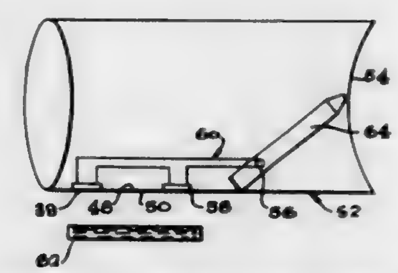
Michael S. Williams, Half Moon Bay; Robert R. Durrell, Moss Beach; Simon M. Kokoshvili, Mountain View; Charles J. Moore, Jr., San Mateo; Jeffrey M. Moser, and Theodore J. Netoff, both of Oakland, all of Calif., assignors to Quantic Industries, Inc., San Carlos, Calif.
Filed Mar. 28, 1991, Ser. No. 676,345
Int. Cl.⁵ F42C *19/08*
U.S. Cl. 102—201 **59 Claims**



1. Apparatus for ordnance initiation comprising:
an explosive charge;
means for generating command control signals;
means for initiating said charge;
means responsive to said command control signals for firing laser energy into said charge initiating means and;
means for performing a laser energy test of said laser energy firing means.

5,206,456
ORDNANCE THERMAL BATTERY

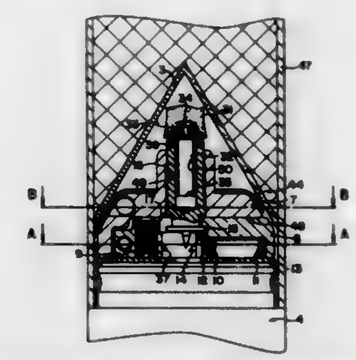
Louis Pracchia; Ronald F. Vetter, and Darwin Rosenlof, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Division of Ser. No. 401,200, Aug. 24, 1989, Pat. No. 5,006,429. This application Nov. 5, 1990, Ser. No. 608,940
Int. Cl.⁵ F42C *11/00;* **F42B** *39/20*
U.S. Cl. 102—207 **12 Claims**



1. In combination, a thermal battery adapted to an ordnance device and to be activated only by externally heating said ordnance device which comprises at least one cell having
an anode,
a cathode, and
an electrolyte positioned between said anode and said cathode, said electrolyte being inactive at ambient temperature but being activated by melting at a predetermined temperature by external heating and a means using the electrical output of the battery activated by externally heating said ordnance device, to ignite pyrotechnic or power electronic devices.

5,206,457
PYROTECHNIC CHAIN IGNITER FOR CARGO WARHEAD SUBMUNITION

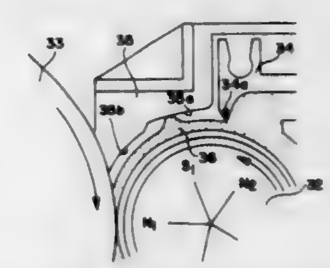
Alain R. Pascal, Saint Eloy de Gy; Patrice H. Chemiere, and Jean-Paul A. Dupuy, both of Bourges, all of France, assignors to GIAT Industries, France
Filed Jul. 30, 1990, Ser. No. 559,097
Claims priority, application France, Aug. 1, 1989, 89 10338
Int. Cl.⁵ F42C *15/184*
U.S. Cl. 102—235 **8 Claims**



1. A pyrotechnic chain igniter device for cargo warhead submunition including an explosive charge contained in an enclosure, comprising:
a first striker mobile in a longitudinal bore of a body for striking a primer;
a slider carrying said primer, said slider being slidably mounted in a transverse groove in said body and being adapted for sliding between a safety position and an armed position, wherein said safety position is defined by said primer being misaligned with said first striker and said armed position is defined by said primer being substantially aligned with said first striker, and wherein said first striker is adapted for striking said primer when said slider is in said armed position and when said submunition impacts a target;
at least one means for blocking said slider in said safety position;
neutralization means comprising a trigger actuated by driving means for preventing said slider from sliding into said armed position; and
delayed self-destruct means comprising a second primer, a delay wick, an igniter relay and a second striker, wherein said second striker is mounted on said slider for initiation of said second primer, said second primer being cooperable with said delay wick and igniter relay to initiate said primer.

5,206,458
DEVELOPING APPARATUS

Yoshikazu Nishikawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 564,626, Aug. 8, 1990, abandoned, which is a continuation of Ser. No. 287,780, Dec. 21, 1988, abandoned. This application Dec. 12, 1991, Ser. No. 808,057
Claims priority, application Japan, Dec. 21, 1987, 62-324790
Int. Cl.⁵ G03G *15/09*
U.S. Cl. 118—658 **6 Claims**



1. A developing apparatus for electrophotographic machines comprising:
a magnetic roller including a magnet with a main polarity and a supplementary polarity and a rotating sleeve disposed around said magnet,
said main polarity opposing a photosensitive drum and said supplementary polarity disposed upstream of said main polarity in the direction of rotation of said sleeve,
said main polarity and said supplementary polarity being opposite in polarity to each other, said magnetic roller conveying a developer along the surface of said sleeve forming a magnetic brush on said sleeve at said supplementary polarity as said sleeve rotates,
a developer-regulating means that is disposed upstream of said supplementary polarity for regulating the amount of developer conveyed on the surface of said sleeve, and
a guiding means having a first surface area disposed downstream of said developer-regulating means in the direction of rotation of said sleeve extending downstream of said supplementary polarity, and a second surface area successively disposed downstream of said first surface area;
wherein said first surface area of said guide means is spaced from the surface of said sleeve to such an extent as to allow the magnetic brush to come into contact with said first surface area,
said second surface area being closer to the surface of said sleeve than said first surface area, and
said first surface area, the surface of said sleeve, said second surface area and said developer-regulator means forming a hollow within which said magnetic brush is formed, said hollow and said magnetic brush acting to prevent the escape of excess toner forced past said developer-regulator means.

5,206,459
CONDUCTIVE POLYMERIC SHIELDING MATERIALS

5,206,461
ARRANGEMENT FOR CONNECTING BUS BARS

disposed in parallel on a plane at predetermined intervals and a contact portion comprising exposed conductors produced by

mount the loudspeaker to a ceiling having an upper side and a lower side, the assembly comprising:

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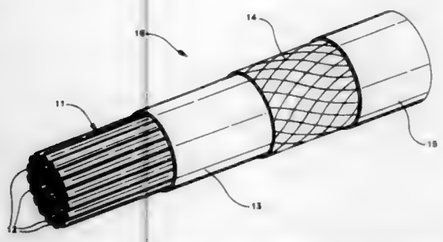
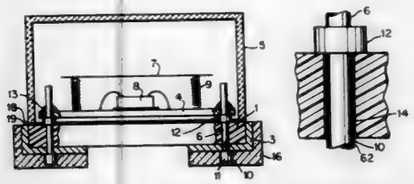
5,206,459
CONDUCTIVE POLYMERIC SHIELDING MATERIALS AND ARTICLES FABRICATED THEREFROM
Mahmoud Aldissi, Colchester, Vt., assignor to Champlain Cable Corporation, Winooski, Vt.
Filed Aug. 21, 1991, Ser. No. 748,146
Int. Cl.[5] H01B *11/18*
U.S. Cl. 174—36 11 Claims



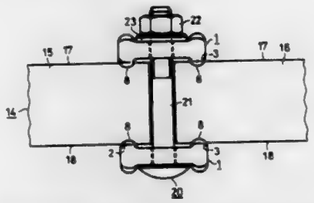
1. A shielded wire or cable article wherein EMI shielding is provided in a polymer shielding layer, comprising:
a) at least one conductive core member;
b) an insulation layer disposed over said at least one conductive core member;
c) a shielding layer overlaying said insulation layer and comprising geometrically round shaped ferrite particles, or combinations of geometrically round shaped and non-geometrically round shaped ferrite particles, dispersed within a polymer matrix; and
d) a jacket layer disposed over said shielding layer.

5,206,460
OSCILLATOR PACKAGE
Mu K. Yang, 4Fl., No. 85, Yenping S. Rd., Taipei, Taiwan
Filed Jul. 24, 1991, Ser. No. 734,902
Int. Cl.[5] H05K *5/00*; H01L *23/02*
U.S. Cl. 174—52.1 6 Claims



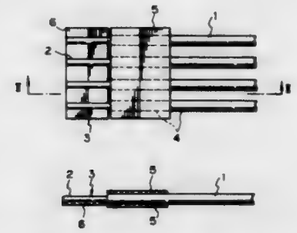
1. An oscillator package capable of being mounted on a circuit board by surface mounting technique, comprising:
a header substrate with a plurality of through holes formed therein;
a copper post passed through each said through hole, each said copper post having a first flange formed at an underside of said header substrate and a second flange formed at an upper side of said header substrate;
a ceramic substrate securely mounted to and supported by said second flanges of said copper posts for mounting a die thereon;
a substantially L-shaped lead securely attached to an underside as well as a lateral side of said header substrate, contacting each copper post, such that said first flange is at an underside of said L-shaped lead; and
a ceramic cover provided on an upper side of said header substrate for housing and sealing said die and said crystal.

5,206,461
ARRANGEMENT FOR CONNECTING BUS BARS
Rolf-Günter Genzel, Lützelbach/ODW, and Karl-Josef Zeimetz, Plein, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Aug. 16, 1991, Ser. No. 746,423
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1990, 4027214
Int. Cl.[5] H01R *11/00*
U.S. Cl. 174—88 B 19 Claims



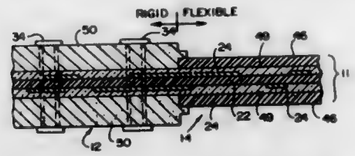
1. An arrangement for connecting a first and second aligned section of a bus bar, comprising:
a) a first connecting piece for gripping a first side of the first and second aligned sections, including:
(i) a first end having:
(A) a first pair of elevations; and
(B) a first crown-rounded contact surface, said first crown-rounded contact surface adapted for resting on the first side of the first aligned section and being disposed between said first pair of elevations; and
(ii) a second end having:
(A) a second pair of elevations; and
(B) a second crown-rounded contact surface, said second crown-rounded contact surface adapted for resting on the first side of the second aligned section and being disposed between said second pair of elevations; and
b) a second connecting piece for gripping a second side of the first and second aligned sections, including:
(i) a third end having:
(A) a third pair of elevations; and
(B) a third crown-rounded contact surface, said third crown-rounded contact surface adapted for resting on the second side of the first aligned section and being disposed between said second pair of elevations; and
(ii) a fourth end having:
(A) a fourth pair of elevations; and
(B) a fourth crown-rounded contact surface, said fourth crown-rounded contact surface adapted for resting on the second side of the second aligned section and being disposed between said second pair of elevations; and
c) a clamping screw for holding the first and second aligned sections between the first and second connecting pieces.

5,206,462
FLAT MULTICORE WIRE AND METHOD OF FORMING THE SAME WIRE
Kazuo Iura; Yoshiaki Yamano, and Kazuhito Saka, all of Mie, Japan, assignors to Sumitomo Wiring System Ltd., Mie, Japan
Division of Ser. No. 728,503, Jul. 11, 1991. This application Jun. 26, 1992, Ser. No. 903,960
Claims priority, application Japan, Jul. 13, 1990, 2-186575; Mar. 6, 1991, 3-65386; Mar. 15, 1991, 3-76740; May 20, 1991, 3-143782
Int. Cl.[5] H01B *7/08*
U.S. Cl. 174—117 F 1 Claim
1. A flat multicore wire having a group of round wires disposed in parallel on a plane at predetermined intervals and a contact portion comprising exposed conductors produced by equally peeling off coatings of said round wires at the end portion thereof by a slightly short distance, said flat multicore wire being characterized by an end structure in which pieces of



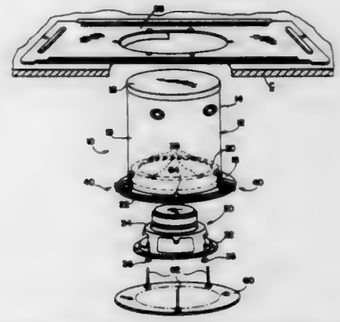
common coating connecting tape of a slightly short length are applied on the top and bottom surfaces of the coatings adjacent to the proximal end of said exposed conductors, and in which a piece of conductor connecting tape that is separate from said coating connecting tape is applied to the underside of said exposed conductors.

5,206,463
COMBINED RIGID AND FLEXIBLE PRINTED CIRCUITS AND METHOD OF MANUFACTURE
Arthur J. DeMaso, Pepperell, Mass., and Thomas H. Stearns, Nashua, N.H., assignors to Miraco, Inc., Nashua, N.H.
Continuation-in-part of Ser. No. 557,526, Jul. 24, 1990. This application Mar. 28, 1991, Ser. No. 676,877
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—254 18 Claims



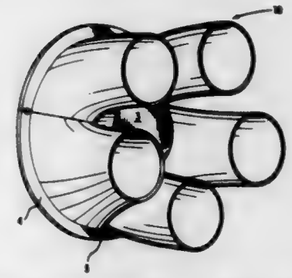
1. A printed circuit structure having rigid and flexible portions having a via through a rigid portion thereof to interconnect conductive circuit layers thereof, comprising:
a) a least one polymeric substrate;
b) at least two conductive circuit layers carried by said at least one substrate for interconnection by said via;
c) at least one layer of polymeric prepreg overlying at least the location of said via; and
d) a sheet of flexible polymeric over-layer material extending over the paths of conductive material in at least the entirety of all the flexible portion in a manner to prevent exposure of at least the conductive paths to the environment;
e) said polymeric materials in the rigid portion having a TCE of no more than about 400 ppm/° C. over a temperature range of 20° C. to 287° C.

5,206,464
LOUDSPEAKER MOUNTING ASSEMBLY
Michael E. Lamm, High Ridge, Mo., and S. Richard Hrach, Jr., Ellisville, Ill., assignors to American Trading and Production Corporation, Baltimore, Md.
Filed May 17, 1991, Ser. No. 702,276
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—150 17 Claims
1. A loudspeaker mounting assembly for a loudspeaker having a mounting flange, the assembly being adapted to recess mount the loudspeaker to a ceiling having an upper side and a lower side, the assembly comprising:
(a) a first enclosure portion including an upper endwall and a peripheral sidewall having a remote end,
(b) a second enclosure portion including an interior flange disposed in axially spaced recessed relation from said first enclosure portion remote end inwardly of the peripheral sidewall,



(c) first attachment means attaching the second enclosure portion to the first enclosure portion,
(d) second attachment means attaching the loudspeaker flange to the interior flange whereby the loudspeaker is recessed within the ceiling, and
(e) third attachment means operatively attaching the first and second enclosure portions to the ceiling.

5,206,465
SOUND COLLECTING AND CONCENTRATING DEVICE FOR ATTACHING TO THE BACK OF A LOUDSPEAKER
Gin Kou Jung, 93-73 GA Jung Ang Dong, Iri-City Jungbuk 570-120, Rep. of Korea
Continuation-in-part of Ser. No. 531,660, Jun. 1, 1990, Pat. No. 5,025,886. This application Jun. 13, 1991, Ser. No. 714,529
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—152 22 Claims



1. A sound collecting and directing device for use with a loudspeaker having a diaphragm with a frontal side which generally faces an ambient surrounding and a back side which faces opposite the frontal side; a frame means which operatively supports the diaphragm and a speaker driving means, the frame means having a flange at its outermost peripheral edge; and a plurality of sound venting cut-outs in the frame means to permit sound waves to substantially freely pass therethrough, said device comprising:
a sound collecting tube having an inlet tube and an outlet end, said inlet end having a flange means for attaching to the flange of the frame means to attach said inlet end to the frame means to shroud said inlet end over at least one of

the cutouts in the frame means and means for isolating the speaker driving means from the sound traveling path in

inside from the outside of the muffler closure, the thermal insulation acoustic layer having an inner surface;

5,206,469
CRASH SENSOR

being received in said operating cylinder so as to reciprocably move between a first position and a second position,

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the cutouts in the frame means and means for isolating the speaker driving means from the sound traveling path in said sound collecting tube; and

a sound concentrating and directing horn means formed at said outlet end of said sound collecting tube,

wherein said sound collecting tube is for collecting sound emitting from the back side of the diaphragm and directing into said horn means.

5,206,466

DIAPHRAGM FOR SPEAKER

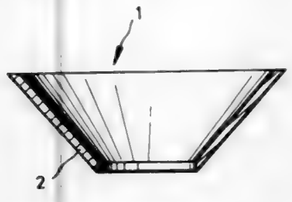
Tatsuya Inamiya, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1991, Ser. No. 671,955

Claims priority, application Japan, Apr. 13, 1990, 2-98514; Nov. 29, 1990, 2-331147

Int. Cl.[5] G10K *13/00*

U.S. Cl. 181—169 **5 Claims**



1. A speaker diaphragm comprising:

a bast fiber;

a silk fiber combined with said bast fiber;

said bast fiber having been flaked before being combined with said silk fiber;

said silk fiber having been crushed before being combined with said bast fiber;

said silk fiber includes a fiber diameter of less than 10 microns; and

said bast fiber and said silk fiber forming a combined fiber paper of said diaphragm.

5,206,467

MUFFLER WITH A CATALYST

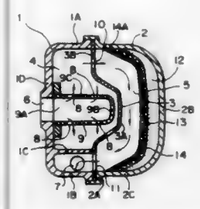
Noboru Nagai, Hachioji; Akira Sageshima, Kunitachi; Tadashi Ozaki, Yokosuka, and Isao Masuda, Tachikawa, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 26, 1992, Ser. No. 840,979

Claims priority, application Japan, Mar. 26, 1991, 3-018492[U]

Int. Cl.[5] F01N *7/02*

U.S. Cl. 181—232 **4 Claims**



1. A muffler with a catalyst, comprising:

a muffler body having an open end;

a muffler closure, detachably attached to the muffler body to close the open end, the muffler closure having an inner surface;

a thermal insulation acoustic layer, mounted over the inner surface of the muffler closure, for thermally insulating the inside from the outside of the muffler closure, the thermal insulation acoustic layer having an inner surface;

a catalytic layer, superposed on the inner surface of the thermal insulation acoustic layer, for achieving a catalytic reaction with exhaust gas to clean the exhaust gas, the catalytic layer having an inner surface; and

a porous holding means for holding both the thermal insulation acoustic layer and the catalytic layer against the muffler closure, the porous holding means having an inner surface contacting the exhaust gas.

5,206,468

LOCKING APPARATUS FOR A DRAWER TYPE CIRCUIT BREAKER

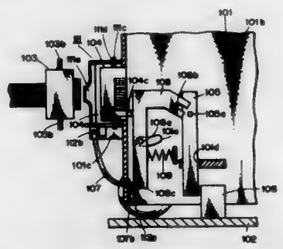
Keiji Kobayashi, and Yoshimi Fujii, both of Kagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 719,136

Claims priority, application Japan, Jun. 21, 1990, 2-165219; Jun. 21, 1990, 2-165220; Jun. 21, 1990, 2-165221; Jul. 25, 1990, 2-198556

Int. Cl.[5] H01H *9/20;* **H02B** *11/00*

U.S. Cl. 200—50 AA **14 Claims**



1. A locking apparatus for a drawer type circuit breaker, said circuit breaker moving on a switchboard and stopping at a disengage position and a engage position, said locking apparatus being mounted and having a first plug inserted into a second plug on the switchboard for establishing an electrical connection between said circuit breaker and said switchboard, said locking apparatus comprising:

plug-connection sensing means for sensing a connection of said first plug into said second plug;

lock means for locking said first plug inserted into said second plug when said lock means is at a lock position thereof, and for unlocking when said lock means is at an unlock position thereof;

a stopper fixed on said switchboard;

a lock pin drivingly connected to said plug-connection sensing means and said lock means, said lock pin moving to a contact position to contact the stopper to inhibit advancement of the circuit breaker from said disengage position to said engage position when said plug-connection sensing means does not detect that said first and said second plugs are connected with each other, while at the same time said lock means locks said first plug, and lock pin moving to a non-contact position to move out of contact with said stopper so that the circuit breaker is allowed to move from said disengage position to said engage position when said plug-connection sensing means detects that said first and second plugs are connected with each other while at the same time said lock means locks said first plug; and

access-inhibiting means for inhibiting an operator to access to said first and second plugs when said circuit breaker is between said disengage position and said engage position.

5,206,469

CRASH SENSOR

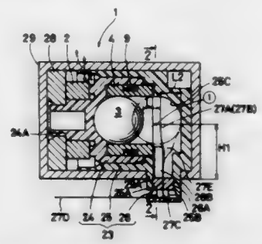
Masaru Takeda; Akihiko Kuroiwa, both of Kobe; Etsujiro Imanishi, Chiyoda; Koji Minekubo, Kobe; Tatsuo Munakata, Chiyoda; Atsushi Taniguchi, Chiyoda; Kazuyuki Kita, Chiyoda, and Masaharu Kakiya, Chiyoda, all of Japan, assignors to Sensor Technology Co., Ltd., Kobe, Japan

Filed Jul. 16, 1991, Ser. No. 730,680

Claims priority, application Japan, Jul. 16, 1990, 2-75861[U]; May 2, 1991, 3-040868[U]

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 M **6 Claims**



1. A crash sensor, comprising:

a hollow magnetic shield made of a ferromagnetic material shielding said crash sensor from external magnetic influences, said magnetic shield being formed in the shape of a hollow cylinder which is closed at each end;

a hollow body and a sleeve cooperating with one another within said magnetic shield to form a chamber for receiving a sensing mass therein;

a magnet located within said magnetic shield at a first end of said sleeve;

a ferromagnetic sensing mass longitudinally movable through said sleeve and attracted to said first end of said sleeve by a magnetic attraction force of said magnet;

a pair of electrical contact strips located at a second end of said sleeve for making a closed circuit by contacting the sensing mass when an acceleration force acting on the sensing mass overcomes said magnetic attraction force;

a separate contact leading to each of said electrical contact strips, each said contact leading radially out through an opening in the magnetic shield;

wherein said magnetic shield substantially surrounds said magnet and said hollow body such that said magnetic shield provides a path for magnetic flux of said magnet to form appropriate loops in the vicinity of the sensing mass and wherein said magnetic shield also serves as a casing protecting said crash sensor from shock and environmental influences; and

wherein said hollow body includes a hollow projection extending radially outwardly through said opening in the magnetic shield, said hollow projection having a strip support received therein which is sealed air-tightly against the hollow body.

5,206,470

OPERATING DEVICE FOR GAS CIRCUIT BREAKER

Hiromichi Hokutou, Hitachi; Tetsuo Fukuchi, Hitachiota; Masatomo Ohno, and Akira Suzuki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1991, Ser. No. 705,531

Claims priority, application Japan, May 30, 1990, 2-138226

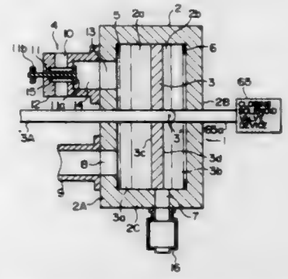
Int. Cl.[5] H01H *3/24, 33/30, 35/38*

U.S. Cl. 200—82 B **3 Claims**

1. An operating device for a gas circuit breaker, the operating device comprising:

an operating cylinder having an exhaust port;

and an operating piston having one end operatively connected to the gas circuit breaker for effecting a breaking operation and closing operation, said operating piston being received in said operating cylinder so as to reciprocably move between a first position and a second position, said operating piston dividing an internal space of said operating cylinder into a first chamber and a second chamber respectively disposed on opposite sides of said operating piston, said operating piston being movable from said first position to said second position at a time of the breaking operation of said operating device, said operating piston being movable from said second position to said first position at a time of the closing operation of said operating device, an exhaust port communicating with said first chamber when said operating piston is disposed near said second position, and said exhaust port communicating with said second chamber when said operating piston is remote from said second position;



means for introducing high-pressure air into said first chamber at the time of said breaking operation; and

exhaust valve means for discharging the air from said first chamber when the air pressure within said first chamber decreases below a predetermined level, said exhaust valve means including a valve element having a pressure-receiving portion which receives the air pressure from said first chamber, and wherein said pressure-receiving portion is positioned so that said pressure-receiving portion is out of contact with said operating piston when said operating piston is disposed at said first position.

5,206,471

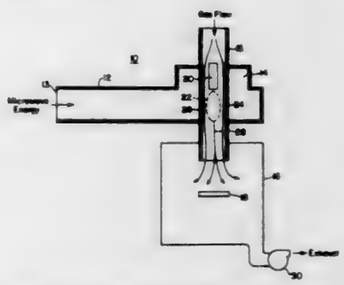
MICROWAVE ACTIVATED GAS GENERATOR

Donald K. Smith, Arlington, Mass., assignor to Applied Science and Technology, Inc., Woburn, Mass.

Filed Dec. 26, 1991, Ser. No. 813,978

Int. Cl.[5] B05C *5/00;* **H05B** *6/64*

U.S. Cl. 219—10.55 R **26 Claims**



1. A microwave activated gas generator, comprising:

means for supplying microwave energy to an activated gas formation region;

means for flowing gas to be activated through said activated gas formation region; and

means for disturbing the flowing gas stream to form a down-

5,206,473

NC LASER DEVICE

position on the basis of the corrected weaving width, and

pair of sides separated by a plurality of ribs extending between said sides so as to provide increased heat transfer

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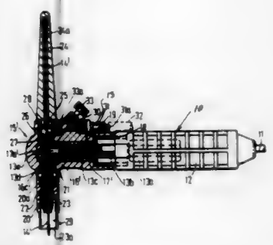
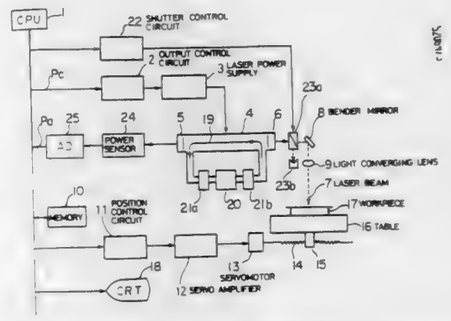
means for disturbing the flowing gas stream to form a downstream stagnation region in said activated gas formation region for encouraging microwave gas activation to effectively couple power to the gas for forming a relatively high volume of activated gas in the gas stream.

5,206,472
SYSTEM FOR USE IN ELECTRODE WELDING AND GAS/ARC WELDING
Reidar Myking, Postboks 45, N-5100 Isdalsto, and Oystein Vetas, N-5123 Saebovagen, both of Norway
PCT No. PCT/NO90/00103, § 371 Date Dec. 10, 1991, § 102(e) Date Dec. 10, 1991, PCT Pub. No. WO90/15687, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 12, 1990, Ser. No. 778,133
Claims priority, application Norway, Jun. 12, 1989, 892390
Int. Cl.[5] B23K *9/167*
U.S. Cl. 219—75 **4 Claims**



1. In combination,
an electrode holder having a handle, a current-conducting cable extending from said handle, and a current conductor connected to said cable within said handle, said conductor having a screw-threaded portion extending outside said handle;
a first fastening head for selectively securing a first electrode to said current conductor, said head including a first current-conducting clamping member having an internal screw thread for threading onto said current conductor of said holder and a transverse bore at one end for receiving an electrode therein for clamping between said screw-threaded portion of said current conductor and said current-conducting clamping member; and
a second fastening head for selectively securing an arc electrode to said current conductor, said second fastening head including a second current-conducting clamping member having an internal screw thread for threading onto said current conductor of said holder and a transverse bore at one end for receiving an arc electrode therein for clamping between said screw-threaded portion of said current conductor and said second current-conducting clamping member, a coupling bushing for coupling with a source of gas, a gas passage extending from said bushing for conducting a flow of gas about one end of an arc electrode secured to said second clamping member, and a control valve for adjusting the flow of gas in said passage.

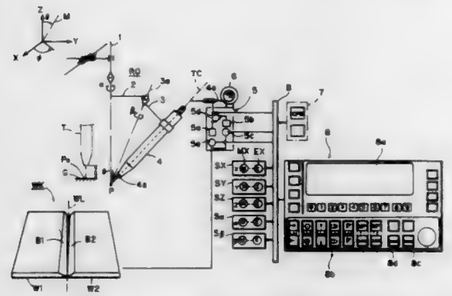
5,206,473
NC LASER DEVICE
Kazuhiro Suzuki, Minamitsuru, and Nobuaki Iehisa, Mishima, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP90/00306, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990, PCT Pub. No. WO90/10961, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 8, 1990, Ser. No. 601,720
Claims priority, application Japan, Mar. 15, 1989, 1-62794
Int. Cl.[5] B23K *26/02*
U.S. Cl. 219—121.83 **3 Claims**



1. An NC laser device having a combination of a numerical control device and a laser oscillator, and comprising:
command means for commanding a specific laser output at a time of starting of the laser oscillator;
monitoring means for monitoring the laser output;
ratio calculating means for obtaining a ratio of a command value output from said command means to a monitored value output from said monitoring means;
non-volatile memory means for storing said ratio; and
abnormality detecting means for obtaining a difference between said ratio and the ratio obtained at a previous start of the laser oscillator and for producing an alarm when said difference is higher than a predetermined set value.

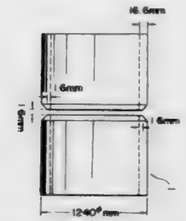
5,206,474
WELD LINE PROFILE CONTROL METHOD
Hisahiro Fukuoka; Hirotoshi Watanabe; Shunji Iwaki, and Kazumasa Yoshima, all of Takarazuka, Japan, assignors to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan
PCT No. PCT/JP90/00741, § 371 Date Apr. 4, 1991, § 102(e) Date Apr. 4, 1991, PCT Pub. No. WO90/15686, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 6, 1990, Ser. No. 651,418
Claims priority, application Japan, Jun. 14, 1989, 1-151081; Jul. 10, 1989, 1-178541
Int. Cl.[5] B23K *9/127*
U.S. Cl. 219—124.34 **6 Claims**

1. A weld line profile control method of weaving welding bodies to be welded along a weld line on the basis of teaching data, said weld line profile control method including:
(a) a step of evaluating at least one of a welding current and a welding voltage in a position close to a weaving endpoint as a reference value; and
(b) a step comprising the following steps (b-1) to (b-4);
(b-1) a step of actually measuring at least one of a welding current and a welding voltage in the vicinity of an n-th ($n \geqq 2$) weaving endpoint, respectively,
(b-2) a step of correcting a weaving width from an $(n-1)$-th weaving endpoint to the n-th weaving endpoint on the basis of difference between the actually measured value and the reference value,
(b-3) a step of evaluating an $(n+1)$-th weaving endpoint position on the basis of the corrected weaving width, and



(b-4) a step of performing weaving welding from the n-th weaving endpoint to the $(n+1)$-th weaving endpoint on the basis of the positional data.

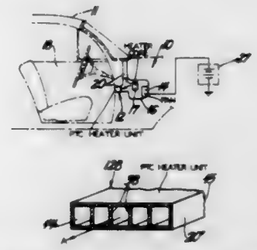
5,206,475
HIGH CELLULOSE TYPE COATED ELECTRODE
Takashi Wada; Shozo Naruse, and Takeshi Sugino, all of Fujisawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Mar. 10, 1992, Ser. No. 848,183
Int. Cl.[5] B23K *35/22*
U.S. Cl. 219—145.23 **11 Claims**



1. A high cellulose type coated electrode made up of a steel core wire and a coating material formed thereon from a mixture of a flux containing a large amount of cellulose and a binder, said coating material containing:
0.1 7.0% MgO;
7–25% iron oxide (in terms of FeO);
8–19% TiO_2;
10–30% SiO_2;
5–27% Mn; and
0.05–0.5% B,
wherein the TiO_2/B ratio is 60–200, and the weight ratio of said coating material to said coated electrode is 0.1–0.19.

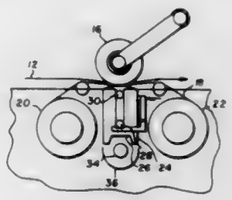
5,206,476
SUPPLEMENTARY AUTOMOBILE DUCT HEATER
John B. Fresch, Lockport, and Thomas P. Warszawski, Niagara Falls, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 30, 1991, Ser. No. 767,184
Int. Cl.[5] B60H *1/02;* **H05B** *3/14;* **F24H** *3/04*
U.S. Cl. 219—202 **1 Claim**

1. A supplementary passenger compartment heating assembly for an automobile having an electrical power source and a forced air duct opening to said compartment, comprising,
a generally rectangular air distribution duct molded integrally with said forced air duct from a heat conductive PTC polymer material, said air distribution duct having a pair of sides separated by a plurality of ribs extending between said sides so as to provide increased heat transfer area to air forced therethrough, and,
means selectively connecting said electrical power source to said air distribution duct,



whereby air is both communicated to said compartment by said distribution duct and heated in supplementary fashion.

5,206,477
APPARATUS AND METHOD FOR REPLACING A FUSER BAR WITHOUT TOOLS
Stanley W. Stephenson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 5, 1992, Ser. No. 894,676
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—216 **15 Claims**



1. An apparatus for stabilizing dye on an image bearing surface, comprising:
a frame having a pair of spaced apart slots;
a fuser bar having a temperature, a heat radiating surface, a heat absorbing surface, and means for slidably engaging said slots for insertion and removal of said fuser bar;
a temperature sensor for sensing the temperature of said fuser bar; and
means for moving said temperature sensor into temperature sensing contact with said fuser bar in response to insertion of said fuser bar and for moving said temperature sensor away from temperature sensing contact with said fuser bar in response to removal of said fuser bar.

5,206,478
MICROWAVE SHIELDING FOR A DOOR OF A MICROWAVE OVEN
Ki I. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Youngdungpo, Rep. of Korea
Filed Oct. 24, 1991, Ser. No. 781,911
Claims priority, application Rep. of Korea, Oct. 24, 1990, 17046/1990; Nov. 28, 1990, 19381/1990
Int. Cl.[5] H05B *6/76*
U.S. Cl. 219—10.55 D **18 Claims**

1. A microwave shielding device for a door of a microwave oven, comprising:
a door frame having a stepped portion formed at one side

thereof defining a surface portion for contacting a front plate of the microwave oven when the door is closed; and

changes in a magnetic field generated by the stationary magnetic means as the container and the magnetic mixer in it are

at least to said location, an inner wall of said annular passage being formed by an electrically insulating tube

one end of said first helical resistive element and made of a material having a positive resistance temperature coeffi-

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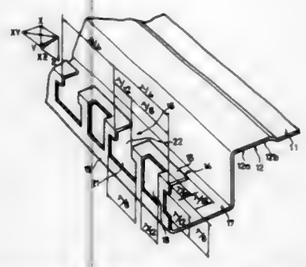
thereof defining a surface portion for contacting a front plate of the microwave oven when the door is closed; and
a choke seal formed integrally and of one piece with the door frame for preventing leakage of microwave energy from the microwave oven, wherein choke seal comprises:
an inner wall extending from the door frame perpendicular to the stepped portion,
a front wall extending perpendicularly from a distal end portion of the inner wall,



an outer wall extending perpendicularly from a distal end portion of said front wall, and
a flange extending perpendicularly from a distal end portion of the outer wall and toward the stepped portion;
wherein a plurality of through-holes are formed in the outer wall and the flange, each said through-hole extending over a boundary between the outer wall and the flange;
wherein a rectangular aperture is formed in the outer wall between each through-hole; and
wherein a plurality of slits are formed in the flange.

5,206,479

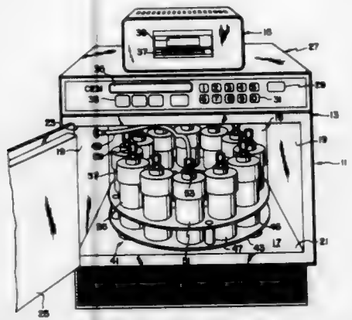
MICROWAVE HEATING SYSTEM

Zairani Zakaria, Charlotte; Edwin D. Neas, Matthews; Dennis P. Manchester, Matthews, and Wyatt P. Hargett, Matthews, all of N.C., assignors to CEM Corporation, Matthews, N.C.

Filed May 4, 1990, Ser. No. 518,954

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 F **19 Claims**



1. A system for improved microwave heating of a material in a container in a microwave chamber, which comprises a walled chamber, a source of microwave radiation, which radiation is directed into the chamber, a walled container in the chamber for holding material to be heated, supporting means in the chamber for supporting the container and for moving it in substantially horizontal rotary or oscillating rotary motion, and means for mixing the material to be heated in the container during microwave heating thereof, which means comprises stationary magnetic means under the walled container and under the supporting means, and a magnetic mixer in the container, which magnetic mixer is set in motion by relative changes in a magnetic field generated by the stationary magnetic means as the container and the magnetic mixer in it are moved past the stationary magnetic means, thereby mixing contained material.

5,206,480

WIRE ELECTRODE FOR ELECTRO-DISCHARGE MACHINING

Yoshihiro Nakai; Kazuo Sawada; Kouichi Yamada, and Shigeo Ezaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 530,519, May 3, 1990, abandoned. This application Mar. 26, 1992, Ser. No. 859,258

Claims priority, application Japan, May 31, 1989, 1-139845

Int. Cl.[5] B23H *7/08*

U.S. Cl. 219—69.12 **8 Claims**

1. A wire electrode for electro-discharge machining, said wire electrode being made of a Cu alloy containing from more than 40 and up to 50 percent by weight of Zn and 0.01 to 2.0 percent by weight in total of Al.

5,206,481

PLASMA BURNER FOR TRANSFERRED ELECTRIC ARC

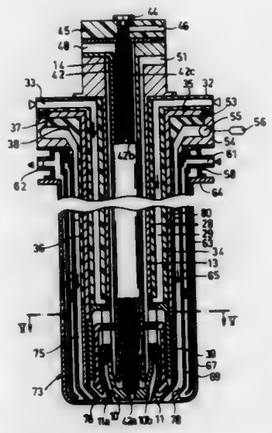
Heinrich O. Rossner; Ulrich Scheffler; Gebhard Tomalla, all of Essen, and Herbert Klein, Kiel, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft Mit Beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Jul. 2, 1991, Ser. No. 725,628

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1990, 4022111

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.48 **19 Claims**



1. A plasma burner for transferred electric arc, comprising:
a central electrode;
a nozzle end piece concentric with an end of said central electrode at a front of the burner and spaced from said central electrode by an annular gap for discharging a plasma gas from said burner;
a burner shell surrounding said nozzle end piece at an end of said burner shell and extending axially from said end of said burner shell along said electrode, said burner shell being formed with a coolant inlet and a coolant outlet at a location axially spaced from and distal to said end of said burner shell, said burner shell defining an annular passage with said nozzle end piece communicating with a mouth spacedly surrounding said annular gap, said annular passage extending axially from said nozzle end piece distally

at least to said location, an inner wall of said annular passage being formed by an electrically insulating tube separating said burner shell from said nozzle end piece; and
means at a rear end of said annular passage remote from said nozzle end piece forming a pipe connection communicating with a source of a gaseous medium under pressure.

5,206,482

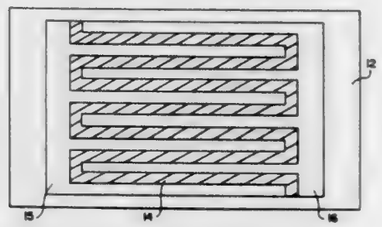
SELF REGULATING LAMINAR HEATING DEVICE AND METHOD OF FORMING SAME

Jack H. Smuckler, 9 Countryside La., Marblehead, Mass. 01945

Continuation-in-part of Ser. No. 610,795, Nov. 8, 1990. This application Jan. 23, 1992, Ser. No. 824,331

Int. Cl.[5] H05B *3/84*

U.S. Cl. 219—219 **9 Claims**



1. A heated mirror assemble comprising:
a. a reflective mirror;
b. a temperature self-regulating positive temperature coefficient material in thermal communication with said mirror, said material formed by applying to a non-reflective side of the mirror a composition comprising a dispersion of electrically conductive particulate material in a solution of a crystalline polyurethane or crystalline polychloroprene polymer comprising at least 10% by weight of the polymer, which solution is stable at a temperature in the range of from about 60° F. to about 80° F.; and
c. a plurality of electrodes disposed in contact with said positive temperature coefficient material spaced apart at a distance to permit current flow between the electrodes through the material at a temperature below its switching temperature.

5,206,483

TEMPERATURE CONTROLLED GLOW PLUG HAVING CONTROLLED SATURATION AND AFTERGLOW CHARACTERISTICS

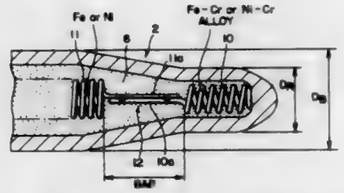
Takashi Aota, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Japan

Filed May 4, 1992, Ser. No. 878,057

Claims priority, application Japan, May 30, 1991, 3-048304[U]

Int. Cl.[5] F23Q *7/22*; H05B *3/00*; F02P *19/02*; H01C *3/02*

U.S. Cl. 219—270 **5 Claims**



1. A temperature self-control type glow plug comprising:
a first helical resistive element serving as a heating element;
a second helical resistive element connected in series with one end of said first helical resistive element and made of a material having a positive resistance temperature coefficient larger than that of said first helical resistive element;
a metallic sheath enclosing said first and second helical resistive elements in an end to end relationship, said first and second helical resistive elements embedded in a heat resistant electric insulating powder,
wherein an outer sheath diameter DR of a portion of said sheath in which said first helical resistive element is embedded is set to be smaller than an outer sheath diameter DB of a portion of said sheath in which said second helical resistive element is embedded,
a gap larger than the sheath diameter DR of the portion in which said first helical resistive element is embedded formed between ends of said first and second helical resistive elements, and
said two helical resistive elements connected to each other within the gap through connecting ends respectively extending from said resistive elements,
said connecting ends located within an outer diameter of said first helical resistive element.

5,206,484

GLOW-PLUG HAVING CERAMIC BASE MATRIX AND CONDUCTING ELEMENT DISPERSED THEREIN

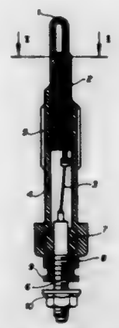
Jean-Paul Issartel, Annemasse, France, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Oct. 26, 1990, Ser. No. 603,395

Claims priority, application Switzerland, Nov. 9, 1989, 4043/89

Int. Cl.[5] F23Q *7/22*

U.S. Cl. 219—270 **7 Claims**



1. Ignition glow-plug for high-compression internal combustion engines, e.g., Diesel motors, said glow-plug having an elongated heating body which protrudes into a combustion chamber of an engine and whose essential components are:
(a) an electrically conducting element, made of a sintered mixture of ceramic and an electrically conducting phase homogeneouly dispersed therein, and having two ends, a first one of which is internally connected to an axial terminal of the glow-plug for supplying ignition current thereto, and a second end of said electrically conducting element is connected to an external metallic case of the glow-plug to be screwed in said engine; and
(b) an insulating supporting substrate element made of insulative ceramic integral with said electrically conducting element and sealed in said metallic case,
characterized in that said electrically conducting element (a) is made of a cermet material of which the ceramic base matrix is of a same nature as the ceramic of said insulating element (b) and said conducting phase dispersed uniformly and homogeneously therein is a particulate metallic phase whose thermal expansion factor differs by no more than four times the thermal expansion factor of the

ceramic base matrix in which said particulate metallic phase is dispersed and the particles of which have a size

disposed adjacent to the first end thereof and including an elongated, linear slot for receiving the data card

an automatic cash handling machine for use by customers,
a movable shutter located between the window machine and the automatic cash handling machine, and

ing the cost thereof from the amount stored in the subscriber's local storage device.

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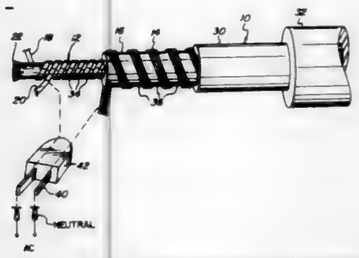
ceramic base matrix in which said particulate metallic phase is dispersed and the particles of which have a size sufficiently small to keep the internal stress forces that result from the thermal variations undergone by the glow-plug in operation below the limits where cracking of the ceramic may occur.

5,206,485

LOW ELECTROMAGNETIC AND ELECTROSTATIC FIELD RADIATING HEATER CABLE

Robert C. Srubas, Granby, Conn., and William M. Rowe, Jr., DeKalb, Miss., assignors to Specialty Cable Corp., Wallingford, Conn.

Filed Oct. 1, 1990, Ser. No. 591,412
Int. Cl.[5] H05B *1/02, 3/34*
U.S. Cl. 219—549 **1 Claim**



1. A low electromagnetic field and low electrostatic field radiating AC-powered heater cable for a personal comfort product such as an electric blanket and the like, comprising:
an inner conductor;
a flexible continuous, intermediate polymer layer enclosing the inner conductor;
an outer conductor helically wrapped around the intermediate layer with a predetermined number of turns per unit length;
a conductive polymer layer having a desired low resistivity and which extends around the outer conductor and in electrical contact therewith and covering regions between successive turns of the outer conductor;
wherein the conductive polymer layer and the number of turns per unit length of the outer conductor are selected to inhibit the radiation of electromagnetic and electrostatic fields from the heater cable, with the number of turns per unit length of the outer conductor being sufficiently high and the resistivity of the conductive polymer being sufficiently low to limit the ESR field to a level of less than about three volts and the EMR field to generally less than about a fraction of a milligauss; and
an insulative jacket enclosing the conductors and conductive polymer layer.

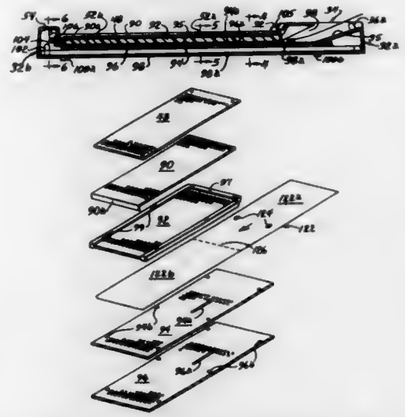
5,206,486

DATA RECORDER AND STYLUS THEREFOR

Richard J. Stephens, Escondido, Calif., and Harry H. Boucher, Dallas, Tex., assignors to Election Data Corporation, St. Charles, Ill.

Continuation of Ser. No. 387,519, Jul. 28, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 678,896
Int. Cl.[5] G07C *13/00*
U.S. Cl. 235—51 **18 Claims**

1. Apparatus for recording data on a data card by removing portions of said data card with a stylus, said apparatus comprising:
a unitary housing having an open upper portion and first and second end portions, said housing including:
positioning means integral with said housing for receiving at least one page containing information relevant to the recording of data on the data card;
data card receiving means integral with said housing and disposed adjacent to the first end thereof and including an elongated, linear slot for receiving the data card inserted in said housing in a sliding manner, wherein said slot is precisely dimensioned so as to prevent insertion of more than one data card in said housing;
a plurality of generally flat, fixed templates arranged in a stacked array in said housing below and in alignment with the open upper portion thereof, wherein each of said templates includes a plurality of spaced apertures and wherein the apertures of adjacent templates are in common alignment; and



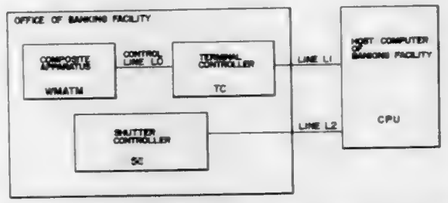
a movable template disposed in said stacked array of fixed templates and having a plurality of spaced apertures, wherein said movable template is adapted for engagement by the data card inserted in said housing and is linearly displaced thereby so that the apertures of said movable template are aligned with the apertures of said fixed templates permitting the stylus to be inserted in said aligned apertures and through a designated portion of the data card in alignment with said apertures.

5,206,487

METHOD OF OPERATING OFFICES OF FINANCIAL INSTITUTES

Shozo Susuki, Yokohama; Masanori Kinoshita, Kawasaki, and Shigeru Uchino, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi System Engineering, Ltd., both of Tokyo, Japan

Filed May 7, 1990, Ser. No. 519,472
Claims priority, application Japan, May 16, 1989, 1-120394
Int. Cl.[5] G06F *15/30*
U.S. Cl. 235—379 **1 Claim**



1. An apparatus for use at a transaction location, said transaction location including a teller side area and a customer side area, said apparatus comprising:
a window machine for use by a teller,

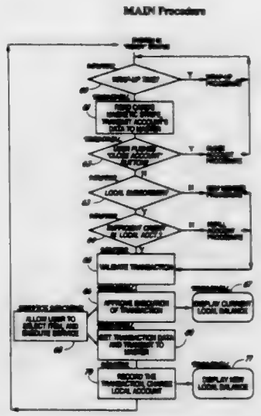
an automatic cash handling machine for use by customers,
a movable shutter located between the window machine and the automatic cash handling machine, and
interlock control means for only activating said window machine as said movable shutter is raised and until said movable shutter is lowered to remove a separation between the teller side area and the customer side area and only controlling said automatic cash handling machine as said movable shutter is lowered and until said movable shutter is raised to provide the separation between the teller side area and the customer side area.

5,206,488

CREDIT CARD SYSTEM INCLUDING A CENTRAL UNIT AND A PLURALITY OF LOCAL UNITS FOR CONDUCTING LOW-COST TRANSACTIONS

Mordechai Teicher, 9 Gordon St., Kfar Saba 44260, Israel, assignor to Mordechai Teicher, Kfar Saba, Israel

Filed Jun. 7, 1989, Ser. No. 362,785
Int. Cl.[5] G06F *7/08*
U.S. Cl. 235—380 **19 Claims**



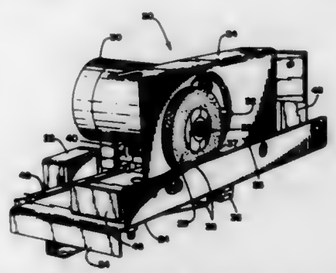
1. A credit card system for a plurality of subscribers each having a subscriber account and a credit card identifying the subscriber's account, comprising:
a central unit and a plurality of local units communicating with said central unit;
said central unit including a central storage device for each subscriber's account for storing amounts to be charged to the respective subscriber's accounts;
each of said local units including:
a plurality of local storage devices assignable to said subscriber's accounts;
at least one card reader for receiving a subscriber's card when inserted therein to order a transaction involving the sale of a product or service, and for identifying the subscriber's account;
an Open-Account means enabling a subscriber of the central unit, upon inserting the subscriber's card into the card reader of the local unit, to open a local account in the respective local unit, to be assigned a local storage device, and to transfer and store a predetermined amount from the subscriber's account at the central storage device to the subscriber's local storage device;
validating means for comparing the cost of the ordered transaction with the amount stored in the subscriber's local storage device, and for validating the transaction if said cost does not exceed said stored amount by a specified permitted sum; and
means effective upon validating the transaction for subtracting the cost thereof from the amount stored in the subscriber's local storage device.

5,206,489

MAGNETIC ENCODING DEVICE FOR CARDS

Dennis J. Warwick, Richfield, Minn., assignor to Datacard Corporation, Minneapolis, Minn.

Continuation of Ser. No. 312,738, Feb. 17, 1989, abandoned. This application Aug. 13, 1992, Ser. No. 929,465
Int. Cl.[5] G06K *7/08*
U.S. Cl. 235—449 **16 Claims**



1. An encoding and reading apparatus for encoding and reading information on a magnetic stripe of a card, comprising:
supporting framework defining a card transport path;
card retaining and positioning means located along one side of the card transport path for providing even pressure along an edge of the card for aligning the card as the card is transported past the card retaining and positioning means, wherein the card retaining and positioning means comprises first and second resilient rail members mounted on the framework, each member having a rail portion extending parallel to the card transport path;
card driving means rotatably contacting a face of the card at a single point along the card transport path for advancing the card into and out of the apparatus and having an opposing idler roller contacting an opposite face of a card; and
encoding means proximate the card driving means comprising an encoder and encoding head in communication with an idler roller, the idler roller engaging the surface of the card, providing for encoding by position.

5,206,490

BAR CODE PRINTING

Robert M. Petigrew, Foxton; Alan J. Harry, Royston; Paul R. Nailor, London, all of United Kingdom; Fred Adelmann, Eberbach am Neckar, Fed. Rep. of Germany; Peter Franzen, Hirschhorn am Neckar, Fed. Rep. of Germany; Juergen Schoon, Eberbach am Neckar, Fed. Rep. of Germany, and Vincent Geake, Cambridge, United Kingdom, assignors to Esselte Meto International Produktions GmbH, Neckar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 392,432, Aug. 11, 1989, abandoned. This application Jan. 28, 1991, Ser. No. 646,885
Claims priority, application United Kingdom, Aug. 12, 1988, 8819172
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—462 **22 Claims**

1. A method of applying a bar code to a product, including the steps of measuring a mean albedo of a packaging material associated with the product, selecting a first ink from a set of inks having different albedos and imprinting bar code indicia with said first selected ink on said packaging material so that

the ink used to produce the bar code is such that indicia constituting the bar code can be discriminated from the packaging

5,206,492

BAR CODE SYMBOL SCANNER WITH REDUCED

wheel has a trapezoidal cross-sectional configuration, having a larger dimension at its lower circumference than at its upper,

(e) means for accurately positioning said movable slide member in said predetermined position.

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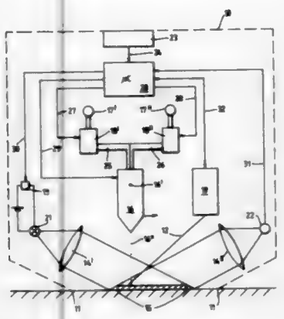
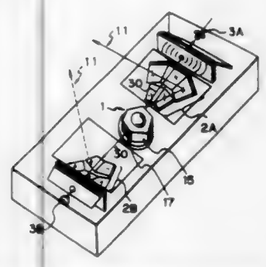
the ink used to produce the bar code is such that indicia constituting the bar code can be discriminated from the packaging



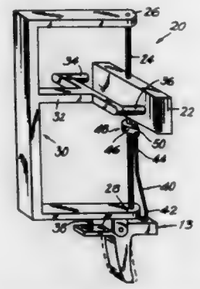
material regardless of the albedo of the packaging material onto which the bar code is printed.

5,206,491
PLURAL BEAM, PLURAL WINDOW MULTI-DIRECTION BAR CODE READING DEVICE
Hiroaki Katoh, Sagamihara, and Toshimasa Miyazaki, Yamato, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 28, 1991, Ser. No. 662,118
Claims priority, application Japan, Mar. 2, 1990, 2-051992; Mar. 8, 1990, 2-056952
Int. Cl.[5] G06K *7/10;* **H01J** *3/16;* **G02B** *26/10*
U.S. Cl. 235—467 **8 Claims**



1. A multi-directional bar code reading device for reading a bar code on an object that is to be read by projecting scanning beams from many directions, comprising:
a beam scanning unit;
at least two windows;
a plurality of mirrors positioned adjacent each of said at least two windows; and
a plurality of beam sources positioned to emit beams toward said beam scanning unit,
said beam scanning unit being irradiated with beams generated from said plurality of beam sources and producing scanning beams which are reflected by said plurality of mirrors through said at least two windows to project a scan pattern, including a plurality of intersecting scan lines, through each of said at least two windows onto different portions of an object to be read.

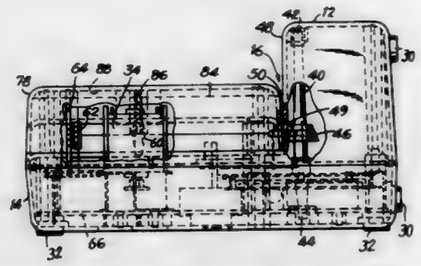
5,206,492
BAR CODE SYMBOL SCANNER WITH REDUCED POWER USAGE TO EFFECT READING
Howard M. Shepard, Great River; Boris Metlitsky, Stony Brook, and Mark Krichever, Hauppauge, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Division of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110.
This application Aug. 5, 1991, Ser. No. 740,244
Int. Cl.[5] G06K *7/01, 7/10*
U.S. Cl. 235—472 **33 Claims**



1. In a scanner for reading indicia having parts of different light reflectivity by directing light along a transmission path toward the indicia, and by collecting reflected light returning along a return path from the indicia, an arrangement for scanning the indicia, comprising:
(a) a movable component mounted in at least one of said paths for guiding the light therein;
(b) biasing means for exerting a biasing force to the component to constantly bias the component to a rest position; and
(c) read-start means for moving the component away from the rest position against the biasing force to a launch position, and concomitantly storing energy in the biasing means, said read-start means including means for abruptly releasing the stored energy after the component is in the launch position to enable the biasing means to move the component back and forth and guide the light in said at lest one path over swing distances of progressively smaller amplitude until the component returns to, and halts in, the rest position, at least one of the swing distances extending over all parts of the indicia to read the same during the back-and-forth movement of the movable component.

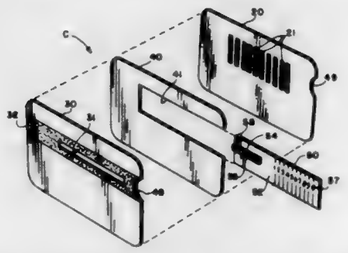
5,206,493
DOCUMENT READER
Robert L. Anderson, Jr., Tigard, Oreg., and James R. Goecks, Camas, Wash., assignors to Soricon Corporation, Boulder, Colo.
Filed Oct. 2, 1989, Ser. No. 415,622
Int. Cl.[5] G06K *13/00*
U.S. Cl. 235—475 **2 Claims**

1. A document reader for reading a document, comprising a document transport station and a read station, said read station positioned to read said document as it is driven along a predetermined direction, by said transport station, thereacross along a linear path, said transport station including drive means, said drive means including means to compensate for any nonlinearity in said document position by rotation of said document during transport prior to said reading of said document, said drive means comprises a drive wheel positioned to engage said document below the center line thereof and at an angle with respect to the plane of said document, said document undergoes a moment of rotation with respect to said predetermined direction so as to place said document in proper alignment with the read station for traversing said linear path, said drive wheel has a trapezoidal cross-sectional configuration, having a larger dimension at its lower circumference than at its upper,



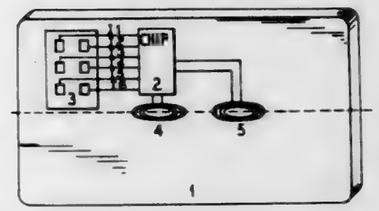
its lower circumference projecting further into the object plane than said upper circumference.

5,206,494
IDENTIFICATION CARD
Romain Metzger, 15559 Brookridge Blvd., Brooksville, Fla. 34613
Filed Dec. 9, 1991, Ser. No. 803,506
Int. Cl.[5] G06K *19/00*
U.S. Cl. 235—487 **14 Claims**



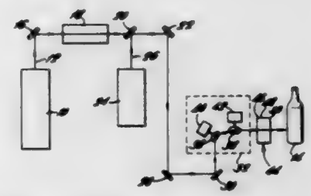
1. An identification card having a primary code portion, located on a non-movable member of the card, and a secondary code portion, located on a movable member of the card, which card requires action by a card holder to make said code portions function in combination with each other in order to identify the owner of the card, comprising:
(a) a non-movable base member including:
(i) a pair of thin, flat, generally rectangular, first and second outer layers;
(ii) a thin, flat, generally U-shaped inner layer secured between said outer layers and having an elongated first opening therein that forms between said outer layers a groove extending to one end thereof for receiving a movable slide member;
(b) said first outer layer having an elongated second opening therein located intermediate opposite ends thereof, aligned with portions of said first opening, and having on an outer first surface thereof, adjacent said second opening, a primary portion of a magnetic identification code;
(c) a movable slide member positioned within said groove for slidable movement between said outer layers;
(d) said movable slide member having on one side thereof a raised portion with a second surface co-planer with said first surface and having thereon a secondary portion of a magnetic identification code which, when said second surface is placed in a predetermined position relative to said first surface, will enable said secondary code portion, in combination with said primary code portion, to identify the owner of the card;
(e) means for accurately positioning said movable slide member in said predetermined position.

5,206,495
CHIP CARD
H. D. Kreft, Dusseldorf, Fed. Rep. of Germany, assignor to Angewandte Digital Elektronik GmbH, Fed. Rep. of Germany
Filed Oct. 19, 1990, Ser. No. 599,864
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935364
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 **10 Claims**



1. A chip card comprising:
a contact field including contacts for bidirectional transmission of signals;
coils for electromagnetic induction bidirectional transmission of signals;
a semiconductor device; and
a switching element device coupled to said contacts, said coils, and said semiconductor device operative to effect selective data transmission between said contacts or said coils and said semiconductor device.

5,206,496
SUB-SURFACE MARKING
Robert M. Clement; Neville R. Ledger, both of Swansea, and Robert P. Sussman, Cardiff, all of Wales, assignors to United Distillers, PLC, England
Filed Aug. 15, 1991, Ser. No. 745,170
Claims priority, application United Kingdom, Aug. 15, 1990, 9017939; Sep. 12, 1990, 9019929; Nov. 27, 1990, 9025790
Int. Cl.[5] G06K *7/10*
U.S. Cl. 250—271 **25 Claims**



1. A method of forming a sub-surface mark within a body, at least a portion of said body being of a material to be marked, said method comprising the steps of:
(a) directing at said portion a high energy density beam to which the material is transparent; and
(b) focusing the beam at a location in the material, within said portion, and spaced from the surfaces of said portion so as to cause localised ionisation of the material at said location and the creation at said location of a mark in the form of an area of increased opacity to electromagnetic radiation, substantially without any detectable change at said surfaces or at the surfaces of said body.

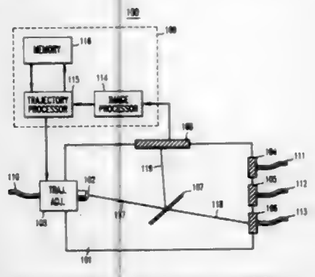
5,206,497
FREE-SPACE OPTICAL SWITCHING APPARATUS

said focus detecting zone deviates from an optical axis of said taking lens, and,

5,206,500
PULSED-LASER DETECTION WITH PULSE

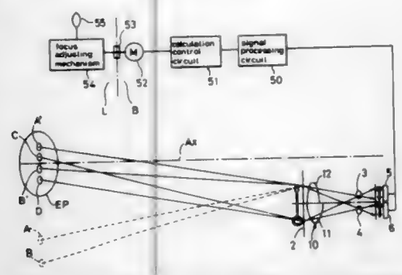
5,206,501
IMAGE-READING DEVICE HAVING A

5,206,497
FREE-SPACE OPTICAL SWITCHING APPARATUS
Byung H. Lee, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 6, 1992, Ser. No. 863,660
Int. Cl.[5] G01J 1/20; G02B 27/00, 6/00
U.S. Cl. 250—201.1 21 Claims



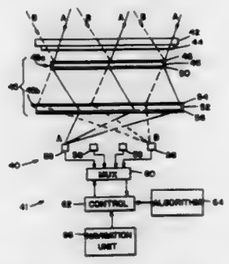
1. An optical switching apparatus comprising:
means responsive to a control signal for controllably launching a collimated laser beam along a selectable trajectory into a free-space optical path;
means for obtaining first and second component beams from said launched collimated laser beam, each of said component beams having a trajectory directly related to said trajectory of said launched collimated laser beam;
a plurality of optical receptors for collecting said first component beam from said free-space optical path; and
control means responsive to a trajectory of said second component beam for generating said control signal, wherein said control signal is applied to means for controllably launching said collimated laser beam so as to direct said first component beam onto a selected one of said plurality of optical receptors.

5,206,498
FOCUS DETECTING APPARATUS HAVING VARIABLE POWER CONDENSER LENS
Takayuki Sensui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1992, Ser. No. 893,045
Claims priority, application Japan, Jun. 7, 1991, 3-233677
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.8 11 Claims



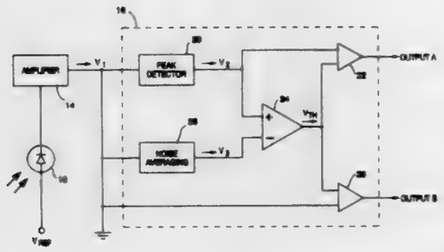
1. A focus detecting apparatus in which a pair of bundles of rays, transmitted through different portions of an exit pupil of a taking lens, are transmitted through a common focus detecting zone on a predetermined focal plane of said taking lens and are then converged onto corresponding line sensors through a condenser lens and separator lenses to reform separate images of an image formed on said predetermined focal plane of said taking lens, wherein
said focus detecting zone deviates from an optical axis of said taking lens, and,
said condenser lens has an asymmetrical power distribution with respect to an optical axis of said exit pupil of said taking lens.

5,206,499
STRAPDOWN STELLAR SENSOR AND HOLOGRAPHIC MULTIPLE FIELD OF VIEW TELESCOPE THEREFOR
Murty V. Mantravadi, Carson; Susan M. Raffensperger, Long Beach; Phillip Simpson, Rancho Palos Verdes; Douglas R. Jungwirth, Reseda, and Seymour Levine, Topanga, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.
Continuation-in-part of Ser. No. 688,190, Apr. 19, 1991, abandoned, which is a division of Ser. No. 369,790, Jun. 22, 1989, Pat. No. 5,012,081. This application Dec. 20, 1991, Ser. No. 811,566
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—203.6 21 Claims



1. A multiple field of view optical telescope, comprising:
a primary holographic optical element (HOE) having a first surface for receiving a plurality (N) of ray bundles representing a plurality (N) of wavefronts and a second surface for outputting the plurality of ray bundles to a plurality (N) of focal points, the primary HOE having a first aberration characteristic for wavelengths within a band of wavelengths;
a plurality (N) of secondary HOEs individual ones of which have a concave reflecting surface of radius (r) for directing an incident ray bundle received from said primary HOE so as to form a final real image at an associated one of (N) focal points, each of said concave reflecting surfaces being disposed along an axis that runs from said second surface of said primary HOE and that passes through an associated one of said N focal points, each of said plurality of secondary HOEs having a second aberration characteristic for wavelengths within the band of wavelengths that is opposite that of the first aberration characteristic for substantially cancelling an effect of the first aberration characteristic upon the associated one of the final real images; and
a plurality (N) of achromatic lens elements individual ones of which are disposed in proximity to one of said (N) focal points for imaging the primary HOE upon an associated one of the secondary HOEs such that all rays diverging from a single point on the second surface of the primary HOE are brought to a single point on the surface of the secondary HOE.

5,206,500
PULSED-LASER DETECTION WITH PULSE STRETCHER AND NOISE AVERAGING
Lawrence G. Decker, Loveland, Ohio; Janet R. Poston, Alexandria, Ky., and Edward F. Hume, Cincinnati, Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio
Filed May 28, 1992, Ser. No. 890,555
Int. Cl.[5] H01T 40/14
U.S. Cl. 250—214 R 6 Claims

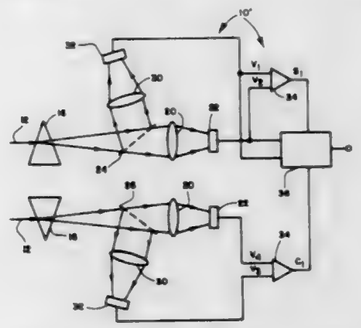


1. In a laser detection system of the type having a photodetector and a decision network, wherein the photodetector receives an optical signal and converts it to an electrical signal and the decision network receives the electrical signal and evaluates it to determine whether it represents a valid laser signal, said decision network comprising:
pulse stretching means for receiving the electrical signal and converting it into a first signal having an increased pulse width relative to the received electrical signal;
noise averaging means for receiving the electrical signal and converting it into a second signal corresponding to an average noise component of the received electrical signal;
envelope generating means for generating a threshold reference signal which is a linear function of the difference in magnitude between the first signal and the second signal;
first comparator means for receiving the first signal and the threshold reference signal and for comparing the magnitude of the first signal to the magnitude of the threshold reference signal, wherein the first comparator means generates a first logic output which is true when the magnitude of the first signal is greater than the magnitude of the threshold reference signal;
second comparator means for receiving the electrical signal and the threshold reference signal and for comparing the magnitude of the electrical signal to the magnitude of the threshold reference signal, said second comparator means having a characteristic response time, wherein the second comparator means generates a second logic output which is true when the magnitude of the electrical signal is greater than the magnitude of the threshold reference signal and the pulse width of the electrical signal as a function of time is greater than the response time of the second comparator;
logic means responsive to the first logic output and to the second logic output for generating a first alert signal when the first logic output is true and the second logic output is false; and
first indicator means responsive to the logic means for indicating the alert signal.

5,206,501
IMAGE-READING DEVICE HAVING A PHOTOELECTRIC TRANSDUCER
Jun Sakakibara; Hajime Nakamura; Junichi Koseki, and Katsuya Nagamochi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 25, 1992, Ser. No. 857,187
Claims priority, application Japan, Aug. 30, 1991, 3-220740
Int. Cl.[5] H01J 40/14
U.S. Cl. 250—208.1 19 Claims

1. An image-reading device comprising:
illumination means for applying light to an object to be illuminated including an original placed on an original table;
output means for outputting electric signals in accordance with the light reflected from the original which said illumination means applies the light to;
reference signal generating means for generating a first reference signal, a second reference signal at a level higher than that of the first reference signal, or a third reference signal at a level higher than that of the first reference signal and lower than that of said second reference signal, in accordance with the level of the electric signal outputed by said output means;
memory means for storing the first, second, and third reference signals generated by said reference signal generating means; and
processing means for performing shading correction on the signal outputed by said output means, by using the first, second and third reference signals stored in said memory means.

5,206,502
LASER RADIATION DETECTION SYSTEM
Keith L. Gardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 21, 1976, Ser. No. 735,471
Int. Cl.[5] G01J 3/50, 3/36
U.S. Cl. 250—226 8 Claims



1. A laser radiation detection system for detecting monochromatic radiation with respect to a white noise background comprising:
a least one channel including:

dispersing means for spectrally receiving and dispersing incoming light incident thereon;
placed at four corners of a tetrahedronal three-dimensional confinement zone for generating generally opposing laser

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ION PROCESSING: CONTROL AND ANALYSIS
Nicholas J. Kirchner, 250 Del Medio Ave., No. 201, Mountain

said selected ones of the ions from the trapping region, wherein the combined signal comprises a trapping voltage signal and a filtered noise signal; and

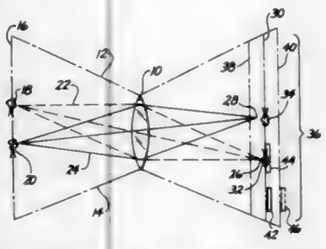
dispersing means for spectrally receiving and dispersing incoming light incident thereon;
the output beam from said dispersing means defining an optical path;
filtering means positioned in said optical path adjacent the output of said dispersing means for spatially filtering the output of said dispersing means;
said filter operating to produce optical outputs consisting of reflected radiation and transmitted radiation when radiation impinges thereon;
the transmissivity and reflectivity of said filter means varying across the face of said filter means with respect to d where d is the distance across the face of said filter;
detector means in the path of said reflected and transmitted radiation;
each said detector means outputting signals therefrom; and
differencing means operatively receiving the outputs of each said detector means and providing an output indicative of reception of monochromatic radiation in the system.

5,206,503

X-Y TRANSLATIONAL IMAGING DEVICE WITH HOUSING SUPPORTING MEANS FOR A CAMERA BODY INCLUDING IMAGE SENSING MEANS

Laurence C. Toops, Newbury Park, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Aug. 7, 1991, Ser. No. 741,385
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—234 **15 Claims**



1. A camera having an angularly adjustable field of view while maintaining a lens and outer support housing stationary comprising:
a lens mounted to said housing and having an axis and a focal length such that parallel light rays from object space entering said lens are focused on a plane in image space;
the rays from separated objects in object space defining angularly separate bundles so that spaced objects in the object space become angularly spaced bundles and spaced images in image space;
a camera body including image sensor means; and
means carried on said housing for supporting said camera body and sensor means in image space and for moving said camera body and sensor in X-Y translational movement about image space so that said translation movement of the sensor camera body are alone causes the sensor to shift its angular field of view in object space.

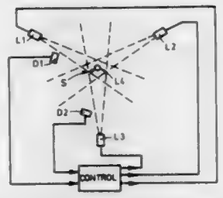
5,206,504

SAMPLE POSITIONING IN MICROGRAVITY

Govind Sridharan, Bangalore, India, assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 1, 1991, Ser. No. 786,612
Int. Cl.[5] H05H *3/04*
U.S. Cl. 250—251 **19 Claims**

1. A system for positioning samples in a low gravity environment, comprising: four lasers providing pulsed laser beams placed at four corners of a tetrahedronal three-dimensional confinement zone for generating generally opposing laser beams for providing generally opposing repulsion forces upon a sample located within said confinement zone;
a detector means for detecting the location of said sample within said confinement zone; and



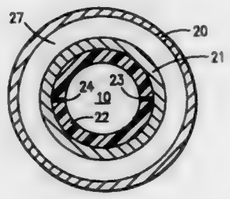
a feedback means for controlling and altering one or more of the intensity, duration or pulse cycle rate of the laser beams in response to detected sample movements for controlling said sample movements, said laser beams creating a confinement zone defined to include a region where the laser beams overlap and to include a region along each respective laser beam between a source of the respective laser beam and the region of beam overlap.

5,206,505

APPARATUS AND METHOD FOR RETRIEVING AND EVALUATING A SLIM HOLE DRILLED CORE SAMPLE OF A SUBSURFACE FORMATION

Eve S. Sprunt, Farmers Branch, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 23, 1992, Ser. No. 824,928
Int. Cl.[5] G01V *5/12*
U.S. Cl. 250—255 **13 Claims**



1. Apparatus for obtaining and evaluating a core sample from a subsurface formation below the bottom of a wellbore at a well site, comprising
a) a coring tool for positioning at the bottom of a wellbore through a subsurface formation,
b) a coring bit at the lower end of said coring tool for drawing a core sample of the subsurface formation at the bottom of the wellbore into said coring tool,
c) a coring barrel positioned along said coring tool above said coring bit,
d) a hollow cylindrical split member within said coring barrel into which said core sample is drawn during subsurface coring, said member being split into two halves in an axial direction and comprised of a material effectively transparent to nuclear radiation, and
e) means for raising said split member containing said core sample upward within said coring tool to the surface of the earth, and
f) means for measuring a nuclear radiation characteristic of said core sample through the effectively nuclear radiation transparent material of said split member at the well site.

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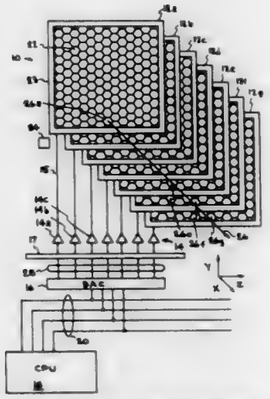
ION PROCESSING: CONTROL AND ANALYSIS

Nicholas J. Kirchner, 250 Del Medio Ave., No. 201, Mountain View, Calif. 94040

Filed Feb. 12, 1991, Ser. No. 654,374
Int. Cl.[5] B01D *59/44*; H01J *49/40*
U.S. Cl. 250—281 **36 Claims**



1. Charged particle processor apparatus for manipulating charged particles that have an energy and a mass, the apparatus comprising:
an electrode array (**10**), said electrode array including a of transversely extending, substantially planar electrode sheets (**12**), each of said electrode sheets having at least one perforation therein;
a plurality of spacer means (**24**), each of said electrode sheets being separated from adjacent electrode sheets by said spacer means, said electrode sheets being aligned relative to one another such that respective perforations of each of said electrode sheets align to form at least one charged particle channel (**26**);
a vacuum enclosure (**17**) enclosing said plurality of electrode sheets;
a plurality of electric potential drivers (**14**), each of said drivers being coupled to a respective electrode sheet;
digital-to-analog converter means (**16**) coupled to said plurality of drivers;
a data bus (**20**), said data bus being coupled to said digital-to-analog converter means; and
a computer (**18**) coupled to said digital-to-analog converter means through said data bus, whereby data from said computer is converted by said digital-to-analog converter means to analog data and causes at least one of said drivers to apply an electric potential to at least one of said electrode sheets.

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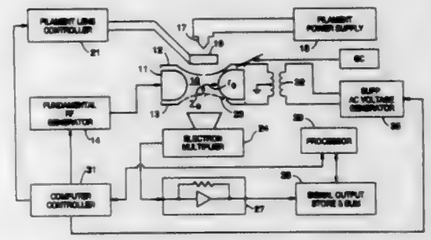
MASS SPECTROMETRY METHOD USING FILTERED NOISE SIGNAL

Paul E. Kelley, San Jose, Calif., assignor to Teledyne MEC, Mountain View, Calif.

Continuation-in-part of Ser. No. 753,325, Aug. 30, 1991, which is a continuation-in-part of Ser. No. 662,191, Feb. 28, 1991. This application Dec. 18, 1991, Ser. No. 809,767
Int. Cl.[5] H01J *49/42*
U.S. Cl. 250—282 **40 Claims**

1. A mass spectrometry method, including the steps of:
(a) introducing ions in a trapping region defined by a set of electrodes, while applying a combined signal to at least a subset of the electrodes thereby establishing a combined field capable of trapping one or more selected ones of the ions in the trapping region, and ejecting ions other than said selected ones of the ions from the trapping region, wherein the combined signal comprises a trapping voltage signal and a filtered noise signal; and



(b) after step (a), changing one or more parameters of the combined signal to sequentially excite the selected ones of the ions for detection.

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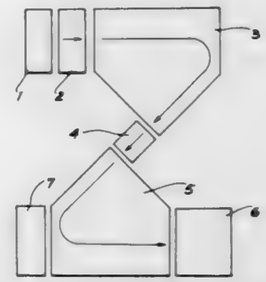
TANDEM MASS SPECTROMETRY SYSTEMS BASED ON TIME-OF-FLIGHT ANALYZER

David S. Alderdice; Peter J. Derrick, and Daniel J. Jardine, all of Kensington, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Oct. 18, 1991, Ser. No. 776,789
Claims priority, application Australia, Oct. 18, 1990, PK2854
Int. Cl.[5] H01J *49/26*
U.S. Cl. 250—287 **16 Claims**



1. A tandem mass spectrometry system, capable of obtaining tandem mass spectra for each parent ion without separation of parent ions of differing mass from each other, comprising an ion source, a particle detector, two separated time-of-flight devices between the source and the detector, a control ion-excitation device between the time-of-flight devices, and means measuring a time-of-flight for particles reaching the detector, all of which lie on a common ion path, and wherein ion optics maintain ion flight from the source within the ion path and a computer control system controls the excitation device and the optics such that the parent ion of differing mass need not be separated from one another in order to obtain tandem mass spectra for each parent ion.

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UNIVERSAL COLLISIONAL ACTIVATION ION TRAP MASS SPECTROMETRY

Scott A. McLuckey; Douglas E. Goeringer, and Gary L. Glish, all of Oak Ridge, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Dec. 11, 1991, Ser. No. 805,442
Int. Cl.[5] B01D *59/44*; H01J *49/00*
U.S. Cl. 250—292 **18 Claims**

1. A universal collisional activation ion trap comprising an

ion trapping means having connected thereto a noise signal generator for effecting universal collisional activation of ions

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CALIBRATORS FOR INFRARED-TYPE GAS ANALYZERS

tor and at least one collimator to obtain a SPECT image in a head portion of the living body, comprising:

periods have elapsed after the termination of said dwell period; and

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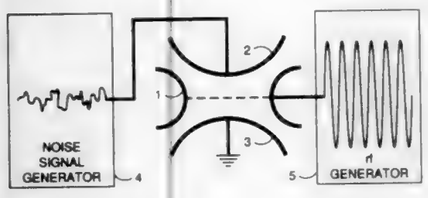
ion trapping means having connected thereto a noise signal generator for effecting universal collisional activation of ions trapped within said ion trapping means, said ion trapping



means containing a bath gas for serving as a collision partner for collisional activation and for providing a a mechanism for power dissipation.

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SPECTROSCOPIC ANALYSIS PROCESS FOR PLASTIC MIXTURES

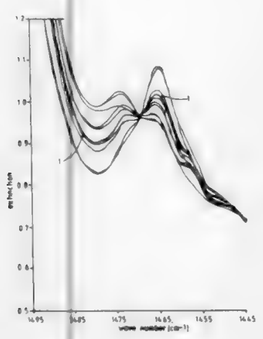
Udo Wolf; Hans Dohmen, both of Krefeld, and Jürgen Diefendahl, Neukirchen-Vluyn, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1991, Ser. No. 788,645

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1990, 4036201

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—339 **4 Claims**



1. A method for the analysis of an anisotropic plastic foil or film specimen in a rotatable sample holder by determination of infrared transmission spectra in a Fourier transform spectrometer wherein the method comprises

a) obtaining a plurality of distinct spectra while the specimen is rotated at an angular velocity so that the period of rotation is greater than the time required to obtain a single transmission spectrum and

b) calculating the percentage contents of individual constituents in the specimen by averaging the data in the plurality of spectra.

5,206,511

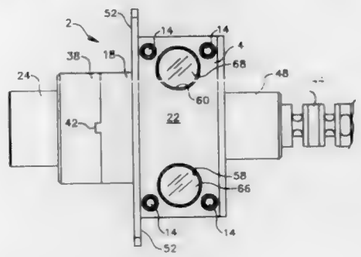
CALIBRATORS FOR INFRARED-TYPE GAS ANALYZERS

Jerry R. Apperson, Seattle; Paul K. Graham, Renton; Leslie E. Mace, Mercer Island; James T. Russell, Bellevue; Lawrence L. Labuda, Issaquah, and Walter A. Cooke, Monroe, all of Wash., assignors to Cascadia Technology Corporation, Redmond, Wash.

Filed Oct. 18, 1990, Ser. No. 600,413

Int. Cl.[5] G01N *21/61*

U.S. Cl. 250—343 **23 Claims**



1. The combination of:

a transducer having: (a) a source for generating a beam of infrared radiation and propagating the beam along an optical path through a gas sample, and (b) a detector spaced along the optical path, from said source, for generating a signal which is indicative of the attenuation of the beam by a designated gas in said sample and, consequentially, of the concentration of the designated gas;

memory means for storing a predetermined concentration factor for said transducer, the concentration factor being indicative of the magnitude of the signal generated by the detector for a known concentration of the designated gas;

calibration means for calculating calibration values for said transducer from: (a) the concentration factor, and (b) a zero signal generated by the detector when the designated gas is absent; and

concentration calculation means for subsequently calculating the concentration of the designated gas in the sample from: (a) the calibration values, and (b) the magnitude of the signal generated by the detector as the beam of infrared radiation traverses the sample.

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SINGLE PHOTON EMISSION CT APPARATUS

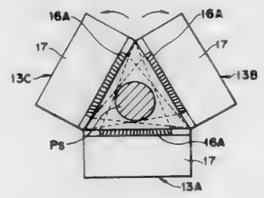
Hirofumi Iwao, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1991, Ser. No. 723,295

Claims priority, application Japan, Jun. 29, 1990, 2-173076

Int. Cl.[5] G01T *1/164*

U.S. Cl. 250—363.05 **18 Claims**



1. A single photon emission CT apparatus in which a detection operation is performed from outside of a living body by a detecting portion constituted by at least one scintillation detector and at least one collimator to obtain a SPECT image in a head portion of the living body, comprising:

a gantry;

a rotatable ring arranged on said gantry so as to rotate said rotatable ring with the gantry and having a patient insertion hole formed in a central portion thereof;

three detecting portion pairs arranged around the hole in said rotatable ring, each of said detecting portion pairs being constituted by a scintillation detector and a collimator, and each having a detection surface thereof;

moving mechanisms comprising means for rotating at least two of said three detecting portion pairs so as to form a triangle with the detection surfaces of said scintillation detectors; and

a bed unit having a slide top plate for transferring a patient to be examined to a position near said detecting portion pairs.

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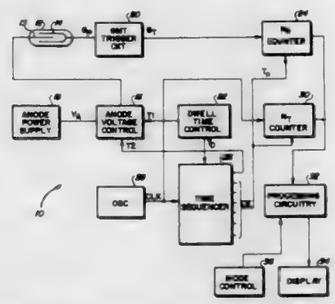
EXTENDED RANGE GEIGER COUNTING APPARATUS AND METHOD UTILIZING A SINGLE GEIGER-MUELLER TUBE

Kenneth H. Valentine, Del Mar, and John M. Wettroth, San Diego, both of Calif., assignors to Science Applications International Corporation, San Diego, Calif.

Filed Jul. 13, 1990, Ser. No. 553,208

Int. Cl.[5] G01T *1/18*

U.S. Cl. 250—374 **27 Claims**



6. A method of operating radiation measurement apparatus having a single Geiger-Mueller tube (GMT) comprising:

(a) establishing specified initial conditions of said GMT, whereby said GMT is enabled to detect a charged particle, including establishing a first prescribed anode voltage for said GMT, said first prescribed anode voltage being less than an operating voltage of said GMT, and establishing a second prescribed anode voltage after a dwell time period subsequent to detecting a charged particle by said GMT, said second anode voltage being at least equal to said operating voltage;

(b) generating detection and elapsed time data indicative of the detection of a charged particle by said GMT and the time interval between enabling said GMT and the detection of the charged particle by said GMT, comprising:

detecting the charged particle entering said GMT,

triggering the beginning of said dwell time period upon the detection of the charged particle by said GMT, and generating a prescribed clock signal having a period;

(c) discarding a first portion of the detection and elapsed time data, said first portion of data including at least that portion of the data during which the initial conditions associated with said GMT are uncertain, including

not counting the number of periods of the prescribed clock signal during said dwell time period, and

not counting the number of periods of the prescribed clock signal until a prescribed number of the clock periods have elapsed after the termination of said dwell period; and

(d) processing a second portion of said detection and elapsed time data to determine the radiation dosage rate to which said GMT has been exposed, said second portion of data not including said first portion of data; and

(e) repeating steps (a) through (d) for each charged particle detected by said GMT.

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LUMINESCENT STORAGE SCREEN HAVING A STIMULABLE PHOSPHOR

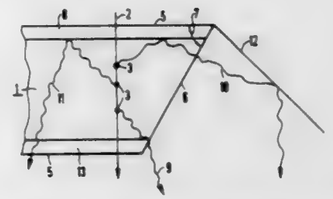
Gerhard Brandner, Zirndorf, and Peter Hoebel, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 5, 1992, Ser. No. 831,501

Claims priority, application European Pat. Off., Feb. 13, 1991, 91102025

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—484.1 **8 Claims**



1. In a system for storing and reading-out x-ray images having a luminescent storage screen containing a stimulable phosphor in which an x-ray image is latently stored, said stimulable phosphor emitting radiation at a second wavelength when excited by radiation of a first wavelength, the improvement comprising said luminescent storage screen having end faces, said stimulation radiation entering said luminescent storage screen through one of said end faces, and lateral faces joining said end faces, with the entirety of said lateral faces being disposed at an angle relative to said one of said end faces which is less than 90°, said end faces being transparent to said radiation of said second wavelength for permitting said radiation of said second wavelength to exit said luminescent storage screen.

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DEEP ULTRAVIOLET PHOTOLITHOGRAPHY AND MICROFABRICATION

David J. Elliott, 147 Rice Rd., Wayland, Mass. 01778, and Wolfgang Mueller-Herget, 144-07 29th Ave., Flushing, N.Y. 11354

Filed Aug. 29, 1991, Ser. No. 752,092

Int. Cl.[5] B23K *26/00*; **H01L** *21/268*

U.S. Cl. 250—492.2 **22 Claims**

1. A high resolution, deep UV beam delivery system for exposing a surface, directly or through a mask, for the purpose of photolithography surface cleaning, microstructuring, pattern microimaging, surface modification or the like, said delivery system including

a deep UV radiation source for generating a beam of deep ultraviolet radiation along a first path;

variable attenuator apparatus disposed in said first path for adjustment of the deep UV beam energy in said first path;

an optical system in said first path for homogenizing and shaping the deep UV beam energy in said first path; said homogenizing and shaping optical system including two orthogonally disposed cylindrical lenses and a conical surface lens,

a second radiation source for generating visible wavelength

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ballast control signal for controlling operation of the ballast means;

tion of said detection means in preparation for the receipt of a new sample is determined; and

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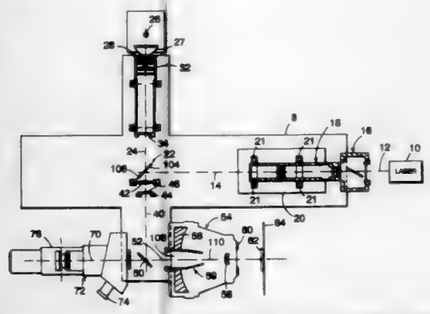
a second radiation source for generating visible wavelength radiation along a second beam path,
merging structure for merging radiation energy in said first path and radiation energy in said second path for passage along a common third path;
reticle structure in said third path;



beam splitter structure in said third path for directing radiation energy in said third optical path along a fourth optical path angularly offset from said third path; and
large area mirror structure having a numerical aperture greater than 0.3 disposed in said fourth optical path for directing radiation energy in said fourth optical path on the surface of a substrate to be processed that is disposed in said fourth path.

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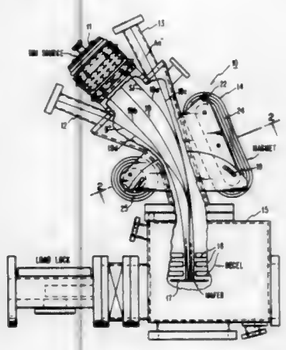
LOW ENERGY, STEERED ION BEAM DEPOSITION SYSTEM HAVING HIGH CURRENT AT LOW PRESSURE

John H. Keller, Poughkeepsie, and Dennis K. Coultas, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1991, Ser. No. 692,589
Int. Cl.[5] H01J *27/18*
U.S. Cl. 250—492.2 **40 Claims**



1. An ion beam deposition apparatus for producing low temperature epitaxial growth of a semiconductor material including at least a first ion source, said ion source providing a particular pattern, said ion beam deposition apparatus including
a magnet means having means for mass-analyzing an ion beam from at least said first ion source including means for focussing said particular pattern in at least one plane into a pattern of high aspect ratio at a focal or crossover point located prior to a target.

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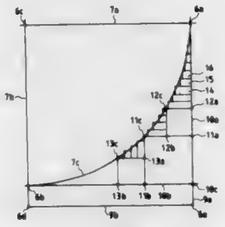
ELECTRON BEAM LITHOGRAPHIC METHOD

Yukinobu Shibata, Juou; Ikuo Takada, Hitachi; Akira Hirakawa, Katsuta, and Tadao Konishi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Instrument Engineering Co., Ltd., Katsuta, both of Japan

Filed Nov. 27, 1991, Ser. No. 798,905
Claims priority, application Japan, Nov. 30, 1990, 2-329181
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 **6 Claims**



1. An electron beam lithographic method in which a sample is irradiated with an electron beam and is lithographed by deflecting and turning on/off the electron beam, comprising the steps of:
obtaining an extreme point of a curve of a lithographic pattern;
dividing a lithographic area adjacent the curve into a first region completely surrounded by straight lines parallel to an x-axis and a y-axis of said lithographic pattern, the extreme point being on at least one of the straight lines, and second regions not including said first region.

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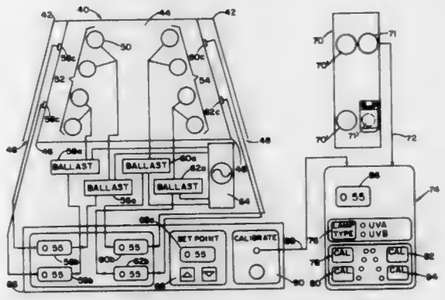
ACCELERATED WEATHERING APPARATUS

Gregory R. Fedor, Bay Village, and Douglas M. Grossman, Fairview Park, both of Ohio, assignors to Q-Panel Company, Cleveland, Ohio

Filed Dec. 2, 1991, Ser. No. 801,715
Int. Cl.[5] G01N *17/00*
U.S. Cl. 250—504 R **21 Claims**



1. An accelerated weathering apparatus comprising:
a test chamber;
a specimen supporting means for supporting specimens in the test chamber;
a light source located within the test chamber for producing light in the test chamber;
a power source for powering the light source;
a ballast means connected to the light source, for controlling the amount of power the light source receives from the power source;
a controller, connected to the ballast means, to produce a ballast control signal for controlling operation of the ballast means;
a set-point means connected to the controller for generating and sending a set-point signal to the controller, the set-point signal determining an initial set-point value of the ballast control signal;
a light source detector means inserted into the specimen supporting means for detecting irradiance existing in the test chamber, and for generating an irradiance signal repreasentative of the detected irradiance;
an irradiance signal input means, for inputting the irradiance signal to the controller, the controller using the irradiance signal to adjust the ballast control signal, to maintain the selected set-point value;
a reference detector means designed to detect the irradiance in the test chamber and to produce a reference irradiance signal representative of the detected irradiance;
a reference irradiance signal transmitting means for transmitting the signal to the reference detector means;
a calibration meter arranged for receiving the reference irradiance signal and for producing a calibration signal; and,
a calibration signal input means for inputting the calibration signal directly to the controller.

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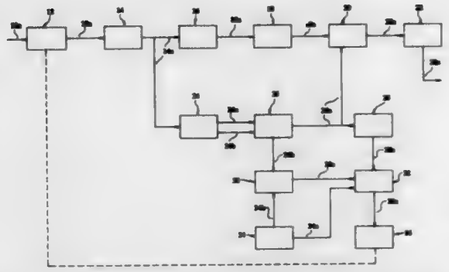
CONSTITUENT CONCENTRATION INDICATOR WITH A DIFFERENTIATOR MEANS AND A SIGNAL CONDITIONING MEANS

David Kirk, Calgary, Canada, assignor to Galvanic Analytical Systems Ltd., Alberta, Canada

Filed Mar. 9, 1992, Ser. No. 848,668
Int. Cl.[5] G01N *21/00*
U.S. Cl. 250—565 **22 Claims**



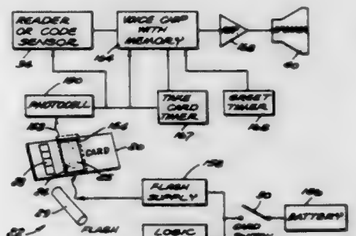
1. An instrument for the detection and measurement of a constituent concentration in liquid, solid and gaseous samples comprising:
detection means for detecting the presense of a particular constituent in a sample and providing an electrical output signal indicative of the constituent concentration wherein said electrical output signal has a linear component;
filtering means wherein undesirable attributes of said electrical output signal are blocked;
differentiator means wherein said linear component of said electrical output signal is differentiated and the differentiated signal is indicative of the average magnitude of increase in concentration of said constituent in said sample and hence the absolute concentration of said constituent in said sample;
signal conditioning means wherein said differentiated signal is manipulated in preparation for further use and the manipulated signal is proportional to said differentiated signal;
timing control means wherein the timing of the re-initialization of said detection means in preparation for the receipt of a new sample is determined; and
display means for providing visual reporting of said manipulated signal.

5,206,520

IMAGING CARD DEVICE HAVING AN OPTICAL VALIDATION SENSOR

Andrew S. Filo, Cupertino, Calif., assignor to Simon Marketing, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 598,266, Oct. 16, 1990, Pat. No. 5,151,595. This application Jun. 23, 1992, Ser. No. 902,746
Int. Cl.[5] G06K *7/10*; G01V *9/04*
U.S. Cl. 250—568 **11 Claims**



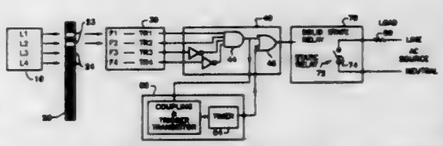
1. An imaging card device, comprising:
a receiving means for receiving a card having at least one symbol and at least one area having binary zones representative of said symbol, said binary zones being selectively filled with infrared radiating ink;
a strobe light source disposed proximate said receiving means, said strobe light source being adapted to shine visible light onto said card and expose said prize;
a code sensor coupled to said receiving means, said code sensor being adapted to read said binary zones to detect the presence and absence of ink and indicate said symbol; and
an optical validation sensor disposed proximate said symbol, said optical validation sensor adapted to detect the density of light passing through said card and activate said code sensor only upon detecting density of light over a predetermined threshold.

5,206,521

ENERGY SAVING OPTOELECTRONIC CODE READING ACCESS DEVICE

Gregorio Ruiz, Tlalnepantla, and Juan Santarriaga, Atizapan de Zaragoza, both of Mexico, assignors to Novedades Electronicas Internacionales s.a. de C.V., Mexico City, Mexico

Filed Apr. 5, 1991, Ser. No. 681,909
Int. Cl.[5] G06K *7/10*
U.S. Cl. 250—569 **22 Claims**



1. An energy saving, optoelectronic system for energizing and deenergizing electrical loads, comprising:
(a) a light transmissiofl source emitting a continuous light signal;
(b) a photoelectric receiving circuit placed to a receive a continuous light signal from said light transmission source,

and to transmit a first output signal or a second output

5,206,523

MICROPOROUS CRYSTALLINE SILICON OF

portion that is adjacent to the emitter region and is not overlain by the emitter region, the further portion to be referred to as

ends of said π-conjugated macromolecular material to make their respective ohmic-contacts therewith; and

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and to transmit a first output signal or a second output signal in response to the particular light signal received from said light transmission source;

(c) photoelectric switching card removably insertable between said light transmission source and said receiving circuit, such that when said switching card is not inserted, said receiving circuit receives an unabbreviated light signal from said light transmission source and transmits a first output signal, and when said switching card is inserted, said receiving circuit receives a predetermined, unique, abbreviated light signal from said light source and transmits a second output signal;

(d) a gating circuit coupled to receive output signals from said receiving circuit such that said gating circuit transmits an open circuit signal in response to a first output signal and transmits a close circuit signal in response to a second output signal, the gating circuit comprising NOT gates arranged such that the receiving circuit will transmit the second output signal upon receiving the predetermined light signal; and

(e) a power switch coupled to said gating circuit such that said power switch is open in response to an open circuit signal from said gating circuit and said power switch is closed in response to a close circuit signal from said gating circuit.

5,206,522

DEVICE FOR DETECTING AIR IN FLUID CONDUCTING TUBING

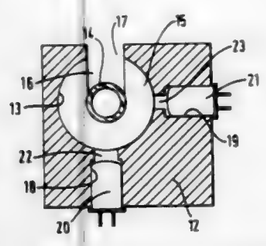
Hal C. Danby, Sudbury, and Alan Brundle, Halstead, both of United Kingdom, assignors to Danby Medical Limited, Earls Colne, United Kingdom

Filed Oct. 15, 1991, Ser. No. 775,449

Claims priority, application United Kingdom, Oct. 17, 1990, 9022479

Int. Cl.[5] **G01N** *15/06*

U.S. Cl. 250—574 **25 Claims**



1. A device for detecting the presence of air in translucent or transparent tubing, comprising:

a body having a tubing accommodating passage providing accommodation for said tubing;

a light energy transmitter for light transmitting light energy towards said tubing;

a light energy receiver for receiving light energy transmitted by said transmitter and modified by changes in the constituency of fluid passing through said tubing; and

an optical spacer having a circular cross-section and occupying space between said light energy transmitter and said tubing and said tubing and said light energy receiver in said tubing accommodating passage,

wherein said light energy transmifter and said light energy receiver are located in passages extending through said body and opening into said tubing accommodating passage.

5,206,523

MICROPOROUS CRYSTALLINE SILICON OF INCREASED BAND-GAP FOR SEMICONDUCTOR APPLICATIONS

Ulrich M. Goesele, 3008 Eubanks Rd., Durham, N.C. 27707, and Volker E. Lehmann, Geyerspergerstr. 53, D-8 Munich 21, Fed. Rep. of Germany

Filed Aug. 29, 1991, Ser. No. 751,800

Int. Cl.[5] **H01L** *27/14*

U.S. Cl. 257—16 **6 Claims**

1. Microporous crystalline silicon for use in active semiconductor applications, wherein said microporous crystalline silicon is produced on a surface of normal semiconducting non-degenerated p-type crystalline silicon, said microporous crystalline silicon consisting essentially of an interconnected bulk-like quantum wire structure, said bulk-like quantum wire having a side length, and said interconnected bulk-like quantum wire structure having an increased band-gap being produced through a process of chemical attack, said chemical attack being carried out on a non-degenerated p-type silicon substrate, said non-degenerated p-type silicon substrate having a resistivity between 0.1 and 30,000 ohm-centimeters and said chemical attack being carried out under an anodic bias such that said chemical attack is limited by charge supply from the semiconducting non-degenerated p-type crystalline silicon, wherein said chemical attack becomes self-limiting as said attack proceeds due to an increase in the band-gap of said interconnected bulk-like quantum wire structure which occurs as said side length decreases to less than 100 Angstroms wherein said chemical attack which is carried out under an anodic bias is carried out in an electrolyte that contains a concentration of hydrofluoric acid wherein said anodic bias is produced by an applied current density whose numerical value, when measured in milliamperes per square centimeter is such that this current density is less than three times the numerical value of said concentration of hydrofluoric acid present in said electrolyte when said concentration is measured in weight percent.

5,206,524

HETEROSTRUCTURE BIPOLAR TRANSISTOR

Young-Kai Chen, Berkeley Heights; Anthony F. J. Levi, Summit, both of N.J.; Richard N. Nottenburg, New York, N.Y., and Morton Panish, Springfield, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 511,872, Apr. 19, 1990, abandoned, which is a continuation of Ser. No. 250,790, Sep. 28, 1988, abandoned. This application Jun. 20, 1991, Ser. No. 721,913

Int. Cl.[5] **H01L** *29/72*

U.S. Cl. 257—29 **8 Claims**

1. A heterostructure bipolar transistor comprising a collector region, a base region, and an emitter region, and further comprising means for making electrical contact with the emitter, base, and collector regions, respectively; the transistor being of the type wherein, under normal emitter/base forward bias conditions, hot electrons are injected into the base region from the emitter region; associated with the transistor being structural features including a width W of the emitter region, a base region thickness, a base region dopant concentration, and a base region surface that comprises, in addition to a portion that is overlain by the emitter region (this portion to be referred to as the "intrinsic" base region surface), a further

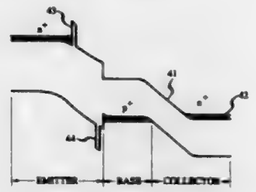
portion that is adjacent to the emitter region and is not overlain by the emitter region, the further portion to be referred to as the "extrinsic" base region surface; wherein

a) the emitter and collector regions comprise n-type III-V semiconductor material and the base region comprises p-type III-V semiconductor material;

b) the width W is at most 1 μm, the base region thickness is less than 100 nm, and at least a portion of the base region has a dopant concentration of at least $2\times10^{19}/cm^3$;

characterized in that

c) the emitter region comprises at least a first and a second semiconductor material, associated with each of the first



and second materials being a valence band edge and a conduction band edge, the second material having a bandgap that is wider than the bandgap of the first material, with the offset between the first and second material valence band edge being greater than half the difference between said bandgaps, a layer of the second material being epitaxial with the first material and being situated relatively close to the emitter region/base region interface and being substantially undoped, with the second material layer thickness selected to substantially prevent tunneling of holes from the base region into the emitter under normal emitter/base forward bias conditions.

5,206,525

ELECTRIC ELEMENT CAPABLE OF CONTROLLING THE ELECTRIC CONDUCTIVITY OF π-CONJUGATED MACROMOLECULAR MATERIALS

Hiromichi Yamamoto; Hideo Kumehara, both of Kawasaki, and Takashi Nishibe, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

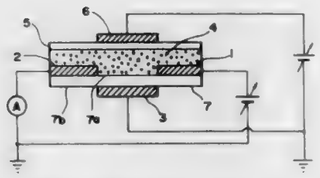
PCT No. PCT/JP90/01728, § 371 Date Aug. 20, 1991, § 102(e) Date Aug. 20, 1991, PCT Pub. No. WO91/10264, PCT Pub. Date Jul. 11, 1991

PCT Filed Aug. 27, 1990, Ser. No. 743,324

Claims priority, application Japan, Dec. 27, 1989, 1-336417; Dec. 27, 1989, 1-336418

Int. Cl.[5] **H01L** *29/28*

U.S. Cl. 257—40 **10 Claims**



1. An electric element which comprises:

a π-conjugated macromolecular material which is liable to increase its conductivity when it is put in an excited state by polarization of a dielectric substance;

a ferroelectric material disposed so close to said π-conjugated macromolecular material that excitation of said π-conjugated macromolecular material occurs in response to polarization of said ferroelectric material;

a pair of input and output electrodes disposed at the opposite ends of said π-conjugated macromolecular material to make their respective ohmic-contacts therewith; and

a pair of control electrodes disposed so as to sandwich said π-conjugated macromolecular material in the direction perpendicular to the direction in which said input and output electrodes are laid, the conductivity of said electric element between input and output electrodes varying corresponding to the voltage of the electric field when an electric field is applied between said control electrodes.

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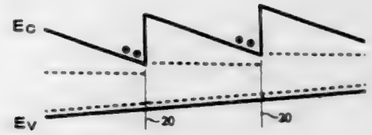
STAIRCASE BANDGAP PHOTODETECTOR USING RECOMBINATION

Chua-Ting Liu, Piscataway, and Sergey Luryi, Bridgewater, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1991, Ser. No. 699,057

Int. Cl.[5] **H01L** *31/0304*

U.S. Cl. 257—185 **10 Claims**



1. An article comprising

a) a semiconductor body having a major surface and comprising a doped region whose chemical composition varies periodically as a function of distance from the surface, the region to be referred to as the "superlattice region", the superlattice region having a minimum bandgap energy Δ and a minority carrier lifetime τ_e at the region of minimum bandgap energy, the compositional variation in the superlattice region being such that the region lacks reflection symmetry in the direction normal to the surface; and

b) means for making electrical contact with the body such that a voltage across the superlattice region can be provided to responsive means;

CHARACTERIZED IN THAT

c) the minority carrier lifetime τ_e is less than 10^{-9} second, and furthermore is selected such that a constant flux of electromagnetic signal radiation of frequency $\nu>\Delta/h$ impinging on the body can result in a substantially constant voltage across the superlattice region, said voltage being substantially proportional to the radiation flux for relatively small values of the flux, and saturating at a value V_{max} that is at least N times 0.01 volt for relatively large values of the flux, where N, the number of superlattice periods, is an integer greater than or equal to 1, and where h is Planck's constant.

5,206,527

FIELD EFFECT TRANSISTOR

Nobuhiro Kuwata, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Nov. 7, 1991, Ser. No. 788,149

Claims priority, application Japan, Nov. 9, 1990, 2-305747; Jan. 9, 1991, 3-000976

Int. Cl.[5] **H01L** *29/80, 29/161*

U.S. Cl. 257—191 **14 Claims**

1. A field effect transistor comprising:

a channel layer made of GaInAs and having a planar doped layer formed by impurity doping in a thin plane;

a cap layer and a buffer layer formed of GaInAs so as to sandwich and contact said channel layer therebetween, said cap layer and said buffer layer having an In concentration lower than a minimum In concentration of said channel layer;

a first semiconductor layer underlying said buffer layer and

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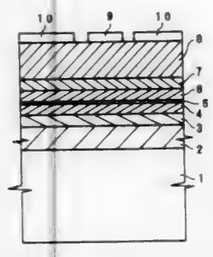
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

a plurality of trapezoidal shaped transfer electrodes arrayed in juxtaposition along the direction of electrical charge transfer on the insulating film for controlling charge trans-

tive layer on a substrate, said diffusion region being located in the surface of the substrate remote from the polysilicon gate, said buried contact comprising:

a first semiconductor layer underlying said buffer layer and having an In concentration lower than a minimum In concentration of said buffer layer; and



a second semiconductor layer formed on said cap layer and having an In concentration lower than a minimum In concentration of said cap layer.

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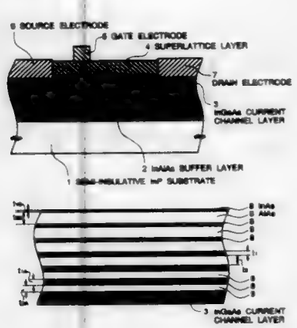
COMPOUND SEMICONDUCTOR FIELD EFFECT TRANSISTOR HAVING A GATE INSULATOR FORMED OF INSULATIVE SUPERLATTICE LAYER

Yasunobu Nashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 2, 1991, Ser. No. 801,796
Claims priority, application Japan, Nov. 30, 1990, 2-340918
Int. Cl.[5] H01L *29/267, 29/780*
U.S. Cl. 257—192 **15 Claims**



1. A field effect transistor comprising an InGaAs current channel layer, a source electrode and a drain electrode formed on said current channel layer separately from each other and in ohmic contact with said current channel layer, an insulator layer formed above and in contact with said current channel layer between said source electrode and said drain electrode, and a gate electrode formed above and in contact with said insulator layer, said insulator layer being composed of a superlattice layer formed of alternately stacked undoped InAs thin films and undoped AlAs thin films, a ratio t_1/t_2 of the thickness t_1 of each one InAs thin film and the thickness t_2 of one AlAs thin film adjacent to said each one InAs thin film being gradually reduced toward an upper surface of said superlattice layer.

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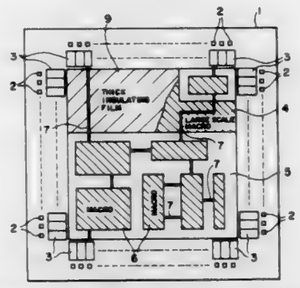
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hirotoshi Mine, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 584,621, Sep. 19, 1990, abandoned. This application Apr. 28, 1992, Ser. No. 877,251
Claims priority, application Japan, Sep. 25, 1989, 1-248532
Int. Cl.[5] H01L *27/02, 23/48*
U.S. Cl. 257—202 **6 Claims**



1. A semiconductor integrated circuit wherein a plurality of macros are formed on a master chip in which a plurality of basic cells are regularly arranged, each of said macros being a functional block registered in a library, said integrated circuits having at least one interlayer insulating film, an insulating film substantially thicker than said interlayer insulating film selectively formed on a specific macro, a power line formed on the thick insulating film and extending across the specific macro, said power line being connected to said specific macro through a contact hole formed in said thick insulating film, and signal lines interconnecting the macros other than said specific macro, said signal lines extending across said thick insulating film disposed on said specific macro.

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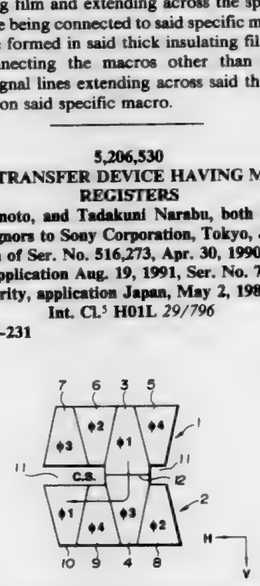
CHARGE TRANSFER DEVICE HAVING MULTIPLE REGISTERS

Seiichi Kawamoto, and Tadakuni Narabu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 516,273, Apr. 30, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 749,616
Claims priority, application Japan, May 2, 1989, 1-113448
Int. Cl.[5] H01L *29/796*
U.S. Cl. 257—231 **4 Claims**



1. A charge transfer device for transferring signal charges comprising

a semiconductor substrate,

a plurality of registers formed on the semiconductor substrate for transferring electrical charges along one or more given directions, the registers being electrically isolated from and parallel to each other, each of the registers including

a channel layer formed on the semiconductor substrate,

an insulating film formed on the channel layer, and

a plurality of trapezoidal shaped transfer electrodes arrayed in juxtaposition along the direction of electrical charge transfer on the insulating film for controlling charge transfer in each of the registers and supplied with respective different control signals, a certain one of the transfer electrodes of one of the registers having the wider of its two parallel sides contiguous to the wider of the two parallel sides of a transfer electrode of an adjacent one of the registers, so that a junction region exists at the point of contiguity, to effect charge transfer across the registers, wherein

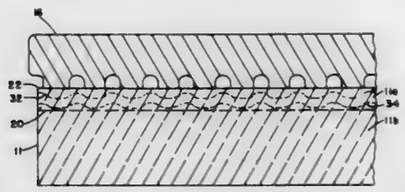
during charge transfer across the adjacent registers, the transfer electrodes arrayed contiguous to each other between the adjacent registers are controlled by externally applied driving signals so that the channel potential of the charge receiving side region thereof becomes greater than the channel potential of the charge forwarding side region thereof.

5,206,531

SEMICONDUCTOR DEVICE HAVING A CONTROL GATE WITH REDUCED SEMICONDUCTOR CONTACT

Niru V. Dandekar, Nashua, N.H., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 495,877, Mar. 19, 1990, abandoned. This application Mar. 19, 1991, Ser. No. 672,197
Int. Cl.[5] H01L *29/812*
U.S. Cl. 257—270 **5 Claims**



1. In a semiconductor device of the type having a doped semiconductor region coupled to source and drain electrodes with a surface extending therebetween and a control gate located adjacent to and extending across the doped region along the surface thereof for forming a nonconducting depletion region across the doped region for controlling current flow therethrough between the source and drain electrodes, wherein the improvement comprises:

the doped region having an approximately known density of doping ions which density increases to a maximum and then decreases to a minimum in accordance with increasing distance from the surface of the doped region; and

the control gate having a multiplicity of regularly spaced contact elements contacting the doped semiconductor region along the surface thereof, wherein an unbiased depletion region is formed in the doped semiconductor region at the contact elements, which unbiased depletion region extends only to the maximum density of doping ions.

5,206,532

BURIED CONTACT BETWEEN POLYSILICON GATE AND DIFFUSION AREA

Martin C. Roberts, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 592,121, Oct. 3, 1990, Pat. No. 5,064,776. This application Aug. 22, 1991, Ser. No. 748,796
Int. Cl.[5] H01L *29/04, 27/02*
U.S. Cl. 257—382 **12 Claims**

1. A buried contact between a polysilicon gate and a diffusion region of a first conductivity type, said polysilicon gate having both a bottom surface and a plurality of vertical sides above the bottom surface and being disposed on a first insulative layer on a substrate, said diffusion region being located in the surface of the substrate remote from the polysilicon gate, said buried contact comprising:

(a) a polysilicon interconnect structure, having both a bottom surface and a plurality of vertical sides above the bottom surface, disposed both above the first insulative layer on the substrate and against at least one of said plurality of vertical sides of the gate and contacting both the surface of the substrate and the first insulative layer, said polysilicon interconnect structure contacting the surface of the substrate to define thereat a surface current pathway interface located at the surface of said substrate remote and separated from the diffusion region;

(b) a migration region of the first conductivity type disposed

in the surface of the substrate below and in contact with all of said surface current pathway interface, said migration region extending laterally from said surface current pathway interface away from the gate to contact the diffusion region; and

(c) a second insulative layer disposed against at least one of said plurality of sides of said polysilicon interconnect structure remote from the gate, said second insulative layer contacting the surface of the substrate adjacent said surface current pathway interface to define thereat an insulator contact surface, said insulator contact surface including at least a portion of the boundary between said diffusion region and said migration region;

wherein said surface current pathway interface and said insulator contact surface are substantially coplanar.

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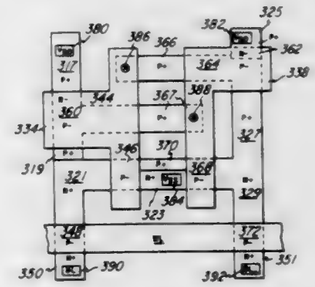
TRANSISTOR DEVICE WITH RESISTIVE COUPLING

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 24, 1991, Ser. No. 719,430
Int. Cl.[5] H01L *27/01, 27/02, 29/78*
U.S. Cl. 257—393 **16 Claims**



1. A static memory cell comprising:

a first PMOS transistor including a source, a channel, a drain, and a lightly doped drain;

a first NMOS transistor including a source, a channel, and a drain;

a first gate insulatively overlying said channel and said

lightly doped drain region of said first PMOS transistor and said channel of said first NMOS transistor;

of said groove, and said two impurity density profiles are substantially identical to one another.

ting windmill structure to be taken from a horizontal to vertical position utilizing the attached winch structure;

control system can send electronic signals recognizable by a water pump circuitry to either activate or deactivate the

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lightly doped drain region of said first PMOS transistor and said channel of said first NMOS transistor;
a second PMOS transistor including a source, a channel, a drain, and a lightly doped drain;
a second NMOS transistor including a source, a channel, and a drain;
a second gate insulatively overlying said channel and said lightly doped drain region of said second PMOS transistor and said channel of said second NMOS transistor;
a first gated resistor coupled between said drain of said first PMOS transistor and said second gate, wherein said first gated resistor comprises said drain of said first PMOS transistor, said lightly doped drain of said first PMOS transistor, and a heavily p-type doped region which is coupled to said second gate; and
a second gated resistor coupled between said drain of said second PMOS transistor and said first gate.

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PHOTOCELL

Siegfried Birkle, Hoechstadt A/Aisch; Johann Kammermaier, Unterhaching, and Gerhard Rittmayer, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Aug. 20, 1991, Ser. No. 747,695

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1990, 4026315

Int. Cl.[5] **H01L** *27/14, 31/00*

U.S. Cl. 257—464 **12 Claims**

1. In a photocell based on gallium arsenide or indium phosphide, having a layer of p-doped gallium arsenide (GaAs) or indium phosphide (InP), the improvement comprising a layer of amorphous, hydrogenated carbon (a-C:H) having a thickness of $\leqq 0.1$ μm and a specific electrical resistance of $\geqq 10^6$ Ω.cm disposed on the p-doped layer.

5,206,535

SEMICONDUCTOR DEVICE STRUCTURE

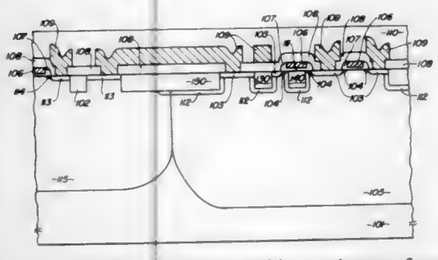
Isamu Namose, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 327,234, Mar. 22, 1989, Pat. No. 4,923,821. This application May 1, 1990, Ser. No. 517,580

Claims priority, application Japan, Mar. 24, 1988, 63-70221; Mar. 24, 1988, 63-70222; Nov. 18, 1988, 63-291520

Int. Cl.[5] **H01L** *29/06*

U.S. Cl. 257—519 **13 Claims**



1. A semiconductor device comprising a substrate of semiconductor material, said substrate having a surface, at least one groove extending into said substrate from said surface, and an active region adjacent at least one said groove and having a semiconductor circuit element constituted by an MOS transistor; an isolator at least partially filling said groove to form an element isolating region; and an impurity material imbedded in said substrate at said active region and below at least a part of said groove which is adjacent said active region; wherein said impurity material has an impurity density profile in said active region, starting from said surface, and an impurity density profile below said part of said groove, starting from the bottom of said groove, and said two impurity density profiles are substantially identical to one another.

5,206,536

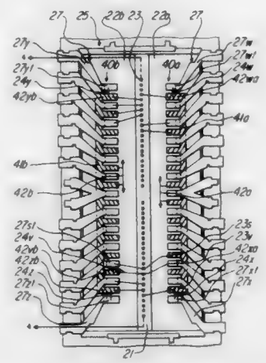
COMB INSERT FOR SEMICONDUCTOR PACKAGED DEVICES

Thiam B. Lim, Singapore, Singapore, assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Jan. 23, 1991, Ser. No. 644,805

Int. Cl.[5] **H01L** *23/48*

U.S. Cl. 257—668 **15 Claims**



1. A conductive comb for a semiconductor packaged device, comprising:
a base, formed out of a conductive material, residing underneath lead fingers and above an integrated circuit of the semiconductor packaged device, electrically isolated from the lead fingers, and dielectrically adhered to the integrated circuit; and
teeth extending from the base, formed out of the conductive material, residing between the lead fingers of the semiconductor packaged device, approximately coplanar with the lead fingers at least one tooth electrically connected by means to a lead finger.

5,206,537

EPCON ENERGY FIELD SYSTEM AN ENERGY PRODUCING CONGLOMERATE (EPCAN) SYSTEM USING WIND ENERGY, SOLAR PANELS, AND STEAM TURBINES

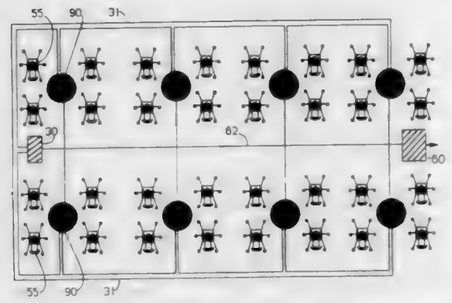
Jose L. A. Alejandro, and Serge J. Grant, both of Galveston, Tex., assignors to ECM International Inc., Tacoma, Wash.

Filed Sep. 24, 1990, Ser. No. 587,051

Int. Cl.[5] **F03D** *11/00*

U.S. Cl. 290—1 R **4 Claims**

1. An energy producing system comprising of:
at least one windmill including a support means, a winch structure, an electrical component used to convert DC current to usable AC current, a shaft rotor assembly mounted to support means, said rotor assembly including a plurality of vanes in sets of four windtraps mounted to said rotor assembly and rotatable by the impact of wind, said rotor assembly including a pulley capable of supporting a plurality of two sets of induction generators mounted on the support assembly, with the generator pulleys attached to said flywheel pulley of the rotor assembly by belts, the improvement comprising of a secondary pulley on the said rotor assembly capable of supporting a plurality of steam turbines, with the said steam turbine attached to said secondary pulley of the rotor a mounted on the support assembly and the windmill foundation, said steam turbines so attached as to be able to be removed permitting windmill structure to be taken from a horizontal to vertical position utilizing the attached winch structure;
at least one solar apparatus consisting of a plurality of exoskeletal frames having parallel spaced ribs, means defining a foundation shaft to which a plurality of frames are attached by moveable braces, means for attaching a miniature exoskeletel frame on the outermost position of said shaft on which a solar eye unit may be attached, means defining an axial opening, a foundation shaft disposed in said axial opening, means for rotatably supporting said shaft, and coupling collar within said axial opening, controlled by an on board controller connected electrically to a system controller, having capability of receiving commands to either activate or deactivate from said system controller, said on board controller supplied electricity through conduit lines leading to controller housing where resides a battery bank and inverters to support such activity, said on board controller capable of receiving readings of light intensity from solar eye for positioning plurality of said frames so as to keep surface directly perpendicular to the light rays;
at least two sets of two panels consisting of an open framework lattice having parallel spaced ribs on which is attached tubular cooper or aluminum or other heat absorbent metal arranged in an array of at least two parallel piping lines and means of attaching said piping to said frame, coupling at the end of pipe provides means for interconnect to another pipe of another panel, vertically



spaced tiers extending from base frame over the piping providing a harness support for a plurality of lenses so spaced from the piping as to focus light directly onto the piping, said harness and lenses occuring in a series of not more than ten per said pipe line, each panel piping to also have one check valve at the start of the piping from where flow commences, each of said panels has fastener means of attaching to said solar apparatus;
at least one water pump capable of pumping water at a water pressure adequate to support a single solar apparatus supplied by electrical power and activated or deactivated by circuitry controlled by a system controller, said pump connected to tubular aluminum or other usable metal which is in turn connected to the piping of the solar apparatus;
at least two tubular aluminum lines, or other usable tubular metal lines, extending from a plurality of solar apparatus frames, each having at least two said panels, to each of the steam turbines of the windmill;
a system battery bank stored at the system controller housing and means of converting DC current to usable AC current;
control system including means of measuring and analyzing wind velocity, said control system including means of measuring and analyzing light intensity, said control system including means of measuring and analyzing line load, wherein said control system can send electronic signals recognizable by a solar apparatus controller to either activate or deactivate the said solar apparatus and said control system can send electronic signals recognizable by a water pump circuitry to either activate or deactivate the said water pump.

5,206,538

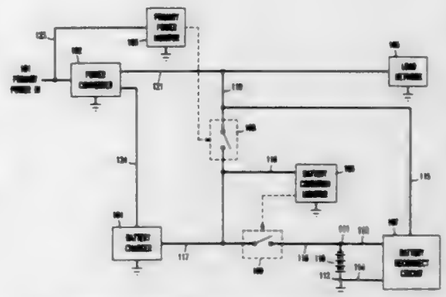
AUTOMATIC SYSTEM BATTERY RECONNECT CIRCUIT RESPONSIVE TO INSERTION OF NEW BATTERY REPLACEMENT

Conrad Orta, Denville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 3, 1991, Ser. No. 680,177

Int. Cl.[5] **H02J** *9/04*

U.S. Cl. 307—66 **8 Claims**



1. A power system for energizing a load network, comprising:
power circuitry for connecting a source of primary power to the load network;
backup circuitry including a reserve input for accepting a reserve voltage source and coupling it to the load network upon failure of the primary power source; and including disconnect circuitry for disconnecting the reserve voltage source from the load network when it becomes discharged below a threshold voltage;
circuitry for enabling connection of the reserve input to the load network in response to replacement of the reserve voltage source with a substitute reserve voltage source, and including;
a first semiconductor switch for enabling coupling of the reserve input to the load network,
a second semiconductor switch responsive to the operativeness of the primary power source for disabling the first semiconductor switch and responsive to the failure of primary power to allow a voltage of the reserve input to bias the first semiconductor switch into conduction, and timing circuitry operative for disabling the first semiconductor switch after an interval of conduction connecting the reserve input to the load network.

5,206,539

TRANSFORMER WITH CANCELLATION OF HARMONIC CURRENTS BY PHASE SHITED SECONDARY WINDINGS

John B. Kammeter, Richmond, Va., assignor to Power Distribution, Inc., Richmond, Va.

Filed Nov. 15, 1991, Ser. No. 792,893

Int. Cl.[5] **H02J** *3/01;* **H01F** *33/00*

U.S. Cl. 307—105 **25 Claims**

1. A transformer, comprising:
at least one transformer core;
a three-phase primary input winding; and
at least two three-phase wye-connected output windings, wherein said output windings are phase-shifted relative to each other to cause magnetic flux vectors generated in

said core by harmonic currents present in the output windings to add to zero for respective orders of selected

tively, upon the detection of zero current flow in the primary side of said transformer;

a first end having at least one terminal,
a second end having at least one terminal, and

first memory capacitor being charged by said sampled signals output from the first sampling gate means;

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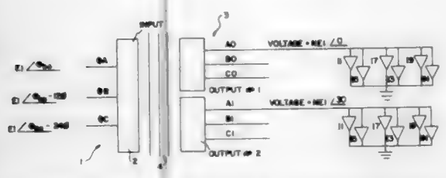
said core by harmonic currents present in the output windings to add to zero for respective orders of selected



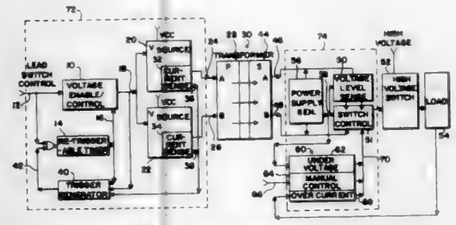
harmonic currents and thereby prevent the selected harmonic currents present in the output windings from being induced in said input windings.

5,206,540

TRANSFORMER ISOLATED DRIVE CIRCUIT

Claudio de Sa e Silva, Lynnwood, Wash.; Jeffrey D. Putsch, Milford, N.H.; Varnum S. Holland, Amherst, N.H., and Wilburn M. Miller, Wilton, N.H., assignors to Unitrode Corporation, Billerica, Mass.

Filed May 9, 1991, Ser. No. 697,895
Int. Cl.[5] H03K *5/135, 17/284;* **G05F** *1/56*
U.S. Cl. 307—127 **13 Claims**



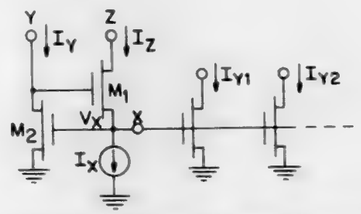
1. A transformer isolated drive circuit, for selectively energizing a load switch over a duty cycle of 0–100% in response to a load switch control signal, comprising:
retriggerable timer means, for providing at least one timed output signal having a preselected time period in response to one of at least first and second trigger signals;
voltage enable and control means, responsive to a load switch input control signal, and said at least one timed output signal, for providing at least one voltage control signal;
said load switch input control signal operative as said first trigger signal;
first and second voltage sources, responsive to said at least one voltage control signal, for providing first and second voltage signals which are of selectable voltage potentials for providing a primary voltage of selectable voltage potential and wherein different combinations of the first and second voltage signals of selectable voltage potentials provide first and second voltage signals at an alternating positive and negative voltage polarity;
a transformer having a primary side and a secondary side, said primary side including first and second inputs coupled to said first and second voltage signals, and operative for inducing a secondary voltage across first and second outputs of said secondary side, said induced secondary voltage of the same relative voltage polarity as said primary voltage on said primary side, and of a voltage potential proportional to the turns ratio of the primary to the secondary side;
said first and second voltage sources including first and second current sense means respectively, for sensing current flow in said transformer primary side, and for providing first and second zero current indicator signals respectively, upon the detection of zero current flow in the primary side of said transformer;
trigger signal generator means, responsive to said first and second zero current indicator signals, said at least one voltage control signal and said at least one timed output signal, for providing said second trigger signal; and
voltage level sense and switch control means, coupled to said first and second outputs of said transformer secondary side, and responsive to said relative voltage potential and polarity induced across said first and second transformer secondary side outputs, for enabling said load switch in response to a first sensed voltage potential and polarity, and for disabling said load switch in response to a second sensed voltage potential and polarity.

5,206,541

CURRENT-MODE BASED ANALOG CIRCUITS FOR SYNTHETIC NEURAL SYSTEMS

Kwabena A. Boahen, Pasadena, Calif.; Andreas G. Andreou, Baltimore, Md.; Philippe O. Pouliquen, Potomac, Md., and Robert E. Jenkins, Laurel, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 30, 1991, Ser. No. 693,310
Int. Cl.[5] G06G *7/12*
U.S. Cl. 307—201 **8 Claims**



1. A circuit to fan-out a control current and, simultaneously over the same physical line, to fan-in current input signals comprising:
a current-controlled current conveyor (C4) circuit comprising:
a first transistor having a node for introduction of a first current and whose gate is connected to a control current; and
a second transistor having a node for introduction of the control current and whose gate is connected to the first current;
wherein the first current is conveyed by the first transistor to a supply node and the control current determine the voltage at the node of the first transistor; and
a plurality of transistors identical to the second transistor of the C4 circuit, the plurality of transistors each having a gate connected to the node of the first transistor of the C4 circuit;
whereby the control current is mirrored in each of the plurality of transistors.

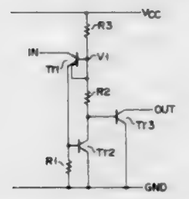
5,206,542

COMPARATOR HAVING A REDUCED NUMBER OF ELEMENTS

Satoshi Nakao, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 15, 1991, Ser. No. 700,415
Claims priority, application Japan, May 17, 1990, 2-127471
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—350 **25 Claims**

1. A comparator circuit with a hysteresis, the comparator circuit being adapted for receiving a first potential and a second potential, the comparator circuit comprising:
a first transistor of a first conductivity type, including
a first end having at least one terminal,
a second end having at least one terminal, and
a first control terminal for controlling a current flow between the first and second ends;
a second transistor of a second conductivity type, including
a first end having at least one terminal,
a second end having at least one terminal, and
a second control terminal for controlling a current flow between the first and second ends, the first end of said first transistor being coupled to the second control terminal and the first end of said second transistor being



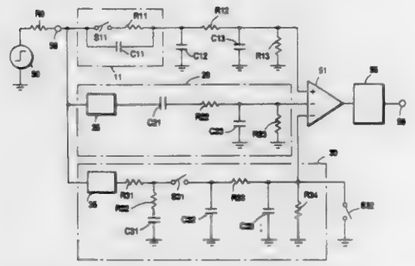
coupled to the first control terminal between said first potential and said second potential so as to provide positive feedback;
a first resistance element coupled between the second control terminal and said second potential;
a second resistance element in a positive feedback path between the first control terminal and the first end of said second transistor; and
a third transistor of the second conductivity type having a third control terminal coupled to the first end of said second transistor.

5,206,543

BROADBAND SAMPLING GATE CIRCUIT CAPABLE OF ELIMINATING WAVEFORM DISTORTIONS IN TRACK HOLD MODE

Shintaro Takita; Masahiro Ohtaka, and Kensuke Kobayashi, all of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1992, Ser. No. 899,292
Claims priority, application Japan, Jun. 21, 1991, 3-177173
Int. Cl.[5] H03K *5/151, 5/153*
U.S. Cl. 307—352 **8 Claims**



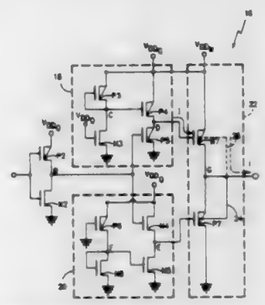
1. A broadband sampling gate circuit comprising:
an input terminal to which an input signal corresponding to a signal to be measured is supplied;
a first sampling gate means connected to the input terminal and having an output terminal from which instantaneous amplitudes of said input signal are sampled to thereby output sampled signals, and having an input/output capacitor connected between said input terminal and said output terminal;
a first memory capacitor connected between the output terminal of said first sampling gate means and ground, said first memory capacitor being charged by said sampled signals output from the first sampling gate means;
a first buffer resistor connected to the output terminal of said first sampling gate means;
a second memory capacitor charged by said sampled signals output from the first sampling gate means through said first buffer resistor;
a first reset resistor for resetting said second memory capacitor by discharging said second memory capacitor;
differential amplifier means comprising:
a first terminal to which said second memory capacitor is connected whereby signals charged into said second memory capacitor are supplied to signals input to said first terminal of the differential amplifier; and
a second terminal and a third terminal to which two signals are inputted respectively so as to obtain a difference with respect to signals input to said first terminal;
a second sampling gate means connected to the output of the differential amplifier for producing an output signal;
a second buffer resistor coupled to the input terminal; a third memory capacitor connected to the second buffer resistor and being charged by signals passing through said second buffer resistor;
first switching means coupled between the input terminal and the second buffer resistor;
a second reset resistor for resetting said third memory capacitor by discharging said third memory capacitor; and,
second switching means for applying one of said two signals appearing between terminals of said third memory capacitor to said third terminal of said differential amplifier means when said first switch means is in a disconnection state, and for grounding the terminals of said third memory capacitor when said first switch means is in a connection state.

5,206,544

CMOS OFF-CHIP DRIVER WITH REDUCED SIGNAL SWING AND REDUCED POWER SUPPLY DISTURBANCE

Chih-Liang Chen, Briarcliff; Robert H. Dennard, Peekskill, and Hussein I. Hanafi, Goldens Bridge, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1991, Ser. No. 682,753
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **18 Claims**



1. A driver circuit comprising:
a pair of complementary field effect transistors each having source, drain and gate terminals, the sources of each of said pair of transistors being connected in series at an output node, the drain of a first of said pair of transistors being connected to a first voltage potential and the drain of a second of said pair of transistors being connected to a second voltage potential which is at a lower voltage than said first voltage potential, the gates of each of said pair of transistor being coupled to an input node, a well of one of

said pair of transistors being connected to said output node;
an output terminal;
a first input bipolar transistor having a base coupled to re-

providing the output signal of the programmable state counter.

5,206,549

FREQUENCY DISCRIMINATING CIRCUIT

Tetsuya Suzuki, and Hideo Hotoda, both of Kanagawa, Japan

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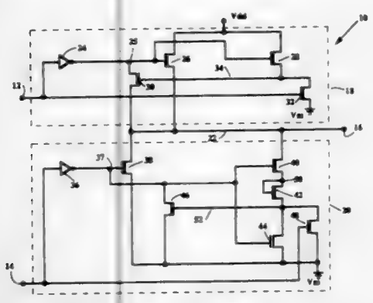
said pair of transistors being connected to said output node.

5,206,545

METHOD AND APPARATUS FOR PROVIDING OUTPUT CONTENTION RELIEF FOR DIGITAL BUFFERS

Eddy C. Huang, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 5, 1991, Ser. No. 650,512
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **20 Claims**



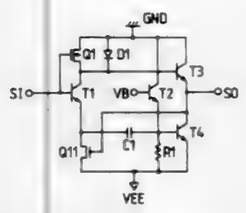
1. A digital output buffer comprising:
input means and output means;
driver means coupled between said input means and said output means, said driver means being adapted to drive an output signal voltage up to a maximum drive current level on said output means in response to an input signal on said input means; and
driver control means coupled to said output means and to said driver means, said driver control means being responsive to a voltage of said output means and operative to reduce said drive current of said driver means below said maximum drive current level when said voltage of said output means is in contention with said output signal voltage of said driver means.

5,206,546

LOGIC CIRCUIT INCLUDING VARIABLE IMPEDANCE MEANS

Mitsuo Usami, Akishima, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 669,642, Mar. 14, 1991. This application Aug. 1, 1991, Ser. No. 739,195
Claims priority, application Japan, Mar. 16, 1990, 2-66069; Aug. 18, 1990, 2-217640
Int. Cl.[5] H03K *19/01;* **F24H** *00/00*
U.S. Cl. 307—446 **32 Claims**



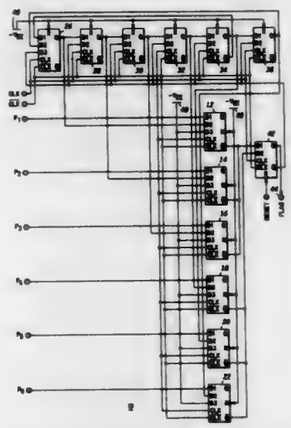
1. A logic circuit comprising:
first and second terminals for receiving first and second supply voltages, respectively;
a first input terminal for receiving an input signal;
an output terminal;
a first input bipolar transistor having a base coupled to receive the input signal, a collector and an emitter;
first variable impedance means coupled between the first terminal and the collector of the first input bipolar transistor and responsive to the input signal and for changing its impedance thereof;
second variable impedance means coupled between the emitter of the first input bipolar transistor and the second terminal and for changing its impedance thereof in response to an output signal on the output terminal;
an output bipolar transistor having a base coupled to the collector of the first input bipolar transistor and an emitter-collector path coupled between the first terminal and the output terminal; and
pull-down means coupled between the output terminal and the second terminal and responsive to an emitter signal on the emitter of the first input bipolar transistor and for pulling down a voltage on the output terminal.

5,206,547

HIGH-SPEED PROGRAMMABLE STATE COUNTER

Jonathan L. Houghten, Chandler, and Jerry E. Prioste, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1992, Ser. No. 817,213
Int. Cl.[5] H03K *23/40*
U.S. Cl. 307—465 **9 Claims**



1. A programmable state counter for generating an output signal when a predetermined count sequence matches a programmed input data pattern, comprising:
first means for generating the predetermined count sequence at a plurality of outputs;
a plurality of first flipflops each having first and second data inputs, an output and an inverted output, said first data inputs receiving the programmed input data pattern, said second data inputs being respectively coupled to said plurality of outputs of said first means, said first and second data inputs of each of said plurality of first flipflops combining as a logical exclusive-NOR operation for providing an output signal at said output of each of said plurality of first flipflops; and
a second flipflop having first and second data inputs and an output, said first data input being wired-OR'ed to said inverted outputs of a first portion of said plurality of first flipflops, said second data input being wired-OR'ed to said inverted outputs of a second portion of said plurality of first flipflops, said first and second data inputs of said second flipflop combining as a logical OR operation for

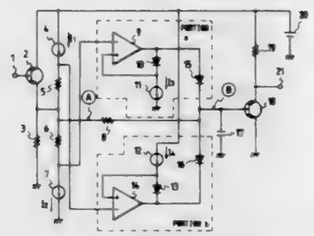
providing the output signal of the programmable state counter.

5,206,548

NOISE REDUCTION CIRCUIT

Satoshi Takahashi, Hitachi Hachimanyama Apartment 537, 1545 Yoshida-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, and Koji Kamogawa, Hitachi Jonan Heights 101, 5-3-7 Jonan, Fujisawa-shi, Kanagawa-ken, both of Japan

Filed Jun. 18, 1991, Ser. No. 716,775
Claims priority, application Japan, Jun. 18, 1990, 2-157521
Int. Cl.[5] H03B *1/00;* **H03K** *5/00*
U.S. Cl. 307—520 **12 Claims**



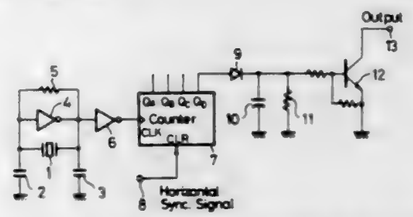
1. A noise reduction circuit comprising amplification means including first and second voltage-follower amplifier means for providing symmetrical push-pull operation on an input signal and low-pass filter means coupled to at least one of an input and output of the amplification means so that an output voltage offset of an output signal of the amplification means is suppressed, wherein the first and second voltage-follower amplifier means providing symmetrical push-pull operation includes first and second two-input voltage-controlled voltage source means, respectively, and wherein the first two-input voltage controlled source means has an output connected with an anode of a first diode, one input of the first two-input voltage-controlled voltage source means being connected with a cathode of the first diode and a first current source for supplying the first diode with a forward current, an other input of the first two-input voltage controlled voltage source means having the input signal of the amplification means supplied thereto, the second two-input voltage-controlled voltage source means having an output connected with a cathode of a second diode, one input of the second two-input voltage-controlled voltage source means being connected with an anode of the second diode and a second current source for supplying the second diode with forward current, an other input of the second two-input voltage controlled source means having the input signal of the amplification means supplied thereto, a third diode having an anode connected with the output of the first voltage-controlled voltage source means, and a fourth diode having an anode connected with the cathode of the third diode, the fourth diode having a cathode connected with the output of the second voltage-controlled voltage source means, a junction of the cathode of the third diode and the anode of the fourth diode serving as the output of the amplification mens, a first and second resistor connected in series between the other inputs of the first and second voltage-controlled voltage source means and the first and second resistors, respectively, and supplying a current flow in a direction from the first resistor to the second resistor so as to determine a noise-reduction quantity, the low-pass filter means including a capacitor connected to the junction of the cathode of the third diode and the anode of the fourth diode serving as the output and a current path connected to a junction of the first and second resistors and to the capacitor and for enabling charging and discharging of the capacitor at the time when the third and fourth diodes are in an off-state.

5,206,549

FREQUENCY DISCRIMINATING CIRCUIT

Tetsuya Suzuki, and Hideo Hatada, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1991, Ser. No. 802,409
Claims priority, application Japan, Dec. 20, 1990, 2-412516
Int. Cl.[5] H03K *9/06, 3/00*
U.S. Cl. 307—525 **4 Claims**



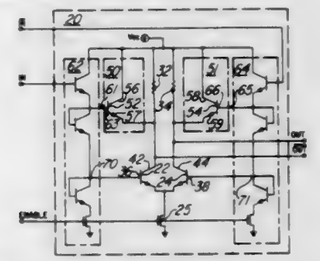
1. A frequency discriminating circuit suitable for use with a display capable of displaying a plurality of signal formats respectively employing horizontal synchronizing signals of different frequencies, the frequency discriminating circuit comprising:
an oscillator having an oscillation frequency higher than the frequencies of said horizontal synchronizing signals;
a counter for frequency-dividing the oscillation frequency of said oscillator to produce a frequency-divided signal; and
a terminal to which a selected one of said horizontal synchronizing signals is applied, in which said counter is reset by said selected horizontal synchronizing signal;
said frequency-divided signal having a frequency intermediate the frequencies of said horizontal synchronizing signals to thereby discriminate between said horizontal synchronizing signals.

5,206,550

AMPLIFIER WITH ACTIVELY CLAMPED LOAD

Aswin N. Mehta, Houston, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Jun. 20, 1991, Ser. No. 718,053
Int. Cl.[5] G01R *19/00*
U.S. Cl. 307—530 **19 Claims**



1. A differential amplifier comprising:
first and second emitter-coupled transistors;
a current source connected between the emitters of the first and second emitter-coupled transistors and a reference potential;
first and second loads are connected between the respective collector electrodes of the first and second emitter-coupled transistors and a voltage supply;
first and second clamping transistors, each has its collector-emitter path connected across a respective one of the loads; and
a clamping control circuit, responsive to an input signal, for producing and applying to base electrodes of the first and second clamping transistors variable control signals to

clamp output signal swings at various levels across the

5,206,552

SENSE AMPLIFIER FOR NON-VOLATILE

5,206,553

CLAMPING CIRCUIT

rial, such overmolding including a mechanical coupling means for a mechanism to be driven,

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clamp output signal swings at various levels across the first and second loads.

5,206,551

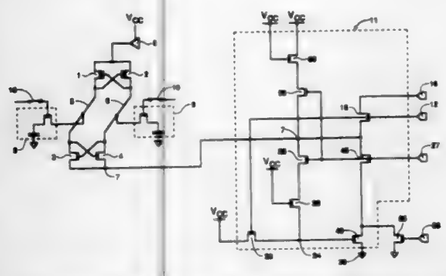
METHOD FOR PROVIDING MULTI-LEVEL POTENTIALS AT A SENSE NODE

Wen-Foo Chern, Colorado Springs, Colo., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 749,247, Aug. 23, 1991, Pat. No. 5,132,575. This application Apr. 15, 1992, Ser. No. 869,687

Int. Cl.[5] H03F *3/45;* **H03K** *19/02*

U.S. Cl. 307—530 **18 Claims**



1. A method for effecting a potential at a sense node comprising:

a) charging a control input node of an initial electrical device toward a supply potential by coupling said control input node to a supply node through an actuated first switching device, said supply node capable of accepting said supply potential;

b) isolating the sense node from said supply node and a reference node, said reference node connectable to a reference potential;

c) charging the sense node to a generated potential by coupling the sense node to a generating means;

d) isolating the sense node from said generated potential;

e) isolating said control input node from said supply node by deactuating said first switching device;

f) actuating a second switching device to discharge said generated potential on the sense node through said initial electrical device and said second switching device, the sense node discharged to a first potential substantially equal to said reference potential;

g) pulling the sense node to a second potential equal to said first potential plus at least a threshold voltage of said initial electrical device;

h) maintaining said second potential; and

i) discharging said second potential to a third potential less than said second potential, said discharging of said second potential to said third potential performed sufficiently later than said pulling said sense node to said second potential such that an interim time period exists during which the second potential remains at said second potential, said interim time period interposed between a time period wherein said first potential is effected at said sense node and a time period wherein said third potential is effected at said sense node, wherein said second potential is greater than said first potential and wherein said second potential is greater than said third potential.

5,206,552

SENSE AMPLIFIER FOR NON-VOLATILE SEMICONDUCTOR STORAGE DEVICE

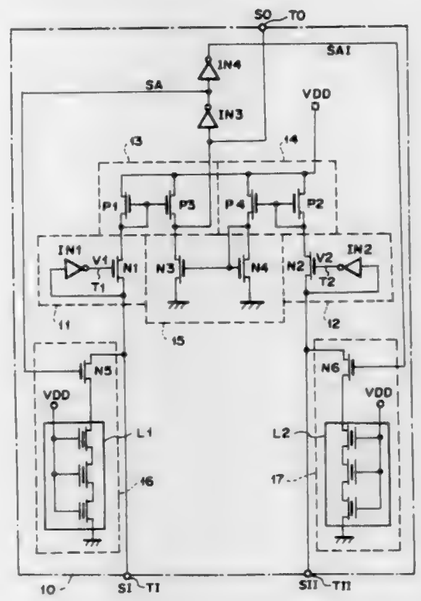
Shinichi Iwashita, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 15, 1991, Ser. No. 776,791

Claims priority, application Japan, Oct. 12, 1990, 2-273867

Int. Cl.[5] H03F *3/45;* **H03K** *5/22*

U.S. Cl. 307—530 **5 Claims**



1. A sense amplifier for a non-volatile semiconductor storage device having a plurality of memory cells in a memory cell array, said sense amplifier comprising:

a true and a complementary input terminal (TI, TII) for receiving a true and a complementary input signal (SI, SII) from said memory cells;

first and second current mirror circuits (13,14) which amplify and detect said true and said complementary input signal from said memory cells, respectively;

a true and a complementary input signal stabilizing circuit having input nodes connected to said true and complementary input terminals, respectively, and having output nodes connected to input nodes of said first and second current mirror circuits, respectively, for suppressing potential variations in said true and complementary input signals;

true and complementary input signal potential holding means (16,17) which are connected with said true and said complementary input terminal, respectively, for holding potentials of the true and complementary input signals and having a current driving capability which is lower than the current driving capability of said memory cell in said memory cell array; and

true and complementary sense signal producing circuit (IN3,IN4) for producing a true and a complementary sense signals which determine an operation or non-operation of said true and said complementary input signal potential holding means based on an output logical value of the sense amplifier.

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CLAMPING CIRCUIT

Shin-ichi Imai, Yokohama, and Akira Sakata, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawaraki, Japan

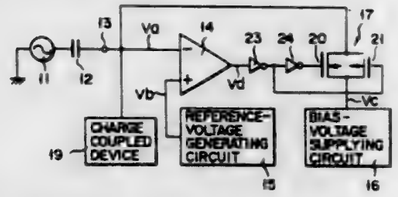
Continuation of Ser. No. 728,531, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 365,383, Jun. 13, 1989, Pat. No. 5,065,056. This application Feb. 10, 1992, Ser. No. 831,757

Claims priority, application Japan, Jun. 17, 1988, 63-149601

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[5] H03K *5/05, 5/135*

U.S. Cl. 307—540 **22 Claims**



1. A clamping circuit comprising:

a signal input terminal to which an input signal voltage is supplied through a coupling capacitor;

reference voltage generating means;

voltage comparison means, including an operational amplifier having one input terminal to which the input signal voltage supplied to said input terminal is applied and another input terminal to which a reference voltage generated by said reference voltage generating means is applied, for comparing the input signal voltage to the reference voltage;

bias voltage supplying means; and

means, responsive to the voltage comparison means, for selectively electrically coupling said bias voltage supplying means to said signal input terminal, including a transmission gate having a first terminal coupled to said bias voltage supplying means and a second terminal, coupled to said signal input terminal.

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ELECTROMAGNETIC MICROMOTOR FOR USE IN WATCH MOVEMENTS OF SMALL DIMENSIONS

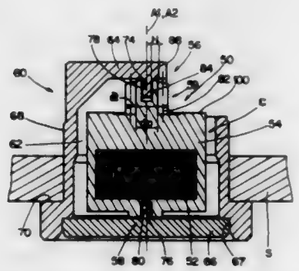
Friedrich Perrot, Lengnau, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Granges, Switzerland

Filed Feb. 15, 1991, Ser. No. 655,811

Claims priority, application Switzerland, Feb. 19, 1990, 00527/90

Int. Cl.[5] H02K *7/10, 5/02, 5/04*

U.S. Cl. 310—40 MM **11 Claims**



1. An electromagnetic micromotor of the type comprising;

a rotor constituted by a permanent magnet at least partially embedded in an overmolding formed from a plastic material, such overmolding including a mechanical coupling means for a mechanism to be driven,

a cage including an interior cavity defined therein by a peripheral wall and a bottom integral with said peripheral wall, said interior cavity being closed by a cover inset into the cage to house therein said rotor which is freely mounted in rotation within said cavity, said bottom having a notch to open said cavity outwardly in order to enable said mechanical coupling means of said overmolding of said rotor to mesh with said mechanism to be driven, and

first and second rotation guide means for guiding the rotor in rotation within the cage, said first and second rotation guide means being arranged on the overmolding of said rotor as well as respectively on the bottom and on the cover of said cage, said first and second rotation guide means being constituted, on the rotor, by two housings arranged coaxially in said overmolding of plastic material, and on the cage by two spindles or pivots which project inwardly, within the interior cavity and which are respectively fixed on the bottom and the cover of the cage and at least one said spindle or pivot is accommodated in one of the aforesaid housings, the spindle or pivot of said first guide means and said cage bottom comprising a monolithic structure and said notch comprising a machined face provided close to said spindle or pivot of said first rotation guide means.

5,206,555

ADJUSTABLE BRAKE FOR MAGNETIC ACTUATOR

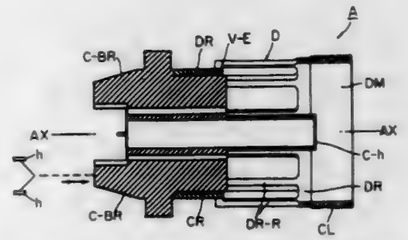
Frank I. Morris, San Jose, and Whitney B. Kroetz, Sunnyvale, both of Calif., assignors to Unisys Corp., Blue Bell, Pa.

Division of Ser. No. 576,917, Sep. 4, 1990, Pat. No. 5,084,640, which is a continuation of Ser. No. 386,324, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 307,113, Feb. 6, 1989, which is a continuation of Ser. No. 20,933, Mar. 2, 1987, Pat. No. 4,827,162. This application Nov. 1, 1991, Ser. No. 786,682

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.[5] H02K *49/02;* **G11B** *5/55*

U.S. Cl. 310—105 **17 Claims**



1. A method of arranging a voice coil linear actuator to exhibit automatic eddy-current braking at prescribed "speeds" well above its normal operating speed, this actuator comprising bobbin means, a drive coil wound on this bobbin means, and arranged to operate within a prescribed magnetic flux; damping means spaced from the bobbin means, cylindrical connect means joining said bobbin means to said damping means and driven means adopted and arranged to be driven by said actuator; this method comprising:

configuring said connect means as narrow ribs spaced equidistant about the bobbin means and exhibiting sufficiently narrow cross-section so that when said actuator is traversing said flux at a prescribed "speed", sufficient eddy-current will be generated to reduce actuator speed; cutting thru the cross-section of each said damping means to create several impedance gaps; such that when said actuator is traversing said flux at prescribed respective speeds,

sufficient eddy-current will be generated to reduce actuator speed; and

predetermined pattern to define an internal electrical signal distribution network for said transducer for distrib-

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CATHODE RAY TUBE WHICH IMPROVES

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ELECTRON GUN FOR A COLOR CATHODE RAY TUBE

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sufficient eddy-current will be generated to reduce actuator speed; and

providing visco-elastic coupling means between said actuator and said driven means.

5,206,556

FIELD MAGNET FOR MINIATURE MOTORS

Shotaro Hayakawa, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

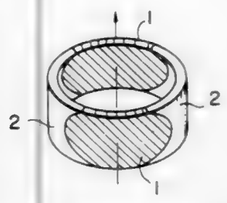
Continuation-in-part of Ser. No. 572,001, Aug. 23, 1990, Pat. No. 5,162,684. This application Mar. 1, 1991, Ser. No. 663,097

Claims priority, application Japan, Aug. 29, 1989, 1-00895

The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.

Int. Cl.[5] H02K *21/26*

U.S. Cl. 310—154 **4 Claims**



1. A field magnet for miniature motor of a type having a stator comprising a field magnet fixedly fitted to a motor housing; an end plate mounted on an open end of said motor housing; a rotor comprising a rotor winding wound on a rotor core; electric current being fed to said rotor winding via a commutator making sliding contact with current feeding brushes held by brush holders fixedly fitted to an end plate, said field magnet being formed as an arc shaped segment with a rotor facing surface and an opposite surface, said shaped segment being formed of two different material portions including a central first material portion of a non-rectangular shape extending from said rotor facing surface of the segment to said opposite surface of the segment, said central portion being formed of a material having a high magnetic energy product and an outer second material portion forming another region of second segment on each side of said central first material portion said outer second material portion, comprising a remainder of said segment, formed of a material having a low magnetic energy product.

5,206,557

MICROELECTROMECHANICAL TRANSDUCER AND FABRICATION METHOD

Stephen M. Bobbio, Wake Forest, N.C., assignor to MCNC, Research Triangle Park, N.C.

Filed Nov. 27, 1990, Ser. No. 619,183

Int. Cl.[5] H02N *1/00*

U.S. Cl. 310—309 **43 Claims**

1. An electromechanical transducer comprising:

a plurality of electrically conductive strips arranged in closely spaced relation to an array;

a plurality of dielectric spacers positioned between adjacent portions of said strips and connected thereto; and

electrically conductive layers on said dielectric spacers and interconnecting said electrically conductive strips in a predetermined pattern to define an internal electrical signal distribution network for said transducer for distributing an electrical signal to said electrically conductive strips so as to urge adjacent portions of said electrically conductive strips together responsive to the electrical signal.

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LIGHT SOURCE PROVIDED WITH LIGHT REFLECTING MEANS

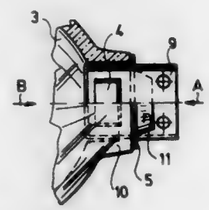
Zoltán Losonczi, and György Szabó, both of Budapest, Hungary, assignors to Tungsram Részvénytársaság, Budapest, Hungary

Filed Apr. 29, 1991, Ser. No. 691,327

Claims priority, application Hungary, Apr. 28, 1990, 2623/90

Int. Cl.[5] H01K *1/26*; H01J *5/50*

U.S. Cl. 313—113 **3 Claims**



1. A light source comprising

(a) a reflector including a reflecting portion and a central hollow neck portion having an inner surface;

(b) a lamp having

(1) an envelope provided with a pinch-sealed portion;

(2) a light emitting component accommodated in said envelope; and

(3) current feedthroughs electrically connected to said light emitting components and passing through said pinch-sealed portion to project outwardly from said envelope; and

(c) securing means for firmly fixing said lamp to said reflector whereby said lamp and said reflector form an integral unit; said securing means comprising

(1) a first metal sleeve tightly surrounding said pinch-sealed portion of said envelope;

(2) a second metal sleeve lining said inner surface of said neck portion of said reflector and surrounding said first metal sleeve;

(3) clamping components affixed to said second sleeve; said clamping components fitting into said hollow neck portion and encasing said inner surface thereof from two opposite sides; said clamping components comprising

(i) tabs carried on and projecting outwardly from said second metal sleeve and engaging said inner surface; and

(ii) a metal plate surrounding said second metal sleeve and being joined thereto; said metal plate being in engagement with an outer edge of said hollow neck portion; and

(4) connecting means for fixedly securing said first metal sleeve to said second metal sleeve.

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CATHODE RAY TUBE WHICH IMPROVES DEFLECTION ABERRATION

Takeshi Fujiwara, Kumagaya; Kiyoshi Tokita, and Masatsugu Inoue, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 562,607, Aug. 3, 1990, abandoned. This application Jul. 13, 1992, Ser. No. 911,788

Claims priority, application Japan, Aug. 4, 1989, 1-202446; Sep. 29, 1989, 1-252105

Int. Cl.[5] H01J *29/76*

U.S. Cl. 313—440 **6 Claims**

1. A cathode ray tube apparatus, comprising:

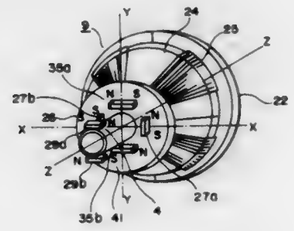
an envelope having a tube axis extending in an axial direction;

an in-line type electron gun assembly, received in said envelope, for emitting a center electron beam and two side beams in the same plane;

deflection magnetic field generating means for generating a mainly pin-cushion type deflection magnetic field for deflecting the electron beams in a first direction along the plane and generating a mainly barrel type deflection magnetic field for deflecting the electron beams in a second direction perpendicular to the first direction;

a first pair of permanent magnet pieces, each having one and opposite poles, located on an electron gun assembly side of said deflection magnetic filed generating means, arranged in the first direction so as to be substantially symmetrical about the tube axis, and faced to each other in such a manner that different polarities are opposed to each other, for constantly generating a pin-cushion type first correction magnetic field; and

a second pair of permanent magnet pieces, each having one and opposite poles, located on the electron gun assembly side of said deflection magnetic field generating means and separated in the axial direction from said first pair of permanent magnetic pieces towards said electron gun assembly, arranged in the second direction so as to be substantially symmetrical about the tube axis, and faced to each other in such a manner that different polarities are opposed each other, for constantly generating a pin-cushion type second correction magnetic field.



5,206,560

Patent Not Issued For This Number

5,206,561

ELECTRON GUN FOR A COLOR CATHODE RAY TUBE

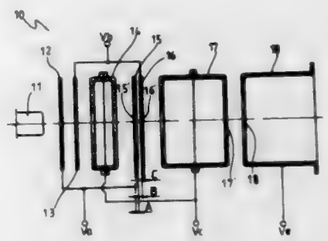
Tae-sik Oh, Pusan, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Jan. 30, 1992, Ser. No. 828,229

Claims priority, application Rep. of Korea, Jan. 7, 1991, 91-9428

Int. Cl.[5] H01J *29/46, 29/50*; G09G *1/04*

U.S. Cl. 315—15 **6 Claims**



1. An electron gun for a color cathode ray tube comprising:

a cathode for generating thermoelectrons;

an adjacent control electrode and screen electrode for transforming said thermoelectrons into an electron beam;

a first focusing electrode in the vicinity of said screen electrode, and a fourth focusing electrode electrically connected to said first focusing electrode;

a second focusing electrode provided between said first and fourth focusing electrodes, and electrically connected to said control electrode;

a third focusing electrode formed between said second and fourth focusing electrodes, and electrically connected to said screen electrode; and

an anode adjacent said fourth focusing electrode.

5,206,562

LIGHTING SYSTEM FOR USE IN VEHICLE CABIN

Yoshio Matsuno, Tokyo; Hitoshi Matsui, Kawasaki; Izumi Okamura, Hikone; Teruaki Shigeta, and Yoshinori Tanabe, both of Osaka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Matsushita Electric Industrial Co., Ltd., Osaka, both of Japan

Filed Sep. 18, 1991, Ser. No. 761,056

Claims priority, application Japan, Sep. 21, 1990, 2-253444

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 315—77 **10 Claims**

1. A method of controlling a lighting system for use in a cabin of a vehicle on a road, the vehicle having a door, a step, a floor, a roof and a seat, the lighting system including a step lamp arranged to the door, a foot lamp arranged to the seat and a seat lamp arranged to the roof, the method comprising the steps of:

checking whether or not the door is opened;

detecting brightness of the road and step, the floor and the seat when the door is opened and generating brightness indicative signals indicative of said brightness detected;

determining luminous intensities of the step lamp, the foot

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CIRCUIT FOR CONTROLLING LIGHT OUTPUT OF A

third radius and said second radius are each smaller than 1 mm;

pensation value to produce a compensated drive signal for moving said actuator said segment distance; and

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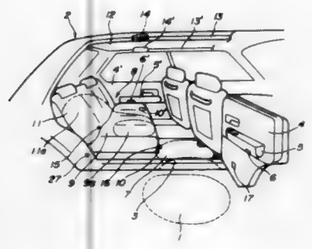
determining luminous intensities of the step lamp, the foot lamp and the seat lamp in response to said brightness indicative signals to obtain a gradual increase in brightness in order of the road and step, the floor and the seat and



generating luminous intensity indicative signals indicative of said luminous intensities determined; and

controlling the step lamp, the foot lamp and the seat lamp in response to said luminous intensities indicative signals.

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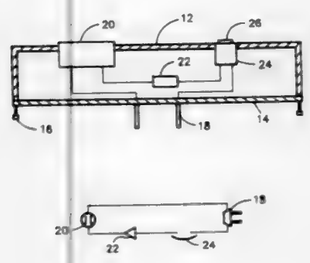
LIGHTBULB LIFE EXTENDER

Anthony B. Castelli, Grubville, Mo., assignor to Harold W. Glacken, Jr., Dittmer, Mo., a part interest

Filed Apr. 8, 1992, Ser. No. 866,799

Int. Cl.[5] H05B *39/00*; H01R *13/713, 13/73*

U.S. Cl. 315—127 **6 Claims**



1. An electrical device for providing direct current to incandescent lightbulbs, said device comprising a housing, an electrical circuit contained within said housing comprising a diode rectifier having circuit means for connection to an alternating current source, circuit means connecting a direct current output from said diode to a circuit supplying said direct current to an incandescent lightbulb circuit and a circuit breaker connected to said diode, said circuit breaker having a resettable switch externally mounted on said housing.

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CIRCUIT FOR CONTROLLING LIGHT OUTPUT OF A DISCHARGE LAMP

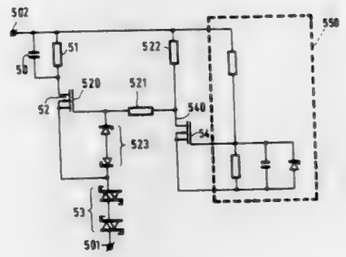
Johannes H. Wessels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1991, Ser. No. 772,984

Claims priority, application Netherlands, Oct. 10, 1990, 9002202

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—209 R **13 Claims**



1. A circuit arrangement for operating a discharge lamp, said circuit arrangement comprising: a DC/AC converter for connection to a DC supply and a starting circuit for starting said DC/AC converter, said starting circuit including capacitive means for connection to said DC supply, said starting circuit generating a starting pulse when said capacitive means is connected to said DC supply, said starting circuit also comprising disconnecting means and means for discharging the capacitive means, said disconnecting means having a control input operable from said DC supply to enable said discharging means to operate to discharge said capacitive means.

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HIGH-POWER LOW-VOLTAGE TETRODE HAVING A FULL WALLED MATRIX CATHODE AND A CONTROL GRID SPACING OF LESS THAN 1 MM

Fritz Lüssi, Brugg; Hans-Gunter Mathews, Oberehrendingen, both of Switzerland, and Werner Rohrbach, Waldshut-Tiengen, Fed. Rep. of Germany, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Dec. 12, 1991, Ser. No. 805,613

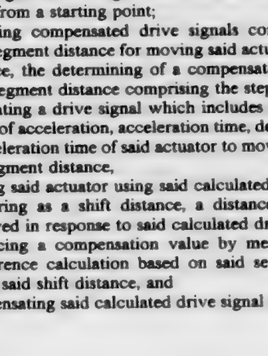
Claims priority, application European Pat. Off., Jan. 21, 1991, 91100661.7

Int. Cl.[5] H01J *11/04, 1/46*

U.S. Cl. 315—349 **5 Claims**

1. Controllable high-power electron tube in the form of a tetrode for an output power of at least 100 kW, comprising;

a coaxial electrode arrangement comprising a cylindrical cathode with a first radius, a cylindrical control grid with a second radius which is larger than said first radius, a cylindrical screen grid with third radius which is larger than said second radius, and an anode surrounding said screen grid, wherein the difference between said second radius and said first radius and the difference between said third radius and said second radius are each smaller than 1 mm;



said cathode comprising an indirectly heated matrix cathode containing BaO; and

said cylinder of said cathode being full-walled.

5,206,566

ACCESS METHOD OF ACTUATOR AND CONTROL APPARATUS THEREFOR

Shuichi Yoshida, Osaka; Mitsuo Tokura, and Noriaki Wakabayashi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 5, 1991, Ser. No. 664,565

Claims priority, application Japan, Mar. 8, 1990, 2-57167; Jun. 18, 1990, 2-159019

Int. Cl.[5] G05B *19/42*

U.S. Cl. 318—568.22 **18 Claims**

1. A method for initializing an actuator controller using fuzzy logic, the method comprising the steps of:

dividing a predetermined moving range of said actuator into a plurality of segments having equal length, a beginning of each segment defining a different discrete segment distance from a starting point;

determining compensated drive signals corresponding to each segment distance for moving said actuator a segment distance, the determining of a compensated drive signal for a segment distance comprising the steps of,

calculating a drive signal which includes data of at least one of acceleration, acceleration time, deceleration, and deceleration time of said actuator to move said actuator a segment distance,

driving said actuator using said calculated drive signal,

measuring as a shift distance, a distance said actuator moved in response to said calculated drive signal,

producing a compensation value by means of a fuzzy inference calculation based on said segment distance and said shift distance, and

compensating said calculated drive signal using said compensation value to produce a compensated drive signal for moving said actuator said segment distance; and

storing each of said compensated drive signals for driving said actuator during operation.

5,206,567

APPARATUS FOR RELIABLY ACTIVATING SENSORLESS AND BRUSHLESS DC MOTOR

Tetsuji Sakurai; Hideo Masaki, and Katsuhiko Kaida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 27, 1991, Ser. No. 750,413

Claims priority, application Japan, Aug. 28, 1990, 2-224195; Aug. 28, 1990, 2-224196

Int. Cl.[5] H02P *7/00*

U.S. Cl. 312—254 **9 Claims**

1. A sensorless and brushless DC motor control apparatus comprising:

a sensorless and brushless DC motor having a rotor and a plurality of phase coils, the rotor having a plurality of magnetic pole positions;

excitation means for exciting a pair of phase coils from the plurality of phase coils to rotate the rotor;

detection means for detecting a magnetic pole position of the rotor from a back electromotive force produced in the excited phase coils; and

control means for controlling the excitation means in accordance with the detected magnetic pole position, and

wherein at activation of the sensorless and brushless DC motor, the control means controls the excitation means to excite one pair of phase coils to rotate the rotor and then to excite another pair of phase coils to position the magnetic pole position in another pair of phase coils, and the control means determines whether or not the rotor vibrates in accordance with the detected magnetic position when the rotor starts to rotate.

5,206,568

COORDINATED CONTROL OF STEPPER MOTORS

Dale R. Pfost, Los Altos; Torleif O. Björnson, Milpitas; Robert M. Coppock, Mount View; Carl Kowalski, Fremont; Samuel A. Marquiss, Milpitas; Donald S. Murray, Sunnyvale; R. Fred Pfost, Los Altos; Brian Sanford, Cupertino, all of Calif., and Torleif O. Björnson, Milpitas; Robert M. Coppock, Mount View; and Samuel A. Marquiss, Milpitas, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 844,374, Mar. 26, 1986. This application May 10, 1991, Ser. No. 698,759

Int. Cl.[5] B25J *9/16*; G05B *19/18*

U.S. Cl. 318—568.1 **12 Claims**

1. A controller for driving a plurality of stepper motors by discrete motor steps to move a first structure with respect to a second structure from a first location to a second location, said second structure having features defining obstacles which

interrupt a direct path between the first and second locations, the controller comprising:

second means for measuring time after the one leg linkage is lifted from the ground;

state current flowing in a winding of the stepper motor is dependent on the electrical parameters of the winding, said

processor for electrically programming or reprogramming said electrically erasable and programmable read-

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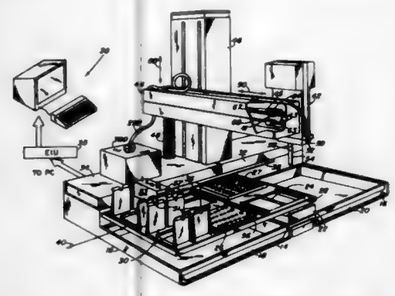
interrupt a direct path between the first and second locations, the controller comprising:

first and second stepper motors, said first motor for moving the first structure along a first path, said second motor for moving the first structure relative to the second structure along a second path;

memory means for storing data representing desired motor stepping characteristics, and positions of said first location, said second location, and said obstacles;

motor control devices for the motors, at least one of the control devices comprises first means for advancing its



associated motor a determined number of steps, second means for initiating said advancing after a determined number of delay-steps from initiating advancement of another motor, and third means for counting the number of steps advanced; and

processing means for providing a plurality of motor control instructions to each of the motor control devices, said instructions including timing coordination between stepping of the motors in terms of delay-steps, thereby effective to move the first structure from the first location to the second location in a manner avoiding said obstacles.

5,206,569

SYSTEM FOR CONTROLLING LOCOMOTION OF LEGGED WALKING ROBOT

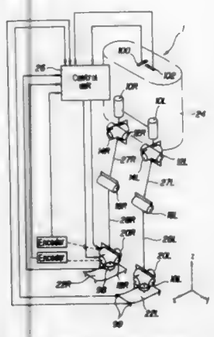
Nobuaki Ozawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 800,648

Claims priority, application Japan, Nov. 30, 1990, 2-336418

Int. Cl.[5] G05B *19/00*

U.S. Cl. 318—568.12 **9 Claims**



1. A system for controlling locomotion of a biped walking robot having a body and two leg linkages each connected to the body and each made up of a foot portion and a leg portion connected by an ankle drive joint, comprising:

first means for detecting moment or force acting on one leg linkage;

second means for measuring time after the one leg linkage is lifted from the ground;

third means for determining a drive speed of the ankle drive joint of the one leg linkage by multiplying the detected value by a gain set with respect to time; and

servo motor means for driving the ankle drive joint at the drive speed in order to provide compliance to the foot portion of the one leg linkage.

5,206,570

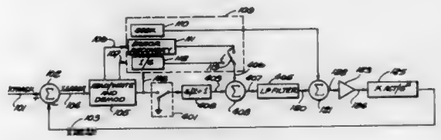
ACTUATOR SERVO COMPENSATION METHOD

Jim Hargarten, Lafayette; Gary Counts, Arvada, and Scott Chase, Longmont, all of Colo., assignors to Maxtor Corporation, San Jose, Calif.

Filed Mar. 19, 1991, Ser. No. 671,500

Int. Cl.[5] G05B *13/00*; **G11B** *21/08*

U.S. Cl. 318—611 **23 Claims**



1. A circuit for providing a position compensation signal comprising:

receiving means for receiving an error signal and for generating a position error signal (PES) having a normal component and a quadrature component;

integrating means coupled to said receiving means for integrating said normal component and providing a first output signal;

compensating means coupled to said receiving means for compensating said normal component and providing a second output signal;

first summing means coupled to said integrating means and said compensating means for summing said first and second output signals and providing a third output signal;

filter means coupled to said first summing means for providing a fourth output signal;

amplifying means coupled to said filter means for generating a fifth output signal;

actuator control means coupled to said amplifying means and to said receiving means, said actuator control means for providing said error signal.

5,206,571

STEPPER MOTOR CONTROLLERS

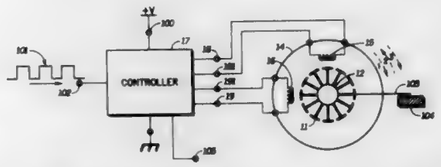
Michel Burri, Gd-Saconnex, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1991, Ser. No. 695,078

Claims priority, application United Kingdom, May 25, 1990, 9011704

Int. Cl.[5] G05B *19/40*

U.S. Cl. 318—685 **11 Claims**



1. A stepper motor controller for providing a drive signal to a stepper motor and for detecting when the driven stepper motor is in a blocked or running state, wherein the blocked

state current flowing in a winding of the stepper motor is dependent on the electrical parameters of the winding, said current being the blocked current and in the running state the current flowing int h winding is dependent on a motion current superimposed on the blocked current, wherein the stepper motor controller comprises:

detection means for sampling the current flowing in the winding a predetermined interval after coil commutation and for providing a first output signal in response to detecting the superimposed motion current and a second output signal when no superimposed motion current is detected, wherein the first output signal indicates the stepper motor is in the running state, and the second output signal indicates the stepper motor is in the blocked state.

5,206,572

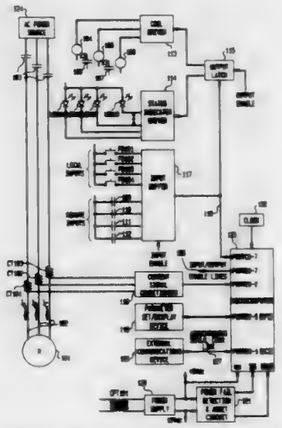
MOTOR CONTROLLER

Samir F. Farag, Roswell, Ga., and James T. Cronvich, Harahan, La., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Continuation of Ser. No. 209,803, Jun. 22, 1988, abandoned. This application Jan. 3, 1990, Ser. No. 462,934

Int. Cl.[5] H02P *1/26*

U.S. Cl. 318—778 **9 Claims**



1. An apparatus for starting and controlling an electric motor which is coupled with a power supply through contactors which when closed connect the motor to the power supply through respective conductors and when open disconnect the motor from the power supply, said apparatus being able to store at any one time program information for starting and controlling only a subset of a set of different electric motors but being electrically reprogrammable to store therein program information for any selected subset of said set, said apparatus comprising:

(a) sensors coupled with the conductors to generate sensor outputs related to the state of selected parameters of at least one of said motor and said conductors;

(b) a display for displaying the state of selected parameters of the motor and of said apparatus;

(c) a microprocessor circuit having:

(1) an electrically erasable and programmable read-only memory for storing program information for both starting and controlling an electric motor;

(2) pins coupled with said sensors to receive sensor outputs therefrom; and

(3) pins coupled with said contactors to command the contactors to open or close and coupled with said display to control the state of the display;

(d) a source of program information coupled to said microprocessor for electrically programming or reprogramming said electrically erasable and programmable read-only memory to store therein program information for starting and for controlling a selected motor, said program information comprising:

(1) starting programs defining parameters of the delivery of electric power to the motor when starting the motor; and

(2) control programs defining relationships between said sensor outputs on the one hand and, on the other hand, the state of the display and the open and closed states of the contractors; and

(e) said source of program information being selectively energized to electrically program or re-program said memory in the microprocessor circuit to store therein a selected program information matching a selected motor, and said microprocessor circuit thereby being enabled to start and control said selected motor and to control said display when coupled with said selected motor.

5,206,573

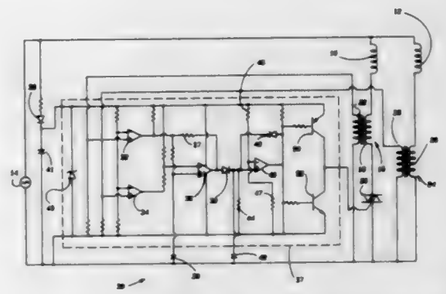
STARTING CONTROL CIRCUIT

Arthur P. McCleer, 900 Williamsville Lake, Gregory, Mich. 48137, and Patrick J. McCleer, 1116 S. Bowen, Jackson, Mich. 49203

Filed Dec. 6, 1991, Ser. No. 804,831

Int. Cl.[5] H02P *1/42*

U.S. Cl. 318—787 **8 Claims**



1. For use in conjunction with a mechanical duty single phase alternating current electric motor having a start winding and a main winding, both windings adapted for connection with a source of alternating current, a starting control circuit for controlling enerization of the starting winding comprising:

means for electrically connecting the start winding and main winding to the source of power during initial enerization of the motor,

means for detecting the current phase of the start winding,

means for detecting the current phase of the main winding,

means for comparing the current phase of the start and main windings and for generating a pulsed output signal when the phase of said start winding lags the phase of said main winding, said pulsed output signal having a pulse width proportional to the magnitude of the phase lag,

means for integrating said pulsed output signal,

means for electrically disconnecting said starting winding from the source of power whenever the integrated pulsed output signal exceeds a predetermined value.

5,206,574

VECTOR CONTROL APPARATUS FOR INDUCTION

5,206,575

DEVICE FOR CONTROLLING AN AC MOTOR

(a) inserting the battery in a charging device wherein the battery mechanically engages an activation mechanism

make a determination of the resistance free voltage of that module;

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5,206,574

VECTOR CONTROL APPARATUS FOR INDUCTION MOTOR

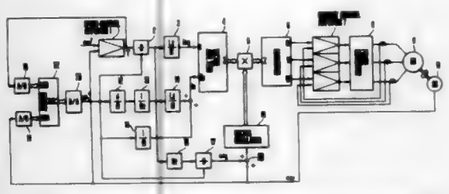
Kiyokazu Okamoto, and Hideyuki Amagai, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 44,818, Apr. 30, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 341,300

Claims priority, application Japan, May 2, 1986, 61-102666; May 2, 1986, 61-102667; May 2, 1986, 61-102668

Int. Cl.[5] H02P *3/00*

U.S. Cl. 318—800 **1 Claim**



1. A vector control apparatus for an induction motor comprising:

A) a vector control system comprising:

i) means for generating a torque command T in response to an actual rotation speed ω_r, obtained from means for detecting a rotation speed of said induction motor, and in response to a speed command ω_r;

ii) means for receiving said torque command T and a secondary flux command ϕ_2 and calculating, as a function of a vector relational equation, a variable exciting current i_0, a torque current i_1q, and a slip speed ω_s, using predetermined circuit constants of said induction motor, including an inductance and a resistance; and

iii) means for supplying predetermined three-phase current in response to said i_0, i_1q, and ω_s, to said induction motor, including a vector analyzer, a vector oscillator, a three-phase signal generator, a current control amplifier, and a power amplifier;

B) a memory system comprising:

signal conversion means **19**, **21** for converting said torque command T and said actual rotation speed ω_r into corresponding data;

memory means **22** for receiving said data corresponding to said torque command T and said actual rotation speed ω_r, and generating data corresponding to a desired secondary magnetic flux ϕ_2 in accordance with a predetermined magnetic flux relation;

signal conversion means **23** for converting said data corresponding to a desired secondary magnetic flux ϕ_2 to a magnetic flux command;

said magnetic flux command being fed back as said secondary magnetic flux command ϕ_2 to be received by said means for receiving said torque command T and a secondary flux command ϕ_2 and calculating, as a function of a vector relational equation, an exciting current i_0, a torque current i_1q, and a slip speed ω_s, using predetermined circuit constants of said induction motor, including an inductance and a resistance; and

said predetermined magnetic flux relation between T, ω_r, and ϕ_2 being determined such that when T is large the secondary magnetic flux ϕ_2 is increased, within a range where the ratio of the motor loss L to T (T/L) can reach a maximum value, in such a way as to minimize the slip speed ω_s, and when T is small and said actual rotation speed is less than a predetermined value, the secondary magnetic flux ϕ_2 is reduced in such a way as to reduce the ripple of said actual rotation speed ω_r, and to increase said slip speed ω_s, within an allowable range of the loss L.

5,206,575

DEVICE FOR CONTROLLING AN AC MOTOR

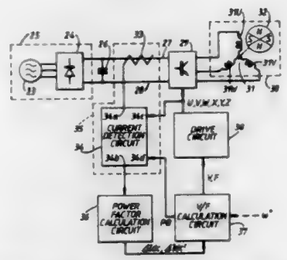
Yoshinobu Nakamura, Aichi, and Hiroshi Mochikawa, Mie, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 9, 1990, Ser. No. 610,248

Claims priority, application Japan, Nov. 10, 1989, 1-292839

Int. Cl.[5] H02P *5/28*

U.S. Cl. 318—807 **6 Claims**



1. A control device for an AC motor, comprising:

a source of DC power;

inverter means for converting the DC power into AC power and supplying the AC power to the AC motor;

current detection means for detecting a current flowing from said DC power source to the inverter means and for generating a signal representative of the detected current that is determined from both of a detected current Ia occurring at a first time at least before a changeover of phase of an output of the inverter means and a detected current Ib occurring at a second time at least after the changeover of phase of the output of the inverter means;

power factor calculation means connected to the current detection means for calculating a power factor of the AC motor from the detected current and for outputting a corresponding power factor signal;

voltage frequency calculating means for receiving as input signals at least the calculated power factor and a speed setting signal, for calculating control signals in accordance with the input signals, and for outputting the control signals; and

control means for receiving the control signals and for generating drive signals to control the inverter means based on the control signals.

5,206,576

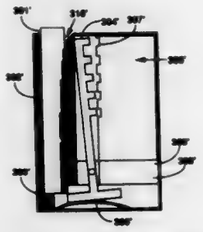
BATTERY CHARGER

Leon Jasinski, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 440,141, Nov. 22, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,798

Int. Cl.[5] H01M *10/46, 4/00*

U.S. Cl. 320—2 **10 Claims**



1. A method for charging a battery comprising the steps of:

(a) inserting the battery in a charging device wherein the battery mechanically engages an activation mechanism and electrically couples to an energy source incorporated with the charging device;

(b) opening at least one vent in the energy source in response to the mechanical engagement of the battery with the activation mechanism, the at least one open vent allowing infiltration of at least one activating gas into the energy source resulting in generation of electrical power thereby; and

(c) charging the battery using electrical power generated by the energy source.

5,206,577

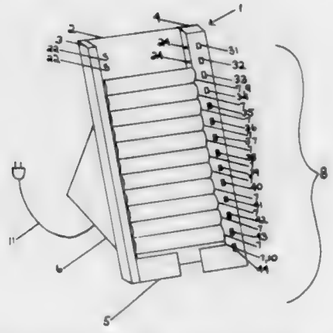
BATTERY CHARGER

Robert D. Fish, 255 S. Grand Ave. #911, Los Angeles, Calif. 90012

Filed Sep. 30, 1991, Ser. No. 767,404

Int. Cl.[5] H01M *10/44*

U.S. Cl. 320—2 **10 Claims**



1. A device for charging rechargeable batteries comprising:

a housing sized and dimensioned to contain a stack of batteries, said stack having a top and a bottom;

means for advancing the batteries from the top of the stack to the bottom of the stack;

means for parallely charging at least one of the batteries in the stack; and

means for causing at least one position to discharge and another position to charge the batteries such that the batteries are discharged and then subsequently charged as a result of passing from one of the positions to another in the housing.

5,206,578

MONITORING SYSTEM FOR BATTERIES DURING CHARGE AND DISCHARGE

Jiri K. Nor, Oakville, Canada, assignor to Norvik Technologies Inc., Mississauga, Canada

Filed Oct. 15, 1991, Ser. No. 775,485

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—14 **11 Claims**

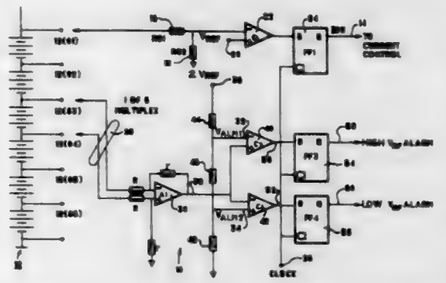
1. A monitoring circuit for a battery while said battery is being charged or discharged, where said battery comprises a series of modules connected in series, and where a terminal is placed between each adjacent pair of modules and at each end of said battery, so that the voltage across each module may be measured at the pair of terminals defining the module, said monitoring circuit comprising:

means for periodically interrupting the flow of current to or from said battery for an interruption interval of fewer than about 2 to 10 ms;

means for selectively sampling the voltage of any one of said modules, during an interruption of current flow, so as to make a determination of the resistance free voltage of that module;

means for comparing said resistance free voltage of the module against at least two reference voltages, to determine if said resistance free voltage is above a first predetermined level or below a second predetermined level; and

means for causing an alarm indication in the event that said resistance free voltage is found to be either above said first predetermined level or below said second predetermined level.



5,206,579

BATTERY CHARGER AND CHARGE CONTROLLER THEREFOR

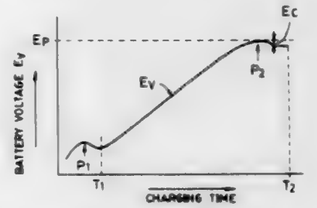
Yosuke Kawate, Omihachiman; Norihiko Nakano, Kitaibaragi, and Tadashi Kato, Chiba, all of Japan, assignors to Nippon Denzan Corporation, Kyoto, Japan

Filed Feb. 22, 1991, Ser. No. 660,408

Claims priority, application Japan, Feb. 26, 1990, 2-46403; Feb. 28, 1990, 2-48302; Mar. 1, 1990, 2-50420

Int. Cl.[5] H02J *7/04*

U.S. Cl. 320—20 **9 Claims**



1. A battery charger having a supply circuit for supplying a predetermined charging current to a battery and a control circuit for controlling charging of said charging current to said battery, said control circuit of said battery charger comprising:

battery voltage detection means for detecting the voltage of said battery;

peak value holding means for holding a peak value of said voltage of said battery detected by said battery voltage detection means;

voltage comparison means for subjecting said peak voltage held by said peak value holding means and said voltage of said battery detected by said battery voltage detection means to a comparison; and

means for shutting said charging current when said voltage comparison means determines that said detected voltage of said battery is smaller than said peak value of said voltage by a predetermined quantity,

and a first timer which is set to a time which exceeds a time at which an initial voltage drop takes place, said first timer acting to prevent said operation of shutting said charging

current performed by said shutting means in said set time, and said first timer actuating said peak value holding

tor connected to a second terminal of said second resistor element, and an emitter connected to a first node;

a control means responsive to a set of specifications stored in said third means to select a measurement stored in said

5,206,584

TEST CIRCUIT FOR TESTING A THREE-STATE OUTPUT

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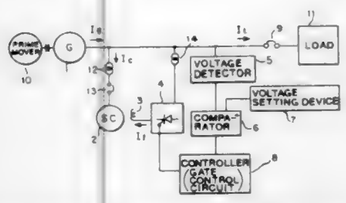
current performed by said shutting means in said set time, and said first timer actuating said peak value holding means after said set time has elapsed.

5,206,580

MAGNETOELECTRIC GENERATING SYSTEM

Hitoshi Okamoto, and Katsuhiko Kibe, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1992, Ser. No. 854,866
Claims priority, application Japan, Jun. 4, 1991, 3-159465
Int. Cl.[5] H02P *9/00, 9/10*
U.S. Cl. 322—46 **10 Claims**



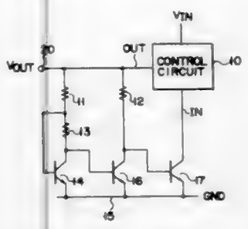
1. A magnetoelectric generating system comprising: a synchronous magnetoelectric generator provided with permanent magnets for creating a rotating magnetic field; a synchronous phase modifier connected to the output side of the synchronous magnetoelectric generator; a voltage detector for detecting the output voltage of the synchronous magnetoelectric generator; a comparator for comparing the voltage detected by the voltage detector and a reference voltage set by means of a voltage setting device; an exciting current regulating circuit connected to the field winding of the synchronous phase modifier; and a controller for controlling the exciting current regulating circuit according to the output of the comparator.

5,206,581

CONSTANT VOLTAGE CIRCUIT

Yoshihiro Yoshida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 606,831, Oct. 31, 1990, abandoned.
This application Dec. 9, 1991, Ser. No. 803,892
Claims priority, application Japan, Nov. 2, 1989, 1-284976
Int. Cl.[5] G05F *3/30*
U.S. Cl. 323—313 **7 Claims**



1. A constant voltage circuit comprising:
- a control circuit having input and output terminals in which an output at said output terminal is controlled according to a current at said input terminal;
- a first resistor element having a first terminal connected to said output terminal of said control circuit;
- a second resistor element having a first terminal connected to a second terminal of said first resistor element;
- a first transistor of a first polarity having a base connected to said second terminal of said first resistor element, a collector connected to a second terminal of said second resistor element, and an emitter connected to a first node;
- a third resistor element having a first terminal connected to said output terminal of said control circuit;
- a second transistor of the first polarity having a collector connected to a second terminal of said third resistor element, a base connected to said second terminal of said second resistor element, and an emitter connected to said first node; and
- a third transistor of the first polarity having a collector connected to said input terminal of said control circuit, a base connected to said second terminal of said third resistor element, and an emitter connected to said first node;

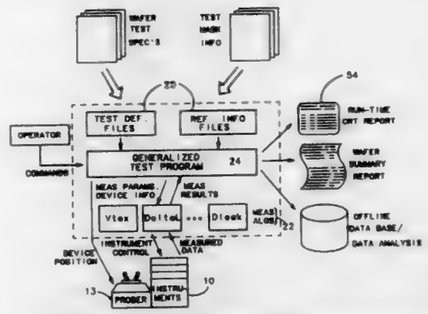
said control circuit including:
- a current source having a first terminal connected to a second node having a predetermined potential applied thereto and a second terminal connected to said collector of said third transistor,
- a fifth transistor of a second polarity having an emitter connected to said second node and a collector connected to said first terminal of said first resistor element, to said first terminal of said third resistor element and to a third node at which an output voltage is provided, and
- a sixth transistor of the first polarity having a collector connected to a base of said fifth transistor, a base connected to said collector of said third transistor, and an emitter connected to said first node.

5,206,582

CONTROL SYSTEM FOR AUTOMATED PARAMETRIC TEST EQUIPMENT

Thomas W. Ekstedt, Palo Alto; Mary L. Dryden, Mountain View; Ulrich Kaempf, Los Altos, and Richard R. Clark, Redwood City, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 195,667, May 18, 1988, abandoned.
This application Aug. 21, 1990, Ser. No. 570,998
Int. Cl.[5] G01R *31/28*; G06F *11/22*
U.S. Cl. 324—73.1 **14 Claims**



1. A control system for an automated parametric test system of the type in which test signals are applied to devices on an integrated circuit wafer and the responses of the devices to said test signals are measured to determine the performance of the devices, comprising:
- a first memory means for storing location information pertaining to the configuration of a plurality of devices within a die on one wafer;
- a second memory means for storing a plurality of measurements to be applied to various ones of said devices to determine a characteristic parameter of each device;
- the second memory means for storing specifications for particular tests to be performed on particular devices on a wafer whose configuration is stored in said first memory means; and

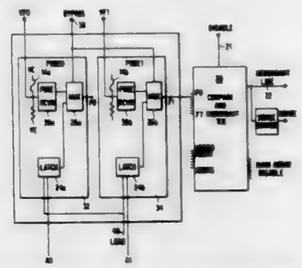
- a control means responsive to a set of specifications stored in said third means to select a measurement stored in said second memory means, determine the location of a device to which the selected measurement is to be applied on the basis of the information stored in said first memory means, and control said test system to supply the selected measurement to the device at said determined location on the wafer, said control means for interpreting information stored in said first and third memory means and for calling predetermined information from said second memory means.

5,206,583

LATCH ASSISTED FUSE TESTING FOR CUSTOMIZED INTEGRATED CIRCUITS

James W. Dawson, Poughkeepsie; George A. DeLuca, Salt Point, and Michael Nicewicz, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1991, Ser. No. 747,848
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R **8 Claims**



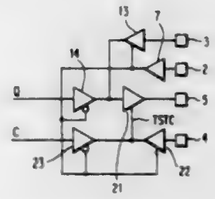
1. A latch assisted fuse testing method for testing integrated circuit chips during the process of manufacturing said chips, said chips being fabricated with an array structure characterized by a main array structure and redundant blocks wherein redundant blocks can be subetituted for blocks in said main array structure by the selective blowing of fuses in a fuse array, said testing method comprising the steps of:
- providing an on-chip latch stack comprising a plurality of programmable latches paralleling the fuses in said fuse array;
- providing an on-chip multiplexer means responsive to a bypass signal for selecting outputs from said fuses or said latches;
- programming said latches to simulate a pattern of blown fuses according to previously generated error data;
- selecting outputs from said latches to simulate a pattern of blown and unblown fuses;
- comparing outputs provided by said multiplexer means with a predetermined test input to either allow the selection of a block within said main array structure or a redundant block; and
- blowing fuses according to the simulated pattern in only those chips which are tested as repairable during production manufacture of the chips.

5,206,584

TEST CIRCUIT FOR TESTING A THREE-STATE OUTPUT BUFFER GATE IN A SEMICONDUCTOR INTEGRATED CIRCUIT

Hiroaki Nishimori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 22, 1992, Ser. No. 824,217
Claims priority, application Japan, Feb. 1, 1991, 3-11808
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **2 Claims**



1. A test circuit for testing a three-state output buffer gate in a semiconductor integrated circuit provided with first and second means, said first means selecting one of a test data signal supplied form an external circuit and a logic data signal Q supplied from an internal logic circuit of the semiconductor integrated circuit, in response to an externally supplied selection signal, and delivering a selected data signal to a data input of the output buffer gate to be tested, and said second means selecting, in response to the selection signal, one of a test control signal supplied from the external circuit and a control signal C supplied form the internal logic circuit for controlling an output of the output buffer gate and delivering a selected control signal of the control input of the output buffer gate, wherein said first means comprises:
- a first three-state buffer fate having a data input supplied with the test data signal, an output connected to the data input of the three-state output buffer gate, and a control input supplied with the selection signal, said first three-state buffer gate being controlled to be in a high-impedance state when the selection signal is at a first logic level, and to transmit the test data signal to the output buffer gate when the selection signal is at a second logic level; and
- a second three-state buffer gate having a data input supplied with the logic data signal Q, an output connected to the data input of the three-state output buffer gate and a control input supplied with the selection signal, said second three-state buffer gate being controlled to transmit the logic data signal Q to the output buffer gate when the selection signal is at the first logic level, and to be in a high-impedance state when the selection signal is at the second logic level, and

said second means comprises:
- a third three-state buffer gate having a data input supplied with the control signal C, an output connected to the control input of the three-state output buffer gate a, and a control input supplied with the selection signal, said third three-stage buffer gate being controlled to transmit the control signal C to the control input of the three-state output buffer gate when the selection signal is at the first logic level, and to be in a high-impedance state when the selection signal is at a second logic level, and
- a fourth three-state buffer gate having a data input supplied with the test control signal, an output connected to the control input of the output buffer gate, and a control input supplied with the selection signal, said fourth three-state buffer gate being controlled to be in a high-impedance state when the selection signal is at the first logic level, and to transmit the test control signal to the control input of the output buffer gate when the selection signal is at the second logic level.

5,206,585

METHODS FOR TESTING INTEGRATED CIRCUIT

rogation pulses into acoustic pulses in said delay line, at the location of said magnet means;

a slit aligned with said longitudinal axis of said coil and extending the entire length thereof;

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METHOD OF MEASURING VECTOR MAGNETIC FLUX

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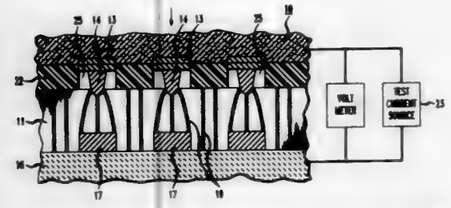
METHODS FOR TESTING INTEGRATED CIRCUIT DEVICES

David D. C. Chang, and Edward L. Smith, Jr., both of Lawrenceville, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1991, Ser. No. 801,213
Int. Cl.[5] G01R *1/073*
U.S. Cl. 324—158 P 8 Claims



1. A method for testing an integrated circuit chip comprising the steps of:

making an array of solder bumps on one surface of the integrated circuit chip, at least certain ones of the solder bumps having center-to-center spacings of less than about fifteen mils;

interconnecting at least certain ones of the solder bumps to at least certain ones of conductor pads of a test fixture;

said interconnecting step comprising the steps of, first, placing on the conductor pads a layer of anisotropic conductive material comprising a plurality of columns of conductive particles each extending across the thickness of the layer, second, placing the integrated circuit chip on the anisotropic conductive layer with the solder bumps contacting the anisotropic conductive layer, and third, compressing the integrated circuit chip against the anisotropic conductive layer with sufficient force to establish electrical interconnection between at least certain ones of said solder bumps and at least certain ones of the conductor pads by way of at least certain ones of said columns of conductive particles;

and testing the integrated circuit chip comprising the step of directing electrical current through the integrated circuit chip, at least some of the solder bumps, at least some of the columns of conductive particles, and at least some of the test fixture conductor pads;

wherein, prior to the interconnecting step, each solder bump is inserted through an aperture in a spacer member, the spacer member having a smaller thickness than the length of each solder bump, thereby to reduce the physical distortion of the anisotropic layer during the compression step and reducing the likelihood of spurious breakdown between adjacent conductive columns.

5,206,586

MAGNETOSTRICTIVE POSITION TRANSDUCER HAVING SQUARE-WAVE-IN-QUADRATURE-OUTPUT

Steven S. Yauch, Raleigh; Wade D. Peterson, Morrisville, and Lawrence J. Russell, Knightdale, all of N.C., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 667,565, Mar. 11, 1991, abandoned. This application Jul. 14, 1992, Ser. No. 913,739
Int. Cl.[5] G01B *7/14*; G01F *23/30*
U.S. Cl. 324—207.13 11 Claims

1. A magnetostrictive transducer for generating an indication of a magnet position along a magnetostrictive gauge comprising:

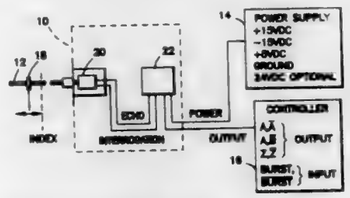
a magnetostrictive waveguide delay line;

pulse generator means for generating interrogation pulses on said delay line, in response to interrogation pulses on said delay line, in response to interrogate signals;

said magnet proximate said delay line, for converting interrogation pulses into acoustic pulses in said delay line, at the location of said magnet means;

mode converter means coupled to said wave guide for converting said acoustic pulses into corresponding echo signals;

time interval measuring means for measuring the time interval from interrogation signals to the reception of corresponding echo signals, and for generating a raw count value corresponding to said time measurement;



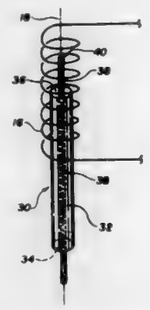
output conversion means for converting said raw count value to a plurality of quadrature pulses where the number of quadrature pulses indicates the position of said magnet on said waveguide.

5,206,587

INDUCTIVE DISPLACEMENT TRANSDUCER HAVING TELESCOPING PROBE ASSEMBLY

Mitchell Rose, 3718 Silsby Rd., University Heights, Ohio 44118

Continuation-in-part of Ser. No. 502,847, Mar. 30, 1990, Pat. No. 5,111,139. This application Oct. 23, 1991, Ser. No. 781,847
Int. Cl.[5] G01B *7/14*; H01F *21/06*
U.S. Cl. 324—207.16 10 Claims



1. A transducer for measuring linear displacement of an object, comprising:

a uniformly wound substantially cylindrical coil for generating a magnetic field when an electrical current passes therethrough, said coil having a predetermined length and an inductance determined in part by said length, said coil defining a hollow interior portion and having a longitudinal axis;

a probe assembly comprising a hollow aluminum tube disposed substantially within said hollow interior portion of said coil and having a first opening and a second opening, and further comprising a steel rod at least partially disposed within said hollow aluminum tube through said first opening, the position of each of said tube and said steel rod being manually adjustable with respect to each other and with respect to said coil in a direction co-axial with the longitudinal axis of said coil to cause a change in the inductance of said coil;

a protective shield surrounding a substantial portion of said probe assembly and said coil, said protective shield having

a slit aligned with said longitudinal axis of said coil and extending the entire length thereof;

an oscillating circuit connected electrically in parallel to said coil, said oscillating circuit being responsive to said change in the inductance of said coil to output an oscillating signal having a voltage amplitude varying as a function of the change in the inductance; and

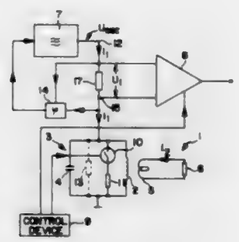
a demodulating circuit connected electrically in parallel to said oscillating circuit, said demodulating circuit being responsive to changes in said oscillating signal of said oscillating circuit to output a voltage signal which is linearly related to the axial position of said steel rod within said hollow aluminum tube.

5,206,588

APPARATUS AND PROCESS FOR THE NON-DESTRUCTIVE MEASUREMENT OF THE OHMIC RESISTANCE OF A THIN LAYER USING EDDY CURRENTS

Gernot Thorn, Hanau, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 345,037
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3815009
Int. Cl.[5] G01B *7/10*; G01R *33/12, 35/00*; G01N *27/72*
U.S. Cl. 324—230 22 Claims



1. An apparatus for the non-destructive measurement of the ohmic resistance of thin layers according to the Eddy Current Principle, wherein an inductor is fed with alternating current with the magnetic field of which produces an Eddy Current in the thin layers, the magnetic field of which opposes the original magnetic field of the inductor, and wherein the inductor with a capacitor forms an oscillating circuit (3) and a means for keeping the oscillating circuit always at resonance is provided, said means for keeping said oscillator always at resonance comprising a phase regulation means and further characterized in that the inductor (2) has a cover (37) and is so embedded in a roller (20) that a surface of the cover (37) is flushed with the surface of the roller (20), while the thin layer (1) to be measured is displaceable on a carrier foil (21) over the roller (20), a means for maintaining the thin layer at a constant distance from aid inductor is provided, an amplifier (8) is provided to amplify the current (i_1) flowing to the oscillating circuit (3), a voltage-to-current converter (57) is connected in series with the amplifier (8) and the gain of the amplifier (8) is stepwise switchable via several resistors (52–55).

5,206,589

METHOD OF MEASURING VECTOR MAGNETIC FLUX BY PERFORMING CURVED SURFACE INTERPOLATION WITH DATA OBTAINED BY PLURAL SQUID TYPE VECTOR MAGNETIC FLUX METERS, AND APPARATUS FOR CARRYING OUT THE SAME

Hisashi Kado, Kashiwa, and Tomoaki Ueda, Kyoto, both of Japan, assignors to Agency of Industrial Science & Technology and Daikin Industries, Ltd., Japan

Filed Sep. 27, 1991, Ser. No. 766,344
Claims priority, application Japan, Sep. 30, 1990, 2-262014
Int. Cl.[5] G01R *33/035*; A61B *5/05*; G06G *7/30*
U.S. Cl. 324—248 2 Claims

1. A method for determining vector magnetic flux within a predetermined region based on data indicative of vector magnetic flux components, the components indicative data being obtained by plural vector magnetic flux meters disposed at predetermined relative positions within said region, each vector magnetic flux meter including a body which has plural faces crossing at predetermined angles to one another, and plural pickup coils each disposed on a corresponding one of the faces, each of the pickup coils corresponding to a SQUID flux meter whereby each vector magnetic flux meter has a corresponding plurality of SQUID flux meters, said method comprising the steps of:

measuring vector magnetic flux, which includes magnetic flux components in plural directions, said step of measuring comprising collecting data indicative of the magnetic field flux components using the plural vector magnetic flux meters to obtain collected data, and holding the collected data,

performing curved surface interpolation using the held data indicative of the measured magnetic flux components in each corresponding direction to provide curved surface interpolation data, and

obtaining data indicative of vector magnetic flux at arbitrary points in said predetermined region by using the curved surface interpolation data, said predetermined region being a region wherein interpolation regions corresponding to all the magnetic flux components overlap.

5,206,590

MAGNETORESISTIVE SENSOR BASED ON THE SPIN VALVE EFFECT

Bernard Dieny, San Jose; Bruce A. Gurney, Santa Clara; Steven E. Lambert, San Jose; Daniele Mauri, San Jose; Stuart S. P. Parkin, San Jose; Virgil S. Speriosu, San Jose, and Dennis R. Wilhoit, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1990, Ser. No. 625,343
Int. Cl.[5] G01R *33/02*; H01L *43/08*; G11C *19/08*; G11B *5/39*
U.S. Cl. 324—252 16 Claims

1. The magnetoresistive sensor comprising:

a first and a second thin film layer of ferromagnetic material separated by a thin film layer of non-magnetic metallic material, the magnetization direction of said first layer of ferromagnetic material being substantially perpendicular to the magnetization direction of said second layer of ferromagnetic material at zero applied magnetic field;

means for fixing the magnetization direction of said second layer of ferromagnetic material;

means for producing a current flow through said magnetoresistive sensor; and

means for sensing the variations in the resistivity of said

5,206,592

trometer having means for controlling the generation and phase of RF pulses and other functions in response to function

positioning a sensor proximate to an open point in said power distribution circuit;

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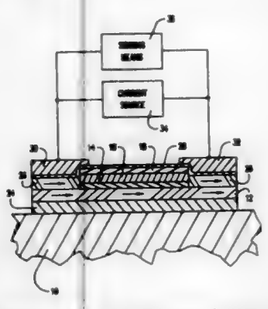
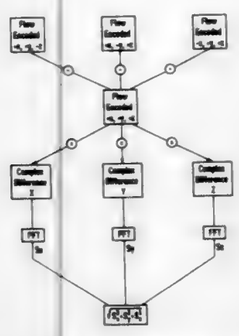
means for sensing the variations in the resistivity of said magnetoresistive sensor due to rotation of the magnetization in said first layer of ferromagnetic material as a function of the magnetic field being sensed.



5,206,591
METHOD FOR OBTAINING DATA IN PHASE-CONTRAST MR ANGIOGRAPHY
Richard Hausmann, Erlangen, Fed. Rep. of Germany, and Gerhard Laub, Edison, N.J., assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany
Filed Oct. 23, 1991, Ser. No. 781,796
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—306 **7 Claims**



1. A method for obtaining data for phase-contrast MR angiography, which method is sensitive to flow in a sample in three orthogonal directions, comprising:

a sequence with four steps:

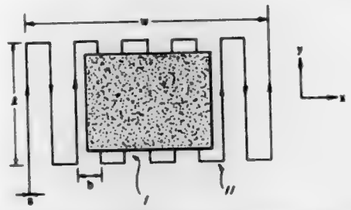
a first step comprising excitation of spins in said sample and flow encoding said spins in a positive direction;

three further steps whereby in each further step flow encoding of said spins is inverted in one of said orthogonal directions and positive in the other two directions, and said one direction is a different one of said three directions in each of said three further steps;

sampling the signals obtained during each of said above four steps; and

obtaining a raw data set for each of said orthogonal directions by complex subtraction of the signals obtained by one of said further steps and of the signals obtained by said first step.

5,206,592
DETECTION OF EXPLOSIVES BY NUCLEAR QUADRUPOLE RESONANCE
Michael L. Buess, 4337 Taney Ave., Apt. #304, Alexandria, Va. 22304; Allen N. Garroway, 13404 Kris Ran Ct., Fort Washington, Md. 20744, and Joel B. Miller, 3003 Crest Ave., Cheverly, Md. 20785
Filed May 23, 1991, Ser. No. 704,744
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **19 Claims**



1. A system for detecting a class of explosives and narcotics containing nitrogen in a specimen by nuclear quadrupole resonance, comprising:

pulse generating means for generating a train of radio frequency pulses having a predetermined frequency;

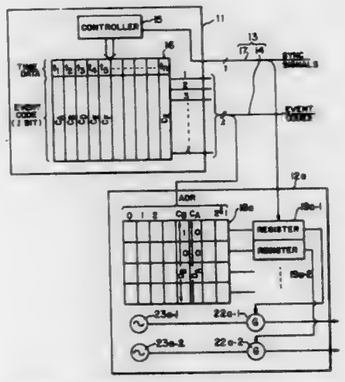
a meanderline surface coil for irradiating the specimen with said train of radio frequency pulses and detecting an integrated nitrogen signal in response to irradiating the specimen;

coupling means for transmitting said train of radio frequency pulses to said meanderline surface coil and receiving said integrated nitrogen signal from said surface meanderline coil;

comparing means for comparing said integrated nitrogen signal to a predetermined threshold value; and

an alarm for signalling when said integrated nitrogen signal exceeds said predetermined threshold value.

5,206,593
REAL-TIME CONTROL SYSTEM FOR NMR SPECTROMETER
Noriaki. Kurihara; Kozo Sato, both of Tokyo, Japan; Gary L. Samuelson, Amesbury, and Howard S. Hutchins, Byfield, both of Mass., assignors to Joel Ltd., Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 605,997
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—312 **1 Claim**



1. A real-time control system for use with an NMR spectrometer having means for controlling the generation and phase of RF pulses and other functions in response to function control signals, said control system comprising:

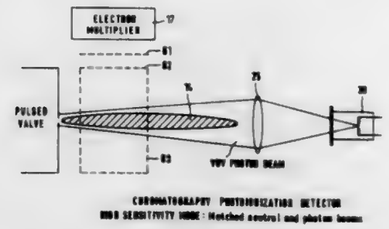
a control section having means for storing timing data and event codes and a plurality of controlled sections having means for storing event data;

said control section having means for successively producing synchronizing signals according to said stored timing data and successively outputting event code data previously stored in the control section and which outputs event codes prior to the generation of each synchronizing signal;

an event bus including a single synchronizing control line for transmitting the synchronizing signals to each controlled section simultaneously and an event code bus for transmitting the event codes placed thereon by said control section to each controlled section simultaneously; and

said controlled sections connected with the event bus, the event data being stored in association with event codes, each controlled section accepting each event code placed on the event code bus and reading the event data from the storage means thereof according to the event codes sent through the event code bus to all controlled sections to generate function control signals for the control of the NMR spectrometer according to the event data read from the storage means of each controlled section at the timing determined by the synchronizing signals.

5,206,594
APPARATUS AND PROCESS FOR IMPROVED PHOTOIONIZATION AND DETECTION
Edward C. Zipf, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed May 11, 1990, Ser. No. 522,191
Int. Cl.[5] G01N *27/62*
U.S. Cl. 324—464 **27 Claims**



1. A method for selectively photoionizing a sample gas comprising the steps of:

A. introducing said gas into a spatially limited ionization region of a vacuum chamber in a high density stream at a pressure of from about 0.8 to 150 torr, said vacuum chamber being maintained at a pressure less than 10^{-3} torr; and

B. directing a flash of high intensity vacuum ultraviolet photons at said gas as it enters said ionization region.

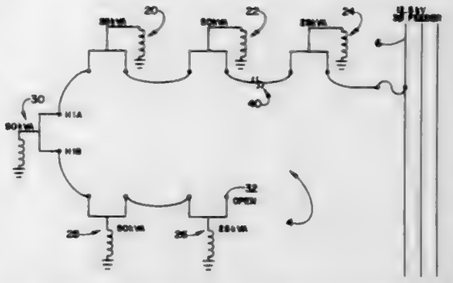
5,206,595
ADVANCED CABLE FAULT LOCATION
Carl M. Wiggins; Frank S. Nickel, both of Albuquerque; David E. Thomas, Peralta; Stephen J. Halko, Corrales; Thomas M. Salas, and Gary H. Shapiro, both of Albuquerque, all of N. Mex., assignors to Electric Power Research Institute, Palo Alto, Calif.
Filed Sep. 10, 1991, Ser. No. 757,176
Int. Cl.[5] G01R *31/08*
U.S. Cl. 324—535 **50 Claims**

1. A method for locating a fault occurring in an underground residential power distribution (URD) circuit having a predetermined propagation velocity, comprising:

positioning a sensor proximate to an open point in said power distribution circuit;

sensing a first electrical signal propagating from a line fault using said a sensor;

sensing a second electrical signal with said sensor, said second signal being produced by said first signal reflecting from said open point to said fault and back to said sensor;

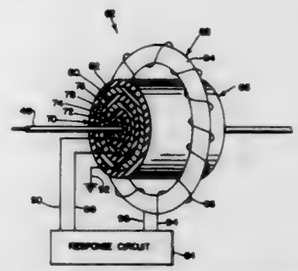


measuring a time interval occurring between sensing of said first and second electrical signals;

determining a distance of said fault from said sensor based on said time interval and predetermined propagation velocity; and

indicating said distance of said fault from said sensor to allow location of said fault.

5,206,596
ARC DETECTOR TRANSDUCER USING AN E AND B FIELD SENSOR
Bruce C. Belhoff, Wauwatosa; Charles J. Tennies, Waukesha, and Jerome K. Hastings, Sussex, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Mar. 28, 1991, Ser. No. 676,781
Int. Cl.[5] G01R *31/12*
U.S. Cl. 324—536 **5 Claims**



1. An arc detector transducer for an electric circuit including an electrified conductor connecting a voltage source to a load, said arc detector transducer comprising an E field sensor sensing the E field established about said electrified conductor by the occurrence of an electrical arc in said circuit, and a B field sensor sensing the B field established about said electrified conductor by the occurrence of an electrical arc in said circuit, wherein said B field sensor comprises a current transformer around said electrified conductor, said current transformer comprising a core, a conductive coil wrapped around said core and having first and second leads, and a conductive shield enclosing said core and said coil, and wherein said shield comprises first and second annular cups facing each other and defining an enclosed annular space therebetween, and wherein said core and said coil are received in said annular space.

5,206,597
CAPACITIVE MOISTURE DETECTION APPARATUS

5,206,600
IMPEDANCE DETERMINING APPARATUS USING QUADRATURE CURRENT AND PEAK DETECTORS

predetermined value and preserving the algebraic sign of said differences;

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CAPACITIVE MOISTURE DETECTION APPARATUS

David F. Rivera, New London, Conn.; Charles E. Odams, Londonderry, N.H., and Michael J. McDonald, Jr., Niantic, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1990, Ser. No. 573,968
Int. Cl.[5] G01R 27/26
U.S. Cl. 324—664 5 Claims

1. An apparatus for detecting and measuring a volume of water in a cable, comprising:

means for measuring electrical capacitance along the cable, said measuring means being formed of two joinable, symmetric encasements which form a sleeve when joined and the cable being disposed so as to movably pass through the sleeve at a predetermined rate;

each of said encasements comprising i) a curved electrical conducting plate disposed in an arc of less than 180° about said cable, said conduction plate being electrically connected to a displaying means, and ii) cylindrical means for shielding said curved conducting plate from electrical interference, said cylindrical means disposed in an arc of 180° about said curved conducting plate;

said cylindrical means comprising i) a clyindrical brass shell encasing said curved conducting plate, said brass shell being at an electrical ground potential, and ii) non-conducting material interposed between said curved conducting plate and said cylindrical brass shell;

means for determining a position along the cable corresponding to said measured electrical capacitance; and

said display means for displaying said measured electrical capacitance at said position wherein said measured electrical capacitance is indicative of the volume of water in the cable at said position.

5,206,598

ISOTHERMAL CAPACITANCE TRANSIENT SPECTROSCOPY METHOD AND APPARATUS

Issei Yokoyama, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed May 27, 1992, Ser. No. 889,476
Claims priority, application Japan, Jun. 1, 1991, 3-157569
Int. Cl.[5] G01R 31/26
U.S. Cl. 324—676 8 Claims

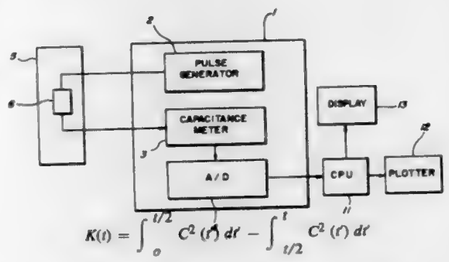
1. A method of determining the amount of impurities in an object with isothermal capacitance transient spectroscopy (ICTS), comprising the steps of:

maintaining the object at a constant temperature;

applying a predetermined voltage pulse to the object at predetermined test locations;

measuring the capacitance over a predetermined time period, and

processing the measured capacitance to determine the amount of impurities in accordance with a differential coefficient obtained by differentiating the following equation used as the ICTS spectrum:



$$K(t) = \int_0^{t/2} C^2(t')\,dt' - \int_{t/2}^{t} C^2(t')\,dt'$$

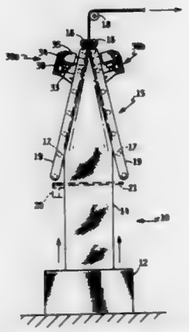
wherein C is the capacitance and t is the time period.

5,206,599

CAPACITANCE SENSOR FOR MEASURING THICKNESS OF BLOWN FILM INCLUDING A COLLAPSING FRAME AND A PAIR OF LINEAR MOTOR ASSEMBLIES

Daniel W. Mayer, St. Paul, Minn., assignor to Modern Controls, Inc., Minneapolis, Minn.

Filed Aug. 1, 1991, Ser. No. 739,176
Int. Cl.[5] G01R 27/26; G01B 7/08
U.S. Cl. 324—671 7 Claims



3. A system for measuring thickness of blown film in a blown film machine utilizing an A-shaped collapsing frame to transform a rotating cylindrical film bubble shape to a flattened film bubble shape, comprising:

a) a pair of linear motor assemblies, each motor assembly affixed to a different side of the A-shaped collapsing frame, each assembly having a fixed platen element and a movable forcer element;

b) a capacitance sensor mounted to each of said forcer elements, said capacitance sensor having a sensor head for making film thickness measurement facing toward said flattened film bubble shape; and

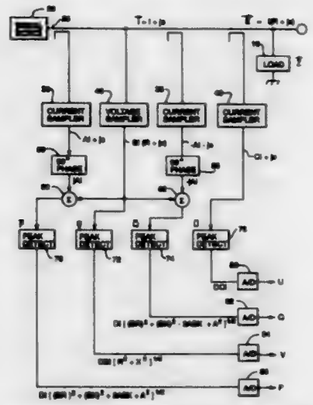
c) means for moving said forcer elements along said fixed platen to substantially traverse each side of said collapsing frame in a time increment substantially less than the time required for a complete rotation of the cylindrical film bubble.

5,206,600

IMPEDANCE DETERMINING APPARATUS USING QUADRATURE CURRENT AND PEAK DETECTORS

Richard H. Moehlmann, Rochester, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 18, 1991, Ser. No. 779,046
Int. Cl.[5] G01R 27/02
U.S. Cl. 324—650 1 Claim



1. A system to compute the parameters of a complex load impedance comprising:

a signal source;

a load;

a transmission path for transmitting an RF signal from said signal source to said load;

quadrature current samplers for providing measures of the current in the RF signal;

a voltage sampler for providing a measure of the voltage in the RF signal;

plural peak detectors to detect the peak of the measures of current and voltage;

analog to digital converters to convert the signals output from the peak detectors to digital signals;

a digital computational unit to compute the parameters of the impedance of the load from the digital signals and from a signal indicating the frequency of said RF signal sources.

5,206,601

ORDER STATISTIC SIGNAL PROCESSOR FOR ESTIMATING VALUES OF SIGNAL PARAMETERS AND DEMODULATING AMPLITUDE-, PHASE-, AND FREQUENCY-MODULATED SIGNALS

Patrick J. Ready, Westlake Village, Calif., assignor to Elanix Inc., Westlake Village, Calif.

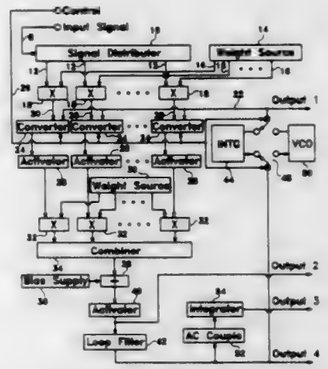
Filed Apr. 29, 1992, Ser. No. 875,743
Int. Cl.[5] H03D 1/02, 3/02, 5/00
U.S. Cl. 329—317 18 Claims

1. An order statistic signal processor for estimating the values of signal parameters and demodulating amplitude-, phase-, and frequency-modulated signals, said processor being adapted to receive an input signal and producing an output signal at a processor output terminal, said input signal being characterized by a plurality of parameters, one of said parameters being selected for processing, said processor comprising:

a means for generating a parameter reference;

a means for subtracting at successively-occurring times said parameter reference from each of a plurality of delayed versions of said selected signal parameter thereby obtaining differences;

a means for limiting the magnitudes of said differences to a predetermined value and preserving the algebraic sign of said differences;



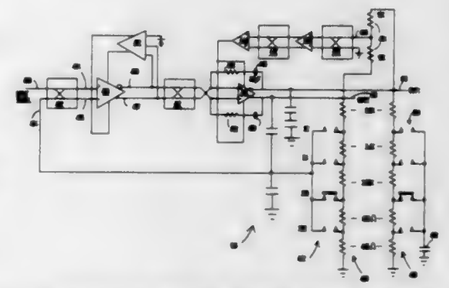
a means for adding said limited differences together thereby obtaining said output signal.

5,206,602

BIOMEDICAL AMPLIFIER CIRCUIT

Richard A. Baumgartner, Palo Alto, Calif., and Charles E. Moore, Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 30, 1992, Ser. No. 876,612
Int. Cl.[5] M03F 1/02
U.S. Cl. 330—9 6 Claims



1. An electronic differential amplifier circuit comprising;

first stage amplifier means for receiving an input voltage and a gain feedback voltage and for generating a pair of first stage outputs by differentially amplifying said input voltage and said gain feedback voltage;

wherein said first stage amplifier means is chopper stabilized; and

second stage amplifier means for receiving said pair of first stage outputs and for generating a pair of second stage outputs by differentially amplifying said pair of first stage outputs;

wherein said pair of second stage outputs further comprise a negative gain second stage output and a positive gain second stage output; and

second stage common mode feedback means for receiving said pair of second stage outputs and for generating an average voltage by summing said pair of second stage outputs and for generating a second stage common mode feedback voltage by differentially amplifying said average voltage and a ground voltage;

wherein said second stage common mode feedback means

a plurality of N input ports to which a plurality of signals of

5,206,606

CONTROL CIRCUIT FOR SIGNAL LEVEL

variations of the amplifier and said second point being positioned at a center of the Smith chart;

wherein said second stage common mode feedback means is chopper stabilized; and

gain feedback means for receiving said negative gain second stage output and for generating said gain feedback voltage by forming a fraction of said negative gain second stage output.

5,206,603

CIRCUIT ARRANGEMENT WITH ELECTRONICALLY CONTROLLABLE TRANSFER CHARACTERISTIC

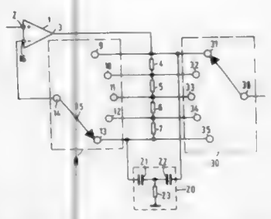
Ernst-August Kilian, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1991, Ser. No. 697,846

Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4015019

Int. Cl.[5] H03F *1/34*

U.S. Cl. 330—107 **16 Claims**



1. A control circuit with an electronically controllable transfer characteristic, comprising: an amplifier with controllable negative feedback having an input for receiving an input signal, means connecting an output of the amplifier to a voltage-divider circuit having a frequency-dependent characteristic, said voltage-divider circuit having a plurality of taps connected to an inverting input of the amplifier via first electronically controllable switch and to an output of the control circuit via a second electronically controllable switch wherein the first and second switches are controlled in a manner such that for boosting the input signal in a frequency band determined by

the frequency-dependent voltage divider

the first switch is set to a position such that boosting is effected with the desired frequency bandwidth, and that

the position of the second switch is selected so as to obtain boosting to the desired degree, and that

for attenuating the input signal in the frequency band determined by the frequency-dependent voltage divider

the second switch is set to a position such that attenuation is effected with the desired frequency bandwidth, and that

the first switch is set to such a position as to obtain attenuation to the desired degree.

5,206,604

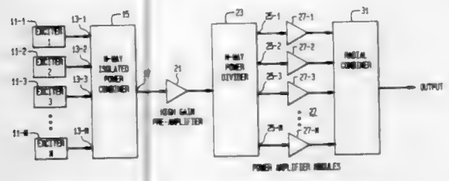
BROADBAND HIGH POWER AMPLIFIER

Roy A. Vaninetti, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 20, 1991, Ser. No. 811,168

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—124 R **3 Claims**



1. A broadband high power amplifier comprising:

a plurality of N input ports to which a plurality of signals of differing frequencies are applied;

an N-way power combiner coupled to combine the plurality of signals applied to said input ports and provide a combined output signal at an output port thereof;

a preamplifier coupled to amplify the combined output signal provided by said N-way power combiner;

an M-way power divider having an input coupled to receive the amplified combined output signal from said preamplifier and providing said input port and a plurality of M output ports from which M subdivided combined output signals are derived;

a plurality of signal amplifier stages having matched amplitude and phase characteristics, respectively coupled to the plurality of output ports of said power divider; and

a radial power combiner having a plurality of inputs respectively coupled to outputs of said plurality of signal amplifier stages, and having an output from which an amplified signal is derived.

5,206,605

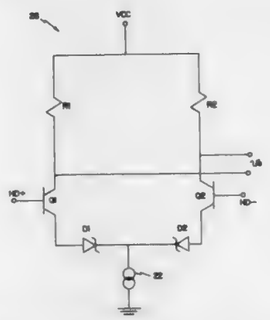
HIGH BREAKDOWN VOLTAGE/LOW INPUT CAPACITANCE AMPLIFIER

Craig M. Brannon, Golden Valley, and John J. Price, Edina, both of Minn., assignors to VTC, Inc., Bloomington, Minn.

Filed Mar. 13, 1992, Ser. No. 850,672

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—252 **24 Claims**



1. An amplifier, comprising:

first and second transistors, each transistor having a conduction path, with first and second conduction path terminals, and a control terminal for controlling conduction through the conduction path;

a current source;

a voltage reference terminal for being coupled to a voltage reference;

a first Schottky diode coupled between the second conduction path terminal of the first transistor and the current source;

a second Schottky diode coupled between the second conduction path terminal of the second transistor and the current source;

a third Schottky diode coupled between the first conduction path terminal of the first transistor and the voltage reference terminal; and

a fourth Schottky diode coupled between the first conduction path terminal of the second transistor and the voltage reference terminal.

5,206,606

CONTROL CIRCUIT FOR SIGNAL LEVEL

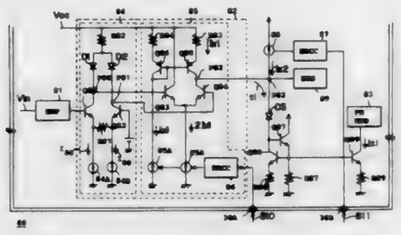
Futao Yamaguchi, Kanagawa; Takeshi Ikeda, and Osamu Yoshioka, both of Kagoshima, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1992, Ser. No. 860,991

Claims priority, application Japan, Mar. 31, 1991, 3-092937; Mar. 31, 1991, 3-092938

Int. Cl.[5] H03F *3/45*; H04N *5/52*

U.S. Cl. 330—254 **3 Claims**



1. A signal level control circuit for controlling the first and second peak levels of an output signal supplied to a signal processing circuit through a load resistor to a desired signal level by controlling first and second reference potentials impressed across said load resistor, comprising:

a first reference potential control means for controlling said first reference potential by connecting one end of said load resistor to the junction at which a first internal resistor and a first constant current source are connected and controlling a first external reference current flowing from said internal resistor to said constant current source; and

a second reference potential control means for controlling said second reference potential by connecting the other end of said load resistor to the junction at which a second internal resistor and a second constant current source are connected and superimposing said other end on a second reference current flowing to said second constant current source to thereby control a gain of an AC current flowing to said second internal resistor.

5,206,607

INPUT MATCHING CIRCUIT

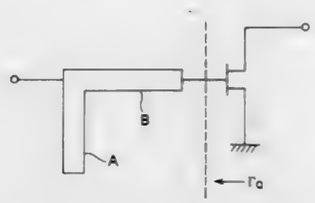
Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 29, 1991, Ser. No. 677,433

Claims priority, application Japan, Apr. 13, 1990, 2-98381

Int. Cl.[5] H03F *3/60*

U.S. Cl. 330—286 **3 Claims**



1. A method for constructing an input matching circuit adapted to be connected to an input circuit of an amplifier, comprising the steps of:

(a) drawing a line on a Smith chart, said lien connecting a first point and a second point, said fist point being on the Smith chart and indicating a man value of variations of an optimum signal source impedance due to manufacturing variations of the amplifier and said second point being positioned at a center of the Smith chart;

(b) determining a third point and a fourth point on said line drawn in step (a), said third point and said fourth point being spaced from said mean value by predetermined multiples of a standard deviation of variations of said optimum signal source impedance;

(c) obtaining a crosspoint and equi-noise index circles crossing said line drawn in step (a) at said crosspoint, said equi-noise index circles being circles of a group which respectively have said cited point and said fourth point as the optimum signal source impedance and imparting the aem noise index;

(d) designing an input matching circuit wherein the signal source impedance as viewed from said low noise amplifier has the impedance indicated by said crosspoint; and

(e) constructing an input matching circuit in accordance with the design of step (d).

5,206,608

DRAIN BIAS CIRCUIT FOR HIGH POWER MICROWAVE FIELD EFFECT TRANSISTORS (FETS) HAVING INTERNAL MATCHING

Francisco T. Torres, E - Barcelone, Spain, assignor to Agence Spatiale Europeenne, Paris, France

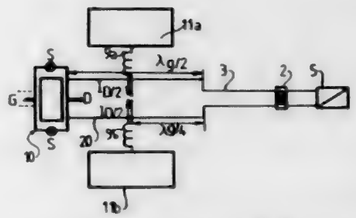
PCT No. PCT/FR91/00082, § 371 Date Oct. 7, 1991, § 102(e) Date Oct. 7, 1991, PCT Pub. No. WO91/12659, PCT Pub. Date Aug. 22, 1991

PCT Filed Feb. 5, 1991, Ser. No. 768,849

Claims priority, application France, Feb. 6, 1990, 90 01342

Int. Cl.[5] H03F *3/60*

U.S. Cl. 330—277 **2 Claims**



2. A drain bias circuit for a high power FET having internal matching for use in an amplifier operating in the microwave range, said FET having a gate electrode, a source electrode and a drain electrode, the circuit comprising:

a transmission line having a low impedance microstrip of length λg/2 where λg is the wavelength of waves travelling on the microstrip, one end of the transmission line being connected to the drain electrode, the microstrip having a center; and

first and second RF choke coil means each for sending one-half of a drain bias current of the FET from a bias current source means to the center of the microstrip.

5,206,609

CURRENT CONTROLLED OSCILLATOR WITH LINEAR OUTPUT FREQUENCY

Dejan Mijuskovic, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 15, 1992, Ser. No. 883,437

Int. Cl.[5] H03B *5/24*

U.S. Cl. 331—57 **16 Claims**

1. An oscillator circuit, comprising:

a plurality of differential amplifier stages serially coupled output to input with a differential output of a last differential amplifier stage cross-coupled to a differential input of a first differential amplifier stage; and

a control circuit having first and second outputs coupled to

said plurality of differential amplifier stages for adjusting

said second position, while said housing blocks said arms of said first passage;

5,206,612

SYSTEM FOR COMBINING HIGH FREQUENCY SIGNALS

tribute an electric field across said flange opening in a predetermined direction that is both normal to a propaga-

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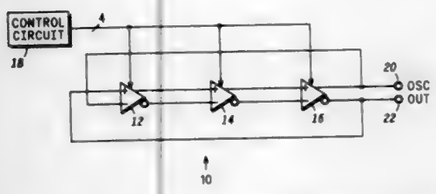
said plurality of differential amplifier stages for adjusting an output frequency of the oscillator circuit while maintaining linear operation of said output frequency over a control range, said control circuit including,

(a) a first differential amplifier having first and second inputs and an output, said first input receiving a first reference signal, said output providing said first output of said control circuit,



(b) a first transistor having a gate, a drain and a source, said gate being coupled to said output of said first differential amplifier, said drain being coupled to a first power supply conductor, said source being coupled to said second input of said first differential amplifier, and

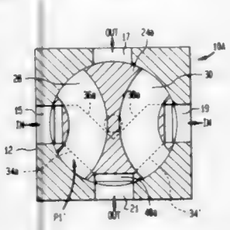
(c) a second transistor having a gate, a drain and a source, said gate receiving a first control signal, said source being coupled to a second power supply conductor, said drain being coupled to said source of said first transistor.

5,206,610

TRANSFER DEVICE FOR COMBINING AND SWITCHING MICROWAVE SIGNAL USING A ROTARY WAVEGUIDE SWITCHING STRUCTURE

Victor Nelson, 8 Midvale Ct., East Northport, N.Y. 11731

Filed Jun. 3, 1991, Ser. No. 709,311
Int. Cl.[5] H01P *1/10*
U.S. Cl. 333—106 **10 Claims**



1. A transfer device for selectively combining and switching a plurality of microwave signals, comprising;

a housing having a cylindrical cavity open at one end of said housing and having four orthagonally oriented mutually rectangular walls with first, second, third and fourth ports therein respectively, opening into said cavity;

a cylindrical rotor having a central axis of rotation disposed in said cavity and turnable in succession to a first, second and third and fourth spaced position in said housing;

said rotor having portions defining at least in part a first passage having first, second and third arms aligned with and terminating at said first, third and fourth ports respectively when said rotor is in said first position, said passage providing means for propagating a first and a second microwave signal respectively applied to said first and second arms and for combining said signals in said third arm to leave said housing via said fourth port;

said rotor having second and third passages disposed in a first plane therein and defining respectively a first path for said first microwave signal between said first and second ports and a second path for said second microwave signal between said third and fourth ports when said rotor is in said second position, while said housing blocks said arms of said first passage;

said first path extending between said first and fourth ports to pass microwaves therethrough, and second path extending between said second and third ports to pass microwaves therethrough, when said rotor is in said third position, while said housing blocks said arms of said first passage, said first passage having portions of said first, second and third arms disposed in a second plane parallel to said first plane and spaced axially from said first plane;

said housing having portions blocking said second and third passages when said rotor is in said first position, to prevent switching of microwave signals in said second and third passages while microwave signals are being combined in said first passage;

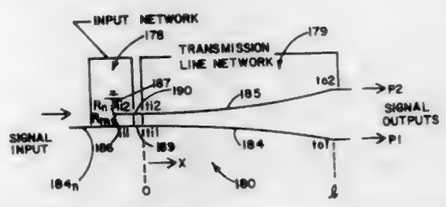
whereby said rotor operates to combine microwave signals in said first passage when said rotor is in said first position, and whereby said rotor operates to switch microwave signals in said first and second paths when said rotor is turned to said second and third positions.

5,206,611

N-WAY MICROWAVE POWER DIVIDER

Thomas J. Russell, Sunnyvale, Calif., assignor to Krytar, Inc., Sunnyvale, Calif.

Filed Mar. 12, 1992, Ser. No. 853,410
Int. Cl.[5] H01P *5/12*
U.S. Cl. 333—127 **15 Claims**



1. A microwave N-way power divider, where N is an integer greater than 1, comprising:

a transmission line network having N substantially uncoupled output ports, and N transmission lines, with each transmission line having an input end, and an output end connected to a corresponding one of said N output ports, said transmission lines being significantly coupled together at said input ends and providing a low reflection transformation from said output ports to said input ends; and

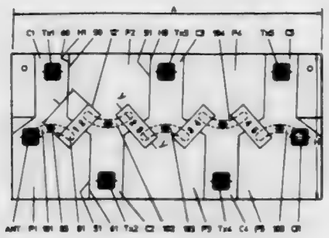
an input network having an input port for receiving microwave frequency energy within a band of frequencies from a source, and N signal paths coupling said input port to said input ends of said N transmission lines, said input network including at least N−1 resistors, with each of said N−1 resistors having an end connected to a different one of said input ends of said transmission lines, and said input network providing a low reflection termination for all signals incident from said input ends of said transmission lines.

5,206,612

SYSTEM FOR COMBINING HIGH FREQUENCY SIGNALS

Enzo C. D'Oro, Monza, and Vittorio Tansini, Milan, both of Italy, assignors to FOR.E.M. S.p.A., Agrate-Brianza, Italy

Filed Dec. 18, 1991, Ser. No. 810,729
Claims priority, application Italy, Dec. 28, 1990, 22559 A/90
Int. Cl.[5] H01P *1/213*
U.S. Cl. 333—135 **13 Claims**



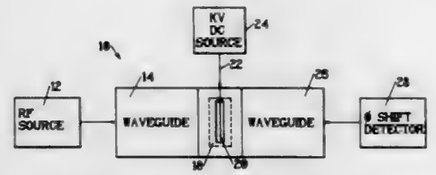
1. A system for coupling a plurality of high frequency band signals, comprising a plurality of cavity band-pass filters, each filter comprising: a box for containing an ancillary circuit; output and input connectors for coupling the filters together; and a housing, the housing including a base body and a tapered top body located above the base body, the top body having a substantially trapezoidal cross-section, the box having a width substantially equal to a width of a smallest side of the top body.

5,206,613

MEASURING THE ABILITY OF ELECTROPTIC MATERIALS TO PHASE SHAFT RF ENERGY

Donald C. Collier, Newtown; Kevin J. Krug, Stamford, and Brittan Kustom, Wilton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 19, 1991, Ser. No. 794,267
Int. Cl.[5] H01P *1/18*
U.S. Cl. 333—156 **13 Claims**



1. Apparatus for phase shifting radio frequency ("RF") energy, comprising:

RF means, for providing the RF energy at a selected frequency;

a waveguide flange, having a opening formed therein;

first waveguide means, having an opening of predetermined dimensions, for propagating the RF energy along an entire length thereof to said flange opening, said first waveguide means having a first dimension of said opening that is tapered downward in a direction from said RF means to said flange opening, and having a second dimension of said opening that is constant in a direction from said RF means to said flange opening;

a quantity of material disposed uniformly within said flange opening;

impedance matching means, comprising a pair of layers disposed on both sides of said material and adjacent thereto, for propagating the RF energy through said material, thereby minimizing any reflections of the RF energy when contacting surfaces of said material; and

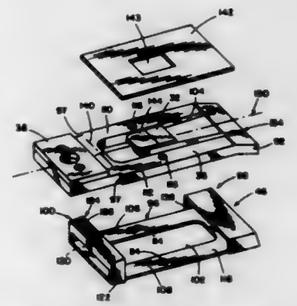
an electrode, disposed in said material and operable to distribute an electric field across said flange opening in a predetermined direction that is both normal to a propagation direction of the RF energy and parallel to a polarization direction of the RF energy, whereby said electric field changes a corresponding refractive index of said material, thereby producing a varying path length therein, resulting in a controllable alteration of propagation phase of the RF energy.

5,206,614

LINE CONDUCTOR GASKET

Arthur D. Carothers, Beaver Falls, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1991, Ser. No. 676,584
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—16 **22 Claims**



1. A molded case circuit breaker comprising:

a housing which includes a base portion, said base portion including a first wall with an opening and a second wall;

one or more pairs of separable main contacts disposed in said base portion;

a line conductor defining a terminal portion for connection to an external electrical circuit, coupled to one of said separable main contacts, said line conductor received in said opening in said first wall defining a first interface and disposed adjacent said second wall defining a second interface;

a load conductor coupled to the other of said separable main contacts;

an operating mechanism, operatively coupled to said one or more pairs of separable main contacts; and

a first molded gasket for providing a gas seal between said line conductor and said first interface.

5,206,615

SENSOR FOR MEASURING SOLUTE CONCENTRATION IN AN AQUEOUS SOLUTION

Yuko Fujita; Hisashi Kudo; Yoshiharu Iwasami, all of Kyoto; Haruo Nomi; Yoshihiko Shibata, both of Okayama, and Ryoso Ueno, Tokyo, all of Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.

PCT No. PCT/JP89/00350, § 371 Date Sep. 19, 1991, § 102(e) Date Sep. 19, 1991, PCT Pub. No. WO89/09387, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 31, 1989, Ser. No. 582,212
Claims priority, application Japan, Mar. 31, 1988, 63-76210
Int. Cl.[5] H01C *7/00*
U.S. Cl. 335—35 **4 Claims**

1. A sensor for measuring a concentration of a solute in an aqueous solution, characterized in that a humidity sensor is

surrounded by and sealed within a porous liquid water imper-

a shaft connected to said movable switch contact and penetrating said partition toward said second chamber;

site sides of the contact bridge support and with the other end in, respectively, one of recesses provided in housing sections,

5,206,619

TONER CARTRIDGE

Masahiro Kita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo

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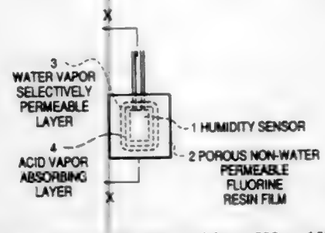
surrounded by and sealed within a porous liquid water impermeable water vapor permeable fluorine polymer film having a



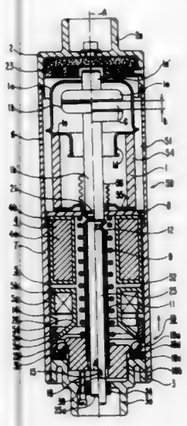
moisture vapor transmission rate of from 500 to 150000 g/m^2 per 24 hrs.

5,206,616

SWITCHING DEVICE FOR THE INTERRUPTION OF FAULT CURRENTS

Karl Stegmüller, Wiesent, Fed. Rep. of Germany, assignor to Sachsenwerk Aktiengesellschaft, Regensburg, Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 728,232
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021945
Int. Cl.^{5} H01H *67/02*
U.S. Cl. 335—126 **27 Claims**



1. A switching device for the interruption of a fault current, comprising:

a cylindrically shaped housing including: first and second electrical connectors for connection in the path of an electrical conductor carrying a single current phase; a partition separating said housing into first and second chambers; an insulating tube having an end face terminated at least in part by said first electrical connector which together form an exterior surface of said first chamber; a metal tube sealed against said first chamber by said partition, said metal tube having an end face within which said second electrical connector is inserted, with said metal tube and said second connector forming an exterior surface of said second chamber;

a vacuum switching chamber disposed in said first chamber, and coaxially arranged in said housing;

a stationary switch contact and a movable switch contact disposed in said vacuum switching chamber;

a shaft connected to said movable switch contact and penetrating said partition toward said second chamber;

first connection means disposed in said first chamber for connecting said stationary switch contact to said first electrical connector;

second connection means disposed in said second chamber for creating a displaceable contact connection between said shaft and said second electrical connector for electrically connecting said movable switch contact with said second electrical connector;

a current transformer disposed in said second chamber, coaxially arranged in said housing and including a secondary winding, and a primary circuit connected between said first and second electrical connectors for conducting said single current phase and inducing a corresponding current in said secondary winding;

magnet actuator means disposed in said second chamber, coaxially arranged in said housing and electrically connected in a circuit with said secondary winding of said current transformer, said magnet actuator means having an inactive state and an actuated state and being responsive to a fault current in said primary circuit of said current transformer, by way of the corresponding current in said secondary winding, for changing from the inactive state to the actuated state;

latch means disposed in said second chamber, coaxially arranged in said housing and coupled to said movable switch contact for latching said movable switch contact in a closed position with respect to said stationary switch contact and for being unlatched in response to a change to the actuated state of said magnet actuator means for moving said movable switch contact to an open position relative to said stationary switch contact;

a turn-off spring disposed in said second chamber and coaxially arranged in said housing for storing a spring force and operatively associated with said latch means for causing said latch means, under influence of the spring force, to separate said movable switch contact from said stationary switch contact when said latch means becomes unlatched; and

reset means operatively connected to said latch means for causing said latch means to latch said movable switch contact in the closed position and for restoring the spring force of said turn-off spring after said latch means is unlatched in response to a fault current.

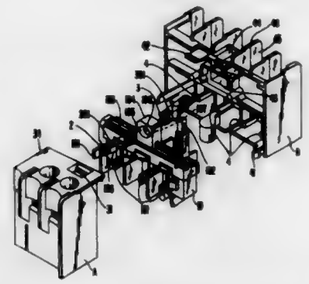
5,206,617

AUXILIARY SWITCH FOR AN ELECTROMAGNETIC SWITCHING DEVICE

Jakob Bolz, Nikolaus-GroB-Str. 4, D-5300 Bonn 1 / FRG, Fed. Rep. of Germany

PCT No. PCT/EP89/G0695, § 371 Date Dec. 19, 1991, § 102(e) Date Dec. 19, 1991, PCT Pub. No. WO90/16077, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 21, 1989, Ser. No. 778,803
Int. Cl.^{5} H01H *67/02*
U.S. Cl. 335—132 **6 Claims**

1. Auxiliary switch for an electromagnetic switching device with a drive, said switch comprising, in a multipartite housing equipped with fixed contacts, a contact bridge support secured in its position by means of a pressure spring and movable against the spring force upon energization/nonenergization of the drive of the switching device, said contact bridge support being provided with bridge contacts, characterized in that two pressure springs each with an axis located outside of an axis of movement of the contact bridge support are supported in the manner of a two-armed toggle joint respectively with one end in, respectively, one of blind holes formed on mutually opposite sides of the contact bridge support and with the other end in, respectively, one of recesses provided in housing sections,



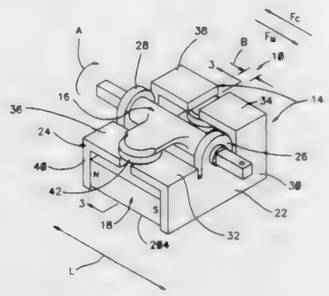
and exhibit a negative return spring characteristic against the tensile force of the drive.

5,206,618

MAGNETIC LATCH

Stuart Koch, Philadelphia, Pa., assignor to SPD Technologies Inc., Philadelphia, Pa.

Filed Nov. 26, 1991, Ser. No. 798,922
Int. Cl.^{5} H01F *7/08*
U.S. Cl. 335—253 **56 Claims**



1. A magnetic latch comprising:

a. a coil;

b. a frame receiving magnetic flux from said coil when energized, including spaced apart magnetically permeable means for carrying said coil flux;

c. a latching member mounted in said frame and rotatably movable between first and second positions;

d. said latching member including magnetically permeable means for selectably providing a magnetic flux bridge between said flux carrying means by contacting said flux carrying means when in said first position;

e. means providing magnetic flux, carried by said flux carrying means and said magnetically permeable bridging means portion of said latching member when in contact with said flux carrying means, opposing magnetic flux provided by said coil, for magnetically retaining said latching member in said first position when said coil is deenergized; and

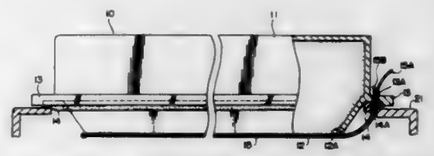
f. resilient means for biasing said latching member towards said second position with force sufficient to overcome magnetic retention of said latching member at said first position when said coil is providing magnetic flux to said flux carrying members, in direction opposite that of said flux providing means, through said magnetically permeable bridging means.

5,206,619

TONER CARTRIDGE

Masahiro Kita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,548
Claims priority, application Japan, Oct. 12, 1990, 2-107462[U]
Int. Cl.^{5} G03G *15/06*
U.S. Cl. 355—260 **7 Claims**



1. A toner cartridge to be coupled to a developing device for supplying a toner accommodated in said cartridge to said developing device through an opening formed on said developing device, comprising:

a main body in which the toner is adapted to be accommodated;

a flange portion formed on said main body, to be seated on a peripheral portion of said opening of said developing device;

a supply port which is formed on said main body, to be received in said opening and through which the toner is supplied from said main body;

a sheet member for removably covering said supply port, said sheet member being folded in a double-layered manner to have a first layer and a second layer and both end portions of said sheet member being positioned at one side of said cartridge, said first layer being adhered to a peripheral surface of said supply port in a detachable manner;

a sealing member interposed between said flange portion and said peripheral portion of said opening, when said cartridge is coupled to said developing device, for tightly closing said opening; and

slits which are formed through superposed portions of said flange portion and said sealing member and communicating with each other, for passing said both end portions of said sheet member so that said both end portions protrude outside from said main body when said cartridge is coupled to said developing device,

wherein said supply port is opened when one end portion of said second layer of said sheet member is pulled out.

5,206,620

SINTERED FERRITE BODY, CHIP INDUCTOR, AND COMPOSITE LC PART

Hideo Watanabe, Chiba; Yoichi Kanagawa, Tokyo; Takashi Suzuki, Ichikawa, and Takeshi Nomura, Matsudo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 213,225, Jun. 29, 1988, Pat. No. 4,956,114.
This application Jun. 18, 1990, Ser. No. 539,600
Claims priority, application Japan, Jul. 1, 1987, 62-164961; Jul. 1, 1987, 62-164962; Nov. 16, 1987, 62-289095
Int. Cl.^{5} H01F *15/04;* **C04B** *35/26;* **H05K** *7/00*
U.S. Cl. 336—84 M **18 Claims**

1. A chip inductor comprising at least one ceramic magnetic layer and at least one internal conductor layer placed one on

the other, said ceramic magnetic layer containing a ferrite and

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5,206,622

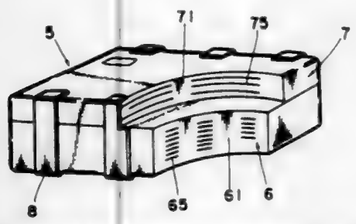
PROTECTOR DEVICE WITH IMPROVED BIMETAL

5,206,624

INTERMEDIATE PRODUCT FOR USE IN THE

having an opening for receiving said push rod for movement of said push rod between said operative position and

the other, said ceramic magnetic layer containing a ferrite and a borosilicate glass, wherein said borosilicate glass comprises



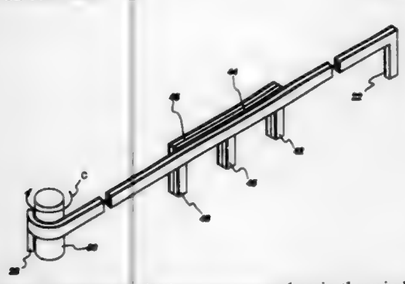
about 25 to about 35% by weight based on the weight of the ceramic magnetic layer.

5,206,621

BARREL-WOUND CONDUCTIVE FILM TRANSFORMER

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1990, Ser. No. 548,468
Int. Cl.[5] H01F *27/28*
U.S. Cl. 336—180 **30 Claims**



1. In a transformer, the improvement wherein the windings comprise:

a dielectric membrane having first and second major surfaces;

an elongated, continuous primary winding conductive film disposed on one of the major surfaces of said dielectric membrane, said primary conductive film having first and second terminal poritons extending at an angle therefrom at respective ends thereof;

a secondary winding conductive film on one of the major surfaces of said dielectric membrane, said secondary conductive film being situated adjacent to and insulated from said primary conductive film, said primary and secondary conductive films being disposed on opposite sides of a longitudinal axis, said secondary conductive film having first and second terminal portions extending at an angle therefrom;

said dielectric membrane being folded along at least one fold line parallel to said longitudinal axis so that said primary and secondary conductive films overlie each other; and

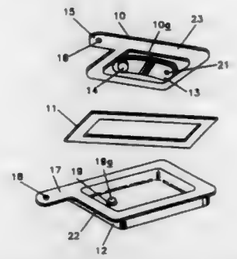
said dielectric membrane and said conductive films being wound about a central axis perpendicular to said longitudinal axis in the form of a spiral, such that said primary and secondary windings are situated in the same spiral plane, to provide a multi-turn, barrel-wound transformer winding structure having said primary and secondary terminal portions extending outwardly therefrom.

5,206,622

PROTECTOR DEVICE WITH IMPROVED BIMETAL CONTACT ASSEMBLY AND METHOD OF MAKING

Michael E. Lattari, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 10, 1992, Ser. No. 867,266
Int. Cl.[5] H01H *37/54, 37/52, 71/16*
U.S. Cl. 337—89 **10 Claims**



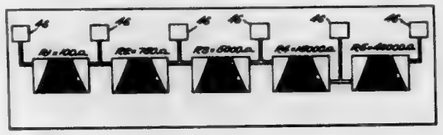
6. In a thermostatic protector having an electrically conductive can, an electrically conductive lid for closing said can to form a housing, an electrically insulative means interposed between said can and said lid member, a movable thermostatic contact assembly mounted on one of said can and said lid members, a stationary contact mounted on the other of said can and said lid members, said contact assembly having a contact on a thin thermostatic member so that said movable contact is movable into an out of engagement with said stationary contact, and terminals attached to said lid and said can, the improvement comprising said thermostatic member having weld projection means formed as an integral part of said thermostatic member for reliably and accurately attaching said movable contact to said thermostatic member.

5,206,623

ELECTRICAL RESISTORS AND METHODS OF MAKING SAME

Michel Rochette, Lyons, and Paul R. Simon, Nice, both of France, assignors to Vishay Intertechnology, Inc., Malvern, Pa.

Filed May 2, 1991, Ser. No. 695,044
Claims priority, application Israel, May 9, 1990, 094340
Int. Cl.[5] H01C *7/00, 7/22, 10/00, 1/02*
U.S. Cl. 338—203 **16 Claims**



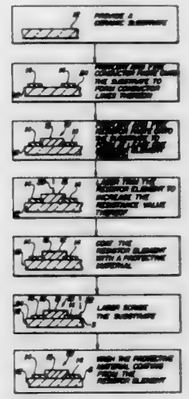
1. A resistor comprising an insulative substrate, first and second conductive terminals on the substrate, a multiplicity (n) of resistance units connected in series, by interconnecting first links joining alternate ones of said units at opposite ends thereof, second links providing selectively removable connections which are shorter than said units, and join said first links to said first and second terminals alternately, so that with all the second links intact the collective resistance of the units is the sum of all the units connected in parallel (R/n) and with all the second links removed, leaving only the first links, the collective resistance is the sum of all the lengths in series (nR), which collective resistance is adjustable in steps.

5,206,624

INTERMEDIATE PRODUCT FOR USE IN THE PRODUCTION OF THICK-FILM CIRCUITS

Daxesh K. Patel, Hatfield, Pa., and Jay D. Baker, Detroit, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 570,063, Jun. 29, 1988,. This application Feb. 27, 1992, Ser. No. 842,693
Int. Cl.[5] H01C *1/012*
U.S. Cl. 338—308 **16 Claims**



1. An intermediate product for use in the production of thick-film circuits comprising:

a substrate;

at least two conductor lines formed on said substrate;

at least one resistor element formed on said substrate and over a portion of each of said two conductor lines; and

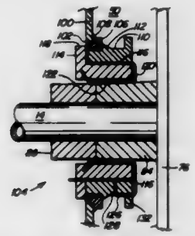
a readily removable protective material formed over said resistor to protect said resistor from hot-slag substrate material generated during a laser scribing operation, said protective material being adapted for easy removal after said laser scribing operation.

5,206,625

BRAKE WEAR INDICATOR

William E. Davis, 2615 Charter Hill Place, Coquitlam, British Columbia, Canada V3E 1R8

Filed Jun. 27, 1991, Ser. No. 722,206
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—454 **9 Claims**



1. An apparatus for monitoring brake condition for an air actuated diaphragm spring brake actuator having a push rod connecting the vehicle brake to the brake actuator, the push rod mounted for reciprocal movement between an operative position extending from said actuator and an inoperative position retracted within said actuator, comprising:

(a) a first member connected to the actuator;

(b) a second member cooperating with the first member having an opening for receiving said push rod for movement of said push rod between said operative position and said inoperative position therethrough;

(c) said second member movable with respect to said first member on application of pressure from said push rod;

(d) said second member comprising engaging means for engaging and retaining said second member with respect to said first member when said second member is moved by said push rod to a first predetermined position with respect to said first member corresponding to reciprocating movement of said push rod to a predetermined second operative position indicative of an actual or potential brake problem; and

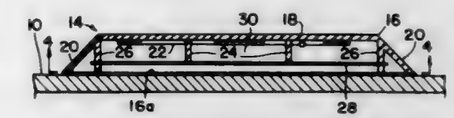
(e) said engaging means retaining said second member in a fixed position with respect to said first member irrespective of subsequent movement of said push rod.

5,206,626

STABILIZED ARTICLE SURVEILLANCE RESPONDER

Arthur J. Minasy, Woodbury, N.Y.; Samuel Seszjper, Los Angeles, Calif., and Scott H. Fisher, East Northport, N.Y., assignors to Knogo Corporation, Hauppauge, N.Y.

Filed Dec. 24, 1991, Ser. No. 812,949
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—572 **24 Claims**



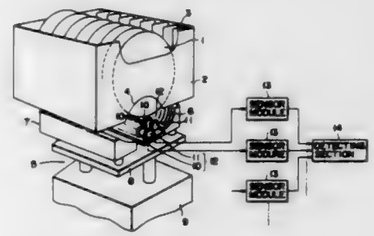
12. A responder for use in detecting the unauthorized movement of an article to which it is attached, said responder comprising an electric circuit lying in a flat plane and configured to respond to incident electromagnetic interrogation waves by producing predetermined detectable disturbances thereto, an electrically conductive plate, a support which mounts said circuit over said plate, said support being constructed to provide between said circuit and said plate, a dielectric region of sufficient thickness to prevent substantial degradation by said plate of the response of said circuit to said electromagnetic interrogation waves.

5,206,627

SUBSTRATE DETECTING SYSTEM WITH EDGE DETECTION, SUCH AS WAFER OR BASE MATERIAL OF SEMICONDUCTOR DEVICE OR LCD

Mitsuo Kato, Sagamihara, Japan, assignor to Tokyo Electron Sagami Limited, Kanagawa, Japan

Filed Nov. 20, 1991, Ser. No. 794,943
Claims priority, application Japan, Nov. 21, 1990, 2-316860
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—674 **19 Claims**



1. A substrate detecting apparatus, comprising:

a plurality of light-emitting/receiving means having light-

parallel adder circuits that simultaneously compute said intensity values for said multiplicity of the pixels encom-

data signals to said data driving means, and scan synchronization signal generating means responsive to said timing signals

plurality of odd number scanning-side electrodes and even number scanning-side electrodes for applying a positive or

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a plurality of light-emitting/receiving means having light-emitting sections arranged to correspond to substrates to be detected and light-receiving sections for receiving beams from the light-emitting sections, said substrates to be detected being a predetermined number of substrates arranged and accommodated at predetermined intervals in a substrate accommodating means;

moving means for relatively moving said plurality of light-emitting/receiving means and said substrates to be detected in directions cross or perpendicular to each other;

a plurality of signal processing means for detecting changes in amounts of received light in accordance with an output signal from each of said light-receiving sections when beams from said light-emitting sections are opposite to edge portions of said substrates to be detected, respectively, while said plurality of light-emitting/receiving means and said substrates to be detected are moved relative to each other in the directions cross or perpendicular to each other by said moving means; and

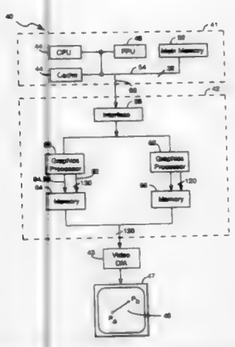
detecting means for detecting the presence/absence of said predetermined number of substrates to be detected which are arranged and accommodated in said substrate accommodating means in accordance with output signals from said plurality of signal processing means.

5,206,628

METHOD AND APPARATUS FOR DRAWING LINES IN A GRAPHICS SYSTEM

Brian M. Kelleher, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 438,754, Nov. 17, 1989, abandoned.
This application Jun. 30, 1992, Ser. No. 908,591
Int. Cl.[5] G09G *1/28*
U.S. Cl. 340—703 **10 Claims**



1. Graphics processing apparatus for drawing wide lines in a graphics system, the graphics system having a frame buffer storing pixel values, said graphics processing apparatus comprising:

line identifying apparatus for identifying a wide line L to be drawn and a planar region that emcompasses said wide line L; said planar region encompassing a multiplicity of pixels represented by a subset of the pixel values stored in said frame buffer; and

line drawing apparatus for drawing said wide line L, including:

control logic for assigning respective intensity values to at least three non-collinear pixels encompassed by said planar region, and for calculating from said assigned intensity values a set of intensity gradient parameters; and

a multiplicity of parallel pixel processors that simultaneously generate intensity values for a multiplicity of the pixels encompassed by said planar region and then store corresponding pixel values in said frame buffer; said multiplicity of parallel pixel processors including a multiplicity of parallel adder circuits that simultaneously compute said intensity values for said multiplicity of the pixels encompassed by said planar region in accordance with said calculated intensity gradient parameters and each pixel's position in encompassed by said planar region;

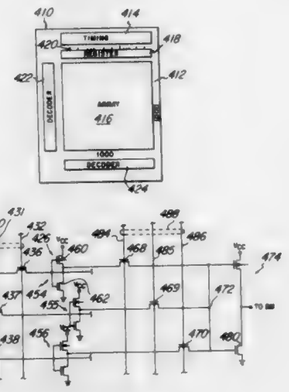
said parallel set of pixel processors including means for repeatedly generating intensity values on a different multiplicity of pixels until all pixels encompassed by said planar region have been computed and corresponding pixel values stored in said frame buffer.

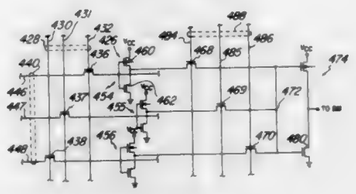
5,206,629

SPATIAL LIGHT MODULATOR AND MEMORY FOR DIGITIZED VIDEO DISPLAY

Thomas W. DeMond, Richardson, and E. Earle Thompson, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 315,639, Feb. 27, 1989, abandoned.
This application Jul. 3, 1991, Ser. No. 725,907
Int. Cl.[5] G09G *3/00*
U.S. Cl. 340—719 **10 Claims**





1. A spatial modulator comprising:

(a) an array of display cells;

(b) a plurality of memory cells;

(c) each said display selectively and alternatively directly connected to at least two different ones of said memory cells; and

(d) addressing circuitry for selecting which of said memory cells is directly connected.

5,206,630

IMPROVED DRIVING CIRCUIT FOR A GASEOUS DISCHARGE DISPLAY DEVICE WHICH PROVIDES REDUCED POWER CONSUMPTION

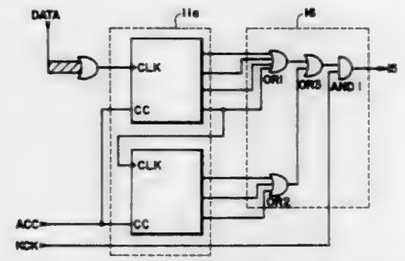
Jung-Hea Kim, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Hwasung-kun, Rep. of Korea

Filed Dec. 21, 1990, Ser. No. 631,457
Claims priority, application Rep. of Korea, Dec. 23, 1989, 89-19634
Int. Cl.[5] G09G *3/28*
U.S. Cl. 340—771 **3 Claims**

1. A gaseous discharge display processing circuit including a display matrix panel for generating an image thereon, data driving means for driving electrode columns of said display matrix panel associated with externally provided data signals, scan driving means for driving scan line electrode rows of said display matrix panel, data input means for receiving said externally provided data signals together with timing signals, data/-clock signal processing means responsive to said data signals and said timing signals for generating control signals and pixel data signals to said data driving means, and scan synchronization signal generating means responsive to said timing signals from said data input means for generating scan line synchronization signals, said gaseous discharge display processing circuit further comprising:

data counter means coupled to said data/clock signal processing means for receiving said pixel data and generating scan line pixel count information in response thereto;

and



scan control means responsive to said scan line pixel count information from said data counter means and select ones of said scan synchronization signals for generating a scan line enable signal to said scan driving means in response thereto,

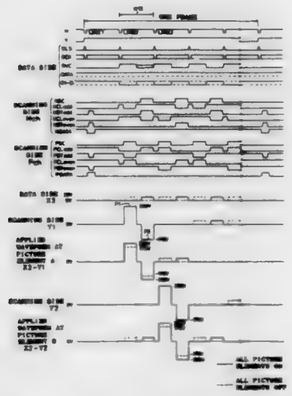
wherein said scan line enable signal is inactive when either no pixel data is available or when said selected synchronization signals indicate a no scan operation.

5,206,631

METHOD AND APPARATUS FOR DRIVING A CAPACITIVE FLAT MATRIX DISPLAY PANEL

Kyoichi Yamamoto, Yamatokooriyama; Shigeyuki Harada, Nara; Atsushi Sakamoto, Nara; Toshihiro Ohba, Nara, and Hiroshi Kishishita, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1991, Ser. No. 688,144
Claims priority, application Japan, Apr. 25, 1990, 2-111375
Int. Cl.[5] G09G *3/30*
U.S. Cl. 340—781 **17 Claims**



2. A driving device for a display device having a plurality of scanning-side electrodes, a plurality of data-side electrodes, and dielectric layers interposed therebetween, picture elements being formed at intersections of the scanning-side electrodes and data-side electrodes, comprising:

scanning-side electrode driving means connected to the plurality of odd number scanning-side electrodes and even number scanning-side electrodes for applying a positive or negative polarity write voltage to the scanning-side electrodes;

data-side electrode driving means connected to the plurality of data-side electrodes which, when a picture element on the scanning-side electrode supplied with a write voltage is to be driven for light emission, applies a modulating voltage that cooperates with each write voltage to set a cumulative voltage of the applied modulated and write voltages applied to picture element above a threshold voltage, to the corresponding data-side electrode, and when the picture element is not driven for light emission, applies a modulating voltage, which cooperates with each write voltage to set a cumulative voltage of the applied modulated and write voltages applied to picture element below a threshold voltage, to the corresponding data-side electrode; and

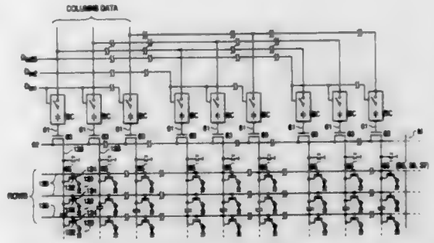
display control means for controlling the scanning-side electrode driving means and the data-side electrode driving means and reversing the polarity of said cumulative voltage applied between the data-side electrode and the scanning-side electrode corresponding to the picture element to be driven for light emission, one or more times during the period required to scan a single picture element on the scanning-side electrode.

5,206,632

ACTUATING CIRCUIT FOR A LIQUID CRYSTAL DISPLAY

Antoine Dupont, Villingen; Michael Maier, Bad Peterstal-Griesbach, both of Fed. Rep. of Germany; Bernard Hepp, Neuilly, France, and Eric Benoit, Schwenningen, Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,462
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1989, 3930259
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **11 Claims**



1. An actuation circuit for a liquid crystal display, comprising:

a plurality of actuation lines arranged in columns and a plurality of selection lines arranged in rows intersecting the columns;

a matrix of pixel elements each being operatively connected at an intersection of the columns and rows of said actuation and selection lines, respectively, said columns of actuation lines being grouped in a number of separate blocks of actuation lines;

a plurality of column capacitors each coupled to a respective one of said actuation lines;

a plurality of data lines for receiving data signals and feeding the data signals in parallel to the actuation lines of a respective block of actuation lines;

a plurality of storage capacitor means each connected to an actuation line and coupled with a respective one of said

data lines for intermediately storing data signals to be displayed;

PELs, said calibration means being operative during said calibration mode and comprising

nating the application of said signal to one of said at least two scanning signal lines earlier than the termination of

crystal panel, whereby a dot of the liquid crystal panel is displayed in accordance with outputs of the X drive circuit means and the Y drive circuit means.

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data lines for intermediately storing data signals to be displayed;

first switch means coupled between said data lines and said plurality of storage capacitor means for successively switching data signals on said data lines to the respective storage capacitor means of one block of actuation lines and then to the respective storage capacitor means of a following block of actuation lines until all storage capacitor means are charged with data signals; and

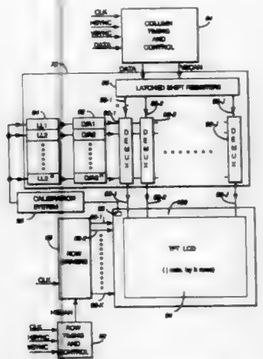
second switch means coupled between the respective storage capacitor means and said column capacitors for charging all column capacitors simultaneously in parallel after all storage capacitor means of all blocks of actuation lines have been charged by data signals.

5,206,633

SELF CALIBRATING BRIGHTNESS CONTROLS FOR DIGITALLY OPERATED LIQUID CRYSTAL DISPLAY SYSTEM

Walter N. Zalph, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 19, 1991, Ser. No. 747,217
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **5 Claims**



1. A thin film transistor (TFT) liquid crystal display (LCD) system having a run mode of operation and a calibration mode of operation, said LCD system comprising:

a matrix of viewable picture elements (PELs), each PEL comprising liquid crystal material coupled with a TFT and operative to transmit light to a degree controllable by a drain voltage applied to such TFT;

a plurality of N digitally controlled voltage sources connected to said matrix for supplying different levels of drain voltages to said viewable PELs to produce in said viewable PELs N different gray scale levels, each voltage source comprising

a register for storing a digital voltage value establishing the value of drain voltage to be produced by said each voltage source,

and a digital-to-analog converter connected to said register for converting said digital voltage value stored in said register into an analog value of drain voltage;

control means connected to said voltage sources and to said viewable PELs for controlling which voltage source supplies a drain voltage to each viewable PEL;

a test PEL having characteristics substantially the same as those of said viewable PELs, said test PEL comprising a gate line and a drain line;

and selectively operated calibration means connected to said test PEL and to said voltage sources for measuring said characteristics of said test PEL and setting said voltage sources to produce N different levels of drain voltages and thereby provide N gray scale levels for said viewable PELs, said calibration means being operative during said calibration mode and comprising

a photodiode positioned adjacent said test PEL for measuring light transmitted therethrough and producing an output signal proportional thereto,

a test digital-to-analog converter (DAC) connected to said drain line of said test PEL for applying drain voltage test signals to said test PEL, said test DAC having characteristics the same as the characteristics of said digital to analog converters in said voltage sources,

a gate driver connected to said gate line of said test PEL and operative to generate gate signals concurrent with said drain voltage test signals,

means, including an analog-to-digital converter (ADC), connected to said photodiode and to said DPS for converting analog output signals from said photodiode into digital output values (DOs) and storing such DOs in said memory,

and a digital data processing system (DPS) including a processor, and a memory connected to said processor for storing a calibration routine and measurement results, said DPS being connected to said registers in said voltage sources and to said ADC;

said DPS being operative, in response to execution of said calibration routine by said processor during said calibration mode, to measure characteristics of said test PEL

by storing in said memory a test series of different digital drain voltage test signals (DVs) and transmitting said DVs to said test DAC to thereby actuate said test PEL and produce said DOs, said series of DVs encompassing a range extending from minimum transmissivity of said test PEL to maximum transmissivity of said test PEL and includes a plurality of test signals that greatly exceeds the number of gray scale levels,

and by receiving said DOs from said ADC and storing said DOs in said memory at locations corresponding to the respective ones of said DVs which produced said DOs;

and said DPS being further operative in response to execution of said calibration routine by said processor to analyze said signals stored in said memory and

locate N ascending values of DOs where each higher DO so located differs from a lower preceding value by a ratio of at least 1.4, where N is determined from the relationship $N=\ln(CR) / ((\ln 2)/2)$, and $CR=$(maximum transmissivity/minimum transmissivity) of said test PEL, N being rounded down to nearest integer,

and store in said registers of said voltage sources the ones of DVs corresponding to the N values of ascending DOs so located.

5,206,634

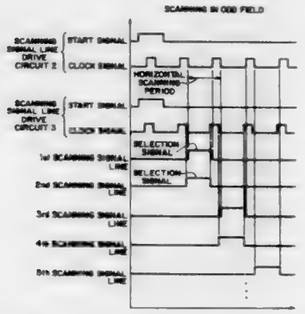
LIQUID CRYSTAL DISPLAY APPARATUS

Toshio Matsumoto; Kyoushi Tanaka, and Kenichi Kato, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1991, Ser. No. 771,454
Claims priority, application Japan, Oct. 1, 1990, 2-264578; Apr. 4, 1991, 3-71930
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **3 Claims**

1. A display apparatus comprising: a display panel having scanning signal lines arranged in parallel, data signal lines, switching elements which are controlled by a signal supplied through said scanning signal lines, pixel electrodes connected to said data signal lines through said switching elements; and drive means for simultaneously applying said signal to at least two succeeding ones of said scanning signal lines,

said drive means comprising timing control means for terminating the application of said signal to one of said at least two scanning signal lines earlier than the termination of



the application of said signal to another one of said at least two scanning signal lines.

5,206,635

METHOD AND APPARATUS FOR MULTI-LEVEL TONE DISPLAY FOR LIQUID CRYSTAL APPARATUS

Tatsuhiro Inuzuka; Hiroyuki Mano; Kazuhiro Fujisawa; Satoshi Konuma, all of Kanagawa; Kiyoshige Kinugawa, Chiba, and Satoru Tsunekawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Inc., Kanagawa, both of Japan

Filed Jan. 30, 1990, Ser. No. 472,306
Claims priority, application Japan, Jan. 30, 1989, 1-017658
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **14 Claims**

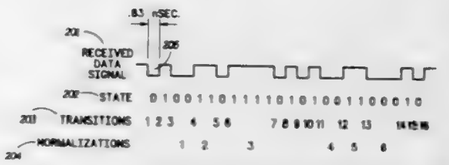
1. A liquid crystal display apparatus comprising a liquid crystal panel of a plurality of dots, Y drive circuit means for selecting a line of the liquid crystal panel, line memory means for storing bits of information data to be displayed, the line memory means having a capacity at least equal to the total number of bits of information data of one line of the liquid crystal panel, each dot of the line of the liquid crystal panel having two bits of display information, phase inverting circuit means for rearranging two-bit display information supplied from the line memory means in a one dot-wise manner in an X direction and in a one line-wise manner in a Y direction, the phase inverting circuit means rearranging the two-bit display information on a one-half horizontal scanning period timing basis, selecting means for selecting one-bit of the two-bit display information supplied from the phase inverting circuit means, and X drive circuit means for receiving the selected one-bit display information form the selecting means and for outputting a signal in a dot manner on a one-half of the horizontal scanning period interval timing basis for the liquid crystal panel, whereby a dot of the liquid crystal panel is displayed in accordance with outputs of the X drive circuit means and the Y drive circuit means.

5,206,636

SIGNAL SEARCH METHOD FOR SELECTIVE CALL RECEIVER

Courtney S. Henry, Coconut Creek; Gregory O. Snowden, Boca Raton, and Thomas E. Holmes, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 426,388, Oct. 25, 1989, abandoned.
This application Jan. 7, 1991, Ser. No. 635,384
Int. Cl.[5] H04B *7/00*
U.S. Cl. 340—825.52 **18 Claims**



1. A method in an electronic device capable of receiving signals having transitions between first and second states and including data as determined by said first and second states, said method comprising the steps of:

measuring the time between adjacent ones of each of said transitions for a predetermined number of transitions;

counting the number of measured times having a magnitude greater than a predetermined time; and

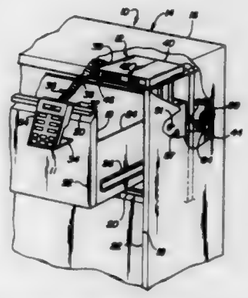
making a decision based on the number of counted measured times.

5,206,637

REMOVABLE FILE PROGRAMMING UNIT

Edward L. Warren, Spring Lake, Mich., assignor to Meridian Incorporated, Spring Lake, Mich.

Filed Jan. 31, 1991, Ser. No. 648,967
Int. Cl.[5] G06F *7/04*
U.S. Cl. 340—825.31 **13 Claims**



1. A storage assembly (10) comprising:

housing means (16) defining an enclosure;

a plurality of storage units (18) to be supported by said housing means (16) for movement between a closed condition and an open condition;

individual locking means (44) each associated with one of said plurality of storage units (18) having a normally locked condition for independently locking each of said storage units (18) in said closed position and movable to an unlocked condition in response to an unlock signal for

independently allowing each of said plurality of storage units (18) to move to said open position;

second states, said signal generating means changing said second control signal from said first state to said second

tecting devices in a predetermined manner, said predetermined manner including at least a pair of said detecting

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5,206,642

DEVICE FOR DETECTING DATA RELATING TO THE

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independently allowing each of said plurality of storage units (18) to move to said open position;

control means (40) connected within said housing means (16) for storing a plurality of stored access codes and for receiving input codes and for controlling said locking means (44) by producing said unlock signal when said input code matches one of said plurality of stored access code,

said assembly (10) characterized by removable programming means (11) removably connectable with said control means (40) for selectively altering said plurality of stored access codes therein and disconnectable from said control means (40) for removal to a remote site for preventing the altering of said plurality of access codes.

5,206,638

METHOD AND APPARATUS FOR EXCHANGING DATA WITHIN A DIGITAL COMMUNICATIONS SYSTEM

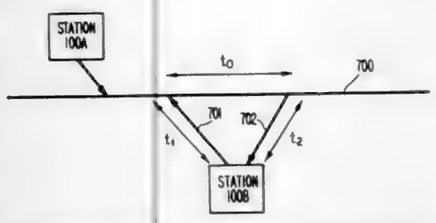
Nicholas McKeown, Berkeley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 28, 1991, Ser. No. 647,591

Claims priority, application European Pat. Off., Jan. 30, 1990, 90101759

Int. Cl.[5] H04Q 1/00

U.S. Cl. 340—825.510 26 Claims



1. A communications system arranged to operate in cycles, comprising a plurality of stations interconnected by transmission paths, each station being permitted to transmit data during each cycle in a predetermined order of permitted transmissions, each data transmission including identity information indicative of the identity of the transmitting station, at least one of said stations comprising:

(a) first means for determining whether said at least one station is a first station in a sequence of stations with data to transmit in a given cycle; and

(b) second means for determining when said at least one station is a next station with data to transmit, including means for receiving data transmissions and identifying an originating station, and means for transmitting data in said given cycle at a timing dependent upon the actual reception of transmissions in said given cycle from an immediately preceding station in said order of permitted transmissions, this timing being in advance of when said at least one station has finished receiving data from said immediately preceding station and being judged by said at least one station to avoid its data transmission colliding at any other station with a data transmission from said immediately preceding station.

5,206,639

SINGLE ANTENNA DUAL FREQUENCY TRANSPONDER

Bruce Kamens, Thomaston, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Oct. 25, 1990, Ser. No. 604,044

Int. Cl.[5] H04B 1/59, 1/44

U.S. Cl. 340—825.54 18 Claims

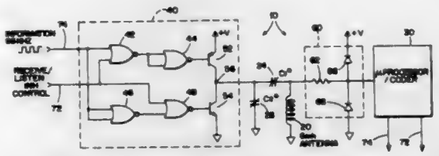
1. A single antenna transponder comprising:

a) signal generating means for generating a first signal of a first desired frequency in response to a trigger signal, and for generating a second control signal having first and second states, said signal generating means changing said second control signal from said first state to said second state after receiving said trigger signal;

b) an antenna coupled to said signal generating means;

c) logic control means coupled to said signal generating means, and including means for receiving said first signal and said second control signal, and having an output, wherein said logic control means includes means for generating a very high impedance at said output when said logic control means receives said first state of said second control signal, and wherein said logic control means includes means for providing a transmitting signal of said first desired frequency when said logic control means receives said first signal and said second state of said second control signal;

d) a first capacitor having a first plate coupled to said output of said logic control means, and a second plate coupled to said antenna and to said signal generating means; and



e) a second capacitor having a first plate coupled to a first fixed voltage, and a second plate coupled to said first plate of said first capacitor, wherein

when said logic control means receives said first state of said second control signal and said output of said logic control means is at a very high impedance, said first capacitor, said second capacitor, and said antenna comprise a first tuned LC circuit for receiving an incoming signal at a second frequency from which said trigger signal is generated, and

when said logic control means receives said second state of said second control signal, said output of said logic control means is at a low impendance, and said first capacitance and said antenna comprise a second tuned LC circuit for taking said transmitting signal at said first desired frequency and transmitting the same.

5,206,640

SURVEILLANCE SYSTEM

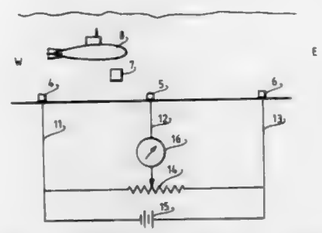
Esko Hirvonen, Kaurauashi 7, 02340 Espoo, and Juhani Niinivaara, 45610 Koria, both of Finland

Filed Aug. 16, 1991, Ser. No. 745,714

Claims priority, application Finland, Feb. 1, 1991, 910512

Int. Cl.[5] H04B 13/02

U.S. Cl. 340—852 33 Claims



1. A method of detecting an anomaly, the anomaly being located in an electrically conductive medium, the method comprising the steps of:

arranging a plurality of current feeding electrodes and detecting devices in a predetermined manner, said predetermined manner including at least a pair of said detecting devices arranged generally in an equipotential surface;

generating at least two electric fields by means of at least two pairs of said current feeding electrodes, said at least two electric fields having different orientations;

measuring an electric field parameter between a said pair of said current feeding electrodes; and

comparing said measured electric field parameter to an electric field reference parameter, said electric field reference parameter representing absence of the anomaly.

5,206,641

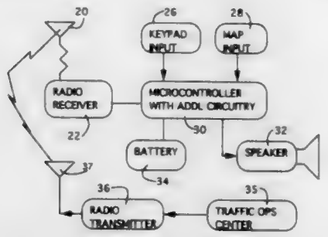
PORTABLE TRAFFIC CONGESTION RADIO

Charles A. Grant, Kensington, and Mark L. Greenberg, Berkeley, both of Calif., assignors to Way To Go Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 609,208, Nov. 5, 1990, abandoned. This application Dec. 31, 1991, Ser. No. 815,433

Int. Cl.[5] G08G 1/09

U.S. Cl. 340—905 10 Claims



1. A self-contained, portable device adapted to be held and operated in one hand of the user for presenting information on the state of traffic conditions in a predefined geographical area, comprising:

a) radio receiver means for deriving digitally coded radio signals from a transmitting source within the geographical area;

b) derivation means connected to the ratio receiver means for deriving a stream of data signals from the coded radio signals;

c) recognition means connected to receive the stream of data signals to recognize those data signals which constitute encoded traffic reports which are to be received by the device;

d) storage means connected to the recognition means for storing a plurality of encoded traffic reports in a memory of sufficient size to hold a predetermined number of currently active traffic reports for the geographical area;

e) user travel selection means operable by a finger of the user's said one hand for entering a selection of roadways and directions of travel into the storage means for which presentation of traffic reports are desired;

f) entering means operable by said finger for entering user defined selected criteria requesting presentation of selected traffic reports based upon selected roadway and direction;

g) search means for searching the traffic reports stored in the storage means and selecting means for selecting the stored traffic reports which are coded to be relevant to the selected roadways and directions of travel in accordance with the user defined selection criteria;

h) conversion means for converting a stored encoded traffic report into a presentation report; and,

i) presentation means for presenting the presentation report to the user.

5,206,642

DEVICE FOR DETECTING DATA RELATING TO THE PASSAGE OF VEHICLES ON A ROAD

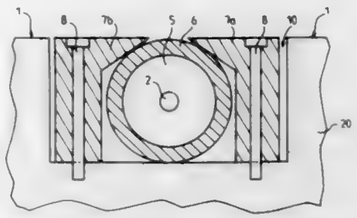
Pierre Gregoire, Lagny, and Gilles Bailleul, Montesson, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1991, Ser. No. 693,738

Claims priority, application France, May 11, 1990, 90 05918

Int. Cl.[5] G08G 1/01

U.S. Cl. 340—933 6 Claims



1. An installation of a device for detecting data relating to the passage of vehicles on a road, said installation including a groove formed in the upper surface of the road, a device comprising a piezoelectric cable and means making said cable rigid and transmitting loads produced by passing vehicles to said cable, characterized in that the means comprises a cylindrical metal tube having an inside diameter which is larger than the outside diameter of the piezoelectric cable which is arranged along the axis of the tube, the space between the cable and the inner walls of the tube being filled with a compact metal oxide powder, said groove in said road having a depth which is substantially equal to the outside diameter of said tube and a transverse dimension which is slightly larger than said outside diameter, and a mechanical means for fixing said device in said groove so that the upper surface of the device is flush with the upper surface of said road, wherein said mechanical means includes wedge members resting on the upper part of the tube which is arranged in the groove, said wedge members being arranged between the tube and the vertical walls of the groove and being fixed to the road by screws.

5,206,643

SYSTEM FOR MANAGING A PLURALITY OF MOTOR VEHICLES

Manfred Eckelt, Mainz, Fed. Rep. of Germany, assignor to Deutsche Lufthansa Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 14, 1990, Ser. No. 628,388

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3942070

Int. Cl.[5] G08G 1/01

U.S. Cl. 340—932.2 14 Claims

1. A system for managing rental processes of a plurality of motor vehicles that are driven by different people, comprising:

a parking area for said vehicles having at least one entrance and one exit;

barrier means for securing said at least one entrance and one exit;

at least one card reader, for controlling user access, disposed in front of said barrier means, as viewed in a direction of travel, of said at least one entrance and one exit;

at least one receiver, disposed in the vicinity of said barrier means, for receiving a vehicle identification code as well as vehicle operation data that is transmitted by a transmitter that is integral with a vehicle; and

a central control unit that is connected to said barrier means, said at least one card reader, and said at least one receiver, whereby during exit of a vehicle from said parking area, not only does said central control unit compare identifica-

tion data read by the pertaining card reader with the vehicle identification code received from the pertaining

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5,206,645

SINGLE CHANNEL ENCODER

[illegible], assignor to Xerox Corporation

5,206,647

LOW COST AGC FUNCTION FOR MULTIPLE

pled digital signal into one of discrete values of +1, 0 and

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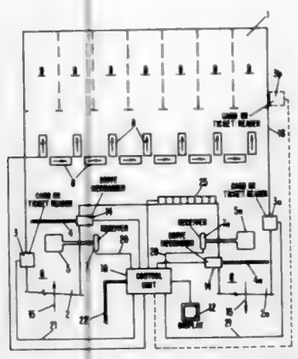
tion data read by the pertaining card reader with the vehicle identification code received from the pertaining receiver for controlling said barrier means, but said central control unit also stores vehicle operation data received by said at least one receiver, and whereby during entry of a vehicle into said parking area, not only does said central control unit compare identification data read by



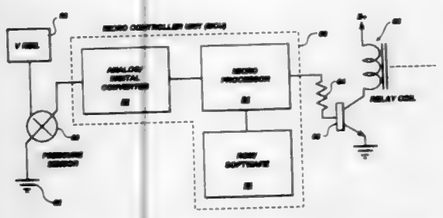
the pertaining card reader with the vehicle identification code received from the pertaining receiver for controlling said barrier means, but said central control unit also records vehicle operation data received by said at least one receiver and correlates this recorded vehicle operation data with said vehicle operation data stored during exit of said vehicle in order to settle a rental process.

5,206,644

SYSTEM AND METHOD FOR EXTENDING THE LIFE OF AIRCRAFT ANTI-COLLISION LIGHTS

Robert M. Dempsey, 4541 Wagon Wheel Rd., Carson City, Nev. 89703

Filed Sep. 26, 1991, Ser. No. 765,955
Int. Cl.[5] G08G 5/04
U.S. Cl. 340—961 32 Claims



1. An apparatus for extending the useful life of an anti-collision light included on an aircraft capable of flying in high altitude controlled air space, the apparatus comprising:

means for sensing when the aircraft is above a threshold altitude;

means for sensing when the aircraft undergoes a substantial change in altitude; and

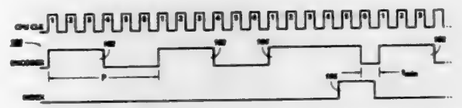
means for automatically reducing power input to the anti-collision light when the aircraft is above the threshold altitude and when the aircraft is not substantially changing altitude such that the useful life of the anti-collision light is extended.

5,206,645

SINGLE CHANNEL ENCODER

George H. Urich, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1991, Ser. No. 783,587
Int. Cl.[5] H03M 1/22
U.S. Cl. 341—11 12 Claims



1. An apparatus for generating a pulse train having a plurality of timing pulses, comprising:

a member having a plurality of spaced marks disposed thereon with one of the spaced marks being a reference mark having a leading edge and a trailing edge; and

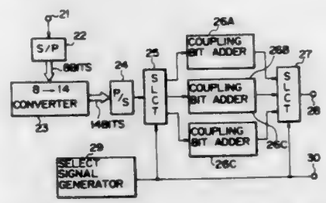
means, in communication with said member, for generating the pulse train as the plurality of spaced marks move, the pulse train being defined by a series of durations, each of the durations having a periodicity defined by the same edge of two successive pulses, the plurality of spaced marks being configured so that the periodicity of each duration remains constant throughout the pulse train and said generating means forms a reference pulse from the reference mark as the leading and trailing edges of the reference mark are moved adjacent the generating means, the reference pulse occurring during one of the durations and serving as one of the timing pulses.

5,206,646

DIGITAL MODULATING METHOD

Yoichiro Sako, Chiba, and Tamotsu Yamagami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,932
Claims priority, application Japan, Oct. 31, 1989, 1-284401; Oct. 31, 1989, 1-284402
Int. Cl.[5] H03M 7/20
U.S. Cl. 341—95 12 Claims



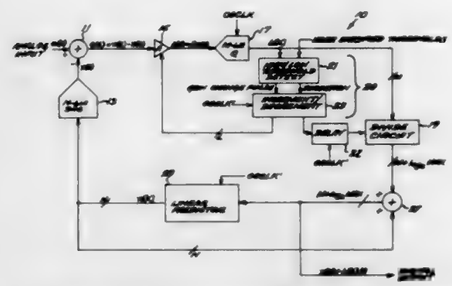
1. A digital modulating method for coding M data bits in to N channel bits (M<N) comprising the steps of: forming said N channel bits of a number of bits that satisfies N=αM, where α is 2; arranging a number of successive "0"s between "1" and "1" in a row of coded bits; and wherein said coding of M data bits comprises eight to fourteen modulation and further comprising the steps of selecting a pattern of successive fourteen channel bits in said N channel bits and a pattern of the eight to fourteen modulation to be identical.

5,206,647

LOW COST AGC FUNCTION FOR MULTIPLE APPROXIMATION A/D CONVERTERS

Wade J. Stone, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 27, 1991, Ser. No. 722,763
Int. Cl.[5] H03M 1/18
U.S. Cl. 341—139 9 Claims



8. An automatically gain controlled linear predictive analog to digital converter for converting bandlimited analog input signal to a digital output signal, comprising:

a linear predictor circuit for providing a digital predictor output;

a digital to analog converter responsive to said digital predictor output for providing an analog predictor output;

analog subtraction means for subtracting said analog predictor signal from the bandlimited input analog signal to provide an analog residue signal;

gain controlled amplifier means responsive to said analog subtraction means for providing a gain controlled analog residue signal;

quantizing means for converting said gain controlled analog residue signal to a gain controlled digital residue signal;

control means responsive to said gain controlled digital residue signal for controlling said gain controlled amplifier means so that the amplitude of said gain controlled analog residue signal tends to remain between a high threshold and a low threshold;

dividing means responsive to said control means and said gain controlled digital residue signal for dividing said amplitude adjusted digital residue signal by a factor representative of the gain of the gain controlled analog residue signal that resulted in the gain controlled digital residue signal to provide a restored digital residue signal; and

digital summing means for summing said restored digital residue signal and said digital predictor output to provide the digital output of the linear predictive analog to digital converter, said digital output being further provided as the input to said linear predictor;

whereby control of the amplitude of aid gain controlled analog residue signal avoids loop instability of the analog to digital converter.

5,206,648

OVERSAMPLING DA CONVERTER WITH OPERATIONAL AMPLIFIER DRIVEN BY A SINGLE REFERENCE VOLTAGE

Akira Yukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 21, 1992, Ser. No. 822,956
Claims priority, application Japan, Jan. 18, 1991, 3-004194
Int. Cl.[5] H03M 3/00
U.S. Cl. 341—143 8 Claims

1. An oversampling digital-to-analog converter comprising:

oversampling means for oversampling a digital signal to produce an oversampled digital signal;

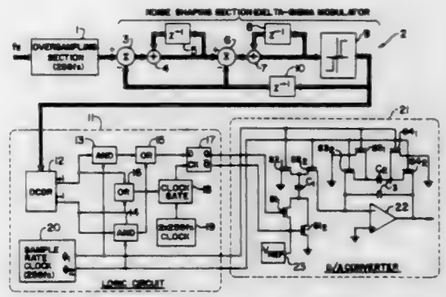
delta-sigma modulator means for quantizing said oversampled digital signal into one of discrete values of +1, 0 and −1;

an operational amplifier and a leaky integrator coupled between input and output terminals of the operational amplifier;

a capacitor;

a reference voltage source; and

logic switching means coupled to said delta-sigma modulator means and said capacitor for charging the capacitor by drawing a unit charge from said reference voltage source during a first half of the sample period of said +1 discrete



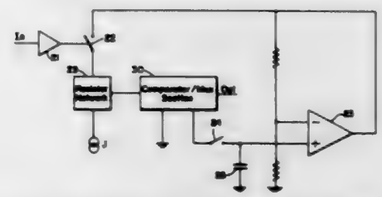
value and discharging the capacitor by injecting a unit charge to the input terminal of said operational amplifier during a second half of the sample period of said +1 discrete value, for discharging the capacitor during a first half of the sample period of said −1 discrete value and charging the capacitor by drawing a unit charge from the input terminal of said operational amplifier during a second half of the sample period of said −1 discrete value, and causing said capacitor to maintain a most recent condition thereof during the sample period of said 0 discrete value.

5,206,649

DUAL FLASH ANALOG-TO-DIGITAL CONVERTER

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Division of Ser. No. 75,448, Jul. 20, 1987, Pat. No. 4,857,931.
This application Feb. 24, 1989, Ser. No. 316,594
Int. Cl.[5] H03M 1/34
U.S. Cl. 341—156 6 Claims



1. Analog-to-digital converter (ADC) for converting an input signal into output code, comprising:

a source means for providing a reference current;

a resistive means coupled to the source means and to a reference signal for providing a plurality of comparison signals;

a comparator/multiplexer means for comparing the comparison signals against ground, selecting one of the comparison signals and producing a code;

an amplifying means for amplifying the comparison signal selected by the comparator/multiplexer means and providing a signal;

a switch means for providing the reference signal in response

to the input signal and subsequently in response to the

discontinuing said alerting step upon failure to detect said

tending to a low height above ground, which subsequent to activation by the waking sensor radiates an omnidirectional

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HIGH-YIELD ACTIVE PRINTED-CIRCUIT ANTENNA

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to the input signal and subsequently in response to the amplifying means signal; and

a digital means for converting a plurality of the codes produced by the comparison/multiplexer means into the output code.

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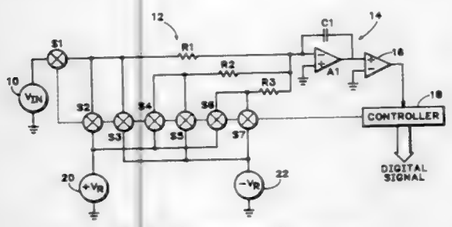
CHARGE-CONTROLLED INTEGRATING SUCCESSIVE-APPROXIMATION ANALOG-TO-DIGITAL CONVERTER

Jonathan J. Parle, Seattle; Todd E. Holmdahl, Bothell, and A. Brinkley Barr, Woodinville, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Sep. 5, 1991, Ser. No. 755,085
Int. Cl.[5] H03M *1/38*
U.S. Cl. 341—163 **10 Claims**



1. An analog-to-digital converter, comprising:

input means for receiving an analog voltage;

an integrator having an input coupled to said input means and an output, said integrator having a full-scale charge value dynamic operating range;

control means for controlling a state of charge of said integrator by causing said integrator to first store an acummulated charge proportional to said analog voltage, said accumulated charge being within said full-scale charge value dynamic operating range, and thereafter remove and add charge in a binary search sequence to determine digital bits representative of said analog voltage, said binary search sequence first locating the most significant bit by comparing said accumulated charge with one-half the full-scale charge value, and continuing through the search sequence to locate each successively less significant bit by comparing said accumulated charge with successively halved full-scale charge values; and

means coupled between the output of said integrator and said control means to monitor said state of charge and provide to said control means an indication of the logic states of said digital bits.

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MOTOR VEHICLE POLICE RADAR DETECTOR FOR DETECTING MULTIPLE RADAR SOURCES

Michael D. Valentine; Stephen R. Scholl, and Clarence R. Groth, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Division of Ser. No. 687,282, Apr. 18, 1991, Pat. No. 5,146,226.
This application Jun. 1, 1992, Ser. No. 891,715
Int. Cl.[5] G01S *7/295, 7/40*
U.S. Cl. 342—20 **4 Claims**

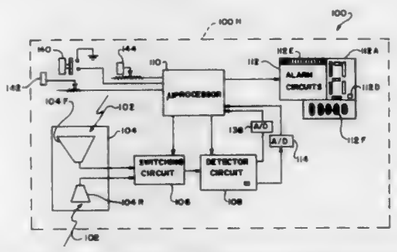
4. A method of operating a motor vehicle police radar signal detector for alerting an operator of a motor vehicle to incoming radar signals, said method comprising the steps of:

detecting an incoming radar signal;

alerting an operator of a motor vehicle using said radar signal detector of said detected radar signal;

maintaining a record of said detected radar signal and alarm status;

discontinuing said alerting step upon failure to detect said detected radar signal; and



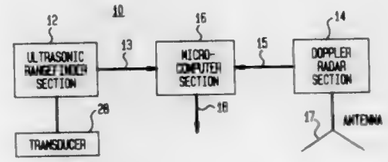
reinstating said alerting step with the preexisting alarm status upon redetection of said radar signal within a period of time.

5,206,652

DOPPLER RADAR/ULTRASONIC HYBRID HEIGHT SENSING SYSTEM

Reed W. Hoyt, Framingham, and John F. Lanza, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1991, Ser. No. 788,951
Int. Cl.[5] G01S *13/86*
U.S. Cl. 342—52 **10 Claims**



1. Hybrid distance measuring apparatus for correcting ultrasonic distance measurements comprising:

ultrasonic means for measuring an apparent distance between first and second objects by transmission and reflection of ultrasonic signals;

radar means for measuring a relative velocity between the first and second objects by transmission and reflection of radar signals; and

compensating means for compensating the apparent distance measured by said ultrasonic means by modifying the apparent distance in accordance with the relative velocity measured by said radar means and for producing an indication of true distance between the objects.

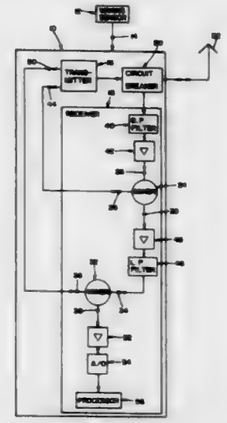
5,206,653

SENSOR ARRANGEMENT FOR THE ACTIVATION OF AN ACTIVE BODY

Robert Westphal, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Fed. Rep. of Germany

Filed May 27, 1992, Ser. No. 889,455
Claims priority, application Fed. Rep. of Germany, May 31, 1991, 4117873
Int. Cl.[5] G01S *13/00*
U.S. Cl. 342—61 **19 Claims**

1. Sensor arrangement for an active body, such as a land mine deployed against ground and airborne targets; including a waking sensor responsive to the approach of a target to activate the arrangement, and a circuit arrangement for the surroundings-adaptive setting of sensor-evaluating circuits for the release of an operative mechanism for combatting the target, said arrangement comprising at least one antenna extending to a low height above ground, which subsequent to activation by the waking sensor radiates an omnidirectional electromagnetic ground wave and receives reflections from



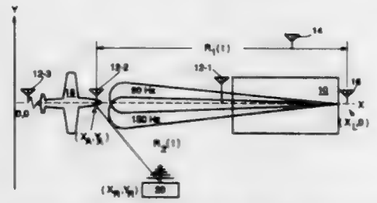
the encompassing surroundings, and for determining by reflected radiation from a target the relative movement of a target which has penetrated the encompassing surroundings.

5,206,654

PASSIVE AIRCRAFT MONITORING SYSTEM

Marc Finkelstein, Vienna, Va.; Martin J. Geesaman, Bowie, and Thomas J. Lynch, Potomac, both of Md., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 19, 1992, Ser. No. 886,112
Int. Cl.[5] G01S *1/16, 1/18*
U.S. Cl. 342—410 **22 Claims**



1. A method for monitoring aircraft on a runway approach or departure flight path wherein the aircraft are subject to electromagnetic radiation signals of a landing system, the signals having a known frequency and source comprising:

receiving, at a location offset laterally from the runway, the signals reflected from the aircraft flying along the flight path;

generating digital samples of the reflected signals received by the receiver;

performing a Fourier transform on the digital samples, thereby converting the signals to the frequency domain;

determining the Doppler frequency shift in the converted digital samples; and

calculating an attribute of the aircraft using the Doppler frequency shift of the reflected signals.

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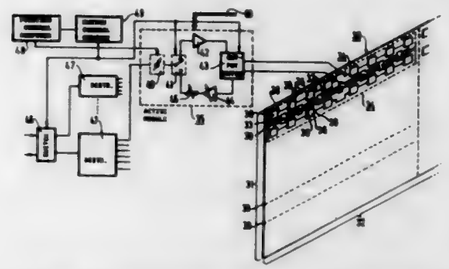
HIGH-YIELD ACTIVE PRINTED-CIRCUIT ANTENNA SYSTEM FOR FREQUENCY-HOPPING SPACE RADAR

Gérard Caille, Tournefeuille; Jean-Louis Cazaux, Toulouse, and Olivier Remondiere, Frouzins, all of France, assignors to Alcatel Espace, Courbevoie, France

Filed Mar. 6, 1991, Ser. No. 665,212
Claims priority, application France, Mar. 9, 1990, 90 03027
Int. Cl.[5] H01Q *1/380, 21/060, 3/260*
U.S. Cl. 343—700 MS **10 Claims**



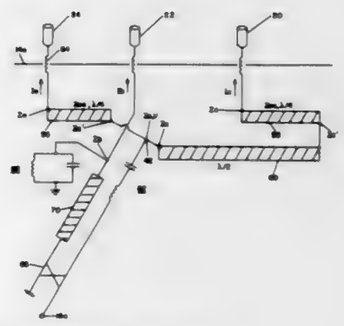
1. High-yield antenna system including an active printed-circuit planar antenna for pulsed frequency-hopping space radar electronically scanned in two planes, its timing diagram encompassing the transmission of a horizontal polarization pulse, the reception of echoes from a previous horizontal polarization pulse, the transmission of a vertical polarization pulse and the reception of echoes from a previous vertical polarization pulse, said system comprising, distributed on insulative substrates, several thousand MMIC active transmit-receive modules, each of which contains a switching device, amplifier means and a phase shifter, and each of which is connected to one of a plurality of printed-circuit radiating elements, each printed-circuit radiating element comprising a plurality of dual polarized square patches connected by microstrip lines adapted selectively to excite the patches with the same amplitude and the same phase at two perpendicular ports coupled to said switching device, said switching device switching between said two ports for selectively procuring transmission or reception with horizontal or vertical polarization.

5,206,656

ARRAY ANTENNA WITH FORCED EXCITATION

Peter W. Hannan, 22 Ursular Ct., Smithtown, N.Y. 11787

Filed Dec. 28, 1989, Ser. No. 458,220
Int. Cl.[5] H01Q *1/28*
U.S. Cl. 343—705 **39 Claims**



1. An array antenna, comprising:

terminal means for coupling signals;

a plurality of antenna elements comprising at least first,

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μs and to achieve homogenous nucleation via which a bubble of gas is produced and induces a droplet of ink to

ink of an ink sheet to a recording medium to thereby effect recording of images on said recording medium, comprising:

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a plurality of antenna elements comprising at least first, second and third antenna elements for coupling radiated signals;

first excitation means, coupled between said terminal means and said first and third elements, comprising first and third signal transmission paths for coupling signal components of predetermined relative phase and amplitude to said first and third elements, respectively, by way of a point of common voltage included in said first excitation means, said first and third transmission paths including transmission line means having characteristics equivalent to a quarter wavelength transformer coupled between said point of common voltage and each of said first and third elements, said wavelength corresponding to approximately the average design frequency;

second excitation means, coupled between said terminal means and said second element, comprising a second signal transmission path for coupling to said second element a signal component of predetermined phase and amplitude relative to said signal components coupled to said first and third elements; and

tuning means coupled to said point of common voltage for providing impedance matching for said first and third elements in a desired frequency range;

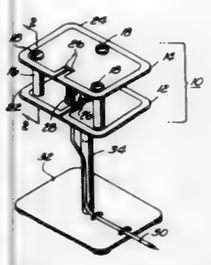
whereby signal components in said antenna elements are caused to have a predetermined relationship of phase and amplitude, substantially independently of intercoupling affecting antenna elements of the array antenna.

5,206,657

PRINTED CIRCUIT RADIO FREQUENCY ANTENNA

Walter J. Downey, San Jose, Calif., assignor to Echelon Corporation, Palo Alto, Calif.

Filed Oct. 7, 1991, Ser. No. 772,239
Int. Cl.[5] H01Q *11/12*
U.S. Cl. 343—742 **2 Claims**



1. A radio frequency antenna for operation at a nominal frequency comprising:

a first circuit board etched on each side thereof to form a first pair of coaxial congruent conductive loops, each loop having a perimeter much smaller than a wavelength corresponding to the nominal frequency;

a second circuit board etched on each side thereof to form a second pair of coaxial congruent conductive loops congruent with the first pair of conductive loops;

spacer means for maintaining the first and second circuit boards in a fixed spaced apart relationship with the first and second pairs of conductive loops in a coaxial relationship;

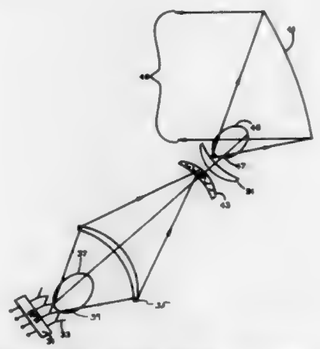
circuit connection means for electrically coupling the first and second pairs of conductive loops in a series relationship.

5,206,658

MULTIPLE BEAM ANTENNA SYSTEM

John Wokurka, Santa Ana, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Oct. 31, 1990, Ser. No. 607,389
Int. Cl.[5] H01Q *19/19*
U.S. Cl. 343—755 **9 Claims**



1. A multiple beam antenna system comprising:

a beam forming network including a plurality of feed horns in a feed horn cluster;

an objective;

an imaging lens having a lateral magnification less than unity for focusing at a predetermined point in space a reduced image of said feed horn cluster;

a field lens positioned at said predetermined point in space;

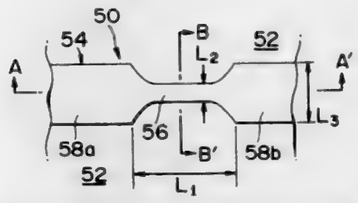
an amplitude shaping lens positioned between said field lens and said objective, said amplitude shaping lens having an amplitude shaping refractive surface for creating a desired ray bunching distribution at the objective.

5,206,659

THERMAL INK-JET PRINTHEAD METHOD FOR GENERATING HOMOGENEOUS NUCLEATION

Kikukazu Sakurai, and Mitsuo Tsuzuki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,103
Claims priority, application Japan, Mar. 15, 1990, 2-66407
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—1.1 **2 Claims**



1. In a method of operating a thermal ink-jet type print head which includes a substrate, a strip-like thin metallic layer formed on said substrate, said strip-like thin metallic layer being configured so as to define the narrow portion which is located between broad portions, the narrow portion defining a heating element which is integral with the broad portions which act as electrodes via which currents are supplied to the narrow heater portion, the steps of:

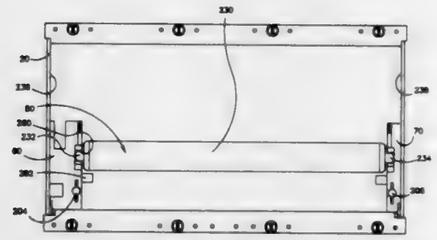
applying a current to the heating element in a manner to heat the same in a range from $10^{6°}$ to $10^{9°}$ C./sec so as to transfer heat energy from the heating element to an ink at a rate of 10^7 to 10^8 MW/m^2 over a time period less than 10 μs and to achieve homogenous nucleation via which a bubble of gas is produced and induces a droplet of ink to be ejected from a nozzle located adjacent the heating element.

5,206,660

AIRBORNE THERMAL PRINTER

Goeffrey G. Cochrane, Longmont, Colo.; Michael D. Tartamella, Aurora; Philip W. McLean, Richfield; Samuel K. Taylor, Chardon, and Christ H. Heipp, Chagrin Falls, all of Ohio, assignors to Summit World Trade Corporation, Hudson, Ohio

Filed May 24, 1991, Ser. No. 705,517
Int. Cl.[5] G01D *15/00, 15/10;* **B41J** *15/00, 15/16*
U.S. Cl. 346—76 PH **10 Claims**



1. A paper feed mechanism for unrolling a paper roll having a hollow core comprising:

a) a mandrel roll for internally supporting the hollow core;

b) a rigid arm adjacent the mandrel roll biased against one of the hollow core and the paper roll to provide a frictional braking force against the paper roll;

c) a pair of opposed mounting blocks for rotatably supporting opposite end portions of the mandrel roll, a first of the mounting blocks including a hinge for pivotally supporting the arm for pivotal movement against one of the hollow core and the paper roll; and

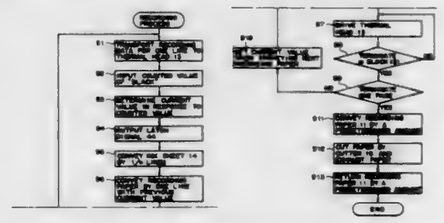
d) a biasing member supported by the first mounting block and spaced from the hinge for biasing the rigid arm into frictional engagement with the one of the hollow core and the paper roll.

5,206,661

THERMAL TRANSFER RECORDING APPARATUS AND METHOD THAT STABLY CONVEYS

Hisao Terajima, Yokohama; Satoshi Wada, Kawasaki; Makoto Kobayashi, Tama; Takehiro Yoshida, Tokyo; Takeshi Ono, Yokohama; Minoru Yokoyama, Yokohama; Takashi Awai, Yokohama; Yasushi Ishida, Tokyo, and Akihiro Tomoda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,809
Int. Cl.[5] B41J *2/325*
U.S. Cl. 346—76 PH **30 Claims**



1. A thermal transfer recording apparatus for transferring an ink of an ink sheet to a recording medium to thereby effect recording of images on said recording medium, comprising:

ink sheet conveying means for conveying said ink sheet;

recording medium conveying means for conveying said recording medium, said recording medium conveying means having a driving torque;

recording means for acting on said ink sheet to thereby record images on said recording medium when said recording medium and said ink sheet are held together, said driving torque causing said recording medium and said ink sheet to be separated;

counting means for counting a quantity of a dot driving information of image data recorded by said recording means; and

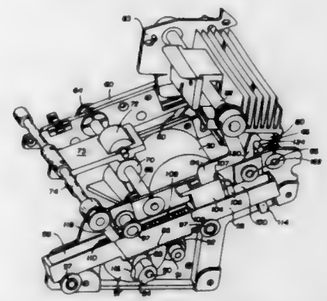
control means for controlling said driving torque of said recording medium conveying means in conformity with said quantity of said dot driving information.

5,206,662

METHOD AND APPARATUS FOR ADJUSTING CONTACT PRESSURE OF A THERMAL PRINTHEAD

Duane M. Fox, Snohomish; Edward D. Caldwell, Seattle, and William P. Stiles, Bothell, all of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Apr. 8, 1991, Ser. No. 683,459
Int. Cl.[5] B41J *25/304, 25/312*
U.S. Cl. 346—76 PH **7 Claims**



1. Apparatus for variably adjusting pressure of a printhead against a print medium in accordance with a control signal, comprising:

means for receiving the control signal and producing a drive signal responsive thereto; and

biasing means for applying a selectively adjustable biasing force on the printhead to adjust the pressure of the printhead against the print medium in response to the drive signal, the biasing means including a motor responsive to the drive signal for rotating a rotatable member about an axis, a rack having teeth driven by the rotatable member, a pivot arm having a free end, the pivot arm being connected to the printhead to apply a biasing force thereto in response to rotation of the rotatable member, and a spring connecting the rack to the pivot arm to generate the biasing force as the rotatable member rotates, the rotatable member being a pinion gear which drivably engages the rack.

5,206,663

THERMAL HEAD

Takayuki Yamamoto, and Shigenori Ota, both of Aira, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Oct. 29, 1991, Ser. No. 784,556
Claims priority, application Japan, Oct. 31, 1990, 2-114903[U]
Int. Cl.[5] B41J *2/325*
U.S. Cl. 346—76 PH **19 Claims**

1. A thermal head composed by disposing a plurality of

drive circuit elements for driving heating resistance elements on a substrate having a coefficient of linear expansion on which

compound, and a plurality of fine lone electrodes comprising an electroconductive material disposed systematically on said

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5,206,667

FLEMING-TYPE INK JET HEAD

calculating a change in printhead temperature from temperature values sensed; and

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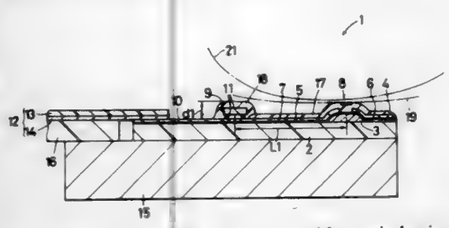
drive circuit elements for driving heating resistance elements on a substrate having a coefficient of linear expansion on which a plurality of heating resistance elements are arranged linearly,



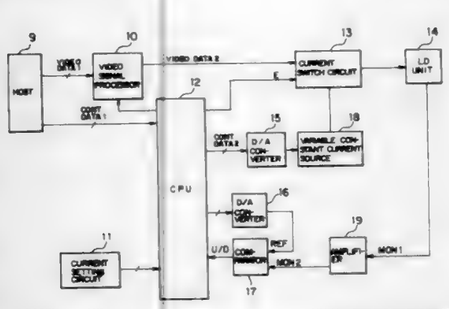
and covering the drive circuit elements with a resin having a coefficient of linear expansion, wherein the resin and the substrate possess a substantially similar coefficient of linear expansion.

5,206,664

RECORDING APPARATUS USING SEMICONDUCTOR LASER

Akira Sasaki, and Takeshi Kato, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,679
Claims priority, application Japan, Feb. 26, 1990, 2-42460
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **8 Claims**



1. A semiconductor laser recording apparatus for recording an image by scanning a laser beam from a semiconductor laser oscillator on a recording medium, said apparatus comprising a video signal processor including means for reducing a current conduction time for said semiconductor laser oscillator by cutting away a pulse signal for control of turn on/off of said semiconductor laser oscillator at its leading and trailing edges, and means for causing said semiconductor laser oscillator to conduct current based on the pulse signal cut away by the reducing means.

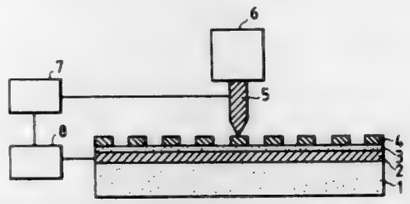
5,206,665

RECORDING MEDIUM, METHOD FOR PREPARING THE SAME, RECORDING AND REPRODUCING DEVICE, AND RECORDING, REPRODUCING AND ERASING METHOD BY USE OF SUCH RECORDING MEDIUM

Hisaaki Kawade, Atsugi; Hiroshi Matsuda, Isehara, and Yuko Morikawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,080
Claims priority, application Japan, Aug. 10, 1989, 1-205763; Aug. 10, 1989, 1-205769; Aug. 10, 1989, 1-205771
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—135.1 **18 Claims**

1. A recording medium comprising a recording layer on an electrode substrate, said recording layer comprising an organic compound, and a plurality of fine lone electrodes comprising an electroconductive material disposed systematically on said



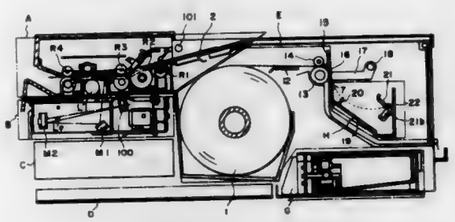
recording layer wherein a voltage can be applied on the recording medium through said fine lone electrodes on said recording layer.

5,206,666

INK JET RECORDING APPARATUS

Fumihiko Watanabe, and Takeshi Ono, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1990, Ser. No. 617,365
Claims priority, application Japan, Nov. 22, 1989, 1-304069; Dec. 7, 1989, 1-318599
Int. Cl.[5] B41J *2/01, 2/165*; H04N *1/034*
U.S. Cl. 346—140 R **20 Claims**



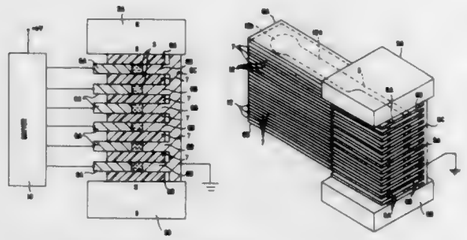
1. An ink jet recording apparatus, comprising:
a full-line type recording head having plural ejection outlets on a front side;
a shaft for rotatably supporting said recording head in a movement path between a recording position in which ink is ejected in a non-vertical direction onto a recording material and a non-recording position in which the ink is ejected substantially vertically;
a capping member, disposed adjacent the non-recording position, for covering the front side of said recording head, wherein during movement of said recording head from the recording position to the non-recording position, said capping member is moved by contact with a part of said recording head, and when the movement of said recording head to the non-recording position is completed, capping by said capping member is effected; and
a tray disposed below said capping member and below the movement path of said recording head for receiving ink leaked from said recording head,
wherein said tray is provided with a collector with an inclined surface for collecting the leaked ink, wherein said collector is detachably mounted to said tray.

5,206,667

FLEMING-TYPE INK JET HEAD

Akio Yano, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Sep. 6, 1991, Ser. No. 755,961
Claims priority, application Japan, Sep. 7, 1990, 2-238646; Sep. 7, 1990, 2-238647; Oct. 12, 1990, 2-273872; Oct. 12, 1990, 2-273873; Oct. 19, 1990, 2-281675
Int. Cl.[5] B41J *2/035*
U.S. Cl. 346—140 R **20 Claims**



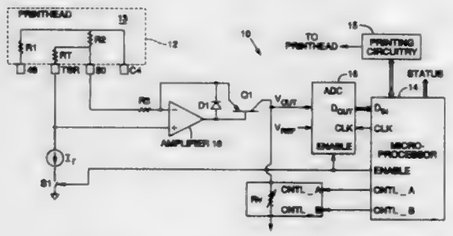
1. An ink jet head comprising:
a plurality of nozzles opening toward a print surface;
a plurality of channels connected to said plurality of nozzles and filled with an electroconductive ink;
magnetic flux generation means between which a plurality of electrodes are interposed for generating a magnetic fux extending across said plurality of channels;
a plurality of pairs of electrodes, each pair of electrodes disposed so as to face each other on opposite sides of corresponding channels, each of said plurality of pairs of electrodes further being formed so as to generate electric currents across the corresponding channels in a direction perpendicular to the magnetic flux;
current control means for controlling generation of the electric currents between said pairs of electrodes; and
a common member connected and formed so as to support at least a portion of said plurality of pairs of electrodes whereby said plurality of pairs of electrodes are electrically connected to said current control means through said common member.

5,206,668

METHOD AND APPARATUS FOR DETECTING INK FLOW

Clement C. Lo, Lake Oswego, and Izadpour Khormaee, West Linn, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 29, 1991, Ser. No. 784,185
Int. Cl.[5] G01D *15/16, 15/18*
U.S. Cl. 346—140 R **20 Claims**



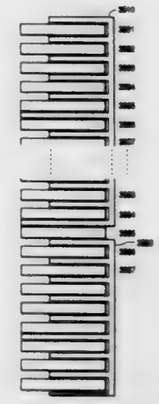
1. A method of detecting ink flow through a thermal inkjet printhead, comprising:
sensing temperature of the printhead as the printhead prints;
calculating a change in printhead temperature from temperature values sensed; and
determining from the change in printhead temperature whether ink flow through the printhead is sufficient for printing.

5,206,669

APPARATUS AND METHOD FOR SELECTIVELY DELIVERING AN ION STREAM

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1991, Ser. No. 801,292
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—159 **15 Claims**



1. A subassembly for an apparatus for selectively delivering ion currents comprising:
a first wall;
a first plurality of electrodes arranged on the first wall;
a second plurality of electrodes arranged on the first wall and adjacent to the first plurality of electrodes;
a second wall, opposed to the first and second pluralities of electrodes to define a channel therebetween,
means for generating a flow of ions in the channel;
a first correction electrode, sufficiently close to each of the electrodes in the first plurality of electrodes such that an electric field generated by the first correction electrode substantially coincides with an electric field generated by each of the electrodes in the first plurality of electrodes, to influence the flow of ions within the channel; and
a second correction electrode, sufficiently close to each of the electrodes in the second plurality of electrodes such that, within the channel, an electric field generated by the second correction electrode substantially coincides with an electric field generated by each of the electrodes in the second plurality of electrodes, to influence the flow of ions within the channel.

15. A method of operating a subassembly for an apparatus for selectively delivering ion currents, the apparatus having a first wall, first charge holding means for holding a charge, the first charge holding means being on the first wall, second charge holding means, for holding a charge, the second charge holding means being adjacent to the first charge holding means on the first wall, a second wall, opposed to the first wall to define a channel therebetween, means for generating an ion flow in the channel, a third charge holding means for holding a charge, the third charge holding means being sufficiently close to the first charge holding means such that an electric field generated by the third charge holding means substantially coincides with an electric field generated by the first charge holding means, to influence the flow of ions in the channel and

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a fourth charge holding means for holding a charge, the fourth charge holding means being sufficiently close to the second charge holding means such that an electric field generated by the fourth charge holding means substantially coincides with an electric field generated by the second charge holding means, to influence the flow of ions in the channel the method comprising the steps of:

charging the first charge holding means to one of a first set of voltage values;

charging the second charge holding means to one of the first set of voltage values;

charging the third charge holding means to one of a second set of voltage values, the second set of voltage values being larger than the first set of voltage values; and

charging the fourth charge holding means to one of the second set of voltage values.

5,206,670

ION CURRENT CONTROL HEAD

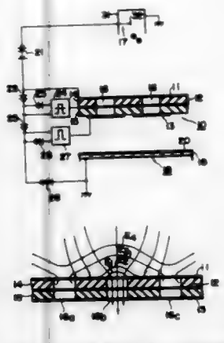
Masaji Nishikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1991, Ser. No. 793,617

Claims priority, application Japan, Nov. 28, 1990, 2-328334

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—159 **4 Claims**



1. An ion current control head for controlling ion current flying from an ion generation source to provide a pattern of charges on a dielectric medium through openings is arranged in a two-dimensional matrix array in a main scanning direction and a sub-scanning direction intersecting the main scanning direction, comprising:

(a) first electrically insulating means;

(b) first electrode means having a plurality of band-like segment electrodes arranged, as a parallel array, on a first plane along a first direction, and supported by the first electrically insulating means;

(c) second electrode means having a plurality of band-like segment electrodes arranged, as a parallel array, on, a second plane spaced from the first electrode means in a direction to or from which the ion current flies, the band-like segment electrodes being arranged along a second direction different from the first direction and supported by the first, electrically insulating means;

(d) second electrically insulating means;

(e) a third electrode means having an undivided continuous electrode separated by the second, electrically insulating means from the, first and second electrode means in the direction to or from which the ion current flies, the third electrode being located on the ion generation source side as viewed from the first and second electrodes so that it faces the ion generation source;

(f) ion current passage means having openings, each of the openings being located at those intersections of the segment electrodes in the first electrode means and the segment electrodes in the second electrode means, the openings piercing the first, second and third electrode means and being arranged as a two-dimension matrix relative to the main scanning direction and sub-scanning direction; and

(g) control means for applying a first signal voltage across the third electrode means and one of the adjacent electrode means to control whether the ion current is flowed into the opening or suppressed relative to that opening and applying a second signal voltage across the segment electrode selected by the first electrode means and the segment electrode selected by the second electrode means to control whether ion current trapped in a corresponding opening is allowed to be passed or suppressed and for performing a matrix drive operation by the signal voltage applied to the respective electrode so that the ion current can be controlled.

5,206,671

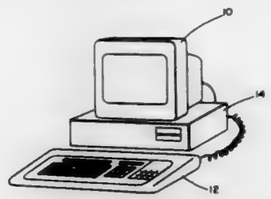
TESTING AND TREATING OF VISUAL DYSFUNCTIONS

Malvina B. Eydelman, 368 Longwood Ave., Apt. 45, Boston, Mass. 02215, and Shirley H. Wray, 987 Memorial Dr., Cambridge, Mass. 02138

Filed Jun. 29, 1990, Ser. No. 546,544

Int. Cl.[5] A61B *3/00*

U.S. Cl. 351—203 **8 Claims**



1. A method for testing and treating visual dysfunctions in a patient, comprising determining a threshold value for the patient's visual parameter or parameters, providing an interactive visual game that presents to the patient a visual task, said visual game employing an image or images selected as suited to the patient's interest and scaled to the patient's determined threshold value for the visual parameter or parameters, and presenting a non-visual reward to the patient for successful completion of the task.

5,206,672

SURGICAL OPTOMETER

Temple S. Rowe, Mission Viejo, Calif., assignor to Nestle S.A., Switzerland

Filed Sep. 5, 1990, Ser. No. 577,514

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—212 **12 Claims**

1. A method of testing optical properties of an optical system comprising the steps of:

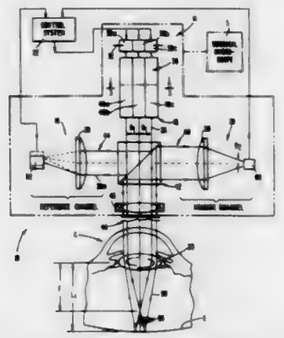
providing a plurality of stationary measurement beams of collimated radiant energy as collimated measurement beams;

dividing the collimated measurement beams into at least a measurement fixed path and a reference channel path, and directing the beams traveling along the measurement fixed path toward the optical system;

stationarily detecting each of a plurality of reflected measurement beams reflected from the optical system and traveling along a reflected fixed path from the optical system and providing a signal of each reflected measurement beam; and,

processing each of the signals of the reflected measurement beams and generating at least a signal representative of an optical property of the optical system based on the signals of the reflected beams;

detecting the intensity of measurement beams travelling along the reference channel path for facilitating calibration of each of the beams to ensure that the beams are of substantially equal intensity.



5,206,673

REFLECTION TYPE OVERHEAD PROJECTOR

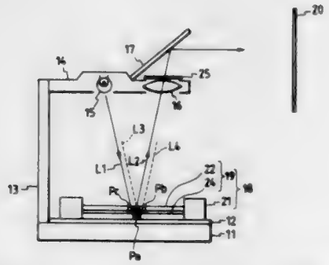
Yukio Kawahara; Keiichi Mori; Akihiro Homma; Toshiya Isobe; Mitsugi Kajikawa, and Toshihiro Yonemitsu, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Jul. 19, 1991, Ser. No. 733,206

Claims priority, application Japan, Feb. 22, 1991, 3-028610; Jun. 7, 1991, 3-136388; Jun. 7, 1991, 3-136389

Int. Cl.[5] G02F *1/13*

U.S. Cl. 353—98 **14 Claims**



1. A refection type overhead projector in which a mirror Fresnel lens reflects light from a light source, and an image on said mirror Fresnel lens is converged onto a projection lens spaced from said mirror Fresnel lens and projected in an enlarged manner and displayed on a screen, comprising:

a transmission type liquid crystal display using an ECB type liquid crystal cell, said liquid crystal display being removably disposed on said mirror Fresnel lens and provided with a first polarization plate on only one side thereof in opposing relation to said mirror Fresnel lens; and

a second polarization plate disposed adjacent said projection lens for effecting image formation in cooperation with said first polarization plate of said liquid crystal display.

5,206,674

SYSTEM FOR THE DISPLAY OF IMAGES GIVEN BY A SPATIAL MODULATOR WITH TRANSFER OF ENERGY

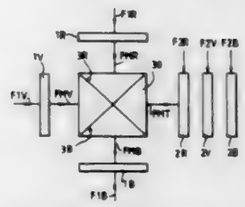
Claude Puech, Ballainvilliers; Jean-Pierre Huignard, Paris; Michel Papuchon, Villebons Sur Yvette; Henri Raobenbach, Paris, and Brigitte Loiseaux, Villebon Sur Yvette, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Nov. 1, 1991, Ser. No. 786,898

Claims priority, application France, Nov. 9, 1990, 90 13941

Int. Cl.[5] G03B *21/14*

U.S. Cl. 353—122 **12 Claims**



11. A system for the display of images comprising:

a spatial modulator of light receiving a first light beam and retransmitting a modulated beam;

an energy transfer device receiving the modulated beam and a second light beam and transferring the energy from the second light beam towards the modulated beam;

several spatial modulators of light each receiving a light beam of a particular wavelength, a device for the combination of beams receiving the modulated beams given by the modulators and giving a combined beam, several energy transfer devices placed in series on the combined beam, each receiving a pump beam of one of said wavelengths, each energy transfer device enabling the amplification of one or more wavelengths and being transparent to the other wavelengths.

5,206,675

REAL IMAGE MODE FINDER OPTICAL SYSTEM

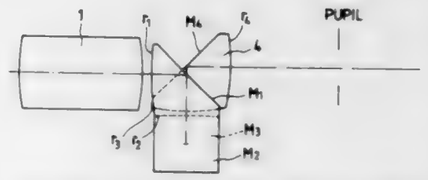
Yuji Miyauchi, Okaya, and Tatsuru Kanamori, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 13, 1991, Ser. No. 698,843

Claims priority, application Japan, May 15, 1990, 2-124860

Int. Cl.[5] G03B *13/02*

U.S. Cl. 354—219 **4 Claims**



1. A real image mode finder optical system, comprising:

a finder objective lens independent of a photographic objective lens;

a first reflecting member having at least one reflecting surface for erecting an image of an object formed by said finder objective lens, disposed behind a surface of said image; and

a second reflecting member functioning as an eyepiece, including an entrance surface having a curvature opposite to said first reflecting member with an airspace therebetween, at least one reflecting surface, and an exit surface having a curvature.

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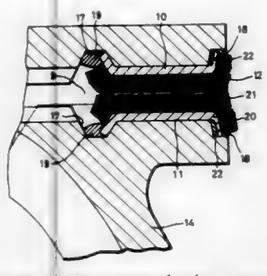
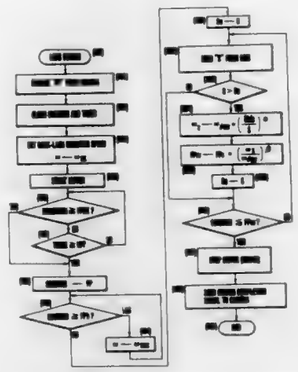
5,206,676
PHOTOGRAPHIC FILM CASSETTE
Kazunori Mizuno, and Masuhiko Hirose, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 685,774, Apr. 16, 1991, abandoned.
This application Sep. 16, 1992, Ser. No. 945,592
Claims priority, application Japan, Apr. 20, 1990, 2-105849; May 14, 1990, 2-123494
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—275 **17 Claims**



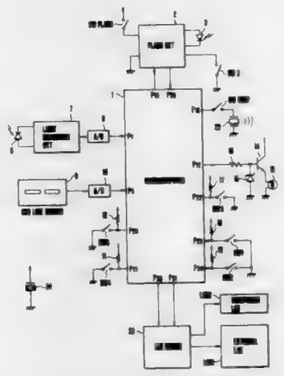
1. A photographic film cassette having a spool with photographic film wound thereon and a cassette shell for containing the film in a light-tight fashion and for supporting the spool rotatably, a film passageway being formed on said cassette shell for directing the film to a film passage mouth of said cassette, means for advancing a film leader of said film through said film passageway by rotating said spool toward an outside of said film passage mouth, and two light trapping members provided respectively on upper and lower inside surfaces of said film passageway for trapping light; said cassette comprising:
two inner recess portions, associated with said upper and lower inside surfaces, for increasing a degree of retraction from said upper and lower inside surfaces in an inward direction toward an inside of said cassette shell, inner edges of said two light trapping members being attached to respective ones of said two inner recess portions so as to increase an interval between upper and lower inside surfaces of said two light trapping members in the inward direction on said inner edges, so that a leading end of said film leader is surely advanced into a path between said two light trapping members toward the outside of said film passage mouth;
further comprising an adhesive agent for completely enclosing said inner edges of said two light trapping members, thereby to attach said two light trapping members to respective ones of said two inner recess portions.

5,206,677
OPTICAL APPARATUS
Ichiro Onuki, and Tatsuo Chigira, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 6, 1990, Ser. No. 609,838
Claims priority, application Japan, Nov. 8, 1989, 1-288744
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—400 **33 Claims**

1. An optical apparatus comprising:
a) an optical system including at least a focusing lens;
b) driving means for driving said focusing lens;
c) computing means for obtaining sensitivity information concerned with an amount of movement of the position of an image forming plane relative to a predetermined driving degree of said focusing lens;
d) focus detecting means; and
e) control means for causing said driving means to drive said focusing lens at a first speed and, after that, at a second speed which is lower than said first speed and, then, stop said focusing lens, on the basis of focus information obtained by said focus detecting means and said sensitivity information obtained by said computing means, said control means being arranged to vary said second speed according to said sensitivity information.

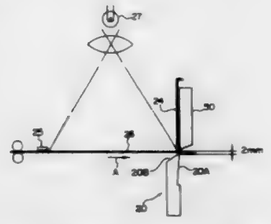


5,206,678
CAMERA HAVING PRELIMINARY FLASH DEVICE FOR PREVENTING RED-EYE
Jiro Kazumi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 16, 1991, Ser. No. 778,345
Claims priority, application Japan, Oct. 25, 1990, 2-288130; Oct. 25, 1990, 2-288133
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—415 **24 Claims**



1. A camera arranged to perform, prior to flash photographing, a preliminary flashing action on an object so as to prevent a red-eye phenomenon, comprising:
a) selection means for selecting a preliminary flashing mode of executing the preliminary flashing action;
b) a detecting circuit arranged to detect a state of preparation for flash photography; and
c) an indicating device for indicating selection of the preliminary flashing mode when the preliminary flashing mode is selected by said selection means, and for indicating execution of the preliminary flashing action when the preliminary flashing mode is selected by said selection means and completion of the preparation for flash photography is detected by said detecting circuit.

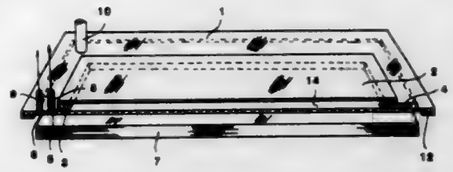
5,206,679
METHOD OF AND APPARATUS FOR CUTTING SHEET-MATERIAL
Syuji Tahara; Hiroyuki Satou, and Norio Ookawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 509,837, Apr. 17, 1990, abandoned, which is a division of Ser. No. 292,801, Jan. 3, 1989, abandoned.
This application Aug. 19, 1991, Ser. No. 747,485
Claims priority, application Japan, Jan. 19, 1988, 63-9147; Jan. 20, 1988, 63-5622[U]; Jan. 20, 1988, 63-10377
Int. Cl.[5] B26D *5/20*; **G03B** *29/00*
U.S. Cl. 355—29 **11 Claims**



1. A sheet-material cutting apparatus for cutting a fed long photographic sheet-material into a plurality of frames to be printed, said apparatus being provided in the vicinity of an outlet of a photographic printer from which said photographic sheet-material is discharged for cutting by said cutting apparatus, said apparatus comprising:
a fixed cutting edge;
a movable cutting edge disposed opposite said fixed cutting edge and moved in a first direction to engage said fixed cutting edge, causing a shearing force by which said sheet-material is cut into a cut segment and a remaining portion, said movable cutting edge being subsequently moved in a second direction opposite to said first direction to disengage from said fixed cutting edge;
a movement preventing means, comprising:
a plate member, disposed up-stream of a direction in which said sheet-material is carried with respect to said movable cutting edge, for preventing the end of said remaining portion from moving in said second direction by a lower horizontal end portion of said plate member when said movable cutting edge moves in said second direction; and
a fixed bracket, cooperating with said fixed cutting edge, said plate member being disposed below said movable cutting edge when said movable cutting edge is at a top dead center of its movement;
said sheet-material cutting apparatus further comprising a movable mask disposed up-stream from said plate member, cooperating with said plate member in constituting a printing frame defining an image size of each of said plurality of frames to be printed, said printing frame exhibiting a flare preventing function when images are printed on said photographic sheet material.

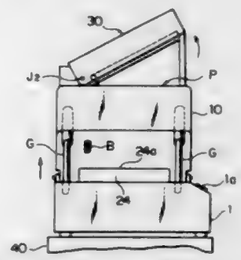
5,206,680
CONTACT PRINT FRAME HAVING A DOUBLE GLASS
Brian S. Dillow, Vällingby, Sweden, assignor to Misomex AB, Sweden
Filed Apr. 3, 1992, Ser. No. 862,845
Int. Cl.[5] G03B *27/20*
U.S. Cl. 355—91 **4 Claims**

1. A contact print frame of the type which is especially adapted to move one or more transparent films (7) into intimate contact with a light sensitive printing plate (11), a light sensitive collection film or any other light sensitive medium and to expose/print said one or more transparent films (7) onto said light sensitive medium (11), and comprising a supporting transparent glass, named contact glass (1), which has, as conventional, vacuum grooves (5, 6) at the bottom surface thereof for vacuum connecting an original/master film (7) and eventually also a masking film to said contact glass (1), and which is arranged to be pressed into contact with the printing plate (11) during the exposure/printing process, and an assisting glass (2) which is carried by the contact glass (1) and which is sealingly connected thereto on a slight distance above the upper surface



of the contact glass (1), an air pressure chamber (14) formed between the the sealingly interconnected contact and assisting glasses (1, 2), means (4) for putting said air pressure chamber (14) under a slight positive pressure, so that the contact glass (1) is thereby cambering slightly convexly towards the printing plate (11) while the contact print frame with the contact glass (1) is being moved into contact with the printing plate (11).

5,206,681
ARRANGEMENT FOR FACILITATING OPENING AND CLOSING A CLAMSHELL TYPE OF COPYING MACHINE
Naoki Otomo, and Toshio Shida, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Sep. 16, 1991, Ser. No. 760,874
Claims priority, application Japan, Sep. 16, 1990, 2-248498; Feb. 2, 1991, 3-33530
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 **8 Claims**



1. An image forming apparatus for reproducing an image of a document, comprising:
a lower half of said apparatus;
an upper half of said apparatus;
means for connecting said lower half and said upper half so that said upper half pivots relative to said lower half to open or close said apparatus around an axis;
a first urging means located at a first side which is perpendicular to said axis; and
a second urging means located at a second side which is opposite to said first side;
wherein both of said first urging means and said second urging means cause at least one of said upper half and said lower half to move so as to be separated from each other, and an urging force of said second urging means is greater than an urging force of said first urging means.

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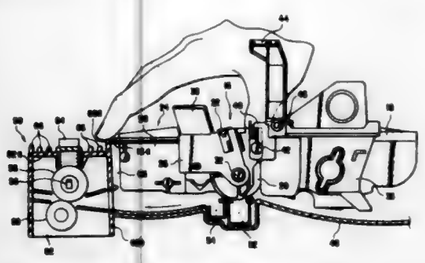
5,206,682

IMAGE FORMING APPARATUS

Katsuhiro Yamada, and Naoki Yamamura, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1992, Ser. No. 926,155
Claims priority, application Japan, Aug. 13, 1991, 3-202688
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 14 Claims



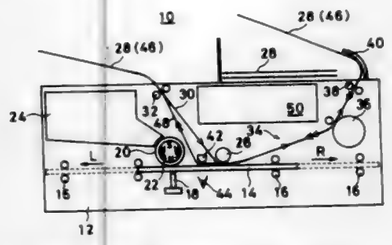
1. An image forming apparatus comprising:
a housing;
a photoconductor unit removably arranged in the housing and having an image carrying body; and
a fixing device arranged adjacent to the photoconductor unit in the housing, the fixing device including a heating member, a cover concealing the heating member, and a plurality of projections formed on an outer surface of the cover, for preventing an operator's hand from directly touching the outer surface of the cover and preventing the operator's fingers from being caught by the fixing-device-side end portion of the photoconductor unit.

5,206,683

COMPACT OPTICAL PRINTER WITH PLANAR PHOTORECEPTOR

Takeo Fukatsu, Kyoto; Hironobu Tsujimoto; Toshihiko Hiratani, both of Osaka; Kazuyuki Gotoh, Kumamoto, and Yasuo Kishi, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osak, Japan

Filed May 9, 1990, Ser. No. 521,688
Claims priority, application Japan, May 21, 1989, 1-119106
Int. Cl.[5] G03G *15/00, 21/00*
U.S. Cl. 355—202 17 Claims



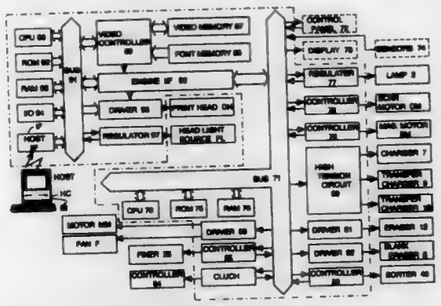
1. An optical printer, comprising:
a photoreceptor including a transparent substrate, a transparent electrode layer and a photosensitive layer formed on said substrate, said photoreceptor forming a generally planar surface;
means for moving said photoreceptor in a direction generally parallel to its planar surface;
arranged in opposition to said photoreceptor for supplying toner onto said photoreceptor, said opposite electrode having a single roller with an outer metallic sleeve to transfer the toner to said photoreceptor;
a single electric field applying means for applying an electric field between said transparent electrode layer of said photoreceptor and said opposite electrode;
mean for exposing said photoreceptor with a light image at a position opposite to said opposite electrode from a side of said transparent substrate;
toner absorption means for applying a force by which said toner can be absorbed toward said opposite electrode;
transcribing means for forming a toner image on said photoreceptor by selectively adhering said toner on said photoreceptor and for transcribing the toner image onto a paper; and
means for fixing the toner image being transcribed on said paper.

5,206,684

RECORDING APPARATUS INCLUDING A MEMORY INTO WHICH INFORMATION IS WRITTEN IN A PARTICULAR ORDER AND FROM WHICH MEMORY INFORMATION IS READ IN THE REVERSE ORDER

Kenichi Wada; Tsukasa Yagi; Tomohiko Masuda; Hirohisa Kitano; Ken Matsubara, and Kohichi Shingaki, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1990, Ser. No. 493,367
Claims priority, application Japan, Mar. 14, 1989, 1-62722; May 9, 1989, 1-116869
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—203 19 Claims



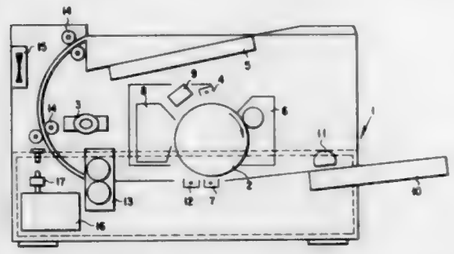
1. A recording apparatus comprising:
memory means for storing recording information input from an external device, said memory means capable of storing a predetermined amount of data;
write control means for successively writing the recording information input from the external device into said memory means, and stopping a writing operation when the recording information stored reaches the predetermined amount;
read control means for reading the recording information from said memory means in an order opposite to an order in which the recording information is written;
recording means for recording the recording information read by said read control means onto recording paper; and
resuming means for controlling said write control means to resume the write operation upon completion of an operation of said recording means.

5,206,685

APPARATUS FOR MAINTAINING AN ELECTROPHOTOGRAPHIC APPARATUS

Kei Hara, and Koki Tanaka, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1992, Ser. No. 854,417
Claims priority, application Japan, Mar. 29, 1991, 3-89082; Jun. 27, 1991, 3-156623; Sep. 18, 1991, 3-265392
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—206 5 Claims



1. An apparatus for maintaining an electrophotographic apparatus with at least a photosensitive member comprising:
a central processing unit (CPU) which comprises a control section;
memory means provided detachably for storing a count value for a number of prints;
a rewritable non-volatile memory element for storing the number of replacements of said memory means when the count value for said number of prints has reached a value based on which a decision is made whether a service life of said photosensitive member is expired;
memory-means replacement for counting means for updating a stored value in said non-volatile memory element and counting an updated value upon each replacement of said memory means;
comparing means for comparing a count value of the replacement counting means with a predetermined value indicating a maintenance period of other components than said photosensitive member that need maintenance; and
informing means for reporting the need for maintenance of said other components than said photosensitive member when it is judged that a value stored in said non-volatile memory element has reached said predetermined value.

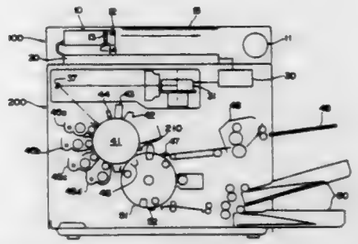
5,206,686

APPARATUS FOR FORMING AN IMAGE WITH USE OF ELECTROPHOTOGRAPHIC PROCESS INCLUDING GRADATION CORRECTION

Kazuyuki Fukui, Toyokashi; Takanobu Yamada, Toyokawa, and Masaaki Nishiyama, Toyokashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1991, Ser. No. 671,977
Claims priority, application Japan, Mar. 20, 1990, 2-071410; Mar. 20, 1990, 2-071411; Mar. 20, 1990, 2-071412; Mar. 20, 1990, 2-071413; Mar. 20, 1990, 2-071414; Mar. 20, 1990, 2-071415; Mar. 20, 1990, 2-071416
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 44 Claims

1. An apparatus for forming an image with use of an electrophotographic process, comprising:
(a) a photoconductor layer;
(b) a charger which sensitizes said photoconductor layer at a desired initial electric potential;
(c) exposure means for exposing the sensitized photoconductor layer to form an electrostatic latent image;
(d) a development device which develops the electrostatic latent image to form a toner image;
(e) application means for applying a bias electric voltage to said development device;
(f) detection means for detecting the state of the surface of said photoconductor layer;
(g) determination means for determining the values of the initial electric potential and the bias electric voltage in correspondence with the results detected by said detection means;
(h) charger control means for controlling said charger so that the initial electric potential of said photoconductor layer becomes the value determined by said determination means;



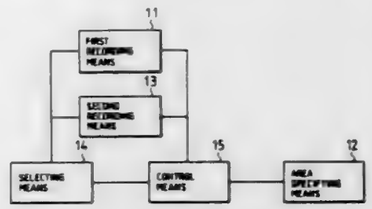
(i) bias control means for controlling said application means so as to make said bias electric voltage to become the value determined by said determination means;
(j) operation means for inputting data by an operator; and
(k) correction means for controlling said charger and/or said application means so as to increase or decrease the value of the initial electric potential set by said charger control means and/or the value of the bias electric voltage set by said bias control means in correspondence with the data set by said operation means.

5,206,687

COLOR MARKING APPARATUS FOR A RECORDING APPARATUS

Takanobu Suzuki; Michikiro Kawamura; Akio Arai; Kiyoshi Matsuzawa; Takeshi Huruya; Satoshi Ootani, and Mamoru Kobayashi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 320,269
Claims priority, application Japan, May 15, 1987, 62-116918; May 15, 1987, 62-116919; May 15, 1987, 62-116920; Jun. 10, 1987, 62-143306
Int. Cl.[5] G03G *21/00, 15/01*
U.S. Cl. 355—214 19 Claims



1. A color marking apparatus comprising:
first recording means for copying the whole area of an original with a first color to form an image;
area designating means for designating an area on the original;
second recording means for superimposing a second color different from said first color onto the image formed by

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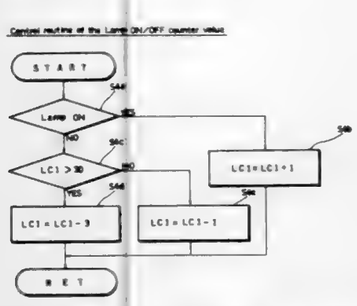
said first recording means to mark the area designated by said area designating means;
selection means for alternatively selecting the recording operations of said first and second recording means;
control means for controlling said recording operation in an order selected by said selection means; and
copy density controlling means for controlling the first recording means and said second recording means such that said designated area marked by said first recording means has a copy density different from a copy density of said designated area marked by said second recording means.

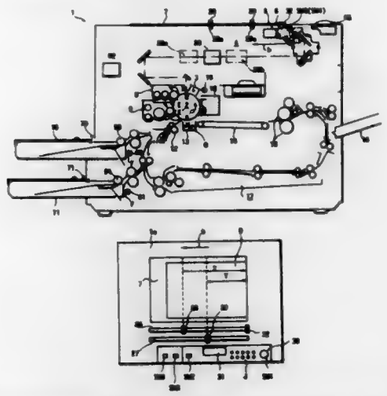
5,206,688
LIGHT CONTROL DEVICE FOR AN IMAGE FORMING APPARATUS
Kunihiro Onishi; Akihiro Takada, both of Osaka, and Kaneyuki Sakamoto, Nara, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 483,542, Feb. 22, 1990, abandoned. This application Feb. 5, 1992, Ser. No. 831,009
Claims priority, application Japan, Feb. 22, 1989, 1-42582
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—228 **2 Claims**



1. A light control device for an image forming apparatus comprising:
a timer means for calculating a preheating ON time of a fluorescent lamp during a copying state and a preheating state;
a subtract means for subtracting a predetermined amount from the ON time of said timer means during a non copying state; and
a lamp preheating means for supplying a lower electric voltage than an electric voltage of ordinary copying process for the fluorescent lamp during a predetermined interval after the timer means becomes zero when the power source of the apparatus turns ON.

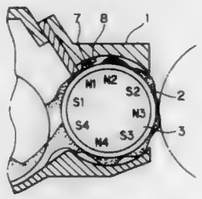
5,206,689
COPY RATIO SETTING APPARATUS
Yasuhiro Kusuda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 21, 1989, Ser. No. 341,713
Claims priority, application Japan, Apr. 22, 1988, 63-100886; Oct. 17, 1988, 63-262522; Oct. 17, 1988, 63-262523
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—243 **5 Claims**

1. A copying apparatus comprising:
a rectangular document table,
first specifying means, which is movable in parallel with one side of said document table to an arbitrary position, for specifying a position,
second specifying means, which is movable in parallel with the same side of said document table to an arbitrary position, for specifying a position representative of a portion of an area on a paper onto which an image of the document is to be formed,
first signal generating means for generating a first signal corresponding to the position of said first specifying means,
second signal generating means for generating a second signal corresponding to the position of said second specifying means,



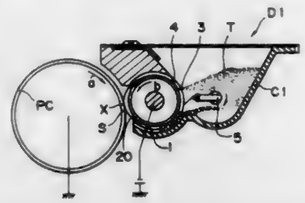
computing means for computing a copy ratio based on the first and the second signals,
a plurality of paper feeding means,
selecting means for selecting one of said paper feeding means based on the second signal, and
image forming means for forming an image corresponding to a document onto the paper fed from the selected paper feeding means with the above copy ratio.

5,206,690
DEVELOPING ROLLER WITH AN IDENTICAL POLARITY MAGNETIC PART
Tamotsu Shimizu, Settsu; Hiroshi Murasaki, Ibaragi; Masahiko Matsuura, Amagasaki, and Susumu Mikawa, Itami, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 27, 1991, Ser. No. 813,845
Claims priority, application Japan, Jan. 11, 1991, 3-1810; Oct. 3, 1991, 3-255646
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **12 Claims**



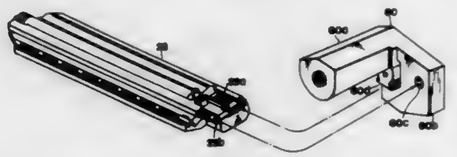
1. A developing device comprising:
a rotatable developing sleeve;
a magnet member stationarily disposed inside said developing sleeve; and
a developer restricting member which restricts an amount of developer transported on a peripheral surface of said developing sleeve toward a developing region in accordance with rotation of said developing sleeve,
said magnet member having a developing magnetic pole confronting said developing region, an identical polarity magnetic part which is provided downstream between said developer restricting member and said developing magnetic pole and is formed of a plurality of adjacent magnetic poles of identical polarity, said identical polarity magnetic part having the same polarity as the developing magnetic pole, and a transporting magnetic pole which is provided downstream between the identical polarity magnetic part and said developing magnetic pole for transporting the developer and has a polarity opposite to that of the identical polarity magnetic part.

5,206,691
DEVELOPING APPARATUS
Hiroshi Mizuno, Ikoma; Toshiya Natsuhara, Nishinomiya; Satoshi Deishi, Amagasaki, and Toshimitsu Fujiwara, Kobe, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 30, 1992, Ser. No. 828,300
Claims priority, application Japan, Feb. 1, 1991, 3-011926
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—259 **8 Claims**



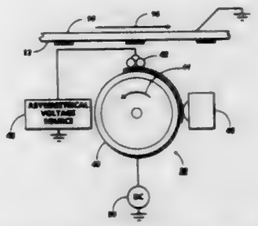
1. A developing apparatus for use in electrophotography, which comprises a toner holding member having a surface and holding toner on the surface and adapted to be driven for rotation, the surface of said toner holding member containing a mixture mainly composed of crystalline polyamide and non-crystalline polyamide, means for supplying toner onto the surface of said toner holding member, and a restricting member for restricting a layer of toner on said surface by depressing the toner thus supplied onto the surface of said toner holding member.

5,206,692
IMAGE FORMING APPARATUS HAVING AN INTEGRAL TONER SUPPLY CONTAINER AND TONER STORAGE CONTAINER
Takao Ishida, Yokohama, and Naoto Higure, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 14, 1991, Ser. No. 791,517
Claims priority, application Japan, Nov. 30, 1990, 2-340532
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—260 **9 Claims**



1. An image forming apparatus comprising:
developing means for developing with a developing agent a latent image formed on an image carrying body;
transferring means for transferring the image developed by the developing means to a recorded medium;
removing means for removing the developing agent remaining on the image carrying body after transfer of the developed image by the transferring means;
convey means for conveying the developing agent removed by the removing means;
supply means having a first storage portion with a predetermined capacity for storing the developing agent, said supply means supplying the developing agent from the first storage portion to the developing means;
storing means having a second storage portion, the capacity of which is less than that of the first storage portion of the supply means and is greater than the value of the product of a non-transfer rate of the transfer means and the capacity of the first storage portion of the supply means, said second storage portion storing the developing agent removed from the image carrying body by the removing means and conveyed by the convey means;
a first unit having the developing means and the convey means; and
a second unit detachably mountable to the first unit, the second unit having the storing means and the supply means.

5,206,693
DEVELOPMENT UNIT HAVING AN ASYMMETRICALLY BIASED ELECTRODE WIRES
Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 16, 1991, Ser. No. 745,786
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—261 **4 Claims**



1. An electrophotographic printing machine of the type in which an electrostatic latent image recorded on a charge retentive surface is developed with toner to form a visible image thereof, wherein the improvement includes:
a donor roll arranged to transport toner to a development zone adjacent the surface;
a plurality of electrode wires disposed in the development zone; and
means for electrically biasing said electrode wires relative to said donor roll with a DC electric potential and an asymmetrical AC electrical wave form to detach toner from said donor roll and produce a toner cloud in the development zone.

5,206,694
IMAGE FORMING APPARATUS
Tadashi Ohira, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jul. 19, 1989, Ser. No. 382,181
Claims priority, application Japan, Jul. 20, 1988, 63-181228; Jul. 20, 1988, 63-181229; Jul. 20, 1988, 63-181230; May 12, 1989, 63-119570
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—290 **17 Claims**

1. An image forming apparatus, comprising:
image forming means for forming a toner image on a sheet of paper at a prescribed image forming speed;
fixing means for fixing said toner image on said sheet of paper;

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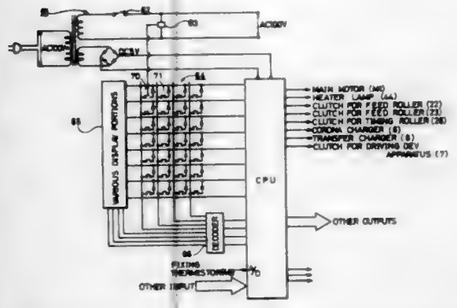
said fixing means including a heat roller having heating means for heating said sheet of paper, and a pressing roller rotatable in contact with said heat roller;
driving means for rotating said heat roller and said pressing roller;
a sensor for detecting temperature of said heat roller;
power switch for supplying power to said image forming means;
power supply means for supplying power to said heating means after turning on of said power switch;



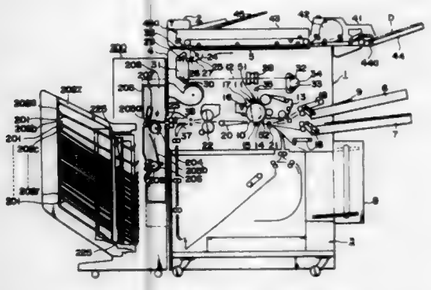
inhibiting means for inhibiting operation of said image forming means and of said driving means until a prescribed temperature is detected by said sensor;
counting means for counting the number of sheets on which the image is fixed by said fixing means after inhibition by said inhibiting means is released; and
controlling means for reducing said prescribed image forming speed per unit time period until the value of said counter reaches a prescribed the value.

5,206,695

IMAGE FORMING APPARATUS HAVING SORTING FUNCTION

Yasuhiro Iwata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1991, Ser. No. 757,906
Claims priority, application Japan, Oct. 31, 1990, 2-293896
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—323 9 Claims



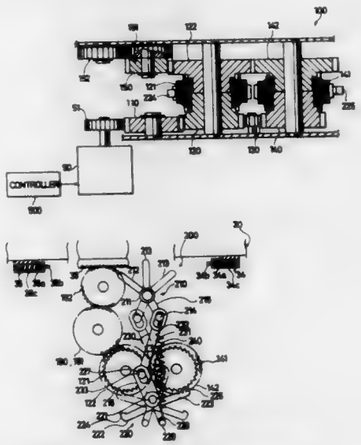
1. An electronic copying machine comprising:
a platen on which a document having an image is placed;
a return auto document feeder for feeding the document to an image reading position on the platen;
an image scanner for optically scanning the document set at the image reading position;
means for forming an image on a copying material corresponding to an image of the document scanned by said image scanner is formed;
a plurality of bins for receiving the image forming media;
sorting means for sorting the image forming media having the image information formed thereon by said image forming means to the plurality of bins;
means for stacking the image forming media having the image information formed thereon by said image forming means at a predetermined bin of the plurality of bins;
an operation guide key for designating a copy mode of said electronic copying machine, the copy mode including a sorting mode, a stacking mode and a nonsort mode;
guide means for generating guide message data for inquiring whether the sorting and stacking modes are to be set, when a plurality of copies are designated while no sorting and stacking modes are designated;
display unit for displaying the guide message data;
an answer key for designating the sort or stack mode in response to the message displayed by said display unit;
detection means for detecting whether said answer key is operated within a predetermined period of time;
determining means for determining that the sort or stack mode is designated when said detection means detects that the answer key is operated within the predetermined period of time; and
means for using a copy button as said answer key.

5,206,696

IMAGE FORMING APPARATUS PROVIDED WITH A MOVABLE DOCUMENT TABLE

Junichi Hirobe, Kadoma; Masakatsu Akashi, Kakogawa; Masahiko Kobayashi, Ikoma, and Tsutomu Sugaya, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 9, 1992, Ser. No. 848,555
Claims priority, application Japan, Mar. 12, 1991, 3-046444; Mar. 12, 1991, 3-046445
Int. Cl.[5] G03G *15/28*
U.S. Cl. 355—234 19 Claims



1. An image forming apparatus comprising:
a main body having an image forming means;
a document table for holding the document, the table being movable reciprocatingly to the left and right sides of the apparatus when viewed from front over an upper surface of the main body;
drive means for moving the document table, the drive means including a drive motor rotatable in a specified direction and a conversion mechanism for converting the torque of the drive motor into the driving force for moving the document table to the left or right side;
movement control means for mechanically executing at least one operation of:

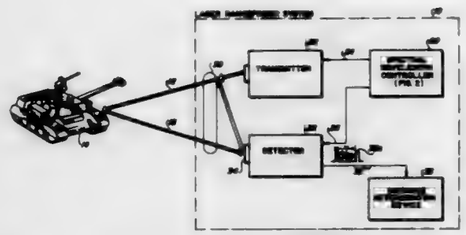
a) switching a moving direction of the document table; and
b) locking the document table in a predetermined position;
the movement control means including switch means for causing the conversion mechanism to convert the torque of the drive motor into movement of the document table to the left from that of the document table to the right when the document table moves to the left up to a first predetermined position, and to convert the torque of the driving motor into movement of the document table to the right from that of the document table to the left when the document table moves to the right up to a second predetermined position;
the conversion mechanism including a drive portion operable in association with the drive motor, and a left movement drive portion and a right movement drive portion operable in association with the drive portion; and
the switch means includes:
a clutch mechanism provided between the drive portion and left movement drive portion and between the drive portion and right movement drive portion for coupling the drive portion with either the left or right movement drive portion;
a toggle mechanism operable in association with the clutch mechanism, the toggle mechanism having a first position and a second position; and
a switch member for switching the position of the toggle mechanism;
the clutch mechanism coupling the drive portion with the left movement drive portion when the toggle mechanism is switched to the first position by the switch member, and coupling the drive portion with the right movement drive portion when the toggle mechanism is switched to the second position by the switch member.

5,206,697

TUNABLE LASER RANGEFINDER AND METHOD

William C. Schwartz, Orlando, Fla., assignor to Schwartz Electro Optics, Inc., Orlando, Fla.

Filed Oct. 19, 1990, Ser. No. 599,715
Int. Cl.[5] G01C *3/08*; G01S *13/08*
U.S. Cl. 356—5 18 Claims



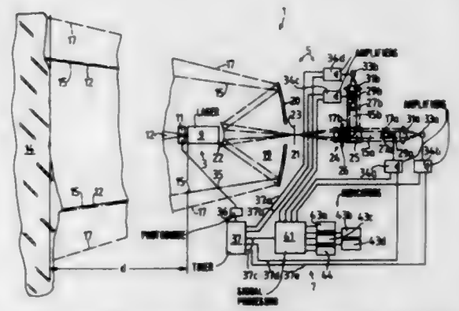
1. An apparatus for determining the range of a target from a reference location, the apparatus comprising:
means disposed at said reference location for transmitting a pulse of coherent light energy having a first predetermined wavelength at the target such that said coherent light energy reflects off said target;
means for detecting said transmitted and said reflected coherent light energy pulse having the first predetermined wavelength;
means for changing the wavelength of said coherent light energy pulse transmitted at the target from a first predetermined wavelength to a second predetermined wavelength;
means for changing the wavelength that said detecting means detects said coherent light energy pulse from the first predetermined wavelength to the second predetermined wavelength; and
means responsive to said light energy pulses detected by said detecting means for computing the distance between the target and said reference location at both the first predetermined wavelength of said coherent light energy pulses and the second predetermined wavelength.

5,206,698

LIDAR ARRANGEMENT FOR MEASURING ATMOSPHERIC TURBIDITIES

Christian Werner, Munich; Jürgen Streicher, Germering; Wilhelm Krichbaumer, Munich; Hartwut Herrmann; Ulrich Oppel, both of Woerthsee; Eberhard Gelbke, Uetersen; Christoph Münkel, Hamburg, and Uwe F. W. Berghaus, Wedel/Holstein, all of Fed. Rep. of Germany, assignors to DLR Deutsche Forschungsanstalt für Luft-und Raumfahrt, Köln and Impulsphysik GmbH, Hamburg, both of Fed. Rep. of Germany

Filed Oct. 3, 1989, Ser. No. 416,652
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3838351
Int. Cl.[5] G01C *3/08*; G01N *21/00*; G06F *7/70*; B60T *7/16*
U.S. Cl. 356—5 12 Claims



1. A lidar for measuring various atmospheric turbidities, comprising means for transmitting a cone of linearly polarized radiation having a given apex angle; means for receiving backscattered radiation; means for evaluating output signals from said receiving means with regard to different kinds of turbidities in the atmosphere; timing means for controlling evaluation of the output signals from said receiving means with regard to different measuring distances; said receiving means comprising a first and a second receiving device, each device having a reception region which is spatially separated from that of the other device; the reception region of said first receiving device receiving a backscattered radiation part which substantially coincides with the transmitted radiation cone; the reception region of said second receiving device receiving a part of the backscattered radiation which is substantially outside the cone of the transmitted radiation; said receiving devices including a reception optical system designed such that the reception region of said second receiving device surrounds the reception region of said first receiving device; said reception optical system including a polarization analysis optical member; said first receiving device including first and second detecting mean arranged behind said polarization analysis optical member for detecting the intensities of radiation of parallel and perpendicular polarization with respect to the polarization direction of the transmitted radiation cone; said second receiving device including first detecting means arranged with said polarization analysis optical member for detecting the intensity of scattered radiation.

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5,206,699
SENSING A NARROW FREQUENCY BAND OF RADIATION AND GEMSTONES

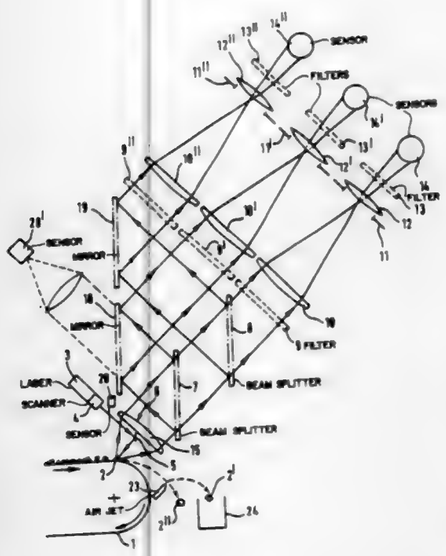
Andrew D. G. Stewart, Reading; Robin W. Smith, Croyden; Martin P. Smith, Berkshire, all of Great Britain; Daniel J. Brink, Pretoria, South Africa; Martin Cooper, Marlow, Great Britain; Christopher M. Welbourn, Maidenhead, Great Britain, and Paul M. Spear, Reading, Great Britain, assignors to Gersan Establishment, Liechtenstein, Liechtenstein

Continuation of Ser. No. 349,265, May 8, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 810,355

Claims priority, application United Kingdom, May 6, 1988, 8810723; May 6, 1988, 8810724; Jul. 5, 1988, 8815941; Jul. 7, 1988, 8816156; Jul. 7, 1988, 8816157; Jul. 7, 1988, 8816164; Jul. 7, 1988, 8816165; Jul. 7, 1988, 8816167; Nov. 9, 1988, 8826225; Mar. 23, 1989, 8906853

Int. Cl.[5] G01N *21/64, 21/65, 21/87*

U.S. Cl. 356—30 91 Claims



1. Apparatus for examining objects or for examining an article, comprising:

means for irradiating a line across the objects or article with radiation which excites Raman emission from an object or a zone of the article; and

viewing means for viewing all or an extended part of said line and sensing a narrow frequency band of radiation emitted by specific objects or zones of the article on excitation by radiation irradiated by said irradiating means which narrow band corresponds to the anti-Stokes radiation characteristic of an object or zone, the viewing means comprising narrow band pass filter means which, within a specific angle of incidence, substantially filter out all but said narrow band, sensing means for sensing radiation which has passed through the filter means, and means for preventing rays outside said angle of incidence reaching the sensing means.

5,206,700
METHODS AND APPARATUS FOR RETROREFLECTIVE SURFACE INSPECTION AND DISTORTION MEASUREMENT

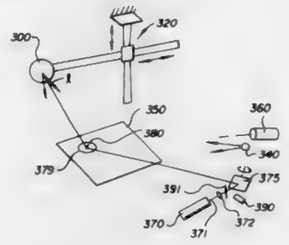
Rodger Reynolds; Donald A. Clarke, and Timothy R. Pryor, all of Windsor, Canada, assignors to Diffracto, Ltd., Windsor, Canada

Division of Ser. No. 212,011, Jun. 27, 1988, Pat. No. 5,074,661, which is a continuation-in-part of Ser. No. 33,930, Apr. 2, 1987, Pat. No. 4,863,268, which is a continuation of Ser. No. 711,646, Mar. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 868,736, May 30, 1986, abandoned. This application Sep. 26, 1991, Ser. No. 765,832

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—237 12 Claims



1. A method for creating a retroreflective image of a surface comprising the steps of:

illuminating an area of the surface with light from a broad light source by directing the broad light therefrom onto the surface area in such a manner that the broad light is reflected from the surface area;

providing a retroreflective member in a position such that the broad light reflected from the illuminated surface area impinges on the retroreflective member to form a primary signature thereon, is then returned to the illuminated surface area to form a secondary signature on the surface area, and is re-reflected from the surface area; and

imaging the secondary signature to form the retroreflective image.

5,206,701
APPARATUS FOR NEAR-INFRARED SPECTROPHOTOMETRIC ANALYSIS

James L. Taylor, Naperville; Ronald L. Cutshall, Mokena, and Ernest H. Baughman, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 20, 1991, Ser. No. 764,146

Int. Cl.[5] G01J *3/08, 3/36;* G01N *21/35*

U.S. Cl. 356—325 35 Claims

1. An apparatus for obtaining spectral information and quantifying the physical properties of a sample comprising:

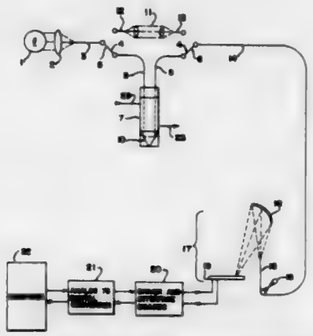
a light source for providing light;

a high-efficiency fiber optic switch means, in communication with said light source through a single fiber optic strand, said high-efficiency fiber optic switch means directing said light alternatively along at least two channels, said channels comprising at least one reference channel and at least one sample channel;

a sampling means in communication with said sample channel for providing an interface between said light and said sample;

a mode scrambler;

a fiber optic means selected from the group consisting of a high-efficiency fiber optic switch and an optical coupler, in communication with said sample channels and said reference channels for directing said light alternatively from said reference and sample channels to said mode scrambler;



a wavelength discrimination device for separating said light into component wavelengths and providing spectral information for the determination of the physical properties of said sample.

5,206,702
TECHNIQUE FOR CANCELING THE EFFECT OF EXTERNAL VIBRATION ON AN ATOMIC FORCE MICROSCOPE

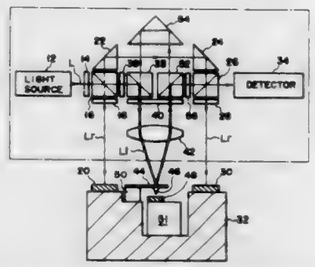
Masahiko Kato, Akikawa; Takao Okada, Hachioji, and Hiroshi Kajimura, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,239

Claims priority, application Japan, Oct. 9, 1989, 1-262061; Oct. 9, 1989, 1-262062

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—358 8 Claims



1. An atomic force microscope for evaluating the surface of a sample, comprising:

a probe having a tip arranged close to the surface of the sample;

a cantilever having one end which supports the probe on one face thereof and has a reflecting surface on the opposite face, said cantilever being elastically deformable in accordance with the magnitude of an interatomic force acting between the atoms of the tip of the probe and a surface portion of the sample;

means for moving the probe along the surface of the sample;

a light source for emitting a coherent light beam;

means for dividing said coherent light beam into two light beams;

a first support to which the sample is mounted and a second support to which is secured another end of said cantilever opposite to said one end thereof;

a reference mirror face coupled to one of said first and second supports so as to vibrate with a corresponding one of the reflecting surface of the cantilever and the surface of the sample as part of the same vibration system;

means for guiding one of said two light beams to said reference mirror face;

means for guiding the other of said two light beams to the reflecting surface of said cantilever;

means for detecting displacement of said cantilever by synthesizing the light beam reflected by the reference mirror face and the light beam reflected by the reflecting surface of the cantilever with each other, so as to cause interference therebetween; and

means for forming an image of the surface profile of the sample on the basis of a signal output from the probe-moving means and a signal output from the detecting means.

5,206,703
METHOD OF AND APPARATUS FOR MEASURING SMALL GAPS

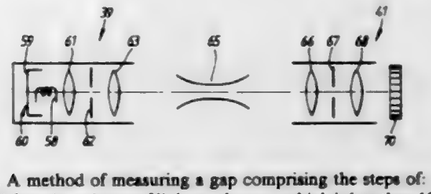
Christopher S. Holmes, Keighley; Robert G. Munro, Huddersfield, and Stanley Eastwood, Rochdale, all of England, assignors to Resold Power Transmission Ltd., Wythenshawe, England

Filed Aug. 21, 1990, Ser. No. 570,229

Claims priority, application United Kingdom, Aug. 25, 1989, 8919399

Int. Cl.[5] G01B *11/00, 11/22, 11/02*

U.S. Cl. 356—372 28 Claims



1. A method of measuring a gap comprising the steps of:

(a) focusing a beam of light on the gap, which is less than 100 microns in width,

(b) substantially eliminating non-paraxial light passing through the gap by means of telecentric filtering,

(c) measuring the amount of substantially only paraxial light passing through the gap,

(d) and determining the width of the gap from the measured amount of paraxial light.

5,206,704
POSITION MEASURING APPARATUS AND METHOD OF USE THEREOF

Walter Huber, and Erwin Spanner, both of Traunstein, Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 1, 1991, Ser. No. 663,429

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006365

Int. Cl.[5] G01B *11/14;* H01J *3/14*

U.S. Cl. 356—375 47 Claims

1. A position measuring arrangement having an illumination arrangement emitting a light beam and a detection arrangement for measuring the position of two objects, which are movable in relation to each other, with the aid of diffraction of the light beam at at least one grid division, in which the light beam is split at a first plane by means of at least one optical instrument into partial beams which extend in different directions, an improvement comprising:

in a second plane, parallel to the first plane, a first diffraction grid is provided, at which the partial beams are diffracted in such a manner that the partial beams are oriented parallel to each other;

the partial beams penetrate a retro-reflecting element in the form of parallel partial beams and the parallel partial

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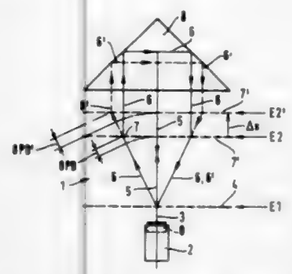
beams impinge on a second diffraction grid to be again diffracted and to be subsequently directed to an optical element at the first plane wherein the partial beams are brought to an interference at the optical element, such that, if there is a change (Δs) in a distance between the first



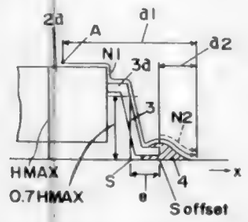
plane and the second plane, a change in the optical path difference (ΔOPD) of the partial beams occurs which is directly proportional to the change in the distance Δs, and which is detected by the detection arrangement as a light-dark modulation.

5,206,705

METHOD OF CHECKING EXTERNAL SHAPE OF SOLDER PORTION

Nobufumi Tokura, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1990, Ser. No. 623,499
Claims priority, application Japan, Dec. 13, 1989, 1-323351
Int. Cl.[5] G01B *11/24*; G01N *21/00*
U.S. Cl. 356—376 1 Claim



1. A method of checking an external shape of a solder portion of a chip which includes a mold member, a lead and said solder portion, the solder portion bonding said chip to a circuit board, comprising the steps of:

(a) establishing a starting point at an upper surface of the mold member of said chip;

(b) sweepingly projecting a laser beam from said starting point to said solder portion;

(c) employing a position sensor to detect light reflected from said chip and said solder portion in order to measure an external shape of said chip and to detect a location of a reference part of the chip having a height at a predetermined ratio to a height of an upper surface of said molder member;

(d) establishing an offset position which is offset by a predetermined distance from said location of said reference part toward the solder portion; and

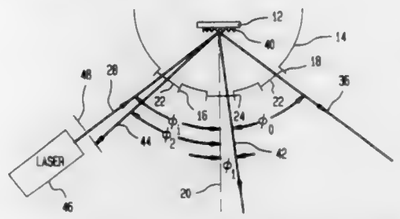
(e) sweepingly projecting the laser beam from said offset position toward an outer end of said solder portion in order to measure an external shape of said solder portion.

5,206,706

ALIGNMENT OF AN ELLIPSOMETER OR OTHER OPTICAL INSTRUMENT USING A DIFFRACTION GRATING

William E. Quinn, Middlesex Boro, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Jul. 1, 1991, Ser. No. 723,580
Int. Cl.[5] G01B *11/00*; G01J *4/00*
U.S. Cl. 356—400 9 Claims



1. A method of aligning an optical instrument, comprising the steps of:

irradiating along a first axis a diffraction grating having a grating period of d with an incident beam of light having a wavelength λ, thereby diffracting along a second axis at least an n-th order diffracted beam from said grating, n being an integer greater than zero; and

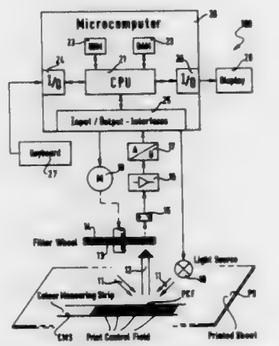
auto-collimating said n-th order diffracted beam with said incident beam, wherein said first and second axis are made to be substantially coincident, whereby an angular orientation between said incident beam and said grating is established, thereby determining an angle of incidence between said incident beam and said grating at said established orientation.

5,206,707

APPARATUS FOR THE ANALYSIS OF PRINT CONTROL FIELDS

Hans Ott, Regensdorf, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Apr. 1, 1991, Ser. No. 678,589
Claims priority, application Switzerland, Apr. 6, 1990, 1170/90
Int. Cl.[5] G01I *3/46*
U.S. Cl. 356—402 22 Claims



1. Apparatus for the analysis of print control fields, comprising:

an electro-optical measuring device to determine a set of color densities of a print control field;

a color recognition device to determine relative variables of grayness and color hue errors from said set of color densities, and to determine a color of the print control field from said relative variables;

a type recognition device to determine print control field type from the set of color densities as one of a given set of print control field types;

a measured value determination device to determine a measuring variable correlated with the type and the color of the print control field; and,

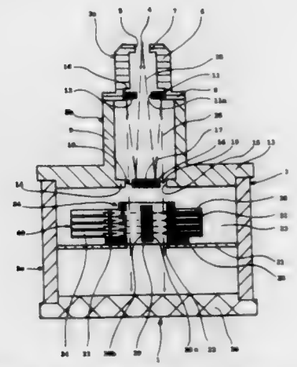
a display unit to display the measuring variable, the color of the print control field and user guide indications.

5,206,708

APPARATUS FOR THE SIMULTANEOUS DETECTION OF RANGES OF WAVELENGTHS

Gunter Knapp, Sorgerweg 16, A-8047 Graz, and Bernhard Platzer, Wielandgasse 48, A-8010 Graz, both of Austria

Filed Dec. 21, 1990, Ser. No. 631,496
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942375
Int. Cl.[5] G01N *21/25*
U.S. Cl. 356—416 16 Claims



1. Apparatus for the simultaneous detection of several ranges of wavelengths of polychromatic light radiation, comprising:

optical guidance means for guiding an incident polychromatic light beam, said optical guidance means comprising:

means including a first system of mirrors located in the path of the incident polychromatic light beam for collimating said polychromatic light beam into a hollow-cylindrically collimated light beam, wherein one mirror of the first system of mirrors is mounted at the center of the collimated light beam, and

means including a second system of mirrors, said second system including a plurality of deflecting mirrors located in the path of the hollow-cylindrically collimated light beam, for deflecting the collimated light beam essentially perpendicularly in respect to a conceptual outer surface of a hollow cylinder defined by the collimated light beam and radially in respect to the longitudinal axis of the hollow cylinder;

a photo-detector for each range of wavelength to be detected, said photo-detectors being mounted opposite the deflecting mirrors; and

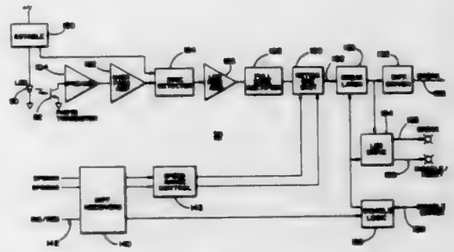
a common interference filter which filters the ranges of wavelengths to be detected out of the polychromatic light beam, said common interference filter being mounted in a path of the collimated light beam between the deflecting mirrors and the photo-detectors, the deflecting mirrors and the associated photo-detectors being pivotal about the interference filter; said filtered ranges of wavelengths depending on the orientation of the deflecting mirrors in relation to the interference filter.

5,206,709

APPARATUS FOR SENSING YARN MOVEMENT AND FOR SIGNALING BREAKAGE OF THE YARN

Richard A. Schewe, Loves Park; Richard J. Fachanich, Niles, and Timothy R. Fox, Chicago, all of Ill., assignors to Reed-Chatwood, Inc., Rockford, Ill.

Filed Sep. 23, 1991, Ser. No. 763,975
Int. Cl.[5] G01N *2/89*
U.S. Cl. 356—430 7 Claims



1. Apparatus for sensing lengthwise movement of a strand of yarn of non-uniform surface texture and for producing an electrical signal when the yarn stops, said apparatus comprising a guide for causing the yarn to travel along a predetermined and substantially linear path, a light source located on one side of said path for casting a beam of light across said path, a photoelectric detector located on the opposite side of said path in opposing relation with said light source to receive said beam, said guide comprising a nose made of wear-resistant material and having a throat for guiding said yarn along said path, said throat having entrance surfaces engageable with said yarn before the yarn reaches said beam and having exit surfaces spaced along said path from said entrance surfaces and engageable with said yarn after the yarn passes through said beam, a holder of light-transmitting material having a tongue projecting into said throat between said entrance and exit surfaces, pockets in said tongue and receiving said light source and said photoelectric detector, said tongue having a yarn-receiving throat located between said pockets, said entrance and exit surfaces of the throat of said nose holding said yarn out of engagement with the throat of said holder, said detector producing an output signal whose frequency varies as a function of changes in the intensity of said beam, the intensity of the beam received by said detector changing during movement of said yarn due to non-uniformity of the surface texture of the yarn, and means responsive to the output signal of said detector for producing said electrical signal when the frequency of said output signal remains substantially constant for a predetermined period of time.

5,206,710

METHOD AND APPARATUS FOR THERMOWAVE ANALYSIS

Hans-Dieter Geller; Matthias Wagner, and Peter Kowalski, all of Jena, German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, Fed. Rep. of Germany

Filed Sep. 25, 1991, Ser. No. 765,646
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4035266
Int. Cl.[5] G01N *21/17*
U.S. Cl. 356—432 32 Claims

1. In the method of thermowave analysis in which a laser beam is directed onto an object to be analyzed, whereby the intensity of said laser beam is modified by the reaction of the object to the energy of the beam directed thereto, and modification of the beam is detected with a measurement detector by way of a focussing objective, the improvement comprising

modulating the intensity of the laser beam, before it strikes

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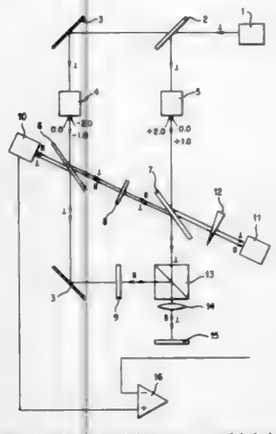
the object, to have a modulation spectrum that contains two discrete frequencies (f_1; f_2) and
measuring the optical response of the object by measuring



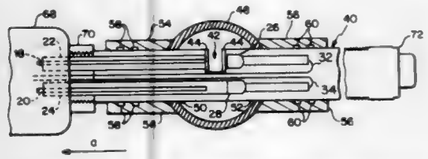
the amplitude of a mixed frequency which is produced by the reaction of said object to the two modulation frequencies (f_1; f_2) at the output of the measurement detector, with a frequency-selective device.

5,206,711

FLUID OPACITY SENSOR

John W. Berthold, Salem, and Charles R. Dailey, Akron, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 11, 1990, Ser. No. 535,934
Int. Cl.[5] G01N *21/00*
U.S. Cl. 356—436 **18 Claims**



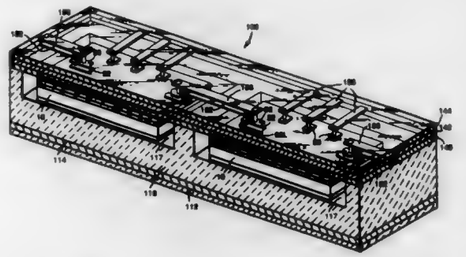
1. A fiber optic fluid opacity sensor for measuring opacity of a sample, comprising:
a light source;
means for dividing light from said light source into a sample signal and a reference signal;
a sample optical pathway for transmitting said sample signal through a sample in a passage defined by a predetermined distance;
a reference optical pathway for transmitting said reference signal through passage defined by a predetermined distance approximately equal to said sample passage;
a probe for containing said sample and reference optical pathways, said probe having a passage for providing sample to the sample passage, said reference optical pathway being situated in said probe adjacent said sample optical pathway and sealed from sample ingress;
nozzle means constructed to receive said probe in a sample process line, said nozzle means having sealing means to prevent sample escape, said sealing means being constructed to allow said probe of the fluid opacity sensor to be withdrawn from the sample process line for cleaning the sample passage and setting offset adjustment;
a photodetector for each optical pathway for receiving said sample signal and said reference signal being propagated along said sample optical pathway and said reference optical pathway, each of said photodetectors being situated inside said probe, both of said optical pathways being defined by optical fiber means spaced apart from and axially aligned with said photodetectors at the predetermined distance of the sample and reference passage, said reference optical pathway being exposed to a similar environment as said sample optical pathway; and
means for measuring variations in light intensity of said sample and reference signals for determining opacity.

5,206,712

BUILDING BLOCK APPROACH TO MICROWAVE MODULES

William P. Korarumpf, Albany, and David A. Bates, Fayetteville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1990, Ser. No. 504,760
Int. Cl.[5] H01L *23/02*
U.S. Cl. 361—393 **49 Claims**



1. A packaged microwave component comprising:
a microwave component having a microwave signal terminal;
a package dielectric layer overlying said microwave component,
a package signal conductor disposed on said package dielectric layer and coupled to said microwave signal terminal of said microwave component; and
a package ground conductor ohmically connected to a ground conductor of said microwave component;
said package signal conductor being spaced from said package ground conductor to form a package microwave transmission line which is coupled to said microwave signal terminal of said microwave component;
said package microwave transmission line having a port portion suitable for coupling to an external microwave transmission line, whereby said component is suitable for assembly into a larger system.

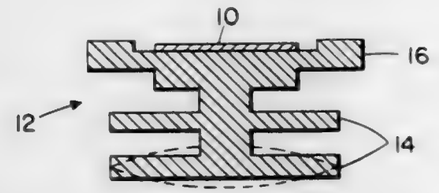
5,206,713

MOUNTING SILICON CHIPS

Michael L. McGeary, Alloway, Scotland, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1991, Ser. No. 722,741
Claims priority, application United Kingdom, Jun. 29, 1990, 9014491
Int. Cl.[5] H01L *39/02*
U.S. Cl. 257—684 **8 Claims**

1. A semiconductor chip and heat dissipating mounting assembly comprising a semiconductor chip, a unitary mounting formed entirely of polysilicon material and carrying on one side thereof the semiconductor chip, the mounting being shaped to include a group of heat dissipating elements formed on its external surface on the side opposite the side carrying the semiconductor chip, the group of heat dissipating elements



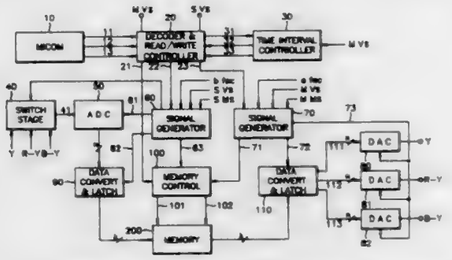
projecting outwardly of such exterior surface at a location directly opposite the semiconductor chip.

5,206,714

CIRCUIT FOR CONTROLLING THE TIME INTERVAL BETWEEN ROTATIONAL MOVEMENTS OF A PLURALITY OF SUBORDINATE PICTURES IN A PICTURE-IN-PICTURE-TYPE TELEVISION OR VTR SYSTEM AND METHOD THEREFOR

Yong-Je Kim, Jinhae, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Mar. 31, 1989, Ser. No. 331,352
Claims priority, application Rep. of Korea, Apr. 16, 1988, 1988-4339
Int. Cl.[5] H04N *9/74, 5/262*
U.S. Cl. 358—22 **23 Claims**



1. In a picture-in-picture-type color television or video-tape-recorder system having a synchronizing separator, a chroma circuit and a microcomputer, a circuit for moving rotationally a plurality of subordinate pictures, said circuit, comprising:
memory means for storing video digital data, said video digital data being written onto or read from said memory means through dual ports;
read/write controller means for generating a first control signal to control a start of writing or reading subordinate picture data onto or from said memory means and a second control signal to select an address for writing or reading said subordinate picture data onto or from said memory means, said read/write controller means receiving mode selecting data, a clock pulse control signal, and a strobe control signal from the microcomputer and main and subordinate picture vertical synchronizing signals separated by a synchronizing separator, said subordinate picture vertical synchronizing signal being used when said subordinate picture data is written onto said memory means, said main picture vertical synchronizing signal being used when said subordinate picture data is read from said memory means;
time interval controller means for receiving a recognition signal for moving rotatably two selected subordinate pictures from a plurality of subordinate pictures and said main picture vertical synchronizing signal to control generation of said first and second control signals for writing and reading said subordinate picture data onto and from said memory means and a third control signal to maintain a fixed time interval between the movements of the two subordinate pictures, said time interval controller means being connected with said read/write controller means;
switching means for switching sequentially and transmitting sequentially analog video chrominance signals for brightness, red, and blue of the two subordinate pictures, said chrominance signals being separated by a chroma circuit;
analog/digital converter means for receiving the analog video chrominance signals from said switching means and for converting the analog video chrominance signals into video digital data;
first data converting and latching means for converting and latching video digital data of said analog/digital converter means into a fixed bit adapted to be stored into said memory means;
writing clock pulse and writing address signal generator means for generating switching signals to control the sequential transmission of said analog video chrominance signals of said switching means, for generating a sampling signal for the digital data conversion by said analog/digital converter means, for generating a first clock pulse for the converting and latching of said first data converting and latching means, for generating a second clock pulse for refreshing the writing, address and control of said memory means, upon receiving said first control signal to control the start of the writing of said read/write controller means, second basic frequency and the subordinate picture vertical and horizontal synchronizing signals being separated by said synchronizing separator;
second data converting and latching means for converting the data read from said memory means into a form adapted for first to third digital/analog data;
first to third digital/analog converter means for converting into analog output signals the first to third digital/analog data received from said second data converting and latching means;
reading clock pulse and reading address signal generator means for generating a reading address signal, a latching clock pulse for the data conversion of said second data converting and latching means, and a third clock pulse for said first to third digital/analog converter means for converting the data into picture-in-picture analog signals by receiving said first control signal to control the start of the reading from said read/write controller means, first basic frequency supplied to a timing clock and the main picture horizontal and vertical synchronizing signals being separated by said synchronizing separator; and
memory control timing and address selecting means for selecting a writing and reading address on a basis of the second clock pulse of said writing clock pulse and writing address signal generator means and the reading address signal of said reading clock pulse and reading address signal generator respectively, according to the first control signal received from said read/write controller means.

5,206,715

CIRCUIT FOR SEPARATING LUMINANCE AND CHROMINANCE SIGNALS

Jun-mo Jung, and Jeong-eang Lee, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 15, 1991, Ser. No. 641,274
Claims priority, application Rep. of Korea, Jun. 9, 1990, 90-8475
Int. Cl.[5] H04N *9/64, 9/77*
U.S. Cl. 358—31 **15 Claims**

1. A circuit for separating the luminance and chrominance signals from a composite video signal in a color video signal processing system, comprising:
first delay means for delaying a composite video signal over

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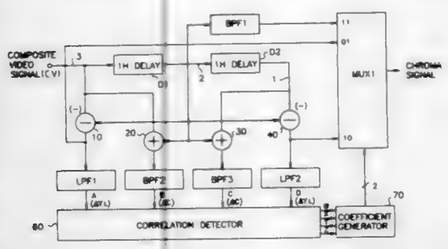
a predetermined time interval to provide a first delayed signal;
second delay means for delaying said first delayed signal at said predetermined time interval to provide a second delayed signal;
first subtractor means for subtracting said composite video signal from said first delayed signal to provide a first subtracted signal;
first adder means for adding said first delayed signal to said composite video signal to provide a first added signal;
second adder means for adding said first delayed signal to said second delayed signal to provide a second added signal;
second subtractor means for subtracting said second delayed signal from said first delayed signal to provide a second subtracted signal;
first filter means for filtering said first and second subtracted signals respectively over a first predetermined bandwidth to provide first and second luminance difference signals;



second filter means for filtering said first and second added signals respectively over a second predetermined bandwidth to provide first and second chrominance difference signals;
correlation detector means for detecting correlation of said first and second luminance difference signals and said first and second chrominance difference signals to generate a plurality of correlation control signals;
coefficient generator means for logically combining said plurality of correlation control signals to generate a correlation coefficient;
third filter means for filtering said first delay signal over a third predetermined bandwidth to provide an intermediate signal; and
multiplexer means for receiving and for selectively transmitting one of said intermediate signal, and said first and second subtracted signals in accordance with said correlation coefficient.

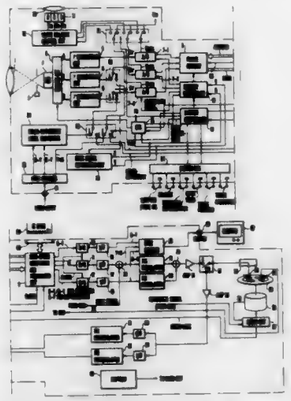
5,206,716

CAMERA HAVING DIGITAL-TO-ANALOG CONVERTER WITH VARIABLY SETTABLE REFERENCE LEVEL

Tomishige Taguchi, Saitama, and Makoto Kondo, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 512,873, Apr. 23, 1990. This application Jul. 9, 1991, Ser. No. 727,293
Claims priority, application Japan, Apr. 28, 1989, 1-109522
Int. Cl.[5] H04N 9/07
U.S. Cl. 358—41 17 Claims

1. A camera comprising:
a) selection means for selecting one of an image signal read out from an image sensor and a reproduced signal obtained from a recording medium;
b) an analog-to-digital converter for converting the signal selected by said selection means into a digital signal;
c) storage means for storing said digital signal; and
d) reference control means arranged to control a reference voltage of said analog-to-digital converter by using a white balance control signal when said image signal is selected by said selection means and to make said reference voltage constant when said reproduced signal is selected by said selection means.

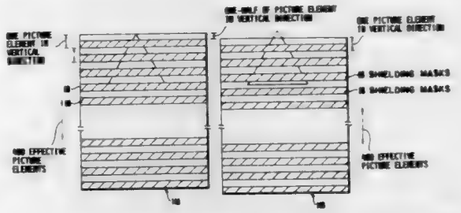


5,206,717

IMAGE SENSING APPARATUS HAVING HORIZONTAL SHIELDING MASKS

Tsuguhide Sakata, Tokyo, and Toshihiko Mimura, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 652,187, Feb. 7, 1991, abandoned, which is a continuation of Ser. No. 388,682, Aug. 2, 1989, abandoned. This application Nov. 7, 1991, Ser. No. 789,458
Claims priority, application Japan, Aug. 8, 1988, 63-196028; Aug. 8, 1988, 63-196029
Int. Cl.[5] H04N 5/335
U.S. Cl. 358—43 13 Claims



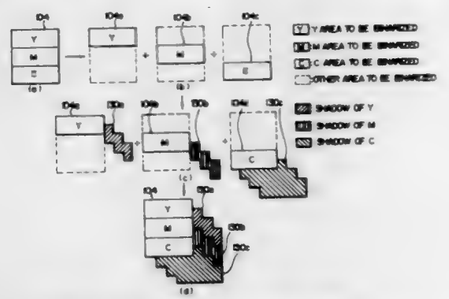
1. An image sensing apparatus comprising a photographic optical system, splitting means for splitting an optical image formed by said photographic optical system into two channels to form two optical images, and first and second image sensing means for photoelectrically converting the two optical images formed by said splitting means into electrical signals, wherein said first image sensing means and said second image sensing means are arranged on optically equivalent planes in offset relation by a pitch equal to one-half of a picture element in the vertical direction and, wherein horizontally extending shielding masks having a width equal to about one-half of a picture element in the vertical direction with a pitch equal to one picture element in the vertical direction are arranged on an imaging plane of each of said first and second image sensing means.

5,206,718

COLOR IMAGE PROCESSOR FOR CREATING SHADOWS AND MASKS

Shinji Yamakawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 17, 1990, Ser. No. 568,716
Claims priority, application Japan, Aug. 19, 1989, 1-212115; Aug. 23, 1989, 1-214834; Mar. 26, 1990, 2-73373; Jul. 20, 1990, 2-190821
Int. Cl.[5] H04N 1/46
U.S. Cl. 358—75 28 Claims



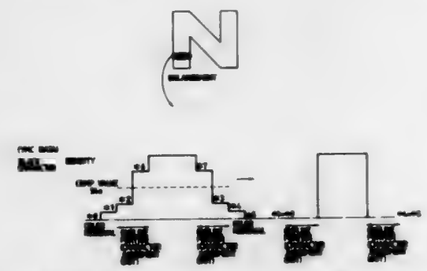
1. An image processing apparatus comprising:
reading means for reading a color image to produce multi-level data representative of said color image;
binarizing means for binarizing the multi-level data read by the reading means color component by color component;
storing means for storing the binarized multi-level data binarized by said binarizing means;
operational control means for causing said reading means and said storing means to operate on a real time basis;
moving means for moving each binary data of a particular color component produced by said binarizing means in a predetermined direction; and
combining means for combining the binary data of the color components and moved data produced by said moving means.

5,206,719

IMAGE PROCESSING APPARATUS INCLUDING MEANS FOR EXTRACTING AN OUTLINE

Yoshinori Ikeda, Tokyo; Hiroyuki Ichikawa, Kawasaki; Mitsuru Kurita; Yasumichi Suzuki, both of Tokyo, and Toshiyuki Kitamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1990, Ser. No. 519,272
Claims priority, application Japan, May 10, 1989, 1-117010; May 31, 1989, 1-138941
Int. Cl.[5] H04N 1/46
U.S. Cl. 358—80 38 Claims



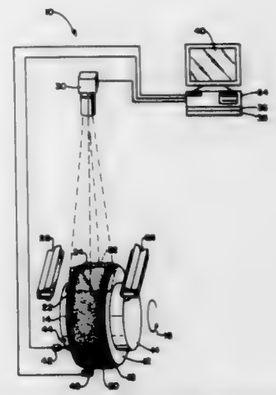
1. An image processing apparatus comprising:
a) input means for inputting a color image signal;
b) extraction means for extracting an outline portion from the color image signal; and
c) output means for removing the color image signal in an area other than the outline portion and outputting, the color image signal representing the extracted outline portion in multi-colors based on the color image signal input by said input means.

5,206,720

APPARATUS AND TECHNIQUE FOR MONITORING COMPONENT POSITION DURING TIRE BUILDING

John D. Clothiaux, Copley, Ohio, and Sheldon Smilo, San Diego, Calif., assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 16, 1991, Ser. No. 808,783
Int. Cl.[5] H04N 7/00, 7/18
U.S. Cl. 358—101 20 Claims



1. A measurement system for tire building apparatus, comprising:
a drum for receiving tire components, said drum being rotatable about an axis;
a camera having a field of view encompassing a portion of said drum receiving the tire components;
illumination means on either side of said drum for directly illuminating edge portions of the tire components; and
processing means interconnected with said camera for acquiring, analyzing and presenting video data of selected discrete sections of said edge portions of the tire components and thereby evidencing any lateral displacement of such tire components.

5,206,721

TELEVISION CONFERENCE SYSTEM

Youichi Ashida, Kawasaki; Ryusaku Imai, Yamato; Yuji Yoshida; Toshihiro Homma, both of Yokohama; Hitoshi Sato, Tokyo; Hitoshi Ishiguro, Inagi; Hiroaki Natori, Kawasaki, and Masakazu Yamaguchi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1990, Ser. No. 490,469
Int. Cl.[5] H04N 7/12; H04M 11/00
U.S. Cl. 358—85 33 Claims

1. A television conference system for automatically shooting a current speaker of a plurality of speakers with a camera, comprising:
microphone input judgement means for judging existence of microphone inputs into microphones provided for each of the speakers;
judgement result holding means for holding the results of the judging of the existence of the microphone inputs over a first predetermined period, the first predetermined period being longer than the shortest period of continuous speak-

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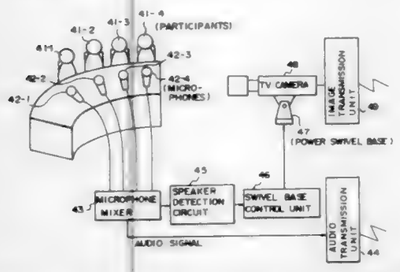
ing, said judgement result holding means including a plurality of storage buffers, the number of the storage buffers being the same as the number of samplings in the first predetermined period, and the storage buffers being ring shift registers;

time totaling means for obtaining a total time of the microphone inputs during the first predetermined period from the results of the judging held in said judgement resulting holding means;



speaker specifying means for specifying as a current speaker the speaker using the microphone input having the total time obtained by said time totaling means over a second predetermined period, the second predetermined period being a predetermined continuing period of noise; and

camera drive means for driving a camera within a shooting range of the speaker specified as the current speaker by said speaker specifying means.

5,206,722

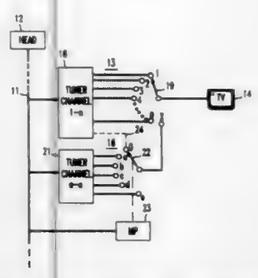
REMOTE CHANNEL SWITCHING FOR VIDEO ON DEMAND SERVICE

Shue-Yu Kwan, Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1990, Ser. No. 635,044

Int. Cl.[5] H04H *1/02*

U.S. Cl. 358—86 **12 Claims**



1. A method for delivering from a head end of a television system selected VOD television programs to television subscribers, each having an assigned set top box for selecting any of a plurality of first TV channels of different frequency, comprising the steps of:

dedicating a plurality of second TV channels of different frequency to VOD programs, the second TV channels being different from the first TV channels;

providing each subscriber with a set top box that includes a single channel designation for VOD reception;

providing each set top box with remotely controlled switching apparatus for selectively making said single channel designation to be receptive of any of the second TV channels;

providing a plurality of programs on the second TV channels including the step of providing a first selected program on a first one of the second TV channels during a first selected time period specified by a first subscriber;

prior to the first selected time period, actuating from the head end the remotely controlled switching apparatus of the first subscriber so as to make the single channel designation of the set top box assigned to the first subscriber receptive of said first one of the second TV channels carrying the selected program;

and after the first selected time period, actuating the remotely controlled switching apparatus to make the VOD channel of the set top box assigned to the first subscriber substantially unreceptive of any of said second TV channels.

5,206,723

MOTION ESTIMATOR

Ian Parke, Suffolk, England, assignor to British Telecommunications public limited company, London, England

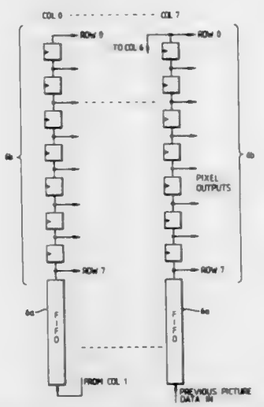
PCT No. PCT/GB90/00581, § 371 Date Dec. 19, 1991, § 102(e) Date Dec. 19, 1991, PCT Pub. No. WO90/13205, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 18, 1990, Ser. No. 778,802

Claims priority, application United Kingdom, Apr. 26, 1989, 8909498

Int. Cl.[5] H04N *7/137*

U.S. Cl. 358—105 **15 Claims**



1. A motion detector for video signals comprising:

means for reception and temporary storage of signals representing one line-scanned frame of a picture and of signals representing another such frame of the picture; and

means for comparing each of a plurality of blocks into which the said one frame is divided with the corresponding region of the other frame and with a plurality of positionally shifted regions of the other frame, to produce vector information indicating the positional shift if any between the position of the block and the position of that region of the other frame which meets a criterion of similarity between the block and the region;

said comparison means including means arranged to operate sequentially upon blocks disposed in rows aligned with the picture line direction of said one frame, and to compare each with the said plurality of positionally shifted regions of the other frame in a sequential column-by-column scan of part of said other frame.

5,206,724

Patent Not Issued For This Number

5,206,725

METHOD AND APPARATUS FOR CODING/DECODING IMAGE SIGNAL PROVIDING ACCURATE DETERMINATION OF AN IMAGE CONTOUR AND EFFICIENT COMPRESSION CODING

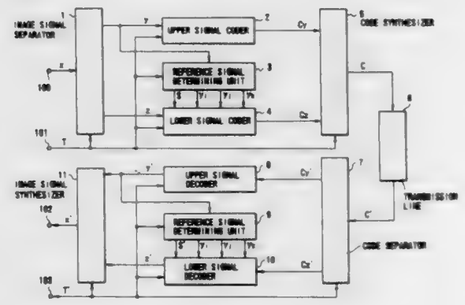
Shoji Mizuno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 791,150

Claims priority, application Japan, Nov. 13, 1990, 2-306479

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—133 **16 Claims**



1. A method of coding an image signal, comprising the steps of:

dividing an image signal into an upper signal for coarsely designating a level of the image signal and a lower signal for finely designating the level of the image signal;

coding the upper signal;

detecting a contour direction of an image from said upper signal;

selecting a reference signal for coding the lower signal in accordance with a direction code indicating the contour direction;

coding the lower signal by referring to the selected reference signal; and

synthesizing the coded upper signal and the coded lower signal and outputting a code corresponding to the image signal.

5,206,726

TIME BASE CORRECTOR FOR ELIMINATING TIME BASE FLUCTUATIONS IN A COMPOSITE VIDEO SIGNAL

Yoshiyuki Okuda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 1, 1991, Ser. No. 694,412

Claims priority, application Japan, Jul. 27, 1990, 2-199879

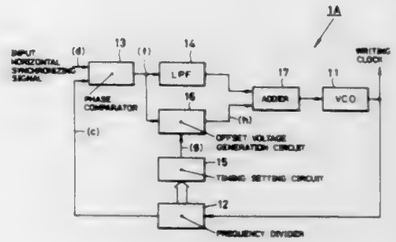
Int. Cl.[5] H04N *9/89*

U.S. Cl. 358—149 **3 Claims**

1. A time base corrector, comprising writing clock generating means for generating a writing clock following time base fluctuation of an input composite video signal, and reading clock generating means for generating a reading clock based on a reference signal, means for coupling said input composite video signal to a memory for writing said input composite video signal in said memory in synchronism with said writing clock, and data stored in said memory being read from said memory in synchronism with said reading clock, wherein said writing clock generating means comprises:

a voltage controlled oscillator;

phase difference detecting means for detecting a phase difference between said input composite video signal and an output signal of said voltage controlled oscillator;



means, receiving an output signal of said phase difference detecting means as a control input signal, for generating offset voltages having polarities opposite to each other and a level corresponding to a signal level of said control input signal at predetermined timings in a back porch and a front porch of said input composite video signal; and

an adder using the outer signal of said phase difference detecting means as an augend input signal, for adding said offset voltages to said augend input signal, and using a resultant output signal as a control signal of said voltage controllied oscillator.

5,206,727

TELEVISION SIGNAL ACCORDING TO THE SIGNAL-TO-NOISE RATIO OF THE TELEVISION SIGNAL

Kazuyuki Ebihara; Shigehiro Ito, both of Toride; Yuji Nishi, and Tatsushi Koguchi, both of Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 16, 1991, Ser. No. 700,700

Claims priority, application Japan, May 18, 1990, 2-128346; May 18, 1990, 2-128347

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—167 **4 Claims**

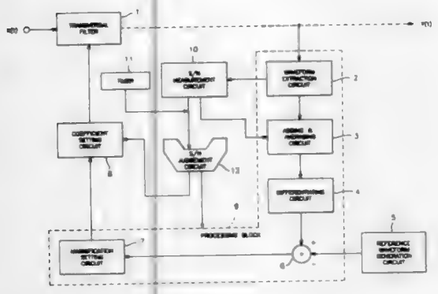
1. A television ghost removal apparatus comprising:

transversal filter means for receiving input television signals, for compensating waveform distortion included in said television signals, and for removing a ghost component on the basis of filter coefficients;

waveform extraction means for extracting signal waveforms of predetermined periods that include reference signals for ghost detection from said television signals;

coefficient setting means for comparing a reference waveform signal and the signal waveforms extracted by said

waveform extraction means to obtain error signals, setting coefficient data corresponding to the error signals, and in accordance with said coefficient data, and changing said filter coefficients of said transversal filter means;



S/N measurement means for measuring a signal to noise ratio (S/N) of said television signals; and

S/N judgment means for prohibiting change of said filter coefficients by said coefficient setting means when said S/N has deteriorated, and for initializing said coefficient data when said S/N has recovered to a favorable status.

5,206,728

TELEVISION SYSTEM HAVING AN ULTRABLACK VIDEO SIGNAL BLANKING LEVEL FOR AN ON-SCREEN CHARACTER DISPLAY

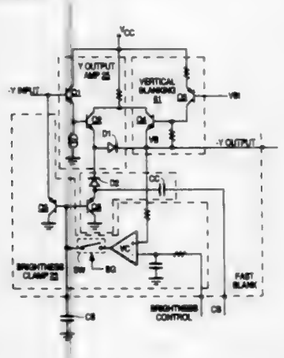
Yong H. Kim, Singapore, Singapore, assignor to Thomson Consumer Electronics, S.A., Courbevoie, France

Filed May 6, 1991, Ser. No. 696,489

Claims priority, application United Kingdom, May 3, 1991, 9109613

Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—168 **6 Claims**



1. In a television system, apparatus comprising:

a source of an input video signal representing an image to be displayed and including a black level contained in periodic synchronization intervals separating image intervals;

brightness control means responsive to said input video signal and to a brightness control signal and keyed in response to keying pulses for providing at an output an output video signal including a black level dependent on said brightness control signal;

timing means for deriving said keying pulses in response to image blanking pulses occurring during respective ones of said synchronization intervals;

means for coupling said image blanking pulses to said timing means through said output whereby said output video signal is also coupled to timing means;

a source of an auxiliary signal representing characters or graphics to be displayed by a display device and an associated character blanking pulses indicating when said video signal is to be blanked and when said characters or graphics are to be displayed; and

character control means responsive to said character blanking pulses and said brightness control signal for causing said output video signal to assume a character blanking level which is dependent on said brightness control signal, which is offset from said black level of said output video signal and which has an amplitude between said black level and the level of said image blanking pulses coupled to said timing means and at which said timing means is inhibited from responding to said character blanking pulses.

5,206,729

IMAGE SWITCHING APPARATUS FOR PRODUCING SPECIAL VIDEO EFFECTS

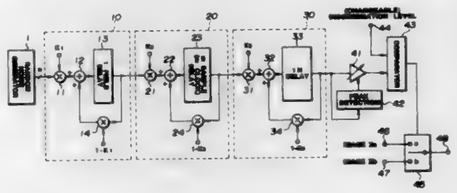
Tetsuro Nakata, and Naotaka Tachibana, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 792,613

Claims priority, application Japan, Nov. 21, 1990, 2-317479

Int. Cl.[5] H04N *5/262, 5/268, 9/74*

U.S. Cl. 358—182 **39 Claims**



1. Apparatus for producing special video effects, comprising: random noise generating means for generating a random noise signal; filtering means for filtering the random noise signal, said filtering means having a variable filter characteristic controllable by an adjustable filter control signal; reference generating means for generating a reference level that changes with respect to time; comparator means coupled to said filtering means and said reference generating means for comparing the filtered random noise signal with said reference level; and switch means supplied with first and second video signals and responsive to said comparator means for selecting one or the other of said video signals as a function of whether the filtered random noise signal exceeds said reference level.

5,206,730

STILL VIDEO CAMERA HAVING ONE-SHOT AND SERIAL SHOT MODES

Yuki Sakai, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 606,319, Oct. 31, 1990, abandoned. This application Mar. 4, 1992, Ser. No. 844,932

Claims priority, application Japan, Nov. 10, 1989, 1-293601

Int. Cl.[5] H04N *5/30*

U.S. Cl. 358—209 **2 Claims**

1. A still video camera having a one-shot mode for photographing one frame and a serial-shot mode for photographing a plurality of successive frames at a specific frequency, the camera comprising:

means for selecting between the one-shot mode and the serial-shot mode;

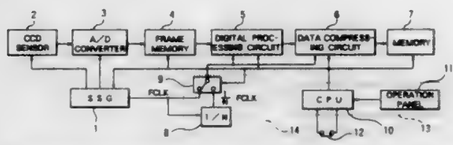
means for generating a digital signal representative of the frame being photographed;

a frame memory for temporarily storing and then transmitting the digital signal, the frame memory having the capacity to store the digital signal corresponding to at least one frame;

a semiconductor memory;

means for processing the digital signal from the frame memory, the processing means changing its operating speed in synchronization with the frequency of a clock signal;

means for compressing the digital signal from the processing means for storage in the semiconductor memory, the compressing means changing its operating speed in synchronization with the frequency of the clock signal;



the semiconductor memory storing the processed and compressed digital signal in synchronization with the operating speed of the processing means and the compressing means;

clock means for providing the clock signal to the processing means and compressing means at different frequencies in accordance with the selected mode so that the processing means and compressing means change their operating speed in accordance with the selection mode and so that the semiconductor memory stores the processed and compressed digital signal at a speed and power consumption in the one-shot mode lower than the speed and power consumption in the serial-shot mode; and

a battery for supplying power to the selecting means, the generating means, the frame memory, the semiconductor memory, the processing means, the compressing means, and the clock means.

5,206,731

SOLID STATE CAMERA HAVING A CAMERA BODY FOR SUPPORTING A RECORDING MEDIUM

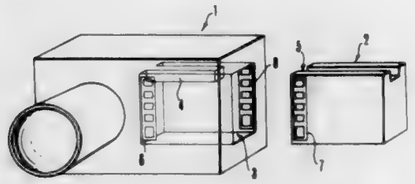
Kan Takaiwa, Tokyo; Toshihiko Mimura, Kanagawa; Yoshitaka Murata, Kanagawa; Nobuaki Date, Kanagawa; Hideaki Kawamura, Kanagawa; Hiroyuki Horii, Kanagawa; Akihiko Tojo, Kanagawa; Takashi Suzuki, Kanagawa, and Seiichi Ozaki, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1989, Ser. No. 398,137

Claims priority, application Japan, Sep. 5, 1988, 63-220368; Sep. 5, 1988, 63-220369; Mar. 28, 1989, 1-076022; Mar. 28, 1989, 1-076023

Int. Cl.[5] H04N *5/30*

U.S. Cl. 358—209 **20 Claims**



11. An electronic instrument system, comprising:

a) a first electronic instrument including a memory for storing signals and, at least first and second connecting means for the transmission of signals; and

b) a second electronic instrument including a mounting part mounted on said first electronic instrument and a third connecting means for the transmission of signals; wherein at least two kinds of mounting state are included as the mounting state of said first electronic instrument on said second electronic instrument, and said first or second connecting means is selectively connected with the third connecting means, depending upon the mounting state.

5,206,732

VIDEO CAMERA CONTROL APPARATUS

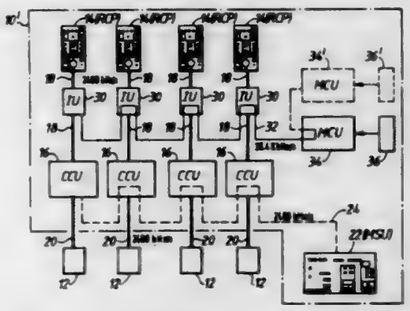
John Hudson, Aldershot, England, assignor to Sony Broadcast & Communications Limited, Basingstoke, United Kingdom

Filed Dec. 11, 1991, Ser. No. 804,917

Claims priority, application United Kingdom, Jan. 10, 1991, 9100507

Int. Cl.[5] H04N *5/30, 7/18*

U.S. Cl. 358—209 **4 Claims**



1. An apparatus for controlling a plurality of video cameras, said apparatus comprising:

a camera control unit for each of said plurality of video cameras;

a plurality of remote control panels each connected to an associated one of the camera control units by a respective bus so that technical operational control of each of said video cameras can be effected at the associated remote control panel;

a plurality of interface units each connected in the respective bus between one of the remote control panels and the associated camera control unit, each of said interface units including control microprocessor means which, in response to receipt of technical operational control data identified as pertaining to the camera associated with the respective interface unit, directs said data to the associated camera control unit by way of the bus to which the respective interface unit is connected; and

a master control unit connected to all of said interface units by a common bus for supplying said technical operational control data thereto, thereby enabling said master control unit to communicate with any one of the camera control units by way of the associated interface unit and thereby allowing technical operational control of any selected one of the cameras at said master control unit.

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5,206,733

CONVERTIBLE VISUAL DISPLAY DEVICE

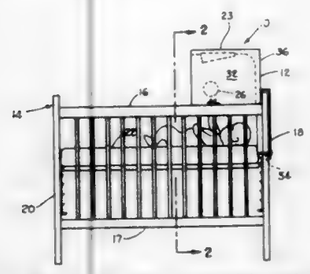
Terry K. Holdredge, and Susan S. Holdredge, both of 1303 Hanover Rd., Anderson, S.C. 29621

Continuation of Ser. No. 541,512, Jun. 21, 1990, Pat. No. 5,073,825, which is a continuation of Ser. No. 34,691, Apr. 16, 1987, Pat. No. 4,939,582. This application Dec. 3, 1991, Ser. No. 802,130

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.[5] H04N *5/64*

U.S. Cl. 358—254 11 Claims



1. A visual display system for a bed which can be viewed by a person lying in a supine position on said bed comprising:

a canopy disposed above and spanning a substantial dimension of said bed;

a visual display unit carried by said canopy having a display screen for viewing by said person in said supine position;

mounting means supporting said visual display unit in a viewing position on said canopy with an image on said display screen being oriented in the same direction as said person lying below said canopy in said supine position; and

support means supporting said canopy above said bed with said display screen disposed in said viewing position generally overhead of said person in said supine position.

5,206,734

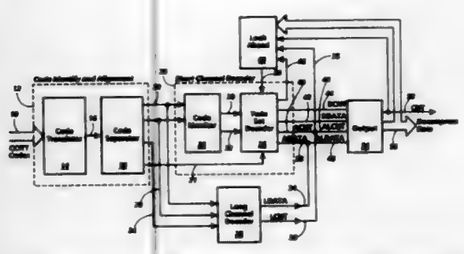
LOOK AHEAD FOR HIGH SPEED CCITT DECOMPRESSOR

Jean-Swey Kao, Cerritos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 632,779

Int. Cl.[5] H04N *1/419*

U.S. Cl. 358—261.3 23 Claims



20. A method for finding a_0b_1, a_0b_2 for each of the next two codes to be decoded on the next clock cycle during a single clock cycle of decoding compressed data of one or more current codes wherein a_0 is a starting changing element on a current line and a_0b_1 is the relative distance between starting changing element on the current line and the first changing element on a previous line to the right of a_0 and a_0b_2 is the relative instance between starting changing element on the current line and the next changing element to the right of b_1 on the previous line, the method comprising:

a. determining if a current code is a short or long code based upon a short code being capable of generating a first minimum number of bits of decompressed data and a long code being capable of generating a second minimum number of bits of decompressed data with the second number of bits being greater than the first minimum number of bits;

b. decoding a code in order to generate a decompreased data having a length;

c. if the first current code is short, finding a_0b_1, a_0b_2 for each of the next two codes based upon using the previous line decompressed data and finding the position of a_0 of the first of the two next codes by adding the length of the decompressed data of the short first current code to the position of a_0 of the first current code and finding the position of a_0 of the second of the two next codes by adding the first minimum number of bits to the position of a_0 of the first of the two next codes;

d. if the first current code is short and the second current code is short, finding a_0b_1, a_0b_2 for each of the next two codes based upon using the previous line decompressed data and finding the position of a_0 of the first of the two next codes by adding the first minimum number of bits and the length of the decompressed data of the short second current code to the position of a_0 of the first current code and finding the position of a_0 of the second of the two next codes by adding the first minimum number of bits to the a_0 position of the first of the two next codes;

e. if the first current code is short and the second current code is short, determining if the length of the decompressed data of the short first current code is greater than or equal to the first minimum number of bits;

f. if the length of the short first current code is greater than the first minimum number of bits, selecting the a_0b_1, a_0b_2 for each of the next two codes determined in step c);

g. if the length of the short first current code is equal to the first minimum number of bits and a second current code is a short code, selecting the a_0b_1, a_0b_2 for each of the next two codes determined in step d).

5,206,735

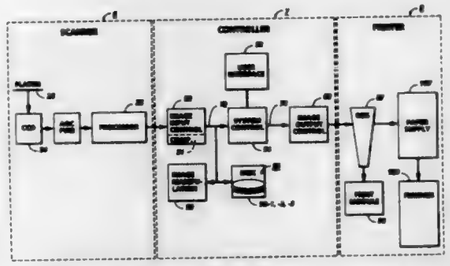
JOB INTERRUPT FOR ELECTRONIC COPYING/PRINTING MACHINES

John F. Gaurowski, Rochester, N.Y.; Acco Hengst, Lewisville, Tex., and Alane H. Rowold, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 546,606, Jun. 29, 1990, abandoned. This application Mar. 25, 1992, Ser. No. 859,266

Int. Cl.[5] H04N *01/21*; G03G *21/00*

U.S. Cl. 358—296 14 Claims



1. A method for producing prints from an interrupt job in a printing apparatus having a printing device responsive to electronic imaging signals and a print queue containing a plurality of print jobs in a preselected job file succession with each of the print jobs including electronic imaging signals representative of image information on a document and corresponding printing instructions for performing the print job, comprising the steps of:

producing prints for the corresponding electronic imaging signals of each successive print job in the print queue in response to processing of printing instructions from the print jobs in the print queue;

forming the interrupt job by programming printing instructions for the interrupt job, providing electronic imaging signals representative of image information on a document with a plurality of pages, and combining the printing instructions with the electronic imaging signals;

interrupting the job file succession in the print queue for inserting the interrupt job at a selected location in the job file succession for printing the interrupt job at an earliest logical point and interrupting the print job currently being printed when the printer detects the interrupt job;

reprogramming the printing apparatus with the printing instructions of the interrupt job;

producing prints of the interrupt job in response to the reprogrammed printing instructions;

deleting the interrupt job once the interrupt job has been printed completely unless the printing instructions of the interrupt job indicate that the interrupt job should be saved;

reprogramming the printing apparatus with the printing instructions for the interrupted job upon detecting the completion of printing of the interrupt job; and

resuming printing of the interrupted print job when a current operating mode of the printing device is compatible with the printing instructions for the interrupt job.

5,206,736

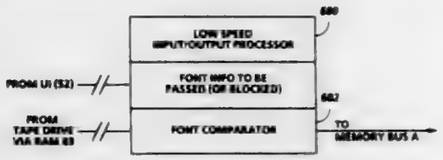
FONT STORAGE MANAGEMENT AND CONTROL

Russell W. Simpson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1990, Ser. No. 590,096

Int. Cl.[5] H04N *1/23*; B41J *5/46, 5/48*; G06F *3/12, 15/66*

U.S. Cl. 358—296 8 Claims



1. In a print controller for a printer, including an arrangement to print characters in documents transmitted to the controller designated for printing in selected fonts, the selected fonts stored for future use in a device memory, including:

said device memory including font storage means for storing the selected fonts therein, the selected fonts accessible at the font storage means when required for printing characters designated for printing in the selected fonts;

external font receipt means, for receiving sets of font information for storage in said font storage means, from a source external to the printer;

font designation means for designating selected subsets of font information from said font information for storage in said font storage means for future use; and

font comparison means for comparing said selected font information with font information received from said external font receipt means, and forwarding to said font storage means only such selected subsets of font information as are designated at said font designation means.

5,206,737

FACSIMILE APPARATUS USING A SINGLE BI-DIRECTIONAL MOTOR TO CONTROL FEEDING OF AN ORIGINAL DOCUMENT AND A RECORDING PAPER WITH SELECTION BETWEEN PLURAL MODES OF OPERATION

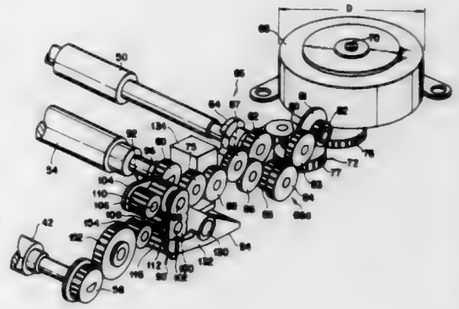
Hideaki Sugiyama, Mishima, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1992, Ser. No. 864,522

Claims priority, application Japan, Apr. 15, 1991, 3-111027

Int. Cl.[5] H04N *1/31*; B41J *23/34*

U.S. Cl. 358—296 11 Claims



1. An apparatus for feeding recording paper, comprising:

recording means, including a platen roller and a printing head between which recording paper is passed, for effecting recording on the recording paper;

original read means, including a white roller and an original read sensor between which an original is passed, for reading an image on the original by means of the original read sensor;

a single motor having a forwardly/reversely rotatable output shaft;

transmission means connected to the output shaft;

a platen roller gear fixed on the platen roller;

a white roller gear fixed on the white roller; and

operation mode selection means including a relay mechanism, provided between the platen roller gear and the white roller gear, for transmitting a torque from the transmission means selectively to at least one of the platen roller gear and the white roller gear, and a switching mechanism having first and second operation positions which are selected to control the selection operation of the relay mechanism, wherein the white roller gear is rotated forwardly when the switching mechanism is in the first operation position and the output shaft is rotated forwardly; the platen roller gear is rotated forwardly to pass the recording paper through the recording means when the switching mechanism is in the first operation position and the output shaft is rotated reversely; the white roller gear is rotated forwardly and simultaneously the platen roller gear is rotated forwardly to pass the recording paper through the recording means, when the switching mechanism is in the second operation position and the output shaft is rotated reversely; and the platen roller gear is rotated reversely to feed the recording paper backwards when the switching mechanism is in the second operation position and the output shaft is rotated forwardly.

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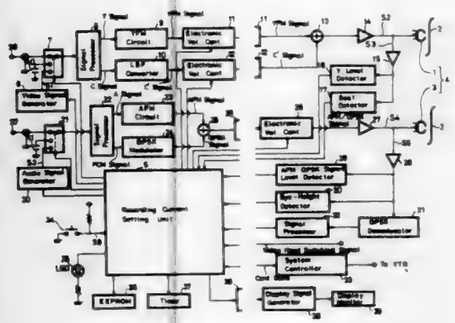
5,206,738

MAGNETIC RECORDING APPARATUS HAVING A MEANS FOR DETERMINING RECORDING CURRENT

Tetsuo Nishigaki; Takashi Kakuta; Hiroshige Okamoto, and Hirokazu Nagasawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 774,801
Claims priority, application Japan, Oct. 19, 1990, 2-280783
Int. Cl.[5] H04N *9/79, 5/782*
U.S. Cl. 358—315 9 Claims



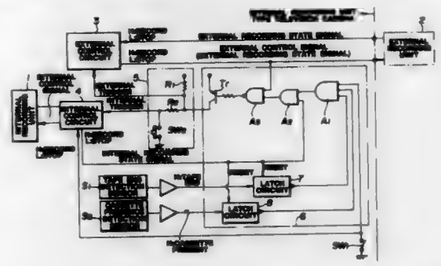
1. A magnetic recording apparatus comprising:
a recording and reproducing head receiving recording currents corresponding to audio and video signals for magnetically recording signals corresponding to said recording currents on a magnetic tape and for reproducing recorded signals from said magnetic tape;
recording current setting means for setting levels of said current supplied to said recording and reproducing head;
recording signal adjusting means connected to be controlled by said recording current setting for outputting audio and video signals to be recorded and for adjusting levels of said audio and video signals to set the recording currents;
reproduced signal detecting means for detecting reproduced audio and video signals supplied from said recording signal adjusting means and recorded on and reproduced from the magnetic tape by said recording and reproducing head and supplying the detected signals to said recording current setting means; and
said recording current setting means comprising means for controlling said recording signal adjusting means to hold the audio signal at a constant level and to simultaneously vary levels of luminance and chrominance signals of the video signal with said levels being kept at a constant ratio, while controlling said recording and reproducing head to magnetically record the audio and video signals on the magnetic tape, and for measuring the level of the reproduced audio signal from said reproduced signal detecting means and controlling said recording signal adjusting means for outputting recording currents based on the levels of the luminance and chrominance signals corresponding to a predetermined value of the measured level of the audio signal.

5,206,739

INTEGRAL RECORDING UNIT TYPE TELEVISION CAMERA WITH RECORDING CONTROL FOR EXTERNAL RECORDING UNIT

Noritaka Miyaji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,516
Claims priority, application Japan, Mar. 27, 1990, 2-78191; Mar. 28, 1990, 2-79103
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 9 Claims



6. An integral recording unit type television camera system, comprising:
an integral recording unit type television camera having an internal recording unit integral with a television camera having a picture element, said internal recording unit means recording a video signal supplied from said camera;
an external recording unit means connected through a cable but not integral with said integral recording unit television camera for recording video signals received through said cable; and
said integral recording unit type television camera having integral therewith and for operator use when the operator is using the integral recording unit type television camera means for supplying the video signal through said cable to said external recording unit means; and
means for displaying by a constant illumination to said user both said internal recording unit means and external recording unit means are in a recording state, and for displaying by no illumination to the user when only one of said internal recording unit means or external recording unit means are in the recording state.

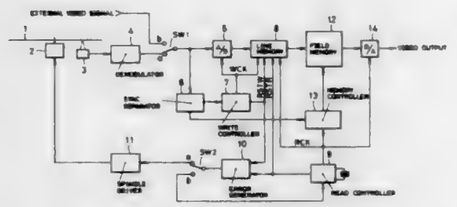
5,206,740

VIDEO DISK PLAYER CAPABLE OF PROVIDING NORMAL IMAGE REPRODUCTION OF AN EXTERNAL VIDEO SIGNAL AS WELL AS A VIDEO SIGNAL STORED ON A DISK

Masao Kanda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,419
Claims priority, application Japan, May 28, 1990, 2-137629
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—342 4 Claims

1. A video disk player having play means for rotating a video disk, reading a recorded video signal therefrom and demodulating the read video signal so as to produce a demodulated video signal; A/D converting means for converting the demodulated video signal into a digital video signal; a video memory; write/read control means for generating a read clock and a write clock, said write clock being synchronized to a sync signal include in said digital video signal, said write/read control means writing the digital video signal into the memory in synchronism with the write clock and reading digital data from the memory in synchronism with the read clock; D/A converting means for converting digital data read by the write/read control means from the video memory into an analog signal, and an error signal generating means for generating an error signal in accordance with a difference between write and read addresses specified by said write/read control means, the video disk player further comprising:
replacing and supplying means for supplying an external video signal in place of the demodulated video signal to the A/D converting means, said replacing and supplying means capable of being actuated in which case the external video signal is supplied to said A/D converting means and capable of being not actuated in which case the demodulated video signal is supplied to the A/D converting means; and selectively supplying means for supplying the



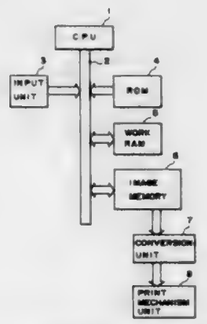
error signal to said play means while the replacing and supplying means is not actuated and supplying the error signal to the write/read control means when the replacing and supplying means is actuated, said play means performing rotational servo control of the video disk on the basis of said error signal and the write/read control means generating the read clock on the basis of a fixed reference clock signal while the replacing and supplying means is not actuated, and while the replacing/supplying means is actuated, the write/read control means generates the read clock on the basis of the error signal.

5,206,741

IMAGE PROCESSING APPARATUS

Akihiro Shimura, Tokyo, and Shigeru Ueda, Wako, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,265, Jul. 11, 1991, abandoned. This application Apr. 13, 1992, Ser. No. 866,295
Claims priority, application Japan, Jul. 13, 1990, 2-184339
Int. Cl.[5] H04M *1/00*
U.S. Cl. 358—404 12 Claims



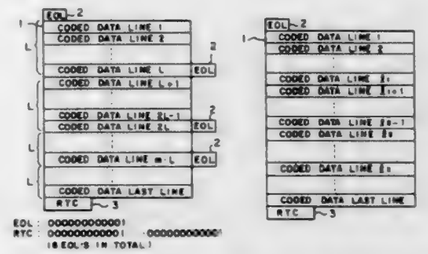
1. An image processing apparatus for outputting image data to a printing unit, comprising:
input means for inputting data from an external unit;
image data generating means for generating pixel image data in accordance with the input data;
memory means for storing the pixel image data;
resolution converting means for converting a resolution of the pixel image data; and
output means for outputting the pixel image data whose resolution is converted by said resolution converting means,
wherein the image data generating means determines the resolution of the pixel image data when it is stored into the memory means in accordance with a memory capacity of the memory means.

5,206,742

ONE-DIMENSIONAL CODING METHOD

Itsuya Soga, and Reiko Soga, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1991, Ser. No. 678,413
Claims priority, application Japan, Apr. 11, 1990, 2-95580
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—427 9 Claims



1. A one-dimensional coding method for MH-coding one page of image data in units of lines in order to compress the amount of said image data, said method comprising the steps of:
MH-coding one line of said image data;
checking to see if a line number of said MH-coded line is a multiple of a fixedly established number of lines (L);
attaching an end-of-line code to the MH code of said MH-coded line when said line number is a multiple of said number of lines (L); and
attaching an end-of-page code to the MH code of the last line of said image data when the MH-coding of all lines constituting said image data has terminated.

5,206,743

FACSIMILE ROUTING METHODOLOGY

Gary Hochman, Glen Head, and Paul Lichter, Kew Gardens, both of N.Y., assignors to All the Fax Business Systems, Inc., New York, N.Y.

Filed Dec. 28, 1990, Ser. No. 636,077
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—440 10 Claims

1. A method for directing a facsimile communication including handshake data fields transmitted from a facsimile transmitting apparatus at a first location to an intended recipient at a second location, the intended recipient being one of a plurality of users of a local area network having a facsimile receiving apparatus coupled thereto, comprising:
assigning each user an identification number identifying his location on said network;
modifying in a non-destructive manner a field of said data

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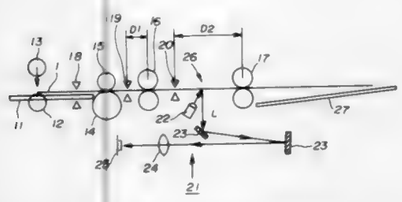
fields transmitted during the handshake protocols between said transmitting and receiving apparatus to accept one of said identification numbers;
inserting the identification number of the intended recipient into said modified field;
establishing facsimile communication between said transmitting and receiving apparatus;
transmitting the facsimile communication to the receiving apparatus, wherein said transmission includes said modified field as part of the handshake data fields and generating an image of said received facsimile communication at the receiving apparatus;
identifying the received modified field at said second location and extracting the identification number therefrom; and
forwarding the facsimile image to the location identified by said identification number.

5,206,744

DOCUMENT SCANNING APPARATUS HAVING IMAGE SIGNAL CORRECTING CAPABILITY

Takeshi Kamada, Atsugi, and Masato Nakajima, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,893
Claims priority, application Japan, May 31, 1990, 2-140070
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—488 **10 Claims**



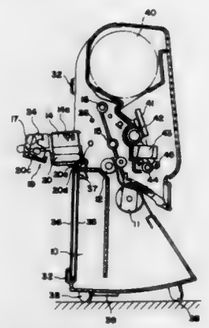
1. A document scanning apparatus comprising:
image signal means for generating a number of successive image signals on the basis of image information read from a document which is transported along a transport path between a pair of feeding rollers and a pair of ejection rollers;
first detection means for detecting a position of said document in the transport path where the transport of said document in the transport path is disordered when a front edge of said document being transported comes in contact with the pair of ejection rollers;
second detection means for detecting a position of said document in the transport path where the transport of said document in the transport path is disordered when a rear edge of said document being transported separates from the pair of feeding rollers; and
signal correction means for correcting a defective image signal when at least one of said first detection means and said second detection means detects the position of the document where the document transport is disordered, the defective image signal being corrected through a prescribed signal correction which is carried out for a number of image signals adjacent to the defective image signal which are received from said image signal means.

5,206,745

IMAGE READING DEVICE

Hiroyuki Yamada; Toshihiro Kumano; Yuji Ishii, all of Chiisagata; Shiro Takamizawa, Saku, and Masanori Sato, Chiisagata, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Dec. 12, 1990, Ser. No. 626,287
Claims priority, application Japan, Dec. 29, 1989, 1-340741
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—498 **9 Claims**



3. An image reading device comprising:
a device body;
a document transport means which is provided within said device body and which transports original documents along a predetermined document transport path;
an image sensor unit which is located under said document transport path so as to read each of the documents passing through said path;
a retaining member rotatably mounting said image sensor unit to said device body for rotation relative to said device body, said retaining member comprising a rotary fulcrum shaft located adjacent to a bottom of said device body; and
a cover member for swingingly covering a portion of said bottom of said device body near the position where said retaining member is located, said cover member including a means for restricting the rotational angle through which said image sensor unit can rotate when said cover member is fixedly mounted in place covering said portion of said bottom of said device body.

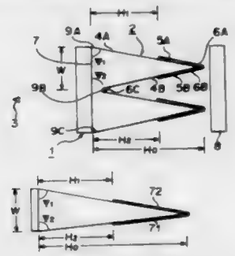
5,206,746

TRANSPARENT-SCATTERING TYPE OPTICAL DEVICE INCLUDING A PRISM WITH A TRIANGULAR LONGITUDINAL CROSS SECTION

Yoshiharu Ooi; Tomoki Gunjima, and Yoshinori Hirai, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 12, 1991, Ser. No. 729,499
Claims priority, application Japan, Jul. 12, 1990, 2-182706; Oct. 30, 1990, 2-290668
Int. Cl.[5] G02F *1/1335, 5/04*
U.S. Cl. 359—40 **20 Claims**

1. A transparent-scattering type optical device comprising:
a transparent-scattering type optical element, said element comprising a transparent-scattering mode optical material layer whose light scattering characteristics are changed in response to an external input; and
at least one prism having a bottom surface attached to a back surface of said transparent-scattering type optical element,
wherein said prism has a longitudinal cross section of a shape which is either triangular or triangular with a top portion cut away, and
wherein first and second angles formed by the two sides of the triangular longitudinal cross section of the prism and said bottom surface are each between 65° and 90°, inclusive, such that one of said angles does not equal 90°, and wherein an area defined by portions of side surfaces of the prism nearest to the top of the prism or, when the top portion is cut away, a portion of a top face of the prism functions as absorbing faces or an absorbing face, respectively.

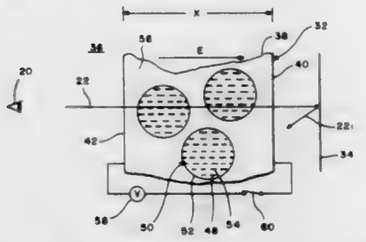


5,206,747

POLYMER DISPERSED LIQUID CRYSTAL DISPLAY WITH BIREFRINGENCE OF THE LIQUID CRYSTAL AT LEAST 0.23

Richard C. Wiley, Los Altos, and Paul S. Drzaic, Palo Alto, both of Calif., assignors to Taliq Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 705,824, May 28, 1991, abandoned, which is a continuation of Ser. No. 490,643, May 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 250,435, Sep. 28, 1988, abandoned. This application Dec. 20, 1991, Ser. No. 811,310
Int. Cl.[5] G02F *1/13, 1/1335*
U.S. Cl. 359—51 **50 Claims**



1. A liquid crystal apparatus comprising: a containment medium, a birefringent liquid crystal material wherein the difference between the ordinary and extraordinary indices of refraction of said liquid crystal material is greater than or equal to about .23, said liquid crystal material dispersed in plural volumes in said containment medium and a pleochroic dye contained in said liquid crystal material that conforms to the structure thereof.

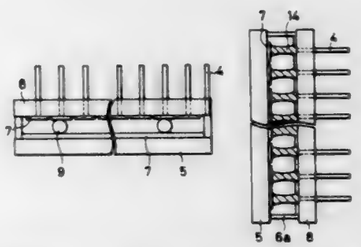
5,206,748

WIDE-FRAME ELECTRO-OPTIC DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Mar. 22, 1991, Ser. No. 673,813
Claims priority, application Japan, Mar. 27, 1990, 2-77795
Int. Cl.[5] G02F *1/1343*
U.S. Cl. 359—53 **23 Claims**

1. An electro-optic device comprising:
a transparent substrate;
an opposed substrate;
an electrode arrangement formed on the inside surface of both of said transparent and opposed substrates in order to define a plurality of picture elements;
a light influencing layer disposed between said transparent and opposed substrates;
a sealing member provided at the periphery of said substrates for sealing said light influencing layer;
a plurality of leads making electrical contact with said electrode arrangement,
wherein the contacts of each of said leads with said electrode arrangement are made through a plurality of through holes formed in a peripheral portion of said opposed substrate and said sealing member overlays said through holes.

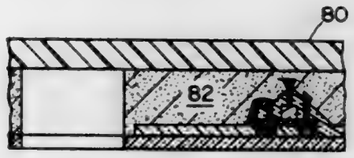


5,206,749

LIQUID CRYSTAL DISPLAY HAVING ESSENTIALLY SINGLE CRYSTAL TRANSISTORS PIXELS AND DRIVING CIRCUITS

Paul M. Zavracky, Norwood; John C. C. Fan, Chestnut Hill; Robert McClelland, Norwell, all of Mass.; Jeffrey Jacobsen, Hollister, Calif., and Brenda Dingle, Mansfield, Mass., assignors to Kopin Corporation, Taunton, Mass.

Filed Dec. 31, 1990, Ser. No. 636,602
Int. Cl.[5] G02F *1/1343, 1/1333*
U.S. Cl. 359—59 **25 Claims**



1. A liquid crystal panel display comprising:
an optically transmissive substrate positioned to receive light incident from a light source;
a circuit panel comprising a thin film of essentially single crystal semiconductor material from which an array of transistors, an array of pixel electrodes and a driver circuit are formed, each transistor comprising source, drain and channel regions, each essentially single crystal semiconductor pixel electrode being electrically connected to one of the transistors and the driver circuit being electrically connected to each transistor to actuate the pixels;
an adhesive for bonding the circuit panel to the optically transmissive substrate such that the substrate is positioned between the circuit panel and the light incident from the light source; and
a light transmitting liquid crystal material positioned adjacent to each pixel such that an electric field applied to the liquid crystal material alters a light transmitting property of the liquid crystal material.

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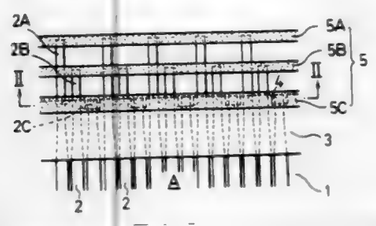
5,206,750

METHOD OF FORMING A COLOR FILTER FOR A LIQUID CRYSTAL COLOR DISPLAY APPARATUS

Masanobu Aizawa, Yokohama; Shigekazu Yamauchi; Hisao Sekine, both of Sagamihara, and Shinji Kanagawa, Isehara, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 661,458
Claims priority, application Japan, Feb. 28, 1990, 2-48093
Int. Cl.[5] G02F *1/1335, 1/1343*
U.S. Cl. 359—68 2 Claims



1. A method of forming a color filter, the method comprising the steps of:

forming on a transparent substrate a plurality of groups of liquid crystal driving terminal portions of transparent electrodes, each group having as many extended terminal portions of staggered lengths as one less than the number of colors to be filtered and each group having one non-extended terminal portion, thereby providing a plurality of terminals for electrodeposition;

forming a protective film so as to cover selected portions of the transparent electrodes including each of said non-extended terminal portions;

forming a plurality of notches for exposing an end edge portion of each of said non-extended terminals;

for each color filter portion to be formed, coating end edge portions of all terminals for electrodeposition associated with the color filter portion to be formed with a transverse strip of a conductive material that is to be electrically energized at the time of electrodeposition, so as to place the terminals for electrodeposition associated with the color filter portion to be formed in a conducting state

and applying a current between transparent electrodes of the terminal associated with the color filter portion to be formed and opposed electrodes in an electrodeposition bath liquid to form by electrodeposition a color filter portion having a predetermined color on only the transparent electrodes that are in a conducting state.

5,206,751

PROCESS FOR THE PRODUCTION OF AN IMPACT-RESISTANT LIQUID CRYSTAL SWITCHING AND DISPLAY DEVICE

Claus Escher, Mühltal; Gerhard Illian; Norbert Rösch, both of Frankfurt am Main, all of Fed. Rep. of Germany; Takamasa Harada, Inzai, Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 10, 1991, Ser. No. 683,325
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011805
Int. Cl.[5] G02F *1/13;* C09K *19/52, 19/54, 19/56*
U.S. Cl. 359—100 9 Claims

1. A process for producing a liquid crystal switching and display device which is shock-resistant and in which two connected support plates, at least one of which has an orientation layer, are provided with electrodes and at least one polarizer and a liquid-crystalline material is poured into the gap between the two support plates, wherein the liquid-crystalline material is a ferroelectric liquid crystal mixture containing at least one liquid-crystalline base component and furthermore at least one cryptand or coronand, which comprises applying a continuous periodic electric voltage to the electrodes of the switching and display device in the ferroelectric phase before startup, until the liquid crystal layer adopts a "bookshelf" or "quasi-bookshelf" orientation.

6. A process for regenerating a liquid crystal switching and display device which has been shock damaged and contains two support plates, at least one orientation layer, an adhesive

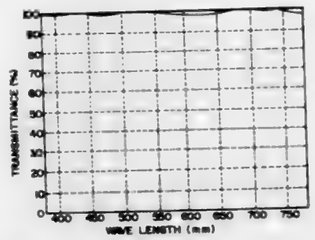
frame, electrodes, at least one polarizer and a liquid-crystalline material, in which the liquid crystal layer was originally present in a "bookshelf" or "quasi-bookshelf" orientation, wherein the liquid crystal layer is a ferroelectric liquid crystal mixture containing at least one liquid-crystalline base component and furthermore at least one coronand or cryptand, which comprises applying a continuous periodic square voltage to the electrodes of the shock-damaged switching and display device.

5,206,752

OPTICAL ROTATOR FORMED OF A TWISTED NEMATIC LIQUID CRYSTAL POLYSTER INCLUDING AN ORTHO-SUBSTITUTED AROMATIC UNIT

Hiroyuki Itoh; Takehiro Toyooka, both of Yokohama, and Shigeki Iida, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed May 20, 1991, Ser. No. 703,179
Claims priority, application Japan, May 18, 1990, 2-126962
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] G02F *1/13;* C09K *19/52, 19/00*
U.S. Cl. 359—106 5 Claims



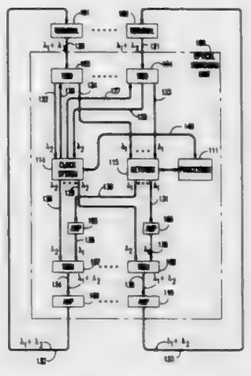
1. An optical rotator comprising a light transmitting base; an alignment film layer formed on said base; and a film layer formed of a liquid crystalline polyester which includes an ortho-substituted aromatic unit which exhibits twisted nematic orientation in the state of liquid crystal and assumes a glassy state at a temperature below the liquid crystal transition point of the polyester.

5,206,753

OPTICAL SWITCHING SYSTEM

Gary J. Grimes, Thornton, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1991, Ser. No. 738,407
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—128 14 Claims



1. An optical system having all optical communication paths for communication of data, comprising:

a plurality of terminals;

a plurality of optical links;

an optical switching unit for providing all optical communication paths between one of said plurality of terminals and another one of said plurality of terminals via said optical links;

means physically located with said optical switching unit and interconnected to said plurality of optical links responsive to information transmitted via said optical links from said plurality of terminals for synchronizing the internal timing of said plurality of terminals with that of said optical switching unit; and

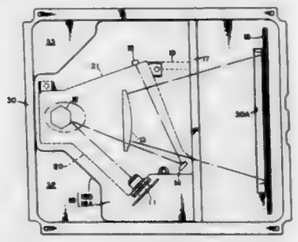
said synchronizing means comprises means for blocking data information from one of said plurality of terminals not in synchronization with said optical switching unit from being switched by said optical switching unit.

5,206,754

MOISTURE CONDENSATION PREVENTION STRUCTURE FOR LASER SCANNING OPTICAL SYSTEM

Takaaki Yano, Kawagoe, and Masahide Inoue, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,544
Claims priority, application Japan, Apr. 10, 1990, 2-94421
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—196 10 Claims



1. A laser scanning system employed in an electrophotographic image forming apparatus, comprising: deflecting means movably driven in order to enable a laser beam to repeatedly scan a predetermined range;

reflecting means for reflecting said scanning laser beam;

a casing that accommodates said deflecting means and said reflecting means, an opening being formed on said casing through which said scanning laser beam, reflected by said reflecting means, is directed to a photoconductive member of said image forming apparatus, said laser scanning system further comprising:

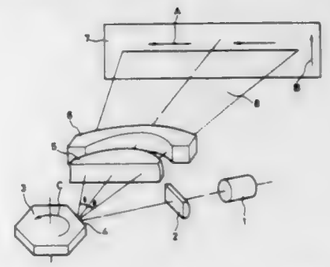
a separating member for preventing a circulation of air in said casing by separating said casing into one room containing said deflecting means and another room containing said reflecting means, said separating member having a slit that extends in a scanning direction of said laser beam, said laser beam, deflected by said deflecting means, passing through said slit to said reflecting means, said separating means being composed of a heat insulating material.

5,206,755

OPTICAL BEAM SCANNER

Hiromitsu Yamakawa, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 3, 1991, Ser. No. 770,476
Claims priority, application Japan, Oct. 3, 1990, 2-263751
Int. Cl.[5] G02B *26/08, 9/04*
U.S. Cl. 359—218 8 Claims



1. An optical beam scanner of the type including a first image-forming optical system arranged to form an image of a light beam from a light source linearly on or in the vicinity of a reflective deflection surface of a deflector, and a second image-forming optical system arranged to form an image of the deflected light beam from said deflector on a scanning surface; characterized in that said second image-forming optical system comprises successively from the side of said deflector:

a first singular lens element in the form of a positive meniscus, wherein in a first cross-section of the first singular lens element taken in a plane extending parallel to a main scan direction of said light beam, the first cross-section of the first singular lens element has a convex curve facing the scanning surface, and wherein in a second cross-section of the first singular lens element taken in a plane extending parallel to a subscan direction which is perpendicular to said main scan direction, the second cross-section of the first singular lens element has a convex curve facing said scanning surface, and wherein said first singular lens element has a toric surface at least one the side facing the deflector;

a second singular lens element in the form of a negative meniscus, wherein in a first cross-section of the second singular lens element taken in a plane extending parallel to the main scan direction, the first cross-section of the second singular lens element has a convex curve facing said scanning surface and a concave curve facing said deflector, and wherein in a second cross-section of the second singular lens element taken in a plane extending parallel to said subscan direction, the second cross-section of the second singular lens element has either a convex curve or

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a straight line facing said scanning surface and either a concave curve or straight line facing said deflector.

5,206,756

SOLID STATE ELECTROCHROMIC DEVICES

Philip Cheshire, Lancashire, England, assignor to Imperial Chemical Industries PLC, London, England

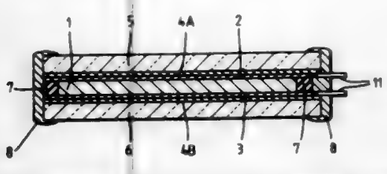
Filed Dec. 19, 1990, Ser. No. 630,996

Claims priority, application United Kingdom, Dec. 20, 1989, 8928748

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] G02F *1/23*

U.S. Cl. 359—270 **9 Claims**



1. In an electrochromic device which comprises a conductive second electrode and first electrode separated by a solid electrolyte and an electrochromic material capable of reversible electrochromic interaction with activating electrons or ions under the influence of an electrical potential applied across the electrodes, the improvement wherein the solid electrolyte in the device comprises:

a) a matrix of cross-linked main polymer chains, having side-chains linked to the main polymer chains, which side chains comprise polar groups,

b) a polar aprotic liquid dispersed in the matrix, and

c) an ionised ammonium or alkali metal salt dissolved in the matrix or liquid.

5,206,757

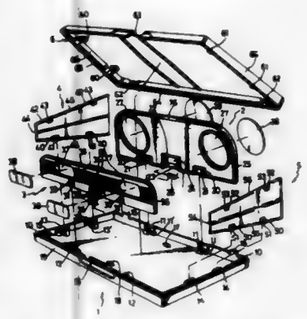
COLLAPSIBLE FIELD GLASSES

Billy Cheng, 6F, No. 31-9, San Min Rd., Hsin Tien, Taipei, and Mao-Te Chu, 3F, No. 178, Lane 415, Kuang Fu S. Rd., Taipei, both of Taiwan

Filed Feb. 13, 1992, Ser. No. 834,842

Int. Cl.[5] G02B *23/18*

U.S. Cl. 359—408 **1 Claim**



1. A field glasses comprising a flat, rectangular bottom shell, a flat, rectangular cover shell, an object lens assembly pivoted to said bottom shell at one end, said object lens assembly having two object lenses mounted thereon, an eyepiece assembly pivoted to said bottom shell at an opposite end, said eyepiece assembly having two eyepieces mounted thereon at locations corresponding to said object lenses, and two opposite folding side strips connected between said bottom shell and said cover shell at two opposite sides, and characterized in that said two opposite folding side strips each has a plurality of fastening rods longitudinally aligned at two opposite side edges thereof and fastened in holes on a first set of retainer members on said cover shell and said bottom shell respectively; said object lens assembly and said eyepiece assembly each has a plurality of fastening rods longitudinally aligned on a bottom edge thereof and fastened in holes on a second set of retainer members on said bottom shell respectively and supported by a respective spring, and a flange on a top edge thereof releasably stopped at a respective retaining recess on said cover shell, said spring being to support said object lens assembly or said eyepiece assembly into a vertical position.

5,206,758

BINOCULARS WITH VARIABLE AND FIXED FOCUS ADJUSTMENTS

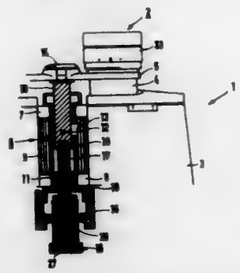
Byung-Sun Kim, Borken, and Rudolf Bresser, Heiden, both of Fed. Rep. of Germany, assignors to Josef Bresser Import-Export GmbH & Co., Borken, Fed. Rep. of Germany

Continuation of Ser. No. 594,125, Oct. 9, 1990, abandoned. This application May 19, 1992, Ser. No. 887,250

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1989, 3933793; European Pat. Off., Nov. 4, 1989, 89120421.6

Int. Cl.[5] G02B *7/06*

U.S. Cl. 359—414 **8 Claims**



1. Binoculars the ocular abridgement of which are connected through a moveable bridge and which is activated through a center drive that has a drive consisting of a knurled roller that can be turned and a guide pin, the knurled roller being operably coupled with the guide pin to axially move the guide pin along the longitudinal axis to provide normal focus, the bridge being connected relative to the guide pin to provide adjustment wherein the improvement comprises:

a fixable tube supported relative to the guide pin and movable therewith for normal focus adjustment and slidable relative to the guide pin for dual focus adjustment;

means for restricting the slidable movement of the guide pin relative to the fixable tube, said means including an axially adjustable stop ring, the stop ring being adjustable to an extended position for slidable movement of the guide pin between a short range position and a long range position to provide dual focus adjustment, the stop ring restricting slidable movement of the guide pin for long range fixed focus and restricting slidable movement of the guide pin for short range fixed focus adjustment;

a clamping jaw supported for selective engagement with the fixable tube to restrict the translational motion of the fixable tube for fixed focus adjustment; and

means for selectively clamping the clamping jaws to alternatively engage the fixable tube for fixed focus adjustment and disengage the fixable tube for normal focus adjustment, whereby for dual focus adjustment the axially adjustable stop ring is selectively positioned for slidable adjustment of the guide pin for long range fixed focus and short range fixed focus.

5,206,759

IMAGE RELAYING OPTICAL SYSTEM

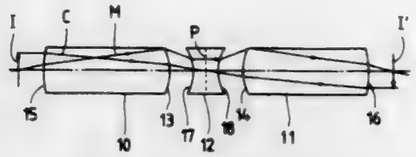
Katsuya Ono, Tokyo, and Akira Kikuchi, Kanagawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 508,670, Apr. 13, 1990, Pat. No. 5,142,410. This application Aug. 24, 1992, Ser. No. 933,702

Claims priority, application Japan, Apr. 14, 1989, 1-092949; Apr. 14, 1989, 1-095014

Int. Cl.[5] G02B *23/24*

U.S. Cl. 359—434 **6 Claims**



1. An image relay lens unit comprising two bar-shaped lens components, and a negative lens component having concave surfaces on both the side thereof and arranged between said bar-shaped lens components, each of the surfaces arranged on said two bar-shaped lens components having positive refractive power and located on the side of said negative lens component, and said lens unit being designed so as to satisfy the following conditions (4) and (5):

(4) $-2<\Phi_{rB}\Phi_2<-0.1$

(5) $0.5<D_A/D_B<4.0$

wherein the reference symbol Φ_{rB} represents refractive power of the pupil side surface of said bar-shaped lens component, the reference symbol Φ_2 designates refractive power of said lens component having concave surfaces on both the sides thereof, the reference symbol D_A denotes optical path length in terms of glass of said bar-shaped lens component, and the reference symbol D_B represents the distance as measured along the optical axis between said bar-shaped lens component and said lens component having concave surfaces on both the sides thereof.

5,206,760

MULTIPROJECTION APPARATUS

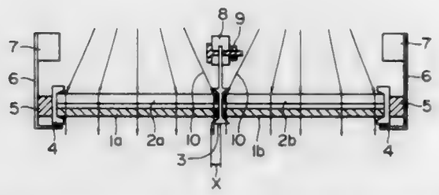
Akio Nakashima, Yokohama; Junichi Ikoma, Yoksuka; Yasutoshi Nakashima, Toyokawa; Sadayuki Nishimura, Minokamo; Yoshihisa Hosoe, Kakamigahara; Tatsumi Hasebe, Kamo, and Akira Okamoto, Minokamo, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video & Information System, Inc., Kanagawa, both of Japan

Filed Mar. 25, 1992, Ser. No. 857,253

Claims priority, application Japan, Oct. 1, 1990, 3-260573; Apr. 19, 1991, 3-113889

Int. Cl.[5] G03B *21/56*

U.S. Cl. 359—457 **6 Claims**



1. A multiprojection apparatus for arranging a plurality of screens each composed of a lenticular sheet and a Fresnel lens on the front of a plurality of combined projection units in order to form a large screen, wherein a holding strip having an at least partially substantially H-shaped cross section and made of a transparent material is inserted between adjoining screens of said screens and support strips having elasticity are disposed at the ends of screens of said screens corresponding to the right and left ends of said large screen to support the ends of said screens.

5,206,761

LARGE-SCREEN PROJECTION TYPE DISPLAY

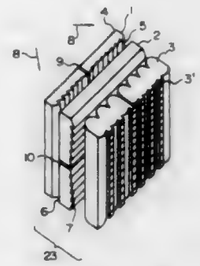
Masanori Ogino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1992, Ser. No. 845,648

Claims priority, application Japan, Mar. 27, 1991, 3-085853

Int. Cl.[5] G03B *21/60*

U.S. Cl. 359—457 **30 Claims**



1. A large-screen projection-type display using a transmission type screen, said transmission type screen comprising at least:

a first sheet transparent to light from a projection source;

a second sheet which is provided on the viewer's side of said first sheet and which is transparent to light from said first sheet; and a third sheet which is located on the viewer's side of said second sheet and which is transparent to light from said second sheet, said first sheet having first divergence means for diverging light at least in the horizontal direction and Fresnel lenses for converging light at least in the horizontal direction, said third sheet having first lenticular lenses of a relatively large pitch, an effective divergence angle ϵ of said first divergence means, an arrangement period T_F of said Fresnel lens, and a thickness D of said second sheet have a relation given by

$$\epsilon D/T_F \geqq 0.7$$

5,206,762

VISCOELASTIC SUBSTANCE AND OBJECTIVE LENS DRIVING APPARATUS WITH THE SAME

Akihiro Kasahara, Kawasaki; Akira Yamada; Takashi Yoshizawa, both of Yokohama; Katsutoshi Wada, Kawasaki, and Hideo Yamasaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1989, Ser. No. 442,578

Claims priority, application Japan, Dec. 1, 1988, 63-302203

Int. Cl.[5] G02B *7/02*; G11B *7/00*

U.S. Cl. 359—814 **24 Claims**

1. An objective lens driving apparatus comprising:

an objective lens through which a light beam is applied to a predetermined position on an optical disk;

a movable member for holding the objective lens;

means for driving the objective lens in a predetermined direction with respect to the optical disk, the means for driving having a coil and a magnetic field forming means for applying a magnetic field to the coil, and the movable member being attached to one of the coil and the magnetic field forming means; and

a viscoelastic substance having magnetic particles dispersed therein and arranged between the movable member and a

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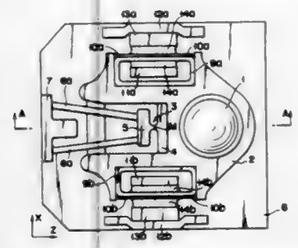
fixed portion under the influence of the magnetic field, for absorbing vibration of the movable member wherein magnetic attractions between the magnetic particles generating a force for restoring deformation of the viscoelastic substance when an external force acts on the viscoelastic substance.



5,206,763

CORRECTIVE OPTICS FOR RECTANGULAR LASER BEAMS

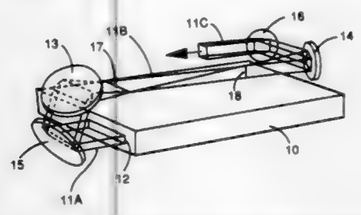
John A. Macken, 3755 Wallace Rd., Santa Rosa, Calif. 95404, and John A. Zuryk, 2144 Coffee La., Sebastopol, Calif. 95472

Continuation-in-part of Ser. No. 349,234, May 9, 1989, Pat. No. 4,921,338. This application Apr. 30, 1990, Ser. No. 516,274

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] **G02B** *5/10, 17/06*

U.S. Cl. 359—858 **4 Claims**



1. An apparatus for changing the geometric cross section of a laser beam comprising:

first mirror with a generally spherical curvature of radius R_1 and a second mirror with a generally spherical curvature of radius R_2;

said laser beam can be defined to having an imaginary central ray;

said first and second mirror positioned and oriented such that a said central ray of said laser beam strikes said first mirror at an incidence angle ϕ_1 producing a reflected beam which strikes said second mirror at angle ϕ_2 and producing a reflected beam;

said central ray has a path length of L between said first mirror and said second mirror;

said laser beam immediately before it strikes said first reflector has transverse dimensions of d_1 and d_2 where d_2 is at least as larger than as d_1;

said laser beam immediately before it strikes said first reflector has a wavefront with radius of curvature S_2 in a first imaginary plane perpendicular to said dimension d_1;

said laser beam immediately before it strikes said first mirror has a wavefront of radius of curvature S_1 in a second imaginary plane perpendicular to said dimension d_2;

said first mirror is oriented such that said incident and reflected beam striking said first mirror generally lies in a said second imaginary plane;

said second mirror is oriented such that said incident and reflected beam striking said second mirror lies in a third imaginary plane which is generally perpendicular to said second imaginary plane;

said laser beam immediately after it has reflected off said second mirror has transverse dimensions D_1 and D_2, said dimension D_1 approximately equal to said dimension D_2;

said laser beam immediately after is has reflected off said second mirror has generally spherical wavefront of radius of curvature equal to S_5 where radius S_5 approximately equals infinity;

said first and second mirrors are positioned and configured to generally satisfy the following equations:

$$R_1 = \frac{2 \cos \phi_2}{\frac{1}{S_2} + \frac{D_2 + d_2}{d_2 L}}$$

$$R_2 = \frac{2 \cos \phi_1}{\frac{1}{S_5} + \frac{D_1 + d_1}{D_1}}$$

$$\cos \phi_1 = \left(\frac{\frac{1}{S_2} + \frac{D_2 + d_1}{d_2 L}}{\frac{1}{S_1} + \frac{D_1 + d_1}{d_1 L}} \right)^{\frac{1}{2}}$$

$$\cos \phi_2 = \left(\frac{\frac{1}{S_5} + \frac{D_1 + d_1}{D_1 L}}{\frac{1}{S_5} + \frac{D_2 + d_2}{D_2 L}} \right)^{\frac{1}{2}}$$

5,206,764

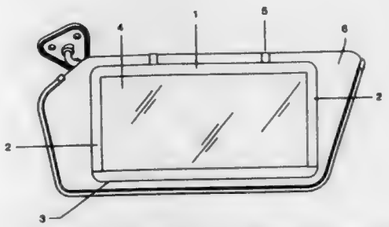
REFLECTANT NON-GLARE SLIDING PLASTIC EXTENSION COMBINED WITH SUN VISOR'S MIRROR

Miguel R. Lamoglia, 635 W. 49th St., Hialeah, Fla. 33012

Division of Ser. No. 554,479, Jul. 9, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 604,911

Int. Cl.[5] **G02B** *7/18*

U.S. Cl. 359—844 **3 Claims**



1. A selectively attachable mirror encased in a frame which is attached with detachable means to the sun visor of a vehicle, and further including: an extendible sun shield located in back of said mirror within said frame; wherein said sun shield is made of a polarized or tinted material and is designed to protect the vehicle operator's eyes from glare projected against the vehicle's windshield; said sun shield both rests within and moves along slotted grooves that line each side of the mirror's frame, whereby the shield is easily pulled down and put into use by the vehicle operator.

5,206,765

PRECISION SLIT OF ADJUSTABLE WIDTH FOR A SPECTRAL INSTRUMENT

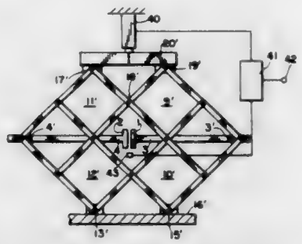
Rolf Träger, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Mar. 27, 1992, Ser. No. 859,102

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1991, 4110839

Int. Cl.[5] **G02B** *5/00*

U.S. Cl. 359—894 **13 Claims**



12. A precision slit of adjustable width for spectral instruments in which adjustably spaced slit jaws are guided for a first direction of displacement by a linkage system developed as a parallelogram, characterized by the fact that each slit jaw is carried by an arm which is pivotally connected with at least two guide parallelograms arranged on opposite lateral sides of the arm, said guide parallelograms being defined by a pantograph assembly of first and second intersecting sets of at least four equally spaced elongate parallel members, there being a pivotal interconnection of members of said sets at each intersection, whereby a diagonal alignment exists for at least four of said pivotal connections and diagonally through at least three of said parallelograms, said slit jaws confronting each other within the central one of said three parallelograms and their respective arms each having pivotal connection at the respective two spaced member intersections at one of the remaining parallelograms on said alignment, each of said arms having a longitudinal slot at its pivotal connection at one of its said two member intersections, first and second elongate guide members establishing guide alignments that are parallel to each other and to said arms and at opposite lateral offsets from said arms, first individual slides having engagement to said first guide member and connected to each of two pivotally connected intersections on an alignment parallel to said arms and at one lateral offset from said arms, second individual slides having sliding engagement to said second guide member and connected to each of two pivotally connected intersections on an alignment parallel to said arms and at the opposite lateral offset from said arms, and slit-width adjustment means including means for displacing at least one of said guide members in the direction perpendicular to said diagonal alignment and with respect to the other of said guide members.

5,206,766

LASER DIODE ALIGNMENT APPARATUS AND METHOD FOR OPTICAL SCANNERS

Jonathan D. Bassett, Ithaca, N.Y.; Charles K. Wike, Jr., Cambridge, Ohio; David E. Weeks, Candor, N.Y., and Rex A. Aleshire, Byesville, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 24, 1991, Ser. No. 719,867

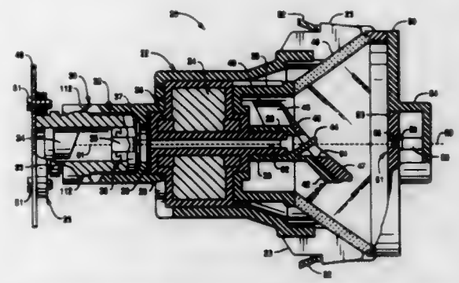
Int. Cl.[5] **G02B** *26/08*

U.S. Cl. 359—896 **38 Claims**

1. In an optical scanner, an apparatus for aligning a laser beam produced by a laser diode comprising:

a socket member, including a cylindrical wall portion around a central socket axis having a back end, an inner surface describing a cylindrical aperture, and a base portion coupled to the cylindrical wall portion having a circular aperture therethrough;

a plug member having a central plug axis and having an aperture for containing the laser diode and including a cylindrical front end portion having a diameter smaller than the diameter of the cylindrical aperture; and



means for pivotally and rotatably mounting the plug member within the socket member, the plug axis being alignable in a plurality of directions including a direction parallel to the socket axis and a direction across the socket axis in order to align the laser beam with the socket axis.

5,206,767

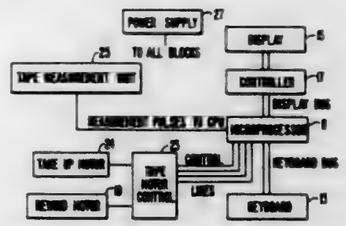
VCR ACCESSORY AND EDITOR

Jerry J. Heep, Weatherford, Tex., assignor to Tandy Corporation, Forth Worth, Tex.

Filed Dec. 29, 1989, Ser. No. 459,014

Int. Cl.[5] **G11B** *27/02, 15/18*

U.S. Cl. 360—13 **1 Claim**



1. In a tape editing device for determining the relative position of a tape to its start position as a function of tape length expressed in units of time, a method for determining the current position of the tape relative to the start position expressed in units of time, comprising the steps of:

resetting a time counter to a present position count representing a present position on the tape relative to the start position expressed in units of time;

initiating said time counter to start said time counter counting for measuring the length of the tape expressed in units of time;

rewinding the tape to the start position;

recording a start count reached by said time counter, said start count representing the tape length from said present position expressed in units of time;

winding the tape in a forward direction until it reaches the end position;

recording an end count reached by said time counter, said end count representing the tape length from said start position expressed in units of time;

rewinding the tape by a count value equal to said end count minus said present position count; and

displaying a time period representing the length of tape expressed in units of time between the present position and

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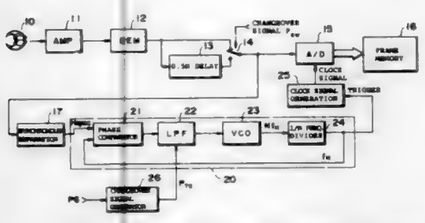
the end position equal to said end count minus said present position count and a time period representing the length of tape expressed in units of time between the start position and said present position equal to said present position count minus said start count.

5,206,768

METHOD AND APPARATUS FOR WRITING VIDEO SIGNAL IN MEMORY

Shigekazu Fukada, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1991, Ser. No. 757,016
Claims priority, application Japan, Sep. 28, 1990, 2-257017
Int. Cl.[5] H04N *5/78*
U.S. Cl. 360—36.2 2 Claims



2. An apparatus for writing a video signal in a memory, comprising:

an A/D converter circuit for converting an analog video signal read from a magnetic recording medium into digital image data in order to be written in the memory;

a timing clock signal generating circuit for controlling A/D conversion timing of said A/D converter circuit;

a synchronous separation circuit for separating a horizontal synchronizing signal from the video signal;

an automatic frequency control circuit having a variable time constant for generating a trigger signal tuned to the horizontal synchronizing signal, which has been separated by said synchronous separation circuit, at a response speed conforming to the time constant, and resetting said timing clock signal generating circuit by said trigger signal; and

control means for controlling a changeover in such a manner that the time constant of the automatic frequency control circuit is made relatively large in the vicinity of a vertical synchronizing signal of the video signal.

5,206,769

METHOD FOR CONTROLLING A PLURALITY OF PHASE-LOCK LOOPS FROM A COMMON FREQUENCY CONTROL

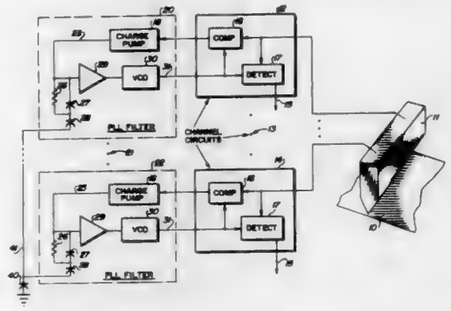
James A. Bailey, and Gary F. Gooding, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 511,688, Apr. 20, 1990, Pat. No. 5,138,282.
This application Apr. 6, 1992, Ser. No. 862,919
Int. Cl.[5] G11B *5/09*; H03L *7/07, 7/093*
U.S. Cl. 360—51 6 Claims

4. In a signal processing system, a method for timing the operation of a given plurality of phase lock loops, the steps of:

supplying a single frequency-determining electrical capacitance for all of said given plurality of phase lock loops;

separately and individually AC coupling said single frequency-determining electrical capacitance to a frequency determining portion in each of said given plurality of phase lock loops.

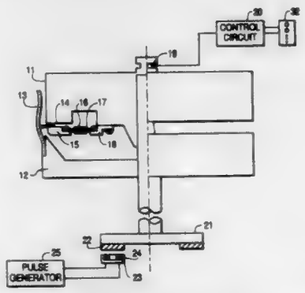


5,206,770

APPARATUS WITH ARRANGEMENT FOR KEEPING ROTATING HEAD IN OPTIMAL CONTACT WITH MAGNETIC TAPE

Hideyuki Hashi, Kadoma, and Shigeki Murata, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 436,790, Nov. 15, 1989, abandoned.
This application Jul. 10, 1992, Ser. No. 911,807
Claims priority, application Japan, Nov. 15, 1988, 63-287973
Int. Cl.[5] G11B *5/56*
U.S. Cl. 360—75 4 Claims



1. A rotating head apparatus comprising:

a cylinder which guides a magnetic tape along a helical path over a specific circumferential angle, said magnetic tape being one of a plurality of kinds of magnetic tapes, each kind of magnetic tape having different mechanical characteristics from the other kinds of magnetic tapes, and said cylinder including a rotary cylinder which is rotating at a specific rotational speed;

a rotating head which is mounted on said rotary cylinder so as to rotate at said specific rotational speed and has a magnetic gap for recording signals on and reproducing signals from said magnetic tape;

a moving means for pivotally moving said rotating head relative to said rotary cylinder so as to change an angle formed between a center line of said magnetic gap and a normal line to a contacting surface between said rotating head and said magnetic tape;

a discriminating means for discriminating the kind of said magnetic tape and for outputting a signal indicative of the discriminated kind of said magnetic tape; and

a control means for controlling said moving means according to said signal output from said discriminating means to keep said rotating head in such a contact with said magnetic tape that the center line of said magnetic gap coincides with the normal line to the contacting surface between said rotating head and said magnetic tape.

5,206,771

TAPE DRIVE MECHANISM

Daiichirou Katou; Tamotsu Mitsuyasu; Kazuo Abe; Takuji Sekiguchi; Hitoshi Yanagisawa, all of Tokyo; Tsuneharu Hashizume, Shimosuwa; Toshihiko Okina, Komagane; Mitsutaka Miyashita, and Masaki Gotoh, both of Shimosuwa, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

PCT No. PCT/JP89/00234, § 371 Date Aug. 30, 1990, § 102(e) Date Aug. 30, 1990, PCT Pub. No. WO89/08309, PCT Pub. Date Sep. 8, 1989
PCT Filed Mar. 3, 1989, Ser. No. 571,641
Claims priority, application Japan, Mar. 4, 1988, 63-49825; Apr. 21, 1988, 63-99154; Jun. 15, 1988, 63-147558
Int. Cl.[5] G11B *15/60*
U.S. Cl. 360—71 5 Claims

1. A tape drive mechanism comprising:

a sensor for detecting an amount of dislocation of said tape from a reference running position in a width-wise direction of said tape, and supplying a detection signal;

a supply reel base device including a supply reel base for supplying said tape;

a winding reel base device including a winding reel base for winding said tape being supplied from said supply reel base;

an actuator provided in either or both of said supply reel base device and said winding reel base device, said actuator acting in response to said detection signal being supplied from said sensor so as to move either or both of said supply and winding reel bases in the width-wise direction of said tape in accordance with said tape dislocation amount; and

a means for causing either or both of said supply and winding reel bases to be rotated, said means being provided in either or both of said supply and winding reel bases,

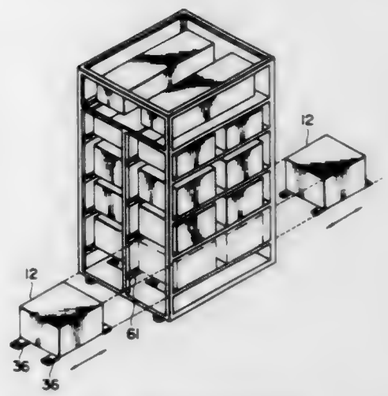
wherein operation of said actuator and said means causes either or both of said supply and winding reel bases to be rotated, while being moved in said width-wise direction of said tape in case of said sensor detecting said tape dislocation amount, to thereby maintain said tape at a predetermined position.

5,206,772

MAGNETIC DISK APPARATUS HAVING IMPROVED ARRANGEMENT OF HEAD DISK ASSEMBLIES

Yoshiyuki Hirano, Yoao; Tsuyoshi Takahashi, Odawara; Jun Naruse, Odawara, and Kazuo Nakagoshi, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 415,987, Oct. 2, 1989, abandoned, which is a continuation of Ser. No. 733,008, Jul. 19, 1991, Pat. No. 5,173,819. This application Jan. 8, 1991, Ser. No. 638,822
Claims priority, application Japan, Jan. 19, 1990, 2-8327
Int. Cl.[5] G11B *5/12*
U.S. Cl. 360—98.01 8 Claims



1. A magnetic disk apparatus comprising:

a housing having a front side, a rear side, a top side, a bottom side and a longitudinal axis running perpendicular to and intersecting said front side and said rear side;

a plurality of head disk units arranged in said housing in a plurality of rows including at least front and rear rows which are spaced from each other in a direction of said longitudinal axis and forming a front space between said front row of the head disk units and said front side of the housing and a rear space between said rear row of the head disk units and said rear side of the housing, each of said plurality of head disk units including a head disk assembly and a control circuit board, each of said head disk units being surrounded by a cover in each direction except two longitudinal sides of the head disk unit which are intersected in a perpendicular manner by said longitudinal axis or by a line parallel to said longitudinal axis which runs perpendicular to and intersects said front side and said rear side so as to provide a longitudinal air passage through each of said head disk units via said two longitudinal sides;

a central air passage provided near a center of said housing in such a manner as to space adjacent front and rear rows of said head disk units, said central air passage communicating with an outer space of the housing through the bottom side of the housing;

fans introducing air front said central air passage into said longitudinal air passage of each head disk unit so as to discharge the air to the top side of the housing through said front space or aid rear space;

one or more power sources supplying power to said head disk units, mounted in said housing above said plurality of head disk units; and

a discharge opening provided in the vicinity of the top side of the housing through which said air discharged to the top side of the housing is discharged from said housing.

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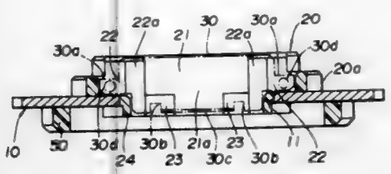
5,206,773

MAGNETIC RECORDING DISK

Toyoko Sakamoto, and Taizo Aizawa, both of Miyagi, Japan, assignors to Sony Corporation, Japan

Filed Jul. 23, 1991, Ser. No. 734,783
Claims priority, application Japan, Jul. 31, 1990, 2-203066
Int. Cl.[5] G11B 5/82
U.S. Cl. 360—135 3 Claims



1. A magnetic recording disk comprising a magnetic recording medium made of a flexible sheet-like material and a central hub having a central bore adapted for receiving a spindle of a disk driving mechanism, said central hub comprising:

a core member being made of a metal sheet and having a central aperture;

a ring member concentrically mounted on said core member and having a recessed portion provided on an outer surface thereof, a pair of slotted portions opposingly formed inside thereof and a pair of swelled portions extending radially inwardly into said central apperture of said core member; said pair of slotted portions each having a pair of opposite protrusions;

a covering member mounted over an outer surface of said ring member so that said magnetic recording medium is retained between the covering member and said core member;

a leaf spring having a pair of tongue portions extending outwardly from both ends thereof, a pair of notched portions at a lower side thereof and a folded portion extending between said pair of notched portions; said leaf spring being insertedly mounted into said pair of slotted portions such that each end of the leaf spring is interposed between said pair of opposite protrusions in each of said slotted portions;

a pulse generating member fixedly connected to said core member and extending through said ring member in a direction perpendicular to the surface of said core member so that a tip end of the pulse generating member is projected outwardly from a bottom surface of said recessed portion.

5,206,774

PROCESS FOR MAKING A MAGNETO-RESISTIVE MAGNETIC TRANSDUCER HAVING INCREASED SENSITIVITY AND AN IMPROVED FLUX PATH AND THE PRODUCT MADE THEREBY

Marybelle C. Blakeslee, Golden; Richard H. Dee, Louisville, both of Colo., and Richard F. M. Thornley, Fort Lauderdale, Fla., assignors to Storage Technology Corporation, Louisville, Colo.

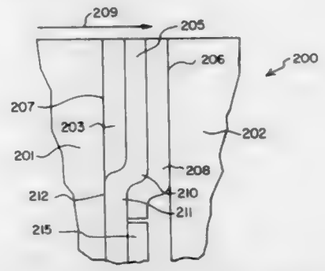
Filed Jul. 26, 1991, Ser. No. 736,243
Int. Cl.[5] G11B 5/127
U.S. Cl. 360—113 13 Claims

7. A method of forming an MR read head, said method comprising the steps of:

positioning an MR element intermediate a first pole piece having a first mating surface and a second pole piece having a second mating surface positioned facing said first mating surface,

said MR read element having first and second planar surfaces,

positioning said first planar surface of said MR element adjacent said first mating surface and positioning said second planar surface of said MR element adjacent a second mating surface so as to form an operative read head wherein said MR element cooperates with said pole pieces to generate an output signal representing a detected flux in response to the movement of a magnetic material over top edges of said pole pieces and said MR element,



said top edge of said MR element being adapted to receive flux from said magnetic material positioned over a top portion of said head, and

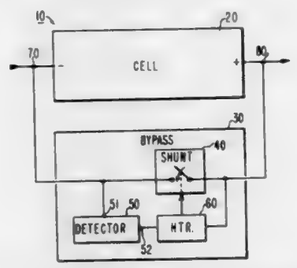
forming an extension connecting a lower edge of said MR element with said first mating surface to provide a low impedance flux path for flux entering said top edge of said MR element.

5,206,775

CIRCUIT BYPASS DEVICE

Jean P. Wilson, Mountain View, Calif., assignor to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed May 23, 1991, Ser. No. 704,772
Int. Cl.[5] H02H 7/16
U.S. Cl. 361—15 12 Claims



1. Apparatus having terminals for connection to a pair of contacts in a circuit to provide a conductive path in response to voltage excursion therebetween, the apparatus comprising:

switching means, coupled to the pair of contacts in the circuit, having a conductive shunt that is movable form a normally non-conductive position to a conductive position between the terminals;

detecting means, coupled to the switching means and to the pair of contacts, for sensing a voltage excursion beyond a specified limit between the contacts; and

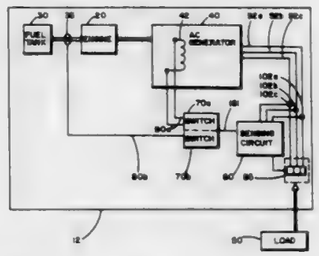
actuating means, coupled to the switching means, having a heat-to-recover shape memory metal alloy that is formed to contract in response to the detecting means sensing the voltage excursion, for moving the conductive shunt from the non-conductive position to the conductive position, wherein the heat-to-recover shape memory metal alloy is connected serially to the detecting means and the conductive shunt between the terminals such that current flows through such serial connection upon the sensing by the detecting means of the voltage excursion.

5,206,776

PROTECTION SYSTEM FOR AC GENERATORS

Bert A. Bodenheimer, Stamford; Daniel W. Gravereaux, New Canaan, and Joseph J. DeRosa, Jr., Trumbull, all of Conn., assignors to B. A. Bodenheimer and Co., Inc., Stamford, Conn.

Filed Dec. 17, 1990, Ser. No. 628,449
Int. Cl.[5] H02H 7/06
U.S. Cl. 361—20 25 Claims



1. A system for protecting a multiphase ac generator of a diesel-engine generator set to which a load is electrically coupled, the multiphase ac generator having field windings and a plurality of output load carrying conductors carrying current of different phases, said system being coupled to said output load carrying conductors, wherein a fuel valve solenoid is associated with said said diesel-engine generator set, said system comprising:

a) circuit means coupled to said output load carrying conductors for determining the presence of an undesired overcurrent condition where the current in any of said plurality of output load carrying conductors is greater than a predetermined current for a predetermined length of time, said circuit means including means for providing a signal indicative of an undesired condition in response to a determined undesired overcurrent condition;

b) at least one of a means for shorting said field windings and a means for de-energizing said fuel valve solenoid;

c) switch means coupled to said circuit means and coupled to at least one of said means for shorting said field windings and said means for de-energizing said fuel valve solenoid, said switch means for receiving said signal indicative of an undesired condition and for causing said means for shorting to short said field windings and/or for causing said means for de-energizing to de-energize said fuel valve solenoid protecting the ac generator in response to said signal indicative of an undesired condition; and

d) switch interlock means coupling said output load carrying conductors to said load, said switch interlock means for preventing an application of voltage from said output load carrying conductors to said load upon initial physical connection of said load to said switch interlock means, and for allowing an application of voltage from said output load carrying conductors to said load upon activation of said switch interlock means.

5,206,777

THREE-PHASE PANELBOARD USING STANDARD RATED THREE-POLE CIRCUIT PROTECTIVE DEVICES IN A GROUNDED DELTA SYSTEM

Robert J. Clarey, Brookfield, and Richard A. Reiner, Colgate, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

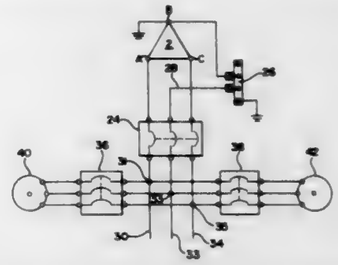
Filed Sep. 23, 1991, Ser. No. 764,255
Int. Cl.[5] H02H 3/00
U.S. Cl. 361—63 17 Claims

1. A three-phase, three-wire panelboard for use in a grounded delta electrical distribution system wherein one phase of a delta configured electric power supply is grounded, said panelboard comprising

three electrically conductive bus members having branch circuit connector means for electrical connection of branch circuit protective apparatus to said bus members;

main connection means electrically connected to said bus members and connectable to power conductors for connecting said bus members to respective phases of said grounded delta power supply;

grounding means connecting said power conductor of said grounded phase to ground at a power supply side of said main connection means; and



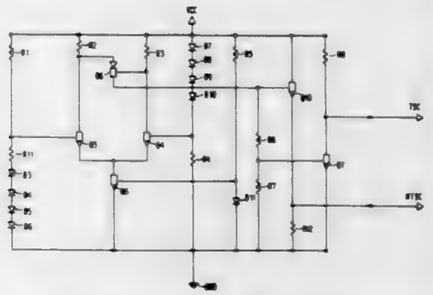
three-pole circuit protective apparatus connected to said branch circuit connector means of respective said bus members for supplying a three-phase load in a branch circuit, respective phases of said three-phase load being individually connectable to each pole of said three-pole circuit protective apparatus.

5,206,778

SENSE CIRCUIT FOR ON-CHIP THERMAL SHUTDOWN

Denis M. Flynn, San Jose, Calif., and Peter M. Ippolito, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1991, Ser. No. 701,490
Int. Cl.[5] H02H 5/04
U.S. Cl. 361—103 12 Claims



1. A sense circuit for on-chip thermal shutdown of an integrated circuit device on a chip comprising:

comparator means having first and second inputs for sensing a voltage difference at said first and second inputs and switching from a first state to a second state upon a predetermined increase in voltage at said first input and a corresponding predetermined decrease in voltage at said second input;

temperature sensing means including first and second diode means connected respectively to said first and second inputs of said comparator means, voltage drops across said first and second diode means decreasing with increasing temperature, said first diode means being connected to decrease a voltage at said first input and said second diode means being connected to increase a voltage at said second input with increasing temperature; and

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means connected to said comparator means for detecting the state of said comparator means.

5,206,779

NOISE FILTER WITH SURGE ABSORBER AND SURGE ABSORBER ATTACHED TO NOISE FILTER

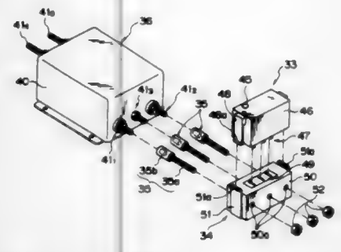
Sadshiro Sato, Okaya; Yoshihito Oguchi, and Akihiko Ikazaki, both of Tokyo, all of Japan, assignors to Okaya Electric Industries Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1991, Ser. No. 720,952

Claims priority, application Japan, Oct. 1, 1990, 2-103421[U]; Nov. 15, 1990, 2-119979[U]; Nov. 15, 1990, 2-119980[U]

Int. Cl.[5] H02H *3/22;* **H01R** *13/207*

U.S. Cl. 361—111 **4 Claims**



3. An apparatus comprising:

a noise filter having a plurality of screw type terminals;

a surge absorber having a three terminal plug;

connector means by which said plurality of screw type terminals may pass through and connect said noise filter to an attaching means, wherein said attaching means has a three terminal socket capable of connecting said attaching means to said three terminal plug of said surge absorber.

5,206,780

CABLE TERMINATION

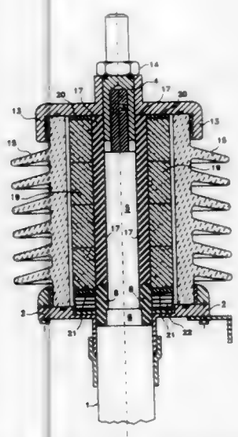
Jan Varreng, Oslo, Norway, assignor to Alcatel STK A/S, Oslo, Norway

Filed Mar. 19, 1990, Ser. No. 496,433

Claims priority, application Norway, Mar. 20, 1989, 891198

Int. Cl.[5] H02H *9/06*

U.S. Cl. 361—117 **7 Claims**



1. High voltage termination for a high voltage cable operating in excess of 15 kV, said termination comprising a high voltage conductor integral with the cable and having an intermediate portion terminating with an exposed end,

a high voltage insulating layer integral with the cable voltage conductor adjacent said exposed end and extending towards a remote end of the cable,

an annular high voltage surge protector formed of one or more metal oxide sections having a nonlinear voltage characteristic, the interior of said surge protector defining a hollow extending from a first end to a second end of the surger protector for accommodating said high voltage conductor and said insulating layer extending into said hollow and with the exposed end of the conductor extending out from the second end of the surge protector,

a semiconductor layer integral with the cable and surrounding said insulating layer, said semiconductor layer extending from the first end of the annular surge protector towards the remote end of the cable leaving an exposed portion of said insulating layer inside said surge protector adjacent said exposed end,

a ground sheath integral with the cable and surrounding said semiconductor layer, said ground sheath extending from the first end of the annular surge protector towards the remote end of the cable and leaving an exposed portion of the semiconductor layer in the vicinity of the first end of the surge protector,

high voltage connection means for effecting a first electrical connection between the second end of the annular surge protector and the exposed end of the conductor, and

grounding means adjacent the first end of the annular surge protector and separated from said high voltage conductor by said high voltage insulating layer and said semiconductor layer, for effecting a second electrical connection between said first end of the annular surge protector, said semiconductor layer and said grounding sheath.

5,206,781

MAGNETIC TAPE CASSETTE HAVING A PROTECTIVE PLUG TO AVOID ERRONEOUS ERASURE

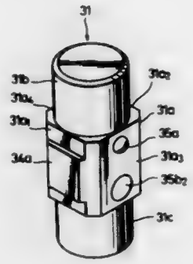
Kiyotaka Yanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,779

Claims priority, application Japan, Dec. 6, 1989, 1-317029

Int. Cl.[5] G11B *23/02, 15/04, 19/04;* **G03B** *1/04*

U.S. Cl. 360—132 **5 Claims**



1. A magnetic tape cassette in which a signal recorded on a tape-shaped record medium accommodated therein can be prevented from being erased inadvertently by a sliding member movable by a user of said cassette and being slidably inserted within an insertion aperture formed through a cassette casing in a thickness direction of the cassette casing, said cassette comprising:

disengagement preventing stopper means including convex portions formed on said sliding member and concave portions formed in said insertion aperture for preventing said sliding member from being disengaged from the cassette casing; and

positioning click stopper means including protrusions formed on said sliding member separate and apart from said convex portions and click stopper concave portions formed in said insertion aperture separate and apart from said concave portions of said disengagement preventing stopper means for selectively stopping movement of said sliding member at predetermined switching positions so that a recorded signal can be erased or that the recorded signal can be prevented from being inadvertently erased, wherein said positioning click stopper means further includes guide groove portions respectively contiguous to said click stopper concave portions in said insertion aperture.

5,206,782

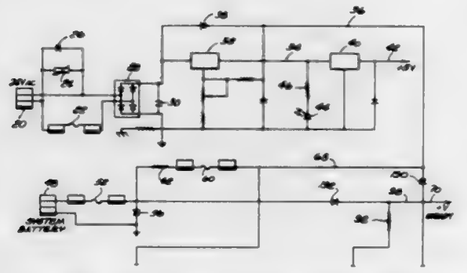
SURGE LOCK POWER CONTROLLER

Phillip C. Landmeier, Irvine; Douglas J. Morgan, Del Mar, and Gerald E. Hammond, Tustin, all of Calif., assignors to Hirsch Electronics Corporation, Irvine, Calif.

Filed Jan. 18, 1991, Ser. No. 642,818

Int. Cl.[5] E05B *47/02*

U.S. Cl. 361—154 **10 Claims**



1. A surge lock power controller for providing electrical power to a lock system requiring steady state power and utilizing surge locks further requiring a short term high power surge to operate the same, comprising:

first and second rechargeable storage batteries;

recharging means coupled to the rechargeable storage batteries and for coupling to a power supply for charging the rechargeable storage batteries, the recharging means having a charging rate greater than the steady state power drain of a lock system and less than the power drain on the rechargeable storage batteries during the high power surge operation of one or more of the surge locks;

the first storage battery being coupled to a steady state power output to provide steady state power for a lock system;

first switch means coupled between the first storage battery and the second storage battery;

second switch means coupled between the second storage battery and a surge lock output to provide the power for the surge locks in a lock system;

first voltage sensitive means coupled to the first switch means responsive to the voltage of the steady state power output to turn off the first switch means for at least a first predetermined time whenever the voltage of the steady state power output drops below a first predetermined value; and,

second voltage sensitive means coupled to the second switch means and responsive to the voltage of the second rechargeable storage battery to turn off the second switch means for at least a second predetermined time whenever the voltage of the second rechargeable storage battery drops below a second predetermined value;

the second predetermined value being less than the first predetermined value.

5,206,783

PORTABLE SEMICONDUCTOR MEMORY UNIT

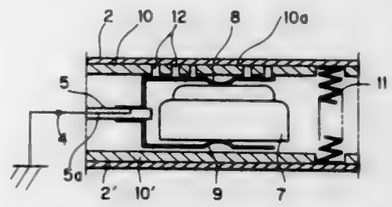
Yoshihide Mori, Kawanishi, and Takayuki Shinohara, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 715,962

Claims priority, application Japan, Aug. 18, 1990, 2-217613

Int. Cl.[5] H05F *3/00, 3/04*

U.S. Cl. 361—212 **4 Claims**



1. A portable semiconductor memory unit, comprising:

an IC card having an internal battery;

a card body with a conductive panel on an outer surface;

an insulating layer provided on an inner surface of said card body;

a circuit board provided in said card body, said circuit board having a ground interconnection; and

said internal battery supported between a positive and a negative contact electrodes connected to the circuit board and approximately parallel to a length of said card body, said negative contact electrode connected to the ground interconnection;

a portion of said insulating layer, which is opposed to said negative contact electrode, having a lower electrostatic breakdown voltage than other portions of said insulating layer.

5,206,784

CHARGER FOR ELECTROPHOTOGRAPHY HAVING A GRID ASSEMBLY

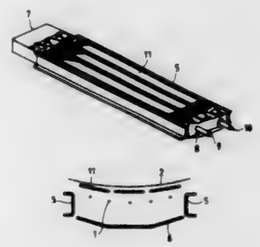
Yasushi Kimiwada; Akira Terakado; Minoru Seino; Yasushi Hashimoto; Koji Kato, and Isamu Komatsu, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 483,552

Claims priority, application Japan, Apr. 14, 1989, 1-95806

Int. Cl.[5] G03G *15/02*

U.S. Cl. 361—229 **2 Claims**



1. An electrophotographic charger for a photosensitive drum, said charger comprising:

a plurality of corona wires spaced regularly and extending linearly in a longitudinal direction of the photosensitive drum, said corona wires being disposed equidistant, by a predetermined distance, from the surface of the drum; and

a grid assembly comprising a plurality of separately attached, individually removable etching grids, said grid assembly being interposed between said corona wires and

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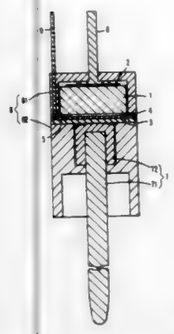
the photosensitive drum such that a charge is uniformly spread over a peripheral surface of the photosensitive drum and such that a distance between said grid assembly and said corona wires is substantially uniform over said peripheral surface.

5,206,785

VARIABLE CAPACITOR AND POSITION INDICATOR EMPLOYING VARIABLE CAPACITOR

Yasuyuki Hukashima, Saitama, Japan, assignor to Wacom Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1991, Ser. No. 740,580
Int. Cl.[5] H01G *7/00, 5/34*
U.S. Cl. 361—283 **45 Claims**



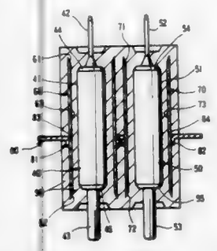
1. A variable capacitor comprising a solid dielectric, a first electrode on the solid dielectric, a second flexible electrode normally spaced by a dielectric gas from a surface of the solid dielectric, the normal spacing between the second electrode and the surface and the flexibility of the second electrode being such that the second electrode (a) is urged into contact with the surface in response to an initial force being applied to the second electrode, (b) has differing contact areas with the surface in response to differing forces greater than the initial force being applied thereto and (c) returns to its normally spaced location from the surface in response to removal of the forces.

5,206,786

THROUGH TYPE CONDENSER

Soo-Cheol Lee, Suweon, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Kyungki, Rep. of Korea

Filed Nov. 27, 1991, Ser. No. 800,594
Claims priority, application Rep. of Korea, Nov. 28, 1990, 90-18422
Int. Cl.[5] H01G *4/42*
U.S. Cl. 361—302 **18 Claims**



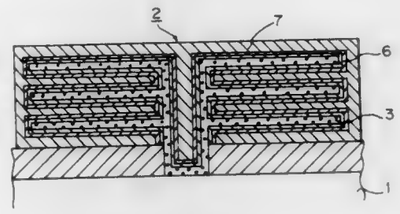
1. A through-condenser comprising:
a grounding plate having a pair of through-holes;
a pair of cylindrical ground electrodes for being inserted into the pair of through-holes in a conductive manner;
a pair of conductive rods for being inserted into said cylindrical ground electrodes in a non-conductive manner, and consisting respectively of a body portion, and a tap terminal and an output terminal formed integrally on the upper and lower ends of said body portion, with said body portion being disposed opposingly with the inner circumferential face of said ground electrode in order to serve as a positive electrode;
said body portions of said conductive rods having a diameter larger than the diameter of said tap terminal and said output terminal, wherein the length of the body portion of said conductive rods is shorter than the length of said ground electrode; and
a single insulating resin forming an outer casing of the condenser and a dielectric layer between said ground electrodes and said body portions.

5,206,787

CAPACITOR AND METHOD OF FABRICATING SAME

Hiroshi Fujioka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 27, 1992, Ser. No. 859,109
Claims priority, application Japan, Apr. 1, 1991, 3-67496
Int. Cl.[5] H01G *4/06;* **H01L** *21/70*
U.S. Cl. 257—307 **8 Claims**



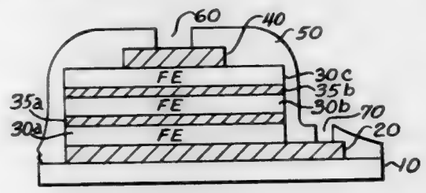
1. A stacked capacitor comprising:
a first electrode having a fin structure and formed on a semiconductor substrate;
a dielectric film formed on the first electrode; and
a second electrode formed on the dielectric film and spaced thereby from the first electrode;
the first electrode comprising an electrically conductive material different from polycrystalline silicon and a polycrystalline silicon film containing an impurity and covering the electrically conductive material.

5,206,788

SERIES FERROELECTRIC CAPACITOR STRUCTURE FOR MONOLITHIC INTEGRATED CIRCUITS AND METHOD

William Larson; Thomas Davenport, and Constance DeSmith, all of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Filed Dec. 12, 1991, Ser. No. 806,726
Int. Cl.[5] H01G *1/01;* **H01L** *3/00, 27/02*
U.S. Cl. 361—313 **30 Claims**



1. A ferroelectric capacitor comprising:

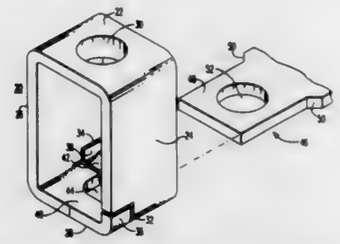
a substrate;
a bottom electrode over said substrate;
a first layer of a ferroelectric material over said bottom electrode;
an intermediate electrode over said first layer of ferroelectric material;
a second layer, distinct from said first layer, of ferroelectric material, said second layer being located over said intermediate electrode; and
a top electrode over said second ferroelectric material.

5,206,789

TERMINAL ASSEMBLY FOR A CIRCUIT BREAKER AND SIMILAR APPARATUS

Ernest D. Barbry, Beaver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1992, Ser. No. 846,101
Int. Cl.[5] H02B *1/20*
U.S. Cl. 361—355 **28 Claims**



1. In combination with a circuit interrupter that has a housing of insulating material and is adapted to protect an electric circuit from current overloads,
a bus conductor extending from said housing, and
a collar assembly fastened to said bus conductor for facilitating the connection of said circuit interrupter to an electric cable conductor that comprises part of said circuit being protected,
said collar assembly comprising:
a collar having a first leg and a second leg;
securing means associated with said collar for applying a first securing force upon the electric cable conductor for urging the electric cable conductor into electrical contact with said bus conductor and for securing the electric cable conductor within said collar; and
a movable portion connected to said first leg and extending toward said second leg for moving in cooperation with said securing means as said securing means is operated to apply said first securing force for attenuating a stress said first securing force generates upon said collar.

5,206,790

PIVOT AND SWIVEL MECHANISM FOR LAP TOP DISPLAY

William B. Thomas, Fremont; Michael R. Barry, and James R. Flom, both of Palo Alto, all of Calif., assignors to Zeos International, Ltd., St. Paul, Minn.

Filed Jul. 11, 1991, Ser. No. 728,570
Int. Cl.[5] H05K *7/16;* **G06F** *1/16;* **E05D** *11/08*
U.S. Cl. 361—380 **14 Claims**

1. A laptop or notebook computer comprising:
a case;
a mother board and a keyboard in said case;
a display;
means for swivel mounting said display on said case connected between said display and said case; and
means for pivotably mounting said display on said case connected between said display and said case, said means for pivotably mounting said display on said case comprising a first pivot connected between said display and a pivot plate and a second pivot connected between said pivot plate and a base for said display, said first pivot having a greater resistance to pivoting in an opening direction of said display than said second pivot, said first pivot and said second pivot being axially displaced with respect to one another, so that said display and said pivot plate initially pivot together about said second pivot with respect to said case as said display is opened to a given extent, and said display then pivots with respect to said

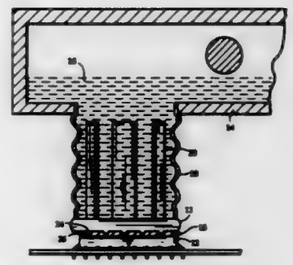
pivot plate about said first pivot when said display is opened a greater extent than the given extent, said second pivot having a greater resistance to pivoting than said first pivot when said display is lowered over said keyboard, so that said display initially pivots with respect to said pivot plate about said first pivot, and said display and said pivot plate then pivot together about said second pivot with respect to said case until said display is closed over said case.

5,206,791

BELLOWS HEAT PIPE APPARATUS FOR COOLING SYSTEMS

Shlomo D. Novotny, Wayland, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 7, 1992, Ser. No. 832,524
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 **21 Claims**



1. A cooling system comprising:
an evaporator section in fluid flow communication with a condenser section;
a resilient bellows pipe element having first and second ends;
said first end of said resilient bellows pipe element attached in fluid tight relation and in communication with said evaporator section;

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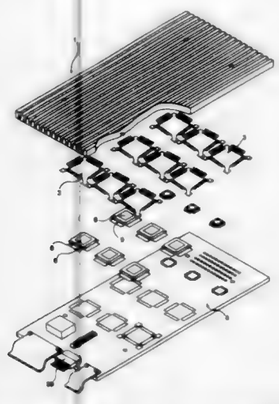
a thermally conductive heat sink member having first and second opposed surfaces, said first opposed surface attached to said second end of said resilient bellows pipe element; and
a plurality of spaced protuberances disposed on said second opposed surface of said thermally conductive heat sink member; and
a layer of thermally conductive filling material disposed on said second opposed surface of said heat sink member filling spaces between said protuberances.

5,206,792

ATTACHMENT FOR CONTACTING A HEAT SINK WITH AN INTEGRATED CIRCUIT CHIP AND USE THEREOF

Scott D. Reynolds, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,132
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 31 Claims



1. An attachment for removably and thermally contacting a heat sink with an integrated circuit chip located on a chip carrier which is located on an integrated circuit card or board, said attachment comprises:
a body portion for contacting the integrated circuit chip;
a plurality of flange members extending from said body portion;
each of said flange members containing a pad-like member located at its end farthest from said body portion, wherein said pad-like members being for contacting the integrated circuit card or board;
a compliant portion extending away from said body portion in a direction different from said flange members for contacting the heat sink;
and wherein said portion, said flange members, said pad-like members and said compliant portion are thermally conducting.

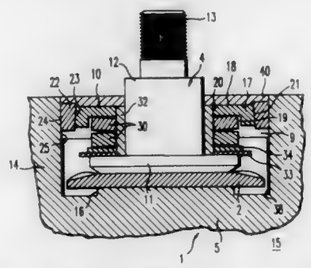
5,206,793

DIODE WITH ELECTRODES AND CASE ASSEMBLED WITHOUT SOLDERING OR CRIMPING, AND RECTIFIER BRIDGE MADE WITH SUCH DIODES

Antoine Boudrant, Paris, and Bela Skorucak, Cormeilles en Parisis, France, assignors to Auxilec, Chatou, France

Filed Aug. 2, 1991, Ser. No. 739,850
Claims priority, application France, Aug. 7, 1990, 90 10067
Int. Cl.[5] H05K *7/20*
U.S. Cl. 257—689 12 Claims

1. A diode assembly comprising at least one diode subassembly which includes:
a diode chip having opposed faces,
a first electrode and a second electrode in intimate electrical and thermal contact with a respective one of said opposed faces of said chip,
a case in which said diode is mounted,
a cover which closes said case, and



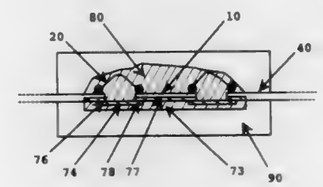
an elastic element disposed in said case and which applies a permanent pressure action to maintain, on the one hand, said electrodes in intimate contact with said chip and on the other hand, the cover in a closed position.

5,206,794

INTEGRATED CIRCUIT PACKAGE WITH DEVICE AND WIRE COAT ASSEMBLY

Jon M. Long, Livermore, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 20, 1991, Ser. No. 811,406
Int. Cl.[5] H05K *7/20*
U.S. Cl. 257—675 18 Claims



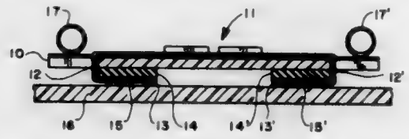
1. An integrated circuit package comprising:
an integrated circuit die,
a lead frame,
at least one bonding wire having one end attached to said integrated circuit die and an opposite end attached to said lead frame,
a heat conductive tape having a surface with a heat conductive strip, said surface having first and second locations, said heat conductive strip being thermally connected to said first and second locations,
means for attaching said heat conductive tape to said integrated circuit die at said first location and to said lead frame at said second location,
a layer of a first encapsulating material contacting and covering said integrated circuit die and said at least one bonding wire including its attachment points to said integrated circuit die and said lead frame, and
a layer of a second encapsulating material contacting and covering said layer of first encapsulating material,
wherein said heat conductive tape acts as a support base for said layer of first encapsulating material.

5,206,795

COMPLIANT CONNECTION FOR SUBSTRATES

Thomas D. Belanger, Jr., Saline, Mich., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 30, 1991, Ser. No. 814,645
Int. Cl.[5] H05K *1/00*
U.S. Cl. 361—398 8 Claims



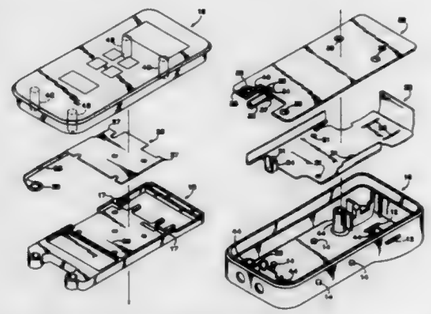
1. In combination an electrical substrate for electrically connecting a flexible printed circuit to a carrier substrate including at least one circuit contact, said electrical substrate comprising:
a relatively flat rectangular platelike structure having parallel first and second surfaces, connected by a plurality of side surfaces, certain ones of said side surfaces offset from other side surfaces to define at least one recessed area;
a flexible printed circuit located on said first surface, including at least one extension section depending from said first surface adjacent to one of said side surfaces defining said recessed area, and further extending beneath said second surface;
whereby in response to placement of said electrical substrate in a predetermined location on a carrier substrate, said flexible printed circuit is electrically connected to said carrier substrate circuit contact.

5,206,796

ELECTRONIC INSTRUMENT WITH EMI/ESD SHIELDING SYSTEM

Bradley H. Thompson, Lynnwood; Brian S. Aikins, Everett, and Roger M. Trana, Bothell, all of Wash., assignors to John Fluke Mfg. Co. Inc., Everett, Wash.

Filed Mar. 11, 1991, Ser. No. 667,432
Int. Cl.[5] H05K *9/00*
U.S. Cl. 361—424 9 Claims



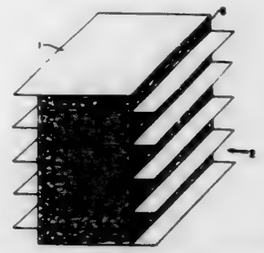
1. An electronic instrument comprising:
an instrument case including a first case part and a second case part,
a circuit board disposed in the instrument case, the circuit board embodying electronic circuitry that includes a common (ground) region comprising a common area on the circuit board and a common jack connected to the common area,
a first metallic shield part press fitted to the first case part and comprising a vee spring that contacts the common jack to provide electrical contact with the common region of the electronic circuitry, and
a second metallic shield part press fitted to the second case part and having a contact portion in electrical contact with the common region.

5,206,797

NONISOTROPIC SOLUTION POLARIZABLE MATERIAL AND ELECTRICAL COMPONENTS PRODUCED THEREFROM

Rhyta S. Rounds, Flemington, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 396,482, Aug. 21, 1989, Pat. No. 4,974,118, which is a continuation-in-part of Ser. No. 147,045, Feb. 5, 1988, Pat. No. 5,038,249, which is a continuation-in-part of Ser. No. 17,424, Feb. 20, 1987, Pat. No. 4,878,150. This application Oct. 23, 1990, Ser. No. 602,104
Int. Cl.[5] H01G *9/02*
U.S. Cl. 361—504 13 Claims



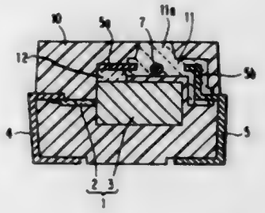
1. An electrical device comprising an electrical transmission means connected to a nonisotropic compound selected from the group consisting of nonionic, cationic, anionic and amphoteric surfactants and including a liquid wherein said nonisotropic solution has a liquid crystal microstructure and a high capacitance and said nonisotropic solution acts as a dielectric.

5,206,798

CHIP-TYPE SOLID ELECTROLYTIC CAPACITOR WITH A FUSE

Yukio Sagisaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 17, 1992, Ser. No. 899,849
Claims priority, application Japan, Jun. 19, 1991, 3-146402
Int. Cl.[5] H01G *9/06*
U.S. Cl. 361—534 3 Claims



1. A chip-type solid electrolytic capacitor with a fuse, comprising:
a solid electrolytic capacitor element;
an anode terminal connected to an anode lead led from said solid electrolytic capacitor element;
a cathode terminal with a fuse, connected to a cathode layer of said solid electrolytic capacitor element; and
a molding resin with which all of said elements are covered so that predetermined portions of the respective anode terminal and cathode terminal are exposed.

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wherein said cathode terminal has an inside connecting portion, an outside lead portion, and protective resin protecting the fuse for bridging between said inside connecting portion and said outside lead portion,

characterized in that part of said protective resin is exposed from said molding resin.

5,206,799

LAMP/REFLECTOR UNIT

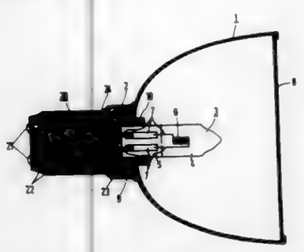
Helmut Tiesler, Cologne, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1991, Ser. No. 790,937

Claims priority, application Netherlands, Nov. 22, 1990, 9002543

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—296 **5 Claims**



1. A lamp/reflector unit comprising

a concave metal reflector (**1**) provided with a neck-shaped portion (**2**);

an electric lamp (**3**) provided with a lamp vessel (**4**) having a seal (**5**) which is fixed in the neck-shaped portion (**2**), an electric element (**6**) in the lamp vessel, and current supply conductors (**7**) extending from the electric element through the seal to the exterior;

a lamp base (**20**) provided with contacts (**21**), which is fastened to the neck-shaped portion (**2**) of the reflector (**1**);

current conductors (**22**) fastened to respective current supply conductors (**7**) and to respective contacts (**21**), characterized in that the lamp base (**20**) is fastened to the neck-shaped portion (**2**) by means of an elastic synthetic resin (**23**).

5,206,800

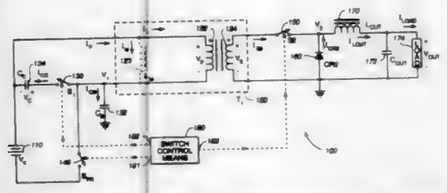
ZERO VOLTAGE SWITCHING POWER CONVERTER WITH SECONDARY SIDE REGULATION

David A. Smith, Kowloon, Hong Kong, assignor to Astec International, Ltd., Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 668,587, Mar. 13, 1991, Pat. No. 5,173,846. This application Jun. 2, 1992, Ser. No. 892,226

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—21 **13 Claims**



1. In a converter having a transformer including a primary winding and a secondary winding, said secondary winding coupled to an output load, and having a primary switch means connected in series between said primary winding and a voltage source, said primary switch means causing energy from said voltage source to be stored in said transformer when said primary switch means is closed during an ON period and causing said energy to be released from said transformer when said primary switch means is open during an OFF period, circuitry for utilizing the energy stored in said transformer to reset the core of said transformer during said OFF period of said primary switch means, to minimize the voltage stress on said primary switch means when said primary switch means closes, and to regulate the output voltage at said output load, said circuitry comprising:

a storage capacitor;

a first switch means coupled in series with said storage capacitor, the series combination of said storage capacitor and said first switch means coupled in parallel with one of said transformer windings;

a second switch means coupled in series with said secondary winding of said transformer; and

a switch control means for operating said first and second switch means in relation to the operation of said primary switch means, said switch control means closing said first switch substantially when said primary switch means opens and opening said first switch means prior to when said primary switch means closes to create a zero-voltage switching condition on said primary switch means when said primary switch means next is caused to close, said switch control means including a secondary-side control means for controlling said second switch means and for regulating the output voltage of said converter, said secondary-side control means closing said second switch means no earlier than when said primary switch means closes and opening said second switch means before said first switch means closes, said secondary-side control means further for controlling the duration said second switch means is closed such that the value of said output voltage is regulated within a predetermined voltage range.

5,206,801

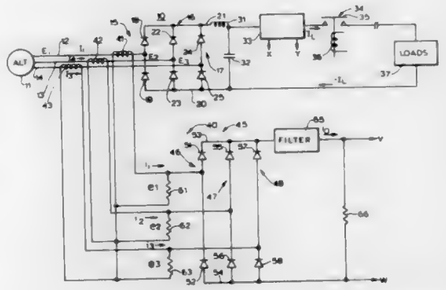
AC/DC CONVERTER FAULT DETECTOR

John R. Flick, 3427 Lauderdale La., Rockford, Ill. 61107, and Cecil W. Sims, 782 Timber Ridge Trail, Rockford, Ill. 61111

Filed Sep. 18, 1991, Ser. No. 761,455

Int. Cl.[5] H02M *7/125*

U.S. Cl. 363—53 **18 Claims**



12. A system for detecting faults represented by a difference between a first DC voltage representing an AC signal and as second DC voltage representing a DC signal, said system comprising:

AC lines for carrying said AC signal;

DC lines for carrying said DC signal;

first means coupled to said AC lines for providing said first DC voltage based upon said AC signal;

second sensing means coupled to said DC lines for providing said second DC voltage based upon said DC signal; and

fault detecting means coupled to said first sensing means and to said second sensing means for providing a fault signal

when said first and second DC voltages are not substantially equal and for providing a non-fault signal when said first and second DC voltages are substantially equal.

5,206,802

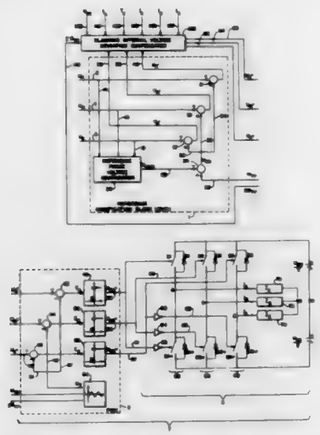
BLANKING INTERVAL VOLTAGE DEVIATION COMPENSATOR FOR INVERTERS AND CONVERTERS

Vladimir Blasko, Newington, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Sep. 17, 1991, Ser. No. 761,113

Int. Cl.[5] H02M *7/537*

U.S. Cl. 363—41 **6 Claims**



1. A method for compensating a voltage deviation in an output voltage of a pulse-width-modulation (PWM) inverter, said inverter including a bridge having three legs, said PWM using a carrier signal, a magnitude of the carrier signal having a positive peak and a negative peak, comprising the steps of:

providing a plurality of reference current signals, each displaced by a phase angle from an adjacent reference current, one reference current associated with each leg;

providing a plurality of first augmented reference voltage signals to a pulse-width modulation circuit, each first augmented reference voltage being associated with a single one of said reference current signals;

calculating a blanking interval compensation voltage signal in response to a DC buss voltage of said inverter, a blanking interval, and a period of said carrier signal;

adding the blanking interval voltage compensation signal to said first augmented reference voltage signals when said inverter is not saturated and said step of adding will not cause said inverter to saturate, thereby providing a second augmented reference signal.

5,206,803

SYSTEM FOR ENHANCED MANAGEMENT OF PENSION-BACKED CREDIT

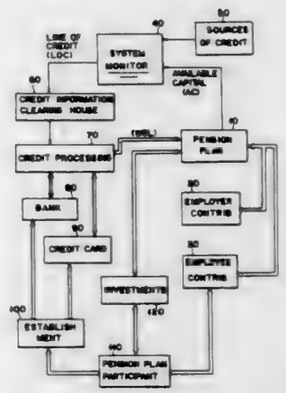
Francis M. Vitagliano, 117 Revere St., Boston, Mass. 02114, and Franco Modigliani, 25 Clark St., Belmont, Mass. 02178

Filed Mar. 15, 1991, Ser. No. 670,060

Int. Cl.[5] G06F *15/30*

U.S. Cl. 364—408 **3 Claims**

1. In combination in a system for the management of a plurality of pension-backed credit accounts comprising: a deposit and/or withdrawal input means for receiving select deposit and withdrawal transaction activity associated with a particular plan account; memory means for storing current vested pension account data associated with a plurality of individual pension plan participants; data processing means for receiving said deposit and withdrawal transaction activity, in conjunction with memory access means for retrieving current vested pension account data and responsive thereto for determining a level of Available Capital associated with a pension-backed credit account, approval of a requested withdrawal, if any; and account update means for adjusting a line of credit value stored



in conjunction with said pension-backed credit account wherein said vested pension account data includes periodic contributions and disbursements from a pension account and said data processing means determines a level of vested interest therein pursuant to corresponding years of service for the plan participant.

5,206,804

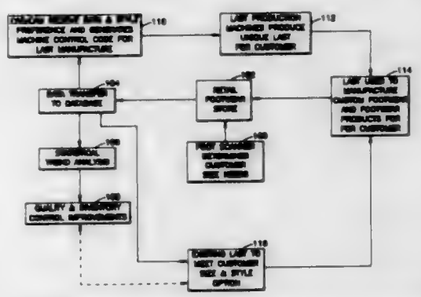
FOOTWEAR VISUAL IMAGE CATALOGING AND SIZING

Wesley A. Thies, Red Wing, Minn.; Jay P. White, Bend, Oreg., and William J. Sweasy, Red Wing, Minn., assignors to Foot Image Technology, Inc., Bend, Oreg.

Filed May 11, 1990, Ser. No. 520,572

Int. Cl.[5] G06F *15/24*

U.S. Cl. 364—401 **9 Claims**



1. An integrated system for footwear visual image cataloging and selection, comprising:

a) foot measuring means for electronically measuring a customer's foot and for outputting foot measurement data;

b) data processing means logically coupled to the foot measuring means for receiving the foot measurement data, customer identification data, and customer preference data;

c) storage means logically coupled to the data processing means for storing a footwear catalog comprising footwear images and footwear related data in a manner which allows rapid selection and retrieval by the customer;

d) visual display means for displaying images and data relat-

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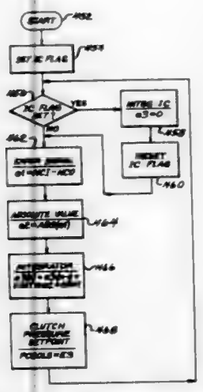
ing to the measured foot, suggested footwear images, and suggested footwear related data stored in the footwear catalog, the suggested footwear images and the suggested footwear related data being automatically selected by matching the customer preference data and the foot measurement data to the footwear related data in the footwear catalog.

5,206,805

CONTINUOUSLY VARIABLE TRANSMISSION CLUTCH CONTROL SYSTEM INCLUDING SPECIAL START MODE OPERATION

Werner P. Petzold, Harwood Heights, Ill., and William P. Umlauf, Schererville, Ind., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation of Ser. No. 25,476, Mar. 13, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 377,747
Int. Cl.[5] B60K *41/02*
U.S. Cl. 364—424.1 **23 Claims**



1. A method for providing a clutch control signal in a continuously variable transmission system to a fluid-actuated clutch to transfer torque between an engine and a drive line mounted in a vehicle, said clutch having an associated supply line to supply fluid to apply the clutch and discharge fluid to release the clutch controlled by a clutch control valve assembly in said supply line including:
- sensing input speed at said clutch;
- sensing output speed at said clutch;
- providing a signal representative of the absolute value of the difference between said clutch input speed and said clutch output speed; and
- integrating said absolute value signal to provide a speed difference pressure signal for controlling said clutch control valve.

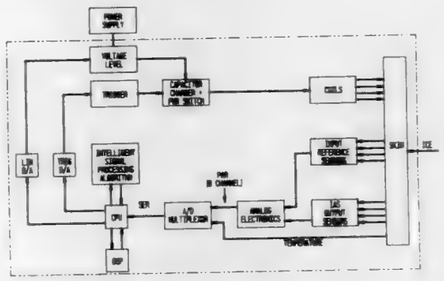
5,206,806

SMART SKIN ICE DETECTION AND DE-ICING SYSTEM

Joseph J. Gerardi, 81 Crystal Dr., Dryden, N.Y. 13053; Philip R. Dahl, 16919 Strawberry Dr., Encino, Calif. 91436, and Gail A. Hickman, 81 Crstal Dr., Dryden, N.Y. 13053

Filed Jan. 10, 1989, Ser. No. 295,722
Int. Cl.[5] B64D *15/20*
U.S. Cl. 364—424.06 **12 Claims**

1. A distributed system for detecting ice on a surface capable of vibrating in at least one vibrational mode, comprising:
- piezoelectric sensor array means located a distance from a formation of said ice, said array means responsive to strain caused by vibration of said surface for generating sensor signals proportional to said strain; and



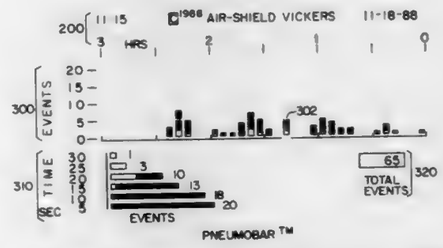
- processor means for processing said sensor signals to determine the resonant characteristics of said surface so as to determine the presence of ice on said surface.

5,206,807

NEONATAL CARDIORESPIROGRAPH INCORPORATING MULTI-VARIABLE DISPLAY AND MEMORY

Fred L. Hatke, Skillman; Ronald S. Kolarovic, Palmyra, both of N.J.; Reagh A. Stubbs, Rogers, Ark., and James A. Wise, Holland, Pa., assignors to Air-Shields, Inc., Hatboro, Pa.

Filed Feb. 16, 1989, Ser. No. 310,678
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.03 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(16 Microfiche, 970 Pages)



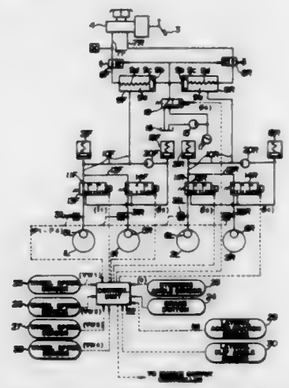
1. A method for displaying historical information related to apnea events in a human infant comprising the steps of:
- a) producing signals indicative of cardiac activity, and respiratory effort;
- b) transmitting said produced signals to a computer;
- c) receiving said signals into said computer;
- d) calculating smoothed instantaneous heart rate, respiratory effort, transthoracic impedance, and smoothed instantaneous respiration rate;
- e) detecting apnea and bradycardia events, storing data indicative of said events, and simultaneously displaying to a user on a single visual display:
  - 1) a first histogram showing the absolute number of apnea events for each of a predetermined number of time intervals over a predetermined period;
  - 2) a numeric indication of the absolute number of apnea events during said predetermined period; and
  - 3) a second histogram showing the absolute number of apnea events for each of a predetermined number of durations during said predetermined period.

5,206,808

VEHICLE TURNING BEHAVIOR CONTROL APPARATUS

Hideaki Inoue; Hirotsugu Yamaguchi; Sunao Hano; Shinji Matsumoto, and Jun Kubo, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 22, 1991, Ser. No. 673,298
Claims priority, application Japan, Mar. 27, 1990, 2-75616
Int. Cl.[5] B60T *8/26*
U.S. Cl. 364—424.05 **8 Claims**



1. An apparatus for controlling turning behavior of a multi-wheeled automotive vehicle supported on a plurality of pairs of wheels, the apparatus comprising:
- braking means for applying braking forces to the respective wheels;
- first sensor means sensitive to a vehicle steering condition for producing a first signal indicative of a sensed vehicle steering condition;
- second sensor means sensitive to a vehicle lateral slip angle for producing a second signal indicative of a sensed vehicle lateral slip angle; and
- a control unit coupled to the first and second sensor means, the control unit including means for providing a difference between the braking forces applied to nearside and offside wheels of at least one of the pairs of wheels based upon the sensed vehicle steering condition to produce a yaw moment in a direction to which the vehicle turns, and means for modifying the difference based upon the sensed vehicle lateral slip angle to decrease the difference as the vehicle lateral slip angle increases.

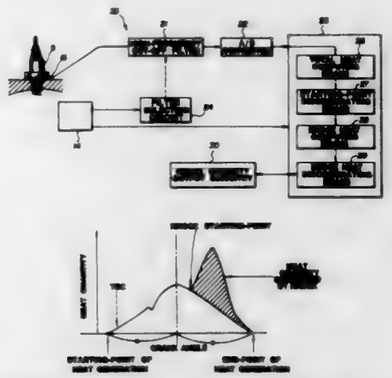
5,206,809

HEAT MEASURING SYSTEM FOR DETECTING KNOCK IN INTERNAL COMBUSTION ENGINE

Yasunori Iwakiri, Kanagawa, and Yoshihisa Sugimoto, Shizuoka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 576,582, Sep. 4, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 866,123
Claims priority, application Japan, Sep. 4, 1989, 1-230145
Int. Cl.[5] F02P *5/15, 5/12, 5/14*
U.S. Cl. 364—431.08 **10 Claims**

1. In an internal combustion engine having an engine cylinder defining a combustion chamber:
- pressure detecting means for monitoring fluctuations in pressure within the combustion chamber of the engine cylinder of the internal combustion engine and generating a first signal indicative of said monitored fluctuations;
- removing means for removing high-frequency components having frequencies higher than a predetermined cut-off frequency from said first signal and generating a second signal, wherein said high-frequency components from said first signal are removed;
- running condition detecting means for monitoring a running condition of the internal combustion engine and generating a third signal indicative of said monitored running condition;
- total heat quantity computing means for deriving a total heat quantity produced in every engine cycle, on the basis of said second and third signals;
- knock heat quantity computing means for deriving a knock



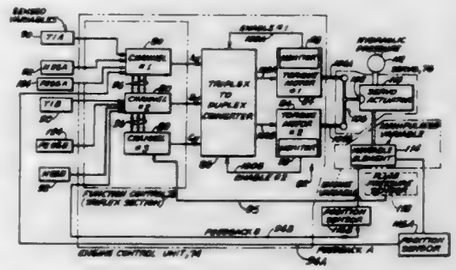
heat quantity generated in every engine cycle, on the basis of said second and third signals;
- knock intensity determining means for determining knock intensity on the basis of a predetermined relationship between said knock heat quantity and said total heat quantity and generating an output signal indicative of said determined knock intensity;
- means for generating an ignition control signal on the basis of said output signal; and
- means, including a spark plug, for generating an electric discharge in response to said ignition control signal.

5,206,810

REDUNDANT ACTUATOR CONTROL

William G. Bools, Montgomery, and Paul R. Reismiller, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 7, 1991, Ser. No. 652,344
Int. Cl.[5] G05B *19/02*
U.S. Cl. 364—431.02 **19 Claims**



1. A redundant network for control of an actuator, the network comprising:
- a control system comprising three electronic control channels interconnected in a triplex redundant control;

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a servo actuator comprising a servo valve and a duplex redundant input driver of the servo actuator for controlling an output variable wherein said duplex driver comprises two driver elements connected to said servo valve and dual amplifier channels outputting signals respectively to said driver elements; and

means comprising a fan-in circuit connecting each of said control channels to said amplifier channels for converting a triplex redundant control to a duplex redundant control, said converting means interconnecting said control system with said actuator.

5,206,811

NAVIGATION SYSTEM FOR AUTOMOTIVE VEHICLE

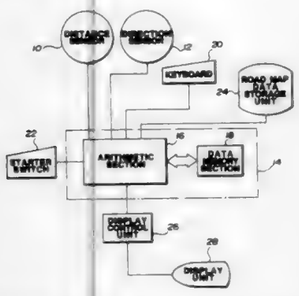
Toshiyuki Itoh; Hiroshi Tsuda; Kiyomichi Yamada; Katsuhiko Mizushima, and Kouichi Ide, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 610,246, Nov. 9, 1990, abandoned. This application Jun. 24, 1992, Ser. No. 902,425

Claims priority, application Japan, Nov. 10, 1989, 1-293718

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **15 Claims**



1. A navigation system for an automotive vehicle, comprising:

first means for storing first known target points and adjoining target points preselected for each of said first target points, said adjoining target points being preselected from said first target points;

second means for storing a first data group associated with each of said first target points, each of said first data groups including a second data group corresponding to each of said adjoining target points of the corresponding first target point, each of said second data groups including an abstract configuration of said corresponding first target point and travel guidance information required at said corresponding first target point for going to the corresponding adjoining target point;

third means for defining a travel route of the vehicle including second target points therein, said second target points being selected from said first target points;

fourth means for storing said second target points;

fifth means for setting third and fourth target points selected from said stored second target points, said third target point being a next forward target point for the vehicle along said travel route and said fourth target point being one of said adjoining target points of said third target point and being positioned forward of said third target point along said travel route;

sixth means for monitoring a position of the vehicle;

seventh means for monitoring a positional relationship between the monitored position of the vehicle and said third target point; and

eighth means, responsive to said monitored positional relationship, for selecting one of said second data groups based on said third target point being used as the target point and said fourth target point being used as the adjoining target point so as to display, before the vehicle reaches said third target point, the corresponding travel guidance information such that said corresponding travel guidance information is superimposed on said abstract configuration of said third target point so as to form an integral image of said third target point by said corresponding travel guidance information and said abstract configuration of the third target point.

5,206,812

FRANKING MACHINE

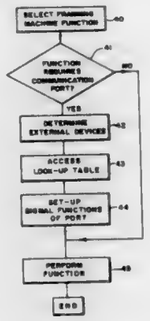
Cyrus Abumehdi, Harlow, United Kingdom, assignor to Alcatel Business Systems Limited, United Kingdom

Continuation-in-part of Ser. No. 175,338, Mar. 30, 1988, abandoned. This application Jul. 25, 1990, Ser. No. 557,085

Claims priority, application United Kingdom, Apr. 3, 1987, 8708031

Int. Cl.[5] G06F *13/00, 13/14*

U.S. Cl. 364—464.02 **5 Claims**



5. A method of controlling communication through a general purpose port of a franking machine with an external peripheral device comprising the steps of:

storing secure and non-secure data in storage registers of the franking machine;

selecting a function to be performed by the franking machine; determining whether said function requires communication with an external device;

in response to determination that communication with an external device is required by said function determining a specific one of a plurality of devices with which communication is required to be effected;

determining signal carrying functions of connections of the port required for communication with said specific device;

setting the signal carrying functions of said connections to correspond to those required by said specific peripheral device and

in response to selection of a function requiring read out of data from the storage registers the steps of determining whether the data to be read out is secure data and that the function requires transmission of the data by way of the general purpose port in encrypted form; and

transmitting the secure data by way of the general purpose port only if the function specifies transmission of the data in encrypted form.

5,206,813

GRAPHIC DISPLAY METHOD FOR NUMERICAL CONTROLLER

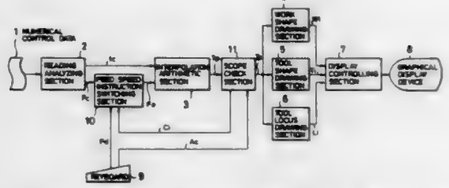
Yukinori Otsubo; Tomohiro Suzuki, and Yasushi Fukaya, all of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Continuation of Ser. No. 441,151, Nov. 15, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 798,365

Claims priority, application Japan, Nov. 15, 1988, 63-287905

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—474.24 **4 Claims**



1. A graphic display method in which a work shape, a tool shape and a tool locus of a numerical control machining operation are simulated and displayed on a graphic display device, said method comprising:

a step of defining a display subregion of an overall work region, the overall work region constituting a entirety of a work area of the numerical control machining operation, the display subregion constituting a subportion of the overall work region;

a step of repeatedly interpolating a tool tip position based on an interpolation instruction generated in accordance with numerical control data and based on one of a first feed speed generated in accordance with the numerical control data or a second feed speed which is greater than the first feed speed;

a step of determining, after each interpolation of said interpolating step, whether the tool tip position interpolated in said interpolating step is within the display subregion defined in said defining step, wherein a next interpolation of said interpolating step is based on the first feed speed when the tool tip position is within the display subregion, and wherein the next interpolation of said interpolating step is based on the second feed speed when the tool tip position is external the display subregion; and

a step of displaying on the graphic display device, after each interpolation of said interpolating step, the work shape, tool shape and tool locus within the display subregion.

5,206,814

ROBOTIC MUSIC STORE

Robert L. Cahlander; Thomas E. Jung, both of Red Wing; David W. Carroll, Cannon Falls, and Robert A. Hanson, Inver Grove Heights, all of Minn., assignors to Robot Aided Manufacturing Center, Inc., Red Wind, Minn.

Filed Oct. 9, 1990, Ser. No. 595,203

Int. Cl.[5] G11B *15/68*

U.S. Cl. 364—479 **17 Claims**

1. An automated system for vending recorded music packaged in generally flat boxes, comprising:

a) an articulated, multi-limbed robotic arm having a control system which controls motion of the limbs in response to a command to move the arm to a designated place;

b) a gripper supported by the arm and having two conveyor belts capable of pinching one of the boxes therebetween and drawing the box into a pair of channels in the gripper;

c) several stacks of horizontal boxes, at least partially surrounding the robotic arm, with a vertical space between adjacent stacks, the stacks being grouped into planar panels;

d) several stacks of vertical boxes, located near respective vertical spaces, but farther from the arm than the horizontal boxes, with movable carriers associated with at least some vertical boxes for moving vertical boxes into the vertical space for allowing grasping by the gripper;

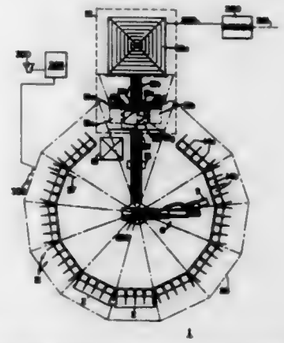
e) communication means for communicating with a customer;

f) computation means connected to the communication means and to the control system, for

i) allowing a customer to designate boxes for purchase;

ii) ascertaining the location of the designated box, in terms of rack address and x-y position within a rack;

iii) informing the control system of the location, and prompting the control system to articulate the arm in order to position the gripper near the designated box;



iv) accepting payment from the customer; and

v) responding to external commands by doing one or more of the following:

A) transmitting stored information;

B) storing received information;

C) terminating electric power to a component of the station; or

D) connecting electric power to a component of the station; and

g) means for playing samples of recorded music which is available for purchase, in response to a request by a person.

5,206,815

METHOD FOR ARRANGING MODULES IN AN INTEGRATED CIRCUIT

Shawn M. Purcell, Mountain View, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jan. 13, 1989, Ser. No. 297,476

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—491 **7 Claims**

1. A method for generating a layout of a rectangular block of cells for use with a second rectangular block of cells in an integrated circuit, comprising the steps of:

a) providing a set of component circuit cells, each of the cells being of generally rectangular shape with predefined dimensions;

b) concatenating the component cells with at least one space cell that is expandable between non-abutting adjacent edges of at least two of the component cells such that the

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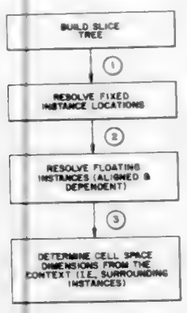
boundary of a concatenated set of component cells and at least one expandable space cell defines a block of cells



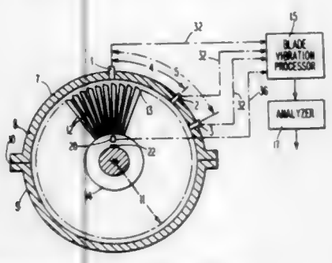
having a rectangular shape which is coterminous and contiguous with said second rectangular block of cells.

5,206,816

SYSTEM AND METHOD FOR MONITORING SYNCHRONOUS BLADE VIBRATION

Peter D. Hill, Monroeville; Francis S. McKendree, Penn Hills; Charles W. Einolf, Jr., Murrysville, all of Pa.; Paul F. Rozelle, Fern Park, and Roger W. Heinig, Cocoa Beach, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1991, Ser. No. 647,906
Int. Cl.[5] G01M *1/22*; G01H *11/00*
U.S. Cl. 364—508 **25 Claims**



1. A turbo-machine system comprising:

(a) a turbo-machine having a rotor having:

(i) a reference indicator,

(ii) a periphery, and

(iii) a plurality of blades spaced in a row around said periphery of said rotor, said blades having a radius R and being subject to vibration when said rotor rotates at a frequency of rotation, said vibration having components having an amplitude Dh_k of vibration at a set H of M harmonics h_k of said frequency of rotation of said rotor; and

(b) a vibration monitor for monitoring said components of said vibration, said vibration monitor having:

(i) N sensors for generating a signal at an actual arrival time when each one of said blades arrives at one of said sensors, said sensors circumferentially spaced about said blade row at a spacing between each of said sensors that is not limited to uniform spacing, N being equal to $2M+1$;

(ii) means, responsive to said sensor signals, for generating data representative of said actual arrival time tm_i of each of said blades sensed by each of said sensors;

(iii) means for generating data representative of an expected arrival time te_i at which each of said blades is expected to arrive at each of said sensors in the absence of said vibration;

(iv) means for forming a vector ΔT from an equation $\Delta T = tm_i - te_i$; and

(v) means for calculating values of elements a_{ij} of a matrix [A], having an inverse matrix $[A]^{-1}$, using equations:

$$a_{ij} = \begin{cases} \sin(2\pi h_k t e_i) & \text{for } j = 1,3,5 \ldots 2M-1 \\ \cos(2\pi h_k t e_i) & \text{for } j = 2,4,6 \ldots 2M \\ 1 & \text{for } j = 2M+1 \end{cases}$$

$k = [(j-1)/2] + 1$, truncated to integer values;

(vi) means for calculating said inverse matrix $[A]^{-1}$ of said [A] matrix;

(vii) means for calculating values of elements d_p of a vector D from an equation $D = 2\pi R[A]^{-1}\Delta T$; and

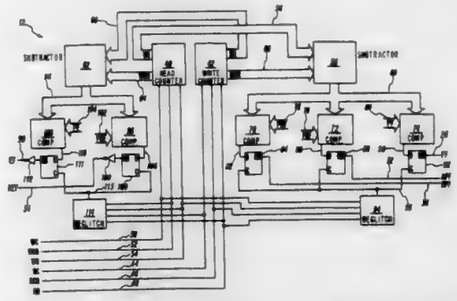
(viii) means for calculating said amplitude Dh_k of said components of vibration at each of said harmonics h_k in said set H from an equation $Dh_k = [d^{2k-1} + d^{2k}]^{\frac{1}{2}}$.

5,206,817

PIPELINED CIRCUITRY FOR ALLOWING THE COMPARISON OF THE RELATIVE DIFFERENCE BETWEEN TWO ASYNCHRONOUS POINTERS AND A PROGRAMMABLE VALUE

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 454,408, Dec. 21, 1989, Pat. No. 5,121,346, which is a continuation-in-part of Ser. No. 332,289, Mar. 31, 1989, abandoned. This application Oct. 18, 1990, Ser. No. 600,201
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—550 **11 Claims**



1. Apparatus for producing an output signal indicative of the difference between a first clock signal and a second clock signal relative to a program value of a predetermined binary number, said apparatus comprising, in combination:

(a) a first counter for counting the number of first clock pulses of said first clock signal, and a second counter for counting the number of second clock pulses of said second clock signal;

(b) a subtractor circuit for producing true and complement difference signals corresponding to the difference of the count of said first counter and the count of said second counter, said true and complement difference signals each having first and second logic states corresponding to equal and unequal clock counts, respectively;

(c) a comparator circuit having true and complement signal inputs for comparing the logic state of a selected one of said true and complement difference signals to the program value of said predetermined binary number and for producing a compare output signal having a first logic level if the program value of the binary number is greater than the count difference between the first and second counters and having a second logic level if the program value is equal to or less than said count difference;

(d) a program selector circuit coupled between said subtractor circuit and said comparator circuit for selectively connecting the true and complement difference signals to the true input and complement input of said comparator, respectively, when said predetermined binary number is in a first logic state, and for selectively connecting said true and complement difference signals to the complement input and true input of said comparator circuit, respectively, when said predetermined binary number is in a second logic state;

(e) a blanking circuit for providing a blanking output signal having a first logic state in response to a predetermined logical transition of one of said clock signals, and said blanking output signal having a second logic state in the absence of a clock signal logical transition; and,

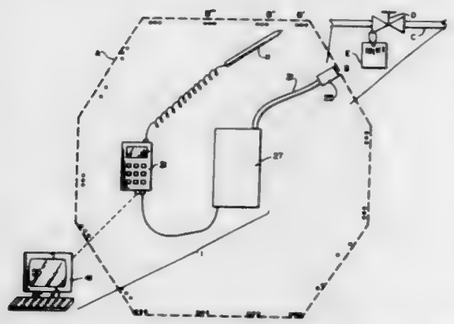
(f) a bistable memory circuit having a data signal input coupled to the compare output signal, a clock signal input coupled to the blanking output signal, and a data output node, said bistable memory circuit being operable to generate a flag status bit on the data output node, the flag status bit having a logic level corresponding to the logic level of the compare output signal in response to a predetermined logical transition of the blanking output signal, and said bistable memory circuit being operable to store the flag status signal bit on the data output node until the next occurrence of the predetermined logical transition.

5,206,818

FUGITIVE EMISSIONS MONITORING SYSTEM INCLUDING INTEGRATED FUGITIVE EMISSIONS ANALYZER AND SOURCE IDENTIFIER

Paul A. Sperazza, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1991, Ser. No. 762,194
Int. Cl.[5] G06F *15/74*
U.S. Cl. 364—550 **3 Claims**



1. A system for monitoring fugitive volatile organic emissions in an environment having a plurality of fugitive volatile organic emission sources and comprising:

a. unique machine readable bar code means at each fugitive volatile organic emissions source for identifying the source;

b. portable monitoring means including:

(1). reader means, responsive to said unique machine readable bar code means, for reading the machine readable bar code means and generating a machine storable source identification signal responsive thereto;

(2). organic vapor analyzer detection means for generating a machine storable fugitive volatile organic emissions signal representing the chemical identity and concentration of said fugitive volatile organic emissions from said fugitive volatile organic emissions source; and

(3). means for storing said source identification signal and said fugitive volatile organic emissions signal; and

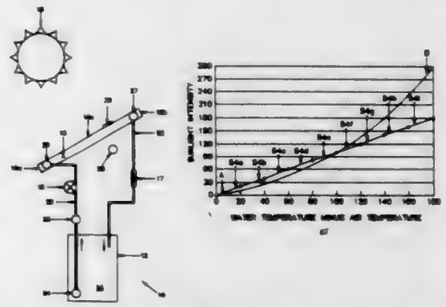
c. computer means including a database management system responsive to said stored source identification signal and said fugitive volatile organic emissions signal, said database management system having means for storing, sorting, tracking and comparing the instantaneous and total amounts of fugitive volatile organic emissions by source, commodity, source parameters including pressure and temperature, and time, and reporting fugitive volatile organic emissions across commodities, by source, across sources for a given time, and b y time series for a given source or sources.

5,206,819

CONTROL SYSTEM FOR SOLAR HEATER

Wesley R. Illing, 6622 Marilyn Dr., Huntington Beach, Calif. 92647

Filed Sep. 6, 1990, Ser. No. 579,358
Int. Cl.[5] F24J *2/40*; G01D *18/00*
U.S. Cl. 364—551.01 **20 Claims**



4. A method of controlling the operation of a solar heating system including solar collector means through which a heat transfer medium is circulated by pump means between the solar collector means and a reservoir, comprising

controlling the operation of the pump means in accordance with an equilibrium curve for the collector means which relates a measured sunlight intensity at any given point in time to a differential in temperature between a measured temperature of the heat transfer medium and a reference environmental temperature for the system using sensing means for measuring which drift, and

determining a temperature derivative for the collector means under stagnation conditions and adjusting the equilibrium curve as required by said temperature derivative determination.

5,206,820

METROLOGY SYSTEM FOR ANALYZING PANEL MISREGISTRATION IN A PANEL MANUFACTURING PROCESS AND PROVIDING APPROPRIATE INFORMATION FOR ADJUSTING PANEL MANUFACTURING PROCESSES

Hans H. Ammann, Chester; Kwokming J. Cheng, Lake Hiawatha; Richard F. Kovacs, Morris Plains, all of N.J.; Henry B. Micka, Jr., Richmond, Va.; Jamey Potochin, Oak Ridge; Everett Simons, Cedar Knolls, both of N.J.; Richard C. Steines, Richmond, Va., and John G. Totz, Succasunna, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 31, 1990, Ser. No. 576,304
Int. Cl.[5] G01B *11/26*
U.S. Cl. 364—559 **5 Claims**

5. In a panel inspection and measurement system in which

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panels are analyzed for misregistration a method of determining causes of the misregistration, comprising the steps of:

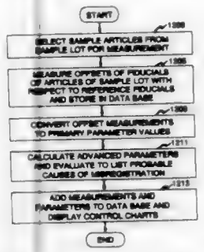
including pattern fiducials as part of a overall pattern on a panel and the panel having an axis and center locus about which the overall pattern and pattern fiducials are referenced;

placing the panel having the pattern fiducials on a transparent reference surface having corresponding reference fiducials and an axis and center about which the reference fiducials are referenced;

positioning the panel on the transparent reference surface by engaging tooling features of the panel with a locating system associated with the transparent reference surface and operative to align the axis and center of the panel with the axis and center of the transparent reference surface;

measuring displacements of the pattern fiducials from the reference fiducials by vision measuring techniques;

collecting data on displacements measured;



displaying the data on displacements measured;

storing the displacement measurements in a data storage system;

wherein the improvement comprises the steps of:

transforming the displacement measurements into a first set of primary parameters restructuring the displacements into rigid body displacements and material deformed displacements,

transforming the parameters into a second set of advanced parameters related to displacements of the pattern center and pattern axis of the panel from registration with the reference pattern and reference axis surface;

analyzing the individual terms of the advanced parameters to generate an output to suggest probable causes of the misregistration; and

displaying and printing out a graph representing the probable causes as a part of a readout of the displacement measurements.

5,206,821

DECIMATION CIRCUIT EMPLOYING MULTIPLE MEMORY DATA SHIFTING SECTION AND MULTIPLE ARITHMETIC LOGIC UNIT SECTION

William R. Young, and William F. Johnstone, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

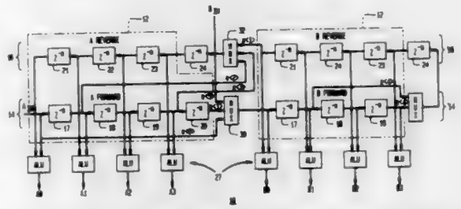
Filed Jul. 1, 1991, Ser. No. 724,206
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.1 **33 Claims**

1. A decimation circuit, comprising:

a forward shifting data section receiving input data samples in order including a plurality of forward decimation registers coupled in series, each forward decimation registers having an input and an output, said forward decimation registers having a decimation depth and operating as FIFO registers;

a reverse shifting data section including a plurality of reverse decimation registers coupled in series with each reverse decimation register having an input, output and a decimation depth, a first of said reverse decimation registers, which receives sequenced data samples in blocks from one of said forward decimation registers, operates as a paintbrush LIFO register to reverse sequence said data samples within the blocks, said blocks having a size corresponding to a decimation factor, wherein each of the other reverse decimation registers operate as FIFO registers; and

a plurality of arithmetic logic units (ALUs) having two



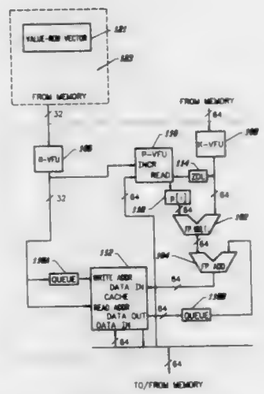
inputs and an output, each ALU having a first of said two inputs coupling with the output of one of said reverse decimation registers and a second of said two inputs coupling with the input of one of said forward decimation registers.

5,206,822

METHOD AND APPARATUS FOR OPTIMIZED PROCESSING OF SPARSE MATRICES

Valerie E. Taylor, Evanston, Ill., assignor to Regents of the University of California, Oakland, Calif.

Filed Nov. 15, 1991, Ser. No. 792,907
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—736 **19 Claims**



1. A computer architecture for processing a sparse matrix, comprising:

a memory that stores a value-row vector corresponding to nonzero values of said sparse matrix, where each of said nonzero values is located at a defined row and column position in said sparse matrix, said value-row vector including

a first vector including nonzero values of said sparse matrix and delimiting characters indicating a transition from one of said columns to another of said columns, and

a second vector defining row position values of said sparse matrix corresponding to said nonzero values in said first vector and column position values in said sparse matrix corresponding to the column position of said nonzero values in said first vector;

a circuit, coupled to said memory, to detect said delimiting characters within said value-row vector; and

a multiplier, coupled to said memory and sad circuit, to

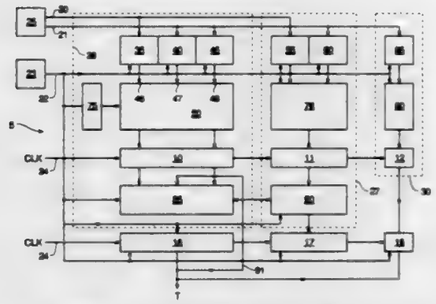
execute matrix-vector multiplication on said value-row vector from said memory.

5,206,823

APPARATUS TO PERFORM NEWTON ITERATIONS FOR RECIPROCAL AND RECIPROCAL SQUARE ROOT

James H. Hesson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 13, 1990, Ser. No. 627,075
Int. Cl.[5] G06F *7/38, 7/52*
U.S. Cl. 364—748 **41 Claims**



1. A multiplier for performing reciprocal and reciprocal square root computations of a value C using iterative numerical techniques, the multiplier having XS input and an XR input respectively, the XS and XR inputs having variable values dependent upon which iteration the multiplier is processing, said variable values including the value C, x_m, and p_m, wherein x_m is an mth iteration of a function F(x) wherein said F(x) approximates 1 divided by the value of C, and wherein the p_m is equal to a product of the value C and the x_m, the multiplier comprising:

a mantissa processing portion having;

a) an XS mantissa operand format block having an input port for receiving the XS input, said XS mantissa operand format block normalizing the XS input to create an XS mantissa operand;

b) an XR mantissa operand format block having an input port for receiving the XR input, said XR mantissa operand format block normalizing the XR input to create an XR mantissa operand;

c) an accumulator format block for receiving the XR input and for correctly compensating the XR input by placing the XR input in a correct position for further computations thereby creating an XR formatted operand;

d) control circuitry for determining a selected case of a first case and a second case of which said XS and XR inputs are representative and for generating a control signal according to a generated opcode containing a mnemonic for a function to be performed specific to said selected case, said control signal being an input to said XS mantissa operand format block, said XR operand format block, and said accumulator format block thereby allowing said opcode to be implemented on the XS and XR inputs in said XS mantissa operand format block, said XR operand format block, and said accumulator format block, said opcode thereby determining said normalization and said correct position appropriate to the XS and XR inputs; and

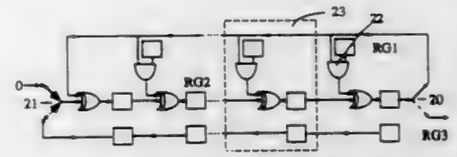
e) a fixed point multiplier-accumulator for receiving said normalized XR and XR mantissa operands and said XR formatted operand, said fixed point multiplier-accumulator performing a first stage computation by forming a product of said normalized XR and XS mantissa operands and then adding said XR formatted operand to said product, said first stage computation representing a fixed point product of said reciprocal and said reciprocal square root of the value C.

5,206,824

METHOD AND APPARATUS FOR EXPONENTIATION OVER GF(2^N)

Benjamin Arazi, Omer, Israel, assignor to Fortress U&T (2000) Ltd., Beer-Sheva, Israel

Filed May 17, 1991, Ser. No. 702,612
Claims priority, application Israel, May 20, 1990, 94449
Int. Cl.[5] G06F *7/72*
U.S. Cl. 364—746.1 **19 Claims**



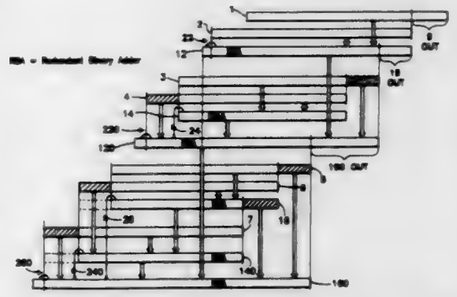
1. An apparatus for performing modular arithmetic in a finite field GF(2^n), comprising squaring means for squaring a base vector, wherein the base vector includes a plurality of components and wherein the means for squaring comprise dividing means for dividing a vector by a modulo primitive polynomial and feeding means for alternatively feeding to the dividing means the components of the base vector and the number 0.

5,206,825

ARITHMETIC PROCESSOR USING SIGNED-DIGIT REPRESENTATION OF EXTERNAL OPERANDS

Naofumi Takagi, Kyoto; Tsuguyasu Hatsuda, Osaka; Toru Kakisage, Hyogo; Takashi Taniguchi, and Tamotsu Nishiyama, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 599,275, Oct. 16, 1990, Pat. No. 5,153,847, which is a continuation of Ser. No. 199,318, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 66,817, Jun. 25, 1987, Pat. No. 4,873,660, Ser. No. 70,565, Jul. 7, 1987, Pat. No. 4,878,192, Ser. No. 74,892, Jul. 17, 1987, Pat. No. 4,866,655, Ser. No. 74,971, Jul. 17, 1987, Pat. No. 4,864,528, Ser. No. 86,967, Aug. 18, 1987, Pat. No. 4,866,657, Ser. No. 95,525, Sep. 10, 1987, Pat. No. 4,868,777, and Ser. No. 136,365, Dec. 22, 1987, Pat. No. 4,935,842. This application Mar. 24, 1992, Ser. No. 857,644
Claims priority, application Japan, May 27, 1987, 62-130528; May 29, 1987, 62-135069
Int. Cl.[5] G06F *7/49*
U.S. Cl. 364—746.2 **5 Claims**



1. An adder circuit for use in an adder tree having a plurality of adder stages that generate a partial sum from the addition of an augend and an addend, said augend and addend being represented as signed-digit numbers which have an overlapping

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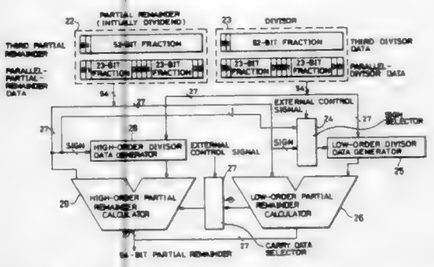
portion wherein digits of said augend overlap digits of said addend and first and second non-overlapping portions caused by the augend being offset with respect to said addend, wherein said first non-overlapping portion contains only higher order digits of said addend and said second non-overlapping portion contains only lower order digits of said augend, said adder circuit comprising logic circuitry for adding the digits of said augend and addend in said overlapping portion to generate part of said partial sum for application to an adder in a subsequent adder stage, generating a carry resulting from the addition of the highest order digits of said overlapping portion, and directly applying the digits in the first non-overlapping portion to said subsequent adder stage to form part of the partial sum therein.

5,206,826

FLOATING-POINT DIVISION CELL

Junji Mori, Yokohama; Masato Nagamatsu, Ooita; Itaru Yamazaki, Yokohama; Yoshihisa Kondo, Sagamihara; Nobuhiro Ide, and Takeshi Yoshida, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 6, 1991, Ser. No. 787,926
Claims priority, application Japan, Nov. 7, 1990, 2-299942
Int. Cl.[5] G06F *7/38, 7/52*
U.S. Cl. 364—748 **3 Claims**



1. A floating-point division cell for calculating new partial remainder data by subtracting or adding multi-divisor data, which is obtained by multiplying divisor data incorporated in a divisor format and a multiple of 2 together, from/to partial remainder data in which sign data is attached to the highest digit of a remainder format, comprising:

partial remainder data storing means for registering either parallel-partial-remainder data, in which first partial remainder data is incorporated in a high-order section of the remainder format and second partial remainder data is incorporated in a low-order section of the remainder format, or third partial remainder data is incorporated in an entire section of the remainder format;

divisor data storing means for storing either parallel-divisor data, in which first divisor data corresponding to the first partial remainder data is incorporated in a high-order section of the divisor format and second divisor data corresponding to the second partial remainder data is incorporated in a low-order section of the divisor format, or third divisor data, corresponding to the third partial remainder, is incorporated in an entire section of the divisor format;

sign selecting means for selecting the sign data attached to the second partial remainder data in cases where the parallel-partial-remainder data is stored in the partial remainder data storing means and selecting the sign data attached to the third partial remainder data in cases where the third partial remainder data is stored in the partial remainder data storing means, the selection of the sign data being controlled by an external control signal;

low-order divisor data generating means for receiving both the sign data selected in the sign selecting means and the low-order portion of the divisor data stored in the divisor data storing means and generating low-order divisor data with the sign data;

low-order partial remainder calculating means for

(1) obtaining low-order multi-divisor data by multiplying the low-order divisor data with the sign data generated in the low-order divisor data generating means and a multiple of 2 together and

(2) calculating new low-order partial remainder data by subtracting or adding the low-order multi-divisor data from/to the low-order portion of the partial remainder data stored in the partial remainder data storing means;

carry data selecting means for

(1) selecting carry data carried by the calculation performed in the low-order partial remainder calculating means in cases where the third partial remainder data is stored in the partial remainder data storing means and

(2) selecting a "0" bit in cases where the parallel-partial-remainder data is stored in the partial remainder data storing means, the selection of either the carry data or the "0" bit being controlled by the external control signal;

high-order divisor data generating means for receiving both the sign data attached to the first or third divisor data stored in the partial remainder data storing means and the high-order portion of the divisor data stored in the divisor data storing means and generating high-order divisor data with the sign data; and

high-order partial remainder calculating means for

(1) obtaining high-order multi-divisor data by multiplying the high-order divisor data with the sign data generated in the high-order divisor data generating means and a multiple of 2 together,

(2) calculating new high-order partial remainder data by subtracting or adding the high-order multi-divisor data from/to the high-order portion of the partial remainder data stored in the partial remainder data storing means, and

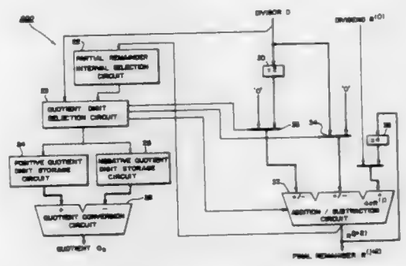
(3) adding either the carry data or the "0" bit selected by the carry data selecting means to the lowest digit of the new high-order partial remainder data.

5,206,827

ITERATIVE HIGH RADIX DIVIDER DECODING THE UPPER BITS OF A DIVISOR AND DIVIDEND

Hideyo Tsuruta, Hirakata, Japan, assignor to Matsushita Electric Co., Ltd., Osaka, Japan

Filed Apr. 9, 1991, Ser. No. 682,902
Claims priority, application Japan, Apr. 10, 1990, 2-95759; Apr. 4, 1991, 3-071405
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—767 **45 Claims**



1. A divider unit for executing a high radix division using a partial remainder expressed in a two's complement representation, said unit comprising:

quotient digit selection means for selecting one quotient digit out of all quotient digits obtainable under a radix value of an applied radix based on values of a part of upper digits of a divisor, on values of a part of upper digits of a partial remainder, and on a sign of the partial remainder;

a plurality of divisor's multiple generating means, each for generating at least one of a value 0 and another value obtained by multiplying the divisor with 2^j, where j is an integer;

multiplication means for generating a first product of the partial remainder and the radix value; and

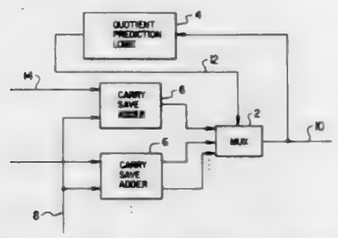
adding and subtracting means having at least three inputs for selectively executing an addition and a subtraction using the first product and at least two of the values generated by said divisor's multiple generating means to generate an equivalent of one of an addition and a subtraction of the first product on one hand and a second product of the divisor and the one quotient digit on another hand to generate another partial remainder in the two's complement representation.

5,206,828

SPECIAL CARRY SAVE ADDER FOR HIGH SPEED ITERATIAVE DIVISION

Salim A. Shah, and Thomas W. Lynch, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Austin, Tex.

Continuation of Ser. No. 505,350, Apr. 2, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 806,820
Int. Cl.[5] G06F *7/50, 7/52*
U.S. Cl. 364—784 **6 Claims**



1. A carry save adder for operation in conjunction with a quotient prediction logic circuit, said quotient prediction logic circuit providing quotient prediction logic signals, and also in conjunction with circuitry carrying true functions of a plurality of values and complement functions of a plurality of values, said plurality of values provided so as to be processed by said carry save adder, said carry save adder comprising:

means for receiving said quotient prediction logic signals from said quotient prediction logic circuit;

means for receiving partial remainder sum signals;

means for receiving partial remainder carry signals;

means for receiving said true functions of said plurality of values;

means for receiving said complement functions of said plurality of values;

means for manipulating said received true functions, complement functions, partial remainder sum signals, and partial remainder carry signals to produce all possible additions that may be made therefrom; and

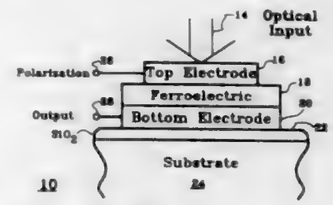
means for selecting a proper one of said all possible additions, said means for selecting comprising a multiplexing means connected serially in circuit with said means for manipulating, said multiplexing means also connected in circuit so as to receive said quotient prediction logic signals which direct said means for selecting to said proper one of all possible additions, and said multiplexing means also connected in a feed back loop type of connection with said quotient prediction logic circuit, whereby the operation of the carry save adder and the operation of the quotient prediction logic circuit are overlapped to speed their combined operation.

5,206,829

THIN FILM FERROELECTRIC ELECTRO-OPTIC MEMORY

Sarita Thakoor, and Anilkumar P. Thakoor, both of 497 S. El Molino #109, Pasadena, Calif. 91101

Filed Oct. 24, 1990, Ser. No. 603,935
Int. Cl.[5] G11C *11/42*
U.S. Cl. 365—117 **17 Claims**



1. A data cell comprising:

a transparent top electrode;

a bottom electrode;

a thin film of ferroelectric material therebetween;

means for applying a level of remanent polarization to the thin film of ferroelectric material, said level being related to an analog value to be stored; and

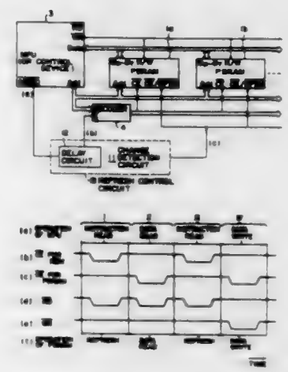
means for applying light to said thin film, said light having a wavelength near the bandgap of the ferroelectric material, said light being applied to generate a photoresponse therein a magnitude of which is related to the product of said analog value and said intensity.

5,206,830

REFRESH CONTROL CIRCUIT OF PSEUDO STATIC RANDOM ACCESS MEMORY AND PSEUDO STATIC RANDOM ACCESS MEMORY APPARATUS

Mitsuo Isobe, Tama, and Hisashi Ueno, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 375,856, Jul. 6, 1989, Pat. No. 5,075,886. This application Jul. 19, 1991, Ser. No. 733,126
Claims priority, application Japan, Jul. 6, 1988, 63-168186
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—194 **10 Claims**



1. A refresh control circuit for controlling a pseudo static random access memory cell, comprising:

control means for providing a memory request signal which alternatively changes between a selection level and a non selection level;

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a delay circuit for receiving said memory request signal, delaying said memory request signal by a predetermined delay time and outputting a delay memory request signal as a chip enable signal having a level change between a selection level and a non-selection level; and

a refresh control signal output circuit for receiving said memory request signal and for outputting a refresh control signal, and said refresh control signal output circuit responding to the level change of said memory request signal between said selection level and said non-selection level for changing said refresh control signal for ma first level to a second level at a first predetermined time lapse after said level change of said memory request signal between said selection level and said non-selection level has occurred nd thereafter changing said refresh control signal from said second level to said first level at a second predetermined time lapse, and

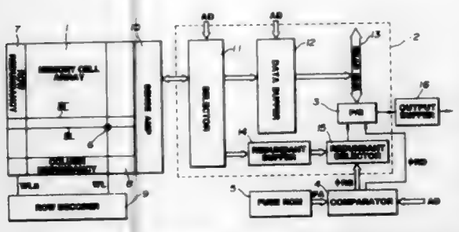
wherein said level of said refresh control signal changes from si second level to said first level after said level of said chip enable signal changes between said selection level said non-selection level, said pseudo static random access memory cell changes to write mode when said chip enable signal take said selection level, said refresh control signal takes said selection level, said refresh control signal takes said first level and said signal is outputted from said control means, said refresh control signal changing to a read mode when said chip enable signal takes said selection level, said refresh control signal takes first level and said write signal is prevented from being outputted from said control means, and changes to a refresh mode when said chip enable signal takes said non-selection level and said refresh control signal further takes said second level whether or not said write signal is being outputted from said control means.

5,206,831

SERIAL ACCESS SEMICONDUCTOR MEMORY DEVICE HAVING A REDUNDANCY SYSTEM

Masataka Wakamatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 620,080
Claims priority, application Japan, Nov. 30, 1989, 1-311060
Int. Cl.[5] G11C *11/34*; G06F *11/20*
U.S. Cl. 365—200 10 Claims



1. A semiconductor memory device for reading out serial data stored therein, comprising:

a plurality of memory cells arranged in a two-dimensional matrix array of rows and columns,

column redundancy means for storing data in lieu of a defective memory cell of the array, being located adjacent the array, having a plurality of memory cells in which the number of rows of the memory cells therein is equal to that of the array,

selecting means for selecting one of the rows of the array and the column redundancy means simultaneously to output data from the array and the column redundancy means in parallel in responsive to a readout address signal,

controlling means for generating a switching control signal by comparing a defective address signal with the readout address signal,

parallel-serial converting means for inputting the data from the array and the column redundancy means and for outputting the data in series, comprising:

a plurality of flip-flop circuits connected in series, in which the final stage of the flip-flop circuits outputs the data in series,

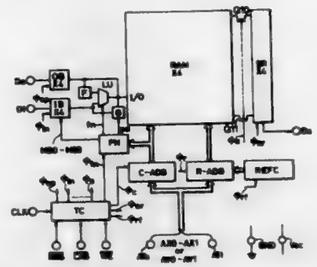
a plurality of selectors for selecting data from the array and from the flip-flop circuit, being provided between the flip-flop circuits, wherein one of the selectors which is associated with the final stage selects the data from the column redundancy means and the data from the array or the flip-flop circuit in responsive to the switching control signal.

5,206,832

SEMICONDUCTOR MEMORY DEVICE

Yasunori Yamaguchi, and Jun Miyake, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 510,525, Aug. 21, 1990, Pat. No. 5,068,829, which is a continuation of Ser. No. 224,375, Jul. 26, 1988, Pat. No. 4,951,251, which is a division of Ser. No. 874,106, Jun. 13, 1986, Pat. No. 4,766,570. This application Jul. 12, 1991, Ser. No. 729,337
Claims priority, application Japan, Jun. 17, 1985, 60-129826
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.02 7 Claims



1. A method of selecting a predetermined one of a plurality of operation modes of an internal circuit in an address multiplexed dynamic RAM having at least a first external terminal for receiving a row address strobe signal, a second external terminal for receiving a column address strobe signal, a third external terminal for receiving a write enable signal and a fourth external terminal for receiving a selection signal for designating said predetermined one of operation modes, comprising the steps of:

setting said column address strobe signal at a logic "low" level;

setting said write enable signal at a logic "low" level;

setting said selection signal at a predetermined logic level;

setting said row address strobe signal at a logic "low" level when said column address strobe signal and said write enable signal are at a logic "low" level and said selection signal is at a predetermined logic level; and

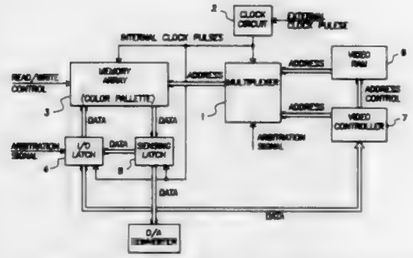
detecting the levels of the columns address strobe signal, the write enable signal, the selection signal and the row address strobe signal, and selecting the predetermined one of the operation modes in response to the column address strobe signal being at a logic "low" level, the write enable signal being at the logic "low" level, the selection signal being at the predetermined logic level and the row address strobe signal being at the logic "low" level.

5,206,833

PIPELINED DUAL PORT RAM

Sheau-Jiung Lee, Taipei, Taiwan, assignor to Acer Incorporated, Hsin Chu Science-Based Industrial Park, Taiwan

Continuation-in-part of Ser. No. 243,394, Sep. 12, 1988, abandoned. This application Mar. 13, 1991, Ser. No. 668,543
Int. Cl.[5] G11C *7/04*
U.S. Cl. 365—233 2 Claims



1. A pipelined dual port Random Access Memory, comprising:

a multiplexer having a video port and a microprocessor port, wherein said video port receives address signals from a video memory and said microprocessor port accepts address signals from a video controller, the multiplexer being controlled by an arbitration signal to regulate asynchronous access of the addressed memory;

a memory array connected to receive address signals from the video memory through the multiplexer to output digital data in addressed cells of said memory array;

a sensing latch connected to receive digital data from the memory array, and to deliver the digital data to a digital-to-analog converter;

an I/O latch, coupled to the memory array, the video controller and the sensing latch, said I/O latch capable of storing digital data read from said memory array through an output of the sensing latch and capable of storing digital data to be written to said memory array from the video controller under the coordination of an arbitration signal; and

a clock circuit for converting external clock pulses into internal clock pulses, said clock circuit being coupled to the multiplexer, memory array, sensing latch and I/O latch, to supply the internal clock pulses thereto.

5,206,834

SEMICONDUCTOR MEMORY DEVICE PERFORMING LAST IN-FIRST OUT OPERATION AND THE METHOD FOR CONTROLLING THE SAME

Takenori Okitaka, and Yasunori Maeda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 545,796, Jun. 29, 1990, abandoned. This application Mar. 12, 1992, Ser. No. 850,203
Claims priority, application Japan, Oct. 14, 1989, 1-267140
Int. Cl.[5] G11C *8/04*
U.S. Cl. 365—259 15 Claims

1. A semiconductor memory device comprising

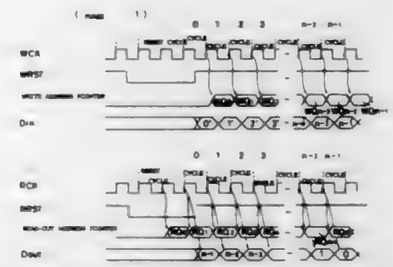
a plurality of memory means (1) having predetermined addresses for respectively storing data,

read pointer means (3) for sequentially pointing to addresses of said plurality of memory means (1) in a first sequence having a first direction and reading out data stored in the first sequence of the selected addresses,

write pointer means (2) for sequentially pointing to addresses of said plurality of memory means (1) in the same first sequence having the same first direction and writing externally applied data to the first sequence of selected addresses,

said read pointer means pointing to each address in said first sequence before said write pointer means points to each said address,

each of said read pointer means and said write pointer means (2, 3) responsive to an external reset signal by alternating



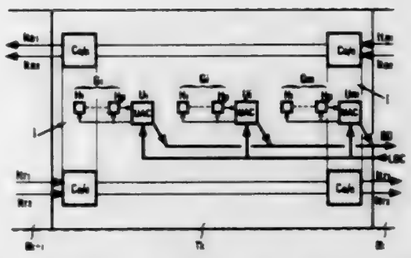
between said first sequence and a second sequence having a second direction opposite to said first direction, said external reset signal synchronously provided after said write pointer means points to a last address in said sequence.

5,206,835

MODULAR DEVICE FOR RECEPTION, THE ACQUISITION AND THE TRANSMISSION OF SEISMIC DATA WITH SEVERAL MULTIPLEXING LEVELS

Claude Beauducel, Hesouville, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Oct. 31, 1990, Ser. No. 606,623
Claims priority, application France, Nov. 3, 1989, 89 14556
Int. Cl.[5] H03G *3/20*; G01V *1/22*; H04R *9/00*
U.S. Cl. 367—21 11 Claims



1. A modular system for transmitting signals received by seismic sensors in an immersed seismic streamer to a central control and recording station on a ship towing the seismic streamer with the streamer comprising a sheath made by a series of connected sections interconnected by interconnection boxes with the sensors being distributed along a length of a plurality of the sections, the modular system including an electronic device comprising:

a first stage assembly in each interconnection box including transmitting modules connected to the central station through digital transmission cables having outward lines for transmission of commands from the central station and inward lines for transmission of data to the central station, the transmitting modules each having means for decoding commands from the central station, means for storing data and means for coding the data transmitted to the central station through the return lines;

a second stage assembly in the central station connected with the digital transmission cables for selectively addressing orders to all of the means for decoding through the outward lines and the transmitting modules in the

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interconnection boxes and for sequentially collecting data stored in the interconnection boxes through said transmitting modules; and

a third stage assembly having a plurality of acquisition and transmission units, the acquisition and transmission units being distributed along each section and adjacent a group of the sensors in the section and amplifying, multiplexing and digitizing signals received by associated sensors and being interconnected through the digital transmission cables, connected with the transmitting modules including local lines for transmission of commands and local lines for the transmission of data and the local lines for the transmission of data each being coupled to a local synchronizing element linked to the means for decoding and an analog-to-digital converter connected with the means for storing.

5,206,836

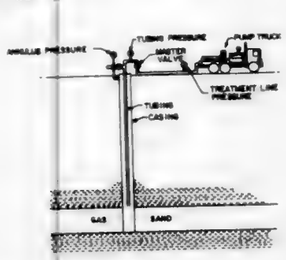
METHOD OF DETERMINING POSITION AND DIMENSIONS OF A SUBSURFACE STRUCTURE INTERSECTING A WELLBORE IN THE EARTH

Gary R. Holzhausen, Santa Cruz; Richard P. Gooch, Palo Alto, both of Calif., and David E. Goldberg, Tuscaloosa, Ala., assignors to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 208,425, Jun. 17, 1988, Pat. No. 5,031,163, which is a division of Ser. No. 841,644, Mar. 20, 1986, Pat. No. 4,783,769. This application Apr. 4, 1990, Ser. No. 504,767

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—35 **3 Claims**



1. A method of determining fracture closure pressure comprising the steps of

initiating pressure oscillations in the wellbore at a variety of static pressures,

measuring the fundamental resonant frequency in the wellbore at these different static pressures,

determining the static pressure at which the resonant frequency and its higher order harmonics shift from frequencies characteristic of an open fracture to frequencies characteristic of a closed fracture, and

defining this static pressure as the fracture closure pressure.

5,206,837

METHOD FOR COMPENSATING FOR THE EFFECT OF IRREGULAR SPATIAL SAMPLING OF SEISMIC WAVEFIELDS

Craig J. Beasley, Houston, Tex., and Rolf Klotz, Singapore, Singapore, assignors to Western Atlas International, Inc., Houston, Tex.

Filed May 29, 1992, Ser. No. 890,924

Int. Cl.[5] G01V *1/36*

U.S. Cl. 367—38 **7 Claims**

1. A method for processing seismic wavefields propagated from a source location, comprising:

spatially sampling said wavefield at a preselected plurality of discrete sampling stations distributed over an area remotely from said source location;

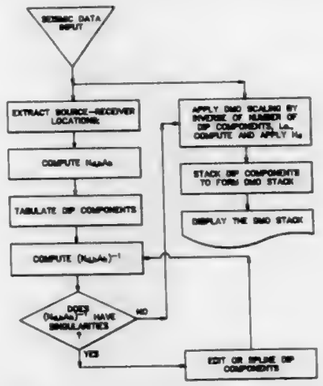
combining the wavefield samples into a raw wavefield input gather;

applying a selected processing operator to said raw wavefield input gather to provide a processed gather;

applying an inverse sampling operator to said processed gather, the inverse sampling operator including the steps of:

(a) decomposing the processed gather into constituent dip components;

(b) tabulating the number of live dip components;



(c) scaling selected attributes of said constituent dip components by dividing the constituent dip components by the number of live dip components to provide equalized dip components; and

(d) correcting said equalized dip components to suppress undesired processing artifacts resulting from locally relatively sparse and locally relatively dense spatial sampling.

5,206,838

ULTRASONIC TRANSDUCER

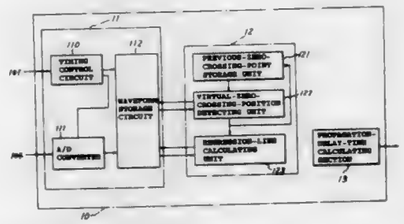
Yutaka Kashiwase, Tokyo, Japan, assignor to Tokimec Inc., Tokyo, Japan

Filed Jul. 20, 1992, Ser. No. 914,595

Claims priority, application Japan, Jul. 29, 1991, 3-211656; Jul. 13, 1992, 4-208524

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—99 **10 Claims**



1. An ultrasonic transducer comprising:

an ultrasonic transmitter;

an ultrasonic receiver; and

propagation-delay-time calculating means for calculating a propagation delay time from the time when an ultrasonic wave is transmitted by said transmitter until the time when the ultrasonic wave is received by said receiver,

wherein said propagation-delay-time calculating means includes: a waveform storage section in which a waveform signal of the ultrasonic wave received by said ultrasonic receiver is converted to a digital value after sampling at a predetermined timing and is stored sequentially; a virtual-zero-crossing-position detecting unit for detecting a virtual zero-crossing point on the basis of the waveform signal stored; a regression-line calculating unit for estimating a zero-crossing point of the received wave by fetching from said waveform storage section waveform data at a plurality of addresses centering on an address shown by an output of said virtual-zero-crossing-position detecting unit, and by effecting a regression-line interpolation with respect to the waveform data; and a propagation-delay-time calculating section for calculating the propagation delay time of the ultrasonic wave received on the basis of the zero-crossing point estimated.

5,206,839

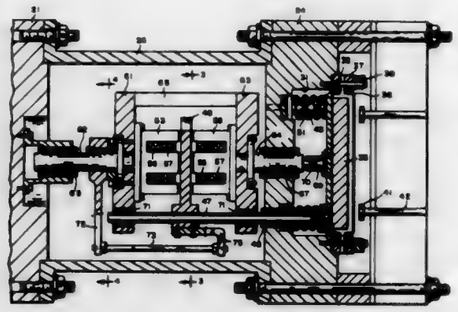
UNDERWATER SOUND SOURCE

Bruce S. Murray, Winchester, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 575,326, Aug. 30, 1990. This application Nov. 20, 1991, Ser. No. 796,075

Int. Cl.[5] H04R *15/00*

U.S. Cl. 367—175 **7 Claims**



1. An underwater sound source comprising:

a hollow shell providing axially opposed first and second ends;

at each of said ends, a diaphragm mounted for axial movement with respect to said shell;

means for sealing the periphery of each of said diaphragms to said shell without substantially impeding axial movement;

spring means operating between said shell and each of said diaphragms for allowing axial movement of the diaphragm in response to external pressure;

a separate magnetic motor for each diaphragm comprising:

rigidly connected to each diaphragm and axially aligned therewith, a lightweight magnetic armature structure;

an open magnetic circuit core structure on either side of said armature structure along the axis of said shell for providing a respective magnetic circuit linking each armature structure across a magnetic gap, said magnetic core structures being substantially more massive than said armature structures, each such core structure including at least one energizing winding;

spring means operating between each armature structure and the linked core structures for resiliently maintaining a nominal gap; and

means for connecting the windings on said magnetic core structures to an energizing supply of alternating current.

5,206,840

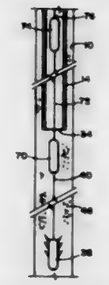
GEOPHONE IMPLANTATION SYSTEM

David C. Cobbs, 669 E. 139 Pl., Glenpool, Okla. 74033, and James H. Cobbs, 5350 E. 46th St., Tulsa, Okla. 74135

Filed Jan. 17, 1991, Ser. No. 703,507

Int. Cl.[5] G01V *1/00*

U.S. Cl. 367—178 **9 Claims**



1. A method of implanting a geophone package in the earth comprising the steps of:

(a) drilling a borehole in the earth with a tubular drill pipe, at least the lower portion of the borehole remaining casingless:

(b) pumping grout by means of a tubular pipe string into the borehole through the interior of the tubular pipe string, the tubular pipe string having an open lower end out through which the grout passes into the borehole;

(c) pumping a geophone package down through the drill string and out the open lower end into the borehole;

(d) pumping additional grout into the borehole to completely surround the geophone package; and

(e) allowing the group to solidify the geophone package being thereby implanted in the borehole free of the tubular pipe and any borehole casing; and wherein step (a) includes the use of a tubular drill pipe having a severable bit attached thereto, including after step (a), severing the drill bit from the tubular drill pipe while the tubular drill pipe and bit are in the borehole and wherein, in steps (b), (c) and (d) the grout and geophone package are pumped down the interior of the tubular drill string to emerge into the borehole above the severed drill bit.

5,206,841

WRISTWATCH WITH CASE HAVING AN INTERCHANGEABLE COVER

Alain Boucheron, Paris, France, assignor to Boucheron, Paris, France

Filed Jul. 25, 1991, Ser. No. 735,788

Claims priority, application France, Aug. 1, 1990, 90 09844

Int. Cl.[5] A44C *5/00*; **G04B** *37/00*

U.S. Cl. 368—276 **7 Claims**

1. A wristwatch comprising:

a flexible strap provided with rigid reinforcing elements at both ends,

a case with an enclosed watch module, said case having an upper surface which is provided with a dial and is delimited by two lateral sides and two opposite sides, with two bores near the opposite sides and opened at the lateral sides for receiving in a removable manner the reinforcing elements of the strap, said case having two passages between the upper surface of the case and the bores,

a cover removably mounted by slipping over the case and provided with a window for the dial of the case, said cover including two integral locking components passing through the passages of the case and cooperating inside the bores of the case with the reinforcing elements of the

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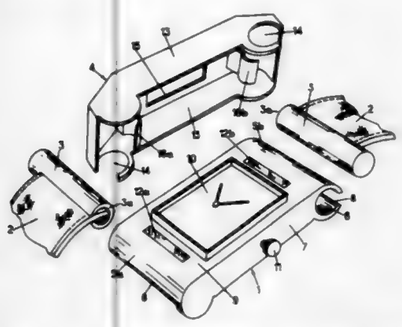
strap to secure the cover on the case, the cover having lateral sides each provided with an opening for the entry



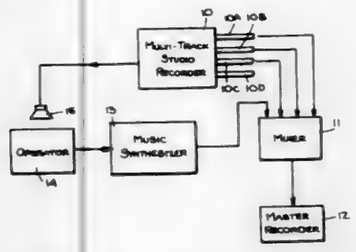
of one of the reinforcing elements of the strap during its assembly with the case.

5,206,842

TECHNIQUE FOR PRODUCING RECORDINGS OF MUSICAL WORKS WHOSE BEAT SIMULATES ARCADE-GAME SOUNDS

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Sep. 21, 1989, Ser. No. 410,341
Int. Cl.[5] G10F *1/00*; H04B *1/20*; G11B *31/00*
U.S. Cl. 369—4 **3 Claims**



1. A technique for recording a performance of a rhythmic musical work, such as rock music, having a persistent accented beat, said work being performed by a group of performers divided into sections, one section producing the sounds of the beat which accompany the musical sounds produced by the other sections of the group, said technique comprising the steps of:

(a) recording on corresponding tracks of a multiple-track recorder the sounds produced by said sections of the group, one of the tracks having recorded thereon the beat, the other tracks having recorded thereon the sounds produced by the other sections;

(b) simulating in a music synthesizer for audio duplication sound effects associated with a particular arcade electronic game and reducing these sound effects to a single keystroke to produce, when the key is operated at a time coincident with that of the beat recorded on said one track, a percussive audit pulse whose constituents are the sound effects; and

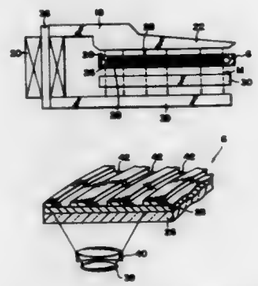
(c) recording in a master recorder the audio pulses yielded by the synthesizer in place of the beat together with the sounds recorded in said other tracks to produce a master recording of the work, whereby when the master recording is played back, it incorporates these pulses to define the accented beat of the music whereby a listener thereto receives an acoustic impression in which the music is heard in an arcate-like environment, the recordings on said other tracks of the multiple-track recorder being fed to a mixer whose output is applied to said master recorder, to which mixer is also fed the audio pulses from the synthesizer.

5,206,843

APPARATUS FOR ERASING INFORMATION RECORDED ON AN INFORMATION RECORDING MEDIUM BY APPLYING LIGHT AND A MAGNETIC FIELD OVER A PLURALITY OF RECORDING TRACKS

Koji Kaburagi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1991, Ser. No. 737,031
Claims priority, application Japan, Jul. 31, 1990, 2-203554
Int. Cl.[5] G11B *13/03*, *11/12*, *11/10*
U.S. Cl. 369—13 **4 Claims**



1. A processing apparatus for erasing information recorded on an information recording medium having a plurality of recording tracks on which the information is recorded by applying light and a magnetic field, comprising:

magnetic field applying means for applying the magnetic field to said plurality of recording tracks of said information recording medium, the magnetic field applying means including a substantially U-shaped member having two extending portions between which the information recording medium is positioned; and

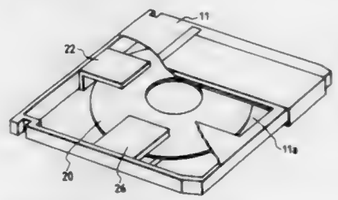
light radiating means for radiating the light on at least two tracks of said plurality of recording tracks having the magnetic field applied thereon by said magnetic field applying means, the light radiating means being positioned between the two extending portions of the magnetic field applying means and radiating the light on said at least two tracks simultaneously.

5,206,844

MAGNETOOPTIC RECORDING MEDIUM CARTRIDGE FOR TWO-SIDED OVERWRITING

Yuwa Ishii, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 9, 1991, Ser. No. 743,122
Claims priority, application Japan, Sep. 7, 1990, 2-238328
Int. Cl.[5] G11B *13/04*, *11/10*, *11/12*, *23/03*
U.S. Cl. 369—13 **2 Claims**



1. A magnetooptic recording medium cartridge comprising:

a hollow cartridge body;

a rotatable magnetooptic disk recording medium having first and second recording medium sides and disposed within said body and capable of overwriting at each of said sides by a laser beam intensity-modulated in accordance with two-valued information, the laser beam impinging upon the first side or the second side of the medium through a corresponding window or opening in the body, along a beam path that remains the same irrespective of which side of the medium faces the impinging laser beam, while the medium is rotated in a direction, as seen from the side of the medium facing the laser beam, that remains the same irrespective of which side faces the laser beam; and

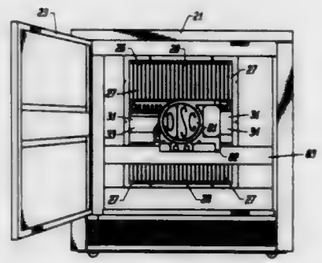
two magnetic means disposed on said body to apply respective initial magnetic fields to said medium transversely thereto at predetermined positions along said medium that are spaced from each other circumferentially of said medium, said initial magnetic fields having polarities that are opposite to each other, one of said initial magnetic fields being effective to initialize one side of said recording medium sides and the other of said initial magnetic fields being effective to initialize the other side of said recording medium sides.

5,206,845

MODULAR DATA STORAGE AND RETRIEVAL SYSTEM

C. Graham Baxter, Los Gatos, and John W. Meadows, Los Altos Hills, both of Calif., assignors to Document Imaging Systems Corporation, Sunnyvale, Calif.

Filed Jun. 5, 1989, Ser. No. 631,046
Int. Cl.[5] G11B *17/00*
U.S. Cl. 369—34 **28 Claims**



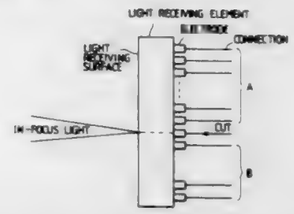
1. A modular system for the storage and retrieval of data recorded on cartridges, comprising a first type of cell for holding a plurality of cartridges, a second type of cell for holding a device for transcribing data on the cartridges, a generally planar back plate having a front surface with a plurality of mounting positions for receiving at least one cell of the first type and one cell of the second type, said first and second types of cells being of similar size and shape and being interchangeable between different ones of the mounting positions, registration means carried by the back plate and rear portions of the cells for aligning either type of cell in a predetermined fixed position in each of the mounting positions, and fasteners arranged in a similar pattern on each of the cells for securing the cells to the back plate with the rear portions of the cells adjacent to the front surface of the back plate and the cells projecting in a forward direction from the back plate and being supported solely by the back plate and the fasteners.

5,206,846

SIGNAL DETECTOR HAVING A VIRTUAL DIVISION

Satoshi Sugiura, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 627,273
Claims priority, application Japan, Jul. 25, 1990, 2-196709
Int. Cl.[5] G11B *7/13*
U.S. Cl. 369—44.12 **14 Claims**



1. A signal detector for optically detecting a signal from an information recording medium onto which information is recorded or from which said information is reproduced, the detector comprising:

at least one light receiving element means for receiving light from said information recording medium which is irradiated with light for recording or reproduction, said light receiving element means having a light receiving surface for receiving the light from said information recording medium;

a plurality of electrodes arranged in positions opposite to said light receiving surface; and

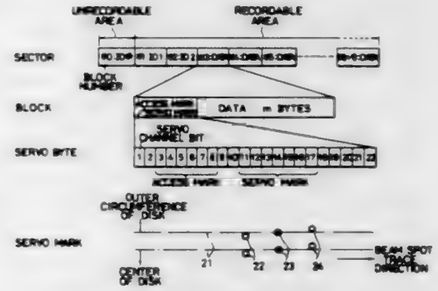
connection means for omitting at least one electrode of said plurality of electrodes, said one electrode being opposite to a point on said light receiving surface at which the light from said information recording medium is incident upon said light receiving surface so as to separate said plurality of electrodes into two divided electrode regions on either side of said electrode thus omitted for adjusting the boundary of the divided electrode regions and the light receiving element means and for respectively connecting signals output from the two electrode regions.

5,206,847

INFORMATION RECORDING DISK, AND INFORMATION RECORDING/REPRODUCING METHOD AND APPARATUS UTILIZING THE SAME

Shigeto Kanda, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,737
Claims priority, application Japan, Mar. 31, 1989, 1-83207
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.130 **18 Claims**



1. An information recording disk comprising:

a plurality of tracks arranged in a plurality of turns in one of a concentric and a spiral manner on said disk, wherein

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each of said tracks is divided into a plurality of sectors each recording therein information of a predetermined number of bytes; and

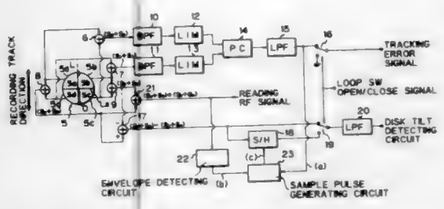
a plurality of servo signals for detecting tracking error, said servo signals being discretely recorded in each of said sectors at predetermined angular intervals and comprising first and second wobble pits formed in positions which mutually deviate from the center of a respective track in opposite directions, wherein the number of said servo signals recorded in each sector is an integer and the integral number in an inner track being greater than that in an outer track.

5,206,848

OPTICAL DISK PLAYER HAVING TILT SERVO CONTROL ABSENT TILT SENSOR

Satoshi Kusano; Shinichi Takahashi; Toshio Suzuki; Yuji Tawaragi, and Noriko Obitsu, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,752
Claims priority, application Japan, Jul. 19, 1990, 2-191450
Int. Cl.[5] G11B *7/09*
U.S. Cl. 369—44.41 **5 Claims**



1. An optical disk player, comprising:

a pickup having an objective lens for converging an irradiated light beam on an information recording surface of a disk and with a photodetector for receiving a reflected light beam from said information recording surface through the objective lens, said objective lens and said photodetector being integrally and movably arranged;

a tracking servo unit operating on a tracking error signal produced by a time difference detection method, said tracking servo unit comprising a servo loop, said servo loop including means for generating said tracking error signal by detecting a phase variation component of output signals of said photodetector varying with the deviation of said irradiated light beam spot in a radial direction of the disk relative to a recording track of the disk, and means for deviating said irradiated light beam spot in the radial direction of the disk according to the tracking error signal; and

a tilt servo unit for controlling said irradiated light beam so as to be perpendicular to an optical axis of said information recording surface according to a disk tilt detecting signal, said tilt servo unit comprising disk tilt detecting means responsive only to said photodetector for generating the disk tilt detecting signal by detecting the tilt of said information recording surface relative to the optical axis of said irradiated light beam;

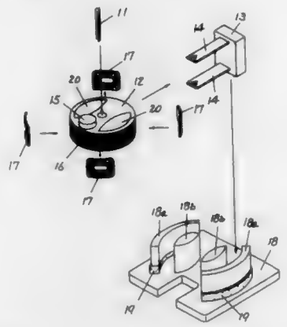
wherein said photodetector consists of at least a pair of photoelectric conversion elements arranged so that said photodetector is divided into two parts along the direction of said recording track, and said disk tilt detecting means issues a differential output of light receiving outputs of said pair of photoelectric conversion elements when said servo loop of said tracking servo unit is in a closed state for generating said tracking error signal and issues said differential output as said disk tilt detecting signal.

5,206,849

OBJECT LENS HOLDER AND DRIVING DEVICE

Hiroshi Yamamoto; Ichiro Kawamura, and Shoji Goto, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1991, Ser. No. 653,340
Claims priority, application Japan, Feb. 13, 1990, 2-32047
Int. Cl.[5] G11B *7/12*
U.S. Cl. 369—44.16 **5 Claims**



1. An objective lens actuator for an optical storage drive, comprising:

an objective lens holder;

a torsion plate spring disposed on a center of rotation of said objective lens holder and having a central portion fixed to said objective lens holder, said torsion plate spring having a substantially L-shaped transverse cross section;

a pair of parallel spaced plate springs each supported at one end by a stationary support member and fixedly connected at an opposite end to respective opposite ends of said torsion plate spring;

a magnetic circuit base carrying thereon said stationary support member;

an objective lens fixedly mounted on said objective lens holder with its optical axis spaced from, and substantially parallel to, a longitudinal axis of said torsion plate spring; and

means for driving the objective lens holder and the objective lens mounted thereon, said driving means including a plurality of tracking coils and a first magnetic circuit which are cooperative with each other to move said objective lens holder in a direction circumferentially about the longitudinal axis of said torsion plate spring, and a focusing coil and a second magnetic circuit which are cooperative with each other to move said objective lens holder in a direction parallel to the longitudinal axis of said torsion plate spring.

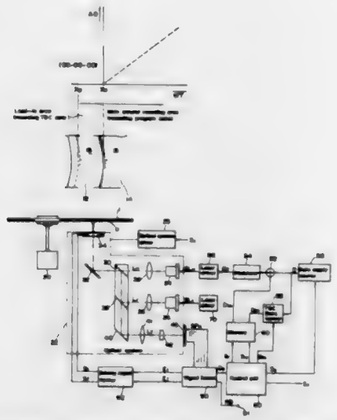
5,206,850

OPTICALLY WRITABLE RECORD OF DIGITAL INFORMATION AND RECORDING APPARATUS THEREFOR

Masaru Tezuka; Satoru Tobita, and Koji Ishiwata, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 469,042
Claims priority, application Japan, Jan. 25, 1989, 1-15557
Int. Cl.[5] G11D *5/09*
U.S. Cl. 369—48 **13 Claims**

1. A digital information record comprising: an optically writable record disk having a reflection factor substantially higher than seventy percent, first digital information including a plurality of program data and respective address data indicative of the individual addresses of the respective program data and being recorded with the latter sequentially along a first track in a first area of said record disk, second digital information including table-of-contents data identifying said plurality of program data, respectively, and being recorded sequentially along a second track which is in a second area of said record disk, said second area being contiguous with said first area and having a recording capacity greater than that required for said second digital information, and said second digital information



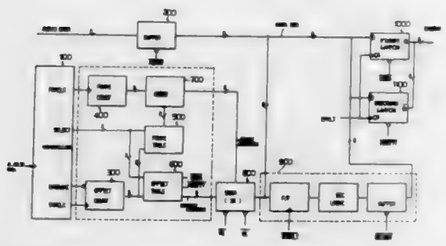
being recorded at least in part more than once along said second track so as to fully occupy said second area and thereby cause said second track to have a concluding end contiguous to a starting end of said first track so that, upon playback of the digital information record, said table-of-contents data and said plurality of program data and respective address data can be reproduced successively without interruption.

5,206,851

CROSS INTERLEAVING CIRCUIT

Hun-Chul Cho, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 29, 1991, Ser. No. 737,378
Claims priority, application Rep. of Korea, Aug. 9, 1990, 90-12212
Int. Cl.[5] G11B *00/00*
U.S. Cl. 369—48 **6 Claims**



3. A cross-interleaving circuit, comprising:

means for loading digital audio data onto a data bus;

means for providing an offset value of a frame by counting symbol clock pulses, and for providing a frame counted value by counting frame clock pulses to determine the number of digital audio data frames;

means responsive to said offset value of the frame and a selecting frame value, for providing a frame table value by determining a number of delayed frames for encoding said digital audio data on the basis of a present frame;

means responsive to said offset value of the frame and said selecting frame value, for generating an offset address of said frame;

means for adding said frame counted value and said frame table value to provide a frame address;

means for temporarily storing said digital audio data, said offset address and said frame address within each frame;

means for encoding said digital audio data to provide encoded data having parity symbols; and

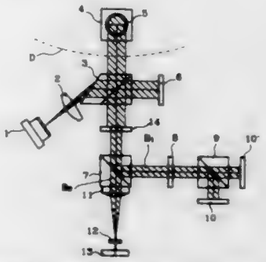
means for latching and inversely latching the encoded data by synchronizing the encoded data with eight-to-fourteen modulation clock pulses during a data interval and a parity interval respectively.

5,206,852

HIGH-DENSITY RECORDING OPTICAL HEAD

Yeong-woong Kim, Seoul; Ick-kyoung Yoo, Kyunggi-do; Chul-woo Lee; Byeong-ho Park, both of Seoul, and Chang-geun Kim, Seongnam, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Dec. 30, 1991, Ser. No. 814,629
Claims priority, application Rep. of Korea, Jun. 29, 1991, 91-11046
Int. Cl.[5] G11B *7/18*
U.S. Cl. 369—112 **11 Claims**



1. A high-density recording optical head for recording and reproducing information optically on and from a medium comprising a light source, an objective lens for focusing incident light on a medium and light reflected from the medium, a photodetector for detecting the reflected light, and an iris for passing a central portion of the reflected light from said objective lens to said photodetector, whereby only light reflected from a recording region of said medium is detected as a reproduction signal.

5,206,853

APPARATUS AND METHOD FOR DETECTING INTERSYMBOL INTERFERENCE

Shinichi Tanaka, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1991, Ser. No. 661,534
Claims priority, application Japan, Feb. 28, 1990, 2-47609
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—54 **26 Claims**

1. An apparatus for detecting an intersymbol interference in a digital signal read out from a recording medium comprising:

a clock generator for generating clock pulses having a predetermined cycle length;

a pattern writing means for writing a predetermined data pattern on said medium, said data pattern having a short transition interval positioned between two long transition intervals;

a reading means for reading said data pattern on said medium;

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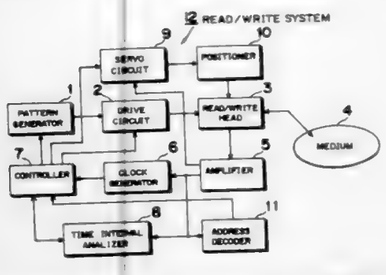
a measuring means for measuring said short transition interval; and



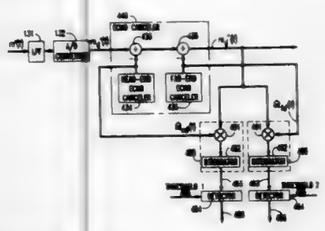
a calculating means for calculating an edge shift between said short transition interval and said long transition interval.

5,206,854

DETECTING LOSS OF ECHO CANCELLATION

William L. Betts, St. Petersburg, Fla., and Robert A. Day, II, Manalapan, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 24, 1991, Ser. No. 766,234
Int. Cl.[5] H04B *3/23*
U.S. Cl. 372—32.1 **5 Claims**



1. A method comprising the steps of
receiving a signal,
subtracting an echo estimate signal from the received signal to provide an echo-canceled signal,
correlating the echo estimate signal with the echo-canceled signal to provide a degree of correlation, and
determining the absence of a remote signal by detecting the degree of correlation of the echo estimate signal with the echo-canceled signal.

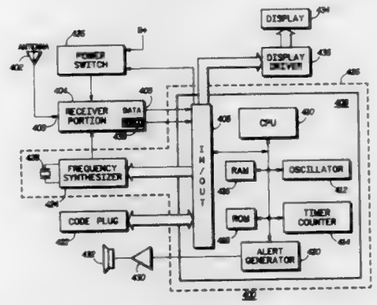
5,206,855

MULTIPLE FREQUENCY MESSAGE SYSTEM

Robert J. Schwendeman, Pompano Beach, and David F. Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1990, Ser. No. 505,860
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 370—50 **15 Claims**

1. A receiver means, capable of receiving coded message signals, including channel identification information assigned to each of a plurality of channels in a plurality of geographic areas and message information being transmitted in a predetermined sequence of coded transmission slots on each of a plurality of channels, each coded transmission slot of the predetermined sequence being transmitted sequentially on each of the plurality of channels so as to preclude the substantially simultaneous transmission of a correspondingly coded transmission slot on any two channels in a particular geographic area, said receiver means comprising:
a receiver portion, capable of receiving the transmitted coded message signals during a predetermined one of the coded transmission slots being transmitted on each of the plurality of channels, said receiver portion having an output for detected channel identification information;
memory means for storing predetermined channel identification information, and active channel information indicating the active channels of the plurality of channels capable of being received for at least one geographic area;



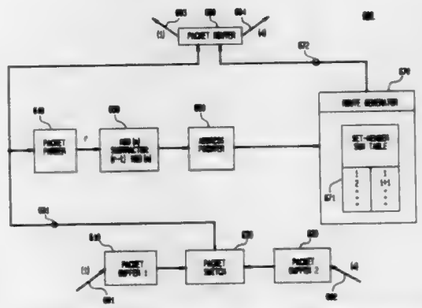
channel selecting means being responsive to the active channel information for selecting the reception by said receiver portion of only the active channels in the particular geographical area when the channel identification information detected on the predetermined one of the plurality of channels does not match the predetermined channel identification information; and
battery saver means being responsive to the active channel information for supplying power to said receiver portion during the predetermined coded transmission slots on the active channels being selected in the particular geographical area.

5,206,856

ROUTING OF NETWORK TRAFFIC

Fan R. K. Chung, Watchung, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 457,285, Dec. 27, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 616,396
Int. Cl.[5] H04L *12/56*; **H04G** *11/04*
U.S. Cl. 370—60 **11 Claims**



1. A method for physically implementing a directed network composed of a plurality n of nodes, with i and j representing an arbitrary pair of the nodes, the method comprising the steps of
selecting a set X of k integers as determined by network grade-of-service constraints, wherein said set X is selected

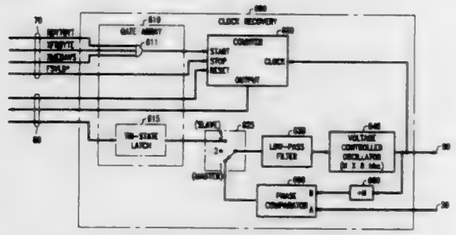
to produce distinct partial sums corresponding to all (j−i) (mod n) differences, i≠j, and
interconnecting the network nodes with unidirectional links from node i to node j if and only if (j−i) (mod n)=x for some x in X as determined by said partial sums.

5,206,857

APPARATUS AND METHOD FOR TIMING DISTRIBUTION OVER AN ASYNCHRONOUS RING

Scott E. Farleigh, Denver, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1991, Ser. No. 692,741
Int. Cl.[5] H04L *12/42, 7/04*
U.S. Cl. 370—85.5 **13 Claims**



1. A communication network interconnecting a master node and at least one slave node in a ring topology, each node including a clock for providing timing signals to equipment at that node, each node further including means for transmitting and receiving data to and from the ring network,
characterized in that:
the master node includes:
means responsive to the clock at the master node for measuring a first time delay encountered by data traversing the ring network;
means for transmitting the measure of the first time delay to the slave node,
the slave node includes:
means responsive to the clock at the slave node for measuring a second time delay encountered by data traversing the ring network;
means for receiving the measure of the first time delay from the master node; and
means responsive to the difference between the measured first and second time delays for adjusting the frequency of the clock at the slave node to bring its frequency into a predetermined relationship with the frequency of the clock at the master node.

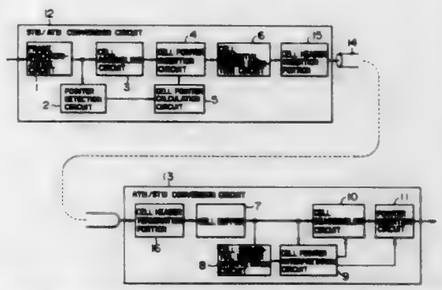
5,206,858

TRANSMISSION METHOD AND CIRCUIT OF VIRTUAL CONTAINER USING ASYNCHRONOUS TRANSFER MODE

Yukio Nakano, Hachioji; Takashi Mori, and Tadayuki Kanno, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 747,137
Claims priority, application Japan, Aug. 17, 1990, 2-215711
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—94.1 **4 Claims**

4. A virtual container transmission circuit using an asynchronous transfer mode, comprising:
a conversion circuit for converting a virtual container; and
a regeneration circuit for regenerating a virtual container;
said conversion circuit comprising:
a pointer detecting circuit for deriving a first bit position of a virtual container in a transmission frame from the value of a pointer of said virtual container,
a cell assembling circuit for mapping said virtual container onto information fields of cells,
a cell pointer insertion circuit for deriving information of a first bit position of said virtual container within a cell information field of an asynchronous transfer mode cell from the output of said pointer detection circuit and for inserting said information of the first bit position of said virtual container signal thus derived into a cell as a cell pointer;
said regeneration circuit comprising:



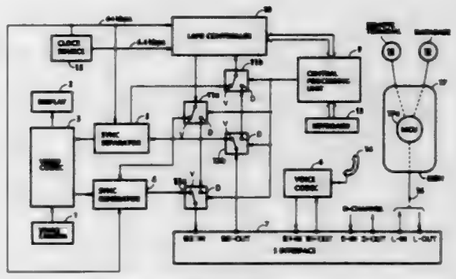
a buffer for receiving cells transmitted from said conversion circuit and for temporarily storing the cells,
a cell disassembling circuit for disassembling said cells and for regenerating the virtual container,
a cell pointer interpretation circuit for detecting said cell pointer, and
a pointer insertion circuit for deriving a pointer from the output of said cell pointer interpretation circuit and for supplying the pointer to the virtual container.

5,206,859

ISDN MULTIMEDIA COMMUNICATIONS SYSTEM

Masaki Anzai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 5, 1991, Ser. No. 649,862
Claims priority, application Japan, Feb. 5, 1990, 2-26467
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 **9 Claims**



1. A multimedia communications terminal station comprising:
a source for generating a video-to-data mode switching command signal and a data-to-video mode switching command signal;
a central processing unit responsive to said video-to-data mode switching command signal for generating an outgoing data mode identifier indicating that a signal to be transmitted to a distant station is computer-generated data and an outgoing video-to-data mode switching signal, indicating the distant station to switch to a data mode of reception, and responsive to said data-to-video mode

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switching command signal for generating an outgoing video mode identifier indicating that a signal to be transmitted to the distant station is a video signal and an outgoing data-to-video mode switching signal indicating the distant station to switch to a video mode of reception, said outgoing video-to-data mode switching signal and said outgoing data-to-video mode switching signal being further generated respectively in response to receipt of an incoming data mode identifier and an incoming video mode identifier from said distant station, respectively indicating the terminal station to switch to data and video modes of reception;

LAPB (link access procedure balanced) control means for exchanging signals with said central processing unit;

video coder/decoder means for generating an outgoing digital video signal and decoding an incoming digital video signal;

multiplexer means for synchronously multiplexing said outgoing digital video signal from the video coder/decoder means with said outgoing data mode identifier to generate an outgoing composite video signal;

demultiplexer means for synchronously demultiplexing an incoming composite video signal from said distant station into said incoming data mode identifier and a digital video signal, and supplying the demultiplexed video signal to said video coder/decoder means;

an ISDN (integrated services digital network) interface for interfacing the terminal station with an integrated services digital network to which said distant station is also terminated; and

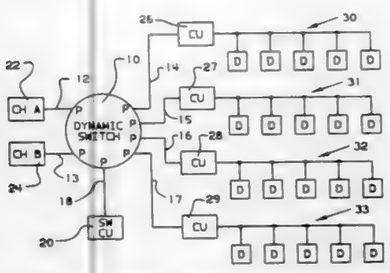
switching means responsive to said outgoing video-to-data mode switching signal for coupling said LAPB control means to said ISDN interface for allowing said central processing unit to exchange computer-generated data and said incoming and outgoing video mode identifiers with said distant station, and responsive to said outgoing data-to-video mode switching signal for coupling said LAPB control means to said interface via said video coder/decoder means to exchange said outgoing and incoming composite video signals with said distant station, allowing said demultiplexer means to supply said incoming data mode identifier to said central processing unit via said LAPB control means and allowing said central processing unit to supply said outgoing data mode identifier to said multiplexer means via said LAPB control means.

5,206,860

RECOVERY FROM A POSSIBLE SWITCHING ERROR IN A COMPUTER I/O SYSTEM

Paul J. Brown, Poughkeepsie, N.Y.; Matthew J. Kalos, Tucson, Ariz., and Martin W. Sachs, Westport, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 576,302
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—20.1 **11 Claims**



1. A connection recovery apparatus for use in a computer I/O system having a dynamic switch for making a dynamic connection between a pair of dynamic switch ports, each dynamic switch port being attached by a link to a link-level facility, said connection recovery apparatus comprising:

a receiver connected to the link for receiving transmitted messages from the link;

a transmitter connected to the link for transmitting messages over the link;

a UD-transmission state means connected to said transmitter for causing the repetitive transmission of an unconditional disconnect message from said transmitter responsive to an error condition in the dynamic connection of the dynamic switch;

a UD-reception state means connected to said transmitter for causing the repetitive transmission of an unconditional disconnect response message from said transmitter responsive to receiving a UD message at said receiver; and

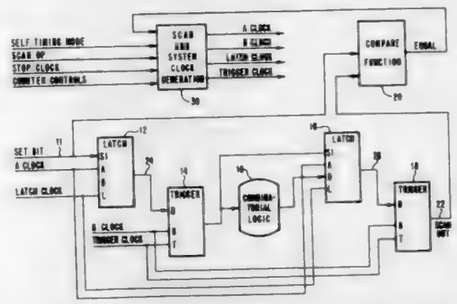
an inactive state means connected to said transmitter indicating said connection recovery is complete, said inactive state for causing the transmission of idle characters from said transmitter responsive to receiving a UDR message at said receiver.

5,206,861

SYSTEM TIMING ANALYSIS BY SELF-TIMING LOGIC AND CLOCK PATHS

Nicholas P. Hannon; Albert Tarolli, both of Kingston, and Paul L. Wiltgen, Hurley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1990, Ser. No. 574,639
Int. Cl.[5] H04B *17/00*
U.S. Cl. 371—22.3 **12 Claims**



1. In a system having level sensitive scan delay latch pairs composed of a latch and a trigger, and clock means for providing system latch clock signals and system trigger clock signals, respectively, to each of said latch and said trigger comprising said latch pairs, said system being normally started with a system latch clock signal and stopped on a system trigger clock signal and further having an A scan clock signal to latches followed by a B scan clock signal to triggers of said latch pairs, a system for determining the propagation delay between any two of said latch pairs comprising:

means for initializing a latch and a trigger of an input latch pair to opposite states and a latch of an output latch pair to a state opposite said latch of said input latch pair;

means for providing a set bit to an output of said latch of said input latch pair;

means for operating said A and B scan clocks to scan in said set bit to said trigger of said input latch pair;

means for setting a cycle time between successive system trigger clock signals;

means for inhibiting a first system latch clock signal at said latch of said input latch pair allowing a first system trigger clock signal to be first in time to launch said set bit from said trigger of said input latch pair and initiate the determination of said propagation delay;

means for inhibiting a second system trigger clock signal allowing said set bit to be received and held by said latch of said output latch pair; and

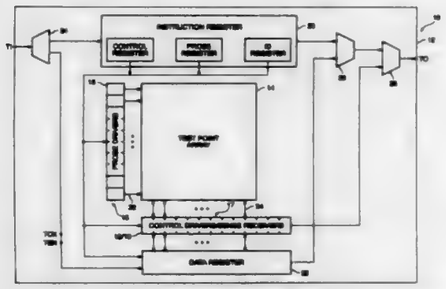
means for operating said A and B scan clocks to scan out data from said latch of said output latch pair.

5,206,862

METHOD AND APPARATUS FOR LOCALLY DERIVING TEST SIGNALS FROM PREVIOUS RESPONSE SIGNALS

Susheel J. Chandra, Fremont, and Tushar Gheewala, Cupertino, both of Calif., assignors to Crosscheck Technology, Inc., San Jose, Calif.

Filed Mar. 8, 1991, Ser. No. 667,611
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—27 **7 Claims**



1. A method for defining a test signal for an IC test point based upon a logic state of a signal path local to the IC, the IC having an integral test structure comprising a plurality of probe lines, a plurality of control/sense lines and a data register, said data register for storing a first data pattern, the method comprising the steps of:

reading a first plurality of control/sense lines, each one of said first plurality of control/sense line defining a logic state;

deriving a second data pattern from said first data pattern and said first plurality of control/sense lines, said second data pattern being stored in said data register;

applying a plurality of bits of said second data pattern to a plurality of select test points, respectively.

5,206,863

PROCESSOR-TO-PROCESSOR COMMUNICATIONS PROTOCOL FOR A PUBLIC SERVICE TRUNKING SYSTEM

Dimitri M. Nazarenko; Houston H. Hughes, III; Robert T. Gordon; David L. Hattey, and Bruno Yurman, all of Lynchburg, Va., assignors to General Electric Company, Schenectady, N.Y.

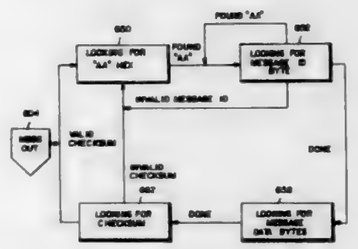
Division of Ser. No. 365,810, Mar. 6, 1989, Pat. No. 5,020,132, which is a division of Ser. No. 85,572, Aug. 14, 1987, Pat. No. 4,835,731. This application Mar. 8, 1991, Ser. No. 666,862
Int. Cl.[5] G06F *11/10;* **G08C** *25/00*
U.S. Cl. 371—37.1 **4 Claims**

1. A method of receiving and acquiring digital signal messages from a site controller to a trunking card in a digital trunked RF system, comprising:

(1) receiving at the trunking card from the site controller a frame start character having a value of "AA" hex;

(2) receiving at the trunking card from the site controller a message identification byte which identifies an operational code and a number N of data bytes to follow said identification byte;

(3) receiving at the trunking card from the site controller a variable number N of message data bytes following said identification byte, said variable number being dependent on the value of said identification byte; and



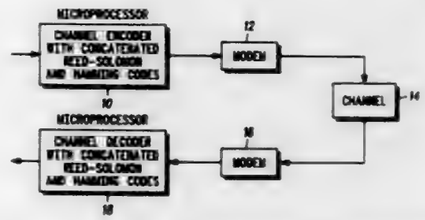
(4) receiving at the trunking card from the site controller a checksum byte indicating the end of message and also specifying error checking/correction information.

5,206,864

CONCATENATED CODING METHOD AND APPARATUS WITH ERRORS AND ERASURES DECODING

Peter R. H. McConnell, Burnaby, Canada, assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 4, 1990, Ser. No. 622,073
Int. Cl.[5] G06F *11/10;* **H03M** *13/00*
U.S. Cl. 371—37.4 **7 Claims**



1. A concatenated coding arrangement for a communication signalling system transmitting data, wherein error correction capabilities are enhanced, comprising, in combination:

means for encoding data to be transmitted with a first code type to form an outer code which is capable of correcting burst errors, correcting erasures, and further detecting if the remaining data is error free, and

means for encoding the data and the outer code with a second code type to form an inner code which is capable of correcting random errors and detecting multiple bit errors to designate the erasures, such that the second and the first code types may be cooperatively and sequentially utilized to enhance the error correction capabilities of the communication signalling system without incurring the otherwise requisite coding overhead.

5,206,865

ERROR DETECTION AND CORRECTION MEMORY SYSTEM

Eugene H. Gruender, Jr., and Douglas R. Kraft, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1990, Ser. No. 628,502
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.1 **11 Claims**

1. A method of detecting errors in a memory system having first and second memory arrays, each memory array having a plurality of memory devices, said method comprising the steps of:

storing a data word and a correction word in said memory devices, said data and correction words each having a first

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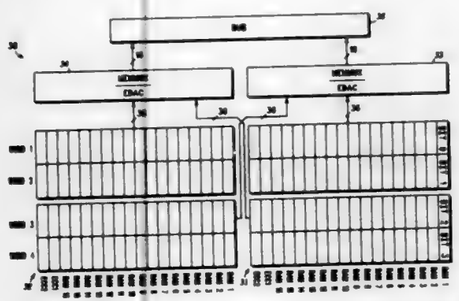
portion stored in said first memory array and a second portion stored in said second memory array;

retrieving said data and correction words from said memory arrays;

transmitting said data word from a first portion of each of said plurality of memory devices of said first array to a first error detecting and correcting means for detecting errors in said data word;



transmitting said data word from a first portion of each of said plurality of memory devices of said second array to said first error detecting and correcting means; and

transmitting said data word from a second portion of each of said plurality of memory devices of said second array to said second error detecting and correcting means; and

checking said data word for an error.

5,206,866

BIT ERROR CORRECTING CIRCUIT FOR A NONVOLATILE MEMORY

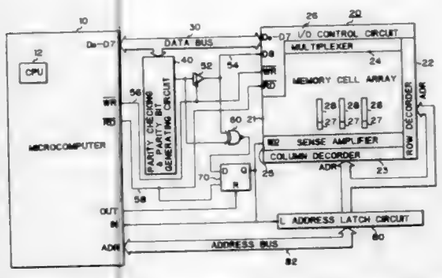
Koji Tanagawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 612,978

Claims priority, application Japan, Nov. 16, 1989, 1-298654

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.1 **7 Claims**



1. An arrangement comprising a bit error correcting circuit connected to a non-volatile memory and a control circuit, the non-volatile memory having a plurality of sets of memory cells each of which has a plurality of data cells for storing data and a parity cell for storing a first parity bit corresponding to the data and a sense amplifier circuit connected to the sets of memory cells for sensing data with a plurality of sense voltages, the control circuit outputting first and second read signals in respective read cycles, the bit error correcting circuit comprising:

a parity bit generating circuit connected to the non-volatile memory and the control circuit for generating a second parity bit generated from the stored data read from the data cells in response to the first read signal;

a comparison circuit connected to the parity bit generating circuit and the non-volatile memory for comparing the first and second parity bits and outputting a comparison signal which corresponds to the result of the comparison:

a data holding and sense voltage switching circuit connected to the comparison circuit, the control circuit and the non-volatile memory for holding the comparison signal and outputting a holding signal until the second read signal is received, the holding signal controlling sense voltage of the sense amplifier circuit; and

an address holding circuit connected to the control circuit, the non-volatile memory and the data holding and sense voltage switching circuit for holding and outputting an address signal from the control circuit to the non-volatile memory in response to the holding signal.

5,206,867

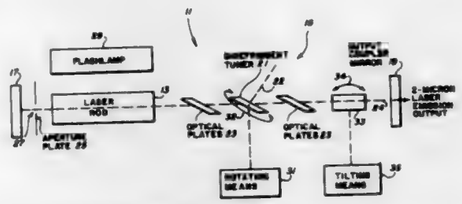
SUPPRESSION OF RELAXATION OSCILLATIONS IN FLASHPUMPED, TWO-MICRON TUNABLE SOLID STATE LASERS

Leon Esterowitz, Springfield, Va., and Joseph F. Pinto, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1992, Ser. No. 829,145

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—20 **34 Claims**



1. A solid state laser comprising:

a laser cavity defined by a first reflective element and an output coupler reflective element to form a reflective path therebetween;

a laser crystal disposed in said laser cavity, said laser crystal having a host material doped with preselected activator ions sufficient to produce a laser emission at a laser transition wavelength in a range of wavelengths between about 1.9 microns and about 2.1 microns when said laser crystal is optically excited to produce said laser emission;

means for optically exciting said laser crystal to produce a pulse of laser emission in said range of wavelengths;

means disposed in said laser cavity between said laser crystal and one of said reflective elements for tuning said laser emission to a desired laser transition wavelength in said range of wavelengths;

first means oriented at Brewster's angle in said reflective path in said laser cavity for suppressing oscillation of undesired wavelengths within said laser cavity; and

second means disposed in said reflective path for suppressing laser spiking in said laser cavity to enable said laser to emit through said output coupler reflective element a smooth, long pulse of laser emission without spiking at said desired laser transition wavelength.

5,206,868

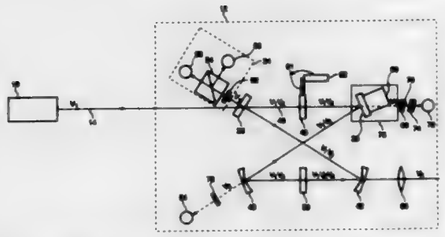
RESONANT NONLINEAR LASER BEAM CONVERTER

David A. G. Deacon, Los Altos, Calif., assignor to Deacon Research, Palo Alto, Calif.

Continuation-in-part of Ser. No. 632,447, Dec. 20, 1990, Pat. No. 5,134,622. This application Jan. 24, 1992, Ser. No. 826,316

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—21 **44 Claims**



1. An apparatus for generating an optical output beam, the apparatus comprising:

an optical pump means for producing a first optical beam of a first frequency;

a first resonator cavity means for supporting buildup of selected optical power at said first frequency and at a second frequency within said first resonator cavity means, said first resonator cavity means being disposed to have an axis coincident with said first optical beam for admitting a portion of said first optical beam;

a first nonlinear element means in said first resonator cavity means which is phase matched for generating a second optical beam at said second frequency whose frequency is a harmonic multiple of the frequency of said first frequency; and

a second nonlinear element means in said first resonator cavity means for combining said first optical beam and said second optical beam and producing a third optical beam at a third frequency which is a linear combination of said first frequency and said second frequency.

5,206,869

METHOD AND DEVICE FOR GENERATING HIGH QUALITY LASER BEAM FROM LASER DIODES

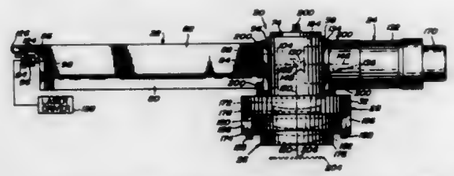
Najeeb A. Khalid, Montreal; Carl Diehl, Dollard-Des-Ormeaux, and Stan Schwartz, Montreal, all of Canada, assignors to Escher-Grad Incorporated, Montreal, Canada

Continuation of Ser. No. 670,883, Mar. 18, 1991. This application Oct. 31, 1991, Ser. No. 785,478

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—24 **8 Claims**



1. A method of generating a collimated laser beam which is circular in cross-section, non-astigmatic, diffraction-limited and has a gaussian energy distribution, which comprises providing a single mode optical waveguide having an input end and an output end, disposing a collimating lens in spaced relationship to the output end of said optical waveguide such that said output end is positioned at a focal point of said collimating lens, optically coupling a laser diode to the input end of said optical waveguide, energizing said laser diode to produce at the output end of said optical waveguide a laser beam which is circular in cross-section, non-astigmatic, diffraction-limited and has a gaussian energy distribution, and directing said laser beam through said collimating lens to collimate same.

5,206,870

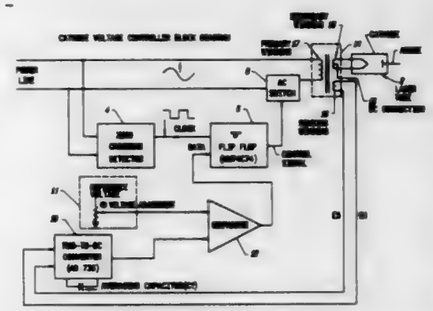
LASER CATHODE VOLTAGE CONTROLLER

Robert J. Rorden, Los Altos, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Oct. 11, 1991, Ser. No. 775,812

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—25 **14 Claims**



1. A voltage controller for controlling AC power for a laser tube cathode heater, including:

a switch control means for generating a control signal from a feedback signal and a reference voltage signal, wherein the control signal is timed to the AC power and has an amplitude indicative of the greater of the feedback signal and the reference voltage signal, and wherein the feedback signal is indicative of measured voltage at the laser tube cathode heater; and

a switch connected to the laser tube cathode heater, for selectively supplying the AC power to the laser tube cathode heater in response to the control signal.

5,206,871

OPTICAL DEVICES WITH ELECTRON-BEAM EVAPORATED MULTILAYER MIRROR

Dennis G. Deppe, Austin, Tex.; Niloy K. Dutta, Colonia, N.J.; Erdmann F. Schubert, New Providence, N.J.; Li-Wei Tu, Westfield, and George J. Zydzik, Columbia, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1991, Ser. No. 815,311

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **9 Claims**

1. An optical device comprising a semiconductor material selected from the group consisting of III-V and II-VI semiconductors, comprising a lasing cavity and top and bottom metal electrodes for applying electric field to the lasing cavity, said lasing cavity comprises a bottom mirror, a bottom confining region, an active region, a top confining region and a top mirror, said top mirror comprising a plurality of pairs of quarterwave layers, each pair of layers consisting of a low index layer and a high index layer arranged in an alternating sequence beginning with the low index layer, wherein said high

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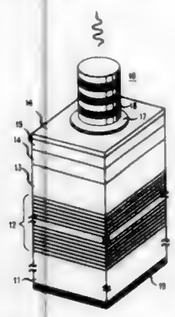
index layer is a semiconductor selected from the group consisting of GaP and ZnS, and said low index layer is of a material



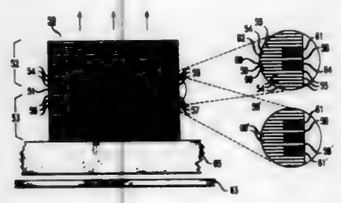
chosen from the group of materials selected from borosilicate glass (BSG), CaF_2,MgF_2 and NaF.

5,206,872

SURFACE EMITTING LASER

Jack L. Jewell, Bridgewater, and Axel Scherer, Matawan, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 1, 1991, Ser. No. 786,653
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 23 Claims



1. Apparatus comprising at least one electrically pumped vertical cavity laser consisting essentially of an active region containing a semiconductor active material layer for generating photons to result in laser emission, said active region comprising p-type and n-type conductivity portions and including a semiconductor junction, said active region being sandwiched between Distributed Bragg Reflectors each comprising a plurality of layers of relatively low and high refractive index for the said laser emission, together with circuit means for electrically pumping said active region to lasing threshold, lasing entailing presence of a standing wave defining a cavity here described as including the said electrode and as bounded by a cavity between the said Distributed Bragg Reflectors

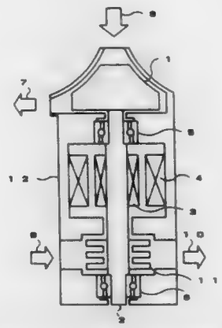
characterized in that said circuit means includes an electrode layer at least part of which is outside said active region, whereby at least a major portion of one DBR is excluded from the circuit means, said electrode layer having a conductivity sufficient to result in total conduction of said circuit greater than that of a circuit including the entire DBR as conductivity-doped to an average carrier concentration of 10^{19} carriers/cm^3, and in that absorption for laser emission is reduced in part due to reduction in conductivity-doping of the excluded portion of the DBR to result in a numerical value of equal to or less than 0.25 for the product $r \cdot A_p$ in which r is circuit resistance in ohms of that portion of the circuit consisting of p-type material and the associated electrode layer and A_p is per-pass photon absorption for that circuit portion expressed as a fraction.

5,206,873

TURBO BLOWER FOR LASER AND LASER OSCILLATION DEVICE EMPLOYING THE TURBO BLOWER

Tsutomu Funakubo, Fujiyoshida; Norio Karube, Machida, and Kenji Nakahara, Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP90/01227, § 371 Date May 22, 1991, § 102(e) Date May 22, 1991, PCT Pub. No. WO91/05384, PCT Pub. Date Apr. 18, 1991
PCT Filed Sep. 21, 1990, Ser. No. 700,174
Claims priority, application Japan, Oct. 4, 1989, 1-259825
Int. Cl.[5] H01S 3/22
U.S. Cl. 372—58 32 Claims



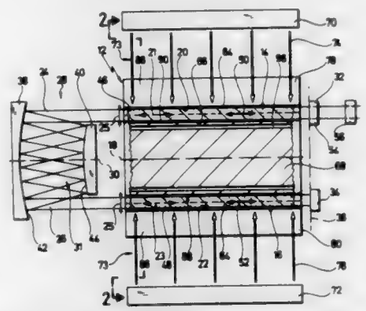
1. A turbo blower for a laser, comprising a rotatable shaft having an impeller on one end therof, a pair of bearings supporting said shaft, a motor for rotating said shaft, and a heat radiating fin structure mounted on said shaft for rotation therewith.

5,206,874

SOLID-STATE LASER

Hans Opower, Krailling, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt, Bonn, Fed. Rep. of Germany

PCT No. PCT/DE91/00595, § 371 Date Mar. 6, 1992, § 102(e) Date Mar. 6, 1992, PCT Pub. No. WO92/02062, PCT Pub. Date Feb. 6, 1992
PCT Filed Jul. 17, 1991, Ser. No. 838,303
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4022818
Int. Cl.[5] H01S 3/093
U.S. Cl. 372—72 74 Claims



1. Solid-state laser comprising a laser-active unit with a laser amplification volume (**46, 48, 216**) extending in a first direction in a solid, a pump means (**174, 192, 218**) associated with said laser amplification volume (**46, 48, 216**) for exciting said laser amplification volume and a resonator (**152, 262, 300**) with an

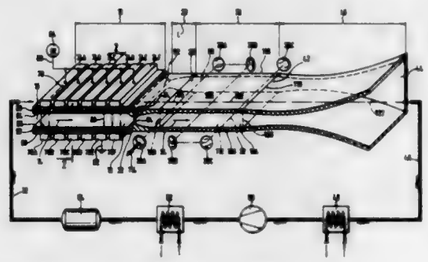
excitation section (**14, 16, 280**) arranged between its resonator mirrors and a beam (**20, 22, 294**) extending in a direction of propagation (**21, 23 296**) in said excitation section and thereby penetrating said laser amplification volume (**46, 48, 216**) in said first direction (**50, 52, 230**), characterized in that at least two excitation sections (**14, 16, 218**) are provided, each having one laser amplification volume (**46, 48, 216**), in that said beams (**20, 22, 294**) of said excitation sections (**14, 16, 280**) extend in spaced relation to one another, in that said resonator (**152, 262**) has a coupling section (**28, 282, 284**) containing a coherent joint beam (**121, 286**) of said resonator (**152, 262**), the cross-section thereof being comprised of several partial beams (**24, 26, 292**), and in that an optical element (**156, 288, 290**) is arranged between said coupling section (**28, 282, 284**) and each excitation section (**14, 16, 280**) for imaging one of said partial beams (**24, 26, 292**) of said joint beam (**121, 286**) into one of said beams (**20, 22, 294**) extending in spaced relation to one another in said excitation sections (**14, 16, 280**).

5,206,875

GASDYNAMIC CO LASER

Hartwig Von Buelow, Tuebingen, and Eberhard Zeyfang, Reichenbach, both of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Aug. 30, 1991, Ser. No. 751,812
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1990, 4028054
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—90 23 Claims



1. A gasdynamic CO laser comprising:

an excitation region;

means for exciting a laser gas supplied to said excitation region;

a supersonic nozzle in series with said excitation region for receiving said laser gas;

a laser active region in series with said supersonic nozzle and excitation region, said laser active region being penetrated by a resonator beam path; and

a closed laser gas circuit for cyclically conducting said laser gas through said series coupled excitation region, supersonic nozzle and laser active region;

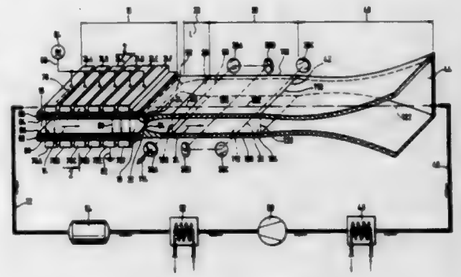
wherein said supersonic nozzle has a cross sectional profile along its length for providing said laser gas at a temperature of approximately 80° Kelvin to approximately 180° Kelvin at an outlet thereof.

5,206,876

GASDYNAMIC CO LASER

Hartwig von Buelow, Tuebingen; Eberhard Zeyfang, Reichenbach, and Wolfram Schock, Boeblingen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Aug. 30, 1991, Ser. No. 751,827
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1990, 4028053
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—90 15 Claims



1. A gasdynamic CO laser comprising:

an excitation region having a high frequency discharge within region;

means for providing a high frequency discharge within said high frequency discharge region for exciting a laser gas supplied thereto;

a supersonic nozzle arranged downstream of said excitation region, said high frequency discharge region ending in front of the supersonic nozzle; and

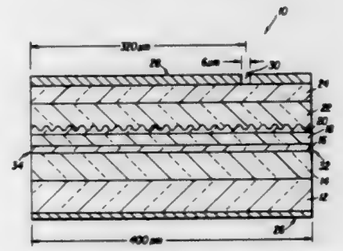
a laser active region penetrated by a resonator beam path downstream of said high frequcny discahrge region.

5,206,877

DISTRIBUTED FEEDBACK LASER DIODES WITH SELECTIVELY PLACED LOSSY SECTIONS

Keith B. Kaben, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1992, Ser. No. 836,568
Int. Cl.[5] H01S 3/08, 3/19
U.S. Cl. 372—96 8 Claims



1. A distributed-feedback semiconductor laser diode comprising:

(a) a semiconductor substrate of a first conductivity type;

(b) a lower cladding layer of such first conductivity type deposited on the semiconductor substrate;

(c) a semiconductor active layer formed on the lower cladding layer;

(d) a barrier layer of a second conductivity type deposited on the semiconductor active layer;

(e) a grating layer of such second conductivity type deposited on the barrier layer;

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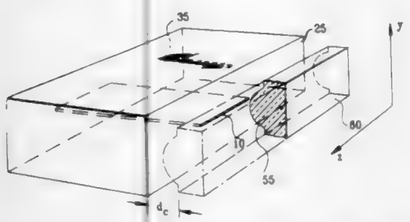
(f) an upper cladding layer of such second conductivity type deposited on the grating layer;
(g) a capping layer of such second conductivity type formed on the upper cladding layer;
(h) an electrically conductive layer formed on the substrate; and
(i) a patterned electrically conductive layer deposited on the capping layer, selectively forming a lossy section, such that electrical contact is absent for a small longitudinal section of the capping layer.

5,206,878

WIDE STRIP DIODE LASER EMPLOYING A LENS

Theodore Sizer, II, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 11, 1991, Ser. No. 774,929
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—101 **12 Claims**



1. An external cavity diode laser having a broad quantum wells strip between a first facet, which is at least partially reflective, and a second facet parallel to said first facet, strip appears at the second facet with a cross section having a long measure along a first axis and a short measure along a second axis that is perpendicular to the first axis, and a focusing means having a columnar portion with a long dimension along a longitudinal axis and a cross section perpendicular to the longitudinal axis that arrest divergence of light along said second axis, situated in proximity to said second facet with its longitudinal axis parallel to said first axis, characterized in that

a principal plane of said focusing means, lying in the plane of said first axis and said second axis, is situated approximately at a distance d_c from said second facet, with d_c being the distance from said second facet where the girth of a light beam emanating from said optically emitting area is substantially the same in the direction of said first axis and said second axis.

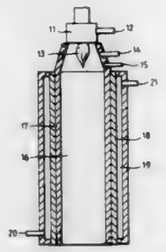
5,206,879

DESTRUCTION PROCESS

John R. Moody; Allan P. George, both of Billingham; Robert H. Peeling, Stockton On Tees, and Stephen M. Jones, Middlesbrough, all of England, assignors to Tioxide Group Services Limited, London, England

Filed Jul. 23, 1991, Ser. No. 734,459
Claims priority, application United Kingdom, Aug. 3, 1990, 9017146
Int. Cl.[5] H05B *7/00*
U.S. Cl. 373—22 **12 Claims**

1. A process for the destruction of chemical waste comprising the steps of forming an electric plasma flame by heating a stream of gas by means of an electric discharge, said gas comprising at least 70% by weigh oxygen, introducing the chemical waste in liquid form by means of a two-fluid atomiser into the electric plasma flame, introducing an amount of oxygen into the electric plasma flame to form a reaction mixture of oxygen and chemical waste, the amount of oxygen being sufficient to ensure that the total amount of oxygen in the reaction mixture is at least 30% more than required for complete combustion of the chemical waste, maintaining the reaction mixture at a temperature of at least 1450° for at least 2 milliseconds



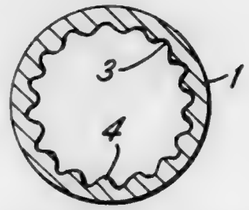
and subsequently cooling rapidly the reaction mixture to below 300° C.

5,206,880

FURNACE HAVING TUBES FOR CRACKING HYDROCARBONS

Jan-Olof Olsson, Hallstahammar, Sweden, assignor to Kanthal AB, Hallstahammar, Sweden

Filed May 13, 1991, Ser. No. 699,160
Claims priority, application Sweden, May 14, 1990, 9001728
Int. Cl.[5] F27D *7/06*
U.S. Cl. 373—111 **6 Claims**



1. A furnace for cracking hydrocarbons comprising:

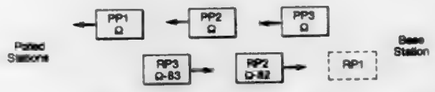
at least one seamless tube, having a wall, through which said hydrocarbons flow during intensive heating and cracking, said tube being made from an alloy having 15–30 weight percent Cr, 3–10 weight percent Al, the balance being primarily iron.

5,206,881

WIRELESS LOCAL AREA NETWORK

Steven Messenger, and Tommy Tsoulogia, both of Scarborough, Canada, assignors to Telesystems SLW Inc., Don Mills, Canada

Filed Apr. 15, 1992, Ser. No. 868,696
Int. Cl.[5] H04B *9/00*
U.S. Cl. 375—1 **23 Claims**



1. In a local area network comprising a plurality of stations each adapted to generate a PN code common to the stations, to transmit packets spread spectrum encoded with the PN code and to decode packets by combining the packets with the PN code, a method of determining phase values that synchronize the PN code of a first of the stations with a data packet transmitted through air by a second station to the first station, comprising:

transmitting from any one of the stations through air to the other stations a synchronizing packet direct sequence spread spectrum encoded with the PN code of the one station, the transmission of the synchronizing packet occurring before transmission of the data packet of the second station;

adjusting the phase of the PN code of each of the other stations prior to transmission of the data packet by the second station to a phase value synchronizing the phase of the PN code of the station with the phase of the transmitted synchronizing packet, the adjusting of the phase at each of the other stations comprising producing phase-shifted PN codes corresponding to the PN code of the station shifted in phase according to different phase values, combining the transmitted synchronizing packet with the phase-shifted PN codes to produce signals and detecting from the signals the synchronizing phase value;

searching at the first station for a phase value which synchronizes the PN code of the first station with the data packet, the searching at the first station comprising:

a. setting predetermined upper and lower bounds for a restricted set of phase values corresponding to the phase of the synchronizing packet,

b. selecting different phase values for the PN code of the first station from the restricted set,

c. producing phase-shifted PN codes corresponding to the PN code of the first station shifted in phase according to each of the phase values selected from the restricted set of phase values,

d. combining the phase-shifted PN codes with the data packet to produce signals each corresponding to a different phase value selected from the restricted set,

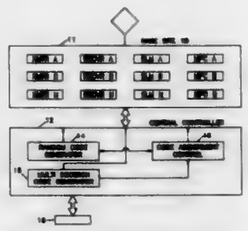
e. detecting from the signals a phase value which synchronizes the PN code with the data packet.

5,206,882

SYSTEM FOR AND METHOD OF CREATING AND ASSIGNING ADDRESS CODES IN A CELLULAR SPREAD SPECTRUM SYSTEM

Gerald R. Schloemer, P.O. Box 307, Round Lake, Ill. 60073

Filed Mar. 11, 1991, Ser. No. 667,803
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 **6 Claims**



1. A radiotelephone communication system utilizing CDMA/direct sequence spread spectrum and code division multiple access techniques comprising:

a) a plurality of base sites each having transmitters and receivers transmitting and receiving communicating signals on selected bands,

b) a plurality of first mobile units each having transmitting and receiver means transmitting and receiving communication signals on selected bands,

c) means for adding new mobile units to said system,

d) means for determining those first mobile units whose transmitted signals are above a selected threshold and which signals could potentially cause interference with said new mobile units,

e) means for generating non-correlated address codes for each new mobile unit which codes are spaced a selected minimum Hamming distance from any other code in use by said first mobile units, and

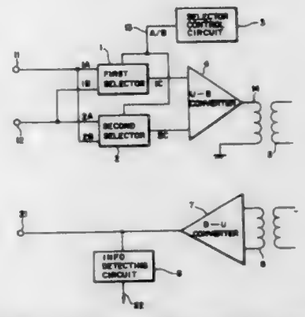
f) means for assigning non-correlated address codes to each new mobile unit.

5,206,883

VIOLATION CONTROL CIRCUIT IN ISDN

Akira Seki, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1991, Ser. No. 637,215
Claims priority, application Japan, May 8, 1990, 2-117975
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—20 **7 Claims**



1. A violation control circuit is ISDN comprising:

a first selector having a first input connected to a negative polarity pulse transmission signal and a second input connected to a positive polarity pulse transmission signal;

a second selector having a first input connected to the positive polarity pulse transmission signal and a second input connected to the negative polarity pulse transmission signal;

a selector control circuit for providing a first control signal which causes said first selector to connect the first input of the first selector to an output of the first selector and causes said second selector to connect the first input of the second selector to an output of the second selector, and for providing a second control signal which causes said first selector to connect the second input of the first selector to the output of the first selector and causes said second selector to connect the second input of the second selector to the output of the second selector;

a unipolar to bipolar converter for receiving the output of the first selector and the output of the second selector;

a transmission transformer for receiving an output of the unipolar to bipolar converter;

a receiving transformer for receiving a receiving pulse;

a bipolar to unipolar converter for receiving an output of the receiving transformer; and

an INFO detecting circuit connected to an output of the bipolar to unipolar converter.

5,206,884

TRANSFORM DOMAIN QUANTIZATION TECHNIQUE FOR ADAPTIVE PREDICTIVE CODING

Bangalore R. R. U. Bhaskar, Gaithersburg, Md., assignor to Comsat, Washington, D.C.

Filed Oct. 25, 1990, Ser. No. 603,104
Int. Cl.[5] H04B *1/10, 1/66*
U.S. Cl. 375—34 **8 Claims**

1. An adaptive predictive coding method in which digital signals are processed before being transmitted, said method comprising the steps of:

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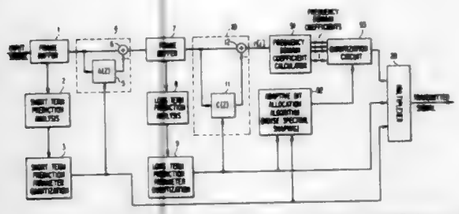
performing adaptive prediction on said digital signals by using digital filtering;

transforming resultant digital signals from said performing step into the frequency domain by calculating frequency domain coefficients corresponding to said digital signals; and

quantizing said frequency domain coefficients, in which said quantizing step is performed by using an adaptive bit



allocation algorithm whereby each of said coefficients is allocated a variable number of quantization bits by (a) comparing the power level of each coefficient with a variable threshold, (b) allocating a bit to each coefficient whose power level is greater than the threshold, (c) lowering the variable threshold once all coefficients have been compared, and (d) returning to step (a) until there are not more bits left to be allocated.

5,206,885

SELECTIVE CALL RECEIVER WITH FAST BIT SYNCHRONIZER

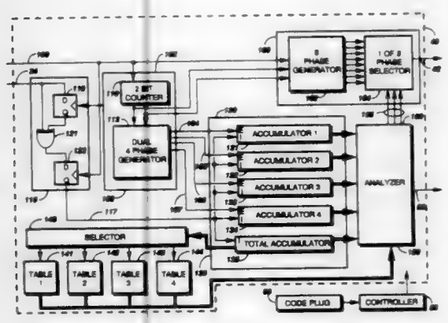
Michael J. DeLuca, and Joan S. DeLuca, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 306,124, Feb. 6, 1989, Pat. No. 5,095,498. This application Oct. 31, 1991, Ser. No. 786,316

The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.

Int. Cl.[5] H03D *1/00*; H04L *7/04*

U.S. Cl. 375—95 **20 Claims**



1. A radio communications receiver comprising:

receiving means for receiving a radio frequency signal; and

signal detecting means for detecting a signal modulated onto said radio frequency signal, the signal having a plurality of digital symbols and received at a predetermined baud rate, the signal detecting means comprising:

data clock means for generating a timing signal;

phase generating means, responsive to the timing signal, for generating a reference signal having a frequency integerly related to the baud rate, the reference signal comprising a plurality of independent phase signals generated relative to the received signal;

transition detecting means responsive to the timing signal for detecting transitions which may occur between symbols and for producing an edge signal in response thereof;

counting means, coupled to said transition detecting means and said phase generating means, and having a plurality of phase accumulators, each responsive to the edge signal and one of the phase signals which is selectively coupled thereto for accumulating an edge signal count when the edge signal coincides with the phase signal selectively coupled thereto,

said counting means further including totalizing means for accumulating a total edge signal count of the number of edge signals detected with a fixed integration time interval;

controlling means for initializing said counting means and for enabling said counting means for the fixed integration time interval and for generating a completion signal at the end of the fixed integration time interval; and

analyzing means coupled to said counting means and including memory means for storing at least one table of predetermined threshold values corresponding to each of a plurality of total edge signal counts, said analyzing means responsive to the completion signal for selecting from said memory means a threshold value corresponding to the total edge signal count accumulated, and for producing a detect signal in response to the threshold value selected being exceeded by at least one of the edge signal counts accumulated within one of the plurality of phase accumulators.

5,206,886

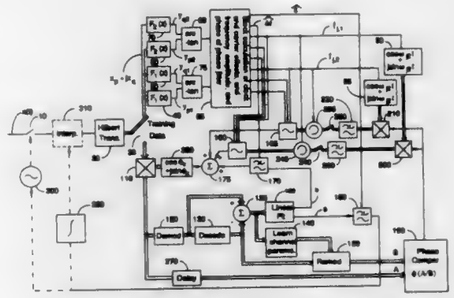
METHOD AND APPARATUS FOR CORRECTING FOR CLOCK AND CARRIER FREQUENCY OFFSET, AND PHASE JITTER IN MULICARRIER MODEMS

John A. C. Bingham, Palo Alto, Calif., assignor to Telebit Corporation, Sunnyvale, Calif.

Filed Apr. 16, 1990, Ser. No. 509,462

Int. Cl.[5] H04L *27/06*

U.S. Cl. 375—97 **20 Claims**



1. A method for estimating, and compensating for phase jitter imposed on a received multicarrier signal by imperfect components in a transmission medium, said method comprising the steps of:

(a) multiplying said multicarrier signal received during a time interval by a locally generated correcting signal to produce a corrected received multicarrier signal, in which said locally generated correcting signal is an estimate of the phase shift required to correct for the effects of said phase jitter;

(b) generating a reference signal by demodulating and then decoding said corrected multicarrier signal to produce an estimate of the transmitted data, and then remodulating said data to produce a reference signal;

(c) calculating a phase-error signal which is the difference between the phase of said correcting multicarrier signal and that of said reference signal;

(d) filtering the calculated phase-error signal of step (b) to generate an estimate of the changes required to the parameters of said locally generated correcting signal, said parameters being the amplitudes, frequencies, and phases of a plurality of components of said correcting signal, or any equivalent set which contains the same information;

(e) updating the parameters of step (d) by said changes to generate new parameters of said correcting signal; and

(f) repeating steps (a) to (e) in each subsequent time interval.

5,206,887

UNIQUE WORD DETECTION APPARATUS

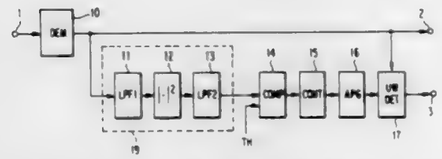
Hiroki Tsuda, and Hizuru Nawata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 591,573

Claims priority, application Japan, Sep. 26, 1989, 1-247915

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—114 **4 Claims**



1. A unique word detection apparatus for detecting a unique word out of a demodulated signal resulting from the demodulation by a demodulator, of a burst signal consisting of a carrier recovery section, a bit timing recovery section, a unique word section and a data section, comprising:

D.C. component extracting means for extracting the D.C. component of said demodulated signal;

first detecting means for detecting a transition timing to said bit timing recovery section from the output of said D.C. component extracting means and for generating a timing signal;

means for generating an aperture signal with which to estimate the position of the unique word contained in said demodulated signal on the basis of said timing signal; and

second detecting means for detecting the unique word out of said demodulated signal on the basis of said aperture signal.

5,206,888

START-STOP SYNCHRONOUS COMMUNICATION SPEED DETECTING APPARATUS

Masayoshi Hiraguchi, Tokyo, and Masanori Hattori, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Oct. 30, 1991, Ser. No. 784,922

Claims priority, application Japan, Oct. 31, 1990, 2-291855

Int. Cl.[5] G04F *10/04*

U.S. Cl. 377—20 **7 Claims**

1. A start-stop synchronous communication speed detecting apparatus comprising:

a counter for counting a time period, in which received data is a space polarity, in start-stop synchronous communication;

speed determining means for comparing the count value with a time per bit of a specified communication speed;

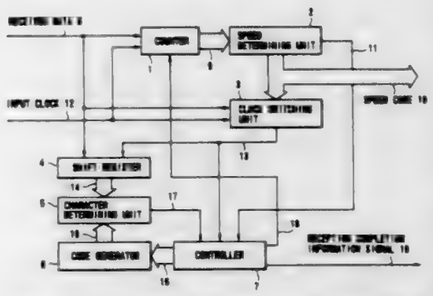
clock switching means for selecting a clock synchronized with a start bit of the received data and having the same frequency as that of the specified communication speed;

a shift register for storing the received data;

character determining means for comparing a received character from said shift register with a predetermined character;

code generating means for supplying codes of first to Nth characters to said character determining means; and

a controller for counting received characters by the output clocks from said clock switching means and informing said code generating means of the number of characters,



generating a reception completion information signal upon receiving a predetermined character string without any abnormality, and outputting a signal for initializing said counter by a signal indicating abnormality in said speed determining means and said character determining means.

5,206,889

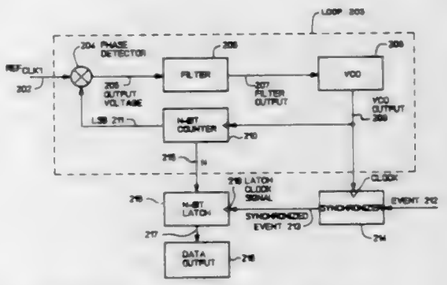
TIMING INTERPOLATOR

Mark A. Unkrich, Redwood City, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 17, 1992, Ser. No. 822,376

Int. Cl.[5] H03K *5/135*

U.S. Cl. 377—20 **18 Claims**



1. An apparatus for timing an event, comprising:

a phase-locked loop for producing a high frequency signal phase-locked to a low frequency signal;

an N-bit counter for counting edges of the high frequency signal to produce a count value, wherein the N-bit counter comprises means for generating a least significant bit of the count value;

a phase detector, coupled to the N-bit counter, for generating an output signal proportional to a phase difference between the low frequency signal and the least significant bit;

a voltage controlled oscillator, coupled to the phase detector, for producing the high frequency signal from the output signal; and

an N-bit latch for latching the count value from the N-bit counter upon receiving the event.

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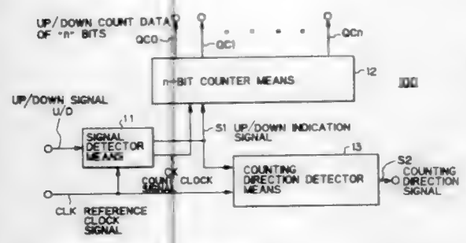
5,206,890

COUNTER CIRCUIT WITH DIRECTION OF COUNT INDICATION

Atsushi Fujita, Hachioji, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1991, Ser. No. 723,078
Claims priority, application Japan, Jun. 29, 1990, 2-174283
Int. Cl.[5] H03K *21/02, 21/08, 21/18*
U.S. Cl. 377—45 12 Claims



1. A counter circuit comprising:

a signal detector means for providing an up/down indication signal and a count clock signal according to an up/down signal and a reference clock signal input thereto;

an n-bit counter means, connected to said signal detector means, for providing up/down count data of "n" bits according to the up/down indication signal and count clock signal; and

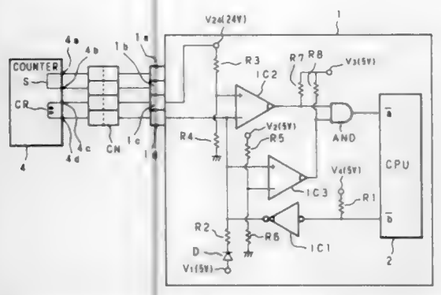
a counting direction detector means, connected to said signal detector means and said reference clock signal input, for providing a counting direction signal according to the up/down indication signal and reference clock signal.

5,206,891

OPERATIONAL CONTROL COUNTER CIRCUITRY FOR ELECTRICAL APPARATUS

Hiroyuki Kishimoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 22, 1991, Ser. No. 780,195
Claims priority, application Japan, Oct. 23, 1990, 2-286576
Int. Cl.[5] G06M *3/02*
U.S. Cl. 377—55 17 Claims



1. An electrical apparatus for performing a specific operation, comprising:

a counter for counting a number of said specific operations;

a counter driving circuit being connected to said counter and supplying a driving voltage to said counter on the basis of an actuating signal;

monitoring means for monitoring a voltage at a predetermined position of said counter driving circuit and outputting a result; and

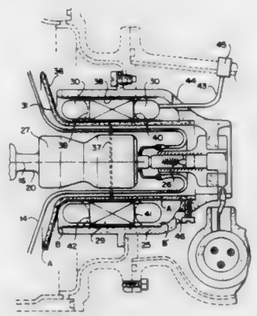
controlling means for controlling allowance of or prohibition of said specific operation in accordance with said result of said monitoring means.

5,206,892

DEVICE FOR THE SHIELDING OF A MOTOR STATOR FOR THE ROTATING ANODE OF AN X-RAY TUBE

Christine Guerin, Issy les Moulineaux; Jacques Le Guen, Paris, and Bernard Pouzergues, Villemoisson sur Orge, all of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France

Filed Apr. 16, 1992, Ser. No. 869,445
Claims priority, application France, Apr. 17, 1991, 91 04734
Int. Cl.[5] H01J *35/16*
U.S. Cl. 378—131 7 Claims



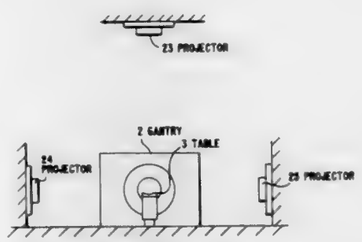
1. A device for the shielding, in an X-ray tube with rotating anode, of a stator, having a magnetic circuit and coil, of a driving motor of the rotating anode borne by the rotor of said motor, wherein said device comprises at least one metal film that encases the stator and is interposed between, firstly, said stator and, secondly, the anode and the rotor.

5,206,893

RADIOTHERAPEUTIC APPARATUS HAVING THREE DIMENSIONAL LIGHT MARKS

Yukihiro Hara, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP90/00856, § 371 Date Dec. 9, 1991, § 102(e) Date Dec. 9, 1991, PCT Pub. No. WO91/00057, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 29, 1990, Ser. No. 778,212
Claims priority, application Japan, Jun. 30, 1989, 1-170746
Int. Cl.[5] A61N *5/10*
U.S. Cl. 378—65 2 Claims



1. In a radiotherapeutic system comprising

a source of radiation for radiating a selected region of a body;

a table comprising a first part on which said body is positioned for radiation treatment; and a second part;

an X-ray CT for providing a multislice scan to said body placed on said second part of said table for examination, to thereby provide multiple tomographic images of said body including regions thereof of interest; and

calculating means for using the multiple tomographic images of the body, including the regions of interest, to calculate three-dimensional coordinates of the center of the region of interest and the calculated perspective image thereof as seen from an imaginary center of projection corresponding to the position of the source of radiation; the improvement comprising

positioning means including projecting means for projecting three dimensional markings using at least three light beams to mark the surface of said body, one of said light beams projecting in one plane, and the other two light beams projecting on opposite sides of said body, with at least another of said light beams projecting in another plane which is perpendicular to said one plane, said marking being at places on the surface of said body determined by said three dimensional coordinates of the center of the region of interest;

means for drawing marks on the surface of said body at the places where the at least three light beams marked the surface of said body;

means for placing said body on said first part of said table in a position such that the center position of the region of interest as determined by the drawn marks coincides with the center of rotation of a gantry of said table;

collimator means having a variable aperature for emitting radiation therethrough to said body; and

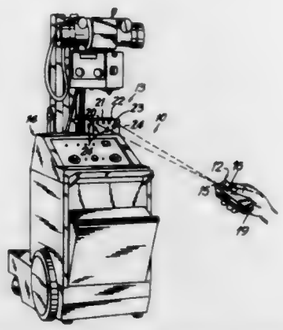
controller means for controlling the aperature of said collimator means in accordance with the calculated perspective image data supplied by said calculating means so that the radiation is controlled so as to imping accurately on a selected region of said body; whereby diagnosis, planning and treatment are all performed on an on-line basis so that reliability, accuracy and execution are enhanced and error is decreased.

5,206,894

X-RAY SYSTEM ACCESSORY

E. Louis Makrinos, Old Greenwich, Conn., and John Simonton, Arcadia, Okla., assignors to Remote Technologies, Inc., a CT Corp., Greenwich, Conn.

Filed Apr. 16, 1992, Ser. No. 869,999
Int. Cl.[5] H05G *1/66*
U.S. Cl. 378—93 6 Claims



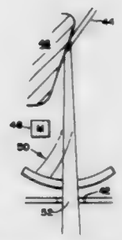
1. An electromagnetic remote control system adapted to transmit an electromagnetic signal for exposure of a mobile X-ray unit having a rotor preparation means and exposure initiate means for producing a radiographic exposure comprising in combination: transmitter means including a manually operated switch means for selectively transmitting a first electromagnetic signal and a second electromagnetic signal and receiver means adapted to be selectively electrically coupled to the mobile X-ray unit and adapted for receiving said first and second electromagnetic signals and in response to said first electromagnetic signal said receiving means is required to effect rotation of said rotor preparation means, and in response to said second electromagnetic signal said receiving means is required to effect excitation of said exposure initiate means to produce a radiographic exposure, said receiver means including deactivation means for deactivating the rotor means when said second electromagnetic signal is delayed beyond a predetermined time interval after said first electromagnetic signal, said deactivation means being further adapted to deactivate the exposure initiate means when said second electromagnetic signal is interrupted.

5,206,895

X-RAY TUBE

Michael Danos, 7525 Spring Lake Dr., Bethesda, Md. 20817

Continuation of Ser. No. 571,705, Aug. 24, 1990, Pat. No. 5,128,977. This application Nov. 19, 1991, Ser. No. 794,504
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] H01J *35/02*
U.S. Cl. 378—121 30 Claims



1. The method of increasing the X-ray emission power of an X-ray tube for the same X-ray emission geometry and target heat load as used in present-day X-ray tubes comprising the steps of

forming a beam of electrons,

aiming the beam of electrons at an X-ray producing target at an angle to the surface of the target determined by the Monte Carlo formula to produce the maximum X-ray beam power per unit of heat deposited in the target,

focusing the beam of electrons to a focal spot on the target surface, with the same size and uniformity as obtained with an incident electron beam angle to anode of 80°,

utilizing the photons emitted from the target at an angle of elevation of approximately 7° to 13° to the surface of the target.

5,206,896

IMMOBILIZATION OF DOMESTIC ANIMALS IN A BED OF FLUIDIZABLE SOLID PARTICLES

Thomas S. Hargest, P.O. Box 21118, Charleston, S.C. 29413

Filed Dec. 13, 1991, Ser. No. 808,011
Int. Cl.[5] H05G *1/00*; G03B *42/02*
U.S. Cl. 378—180 10 Claims

7. Apparatus for immobilizing at least a portion of a domestic animal for treatment, comprising means for creating a fluidized bed of solid particles of sufficient size to submerge at least a portion of the body of a domestic animal therein, means for de-fluidizing the bed of solid particles to immobilize the por-

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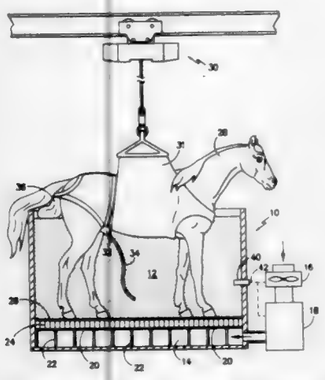
tion of the animal in the solid particles for desired period of time, means for re-fluidizing the bed of solid particles, and



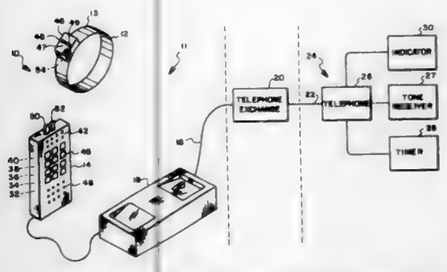
means for removing a portion of body of the animal from the fluidized bed.

5,206,897

HOME INCARCERATION SYSTEM

Noel Goudreau, 2 Turnbridge Turn, Bourbonnais, Ill. 60914, and Dale Monty, 671 Bishop Ct., Bradley, Ill. 60915

Filed Aug. 2, 1991, Ser. No. 739,423
Int. Cl.[5] H04M *11/04, 1/26;* G08B *23/00*
U.S. Cl. 379—38 10 Claims



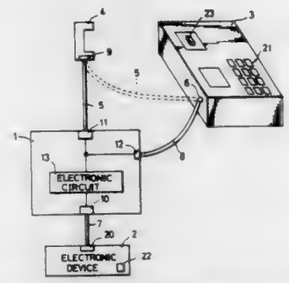
1. In a monitoring system for reporting the presence of an incarceree at a remote location, the system having
a central office with a central telephone,
a remote telephone at said remote location,
means for establishing a telephone link between the central telephone and the remote telephone,
means associated with said remote telephone for generating a verification signal, and
means associated with said central telephone for recognizing said verification signal,
means for identifying the incarceree, comprising:
an incarceree identifier, attached to the incarceree with an electrical component having a selected electrical characteristic;
a comparator circuit associated with said remote telephone for generating a comparison signal;
a reference electrical component connected with said comparator circuit and having an electrical characteristic which matches the selected electrical characteristic of the incarceree identifier electrical component;
means for connecting said incarceree identifier with said comparator circuit to compare the electrical characteristics of the identifier and reference electrical components; and
means responsive to said comparison signal from said comparator circuit for triggering said verification signal generating means when the characteristic of said incarceree identifier electrical component matches the electrical characteristic of the reference component,
wherein the remote telephone includes a tone generator actuated by said means responsive to said comparison signal from said comparator circuit and providing a verification signal transmitted to said central office over said telephone link, and
wherein said means responsive to said comparison signal from said comparator circuit includes a timer, and having a switch connected to an output of the timer, the switch actuating the tone generator to provide the verification signal.

5,206,898

TRANSMISSION CONTROL UNIT

Noriaki Nishijima, Kawanishishi, Japan, assignor to Shirohato Yakuhiin Co., Ltd., Osaka, Japan

Continuation of Ser. No. 527,534, May 23, 1990, abandoned.
This application Oct. 30, 1991, Ser. No. 784,063
Claims priority, application Japan, May 26, 1989, 1-61098[U]
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—90 3 Claims



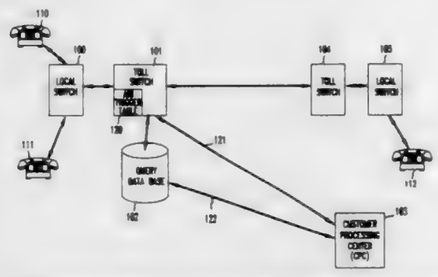
1. A transmission control unit, for controlling the transmission and reception of analog electronic data between an electronic device and a main telephone unit having an electronically detachable handset without any use of acoustic coupling, comprising:
a first terminal for detachably connecting the transmission control unit electronically to the main telephone unit;
a second terminal for detachably connecting the transmission control unit electronically to the handset when the handset is electronically detached from the main telephone unit;
a third terminal for detachably connecting the transmission control unit electronically to the electronic device; and
an electronic circuit interconnecting said first, second, and third terminals and having switching means for connecting the first terminal only to the third terminal when analog electronic data is to be transmitted from the electronic device to the main telephone unit, and connecting the first terminal only to the second terminal when analog electronic data is not to be transmitted from the electronic device to the main telephone unit, said switching means being electronically responsive to a switching signal received from the electronic device through said third terminal for connecting said first terminal to said third terminal when analog electronic data is to be transmitted from the electronic device to the main telephone unit,
wherein the electronic device has a transmit button which is pushed to generate a transmit command in order to effect transmission of analog electronic data from the electronic device to the main telephone unit,
wherein said switching means includes a relay coupled to a switch group which is normally in an OFF position connecting said first terminal to said second terminal and which is responsive to the transmit command for effecting transmission from the electronic device through said third terminal for switching to an ON position disconnecting said first terminal from said second terminal and connecting said first terminal only to said third terminal when analog electronic data is to be transmitted from the electronic device to the main telephone unit, and further,
wherein said electronic circuit includes a current-adjusting power source coupled between said third terminal and said switching means for adjusting a suitable loop current of the electronic device provided to said third terminal, so that said transmission control unit can be connected to any type of electronic device without requiring a matching modification thereof.

5,206,899

ARRANGEMENT FOR OUTBOUND TELECOMMUNICATIONS

Alok K. Gupta, Marlboro; Patricia D. Saleh, Holmdel, and Barry S. Seip, New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 5, 1991, Ser. No. 755,407
Int. Cl.[5] H04M *3/42, 15/16*
U.S. Cl. 379—120 20 Claims



1. In a telecommunications system, apparatus for altering the features provided to outbound telephone calls originating from a target station and routed to a destination via a switch, said apparatus comprising:
a database arranged to store a record indicative of the features to be applied to calls originated from said target station and processed in said switch,
means in said switch responsive to automatic number identification (ANI) information associated with a call originated from said target station for retrieving said record from said database and applying said features to said call, and
means for updating said record in said database in response to a call initiated from a station other than said target station.

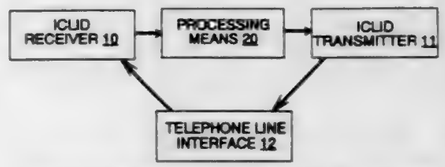
5,206,900

AUTOMATED ATTENDANT

David Callele, 2014 Cairns Avenue, Saskatoon, Saskatchewan, Canada

Filed May 31, 1991, Ser. No. 708,722
Int. Cl.[5] H04M *1/64, 1/57*
U.S. Cl. 379—142 14 Claims

1. A telephone interface apparatus for interfacing a telephone to the public switched telephone network comprising:
line interface means for interfacing the apparatus with the public switched telephone network;
data receiver means for receiving at least signalling information over the telephone network;
line state control means for placing the telephone interface apparatus in an off-hook and an on-hook condition;
dialling signal means for generating dialling signals onto the public switched telephone network;
logic control means including stored program means for interpreting received signalling information and controlling the status of the line state control means and the generation of dialling signals via the dialling signal means in accordance with preprogrammed instructions of the stored program means and in accordance with the received signalling information, said apparatus including



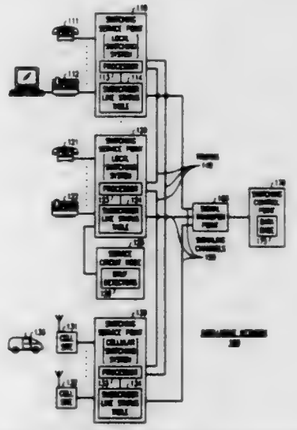
confirmation signal generating means for generating a confirmation signal over the public switched telephone network while the line state control means has placed the apparatus momentarily in the off-hook condition for a period of time sufficient for the confirmation signal to be generated, in order to acknowledge receipt of the signalling information,
whereby, in accordance with preprogrammed instructions of the stored program means and in accordance with the signalling information, if an incoming telephone call is not answered, a confirmation signal may be generated.

5,206,901

METHOD AND APPARATUS FOR ALERTING MULTIPLE TELEPHONES FOR AN INCOMING CALL

John B. Harlow, Middletown; Murthy Kolipakam, East Brunswick; Sankara R. Polepalle, Holmdel, and Goerge Y. Wyatt, Howell, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1991, Ser. No. 812,787
Int. Cl.[5] H04M *3/42, 7/00*
U.S. Cl. 379—211 9 Claims



1. A method for providing alerting signals at a plurality of telephones, said method comprising:
responsive to receiving an incoming call comprising a destination directory number at a local switching system, translating said destination directory number into one or

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more previously stored identifications of lines served by said local switching system and one or more previously stored directory numbers not served by said local switching system said identified lines and directory numbers being associated with said destination directory number;

alerting said one or more identified lines;

placing outgoing calls to said one or more directory numbers; and

terminating said incoming call to said one or more identified lines and directory numbers from which an answer is detected.

5,206,902

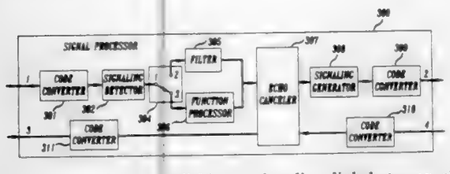
NETWORK SIGNALING ARRANGEMENT FOR CONTROLLING TANDEM NETWORK FUNCTIONS

Duane O. Bowker, Neptune City, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 1, 1991, Ser. No. 677,903

Int. Cl.[5] H04M *3/22, 7/00;* **H04Q** *1/54*

U.S. Cl. 379—220 **13 Claims**



1. A method of establishing a signaling link between elements contained in a communications network connection so that one such element may notify succeeding elements in the connection that a particular network function has been performed, said method comprising the steps of

responding at one of said elements to receipt of speech signals by subjecting said speech signals to a predetermined network function, and

establishing said signaling link between said one of said elements and a next one of said elements in said connection by combining said speech signals after they have been subjected to said predetermined function with said signaling link and then passing said combination to said next one of said elements.

5,206,903

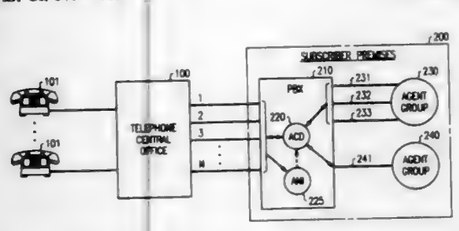
AUTOMATIC CALL DISTRIBUTION BASED ON MATCHING REQUIRED SKILLS WITH AGENTS SKILLS

Joylee E. Kohler, Broomfield, Colo.; Eugene P. Mathews, Barrington, Ill.; Robert D. Nalbone, Thornton, and Craig F. Palmer, Arvada, both of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 26, 1990, Ser. No. 633,918

Int. Cl.[5] H04M *3/00, 3/42;* **H04Q** *3/64*

U.S. Cl. 379—309 **15 Claims**



1. In automatic call distributing equipment, a method for routing incoming telephone calls to available agents, an available agent being an agent that is presently able to accept an incoming telephone call, the method comprising the following steps:

entering calls to a particular telephone number into a first queue for service by a first group of agents;

associating first and second call-skill indicators with each incoming call, each call-skill indicator representing a particular need of the caller;

associating at least one agent-skill indicator with each agent, the agent-skill indicator representing a particular ability of the agent deemed useful in satisfying a need of the caller;

searching the agent-skill indicators of the available agents for a match with the first call-skill indicator of the incoming call;

after a first time interval has expired without finding a match with the first call-skill indicator, expanding the search of agent-skill indicators to include one that matches the second call-skill indicator; and

connecting the incoming call to the available agent possessing an agent-skill indicator that matches the first or second call-skill indicator of the incoming call.

5,206,904

APPARATUS FOR DRIVING A SERVICE FUNCTION UNIT OF A MULTI-FUNCTION TELEPHONE SET

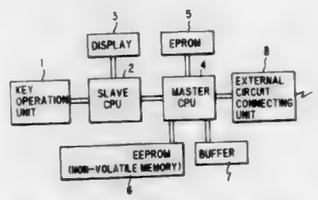
Noriko Koma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,571

Claims priority, application Japan, Dec. 20, 1989, 1-330154

Int. Cl.[5] H04M *1/26*

U.S. Cl. 379—355 **8 Claims**



1. An apparatus for driving a service function unit of a multi-function telephone set, comprising:

a memory for storing service information generated by pushing a plurality of keys;

at least one programmable key for reading said service information from said memory; and

means for controlling said service function unit to be driven in accordance with said service information which is read from said memory by said programmable key,

wherein said controlling means includes a master controlling unit for controlling main operation of said telephone set, and a slave controlling unit provided between said master controlling unit and a key operation unit having said plurality of keys and for controlling auxiliary operation of said telephone set, said service information being supplied from said master controlling unit to said slave controlling unit together with an echo-back command, said slave controlling unit processes said service information simultaneously with the returning of said service information to said master controlling unit.

5,206,905

PASSWORD PROTECTED DEVICE USING INCORRECT PASSWORDS AS SEED VALUES FOR PSEUDO-RANDOM NUMBER GENERATOR FOR OUTPUTTING RANDOM DATA TO THWART UNAUTHORIZED ACCESSES

Robert D. Lee, Denton; Stephen M. Curry, Dallas, and Scott J. Curry, Coppell, all of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Continuation-in-part of Ser. No. 352,581, May 15, 1989, and a continuation-in-part of Ser. No. 351,759, May 15, 1989, Pat. No. 4,982,371, and a continuation-in-part of Ser. No. 351,760, May 15, 1989, Pat. No. 5,091,771, and a continuation-in-part of Ser. No. 351,998, May 15, 1989, Pat. No. 4,972,377, and a continuation-in-part of Ser. No. 352,598, May 15, 1989, Pat. No. 4,945,217, and a continuation-in-part of Ser. No. 352,596, May 15, 1989, Pat. No. 4,948,954, and a continuation-in-part of Ser. No. 351,999, May 15, 1989, Pat. No. 5,045,675, and a continuation-in-part of Ser. No. 352,142, May 15, 1989, Pat. No. 4,995,004, and a continuation-in-part of Ser. No. 351,997, May 15, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,606

Int. Cl.[5] G06F *12/14*

U.S. Cl. 380—4 **4 Claims**

1. An electronic key device, comprising:

a memory;

a pseudo-random number generator, connected to receive a seed value and to output a number which is strictly dependent on said seed value, but which is a nonlinear and non-monotone function of said seed value;

external connections for receiving a password, and external connections for outputting data;

a digital comparator, connected to compare a received password with a stored value, and (1) to enable output of data from said memory when said password does match said stored value and (2) to enable output of data from said pseudo-random number generator when said password does not match said stored value; said pseudo-random number generator being connected to receive said password and to use said password as said seed value such that a unique set of data is output from said pseudo-random number generator for each non-identical password.

5,206,906

VIDEO SCRAMBLING SYSTEM

Bruce E. McNair, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 31, 1991, Ser. No. 816,420

Int. Cl.[5] H04N *7/167;* **H04K** *1/06*

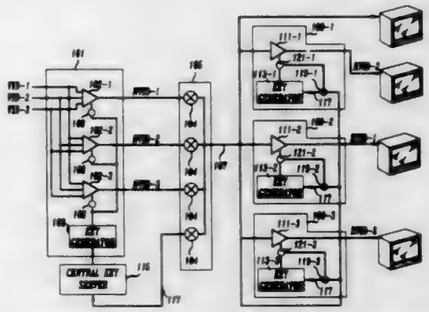
U.S. Cl. 380—14 **38 Claims**

1. Apparatus for use in cryptographically scrambling at least three signals to obtain an output signal, each of said at least three signals being divided into predetermined portions, the apparatus comprising:

means for generating a selection signal cryptographically, said means for generating employing a cryptographic algorithm responsive to a set of controlling parameters for generating said selection signal;

means responsive to said selection signal for selecting portions from each signal of said at least three signals to obtain said output signal; and

means for developing and updating said set of controlling



parameters and for securely delivering said controlling parameters, out-of-band with respect to said output signal and upon request, to a plurality of locations, one of said locations being said means for generating.

5,206,907

TELEVISION SIGNAL SCRAMBLING METHOD AND APPARATUS

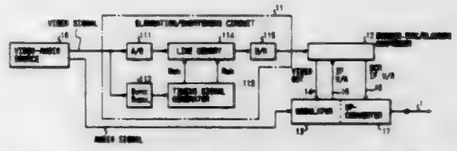
Takashi Hashimoto, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 30, 1991, Ser. No. 693,879

Claims priority, application Japan, May 10, 1990, 2-118697

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—14 **17 Claims**



1. A scrambling apparatus of a television signal including a video signal and an audio signal, comprising:

analog-to-digital conversion means for converting a first video signal to a digital signal;

memory means for storing the digital signal;

timing generating means for providing a write clock and a read clock to the memory means to write the digital signal to and read the digital signal from the memory means, the provision of the read clock or write clock being temporarily suspended so that a corresponding part of the read-out digital signal is elongated or shortened, respectively, to change the length of a line of the video signal;

digital-to-analog conversion means for converting the digital signal output from the memory means to a second video signal; and

scrambling means for compressing a horizontal sync signal portion and/or a vertical blanking interval portion of the second video signal by a predetermined amount.

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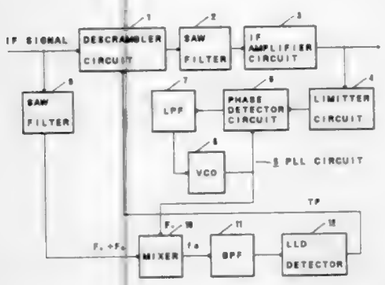
5,206,908

METHOD AND APPARATUS FOR DETECTING TIMING PULSES FOR SCRAMBLED TELEVISION SYSTEM

Ryuji Kikuchi; Nobuo Uee; Fujinori Ozawa, and Tomonori Suzuki, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,585
Claims priority, application Japan, Jan. 9, 1991, 3-11615
Int. Cl.[5] H04N 7/167
U.S. Cl. 380—15 8 Claims



1. An apparatus for detecting timing pulses for descrambling a scrambled intermediate frequency (IF) television signal having at least a video IF signal component, a sound IF signal component, and timing pulses amplitude modulated (AM) on said sound IF signal, the apparatus comprising:
- a first filter circuit for separating a video IF signal from a scrambled television IF signal through a descrambler circuit;
- a second filter circuit for separating a sound IF signal from the scrambled television IF signal;
- a PLL (phase-locked loop) circuit for generating a local oscillation signal having a video carrier frequency in synchrony with the separated video IF signal;
- a mixer circuit for outputting a beat signal by mixing the sound IF signal separated by the second filter circuit with the local oscillation signal generated by the PLL circuit;
- a third filter circuit for separating a main sound IF signal from the beat signal output by the mixer circuit; and
- an AM demodulator circuit for demodulating timing pulses from the main sound IF signal, whereby the timing pulse is fed to the descrambler circuit and thereby the scrambled television IF signal is descrambled.

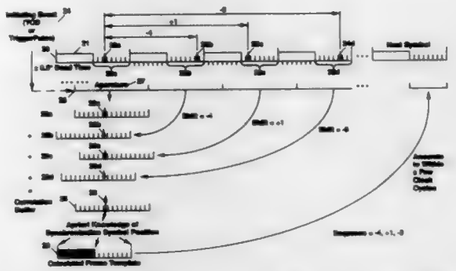
5,206,909

METHOD FOR SECURE PPM-BASED LASER COMMUNICATIONS

John A. Gates, San Jose, Calif., assignor to GTE Government Systems Corporation, Mountain View, Calif.

Filed Jan. 18, 1991, Ser. No. 643,250
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—59 9 Claims

5. A method for secure communication of data between transmitting and receiving devices in a laser communications system using pulse position modulation, comprising the steps of:
- selecting a number N (N≧1) of pulses to represent each symbol to be transmitted;
- selecting a pulse position format for each pulse of said N pulses of a synchronization symbol, such that each of said N pulses appears to be pseudo-randomly positioned within its frame;
- selecting a pulse position format for each pulse of said N pulses of each message symbol, such that each of said N pulses is pseudo-randomly positioned within its frame;
- selecting a trigger event to signal the start of a transmission;
- said number of pulses, symbol formats, and trigger event being known by both transmitter and receiver;
- initializing a transmission with a trigger signal;
- transmitting a synchronization symbol having N pulses, in N sequential frames, one pulse per frame, to a receiving device immediately after a trigger event;
- receiving and storing the first frame of pulse data of said synchronization symbol in a buffer of said receiving device;
- adding each subsequently received frame of pulse data of said synchronization symbol to pulse data previously stored in said buffer, such that the sum of said N frames is said synchronization pulse;



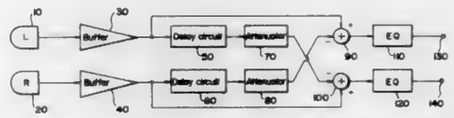
- calculating a frame template, from the stored pulse data of said first N pulses in said buffer and from said selected synchronization symbol format, for subsequent message symbols; and
- transmitting each subsequent message symbol in N frames per symbol, in said calculated frame template, the first of said frames of each message symbol being stored in said buffer, and subsequent frames being added to said stored data, such that the summed data in said buffer after receipt of said Nth frame of each message symbol represents the message symbol.

5,206,910

STEREO MICROPHONE UNIT

Ichiro Hamada, Tokyo; Kiyoshi Ohta, Kanagawa, and Yoshihiro Ono, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,756
Claims priority, application Japan, May 22, 1990, 2-132051
Int. Cl.[5] H04R 5/027
U.S. Cl. 381—26 5 Claims



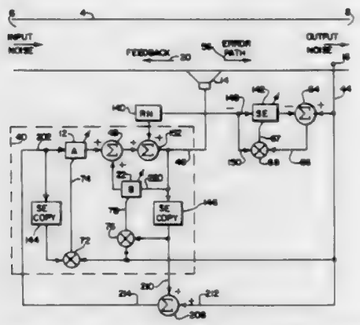
1. A stereo microphone unit for providing left and right stereo audio signals, comprising:
- a cabinet having two oppositely facing walls spaced apart by a distance determined by a wavelength of an audio signal at a predetermined crossover frequency;
- two nondirectional microphones mounted on respective walls of said cabinet so as to have said distance therebetween for detecting an outside sound signal and producing respective output signals;
- two delay circuits for respectively delaying the output signal of said microphones and forming low-pass filters having an upper cut-off frequency at said predetermined crossover frequency and producing respective outputs; and
- subtracter means for subtracting the output of each delay circuit corresponding to one microphone from the output of the other microphone, whereby left and right stereo audio signals are produced.

5,206,911

CORRELATED ACTIVE ATTENUATION SYSTEM WITH ERROR AND CORRECTION SIGNAL INPUT

Larry J. Eriksson, Madison, and Mark C. Allie, Oregon, both of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Feb. 11, 1992, Ser. No. 835,721
Int. Cl.[5] G10K 11/16
U.S. Cl. 381—71 4 Claims



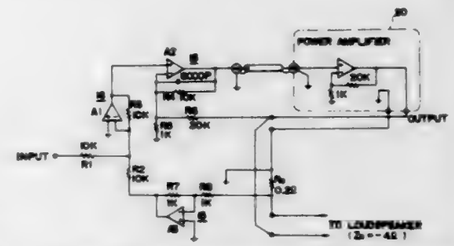
1. An active acoustic attenuation system for attenuating a correlated input acoustic wave and eliminating the need for an input transducer sensing said input acoustic wave, comprising:
- an output transducer introducing a canceling acoustic wave to attenuate said input acoustic wave and yield an attenuated output acoustic wave;
- an error transducer sensing said output acoustic wave and providing an error signal;
- an adaptive filter model having a model input, a model output outputting a correction signal to said output transducer to introduce said canceling acoustic wave, and an error input from said error transducer;
- a first summer having a first input from said model output, a second input from said error transducer, and an output outputting a resultant sum to said model input, such that said model input is provided by the sum of said correction signal and said error signal;
- an auxiliary noise source introducing auxiliary noise into said adaptive filter model;
- a second adaptive filter model adaptively modeling at least one of said output transducer and an error path between said output transducer and said error transducer;
- a copy of said second adaptive filter model in said first adaptive filter model to compensate for said one of said output transducer and said error path;
- wherein said second adaptive filter model has a model input from said auxiliary noise source, and said copy of said second adaptive filter model has an output provided to said first summer for summing with said error signal;
- wherein said first mentioned adaptive filter model comprises:
- an A filter having a filter input from said first summer, a filter output, and an error input from said error transducer;
- a B filter having a filter input from said correction signal, a filter output, and an error input from said error transducer; and
- a second summer having a first input from said filter output of said A filter, a second input from said filter output of said B filter, and an output outputting a resultant sum as said correction signal;
- and comprising:
- a first copy of said second adaptive filter model compensating said one of said output transducer and said error path in said A filter;
- a second copy of said second adaptive filter model compensating said one of said output transducer and said error path in said B filter,
- wherein said second copy of said second adaptive filter model has an output providing said first input to said first summer.

5,206,912

POWER AMPLIFIER ADAPTER

Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 15, 1990, Ser. No. 538,999
Claims priority, application Japan, Jun. 20, 1989, 1-155800
Int. Cl.[5] H04R 3/00
U.S. Cl. 381—96 5 Claims



1. An adapter used in combination with a power amplifier in order to apparently change transfer characteristics of said power amplifier when a loudspeaker is driven by said power amplifier, comprising:
- a first terminal connected to a signal source;
- a second terminal connected to a signal input terminal of said power amplifier;
- a third terminal connected to an output terminal of said power amplifier;
- a fourth terminal substantially directly connected to said third terminal and connected to said loudspeaker;
- a connecting means for connecting the first terminal with the second terminal;
- a feedback circuit, comprising current detection means for detecting a current flowing through said loudspeaker through said fourth terminal, for positively feeding back the current to the input side of said power amplifier through said second terminal; and
- a transfer characteristic correcting circuit for negatively feeding back an output of said power amplifier inputted through said third terminal to the input side of said power amplifier through said second terminal.

5,206,913

METHOD AND APPARATUS FOR LOGIC CONTROLLED MICROPHONE EQUALIZATION

Travis M. Sims, Rio Rancho, N. Mex., assignor to Lectrosonics, Inc., Rio Rancho, N. Mex.

Filed Feb. 15, 1991, Ser. No. 657,177
Int. Cl.[5] H03G 5/00
U.S. Cl. 381—103 29 Claims

1. Apparatus for equalizing a microphone channel in a sound system comprising:
- means for simultaneously providing an audio signal to a filter network and a logic input signal responsive only to an on-off state of said microphone channel to a microprocessor;
- means for selectively filtering the audio signal based solely

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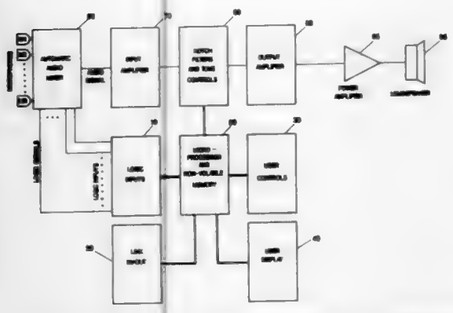
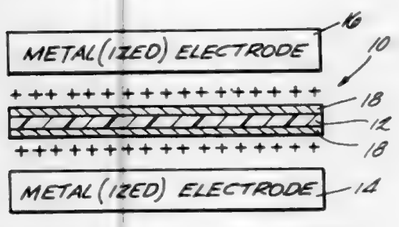
upon the logic input signal provided to said microprocessor; and



wherein said means for selectively filtering the audio signal further comprises a combination of preprogrammed filters preset by a user.

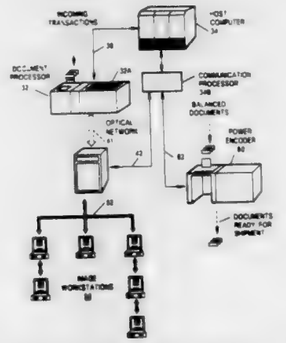
5,206,914
ELECTROSTATIC ACOUSTIC TRANSDUCER HAVING EXTREMELY THIN DIAPHRAGM SUBSTRATE
Neil K. Fortney, Madison, and Manfred W. Suhr, Oregon, both of Wis., assignors to Koss Corporation, Milwaukee, Wis.
Continuation-in-part of Ser. No. 461,197, Jan. 5, 1990. This application Aug. 1, 1991, Ser. No. 738,826
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—191 **9 Claims**



1. An electrostatic acoustic transducer comprising:
a pair of spaced apart opposing plates; and
a diaphragm connected and positioned between said plates, and spaced apart from each of said plates;
said diaphragm including a flexible substrate material of a thickness less than about 5.0×10^{-6} meters, and a material transparent to infrared energy deposited onto each side of said substrate.

5,206,915
IMQGE-BASED DOCUMENT PROCESSING SYSTEM PROVIDING LOST IMAGE RECOVERY
Norman P. Kern, Birmingham, and Donald A. Boone, Northville, both of Mich., assignors to Unisys Corporation, Detroit, Mich.
Filed Oct. 10, 1989, Ser. No. 420,090
Int. Cl.[5] G06K *9/00*; G06F *15/30*
U.S. Cl. 382—7 **8 Claims**

1. In an image based document processing system for processing blocks of documents, wherein each block comprises documents having a predetermined ordered relationship, and wherein each document includes machine-readable data thereon, a method for sorting said documents, capturing images of said documents and for recovering images which become lost or unavailable after their respective documents are sorted, said method comprising:
arranging each block of documents for sorting based on its ordered relationship;
sorting a plurality of blocks of documents into a plurality of pockets such that the documents of a block are sorted into a plurality of different pockets, thereby disturbing said predetermined ordered relationship;
said sorting including reading said machine-readable data on each document for determining the pocket to which each document is to be sorted;
capturing images of said documents during said sorting;
storing captured images so as to provide for retrievability based on said predetermined ordered relationship;
deriving document identifying data during said sorting;
also deriving document order data during said sorting indicative of said predetermined ordered relationship;

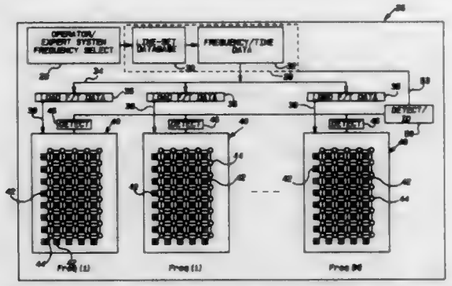


determining a sorted block of documents in said pockets which requires reimaging because documents in said block are lost or unavailable, the documents in said sorted block being in a plurality of different pockets;
collecting documents corresponding to said sorted block of documents from said pockets for resorting without reordering the collected documents into said predetermined ordered relationship,
again sorting the collected documents while capturing images thereof and deriving document identifying data therefrom during said again sorting; and
storing the captured images produced by the step of again sorting using the document identifying data derived therefrom in conjunction with the document identification data and document order data derived from the first sorting so as to provide for retrievability of the stored images based on said predetermined ordered relationship.

5,206,916
MODULAR CELLULAR AUTOMATION FOR LINE ASSOCIATION AND IDENTIFICATION
Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 22, 1991, Ser. No. 796,290
Int. Cl.[5] G06K *9/28*
U.S. Cl. 382—14 **23 Claims**

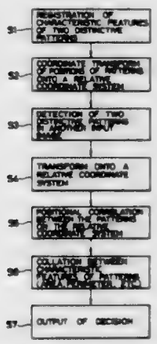
1. A system for identifying patterns in multi-dimensional data, said system comprising:
a regular two-dimensional array of interconnected processing cells and data cells, each data cell being located at a particular x-y location on a cartesian coordinate system;
input means for accepting said data, and also for transmitting said data to data cells having x-y coordinate locations which correspond to the coordinates of the data
summing means for determining the sum of multiple data values surrounding each of said data cells;

comparison means for comparing each of said sums with a threshold and for setting said sum equal to zero if said threshold is not exceeded; and



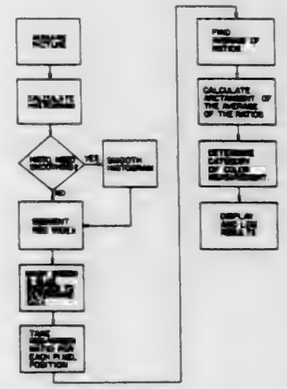
iterating means for repeating said summing and said comparison for each data cell until said sum is set to zero or said sum no longer changes on two successive iterations, whereby said data cells which remain that are not set to zero comprise said pattern in said multi-dimensional data.

5,206,917
METHOD FOR COLLATING INDEPENDENT FIGURE ELEMENTS BETWEEN IMAGES
Hiroshi Ueno, and Hisami Nishi, both of Dosbomachi, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan
Filed Apr. 10, 1991, Ser. No. 683,557
Claims priority, application Japan, Apr. 19, 1990, 2-103760
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—44 **18 Claims**



1. A method for correlating independent pattern elements in an object image with a reference image both images including elements which are not interlinked with each other, the elements of each image having a fixed positional relationship to one another, comprising steps of:
plotting said elements on orthogonal coordinates and plotting values indicative of features of each element on orthogonal feature coordinates;
selecting two distinctive independent elements in the reference image based on values indicative of features of each element plotted on said orthogonal feature coordinates;
identifying the two distinctive independent elements in the object image based on the values indicative of features of the selected elements;
defining a relative coordinate system in an image plane for each of the reference image and the object image such that a predetermined coordinate of each of the two distinctive independent elements are used to establish one axis of the relative coordinate system;
plotting the elements of each image on the relative coordinate system such that the positional relationships between the elements of each image are not altered; and
correlating pairs of independent elements between the reference image and the object image on the basis of the relative coordinate system.

5,206,918
COLOR ANALYSIS BASED UPON TRANSFORMATION TO SPHERICAL COORDINATES
Susan B. Levene, Stamford, Conn., assignor to Kraft General Foods, Inc., Northfield, Ill.
Filed Apr. 3, 1991, Ser. No. 679,888
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—17 **12 Claims**



1. A method of analyzing a detected color of an object or an image comprising:
a. scanning an object or image with a detector to measure three primary color components of each pixel of a matrix of pixels into which the object or image is divided by the detector;
b. generating a histogram for at least one of the color components by determining the number of pixels having each of a number of subdivisions of magnitude into which the at least one of the color components is divided, wherein one axis of the histogram is the number of pixels and a second axis of the histogram is each subdivision of magnitude of the at least one of the color components;
c. utilizing the generated histogram to determine an area of interest of the object or image;
d. transposing the measured primary color components in said area of interest to a spherical coordinate system, and taking the ratio of at least two color components for each pixel in said area of interest, determining the average ratio of the at least two color components for all pixels in said area of interest, and determining the average color angle within the spherical coordinate system which defines the relative hue of those at least two color components; and
e. determining whether said average color angle is within predetermined minimum and maximum values to determine if the average color angle is within an acceptable color range.

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5,206,919

IMAGE SIGNAL PROCESSING WITH DIGITAL FILTERING TO MINIMIZE ALIASING CAUSED BY IMAGE MANIPULATION

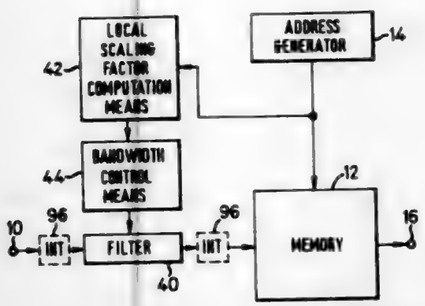
Stephen M. Keating, Reading, England, assignor to Sony Broadcast & Communications Limited, Viables, England

Filed Apr. 24, 1991, Ser. No. 690,579

Claims priority, application United Kingdom, May 30, 1990, 9012025

Int. Cl.[5] G06K 9/36

U.S. Cl. 382—46 14 Claims



1. An image processing apparatus for manipulating an input image by rotating and/or compressing said input image, said apparatus comprising:

receiving means for receiving a digital input signal having a plurality of words representing said input image in which each of said words has a respective position with horizontal and vertical coordinates; and

manipulating means for manipulating said input image so as to form a manipulated image, said manipulating means including address generating means for generating respective addresses for successive words of said digital input signal; local scaling factor computation means computing respective horizontal and vertical local scaling factors representing amounts of compression and rotation in horizontal and vertical directions, respectively, for successive local areas of said manipulated image based on sets of said addresses generated for sets of said words of said input image in which each of said sets of said words includes first and second words that are horizontally spaced in said input image and a third word that is aligned vertically with said second word in said input image, each of said horizontal local scaling factors corresponding to the length of a line that extends perpendicularly from a line passing through the respective positions of said second and third words to the position of said first word in each of said successive local areas in said manipulated image and each of said vertical local scaling factors corresponding to the length of a line that extends perpendicularly from a line passing through the respective positions of said first and second words to the position of said third word in each of said successive local areas in said manipulated image; bandwidth control means responsive to the successive horizontal and vertical local scaling factors for generating horizontal and vertical bandwidth control signals; and a digital filter having variable horizontal and vertical bandwidths for respectively varying said horizontal and vertical bandwidths in response to said horizontal and vertical bandwidth control signals and for performing two-dimensional filtering of said digital input signal so as to minimize the amount of aliasing errors that would be caused by the manipulation of said local areas.

5,206,920

INTEGRATED OPTICAL ARRANGEMENT FOR DEMULTIPLEXING A PLURALITY OF DIFFERENT WAVELENGTH CHANNELS AND THE METHOD OF MANUFACTURE

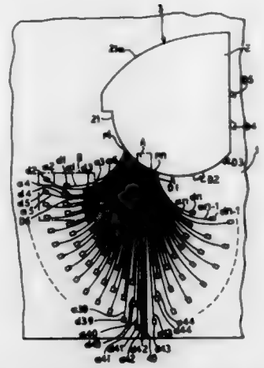
Cornelius Cremer, Pong; Norbert Emeis, Munich, and Hans Mahlein, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1992, Ser. No. 824,354

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1991, 4103095; Feb. 21, 1991, 4105465

Int. Cl.[5] G02B 6/10; H01L 21/70; H04J 1/00

U.S. Cl. 385—37 32 Claims



1. In an integrated optical arrangement for demultiplexing a plurality of different optical wavelength channels, said arrangement including an optical layer waveguide being integrated on a substrate as a film waveguide and being limited by an edge with a portion of said edge having an optical diffraction grating formed thereon, said arrangement including first means for coupling a plurality of different wavelength channels into the film waveguide at an infeed point, said plurality of different wavelength channels being conducted to the diffraction grating by the film waveguide, said diffraction grating spatially separating the plurality of different wavelength channels from one another by diffraction into different directions, said film waveguide guiding said plurality of different diffracted wavelength channels in different directions spatially separated from one another to another portion of the edge of the film waveguide and second means for coupling out a plurality of the waveguide channels at each of the output points, the improvements comprising the second means for coupling being strip-like optical outfeed waveguides integrated on the substrate and being coupled to each of the outfeed points, said outfeed waveguide guiding the wavelength of the channels coupled out from the film waveguide at said output points to an optical detector which is integrated on the substrate for each outfeed waveguide, and said first means for coupling including a plurality of infeed waveguides extending side-by-side in the form of strip-like waveguides which are integrated on the substrate.

17. A method for manufacturing an integrated optical arrangement for demultiplexing a plurality of different optical wavelength channels, said arrangement including an optical layer waveguide being integrated on a substrate as a film waveguide having an edge with a portion being an optical diffraction grating, first means for coupling a plurality of different wavelength channels at an infeed point into the film waveguide, which conducts the wavelength channels to the diffraction grating which spatially separates the plurality of different wavelength channels into individual diffracted waveguide channels that are directed and conducted to a plurality of output points on another portion of the edge of the film waveguide, second means for coupling out each of the diffracted waveguide channels at each of the output points including outfeed waveguides formed in a strip-like optical waveguide integrated on the substrate, said outfeed waveguides guiding the waveguide channels coupled out from said film waveguide at said outfeed points to an optical detector which is integrated on the substrate as a photodiode for each of the outfeed waveguides, said method comprising the steps of providing a packet of layers on a substrate, said packet including an optical waveguiding layer, a cover layer disposed on the waveguiding layer, an absorption layer disposed on the cover layer, and a contact layer disposed on the absorption layer, said contact layer having at least a local region disposed at each location for each photodiode with a doping opposite in comparison to a doping present immediately under the waveguiding layer, providing contacts for said contact layer at said local region, reducing the packet of layers in a region outside of each of the local regions by removing the contact layer and absorption layer in the outside region, and producing a film waveguide having a diffraction grating and strip-like waveguides extending to each of the mesa-shaped raised regions by a region-by-region removal of said cover layer and waveguiding layer so that the waveguiding layer and the cover layer remain at a location for the film waveguide and strip-like waveguides.

5,206,921

METHOD AND APPARATUS FOR ATTACHING FERRULE TO OPTICAL CABLE

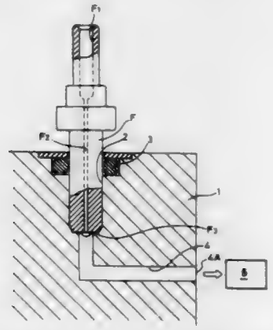
Kinjiro Okada; Hiromasa Shiraishi, both of Tokyo; Hirokazu Yokosawa, Nagano; Shinichi Takehana, Nagano, and Norio Kobayashi, Nagano, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed May 21, 1992, Ser. No. 886,361

Claims priority, application Japan, May 22, 1991, 3-145244

Int. Cl.[5] G02B 6/36

U.S. Cl. 385—134 2 Claims



1. Apparatus for attaching an optical cable to a ferrule which has a front aperture for holding an optical cable and a rear aperture for retaining an optical fiber of said optical cable, comprising:

a support block;

a vertical passage extending downwardly from an upper face of said support block;

sealing means disposed around said vertical passage for making an airtight seal when a rear section of said ferrule is set in said vertical passage;

a lateral passage extending laterally from a side of said support block and communicating with said vertical passage; and

a suction unit connected to said lateral passage to draw a quantity of adhesive from said front aperture to said rear aperture, forming a mass of adhesive.

5,206,922

NONLINEAR OPTICAL SWITCH UTILISING ORGANIC CONJUGATED MATERIAL AND FOUR WAVE MIXING TECHNIQUES

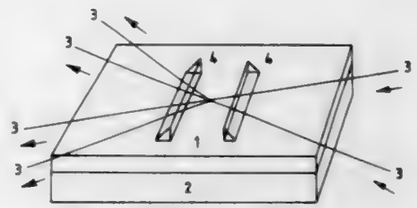
Duncan J. Westland, Horsell, Woking; Vladimir Skarda, Ashtead, both of England; Werner Blau, Dublin, Ireland, and Lorenzo Costa, Somma, Italy, assignors to Enichem S.p.A., Milan, Italy and The University of Dublin, Dublin, Ireland

Filed Sep. 4, 1990, Ser. No. 576,947

Claims priority, application Italy, Sep. 4, 1989, 21611 A/89

Int. Cl.[5] G02F 1/35

U.S. Cl. 385—5 13 Claims



1. A waveguide structure for nonlinear optical switching of at least one light beam propagating in a waveguide, comprising:

a substrate having a first flat surface;

a film of a conjugated polymer material on said first flat surface, wherein sid conjugated polymer material is a member selected from the group consisting of polydiacetylenes and polythiophenes;

said film being 0.1 to 10 μm thick, and having a third order nonlinear optical susceptibility equal to or greater than 10^{-11} esu;

means, including a second light beam intersecting said at least one light beam in an intersection region, for altering the refractive index of material in the intersection region; and

wherein first and second coherent beams counterpropagate in said film, a third beam spatially overlaps portions of the first and second counterpropagating beams, and a fourth phase conjugate beam diffracted from said third beam counterpropagates along the path of said third beam, the intensity of said fourth beam being a function of the intensities of the first, second and third beams.

5,206,923

METHOD TO USE AN OPTICAL FIBRE AS A SENSOR

Stefan U. Karlsson, Rönnbärsgatan 2, S-590 50 Vikingstad, Sweden

PCT No. PCT/SE90/00094, § 371 Date Sep. 9, 1991, § 102(e) Date Sep. 9, 1991, PCT Pub. No. WO90/10883, PCT Pub. Date Sep. 20, 1990

PCT Filed Feb. 14, 1990, Ser. No. 761,358

Claims priority, application Sweden, Mar. 8, 1989, 8900805

Int. Cl.[5] G02B 6/26

U.S. Cl. 385—12 10 Claims

1. A method to use an optical fibre as a sensor, comprising:

measuring external influence on an optical fibre in a sensor area where the external influence on the optical fibre that is to be measured, for example, pressure or magnetic field, is freely able to influence the fibre,

transmitting coherent radiation through the sensor area in several modes,

splitting radiation received on a receiver side of a detector device into two beams, each beam including an entire interference pattern created by transmission in the fibre,

plane-polarizing the two beams in two different directions which are conducted to a signal processing device which

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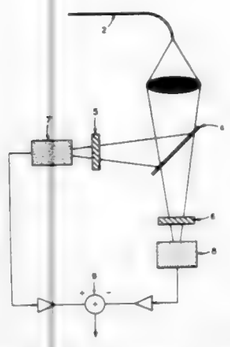
detects the amplitude and/or frequency content of each beam, and



forming a signal which is a measure of amplitude and/or frequency relation of the beams, which is a measure of the external influence in the sensor area.

5,206,924

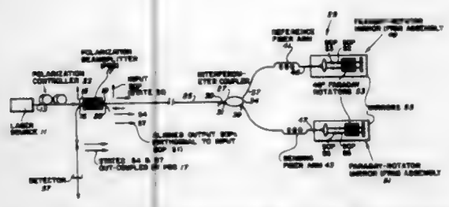
FIBER OPTIC MICHELSON SENSOR AND ARRAYS WITH PASSIVE ELIMINATION OF POLARIZATION FADING AND SOURCE FEEDBACK ISOLATION

Alan D. Kersey, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 828,826, Jan. 31, 1992, abandoned. This application Sep. 1, 1992, Ser. No. 937,782

Int. Cl.[5] **G02B** *6/28*

U.S. Cl. 385—24 **18 Claims**



14. A polarization-independent fiber optic interferometric sensor system comprising:

optical source means for providing consecutive first and second pulses of light of a first polarization state;

a polarization beamsplitter having first and second input ports and first and second output ports and being coupled to said optical source means, said polarization beamsplitter being responsive to the application of said consecutive first and second pulses of light of said first polarization state to said first input port for coupling said consecutive first and second pulses of light from said first input port to said first output port;

an input fiber having a birefringence and having a proximal end coupled to said first output port;

a plurality of optical couplers serially disposed along said input fiber for respectively tapping off portions of the light in each of said consecutive first and second pulses of light;

a plurality of delay sensing coils, each of delay T, interleaved between adjacent ones of said plurality of optical couplers;

a plurality of Faraday rotator mirror assemblies, each said Faraday rotator mirror assembly reflecting light applied thereto back with a change in polarization;

a plurality of fiber arms respectively coupled between associated ones of said plurality of optical couplers and associated ones of said plurality of Faraday rotator mirror assemblies, said pluralities of optical couplers, fiber arms, Faraday rotator mirror assemblies and delay sensing coils forming a plurality of fiber Michelson interferometers, each of said fiber Michelson interferometers including:

a first arm having an associated first optical coupler coupled by way of an associated first fiber arm to an associated first said Faraday rotator mirror assembly; and

a second arm having said associated first optical coupler serially coupled by way of an adjacent said delay sensing coil to an associated second optical coupler, and an associated second fiber arm coupled between said associated second optical coupler and an adjacent second Faraday rotator mirror assembly, said first and second Faraday rotator mirror assemblies in each of said plurality of fiber Michelson interferometers changing the polarization states of the portions of the light in each of said consecutive first and second pulses of light and returning such light by way of said input fiber to said first output port of said polarization beamsplitter, each of said consecutive first and second pulses of light from each Faraday rotator mirror assembly having said second polarization state upon its arrival at said first output port and passing through said polarization beamsplitter to said second input port; and

output means coupled to said second input port of said polarization beamsplitter and being responsive to any interference pattern contained in any one of said sequence of pulses of light for developing an associated electrical signal that has a peak-to-peak amplitude proportional to the visibility of said interference pattern;

wherein, in each one of said plurality of fiber Michelson interferometers, only the first pulse of the two pulses of light reflected off of said second Faraday rotator mirror assembly will overlap the second pulse of the two pulses of light reflected off of said first Faraday rotator mirror assembly to produce an interference pattern at said output means.

5,206,925

RARE EARTH ELEMENT-DOPED OPTICAL WAVEGUIDE AND PROCESS FOR PRODUCING THE SAME

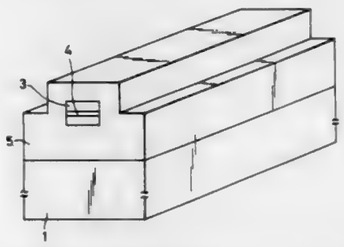
Masataka Nakazawa; Yasuo Kimura, both of Mito; Katsuyuki Imoto, Sayama; Seiichi Kashimura, Hitachi; Toshikazu Kamoshida, Kuji, and Fujio Kikuchi, Katsuta, all of Japan, assignors to Hitachi Cable Limited and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 692,336

Claims priority, application Japan, Jun. 29, 1990, 2-173156

Int. Cl.[5] **G02B** *6/10;* **H01L** *21/70*

U.S. Cl. 385—142 **12 Claims**



1. A rare earth element-doped optical waveguide comprising:

a substrate;

a cladding provided on the substrate;

a core waveguide provided in the cladding, the core waveguide being substantially rectangular in cross section with the width thereof greater than the thickness thereof; and

a rare earth element-doped layer provided in the core waveguide along a waveguiding direction, whereby good optical confinement is ensured in the width direction of the waveguide.

11. The method of producing a rare earth element-doped optical waveguide comprising the steps of:

providing a first core waveguide doped with a rare earth element and substantially rectangular in cross section on a substrate having a low refractive index;

providing a core layer not doped with a rare earth element over the substrate so as to bury completely the first core waveguide therein;

forming on the substrate a core waveguide including the first core waveguide and a rare earth element-undoped second core waveguide covering the first core waveguide; and

providing a cladding layer so as to cover the entire surface of the core waveguide.

5,206,926

PLASTIC OPTICAL FIBER CORDS

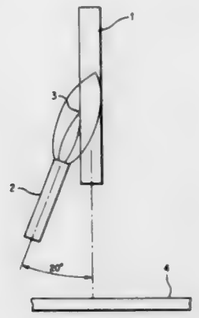
Takashi Yamamoto; Katsuhiko Shimada, and Hiroaki Oonishi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1992, Ser. No. 826,464

Claims priority, application Japan, Feb. 4, 1991, 3-033468

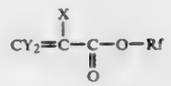
Int. Cl.[5] **G02B** *6/22, 6/00*

U.S. Cl. 385—143 **2 Claims**



1. A plastic optical fiber cord comprising a plastic optical fiber including a core and a cladding, and a jacket layer provided on the optical fiber, wherein the jacket layer has an oxygen index of not less than 25 as measured by the formula, oxygen flow rate divided by the sum of the nitrogen flow rate and the oxygen flow rate, multiplied by one hundred; and

wherein the core is composed of a polymer containing a monomer represented by the following general formula as the main component:



(wherein X represents H, CH_3, D, F, CF_3 or Cl; Y represents H or D; and Rf represents a linear or branched fluoro alkyl group.)

5,206,927

CASSETTE AND CASSETTE BLOCK FOR LIGHT WAVEGUIDES

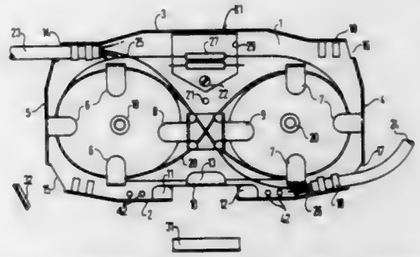
Lothar Finzel, Unterschleissheim; Thomas Ruckgaber, Munich, and Winfried Lieber, Krailling, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 19, 1992, Ser. No. 836,956

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1991, 4106171

Int. Cl.[5] **G02B** *6/36*

U.S. Cl. 385—135 **16 Claims**



1. A cassette block comprising a plurality of cassettes for coupling and branching light waveguides, each cassette comprising a floor having a first longitudinal side wall, a second longitudinal side wall, and a pair of end walls upstanding from said floor, each cassette having deposit means for guiding light waveguides to enable them to be held in the shape of a figure eight configuration in the cassette and to enable them to be deposited in one half of the figure eight configuration, each cassette having first means for forming an opening adjacent each corner of the first and second longitudinal side walls for receiving incoming and outgoing leads, said first means supporting the lead adjacent the first longitudinal side wall to a extend obliquely to a center line of the cassette and outward of the deposit means and said first means supporting the lead adjacent the second longitudinal side wall to extend outwardly and longitudinally to the deposit means, each cassette having an opening mid-way along the first longitudinal side wall and a portion of the cassette floor adjacent thereto, and said cassette being joined together by a hinge positioned in the neighborhood of the first longitudinal side wall.

5,206,928

THERMOSTAT-CONTROLLED WATER HEATING DEVICE FOR A BIDET OF A WATER CLOSET WITH DAMPED COLD WATER INFLOW

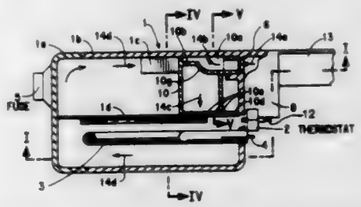
Beat Spörri, Uzach, Switzerland, assignor to Geberit AG, Jona, Switzerland

Filed Apr. 2, 1991, Ser. No. 679,289

Claims priority, application Switzerland, Apr. 3, 1990, 1105/90

Int. Cl.[5] **A61H** *35/00;* **A47K** *7/08;* **F24H** *00/00*

U.S. Cl. 392—491 **10 Claims**



1. A fluid heater and storage device for a bidet to be accom-

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modated in a hollow projection of a toilet seat, comprising: a hot water storage tank housing; an electrical heater positioned in said housing, a temperature sensor extending into said housing, a water inlet connected to said housing for admitting cold water; and a water outlet connected to said housing for connection to a water pipe leading to a shower arm, said water inlet and said water outlet being located on a same side of said housing and said water inlet and said water outlet being arranged in an upper area of said housing; insert means for damping the water flowing in said housing through said inlet under mains pressure, said insert means being arranged under said water inlet and inside said upper area of said housing, said insert means also guiding water flowing into said housing from a top of said housing to a bottom of said housing; and separating means being attached to said housing in said upper area for separating said cold water from said inlet and said insert means from hot water exiting said outlet, said separating means being open toward said inside of said housing.

5,206,929

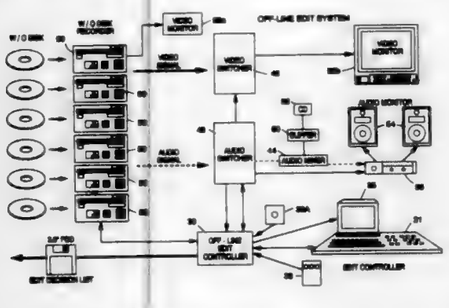
OFFLINE EDITING SYSTEM

Ted E. Langford, Fremont, and David Wheeler, Palo Alto, both of Calif., assignors to Sony Corporation of America, Park Ridge, N.J.

Continuation-in-part of Ser. No. 467,160, Jan. 19, 1990. This application Oct. 26, 1990, Ser. No. 604,890

Int. Cl.[5] G06F *9/00, 15/62;* **H04N** *5/76*

U.S. Cl. 395—159 **25 Claims**



1. An offline editing system, including:

a random access storage means for storing unedited video takes; and

a computer connected to the storage means, wherein the computer is programmed with:

a means for controlling the storage means in response to user-entered commands; and

a user interface for providing global access to multiple, randomly accessible video post production application software modules, including a single camera editing software module and a multiple camera editing software module, at any time during an offline editing operation.

5,206,930

METHOD OF COMPLIANCE CONTROL OF A MANIPULATOR

Hiroshi Ishikawa, Ichikawa, and Chihiro Sawada, Tokyo, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 717,183, Jun. 18, 1991, abandoned, which is a continuation of Ser. No. 320,359, Mar. 8, 1989, abandoned. This application Feb. 7, 1992, Ser. No. 833,567

Claims priority, application Japan, Mar. 15, 1988, 63-59574

Int. Cl.[5] G05B *19/18;* **B25J** *9/18*

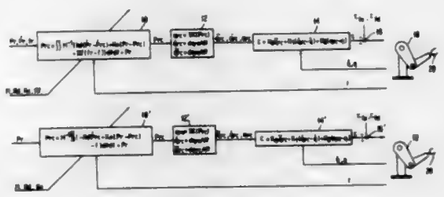
U.S. Cl. 395—95 **7 Claims**

1. A method for compliance control in a manipulator system having a hand wherein a force exerted upon the hand to be controlled is detected and the position of the hand is controlled on the basis of the detected force, comprising the steps of:

specificying predetermined parameters for compliance and goal values for position and force applied to the hand;

solving a second-order equation of motion for the hand in a global coordinate system which includes said specified predetermined parameters for compliance, goal values for position and force applied to the hand, and a value for detected force, to generate a first signal commensurate with a position trajectory of the hand in the global coordinate system which satisfies the equation of motion;

transforming said first signal commensurate with a position



trajectory of the hand in the global coordinate system into a second signal commensurate with a position trajectory of the hand in a coordinate system specific to the hand;

generating a third signal commensurate with a velocity trajectory and an acceleration trajectory of the hand in the specific coordinate system from said second signal commensurate with a position trajectory of the hand in the specific coordinate system, and

performing position control of the hand responsive to said second signal and to said third signal so that the hand follows said position trajectory, velocity trajectory, and acceleration trajectory of the hand in the specific coordinate system.

5,206,931

PICTURE FILE SYSTEM

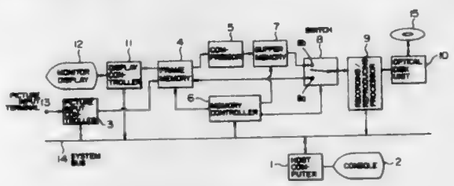
Mari Kimura, Kishiwada; Misao Kato, Katano; Yoshinori Amano, Takatsuki; Yoshio Hirauchi, Osaka, and Kunihiko Hontani, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 6, 1990, Ser. No. 623,162

Claims priority, application Japan, Dec. 12, 1989, 1-322125

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—161 **5 Claims**



1. A picture file system comprising:

means for receiving and storing picture data;

means for compressing said stored picture data to obtain reduced-picture data;

recording medium means for storing therein said reduced-picture data at a predetermined address thereof, said reduced-picture data having a predetermined unit size;

means for sequentially reproducing said reduced-picture data stored at said predetermined address to obtain a plurality of reproduced reduced-picture data in a picture retrieval mode;

means for simultaneously displaying said plurality of reproduced reduced-picture data;

means for selecting one of said displayed reproduced reduced-pictures; and

means for reproducing and displaying an original not-reduced picture corresponding to said selected reduced-picture.

5,206,932

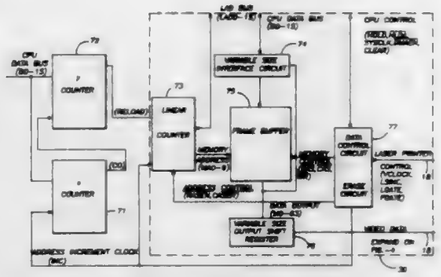
FLEXIBLE FRAME BUFFER ARCHITECTURE HAVING ADJUSTABLE SIZES FOR DIRECT MEMORY ACCESS

Hershow Chang; Seong Kim, and Tetsuro Motoyama, all of Santa Clara County, Calif., assignors to Ricoh Corporation, San Jose, Calif. and Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 379,019, Jul. 12, 1989. This application Oct. 22, 1991, Ser. No. 780,822

Int. Cl.[5] G06K *15/00*

U.S. Cl. 395—165 **14 Claims**



1. A control system for displaying an image on an output device, wherein said image is represented by a plurality of pixels arranged in a plurality of lines, said controller system comprising:

frame buffer memory means, including a plurality of memory cells, for storing said plurality of pixels as image data; and

control means for controlling transmission of said image data from said plurality of memory cells to said output device in a direct memory access (DMA) mode that operates in clock cycles, said control means including:

a) means for setting a DMA cycle;

b) means for indicating a start address of said frame buffer memory means;

c) first setting means for setting a first-dimension number indicating a length of said image along a first dimension; and

d) means for reading out within said DMA cycle a portion of said memory cells indicated by said start address and by said first dimension number.

5,206,933

DATA LINK CONTROLLER WITH CHANNELS SELECTIVELY ALLOCATABLE TO HYPER CHANNELS AND HYPER CHANNEL DATA FUNNELED THROUGH REFERENCE LOGICAL CHANNELS

Joseph K. Farrell, Boca Raton, Fla.; Jeffrey S. Gordon, Centreville, Va.; Daniel C. Kuhl, Delray Beach, Fla.; Timothy V. Lee, and Tony E. Parker, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1990, Ser. No. 495,821

Int. Cl.[5] G06F *7/00*

U.S. Cl. 395—200 **14 Claims**

12. In a data communication controller for interfacing between a communication network and a data processing system, said controller having a plurality of internal channels selectively assignable for interfacing to discrete external channels in said network, said controller having internal buffer memory reserved to each said internal channel for storing data signals being transferred between said network and the respective internal channel, an arrangement for operating a selected group of said internal channels as a single HyperChannel unit having greater bandwidth than individual said internal channels, said arrangement comprising:

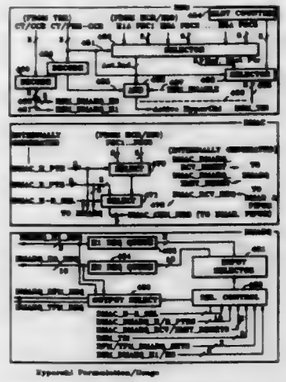
first means for designating a group of plural selected ones of said internal channels as constituents parts of a said HyperChannel unit;

second means for designating a selected one of said constituent channels as a reference channel for the group;

means for storing control information in association with said reference channel for controlling operations relative to the respective group;

means coupled to said first and second designating means for accessing said control information while operating relative to constituent channels other than a said reference channel, and responsive to said control information for transferring data exclusively between the buffer memory reserved to the respective reference channel and said network, whereby data in transit between said other constituent channels and said network is effectively funneled through said respective reference channel while being internally processed in said controller and whereby such data is always handled internally by said controller in the same sequence in which the associated data signals are transferred over said network; and wherein:

said data transferred between said controller and said processing system, relative to each said HyperChannel unit, is transferred effectively relative to the respective reference channel and consists exclusively of data transferred relative to the internal buffer memory reserved to said respective to said respective reference channel.



5,206,934

METHOD AND APPARATUS FOR INTERACTIVE COMPUTER CONFERENCING

Frederick E. Naef, III, Reston, Va., assignor to Group Technologies, Inc., Arlington, Va.

Filed Aug. 15, 1989, Ser. No. 393,876

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—200 **34 Claims**

1. An apparatus for conferencing among at least two computers designated as local and remote user terminals, respectively, said apparatus comprising:

means at said local user terminal for receiving and interpreting local user inputs and for producing local user action outputs;

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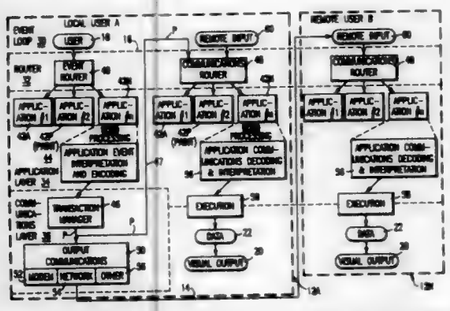
means at said local user terminal for encoding said local user action outputs into packets of encoded commands;

means at said local user terminal for sending said encoded commands to at least one remote user terminal and for sending the same encoded commands to said local user terminal;



means at said local and remote user terminals for receiving and decoding said encoded commands; and

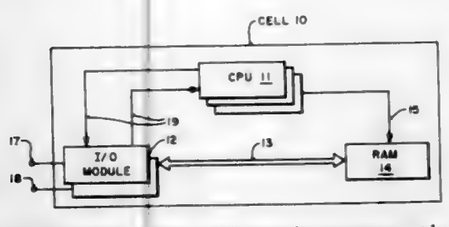
means at said local and remote user terminals for responding to the decoded commands by executing equivalent operations on data stored at said local and remote user terminals.

5,206,935

APPARATUS AND METHOD FOR FAST I/O DATA TRANSFER IN AN INTELLIGENT CELL

Rod G. Sinks, 10316 Denison Ave., Cupertino, Calif. 95014, and Robert W. Donner, 2580 Bean Creek Rd., Scotts Valley, Calif. 95066

Filed Mar. 26, 1991, Ser. No. 675,448
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—275 **11 Claims**



1. In a computer system which comprises a memory, at least one input/output (I/O) module, a bus coupling said memory to said I/O module, and a central processing unit (CPU) having a processor executable instruction for transferring multiple bytes of data to said memory from said I/O module across said bus, wherein execution of said instruction causes said CPU to transfer said multiple bytes of data, said CPU comprising:

register means for storing a current address location for data to be stored within said memory and a current count of a number of bytes of data yet to be transferred to said memory across said bus;

control means for successively transferring an available byte of data from said I/O module onto said internal bus for storage in said memory at said current address location, said control means issuing a control signal following each said transfer;

means responsive to said control signal for incrementing said current address and decrementing said current count, wherein the incremented address is stored in said register means as said current address and said decremented count is stored in said register means as said current count prior to a transferal of a next available byte of data;

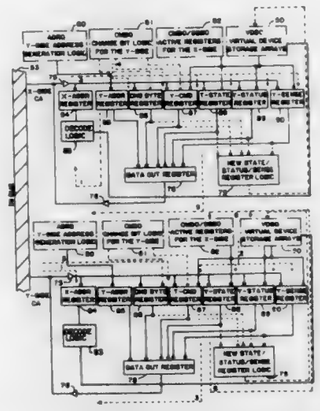
means coupled to said control means for terminating said transferal whenever said count equals a predetermined number.

5,206,936

APPARATUS FOR EXCHANGING CHANNEL ADAPTER STATUS AMONG MULTIPLE CHANNEL ADAPTERS

Hugh C. Holland, Brackney, Pa.; Robert J. Kammerer, Endicott, and Ronald S. Svec, Berkshire, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,593
Int. Cl.[5] G06F *13/12*
U.S. Cl. 395—325 **15 Claims**



1. A device information interface for a I/O device having a plurality of channel adapters of a channel to channel I/O device, each channel adapter being connected to a channel, said channel adapters being interconnected with a plurality of data buses under control of a control microprocessor, comprising:

a device information interface bus interconnecting said channel adapters;

a virtual device storage array for storing the status of each logical channel adapter of a channel adapter connected to said channel;

logic decoder connected to said device information interface to decode inquiries received over said device information interface bus from another adapter, and address said virtual device storage array to derive status information regarding a logical adapter of a channel adapter; and,

an output register connected to receive said status information from said virtual storage array and present said information to said interface bus for transmission to said another adapter, permitting said another adapter to determine the status of said logic adapter before requesting a link with said logical adapter.

5,206,937

DATA COMMUNICATION SYSTEM HAVING PLURAL STATIONS CONNECTED TO A SINGLE TRANSMISSION PATH

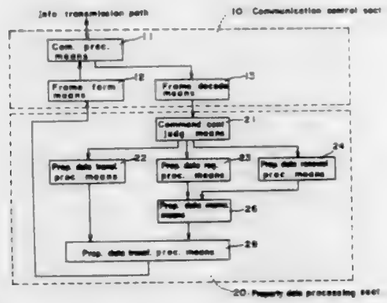
Takeshi Goto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 1, 1990, Ser. No. 561,503
Claims priority, application Japan, Aug. 4, 1989, 1-203308
Int. Cl.[5] G06F *13/38*
U.S. Cl. 395—325 **4 Claims**

1. A data management method for controlling the transfer of

data in an information communication system in which a plurality of stations are operatively coupled to a same information transmission path and in which frames of data are transmitted among the plurality of stations on the information transmission path, each frame of data including a command region and a relevant data region, said method comprising:

a step of analyzing at a receiving station a command region of a frame transmitted by a sending station on said information transmission path to determine if said command region denotes one of a data registration command, a data renewal command or a data transfer command;



a step of storing in a data memory of said receiving station the relevant data contained in said frame when said command region denotes the data registration command;

a step of overwriting previously stored relevant data of said sending station stored in said data memory of said receiving station with said relevant data contained in said frame when said command region denotes the data renewal command; and

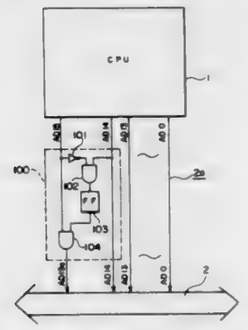
a step of transmitting relevant data contents, specified in said frame of data, of said data memory of said receiving station on said information transmission path when said command region denotes the data transfer command.

5,206,938

IC CARD WITH MEMORY AREA PROTECTION BASED ON ADDRESS LINE RESTRICTION

Shuzo Fujioka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1989, Ser. No. 398,509
Claims priority, application Japan, May 9, 1989, 1-114246
Int. Cl.[5] G06F *12/14, 12/16*; G06K *5/00*; G11C *7/00*
U.S. Cl. 395—400 **7 Claims**



1. An IC card including a test program for testing said IC card comprising:

non-volatile memory means storing a pass code;

read only memory means storing a test program for testing various functions of said IC card, at least one application program for executing various functions of said IC card, a branch routine for determining which of the test program and the at least one application program is to be executed in response to an external command, and a pass code confirmation routine for collating, before executing the test program, the pass code with a pass code input from outside of said IC card;

resettable control means including address bit lines for executing and controlling the test program and the at least one application program;

input/output control means for controlling input of signals to said IC card and output of signals from said IC card;

signal transmitting means, including an address bus having a plurality of bit lines connected to corresponding address bit lines of said resettable control means, a data bus, and a plurality of control lines, connected to and for transmitting signals between said non-volatile memory means, said read only memory means, said resettable control means, and said input/output control means; and

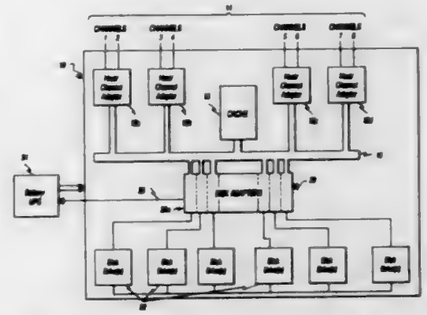
address restriction means for restricting values of address bits of predetermined bit lines of the address bus to prohibit accessing of one portion of said non-volatile memory means during execution of an application program, the pass code being stored in the portion of said non-volatile memory means, said address restriction means being connected to and between the address bit lines of said resettable control means and the address bit lines of said address bus.

5,206,939

SYSTEM AND METHOD FOR DISK MAPPING AND DATA RETRIEVAL

Moshe Yanai, Framingham; Natan Vishlitzky, Brookline; Bruno Alterescu, Newton, and Daniel Castel, Framingham, all of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Sep. 24, 1990, Ser. No. 586,796
Int. Cl.[5] G06F *13/00, 12/06*; G11B *5/09*
U.S. Cl. 395—400 **19 Claims**



1. Apparatus for retrieving at least one requested data record stored on a storage medium comprising:

means for receiving a plurality of data records, each of said data records including at least a record identification portion and a data portion;

means, responsive to said means for receiving, for transferring and storing said plurality of data records on at least one of said storage mediums;

means, responsive to said means for transferring and storing, for generating a corresponding plurality of recording locator indices, each of said corresponding plurality of record locator indices associated with one of said plurality of data records and a corresponding recording identification portion, for uniquely identifying the location of each of said plurality of data records stored on said at least one of said storage mediums;

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memory storage means, for storing at least said plurality of record locator indices and the associated record identification portions in one record locator table;

means for requesting access to one or more of said plurality of data records, and for providing the data identification portion corresponding to said at least one requested data record;

means, responsive to said means for requesting access, for searching said record locator table stored in said memory storage means, for locating said data record identification portion and associated one or more record locator indices corresponding to said at least one requested data record; and

record retrieval means, responsive to said means for searching, for directly retrieving from said at least one storage medium said at least one requested data record as directed by said associated record locator indices.

5,206,940

ADDRESS CONTROL AND GENERATING SYSTEM FOR DIGITAL SIGNAL-PROCESSOR

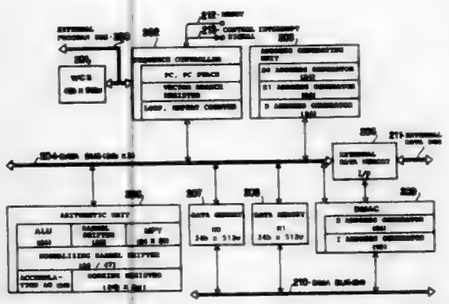
Tokumichi Murakami; Koh Kamizawa; Yoshiaki Katoh; Hideo Ohira; Masatoshi Kameyama, and Naoto Kinjo, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 201,208, Jun. 3, 1988, Pat. No. 5,045,993. This application Aug. 27, 1991, Ser. No. 750,512

Claims priority, application Japan, Jun. 5, 1987, 62-140872; Jul. 27, 1987, 62-186858; Aug. 6, 1987, 62-197009; Oct. 29, 1987, 62-273763; Oct. 30, 1987, 62-274810; Nov. 25, 1987, 62-296611; Nov. 25, 1987, 62-296612; Dec. 15, 1987, 62-316553

Int. Cl.[5] **G06F** *12/02, 9/36*

U.S. Cl. 395—400 **8 Claims**



1. A digital signal processor having a signal processing address control system comprising:

an instruction memory storing microinstructions;

a data operating unit which processes signal processing of two blocks of input signal data through a predetermined signal processing operation according to an instruction fetch from the instruction memory to obtain one block of output signal data;

data memories each for individually storing at least one signal processing block corresponding to at least three signal data systems for two input signal data systems and one output signal data system;

at least three address generators each for sequentially reading individual component signal data corresponding to the at least three signal data systems stored in the data memories in a predetermined signal processing procedure and for generating data memory addresses for writing data in the data memories individually for the signal data systems;

data transfer means for simultaneously reading the two input signal data systems from the data memories according to addresses provided by the two address generators among the at least three address generators and simultaneously transferring the two input signal data systems through data buses to the data operating unit; and

data transfer means for simultaneously transferring the one output signal data system from the data operating unit and to the data memory through the data bus according to an address generated by another one of the at least three address generators;

characterized in that an address control code for controlling each of the at least three address generators for generating addresses for the signal data systems according to a predetermined signal processing procedure for processing the at least three signal data systems is placed horizontally in the field of the microinstruction, and at least three address control codes corresponding to predetermined signal processing operations are assigned concurrently to every microinstruction.

5,206,941

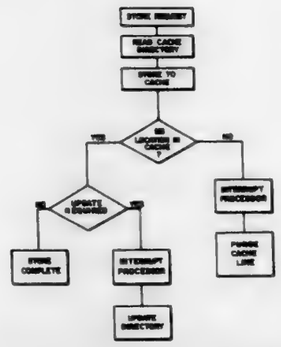
FAST STORE-THROUGH CACHE MEMORY

Richard G. Elkill; Charles P. Geer, and Sheldon B. Levenstein, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1990, Ser. No. 468,048

Int. Cl.[5] **G06F** *9/00, 13/00*

U.S. Cl. 395—425 **17 Claims**



1. In an information processing network including a processing configuration for manipulating bit-encoded data as data words, each word having a plurality of data bits, a main storage memory having memory locations for storing bit-encoded data, and a main storage interface connected to the processing configuration and to the main storage memory; said processing configuration including at least one processor having a cache memory and a cache memory interface, with said cache memory including a plurality of cache locations for storing data, and a cache directory for storing status information relating to the cache locations; said processor further including means for storing bit-encoded data to selected memory locations in the main storage memory via the main storage interface and means for storing bit-encoded data to selected cache locations in the cache memory via the cache memory interface: a process for storing data, including the steps of:

simultaneously storing a first data word to a first cache location in a first cache memory of a processing device, and reading a cache directory of the cache memory to determine the presence or absence of a need to modify the cache directory in view of storing the first data word;

storing the first data word to a first memory location in the main storage memory;

responsive to determining a need to modify the first cache directory, generating a first interrupt signal for interrupting the processing device for a predetermined length of time to free a cache interface associated with the first cache memory, for the predetermined time; and

modifying the cache directory during the predetermined time.

5,206,942

PARTIALLY STORING CONTROL CIRCUIT USED IN A MEMORY UNIT

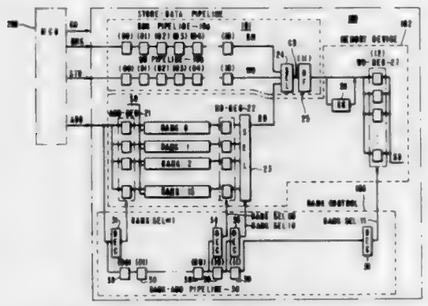
Takashi Ibi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1990, Ser. No. 490,447

Claims priority, application Japan, Mar. 8, 1989, 1-055407

Int. Cl.[5] **G06F** *12/00, 12/04;* **G11C** *8/00*

U.S. Cl. 395—425 **29 Claims**



1. An apparatus for controlling partial storage of data from a memory control unit, said apparatus comprising:

a bank control circuit to generate a plurality of bank control signals;

a plurality of parts operatively coupled to the bank control circuit, each said part including

an AND circuit operatively coupled to said bank control circuit and a word mark signal from the memory control unit to generate set signals;

a plurality of write data registers operatively coupled to a word signal from the memory control unit and said AND circuit to store the word signal in one of said write data registers selected by the set signal;

a plurality of word mark registers operatively coupled to the word mark signal from the memory control unit and said AND circuit to store the word mark signal in one of said word mark registers selected by the set signal;

a write data selector operatively coupled to said plurality of write data registers and said bank control circuit to select a write data register for output based on the bank control signals; and

a word mark selector operatively coupled to said plurality of word mark registers and said bank control circuit to select a word mark register for output based on the bank control signals.

5,206,943

DISK ARRAY CONTROLLER WITH PARITY CAPABILITIES

Ryan A. Callison; Thomas W. Grieff, both of Spring, and Kenneth L. Bush, Cypress, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 3, 1989, Ser. No. 431,735

Int. Cl.[5] **G06F** *12/00*

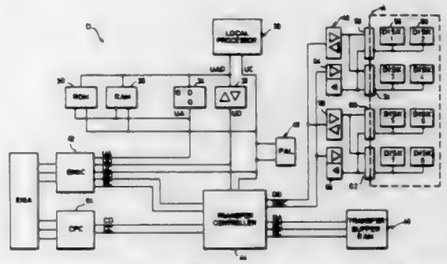
U.S. Cl. 395—425 **17 Claims**

1. A disk data controller in a computer system for transferring data with a plurality of individual disk drives forming a disk array in a computer system, comprising:

buffer memory for storing data to be transferred to or transferred from the disk drives in the disk array;

a plurality of means for controlling data to be transferred to or transferred from the disk drives in the disk array;

means coupled to the disk array and said plurality of means for controlling data transfer with the disk drives for selecting which of said plurality of means for controlling data transfer with the disk drives may transfer data with the disk drives in the disk array and for passing said data between said selected means for controlling data transfer with the disk drives and the disk drives in the disk array; and



means coupled to said buffer memory and said plurality of means for controlling data transfer with the disk drives for selecting which of said plurality of means for controlling data transfer with the disk drives may transfer data with said buffer memory and for passing data between said selected means for controlling data transfer with the disk drives and said buffer memory.

5,206,944

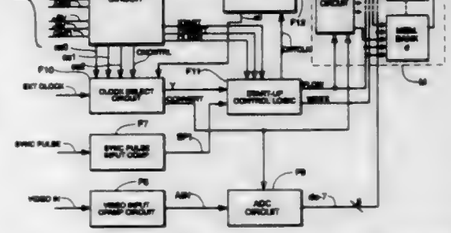
HIGH SPEED ANALOG TO DIGITAL CONVERTER BOARD FOR AN IBM PC/AT

Michael D. Pilkenton, Huber Heights, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 7, 1990, Ser. No. 535,002

Int. Cl.[5] **G06F** *1/00*

U.S. Cl. 395—425 **6 Claims**



1. A digitizer for converting analog signals from a video unit to digital data for analysis using a computer, wherein the digitizer comprises:

an interface circuit coupled to the computer via interface data lines, interface address lines and interface control lines, for supplying commands from the computer to the digitizer;

a flash analog-to-digital converter having an analog input coupled to a video output of the video unit, for digitizing analog data signals from the video unit to produce a sequence of N-bit data words at a digital output line;

address counter means providing an address output having M bits, comprising X low order bits and (M-X) remaining bits;

a memory comprising memory devices organized into a

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plurality of banks, each of said plurality of banks having address register means (M41-M42) with inputs coupled to the address output for said (M-X) remaining bits, and data register means (M54) having inputs coupled to the digital output line form the analog-to-digital converter;

a memory decode circuit having inputs for the X low order bits form the address output, and means for decoding said low order bits to select the banks of said memory devices in turn;

clock means coupled to the analog-to-digital converter and to the memory for supplying clock pulses at a selected frequency;

start-up control means having a synchronizing input coupled to a synchronizing output of the video unit, means for supplying a START command from the computer via the interface circuit to set the start-up control means to a run state, means effective with the start-up circuit in the run state and responsive to a pulse at the synchronizing input for starting a digitizing sequence;

means effective during said digitizing sequence for coupling clock pulses for the clock means to the address counter means to advance an address count on each clock pulse, so that the memory decode circuit enables the memory banks in turn to store the address in the address register means and the data word form the digital output line in the data register means, and in each of said plurality of banks the data word form the data register means is stored in the memory devices at the address from the address register means for the bank of said memory devices which is selected by said X low order bits.

5,206,945

SINGLE-CHIP PIPELINE PROCESSOR FOR FETCHING/FLUSHING INSTRUCTION/DATA CACHES IN RESPONSE TO FIRST/SECOND HIT/MISHIT SIGNAL RESPECTIVELY DETECTED IN CORRESPONDING TO THEIR LOGICAL ADDRESSES

Tadahiko Nishimukai, Sagamihara; Atsushi Hasegawa, Koganei; Kunio Uchiyama, Hachioji; Ikuya Kawasaki, Kodaira, and Makoto Hanawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Micro Computer Engineering, Ltd., both of Tokyo, Japan

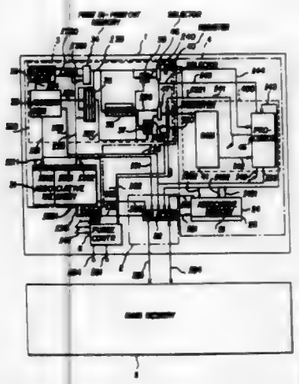
Continuation of Ser. No. 323,125, Mar. 13, 1989, Pat. No. 4,989,140, which is a continuation of Ser. No. 840,433, Mar. 17, 1986, abandoned. This application Oct. 31, 1990, Ser. No. 606,804

Claims priority, application Japan, Mar. 15, 1985, 60-50512

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] **G06F** *13/00, 9/30*

U.S. Cl. 395—425 **42 Claims**



1. A single chip pipeline data processor for use with a main memory, in which operand data and instructions are stored, comprising:

an instruction decoder decoding instructions and generating decoded results;

an execution unit executing instructions in accordance with said decoded results;

an instruction address generator generating an instruction read demand signal and a logical instruction address;

an instruction cache memory coupled to said instruction address generator and storing a plurality of logical instruction addresses and instructions corresponding to said logical instruction addresses and generating an instruction hit signal when said logical instruction address supplied from said instruction address generator is present in said instruction cache memory, wherein said instruction hit signal inhibits access to the main memory;

an operand address generator generating an operand fetch demand signal and a logical operand address signal;

an operand cache memory coupled to said operand address generator and storing a plurality of logical operand addresses and operand data corresponding to said logical operand addresses and generating an operand hit signal when said logical operand address supplied from said operand address generator is present in said operand cache memory, wherein said operand hit signal inhibits access to said main memory;

an interface selector coupled to said instruction address generator and to said operand address generator, receiving said generated logical instruction address and said generated logical operand address, responding to said instruction read demand signal, said operand fetch demand signal, said instruction hit signal and said operand hit signal, and sending out said generated logical instruction address in response to the absence of said instruction hit signal and sending out said generated logical operand address in response to the absence of said operand hit signal;

an address translator coupled to said interface selector translating said logical addresses into physical addresses to be sent to the main memory, whereby the instruction address and operand address sent to said main memory are physical addresses obtained from said address translator; and

circuitry having first and second outputs coupled to said instruction cache memory and said operand cache memory respectively, and responsive to data designated by one of said instructions, said circuitry responsive to a first bit of said designated data to provide a first clear signal on said first output, to a second bit of designated data to provide a second clear signal on said second output and to said first bit and second bit of said designated data to provide first and second clear signals on said first and second outputs respectively, said one instruction belonging to instructions decoded by said instruction decoder and executed by said data processor.

5,206,946

APPARATUS USING CONVERTERS, MULTIPLEXER AND TWO LATCHES TO CONVERT SCSI DATA INTO SERIAL DATA AND VICE VERSA

John L. Brunk, Brighton, Mich., assignor to Sand Technology Systems Development, Inc., Quebec, Canada

Filed Oct. 27, 1989, Ser. No. 427,723

Int. Cl.[5] **G06F** *5/00*

U.S. Cl. 395—500 **7 Claims**

1. A data communication network range expander formed of a first central processing unit connected to at least one second central processing unit and communicating between the first and second central processing units using a parallel small computer system interface ("SCSI") protocol, comprising:

a first unit connected in data communication with the first central processing unit, receiving SCSI protocol information, which includes parallel data, from said first central processing unit;

a second SCSI unit connected in data communication with the second central processing unit, receiving SCSI protocol information, which includes parallel data, from said second central processing unit;

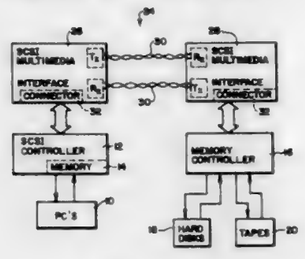
each of the first and second SCSI units comprising:

means for separating said SCSI protocol information into two portions, a first portion which includes control information for said SCSI information and a second portion which includes data information for SCSI information;

a multiplexer, receiving said first portion on a first set of inputs thereof and receiving said second portion on a second set of inputs thereof, and producing an output corresponding to one of said set of inputs based on a control signal applied thereto;

controlling means for providing said control signal to control said multiplexing means to first output one of said sets of inputs in parallel at a first time period and next output the other of said set of inputs in parallel at a next time period;

parallel to serial means, connected to receive outputs from said multiplexer, for converting each parallel set of SCSI information from said multiplexer to a serial data format indicative of the parallel data;



serial to parallel means for converting data in said serial data format to SCSI format information which includes parallel data, and connecting said SCSI information to its associated central processing unit, said serial to parallel means comprising a first latch structure for receiving a first parallel word, and holding said first parallel word; and a second latch structure for receiving a second parallel word and holding said second parallel word;

means, responsive to the parallel to serial converting means, for transmitting said information in said serial format; and

means, associated with the serial to parallel converting means, for receiving said serial data and connecting said serial data to said serial to parallel converting means; and

serial data communication means for connecting the transmitting means of the first SCSI unit to the receiving means of the second SCSI unit and for connecting the receiving means of the first SCSI unit to the transmitting means of the second SCSI unit and performing serial data communication therebetween.

5,206,947

STABLE SORTING FOR A SORT ACCELERATOR

Brian C. Edem, San Jose, Calif.; Richard P. Helliwell, Colorado Springs, Colo., and John T. Johnston, San Jose, Calif., assignors to Digital Equipment Corporation, Maynard, Mass. and National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 30, 1989, Ser. No. 375,053

Int. Cl.[5] **G06F** *7/08*

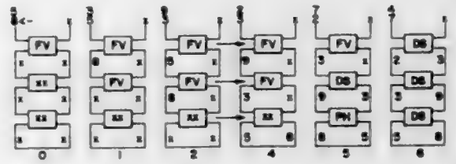
U.S. Cl. 395—600 **2 Claims**

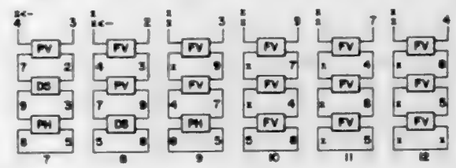
1. A method of stabilizing a sorter receiving a plurality of groups of N unordered records and providing a plurality of strings of N sorted records, each of said records having key bits, an order bit having a first and second state and data bits, said sorter comprising a plurality of processing element means for receiving N−1 records of one of the groups of N unordered records and outputting the smallest record of the one group upon receipt of the Nth record and then outputting the remaining N−1 records of the one group to form a sorted string of N records, said processing element means being connected in cascade relationship from a first processing element to a last processing element means each processing element means having an upper left input and a lower right input and an upper right output and a lower left output, said method comprising the steps of;

receiving the unordered records from one of the groups and setting said order bit for each record to said first state;

sorting the records by comparing the key bits and order bit of the records at the upper left input and the lower right input of each processing element means;

operating the processing element means in a first mode when the key bits of a record at said upper left input are greater than the key bits of a record at said lower right input or the key bits and order bit of a record at said upper left input are equal to the key bits and order bit of a record at said lower right input or the key bits of a record at said upper left input are equal to the key bits of a record at said lower right input and the order bit of said record at said upper left input is in said first state and the order bit of said record at said lower right input is in said second state by passing said record at the upper left input to the lower left output and setting the order bit of said record to said first state and passing the record from the lower right input to the upper right output and leaving the order bit of said record unchanged; operating the processing element means in a second mode when the key bits of a record at said upper left input are less than the key bits of a record at said lower right input or the key bits or a record at said upper left input are equal to the key bits of a record at said lower right input and the order bit of said record at said upper left input is in said second state and the order bit of said record at said lower right input is in said first state by passing said record at the upper left input to the upper right output and setting the order bit of said record to said first state and passing said record at the lower right input to the lower left output and setting the order bit of said record to said second state;





setting to said first state the order bit of each record at the lower right input of said last processing element means;

outputting said records in sorted order with records having equal key bits exiting the processing element means in the same relative order in which they entered.

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5,206,948

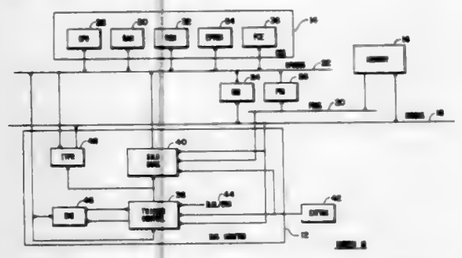
BUS MONITOR WITH MEANS FOR SELECTIVELY CAPTURING TRIGGER CONDITIONS

Douglas J. De Angelis, Woburn; Henry W. J. Maddox, Franklin; Arthur Peters, Sudbury; Donald J. Rathbun, Methuen, and William L. Saltmarsh, Brockton, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 22, 1989, Ser. No. 455,666

Int. Cl.[5] G06F *11/34*

U.S. Cl. 395—575 **32 Claims**



1. In a monitoring means for use in a computer system for selectively detecting and recording signals representing conditions of system operation at selected points within the system during operation, the monitoring means including a trigger generation means connected from a first plurality of selected points and responsive to the signals representing selected conditions for generating corresponding trigger signals representing an occurrence of corresponding selected conditions and a recording memory means connected from a second plurality of selected points and responsive to trigger outputs for recording the conditions present at the second selected points, means for selecting trigger outputs corresponding to the trigger signals, comprising:

trigger code enabling means for storing a plurality of selectable trigger enabling codes,

wherein each trigger enabling code corresponds to a trigger signal representing the occurrence of a corresponding condition to be detected, and

trigger output means connected from the trigger generating means and from the trigger code enabling means and having an output connected to the recording memory means and responsive to the trigger enabling codes and to the trigger signals for providing trigger outputs upon the occurrence of a trigger signal corresponding to a selected trigger enabling code.

5,206,949

DATABASE SEARCH AND RECORD RETRIEVAL SYSTEM WHICH CONTINUOUSLY DISPLAYS CATEGORY NAMES DURING SCROLLING AND SELECTION OF INDIVIDUALLY DISPLAYED SEARCH TERMS

Nancy P. Cochran, 1 Linden Pl., #212, Hartford, Conn. 06106, and Susan Byrnes, East Hartford, Conn., assignors to Nancy P. Cochran, Nyack, N.Y.

Continuation of Ser. No. 909,293, Sep. 19, 1986, Pat. No. 4,879,648. This application Aug. 7, 1989, Ser. No. 390,524

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] G06F *7/10*

U.S. Cl. 395—600 **35 Claims**

1. A method of retrieving information from a database, comprising the steps of:

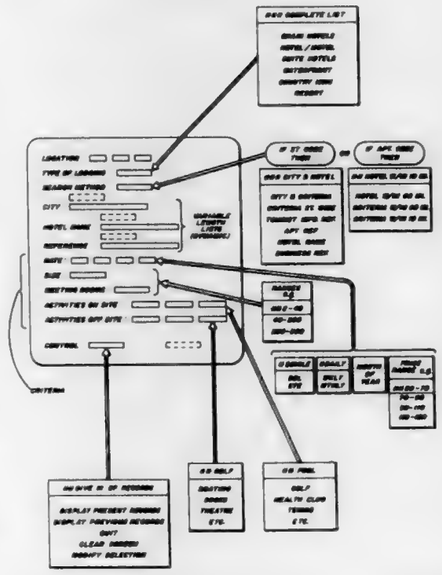
accessing a database containing records each having data fields searchable by using data sets that are categorized by categorical identifiers and sequentially ordered into a plurality of lists with each data set being one selectable data set entity in a list of a respective one of the categorical identifiers;

continuously displaying a plurality of said categorical identifiers at respective coordinates on a display medium, at least some of said categorical identifiers being displayed simultaneously during at least a portion of the displaying of said categorical identifiers, and each of said categorical identifiers corresponding to at least one of said plurality of lists;

sequentially displaying data sets in one list corresponding to a respective one of said displayed categorical identifiers upon sequential application of a scrolling control, so that said selectable data set entities in said one list are displayed in a respective one of a plurality of preselected locations on said display medium, one at a time;

selecting a desired data set entity from said one list when said desired data set entity is displayed in said one preselected location;

searching for records having data fields corresponding to said selected data set entity;



selecting at least one additional one of said displayed categorical identifiers corresponding to another one of said plurality of lists;

sequentially displaying sequential data sets of respective additional lists corresponding to said at least one additional displayed categorical identifier and any desired additional displayed categorical identifiers, upon sequential application of a scrolling control, so that said selectable data set entities in said additional lists are displayed in respective ones of said preselected locations on said display medium, one at a time;

selecting respective desired data set entities of said at least one additional displayed categorical identifier and each of said desired additional displayed categorical identifiers, when each of said desired data set entities is displayed in its respective preselected location; and

searching for and retrieving records having data fields corresponding to each additional selected data set entity using only those records which were found to have data field-data set entity correspondence in preceding searches.

5,206,950

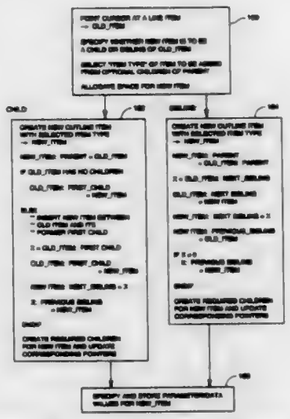
SOFTWARE DEVELOPMENT SYSTEM AND METHOD USING EXPANDING OUTLINE INTERFACE

Michael E. Geary, Los Gatos; Umang P. Gupta, San Mateo; David W. Roth, Mountain View, and Donal B. Scott, Santa Clara, all of Calif., assignors to Gupta Technologies, Inc., Menlo Park, Calif.

Continuation of Ser. No. 248,406, Sep. 23, 1988, abandoned. This application Jul. 8, 1991, Ser. No. 767,557

Int. Cl.[5] G06F *15/40*

U.S. Cl. 395—600 **10 Claims**



1. A method of composing computer programs using a programmed digital computer having a display, the steps of the method comprising:

storing in a computer memory coupled to said computer outline item definition data which defines a set of program outline items which can be selected and combined under the control of said computer to form a computer program so that said computer program will accomplish a specified set of tasks;

said stored outline item definition data including data specifying a set of outline item characteristics governing the usage of each of sad outline item, including for each said outline item a set of required children, comprising outline items that must be included at the next lower outline level than said outline item each time said outline item is used in a computer program, and optional children, comprising outline items that may be included at the next lower outline level than said outline item when said outline item is used in a computer program;

storing in said computer memory a computer program comprising a selection of said outline items arranged in a multilevel outline, wherein the items at each outline level except the topmost level are the children of the preceding outline item at the next higher outline level;

interactively, in response to user commands, adding selected outline items to said stored computer program, said adding step including the steps of selecting a position in said multilevel outline to add an outline item, thereby selecting a parent outline item one outline level higher than the outline item to be added to said stored computer program, and selecting an outline item to be added to said stored computer program;

said adding step including the steps of

restricting selected outline items that are to be added to said stored computer program to the optional children of said parent outline item, as specified by said stored outline item definition data, and

automatically adding to said stored computer program, at the next outline level lower than an added outline item, said required children for said added outline item;

displaying on said display a selected contiguous portion of said multilevel outline, including automatically changing the display of said multilevel outline to incorporate outline items added to said computer program;

storing in said computer memory for each outline item an expansion indicator, the status of which denotes whether the corresponding outline item has children and whether the display of said children is enabled; and

providing user interface means for interactively changing the status of said expansion indicators for specified outline items;

wherein the user is prevented from adding a outline item that is not included in said set of optional children for said parent outline item; and

wherein said displaying step displays only outline items whose display is enabled by a corresponding expansion indicator, and includes the step of responding to changes in the status of said expansion indicators by updating the display of said multilevel outline so as to reflect the current status of said expansion indicators.

5,206,951

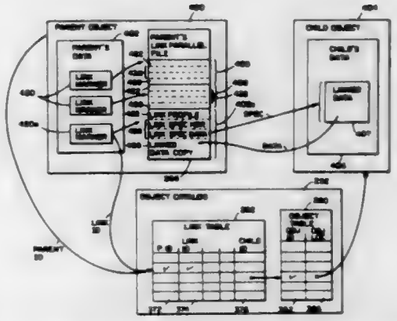
INTEGRATION OF DATA BETWEEN TYPED OBJECTS BY MUTUAL, DIRECT INVOCATION BETWEEN OBJECT MANAGERS CORRESPONDING TO OBJECT TYPES

Dana Khoyi, Dracut; Marc S. Soucie, Tyngsboro; Carolyn E. Surprenant, Dracut; Laura O. Stern, Woburn, and Ly-Hsong T. Pham, Chelmsford, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 88,622, Aug. 21, 1987, abandoned. This application Apr. 3, 1991, Ser. No. 681,435

Int. Cl.[5] G06F *9/40*

U.S. Cl. 395—650 **12 Claims**



8. In an object based data processing system having a plurality of object managers for performing operations with respect to typed objects, each object manager including means for performing at least one operation with respect to at least one corresponding type of object, the means for performing at least one operation being responsive to a request to perform an operation of the at least one operation with respect to an identified object of the corresponding type for performing the requested operation with respect to the identified object, each object manager including a means for identifying in a first, corresponding type of object a reference to a second object and means responsive to the identification of a reference to a second object for generating a request for an operation with respect to the second object, each request including an identification of the second object and an operation to be performed with respect to the second object, an application manager comprising:

(A) means for receiving from a requesting object manager an identification of a second object and an identification of an

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operation to be performed with respect to the second object,

(B) means for using the received object and operation identification to identify an object manager that includes means for performing the identified operation on objects of the type of the identified second object, and

(C) means for invoking the identified object manager, and

(D) means for communicating to the identified object manager a request to perform the identified operation on the identified second object,

wherein an object manager can through operation of the application manager both request invocation of other object managers and itself be invoked by other object managers.

5,206,952

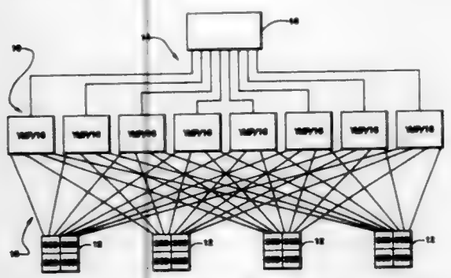
FAULT TOLERANT NETWORKING ARCHITECTURE

James W. Sundet, Chippewa Falls, and Roger G. Brown, Colfax, both of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed Sep. 12, 1990, Ser. No. 582,507

Int. Cl.[5] **G06F** *13/14*

U.S. Cl. 395—725 **11 Claims**



1. A fault-tolerant apparatus for controlling access to a plurality of shared peripherals by a plurality of computers, comprising:

input means for receiving reservation information from the plurality of computers;

a redundant set of reservation semaphores for storing the reservation information and for reserving a selected one of the peripherals for a selected one of the plurality of computers;

a redundant set of heartbeat semaphores for indicating whether the selected one of the plurality of computers has sent reservation information during a predetermined time period;

voting means for comparing at least a portion of the members of the redundant set of reservation semaphores, for comparing at least a portion of the members of the redundant set of heartbeat semaphores and for selecting a majority decision to produce a majority result therefrom;

output means for returning the majority result to the plurality of computers; and

means for clearing a selected portion of the heartbeat semaphores after returning the majority result.

5,206,953

DATA COMMUNICATION SYSTEM

Yutaka Hasegawa, Tokyo, and Syuichi Yamazaki, Fujimi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 273,461, Nov. 18, 1988, abandoned. This application Jul. 22, 1991, Ser. No. 733,975

Claims priority, application Japan, Nov. 18, 1987, 62-289383

Int. Cl.[5] **G06F** *13/14, 13/24;* **G03B** *27/00*

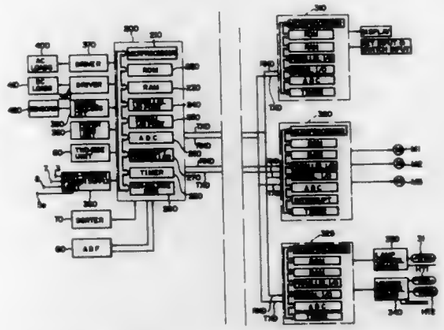
U.S. Cl. 395—775 **4 Claims**

1. A data communication system comprising:

a plurality of interconnected CPUs, each of said CPUs having serial and interrupt data communication ports;

a plurality of inhibit means with at least one of said inhibit means being in each of said CPUs with said inhibit means located in a given CPU, for masking interrupts received at said interrupt data communication port, of said CPU based upon data received from said serial communication port of each of said CPU;

interconnection means for connecting from said serial port within each CPU to said inhibit means in each CPU and for providing a transmission path for masking and unmasking commands which are based upon data received by said serial port in each CPU; and



communication processing means contained within each of said CPU to cause each of said respective CPU to accept a first type of data, denominated as ordinary data, from the serial port of said respective CPU when a mask command is present and to accept a second type of data, denominated urgent data, at least at said interrupt port when an unmask command is present at said serial port; and

wherein said second type of data is emergency timing signal data.

5,206,954

SATELLITE SIGNAL RECEIVING APPARATUS

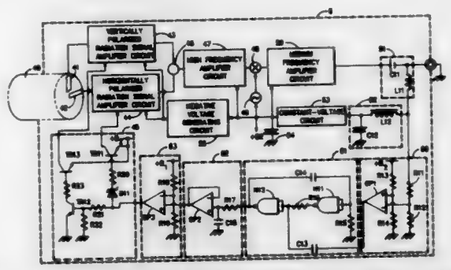
Nobutaka Inoue, Aichi; Hiroshi Matsubara, Owariasahi, and Masaaki Nagase, Toyoake, all of Japan, assignors to Maeprodenkoh Kabushikiaisha, Japan

Filed Sep. 26, 1991, Ser. No. 766,195

Claims priority, application Japan, Sep. 27, 1990, 2-258196

Int. Cl.[5] **H04H** *1/02;* **H04B** *7/185, 1/18*

U.S. Cl. 455—6.2 **22 Claims**



1. A satellite signal receiving apparatus comprising an outdoor unit, a channel selector and a transmission line connecting therebetween, wherein said outdoor unit comprises:

a receiving means for receiving vertically polarized radiation and horizontally polarized radiation, respectively, transmitted from an artificial satellite;

a frequency converting means for converting either one of said vertically polarized radiation and said horizontally polarized radiation output from said receiving means into transmission signal having a predetermined frequency band and outputting said transmission signal to said transmission line;

a source voltage extracting means for extracting a source voltage superposed over a pulse train by said channel selector and received therefrom via said transmission line;

a smoothing means for smoothing said source voltage extracted by said source voltage extracting means;

a constant-voltage means for converting said source voltage smoothed by said smoothing means into a predetermined voltage and for supplying said predetermined voltage to each component of said outdoor unit;

a pulse train detecting means for detecting a pulse train from said source voltage extracted by said source voltage extracting means to generate a detection signal; and

a polarized radiation signal switch control means for switching said vertically and horizontally polarized radiation signals to be converted in frequency by said frequency converting means and output to said transmission line in accordance with said detection signal generated by said pulse train detecting means.

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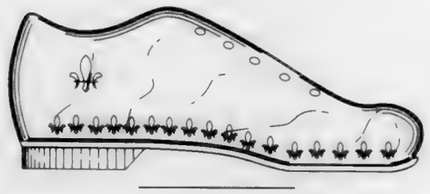
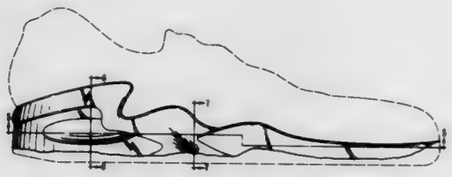
335,013
AIR SOLE SHOE
Gary G. Durfey, 16802 Bellbrook St., Covina, Calif. 91722
Filed Dec. 14, 1990, Ser. No. 627,369
Term of patent 14 years
U.S. Cl. D2—273

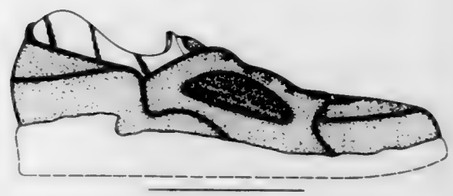


335,014
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed Apr. 10, 1992, Ser. No. 866,541
Term of patent 14 years
U.S. Cl. D2—314

335,015
SHOE MIDSOLE
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International, Ltd., Bermuda
Filed May 1, 1992, Ser. No. 877,126
Term of patent 14 years
U.S. Cl. D2—314

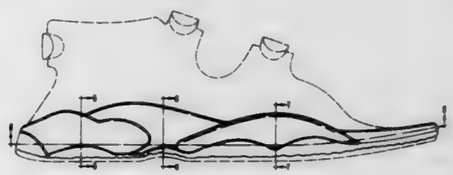


335,016
SHOE UPPER
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc, Beaverton, Oreg. and Nike International, Ltd., Bermuda
Filed May 1, 1992, Ser. No. 877,154
Term of patent 14 years
U.S. Cl. D2—314



335,017
SHOE UPPER
Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 5, 1992, Ser. No. 878,507
Term of patent 14 years
U.S. Cl. D2—314

335,018
SHOE MIDSOLE
Eric P. Avar, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jul. 1, 1992, Ser. No. 905,660
Term of patent 14 years
U.S. Cl. D2—314



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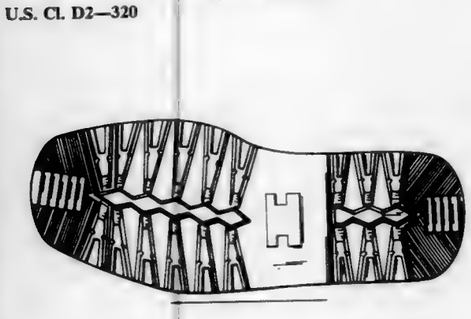
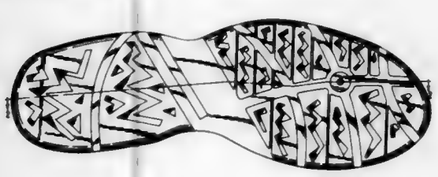
335,019
SURFACE ORNAMENTATION FOR A SHOE TONGUE
Thomas P. Allen, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 4, 1991, Ser. No. 637,523
Term of patent 14 years
U.S. Cl. D2—315

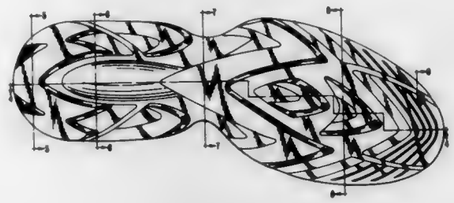
335,020
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H.H. Brown Shoe Company, Inc., Del.
Filed Jan. 30, 1991, Ser. No. 648,396
The portion of the term of this patent subsequent to Mar. 30, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320



335,021
SHOE OUTSOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International, Ltd., Oregon, Bermuda
Filed Apr. 10, 1992, Ser. No. 866,547
Term of patent 14 years
U.S. Cl. D2—320



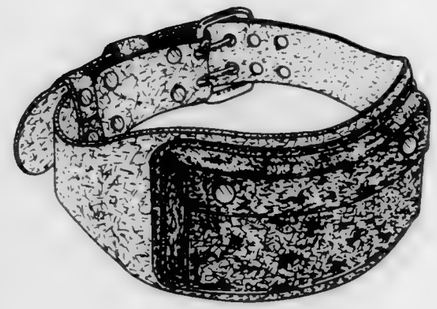
335,022
SHOE OUTSOLE
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed May 1, 1992, Ser. No. 878,005
Term of patent 14 years
U.S. Cl. D2—320



335,023
WRIST BAND WITH ARTICLE COMPARTMENT AND COVER
Steven R. Hutcheson, 69 Sturges Rd., Reading, Mass. 01867
Filed Jul. 5, 1991, Ser. No. 726,018
Term of patent 14 years
U.S. Cl. D2—612

335,024
GLOVE
Marlene L. Moffitt, 345 Brannor Ave., Monterey, Calif. 93940
Filed Apr. 22, 1991, Ser. No. 689,688
Term of patent 14 years
U.S. Cl. D2—619

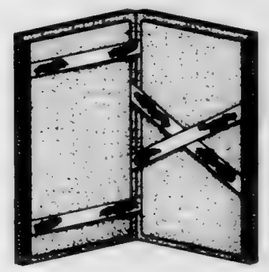
335,025
COMBINED WEIGHTLIFTING BELT AND POUCH
Bruce W. Thomas, P.O. Box 8265, Turnersville, N.J. 08012
Filed Mar. 25, 1991, Ser. No. 674,727
Term of patent 14 years
U.S. Cl. D2—630



335,026
JEAN BAG
Donna L. Cape, 7010 Pea Ridge Rd., Gainesville, Ga. 30506
Filed Jul. 27, 1990, Ser. No. 559,567
Term of patent 14 years
U.S. Cl. D3—44

335,027
BINGO ACCESSORY CARRYING CASE
Mary M. Flood, 120 Lambert Ave., South Farmingdale, N.Y. 11735
Filed Jun. 21, 1991, Ser. No. 718,856
Term of patent 14 years
U.S. Cl. D3—45

335,028
COMBINED MONEY AND BUSINESS CARD HOLDER
Iosif Berlin, 302 High St. #H25, Fair Lawn, N.J. 07410
Filed Sep. 18, 1990, Ser. No. 566,702
Term of patent 14 years
U.S. Cl. D3—56



UMI

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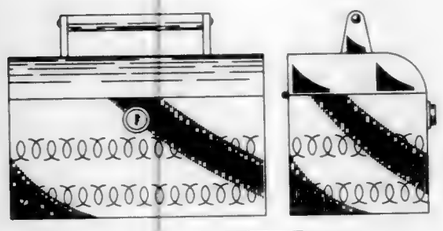
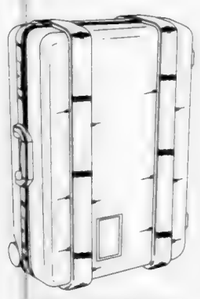
335,029
TRUNK TOOL CARRIER
Eugene E. Gerding, 2 Darmouth Dr., Ft. Mitchell, Ky. 41017
Filed Jul. 20, 1990, Ser. No. 555,155
Term of patent 14 years
U.S. Cl. D3—70

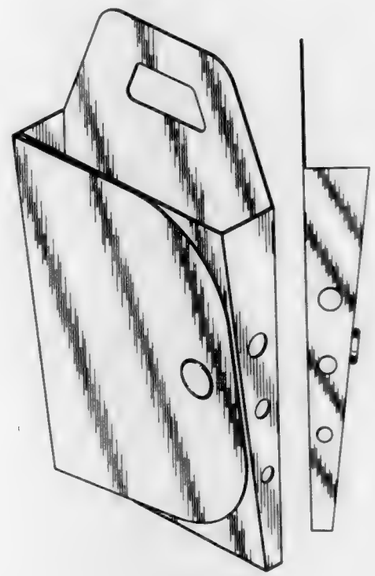


335,030
CARRYING CASE FOR A PERSONAL COMPUTER
Pedro M. Alfonso, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 27, 1990, Ser. No. 558,950
Term of patent 14 years
U.S. Cl. D3—76

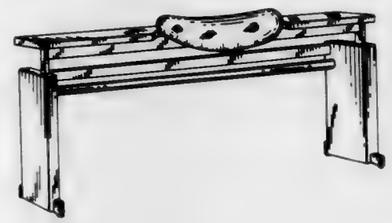


335,031
BELT ATTACHED FISHING ROD HOLDER
Bramy Resnik, 1319 Sonata St., and Noam Zaionit, 2002 Sherwood Dr., both of Greenville, N.C. 27858
Filed Jun. 22, 1990, Ser. No. 544,461
Term of patent 14 years
U.S. Cl. D3—104

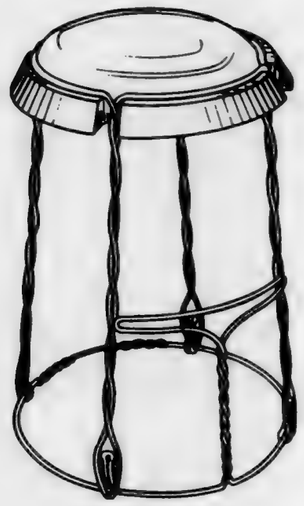
335,032
PAINTBRUSH HOLDER
Leo W. Durkin, III, 6342 Inman St., San Diego, Calif. 92111
Filed Jun. 29, 1990, Ser. No. 546,516
Term of patent 14 years
U.S. Cl. D4—199



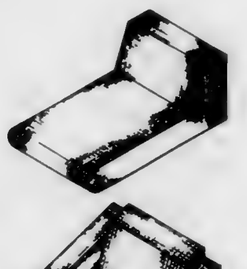
335,033
ORGAN BENCH
Eskild Pontoppidan, Blegdamsvej 28, DK-2200 Copenhagen N, Denmark
Filed Jan. 4, 1990, Ser. No. 460,722
Claims priority, application Denmark, Jul. 5, 1989, MA 0815 1989
Term of patent 14 years
U.S. Cl. D6—349



335,034
STACKABLE BAR STOOL
James G. Herman, 42 N. Moore St., New York, N.Y. 10013
Filed Nov. 7, 1990, Ser. No. 611,001
Term of patent 14 years
U.S. Cl. D6—360



335,035
SEAT
James M. Floyd, Rte. 2, Box 267, Thomasville, N.C. 27360
Filed May 29, 1990, Ser. No. 529,261
Term of patent 14 years
U.S. Cl. D6—361



335,036
BATHTUB LOUNGE CHAIR
Lois D. Simmons, 6002 Qualfield Rd., Mechanicsville, Va. 23111
Filed Oct. 12, 1990, Ser. No. 596,590
Term of patent 14 years
U.S. Cl. D6—361

335,037
CHAIR FOR BOWLING ALLEY
Edgar B. Montague, III, 1923 Club Rd., Charlotte, N.C. 28205; Tracy L. Teague, 1722 Winthrop Ave.; James R. Machen, 2032 Springdale Ave., both of Charlotte, N.C. 28203, and Edward L. Boyd, 7540 L Quailwood Dr., Charlotte, N.C. 28226
Filed Aug. 27, 1990, Ser. No. 572,797
Term of patent 14 years
U.S. Cl. D6—364

335,038
LAWN CHAIR
Chaes-Jong Tseng, No. 181, Pu-Tzepu, Wan-Chao Tsun, Chu-Chee Hsiang, Chiayi Hsien, Taiwan
Filed Aug. 9, 1990, Ser. No. 564,973
Term of patent 14 years
U.S. Cl. D6—365

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335,039
LAWN CHAIR
Chuen-Jong Tseng, No. 181, Pu-Tzepu, Wan-Chao Tsun, Chu-Chee Hsiang, Chiayi Hsien, Taiwan
Filed Aug. 9, 1990, Ser. No. 564,976
Term of patent 14 years
U.S. Cl. D6—365

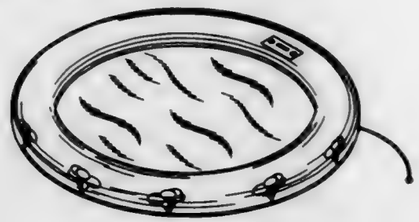
335,040
LAWN CHAIR
Chuen-Jong Tseng, No. 181, Pu-Tzepu, Wan-Chao Tsun, Chu-Chee Hsiang, Chiayi Hsien, Taiwan
Filed Aug. 9, 1990, Ser. No. 564,974
Term of patent 14 years
U.S. Cl. D6—370

335,041
CHAIR
Just B. Meijer, Rhenen, Netherlands, assignor to J. B. Invocom N.V., Netherlands
Filed Nov. 15, 1990, Ser. No. 614,738
Claims priority, application 05231990, May 23, 1990, 65565-01/02
Term of patent 14 years
U.S. Cl. D6—379

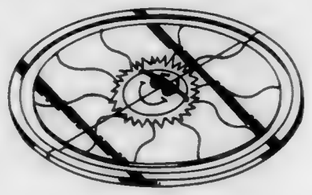
335,042
CHAIR
Terence Gibbs, Nyack, N.Y., assignor to Omni Products International, Inc., Fairfield, N.J.
Filed Aug. 28, 1990, Ser. No. 574,238
Term of patent 14 years
U.S. Cl. D6—373

335,043
CHAIR
Bernd Makulik, Hannover, Fed. Rep. of Germany, assignor to Casala-Werke Carl Sasse GmbH & Co. KG, Lauenau, Fed. Rep. of Germany
Filed Jun. 26, 1990, Ser. No. 544,370
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, DM/015695
Term of patent 14 years
U.S. Cl. D6—379

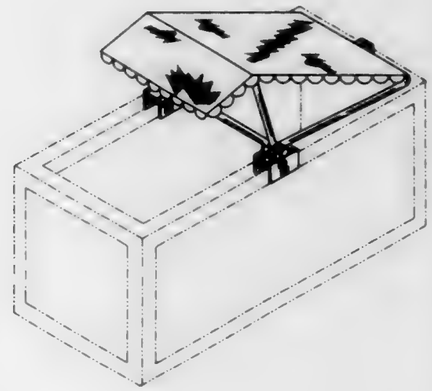
335,044
ROTATING BED
Randall L. Sutton, 6931 A71C, PSC 102 Box 767, APO AE 09646-0021
Filed Mar. 29, 1990, Ser. No. 501,184
Term of patent 14 years
U.S. Cl. D6—382



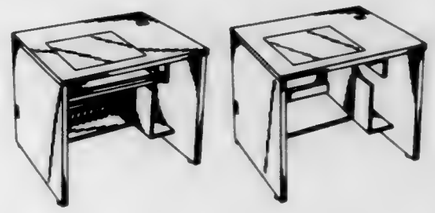
335,045
ROTATING BED FOR A SUNBATHER
Lino J. Ferrari, and Betty J. Ferrari, both of 405 Fairpoint Dr., Gulf Breeze, Fla. 32561
Filed Aug. 21, 1990, Ser. No. 570,366
Term of patent 14 years
U.S. Cl. D6—382



335,046
SUNSHADE FOR A CHILD'S PLAYPEN
Anita R. Diaz, 6207 Jasper St., Alta Loma, Calif. 91701
Filed Jun. 15, 1990, Ser. No. 538,486
Term of patent 14 years
U.S. Cl. D6—389



335,047
DESK
John N. Lechman, and Thomas Wegman, both of Effingham, Ill., assignors to Nova Office Furniture, Inc., Effingham, Ill.
Filed Feb. 5, 1991, Ser. No. 653,447
Term of patent 14 years
U.S. Cl. D6—422



UMI

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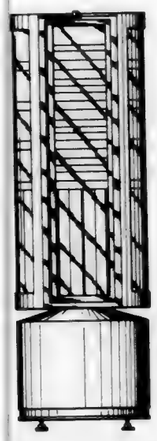
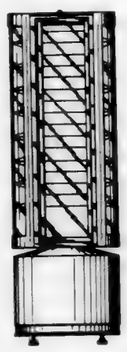
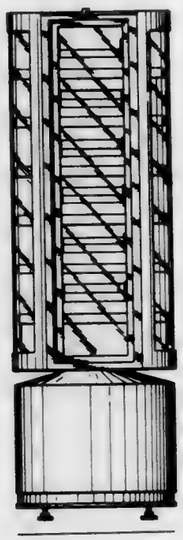
335,048
DISPLAY STAND
Floyd R. Callon, Punta Gorda, Fla., assignor to Dyment Limited, Canada
Continuation-in-part of Ser. No. 167,622, Mar. 10, 1988, which is a continuation-in-part of Ser. No. 764,849, Aug. 12, 1985, Pat. No. Des. 295,815. This application Feb. 22, 1990, Ser. No. 483,419
The portion of the term of this patent subsequent to Sep. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—472



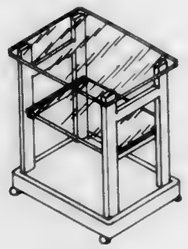
335,049
DISPLAY STAND
Floyd R. Callon, Punta Gorda, Fla., assignor to Dyment Limited, Canada
Continuation-in-part of Ser. No. 167,622, Mar. 10, 1988, which is a continuation-in-part of Ser. No. 764,849, Aug. 12, 1985, Pat. No. Des. 295,812. This application Feb. 22, 1990, Ser. No. 483,949
The portion of the term of this patent subsequent to Sep. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—472



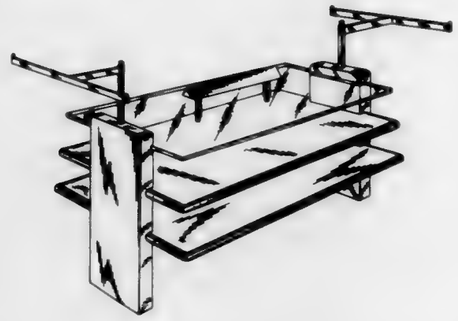
335,050
DISPLAY STAND
Floyd R. Callon, Punta Gorda, Fla., assignor to Dyment Limited, Canada
Continuation-in-part of Ser. No. 167,622, Mar. 10, 1988, Continuation-in-part of Ser. No. 764,849, Aug. 12, 1985, Pat. No. Des. 295,815. This application Feb. 22, 1990, Ser. No. 483,414
The portion of the term of this patent subsequent to Sep. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—472



335,051
TV AND VCR STAND
Kenneth B. Ossip, 141-05 68th Dr., Kew Gardens Hills, N.Y. 11367-1635
Filed Feb. 11, 1991, Ser. No. 653,805
Term of patent 14 years
U.S. Cl. D6—477

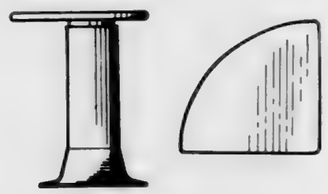


335,052
MERCHANDISE DISPLAY STAND
Joanna H. Barbuto, Maspeth, and Elizabeth Kane, New York, both of N.Y., assignors to Liz Claiborne, Inc., New York, N.Y.
Filed Aug. 5, 1991, Ser. No. 740,188
Term of patent 14 years
U.S. Cl. D6—477

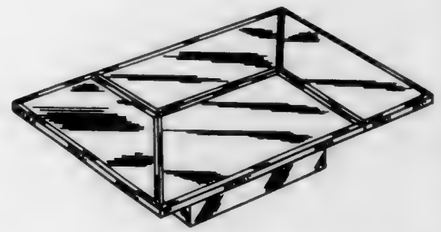


335,053
TABLE
Andre Morin, Pointe-Claire, Canada, assignor to Andre Morin Designers Inc., Pointe Claire, Canada
Filed May 20, 1991, Ser. No. 702,693
Claims priority, application Canada, Apr. 17, 1991, 17-04-91-4
Term of patent 14 years
U.S. Cl. D6—484

335,054
TABLE
Geoffrey A. Hollington, London, England, assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Mar. 19, 1990, Ser. No. 495,307
Term of patent 14 years
U.S. Cl. D6—486



335,055
TABLE
Jack D. Game, Stanleytown, Va., assignor to James P. Kenny and Bassett Mirror Co., both of High Point, N.C.
Filed Feb. 5, 1991, Ser. No. 650,665
Term of patent 14 years
U.S. Cl. D6—486



335,056
TABLE
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed Mar. 19, 1990, Ser. No. 495,228
Term of patent 14 years
U.S. Cl. D6—487

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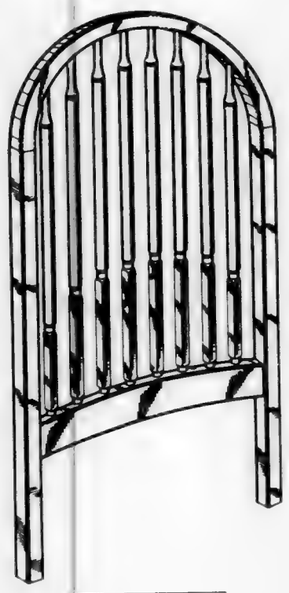
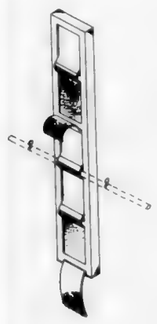
335,057
CRIB ENDBOARD
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Jul. 15, 1991, Ser. No. 730,298
Term of patent 14 years
U.S. Cl. D6—508

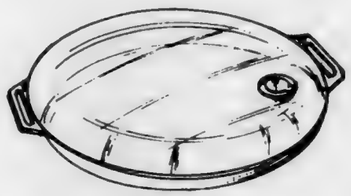


335,058
FISHING ROD HOLDER
James L. Williams, 118 Sorrento, Sugarland, Tex. 77478
Filed Mar. 28, 1991, Ser. No. 676,249
Term of patent 14 years
U.S. Cl. D6—552

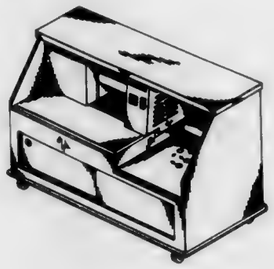


335,059
CONNECTOR FOR WAND AND ACTUATING MECHANISM
John F. Schaefer, Corona del Mar; Sandra K. Young, Newport Beach, and David C. Burns, San Francisco, all of Calif., assignors to Levolor Corporation, Sunnyvale, Calif.
Filed Mar. 14, 1990, Ser. No. 493,557
Term of patent 14 years
U.S. Cl. D6—580

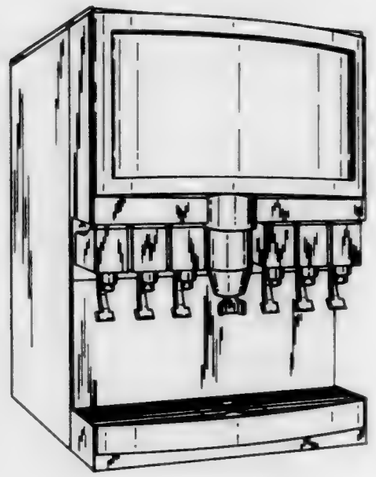
335,060
CHILDREN'S PLAY MAT
Linda F. Dial, Atlanta, Ga., assignor to W. B. Nod & Co., Atlanta, Ga.
Filed Sep. 5, 1990, Ser. No. 582,411
Term of patent 14 years
U.S. Cl. D6—604



335,061
PORTABLE BEVERAGE DISPENSING SYSTEM
Mason R. Roberts, 821 Hall Ave., Dayton, Ohio 45404
Filed Oct. 11, 1990, Ser. No. 598,085
Term of patent 14 years
U.S. Cl. D7—306

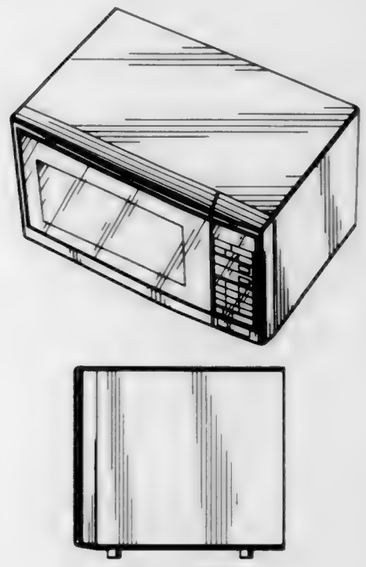


335,062
COMBINED COUNTERTOP ICE AND BEVERAGE DISPENSER
Paul P. Kolada, Bexley, and Gregory M. Davis, Columbus, both of Ohio, assignors to Scotsman Group, Inc.
Filed Nov. 20, 1990, Ser. No. 618,838
Term of patent 14 years
U.S. Cl. D7—308

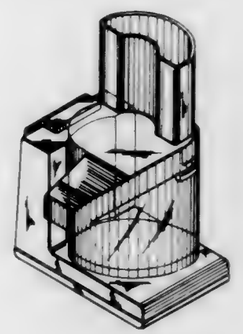


335,063
ELECTRIC COOKER
Christopher L. Napolitano, 3603 N. Doral St., La Verne, Calif. 91750
Filed Jun. 15, 1990, Ser. No. 538,515
Term of patent 14 years
U.S. Cl. D7—360

335,064
MICROWAVE OVEN
Masakazu Sugiyama, Nara, and Tadao Orihara, Tochigi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 20, 1991, Ser. No. 718,166
Claims priority, application Japan, Dec. 20, 1990, 2-42752
Term of patent 14 years
U.S. Cl. D7—351



335,065
FOOD PROCESSOR
Paul Gildersleeve, Ridgefield, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Dec. 21, 1990, Ser. No. 633,445
Term of patent 14 years
U.S. Cl. D7—384



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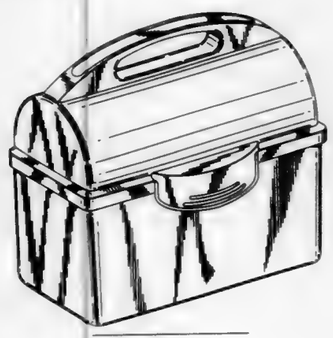
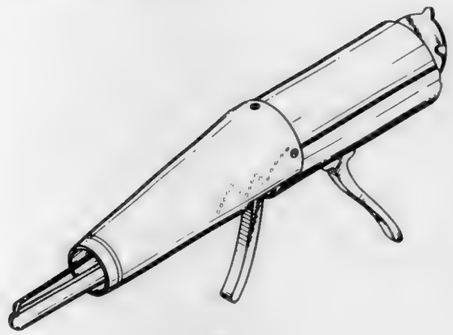
335,066
COMBINED SALT AND PEPPER SHAKER
Vernon B. Good, 65608 S.R. 15, Goshen, Ind. 46526
Filed Aug. 19, 1991, Ser. No. 746,554
Term of patent 14 years
U.S. Cl. D7—596

335,067
LUNCH TRANSPORTING CONTAINER
Phillip W. Hamilton, and W. Henry Kahl, both of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 12, 1991, Ser. No. 790,705
Term of patent 14 years
U.S. Cl. D7—626

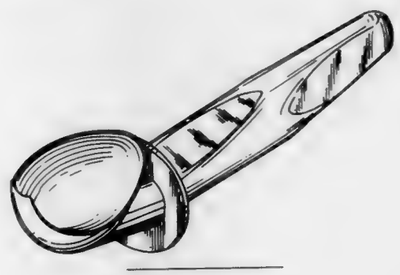


335,068
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida, Ltd., Oneida, N.Y.
Filed May 24, 1991, Ser. No. 705,145
Term of patent 14 years
U.S. Cl. D7—663

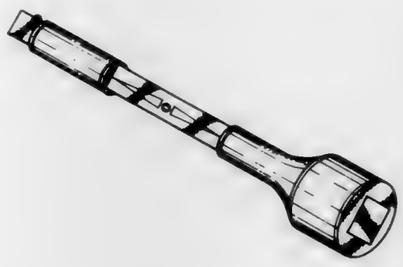
335,069
CAKE DECORATING TOOL
Apolinar Capelian, 344 Kenwood St., Englewood, N.J. 07631
Filed Nov. 4, 1991, Ser. No. 786,980
Term of patent 14 years
U.S. Cl. D7—669



335,070
ICE CREAM SCOOP
John Empie, 5428 Halifax La., Edina, Minn. 55424
Filed Feb. 13, 1991, Ser. No. 654,920
Term of patent 14 years
U.S. Cl. D7—681



335,071
SOCKET WRENCH EXTENSION
Eugene Fine, 72 Samantha Way, Cheektowaga, N.Y. 14227
Filed Sep. 11, 1990, Ser. No. 580,620
Term of patent 14 years
U.S. Cl. D8—29



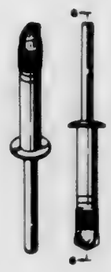
335,072
BOTTLE OPENER
Michel Gourhant, Paris, France, assignor to AS Birambeau, Paris, France
Filed Jan. 28, 1991, Ser. No. 723,524
Claims priority, application France, Dec. 28, 1990, 908123
Term of patent 14 years
U.S. Cl. D8—42

335,073
CORDLESS IMPACT WRENCH
Philip M. Anthony, Lindenhurst, Ill.; John E. Fuhrock, Racine, Wis.; Michael A. Norris, Kenosha, Wis.; Gerald J. Smolinski, Bristol, Wis., and Edward S. Wahoski, Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Apr. 15, 1991, Ser. No. 685,008
Term of patent 14 years
U.S. Cl. D8—68

335,074
SCREWDRIVER HANDLE
Wilfried Haha, Schoenach, Fed. Rep. of Germany, assignor to Willi Haha GmbH & Co. KG, Schoenach, Fed. Rep. of Germany
Filed Jan. 22, 1991, Ser. No. 644,010
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1990, 9004938
Term of patent 14 years
U.S. Cl. D8—83

335,075
KNIFE SHARPENER
Michael W. Martin, Clackamas, Oreg., assignor to Plastics Northwest, Inc., Clackamas, Oreg.
Filed Sep. 25, 1989, Ser. No. 412,865
Term of patent 14 years
U.S. Cl. D8—93

335,076
SELF-DRILLING RIVET FOR FASTENING PANEL MEMBERS
Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seisakusho, Osaka, Japan
Filed Jun. 21, 1989, Ser. No. 369,276
Claims priority, application Japan, Dec. 26, 1988, 63-50697
Term of patent 14 years
U.S. Cl. D8—386



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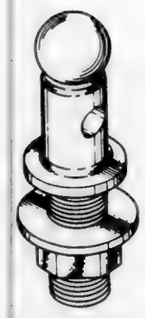
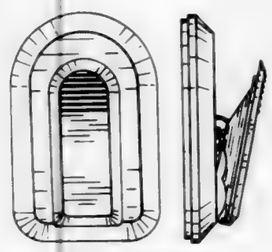
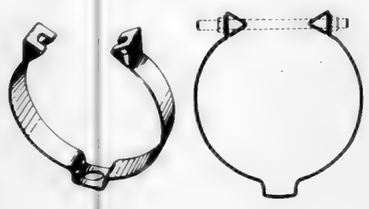
335,077
VEHICLE COVER FASTENER UNIT
Warren Haney, 519 Mosgrove St., Urbana, Ohio 43078
Filed Jul. 12, 1990, Ser. No. 551,731
Term of patent 14 years
U.S. Cl. D8—387



335,078
CLIP
James Hampshire, Solon, Ohio, assignor to Interdesign, Inc., Solon, Ohio
Filed Dec. 31, 1990, Ser. No. 636,364
Term of patent 14 years
U.S. Cl. D8—395

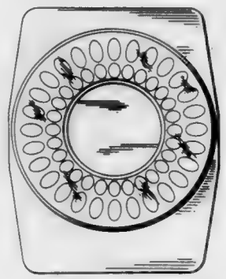


335,079
ATTACHMENT CLAMP
Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval Quebec, Canada H7W 1L3
Division of Ser. No. 498,383, Mar. 26, 1990, Pat. No. D. 329,014, which is a continuation-in-part of Ser. No. 366,412, Jun. 15, 1989, Pat. No. D. 323,474. This application Jun. 10, 1992, Ser. No. 896,552
Term of patent 14 years
U.S. Cl. D8—396

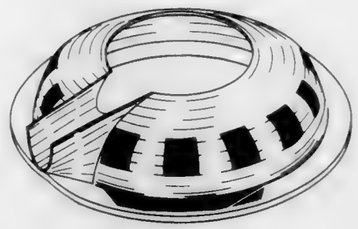


335,080
HOLDER FOR A COSMETIC SAMPLE CONTAINER
Melvin E. Kamen, Highlands, N.J., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 5, 1990, Ser. No. 548,635
Term of patent 14 years
U.S. Cl. D9—455

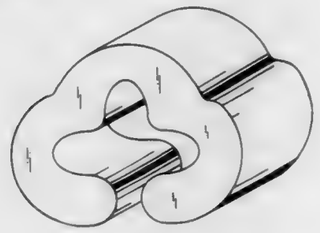
335,081
PHARMACEUTICAL TABLET DISPENSER
James J. Pierantozzi, Blue Bell, and William Walchek, Jr., Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
Filed Jul. 30, 1991, Ser. No. 738,931
Term of patent 14 years
U.S. Cl. D9—341



335,082
POUR SPOUT FOR PAINT CANS
Maurice J. Delorey, 5150 Champagne Dr., Colorado Springs, Colo. 80919
Filed Aug. 30, 1990, Ser. No. 574,942
Term of patent 14 years
U.S. Cl. D9—447



335,083
LOOSE FILL PACKING INSERT
Patrick M. Russell, Freeland, and Ronald B. Schultze, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 21, 1990, Ser. No. 633,694
Term of patent 14 years
U.S. Cl. D9—456



335,084
BOTTLE
Martin Snyder, New York, N.Y., assignor to Joseph E. Seagram & Sons, Inc., New York, N.Y.
Filed Oct. 9, 1991, Ser. No. 775,231
Term of patent 14 years
U.S. Cl. D9—502

335,085
COSMETIC JAR
Susan R. Wacker, New York, N.Y., assignor to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.
Filed Apr. 27, 1990, Ser. No. 515,285
Term of patent 14 years
U.S. Cl. D9—504

335,086
COMBINED BOTTLE AND CAP
Susan R. Wacker, New York, N.Y., assignor to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.
Filed Apr. 16, 1991, Ser. No. 686,578
Term of patent 14 years
U.S. Cl. D9—529

335,087
CLOCK
Katsumi Shimamura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jan. 11, 1991, Ser. No. 640,015
Term of patent 14 years
U.S. Cl. D10—28

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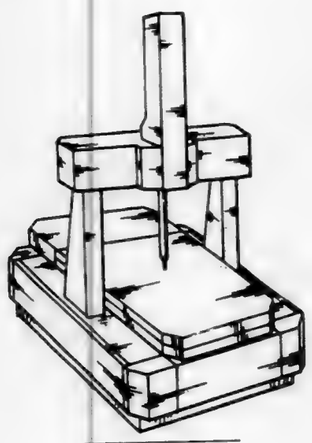
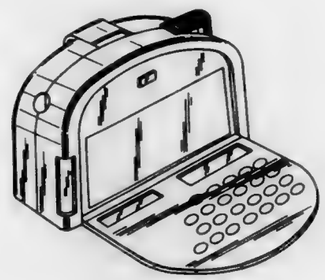
335,088
COORDINATE MEASURING MACHINE WITH COVERS
Freddie L. Raleigh, and Frederick K. Bell, both of Centerville, Ohio, assignors to Warner & Swasey Co., Sheffield Measurement Div., Bloomfield Hills, Mich.
Filed Apr. 22, 1991, Ser. No. 688,210
Term of patent 14 years
U.S. Cl. D10—46



335,089
TEMPLATE FOR MARKING THE LOCATION OF A DOOR HINGE
Dale Grubelnik, 6120 Lynn Haven, Lubbock, Tex. 79413
Filed Feb. 12, 1991, Ser. No. 654,556
Term of patent 14 years
U.S. Cl. D10—64

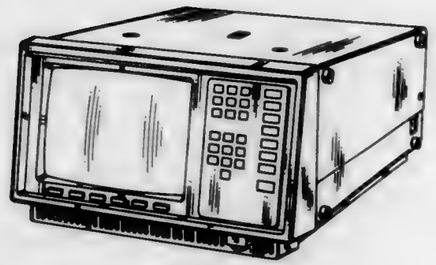
335,090
I-BEAM MEASURING DEVICE
Bob L. Guillen, 21958 Vivienda, Grand Terrace, Calif. 92324
Filed May 6, 1991, Ser. No. 697,290
Term of patent 14 years
U.S. Cl. D10—64

335,091
COMBINATION CALCULATOR AND TAPE RULE
Alfred S. Schwartz, Darien, Conn., assignor to Sonin, Inc., Scarsdale, N.Y.
Filed Mar. 9, 1990, Ser. No. 491,715
Term of patent 14 years
U.S. Cl. D10—72

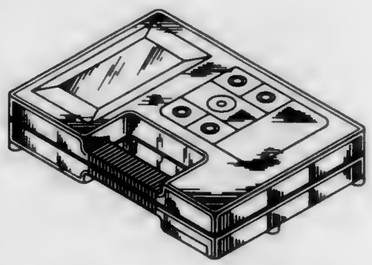


335,092
ELECTRONIC ENERGY METER REGISTER
David J. Miller, South Berwick, Me., and Paul J. Babineau, Ashburnham, Mass., assignors to General Electric Company, Somersworth, N.H.
Filed Aug. 30, 1991, Ser. No. 752,316
Term of patent 14 years
U.S. Cl. D10—75

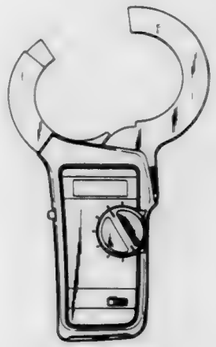
335,093
DIGITAL OSCILLOSCOPE
Robert J. Holmen; Larry D. Pacetti; Theodore J. Caron, all of Kenosha; Thomas J. Green, West Bend; David R. Ellingen, Kenosha; Michael C. Putrow, Racine, all of Wis., and Craig F. Govekar, Gurnee, Ill., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Sep. 23, 1991, Ser. No. 764,392
Term of patent 14 years
U.S. Cl. D10—76



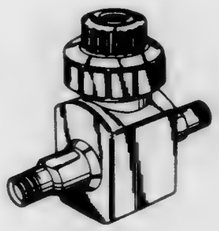
335,094
TELECOMMUNICATIONS CABLE TESTER
Daryl E. Ingalsbe, Blair, Nebr., and David L. Ingalsbe, Hastings, Minn., assignors to Independent Technologies, Inc., Eagan, Minn.
Filed Jan. 7, 1991, Ser. No. 638,415
Term of patent 14 years
U.S. Cl. D10—78



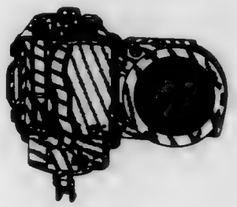
335,095
VOLTAMMETER
Masamichi Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 574,235
Claims priority, application Japan, Mar. 30, 1990, 2-10585
Term of patent 14 years
U.S. Cl. D10—79



335,096
BLUFF BODY FLOWMETER
David Marsh, Universal Vortex, Inc., Engineering Division, 29 Main St., P.O. Box 485, Harrisville, R.I. 02830
Filed Jan. 28, 1987, Ser. No. 7,812
Term of patent 14 years
U.S. Cl. D10—96



335,097
CLOCK MOVEMENT
Nobuhiro Goto, and Koichi Miyagi, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,169
Claims priority, application Japan, Nov. 28, 1990, 2-39683
Term of patent 14 years
U.S. Cl. D10—129



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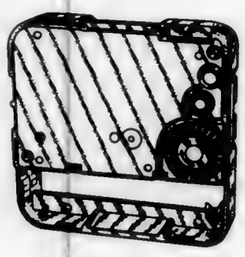
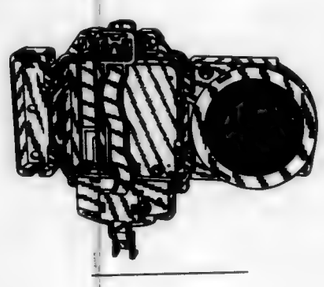
335,098
CLOCK MOVEMENT
Hidetsugu Ikeda, and Makoto Yanaka, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,155
Claims priority, application Japan, Nov. 28, 1990, 2-39687
Term of patent 14 years
U.S. Cl. D10—129



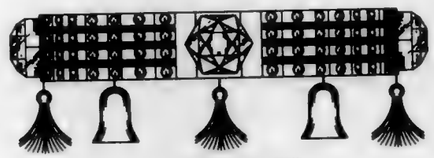
335,099
CLOCK MOVEMENT
Nobuhiro Goto, and Hidetsugu Ikeda, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,156
Claims priority, application Japan, Nov. 28, 1990, 2-39684
Term of patent 14 years
U.S. Cl. D10—129



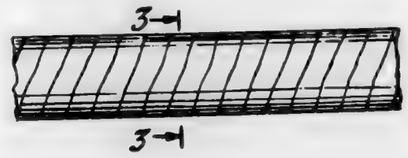
335,100
CLOCK MOVEMENT
Nobuhiro Goto; Hidetsugu Ikeda, and Koichi Miyagi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,158
Claims priority, application Japan, Nov. 28, 1990, 2-39682
Term of patent 14 years
U.S. Cl. D10—129

335,101
CLOCK MOVEMENT HOUSING SET
Nobuhiro Goto, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed May 24, 1991, Ser. No. 705,159
Claims priority, application Japan, Nov. 28, 1990, 2-39681
Term of patent 14 years
U.S. Cl. D10—129

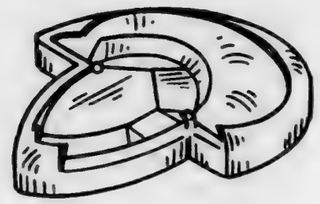
335,102
LEG RING
John S. Crowder, 1728 Hoxie Ave., and Ann O. Worcester, 78 Hodges Ct., both of Richland, Wash. 99352
Filed Feb. 22, 1991, Ser. No. 659,064
Term of patent 14 years
U.S. Cl. D11—3



335,103
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to M. Z. G. S.p.A., Arezzo, Italy
Filed Jun. 13, 1990, Ser. No. 537,527
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—6



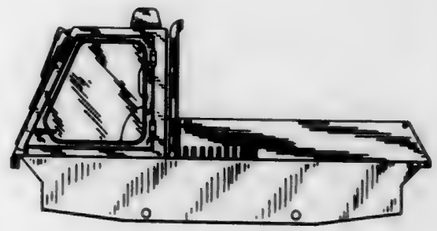
335,104
JEWELRY FINDING
Sammy L. Coleman, 5125 Highway 16, Rapid City, S. Dak. 57701
Filed Jul. 12, 1991, Ser. No. 729,007
Term of patent 14 years
U.S. Cl. D11—79



335,105
FLOWER POT SLEEVE
Max Ottenwälder, and Karl-Leo Heitlinger, both of Schwäbisch Gmünd, Fed. Rep. of Germany, assignors to Heinrich Kossmann AG Plasticfabrikation, Freiburg, Fed. Rep. of Germany
Filed Mar. 28, 1990, Ser. No. 500,281
Term of patent 14 years
U.S. Cl. D11—164

335,106
GARMENT CONNECTOR
Ardena E. Teeter, 27601 Forbes Rd., #38B, Laguna Niguel, Calif. 92629
Filed Oct. 18, 1990, Ser. No. 599,380
Term of patent 14 years
U.S. Cl. D11—202

335,107
ALL-TERRAIN VEHICLE BODY
Jean-Hugues Lagace, 118A, rue Grande-Ligne, Lac Etchemin, Canada G0R 1S0
Division of Ser. No. 650,727, Feb. 5, 1991. This application Aug. 26, 1992, Ser. No. 935,378
Term of patent 14 years
U.S. Cl. D12—3



335,108
BOAT FENDER COVER
Thomas W. Armour, II, 645 Isleview Dr., Akron, Ohio 44319
Filed Nov. 15, 1991, Ser. No. 792,742
Term of patent 14 years
U.S. Cl. D12—168

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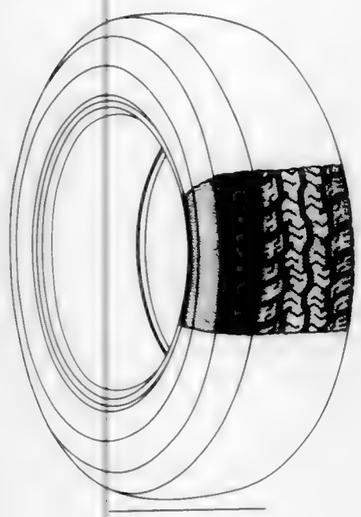
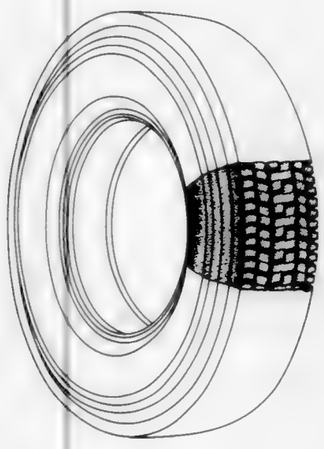
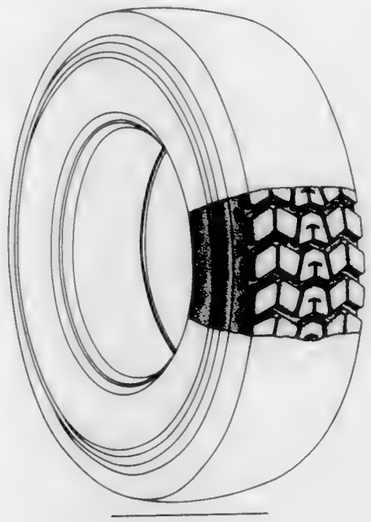
335,109
TIRE
Guy Serpaggi, Vic le Comte, France, assignor to Compagnie Generale des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand, France
Filed Sep. 3, 1991, Ser. No. 753,699
Claims priority, application France, Mar. 4, 1991, 240
Term of patent 14 years
U.S. Cl. D12—143



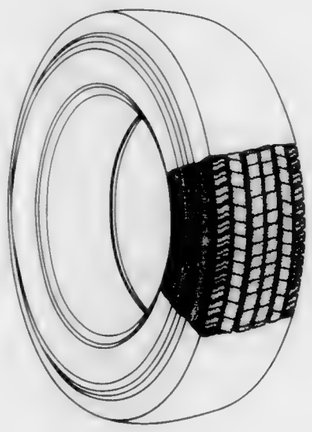
335,110
TIRE
Patrick Lourois, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand, France
Filed Mar. 28, 1991, Ser. No. 676,727
Claims priority, application France, Oct. 1, 1990, 227
Term of patent 14 years
U.S. Cl. D12—147



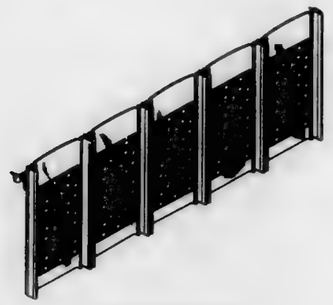
335,111
TIRE
Patrick Lurois, Cebazat, France, assignor to Compagnie Generale des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand, France
Filed Mar. 28, 1991, Ser. No. 676,729
Claims priority, application France, Oct. 5, 1990, 231
Term of patent 14 years
U.S. Cl. D12—147



335,112
TIRE
Patrick Lurois, Cebazat, France, assignor to Compagnie Generale Des Etablissements Michelin-Michelin & Cie, Clermont Ferrand Cedex, France
Filed Mar. 28, 1991, Ser. No. 676,731
Claims priority, application France, Oct. 1, 1990, 229
Term of patent 14 years
U.S. Cl. D12—147



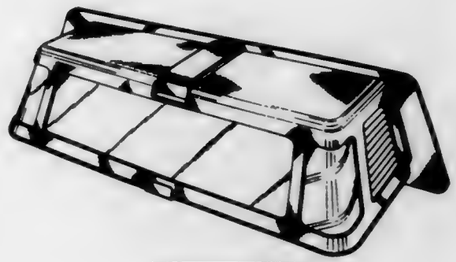
335,113
SUNSHADE FOR A WINDSHIELD
Frank Douglas, Rte. 1 6413 Cree Rd., Dexter, N. Mex. 88230
Filed Dec. 20, 1990, Ser. No. 631,069
Term of patent 14 years
U.S. Cl. D12—155



335,114
AUTOMOBILE TIRE
Yoshiaki Uemura, Hyogo, Japan, assignor to Sumotomo Rubber Industries, Ltd., Kobe, Japan
Filed May 1, 1991, Ser. No. 694,038
Claims priority, application Japan, Nov. 1, 1990, 2-36778
Term of patent 14 years
U.S. Cl. D12—147

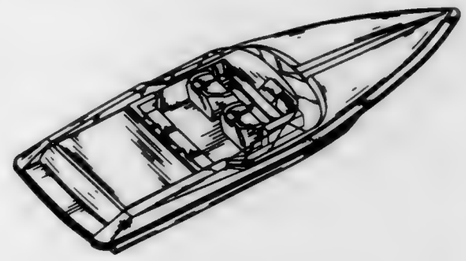
335,115
AUTOMOBILE TIRE
Toshiaki Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 13, 1991, Ser. No. 699,225
Claims priority, application Japan, Nov. 22, 1990, 2-39219
Term of patent 14 years
U.S. Cl. D12—147

335,116
CARGO BOX FOR ATTACHMENT TO THE REAR WINDOW OF TRUCKS
Floyd W. Reed, P.O. Box 36, Rockford, S. Dak. 57778, and Arlen L. Huff, South Bend, Ind., assignors to Floyd W. Reed, Rockford, S. Dak.
Filed Dec. 3, 1991, Ser. No. 801,970
Term of patent 14 years
U.S. Cl. D12—157



335,117
LICENSE PLATE FRAME
Paul E. Spencer, 2860 W. 230th St., Torrance, Calif. 90503
Division of Ser. No. 782,461, Oct. 25, 1991, Pat. No. Des. 331,217. This application Sep. 8, 1992, Ser. No. 939,647
Term of patent 14 years
U.S. Cl. D12—193

335,118
POWER BOAT
John E. Alexander, Monroeville, Ind., assignor to Porter, Inc., Decatur, Ind.
Filed Mar. 4, 1991, Ser. No. 663,658
Term of patent 14 years
U.S. Cl. D12—314



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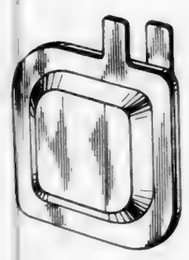
335,119
GYROPLANE
Peter Haseloh, Edmonton, and Daniel Haseloh, Beaumont, both of Canada, assignors to Rotary Air Force Management, Inc., Canada
Filed Jan. 11, 1990, Ser. No. 463,361
Claims priority, application Canada, Jul. 11, 1989, 11-07-89-11
Term of patent 14 years
U.S. Cl. D12—327

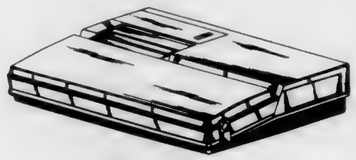
335,120
BATTERY FOR AN IC CARD
Mitsugu Okahisa; Seiichi Mizutani, both of Osaka, and Fumio Daio, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 1, 1991, Ser. No. 769,668
Term of patent 14 years
U.S. Cl. D13—103

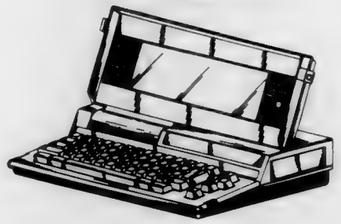


335,121
LIGHT SWITCH EXTENSION HANDLE
Glenn A. Brillheart, III, P.O. Box 1429, Banner Elk, N.C. 28604
Filed May 4, 1990, Ser. No. 518,850
Term of patent 14 years
U.S. Cl. D13—173

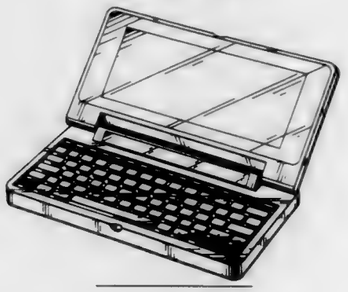
335,122
TRAILER PLUG ADAPTER
Michael Hughes, P.O. Box 1379, Berthoud, Colo. 80513
Filed Nov. 25, 1991, Ser. No. 797,104
Term of patent 14 years
U.S. Cl. D13—146

335,123
PORTABLE WORD PROCESSOR
Gregory W. Smiley, Cortland, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Nov. 30, 1990, Ser. No. 622,083
Term of patent 14 years
U.S. Cl. D14—106

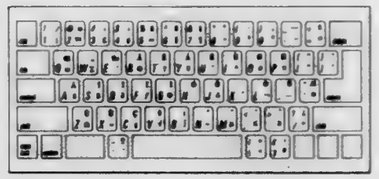




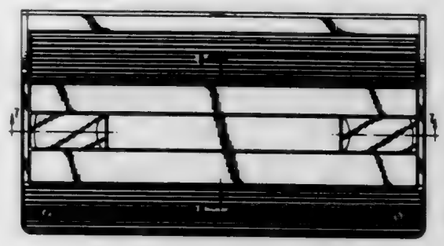
335,124
COMPUTER
Kanji Mizusugi, Mie; Kensho Tuji, and Hiroshi Yamamizu, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 17, 1991, Ser. No. 714,759
Claims priority, application Japan, Dec. 18, 1990, 2-42321; Dec. 18, 1990, 2-42327
Term of patent 14 years
U.S. Cl. D14—106

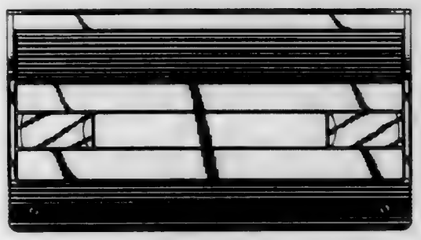


335,125
SET OF KEYBOARD LABELS
Andrew V. Frankel, New York, N.Y., assignor to Peter L. Witte, New York, N.Y., a part interest
Filed Nov. 13, 1990, Ser. No. 611,661
Term of patent 14 years
U.S. Cl. D14—115

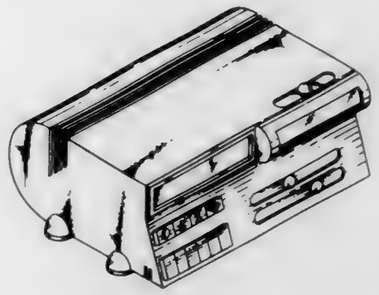


335,126
TAPE CASSETTE
Anthony L. Gelardi, Cape Porpoise; Craig Lovecky, Old Orchard Beach, both of Me.; Alan Lowry, Canton, Mass., and John Gelardi, Cape Porpoise, Me., assignors to Shape Inc., Biddeford, Me.
Continuation-in-part of Ser. No. 458,563, Dec. 28, 1989. This application Jan. 29, 1990, Ser. No. 471,075
Term of patent 14 years
U.S. Cl. D14—121





335,127
TAPE PLAYBACK DEVICE
Jack Stambaugh, 2553 S. 3rd St., Steelton, Pa. 17113
Filed Jun. 21, 1990, Ser. No. 541,362
Term of patent 14 years
U.S. Cl. D14—135



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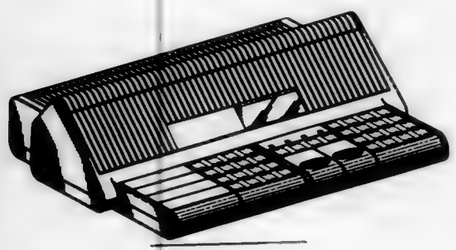
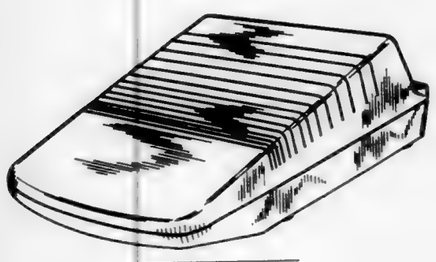
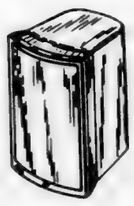
335,128
REMOTE RADIO COMMUNICATIONS CONSOLE
Leonid Sorea, Lincolnwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 9, 1990, Ser. No. 478,175
Term of patent 14 years
U.S. Cl. D14—137



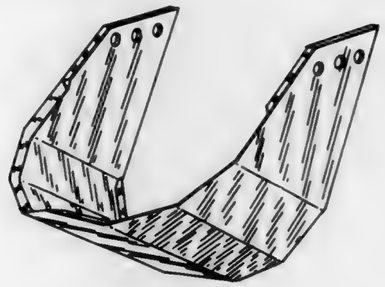
335,129
SYNTHESIZED TELEPHONE CALL ANNOUNCER
David A. Theisen, Hampstead, and Robert L. Gault, Raleigh, both of N.C., assignors to Marpac Corporation, Wilmington, N.C.
Filed Jun. 11, 1990, Ser. No. 536,338
Term of patent 14 years
U.S. Cl. D14—158



335,130
SPEAKER
Charles Rozier, New York, N.Y., assignor to Boston Acoustics, Inc., Lynnfield, Mass.
Filed Nov. 22, 1991, Ser. No. 797,090
Term of patent 14 years
U.S. Cl. D14—214

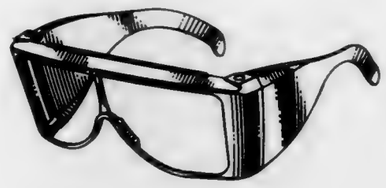


335,131
BLADE FOR EARTH DIGGING IMPLEMENT
Charles E. Devaney, 16700 Pueblo Blvd., Jordan, Minn. 55352
Division of Ser. No. 685,007, Apr. 15, 1991. This application Apr. 2, 1992, Ser. No. 862,592
Term of patent 14 years
U.S. Cl. D15—32

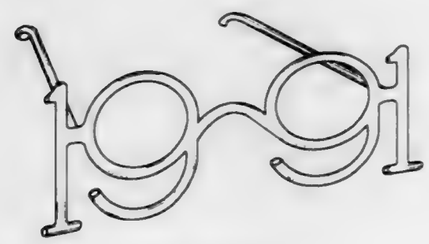


335,132
REPLACEABLE DEEP TILLAGE POINT
Robert A. Williams, and William A. Bell, both of Garden City, Kans., assignors to Acra-Plant, Inc., Garden City, Kans.
Filed Mar. 15, 1991, Ser. No. 670,207
Term of patent 14 years
U.S. Cl. D15—29

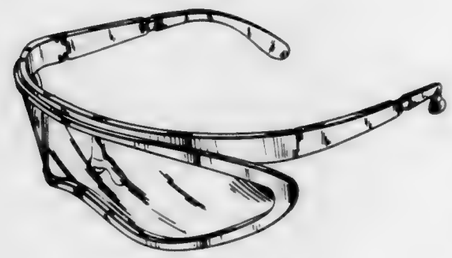
335,133
SUNGLASSES FRAME
Diana S. Langley, 1444 Doral Ct., San Luis Obispo, Calif. 93401
Filed Jan. 24, 1992, Ser. No. 825,046
Term of patent 14 years
U.S. Cl. D16—102



335,134
NOVELTY EYEGLASS FRAMES
Richard E. Sclafani, 615 NW. 81st St., Seattle, Wash. 98117, and Peter S. Cicero, 2024 NW. 64th St., Seattle, Wash. 98107
Continuation-in-part of Ser. No. 507,138, Apr. 2, 1990. This application Jul. 24, 1992, Ser. No. 918,399
Term of patent 14 years
U.S. Cl. D16—104

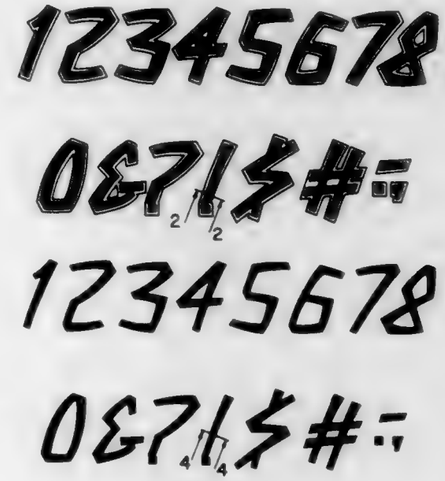


335,135
SUNGLASSES
Maurice Bolle, Oyonnax, France, assignor to Etablissements Bolle S.N.C., Oyonnax Cedex, France
Filed Mar. 24, 1992, Ser. No. 857,292
Term of patent 14 years
U.S. Cl. D16—112



335,136
GUITAR SHOULDER STRAP
C. Wayne McMichael, 809 Barksdale Dr., Vidalia, Ga. 30474
Filed Jul. 2, 1990, Ser. No. 547,069
Term of patent 14 years
U.S. Cl. D17—20

335,137
NUMERAL FONT
Ted A. Stahl, Mt. Clemens, Mich., assignor to Stahls', Inc., St. Clair Shores, Mich.
Filed May 14, 1991, Ser. No. 701,955
Term of patent 14 years
U.S. Cl. D18—26



335,138
SCRIPT FONT
Ted A. Stahl, Mt. Clemens, Mich., assignor to Stahls', Inc., St. Clair Shores, Mich.
Filed May 14, 1991, Ser. No. 701,956
Term of patent 14 years
U.S. Cl. D18—28

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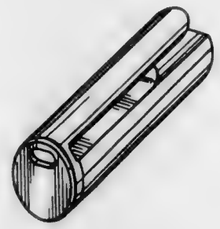
335,139
BOOK MARKER
Hugh W. McKay, 4317 Kansas Ave., Los Angeles, Calif. 90037
Filed Apr. 27, 1992, Ser. No. 873,568
Term of patent 14 years
U.S. Cl. D19—34

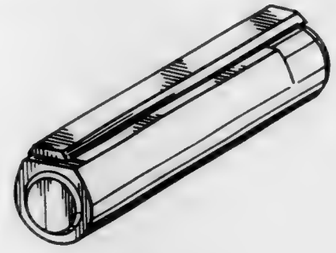
335,140
WRITING INSTRUMENT
Rhodessa R. Walker, 835 Hill St., No. 7, Santa Monica, Calif. 90405
Filed Dec. 27, 1990, Ser. No. 634,309
Term of patent 14 years
U.S. Cl. D19—46

335,141
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. Des. 330,389. This application Jun. 30, 1992, Ser. No. 907,197
Term of patent 14 years
U.S. Cl. D19—57

335,142
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Tokyo, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 907,198
Term of patent 14 years
U.S. Cl. D19—57

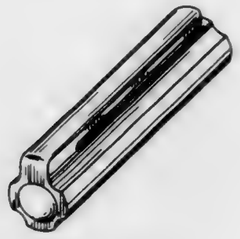


335,143
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 907,199
Term of patent 14 years
U.S. Cl. D19—57

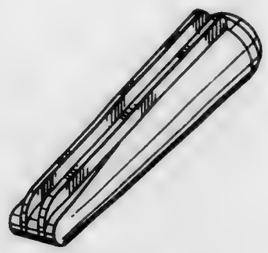


335,144
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 907,200
Term of patent 14 years
U.S. Cl. D19—57

335,145
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 905,646
Term of patent 14 years
U.S. Cl. D19—57

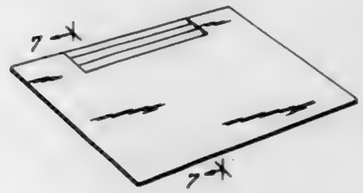


335,146
WRITING INSTRUMENT CAP
Kazunori Katami, Saitama, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 905,647
Term of patent 14 years
U.S. Cl. D19—57



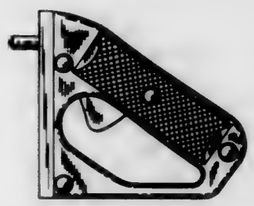
335,147
WRITING INSTRUMENT CAP
Kazunori Katami, Kawagoe, and Kazuhiko Suzuki, Higashikurume, both of Japan, assignors to Tombow Pencil Co., Ltd., Tokyo, Japan
Division of Ser. No. 540,416, Jun. 18, 1990, Pat. No. D. 330,389.
This application Jun. 30, 1992, Ser. No. 907,196
Term of patent 14 years
U.S. Cl. D19—57

335,148
DESK PAD
Raul Barbieri, Via Pietro Custodi, 14, 20136 Milan, Italy
Filed Mar. 7, 1990, Ser. No. 490,991
Claims priority, application Italy, Sep. 15, 1989, 21737/89[U]
Term of patent 14 years
U.S. Cl. D19—95



335,149
CURRENCY ACCEPTOR AND COIN DISPENSING MACHINE
Stanley P. Dabrowski, Las Vegas, Nev., assignor to Sevens Unlimited, Inc., Las Vegas, Nev.
Filed Jun. 26, 1991, Ser. No. 721,668
Term of patent 14 years
U.S. Cl. D20—1

335,150
TRIGGER HANDLE SWITCH FOR PINBALL TYPE GAMES
Carl A. Biagi, and Steven S. Ritchie, both of Chicago, Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.
Filed Sep. 11, 1991, Ser. No. 757,514
Term of patent 14 years
U.S. Cl. D21—48



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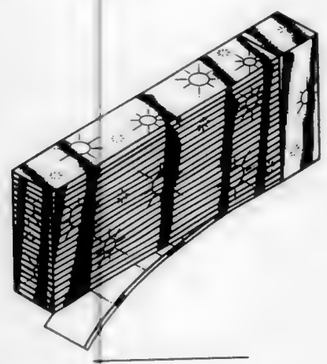
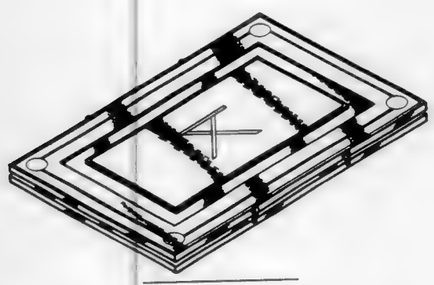
335,151
PARTY NOISEMAKER
Gerard J. Kiefer, 121 Athania Pkwy., Apt. #307, and Warren J. Griffin, Jr., 2300 Edenborne Ave., Apt. #274 Bldg. 3, both of Metairie, La. 70001
Filed Mar. 27, 1991, Ser. No. 675,702
Term of patent 14 years
U.S. Cl. D21—64

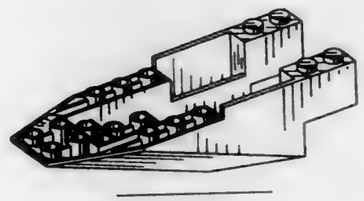


335,152
HOLDER FOR JIGSAW PUZZLES
Paul R. Hollrah, Cedar Crest Club, Rte. 2, Box 879, Locust Grove, Okla. 74352
Filed Sep. 19, 1990, Ser. No. 584,890
Term of patent 14 years
U.S. Cl. D21—104

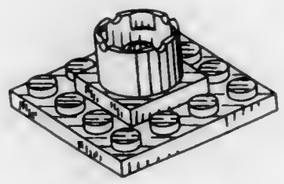


335,153
ELEMENT FOR A TOY BUILDING SET
Ib T. Skov, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,102
Term of patent 14 years
U.S. Cl. D21—108

335,154
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,106
Term of patent 14 years
U.S. Cl. D21—108

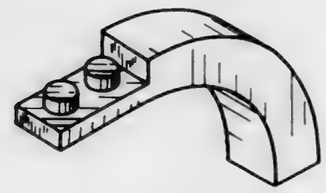


335,155
ELEMENT FOR A TOY BUILDING SET
Niels M. Pedersen, Århus C, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,112
Term of patent 14 years
U.S. Cl. D21—108

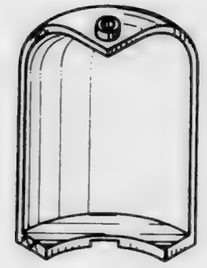


335,156
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, and Daniel A. Krentz, both of Billund, Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,113
Term of patent 14 years
U.S. Cl. D21—108

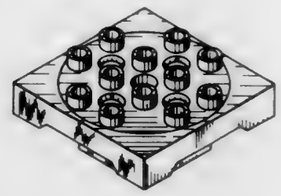
335,157
ELEMENT FOR A TOY BUILDING SET
Helle Rahbek, Vildbjerg, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,116
Term of patent 14 years
U.S. Cl. D21—108



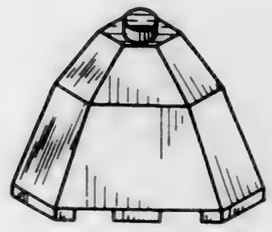
335,158
ELEMENT FOR A TOY BUILDING SET
Helle Rahbek, Vildbjerg, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,117
Term of patent 14 years
U.S. Cl. D21—108



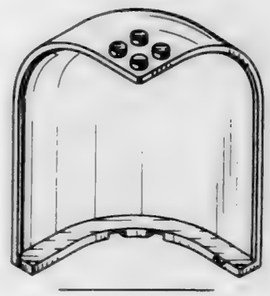
335,159
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Espergerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,131
Term of patent 14 years
U.S. Cl. D21—108



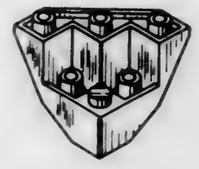
335,160
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,134
Term of patent 14 years
U.S. Cl. D21—108



335,161
ELEMENT FOR A TOY BUILDING SET
Helle Rahbek, Vildbjerg, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,136
Term of patent 14 years
U.S. Cl. D21—108



335,162
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,135
Term of patent 14 years
U.S. Cl. D21—108



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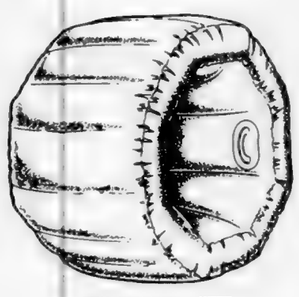
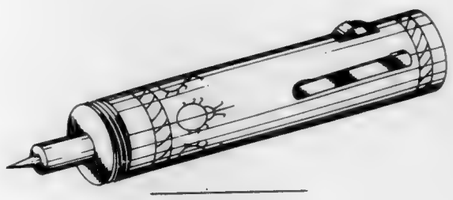
335,163
BRACE FOR BOWLING PIN SETTER DECK
Vincent J. Cabot, Brooklyn, Ohio, assignor to Zot Pinsetter Parts, Inc., Wheat Ridge, Colo.
Filed Dec. 18, 1990, Ser. No. 628,657
Term of patent 14 years
U.S. Cl. D21—233

335,164
INFLATABLE ROLLAROUND TOY
Roger Lee, Taipei, Taiwan, assignor to Leisuretime Products Limited, Surrey, England
Filed Jun. 14, 1991, Ser. No. 715,666
Claims priority, application United Kingdom, Dec. 15, 1990, 2011739
Term of patent 14 years
U.S. Cl. D21—242



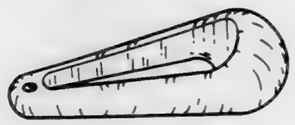
335,165
INFLATABLE SEESAW
Roger Lee, Taipei, Taiwan, assignor to Leisuretime Products Limited, Surrey, England
Filed Jun. 14, 1991, Ser. No. 715,668
Claims priority, application United Kingdom, Dec. 15, 1990, 2011741
Term of patent 14 years
U.S. Cl. D21—251

335,166
COMBINED WOODTICK AND LEECH REMOVER
D'Wayne Johnston, 403 Eureka St., Wolf Point, Mont. 59201
Filed Feb. 28, 1990, Ser. No. 486,183
Term of patent 14 years
U.S. Cl. D22—122

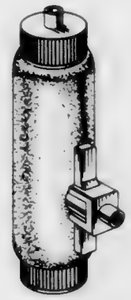


335,167
FISHING LURE WITH ATTRACTANT CHAMBER
Frank R. Miller, 1923 Cumberland Rd., Glendora, Calif. 91740
Filed Nov. 27, 1990, Ser. No. 618,835
Term of patent 14 years
U.S. Cl. D22—126

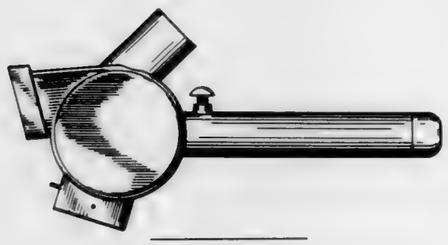
335,168
CASTING PLUG
Tommy J. Cocanougher, Claremore, Okla.; Todd J. Cook, Kirksville, Mo., and David D. Cosby, Tulsa, Okla., assignors to Zebco Corporation, Tulsa, Okla.
Filed Mar. 28, 1991, Ser. No. 676,253
Term of patent 14 years
U.S. Cl. D22—126



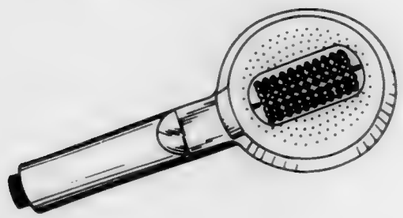
335,169
SPRAY DISPENSER FOR ATTACHMENT TO A BOTTLE
Cecil E. Boyd, Springfield, Mo., assignor to BBG, Inc., Springfield, Mo.
Filed Aug. 26, 1991, Ser. No. 750,024
Term of patent 14 years
U.S. Cl. D23—213



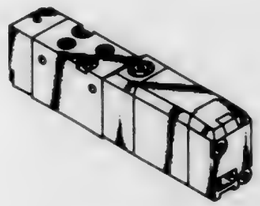
335,170
AIR BRUSH
James W. Hoogeveen, Jr., Griffith, Ind., assignor to KOZ Bros. Toys, Ltd., Elmhurst, Ill.
Filed Aug. 28, 1991, Ser. No. 676,329
Term of patent 14 years
U.S. Cl. D23—223



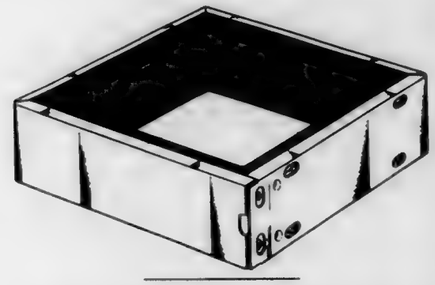
335,171
MASSAGING SPRAY HEAD FOR SHOWER
Fabio Lenci, and Giovanna Talocci, both of Rome, Italy, assignors to Fornara & Maulini S.P.A., Gravellona Toce, Italy
Filed Sep. 3, 1991, Ser. No. 753,661
Claims priority, application Int'l Pat. Institute, Mar. 11, 1991, DM/019103
Term of patent 14 years
U.S. Cl. D23—223



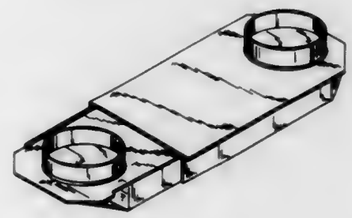
335,172
ELECTROMAGNETIC VALVE
Shigeo Tamaki, Asahi, Japan, assignor to Kuroda Seiko Company Limited, Japan
Filed Sep. 19, 1989, Ser. No. 409,651
Claims priority, application Japan, Mar. 10, 1989, 1-8706
Term of patent 14 years
U.S. Cl. D23—248



335,173
COUPLING ELEMENT FOR CONNECTING THE FLANGED ENDS OF DUCTS
Stefan Leufstedt, Carl XII gatan 11a, S-271 44 Ystad, and Carl-Eric Jiderberg, Larmgatan 8, S-393 23 Kalmar, both of Sweden
Filed Jun. 22, 1990, Ser. No. 542,165
Claims priority, application Sweden, Dec. 27, 1989, 89 2961
Term of patent 14 years
U.S. Cl. D23—393



335,174
VENT WHICH ATTACHES TO THE REAR OF A CLOTHES DRYER AND CONNECTS TO THE OUTLET IN A WALL
Charles B. Anderson, Jacksonville, Tex., and Charles R. Kenrick, Spring Lake, Mich., assignors to Builder's Best, Inc., Jacksonville, Tex.
Filed Jan. 31, 1992, Ser. No. 829,735
Term of patent 14 years
U.S. Cl. D23—393



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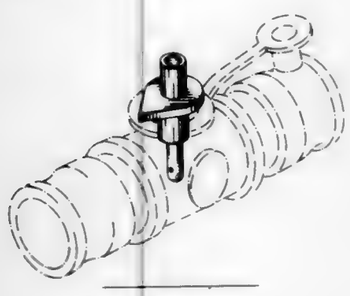
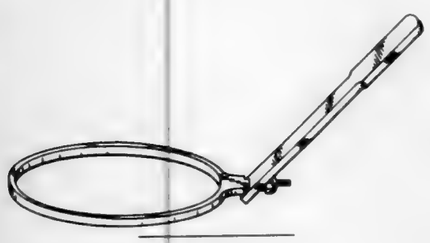
335,175
COMBINED VENTILATOR DISPENSER AND ADAPTER
David T. Sladek, 8141 East McLaren, P.O. Box 57907, Tucson, Ariz. 85732-7907
Filed Oct. 15, 1990, Ser. No. 597,771
Term of patent 14 years
U.S. Cl. D24—110

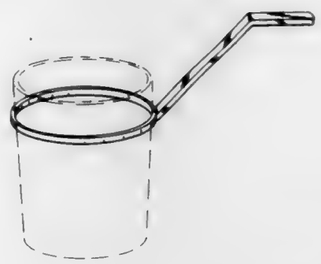


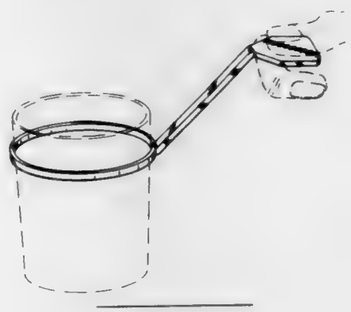
335,176
SPECIMEN CUP HOLDER WITH BREAKAWAY HANDLE
Timothy B. Jones, 200 15th St. - No. 134, Edmmond, Okla. 73013; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Mar. 27, 1991, Ser. No. 675,719
Term of patent 14 years
U.S. Cl. D24—128



335,177
SPECIMEN CUP HOLDER WITH BREAKAWAY HANDLE
Timothy B. Jones, 200 15th St. - No. 134, Edmond, Okla. 73013; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Sep. 30, 1991, Ser. No. 767,973
Term of patent 14 years
U.S. Cl. D24—128

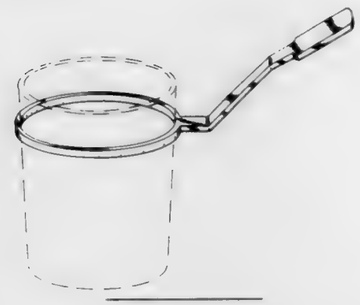
335,178
SPECIMEN CUP HOLDER
Timothy B. Jones, 200 15th St. - No. 134, Edmond, Okla. 73013; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Mar. 27, 1991, Ser. No. 675,723
The portion of the term of this patent subsequent to Apr. 13, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—128



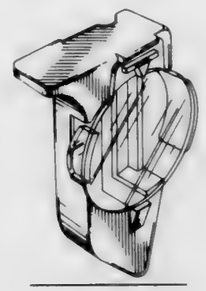


335,179
SPECIMEN CUP HOLDER
Timothy B. Jones, 3030 SW. 89th, Apt. #E, Oklahoma City, Okla. 73159; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Oct. 3, 1991, Ser. No. 770,658
Term of patent 14 years
U.S. Cl. D24—128

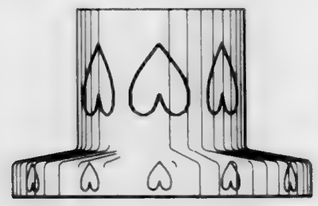
335,180
SPECIMEN CUP HOLDER
Timothy B. Jones, 200 15th St.-No. 134, Edmond, Okla. 73013; Robert D. Jones, and Lori D. Jones, both of 1452 N. Washington, Ardmore, Okla. 73401
Filed Jul. 3, 1991, Ser. No. 725,257
The portion of the term of this patent subsequent to Apr. 13, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—128



335,181
HOLDER FOR AN I.V. RATE CONTROLLER
Jerry L. Aslanian, 6210 N. Camelback Manor Dr., Paradise Valley, Ariz. 85253
Filed Feb. 7, 1991, Ser. No. 651,902
Term of patent 14 years
U.S. Cl. D24—129



335,182
SAFETY NEEDLE RECAPPER
William J. Drummond, Jr., Rte. 2, Box 643, Smithfield, Va. 23430
Filed Dec. 20, 1990, Ser. No. 631,042
Term of patent 14 years
U.S. Cl. D24—130



335,183
OSTOMY CUTTER
Mark A. Everhart, 418 Nilsen Rd. NE., Cedar Rapids, Iowa 52402
Filed Jan. 18, 1991, Ser. No. 643,064
Term of patent 14 years
U.S. Cl. D24—147

335,184
COMBINED PACIFIER COVER AND RETAINER
Daniel Mastropierro, 73 Clifton Ter., Weehawken, N.J. 07087
Filed Sep. 11, 1987, Ser. No. 95,254
The portion of the term of this patent subsequent to Jan. 24, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—194

335,185
PACIFIER
Archie L. Lunsford, P.O. Box 1913, Asheville, N.C. 28802
Filed Jul. 1, 1991, Ser. No. 723,640
Term of patent 14 years
U.S. Cl. D24—194

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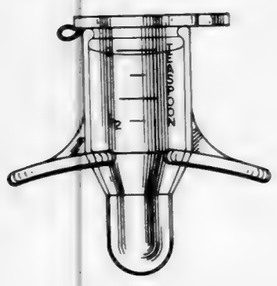
335,186
PACIFIER
Ching-Chou Ho, No. 58, Ching Fong Street, Taipei, Taiwan
Filed Jan. 28, 1992, Ser. No. 827,951
Term of patent 14 years
U.S. Cl. D24—194

335,187
MEDICATION DISPENSING NIPPLE
Terri J. Stege, 226 E. Patton, Paxton, Ill. 60957
Filed Aug. 10, 1990, Ser. No. 565,115
Term of patent 14 years
U.S. Cl. D24—196



335,188
DEERSTAND
Truman C. Rosser, Rte. 22 Box 416, Tyler, Tex. 75704
Filed Jun. 27, 1990, Ser. No. 544,485
Term of patent 14 years
U.S. Cl. D25—62

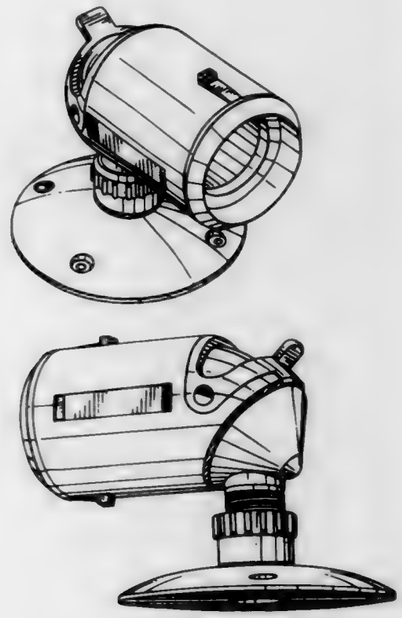
335,189
FOLDING TREE STAND
Paul A. Saeva, and Donna L. Saeva, both of 9106 Linwood Rd., Leroy, N.Y. 14482
Filed Oct. 11, 1991, Ser. No. 775,056
Term of patent 14 years
U.S. Cl. D25—62

335,190
ADJUSTABLE LAMP
Thierry Blet, Paris, France, assignor to Societe Elixir, Paris, France
Filed Jul. 18, 1991, Ser. No. 732,309
Claims priority, application France, Jan. 18, 1991, 91 0297
Term of patent 14 years
U.S. Cl. D26—63

335,191
INTERIOR LAMP FOR A VEHICLE
David Morgan, London, United Kingdom, assignor to Alexander Engineering Company, Ltd., Bucks, Great Britain
Filed Sep. 28, 1990, Ser. No. 589,970
Claims priority, application United Kingdom, Apr. 3, 1990, 2005908
Term of patent 14 years
U.S. Cl. D26—28

335,192
SAFETY FLASHLIGHT
Carl W. Abel, 6654 Marina Rd., North Port, Fla. 34287
Filed Dec. 30, 1991, Ser. No. 813,412
Term of patent 14 years
U.S. Cl. D26—49

335,193
ADJUSTABLE LIGHT FIXTURE
Gad Shaanan, 49 Oakland Ave., Montreal, and Serge Provost, 3530 Toupin Ville, St. Laurent, both of Canada
Filed Aug. 20, 1991, Ser. No. 748,164
Term of patent 14 years
U.S. Cl. D26—63



335,194
LIGHTER
Gina Bruzzi, Lyons, France, assignor to St. Dupont S.A., Paris, France
Filed Feb. 11, 1991, Ser. No. 653,820
Claims priority, application France, Aug. 31, 1990, 905486
Term of patent 14 years
U.S. Cl. D27—159

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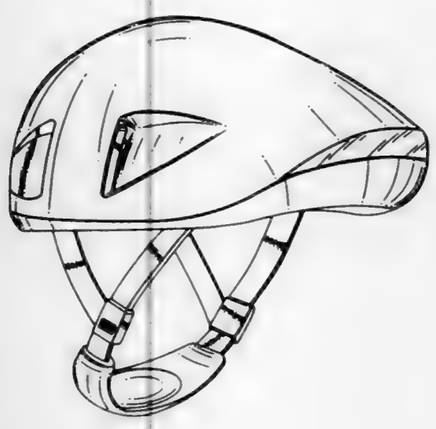
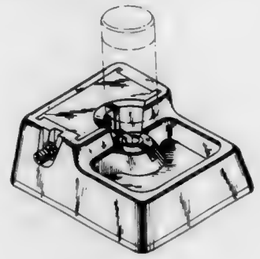
335,195
BICYCLE HELMET
Robert S. Choi, Landisville; C. Kwai Kong, Mount Joy, and Oong Choi, Lancaster, all of Pa., assignors to Vistalite, Incorporated, Petersburg, Pa.
Filed Sep. 18, 1990, Ser. No. 583,975
Term of patent 14 years
U.S. Cl. D29—13



335,196
SHEAR GUARD
George L. Lamb, and Frances A. Lamb, 570 Encina Dr., both of El Dorado Hills, Calif. 95630
Filed Aug. 20, 1991, Ser. No. 747,719
Term of patent 14 years
U.S. Cl. D29—20

335,197
PET WATERING DISH
George B. Strickland, P.O. Box 41406, Fayetteville, N.C. 28314
Filed Oct. 29, 1991, Ser. No. 784,017
Term of patent 14 years
U.S. Cl. D30—132



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TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1993

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Hunter, Robert M.; and Hunter, Mary M. Child-resistant buckle and buckle guard combination. 5,205,023, Cl. 24-633.000

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Ibay, Augusto C.; and Tenney, Linwood P., to Southern Research Institute. Polymers from hydroxy acids and polycarboxylic acids. 5,206,341, Cl. 528-361.000.

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Kadokura, Masaki; and Akahoshi, Hideaki, to Mazda Motor Corporation. Structure of vehicle power train. 5,205,373, Cl. 180-248.000.

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Kato, Eiichi, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,206,105, Cl. 430-96.000.

Kato, Hiroyuki, to Brother Kogyo Kabushiki Kaisha. Printer having continuous paper/cut paper changeover apparatus. 5,205,661, Cl. 400-605.000.

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Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Process and an arrangement for exchanging spools and packages at an individual spinning unit of a spinning machine. 5,205,118, Cl. 57-269.000.

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Staley, Joseph A., Jr.: *See*—
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Stallman, William T., to Volunteers of America Bay Area, Inc. Geodesic globe puzzle. 5,205,556, Cl. 273-157.00R.

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Stamper, Ralph H.; and Norman, Deborah, to British Aerospace Public Limited Company. Distributed weapon launch system. 5,206,452, Cl. 89-1.110.

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Schmid, Karl-Heinz; Koren, Karin; Stanislowski, Detlev; and Langen, Michael, 5,205,959, Cl. 252-174.170.

Stanley Electric Co., Ltd.: *See*—
Aizawa, Masanobu; Yamauchi, Shigekazu; Sekine, Hisao; and Kanagawa, Shinji, 5,206,750, Cl. 359-68.000.

Stanley, Samuel L., Jr.; and Li, Ellen, to Washington University. *Entamoeba histolytica* diagnostic assay. 5,206,142, Cl. 435-7.220.

Star Seiki Co., Ltd.: *See*—
Shiotani, Yosuke, 5,206,035, Cl. 425-186.000.

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Maroney, George Earl; Bennett, Larry P.; Chamberlin, Mark B.; and Stark, Fred L., 5,205,321, Cl. 137-493.300.

Stark, Lori A.: *See*—
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Starline Manufacturing Company, Inc.: *See*—
Treul, Frederick F.; Hoesly, Thomas R.; and Mackay, William F., 5,205,341, Cl. 164-306.000.

Stastny, Erich. Device for producing injection molded parts and comprising heated and/or cooled as well as temperature-controlled supply conduits for molten material. 5,206,033, Cl. 425-143.000.

Stearns, Thomas H.: *See*—
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Steelcase Inc.: *See*—
Ball, Douglas C.; Ritter, Donald R.; and Fraga, Johnny C., 5,205,223, Cl. 108-124.000.
Simons, George J., 5,205,629, Cl. 312-249.900.

Steen, Michael J.; Wardwell, Robert H.; and McKenzie, Joseph A., Jr., to Hewlett-Packard Company. Connector assembly for testing integrated circuit packages. 5,205,741, Cl. 439-70.000.

Stegmuller, Karl, to Sachsenwerk Aktiengesellschaft. Switching device for the interruption of fault currents. 5,206,616, Cl. 335-126.000.

Steiger, Ronald P.; and Leung, Peter K., to Exxon Production Research Company. Methods for determining in situ shale strengths, elastic properties, pore pressures, formation stresses, and drilling fluid parameters. 5,205,164, Cl. 73-153.000.

Steinberger, Richard N. Screw stabilizer. 5,205,691, Cl. 411-147.000.

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Steinhardt, Michael D.; DeKeyser, Kathleen S.; Sieth, Kenneth J.; and Rische, David K., to Kohler Co. Body spray nozzle. 5,205,490, Cl. 239-449.000.

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Stephens, Frederick O., 5,205,611, Cl. 297-391.000.

Stephens, Frederick William Peter: *See*—
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Stephens, Gillian Dorys Janet: *See*—
Stephens, Frederick O., 5,205,611, Cl. 297-391.000.

Stephens, Katriona Alison: *See*—
Stephens, Frederick O., 5,205,611, Cl. 297-391.000.

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Stephens, Robert Bruce Henry: *See*—
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Stephenson, Stanley V., to Halliburton Company. Automatic ball injector apparatus and method. 5,205,359, Cl. 166-284.000.

Stephenson, Stanley W.; and Goodwin, William D., to Eastman Kodak Company. Capstan bodies in printer rollers. 5,205,663, Cl. 400-662.000.

Stephenson, Stanley W., to Eastman Kodak Company. Apparatus and method for replacing a fuser bar without tools. 5,206,477, Cl. 219-216.000.

Stephenson, W. Kirk; and DeShazo, J. Derwin, to Nalco Chemical Company. Method of breaking crude oil emulsions using ethylene carbonate adducts of alkylphenol-formaldehyde resins. 5,205,964, Cl. 252-340.000.

Sterling Canada Inc.: *See*—
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Stewart, Mark E., to Eastman Kodak Company. Polymer compositions having improved impact strength. 5,206,291, Cl. 525-173.000.

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Stig, Ingemar, to General Engineering (The Netherlands) B.V. Child seat foldable from within seat back having extension control mechanism. 5,205,608, Cl. 297-238.000.

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Sugiura, Satoshi, to Pioneer Electronic Corporation. Signal detector having a virtual division. 5,206,846, Cl. 369-44.120.

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Sun, Jung-Hui, to Du Pont Merck Pharmaceutical Company. Bis-naphthalimides containing amide and thioamide linkers as anticancer agents. 5,206,250, Cl. 514-296.000.

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Suzuki, Yoshitsugu; Iizuka, Shougo; Kajiyama, Shigeo; Suzuki, Sanae; Kudo, Shigeji; Inoue, Toshihiro; Isobe, Norio; and Oosumi, Yoshihisa, to Yazaki Corporation. Wire harness and method of and apparatus for manufacturing the same. 5,205,329, Cl. 140-92.100.

Svec, Ronald S.: *See*—
Holland, Hugh C.; Kammerer, Robert J.; and Svec, Ronald S., 5,206,936, Cl. 395-325.000.

Svehaug, Oswald C. Lock mechanism. 5,205,595, Cl. 292-175.000.

Swanson, David; and Emerson, Michale. Support system. 5,205,101, Cl. 52-650.100.

Swarup, Shanti; McCollum, Gregory J.; and Kania, Charles M., to PPG Industries, Inc. Aqueous emulsion polymers prepared with crosslinkable non-ionic surfactants. 5,206,286, Cl. 524-761.000.

Swatling, Donald K.; Finn, Leslie E.; and Mankin, Erle D., to Clorox Company, The. Zeolite agglomeration process and product. 5,205,958, Cl. 252-174.130.

Sweasy, William J.: *See*—
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Swedo, Raymond J., to Allied-Signal Inc. o,o'-bismaleimide resin systems. 5,206,383, Cl. 548-521.000.

Swets, Mark D.; Williams, George A.; and Goodman, Steven F., to Herman Miller, Inc. Pharmaceutical cabinet locking arrangement. 5,205,628, Cl. 312-216.000.

Swisher, William J. Exercise apparatus. 5,205,802, Cl. 482-141.000.

Symbol Technologies, Inc.: *See*—
Shepard, Howard M.; Metlitsky, Boris; and Krichever, Mark, 5,206,492, Cl. 235-472.000.

Syrinek, Allen R., to Nalco Chemical Company. Removal of silver from aqueous systems. 5,205,939, Cl. 210-727.000.

Szabo, Gyorgy: *See*—
Losonczi, Zoltan; and Szabo, Gyorgy, 5,206,558, Cl. 313-113.000.

Szente, Pedro A. Magazine for compressed gas single-shot bolt-action pellet shoulder guns. 5,205,270, Cl. 124-50.000.

Szpunar, Stephen J.; and Glynn, Christopher C., to General Electric Company. Fan blade damper. 5,205,713, Cl. 416-193.00A.

T C Manufacturing Co. Inc.: *See*—
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Tachibana, Masaharu: *See*—
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Tachibana, Naotaka: *See*—
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Tagliabue, Aldo: *See*—
Nencioni, Luciano; Antoni, Guido; Boraschi, Diana; and Tagliabue, Aldo, 5,206,014, Cl. 424-88.000.

Taguchi, Naoto; Hatagishi, Yuji; and Onoda, Katsuhiko, to Yazaki Corporation. Low insertion/withdrawal-force connector. 5,205,752, Cl. 439-157.000.

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Taguchi, Tomishige; and Kondo, Makoto, to Canon Kabushiki Kaisha. Camera having digital-to-analog converter with variably settable reference level. 5,206,716, Cl. 358-41.000.

Tahara, Syuji; Satou, Hiroyuki; and Ookawa, Norio, to Fuji Photo Film Co., Ltd. Method of and apparatus for cutting sheet-material. 5,206,679, Cl. 355-29.000.

Tai, Hsin-Hsiung, to University of Kentucky Research Foundation. Composition of, method of producing and method of using a stabilized formulation for assaying peroxidase activity. 5,206,150, Cl. 435-28.000.

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Takeuchi, Tomio: *See*—
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Tanaka, Kyoushi: *See*—
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Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for detecting intersymboi interference. 5,206,853, Cl. 369-54.000.

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Tansini, Luigi, to Off. Mecc. Giacomo Toresani S.p.A. Device applicable to an apparatus for manufacturing "ravioli" in order to obtain "tortellini". 5,205,209, Cl. 99-450.600.

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Tashiro, Mikio; Hongu, Tetsuya; and Orii, Kazunori, to Tree Extracts Research Association. Fragrant non-hollow core-in-sheath type

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Yeda Research and Development Co. Ltd.: *See*—
Vlodavsky, Israel; Eldor, Amiram; Naparstek, Yaakov; and Cohen, Irun, 5,206,223, Cl. 514-56.000.

Yee, Dennis S.: *See*—
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Yerman, Alexander J., to General Electric Company. Barrel-wound conductive film transformer. 5,206,621, Cl. 336-180.000.

Yeung, Kwok-Him: *See*—
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Yokogawa Medical Systems, Limited: *See*—
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Yokohama Rubber Co., Ltd., The: *See*—
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Yokoi, Toshio: *See*—
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Yokota, Hiroaki: *See*—
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Yokoyama, Issei, to Horiba, Ltd. Isothermal capacitance transient spectroscopy method and apparatus. 5,206,598, Cl. 324-676.000.

Yokoyama, Minoru: *See*—
Terajima, Hisao; Wada, Satoshi; Kobayashi, Makoto; Yoshida, Takehiro; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Ishida, Yasushi; and Tomoda, Akihiro, 5,206,661, Cl. 346-76.0PH.

Yokoyama, Yoshiaki, to Ogihara Technical Center Co., Ltd. Method and apparatus for recovering substance adhered to object to be processed. 5,205,857, Cl. 75-401.000.

Yonemitsu, Toshihiro: *See*—
Kawahara, Yukio; Mori, Keiichi; Homma, Akihiro; Iaobe, Toshiya; Kajikawa, Mitsugi; and Yonemitsu, Toshihiro, 5,206,673, Cl. 353-98.000.

Yonezawa, Keitaro, to Kabushiki Kaisha KOSMEK. Clamping apparatus. 5,206,038, Cl. 425-450.100.

Yoo, Byoung H., to Kang, Yong Won. Vacuum cleaner having a liquid medium filter. 5,205,014, Cl. 15-353.000.

Yoo, Ick-hyoung: *See*—
Kim, Yeong-woong; Yoo, Ick-hyoung; Lee, Chul-woo; Park, Byeong-ho; and Kim, Chang-geun, 5,206,852, Cl. 369-112.000.

Yorinobu, Takino: *See*—
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York, Harold D., Jr. Adjustable sandal. 5,205,054, Cl. 36-11.500.

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Yoshida, Akira: *See*—
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Yoshida Kogyo K. K.: *See*—
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Yoshida, Noriyuki, to Sumitomo Electric Industries, Ltd. Method for fabricating oxide superconducting wires by laser ablation. 5,206,216, Cl. 505-1.000.

Yoshida, Shuichi; Tokura, Mitsuo; and Wakabayashi, Noriaki, to Matsushita Electric Industrial Co., Ltd. Access method of actuator and control apparatus therefor. 5,206,566, Cl. 318-568.220.

Yoshida, Takashi, to Fuji Electric Corporate Research and Development Ltd. Process for producing an amorphous photoelectric transducer. 5,206,180, Cl. 437-4.000.

Yoshida, Takehiro: *See*—
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Yoshida, Takeshi: *See*—
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Yoshikawa, Hiroshi: *See*—
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Yoshikawa Iron Works Ltd.: *See*—
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Yoshikawa, Yuji: *See*—
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Yoshima, Kazumasa: *See*—
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Yoshimura, Hiroyuki: *See*—
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Yoshimura, Yasutsugu: *See*—
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Yoshino, Jun: *See*—
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Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshioka, Masaki: *See*—
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Yoshioka, Osamu: *See*—
Yamaguchi, Futao; Ikeda, Takeshi; and Yoshioka, Osamu, 5,206,606, Cl. 330-254.000.

Yoshizawa, Takashi: *See*—
Kasahara, Akihiro; Yamada, Akira; Yoshizawa, Takashi; Wada, Katsutoshi; and Yamasaki, Hideo, 5,206,762, Cl. 359-814.000.

Young, Daniel A.: *See*—
Crews, Nathan C., IV; and Young, Daniel A., 5,205,874, Cl. 148-254.000.

Young, Michael A.: *See*—
Liang, Rong C.; Schwarzel, William C.; Shon Baker, Rita S.; Short, Robert P.; Sofen, Stephen R.; and Young, Michael A., 5,206,208, Cl. 503-201.000.

Young, William R.; and Johnstone, William F., to Harris Corporation. Decimation circuit employing multiple memory data shifting section and multiple arithmetic logic unit section. 5,206,821, Cl. 364-724.100.

Yuasa Battery Co., Ltd.: *See*—
Muto, Junji; Kitawaki, Hironori; Sugiyama, Shoji; Nakayama, Yasuhide; Kitagawa, Katsumi; and Kishimoto, Kenjiro, 5,206,100, Cl. 429-247.000.

Yukawa, Akira, to NEC Corporation. Oversampling DA converter with operational amplifier driven by a single reference voltage. 5,206,648, Cl. 341-143.000.

Yurgevich, Howard J.; and Rosby, Thomas J., to Rosby Corporation. Large cubic volume cargo container. 5,205,428, Cl. 220-1.500.

Yurman, Bruno: *See*—
Nazarenko, Dimitri M.; Hughes, Houston H., III; Gordon, Robert T.; Hattey, David L.; and Yurman, Bruno, 5,206,863, Cl. 371-37.100.

Yushan, Fu; and Ru, Zhang, to Yushan, Fu. Lead-auto-sharpened propelling pencil and the making process thereof. 5,205,664, Cl. 401-50.000.

Z C Mines Pty. Ltd.: *See*—
Sugden, David B.; Turner, John; Boyd, Robert J.; Hartman, Thomas M.; Dollinger, Gerald L.; and Moore, John G., 5,205,612, Cl. 299-10.000.

Zahler, Robert; and Slusarchyk, William A., to E. R. Squibb & Sons, Inc. Hydroxymethyl (methylenecyclopentyl) purines and pyrimidines. 5,206,244, Cl. 514-262.000.

Zaidan Hojin Biseibutsu Kagaku Kai: *See*—
Shibahara, Seiji; Koyama, Yoshiyuki; Inoue, Shigeharu; Hachisu, Mitsugu; Kondo, Shinichi; Aoyagi, Takaaki; and Takeuchi, Tomio, 5,206,384, Cl. 548-537.000.

Zakaria, Zairani; Neas, Edwin D.; Manchester, Dennis P.; and Hargett, Wyatt P., to CEM Corporation. Microwave heating system. 5,206,479, Cl. 219-10.55F.

Zalph, Walter N., to International Business Machines Corp. Self calibrating brightness controls for digitally operated liquid crystal display system. 5,206,633, Cl. 340-784.000.

Zanussi Elettrodomestici S.P.A.: *See*—
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Zavracky, Paul M.; Fan, John C. C.; McClelland, Robert; Jacobsen, Jeffrey; and Dingle, Brenda, to Kopin Corporation. Liquid crystal display having essentially single crystal transistors pixels and driving circuits. 5,206,749, Cl. 359-59.000.

Zdeb, Brian, to Retrax, Inc. Retractable syringe. 5,205,823, Cl. 604-110.000.

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Zeiner, Mark S.: *See*—
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Zejda, Jaroslav, to Leybold Aktiengesellschaft. Cathode sputtering apparatus. 5,205,919, Cl. 204-298.250.

Zeller, Werner, to Elin Energieversorgung GmbH. Automatic delivery device for lubricating a bearing. 5,205,654, Cl. 384-404.000.

Zemitis, Martin S. Elastic cord apparatus. 5,205,803, Cl. 482-121.000.

Zeos International, Ltd.: *See*—
Thomas, William B.; Barry, Michael R.; and Flom, James R., 5,206,790, Cl. 361-380.000.

Zeuschner, Roland, to Natec, Reich, Summer GmbH & Co. KG. Device for the perpendicular change in the direction of conveyance of a foodstuff, in particular cheese, sausage and similar product in slice form. 5,205,394, Cl. 198-369.000.

Zeuthen, Jesper; Prento, Annette; and Kruse, Viggo, to Novo Industri A/S. Determination of glycated (glycosylated) hemoglobin in blood. 5,206,144, Cl. 435-7.250.

Zexel Corporation: *See*—
Nagao, Teruyuki; and Nagasaka, Yoshikiyo, 5,205,349, Cl. 165-67.000.

Zeyfang, Eberhard: *See*—
Von Buelow, Hartwig; and Zeyfang, Eberhard, 5,206,875, Cl. 372-90.000.
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Zhang, Jack Y.: *See*—
Xia, Frank Z.; Luo, Mary Z.; and Zhang, Jack Y., 5,205,000, Cl. 4-324.000.

Zhao, Dalian: *See*—
Chung, John Y. L.; Hughes, David L.; and Zhao, Dalian, 5,206,373, Cl. 546-335.000.

Ziger, David H., to AT&T Bell Laboratories. Spin coating apparatus having a horizontally linearly movable wafer holder. 5,205,867, Cl. 118-54.000.

Zimmerman, Jeffery C. Fish lure. 5,205,062, Cl. 43-42.040.

Zimmermann, Craig E.; and Merle, Rene K., to General Mills, Inc. Rolled food item fabricating apparatus and methods. 5,205,106, Cl. 53-118.000.

Zimmermann, John, to Paperboard Industries Corporation. Interlocking carton and lid. 5,205,477, Cl. 229-125.280.

Zinnbauer, Gerald B., to Procter & Gamble Company, The. Cosmetic case. 5,205,431, Cl. 220-326.000.

Zipf, Edward C., to Mine Safety Appliances Company. Apparatus and process for improved photoionization and detection. 5,206,594, Cl. 324-464.000.

Ziu, Christopher G., to Double Containment Systems. Underground conainment tank and piping asembly. 5,205,592, Cl. 285-45.000.

Zoll Medical Corporation: *See*—
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Zook, Larry J.: *See*—
Avery, James F.; Fletcher, Edward C.; Francis, Trevor A.; Gheorghiu, Tudor C.; and Zook, Larry J., 5,205,991, Cl. 422-129.000.

Zorumski, Charles F.: *See*—
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Zubieta, Jon A.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, David W., Jr. Refrigeration cleaning and flushing system. Re. 34,231, Cl. 62-85.000.

Atochem: *See*—
Bachot, Jean; and Grosbois, Jean, Re. 34,233, Cl. 204-242.000.

Bachot, Jean; and Grosbois, Jean, to Atochem. Electrically conductive fibrous web substrate and cathodic element comprised thereof. Re. 34,233, Cl. 204-242.000.

Chiquita Brands, Inc.: *See*—
Sole, Pedro, Re. 34,237, Cl. 426-49.000.

Cooper, Gordon C.; and Dawson, Margaret L., to Rolls-Royce plc. Sealing plug. Re. 34,235, Cl. 277-2.000.

Da Silveira, John A. Cattle stanchion. Re. 34,232, Cl. 119-148.000.

Dawson, Margaret L.: *See*—
Cooper, Gordon C.; and Dawson, Margaret L., Re. 34,235, Cl. 277-2.000.

Grosbois, Jean: *See*—
Bachot, Jean; and Grosbois, Jean, Re. 34,233, Cl. 204-242.000.

Hitachi, Ltd.: *See*—
Kuroiwa, Hiroshi; Oyama, Yoshishige; and Nogi, Toshiharu, Re. 34,234, Cl. 123-425.000.

Kuroiwa, Hiroshi; Oyama, Yoshishige; and Nogi, Toshiharu, to Hitachi, Ltd. Control apparatus for internal combustion engines. Re. 34,234, Cl. 123-425.000.

Nogi, Toshiharu: *See*—
Kuroiwa, Hiroshi; Oyama, Yoshishige; and Nogi, Toshiharu, Re. 34,234, Cl. 123-425.000.

Noise Cancellation Technologies, Inc.: *See*—
Taylor, Jefferson H., Re. 34,236, Cl. 381-25.000.

Oyama, Yoshishige: *See*—
Kuroiwa, Hiroshi; Oyama, Yoshishige; and Nogi, Toshiharu, Re. 34,234, Cl. 123-425.000.

Rolls-Royce plc: *See*—
Cooper, Gordon C.; and Dawson, Margaret L., Re. 34,235, Cl. 277-2.000.

Sole, Pedro, to Chiquita Brands, Inc. Banana processing. Re. 34,237, Cl. 426-49.000.

Taylor, Jefferson H., to Noise Cancellation Technologies, Inc. Frequency attenuation compensated pneumatic headphone and liquid tube audio system for medical use. Re. 34,236, Cl. 381-25.000.

Truth Division of SPX Corporation: *See*—
Tucker, Daniel G.; and Vetter, Gregory J., Re. 34,230, Cl. 49-279.000.

Tucker, Daniel G.; and Vetter, Gregory J., to Truth Division of SPX Corporation. Unified casement operator. Re. 34,230, Cl. 49-279.000.

Vetter, Gregory J.: *See*—
Tucker, Daniel G.; and Vetter, Gregory J., Re. 34,230, Cl. 49-279.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Abatement Technologies: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., B1 5,069,691, Cl. 55-126.000.

Anderson, Arthur W.; and Stamatoff, Gelu S., to Du Pont de Nemours, E. I., and Company. Hydrocarbon interpolymer compositions. B1 4,076,698, 4-27-93, Cl. 526-348.600.

Carroll, Kenneth M.: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., B1 1,033,452, Cl. 556-472.000.

Dabbaj, Rad H. Display devices and display elements thereof. B1 4,958,150, 4-27-93, Cl. 340-783.000.

Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Arthur W.; and Stamatoff, Gelu S., B1 4,076,698, Cl. 526-348.600.

Flavell, Evan R. Bilateral isokinetic exerciser. B1 4,082,267, 4-27-93, Cl. 482-6.000.

Flock, John W.: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., B1 1,033,452, Cl. 556-472.000.

Fujisawa, Yoshiho, to TMC Magnet Inc. Magnet device for animals, in particular cattle. B1 4,283,698, 4-27-93, Cl. 335-306.000.

General Electric Company: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., B1 1,033,452, Cl. 556-472.000.

Harber, Blair, Jr.: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., B1 5,069,691, Cl. 55-126.000.

Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, to Petroferm Inc. Method for printed circuit board and/or printed wiring board cleaning. B1 4,640,719, 4-27-93, Cl. 134-40.000.

Hood, Craig C.: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, B1 4,640,719, Cl. 134-40.000.

Kruse, Gary: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., B1 5,069,691, Cl. 55-126.000.

Michael, Daniel W., to Procter & Gamble Company, The. Hard surface liquid detergent compositions containing hydrocarbyl-amidoalkylene sulfobetaine. B1 5,108,660, 4-27-93, Cl. 252-545.000.

Miller, Ronald E.: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, B1 4,640,719, Cl. 134-40.000.

Petroferm Inc.: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, B1 4,640,719, Cl. 134-40.000.

Procter & Gamble Company, The: *See*—
Michael, Daniel W., B1 5,108,660, Cl. 252-545.000.
Van Tilburg, Kees J., B1 4,589,876, Cl. 604-385.100.

Ritzer, Alan: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., B1 1,033,452, Cl. 556-472.000.

Shagott, David: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., B1 5,069,691, Cl. 55-126.000.

Sharpe, Robert: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, B1 4,640,719, Cl. 134-40.000.

Stamatoff, Gelu S.: *See*—
Anderson, Arthur W.; and Stamatoff, Gelu S., B1 4,076,698, Cl. 526-348.600.

Sutherland, Daniel: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., B1 5,069,691, Cl. 55-126.000.

TMC Magnet Inc.: *See*—
Fujisawa, Yoshiho, B1 4,283,698, Cl. 335-306.000.

Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., to Abatement Technologies. Portable filtration unit. B1 5,069,691, 4-27-93, Cl. 55-126.000.

Van Tilburg, Kees J., to Procter & Gamble Company, The. Sanitary napkin. B1 4,589,876, 4-27-93, Cl. 604-385.100.

Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., to General Electric Company. Method for making alkylhalosilanes. B1 1,033,452, 4-27-93, Cl. 556-472.000.

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Abel, Carl W. Safety flashlight. 335,192, 4-27-93, Cl. D26-49.000.

Acra-Plant, Inc.: *See*—
Williams, Robert A.; and Bell, William A., 335,132, Cl. D15-29.000.

Alexander Engineering Company, Ltd.: *See*—
Morgan, David, 335,191, Cl. D26-28.000.

Alexander, John E., to Porter, Inc. Power boat. 335,118, 4-27-93, Cl. D12-314.000.

Alfonso, Pedro M., to International Business Machines Corporation. Carrying case for a personal computer. 335,030, 4-27-93, Cl. D3-76.000.

Allen, Thomas P., to Nike, Inc. Surface ornamentation for a shoe tongue. 335,019, 4-27-93, Cl. D2-315.000.

American Home Products Corporation: *See*—
Pierantozzi, James J.; and Walchek, William, Jr., 335,081, Cl. D9-341.000.

Anderson, Charles B.; and Kenrick, Charles R., to Builder's Best, Inc. Vent which attaches to the rear of a clothes dryer and connects to the outlet in a wall. 335,174, 4-27-93, Cl. D23-393.000.

Andre Morin Designers Inc.: *See*—
Morin, Andre, 335,053, Cl. D6-484.000.

Anthony, Philip M.; Fuhreck, John E.; Norris, Michael A.; Smolinski, Gerald J.; and Wahoski, Edward S., to Snap-on Tools Corporation. Cordless impact wrench. 335,073, 4-27-93, Cl. D8-68.000.

Armour, Thomas W., II. Boat fender cover. 335,108, 4-27-93, Cl. D12-168.000.

AS Birambeau: *See*—
Gourhant, Michel, 335,072, Cl. D8-42.000.

Aslanian, Jerry L. Holder for an I.V. rate controller. 335,181, 4-27-93, Cl. D24-129.000.

Avar, Eric P., to Nike, Inc. Shoe midsole. 335,018, 4-27-93, Cl. D2-314.000.

Babineau, Paul J.: *See*—
Miller, David J.; and Babineau, Paul J., 335,092, Cl. D10-75.000.

Barbieri, Raul. Desk pad. 335,148, 4-27-93, Cl. D19-95.000.

Barbuto, Joanna H.; and Kane, Elizabeth, to Liz Claiborne, Inc. Merchandise display stand. 335,052, 4-27-93, Cl. D6-477.000.

Bassett Mirror Co.: *See*—
Game, Jack D., 335,055, Cl. D6-486.000.

BBG, Inc.: *See*—
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147 5,205,140

CLASS 68

53 5,205,141

CLASS 70

16 5,205,142
366 5,205,143
455 5,205,144

CLASS 72

53 5,205,145
57 5,205,146
429 5,205,147
446 5,205,148
5,205,149
454 5,205,150

CLASS 73

1 R 5,205,151
9 5,205,152
23.35 5,205,154
28.04 5,205,155
38 5,205,156
49.2 5,205,157
54.06 5,205,158
64.41 5,205,159
79.03 5,205,153
113 5,205,160
114 5,205,161
148 5,205,162
151 5,205,163
153 5,205,164
155 5,205,165
5,205,166
5,205,167
167 5,205,168
180 5,205,169
204.26 5,205,170
295 5,205,172
517 B 5,205,171
592 5,205,173
623 5,205,174
628 5,205,175
761 5,205,176
863.12 5,205,177
5,205,178

CLASS 74

365 5,205,179
473 R 5,205,180
480 R 5,205,181
502.1 5,205,182
502.2 5,205,183
538 5,205,184
551.1 5,205,185
558 5,205,186
567 5,205,187
569 5,205,188
573 R 5,205,189
574 5,205,190
880 5,205,191
867 5,205,192

CLASS 75

304 5,205,856
401 5,205,857
426 5,205,858
640 5,205,859

CLASS 81

3.09 5,205,194
176.15 5,205,193

CLASS 82

92 5,205,195

CLASS 83

272 5,205,196
364 5,205,197
435.001 5,205,198
839 5,205,199

CLASS 84

624 5,206,446
635 5,206,447
659 5,206,448
723 5,206,449

CLASS 89

1.11 5,206,452
1.51 5,206,453
1.8 5,206,450
33.14 5,206,454
36.02 5,206,451

CLASS 91

1 5,205,200
387 5,205,201
485 5,205,202

CLASS 92

19 5,205,203
28 5,205,204
63 5,205,205

CLASS 99

326 5,205,206
340 5,205,207
345 5,205,208
450.6 5,205,209

CLASS 101

32 5,205,210
170 5,205,212
171 5,205,211
217 5,205,213
333 5,205,214
348 5,205,215
367 5,205,216
420 5,205,217

CLASS 102

201 5,206,455
207 5,206,456
235 5,206,457

CLASS 106

12 5,205,218
173.2 5,205,219

CLASS 108

167 5,205,220

CLASS 106

2 5,205,860
20 D 5,205,861
22 R 5,205,862
154.1 5,205,863
287.26 5,205,864
311 5,205,865
450 5,205,866

CLASS 108

51.3 5,205,221
97 5,205,222
124 5,205,223

CLASS 109

19 5,205,224

CLASS 110

240 5,205,225
264 5,205,226
345 5,205,227

CLASS 111

89 5,205,228

CLASS 112

80.41 5,205,229
220 5,205,230
235 5,205,231
262.3 5,205,232
266.2 5,205,233

CLASS 114

210 5,205,234
290 5,205,235

CLASS 116

63 R 5,205,236

CLASS 118

54 5,205,867
263 5,205,868
324 5,205,869
658 5,206,458
722 5,205,870

CLASS 119

3 5,205,237
29 5,205,238
52.3 5,205,239
57.4 5,205,240
60 5,205,241
61 5,205,242
148 Re.34,232

CLASS 123

41.86 5,205,243
52 MC 5,205,244
65 P 5,205,245
79 R 5,205,246
90.18 5,205,247
90.17 5,205,248
5,205,249
142.5 R 5,205,250
190.12 5,205,251
198 D 5,205,252
5,205,253
305 5,205,254
331 5,205,255
357 5,205,256
399 5,205,257
425 Re.34,234
5,205,258
432 5,205,259
494 5,205,260
5,205,261
5,205,262
520 5,205,263
555 5,205,264
570 5,205,265

CLASS 124

19 5,205,266
24.1 5,205,267
5,205,268
25.6 5,205,269
50 5,205,270
66 5,205,271
89 5,205,272

CLASS 126

21 A 5,205,273
5,205,274
39 R 5,205,275
109 5,205,276
262 5,205,277
263 5,205,278
299 R 5,205,279

CLASS 128

3 5,205,280
203.26 5,205,282
207.14 5,205,281
419 PG 5,205,283
5,205,284
423 R 5,205,285
630 5,205,286
632 5,205,287
642 5,205,288
653.1 5,205,289
653.4 5,205,290
654 5,205,291
662.03 5,205,292
691 5,205,293
696 5,205,294
711 5,205,295
775 5,205,296
798 5,205,297
844 5,205,298

CLASS 131

241 5,205,299

CLASS 132

202 5,205,300
320 5,205,301
321 5,205,302

CLASS 134

40 B1 4,640,719
73 5,205,303
99.2 5,205,304
104.1 5,205,305
104.2 5,205,306
104.4 5,205,307

CLASS 136

90 5,205,308

CLASS 137

1 5,205,309
2 5,205,310
14 5,205,311
15 5,205,312
112 5,205,313
203 5,205,314
204 5,205,315
209 5,205,316
242 5,205,317
337 5,205,318
423 5,205,319
493.3 5,205,321
504 5,205,320
597 5,205,322
625.44 5,205,323
627.5 5,205,324
844 5,205,325

CLASS 138

30 5,205,326

CLASS 139

370.1 5,205,327

CLASS 140

92.1 5,205,329
93.2 5,205,328

CLASS 141

59 5,205,330

CLASS 144

134 A 5,205,331

CLASS 148

33.3 5,205,871
111 5,205,872
206 5,205,873
254 5,205,874
421 5,205,875
5,205,876
526 5,205,877
684 5,205,878

CLASS 149

97 5,205,983

CLASS 152

209 R 5,205,879
454 5,205,880
527 5,205,881
5,205,882
540 5,205,883

CLASS 156

63 5,205,884
69 5,205,885
71 5,205,886
73.5 5,205,887
89 5,205,888

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158 5,205,889
169 5,205,890
204 5,205,891
212 5,205,892
215 5,205,893
283 5,205,894
293 5,205,895
297 5,205,896
315 5,205,897
441 5,205,898
515 5,205,899
601 5,205,900
635 5,205,901
643 5,205,902
646 5,205,903
662 5,205,905
664 5,205,904

CLASS 159

47.3 5,205,906

CLASS 160

23.1 5,205,332
84.1 5,205,333
5,205,337
89 5,205,334
115 5,205,335
133 5,205,336

CLASS 162

30.1 5,205,908
76 5,205,907

CLASS 164

113 5,205,338
5,205,339
306 5,205,341
412 5,205,340
417 5,205,342
437 5,205,343
440 5,205,344
452 5,205,345
500 5,205,346

CLASS 165

1 5,205,347
46 5,205,348
67 5,205,349
104.18 5,205,350
110 5,205,351
113 5,205,352
170 5,205,353
173 5,205,354

CLASS 166

72 5,205,355
85 5,205,356
117.5 5,205,357
187 5,205,358
284 5,205,359
308 5,205,360
317 5,205,361

CLASS 168

13 5,205,362

CLASS 173

17 5,205,363

CLASS 174

36 5,206,439
52.1 5,206,460
88 B 5,206,461
117 F 5,206,462
254 5,206,463

CLASS 175

38 5,205,364
97 5,205,365
390 5,205,366

CLASS 177

50 5,205,367
163 5,205,368
229 5,205,369
256 5,205,370

CLASS 180

79.1 5,205,371
132 5,205,372
248 5,205,373
300 5,205,374

CLASS 181

150 5,206,464
152 5,206,465
169 5,206,466
232 5,206,467

CLASS 182

187 5,205,375

CLASS 184

6.14 5,205,376
6.26 5,205,377
55.1 5,205,378

CLASS 187

26 5,205,379

CLASS 188

18 A 5,205,380
19 5,205,381
71.5 5,205,382
73.45 5,205,383
266 B 5,205,384
299 5,205,385

CLASS 192

46 5,205,386
85 CA 5,205,387
89 B 5,205,388
106.2 5,205,389

CLASS 193

2 R 5,205,390

CLASS 198

325 5,205,391
343.1 5,205,392
369 5,205,393
5,205,394
389 5,205,395
465.1 5,205,396
5,205,397
780 5,205,398
812 5,205,400
840 5,205,399

CLASS 200

50 AA 5,206,468
61.45 M 5,206,469
82 B 5,206,470

CLASS 202

160 5,205,909
175 5,205,910

CLASS 204

98 5,205,911
157.15 5,205,912
5,205,915
157.22 5,205,913
157.94 5,205,914
181.7 5,205,916
182.8 5,205,917
242 Re.34,233
298.07 5,205,918
298.25 5,205,919
403 5,205,920

CLASS 205

318 5,205,921
332 5,205,922

CLASS 206

1.5 5,205,401
250 5,205,402
256 5,205,403
303 5,205,404
310 5,205,405
328 5,205,406
338 5,205,407
364 5,205,408
370 5,205,409
386 5,205,410
391 5,205,411
394 5,205,412
541 5,205,413

CLASS 208

27 5,205,923
113 5,205,924
262.5 5,205,925

CLASS 209

8 5,205,414
21 5,205,415
168 5,205,926
283 5,205,416
630 5,205,417
645 5,205,418

CLASS 210

170 5,205,927
198.2 5,205,928
5,205,929
251 5,205,930
264 5,205,931
5,205,932
374 5,205,933
500.43 5,205,934
603 5,205,935
614 5,205,936
651 5,205,937
653 5,205,938
727 5,205,939
748 5,205,940
770 5,205,941

CLASS 211

41 5,205,419
43 5,205,420
59.2 5,205,421
70.6 5,205,422

CLASS 215

12.1 5,205,423
210 5,205,424
252 5,205,426

CLASS 219

10.55 D 5,206,478
10.55 F 5,206,479
10.55 R 5,206,471
69.12 5,206,480
75 5,206,472
121.48 5,206,481
121.83 5,206,473
124.34 5,206,474
145.23 5,206,475
202 5,206,476
216 5,206,477
219 5,206,482
270 5,206,483
5,206,484
549 5,206,485

CLASS 220

1.5 5,205,428
4.15 5,205,427
23.83 5,205,429
278 5,205,430
326 5,205,431
412 5,205,432
571 5,205,472
572 5,205,433
608 5,205,434

CLASS 221

1 5,205,438
5,205,439
83 5,205,440
207 5,205,441
341 5,205,442
402.13 5,205,443
472 5,205,444
651 5,205,445

CLASS 224

42.03 A 5,205,446
42.42 5,205,447
151 5,205,448
152 5,205,449
161 5,205,450
5,205,451
275 5,205,452
321 5,205,453

CLASS 225

1 5,205,454
106 5,205,455

CLASS 227

57 5,205,456
66 5,205,457
71 5,205,458
179 5,205,459

CLASS 228

6.2 5,205,460
20 5,205,461
44.3 5,205,462
102 5,205,463
114 5,205,464
119 5,205,465
125 5,205,466
157 5,205,467
164 5,205,468
225 5,205,469
265 5,205,470
5,205,471

CLASS 229

1.5 B 5,205,473
1.5 H 5,205,474
92.8 5,205,475
114 5,205,476
125.28 5,205,477
145 5,205,478
202 5,205,479
229 5,205,480

CLASS 232

16 5,205,481

CLASS 235

51 5,206,486
379 5,206,487
380 5,206,488
449 5,206,489
462 5,206,490
467 5,206,491
472 5,206,492
475 5,206,493
487 5,206,494
492 5,206,495

CLASS 236

12.1 5,205,482
12.2 5,205,483
35.3 5,205,484
44 R 5,205,485
94 5,205,486

CLASS 239

74 5,205,487
124 5,205,488
434 5,205,489
449 5,205,490
457 5,205,491
533.4 5,205,492

CLASS 241

21 5,205,493
30 5,205,494
31 5,205,495
34 5,205,496
36 5,205,497
55 5,205,498
137 5,205,499
154 5,205,500
189.1 5,205,501

CLASS 242

56.2 5,205,504
56.9 5,205,503
58.6 5,205,505
71.1 5,205,506
74.1 5,205,507
80 5,205,508
86 5,205,509
159 5,205,510
261 5,205,511

CLASS 244

1 R 5,205,502
17.19 5,205,512
54 5,205,513
103 R 5,205,514
118.5 5,205,515
121 5,205,516
147 5,205,517
165 5,205,518
198 5,205,519

CLASS 248

74.1 5,205,520
87 5,205,521
123.1 5,205,522
218.4 5,205,523
235 5,205,524
311.2 5,205,525
449 5,205,526
451 5,205,527
602 5,205,528
636 5,205,529
690 5,205,530

CLASS 249

3 5,205,942
27 5,205,943
194 5,205,944

CLASS 250

201.1 5,206,497
201.8 5,206,498
203.6 5,206,499
208.1 5,206,501
214 R 5,206,500
226 5,206,502
234 5,206,503
251 5,206,504
255 5,206,505
271 5,206,496
281 5,206,506
282 5,206,507
287 5,206,508
292 5,206,509
339 5,206,510
343 5,206,511
363.05 5,206,512
374 5,206,513
484.1 5,206,514
492.2 5,206,515
5,206,516
5,206,517
504 R 5,206,518
565 5,206,519
568 5,206,520
569 5,206,521
574 5,206,522

CLASS 251

30.04 5,205,531
85 5,205,532
118 5,205,533
129.11 5,205,534
163 5,205,535
172 5,205,536
205 5,205,537
297 5,205,538
331 5,205,539
339 5,205,540

CLASS 252

25 5,205,946
35 G 5,206,316
47.5 5,205,945
5,205,947
48.6 5,205,948
50 5,205,949
62.51 5,205,950
78.5 5,205,951
88 5,205,952
94 5,205,953
99 5,205,954
102 5,205,955
173 5,205,957
174.13 5,205,958
174.17 5,205,959
174.24 5,205,960
186.37 5,205,961
299.61 5,205,962
301.35 5,205,963
340 5,205,964
350 5,205,956
500 5,205,965
545 B1 5,108,660
626 5,205,966

CLASS 254

131 5,205,541
134.4 5,205,542
231 5,205,543
329 5,205,544

CLASS 257

16 5,206,523
29 5,206,524
40 5,206,525
185 5,206,526
191 5,206,527
192 5,206,528
202 5,206,529
231 5,206,530
270 5,206,531
307 5,206,787
382 5,206,532
393 5,206,533
464 5,206,534
519 5,206,535
668 5,206,536
675 5,206,794
684 5,206,713
689 5,206,793

CLASS 264

1.2 5,205,967
28 5,205,968
40.4 5,205,969
60 5,205,970
86 5,205,971
101 5,205,972
5,205,973
210.1 5,205,974
240 5,205,975
255 5,205,976
261 5,205,977
315 5,205,978

CLASS 266

80 5,205,979
153 5,205,980
234 5,205,981
236 5,205,982

CLASS 267

140.13 5,205,545
5,205,546
158 5,205,547

CLASS 271

3 5,205,548
157 5,205,550
176 5,205,549
225 5,205,551

CLASS 273

80.8 5,205,553
86 R 5,205,554
143 R 5,205,555
153 R 5,205,558
153 S 5,205,557
157 R 5,205,556
167 H 5,205,560
177 R 5,205,559
186.2 5,205,561
195 A 5,205,562
296 5,205,563
400 5,205,564
808 5,205,552

CLASS 277

2 Re.34,235
11 5,205,565
34 5,205,567
180 5,205,566
205 5,205,568
235 B 5,205,569

CLASS 280

24 5,205,570
47.35 5,205,571
284 5,205,572
287 5,205,573
495 5,205,574
625 5,205,575
629 5,205,576
642 5,205,577
5,205,578
5,205,579
675 5,205,580
714 5,205,581
735 5,205,582
743 5,205,583
5,205,584
753 5,205,585
764.1 5,205,586
785 5,205,587
801 A 5,205,588
804 5,205,589
851 5,205,590

CLASS 283

117 5,205,591

CLASS 285

45 5,205,592
222 5,205,593
322 5,205,594

CLASS 290

1 R 5,206,537

CLASS 292

175 5,205,595
336.3 5,205,596

CLASS 293

115 5,205,597

CLASS 294

19.2 5,205,598
67.33 5,205,599
82.27 5,205,600

CLASS 296

20 5,205,601
39.1 5,205,602
62 5,205,603
97.11 5,205,604
98 5,205,605
153 5,205,606
210 5,205,607

CLASS 297

238 5,205,608
367 5,205,609
380 5,205,610
391 5,205,611

CLASS 299

10 5,205,612
31 5,205,613

CLASS 301

37.35 5,205,615
37.37 5,205,614
5,205,616
108.1 5,205,617

CLASS 303

84.1 5,205,618
92 5,205,619
100 5,205,620
113.2 5,205,622
5,205,623
113.5 5,205,621

CLASS 307

66 5,206,538
105 5,206,539
127 5,206,540
201 5,206,541
350 5,206,542
352 5,206,543
443 5,206,544
5,206,545
446 5,206,546
465 5,206,547
520 5,206,548
525 5,206,549
530 5,206,550
5,206,551
5,206,552
540 5,206,553

CLASS 310

40 MM 5,206,554
105 5,206,555
154 5,206,556
309 5,206,557

CLASS 312

1 5,205,624
9.54 5,205,625
184 5,205,626
201 5,205,627
216 5,205,628

249.11 5,205,630
249.9 5,205,629
254 5,206,567
348.3 5,205,631

CLASS 313

113 5,206,558
440 5,206,559
478 5,206,560

CLASS 315

15 5,206,561
77 5,206,562
127 5,206,563
209 R 5,206,564
349 5,206,565

CLASS 318

568.1 5,206,568
568.12 5,206,569
568.22 5,206,566
611 5,206,570
685 5,206,571
778 5,206,572
787 5,206,573
800 5,206,574
807 5,206,575

CLASS 320

2 5,206,576
5,206,577
14 5,206,578
20 5,206,579

CLASS 322

46 5,206,580

CLASS 323

313 5,206,581

CLASS 324

73.1 5,206,582
158 P 5,206,585
158 R 5,206,583
5,206,584
207.13 5,206,586
207.16 5,206,587
230 5,206,588
248 5,206,589
252 5,206,590
306 5,206,591
307 5,206,592
312 5,206,593
464 5,206,594
535 5,206,595
536 5,206,596
650 5,206,600
664 5,206,597
671 5,206,599
676 5,206,598

CLASS 329

317 5,206,601

CLASS 330

9 5,206,602
107 5,206,603
124 R 5,206,604
252 5,206,605
254 5,206,606
277 5,206,608
286 5,206,607

CLASS 331

57 5,206,609

CLASS 333

106 5,206,610
127 5,206,611
135 5,206,612
156 5,206,613

CLASS 335

16 5,206,614
35 5,206,615
126 5,206,616
132 5,206,617
253 5,206,618
306 B1 4,283,698

CLASS 336

84 M 5,206,620
180 5,206,621

CLASS 337

89 5,206,622

CLASS 338

203 5,206,623
308 5,206,624

CLASS 340

454 5,206,625
572 5,206,626
674 5,206,627
703 5,206,628
719 5,206,629
771 5,206,630
781 5,206,631
783 B1 4,958,150
784 5,206,632
5,206,633
5,206,634
5,206,635
825.31 5,206,637
825.510 5,206,638
825.52 5,206,636
825.54 5,206,639
852 5,206,640
905 5,206,641
932.2 5,206,643
933 5,206,642
961 5,206,644

CLASS 341

11 5,206,645
95 5,206,646
139 5,206,647
143 5,206,648
156 5,206,649
163 5,206,650

CLASS 342

20 5,206,651
52 5,206,652
61 5,206,653
410 5,206,654

CLASS 343

700 MS 5,206,655
705 5,206,656
742 5,206,657
755 5,206,658

CLASS 346

1.1 5,206,659
76 PH 5,206,660
5,206,661
5,206,662
5,206,663
FOR 5,206,664
135.1 5,206,665
140 R 5,206,666
5,206,667
5,206,668
159 5,206,669
5,206,670

CLASS 351

203 5,206,671
212 5,206,672

CLASS 353

98 5,206,673
122 5,206,674

CLASS 354

219 5,206,675
275 5,206,676
400 5,206,677
415 5,206,678

CLASS 355

29 5,206,679
91 5,206,680
200 5,206,681
5,206,682
202 5,206,683
203 5,206,684
206 5,206,685
208 5,206,686
214 5,206,687
228 5,206,688
234 5,206,696
243 5,206,689
251 5,206,690
259 5,206,691
260 5,206,619
5,206,692
261 5,206,693
290 5,206,694
323 5,206,695

CLASS 356

5 5,206,697
5,206,698
5,206,699
30 5,206,700
237 5,206,701
325 5,206,702
358 5,206,703
372 5,206,704
375 5,206,705
376 5,206,706
400 5,206,707
402 5,206,708
416 5,206,709
430 5,206,710
432 5,206,711
436

CLASS 358

22 5,206,714
31 5,206,715
41 5,206,716
43 5,206,717
75 5,206,718
[illegible] 5,206,719
85 5,206,721
[illegible] 5,206,722
101 5,206,720
105 5,206,723
133 5,206,724
5,206,725
149 5,206,726
167 5,206,727
168 5,206,728
182 5,206,729
209 5,206,730
5,206,731
5,206,732
254 5,206,733
261 3 5,206,734
296 5,206,735
5,206,736
5,206,737
315 5,206,738
335 5,206,739
342 5,206,740
404 5,206,741
427 5,206,742
440 5,206,743
488 5,206,744
498 5,206,745

CLASS 359

40 5,206,746
51 5,206,747
53 5,206,748
59 5,206,749
68 5,206,750
100 5,206,751
106 5,206,752
128 5,206,753
196 5,206,754
218 5,206,755
270 5,206,756
408 5,206,757
414 5,206,758
434 5,206,759
457 5,206,760
5,206,761
814 5,206,762
844 5,206,764
858 5,206,763
894 5,206,765
896 5,206,766

CLASS 360

13 5,206,767
36.2 5,206,768
51 5,206,769
71 5,206,771
75 5,206,770
98.01 5,206,772
113 5,206,774
132 5,206,781
135 5,206,773

CLASS 361

15 5,206,775
20 5,206,776
63 5,206,777
103 5,206,778
111 5,206,779
117 5,206,780
154 5,206,782
212 5,206,783
229 5,206,784
283 5,206,785
302 5,206,786
313 5,206,788
355 5,206,789
380 5,206,790
385 5,206,791
386 5,206,792
393 5,206,712
398 5,206,795
424 5,206,796
504 5,206,797
534 5,206,798

CLASS 362

33 5,205,632
61 5,205,633
5,205,634
46 5,206,872
58 5,206,873
72 5,206,874
90 5,206,875
5,206,876
96 5,206,877
101 5,206,878

CLASS 373

22 5,206,879
111 5,206,880

CLASS 375

1 5,206,881
5,206,882
20 5,206,883
34 5,206,884
95 5,206,885
97 5,206,886
114 5,206,887

CLASS 377

30 5,206,888
5,206,889
45 5,206,890
55 5,206,891

CLASS 378

65 5,206,893
93 5,206,894
121 5,206,895
131 5,206,892
180 5,206,896

CLASS 379

38 5,206,897
90 5,206,898
120 5,206,899
142 5,206,900
211 5,206,901
220 5,206,902
309 5,206,903
355 5,206,904

CLASS 380

4 5,206,905
14 5,206,906
5,206,907
15 5,206,908
59 5,206,909

CLASS 381

Re.34,236
25 5,206,910
26 5,206,911
71 5,206,912
96 5,206,913
103 5,206,914
191

CLASS 382

7 5,206,915
14 5,206,916
17 5,206,918
44 5,206,917
46 5,206,919

CLASS 383

5 5,205,649
107 5,205,650
119 5,205,651

CLASS 384

5,205,652
306 5,205,653
404 5,205,654
428 5,205,655
474 5,205,656
621 5,205,657

CLASS 385

8 5,206,922
12 5,206,923
24 5,206,924
37 5,206,920
134 5,206,921
135 5,206,927
142 5,206,925
143 5,206,926

CLASS 392

491 5,206,928

CLASS 395

95 5,206,930
159 5,206,929
161 5,206,931
165 5,206,932
200 5,206,933
5,206,934
275 5,206,935
325 5,206,936
5,206,937
400 5,206,938
5,206,939
5,206,940
425 5,206,941
5,206,942
5,206,943
5,206,944
5,206,945
500 5,206,946
575 5,206,948
600 5,206,947
5,206,949
5,206,950
650 5,206,951
725 5,206,952
775 5,206,953

CLASS 400

55 5,205,658
124 5,205,659
304 5,205,660
605 5,205,661
636 5,205,662
662 5,205,663

CLASS 401

50 5,205,664

CLASS 403

15 5,205,665
24 5,205,666
151 5,205,667

CLASS 404

26 5,205,668
97 5,205,669

CLASS 405

79 5,205,670
154 5,205,671
186 5,205,672
230 5,205,673
258 5,205,674
273 5,205,675
290 5,205,676

CLASS 406

39 5,205,677

CLASS 407

6 5,205,678
23 5,205,679
116 5,205,680

CLASS 408

1 R 5,205,681
46 5,205,682
5,205,683
145 5,205,684
204 5,205,685

CLASS 409

131 5,205,686

CLASS 410

98 5,205,687

CLASS 411

38 5,205,688
54 5,205,689
82 5,205,690
147 5,205,691
173 5,205,692
354 5,205,693
399 5,205,694

CLASS 414

196 5,205,695
287 5,205,696
341 5,205,697
406 5,205,698
420 5,205,699
540 5,205,700
744.5 5,205,701
751 5,205,702
796 5,205,703
796.8 5,205,704
5,205,705

CLASS 415

105 5,205,706
121.2 5,205,707
173.1 5,205,708
216.1 5,205,709

CLASS 416

61 5,205,710
63 5,205,711
155 5,205,712
193 A 5,205,713
220 R 5,205,714
228 5,205,715
229 A 5,205,716

CLASS 417

189 5,205,717
222.2 5,205,718
312 5,205,719
328 5,205,720
356 5,205,721
395 5,205,722
415 5,205,723
420 5,205,724
423.3 5,205,725
572 5,205,726

CLASS 428

420 5,205,984
422 5,205,985
528 5,205,986

CLASS 422

83 5,205,987
91 5,205,988
101 5,205,989
121 5,205,990
129 5,205,991
140 5,205,992
144 5,205,993
186.07 5,205,994
189 5,205,995

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241 5,205,996
248 5,205,997
310 5,205,998

CLASS 423

20 5,205,999
22 5,206,000
24 5,206,001
235 5,206,002
240 S 5,206,003
700 5,206,004
707 5,206,005

CLASS 424

7.1 5,206,006
9 5,206,007
45 5,206,008
5,206,009
49 5,206,010
61 5,206,011
69 5,206,012
71 5,206,013
88 5,206,014
93 C 5,206,015
94.64 5,206,017
122 5,206,018
401 5,206,016
5,206,019
5,206,020
405 5,206,021
409 5,206,022
423 5,206,023
438 5,206,024
439 5,206,025
445 5,206,026
450 5,206,027
484 5,206,028
489 5,206,029
490 5,206,030

CLASS 425

38 5,206,031
131.1 5,206,032
143 5,206,033
145 5,206,034
186 5,206,035
327 5,206,036
397 5,206,037
450.1 5,206,038
526 5,206,039
549 5,206,040

CLASS 426

2 5,206,041
5 5,206,042
49 Re.34,237
106 5,206,043
132 5,206,044
243 5,206,045
589 5,206,046
599 5,206,047
637 5,206,048
649 5,206,049
656 5,206,050

CLASS 427

97 5,206,052
287 5,206,054
304 5,206,055
356 5,206,056
373 5,206,053
412.3 5,206,058
420 5,206,057
449 5,206,059
458 5,206,051
489 5,206,060

CLASS 428

34.7 5,206,061
36.92 5,206,062
43 5,206,069
64 5,206,063
86 5,206,064
98 5,206,065
113 5,206,066
119 5,206,067
143 5,206,068
194 5,206,070
195 5,206,071
5,206,072
5,206,073
209 5,206,074
216 5,206,075
217 5,206,076
221 5,206,077
225 5,206,078
252 5,206,079
253 5,206,080
288 5,206,081
294 5,206,082
323 5,206,083
336 5,206,084
372 5,206,085
403 5,206,086
5,206,087
413 5,206,088
426 5,206,089
446 5,206,091
447 5,206,092
651 5,206,093

CLASS 429

16 5,206,095
26 5,206,094
27 5,206,096
90 5,206,097
96 5,206,098
142 5,206,099
247 5,206,100

CLASS 430

44 5,206,101
49 5,206,102
59 5,206,103
96 5,206,104
5,206,105
106.6 5,206,106
115 5,206,107
127 5,206,108
5,206,109
167 5,206,110
192 5,206,111
203 5,206,112
230 5,206,115
264 5,206,123
270 5,206,113
5,206,114
311 5,206,116
325 5,206,117
343 5,206,118
372 5,206,119
376 5,206,120
398 5,206,121
414 5,206,122
505 5,206,124
507 5,206,125
508 5,206,126
523 5,206,127
539 5,206,128
558 5,206,129
5,206,130
559 5,206,131
567 5,206,132
5,206,133
569 5,206,134

CLASS 431

1 5,205,727
5,205,728
153 5,205,729
320 5,205,730
328 5,205,731

CLASS 432

238 5,205,732

CLASS 433

1 5,205,733
4 5,205,734
5 5,205,735
18 5,205,736
55 5,205,737
92 5,205,743
122 5,205,744
173 5,205,745
174 5,205,746

CLASS 434

203 5,205,747
258 5,205,748

CLASS 435

4 5,206,135
5 5,206,136
6 5,206,137
5,206,139
7.1 5,206,140
5,206,141
7.22 5,206,142
7.24 5,206,143
7.25 5,206,144
14 5,206,145
16 5,206,146
25 5,206,147
5,206,148
28 5,206,149
5,206,150
32 5,206,151
69.1 5,206,152
69.7 5,206,153
5,206,154
71.3 5,206,155
101 5,206,156
120 5,206,157
129 5,206,158
180 5,206,159
189 5,206,160
211 5,206,170
212 5,206,161
228 5,206,162
240.2 5,206,163
5,206,164
5,206,165
252.3 5,206,166
262 5,206,168
284 5,206,169
293 5,206,171
311 5,206,172
313 5,206,173

CLASS 436

58 5,206,174
106 5,206,175
140 5,206,176
518 5,206,177
5,206,178
537 5,206,179

CLASS 437

4 5,206,180
8 5,206,181
33 5,206,182
47 5,206,183
51 5,206,184
129 5,206,185
183 5,206,186
192 5,206,187
211 5,206,188

CLASS 439

59 5,205,738
66 5,205,739
67 5,205,740
70 5,205,741
73 5,205,742
77 5,205,750
86 5,205,751
157 5,205,752
5,205,753
164 5,205,754
247 5,205,755
266 5,205,756
335 5,205,749
441 5,205,757
535 5,205,758
545 5,205,759
551 5,205,760
578 5,205,761
607 5,205,762
752 5,205,763

CLASS 440

58 5,205,764
66 5,205,765
72 5,205,766
90 5,205,767

CLASS 441

5 5,205,768

CLASS 445

24 5,205,770
27 5,205,769

CLASS 446

21 5,205,771
124 5,205,772
183 5,205,773
199 5,205,774
317 5,205,775
394 5,205,776

CLASS 452

142 5,205,777
155 5,205,778
157 5,205,779

CLASS 453

10 5,205,780

CLASS 454

141 5,205,782
164 5,205,781
238 5,205,783
245 5,205,784
256 5,205,785

CLASS 455

6.2 5,206,954

CLASS 460

9 5,205,786

CLASS 462

56 5,205,787

CLASS 464

61 5,205,788
157 5,205,789
162 5,205,790

CLASS 472

126 5,205,791

CLASS 474

135 5,205,792
141 5,205,793
160 5,205,794
166 5,205,795
185 5,205,796

CLASS 475

221 5,205,797

CLASS 482

B1 4,082,267
6 5,205,799
16 5,205,800
54 5,205,801
63 5,205,798
77 5,205,803
121 5,205,802
141 5,205,804

CLASS 483

9 5,205,805
18 5,205,806

CLASS 493

125 5,205,807
194 5,205,808
321 5,205,809

CLASS 501

12 5,206,189
32 5,206,190
83 5,206,191
103 5,206,192
117 5,206,193

CLASS 502

26 5,206,194
64 5,206,195
73 5,206,196
103 5,206,197
107 5,206,198
117 5,206,199
167 5,206,200
206 5,206,201
216 5,206,202
304 5,206,203
401 5,206,204
402 5,206,205
404 5,206,206
424 5,206,207

CLASS 503

201 5,206,208
209 5,206,209
210 5,206,210

CLASS 504

191 5,205,854
199 5,205,852
247 5,205,853
257 5,205,855

CLASS 505

1 5,206,211
5,206,212
5,206,213
5,206,214
5,206,215
5,206,216

CLASS 512

18 5,206,217

CLASS 514

2 5,206,218
3 5,206,219
19 5,206,220
5,206,221
46 5,206,222
56 5,206,223
58 5,206,224
63 5,206,225
75 5,206,226
112 5,206,227
141 5,206,228
167 5,206,229
5,206,230
183 5,206,231
184 5,206,232
211 5,206,233
213 5,206,234
5,206,235
215 5,206,239
218 5,206,236
219 5,206,237
221 5,206,238
231.5 5,206,240
232.8 5,206,241
236.5 5,206,242
239.5 5,206,243
262 5,206,244
269 5,206,245
272 5,206,246
278 5,206,247
289 5,206,248
296 5,206,249
5,206,250
315 5,206,251
362 5,206,252
363 5,206,253
365 5,206,254
374 5,206,255
383 5,206,256
398 5,206,257
403 5,206,258
406 5,206,259
411 5,206,260
418 5,206,261
428 5,206,262
460 5,206,263
483 5,206,264
502 5,206,265
522 5,206,266
536 5,206,267
548 5,206,268
561 5,206,269
562 5,206,270

CLASS 521

59 5,206,271

CLASS 523

109 5,206,272
300 5,206,273
404 5,206,274

CLASS 524

114 5,206,275
151 5,206,276
259 5,206,277
377 5,206,278
379 5,206,279
409 5,206,280
425 5,206,281
451 5,206,282
496 5,206,283
504 5,206,284
588 5,206,285
761 5,206,286

CLASS 525

65 5,206,287
83 5,206,288
114 5,206,289
134 5,206,290
173 5,206,291
194 5,206,293
196 5,206,294
207 5,206,295
230 5,206,296
240 5,206,292
279 5,206,297
283 5,206,298
305 5,206,299
314 5,206,300
5,206,301
316 5,206,302
319 5,206,303
329.3 5,206,304
331.7 5,206,305
332.1 5,206,306
338 5,206,307
410 5,206,308
432 5,206,309
5,206,310
434 5,206,311
474 5,206,312
524 5,206,313

CLASS 526

125 5,206,314
142 5,206,315
220 5,206,317
224 5,206,319
238.23 5,206,318
249 5,206,320
256 5,206,321
264 5,206,322
279 5,206,323
290 5,206,358
348.6 5,206,324
B1 4,076,698

CLASS 527

305 5,206,325
309 5,206,326

CLASS 528

4 5,206,327
14 5,206,328
15 5,206,329
23 5,206,330
52 5,206,331
118 5,206,332
139 5,206,333
204 5,206,334
266 5,206,335
265 5,206,336
313 5,206,337
322 5,206,338
353 5,206,339
5,206,340
361 5,206,341
392 5,206,342

CLASS 530

331 5,206,343
351 5,206,344
388.7 5,206,345
391.3 5,206,346
413 5,206,347

CLASS 534

557 5,206,348
561 5,206,349

CLASS 536

4.1 5,206,355
18.1 5,206,350
18.6 5,206,357
23.4 5,206,353
23.5 5,206,354
24.31 5,206,352
27.11 5,206,351
53 5,206,356

CLASS 540

141 5,206,359
205 5,206,360
352 5,206,361
454 5,206,362
593 5,206,363

CLASS 544

216 5,206,364
278 5,206,365
368 5,206,366

CLASS 546

15 5,206,367
168 5,206,368
249 5,206,369
281 5,206,370
290 5,206,371
294 5,206,372
335 5,206,373

CLASS 548

110 5,206,374
152 5,206,375
194 5,206,376
253 5,206,377
259 5,206,378
261 5,206,379
444 5,206,380
476 5,206,381
494 5,206,382
521 5,206,383
537 5,206,384
543 5,206,385
551 5,206,386

CLASS 549

9 5,206,387
31 5,206,388
72 5,206,389
214 5,206,390
246 5,206,391
261 5,206,392
397 5,206,393
429 5,206,394

CLASS 552

201 5,206,395

CLASS 554

27 5,206,396
147 5,206,397

CLASS 556

16 5,206,398
20 5,206,399
137 5,206,400
175 5,206,401
472 B1 Re.33,452
479 5,206,402

CLASS 558

1 5,206,403
146 5,206,404
182 5,206,405
262 5,206,406
276 5,206,407
277 5,206,408
5,206,409
389 5,206,410

CLASS 560

8 5,206,411
25 5,206,412
41 5,206,413
75 5,206,414
117 5,206,415
119 5,206,416
137 5,206,417
139 5,206,418
176 5,206,419
196 5,206,420
224 5,206,421
227 5,206,422
241.1 5,206,423

CLASS 562

6 5,206,425
52 5,206,426
83 5,206,427
427 5,206,428
434 5,206,429
494 5,206,430
534 5,206,431
553 5,206,432

609 5,206,433
891 5,206,434

CLASS 564

1 5,206,435
153 5,206,436
310 5,206,437
315 5,206,438

CLASS 568

21 5,206,439
35 5,206,440
342 5,206,441
447 5,206,442
598 5,206,443
909.8 5,206,424

CLASS 600

16 5,205,810
28 5,205,811

CLASS 602

5 5,205,812
17 5,205,813
19 5,205,814
5,205,815

CLASS 604

1 5,205,816
22 5,205,817
53 5,205,818
67 5,205,819
85 5,205,820
91 5,205,821
96 5,205,822
110 5,205,823
5,205,824
5,205,825
5,205,826
5,205,827
158 5,205,828
164 5,205,829
5,205,830
167 5,205,831
179 5,205,832
180 5,205,833
247 5,205,834
385.1 B1 4,589,876

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CLASSIFICATION OF DESIGNS

D2—	273	335,013		382	335,044		93	335,075		202	335,106	D18—	26	335,137			335,168
	314	335,014			335,045		386	335,076	D12—	3	335,107		28	335,138	D23—	213	335,169
		335,015		389	335,046		387	335,077		143	335,109	D19—	34	335,139		223	335,170
		335,016		422	335,047		395	335,078		147	335,110		46	335,140			335,171
		335,017		472	335,048		396	335,079			335,111		57	335,141		248	335,172
		335,018			335,049	D9—	341	335,081			335,112			335,142		393	335,173
	315	335,019			335,050		447	335,082			335,114			335,143			335,174
	320	335,020		477	335,051		455	335,080			335,115			335,144	D24—	110	335,175
		335,021			335,052		456	335,083		155	335,113			335,145		128	335,176
		335,022		484	335,053		502	335,084		157	335,116			335,146			335,177
	612	335,023		486	335,054		504	335,085		168	335,108			335,147			335,178
	619	335,024			335,055		529	335,086		193	335,117		95	335,148			335,179
	630	335,025		487	335,056	D10—	28	335,087		314	335,118	D20—	1	335,149			335,180
D3—	44	335,026		508	335,057		46	335,088		327	335,119	D21—	48	335,150		129	335,181
	45	335,027		552	335,058		64	335,089	D13—	103	335,120		64	335,151		130	335,182
	56	335,028		580	335,059			335,090		146	335,122		104	335,152		147	335,183
	70	335,029		604	335,060		72	335,091		173	335,121		108	335,153		194	335,184
	76	335,030	D7—	306	335,061		75	335,092	D14—	106	335,123			335,154			335,185
	104	335,031		308	335,062		76	335,093			335,124			335,155			335,186
D4—	199	335,032		351	335,064		78	335,094		115	335,125			335,156		196	335,187
D6—	349	335,033		360	335,063		79	335,095		121	335,126			335,157	D25—	62	335,188
	360	335,034		384	335,065		96	335,096		135	335,127			335,158			335,189
	361	335,035		596	335,066		129	335,097		137	335,128			335,159	D26—	28	335,191
		335,036		626	335,067			335,098		158	335,129			335,160		49	335,192
	364	335,037		663	335,068			335,099		214	335,130			335,161		63	335,190
	365	335,038		669	335,069			335,100	D15—	29	335,132			335,162			335,193
		335,039		681	335,070			335,101		32	335,131		233	335,163	D27—	159	335,194
	370	335,040	D8—	29	335,071	D11—	3	335,102	D16—	102	335,133		242	335,164	D29—	13	335,195
	373	335,042		42	335,072		6	335,103		104	335,134		251	335,165		20	335,196
	379	335,041		68	335,073		79	335,104		112	335,135	D22—	122	335,166	D30—	132	335,197
		335,043		83	335,074		164	335,105	D17—	20	335,136		126	335,167			

CLASSIFICATION OF PLANTS

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PATENTS

01 :	5,205,220	5,205,395	5,206,450	08 :	4,082,267	5,206,250	5,205,710
	5,205,340	5,205,435	5,206,455		5,205,153	5,206,294	5,205,800
	5,205,932	5,205,446	5,206,456		5,205,306	5,206,327	5,205,890
	5,206,037	5,205,448	5,206,486		5,205,489	5,206,374	5,206,015
	5,206,341	5,205,449	5,206,499		5,205,496	5,206,398	5,206,282
02 :	5,206,047	5,205,454	5,206,502		5,205,567	5,206,440	5,206,311
04 :	5,205,062	5,205,455	5,206,503		5,205,741	4,076,698	5,206,371
	5,205,128	5,205,467	5,206,506		5,205,891	11 : 5,205,554	5,206,572
	5,205,175	5,205,470	5,206,507		5,205,952	12 : Re.34,231	5,069,691
	5,205,290	5,205,547	5,206,513		5,206,054	5,205,003	15 : 5,205,126
	5,205,510	5,205,552	5,206,520		5,206,182	5,205,024	5,205,670
	5,205,698	5,205,556	5,206,541		5,206,551	5,205,097	16 : 5,205,058
	5,205,786	5,205,564	5,206,545		5,206,570	5,205,234	5,205,069
	5,206,141	5,205,586	5,206,555		5,206,660	5,205,236	5,205,770
	5,206,547	5,205,595	5,206,568		5,206,753	5,205,264	5,206,174
	5,206,609	5,205,598	5,206,577		5,206,774	5,205,300	5,206,183
	5,206,769	5,205,625	5,206,582		5,206,788	5,205,457	5,206,532
05 :	5,205,109	5,205,672	5,206,590		5,206,857	5,205,465	5,206,823
	5,205,302	5,205,686	5,206,601		5,206,903	5,205,501	17 : 5,205,057
	5,205,626	5,205,690	5,206,602	09 :	5,205,073	5,205,523	5,205,061
	5,206,058	5,205,712	5,206,611		5,205,142	5,205,524	5,205,088
	5,206,169	5,205,726	5,206,628		5,205,288	5,205,541	5,205,090
06 :	Re.34,232	5,205,753	5,206,638		5,205,376	5,205,600	5,205,091
	5,204,995	5,205,768	5,206,641		5,205,386	5,205,667	5,205,108
	5,204,996	5,205,771	5,206,647		5,205,517	5,205,693	5,205,129
	5,205,000	5,205,803	5,206,657		5,205,638	5,205,697	5,205,152
	5,205,013	5,205,812	5,206,658		5,205,793	5,205,775	5,205,194
	5,205,054	5,205,824	5,206,672		5,205,884	5,205,822	5,205,198
	5,205,071	5,205,825	5,206,734		5,205,926	5,205,935	5,205,212
	5,205,076	5,205,832	5,206,747		5,206,013	5,205,943	5,205,215
	5,205,082	5,205,843	5,206,763		5,206,094	5,206,044	5,205,227
	5,205,117	5,205,852	5,206,775		5,206,137	5,206,097	5,205,259
	5,205,119	5,205,896	5,206,778		5,206,263	5,206,356	5,205,261
	5,205,122	5,205,917	5,206,782		5,206,335	5,206,410	5,205,328
	5,205,132	5,205,951	5,206,790		5,206,348	5,206,494	5,205,444
	5,205,149	5,205,958	5,206,794		5,206,360	5,206,576	5,205,476
	5,205,171	5,205,967	5,206,815		5,206,365	5,206,604	5,205,480
	5,205,177	5,205,968	5,206,819		5,206,366	5,206,633	5,205,509
	5,205,207	5,206,017	5,206,829		5,206,367	5,206,636	5,205,531
	5,205,224	5,206,024	5,206,836		5,206,485	5,206,697	5,205,538
	5,205,246	5,206,102	5,206,845		5,206,597	5,206,764	5,205,610
	5,205,268	5,206,117	5,206,862		5,206,613	5,206,821	5,205,631
	5,205,269	5,206,154	5,206,868		5,206,639	5,206,854	5,205,633
	5,205,270	5,206,161	5,206,870		5,206,776	5,206,855	5,205,696
	5,205,272	5,206,166	5,206,886		5,206,802	5,206,885	5,205,751
	5,205,294	5,206,184	5,206,889		5,206,894	5,206,933	5,205,758
	5,205,295	5,206,194	5,206,909		5,206,918	4,640,719	5,205,774
	5,205,296	5,206,248	5,206,916		5,206,949	13 : 5,205,408	5,205,776
	5,205,308	5,206,264	5,206,929	10 :	5,205,603	5,205,421	5,205,780
	5,205,318	5,206,270	5,206,932		5,206,036	5,205,434	5,205,811
	5,205,362	5,206,285	5,206,935		5,206,107	5,205,474	5,205,821
	5,205,365	5,206,344	5,206,947		5,206,135	5,205,478	5,205,823
	5,205,371	5,206,347	5,206,950		5,206,249	5,205,493	5,206,042

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